RCA VICTOR
SERVICE DATA

VOLUME V
1949

RADIO RECEIVERS

PHONOGRAPHS

TELEVISION

RADIO CORPORATION OF AMERICA
RCA Victor Division   Harrison, N. J., U. S. A.

RCA VICTOR

SERVICE DATA

"HIS MASTER'S VOICE"

- **TELEVISION RECEIVERS**
- **RADIO RECEIVERS**
- **PHONOGRAPHS**

This volume is a compilation of Service Data previously issued for the year 1949 with the latest changes and corrections.

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First Edition—First Printing

Printed in U. S. A.

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
HARRISON, N. J., U. S. A.

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RADIOS AND RECORD PLAYERS

RADIOS AND RECORD PLAYERS (Cont.)

TELEVISION

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1943-1948 SERVICE DATA LISTING

The Service Data listed below will be found in the 1943-1946 or in the 1947-1948 Bound Volumes of RCA Victor Service Data. Supplementary information is designated with an "S" as a prefix to the bound volume designation.

MODEL vs. RECORD CHANGER (1943 to 1949)

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QU61	960001-4
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Rad. 62-1	960260-2
65U, 65AU	960260-2
65U-1	960260-2
67V1, 67AV1	960260-1
QU68	960001-4
Rad. 75ZU	RP 178 or 960276
77U	RP 178
77V1	960260-1
77V2	960260-1
610V1	960001-5 or -6 or RP 177
610V2	960001-5 or -6 or RP 177
612V1	RP 176A or RP 176B
612V3	RP 176 or RP 178A
612V4	RP 176 or RP 176A
641TV	960001-1 or -6
648PV	RP 176
710V2	RP 177 or RP 177A
730TV1	RP 177 or RP 177A
730TV2	RP 177 or RP 177A
711V1	960001-5
711V2	960001-5
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Identification numbers beginning with R (RC, RS, etc.) are used with all radios and some television receivers. Identification numbers beginning with K (KCS, KRS, etc.) are used exclusively with television.

RADIO CHASSIS

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RK-117	711V1, 711V2, 711V3, R-F/I-F Chassis
RK-117A	641TV, 8TV41 Radio R-F/I-F Chassis
RK-121	612V1, 612V3, 612V4, R-F/I-F Chassis
RK-121A	648 PTK, 648PV Radio R-F/I-F Chassis
RK-121C	8V151, R-F/I-F Chassis
RK-135	8TR29, 8TK29 Radio Section
RK-135A	8TR29, 8TK29, 8TK320 Radio Section
RK-135C	9TW309 Radio Section
RC-315B	86T6
RC-315C	5Q1
RC-318	8M
RC-319	87K2, 87T2
RC-319B	U-106
RC-320	8M1
RC-320A	8M2
RC-321	8M3
RC-321A	8M4
RC-323	95T, 95T1
RC-325C	5Q2
RC-325D	5Q2X
RC-331	HF-8, HF-8A
RC-331A	HF-6
RC-331B	U-134, U-134A
RC-331C	U-132
RC-332	94X
RC-333	94BK, 94BT
RC-333A	94BT6
RC-333B	94BT1, 94BK1
RC-333C	94BT61
RC-335	911K
RC-335A	98K
RC-335B	99K
RC-335C	11Q4, 11QK
RC-335D	U-126, U-128
RC-335E	11QU
RC-335F	910KG
RC-335H	99T
RC-335K	U-129
RC-335KR	U-30
RC-336	8QB, 8QBK Tuner Unit
RC-337	8Q1 Tuner Unit
RC-337A	8Q4 Tuner Unit
RC-337B	10Q1 Tuner Unit
RC-338	12Q4, 12QK Tuner Unit
RC-338A	12QU Tuner Unit
RC-339	HF-1
RC-340	94X-1, 94X-2
RC-341	U-111
RC-341C	U-112
RC-345C	95X-1
RC-345D	95X
RC-345E	95XL
RC-345F	95XLW
RC-345H	U-104
RC-348	95T5
RC-348A	96T
RC-348C	96E
RC-348D	96T1
RC-348E	U-115
RC-348F	95T5LW
RC-348H	U-123 (1 band)
RC-348J	U-121
RC-348L	U-127E
RC-349	97X
RC-350	9X to 9X-4
RC-350A	9X-6, 9X-11 to 9X-14
RC-351	96K, 96T2
RC-351A	97E, 97KG, 97T
RC-351B	96K2, 96T3
RC-351C	U-124
RC-351D	U-122E
RC-351E	U-119
RC-351F	97K
RC-351K	97K2, 97T2
RC-351L	96E2, 96K5, 96K6, 96T7
RC-352	98EY, 98X, 98YG
RC-352A	97Y
RC-352B	UY-122E
RC-352C	UY-124
RC-352D	98T2
RC-354	U-130
RC-354A	HF-4
RC-354B	HF-2
RC-357	9M1
RC-357A	9M2
RC-357J	M-50
RC-357K	M-60
RC-366	5Q4
RC-381	95X-11
RC-381A	95X-6
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RC-386A	98K2, 98T
RC-386B	U-25, U-26
RC-390	94BK2, 94BT2
RC-392	96BK6, 96BT6 Tuner Unit
RC-394	M-70 Tuner Unit
RC-396	5Q5, 5Q55, 5Q56
RC-396B	5Q8
RC-396D	5Q12
RC-396E	5Q12A
RC-399	96T4, 96T5
RC-399A	96T6
RC-400	96X-1 to 96X-4
RC-400A	96X-11 to 96X-14
RC-401	9TX-1 to 9TX-5
RC-403	9TX-21, 9TX-22
RC-403A	9TX-23
RC-404A	U-8
RC-405	9TX-31
RC-405A	9TX-32
RC-405B	9TX-33
RC-405C	40X-30
RC-405D	40X-31
RC-406	5X5-W
RC-406A	5X5-1
RC-407	94BP-1 Series (94BP-61, -62, -64, -66, -80, -81)
RC-407B	94BP-1 (2nd Prod.) (94BP-61, -62, -64, -66)
RC-408	BT-40
RC-408A	BT-42
RC-408C	BK-42
RC-410	94BP4, -B, -C, -R
RC-414	6QU
RC-414A	6Q7
RC-414B	6Q8, 6QK8
RC-414C	U-50
RC-415	K-60
RC-415A	K-80
RC-415B	K-60 (Loop), K-62
RC-415C	K-80 (Loop), K-81, K-82
RC-415D	K-80 (Loop)
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RC-416A	T-80
RC-418	T-55, T-55-S, T-56
RC-418A	K-50
RC-418B	U-10
RC-421	U-123 (2 bands)
RC-425	T-60
RC-425A	U-12
RC-425D	T-62
RC-427	TRK-12 Radio Tuner Unit
RC-427A	TRK-9 Radio Tuner Unit
RC-427F	TRK-120 Radio Tuner Unit
RC-427G	TRK-90 Radio Tuner Unit
RC-429	TRK-5 Radio Tuner Unit
RC-435	9TX-50, 9TX-50M
RC-435A	45E, 45E-M, 45E-W
RC-436	40X-50 to 40X-57
RC-440	4QB
RC-440A	4QB4
RC-441	6Q1
RC-441A	6Q4
RC-442	6Q4X
RC-443	8Q2
RC-443B	8QU5-C, 8QU5-M
RC-444	9Q1
RC-444A	9QK
RC-449	BK-41, BT-41
RC-453	40X-52, 40X-55 (2nd Prod.)
RC-454	9TX-50, 9TX-50M (2nd Prod.)
RC-455	BP-55, -56, -85
RC-456	46X-11, 46X-12
RC-456A	46X-13
RC-457	45X-1, 45X-2
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RC-457E	45X-3, 45X-4
RC-459	45X-11, 45X-12
RC-459A	45X-13
RC-459B	46X-1, 46X-2
RC-459C	46X-3
RC-459D	45X-11, 45X-12 (2nd Prod.)
RC-459E	45X-13 (2nd Prod.)
RC-459F	46X-1, 46X-2 (2nd Prod.)
RC-459H	46X-3 (2nd Prod.)
RC-459J	45X-111, 45X-112, Radiola 510
RC-459K	45X-113
RC-459L	45X
RC-459M	45X-16, 45X-17
RC-459T	45X-11, 45X-12 (3rd Prod.)
RC-461	46X-24
RC-461A	46X-23
RC-461B	46X-21
RC-462	15X
RC-462A	16X-1, 16X-2, 36X
RC-462B	16X-3
RC-462C	16X-4
RC-464	Radiola 500, 501
RC-464A	Radiola 511
RC-464B	Radiola 512, 513
RC-465	Radiola P-5
RC-465A	Radiola P-5
RC-472F	T-63
RC-473A	X-55
RC-474D	X-60
RC-476	K-105
RC-477	5Q5 (2nd Prod.), Q18
RC-477A	5Q6
RC-477B	5Q8 (2nd Prod.)
RC-477C	5Q66
RC-478	9Q4
RC-478A	7Q4
RC-478B	7QK4
RC-482B	U-9
RC-482C	U-9 (2nd Prod.)
RC-486B	U-44 Tuner Unit
RC-486C	U-45 Tuner Unit
RC-490	96X-5
RC-496	7QB, 7QBK Tuner Unit
RC-497	K-50 (2nd Prod.)
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RC-501A	K-130 Tuner Unit
RC-502	7Q4X
RC-507	Q22, Q22A, Q32, Q121 (EM)
RC-507A	Q25
RC-507B	QK23
RC-507C	QU2C
RC-507D	QU2M
RC-507F	QU3C
RC-507H	QU3M
RC-507J	Q26
RC-507K	Q27
RC-507L	QU52C
RC-507N	QU52M
RC-507U	Q121 (PM)
RC-508	Q24
RC-509	16T4
RC-509A	16T3
RC-509B	16T2
RC-509C	16K
RC-509F	16T4 (2nd Prod.)
RC-509H	16T3 (2nd Prod.)
RC-509J	16T2 (2nd Prod.)
RC-511	18T
RC-512	17K
RC-512A	19K
RC-513	110K, 110K2
RC-513A	111K
RC-514	Q20, Q21
RC-517	V-100
RC-517C	V-105
RC-517F	Radiola R-560P
RC-517H	V-135
RC-517J	Radiola R-566P
RC-518	V-300 Tuner Unit
RC-518A	V-301, V-302 Tuner Unit
RC-519	V-200
RC-521	V-205
RC-521B	V-405
RC-522	V-201
RC-523	V-170
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RC-525A	14BT-2
RC-525B	14BK
RC-526	15BT
RC-527	15BP-1, -2, -4, -6
RC-527A	15BP-3, -5
RC-527C	15BP-7
RC-527D	25BP
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RC-529A	QB1, QB11, QB12 Tuner Unit
RC-529D	QB6
RC-529H	QB9 Tuner Unit
RC-530	QU5 Tuner Unit
RC-531	Q44
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RC-539	Q33
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RC-544	BP-10
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RC-555	VHR-307 Tuner Unit
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RC-561	Q-16
RC-561A	Q-17
RC-561C	Q-16E
RC-563A	QB5, QB55
RC-563B	Q12
RC-563C	Q12
RC-563D	Q12
RC-563E	Q11
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RC-563K	QB55X
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RC-566A	QU56C, QU56M
RC-566B	Q14E, Q15E
RC-567	27K
RC-568	QU51C, QU51M
RC-568A	QU55
RC-568B	QU61
RC-569	28T
RC-570	29K
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RC-570D	29K2 (2nd Prod.)
RC-571	211K
RC-572A	V-140
RC-573	V-209
RC-573A	V-210
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RC-589	54B1
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RC-589B	54B3
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RC-589U	54B1 2nd Prod.
RC-589UA	54B2 2nd Prod.
RC-589UB	54B3 2nd Prod.
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RC-616B	8TV321 Radio Section
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RC-616H	8V91 2nd Prod.
RC-616J	8TV321 2nd Prod. Radio Section
RC-616K	8TV323 2nd Prod. Radio Section
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RC-1003B	Radiola 510 (2nd Prod.), 511 (2nd Prod.)
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RC-1004D	Radiola B-52
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RC-1004F	24BT1, 24BT2
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RC-1011A	56X, 56X2, 56X3, Radiola 61-1, 61-2, 61-3 2nd Prod.
RC-1011B	56X, 56X2, 56X3, Radiola 61-1, 61-2, 61-3 3rd Prod.
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RC-1017A	65U, 65AU, 65U-1, Radiola 62-1
RC-1017B	65U, 65AU (50 cycle)
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RC-1020B	Radiola P-5 (2nd Prod.)
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RC-1023C	Radiola 61-10 2nd Prod.
RC-1034	65X1, 65X2, 65X8, 65X9, Radiola 61-8, 61-9
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RC-1038	66X1, 66X2
RC-1038A	66X3, 66X7, 66X8, 66X9
RC-1040	66BX (3Q4 output)
RC-1040A	66BX (3V4 output)
RC-1040B	66BX (Selenium rect.)
RC-1040C	8BX6, 8BX65
RC-1040D	8BX6 2nd Prod.
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RC-1044A	Q103X, Q103AX, Q103X-2, Q103AX-2
RC-1045	65BR9, Radiola R65BR9
RC-1046	66X12
RC-1046A	66X11
RC-1046B	66X13
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RC-1046D	66X12 2nd Prod.
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RC-1053B	5Q21 2nd Prod. (234 v.)
RC-1054	5Q31
RC-1054A	6Q33
RC-1054B	6Q33X
RC-1054C	6QU3
RC-1054D	6QV3
RC-1054E	5Q31X
RC-1055	7Q51 (PM)
RC-1055C	7Q51 (EM)
RC-1055D	7Q51X
RC-1057A	77U
RC-1057B	9Y7
RC-1058	Radiola 76ZX11, 76ZX12
RC-1058A	Radiola 76ZX11, 76ZX12 2nd Prod.
RC-1059	8BX5, 8BX54, 8BX55
RC-1059A	8BX5, 8BX54, 8BX55 2nd Prod.
RC-1059B	9BX5
RC-1059C	9BX5 2nd Prod.
RC-1060	8R71, 8R74, 8R75
RC-1060A	8R72, 8R76
RC-1061	8X681, 8X682
RC-1063A	Radiola 75ZU
RC-1063B	Radiola 75ZU 2nd Prod.
RC-1064	65X1, 65X2, Radiola 61-8, 61-9 2nd Prod., 8X53
RC-1065	8X541, 8X544, 8X545
RC-1065A	8X542, 8X546, 8X547
RC-1065B	8X541, 8X544, 8X545 2nd Prod.
RC-1065C	8X542, 8X546, 8X547 2nd Prod.
RC-1065F	8X541, 8X544, 8X545 3rd Prod.
RC-1065H	8X542, 8X546, 8X547 3rd Prod.
RC-1065J	8X541 4th Prod.
RC-1065K	8X542, 8X547 4th Prod.
RC-1065L	8X541 5th Prod.
RC-1065M	8X542, 8X547 5th Prod.
RC-1066	8X521
RC-1066A	8X522
RC-1067	6QP3
RC-1068	9BX56
RC-1069	8B41
RC-1069A	8B42
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RC-1071	4QB3
RC-1071A	4QB3X
RC-1072	5QA5
RC-1077	9Y51
RC-1079	9X571
RC-1079A	9X572
RC-1079B	9X561
RC-1079C	9X562
RC-1079D	9W51
RC-1079E	9X571 2nd Prod.
RC-1079F	9X572 2nd Prod.
RC-1080	9X641
RC-1080A	9X642
RC-1084A	9W78
RC-1085	9X651
RC-1085A	9X652

TELEVISION CHASSIS

Chassis No.	Model
KC-3	TT-5
KC-3A	TRK-5 TV Chassis
KC-3B	TT-5 (50 cy.)
KC-3C	TRK-5 (50 cy.) TV Chassis
KC-4	TRK-12 TV Tuner
KC-4A	TRK-9 TV Tuner
KC-4B	TRK-12 (50 cy.) TV Tuner
KC-4C	TRK-9 (50 cy.) TV Tuner
KC-4F	TRK-120 TV Tuner
KC-4H	TRK-90 TV Tuner
KC-4J	TRK-120 (50 cy.) TV Tuner
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KCS-20B	630TCS
KCS-20C	630TS (50 cy.)
KCS-20D	630TCS (50 cy.)
KCS-20J	8TS30
KCS-20K	8TS30 (50 cy.)
KCS-21	621TS
KCS-24	648PTK TV R-F/I-F Chassis
KCS-24A	648PV TV R-F/I-F Chassis
KCS-24B	741PCS, 8PCS41 R-F/I-F Chassis
KCS-24C	8PCS41, 9PC41 R-F/I-F Chassis
KCS-24D	9PC41 R-F/I-F Chassis
KCS-25A	641TV TV Chassis
KCS-25C	641TV (50 cy.) TV Chassis
KCS-25D	8TV41 TV Chassis
KCS-25E	8TV41 (50 cy.) TV Chassis
KCS-26-1	721TS
KCS-26-2	721TS (50 cy.)
KCS-26A-1	721TCS
KCS-26A-2	721TCS (50 cy.)
KCS-27-1	730TV1, 730TV2 TV Chassis
KCS-27-2	730TV1, 730TV2 (50 cy.) TV Chassis
KCS-28	8T241, 8T243, 8T244, 9T240
KCS-28A	9T240
KCS-28B	9TC240
KCS-28C	9T246
KCS-29	8T270, 9T270
KCS-29A	8TC270, 8TC271
KCS-29C	9TC272, 9TC275
KCS-30	8TV321, 8TV323, 9TW333 TV Chassis
KCS-31	9TW390 TV Chassis
KCS-32	8TR29
KCS-32A	8TK29
KCS-32B	8TR29
KCS-32C	8TK29
KCS-33A	8TK320
KCS-34	9TC247, 9TC249
KCS-34B	9TC245, 9TC247, 9TC249
KCS-38	9T246
KCS-38C	9T256
KCS-41	9TW309
KK-7	TRK-12 TV Power Unit
KK-7A	TRK-9 TV Power Unit
KK-7D	TRK-12 (50 cy.) TV Power Unit
KK-7E	TRK-9 (50 cy.) TV Power Unit
KK-7F	TRK-120 TV Power Unit
KK-7J	TRK-90 TV Power Unit
KK-7H	TRK-120 (50 cy.) TV Power Unit
KRS-20	648PTK, 648PV Horiz. Defl. Chassis
KRS-20A	741PCS, 8PCS41 Horiz. Defl. Chassis
KRS-20B	8PCS41, 9PC41 Horiz. Defl. Chassis
KRS-21	648PTK, 648PV TV Power Supply
KRS-21A	741PCS, 8PCS41, 9PC41, TV Power Supply

AUDIO AMP. AND POWER UNITS

Chassis No.	Model
RA-79	9EY31, 9EY32
RS-83-1	PSU-8A
RS-83-2	PSU-8B
RS-83-3	PSU-8C
RS-83A-1	PSU-10A
RS-83A-2	PSU-10B
RS-83A-3	PSU-10C
RS-83C	CV-110 Electrifier
RS-83E	TRK-9, TRK-12, TRK-90, TRK-120 Radio Power Unit
RS-84	R-91
RS-85	PSU-8E
RS-85A	PSU-10E
RS-86	R-89
RS-89	CV-9X Electrifier
RS-89A	TRK-5 Radio Power Unit
RS-89B	U-42 Power Unit
RS-90	VA-21
RS-91A	O-50
RS-91B	R-60
RS-92	M-70 Power Unit
RS-94A	OSC-22
RS-95	CV-111 Electrifier
RS-98	CV-40 Electrifier
RS-102A	U-44 Power Unit
RS-102B	U-46 Power Unit
RS-102C	K-130 Power Unit
RS-102D	U-45 Power Unit
RS-102E	V-300, V-301, V-302 Power Unit
RS-110	QU5 Power Unit
RS-111	CV-112 Electrifier
RS-111A	CV-112X Electrifier
RS-112	QU8 Power Unit
RS-112A	QU7 Power Unit
RS-114A	VHR-307 Power Unit
RS-115	QB1, QB11, QB12, QB13, 6V. Power Unit
RS-115B	QB9 Power Unit
RS-119	R-56
RS-123	612V1, 612V3, 612V4, 711V1, 711V2, 711V3 Audio Amp. & Power Supply
RS-123A	641TV, 648PTK, 8TV41 Audio Amp. & Power Supply
RS-123B	648PV Audio Amp. & Power Supply
RS-123C	741PCS, 8PCS41, 9PC41 Audio Amp. & Power Supply
RS-123D	8V151 Audio Amp. & Power Supply
RS-126	66E, 66ED, 66E-1
RS-127	63E, 63EM
RS-132	9EY3, 9EY3M, 9EY35, 9EY36
RS-132A	9EY35, 9EY36
RS-1000	CV-42 Electrifier
RS-1001	CV-45 Electrifier

7 REASONS WHY. . . .

1 YOU CASH IN ON RCA'S REPUTATION

When you display the RCA emblem in your window or within your shop, you gain immediate recognition from your customers. They recognize RCA as "World leader in radio . . . first in television."

2 YOU'RE POSITIVE OF RCA'S QUALITY AND ACCURACY

When you service an RCA Victor home instrument with RCA tubes or components, you're *sure* that they're right. They are identical twins of the tubes and parts originally used, and may have actually been manufactured at the same time. All the engineered quality and high standards of the original parts are exactly duplicated, electrically and mechanically.

3 YOU BUILD A LOCAL NAME AS AN RCA SERVICE DEALER

RCA cartons in your shop identify you in your neighborhood as a source for genuine RCA tubes and components, and for genuine RCA Victor replacement parts. Customers will count on you to return their RCA Victor instruments to their *original* high performance standards.

4 YOU PROTECT YOUR REPUTATION

When something goes wrong with a set you service, your customer places the blame squarely with you, not the distributor or the manufacturer of the "almost as good" part you installed. Every call-back means lost time and money, and a dissatisfied customer rarely returns. You *protect* your reputation when you use genuine RCA quality parts. You make more than a sale . . . you win a customer, who will learn to depend upon you for all his service needs.

5 YOU ARE ENABLED TO SERVICE ANY RCA VICTOR SET

RCA stocks over 40,000 different parts. The majority of replacement parts for RCA Victor instruments are maintained in stock for at least 10 years. Thus, you're sure of obtaining genuine RCA parts to fit RCA Victor instruments.

6 YOU ORDER RCA PARTS WITH SPEED AND EASE

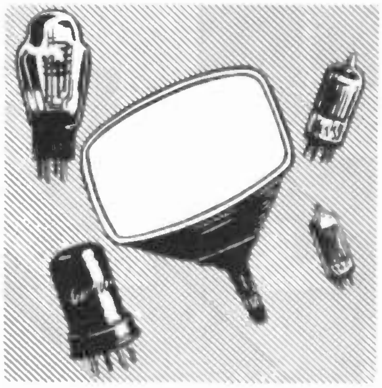
Your RCA distributor carries an adequate supply of RCA parts, or he can obtain them promptly from RCA's conveniently located warehouses. Factory availability means that you can repair RCA Victor Instruments old and new, with a minimum of effort, and with the assurance that original performance standards will be duplicated.

7 RCA LEADS THE WAY.. IN RESEARCH AND PERFORMANCE

At RCA's famed laboratories in Princeton, N. J., intensive research and analysis result in continuous technical advances in electronics. The benefits of the advances are passed along to you in new and improved products.

RCA **For The Complete Line of RCA Product**

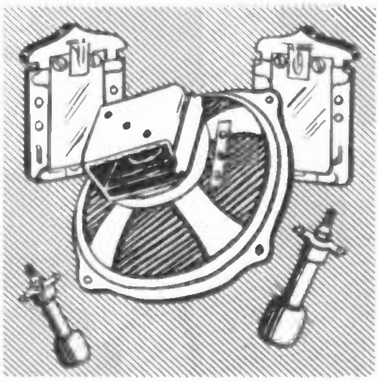
. . You Lead The Way With RCA



. . . IN RECEIVING TUBES AND KINESCOPES

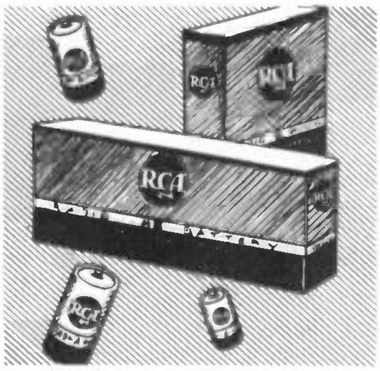
RCA Electron Tubes and Kinescopes are produced under superior quality controls . . . tested and re-tested before they are released. The RCA brand on any tube is your assurance that it is the exact twin of the tube used in the original RCA Victor instrument.

The RCA brand has top consumer preference. Point out the RCA emblem and you quickly gain the confidence and acceptance of your trade. Today, more than ever before, dependable quality is a primary requirement for electron tubes in every application—television, AM, FM, communications and industry. Identify yourself with the leader in the field . . . RCA.



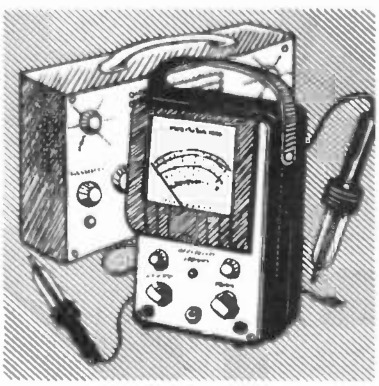
. . . IN ELECTRONIC COMPONENTS AND SERVICE PARTS

RCA electronic components are scientifically designed and ruggedly constructed to meet your replacement needs. Each component is the result of RCA's pioneering work in the field of electronics, and is built to actual set-tested designs. Developed by famed electronic engineers, RCA components and service parts are designed specifically to work with the tubes and circuits used in the top electronic instruments in the field. You can always depend upon RCA parts, engineered by America's leading manufacturer of electronic components—RCA.



. . . IN BATTERIES

RCA provides a complete line of highest quality dry batteries – radio-engineered for extra hours of dependable service. RCA is "The *Radio Battery* for the *Radio Trade*." You're sure of an adequate supply when you need it, because RCA production is geared to coincide with peak seasonal demands. RCA Batteries cover 99% of radio battery demand. The standard flashlight dry cell is sealed-in-steel, to keep it fresh on your shelves, virtually leakproof and moisture-proof. Every cell is aged and individually tested. Exacting laboratory tests prove that RCA Batteries exceed the average of competitive brands. For long life and peak performance, insist upon RCA batteries.



. . . IN TEST EQUIPMENT

More than anything else, the test equipment in the serviceman's shop is the key to his future and his reputation. Any compromise with quality can mean the difference between accurate, dependable analysis, and constant call backs with consequent loss of time, money, and reputation. Test equipment provides the serviceman with a standard upon which he bases all his decisions. That's why the quality of his test equipment must be superior.

RCA Test Equipment is the standard of dependability used in the manufacture of all RCA Victor Home Instruments, where quality and accuracy are the keynote. The RCA equipment you use to test a receiver is very often the very same equipment used to manufacture that receiver. That's why you can depend upon RCA test equipment.

Accurate, dependable, versatile, economical, attractive . . . these are the qualities that make RCA Test Equipment the best your money can buy.

. . . See Your Local RCA Distributor

RCA

TELEVISION SUPPLEMENTARY INFORMATION

APPROVED PM ION TRAP MAGNETS FOR RCA TELEVISION RECEIVERS

When ordering PM Ion Trap Magnets for RCA Victor TV receivers, use the stock numbers shown in the Service Data for the model in question and as repeated below:—

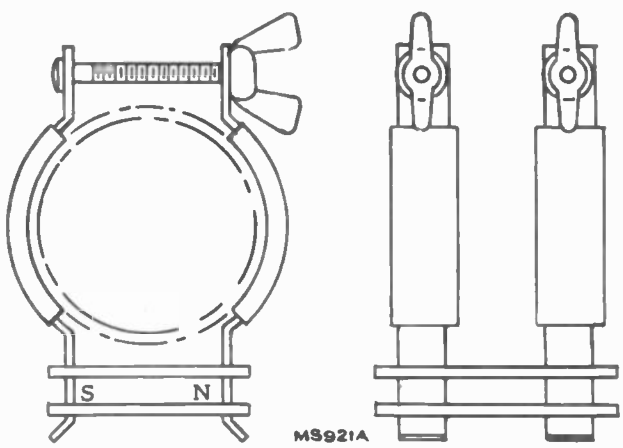
For receivers employing a 10BP4 Kinescope, order Stock No. 73301.

For receivers employing a 12LP4 Kinescope, order Stock No. 74823.

For receivers employing a 16AP4 Kinescope, order Stock No. 74148.

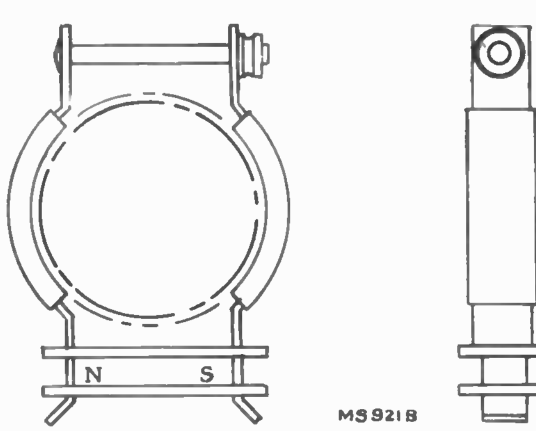
For receivers employing a 16GP4 Kinescope, order Stock No. 74953.

The following illustrated ion trap magnets have been approved for use in RCA Victor Television Receivers, and at various times all have been employed in production.



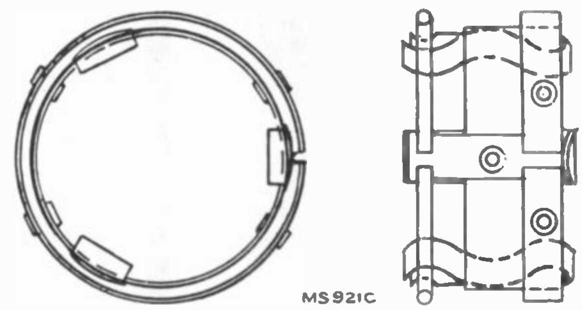
Ion Trap Magnet (Heppner Type 7078)

This magnet is approved for use in 10" and 12" receivers. In production, if ordered for 10" receivers, it is stamped 985587-1, and if ordered for 12" receivers, it is marked 987069-1.



Ion Trap Magnet (Heppner Type 4)

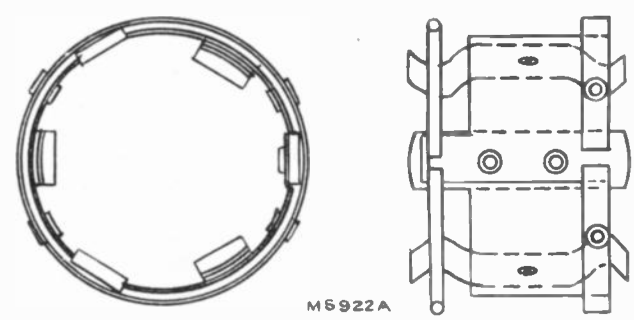
This magnet is approved for use in 10" receivers only. In production it is stamped 985587-1.



Ion Trap Magnet (Clarostat TV-1 Special)

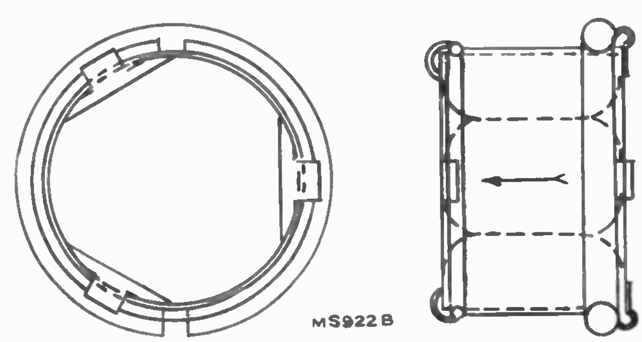
This magnet is approved for use in 10" and 12" and long neck 16" receivers.

In production, if ordered for 10" receivers, it is marked 985587-1, for 12" receivers, it is marked 987069-1, and for long neck 16" receivers, it is marked 986432-1.



Ion Trap Magnet (Clarostat TV-1)

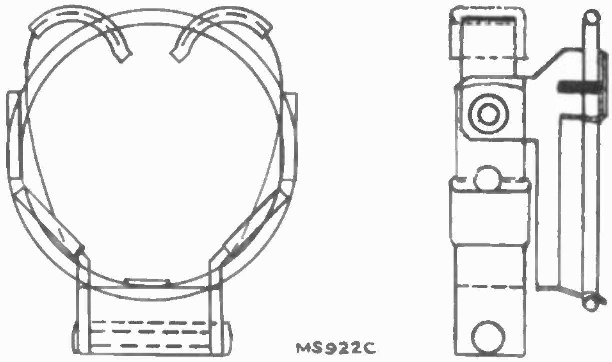
This magnet is approved for use in 10" and 12" receivers. In production, if ordered for 10" receivers, it is marked 985587-1, and for 12" receivers, it is marked 987069-1.



Ion Trap Magnet (RCA type 203D3)

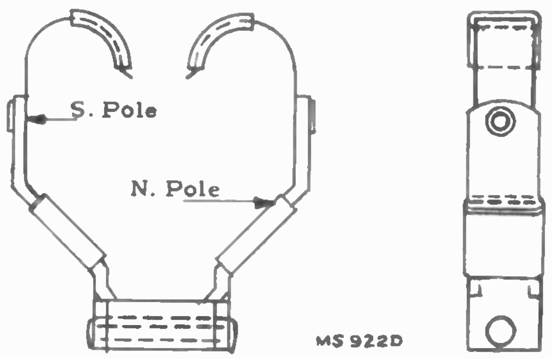
This magnet is approved for use in 10", 12" and long neck 16" receivers.

In production, if ordered for 10" receivers, it is marked 985587-1, and for 12" receivers, it is marked 987069-1, and for long neck 16" receivers, it is marked 986432-1.



Ion Trap Magnet (Clarostat TV-3 or TV-3S)

TV-3S is approved for use in 12" receivers, and is stamped 987069-1. TV-3 is approved for use in long neck 16" receivers and is stamped 986432-1.



Ion Trap Magnet (Clarostat TV-2A or TV-2S)

TV-2A flux density across the magnet is 306 ± 3 gauss. In production it is stamped 985587-1 and is approved for use in 10" receivers.

TV-2S flux density across the magnet is 55 ± 3 gauss. In production it is stamped 987094-1 and is approved for use in short neck 16" receivers.

Clarostat magnets type TV-2A and TV-2S are identical in appearance and can be identified only by number or by comparison of magnet strengths.

BARKHAUSEN OSCILLATION

The usual effects of Barkhausen oscillation make themselves evident by producing one or more dark, sharply defined vertical lines on the left side of the picture or raster. These lines vary in width and/or intensity from one channel to another and from one brightness level to another. They are usually more apparent on the higher frequency channels and at low brightness settings. In the worst cases, these oscillations tend to upset horizontal synchronization. In the mild cases, they usually annoy the customer more than they do the set.

The only tube in the set that could cause this interference is the 6BG6G since it is the only one that has a positive grid to plate potential at any time. The critical voltages are reached just about the time the tube calls for deflection of the beam to the right hand side of the raster. This happens when the spot is about one third the way across horizontally.

Following are a few solutions to the problem:

1. Change the drive control setting.
2. Replace the 6BG6G with another. (The tube being replaced will probably operate satisfactorily in some other chassis.)
3. Change antenna or antenna lead-in placement.

The first method is critical with respect to line voltage and should be adjusted to give satisfactory operation on all available channels at any line voltage encountered.

The installations using either a built-in antenna or an indoor antenna are often subject to an undue amount of pickup because of their location. The lead-in, if draped near the high voltage compartment can also cause trouble. The solution for this type of trouble is obvious.

EM-PM FOCUS COIL TROUBLES

In some cases, trouble has been experienced with EM-PM focus coils. These difficulties show up as inability to reach focus with the focus control.

If everything is operating properly, the overall focus and focus regulation is much better with the new coil than with the straight EM type.

The troubles with the PM-EM coil can be summarized as being one or more of the following:—

1. Incorrect placement of the coil on the kine' neck.
2. Too much PM.
3. Too little PM.
4. Polarity of the EM winding reversed in color code and/or hookup.

The normal placement of the coil is with the front plane of the coil approximately one quarter of an inch behind the back cover of the yoke. Moving the coil back on the kine' will, in effect, be the same as reducing the total flux of the coil. Some cases of too much PM can be thus corrected. In a few such cases, the correct focus was obtained at the sacrifice of loading spring tension. It is suggested that washers be used to bush up the springs if they are too loose when the correct focus is obtained. Under no circumstances should the EM portion of the coil be reversed to compensate for too much PM. Doing this will eventually run the PM down to zero and make the coil useless along with producing a service call every week or so.

(It may appear that an "aiding" flux might gradually increase the PM flux. Such is not the case because the PM material is magnetized to a greater density than the EM portion).

Polarity may be checked by the following method:

1. Get as good a focus as possible with the coil up against the yoke. Note the voltage across the EM winding.
2. Move the coil as far to the rear as possible and turn the focus control so that Condition 2 approximates Condition 1 in appearance. Note the voltage across the EM winding. The voltage across the EM winding should be higher in Condition 2 than in Condition 1.

(The effects of magnetism are minimized as the coil is moved to the rear so that more magnetism must be supplied.

If Condition 2 reading is lower, or if no satisfactory comparison can be obtained by adjustment, then the EM winding is reversed and should be reconnected in the proper way.

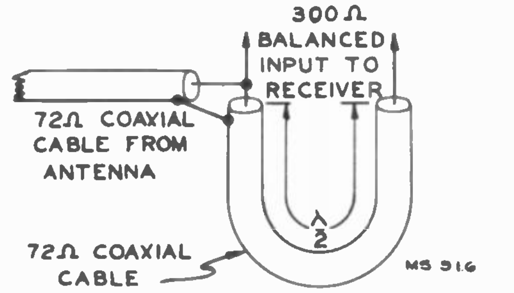
A tag should be attached to the set to indicate a change if the color code is incorrect so that some future serviceman knows what has been done.

If position and polarity have been checked and it is discovered that there is too little PM, the entire coil must be replaced. The 6BG6 supply should not be reconnected to add to the focus current because it overloads the coil and the shunt potentiometer.

On some sets it will be found that by shorting the 10 ohm resistor, enough control is obtained. This should not be done since the focus potentiometer would be overloaded if the arm is set near the short circuit end. Moving the coil toward the rear will solve a problem of this type and still permit good focus with the 10 ohm resistor in the circuit.

CO-AX MATCHING NETWORK

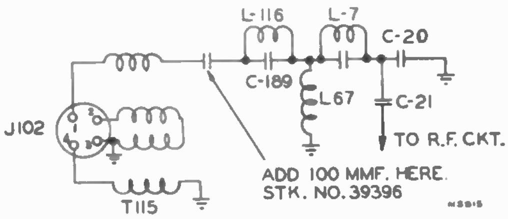
In some locations it may be necessary to use 72 ohm co-ax transmission line between antenna and receiver because of reflection or interference pick-up. Current line receivers are provided with a 72 ohm co-ax input in addition to the usual 300 ohm input. Early receivers employing KRK-2 series r-f units are provided only with 300 ohm balanced input. To connect the co-ax to these early receivers, construct a network as shown below. The matching section should be one electrical half wave-length long for the picture carrier of the weakest signal received.



Co-Ax to Balanced Line Matching Network

BROADCAST INTERFERENCE IN KRK5 AND KRK7 R-F UNITS

In some cases where a television receiver is in operation on a weak signal but near a strong AM station, interference has been experienced. To cure, insert a 100 mmf. capacitor between the high side of T115 and L116, as shown below.



Partial Schematic of R-F Unit

In severe cases of BC interference, it is recommended that a coil such as L80 in KRK-2 r-f units be inserted from terminal #1 of J102 to ground.

ALIGNMENT HINT FOR R-F UNITS

During alignment of the r-f unit, it is often advantageous to have a sweep width of 15 mc. or more when adjusting the high channels. This permits seeing the entire skirts of the curve and makes it easier to see the effects of the various adjustments. When using RCA type WR59A sweep generator, additional sweep width may be obtained by removing the sweep case back and shorting out resistors R14 and R16. After this, the front panel sweep width control still operates as before, except that more sweep width is available on the high channels.

The WR59A should be turned ON and OFF by means of the front panel control. If the sweep was turned off by disconnecting the power plug or by means of a bench master switch, but the sweep power switch was left on and in the maximum sweep width position, then the sweep modulator may overshoot and hit stationary parts when the power is reapplied.

I-F HARMONIC INTERFERENCE

This interference has appeared in a number of television receivers. The following discussion applies specifically to Models 9T270, 9T246, and 9TC245 series and in general to other models using KRK5 series or KRK7 R-F units

Although all the affected receivers employ KRK5 or KRK7 R-F units, the interference is not the fault of the R-F unit.

Sound I-F Interference:

In some instances harmonics created in the sound i-f find their way back into the receiver input circuits and create interference. The sound i-f third harmonic falls into channel 3, the fourth harmonic falls into channel 6, the ninth harmonic falls into channel 9 and the tenth harmonic falls into channel 13. These may be identified by removing the second sound i-f tube to see if the interference disappears. If it does, then the harmonics are created in the sound i-f stage or in the discriminator. The following information may be helpful in eliminating or reducing such interference.

The ground wire running from pin #2 of the second i-f socket, which runs approximately an inch and a half to a lance towards the rear of the chassis, should be dressed away from pin #1 of this socket, and as far as possible towards Terminal B of T112. This will cause the wire to run a curve rather than a straight line and may require a slight lengthening of the ground lead.

Carefully check the i-f and discriminator transformer shield cans and wiring. The shield cans should be tight in place and well grounded to the chassis. In order to insure a good ground of these shield cans, it may be desirable to place some solder on the chassis where the can contacts the chassis so that the can may be pulled into the solder when clamped in place.

Carefully check the lead dress in the discriminator stage, particularly the leads connected to the discriminator transformer, making sure that they conform to all lead dress information contained in the service notes for the instrument involved.

Make sure that all by-pass capacitor leads in the sound i-f system are as short as possible and that the capacitor itself is dressed close to the chassis.

Make certain that the antenna lead-in from the terminal board on the rear of the cabinet to the r-f tuner input is dressed away from the chassis so as not to cause any unbalanced condition to the receiver input.

The normal discriminator wiring is from pin #1 of the 6AL5 to the tube socket shield, then to pin #6 and from pin #6 to ground. Disconnect the wire from ground to pin #6 and ground pin #1 separately with as short a lead as possible.

In some instruments now in production, a zinc discriminator shield can is being used. This can is soldered directly to the chassis.

Picture I-F Interference:

In some instances harmonics created in the picture i-f find their way back into the receiver input circuits and create interference in the picture. The interference takes the form of a beat pattern which varies with fine tuning adjustment. In general, the more sensitive the receiver, the more susceptible it is to this sort of interference.

With the 21.25 mc. sound i-f and 25.75 mc. pix i-f system currently in use, the third pix i-f harmonic falls into channel 5 and the eighth pix i-f harmonic falls into channel 12. If such interference is experienced, it may be reduced by the following steps:

Check the antenna transformer T115, also L67. Check the antenna transmission line for continuity. If any of the above are defective, the interference may be severe.

Shield the fourth picture i-f and video amplifier tubes.

Dress the antenna lead from the r-f unit to the cabinet terminal board as far from the chassis as possible.

The wire leading from L102 and T106 to R120 must lie tight on the chassis.

The 10 mmf. pix detector by-pass capacitor should be wired between terminal C of T106 and pin 7 of the V105 socket with the shortest possible lead lengths and should be dressed down close to the chassis and away from other wiring.

The peaking coil, L103, should lie not over 1/4 inch off the chassis with the shortest possible leads and should be dressed away from other wiring.

The 1500 mmf. by-pass capacitor C193 which goes from plus B to ground at the end of R118 must be in good condition.

The filters on the r-f unit bias and plus B supplies (C132, R112, C192, R214, etc.) must be in good condition.

A few receivers have been found to suffer harmonic interference due to a peculiar fault in the 1500 mmf. bypass capacitors. These capacitors check normal at all frequencies up to 150 mc. but exhibit a higher resistance above this point. Therefore, these capacitors will work satisfactorily in i-f positions but show up defective when used to by-pass high frequencies such as are found in the r-f unit or harmonics of the sound and picture i-f's. Therefore, in such cases it would be wise to check C7, C9, C13, C17, C18, C19, C125, C132, C176, C177, and C192.

A weak 12AU7 (V106) may aggravate the harmonic interference by causing a reduction of AGC voltage.

In general, it is easier from a design standpoint to eliminate low order sound harmonics from the sound circuit than harmonics of higher order from the r-f channels, such as the tenth, etc., since bypass capacitors and ground returns are more effective at the lower frequencies. Likewise, it is more difficult to bypass picture i-f harmonics than sound i-f harmonics, since the impedance of the picture circuits is relatively low compared to that of the sound circuits.

Receivers using BUILT-IN antennas, or having the transmission line draped around the cabinet, are more susceptible to this type of interference. During the installation of a television receiver, this type of interference can be reduced by obtaining as strong a signal from the antenna as possible, and adjusting the AGC control to supply a lower peak voltage to the detector. Thus a higher ratio between TV signal and the i-f harmonic is obtained.

As a last resort, the receiver may be aligned to different i-f frequencies. This has the effect of pushing the interference into other channels. The attached chart shows 5 different i-f frequencies and the interferences that might be encountered in each. Harmonics that fall more than 0.5 mc. below the picture carrier should not cause interference and hence are not listed.

RECEIVER I-F FREQUENCY	MAY HAVE INTERFERENCE ON CHANNEL	CAUSED BY	POSITION OF HARMONIC WITH RELATION TO STATION PIX CARRIER
20.75 mc Sound i-f 25.25 mc Pix i-f 19.25 mc Adj. Chan. Pix 26.75 mc Adj. Chan. Snd.	Channel 7 Channel 11 Channel 3 Channel 6 Channel 9 Channel 12	7th Pix i-f harmonic 8th Pix i-f harmonic 3rd Sound i-f harmonic 4th Sound i-f harmonic 9th Sound i-f harmonic 10th Sound i-f harmonic	1.5 mc above 2.75 mc above 1.0 mc above .25 mc below .50 mc below 2.25 mc above
21.25 mc Sound i-f 25.75 mc Pix i-f 19.75 mc Adj. Chan. Pix 27.25 mc Adj. Chan. Snd.	Channel 5 Channel 12 Channel 3 Channel 6 Channel 13	3rd Pix i-f harmonic 8th Pix i-f harmonic 3rd Sound i-f harmonic 4th Sound i-f harmonic 10th Sound i-f harmonic	0 mc. .75 mc above 2.5 mc above 1.75 mc above 1.25 mc above
21.75 mc Sound i-f 26.25 mc Pix i-f 20.25 mc Adj. Chan. Pix 27.75 mc Adj. Chan. Snd.	Channel 5 Channel 8 Channel 6 Channel 10	3rd Pix i-f harmonic 7th Pix i-f harmonic 4th Sound i-f harmonic 9th Sound i-f harmonic	1.5 mc above 2.5 mc above 3.75 mc above 2.5 mc above
21.9 mc Sound i-f 26.4 mc Pix i-f 20.4 mc Adj. Chan. Pix 27.9 mc Adj. Chan. Snd.	Channel 5 Channel 13 Channel 7	3rd Pix i-f harmonic 8th Pix i-f harmonic 8th Sound i-f harmonic	1.9 mc above .05 mc below .05 mc below
22.1 mc Sound i-f 26.6 mc Pix i-f 20.6 mc Adj. Chan. Pix 28.1 mc Adj. Chan. Snd.	Channel 5 Channel 13 Channel 7 Channel 11	3rd Pix i-f harmonic 8th Pix i-f harmonic 8th Sound i-f harmonic 9th Sound i-f harmonic	2.25 mc above 1.5 mc above 1.5 mc above .25 mc below

60 CYCLE BUZZ IN SOUND OF TELEVISION RECEIVERS

This interference appeared on 8T270, 9T270, 9T246 and 9TC245 series receivers when operated in strong signal areas.

There are several modifications which will cure this difficulty. These modifications are listed below.

RECEIVERS USING ALL 6AG5 TUBES IN PICTURE I-F:

1. Replace 6AG5 tube in first picture i-f with others until one is found to cure condition.
   (6AG5 tubes which have an abnormally sharp grid cut-off characteristic will cause a buzz in sound. A tube removed for this trouble is not necessarily defective, but can be used in either the 2nd or 4th picture i-f where fixed bias is applied.)
2. Ground test connection in r-f unit (R-13, 100K).
3. Check all filter capacitors in the AGC circuit for wrong connections and also see that they are in good working condition.

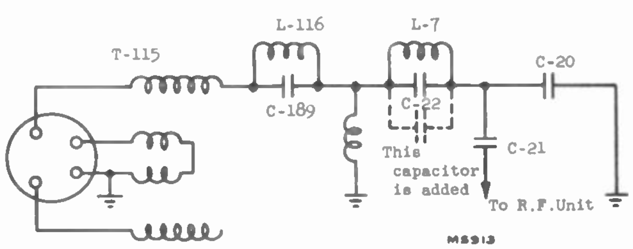
RECEIVERS USING 6BA6 TUBES IN 1ST & 3RD PICTURE I-F:

1. Change 3rd picture i-f tube bias. Disconnect R110-L117 and C113 from their present tie point (junction R135 and C190) and reconnect them to the adjacent tie point of the junction of C197 and R136.
   NOTE: A greater AGC control of the r-f stage and 1st picture i-f amplifier is obtained by this change.
   This change was made in production of the 1949 models and also is used in the current models.
   In fringe areas, a slight reduction in sound may be encountered with this bias change. However, picture sensitivity will not be affected.
   In order to improve sound and if no buzz is encountered the bias can be changed to the original point.
2. Ground test connection (R13, 100K) in r-f unit.
3. Change R136 from 6800 ohms to 10K.
4. Check all filter capacitors in AGC circuit for correct connection and also to see if they are in good working condition.

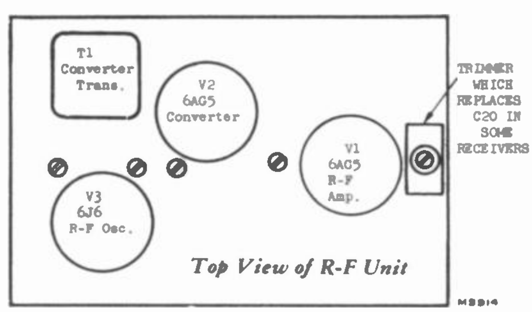
PRODUCTION CHANGES IN KRK5 AND KRK7 R-F UNITS

In some units a 1.5 mmf. capacitor has been added in parallel with C22 since that capacitor was running on the low capacity side of its tolerance and causing the high pass input filter to cut off at too high a frequency, thus putting a tilt in the channel 2 r-f response.

In some units, the capacitor C20 (18 mmf. ceramic) has been replaced by a small trimmer (7-35 mmf.) as shown in the illustration below. This capacitor was set at the factory at 18 mmf. and should not be adjusted in the field. If it is ever necessary to replace the trimmer, use the fixed ceramic capacitor specified in the replacement parts list.



R-F Unit High Pass Input Filter



Top View of R-F Unit

RADIO SUPPLEMENTARY INFORMATION

9JYM, 9EYM3

Change in Parts List:

MISCELLANEOUS

Change:

73549 Emblem—
to read:
73549 Emblem—"RCA Victor" emblem (metal)

Add:

*74674 Emblem—"RCA Victor" emblem (plastic)

The metal emblem is attached to the cabinet by bending the wire tabs.

The plastic emblem is attached to the cabinet either with cement or by pressing the ends of the protruding pins with a hot iron after installation.

The two types are not readily interchangeable.

WCC-9 Carrying Case for Model 9JY

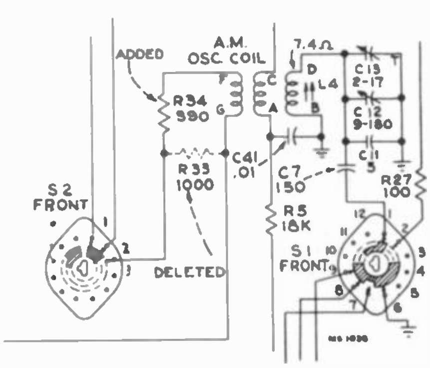
Replacement Parts:

Stock No.	Description
74906	Button—Reject button and shaft
74909	Catch—Spring slide catch
74674	Emblem—"RCA Victor" emblem
31051	Foot—Rubber foot (4 required)
74908	Handle—Carrying handle complete
74907	Hinge—Cabinet lid hinge (2 required)
74905	Knob—Volume control and power switch knob
14270	Spring—Retaining spring for knob
74910	Support—Lid support

8R71 (RC 1060)

Change in Oscillator Circuit:

In present production of this model the 1000 ohm resistor (R33) is removed from the oscillator circuit and a 390 ohm (R34) resistor is added. R33 was connected across terminals F and G of the "A" oscillator coil. R34 is connected in series between terminal F of the "A" oscillator coil and #3 of S2 front. The revised oscillator circuit is shown below.



Oscillator Circuit Revision—8R71

Change in Parts List:

CHASSIS ASSEMBLIES

Delete:

Resistor—Fixed, composition, 1000 ohms ±20%, ½ watt (R33)

Add:

Resistor—Fixed composition, 390 ohms ±10%, ½ watt (R34)

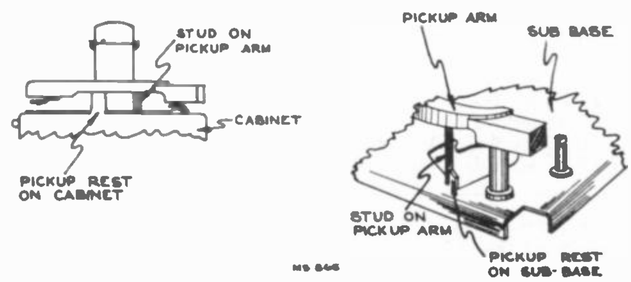
9JY Record Player Attachment

Change in Cabinet Design:

The original production of this instrument has a pickup arm rest as part of the molded plastic cabinet.

The present production uses a modified record changer which has a pickup arm rest on the metal sub-base. The cabinet being used does not have a pickup arm rest.

The stud on the pickup arm was originally of full diameter for its full length. On instruments having the rest on the sub-base the stud is either flat on one side or is of smaller diameter at the bottom end as illustrated below. If replacement of the cabinet, pickup arm or sub-base is required, the correct grouping of parts must be maintained as listed below.



Rest on Cabinet
Cabinet Stock No. Y2062
Pickup arm Stock No. 74041
Sub-base Stock No. 74070

Rest on Sub-base
Cabinet Stock No. Y2151
Pickup arm Stock No. 74824
Sub-base Stock No. 74743

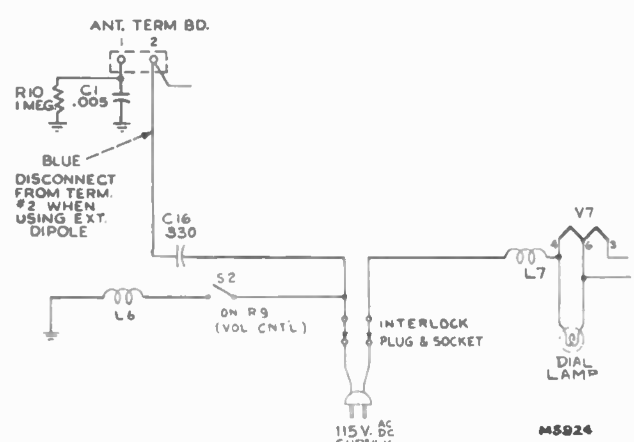
Pickup arm Stock No. 74824 may be used as a direct substitute for Stock No. 74041.

NOTE: The above pickup arm and sub-base Stock Nos. are correct only for instruments in which the record changer is RUBBER STAMPED or LABELLED RP 168-1, RP 168-3, RP 168B-1, or RP 168B-3. If the record changer is rubber stamped with any other designation—order by description.

8X71, 8X72 (RC 1070)

Oscillation on FM:

When either of these models is serviced, make certain that the power line antenna isolating capacitor is properly connected. If the capacitor C16 is connected to L7 instead of S2 it will cause oscillation on FM reception when using the power line antenna.



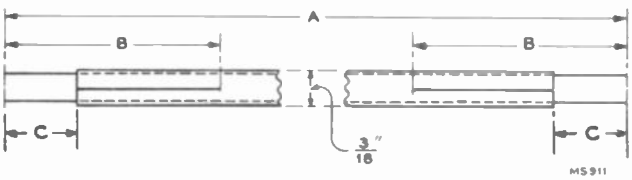
Models 8X71, 8X72—Connection of C16

9X641, 9X642 (RC 1080, RC 1080A)

Service Hint:

The capacitor C7 exists in the circuit due to the capacity between the two conductors of a piece of flat molded cable. The performance of these radios will be adversely affected if a different cable is used or if separate wires are used during service.

This cable has a capacitance of approximately 2 mmf. and is a short length of 150 ohm transmission line. The correct dimensions are illustrated below.



Models 9X641, 9X642—Transmission Line Used As Capacitor C7

A - - - 4 3/8"
B - - - 1 1/8"
C - - - - 3/8"

9X641, 9X642 (RC 1080, RC 1080A)

Change in Resistors:

Resistors R1 (i.f. cathode) and R4 (i.f. cathode) are listed in 9X641, 9X642 Service Data as 68 ohms each.

R1 is now 330 ohms and R4 is now 220 ohms (180 ohms in some chassis).

If any of these receivers having the 68 ohm resistors are found to be unstable, one or both of these resistors (R1 and R4) should be changed to the new values.

Capacitor Substitution:

In some chassis an .025 mf. capacitor has been substituted for the .02 mf. capacitor (C15).

8V91, 8V112

Substitute Speaker:

In some of the above instruments a substitute speaker (stamped 92569-5K) has been used in place of the specified speakers (stamped 92569-5W or 92569-1KX). The cone and voice coil assembly for 92569-5K speaker is available as Stock No. 75642.

MI-13174-1, MI-13174-3 Coin Operated Radio Receiver

Service Data:

This instrument uses a chassis identical to that used in the Radiola 61-10 (described in RCA Victor Service Data 1943-1946 bound volume). It is housed in a metal cabinet and equipped with a coin operated mechanism to control application of input power.

Replacement parts for the chassis and speaker are identical to those listed for Radiola 61-10. Miscellaneous parts are listed below.

Stock No.	Description
55063	Clamp—Dial clamp
55064	Dial—Glass dial scale
17397	Foot—Rubber foot for cabinet (4 required)
70414	Knob—Control knob
30900	Spring—Retaining spring for knob

Apply to your RCA distributor for prices of replacement parts.

The circuit diagram is identical to that given for Radiola 61-10 except for the input power supply as shown below.

INSTALLATION, ADJUSTMENT AND CLEANING OF SLUG REJECTORS

If copper slugs are accepted, loosen adjusting screw (at right center) and move gage approx. 1/64" towards the left, hold gage in position and tighten screw.

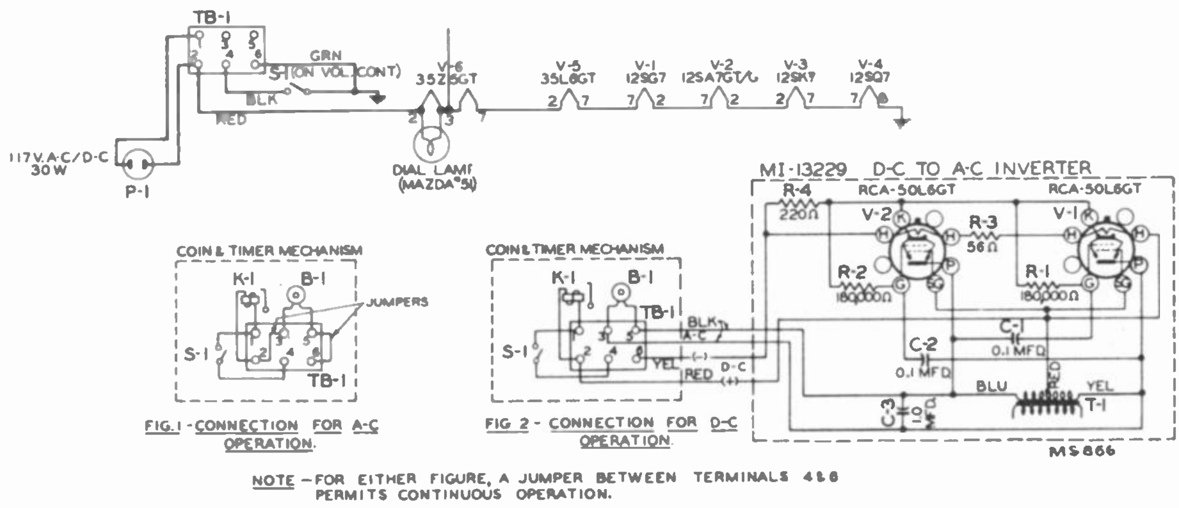
If genuine coins are rejected, loosen adjusting screw (at right center) and move gage approx. 1/64" towards the right, hold gage in position and tighten screw.

Best results are always attained when the slug rejector is mounted level in your machine. Should it become necessary to remove it from the cabinet, it must be handled on a clean bench, as the magnets will attract small iron or steel particles.

At no time should any part of it be oiled or greased. If any moving part does not operate as freely as desired, it is never a matter of lubrication, but rather of adjusting that particular part to its original shape, (for it might have accidentally been bent or distorted) or, more likely, a matter of cleaning it with a brush or cloth, using a little naphtha or alcohol.

Do not ever use files, sand paper or any other abrasives when cleaning the slug rejector.

Be sure your slug rejector is dry and clean at all times.



Power Supply Circuit—Coin Operated Radio

QB60 (RC 607)

Correction in Parts List:

CHASSIS ASSEMBLIES

Delete:

31518 Spring—

Add:

31418 Spring—Tension spring for pointer and drive cords

RK 137-1, RK 137-2 Ceramic Pickup Kits

Service Data:

These kits are intended for use in replacing the crystal pickup of certain instruments in areas where extreme temperature and humidity adversely affect the life of crystal pickups.

Each kit contains a small amplifier, required leads and plug adaptors, a ceramic pickup unit and necessary mounting hardware.

RK 137-1 is intended to replace the crystal pickup of Model QU72, 6QU3 or 6QV3. The amplifier power is obtained by wiring-in to the radio chassis.

RK 137-2 is intended to replace the crystal pickup of Model QU61, QU62, QU68, or 7QV5. The amplifier power is obtained by a plug-in adaptor inserted into one of the output tube sockets.

Replacement Parts:

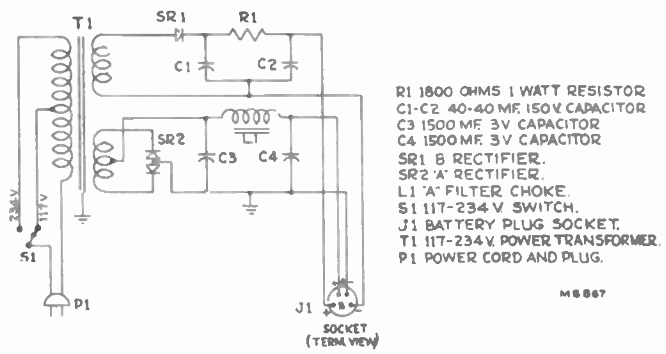
Stock No.	Description
	AMPLIFIER ASSEMBLIES
S-5513	Cable—Power cable and adaptor plug for RK 137-2 (plug-in type)
S-4856	Capacitor—Mica, 270 mmf. C6
S-5514	Capacitor—Tubular, .0018 mf., 600v. ..C3 of RK 137-1, C4
S-5469	Capacitor—Tubular, .0047 mf. 600v. ....C3 of RK 137-2
S-5515	Capacitor—Tubular, .0068 mf., 400v. C1
S-4444	Capacitor—Tubular, .01 mf., 400 v. C2
S-4634	Capacitor—Tubular, .1 mf., 400v. ....C5, C7 of RK 137-1
S-4579	Plug—Pin plug for output cable
	Fixed Composition Resistors
S-5485	4700 ohms, ½ watt ....R6 of RK 137-2
S-4621	15,000 ohms, ½ watt ....R6 of RK 137-1
S-4767	100,000 ohms, ½ watt ....R4 of RK 137-2
S-4639	150,000 ohms, ½ watt R1
S-4559	270,000 ohms, ½ watt ....R4 of RK 137-1
S-4476	470,000 ohms, ½ watt R5
S-5516	1 megohm, ½ watt R2
S-4562	2.2 megohm, ½ watt R7
S-5517	10 megohm, ½ watt R3
S-4480	Socket—Input socket
S-4742	Socket—Tube socket
S-5518	Transformer—Power transformer for RK 137-1 (wire-in type)
	MISCELLANEOUS
S-5519	Connector—Connector to connect pickup to pickup arm cable
S-5520	Pickup—Ceramic pickup complete for RK 137-1 (wire-in type)
S-5521	Pickup—Ceramic pickup complete for RK 137-2 (plug-in type)
S-5522	Plate—Mounting plate for pickup (used with 960001 record changer and Model QU72)
S-5523	Plate—Mounting plate for pickup (used with RP 178 record changer)

CV 120 Power Unit

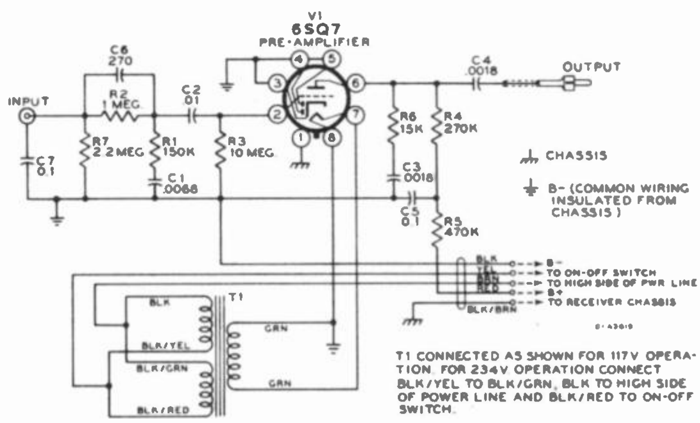
Service Data:

Model CV 120 is an a.c. power unit designed for use with battery operated radio receivers Model 4QB3 or 4QB3X.

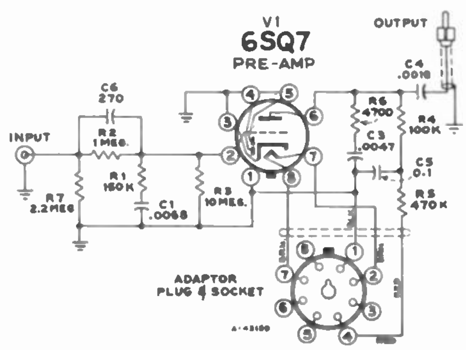
A switch on the unit permits operation from either a 105 to 125 volt or 210-250 volt 50 to 60 cycle power supply.



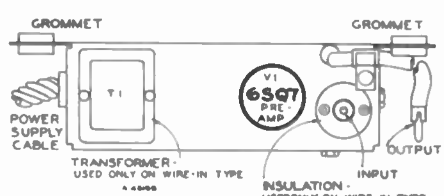
Schematic Diagram and Parts List—CV 120



Schematic Diagram RK 137-1



Schematic Diagram RK 137-2



Amplifier Top View RK 137

RCA VICTOR

Battery Operated Radio Receiver

MODELS 4QB3, 4QB3X

Chassis No. RC-1071 RC-1071A

— Mfr. No. 274 —

SERVICE DATA

— 1949 . . . . X3 —

RADIO CORPORATION OF AMERICA

RCA INTERNATIONAL DIVISION

745 FIFTH AVE., NEW YORK 22, N. Y.

Specifications

Tuning Ranges—Model 4QB3

Standard Broadcast ("A" Band) .... 535-1605 kc (560-187 m)
Medium Wave ("B" Band) .... 2.3-7 mc (131-42.8 m)
Short Wave ("C" Band) ....7-22 mc (42.8-13.7 m)

Tuning Ranges—Model 4QB3X

Long Wave ("X" Band) .... 150-380 kc (2000-789.5 m)
Standard Broadcast ("A" Band) .... 525-1605 kc (571-187 m)
Short Wave ("C" Band) .... 5.9-18 mc (50.8-16.6 m)

Intermediate Frequency .... 455 kc

Tube Complement

(1) RCA 1A7GT .... Converter
(2) RCA 1N5GT .... I.F. Amplifier
(3) RCA 1U5 .... Det.—A.F. Amp.—A.V.C.
(4) RCA 3Q5GT .... Output

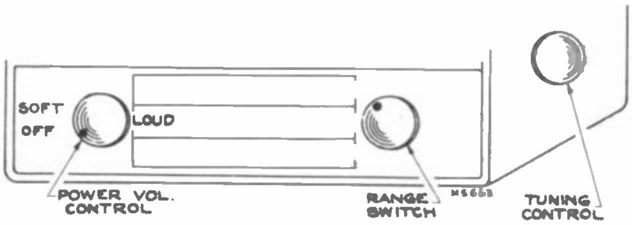
Battery Required .... One RCA VS022 or equivalent

("A" Battery .... 1.5 volts, 250 ma)
("B" Battery .... 90 volts, 11.7 ma)

An electrifier (Model CV-112X) may be used as a substitute for the battery when a 105-125 v. or 210-250 v. 50 to 60 cycle power supply is available.

CRITICAL LEAD DRESS

1. All oscillator plate leads to coils and range switch to be as short and direct as possible.
2. Keep green and white leads from volume control away from blue and red output transformer leads.
3. All leads from antenna coil (on top of chassis to range switch) to be dressed away from coil windings.
4. Capacitor C15 (connected to pin #4 of 1A7GT socket and pin #1 of 1N5GT socket) to be dressed against rear chassis apron.
5. Ground straps or braids to 1A7GT socket and tuning condenser to be looped to provide freedom of movement.



Location of Controls

Tuning Drive Ratio .... 18.1 (9 turns of knob)

Loudspeaker (92576-2)

Size and type .... 4"x6" PM dynamic
Voice coil impedance .... 3.2 ohms

Power Output

Maximum .... 0.45 watt Undistorted .... 0.20 watt

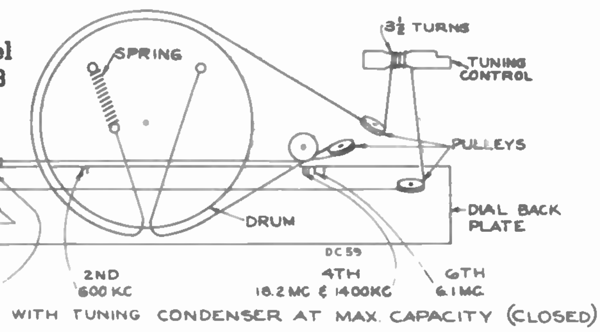
Cabinet Dimensions

Height	Width	Depth
9 in. (23 cm)	14⅝ in. (37 cm)	7¾ in. (19.5 cm)

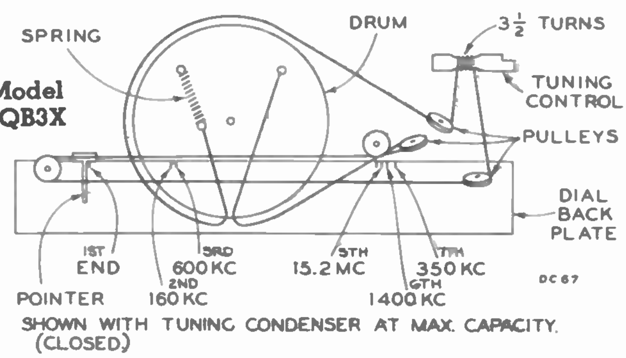
PHONOGRAPH ATTACHMENT

A jack is provided on the REAR OF THE CHASSIS for connecting a phonograph attachment. When phonograph attachment is in use the tuning should be adjusted to a point where no station is received. When not in use the attachment should be disconnected.

Model 4QB3



Model 4QB3X



Dial Indicator and Drive Mechanism

4QB3, 4QB3X

Alignment Procedure

Cathode-Ray Alignment is the preferable method.

Output Meter Alignment—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output low to avoid a-v-c action.

Calibration Scale.

The dial scale may be readily removed from the cabinet and used as a reference during alignment—or the marks on the dial back plate which corresponds to the frequencies indicated on the illustration "Dial Indicator and Drive Mechanism" may be used for reference.

Dial Pointer—With the gang condenser in full mesh the right hand edge of the dial pointer should be set to the left hand reference mark (1st mark) on the dial backing plate.

For additional information refer to booklet "RCA Victor Receiver Alignment."

Model 4QB3

CHASSIS No. RC-1071

Step	Connect high side of test osc. to—	Tune test osc. to—	Range switch	Turn radio dial to—	Adjust for max. output
1	1N5GT top cap in series with .01 mf.	455 kc	A	Quiet point near 1600 kc	T-2 top & bottom
2	1A7GT top cap in series with .01 mf.				T-1* bottom & top
3	Antenna lead in series with 220 mmf.	1400 kc	A	1400 kc (6th mark)	C4 osc. C11 ant.
4		600 kc		600 kc (3rd mark)	L5 osc. (rock gang)
5		Repeat steps 3 and 4			
6	Antenna lead in series with 300 ohms	6.1 mc	B	6.1 mc (7th mark)	C6 osc.** C2 ant.
7		2.5 mc		2.5 mc (2nd mark)	L8 (rock gang)
8		Repeat steps 6 and 7			
9		9.5 mc	C	9.5 mc (5th mark)	L10 (rock gang)
10		18.2 mc		18.2 mc (6th mark)	C1† (rock gang)
11		Repeat steps 9 and 10			

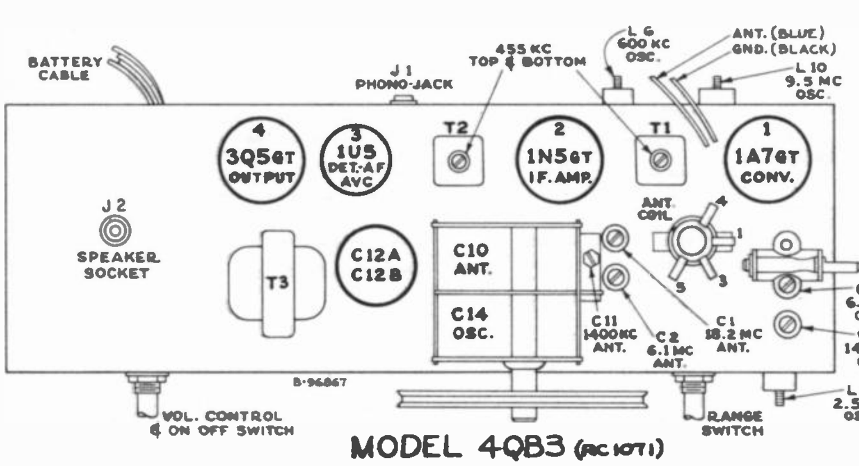
* Do not readjust T-2.
** Preset L8 so that stud projects 7/32 in.
† If two peaks are found, adjust C1 at minimum capacity peak.
NOTE: Oscillator tracks above signal on all bands.

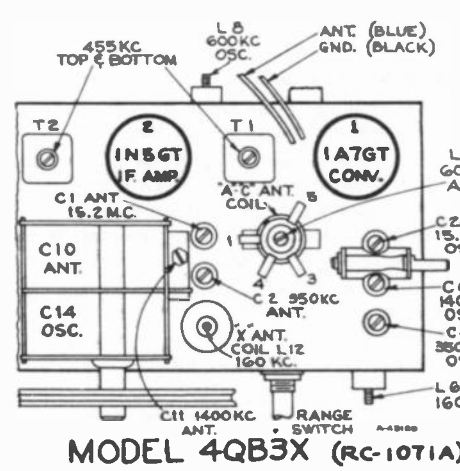
Model 4QB3X

CHASSIS No. RC-1071A

Step	Connect high side of test osc. to—	Tune test osc. to—	Range switch	Turn radio dial to—	Adjust for max. output
1	1N5GT top cap in series with .01 mf.	455 kc	A	Quiet point near 1600 kc	T-2 top & bottom
2	1A7GT top cap in series with .01 mf.				T-1* bottom & top
3	Antenna lead in series with 220 mmf.	Pre-set L4 ("A" ant.) so that stud projects 7/16 inch.			
4		1400 kc	A	1400 kc (7th mark)	C6 osc. C11 ant.
5		600 kc		600 kc (4th mark)	L8 osc. L4 ant.
6		Repeat steps 4 and 5			
7		350 kc	X	350 kc (8th mark)	C4 osc. C2 ant.
8		160 kc		160 kc (4th mark)	L6 osc. L12 ant.
9		Repeat steps 7 and 8			
10	Antenna lead in series with 300 ohms	15.2 mc	C	15.2 mc (7th mark)	C24 osc.† C1 ant.**

* Do not readjust T-2.
** Rock gang while adjusting C1.
† If two peaks are found, adjust C24 at minimum capacity peak.
NOTE: Oscillator tracks above signal on all bands.





Tube and Trimmer Locations

Change in Wiring:

The primary leads of the output transformer should be connected as follows:

Blue lead to screen grid (pin #4) of the 3Q5GT tube.

Red lead to plate (pin #3) of the 3Q5GT tube.

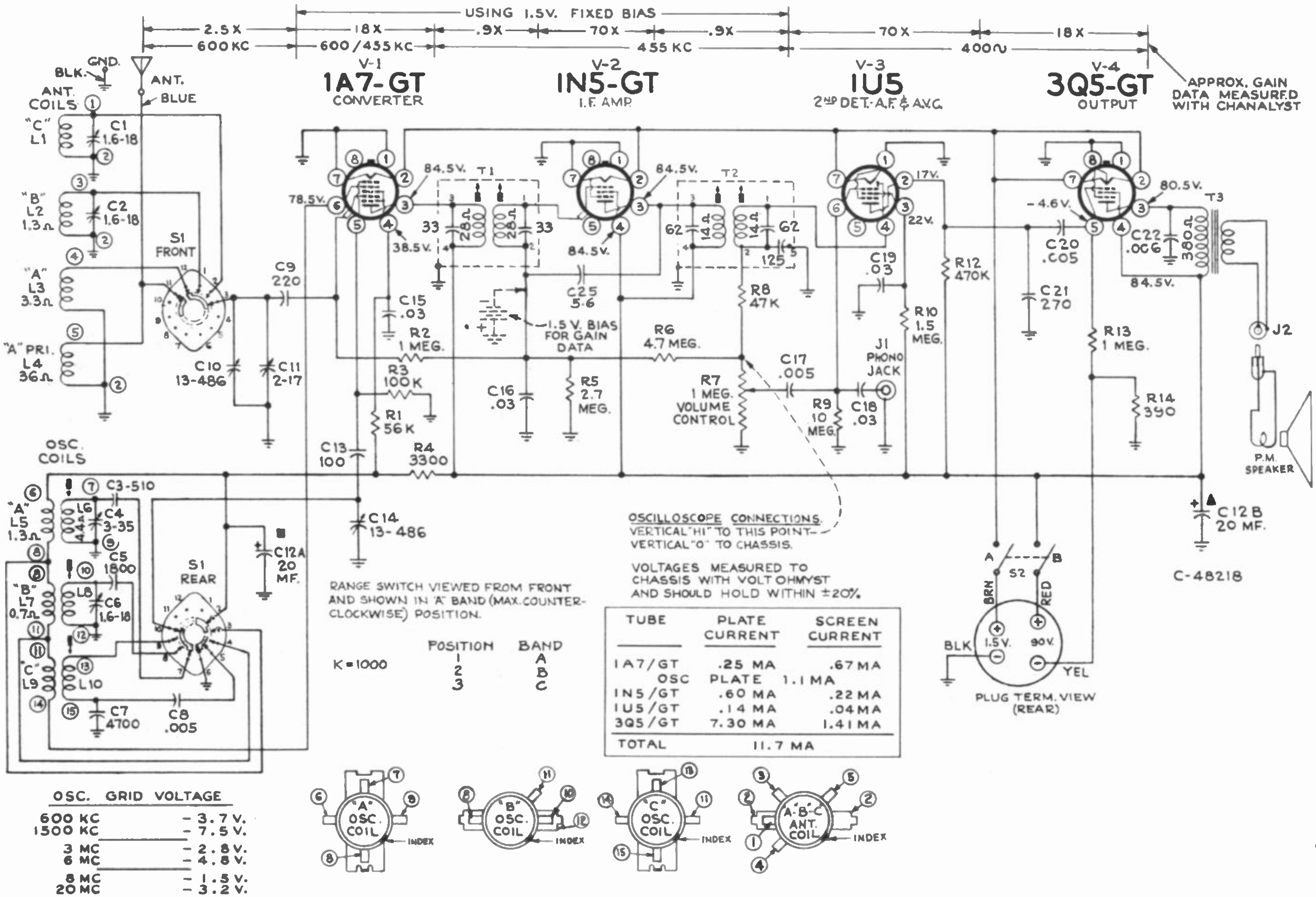
It has been found that if the leads were connected according to general practice (opposite to above) undesirable coupling would be introduced into the circuit.

Change in Audio Circuit:

The following resistors and capacitor have been changed in value:

R10 now 3.3 megohms (was 1.5 megohm)
R12 now 1 megohm (was 470,000 ohms)
R13 now 3.3 megohms (was 1 megohm)
C21 now 220 mmf (was 270 mmf)

The plate and screen voltages of the 1U5 tube will be slightly lower when using the new resistors.



POSITION	BAND
1	A
2	B
3	C

VOLTAGES MEASURED TO CHASSIS WITH VOLTOHMYST AND SHOULD HOLD WITHIN ±20%.

TUBE	PLATE CURRENT	SCREEN CURRENT
1A7/GT	.25 MA	.67 MA
OSC	PLATE 1.1 MA	
1N5/GT	.60 MA	.22 MA
1U5/GT	.14 MA	.04 MA
3Q5/GT	7.30 MA	1.41 MA
TOTAL	11.7 MA	

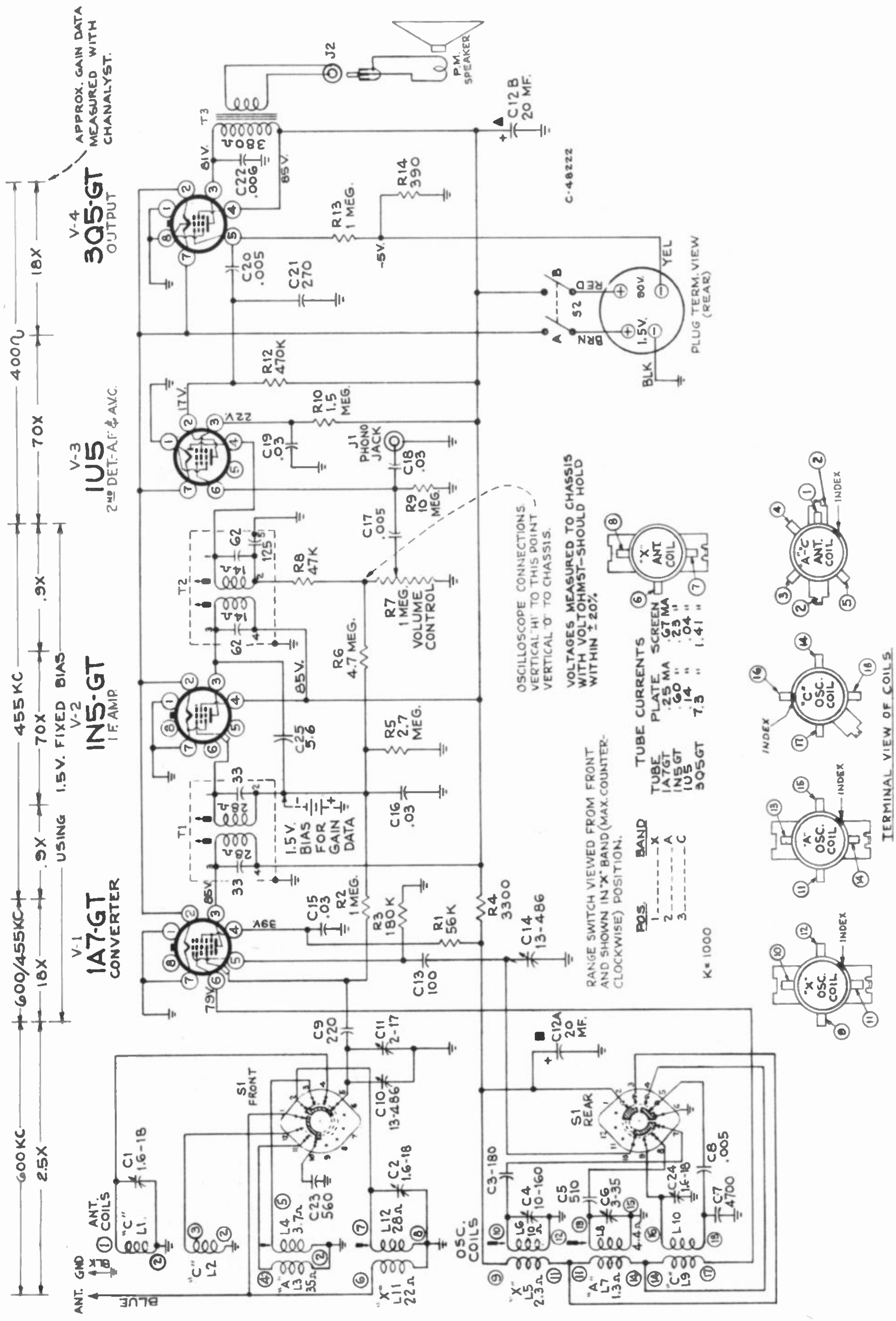
OSC. GRID VOLTAGE	
600 KC	- 3.7 V.
1500 KC	- 7.5 V.
3 MC	- 2.8 V.
6 MC	- 4.8 V.
8 MC	- 1.5 V.
20 MC	- 3.2 V.

Schematic Diagram—Model 4QB3—Chassis No. RC-1071

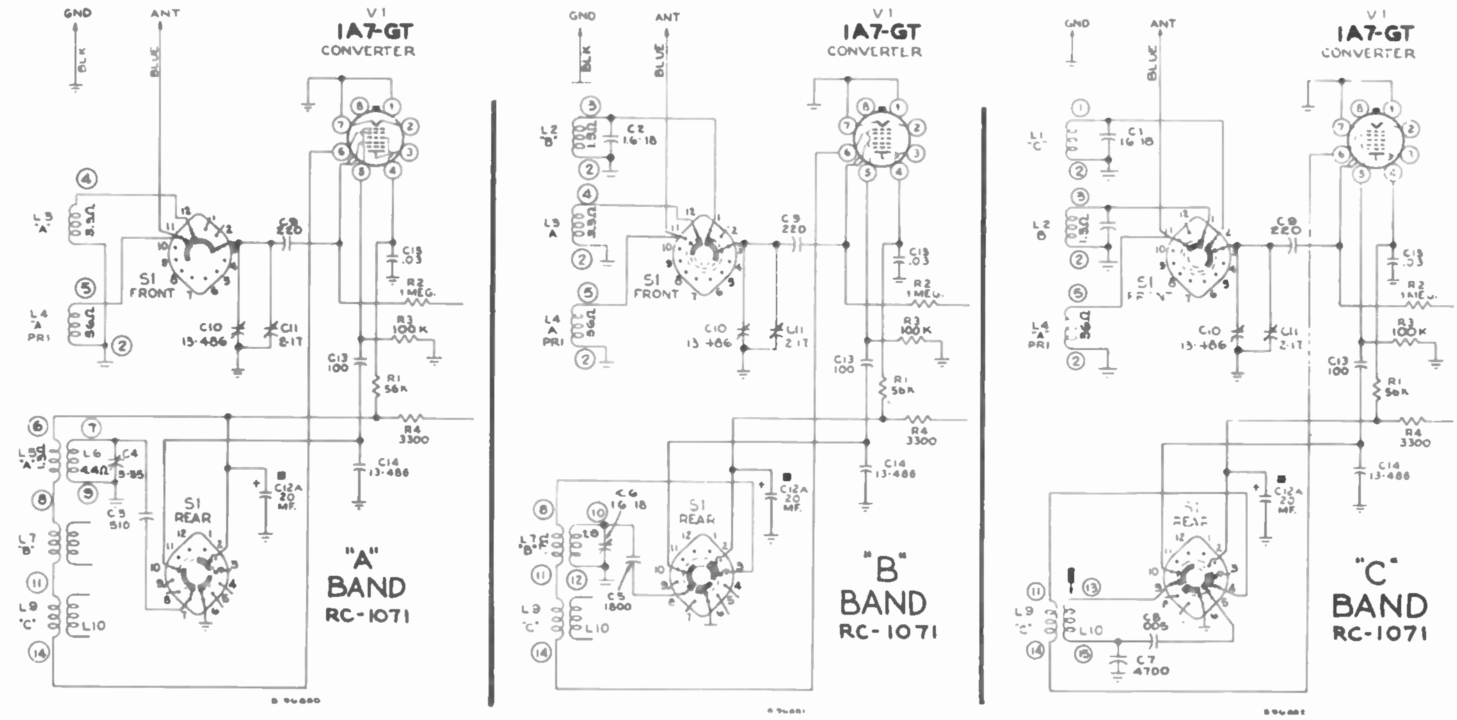
Service Hint:

It has been found advisable to hold the grid lead of the 1N5GT tube in position with a rubber band. A change in position of this lead after alignment will result in detuning of the 1st i.f. transformer and lowered sensitivity

4QB3, 4QB3X



Schematic Diagram—Model 4QB3X—Chassis No. RC-1071A

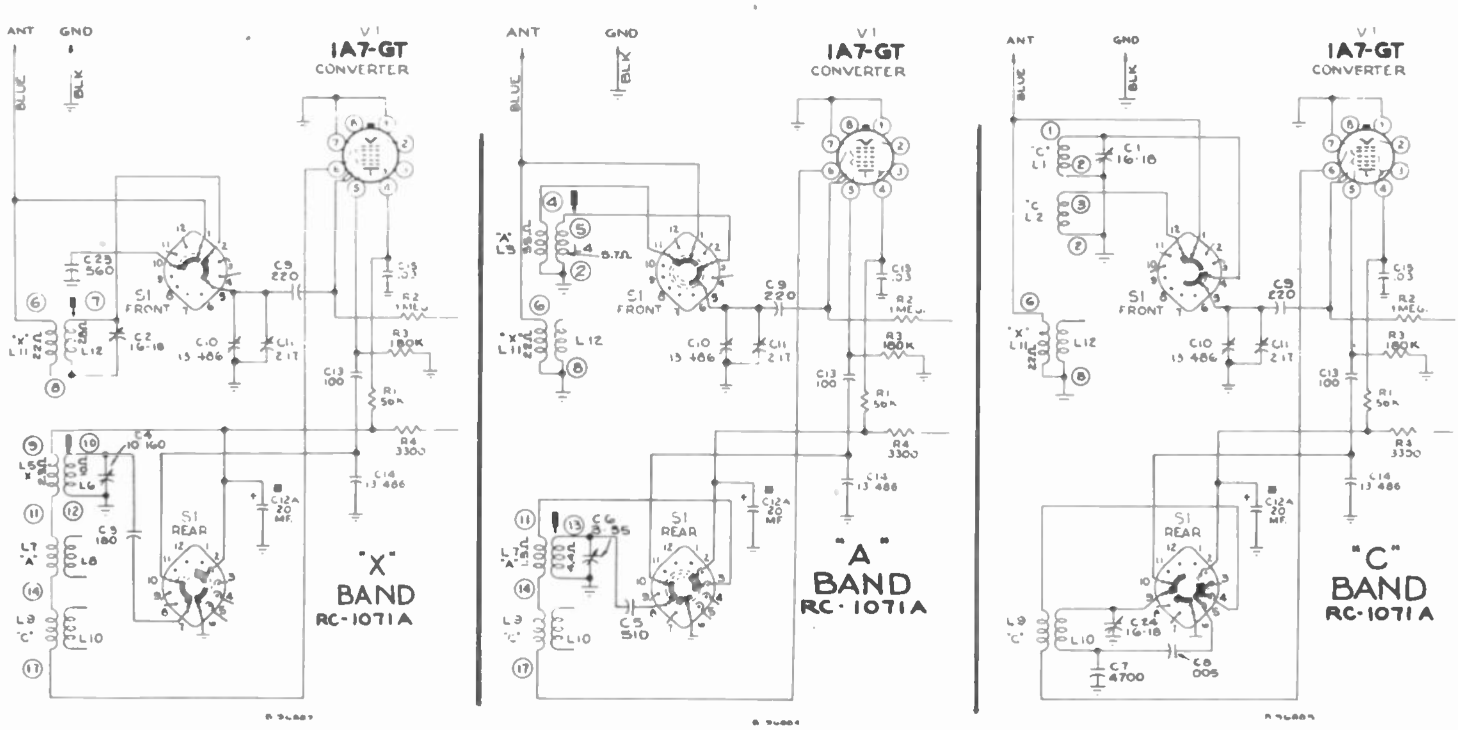


RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "A" BAND POSITION (MAX COUNTER CLOCKWISE)

RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "B" BAND POSITION (CENTER)

RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "C" BAND POSITION (MAX CLOCKWISE)

Simplified Schematic Diagrams—Chassis No. RC-1071



RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "X" BAND POSITION (MAX COUNTER-CLOCKWISE)

RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "A" BAND POSITION (CENTER)

RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN "C" BAND POSITION (MAX CLOCKWISE)

Simplified Schematic Diagrams—Chassis No. RC-1071A

4QB3, 4QB3X

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1071—Model 4QB3 RC 1071A—Model 4QB3X
74393	Board—Insulating board for output transformer
74380	Bracket—Drive cord bracket complete with pulley—L.H.
74379	Bracket—Drive cord bracket complete with four (4) pulleys—R.H.
74376	Capacitor—Variable tuning capacitor (C10, C11, C14)
74389	Capacitor—Mica trimmer, dual 1.6-18 mmf. (C1, C2)
74390	Capacitor—Mica trimmer, consisting of 1 section of 1.6-18 mmf. and 1 section of 3-35 mmf.—for Model 4QB3 (C4, C6)
74440	Capacitor—Mica trimmer, consisting of 1 section of 10-160 mmf., 1 section of 3-35 mmf. & 1 section of 1.6-18 mmf.—for Model 4QB3X (C4, C6, C24)
70997	Capacitor—Ceramic, 5.6 mmf. (C25)
39628	Capacitor—Mica, 100 mmf. (C13)
71933	Capacitor—Mica, 180 mmf.—for Model 4QB3X (C3)
39636	Capacitor—Mica, 220 mmf. (C9)
71540	Capacitor—Ceramic, 270 mmf. (C21)
71932	Capacitor—Mica, 510 mmf.—for Model 4QB3 (C3)
71932	Capacitor—Mica, 510 mmf.—for Model 4QB3X (C5)
39646	Capacitor—Mica, 560 mmf.—for Model 4QB3X (C23)
39658	Capacitor—Mica, 1800 mmf.—for Model 4QB3 (C5)
39668	Capacitor—Mica, 4700 mmf. (C7)
73550	Capacitor—Tubular, .005 mfd., 400 volts (C8, C17, C20)
70649	Capacitor—Tubular, .006 mfd., 1000 volts (C22)
70613	Capacitor—Tubular, .03 mfd., 400 volts (C15, C16, C18, C19)
74383	Capacitor—Electrolytic, dual 20 mfd., 150 volts (C12A, C12B)
73935	Clip—Mounting clip for I-F transformers (2 required)
74435	Coil—Antenna coil—"A-C" bands—for Model 4QB3X (L1, L2, L3, L4)
74385	Coil—Antenna coil—"A-B-C" bands—for Model 4QB3 (L1, L2, L3, L4)
74386	Coil—Oscillator coil—"A" band—complete with core and stud—for Model 4QB3 (L5, L6)
74386	Coil—Oscillator coil—"A" band—complete with core and stud—for Model 4QB3X (L7, L8)
74438	Coil—Oscillator coil—"X" band—complete with core & stud—for Model 4QB3X (L5, L6)
74387	Coil—Oscillator coil—"B" band—for Model 4QB3 (L7, L8)
74437	Coil—Oscillator coil—"C" band—complete with core & stud—for Model 4QB3X (L9, L10)
74388	Coil—Oscillator coil—"C" band—complete with core & stud—for Model 4QB3 (L9, L10)
74436	Coil—Antenna coil—"X" band—for Model 4QB3X (L11, L12)
30568	Connector—4 contact male connector for battery cable
38406	Control—Volume control and power switch (R7, S2)
†72953	Cord—Drive cord (approx. 49" overall)
74391	Core—Adjustable core & stud assembly for "B" band oscillator coil—for Model 4QB3
74439	Core—Adjustable core & stud assembly for "A-C" bands antenna coil—for Model 4QB3X
74378	Gasket—Rubber gasket for dial back plate
72283	Grommet—Rubber grommet for mounting tuning capacitor (4 required)
70429	Grommet—Rubber grommet for mounting tube socket (2 required)
74394	Indicator—Station selector indicator
74377	Plate—Dial back plate less dial and rubber gasket
72602	Pulley—Drive cord pulley
	Resistor—Fixed, composition, 390 ohms, ±10%, ½ watt (R14)
	Resistor—Fixed, composition, 3300 ohms, ±10%, ½ watt (R4)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R8)
	Resistor—Fixed composition, 56,000 ohms, ±10%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt—for Model 4QB3 (R3)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt—for Model 4QB3X (R3)
	Resistor—Fixed, composition, 470,000 ohms, ±20%, ½ watt (R12)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R2, R13)
	Resistor—Fixed, composition, 1.5 megohms, ±20%, ½ watt (R10)
	Resistor—Fixed, composition, 2.7 megohms, ±10%, ½ watt (R5)
	Resistor—Fixed, composition, 4.7 megohms, ±20%, ½ watt (R6)
	Resistor—Fixed, composition, 10 megohms, ±20%, ½ watt (R9)
74392	Shaft—Tuning knob shaft
70377	Shield—Tube shield
35787	Socket—Phono or speaker cable socket (J1, J2)
71037	Socket—Tube socket, 7 prong, miniature
31319	Socket—Tube socket, octal, moulded
70827	Socket—Tube socket octal, wafer
31418	Spring—Drive cord spring
74434	Switch—Range switch—for Model 4QB3X (S1)
74384	Switch—Range switch—for Model 4QB3 (S1)
74381	Transformer—First I-F transformer (T1)
74382	Transformer—Second I-F transformer (T2)
71159	Transformer—Output transformer (T3)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLY 92576-2W RL100A3
31048	Plug—Pin plug for speaker cable
74395	Speaker—4" x 6" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74396	Board—Baffle board and grille cloth
Y2109	Cabinet—Brown plastic cabinet
74399	Clip—Retaining clip for baffle and grille
74400	Clip—Mounting clip for dial scale (3 required)
74398	Dial—Lucite dial scale—for Model 4QB3
74441	Dial—Lucite dial scale—for Model 4QB3X
74403	Emblem—"RCA" emblem
74404	Emblem—"RCA Victor" emblem
74402	Eyelet—Chassis mounting eyelet (4 required)
74401	Grommet—Rubber grommet for mounting chassis (4 required)
37396	Grommet—Rubber grommet for mounting speaker (4 required)
72549	Knob—Range switch or volume control knob
74397	Knob—Tuning knob
14270	Spring—Retaining spring for tuning knob
30900	Spring—Retaining spring for range switch or volume control knob

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Change in Parts List:

CHASSIS—ASSEMBLIES

Delete:

71540	Capacitor—270 mmf	C21
	Resistor—470,000 ohms	R12
	Resistor—1 megohm	R13
	Resistor—1.5 megohm	R10

Add:

51839	Capacitor—Ceramic, 220 mmf	C21
	Resistor—Fixed, composition, 1 megohm ±20%, ½ watt	R12
	Resistor—Fixed, composition, 3.3 megohm ±20%, ½ watt	R10, R13

MISCELLANEOUS

Add:

74821	Back—Cabinet back
37831	Fastener—Push fastener for cabinet back (1 set of 4)

RCA VICTOR

PH 432

MODEL 5QA5

Chassis No. RC-1072—Mfr. No. 274

SERVICE DATA

1949 . . . X5

RADIO CORPORATION OF AMERICA
RCA INTERNATIONAL DIVISION
745 FIFTH AVE., NEW YORK 22, N. Y.

Electrical and Mechanical Specifications

Frequency Ranges

Standard Broadcast ("A" Band)	525-1600 kc (571-187 m)
Medium Wave ("B" Band)	2.3-7 mc (130-42.9 m)
Short Wave ("C" Band)	7-22 mc (42.9-13.6 m)
"31-25 Meter" Spread Band	9.5-12 mc (31.6-25 m)
"19-16 Meter" Spread Band	15.1-17.9 mc (19.8-16.7 m)

Intermediate Frequency .... 455 kc

Tube Complement

(1) RCA 6BE6	Converter
(2) RCA 6BJ6	I.F. Amplifier
(3) RCA 6AQ6	Det.-A.V.C.-A.F. Amp.
(4) RCA 6AK6	Output
(5) RCA 6ZY5G	Rectifier

Dial Lamp (2) .... Mazda No. 47, 6.3 volts, .15 amp.

Power Supply

1. Rating C .... 105-125 and 210-250v, 56-60 cycles, 25 watts
2. 6.3 volt storage battery .... Normal 2.7A—battery saver 2.2A

The instrument has a switch on the chassis to select 105-125 or 210-250 volt operation (switch marked 117v 235v). (Shipped with switch in 235v position.)

Loudspeaker

6½ in. P.M. .... Type 92570-4
V. C. Impedance .... 3.2 ohms @ 400 cycles

Power Output	125v—A.C.	6.3v—Batt.	Current Saver Batt.
Undistorted	0.9 watt	0.75 watt	0.24 watt
Maximum	1.9 watts	1.60 watts	0.47 watt

Cabinet Dimensions

Height	10¾ inches
Width	16¼ inches
Depth	8¼ inches

Tuning Drive Ratio .... 13½ to 1 (6¾ turns of knob)
Weight, Net .... 18½ pounds

CRITICAL LEAD DRESS

1. The 6BJ6 screen by-pass capacitor C27 should be dressed down to the base with short leads.
2. Dress R2-C10 midway between spread band tuning coil and shield plate.
3. Dress 6AQ6 grid lead R12 close to base.
4. Dress volume control coupling capacitor C34 close to base.
5. Dress audio coupling capacitor C30 close to base.
6. Red B+ lead from 6ZY5G socket must be dressed away from audio sockets.
7. Dress 6BJ6 plate lead close to base.
8. Dress speaker leads away from 6AQ6 and 6AK6 tubes.
9. Keep leads on C21 and C37 as short as possible.
10. Keep leads on C20, R16 as short as possible and dress close to rectifier socket.
11. Dress black lead running from AC switch S5 to 117/234 switch S4 close to base.
12. Keep slack of pilot socket leads, AC cord and battery cable, out of compartment.
13. Keep leads on L5 and L16 chokes as short as possible.
14. Keep R14, R15 as short as possible and dress close to vibrator socket.
15. Keep leads on C38 and C40 as short as possible.
16. The following transformer leads should be twisted and dressed close to chassis base:
    (a) Blue vibrator primary leads
    (b) Each AC primary
    (c) 6AY5G plate leads
    (d) Red/Yellowcenter tap and one AC filament lead

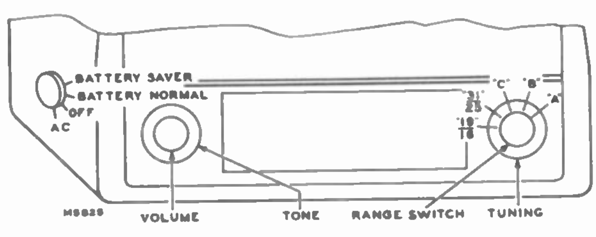
Description

This instrument is a five-tube five-band receiver of conventional design with the exception of the spread-band tuning.

A two-section gang condenser one section for antenna and one for oscillator circuit, is used for the A, B, and C bands. The 31-25 Meter and the 19-16 Meter spread bands are tuned by a specially designed permeability tuning system actuated by a cam and rocker assembly which is mechanically fastened to the gang condenser shaft. The core assembly of the permeability tuning system is molded to insure the required tolerances, and tunes both the 31-25 Meter and the 19-16 Meter bands with different circuit constants.

In the 31-25 Meter band position the 31-25 Meter coils (antenna and oscillator) are used. In the 19-16 Meter band position the 31-25 Meter and 19-16 Meter band coils are used in parallel.

The inductances of the A-B-C windings of the multiple antenna coil are all fixed, but the inductances of all other coils in the antenna and oscillator circuits are permeability adjusted. Ungrounded screw-type cores are used for these coils and adjustments are made with a non-metallic screwdriver.



Controls

Change in Dial Lamp Switch:

Due to procurement difficulties it has been necessary to change the volume control on this chassis. The original control had a dial light switch in which pushing in on the control knob caused the switch to close—spring action would return the switch to the open position. With the control now being used it is necessary to pull out on the control knob to close the switch and to push in to return it to the open position (it does not have spring action return).

5QA5

Alignment Procedure

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Receiver Dial with Calibration Scale.—To determine the corresponding frequency for any setting of the calibration scales, refer to the dial with calibration scale drawing.

Tube		Fil. V	Plate V.	Screen V.	Cathode V.	Grid V.
17V. Volt Operation						
6BE6	V1	6.3	172	82	......	.7
6BJ6	V2	6.3	172	52	......	.7
6AQ6	V3	6.3	49	......	......	.7
6AK6	V4	6.3	182	172	6.8	....
6ZY5G	V5	6.3	......	......	189	....
Battery Operation						
6BE6	V1	6.0	160	77	......	.6
6BJ6	V2	6.0	160	49	......	.6
6AQ6	V3	6.0	48	......	......	.6
6AK6	V4	6.0	168	160	6.0	....
6ZY5G	V5	6.0	......	......	175	....
Vibrator coil		3.9				
Battery Operation (Current Saver)						
6BE6	V1	6.0	102	50	......	....
6BJ6	V2	6.0	102	37	......	....
6AQ6	V3	6.0	38	......	......	....
6AK6	V4	6.0	108	102	3.3	....
6ZY5G	V5	6.0	......	......	110	....
Vibrator coil		4 volts				

Spread-Band Alignment.—For spread-band alignment an extremely high degree of accuracy is required of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials.

Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by one of the following methods:

1. Zero-beat the test-oscillator against short-wave stations of known frequency.
2. Check test-oscillator signals with a crystal controlled oscillator.

A final check should be made on actual reception of short-wave stations of known frequency.

For additional information, refer to booklet "RCA Victor Receiver Alignment."

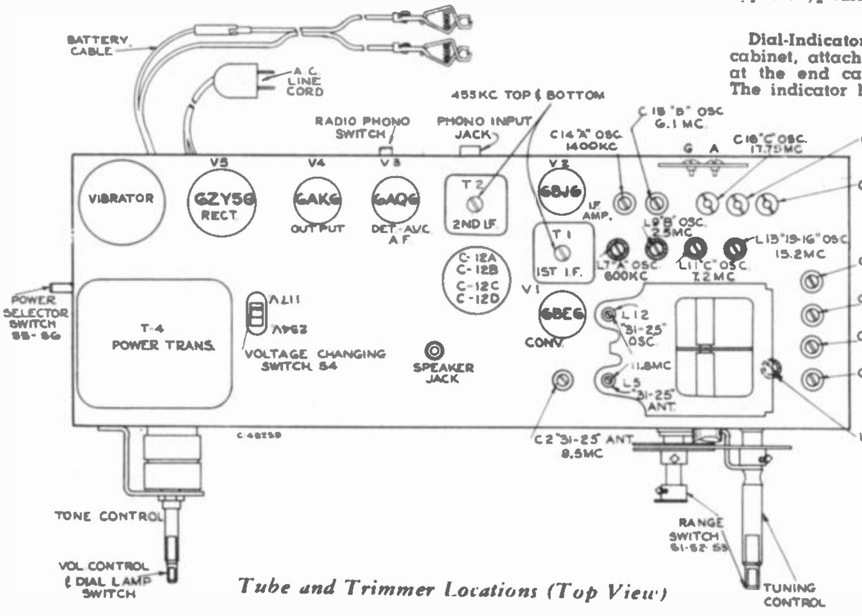
Step	Connect high side of test oscillator to—	Test oscillator frequency	Turn radio dial to—	Adjust for maximum output
1	Pin #1 of 6BJ6 thru .01 mfd. capacitor	455 kc	Quiet point near 600 kc A Band	T-2 2nd I.F. trans.—top and bottom
2	Pin #7 of 6BE6 thru .01 mfd. capacitor	455 kc	Quiet point near 600 kc A Band	T-1 1st I.F. trans.—top and bottom
3	Ant. terminal thru 200 mmfd capacitor	1400 kc	A Band 27.3°	C14 osc. C5 ant.
4	Ant. terminal thru 200 mmfd capacitor	600 kc	A Band 142.6°	L7 osc.
5		Repeat steps 3 and 4		
6	Ant. terminal thru 300 ohm resistor	6.1 mc	B Band 28.2°	C15 osc. C4 ant.
7		2.5 mc	B Band 148.9°	L9 osc.
8		Repeat steps 6 and 7		
9		17.75 mc	C Band 34.4°	†C16 osc. C3 ant.
10		7.2 mc	C Band 160.3°	L11 osc.
11		Repeat steps 9 and 10		
12		9.5 mc	31-25 Meter Band 169.6°	*C13 osc. *C2 ant.
13		11.8 mc	31-25 Meter Band 44.8°	†L12 osc.‡ L5 ant.‡
14		Repeat steps 12 and 13		
15		17.75 mc	19-16 Meter Band 37.5°	†C19 osc. C8 ant.
16		15.2 mc	19-16 Meter Band 157.2°	†L13 osc. L6 ant.
17		Repeat steps 15 and 16		

† Oscillator frequency is higher than signal frequency on all bands. Use minimum capacity or minimum inductance peak on oscillator adjustments if two peaks can be obtained.

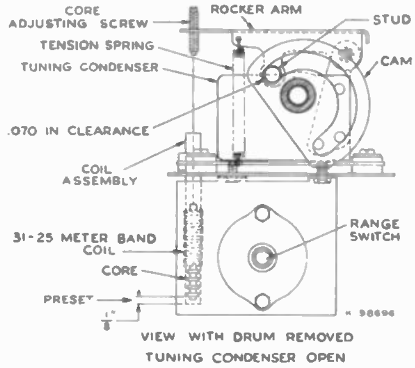
* Pre-set L12 and L5, with tuning condenser at minimum capacity (0°), so that the cores are exactly 1/8 in. (3.175 mm) from the bottom end of their respective coils (coil end to bottom end of iron core—not the insulating rod of the core assembly).

‡ If dial reading for maximum output at 11.8 mc is lower than 11.8 mc, rotate studs approx. 1/2 turn clockwise—if higher rotate approx. 1/2 turn counterclockwise.

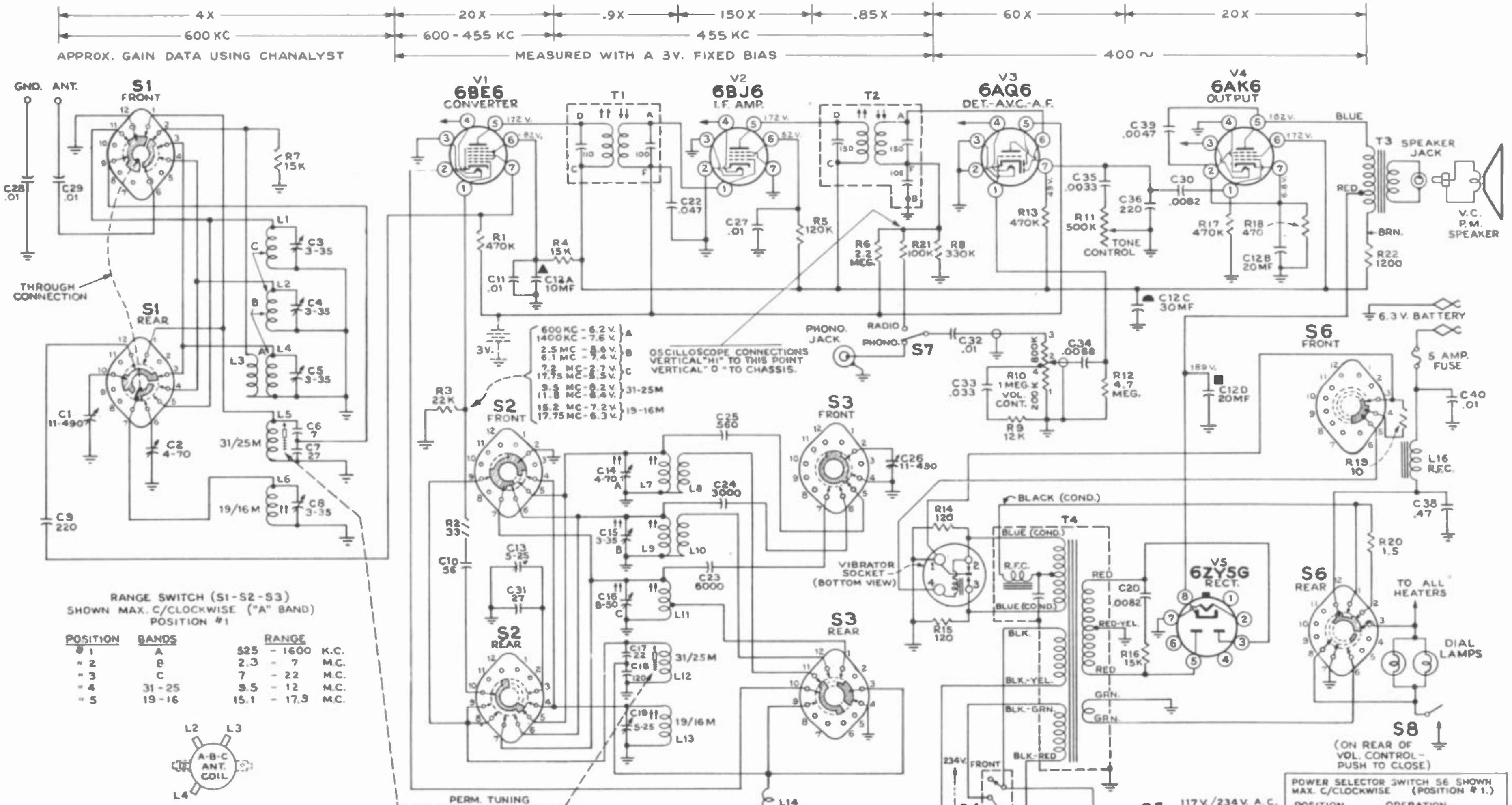
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the end calibration mark, and gang condenser fully meshed. The indicator has a clip for attachment to the cable.



Tube and Trimmer Locations (Top View)



Spread-Band Tuning (Front View)



RANGE SWITCH (S1-S2-S3)
SHOWN MAX. C/CLOCKWISE ("A" BAND)
POSITION #1

POSITION	BANDS	RANGE	
#1	A	525 - 1600	K.C.
" 2	B	2.3 - 7	M.C.
" 3	C	7 - 22	M.C.
" 4	31 - 25	9.5 - 12	M.C.
" 5	19 - 16	15.1 - 17.9	M.C.

RESISTANCE VALUES IN OHMS. K = 1000
CAPACITANCE VALUES LESS THAN 1 IN MF AND ABOVE 1 IN MMF UNLESS OTHERWISE NOTED.
VOLTAGES MEASURED WITH VOLTOHMYST AND SHOULD HOLD WITHIN ± 20% WITH RATED A.C. POWER SUPPLY.
ON NORMAL BATTERY POSITION VOLTAGES ARE APPROX. 10% LOWER.
ON CURRENT SAVER POSITION "A" VOLTAGE IS APPROX. 10% LOWER AND "B" VOLTAGES ARE APPROX. 40% LOWER.

CATHODE CURRENTS

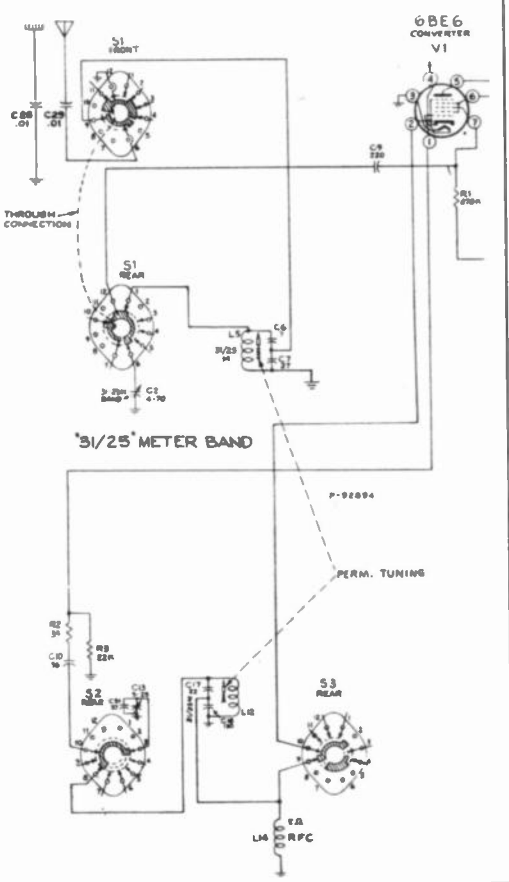
TUBE	POWER LINE	NORM. BATT.	CURRENT SAVER
6BE6	8.5 M.A.	7.76 M.A.	4.46 M.A.
6BJ6	4.0 "	3.63 "	2.07 "
6AQ6	.3 "	.25 "	.14 "
6AK6	13.4 "	11.8 "	7.12 "
6ZY5G	26.5 "	24.6 "	14.0 "

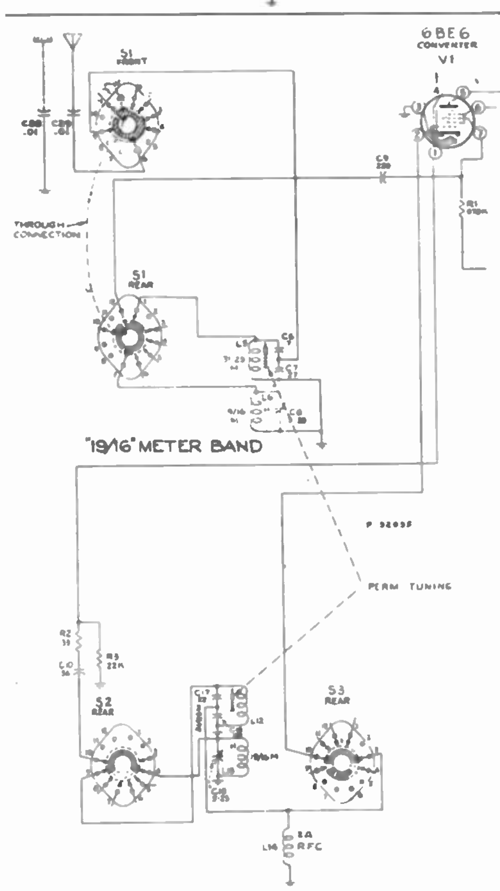
POWER SELECTOR SWITCH S6 SHOWN MAX. C/CLOCKWISE (POSITION #1.)

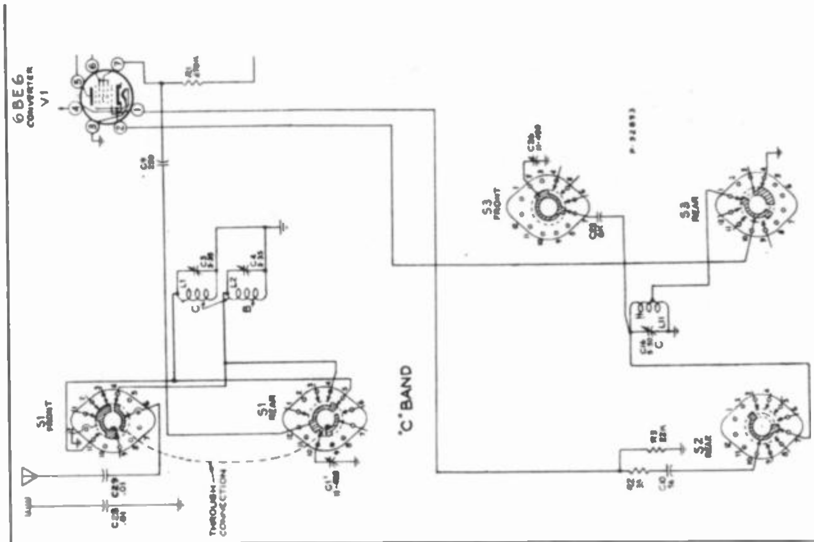
POSITION	OPERATION
1	BATTERY (CURRENT SAVER)
2	BATTERY (NORMAL)
3	OFF
4	POWER LINE

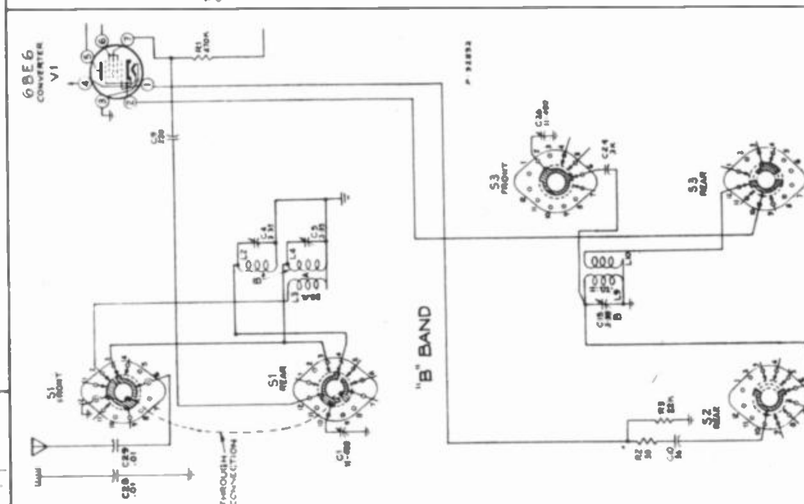
D-48628

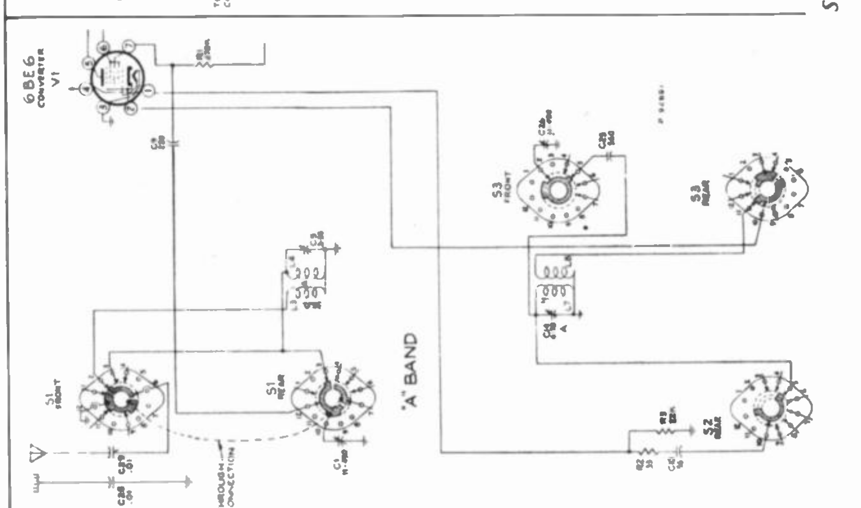
Complete Schematic Diagram



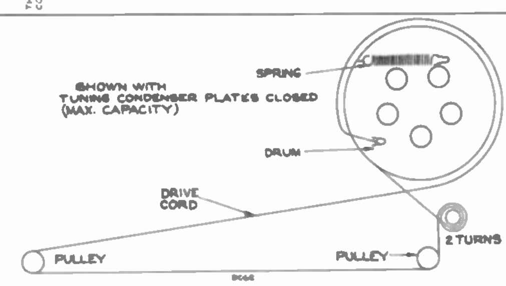




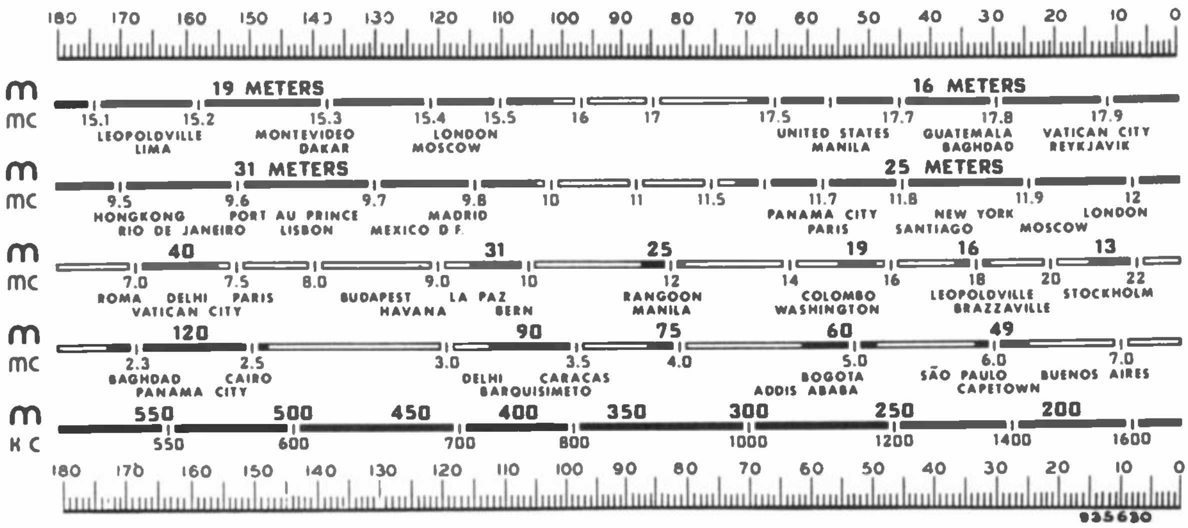




Simplified Schematic Diagrams

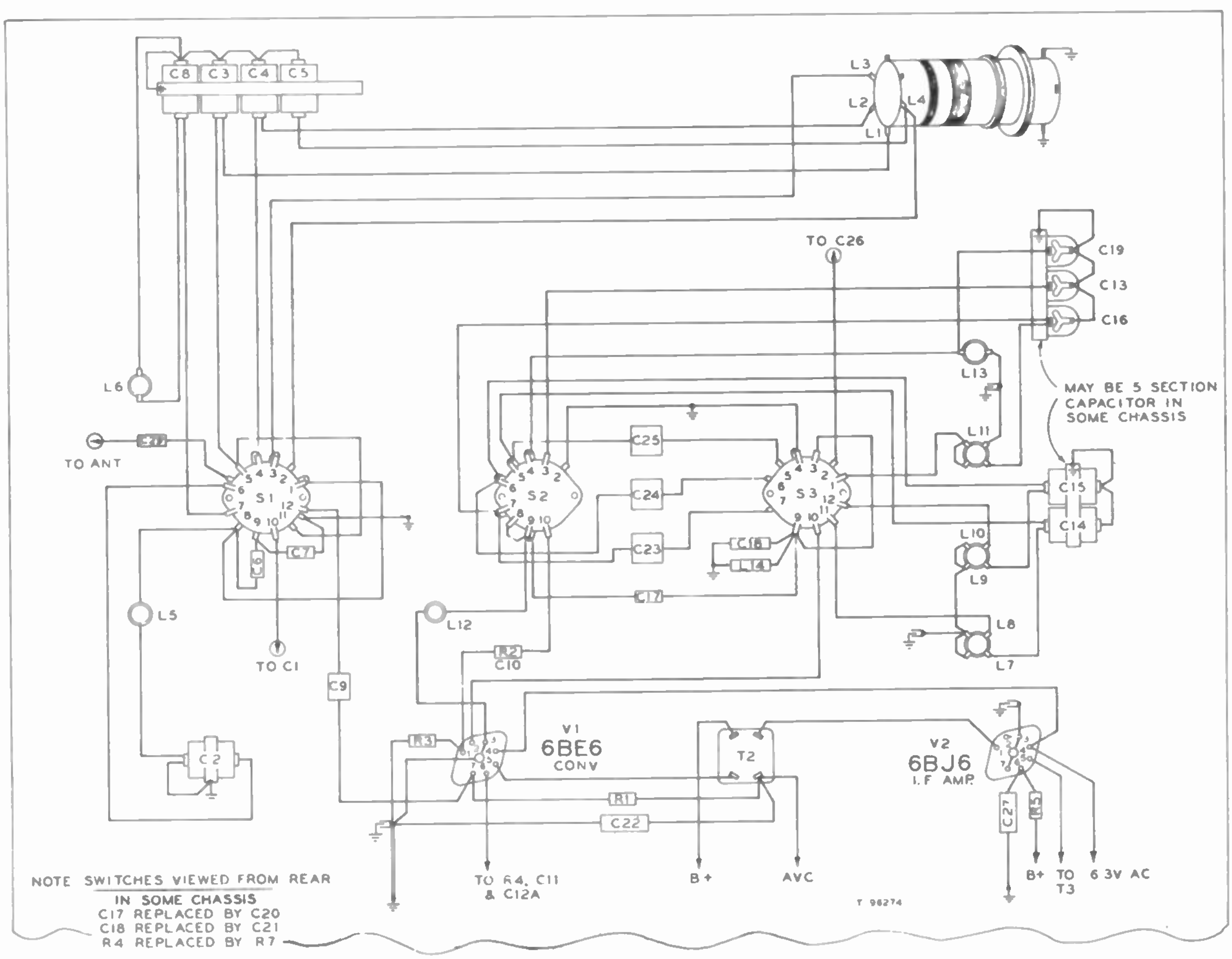


Dial-Indicator and Drive Mechanism



Reduced Reproduction of Receiver Dial and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 143° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedures."



R. F. Wiring Diagram (Bottom View)

Replacement Parts—5QA5

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC-1072
	R-F PLATE SUB-ASSEMBLY
S-4512	Board—Antenna-Ground terminal board
S-4513	Capacitor—Trimmer capacitor, single, 4-70 mmf. (C2)
S-4514	Capacitor—Trimmer capacitor, dual, 4-70 mmf. and 3-35 mmf. (C14, C15)
S-4515	Capacitor—Trimmer capacitor, triple, two sections of 5-25 mmf. and one section of 8-50 mmf. (C13, C16, C19)
S-4516	Capacitor—Trimmer capacitor, quadruple, four sections of 3-35 mmf. (C3, C4, C5, C8)
S-4517	Capacitor—Ceramic, 7 mmf. (C6)
S-4518	Capacitor—Ceramic, 22 mmf. (C17)
S-4519	Capacitor—Ceramic, 27 mmf. (C7)
S-4520	Capacitor—Ceramic, 27 mmf. (C31)
S-4521	Capacitor—Ceramic, 120 mmf. (C18)
S-4439	Capacitor—Mica, 220 mmf. (C9)
S-4440	Capacitor—Mica, 560 mmf. (C25)
S-4522	Capacitor—Mica, 3000 mmf. (C24)
S-4442	Capacitor—Mica, 6000 mmf. (C23)
S-4444	Capacitor—Tubular, .01 mf., 400 v. (C28)
S-4448	Capacitor—Tubular, .047 mf., 200 v. (C22)
S-4523	Capacitor and Resistor Assembly—56 mmf., capacitor and 33 ohm resistor (C10, R2)
S-4524	Choke—Cathode choke coil (L14)
S-4525	Coil—"A" band oscillator coil with adjustable core and stud (L17, L8)
S-4526	Coil—"B" band oscillator coil with adjustable core and stud (L9, L10)
S-4527	Coil—"C" band oscillator coil with adjustable core and stud (L11)
S-5456	Coil—"31-25 Meter" band antenna or oscillator coil (L5, L12)
S-4529	Coil—"19-16 Meter" band antenna or oscillator coil with adjustable core and stud (L6, L13)
S-4530	Condenser—Tuning condenser (C1, C26)
S-4531	Core—Adjustable core and stud for "31-25 Meter" band oscillator coil
S-4532	Drum—Tuning condenser drum, hub and cam assembly
S-4533	Grommet—Rubber grommet to mount tuning condenser
S-4534	Plate—Rocker arm plate and stud assembly—less adjustable cores
S-4535	Resistor—Fixed, composition, 22,000 ohms, ½ watt (R3)
S-4476	Resistor—Fixed, composition, 470,000 ohms, ½ watt (R1)
S-4536	Screw—Rocker arm plate bearing screw
S-4894	Socket—Tube socket
S-4537	Spring—Rocker arm plate tension spring
S-4538	Switch—Range switch
S-4539	Transformer—First IF transformer (T1)
	MAIN CHASSIS ASSEMBLY
S-4540	Bracket—Dial cord bracket and pulley assembly (2 required)
S-5422	Cable—Battery cable complete with fuse holder and spring clips
S-4439	Capacitor—Mica, 220 mmf. (C36)
S-4541	Capacitor—Tubular, .0033 mf., 600 v. (C35)
S-4542	Capacitor—Tubular, .0047 mf., 600 v. (C39)
S-4543	Capacitor—Tubular, .0068 mf., 400 v. (C34)
S-5423	Capacitor—Tubular, .0082 mf., 1600 v. (C20)
S-5424	Capacitor—Tubular, .0082 mf., 400 v. (C30)
S-4820	Capacitor—Ceramic, .01 mf. (C29, C40)
S-4609	Capacitor—Tubular, .01 mf., 600 v. (C21, C37)
S-4444	Capacitor—Tubular, .01 mf., 400 v. (C11, C27, C32)
S-4611	Capacitor—Tubular, .003 mf., 400 v. (C33)
S-5425	Capacitor—Tubular, .47 mf., 200 v. (C38)
S-5426	Capacitor—Electrolytic, four section; 10 mf., 275 v., 20 mf., 25 v., 30 mf., 275 v., and 20 mf., 275 v. (C12A, C12B, C12C, C12D)
S-5427	Clip—Spring clip for battery cable (2 required)
S-4546	Coil—"A", "B", and "C" bands antenna coil (L1, L2, L3, L4)
S-5428	Coil—Choke coil (L15)
S-5429	Coil—Choke coil (L16)
S-5430	Control—Volume control, tone control and dial lamp switch (R10, R11, S8)
S-4313	Cord—Dial drive cord (approx. 45 in. required)
S-4548	Cord—Power cord and plug
S-4549	Gear—Gear and hub for range switch shaft
S-4550	Gear—Gear and hub for range switch control shaft
S-4551	Lever—Range indicator lever and hub
S-5431	Resistor—Flexible, wire wound, 1.5 ohms, 4 watt (R20)
S-5432	Resistor—Fixed, composition, 10 ohms, 1 watt (R19)
S-4470	Resistor—Fixed, composition, 120 ohms, ½ watt (R14, R15)
S-5433	Resistor—Fixed, composition, 470 ohms, ½ watt (R18)
S-5006	Resistor—Fixed, composition, 1200 ohms, ½ watt (R22)
S-5434	Resistor—Fixed, composition, 12,000 ohms, ½ watt (R9)
S-4621	Resistor—Fixed, composition, 15,000 ohms, 1 watt (R4)
S-5435	Resistor—Fixed, composition, 15,000 ohms, ½ watt (R7, R16)
S-4558	Resistor—Fixed, composition, 100,000 ohms, ½ watt (R21)
S-5436	Resistor—Fixed, composition, 120,000 ohms, ½ watt (R5)
S-4560	Resistor—Fixed, composition, 330,000 ohms, ½ watt (R8)
S-4561	Resistor—Fixed, composition, 470,000 ohms, ½ watt (R13)
S-4476	Resistor—Fixed, composition, 470,000 ohms, ½ watt (R17)
S-4562	Resistor—Fixed, composition, 2.2 megohm, ½ watt (R6)
S-4478	Resistor—Fixed, composition, 4.7 megohm, ½ watt (R12)
S-4565	Shaft—Range switch control shaft
S-4566	Shaft—Tuning control shaft
S-5437	Shield—Vibrator socket shield assembly
S-5438	Shield—Tube shield for 6AQ6 tube
S-5439	Shield—Tube shield for 6ZY5G tube
S-5440	Socket—Dial lamp socket and lead assembly
S-5441	Socket—Dial lamp socket and lead assembly
S-4480	Socket—Phono input or speaker output socket
S-4426	Socket—Tube socket—miniature—for 6AQ6 or 6AK6 tubes
S-5442	Socket—Tube socket—octal—for 6ZY5G tube
S-5443	Socket—Vibrator socket
S-5444	Spring—Dial drive cord tension spring
S-5445	Switch—Power selector switch (S5, S6)
S-4569	Switch—Radio-Phono switch (S7)
S-4570	Switch—Voltage change switch (S4)
S-4571	Transformer—Second I.F. transformer (T2)
S-5446	Transformer—Output transformer (T3)
S-5447	Transformer—Power transformer (T4)
S-5448	Vibrator—Plug-in vibrator
S-4576	Washer—"C" washer for range switch control shaft (inside)
S-4577	Washer—"C" washer to retain tuning control shaft
	SPEAKER ASSEMBLY STAMPED 92570-4
S-4578	Cone—Speaker cone
S-4579	Plug—Pin plug for speaker cable
S-4580	Speaker—PM speaker complete with cone and connecting cable
	MISCELLANEOUS
S-5449	Back—Back cover for cabinet
S-5450	Baffle—Baffle board and grille cloth assembly—less emblem
S-4583	Bezel—Dial bezel
S-5451	Cabinet—Plastic cabinet
S-4585	Cover—Plastic dial cover
S-5452	Decal—Control marker decal
S-4586	Dial—Glass dial scale
S-4499	Emblem—Trademark emblem (RCA)
S-4500	Emblem—Trademark emblem (RCA Victor)
S-4588	Grommet—Rubber grommet for chassis mounting
S-4503	Grommet—Rubber grommet for speaker mounting
S-4589	Indicator—Station selector indicator
S-5453	Knob—Power switch knob
S-4590	Knob—Range switch knob
S-4896	Knob—Tone control knob
S-4895	Knob—Tuning control knob
S-4591	Knob—Volume control knob
S-4893	Lamp—Dial lamp
S-5454	Plate—Dial back plate
S-5455	Screw—Chassis mounting screw
S-4511	Spacer—Metal spacer for speaker mounting
S-4595	Shield—Dial lamp shield

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AC-DC-Battery Portable Radio

MODEL 6QP3

Chassis No. RC 1067
— Mfr. No. 274 —

SERVICE DATA

— 1949 No. X4 —

RADIO CORPORATION OF AMERICA
RCA INTERNATIONAL DIVISION
745 FIFTH AVE., NEW YORK 22, N. Y.

Specifications

Tuning Ranges

Standard Broadcast ("A" Band) ....535-1610 kc. (560-186 m.)
Medium Wave ("B" Band) ....2.3-7 mc. (131-42.8 m.)
Short Wave ("C" Band) ....7-22 mc. (42.8-13.7 m.)
Intermediate Frequency ....455 kc.

Tube Complement

(1) RCA 1T4 ....R.F. Amplifier
(2) RCA 1A7GT ....Converter
(3) RCA 1T4 ....I.F. Amplifier
(4) RCA 1U5 ....Det.-A.V.C.-A.F. Amp.
(5) RCA 3V4 ....Output

Two selenium rectifiers (connected in series) are used.

Power Supply Ratings

Power Line Operation ....105-125v. or 210-250v. d.c. or 50 to 60 cycles a.c.

The two switches on the back of the chassis (117v.-234v., AC-DC) must be in the correct position for the available power supply.

Power consumption .. {117v. d.c.—7 watts, 117v. a.c.—11 watts, 234v. d.c.—14 watts, 234v. a.c.—22 watts.

NOTE: If reception is not obtained on d.c., reverse the plug in the outlet receptacle.

Battery Operation

Battery pack ....RCA VS 019

The power cord plug must be inserted into the socket provided on the top of the chassis.

Current consumption ...."A" (9v.) 50 ma., "B" (90v.) 14.5 ma.

Power Output

Undistorted ....150 milliwatts
Maximum ....275 milliwatts

Loudspeaker (970268-75)

Size and type ....4" x 6" P.M. dynamic
Voice coil impedance ....3.2 ohms at 400 cycles

Dimensions

Height............13¼"   Width............9½"   Depth............5½"

Weight ....9 lbs. (without battery)

Antennas

Under normal conditions the built-in antennas will give satisfactory service. If the receiver is used in a shielded location such as an automobile, airplane or railway train, an RCA VICTOR EXTERNAL LOOP ANTENNA may be used for improved performance on "A" band.

An external antenna and ground may be connected to the ANT and GND terminal screws at the end of the chassis. This may improve reception on all bands.

For improved short wave reception on battery operation, the metal ground plate should be removed from the case and placed on the ground. Its connecting wire should be attached to the GND terminal screw.

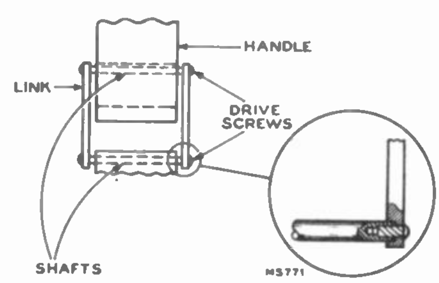
The telescoping rod antenna should be extended to its full height for good short wave reception.

Insulating Washers

The dial support and base holder brackets are insulated from the chassis with insulating washers. This serves to insulate the case from the chassis. In servicing make certain that these washers are in place and properly positioned.

Power Line Operation

A power cord is stored beneath the battery inside the case. Its plug is inserted in a socket on top of the chassis. For power line operation: remove the plug from its socket and insert it into a convenient power supply outlet.



Handle Link Assembly

6QP3

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscilloscope are shown in the Schematic Diagram.

Output Meter Alignment—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output low to avoid a-v-c action.

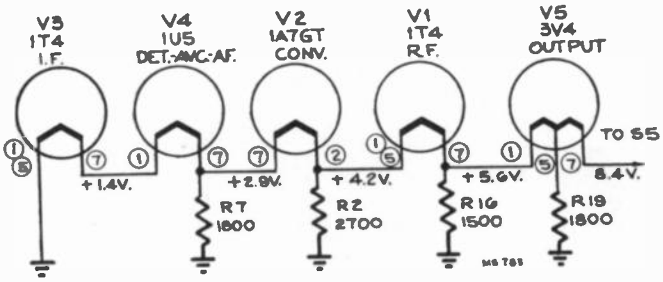
NOTE—If the test-oscillator is also a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and to connect the low side of the test oscillator to common wiring—reversal of the plug may reduce hum.

Dial Indicator—With tuning condenser in full mesh, the indicator should be set to the position shown in the illustration "Dial Indicator Position."

For additional information refer to booklet "RCA Victor Receiver Alignment."

Step	Connect high side of test osc. to—	Tune test osc. to—	Range Switch	Turn radio dial to—	Adjust for maximum output—
1	I.F amp. grid (pin #6) in series with .01 mf.	455 kc.	A	quiet point near 1600 kc.	T2 top & bottom
2	Converter grid (top cap) in series with .01 mf.				T1 top & bottom
3	Rod ant. lead in series with dummy ant. (22 ohms in series with 33 mmf.)	17.75 mc.	C	17.75 mc.	C22 (osc.) C2 (R.F.) C14(ant.)*
4		7.2 mc.		7.2 mc.	L13 (osc.) L7 (R.F.) L4 (ant.)
5		Repeat Steps 3 and 4.			
6		6.1 mc.	B	6.1 mc.	C28 (osc.) C13 (ant.)
7		2.5 mc.		2.5 mc.	L12 (osc.) L6 (R.F.) L3 (ant.)
8		Repeat Steps 6 and 7.			
9	Blue loop lead in series with .01 mf.	1400 kc.	A	1400 kc.	C26 (osc.) C21 (R.F.)
10		600 kc.		600 kc.	L11 (osc.) L5 (R.F.)
11		Repeat Steps 9 and 10.			
12	Assemble receiver, connect loop ant. leads, install rod antenna, connect blue rod ant. lead to C36. Install and connect battery.				
13	Short wire placed near receiver for radiated signal	1400 kc.	A	1400 kc.	C4 (loop)
14		17.75 mc.	C	17.75 mc.	†C14 (ant.)*
15		6.1 mc.	B	6.1 mc.	†C13 (ant.)

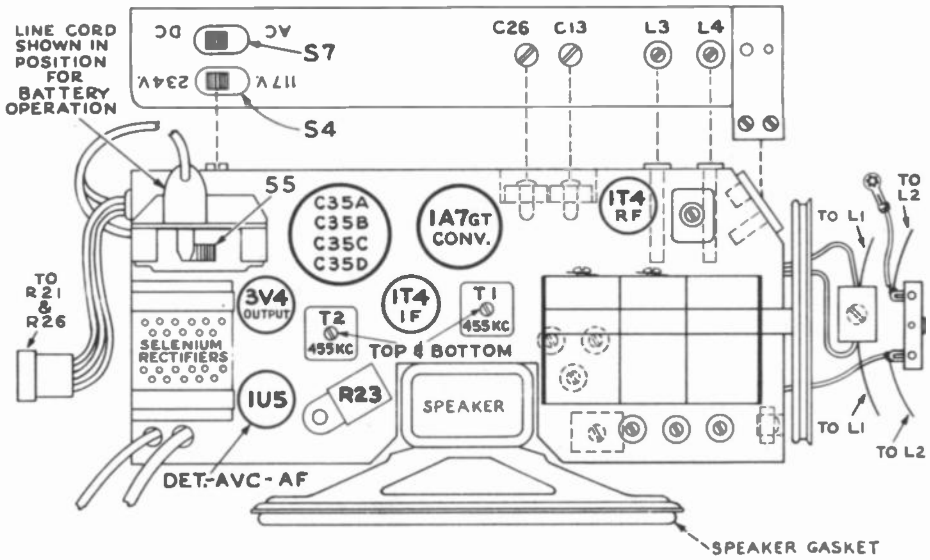
* Rock gang, use maximum capacity peak.
† Extend rod antenna to full height.
Oscillator tracks above signal on all bands.

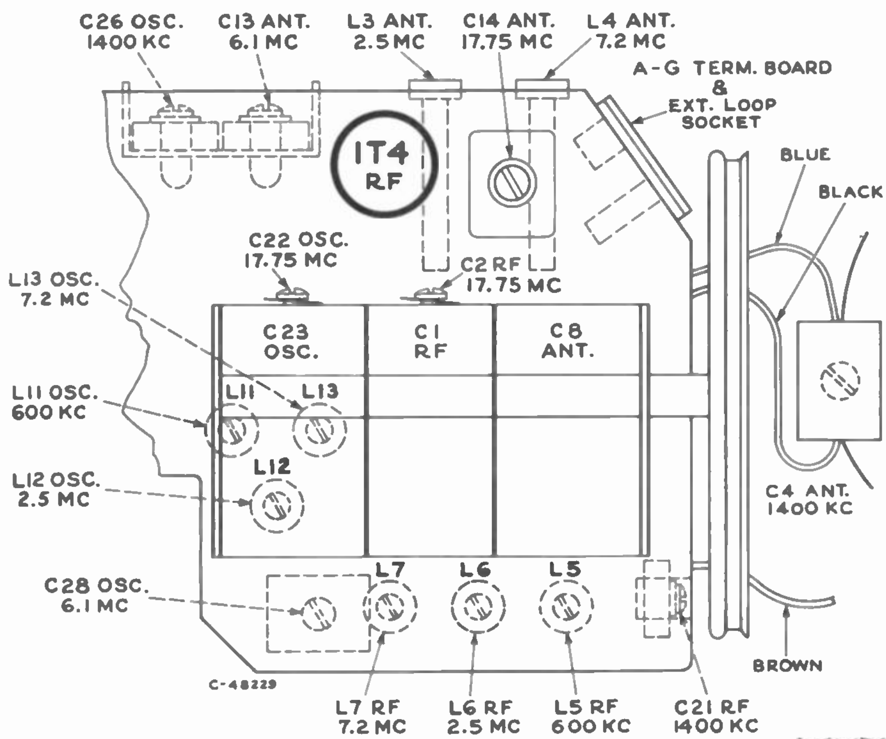


Filament Circuit

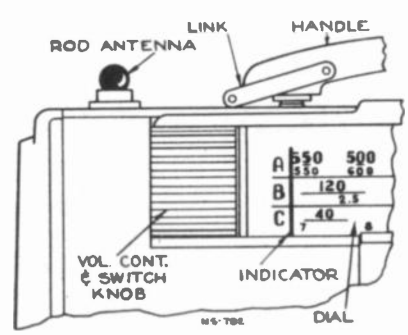
CRITICAL LEAD DRESS

1. Dress all filament leads close to chassis.
2. Dress 33 ohm fuse resistor up and away from all wiring.
3. Dress C40 close to side apron.
4. Keep R14 leads as short as possible and dress close to 1U5 socket.
5. Dress R24 up and away from chassis.
6. Dress R23 leads under bus wire that runs between terminal #3 of 2nd IF and pin #2 of 1T4 (IF).
7. Dress C45 against chassis.
8. Keep bus leads on C43 and C38 as short as possible.
9. Dress neutralizing capacitor C15 against chassis.
10. Dress C34 against chassis and keep leads as short as possible.
11. Dress C46 leads up and away from IF transformer and keep leads as short as possible.
12. Keep leads on R5 and C16 as short as possible.
13. Keep bus leads on C20 and R13 as short as possible and dress midway between chassis and bottom pan, center R13 bus in chassis hole.
14. Dress "C" oscillator coil lead to S3-10 up and away from chassis base.
15. Dress all leads away from "C" oscillator coil.
16. Dress C27 under "B" oscillator trimmer and edge-wise to chassis base.
17. Dress R1 and C3 close to chassis base and away from R.F. grid.
18. Dress "C" R.F. coil lead to S2-10 up and away from chassis base.
19. Keep leads on R11 as short as possible and dress close to 1A7 socket.
20. Dress C12 close to range switch wafer.
21. Keep 1A7 I.F. plate lead away from terminal #1 of 1st IF transformer.
22. Dress white leads of "A" and "B" R.F. coils under bus wire to S2-7 and dress close to range switch wafer.
23. Dress C11 away from range switch shaft.
24. Dress filament leads to R.F. tube between back apron and 1A7 socket.
25. Dress R3, R4 close to chassis base.
26. Dress C7 away from RF section of range switch and midway between antenna coils and bottom pan.
27. Keep leads to 1st audio plate as short as possible.
28. Dress wiring near external loop socket to clear external loop pins.
29. Dress loop lead away from tuning drum and battery.
30. Dress leads to S1-3 away from R.F. range switch wafer.
31. Dress "B" R.F. coil leads close to coil.

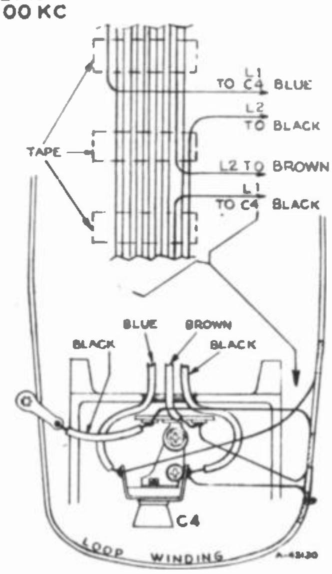




Tube and Trimmer Locations

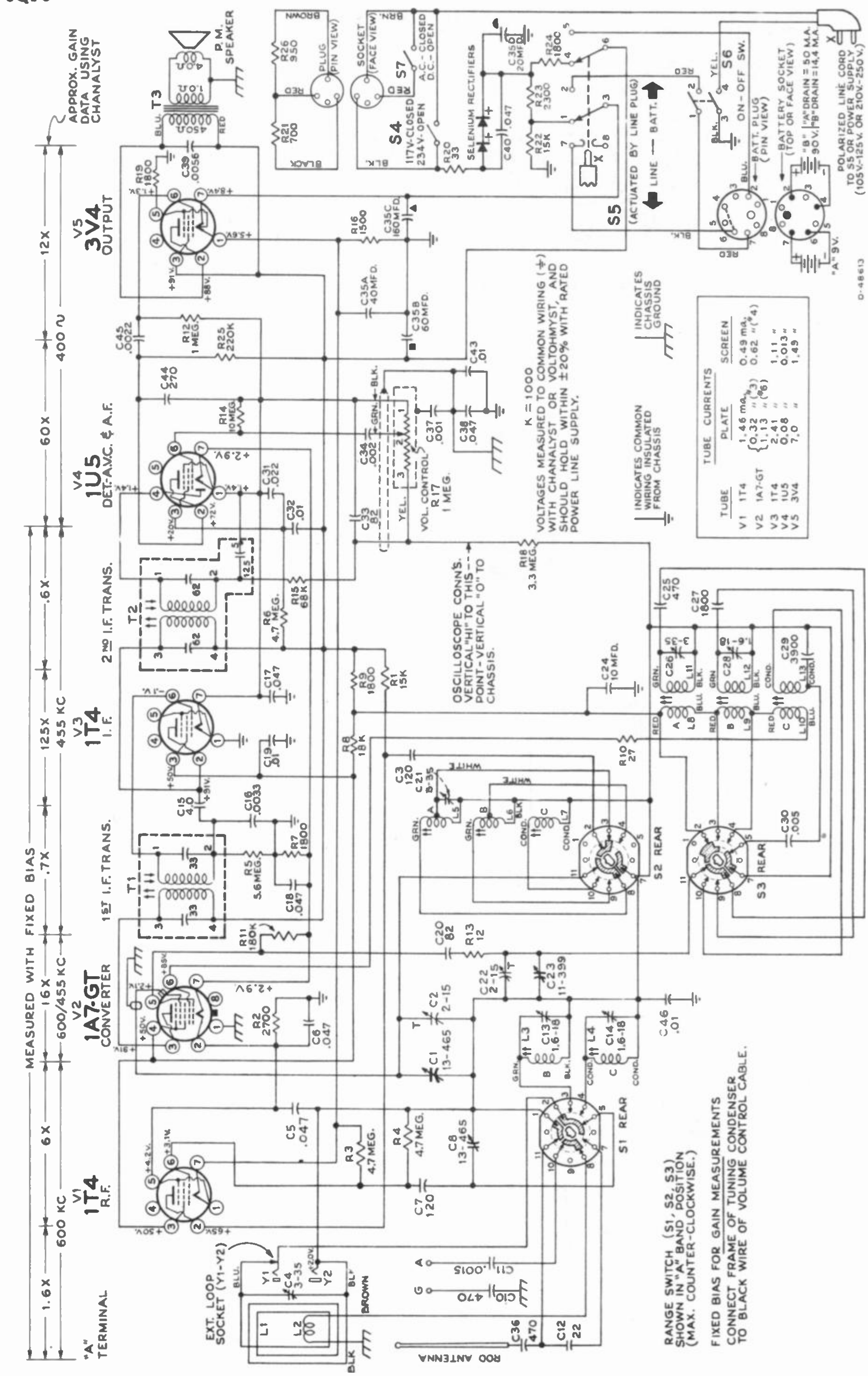


Dial Indicator Position

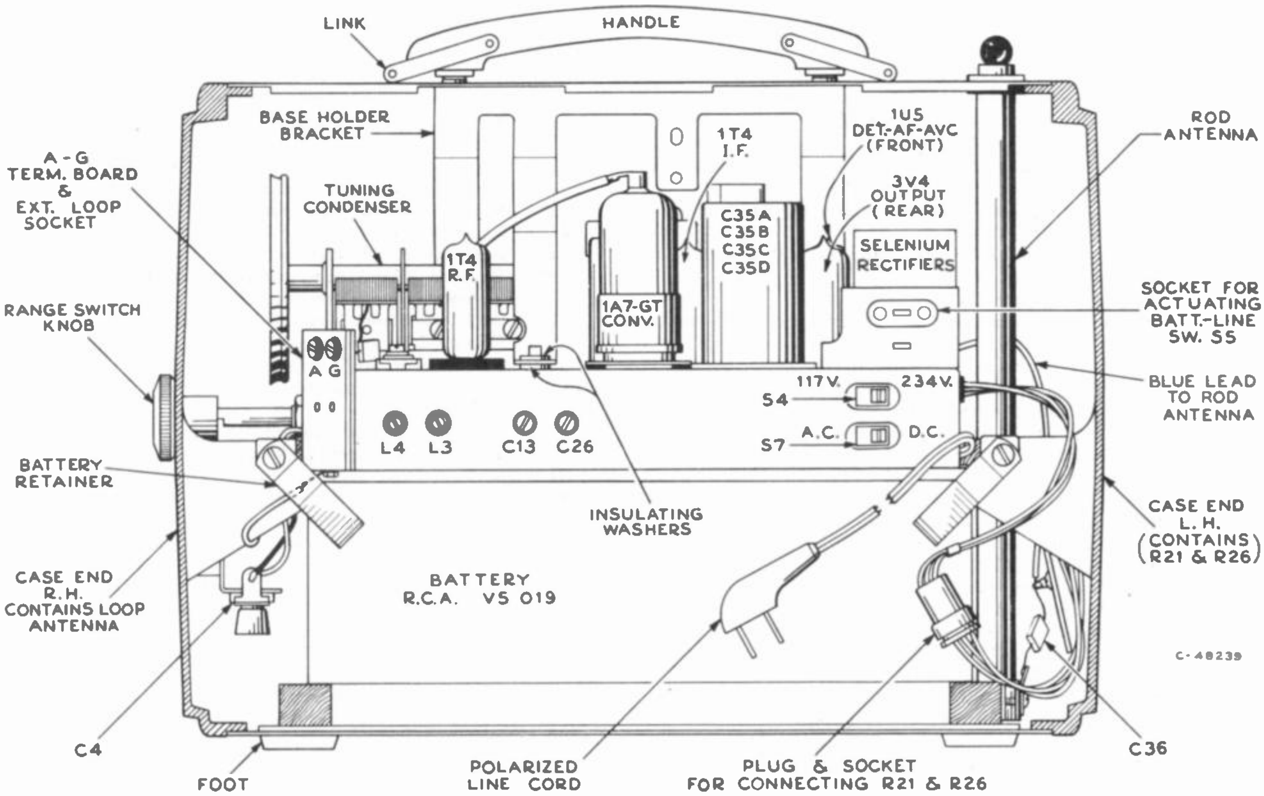


Loop Antenna Connections

6QP3



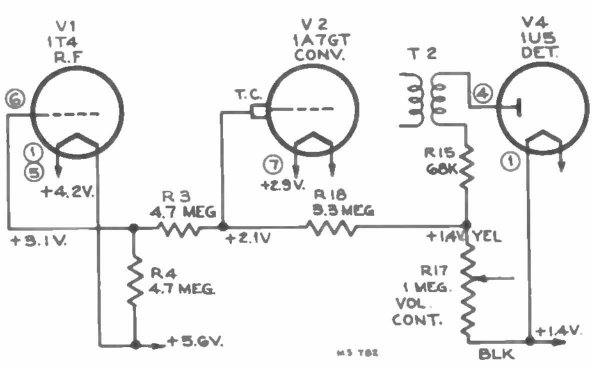
Schematic Diagram



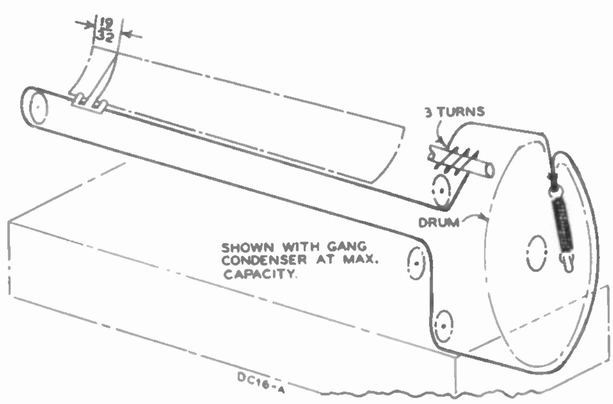
Assembly Back View

To Remove Chassis

1. Disconnect and remove battery.
2. Disconnect loop antenna leads.
3. Disconnect rod antenna lead from C36.
4. Separate line ballast cable plug and socket.
5. Disconnect C36 from rod antenna.
6. Remove rod antenna through top of case.
7. Remove range switch knob.
8. Remove the two screws holding chassis to case ends.
9. Remove two screws (under carrying handle) holding base holder bracket to top of case.



A V C Circuit



Dial Indicator and Drive Mechanism

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLY RC-1067
S-5121	Bracket-Drive cord pulley bracket complete with one pulley (volume control side)
S-5122	Bracket-Drive cord pulley bracket complete with two pulleys (tuning control side)
S-5123	Bracket-Drive cord pulley bracket complete with one pulley (tuning control side)
S-5124	Capacitor—Mica trimmer, 1.6-18 mmf. (C14)
S-5125	Capacitor—Mica trimmer, dual, 1.6-18 mmf., and 3-35 mmf. (C13, C26)
S-5126	Capacitor—Mica trimmer, 3-35 mmf. (C21)
S-5127	Capacitor—Mica trimmer, 1.6-18 mmf. (C28)
S-5128	Capacitor—Ceramic, 4 mmf. (C15)
S-5129	Capacitor—Ceramic, 22 mmf. (C12)
S-5130	Capacitor—Ceramic, 82 mmf. (C20, C33)
S-5131	Capacitor—Ceramic, 120 mmf. (C3, C7)
S-5132	Capacitor—Ceramic, 270 mmf. (C44)
S-5108	Capacitor—Mica, 470 mmf. (C10, C36)
S-5134	Capacitor—Tubular, .001 mf., 600V. (C37)
S-5135	Capacitor—Ceramic, .0015 mf. (C11)
S-5136	Capacitor—Mica, 1800 mmf. (C27)
S-5137	Capacitor—Molded, 2000 mmf., 200V. (C34)
S-5138	Capacitor—Tubular, .0022 mf., 600V. (C45)
S-4541	Capacitor—Tubular, .0033 mf., 600V. (C16)
S-5139	Capacitor—Mica, 3900 mmf. (C29)
S-5140	Capacitor—Molded, .005 mf., 200V. (C30)
S-4608	Capacitor—Tubular, .0056 mf., 400V. (C39)
S-4820	Capacitor—Ceramic, .01 mf., (C19, C32, C43, C46)
S-5142	Capacitor—Tubular, .022 mf., 400V. (C31)
S-4706	Capacitor—Tubular, .047 mf., 400V. (C5, C6, C17, C18)
S-5144	Capacitor—Tubular, .047 mf., 600V. (C38, C40)
S-5145	Capacitor—Electrolytic, 10 mf., 150V (C24)
S-5146	Capacitor—Electrolytic, comprising 1 section of 40 mf., 25V., 1 section of 60 mf., 150V., 1 section of 160 mf., 25V., & 1 section of 20 mf., 150V. (C35A, C35B, C35C, C35D)
S-4454	Clip—Mounting clip for I-F transformers
S-5221	Coil—"A" osc. coil complete with adjustable core (L8, L11)
S-5222	Coil—"B" osc. coil complete with adjustable core (L9, L12)
S-5223	Coil—"C" osc. coil complete with adjustable core (L10, L13)
S-5224	Coil—"A" R.F. coil complete with adjustable core (L5)
S-5225	Coil—"B" R.F. coil complete with adjustable core (L6)
S-5226	Coil—"C" R.F. coil complete with adjustable core (L7)
S-5227	Coil—"B" ant. coil complete with adjustable core (L3)
S-5228	Coil—"C" ant. coil complete with adjustable core (L4)
S-5147	Condenser—Variable tuning condenser (C1, C2, C8, C22, C23)
S-5148	Control—Volume control & power switch (R17, S6)
S-4313	Cord—Dial drive cord (approx. 40 in. required)
S-5149	Cord—Power cord
S-5150	Dial—Dial scale and window assembly
S-5151	Drive—Vernier drive assembly with tuning knob shaft
S-4464	Grommet—Rubber grommet for mounting tuning condenser (three required)
S-4463	Grommet—Rubber grommet for mounting ant., osc., & r.f. coils (1 required for each) or 1A7GT tube socket (2 required)
S-5152	Grommet—Rubber grommet for line ballast cable
S-5153	Indicator—Station selector indicator
S-5154	Insulator—Bakelite insulator for dial support (2 required)
S-5155	Knob—Tuning knob with retaining spring
S-5156	Knob—Volume control & power switch knob with retaining spring
S-5157	Plate—Insulating plate for mounting electrolytic capacitor
S-5158	Plate—Insulating plate for selenium rectifiers.
S-5159	Plug—5 prong male plug for battery cable
S-4829	Rectifier—Selenium rectifier (2 required)
S-5160	Resistor—Fixed, composition, 12 ohms, ½w. (R13)
S-5161	Resistor—Fixed, composition, 27 ohms, ½w. (R10)
S-5162	Resistor—Fixed, composition, 33 ohms, 1w. (R20)
S-5163	Resistor—Fixed, composition, 1500 ohms, ½w. (R16)
S-5164	Resistor—Fixed, composition, 1800 ohms, ½w. (R7, R9, R19)
S-5165	Resistor—Fixed, composition, 1800 ohms, 1w. (R24)
S-5166	Resistor—Fixed, wire wound, 2300 ohms, 6w. (R23)
S-5167	Resistor—Fixed, composition, 2700 ohms, ½w. (R2)
S-5168	Resistor—Fixed, composition, 15,000 ohms, ½w. (R1)

STOCK No.	DESCRIPTION
S-5169	Resistor—Fixed, composition, 15,000 ohms, ½w. (R22)
S-5170	Resistor—Fixed, composition, 18,000 ohms, ½w. (R8)
S-5171	Resistor—Fixed, composition, 68,000 ohms, ½w. (R15)
S-5172	Resistor—Fixed, composition, 180,000 ohms, ½w. (R11)
S-5173	Resistor—Fixed, composition, 220,000 ohms, ½w. (R25)
S-5174	Resistor—Fixed, composition, 1 megohm, ½w. (R12)
S-5175	Resistor—Fixed, composition, 3.3 megohm, ½w. (R18)
S-5176	Resistor—Fixed, composition, 4.7 megohm, ½w. (R3, R4, R6)
S-5177	Resistor—Fixed, composition, 5.6 megohm, ½w. (R5)
S-5178	Resistor—Fixed, composition, 10 megohm, ½w. (R14)
S-5179	Shield—L.H. end shield for dial
S-5180	Shield—R.H. end shield for dial
S-4511	Spacer—Metal spacer for mounting tuning condenser (3 required)
S-5181	Socket—4 contact socket for line ballast cable
S-4721	Socket—Tube socket—miniature—for V1
S-5182	Socket—Tube socket—miniature—for V3
S-5183	Socket—Tube socket—miniature—for V4 or V5
S-4481	Socket—Tube socket—octal—for V2
S-5184	Socket—External loop socket—with ant. & gnd. term. (Y1, Y2)
S-5185	Spring—Dial drive cord tension spring
S-5186	Switch—LINE-BATT change switch and bracket (S5)
S-5187	Switch—Range switch (S1, S2)
S-5188	Switch—AC-DC or 117-234V. change switch (S4, S7)
S-5229	Transformer—First I-F transformer (T1)
S-5230	Transformer—Second I-F transformer (T2)
S-5231	Transformer—Output transformer (T3)
S-5189	Washer—Insulating washer (flat) for mounting base holder bracket to chassis base
S-5190	Washer—Insulating washer (extruded) for mounting base holder bracket or dial support to chassis base (5 required)
	SPEAKER ASSEMBLY STAMPED 970268-75
S-5191	Gasket—Speaker gasket (black tubing 15⅞" in length)
S-5192	Speaker—4" x 6" PM speaker complete with cone and voice coil
	MISCELLANEOUS
S-5193	Antenna—Telescopic rod antenna
S-5194	Arm—Shutter arm lever
S-5195	Back—Case back and top cover—less rear feet
S-5196	Bracket—Bearing bracket for shutter arm lever
S-5197	Capacitor—Mica trimmer, 3-35 mmf. (C4)
S-5198	Clip—Spring clip for case ends (2 required)
S-5199	End—Case end—R.H.—with trimmer capacitor and spring clip—less loop
S-5200	End—Case end—L.H.—complete with line ballast resistors, cable and spring clip
S-5201	Foot—Case foot—front (2 required)
S-5202	Foot—Case foot—rear (2 required)
S-5203	Front—Case front complete with feet, less shutter
S-5204	Grommet—Rubber grommet to insulate rod antenna
S-5205	Handle—Carrying handle
S-5206	Link—Carrying handle link consisting of two links, two shafts and four drive screws (2 required)
S-5207	Knob—Range switch knob
S-5208	Nut—Speed nut to retain line ballast resistors in case end
S-5209	Loop—Loop antenna (L1, L2)
S-5210	Plate—External ground plate
S-5211	Plug—4 prong male plug for line ballast resistor cable
S-5212	Resistor—Line ballast resistor, flexible, wire wound, 700 ohms, 48 watts (R21)
S-5213	Resistor—Line ballast resistor, flexible, wire wound, 950 ohms, 24 watts (R26)
S-5214	Retainer—Spring retainer for battery (2 required)
S-5215	Retainer—Spring retainer for rear feet (2 required)
S-5216	Screw—Complete set of screws, nuts and washers to fasten case front to case ends.
S-5217	Shutter—Case shutter
S-5218	Spring—Case shutter compression spring
S-5219	Washer—"C" washer for shutter shafts (2 required)
S-5220	Washer—Dampening washer for shutter shafts (2 required)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

MODEL 7Q51X

Chassis No. RC-1055D—Mfr. No. 274

SERVICE DATA

1949 . . . . X6

RADIO CORPORATION OF AMERICA

RCA INTERNATIONAL DIVISION

745 FIFTH AVE., NEW YORK 22, N. Y.

Electrical and Mechanical Specifications

Frequency Ranges

Low Frequency ("X" Band)	150-380 kc (2000-789.5 m)
Standard Broadcast ("A" Band)	525-1600 kc (571-187 m)
Short Wave ("C" Band)	5.9 mc-18.0 mc (50.8-16.6 m)
"31-25 Meter" Spread Band	9.5-12 mc (31.6-25 m)
"19-16 Meter" Spread Band	15.1-17.9 mc (19.8-16.7 m)
Intermediate Frequency	455 kc

Tube Complement

(1) RCA 6BE6	Converter
(2) RCA 6BA6	I.F. Amplifier
(3) RCA 6SQ7	Det.-A.V.C.-A.F. Amp.
(4) RCA 6F6G	Output
(5) RCA 6F6G	Output
(6) RCA 5Y3GT	Rectifier
(7) RCA 6AT6	Phase Inverter

Loudspeaker

Type 92570-4	Permanent-Magnet Dynamic
Size	6½ in. (16.5 cm)
V. C. Impedance	3.2 ohms @ 400 cycles

Power Output

Undistorted	4 watts
Maximum	4.25 watts

Power Supply Ratings

Symbol	Voltage	Frequency	Watts
Rating A	105-125	50-60	60
Rating B	105-125	25-60	60
Rating D	(See below)	40-60	60

110 position—100 to 115 v.
125 position—115 to 135 v.
150 position—135 to 165 v.
210 position—180 to 220 v.
240 position—220 to 260 v.

Note: Shipped in 240 v. position. To change, remove round cover on top of transformer case and move link to desired position.

CAUTION: Remove power cord from line receptacle before changing link position.

Dial Lamps (2) .... Mazda No. 44, 6.3 volts, .25 amp.

Cabinet Dimensions

Height	10-13/16 in. (27.4 cm)
Width	16¼ in. (41.3 cm)
Depth	8¼ in. (21 cm)

Tuning Drive Ratio .... 13½ to 1 (6¾ turns of knob)

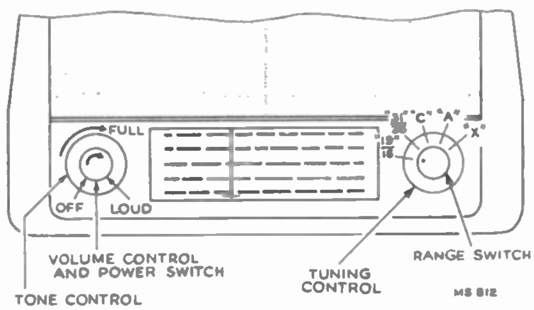
Description

This instrument is a seven-tube five-band receiver of conventional design with the exception of the spread-band tuning.

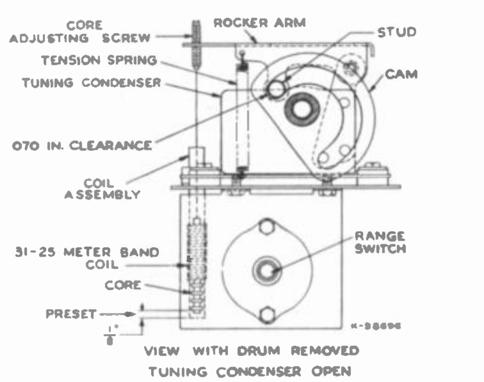
A two-section gang condenser one section for antenna and one for oscillator circuit, is used for the X, A, and C bands. The 31-25 Meter and the 19-16 Meter spread bands are tuned by a specially designed permeability tuning system actuated by a cam and rocker assembly which is mechanically fastened to the gang condenser shaft. The core assembly of the permeability tuning system is molded to insure the required tolerances, and tunes both the 31-25 Meter and the 19-16 Meter bands with different circuit constants.

In the 31-25 Meter band position the 31-25 Meter coils (antenna and oscillator) are used. In the 19-16 Meter band position the 31-25 Meter and 19-16 Meter band coils are used in parallel.

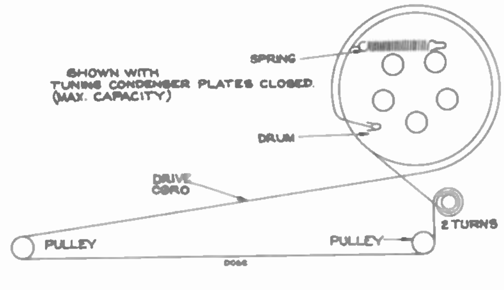
The inductances of the AC windings of the multiple antenna coil are all fixed, but the inductances of all other coils in the antenna and oscillator circuits are permeability adjusted. Ungrounded screw-type cores are used for these coils and adjustments are made with a non-metallic screwdriver.



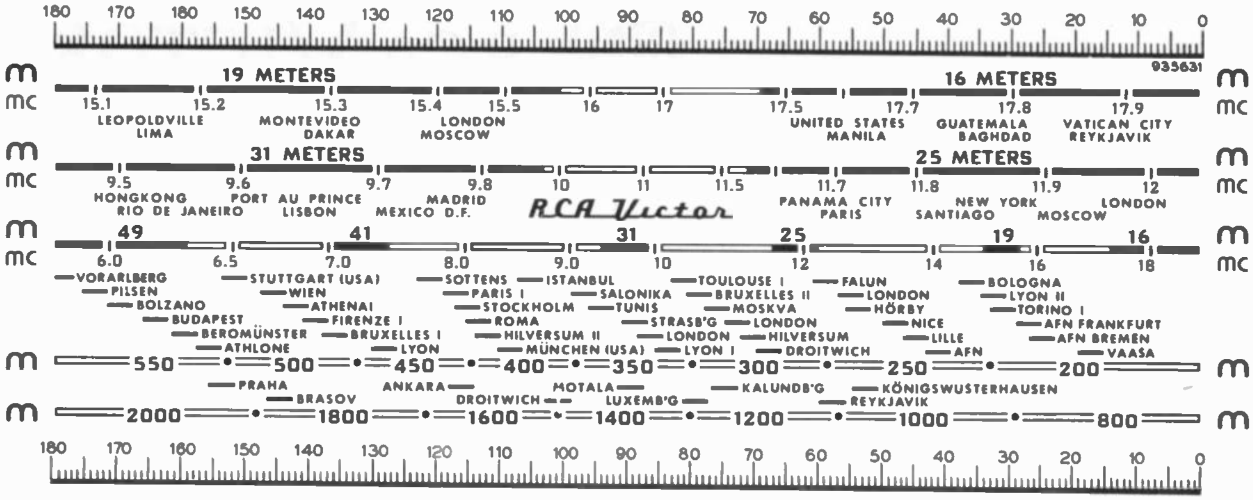
Operating Controls



Spread-Band Tuning (Front View)



Dial-Indicator and Drive Mechanism



Reduced Reproduction of Receiver Dial and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 143° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedures."

Alignment Procedure

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Receiver Dial with Calibration Scale.—To determine the corresponding frequency for any setting of the calibration scales, refer to the dial with calibration scale drawing.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the end calibration mark, and gang condenser fully meshed. The indicator has a clip for attachment to the cable.

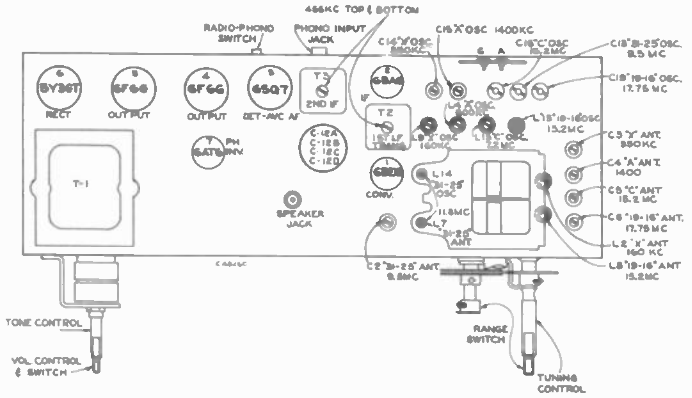
Spread-Band Alignment.—For spread-band alignment an extremely high degree of accuracy is required of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials.

Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by one of the following methods:

1. Zero-beat the test-oscillator against short-wave stations of known frequency.
2. Check test-oscillator signals with a crystal controlled oscillator.

A final check should be made on actual reception of short-wave stations of known frequency.

For additional information, refer to booklet "RCA Victor Receiver Alignment."



Tube and Trimmer Location (Top View)

Step	Connect high side of test oscillator to—	Test oscillator frequency	Turn radio dial to—	Adjust for maximum output
1	Pin #1 of 6BA6 thru .01 mfd. capacitor	455 kc	Quiet point near 600 kc A Band	T-3 2nd I.F. trans.—top and bottom
2	Pin #7 of 6BE6 thru .01 mfd. capacitor			T-2 1st I.F. trans.—top and bottom
3	Ant. terminal thru 200 mmfd capacitor	350 kc	X Band 23°	C14 osc. C3 ant.
4		160 kc	X Band 144.9°	L9 osc. L2 ant.
5		Repeat steps 3 and 4		
6		1400 kc	A Band 27.3°	C15 osc. C4 ant.
7		600 kc	A Band 142.6°	L11 osc.
8		Repeat steps 6 and 7		
9	Ant. terminal thru 300 ohm resistor	15.2 mc	C Band 31.7°	†C16 osc. C5 ant.
10		7.2 mc	C Band 132°	L13 osc.
11		Repeat steps 9 and 10		
12		9.5 mc	31-25 Meter Band 169.6°	*C13 osc. *C2 ant.
13		11.8 mc	31-25 Meter Band 44.8°	†L14 osc.‡ L7 ant.‡
14		Repeat steps 12 and 13		
15		17.75 mc	19-16 Meter Band 37.5°	†C19 osc. C8 ant.
16		15.2 mc	19-16 Meter Band 157.2°	†L15 osc. L8 ant.
17		Repeat steps 15 and 16		

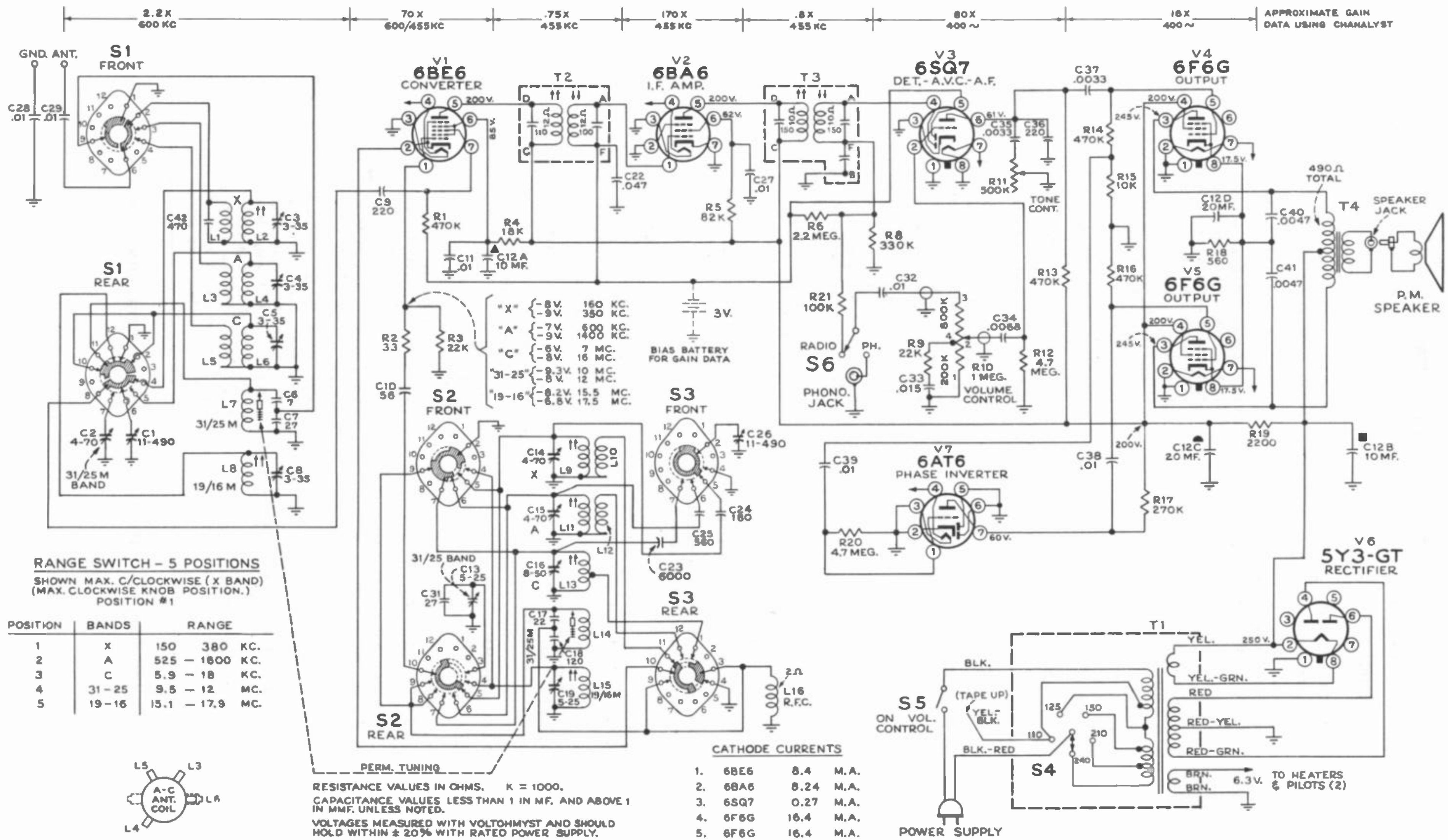
† Oscillator frequency is higher than signal frequency on all bands. Use minimum capacity or minimum inductance peak on oscillator adjustments if two peaks can be obtained.

* Pre-set L14 and L7, with tuning condenser at minimum capacity (0°), so that the cores are exactly ⅛ in. (3.175 mm) from the bottom end of their respective coils (coil end to bottom end of iron core—not the insulating rod of the core assembly).

‡ If dial reading for maximum output at 11.8 mc is lower than 11.8 mc, rotate studs approx. ½ turn clockwise—if higher rotate approx. ½ turn counterclockwise.

Critical Lead Dress

1. The 6BA6 screen by-pass capacitor C27 should be dressed close to the chassis with short leads.
2. The grid resistors R12 and R20 should be dressed close to the chassis with short leads.
3. The speaker wires should be dressed as far away from the 6SQ7 and 6AT6 sockets as possible.



RANGE SWITCH – 5 POSITIONS
SHOWN MAX. C/CLOCKWISE (X BAND)
(MAX. CLOCKWISE KNOB POSITION.)
POSITION #1

POSITION	BANDS	RANGE
1	X	150 – 380 KC.
2	A	525 — 1600 KC.
3	C	5.9 — 18 KC.
4	31 – 25	9.5 — 12 MC.
5	19 – 16	15.1 — 17.9 MC.

RESISTANCE VALUES IN OHMS. K = 1000.
CAPACITANCE VALUES LESS THAN 1 IN MF. AND ABOVE 1 IN MMF. UNLESS NOTED.
VOLTAGES MEASURED WITH VOLTOHMYST AND SHOULD HOLD WITHIN ± 20% WITH RATED POWER SUPPLY.

CATHODE CURRENTS

1.	6BE6	8.4	M.A.
2.	6BA6	8.24	M.A.
3.	6SQ7	0.27	M.A.
4.	6F6G	16.4	M.A.
5.	6F6G	16.4	M.A.
6.	5Y3/GT	50	M.A.
7.	6AT6	0.5	M.A.

Schematic Diagram

Replacement Parts

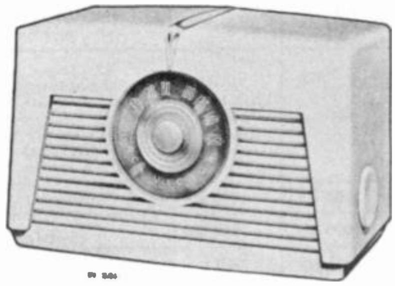
STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC-1055D
	R-F PLATE SUB-ASSEMBLY
S-4512	Board—Antenna-Ground terminal board
S-4513	Capacitor—Trimmer capacitor, single, 4-70 mmf. (C2)
S-5390	Capacitor—Trimmer capacitor, dual, two sections of 4-70 mmf. (C14, C15)
S-4515	Capacitor—Trimmer capacitor, triple, two sections of 5-25 mmf. and one section of 8-50 mmf. (C13, C16, C19)
S-4516	Capacitor—Trimmer capacitor, quadruple, four sections of 3-35 mmf. (C3, C4, C5, C8)
S-4517	Capacitor—Ceramic, 7 mmf. (C6)
S-4518	Capacitor—Ceramic, 22 mmf. (C17)
S-4519	Capacitor—Ceramic, 27 mmf. (C7)
S-4520	Capacitor—Ceramic, 27 mmf. (C31)
S-4521	Capacitor—Ceramic, 120 mmf. (C18)
S-5017	Capacitor—Mica, 180 mmf. (C24)
S-4439	Capacitor—Mica, 220 mmf. (C9)
S-5018	Capacitor—Mica, 470 mmf. (C42)
S-4440	Capacitor—Mica, 560 mmf. (C25)
S-4442	Capacitor—Mica, 6000 mmf. (C23)
S-4820	Capacitor—Ceramic, .01 mf. (C28)
S-4448	Capacitor—Tubular, .047 mf., 200 v. (C22)
S-4523	Capacitor and Resistor Assembly—56 mmf., capacitor and 33 ohm resistor (C10, R2)
S-4524	Choke—Cathode choke coil (L14)
S-4525	Coil—"A" band oscillator coil (L11, L12)
S-5391	Coil—"X" band oscillator coil (L9, L10)
S-4527	Coil—"C" band oscillator coil (L13)
S-5023	Coil—"X" band antenna coil (L1, L2)
S-4528	Coil—"31-25 Meter" band antenna or oscillator coil (L7, L14)
S-4529	Coil—"19-16 Meter" band antenna or oscillator coil (L8, L15)
S-4530	Condenser—Tuning condenser (C1, C26)
S-4531	Core—Adjustable core and stud for "31-25 Meter" band oscillator coil
S-5392	Core—Adjustable core and stud for "31-25 Meter" band antenna coil
S-4532	Drum—Tuning condenser drum, hub and cam assembly
S-4533	Grommet—Rubber grommet to mount tuning condenser
S-4534	Plate—Rocker arm plate and stud assembly—less adjustable cores
S-4535	Resistor—Fixed-composition, 22,000 ohms, ½ watt (R3)
S-4476	Resistor—Fixed-composition, 470,000 ohms, ½ watt (R1)
S-4536	Screw—Rocker arm plate bearing screw
S-4894	Socket—Tube socket
S-4537	Spring—Rocker arm plate tension spring
S-5393	Switch—Range switch (S1, S2, S3)
S-4539	Transformer—First I.F. transformer (T2)
	MAIN CHASSIS ASSEMBLY
S-4540	Bracket—Dial cord bracket and pulley assembly (two required)
S-4439	Capacitor—Mica, 220 mmf. (C36)
S-4541	Capacitor—Tubular, .0033 mf., 600 v. 20% (C37)
S-4853	Capacitor—Tubular, .0033 mf., 600 v. 10% (C35)
S-4542	Capacitor—Tubular, .0047 mf., 1000 v. (C40, C41)
S-4543	Capacitor—Tubular, .0068 mf., 400 v. (C34)
S-4820	Capacitor—Ceramic, .01 mf. (C29)
S-4444	Capacitor—Tubular, .01 mf., 400 v. (C11, C27, C32, C38, C39)
S-4544	Capacitor—Tubular, .015 mf., 400 v. (C33)
S-4545	Capacitor—Electrolytic, comprising one section of 20 mfd., 400 volts, two sections of 10 mfd., 400 volts and one section of 20 mfd., 25 volts (C12A, C12B, C12C, C12D)
S-5394	Coil—"A" and "C" bands antenna coil (L3, L4, L5, L6)
S-4547	Control—Volume control, tone control and power switch (R10, R11, S5)
S-4313	Cord—Dial drive cord (approx. 45" required)
S-4548	Cord—Power cord
S-4549	Gear—Gear and hub for range switch shaft
S-4550	Gear—Gear and hub for range switch control shaft
S-4551	Lever—Range indicator lever and hub
S-4552	Resistor—Fixed-composition, 560 ohms, 1 watt (R18)
S-4553	Resistor—Fixed-composition, 2200 ohms, 2 watt (R19)
S-4554	Resistor—Fixed-composition, 10,000 ohms, ½ watt (R15)
S-4555	Resistor—Fixed-composition, 18,000 ohms, 1 watt (R4)
S-4556	Resistor—Fixed-composition, 22,000 ohms, ½ watt (R9)
S-4557	Resistor—Fixed-composition, 82,000 ohms, ½ watt (R5
S-4558	Resistor—Fixed-composition, 100,000 ohms, ½ watt (R21)
S-4559	Resistor—Fixed-composition, 270,000 ohms, ½ watt (R17)
S-4560	Resistor—Fixed-composition, 330,000 ohms, ½ watt (R8)
S-4476	Resistor—Fixed-composition, 470,000 ohms, ½ watt (R13, R16)
S-4561	Resistor—Fixed-composition, 470,000 ohms, ½ watt (R14)
S-4562	Resistor—Fixed-composition, 2.2 megohm, ½ watt (R6)
S-4478	Resistor—Fixed-composition, 4.7 megohm, ½ watt (R12, R20)
S-4563	Socket—Dial lamp socket and lead assembly
S-4564	Spring—Dial drive cord tension spring
S-4565	Shaft—Range switch control shaft
S-4566	Shaft—Tuning control shaft
S-4480	Socket—Phono input or speaker output socket
S-4567	Socket—Tube socket—octal—for 6SQ7 tube
S-4482	Socket—Tube socket—octal—for 5Y3 GT or 6F6G tubes
S-4568	Socket—Tube socket—minature—for 6AT6 tube
S-4569	Switch—Radio—phono switch (S6)
S-4571	Transformer—Second I.F. transformer (T3)
S-4572	Transformer—Output transformer (T4)
S-4573	Transformer—Power transformer, 105-125 volts, 50/60 cycles (T1)
S-4574	Transformer—Power transformer, 105-125 volts, 25/60 cycles (T1)
S-5395	Transformer—Power transformer, 100-115, 115-135, 135-165, 180-220, 220-260 volts, 40/60 cycles (T1)
S-4576	Washer—"C" washer for range switch shaft (inside)
S-4577	Washer—"C" washer to retain tuning shaft on range switch shaft
	SPEAKER ASSEMBLIES
S-4578	Cone—Speaker cone
S-4579	Plug—Male pin plug for speaker cable
S-4580	Speaker—6½" P.M. speaker complete with cone and connecting cable
	MISCELLANEOUS
S-4581	Back—Back cover for cabinet
S-4582	Baffle—Baffle board and grille cloth assembly—less emblem
S-4583	Bezel—Dial bezel
S-4584	Cabinet—Plastic cabinet
S-4585	Cover—Plastic dial cover
S-5396	Dial—Glass dial scale
S-4499	Emblem—Trademark emblem
S-4587	Grille—Metal grille
S-4588	Grommet—Rubber grommet for chassis mounting
S-4503	Grommet—Rubber grommet for speaker mounting
S-4589	Indicator—Station selector indicator
S-4590	Knob—Range switch knob
S-4591	Knob—Volume control knob
S-4895	Knob—Tuning control knob
S-4896	Knob—Tone control knob
S-4897	Lamp—Dial lamp—Mazda type No. 44
S-4592	Plate—Dial back plate
S-5397	Screw—Chassis mounting screw
S-4511	Spacer—Metal spacer for speaker mounting
S-4595	Shield—Dial lamp shield

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

RCA VICTOR

AC-DC Radio Receivers

8X541, 8X542, 8X544, 8X545, 8X546, 8X547



8X541 (Maroon)
8X542 (Ivory)
8X547 (White)

8X544 (Mahogany)
8X545 (Walnut)
8X546 (Blonde)

Chassis No. RC 1065, RC 1065A 1st Prod.
RC 1065C, RC 1065D 2nd Prod.
RC 1065F, RC 1065H 3rd Prod.
RC 1065J, RC 1065K 4th Prod.

SERVICE DATA

—1948 No. 11—

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range.......540-1600 kc
Intermediate Frequency.......455 kc
Tube Complement
(1) RCA-12SA7.......Converter
(2) RCA-12SK7.......I.F. Amplifier
(3) RCA-12SQ7.......Det., A.V.C., and A.F. Amp.
(4) RCA-50L6GT (1st, 2nd & 4th prod.).......Output
RCA-50B5 (RC 1065F, RC 1065H).......Output
(5) RCA-35Z5GT.......Rectifier

Dial Lamp.......Mazda No. 47, 6-8 volts, 0.15 amp.

Loudspeaker (92577-5)
Size and Type.......4-inch PM
V. C. Impedance.......3.2 ohms at 400 cycles

Power Output
Undistorted.......1.0 watt
Maximum.......1.5 watts

Cabinet Dimensions
Height......7" Width......10¾" Depth......5⅞"

Power Supply Rating
115 volts, AC, 50 or 60 cycles, or DC.......30 watts

POWER SUPPLY POLARITY—
For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

CHASSIS IDENTIFICATION

1st Production
Chassis No. RC 1065—Models 8X541, 8X544, 8X545.
Chassis No. RC 1065A—Models 8X542, 8X546, 8X547.

2nd Production
Chassis No. RC 1065C—Models 8X541, 8X544, 8X545.
Chassis No. RC 1065D—Models 8X542, 8X546, 8X547.

3rd Production
Chassis No. RC 1065F—Models 8X541, 8X544, 8X545.
Chassis No. RC 1065H—Models 8X542, 8X546, 8X547.

4th Production
Chassis No. RC 1065J—Model 8X541.
Chassis No. RC 1065K—Models 8X542, 8X547.

1st Production (RC 1065, RC 1065A)
Has 50L6GT output tube, Stock No. 70133 osc. coil, No. 73485 tuning condenser (stamped 941274-1), No. 73036 1st I.F. trans. (stamped 970441-1), No. 73037 2nd I.F. trans. (stamped 970441-2) and No. 38410 vol. cont. (500K—stamped 970058-26, —30 or —40).

2nd Production (RC 1065C, RC 1065D)
Has Stock No. 74448 osc. coil, No. 74447 tuning condenser (stamped 941274-2) otherwise same as 1st Production.

3rd Production (RC 1065F, RC 1065H)
Uses 50B5 output tube, otherwise same as 2nd Production.

4th Production (RC 1065J, RC 1065K)
Has Stock No. 75486 1st I.F. trans. (stamped 970441-11), No. 75487 2nd I.F. trans. (stamped 970441-12) and No. 71168 vol. cont. (1 megohm—stamped 970776-4) otherwise similar to 2nd Production.

8X541 Chassis No. RC 1065L
8X542, 8X547 Chassis No. RC 1065M

These instruments are almost identical to 4th production instruments. Refer to RC 1065J and RC 1065K for all service information.

8X541, 8X542, 8X544, 8X545, 8X546, 8X547

Alignment Procedure

Critical Lead Dress

1. Dress all heater leads close to chassis.
2. Dress pilot light leads away from speaker cone.
3. Dress lead to low side of loop between the two gang condenser leads.
4. Dress C5 (AVC by-pass) close to the bend in the base and clear of the 2nd I.F. transformer.

Test-Oscillator

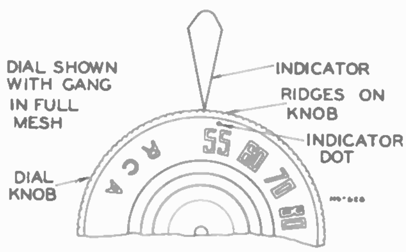
For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

On AC operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also AC operated.

Dial Centering:

If the mounting of the tuning condenser has been disturbed, it may be necessary to adjust its position after replacing the chassis in the cabinet. This may be done in the following manner:

1. Install chassis and tighten the three mounting screws.
2. Replace tuning knob.
3. Loosen the two screws which hold the tuning condenser mounting bracket to the chassis.
4. Adjust the position of the tuning condenser mounting bracket so that the tuning knob may be rotated without binding on the cabinet. With tuning condenser plates fully meshed the dial should be in the position indicated below.
5. The two screws should then be tightened to maintain this position.

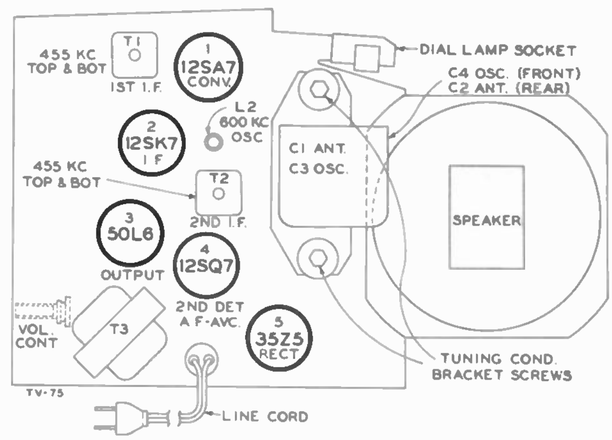


Dial and Indicator

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12SK7 I-F grid through 0.1 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (Top and bottom) 2nd I-F trans.
2	Stator of C1 through 0.1 mfd.			*T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1600 kc	1600 kc	C4 (osc.)
4		1400 kc	1400 kc	†C2 (ant.)
5		600 kc	600 kc	L2 (osc.) Rock gang
6		Repeat steps 3, 4 and 5.		

*Do not readjust T2 when test oscillator is connected to C1.

†When adjusting C2 (ant. trimmer) it is necessary to have the loop in the same position and spacing as it will have when assembled in the cabinet. This spacing is 3¼" from chassis to loop.



CHASSIS NOS. RC 1065F AND RC 1065H USE A 50B5 OUTPUT TUBE INSTEAD OF TYPE 50L6.

Tube and Trimmer Locations

RC 1065, RC 1065A
RC 1065C, RC 1065D
RC 1065F, RC 1065H

Substitute Volume Controls:

The original volume control used in these receivers is stamped 970058-26, 970058-30 or 970058-40. It is a 500,000 ohm control with an internal stop at 50,000 ohms.

Substitute control stamped 970058-20 is a 500,000 ohm control without the internal stop. An external 68,000 ohm resistor is connected between the high side of the volume control and #2 lug of the 2nd i.f. transformer.

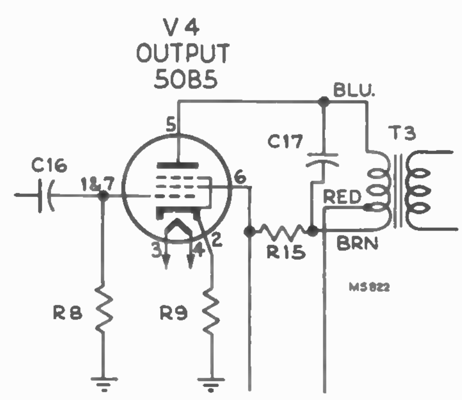
Substitute control stamped 97900-110 is a 1 megohm control without the internal stop. An external 68,000 ohm resistor is connected between the high side of the volume control and #2 lug of the 2nd i.f. transformer. A one megohm resistor is connected in parallel with the control.

Excessive Hum:

When excessive hum is encountered in these models the value of R15 should be checked. The correct value of this resistor is 1200 ohms. In a few instruments which reached the field, this resistor was actually 220 ohms.

Substitute Resistor:

In some chassis, two one-half watt resistors (one each of 2200 ohms and 2700 ohms) are connected in parallel and used as a substitute for the 1200 ohm 1 watt resistor R15.



Third Production Output Tube Circuit
Chassis Nos. RC 1065F and RC 1065H

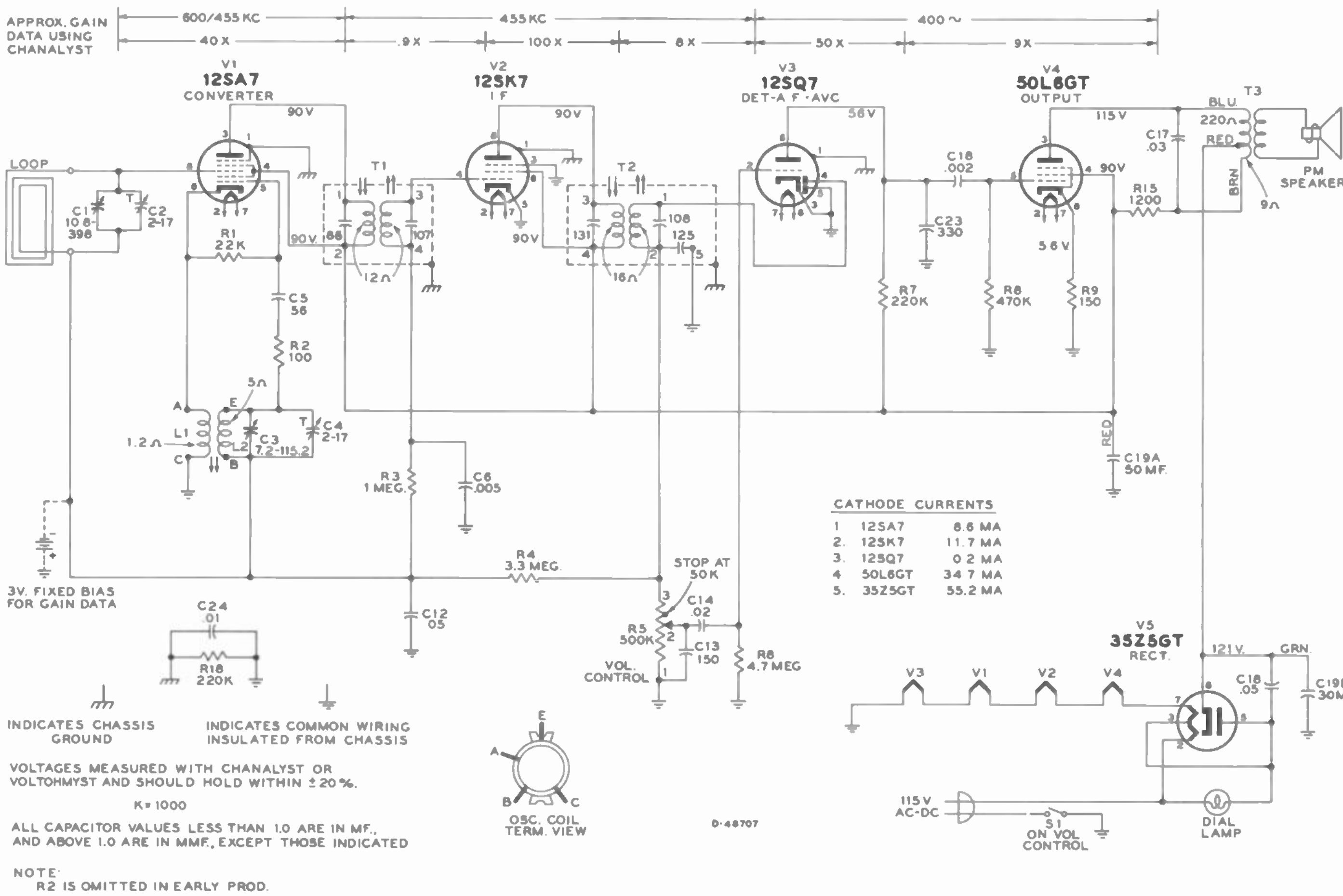
Capacitor Substitution:

In some chassis .06 mf. capacitors have been used as a substitute for the .05 mf. capacitors C12 and C18.

Substitute Speaker:

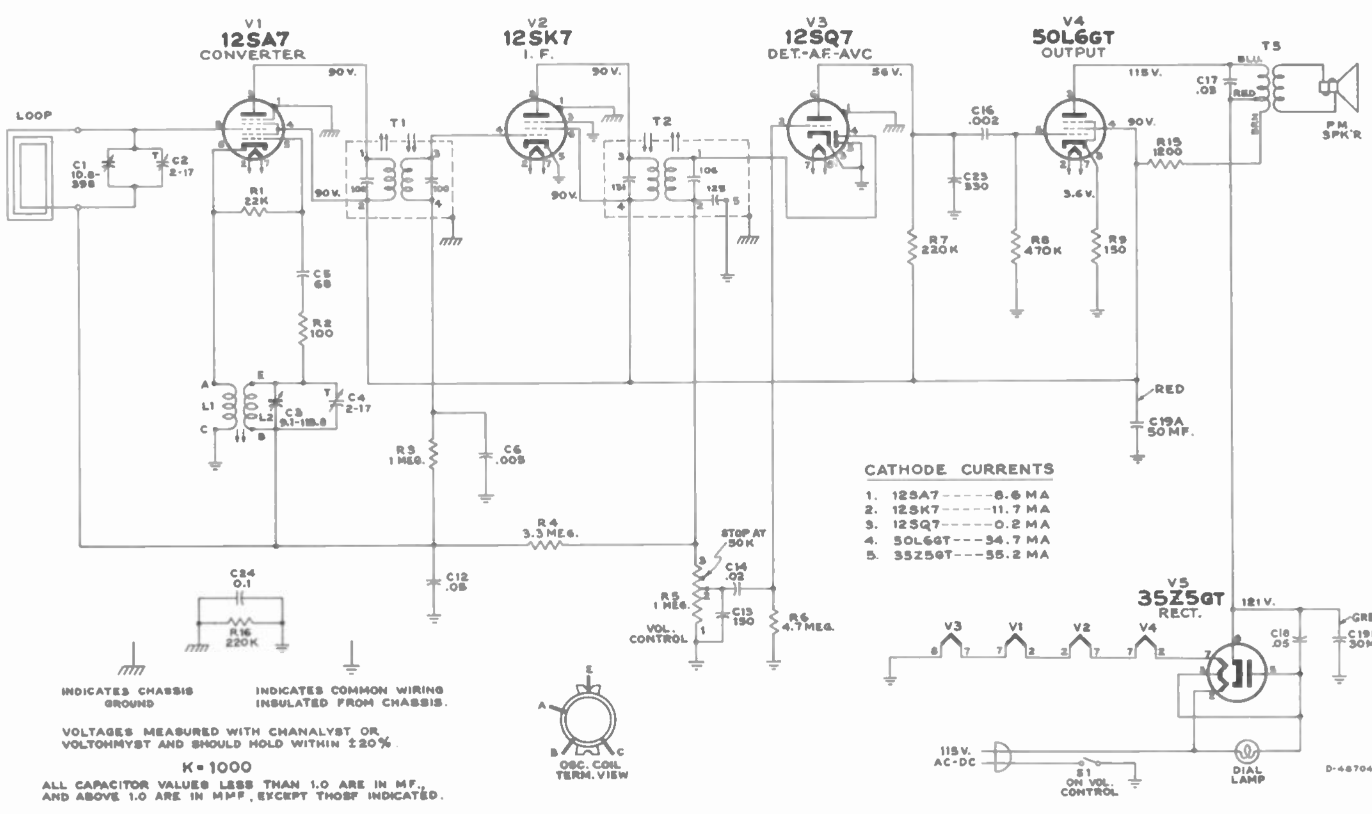
In some chassis speakers stamped 92577-3 or 92577-6 have been used as a substitute for the speaker (92577-5) specified in the parts list.

8X541, 8X542, 8X544, 8X545, 8X546, 8X547



Schematic Circuit Diagram—Chassis No. RC-1065, RC-1065A

SECOND PRODUCTION (CHASSIS No. RC 1065C, RC 1065D) C3 IS 9.1-113.8 MMF., OTHERWISE AS SHOWN ABOVE



Schematic Circuit Diagram—Chassis No. RC-1065J, RC-1065K

8X541, 8X542, 8X544, 8X545, 8X546, 8X547

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1065—8X541, 8X544, 8X545 (1st Production)
	RC 1065A—8X542, 8X546, 8X547 (1st Production)
	RC 1065C—8X541, 8X544, 8X545 (2nd Production)
	RC 1065D—8X542, 8X546, 8X547 (2nd Production)
	RC 1065F—8X541, 8X544, 8X545 (3rd Production)
	RC 1065H—8X542, 8X546, 8X547 (3rd Production)
	RC 1065J—8X541 (4th Production)
	RC 1065K—8X542, 8X547 (4th Production)
73486	Back—Back cover (maroon) and loop antenna assembly complete for RC1065, RC1065C & RC1065F
75905	Back—Back cover (maroon) and loop antenna assembly complete for RC1065J
73487	Back—Back cover (ivory) and loop antenna assembly complete for RC1065A, RC1065D & RC1065H
75906	Back—Back cover (ivory) and loop antenna assembly complete for RC1065K
73485	Capacitor—Variable tuning capacitor for RC1065 and RC1065A C1, C2, C3, C4
74447	Capacitor—Variable tuning capacitor for 2nd, 3rd and 4th productions C1, C2, C3, C4
73499	Capacitor—Ceramic, 56 mmf. for 1st, 2nd and 3rd productions C5
39624	Capacitor—Mica, 68 mmf. for RC1065J and RC1065K C5
73501	Capacitor—Ceramic, 150 mmf. for 1st, 2nd and 3rd productions C13
39632	Capacitor—Mica, 150 mmf. for RC1065J and RC1065K C13
72571	Capacitor—Mica, 330 mmf. C23
73803	Capacitor—Tubular, paper, .002 mfd., 400 volts C16
73920	Capacitor—Tubular, paper, .005 mfd., 400 volts C6
73562	Capacitor—Tubular, paper, .02 mfd., 400 volts C14
70613	Capacitor—Tubular, paper, .03 mfd., 400 volts C17
73553	Capacitor—Tubular, paper, .05 mfd., 400 volts C12, C18
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts C24
73500	Capacitor—Electrolytic comprising 1 section of 50 mfd., 150 volts & 1 section of 30 mfd., 150 volts .. C19A, C19B
73935	Clip—Mounting clip for I-F transformer
70133	Coil—Oscillator coil for RC1065 and RC1065A L1, L2
74448	Coil—Oscillator coil for 2nd, 3rd and 4th productions L1, L2
38410	Control—Volume control (½ megohm) and power switch for 1st, 2nd and 3rd productions R5, S1
71168	Control—Volume control (1 megohm) and power switch for RC1065J and RC1065K R5, S1
70392	Cord—Power cord and plug
72283	Grommet—Rubber grommet to mount variable tuning capacitor (3 required)
	Resistors—Fixed, composition:—
	100 ohms, ±20%, ½ watt R2
	150 ohms, ±20%, ½ watt R9
	1200 ohms, ±10%, 1 watt R15
	22,000 ohms, ±20%, ½ watt R1
	220,000 ohms, ±20%, ½ watt R7, R16
	470,000 ohms, ±20%, ½ watt R8
	1 megohm, ±20%, ½ watt R3
	3.3 megohm, ±20%, ½ watt R4
	4.7 megohm, ±20%, ½ watt R6
74697	Socket—Dial lamp socket and lead assembly
54414	Socket—Tube socket (molded)
70827	Socket—Tube socket (wafer)
74822	Socket—Tube socket (miniature) for 50B5 tube
73036	Transformer—First I-F transformer (stamped 970441-1) complete with adjustable cores for 1st, 2nd and 3rd productions
75486	Transformer—First I-F transformer (stamped 970441-11) complete with adjustable cores for RC1065J and RC1065K T1
73037	Transformer—Second I-F transformer (stamped 970441-2) complete with adjustable cores for 1st, 2nd and 3rd productions
75487	Transformer—Second I-F transformer (stamped 970441-12) complete with adjustable cores for RC1065J and RC1065K T2
72296	Transformer—Output transformer T3
	SPEAKER ASSEMBLIES
	92577-5
73919	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
Y1495	Cabinet—Plastic cabinet—maroon—complete with station indicator and dial backing disc for Model 8X541
Y1496	Cabinet—Plastic cabinet—ivory—complete with station indicator and dial backing disc for Model 8X542
Y2096	Cabinet—Plastic cabinet—mahogany—complete with station indicator and dial backing disc for Model 8X544
Y2097	Cabinet—Plastic cabinet—walnut—complete with station indicator and dial backing disc for Model 8X545
Y2098	Cabinet—Plastic cabinet—blonde—complete with station indicator and dial backing disc for Model 8X546
Y2053	Cabinet—Plastic cabinet—white—complete with station indicator and dial backing disc for Model 8X547
73494	Clip—Spring clip to hold cabinet back and loop assembly to cabinet (4 required)
73489	Dial—Dialing knob
73493	Disc—Dial backing disc
70429	Grommet—Rubber grommet to mount speaker (4 required)—1st production only
73492	Indicator—Station selector indicator
74666	Knob—Volume control and power switch knob—maroon—for Models 8X541, 8X544 and 8X545
74667	Knob—Volume control and power switch knob—ivory—for Model 8X542
74247	Knob—Volume control and power switch knob—tan—for Model 8X546
74007	Knob—Volume control and power switch knob—white—for Model 8X547
31480	Lamp—Dial lamp—Mazda No. 47
72765	Nut—Speed nut to fasten indicator to cabinet
73914	Spring—Retaining spring for dialing knob
14270	Spring—Retaining spring (flat) for volume control and power switch knob (early type)
74734	Spring—Retaining spring (circular) for volume control and power switch knob (late type)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES ON REPLACEMENT PARTS

8X541 Chassis No. RC 1065L
8X542, 8X547 Chassis No. RC 1065M

These instruments are almost identical to 4th production instruments. Refer to RC 1065J and RC 1065K for all service information.

RCA VICTOR

AC-DC-Battery Portable Receiver

MODEL 9BX5

Chassis No. RC-1059B, RC-1059C

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 7 —

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION

CAMDEN, N. J., U. S. A.

Specifications

Tuning Range ....540-1600 kc.

Intermediate Frequency ....455 kc.

Tube Complement

(1) RCA 1R5 ....Converter

(2) RCA 1U4 ....I. F. Amplifier

(3) RCA 1U5 ....Det.-A. V. C.-A. F. Amp.

(4) RCA 3V4 ....Output

(5) RCA 117Z3 ....Rectifier

Power Supply Rating

Power Line Operation

115 volts, d. c. or 50 to 60 cycles a. c. ....18 watts

or

Battery Operated ....VS 050 Battery

(Average life—100 hrs. intermittent service)

Loudspeaker (92577-1)

Size and type ....4 in. PM dynamic

Voice coil impedance ....3.4 ohms at 400 cycles

Power Output

Undistorted—150 milliwatts   Maximum—250 milliwatts

(Output is slightly lower on battery operation)

Cabinet Dimensions

Height 9½ in.   Width 11 in.   Depth 5 in.

Weight

5 lb. less battery   8 lb. 2 oz. with battery

AC-DC Operation

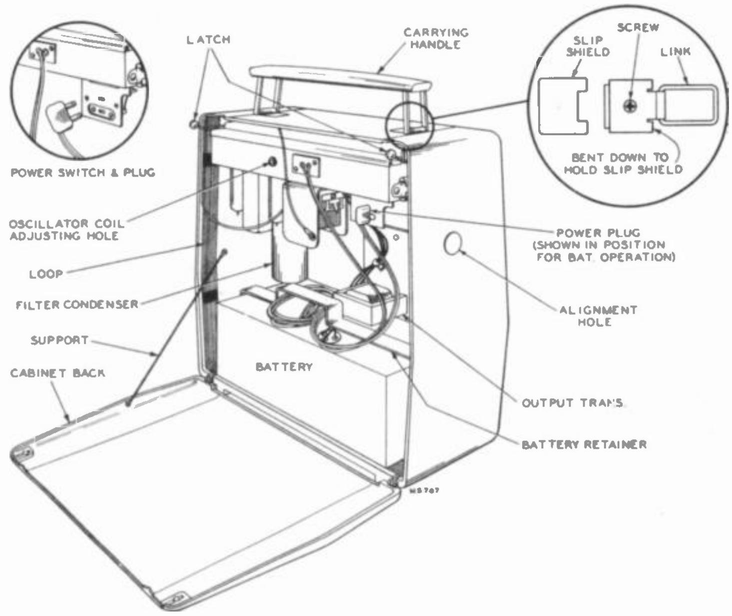
This receiver will operate on 115 volts, d. c. or 50 to 60 cycles a. c.

A power cord is stored inside the cabinet. To open the cabinet, push upward on the two metal ball catches at the top rear of the cabinet. Remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical outlet. A slot in the bottom of the back cover allows the back to be closed with the cord passing through.

Note: If reception is not obtained on d. c., reverse plug in outlet receptacle. This may also reduce hum on a. c. operation.

When returning to battery operation replace the plug in the socket provided on the chassis, roll up the cord and place under the raised portion of the battery holder bracket.

Note: Make certain that the plug is fully inserted (base of plug touching chassis) to assure proper operation of the Batt-Line switch.



Cabinet Hinges

The cabinet hinges may be readily removed, they are secured to the cabinet and back by force fit. To remove back from cabinet—pull straight outward on both hinges at the same time.

To Remove Chassis

1. Pull off the volume control knob
2. Close tuning condenser (dial at 54) to prevent possible damage to tuning condenser.
3. Unsolder the loop leads.
4. Remove the plug from the battery.
5. Remove the two screws holding the bottom edge of the speaker and the screw holding dial back-plate to cabinet.
6. Remove the two slip shields beneath the handle. They may be removed by pushing straight toward the top center of the case. The chassis mounting screws are then accessible.
7. Remove the two screws at the top of the cabinet while supporting the chassis with one hand.

Note: When re-installing, replace speaker holding screws first but do not securely tighten until the two screws at the top of the cabinet have been tightened.

Alignment Procedure

Cathode Ray Alignment is the preferable method. Connections for the oscilloscope are shown on the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis and keep the oscillator output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on a. c. operation an isolation transformer (117v./117v.) may be necessary for the receiver if the test oscillator is also a. c. operated.

Note: **Battery or substitute must be in place for ant. alignment (step 5).**

Step	Connect high side of test oscillator to—	Test oscillator output—	Turn receiver dial to—	Adjust for maximum peak output
1	Disconnect loop—remove chassis—connect a 1000 ohm resistor from C1 stator terminal to tuning condenser frame.			
2	Stator terminal of C1 through a 39 mmf. capacitor	455 kc	55	*Top and bottom T2 (2nd. I-F. trans.) *Top and bottom T1 (1st. I-F trans.)
3	Remove the 1000 ohm resistor. Replace bottom cover and install chassis in cabinet. Re-connect loop.			
4	Short wire placed near receiver (for radiated signal)	1600 kc	160	†C5 (osc.)
5	Short wire placed near receiver (for radiated signal)	1400 kc	140	†C2 (ant.)
6	Short wire placed near receiver (for radiated signal)	600 kc	60	*L2 (osc.) while rocking gang
7		Repeat steps 4, 5 and 6		

NOTES:

*The magnetite cores of L2 and T2 and T1 do not have visible adjusting screws. The cores have screw driver slots to permit adjustment (use non-metallic screwdriver).

†Adjustable thru hole in side of case.

CAUTION.—

Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.

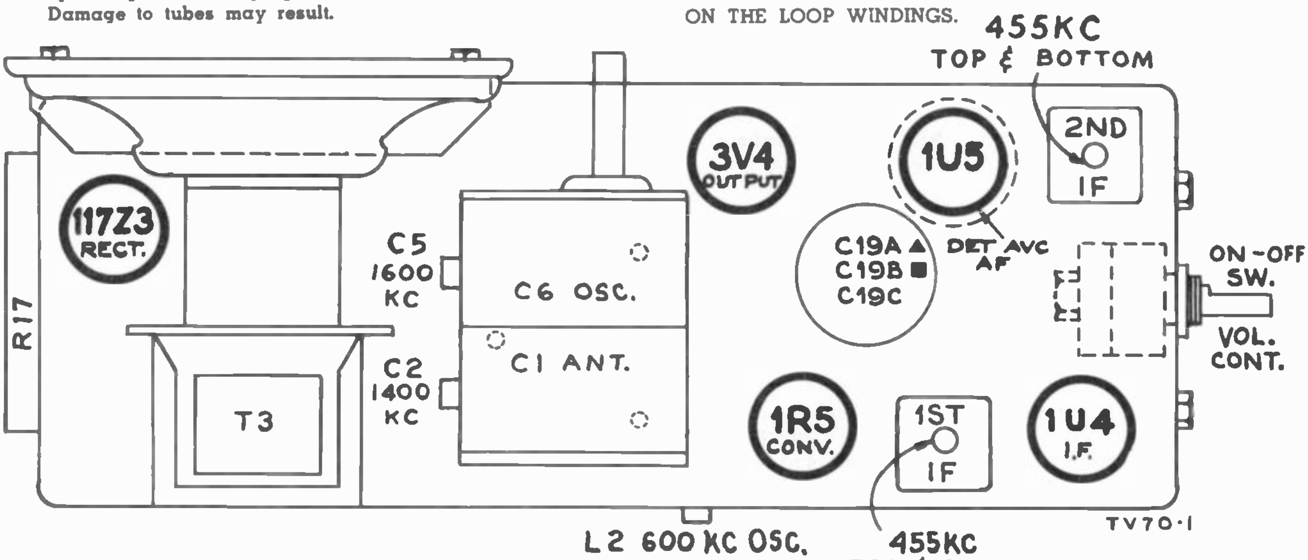
Critical Lead Dress

1. Dress output plate bypass C20 capacitor against chassis.
2. Dress output plate lead to output transformer against chassis.
3. Dress audio coupling capacitor C14 (volume control to grid of 1U5) away from chassis, away from audio limiting resistor R8 and to permit adjustment of second I.F. Transformer.
4. Dress all exposed leads away from each other, and away from chassis to prevent short circuits.
5. Dress all filament and ground leads against chassis.
6. Dress filament bypass capacitor C23 and accompanying compensating resistor R15 (volume control to 1U4) against volume control.
7. Dress power line cord away from line-battery switch mechanism.
8. Dress all capacitors and wiring away from oscillator coil.
9. Dress 4 mmf. neutralizing capacitor C7 against A.V.C. bypass capacitor C8 (1U4 filament to first I.F. trans.).

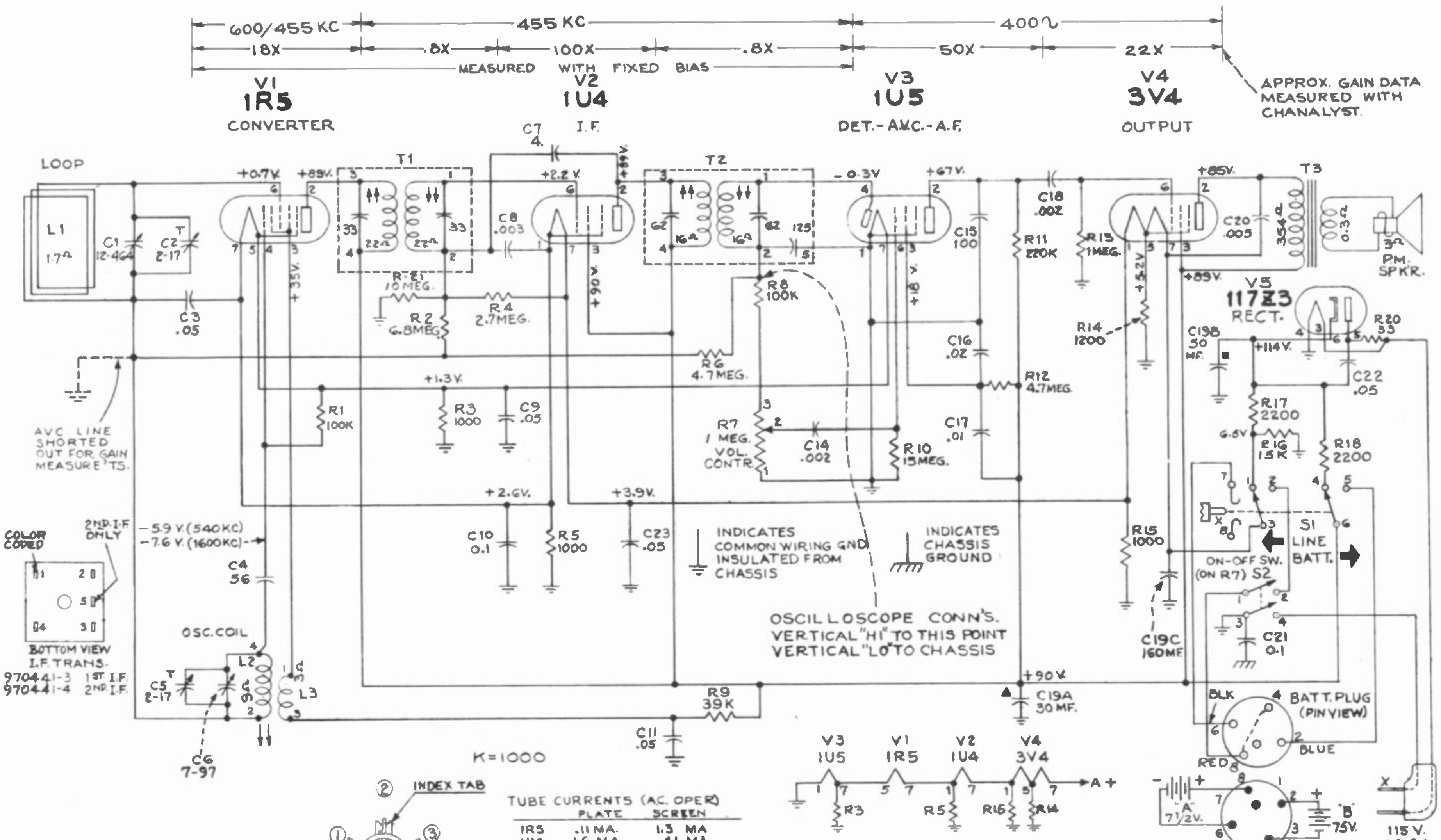
Note: **These instruments are designed to be operated with a battery in position inside the cabinet. Reception will be below normal unless the battery is in its normal location.**

The position of the battery pack affects the loop inductance. Therefore, when the battery is removed, the loop inductance will change (increase) and the sensitivity will be slightly worse because of improper electrical tracking of the loop circuit with the heterodyne oscillator.

Where a battery is temporarily unavailable, a sheet of aluminum 8½" long x 3⅝" wide and from .020 to .050" thick may be placed in the cabinet in the position occupied by the battery so that it is lying flat down on the bottom. This sheet of aluminum has an effect on the loop inductance similar to the effect caused by the battery and will, therefore, return the performance of the loop to approximately the same as obtained when a battery is installed. If aluminum is not available, brass may be substituted with approximately the same performance. DO NOT USE STEEL OR IRON since the performance will be adversely affected. If desired, the sheet of aluminum may be waxed to the inside bottom of the case. DO NOT PLACE ANY WAX, CEMENT OR OTHER MATERIAL ON THE LOOP WINDINGS.



Tube and Trimmer Locations



TUBE CURRENTS (AC. OPER.)

	PLATE	SCREEN
1R5	.11 MA.	1.3 MA
1U4	1.6 MA.	.41 MA
1U5	.09 MA.	.014 MA.
3V4	7.1 MA	1.5 MA
117Z3	60 MA	

ON BATTERY OPERATION TUBE CURRENTS ARE APPROX. 20% LOWER. (117Z3 RECTIFIER NOT USED)

VOLTAGES MEASURED TO COMMON WIRING (-B) WITH CHANALYST OR VOLTOHMYST AND SHOULD HOLD WITHIN ± 20% WITH 115 V. A.C. LINE SUPPLY.

SWITCH "S1" ACTUATED BY LINE PLUG.

ON BATTERY OPERATION "A" VOLTAGES ARE APPROX. 10% HIGHER "B" VOLTAGES ARE APPROX. 10% LOWER. (117Z3 RECT. NOT USED.)

SCHEMATIC DIAGRAM
CHASSIS NO. RC-1059C
Identical to Chassis No. RC-1059B
EXCEPT
C6 (osc. tuning cond.) is 9—113.7 mmf.

RC-1059B—SCHEMATIC DIAGRAM

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1059B and RC 1059C
74286	Capacitor—Variable tuning capacitor for RC 1059B (C1, C2, C5, C6)
74406	Capacitor—Variable tuning capacitor for RC 1059C (C1, C2, C5, C6)
73153	Capacitor—Ceramic, 4 mmf. (C7)
71924	Capacitor—Ceramic, 56 mmf. (C4)
73152	Capacitor—Ceramic, 100 mmf. (C15)
73750	Capacitor—Tubular, .002 mfd., 200 volts (C14, C18)
73961	Capacitor—Tubular, .003 mfd., 200 volts (C8)
72791	Capacitor—Tubular, .005 mfd., 400 volts (C20)
71923	Capacitor—Tubular, .01 mfd., 200 volts (C17)
71928	Capacitor—Tubular, .02 mfd., 200 volts (C16)
72596	Capacitor—Tubular, .05 mfd., 200 volts (C9, C23)
73553	Capacitor—Tubular, .05 mfd., 400 volts (C3, C11, C22)
73784	Capacitor—Tubular, 0.1 mfd., 200 volts (C10)
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C21)
73127	Capacitor—Electrolytic, comprising 1 section of 50 mfd., 150 volts, 1 section of 30 mfd., 150 volts and 1 section of 160 mfd., 25 volts (C19A, C19B, C19C)
73935	Clip—Mounting clip for I-F transformer (2 required)
73114	Coil—Oscillator coil complete with adjustable core for RC 1059B (L2, L3)
74405	Coil—Oscillator coil complete with adjustable core for RC 1059C (L2, L3)
74285	Control—Volume control and power switch (R7, S2)
70022	Cord—Power cord and plug
74282	Dial—Dial scale and back plate assembly less cushions
72283	Grommet—Rubber grommet to mount tuning condenser (3 required)
74284	Knob—Tuning knob complete with indicator window
28452	Plate—Mounting plate for electrolytic capacitor
73275	Plug—5 prong male plug for battery cable
73237	Resistor—Wire wound, 33 ohms, 150 MA (R20)
	Resistor—Fixed, composition, 1000 ohms, ±10%, ½ watt (R3, R5, R15)
	Resistor—Fixed, composition, 1200 ohms, ±10%, ½ watt (R14)
	Resistor—Fixed, composition, 2200 ohms, ±10%, ½ watt (R18)
73132	Resistor—Wire wound, 2200 ohms, 7 watts (R17)
	Resistor—Fixed, composition, 15,000 ohms, ±10%, ½ watt (R16)
	Resistor—Fixed, composition, 39,000 ohms, ±10%, ½ watt (R9)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R8)
	Resistor—Fixed, composition, 220,000 ohms, ±20%, ½ watt (R11)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R13)
	Resistor—Fixed, composition, 2.7 megohms, ±10%, ½ watt (R4)
	Resistor—Fixed, composition, 4.7 megohms, ±20%, ½ watt (R12)
	Resistor—Fixed, composition, 4.7 megohms, ±10%, ½ watt (R6)
	Resistor—Fixed, composition, 6.8 megohms, ±10%, ½ watt (R2)
	Resistor—Fixed, composition, 10 megohms, ±10%, ½ watt (R21)
	Resistor—Fixed, composition, 15 megohms, ±20%, ½ watt (R10)
73103	Shield—Tube shield for 1U5 tube
73117	Socket—Tube socket
14270	Spring—Retaining spring for tuning knob
71039	Switch—"Line-Battery" switch (S1)
73129	Transformer—First I-F transformer (T1)
73130	Transformer—Second I-F transformer (T2)
71047	Transformer—Output transformer (T3)
	SPEAKER ASSEMBLIES
	92577-1
73123	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74287	Back—Case back—less hinges
73147	Ball—Metal ball with groove for back cover latching mechanism (2 required)
74292	Button—Plug button for L.H. case side
Y2099	Case—Case complete with loop, metal front, decorative ring, and emblem—less latch mechanism, hinges, handle, handle mounting plate and case back (L1)
74302	Channel—Carrying handle under channel
74457	Cushion—Rubber cushion for under-side of carrying handle
70425	Clip—Spring clip for volume control knob
73549	Emblem—"RCA Victor" emblem
74293	Front—Decorative metal front for case
74288	Handle—Carrying handle less links and under channel
74180	Hinge—Cabinet hinge (2 required)
74290	Knob—Volume control knob—less spring clip
74303	Link—Carrying handle link (2 required)
73141	Loop—Antenna loop (L1)
73145	Nut—Hex nut with groove for back cover latching mechanism (2 required)
74289	Plate—Carrying handle mounting plate (2 required)
74294	Ring—Decorative ring for front of case
74291	Screw—#4-40 x ⅜" flat head cross recessed machine screw for mounting flexible drop support (2 required)
74295	Screw—#4-40 x 7/16" flat head cross recessed machine screw for mounting latch mechanism to case side
74304	Screw—#4 x 5/16" flat head thread cutting screw for handle (2 required)
74301	Screw—8 x ⅜" pan head cross recessed thread cutting screw for holding speaker (2 required) or dial plate to case
74364	Shield—Slip shield for handle mounting plate (2 required)
73148	Spring Extension spring for back cover latching mechanism—L.H.
73146	Spring—Extension spring for back cover latching mechanism—R.H.
73483	Support—Flexible drop support for back cover

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Addition to Parts List:

MISCELLANEOUS

73549 Emblem—"RCA Victor" emblem (metal)

74674 Emblem—"RCA Victor" emblem (plastic)

The plastic emblem is attached to the cabinet either with cement or by pressing the ends of the protruding pins with a hot iron after installation.

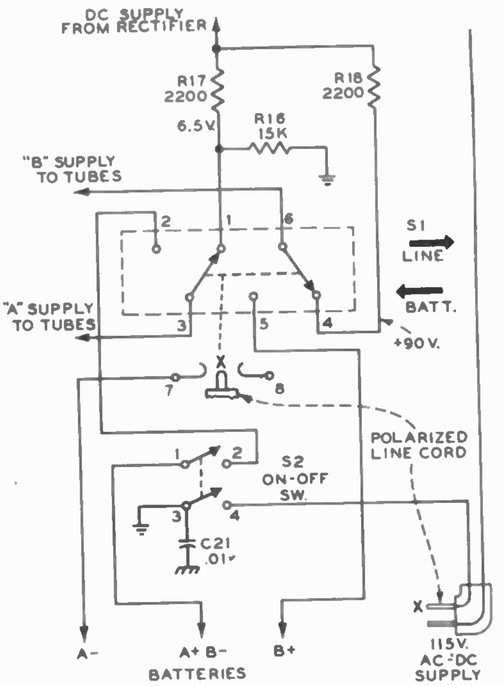
The two types are not readily interchangeable.

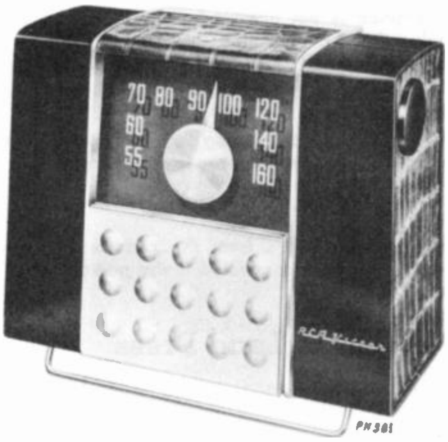
Oscillator Coil Substitution:

On some RC 1059C chassis a substitute oscillator coil was used. The specified coil (Stock No. 74405) has an identifying GREEN dot of paint. The substitute coil (Stock No. 73114) has an identifying YELLOW dot of paint. The GREEN dot coil should be used only with variable capacitors stamped 941225-7 (Stock No. 74406), the YELLOW dot coil should be used only with variable capacitors stamped 941225-4 or 941225-6 (Stock No. 74286).

LINE-BATT. Switch:

The LINE-BATT. switch used in these receivers is of the "slide" type. The actual switch does not have numbered terminals although the schematic diagrams have numbers indicated. The numbers on the schematic diagrams do not indicate the actual sequence of the terminals on the switch. The illustrations below show the actual sequence of the switch terminals and the corresponding numbers which appear on the schematic diagrams.





RCA VICTOR

AC-DC-Battery Portable Receiver

MODEL 9BX56

Chassis No. RC-1068
— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 9 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc.
Intermediate Frequency .... 455 kc.

Tube Complement
(1) RCA 1R5 .... Converter
(2) RCA 1U4 .... I.F. Amplifier
(3) RCA 1U5 .... Det.—A.V.C.—A.F. Amp.
(4) RCA 3V4 .... Output
(A selenium rectifier is used)

Power Supply Rating
Power Line Operation
115 volts d.c. or 50 to 60 cycles a.c. .... 17 watts
or
Battery Operation
1 RCA VS 065 "A" Battery .... 7.5 v., 60 ma.
1 RCA VS 016 "B" Battery .... 67.5 v., 10 ma.
(Battery life—approx. 40 hrs. intermittent service)

Power Output
A.C. operation .... 150 mw. undistorted, 250 mw. max.
Batt. operation .... 70 mw. undistorted, 180 mw. max.

Loudspeaker (92584-1)
Size and type .... 4 in. PM dynamic
Voice coil impedance .... 3.2 ohms @ 400 cycles

Dial Drive Ratio .... 6:1 (3 turns of knob)

Cabinet Dimensions
Height 8⅜ in. Width 10½ in. Depth 5 in.

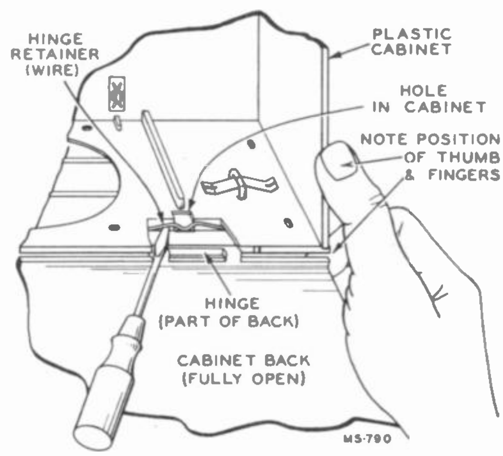
Weight 5½ lbs. (less batteries) 6¼ lbs. (with batteries)

To Open Cabinet:
The back is secured to the cabinet with two clip catches at the top and two hinges at the bottom. To open—while facing the front of the receiver, with the handle in the upright position grip the sides of the cabinet with both hands and push the top of the back to the rear with both thumbs.

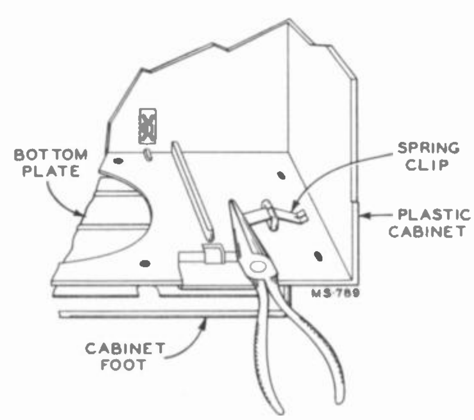
To Remove Back:
Open the cabinet as explained above. With the back fully open, grip the cabinet as illustrated. Insert a screwdriver under one hinge retainer and pry the center of the retainer out of the opening in the cabinet while maintaining pressure on the back with the fingers and on the cabinet with the thumb. Repeat this procedure with the other hinge retainer. Pull straight to the rear.

To Remove Cabinet Foot:
Open the cabinet. Grip the end of the spring clip with long nose pliers as illustrated and pull toward the center of the cabinet. Repeat this procedure with the other clip.

To Remove Chassis:
1. Remove knobs (pull off).
2. Open cabinet.
3. Unsolder loop leads.
4. Disconnect batteries and speaker.
5. Remove the two screws which hold the dial back plate to the cabinet.
6. Remove the TWO SCREWS AT THE BOTTOM EDGE OF THE REAR CHASSIS APRON.
7. Pull chassis to rear.



Removal of Cabinet Back



Removal of Cabinet Foot

9BX56

Alignment Procedure

Cathode Ray Alignment is the preferable method. Connections for the oscilloscope are shown on the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis and keep the oscillator output as low as possible to avoid AVC action.

Battery operation of the receiver is preferable during alignment; on a.c. operation an isolation transformer (117v./117v.) may be necessary for the receiver if the test oscillator is also a.c. operated.

Dial Pointer Position.—There are two score marks on the dial back plate—with the tuning condenser fully meshed (closed) the pointer should be set to the LEFT HAND MARK.

The RIGHT HAND MARK is for 1600 kc.

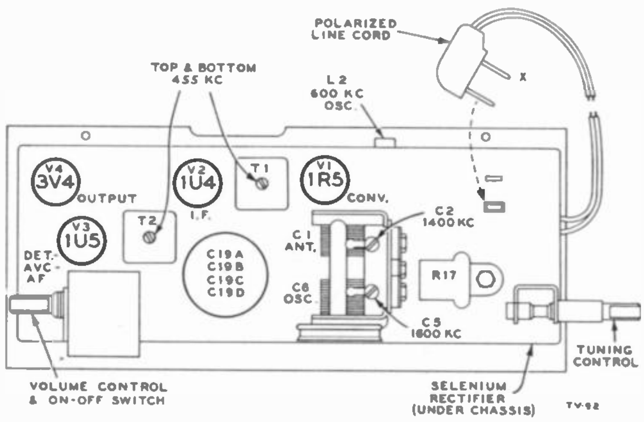
The dial is not easily removed. A reproduction of the dial is illustrated on another page. It is suggested that a tracing be made of it for use in alignment.

Step	Connect high side of test oscillator to—	Test oscillator output—	Turn receiver dial to—	Adjust for maximum peak output
1	Disconnect loop—remove chassis—connect a 1000 ohm resistor from C1 stator terminal to tuning condenser frame.			
2	Stator terminal of C1 through a 39 mmf. capacitor	455 kc.	Quiet point near 160	*Top and bottom T2 (2nd I-F trans.) *Top and bottom T1 (1st I-F trans.)
3	Remove the 1000 ohm resistor. Replace but do not fasten chassis in cabinet. Re-connect loop.			
4	Short wire placed near receiver (for radiated signal)	1630 kc.	Max. clockwise	†C5 (osc.)
5		1400 kc.	140	†C2 (ant.)
6		600 kc.	60	*L2 (osc.) while rocking gang
7		Repeat steps 4, 5 and 6		
8	Fasten chassis to cabinet.			

NOTES:

* The magnetite cores of L2, T2 and T1 do not have visible adjusting screws. The cores have screw driver slots to permit adjustment (use non-metallic screwdriver).

† C5 and C2 are more readily accessible if the chassis is not fully inserted into the cabinet. However the chassis should be near its proper position because its position affects the inductance of the loop.



Tube and Trimmer Locations

Power Line Operation:

A power cord is stored inside the cabinet. Open the cabinet and remove the plug of the power cord from its socket on the chassis and insert the plug into a convenient electrical outlet. A slot in the right-hand end of the cabinet allows the back to be closed with the cord passing through.

NOTE: If reception is not obtained on DC, reverse plug in outlet receptacle. On AC operation this may reduce hum.

When returning to battery operation replace the plug in the socket provided on the chassis, with the cord extending toward the back.

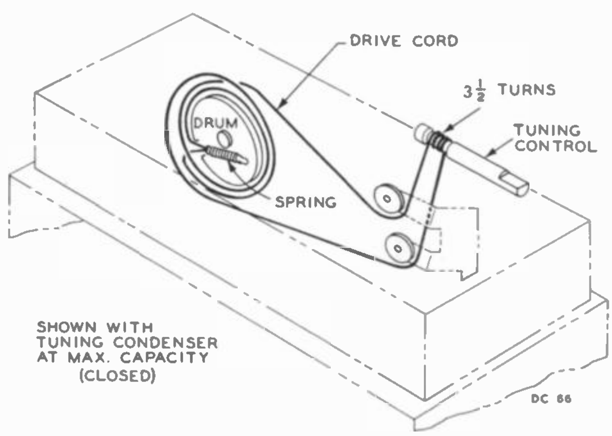
NOTE: Make certain that the plug is fully inserted (base of plug touching chassis) to assure proper operation of the Batt-Line switch.

CAUTION.—

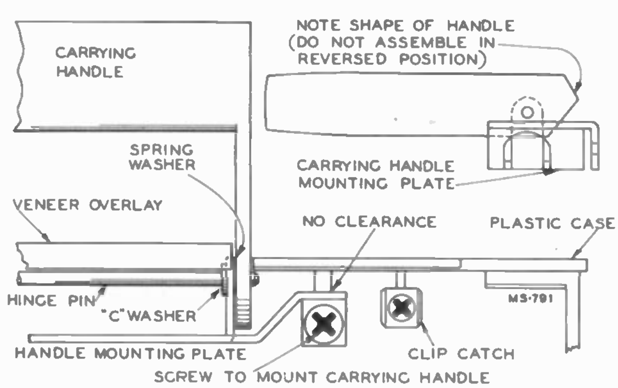
Do not remove any tubes from the chassis with the set operating and the plug connected to the power line. Damage to tubes may result.

Critical Lead Dress

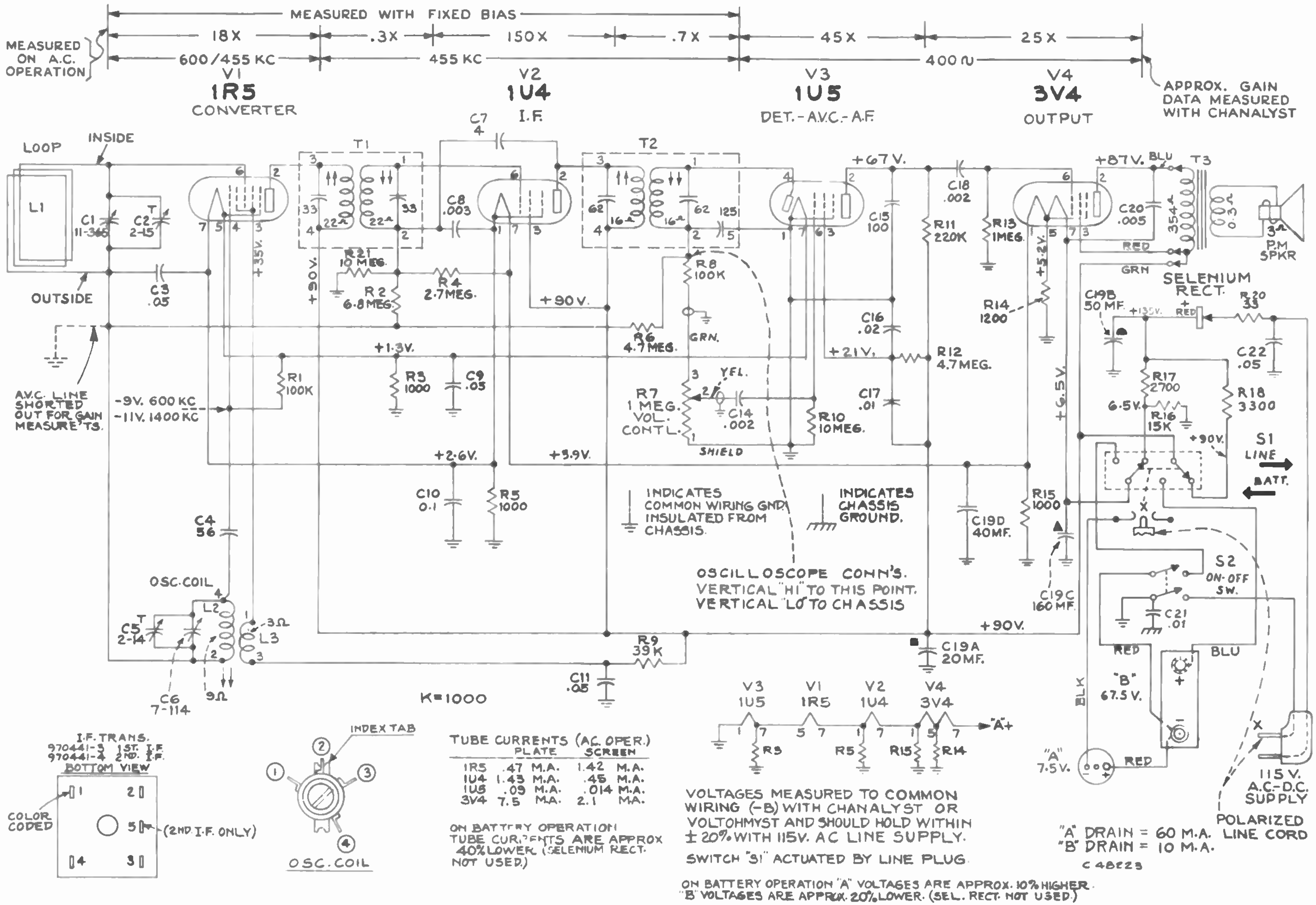
1. Dress 1R5 plate lead and 1U4 grid lead down against chassis.
2. Dress all filament and ground leads against chassis.
3. Dress the 4 mmf. neutralizing capacitor C7 against the 1U4 tube socket with short lead at the plate end.
4. Dress .002 mf. capacitor C14 down against chassis and away from other wiring.
5. Dress .05 mf. capacitor C9 down over top of C14.
6. Dress capacitors C10 and C22 away from oscillator coil so that pressure is not exerted on the side of the coil.
7. Dress all wiring away from the selenium rectifier.
8. Dress .003 mf. capacitor C8 as near chassis as possible.



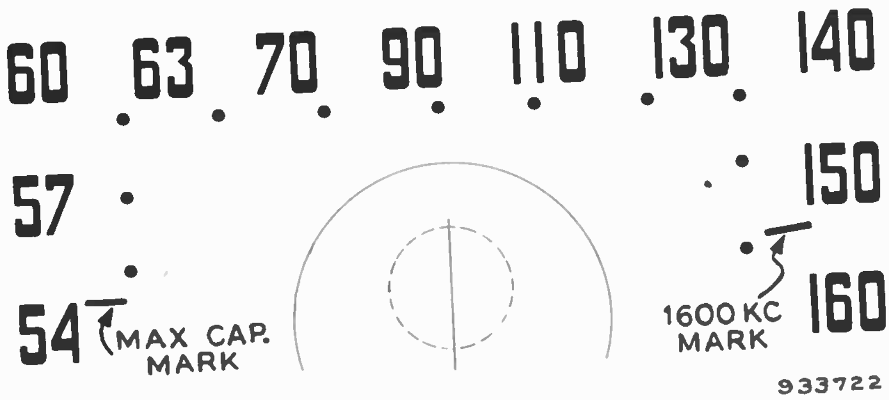
Dial Drive Cord



Carrying Handle Assembly



Schematic Diagram



Dial Scale

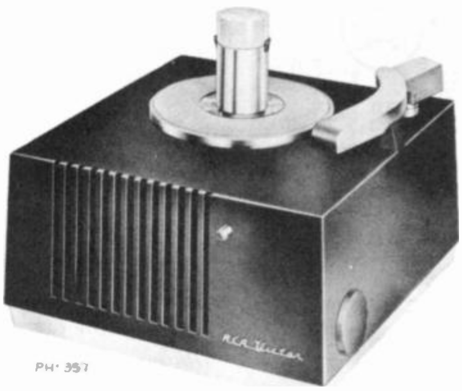
The dial scale drawing shown is a full size reproduction. It can be used as a reference in alignment procedure.

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1068
74318	Bracket—Drive cord pulley bracket complete with two (2) pulleys
74323	Capacitor—Variable tuning capacitor (C1, C2, C5, C6)
73153	Capacitor—Ceramic, 4 mmf. (C7)
71924	Capacitor—Ceramic, 56 mmf. (C4)
73152	Capacitor—Ceramic, 100 mmf. (C15)
73750	Capacitor—Tubular, .002 mfd., 200 volts (C14, C18)
73961	Capacitor—Tubular, .003 mfd., 200 volts (C8)
72791	Capacitor—Tubular, .005 mfd., 400 volts (C20)
71923	Capacitor—Tubular, .01 mfd., 200 volts (C17)
71928	Capacitor—Tubular, .02 mfd., 200 volts (C16)
71551	Capacitor—Tubular, .05 mfd., 200 volts (C9)
54859	Capacitor—Tubular, .05 mfd., 400 volts (C11)
73553	Capacitor—Tubular, .05 mfd., 400 volts (C3, C22)
73784	Capacitor—Tubular 0.1 mfd., 200 volts (C10)
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C21)
73113	Capacitor—Electrolytic, comprising 1 section of 50 mfd., 150 volts, 1 section of 20 mfd., 150 volts, 1 section of 160 mfd., 25 volts and 1 section of 40 mfd., 25 volts (C19A, C19B, C19C, C19D)
73935	Clip—I-F transformer mounting clip (2 required)
73114	Coil—Oscillator coil (L2, L3)
74315	Connector—"B" Battery connector—less cable
73125	Control—Volume control and power switch (R7, S2)
†72953	Cord—Drive cord (approx. 19" length required)
70022	Cord—Power cord and plug
72283	Grommet—Rubber grommet to mount tuning capacitor (3 required)
74321	Indicator—Station selector indicator
18469	Plate—Bakelite mounting plate for electrolytic capacitor
74317	Plate—Dial back plate—less dial
31572	Plug—3 contact female plug for speaker cable
74324	Plug—3 prong male plug for battery cable
74322	Rectifier—Selenium rectifier
73237	Resistor—Wire wound, 33 ohms, 150 MA (R20)
	Resistor—Fixed, composition, 1000 ohms, ±10%, ½ watt (R3, R5, R15)
	Resistor—Fixed, composition, 1200 ohms, ±10%, ½ watt (R14)
74319	Resistor—Wire wound, 2700 ohms, 7 watts (R17)
	Resistor—Fixed, composition, 3300 ohms, ±10%, ½ watt (R18)
	Resistor—Fixed, composition, 15,000 ohms, ±10%, ½ watt (R16)
	Resistor—Fixed, composition, 39,000 ohms, ±10%, ½ watt (R9)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R8)
	Resistor—Fixed, composition, 220,000 ohms, ±20%, ½ watt (R11)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R13)
	Resistor—Fixed, composition, 2.7 megohms, ±10%, ½ watt (R4)
	Resistor—Fixed, composition, 4.7 megohms, ±20%, ½ watt (R12)
	Resistor—Fixed, composition, 4.7 megohms, ±10%, ½ watt (R6)
	Resistor—Fixed, composition, 6.8 megohms, ±10%, ½ watt (R2)
	Resistor—Fixed, composition, 10 megohms, ±20%, ½ watt (R10)
	Resistor—Fixed, composition, 10 megohms, ±10%, ½ watt (R21)
74320	Shaft—Tuning knob shaft
38904	Socket—2 contact socket for power cord
73117	Socket—Tube socket
72540	Spring—Drive cord spring
38905	Switch—"Line-Battery" change switch (S1)
73129	Transformer—First I-F transformer (T1)
73130	Transformer—Second I-F transformer (T2)
35969	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	92584-1
	RL 108 B5
74415	Connector—3 contact male connector for speaker
74411	Speaker—4" P.M. speaker complete with cone and voice coil—less output transformer and connector
71047	Transformer—Output transformer (T3)
	MISCELLANEOUS
74328	Back—Cabinet back complete with two hinges, two top retainers and two hinge retainers
74327	Board—Antenna loop lead terminal board complete with retaining clip
74346	Button—Dial drop door release button
Y2108	Cabinet—Cabinet including veneer overlay with drop door, door catch, loop and loop supports—less drop door, handle, foot, trim strips, dial, clip catches, protective bottom plate and back (L1)
74339	Catch—Cabinet back clip catch (fastens to cabinet) (2 required)
74345	Catch—Drop door catch assembly
74338	Clip—Spring clip for holding cabinet foot (2 required)
74334	Dial—Polystyrene dial scale
74330	Door—Drop door for front of cabinet
73549	Emblem—"RCA Victor" emblem (metal)
74674	Emblem—"RCA Victor" emblem (plastic)
74331	Foot—Cabinet mounting foot—less protective plate
74349	Handle—Carrying handle—less mounting plate and hinge pin
73490	Knob—Volume control knob or tuning knob
74326	Loop—Antenna loop (L1)
74412	Nut—Speed nut for speaker mounting (4 required)
74337	Nut—Speed nut for mounting dial (4 required)
74340	Nut—Speed nut for mounting veneer overlay (4 required)
74336	Nut—Spring nut to fasten cabinet trim strip (2 required for each strip)
74329	Overlay—Veneer overlay for top of cabinet including drop door catch and release button
74351	Pin—Carrying handle hinge pin
74344	Plate—Protective bottom plate for cabinet—less foot
74350	Plate—Mounting plate for carrying handle
74325	Screen—Speaker screen
74348	Screw—#4 x 3/16" self tapping round head screw (cross-recessed) for mounting drop door catch (2 required)
74341	Screw—#4 x 5/16" self tapping round head (cross-recessed) screw for cabinet back clip catch
74342	Screw—#8 x 7/16" self tapping round head (cross-recessed) screw for carrying handle mounting plate (2 required)
74335	Spring—Drop door release spring for front of cabinet (2 required)
14270	Spring—Retaining spring for knobs
74347	Spring—Coil spring for drop door release button
74332	Strip—Trim strp—R.H.
74333	Strip—Trim strip—L.H.
74353	Washer—"C" washer for carrying handle hinge pin
74352	Washer—Spring washer for carrying handle hinge pin (2 required)
74343	Washer—Spring washer for dial drop door (2 required)

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

RCA VICTOR

Automatic Record Player
MODEL 9EY3
Chassis No. RS-132 Mfr. No. 274
SERVICE DATA
— 1949 No. 1 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tube Complement
1. RCA 12AV6 .... Amplifier
2. RCA 50C5 .... Output
3. RCA 35W4 .... Rectifier

Loudspeaker (92577-6W)
Size and type .... 4 in. P.M.
Voice coil impedance ....3.2 ohms at 400 cycles

Dimensions (overall)
Height, 7 5/8" Width, 9 11/16" Dept, 9 5/8"

Power Supply Rating
115 volts, 60 cycles A.C. .... 45 watts

Power Output
Undistorted ....1.0 watt Maximum ....1.25 watts

Record Changer (RP-168-1)
Turntable speed .... 45 r.p.m.
Records used ....RCA 7 in. fine groove
Record capacity .... up to 10 records
Pickup .... Crystal (medium output)

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES RS 132
39648	Capacitor—Mica, 680 mmf. (C1)
72281	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts, 1 section of 40 mfd., 150 volts and 1 section of 20 mfd., 25 volts (C5)
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts (C2)
73920	Capacitor—Tubular, moulded paper, .0047 mfd., 600 volts (C4)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C3)
58476	Capacitor—Tubular, paper, .018 mfd., 400 volts (C6)
73553	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C7, C8)
30868	Connector—2 contact female connector for motor cable
36422	Connector—3 contact female socket for phono cable (J1)
74133	Control—Volume control and power switch (R3, S1)
73127	Cover—Insulating cover for electrolytics
73693	Grommet—Power cord strain relief grommet (1 set)
72314	Resistor—Wire wound, 120 ohms, 5 watts (R7)
73237	Resistor—Wire wound, 33 ohms, 150 ma (R11)
	Resistor—Fixed, composition:—
	150 ohms, ±10%, ½ watt (R9)
	2700 ohms, ±10%, ½ watt (R10)
	120,000 ohms, ±10%, ½ watt (R4)
	180,000 ohms, ±10%, ½ watt (R2)
	27.0000 ohms, ±10%, ½ watt (R6, R8)

STOCK No.	DESCRIPTION
	470,000 ohms, ±10%, ½ watt (R1)
	4.7 megohm, ±20%, ½ watt (R5)
73117	Socket—Tube socket
72535	Transformer—Output transformer (T1)
	SPEAKER ASSEMBLIES 92577-6W
74165	Speaker—4" P.M. speaker complete with cone and voice coil.
	MISCELLANEOUS
74135	Baffle—Speaker baffle
74134	Bottom—Cabinet bottom cover
74136	Bracket—Speaker mounting bracket
74137	Bracket—Mounting bracket for reject button and shaft
74138	Button—Reject button and shaft
Y2071	Cabinet—Plastic cabinet—maroon—less bottom cover
74190	Cable—Shielded pickup cable complete with 3 contact male connector
74193	Clamp—Spring clamp for reject button and shaft
74192	Connector—3 contact male connector for pickup cable
73549	Emblem—"RCA Victor" emblem (metal)
74674	Emblem—"RCA Victor" emblem (plastic)
74623	Hardware—Set of mounting parts consisting of 3 flat washers, 3 eyelets and 3 grommets to mount changer mechanism
73490	Knob—Volume control and power switch knob
74734	Spring—Retaining spring for knob
74139	Spring—Reject button and shaft return spring
2917	Washer—"C" washer for reject button and shaft

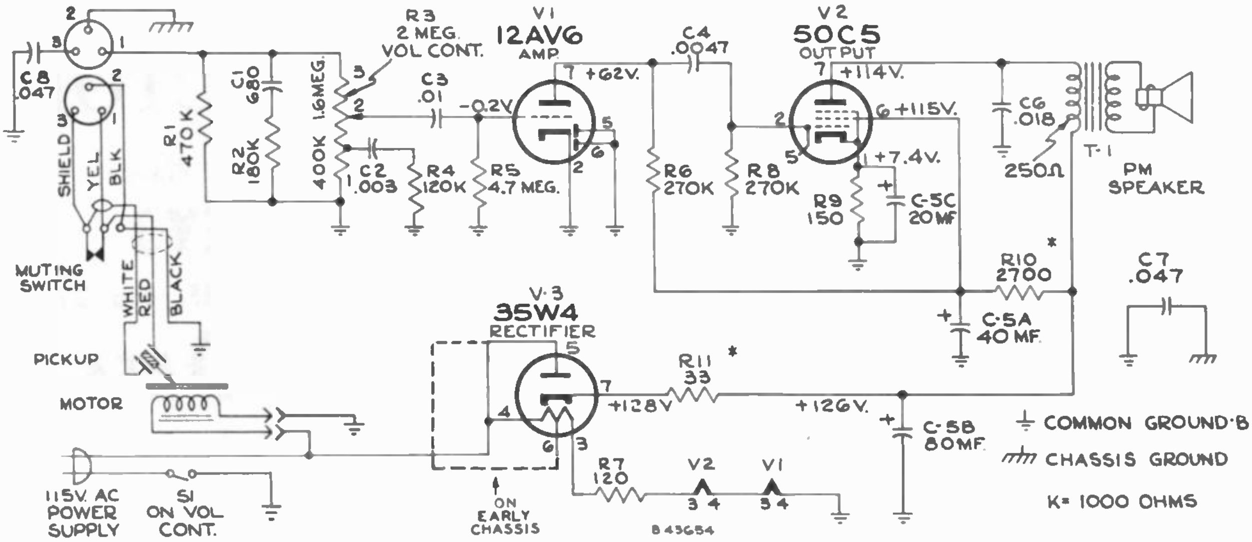
APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

Change in Resistor and Capacitor:

To aid in hum reduction R8 and C4 have been changed in value. R8 is now 270,000 ohms (was 470,000) and C4 is now .0047 mf (was .002 mf)

Service Hint:

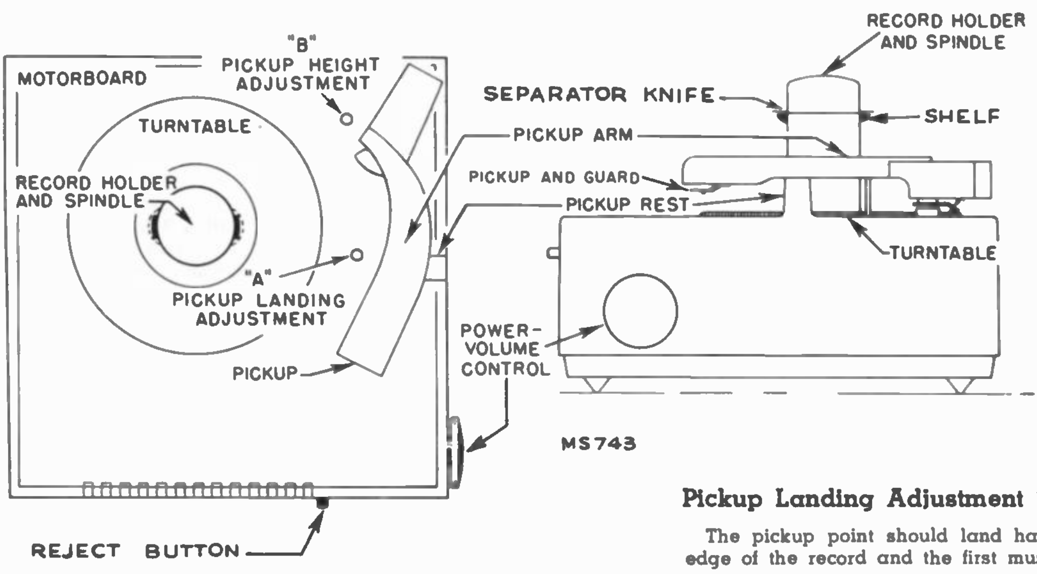
The leads of C3 and R5 are close to the chassis base. If either of these leads touch the chassis it results in low volume. When servicing check the lead dress of these two components.



VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST"- SHOULD HOLD WITHIN ± 20%

* IN SOME CHASSIS R10 IS 5600 OHMS, R11 IS NOT USED, RECTIFIER CIRCUIT AS SHOWN BY DOTTED LINE.

Schematic Diagram



Top and Side Views

Record Separators

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

Record Changer Mounting

The cabinet is used as the motor board of the record changer. The record changer is attached to the cabinet with three screws, grommets and spacers. THE PICKUP ARM MUST BE REMOVED BEFORE THE RECORD CHANGER CAN BE REMOVED—REFER TO RP-168 SERIES SERVICE DATA.

To Remove Chassis

Remove the four screws at the corners of the bottom cover, separate the motor power plug and socket and remove the pickup cable from its socket on the amplifier chassis.

Elongated holes permit the speaker position to be adjusted. If the speaker should be replaced or its mounting bracket loosened, the speaker mounting bracket screws should not be tightened until after the bottom cover is assembled to the cabinet.

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

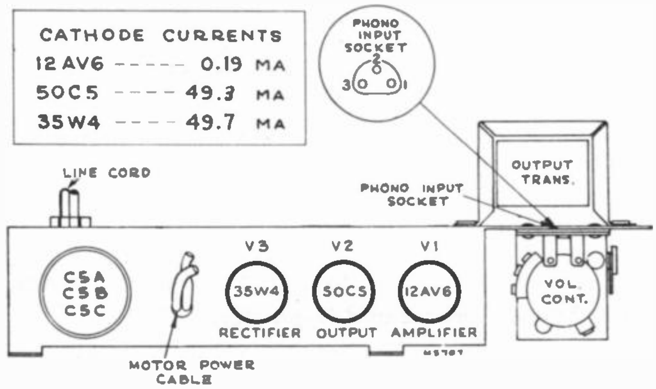
If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

CATHODE CURRENTS	
12 AV6	0.19 MA
50C5	49.3 MA
35W4	49.7 MA



Amplifier Top View

RCA VICTOR

Manual Record Player

MODEL 9EYM3

Chassis No. RS-132

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 10 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tube Complement

1. RCA 12AV6 .... Amplifier
2. RCA 50C5 .... Output
3. RCA 35W4 .... Rectifier

Loudspeaker (92577-6W)

Size and type .... 4 in. P.M.

Voice coil impedance .... 3.2 ohms at 400 cycles

Dimensions (overall)

Height, 6¼" Width, 9$^{11}/_{16}$" Depth, 9⅝"

Weight .... 9½ lbs.

Power Supply Rating

115 volts, 60 cycles A.C. .... 45 watts

Power Output

Undistorted .... 1.0 watt Maximum .... 1.25 watts

Record Player (RP 186-1)

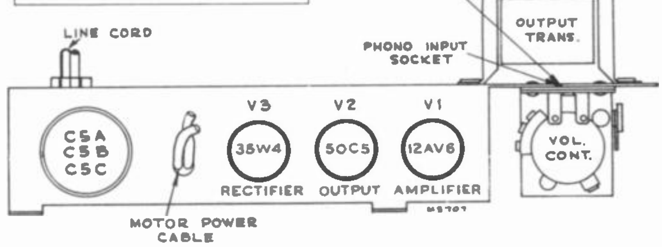
Turntable speed .... 45 r.p.m.

Record used .... RCA 7 in. fine groove

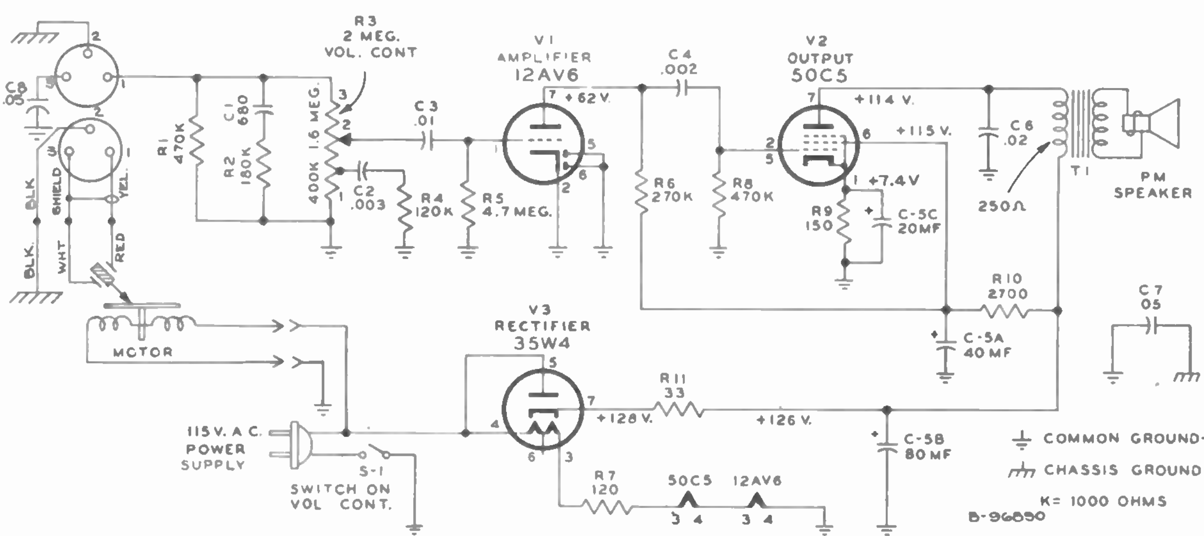
Record capacity .... 1 record

Pickup .... Crystal (medium output)

CATHODE CURRENTS	
12AV6 -----	0.19 MA
50C5 ----	49.3 MA
35W4 ----	49.7 MA



Amplifier Top View



VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST" — SHOULD HOLD WITHIN ± 20%

Schematic Diagram

To Remove Chassis

Remove the four screws at the corners of the bottom cover, separate the motor power plug and socket and remove the pickup cable from its socket on the amplifier chassis.

Elongated holes permit the speaker position to be adjusted. If the speaker should be replaced or its mounting bracket loosened, the speaker mounting bracket screws should not be tightened until after the bottom cover is assembled to the cabinet.

Care of Pickup

The sapphire of the crystal pickup is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE SAPPHIRE POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

Replacement of Sapphire

Caution: Never bend the sapphire support wire.

Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal. Take hold of the lower end of the shaft with a pair of pliers while loosening or tightening the nut, being very careful so as not to strip the threads or break the crystal.

Remove the two screws holding sapphire guard in place and remove the guard. Remove the small nut and washer on the threaded shaft of the sapphire holder and gently push the shaft through the hole in the armature shaft until the sapphire holder assembly comes free.

Insert threaded shaft of replacement sapphire holder through armature shaft and replace the washer and nut. Make sure that the sapphire is in the correct position.

Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws. Before using, check to see that the sapphire projects far enough beyond the guard so that the guard will not touch the record. If necessary, bend the guard a little.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	PICKUP & ARM ASSEMBLY
74041	Arm—Pickup arm shell and stud—less crystal, cable and rear pivot arm
74059	Arm—Pivot arm and shaft
74066	Cable—Twisted pickup cable (12") complete with connectors
74067	Crystal—Crystal cartridge complete including sapphire and guard
74069	Guard—Sapphire guard
38458	Nut—Speed nut to hold pickup cable
74061	Pivot—Tone arm pivot
74068	Sapphire—Sapphire and holder
74065	Screw—#2-56 x 3/16" fillister head screw to mount crystal (2 required) or needle guard (2 required)
74062	Screw—#8-32 x 13/32" cone point pivot adjusting screw
74410	Screw—#4-40 x 3/16" fillister head set screw to lock pivot screw 74062
74060	Spring—Pivot arm spring (.171" O.D. x .695"—43 turns)
74230	Washer—Washer and nut to mount sapphire and holder
	AMPLIFIER ASSEMBLY RS 132
39648	Capacitor—Mica, 68 mmf. (C1)
72839	Capacitor—Moulded paper, .002 mfd., 400 volts (C4)
73961	Capacitor—Tubular, .003 mfd., 200 volts (C2)
71923	Capacitor—Tubular, .01 mfd., 200 volts (C3)
73562	Capacitor—Moulded paper, .02 mfd., 400 volts (C6)
71702	Capacitor—Moulded paper, .05 mfd., 400 volts (C7, C8)
72281	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 150 volts; 1 section of 40 mfd., 150 volts; and 1 section of 20 mfd., 25 volts (C5A, C5B, C5C)
74133	Control—Volume control and power switch (R3, S1)
28451	Cover—Insulating cover for electrolytic capacitor
73693	Grommet—Strain relief grommet (1 set) for power cord
70391	Insulator—Phono input socket insulator
30868	Plug—2 contact female plug for motor cable
73237	Resistor—Wire wound, 33 ohms, 150MA (R11)
72314	Resistor—Wire wound, 120 ohms, 5 watts (R7)
	Resistor—Fixed, composition, 150 ohms ±10%, ½ watt (R9)
	Resistor—Fixed, composition, 2700 ohms ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 120,000 ohms, ±10%, ½ watt (R4)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt (R2)
	Resistor—Fixed, composition, 270,000 ohms, ±10%, ½ watt (R6)
	Resistor—Fixed, composition, 470,000 ohms, ±20%, ½ watt (R8)
	Resistor—Fixed, composition, 470,000 ohms, ±10%, ½ watt (R1)
	Resistor—Fixed, composition, 4.7 megohms ±20%, ½ watt (R5)
73117	Socket—Tube socket
36422	Socket—3 contact socket for phono input cable
72535	Transformer—Output transformer (T1)
	MOTORBOARD ASSEMBLY RP 186-1
72349	Bearing—Thrust bearing
30870	Connector—2 contact male connector for motor
74087	Grommet—Rubber grommet to mount motor (3 required)
74132	Hardware—Motor mounting hardware consisting of three (3) spacers, six (6) flat washers, three (3) hex nuts and three (3) lockwashers
74094	Mat—Turntable mat
74071	Motor—115 volt, 60 cycle motor complete with male connector
74459	Motorboard—Motorboard sub-assembly complete with idler lever, turntable and tone arm posts
74460	Nose—Spindle nose
74089	Spring—Idler wheel spring
74079	Stud—Idler wheel mounting stud
74452	Turntable—Turntable and shaft complete with rubber mat—less spindle nose
72688	Washer—"C" washer for turntable assembly
74102	Washer—Dampening washer for idler wheel (bottom)
74078	Washer—Dampening washer for idler wheel (top)
74080	Washer—Thrust washer for turntable bearing (2 required)
74077	Wheel—Idler wheel
	SPEAKER ASSEMBLY 92577-6W RL108B4
74165	Speaker—4" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74135	Baffle—Speaker baffle
74134	Bottom—Cabinet bottom cover
74136	Bracket—Speaker mounting bracket
Y2071	Cabinet—Plastic cabinet—maroon—less bottom cover
74190	Cable—Shielded output cable complete with 3 contact male connector
74192	Connector—3 contact male plug for output cable
73549	Emblem—"RCA Victor" emblem
74087	Grommet—Rubber grommet to mount record player mechanism (3 required)
73490	Knob—Volume control and power switch knob
74462	Sleeve—Rubber sleeve for bottom of pivot arm and shaft
74191	Spacer—Metal spacer to mount record player mechanism (3 required)
14270	Spring—Retaining spring for knob #73490
74463	Washer—Flat metal washer for bottom of pivot arm shaft
74256	Washer—Vellutex washer for pivot arm shaft (top)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

9EY31 (Brown)
9EY32 (Red)

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

RCA VICTOR

Portable 45 RPM Record Player

MODELS 9EY31, 9EY32

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 23 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

SPECIFICATIONS

Tube Complement

1. RCA 12SQ7 .... Amplifier
2. RCA 50L6GT .... Output
3. RCA 35Z5GT .... Rectifier

Loudspeaker (RA68)

Size and type .... 5 in. P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Dimensions (overall)

Height, 11½"   Width, 14"   Depth, 9"

Power Supply Rating

115 volts, 60 cycles, A.C. .... 40 watts

Power Output

Undistorted ...... 0.9 watt   Maximum ...... 1.3 watts

Record Changer

Turntable speed .... 45 r.p.m.
Records used .... 7" RCA Fine Groove
Record capacity .... Up to 10 records
Pickup .... Crystal (medium output)

REPLACEMENT PARTS

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES Stamped RA79		Resistor—Fixed, composition:
			220 ohms, ±10%, ½ watt (R6)
			560 ohms, ±10%, ½ watt (R7)
75050	Capacitor—Electrolytic, comprising 2 sections of 50 mfd, 150 volts, and 1 section of 20 mfd, 25 volts (C5A, C5B, C5C)		33,000 ohms, ±10%, ½ watt (R12)
			270,000 ohms, ±10%, ½ watt (R3)
73750	Capacitor—Tubular, paper, .002 mfd, 200 volts (C3)		470,000 ohms, ±10%, ½ watt (R5, R11)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C7)		1 megohm, ±10%, ½ watt (R10)
71923	Capacitor—Tubular, paper, .01 mfd, 200 volts (C4, C6)		10 megohm, ±10%, ½ watt (R2)
		33084	Socket—Tube socket, octal, wafer
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C1)		
70615	Capacitor—Tubular, paper, .05 mfd, 400 volts (C8)		SPEAKER ASSEMBLIES RA68
73784	Capacitor—Tubular, paper, 0.1 mfd, 200 volts (C2)		
30868	Connector—2 contact female connector for motor cable	75053	Speaker—5" P.M. speaker complete with cone and voice coil less transformer
75051	Control—Volume control and power switch (R1, S1)	75054	Transformer—Output transformer
75052	Control—Tone control (R4)		
71783	Cover—Insulating cover for electrolytic		MISCELLANEOUS
35787	Jack—Phono cable input pin jack	75056	Knob—Control knob
18469	Plate—Mounting plate for electrolytic	75057	Screw No. 8 x ⅞" cross recessed oval head wood screw to mount changer in cabinet (3 required)
73237	Resistor—Fuse type, 33 ohms (R8)		
48676	Resistor—Wire wound, 150 ohms, 5 watts (R9)	75055	Well—Knob well

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

9EY31, 9EY32

Record Separators

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service the position of the star wheel on the underside of the record changer may be accidentally shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended — turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post — DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

Pickup Landing Adjustment

(Screw to left of pickup rest)

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves — turn screw slightly clockwise. If pickup lands outside the starting grooves — turn screw slightly counterclockwise.

Pickup Height Adjustment

(Screw to left of pickup arm pivot)

During cycle the pickup arm must rise high enough to clear a full stack of records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

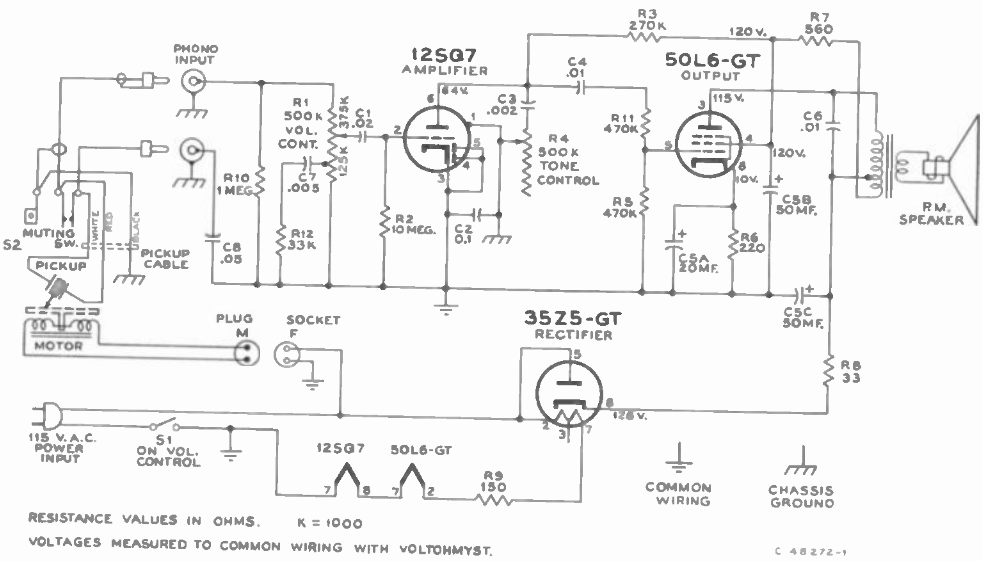
If pickup does not clear a full stack of records — turn screw slightly clockwise. If pickup arm touches records on record supports — turn screw slightly counterclockwise.

Removing Record Player

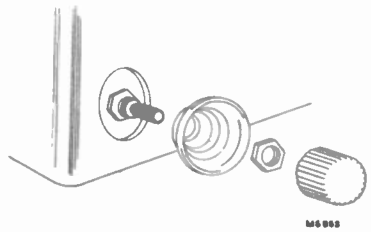
1. Remove the three screws mounting the motor board.
2. Lift the record changer, remove power cord, audio plug and lift assembly out.

Removing Amplifier Assembly

1. Remove record player.
2. Remove two control knobs (just pull).
3. Remove control mounting nuts as shown in exploded view below.
4. Lift amplifier assembly out.

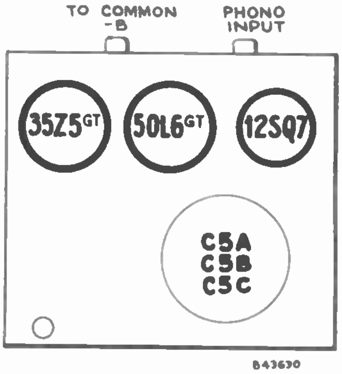


Schematic Diagram

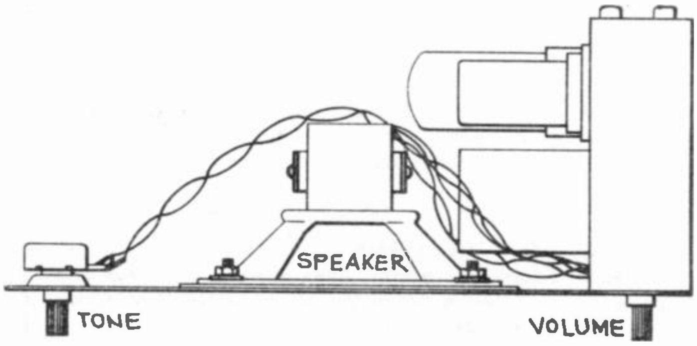


Removal of Amplifier Assembly

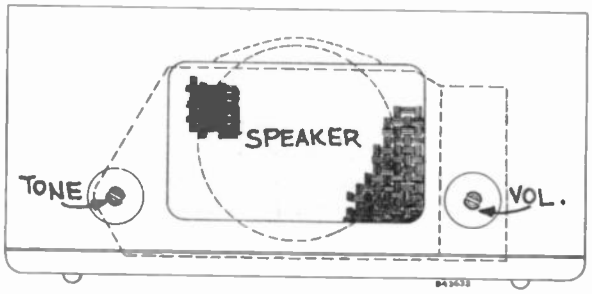
Note: In some instruments C8 and the muting switch S2 are omitted. These instruments will only have one plug connecting the amplifier.



Top View Amplifier Chassis



Amplifier Speaker Assembly



Outline of Chassis Inside Cabinet

9EY36
Roy Rogers

Walt Disney 9EY35

RCA VICTOR

Automatic Record Player

MODELS 9EY35, 9EY36

Chassis Nos. RS-132, RS-132A

SERVICE DATA

— 1949 No. 20 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

NOTE:
Instruments using amplifier stamped RS132 will use crystal pickup Stock No. 74067.
Instruments using amplifier stamped RS132A will use crystal pickup Stock No. 74625 and other minor differences as indicated in note attached to schematic.

MODELS 9EY35U, 9EY36U

These models differ from 9EY35 and 9EY36 only in the power cord and the screws which hold the bottom cover to the cabinet.

Specifications

Tube Complement

1. RCA 12AV6 .... Amplifier
2. RCA 50C5 .... Output
3. RCA 35W4 .... Rectifier

Loudspeaker (92577-6W)

Size and type .... 4 in. P.M.
Voice coil impedance ....3.2 ohms at 400 cycles

Dimensions (overall)

Height, 7⅝" Width, 9$^{11}/_{16}$" Dept, 9⅝"

Power Supply Rating

115 volts, 60 cycles A.C. .... 45 watts

Power Output

Undistorted ....1.0 watt Maximum ....1.25 watts

Record Changer

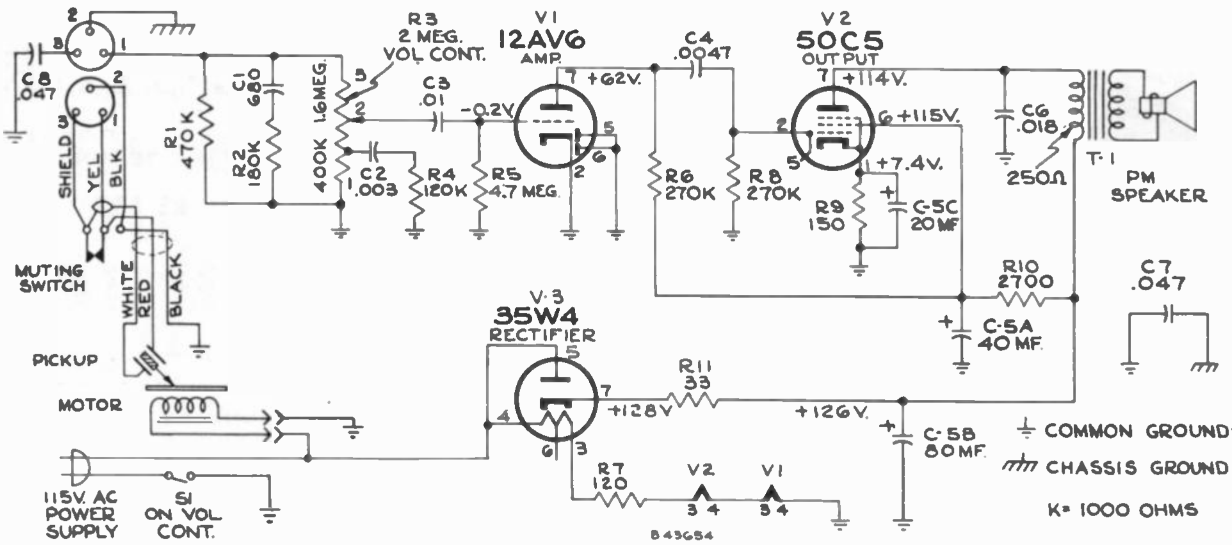
Turntable speed .... 45 r.p.m.
Records used ....RCA 7 in. fine groove
Record capacity .... up to 10 records
Pickup .... Crystal (medium output)

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	AMPLIFIER ASSEMBLIES RS 132, RS 132A
39648	Capacitor—Mica, 680 mmf., for RS 132 (C1)
72281	Capacitor—Electrolytic comprising 1 section of 80 mfd., 150 volts, 1 section of 40 mfd., 150 volts and 1 section of 20 mfd., 25 volts (C5)
71934	Capacitor—Tubular, paper, .0015 mfd., 600 volts for RS 132A (C1)
73961	Capacitor—Tubular, paper, .003 mfd., 200 volts for RS 132 (C2)
73920	Capacitor—Tubular, moulded paper, .0047 mfd., 600 volts (C4)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C2 for RS 132A, C3)
73797	Capacitor—Tubular, paper, .015 mfd., 600 volts for RS 132A (C6)
58476	Capacitor—Tubular, paper, .018 mfd., 400 volts for RS 132 (C6)
73553	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C7, C8)
30868	Connector—2 contact female connector for motor cable
36422	Connector—3 contact female socket (phono input)
74133	Control—Volume control (2 meg.) and power switch for RS 132 (R3, S1)
38412	Control—Volume control (500K) and power switch for RS 132A (R3, S1)
28451	Cover—Insulating cover for electrolytic
73693	Grommet—Power cord strain relief grommet (1 set)
28452	Plate—Mounting plate for electrolytic
72314	Resistor—Wire wound, 120 ohms, 5 watts (R7)
73237	Resistor—Wire wound, 33 ohms, 150 ma (R11)
	Resistor—Fixed, composition:—
	150 ohms, ±10%, ½ watt (R9)
	2700 ohms, ±10%, ½ watt (R10)
	27,000 ohms, ±10%, ½ watt for RS 132A (R4)

STOCK No.	DESCRIPTION
	120,000 ohms, ±10%, ½ watt for RS 132 (R4)
	180,000 ohms, ±10%, ½ watt (R2)
	270,000 ohms, ±10%, ½ watt (R6, R8)
	470,000 ohms, ±10%, ½ watt for RS 132 (R1)
	4.7 megohm, ±20%, ½ watt (R5)
73117	Socket—Tube socket
72535	Transformer—Output transformer (T1)
	SPEAKER ASSEMBLIES 92577-6W
74165	Speaker—4" P.M. speaker complete with cone and voice coil.
	MISCELLANEOUS
74135	Baffle—Speaker baffle
74134	Bottom—Cabinet bottom cover
74136	Bracket—Speaker mounting bracket
74137	Bracket—Mounting bracket for reject button and shaft
74138	Button—Reject button and shaft
Y2170	Cabinet—Plastic cabinet (Walt Disney) for Model 9EY35
Y2171	Cabinet—Plastic cabinet (Roy Rogers) for Model 9EY36
74190	Cable—Shielded pickup cable complete with 3 contact male connector
74193	Clamp—Spring clamp for reject button and shaft
74192	Connector—3 contact male connector for pickup cable
74674	Emblem—"RCA Victor" emblem
74623	Hardware—Set of mounting parts consisting of 3 flat washers, 3 eyelets and 3 grommets to mount changer mechanism
74667	Knob—Control knob—ivory
74734	Spring—Retaining spring for knob
74139	Spring—Reject button and shaft return spring
2917	Washer—"C" washer for reject button and shaft

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.



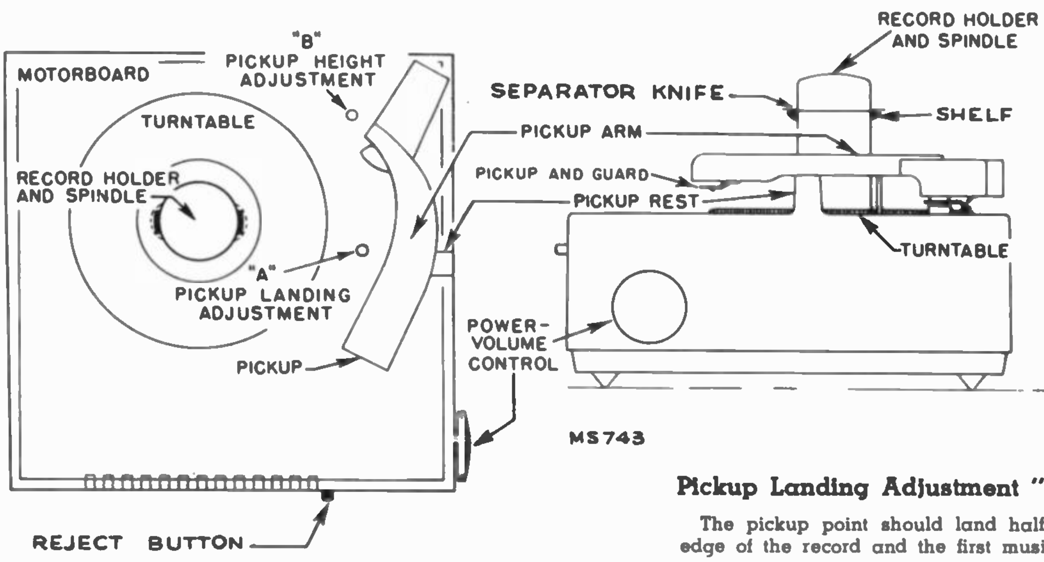
VOLTAGES MEASURED TO COMMON WIRING WITH "VOLTOHMYST"- SHOULD HOLD WITHIN ±20%

Schematic for amplifier marked RS-132

RS-132A

AMPLIFIER ASSEMBLIES

C1—.0015
C2—.01
C6—.015
R1—Not used
R4—27K
R3—500K vol. control tapped at 100K



Top and Side Views

Record Separators

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

Record Changer Mounting

The cabinet is used as the motor board of the record changer. The record changer is attached to the cabinet with three screws, grommets and spacers. THE PICKUP ARM MUST BE REMOVED BEFORE THE RECORD CHANGER CAN BE REMOVED—REFER TO RP-168 SERIES SERVICE DATA.

To Remove Chassis

Remove the four screws at the corners of the bottom cover, separate the motor power plug and socket and remove the pickup cable from its socket on the amplifier chassis.

Elongated holes permit the speaker position to be adjusted. If the speaker should be replaced or its mounting bracket loosened, the speaker mounting bracket screws should not be tightened until after the bottom cover is assembled to the cabinet.

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

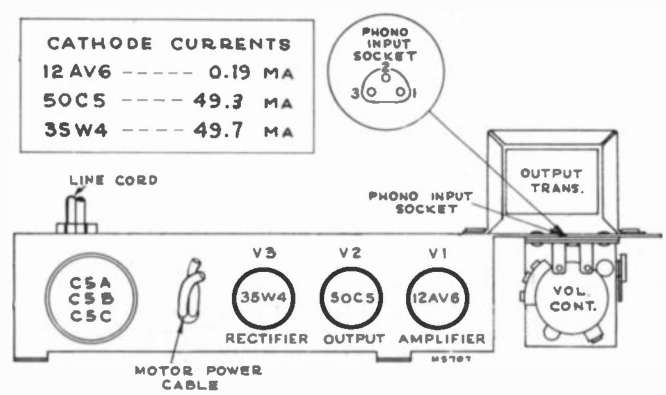
If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

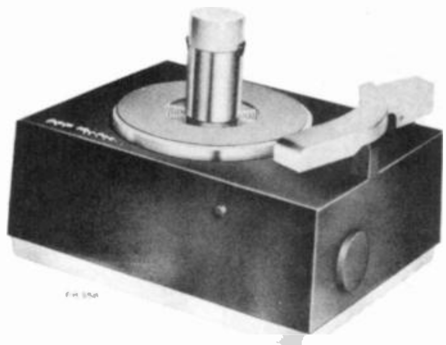
During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

CATHODE CURRENTS	
12AV6	0.19 MA
50C5	49.3 MA
35W4	49.7 MA



Amplifier Top View



RCA VICTOR

Record Changer Attachment

MODEL 9JY

Mfr. No. 274

SERVICE DATA

— 1949 No. 2 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Record Changer (RP-168-1)

Turntable speed .... 45 r.p.m.
Records used .... RCA fine groove—7 in.
Record capacity .... Up to 10 records
Pickup—Stock No. 74067 .... Crystal (medium output)

Power Supply Rating

115 volts, 60 cycles A.C. .... 15 watts

Dimensions (overall)

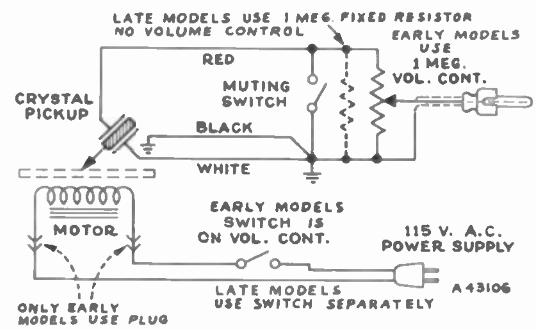
Height 6⅝" Width 9⅛" Depth 6⅞"

Record Separator

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service, the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

Note: This holds true only to mechanisms having the circular, rotating knives.

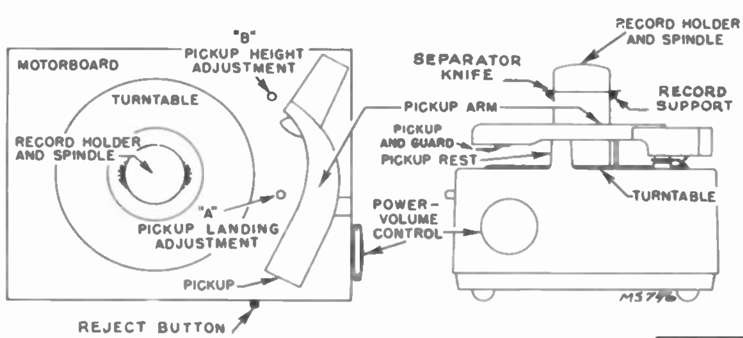


In some instruments: Black wire is omitted or a shielded wire is used in place of the red-black-white cable.

Schematic Diagram

Record Changer Mounting

The cabinet is used as the motorboard of the record changer. The record changer is attached with three screws and bushings. THE PICKUP ARM MUST BE REMOVED BEFORE THE RECORD CHANGER CAN BE REMOVED—REFER TO RP-168 SERIES SERVICE DATA.



Top and Side Views

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
74097	Bottom—Cabinet bottom cover (either model)
74189	Bushing—Shoulder bushing to mount record changer in cabinet (3 required)
74098	Button—Reject button
Y2062	Cabinet—Moulded cabinet less bottom cover (early model)
Y2151	Cabinet—Plastic less bottom cover—No tone arm rest (late production)
74296	Cable—Shielded pickup cable (48") complete with pin plug (late model)
39386	Cable—Shielded pickup cable complete with pin plug (early model)
74101	Control—Volume control and power switch
14086	Cord—Power cord and plug
74674	Emblem—"RCA Victor" emblem (plastic)
73549	Emblem—"RCA-Victor" emblem (metal)
31051	Foot—Rubber foot (4 required)
73490	Knob—Volume control and power switch knob—maroon
14270	Spring—Retaining spring for knob
74871	Switch—Power switch (late model)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

Connecting Record Changer Attachment to Radio Receivers

RCA Radios with Phono Jack

Plug male connector on the end of the "Phono" lead into the female connector on the receiver chassis. If set is provided with a phono switch, push or turn the "Phono" switch to "Phono" position, and operate the Record Changer Attachment according to instructions. If no switch is provided, use maximum setting of volume control on attachment, and minimum setting of radio volume control which will give acceptable volume, and tune receiver off frequency from any very strong station. In some instances the radio volume control will have the effect of a tone control.

RCA Type No. 202W1 Record Player Selector

This selector switch may be used for combined operation of two record players through one phono input jack. A choice of two types of input jacks and output cable plugs are provided.

Radio-Phonograph Combinations

Most radio-phonograph combinations use resistors and/or capacitors for tone compensation in the phono input circuit.

Where unsatisfactory reproduction is obtained with Model 9JY connected into the phono jack of such instruments, we suggest that Model 9JY be connected as indicated for radios which do not have a phono jack.

Radios Without Phono Jack

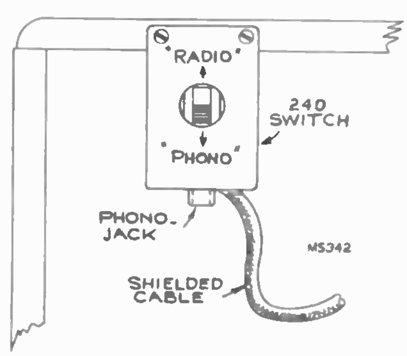
Methods of connecting the Record Changer Attachment to various types of audio systems are given in the accompanying text and illustrations. The data given requires that an RCA Type No. 240X1 (Formerly Stock No. 240) Radio-Phono switch be used for switching from radio to phonograph, as desired. For ease in connecting the "phono" lead to the switch, the male plug on the end of the lead matches the phono jack on the switch.

In general, the Record Changer Attachment must be used with radio receivers having at least two stages of high-gain audio amplification. The output of the Record Changer Attachment should be connected to the input of the first audio tube, and at the same time the output of the radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Record Changer Attachment is in operation.

Installation of Switch

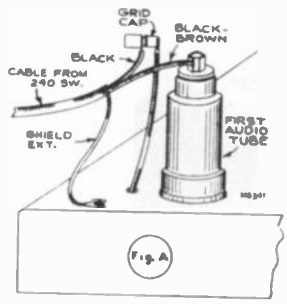
Fasten the bracket to the cabinet in such a position that the switch may be easily reached. For wooden cabinets, a suggested place is the upper rear edge of the cabinet. If the radio has a plastic cabinet, the bracket may be fastened to the chassis by self-tapping screws or soldering. In the case of **a.c.-d.c sets, the bracket should not be fastened to the chassis.** In such cases, a wooden block may be fastened to the chassis and the bracket screwed to the wooden block, care being exercised that there is no metallic path from the bracket to the chassis.

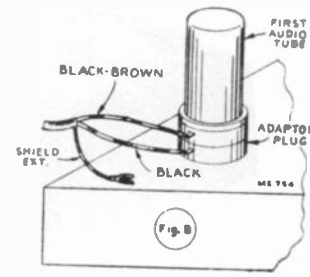
Connect the braided shield extension to the radio chassis by either soldering or placing the spade lug under a mounting screw.



On a.c.-d.c. sets it is necessary to isolate the cable shield from the chassis. This is best done by connecting the shield to the chassis through a .25 mfd 300-volt condenser. Care should be taken that the shield braiding and switch bracket do not come in contact with the chassis.

If the common-negative wiring in the a.c.-d.c. set is isolated from the set chassis, connect the cable shield, through a .25 mfd. capacitor, to the common-negative wiring, and not to the chassis.





Note:

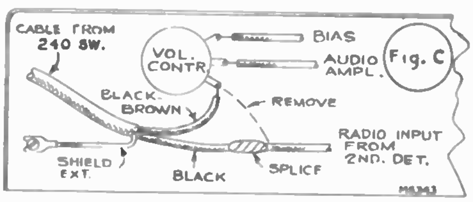
If late production models are connected to a radio set as shown in Fig. A & B, it will probably be necessary to substitute a volume control in place of the 1 meg. fixed resistor, since majority of sets do not have a volume control following the first audio tube.

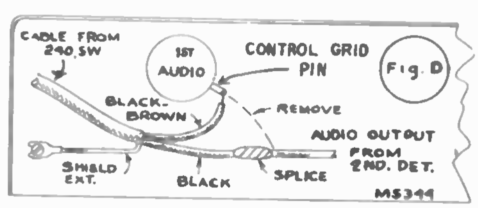
For radio receivers in which the 1st-audio tube has a top grid cap—see Fig. A:

1. Disconnect the grid lead from the first audio tube.
2. Connect the cap on the black lead to the clip on the grid lead, as shown above.
3. Connect the clip on the black-brown lead to the grid cap at the top of the first audio tube, bending the terminal if necessary to proper size for a metal tube cap.
4. Insert the plug on the end of the record player lead into the jack on the bracket.
5. Secure or position the connection cable assembly so that the cap and clip terminals are well separated from each other and other metal parts.

For radio receivers in which the 1st-audio tube is type 6SQ7, 6SR7, 12SQ7 or 12SR7—see Fig. B:

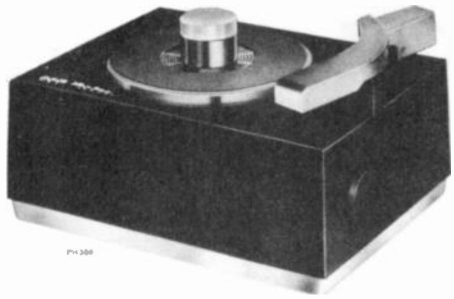
1. Use adaptor plug RCA Stock No. 37798.
2. Remove the 1st audio tube.
3. Solder the switch leads to the adaptor plug terminals—black to bottom lug—black-brown to top lug.
4. Tape terminals to prevent short circuits when installed in set.
5. Insert the adaptor into the 1st audio tube socket.
6. Insert the 1st audio tube into the adaptor.
7. Insert the plug on the end of the record player lead into the jack on the bracket.





For other radio receivers in which the 1st-audio tube does not have a grid cap; connection to volume control input—see Fig. C, connection to 1st-audio tube control grid—see Fig. D:

1. Unsolder the lead from the volume control lug indicated in Fig. C or from the control grid pin indicated in Fig. D. It is usually necessary to remove the chassis from the cabinet to do this.
2. Solder the black-brown lead (remove clip) to the lug or pin disconnected in Step 1.
3. Solder the black lead (remove plug) to the lead disconnected in Step 1. Tape the joint to prevent short circuits.
4. Insert the plug on the end of the record player lead into the jack on the bracket.



RCA VICTOR

Record Player Attachment

MODEL 9JYM

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 11 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Record Player (RP 186-1)

Turntable speed .... 45 r.p.m.
Record used .... RCA 7 in. fine groove
Record capacity .... 1 record
Pickup .... Crystal (medium output)

Power Supply Rating

115 volts, 60 cycles A.C. .... 15 watts

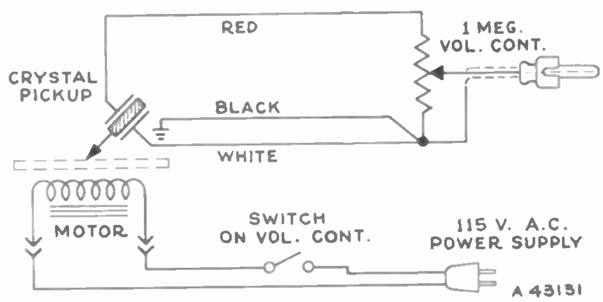
Dimensions (overall)

Height $5\frac{1}{16}$" Width $9\frac{1}{8}$" Depth $6\frac{7}{8}$"

Weight .... 6 lbs.

Care of Pickup

The sapphire of the crystal pickup is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.



Schematic Diagram

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	PICKUP & ARM ASSEMBLY
74041	Arm—Pickup arm shell and stud—less crystal, cable and rear pivot arm
74059	Arm—Pivot arm and shaft
74066	Cable—Twisted pickup cable (12") complete with connectors
74067	Crystal—Crystal cartridge complete including sapphire and guard
74069	Guard—Sapphire guard
38458	Nut—Speed nut to hold pickup cable
74061	Pivot—Tone arm pivot
74068	Sapphire—Sapphire and holder
74065	Screw—#2-56 x $\frac{3}{16}$" fillister head screw to mount crystal (2 required) or needle guard (2 required)
74062	Screw—#8-32 x $\frac{13}{32}$" cone point pivot adjusting screw
74410	Screw—#4-40 x $\frac{3}{16}$" fillister head set screw to lock pivot screw 74062
74060	Spring—Pivot arm spring (.171" O.D. x .695"—43 turns)
74230	Washer—Washer and nut to mount sapphire and holder
	MOTORBOARD ASSEMBLY RP 186-1
72349	Bearing—Thrust bearing
30870	Connector—2 contact male connector for motor
74087	Grommet—Rubber grommet to mount motor (3 required)
74132	Hardware—Motor mounting hardware consisting of three (3) spacers, six (6) flat washers, three (3) hex nuts and three (3) lockwashers
74094	Mat—Turntable mat

STOCK No.	DESCRIPTION
74071	Motor—115 volt, 60 cycle motor complete with male connector
74459	Motorboard—Motorboard sub-assembly complete with idler lever, turntable and tone arm posts
74460	Nose—Spindle nose
74089	Spring—Idler wheel spring
74079	Stud—Idler wheel mounting stud
74452	Turntable—Turntable and shaft complete with rubber mat—less spindle nose
72688	Washer—"C" washer for turntable assembly
74102	Washer—Dampening washer for idler wheel (bottom)
74078	Washer—Dampening washer for idler wheel (top)
74080	Washer—Thrust washer for turntable bearing (2 required)
74077	Wheel—Idler wheel
	MISCELLANEOUS
74097	Bottom—Cabinet bottom cover
74189	Bushing—Shoulder bushing to mount motorboard in cabinet (3 required)
Y2062	Cabinet—Plastic cabinet
39386	Cable—Shielded output cable complete with pin plug
30868	Connector—2 contact female connector for motor
74101	Control—Volume control and power switch
73549	Emblem—"RCA Victor" emblem
31051	Foot—Rubber foot (4 required)
73490	Knob—Volume control knob
74462	Sleeve—Rubber sleeve for bottom of pivot arm and shaft
14270	Spring—Retaining spring for knob
74463	Washer—Flat metal washer for pivot arm shaft (bottom) (.190" I.D. x $\frac{3}{8}$" O.D. x .020")
74256	Washer—Vellutex washer for pivot arm shaft (top)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

9JYM

Replacement of Sapphire

Caution: **Never bend the sapphire support wire.**

Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal. Take hold of the lower end of the shaft with a pair of pliers while loosening or tightening the nut, being very careful so as not to strip the threads or break the crystal.

Remove the two screws holding sapphire guard in place and remove the guard. Remove the small nut and washer on the threaded shaft of the sapphire holder and gently push the shaft through the hole in the armature shaft until the sapphire holder assembly comes free.

Insert threaded end of replacement sapphire holder through armature shaft and replace the washer and nut. Make sure that the sapphire is in the correct position. Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws. Before using, check to see that the sapphire projects far enough beyond the guard so that the guard will not touch the record. If necessary, bend the guard a little.

Connecting Record Player Attachment to Radio Receivers

RCA Radios with Phone Jack

Plug male connector on the end of the "Phono" lead into the female connector on the receiver chassis. If set is provided with a phono switch, push or turn the "Phono" switch to "Phono" position, and operate the Record Player Attachment according to instructions. If no switch is provided, use maximum setting of volume control on attachment, and minimum setting of radio volume control which will give acceptable volume, and tune receiver off frequency from any very strong station. In some instances the radio volume control will have the effect of a tone control.

Radio-Phonograph Combinations

Most radio-phonograph combinations use resistors and/or capacitors for tone compensation in the phono input circuit.

Where unsatisfactory reproduction is obtained with Model 9JYM connected into the phono jack of such instruments, we suggest that Model 9JYM be connected as indicated for radios which do not have a phono jack.

Radios Without Phono Jack

Methods of connecting the Record Player Attachment to various types of audio systems are given in the accompanying text and illustrations. The data given requires that an RCA Type No. 240X1 (Formerly Stock No. 240) Radio-Phono switch be used for switching from radio to phonograph, as desired. For ease in connecting the "phono" lead to the switch, the male plug on the end of the lead matches the phono jack on the switch.

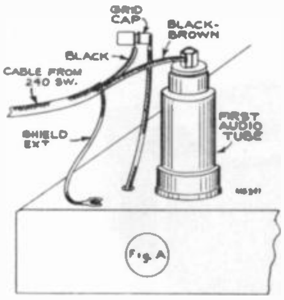
In general, the Record Player Attachment must be used with radio receivers having at least two stages of high-gain audio amplification. The output of the Record Player Attachment should be connected to the input of the first audio tube, and at the same time the output of the radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Record Player Attachment is in operation.

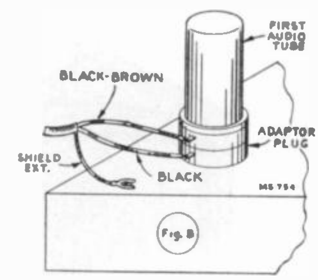
Installation of Switch

Connect the braided shield extension to the radio chassis by either soldering or placing the spade lug under a mounting screw.

On a.c.-d.c. sets it is necessary to isolate the cable shield and switch bracket from the chassis. This is best done by connecting the shield to the chassis through a .25 mfd. 300-volt condenser. Care should be taken that the shield braiding and switch bracket do not come in contact with the chassis.

If the common-negative wiring in the a.c.-d.c. set is isolated from the set chassis, connect the cable shield, through a .25 mfd. capacitor, to the common-negative wiring, and not to the chassis.



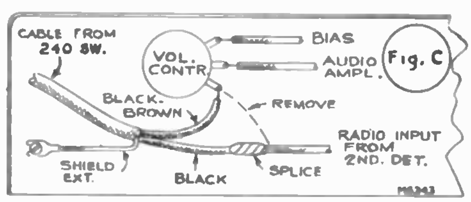


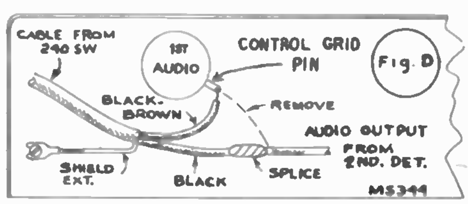
For radio receivers in which the 1st-audio tube has a top grid cap—see Fig. A:

1. Disconnect the grid lead from the first audio tube.
2. Connect the cap on the black lead to the clip on the grid lead, as shown above.
3. Connect the clip on the black-brown lead to the grid cap at the top of the first audio tube, bending the terminal if necessary to proper size for a metal tube cap.
4. Insert the plug on the end of the record player lead into the jack on the switch bracket.
5. Secure or position the connection cable assembly so that the cap and clip terminals are well separated from each other and other metal parts.

For radio receivers in which the 1st-audio tube is type 6SQ7, 6SR7, 12SQ7 or 12SR7—see Fig. B:

1. Use adaptor plug RCA Stock No. 37798.
2. Remove the 1st audio tube.
3. Solder the switch leads to the adaptor plug terminals—black to bottom lug—black-brown to top lug.
4. Tape terminals to prevent short circuits when installed in set.
5. Insert the adaptor into the 1st audio tube socket.
6. Insert the 1st audio tube into the adaptor.
7. Insert the plug on the end of the record player lead into the jack on the switch bracket.





For other radio receivers in which the 1st-audio tube does not have a grid cap; connection to volume control input—see Fig. C, connection to 1st-audio tube control grid—see Fig. D:

1. Unsolder the lead from the volume control lug indicated in Fig. C or from the control grid pin indicated in Fig. D. It is usually necessary to remove the chassis from the cabinet to do this.
2. Solder the black-brown lead (remove clip) to the lug or pin disconnected in Step 1.
3. Solder the black lead (remove cap) to the lead disconnected in Step 1. Tape the joint to prevent short circuits.
4. Insert the plug on the end of the record player lead into the jack on the switch bracket.

RCA Type No. 202W1 Record Player Selector

This selector switch may be used for combined operation of two record players through one phono input jack. A choice of two types of input jacks and output cable plugs are provided.

RCA MODEL 9Q53

Chassis No. RC-614—Mfr. No. 274

SERVICE DATA

1949 - - - - X1

RADIO CORPORATION OF AMERICA
RCA INTERNATIONAL DIVISION
745 FIFTH AVE., NEW YORK 22, N. Y.

Specifications

Tuning Ranges

Standard Broadcast ("A" Band)	525-1600 kc (571-187 m)
Medium Wave ("B" Band)	2.3-7 mc (130-42.9 m)
Short Wave ("C" Band)	7-22 mc (42.9-13.6 m)
"31-25 Meter" Spread Band	9.5-12 mc (31.6-25 m)
"19-16 Meter" Spread Band	15.1-17.9 mc (19.8-16.7 m)

Intermediate Frequency .... 455 kc

Tube Complement

(1) RCA 6BA6	R.F. Amplifier
(2) RCA 6BE6	Converter
(3) RCA 6SF7	I.F. Amp.—Det.—A.V.C.
(4) RCA 6SC7	A.F. Amp.—Ph. Inverter
(5) RCA 6F6G (6) RCA 6F6G	Push-Pull Output
(7) RCA 5Y3GT	Rectifier
(8) RCA 6U5/6G5	Tuning Eye

Lamps

Dial Lamps (2)	Mazda Type 44, 6.3 volts, .25 amp.
Band Indicator Lamp	Mazda Type 47, 6.3 volts, .15 amp.

Power Supply Ratings

Symbol	Voltage	Frequency	Watts
Rating "D"	(See below)	40 to 60 cycles	80

110 position—100 to 115 v.
125 position—115 to 135 v.
150 position—135 to 165 v.
210 position—180 to 220 v.
240 position—220 to 260 v.

Note: Shipped in 240 v. position. To change, remove round cover on top of transformer case and move link to desired position.

CAUTION: Remove power cord from line receptacle before changing link position.

Loudspeaker

Type 92579-3	8 in. (20.3 cm) PM Dynamic
Voice Coil Impedance	2.2 ohms at 400 cycles

Power Output Rating

Undistorted	5 watts
Maximum	5.75 watts

Tuning Drive Ratio .... 15½:1 (7¾ turns of knob)

Cabinet Dimensions

Height 13-15/16 in. (35.4 cm) Width 20 in. (50.8 cm)
Depth 10-11/16 in. (27.2 cm)

Description

This instrument is an eight tube five-band receiver of conventional design with the exception of the spread-band tuning.

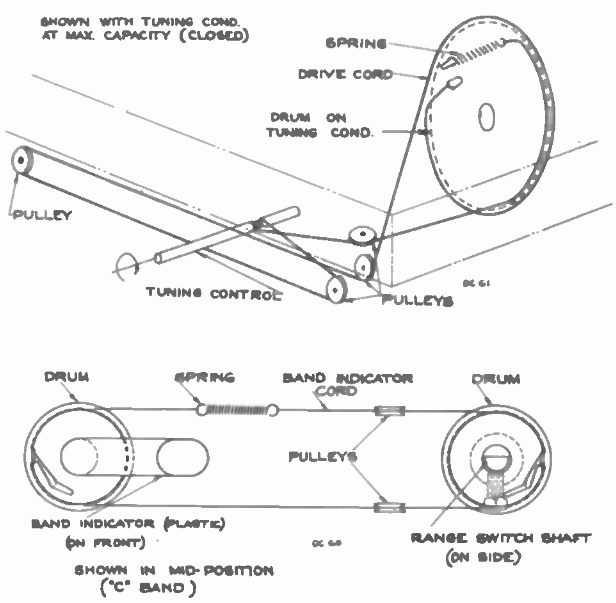
A three section gang condenser, one section each for antenna, r.f. and oscillator circuits, is used for the A, B and C bands. The 31-25 Meter and the 19-16 Meter spread-bands are tuned by a permeability tuning system using a rocker arm assembly which is actuated by a cam attached to the tuning condenser shaft. The core assembly of the permeability tuning system tunes both the 31-25 Meter and the 19-16 Meter bands with different circuit connections.

In the 31-25 Meter band position the 31-25 Meter coils are used. In the 19-16 Meter band position the 31-25 Meter and the 19-16 Meter band coils are used in parallel.

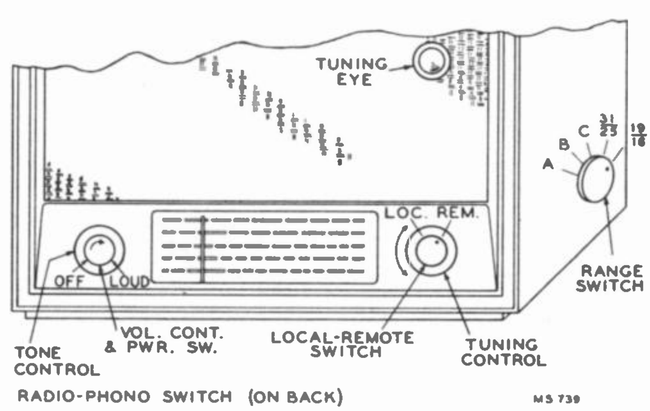
The inductances of the A-B-C windings of the multiple antenna coil are all fixed, but the inductances of all other coils in the antenna, r.f. and oscillator circuits are adjustable. Ungrounded screw type cores are used for these coils and adjustments are made with a non-metallic screwdriver.

A local-remote switch permits reduction of sensitivity on A band to prevent overloading on strong signals. On all other bands full sensitivity is used and the switch is not effective.

The tone control is continuous and is designed to function as a high or low frequency tone control when the control knob is turned to the right or to the left. The center position gives both high and low frequency response.



Dial-Indicator and Drive Mechanism



Controls

Alignment Procedure

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Receiver Dial with Calibration Scale.—To determine the corresponding frequency for any setting of the calibration scales, refer to the dial with calibration scale drawing.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the end calibration mark, and gang condenser fully meshed. The indicator has a clip for attachment to the cable.

Spread-Band Alignment.—For spread-band alignment an extremely high degree of accuracy is required of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials.

Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by one of the following methods:

1. Zero-beat the test-oscillator against short-wave stations of known frequency.
2. Check test-oscillator signals with a crystal controlled oscillator.

A final check should be made on actual reception of short-wave stations of known frequency.

For additional information, refer to booklet "RCA Victor Receiver Alignment."

Critical Lead Dress

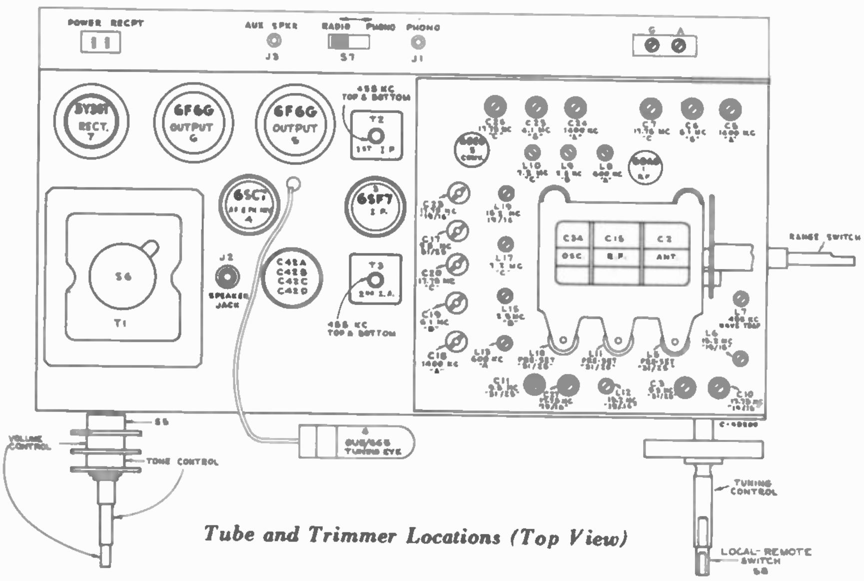
1. Capacitor C37 should be soldered across the 2nd I.F. transformer lugs D and F with the shortest possible leads and away from chassis.
2. Pins No. 1 and No. 3 of the 6SF7 tube should be connected together with a bus wire; pins No. 1 and No. 3 are separately grounded to chassis.
3. Range switch shield should be grounded to the chassis on the side where the 31-25 meter band ant. coil L5 and R.F. coil L11 are located.
4. The leads to the extra speaker jack J3 should be twisted and dressed down to the chassis.
5. Capacitor C39 should be dressed between the Radio-Phono switch S7 and the chassis.
6. Resistors R13 and R23 should be grounded to a common point, nearest to the ground point of capacitor C43.
7. The lead connecting C10 to the range switch should be dressed down to the chassis and then vertically up to the proper terminal of the range switch.
8. Dress all unshielded leads and components away from pins No. 3 and 4 of the 6SC7 tube.

Step	Connect High Side of Test Oscillator to—	Test Oscillator Frequency	Turn Radio Dial to—	Adjust for Maximum Output
1	Pin No. 2 of 6SF7 thru .01 mf. capacitor	455 kc	Quiet point near 600 kc A Band	T-3 2nd I.F. trans.—top and bottom
2	Pin No. 7 of 6BE6 thru .01 mf. capacitor			T-2 1st I.F. trans.—top and bottom
3	Ant. terminal thru 200 mmf. capacitor	1400 kc	27.3° A Band	C18 osc. C24 r.f. C5 ant.
4		600 kc	142.6° A Band	L13 osc. L8 r.f.
5		Repeat steps 3 and 4		
6		455 kc	Approx. 142° A Band	L7 wavetrap MINIMUM OUTPUT
7	Ant. terminal thru 300 ohm resistor	6.1 mc	28.2° B Band	C19 osc. C25 r.f. C6 ant.
8		2.5 mc	148.9° B Band	L15 osc. L9 r.f.
9		Repeat steps 7 and 8		
10		17.75 mc	34.4° C Band	C20 osc.† C26 r.f. C7 ant.
11		7.2 mc	160.3° C Band	L17 osc. L10 r.f.
12		Repeat steps 10 and 11		
13		9.5 mc	169.6° 31-25 Meter Band	C17 osc.* C11 r.f.* C3 ant.*
14		11.8 mc	44.8° 31-25 Meter Band	L18 osc.‡ L11 r.f.‡ L5 ant.‡
15		Repeat steps 13 and 14		
16		17.75 mc	37.5° 19-16 Meter Band	C23 osc.† C27 r.f. C10 ant.
17		15.2 mc	157.2° 19-16 Meter Band	L19 osc.† L12 r.f. L6 ant.
18		Repeat steps 16 and 17		

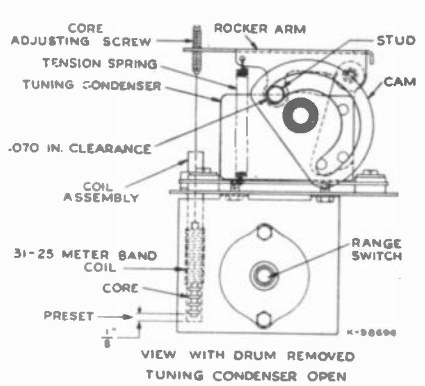
†Oscillator frequency is higher than signal frequency on all bands. Use minimum capacity or minimum inductance peak on oscillator adjustments if two peaks can be obtained.

*Pre-set L18, L11 and L5, with tuning condenser at minimum capacity (0°), so that the cores are exactly ⅛ in. (3.175 mm) from the bottom end of their respective coils (coil end to bottom end of iron core—not the insulating rod of the core assembly).

‡If dial reading for maximum output at 11.8 mc is lower than 11.8 mc, rotate studs approx. ½ turn clockwise—if higher rotate approx. ½ turn counterclockwise.

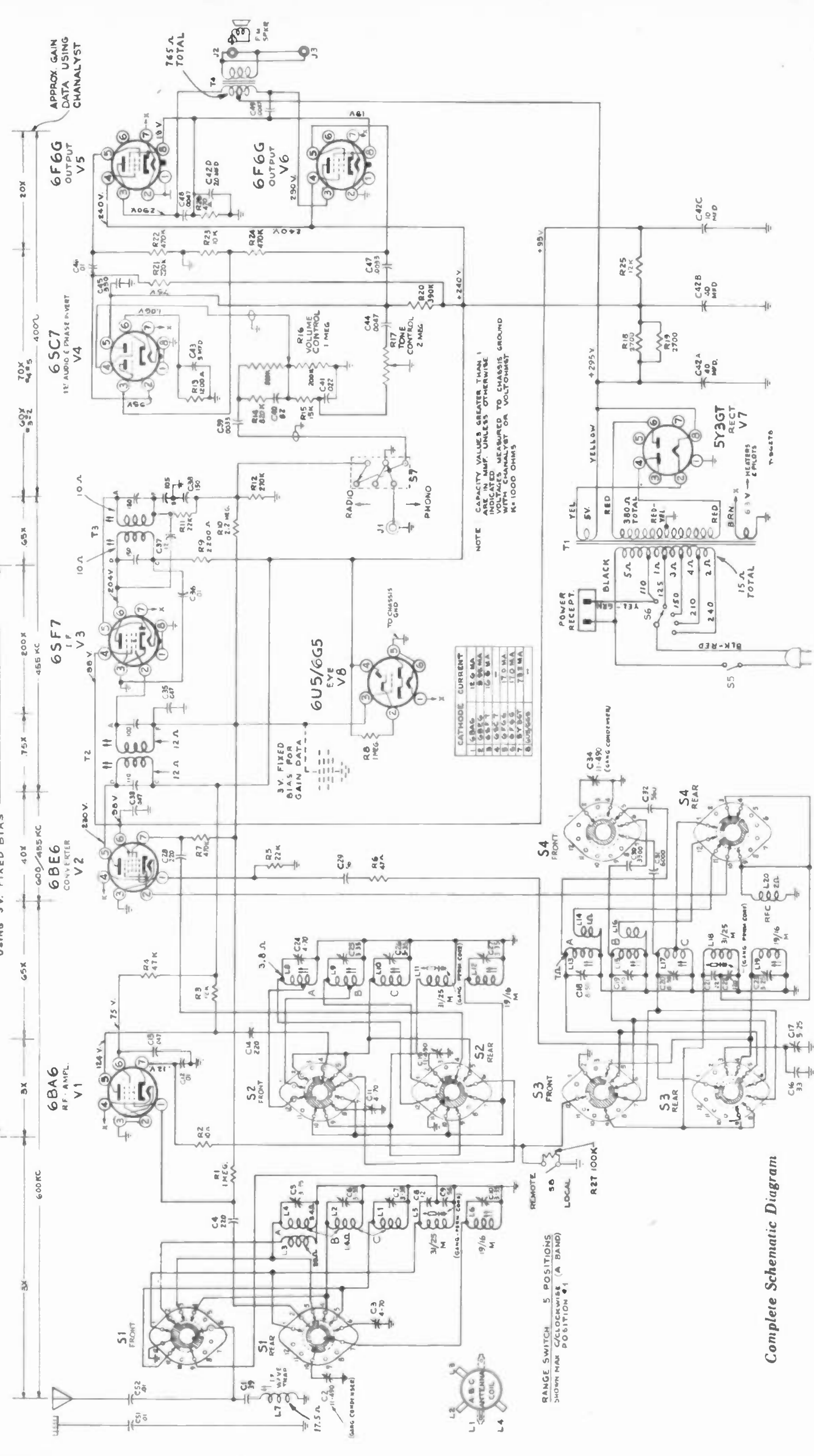


Tube and Trimmer Locations (Top View)



Spread-Band Tuning (Front View)

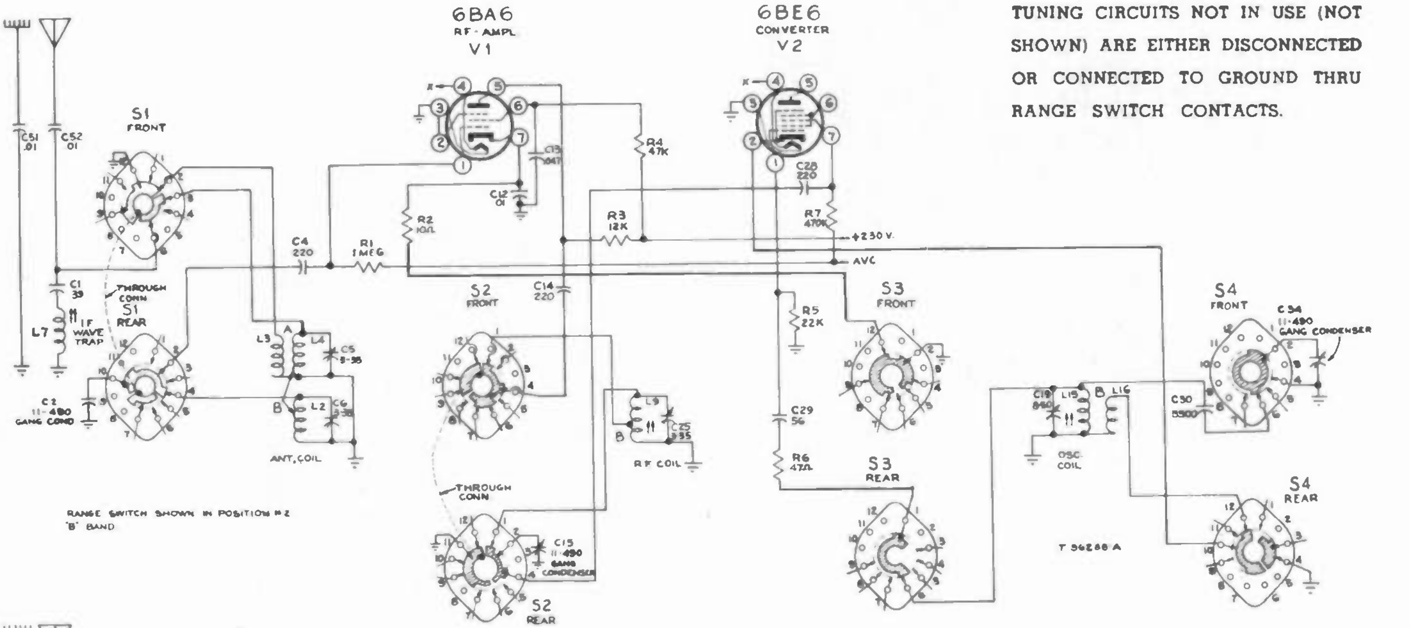
9Q53

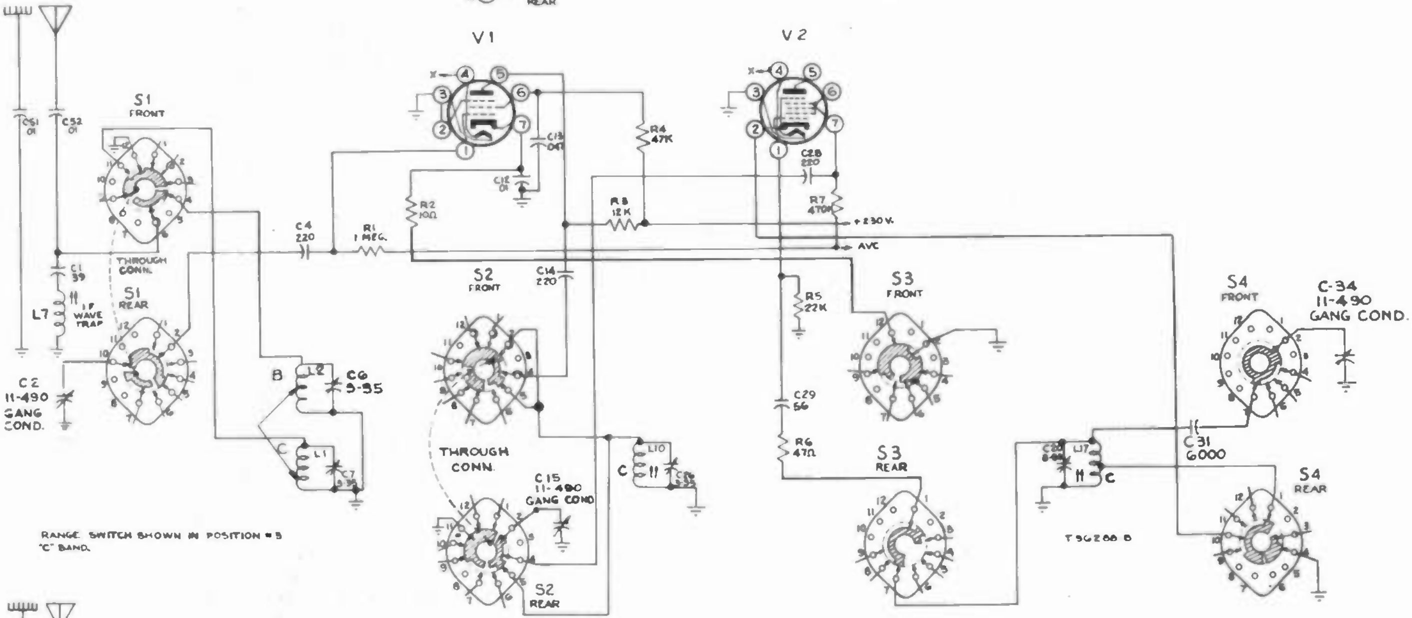


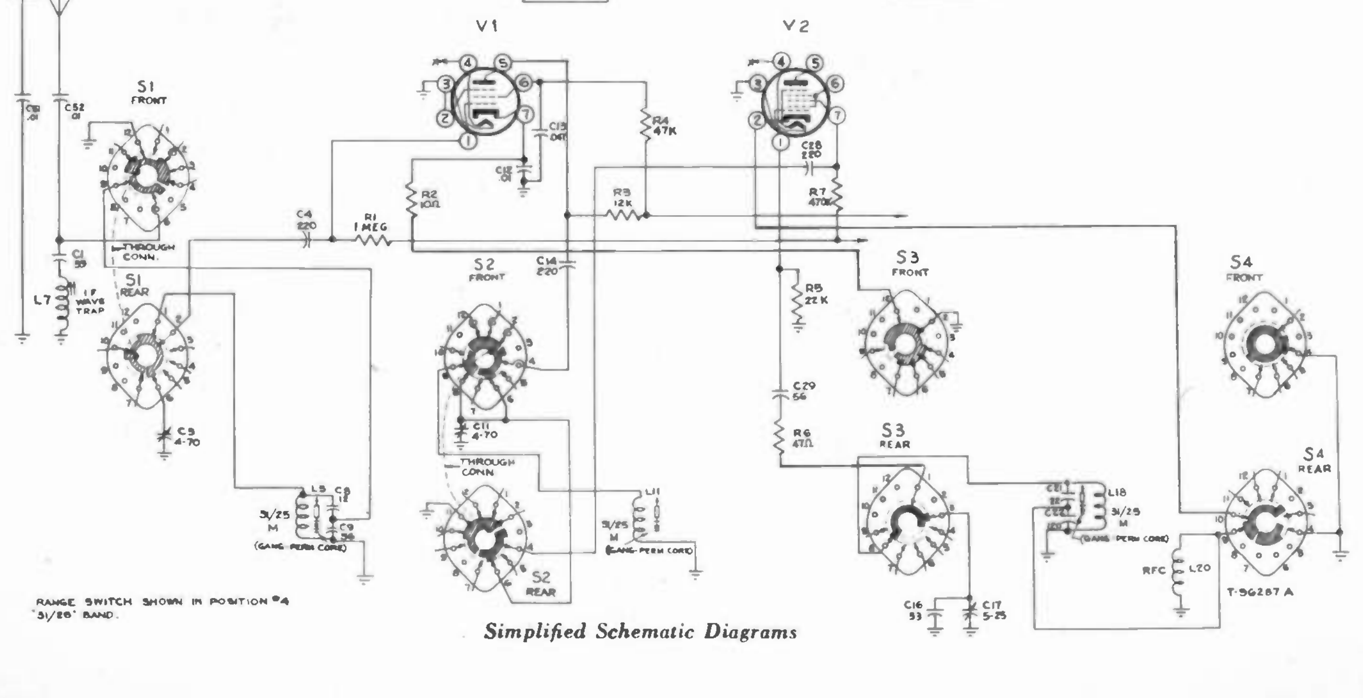
Complete Schematic Diagram

9QS3

TUNING CIRCUITS NOT IN USE (NOT SHOWN) ARE EITHER DISCONNECTED OR CONNECTED TO GROUND THRU RANGE SWITCH CONTACTS.

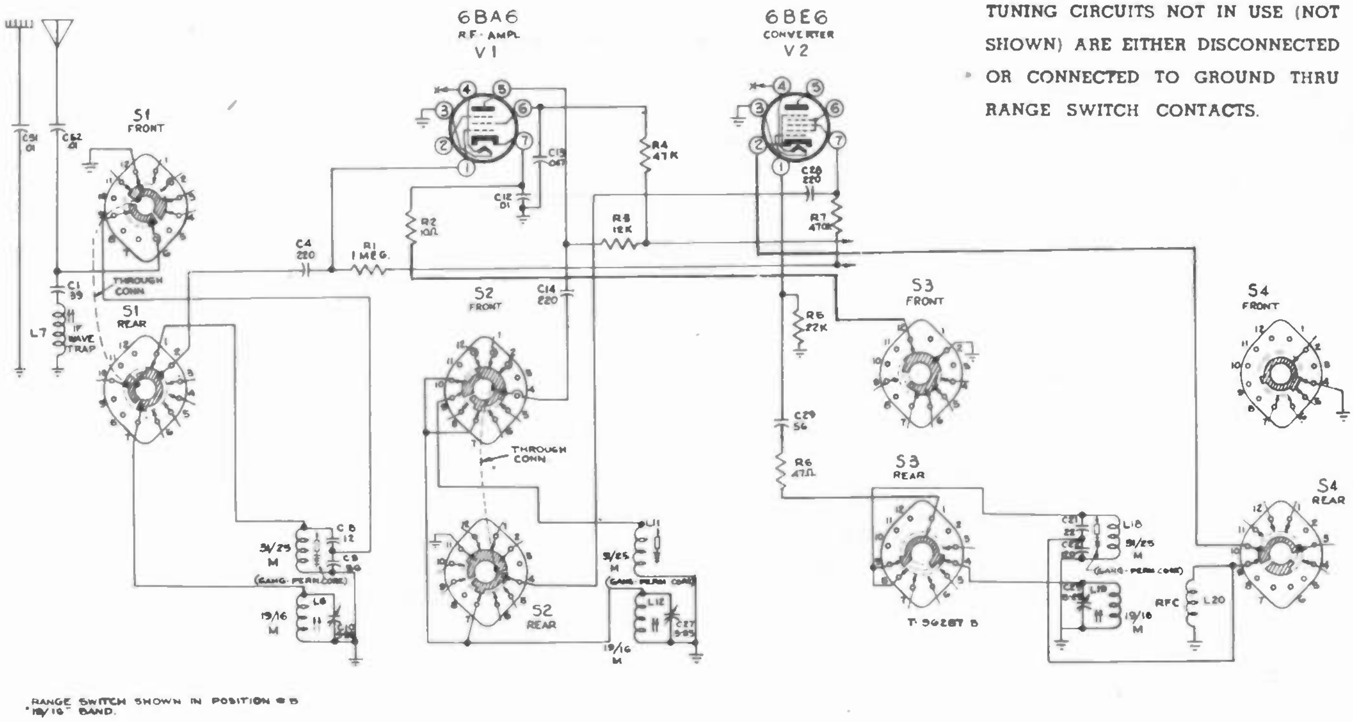


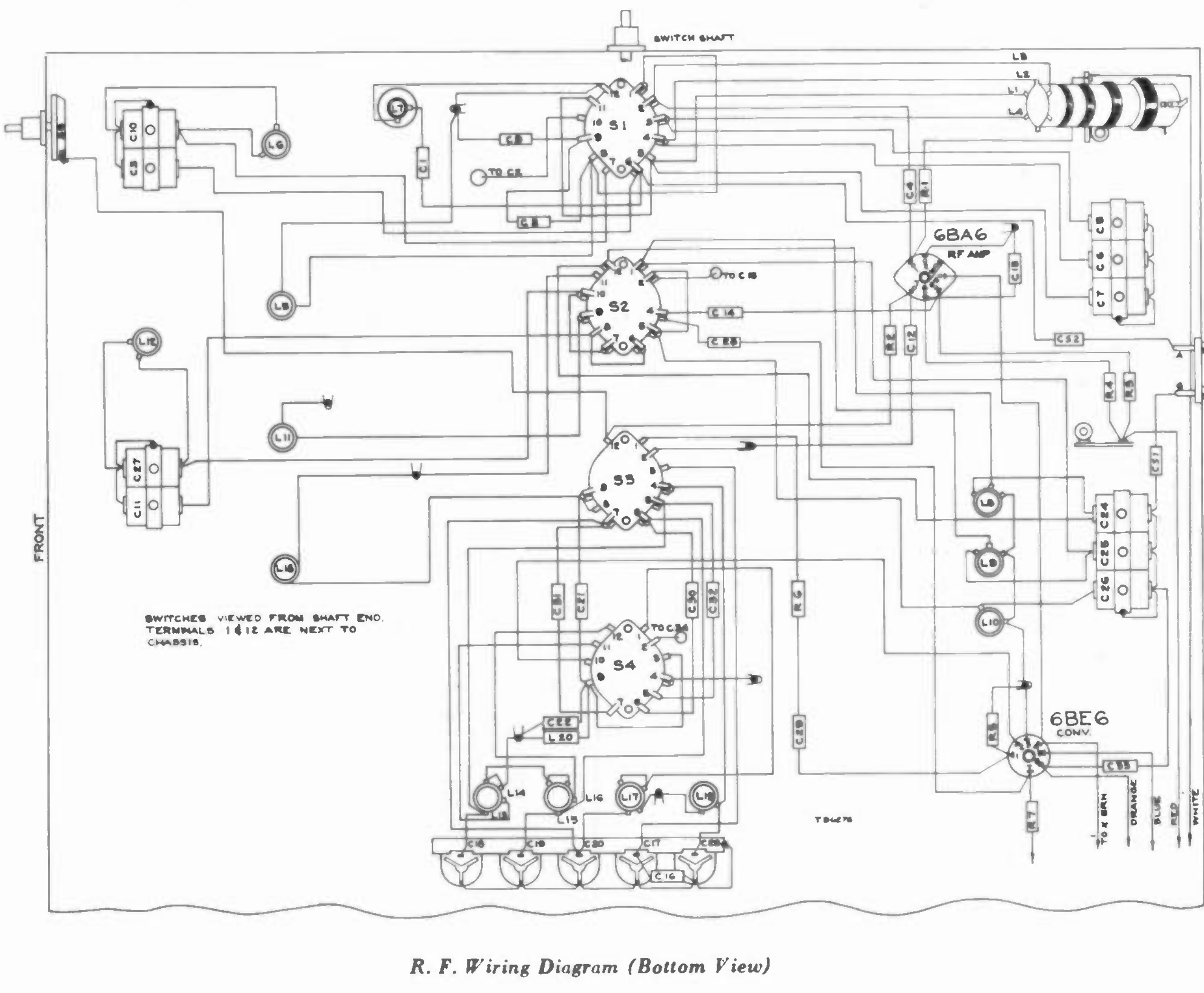




Simplified Schematic Diagrams

TUNING CIRCUITS NOT IN USE (NOT SHOWN) ARE EITHER DISCONNECTED OR CONNECTED TO GROUND THRU RANGE SWITCH CONTACTS.

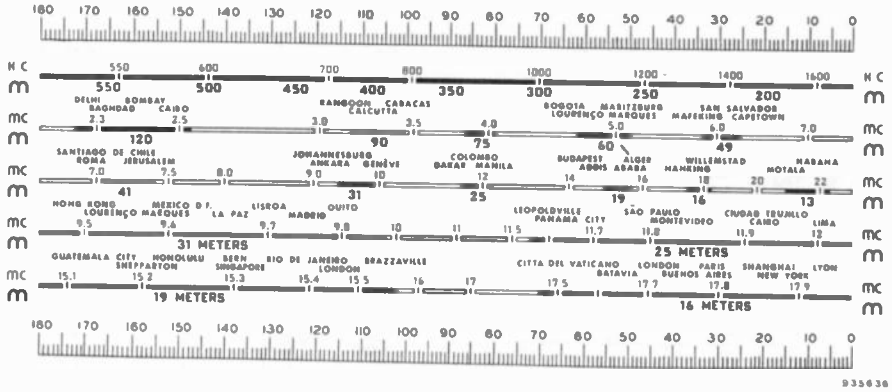




R. F. Wiring Diagram (Bottom View)

9Q53

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 143° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedures."

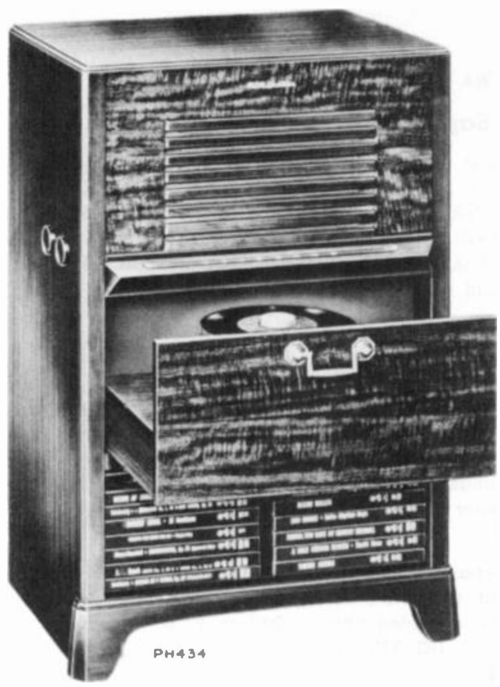


Reduced Reproduction of Receiver Dial and Corresponding 0-180° Calibration Scales

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS No. RC614
	RF PLATE SUB-ASSEMBLY
S-4700	Capacitor—Trimmer capacitor—two section—3-35 mmf. and 4-70 mmf. (C3, C10, C11, C27)
S-4451	Capacitor—Trimmer capacitor—two sections of 3-35 mmf. and one section of 4-70 mmf. (C24, C25, C26)
S-4701	Capacitor—Trimmer capacitor—three sections of 3-35 mmf. (C5, C6, C7)
S-4702	Capacitor—Trimmer capacitor—three sections of 8-50 mmf. and two sections of 5-25 mmf. (C17, C18, C19, C20, C23)
S-4703	Capacitor—Ceramic, 12 mmf. (C8)
S-4518	Capacitor—Ceramic, 22 mmf. (C21)
S-4704	Capacitor—Ceramic, 33 mmf. (C16)
S-4705	Capacitor—Ceramic, 39 mmf. (C1)
S-4899	Capacitor—Ceramic, 56 mmf. (C9)
S-4900	Capacitor—Ceramic, 56 mmf. (C29)
S-4521	Capacitor—Ceramic, 120 mmf. (C22)
S-4439	Capacitor—Mica, 220 mmf. (C4, C14, C28)
S-4440	Capacitor—Mica, 560 mmf. (C32)
S-4441	Capacitor—Mica, 3,300 mmf. (C30)
S-4442	Capacitor—Mica, 6,000 mmf. (C31)
S-4444	Capacitor—Tubular, .01 mf., 400 v. (C12)
S-4703	Capacitor—Tubular, .047 mf., 400 v. (C13, C33)
S-4524	Coil—Cathode choke coil (L20)
S-4525	Coil—Oscillator coil—"A" band, with adjustable core and stud (L13, L14)
S-4523	Coil—Oscillator coil—"B" band, with adjustable core and stud (L15, L16)
S-4527	Coil—Oscillator coil—"C" band, with adjustable core and stud (L17)
S-4528	Coil—Ant., osc. or r.f. coil—"31-25 meter" band (L5, L11, L18)
S-4529	Coil—Ant., osc. or r.f. coil—"19-16 meter" band, with adjustable core and stud (L6, L12, L19)
S-4707	Coil—R.F. coil—"A" band, with adjustable core and stud (L8)
S-4708	Coil—R.F. coil—"B" band, with adjustable core and stud (L9)
S-4709	Coil—R.F. coil—"C" band, with adjustable core and stud (L10)
S-4710	Coil—Wave trap coil, with adjustable core and stud (L7)
S-4711	Core—Adjustable core and stud for "31-25 Meter" band ant., or r.f. coils
S-4712	Core—Adjustable core and stud for "31-25 Meter" band osc. coil
S-4713	Condenser—Variable tuning condenser (C2, C15, C34)
S-4714	Drum—Tuning condenser drum, hub and cam assembly
S-4901	Grommet—Rubber grommet to mount tuning condenser
S-4715	Plate—Rocker arm plate and stud assembly—less adjustable cores
S-4716	Resistor—Fixed, composition, 10 ohms, ½ watt (R2)
S-4717	Resistor—Fixed, composition, 47 ohms, ½ watt (R6)
S-4718	Resistor—Fixed, composition, 12,000 ohms, 2 watt (R3)
S-4535	Resistor—Fixed, composition, 22,000 ohms, ½ watt (R5)
S-4719	Resistor—Fixed, composition, 47,000 ohms, 1 watt (R4)
S-4476	Resistor—Fixed, composition, 470,000 ohms, ½ watt (R7)
S-5010	Resistor—Fixed, composition, 1 megohm, ½ watt (R1)
S-4539	Screw—Rocker arm plate bearing screw
S-4720	Socket—Tube socket—for RF amp. tube V1
S-4721	Socket—Tube socket—for converter tube V2
S-4537	Spring—Rocker arm plate tension spring
S-4722	Switch—Range switch (S1, S2, S3, S4)
	MAIN CHASSIS ASSEMBLY
S-4902	Board—Ant.-Gnd. terminal board
S-4723	Bracket—Dial cord bracket and pulley assembly—L.H.—with one pulley
S-4724	Bracket—Dial cord bracket and pulley assembly—R.H.—with five pulleys
S-4725	Cable—Tuning eye cable and socket assembly—with 1 megohm resistor (R8)
S-4726	Capacitor—Mica, 12 mmf. (C37)
S-4727	Capacitor—Mica, 82 mmf. (C40)
S-4728	Capacitor—Mica, 150 mmf. (C38)
S-4729	Capacitor—Mica, 330 mmf. (C45)
S-4730	Capacitor—Tubular, .0033 mf., 600 v. (C39, C47)
S-4731	Capacitor—Tubular, .0047 mf., 600 v. (C44)
S-4542	Capacitor—Tubular, .0047 mf., 1,000 v. (C48, C49)
S-4444	Capacitor—Tubular, .01 mf., 400 v. (C36, C46)
S-4820	Capacitor—Ceramic, .01 mf. (C51)
S-4821	Capacitor—Tubular, .01 mf., 600 v. (C52)
S-4732	Capacitor—Tubular, .022 mf., 200 v. (C41)
S-4448	Capacitor—Tubular, .047 mf., 200 v. (C35)
S-4612	Capacitor—Electrolytic, 5 mfd., 50 v. (C43)
S-4733	Capacitor—Electrolytic—consisting of two sections of 40 mfd., 450 volts, one section of 10 mfd., 300 volts and one section of 20 mfd., 50 volts (C42A, C42B, C42C, C42D)
S-4546	Coil—"A" "B" "C" bands antenna coil (L1, L2, L3, L4)
S-4734	Collar—Band indicator retaining collar
S-4735	Control—Volume—Tone control and power switch (R16, R17, S5)
S-4736	Cord—Dial cord—approx. 77 in. required
S-4313	Cord—Band indicator cord—approx. 32 in. required
S-4548	Cord—Power cord
S-4737	Drum—Band indicator drum
S-4738	Drum—Band indicator driving drum
S-4739	Indicator—Band indicator
S-4740	Receptacle—Power outlet receptacle
S-5005	Resistor—Fixed, composition, 470 ohms, 2 watt (R26)
S-5006	Resistor—Fixed, composition, 1,200 ohms, ½ watt (R13)
S-5007	Resistor—Fixed, composition, 2,200 ohms, ½ watt (R9)
S-5008	Resistor—Fixed, composition, 2,700 ohms, 2 watt (R18, R19)
S-4554	Resistor—Fixed, composition, 10,000 ohms, ½ watt (R23)
S-4718	Resistor—Fixed, composition, 12,000 ohms, 2 watt (R25)
S-4621	Resistor—Fixed, composition, 15,000 ohms, ½ watt (R15)
S-4535	Resistor—Fixed, composition, 22,000 ohms, ½ watt (R11)
S-4558	Resistor—Fixed, composition, 100,000 ohms, ½ watt (R27)
S-5009	Resistor—Fixed, composition, 220,000 ohms, ½ watt (R21)
S-4559	Resistor—Fixed, composition, 270,000 ohms, ½ watt (R12)
S-4624	Resistor—Fixed, composition, 390,000 ohms, ½ watt (R20)
S-4561	Resistor—Fixed, composition, 470,000 ohms, ½ watt (R22)
S-4476	Resistor—Fixed, composition, 470,000 ohms, ½ watt (R24)
S-4477	Resistor—Fixed, composition, 820,000 ohms, ½ watt (R14)
S-4562	Resistor—Fixed, composition, 2.2 megohms, ½ watt (R10)
S-4741	Socket—Dial lamp socket and lead assembly
S-4480	Socket—Phono or speaker socket (J1, J2, J3)
S-4742	Socket—Tube socket—octal
S-4903	Spring—Dial cord or band indicator cord tension spring
S-4904	Switch—RADIO-PHONO switch (S7)
S-4743	Switch—LOCAL-REMOTE switch (S8)
S-4539	Transformer—First I.F. transformer (T2)
S-4571	Transformer—Second I.F. transformer (T3)
S-4744	Transformer—Output transformer (T4)
S-4745	Transformer—Power transformer 100-115, 115-135, 135-165, 180-220, 220-260 volts, 40-60 cycles (T1)
S-4746	Washer—"C" washer to retain flywheel and tuning shaft
S-4747	Wheel—Flywheel and tuning shaft
	SPEAKER ASSEMBLY
	Stamped 92579-3
S-4748	Cone—Cone and voice coil
S-4491	Plug—Pin plug for connecting cable
S-4749	Speaker—8 in. P.M. speaker complete with cone and connecting cable
	MISCELLANEOUS
S-4750	Baffle—Baffle board and grille cloth assembly—less emblem
S-4751	Bezel—Dial bezel
S-4752	Clip—Dial cover retaining clip
S-4753	Cover—Back cover for cabinet
S-4754	Cover—Plastic dial cover
S-4755	Dial—Glass dial scale
S-4499	Emblem—Trademark emblem (RCA)
S-4500	Emblem—Trademark emblem (RCA Victor)
S-4756	Foot—Rubber foot for cabinet (4 required)
S-4905	Grommet—Rubber grommet for speaker mounting (4 required)
S-4757	Indicator—Station selector indicator
S-4758	Knob—Local-Remote switch knob
S-4759	Knob—Tuning control knob
S-4760	Knob—Volume control knob
S-4761	Knob—Tone control knob
S-4762	Knob—Range switch knob
S-4897	Lamp—Dial lamp—type No. 44
S-4893	Lamp—Band indicator lamp—type No. 47
S-4763	Plate—Dial back plate
S-4598	Shield—Dial lamp shield
S-4511	Spacer—Metal spacer for speaker mounting (4 required)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



RCA VICTOR

Radio-Phonograph Combination

MODEL 9W51

Chassis No. RC-1079D

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 19 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc
Intermediate Frequency .... 455 kc

Tube Complement

(1)	RCA 12SA7	Converter
(2)	RCA 12SK7	I-F Amplifier
(3)	RCA 12SQ7	Det.—A.V.C.—A-F Amplifier
(4)	RCA 50L6GT	Output
(5)	RCA 35Z5GT	Rectifier

Power Supply Rating
115 volts a.c., 60 cycles .... 45 watts total

Power Output
Undistorted .... 1.1 watts
Maximum .... 1.75 watts

Dial Lamps (2) .... Mazda type 1490, 3.2 volts, .16 amp.

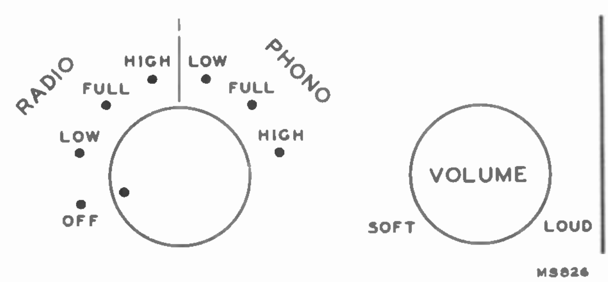
Loudspeaker (92586-2W)
Size and Type .... 8 in. PM
Voice Coil Impedance .... 3.2 ohms at 400 cycles

Cabinet Dimensions
Height.... 28" Width.... 18½" Depth.... 14¼"

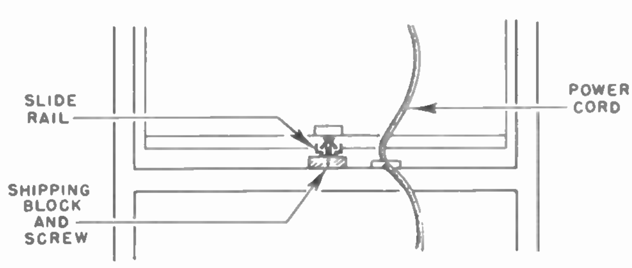
Weight .... 36 lbs.

Tuning Drive Ratio .... 9 to 1 (4½ turns of knob)

Record Changer
Turntable speed .... 45 r.p.m.
Records used .... RCA 7 in. fine groove
Record capacity .... up to 10 records
Pickup .... Crystal (medium output)



Controls



Rear View of Cabinet Showing Shipping Bolt

Shipping Block and Screw—Inside the back of the cabinet in the lower section, and holding the record player secure for shipping on its slide rail, is a wooden shipping block and screw with head painted red. Remove screw and block. The record player drawer will then slide out front.

Power Supply

Although this model employs an AC-DC receiver chassis, the instrument is not suitable for use on DC, as this would damage the motor in the record changer.

Record Changer—Top View

FOR RECORD CHANGER SERVICE INFORMATION —REFER TO RP 168 SERIES SERVICE DATA

Motorboard Packing—The floating motorboard on the record changer, is held secure by three screws with caps. With finger remove caps, then loosen the screws sufficiently to allow removal of packing strips from under sides of motorboard. Remove strips, see that screws are loose enough to allow motorboard to float freely, and replace caps in open screw heads.

9W51

Alignment Procedure

Critical Lead Dress

1. Dress all heater leads down to chassis and away from all audio grid and plate wiring.
2. Dress power cord to back apron and away from phono jack.
3. Dress capacitor C18 against back apron.
4. Connect shielded capacitor C13 direct and with a minimum of exposed leads.
5. Dress dial lamp leads on top of chassis around electrolytic capacitor and between 12SQ7 and 50L6GT tubes.
6. Dress output transformer leads down to chassis.
7. Dress excess loop leads away from tubes and clear of tuning condenser.

Test-Oscillator. — For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

An isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also AC operated.

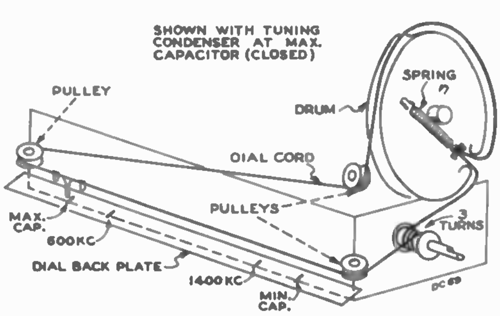
Dial Calibration

With the tuning condenser fully meshed, the dial pointer should be set to the first score mark at the left-hand end of the dial back plate. The four score marks represent: Max. cap., 600 kc, 1400 kc and min. cap.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12SK7 I-F grid through 0.1 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1 through 0.1 mfd.			*T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1630 kc	Min. cap.	C4 (osc.)
4		1400 kc	1400 kc	†C2 (ant.)
5		600 kc	600 kc	L3 (osc.) Rock gang
6	Repeat steps 3, 4 and 5.			

*Do not readjust T2 when test oscillator is connected to C1.

†When adjusting C2 (ant. trimmer) it is necessary to have the loop in the same position and spacing as it will have when assembled in the cabinet.



Dial Indicator and Drive Cord

Care of Sapphire

The record changer sapphire is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE SAPPHIRE POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening — clean by carefully brushing with a small soft brush.

Record Separators

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service, the position of the star wheel on the underside of the record changer may be accidentally shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended — turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post — DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

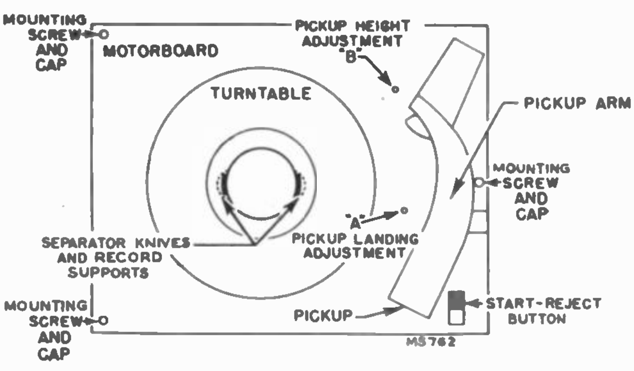
Landing Adjustment "A"

If the pickup lands inside the starting grooves — turn screw "A" slightly clockwise. If pickup lands outside the starting grooves — turn screw "A" slightly counterclockwise.

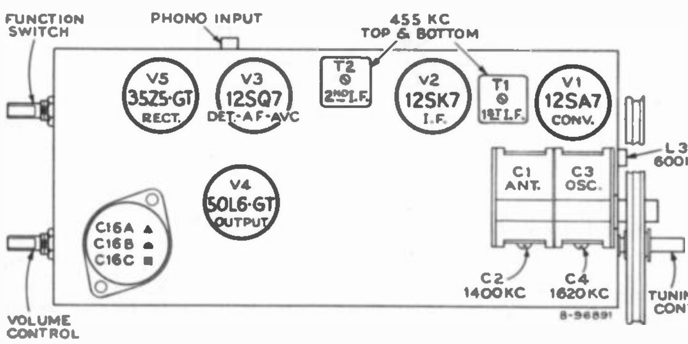
Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

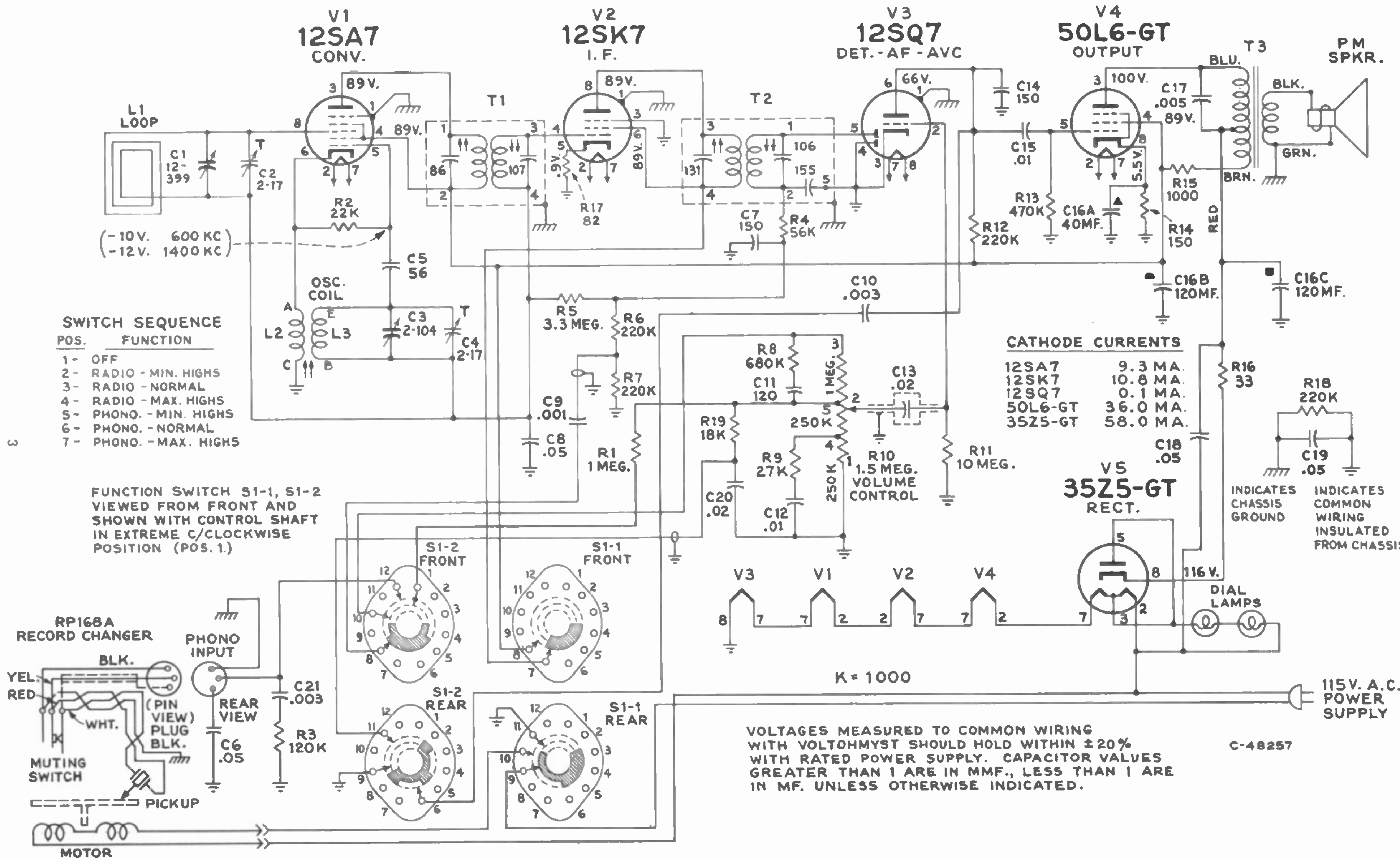
If pickup does not clear a stack of eight records — or if pickup arm touches records on record supports — turn screw "B" slightly.



Record Changer Adjustments



Tube and Trimmer Locations



Schematic Diagram

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1079 D
74655	Back—Chassis back and loop assembly (L1)
74653	Capacitor—Variable tuning capacitor (C1, C2, C3, C4)
71924	Capacitor—Ceramic, 56 mmf. (C5)
71614	Capacitor—Ceramic, 120 mmf. (C11)
73501	Capacitor—Ceramic, 150 mmf. (C14, C7)
74678	Capacitor—Electrolytic comprising 2 sections of 120 mfd, 150 volts and 1 section of 40 mfd, 25 volts (C16A, C16B, C16C)
73186	Capacitor—Tubular, paper, .001 mfd, 400 volts (C9)
73961	Capacitor—Tubular, paper, .003 mfd, 200 volts (C10)
72573	Capacitor—Tubular, paper, .003 mfd, 400 volts (C21)
72791	Capacitor—Tubular, paper, .005 mfd, 400 volts (C17)
71923	Capacitor—Tubular, paper, .01 mfd, 200 volts (C12)
72827	Capacitor—Tubular, paper, .01 mfd, 400 volts (C15)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C13, C20)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C8, C18, C6, C19)
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil (L2, L3)
36422	Connector—3 contact female connector for pickup cable (J1)
30368	Connector—2 contact female connector for motor cable (P3)
74827	Control—Volume control (R10)
†72953	Cord—Drive cord (approx. 43" overall)
73693	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting tuning capacitor (3 required)
74658	Indicator—Station selector indicator
71116	Lamp—Dial lamp—Mazda 1490
74651	Plate—Dial back plate complete with three (3) pulleys
18469	Plate—Bakelite mounting plate for electrolytic
72313	Resistor—Fuse type, 33 ohms (R16)
	Resistors—Fixed composition:
	82 ohms, ±10%, ½ watt (R17)
	150 ohms, ±10%, ½ watt (R14)
	1,000 ohms, ±10%, 1 watt (R15)
	18,000 ohms, ±10%, ½ watt (R19)
	22,000 ohms, ±10%, ½ watt (R2)
	27,000 ohms, ±10%, ½ watt (R9)
	56,000 ohms, ±10%, ½ watt (R4)
	120,000 ohms, ±10%, ½ watt (R3)
	220,000 ohms, ±10%, ½ watt (R6, R7, R12, R18)
	470,000 ohms, ±10%, ½ watt (R13)
	680,000 ohms, ±10%, ½ watt (R8)
	1 megohm, ±10%, ½ watt (R1)
	3.3 megohm, ±10%, ½ watt (R5)
	10 megohm, ±10%, ½ watt (R11)
74825	Shaft—Tuning knob shaft and pulley
31251	Socket—Tube socket, octal
74663	Socket—Dial lamp socket assembly complete with two (2) sockets (miniature bases) and leads
74038	Spring—Tension spring for drive cord
74826	Switch—Function switch (S1)
73036	Transformer—First I.F. transformer (T1)

Stock No.	DESCRIPTION
73037	Transformer—Second I.F. transformer (T2)
74677	Transformer—Output transformer (T3)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	92586-2W
	RL 105 C2
74758	Cone—Cone and voice coil assembly
74679	Speaker—8" P.M. speaker complete with cone and voice coil
	NOTE: If stamping on speaker does not agree with above speaker number, order replacement parts by referring to model number of instrument and full description of part required.
	MISCELLANEOUS
74832	Bottom—Bottom cover for record changer compartment (2 required)
74833	Bracket—Lamp bracket (2 required)
74830	Clamp—Dial clamp (2 required)
X1756	Cloth—Grille cloth
74192	Connector—3 contact male connector for pickup cable (P1)
74581	Cover—Plug-in cover for record changer mounting screws (3 required)
74831	Cushion—Rubber cushion for dial clamp
74682	Decal—Function switch decal for mahogany or walnut instruments
74833	Decal—Function switch decal for oak instruments
74273	Decal—Trade mark decal
74829	Dial—Dial scale
74674	Emblem—"RCA Victor" emblem
74828	Knob—Function switch knob—tan—for oak instruments
74681	Knob—Function switch knob—maroon—for mahogany or walnut instruments
74666	Knob—Volume control or tuning knob—maroon—for mahogany or walnut instruments
74247	Knob—Volume control or tuning knob—tan—for oak instruments
74208	Nut—Tee nut for mounting record changer
73770	Pull—Drawer pull
74582	Screw—No. 8-32 x 1¾" special head screw for mounting record changer (3 required)
74835	Slide—Slide mechanism assembly for record changer drawer
74422	Spring—Conical spring for mounting record changer (upper LH) (2 required)
74421	Spring—Conical spring for mounting record changer (upper RH) (1 required)
74423	Spring—Conical spring for mounting record changer (lower) (3 required)

†Stock No. 72953 is a reel containing 250 feet of cord.

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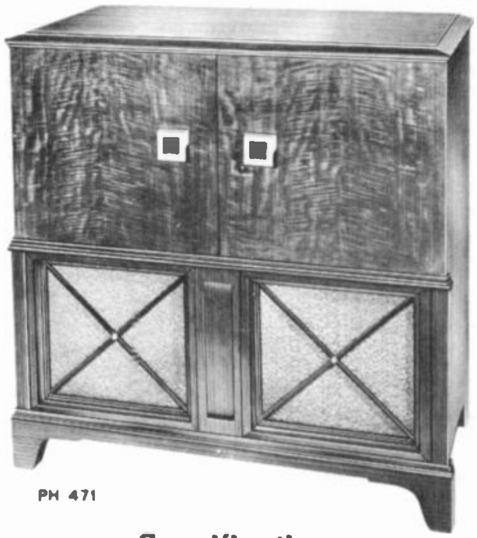
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RCA VICTOR

Radio-Phonograph Combination

MODEL 9W78

Chassis No. RC-1084A

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 22 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Ranges

Standard Broadcast (AM) .... 540-1,600 kc.
Frequency Modulation (FM) .... 88-108 mc.

Intermediate Frequency .... AM—455 kc., FM—10.7 mc.

Tube Complement

(1) 6J6 .... Mixer and Oscillator
(2) 6BA6 .... I. F. Amplifier
(3) 6AU6 .... Driver
(4) 6AL5 .... Ratio Detector
(5) 6AV6 .... AM Det.—AVC—A. F. Amp.
(6) 6V6GT .... Output
(7) 6X5GT .... Rectifier

Power Supply Rating .... 115 volts, 60 cycles, 70 watts

Loudspeaker

Type 92569-9 .... 12 in. P.M.
Voice coil impedance at 400 cycles .... 3.2 ohms

Tuning Drive Ratio .... 18:1 (9 turns of knob)

Pilot Lamps (3) .... Type No. 51, 6-8 volts, 0.2 amp.

Power Output

Maximum .... 5 watts
Undistorted .... 2 watts

Cabinet Dimensions

Height .... 32" Width ...... 30½" Depth ...... 17¼"

Antennas:

This receiver has built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Under average conditions the (FM) antenna will provide satisfactory reception. However, provision is made for the use of external antennas if desired—connect as indicated below:

FM Antenna: Connect the transmission line from an external FM dipole antenna to "FM" and "G" terminals. Remove the internal FM antenna wire from terminal "FM."

Record Player (2)

RP168 .... 45 RPM
RP178 .... 78 RPM

For information on 45 RPM changer refer to RCA Victor RP168 Series Service Data 3rd Ed.

For information on 78 RPM changer refer to RCA Victor RP178 Series Service Data.

Circuit Description

The chassis used in these receivers have a 6J6 tube (V1) (twin triode), one section of which is used as mixer and the other section as oscillator. The FM antenna coil and the FM oscillator coil are placed in such position as to provide coupling between them. A section of the AM oscillator coil is connected in series with the mixer grid input when the range switch is in AM position.

Dual I-F transformers are used, each transformer containing both AM and FM windings. The I-F amplifier is V2 (6BA6).

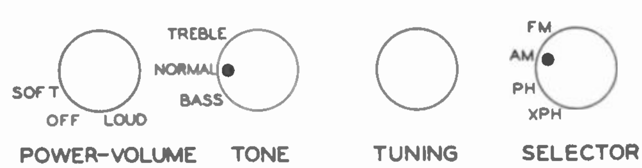
The range switch has four functions:

(1) Selection of AM, FM ranges or Phono.
(2) Selection of AVC supply voltages to be applied to the controlled tubes. Simple AVC is applied to the grids of V1 and V2 on AM. Delayed AVC is used on FM and is applied only to the grid of V2.
(3) Controls application of B+ voltage to the plate circuits of V1 (disconnected for PHONO operation).
(4) Controls audio input to volume control.

The driver V3 (6AU6) and ratio detector V4 (6AL5) circuits are similar to those used in other RCA Victor AM-FM receivers.

The audio voltage controlled by the volume control is amplified by V5 (6AV6) and V6 (6V6GT).

The rectifier V7 is type 6X5GT.



9W78

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I. F. alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of the oscilloscope to term. C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc with ±250 kc sweep) to pin No. 1 of V2 (6BA6) in series with .01 mf., low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3; connect the sweep generator to the antenna terminal board—high side to "FM" term. in series with 300 ohms and low side to "G" terminal. Oscilloscope connections as previously connected.

To check the ratio detector response; remove the 1200 ohm resistor previously used, connect the high side of the oscilloscope direct to term. No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V3 (6AU6) in series with .01 mf. Note: It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

Critical Lead Dress

1. Short leads on C7.
2. Dress R27 away from switch and Pin 5 of V1.
3. Ground lead on Pin 2 of V2 & V3 should be down against chassis. Its length is critical.
4. A.V.C. lead from R26 to switch should be dressed against chassis and on front apron side of output transformer.
5. C43 should have short leads and color code end of capacitor should go to coil. Capacitor is to be cemented down with polystyrene cement the same time L2 is.
6. High side loop lead should be dressed away from tubes.
7. Lead from Pin 2 and V1 to terminal A of first dual I.F. transformer should be dressed against chassis.
8. Wire C40 directly between gang condenser and Pin 1 of V1.
9. Keep all the F.M. leads as short as possible.
10. Dress lead from Pin 5 of V2 to terminal A of T3 down against chassis.
11. Dress resistor R15 near chassis base.
12. Dress all A.C. leads away from volume control.
13. Run lead from F.M. Terminal on the antenna terminal board to L2 tap around the can of T2 and away from V2.
14. The taps on L1 & L2 are critical.
15. The lead from R32 to terminal 10 of S1 should be dressed away from the output transformer, T5.
16. Dress C25 and C26 against chassis with the shortest lead length possible..
17. Coupling between pins 5 & 6 of VI, and the components attached, should be kept to a minimum.
18. Coupling between L1 & L2 should be adjusted to give the proper oscillator injection voltage to the mixer grid.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	C3 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	"A" terminal of terminal board at rear of chassis in series with 220 mmf.	1400 kc.	1400 kc.	C13 osc. C4 ant.
4		600 kc.	600 kc.	L4 osc. (Rock gang.)
5	Repeat Steps 3 and 4.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

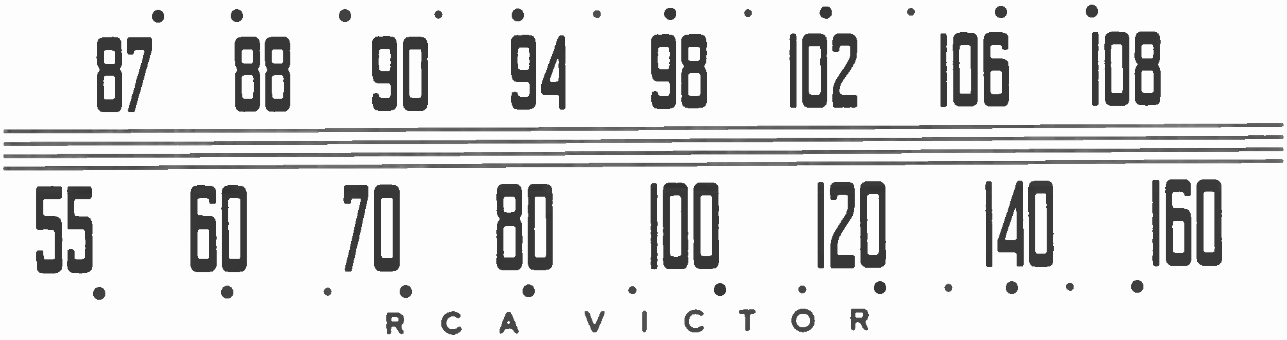
RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C33 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed).			
2	Pin 1 of 6AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed)	T4 top core for max. d-c voltage across C33. T4 bottom core for min. audio output.*
3	FM ant. term in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	10.7 mc. Adjust to provide 2 to 3 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5		106 mc.	106 mc.	L2 osc.** C2 ant. Set C2 at max. capacity while adjusting L2.
6		90 mc.	90 mc.	L1 ant.** (Rock gang.)
7	Repeat Steps 5 and 6 until further adjustment does not improve calibration.			

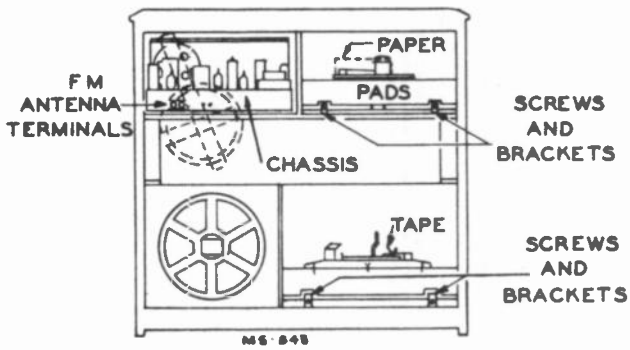
* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

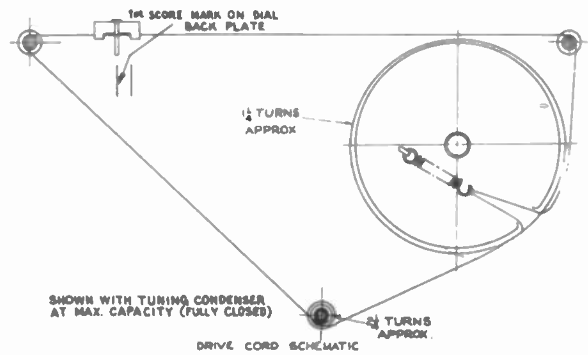
** L1 and L2 are adjustable by increasing or decreasing the spacing between turns.



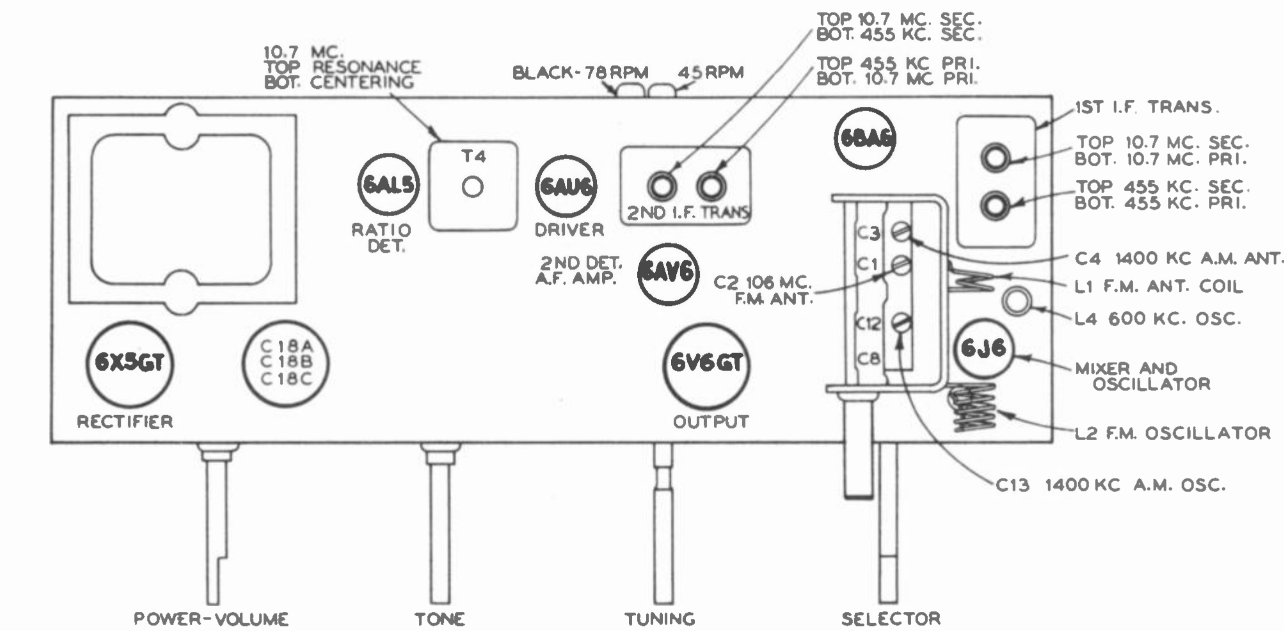
Dial Scale Actual Size



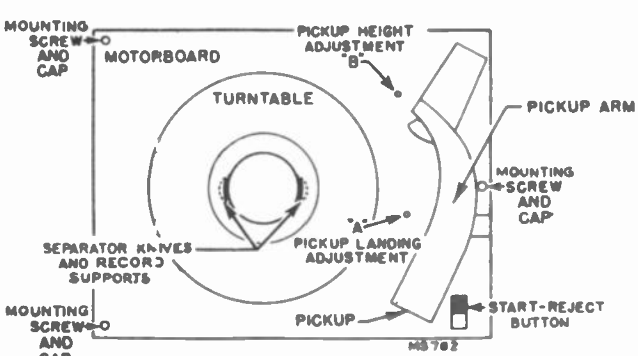
Back View of Cabinet Showing Shipping Material



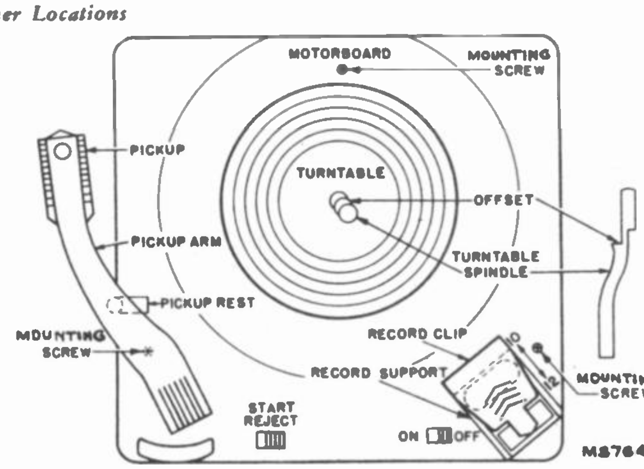
Dial Indicator and Drive Mechanism



Tube and Trimmer Locations

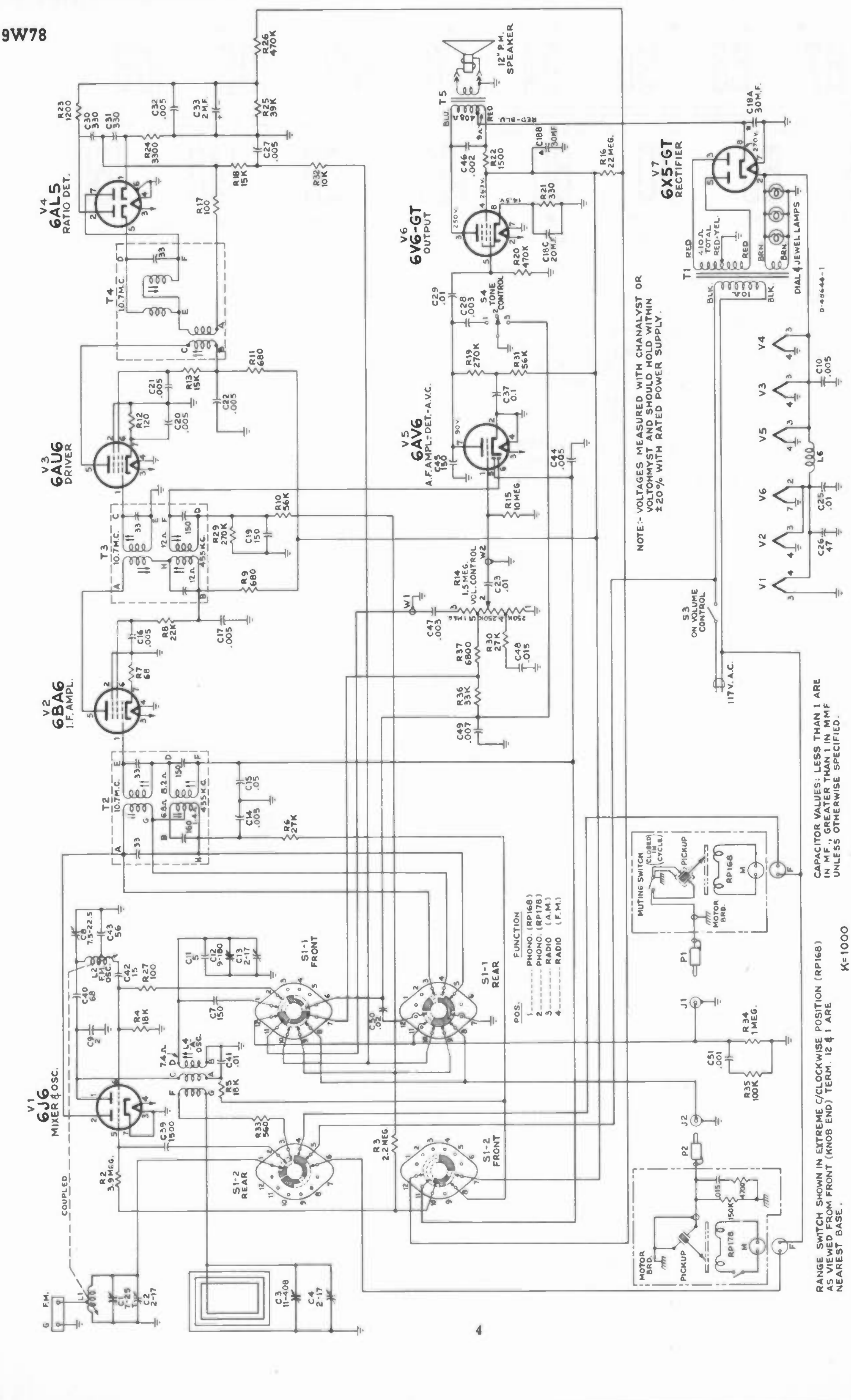


Top View—RP-168A-1 Record Changer

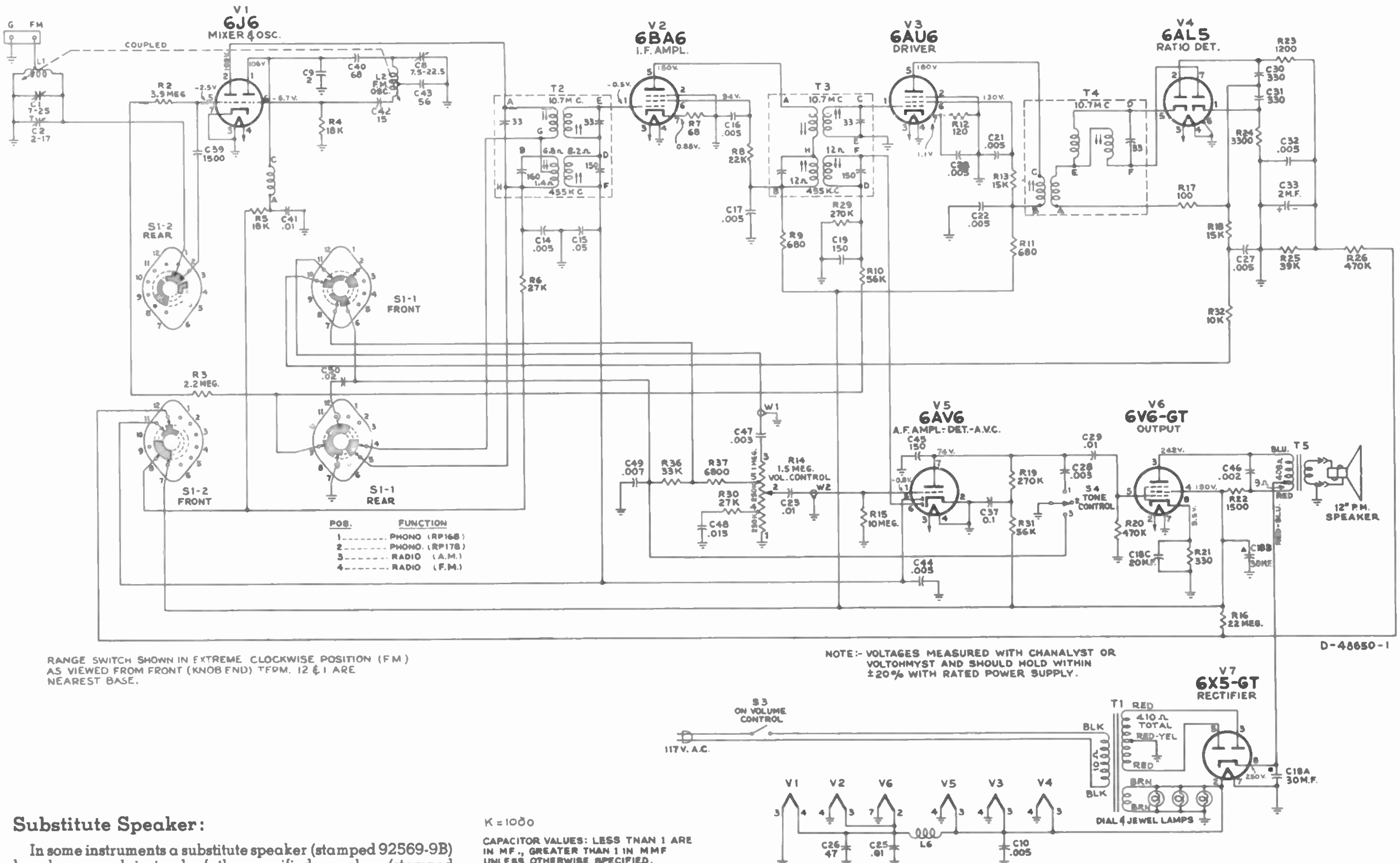


Top View—RP-178 Record Changer

9W78



Complete Schematic Diagram

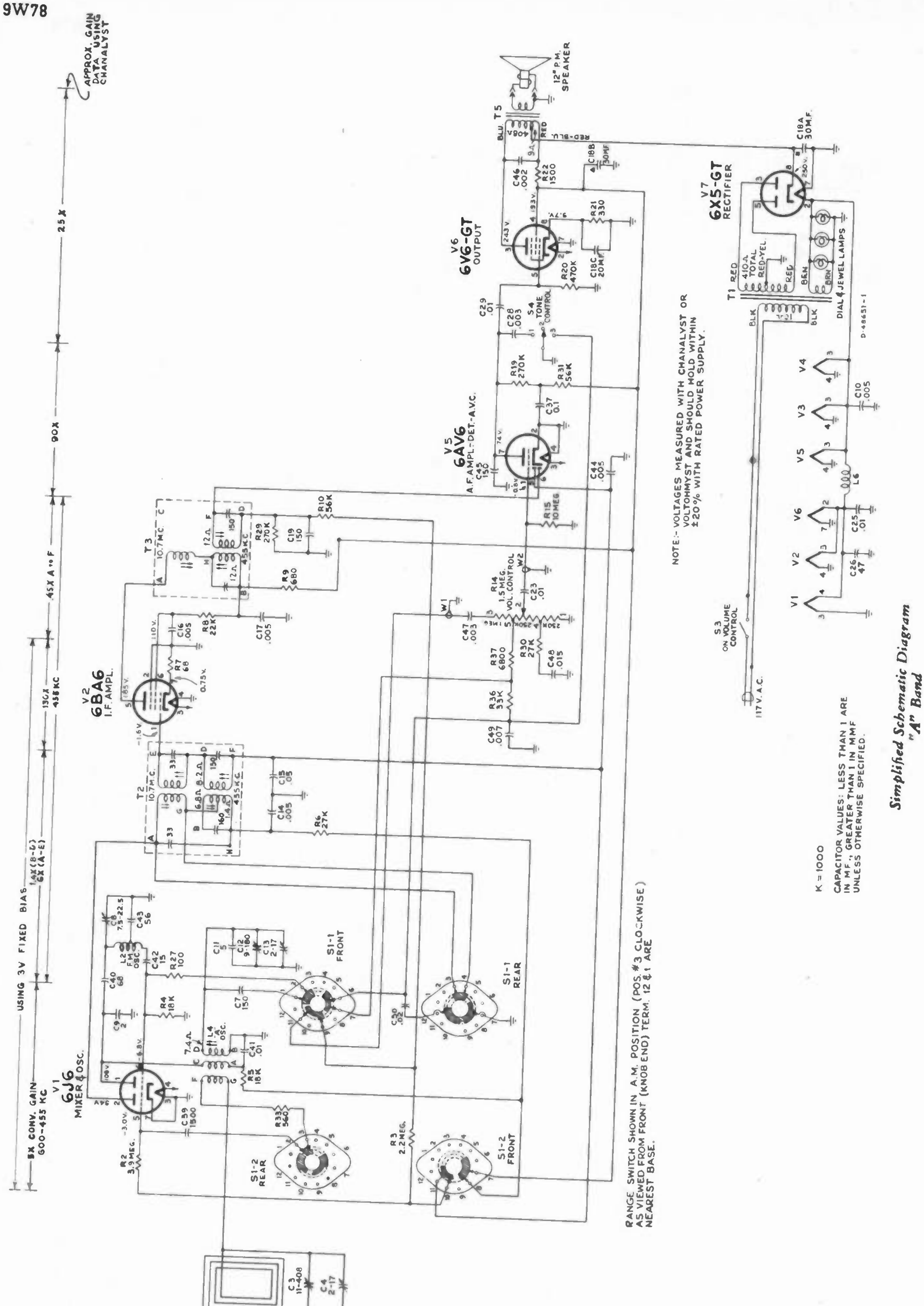


Simplified Schematic Diagram "FM" Band

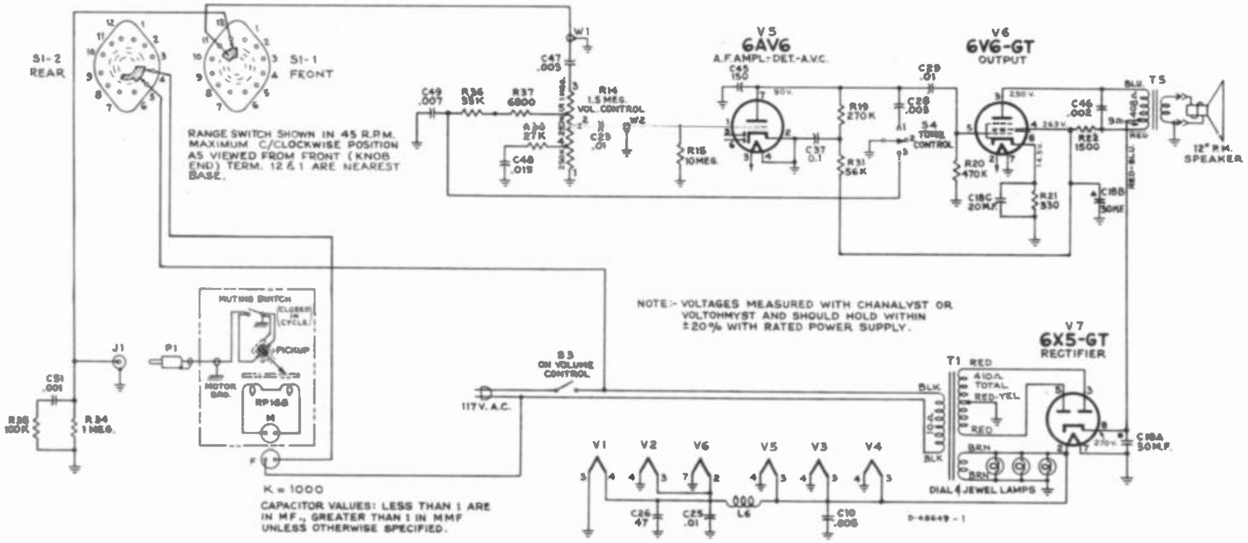
Substitute Speaker:

In some instruments a substitute speaker (stamped 92569-9B) has been used instead of the specified speaker (stamped 92569-9W RMA274 RL111-14). The cone and voice coil assembly for the substitute speaker is available as Stock No. 75875.

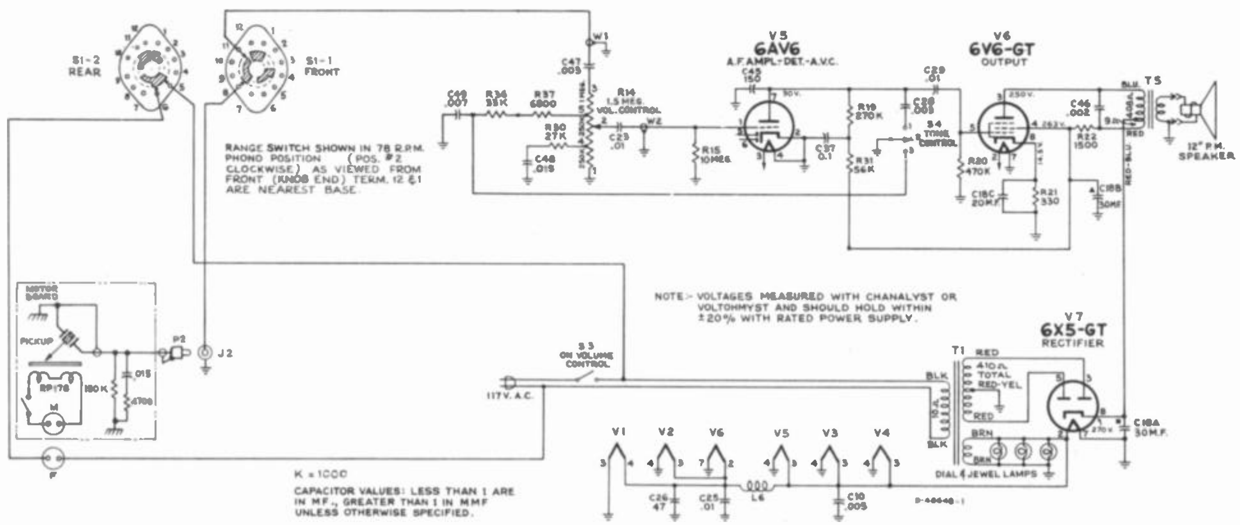
9W78



Simplified Schematic Diagram "A" Band



Simplified Schematic Diagram
45 RPM Phono



Simplified Schematic Diagram
78 RPM Phono

Voltage Chart

Tube	Type		Pin No.	"A"	"FM"	Phono
1	6J6	Plate Plate Grid Grid	1 2 6 5	108 94 -8.8 -3.0	106 109 -6.7 -2.5	— — — —
2	6BA6	Plate Screen Cathode Grid	5 6 7 1	185 110 0.75 -1.6	180 94 0.88 -0.5	— — — —
3	6AU6	Plate Screen Cathode	5 6 7	184 132 1.1	180 130 1.1	— — —
4	6AL5	—	—	—	—	—
5	6AV6	Plate Grid	7 1	74 -0.8	74 -0.8	90 —
6	6V6GT	Plate Screen Cathode	3 4 8	243 193 9.7	242 190 9.5	250 263 14.5
7	6X5GT	Cathode	8	250	250	270

Cathode Currents (MA)

Tube	Type		Pin No.	"A"	"FM"	Phono
1	6J6		7	8.6	8	—
2	6BA6		7	12	13	—
3	6AU6		7	13.5	13.5	—
4	6AL5		1 & 2	—	—	—
5	6AV6		2	0.3	0.3	0.55
6	6V6GT		8	28.2	27.6	44.5
7	6X5GT		8	63	62.2	45

Voltages and currents measured with tuning condenser closed and no signal input should hold within ±20% with rated line voltage.

Note: Plate voltage removed from 6J6 mixer and oscillator tube during "Phono" operation.

Replacement Parts

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES RC1084A
73893	Board—"F. M." terminal board
73889	Capacitor—Variable tuning capacitor (C1, C2, C3, C4, C8, C12, C13)
73866	Capacitor—Ceramic, 2 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C11)
39044	Capacitor—Ceramic, 15 mmf. (C42)
73372	Capacitor—Electrolytic comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 25 volts (C18A, C18B, C18C)
39042	Capacitor—Ceramic, 47 mmf. (C26)
73867	Capacitor—Ceramic, 56 mmf. (C43)
33379	Capacitor—Ceramic, 68 mmf. (C40)
48125	Capacitor—Ceramic, 150 mmf. (C7, C19, C45)
39640	Capacitor—Mica, 330 mmf. (C30, C31)
73748	Capacitor—Ceramic, 1500 mmf. (C39)
73473	Capacitor—Ceramic, 5,000 mmf. (C44, C10)
73747	Capacitor—Electrolytic, 2mfd., 50 volts (C33)
73186	Capacitor—Tubular, paper, .001 mfd., 400 volts (C51)
71927	Capacitor—Tubular, paper, .002 mfd., 400 volts (C46)
72573	Capacitor—Tubular, paper, .003 mfd., 400 volts (C28, C47)
71926	Capacitor—Tubular, paper, .005 mfd., 200 volts (C20, C27, C32)
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts (C14, C16, C17, C21, C22)
70608	Capacitor—Tubular, paper, .007 mfd., 400 volts (C49)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C23, C25)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C29, C41)
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts (C48)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C50)
72596	Capacitor—Tubular, paper, .05 mfd., 200 volts (C15)
70617	Capacitor—Tubular, paper, 0.1 mfd., 400 volts (C37)
73744	Coil—Oscillator coil—A. M. (L4)
71942	Coil—Filament choke coil (L6)
73918	Coil—Antenna coil—F. M. (L1)
73916	Coil—Oscillator coil—F. M. (L2)
30868	Connector—2 contact female connector for motor cable
70342	Control—Volume control and power switch (R14, S3)
72953	Cord—Drive cord (approx. 48" overall)
74839	Fastener—Push fastener to mount R. F. shelf (4 required)
16058	Grommet—Rubber grommet to mount R. F. shelf (4 required)
73895	Indicator—Station selector indicator
11765	Lamp—Dial lamp—Mazda 51
74297	Plate—Dial back plate complete with 2 pulleys less dial
33514	Receptacle—Phono input socket—dual
52436	Resistor—Wire wound, 1500 ohms, 4 watts (R22)
	Resistor—Fixed, composition:—
	68 ohms, ±10%, ½ watt (R7)
	100 ohms, ±10%, ½ watt (R17, R27)
	120 ohms, ±10%, ½ watt (R12)
	330 ohms, ±10%, 1 watt (R21)
	560 ohms, ±10%, ½ watt (R33)
	680 ohms, ±20%, ½ watt (R9, R11)
	1200 ohms, ±5%, ½ watt (R23)
	3300 ohms, ±5%, ½ watt (R24)
	6800 ohms, ±10%, ½ watt (R37)
	10,000 ohms, ±10%, ½ watt (R32)
	15,000 ohms, ±10%, ½ watt (R13, R18)
	18,000 ohms, ±10%, ½ watt (R4)
	18,000 ohms, ±10%, 1 watt (R5)
	22,000 ohms, ±10%, ½ watt (R8)
	27,000 ohms, ±10%, ½ watt (R6, R30)
	33,000 ohms, ±10%, ½ watt (R36)
	39,000 ohms, ±10%, ½ watt (R25)
	56,000 ohms, ±10%, ½ watt (R31)
	56,000 ohms, ±10%, 1 watt (R10)
	100,000 ohms, ±10%, ½ watt (R35)
	270,000 ohms, ±10%, ½ watt (R19, R29)
	470,000 ohms, ±10%, ½ watt (R20, R26)
	1 megohm, ±10%, ½ watt (R34)
	2.2 megohms, ±20%, ½ watt (R3)
	3.9 megohms, ±10%, ½ watt (R2)
	10 megohms, ±20%, ½ watt (R15)
	22 megohms, ±20%, ½ watt (R16)
73894	Shaft—Tuning shaft
72516	Socket—Tube socket, 7 contact, miniature, for V4 and V5
73606	Socket—Tube socket, 7 contact, miniature, for V1, V2, and V3
31251	Socket—Tube socket, octal, wafer, for V6 and V7
31364	Socket—Lamp socket
74038	Spring—Drive cord tension spring
74202	Support—Polystyrene coil support complete with bracket
73891	Switch—Tone control switch (S4)
74913	Switch—Selector switch (S1)
73415	Transformer—Output transformer (T5)
73743	Transformer—Ratio detector transformer (T4)
70127	Transformer—Power transformer 117v/60c (T1)
73745	Transformer—First I. F. transformer—dual (T2)
74019	Transformer—Second I. F. transformer—dual (T3)
33726	Washer—"C" washer for tuning shaft
73333	Washer—Insulating washer (extruded) for mounting output transformer (2 required)
73332	Washer—Insulating washer (flat) for mounting output transformer (2 required)
	SPEAKER ASSEMBLY 92569-9 RMA 274 RL 111—14
13867	Cap—Dust cap
74901	Cone and voice coil assembly
74974	Speaker—12" P. M. speaker (3.16 oz.) complete with cone and voice coil (3.2 ohms)
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
72555	Antenna—F. M. antenna
74205	Bezel—Dial scale bezel less dial
74579	Bumper—Rubber bumper (black) for RP168 changer drawer (2 required) for mahogany or walnut instruments
74580	Bumper—Rubber bumper (white) for RP168 changer drawer (2 required) for oak instruments
71599	Bracket—Pilot lamp bracket
72437	Cable—Shielded pickup cable for RP168 changer
74296	Cable—Shielded pickup cable for RP 178 changer
13103	Cap—Pilot lamp cap
72120	Capacitor—Tubular, paper, .015 mfd., 200 volts for RP 178 changer
71892	Catch—Bullet catch and strike for doors
74298	Clamp—Dial clamp
X3046	Cloth—Grille cloth for mahogany or walnut instruments
X3047	Cloth—Grille cloth for oak instruments
30868	Connector—2 contact female connector for motor cable (RP 178 changer)
30870	Connector—2 contact male connector for motor cable (RP 178 changer)
74581	Cover—Mountng screw cover for RP168 changer (3 required)
74273	Decal—Trade mark decal (Victrola)
71768	Decal—Trade mark decal (RCA Victor)
74915	Decal—Control function decal for mahogany or walnut instruments
74916	Decal—Control function decal for oak instruments
74203	Dial—Glass dial scale
74836	Grommet—Power and strain relief
72856	Grommet—Rubber grommet for mounting RP 178 changer (3 required)
74308	Hinge—Cabinet door hinge (1 set)
74931	Knob—Volume control or tuning control—knob—maroon—for walnut or mahogany instruments
74934	Knob—Tune control switch or selector switch—knob—maroon—for walnut or mahogany instruments
72824	Knob—Control knob—brown—for oak instruments
73896	Loop—Antenna loop complete
74730	Nail—Decorative nail for grille
74208	Nut—Tee nut for mounting RP 168 changer (3 required)
73109	Nut—Tee nut for mounting RP 178 changer (3 required)
74914	Pull—Door pull
	Resistor—Fixed, composition:—
	4700 ohms, ±10%, ½ watt for RP 178 changer
	150,000 ohms, ±10%, ½ watt for RP 178 changer
74582	Screw—#8-32 x 1¾" special screw for mounting RP 168 changer (3 required)
73110	Screw—¼-20 x 1¾" fillister head screw for mounting RP 178 changer (3 required)
74835	Slide—Slide mechanism for RP 168 changer
74736	Slide—Slide mechanism for RP 178 changer
74421	Spring—Conical spring for mounting RP 168 changer (upper—R. H.)
74422	Spring—Conical spring for mounting RP 168 changer (upper—L. H.) (2 required)
30900	Spring—Retaining spring for knobs
74423	Spring—Conical spring for mounting RP 168 changer (lower) (3 required)
72936	Stop—Door stop

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AM-FM Radio-Phonograph Combination

MODELS
9W101, 9W103, 9W105

Chassis No. **RC-618B** **RC-618C**

SERVICE DATA

— 1949 No. 4 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Introduction

All three of these instruments have the new Model RP-168—1 record changer designed for use with the new Victor seven-inch long playing records. Model 9W105 also has a Model RP-178 record changer for use with the conventional ten- and twelve-inch records.

An auxiliary phono input jack on the back of the chassis of Models 9W101 and 9W103 (input controlled by the selector switch) is provided to permit the use of an auxiliary record player if desired.

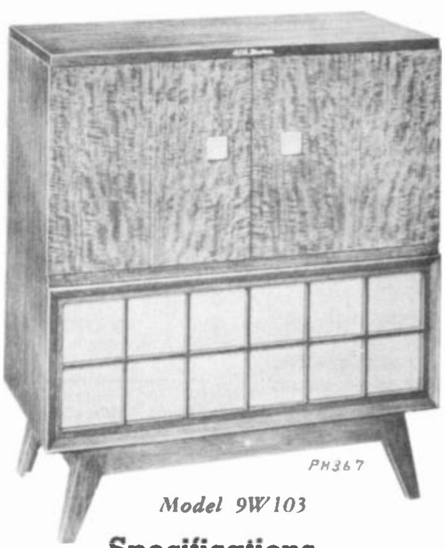
Antennas

These receivers have built-in antennas for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of an external antenna for FM reception if desired. To use external FM antenna—remove the built-in FM antenna lead from the "FM" terminals of the antenna terminal board Connect the transmission line of an external FM dipole antenna to these two "FM" terminals.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA AND RP-178 SERIES SERVICE DATA.

Model 9W101



Model 9W103

Model 9W105

Specifications

Tuning Range

Standard Broadcast (AM) ....540-1600 kc.
Frequency Modulation (FM) ....88-108 mc.
Intermediate Frequencies ....AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6J6 ....Mixer and Oscillator
(2) RCA 6BA6 ....I-F Amplifier
(3) RCA 6AU6 ....Driver
(4) RCA 6AL5 ....Ratio Detector
(5) RCA 6AV6 ....A-F Amplifier
(6) RCA 6V6GT ....Output
(7) RCA 6AV6 ....AM Det.—AVC—Ph. Inv.
(8) RCA 6V6GT ....Output
(9) RCA 6X5GT ....Rectifier
(10) RCA 6BF6 ....Phono Pre-amplifier

Dial Lamps (2) ....Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp ....Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio ....18:1 (9 turns of knob)

Power Supply Rating ....115 volts, 60 cycles, 90 watts

Loudspeaker (92569-5W)

Size and type ....12 in. PM
Voice coil impedance ....3.2 ohms at 400 cycles

Power Output

Undistorted 6 watts ....Maximum 7 watts

Record Changer (RP-168)
Used in all three models

Turntable speed ....45 r.p.m.
Record capacity ....Up to 10 RCA 7 in. fine groove
Pickup ....Crystal (medium output)

Record Changer (RP-178)
Used in Model 9W105 only

Turntable speed ....78 r.p.m.
Record capacity ....Twelve 10 in or ten 12 in.
Pickup ....Crystal (standard output)

Cabinet Dimensions	Height	Width	Depth
Model 9W101	34 in.	31⅞ in.	15$^{15}/_{16}$ in.
Model 9W103	34 in.	30¼ in.	15¾ in.
Model 9W105	35 in.	34⅝ in.	16⅜ in.

Circuit Description

These instruments have a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

(1) Selection of tuning range.
(2) Selection and distribution of a.v.c. voltages.
(3) Application of B+ voltage to tubes V1, V2 and V3.
(4) Selection of audio input applied to the volume control.
(5) Application of a.c. power to the record changer motors.

A one-tube pre-amplifier (6BF6 tube No. V10) is used with the input from the RP-168 record changer.

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I-F alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T3 with a 1200 ohm resistor. Connect the high side of an oscilloscope to terminal C of T3 in series with a diode probe. Apply the output of the sweep generator (10.7 mc. with ±250 kc. sweep) to pin No. 1 of V2 (6BA6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T2.

To check the combined response of T1 and T2; connect the sweep generator to the FM antenna terminals (remove FM antenna lead) in series with 300 ohms. Note: One FM terminal is grounded—it may be necessary to reverse the sweep generator connections. Oscilloscope connections remain as connected.

To check the ratio detector response; connect the high side of the oscilloscope direct to terminal No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V3 (6AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). Note: It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

Response curves illustrated on page 5.

CRITICAL LEAD DRESS

1. Keep leads of C7 short.
2. Dress R27 away from range switch and pin No. 5 of V1.
3. The round lead of pin No. 2 of V2 and V3 should be down against chassis. Its length is critical.
4. The AVC lead from R26 to range switch should be dressed against chassis and away from 6AU6 driver tube socket.
5. C43 should have short leads and the color code of the capacitor should go to the coil L4. The capacitor should be cemented down with polystyrene cement at the same time L2 is cemented.
6. The lead from the high side of the loop should be dressed away from tubes.
7. Lead from pin No. 2 of V1 to terminal "A" of 1st I. F. transformer should be dressed against the chassis.
8. Connect C40 directly between the gang condenser and pin No. 1 of V1.
9. Make all FM leads as short as possible.
10. Dress lead from pin No. 5 of V2 to terminal "A" of 2nd I. F. transformer down against chassis.
11. Dress resistor R15 near chassis base.
12. Dress all A. C. leads away from volume control.
13. The lead from "FM" terminal of antenna terminal board to L1 tap should be dressed away from V2.
14. The taps on L1 and L2 are critical. L1 tap should be ¾ turn from the ground end. L2 tap should be 2½ turns from the gang condenser C8.
15. Dress C25 and C26 against the chassis with the shortest lead length possible.
16. The position of L1 and L2 is critical. L1 should be midway between V1 and the 1st I. F. transformer. The end of L2 should be approximately 3/16" from V1.
17. Capacitor C41 should be secured to the chassis apron with melted wax or cement.
18. FM oscillator coil L2 must be cemented to its support. Amphenol No. 912 cement is recommended for this purpose.

Dial Indicator

With the tuning condenser fully meshed (closed) the indicator should be set to the reference mark on the dial back plate.

Refer to the dial scale reproductions on page 8.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	C3 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2	C3 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	Short wire placed near loop for radiated signal	1400 kc.	1400 kc.	C13 osc. C4 ant.
4	Short wire placed near loop for radiated signal	600 kc.	600 kc.	L4 osc. (Rock gang.)
5	Short wire placed near loop for radiated signal	Repeat Steps 3 and 4.		

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

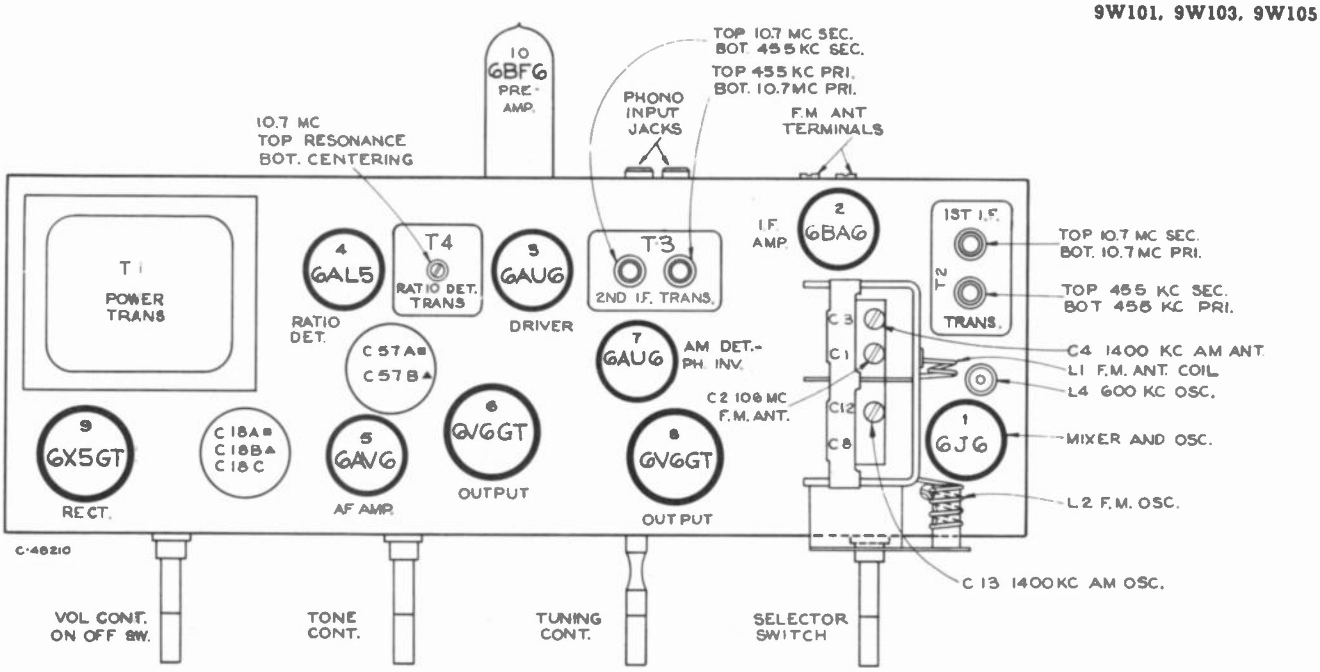
RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C33 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed).			
2	Pin 1 of 6AU6 in series with .01 mfd.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed).	T4 top core for max. d-c voltage across C33. T4 bottom core for min. audio output. *
3	FM ant. term. in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	10.7 mc. Adjust to provide 2 to 3 volts indication on VoltOhmyst during alignment.	Max. capacity (fully meshed).	FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4	FM ant. term. in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	10.7 mc. Adjust to provide 2 to 3 volts indication on VoltOhmyst during alignment.	Max. capacity (fully meshed).	FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5	FM ant. term. in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	106 mc.	106 mc.	L2 osc. ** C2 ant. Set C2 at max. capacity while adjusting L2.
6	FM ant. term. in series with a 300 ohm resistor. (Remove ant. lead from "FM" term.)	90 mc.	90 mc.	L1 ant. ** (Rock gang.)
7	Repeat Steps 5 and 6 until further adjustment does not improve calibration.			

* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1 and L2 are adjustable by increasing or decreasing the spacing between turns.



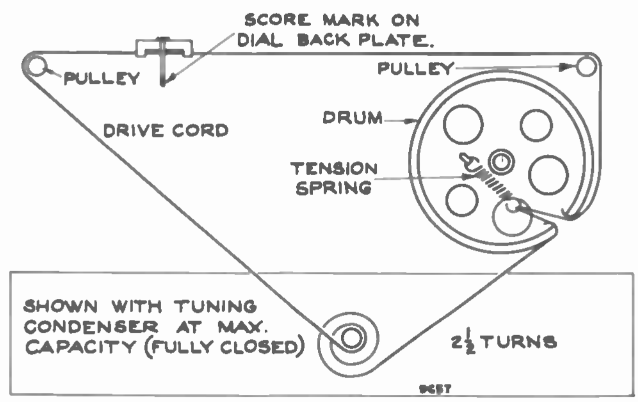
Tube and Trimmer Locations

Note: FM mixer and oscillator coils are adjustable by increasing or decreasing the spacing between turns. The position of the coils and location of the taps are critical (refer to "Critical Lead Dress").

Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

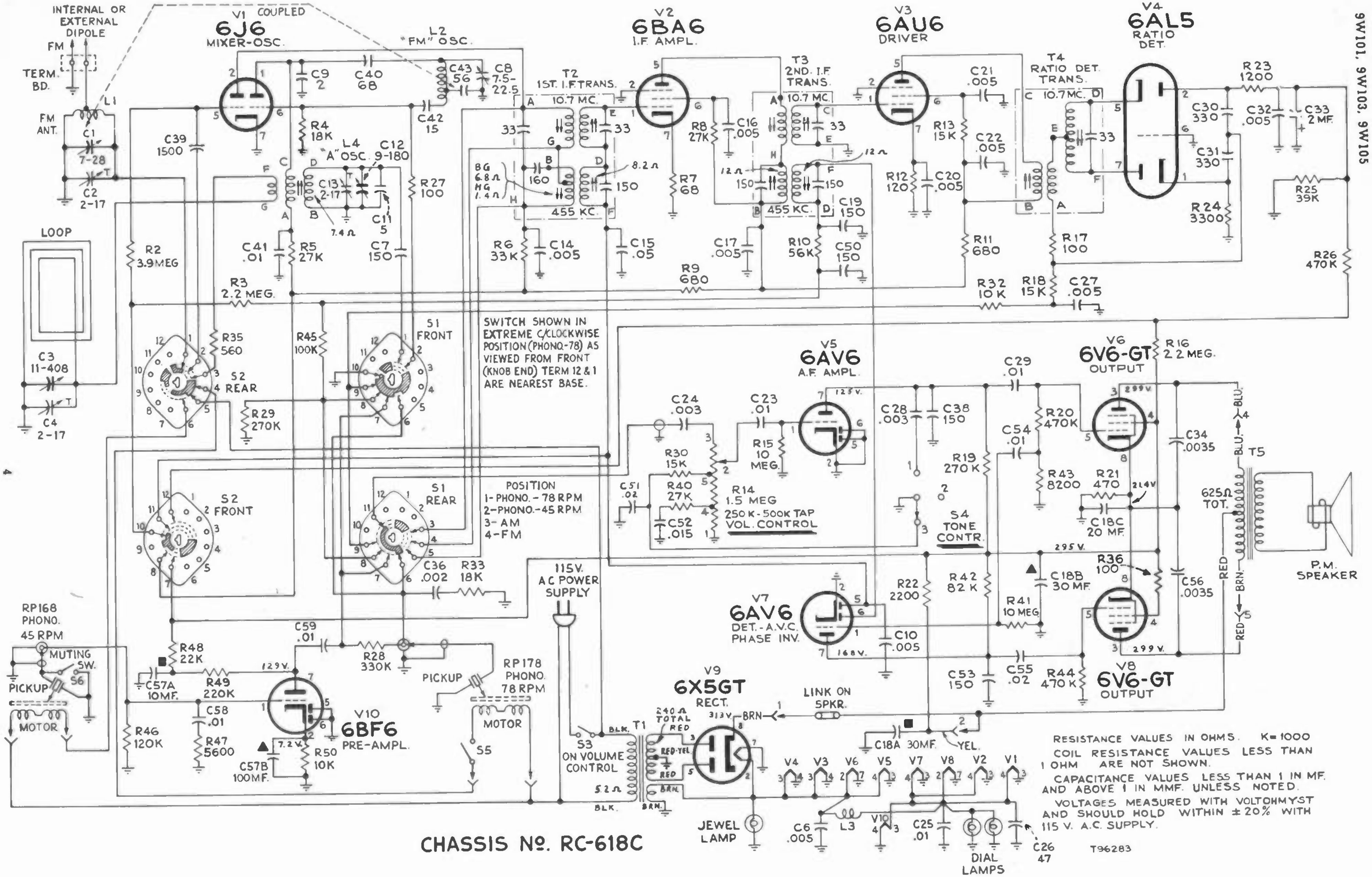
Tube	Terminal		Voltage		
			Phono	A.M.	F.M.
(1) 6J6	Plate	1	—	102	98
	Grid	6	−0.4	−6.8	−6.0
	Plate	2	—	96	110
	Grid	5	−0.8	−2.7	−2.5
(2) 6BA6	Plate	5	—	196	192
	Screen	6	—	100	83
	Cathode	7	—	0.7	0.84
	Grid	1	−0.9	−1.3	−0.2
(3) 6AU6	Plate	5	—	190	185
	Screen	6	—	145	141
	Cathode	7	—	1.25	1.21
(4) 6AL5	——	—	—	—	—
(5) 6AV6	Plate	7	125	85	84
	Grid	1	−0.6	−0.6	−0.6
(6) 6V6GT	Plate	3	299	282	280
	Screen	4	295	220	217
	Cathode	8	21.4	15.5	15.4
(7) 6AV6	Plate	7	168	125	125
	Grid	1	−0.5	−0.5	−0.5
(8) 6V6GT	Plate	3	299	282	280
	Screen	4	286	214	211
	Cathode	8	21.4	15.5	15.4
(9) 6X5GT	Cathode	8	313	300	299
(10) 6BF6	Plate	7	129	89	88
	Cathode	2	7.2	5.4	5.4



Dial Indicator and Drive Mechanism

Cathode Currents (MA)

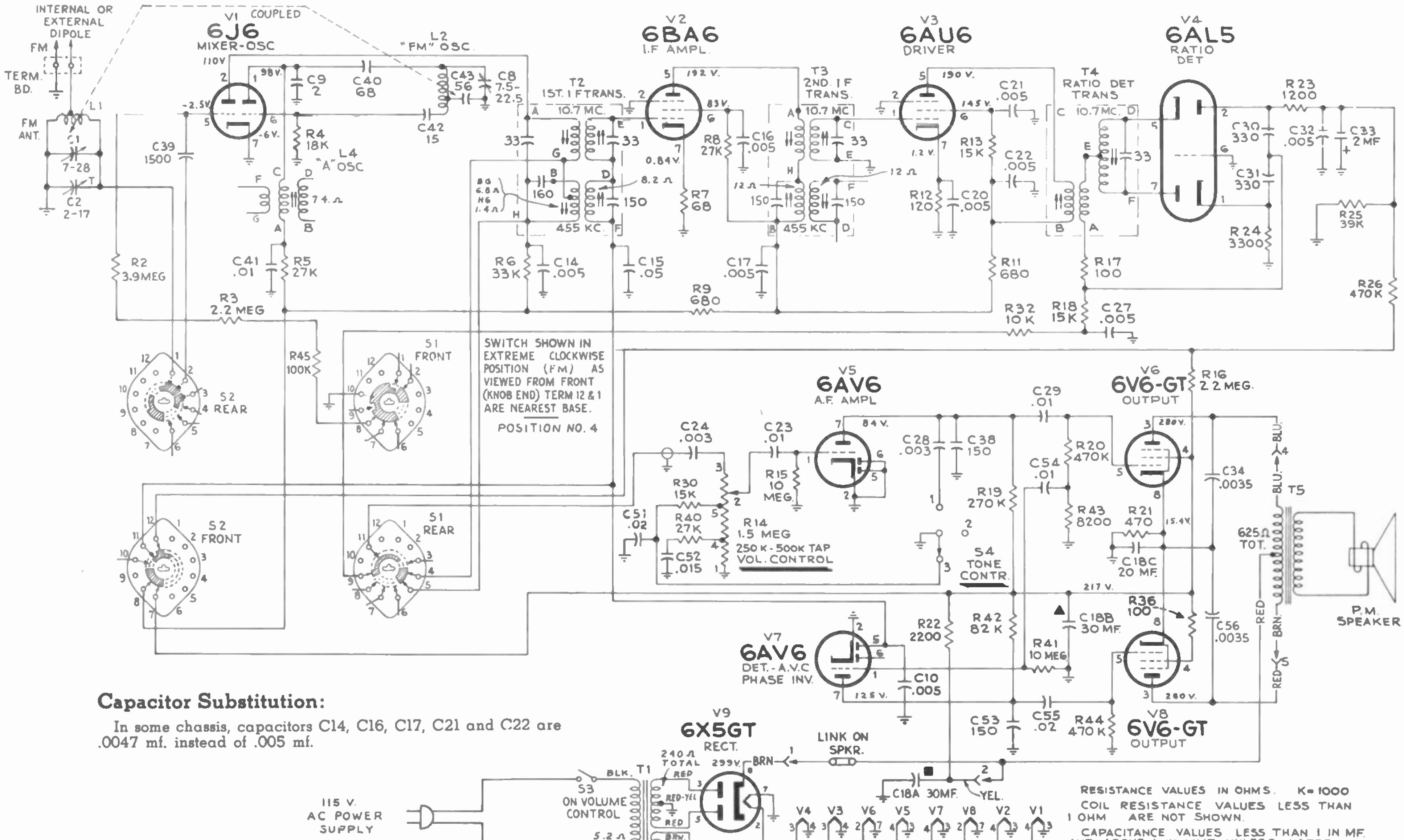
Tube	Terminal	Phono	A.M.	F.M.
(1) 6J6	7	—	8.2	8.7
(2) 6BA6	7	—	11.6	13.4
(3) 6AU6	7	—	10	9.7
(4) 6AL5	1 & 5	—	—	—
(5) 6AV6	2	0.75	0.5	0.5
(6) 6V6GT	8	25.1	19.1	18.5
(7) 6AV6	2	1.7	1.1	1.1
(8) 6V6GT	8	24.1	18.5	18
(9) 6X5GT	8	54	70.5	71
(10) 6BF6	2	0.77	0.55	0.55



Complete Schematic Diagram *Model 9W105, Chassis No. RC-618C*

The RP-178 record changer is used only with Model 9W105. In Models 9W101 and 9W103 the RP-178 record changer and connecting cables are not used; C36 and R33 are omitted.

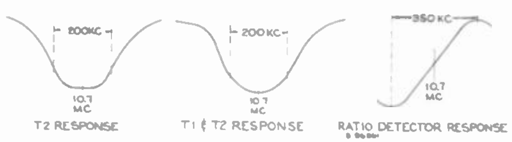
REFER TO PAGE 77 FOR SUPPLEMENTARY INFORMATION



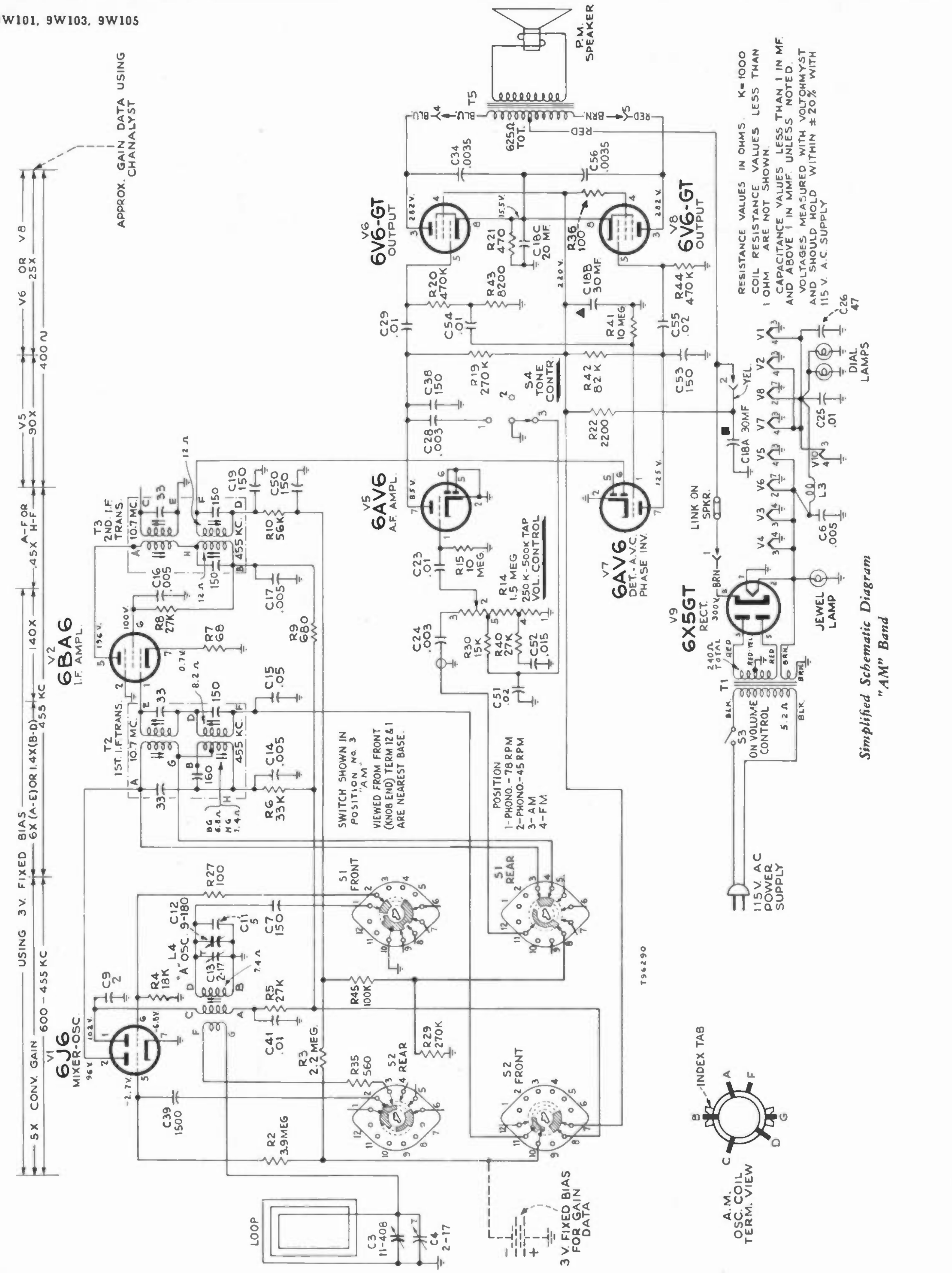
Simplified Schematic Diagram "FM" Band

Capacitor Substitution:

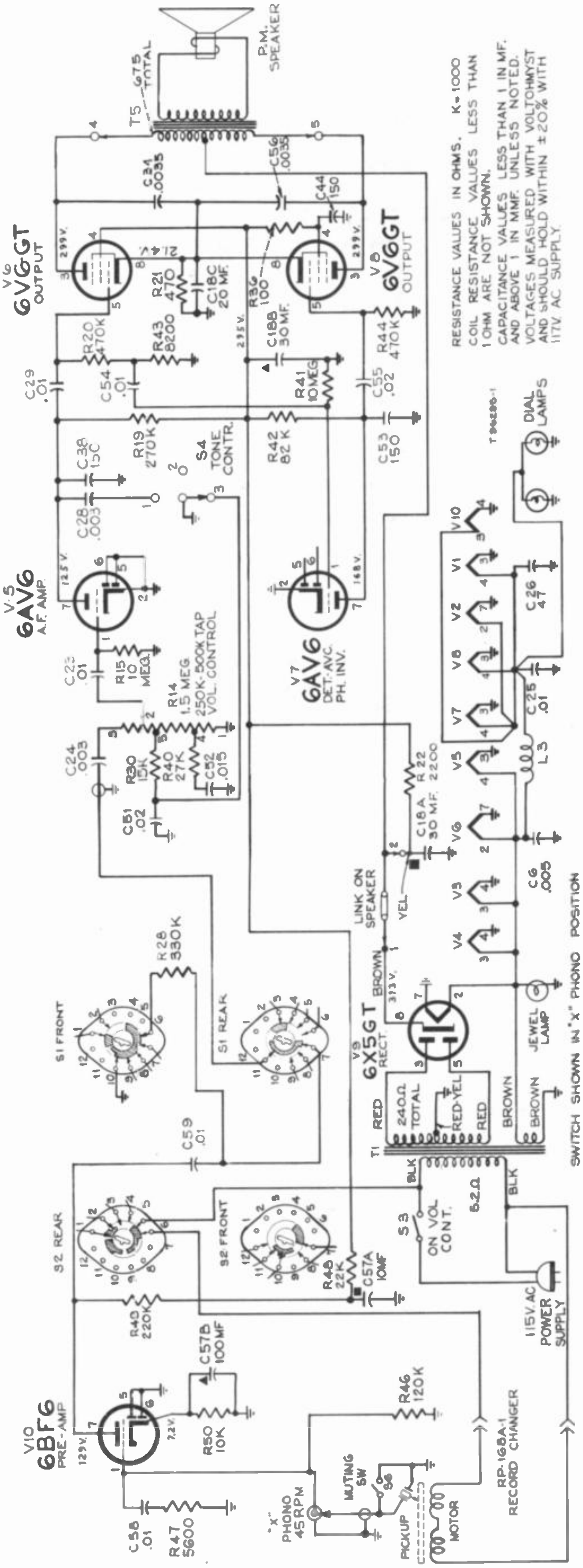
In some chassis, capacitors C14, C16, C17, C21 and C22 are .0047 mf. instead of .005 mf.



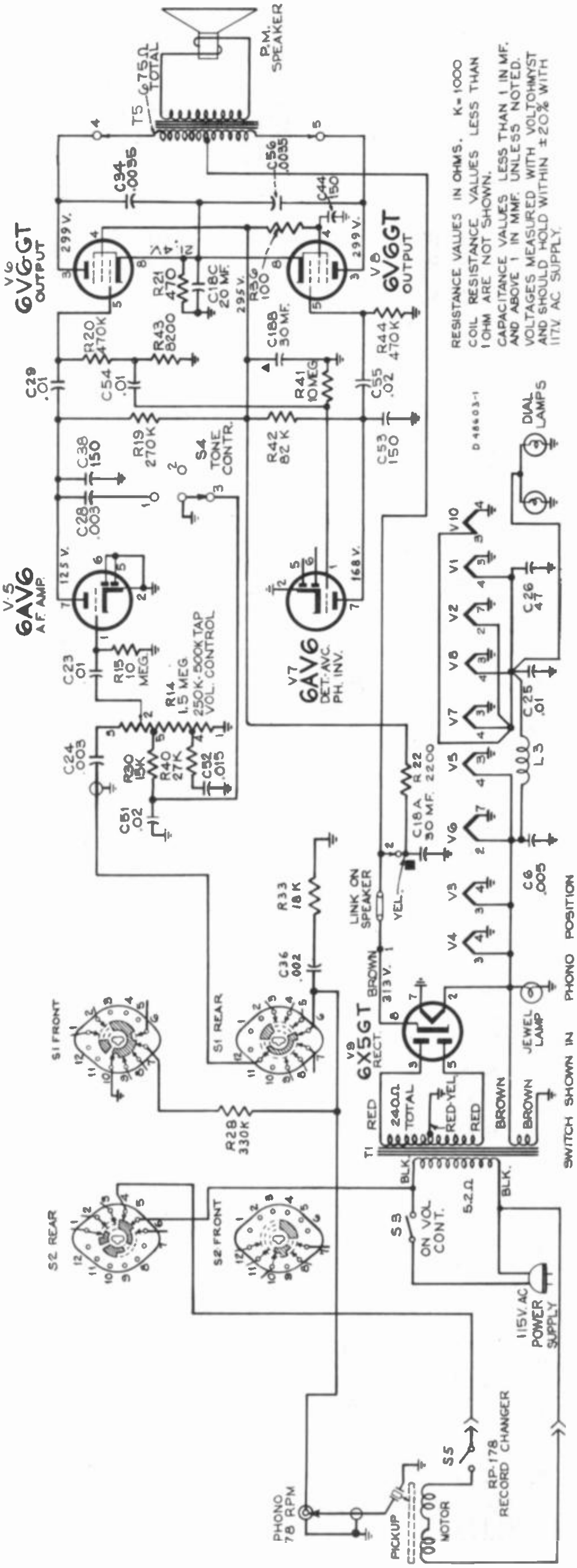
Response Curves



Simplified Schematic Diagram "AM" Band

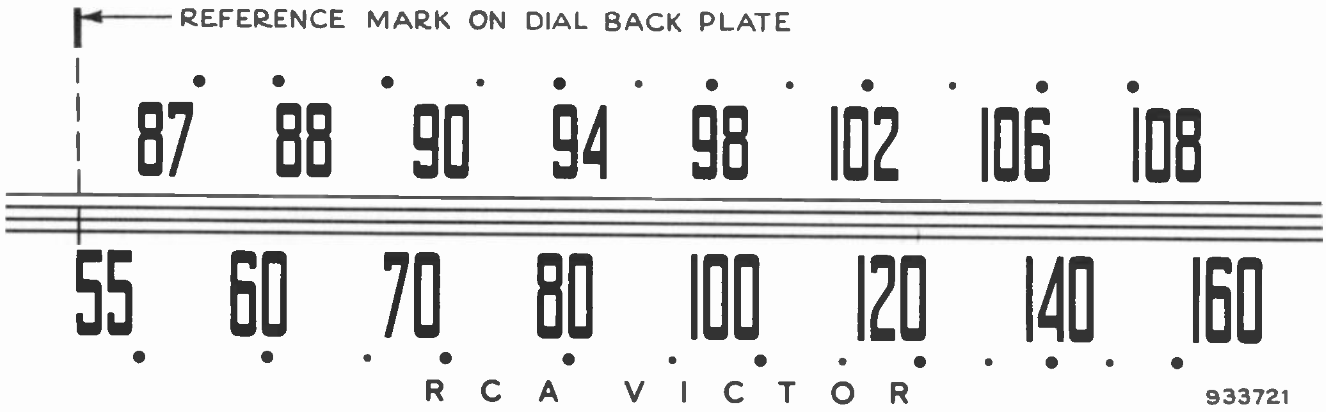


Simplified Schematic Diagram
"Aux." (9W101, 9W103) or "X PH" (9W105) Position



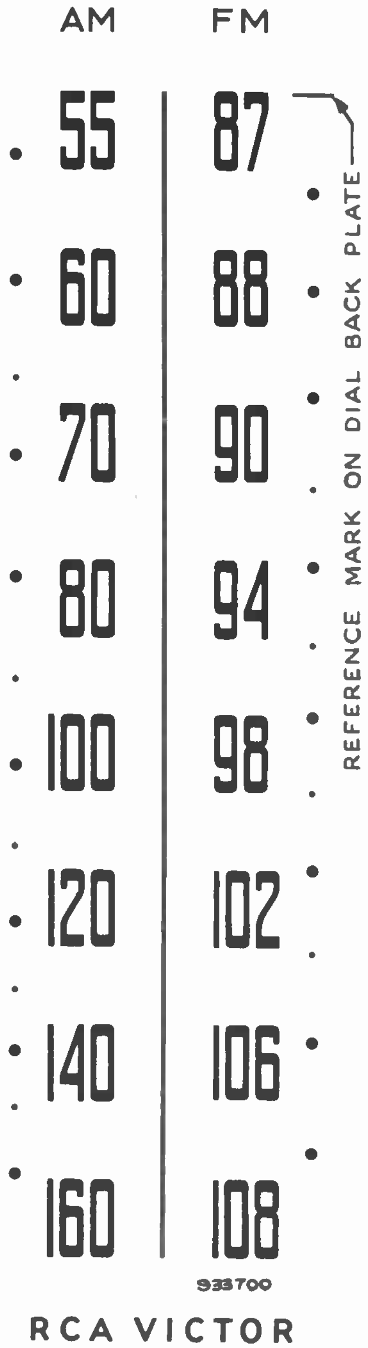
Simplified Schematic Diagram
"PH" Position

In Models 9W101 and 9W103 the RP-178 record changer and connecting cables are not used; C36 and R33 are omitted.



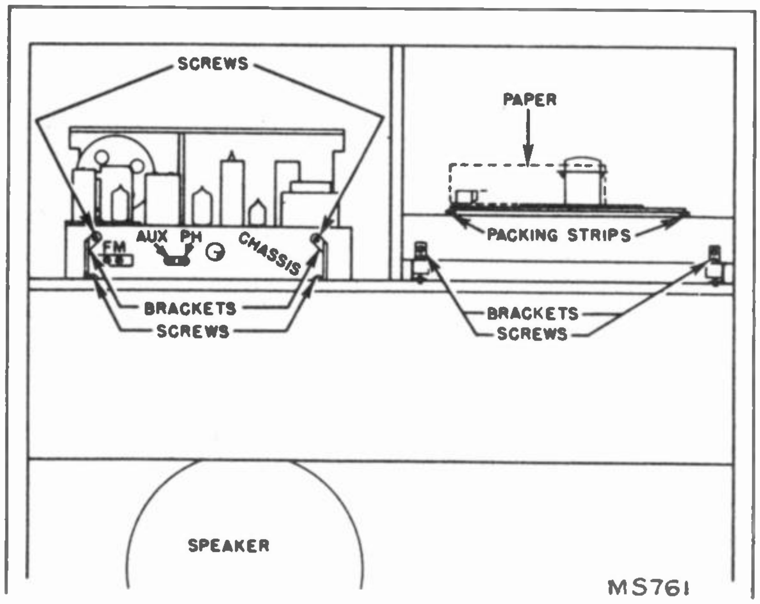
The dial scale drawing shown is a full size reproduction. It can be used as a reference in alignment procedure.

Dial Scale—Models 9W101 and 9W103

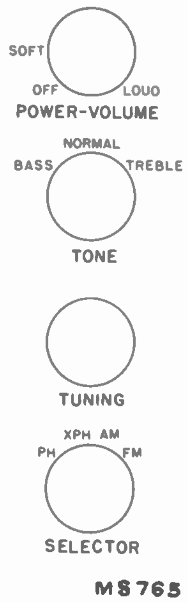


The dial scale drawing shown is a full size reproduction. It can be used as a reference in alignment procedure.

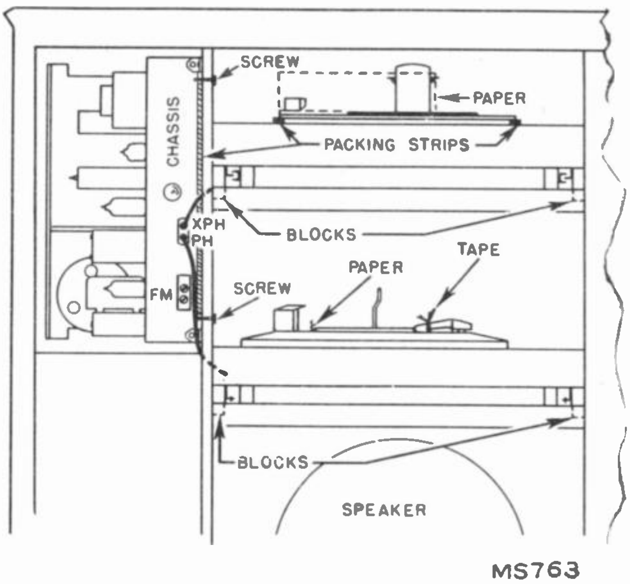
Dial Scale—Model 9W105



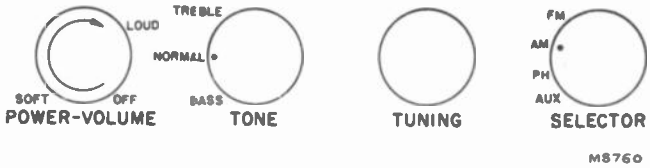
Back View—Models 9W101 and 9W103



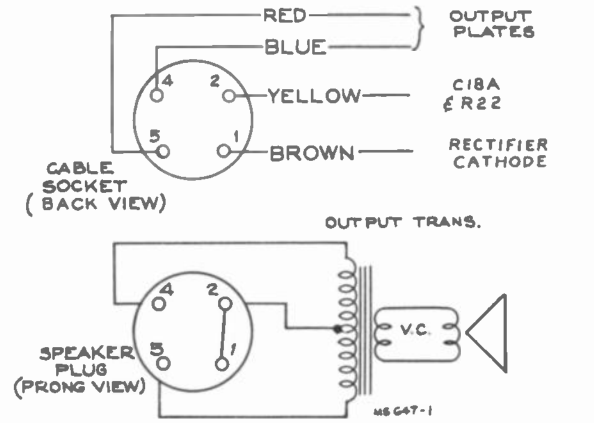
Controls—Model 9W105



Back View—Model 9W105



Controls—Models 9W101 and 9W103



Speaker Connections

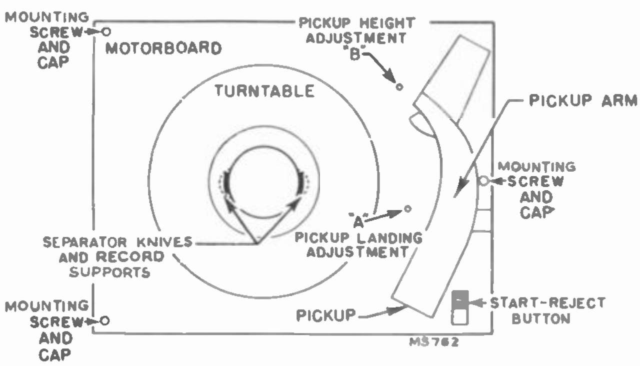
SHIPPING SCREWS

The radio chassis of these instruments is secured to the cabinet with shipping screws (painted red) which, together with wood spacing strips, should be REMOVED at the time of installation.

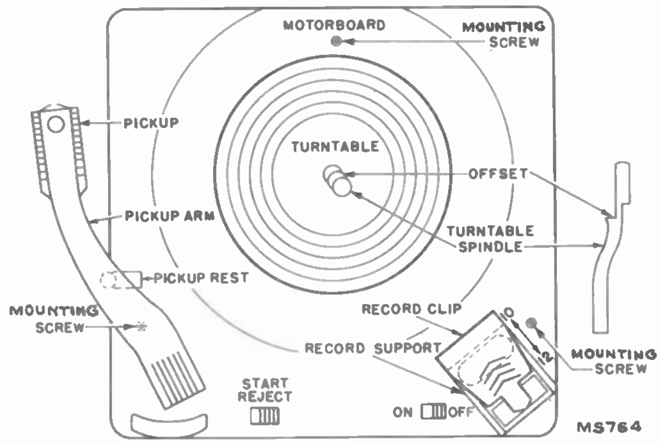
The record changers are each mounted with three screws which should be LOOSENED at the time of installation.

On the RP-168 —1 record changer decorative caps cover the mounting screws, unscrew the caps for access to the screws.

REFER TO ILLUSTRATIONS ON PAGES 8 AND 9.



Top View—RP-168 —1 Record Changer



Top View—RP-178 Record Changer

RP-168 —1 RECORD CHANGER

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

Record Separators

During service work the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the record separator knives to be extended when in the out of cycle position.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

CARE OF SAPPHIRE

The sapphire point on the pickup is protected with a permanent metal guard. Lint may collect to clog the opening in the guard at the sapphire point and cause poor record reproduction. Occasional cleaning may be necessary; brush carefully with a small soft brush.

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 618B—9W101, 9W103 RC 618C—9W105
73893	Board—"F.M." antenna board
73889	Capacitor—Variable tuning capacitor (C1, C2, C3, C4, C8, C12, C13)
73866	Capacitor—Ceramic, 2 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C11)
31353	Capacitor—Ceramic, 15 mmf. (C42)
39042	Capacitor—Ceramic, 47 mmf. (C26)
73867	Capacitor—Ceramic, 56 mmf. (C43)
33103	Capacitor—Ceramic, 68 mmf. (C40)
48125	Capacitor—Ceramic, 150 mmf. (C7, C19, C38, C50, C53)
39640	Capacitor—Mica, 330 mmf. (C30, C31)
73748	Capacitor—Ceramic, 1500 mmf. (C39)
73473	Capacitor—Ceramic, .005 mfd. (C6, C10)
73750	Capacitor—Tubular, .002 mfd., 200 volts (C36 for 9W105)
73659	Capacitor—Tubular, .003 mfd., 200 volts (C24)
72573	Capacitor—Tubular, .003 mfd., 400 volts (C28)
70646	Capacitor—Tubular, .0035 mfd., 1000 v. (C34, C56)
71926	Capacitor—Tubular, .005 mfd., 200 volts (C20, C27, C32)
71553	Capacitor—Tubular, .005 mfd., 400 volts (C14, C16, C17, C21, C22)
72120	Capacitor—Tubular, .015 mfd., 200 volts (C52)
71928	Capacitor—Tubular, .02 mfd., 200 volts (C51)
73638	Capacitor—Tubular, .02 mfd., 400 volts (C55)
71923	Capacitor—Tubular, .01 mfd., 200 volts (C23, C25)
73561	Capacitor—Tubular, .01 mfd., 400 volts (C58, C59)
71925	Capacitor—Tubular, .01 mfd., 400 volts (C29, C41, C54)
71551	Capacitor—Tubular, .05 mfd., 200 volts (C15)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C33)
74200	Capacitor—Electrolytic, comprising 1 section of 10 mfd., 300 volts and 1 section of 100 mfd., 10 volts (C57A, C57B)
73372	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 250 volts (C18A, C18B, C18C)
73918	Coil—Antenna coil—F.M. (#16 tinned bus wire, 8 turns per inch, 1¾ turns L.H.—.469 I. D.) (L1)
73916	Coil—Oscillator coil—F.M. (#16 tinned bus wire, 7 turns per inch, 4¾ turns R.H.—.469 I. D.) (L2)

(Continued on following page)

REFER TO PAGE 77 FOR SUPPLEMENTARY INFORMATION

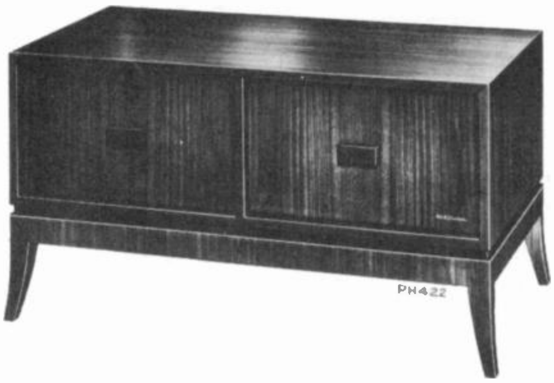
Replacement Parts (Continued)

STOCK No.	DESCRIPTION
71942	Coil—Filament choke coil (L3)
73744	Coil—Oscillator coil—A.M. (L4)
70342	Control—Volume control and power switch (R14, S3)
†72953	Cord—Drive cord (approx. 48" overall length required)
73690	Cord—Power cord and plug
16058	Grommet—Rubber grommet to mount R.F. shelf
72069	Grommet—Rubber grommet for rear mounting feet (2 required)
73895	Indicator—Station selector indicator
30868	Plug—2 contact female plug for motor cables
5040	Plug—4 contact female plug for speaker cable
74297	Plate—Dial back plate complete with two (2) drive cord pulleys less dial
	Resistor—Fixed, composition, 68 ohms ±10%, ½ watt (R7)
	Resistor—Fixed, composition, 100 ohms ±10%, ½ watt (R17, R27, R36)
	Resistor—Fixed, composition, 120 ohms ±10%, ½ watt (R12)
	Resistor—Fixed, composition, 470 ohms ±10%, 2 watts (R21)
	Resistor—Fixed, composition, 560 ohms ±10%, ½ watt (R35)
	Resistor—Fixed, composition, 680 ohms ±20%, ½ watt (R9, R11)
	Resistor—Fixed, composition, 1200 ohms ±5%, ½ watt (R23)
73637	Resistor—Wire wound, 2200 ohms, 5 watts (R22)
	Resistor—Fixed, composition, 3300 ohms ±5%, ½ watt (R24)
	Resistor—Fixed, composition, 5600 ohms ±10%, ½ watt (R47)
	Resistor—Fixed, composition, 8200 ohms ±10%, ½ watt (R43)
	Resistor—Fixed, composition, 10,000 ohms ±10%, ½ watt (R32, R50)
	Resistor—Fixed, composition, 15,000 ohms ±10%, ½ watt (R13, R18, R30)
	Resistor—Fixed, composition, 18,000 ohms ±10%, ½ watt (R4 for 9W101, 9W103 & 9W105) (R33 for 9W105)
	Resistor—Fixed, composition, 22,000 ohms ±10%, ½ watt (R48)
	Resistor—Fixed, composition, 27,000 ohms ±10%, ½ watt (R8, R40)
	Resistor—Fixed, composition, 27,000 ohms ±10%, 1 watt (R5)
	Resistor—Fixed, composition, 33,000 ohms ±10%, ½ watt (R6)
	Resistor—Fixed, composition, 39,000 ohms ±10%, ½ watt (R25)
	Resistor—Fixed, composition, 56,000 ohms ±10%, 1 watt (R10)
	Resistor—Fixed, composition, 82,000 ohms ±10%, ½ watt (R42)
	Resistor—Fixed, composition, 100,000 ohms ±10%, ½ watt (R45)
	Resistor—Fixed, composition, 120,000 ohms ±10%, ½ watt (R46)
	Resistor—Fixed, composition, 220,000 ohms ±10%, ½ watt (R49)
	Resistor—Fixed, composition, 270,000 ohms ±10%, ½ watt (R19, R29)
	Resistor—Fixed, composition, 330,000 ohms ±10%, ½ watt (R28)
	Resistor—Fixed, composition, 470,000 ohms ±10%, ½ watt (R20, R26, R44)
	Resistor—Fixed, composition, 2.2 meg. ±20%, ½ watt (R3)
	Resistor—Fixed, composition, 3.9 meg. ±10%, ½ watt (R2)
	Resistor—Fixed, composition, 10 megohms ±20%, ½ watt (R15, R41)
	Resistor—Fixed, composition, 22 megohms ±20%, ½ watt (R16)
73894	Shaft—Tuning knob shaft
31364	Socket—Dial or jewel lamp socket
33514	Socket—Phono input socket (double)
31251	Socket—Tube socket, wafer, octal
73606	Socket—Tube socket, miniature, for tubes V1, V2, V3, V4, V5, V7
73117	Socket—Tube socket, miniature, for 6BF6 tube
31418	Spring—Drive cord spring
74202	Support—Polystyrene support for F.M. osc. coil complete with mounting bracket
73891	Switch—Tone control switch (S4)
74201	Switch—Selector switch (S1, S2)
73601	Transformer—Power transformer, 115 volt 60 cycle (T1)
73745	Transformer—First I.F. transformer—dual (T2)
74019	Transformer—Second I.F. transformer—dual (T3)
73743	Transformer—Ratio detector transformer (T4)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	92569-5W
	RL 103B5
13867	Cap—Dust cap
73934	Cone—Cone and voice coil assembly
31826	Plug—4 prong male plug for speaker
73635	Speaker—12" PM speaker complete with cone and voice coil less output transformer and plug (92569-5W)
71145	Suspension—Metal cone suspension
73636	Transformer—Output transformer (T5)

STOCK No.	DESCRIPTION
	MISCELLANEOUS
72555	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
74299	Bracket—Jewel lamp bracket for Model 9W105.
71599	Bracket—Jewel lamp bracket for Models 9W101 and 9W103
74268	Button—Rosette button (nail) for grille for Model 9W101
72437	Cable—Shielded pickup cable complete with pin plug (2 required) for Model 9W105
72583	Cable—Shielded pickup cable complete with pin plug for Models 9W101 and 9W103
13103	Cap—Jewel lamp cap
71892	Catch—Bullet catch and strike for doors
74298	Clamp—Dial clamp (2 required)
X1968	Cloth—Grille cloth for Model 9W101
X1973	Cloth—Grille cloth for Model 9W103
X1953	Cloth—Grille cloth for blonde instruments for Model 9W105
X1897	Cloth—Grille cloth for mahogany or walnut instruments for Model 9W105
74209	Cover—Mounting screw cover for RP168A record changer (3 required)
74275	Decal—Control panel decal for limed oak instruments for Model 9W103
74274	Decal—Control panel decal for mahogany or walnut instruments for Models 9W101 & 9W103
74281	Decal—Control panel decal for blonde instruments for Model 9W105
74280	Decal—Control panel decal for mahogany or walnut instruments for Model 9W105
71768	Decal—Trade mark decal (RCA Victor) for Model 9W101
74273	Decal—Trade mark decal (Victrola) for Models 9W101 and 9W103
71910	Decal—Trade mark decal (RCA Victor) for Model 9W105
71966	Decal—Trade mark decal (Victrola) for Model 9W105
74203	Dial—Glass dial scale for Models 9W101 and 9W103
74204	Dial—Glass dial scale for Model 9W105
73180	Emblem—"RCA Victor" emblem for Model 9W103
11889	Grommet—Rubber grommet for front apron chassis (2 required)
72856	Grommet—Rubber grommet for mounting RP178 record changer (3 required)
73903	Hinge—Cabinet door hinge (1 set)
72824	Knob—Tone control or selector switch knob—brown—for blonde or limed oak instruments
71822	Knob—Tone control or selector switch knob—maroon—for mahogany or walnut instruments
72800	Knob—Tuning or volume control knob—brown—for blonde or limed oak instruments
71821	Knob—Tuning or volume control knob—maroon—for mahogany or walnut instruments
11765	Lamp—Dial or jewel lamp—Mazda 51
74300	Loop—Antenna loop complete for Model 9W105
73898	Loop—Antenna loop complete for Models 9W101 and 9W103
73109	Nut—Tee nut for mounting RP178 record changer (3 required)
74208	Nut—Tee nut for mounting RP-168 record changer (3 required)
73771	Pull—Door pull for record storage compartment door or radio compartment door for Model 9W105
74276	Pull—Door pull for Model 9W103
74239	Pull—Door pull for Model 9W101
74277	Pull—Record changers' drawer pull for Model 9W105
30868	Plug—2 contact female plug for motor cable
30870	Plug—2 prong male plug for motor cable
73184	Runner—Record changer motorboard runner—R.H.—for RP178 changer—Model 9W105
73183	Runner—Record changer motorboard runner—L.H.—for RP178 changer—Model 9W105
74271	Runner—Record changer motorboard runner—R.H.—for RP168 changer
74272	Runner—Record changer motorboard runner—L.H.—for RP168 changer
73110	Screw—#¼-20 x 1¾" fillister head screw for mounting RP178 record changer—Model 9W105
74278	Screw—#8-30 x ¾" trimit head screw for record changers' drawer pull for Model 9W105
74424	Screw—#8-32 x 1¾" special screw for mounting RP-168 record changer (3 required)
74269	Screw—#8-32 x ¾" trimit head screw for door pull (2 required) for Model 9W101
74113	Screw—#8-32 x 1" trimit head screw for door pull for Model 9W103
74279	Screw—#8-32 x ⅞" trimit head screw for door pull for record storage compartment door and radio compartment door for Model 9W105
74421	Spring—Conical spring for mounting RP-168 record changer—upper—R.H. side (1 required)
74422	Spring—Conical spring for mounting RP-168 record changer—upper—L.H. side (2 required)
74423	Spring—Conical spring for mounting RP-168 record changer—lower (3 required)
30800	Spring—Retaining spring for knobs
72938	Stop—Door stop
73185	Stop—Metal stop for motorboard runners (2 required)
73182	Track—Record changer compartment track (for RP-168 record changer) (2 required)

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



RCA VICTOR

AM-FM Radio-Phonograph Combination

MODEL 9W102

Chassis No. RC-618D
— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 14 —
SUPPLEMENT TO 1949 No. 4
(9W101, 9W103, 9W105)

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

FOR RECORD CHANGER INFORMATION REFER TO RP 168 SERIES SERVICE DATA

Specifications

Tuning Range
Standard Broadcast (AM) ....540-1600 kc.
Frequency Modulation (FM) .... 88-108 mc.
Intermediate Frequencies ....AM—455 kc., FM—10.7 mc.

Tube Complement
(1) RCA 6J6 ....Mixer and Oscillator
(2) RCA 6BA6 ....I-F Amplifier
(3) RCA 6AU6 ....Driver
(4) RCA 6AL5 ....Ratio Detector
(5) RCA 6AV6 ....A-F Amplifier
(6) RCA 6V6GT ....Output
(7) RCA 6AV6 ....AM Det.—AVC—Ph. Inv.
(8) RCA 6V6GT ....Output
(9) RCA 6X5GT ....Rectifier
(10) RCA 6BF5 ....Phono Pre-amplifier
Dial Lamps (2) ....Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp ....Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio ....18:1 (9 turns of knob)

Power Supply Rating ....115 volts, 60 cycles, 90 watts

Loudspeaker (92569-5W)
Size and type ....12 in. PM
Voice coil impedance ....3.2 ohms at 400 cycles

Power Output
Undistorted 6 watts ....Maximum 7 watts

Cabinet Dimensions
Height 19⅞" Width 38¾" Depth 20"

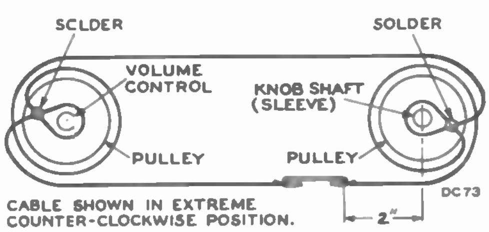
Weight ....71 lbs.

Record Changer
Turntable speed ....45 r.p.m.
Record capacity ....Up to 10 RCA 7 in. fine groove
Pickup ....Crystal (medium output)

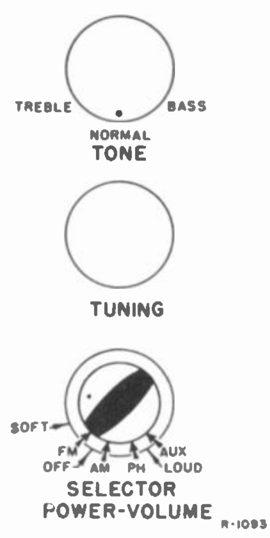
Description

Model 9W102 is identical electrically with Models 9W101 and 9W103. It uses a vertical type of dial. The chassis differs mechanically from that used in 9W101 and 9W103 in that the volume control and range switch shafts are combined as a dual knob control (a drive cord couples the volume control to the volume control knob shaft). The second I-F transformer is stamped 970435-6 and is identical to that used in 9W101 and 9W103 except for having a copper plated shield can to reduce feedback to the loop. **Refer to Service Data on Models 9W101, 9W103, 9W105 for additional information.**

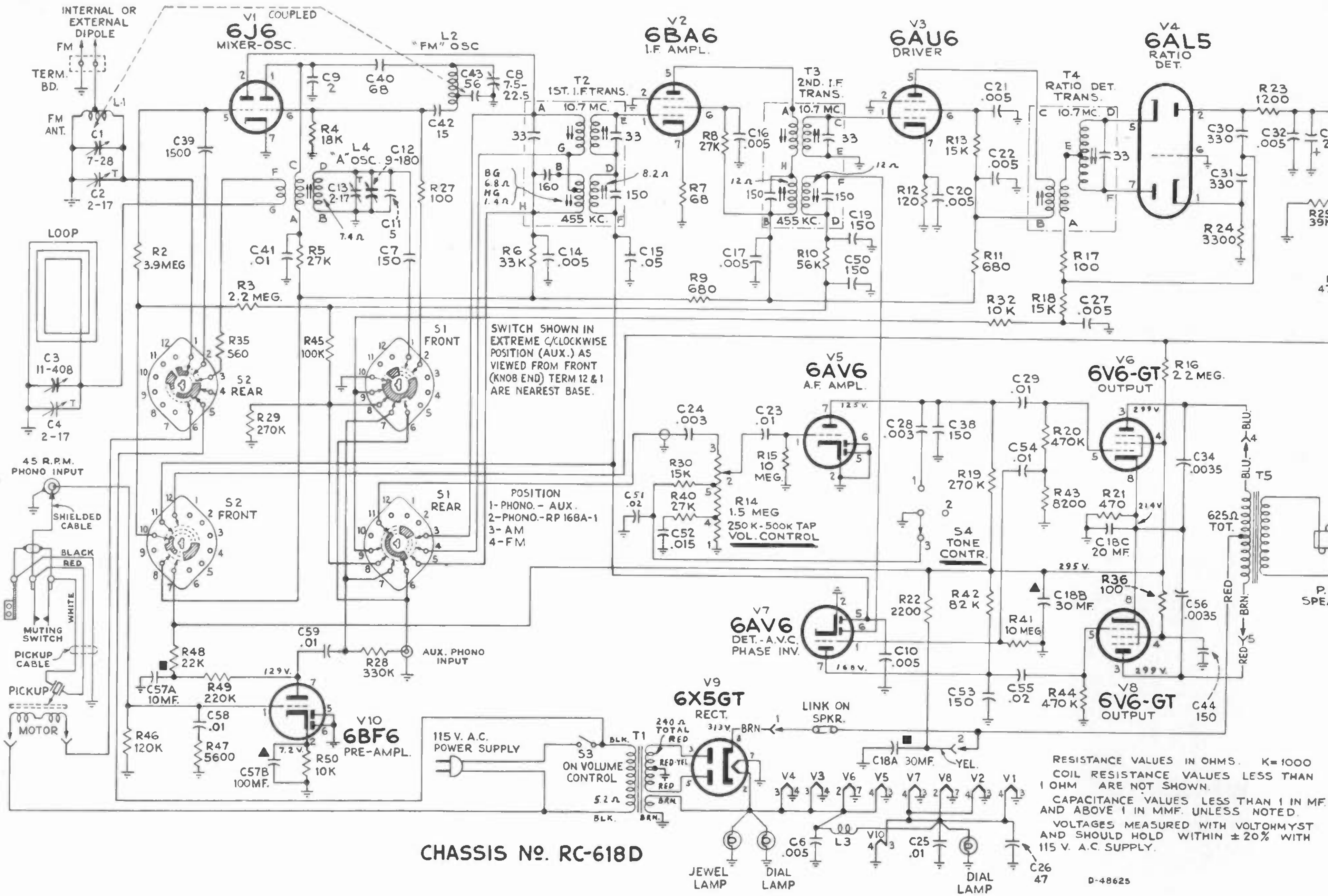
(Supplementary Information on 9W101, 9W103 and 9W105 contained in this publication.)



Volume Control Flexible Cable



Controls



Schematic Circuit Diagram—Model 9W102

Identical to 9W101 and 9W103 but not 9W105

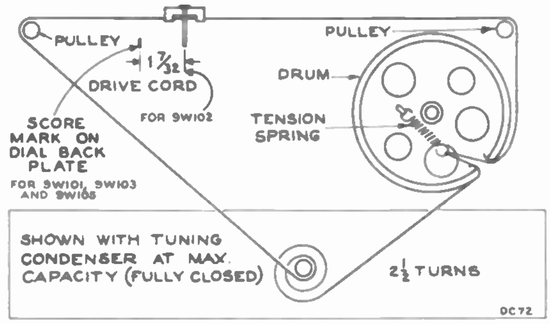
(Model 9W105 has two record changers)

Alignment Procedure

Identical to that given in 9W101, 9W103, 9W105 Service Data Except

After the chassis is installed in the cabinet, recheck the adjustment of C4 (AM Ant.) at 1400 kc. and L4 (AM Osc.) at 600 kc. Two holes in the right hand side of the radio compartment drawer permit access to these adjustments.

The dial indicator should be set to the SPECIFIED POSITION on the dial back plate with the tuning condenser at max. capacity.



Dial Indicator and Drive Mechanism

9W101, 9W103, 9W105 (RC-618B, RC-618C) SUPPLEMENTARY INFORMATION

I.F. Transformer Substitution:

In some chassis I.F. transformers stamped 970435-2 have been used as a substitute for 2nd. I.F. transformers stamped 970435-5.

The 455 Kc. windings of 970435-2 transformers use resonating capacitors of 235 mmf. each, the d.c. resistance of each winding is 8.2 ohm, the transformer indicated in the schematic diagram is stamped 970435-5.

Substitute Speaker:

Speakers stamped 92569-1WX have been used as a substitute for 92569-5W speakers in Model 9W101; 92569-1WX speakers have a 2.2 ohm voice coil; 92569-5W speakers have a 3.2 ohm voice coil.

Speakers stamped 92569-5K have been used as a substitute for 92569-5W speakers in Models 9W101, 9W103 and 9W105. They have a 3.2 ohm voice coil (same as 92569-5W).

Changes in Parts List:

CHASSIS ASSEMBLIES

Add:

48125 Capacitor—Ceramic, 150 mmf. (C44) [same as C7, C19, C38, C50, C53]

SPEAKER ASSEMBLY

92569-1WX

(Used on Model 9W101)

13867 Cap—Dust cap
36145 Cone—Cone and voice coil assembly
5039 Plug—4 prong male plug for speaker
71145 Suspension—Metal cone suspension
37899 Transformer—Output transformer (T3)
NOTE: When replacing complete speaker order Stock No. 73635 (92569-5W).

SPEAKER ASSEMBLY

92569-5K

75642 Cone—Cone and voice coil assembly
For other items refer to 92569-5W

MISCELLANEOUS

Change:

74209 Cover—Mounting screw cover (threaded type) for RP 168 record changer (3 required) (used with 74424 screw).
74424 Screw—#8-32 x 1¾" special screw (tapped hole) for RP 168 record changer (3 required) (used with 74209 cover).

Add:

74579 Bumper—Rubber bumper (black) for front panel of record changer drawer—walnut or mahogany instruments—Models 9W101 and 9W103 (2 required).
74580 Bumper—Rubber bumper (white) for front panel of record changer drawer—blond or limed oak instruments—Models 9W101 and 9W103 (2 required).
74581 Cover—Mounting screw cover (plug-in type) for RP 168 record changer (3 required) (used with 74582 screw).
37396 Grommet—Rubber grommet for mounting speaker (3 required)—for Model 9W103.
74582 Screw—#8-32 x 1¾" special screw (non-tapped hole) for RP 168 record changer (3 required) (used with 74581 cover).

Change in Wiring:

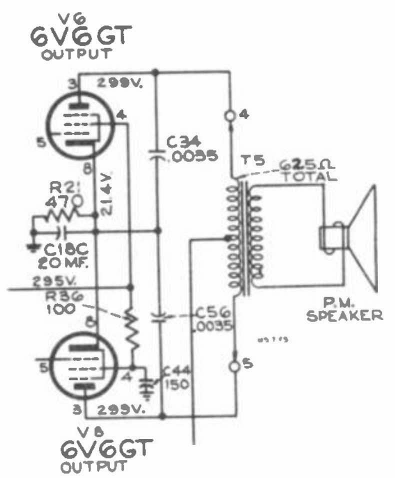
To improve FM stability one dial lamp is now connected to pin #2 of V9 (6X5GT). Previously both were connected to pin #2 of V8 (6V6GT).

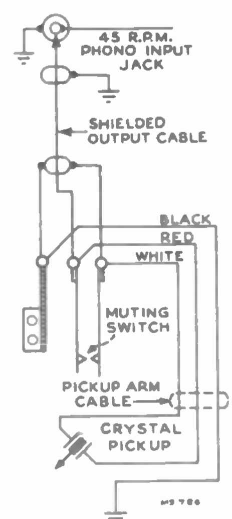
Added Capacitor:

A capacitor (150 mmf.—C44) has been added between the screen grid terminal of V8 (6V6GT) socket and chassis as shown in the illustration below. This was done to eliminate spurious audio oscillation.

Pickup Arm Cable:

The RP-168A-1 record changer pickup arm cable now being used is a three wire cable (RED-WHITE-BLACK). In some instruments the black wire is omitted or a shielded wire may be used as shown in 9W101, 9W103, 9W105 Service Data. The latest connection diagram is given below.





Output Tubes Circuit Pickup Arm Cable
Models 9W101, 9W103, 9W105

Incorrect Color Code on Capacitor:

Some ceramic capacitors C11 (5 mmf.) have been used which have a color code of BLACK-GREEN-BLACK. The capacitor is correct, but the color code is incorrect. The normal color code of this capacitor is GREEN-BLACK-WHITE.

Record Changer Mounting Screws:

The original mounting screws used a cover which screwed into the top of the mounting screw. The screws now being used have a plug-in type of cover.

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 618D
73893	Board—"F. M." terminal board
74641	Cable—Flexible cable to operate volume control
73889	Capacitor—Variable tuning capacitor ... C1, C2, C3, C4, C8, C12, C13
73866	Capacitor—Ceramic, 2 mmf. ... C9
93056	Capacitor—Ceramic, 5 mmf. ... C11
39044	Capacitor—Ceramic, 15 mmf. ... C42
39042	Capacitor—Ceramic, 47 mmf. ... C26
73867	Capacitor—Ceramic, 56 mmf. ... C43
33379	Capacitor—Ceramic, 68 mmf. ... C40
48125	Capacitor—Ceramic, 150 mmf. ... C7, C19, C38, C44, C50, C53
39640	Capacitor—Mica, 330 mmf. ... C30, C31
73748	Capacitor—Ceramic, 1500 mmf. ... C39
73473	Capacitor—Ceramic, 5000 mmf. ... C6, C10
73659	Capacitor—Tubular, .003 mfd., 200 volts ... C24
72573	Capacitor—Tubular, .003 mfd., 400 volts ... C28
70646	Capacitor—Tubular, .0035 mfd., 1000 volts ... C34, C56
71926	Capacitor—Tubular, .005 mfd., 200 volts ... C20, C27, C32
71553	Capacitor—Tubular, .005 mfd., 400 volts ... C14, C16, C17, C21, C22
71923	Capacitor—Tubular, .01 mfd., 200 volts ... C23, C25
71925	Capacitor—Tubular, .01 mfd., 400 volts ... C29, C41, C54
73561	Capacitor—Tubular, .01 mfd., 400 volts ... C58, C59
72120	Capacitor—Tubular, .015 mfd., 200 volts ... C52
71928	Capacitor—Tubular, .02 mfd., 200 volts ... C51
73638	Capacitor—Tubular, .02 mfd., 400 volts ... C55
71551	Capacitor—Tubular, .05 mfd., 200 volts ... C15
73747	Capacitor—Electrolytic, 2 mfd., 50 volts ... C33
74200	Capacitor—Electrolytic, comprising 1 section of 10 mfd., 300 volts and 1 section of 100 mfd., 10 volts ... C57A, C57B
73372	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 25 volts ... C18A, C18B, C18C
73744	Coil—Oscillator coil—A.M. ... L4
73916	Coil—Antenna coil—F.M. ... L1
73916	Coil—Oscillator coil—F.M. ... L2
71942	Coil—Filament choke coil ... L3
33514	Connector—Phono input connection socket (dual)
5040	Connector—4-contact female connecting socket for speaker cable
30868	Connector—2-contact female connecting socket for record changer motor cable
74639	Control—Volume control and power switch (R14, S3)
†72953	Cord—Drive cord (approximately 48" overall length required)
73690	Cord—Power cord and plug
16058	Grommet—Rubber grommet to mount R-F shelf (4 required)
72069	Grommet—Rubber grommet for rear mounting feet (2 required)
73895	Indicator—Station selector indicator
74645	Nut—#8-32 hex retainer nut between R-F shelf and volume control knob shaft
74297	Plate—Dial back plate assembly complete with two (2) drive cord pulleys
74640	Pulley—Pulley and hub for volume control shaft
	Resistors—Fixed composition resistors:
	68 ohms, ±10%, ½ watt ... R7
	100 ohms, ±10%, ½ watt ... R17, R27, R36
	120 ohms, ±10%, ½ watt ... R12
	470 ohms, ±10%, 2 watts ... R21
	560 ohms, ±10%, ½ watt ... R35
	680 ohms, ±20%, ½ watt ... R9, R11
	1200 ohms, ±5%, ½ watt ... R23
73637	Resistor—Wire wound, 2200 ohms, 5 watts ... R22
	Resistors—Fixed composition resistors:
	3300 ohms, ±5%, ½ watt ... R24
	5600 ohms, ±10%, ½ watt ... R47
	8200 ohms, ±10%, ½ watt ... R43
	10,000 ohms, ±10%, ½ watt ... R32, R50
	15,000 ohms, ±10%, ½ watt ... R13, R18, R30
	18,000 ohms, ±10%, ½ watt ... R4
	22,000 ohms, ±10%, ½ watt ... R48
	27,000 ohms, ±10%, ½ watt ... R8, R40
	27,000 ohms, ±10%, 1 watt ... R5
	33,000 ohms, ±10%, ½ watt ... R6
	39,000 ohms, ±10%, ½ watt ... R25
	56,000 ohms, ±10%, 1 watt ... R10
	82,000 ohms, ±10%, ½ watt ... R42
	100,000 ohms, ±10%, ½ watt ... R45
	120,000 ohms, ±10%, ½ watt ... R46
	220,000 ohms, ±10%, ½ watt ... R49
	270,000 ohms, ±10%, ½ watt ... R19, R29
	330,000 ohms, ±10%, ½ watt ... R28
	470,000 ohms, ±10%, ½ watt ... R20, R26, R44
	2.2 megohms, ±20%, ½ watt ... R3
	3.9 megohms, ±10%, ½ watt ... R2
	10 megohms, ±20%, ½ watt ... R15, R41
	22 megohms, ±20%, ½ watt ... R16

STOCK No.	DESCRIPTION
73894	Shaft—Tuning knob shaft
73632	Shield—Tube shield—for V2, V5
74646	Sleeve—Sleeve and pulley assembly (for volume control knob shaft)
72516	Socket—Tube socket, miniature—for V4, V5, V7
73606	Socket—Tube socket, miniature—for V1, V2, V3
31251	Socket—Tube socket, octal, wafer—for V6, V8, V9
73117	Socket—Tube socket, miniature—for V10
31364	Socket—Dial lamp or pilot lamp socket
74038	Spring—Tension spring for drive cord
74202	Support—Polystyrene support for F.M. oscillator coil complete with mounting bracket
73891	Switch—Tone control switch (S4)
74644	Switch—Selector switch (S1, S2)
73743	Transformer—Ratio detector transformer (T4)
73745	Transformer—First I.F. transformer—dual (T2)
74642	Transformer—Second I.F. transformer—dual (T3)
74643	Transformer—Power transformer, 115 volt, 60 cycle (T1)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	Stamped 92569-5W
	RL 103B5
13867	Cap—Dust cap
73934	Cone—Cone and voice coil assembly
5039	Plug—4-prong male plug for speaker
73635	Speaker—12" PM speaker complete with cone and voice coil—less output transformer and plug
71145	Suspension—Metal cone suspension
73636	Transformer—Output transformer (T5)
	Note: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74649	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
74054	Bracket—Pilot lamp bracket
71105	Cable—Shielded pickup cable for record changer, complete with pin plug
13103	Cap—Pilot lamp cap
71892	Catch—Door strike and catch
74298	Clamp—Dial clamp (2 required)
X3038	Cloth—Grille cloth (2 required) for mahogany or walnut instruments
X3039	Cloth—Grille cloth (2 required) for oak instruments
30868	Connector—2-contact female connecting socket for motor cable
30870	Connector—2-contact male connecting plug for motor cable
74581	Cover—Mounting screw cover (plug-in type) for mounting record changer (3 required)
74737	Decal—Control panel function decal for mahogany or walnut instruments
74738	Decal—Control panel function decal for oak instruments
74273	Decal—Trade mark decal ("Victrola")
74647	Dial—Glass dial scale
73549	Emblem—"RCA Victor" emblem (metal)
11889	Grommet—Rubber grommet for front apron of chassis (2 required)
73735	Hinge—Drop door hinge (2 required)
71821	Knob—Tuning knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning knob—brown—for oak instruments
73998	Knob—Volume control knob—maroon—for mahogany or walnut cabinets
73995	Knob—Volume control knob—brown—for oak instruments
73230	Knob—Function switch knob—maroon—for mahogany or walnut instruments
73231	Knob—Function switch knob—brown—for oak instruments
74845	Knob—Tone control switch knob—maroon—for mahogany or walnut instruments
74846	Knob—Tone control switch knob—brown—for oak instruments
11765	Lamp—Dial lamp—Mazda 51
74648	Loop—Antenna loop
74208	Nut—Tee nut for mounting record changer (3 required)
74582	Screw—#8-32 x 1¾" special screw for mounting record changer (3 required)
74736	Slide—Record changer tray slide
74421	Spring—Conical spring for mounting record changer—upper—RH side (1 required)
74422	Spring—Conical spring for mounting record changer—upper—LH side (2 required)
74423	Spring—Conical spring for mounting record changer—lower (3 required)
30900	Spring—Retaining spring for knobs 71821 and 72824
72845	Spring—Retaining spring for knobs 73995 and 73998
14270	Spring—Retaining spring for knobs 73230 and 73231
73412	Support—Drop door fall support

†Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

4 Substitute Speaker:

In some instruments a substitute speaker (stamped 92569-5K) has been used. The cone and voice coil assembly for 92569-5K speaker is available as Stock No. 75642. For other items refer to 92569-5W speaker listed above.

RCA VICTOR

AM-FM Radio-Phonograph Combination

MODEL 9W106

Chassis No. RC-622

SERVICE DATA

— 1949 No. 21 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Antennas

This receiver has built-in antenna for standard broadcast (AM) and frequency modulation (FM) reception.

Provision is made for the use of an external antenna for FM reception if desired. To use external FM antenna — remove the built-in FM antenna lead from the "FM" terminals of the antenna terminal board. Connect the transmission line of an external FM dipole antenna to these two "FM" terminals.

FOR RECORD CHANGER SERVICE INFORMATION REFER TO RP-168 SERIES SERVICE DATA AND RP-178 SERIES SERVICE DATA.

Tuning Range

Standard Broadcast (AM)	540-1,600 kc.
Frequency Modulation (FM)	88-108 mc.
Intermediate Frequencies	AM—455 kc., FM—10.7 mc.

Tube Complement

(1) RCA 6BJ6	R-F Amplifier
(2) RCA 6J6	Mixer and Oscillator
(3) RCA 6BA6	I-F Amplifier
(4) RCA 6AU6	Driver
(5) RCA 6AL5	Ratio Detector
(6) RCA 6AV6	AM Det.—AVC—A-F Amplifier
(7) RCA 6AV6	Ph. Inv.
(8) RCA 6V6GT	Output
(9) RCA 6V6GT	Output
(10) RCA 6X5GT	Rectifier

Dial Lamps (2)	Type No. 51, 6-8 volts, 0.2 amp.
Jewel Lamp	Type No. 51, 6-8 volts, 0.2 amp.

Tuning Drive Ratio .... 18:1 (9 turns of knob)

Power Supply Rating .... 115 volts, 60 cycles, 90 watts

Loudspeaker (92569-6W)

Size and type	12 in. PM
Voice coil impedance	3.2 ohms at 400 cycles

Power Output

(Radio) Undistorted 5 watts	Maximum 6.4 watts
(Phono.) Undistorted 8 watts	Maximum 9 watts

Cabinet Dimensions

Height 31½ in. Width 39¾ in. Depth 17½ in.

Record Changer (RP-168)

Turntable speed	45 r.p.m.
Record capacity	Up to 10 fine groove records
Pickup	Crystal (medium output)

Record Changer (RP-178)

Turntable speed	78 r.p.m.
Record capacity	Twelve 10-in. or ten 12-in.
Pickup	Crystal (standard output)

Circuit Description

This instrument has a ten-tube (including rectifier) chassis which is very similar to those used in other RCA Victor radio-phonograph combinations designed for AM-FM reception.

The selector switch has five functions:

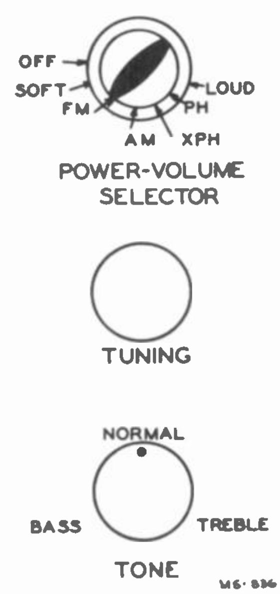
(1) Selection of tuning range.

(2) Selection and distribution of a.v.c. voltages.

(3) Application of B+ voltage to tubes V1, V2, V3 and V4.

(4) Selection of audio input applied to the volume control.

(5) Application of a.c. power to the record changer motors.



Operating Controls

CRITICAL LEAD DRESS

Model 9W106 — RC622

Note: The leads listed may not be critical in all receivers. However, by dressing the leads as specified, unusual difficulties will be minimized.

1. The plate lead of the second IF transformer should be dressed down against the chassis to obtain max. capacity between the lead and chassis. This lead is specified to be two inches long.
2. The "A" band RF transformer plate, and grid leads should be dressed so as to minimize coupling to the RF amplifier grid circuit, and kept close to chassis when possible.
3. The 2.2 meg. grid resistors connecting to the RF and mixer grids should have a minimum practicable amount of lead extending on the grid end. The leads should be cut off short on the grid end and long on the A.V.C. end.
4. The unshielded plate lead from the function switch to the 1st IF transformer should be dressed away from the switch wafer audio lugs as much as possible.
5. The ground strap between the RF shelf and chassis should be well soldered and kept as short as practicable. FM instability may be caused by having this ground strap too long, particularly when no input is connected to the FM antenna terminal.
6. The lead from the 2nd IF to the grid of the 6BA6 1st IF amplifier should be kept short, and dressed against the chassis as much as practicable.
7. The lead from the 2nd IF to the AM detector diode should be dressed to minimize coupling to the 6AV6 1st AF grid and kept close to chassis.
8. Leads from the volume control taps should be kept clear of all filament and output plate wires as in the wiring sample.
9. The loop cable when connected to the AM sec. gang stator should be dressed to have minimum capacity coupling to the stator lug on the RF section of gang condenser.
10. The oscillator coupling condenser C10 should be dressed to have minimum capacity to the mixer grid, Pin No. 5 on V2.
11. The shielding on the shielded lead from the volume control to the function switch should have the minimum practicable exposed wire at the function switch end.

Alignment Procedure

CORRECT ALIGNMENT OF THE FM BAND REQUIRES THAT THE AM BAND BE ALIGNED FIRST

Alignment Indicators:

An RCA VoltOhmyst or equivalent meter is necessary for measuring developed d-c voltage during FM alignment. Connections are specified in the alignment tabulation. An output meter is also necessary to indicate minimum audio output during FM Ratio Detector alignment. Connect the output meter across the speaker voice coil.

The RCA VoltOhmyst can also be used as an AM alignment indicator, either to measure audio output or to measure a-v-c voltage.

When audio output is being measured the volume control should be turned to maximum.

Signal Generator:

For all alignment operations connect the low side of the signal generator to the receiver chassis. The output should be adjusted to provide accurate resonance indication at all times. If output measurement is used for AM alignment the output of the signal generator should be kept as low as possible to avoid a-v-c action.

Oscilloscope Alignment:

The FM I-F alignment may be checked using a sweep generator and an oscilloscope. Shunt terminals B and C of T4 with a 1200 ohm resistor. Connect the high side of an oscilloscope to terminal C of T4 in series with a diode probe. Apply the output of the sweep generator (10.7 mc. with ±250 kc. sweep) to pin No. 1 of V3 (6BA6) in series with .01 mf. Low side of the oscilloscope and sweep generator to chassis. This will show the response of T3.

To check the combined response of T2 and T3: connect the sweep generator to the FM antenna terminals (remove FM antenna lead) in series with 300 ohms. Note: One FM terminal is grounded—it may be necessary to reverse the sweep generator connections. Oscilloscope connections remain as connected.

To check the ratio detector response: connect the high side of the oscilloscope direct to terminal No. 9 of S1, low side to chassis. Apply the output of the sweep generator to pin No. 1 of V4 (6AU6) in series with .01 mf. Driver plate circuit connected for normal operation (1200 ohm resistor removed). Note: It is difficult to observe marker signals in this step—center frequency and sweep width should be previously observed.

AM Alignment

RANGE SWITCH IN BC POSITION

Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 5 of V2 in series with .01 mfd.	455 kc.	Quiet point at low freq. end.	AM windings.† T3 bottom core (sec.). T3 top core (pri.).
2				AM windings.† T2 top core (sec.). T2 bottom core (pri.).
3	Short wire placed near loop for radiated signal	1400 kc.	1400 kc.	C1-2T (osc.). C1-5T (ant.). C1-4T (rf.).
4		600 kc.	600 kc.	L8 (osc.) with 10,000 ohms resistor from RF stator to gnd. (rocking gang)
5				L5 (RF) with the 10,000 ohms removed.
6	Repeat steps 3, 4 and 5 until no improvement in sensitivity is obtained.			

† Use alternate loading.

Alternate loading involves the use of a 47,000 ohm resistor to load the AM plate winding while the AM grid winding of the SAME TRANSFORMER is being peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked. Only one winding is loaded at any one time. Remove the 47,000 ohm resistor after T3 and T2 have been aligned.

Oscillator frequency is above signal frequency on both AM and FM.

FM Alignment

RANGE SWITCH IN FM POSITION—VOLUME CONTROL MAXIMUM

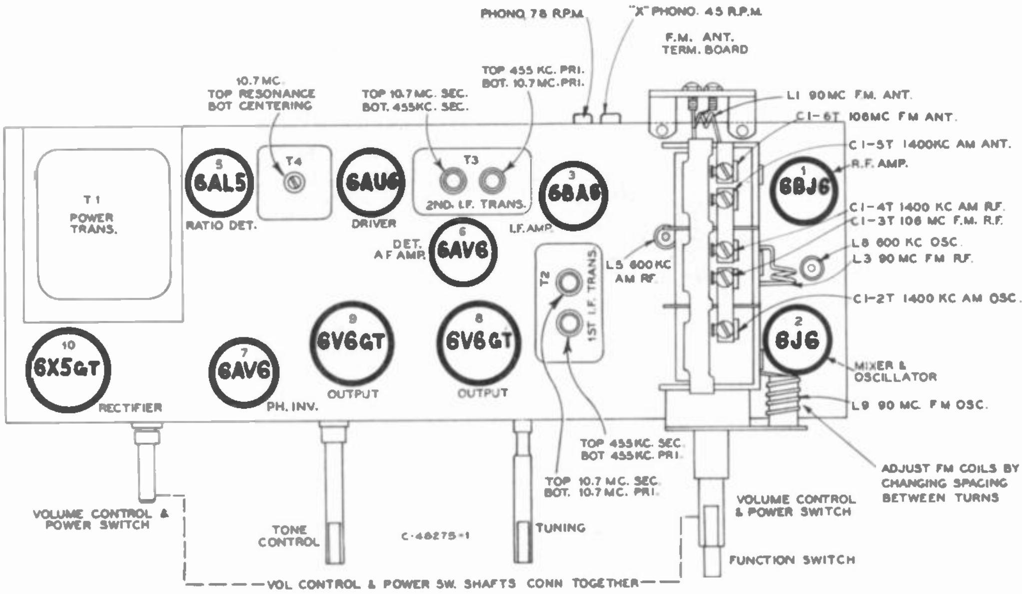
Steps	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 2 mfd. capacitor C42 and the common lead to chassis. Turn gang condenser to max. capacity (fully meshed). Volume Control max.			
2	Pin 1 of V4 6AU6 in series with 470 ohm resistor.	10.7 mc. modulated 30% 400 cycles AM (Approx. .05 volt).	Max. capacity (fully meshed).	T4 top core for max. d-c voltage across C42. T4 bottom core for min. audio output. *
3		10.7 mc. Adjust to provide about 4 volts indication on VoltOhmyst during alignment.		FM windings.†† T3 top core (sec.). T3 bottom core (pri.).
4				FM windings.†† T2 top core (sec.). T2 bottom core (pri.).
5	High and low side of signal gen. through two 120 ohm resistors. To ant. terminals.	90 mc.	90 mc.‡	L9 (osc.).**
6		106 mc.	106 mc.	C1-6T (ant.). C1-3T (rf.).
7		90 mc.	90 mc.	L1 (ant.).** L3 (rf.).**
8	Repeat steps 6 and 7 until no improvement in sensitivity is obtained.			

* Two or more points may be found which lower the audio output. At the correct point the minimum audio output is approached rapidly and is much lower than at any incorrect point.

†† Align T3 and T2 by means of alternate loading as explained under AM alignment. Use a 680 ohm resistor instead of a 47,000 ohm resistor and load the FM windings.

** L1, L3 and L9 are adjustable by increasing or decreasing the spacing between turns.

‡ After dial pointer has been set accurately on calibration point for "A" band (see dial indicator and drive drawing) tune receiver to 90 mc. on FM using dial scale as reference or use dial scale drawing on page 8.

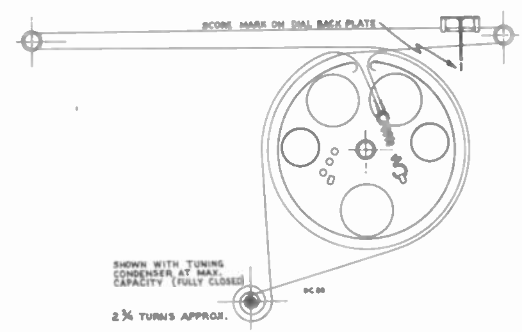


Tube and Trimmer Locations

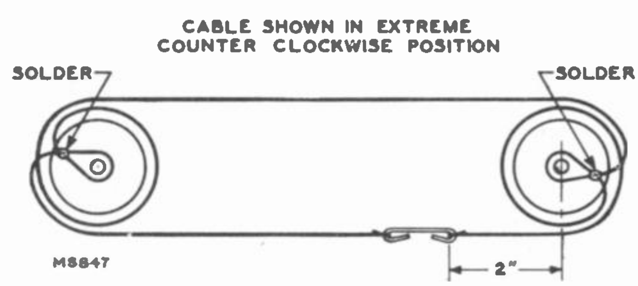
Socket Voltages

Voltages measured with Chanalyst or VoltOhmyst and should hold within ±20% with rated line voltage. Tuning condenser closed—no signal input.

Tube	Terminal		Voltage		
			Phono	A.M.	F.M.
V1 6BJ6 R.F. Amp.	Plate	5	—	185	110
	Screen	6	—	120	100
	Cathode	2	—	0.8	0.8
	Grid	1	–0.9	–0.0	–0.6
V2 6J6 Mixer and Osc.	Plate	1	—	73	80
	Grid	6	–1.07	–2	–3.4
	Plate	2	—	56	56
	Grid	5	–0.54	–5.4	–3.6
V3 6BA6 I.F. Amp.	Plate	5	—	180	178
	Screen	6	—	115	111
	Cathode	7	—	0.9	0.9
	Grid	1	–0.95	–1.1	–.75
V4 6AU6 Driver	Plate	5	—	174	175
	Screen	6	—	125	175
	Cathode	7	—	0.9	0.9
V5 6AL5 Ratio Det.	——	—	—	—	—
V6 6AV6 A.F. Amp.	Plate	7	97	85	80
	Grid	1	–.72	–.75	–0.75
V7 6AV6 Inverter	Plate	7	140	110	110
	Grid	1	–18.7	–17.8	–17.3
	Cathode	2	–18	–17	–16.6
V8 6V6GT Output	Plate	3	262	270	270
	Screen	4	262	190	190
	Grid	5	–18	–17	–16
V9 6V6GT Output	Plate	3	262	270	270
	Screen	4	262	190	190
	Grid	5	–18	–17	–16
V10 6X5GT Rectifier	Cathode	8	271	275	275



Dial Indicator and Drive Mechanism

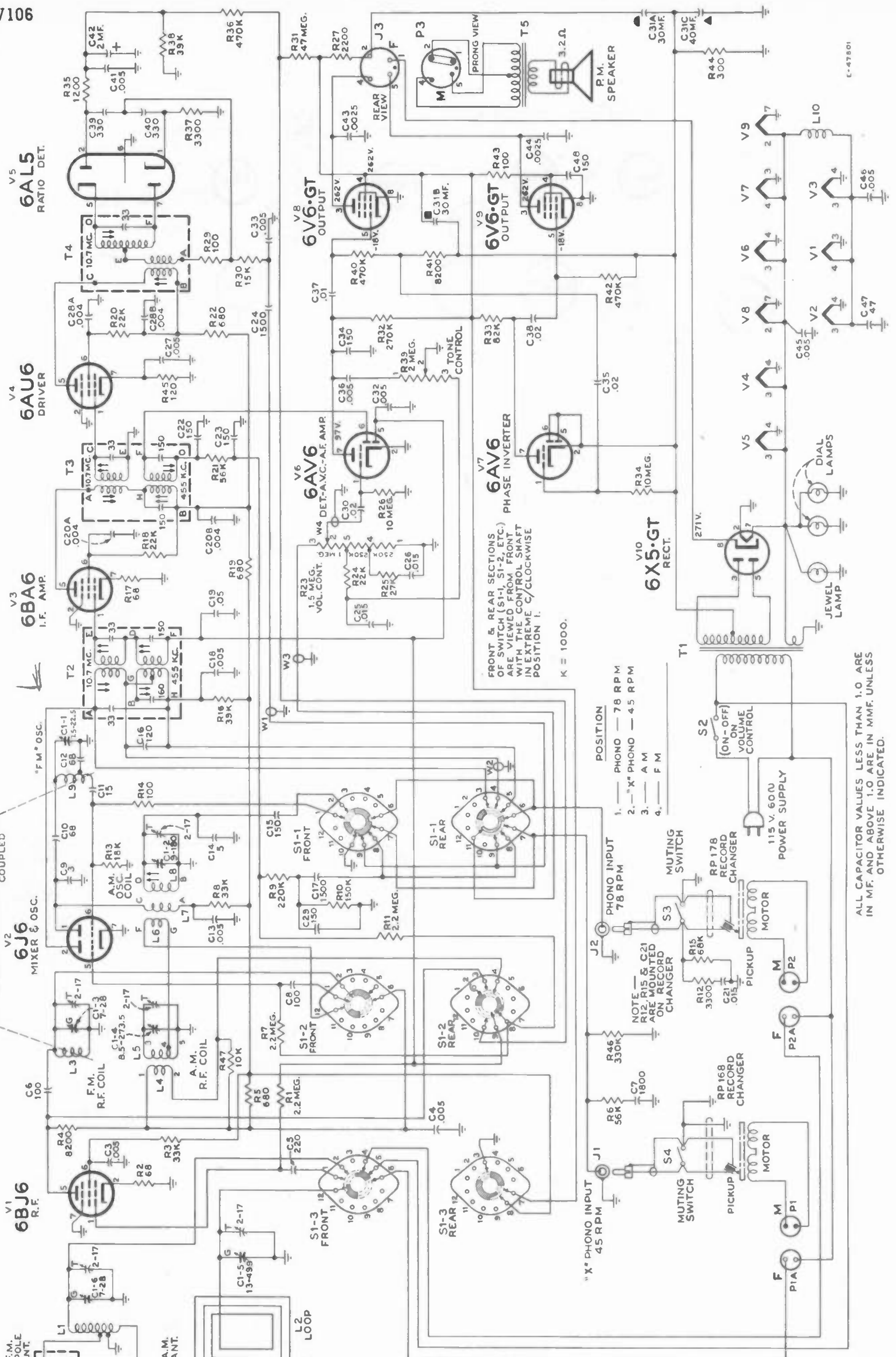


Volume Control Drive Mechanism

Cathode Currents (MA)

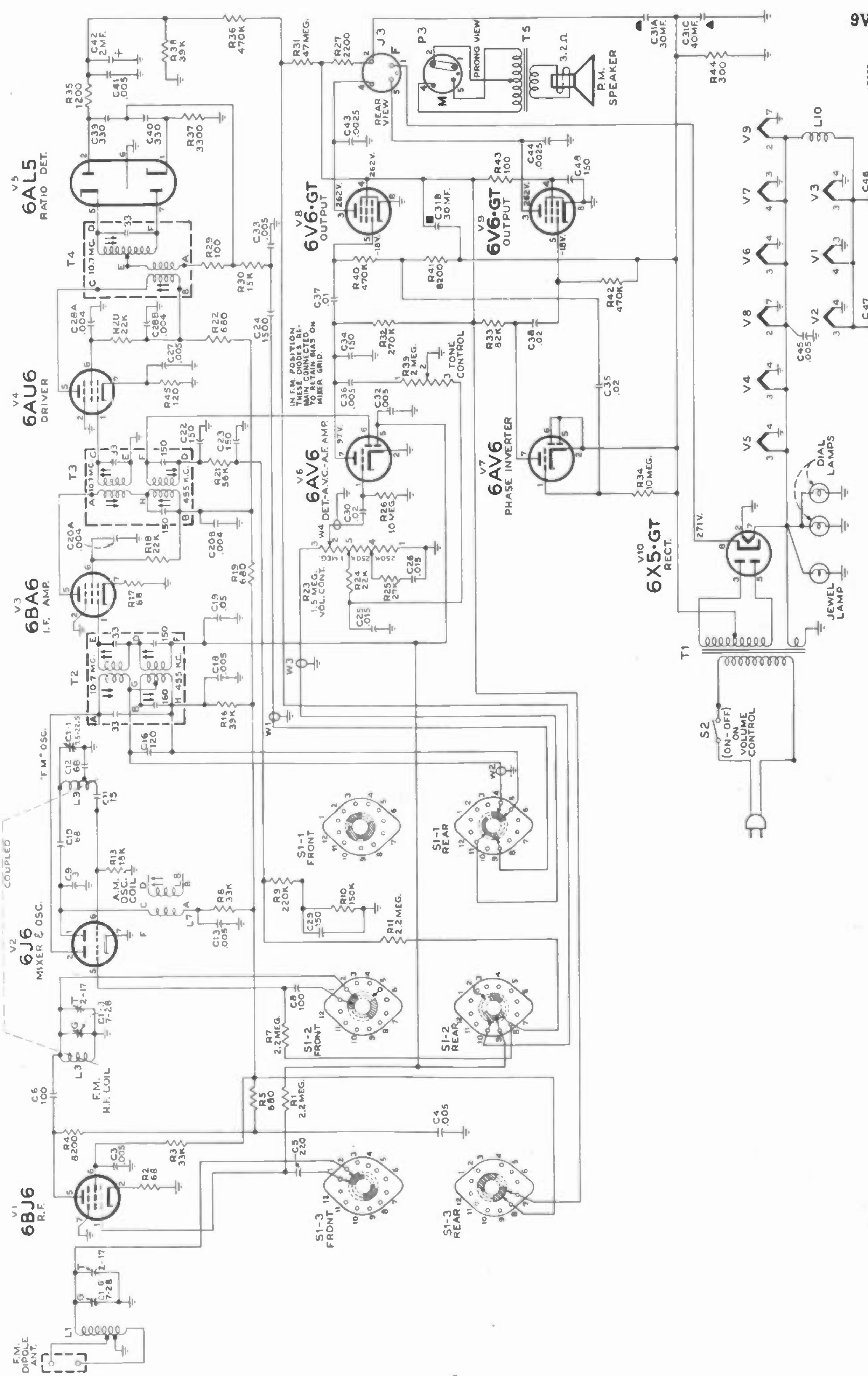
Tube	Terminal	Phono	A.M.	F.M.
V1 6BJ6	2	—	11.1	11.4
V2 6J6	7	—	6.8	6.6
V3 6BA6	7	—	13.1	13.7
V4 6AU6	7	—	8.2	8.1
V5 6AL5	1 & 5	—	—	—
V6 6AV6	2	0.68	.44	.43
V7 6AV6	2	1.7	1.4	1.35
V8 6V6GT	8	33	11.2	11
V9 6V6GT	8	33	11	11
V10 6X5GT	8	66	63	63

9W106

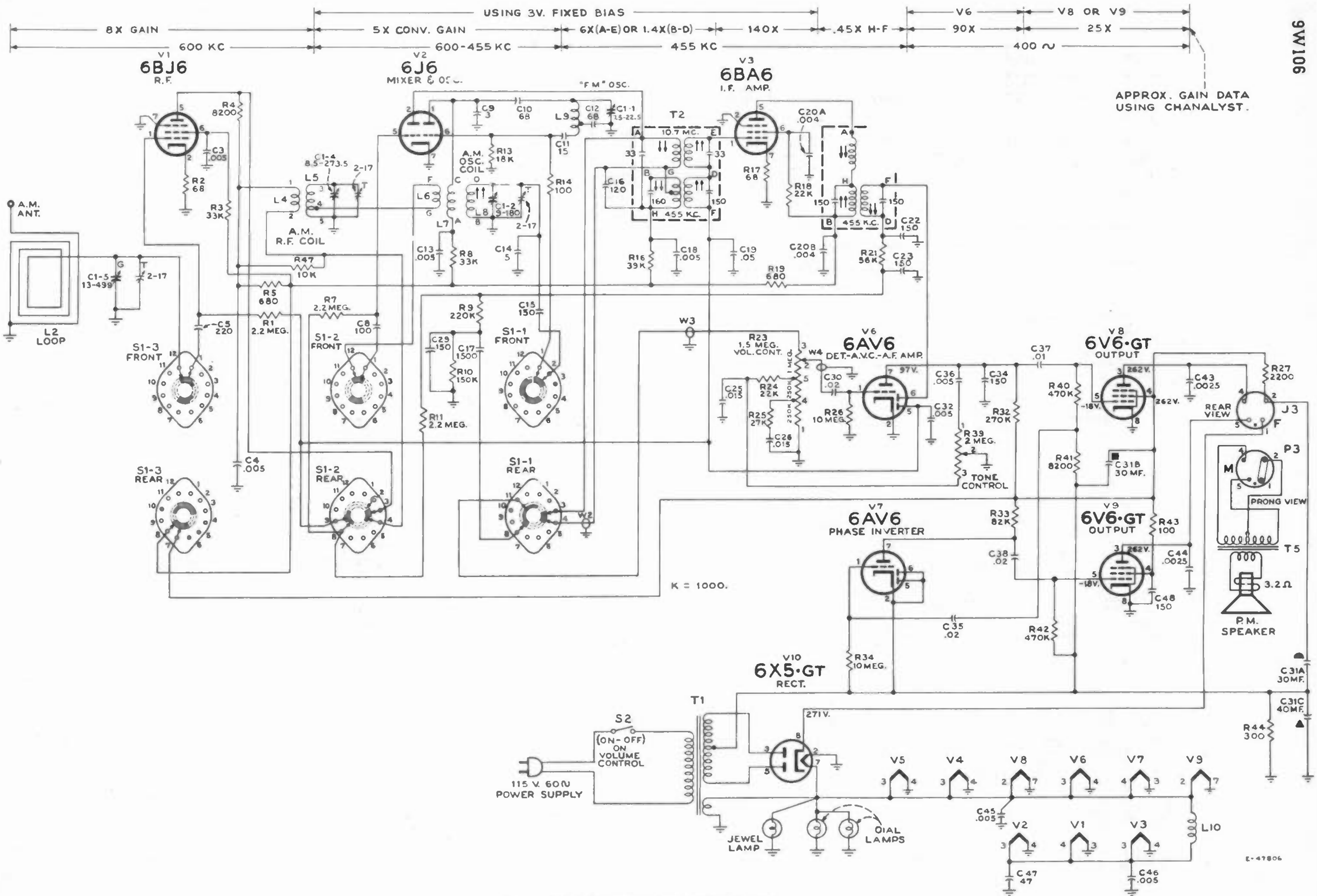


Complete Schematic Diagram

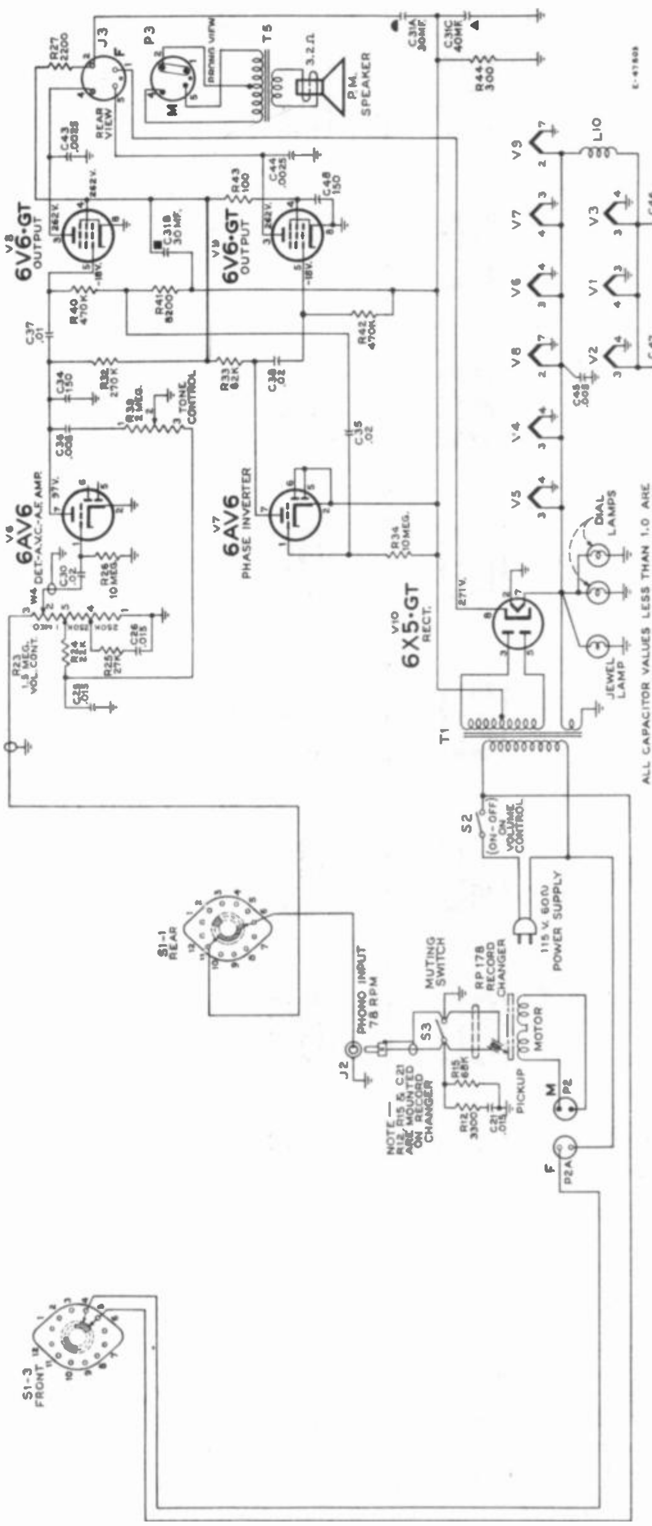
9W106



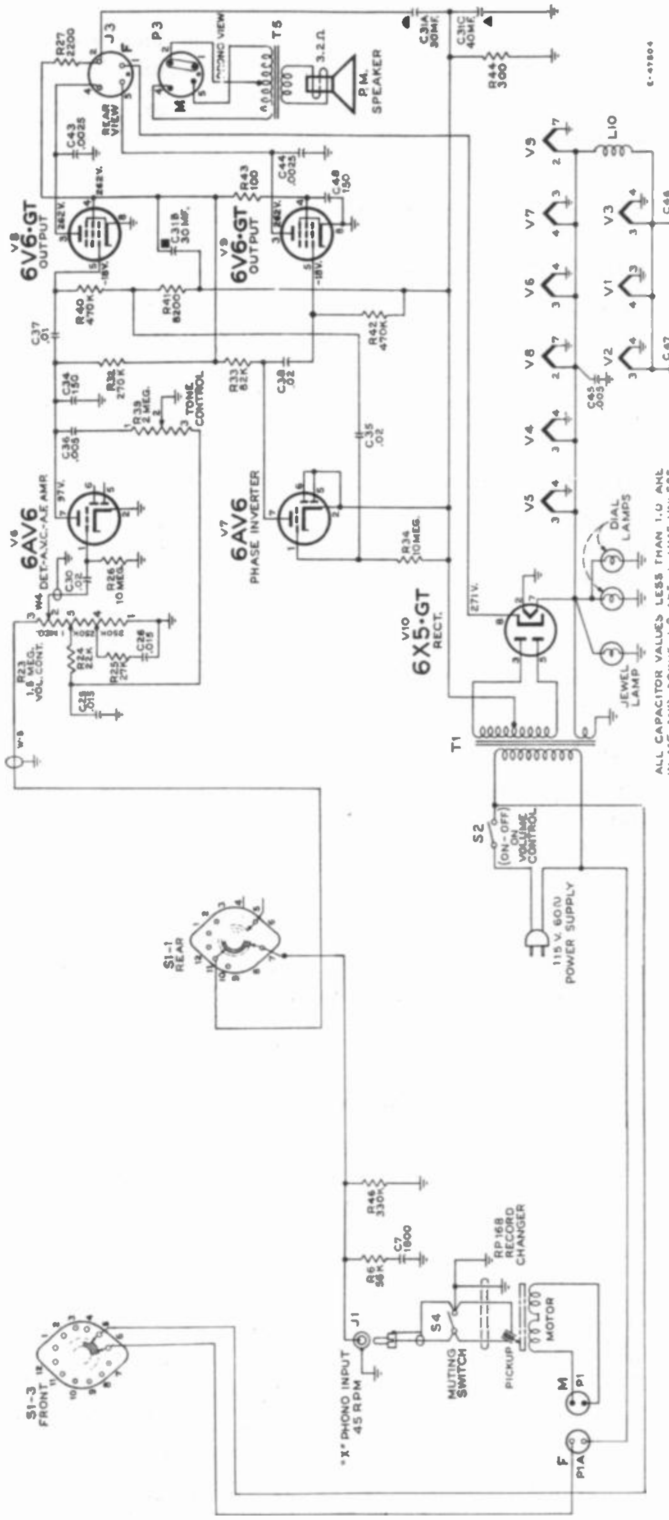
Simplified Schematic Diagram "FM" Position



Simplified Schematic Diagram "AM" Position



Simplified Schematic Diagram of 78 RPM Phonograph



Simplified Schematic Diagram of 45 RPM Phonograph

SHIPPING SCREWS

The radio chassis of these instruments is secured to the cabinet with shipping screws (painted red) which, together with spacing strips, should be **REMOVED** at the time of installation.

The record changers are each mounted with three screws which should be **LOOSENED** at the time of installation.

On the RP-168A-1 record changer decorative caps cover the mounting screws. Unscrew the caps for access to the screws.

RP-168 RECORD CHANGER

Pickup Landing Adjustment "A"

The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.

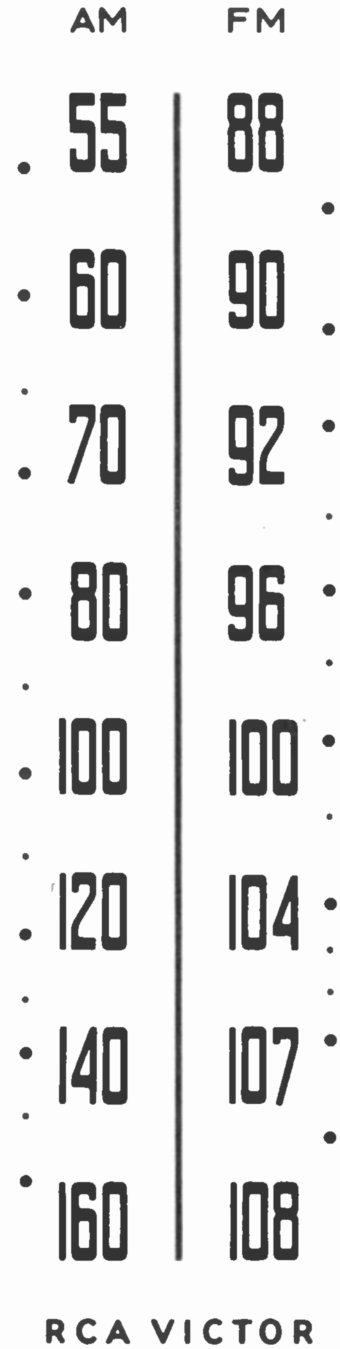
Record Separators

During service work the position of the star wheel on the underside of the record changer may be accidentally shifted; this may cause the record separator knives to be extended when in the out of cycle position.

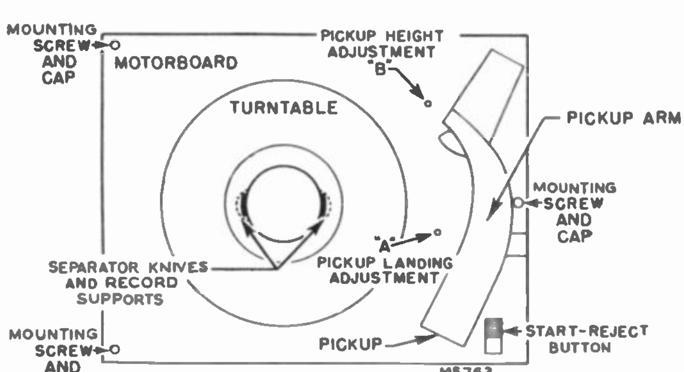
If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

CARE OF SAPPHIRE

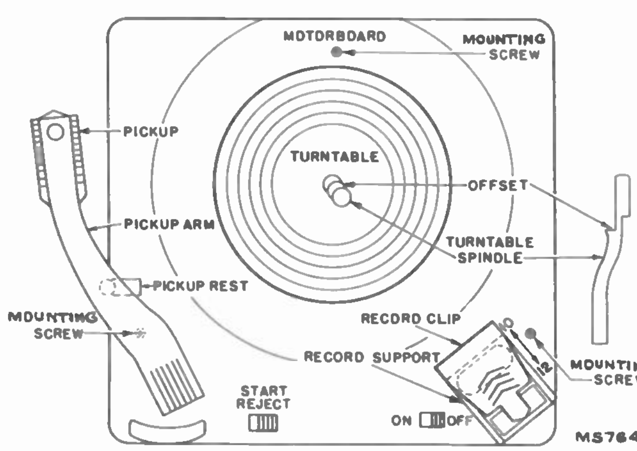
The sapphire point on the pickup is protected with a permanent metal guard. Lint may collect to clog the opening in the guard at the sapphire point and cause poor record reproduction. Occasional cleaning may be necessary; brush carefully with a small soft brush.



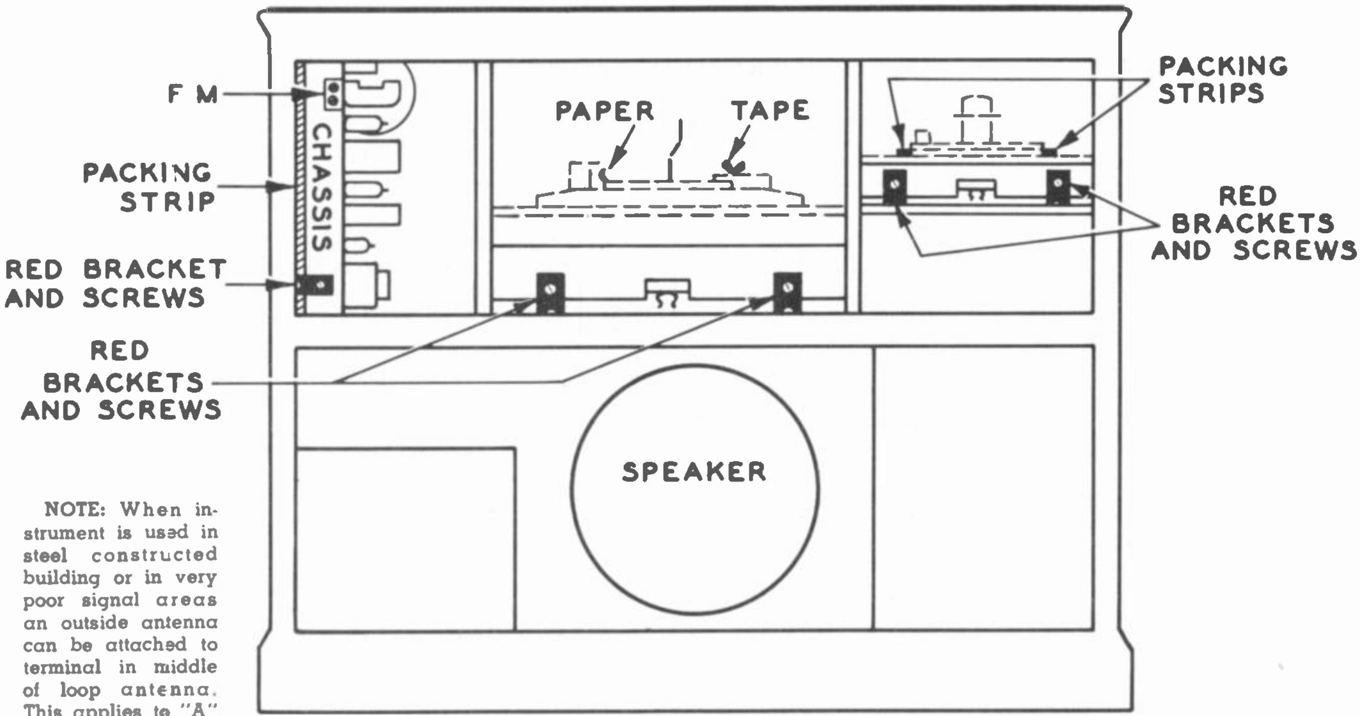
Dial Scale (Actual Size)



Top View—RP-168 Record Changer



Top View RP-178 Record Changer



NOTE: When instrument is used in steel constructed building or in very poor signal areas an outside antenna can be attached to terminal in middle of loop antenna. This applies to "A" band operation.

Rear View Showing Location of Various Units

REPLACEMENT PARTS

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 622	74841	Coil—R.F. coil — A.M. — complete with adjustable core and stud (L4, L5)
74848	Board—"F.M." terminal board	74815	Coil—R.F. coil—F.M. (L3)
74641	Cable—Flexible cable to operate volume control	74816	Coil—Antenna coil—F.M. (L1)
74849	Capacitor—Variable tuning capacitor (C1-1, 1-2, 1-3, 1-4, 1-5, 1-6)	73817	Coil—Oscillator coil—F.M. (L9)
73747	Capacitor—Electrolytic, 2 mmf., 50 volts (C42)	71942	Coil—Filament choke coil (L10)
74733	Capacitor—Ceramic, 3 mmf. (C9)	5040	Connector—4 contact female connector for speaker cable (P3)
93056	Capacitor—Ceramic, 5 mmf. (C14)	30868	Connector—2 contact female connector for motor cables (P2A)
39044	Capacitor—Ceramic, 15 mmf. (C11)	74837	Control—Tone control (R39)
39042	Capacitor—Ceramic, 47 mmf. (C47)	74639	Control—Volume control and power switch (R23, S2)
33379	Capacitor—Ceramic, 68 mmf. (C10, C12)	72953	Cord—Drive cord (approx. 58" overall length)
39396	Capacitor—Ceramic, 100 mmf. (C6, C8)	74839	Fastener—Push fastener to hold R.F. shelf assembly (4 required)
71614	Capacitor—Ceramic, 120 mmf. (C16)	74838	Grommet—Power cord strain relief grommet (1 set)
44704	Capacitor—Ceramic, 150 mmf. (C15, C22, C23, C34, C48)	16058	Grommet—Rubber grommet for mounting R.F. shelf assembly (4 required)
48125	Capacitor—Ceramic,150 mmf. (C29)	72069	Grommet—Rubber grommet for rear mounting feet (2 required)
71920	Capacitor—Ceramic, 220 mmf. (C5)	73895	Indicator—Station selector indicator
39640	Capacitor—Mica, 330 mmf. (C39, C40)	74645	Nut—8-32 hex retainer nut between R.F. shelf and volume control knob
74093	Capacitor—Ceramic, 1,500 mmf. (C17, C24)	74297	Plate—Dial back plate complete with two (2) drive cord pulleys less dial
74850	Capacitor—Ceramic, 1,800 mmf. (C7)	18469	Plate—Bakelite mounting plate for electrolytic
74009	Capacitor—Ceramic, dual, 4,000 mmf. (C20A, C20B, C28A, C28B)	74640	Pulley—Pulley and hub assembly for volume control
73473	Capacitor—Ceramic, 5,000 mmf. (C3, C4, C13, C18, C32, C46)	33514	Receptacle—Phono input receptacle
72052	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 450 volts, 1 section of 30 mfd, 350 volts and 1 section of 40 mfd, 25 volts (C31A, C31B, C31C)	73637	Resistor—Wire wound, 2,200 ohms, 5 watt (R27)
71926	Capacitor—Tubular, paper, .005 mfd, 200 volts (C27, C33, C41, C45)		Resistor—Fixed, composition: 68 ohms, ±10%, ½ watt (R2, R17)
71553	Capacitor—Tubular, paper, .005 mfd, 400 volts (C36)		100 ohms, ±5%, ½ watt (R29)
70644	Capacitor—Tubular, paper, .0025 mfd, 1,000 volts (C43, C44)		100 ohms, ±10%, ½ watt (R14, R43)
			120 ohms, ±10%, ½ watt (R45)
71925	Capacitor—Tubular, paper, .01 mfd, 400 volts (C37)		300 ohms, ±5%, 2 watt (R44)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C30, C35)		680 ohms, ±10%, ½ watt (R19)
			680 ohms, ±20%, ½ watt (R5, R22)
73638	Capacitor—Tubular, paper, .02 mfd, 400 volts (C38)		1,200 ohms, ±5%, ½ watt (R35)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C19)		3,300 ohms, ±5%, ½ watt (R37)
72120	Capacitor—Tubular, paper, .015 mfd, 200 volts (C25, C26)		8,200 ohms, ±10%, ½ watt (R41)
			8,200 ohms, ±10%, 1 watt (R4)
73744	Coil—Oscillator coil—A.M. (L6, L7, L8)		10,000 ohms, ±10%, ½ watt (R47)

REPLACEMENT PARTS — Continued

STOCK No.	DESCRIPTION
	15,000 ohms, ±10%, ½ watt (R30)
	18,000 ohms, ±10%, ½ watt (R13)
	22,000 ohms, ±10%, ½ watt (R18, R20, R24)
	27,000 ohms, ±10%, ½ watt (R25)
	33,000 ohms, ±10%, ½ watt (R3, R8)
	39,000 ohms, ±5%, ½ watt (R38)
	39,000 ohms, ±10%, 1 watt (R16)
	56,000 ohms, ±10%, ½ watt (R6, R21)
	82,000 ohms, ±10%, ½ watt (R33)
	150,000 ohms, ±10%, ½ watt (R10)
	220,000 ohms, ±10%, ½ watt (R9)
	270,000 ohms, ±10%, ½ watt (R32)
	330,000 ohms, ±10%, ½ watt (R46)
	470,000 ohms, ±10%, ½ watt (R36, R40, R42)
	2.2 megohm, ±20%, ½ watt (R1, R7, R11)
	10 megohm, ±20%, ½ watt (R26, R34)
	47 megohm, ±20%, ½ watt (R31)
73894	Shaft—Tuning knob shaft
73584	Shield—Tube shield for V1
74646	Sleeve—Sleeve and pulley assembly for volume control knob
74179	Socket—Tube socket, 7 pin, miniature for V1, V2, V3, V4
73117	Socket—Tube socket, 7 pin, miniature for V5, V6, V7
31251	Socket—Tube socket, octal, wafer for V8, V9, V10
31364	Socket—Lamp socket
74038	Spring—Drive cord spring
74847	Support—Polystyrene support for F.M. oscillator coil complete with mounting bracket
74840	Switch—Selector switch (S1)
73743	Transformer—Ratio detector transformer (T4)
73745	Transformer—First I.F. transformer—dual (T2)
74019	Transformer—Second I.F. transformer—dual (T3)
73601	Transformer—Power transformer—117 volt, 60 cycle (T1)
33726	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLY
	92569-6W
13867	Cap—Dust cap
73934	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker
74753	Speaker—12" P.M. (6.8 oz.) speaker complete with cone and voice coil (3.2 ohm), less output transformer and plug
71145	Suspension—Metal cone suspension
73636	Transformer—Output transformer
	NOTE: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74844	Antenna—F.M. antenna
74205	Bezel—Dial scale bezel less dial
71599	Bracket—Pilot lamp bracket
74296	Cable—Shielded pickup cable complete with pin plug
13103	Cap—Pilot lamp jewel
72120	Capacitor—Tubular, .015 mfd (C21)
71892	Catch—Bullet catch and strike for cabinet doors (3 required)
73897	Clamp—Dial clamp (2 required)
X3057	Cloth—Grille cloth for mahogany or walnut instruments
X1649	Cloth—Grille cloth for blonde instruments
30870	Connector—2 contact female connector for motor cables
30868	Connector—2 contact male connector for motor cables
74581	Cover—Mounting screw cover (plug-in type) for 45 RPM changer (3 required)
74853	Decal—Control panel decal for mahogany or walnut instruments
74854	Decal—Control panel decal for blonde instruments
74273	Decal—Trade mark decal (Victrola)
71984	Decal—Trade mark decal (RCA Victor)
74842	Dial—Glass dial scale
74851	Grille—Metal grille
11889	Grommet—Rubber grommet for front apron of chassis (2 required)
72856	Grommet—Rubber grommet to mount 78 RPM changer (3 required)
74838	Grommet—Strain relief grommet (1 set)
36610	Hinge—Door hinge (1 set) for radio compartment door or R.H. record storage compartment door
36817	Hinge—L.H. record storage compartment door hinge (1 set)
71821	Knob—Tuning control knob—maroon—for mahogany or walnut instruments
72824	Knob—Tuning control knob—brown—for blonde instruments
71822	Knob—Tone control knob—maroon—for mahogany or walnut instruments
72824	Knob—Tone control knob—brown—for blonde instruments
73994	Knob—Volume control knob—maroon—for mahogany or walnut instruments
73995	Knob—Volume control knob—brown—for blonde instruments
73230	Knob—Selector switch knob—maroon—for mahogany or walnut instruments
73231	Knob—Selector switch knob—brown—for blonde instruments
11765	Lamp—Dial or pilot lamp—Mazda 51
74843	Loop—Antenna loop complete (L2)
73109	Nut—Tee nut to mount 78 RPM changer (3 required)
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
74852	Pull—Door pull for record changer drawers or radio compartment door (5 required)
74451	Pull—Door pull for record storage compartment doors (2 required)
	Resistor—Fixed, composition:
	3,300 ohms, ±10%, ½ watt (R12)
	68,000 ohms, ±10%, ½ watt (R15)
73110	Screw—No. ¼-20 x 1¾" fillister head screw to mount 78 RPM changer (3 required)
74582	Screw—No. 8-32 x 1¾" special head screw to mount 45 RPM changer (3 required)
74269	Screw—No. 8-32 x ¾" trimit head screw for door pull No. 74852
74279	Screw—No. 8-32 x ⅞" trimit head screw for door pull No. 74451
74835	Slide—Slide mechanism for 45 RPM changer drawer
74736	Slide—Slide mechanism for 78 RPM changer drawer
30900	Spring—Retaining spring for knobs No. 71821, 71822 and 72824
72845	Spring—Retaining spring for knobs No. 73994 and 73995
14270	Spring—Retaining spring for knobs No. 73230 and 73231
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74222	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower (3 required)
72936	Stop—Door stop for record storage compartment doors (2 required)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

AC-DC Radio Receiver

MODELS 9X561, 9X562

Chassis No. RC-1079-B RC-1079-C

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 17 —

PH428

9X561 Maroon

9X562 Ivory

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc

Intermediate Frequency .... 455 kc

Tube Complement
(1) RCA 12SA7 .... Converter
(2) RCA 12SK7 .... I-F Amplifier
(3) RCA 12SQ7 .... Det.—A.V.C.—A-F Amp.
(4) RCA 50L6GT .... Output
(5) RCA 35Z5GT .... Rectifier

Power Supply Rating
115 volts a.c., 50 to 60 cycles or d.c. .... 30 watts

Power Output
Undistorted .... .85 watts
Maximum .... 1.1 watts

Dial Lamps (2) ..... Mazda type 1490, 3.2 volts, .16 amp.

Loudspeaker (92586-4)
Size and Type .... 8 in. PM
Voice Coil Impedance .... 3.2 ohms at 400 cycles

Cabinet Dimensions
Height... 9¼" Width... 12½" Depth... 8⅜"

Weight .... 9 lbs.

Tuning Drive Ratio .... 9 to 1 (4½ turns of knob)

POWER SUPPLY POLARITY.— For operation on d.c., the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a.c., reversal of the plug may reduce hum.

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1079B—9X561
	RC 1079C—9X562
74655	Back—Cabinet back (maroon) and loop assembly for Model 9X561 .... L1
74656	Back—Cabinet back (ivory) and loop assembly for Model 9X562 .... L1
74653	Capacitor—Variable tuning capacitor .. C1, C2, C3, C4
71924	Capacitor—Ceramic, 56 mmf C5
74661	Capacitor—Ceramic, 470 mmf C14
74662	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 150 volts and 1 section of 50 mfd. 150 volts C16A, C16B
73186	Capacitor—Tubular, .001 mfd., 400 volts C9
71927	Capacitor—Tubular, .002 mfd., 400 volts C15
71923	Capacitor—Tubular, .01 mfd., 200 volts C12
72827	Capacitor—Tubular, .01 mfd., 400 volts C17
71928	Capacitor—Tubular, .02 mfd., 200 volts C13
73553	Capacitor—Tubular, .05 mfd., 400 volts C8, C18
70617	Capacitor—Tubular, 0.1 mfd., 400 volts C19, C6
73935	Clip—Mounting clip for I.F. transformers
74448	Coil—Oscillator coil L2, L3
35767	Connector—Phono input connector (socket)
74133	Control—Volume control and power switch .. R10, S1
†72953	Cord—Drive cord (approx. 43" overall length required)
73693	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting tuning capacitor (3 required)
74658	Indicator—Station selector indicator (ivory) for Model 9X561
74657	Indicator—Station selector indicator (red) for Model 9X562
71116	Lamp—Dial lamp—Mazda 1490
74651	Plate—Dial back plate (maroon) complete with three (3) pulleys for Model 9X561
74652	Plate—Dial back plate (ivory) complete with three (3) pulleys for Model 9X562
74660	Resistor—Wire wound, 15 ohms, ½ watt R16
	Resistors—Fixed composition resistors:
	82 ohms, ±10%, ½ watt R17
	150 ohms, ±10%, ½ watt R14
	1,000 ohms, ±10%, 1 watt R15
	22,000 ohms, ±10%, ½ watt R2
	33,000 ohms, ±10%, ½ watt R9
	56,000 ohms, ±10%, ½ watt R4
	220,000 ohms, ±10%, ½ watt R12, R18
	330,000 ohms, ±10%, ½ watt R6
	470,000 ohms, ±10%, ½ watt R13
	3.3 megohm, ±10%, ½ watt R5
	10 megohm, ±10%, ½ watt R11
74659	Shaft—Tuning knob shaft and pulley
31251	Socket—Tube socket, octal
74663	Socket—Dial lamp socket
74038	Spring—Tension spring for drive cord
33634	Switch—Phono switch S2
74654	Transformer—Output transformer T3
73036	Transformer—First I.F. transformer T1
73037	Transformer—Second I.F. transformer T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	STAMPED 92586-4
74759	Cone—Cone and voice coil assembly
74664	Speaker—8" P.M. speaker complete with cone and voice coil
	NOTE: If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74665	Bezel—Round bezel for cabinet—polystyrene
Y2131	Cabinet—Plastic cabinet—maroon—for Model 9X561
Y2132	Cabinet—Plastic cabinet — ivory — for Model 9X562
74904	Clamp—Dial clamp
74671	Clip—Dial clip (1 set)
74675	Cloth—Grille cloth for Model 9X561
74756	Cloth—Grille cloth for Model 9X562
74668	Dial—Dial scale
74674	Emblem—"RCA Victor" emblem
74666	Knob—Control knob—maroon—for Model 9X561
74667	Knob—Control knob—ivory—for Model 9X562
74673	Nut—Speed nut to fasten bezel
74669	Screw—No. 8 x ⅝" pan head cross-recessed screw to fasten speaker (4 required)
74670	Screw—No. 8 x 7/16" pan head cross-recessed screw to fasten dial clamps (2 required)
74734	Spring—Spring clip for knob

†Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Alignment Procedure

Lead Dress

1. Dress all heater leads down to chassis and away from all audio grid and plate wiring.
2. Dress power cord down to chassis base and corner.
3. Dress capacitor C18 against back apron.
4. Dress capacitor C13 down to base alongside of shielded lead.
5. Dress output transformer leads down to chassis.
6. Dress capacitors C9 and C15 as direct as possible.
7. Dress dial lamp leads on top of chassis between 12SQ7 and 50L6GT tubes; below chassis, as short as possible to rectifier socket.
8. Dress excess loop leads away from tubes and clear of tuning condenser.

Test-Oscillator. — For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

On AC operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also AC operated.

Dial Calibration

With the tuning condenser fully meshed, the dial pointer should be set to the first score mark at the left-hand end of the dial back plate. The four score marks represent: Max. cap. 600 kc 1400 kc min. cap.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12SK7 I-F grid through 0.1 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1 through 0.1 mfd.			*T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1620 kc	Min. cap.	C4 (osc.)
4		1400 kc	1400 kc	†C2 (ant.)
5		600 kc	600 kc	L3 (osc.) Rock gang
6		Repeat steps 3, 4 and 5.		

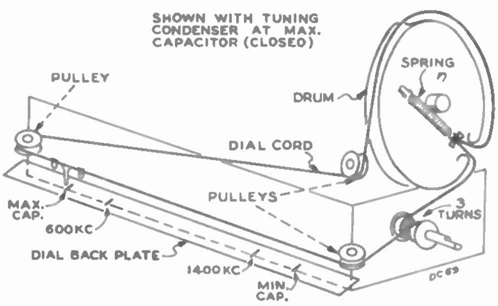
*Do not readjust T2 when test oscillator is connected to C1.

†When adjusting C2 (ant. trimmer) it is necessary to have the loop in the same position and spacing as it will have when assembled in the cabinet.

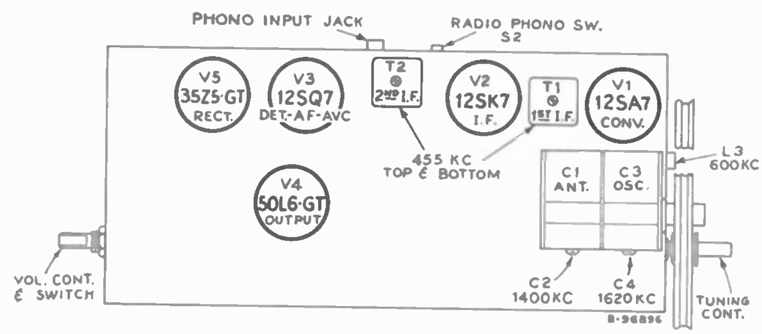
Hum Reduction:

Due to the excellent bass reproduction of these instruments, the precautionary lead dress should be closely observed for minimum hum in the output.

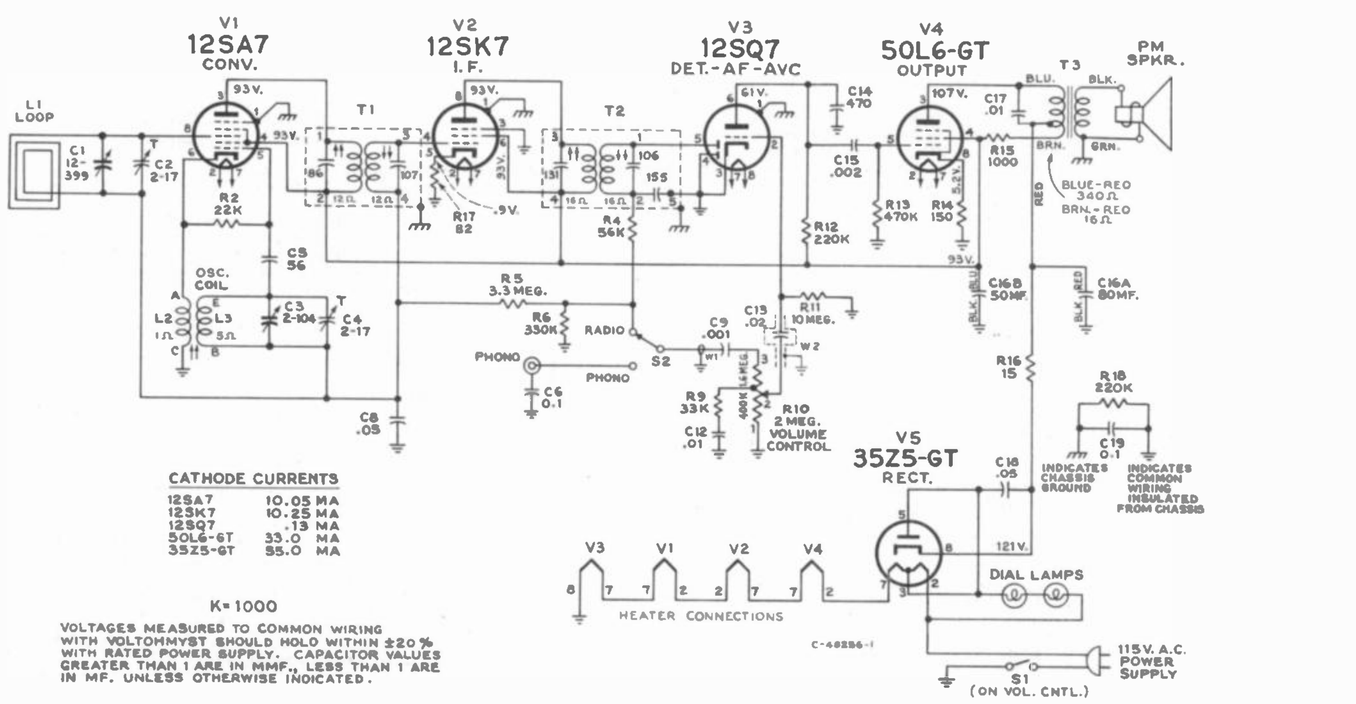
A shield has been added to capacitor C13 and is connected to common wiring. The outside foil polarity of capacitors C9, C12 and C13 should not be reversed.



Dial Indicator and Drive Cord



Tube and Trimmer Locations



Schematic Circuit Diagram

RCA VICTOR

AC-DC Radio Receiver

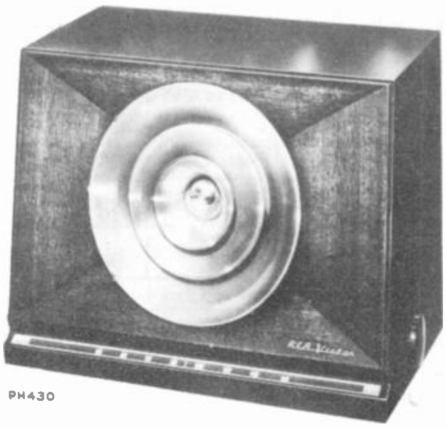
MODELS 9X571, 9X572

Chassis No. RC-1079 RC-1079A RC-1079E RC-1079F

SERVICE DATA

— 1949 No. 16 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.



PH430

9X571 Maroon

9X572 Ivory

Specifications

Tuning Range .... 540-1,600 kc
Intermediate Frequency .... 455 kc
Tube Complement
(1) RCA 12SA7 .... Converter
(2) RCA 12SK7 .... I-F Amplifier
(3) RCA 12SQ7 .... Det.—A.V.C.—A-F Amp.
(4) RCA 50L6GT .... Output
(5) RCA 35Z5GT .... Rectifier
Power Supply Rating
115 volts a.c., 50 to 60 cycles or d.c. .... 30 watts

Dial Lamps (2) ..... Mazda type 1490, 3.2 volts, .16 amp.
Power Output
Undistorted... 1.1 watts Maximum... 1.75 watts
Loudspeaker (92586-2W or 92586-4W)
Size and Type .... 8 in. PM
Voice Coil Impedance .... 3.2 ohms at 400 cycles
Cabinet Dimensions
Height... 9 11/16" Width... 12½" Depth... 8 5/16"
Weight .... 10 lbs.
Tuning Drive Ratio .... 9 to 1 (4½ turns of knob)

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC-1079, RC-1079E Model 9X571
	RC-1079A, RC-1079F Model 9X572
74655	Back—Cabinet back (tan) and loop assembly L1
74653	Capacitor—Variable tuning capacitor. C1, C2, C3, C4
71924	Capacitor—Ceramic, 56 mmf C5
71514	Capacitor—Ceramic, 82 mmf C11
73501	Capacitor—Ceramic, 150 mmf C7, C14
74678	Capacitor—Electrolytic, comprising 2 sections of 120 mfd., 150 volts and 1 section of 40 mfd., 25 volts C16A, C16B, C16C
73186	Capacitor—Tubular, .001 mfd., 400 volts C9
73961	Capacitor—Tubular, .003 mfd., 200 volts C10
71923	Capacitor—Tubular, .01 mfd., 200 volts C12
72827	Capacitor—Tubular, .01 mfd., 400 volts C15, C17
71928	Capacitor—Tubular, .02 mfd., 200 volts C13, C20
73553	Capacitor—Tubular, .05 mfd., 400 volts C8, C18
70617	Capacitor—Tubular, 0.1 mfd., 400 volts C19, C6
73935	Clip—Mounting clip for I.F. transformer
74448	Coil—Oscillator coil L2, L3
35787	Connector—Phono input connector (socket)
71596	Control—Volume control R10
72953	Cord—Dial drive cord—250 ft. (approx. 43" overall length required for each chassis)
73693	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet for mounting tuning capacitor (3 required)
74658	Indicator—Station selector indicator (ivory) for Model 9X571
74657	Indicator—Station selector indicator (red) for Model 9X572
71116	Lamp—Dial lamp—Mazda 1490
74651	Plate—Dial back plate (maroon) complete with three (3) pulleys for Model 9X571
74652	Plate—Dial back plate (ivory) complete with three (3) pulleys for Model 9X572
18469	Plate—Bakelite mounting plate for electrolytic capacitor
72313	Resistor—Fuse type, 33 ohms R16
	Resistors—Fixed composition resistors
	82 ohms, ±10%, ½ watt R17
	150 ohms, ±10%, ½ watt R14
	1,000 ohms, ±10%, 1 watt R15
	18,000 ohms, ±10%, ½ watt R19
	22,000 ohms, ±10%, ½ watt R2
	27,000 ohms, ±10%, ½ watt R9
	56,000 ohms, ±10%, ½ watt R4
	220,000 ohms, ±10%, ½ watt ... R6, R7, R12, R18
	470,000 ohms, ±10%, ½ watt R13
	1 megohm, ±10%, ½ watt R8
	3.3 megohms, ±10%, ½ watt R5
	10 megohms, ±10%, ½ watt R11
74659	Shaft—Tuning knob shaft and pulley
31251	Socket—Tube socket, octal
74663	Socket—Dial lamp sockets and lead assembly
74038	Spring—Tension spring for drive cord
74676	Switch—Function switch for RC-1079, RC-1079A .. S1
75936	Switch—Function switch for RC-1079E, RC-1079F S1
73036	Transformer—First I.F. transformer T1
73037	Transformer—Second I.F. transformer T2
74677	Transformer—Output transformer T3
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	STAMPED 92586-2W
	RL-105C2
74758	Cone—Cone and voice coil assembly
74679	Speaker—8" P.M. speaker complete with cone and voice coil
	SPEAKER ASSEMBLIES
	STAMPED 92586-4W
74759	Cone—Cone and voice coil assembly
74664	Speaker—8" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74683	Base—Grille base for diffuser rings
74687	Button—Diffuser decorative button
Y2133	Cabinet—Plastic cabinet—maroon—less diffuser rings and dial—Model 9X571
Y2134	Cabinet—Plastic cabinet — ivory — less diffuser rings and dial—Model 9X572
74904	Clamp—Dial clamp
74671	Clip—Dial clip (1 set)
74689	Cushion—Rubber cushion between cabinet and grille base
74682	Decal—Function switch decal
74668	Dial—Dial scale
74674	Emblem—"RCA Victor" emblem
74680	Knob—Function switch knob — light tan — for Model 9X572
74681	Knob — Function switch knob — maroon — for Model 9X571
74666	Knob—Volume control or tuning knob—maroon —for Model 9X571
74806	Knob—Volume control or tuning knob—light tan—for Model 9X572
74340	Nut—Speed nut to hold decorative button
74688	Nut—Speed nut to hold diffuser rings (18 required)
74684	Ring—Outer diffuser ring (7" diameter)
74685	Ring—Middle diffuser ring (4 15/32" diameter)
74686	Ring—Inner diffuser ring (2 21/32" diameter)
74301	Screw—No. 8 x 3/8" pan head, cross-recessed screw for mounting grille base (6 required)
74734	Spring—Retaining spring for knobs

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Alignment Procedure

Critical Lead Dress

1. Dress all heater leads down to chassis and away from all audio grid and plate wiring.
2. Dress power cord to back apron and away from phono jack.
3. Dress capacitor C18 against back apron.
4. Connect shielded capacitor C13 direct and with a minimum of exposed leads.
5. Dress dial lamp leads on top of chassis around electrolytic capacitor and between 12SQ7 and 50L6GT tubes.
6. Dress output transformer leads down to chassis.
7. Dress excess loop leads away from tubes and clear of tuning condenser.

Test-Oscillator. — For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

On AC operation an isolation transformer (115 v./115 v.) may be necessary for the receiver if the test oscillator is also AC operated.

Dial Calibration

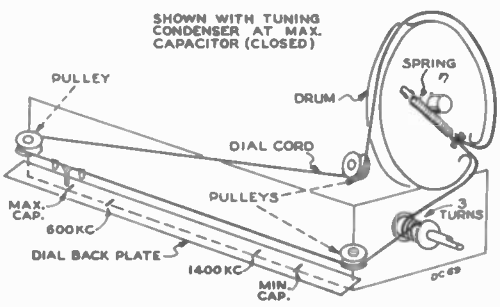
With the tuning condenser fully meshed, the dial pointer should be set to the first score mark at the left-hand end of the dial back plate. The four score marks represent: Max. cap. 600 kc 1,400 kc min. cap.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	12SK7 I-F grid through 0.1 mfd. capacitor	455 kc	Quiet-point 1600 kc end of dial	T2 (top and bottom) 2nd I-F trans.
2	Stator of C1 through 0.1 mfd.	455 kc	Quiet-point 1600 kc end of dial	*T1 (top and bottom) 1st I-F trans.
3	Short wire placed near loop to radiate signal	1620 kc	Min cap.	C4 (osc.)
4	Short wire placed near loop to radiate signal	1400 kc	1400 kc signal	†C2 (ant.)
5	Short wire placed near loop to radiate signal	600 kc	600 kc	L3 (osc.) Rock gang
6		Repeat steps 3, 4 and 5.		

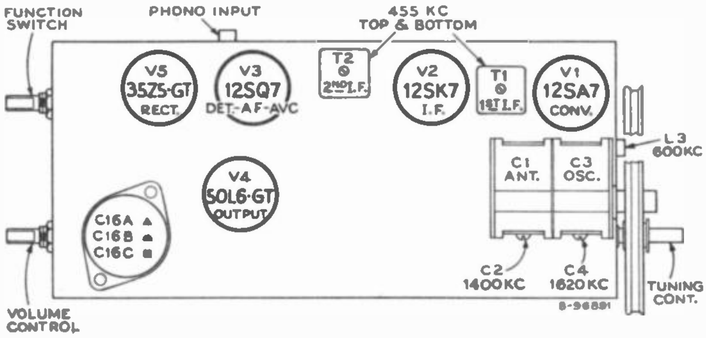
*Do not readjust T2 when test oscillator is connected to C1.

†When adjusting C2 (ant. trimmer) it is necessary to have the loop in the same position and spacing as it will have when assembled in the cabinet.

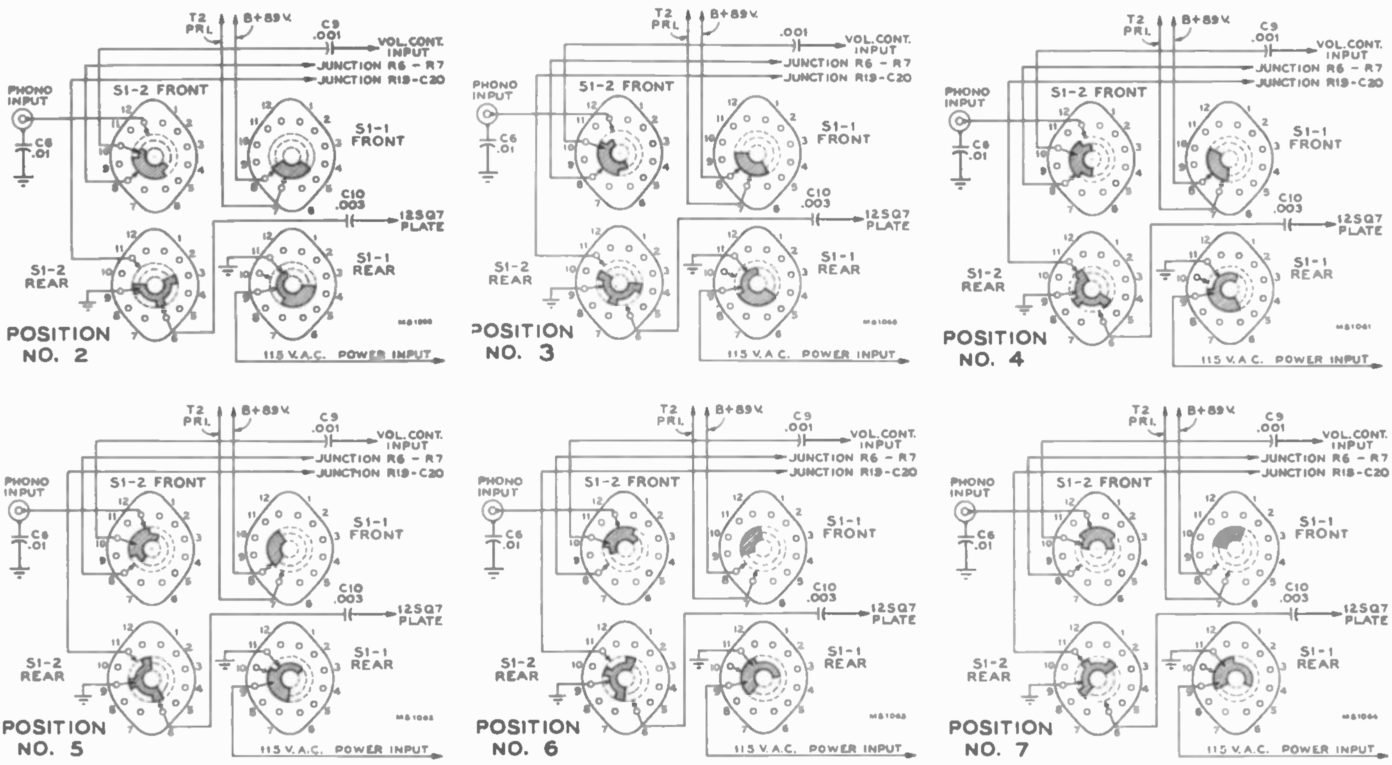
POWER SUPPLY POLARITY. — For operation on d.c., the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a.c., reversal of the plug may reduce hum.



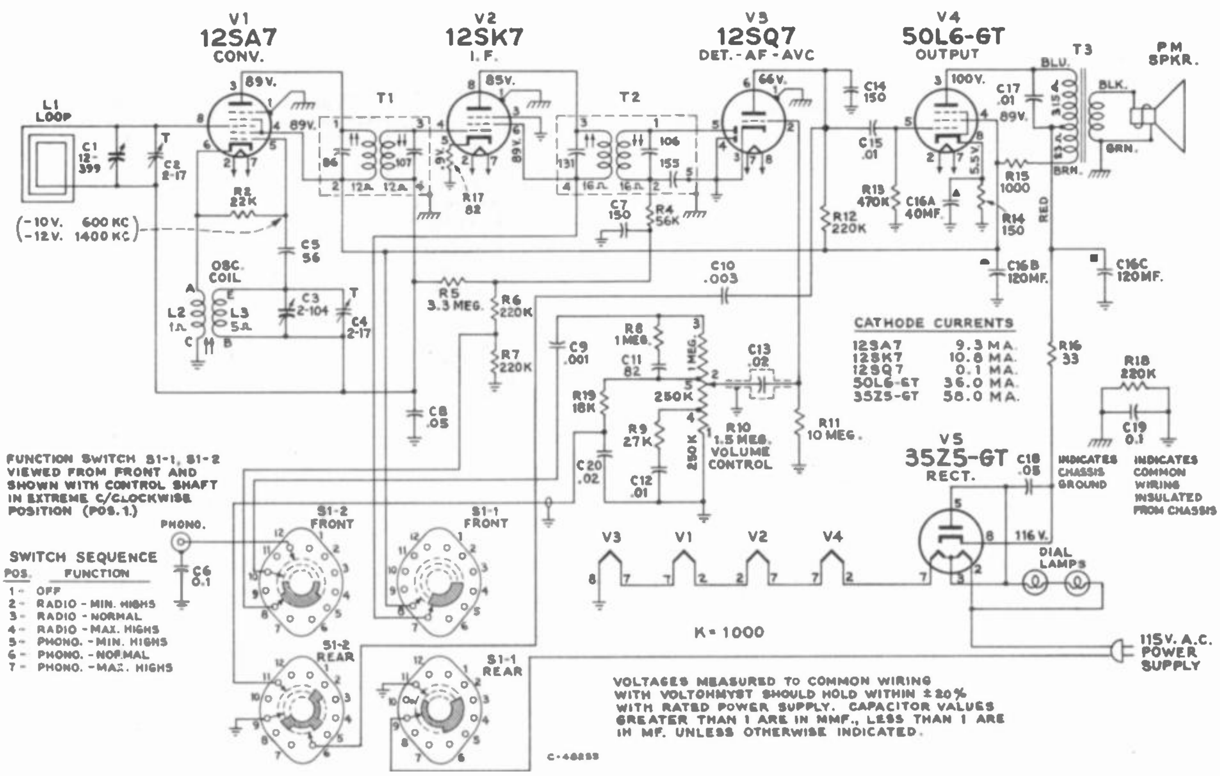
Dial Indicator and Drive Cord



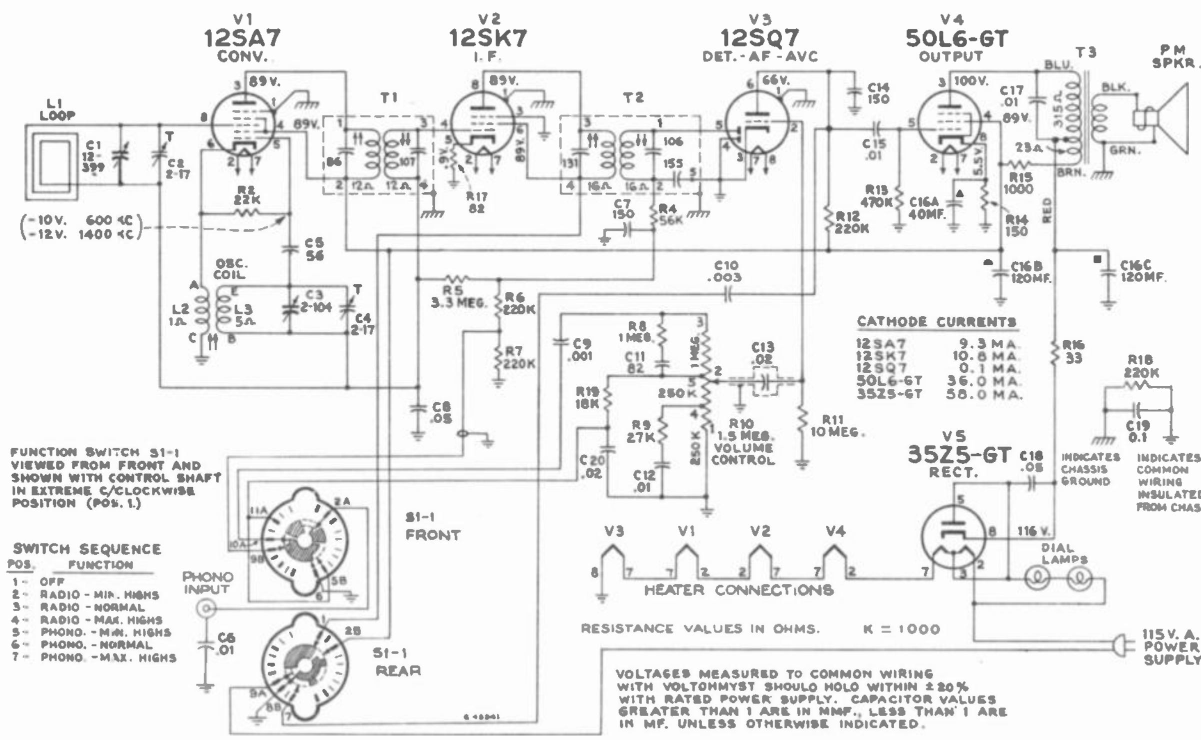
Tube and Trimmer Locations



Switch Position Schematic Diagrams—RC-1079, RC-1079A



Schematic Diagram—RC-1079, RC-1079A



Schematic Diagram—RC-1079E, RC-1079F

SPEAKER GRILLE DIFFUSER RINGS

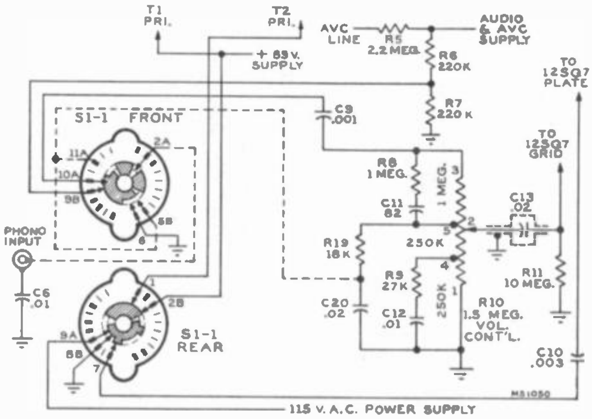
In early production the speaker diffuser rings were fastened in place to the metal speaker grille with speed nuts slipped over plastic tabs protruding through the metal grille base.

In late production these protruding plastic tabs are deformed by heat application, securely fastening the diffuser rings to the metal grille base.

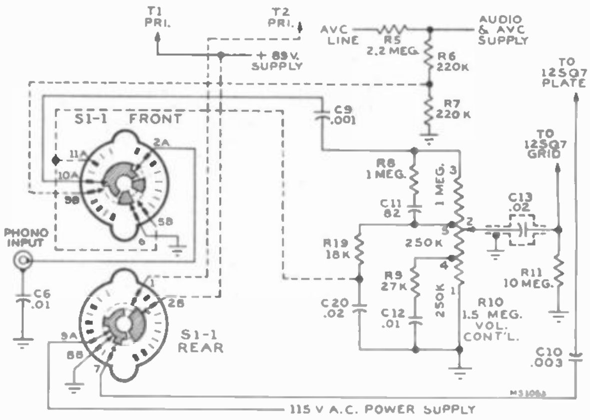
If replacement of any of the diffuser rings is required, it is only necessary to tightly press the rings against the cabinet, and deform the plastic tabs from the inside with a hot soldering iron.

Any ring may be removed or installed without removing any of the other rings. This may be done by pressing on opposite outer edges to form an ellipse large enough to slip over the next smaller ring. Before any ring can be removed, it is necessary to unfasten the plastic tabs which project into the cabinet.

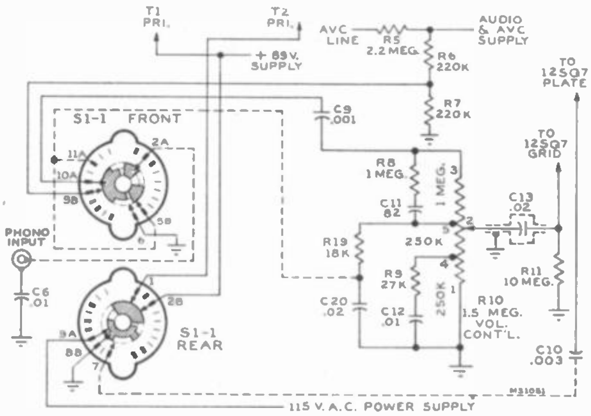
9X571, 9X572



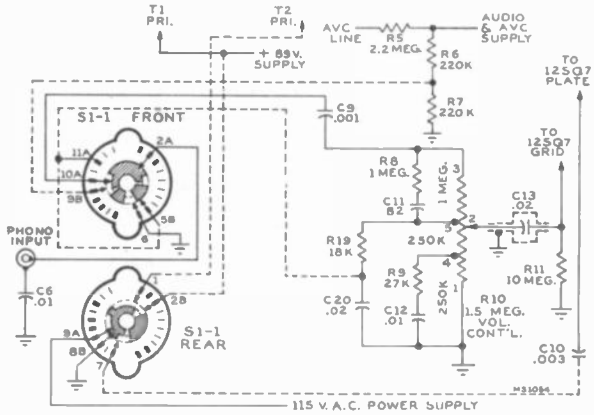
POSITION No. 2—RADIO MIN. HIGHS



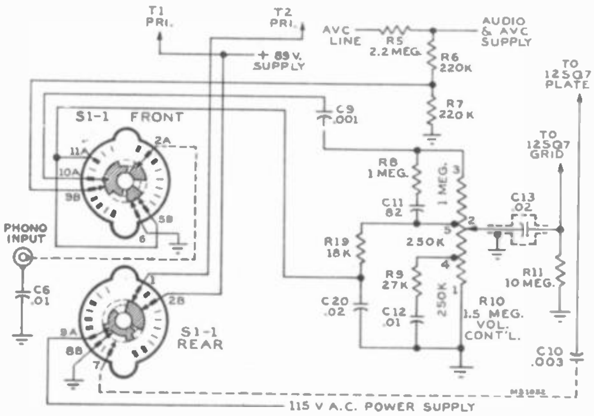
POSITION No. 5—PHONO MIN. HIGHS



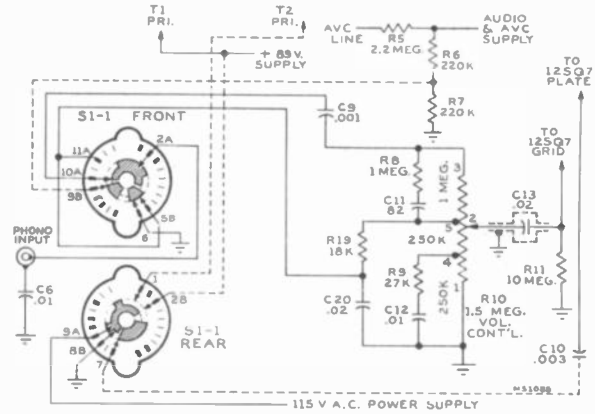
POSITION No. 3—RADIO NORMAL



POSITION No. 6—PHONO NORMAL



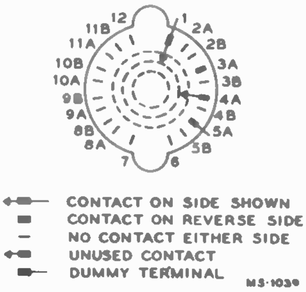
POSITION No. 4—RADIO MAX. HIGHS



POSITION No. 7—PHONO MAX. HIGHS

Switch Position Schematic Diagrams
Chassis RC-1079E, RC-1079F

SELECTOR SWITCH



Selector Switch

Switch contacts #2, 3, 4, 5, 8, 9, 10 and 11 have alternate positions designated as "A" and "B." Either 2A or 2B (but not both) may be used on "FRONT" of a switch wafer. Either (but not both) may be used on "REAR" of a switch wafer. Either may be used on both "FRONT" and "REAR." This also applies to contacts #3, 4, 5, 8, 9, 10 and 11.

Switch contacts #1, 6, 7 and 12 do not have alternate positions.

HUM REDUCTION

Due to the excellent bass reproduction of these instruments the critical lead dress should be closely observed to obtain minimum hum. The outside foil polarity of capacitors in the audio circuit should not be reversed.

RCA VICTOR

Model 9X641
Maroon

Model 9X642
Ivory

AC-DC Radio Receiver

MODELS 9X641, 9X642

Chassis No. RC-1080 RC-1080A

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. 13 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

SPECIFICATIONS

Tuning Range .... 540—1600 kc

Intermediate Frequency .... 455 kc

Tube Complement
(1) RCA 12SK7 .... R.F. Amplifier
(2) RCA 12SA7 .... Converter
(3) RCA 12SK7 .... I.F. Amplifier
(4) RCA 12SQ7 .... Det.-A.V.C.-A.F. Amp.
(5) RCA 35L6GT .... Output
(6) RCA 35Z5GT .... Rectifier

Power Supply Rating
115 volts d. c. or 50 to 60 cycles a. c. .... 32 watts

Dial Lamp .... Mazda type 51, 6-8 volts, 0.2 amp.

Loudspeaker (92572-4)
Size and type .... 5-in. P.M.
Voice coil impedance .... 3.2 ohms at 400 cycles

Power Output
Undistorted .... 0.75 watt
Maximum .... 1.25 watts

Tuning Drive Ratio .... 10 to 1 (5 turns of knob)

Weight .... 8¾ lbs.

Cabinet Dimensions
Height ..... 8½" Width ..... 12⅜" Depth ..... 7½"

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1080—9X641 RC 1080A—9X642
74694	Back—Cabinet back and loop assembly—maroon—for Model 9X641
74695	Back—Cabinet back and loop assembly—ivory—for Model 9X642
74692	Capacitor—Variable tuning capacitor (C1, C2, C3, C4, C5, C6)
39042	Capacitor—Ceramic, 47 mmf. (C8)
71924	Capacitor—Ceramic, 56 mmf. (C9)
73501	Capacitor—Ceramic, 150 mmf. (C12, C13)
74662	Capacitor—Electrolytic, comprising 1 section of 80 mfd. 150 volts and 1 section of 50 mfd. 150 volts (C19A, C19B)
72315	Capacitor—Tubular, .002 mfd. 200 volts (C14)
70572	Capacitor—Tubular, .015 mfd. 400 volts (C16)
71928	Capacitor—Tubular, .02 mfd. 200 volts (C15)
73553	Capacitor—Tubular, .05 mfd. 400 volts (C17, C18)
70617	Capacitor—Tubular, .1 mfd. 400 volts (C10, C11)
73935	Clip—Mounting clip for I.F. transformer
73677	Coil—R.F. coil (L1, L2)
74693	Coil—Oscillator coil (L3, L4)
35787	Connector—Phono input connector (socket)
38410	Control—Volume control and power switch (R14, S1)
70392	Cord—Power cord and plug
†72953	Cord—Dial drive cord (approx. 52" overall length required)
72283	Grommet—Rubber grommet to mount variable tuning capacitor (3 required)
73693	Grommet—Power cord strain relief (1 set)
74696	Indicator—Station selector indicator
74690	Plate—Dial back plate complete with four (4) drive cord pulleys, less dial
74660	Resistor—Wire wound, 15 ohms, ½ watt (R13)
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R1, R4)
	Resistor—Fixed, composition, 120 ohms, ±10%, ½ watt (R11)
	Resistor—Fixed, composition, 1,200 ohms, ±10%, 1 watt (R12)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, ½ watt (R2)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R3)
	Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt (R7)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R5, R6)
	Resistor—Fixed, composition, 470,000 ohms, ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 2.2 megohm, ±10%, ½ watt (R8)
	Resistor—Fixed, composition, 4.7 megohm, ±10%, ½ watt (R9)
74691	Shaft—Tuning knob shaft and pulley
54414	Socket—Tube socket
74697	Socket—Dial lamp socket and lead
74038	Spring—Tension spring for drive cord
33634	Switch—Radio-Phono switch (S2)
73036	Transformer—First I.F. transformer (T1)
73037	Transformer—Second I.F. transformer (T2)
73976	Transformer—Output transformer (T3)
35969	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLIES Stamped 92572-4
73900	Speaker—5" P.M. speaker complete with cone and voice coil. NOTE.—If stamping of speaker does not agree with above number, order replacement by referring to model number of instrument and number stamped on speaker.
	MISCELLANEOUS
Y2135	Cabinet—Plastic cabinet—maroon—for Model 9X641
Y2136	Cabinet—Plastic cabinet—ivory—for Model 9X642
74699	Clamp—Dial clamp (1 set)
74698	Dial—Dial scale
71821	Knob—Control knob—maroon—for Model 9X641
72645	Knob—Control knob—ivory—for Model 9X642
11765	Lamp—Dial lamp—Mazda 51
30900	Spring—Retaining spring for knobs

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

9X641, 9X642

NOTE.—If reception is not obtained on d. c. operation, reverse plug in outlet receptacle. On a.c. operation this may reduce hum.

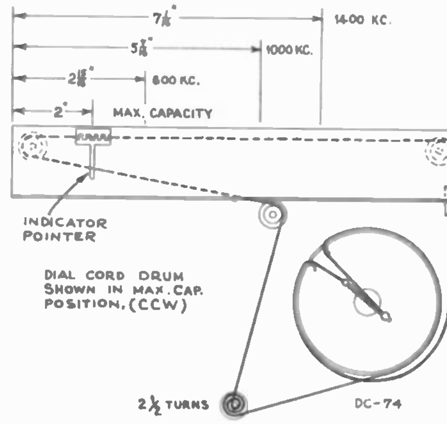
The position of the speaker is adjustable; the correct position is indicated on the illustration "Tube and Trimmer Locations."

ALIGNMENT PROCEDURE

Cathode Ray Alignment is the preferable method. Connections for the oscilloscope are shown on the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil and turn the receiver volume control to maximum.

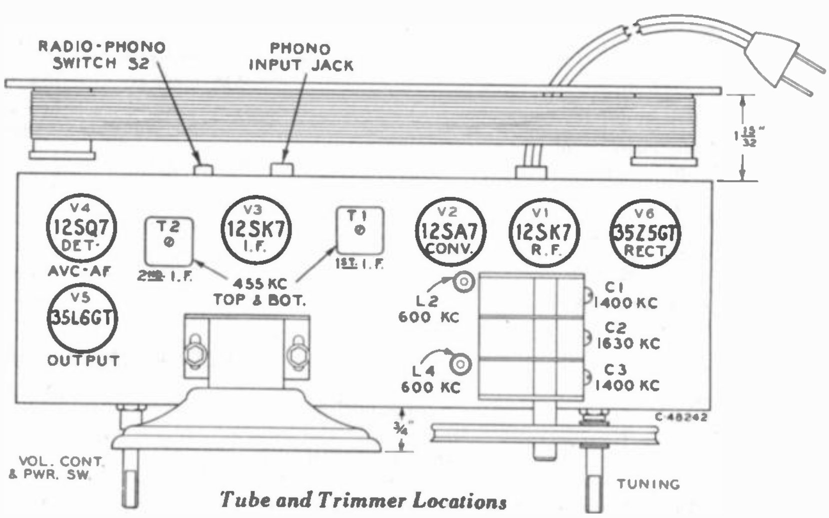
Test Oscillator.—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a. c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring at the electrolytic capacitor. Keep the oscillator output low to prevent a-v-c action.



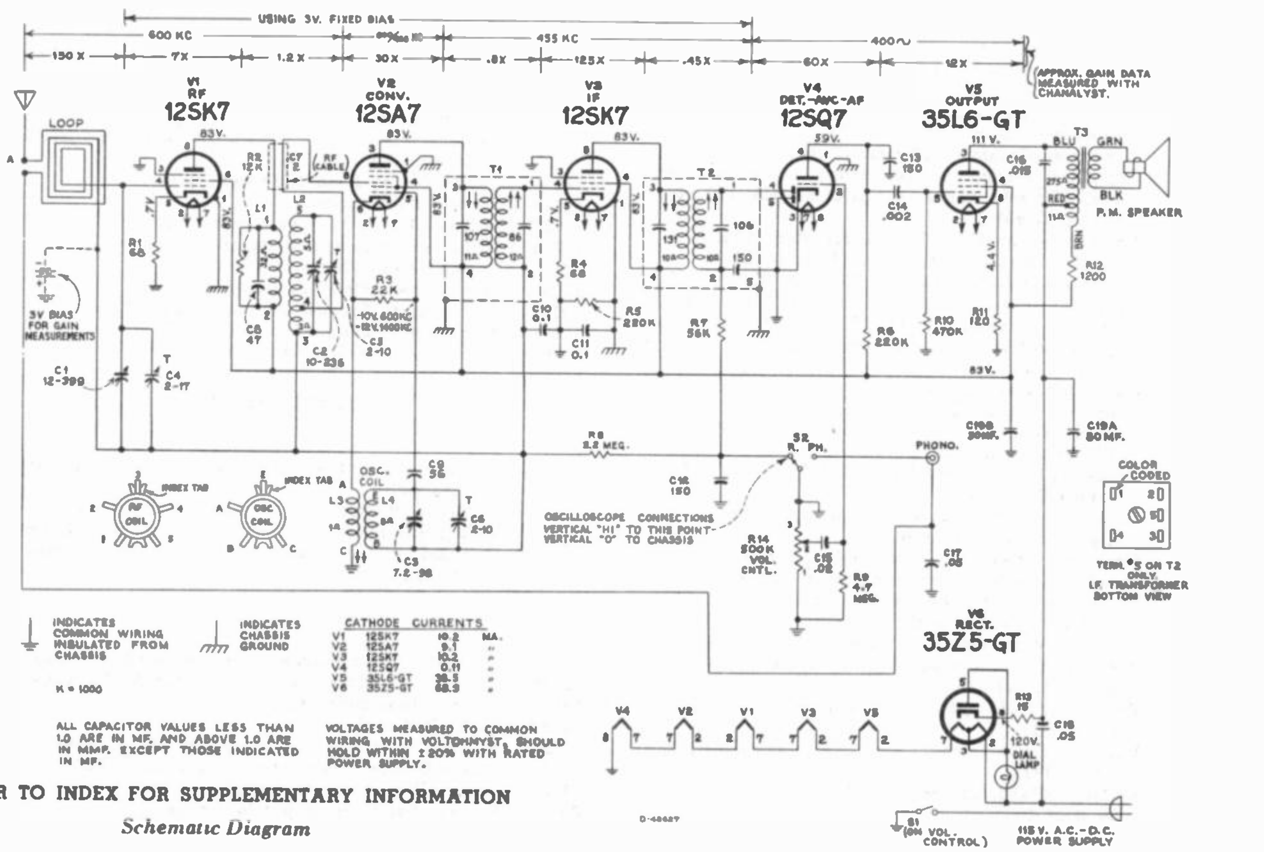
Dial Indicator and Drive Mechanism

Step	Connect high side of sig. gen. to—	Sig. gen. output	Turn radio dial to—	Adjust for peak output
1	Pin No. 8 of 12SA7 tube	455 kc	Quiet point near 600 kc	Top and bottom cores of T1
2				Top and bottom cores of T2
3	"External Antenna" terminal through 100 mmf. capacitor	1,400 kc	1,400 kc	C6 Osc. C5 R.F. C4 Ant.
4		Shunt C5 with 22,000 ohm resistor		
		600 kc	600 kc	L4 Osc. (Rock gang)
5		Remove 22,000 ohm resistor from C5		
		600 kc	600 kc	L2 R.F.
6		Repeat steps 3, 4 and 5		

The position of the loop antenna in relation to the chassis affects adjustment of C4. The correct position is indicated on the illustration "Tube and Trimmer Locations."



Tube and Trimmer Locations



REFER TO INDEX FOR SUPPLEMENTARY INFORMATION

Schematic Diagram

In some chassis an alternate filter capacitor is used which has three sections. The low voltage section (20 mf. 25 volts) is not used. The alternate capacitor is mounted on top of the chassis and is available as Stock No. 73975.

RCA VICTOR

AC-DC Radio Receiver

MODELS 9X651, 9X652

Chassis No. RC-1085 RC-1085A

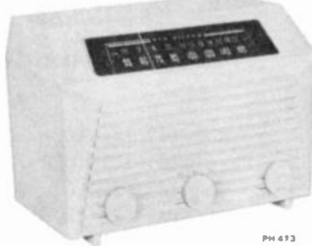
—Mfr. No. 274—

SERVICE DATA

—1949 No. 24—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

9X651—(Brown Plastic)



9X652—(Ivory Plastic)

Specifications

Tuning Ranges

Standard Broadcast ("A" Band)............ 540-1600 kc
Short Wave ("C" Band).................. 5.9-17.9 mc

Intermediate Frequency........................ 455 kc

Tube Complement

(1) RCA 12BA6......................R. F. Amplifier
(2) RCA 12BE6........................... Converter
(3) RCA 12BA6..................... I. F. Amplifier
(4) RCA 12SQ7................. Det. - A.F. - A.V.C.
(5) RCA 35L6GT .... Output
(6) RCA 35Z5 .... Rectifier

Dial Lamp .... Type 51, 6.3 volts, 0.25 amp.

Power Supply Rating

115 volts, D.C. or 50 to 60 cycles, A.C........... 35 watts

Loudspeaker

Type 92572-4 .... 5 in. P.M.
V. C. Impedance.................3.2 ohms at 400 cycles

Power Output

Undistorted .... 0.8 watts
Maximum .... 1.2 watts

Cabinet Dimensions

Height... 8½ in. Width... 12⅜ in. Depth...7½ in.

Tuning Drive Ratio ....11:1 (5½ turns of knob)

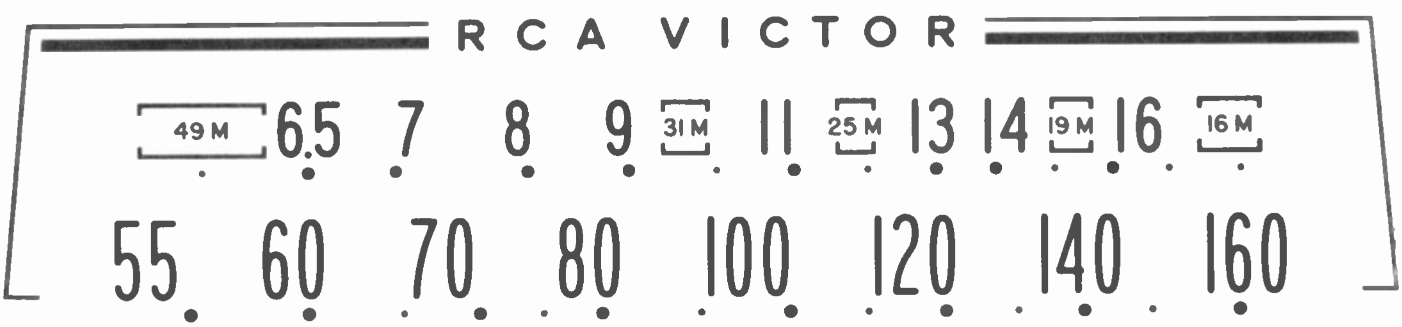
NOTE: If reception is not obtained on DC, reverse plug in outlet receptacle. This may also reduce hum on AC operation.

To Remove Chassis from Cabinet

1. Remove knobs (just pull).
2. Remove four screws holding back.
3. Remove two screws in both ends of rear apron and slide chassis out.

Critical Lead Dress

1. Dress all heater leads and pilot lights leads down to chassis and away from all audio grid and plate wiring.
2. Dress lead from ant. section of gang to pin 1 of V1 direct and as short as possible but position for low capacity to chassis.
3. Dress lead from ant. section of gang to S1-1 rear contact #3 direct and as short as possible but position for low capacity to chassis.
4. Leads to loop antenna are long and draped to permit tube servicing by lowering loop back. They should be evenly spaced to maintain low capacity and dressed to prevent touching gang plates.
5. All R.F. leads to coils should be short and direct. Dress other leads and components away from coils.



Dial Scale Actual Size

DS-933774

9X651, 9X652

Alignment Procedure

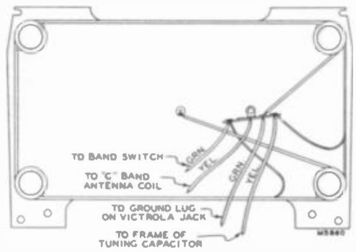
Test Oscillator.—Connect high side of test oscillator as shown in chart. Connect low side to chassis. Keep the output low to avoid A.V.C. action.

Note.—If the test oscillator is A.C. operated it may be necessary to use an isolation transformer (115v./115 v.) for the receiver during alignment, and the low side of the test oscillator connected to common wiring. Reverse line plug if hum is excessive.

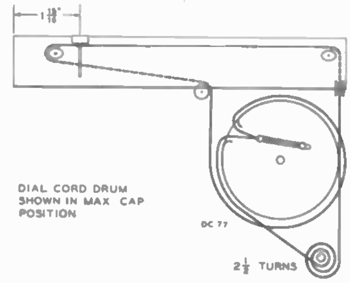
Output Meter.—Connect meter across speaker voice coil. Turn volume control to maximum.

Dial Pointer Adjustment.—Rotate tuning condenser to maximum capacity position (plates fully meshed). Adjust dial to position indicated in drawing.

With the dial adjusted as described above mark the dial pan assembly with a pencil to provide a tuning indicator during alignment.



Loop Antenna



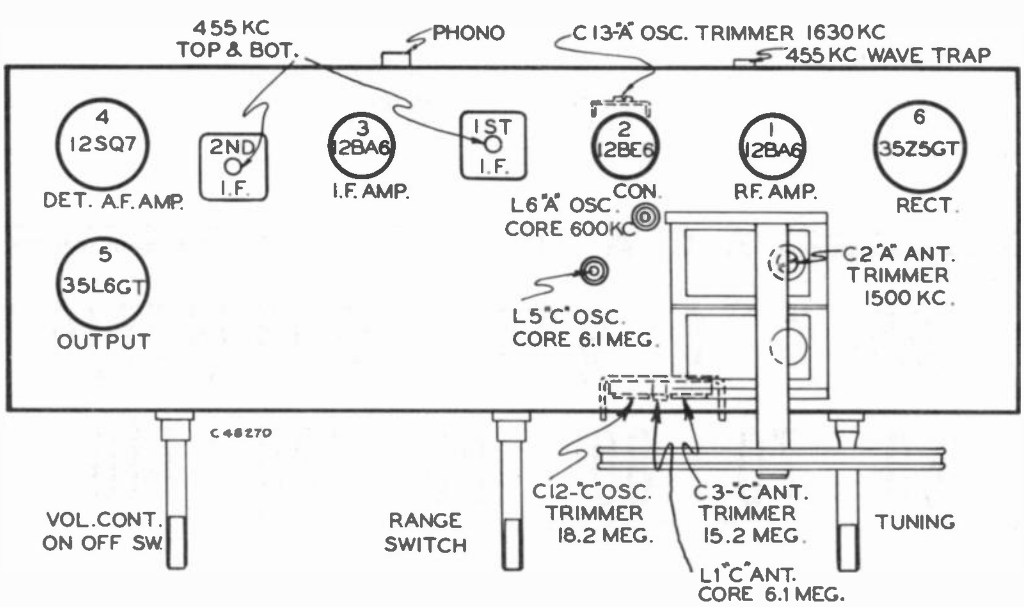
Dial Drive Mechanism

Cathode Currents

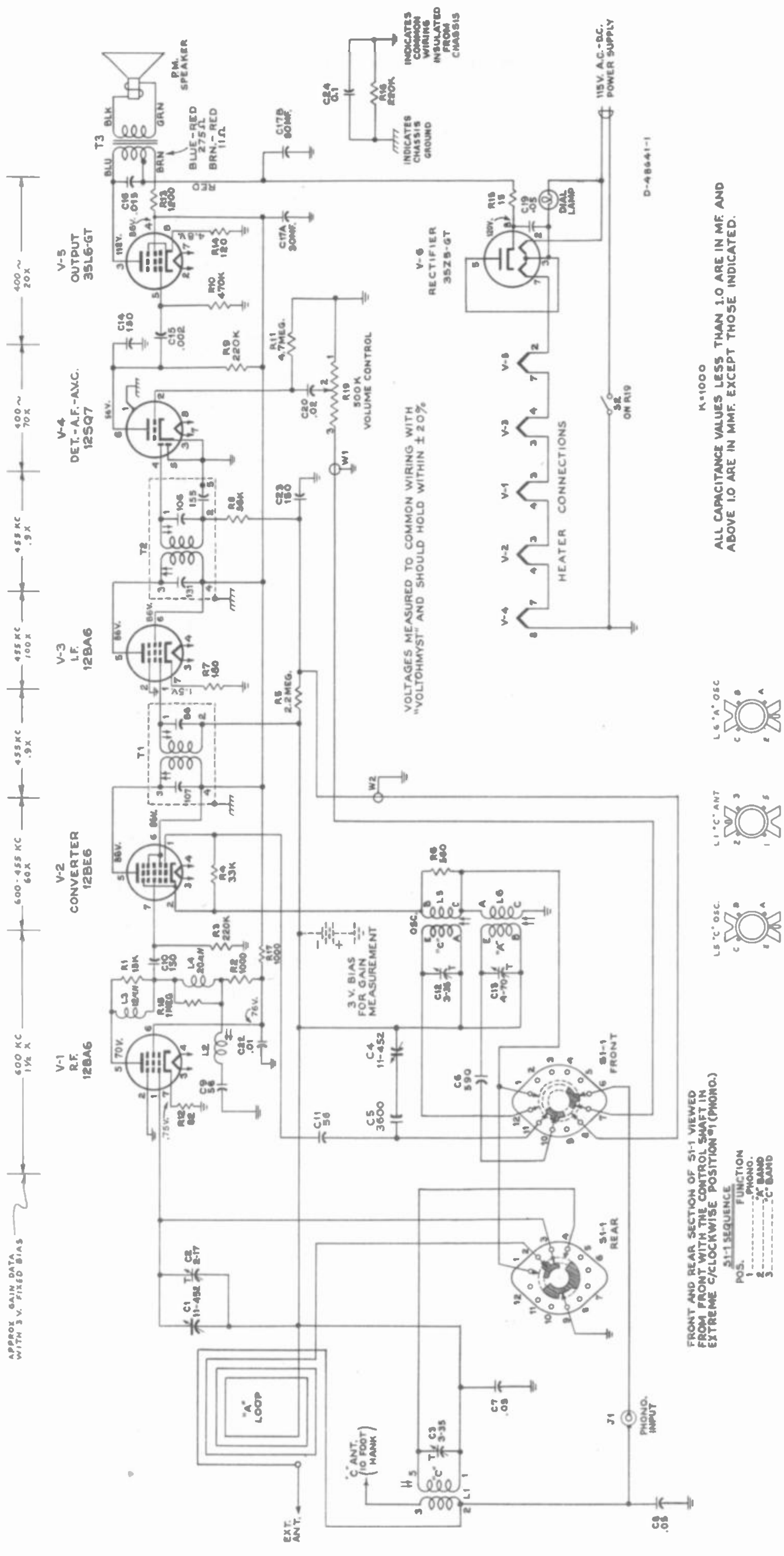
	"A" Band	"C" Band
(1) 12BA6	9.7 ma	9.6 ma
(2) 12BE6	7.8 ma	8.1 ma
(3) 12BA6	8.7 ma	8.4 ma
(4) 12SQ7	0.15 ma	0.15 ma
(5) 35LL	37 ma	37 ma
(6) 35Z5	65 ma	65 ma

Steps	Connect the High Side of The Test Osc. to—	Tune Test Osc. to—	Range Switch to—	Turn Radio Dial to—	Adjust for maximum output
1	Pin No. 1 of 12BA6 I.F. amp. tube in series with 0.1 mfd.	455 kc.	"A"	Quiet Point near 1600 kc.	Top and bottom T2 2nd I.F. Trans.
2	Pin No. 7 of 12BE6 Converter tube in series with 0.1 mfd.				Top and bottom T1 1st I.F. Trans.
3	Pin No. 1 of 12BA6 R.F. tube in series with 0.1 mfd.				L2 wave trap for minimum output.
4	(Radiated signal) short piece of wire placed near ant.	1630 kc.	"A"	1630 kc. (Cap. min.)	C-13 "A" Osc.
5		1500 kc.		1500 kc.	C-2 "A" ant.
6		600 kc.		600 kc.	L6 "A" Osc. Rocking gang.
7	Repeat steps 4, 5 and 6.				
8	Center terminal on loop antenna Term. board through 47 mfd. Low side to loop primary terminal	18.2 mc.	"C"	18.2 mc. (Min. cap.)	C-12* "C" Osc.
9		15.2 mc.		15.2 mc.	C-3**† "C" Ant.
10		6.1 mc.		6.1 mc.	L-5†† "C" Osc. L-1 "C" Ant.
11	Repeat steps 8, 9 and 10 as necessary.				

*Two peaks should be found, use one having lowest capacity.
**Two peaks should be found, use one having highest capacity.
Note: Check for image frequences.
†Radio dial tuned to 15.2 mc. as in step 9, tune test osc. to 16.11 mc. where a weaker signal should be heard.
††Radio dial tuned to 6.1 mc. as in step 10, tune test osc. to 7.01 mc. where a weaker signal should be heard.



Chassis Top View



Schematic Diagram

Replacement Parts

Stock No.	DESCRIPTION
	CHASSIS ASSEMBLIES
	RC 1085-9X651
	RC 1085A-9X652
71042	Button—Plugbutton for trimmer adjustment hole
74924	Capacitor—Mica trimmer, dual, 3-35 mmf. (C3, C12)
74923	Capacitor—Mica trimmer, 4-70 mmf. (C13)
74917	Capacitor—Variable tuning capacitor (C1, C2, C4)
71924	Capacitor—Ceramic, 56 mmf. (C9, C11)
73501	Capacitor—Ceramic, 150 mmf. (C10, C14, C23)
74929	Capacitor—Mica, 590 mmf. (C6)
39665	Capacitor—Mica, 3600 mmf. (C5)
72312	Capacitor—Electrolytic, comprising 1 section of 30 mfd, 15 volts, and 1 section of 80 mfd, 150 volts. (C17A, C17B)
72315	Capacitor—Tubular, paper, .002 mfd, 200 volts (C15)
73561	Capacitor—Tubular, paper, .01 mfd, 400 volts (C22)
70572	Capacitor—Tubular, paper, .015 mfd, 400 volts (C16)
71928	Capacitor—Tubular, paper, .02 mfd, 200 volts (C20)
73553	Capacitor—Tubular, paper, .05 mfd, 400 volts (C7, C8, C19)
70617	Capacitor—Tubular, paper, 0.1 mfd, 400 volts (C24)
73935	Clip—Mounting clip for I.F. transformer
74925	Coil—Oscillator coil—"A" band complete with adjustable core and stud (L6)
74926	Coil—Oscillator coil—"C" band complete with adjustable core and stud (L5)
74927	Coil—Antenna coil—"C" band (L1)
74928	Coil—Series wave trap coil (455KC) complete with adjustable core and stud (L2)
74930	Coil—Peaking coil (12 mh) (L3, R1)
72618	Coil—Peaking coil (20 mh) (L4, R18)
38410	Control—Volume control and power switch (R19, S2)
72953	Cord—Drive cord (approx. 48" overall)
33139	Grommet—Rubber grommet for chassis base
72283	Grommet—Rubber grommet for mounting tuning capacitor (3 req'd)
74838	Grommet—Power cord strain relief grommet (1 set)
74696	Indicator—Station selector indicator
70980	Lead—Antenna lead—part of loop and back cover
74919	Loop—Back cover and loop assembly complete with antenna lead for Model 9X651
74920	Loop—Back cover and loop assembly complete with antenna lead for Model 9X652
74690	Plate—Dial back plate complete with 4 drive cord pulleys less dial
35787	Receptacle—Phono input jack (J1)
	Resistor—Fixed, composition:
	15 ohms, ±10%, ½ watt (R15)
	82 ohms, ±10%, ½ watt (R-12)
	120 ohms, ±10%, ½ watt (R14)
	180 ohms, ±10%, ½ watt (R7)
	560 ohms, ±10%, ½ watt (R6)
	1000 ohms, ±10%, ½ watt (R2, R17)
	1200 ohms, ±10%, 1 watt (R13)
	33,000 ohms, ±10%, ½ watt (R4)
	56,000 ohms, ±10%, ½ watt (R8)
	220,000 ohms, ±10%, ½ watt (R3, R9, R16)
	470,000 ohms, ±10%, ½ watt (R10)
	2.2 megohm, ±20%, ½ watt (R5)
	4.7 megohm, ±20%, ½ watt (R11)
74922	Shaft—Tuning knob shaft and pulley
73117	Socket—Tube socket, 7 contact, miniature
54414	Socket—Tube socket, octal, saddle mounted
74697	Socket—Dial lamp socket and lead
74038	Spring—Drive cord tension spring
74921	Switch—Selector switch (S1)
73976	Transformer—Output transformer (T3)
74918	Transformer—First I.F. transformer (T1)
73037	Transformer—Second I.F. transformer (T2)
35969	Washer—"C" washer for tuning shaft
	SPEAKER ASSEMBLIES
	92572-4
73900	Speaker—5" P.M. speaker complete with cone and voice coil
	NOTE:—If stamping in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
Y2174	Cabinet—Brown plastic cabinet for Model 9X651
Y2175	Cabinet—Ivory plastic cabinet for Model 9X652
74699	Clamp—Dial clamps (1 set)
74933	Decal—Selector switch function decal
74932	Dial—Polystyrene dial scale
74931	Knob—Volume control or tuning control knob—maroon—for Model 9X651
72645	Knob—Volume control or tuning control knob—ivory—for Model 9X652
74934	Knob—Selector switch knob—maroon—for Model 9X651
74935	Knob—Selector switch knob—ivory—for Model 9X652
11765	Lamp—Dial lamp—Mazda 51
30900	Spring—Retaining spring for knobs

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

RCA VICTOR

Radio Phonograph Combination

MODEL 9Y7

Chassis No. RC-1057B

Mfr. No. 274

SERVICE DATA

— 1949 No. 3 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Specifications

Tuning Range .... 540-1600 kc

Intermediate Frequency .... 455 kc

Tube Complement

1. RCA-12SA7 .... Converter
2. RCA-12SK7 .... I-F Amplifier
3. RCA-6AQ6 .... A-F Amplifier
4. RCA-6AQ6 .... 2nd Det.-Ph. Inv.
5. RCA-35L6GT } Push-Pull Output
6. RCA-35L6GT } Push-Pull Output

A selenium rectifier is used.

Power Supply Rating 115 volts, 60 cycles a.c., 60 watts.

Dial Lamps (2) .... Mazda type 51, 6-8 volts, 0.2 amp.

Loudspeaker (92573-1K)

Size and type .... 5" x 7" P.M.

Voice coil impedance .... 3.4 ohms at 400 cycles

Power Output

Undistorted .... 2.2 watts

Maximum .... 3.0 watts

Cabinet Dimensions

Height 9 13/16" Width 16¼" Depth 14⅜"

Tuning Drive Ratio .... 10½:1 (5¼ turns of knob)

Record Changer (RP-168A-1)

Turntable speed .... 45 r.p.m.

Records used .... RCA 7 in. fine groove

Record capacity .... up to 10 records

Pickup .... Crystal (medium output)

Service Hints

The two 6AQ6 tubes and the dial lamps are accessible by removing the sloping panel in the front of the record changer compartment.

When re-installing the chassis in the cabinet the dial lamps should be positioned to give maximum illumination of the dial without direct light of the lamps being visible from the front of the cabinet.

The chassis mounting board should be flush against the front of the cabinet.

The position of the speaker is adjustable. When correctly positioned, it should set firmly against the front of the cabinet but with no undue strain on the speaker.

CAUTION.—CLOSE TUNING CONDENSER PLATES COMPLETELY (C-C-W) BEFORE REMOVING OR RE-INSTALLING CHASSIS.

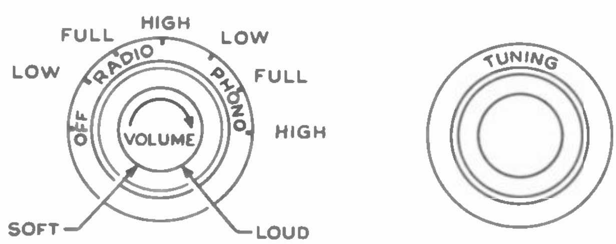
Care of Sapphire

The record changer sapphire is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE SAPPHIRE POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

Record Separators

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service, the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.



Controls

9Y7

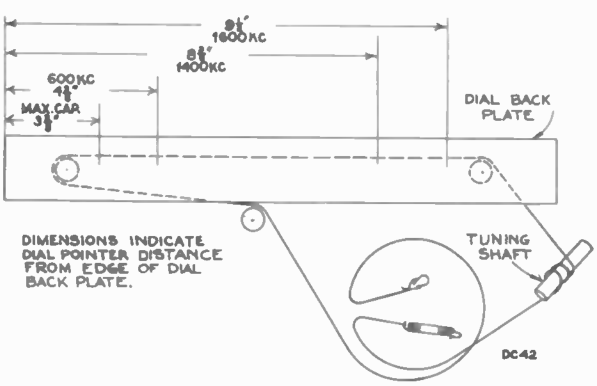
Alignment Procedure

Output Meter.—Connect meter across speaker voice coil. Turn volume control to maximum.

Test Oscillator.—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring at the electrolytic capacitor. Keep the oscillator output low to prevent a-v-c action.

Dial Pointer Adjustment.—Rotate tuning condenser fully counterclockwise (plates fully meshed). Adjust indicator pointer so that it is 3⅜" from the left hand edge of the dial back plate.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	I.F. grid, in series with .1 mfd.	455 kc	Quiet point 1,600 kc end of dial	Pri. & Sec. 2nd I.F. transformer
2	Converter grid in series with .1 mfd.			Pri. & Sec. 1st I.F. transformer
NOTE.—ANTENNA LOOP AND RECORD CHANGER MUST BE IN CABINET FOR THE FOLLOWING				
3	Short wire placed near loop for radiated signal	1,620 kc	Extreme R. H. end (gang open)	C7 (osc.)
4		1,400 kc	1,400 kc	C4 (ant.)
5		600 kc	600 kc	Osc. Coil L3 Rock gang
6	Repeat steps 3, 4, & 5 if necessary			



Dial Indicator and Drive Mechanism

Critical Lead Dress

1. Dress all heater leads down against chassis.
2. Dress a.c. lead to rectifier down against back apron.
3. Excess power cord, motor cable and dial lamp leads should be dressed outside of chassis.
4. Dress shielded audio lead to front apron and beneath terminal board.
5. Dress lead from term. #2 of S-1 Front down to base.
6. Dress R13 and R14 in air across electrolytic capacitor terminals.
7. Dress C13 down to chassis base.
8. Dress output transformer primary leads down to base.
9. Dress R6 away from shield.
10. Dress R4 away from R13 and R14.
11. Dress R16 directly to V-4 tube socket.
12. Dress R10 over V-4 tube socket.
13. Dress lead from positive rectifier terminal directly down to and along back apron beneath all other wiring to 1st I-F trans. (T-1), then to C19C, keeping wire next to base.
14. Dress R18 away from all other components and wiring.

Pickup Landing Adjustment "A"

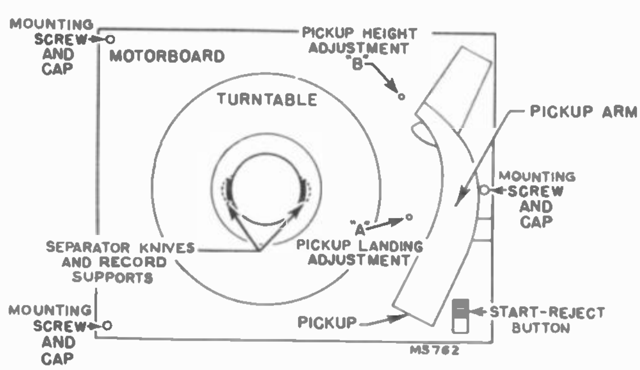
The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A" slightly counterclockwise.

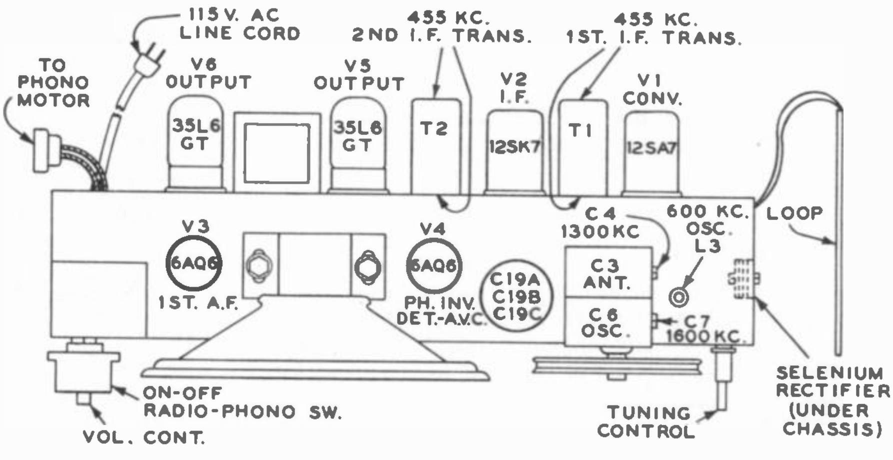
Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

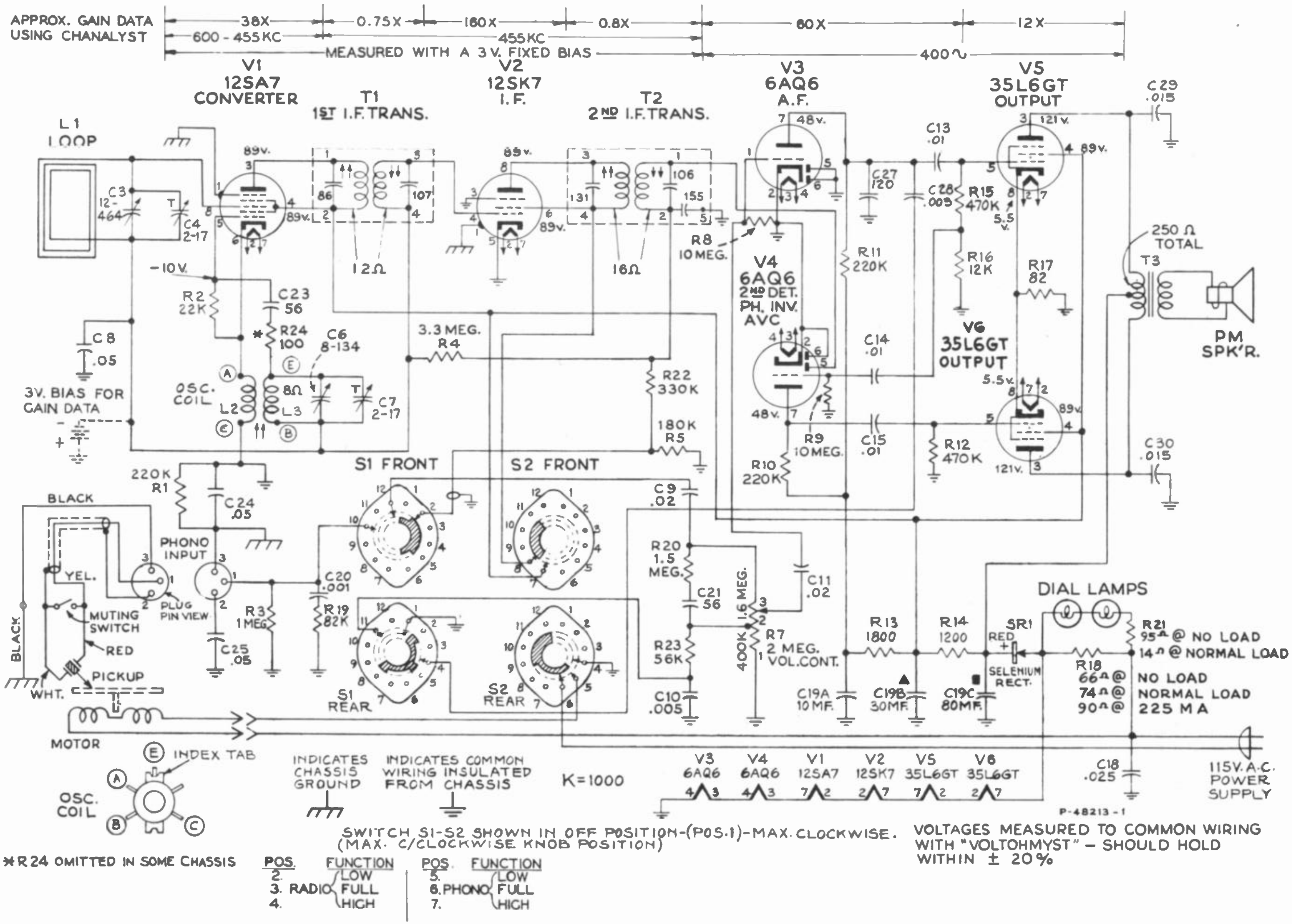
If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B" slightly counterclockwise.



Record Changer Adjustments



Tube and Trimmer Locations



Schematic Diagram

9Y7

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1057B
71042	Button—Plug button to cover holes for I.F. transformers adjustment (2 required)
74246	Capacitor—Variable tuning capacitor (C3, C6, C7)
74270	Capacitor—Mica trimmer, 3-30 mmf. (C26)
39622	Capacitor—Mica, 56 mmf. (C21)
73499	Capacitor—Ceramic, 56 mmf. (C23)
39630	Capacitor—Mica, 120 mmf. (C27)
70600	Capacitor—Tubular, .001 mfd., 400 volts (C20)
70603	Capacitor—Tubular, .003 mfd., 400 volts (C28)
72791	Capacitor—Tubular, .005 mfd., 400 volts (C10)
70612	Capacitor—Tubular, .025 mfd., 400 volts (C18)
73561	Capacitor—Tubular, .01 mfd., 400 volts (C13, C14, C15)
70572	Capacitor—Tubular, .015 mfd., 400 volts (C29, C30)
73638	Capacitor—Tubular, .02 mfd., 400 volts (C9)
70611	Capacitor—Tubular, .02 mfd., 400 volts (C11)
73553	Capacitor—Tubular, .05 mfd., 400 volts (C8, C25)
70615	Capacitor—Tubular, .05 mfd., 400 volts (C24)
73013	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 150 volts, 1 section of 30 mfd., 150 volts and 1 section of 10 mfd., 150 volts (C19A, C19B, C19C)
73935	Clip—Mounting clip for I.F. transformers (2 required)
73048	Coil—Oscillator coil (L2, L3)
38403	Control—Volume control (R7)
†72953	Cord—Drive cord (approx. 50" length required)
70392	Cord—Power cord and plug
70397	Gear—Power, radio and phono switch gear
73014	Gear—Volume control gear—less spring
72283	Grommet—Rubber grommet to mount tuning capacitor (3 required)
73886	Indicator—Station selector indicator
74248	Loop—Antenna loop (L1)
74216	Plate—Dial back plate complete with three (3) drive cord pulleys, less dial
30868	Plug—2 contact female plug for motor cable
73009	Rectifier—Selenium rectifier (SR1)
73038	Resistor—Normal value, 66 ohms with positive temperature coefficient (R18)
	Resistor—Fixed, composition, 82 ohms, ±10%, 1 watt (R17)
73072	Resistor—Normal value, 95 ohms with negative temperature coefficient (R21)
	Resistor—Fixed, composition, 100 ohms, ±20%, ½ watt (R24)
	Resistor—Fixed, composition, 1200 ohms, ±10%, 1 watt (R14)
	Resistor—Fixed, composition, 1800 ohms, ±10%, ½ watt (R13)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, ½ watt (R16)
	Resistor—Fixed, composition, 22,000 ohms, ±20%, ½ watt (R2)
	Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt (R23)
	Resistor—Fixed, composition, 82,000 ohms, ±10%, ½ watt (R19)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt (R5)
	Resistor—Fixed, composition, 220,000 ohms, ±20%, ½ watt (R1, R10, R11)
	Resistor—Fixed, composition, 330,000 ohms, ±10%, ½ watt (R22)
	Resistor—Fixed, composition, 470,000 ohms, ±10%, ½ watt (R15)
	Resistor—Fixed, composition, 470,000 ohms, ±20%, ½ watt (R12)
	Resistor—Fixed, composition, 1 megohm, ±10%, ½ watt (R3)
	Resistor—Fixed, composition, 1.5 megohms, ±10%, ½ watt (R20)
	Resistor—Fixed, composition, 3.3 megohms, ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 10 megohms, ±20%, ½ watt (R8, R9)
73012	Shaft—Tuning knob shaft
73103	Shield—Tube shield for miniature tubes (2 required)
72998	Socket—Dial lamp socket and lead assembly
36422	Socket—Phono input socket, 3 contact
9914	Socket—Tube socket, miniature, for V3
72516	Socket—Tube socket, miniature, for V4
37605	Socket—Tube socket, octal
74038	Spring—Drive cord spring
70396	Spring—Volume control gear tension spring
73011	Switch—Power, radio and phono switch (S1, S2)
73036	Transformer—First I.F. transformer (T1)
73037	Transformer—Second I.F. transformer (T2)
73008	Transformer—Output transformer (T3)
33726	Washer—"C" washer for tuning knob shaft
74029	Washer—Fibre washer for tuning knob shaft
70406	Washer—Spring washer for volume control
34457	Washer—Spring washer for tuning knob shaft
	SPEAKER ASSEMBLIES 92573-1K
72728	Cone—Cone and voice coil assembly
74454	Gasket—Rubber gasket for speaker
72727	Speaker—5" x 7" P.M. speaker complete with cone and voice coil
	MISCELLANEOUS
74225	Bezel—Dial scale bezel less dial
74209	Cover—Mounting screw cover (threaded type) for record changer (3 required) (used with 74424 screw)
74581	Cover—Mounting screw cover (plug-in type) for record changer (3 required) (used with 74582 screw)
74273	Decal—Trademark decal (Victrola)
74224	Dial—Polystyrene dial scale
74237	Escutcheon—Tuning control escutcheon for blonde instruments
74236	Escutcheon—Tuning control escutcheon for mahogany or walnut instruments
74235	Escutcheon—Power—radio—phono switch escutcheon for blonde instruments
74234	Escutcheon—Power—radio—phono switch escutcheon for mahogany or walnut instruments
72894	Foot—Rubber foot (4 required)
72692	Hinge—Cabinet lid hinge (2 required)
74223	Knob—Power, radio and phono switch knob—tan—for blonde instruments
74222	Knob—Power, radio and phono switch knob—maroon—for walnut or mahogany finish instruments
74221	Knob—tuning knob—tan—for blonde instruments
74220	Knob—Tuning knob—maroon—for walnut or mahogany finish instruments
74219	Knob—Volume control knob—tan—for blonde instruments
74218	Knob—Volume control knob—maroon—for walnut or mahogany finish instruments
11765	Lamp—Dial lamp
74208	Nut—Tee nut for mounting record changer (3 required)
71095	Nut—Speed nut for dial scale bezel (8 required)
74192	Plug—3 prong male plug for shielded pickup cable
74424	Screw—#8-32 x 1¾" special screw (tapped hole) for record changer (3 required) (used with 74209 cover)
74582	Screw—#8-32 x 1¾" special screw (non-tapped hole) for record changer (3 required) (used with 74581 cover)
74421	Spring—Conical spring for mounting record changer—upper—R. H. side (1 required)
74422	Spring—Conical spring for mounting record changer—upper—L. H. side (2 required)
74423	Spring—Conical spring for mounting record changer—lower (3 required)
14270	Spring—Retaining spring for knobs
71824	Stud—Stud and screw to mount lid hinge (1 set)
30688	Support—Cabinet lid support

† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

RCA VICTOR

Radio Phonograph Combination

MODEL 9Y51

Chassis No. RC-1077

Mfr. No. 274

SERVICE DATA

— 1949 No. 18 —

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION

CAMDEN, N. J., U. S. A.

PH423

Specifications

Tuning Range	540-1600 kc
Intermediate Frequency	455 kc
Tube Complement	
1. RCA-12BE6	Converter
2. RCA-12BA6	I-F Amplifier
3. RCA-12AV6	Det., AVC., A-F Amplifier
4. RCA-50L6GT	Output
5. RCA-35W4	Rectifier
Power Supply Rating	115 volts, 60 cycles a.c., 60 watts
Dial Lamps (2)	Mazda type 1490, 3.2 volts, 0.16 amp.
Loudspeaker (92585-1)	
Size and type	5" x 7" P.M.
Voice coil impedance	3.2 ohms at 400 cycles
Power Output	
Undistorted	1 watt
Maximum	1.5 watts
Cabinet Dimensions	
Height 7¾" Width 12⅜"	Depth 14¼"
Tuning Drive Ratio	7½:1 (3¾ turns of knob)
Record Changer (RP-168-1 modified or RP-168B-1)	
Turntable speed	45 r.p.m.
Records used	RCA 7 in. fine groove
Record capacity	Up to 10 records
Pickup Stock No. 74625	Crystal (medium output)

Service Hints

The tubes and the dial lamps are accessible by removing the panel in the front of the record changer compartment.

The chassis metal mounting plate should be flush against the front of the cabinet.

The position of the speaker is adjustable. When correctly positioned, it should set firmly against the front of the cabinet but with no undue strain on the speaker.

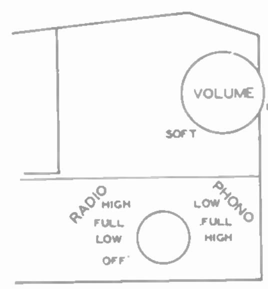
Care of Sapphire

The record changer sapphire is protected by a permanent metal guard. LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE SAPPHIRE POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

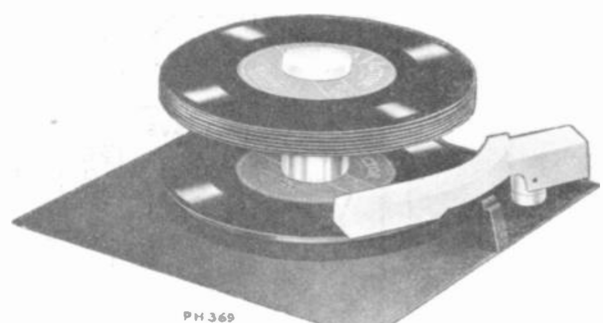
Record Separators

In the out of cycle position the record separator knives or discs are normally concealed inside the center post. During service, the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended—turn the power on so that the turntable is revolving, gently press fingers against the extended knives until they disappear inside the center post—DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.



Controls



FOR RECORD CHANGER SERVICE INFORMATION—REFER TO RP-168 SERIES SERVICE DATA.

Alignment Procedure

Output Meter.—Connect meter across speaker voice coil. Turn volume control to maximum.

Test Oscillator.—Connect low side of test oscillator to common wiring in series with a .1 mf. capacitor. If the test oscillator is a.c. operated it may be necessary to use an isolation transformer for the receiver during alignment and the low side of the test oscillator connected directly to common wiring at the electrolytic capacitor. Keep the oscillator output low to prevent a-v-c action.

Dial Pointer Adjustment.—Rotate tuning condenser until the plates are fully open. Adjust indicator pointer to 1630 kc (extreme high frequency end of the scale).

Steps	Connect the high side of test to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. output
1	I.F. grid, in series with .1 mfd.	455 kc	Quiet point 1,600 kc end of dial	Pri. & Sec. 2nd I.F. transformer
2	Converter grid in series with .1 mfd.	455 kc	Quiet point 1,600 kc end of dial	Pri. & Sec. 1st I.F. transformer
NOTE.—ANTENNA LOOP AND RECORD CHANGER MUST BE IN CABINET FOR THE FOLLOWING				
3	Short wire placed near loop for radiated signal	1,630 kc	Extreme R. H. end (gang open)	C4 (osc.)
4	Short wire placed near loop for radiated signal	1,400 kc	1,400 kc	C2 (ant.)
5	Short wire placed near loop for radiated signal	600 kc	600 kc	Osc. Coil L3 Rock gang
6	Repeat steps 3, 4, & 5 if necessary			

LEAD DRESS

1. Dress all heater leads and pilot light leads down to chassis and as far as possible from all audio grid and plate wiring.
2. Dress all exposed leads away from each other and away from chassis to prevent short circuits.
3. Dress lead from R.F. section of gang to V1 pin 7 direct but away from chassis base to reduce capacity, also away from fuse resistor.
4. Dress lead from oscillator section of gang to oscillator coil direct but away from chassis base to reduce capacity.
5. Connect capacitor C20 with short leads between gang frame and mounting bracket.
6. Dress output transformer leads down to base.
7. Dress loop antenna leads away from gang plates and tubes.
8. Dress 33-ohm limiting resistor away from chassis.

Pickup Landing Adjustment "A"

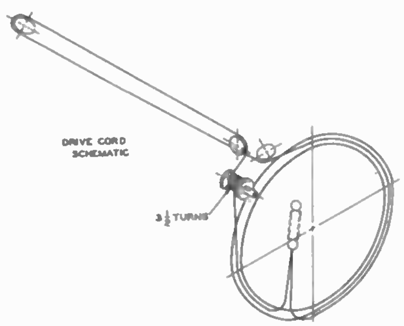
The pickup point should land half-way between the outer edge of the record and the first music groove.

If the pickup lands inside the starting grooves—turn screw "A" slightly clockwise. If pickup lands outside the starting grooves—turn screw "A."

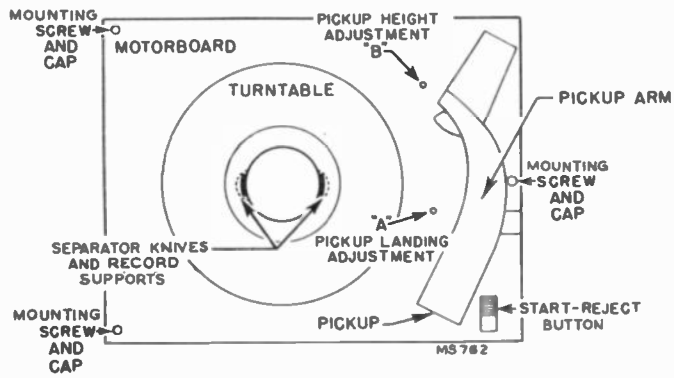
Pickup Height Adjustment "B"

During cycle the pickup arm must rise high enough to clear a stack of eight records on the turntable, but not high enough to cause the top of the arm to touch records resting on the record supports.

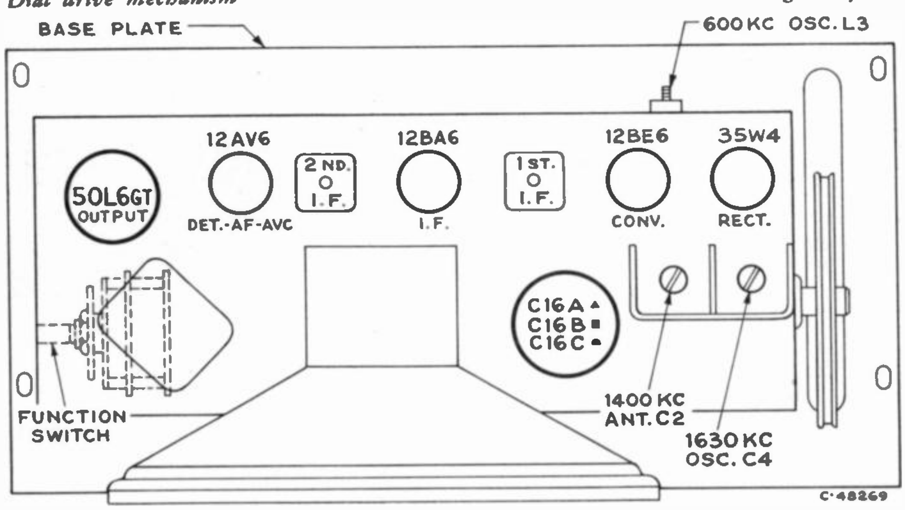
If pickup does not clear a stack of eight records—turn screw "B" slightly clockwise. If pickup arm touches records on record supports—turn screw "B."



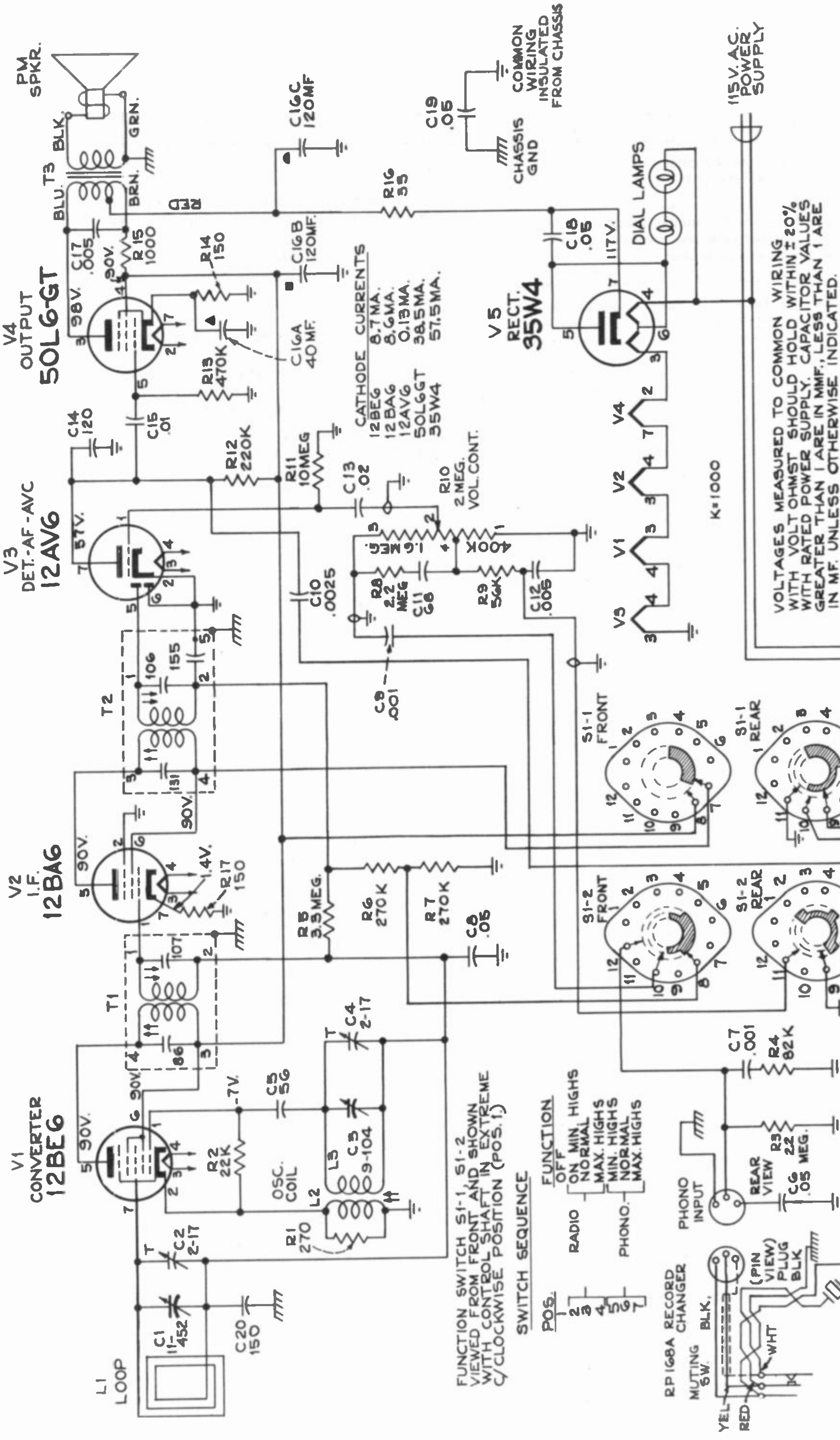
Dial drive mechanism



Record changer adjustments



Tube and trimmer location



Schematic Diagram

Replacement Parts

STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1077
74700	Bracket—Drive cord pulley bracket (L. H.) complete with one (1) pulley and one (1) terminal board.
74705	Bracket—Drive cord pulley bracket (R. H.) complete with two (2) pulleys less long bracket.
74704	Capacitor—Variable tuning capacitor—less bracket..C1, C2, C3, C4
71924	Capacitor—Ceramic, 56 mmf. C5
74884	Capacitor—Ceramic, 68 mmf. C11
39630	Capacitor—Mica, 120 mmf. C14
39632	Capacitor—Mica, 150 mmf. C20
74678	Capacitor—Electrolytic, comprising 2 sections of 120 mfd., 150 volts and 1 section of 40 mfd., 25 volts C16A, C16B, C16C
72792	Capacitor—Tubular, .001 mfd., 200 volts C7
73186	Capacitor—Tubular, .001 mfd., 400 volts C9
71926	Capacitor—Tubular, .005 mfd., 200 volts C12
72791	Capacitor—Tubular, .005 mfd., 400 volts C17
70602	Capacitor—Tubular, .0025 mfd., 400 volts C10
72827	Capacitor—Tubular, .01 mfd., 400 volts C15
71928	Capacitor—Tubular, .02 mfd., 200 volts C13
73553	Capacitor—Tubular, .05 mfd., 400 volts C6, C8, C18, C19
73935	Clip—Mounting clip for I. F. transformer
74448	Coil—Oscillator coil L2, L3
36422	Connector—3 contact female connector (phono input socket) J1
30868	Connector—2 contact female connector for motor cable....P3
74702	Control—Volume control R10
†72953	Cord—Drive cord (approx. 49" overall length required)
74454	Gasket—Rubber gasket for between speaker and cabinet
73693	Grommet—Power cord strain relief (1 set)
72283	Grommet—Rubber grommet to mount variable capacitor (3 required)
74703	Loop—Antenna loop L1
18469	Plate—Bakelite mounting plate for electrolytic capacitor
72313	Resistor—Fuse type, 33 ohms R16
	Resistor—Fixed composition resistors:
	150 ohms, ±10%, ½ watt R14, R17
	270 ohms, ±10%, ½ watt R1
	1,000 ohms, ±10%, 1 watt R15
	22,000 ohms, ±10%, ½ watt R2
	56,000 ohms, ±10%, ½ watt R9
	82,000 ohms, ±10%, ½ watt R4
	220,000 ohms, ±10%, ½ watt R12
	270,000 ohms, ±10%, ½ watt R6, R7
	470,000 ohms, ±10%, ½ watt R13
	2.2 megohm, ±10%, ½ watt R3, R8
	3.3 megohm, ±10%, ½ watt R5
	10 megohm, ±10%, ½ watt R11
74701	Shaft—Tuning knob shaft and pulley
73584	Shield—Tube shield for 12AV6
70827	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket
72998	Socket—Dial lamp socket and lead
74038	Spring—Drive cord spring
74676	Switch—Function switch S1

STOCK No.	DESCRIPTION
74677	Transformer—Output transformer T3
73488	Transformer—First I.F. transformer T1
73037	Transformer—Second I.F. transformer T2
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES Stamped 92585-1
74706	Speaker—5" x 7" elliptical P. M. speaker **Note:** If stamping on speaker does not agree with above number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
Y2137	Cabinet—Plastic cabinet—maroon
74713	Clamp—Dial clamp (2 required)
73508	Clip—Spring clip for knob
74719	Clip—Spring clip for radio compartment back panel (2 required)
74192	Connector—3 contact male connector for shielded pickup cable
74682	Decal—Function switch decal
74273	Decal—Trade mark decal
74722	Dial—Dial scale
74674	Emblem—"RCA Victor" emblem
72894	Foot—Rubber foot (4 required)
74707	Grille—Metal grille
74210	Knob—Reject knob
74710	Knob—Volume control or tuning knob
74711	Knob—Function switch knob
72692	Hinge—Cabinet lid hinge (2 required)
74709	Indicator—Station selector indicator
71116	Lamp—Dial lamp
74940	Lever—"Start-Reject" actuating lever
74720	Lid—Cabinet lid
74717	Mask—End mask for dial (2 required)
74708	Motif—Decorative motif for front of cabinet
74623	Mounting—One set of hardware consisting of 3 rubber grommets, 3 flat washers, and 3 eyelets to mount record changer
74715	Panel—Radio compartment back panel
74721	Plate—Dial back plate, less dial
74212	Nut—Speed nut for reject knob
74712	Nut—Speed nut for "Start-Reject" actuating lever
72765	Nut—Speed nut to fasten motif (1 required) or to fasten dial (2 required)
73728	Screen—Ventilation screen (2 7/16" x 1¼") (2 required)
74716	Screw—#6-32 x ¼" cross-recessed oval head machine screw for lid support (4 required) or radio compartment back panel (3 required)
14270	Spring—Retaining spring for function switch knob
74718	Spring—Return spring for "Start-Reject" actuating lever
71824	Stud—Stud and screw to mount lid hinge (1 set) (2 required)
74714	Support—Lid support

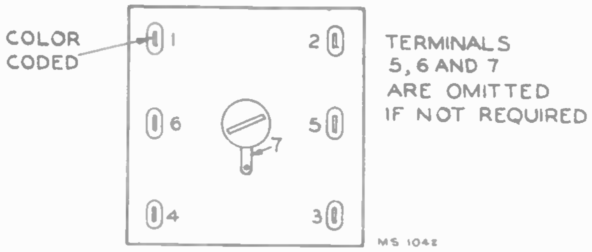
† Stock No. 72953 is a reel containing 250 feet of cord.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.

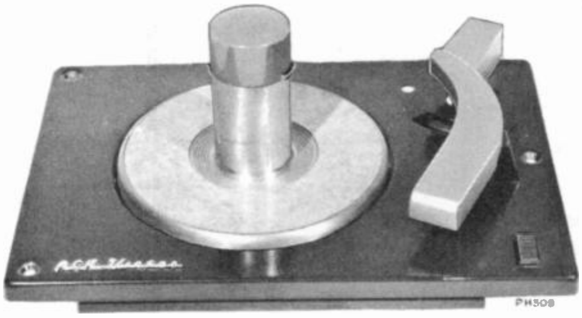
Substitute I.F. Transformer:

To maintain production, first I.F. transformers stamped 970441-5 have been used as a substitute for transformers stamped 970441-1. Connections to the two transformers are different as listed and illustrated below.

	Plate	B+	Grid	A.V.C.
970441-5	4	3	1	2
970441-1	1	2	3	4



Bottom Terminal View—970441 Transformer



RCA VICTOR

RP-168 Series

45 R.P.M. Automatic Record Changer

Mfr. No. 274

SERVICE DATA

—1949 No. 5—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

TYPE AND MODEL IDENTIFICATION

The record changer mechanism may be used either with or without a metal motorboard. When a metal motorboard is not used, the instrument cabinet serves as the motorboard.

Two major changes have been made since the start of production. One change is the type of pickup arm rest, the original design used a visible rest on the motorboard or instrument cabinet which has been replaced by a rest on the sub-base. The other major change is in the record separators, the original type used rotating gear type of separators which were replaced by a push-out type of separators.

Many other changes have been made and there are differences in the color and finish of some parts when used with certain instruments. These changes did not necessarily involve a change in the identification applied to the bottom of the mechanism sub-base.

Five different pickups are in use: Two (2) crystal pickups, one (1) magnetic pickup and two (2) ceramic pickups. A listing of pickup vs. instrument model is given on page 14.

BECAUSE OF THE DIFFERENCES MENTIONED ABOVE, THE LABEL OR STAMPING ON THE SUB-BASE DOES NOT PROVIDE SUFFICIENT IDENTIFICATION FOR ORDERING REPLACEMENT PARTS.

Replacement parts should be ordered only by **stock number**. Refer to the illustrations and parts listings for identification.

The RP 168 Series record changer is used in the following instrument models:

RECORD PLAYER ATTACHMENTS
9JY, CP-5203, 45J, QJY

RECORD PLAYERS (without radio)
9EY3, 9EY31, 9EY32, 9EY35, 9EY36, 45EY, QEY3

RADIO-PHONOGRAPH COMBINATIONS
9QV5, 9W51, 9W78, 9W101, 9W102, 9W103, 9W105, 9W106, 9Y7, 9Y51, A55, A78, A106

RADIO-PHONOGRAPH-TELEVISION COMBINATIONS
9TW309, 9TW333, 9TW390, TA128, TA129, TA169, S1000

AUTOMATIC OPERATION

1. Place a stack of records over the center post, with the desired selections upward, the last record to be played on top.
2. Apply power to drive motor.
3. Push the "start-reject" knob to "start" and let go. The mechanism will automatically play in sequence one side of each record stacked on the separator shelves.
4. To reject a record being played push the "start-reject" knob.
5. At conclusion of playing and as the last record is being repeated, lift the pickup arm and place on its rest. Turn off the power to the drive motor.
6. Remove the stack of records by lifting them straight up.

SPECIFICATIONS

Turntable speed	45 r.p.m.
Records used	RCA seven-inch fine groove
Record capacity	Up to 10 records
Pickup force	5 grams
Stylus tip radius	.001 inch
Type of pickup	Ceramic, crystal or variable reluctance (magnetic)
Power supply	105-125 volts, 60 cycle, a.c.

(May be converted for use on 50 cycle power supply.)

CAUTION

1. Avoid handling the pickup arm when the mechanism is in cycle.
2. Do not use force to release a jam.
3. Do not try to remove the records on the turntable if the turntable is stopped in cycle.
4. Do not try to operate the mechanism if the separator knives protrude from the center post when the mechanism is out of cycle.

During service, the position of the star wheel on the underside of the record changer may be accidently shifted; this may cause the separator knives to be extended when they should be concealed.

If the separator knives are thus extended — turn the power on so that the turntable is revolving, push the "start-reject" knob and allow the mechanism to complete a change cycle. If the knives continue to be extended — while the turntable is still revolving, gently press fingers against the extended knives until they disappear inside the center post — DO THIS ONLY WHILE MECHANISM IS OUT OF CYCLE.

LUBRICATION

A light machine oil (SAE No. 10) should be used to oil the bearings of the drive motor.

On all bearing surfaces, excepting the motor bearings, Houghton STA-PUT No. 320, or equivalent, should be used. On all other sliding surfaces, STA-PUT No. 512, or equivalent, is recommended. STA-PUT can be purchased from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.

(Do not oil or grease record separator shelves.)

It is important that the drive motor spindle and the rubber tire on the idler wheel be kept clean and free from oil or grease, dirt, or any foreign material at all times. Carbon tetrachloride or naphtha is satisfactory for cleaning these parts.

CYCLE OF OPERATION

Function	Explanation
Place records over the center post and turn the power on	1. Records rest on separator shelves protruding from either side of the center post.
Operator — Push start-reject knob	1. Start-reject knob which is linked to start-reject slide (45A) moves trip pawl (37) into tripping position. 2. As the turntable rotates, the small projection (8A) (extending from the underside of the turntable) contacts end of trip pawl.
Automatic Cycle — Pickup arm rises	1. As the turntable continues to rotate it carries the trip pawl (37) along for a short distance. 2. The stud (37A) on trip pawl applies force against director lever (41) in opposition to tension spring (42). This force continues to be applied until the stud (41B) on the director lever has been forced through the slot and into the cycling cam (8B). 3. The end (41C) of the director lever extending below the motorboard moves away, allowing the muting switch (63) to close. 4. At the same time the stud (41A) pushes the pickup arm lift lever (35) which in turn raises the pickup arm.

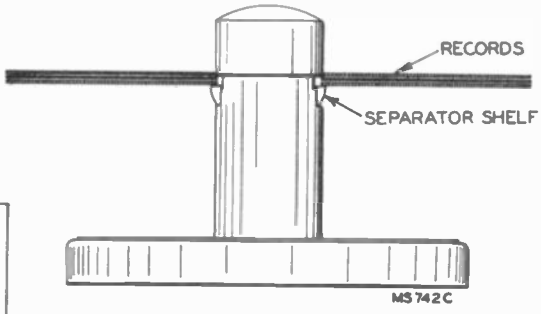


Figure 1.

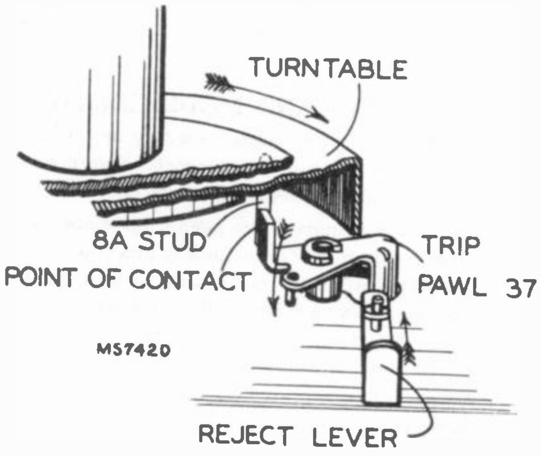


Figure 2.

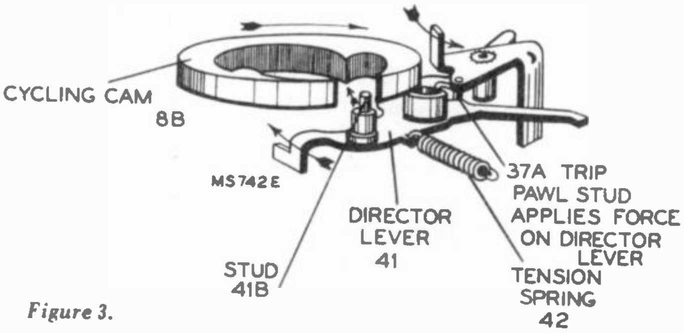


Figure 3.

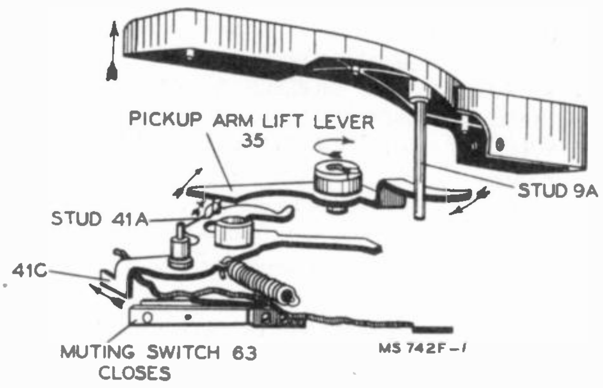


Figure 4.

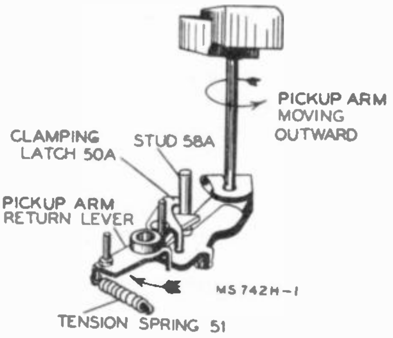


Figure 5.

Function	Explanation
Pickup arm moves out	1. The end (41E) of the director lever (41) contacts stud (58A) on trip lever (58), starting the pickup arm on its outward movement. 2. The stud (58A) on trip lever contacts pickup arm return lever (50), pushing it outward against the tension spring (51). 3. As the pickup arm reaches its outermost position, it is locked in position by the latch (50A) clamping the stud (58A) on the end of the pickup arm return lever.

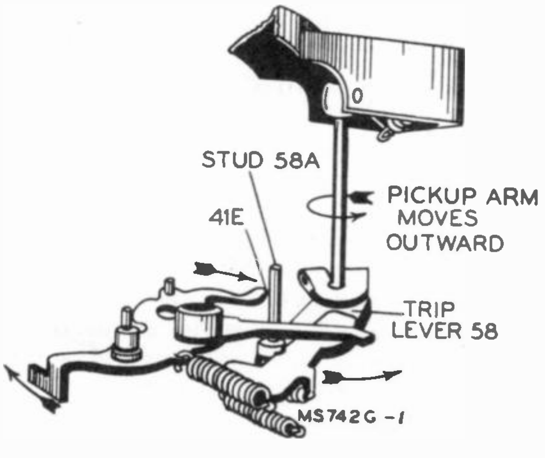


Figure 6.

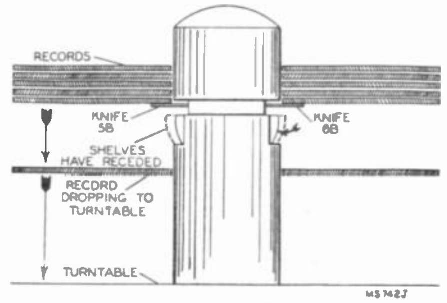
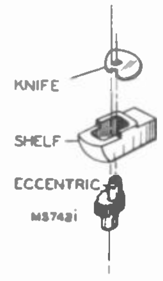


Figure 7.



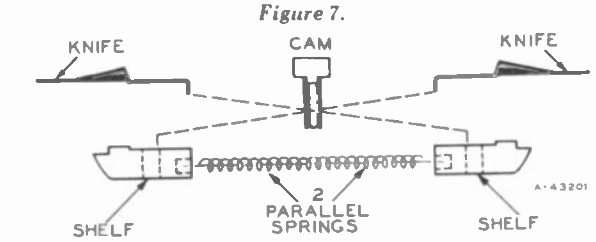


Figure 8.

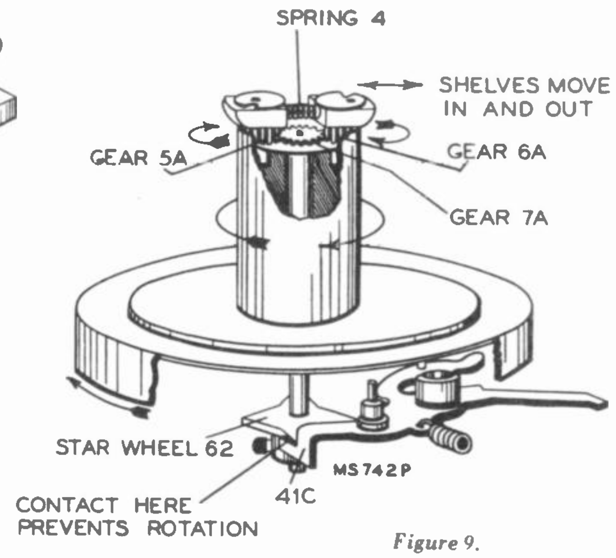


Figure 9.

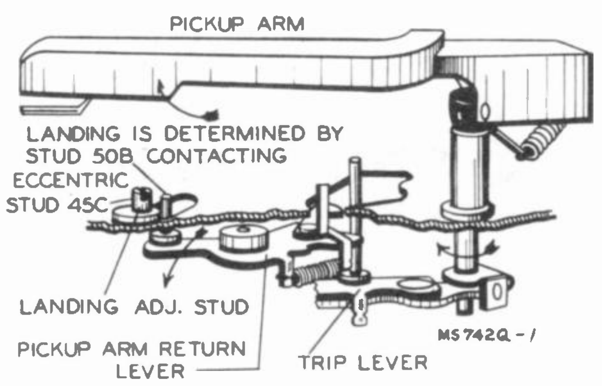
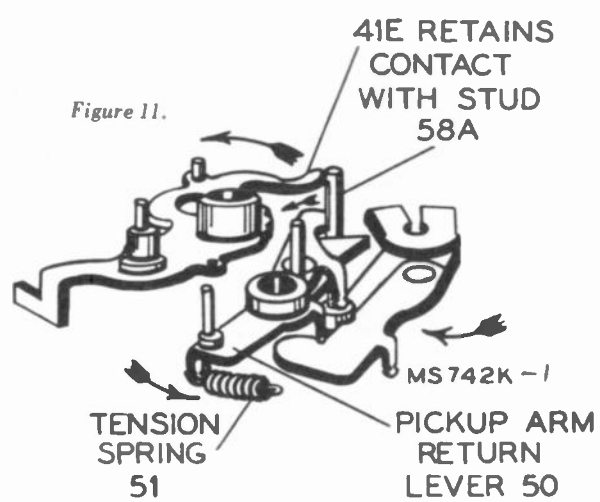


Figure 10.

Figure 11.



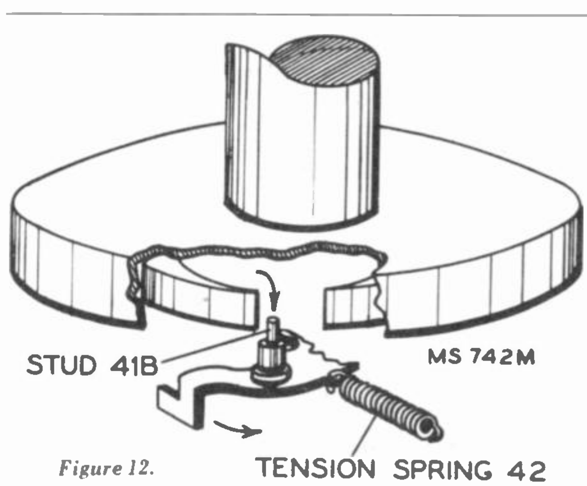


Figure 12.

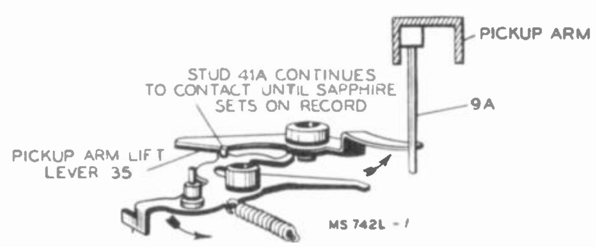


Figure 13.

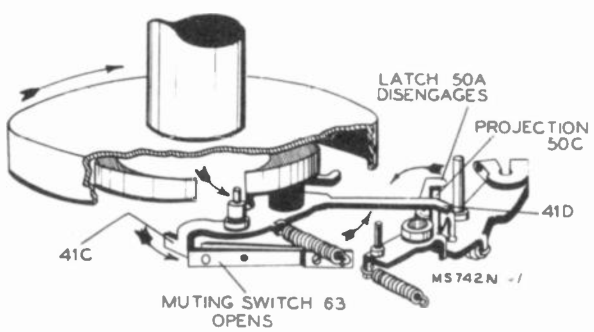


Figure 14.

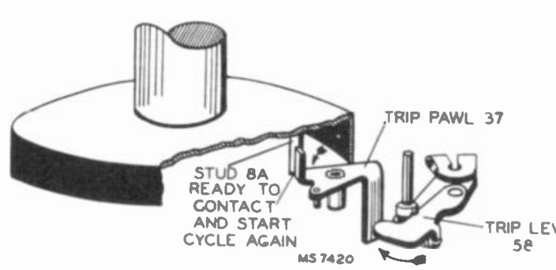


Figure 15.

Separator knives separate the lower record from the stack and allows the record to drop to the turntable

1. While the pickup arm is moving outward, the end (41C) of the director lever (41) extending below the motorboard, contacts and prevents the star wheel (62) from rotating.
2. Since the turntable continues to rotate and the star wheel and shaft remain stationary, the two small gears (5A and 6A) embedded in the upper section of the center post rotate around the gear (7A) on the upper end of the star wheel shaft (7).
3. The eccentric extending from the upper end of the two embedded gears turns in a slot in the separator shelves (5 and 6). This causes the shelves to move in against the tension of spring (4).

   A later type of record separators (knives and shelves), illustrated in Figure 8, are actuated by a cam at the top of the shaft. No gears are used. The cam pushes out on the knives which in turn pull in on the opposite shelves.
4. As the shelves recede the separator knives (5B and 6B), mounted above each separator shelf, separate the lower record of the stack and support the remaining records while the lower record drops to the turntable.

Pickup arm moves in for landing

1. As the director lever (41) continues to move toward the out of cycle position the end of the director lever (41E) retains contact with the stud (58A) on the trip lever (58). This contact stabilizes the inward movement of the pickup arm which is being pushed in by the pickup arm return lever (50).
2. The inward movement of the pickup arm is stopped directly above the landing position due to the stud (50B) on pickup arm return lever coming in contact with the eccentric stud (45C).

Sapphire is lowered to the record

1. The stud (41A) on director lever (41) continues to contact pickup arm elevating lever (35) and lowers the sapphire on the start of the record.
2. As the turntable completes one revolution, the stud (41B) on director lever is pulled through the slot in the cycling cam by the tension spring (42).
3. The end of the director lever (41D) contacts projection (50C) and unlatches the pickup arm return lever (50).
4. The end (41C) of the director lever below the motor board moves away from the star wheel and opens muting switch.

Playing of record is completed and mechanism starts change cycle

1. After the selection has been completed the sapphire moves into the tripping groove. At this time the trip lever (58) pushes the trip pawl (37) into position for engagement with the stud (8A) on the underside of the turntable.
2. This contact between stud (8A) and the trip pawl (37) starts another change cycle and the next record is moved into position for playing.

SERVICE HINTS

Care of Pickup

LINT MAY COLLECT TO CLOG THE OPENING IN THE GUARD AT THE STYLUS POINT AND CAUSE POOR RECORD REPRODUCTION. This may require occasional cleaning of the guard opening—clean by carefully brushing with a small soft brush.

Replacement of Stylus

Caution: Never bend the stylus support wire.

CRYSTAL PICKUPS (Stock Nos. 74067 and 74625)

Remove the two screws holding sapphire guard in place and remove the guard. Remove the small nut and washer on the threaded shaft of the sapphire holder and gently push the shaft through the hole in the armature shaft until the sapphire holder assembly comes free.

Extreme care should be used when loosening the nut so that the twisting motion does not break the crystal. Take hold of the lower end of the shaft with a pair of pliers while loosening or tightening the nut, being very careful so as not to strip the threads or break the crystal.

Insert threaded shaft of replacement sapphire holder through armature shaft and replace the washer and nut. Make sure that the sapphire is in the correct position.

Replace the sapphire guard, positioning it by means of the oversize screw slots. Make certain that the sapphire and its supporting wire are centered in the guard. Tighten the guard screws. Before using, check to see that the sapphire projects far enough beyond the guard so that the guard will not touch the record. If necessary, bend the guard a little.

VARIABLE RELUCTANCE PICKUP (Stock No. 74466)

To remove the stylus assembly, insert a bent paper clip or equivalent tool into the stylus stud pin socket at point "A." Press the assembly out from the cartridge with the tool as shown by the arrow in the illustration below.

To replace the stylus assembly, insert the stud pin into the recess "A," with the locating tab positioned above the locating slot "B" between the two pole pieces. Press assembly in firmly by applying pressure upon the stud pin at point "C" with a blunt tool. Care must be taken to press assembly only at point "C" so as not to damage or distort the stylus arm.

CERAMIC PICKUP (Stock No. 74984)

To remove stylus, insert the point of a knife blade between the stylus wire and the case. The stylus may be pried out of its rubber mounting with a twisting motion of the knife blade.

To replace stylus, push end of stylus wire down into its rubber mounting. Be certain that the stylus is centered in the groove of the pickup case.

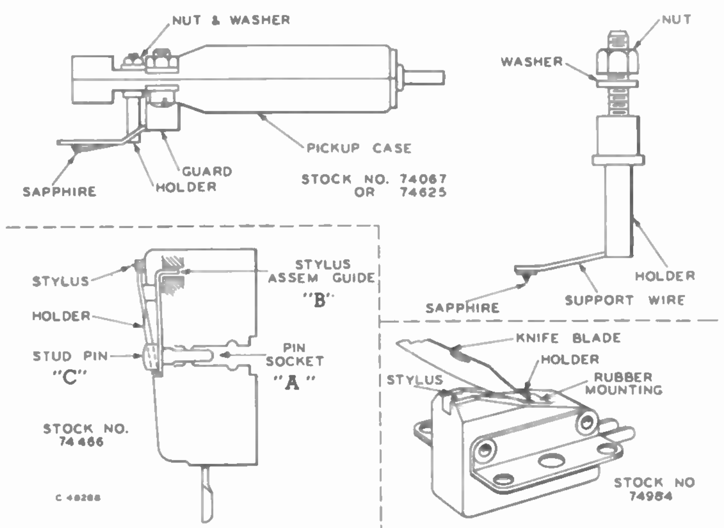


Figure 16—Stylus Replacement.

RP-168 Series

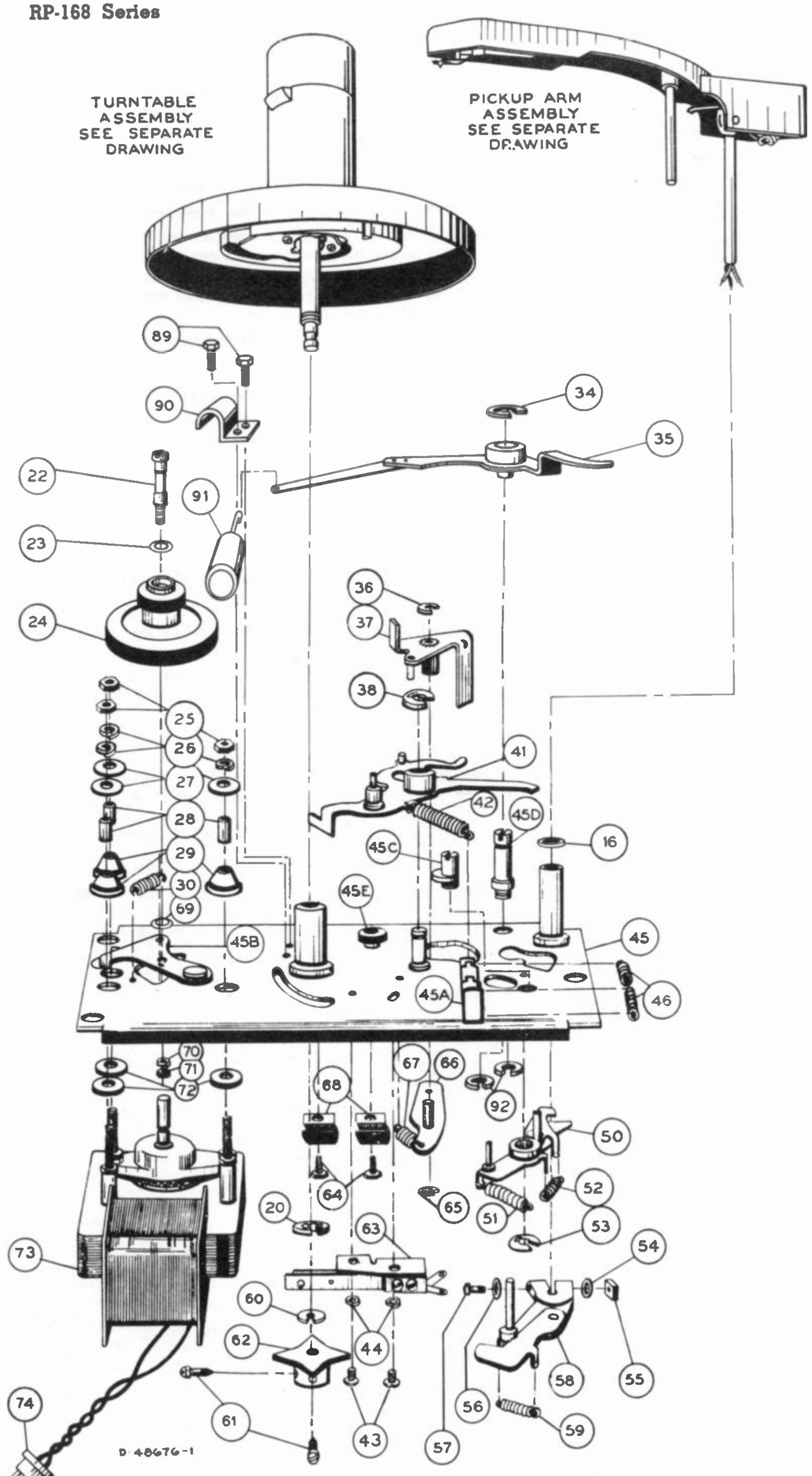


Figure 17—Exploded View of Sub-base Assembly.

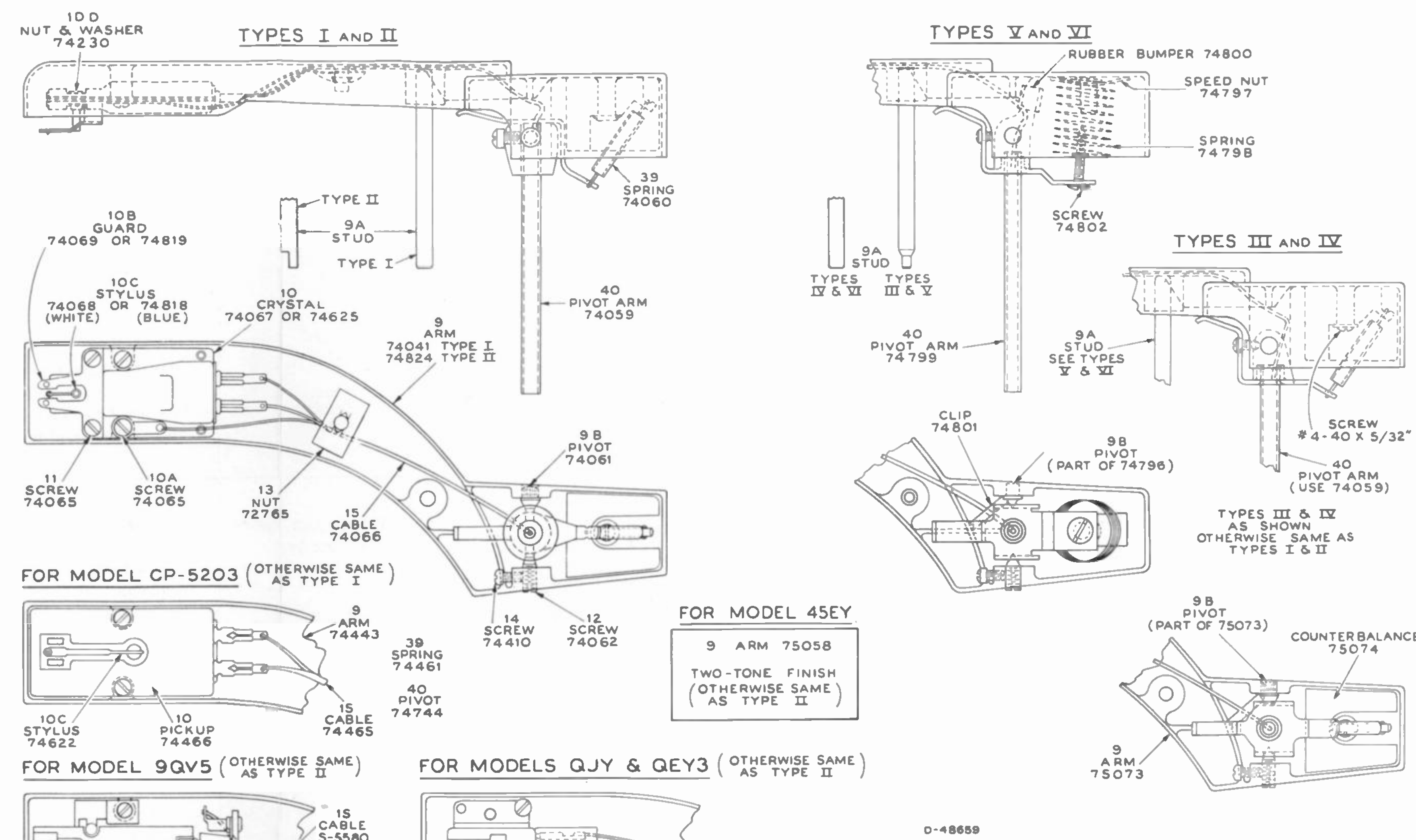


Figure 18—Pickup Arm Assemblies.

SUB-BASE ASSEMBLIES

Type I

Sub-base Stock No. 74070. Has staked studs for spring anchors and one-piece reject lever. Stamped or labelled RP168-1 or RP168-3.

Type II

Same as Type I, except it uses a two-piece reject lever. Use Stock No. 74743 Sub-base (Type III) for replacement.

Type III

Sub-base Stock No. 74743. Same as Type II, except that it has pickup arm rest on sub-base (when motorboard rest is used, the sub-base rest is to be deformed).

Type IV

Sub-base Stock No. 74468. It uses an a.c. input connector and audio output jack mounted on a separate bracket. Labelled RP168-2 and used only with Model CP-5203.

Type V

Sub-base Stock No. 74856. Has turned up lances for spring anchors. Idler wheel mounting plate (45B—Stock No. 74814) is removable. It is labelled RP168-1, RP168B-1, etc. It has pickup arm rest on sub-base (when motorboard rest is used, the sub-base rest is to be deformed).

Type VI

Stock No. 74803. Similar to Type V, but it does not bear any "RP168" identification. It has pickup arm rest on sub-base. Idler wheel mounting plate (45B) is secured to the sub-base with a shoulder rivet.

Type VII

Same as Type VI, except it does not have pickup arm rest on sub-base. Use Stock No. 74803 (Type VI) for replacement (the pickup arm rest is to be deformed).

NOTE. Types VI and VII

Late production of these types have the idler wheel mounting stud (22) staked to its mounting plate. The idler wheel retainer (horseshoe washer) is Stock No. 75081.

NOTE: Type V

Two different main levers (director lever) are used, depending upon which turntable assembly is used. Lever (41), Stock No. 74076 has a long end (41C) and is used with Turntables Types I and II. Lever (41), Stock No. 74857 has a short end and is used with Turntable Type III.

PICKUP ARM ASSEMBLIES (LESS PICKUP)

Type I

Arm Stock No. 74041. Stamped 970488. Pickup arm stud (9A) is full diameter for entire length (do not use where pickup arm rest is on sub-base). Lead counterbalance is riveted to arm.

Arm Stock No. 74443. For Model CP-5203 only. Black finish, otherwise similar to No. 74041.

Type II

Arm Stock No. 74824. Same as No. 74041 except that stud (9A) has a flat on one side at bottom end. Can be used with either type of pickup rest.

Arm Stock No. 75058. For Model 45EY only. Two-tone finish, otherwise same as No. 74824.

Type III

Arm stock No. 75073. Stamped 3R1. Similar to No. 74824 except that a different pivot (9B) is used and the lead counter-balance is fastened to the arm with a screw. Stud (9A) is of smaller diameter at bottom end. Can be used with either type of pickup rest. Use only with No. 74059 pivot arm.

Type IV

Same as Type III except that stud (9A) is of full diameter for entire length. Use No. 75073 for replacement.

Type V

Arm Stock No. 74796. Stamped 3R1. Similar to Type III except that a different pivot (9B) is used and the lead counter-balance is not used. A 3/8" O.D. counter-balance spring is used. Can be used with either type of pickup rest. Use only with No. 74799 pivot arm.

Type VI

Same as Type V except that stud (9A) is of full diameter for entire length. Use No. 74796 for replacement.

STOCK No.	ILL. No.	DESCRIPTION
		SUB-BASE ASSEMBLIES
74256	16	Washer—Vellutex washer (pivot arm shaft bearing washer)
74080	17-19	Washer—Washer for turntable bearing
72349	18	Bearing—Turntable thrust bearing
72688	20	Washer—"C" washer—turntable assembly retainer
74079	22	Stud—Idler wheel mounting stud—for Sub-base Types I, II, III, IV, early VI, and early VII
74078	23	Washer—Dampening washer for idler wheel—top
74077	24	Wheel—Idler wheel for all except Model CP-5203
74470	24	Wheel—Idler wheel for Model CP-5203
74132		Hardware—Motor mounting hardware consisting of:
	25	Three hex nuts
	26	Three lockwashers
	27-72	Six flat washers
	28	Three spacers
74087	29	Grommet—Rubber grommet to mount motor (3 required)
74089	30	Spring—Idler wheel tension spring (.195" O.D. x .593" —14 turns)
35969	34	Washer—"C" washer to retain pickup arm lift lever
74073	35	Lever—Pickup arm lift lever for mechanisms without dashpot
74757	35	Lever—Pickup arm lift lever for mechanisms with dashpot
——	35	Lever—Two piece pickup arm lift lever (use No. 74073 or No. 74757 for replacement)
74805	–	Spring—Tension spring for two piece pickup arm lift lever (.170" O.D. x ¾")
33726	36	Washer—"C" washer to retain trip pawl
74072	37	Pawl—Trip pawl
74453	–	Washer—Bearing washer between trip pawl (Ill. No. 37) and trip pawl lever (Ill. No. 66)
35969	38	Washer—"C" Washer to retain main lever
74076	41	Lever—Main lever (director lever) for use with turntables having rotating gear record separators
74857	41	Lever—Main lever (director lever) for use with turntables having push-out record separators
74084	42	Spring—Main lever spring (.195" O.D. x .800"—27¼ turns)
——	43	Screw—Screw to mount muting switch (No. 6-32 or No. 6 self tapping)
——	44	Washer—No. 6 lockwasher used with Item 43 (No. 6-32 screw)
74070	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever and reject lever—Type I without pickup rest
74743	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever and reject lever—Type III with pickup rest
74468	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever and reject lever—less No. 74473 bracket—Type IV—for RP-168-2—used only on Model CP-5203
74473	–	Bracket—Metal bracket with power input connector and audio output jack—RP168-2 only
74856	45	Base—Sub-base assembly complete with all staked and riveted parts—less idler lever and reject lever —Type V—with pickup rest
74803	45	Base—Sub-base assembly complete with all staked and riveted parts, including idler lever—less reject lever—Type VI—with pickup rest
74860	45A-1	Lever—Reject lever — bottom section — for sub-base Types V, VI, and VII
74861	45A-2	Lever—Reject lever—top section—for sub-base Types V, VI, and VII
74814	45B	Plate—Idler wheel mounting plate and stud—for sub-base Type V
74870	45B-1	Retainer—Idler wheel retainer (spring sleeve) for use with No. 74814 plate (45B)
75081	45B-1	Retainer—Idler wheel retainer (horseshoe washer) for use with sub-base Types VI and VII (late production)
74804	45B-2	Washer—Idler wheel bearing washer (½" O.D. x .185" I.D. x .032" thick) for sub-base Types VI and VII (late production)
74430	45C	Stud—Eccentric stud for landing adjustment
74429	45D	Stud—Eccentric stud for height adjustment
74082	45E	Washer—Felt washer (½" O.D. x ¼" I.D. x 3/16" thick)
74086	46	Spring—Reject lever spring (.203" O.D. x 13/16"—34¾ turns) for sub-base having one piece reject lever—1 required
74427	46	Spring—Reject lever spring (.203" O.D. x .531"—13 turns) for sub-bases having two piece reject lever—2 required
74074	50	Lever—Return lever (includes spring Ill. No. 51)
74085	51	Spring—Return lever actuating spring (.195" O.D. x 29/32"—37½ turns)
74075	52	Spring—Return lever latch spring (.180" O.D. x .535"—21½ turns)
——	54	Washer — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
——	55	Nut — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
——	56	Washer — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
——	57	Screw — To clamp trip lever (Ill. No. 58) to pivot arm shaft (Ill. No. 40)
74099	58	Lever—Trip lever (includes Items 54, 55, 56, 57 and 59)
74426	59	Spring—Trip lever spring (.171" O.D. x .595"—30 turns)
33726	60	Washer—"C" washer for star wheel shaft
74083	61	Screw—No. 6-32 x .281" cone point set screw for star wheel (2 required)
74081	62	Wheel—Star wheel
74088	63	Switch—Muting switch
——	64	Screw—No. 8 x ¼" self tapping screw
33726	65	Washer—"C" washer to retain trip pawl lever
74245	66	Lever—Trip pawl lever
74100	67	Spring—Trip pawl take up spring (.195" O.D. x ⅝"—20½ turns)
——	68	Clamp—Cable clamp
74102	69	Washer—Dampening washer for idler wheel (bottom)
——	70	Washer—No. 4 lockwasher for idler mounting stud (Ill. No. 22)

STOCK No.	ILL. No.	DESCRIPTION
——	71	Nut—No. 4-40 hex nut for idler wheel mounting stud (Ill. No. 22)
——	72	Washer—Part of No. 74132—see Ill. No. 27
74071	73	Motor—115 volt, 60 cycle motor complete with connector—shaded pole type. Not suitable for 50 cycle conversion
74624	73	Motor—115 volt, 60 cycle motor complete with connector and No. 73158 spring sleeve (for 50 cycle conversion), shaded pole type
74469	73	Motor—115 volt, 60 cycle motor complete with connector and 5 mf. capacitor—for RP 168-2 only
74621	–	Capacitor—Motor capacitor (5 mf.) for No. 74469 motor
30870	74	Connector—Two prong male plug (connector) for motor cable
73158	–	Spring—Spring sleeve to convert motors No. 74624 to 50 cycle operation
——	89	Screw—No. 8 x ¼" self tapping screw
74859	90	Clamp—To mount dash-pot
74428	91	Dash-pot—Pneumatic dash-pot complete with plunger
74431	92	Washer—"C" washer for mounting adjustment studs No. 74429 (Ill. No. 45D) and No. 74430 (Ill. No. 45C)
		PICKUP ARM ASSEMBLIES
74041	9	Arm—Pickup shell and stud—with pivot (9B) and lead counter-balance—Type I for use with rest on motor-board
74443	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counter-balance—for Model CP-5203 only—black finish
74824	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counter-balance—Type II for use with rest on sub-base
75058	9	Arm—Pickup arm shell and stud—with pivot (9B) and lead counter-balance—for Model 45EY only—two-tone finish
75073	9	Arm—Pickup arm shell and stud—with pivot (9B)—less lead counter-balance—Type III—for use with either type of pickup rest
74796	9	Arm—Pickup shell and stud—with pivot (9B)—less balance spring—Type V—for use with either type of pickup rest
74061	9B	Pivot—Pickup arm pivot—for use with arms No. 74041, No. 74443, No. 74824, and No. 75058 only (arms stamped 970488)
74067	10	Pickup—Crystal pickup cartridge complete including sapphire and guard—RMP 128-1
74625	10	Pickup—Crystal pickup cartridge complete including sapphire and guard—RMP 128-2
74466	10	Pickup—Magnetic pickup cartridge complete with stylus—for Model CP-5203 only
74984	10	Pickup—Ceramic pickup cartridge complete with stylus—for Models QJY and QEY3
*S-5578	10	Pickup—Ceramic pickup cartridge complete with stylus—for Model 9QV5
74065	10A	Screw—No. 2-56 x 3/16" fillister head screw to mount No. 74067 or No. 74625 crystal pickups or No. S-5578 ceramic pickup
74464	10A	Screw—No. 2-56 x ¼" fillister head screw to mount No. 74466 pickup (Model CP-5203)
74986	10A	Screw—No. 2-56 x 3/16" screw for mounting No. 74984 pickup (Models QJY and QEY3)
74069	10B	Guard—Stylus guard for No. 74067 pickup (RMP 128-1)
74819	10B	Guard—Stylus guard for No. 74625 pickup (RMP 128-2)
74068	10C	Sapphire—Sapphire and holder (WHITE) for No. 74067 pickup (RMP 128-1)
74818	10C	Sapphire—Sapphire and holder (BLUE) for No. 74625 pickup (RMP 128-2)
74622	10C	Stylus—Diamond stylus and holder for No. 74466 pickup (Model CP-5203)
74985	10C	Stylus—Stylus and holder for No. 74984 pickup (Models QJY and QEY3)
74230	10D	Washer and Nut—to mount No. 74068 or No. 74818 stylus
74065	11	Screw—No. 2-56 x 3/16" fillister head screw to mount stylus guard on No. 74067 or No. 74625 pickups
74062	12	Screw—No. 8-32 x 13/32" cone point pivot adjusting screw
72765	13	Nut—Speed nut to hold pickup arm cable
74801	–	Clip—Spring clip to hold pickup arm cable (used only on pickup arm Type V and VI—No. 74796)
74410	14	Screw—No. 4-40 x 3/16" fillister head screw to lock pivot screw No. 74062
74066	15	Cable—3-wire twisted pickup arm cable complete with connectors
74465	15	Cable—Shielded pickup arm cable complete with connectors—Model CP-5203 only
*S-5580	15	Cable—Shielded pickup arm cable complete with connectors—Model 9QV5 only
74060	39	Spring—Counter-balance spring (.171" O.D. x .695"—43 turns) for Pickup Arm Types I, II, III and IV when using No. 74067, No. 74625 or No. 74984 pickups (most models)
74426	39	Spring—Counter-balance spring (.171" O.D. x .595"—30 turns) for Model 9QV5 only
74461	39	Spring—Counter-balance spring (.185" O.D. x .695"—29¾ turns) for Model CP-5203 only
74798	39	Spring—Counter-balance spring (⅝" O.D.—11 turns) for Pickup Arm Types V and VI (Stock No. 74796)
74797	–	Nut—Speed nut to hold No. 74798 spring in Pickup Arm Types V and VI
75074	–	Weight—Lead counter-balance weight for Pickup Arm Types III and IV
——	–	Screw—No. 4-40 round head screw to hold No. 75074 weight to No. 75073 Arm
74059	40	Arm—Pivot arm and shaft for use with all pickup arms having lead counter-balance except Model CP-5203
74744	40	Arm—Pivot arm and shaft for Model CP-5203 only
74799	40	Arm—Pivot arm and shaft for use with Pickup Arm Types V and VI
74802	–	Screw—No. 4 x 9/16" oval head counter-balance adjusting screw for use with No. 74799 pivot arm
74800	–	Bumper—Rubber bumper for No. 74799 pivot arm

STOCK No.	ILL. No.	DESCRIPTION
		TURNTABLE ASSEMBLIES
74090	1	Nose—Spindle nose—RED (early type—thin wall) for Turntable Type I
74620	1	Nose—Spindle nose—RED (late type—thick wall) for Turntable Type I or II
74863	1	Nose—Spindle nose—RED—for Turntable Type III
74472	1	Nose—Spindle nose—BLACK—for Turntable Type I
74795	1	Nose—Spindle nose—BLACK—for Turntable Type III
74091	2	Spring—Spindle nose spring — formed — for spindle nose No. 74090, No. 74620, or No. 74472
74862	2	Spring—Spindle nose spring—formed wire—for spindle nose No. 74863 or No. 74795
——	3	Screw—No. 6-32 round head machine screw for spindle nose spring No. 74091
74095	4	Spring—Separator shelf return spring (.180" O.D. x 1 1/16"—10 turns) for Turntable Types I and II
74866	4	Spring—Separator shelf return spring (.118" O.D. x ¾"—16 turns)—two required—for Turntable Type III
74096	5-6	Separator—Separator knife, shelf and gear assembly for Turntable Types I and II
74865	5-6	Shelf—Separator shelf for Turntable Type III
74864	5B 6B	Separator—Separator knife for Turntable Type III
74092	7	Shaft—Star wheel shaft and gear assembly for Turntable Types I and II
74867	7	Shaft—Star wheel shaft with cam for Turntable Type III
33726	–	Washer—"C" washer for top of No. 74867 shaft
74042	8	Turntable—Turntable with TAN MARBLEIZED mat—Type I—use No. 74090 RED nose (thin wall)
75065	8	Turntable—Turntable with TAN MARBLEIZED mat—Type I—use No. 74620 RED nose (thick wall)
74813	8	Turntable—Turntable with TAN MARBLEIZED mat—Type III—use No. 74863 RED nose
74445	8	Turntable—Turntable with BLACK mat—Type I—use No. 74472 BLACK nose
75145	8	Turntable—Turntable with RED mat—Type I—use No. 74472 BLACK nose
75059	8	Turntable—Turntable with RED mat—Type III—use No. 74795 BLACK nose
74094	8C	Mat—Turntable mat—TAN MARBLEIZED
74471	8C	Mat—Turntable mat—BLACK
74794	8C	Mat—Turntable mat—RED
——	21	Screw—No. 6-32 x 1¾" fillister head screw (holds nose to spindle) two required for Turntable Type I
74868	21	Screw—No. 6-32 x 1⅝" fillister head screw (holds nose to spindle) two required for Turntable Types II and III
74869	21A	Washer—No. 6 flat washer (for use under No. 74868 screw—two required for Turntable Types II and III
——	31	Screw—No. 4-40 x ⅜" fillister head screw (for use with cam, Ill. No. 33)—two required for Turntable Type I
——	32	Washer—No. 4 lockwasher—for use with cam (Ill. No. 33)—two required for Turntable Type I
74231	33	Cam—Follower cam for Turntable Type I

Two different main levers (director lever) are used, depending upon which turntable assembly is used. Lever (41) Stock No. 74076 has a long end (41C) and is used with Turntables Type I and II. Lever (41) Stock No. 74857 has a short end and is used with Turntable Assembly Type III.

STOCK No.	ILL. No.	DESCRIPTION
		MOTORBOARD ASSEMBLIES
74623		Hardware—To mount sub-base to plastic cabinet of Models 9EY3, 9EY35, 9EY36, 9Y51, 45EY and QEY3 or sub-base to motorboard of Models 9EY31 and 9EY32, consisting of:
	47	Three (3) grommets
	–	Three (3) spacers
	48	Three (3) flat washers
——	49	Screw—No. 8-32 x ¾" — for Models 9EY3, 9EY35, 9EY36, 9Y51, 45EY and QEY3
——	49	Screw—No. 8-32 x ½"—for 9JY, 45J and QJY
——	49	Screw—No. 8-32 x ⅜"—for instruments using spring mounting of motorboard
74209	75	Cover—Mounting screw cover (threaded type—3 required)—use with No. 74424 screw (Ill. No. 76)
74581	75	Cover—Mounting screw cover (plug-in type—3 required)—use with No. 74582 screw (Ill. No. 76)
74424	76	Screw—No. 8-32 x 1¾" special screw (with tapped hole) for mounting record changer (3 required)—use with No. 74209 cover (Ill. No. 75)
74582	76	Screw—No. 8-32 x 1¾" special screw (non-tapped hole) for mounting record changer (3 required)—use with No. 74581 cover (Ill. No. 75)
75057	76	Screw—No. 8 x ⅞" oval head wood screw for mounting record changer (3 required)—for Models 9EY31 and 9EY32
73549	77	Emblem—"RCA Victor" emblem—metal
74674	77	Emblem—"RCA Victor" emblem—plastic
74422	78	Spring—Conical spring for mounting record changer —upper L.H. side (2 required)
74423	79	Spring—Conical spring for mounting record changer —bottom (3 required)
74208	80	Nut—Tee nut for mounting record changer (3 required)
74184	81	Motorboard — Motorboard complete with welded brackets and stud—less rest and operating parts—for all models with motorboard rest except CP-5203, 9EY31 and 9EY32
74444	81	Motorboard — Motorboard complete with welded brackets and stud—less operating parts—for Model CP-5203
75076	81	Motorboard — Motorboard complete with welded brackets and stud—less rest and operating parts—for Models 9EY31 and 9EY32
74987	81	Motorboard — Motorboard complete with welded brackets and stud—less operating parts—for all models without motorboard rest
74185	82	Rest — Pickup arm rest — maroon — for all models (where required) except CP-5203, 9EY31 and 9EY32
74446	82	Rest—Pickup arm rest—black—used on Model CP-5203 only
75077	82	Rest—Pickup arm rest and latch—for Models 9EY31 and 9EY32
74210	83	Knob—Reject control knob—maroon
74467	83	Knob—Reject control knob—black
74421	84	Spring—Conical spring for mounting record changer —upper R.H. side (1 required)
74212	85	Nut—Speed nut for reject control knob
——	86	Screw—No. 6 self-tapping screw
33726	87	Washer—"C" washer for mounting reject lever actuating lever
74211	88	Lever—Reject lever actuating lever
74474	–	Switch—"ON-OFF" switch—used on Model CP-5203 only

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Items listed but without Stock Nos. are not stock items.

* Stock Nos. S-5578 and S-5580 are for use in instruments manufactured for RCA International Division and are not stocked by distributors in the U. S. A.

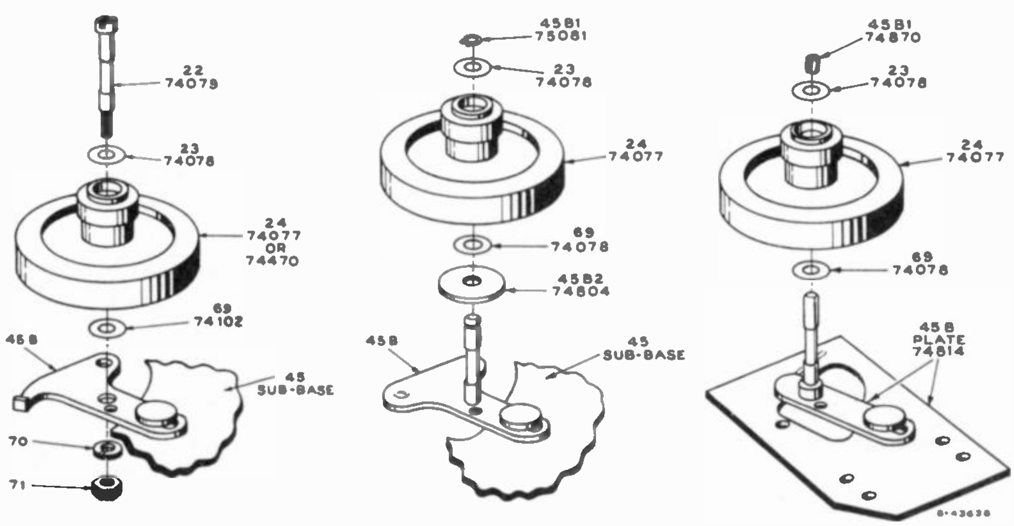
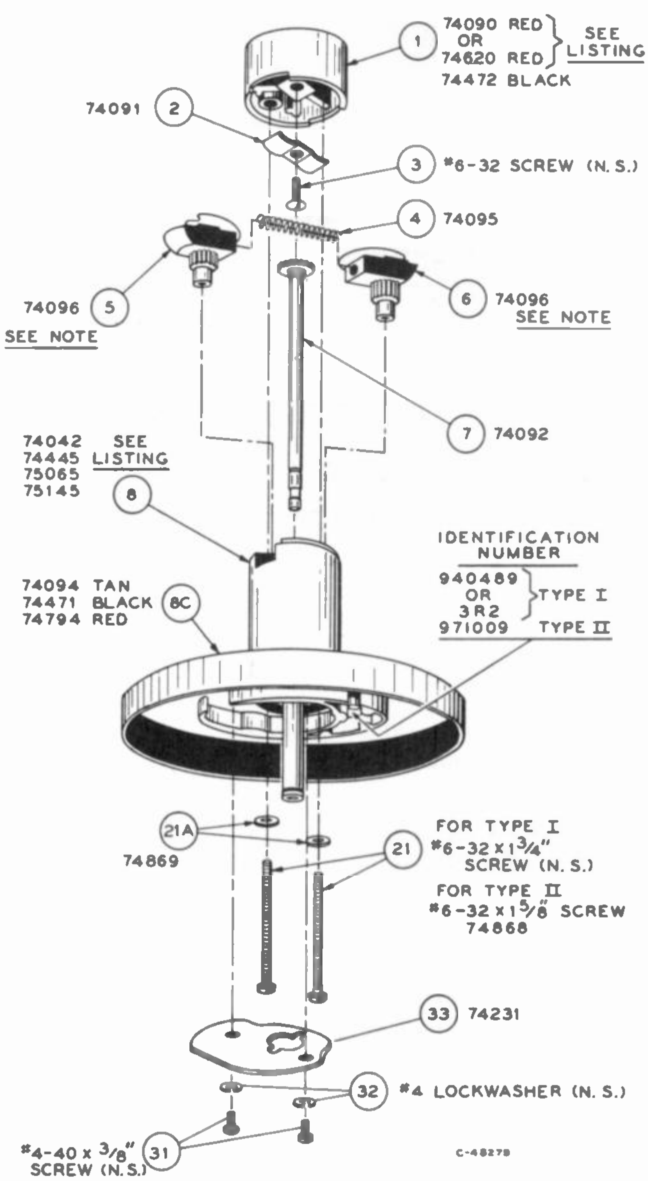
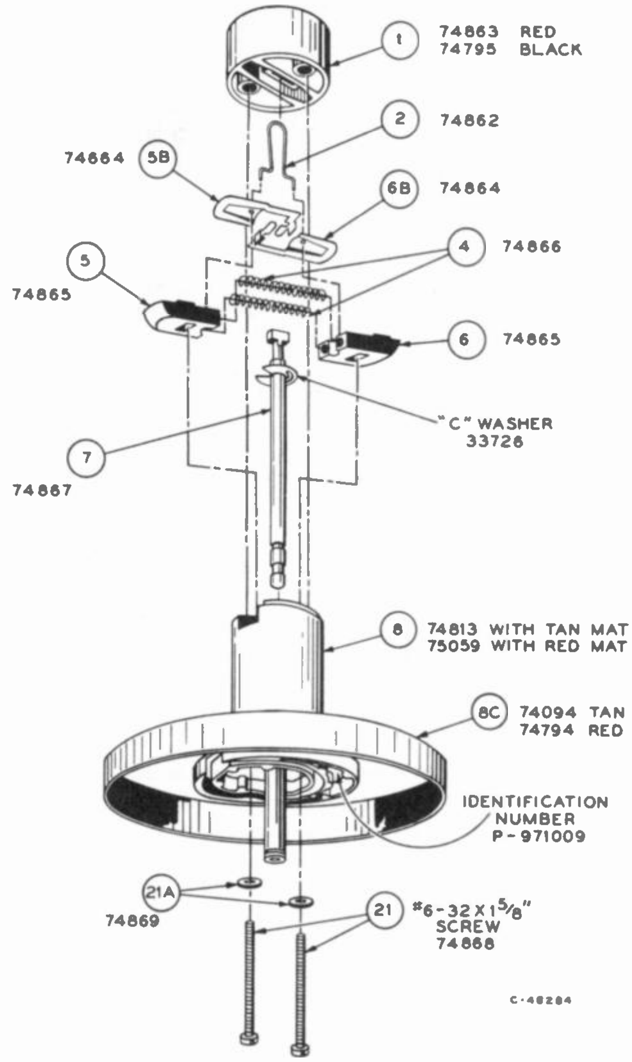


Figure 19—Idler Wheel Mounting.



ON TYPE II TURNTABLES THE CAM (33) IS CAST INTEGRAL WITH THE TURNTABLE (8)

Figure 20—Turntable Assemblies, Types I and II.



NOTE: Use care in dis-assembly to prevent loss of springs. Remove screws—lift nose slightly—hold both separator knives down against shelves—then remove nose.

Figure 21—Turntable Assemblies, Type III.

Main Lever vs Record Separators:

Two different main levers (director lever) are used depending upon the type of record separators being used.

Stock No. 74076 lever is used only with the rotating gear type of record separators. The end (41C) that engages the star wheel is long.

Stock No. 74857 lever is used only with the push-out type of record separators. The end (41C) that engages the star wheel is short.

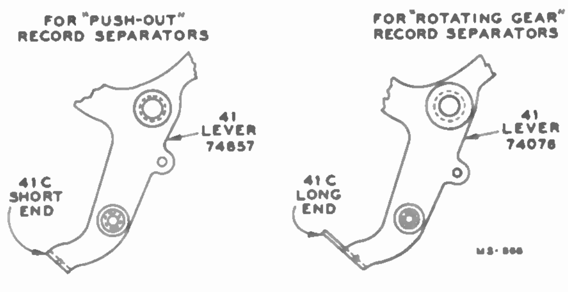


Figure 22—Main Lever.

TURNTABLE ASSEMBLIES

Type I

Turntable Stock No. 74042. Stamped 940489 or 3R2. Has TAN MARBLEIZED mat and uses rotating gear type of record separators. Use No. 74090 spindle nose—RED (thin wall)

Turntable Stock No. 75065. Same as No. 74042, except for diameter at top of spindle. Use No. 74620 spindle nose—RED (thick wall)

Turntable Stock No. 75145. Same as No. 75065, except that it has a RED mat. Use No. 74472 spindle nose —BLACK

Turntable Stock No. 74445. Same as No. 75065, except for finish and BLACK mat. Used only on Model CP-5203. Use No. 74472 spindle nose (BLACK)

Type II

Stamped 971009. Follower cam (33) is a part of the turntable casting. Otherwise, similar to No. 75065. Use No. 75065 turntable, and No. 74231 cam for replacement

Type III

Stock No. 74813. Stamped 971009. Has TAN MARBLEIZED mat and uses push-out type of record separators. Use No. 74863 spindle nose—RED. Although this turntable bears the same stamping as Type II, it does not have the shafts required for mounting the rotating gear type of separators

Stock No. 75059. Same as No. 74813, except that a RED mat is used. Use No. 74795 spindle nose—BLACK

NOTE: Main Lever (41)

Stock No. 74076 lever (with long end 41C) is used in conjunction with rotating gear type of record separators. Stock No. 74857 lever (with short end 41C) is used in conjunction with push-out type of record separators

RP-168 Series

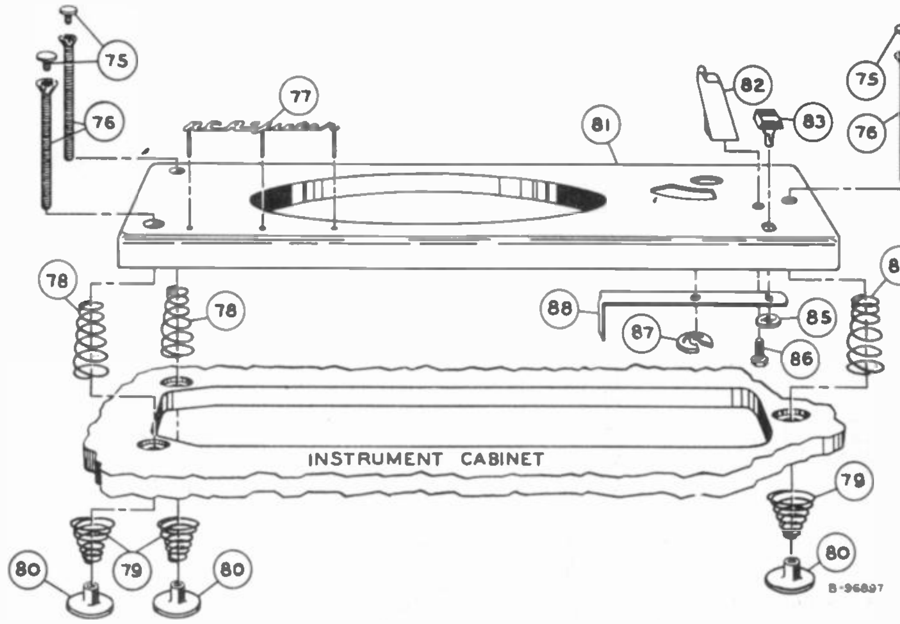


Figure 23
Motorboard Assemblies.

CHANGES—SERVICE HINTS (Continued from Page 4)

Pickup Arm Rest:

Two different types of pickup arm rest are in use. The original type was visible on the motorboard. The type presently in use is a metal projection on the sub-base.

The correct grouping of parts must be used, refer to descriptive text on page 6. The two types are illustrated below.

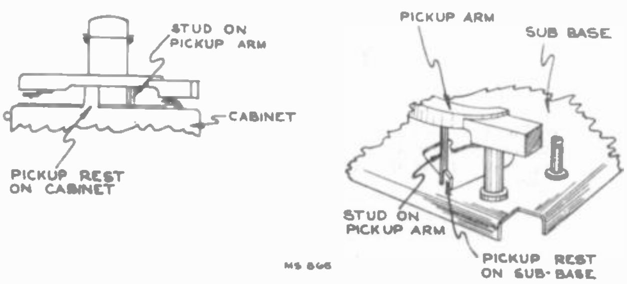


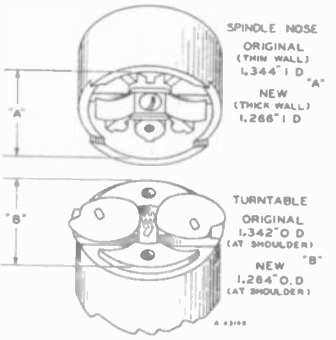
Figure 24—Pickup Arm Rest.

Spindle Nose and Turntable (Type I):

The wall thickness of the spindle nose (Ill. No. 1) has been increased and the machined shoulder at the top of the turntable decreased accordingly. Thick wall spindle nose will not fit on early type turntable. The new type red spindle nose (thick wall) is available as Stock No. 74620.

NOTE: The screws (Ill. No. 21) which hold the spindle nose to the turntable should not be tightened too tight. The spindle nose can be distorted and cause records to bind.

← Figure 26—Spindle Nose.



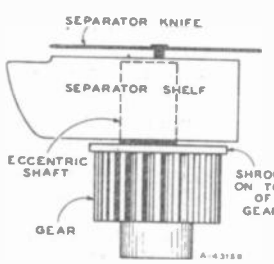


Figure 27—
Separator Assembly.

Sub-base Mounting:

The sub-base is attached directly to metal motorboards and to the cabinets of Models 9JY, QJY and 45J with three screws and three washers. No grommets or spacers are used except with Models 9EY31 and 9EY32.

On all other instruments, the sub-base is cushion mounted to the plastic cabinet with rubber grommets, metal spacers, screws and washers. The mounting is illustrated below.

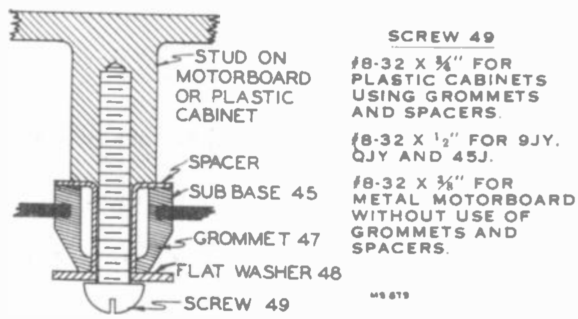


Figure 25—Sub-base Mounting.

Separator Assemblies (Rotating Gear Type):

A flat has been added to the separator gears eccentric shafts. This flat permits the shelf (Ill. Nos. 5 and 6) to stay out until the nose of the blade (Ill. Nos. 5B and 6B) is approximately half-way out. Then the shelf retracts fast. This faster action minimizes unequal dropping of records.

The two types of separator assemblies (Stock No. 74096, Ill. Nos. 5 and 6) are NOT INTERCHANGEABLE. In addition the early type has been grouped according to mold number (at bottom of spring hole) and installed in pairs.

Group Mold Number	Group Mold Number	Group Mold Number
1, 3, 5	9, 10	0, 8

Assemblies of one group should not be mixed with assemblies of another group or unequal dropping of records may occur. If a matched pair is not available, first check timing of separator knives then the dropping of records; it may be necessary to file the edge of the shelf which released the record last.

The late type (having a flat on the eccentric shaft) do not need to be grouped, but an early assembly should not be used in conjunction with a late assembly (use two early or two late assemblies). The late type may be identified by its having a shroud at the top of the gear (see Figure 27).

CHANGES—SERVICE HINTS (Continued)

Turntable Bearing Thrust Washers:

Three thrust washers (Ill. Nos. 17 and 19) are now being used in mounting the turntable. This is done because it was found that the top edge of some idler wheels would contact a non-machined surface on the underside of the turntable and cause noise similar to that caused by a rough idler wheel.

Jamming:

On early RP-168-1 mechanisms it was sometimes possible to jam the mechanism by maintaining pressure on the reject button during cycle. If such jamming should occur check the following:

1. The tip radius of the reject lever (Ill. No. 45A) should be $\frac{1}{16}''$.
2. The edges of the trip pawl (Ill. No. 37) should have a slightly rounded edge (.010" radius).

Present production uses a two piece spring loaded reject lever (Ill. No. 45A) which eliminates the possibility of jamming caused by pressure on the reject button.

Jamming can also be caused by incorrect positioning of the director lever (main lever) (Ill. No. 41) in relation to the star wheel (Ill. No. 62). See Figure 35.

Intermittent Non-Tripping:

The trip lever spring (Ill. No. 59) has been increased in tension to provide better tripping action. The new spring has 30 turns and is available as Stock No. 74426.

To reduce friction a washer has been added between the trip pawl (Ill. No. 37) and the trip pawl lever (Ill. No. 66). It is available as Stock No. 74453.

Eccentric Adjustment Studs:

In early production the eccentric landing (Ill. No. 45C) and height (Ill. No. 45D) adjustment studs were staked to the sub-base assembly. They are now secured to the sub-base assembly with "C" washers. The landing adjustment stud (Ill. No. 45C) is available as Stock No. 74430. The height adjustment stud (Ill. No. 45D) as Stock No. 74429 and the "C" washer (Ill. No. 92) as Stock No. 74431.

Pneumatic Dashpot

A pneumatic dashpot (Stock No. 74428) has been added to improve pickup arm landing. The dashpot case is clamped to the base sub-assembly and the plunger is attached to the long end of the tone arm lift lever (Ill. No. 35) (Stock No. 74757).

ERRATIC PICKUP LANDING

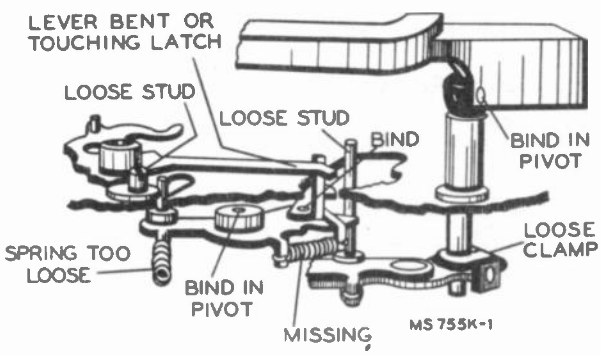


Figure 28.

DISTORTED OUTPUT

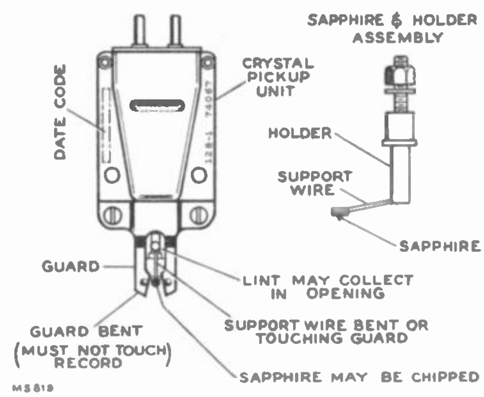


Figure 29.

WOW (Speed Variation)

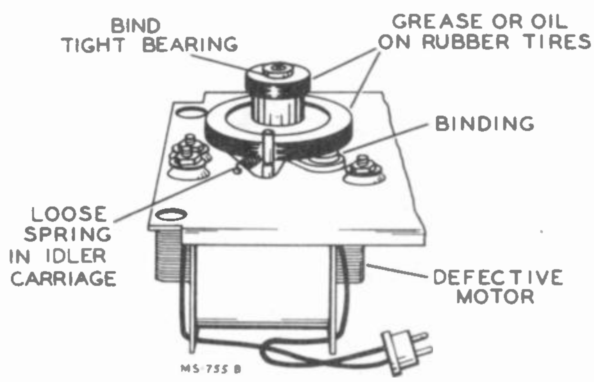


Figure 30.

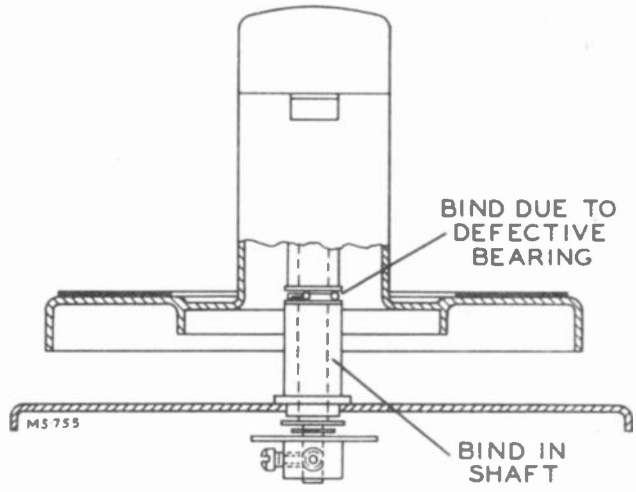


Figure 31.

SERVICE HINTS CONTINUED ON PAGE 14

ADJUSTMENTS

Adjustment Sequence:

1. Synchronize separator shelf (Ill. No. 5) and separator knife (Ill. No. 5B) action (necessary only on rotating gear type of record separators).
2. Adjust position of star wheel (Ill. No. 62).
3. Adjust position of director lever (main lever) (Ill. No. 41) in relation to the star wheel by bending if necessary.
4. Adjust tone arm pivot screw (Ill. No. 12) for minimum side play without binding.
5. Adjust sapphire height above motorboard.
6. Adjust tripping position.
7. Adjust landing position.
8. Adjust pickup arm height during cycle.
9. Adjust position of muting switch so that contacts are open 1/32" during playing and are closed during cycle.

Separator Synchronization:

The following applies only to the rotating gear type of record separators:

1. Make certain the two embedded gears (5 and 6) are meshed with gear (7A) on the upper end of the star wheel shaft so the action of the separator knives is synchronized.

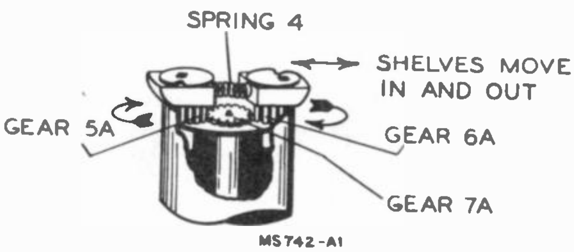


Figure 32.

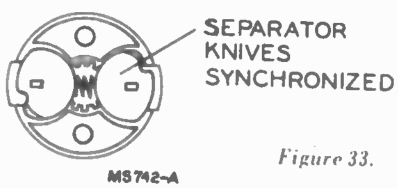


Figure 33.

Star Wheel Position:

1. Turn the star wheel so that the separator knives are in the position indicated in Figure 33 for rotating gear type of separators or fully retracted for push-out separators.
2. Loosen the two set screws (61) sufficiently to permit the star wheel to rotate without disturbing the shaft (7).
3. Rotate the star wheel points directly to a cam screw or nose screw (visible through slot) as shown in Figure 34.
4. Tighten the two set screws (61) and rotate the mechanism through a complete cycle to check operation. The separator knives must rotate 360° to the starting position as indicated in Figure 33.

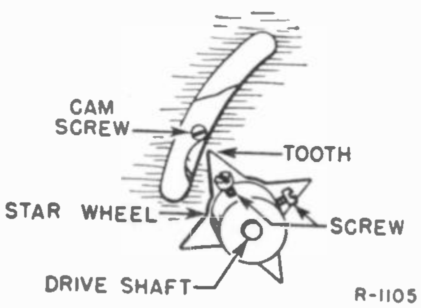


Figure 34—Star Wheel Timing.

Director Lever Position:

Push reject lever and rotate the turntable slowly by hand until the end (41C) of the director lever moves in to its limit of travel so when the star wheel is rotated it contacts by the amount indicated in Figure 35 for lever with long end. For lever with short end, the star wheel should first contact the end (41C) approximately 1 16-inch from the front or leading edge of the lever.

If the end of the director lever (main lever) is too close to the star wheel, it will jam. If too far away, it will cause erratic record dropping. If in doubt and unable to measure, move the end toward the star wheel until most of the play is removed when the star wheel is moved back and forth at this setting. With the push-out record separators and the lever with short end, there will be considerable play but the tension of the separator springs holds the star wheel against the lever.

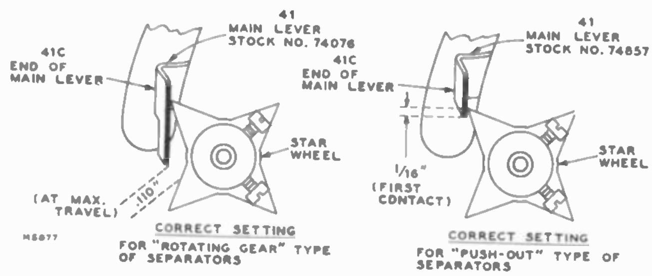


Figure 35—Setting of Director Lever.

Pivot Screw Adjustment:

Loosen the pivot locking screw (14) and adjust the pivot screw (12) for minimum side play without causing binding.

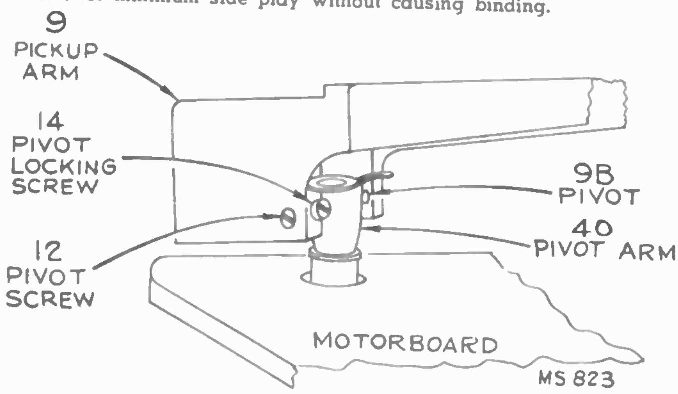


Figure 36.

Sapphire Height Adjustment (Out of Cycle):

Bend the lug on the pivot arm (40) so that the sapphire point is approximately 1/16" above the motorboard.

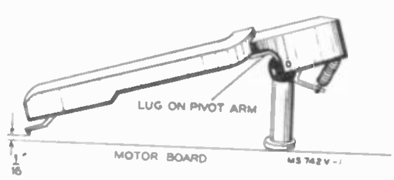


Figure 37.

Tripping Adjustment:

1. Assemble the pickup arm and trip lever assemblies as shown in Figure 38. Leave the clamping screw (57) loose enough to permit horizontal movement of the trip lever on the shaft. (Allow approximately .010 inch vertical end play.)
2. Turn the eccentric landing adjustment stud (45C) to determine the inward and outward limit of adjustment, then turn it to a setting half-way between the limits.

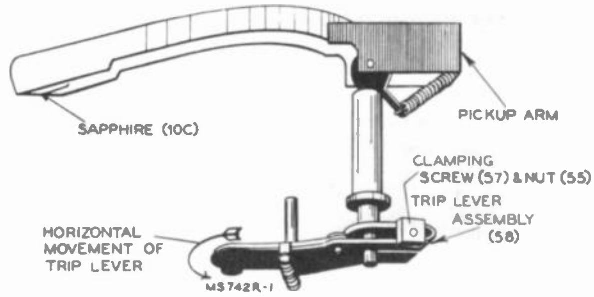


Figure 38.

3. Tripping should occur when the sapphire reaches a position $1\frac{9}{32}$" from the near side of the turntable spindle. This position is adjusted by holding the trip lever and moving the pickup arm inward or outward to obtain the specified position.
4. A convenient way of measuring this distance is to make a mark on the back side of a stroboscope disc $1\frac{9}{32}$" from the inner edge, place the disc on the turntable, with the turntable revolving, hold the disc stationary and move the pickup arm very slowly in towards the turntable spindle.
5. After this position has been obtained, tighten the clamping screw (57) and recheck the tripping position and vertical end play.

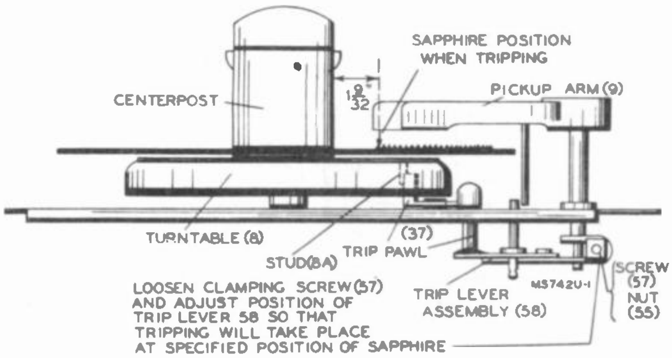


Figure 39—Tripping Position.

Landing Adjustment:

1. After the tripping adjustment has been made as described above, turn the eccentric landing adjustment stud (45C) so that the sapphire will set down on the record half-way between the outer edge and the first music groove. This position is $2\frac{5}{8}$" from the turntable spindle. The location of the adjustment stud is illustrated in Figure 42.

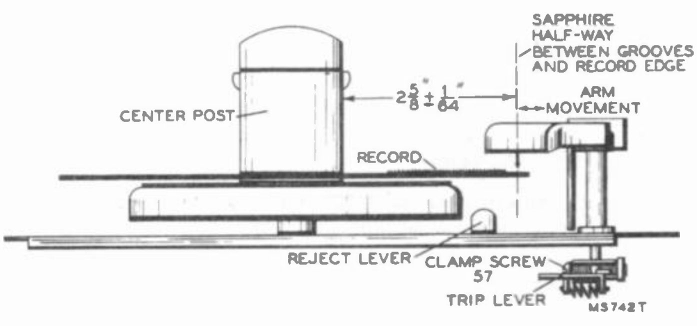


Figure 40—Landing Position.

Pickup Arm Height Adjustment (In Cycle):

Set the mechanism in cycle. Turn the turntable by hand, until the pickup arm has reached its maximum height. By means of a screwdriver turn the height adjustment stud (45D) until the distance between the top of the turntable and the sapphire point is ¾". Use that position of the eccentric stud which causes the pickup arm to rise during clockwise adjustment of the stud. The location of the adjusting stud is illustrated in Figure 42.

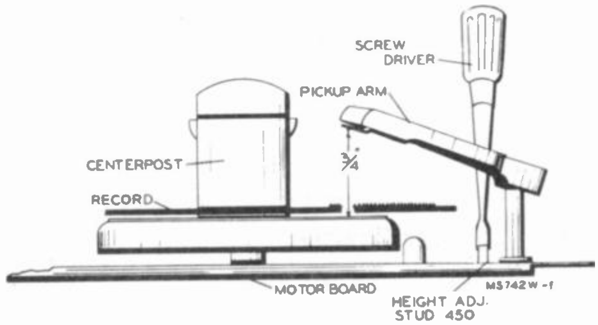


Figure 41—Height Adjustment.

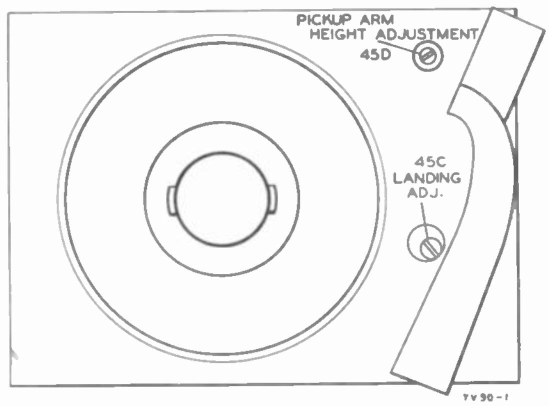


Figure 42—Height and Landing Adjustment Studs.

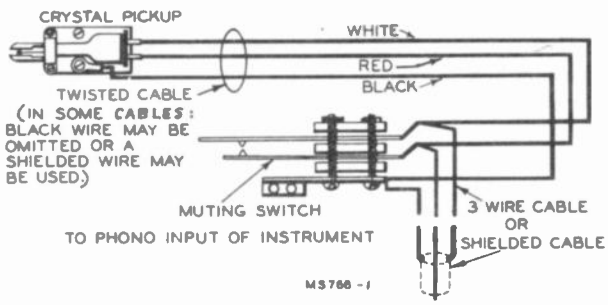


Figure 43—Pickup Muting Switch Wiring.

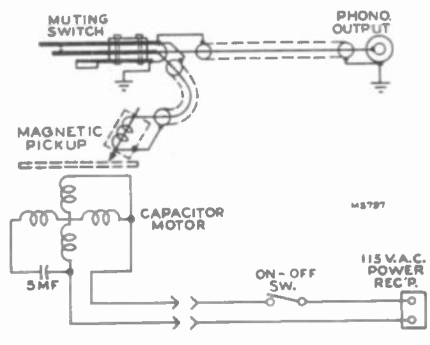


Figure 44—Schematic Diagram (Model CP-5203).

SERVICE HINTS (Continued)

REPEATS GROOVES

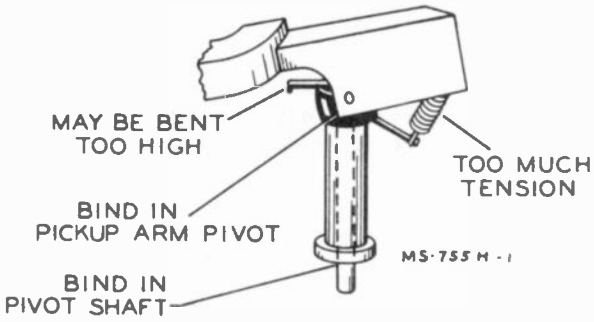


Figure 45.

CONTINUOUS TRIPPING

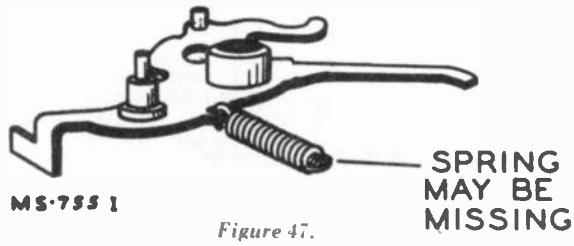


Figure 47.

FAILS TO GO INTO CYCLE

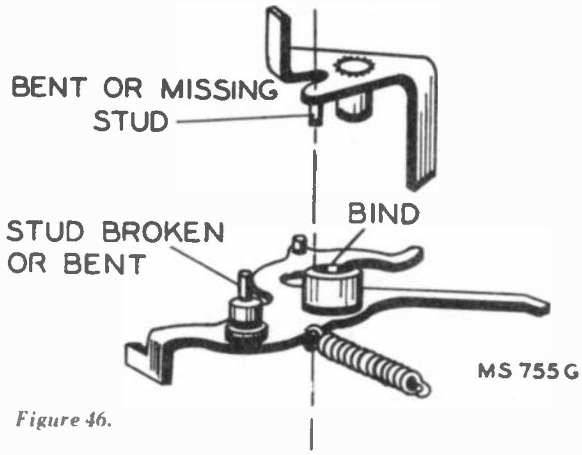


Figure 46.

RECORD DROP ON OR HIT PICKUP ARM

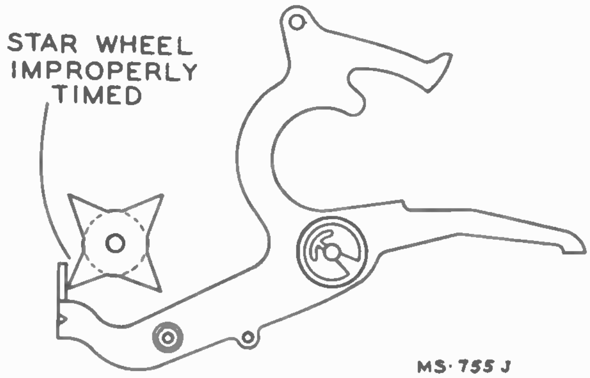


Figure 48.

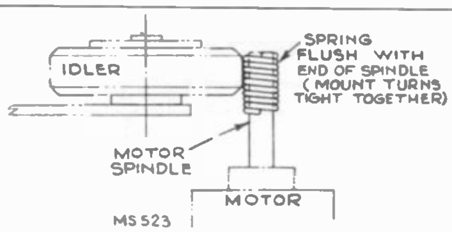


Figure 49—Spring Sleeve Installed on 60-Cycle Motor Spindle for Operation on 50-Cycle Supply.

Weak director lever (main lever) spring (Ill. No. 42) or excessive tension on muting switch may cause poor unlatching action and erratic pickup landing.

A drop of cement (Duco Household Cement or similar) applied to the ends of springs will prevent their becoming unhooked. Use care to prevent cementing turns of the springs.

PICKUP UNIT vs. INSTRUMENT MODEL

It is important to use the correct pickup unit. The receiver chassis has compensation designed for one pickup and may be incorrect for other pickups.

Pickup Stock No. 74067 (RMP 128-1) uses a stylus (Stock No. 74068) which has a WHITE paint coding. It is used with the following instruments: 9EY3†, 9EY35, 9EY36, 9JY*, 9TW333, 9TW390, 9W101, 9W102, 9W103, 9W105, 9Y7, 45EY† and 45J*.

Pickup Stock No. 74625 (RMP 128-2) uses a stylus (Stock No. 74818) which has a BLUE paint coding. It is used with the following instruments: A55, A78, A106, TA128, TA129, TA169, 9EY3†, 9EY31, 9EY32, 9TW309, 9W51, 9W78, 9W106, 9Y51, 45EY† and S1000.

* Models 9JY and 45J.

No. 74067 pickup is recommended as replacement although No. 74625 has been used as a substitute in some instruments.

The characteristics of the two pickups differ in that No. 74067 has a greater output in the middle audio frequencies. The response of No. 74625 is more "flat" and has a greater output at high audio frequencies.

† Models 9EY3 and 45EY.

Use No. 74067 pickup in conjunction with RS132, RS132E or RS132F amplifier.

Use No. 74625 pickup in conjunction with RS132A amplifier.

Pickup Stock No. 74466 (RMP 130-1) uses a stylus (Stock No. 74622) which has a BLACK paint coding. It is used only with Model CP-5203.

Pickup Stock No. 74984 is a ceramic pickup used only with Models QJY and QEY3.

Pickup Stock No. S-5578 is a ceramic pickup used only with Model 9QV5.

CHANGE IN STYLUS COLOR CODE

The identification color on the bottom of the stylus holder of Stock Nos. 74068 and 74818 has been changed to provide identification of a factory process.

Stylus Stock No. 74068

Used in pickup Stock No. 74067 (RMP 128-1). Identification color may be either WHITE or BLACK.

Stylus Stock No. 74818

Used in pickup Stock No. 74625 (RMP 128-2). Identification color may be either BLUE or GREEN.

RCA VICTOR

PROJECTION TELEVISION RECEIVER
MODEL 9PC41

Chassis Nos. KCS 24D or KCS 24C-1, KRS 20B-1, KRS 21A-1, KRK 4, and RS 123C—Mfr. No. 274

SERVICE DATA

— 1949 No. T4 —

SUPPLEMENT TO 1947 No. T2

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model 9PC41
Walnut, Mahogany or Toasted Mahogany

GENERAL DESCRIPTION

Model 9PC41 is a forty-one tube Projection Television console. The receiver employs five chassis with a total of forty tubes and a five-inch projection kinescope. A Reflective Optical System provides a 15" x 20" picture on the screen.

This publication includes all the data applicable only to the 9PC41 such as the Installation Instructions, Wiring Diagram, Circuit Diagram and Replacement Parts List. For alignment information, refer to the Service Data for Model 648PTK.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 15" x 20"

TELEVISION R-F FREQUENCY RANGES
All 13 television channels, 44 mc to 88 mc, 174 mc to 216 mc.

TELEVISION FINE TUNING RANGE
Plus and minus approximately 800 kc on channel 1, and plus and minus approximately 1.9 mc on channel 13.

RECEIVER ANTENNA INPUT IMPEDANCE..300 ohms balanced

POWER SUPPLY RATING .... 115 volts, 60 cycles, 530 watts

AUDIO POWER OUTPUT RATING
Undistorted Power Output .... 10 watts
Maximum Power Output .... 11 watts

CHASSIS DESIGNATIONS
R-F, I-F Chassis .... KSC24C-1 in 9PC41a
KCS24D in 9PC41b and 9PC41c
Horizontal Deflection Chassis KRS20B-1
Power Supply Chassis KRS21A-1
Optical Barrel KRK4
Audio Amplifier RS123C

LOUDSPEAKER (92567-2W)
Type .... 12-inch Electrodynamic
Voice Coil Impedance .... 2.2 ohms at 400 cycles

WEIGHT
Chassis with Tubes in Cabinet .... 247 lbs.
Shipping Weight .... 314 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	36¼	39⅛	24¼
KCS24D, KCS24C-1 (overall)	17	8½	13¼
KRS20B-1 (overall)	18⅛	11	9¾
KRS21A-1 (overall)	12¼	7¾	6½
RS123C (overall)	13¼	5¾	4¾

RCA TUBE COMPLEMENT

KCS24D OR KCS24C-1 R-F, I-F CHASSIS

	Tube Used	Function
(1)	RCA-6J6	R-F Amplifier
(2)	RCA-6J6	R-F Oscillator
(3)	RCA-6J6	Converter
(4)	RCA-6BA6	1st Sound I-F Amplifier
(5)	RCA-6BA6	2nd Sound I-F Amplifier
(6)	RCA-6AU6	3rd Sound I-F Amplifier
(7)	RCA-6AL5	Sound Discriminator
(8)	RCA-6AT6	Audio Amplifier
(9)	RCA-6AT6	A-G-C Amplifier
(10)	RCA-6AL5	A-G-C Diode and D-C Restorer
(11)	RCA-6AG5	1st Picture I-F Amplifier
(12)	RCA-6AG5	2nd Picture I-F Amplifier
(13)	RCA-6AG5	3rd Picture I-F Amplifier
(14)	RCA-6AG5	4th Picture I-F Amplifier
(15)	RCA-6AL5	Picture 2nd Detector and A-G-C Detector
(16)	RCA-6AU6	1st Video Amplifier
(17)	RCA-6V6GT	2nd Video Amplifier
(18)	RCA-6SK7	1st Sync Amplifier
(19)	RCA-6SH7	2nd Sync Amplifier
(20)	RCA-6J5	3rd Sync Amplifier
(21)	RCA-6J5	Vertical Sweep Oscillator and Discharge
(22)	RCA-6K6GT	Vertical Sweep Output

KRS20B-1
HORIZONTAL DEFLECTION CHASSIS

(1)	RCA-6H6	Horizontal Sync Discriminator
(2)	RCA-6K6GT	Horizontal Sweep Oscillator
(3)	RCA-6J5	Horizontal Discharge
(4)	RCA-6AC7	Horizontal Sweep Oscillator Control
(5)	RCA-6BG6G	Horizontal Sweep Output (2 tubes)
(6)	RCA-5V4G	Horizontal Damper
(7)	RCA-6AS7C	Horizontal Damper
(8)	RCA-1B3-GT/8016	High Voltage Rectifier (3 tubes)
(9)	RCA-5TP4	Projection Kinescope

KRS21A-1 TELEVISION POWER SUPPLY CHASSIS

(1)	RCA-5U4G	Rectifier (3 tubes)

RS123C AUDIO AMPLIFIER

(1)	RCA-5U4G	Rectifier
(2)	RCA-6J5	Phase Inverter
(3)	RCA-6F6G	Power Output (2 tubes)

Specifications continued on page 2

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.75 mc
Adjacent Channel Sound Trap .... 27.25 mc
Accompanying Sound Traps .... 21.25 mc
Adjacent Channel Picture Carrier Trap .... 19.75 mc

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.25 mc
Sound Discriminator Band Width (between peaks) .... 350 kc

VIDEO RESPONSE .... To 4 mc

FOCUS .... Electrostatic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SCANNING FREQUENCY .... 15,750 cps

VERTICAL SCANNING FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector, Fine Tuning .... Dual Control Knobs
Picture, Brightness .... Dual Control Knobs
Picture Horizontal Hold, Picture Vertical Hold .... Dual Control Knobs
On-Off Switch .... Single Control Knob
Sound Volume .... Single Control Knob
Remote-Local Switch .... Single Control Knob

NON-OPERATING CONTROLS (not including r-f and i-f adjustments)

Vertical Centering .... R-F, I-F chassis rear adjustment
Height .... R-F, I-F chassis rear adjustment
Vertical Linearity .... R-F, I-F chassis rear adjustment
Video Peaking Switch .... R-F, I-F chassis rear switch
Width .... Horizontal Deflection chassis screwdriver adjustment
Horizontal Linearity ....Horizontal Deflection chassis adjustment
Horizontal Drive .... Horizontal Deflection chassis adjustment
Horizontal Centering .. Horizontal Deflection chassis adjustment
Horizontal Oscillator Frequency
Horizontal Deflection chassis adjustment
Horizontal Oscillator Phase
Horizontal Deflection chassis adjustment
Focus (Electrical) .. Horizontal Deflection chassis rear adjustment
Focus (Mechanical) .... Optical Barrel adjustment
Deflection Coil .... Optical Barrel adjustment
Horizontal Optical Centering .... Optical Barrel adjustment
Lateral Optical Centering .... Optical Barrel adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE TELEVISION RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF' GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the receiver Installation Instructions section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

FIELD IDENTIFICATION OF DIFFERENT 9PC41 MODELS

Three slightly different models of the 9PC41 are being produced. For convenience, this service note will designate them as 9PC41a, 9PC41b, and 9PC41c, but they will not be so labeled in the field. The 9PC41a uses a KCS24C-1 r-f i-f chassis, and can be recognized readily since it does not have a lighted channel-marker escutcheon. The 9PCS41b uses chassis KCS24D and has a lighted channel-marker escutcheon, but it is made only in walnut and mahogany cabinets. The 9PC41c also uses chassis KCS24D and has a lighted channel-marker escutcheon, but is made only in toasted mahogany cabinets and has a different type of interlock switch and hinge lid support. The parts list, schematic, etc., in this note will use the a, b, c designations where differences in the three models make it necessary.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. Raise the lid until the screen is in place.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel. Set the LOCAL-REMOTE switch to "LOCAL."

4. Turn the PICTURE control fully counter-clockwise.

5. Turn the BRIGHTNESS control clockwise, until a glow appears on the screen, then counter-clockwise until the glow just disappears.

6. Turn the PICTURE control clockwise until a glow or pattern appears on the screen.

7. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.

8. Adjust the VERTICAL hold control until the pattern stops vertical movement.

9. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

10. Adjust the PICTURE control for suitable picture contrast.

11. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

12. In switching from one station to another, it may be necessary to repeat steps number 7 and 10.

13. If remote operation is desired, set the LOCAL-REMOTE switch to "REMOTE." The brightness and contrast can then be controlled from the remote-control box.

14. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 7 is generally sufficient.

15. If the positions of the controls have been changed, it may be necessary to repeat steps number 2 through 10.

Note: The lid is provided with an interlock switch to insure that the receiver will be turned off when the cabinet is closed.

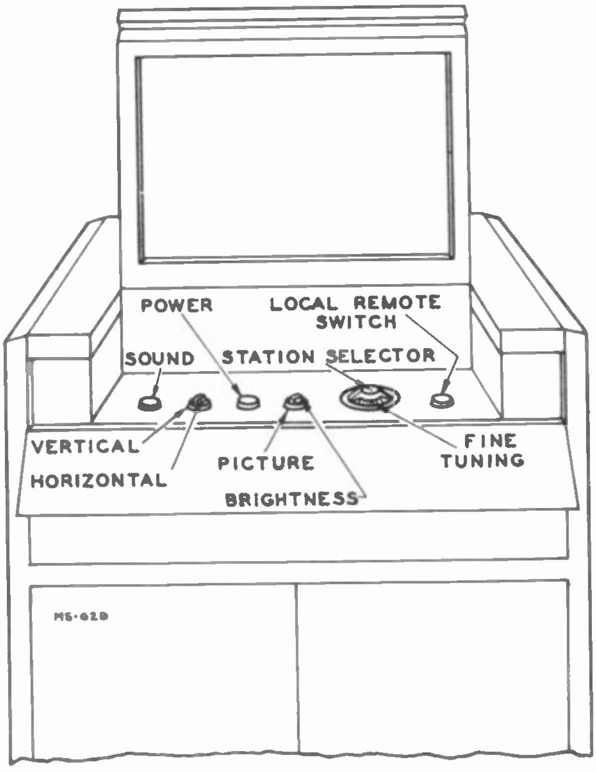


Figure 1—Receiver Operating Controls

INSTALLATION INSTRUCTIONS

The 9PC41 is shipped complete in one carton and with all tubes in place except the 5TP4 Kinescope. The kinescope is packed in a special carton and is shipped separately.

The 9PC41 shipping carton is a plywood box put together with nails. Open the box by removal of the front side. If the front of the carton is removed by prying, do not permit the prying tool to enter the box as the front of the cabinet may become scratched. Slip the cabinet out of the carton.

A flat skid is attached to the bottom of the receiver cabinet which will permit the cabinet to be moved about without stressing the cabinet joints. This skid should be left on the cabinet until the receiver is placed on display or installed. To remove the skid, take out two nuts on the inside as shown in Figure 2. With a man at each end of the cabinet, lift the cabinet off the skid.

Remove the shipping material as shown in Figure 2. Make sure that all tubes are firmly seated in their sockets.

The deflection yoke and the kinescope anode clip are packed in a carton taped to the horizontal deflection chassis shelf support member.

Untie the canvas dust cover for the optical barrel and tie it off to one side.

Remove the speaker grille by taking out four Phillips head screws from the front four corners of the grille. Disconnect the speaker cable from the speaker and set the grille to one side. The 9PC41 employs a KRK4 optical barrel as shown in Figure 4.

Caution: Handle the corrector lens with care. This lens is made of a plastic material, is soft and can be easily scratched by improper handling or even by rubbing with a cloth. Do not use cleaning fluid on the lens as it may be attacked by some of the chemicals used in such solutions. In short, the lens should be given the care due any precision optical equipment.

Remove the corrector lens from the top of the optical barrel by loosening the screws holding the mounting clips as shown in Figure 4. Caution: Do not loosen the screws holding the corrector lens centering cams or plate.

Although the high voltage filter capacitors of a new receiver are not likely to be charged, it is a good idea to form the habit of discharging the optical barrel before making any internal adjustments. Take a clip lead, fasten the clip end to the barrel and discharge the unit by making repeated contacts to the kinescope holder with the other end of the lead.

Clean the back of the screen, the front of the 45° mirror and the optical barrel spherical mirror by "sweeping" the

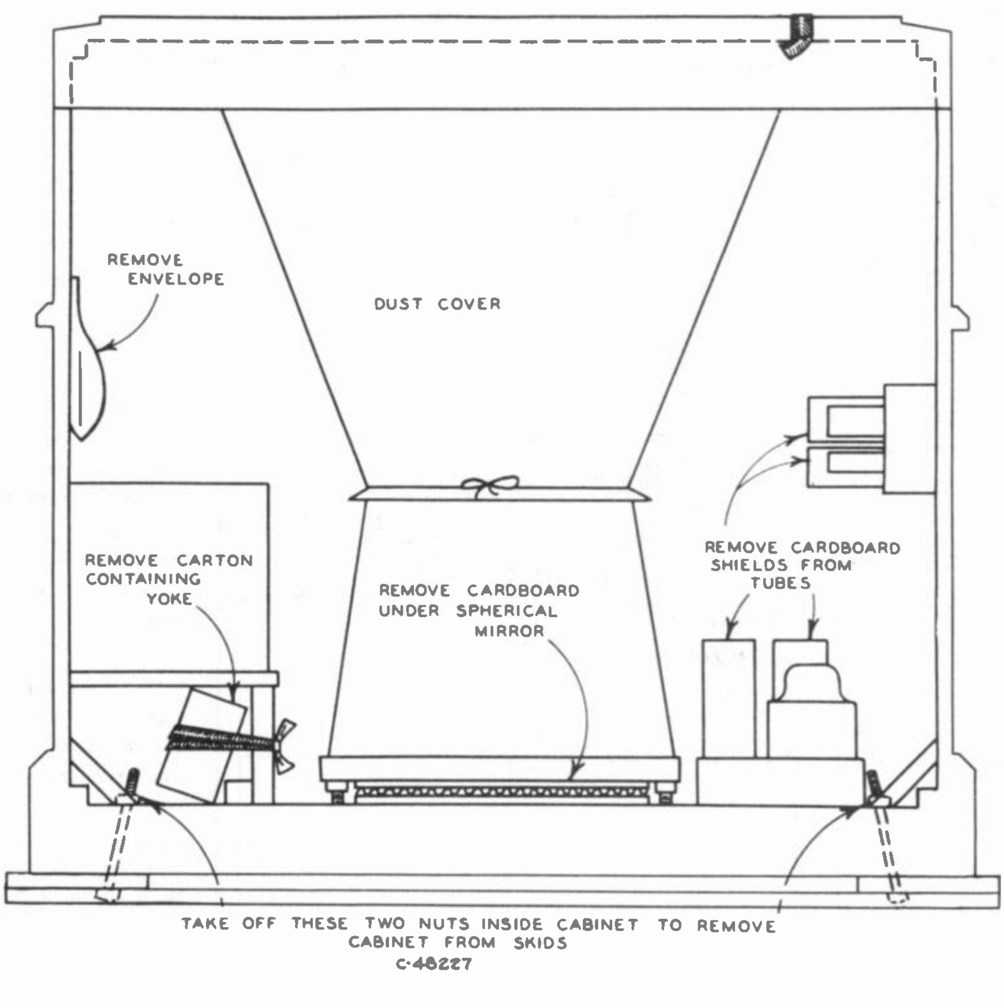


Figure 2—Removal of Shipping Material

surface with a small camel's hair brush. Any dust on the spherical mirror should be swept into the black center portion where it can be picked up with a piece of scotch tape. Caution: Do not touch the silvered portion of the mirrors. The mirrors are surface silvered and can be damaged by contact with the moist hand. If the screen or mirrors require cleaning, a solution of "Dreft" and water should be employed.

Place a type 202-B-1 test lamp in the kinescope holder and adjust the kinescope centering screws to center the lamp in the holder. Connect the lamp cord into a 110-volt power outlet and turn the lamp on. Replace the corrector lens. Rotate the lamp so as to produce a picture on the screen in the proper aspect. Cover the center hole in the corrector lens with a piece of black cardboard in order to prevent light from this source from lowering the resolution.

Loosen the optical focus adjustment lock screws and adjust the optical focus adjustment for the best overall definition on the screen. The optical system should show at least 900 line resolution over all the screen. If the system shows less definition, it will be necessary to make the adjustments under "Alignment of Optical Barrel."

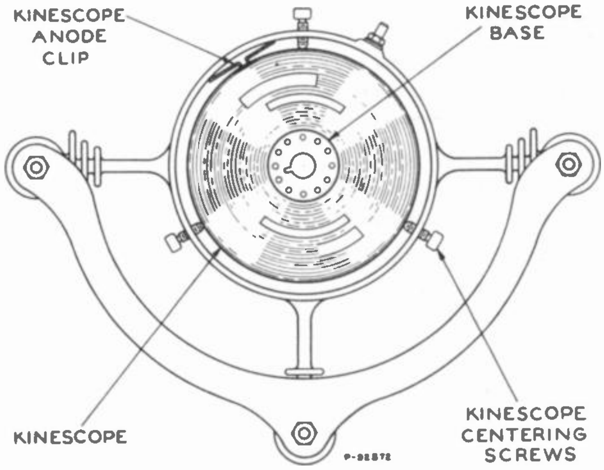


Figure 3—KRK-4 Kinescope Holder

ALIGNMENT OF KRK-4 OPTICAL BARREL—With the test lamp in place as described above, turn the optical focus adjustment until the vertical and horizontal lines become double. When the test lamp is properly centered, the lines are parallel. If the lines are not parallel, the kinescope holder requires horizontal or lateral centering.

Horizontal or Lateral Centering Adjustment—Loosen the focus sprocket support mounting screws and the idler support mounting screws and slide the three focus sprockets back and forth until the vertical and horizontal lines are parallel.

If the vertical lines are not parallel, the sprockets should be slid straight forwards or backwards until the vertical lines are parallel. If the horizontal lines are not parallel, the sprockets should be slid to one side or the other until the lines are parallel. Upon completion tighten the sprocket support mounting screws taking care that the sprockets do not shift in the process. Make sure the focus sprocket drive chain is in place on all sprockets, slide the idler sprocket back until the drive chain is tight, then tighten the idler sprocket support mounting screws.

Caution: The focus screw extensions above the focus sprockets should be equal for all sprockets. If during the adjustment procedure, the drive chain should fall from the sprockets and the sprockets accidentally turned, it will be necessary to readjust the sprockets until the screw extensions are equal.

Corrector Lens Centering—Turn the focus adjustment until a halo appears around the dot in the center of the test lamp. If the halo is not symmetrical around the dot, loosen the four corrector lens centering cam lock screws and slide the lens about until the halo is symmetrical. Turn the cams up firmly against the lens and tighten the cam lock screws. Care should be taken not to disturb the lens position during the tightening process.

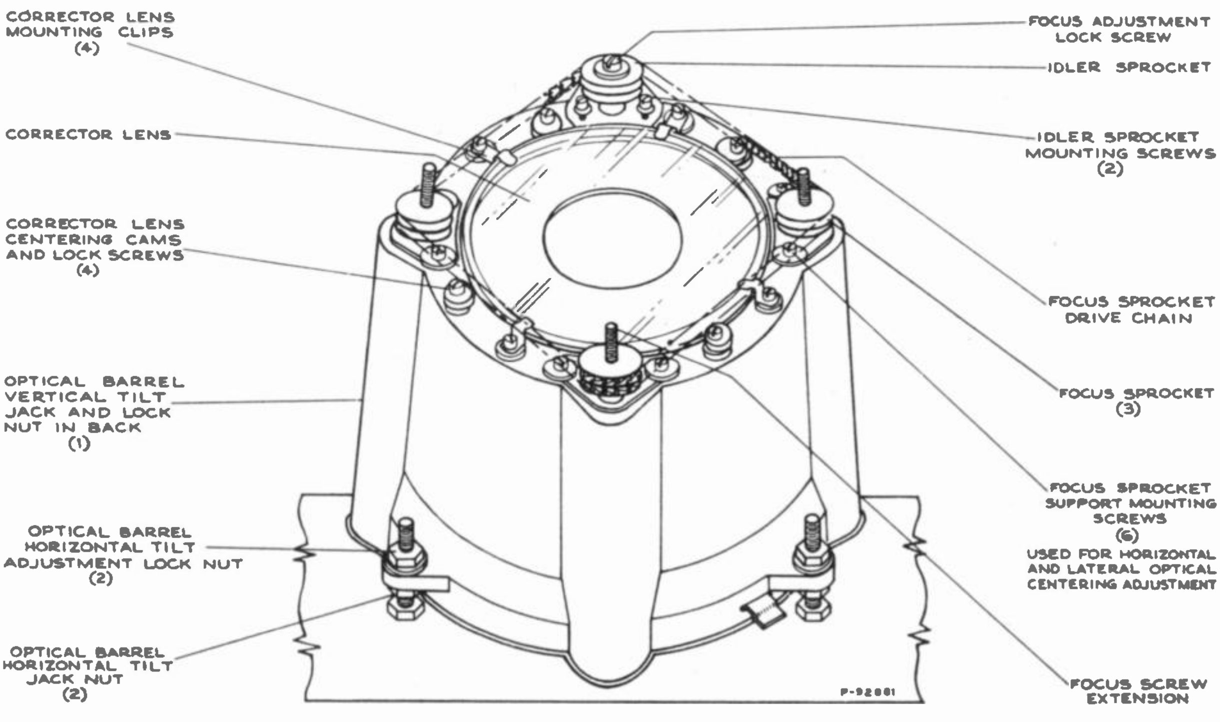


Figure 4—KRK-4 Optical Barrel Adjustments

Check of Optical Barrel Tilt—Adjust the optical focus control to and through the focus range. The picture should go through focus all over at the same time. This does not mean that the definition will be equal over all the picture, but it should be the best definition obtainable. If this is not the case, the optical barrel is not in alignment with the cabinet and requires adjustment as outlined in the following paragraph.

Optical Barrel Tilt Alignment—Turn the optical focus adjustment counterclockwise until the picture is out of focus then clockwise until the picture begins to come in focus. If one side comes into focus before the rest of the picture, it indicates that that side of the optical barrel should be raised. Loosen the lock nuts and turn the rear jack nuts, shown in Figure 4, to raise that side of the barrel and the other jack nut down to lower the other side of the barrel, until both sides of the picture come into focus at the same time.

If the top of the picture comes into focus first as the optical focus adjustment is turned clockwise, it indicates that the jack nut nearest the front of the cabinet should be adjusted to raise the front of the optical barrel, until top and bottom come into focus at the same time.

When the barrel is properly adjusted, the entire picture will come into best focus all over at the same time as the focus control is rocked through the focus point. At this point the pattern should be in the center of the screen. When this condition of alignment is obtained, tighten the lock nuts being careful not to disturb the adjustments.

If the optical barrel tilt adjustments are made, it will be necessary to recheck the adjustments under Horizontal Optical Adjustments and Lateral Optical Adjustments.

Loosen all the kinescope centering screws equally and just sufficiently to permit removal of the test lamp.

KINESCOPE HANDLING PRECAUTION—Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.

Open the kinescope shipping carton and remove the tube. Handle this tube by the neck. Do not cover the envelope of the tube with fingermarks as it will produce leakage paths between the high voltage rim near the screen and the grounded coating on the neck. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride, which is obtainable at most drug stores.

Wipe the kinescope screen clean of all dust or finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

INSTALLATION OF KINESCOPE—The kinescope second anode contact is a recessed metal well in the side of the bulb. A small brass clip (from the carton containing the deflection yoke and front panel control knobs) must be placed in the kinescope anode connector and the tube inserted in the holder as shown in Figure 3. The tube must be installed so that the socket key on the base of the tube is pointed towards the television chassis. Make sure that the anode clip is horizontal so that it cannot protrude out of the holder.

Tighten the three kinescope centering screws equally to center the tube in the support. Caution: Do not apply too much pressure in tightening the screws as the tube can be cracked by so doing.

Wipe the corrector lens clean with a piece of lens tissue and replace making sure that the arrow on the lens points to the rear of the cabinet as before. Turn the lens mounting clips in place and tighten the clip screws.

Turn the deflection yoke so that the slotted end of the bakelite center tube is up and slide the yoke down over the neck of the kinescope. Connect the kinescope socket to the base of the tube. Turn the yoke so that the leads come out towards the rear of the cabinet.

Slip the yoke cables out through the cable sleeve in the optical barrel dust cover. The three-prong plug on the unshielded yoke cable should be plugged into the television r-f, i-f chassis as shown in Figure 5. The two-prong plug on the shielded yoke cable should be plugged into the horizontal deflection chassis. The shield braid extension from this cable should be grounded to the chassis by means of the screw provided for this purpose.

Caution—Do not turn the television receiver on with the deflection yoke cables disconnected. To do so may cause the destruction of the kinescope screen.

Remove the cover from the horizontal deflection chassis and take out the strings holding the high voltage filter capacitors in the clips during shipment. Replace the chassis cover.

Reconnect the speaker. Check all chassis interconnecting cables to make sure that all are plugged into the proper sockets as shown in Figure 5.

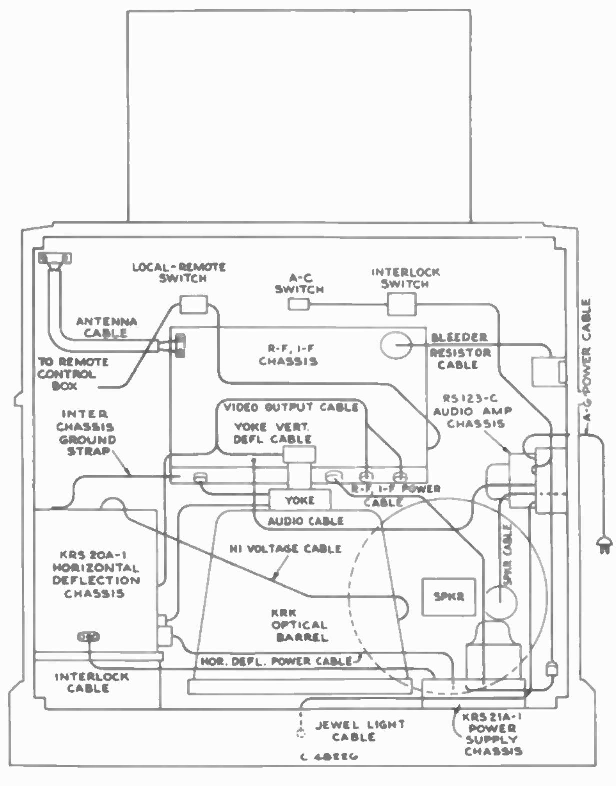


Figure 5—Chassis Interconnecting Cables

The antenna and power connections should now be made. Turn the power switch to the "on" position, the picture control counterclockwise and the brightness control clockwise until a glow appears on the screen.

Adjust the electrical focus control R331 on the horizontal deflection chassis until the raster lines are in sharpest focus as seen when looking down into the barrel. If necessary, reduce the brilliance control setting, and readjust the focus control.

Adjust the optical focus adjustment until the raster lines are in focus on the screen. Turn the deflection yoke until the raster lines are horizontal on the screen and tighten the yoke clamp in this position. Pull the dust cover down around the optical barrel.

Picture Adjustments—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See step 3 through step 10 of the receiver operating instructions on page 3.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT—The sync link (see Figure 7) must be in the normal position (2 to 3). Turn the horizontal hold control to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will pull into sync.

Turn the horizontal hold control to the extreme clockwise position. The picture should remain in sync. Momentarily remove the signal. Again the picture should normally pull into sync.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.

ALIGNMENT OF HORIZONTAL OSCILLATOR—If in the above check the receiver failed to hold sync with the hold control at either extreme or failed to pull into sync after momentary removals of the signal, make the adjustments under "Slight Retouching Adjustments." If, after making these retouching adjustments, the receiver fails to pass the above checks or if the horizontal oscillator is completely out of adjustment, then make the adjustments under "Complete Realignment."

Slight Retouching Adjustments—Tune in a Television Station and adjust the fine tuning control for best sound quality. Sync the picture and adjust the picture control for slightly less than normal contrast. Turn the horizontal hold control to the extreme position in which the oscillator fails to hold or to pull in. Momentarily remove the signal. Turn the T301 frequency adjustment on the chassis rear apron until the oscillator pulls into sync. Check hold and pull-in for the other extreme position of the hold control.

Complete Realignment—Tune in a Television Station and adjust the fine tuning control for best sound quality.

With the sync link in the normal position (2-3), turn the T301 frequency adjustment (on rear apron), until the picture is synchronized. (If the picture is not synchronized vertically, adjust the vertical hold.) Adjust the picture control so that the picture is somewhat below average contrast level.

Turn the T301 phase adjustment screw (under chassis, see Figure 19) until the blanking bar, which may appear in the picture, moves to the right and off the raster. The range of this adjustment is such that it is possible to hit an unstable condition (ripples in the raster). The screw must be turned clockwise from the unstable position. The length of stud beyond the bushing in its correct position is usually about ½ inch.

Turn horizontal hold to extreme counterclockwise position. Turn T301 frequency adjustment clockwise until the picture falls out of sync. Then turn it slowly counterclockwise to the point where the picture falls in sync again.

Readjust T301 phase adjustment so that the left side of the picture is close to the left side of the raster, but does not begin to fold over.

Turn horizontal hold to extreme clockwise. The right side of the picture should be close to the right side of the raster, but should not begin to fold over. If it does, readjust the phase.

Momentarily remove the signal. When the signal is restored, the picture should fall in sync. If it doesn't, turn T301 frequency adjustment counterclockwise until the picture falls in sync.

Turn horizontal hold to extreme counterclockwise position. Remove the signal momentarily. When signal is restored, the picture should fall in sync.

NOTE: If the picture does not pull in sync after momentary removals of signal in both extreme positions of horizontal hold, the pull-in range may be inadequate, though not necessarily. A pull-in through ¾ of the hold control range may still be satisfactory.

There is a difference between the pull-in range and hold-in range of frequencies. Once in sync, the circuit will hold about 50% to 100% more variation in frequency than it can pull in. Since the range of the horizontal hold control is only approximately equal to the pull-in range, considerable variation may be found due to variations in the cut-off characteristic of the horizontal oscillator control tube, V303.

Excessive pull-in is objectionable because the higher sensitivity of the control circuits means also greater susceptibility to noise, and to the vertical sync and equalizing pulses which tend to cause a bend in the upper part of the raster. This effect is more noticeable when the sync link is in the 1-2 position.

Now that a picture has been obtained we may proceed with the picture adjustments.

Adjust the electrical and optical focusing adjustments for maximum definition in the vertical wedge of the test pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS—Adjust the height control (R149 on r-f, i-f chassis rear apron) until the picture fills the screen vertically. Adjust vertical linearity (R175 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust vertical centering to align the picture with the mask. In some cases it may be necessary to shift the position of the kinescope in the holder (see Figure 3) in order to obtain proper centering of the picture.

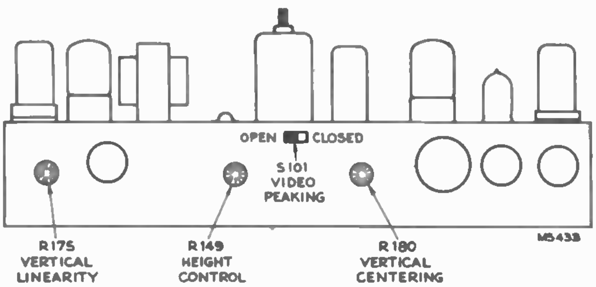


Figure 6—R-F, I-F Rear Chassis Adjustments

WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS—Turn the horizontal drive (R340 on rear apron) clockwise as far as possible without causing crowding of the right of the picture. This position provides maximum high voltage to the kinescope second anode. Adjust the horizontal linearity control R351 (see Figure 7) until the test pattern is symmetrical left to right. A slight readjustment of the horizontal drive control may be necessary when the linearity control is used. Adjust the width control (L302 on rear chassis) until the picture just fills the screen horizontally. Adjust horizontal centering to align the picture with the mask. In some cases it may be necessary to shift the position of the kinescope in the holder in order to obtain proper centering of the picture.

Do not turn the horizontal drive control beyond approximately 7/8 of its maximum clockwise position. To do so may cause the output stage to oscillate and result in the loss of horizontal sync.

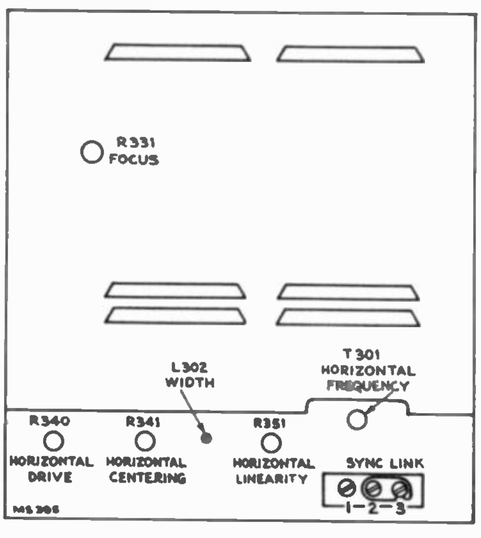


Figure 7—Horizontal Deflection Chassis Adjustments

FOCUS—Adjust the focus control for maximum definition in the test pattern vertical "wedge." Adjust the optical focus adjustment for best overall focus on the screen.

Check to see that all yoke and optical barrel lock screws are tight.

Pull the dust cover down around the top of the optical barrel and tie it securely and tightly in place as shown in Figure 2. Tie the cable sleeve tight around the leads to prevent the entry of dust. These precautions are very important for if dust is permitted to enter and settle on the corrector lens, the optical efficiency of the system will be greatly impaired, resulting in a dim picture with poor definition.

CHECK OF R-F OSCILLATOR ADJUSTMENTS—Tune in all available Television Stations to see if the receiver r-f oscillator is adjusted to the proper frequency on these channels. If adjustments are required, these should be made by the method outlined in the alignment procedure of the Service Data for Model 648PTK. The adjustments for channels 1 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 8. Adjustments for channels 6 and 13 are under the chassis. Observe the picture for detail, for proper interlacing and for the presence of interference or reflections.

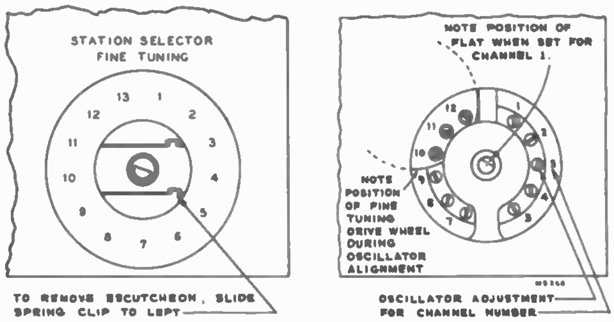


Figure 8—R-F Oscillator Adjustments

ANTENNA TRAP—In some instances interference may be encountered from FM stations that are on the image frequency of a television station. In other instances interference may be observed on channel 6 from a station on channel 10 or on channel 5 from a station on channel 7.

A series resonant trap across the r-f amplifier grid circuit is provided to eliminate this type of interference.

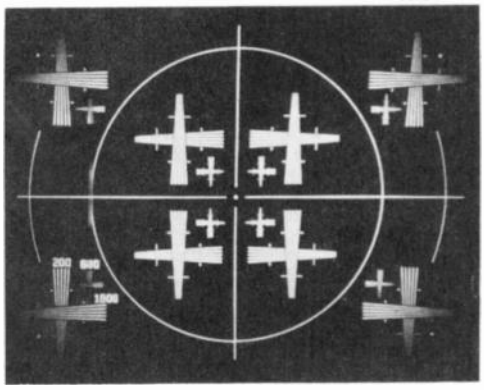
To adjust the trap in the field, tune in the station on which the interference is observed. Tune both cores of the trap for minimum interference in the picture. See Figure 14 for the location of the trap. Keep both cores approximately the same by visual inspection. Then, turn one core ½ turn from the original position and repeak the second for maximum rejection. Repeat this process until the best rejection is obtained.

VIDEO PEAKING SWITCH—A video peaking switch is provided (see Figure 6) to permit changing the video response. Normally the switch should be left open. However, if the pictures from the majority of stations look better with the switch closed, then the switch should be placed in that position. However, if transients are produced on high contrast pictures then the switch should be left open.

Replace the cabinet back grille. Make sure the screws which hold the back grille in place are tight, otherwise the back may rattle or buzz when the receiver is operating at high volume.

The R-F, I-F chassis employed in 9PC41 receivers is wired with a remote picture and brightness control as an attachment. The attachment can be used or stored in the rear of the cabinet, as desired. The attachment schematic is shown in Fig. 21.

VENTILATION CAUTION—The receiver is provided with adequate ventilation holes in the bottom and back of the cabinet. Care should be taken not to allow these holes to be covered or ventilation to be impeded in any way. If the receiver is to be operated with the back of the cabinet near a wall, at least a two-inch clearance should be maintained between cabinet and wall.



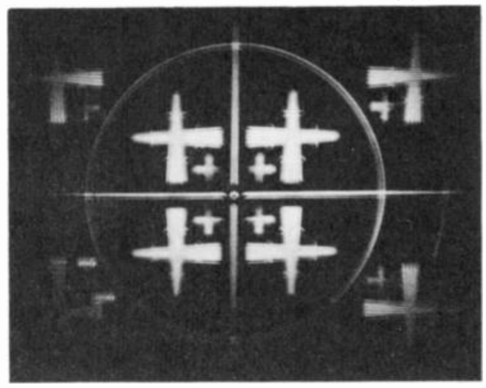
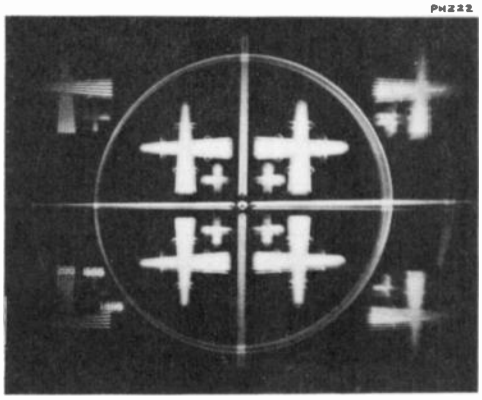


Figure 9—Correct Picture of Optical Test Lamp Pattern

Figure 10—Optical Barrel Focus Adjustment Misadjusted



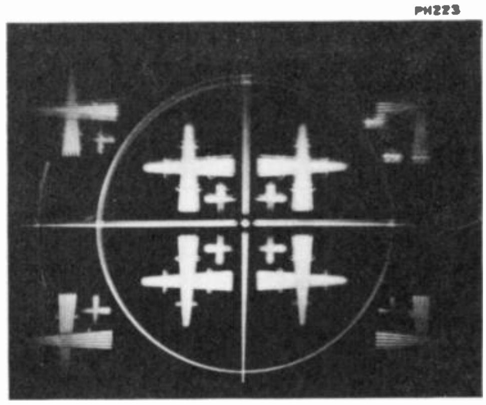


Figure 11—Optical Barrel Horizontal Centering Adjustment Misadjusted

Figure 12—Optical Barrel Lateral Centering Adjustment Misadjusted

CHASSIS VIEWS

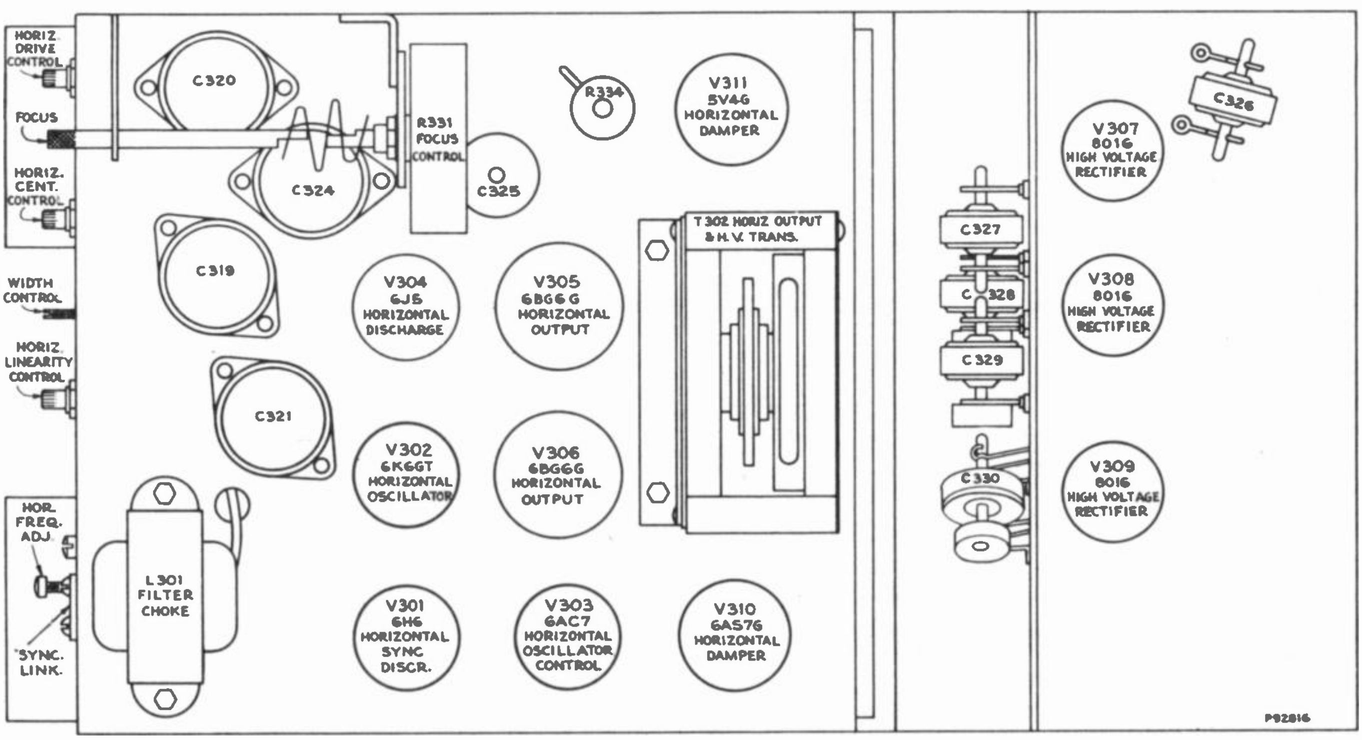


Figure 13—Horizontal Deflection Chassis Top View

9PC41

VOLTAGE CHART

Measurements made with receiver operating on 117 volts 60 cycles a-c and with no signal input. Voltages shown are read with Jr. "VoltOhmyst" between indicated terminal and chassis ground. Symbol < means "less than."

R-F, I-F CHASSIS, KCS 24D OR KCS 24C-1

Tube No.	Tube Type	Function	Operating Condition **	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6J6	R-F Amplifier	Pictr. Min.	1 & 2	133	—	—	7	0	5 & 6	-34	<.1*	—	*Per Plate
			Pictr. Max.	1 & 2	58	—	—	7	0	5 & 6	-.25	6.0*	—	*Per Plate
V2	6J6	Converter	Pictr. Min.	1 & 2	128	—	—	7	0	5 & 6	-3 to -6.	.5 to 4*	—	*Per Plate
			Pictr. Max.	1 & 2	93	—	—	7	0	5 & 6	-2 to -5.	.2 to 3*	—	*Per Plate
V3	6J6	R-F Oscillator	Pictr. Min.	1 & 2	110	—	—	7	.3	5 & 6	-4.5 to -6.5	2.5*	—	*Per Plate
			Pictr. Max.	1 & 2	80	—	—	7	.2	5 & 6	-3.5 to -5.	1.7*	—	*Per Plate
V101	6BA6	1st Sound I-F Amplifier	Pictr. Min.	5	125	6	125	7	2.0	1	0	15.2	6.2	
			Pictr. Max.	5	107	6	107	7	1.65	1	0	13.	5.1	
V102	6BA6	2d Sound I-F Amplifier	Pictr. Min.	5	125	6	125	7	2.0	1	0	15.4	6.2	
			Pictr. Max.	5	107	6	107	7	1.65	1	0	13.2	5.0	
V103	6AU6	3d Sound I-F Amplifier	Pictr. Min.	5	47	6	47	7	0	1	-.23	2.8	2.8	
			Pictr. Max.	5	41	6	41	7	0	1	-.23	2.9	1.8	
V104	6AL5	Sound Discrim.	Pictr. Min.	2 & 7	-.35	—	—	4 & 5	—	—	—	—	—	
			Pictr. Max.	2 & 7	-.45	—	—	4 & 5	—	—	—	—	—	
V105-A	6AL5	AGC Detector	Pictr. Min.	2	-110	—	—	5	-110	—	—	—	—	
			Pictr. Max.	2	-110	—	—	5	-110	—	—	—	—	
V105-B	6AL5	Picture 2d Det.	Pictr. Min.	7	.15	—	—	1	0	—	—	—	—	
V106	6AT6	AGC Amplifier	Pictr. Min.	7	-33	—	—	2	-110	1	-108	—	—	
			Pictr. Max.	7	0	—	—	2	-110	1	-105	—	—	
V107-A	6AL5	AGC Diode	Pictr. Min.	7	-8.0	—	—	1	-8.0	—	—	—	—	
			Pictr. Max.	7	-3.2	—	—	1	-0.9	—	—	—	—	
V107-B	6AL5	DC Restorer	Brightness Min.	2	-110	—	—	5	-97	—	—	—	—	
			Brightness Max.	2	-1	—	—	5	0	—	—	—	—	
V108	6AG5	1st Pix. I-F Amplifier	Pictr. Min.	5	143	6	143	2 & 7	0	1	-8.1	0	0	
			Pictr. Max.	5	103	6	103	2 & 7	.2	1	-1.0	4.5	1.1	
V109	6AG5	2d Pix. I-F Amplifier	Pictr. Min.	5	145	6	145	2 & 7	0	1	-8.1	0	0	
			Pictr. Max.	5	117	6	117	2 & 7	.2	1	-1.0	3.9	1.3	
V110	6AG5	3d Pix. I-F Amplifier	Pictr. Min.	5	147	6	147	2 & 7	0	1	-8.1	0	0	
			Pictr. Max.	5	100	6	111	2 & 7	.21	1	-1.0	4.5	1.3	
V111	6AG5	4th Pix. I-F Amplifier	Pictr. Min.	5	98	6	138	2 & 7	1.4	1	0	7.3	2.3	
			Pictr. Max.	5	82	6	115	2 & 7	1.15	1	0	6.1	1.9	
V112	6AU6	1st Video Amplifier	Pictr. Min.	5	188	6	150	7	0	1	-2.25	6.7	2.6	
			Pictr. Max.	5	205	6	130	7	0	1	-2.35	4.3	1.6	
V113	6V6-GT	2d Video Amplifier	Pictr. Min.	3	180	4	255	8	8.9	5	-3.9	31.5	9.0	
			Pictr. Max.	3	175	4	249	8	8.5	5	-3.9	30.0	8.5	

VOLTAGE CHART

R-F, I-F CHASSIS KCS 24D OR KCS 24C-1 (Continued)

Tube No.	Tube Type	Function	Operating Condition **	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V114	6SK7	1st Sync. Amplifier	Pictr. Min.	8	165	6	113	5	0	4	-4.5	8.5	1.2	
			Pictr. Max.	8	180	6	99	5	0	4	-4.7	4.3	1.1	
V115	6SH7	2d Sync. Amplifier	Pictr. Min.	8	150	6	150	5	0	4	-5.3	0	0	
			Pictr. Max.	8	130	6	130	5	0	4	-5.6*	0	0	*Depends on noise
V116	6J5	3d Sync. Amplifier	Pictr. Min.	3	82	—	—	8	0	5	-.4	8.5	—	
			Pictr. Max.	3	73	—	—	8	0	5	-.4*	6.8	—	*Depends on noise
V117	6J5	Vertical Oscillator	Pictr. Min.	3	40*	—	—	8	-110	5	-144	.17	—	*Height, linearity and hold affect readings 2 to 1
V118	6K6-GT	Vertical Output	Pictr. Min.	3	215	4	215*	8	-81	5	-97	16.3	*	*Screen connected to plate
V119	6AT6	Audio Amplifier	Pictr. Min	7	+75	—	—	2	0	1	-.1	.13	—	
HORIZONTAL DEFLECTION CHASSIS, KRS 20B-1														
V301	6H6	Horizontal Sync. Discr.	Pictr. Min.	3 5	-5.0 -5.0	—	—	4 8	-3.2 -2.2	—	—	—	—	
V302	6K6-GT	Horizontal Oscillator	Hold Max. Resistance	3	240	4	220	8	.30	5	-27.5	23.3	6.12	
			Hold Min. Resistance	3	230	4	192	8	.32	5	-23.0	24.8	6.87	
V303	6AC7	Horizontal Osc. Control	Pictr. Min.	8	246	6	127	5	0	4	-3	2.9	.75	
V304	6J5	Horizontal Discharge	Pictr. Min.	3	78	—	—	8	0	5	-38	.9	—	
V305	6BG6-G	Horizontal Output	Pictr. Min.	Cap	Do not Meas.*	8	280	3	14.0	5	-8	78	9.6	*6000 volt pulse present
V306	6BG6-G	Horizontal Output	Pictr. Min.	Cap	Do not Meas.*	8	280	3	14.0	5	-8	78	9.6	*6000 volt pulse present
V307	8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	10,500	—	—	—	—	*10,500 volt pulse present
			Brightness Max.	Cap	*	—	—	2 & 7	10,000	—	—	—	—	*10,500 volt pulse present
V308	8016	H. V. Rectifier	Brightness Min.	Cap	10,000	—	—	2 & 7	20,000	—	—	—	—	
			Brightness Max.	Cap	9,500	—	—	2 & 7	19,500	—	—	—	—	
V309	8016	H. V. Rectifier	Brightness Min.	Cap	19,500	—	—	2 & 7	29,000	—	—	—	—	
			Brightness Max.	Cap	18,500	—	—	2 & 7	28.000	—	—	—	—	
V310	6AS7-G	Damper	Pictr. Min.	2 & 5	Do not	—	—	3 & 6	470	1 & 4	290	78*	—	*Total both plates ‡1200 volt pulse present
V311	5V4G	Damper	Pictr. Min.	4 & 6	Meas.‡	—	—	8	570	—	—	156*	—	
V312	5TP4	Kinescope	Brightness Min.	Cap	29.000*	10	200	11	0	2	-98	0	—	*Measured with "VoltOhmyst" and high voltage multiplier probe
			Brightness Max.	Cap	28.000*	10	200	11	0	2	-43	.35	-	
POWER SUPPLY CHASSIS, KRS 21A-1														
V401	5U4G	Lo. V. Rectifier	Pictr. Min.	4 & 6	—	—	—	2 & 8	493	—	—	235*	—	*Total for both tubes
V402	5U4G	Lo. V. Rectifier	Pictr. Min.	4 & 6	—	—	—	2 & 8	493	—	—	*	—	
V403	5U4G	Lo. V. Rectifier	Pictr. Min.	4 & 6	—	—	—	2 & 8	265	—	—	172	—	

** Where separate readings are not listed for max. and min. gain settings of the picture control, the effect of the control is slight and readings are given for "Picture Min."

CHASSIS VIEWS

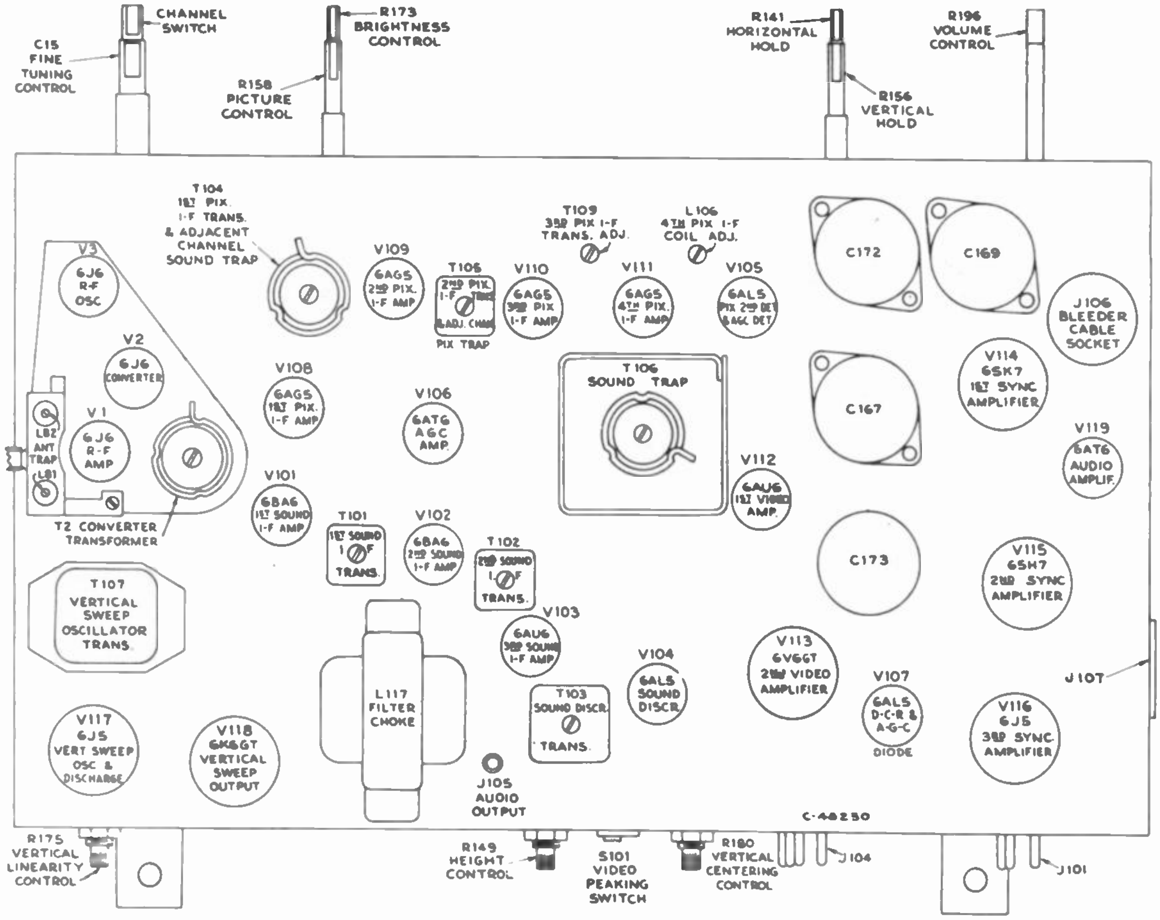


Figure 14—R-F, I-F Chassis Top View

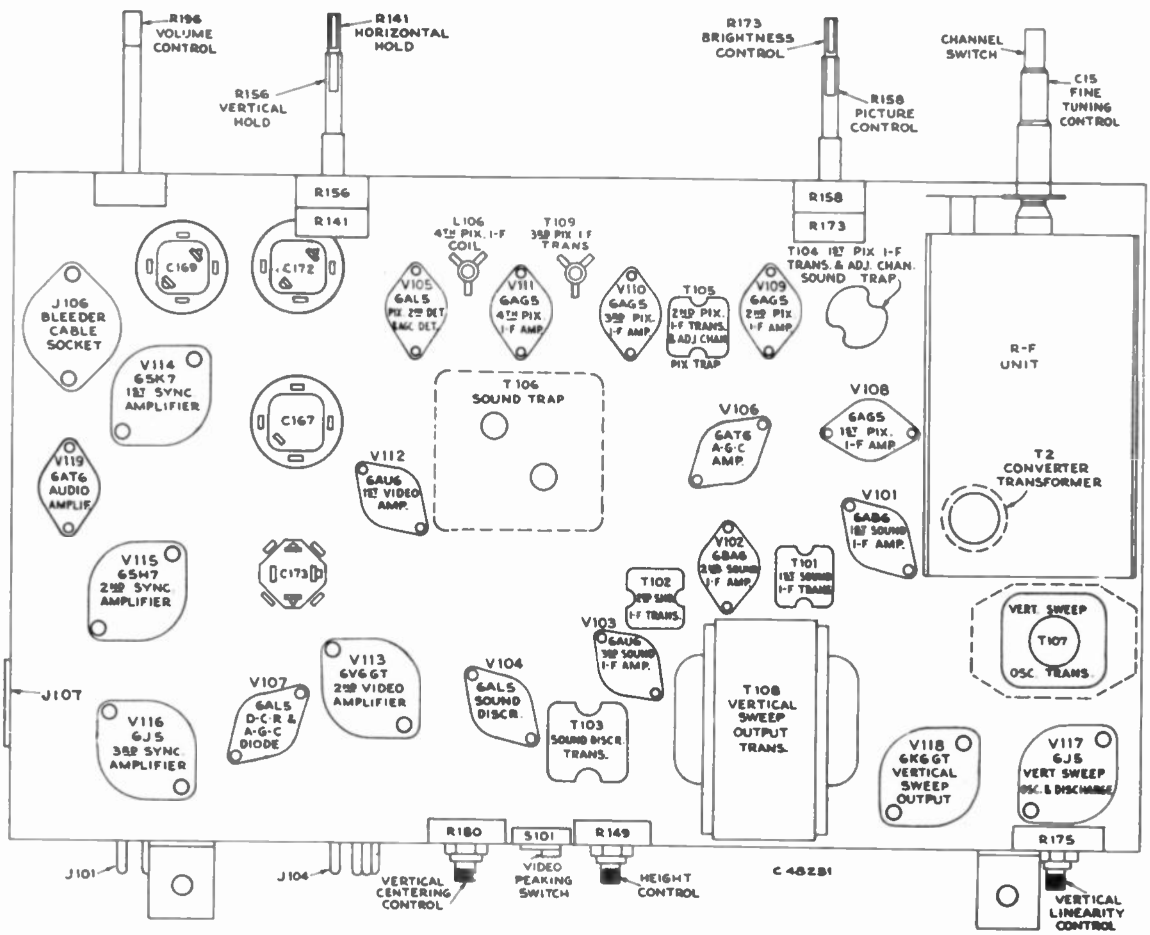


Figure 15—R-F, I-F Chassis Bottom View

CHASSIS WIRING DIAGRAMS

Note: In some units C19 is omitted.

In most units C14 is fixed.

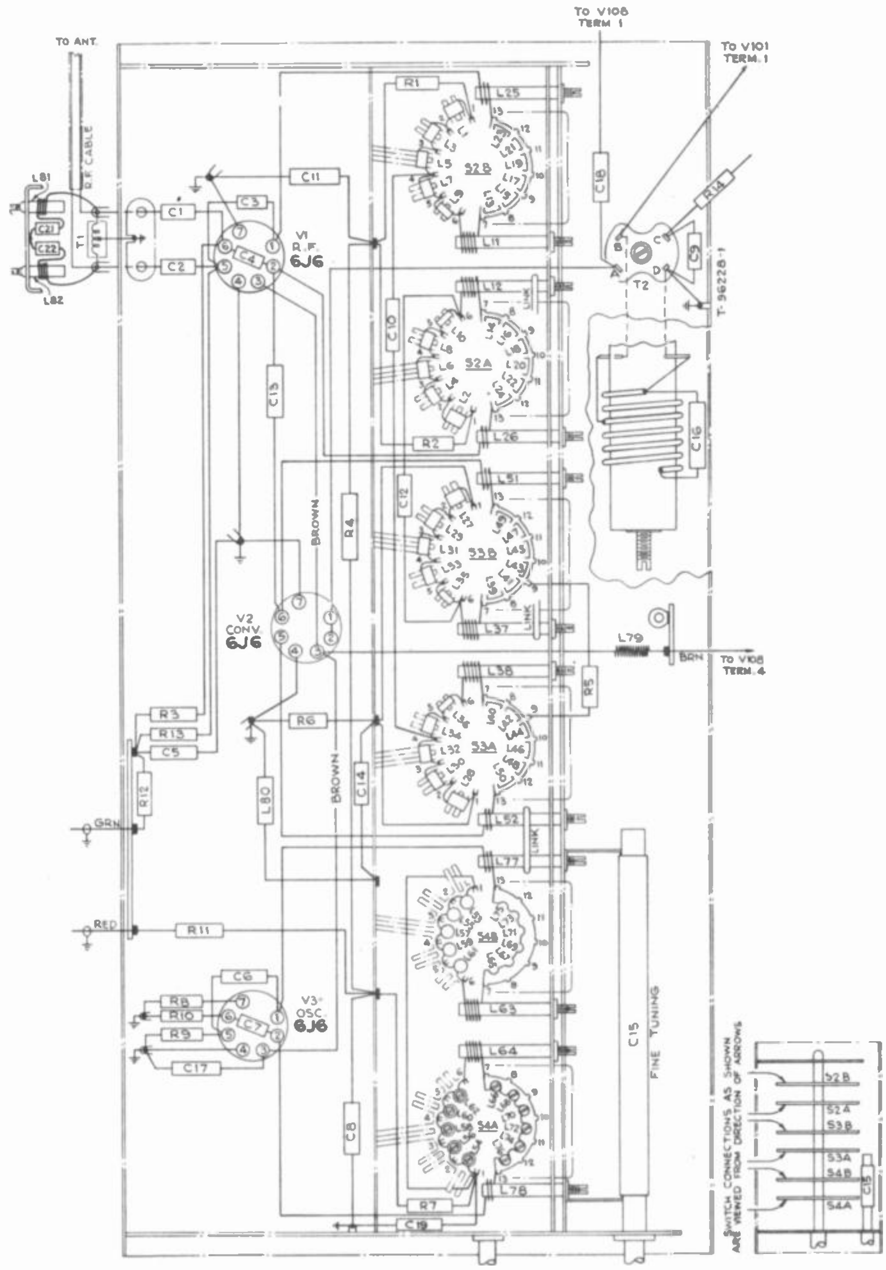


Figure 16—Television R-F Unit Wiring Diagram

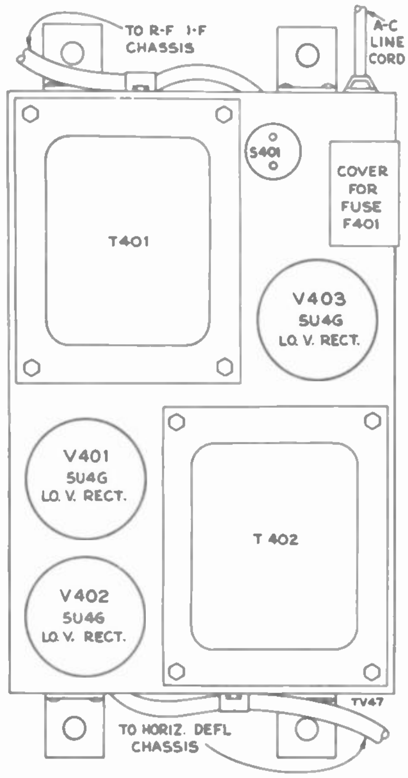


Figure 17—Power Supply, Top View

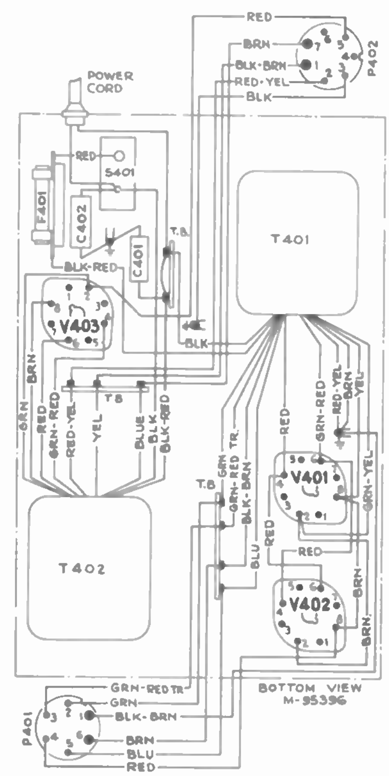
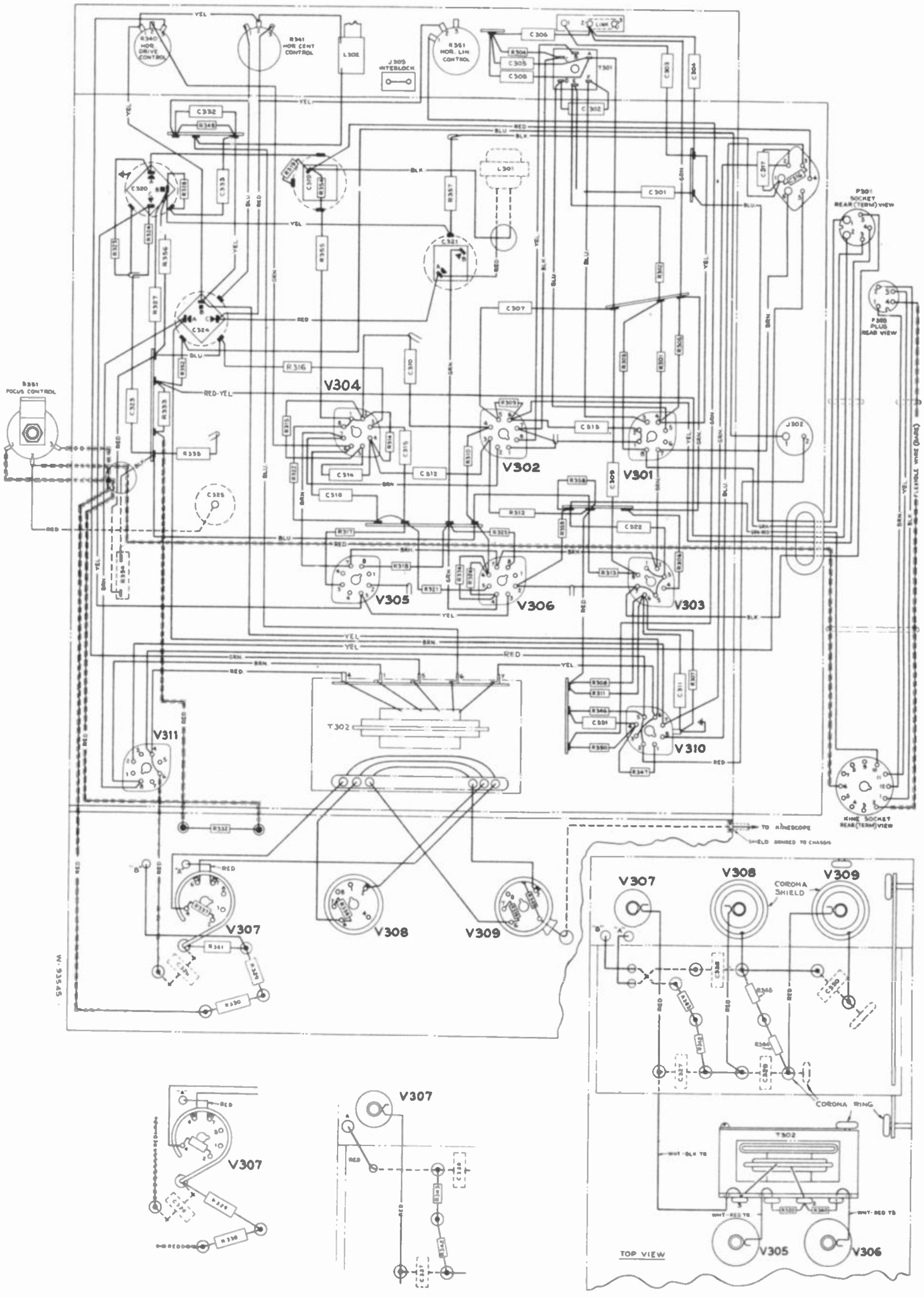


Figure 18—Power Supply Wiring Diagram

CHASSIS WIRING DIAGRAM

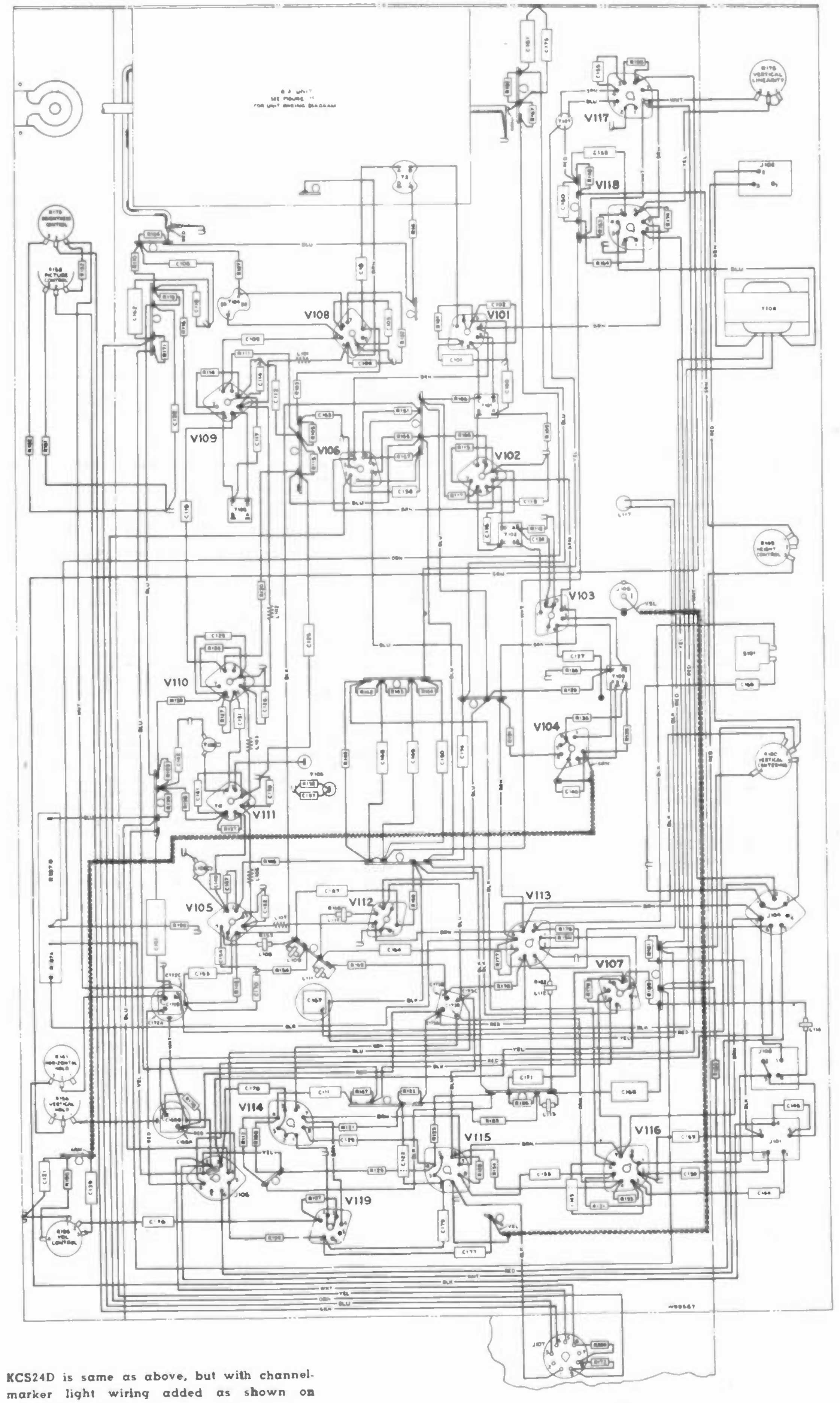


In receivers in which R361 is omitted, detail is as above.

In some receivers R360 may be omitted.

Figure 19—Horizontal Deflection Chassis Wiring Diagram

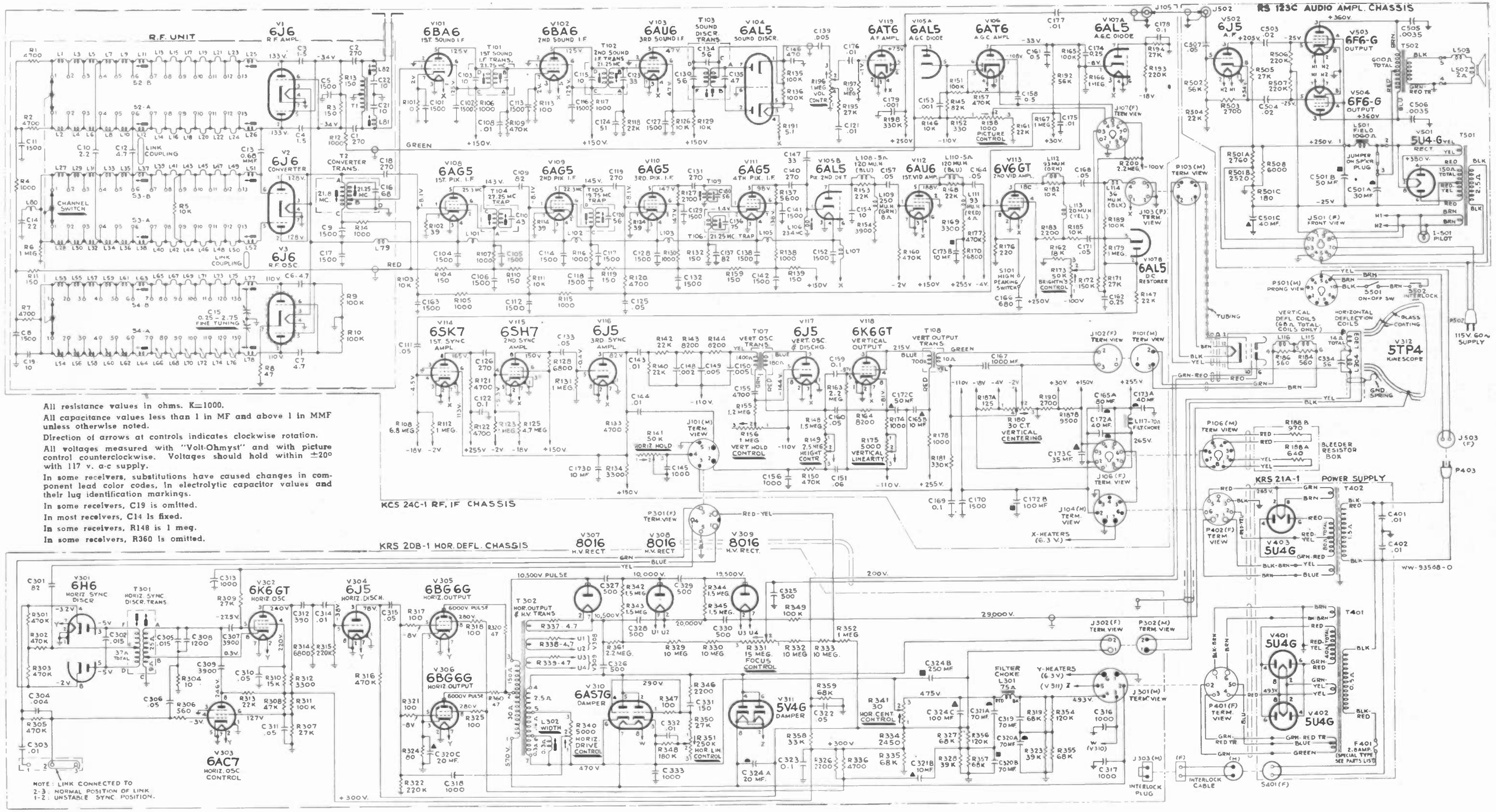
CHASSIS WIRING DIAGRAM



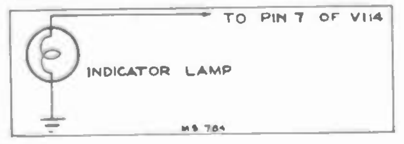
KCS24D is same as above, but with channel-marker light wiring added as shown on schematic.

Figure 20—R-F, I-F Chassis Wiring Diagram (KCS 24C-1)

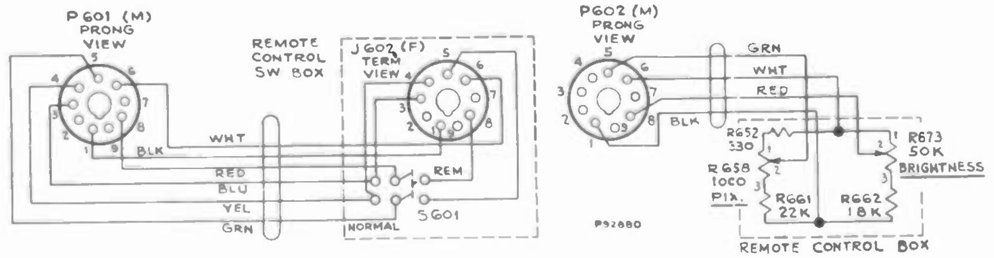
SCHEMATIC DIAGRAM



All resistance values in ohms. K=1000.
All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.
Direction of arrows at controls indicates clockwise rotation.
All voltages measured with "Volt-Ohmyst" and with picture control counterclockwise. Voltages should hold within ±20% with 117 v. a-c supply.
In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.
In some receivers, C19 is omitted.
In most receivers, C14 is fixed.
In some receivers, R148 is 1 meg.
In some receivers, R360 is omitted.



KCS24 is the same as KCS24C-1, except that a channel-marker light is added as shown above.



The R-F, I-F chassis is wired so that a remote Brightness and Picture control can be connected. This connection is made to J107. The schematic for the Local-Remote switch and the Remote Control Box is shown to the left.

Figure 21—Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT KRK2A
75066	Board—2 contact terminal board (used as antenna terminal board) on top of R-F unit chassis
75067	Bracket—Vertical bracket for holding R-F oscillator tube shield
71504	Capacitor—Ceramic, 0.68 mmf. (C13)
71500	Capacitor—Ceramic, 1.5 mmf. (C3, C4)
71502	Capacitor—Ceramic, 2.2 mmf. (C10)
71520	Capacitor—Ceramic, 4.7 mmf. (C6, C7, C12)
53511	Capacitor—Ceramic, 10 mmf. (C19)
33101	Capacitor—Ceramic, 22 mmf. (C14)
71540	Capacitor—Ceramic, 270 mmf. (C1, C2)
39638	Capacitor—Mica, 270 mmf. (C18)
71501	Capacitor—Ceramic, 1500 mmf. (C5, C8, C9, C11, C17)
72122	Coil—Channel #1 r-f amplifier plate coil—front or rear section or channel #1 converter grid coil—front or rear section (L1, L2, L27, L28)
71479	Coil—Channels #2 and #3 r-f amplifier plate coil—front or rear section or channels #2 and #4 converter grid coil—front or rear section (L3, L4, L5, L6, L29, L30, L33, L34)
71480	Coil—Channel #4 r-f amplifier plate coil—front or rear section (L7, L8)
71481	Coil—Channel #5 r-f amplifier plate coil—front or rear section or channel #5 converter grid coil—front or rear section (L9, L10, L35, L36)
71492	Coil—Channel #6 oscillator, converter grid or r-f amplifier plate coil—front or rear sections (L11, L12, L37, L38, L63, L64)
71491	Coil—Channel #13 converter grid or r-f amplifier plate coil —rear section (L25, L51)
71490	Coil—Channel #13 converter grid or r-f amplifier plate coil —front section (L26, L52)
72597	Coil—Channel #3 converter grid coil—front or rear section (L31, L32)
71469	Coil—Channel #1 oscillator coil—front or rear section (L53, L54)
71471	Coil—Channel #5 oscillator coil—front section or channel #2 oscillator coil—rear section (L55, L62)
71470	Coil—Channels #2, 3 and 4 oscillator coil—front section (L56, L58, L60)
72552	Coil—Channel #3 oscillator coil—rear section (L57)
72553	Coil—Channel #4 oscillator coil—rear section (L59)
71472	Coil—Channel #5 oscillator coil—rear section (L61)
71489	Coil—Channel #13 oscillator coil—rear section (L77)
71488	Coil—Channel #13 oscillotor coil—front section (L78)
71505	Coil—Heater choke coil (L79)
71506	Coil—Converter grid i-f choke coil (L80)
71493	Connector—Segment connector
71597	Core—Channel #13 front and rear oscillator coils' adjustable core and stud
71498	Core—Channels #6 and 13 front and rear converter grid coils or front and rear r-f amplifier plate coils' adjustable core and stud
71497	Core—Channel #6 front and rear oscillator coils' adjustable core and stud
71463	Detent—Detent mechanism and fiber shaft
71465	Disc—Rotor disc for fine tuning control (Part of C15)
71464	Drive—Fine tuning pinch washer drive
71487	Form—coil form only for channels #6 and 13 coils—less winding
71462	Loop—Oscillator to converter grid coupling loop
	Resistor—Fixed composition, 47 ohms ±20%, ½ watt (R8)
	Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R3, R11, R13)
	Resistor—Fixed composition, 1000 ohms ±20%, ½ watt (R4, R12, R14)
	Resistor—Fixed composition, 4700 ohms ±20%, ½ watt (R1, R2, R7)
	Resistor—Fixed composition, 10,000 ohms ±10%, ½ watt (R5)
	Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R9, R10)
	Resistor—Fixed Composition, 1 meg. ±20%, ½ watt (R6)
14343	Ring—Retaining ring for drive
71475	Screw—#4-40 x 15/32" adjusting screw for coils L54, L56, L58, L60, L62
71476	Screw—#4-40 x ¼" binder head screw for adjusting coils L66, L68, L70, L72, L74, L76
71473	Segment—Converter grid section front segment—less coils or r-f amplifier plate section front segment—less coils (Part of S2, S3)
71474	Segment—Converter grid section rear section less coils or r-f amplifier plate section rear segment—less coils (Part of S2, S3)
71467	Segment—Oscillator section front segment—less coils (Part of S4)
71468	Segment—Oscillator section rear segment—less coils (Part of S4)
72951	Shield—Lead tube shield for V3
71494	Socket—Tube socket—miniature
75068	Spring—Retaining spring for R-F oscillator tube shield
71461	Spring—Snap spring to hold fine tuning disc
71466	Stator—Oscillator fine tuning stator and bushing (Part of C15)
71507	Transformer—Antenna transformer (T1)
71495	Transformer—Converter transformer (T2 (C16))
73239	Trap—Antenna Trap (L81, L82, C21, C22)
	R-F, I-F CHASSIS KCS 24C-1—9PC41(a)
71894	Bearing—RF Unit shaft bearing
72857	Board—"Antenna" terminal board only
39604	Capacitor—Mica, 10 mmf. (C154)
38868	Capacitor—Ceramic, 33 mmf. (C147)
71771	Capacitor—Ceramic, 51 mmf. (C124)
73090	Capacitor—Mica, 82 mmf. (C109)
71514	Capacitor—Ceramic, 82 mmf. (C137)
73091	Capacitor—Mica, 270 mmf. (C119, C126, C131, C140)
39644	Capacitor—Mica, 470 mmf. (C146)
39648	Capacitor—Mica, 680 mmf. (C166)
72616	Capacitor—Mica, 1000 mmf. (C158)
54346	Capacitor—Mica, 1000 mmf. (C145)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C102, C104, C105, C106, C112, C113, C114, C116, C117, C118, C127, C128, C129, C132, C138, C141, C142, C152, C163, C170)
72524	Capacitor—Mica, 4700 mmf. (C155)
73801	Capacitor—Tubular, .001 mfd., 600 volts (C153, C179)
73803	Capacitor—Tubular, .002 mfd., 400 volts (C148)
73550	Capacitor—Tubular, .005 mfd., 400 volts (C139, C149, C150)
73561	Capacitor—Tubular, .01 mfd., 400 volts (C108, C121, C143, C144, C176, C177)
73553	Capacitor—Tubular, .05 mfd., 400 volts (C111, C125, C133, C157)
70636	Capacitor—Tubulor, .05 mfd., 600 volts (C164)
72996	Capacitor—Moulded paper, .05 mfd., 600 volts (C168, C171)
73093	Capacitor—Oil impregnated, .05 mfd., 1000 volts (C180)
73092	Capacitor—Tubular, .06 mfd., 1600 volts (C151)
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C122, C189, C175, C178)
70659	Capacitor—Tubular, 0.1 mfd., 1000 volts (C159)
70619	Capacitor—Tubular, 0.5 mfd., 200 volts (C158, C161)
70618	Capacitor—Tubular, 0.25 mfd., 200 volts (C162, C174)
72169	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts, 1 section of 35 mfd., 350 volts, and 1 section of 10 mfd., 350 volts (C173A, C173B, C173C, C173D)
72612	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 100 mfd., 150 volts, and 1 section of 50 mfd., 50 volts (C172A, C172B, C172C)
71780	Capacitor—electrolytic, comprising 1 section of 80 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C165A, C165B)
72611	Capacitor—Electrolytic, 1000 mfd., 3 volts, non-polarized (C167)
71505	Coil—Filament choke coil (L101, L102, L103, L105, L107)
71426	Coil—Fourth pix i-f coil (L106)
71526	Coil—Choke coil (L109)
71529	Coil—Peaking coil (L108, L110, R153, R168)
71527	Coil—Choke coil (L111)
72619	Coil—Peaking coil (L112, R182)
72618	Coil—Choke coil (L113)
71793	Coil—Choke coil (L114)
72167	Coil—Filter choke coil (L117)
71971	Control—Brightness and contrast control (R158, R173)
71440	Control—Height control (R149)
71441	Control—Vertical linearity control (R175)
72758	Control—Vertical & Horizontal Hold Control (R141, R156)
72168	Control—Vertical centering control (R180)
70143	Control—Volume control (R196)
71437	Cover—Insulating cover for capacitor #71780 and 72612
18469	Plate—Bakelite mounting plate for capacitors #71780, 72611 and 72612
72174	Plug—5 prong male plug for cable from horizontal deflection chassis (J101)
14404	Plug—7 prong male plug for cable from power supply (J104)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R191)
	Resistor—Fixed composition, 39 ohms ±10%, ½ watt (R102, R114, R124)
	Resistor—Fixed composition, 100 ohms ±10%, ½ watt (R101, R113)
	Resistor—Fixed composition, 150 ohms ±20%, ½ watt (R104, R110, R119, R139, R159)
	Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R132)
	Resistor—Fixed composition, 220 ohms ±10%, ½ watt (R176)
	Resistor—Fixed composition, 330 ohms ± 5%, ½ watt (R152)
	Resistor—Fixed composition, 1000 ohms ±20%, ½ watt (R105, R106, R107, R115, R116, R117, R130, R138, R174)
	Resistor—Fixed composition, 1000 ohms ±20%, 1 watt (R178)
72613	Resistor—Wire wound, 2200 ohms, 10 watts (R183)
	Resistor—Fixed composition, 2700 ohms ±10%, ½ watt (R127)
	Resistor—Fixed composition, 2700 ohms ±10%, 1 watt (R190)
	Resistor—Fixed composition, 3300 ohms ± 5%, ½ watt (R169)
	Resistor—Fixed composition, 3300 ohms ±10%, 1 watt (R134)
	Resistor—Fixed composition, 3900 ohms ±10%, ½ watt (R154)
	Resistor—Fixed composition, 4700 ohms ±10%, 1 watt (R121, R122, R133)
	Resistor—Fixed composition, 4700 ohms ± 5%, ½ watt (R120)
	Resistor—Fixed composition, 5600 ohms ± 5%, ½ watt (R137)
	Resistor—Fixed composition, 6800 ohms ±20%, ½ watt (R128, R170)
	Resistor—Fixed composition, 8200 ohms ± 5%, ½ watt (R164)
	Resistor—Fixed composition, 8200 ohms ±10%, ½ watt (R140, R144)
72171	Resistor—Voltage divider, comprising 1 section of 9500 ohms, 2 watts and 1 section of 125 ohms, 2.5 watts (R187A, R167B)

STOCK No.	DESCRIPTION
	Resistor—Fixed composition, 10,000 ohms ±20%, ½ watt (R185)
	Resistor—Fixed composition, 10,000 ohms ± 5%, ½ watt (R103, R111, R146)
	Resistor—Fixed composition, 10,000 ohms ±10%, 1 watt (R126, R129)
	Resistor—Fixed composition, 18,000 ohms ±10%, ½ watt (R162)
	Resistor—Fixed composition, 22,000 ohms ±20%, ½ watt (R140, R142, R147)
	Resistor—Fixed composition, 22,000 ohms ±10%, ½ watt (R118)
	Resistor—Fixed composition, 22,000 ohms ± 5%, 1 watt (R161)
	Resistor—Fixed composition, 27,000 ohms ±10%, ½ watt (R171, R194, R195)
	Resistor—Fixed composition, 56,000 ohms ±10%, ½ watt (R192)
	Resistor—Fixed composition, 82,000 ohms ±10%, ½ watt (R145)
	Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R135, R136, R151, R165, R189)
	Resistor—Fixed composition, 150,000 ohms ±20%, ½ watt (R172)
	Resistor—Fixed composition, 220,000 ohms ±10%, ½ watt (R193)
	Resistor—Fixed composition, 330,000 ohms ±20%, ½ watt (R181, R198)
	Resistor—Fixed composition, 470,000 ohms ±20%, ½ watt (R109, R150, R157, R177)
	Resistor—Fixed composition, 470,000 ohms ±10%, ½ watt (R160)
	Resistor—Fixed composition, 1 megohm ±20%, ½ watt (R123, R131, R179)
	Resistor—Fixed composition, 1 megohm ±10%, ½ watt (R112, R166, R167)
	Resistor—Fixed composition, 1.2 megohm ±10%, ½ watt (R155)
	Resistor—Fixed composition, 1.5 megohms ±10%, ½ watt (R148)
	Resistor—Fixed composition, 2.2 megohms ±10%, ½ watt (R163, R200)
	Resistor—Fixed composition, 4.7 megohms ±20%, ½ watt (R125)
	Resistor—Fixed composition, 6.8 megohms ±10%, ½ watt (R108)
	Resistor—Fixed composition, 10 megohms ±20%, ½ watt (R197)
72172	Socket—3 contact socket for deflection yoke cable (J102)
31027	Socket—4 contact female socket for cable from horizontal deflection chassis (J103)
35787	Socket—Output socket for audio cable
31251	Socket—Tube socket, wafer
72516	Socket—Tube socket, miniature
71659	Socket—9 contact socket (J107)
30953	Switch—Video-peaking switch (S101)
71424	Transformer—First or second sound i-f transformer (T101, T102 (C103, C107, C115, C123))
71427	Transformer—Sound discriminator transformer (T103, (C130, C134, C135))
71423	Transformer—First pix i-f transformer (T104 (C110))
71425	Transformer—Second pix i-f transformer (T105 (C120))
73708	Transformer—Third picture i-f transformer (T109 (C177))
71775	Transformer—Vertical oscillator transformer (T107)
72952	Transformer—Vertical output transformer (T108)
71422	Trap—Sound trap (T106 (C136))
	R-F, I-F CHASSIS KCS 24D—9PC41(b) AND 9PC41(c)
	Same as for KCS 24C (Model 9PC41(a)) except for the following addition:
71931	Socket—Channel marker escutcheon lamp socket
	HORIZONTAL DEFLECTION CHASSIS KRS 20B-1
71454	Board—Sync-link board
73335	Cable—Anode cable
73414	Cap—Hi-voltage rectifier and horizontal output plate cap
72614	Capacitor—Mica, 82 mmf. (C301)
73095	Capacitor—Mica, 150 mmf. (C331)
73094	Capacitor—Mica, 390 mmf. (C312)
71450	Capacitor—Hi-voltage filter, 500 mmf. (C325, C326, C327, C328, C329, C330)
39652	Capacitor—Mica, 1000 mmf. (C313, C316, C317, C318, C333)
72638	Capacitor—Ceramic, 1200 mmf. (C308)
39686	Capacitor—Mica, 3900 mmf. (C307, C309)
73796	Capacitor—Tubular, .004 mfd., 400 volts (C304)
71516	Capacitor—Tubular, oil impregnated, .015 mfd., 400 volts (C302, C305)
73561	Capacitor—Tubular, .01 mfd., 400 volts (C303, C314, C332)
73553	Capacitor—Tubular, .05 mfd., 400 volts (C306, C311, C322)
70636	Capacitor—Tubular, .05 mfd., 600 volts (C310, C315)
70638	Capacitor—Tubular, 0.1 mfd., 600 volts (C323)
72621	Capacitor—Electrolytic, 70 mfd., 400 volts (C319)
72623	Capacitor—Electrolytic, comprising 1 section of 70 mfd., 400 volts and 1 section of 10 mfd., 400 volts (C321A, C321B)
72622	Capacitor—Electrolytic, comprising 2 sections of 70 mfd., 250 volts and 1 section of 20 mfd., 50 volts (C320A, C320B, C320C)
72624	Capacitor—Electrolytic, comprising 1 section of 20 mfd., 150 volts, 1 section of 250 mfd., 15 volts and 1 section of 100 mfd., 15 volts (C324A, C324B, C324C)
72179	Coil—Filter choke coil (L301)
72180	Coil—Width control coil (L302)
71521	Connector—Hi-voltage capacitor connector
73414	Connector—Hi-voltage rectifier and horizontal output plate cap connector
72183	Control—Focus control (R331)
72181	Control—Horizontal centering control (R341)
71441	Control—Horizontal drive control (R340)
72182	Control—Horizontal linearity control (R351)
70144	Cord—Interlock cord less male plug
33846	Coupling—Focus control shaft coupling
72175	Cover—Insulating cover for electrolytics RCA #72621 and 72623
71437	Cover—Insulating cover for electrolytics RCA #72624
71451	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics RCA #72621, 72623 and 72624
72642	Plug—5 contact female plug on cable from horizontal deflection chassis to r-f, i-f chassis
72625	Plug—6 pin male plug for cable from television power supply (J301)
14793	Plug—2 prong male plug for interlock cable
71448	Plug—2 prong male plug for power cable
30568	Plug—4 prong male plug on cable from horizontal deflection chassis to r-f, i-f chassis
72833	Resistor—Wire wound, 4.7 ohms, 1/3 watt (R337, R338, R339)
	Resistor—Fixed composition, 10 ohms ±5%, ½ watt (R304)
72631	Resistor—Wire wound, 80 ohms, 5 watts (R324)
	Resistor—Fixed composition, 100 ohms ±20%, ½ watt (R317, R318, R325, R347)
	Resistor—Fixed composition, 560 ohms ±10%, ½ watt (R306)
	Resistor—Fixed composition, 2200 ohms ±10%, 1 watt (R326)
	Resistor—Fixed composition, 2200 ohms ±20%, ½ watt (R346)
72184	Resistor—Wire wound, 2450 ohms, 16.5 watts (R334)
48207	Resistor—Wire wound, 3300 ohms, 5 watts (R312)
	Resistor—Fixed composition, 4700 ohms ±10%, ½ watt (R336)
	Resistor—Fixed composition, 6800 ohms ±20%, ½ wott (R314)
	Resistor—Fixed composition, 15,000 ohms ±10%, ½ watt (R310)
	Resistor—Fixed composition, 22,000 ohms ±20%, 2 watts (R313)
	Resistor—Fixed composition, 27,000 ohms ±10%, ½ watt (R309)
	Resistor—Fixed composition, 27,000 ohms ±10%, 1 watt (R307, R350)
	Resistor—Fixed composition, 33,000 ohms ±10%, ½ watt (R358)
	Resistor—Fixed composition, 39,000 ohms ±10%, 2 watts (R323, R328)
	Resistor—Fixed composition, 47,000 ohms ±10%, 1 watt (R308)
	Resistor—Fixed composition, 68,000 ohms ±10%, 1 watt (R355, R357, R359)
	Resistor—Fixed composition, 68,000 ohms ±10%, 2 watts (R319, R327, R335)
	Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R311)
	Resistor—Fixed composition, 100,000 ohms ±20%, 1 watt (R349)
	Resistor—Fixed composition, 120,000 ohms ±10%, 1 watt (R354, R356)
	Resistor—Fixed composition, 180,000 ohms ±10%, ½ watt (R348)
	Resistor—Fixed composition, 220,000 ohms ±20%, ½ watt (R315, R322, R353)
	Resistor—Fixed composition, 470,000 ohms ±20%, ½ watt (R301, R302, R303, R305)
	Resistor—Fixed composition, 470,000 ohms ±10%, ½ watt (R316)
	Resistor—Fixed composition, 1 megohm ±10%, ½ watt (R352)
	Resistor—Fixed composition, 1.5 megohms ±20%, 2 watts (R342, R343, R344, R345)
	Resistor—Fixed composition, 2.2 megohms ±10%, 2 watts (R361)
	Resistor—Fixed composition, 10 megohms ±20%, 2 watts (R329, R330, R332, R333)
72008	Retainer—Focus control coupling shaft retainer
72185	Shaft—Focus control extension shaft
72626	Socket—2 contact socket for deflection yoke cable (J302)
72641	Socket—Kinescope socket
72627	Socket—Tube socket, ceramic
31251	Socket—Tube socket, wafer
71508	Socket—Tube socket for 8016 rectifier tubes
71559	Spring—Grounding spring for hi-voltage capacitor
71428	Transformer—Horizontal oscillator transformer (T301)
72178	Transformer—Horizontal output and hi-voltage transformer (T302 (R320))
	TELEVISION POWER SUPPLY KRS 21A-1
72838	Capacitor—Moulded paper, .01 mfd., 400 volts (C401, C402)
73151	Fuse—2.8 amperes (F401)
13526	Mounting—Fuse mounting
72644	Plug—6 contact female plug on cable from power supply to horizontal deflection chassis (P401)
14409	Plug—7 contact female plug on cable from power supply to r-f, i-f chassis (P402)
14275	Socket—2 contact female socket for interlock cable
31251	Socket—Tube socket
73191	Transformer—Power transformer (115 volt, 50 cycle) for horizontal deflection chassis (T401)
73192	Transformer—Power transformer (115 volt, 50 cycle) for r-f, i-f television chassis (T402)

STOCK No.	DESCRIPTION
72176	Transformer—Power transformer (115 volt, 60 cycle) for horizontal deflection chassis (T401)
72177	Transformer—Power transformer (115 volt, 60 cycle) for r-f, i-f television chassis (T402)
	AUDIO OUTPUT CHASSIS RS 123C
70646	Capacitor—Tubular, .0035 mfd., 1000 volts (C505, C506)
70632	Capacitor—Tubular, .02 mfd., 600 volts (C503, C504)
71551	Capacitor—Tubular, .05 mfd., 200 volts (C507)
72855	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 450 volts, 1 section of 50 mfd., 400 volts and 1 section of 40 mfd., 25 volts (C501A, C501B, C501C)
18469	Insulator—Mounting insulator for electrolytic
11765	Lamp—Pilot lamp—Mazda #51
12493	Plug—5 contact female plug for speaker cable
71660	Resistor—Comprising 1 section of 180 ohms, 3.5 watts, 1 section of 2520 ohms, 3.97 watts and 1 section of 2760 ohms, 9.3 watts (R501A, R501B, R501C)
48344	Resistor—Wire wound, 2000 ohms, 5 watts (R508A, R508B, R508C)
	Resistor—Fixed composition, 2700 ohms ±10%, ½ watt (R503)
	Resistor—Fixed composition, 22,000 ohms ±10%, ½ watt (R504)
	Resistor—Fixed composition, 27,000 ohms ±10%, ½ watt (R505)
	Resistor—Fixed composition, 56,000 ohms ±10%, ½ watt (R502)
	Resistor—Fixed composition, 220,000 ohms ±20%, ½ watt (R506, R507)
35787	Socket—Input socket
31364	Socket—Pilot lamp socket
71659	Socket—9 prong power socket (J501)
31319	Socket—Tube socket
37048	Transformer—Power transformer, 115 volts, 50/60 cycle (T501)
71661	Transformer—Output transformer (T502)
	OPTICAL BARREL ASSEMBLY KRK 4
73328	Band—Kinescope holder contact band
73323	Band—Spring band for supporting spherical mirror
73322	Cam—Corrector lens centering cam (4 required)
73324	Chain—Focus drive chain
73899	Gasket—Dust seal gasket on bottom of optical barrel
73326	Holder—Insulating holder for kinescope
72188	Lens—Corrector lens
73325	Mirror—Spherical mirror (12")
73329	Screw—Centering screw for kinescope (3 required)
73321	Spring—Focus screw compression spring (3 required)
73319	Sprocket—Focus sprocket (3 required)
73320	Sprocket—Idler sprocket
73327	Support—Support for kinescope holder
	SPEAKER ASSEMBLIES 92567-2W—RL 70R1
13867	Cap—Dust cap
71147	Clamp—Clamp to hold metal cone suspension (2 required)
71146	Coil—Field coil—1060 ohms
11233	Coil—Neutralizing coil
36145	Cone—Cone complete with voice coil
71560	Plug—5 prong male plug for speaker
71144	Speaker—12" EM speaker complete with cone and voice coil less plug
71145	Suspension—Metal cone suspension
	MISCELLANEOUS
74198	Back—Cabinet back cover—burgundy—for mahogany or walnut instruments
74199	Back—Cabinet back cover—tan—for toasted mahogany instruments
71599	Bracket—Lamp bracket
70148	Bracket—Reflection mirror mounting bracket complete with felt pad (3 required)
74241	Bumper—Felt bumper for drop panel (2 required)
72195	Cable—Shielded audio lead complete with pin plugs
13103	Cap—Pilot lamp jewel
71892	Catch—Bullet catch and strike
73933	Chain—Cabinet hood chain
72667	Clip—Second anode clip
X1951	Cloth—Grille cloth for mahogany instruments
X1952	Cloth—Grille cloth for walnut instruments
X1953	Cloth—Grille cloth for toasted mahogany instruments
73213	Cover—Dust cover
73246	Decal—Control panel decal for toasted mahogany instruments
73204	Decal—Control panel decal for mahogany or walnut instruments
73865	Decal—"Local-Remote" decal for mahogany or walnut instruments
74242	Decal—"Local-Remote" decal for toasted mahogany instruments
73180	Emblem—"RCA Victor" emblem
73220	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments (Model 9PC41(a))
73221	Escutcheon—Channel marker escutcheon for toasted mahogany instruments (Model 9PC41(a))
74227	Escutcheon—Channel marker escutcheon for Model 9PC41(b)—walnut or mahogany instruments
74257	Escutcheon—Channel marker escutcheon for Model 9PC41(c)—toasted mahogany instruments
37396	Grommet—Rubber grommet to mount speaker (4 required)
74240	Hinge—Cabinet lid hinge (2 required)
74243	Hinge—Drop panel hinge—L.H.
74244	Hinge—Drop panel hinge—R.H.
73735	Hinge—Hinge for movable panel behind drop panel (2 required for 9PC41(a) & 9PC41(b); 1 only for 9PC41(c))
73871	Hinge—Speaker compartment door hinge (2 required)
73228	Knob—Brightness control or horizontal control knob—dark—for mahogany or walnut instruments.
73229	Knob—Brightness control or horizontal control knob—tan—for toasted mahogany instruments
73224	Knob—Channel selector knob—dark—for mahogany or walnut instruments
73225	Knob—Channel selector knob—tan—for toasted mahogany instruments
73222	Knob—Fine tuning knob—dark—for mahogany or walnut instruments
73223	Knob—Fine tuning knob—tan—for toasted mahogany instruments
73226	Knob—Picture control or vertical hold control knob—dark—for mahogany or walnut instruments
73227	Knob—Picture control or vertical hold control knob—tan—for toasted mahogany instruments
72824	Knob—Remote control, volume control or power switch knob—brown—for toasted mahogany instruments
71822	Knob—Remote control switch knob—dark—for walnut or mahogany instruments
71821	Knob—Volume control or power switch knob—dark—for walnut or mahogany instruments
31480	Lamp—Channel marker escutcheon lamp—Mazda #47
74258	Mask—Masking washer (paper) for channel marker escutcheon lamp for Model 9PC41(c) toasted mahogany instruments
74228	Mask—Masking washer (paper) for channel marker escutcheon lamp for Model 9PC41(b) walnut or mahogany instruments
70145	Mirror—Reflecting mirror
73336	Nut—Aluminum nut to fasten anode cable
70146	Pin—Mounting pin to mount front end of television chassis (2 required)
73217	Plate—Plate complete with bullet catch and bracket with pin for cabinet hood—R.H. for 9PC41(a) & 9PC41(b)
73218	Plate—Plate complete with bullet catch and bracket with pin for cabinet hood—L.H. for 9PC41(a) & 9PC41(c)
70147	Plate—Power switch mounting plate
4573	Plug—2 contact female plug on power switch cable
14793	Plug—2 prong male plug on deflection yoke cable
14782	Plug—3 prong male plug on deflection yoke cable
35383	Plug—8 prong male plug on bleeder resistor cable
71968	Plug—9 prong male plug for power switch cable or remote control adapter
31048	Plug—Pin plug for audio cable
74238	Pull—Door pull for lower doors (2 required)
74239	Pull—Door pull for control panels (4 required)
72170	Resistor—Wire wound, comprising 1 section of 970 ohms, 9 watts and 1 section of 640 ohms, 10.5 watts
73416	Ring—Rubber ring between deflection yoke and correction lens
72194	Screen—Viewing screen
70149	Screw—Elevating screw for optic barrel (3 required)
71659	Socket—9 contact female socket for remote control adapter
71538	Spring—Channel marker escutcheon spring
72454	Spring—Lid support spring for 9PC41(a) and 9PC41(b)
74374	Spring—Spring for L.H. lid support for 9PC41(c)
74479	Spring—Spring for R.H. lid support for 9PC41(c)
30330	Spring—Retaining spring for knobs 73228 or 73229
30900	Spring—Retaining spring for knobs 71821, 71822 or 72824
14270	Spring—Retaining spring for knobs 73224, 73225, 73226 or 73227
72845	Spring—Retaining spring for knobs 73222 or 73223
72936	Stop—Speaker compartment door stop
73645	Support—Lid support less spring—L.H.—for 9PC41(a) and 9PC41(b)
73546	Support—Lid support less spring—R.H.—for 9PC41(a) and 9PC41(b)
74372	Support—Lid support—L.H.—for 9PC41(c)
74373	Support—Lid support—R.H.—for 9PC41(c)
73212	Switch—Interlock switch for 9PC41(a) and 9PC41(b)
74371	Switch—Interlock switch for 9PC41(c)
70155	Switch—Power switch
73852	Switch—Remote control switch
74259	Washer—Felt washer (tan) for channel selector knob for Model 9PC41(c)—toasted mahogany instruments
74229	Washer—Felt washer (burgundy) for channel selector knob for Model 9PC41(b)—walnut or mahogany instruments
72196	Yoke—Deflection yoke complete with cables
	REMOTE CONTROL ASSEMBLY
71971	Control—Picture and brightness control (R658, R673)
33006	Foot—Rubber foot (4 required)
73228	Knob—Brightness control knob—dark—for mahogany or walnut boxes
73229	Knob—Brightness control knob—tan—for toasted mahogany boxes
73226	Knob—Picture control knob—dark—for mahogany or walnut boxes
73227	Knob—Picture control knob—tan—for toasted mahogany boxes
71968	Plug—9 prong male plug for remote control cable
	Resistor—Fixed composition, 330 ohms, ±5%, ½ watt (R652)
	Resistor—Fixed composition, 18,000 ohms, ±10%, ½ watt (R662)
	Resistor—Fixed composition, 22,000 ohms, ±5%, ½ watt (R661)
30330	Spring—Retaining spring for knobs
14270	Spring—Retaining spring for knobs

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

Model 9TC240 Walnut, Mahogany or Toasted Mahogany

Model 9T240 Walnut, Mahogany, Toasted Mahogany or Oak

TELEVISION RECEIVERS

MODELS 9T240, 9TC240

Chassis Nos. KCS28, KCS28A, KCS28B

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. T6 —

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION

CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 9T240 is a "10 inch" table model television receiver. Model 9TC240 is a "10 inch" console model. These receivers employ twenty-one tubes plus 2 rectifiers and a 10BP4 kinescope. Later models of the 9T240 are fitted with a special kinescope strap which enables the kinescope to be shipped in place. In this service note, these later models will be designated as 9T240K, but they will not be so labeled in the field.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE ....61 sq. in. on a 10-in. tube

RADIO FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

From plus and minus approximately 250 kc on channel 2 to plus and minus approximately 650 kc on channel 13.

POWER SUPPLY RATING

KCS 28, KCS28A, KCS28B ....115 volts, 60 cycles, 250 watts

AUDIO POWER OUTPUT RATING

Maximum ....2.4 watts

LOUDSPEAKER 92573-4 (9T240)

Type ....5 x 7 inch Permanent Magnet Dynamic

Voice Coil Impedance ....3.2 ohms at 400 cycles

LOUDSPEAKER 92569-7 (9TC240)

Type ....12 inch Permanent Magnet Dynamic

Voice Coil Impedance ....3.2 ohms at 400 cycles

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside) 9T240	22¼	15⅜	19⅞
Cabinet (outside) 9TC240	25¼	37¼	22⅝
Chassis Assembly (outside)	19½	10½	17
Chassis (Overall)	19½	13	20½

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

CHASSIS DESIGNATIONS

9T240 uses KCS28

9T240K uses KCS28A

9TC240 uses KCS28B

WEIGHT

Net with Tubes 9T240, 78 lbs.; 9T240K, 78 lbs; 9TC240, 103 lbs.

Shipping Weight—9T240, 81 lbs; 9T240K, 92 lbs; 9TC240, 123 lbs.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6AG5	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6AG5	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 5V4G	Damper
(22)	RCA 1B3-GT 8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 10BP4	Kinescope

Specifications continued on page 2

REFER TO PAGES 186 TO 201 FOR ALIGNMENT PROCEDURE, SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.75 Mc.
Adjacent Channel Sound Trap .... 27.25 Mc.
Accompanying Sound Traps .... 21.25 Mc.
Adjacent Channel Picture Carrier Trap .... 19.75 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.25 Mc.
Sound Discriminator Band Width between peaks .... 350 kc

VIDEO RESPONSE .... To 4 Mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY .... 15,750 cps

VERTICAL SWEEP FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector / Fine Tuning .... Dual Control Knobs
Picture / Sound Volume and On-Off Switch .... Dual Control Knobs
Picture Horizontal Hold / Picture Vertical Hold .... Dual Control Knobs
Brightness .... Single Control Knob

NON-OPERATING CONTROLS (not including r-f & i-f adjustments)

Horizontal Centering .... top chassis screwdriver adjustment
Vertical Centering .... top chassis screwdriver adjustment
Width .... rear chassis screwdriver adjustment
Height .... rear chassis adjustment
Horizontal Linearity .... rear chassis screwdriver adjustment
Vertical Linearity .... rear chassis adjustment
Horizontal Drive .... rear chassis screwdriver adjustment
Horizontal Osc. Freq. .... bottom chassis adjustment
Horizontal Osc. Waveform .... side chassis adjustment
Horizontal Locking Range .... rear chassis adjustment
Focus .... rear chassis adjustment
Ion Trap Magnet .... top chassis adjustment
Deflection Coil .... top chassis wing nut adjustment
AGC Threshold Control .... top chassis adjustment on 9T240; rear chassis adjustment on 9TC240

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

9T240, 9TC240 R-F UNIT WIRING DIAGRAM

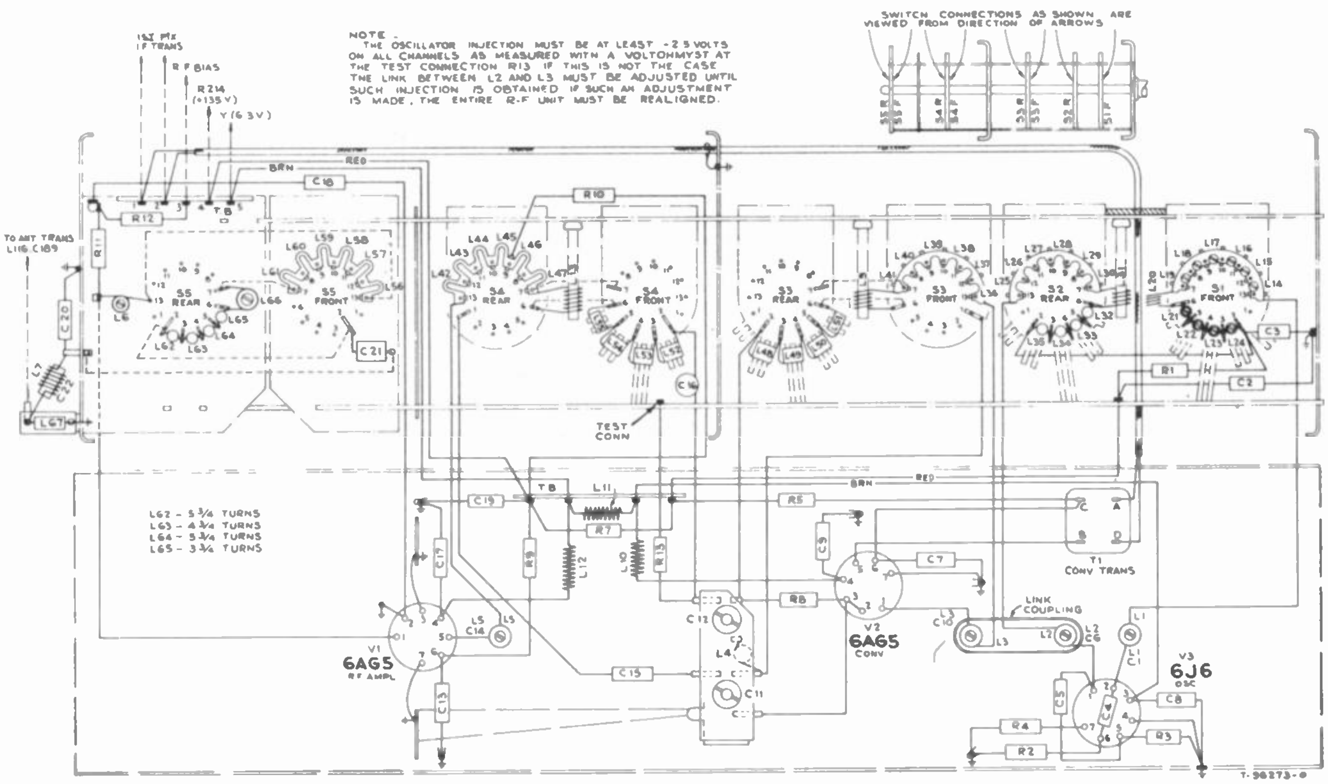


Figure 8—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress the blue lead from pin 5 of V119 down against the chassis.
9. Dress C129 and C130 up and away from the chassis.
10. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
11. Dress the green lead from pin 2 of V106 away from the chassis.
12. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
13. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
14. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
15. Dress leads from L110 (width control coil) away from the transformer frame.
16. Dress T110 winding leads as shown in Figure 9.

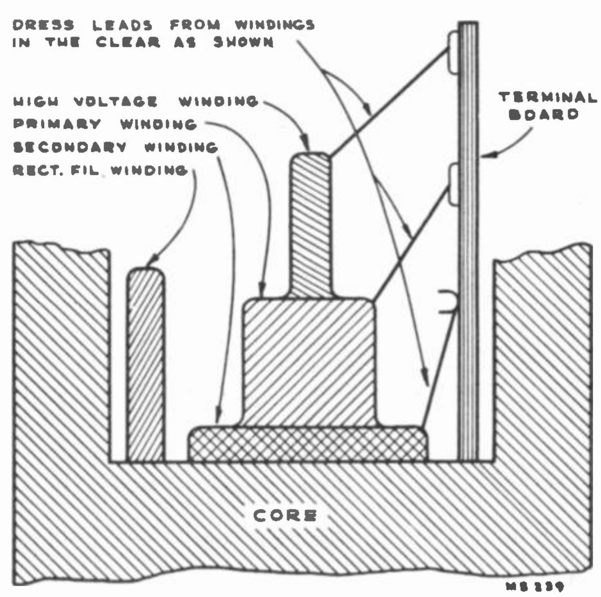


Figure 9—T110 Lead Dress

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	158	—	—	3	0	1	-4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	-5.2	3.75	—	
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	230	—	—	6	-51	4	-106	.4	—	
			No Signal	5	215	—	—	6	-59	4	-80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	223	4	223	8	-67	5	-91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	-79	5	-101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	-110	1	-92	.2	—	*Variation of hold gives -21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	-120	1	-108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	-111	4	-185	2.4	—	
			No Signal	5	54	—	—	6	-120	4	-192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	*	8	160	3	-104	5	-101	93.5	11.5	*5200 volt pulse present
			No Signal	Cap	Do Not Meas.	8	142	3	-113	5	-112	90.8	11.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	8500	—	—	0	—	*8500 volt pulse present
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	8400	—	—	.1	—	
V114	5V4G	Damper	2200 Mu. V. Signal	4 & 6	*	—	—	2 & 8	339	—	—	94.5	—	*1200 volt pulse present
			No Signal	4 & 6	Do Not Meas.	—	—	2 & 8	322	—	—	92	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	390	—	—	2 & 8	291	—	—	225	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	390	—	—	2 & 8	272	—	—	230	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	0	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	148	6	90	7	0	1	-9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	-.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	-8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	-2.0	—	—	5	.41	—	—	—	—	
			2200 Mu. V. Signal	7	-3.7	—	—	1	0	—	—	—	—	
			No Signal	7	-1.08	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	-.89	.49	—	
			No Signal	7	83	—	—	2	0	1	-.89	.4	—	
V120	6K6-GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	-99	5	-108	19.3	3.3	
			No Signal	3	72	4	80	8	-111	5	-114	18	3	
V121	10BP4	Kinescope	2200 Mu. V. Signal	Cap	*8400	10	339	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	—	10	322	11	42	2	14	—	—	Average Brightness
			2200 Mu. V. Signal	Cap	—	10	339	11		2		.4	—	Maximum Brightness
			2200 Mu. V. Signal	Cap	*8500	10	339	11		2		0	—	Minimum Brightness

9T240, 9TC240

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	146	6	148	2 & 7	0	1	–4.9	.72	.33	
			No Signal	5	85	6	120	2 & 7	0	1	–0.4v	12.0	4.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*–3.0 to –7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*–2.0 to –6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*–5.1 to –7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*–4.5 to –6.6	*1.8 to 2.1	—	
V101	6AG5	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	141	6	141	2 & 7	.07	1	–3.9	.8	.22	
			No Signal	5	108	6	108	2 & 7	.11	1	–.09	4.97	1.73	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	130	6	130	2 & 7	.86	1	0	9.48	3.12	
			No Signal	5	106	6	106	2 & 7	.6	1	0	7.6	2.6	
V103	6AG5	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	130	6	140	2 & 7	.03	1	–3.9	.51	.09	
			No Signal	5	94	6	109	2 & 7	.11	1	–.09	3.92	1.5	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	175	6	145	2 & 7	1.38	1	0	7.0	2.0	
			No Signal	5	167	6	109	2 & 7	.95	1	0	5.7	1.5	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	–113	—	—	1	–112	—	—	.48	—	
			No Signal	7	–120	—	—	1	–120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	–107	—	—	5	–56	—	—	—	—	
			No Signal	2	–80	—	—	5	–60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	–23.2	—	—	3	–111	2	–113	4.38	—	
			No Signal	1	–19.2	—	—	3	–117	2	–120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*166	—	—	8	*–5.3	7	*–12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*–5.6	7	*–10.3	6.9	—	
V107 A	6SN7 GT	ACG Amplifier	2200 Mu. V. Signal	5	–17.9	—	—	6	–55.5	4	–56.5	.9	—	
			No Signal	5	–5.2	—	—	6	–60	4	–64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	76	—	—	3	–111	1	–158	.2	—	
			No Signal	2	62	—	—	3	–120	1	–169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	97	—	—	6	–3.4	4	–19.3	.3	—	
			No Signal	5	81	—	—	6	–8.7	4	–19.3	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	96	—	—	3	–1.8	1	–19.5	.1	—	
			No Signal	2	81	—	—		–9.7	1	–19.3	.1	—	

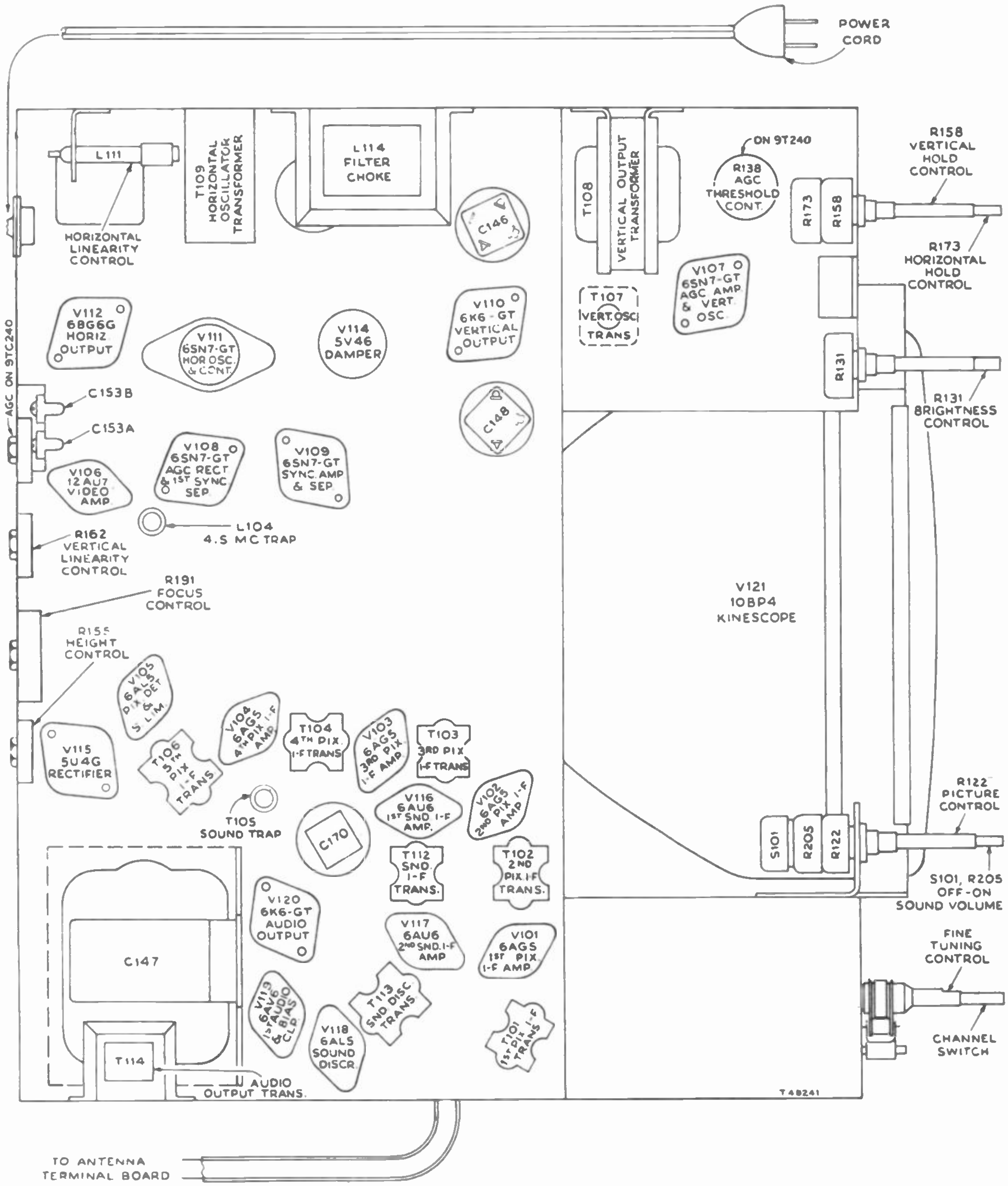


Figure 7—Chassis Bottom View

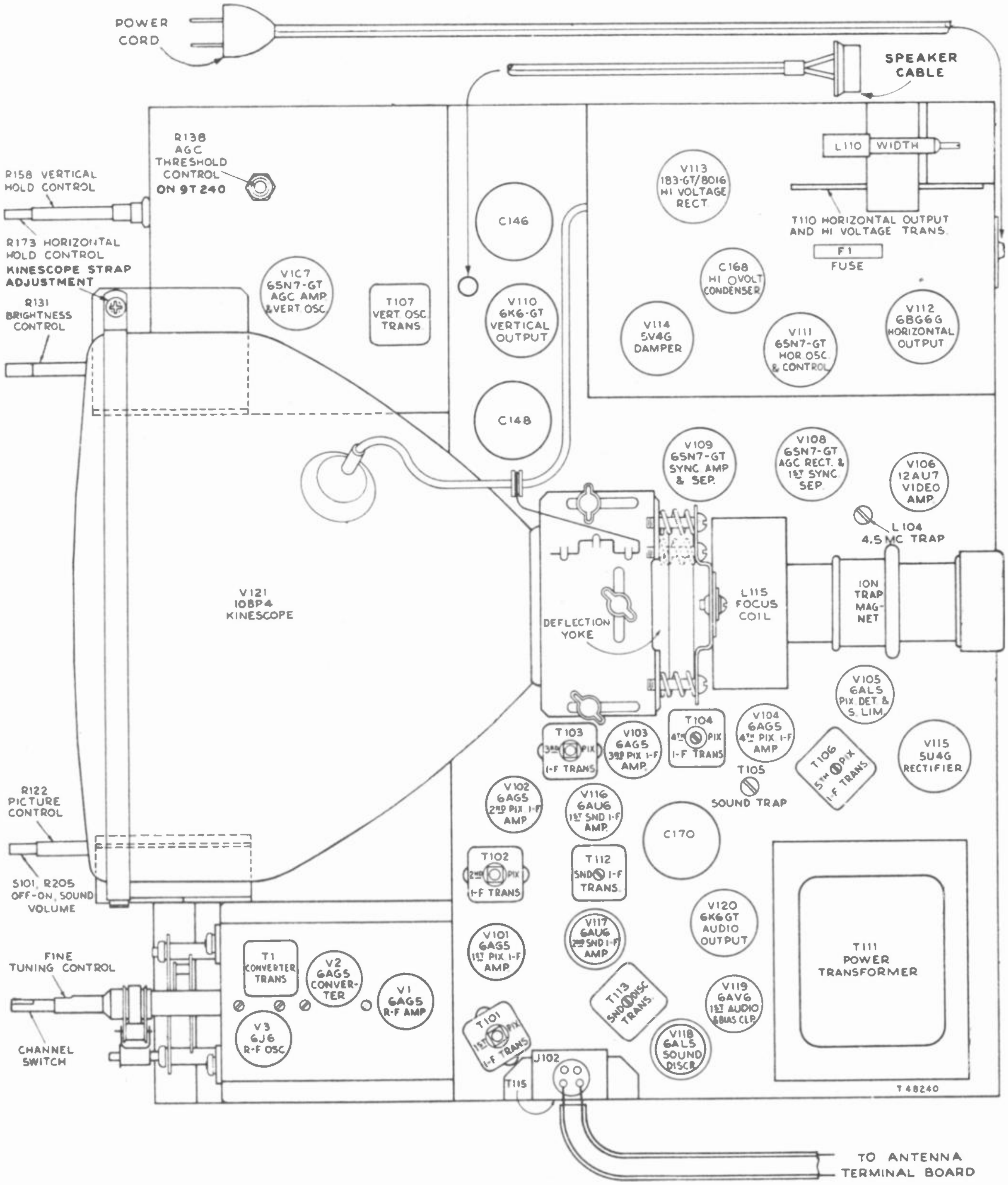


Figure 6—Chassis Top View

wise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is obtained by mechanically orienting the focus coil with the three adjustment screws shown in Figure 3. Center the picture on the screen by adjustment of these screws. The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster, and toward the rear of the receiver as far as possible to produce better overall focus.

FOCUS COIL ADJUSTMENTS.—If, after making the centering adjustments described in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 3) and change the position of the coil to eliminate the shadow. Recenter the picture by adjustment of the centering screws.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

CHECK TO SEE THAT THE CUSHION AND YOKE ADJUSTING SCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

The following adjustment procedure applies verbatim for the 9T240, but for the 9TC240, the AGC control should, in each case, be rotated in a direction opposite to that given below.

Set the picture control at the maximum clockwise position. Turn R138 fully counter-clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 counter-clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 clockwise until the snow in the picture becomes more pronounced, then counter-clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far clockwise on a weak signal, then the receiver may overload when a strong signal is received.

Replace the cabinet top on Models 9T240 and 9T240K. Recheck picture centering after the top is replaced. Replace the cabinet back.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 5. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

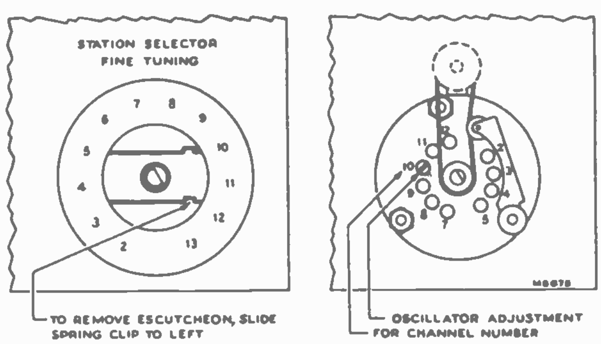


Figure 5—R-F Oscillator Adjustments

Insert the kinescope until the face of the tube protrudes approximately one-quarter of an inch outside the front of the cabinet. Adjust the four centering slides until the face of the kinescope is in the center of the cabinet opening. Tighten the four slides securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel by reversal of the procedure indicated in Figure 2. Press on the knobs.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible.

Connect the high voltage lead to the kinescope second anode socket.

The antenna and power connections should now be made.

Turn the power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise. Proceed now to "ION TRAP MAGNET ADJUSTMENT."

INSTALLATION INSTRUCTIONS FOR MODELS 9T240K AND 9TC240

Models 9T240K and 9TC240 are shipped complete in cardboard cartons. The kinescope is shipped in place in the receiver.

UNPACKING.—To unpack the 9T240K, tear open the carton flaps, pick up the receiver from under the bottom of the cabinet, and lift it out of the shipping carton. To unpack the 9TC240, turn the shipping carton on its side and tear open the carton bottom flaps. Fold the flaps up along the side of the carton and turn the carton back up. Lift the carton up and off the cabinet. A flat skid is attached to the bottom of the 9TC240. To remove the skid, remove the two nuts from the skid bolts on the inside bottom of the cabinet. Then, with a man at each end of the cabinet, lift the cabinet off the skid.

Take off the cabinet top and back, taking care to unplug the speaker in the 9T240K as the top is removed (the 9TC240 top is not removable). The front panels of the 9T240K and the 9TC240 are not removable. The operating control knobs are packed in a bag which is tied to the inside of the cabinet. Remove the bag and install the knobs. Remove the protective cardboard shields from the 5U4G rectifier tube and the neck of the kinescope.

Connect the antenna and plug the power cord into a 115 volt a-c source. Turn the power switch to the "on" position, the brightness control fully clockwise, and the picture control counterclockwise. Proceed now to "ION TRAP MAGNET ADJUSTMENT."

CHASSIS REMOVAL.—To remove the chassis from the 9T240K or the 9TC240 for repair or installation of a new kinescope, remove the back and the knobs, unplug the speaker cable, and remove the six chassis bolts under the cabinet. Unclip the jewel light on the 9TC240, and pull the cable up through the hole in the chassis shelf. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap, as shown in Figure 6. Withdraw the kinescope toward the front of the chassis.

To replace the chassis in the cabinet, first remove the shipping screws from the yoke mounting as shown in Figure 3 (it is not necessary to remove these during installation), and loosen the cushion adjusting screws. Slide the cushion toward the rear of the chassis, and insert the kinescope. Tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the six chassis bolts. Loosen the kinescope strap. In the 9T240K, this can be done through the top of the cabinet. In the 9TC240, this can be done from the rear of the cabinet, or from the bottom through a hole in the chassis shelf. The bottom end of the cross-recessed head screw is slotted to fit a screwdriver. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Tighten the kinescope strap, then replace the knobs, the ion-trap magnet, the second-anode connector, and the kinescope socket.

ION TRAP MAGNET ADJUSTMENT.—Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags.

The ion trap rear magnet poles should be approximately over the ion trap flags. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

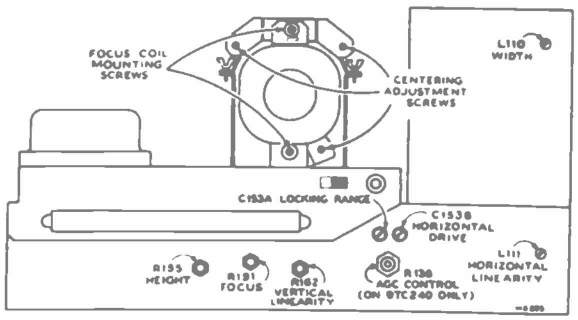


Figure 4—Rear Chassis Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions on page 3.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 (on top of the chassis for the 9T240; on the rear apron for the 9TC240, see Figure 6) counter-clockwise for the 9T240 and clockwise for the 9TC240 until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clock-

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counterclockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.

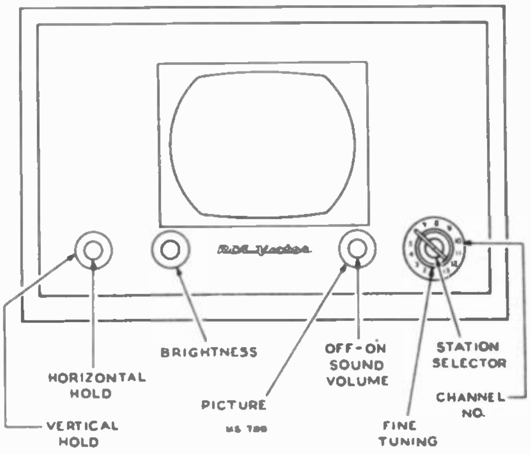


Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH."

INSTALLATION INSTRUCTIONS FOR MODEL 9T240

Model 9T240 television receiver is shipped complete in one carton except for the 10BP4 kinescope. The kinescope is shipped in a special carton and should not be unpacked until ready for installation.

UNPACKING.—To unpack the receiver, tear open the carton flaps, pick the receiver up from under the bottom of the cabinet and lift it out of the shipping carton.

Take off the cabinet top and back, taking care to unplug the speaker as the top is removed. Remove the cabinet front panel as shown for Model 9T240 in Figure 2.

Remove the operating control knobs, which are packed in a paper bag tied to the inside of the cabinet brace.

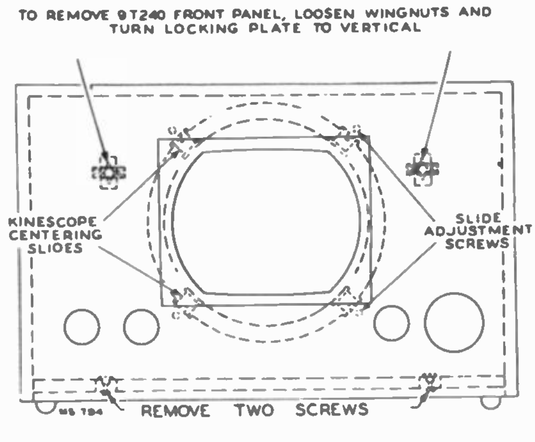


Figure 2—Cabinet, Front View

Remove the protective cardboard shield from the 5U4G rectifier. Make sure all tubes are in place and are firmly seated in their sockets. Remove the two self-tapping screws from the kinescope cushion slide as shown in Figure 3.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis, and tighten.

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the two focus coil mounting screws and move the coil until alignment is obtained. Tighten the mounting screws with the coil in this position.

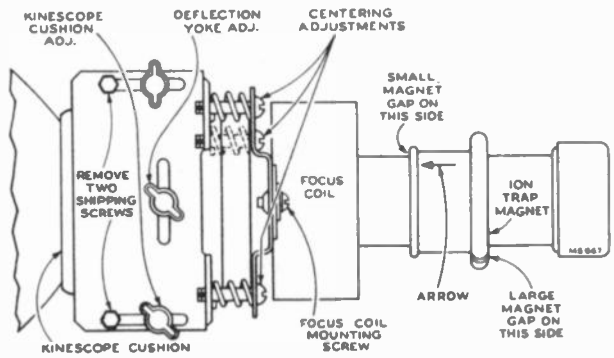


Figure 3—Yoke and Focus Coil Adjustments

Loosen the two lower kinescope face centering slides, and set them at approximately mid position. See Figure 2 for location of the slides and their adjustment screws.

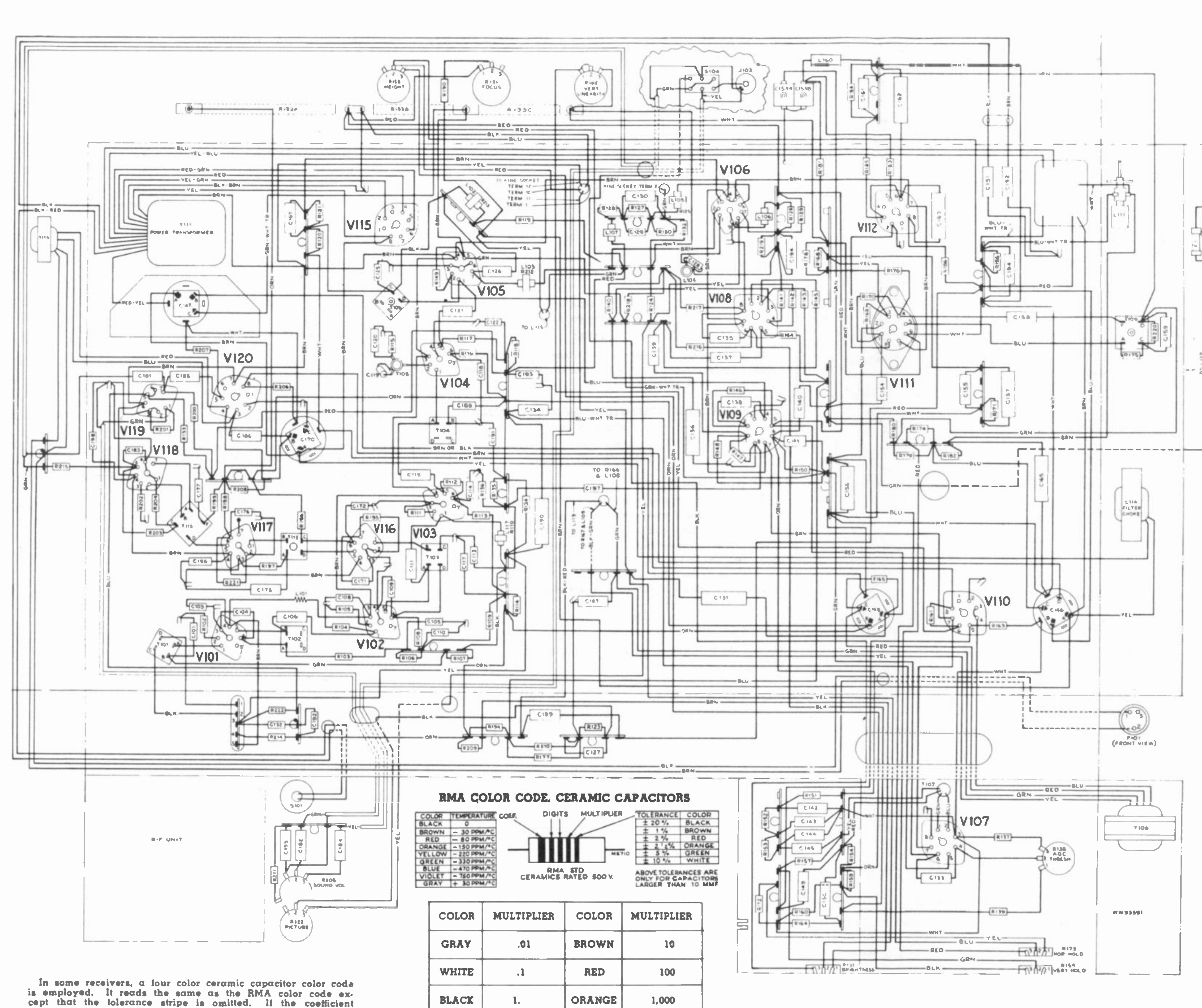
INSTALLATION OF KINESCOPE.—The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils until the base of the tube protrudes approximately two inches beyond the focus coil. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

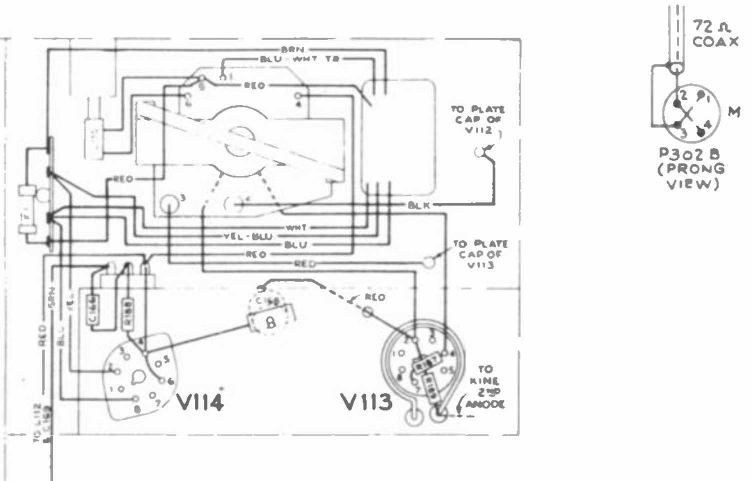
Slip the ion trap magnet assembly over the neck of the kinescope with the large magnet toward the base of the tube and with the arrow on the assembly up as shown in Figure 3. The front magnet is movable on the assembly. The correct position of the front magnet is with the gap on the side toward the high-voltage compartment. The gap of the large rear magnet should be on the opposite side and 180 degrees from the gap of the small magnet.

Connect the kinescope socket to the tube base.

CHASSIS WIRING DIAGRAM



R138 is located on rear apron and has terminals 1 and 3 reversed on 9TC240. Some models do not have a phono jack and switch. Model 9TC240 has a jewel light extension wired in as shown on the schematic.



RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	− 220 PPM/°C
GREEN	−330 PPM/°C
BLUE	−470 PPM/°C
VIOLET	−750 PPM/°C
GRAY	+ 30 PPM/°C

RMA STD
CERAMICS RATED 500 V.

TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

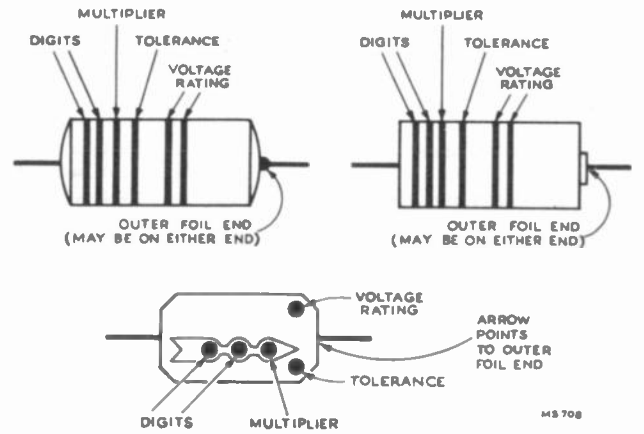
COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 12

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted. If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for bypass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

Figure 10—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS



CAPACITY VALUE IN MMF

COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

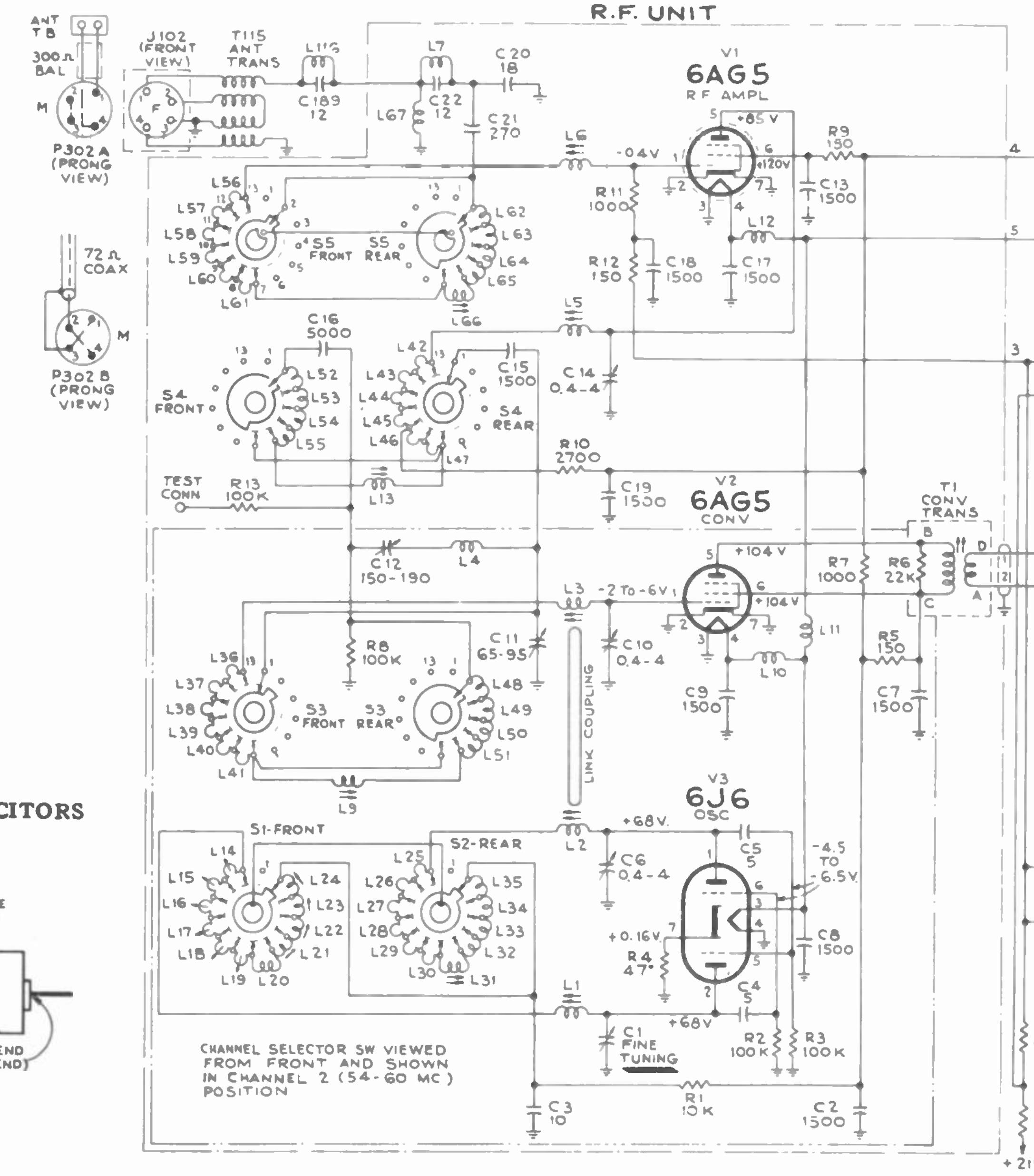
TOLERANCE

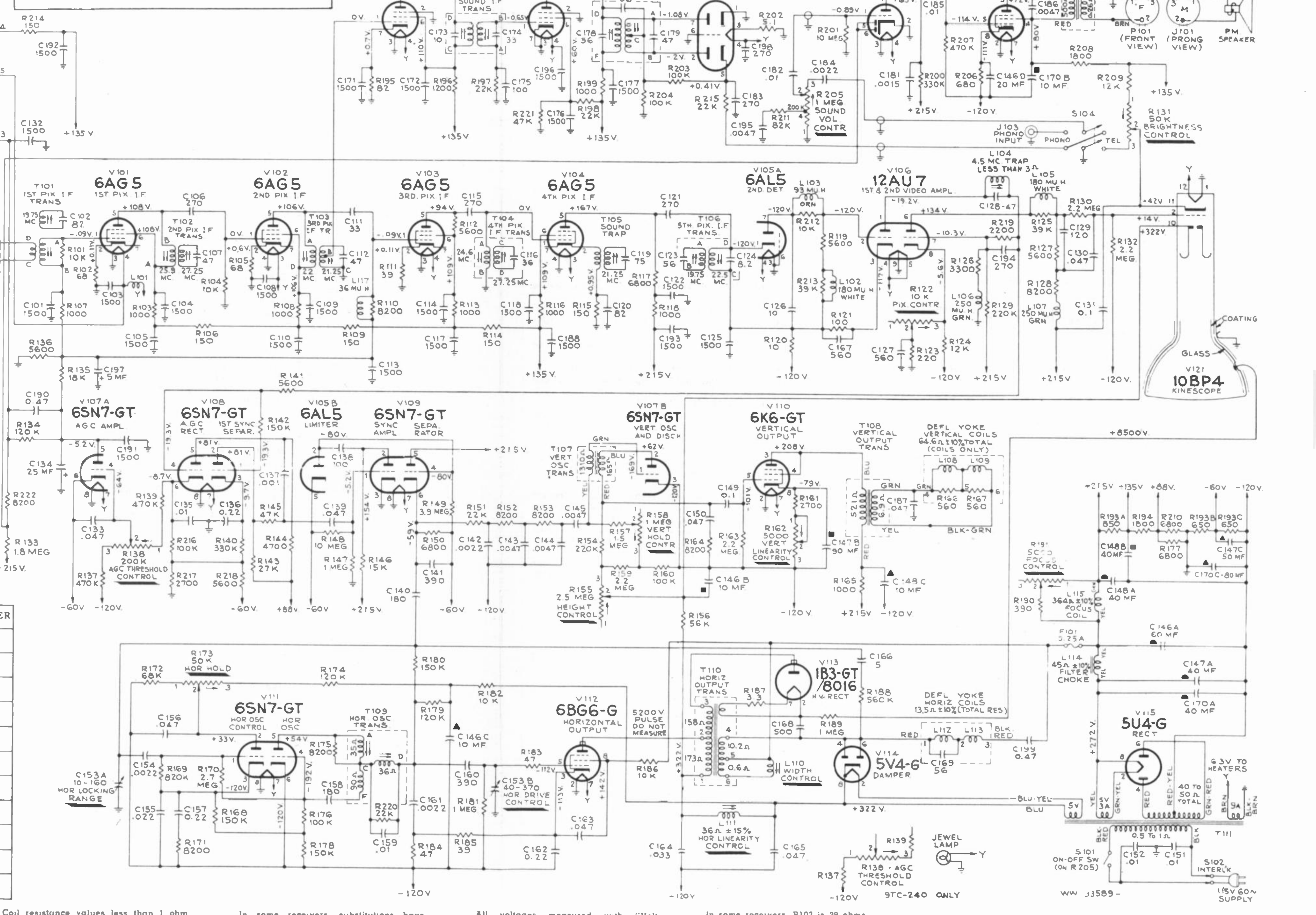
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

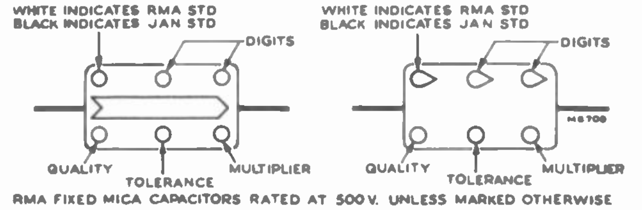
CIRCUIT SCHEMATIC DIAGRAM

REFER TO PAGES 186 TO 201 FOR ALIGNMENT PROCEDURE, SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.





RMA COLOR CODE, FIXED MICA CAPACITORS



RMA FIXED MICA CAPACITORS RATED AT 500V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers, R102 is 39 ohms.

In receivers not equipped with a phono jack and switch, terminal 3 of R131 is grounded, and C184 is connected to R215.

Figure 11—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK5
	KRK5A
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board (5 contact)
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (4⅞") (W1)
73441	Cam—Fine tuning adjustment cam
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, consisting of 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5000 mmf. (C16)
73475	Coil—Antenna filter shunt coil (L67)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Oscillator plate coil or converter grid coil for channel No. 6 (L9, L31)
73462	Coil—Coupling inductance coil (L4)
73443	Coil—Fine tuning coil (1½ turns) with adjustable inductance core & capacitor stud (smooth bushing type with plunger adjustment) (L1, C1)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core & capacitor stud (threaded bushing type with plunger adjustment) (L1, C1)
73476	Coil—I-F trap (L7, C22)
73461	Coil—Oscillator plate coil (4 turns) (L20)
73460	Coil—R-F plate coil for channel No. 6 (L13)
73444	Coil—Trimmer coil (1½ turns) with adjustable inductance core & capacitor stud (threaded bushing type with screw adjustment) for oscillator section or convertor section (L2, C6, L3, C10)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core & capacitor stud (threaded bushing type with screw adjustment) for oscillator section or convertor section (L2, C6, L3, C10)
73446	Coil—Trimmer coil (3 turns) with adjustable inductance core & capacitor stud (smooth bushing type with screw adjustment) for r-f amplifier section (L5, C14)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core & capacitor stud (threaded bushing type with screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for L31
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for oscillator plate coil for channel No. 6 (L31)
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly fine tuning
71462	Loop—Oscillator to convertor trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73467	Nut—Speed nut to mount trimmer coils 73444, 73443 and 73446
73436	Plate—Front plate and bushing
73464	Pulley—Idler Pulley
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 1000 ohms ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 1000 ohms ±10%, ½ watt (R11)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 2700 ohms ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer for fine tuning link stud
71476	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
71475	Screw—No. 4-40 x .296 adjustinf screw for coils L6, L21, L22, L23, L24
73640	Screw—No. 4-40 x ⅜" adjusting screw for L66
73439	Shaft—Actuating shaft for fine tuning control
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F Unit
71494	Socket—Tube socket
73450	Socket—Tube socket, ceramic, 7 prong bottom mounting
73457	Spring—Return spring for fine tuning control core
75068	Spring—Retaining spring for r-f oscillator tube shield
74188	Spring—Retaining spring for adjustable core 74187
73456	Spring—Tension spring for drive belt shield
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Convertor stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass #4-40 x 1 3/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass #4-40 x 1 3/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q" L22, L23, L24)
73448	Transformer—Convertor transformer (T1, R6)
2917	Washer—"C" washer for channel selector shaft
73466	Washer—Insulating washers for front shield (1 set)
	R-F, I-F CHASSIS ASSEMBLIES
	KCS 28-9T240
	KCS 28A-9T240K
	KCS 28B-9TC240
72809	Capacitor—Mica, 5 mmf. (C166)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf., 1000 V. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
51416	Capacitor—Mica, 180 mmf. (C140)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
39642	Capacitor—Mica, 390 mmf. (C141, C160)
74153	Capacitor—Hi-voltage, 500 mmf., 15,000 volts (C168)
39646	Capacitor—Mica, 560 mmf. (C127, C167)

STOCK No.	DESCRIPTION
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C132, C171, C172, C176, C177, C188, C191, C192, C193, C196)
73580	Capacitor—Mica trimmer, comprising 1 section of 10-160 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
73801	Capacitor—Tubular, moulded paper, .001 mfd., 600 volts (C137)
73598	Capacitor—Tubular, moulded paper, .0015 mfd., 600 volts (C181)
73595	Capacitor—Tubular, moulded paper, .0022 mfd., 600 volts (C161)
73803	Capacitor—Tubular, moulded paper, .0022 mfd., 600 volts (C142, C154, C184)
73920	Capacitor—Tubular, moulded paper, oil filled, .0047 mfd., 600 volts (C145)
73550	Capacitor—Tubular, moulded paper, .0047 mfd., 600 volts (C143, C144, C186, C195)
73561	Capacitor—Tubular, moulded paper, .01 mfd., 400 volts (C135, C151, C152, C182)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd., 600 volts (C159)
73565	Capacitor—Tubular, moulded paper, .01 mfd., 1000 volts (C185)
73562	Capacitor—Tubular, moulded paper, .022 mfd., 400 volts (C155)
73596	Capacitor—Tubular, moulded paper, oil filled, .033 mfd., 1000 volts (C164)
73558	Capacitor—Tubular, moulded paper, .047 mfd., 200 volts (C133, C187)
73553	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C130, C139)
73592	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 600 volts (C150, C156)
73597	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 1000 volts (C165)
73564	Capacitor—Tubular, moulded paper, .047 mfd., 1000 volts (C163)
73551	Capacitor—Tubular, moulded paper, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, moulded paper, 0.1 mfd., 600 volts (C131)
73560	Capacitor—Tubular, moulded paper, 0.22 mfd., 200 volts (C136)
73593	Capacitor—Tubular, moulded paper, 0.22 mfd., 400 volts (C157, C162)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd., 200 volts (C190, C199)
74106	Capacitor—Electrolytic, 5 mfd., 50 volts (C197)
53147	Capacitor—Electrolytic, 25 mfd., 50 volts (C134)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd. 150 volts & 1 section 50 mfd., 150 v. (C147A, C147B, C147C)
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73154	Choke—Filter choke (L114)
73477	Coil—Choke coil (L101)
73566	Coil—Focus coil (L115)
71449	Coil—Horizontal linearity control coil (L111)
74170	Coil—Peaking coil (36 mh) (L117, R110)

STOCK No.	DESCRIPTION
72619	Coil—Peaking coil (93 mh) (L103, R212)
71528	Coil—Peaking coil 180 mh) (L102, R213, L105, R125)
71526	Coil—Peaking coil (250 mh) (L106, L107)
71778	Coil—Sound trap (T105 C119)
71429	Coil—Width control coil (L110)
71789	Connector—Kinescope anode connector
71521	Connector—Hi-voltage capacitor connector
5119	Connector—3 contact female connector for speaker cable
35787	Connector—Phono input connector (J103)
73579	Control—AGC threshold control for KCS28 and KCS28A (R138)
73156	Control—Brightness control (R131)
74475	Control—AGC threshold control for KCS28B (R138)
74442	Control—Focus control (R191)
71440	Control—Height control (R155)
72734	Control—Horizontal and vertical hold control (R158, R173)
73910	Control—Picture control, volume control & power switch (R122, R205, S101)
71441	Control—Vertical linearity control (R162)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytic #71432, 73581 & 73582
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
74418	Cushion—Rubber cushion for kinescope bottom support for KCS 28A & KCS 28B
73600	Fuse—0.25 amp., 250 volts (F101)
37396	Grommet—Rubber grommet for mounting ceramic tube socket
71799	Grommet—Rubber grommet for yoke horizontal lead exit
73301	Magnet—Ion trap magnet (P.M. type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics 71432, 73581 & 73582
71448	Plug—Male plug for power cable
71513	Resistor—Wire wound, 3.3 ohms, ⅓ watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
	Resistor—Fixed, composition, 10 ohms ±20%, ½ watt (R120)
	Resistor—Fixed, composition, 39 ohms ±10%, ½ watt (R111)
	Resistor—Fixed, composition, 39 ohms ±10%, 1 watt (R185)
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R183)
	Resistor—Fixed, composition, 47 ohms ±10%, 1 watt (R184)
	Resistor—Fixed, composition, 68 ohms ±10%, ½ watt (R102, R105)
	Resistor—Fixed, composition, 82 ohms ±10%, ½ watt (R195)
	Resistor—Fixed, composition, 100 ohms ±10%, ½ watt (R121)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R106, R109, R114)
	Resistor—Fixed, composition, 150 ohms ±10%, ½ watt (R115, R214)
	Resistor—Fixed, composition, 220 ohms ±10%, ½ watt (R123)
72325	Resistor—Wire wound, 390 ohms, 2 watts (R190)
	Resistor—Fixed, composition, 630 ohms ±10%, 1 watt (R206)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 1000 ohms ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	Resistor—Fixed, composition, 1200 ohms ±10%, ½ watt (R196)
	Resistor—Fixed, composition, 1800 ohms ±10%, 2 watts (R194, R208)
	Resistor—Fixed, composition, 2200 ohms ±10%, ½ watt (R219)
	Resistor—Fixed, composition, 2700 ohms ±10%, ½ watt (R161, R217)
	Resistor—Fixed, composition, 3300 ohms ±5%, ½ watt (R126)
	Resistor—Fixed composition, 4700 ohms ±10%, ½ watt (R144)
	Resistor—Fixed, composition, 5600 ohms ±10%, ½ watt (R141, R218)
	Resistor—Fixed, composition, 5600 ohms ±5%, ½ watt (R112, R119, R136)
	Resistor—Fixed, composition, 5600 ohms ±10%, 1 watt (R127)
	Resistor—Fixed, composition, 6800 ohms ±10%, ½ watt (R150)
	Resistor—Fixed, composition, 6800 ohms ±5%, 1 watt (R117)
	Resistor—Fixed, composition, 6800 ohms ±10%, 2 watts (R177, R210)
	Resistor—Fixed, composition, 8200 ohms ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed, composition, 8200 ohms ±5%, ½ watt (R164, R175, R222)
	Resistor—Fixed, composition, 8200 ohms ±5%, 1 watt (R128)
	Resistor—Fixed, composition, 10,000 ohms ±10%, ½ watt (R182)
	Resistor—Fixed, composition, 10,000 ohms ±5%, ½ watt (R104)
	Resistor—Fixed, composition, 10,000 ohms ±10%, 2 watts (R186)
	Resistor—Fixed, composition, 12,000 ohms ±10%, ½ watt (R209)
	Resistor—Fixed, composition, 12,000 ohms ±10%, 2 watts (R124)
	Resistor—Fixed, composition, 15,000 ohms ±10%, 1 watt (R146)
	Resistor—Fixed, composition, 18,000 ohms ±5%, ½ watt (R135)
	Resistor—Fixed, composition, 22,000 ohms ±20%, ½ watt (R198, R215)
	Resistor—Fixed, composition, 22,000 ohms ±10%, ½ watt (R151, R197, R220)
	Resistor—Fixed, composition, 27,000 ohms ±10%, ½ watt (R143)
	Resistor—Fixed, composition, 47,000 ohms ±20%, ½ watt (R221)
	Resistor—Fixed, composition, 47,000 ohms ±10%, ½ watt (R145)
	Resistor—Fixed, composition, 56,000 ohms ±10%, ½ watt (R156)
	Resistor—Fixed, composition, 68,000 ohms ±10%, ½ watt (R172)
	Resistor—Fixed, composition, 82,000 ohms ±10%, ½ watt (R211)
	Resistor—Fixed, composition, 100,000 ohms ±10%, ½ watt (R160, R216)
	Resistor—Fixed, composition, 100,000 ohms ±5%, ½ watt (R203, R204)
	Resistor—Fixed, composition, 100,000 ohms ±5%, 1 watt (R176)
	Resistor—Fixed, composition, 120,000 ohms ±5%, ½ watt (R134)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 120,000 ohms ±10%, 1 watt (R174, R179)
	Resistor—Fixed, composition, 150,000 ohms ±20%, ½ watt (R142)
	Resistor—Fixed, composition, 150,000 ohms ±10%, ½ watt (R168, R180)
	Resistor— Fixed, composition, 150,000 ohms ±5%, 1 watt (R178)
	Resistor—Fixed, composition, 220,000 ohms ±10%, ½ watt (R129, R154)
	Resistor—Fixed, composition, 330,000 ohms ±10%, ½ watt (R140, R200)
	Resistor—Fixed, composition, 470,000 ohms ±20%, ½ watt (R207)
	Resistor—Fixed, composition, 470,000 ohms ±10%, ½ watt (R137, R139)
	Resistor—Fixed, composition, 560,000 ohms ±10%, ½ watt (R188)
	Resistor—Fixed, composition, 820,000 ohms ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 1 megohm ±10%, ½ watt (R147, R181)
	Resistor—Fixed, composition, 1 megohm ±20%, 1 watt (R189)
	Resistor—Fixed, composition, 1.5 megohm ±5%, ½ watt (R157)
	Resistor—Fixed, composition, 1.8 megohm ±5%, ½ watt (R133)
	Resistor—Fixed, composition, 2.2 megohms ±10%, ½ watt (R130, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohms ±5%, 1 watt (R170)
	Resistor—Fixed, composition, 3.9 megohms ±10%, ½ watt (R149)
	Resistor—Fixed, composition, 10 megohms ±20%, ½ watt (R201)
	Resistor—Fixed, composition, 10 megohms ±10%, ½ watt (R148)
71456	Screw—#8-32 wing screw to mount hood and yoke (3 required)
74416	Screw—#10-32 x 1¾" round head cross-recessed screw for retaining strap 74735
73584	Shield—Tube shield for V117 & V118
72741	Socket—Kinescope socket
31364	Socket—Pilot lamp socket for KCS 28B
71508	Socket—Tube socket for 8016
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
73585	Spring—Anode lead support spring
73586	Spring—Compression spring for hood & yoke assembly (3 required)
74735	Strap—Retaining strap for kinescope mounting for KCS 28A & KCS 28B
46760	Switch—TV-Phono switch (S103)
73571	Transformer—First pix I-F transformer (T101, C102, R101)
73572	Transformer—Second pix I-F transformer (T102, C107)
73573	Transformer—Third pix I-F transformer (T103, C112)
73574	Transformer—Fourth pix I-F transformer (T104, C116)
73575	Transformer—Fifth pix I-F transformer (T106, C123, C124)
73569	Transformer—Vertical oscillator transformer (T107)
73568	Transformer—Vertical output transformer (T108)
73576	Transformer—Synchroguide transformer (T109)

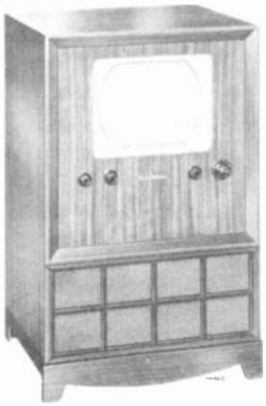
STOCK No.	DESCRIPTION
73570	Transformer—Horizontal output and hi-voltage transformer (T110)
73567	Transformer—Power transformer, 117 volts, 60 cycle (T111)
71424	Transformer—Sound I-F transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
71419	Transformer—Audio transformer (T114)
73578	Transformer—Antenna matching transformer complete with socket and bracket (T115, J102)
73577	Trap—4.5 mc trap (L104, C128)
73476	Trap—I-F trap (L116, C189)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	SPEAKER ASSEMBLIES FOR KCS 28 & KCS 28A
	92573-4W
	RL109-5
5118	Connector—3 contact male connector for speaker
73993	Speaker—5" x 7" P.M. speaker complete with cone & voice coil
	SPEAKER ASSEMBLIES FOR MODEL 9TC240
	92569-7B
	or 9269-7K
	or 92569-7W RL 103-C4
13867	Cap—Dust cap
75875	Cone—Cone and voice coil assembly for 92569-7B
75642	Cone—Cone and voice coil assembly for 92569-7K
73934	Cone—Cone and voice coil assembly for 92569-7W
5118	Plug—3 prong male plug for speaker
73635	Speaker—12" P-M speaker complete with cone and voice coil, less plug
71145	Suspension—Metal cone suspension for 92569-7W
	MISCELLANEOUS
73641	Back—Cabinet back for KCS 28
74420	Back—Cabinet back for KCS 28A & KCS 28B
72857	Board—"Antenna" terminal board
71599	Bracket—Lamp bracket for 9TC240
71892	Catch—Door catch and strike (2 req'd) for 9TC240
13103	Cap—Pilot lamp cap for 9TC240
X1999	Cloth—Grille cloth for toasted mahogany instruments for 9TC240
X1998	Cloth—Grille cloth for walnut or mahogany instruments for 9TC240
X1756	Cloth—Grille cloth for 9T240
39153	Connector—4 contact male connector for antenna cable
74408	Decal—Control panel decal for toasted mahogany or oak instruments for 9T240
74407	Decal—Control panel decal for walnut or mahogany instruments for 9T240

STOCK No.	DESCRIPTION
74034	Decal—Control panel decal for toasted mahogany instruments for 9TC240
74033	Decal—Control panel decal for walnut or mahogany instruments for 9TC240
71768	Decal—Trade mark decal for 9TC240
73180	Emblem—"RCA Victor" emblem
73740	Escutcheon—Channel marker escutcheon for toasted mahogany or oak instruments
73642	Escutcheon—Channel marker escutcheon for walnut or mahogany instruments
72113	Foot—Rubber foot (4 required) for 9T240
74456	Glass—Safety Glass
37396	Grommet—Rubber grommet for speaker mounting (3 required) for 9TC240
74308	Hinge—Door hinges (1 set) (2 required) for 9TC240
74002	Knob—Brighness control knob—dark—for walnut or mahogany instruments
74003	Knob—Brightness control knob—tan—for toasted mahogany or oak instruments
73997	Knob—Channel selector knob—tan—for toasted mahogany or oak instruments
73996	Knob—Channel selector knob—dark—for walnut or mahogany instruments
73995	Knob—Fine tuning knob—tan—for toasted mahogany or oak instruments
73994	Knob—Fine tuning knob—dark—for walnut or mahogany instruments
74001	Knob—Horizontal hold control or volume control and power switch knob—tan—for toasted mahogany or oak instruments
74000	Knob—Horizontal hold control or volume control and power switch knob—dark—for walnut or mahogany instruments
73999	Knob—Picture control or vertical hold control knob—tan—for toasted mahogany or oak instruments
73998	Knob—Picture control or vertical hold control knob—dark—for walnut or mahogany instruments
11765	Lamp—Pilot lamp—Mazda 51—for 9TC240
74450	Plate—Back plate for door pulls (2 required) for 9TC240
74124	Plate—Retainer plate, stud, wing nut & spring assembly for kine shield (2 required) for KCS 28
74451	Pull—Door pull (2 required) for 9TC240
74414	Shield—Kine tube shield
71539	Slide—Kinescope centering slide with rubber cushion (4 required) for KCS 28
72845	Spring—Retaining spring for knobs 73994 and 73995
14270	Spring—Retaining spring for knobs 73996, 73997, 73998, 73999, 74002 & 74003
30330	Spring—Retaining spring for knobs 74000 & 74001
73643	Spring—Spring clip for channel marker escutcheon
72936	Stop—Door stop for 9TC240

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR



Model 9TC245 Walnut, Mahogany or Oak

TELEVISION RECEIVERS

MODELS 9TC245, 9TC247, 9TC249

Chassis Nos. KCS 34 or KCS 34B

Mfr. No. 274

SERVICE DATA

—1949 No. T11—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model 9TC247 Walnut, Mahogany or Toasted Mahogany

Model 9TC249 Walnut, Mahogany or Toasted Mahogany

GENERAL DESCRIPTION

Models 9TC245, 9TC247, and 9TC249 are twelve and one-half inch television receivers and are electrically identical except for cabinets. Receivers employing KCS34B have the kinescopes shipped in place in the cabinet. Those employing KCS34 have the kinescope shipped separately. These receivers employ twenty-one tubes plus two rectifiers and a 12LP4 kinscope.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 87 square inches on a 12LP4 Kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range .. ±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency .... 25.75 mc.
Sound Carrier Frequency .... 21.25 mc.

VIDEO RESPONSE .... To 4 mc.

SWEEP DEFLECTION .... Magnetic

FOCUS .... Magnetic

POWER SUPPLY RATING ..... 115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING .... 2.6 watts max.

LOUDSPEAKERS — 92569-7 .... 12" PM Dynamic, 2.2 ohms

CHASSIS DESIGNATIONS

KCS34 .... In Models 9TC247 and 9TC249
KCS34B .... In Models 9TC245, 9TC247 and 9TC249

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside) 9TC245	23½	37¾	20¼
Cabinet (outside) 9TC247	24½	37¾	20½
Cabinet (outside) 9TC249	24½	37¼	22¼
Chassis Assembly (overall)	19½	14	20

WEIGHT

Chassis with Tubes in Cabinet	9TC245	102 lbs.
	9TC247	96 lbs.
	9TC249	108 lbs.
Shipping Weight	9TC245	123 lbs.
	9TC247	116 lbs.
	9TC249	128 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector and Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier and Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 12LP4	Kinescope

Specifications continued on page 2

REFER TO PAGES 186 TO 201 FOR ALIGNMENT PROCEDURE, SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

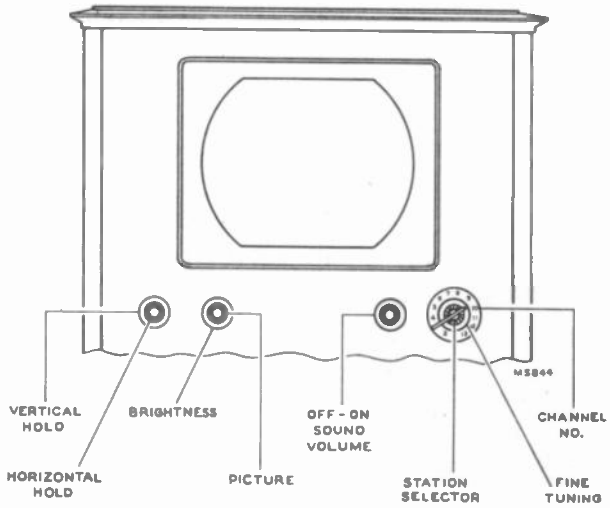


Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

Models 9TC245, 9TC247 and 9TC249 receivers employing KCS34B are shipped complete in one carton with the kinescope in place in the cabinet. Model 9TC247 and 9TC249 receivers employing KCS34 have the kinescope shipped separately in a special carton which should not be opened until ready for installation.

UNPACKING. — These receivers are packed in a cardboard carton. To unpack, turn the shipping carton on its side and tear open the carton bottom flaps. Fold the flaps up along the side of the carton and turn the carton back up. Lift the carton up and off the cabinet.

Remove the cabinet back grille. Take off the two nuts on the bolts holding the cabinet on the skid. With a man on each side of the cabinet, lift the receiver up and off the skid.

Remove the protective cardboard shield from the 5U4G rectifier. Remove all shipping material. Remove the envelope containing the control knobs and ion trap magnet.

When installing receivers employing KCS34B, skip the remainder of the unpacking and kinescope installation instructions and proceed with antenna and power connections.

The following kinescope installation instructions are given for receivers employing KCS34 chassis:

To remove the front panel, loosen the two wingnuts inside the cabinet and turn the two locking plates to vertical as shown in Figure 2. Tilt the panel out at the top.

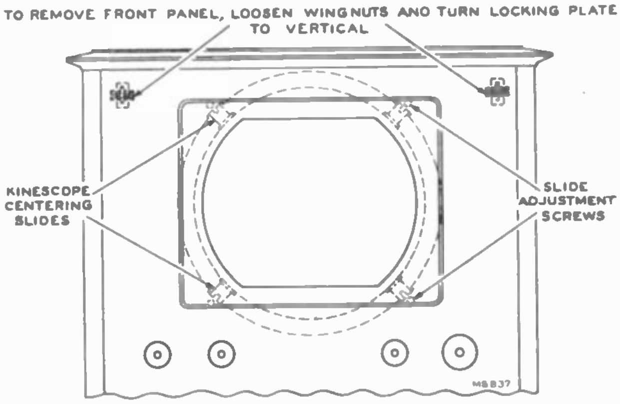


Figure 2—Cabinet, Front View

Remove the two self-tapping screws from the kinescope cushion slide as shown in Figure 3.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

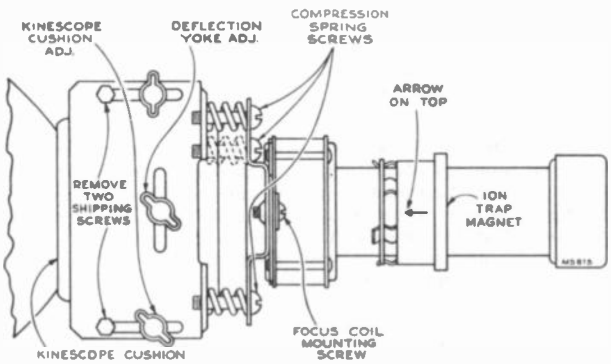


Figure 3—Yoke and Focus Coil Adjustments

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the two focus coil mounting screws and move the coil until alignment is obtained. Tighten the mounting screws with the coil in this position.

Loosen the two lower kinescope face centering slides, and set them at approximately mid-position. See Figure 2 for location of the slides and their adjustment screws. Loosen the two upper slides, slip them up as far as possible and tighten.

KINESCOPE HANDLING PRECAUTION. — Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.

INSTALLATION OF KINESCOPE. — The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils as shown in Figure 4 until the base of the tube protrudes approximately two inches beyond the focus coil. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

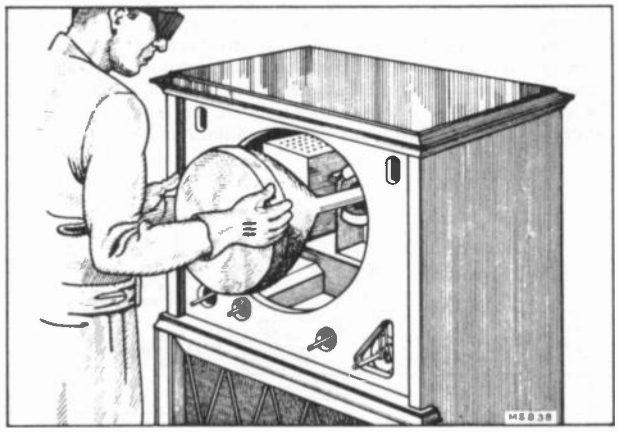


Figure 4—Kinescope Insertion

Slip the ion trap magnet assembly over the neck of the kinescope with the large magnet towards the base of the tube and with the arrow on the assembly up as shown in Figure 3.

Connect the kinescope socket to the tube base.

Insert the kinescope until the face of the tube protrudes approximately one-quarter of an inch outside the front of the cabinet. Adjust the four centering slides until the face of the kinescope is in the center of the cabinet opening. Tighten the four slides securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the front panel by reversal of the procedure indicated in Figure 2.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil due to shadows on the corners of the raster.

Connect the high voltage lead to the kinescope second anode contact.

Make sure all tubes are in place and are firmly seated in their sockets.

ANTENNA AND POWER CONNECTIONS. — Connect the leads from the antenna to the receiver antenna terminals.

Install the front panel control knobs.

Make sure that the receiver power switch is in the off position. Plug the receiver power cord into a 115 volt 60 cycle a-c outlet.

WARNING. — The high voltage supply in this receiver delivers 10,000 volts! A.C. interlocks are provided at the back of the set so that when the back is removed — so is the power.

ION TRAP MAGNET ADJUSTMENT. — Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags, as shown in Figure 5. The ion trap rear magnet poles should be approximately over the ion trap flags.

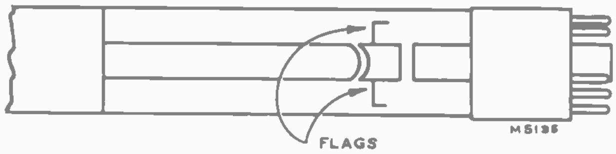


Figure 5—Ion Trap Flags

Turn the power switch to the "on" position, the brightness control three-quarters clockwise, and picture control fully counter-clockwise.

Immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

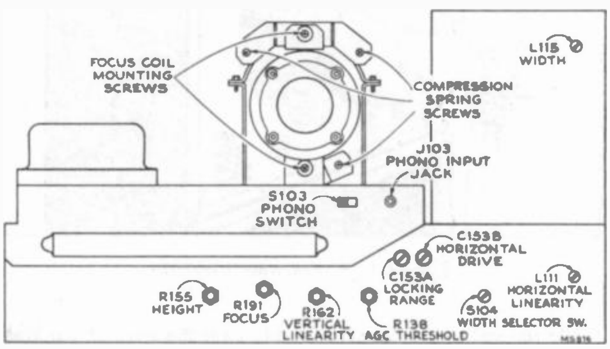


Figure 6—Rear Chassis Adjustments

DEFLECTION YOKE ADJUSTMENT. — If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS. — It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions on page 2.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 (on the rear of the chassis, see Figure 6) clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT. — Turn the horizontal hold control to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counterclockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counterclockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment. — Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment. — Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the picture control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS COIL ADJUSTMENTS. — The focus coil should be adjusted so that there is approximately one-quarter inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. However, it may be necessary to change this distance slightly in order to compensate for small differences in strength of the permanent magnets in the coil. If the receiver focuses with the focus control at or near the clockwise end of its range, the focus coil should be moved toward the yoke and if focus is obtained at or near the counterclockwise end of the control, the coil should be moved away from the yoke.

The axis of the hole through the focus coil should be parallel with the axis of the kinescope neck.

CENTERING ADJUSTMENT. — No electrical centering controls are provided. Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If the focus coil was appreciably changed in position or if a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and recenter the picture by sliding the coil. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In extreme cases it may be necessary to adjust one or more of the three focus coil compression spring screws to eliminate a corner shadow.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS. — Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

A width control coil and a width selector switch are provided. With the switch in position 1 (fully counterclockwise), adjust the width coil until the picture fills the mask. On low line voltages it may not be possible to get sufficient width by adjustment of the width coil. In this case turn the width selector switch clockwise to position 2. In this position the width coil is disconnected, and adjustment of the width coil will have no effect. For still greater width, turn the width selector switch fully clockwise to position 3. In this position, the high voltage is reduced slightly thus permitting greater deflection.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS. — Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS. — Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

In some cases it may be possible to improve focus by a slight reposition of the ion trap magnet while staying within the range of maximum brightness.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

AGC THRESHOLD CONTROL. — The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counterclockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counterclockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counterclockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counterclockwise on a weak signal, then the receiver may overload when a strong signal is received.

Replace the cabinet back and make sure that the screws holding it are up tight, otherwise it may rattle or buzz when the receiver is operated at high volume.

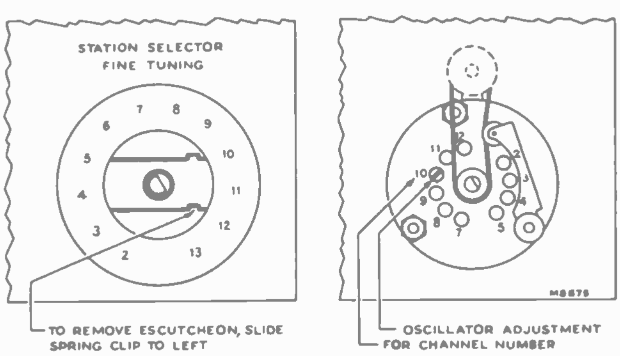


Figure 7—R-F Oscillator Adjustments

CHECK OF R-F OSCILLATOR ADJUSTMENTS. — Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 7. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

CHASSIS REMOVAL. — To remove the KCS34B chassis for repair or installation of a new kinescope, remove the cabinet back and the control knobs, unplug the speaker cable, and remove the six chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE. — The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

To replace the chassis in the cabinet, first tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the six chassis bolts. Loosen the kinescope strap from the rear of the cabinet. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Tighten the kinescope strap, then replace the knobs. Repeat the installation adjustments starting with adjustment of ion trap magnet.

WEAK SIGNAL AREA OPERATION. — Since the vast majority of receivers are sold in strong signal areas the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

On early production receivers R11 was 1,000 ohms and R14 was omitted. In order to "peak" these units it will be necessary to remove the unit from the receiver and change R11 to 10,000 ohms. Once the unit is removed from the chassis R11 is easily accessible on the unit rear wafer. When making this change, if the channel number 2 r-f coil L62 consists of $5\frac{3}{4}$ turns, the outside turn should be "knifed" one wire diameter away from the rest of the coil in order to provide peak response on channel 2. The unit should then be replaced and L66 peaked as described above.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS TOP VIEW

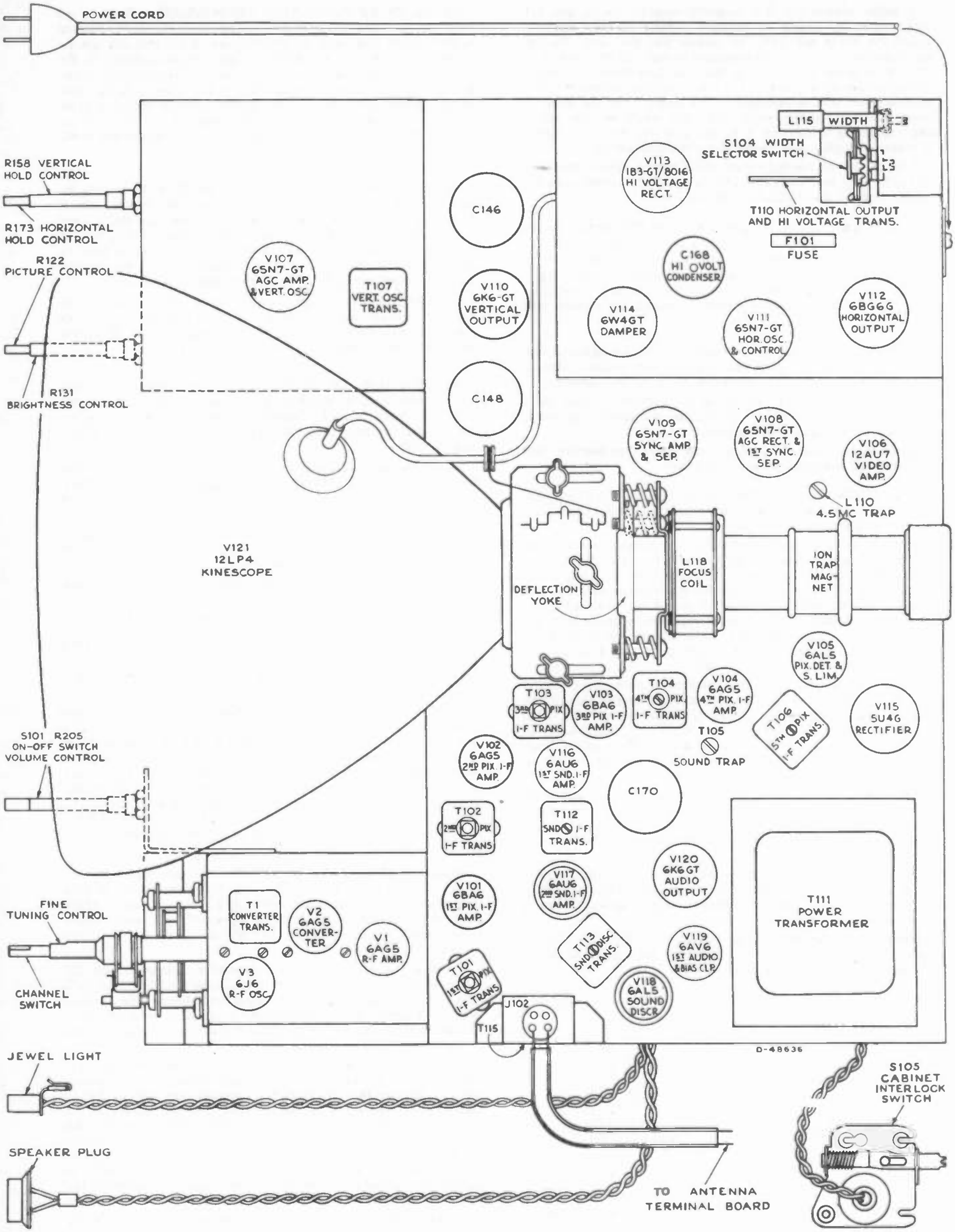


Figure 8—Chassis Top View

CHASSIS BOTTOM VIEW

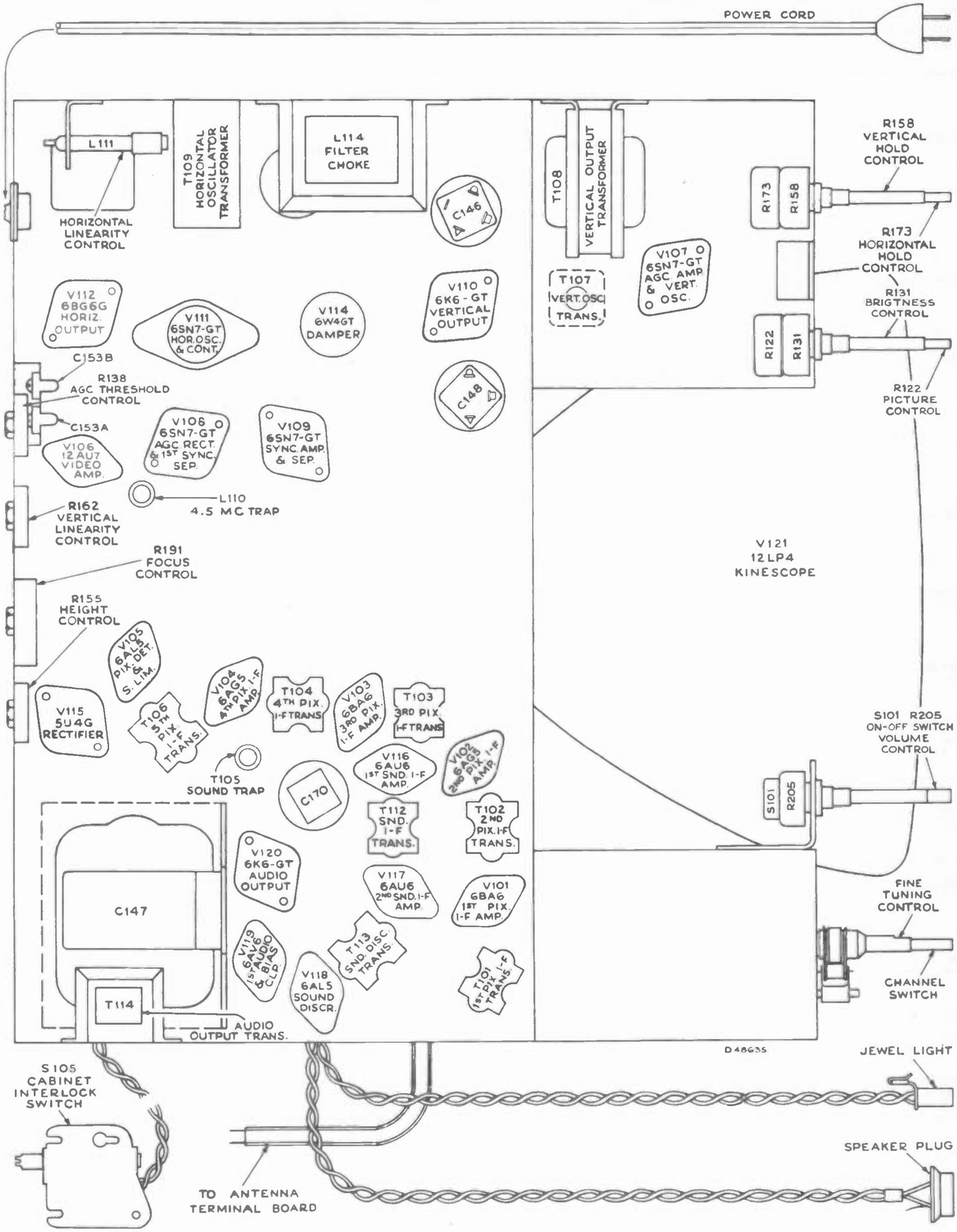


Figure 9—Chassis Bottom View

9TC245, 9TC247, 9TC249 VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2200 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC threshold control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu.V. Signal	5	140	6	142	2 & 7	0	1	−2.4	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	−0.4	14.0	5.0	
V2	6AG5	Converter	2200 Mu.V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*−3.0 to −7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*−2.0 to −6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu.V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*−5.1 to −7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu.V. Signal	5	125	6	125	7	.4	1	−12.5	2.8	1.3	
			No Signal	5	95	6	95	7	1.1	1	+.3	7.5	3.5	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu.V. Signal	5	115	6	115	2 & 7	.75	1	0	8.2	2.5	
			No Signal	5	100	6	100	2 & 7	.65	1	0	6.8	2.1	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu.V. Signal	5	110	6	135	7	.25	1	−2.4	4.0	3.8	
			No Signal	5	60	6	100	7	.75	1	−0.4	11.0	4.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu.V. Signal	5	170	6	135	2 & 7	1.35	1	0	6.5	2.0	
			No Signal	5	175	6	120	2 & 7	1.2	1	0	5.9	1.8	
V105 A	6AL5	Picture 2d Det.	2200 Mu.V. Signal	7	−113	—	—	1	−112	—	—	.48	—	
			No Signal	7	−120	—	—	1	−120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu.V. Signal	2	−107	—	—	5	−56	—	—	—	—	
			No Signal	2	−80	—	—	5	−60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu.V. Signal	1	−23.2	—	—	3	−111	2	−113	4.38	—	
			No Signal	1	−19.2	—	—	3	−117	2	−120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu.V. Signal	6	*120	—	—	8	*−6.5	7	*−16	6.2	—	*At average contrast
			No Signal	6	*110	—	—	8	*−10.5	7	*−13.5	6.9	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu.V. Signal	5	−12.5	—	—	6	−53	4	−54	.9	—	
			No Signal	5	+.3	—	—	6	−60	4	−66	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu.V. Signal	2	76	—	—	3	−111	1	−158	.2	—	
			No Signal	2	62	—	—	3	−120	1	−169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu.V. Signal	5	97	—	—	6	−3.4	4	−23.2	.3	—	
			No Signal	5	81	—	—	6	−8.7	4	−19.2	.28	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V108	6SN7 GT	1st Sync Separator	2200 Mu.V. Signal	2	96	—	—	3	−1.8	1	−19.5	.1	—	
			No Signal	2	81	—	—	3	−9.7	1	−19.3	.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu.V. Signal	2	158	—	—	3	0	1	−4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	−5.2	3.75	—	
V109	6SN7 GT	Sync Separator	2200 Mu.V. Signal	5	230	—	—	6	−51	4	−106	.4	—	
			No Signal	5	215	—	—	6	−59	4	−80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu.V. Signal	3	223	4	223	8	−67	5	−91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	−79	5	−101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu.V. Signal	2	*48	—	—	3	−110	1	−92	.2	—	*Variation of hold gives −21.9 tc +56 volts on plate
			No Signal	2	*33	—	—	3	−108	1	−120	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu.V. Signal	5	70	—	—	6	−111	4	−185	2.4	—	
			No Signal	5	54	—	—	6	−120	4	−192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu.V. Signal	Cap	*	8	*135	3	−90	5	−110	72	9.4	*6000 volt pulse present
			No Signal	Cap	Do Not Meas.	8	*130	3	−100	5	−115	70	9.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	10200	—	—	0	—	*9700 volt pulse present
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	9700	—	—	1	—	
V114	6W4GT	Damper	2200 Mu.V. Signal	5	*	—	—	3	300	—	—	66	—	*1200 volt pulse present
			No Signal	5	Do Not Meas.	—	—	3	295	—	—	65	—	
V115	5U4G	Rectifier	2200 Mu.V. Signal	4 & 6	335	—	—	2 & 8	240	—	—	210	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	335	—	—	2 & 8	230	—	—	215	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu.V. Signal	5	134	6	134	7	.9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	0	5.7	2.6	
V117	6AU6	2d Sound I-F Amplifier	2200 Mu.V. Signal	5	148	6	90	7	0	1	−9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	−.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu.V. Signal	2 7	−8.4 −3.7	—	—	5 1	5.8 0	— —	— —	— —	— —	
			No Signal	2 7	−2.0 −1.08	—	—	5 1	.41 0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu.V. Signal	7	85	—	—	2	0	1	−.89	.49	—	
			No Signal	7	83	—	—	2	0	1	−.89	.4	—	
V120	6K6-GT	Audio Output	2200 Mu.V. Signal	3	102	4	113	8	−99	5	−108	19.3	3.3	
			No Signal	3	72	4	80	8	−111	5	−114	18	3	
V121	12LP4	Kinescope	2200 Mu.V. Signal	Cap	*9700	10	290	11	38	2	11	.1	—	*Average Brightness
			No Signal	Cap	—	10	285	11	34	2	10	—	—	

9TC245, 9TC247, 9TC249 — R-F UNIT WIRING DIAGRAM

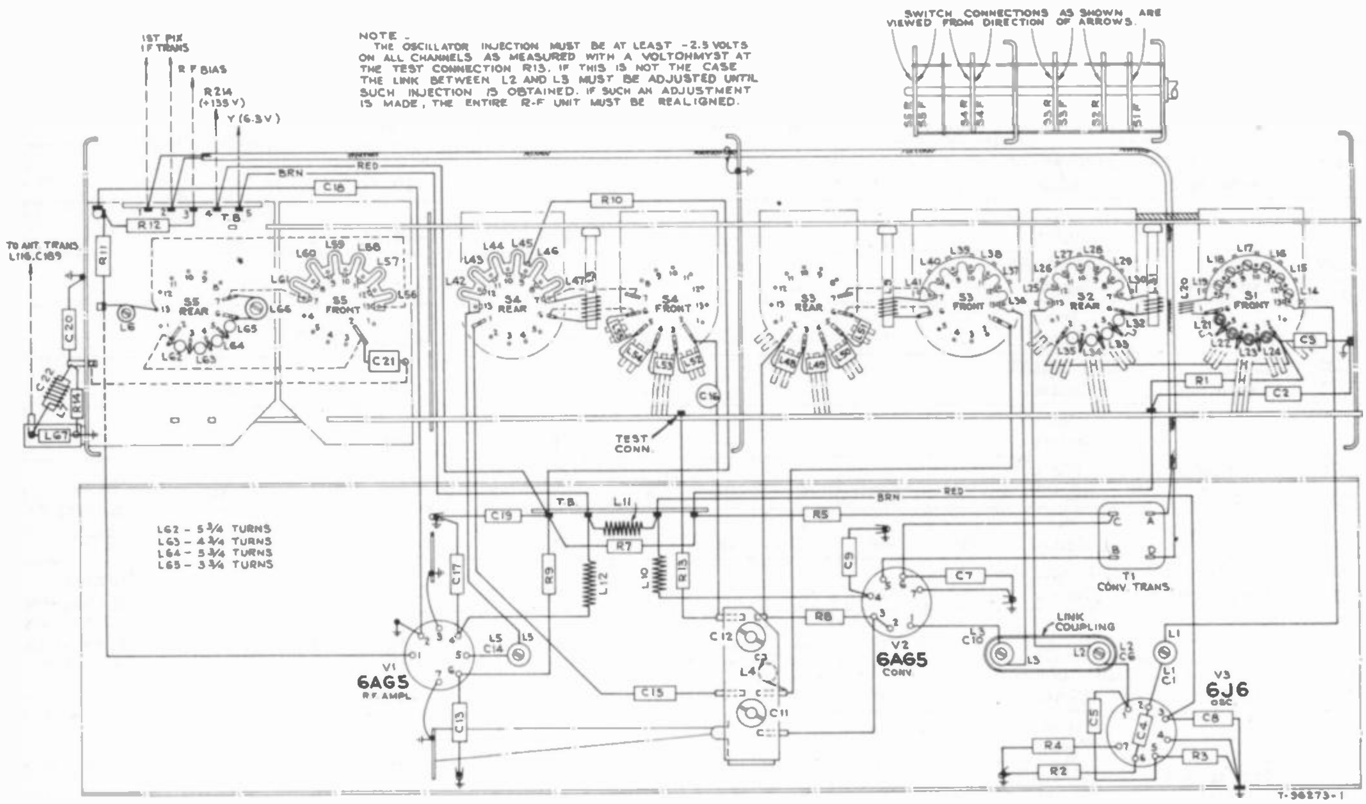


Figure 10—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress the blue lead from pin 5 of V119 down against the chassis.
9. Dress C129 and C130 up and away from the chassis.
10. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
11. Dress the green lead from pin 2 of V106 away from the chassis.
12. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
13. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
14. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
15. Dress leads from L115 (width control coil) away from the transformer frame.
16. Dress T110 winding leads as shown in Figure 11.

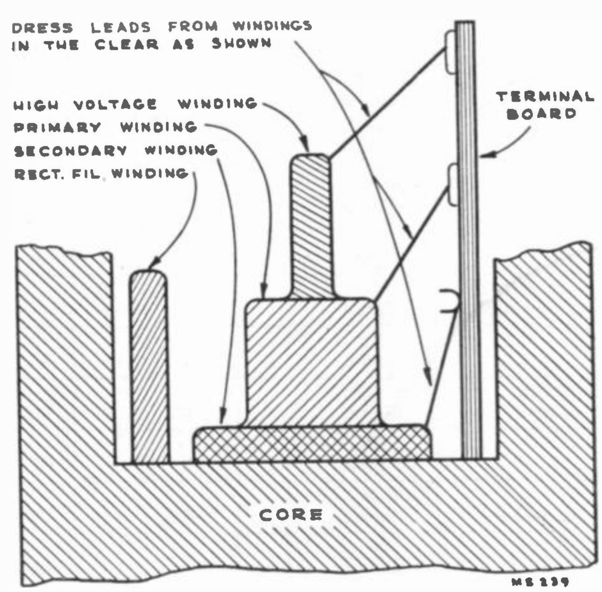


Figure 11—T110 Lead Dress

CHASSIS WIRING DIAGRAM

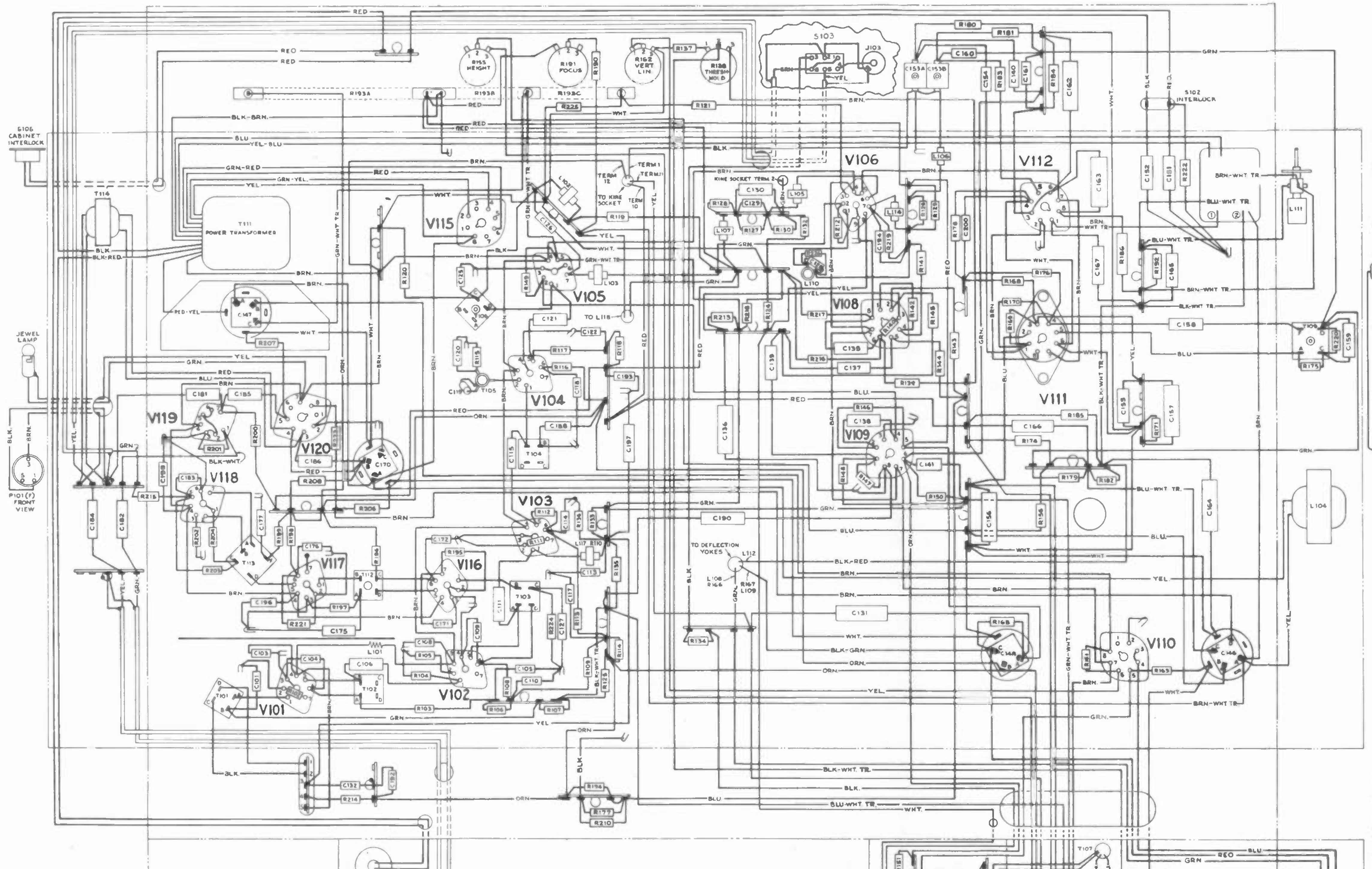
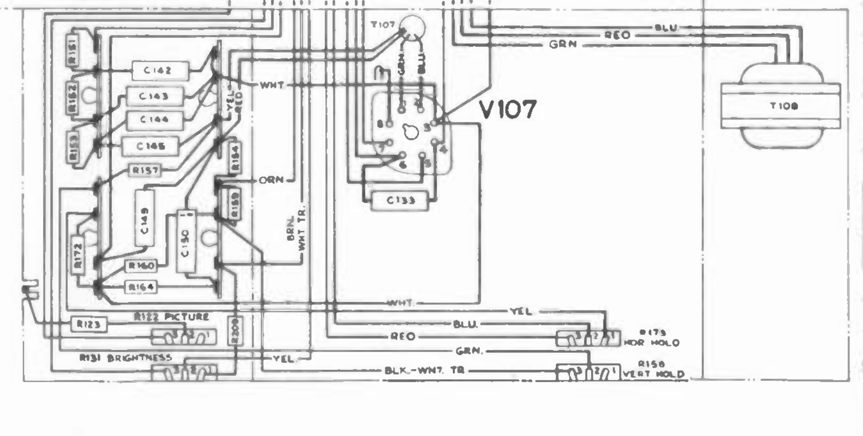
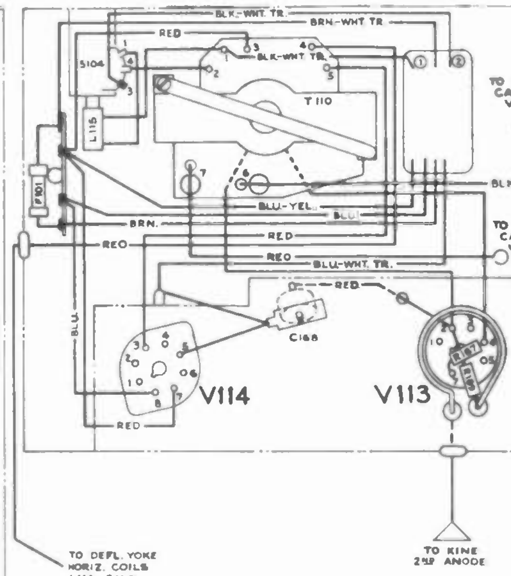
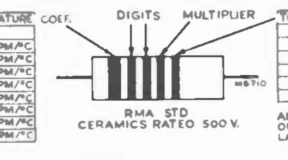




Figure 12—Chassis Wiring Diagram

RMA COLOR CODE. CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	− 220 PPM/°C
GREEN	−330 PPM/°C
BLUE	− 470 PPM/°C
VIOLET	− 750 PPM/°C
GRAY	+ 30 PPM/°C



TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2 ½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

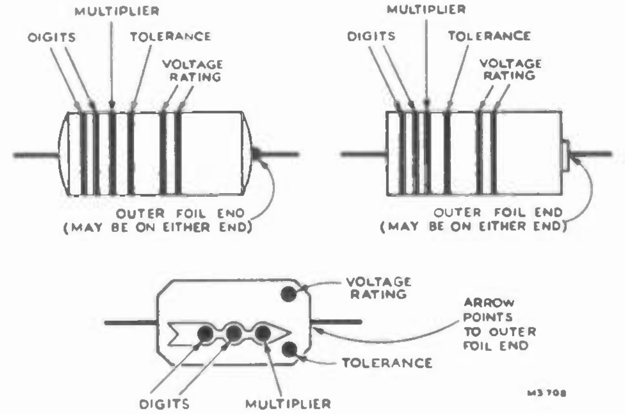
COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 12

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted.

If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for bypass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

COLOR CODES. MOULDED PAPER CAPACITORS

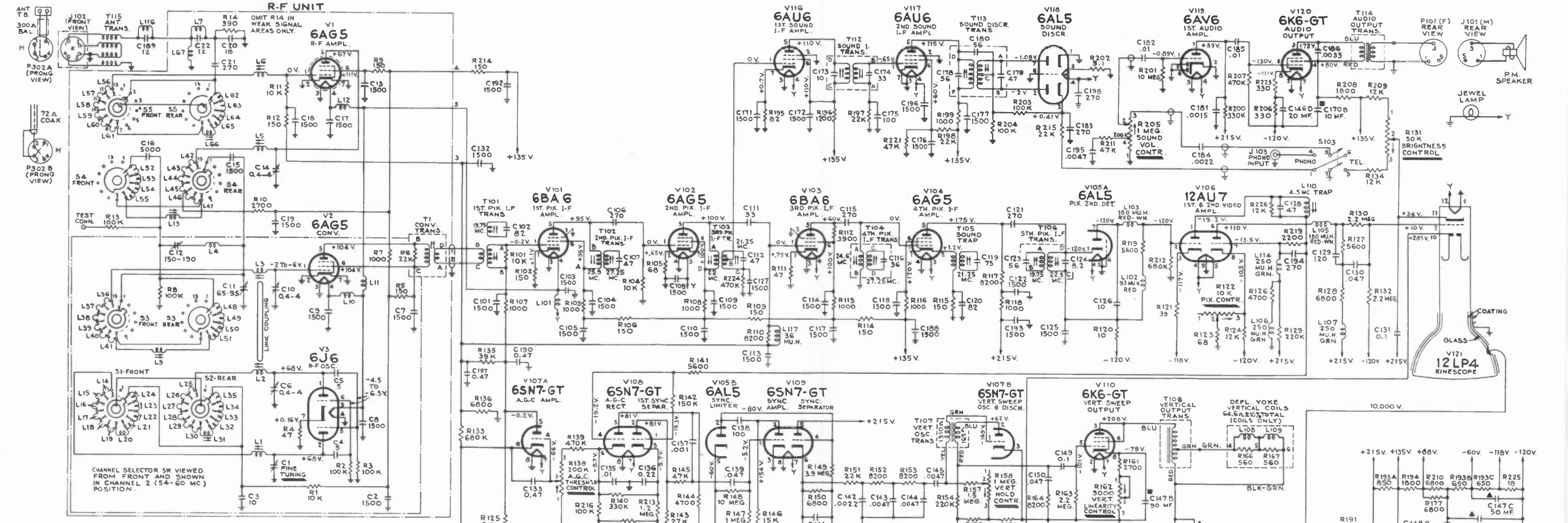
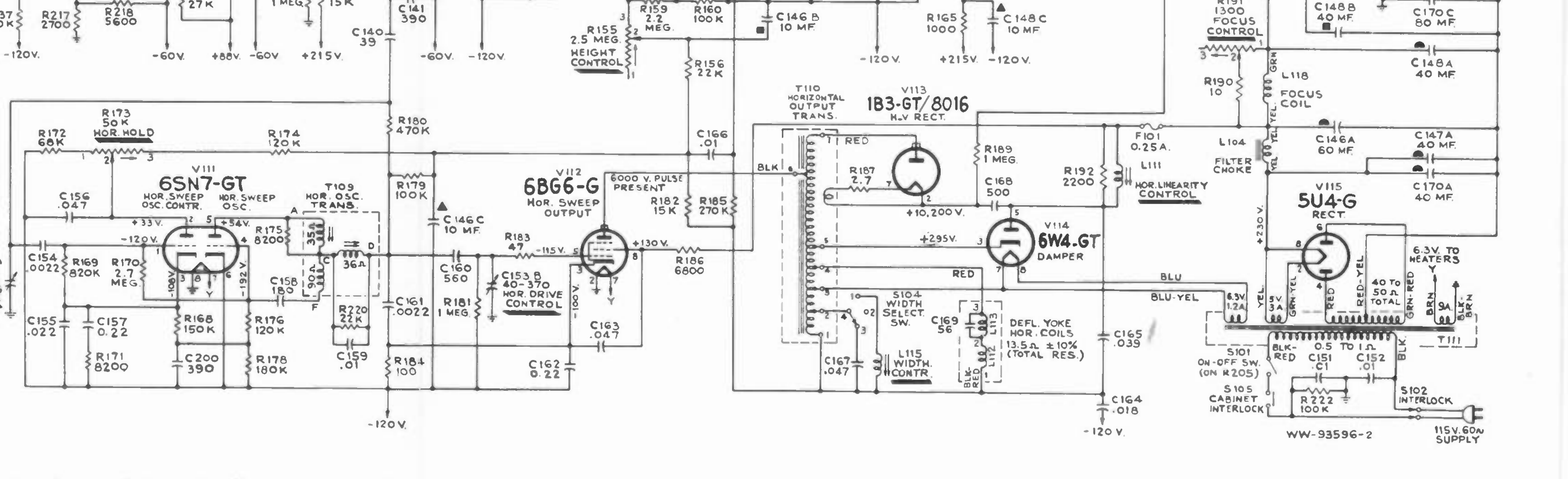


CAPACITY VALUE IN MMF		
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE	
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

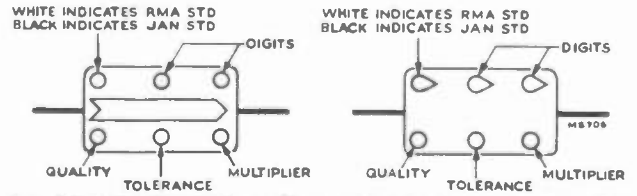
The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

CIRCUIT SCHEMATIC DIAGRAM

REFER TO PAGES 186 TO 201 FOR ALIGNMENT PROCEDURE, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.

RMA COLOR CODE. FIXED MICA CAPACITORS



RMA FIXED MICA CAPACITORS RATED AT 500 V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1,000.

All capacitance values less than 1 in MF and above 1 in MMF unless noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with "VoltOhmyst," no signal input and with 117 v. a-c supply.

In some receivers, R11 is 1K and R14 is omitted.

In some receivers, R226 was omitted.
In some receivers, R212 was 560K.
In some receivers, L117, R110 and C113 were connected to junction R135 and C190.

Figure 13—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	RF UNIT ASSEMBLIES
	KRK 5
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board (5 contact)
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1,500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, S1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Dentent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73436	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition, 47 ohms, ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms, ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 390 ohms, ±10%, ½ watt (R14)
	Resistor—Fixed, composition, 1,000 ohms, ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 2,700 ohms, ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms, ±20%, ½ watt (R1, R11)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring for KRK 5
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—No. 4-40 x ⅝" adjusting screw for L66
71475	Screw—No. 4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—No. 4-40 x 17/32" adjusting screw for L6

STOCK No.	DESCRIPTION
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of r-f unit
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
73457	Spring—Return spring for fine tuning control core
75068	Spring—Retaining spring for r-f oscillator tube shield
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	CHASSIS ASSEMBLIES
	KCS34—9TC247 and 9TC249
	KCS34B—9TC245
74593	Capacitor—Mica trimmer comprising 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
72615	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
74726	Capacitor—Mica, 39 mmf. (C140)
84082	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf., 1,000 volts (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
68542	Capacitor—Mica, 390 mmf. (C141, C200)
74153	Capacitor—Ceramic, 500 mmf., 15,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1,500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)

STOCK No.	DESCRIPTION
73583	Capacitor—Electrolytic comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts, and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, .001 mfd., 600 volts (C137)
73802	Capacitor—Tubular, paper, .0015 mfd., 600 volts (C181)
73595	Capacitor—Tubular, moulded paper, oil impregnated, .0022 mfd., 600 volts (C142, C161, C184)
73803	Capacitor—Tubular, moulded paper, .0022 mfd., 600 volts (C154)
73795	Capacitor—Tubular, paper, .0033 mfd., 600 volts (C186)
73920	Capacitor—Tubular, moulded paper, oil impregnated, .0047 mfd., 600 volts (C143, C144, C145, C195)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd., 600 volts (C159)
73561	Capacitor—Tubular, moulded, .01 mfd., 400 volts (C135, C166, C182)
73565	Capacitor—Tubular, paper, .01 mfd., 1,000 volts (C151, C152, C185)
74727	Capacitor—Tubular, moulded paper, oil filled, .018 mfd., 1,000 volts (C164)
73562	Capacitor—Tubular, paper, .022 mfd., 400 volts (C155)
74728	Capacitor—Tubular, moulded paper, oil filled, .039 mfd., 1,000 volts (C165)
73553	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C130, C139, C167)
73592	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, .047 mfd., 1,000 volts (C163)
73557	Capacitor—Tubular, paper, 0.1 mfd., 600 volts (C131)
73551	Capacitor—Tubular, paper, 0.1 mfd., 400 volts (C149)
73794	Capacitor—Tubular, paper, 0.22 mfd., 400 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, 0.47 mfd., 200 volts (C133, C190, C197)
73154	Choke—Filter choke (L104)
74585	Coil—Focus coil (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L115)
71526	Coil—Peaking coil (250 mh) (L106, L107, L114)
73477	Coil—Filament choke coil (L101)
71527	Coil—Peaking coil (93 mh) (L102)
74214	Coil—Peaking coil (180 mh) (L103, L105)
74170	Coil—Peaking coil (36 mh) (L117, R110)
5119	Connector—3 contact female connector for speaker cable
71789	Connector—Anode connector
71521	Connector—Hi-voltage capacitor connector
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Picture and brightness control (R122, R131)
38408	Control—Volume control and power switch (R205, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC Threshold control (R138)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics, RCA 71432, 73581 and 73582
74811	Cushion—Rubber cushion for kinescope mounting for KCS34B

STOCK No.	DESCRIPTION
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke lead exit (2 required)
37336	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)
35787	Jack—Phono input jack (J103)
18469	Plate—Bakelite plate for mounting electrolytics
74594	Plug—Male plug for power cable
74823	Magnet—Ion trap magnet (PM type)
73587	Nut—Speed nut for mounting hi-voltage capacitor
74598	Resistor—Wire wound, 2.7 ohms, 1/3 watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
	Resistor—Fixed, composition, 10 ohms, ±20%, ½ watt (R120)
	Resistor—Fixed, composition, 18 ohms, ±10%, ½ watt (R225)
	Resistor—Fixed, composition, 39 ohms, ±10%, ½ watt (R121)
	Resistor—Fixed, composition, 47 ohms, ±5%, ½ watt (R111)
	Resistor—Fixed, composition, 47 ohms, ±20%, ½ watt (R183)
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R105)
	Resistor—Fixed, composition, 68 ohms, ±20%, ½ watt (R123)
	Resistor—Fixed, composition, 82 ohms, ±10%, ½ watt (R195)
	Resistor—Fixed, composition, 100 ohms, ±10%, 2 watt (R184)
	Resistor—Fixed, composition, 150 ohms, ±5%, ½ watt (R102)
	Resistor—Fixed, composition, 150 ohms, ±10%, ½ watt (R115)
	Resistor—Fixed, composition, 150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	Resistor—Fixed, composition, 330 ohms, ±10%, ½ watt (R206, R223)
73588	Resistor—Voltage divider comprising 1 section of 850 ohms, 12 watt and 2 sections of 650 ohms, 6 watt (R193A, R193B, R193C)
	Resistor—Fixed, composition, 1,000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R199, R165)
	Resistor—Fixed, composition, 1,200 ohms, ±10%, ½ watt (R196)
	Resistor—Fixed, composition, 1,800 ohms, ±10%, 2 watt (R194, R208)
	Resistor—Fixed, composition, 2,200 ohms, ±10%, ½ watt (R219)
	Resistor—Fixed, composition, 2,200 ohms, ±10%, 1 watt (R192)
	Resistor—Fixed, composition, 2,700 ohms, ±10%, ½ watt (R161, R217)
	Resistor—Fixed, composition, 3,900 ohms, ±5%, ½ watt (R112)
	Resistor—Fixed, composition, 4,700 ohms, ±5%, ½ watt (R126)
	Resistor—Fixed, composition, 4,700 ohms, ±10%, ½ watt (R144)
	Resistor—Fixed, composition, 5,600 ohms, ±5%, ½ watt (R119)
	Resistor—Fixed, composition, 5,600 ohms, ±10%, ½ watt (R141, R218)
	Resistor—Fixed, composition, 5,600 ohms, ±10%, 1 watt (R127)
	Resistor—Fixed, composition, 6,800 ohms, ±5%, ½ watt (R136)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 6,800 ohms, ±10%, ½ watt (R150)
	Resistor—Fixed, composition, 6,800 ohms, ±5%, 1 watt (R128)
	Resistor—Fixed, composition, 6,800 ohms, ±10%, 2 watt (R177, R186, R210)
	Resistor—Fixed, composition, 8,200 ohms, ±5%, ½ watt (R164, R175)
	Resistor—Fixed, composition, 8,200 ohms, ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed, composition, 8,200 ohms, ±5%, 1 watt (R117)
	Resistor—Fixed, composition, 10,000 ohms, ±5%, ½ watt (R104)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, 2 watt (R124)
	Resistor—Fixed, composition, 15,000 ohms, ±10%, ½ watt (R182)
	Resistor—Fixed, composition, 15,000 ohms, ±10%, 1 watt (R146)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R151, R156, R197, R220)
	Resistor—Fixed, composition, 22,000 ohms, ±20%, ½ watt (R198, R215)
	Resistor—Fixed, composition, 27,000 ohms, ±10%, ½ watt (R143)
	Resistor—Fixed, composition, 39,000 ohms, ±5%, ½ watt (R135)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R145, R211)
	Resistor—Fixed, composition, 47,000 ohms, ±20%, ½ watt (R221)
	Resistor—Fixed, composition, 68,000 ohms, ±10%, ½ watt (R172)
	Resistor—Fixed, composition, 100,000 ohms, ±5%, ½ watt (R203, R204)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R160, R216)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, 1 watt (R179)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, 1 watt (R222)
	Resistor—Fixed, composition, 120,000 ohms, ±5%, 1 watt (R176)
	Resistor—Fixed, composition, 120,000 ohms, ±10%, 1 watt (R174)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, ½ watt (R168)
	Resistor—Fixed, composition, 150,000 ohms, ±20%, ½ watt (R142)
	Resistor—Fixed, composition, 180,000 ohms, ±5%, 1 watt (R178)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R129, R154)
	Resistor—Fixed, composition, 270,000 ohms, ±10%, ½ watt (R185)
	Resistor—Fixed, composition, 330,000 ohms, ±10%, ½ watt (R140, R200)
	Resistor—Fixed, composition, 470,000 ohms, ±10%, ½ watt (R137, R139, R180, R224)
	Resistor—Fixed, composition, 470,000 ohms, ±20%, ½ watt (R207)
	Resistor—Fixed, composition, 680,000 ohms, ±10%, ½ watt (R133, R212)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 820,000 ohms, ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 1 megohm, ±10%, ½ watt (R147, R181)
	Resistor—Fixed, composition, 1 megohm, ±20%, 1 watt (R189)
	Resistor—Fixed, composition, 1.2 megohm, ±5%, ½ watt (R213)
	Resistor—Fixed, composition, 1.5 megohm, ±5%, ½ watt (R157)
	Resistor—Fixed, composition, 2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohm, ±5%, 1 watt (R170)
	Resistor—Fixed, composition, 3.9 megohm, ±10%, ½ watt (R149)
	Resistor—Fixed, composition, 6.8 megohm, ±10%, ½ watt (R125)
	Resistor—Fixed, composition, 10 megohm, ±10%, ½ watt (R148)
	Resistor—Fixed, composition, 10 megohm, ±20%, ½ watt (R201)
74601	Screw—No. 8-32 x ⅜" cross-recessed binder head screw for focus coil mounting (2 required)
74602	Screw—No. 10-32 x 1¾" cross-recessed round head screw for focus coil adjustment (3 required)
71456	Screw—No. 8-32 wing screw for deflection yoke
74416	Screw—No. 10-32 x 1¾" cross-recessed round head screw for holding kinescope retaining strap for KCS34B
73584	Shield—Metal tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 8016
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket
73586	Spring—Hood and yoke pressure spring (3 required)
74595	Spring—Anode lead spring
74936	Spring—Suspension spring (coil type) for kinescope tube socket leads
74810	Strap—Kinescope retaining strap for KCS34B
74596	Support—Bakelite supports (1 set) for mounting hi-voltage plate assembly
74147	Switch—Width selector switch (S104)
46760	Switch—"TV-Phono" switch (S103)
74157	Switch—Interlock switch
74586	Transformer—Power transformer, 115 v., 60 cycle (T111)
74587	Transformer—Vertical output transformer (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74588	Transformer—Horizontal output and hi-voltage transformer (T110)
71419	Transformer—Audio output transformer (T114)
74589	Transformer—First pix i-f transformer (T101, C102, R101)
74590	Transformer—Second pix i-f transformer (T102, C107)
74591	Transformer—Third pix i-f transformer (T103, C112)
74592	Transformer—Fourth pix i-f transformer (T104, C116)
73575	Transformer—Fifth pix i-f transformer (T106, C123, C124)

STOCK No.	DESCRIPTION
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna matching transformer complete with connector (T115, J102)
73577	Trap—4.5 mc video trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	SPEAKER ASSEMBLIES
	92569-7B
	or 92569-7K
	or 92569-7W RL103-C4
13867	Cap—Dust cap
75875	Cone—Cone and voice coil assembly for 92569-7B
75642	Cone—Cone and voice coil assembly for 92569-7K
73934	Cone—Cone and voice coil assembly for 92569-7W
5118	Plug—3 prong male plug for speaker
73635	Speaker—12" P-M speaker complete with cone and voice coil, less plug
71145	Suspension—Metal cone suspension for 92569-7W
	NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instruments, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74812	Back—Cabinet back cover for Models 9TC247 and 9TC249
74807	Back—Cabinet back cover for Model 9TC245, also Models 9TC247 and 9TC249 employing KCS34B
72857	Board—"Ant" terminal board
71599	Bracket—Pilot lamp bracket
13103	Cap—Pilot lamp jewel
71892	Catch—Bullet catch and strike for doors (2 required) for Model 9TC249
X1998	Cloth—Grille cloth for mahogany or walnut cabinets for Models 9TC247 and 9TC249
X1999	Cloth—Grille cloth for toasted mahogany cabinets for Models 9TC247 and 9TC249
X3046	Cloth—Grille cloth for mahogany or walnut instruments for Model 9TC245
X3047	Cloth—Grille cloth for oak instruments for Model 9TC245
39153	Connector—4 contact male connector for antenna cable (P102)
74731	Decal—Control panel function decal for mahogany or walnut cabinets
74732	Decal—Control panel function decal for toasted mahogany or oak instruments

STOCK No.	DESCRIPTION
71768	Decal—Trade mark decal for Model 9TC249
73642	Escutcheon—Channel marker escutcheon for walnut or mahogany instruments
73740	Escutcheon—Channel marker escutcheon for toasted mahogany or oak instruments
73180	Emblem—"RCA Victor" emblem (metal) for Models 9TC247 and 9TC249
74809	Emblem—"RCA Victor" emblem (plastic)
74755	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker (4 required)
74308	Hinge—Cabinet door hinge (1 set) (2 required) for Model 9TC249
73994	Knob—Fine tuning knob—dark—for walnut and mahogany instruments (outer)
73995	Knob—Fine tuning knob—tan—for toasted mahogany or oak instruments (outer)
73996	Knob—Channel selector knob—dark—for walnut and mahogany instruments (inner)
73997	Knob—Channel selector knob—tan—for toasted mahogany or oak instruments (inner)
73998	Knob—Brightness control or vertical hold control knob—dark—for walnut or mahogany instruments (outer)
73999	Knob—Brightness control or vertical hold control knob—tan—for toasted mahogany or oak instruments (outer)
74002	Knob—Volume control and power switch knob—dark—for mahogany or walnut instruments
74003	Knob—Volume control and power switch knob—tan—for toasted mahogany or oak instruments
74000	Knob—Picture control or horizontal hold control knob—dark—for walnut or mahogany instruments (inner)
74001	Knob—Picture control or horizontal hold control knob—tan—for toasted mahogany or oak instruments (inner)
11765	Lamp—Pilot lamp—Mazda 51
74730	Nail—Brass head decorative nail for grille bars (4 required) Model 9TC247
74808	Panel—Kine tube shield panel (masonite)
74162	Plate—Mounting plate for interlock switch
74449	Plate—Stud and plate assembly for front panel (2 required) for Models 9TC247 and 9TC249 (KCS34)
74451	Pull—Door pull (2 required) for Model 9TC249
74113	Screw—No. 8-32 x 1" trimit head screw for door pull for Model 9TC249
71539	Slide—Kinescope centering slide (4 required) (KCS34)
72845	Spring—Retaining spring for knobs No. 73994 and 73995
14270	Spring—Retaining spring for knobs No. 73996, 73997, 73998, 73999, 74002 and 74003
30330	Spring—Retaining spring for knobs No. 74000 and 74001
73643	Spring—Spring clip for channel marker escutcheon
72936	Stop—Door stop for Model 9TC249
74161	Stud—Back cover locating stud (2 required)

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

TELEVISION RECEIVER

MODEL 9T246

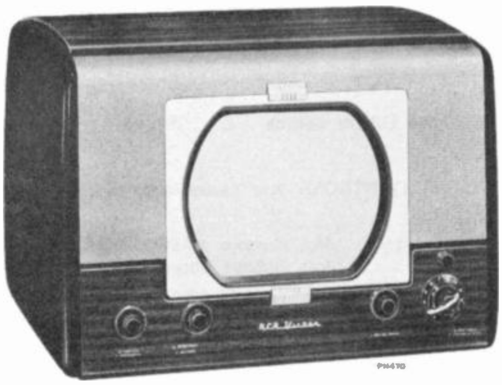
Chassis Nos. KCS28C, or KCS38

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. T10 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.



Model 9T246, Mahogany Finish Metal Cabinet

GENERAL DESCRIPTION

Model 9T246 is a 10" table model television receiver in a mahogany finish metal cabinet.

This receiver was manufactured in two production runs. The first production employs chassis KCS28C. The second production employs chassis KCS38, which is similar to KCS28C. However, KCS38 represents a change of tube types in three sockets, it employs a different speaker, focus coil, power transformer, horizontal and vertical output transformers, picture i-f transformers as well as circuit changes.

Complete service data is provided for both chassis. Separate schematic and wiring diagrams for each chassis are included. When servicing a receiver, care should be taken that the data employed is applicable to the chassis under test.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 61 square inches on a 10BP4 Kinescope

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

Plus and minus approximately 250 kc on channel 2 and plus and minus approximately 650 kc on channel 13.

POWER SUPPLY RATING

KCS28C .... 115 volts, 60 cycles, 250 watts
KCS38 .... 115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING .... 2.0 watts max.

LOUDSPEAKERS

KCS28C ....92573-4 5" x 7" PM Dynamic, 3.2 ohms
KCS38 .... 970773-1 5" x 7" EM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	22	15⅝	21¼
Chassis (overall)	19½	13	20½

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

WEIGHT

Chassis with Tubes in Cabinet .... 84 lbs.
Shipping Weight .... 99 lbs.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6AG5 or 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6AG5 or 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 5V4G or 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier
(24)	RCA 10BP4	Kinescope

Specifications continued on page 2

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency .... 25.75 Mc.
Adjacent Channel Sound Trap .... 27.25 Mc.
Accompanying Sound Traps .... 21.25 Mc.
Adjacent Channel Picture Carrier Trap .... 19.75 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.25 Mc.
Sound Discriminator Band Width between peaks .... 350 kc

VIDEO RESPONSE .... To 4 Mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY .... 15,750 cps

VERTICAL SWEEP FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector .... Single Control Knob
Fine Tuning .... Single Control Knob
Picture, Brightness .... Dual Control Knobs (KCS38 only)
Picture Horizontal Hold, Picture Vertical Hold .... Dual Control Knobs
Sound Volume and On-Off Switch .... Single Control Knob (KCS38 only)

NON-OPERATING CONTROLS (not including r-f & i-f adjustments)

Horizontal Centering .... top chassis screwdriver adjustment
Vertical Centering .... top chassis screwdriver adjustment
Width .... rear chassis screwdriver adjustment
Height .... rear chassis adjustment
Horizontal Linearity .... rear chassis screwdriver adjustment
Vertical Linearity .... rear chassis adjustment
Horizontal Drive .... rear chassis screwdriver adjustment
Horizontal Osc. Freq. .... bottom chassis adjustment
Horizontal Osc. Waveform .... side chassis adjustment
Horizontal Locking Range .... rear chassis adjustment
Focus .... rear chassis adjustment
Ion Trap Magnet .... top chassis adjustment
Deflection Coil .... top chassis wing nut adjustment
AGC Threshold Control .... rear chassis adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 9.

14. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

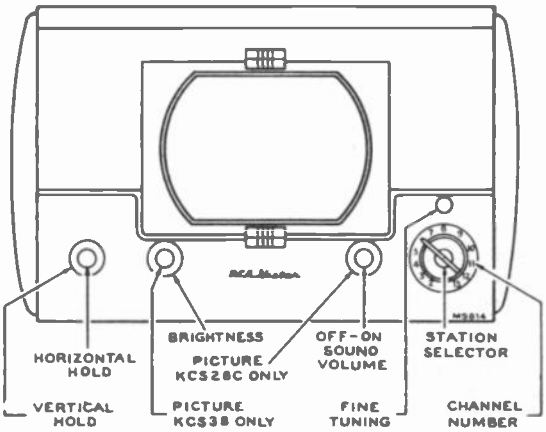


Figure 1—Receiver Operating Controls

INSTALLATION INSTRUCTIONS

Model 9T246 shipped complete in cardboard cartons. The kinescope is shipped in place in the receiver.

UNPACKING.—To unpack the 9T246, tear open the carton flaps, pick up the receiver from under the bottom of the cabinet, and lift it out of the shipping carton.

On some instruments a flat skid is attached to the bottom of the cabinet. To remove the skid, take out the red head bolts on the bottom. The chassis will not shift in the cabinet when these bolts are removed. Lift the cabinet off the skid.

Take off the cabinet back. The operating control knobs and a set of short chassis bolts are packed in a bag which is tied on top of the chassis. Remove the bag, take the six bolts and put them in the holes in the bottom of the cabinet formerly occupied by the red head shipping bolts.

The receiver may now be placed on a stand, table or other appropriate support. If a table or piece of furniture other than the regular stand is used for support, care must be taken to see receiver is sitting on the cabinet feet. If the bottom of the cabinet is permitted to touch a table top, the table could become badly scratched.

Remove the ion trap magnet and take out the cardboard sleeve between the neck of the kinescope and the inner surface of the focus coil. Remove the cardboard shield from the 5U4G rectifier.

Replace the ion trap magnet as shown in Figure 2.

Make sure that all tubes are in place and are firmly seated in their sockets.

Check to see that the high voltage lead is attached to the kinescope second anode connector socket on the bell of the tube.

Connect the antenna transmission line to the receiver antenna terminals.

Plug the receiver power cord into a 115 volt a-c power source. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2, and with the part number on magnet towards the rear of the chassis.

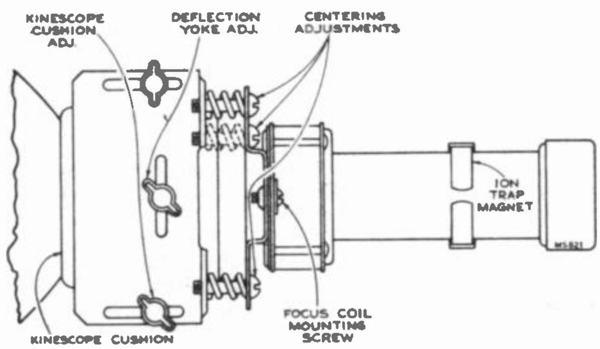


Figure 2—Yoke and Focus Coil Adjustments

Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the

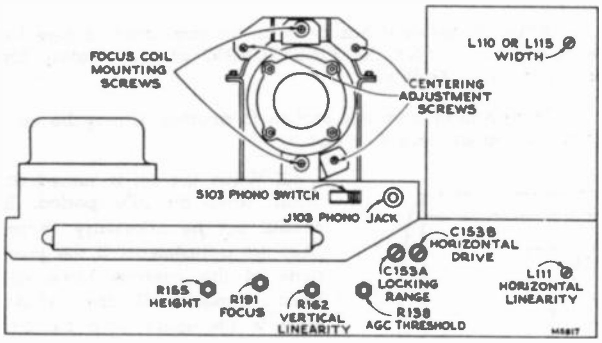


Figure 3—Rear Chassis Adjustments

picture can be synced. On some chassis, the AGC control may be on top of the chassis as shown in Figure 5. On these receivers the control should be turned counter-clockwise until the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 11. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is obtained by mechanically orienting the focus coil with the three adjustment screws shown in Figure 2. Center the picture on the screen by adjustment of these screws. The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster.

FOCUS COIL ADJUSTMENTS.—If, after making the centering adjustments described in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 2) and change the position of the coil to eliminate the shadow. Recenter the picture by adjustment of the centering screws.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, turn the horizontal drive control counter-clockwise until the left side of the picture begins to stretch.

Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMB-SCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 10. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well. See Figures 8 and 9 for their location.

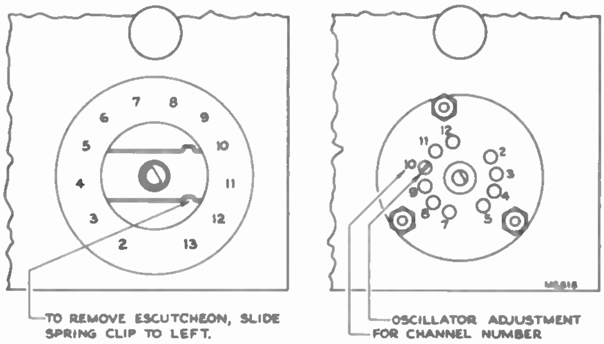


Figure 4—R-F Oscillator Adjustments

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain, is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

On early production receivers R11 was 1000 ohms and R14 was omitted. In order to "peak" these units it will be necessary to remove the unit from the receiver and change R11 to 10,000 ohms. Once the unit is removed from the chassis R11 is easily accessable on the unit rear wafer. When making this change, if the channel number 2 r-f coil L62 consists of 5¾ turns, the outside turn should be "knifed" one wire diameter away from the rest of the coil in order to provide peak response on channel 2. The unit should then be replaced and L66 peaked as described above.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the 9T246 for repair or installation of a new kinescope, remove the back and the knobs, unplug the speaker cable, and remove the chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap, as shown in Figure 5. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

To replace the chassis in the cabinet, first tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the six chassis bolts. Loosen the kinescope strap from the rear of the cabinet, or from the bottom through a hole in the chassis shelf. The bottom end of the cross-recessed head screw is slotted to fit a screwdriver. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Tighten the kinescope strap, then replace the knobs. Perform the set-up procedure.

ANTENNAS.—The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to select the proper antenna to suit the particular local conditions, to install it properly and orient it correctly.

RCA Television Antenna, type No. 225A1 is designed for reception of all twelve television channels. The antenna uses the 300-ohm RCA "Bright Picture" television transmission line. The antenna, a dipole with reflector, is unidirectional on channels two through six. When used on these channels, the maximum signal is obtained when the antenna rods are broadside toward the transmitting antenna, with the antenna element between the reflector and the transmitting antenna.

If two or more stations are available between channels two and six and the two stations are in different directions, it may be possible to make a compromise orientation which will provide a satisfactory signal on all such channels.

When operated on channels seven through thirteen (174 to 216 Mc), the antenna has side lobes. On these channels, the maximum signal will be obtained when the antenna is rotated approximately 35 degrees in either direction from its broadside position toward the transmitting antenna. In many instances this effect may not cause any difficulties and it may be possible to make a compromise orientation which will permit satisfactory reception on all high and low channels. In some instances, however, this will not be the case due to reflections or to insufficient signal strength from one or more stations.

RCA antennas type 204A1 is available for use in locations in which it is desirable to eliminate side lobes and to have the antennas 7-13 directivity the same as 2-6 directivity.

For use in cases where it is desirable to have adjustable 7-13 directivity different from 2-6, RCA antenna type 206A1 is provided.

If it is impossible to obtain satisfactory results on one or more channels, it may become necessary either to provide means for turning the antenna when switching channels or to install a separate antenna for one or more channels and to switch antennas when switching channels.

In weak signal areas it is possible to "stack" the type 204A1 antenna to obtain increased signal strength by employing one type 204A1 antenna and one type 208A1 stacking kit.

CHASSIS TOP VIEW

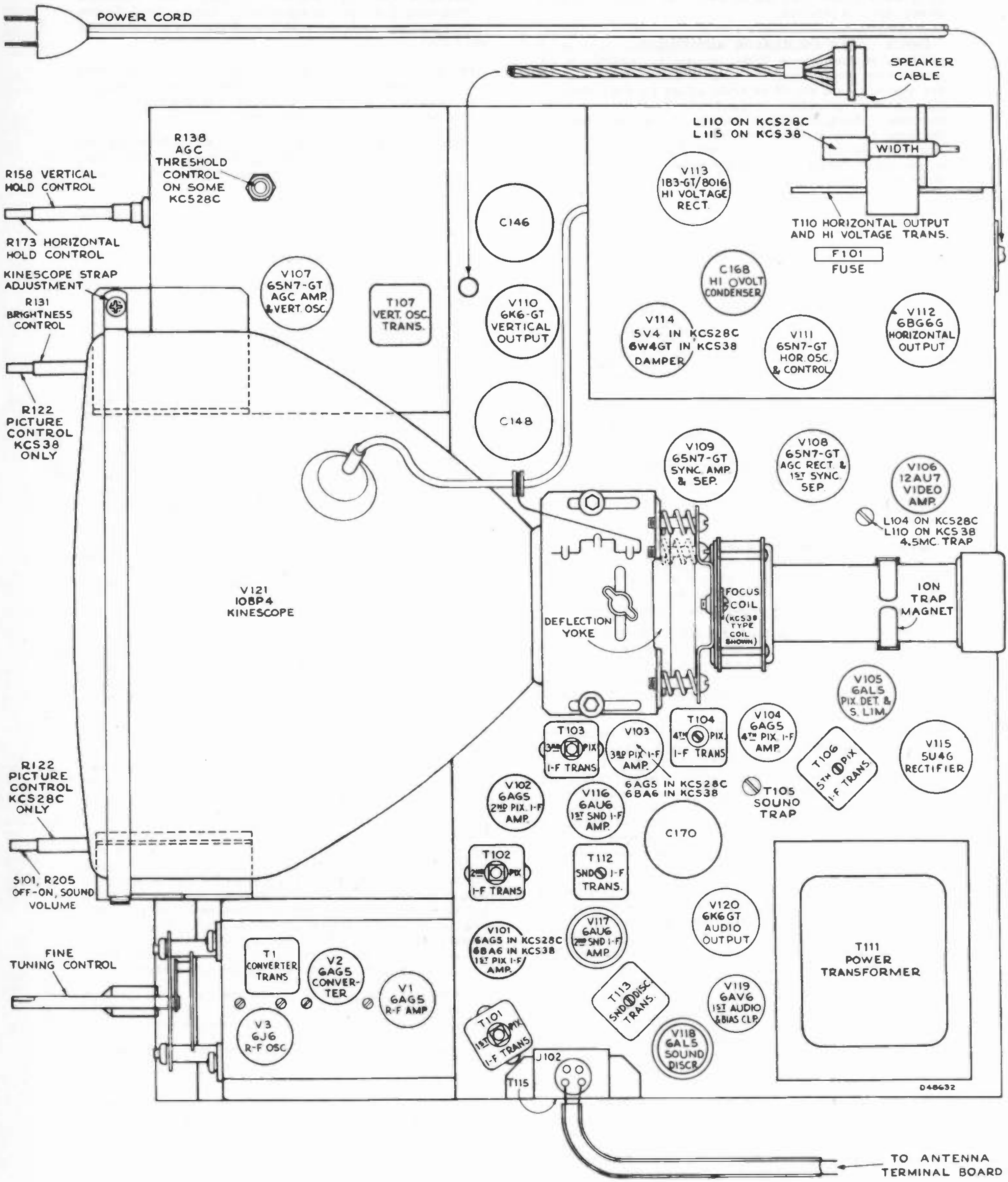


Figure 5—Chassis Top View

CHASSIS BOTTOM VIEW

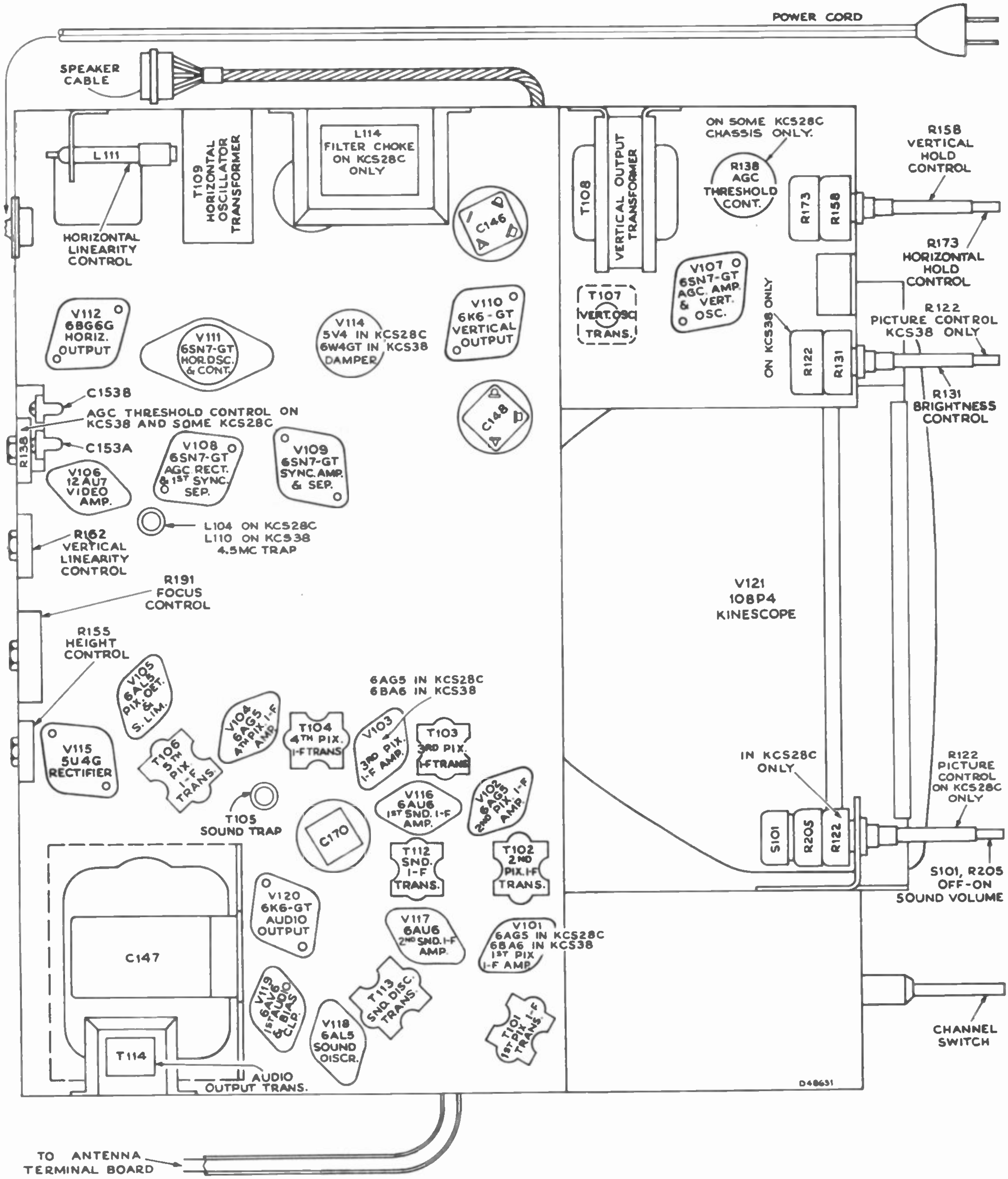


Figure 6—Chassis Bottom View

TEST EQUIPMENT.—To service properly the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges
20 to 30 mc., 1 mc. and 10 mc. sweep width
50 to 90 mc., 10 mc. sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope.—For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-58A, WO-79A, and WO-60C fill the requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least two megacycles in all positions of the gain control. The RCA types WO-58A and WO-79A are ideally suited for this purpose.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies
19.75 mc. adjacent channel picture trap
21.25 mc. sound i-f and sound traps
22.05 and 24.75 mc. conv. and first pix i-f trans.
25.9 mc. second picture i-f transformer
24.6 mc. fourth picture i-f transformer
22.0 mc. third picture i-f transformer
22.5 mc. fifth picture i-f transformer
25.75 mc. picture carrier
27.25 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output on these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 10 kv.

Service Precautions.—If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, make sure the kinescope retaining strap is secure, and the yoke cushion is up firmly against the flare of the tube.

CAUTION: Do not short the kinescope second-anode lead. Its short circuit current is approximately 3 ma. This represents approximately 9 watts dissipation and a considerable overload on the high-voltage filter resistor R189.

Adjustments Required.—Normally, only the r-f oscillator line will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require re-adjustment.

The oscillator line is relatively non-critical. When oscillator tubes are changed, in all probability it will be necessary to adjust only C6 in order to bring the entire line into adjustment.

ORDER OF ALIGNMENT.—When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator	(5) R-F and converter lines
(2) Sound i-f transformers	(6) R-F oscillator line
(3) Picture i-f traps	(7) 4.5 mc. video trap
(4) Picture i-f transformers	(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT.—Set the signal generator for approximately .1 volt output at 21.25 mc. and connect it to the second sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 3-volt scale.

Connect the meter, in series with a one-megohm resistor, to the junction of diode resistors R203 and R204.

Adjust the primary of T113 (top) for max. output on the meter.

Connect the "VoltOhmyst" to the junction of C183 and R203. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.25 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of C183 and R203. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust T113 (top) until the wave form is symmetrical.

The peak to peak band width of the discriminator should be approximately 350 kc. and the trace should be linear from 21.175 mc. to 21.325 mc.

SOUND I-F ALIGNMENT.—Connect the sweep oscillator to the first sound i-f amplifier grid.

Connect the oscilloscope to the second sound i-f grid return (terminal A of T112) in series with a 33,000-ohm isolating resistor.

Insert a 21.25 mc. marker signal from the signal generator into the first sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.25 mc. marker. The pattern obtained should be similar to that shown in Figure 13.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the second sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approx. 200 kc.

PICTURE I-F TRAP ADJUSTMENT.—Connect the "VoltOhmyst" to the junction of R135 and L117 of KCS 28C chassis or to junction of R135 and C190 of KCS38 chassis.

Remove the 6SN7GT AGC Amplifier tube V107. Connect a 250,000-ohm potentiometer between pins 5 and 6 of the V107 socket. Adjust the potentiometer until the "VoltOhmyst" reads approximately −4.5 volts for KCS28C. Adjust the bias to −6.0 volts for early KCS38 chassis in which L117 is connected to the junction of R135 and C190. Adjust the bias to −12 volts in late KCS38 chassis in which L117 is connected to the junction of R135 and C197.

Set the channel switch to the blank position between channels number 2 and 13.

Connect the "VoltOhmyst" across the picture detector load resistor R119. Under this condition, both leads of the meter are at approximately −120 volts. In making this connection, care should be taken not to touch the case of the meter or to permit the meter case to become grounded.

Connect the output of the signal generator to the grid of the converter tube V2. To do this, remove the tube from the socket and fashion a clip by twisting one end of a small piece of wire around pin number 1. Replace the tube in the socket leaving the end of the wire protruding from under the tube. Connect the signal generator to this wire through a 1,500 mmf capacitor keeping the leads as short as possible.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.25 mc.—T103 (top)	(4) 27.25 mc.—T104 (top)
(2) 21.25 mc.—T105 (top)	(5) 19.75 mc.—T106 (top)
(3) 27.25 mc.—T102 (top)	(6) 19.75 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS.—Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

22.5 mc.—T106 (bottom)	22.0 mc.—T103 (bottom)
24.6 mc.—T104 (bottom)	25.9 mc.—T102 (bottom)

T1 and T101 are coupled by a link and in combination constitute an overcoupled transformer. The characteristics of such a transformer are such that it is impossible to adjust it to a single frequency.

To sweep align T1 and T101, connect a 330-ohm composition resistor across the primary coils of T102, T103, T104 and T106. Connect the "VoltOhmyst" to the junction of R135 and L117 on KCS28C or junction at R135 and C190 on KCS38. Adjust the 250,000-ohm variable resistor for −2.0 volts on the meter.

Connect the oscilloscope to pin 1 of V106.

Connect a sweep generator to the converter grid through a 1,500 mmf capacitor. Set the generator to sweep from 20.0 mc. to 30.0 mc. and adjust the output to provide a 4-volt peak-to-peak signal on the scope.

Connect the signal generator loosely to the converter grid and tune it to provide markers at 22.05 mc. and 24.75 mc.

Adjust T1 (top) and T101 (bottom) to obtain the response shown in Figure 14. The T1 core must penetrate to the terminal-board end of the coil in order to obtain the correct response.

Remove the 330 ohm resistors from across T102, T103, T104 and T106.

Adjust the 250,000 ohm potentiometer for a 15-volt peak to peak signal at the plate of the first video amplifier. The bias as measured by the "VoltOhmyst" should be −4.5 volts or less for KCS28C. For KCS38 set the bias to −6 volts for early chassis or −12 volts for late chassis.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 15.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped, with the 22.1 mc. marker at approximately 95% response and the 25.0 mc. marker below 90% response. A 26.5 mc. marker must fall between 5 and 10% response.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the reponse curve, the picture becomes smeared. In making these adjustments, care should be taken to see that no two transformers are tuned to the same frequency as i-f oscillation may result.

Remove the converter tube and take off the clip to pin number 1. Replace the tube in the socket.

Picture I-F Oscillation. If the receiver will operate without oscillating with the test equipment disconnected but breaks into oscillation or becomes unstable with the equipment connected, it may become necessary to establish a ground plane. Cover the test bench with a sheet of copper and set the chassis on the sheet. Set all the test equipment except the "VoltOhmyst" on the sheet and bond or bypass them to it. A Junior "VoltOhmyst" should not be bonded to the sheet since the negative test probe is not always connected to ground during alignment. If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage across the picture detector load resistor that is unaffected by r-f signal input. If such a condition is encountered, it is sometimes possible to stop oscillation by adjusting the transformers approximately to frequency by setting the adjustment cores of T101, T102, T103, T104, T105 and T106 to be approximately equal to those of another receiver known to be in proper alignment. If this does not have the desired effect, it may now be possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f amplifier should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1,000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align T106 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

ANTENNA, R-F AND CONVERTER LINE ADJUSTMENT.—In order to align the r-f tuner, it will first be necessary to set the channel-13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The channel-13 oscillator may be aligned by adjusting it to beat with a crystal-calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203).

Set the receiver switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator.)

Set the fine tuning control to the middle of its range.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel-13 oscillator is set to frequency, we may procede with the r-f alignment.

Connect the "VoltOhmyst" to C132 at the middle terminal of the r-f unit terminal board. Adjust the 250K pot. for − 3.5 volts on the meter.

Remove the first pix i-f amplifier tube V101.

Connect the oscilloscope to the test connection at R13 in the r-f tuning unit.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P102 connections for 300-ohm balanced or 72-ohm single-ended input are shown in the circuit diagrams in Figures 78 and 80. If the sweep oscillator has a 50-ohm single-ended output, 300-ohm balanced output can be obtained by connecting as shown in Figure 7.

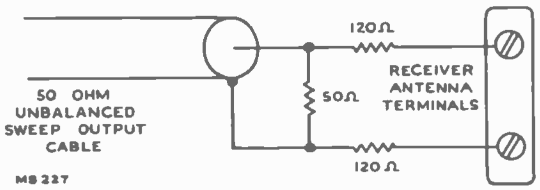


Figure 7- Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Since channel 7 has the narrowest response of any of the high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7.

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier, 175.25 mc. and 179.75 mc.

Adjust C10 and C14 until the curve falls symmetrically between the sound and picture carrier markers. Adjust C11 to give the proper bandwidth. Roughly peak L6 in conjunction with slight adjustments of C10 and C14 for a flat-topped response curve with the sound and picture carriers at 90% to 95% response points on this curve. See Figure 16, channel 7.

Switch to channel 12 and adjust L6 for maximum response and minimum top slope of the curve.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observing the response obtained. See Figure 16 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response. If the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L6, C10, C11 and C14, and possibly compromise some channel slightly in order to get the markers up on other channels. Normally, however, no difficulty of this type should be experienced since the higher frequency channels are comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L9, L13, L66, and C-12 for an approximately flat-topped response curve located symmetrically between the markers. L9, L13 and L66 are the center frequency adjustments. C12 is the band-width adjustment.

Check channels 5 down through channel 2 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 80% response point. If this is not the case, L9, L13, L66 and C12 should be retouched. On final adjustment, all channels must be within the 80% specification.

Disconnect the 250K pot., and replace V107 and V101.

Following an r-f alignment, the oscillator alignment must be checked.

R-F OSCILLATOR LINE ADJUSTMENT.—The r-f oscillator line may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available.

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under Sound Carrier Freq. must be available.

Channel Number	Receiver R-F Osc. Freq. Mc.	R-F Sound Carrier Freq. Mc.	Channel Oscillator Adjustment
2	81	59.75	L24
3	87	65.75	L23
4	93	71.75	L22
5	103	81.75	L21
6	109	87.75	L31
7	201	179.75	L19
8	207	185.75	L18
9	213	191.75	L17
10	219	197.75	L16
11	225	203.75	L15
12	231	209.75	L14
13	237	215.75	C6

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R203) and connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

If the r-f unit is removed from the receiver for service and is aligned separately, the shield over the bottom of the r-f unit must be in place when making adjustments.

Since lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. Oscillator adjustments L1 and L2 shown on the schematic are factory control adjustments and should not be touched in the field.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L14 for indications as above.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

AGC THRESHOLD ADJUSTMENT.—The AGC threshold adjustment can be made by the method outlined in the Installation Instructions. However, a more accurate adjustment can be obtained by the use of an oscilloscope.

Tune in a station and advance the picture control to the maximum clockwise position. Connect the low capacity probe from the oscilloscope to the plate of the first video amplifier, pin 1 of V106. Adjust the oscilloscope to observe the horizontal sync pulse.

Turn the AGC threshold control R138 fully clockwise, then slowly counter-clockwise. As the control is turned counter-clockwise, the receiver gain will increase slowly, increasing the size of the pattern on the oscilloscope. R138 should be turned counter-clockwise until the receiver begins to overload as indicated by clipping of the sync. The control should be left in the maximum gain position in which no clipping of sync is observed. See Figure 17 for proper waveforms.

On some KCS28C chassis, the AGC threshold control is on top of the chassis, in which case the control should be turned in the opposite direction to that specified above.

HORIZONTAL OSCILLATOR ADJUSTMENT.—Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment.—With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T109. Tune in a television station and sync the picture if possible.

A.—Turn the horizontal hold control R173 to the extreme clockwise position. Adjust the T109 Frequency Adjustment (under the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

B.—Turn the hold control approximately one quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C153B, the width control (L110 for KCS28C or L115 for KCS38) and the linearity control L111 until the picture is correct. If C153B (L110 or L115), or L111 were adjusted, repeat step A above.

Horizontal Locking Range Adjustment.—Turn the horizontal hold control fully counter-clockwise. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 9 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 7 bars are present, adjust C153A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat the procedure until 7 to 9 bars are present.

Horizontal Oscillator Waveform Adjustment.—Remove the shorting clip from terminals C and D of T109. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, adjust the Oscillator Waveform Adjustment Core of T109 (on the outside of the chassis) until the horizontal blanking bar appears in the raster.

A.—Connect the low capacity probe of an oscilloscope to terminal C of T109. Turn the horizontal hold control one quarter turn from the clockwise position so that the picture is in sync. The pattern on the oscilloscope should be as shown in Figure 18. Adjust the Oscillator Waveform Adjustment Core of T109 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Horizontal Oscillator Adjustments.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T109 Frequency Adjustment until this condition is fulfilled.

4.5 MC VIDEO TRAP.—With a strong input from a station, detune the receiver from the correct fine tuning point. With a very short clip lead, short the trap winding of T103. Observe the picture for the appearance of a 4.5 mc. beat. If the beat appears in the picture, adjust L104 for KCS28C or L110 for KCS38 until the beat is eliminated.

SENSITIVITY CHECK.—A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES.—The response curves shown on page 15 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

ALIGNMENT TABLE.—Both methods of oscillator alignment are presented in the alignment table. The service technician may thereby choose the method to suit his test equipment.

9T246

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 8 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	DISCRIMINATOR AND SOUND I-F ALIGNMENT								
1	2nd sound i-f grid (pin 1, V117)	21.25 .1 volt output	Not used		Not used	In series with 1 meg. to junction of R203 & R204		Detune T113 (bot.) Adjust T113 (top) for max. on meter	Fig. 8 Fig. 9 Fig. 10
2	"	"	"		"	Junct. of C183 & R203	Meter on 3 volt scale	T113 (bottom) for zero on meter	Fig. 9 Fig. 10
3	"	"	2nd sound i-f grid (pin 1, V117)	21.25 center 1 mc. wide .1 v. out	Junction of C183 & R203	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal		Fig. 10 Fig. 12
4	1st sound i-f grid (pin 1, V116)	21.25 reduced output	1st sound i-f grid	21.25 reduced output	Terminal A, T112 in series with a 33,000 ohm resistor	"	Sweep output reduced to provide .3 volt p-to-p on scope	T112 (top & bot.) for max. gain and symmetry at 21.25 mc.	Fig. 8 Fig. 9 Fig. 10 Fig. 13
	PICTURE I-F AND TRAP ADJUSTMENT								
5	Not used		Not used		Not used	Junction of R135 & L117 of KCS28C. Junction of R135 and C190 of KCS38.	Remove V107. Connect potentiometer between pins 5 & 6 of V107 socket	Adj. pot. for meter reading of -4.5 V. for KCS28C, -6V. or -12 V. for KCS38.	Fig. 10
6	Converter grid (pin 1, V2)	21.25	"		"	Across R119	Meter on 3 volt scale. Receiver between 2 and 13	T103 (top) for min. on meter	Fig. 8
7	"	21.25	"		"	"	"	T105 (top) for min.	"
8	"	27.25	"		"	"	"	T102 (top) for min.	"
9	"	27.25	"		"	"	"	T104 (top) for min.	"
10	"	19.75	"		"	"	"	T106 (top) for min.	"
11	"	19.75	"		"	"	"	T101 (top) for min.	"
12	"	22.5	"		"	"	"	T106 (bottom) for max. on meter	Fig. 9
13	"	24.6	"		"	"	"	T104 (bottom) for max.	"
14	"	22.0	"		"	"	"	T103 (bottom) for max.	"
15	"	25.9	"		"	"	"	T102 (bottom) for max.	"
16	"	22.05 24.75	Converter grid (Pin 1, V2)	Sweeping 20 to 30 mc.	Pin 1, V106	Junction of R135 & L117 of KCS28C. Junction of R135 and C190 of KCS38.	Shunt 330 ohms across pri. T102, T103, T104, T106. Set bias -2 V. Set swp. gen. for 4 V. P-P on scope.	Adjust T1 (top) and T101 (bottom) for proper response	Fig. 8 Fig. 9 Fig. 14
17	"		"	"	"	"	Remove shunt resistors. Set bias to give 15 volts P to P on scope.	Adjust T1 (top), T101, T102, T103, T104, T106 (bot.) for proper resp.	Fig. 8 Fig. 9 Fig. 15
	ANTENNA, R-F AND CONVERTER LINE ALIGNMENT								
18	Antenna terminals	215.75	Not used		Not used	Junction of C183 & R203 for signal gen. method only	Fine tuning centered. Receiver on channel 13. Heterodyne meter coupled to oscillator if used.	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
19						Junction of C132 at r-f unit	Remove V101	Potentiometer for -3.5 volts on meter	Fig. 8 Fig. 10
20	Antenna terminal (loosely)	175.25 & 179.75	Antenna terminals (see text for precaution)	Sweeping channel 7	Test Connection R13	Not used	Receiver on channel 7	L6, C10, C11 & C14 for flat top response between markers. Markers above 90%.	Fig. 8 Fig. 9 Fig. 16 (7)
21	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	L6 for max. response and min. slope of top of curve	Fig. 8 Fig. 16 (12)
22	"	175.25 179.75	"	channel 7	"	"	Receiver on channel 7	Check to see that response is as above	Fig. 16 (7)
23	"	181.25 185.75	"	channel 8	"	"	Receiver on channel 8	"	Fig. 16 (8)
24	"	187.25 191.75	"	channel 9	"	"	Receiver on channel 9	"	Fig. 16 (9)
25	"	193.25 197.75	"	channel 10	"	"	Receiver on channel 10	"	Fig. 16 (10)

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	ANTENNA, R-F AND CONVERTER LINE ALIGNMENT (Cont'd)								
26	"	199.25 203.75	"	channel 11	"	"	Receiver on channel 11	"	Fig. 16 (11)
27	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	"	Fig. 16 (12)
28	"	211.25 215.75	"	channel 13	"	"	Receiver on channel 13	"	Fig. 16 (13)
29	If the response on any channel (steps 22 through 28) is below 80% at either marker, switch to that channel and adjust L6, C10, C11 & C14 to pull response up on that channel. Then recheck steps 22 through 28.								
30	Antenna terminals (loosely)	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping chan. 6	Test Connection R13	Not used	Receiver on channel 6	L9, L13, L66 & C12 for response as above	Fig. 16 (6)
31	"	77.25 81.75	"	channel 5	"	"	Receiver on channel 5	Check to see that response is as above	Fig. 16 (5)
32	"	67.25 71.75	"	channel 4	"	"	Receiver on channel 4	"	Fig. 16 (4)
33	"	61.25 65.75	"	channel 3	"	"	Receiver on channel 3	"	Fig. 16 (3)
34	"	55.25 59.75	"	channel 2	"	"	Receiver on channel 2	"	Fig. 16 (2)
35	If the response on any channel (steps 31 through 34) is below 80% at either marker, switch to that channel and adjust L9, L13, L66 & C12 to pull response up on that channel. Then recheck steps 30 through 34. Disconnect the bias pot. and replace V101 and V107.								
	R-F OSCILLATOR ALIGNMENT								
STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
36	Antenna terminals	215.75	Loosely coupled to r-f osc.	237	Not used	Junction of C183 & R203 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C6 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
37	"	209.75	"	231	"	"	Rec. on chan. 12	L14 as above	Fig. 11
38	"	203.75	"	225	"	"	Rec. on chan. 11	L15 as above	"
39	"	197.75	"	219	"	"	Rec. on chan. 10	L16 as above	"
40	"	191.75	"	213	"	"	Rec. on chan. 9	L17 as above	"
41	"	185.75	"	207	"	"	Rec. on chan. 8	L18 as above	"
42	"	179.75	"	201	"	"	Rec. on chan. 7	L19 as above	"
43	"	87.75	"	109	"	"	Rec. on chan. 6	L31 as above	Fig. 9
44	"	81.75	"	103	"	"	Rec. on chan. 5	L21 as above	Fig. 11
45	"	71.75	"	93	"	"	Rec. on chan. 4	L22 as above	"
46	"	65.75	"	87	"	"	Rec. on chan. 3	L23 as above	"
47	"	59.75	"	81	"	"	Rec. on chan. 2	L24 as above	"
48	Repeat steps 36 through 47 as a check.								
	AGC THRESHOLD ADJUSTMENT								
49	Not used		Not used		Pin 1, V106	Not used	Tune in station, turn pix control clockwise. Adjust R138 for max. gain without clipping sync on scope.		Fig. 10 Fig. 17
	HORIZONTAL OSCILLATOR ADJUSTMENT								
50	Short circuit terminals C and D of T109. Tune in a station.								
51	Turn hold control fully clockwise. Adjust T109 Frequency Adjustment until horizontal blanking bar appears in the picture.								
52	Turn hold control ¼ turn from clockwise to sync picture. Adjust width (L110 on KCS28C or L115 on KCS38), linearity (L111) and drive (C153B) controls until picture is correct. Repeat step 51.								
53	Turn hold control fully counter-clockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 7 to 9 bar pull-in.								
54	Remove clip from terminals C and D of T109. Turn hold control fully clockwise. Adjust T109 Oscillator Waveform Adjustment until horizontal blanking bar appears in picture.								
55	Connect low capacity probe of oscilloscope to terminal C of T109. Turn hold control ¼ turn from clockwise. Adjust T109 Oscillator Waveform Adjustment until broad and sharp peaks of wave on oscilloscope are same height. Keep picture in sync with hold control during adjustment. Remove oscilloscope.								
56	Turn hold control fully counter-clockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 3 bar pull-in.								
57	Turn hold control fully clockwise. Adjust T109 Freq. Adjustment until horizontal blanking appears as single vertical or diagonal bar in pix.								
	4.5 MC VIDEO TRAP ADJUSTMENT								
58	Tune in a strong station. Short T103 trap. If a 4.5 mc. beat appears in picture adjust 4.5 mc. trap (L104 or L110) until beat is eliminated.								
	SENSITIVITY CHECK								
59	Connect antenna to receiver through attenuator pad to provide weak signal. Compare the picture and sound obtained to that obtained on other receivers under the same conditions.								

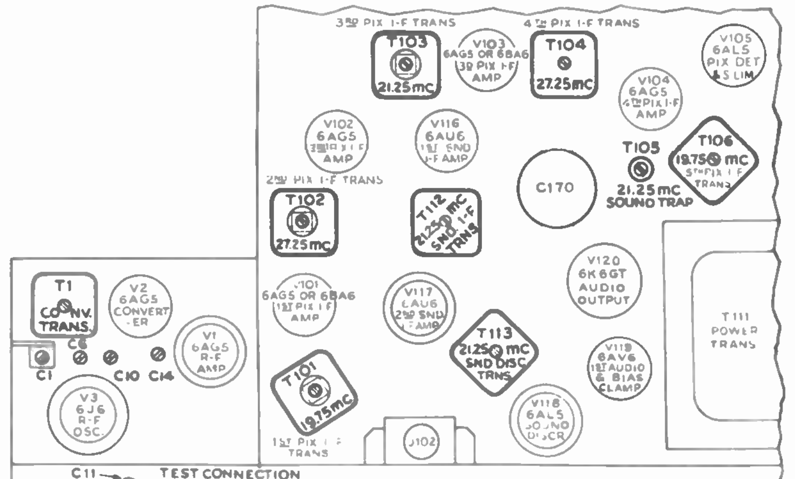


Figure 8—Top Chassis Adjustments

In Models 9T256 and 9TW309 only:
An extra 5U4G rectifier tube is used and is placed in the position shown for C170 in the illustration at left.

In Model 9TW333 only:
The audio output tube (V120 6K6GT) is not used and V119 (6AV6) is bias clamp only.

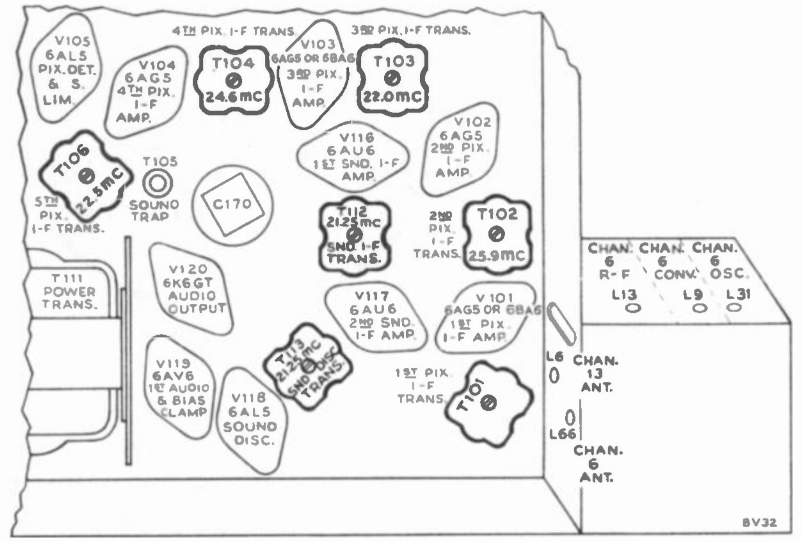


Figure 9—Bottom Chassis Adjustments

In Models 9T256 and 9TW309 only:
An extra 5U4G rectifier tube is used and is placed in the position shown for C170 in the illustration at left.

In Model 9TW333 only:
The audio output tube (V120 6K6GT) is not used and V119 (6AV6) is bias clamp only.

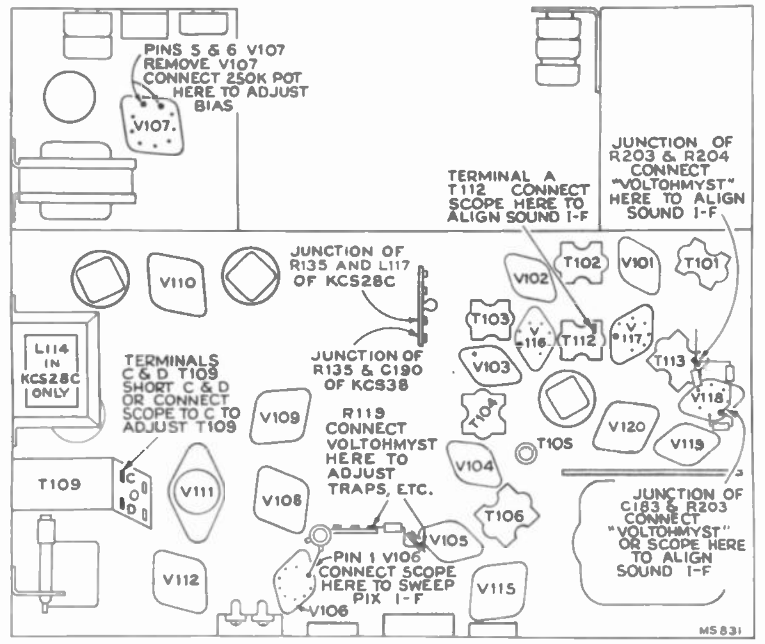


Figure 10—Test Connection Points

In Models 9T256 and 9TW309 only:
An extra 5U4G rectifier tube is used and is placed in the position shown for C170 in the illustration at left.

In Model 9TW333 only:
The audio output tube (V120 6K6GT) is not used and V119 (6AV6) is bias clamp only.

The filter choke designated as L114 in the illustration at left is also used in Models 9T240 and 9TW333.
It is also used in Models 9TC245, 9TC247 and 9TC249 but bears the designation L104.

Refer to text on following page, "Bias for Pix I-F Alignment" for additional information on test connection points.

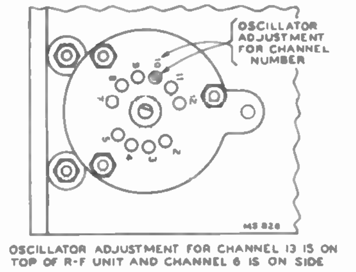


Figure 11—R-F Oscillator Adjustments

BIAS FOR PIX I-F ALIGNMENT

Some question has arisen regarding the bias adjustment alignment of the picture i-f since the change in the 3rd Pix i-f bias.

In order to clear up any misunderstanding regarding the bias setting and point of measuring this bias, the following is correct:

1. In receivers using all 6AG5 tubes in the picture i-f system—
   (a) Adjust bias with potentiometer to read —4.5 volts measured at junction of R135 and R136.
2. In receivers using the 6BA6 1st and 3rd picture i-f system and having the 3rd picture i-f bias connected to the r-f bias bus.—
   (a) Adjust bias with potentiometer to read —12 volts measured at junction of R135 and C190.
3. In receivers using the 6BA6 1st and 3rd picture i-f system and having the 3rd picture i-f bias connected to junction of R135 and C190—
   (a) Adjust bias with potentiometer to read —6.5 volts measured at junction of R135 and C190.

ALIGNMENT HINT FOR R-F UNITS

During alignment of the r-f unit, it is often advantageous to have a sweep width of 15 mc. or more when adjusting the high channels. This permits seeing the entire skirts of the curve and makes it easier to see the effects of the various adjustments. When using RCA type WR59A sweep generator, additional sweep width may be obtained by removing the sweep case back and shorting out resistors R14 and R16. After this, the front panel sweep width control still operates as before, except that more sweep width is available on the high channels.

The WR59A should be turned ON and OFF by means of the front panel control. If the sweep was turned off by disconnecting the power plug or by means of a bench master switch, but the sweep power switch was left on and in the maximum sweep width position, then the sweep modulator may overshoot and hit stationary parts when the power is reapplied.

T101 DEFECTIVE IN 9T246 AND 9TC245 SERIES RECEIVERS

In some cases, in the above listed receivers, it was found difficult to obtain proper response from T1 and T101 during alignment. The difficulties are usually caused by reversed slugs in T101. The trap (top) slug should be between ⅝ to 1" in length (depending on the vendor) and the input (bottom) slug should be about ½" long. On some sets the two slugs might have been switched around which will not permit sufficient adjustment on the over-coupled tuning. Both slugs may be removed for examination from the top of the transformer. The short slug should be put in first in re-assembly.

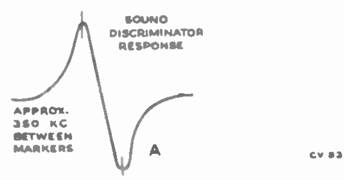


Figure 12 Discriminator Response

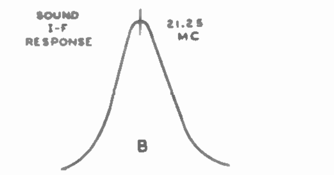


Figure 13 Sound I-F Response

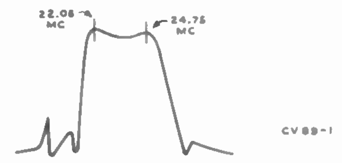


Figure 14 T1 and T101 Response

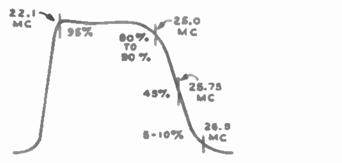


Figure 15 Overall I-F R-F Response

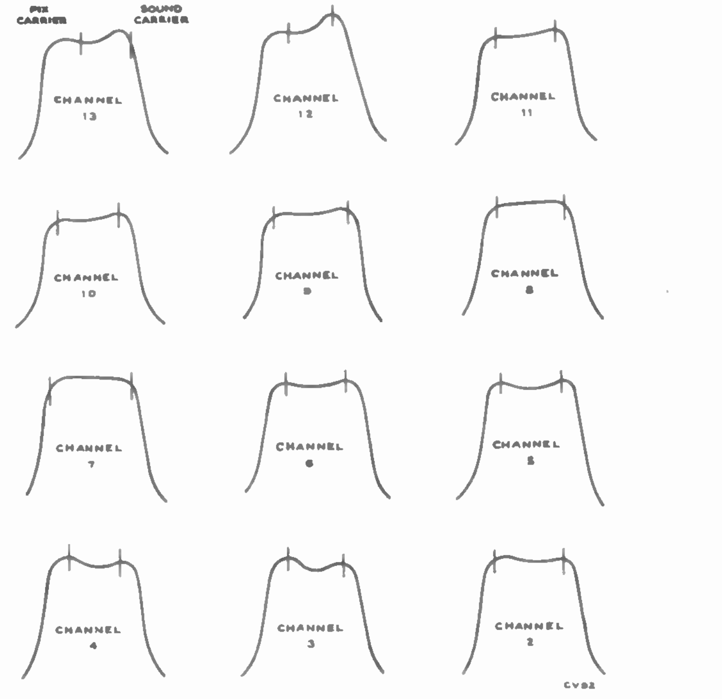


Figure 16—R-F Response

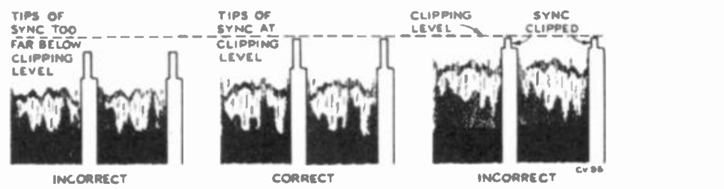


Figure 17—AGC Threshold Adjustment Waveforms

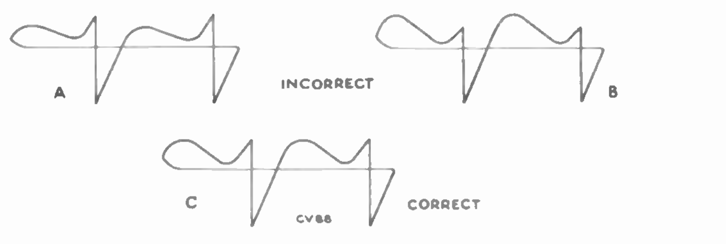


Figure 18—Horizontal Oscillator Waveforms

60 CYCLE BUZZ IN SOUND OF TELEVISION RECEIVERS

This interference appeared on 8T270, 9T270, 9T246, and 9TC245 series receivers when operated in strong signal areas.

There are several modifications which will cure this difficulty. These modifications are listed below.

RECEIVERS USING ALL 6AG5 TUBES IN PICTURE I-F:

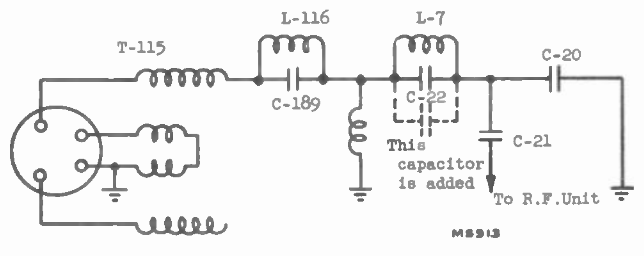
1. Replace 6AG5 tube in first picture i-f with others until one is found to cure condition.
   (6AG5 tubes which have an abnormally sharp grid cut-off characteristic will cause a buzz in sound. A tube removed for this trouble is not necessarily defective, but can be used in either the 2nd or 4th picture i-f where fixed bias is applied.)
2. Ground test connection in r-f unit (R-13, 100K).
3. Check all filter capacitors in the AGC circuit for wrong connections and also see that they are in good working condition.

RECEIVERS USING 6BA6 TUBES IN 1ST & 3RD PICTURE I-F:

1. Change 3rd picture i-f tube bias. Disconnect R110-L117 and C113 from their present tie point (junction R135 and C190) and reconnect them to the adjacent tie point of the junction of C197 and R136.
   NOTE: A greater AGC control of the r-f stage and 1st picture i-f amplifier is obtained by this change. This change was made in production of the 1949 models and also is used in the current models. In fringe areas, a slight reduction in sound may be encountered with this bias change. However, picture sensitivity will not be affected.
   In order to improve sound and if no buzz is encountered the bias can be changed to the original point.
2. Ground test connection (R13, 100K) in r-f unit.
3. Change R136 from 6800 ohms to 10K.
4. Check all filter capacitors in AGC circuit for correct connection and also to see if they are in good working condition.

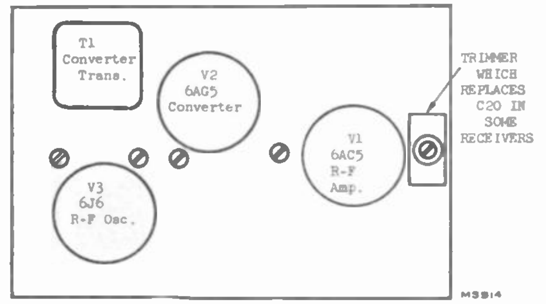
PRODUCTION CHANGES IN KRK5 AND KRK7 R-F UNITS

In some units a 1.5 mmf. capacitor has been added in parallel with C22 since that capacitor was running on the low capacity side of its tolerance and causing the high pass input filter to cut off at too high a frequency, thus putting a tilt in the channel 2 r-f response.



R-F Unit High Pass Input Filter

In some units, the capacitor C20 (18 mmf. ceramic) has been replaced by a small trimmer (7-35 mmf.) as shown below. This capacitor was set at the factory at 18 mmf. and should not be adjusted in the field. If it is ever necessary to replace the trimmer, use the fixed ceramic capacitor specified in the replacement parts list.



Top View of R-F Unit

MODELS 9TC245, 9TC247, 9TC249

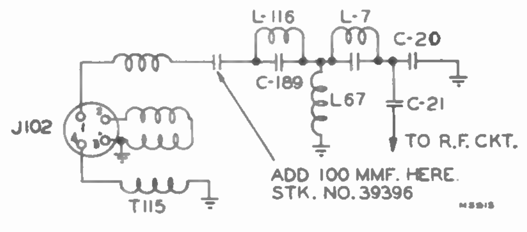
Poor Vertical Sync:

Reports from the field show that in a few cases this has been caused by Capacitor C-136 (cathode by-pass V-108). In some cases this capacitor had broken loose from ground.

Some vertical oscillator transformers marked 274011 with too high a "Q" caused a white condition at the top of the picture and possible instability of sync. The cure was to lower the transformer "Q" by connecting a 1 meg. resistor across the green and yellow transformer leads.

BROADCAST INTERFERENCE IN KRK5 AND KRK7 R-F UNITS

In some cases where a television receiver is in operation on a weak signal but near a strong AM station, interference has been experienced. To cure, insert a 100 mmf. capacitor between the high side of T115 and L116, as shown below.

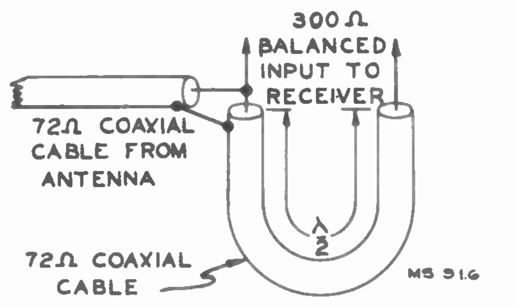


Partial Schematic of R-F Unit

In severe cases of BC interference, it is recommended that a coil such as L80 in KRK-2 r-f units be inserted from terminal #1 of J102 to ground.

CO-AX TO BALANCED LINE MATCHING NETWORK

In some locations it may be necessary to use 72 ohm co-ax transmission line between antenna and receiver because of reflection or interference pick-up. Current line receivers are provided with a 72 ohm co-ax input in addition to the usual 300 ohm input. Early receivers employing KRK-2 series r-f units are provided only with 300 ohm balanced input. To connect the co-ax to these early receivers, construct a network as shown below. The matching section should be one electrical half wave-length long for the picture carrier of the weakest signal received.



Co-Ax to Balanced Line Matching Network

Figure 19—Normal Picture

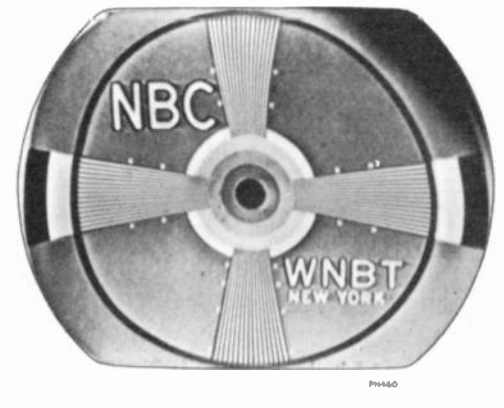


Figure 20—Focus Coil and Ion Trap Magnet Misadjusted

Figure 21—Horizontal Linearity Control Misadjusted

Figure 22—Width Control Misadjusted

Figure 23—Horizontal Drive Control Misadjusted

Figure 24—Transients

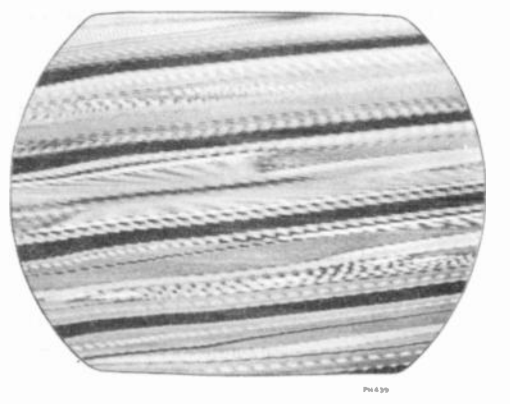


Figure 25—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is in a Counter-clockwise Position—Just Before Pulling Into Sync

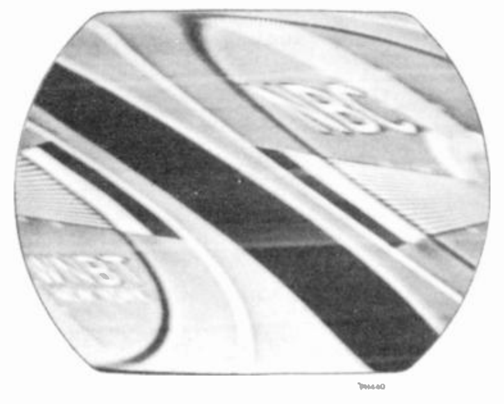


Figure 26—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

Following is a list of symptoms of possible failures and an indication of some of the possible faults:

NO RASTER ON KINESCOPE:

(1) Incorrect adjustment of ion trap magnet. Magnets reversed either front to back or top to bottom; front magnet incorrectly oriented.

(2) V112 or V113 inoperative. Check waveforms on grids and plates.

(3) No high voltage—If horizontal deflection is operating as evidenced by the correct waveform on terminal 4 of horizontal output transformer, the trouble can be isolated to the 8016 circuit. Either the T110 high voltage winding is open, the 8016 tube is defective, its filament circuit is open, C168 is shorted, or R187 or R189 are open.

(4) V111 circuit inoperative—Refer to schematic and waveform chart.

(5) Damper tube (V114) inoperative.

(6) Defective kinescope.

(7) R131 open.

(8) No receiver plate voltage—filter capacitor shorted—bleeder or filter choke open.

NO VERTICAL DEFLECTION:

(1) V107B or V110 inoperative. Check voltage and waveforms on grids and plates.

(2) T107 or T108 open.

(3) Vertical deflection coils open.

SMALL RASTER:

(1) Low Plus B or low line voltage.

(2) V112 defective.

POOR VERTICAL LINEARITY:

(1) If adjustments cannot correct, change V110.

(2) Vertical output transformer defective.

(3) V107B defective—check voltage and waveforms on grid and plate.

(4) C150, R164, C147B or C148-C defective.

(5) Low bias or plate voltage—check rectifiers and capacitors in supply circuits.

POOR HORIZONTAL LINEARITY:

(1) If adjustments do not correct, change V112 or V114.

(2) T110 or L111 defective.

(3) C164 or C165 defective.

WRINKLES ON LEFT SIDE OF RASTER:

(1) R166, R167 or C169 defective.

(2) Defective yoke.

PICTURE OUT OF SYNC HORIZONTALLY:

(1) T109 incorrectly tuned.

(2) R172, R173 or R174 defective.

TRAPEZOIDAL OR NON-SYMMETRICAL RASTER

(1) Improper adjustment of focus coil or ion trap magnet.

(2) Defective yoke.

RASTER AND SIGNAL ON KINESCOPE BUT NO SOUND:

(1) R-F oscillator off frequency.

(2) Sound i-f, discriminator or audio amplifier inoperative—check V116, V117, V118, V119, V120 and their socket voltages.

(3) T114 or C186 defective.

(4) Speaker defective.

SIGNAL AT KINESCOPE GRID BUT NO SYNC:

(1) AGC threshold control R138 misadjusted.

(2) V105B, V107A, V108 or V109 inoperative. Check voltage and waveforms at their grids and plates.

SIGNAL ON KINESCOPE GRID BUT NO VERTICAL SYNC:

(1) Check V107B and associated circuit—C145, T107, etc.

(2) Integrating network inoperative—Check.

(3) R154, R155, R157, R158 or R159 defective.

SIGNAL ON KINESCOPE GRID BUT NO HORIZONTAL SYNC:

(1) T109 misadjusted—readjust as instructed on page 11.

(2) V111 inoperative—check socket voltages and waveforms.

(3) T109 defective.

(4) C140, C153A, C154, C155, C157, C166 or C200 defective.

(5) If horizontal speed is completely off and cannot be adjusted check C158, C159, R172, R173, R174, R179 and R182.

SOUND AND RASTER BUT NO PICTURE OR SYNC:

(1) Picture i-f, detector or video amplifier inoperative—check V103, V104, V105 and V106—check socket voltages.

(2) Bad contact to kinescope grid.

PICTURE STABLE BUT POOR RESOLUTION:

(1) V105A or V106 defective.

(2) Peaking coils defective—check for specified resistance.

(3) Make sure that the focus control operates on both sides of proper focus.

(4) R-F and I-F circuits misaligned.

PICTURE SMEAR:

(1) R-F or I-F circuits misaligned.

(2) Open peaking coil.

(3) This trouble can originate at the transmitter—check on another station.

PICTURE JITTER:

(1) AGC threshold control R138 misadjusted.

(2) If regular sections at the left picture are displaced change V112.

(3) Vertical instability may be due to loose connections or noise.

(4) Horizontal instability may be due to unstable transmitted sync.

RASTER BUT NO SOUND, PICTURE OR SYNC:

(1) Defective antenna or transmission line.

(2) R-F oscillator off frequency.

(3) R-F unit inoperative—check V1, V2, V3.

DARK VERTICAL LINE ON LEFT OF PICTURE:

(1) Reduce horizontal drive and readjust width and horizontal linearity.

(2) Replace V112.

LIGHT VERTICAL LINE ON LEFT OF PICTURE:

(1) C169 defective.

(2) V114 defective.

PICTURE I-F RESPONSE.—At times it may b· desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330-ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

Figures 27 through 31 show the responses of the various stages obtained in the above manner. The curves shown are typical although some variation between receivers can be expected. Relative stage gain is not shown.

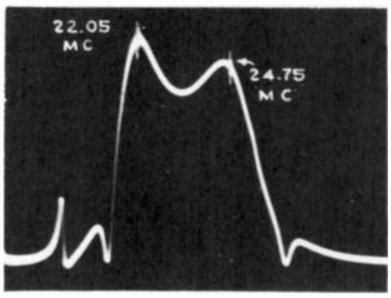


Figure 27—Response of Converter and First Pix I-F Transformer

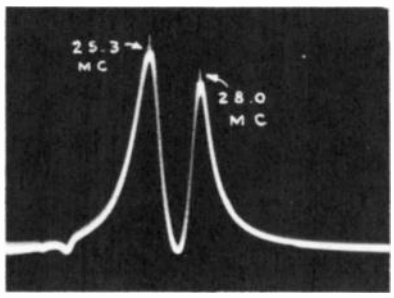


Figure 28—Response of Second Pix I-F Transformer

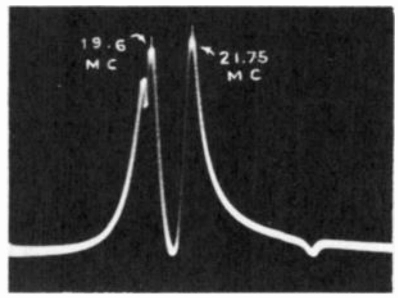


Figure 29—Response of Third Pix I-F Transformer

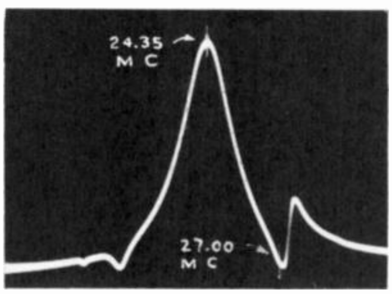


Figure 30—Response of Fourth Pix I-F Transformer

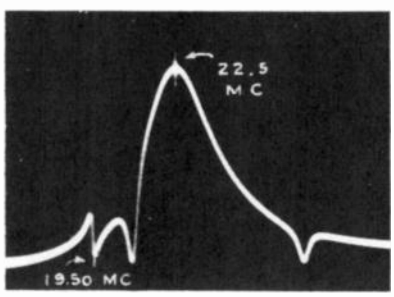


Figure 31—Response of Fifth Pix I-F Transformer

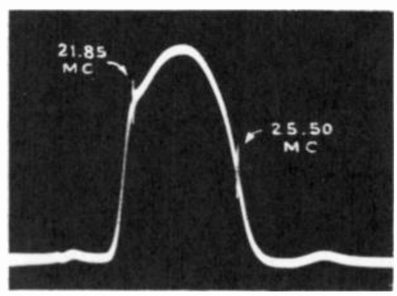


Figure 32—Response from First Pix I-F grid to Pix Det.

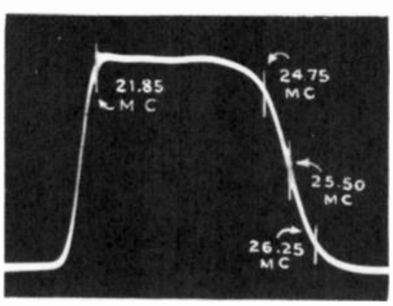


Figure 33—Overall Pix I-F Response

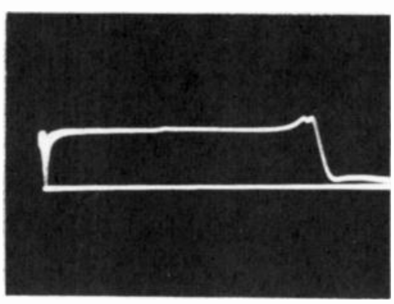


Figure 34—Video Response at Average Contrast

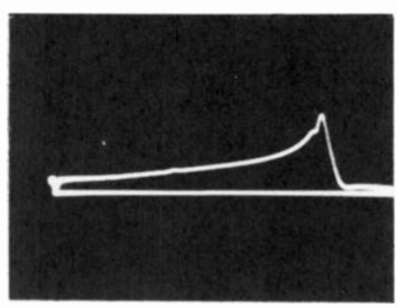
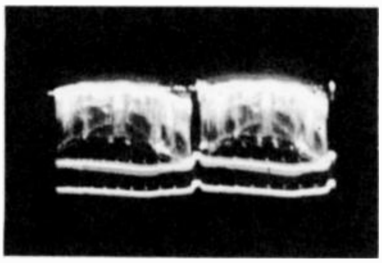


Figure 35—Video Response at Minimum Contrast

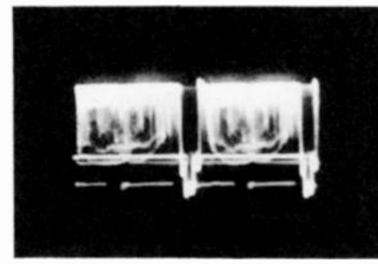
WAVEFORM PHOTOGRAPHS

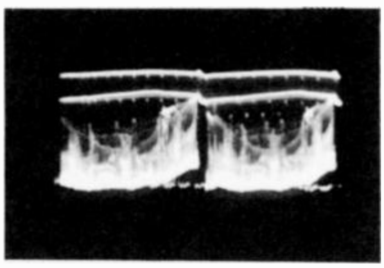


Video Signal Input to 1st Video Amplifier (Pin 2 of V106) (12AU7)

Figure 36—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.4 Volts PP)

Figure 37—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.4 Volts PP)

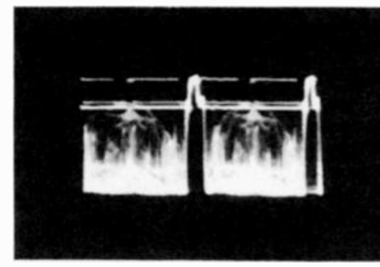


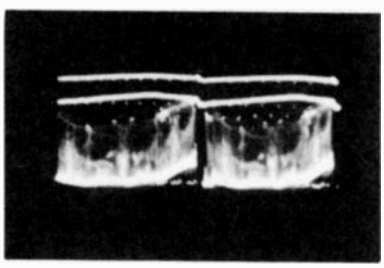


Sync Feed (Junction of L110, R141 and R219 or Junction of L104, R141 and R219)

Figure 38—Vertical (28 Volts PP)

Figure 39—Horizontal (28 Volts PP)

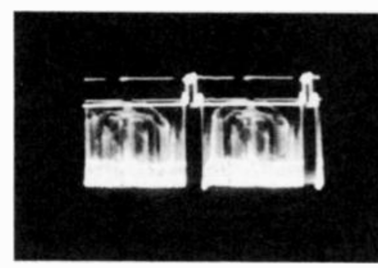


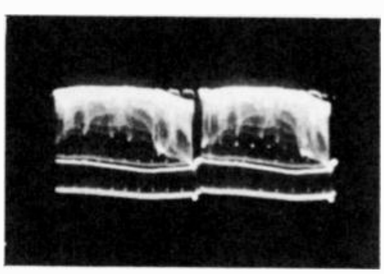


Input to 2nd Video Amplifier (Pin 7 of V106) (12AU7)

Figure 40—Vertical (17 Volts PP)

Figure 41—Horizontal (17 Volts PP)

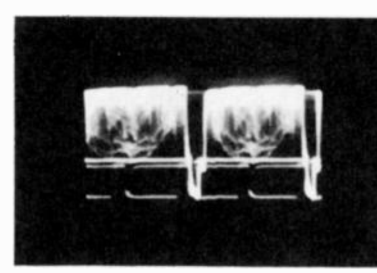


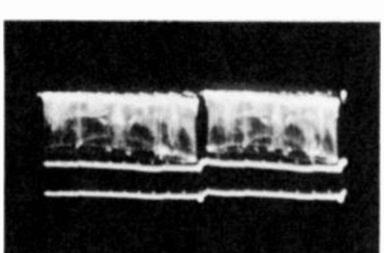


Output of 2nd Video Amplifier (Junction of L105 and R127) (Picture Max.)

Figure 42—Vertical (96 Volts PP)

Figure 43—Horizontal (96 Volts PP)

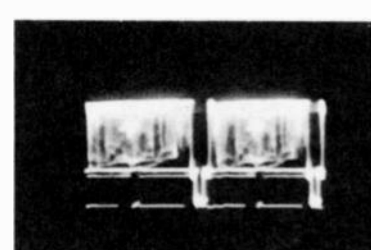


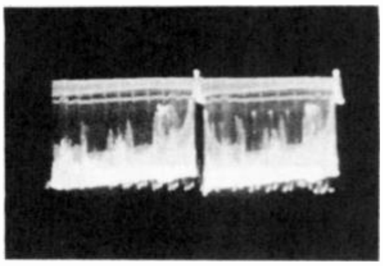


Input to Kinescope (Junction of R127 and R128) (Picture Max.)

Figure 44—Vertical (65 Volts PP)

Figure 45—Horizontal (65 Volts PP)

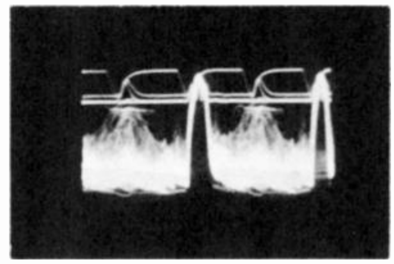


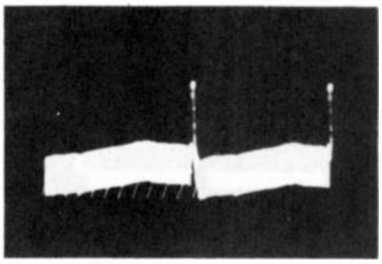


Input to 1st Sync Separator (Pin 1 of V108) (6SN7GT)

Figure 46—Vertical (25 Volts PP)

Figure 47—Horizontal (23 Volts PP)

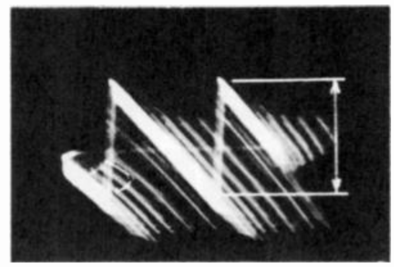


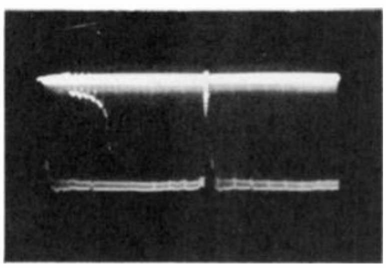


AGC Rectifier Cathode (Pin 6 of V108) (6SN7GT)

Figure 48—Vertical (4.7 Volts PP)

Figure 49—Horizontal (1.5 Volts PP)

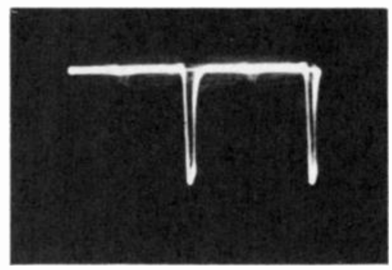


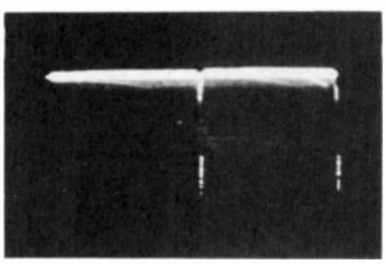


Output of AGC Rectifier (Pin 5 of V108) (6SN7GT)

Figure 50—Vertical (24 Volts PP)

Figure 51—Horizontal (24 Volts PP)

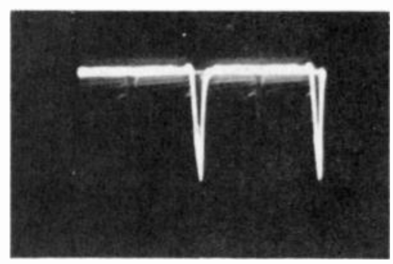


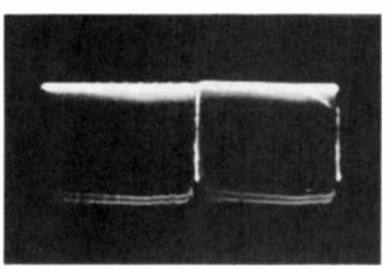


Output of 1st Sync Separator (Pin 2 of V108) (6SN7GT)

Figure 52—Vertical (26 Volts PP)

Figure 53—Horizontal (25.5 Volts PP)

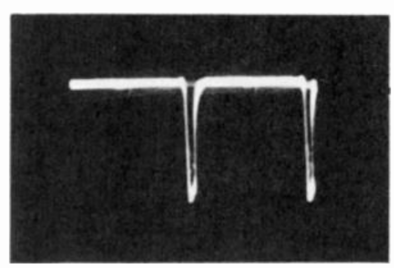




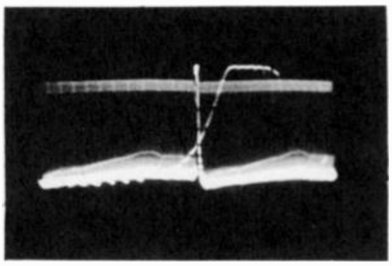
Input to Sync Amplifier (Junction of C137, C139 and R145)

Figure 54—Vertical (21 Volts PP)

Figure 55—Horizontal (21 Volts PP)



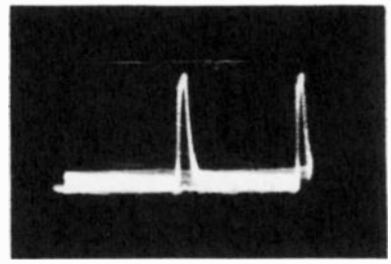
WAVEFORM PHOTOGRAPHS

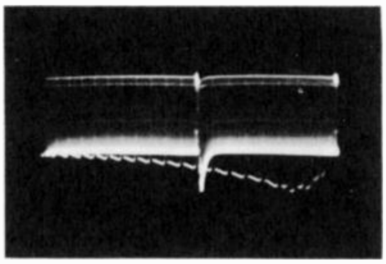


Output of Sync Amplifier (Pin 2 of V109) (6SN7GT)

Figure 56—Vertical (115 Volts PP)
←

Figure 57—Horizontal (105 Volts PP)
→

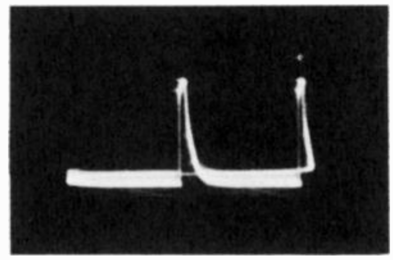




Cathode of 2nd Sync Separator (Pin 6 of V109) (6SN7GT)

Figure 58—Vertical (17 Volts PP)
←

Figure 59—Horizontal (11 Volts PP)
→



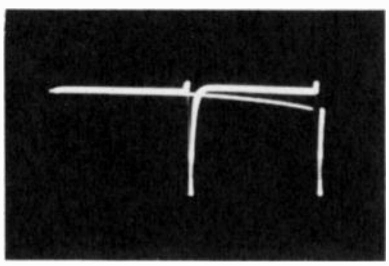
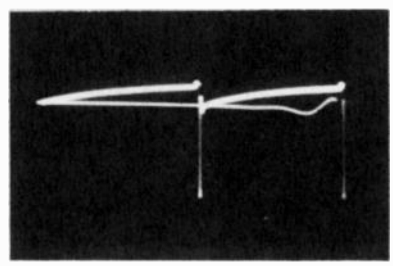


Figure 60—Output of Integrating Network (Junction of C144, C145 and R153) (45 Volts PP)
←

Figure 61—Grid of Verticol Oscillator (720 Volts PP) (Pin 1 of V107) (6SN7GT)
→



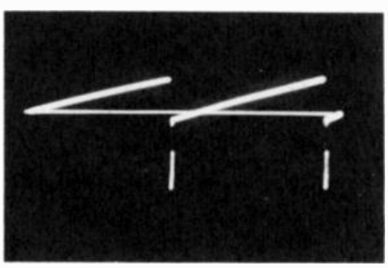
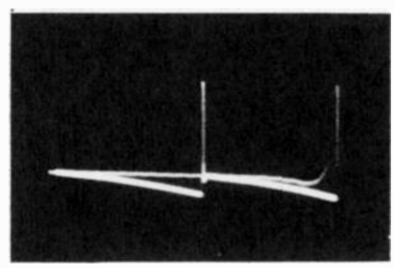


Figure 62—Grid of Vertical Output (160 Volts PP) (Pin 5 of V110) (6K6GT)
←

Figure 63—Plate of Vertical Output (750 Volts PP) (Pin 3 of V110) (6K6GT)
→



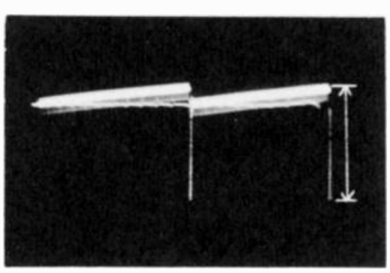
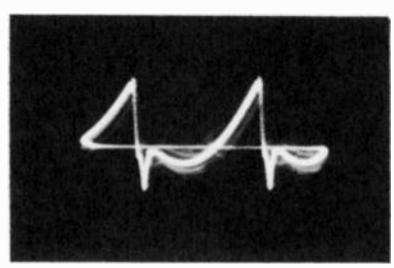


Figure 64—Intput of Vertical Deflection Coils (75 Volts PP) (Junction of Green Lead of T108 and Green Lead of Yoke)
←

Figure 65—Input to Horizontal Oscillator (17.5 Volts PP) (Junction of C153A and C154)
→



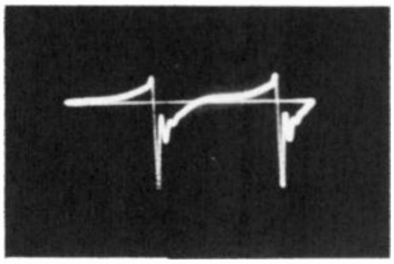
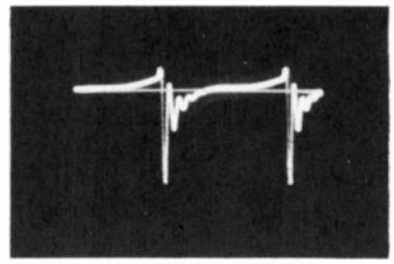


Figure 66—Junction of R168, R176 and R178 (150 Volts PP)

Figure 67—Grid of Horizontal Oscillator (480 Volts PP) Pin 4 of V111) (6SN7GT)



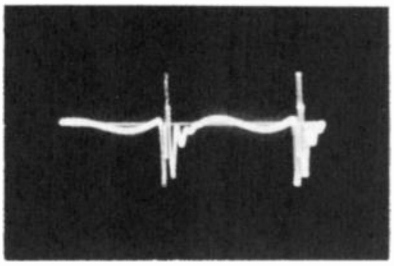
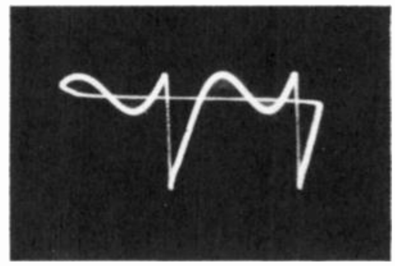


Figure 68—Plate of Horizontal Oscillator (270 Volts PP) (Pin 5 of V111) (6SN7GT)

Figure 69—Terminal "C" of T109 (70 Volts PP)



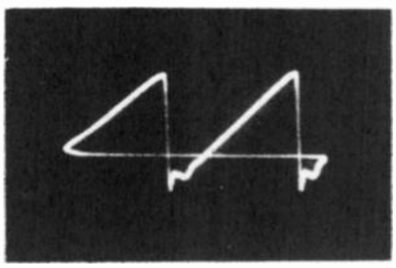
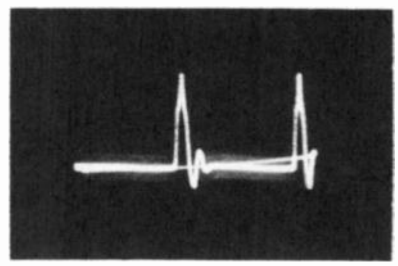


Figure 70—Input to Horizontal Output Tube (42 Volts PP) (Junction of C160, R183 and C153B)

Fig. 71—Plate of Horizontal Output (Approx. 5200 v. PP in 10" sets & 6000 v. PP in 12" Sets) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V112 to Chassis)



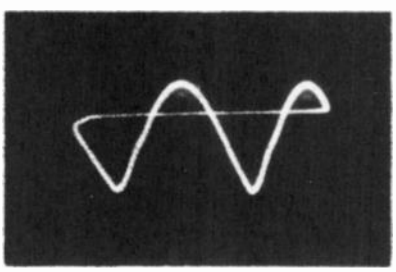
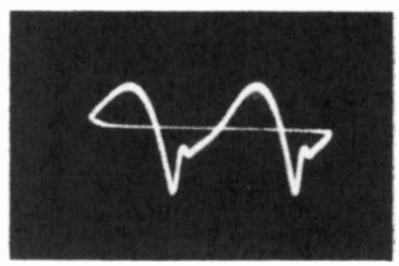


Fig. 72—Terminal 1 of T110 (80 v. PP in Chassis using 5V4G Damper, 165 v. PP in Chassis using 6W4GT Damper —Normal Pix Position in 9T256 and 9TW309)

Fig. 73—Cathode of 5V4G Damper Tube (Pin 8 of V114—33 v. PP) or Plate of 6W4GT Damper Tube (Pin 5 of V114—125 v. PP Normal Pix Position)—Curve will be Inverted for Chassis using 6W4GT Damper Tube



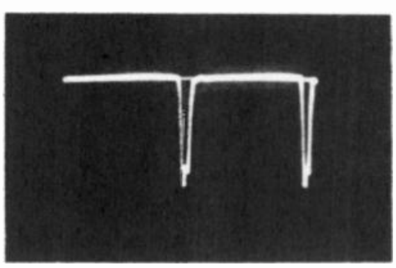
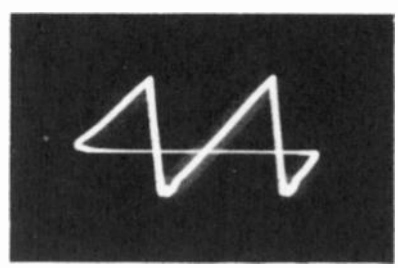


Fig. 74—Input to Horizontal Deflection Coils (Term. 4 of T110)—1150 v. PP in Normal Pix Positon (Curve Will be Inverted for Chassis using 6W4GT Damper Tube)

Figure 75—Horizontal Deflection Coil Current (0.6 amp. PP) Measured by Inserting a 5-ohm Resistor in series with the yoke and observing the waveform across the resistor.



9T246 VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c. Values shown are for both chassis except where otherwise indicated.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140 146	6	142 148	2 & 7	0 0	1	–2.4 –4.9	.72 .72	.33 .33	KCS38 KCS28C
			No Signal	5	67 85	6	111 120	2 & 7	0 0	1	–0.4 –0.4	14.0 12.0	5.0 4.0	KCS38 KCS28C
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*–3.0 to –7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*–2.0 to –6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*–5.1 to –7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*–4.5 to –6.6	*1.8 to 2.1	—	
V101	6BA6 6AG5	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5 5	125 141	6 6	125 141	7 2 & 7	.4 .07	1 1	–12.5 –3.9	2.8 .8	1.3 .22	KCS38 KCS28C
			No Signal	5 5	95 108	6 6	95 108	7 2 & 7	1.1 .11	1	+0.3 –.09	7.5 4.97	3.5 1.73	KCS38 KCS28C
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	115 130	6	115 130	2 & 7	.75 .86	1	0 0	8.2 9.48	2.5 3.12	KCS38 KCS28C
			No Signal	5	100 106	6	100 106	2 & 7	.65 .6	1	0 0	6.8 7.6	2.1 2.6	KCS38 KCS28C
V103	6BA6 6AG5	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5 5	110 130	6 6	135 140	7 2 & 7	.25 .03	1 1	–12.5 –3.9	4.0 .51	3.8 .09	KCS38 KCS28C
			No Signal	5	60 94	6	100 109	2 & 7	.75 .11	1	–0.4 –.09	11.0 3.92	4.8 1.5	KCS38 KCS28C
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	170 175	6	135 145	2 & 7	1.35 1.38	1	0 0	6.5 7.0	2.0 2.0	KCS38 KCS28C
			No Signal	5	175 167	6	120 109	2 & 7	1.2 .95	1	0 0	5.9 5.7	1.8 1.5	KCS38 KCS28C
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	–113	—	—	1	–112	—	—	.48	—	
			No Signal	7	–120	—	—	1	–120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	–107	—	—	5	–56	—	—	—	—	
			No Signal	2	–80	—	—	5	–60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	–23.2	—	—	3	–111	2	–113	4.38	—	
			No Signal	1	–19.2	—	—	3	–117	2	–120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*166	—	—	8	*–5.3	7	*–12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*–5.6	7	*–10.3	6.9	—	
V107 A	6SN7 GT	ACG Amplifier	2200 Mu. V. Signal	5	–12.5 –17.9	—	—	6 6	–55.5 –55.5	4 4	–56.5 –56.5	.9 .9	— —	KCS38 KCS28C
			No Signal	5	+0.3 –5.2	—	—	6 6	–60 –60	4 4	–64 –64	.3 .3	— —	KCS38 KCS28C
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	76	—	—	3	–111	1	–158	.2	—	
			No Signal	2	62	—	—	3	–120	1	–169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	97	—	—	6	–3.4	4	–19.3	.3	—	
			No Signal	5	81	—	—	6	–8.7	4	–19.3	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	96	—	—	3	–1.8	1	–19.5	.1	—	
			No Signal	2	81	—	—		–9.7	1	–19.3	.1	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	158	—	—	3	0	1	–4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	–5.2	3.75	—	
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	230	—	—	6	–51	4	–106	.4	—	
			No Signal	5	215	—	—	6	–59	4	–80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	223	4	223	8	–67	5	–91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	–79	5	–101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	–110	1	–92	.2	—	*Variation of hold gives –21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	–120	1	–108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	–111	4	–185	2.4	—	
			No Signal	5	54	—	—	6	–120	4	–192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	180 160	3	–90 –104	5	–110 –101	68 93.5	— 11.5	KCS38 KCS28C
			No Signal	Cap	Do Not Meas.	8	170 142	3	–100 –113	5	–115 –112	67 90.8	— 11.2	KCS38 KCS28C
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	9500 8500	—	—	0	—	KCS38 KCS28C
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	9000 8400	—	—	.1	—	KCS38 KCS28C
V114	6W4GT 5V4G	Damper	2200 Mu. V. Signal	5 4 & 6	Do Not Meas.	— —	— —	3 2 & 8	290 339	— —	— —	66 94.5	— —	KCS38 KCS28C
			No Signal	4 & 6	Do Not Meas.	—	—	2 & 8	280 322	—	—	65 92	—	KCS38 KCS28C
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6 4 & 6	335 390	For For	KCS38 KCS28C	2 & 8 2 & 8	250 291	—	—	210 225	— —	*A-C measured from plate to trans. center tap
			No Signal	4 & 6 4 & 6	335 390	For For	KCS38 KCS28C	2 & 8 2 & 8	245 272	—	—	215 230	— —	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	0	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	148	6	90	7	0	1	–9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	–.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	–8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	–2.0	—	—	5	.41	—	—	—	—	
			2200 Mu. V. Signal	7	–3.7	—	—	1	0	—	—	—	—	
			No Signal	7	–1.08	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	–.89	.49	—	
			No Signal	7	83	—	—	2	0	1	–.89	.4	—	
V120	6K6-GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	–99	5	–108	19.3	3.3	
			No Signal	3	72	4	80	8	–111	5	–114	18	3	
V121	10BP4	Kinescope	2200 Mu. V. Signal	Cap	9000 *8400	10	339	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	—	10	322	11	42	2	14	—	—	Average Brightness
			2200 Mu. V. Signal	Cap	—	10	339	11		2		.4	—	Maximum Brightness
		KCS38 KCS28C	2200 Mu. V. Signal	Cap	9200 *8500	10	339	11		2		0	—	Minimum Brightness

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the bypass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress the blue lead from pin 5 of V119 down against the chassis.
9. Dress C129 and C130 up and away from the chassis.
10. Dress the yellow lead from the picture control away from the chassis. Dress the yellow lead from pin 8 of V106 away from the chassis.
11. Dress the green lead from pin 2 of V106 away from the chassis.
12. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
13. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
14. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
15. Dress leads from L110 (width control coil) away from the transformer frame.
16. Dress T110 winding leads away from the windings and away from the transformer frame.

R-F UNIT WIRING DIAGRAM

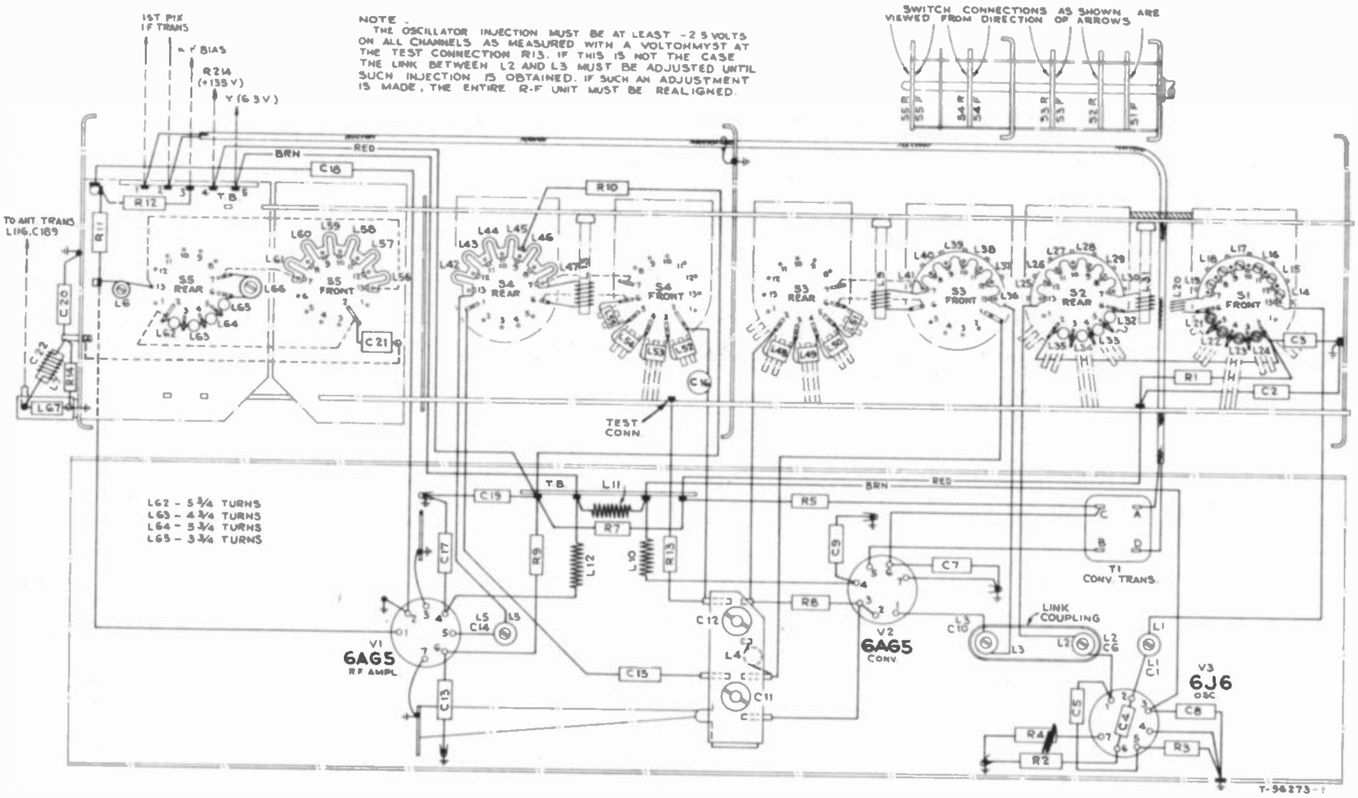


Figure 76—R-F Unit Wiring Diagram

CHASSIS WIRING DIAGRAM FOR KCS28C

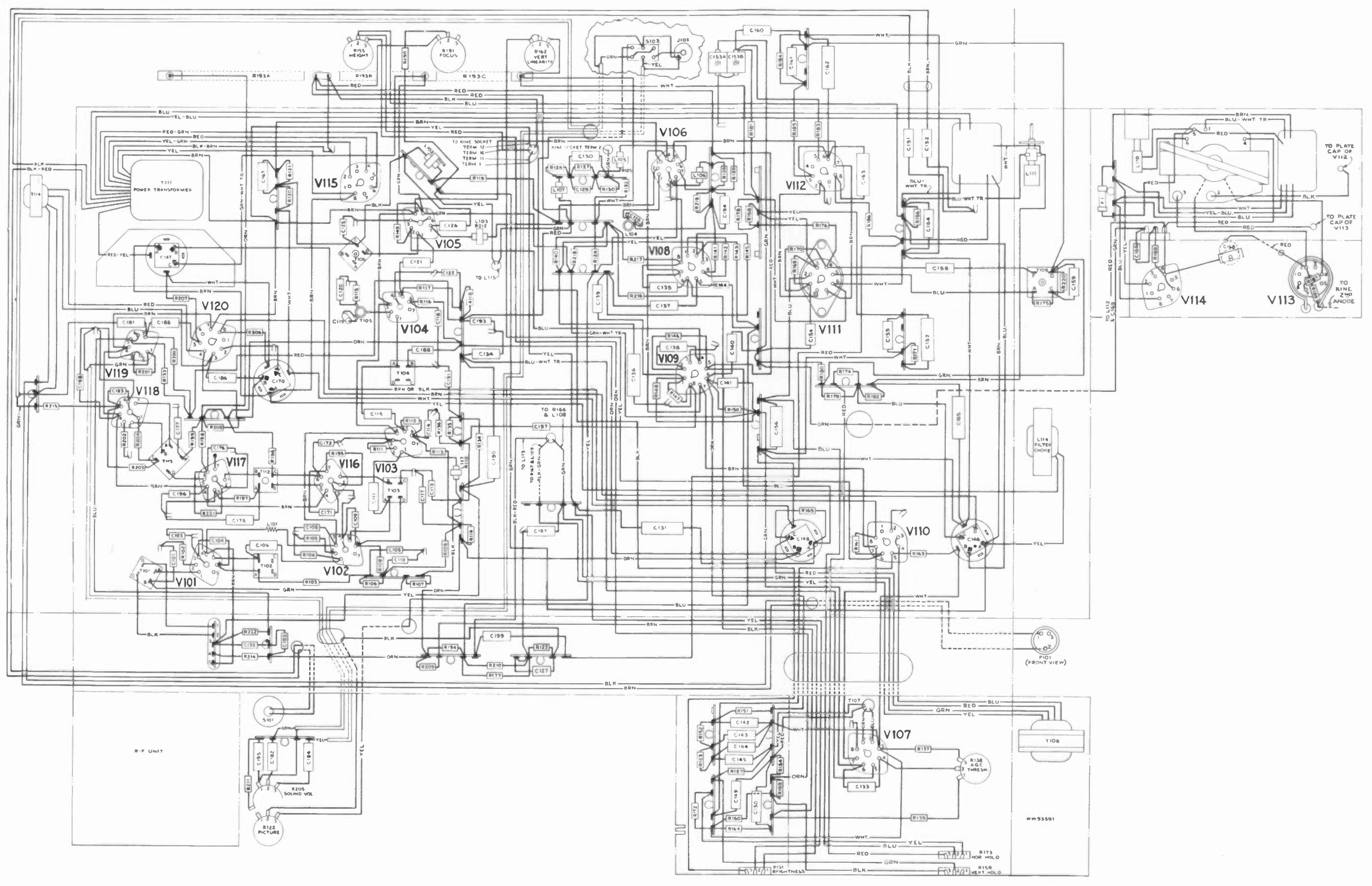
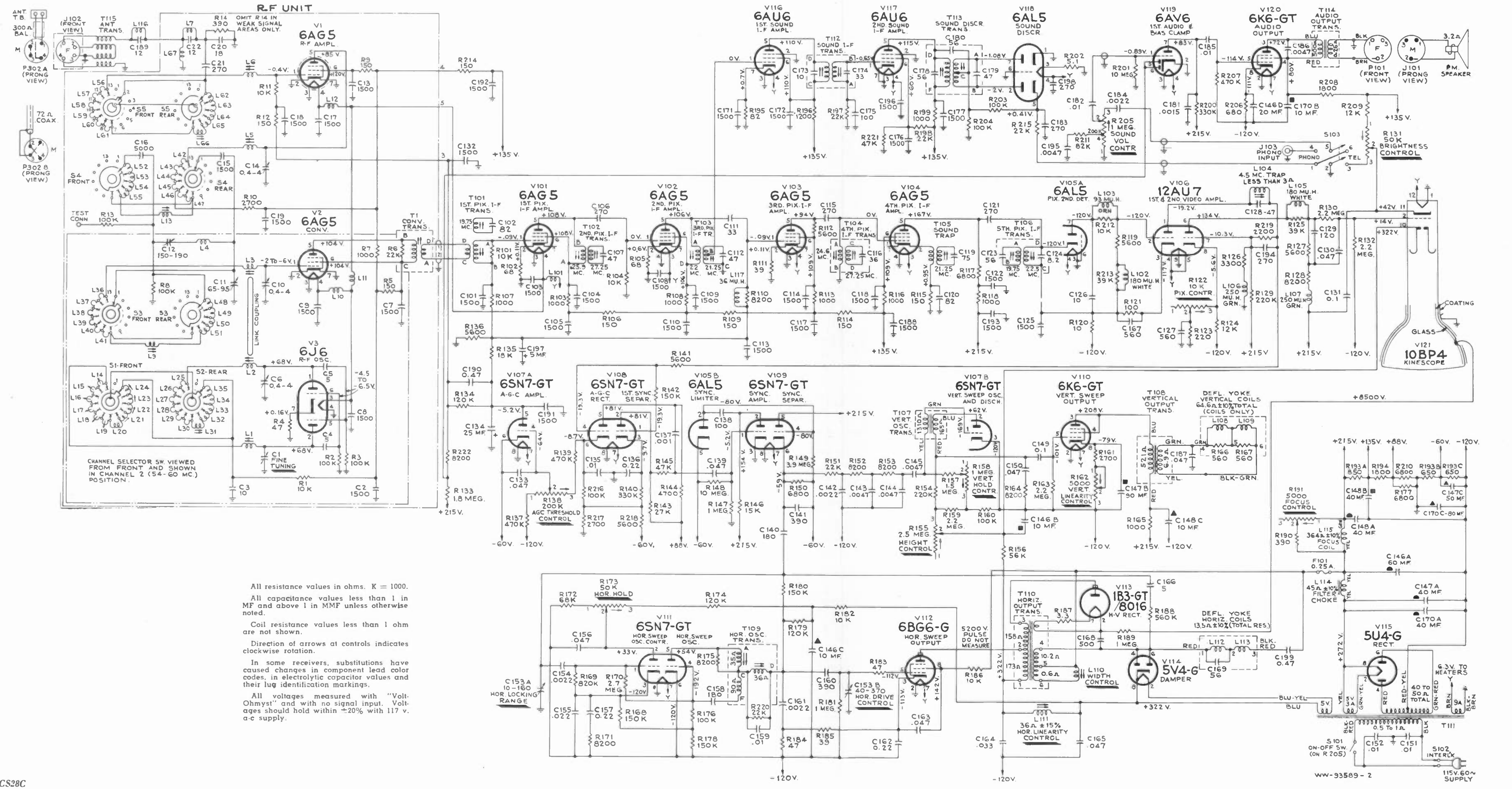


Figure 77—Chassis Wiring Diagram for KCS28C

CIRCUIT SCHEMATIC DIAGRAM FOR KCS28C



All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

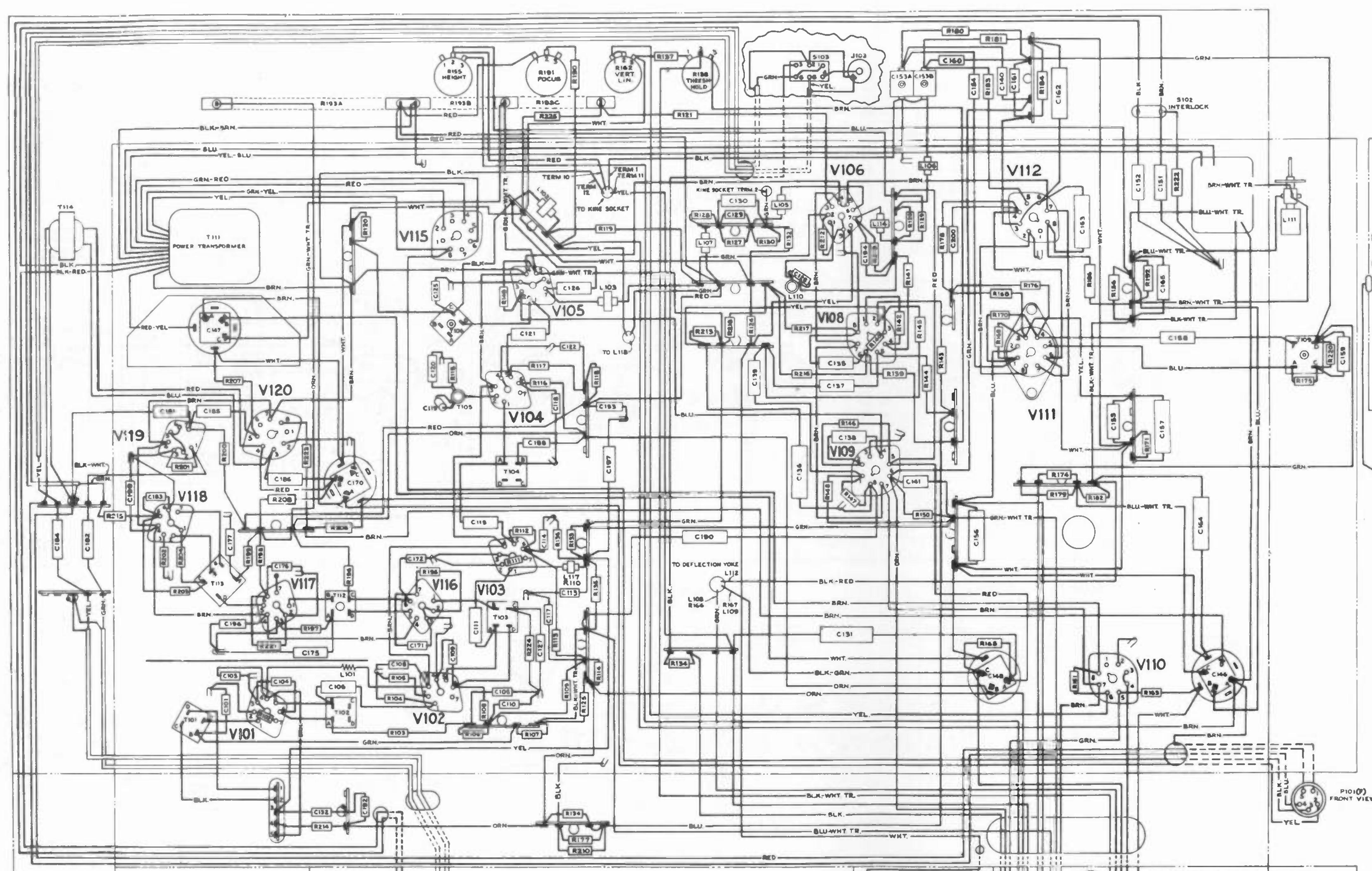
Direction of arrows at controls indicates clockwise rotation.

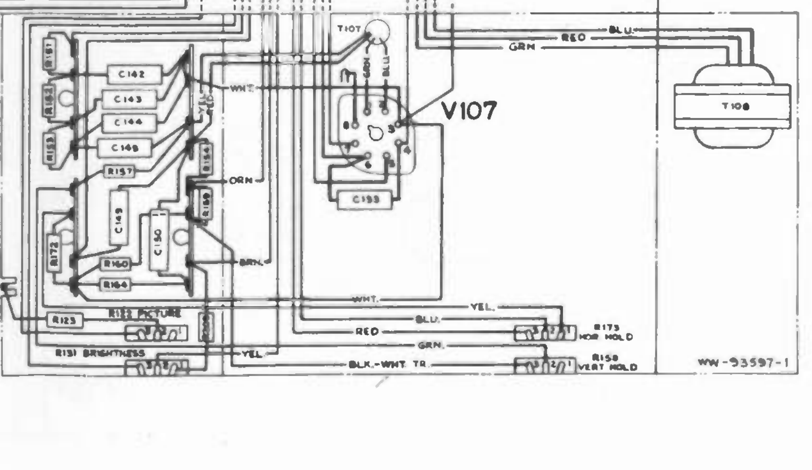
In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

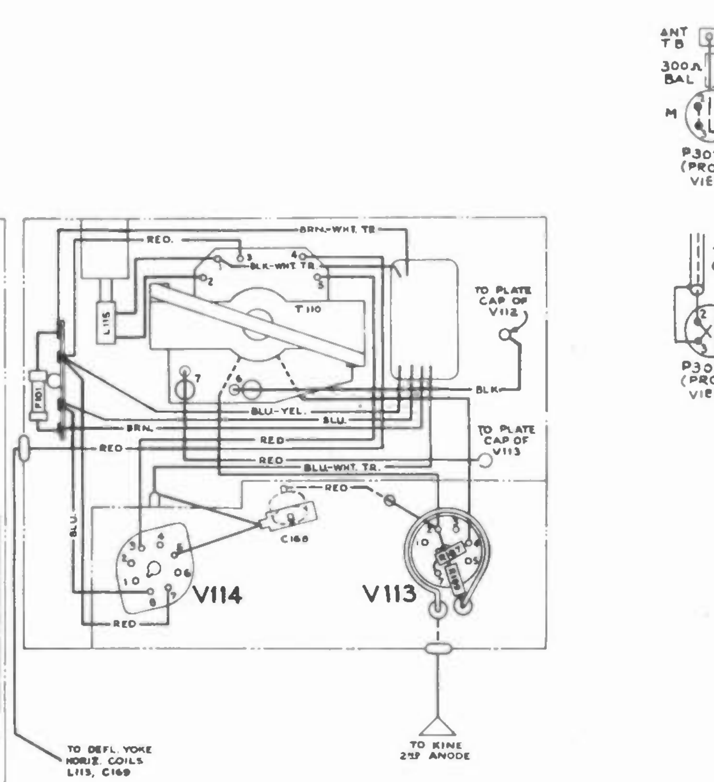
All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 78—Circuit Schematic Diagram for KCS28C

CHASSIS WIRING DIAGRAM FOR KCS38

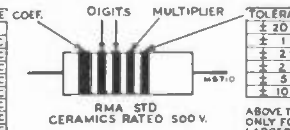






RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	- 30 PPM/°C
RED	- 80 PPM/°C
ORANGE	-150 PPM/°C
YELLOW	- 220 PPM/°C
GREEN	-330 PPM/°C
BLUE	-470 PPM/°C
VIOLET	- 750 PPM/°C
GRAY	+ 30 PPM/°C



TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

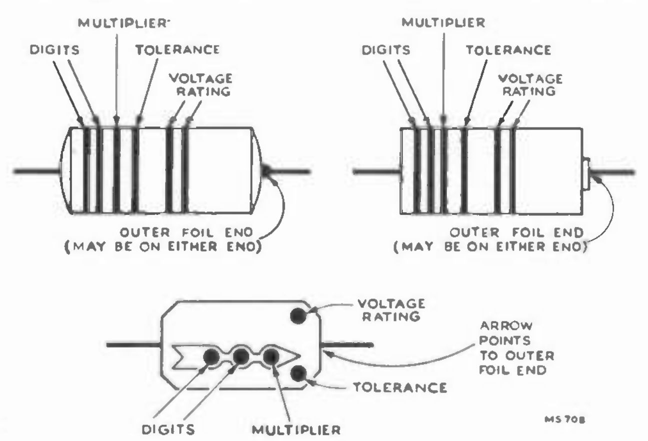
COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 32

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted. If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for bypass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

Figure 79—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS



CAPACITY VALUE IN MMF

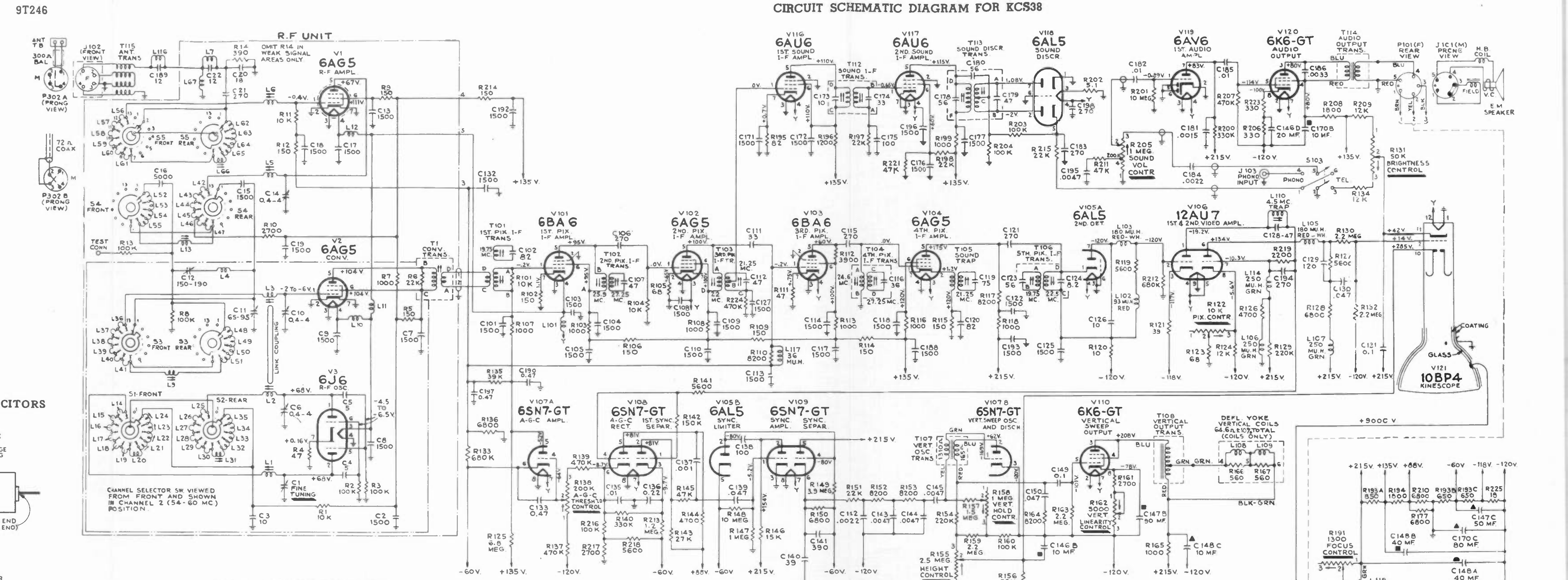
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE

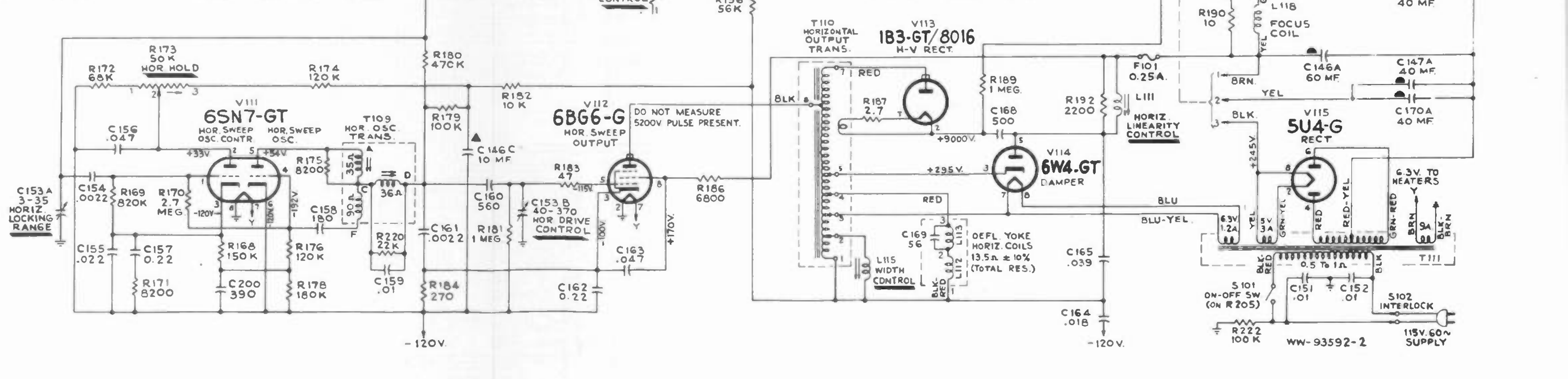
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

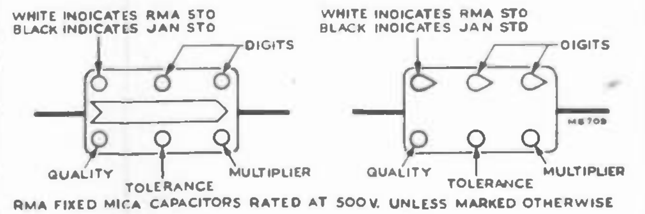
CIRCUIT SCHEMATIC DIAGRAM FOR KCS38



In some receivers, L117, R110 and C113 were connected to junction R135 and C190.



RMA COLOR CODE, FIXED MICA CAPACITORS



RMA FIXED MICA CAPACITORS RATED AT 500V. UNLESS MARKED OTHERWISE

TOLERANCE / **QUALITY**

COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers R212 was 560K.

Figure 80—Circuit Schematic Diagram for KCS38

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK 7
75069	Board—R-F unit power connection terminal board (5 contact)
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C18)
73473	Capacitor—Ceramic, 5000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for oscillator section or converter section (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to convertor trimmer loop connector
74572	Plate—Front plate and bushing for KRK 7
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 1000 ohms ±10%, ½ watt (R11)
	Resistor—Fixed, composition, 1000 ohms ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 2700 ohms ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms ±20%, ½ watt (R2, R3, R8, R13)
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—#4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—#4-40 x ⅝" adjusting screw for L66
71475	Screw—#4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—#4-40 x 17/32" adjusting screw for L6
74573	Shaft—Channel selector shaft complete with pawl and stud for KRK 7
74574	Shaft—Fine tuning shaft and cam assembly for KRK 7
72951	Shield—Metal tube shield for V3
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F Unit
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
75068	Spring—Retaining spring for r-f oscillator tube shield
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
73468	Stator—Front oscillator section stator complete with rotor, segment, coils, and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Convertor stator complete, with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically for "Hi Q"
73448	Transformer—Convertor transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
74577	Washer—Spring washer for fine tuning shaft and cam for KRK 7
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	TELEVISION CHASSIS ASSEMBLIES
	KCS 28 C—9T246 (1s Prod.)
	KCS 38—9T246 (2nd Prod.)
74593	Capacitor—Mica trimmer, comprising 1 section of 3-35 mmf. and 1 section of 40-370 mmf. for KCS38 (C153A, C153B)
72809	Capacitor—Mica, 5 mmf. (C166 for KCS28C)
73580	Capacitor—Mica, trimmer, comprising 1 section of 10-160 mmf. and 1 section of 40-370 mmf. for KCS28C (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
74726	Capacitor—Mica, 39 mmf. (C140 for KCS38)
64062	Capacitor—Ceramic, 82 mmf. (C120)
45233	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf., 1000 v. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
51416	Capacitor—Mica, 180 mmf. (C140 for KCS28C)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
39642	Capacitor—Mica, 390 mmf. (C141, C160 for KCS28C; C200 for KCS38)
74153	Capacitor—Hi-voltage, 500 mmf., 15,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160 for KCS38; C127, C167 for KCS28C)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C132, C171, C172, C176, C177, C188, C192, C193, C196; for KCS28C and KCS38) (C191 for KCS28C, C127 for KCS38)
74106	Capacitor—Electrolytic, 5 mfd., 50 volts (C197 for KCS28C)
53147	Capacitor—Electrolytic, 25 mfd., 50 volts (C134 for KCS28C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts, and 1 section of 50 mfd., 150 volts (C147A C147B, C147C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)

STOCK No.	DESCRIPTION
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73581	Capacitor—Electrolytic, comprtsing 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 1000 volts (C137)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 1000 volts (C181)
73595	Capacitor—Tubular, moulded paper, oil filled, .0022 mfd., 600 volts (C161)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C142, C154, C184)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C186 for KCS38)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mmf., 600 volts (C143, C144, C195, C145, C186 for KCS28C)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C135)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C182)
73565	Capacitor—Tubular, moulded paper, .01 mfd., 600 volts (C151, C152)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd., 600 volts (C159)
73565	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 1000 volts (C185)
74727	Capacitor—Tubular, moulded paper, oil filled, .018 mfd., 1000 volts (C164 for KCS38)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C155)
73596	Capacitor—Tubular, moulded paper, oil filled, .033 mfd., 1000 volts (C164 for KCS28C)
74728	Capacitor—Tubular, moulded paper, oil filled, .039 mfd., 1000 volts (C165 for KCS38)
73558	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 200 volts (C133, C187 for KCS28C)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C130, C139)
73592	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 600 volts (C150)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1000 volts (C163)
73597	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 1000 volts (C165 for KCS28C)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C157, C162)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C136)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C133 for KCS38)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C190, C197)
73787	Capacitor—Tubular, moulded paper, oil impregnated, 0.47 mfd., 200 volts (C199 for KCS28C)
73154	Choke—Filter choke (L114 for KCS28C)
74585	Coil—Focus coil for KCS38 (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L110 for KCS28; L115 for KCS38)
73566	Coil—Focus coil for KCS28C (L115)
71526	Coil—Peaking coil (250 mh) (L106, L107, L114 for KCS38)
73477	Coil—Choke coil (L101)
71527	Coil—Peaking coil (93 mh) (L102 for KCS38)
74214	Coil—Peaking coil (180 mh) (L103, L105 for KCS38)
74170	Coil—Peaking coil (36 mh) (L117, R110)
71528	Coil—Peaking coil (L105, R125, L102, R213 for KCS28C)
72619	Coil—Peaking coil (L103, R212 for KCS28C)
74594	Connector—2 contact male connector for power cable
35787	Connector—Phono input connector (J103)
5119	Connector—3 contact female connector for speaker cable for KCS28C
12493	Connector—5 contact female connector for speaker cable for KCS38
71789	Connector—Kinescope anode connector
71521	Contact—Hi-voltage capacitor contact
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control for KCS38 (R122, R131)
38408	Control—Sound volume control and power switch for KCS38 (R205, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74475	Control—AGG threshold control (R138)
74597	Control—Focus control for KCS38 (R191)
73156	Control—Brightness control for KCS28C (R131)
73910	Control—Picture control and volume control and power switch for KCS28C (R122, R205, S101)
74442	Control—Focus control for KSC28C (R191)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432, #73581 & #73582
74418	Cushion—Rubber cushion for kinescope bottom support
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket
73301	Magnet—Ion trap magnet (P.M. type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
74598	Resistor—Wire wound, 2.7 ohms, ¼ watt (R187 for KCS38)
71513	Resistor—Wire wound, 3.3 ohms, ¼ watt (R187 for KCS28C)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190 for KCS38)
	Resistor—Fixed, composition, 10 ohms ±20%, ½ watt (R120)
	Resistor—Fixed composition, 18 ohms ±10%, ½ watt (R225 for KCS38)
	Resistor—Fixed composition, 39 ohms ±10%, ½ watt (R111 for KCS28C; R121 for KCS38)
	Resistor—Fixed composition, 39 ohms ±10%, 1 watt (R185 for KCS28C)
	Resistor—Fixed composition, 47 ohms ±5%, ½ watt (R111 for KCS38)
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R183)
	Resistor—Fixed composition, 47 ohms ±10%, 1 watt (R184 for KCS28C)
	Resistor—Fixed composition, 68 ohms ±10%, ½ watt (R105; R102 for KCS28C)
	Resistor—Fixed composition, 68 ohms ±20%, ½ watt (R123 for KCS38)
	Resistor—Fixed, composition, 82 ohms ±10%, ½ watt (R195)
	Resistor—Fixed composition, 100 ohms ±10%, ½ watt (R121 for KCS28C)

STOCK No.	DESCRIPTION
	Resistor—Fixed composition, 150 ohms ±5%, ½ watt (R102 for KCS38)
	Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R115)
	Resistor—Fixed composition, 150 ohms ±20%, ½ watt (R106, R109, R114, R214)
	Resistor—Fixed composition, 220 ohms ±10%, ½ watt (R123 for KCS28C)
	Resistor—Fixed composition, 270 ohms ±10%, 2 watts (R184 for KCS38)
	Resistor—Fixed composition, 330 ohms ±10%, ½ watt (R206, R223 for KCS38)
72325	Resistor—Wire wound, 390 ohms, 2 watt (R190 for KCS28C)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
	Resistor—Fixed composition, 680 ohms ±10%, 1 watt (R206 for KCS28C)
	Resistor—Fixed, composition, 1000 ohms ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	Resistor—Fixed, composition, 1200 ohms ±10%, ½ watt (R196)
	Resistor—Fixed, composition, 1800 ohms ±10%, 2 watts (R194, R208)
	Resistor—Fixed, composition, 2200 ohms ±10%, ½ watt (R219)
	Resistor—Fixed, composition, 2200 ohms ±10%, 1 watt (R192 for KCS38)
	Resistor—Fixed, composition, 2700 ohms ±10%, ½ watt (R161, R217)
	Resistor—Fixed composition, 3300 ohms ±5%, ½ watt (R126 for KCS28C)
	Resistor—Fixed composition, 3900 ohms ±5%, ½ watt (R112 for KCS38)
	Resistor—Fixed composition, 4700 ohms ±5%, ½ watt (R126 for KCS38)
	Resistor—Fixed composition, 4700 ohms ±10%, ½ watt (R144)
	Resistor—Fixed composition, 5600 ohms ±5%, ½ watt (R112, R136 for KCS28C; R119 for KCS38)
	Resistor—Fixed, composition, 5600 ohms ±10%, ½ watt (R141, R218)
	Resistor—Fixed, composition, 5600 ohms ±10%, 1 watt (R127)
	Resistor—Fixed composition, 6800 ohms ±5%, ½ watt (R136)
	Resistor—Fixed, composition, 6800 ohms ±10%, ½ watt (R150)
	Resistor—Fixed composition, 6800 ohms ±5%, 1 watt (R117 for KCS28C; R128 for KCS38)
	Resistor—Fixed composition, 6800 ohms ±10%, 2 watts (R177, R210, R186 for KCS38)
	Resistor—Fixed composition, 8200 ohms ±5%, ½ watt (R164, R175, R222 for KCS28C)
	Resistor—Fixed, composition, 8200 ohms ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed composition, 8200 ohms ±5%, 1 watt (R117 for KCS38; R128 for KCS28C)
	Resistor—Fixed, composition, 10,000 ohms ±5%, ½ watt (R104)
	Resistor—Fixed, composition, 10,000 ohms ±10%, ½ watt (R182)
	Resistor—Fixed composition, 10,000 ohms ±10%, 2 watts (R186 for KCS28C)
	Resistor—Fixed composition, 12,000 ohms ±10%, ½ watt (R134, R209, R226 for KCS38)
	Resistor—Fixed, composition, 12,000 ohms ±10%, 2 watts (R124)
	Resistor—Fixed, composition, 15,000 ohms ±10%, 1 watt (R146)
	Resistor—Fixed composition, 18,000 ohms ±5%, ½ watt (R135 for KCS28C)
	Resistor—Fixed, composition, 22,000 ohms ±10%, ½ watt (R151, R197, R220)
	Resistor—Fixed, composition, 22,000 ohms ±20%, ½ watt (R198, R215)
	Resistor—Fixed, composition, 27,000 ohms ±10%, ½ watt (R143)
	Resistor—Fixed composition, 39,000 ohms ±5%, ½ watt (R135 for KCS38)
	Resistor—Fixed composition, 47,000 ohms ±10%, ½ watt (R145, R211 for KCS38)
	Resistor—Fixed, composition, 47,000 ohms ±20%, ½ watt (R221)
	Resistor—Fixed, composition, 56,000 ohms ±10%, ½ watt (R156)
	Resistor—Fixed, composition, 68,000 ohms ±10%, ½ watt (R172)
	Resistor—Fixed composition, 82,000 ohms ±10%, ½ watt (R211 for KCS28C)
	Resistor—Fixed, composition, 100,000 ohms ±5%, ½ watt (R203, R204)
	Resistor—Fixed, composition, 100,000 ohms ±10%, ½ watt (R160, R216)
	Resistor—Fixed composition, 100,000 ohms ±5%, 1 watt (R176 for KCS28C)
	Resistor—Fixed composition, 100,000 ohms ±10%, 1 watt (R179 for KCS38)
	Resistor—Fixed composition, 100,000 ohms ±20%, 1 watt (R226 for KCS28C, R222 for KCS38)
	Resistor—Fixed composition, 120,000 ohms ±5%, ½ watt (R134 for KCS28C)
	Resistor—Fixed composition, 120,000 ohms ±5%, 1 watt (R176 for KCS38)
	Resistor—Fixed composition, 120,000 ohms ±10%, 1 watt (R174, R179 for KCS28C)
	Resistor—Fixed composition, 150,000 ohms ±5%, ±10%, ½ watt (R168, R180 for KCS28C)
	Resistor—Fixed, composition, 150,000 ohms ±20%, ½ watt (R142)
	Resistor—Fixed composition, 150,000 ohms ±5%, 1 watt (R178 for KCS28C)
	Resistor—Fixed composition, 180,000 ohms ±5%, 1 watt (R178 for KCS38)
	Resistor—Fixed, composition, 220,000 ohms ±10%, ½ watt (R129, R154)
	Resistor—Fixed composition, 330,000 ohms ±10%, ½ watt (R140)
	Resistor—Fixed composition, 330,000 ohms ±10%, ½ watt (R200)
	Resistor—Fixed composition, 470,000 ohms ±10%, ½ watt (R137, R139) (R180, R224 for KCS38)
	Resistor—Fixed, composition, 470,000 ohms ±20%, ½ watt (R207)
	Resistor—Fixed composition, 560,000 ohms ±10%, ½ watt (R188 for KCS28C)
	Resistor—Fixed composition, 680,000 ohms ±10%, ½ watt (R133, R212 for KCS38)
	Resistor—Fixed, composition, 820,000 ohms ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 1 megohm ±10%, ½ watt (R147, R181)
	Resistor—Fixed, composition, 1 megohm ±20%, 1 watt (R189)
	Resistor—Fixed composition, 1.2 megohms ±5%, ½ watt (R213 for KCS38)
	Resistor—Fixed composition, 1.5 megohms ±5%, ½ watt (R157)
	Resistor—Fixed composition, 1.8 megohms ±5%, ½ watt (R133 for KCS28C)
	Resistor—Fixed, composition, 2.2 megohms ±10%, ½ watt (R130, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohms ±5%, 1 watt (R170)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 3.9 megohms ±10%, ½ watt (R149)
	Resistor—Fixed composition, 6.8 megohms ±10%, ½ watt (R125 for KCS38)
	Resistor—Fixed, composition, 10 megohms ±10%, ½ watt (R148)
	Resistor—Fixed, composition, 10 megohms ±20%, ½ watt (R201)
74601	Screw—#8-32 x ⅜" cross-recessed binder head screw for focus coil mounting (2 required)
74602	Screw—#10-32 x 1¾" cross-recessed round head screw for focus coil adjustments (3 required)
74416	Screw—#10-32 x 1¾" round-head cross-recessed screw for retaining strap #74735
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pix, miniature
72927	Socket—Tube socket, 9 pix, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 8016
72741	Socket—Kinescope socket
73586	Spring—Compression spring used under centering control screws (3 required)
74595	Spring—Anode lead spring
74936	Spring—Suspension spring (coil type for kinescope socket leads
74735	Strap—Retaining strap for kinescope mounting
74596	Support—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
46760	Switch—"TV-Phono" switch (S103)
74586	Transformer—Power transformer, 115 ,volt x 60 cycle for KCS38 (T111)
74587	Transformer—Vertical output transformer for KCS38 (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74588	Transformer—Horizontal output and hi-voltage transformer for KCS38 (T110)
71419	Transformer—Sound output transformer (T114)
74589	Transformer—First pix i-f transformer for KCS38 (T101, C102, R101)
74590	Transformer—Second pix i-f transformer for KCS38 (T102, C107)
74591	Transformer—Third pix i-f transformer for KCS38 (T103, C112)
74592	Transformer—Fourth pix i-f transformer for KCS38 (T104, C116)
73575	Transformer—Fifth pix i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket and bracket (T115, J102)
73567	Transformer—Power transformer, 115 volt, 60 cycle for KCS28C (T111)
73568	Transformer—Vertical output transformer for KCS28C (T108)
73570	Transformer—Horizontal output and hi-voltage transformer for KCS28C (T110)
73571	Transformer—First pix i-f transformer for KCS28C (T101, C102, R101)
73572	Transformer—Second pix i-f transformer for KCS28C (T102, C107)
73573	Transformer—Third pix i-f transformer for KCS28C (T103, C112)
73574	Transformer—Fourth pix i-f transformer for KCS28C (T104, C116)
73577	Trap—4.5 mc. trap (L104, C128 for KCS28C; L110, C128 for KCS38)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	SPEAKER ASSEMBLY (for KCS38)
	970773-1
	RL116-1
71560	Connector—5 contact male connector for speaker
74599	Speaker—5" x 7" EM speaker complete with cone and voice coil
	SPEAKER ASSEMBLY (for KCS28C)
	92573-4
	RL109-5
5118	Connector—3 contact male connector for speaker
73993	Speaker—5" x 7" P.M. speaker complete with cone & voice coil
	MISCELLANEOUS
74637	Back—Cabinet back
75039	Board—"Antenna" terminal board
X3037	Cloth—Grille cloth
39153	Connector—4 contact male connector for antenna cable
74638	Cushion—Vinylite cushion (29¼") for safety glass
74627	Decal—Control function decal for KCS38
74729	Decal—Control function decal for KCS28C
73180	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon
74631	Foot—Rubber foot (4 required)
74632	Gasket—Cork gasket for safety glass
74629	Glass—Cabinet safety glass
74000	Knob—Horizontal hold control or picture control knob
74635	Knob—Channel selector knob—dark
74636	Knob—Fine tuning knob—dark
73998	Knob—Vertical hold control or brightness control knob
74002	Knob—Volume control and power switch knob
74633	Nut—Speed nut for safety glass retainers (4 required)
74630	Panel—Removable grille panel and cloth assembly
74628	Retainers—Safety glass retainers (1 set)
73643	Spring—Spring clip for channel marker escutcheon
14270	Spring—Retaining spring for knobs #73998, #74002, #74636
30330	Spring—Retaining spring for knob #74000

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

TELEVISION RECEIVER
MODEL 9T256
Chassis No. KCS38C
—Mfr. No. 274—

SERVICE DATA
—1949 No. 12—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

Model 9T256, Mahogany Finish Metal Cabinet

GENERAL DESCRIPTION

Model 9T256 is a 10-inch table type television receiver in a mahogany finish metal cabinet. The receiver employs twenty-one tubes plus three rectifiers and a 10-inch kinescope.

The receiver is provided with Electronic Magnifier deflection circuits by which the center portion of the picture may be enlarged to fill the screen. Choice of picture coverage is made by operation of a remote switch.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE........ 61 square inches on a 10BP4 Kinescope

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

Plus and minus approximately 250 kc on channel 2 and plus and minus approximately 650 kc on channel 13.

POWER SUPPLY RATING

KCS38C...................... 115 volts, 60 cycles, 300 watts

AUDIO POWER OUTPUT RATING............ 2.4 watts max.

LOUDSPEAKER

KCS38C....... 970773-1 5-inch x 7-inch EM Dynamic, 3.2 ohms

DIMENSION (inches)	Width	Height	Depth
Cabinet (outside)	22	15⅝	21¼
Chassis (overall)	19½	13	20½

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

WEIGHT

Chassis with Tubes in Cabinet........................ 84 lbs.
Shipping Weight.................................. 99 lbs.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector and Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier and Vertical Sweep Oscillator
(16)	RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier (two tubes)
(24)	RCA 10BP4	Kinescope

Specifications continued on page 2

REFER TO PAGES 186 TO 201 FOR ALIGNMENT PROCEDURE, SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency ....25.75 Mc.
Adjacent Channel Sound Trap ....27.25 Mc.
Accompanying Sound Traps ....21.25 Mc.
Adjacent Channel Picture Carrier Trap ....19.75 Mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency .... 21.25 Mc.
Sound Discriminator Band Width between peaks .... 350 kc

VIDEO RESPONSE .... To 4 Mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SWEEP FREQUENCY .... 15,750 cps

VERTICAL SWEEP FREQENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector ....Single Control Knob
Fine Tuning ....Single Control Knob
Picture and Brightness ....Dual Control Knobs
Picture Horizontal and Vertical Hold ....Dual Control Knobs
Sound Volume and On-Off Switch ....Single Control Knob

NON-OPERATING CONTROLS (excluding r-f and i-f adjustments)

Horizontal Centering ....top chassis screwdriver adjustment
Vertical Centering ....top chassis screwdriver adjustment
Shunt Width Coil ....rear chassis screwdriver adjustment
Height ....rear chassis adjustment
Horizontal Linearity ....rear chassis screwdriver adjustment
Vertical Linearity ....rear chassis adjustment
Horizontal Drive ....rear chassis screwdriver adjustment
Horizontal Osc. Freq. ....bottom chassis adjustment
Horizontal Osc. Waveform .... side chassis adjustment
Horizontal Locking Range ....rear chassis adjustment
Focus ....rear chassis adjustment
Ion Trap Magnet ....top chassis adjustment
Deflection Coil ....top chassis wing nut adjustment
AGC Threshold Control ....rear chassis adjustment
Series Width Coil ....rear chassis screwdriver adjustment
Expanded Width Coil ....rear chassis screwdriver adjustment
Width Selector Switch ....rear chassis screwdriver adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb — particularly that part at the rim of the viewing surface — must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

The following adjustments are necessary when turning the receiver on for the first time:

1. See that the TV-PH switch on the rear apron is in the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

9. Adjust the PICTURE control for suitable picture contrast.

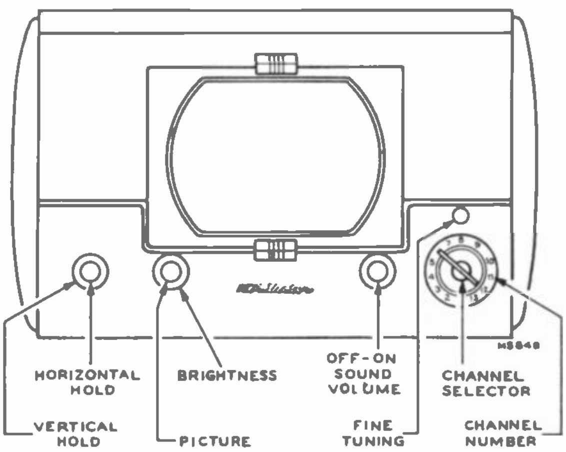


Figure 1—Receiver Operating Controls

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps 4, 8 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have changed, it may be necessary to repeat steps 2 through 9.

14. To operate the Electronic Magnifier push the button on the remote cable.

15. To use the instrument with a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch on "PH." Set the TV-PH switch back to TV on completion of the record program.

INSTALLATION INSTRUCTIONS

Model 9T256 is shipped complete in cardboard cartons. The kinescope is shipped in place in the receiver.

UNPACKING. — To unpack the 9T256, tear open the carton flaps, pick up the receiver from under the bottom of the cabinet, and lift it out of the shipping carton.

The receiver may now be placed on a stand, table or other appropriate support. If a table or piece of furniture other than the regular stand is used for support, care must be taken to see receiver is sitting on the cabinet feet. If the bottom of the cabinet is permitted to touch a table top, the table could become badly scratched.

Take off the cabinet back.

The operating control knobs are packed in a paper bag which is tied on top of the chassis. Remove the bag and install the knobs on the proper control shafts.

Remove the cardboard shield from the 5U4G rectifier.

Make sure that all tubes are in place and are firmly seated in their sockets.

Check to see that the high voltage lead is attached to the kinescope second anode connector socket on the bell of the tube.

Connect the antenna transmission line to the receiver antenna terminals.

Plug the receiver power cord into a 115 volt a-c power source. Turn the receiver power switch to the "on" position, the brightness control three-fourths clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT. — Set the ion trap magnet approximately in the position shown in Figure 2, and with the part number on magnet towards the rear of the chassis. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT. — If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

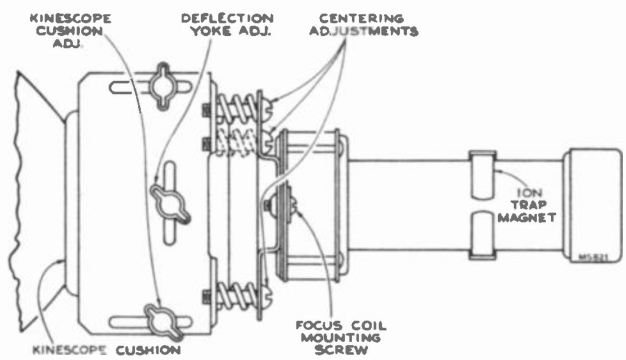


Figure 2—Yoke and Focus Coil Adjustments

PICTURE ADJUSTMENTS. — It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

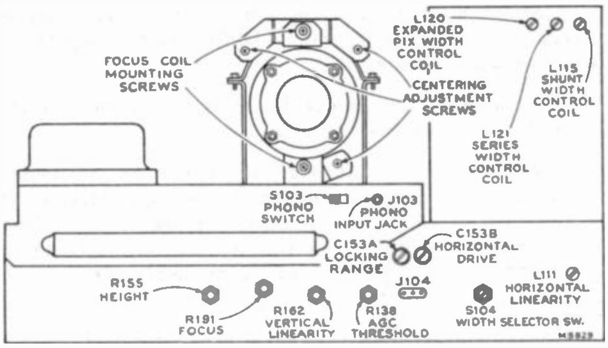


Figure 3—Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT. — Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment. — Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment. — Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENT. — No electrical centering controls are provided. Centering is obtained by mechanically orienting the focus coil with the three adjustment screws shown in Figure 2. Center the picture on the screen by adjustment of these screws. The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster.

FOCUS COIL ADJUSTMENTS. — If, after making the centering adjustments described in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 2) and change the position of the coil to eliminate the shadow. Recenter the picture by adjustment of the centering screws.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained. It is important that the kinescope not be operated with the ion trap magnet adjusted for less than maximum brightness. To do so may cause injury to the tube.

PICTURE SIZE AND LINEARITY. — Connect the "Electronic Magnifier" switch to its socket on the rear apron of the chassis. Set the switch to the large (expanded) picture position. Set the Expanded Width Selector Switch S104 to the counter-clockwise position and adjust the Expanded Width Control L120 so that the test pattern outer circle normally tangent to the top of the picture is now tangent to the side of the picture. (If the width is not sufficient, set the Expanded Width Selector Switch to the center or the clockwise end position.) Adjust the Horizontal Drive and the Horizontal Linearity Control until the pattern is symmetrical from left to right. In general, the core of the Linearity Control Coil should be between one-half to all the way out of the coil.

Set the "Electronic Magnifier" switch to the normal size position. Observe to see if the picture width is correct. If it is not, adjust either the Series Width Control Coil L121, or the Shunt Width Control Coil L115 until the picture is the correct width. If the Series Width Coil core is out too far, the picture will "ring" on the left half. This ring will be shown as one or more faint light or dark vertical bars somewhere on the left half of the picture with resulting poor horizontal linearity.

When the proper width is obtained, switch to the expanded picture position, wait for a few seconds then switch back to the normal position. Observe if the top of the picture immediately assumes its final position or if it takes several seconds to come to a stop. If the picture requires more than a second to become still, adjust the core of L115 or L121 in and the other out while maintaining the proper width. Repeat the above test and observe if the picture immediately comes to rest when switched to the normal size position. Continue to adjust L115 and L121 until this condition is satisfied and the picture is the proper width. Observe the picture horizontal linearity and if necessary retouch Horizontal Drive, Linearity and Width Controls L115 and L121.

With the "Electronic Magnifier" switch in normal position, adjust the Height and Vertical Linearity controls as usual in order to obtain good vertical linearity. In addition, if difficulty is experienced in obtaining good vertical linearity at the top one-half inch of the picture, slightly adjust the Vertical Peaking Control L119.

Switch to the expanded picture position and note if the proper aspect ratio is obtained. If not, adjust L112 and/or S104.

Two hooks are provided in back of the cabinet to permit coiling up any excess cable to the "Electronic Magnifier" switch.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS. — Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMB-SCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL. — The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS. — Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

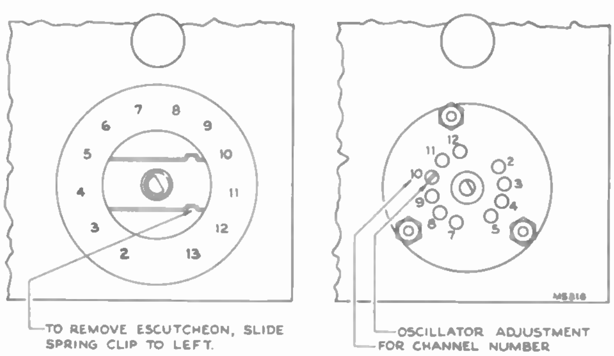


Figure 4—R-F Oscillator Adjustments

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION. — Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

On early production receivers, R11 was 1,000 ohms and R14 was omitted. In order to "peak" these units it will be necessary to remove the unit from the receiver and change R11 to 10,000 ohms. Once the unit is removed from the chassis R11 is easily accessible on the unit rear wafer. When making this change, if the channel number 2 r-f coil L62 consists of 5¾ turns, the outside turn should be "knifed" one wire diameter away from the rest of the coil in order to provide peak response on channel 2. The unit should then be replaced and L66 peaked as described above.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL. — To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the back and the knobs, unplug the speaker cable, and remove the chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

KINESCOPE HANDLING PRECAUTION. — Do not install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap, as shown in Figure 5. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE. — The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

Insert the neck of the kinescope through the deflection and focus coils until the bell of the tube rests against the yoke cushion. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

To replace the chassis in the cabinet, first tighten the cross-recessed head screw on the kinescope strap. Slide the chassis into the cabinet, then insert and tighten the six chassis bolts. Loosen the kinescope strap from the rear of the cabinet, or from the bottom through a hole in the chassis shelf. The bottom end of the cross-recessed head screw is slotted to fit a screw-driver. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Push the yoke forward and tighten. Tighten the kinescope strap. Replace the knobs and proceed with the set-up adjustments.

ANTENNAS. — The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to select the proper antenna to suit the particular local conditions, to install it properly and orient it correctly.

CHASSIS TOP VIEW

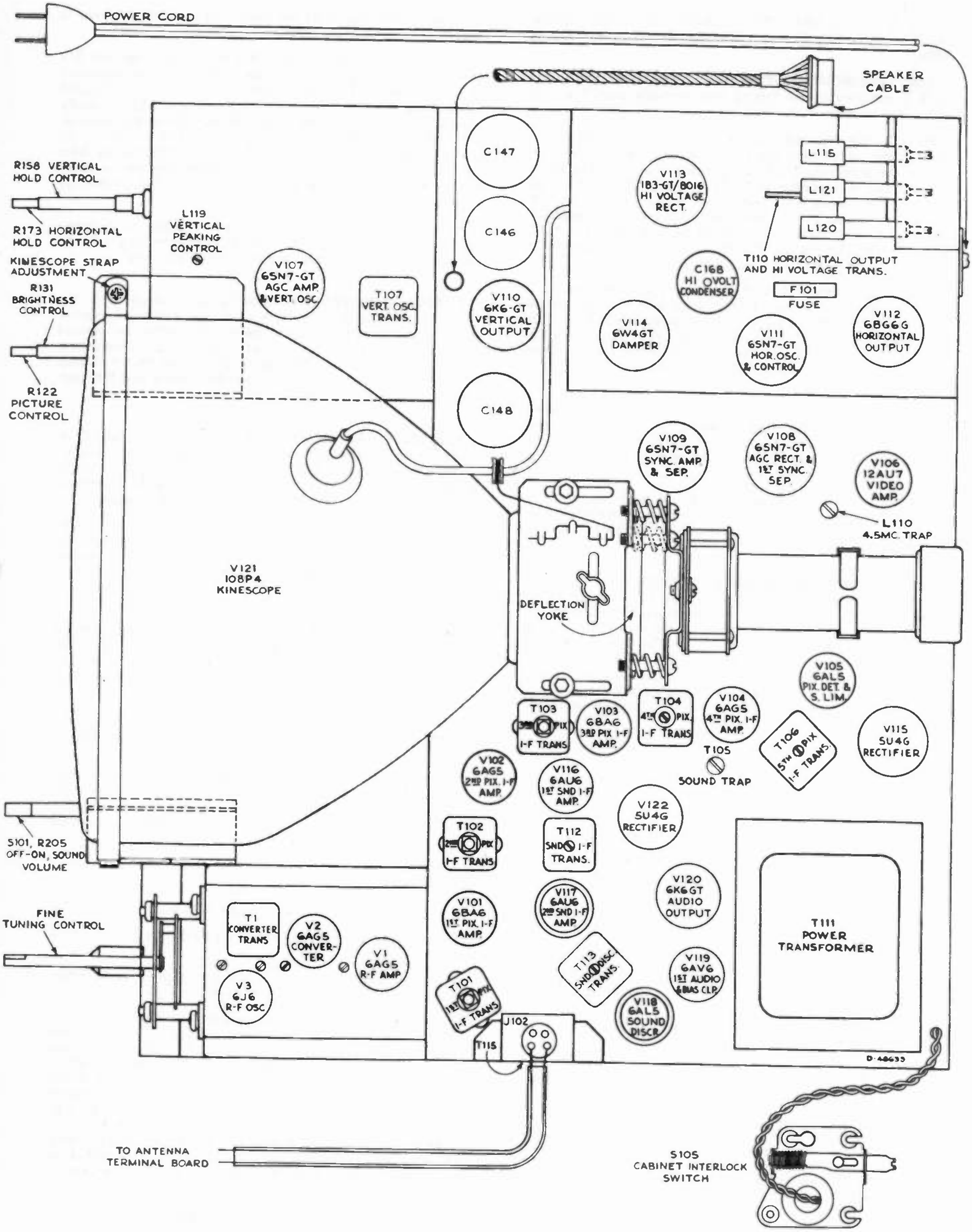


Figure 5—Chassis Top View

CHASSIS BOTTOM VIEW

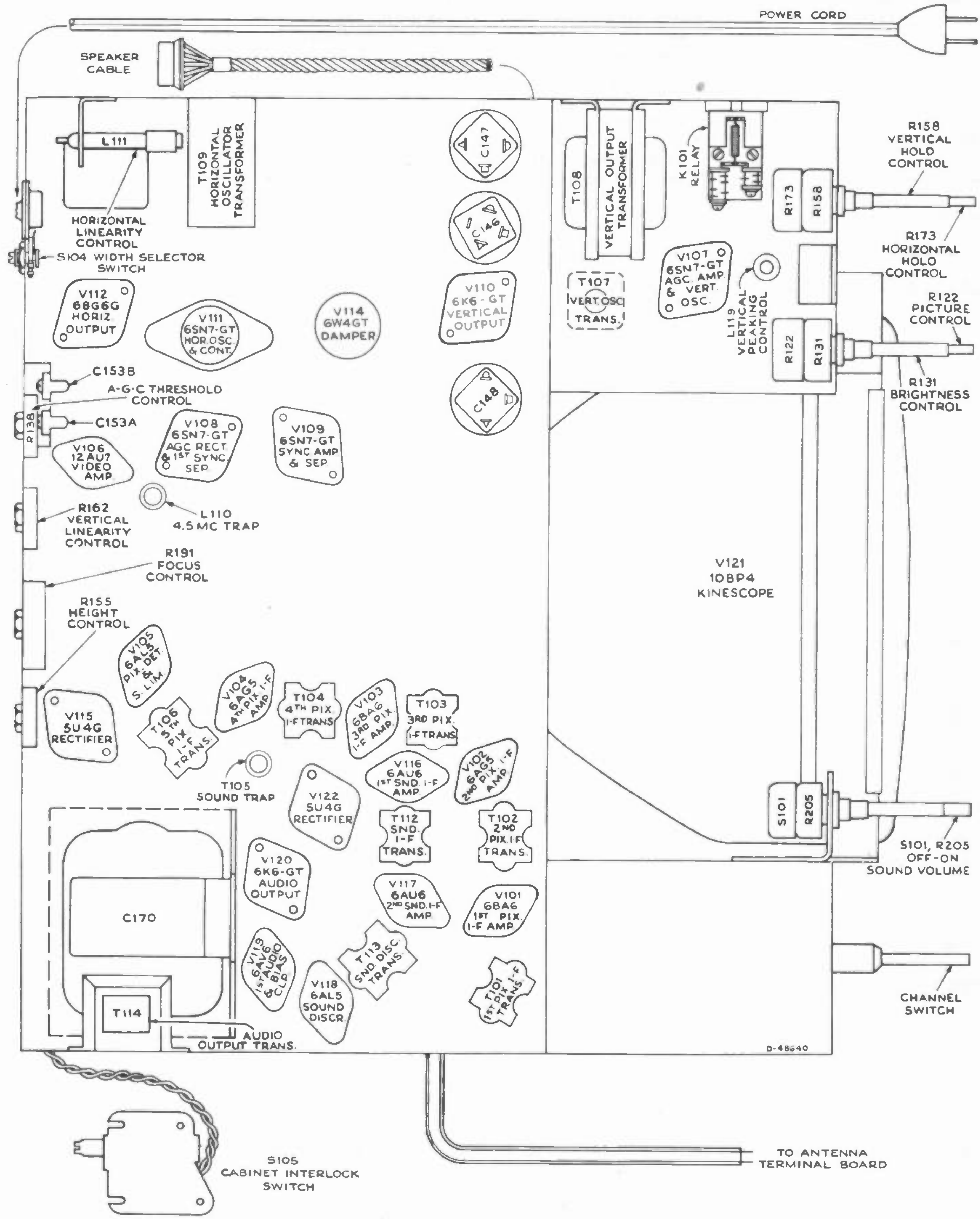


Figure 6—Chassis Bottom View

9T256

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	130	6	132	2 & 7	0	1	–2.2	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	+.2	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*–3.0 to –7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*–2.0 to –6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*–5.1 to –7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*–4.5 to –6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	115	6	115	7	.4	1	–11.0	1.9	.8	
			No Signal	5	87	6	87	7	1.73	1	+.2	8.1	3.4	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	109	6	109	2 & 7	.78	1	0	8.8	2.4	
			No Signal	5	91	6	91	2 & 7	.62	1	0	7.4	1.6	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	81	6	119	7	.52	1	–2.2	11.1	.3	
			No Signal	5	55	6	96	7	.62	1	+.2	13.2	.3	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	159	6	135	2 & 7	1.5	1	0	7.2	2.2	
			No Signal	5	165	6	118	2 & 7	1.35	1	0	6.8	2.4	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	–113	—	—	1	–112	—	—	.48	—	
			No Signal	7	–120	—	—	1	–120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	–107	—	—	5	–56	—	—	—	—	
			No Signal	2	–80	—	—	5	–60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	–30	—	—	3	–111	2	–113	4.38	—	
			No Signal	1	–28	—	—	3	–118	2	–120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*166	—	—	8	–6.5	7	*–12.2	6.2	—	*Variation 0 to –15 with contrast
			No Signal	6	*160	—	—	8	*–9	7	*–10.3	6.9	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	–11.0	—	—	6	–55.5	4	–56.5	.9	—	*Variation of AGC control gives –60 to –75
			No Signal	5	–.2	—	—	6	–60	4	*–64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	*76	—	—	3	–111	1	–158	.2	—	*Variation of height gives –30 to +170
			No Signal	2	*62	—	—	3	–120	1	–169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	95	—	—	6	–3.4	4	–19.3	.3	—	
			No Signal	5	72	—	—	6	–22	4	–28	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	95	—	—	3	–1.8	1	–19.5	.1	—	
			No Signal	2	73	—	—	3	–21	1	–28	.1	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	150	—	—	3	0	1	-4.7	5.25	—	
			No Signal	2	145	—	—	3	0	1	-5.2	3.75	—	
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	220	—	—	6	-51	4	-106	.4	—	
			No Signal	5	205	—	—	6	-59	4	-80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	210	4	210	8	-70	5	-91	*7.85		*Screen connected to plate
			No Signal	3	190	4	190	8	-85	5	-101	*7.7		
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	-110	1	-92	.2	—	*Variation of hold gives -80.9 to +140 volts on plate.
			No Signal	2	*33	—	—	3	-120	1	-108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	-111	4	-185	2.4	—	
			No Signal	5	70	—	—	6	-120	4	-185	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	150	3	-115	5	-110	72	9.4	
			No Signal	Cap	Do Not Meas.	8	145	3	-115	5	-130	70	9.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	9500	—	—	0	—	
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	9000	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	300	—	—	66	—	
			No Signal	5	Do Not Meas.	—	—	3	295	—	—	65	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	*335			2 & 8	220	—	—	210	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	*335			2 & 8	220	—	—	215	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	0	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	148	6	90	7	0	1	-9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	-.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	-8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	-2.0	—	—	5	.41	—	—	—	—	
			2200 Mu. V. Signal	7	-3.7	—	—	1	0	—	—	—	—	
			No Signal	7	-1.08	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	.89	.49	—	
			No Signal	7	83	—	—	2	0	1	-.89	.4	—	
V120	6K6-GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	-99	5	-108	19.3	3.3	
			No Signal	3	72	4	80	8	-111	5	-120	18	3	
V121	10BP4	Kinescope	2200 Mu. V. Signal	Cap	*9000	10	290	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	—	10	285	11	42	2	14	—	—	Average Brightness
			2200 Mu. V. Signal	Cap	—	10	290	11		2		.4	—	Maximum Brightness
			2200 Mu. V. Signal	Cap	9200	10	290	11		2		0	—	Minimum Brightness

R-F UNIT WIRING DIAGRAM

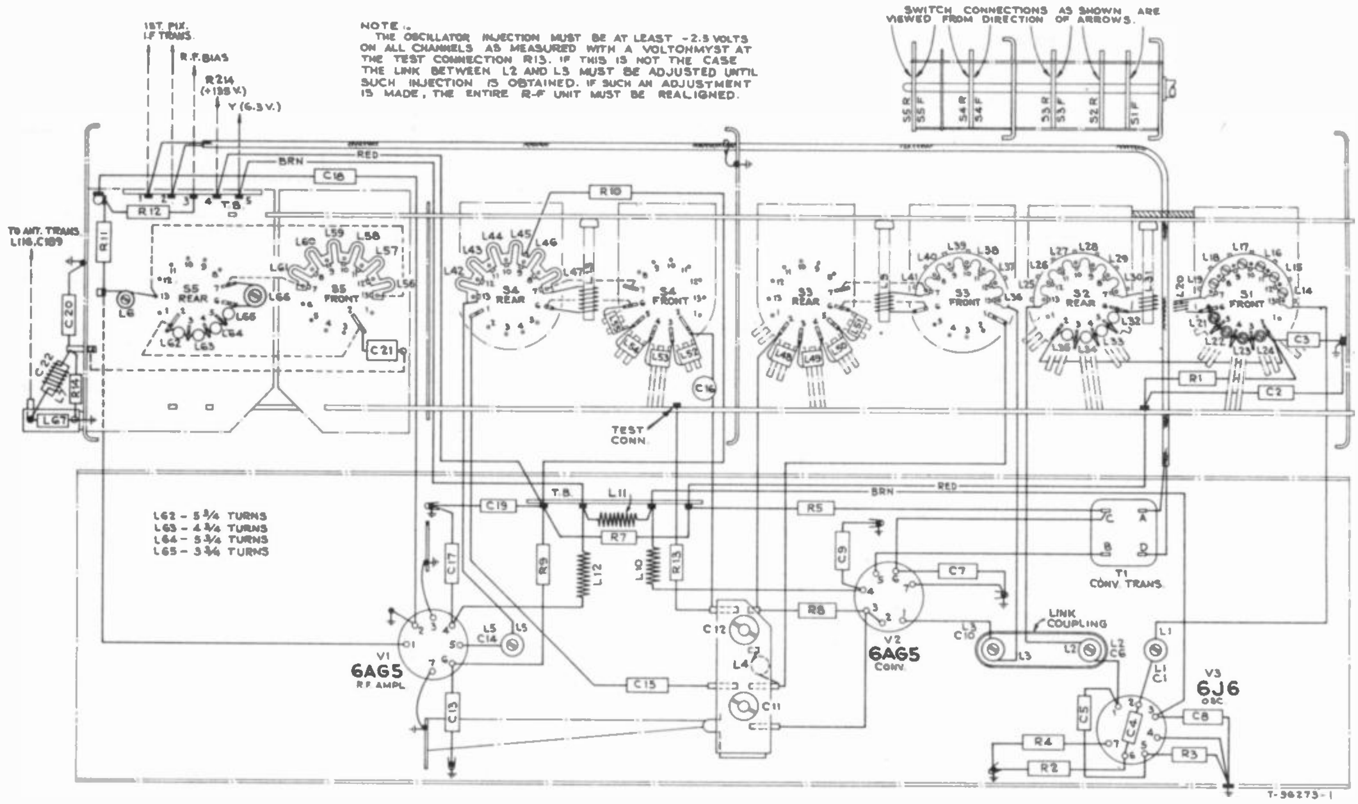


Figure 7—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress C129 and C130 up and away from the chassis.
9. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
10. Dress the green lead from pin 2 of V106 away from the chassis.
11. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
12. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
13. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from the width control coils away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 8 .

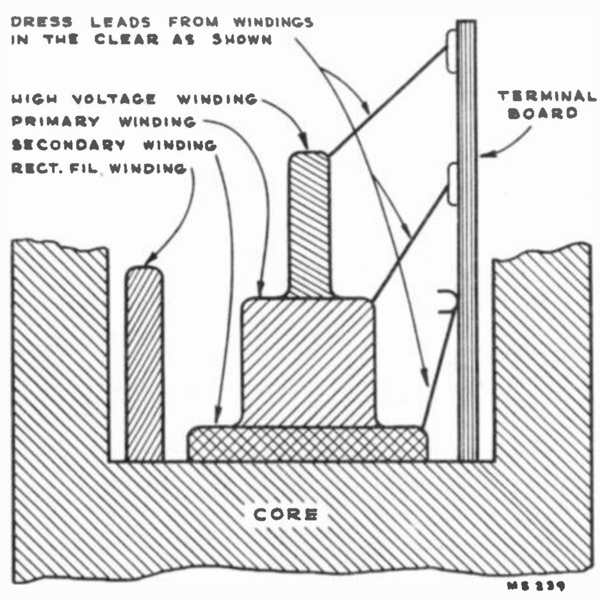
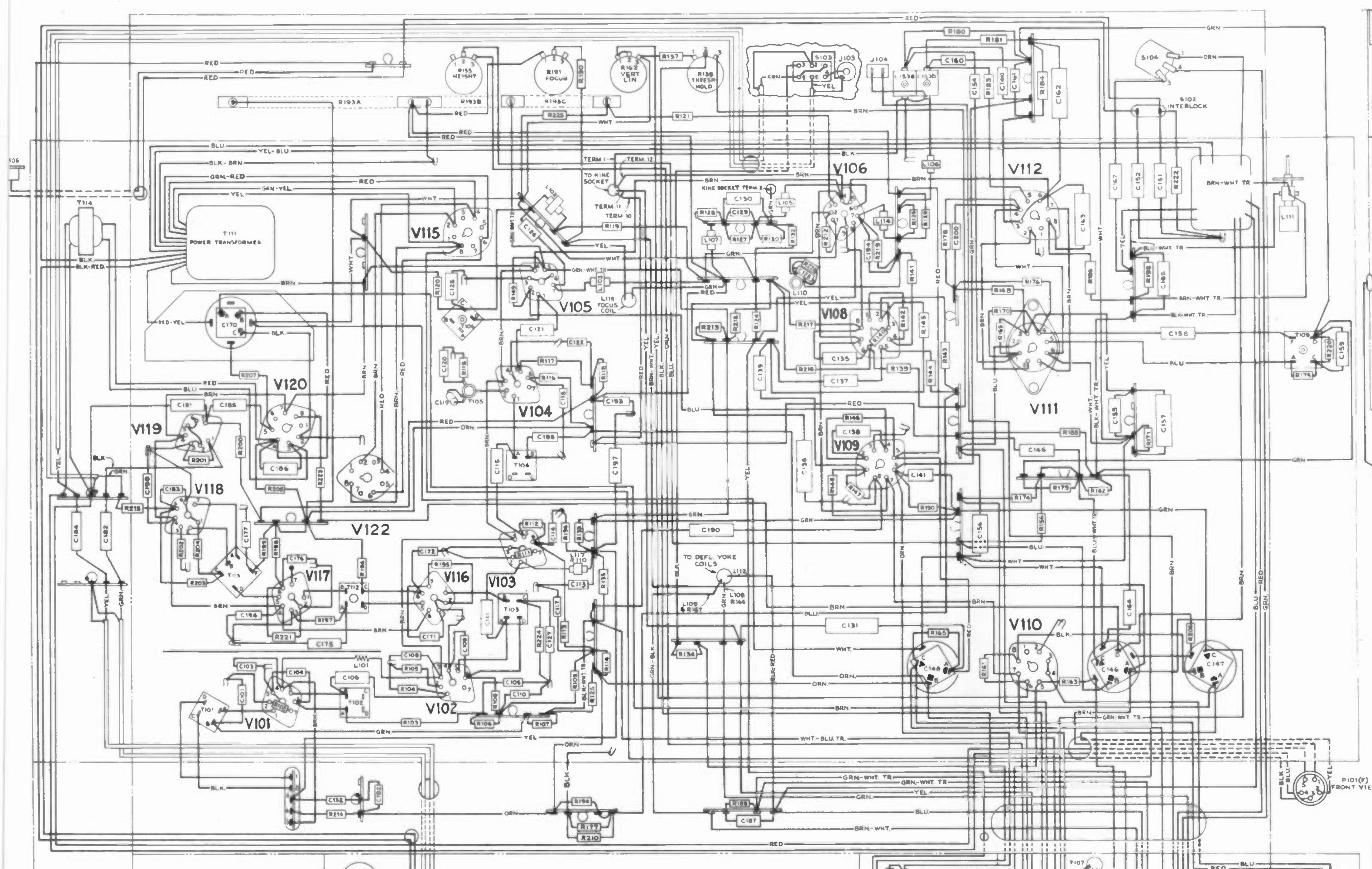
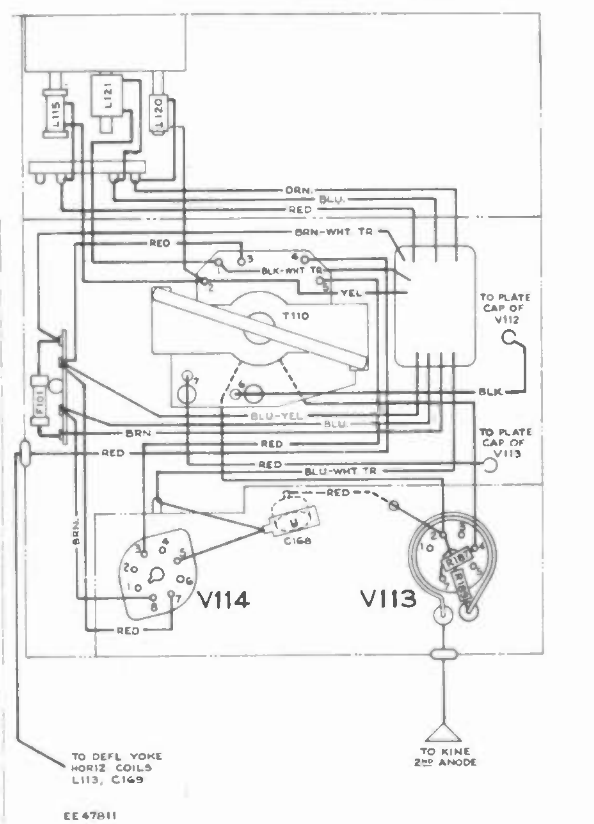


Figure 8—T110 Lead Dress

CHASSIS WIRING DIAGRAM





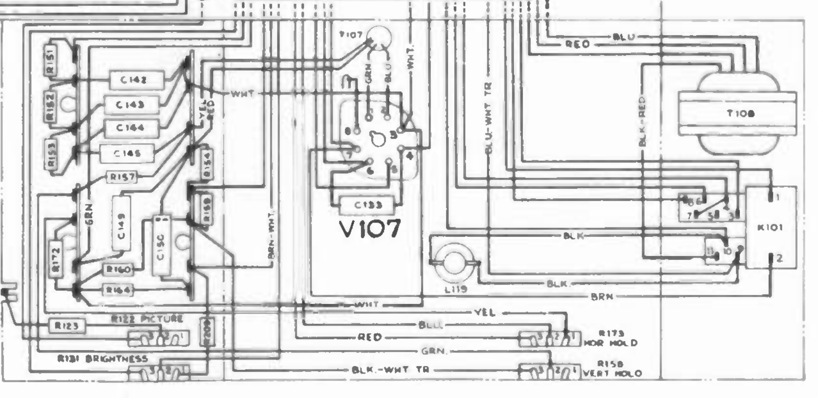
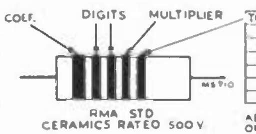


Figure 9—Chassis Wiring Diagram

RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	- 30 PPM/°C
RED	- 80 PPM/°C
ORANGE	- 150 PPM/°C
YELLOW	- 220 PPM/°C
GREEN	- 330 PPM/°C
BLUE	- 470 PPM/°C
VIOLET	- 750 PPM/°C
GRAY	+ 30 PPM/°C



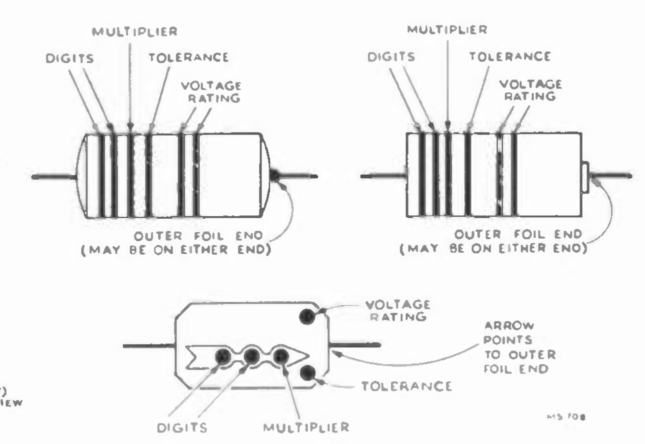
TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 12

COLOR CODES, MOULDED PAPER CAPACITORS



CAPACITY VALUE IN MMF

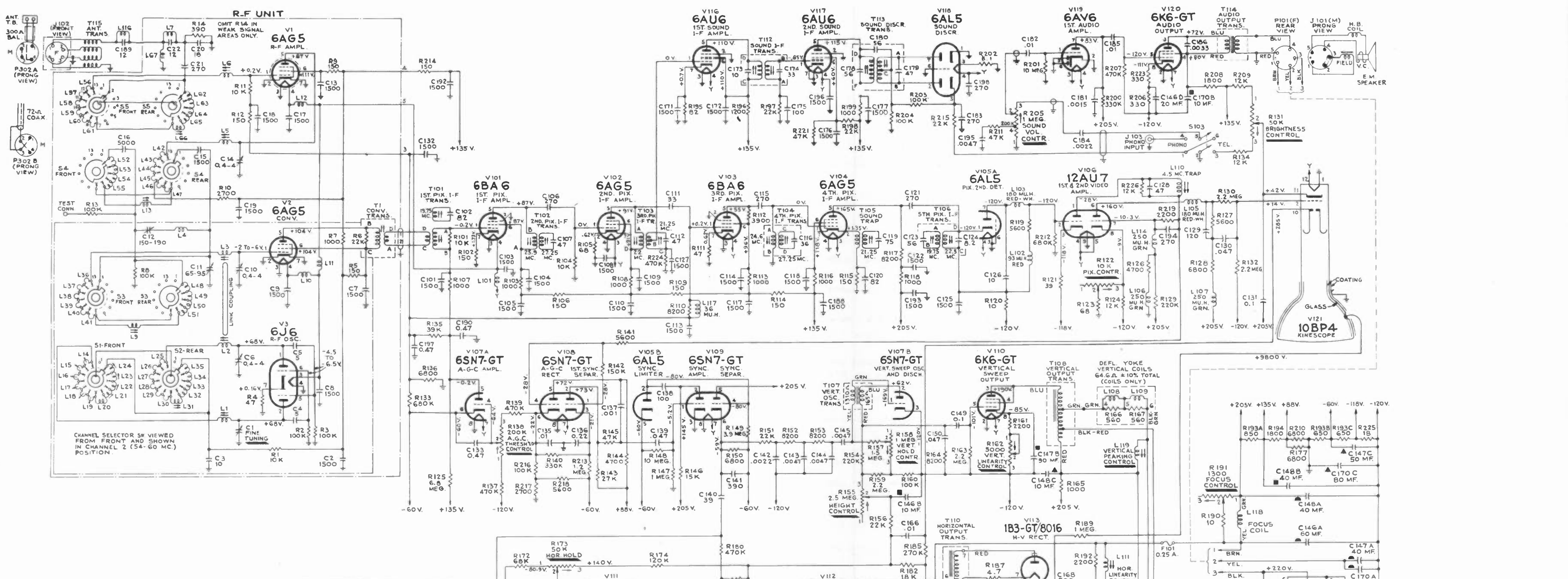
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

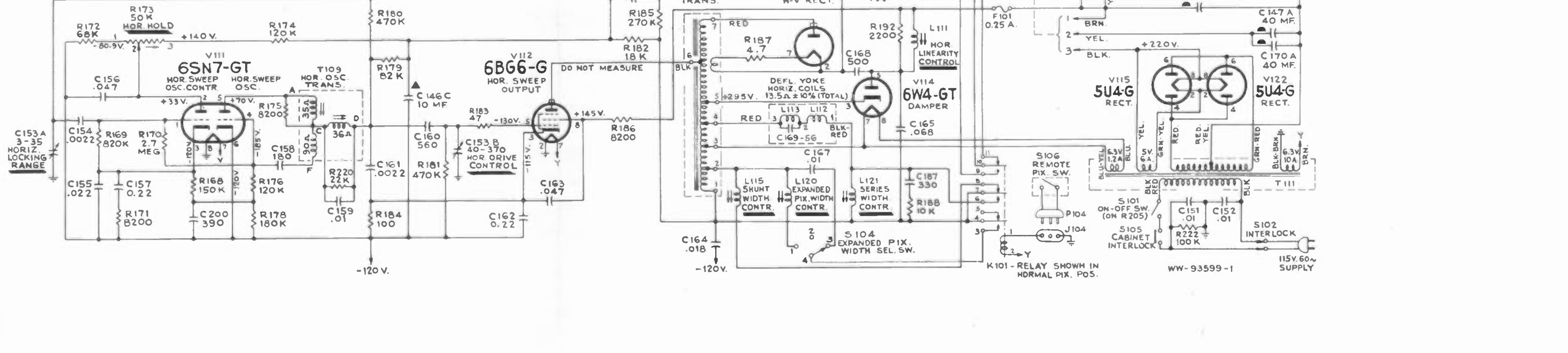
TOLERANCE

COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

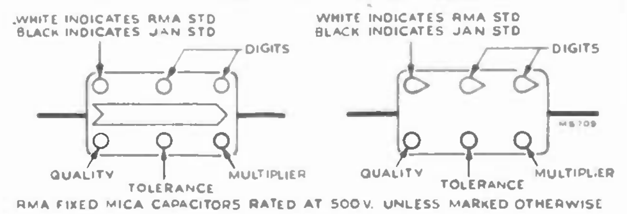
The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

CIRCUIT SCHEMATIC DIAGRAM





RMA COLOR CODE, FIXED MICA CAPACITORS



RMA FIXED MICA CAPACITORS RATED AT 500V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD		.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1,000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers, L117, C113 and R110 are connected to the junction of R135 and C190.

Figure 10—Circuit Schematic Diagram

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	RF UNIT ASSEMBLIES KRK7
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield.
73478	Cable—I-F transmission cable (W1)
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, 1 section of 150-190 mmf and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1,500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section osc. plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section osc. plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or convertor section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to convertor trimmer loop connector
74572	Plate—Front plate and bushing for KRK 7
	Resistor—Fixed, composition:
	47 ohms, ±20%, ½ watt (R4)
	150 ohms, ±20%, ½ watt (R5, R9, R12)
	390 ohms, ±10%, ½ watt (R14)
	1,000 ohms, ±20%, ½ watt (R7)
	2,700 ohms, ±10%, ½ watt (R10)
	10,000 ohms, ±20%, ½ watt (R1, R11)
	100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—No. 4-40 x ⅝" adjusting screw for L66
71475	Screw—No. 4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—No. 4-40 x 17/32" adjusting screw for L6
74573	Shaft—Channel selector shaft complete with pawl and stud
74574	Shaft—Fine tuning shaft and cam assembly
72951	Shield—Metal tube shield for V3
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F Unit
71494	Socket—Tube socket, moulded, 7 prong, saddle mounted
73450	Socket—Tube socket, ceramic, 7 prong, bottom mounted
74576	Spacer—Insulating spacer for front plate (4 required)
75068	Spring—Retaining spring for r-f oscillator tube shield
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L9, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L13, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55, C15, C16, R10)
75446	Stud—Capacitor stud—brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, uncoded or coded "ER"
75447	Stud—Capacitor stud—brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 and 74110, coded numerically or "Hi Q"
73448	Transformer—Convertor transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
74577	Washer—Spring washer for fine tuning shaft
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	CHASSIS ASSEMBLIES KCS 38C
74593	Capacitor—Mica trimmer, 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
74726	Capacitor—Mica, 39 mmf. (C140)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf., 1,000 volts (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
53113	Capacitor—Mica, 330 mmf. (C187)
39642	Capacitor—Mica, 390 mmf. (C141, C200)
74153	Capacitor—Hi-voltage, 500 mmf., 15,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1,500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)
73583	Capacitor—Electrolytic comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 600 volts (C137)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C181)
73803	Capacitor—Tubular, moulded paper, .0022 mfd., 600 volts (C154)
73595	Capacitor—Tubular, moulded paper, oil impregnated, .0022 mfd., 600 volts (C142, C161, C184)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C186)
73920	Capacitor—Tubular, moulded paper, oil impregnated, .0047 mfd., 600 volts (C143, C144, C145, C195)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C135, C166, C167, C182)
73565	Capacitor—Tubular, moulded paper, .01 mfd., 1,000 volts (C151, C152, C185)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C159)
74727	Capacitor—Tubular, moulded paper, oil impregnated, .018 mfd., 1,000 volts (C164)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C155)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C130, C139)
73592	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd., 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1,000 volts (C163)
73815	Capacitor—Tubular, moulded paper, oil impregnated, .068 mfd., 1,000 volts (C165)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C133, C190, C197)
74585	Coil—Focus coil (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L115, L120)
74877	Coil—Vertical peaking coil (L119)
74878	Coil—Series width coil (L121)
71526	Coil—Peaking coil (250 mh) (L106, L107, L114)
73477	Coil—Filament choke coil (L101)
71527	Coil—Peaking coil (93 mh) (L102)
74214	Coil—Peaking coil (180 mh) (L103, L105)
74170	Coil—Peaking coil (36 mh) (L117, R110)
74594	Connector—2 contact male connector for power cable
74879	Connector—2 contact (polarized) female connector for electronic magnifier cable (J104)
35787	Connector—Phono input connector (J103)
71789	Connector—Anode connector
12493	Connector—5 contact female connector for speaker cable (P101)
71521	Connector—Hi-voltage capacitor connector
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control (R122, R131)
38408	Control—Sound volume control and power switch (R205, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics Nos. 71432, 73581 and 73582
74418	Cushion—Rubber cushion for kinescope mounting

REPLACEMENT PARTS (Continued)

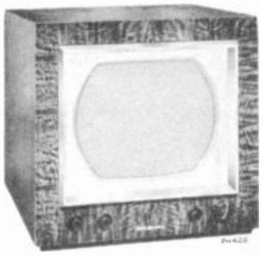
STOCK No.	DESCRIPTION
73590	Cushion—Rubber cushion for deflection yoke hook (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)
72283	Grommet—Rubber grommet for mounting relay (2 required)
73301	Magnet—Ion trap magnet (PM type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
74873	Relay—Electronic magnifier relay (K101)
72633	Resistor—Wire wound, 4.7 ohms, ⅓ watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
73588	Resistor—Voltage divided comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
	Resistor—Fixed, composition:
	10 ohms, ±20%, ½ watt (R120)
	18 ohms, ±10%, ½ watt (R225)
	39 ohms, ±10%, ½ watt (R121)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	100 ohms, ±10%, 2 watt (R184)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	330 ohms, ±10%, ½ watt (R206, R223)
	1,000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1,200 ohms, ±10%, ½ watt (R196)
	1,800 ohms, ±10%, 2 watt (R194, R208)
	2,200 ohms, ±10%, ½ watt (R219)
	2,200 ohms, ±10%, 1 watt (R192, R161)
	2,700 ohms, ±10%, ½ watt (R217)
	3,900 ohms, ±5%, ½ watt (R112)
	4,700 ohms, ±5%, ½ watt (R126)
	4,700 ohms, ±10%, ½ watt (R144)
	5,600 ohms, ±10%, ½ watt (R141, R218)
	5,600 ohms, ±10%, 1 watt (R127)
	6,800 ohms, ±5%, ½ watt (R136)
	6,800 ohms, ±10%, ½ watt (R150)
	6,800 ohms, ±5%, 1 watt (R128)
	6,800 ohms, ±10%, 2 watt (R177, R210)
	8,200 ohms, ±5%, ½ watt (R164, R175)
	8,200 ohms, ±10%, ½ watt (R152, R153, R171)
	8,200 ohms, ±5%, 1 watt (R117)
	8,200 ohms, ±10%, 2 watt (R186)
	10,000 ohms, ±5%, ½ watt (R104)
	10,000 ohms, ±10%, ½ watt (R188)
	12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	12,000 ohms, ±10%, 2 watt (R124)
	15,000 ohms, ±10%, 1 watt (R146)
	18,000 ohms, ±10%, 1 watt (R182)
	22,000 ohms, ±10%, ½ watt (R151, R197, R220, R156)
	22,000 ohms, ±20%, ½ watt (R198, R215)
	27,000 ohms, ±10%, ½ watt (R143)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±10%, ½ watt (R145, R211)
	47,000 ohms, ±20%, ½ watt (R221)
	68,000 ohms, ±10%, ½ watt (R172)
	82,000 ohms, ±10%, 1 watt (R179)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R160, R216)
	100,000 ohms, ±20%, 1 watt (R222)
	120,000 ohms, ±5%, 1 watt (R176)
	120,000 ohms, ±10%, 1 watt (R174)
	150,000 ohms, ±10%, ½ watt (R168)
	150,000 ohms, ±20%, ½ watt (R142)
	180,000 ohms, ±5%, 1 watt (R178)
	220,000 ohms, ±10%, ½ watt (R129, R154)
	270,000 ohms, ±10%, ½ watt (R185)
	330,000 ohms, ±10%, ½ watt (R140, R200)
	470,000 ohms, ±5%, ½ watt (R207)
	470,000 ohms, ±10%, ½ watt (R137, R139, R180, R224, R181)
	680,000 ohms, ±10%, ½ watt (R133, R212)
	820,000 ohms, ±5%, ½ watt (R169)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, 1 watt (R189)
	1.2 megohm, ±5%, ½ watt (R213)
	1.5 megohm, ±5%, ½ watt (R157)
	2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	2.7 megohm, ±5%, 1 watt (R170)
	3.9 megohm, ±10%, ½ watt (R149)
	6.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201)
74416	Screw—No. 10-32 x 1¾" cross-recessed round head screw for kinescope retaining strap
71456	Screw—No. 8-32 wing screw for deflection yoke
74601	Screw—No. 8-32 x ⅜" cross-recessed binder head screw for focus coil mounting (2 required)
74602	Screw—No. 10-32 x 1¼" cross-recessed round head screw for focus coil adjustment (3 required)
73584	Shield—Tube shield

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket, octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 8016
72741	Socket—Kinescope socket
74936	Spring—Suspension spring for kinescope socket leads
73586	Spring—Compression spring used under centering control screws (3 required)
74595	Spring—Anode lead spring
74735	Strap—Kinescope retaining strap
74596	Support—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
74872	Switch—Width selector switch (S104)
46760	Switch—"TV"—Phono switch (S103)
71457	Switch—Interlock switch (S105)
73569	Transformer—Vertical oscillator transformer (T107)
71419	Transformer—Sound output transformer (T114)
74589	Transformer—First pix i-f transformer (T101, C102, R101)
74590	Transformer—Second pix i-f transformer (T102, C107)
74591	Transformer—Third pix i-f transformer (T103, C112)
74592	Transformer—Fourth pix i-f transformer (T104, C116)
73575	Transformer—Fifth pix i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer complete with socket and bracket (T115, J102)
74874	Transformer—Power transformer, 115 volts, 60 cycle (T111)
74875	Transformer—Vertical output transformer (T108)
74876	Transformer—Horizontal output and hi-voltage transformer (T110)
73577	Trap—4.5 mc trap (L110, C128)
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L116, C189)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	SPEAKER ASSEMBLIES 970773-1
71560	Connector—5 contact male connector for speaker (J101)
74599	Speaker—5" x 7" EM speaker complete with cone and voice coil
	Note: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74880	Back—Cabinet back
75039	Board—"Ant" terminal board
74883	Case—Plastic case and bottom cover for electronic magnifier switch
X3037	Cloth—Grille cloth only
39153	Connector—4 contact male connector for antenna cable (P102)
74882	Connector—3 contact male connector for electronic magnifier cable (P104)
74638	Cushion—Vinylite cushion for safety glass
74627	Decal—Control panel function decal
73180	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon
74631	Foot—Rubber foot (4 required)
74632	Gasket—Cork gasket for safety glass
74629	Glass—Safety glass
74000	Knob—Horizontal hold control or picture control knob—inner
74635	Knob—Station selector knob
74636	Knob—Fine tuning control knob
73998	Knob—Vertical hold control or brightness control knob
74002	Knob—Sound volume control and power switch knob
74633	Nut—Speed nut for safety glass retainers
74630	Panel—Removable grille panel and cloth assembly
74162	Plate—Mounting plate for interlock switch
74628	Retainers—Safety glass retainers (1 set)
30330	Spring—Retaining spring for knob 74000
14270	Spring—Retaining spring for knobs 73998, 74002, 74635 and 74636
73643	Spring—Spring clip for channel marker escutcheon
74881	Switch—Electronic magnifier switch (S106)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Model 9T270
Walnut, Mahogany or Oak

RCA VICTOR

TELEVISION RECEIVERS

MODELS 9T270, 9TC272, 9TC275

Chassis Nos. KCS29, KCS29C

Mfr. No. 274

SERVICE DATA

—1949 No. T9—

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U.S.A.

Model 9TC272
Walnut, Mahogany or Toasted Mahogany

Model 9TC275
Walnut, Mahogany or Toasted Mahogany

GENERAL DESCRIPTION

Models 9T270, 9TC272 and 9TC275 are sixteen inch television receivers. These receivers employ twenty-two tubes plus four rectifiers and a 16AP4 kinescope. The receivers are identical except for cabinets and jewel lights.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE......... 146 square inches on a 16" kinescope

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

Plus and minus approximately 250 kc on channel 2 and plus and minus approximately 650 kc on channel 13.

POWER SUPPLY RATING...... 115 volts, 60 cycles, 285 watts

AUDIO POWER OUTPUT RATING............ 2.4 watts max.

LOUDSPEAKERS

Model 9T270............ 92580-2.. 8" PM Dynamic, 3.2 ohms
Models 9TC272, 9TC275.. 92569-7.. 12" PM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside) 9T270	23	22	23½
Cabinet (outside) 9TC272	27¾	40	24
Cabinet (outside) 9TC275	28	40	25
Chassis Assembly (outside)	19⅜	14¼	18¼
Chassis (Overall)	19⅜	14¼	22¾

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

WEIGHT

Chassis with Tubes in Cabinet—9T270................ 90 lbs.
9TC272............ 110 lbs. 9TC275.............. 129 lbs.
Shipping Weight—9T270........................... 109 lbs.
9TC272............ 131 lbs. 9TC275.............. 159 lbs.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator
(3)	RCA 6AG5	Converter
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6K6GT	Audio Output
(9)	RCA 6AG5	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6AG5	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector and Sync Limiter
(14)	RCA 6AU6	1st Video Amplifier
(15)	RCA 6K6GT	2nd Video Amplifier
(16)	RCA 6SN7GT	AGC Amplifier and Vertical Sweep Oscillator
(17)	RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(18)	RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(19)	RCA 6K6GT	Vertical Sweep Output
(20)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(21)	RCA 6BG6G	Horizontal Sweep Output
(22)	RCA 5V4G	Damper
(23)	RCA 1B3-GT/8016	H. V. Rectifier (2 tubes)
(24)	RCA 5U4G	Power Supply Rectifier (2 tubes)
(25)	RCA 16AP4	Kinescope

Specifications continued on page 2

9T270, 9TC272, 9TC275 ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE I-F FREQUENCIES

Picture Carrier Frequency .... 25.75 mc.
Adjacent Channel Sound Trap .... 27.25 mc.
Accompanying Sound Traps .... 21.25 mc.
Adjacent Channel Picture Carrier Trap .... 19.75 mc.

SOUND I-F FREQUENCIES

Sound Carrier Frequency .... 21.25 mc.
Sound Discriminator Band Width between peaks .... 350 kc

VIDEO RESPONSE .... To 4 mc.

FOCUS .... Magnetic

SWEEP DEFLECTION .... Magnetic

SCANNING .... Interlaced, 525 line

HORIZONTAL SCANNING FREQUENCY .... 15,750 cps

VERTICAL SCANNING FREQUENCY .... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) .... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector, Fine Tuning .... Dual Control Knobs
Tone Control, Sound Volume and On-Off Switch .... Dual Control Knobs
Picture Horizontal Hold, Picture Vertical Hold .... Dual Control Knobs
Brightness, Picture .... Dual Control Knobs

NON-OPERATING CONTROLS (not including r-f and i-f adjustments)

Horizontal Centering .... rear chassis adjustment
Vertical Centering .... rear chassis adjustment
Width .... rear chassis screwdriver adjustments
Height .... rear chassis adjustment
Horizontal Linearity .... rear chassis screwdriver adjustment
Vertical Linearity .... rear chassis adjustment
Horizontal Drive .... rear chassis screwdriver adjustment
Horizontal Oscillator Frequency .... bottom chassis adjustment
Horizontal Oscillator Waveform .... side chassis adjustment
Focus .... rear chassis adjustment
Ion Trap Magnet .... top chassis adjustment
Deflection Coil .... top chassis wing nut adjustment
Focus Coil .... top chassis screwdriver adjustment
Video Bias .... rear chassis adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES, AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

2. Set the STATION SELECTOR to the desired channel.

3. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.

4. Turn the BRIGHTNESS control fully counterclockwise, then clockwise until a light pattern appears on the screen.

5. Adjust the VERTICAL hold control until the pattern stops vertical movement.

6. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

7. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.

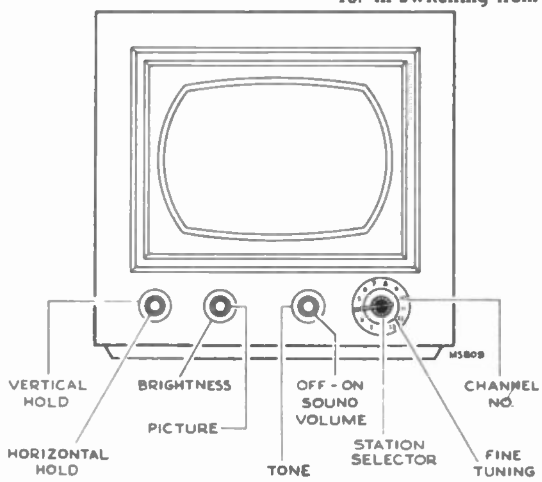


Figure 1—Receiver Operating Controls

8. Adjust the PICTURE control for suitable picture contrast.

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one station to another, it may be necessary to repeat steps numbers 3 and 8.

11. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 3 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 1 through 8.

A phono input jack and a Television-Phono switch are provided on back of the chassis. The switch must be in the Tel position for television operation.

INSTALLATION INSTRUCTIONS

The Model 9T270, 9TC272 and 9TC275 television receivers are shipped complete in one carton except for the 16AP4 kinescope. The kinescope is shipped in a special carton and should not be unpacked until ready for installation.

UNPACKING. — Model 9T270 is shipped in a cardboard carton. To open the carton tear open the carton top flaps, remove the cardboard side packing material and with a man on two sides of the cabinet, lift it out of the carton.

Models 9TC272 and 9TC275 are also shipped in cardboard cartons. To unpack, turn the shipping carton on its side and tear open the carton bottom flaps. Fold the flaps up along the side of the carton and turn the carton back up. Lift the carton up and off the cabinet.

Remove the cabinet back grille. Remove all shipping material. Remove the envelope containing the control knobs and ion trap magnet. Make sure all tubes are in place and are firmly seated in their sockets.

Remove the cabinet front panel by loosening two wingnuts inside the cabinet and turning the two locking plates to the vertical position as shown in Figure 2. In Models 9TC272 and 9TC275, the panel may then be removed by hingeing the panel at the bottom and pulling out on the top edge. In Model 9T270, it will be necessary to remove two screws under the bottom of the cabinet.

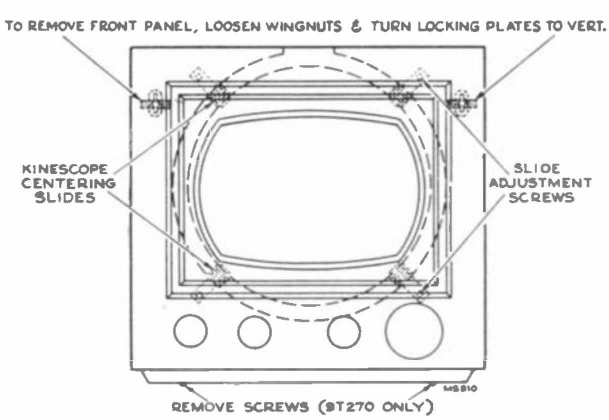


Figure 2—Cabinet, Front View

REMOVE THE TWO SELF-TAPPING SCREWS FROM THE KINESCOPE CUSHION SLIDE AS SHOWN IN FIGURE 3.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

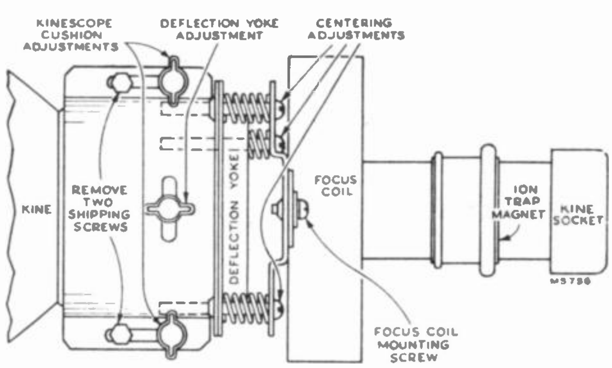


Figure 3—Yoke and Focus Coil Adjustments

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the two focus coil mounting screws and move the coil until alignment is obtained. Tighten the mounting screws with the coil in this position.

Loosen the two lower kinescope face centering slides, and set them at approximately mid-position. See Figure 2 for location of the slides and their adjustment screws. Loosen the two upper slides (from inside the cabinet), slip them up as far as possible and tighten.

Check the centering slides. There should be a small wire clip on the inner surface of each. The clip in the lower left corner should be connected to the high voltage lead.

KINESCOPE HANDLING PRECAUTION. — Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. Persons not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.

Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

KINESCOPE INSTALLATION. — Slip the Vinylite boot over the metal cone of the kinescope, turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection and focus coils as shown in Figure 4. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

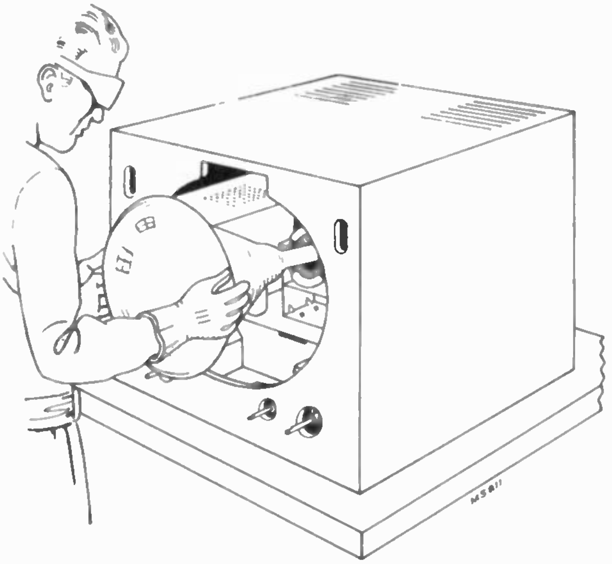


Figure 4—Kinescope Insertion

Slip the ion trap magnet assembly over the neck of the kinescope with the large magnet towards the base of the tube.

Connect the kinescope socket to the tube base.

Adjust the four centering slides until the face of the kinescope is in the center of the cabinet opening. Tighten the four slides securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel by reversal of the procedure indicated in Figure 2.

For Models 9TC272 and 9TC275 to install the front panel, place the lip on the bottom of the panel in the recess below the kinescope opening and push the top in. Fasten the two bars in back of the panel and tighten the wingnuts.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil because of shadows on the corner of the raster.

The antenna and power connection should now be made. Install the front panel control knobs.

WARNING. — The high voltage supply in this receiver delivers 12,000 volts! If it is necessary to remove the kinescope after the receiver has been operating, short the kinescope cone to the chassis before attempting removal of or adjustments to the kinescope. A.C. interlocks are provided at the back of the set so that when the back is removed — so is the power.

Turn the power switch to the "on" position, the brightness control fully clockwise, and picture control counterclockwise.

ION TRAP MAGNET ADJUSTMENT. — Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags, as shown in Figure 5.

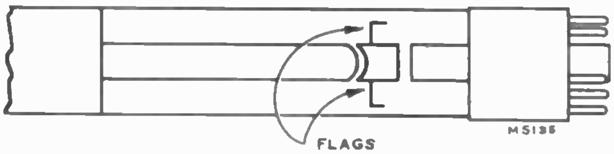


Figure 5—Ion Trap Flags

The ion trap rear magnet poles should be approximately over the ion trap flags. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R201 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

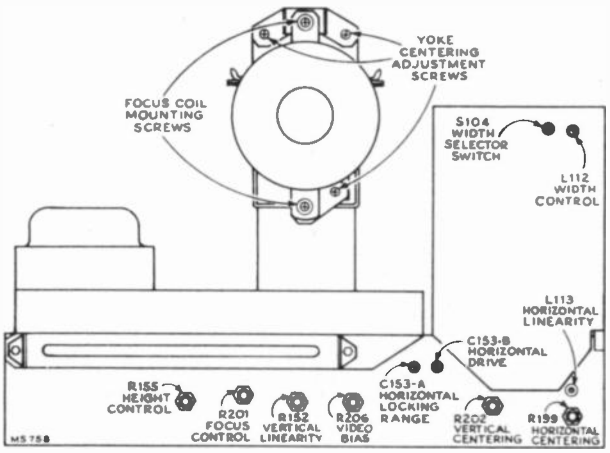


Figure 6—Rear Chassis Adjustments

DEFLECTION YOKE ADJUSTMENT. — If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS. — It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 2 through 8 of the receiver operating instructions on page 3.

If the Horizontal Oscillator is operating properly, it should be possible to sync the picture at this point.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT. — Turn the horizontal hold control to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counterclockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counterclockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment. — Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment. — Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the picture control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is operating properly it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 11. For field purposes paragraph "A" under Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENTS. — Centering is obtained by adjustment of the centering controls and by mechanically orienting the focus coil with three adjustment screws shown in Figure 3 The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster.

Adjust the focus coil until it is at right angles to the neck of the kinescope. Center the picture with the electrical centering controls. If a shadow appears on a corner of the picture, adjust the focus coil centering screws to eliminate the shadow and re-center the picture with the electrical centering controls.

FOCUS COIL ADJUSTMENTS. — If, after making the centering adjustments in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 3) and change the position of the coil to eliminate the shadow. Re-center the picture by adjustment of the electrical centering controls and the focus coil centering adjustments.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS. — Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust vertical centering to align the picture with the mask.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS. — Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L113 to provide best linearity.

A width control coil and a width selector switch are provided. With the switch in position 1 (fully counterclockwise), adjust the width coil until the picture fills the mask. On low line voltages it may not be possible to get sufficient width by adjustment of the width coil. In this case turn the width selector switch clockwise to position 2. In this position the width coil is disconnected, and adjustment of the width coil will have no effect. For still greater width, turn the width selector switch fully clockwise to position 3. In this position, the 6BG6G screen voltage is increased as well as disconnecting the width control coil.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS. — Adjust the focus control (R201 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMB SCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

VIDEO BIAS CONTROL. — Normally the video bias control (R206) should be in the fully clockwise position. To check to see if this is the correct position, turn the picture control clockwise and adjust the brightness control until the retrace lines just disappear. If the whites are compressed as indicated by a "washed out" appearance in light areas, turn the video bias control counterclockwise until the picture appears normal.

Replace the cabinet back and make sure that the screws holding it are up tight, otherwise it may rattle or buzz when the receiver is operated at high volume.

CHECK OF R-F OSCILLATOR ADJUSTMENTS. — Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 10. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 7. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well. See Figures 11 and 12 for their location.

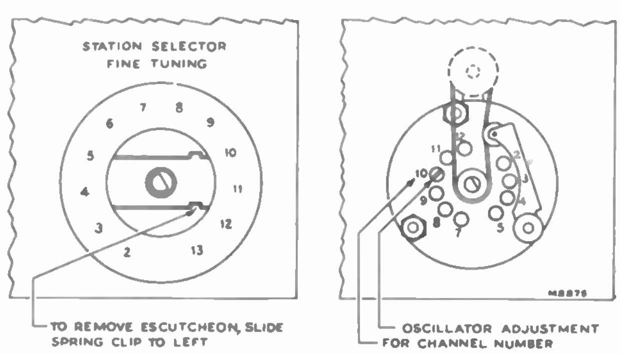


Figure 7 - R-F Oscillator Adjustments

CAUTION. — The ion trap magnet employed for 16AP4 kinescopes is not the same as that used on 10BP4 tubes. Care should be taken to insure that the proper magnet supplied with the instrument is used. The type magnet shown in Figure 3 measures three-fourths of an inch between magnet center lines and carries the number 986432-1 stamped on it.

9T270, 9TC272, 9TC275

CHASSIS TOP VIEW

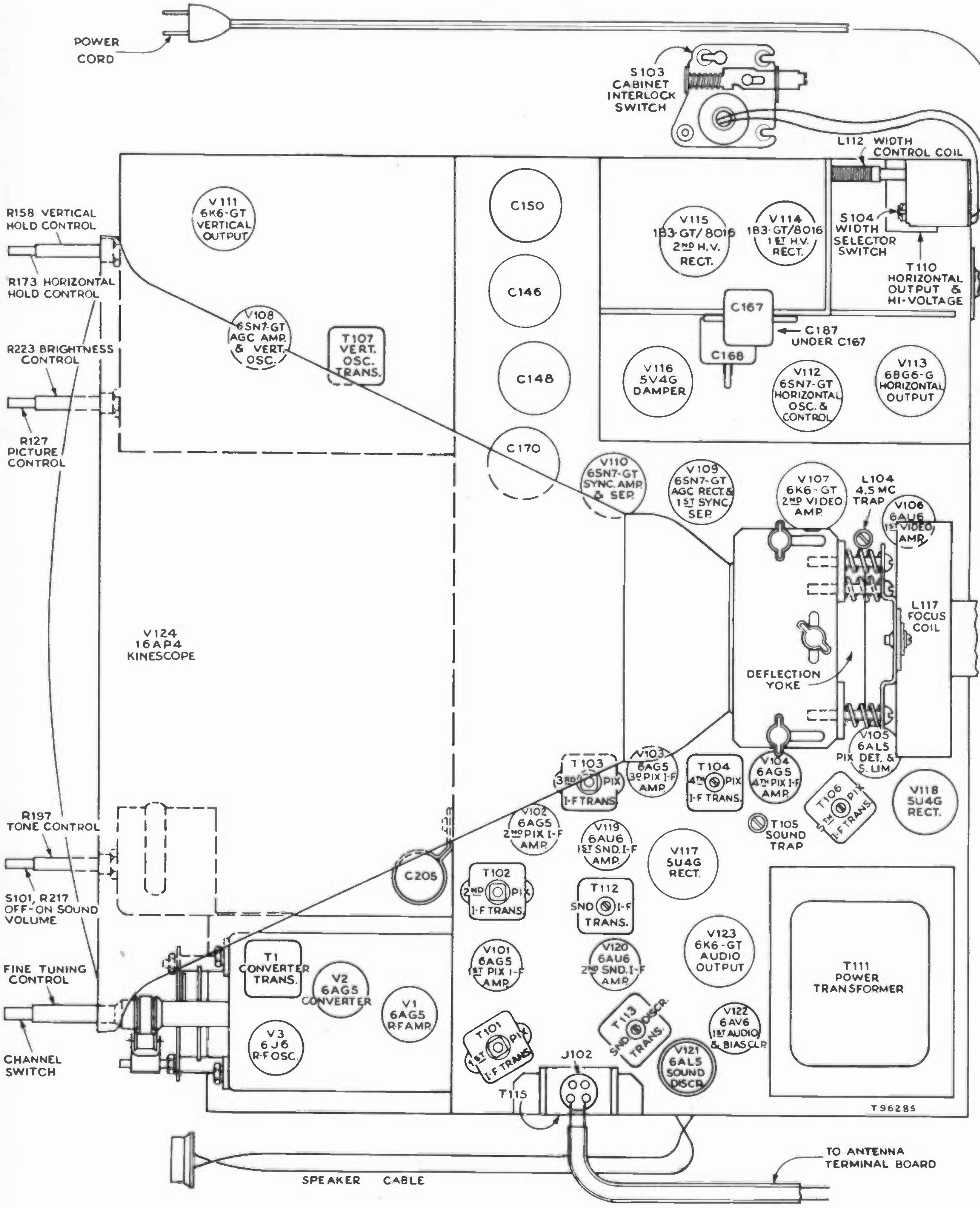


Figure 8—Chassis Top View

CHASSIS BOTTOM VIEW

9T270, 9TC272, 9TC275

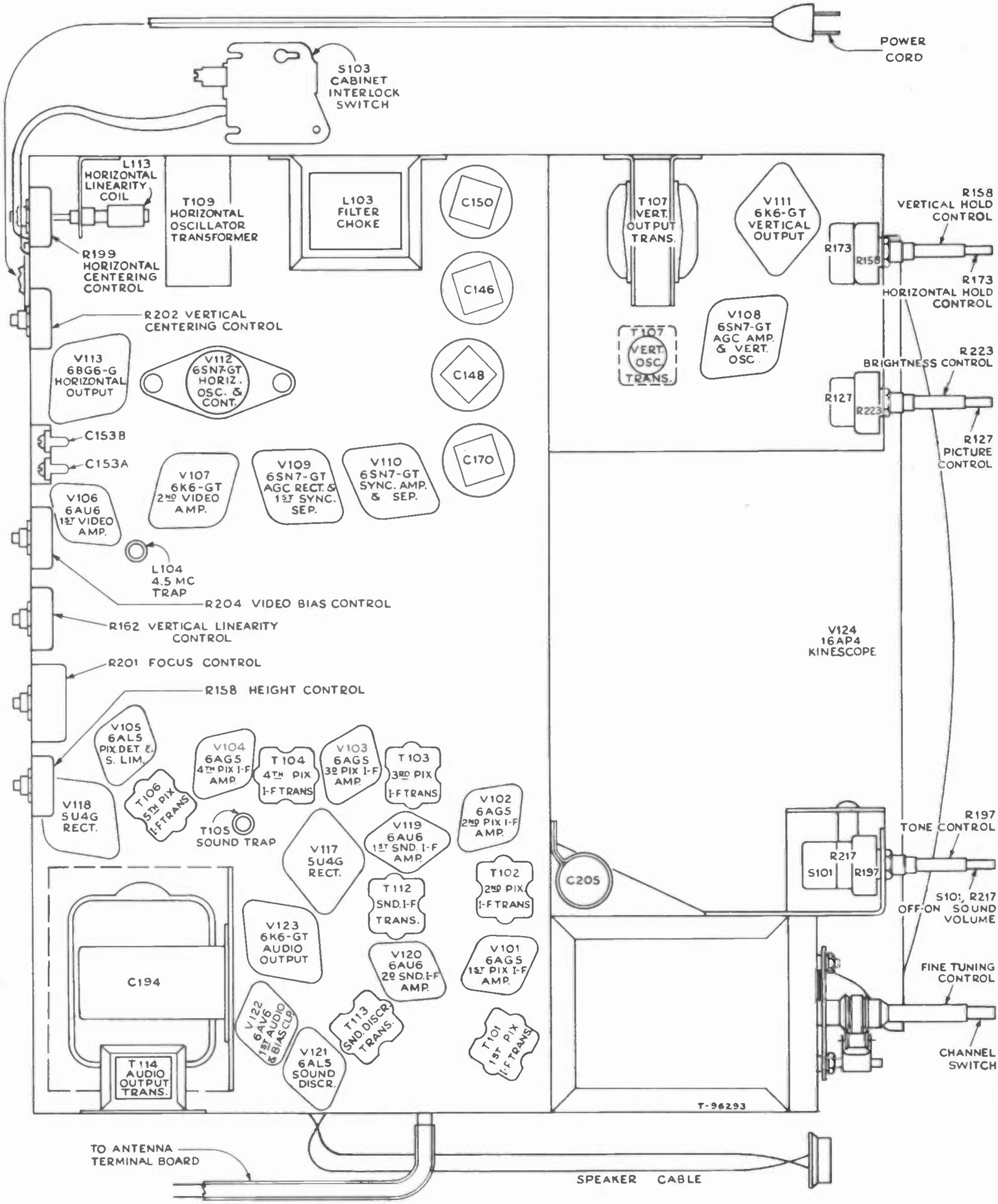


Figure 9—Chassis Bottom View.

ALIGNMENT PROCEDURE

TEST EQUIPMENT. — To properly service the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges

20 to 30 mc., 1 mc. and 10 mc. sweep width

50 to 90 mc., 10 mc. sweep width

170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope, preferably one with a wide band vertical deflection amplifier, an input calibrating source, and a low capacity probe.

For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and must be capable of passing a 60 cycle square wave without noticeable distortion. While many commercial oscilloscopes do not meet this requirement, RCA oscilloscopes, types WO 55A, WO 58A, WO 60C and WO 79A fill this requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least 2 megacycles and in all positions of the gain controls. The RCA types WO 58A and WO 79A are ideally suited for this purpose.

Signal Generator to provide the following frequencies with "crystal" accuracy.

(a) I-F frequencies

19.75 mc. adjacent channel picture trap

21.25 mc. sound i-f and sound traps

22.05 and 24.75 mc. converter and first pix i-f transformer

25.9 mc. second picture i-f transformer

24.6 mc. fourth picture i-f transformer

22.0 mc. third picture i-f transformer

22.5 mc. fifth picture i-f transformer

25.75 mc. picture carrier

27.25 mc. adjacent channel sound trap

(b) R-F frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75	8	181.25	185.75
3	61.25	65.75	9	187.25	191.75
4	67.25	71.75	10	193.25	197.75
5	77.25	81.75	11	199.25	203.75
6	83.25	87.75	12	205.25	209.75
7	175.25	179.75	13	211.25	215.75

(c) Output on these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 15 kv.

Service Precautions. — If necessary to remove the chassis from cabinet, the kinescope must first be removed. See Figures 2 and 4. If possible, the chassis should then be serviced without the kinescope. However, if it is necessary to view the raster during servicing, the kinescope should be inserted only after the chassis is turned on end. The kinescope should never be allowed to support its weight by resting in the deflecting yoke. A bracket should be used to support the tube at its viewing screen.

If the receiver is serviced with the kinescope in place, proper precautions should be taken since the metal shell of the kinescope is "hot" with respect to ground.

CAUTION: Do not short the kinescope second anode lead.

Adjustments Required. — Normally, only the r-f oscillator line will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

The oscillator line is relatively non critical. When oscillator tubes are changed, in all probability it will be necessary to adjust only C6 in order to bring the entire line into adjustment.

ORDER OF ALIGNMENT. — When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R-F and converter lines
(6) R-F oscillator line
(7) 4.5 mc. video trap
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT. — Set the signal generator for approximately .1 volt output at 21.25 mc. and connect it to the second sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 10 volt scale.

Connect the meter in series with a one megohm resistor to the junction of diode resistors R215 and R216.

Adjust the primary of T113 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of C183 and R215. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.25 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of C183 and R215. The pattern obtained should be similar to that shown in Figure 15. If it is not, adjust the T113 (top) until the wave form is symmetrical.

The peak to peak band width of the discriminator should be approximately 350 kc. and it should be linear from 21.175 mc. to 21.325 mc.

SOUND I-F ALIGNMENT. — Connect the sweep oscillator to the first sound i-f amplifier grid.

Connect the oscilloscope to the second sound i-f grid return (terminal "A" of T112) in series with a 33,000 ohm isolating resistor.

Insert a 21.25 mc. marker signal from the signal generator into the first sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.25 mc. marker. The pattern obtained should be similar to that shown in Figure 16.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the second sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 200 kc.

PICTURE I-F TRAP ADJUSTMENT. — Connect the "Volt-Ohmyst" to the junction of R135 and R136.

Remove the 6SN7GT AGC Amplifier tube V108. Connect a 250,000 ohm potentiometer between pins 5 and 6 of the V108 socket. Adjust the potentiometer until the "VoltOhmyst" reads approximately −4.5 volts.

Set the channel switch to the blank position between channel numbers 2 and 13.

Connect the "VoltOhmyst" across the picture detector load resistor R120. Under this condition, both leads of the meter are at approximately −125 volts. In making this measurement, care should be taken not to touch the case of the meter or to permit the meter case to become grounded.

Connect the output of the signal generator to the grid of the converter tube V2. To do this, remove the tube from the socket and fashion a clip by twisting one end of a small piece of wire around pin number 1. Replace the tube in the socket leaving the end of the wire protruding from under the tube. Connect the signal generator to this wire through a 1,500 mmf capacitor keeping the leads as short as possible.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.25 mc.—T103 (top)
(2) 21.25 mc.—T105 (top)
(3) 27.25 mc.—T102 (top)
(4) 27.25 mc.—T104 (top)
(5) 19.75 mc.—T106 (top)
(6) 19.75 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS. — Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "Volt-Ohmyst." During alignment, reduce the input signal if necessary to prevent overloading.

22.5 mc.—T106 (bottom)
24.6 mc.—T104 (bottom)
22.0 mc.—T103 (bottom)
25.9 mc.—T102 (bottom)

T1 and T101 are coupled by a link and in combination constitute an overcoupled transformer. The characteristics of such a transformer are such that it is impossible to adjust it to a single frequency.

To sweep align T1 and T101, connect a 330 ohm composition resistor across the primary coils of T102, T103, T104 and T106.

Connect the "VoltOhmyst" to the junction of R135 and R136. Adjust the 250,000 ohm potentiometer for −2.0 volts on the meter.

Connect the oscilloscope to the plate of the first video amplifier pin 5 of V106.

Connect a sweep generator to the converter grid through a 1,500 mmf capacitor. Set the generator to sweep from 20.0 mc. to 30.0 mc. and adjust the output to provide a 4 volt peak-to-peak signal on the scope.

Connect the signal generator loosely to the converter grid and adjust to provide markers at 22.05 mc. and 24.75 mc.

Adjust T1 (top) and T101 (bottom) to obtain the response shown in Figure 17. The T1 core must penetrate to the terminal board end of the coil in order to obtain the correct response.

Remove the 330 ohm resistors from across T102, T103, T104 and T106.

Adjust the 250,000 ohm potentiometer for a 15 volt peak-to-peak signal at the plate of the first video amplifier. The bias as measured by the "VoltOhmyst" should be −4.5 volts or less.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 18.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped, with the 22.1 mc. marker at approximately 95% response, the 25.0 mc. marker below 90% and the 26.5 mc. marker between 5% and 10% on the response curve.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the response curve, the picture becomes smeared. In making these adjustments, care should be taken that no two transformers are tuned to the same frequency as i-f oscillation may result.

Remove the converter tube and take off the clip to pin number 1. Replace the tube in the socket.

Picture I-F Oscillation. — If the receiver will operate without oscillating with the test equipment disconnected but breaks into oscillation or becomes unstable with the equipment connected, it may become necessary to establish a ground plane. Cover the test bench with a sheet of copper and set the chassis on the sheet. Set all the test equipment except the "Volt-Ohmyst" on the sheet and bond or bypass them to it. A Junior "VoltOhmyst" should not be bonded to the sheet since the negative test probe is not always connected to ground during alignment.

If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage across the picture detector load resistor that is unaffected by r-f signal input. If such a condition is encountered, it is sometimes possible to stop oscillation by adjusting the transformers approximately to frequency by setting the adjustment cores of T101, T102, T103, T104, T105 and T106 to be approximately equal to those of another receiver known to be in proper alignment. If this does not have the desired effect, it may now be possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1,000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align T106 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

ANTENNA, R-F AND CONVERTER LINE ADJUSTMENT. — In order to align the r-f tuner, it will first be necessary to set the channel 13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The channel 13 oscillator may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R215).

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel 13 oscillator is set to frequency, we may procede with the r-f alignment.

Connect the oscilloscope to the test connection at R13 in the r-f tuning unit.

Connect the "VoltOhmyst" to the junction of R133 and R134. Adjust the bias potentiometer for −3.5 volts on the meter.

Remove the first picture i-f amplifier tube V101.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance ot the sweep. The P102 connection for 300 ohm balanced or 72 ohm single-ended input are shown in the circuit diagram in Figure 80. If the sweep oscillator has a 50 ohm single-ended output, 300 ohm balanced output can be obtained by connecting as shown in Figure 10.

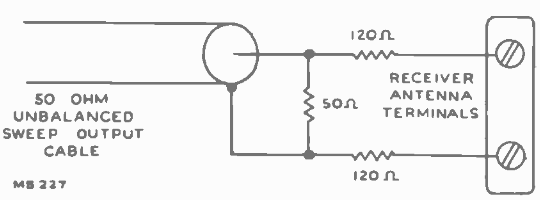


Figure 10—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Since channel 7 has the narrowest response of any of the high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7.

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier 175.25 mc. and 179.75 mc.

Adjust C10 and C14 until the curve falls symmetrically with the sound and picture carrier markers. Adjust C11 to give the proper bandwidth. Roughly peak L6 in conjunction with slight adjustments of C10 and C14 for a flat-topped, response curve with the sound and picture carriers at 90% to 95% response points on this curve. See Figure 19, channel 7.

Switch to channel 12 and adjust L6 for maximum response and minimum top slope of the curve.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observe the response obtained. See Figure 19 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response. If the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L6, C10, C11 and C14, and possibly compromise some channels slightly in order to get the markers up on other channels. Normally, however, no difficulty of this type should be experienced since the higher frequency channels become comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L9, L13, L66 and C12 for an approximately flat-topped response curve located symmetrically between the markers. L9, L13 and L66 are the center frequency adjustments. C12 is the band width adjustment.

Check channels 5 down through channel 2 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 80% response point. If this is not the case, L9, L13, L66 and C12 should be retouched. On final adjustment, all channels must be within the 80% specification.

Disconnect the bias potentiometer and replace V108. Replace V101.

Following an r-f alignment, the oscillator alignment must be checked.

R-F OSCILLATOR LINE ADJUSTMENT.—The r-f oscillator line may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available.

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under Sound Carrier Freq. must be available.

Channel Number	Receiver R-F Osc. Freq. Mc.	R-F Sound Carrier Freq. Mc.	Channel Oscillator Adjustment
2	81	59.75	L24
3	87	65.75	L23
4	93	71.75	L22
5	103	81.75	L21
6	109	87.75	L31
7	201	179.75	L19
8	207	185.75	L18
9	213	191.75	L17
10	219	197.75	L16
11	225	203.75	L15
12	231	209.75	L14
13	237	215.75	C6

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "VoltOhmyst" to the sound discriminator output (junction of C183 and R215.

Connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

The shield over the bottom of the r-f unit must be in place when making adjustments.

Since lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust C6 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. Oscillator adjustments L1 and L2 shown on the schematic are factory control adjustments and should not be touched in the field.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L14 for indications as above.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

HORIZONTAL OSCILLATOR ADJUSTMENT. — Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment. — With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T109. Tune in a television station and sync the picture if possible.

A.—Turn the horizontal hold control R173 to the extreme clockwise position. Adjust the T109 Frequency Adjustment (under the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

B.—Turn the hold control approximately one quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C153B, the width control L112 and the linearity control L113 until the picture is correct. If C153B, L112 or L113 was adjusted, repeat step A above.

Horizontal Locking Range Adjustment. — Turn the horizontal hold control fully counterclockwise. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 9 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 7 bars are present, adjust C153A slightly counterclockwise. Turn the horizontal hold control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

Horizontal Oscillator Waveform Adjustment. — Remove the shorting clip from terminals C and D of T109. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, adjust the Oscillator Waveform Adjustment Core of T109 (on the outside of the chassis) until the horizontal blanking bar appears in the raster.

A.—Connect the low capacity probe of an oscilloscope to terminal C of T109. Turn the horizontal hold control one quarter turn from the clockwise position so that the picture is in sync. The pattern on the oscilloscope should be as shown in Figure 20. Adjust the Oscillator Waveform Adjustment Core of T103 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Horizontal Oscillator Adjustments. — Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the horizontal hold control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T109 Frequency Adjustment until this condition is fulfilled.

4.5 MC. VIDEO TRAP. — Tune in a strong station. With a very short clip lead, short circuit the trap winding of T103. Observe the picture for the appearance of a 4.5 mc. beat. If the beat appears in the picture, adjust L104 until the beat is eliminated. Remove the clip lead.

SENSITIVITY CHECK. — A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES. — The response curves shown on page 14 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

ALIGNMENT TABLE. — Both methods of oscillator alignment are presented in the alignment table. The service technician may thereby choose the method to suit his test equipment.

9T270, 9TC272, 9TC275

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 8 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED.

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
DISCRIMINATOR AND SOUND I-F ALIGNMENT									
1	2nd sound i-f grid (pin 1, V120)	21.25 .1 volt output	Not used		Not used	In series with 1 meg. to junction of R215 & R216		Detune T113 (bot.) Adjust T113 (top) for max. on meter	Fig. 13 Fig. 12 Fig. 11
2	"	"	"		"	Junct. of C183 & R215	Meter on 3 volt scale	T113 (bottom) for zero on meter	Fig. 13 Fig. 12
3	"	"	2nd sound i-f grid (pin 1, V120)	21.25 center 1 mc. wide .1 v. out	Junction of C183 & R215	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal		Fig. 13 Fig. 15
4	1st sound i-f grid (pin 1, V119)	21.25 re-duced output	1st sound i-f grid (pin 1, V119)	21.25 reduced output	Terminal A, T112 in series with a 33,000 ohm resistor.	"	Sweep output re-duced to provide .3 volt p-to-p on scope	T112 (top & bot.) for max. gain and symmetry at 21.25 mc.	Fig. 13 Fig. 11 Fig. 12 Fig. 16
PICTURE I-F AND TRAP ADJUSTMENT									
5	Not Used		Not used		Not used	Junction of R135 & R136	Remove V108. Connect potenti-ometer between pins 5 & 6 of V108 socket	Adjust potentio-meter for -4.5 volts on meter	Fig. 13 Fig. 11
6	Converter grid (pin 1, V2)	21.25	"		"	Across R120	Meter on 3 volt scale. Receiver be-tween 2 & 13	T103 (top) for min. on meter	Fig. 11 Fig. 13
7	"	21.25	"		"	"	"	T105 (top) for min.	Fig. 13 Fig. 11
8	"	27.25	"		"	"	"	T102 (top) for min.	"
9	"	27.25	"		"	"	"	T104 (top) for min.	"
10	"	19.75	"		"	"	"	T106 (top) for min.	"
11	"	19.75	"		"	"	"	T101 (top) for min.	"
12	"	22.5	"		"	"	"	T106 (bottom) for max. on meter	Fig. 12
13	"	24.6	"		"	"	"	T104 (bottom) for max.	"
14	"	22.0	"		"	"	"	T103 (bottom) for max.	"
15	"	25.9	"		"	"	"	T102 (bottom) for max.	"
16	"	22.05 24.75	Converter grid (Pin 1, V2)	Sweep-ing 20 to 30 mc.	Pin 5, V106	Junction of R135 & R136	Shunt 300 ohms across pri. T102, T103, T104, T106. Set bias -2 V. Set swp. gen. for 4 V. P-P on scope.	Adjust T1 (top) and T101 (bot-tom) for proper response	Fig. 12 Fig. 17
17	"		"	"	"	"	Remove shunt re-sistors. Set bias to give 15 volts P to P on scope.	Adjust T1 (top), T101, T102, T103, T104, T106 (bot.) for proper resp.	Fig. 11 Fig. 12 Fig. 13 Fig. 16
ANTENNA, R-F AND CONVERTER LINE ALIGNMENT									
18	Antenna terminals	215.75	Not used		Not used	Junction of C183 & R215 for signal gen. method only	Fine tuning cen-tered. Receiver on channel 13. Het-erodyne meter coupled to oscil-lator if used.	C6 for zero on meter or beat on het. freq. meter	Fig. 13 Fig. 11
19						Junction of R133 & R134	Remove V101	Potentiometer for -3.5 volts on meter	Fig. 13 Fig. 11
20	Antenna terminal (loosely)	175.25 & 179.75	Antenna terminals (see text for precaution)	Sweep-ing channel 7	Test Connection R13	Not used	Receiver on chan-nel 7	L6, C10, C11 & C14 for flat top response between markers. Markers above 90%.	Fig. 13 Fig. 12 Fig. 11 Fig. 19 (7)
21	"	205.25 209.75	"	channel 12	"	"	Receiver on chan-nel 12	L6 for max. re-sponse and min. slope of top of curve	Fig. 11 Fig. 19 (12)
22	"	175.25 179.75	"	channel 7	"	"	Receiver on chan-nel 7.	Check to see that response is as above	Fig. 19 (7)
23	"	181.25 185.75	"	channel 8	"	"	Receiver on chan-nel 8	"	Fig. 19 (8)
24	"	187.25 191.75	"	channel 9	"	"	Receiver on chan-nel 9	"	Fig. 19 (9)

ALIGNMENT TABLE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	R-F AND CONVERTER LINE ALIGNMENT (Cont'd)								
25	Antenna terminal (loosely)	193.25 197.75	Ant. terminals (see text for precaution)	channel 10	Test Connection R13	Not used	Receiver on channel 10	Check to see that response is as above	Fig. 19 (10)
26	"	199.25 203.75	"	channel 11	"	"	Receiver on channel 11	"	Fig. 19 (11)
27	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	"	Fig. 19 (12)
28	"	211.25 215.75	"	channel 13	"	"	Receiver on channel 13	"	Fig. 19 (13)
29	If the response on any channel (steps 22 through 28) is below 80% at either marker, switch to that channel and adjust L6, C10, C11 & C14 to pull response up on that channel. Then recheck steps 22 through 28.								
30	Antenna terminals (loosely)	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping chan. 6	Test Connection R13	Not used	Receiver on channel 6	L9, L13, L66 & C12 for response as above	Fig. 19 (6)
31	"	77.25 81.75	"	channel 5	"	"	Receiver on channel 5	Check to see that response is as above	Fig. 19 (5)
32	"	67.25 71.75	"	channel 4	"	"	Receiver on channel 4	"	Fig. 19 (4)
33	"	61.25 65.75	"	channel 3	"	"	Receiver on channel 3	"	Fig. 19 (3)
34	"	55.25 59.75	"	channel 2	"	"	Receiver on channel 2	"	Fig. 19 (2)
35	If the response on any channel (steps 31 through 34) is below 80% at either marker, switch to that channel and adjust L9, L13, L66 & C12 to pull response up on that channel. Then recheck steps 30 through 34. Replace V101. Disconnect bias pot and replace V108.								
	R-F OSCILLATOR ALIGNMENT								
STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
38	Antenna terminals	215.75	Loosely coupled to r-f osc.	237	Not used	Junction of C183 & R215 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C6 for zero on meter or beat on het. freq. meter	Fig. 13 Fig. 12 Fig. 11
37	"	209.75	"	231	"	"	Rec. on chan. 12	L14 as above	Fig. 14
38	"	203.75	"	225	"	"	Rec. on chan. 11	L15 as above	"
39	"	197.75	"	219	"	"	Rec. on chan. 10	L16 as above	"
40	"	191.75	"	213	"	"	Rec. on chan. 9	L17 as above	"
41	"	185.75	"	207	"	"	Rec. on chan. 8	L18 as above	"
42	"	179.75	"	201	"	"	Rec. on chan. 7	L19 as above	"
43	"	87.75	"	109	"	"	Rec. on chan. 6	L31 as above	Fig. 12
44	"	81.75	"	103	"	"	Rec. on chan. 5	L21 as above	Fig. 14
45	"	71.75	"	93	"	"	Rec. on chan. 4	L22 as above	"
46	"	65.75	"	87	"	"	Rec. on chan. 3	L23 as above	"
47	"	59.75	"	81	"	"	Rec. on chan. 2	L24 as above	"
48	Repeat steps 36 through 47 as a check.								
	HORIZONTAL OSCILLATOR ADJUSTMENT								
49	Short circuit terminals C and D of T109. Tune in a station.								
50	Turn hold control fully clockwise. Adjust T109 Frequency Adjustment until horizontal blanking bar appears in the picture.								
51	Turn hold control ¼ turn from clockwise to sync picture. Adjust width (L110), linearity (L111) and drive (C153B) controls until picture is correct. Repeat step 50.								
52	Turn hold control fully counterclockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 7 to 9 bar pull-in.								
53	Remove clip from terminals C and D of T109. Turn hold control fully clockwise. Adjust T109 Oscillator Waveform Adjustment until horizontal blanking bar appears in picture.								
54	Connect low capacity probe of oscilloscope to terminal C of T109. Turn hold control ¼ turn from clockwise. Adjust T109 Oscillator Waveform Adjustment until broad and sharp peaks of wave on oscilloscope are same height. Keep picture in sync with hold control during adjustment. Remove oscilloscope.								
55	Turn hold control fully counterclockwise. Momentarily remove signal. Turn hold control slowly clockwise. Note least number of bars before pull-in. Adjust Locking Range Control (C153A) for 3 bar pull-in.								
56	Turn hold control fully clockwise. Adjust T109 Freq. Adjustment until horizontal blanking appears as single vertical or diagonal bar in pix.								
	4.5 MC VIDEO TRAP ADJUSTMENT								
57	Tune in a strong station. Short trap winding of T103 with a clip lead. If 4.5 mc beat appears in picture adjust L104 until beat is eliminated.								
	SENSITIVITY CHECK								
58	Connect antenna to receiver through attenuator pad to provide weak signal. Compare the picture and sound obtained to that obtained on other receivers under the same conditions.								

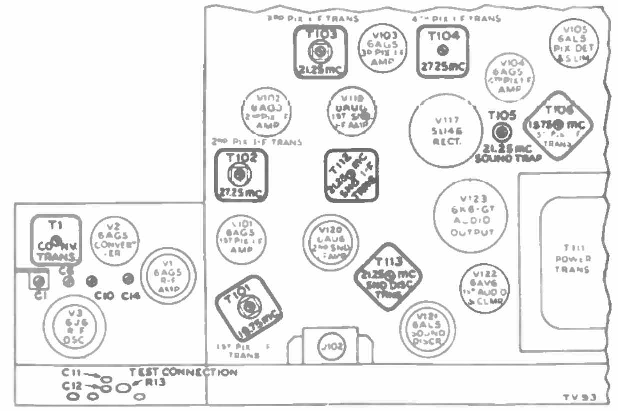


Figure 11—Top Chassis Adjustments

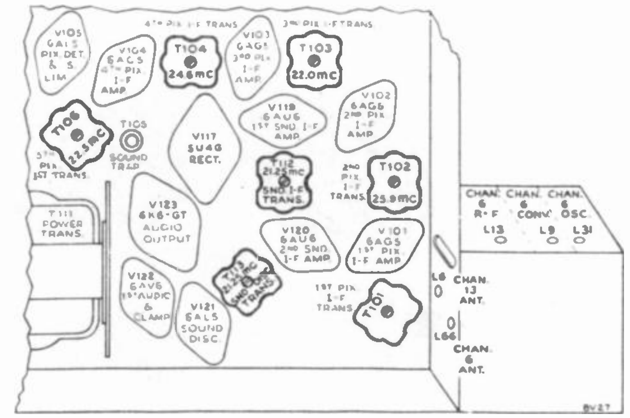


Figure 12—Bottom Chassis Adjustments

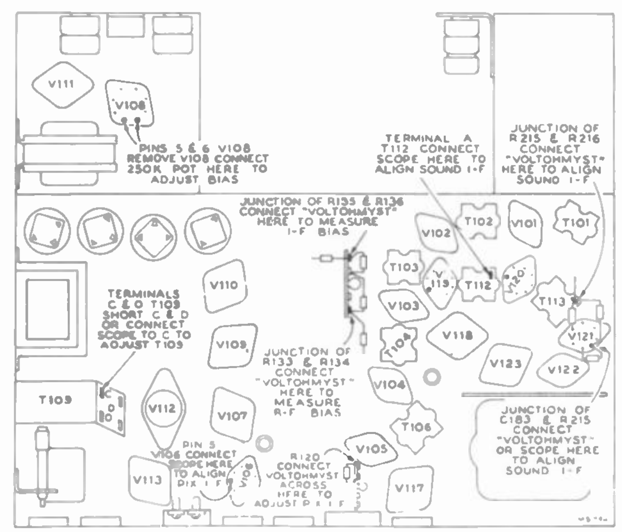
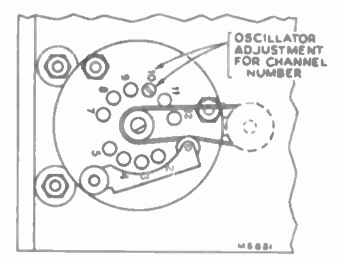


Figure 13—Test Connection Points

NOTE—
Model 9TW390:
V123 (6K6 Audio Output) is not used. V122 (6AV6) is Bias Clamp only.



OSCILLATOR ADJUSTMENT FOR CHANNEL 13 IS ON TOP OF R-F UNIT AND CHANNEL 6 IS ON SIDE.

Figure 14—R-F Oscillator Adjustments

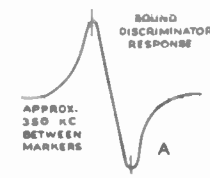


Figure 15 Discriminator Response

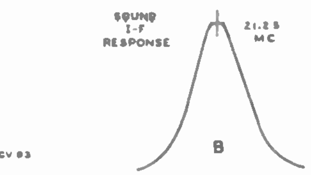


Figure 16 Sound I-F Response

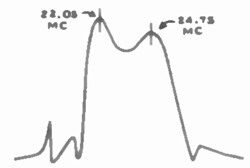


Figure 17 T1 and T101 Response

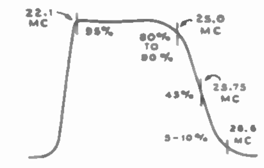


Figure 18 Overall I-F R-F Response

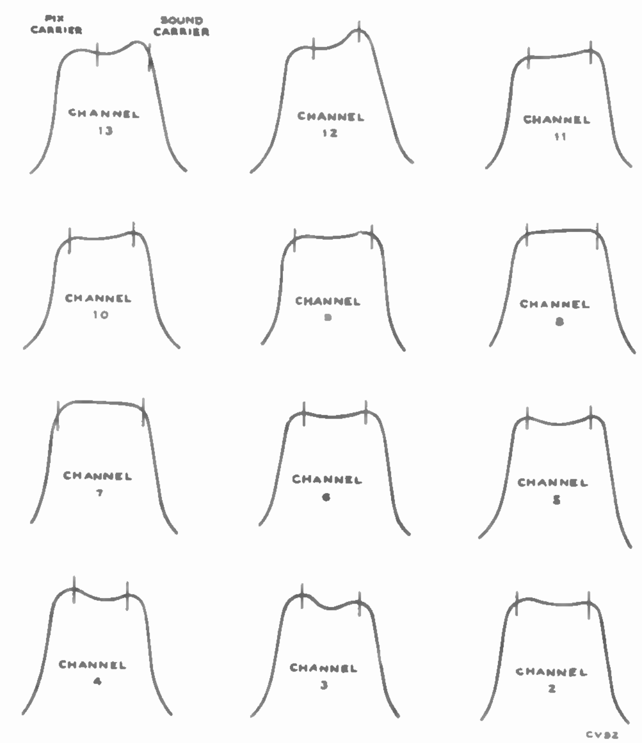


Figure 19—R-F Response

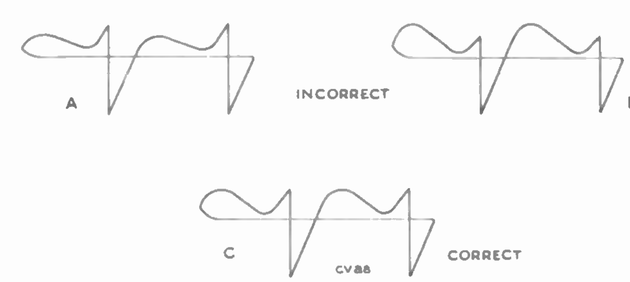


Figure 20—Horizontal Oscillator Waveforms

Figure 21—Normal Picture

Figure 22—Focus Coil and Ion Trap-Magnet Misadjusted

Figure 23—Horizontal Linearity Control Misadjusted

Figure 24—Width Control Misadjusted

Figure 25—Horizontal Drive Control Misadjusted

Figure 26—Transients

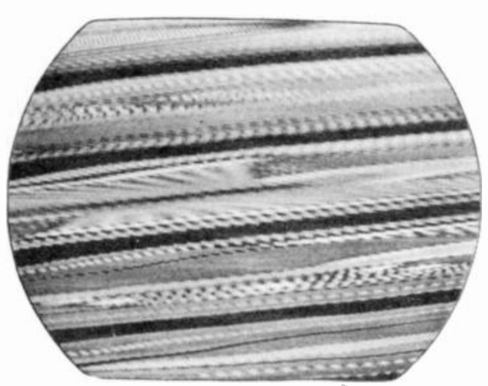


Figure 27—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is in a Counterclockwise Position—Just Before Pulling Int- Sync

Figure 28—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

Following is a list of symptoms of possible failures and an indication of some of the possible faults.

NO RASTER ON KINESCOPE:

(1) Incorrect adjustment of ion trap magnet – Magnets reversed either front to back or top to bottom, front magnet incorrectly oriented.

(2) V113, V114 or V115 inoperative - check voltage and waveform on grids and plates.

(3) No high voltage—If horizontal deflection is operating as evidenced by the correct waveform on terminal 4 of horizontal output transformer, the trouble can be isolated to the 8016 circuit. Either the T110 high voltage winding is open (points 2 to 3), an 8016 tube is defective, its filament circuit is open, C167, C168 or C187 is shorted or R189, R190, R191, R192 or R193 is open.

(4) V112 circuit inoperative - Refer to schematic and waveform chart.

(5) Damper tube (V116) inoperative.

(6) Defective kinescope.

(7) R223 open (terminal 3 to R224).

(8) No receiver plate voltage—filter capacitor or filter choke shorted—bleeder or filter choke open.

NO VERTICAL DEFLECTION:

(1) V108B or V111 inoperative—check voltage and waveforms on grids and plates.

(2) T107 or T108 open.

(3) Vertical deflection coils open.

SMALL RASTER:

(1) Low Plus B or low line voltage.

(2) V113 defective.

POOR VERTICAL LINEARITY:

(1) If adjustment cannot correct, change V111.

(2) Vertical output transformer defective.

(3) V108B defective—check voltage and waveforms on grid and plate.

(4) C147, R164, C148B or C150C defective.

(5) Low bias or plate voltage—check rectifiers and capacitors in supply circuits.

POOR HORIZONTAL LINEARITY:

(1) If adjustments do not correct, change V113 or V116.

(2) T110 or L113 defective.

(3) C164 or C165 defective.

WRINKLES ON LEFT SIDE OF RASTER:

(1) R166, R167 or C169 defective.

(2) Defective yoke.

PICTURE OUT OF SYNC HORIZONTALLY:

(1) T109 incorrectly tuned.

(2) R172, R173, R174, R176 or R178 defective.

TRAPEZOIDAL OR NON-SYMMETRICAL RASTER:

(1) Improper adjustment of focus coil or ion trap magnet.

(2) Defective yoke.

RASTER AND SIGNAL ON KINESCOPE BUT NO SOUND:

(1) R-F oscillator off frequency.

(2) Sound i-f, discriminator or audio amplifier inoperative—check V119, V120, V121, V122, V123 and their socket voltages.

(3) T114 or C186 defective.

(4) Speaker defective.

SIGNAL AT KINESCOPE GRID BUT NO SYNC:

(1) V105A, V106, V108A, V109 or V111 inoperative—check voltage and waveforms at their grids and plates.

(2) Check V104. Try another tube.

SIGNAL ON KINESCOPE GRID BUT NO VERTICAL SYNC:

(1) Check V108B and associated circuit—C145, T107, etc.

(2) Integrating network inoperative—check.

(3) R154, R155, R157, R158 or R159 defective.

SIGNAL ON KINESCOPE GRID BUT NO HORIZONTAL SYNC:

(1) T109 misadjusted—readjust as instructed on page 11.

(2) V112 inoperative—check socket voltages and waveforms.

(3) T109 defective.

(4) C140, C153A, C154, C155, C157 or C166 defective.

(5) If horizontal speed is completely off and cannot be adjusted check C158, C159, R172, R173, R174, R179 and R182.

SOUND AND RASTER BUT NO PICTURE OR SYNC:

(1) Picture i-f, detector or video amplifier inoperative—check V103, V104, V105, V106 and V107—check socket voltages.

(2) Bad contact to kinescope grid

PICTURE STABLE BUT POOR RESOLUTION:

(1) V105A, V106 or V107 defective.

(2) Peaking coils defective—check for specified resistance.

(3) Make sure that the focus control operates on both sides of proper focus.

(4) R-F and I-F circuits misaligned.

PICTURE SMEAR:

(1) R-F or I-F circuits misaligned.

(2) Open peaking coil.

(3) This trouble can originate at the transmitter—check on another station.

PICTURE JITTER:

(1) Check for proper operation of hold controls.

(2) If regular sections at the left picture are displaced change V113.

(3) Vertical instability may be due to loose connections or noise.

(4) Horizontal instability may be due to unstable transmitted sync.

RASTER BUT NO SOUND, PICTURE OR SYNC:

(1) Defective antenna or transmission line.

(2) R-F oscillator off frequency.

(3) R-F unit inoperative—check V1, V2, V3.

PICTURE I-F RESPONSE. — At times it may be desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

DARK VERTICAL LINE ON LEFT OF PICTURE:

(1) Reduce horizontal drive and readjust width and horizontal linearity.

(2) Replace V113.

LIGHT VERTICAL LINE ON LEFT OF PICTURE:

(1) C169 defective.

(2) V116 defective.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

Figures 29 through 33 show the response of the various stages obtained in the above manner. The curves shown are typical although some variation between receivers can be expected. Relative stage gain is not shown.

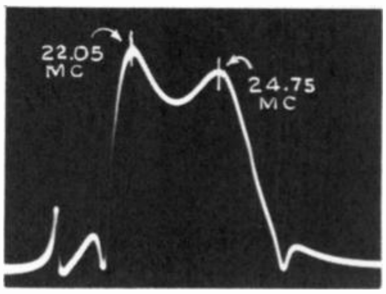


Figure 29—Response of Converter and First Pix I-F Transformer

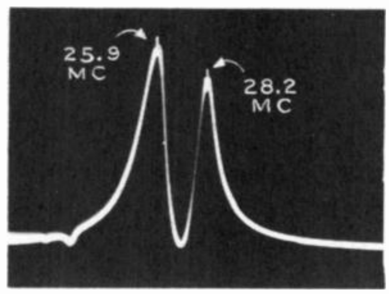


Figure 30—Response of Second Pix I-F Transformer

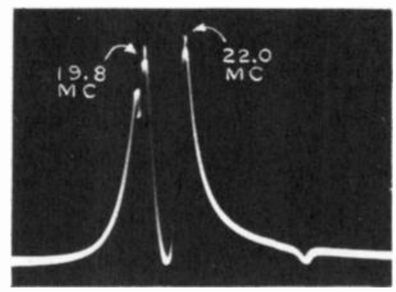


Figure 31—Response of Third Pix I-F Transformer

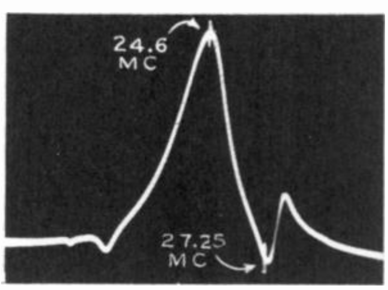


Figure 32—Response of Fourth Pix I-F Transformer

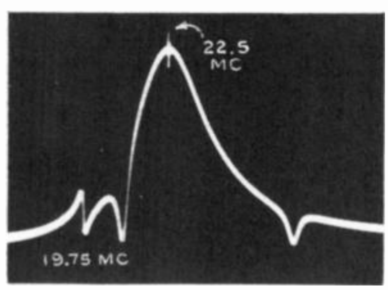


Figure 33—Response of Fifth Pix I-F Transformer

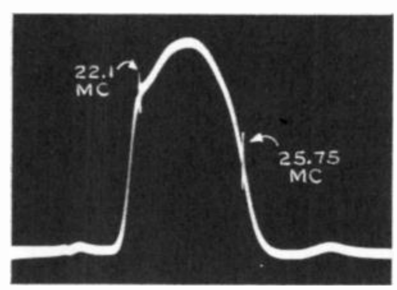


Figure 34—Response from First Pix I-F Grid to Pix Det.

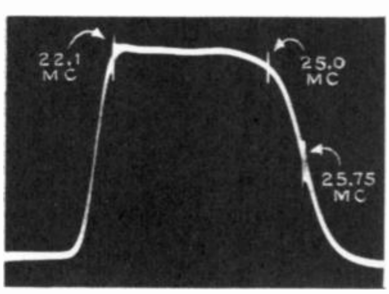


Figure 35—Overall Pix I-F Response

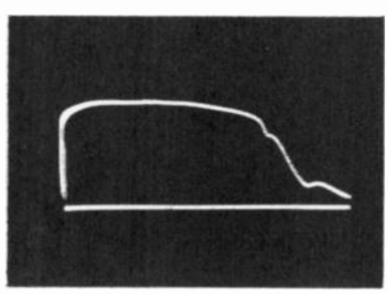


Figure 36—Video Response at Average Contrast

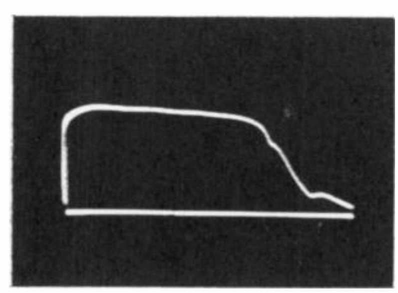
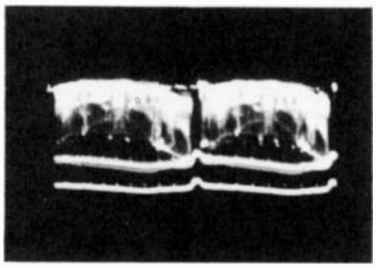


Figure 37—Video Response at Maximum Contrast

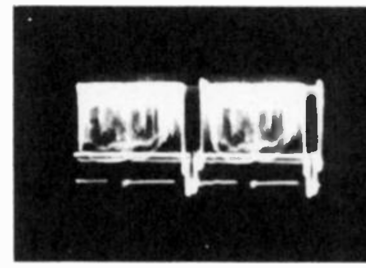
WAVEFORM PHOTOGRAPHS

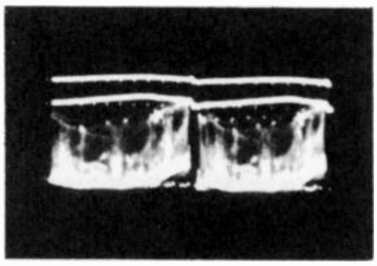


Video Signal Input to 1st Video Amplifier (Pin 1 of V106) (6AU6)

Figure 38—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (2.1 Volts PP)

Figure 39—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (2.1 Volts PP)

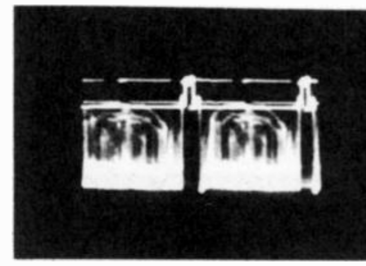


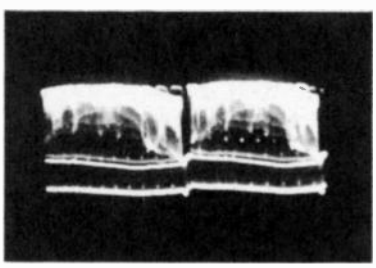


Input to 2nd Video Amplifier (Pin 5 of V107) (6K6GT)

Figure 40—Vertical (15 Volts PP)

Figure 41—Horizontal (15 Volts PP)

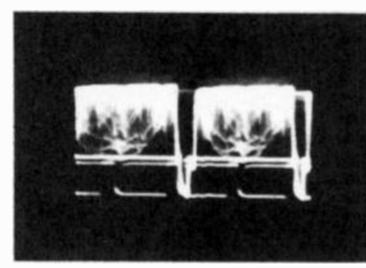


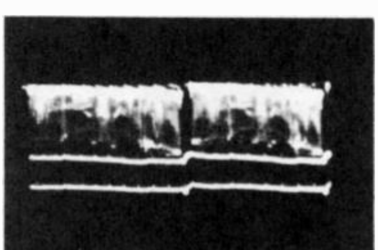


Output of 2nd Video Amplifier (Pin 3 of V107) (6K6GT) (Picture Max.)

Figure 42—Vertical (130 Volts PP)

Figure 43—Horizontal (130 Volts PP)

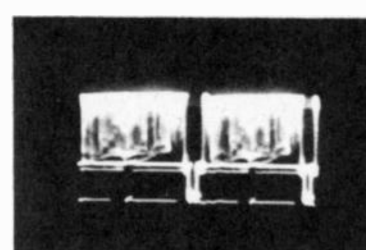


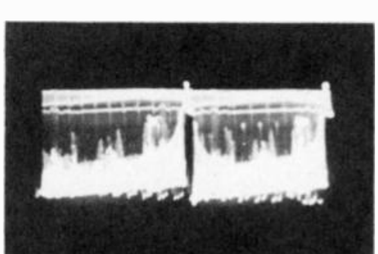


Input to Kinescope (Junction of R131 and R132) (Picture Max.)

Figure 44—Vertical (65 Volts PP)

Figure 45—Horizontal (65 Volts PP)

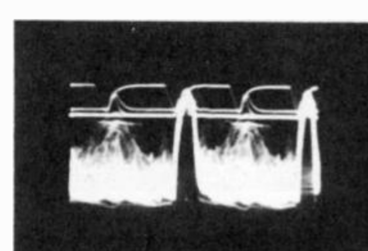




Input to 1st Sync Separator (Pin 1 of V109) (6SN7GT)

Figure 46—Vertical (24 Volts PP)

Figure 47—Horizontal (24 Volts PP)



AGC Rectifier Cathode (Pin 6 of V109) (6SN7GT)

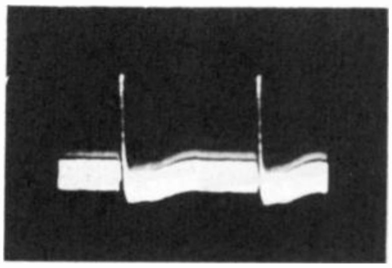


Figure 48—Vertical (4.3 Volts PP)

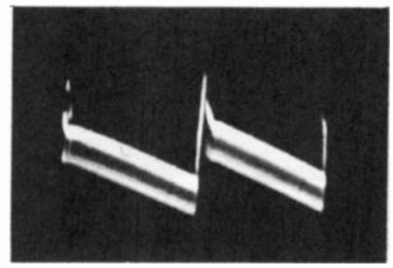


Figure 49—Horizontal (2.2 Volts PP)

Output of AGC Rectifier (Pin 5 of V109) (6SN7GT)

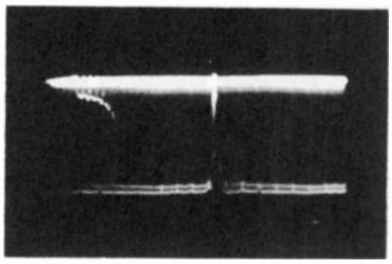


Figure 50—Vertical (19 Volts PP)

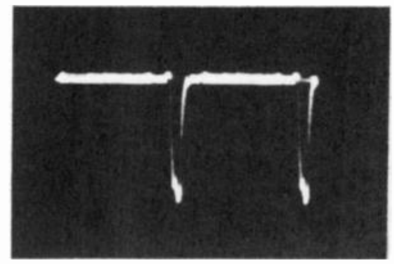


Figure 51—Horizontal (19 Volts PP)

Cathode of 1st Sync Separator (Pin 3 of V109) (6SN7GT)

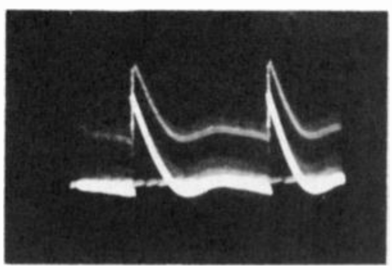


Figure 52—Vertical (1.3 Volts PP)

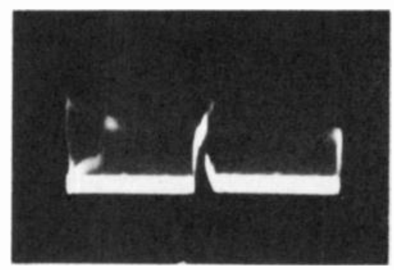


Figure 53—Horizontal (0.9 Volts PP)

Output of 1st Sync Separator (Pin 2 of V109) (6SN7GT)

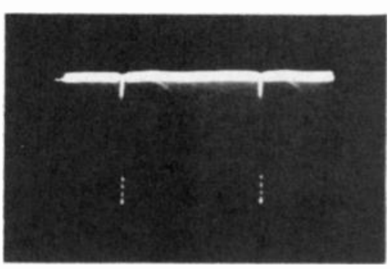


Figure 54—Vertical (48 Volts PP)

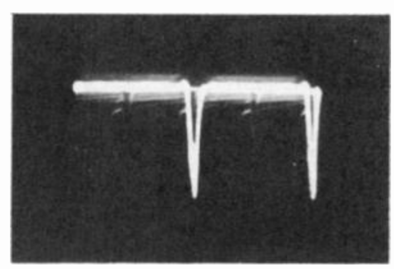


Figure 55—Horizontal (38 Volts PP)

Input to Sync Amplifier (Junction of C137, C139 and R144)

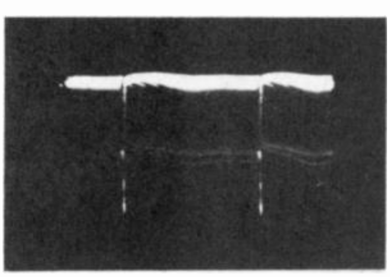


Figure 56—Vertical (30 Volts PP)

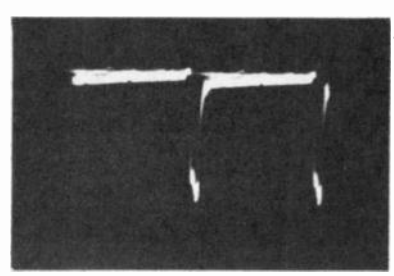
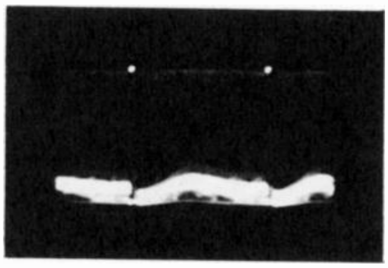


Figure 57—Horizontal (17 Volts PP)

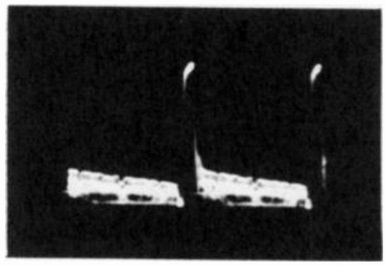
WAVEFORM PHOTOGRAPHS

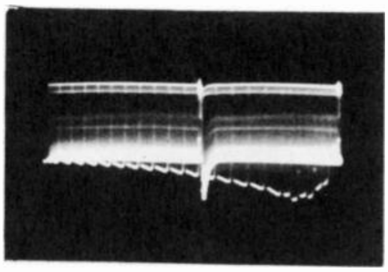


Output of Sync Amplifier (Pin 2 of V110) (6SN7GT)

Figure 58—Vertical (150 Volts PP)

Figure 59—Horizontal (145 Volts PP)

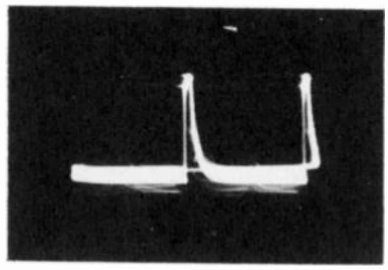




Cathode of 2nd Sync Separator (Pin 6 of V110) (6SN7GT)

Figure 60—Vertical (17 Volts PP)

Figure 61—Horizontal (11 Volts PP)



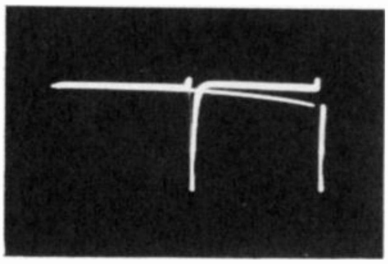
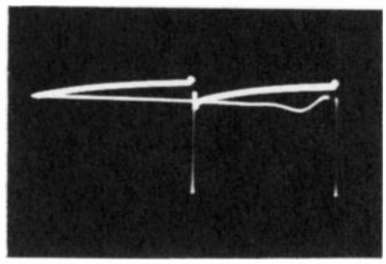


Figure 62—Output of Integrating Network (Junction of C144, C145 and R153) (38 Volts PP)

Figure 63—Grid of Vertical Oscillator (480 Volts PP) (Pin 1 of V108) (6SN7GT)



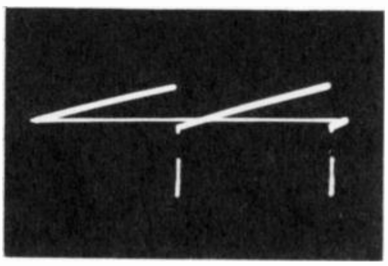
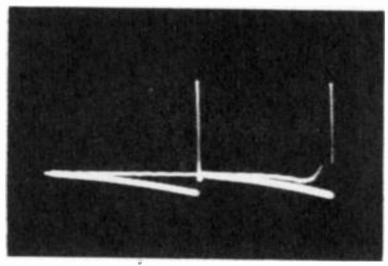


Figure 64—Grid of Vertical Output (140 Volts PP) (Pin 5 of V111) (6K6GT)

Figure 65—Plate of Vertical Output (925 Volts PP) (Pin 3 of V111) (6K6GT)



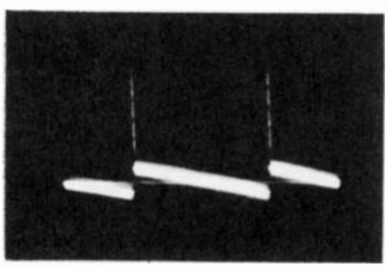
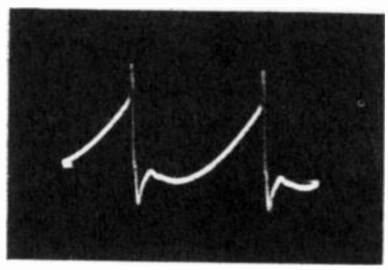


Figure 66—Input of Vertical Deflection Coils (75 Volts PP) (Junction of Green Lead of T108 and Green Lead of Yoke)

Figure 67—Input to Horizontal Oscillator (25 Volts PP) (Junction of C153A and C154)



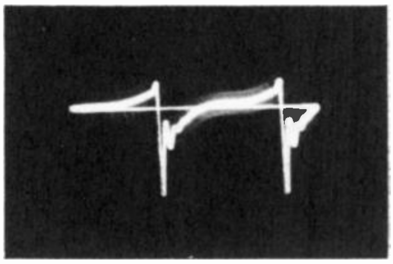


Figure 68—Junction of R168, R176 and R178 (140 Volts PP)

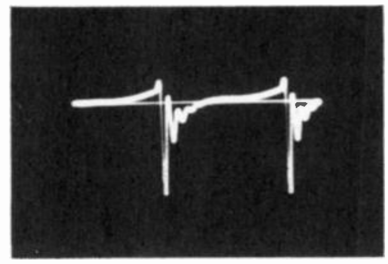


Figure 69—Grid of Horizontal Oscillator (500 Volts PP) (Pin 4 of V112) (6SN7GT)

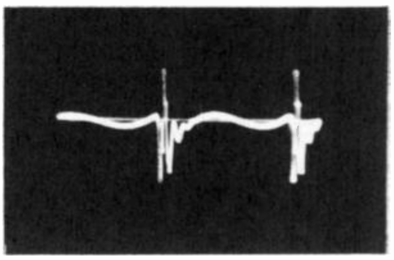


Figure 70—Plate of Horizontal Oscillator (280 Volts PP) (Pin 5 of V112) (6SN7GT)

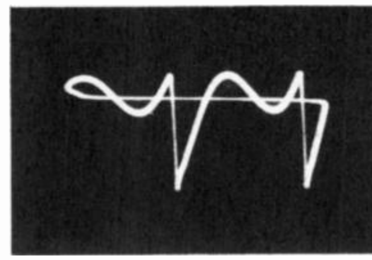


Figure 71—Terminal "C" of T109 (85 Volts PP)

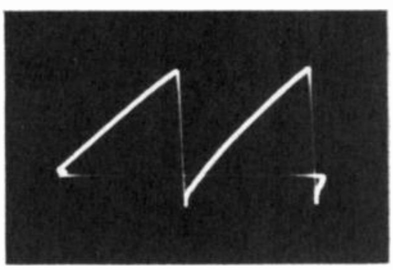


Figure 72—Input to Horizontal Output Tube (75 Volts PP) (Junction of C160, R181 and C153B)

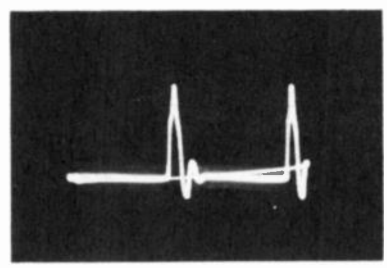


Figure 73—Plate of Horizontal Output (Approx. 6,100 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V113 to Ground)

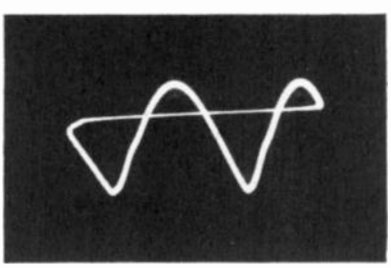


Figure 74—Junction of C164, L113 and Terminal 1 of T110 (80 Volts PP)

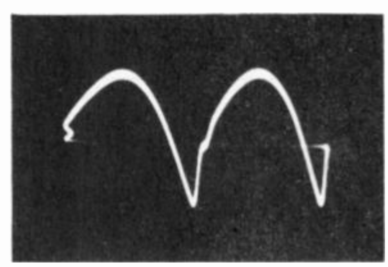


Figure 75—Cathode of Damper (50 Volts PP) (Pin 8 of V116) (5V4G)

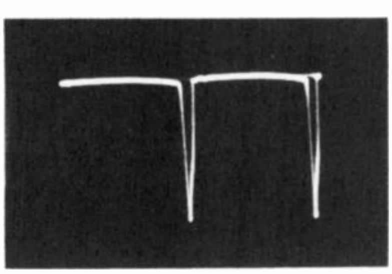


Figure 76—Input to Horizontal Deflection Coils (1,600 Volts PP) (Pin 4 of V116) (5V4G)

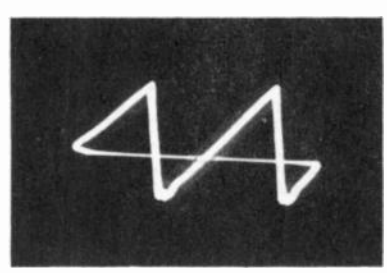


Figure 77—Horizontal Deflection Coil Current (800 ma PP) (Calculated Value from PP Voltage across R199)

9T270, 9TC272, 9TC275

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver and the picture synced. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	6	142	2 & 7	0	1	−4.9	.7	.3	
			No Signal	5	67	6	111	2 & 7	0	1	−0.3	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	137	6	137	2 & 7	0	1	*−5.4	—	—	*Depending upon channel
			No Signal	5	108	6	108	2 & 7	0	1	*−2.0 to −7.0	*6.0 to 10	*1.5 to 3.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	90.5	—	—	7	.19	5 & 6	*−7.0	—	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6AG5	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	136	6	136	2 & 7	<0.1	1	−4.2	0.5	0.1	
			No Signal	5	110	6	103	2 & 7	0.17	1	−1.5	3.8	0.6	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	122	6	122	2 & 7	0.9	1	0	10.3	2.9	
			No Signal	5	96	6	100	2 & 7	0.6	1	0	6.8	2.0	
V103	6AG5	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	130	6	137	2 & 7	<0.1	1	−4.2	1.0	.3	
			No Signal	5	95	6	106	2 & 7	0.17	1	−1.5	3.6	.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	194	6	137	2 & 7	1.6	1	0	8.3	2.7	
			No Signal	5	200	6	113	2 & 7	1.2	1	0	7.1	1.4	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	−117	—	—	1	−115	—	—	0.2	—	
			No Signal	7	−130	—	—	1	−125	—	—	0.3	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	−131	—	—	5	−46	—	—	<0.1	—	
			No Signal	2	−100	—	—	5	−52	—	—	<0.1	—	
V106	6AU6	1st Video Amplifier	2200 Mu. V. Signal	5	−68	6	27	7	−114.5	1	−117	3.9	1.8	
			No Signal	5	−72	6	25	7	−124	1	−130	3.7	1.6	
V107	6K6 GT	2d Video Amplifier	2200 Mu. V. Signal	3	*68	4	140	8	−47	5	−68	10.0	2.5	Maximum contrast
			No Signal	3	*34	4	120	8	−52	5	−72	11.0	2.3	
V108 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	−24	—	—	6	−50	4	−51	0.4	—	
			No Signal	5	−7	—	—	6	−56	4	−60	<0.1	—	
V108 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	54	—	—	3	−110	1	−157	0.32	—	
			No Signal	2	39	—	—	3	−125	1	−171	0.32	—	
V109	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	27	—	—	6	−51	4	−68	0.25	—	
			No Signal	5	19	—	—	6	−59	4	−72	0.25	—	
V109	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	23	—	—	3	−52	1	−68	0.13	—	
			No Signal	2	18	—	—	3	−63	1	−70	0.18	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V110	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	81	—	—	3	−46	1	−48	10.8	—	
			No Signal	2	71	—	—	3	−50	1	−54	10.8	—	
V110	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	210	—	—	6	−44	4	−131	0.34	—	
			No Signal	5	200	—	—	6	−51	4	−100	0.15	—	
V111	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	197	4	*197	8	−76	5	−96	7.7	1.3	*Screen connected to plate
			No Signal	3	185	4	*185	8	−93	5	−110	7.6	1.3	
V112	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	25	—	—	3	−120	1	−110	0.24	—	Horizontal hold control completely clockwise
			No Signal	2	−8	—	—	3	−146	1	−128	0.1	—	
			No Signal	2	+60	—	—	3	−130	1	−114	0.13	—	Hold control counterclockwise
V112	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	75	—	—	6	−115	4	−190	2.3	—	
			No Signal	5	60	—	—	6	−125	4	−204	1.5	—	
V113	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	*	8	180	3	−100	5	−120	90.0	10.0	*5200 volt pulse present
			No Signal	Cap	Do Not Meas.	8	160	3	−112	5	−126	92.6	10.4	
V114	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	6400	—	—	—	—	*6000 volt pulse present
			Brightness Max.	Cap	Do Not Meas.	—	—	2 & 7	6100	—	—	—	—	
V115	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	11700	—	—	—	—	*6000 volt pulse present
			Brightness Max.	Cap	Do Not Meas.	—	—	2 & 7	11600	—	—	—	—	
V116	5V4G	Damper	2200 Mu. V. Signal	4 & 6	*	—	—	2 & 8	350	—	—	93.0	—	*1200 volt pulse present
			No Signal	4 & 6	Do Not Meas.	—	—	2 & 8	340	—	—	92.0	—	
V117 V118	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	*365	—	—	2 & 8	277	—	—	†125	—	†Per tube *A-C measured from plate to trans. center tap
			No Signal	4 & 6	*365	—	—	2 & 8	264	—	—	†130	—	
V119	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	131	6	131	7	0.65	1	0	6.0		
			No Signal	5	106	6	106	7	0.55	1	0	4.9		
V120	6AU6	2d Sound I-F Amplifier	2200 Mu. V. Signal	5	136	6	80	7	0	1	−0.6	3.5		
			No Signal	5	111	6	62	7	0	1	−0.7	3.0		
V121	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	−1.4	—	—	5	0	—	—	—	—	
			No Signal	2	−0.7	—	—	5	0	—	—	—	—	
V122	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	88	—	—	2	0	1	−0.7	0.5	—	
			No Signal	7	91	—	—	2	0	1	−0.7	0.5	—	
V123	6K6-GT	Audio Output	2200 Mu. V. Signal	3	152	4	165	8	−94	5	−115	24.0	3.4	
			No Signal	3	139	4	152	8	−107	5	−125	24.0	3.4	
V124	16AP4	Kinescope	2200 Mu. V. Signal	Cap	11700	10	320	11	26	2	−29	0.08	—	Average Brightness
			No Signal	Cap	11600	10	305	11	11	2	−47	0.08	—	Average Brightness

9T270, 9TC272, 9TC275 **R-F UNIT WIRING DIAGRAM**

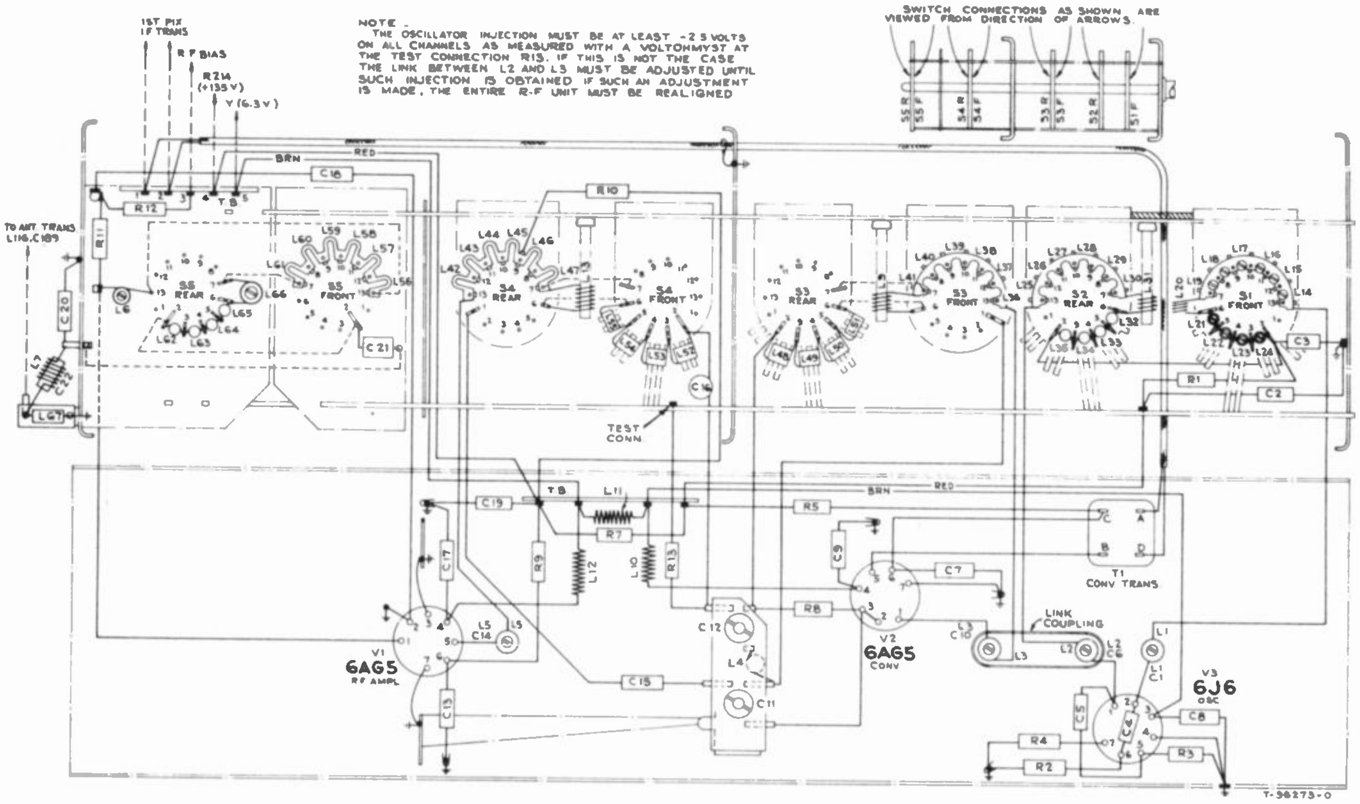


Figure 78—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V120 socket should not be shortened or rerouted.

2. Dress the body of R195 as close to tube pin as possible.

3. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V120, V121 and V122 should be down against the chassis and away from grid or plate leads.

4. Dress all leads crossing the i-f circuits close to the chassis and held so they cannot move and change alignment.

5. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.

6. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.

7. Leads to L102 and L103 must be as short as possible.

8. Dress peaking coils L105, L106, L107, L108 and L109 up and away from the chassis.

9. Dress R129 away from L109.

10. Dress C183 across V121 tube pins 5 and 6 with leads not exceeding ⅜ inch.

11. Dress the blue lead from pin 5 of V122 down against the chassis and under two shielded leads.

12. Dress C129 and C199 up and away from the chassis.

13. Dress the yellow lead from the picture control away from the chassis. Dress the yellow lead from pin 8 of V106 away from the chassis.

14. Dress the green lead from pin 8 of V107 away from the chassis.

15. Dress R168, R169, R170, R176 and R178 up and away from the chassis.

16. The leads to the volume control should be dressed down against the chassis and away from V119 and V120.

17. Dress the yoke red horizontal deflection lead under the clips of the fixed H. V. shield.

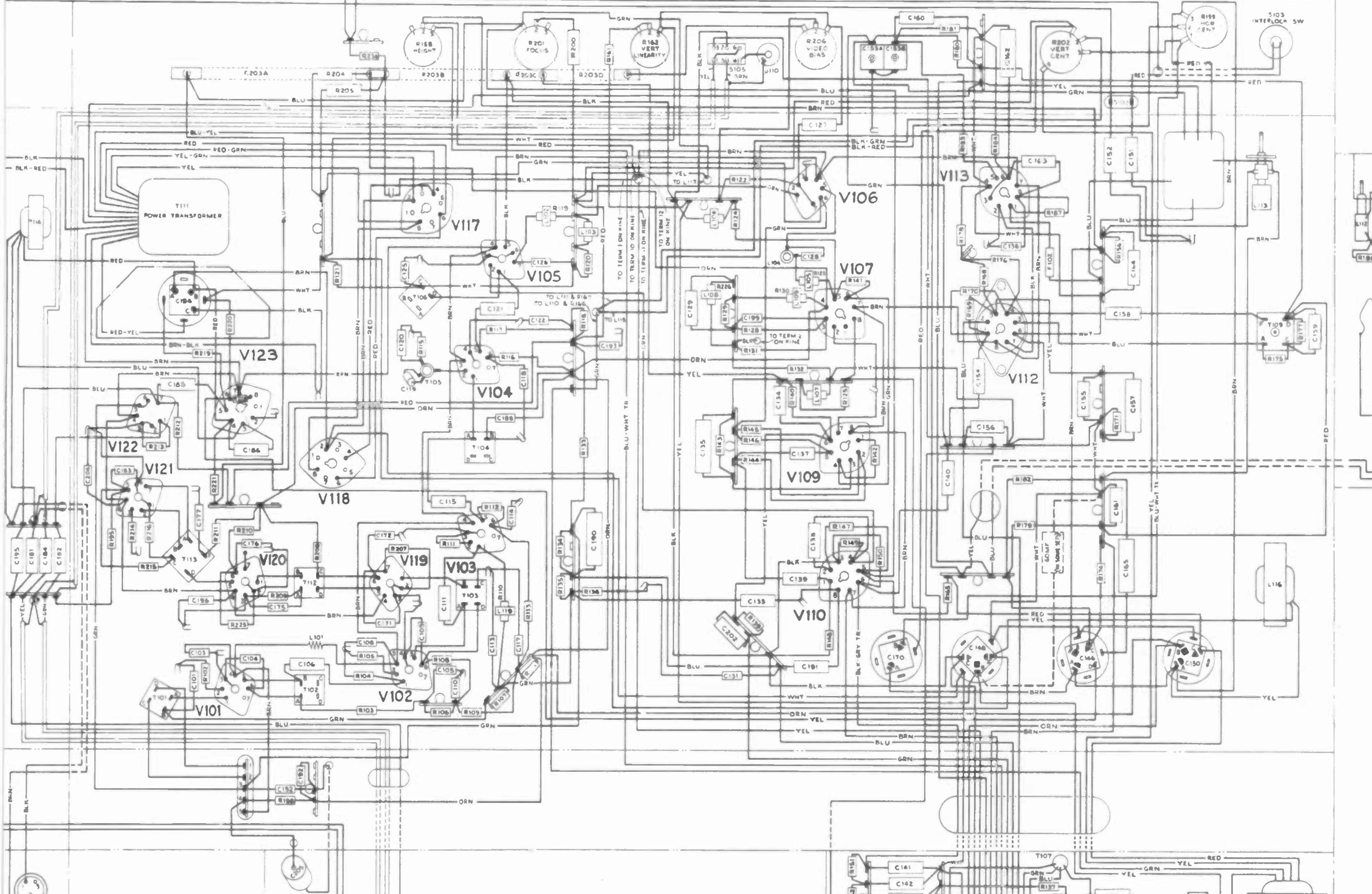
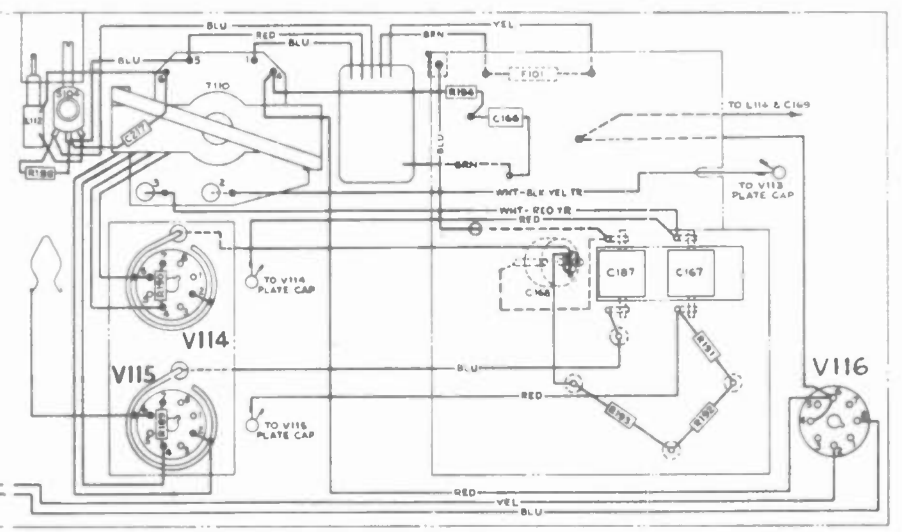
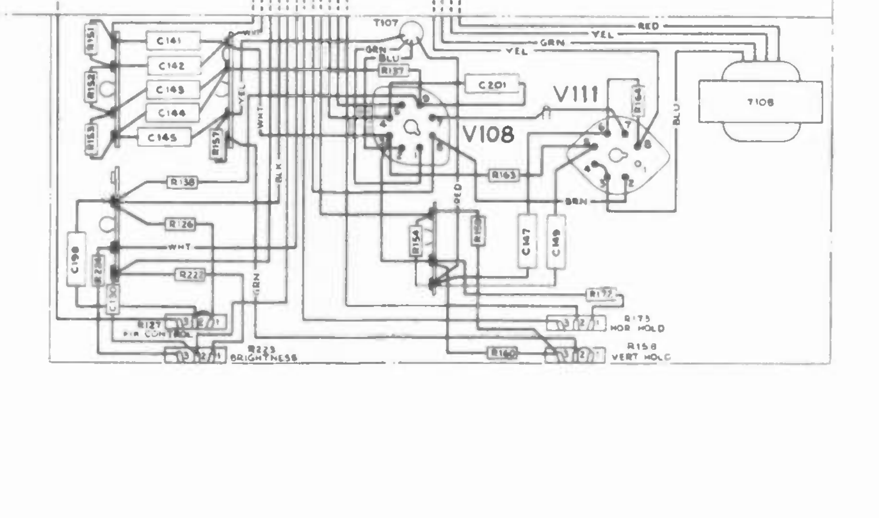
18. Dress the green lead from C166 close to the chassis and away from the red lead connected to T110-4.

19. Insert the red lead into T110-4 from the top of the terminal.

20. All soldered connections in the high voltage compartment should be free of sharp points.

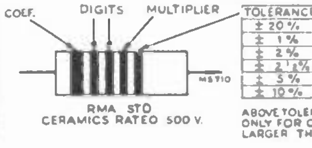
21. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.

CHASSIS WIRING DIAGRAM

RMA COLOR CODE, CERAMIC CAPACITORS

COLOR	TEMPERATURE COEF.
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	−220 PPM/°C
GREEN	−330 PPM/°C
BLUE	−470 PPM/°C
VIOLET	−750 PPM/°C
GRAY	+ 30 PPM/°C



TOLERANCE	COLOR
± 20 %	BLACK
± 1 %	BROWN
± 2 %	RED
± 2½ %	ORANGE
± 5 %	GREEN
± 10 %	WHITE

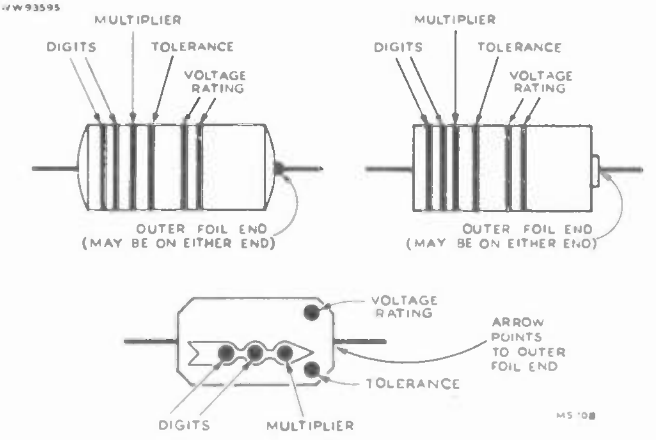
ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 26.

Figure 79—Chassis Wiring Diagram

COLOR CODES, MOULDED PAPER CAPACITORS

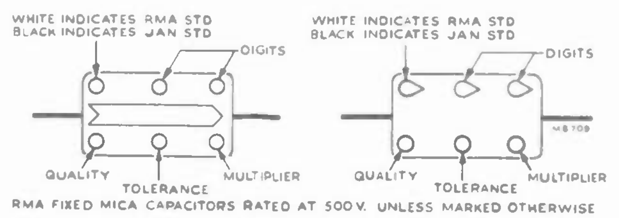


CAPACITY VALUE IN MMF		
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE	
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.

RMA COLOR CODE, FIXED MICA CAPACITORS



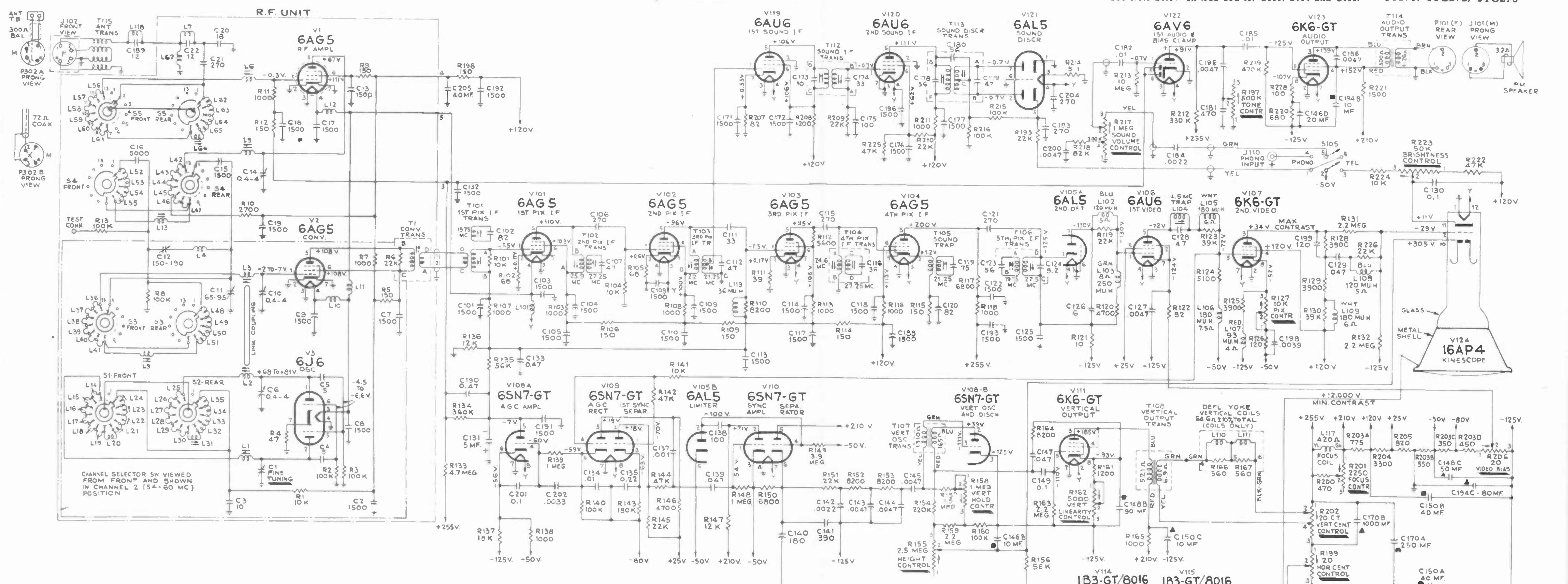
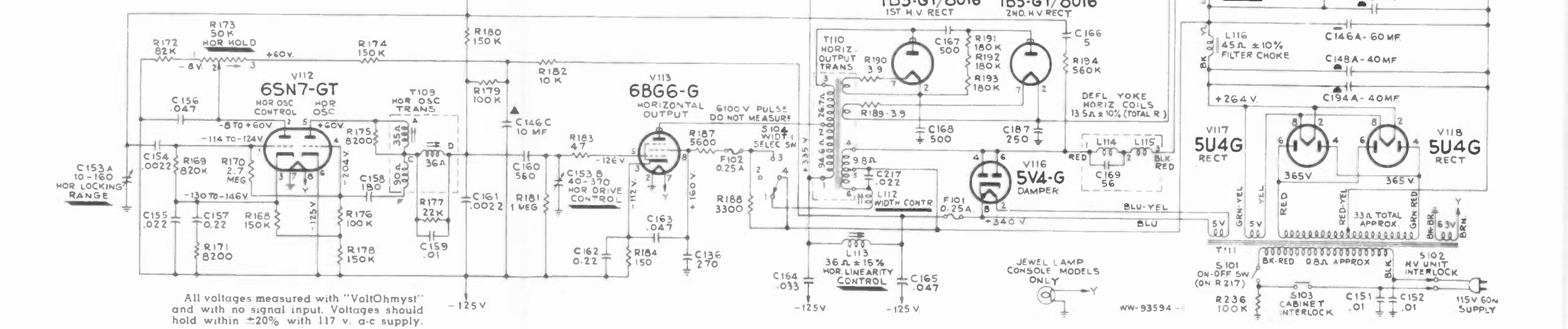
RMA FIXED MICA CAPACITORS RATED AT 500 V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

CIRCUIT SCHEMATIC DIAGRAM

See Note below on KCS 29C for C181, C184 and C186.

All voltages measured with "VoltOhmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

KCS 29C
9TC272, 9TC275

C181 is replaced by C207 120 mmf.
C184 is replaced by C208 .0047 mf.
C186 is replaced by C209 .0033 mf.

In some receivers, R102 was 39 ohms.

In some receivers C148B was 10 MF and a 60 MF tubular condenser was connected in parallel with it.

Figure 80—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLY KRK5A
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (4⅞") (W1)
73441	Cam—Fine tuning adjustment cam
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1,500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73475	Coil—Antenna filter shunt coil (L67)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Converter grid coil for channel No. 6 (L9, L31)
73462	Coil—Coupling inductance coil (L4)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (threaded bushing type with plunger adjustment) (L1, C1)
73443	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (smooth bushing type with plunger adjustment) (L1, C1)
73476	Coil—I-F trap (L7, C22)
73461	Coil—Oscillator plate coil (4 turns) for channel No. 6 (L20)
73460	Coil—R-F plate coil for channel No. 6 (L13)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (threaded bushing type with screw adjustment) for oscillator section or converter section (L2, C6, L3, C10)
73444	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (smooth bushing type with screw adjustment) for oscillator section or converter section (L2, C6, L3, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (threaded bushing type with screw adjustment) for r-f amplifier section (L5, C14)
73446	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (smooth bushing type with screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
74187	Core—Adjustable core for L31
73455	Core—Sliding core for fine tuning control trimmer
73440	Detent—R-F unit detent mechanism and fibre shaft
73453	Form—Coil form assembly for L9, L13
71487	Form—Coil form for oscillator plate coil L31
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73467	Nut—Speed nut to mount trimmer coils 73443, 73444 and 73446
74166	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition, 47 ohms, ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms, ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 1,000 ohms, ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 1,000 ohms, ±10%, ½ watt (R11)
	Resistor—Fixed, composition, 2,700 ohms, ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms, ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer for fine tuning link stud

STOCK No.	DESCRIPTION
71476	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
71475	Screw—No. 4-40 x .296 adjusting screw for coils L6, L21, L22, L23, L24
73640	Screw—No. 4-40 x ⅜" adjusting screw for L66
74167	Shaft—Actuating shaft for fine tuning control
74168	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F Unit
71494	Socket—Tube socket
73450	Socket—Tube socket, ceramic, 7 prong bottom mounted
75068	Spring—Retaining spring for r-f oscillator tube shield
74188	Spring—Retaining spring for adjustable core No. 74187
73457	Spring—Return spring for fine tuning control core
73456	Spring—Tension spring for drive belt shield
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55)
75446	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q" L22, L23, L24)
73448	Transformer—Convertor transformer (T1, R6)
2917	Washer—"C" washer for channel selector shaft
73466	Washer—Insulating washers for front shield (1 set)
	TELEVISION CHASSIS ASSEMBLIES KCS29—9T270 KCS29C—9TC272 & 9TC275
73414	Cap—Hi-voltage rectifier and horizontal output plate cap
72809	Capacitor—Mica, 5 mmf. (C166)
74182	Capacitor—Ceramic, 6 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
75060	Capacitor—Mica, 100 mmf., 1,000 volts (C138)
39396	Capacitor—Ceramic, 100 mmf. (C175)
73921	Capacitor—Ceramic, 120 mmf. (C199)
39630	Capacitor—Mica, 120 mmf. (C207)
51416	Capacitor—Mica, 180 mmf. (C140)
73102	Capacitor—Mica, 180 mmf. (C158)
74154	Capacitor—Ceramic, 250 mmf., 20,000 volts (C187)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121, C136)
73922	Capacitor—Ceramic, 270 mmf. (C183, C204)
39642	Capacitor—Mica, 390 mmf. (C141)
39644	Capacitor—Mica, 470 mmf. (C181)
74153	Capacitor—Ceramic, 500 mmf., 15,000 volts (C167, C168)
74250	Capacitor—Mica, 560 mmf. (C160)
73580	Capacitor—Mica trimmer, comprising 1 section of 10-160 mmf. and 1 section of 40-370 mmf. (C153A, C153B)

STOCK No.	DESCRIPTION
71501	Capacitor—Ceramic, 1,500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C132, C171, C172, C176, C177, C188, C191, C192, C193, C196)
73801	Capacitor—Tubular, moulded paper, .001 mfd., 600 volts (C137)
73803	Capacitor—Tubular, moulded paper, .0022 mfd., 600 volts (C142, C154, C184)
73595	Capacitor—Tubular, moulded paper, oil treated, .0022 mfd., 600 volts (C161)
73795	Capacitor—Tubular, moulded paper, .0033 mfd., 600 volts (C202, C209)
73796	Capacitor—Tubular, moulded paper, .0039 mfd., 600 volts (C198)
73920	Capacitor—Tubular, moulded paper, oil treated, .0047 mfd., 600 volts (C145)
73550	Capacitor—Tubular, moulded paper, .0047 mfd., 600 volts (C127, C143, C144, C186, C195, C200, C208)
73561	Capacitor—Tubular, moulded paper, .01 mfd., 400 volts (C134, C151, C152, C182)
73594	Capacitor—Tubular, moulded paper, oil treated, .01 mfd., 600 volts (C159)
73565	Capacitor—Tubular, moulded paper, .01 mfd., 1,000 volts (C185)
73562	Capacitor—Tubular, moulded paper, .022 mfd., 400 volts, (C155, C217)
73596	Capacitor—Tubular, moulded paper, oil treated, .033 mfd., 1,000 volts (C164)
73553	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C129, C139)
73592	Capacitor—Tubular, moulded paper, .047 mfd., 600 volts (C147, C156)
73597	Capacitor—Tubular, moulded paper, oil treated, .047 mfd., 1,000 volts (C165)
73564	Capacitor—Tubular, moulded paper, .047 mfd., 1,000 volts (C163)
73784	Capacitor—Tubular, moulded paper, 0.1 mfd., 200 volts (C201)
73551	Capacitor—Tubular, moulded paper, 0.1 mfd., 400 volts (C130, C149)
73560	Capacitor—Tubular, moulded paper, 0.22 mfd., 200 volts (C135)
73794	Capacitor—Tubular, moulded paper, 0.22 mfd., 400 volts (C157, C162)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd., 200 volts (C133, C190)
74106	Capacitor—Electrolytic, 5 mfd., 50 volts (C131)
74266	Capacitor—Electrolytic, 40 mfd., 400 volts (C205)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts, and 1 section of 10 mfd., 450 volts (C150A, C150B, C150C)
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B C146C, C146D)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts, and 1 section of 80 mfd., 200 volts (C194A, C194B, C194C)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 450 volts, and 1 section of 50 mfd., 150 volts (C148A, C148B, C148C)
71436	Capacitor—Electrolytic, comprising 1 section of 250 mfd., 10 volts, and 1 section of 1,000 mfd., 6 volts (C170A, C170B)
73154	Choke—Filter choke (L116)
73578	Coil—Antenna matching coils complete with socket and bracket (T115)
73477	Coil—Choke coil (L101)
74142	Coil—Focus coil (L117)
71449	Coil—Horizontal linearity control coil (L113)

STOCK No.	DESCRIPTION
74170	Coil—Peaking coil (36 mh) (L119, R110)
71527	Coil—Peaking coil (93 mh) (L107)
71529	Coil—Peaking coil (120 mh) (L102, R119, L108, R226)
74214	Coil—Peaking coil (180 mh) (L106)
71528	Coil—Peaking coil (180 mh) (L105, R123, L109, R130)
71526	Coil—Peaking coil (250 mh) (L103)
71429	Coil—Width control coil (L112)
74160	Connector—Anode connector
71521	Contact—Hi-voltage capacitor contact
74047	Control—Brightness and picture control (R127, R223)
72735	Control—Focus control (R201)
71440	Control—Height control (R155)
74146	Control—Horizontal centering or video bias control (R199, R206)
72734	Control—Horizontal and vertical hold control (R158, R173)
74048	Control—Tone control, volume control and power switch (R197, R217, S101)
71441	Control—Vertical linearity control (R162)
71443	Control—Vertical centering control (R202)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics Nos. 71432, 73581 and 73583
72772	Cover—Insulating cover for electrolytics No. 71436
73590	Cushion—Deflection yoke hood cushion (2 req'd)
73600	Fuse—0.25 ampere, 250 volts (F101, F102)
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 req'd)
71799	Grommet—Rubber grommet for 2nd anode lead
74148	Magnet—Ion trap magnet (PM type)
18469	Plate—Bakelite mounting plate for electrolytics
5119	Plug—3 contact female plug for speaker cable
71448	Plug—Male plug for power cable
74156	Resistor—Wire wound, 3.9 ohms, 1/3 watt (R189, R190)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R214)
	Resistor—Fixed, composition, 10 ohms, ±20%, ½ watt (R121)
	Resistor—Fixed, composition, 39 ohms, ±10%, ½ watt (R111)
	Resistor—Fixed, composition, 47 ohms, ±20%, ½ watt (R183)
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R192, R105)
	Resistor—Fixed, composition, 82 ohms, ±10%, ½ watt (R207)
	Resistor—Fixed, composition, 82 ohms, ±5%, ½ watt (R122)
	Resistor—Fixed, composition, 100 ohms, ±10%, ½ watt (R228)
	Resistor—Fixed, composition, 120 ohms, ±10%, ½ watt (R126)
	Resistor—Fixed, composition, 150 ohms, ±20%, ½ watt (R106, R109, R114, R198)
	Resistor—Fixed, composition, 150 ohms, ±10%, ½ watt (R115)
	Resistor—Fixed, composition, 150 ohms, ±10%, 2 watts (R184)
74197	Resistor—Wire wound, 470 ohms, 4 watts (R200)
	Resistor—Fixed, composition, 680 ohms, ±10%, 1 watt (R220)
74213	Resistor—Wire wound, 820 ohms, 4 watts (R205)
74155	Resistor—Voltage divider, comprising 1 section of 775 ohms, 9.5 watts, 1 section of 550 ohms, 5 watts, 1 section of 350 ohms, 3 watts, and 1 section of 450 ohms, 5 watts (R203A, R203B, R203C, R203D)
	Resistor—Fixed, composition, 1,000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R211)
	Resistor—Fixed, composition, 1,000 ohms, ±10%, ½ watt (R138)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 1,200 ohms, ±10%, ½ watt (R161, R208)
	Resistor—Fixed, composition, 1,500 ohms, ±10%, 2 watts (R221)
	Resistor—Fixed, composition, 3,300 ohms, ±10%, ½ watt (R188)
48207	Resistor—Wire wound, 3,300 ohms, ±10 watts (R204)
	Resistor—Fixed, composition, 3,900 ohms, ±5%, 2 watts (R125, R128, R129)
	Resistor—Fixed, composition, 4,700 ohms, ±10%, ½ watt (R146)
	Resistor—Fixed, composition, 4,700 ohms, ±5%, ½ watt (R120)
	Resistor—Fixed, composition, 5,100 ohms, ±5%, ½ watt (R124)
	Resistor—Fixed, composition, 5,600 ohms, ±5%, ½ watt (R112)
	Resistor—Fixed, composition, 5,600 ohms, ±10%, 1 watt (R187)
	Resistor—Fixed, composition, 6,800 ohms, ±10%, ½ watt (R150)
	Resistor—Fixed, composition, 6,800 ohms, ±5%, 1 watt (R117)
	Resistor—Fixed, composition, 8,200 ohms, ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed, composition, 8,200 ohms, ±5%, ½ watt (R164, R175)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, ½ watt (R141, R182, R224)
	Resistor—Fixed, composition, 10,000 ohms, ±5%, ½ watt (R104)
	Resistor—Fixed, composition, 12,000 ohms, ±5%, ½ watt (R136)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, 2 watts (R147)
	Resistor—Fixed, composition, 18,000 ohms, ±10%, ½ watt (R137)
	Resistor—Fixed, composition, 22,000 ohms, ±20%, ½ watt (R195, R209, R210)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R145, R151, R177)
	Resistor—Fixed, composition, 47,000 ohms, ±20%, ½ watt (R225)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R142, R144, R222)
	Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt (R156)
	Resistor—Fixed, composition, 56,000 ohms, ±5%, ½ watt (R135)
	Resistor—Fixed, composition, 82,000 ohms, ±10%, ½ watt (R218, R172)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R140, R160)
	Resistor—Fixed, composition, 100,000 ohms, ±5%, ½ watt (R215, R216)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, 1 watt (R179)
	Resistor—Fixed, composition, 100,000 ohms, ±5%, 1 watt (R176)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, 2 watts (R236)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, ½ watt (R168, R180)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, 1 watt (R174)
	Resistor—Fixed, composition, 150,000 ohms, ±5%, 1 watt (R178)
	Resistor—Fixed, composition, 180,000 ohms, ±10% ½ watt (R143)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, 2 watts (R191, R192, R193)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R154)

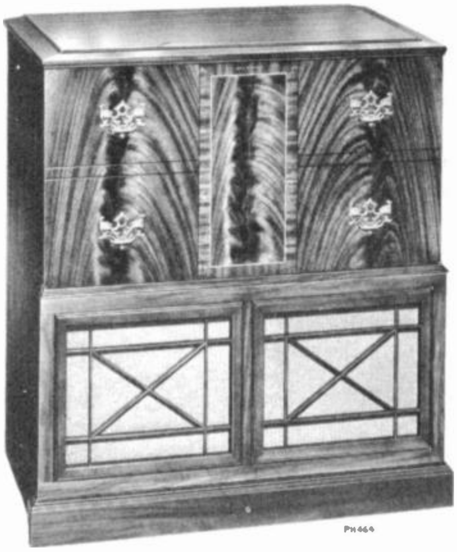
STOCK No.	DESCRIPTION
	Resistor—Fixed, composition, 330,000 ohms, ±10%, ½ watt (R212)
	Resistor—Fixed, composition, 360,000 ohms, ±5% ½ watt (R134)
	Resistor—Fixed, composition, 470,000 ohms, ±20%, ½ watt (R219)
	Resistor—Fixed, composition, 560,000 ohms, ±10%, ½ watt (R194)
	Resistor—Fixed, composition, 820,000 ohms, ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R139, R148)
	Resistor—Fixed, composition, 1 megohm, ±10%, ½ watt (R181)
	Resistor—Fixed, composition, 1.5 megohm, ±5%, ½ watt (R157)
	Resistor—Fixed, composition, 2.2 megohms, ±10%, ½ watt (R131, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohms, ±5%, 1 watt (R170)
	Resistor—Fixed, composition, 3.9 megohms, ±10%, ½ watt (R149)
	Resistor—Fixed, composition, 4.7 megohms, ±5%, 1 watt (R133)
	Resistor—Fixed, composition, 10 megohms, ±20%, ½ watt (R213)
71456	Screw—No. 8-32 wing screw to mount hood and yoke (3 req'd)
74601	Screw—No. 8-32 x ⅜" cross-recessed binder head screw for focus coil mounting (2 req'd)
74602	Screw—No. 10-32 x 1¾" cross-recessed round head screw for focus coil adjustments (3 req'd)
73584	Shield—Tube shield for V120 and V121
73117	Socket—Tube socket, 7 pin, miniature
74251	Socket—Kinescope socket
31364	Socket—Pilot lamp socket for Models 9TC272 and 9TC275
31251	Socket—Tube socket, octal, wafer
31319	Socket—Tube socket, octal, moulded, saddle mounted
71508	Socket—Tube socket for 8016
73249	Socket—Tube socket, octal, ceramic, plate mounted
74151	Spacer—Bakelite spacer to mount moulded tube socket (2 req'd)
74936	Spring—Suspension spring for kinescope socket leads
74152	Spring—Anode spring
72190	Spring—Hood and yoke pressure spring (3 req'd)
74149	Supports—Set of bakelite supports or horizontal plate assembly
74425	Support—Bakelite support for 2nd anode lead
74150	Support—Vertical plate support (bakelite)
74157	Switch—Interlock switch (S103)
74147	Switch—Width selector switch (S104)
73571	Transformer—First pix i-f transformer (T101, C102, R101)
73572	Transformer—Second pix i-f transformer (T102, C107)
73573	Transformer—Third pix i-f transformer (T103, C112)
73574	Transformer—Fourth pix i-f transformer (T104, C116)
73575	Transformer—Fifth pix i-f transformer (T106, C123, C124)
74144	Transformer—Vertical oscillator transformer (T107)
73568	Transformer—Vertical output transformer (T108)
73570	Transformer—Horizontal oscillator transformer (T109)
74145	Transformer—Horizontal output and hi-voltage transformer (T110)
74143	Transformer—Power transformer, 115 volts, 60 cycles (T111)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
71419	Transformer—Audio output transformer for KCS29 only (T114)
*74600	Transformer—Audio output transformer for KCS29C
73577	Trap—4.5 mc video trap (L104, C128)

STOCK No.	DESCRIPTION
71778	Trap—Sound trap (T105, C119)
73476	Trap—I-F trap (L118 C189)
74141	Yoke—Deflection yoke (L110, L111, L114, L115 C169, R166, R167)
	SPEAKER ASSEMBLIES (FOR MODEL 9T270) 92580-2W RL105A3
31825	Cap—Dust cap
73912	Cone—Cone and voice coil assembly
5118	Plug—3 prong male plug for speaker
74169	Speaker—8" P.M. speaker complete with cone and voice coil, less plug
	SPEAKER ASSEMBLIES (FOR MODELS 9TC272 & 9TC275) 92569-7B or 92569-7K or 92569-7W RL 103-C4 or 92569-7W RL 111-9
13867	Cap—Dust cap
75875	Cone—Cone and voice coil assembly for 92569-7B
75642	Cone—Cone and voice coil assembly for 92569-7K
73934	Cone—Cone and voice coil assembly for RL103-C4
74901	Cone—Cone and voice coil assembly for RL111-9
5118	Plug—3 prong male plug for speaker
73635	Speaker—12" P-M speaker complete with cone and voice coil, less plug
71145	Suspension—Metal cone suspension for RL103-C4
	NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74158	Back—Cabinet back (Model 9T270)
74603	Back—Cabinet back (Models 9TC272 & 9TC275)
72857	Board—"Antenna" board
71599	Bracket—Pilot lamp bracket (Models 9TC272 & 9TC275)
13103	Cap—Pilot lamp jewel (Models 9TC272 & 9TC275)
71892	Catch—Bullet catch and strike for doors (4 req'd) (Model 9TC275)
74604	Clip—Spring clip to hold top of control panel (2 req'd) (Models 9T270 & 9TC272)
X1917	Cloth—Grille cloth for mahogany or walnut instruments (Model 9T270)
X1918	Cloth—Grille cloth for oak instruments (Model 9T270)
X3031	Cloth—Grille cloth for mahogany or walnut instruments (Models 9TC272 & 9TC275)
X3032	Cloth—Grille cloth for toasted mahogany instruments (Models 9TC272 & 9TC275)
74160	Connector—Anode connector (3 req'd)
39153	Connector—4 contact male connector for antenna cable
74607	Decal—Control panel decal for mahogany or walnut instruments
74608	Decal—Control panel decal for toasted mahogany or oak instruments
71768	Decal—Trade mark decal (Model 9TC275)
73180	Emblem—"RCA Victor" emblem—metal
74809	Emblem—"RCA Victor" emblem—plastic

STOCK No.	DESCRIPTION
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for toasted mahogany or oak instruments
72113	Foot—Rubber foot (4 req'd) (Model 9T270)
74606	Glass—Safety glass (Model 9T270)
74609	Glass—Safety glass (Models 9TC272 & 9TC275)
37396	Grommet—Rubber grommet for mounting speaker (4 req'd) (Models 9TC272 & 9TC275)
74308	Hinge—Door hinge (1 set) (4 req'd) (Model 9TC275)
73994	Knob—Fine tuning knob—dark—for mahogany or walnut instruments
73995	Knob—Fine tuning knob—tan—for toasted mahogany or oak instruments
73996	Knob—Channel selector knob—dark—for mahogany or walnut instruments
73997	Knob—Channel selector knob—tan—for toasted mahogany or oak instruments
73998	Knob—Vertical hold control, brightness control or tone control knob—dark—for mahogany or walnut instruments
73999	Knob—Vertical hold control, brightness control or tone control knob—tan—for toasted mahogany or oak instruments
74000	Knob—Horizontal hold control, picture control or volume control knob—dark—for mahogany or walnut instruments
74001	Knob—Horizontal hold control, picture control or volume control knob—tan—for toasted mahogany or oak instruments
11765	Lamp—Pilot lamp—Mazda (Models 9TC272 & 9TC275)
74605	Mask—Kinescope mask
74610	Nail—Brass head decorative nail for grille (5 req'd) (Model 9TC272)
74611	Nail—Brass head decorative nail for grille (4 req'd) (Model 9TC275)
74162	Plate—Mounting plate for interlock switch
74006	Plate—Stud and plate including wing nut and spring for front panel (2 req'd) (Model 9T270)
74449	Plate—Stud and plate including wing nut and spring for front panel (2 req'd) (Models 9TC272 & 9TC275)
74111	Plate—Door pull back plate for upper RH door (Model 9TC275)
74112	Plate—Door pull back plate for upper LH door (Model 9TC275)
72938	Pull—Door pull for lower doors (2 req'd) (Model 9TC275)
73771	Pull—Door pull for upper doors (2 req'd) (Model 9TC275)
74113	Screw— No. 8-32 x 1" trimit head screw for door pulls (4 req'd) (Model 9TC275)
73643	Spring—Spring clip for channel marker escutcheons
72854	Spring—Retaining spring for knobs Nos. 73994 and 73995
14270	Spring—Retaining spring for knobs Nos. 73996, 73997, 73998 and 73999
30330	Spring—Retaining spring for knobs Nos. 74000 and 74001
72936	Stop—Door stop (2 req'd) (Model 9TC275)
74161	Stud—Locating stud for cabinet back (2 req'd)
74159	Support—Moulded insulator supports for kinescope (4 req'd)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS



Model 9TW309 Walnut, Mahogany or Toasted Mahogany

RCA VICTOR

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL 9TW309

Chassis Nos. KCS41-1, RK135C

— Mfr. No. 274 —

SERVICE DATA

— 1949 No. T13 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 9TW309 receiver employs twenty-six tubes plus three rectifiers and a 12LP4 kinescope.

The television receiver is provided with Electronic Magnifier deflection circuits by which the center portion of the picture may be enlarged to fill the screen. Choice of picture coverage is made by operation of a remote switch.

The radio tuner unit which feeds through the television audio system covers the AM and the FM broadcast bands.

Two record changers are provided to play 45 and 78 RPM records.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE .... 87 square inches on a 12LP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range....±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency ....25.75 mc.
Sound Carrier Frequency ....21.25 mc.

RADIO TUNING RANGE

Broadcast ....540-1,600 kc.
Frequency Modulation ....88-108 mc.
Intermediate Frequency—AM ....455 kc.
Intermediate Frequency—FM ....10.7 mc.

POWER SUPPLY RATING ....115 volts, 60 cycles, 300 watts

AUDIO POWER OUTPUT RATING ....6.0 watts max.

CHASSIS DESIGNATIONS

Television Chassis KCS41-1
Radio Chassis RK135C
78 RPM Record Changer RP178
45 RPM Record Changer RP168
Refer to Service Data RP178 or RP168 for information on the record changers.

LOUDSPEAKER—92569-8 (RL111-10) ....12 inch PM Dynamic
Voice Coil Impedance ....3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet ....183 lbs.
Shipping Weight ....221 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside)	37	38¾	22¾
Chassis (Overall)	19⅜	12¼	20¼

RECEIVER ANTENNA INPUT IMPEDANCE....300 ohms balanced
If necessary, the television chassis may be fed separately from either a 300 ohm balanced line or a 72 ohm co-ax.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6AG5	Converter
(3)	RCA 6J6	R-F Oscillator
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	1st Audio Amplifier
(8)	RCA 6V6GT	Audio Output
(9)	RCA 6BA6	1st Picture I-F Amplifier
(10)	RCA 6AG5	2nd Picture I-F Amplifier
(11)	RCA 6BA6	3rd Picture I-F Amplifier
(12)	RCA 6AG5	4th Picture I-F Amplifier
(13)	RCA 6AL5	Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7	1st and 2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier & Vertical Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 6W4GT	Damper
(22)	RCA 1B3-GT/8016	High Voltage Rectifier
(23)	RCA 5U4G	Power Supply Rectifier (2 tubes)
(24)	RCA 12LP4	Kinescope

(Radio Tuner Chassis)

	Tube Used	Function
(1)	RCA 6J6	Mixer and Oscillator
(2)	RCA 6BA6	I-F Amplifier
(3)	RCA 6AU6	F-M Driver
(4)	RCA 6AL5	Ratio Detector
(5)	RCA 6BF6	AM Detector AVC

Specifications continued on page 2

REFER TO PAGES 186 TO 201 FOR TELEVISION ALIGNMENT PROCEDURE, SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE I-F FREQUENCIES

Picture Carrier Frequency	25.75 mc.
Adjacent Channel Sound Trap	27.25 mc.
Accompanying Sound Traps	21.25 mc.
Adjacent Channel Picture Carrier Trap	19.75 mc.

SOUND I-F FREQUENCIES

Sound Carrier Frequency	21.25 mc.
Sound Discriminator Band Width between peaks	350 kc.

VIDEO RESPONSE	To 4 mc.
FOCUS	Magnetic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SCANNING FREQUENCY	15,750 cps
VERTICAL SCANNING FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

OPERATING CONTROLS (front panel)

Channel Selector Fine Tuning	Dual Control Knobs
Tone Sound Volume and On-Off Switch	Dual Control Knobs
Picture Horizontal Hold Picture Vertical Hold	Dual Control Knobs
Picture Brightness	Dual Control Knobs
Function Switch	Single Control Knob
Radio Tuning	Single Control Knob

NON-OPERATING CONTROLS

Horizontal Centering	rear chassis adjustment
Vertical Centering	rear chassis adjustment
Shunt Width Coil	rear chassis screwdriver adjustments
Series Width Coil	rear chassis screwdriver adjustment
Expanded Width Coil	rear chassis screwdriver adjustment
Width Selector Switch	rear chassis screwdriver adjustment
Height	rear chassis adjustment
Horizontal Linearity	rear chassis screwdriver adjustment
Vertical Linearity	rear chassis adjustment
Horizontal Drive	rear chassis screwdriver adjustment
Horizontal Oscillator Frequency	bottom chassis adjustment
Horizontal Oscillator Waveform	side chassis adjustment
Focus	rear chassis adjustment
Ion Trap Magnet	top chassis adjustment
Deflection Coil	top chassis wing nut adjustment
Focus Coil	top chassis screwdriver adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES, AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume

5. Turn the BRIGHTNESS control fully counterclockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.

9. Adjust the PICTURE control for suitable picture contrast.

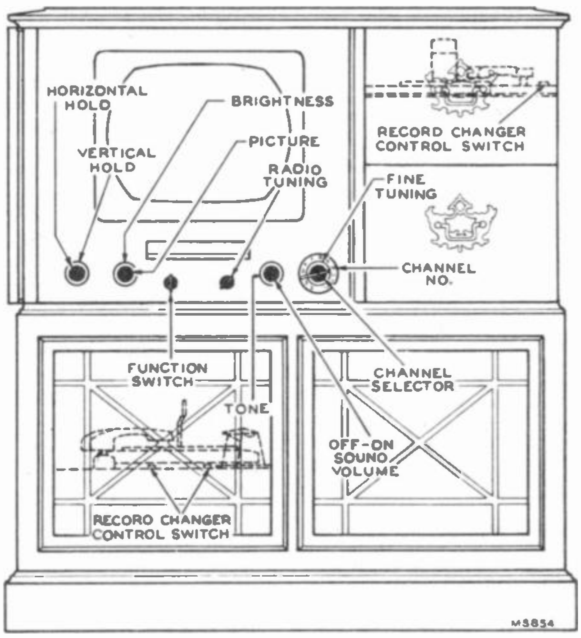


Figure 1—Receiver Operating Controls

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 9.

12. To operate the Electric Magnifier, push the button on the remote cable.

13. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

14. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 1 through 9.

15. For radio operation turn the FUNCTION switch to AM or FM and tune in station with the radio TUNING control.

16. For phono operation, turn the function switch to PH for operation of the 78 rpm changer or to XPH for operation of the 45 rpm changer.

INSTALLATION INSTRUCTIONS

UNPACKING.—The 9TW309 receiver is packed complete with kinescope in a cardboard carton. To unpack, turn the shipping carton on its side and tear open the carton bottom flaps. Fold the flaps up along the side of the carton and turn the carton back up. Lift the carton up and off the cabinet.

A flat skid is attached to the bottom of the receiver cabinet which will permit the cabinet to be moved about without stressing the cabinet joints. To remove the skid, take off the nuts from the two bolts that hold the cabinet on the skid. With a man at each end of the cabinet, lift the cabinet off the skid.

From the rear of the cabinet remove the red bracket which holds the RP168 record changer drawer in the closed position. Slide the drawer out. From the top of the changer, remove the three filler plugs from over the motorboard mounting screws. Loosen these three screws just enough to permit removal of two wooden shipping strips under the edge of the motorboard. Tighten the screws just enough to keep the motorboard springs from rattling and replace the filler plugs.

Remove the red bracket which holds the RP178 changer drawer in the closed position. Open the drawer and from the top of the changer, loosen the motorboard mounting bolts until the changer floats free.

The operating control knobs are packed in a paper bag and tied to a crossmember in back of the cabinet. Remove the bag and install the knobs on the proper control shafts.

Remove the television compartment back.

Make sure that all tubes are in place and are firmly seated in their sockets.

Check to see that the high voltage lead is attached to the kinescope second anode connector socket on the bell of the tube.

Connect the antenna transmission line to the receiver antenna terminals.

Plug the receiver power cord into a 115 volt a-c power source. Turn the power switch to the "on" position, the function switch to Tel, the brightness control three-quarters clockwise, and picture control counterclockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving

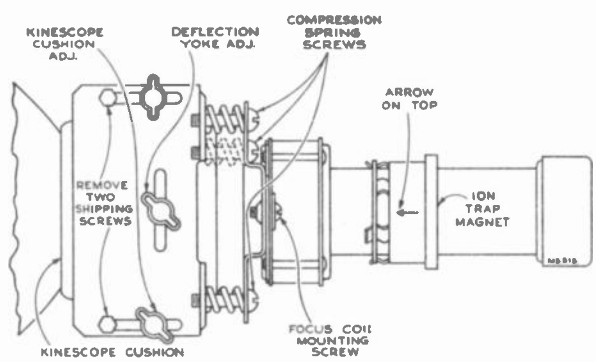


Figure 2—Yoke and Focus Coil Adjustments

it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

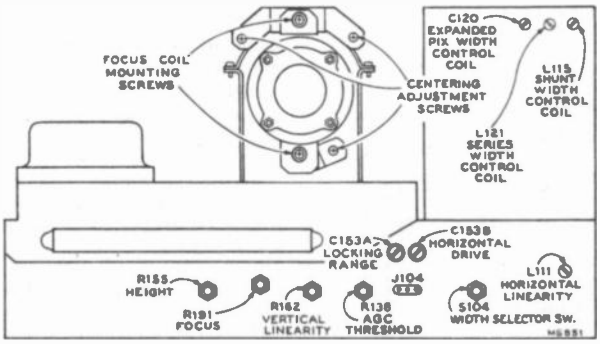


Figure 3—Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustments."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or disagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately ¼ inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. However, it may be necessary to change this distance slightly in order to compensate for small differences in strength of the permanent magnets in the coil. In order to prevent the beam from striking the neck of the kinescope, it is important that the axis of the hole through the focus coil should be kept in accurate alignment with the axis of the neck of the kinescope.

CENTERING ADJUSTMENTS.—Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If a corner of the raster is shadowed, check the position of the ion trap magnet. Slightly reposition it to eliminate the shadow and recenter the picture by sliding the coil. In extreme cases it may be necessary to adjust one or more of the focus coil compression screws to eliminate a corner shadow.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained. It is important that the kinescope not be operated with the ion trap magnet adjusted for less than maximum brightness. To do so may cause injury to the tube.

PICTURE SIZE AND LINEARITY.—Connect the "Electronic Magnifier" switch to its socket on the rear apron of the chassis. Set the switch to the large (expanded) picture position. Set the Expanded Width Selector Switch S104 to the counter-clockwise position and adjust the Expanded Width Control L120 so that the test pattern outer circle normally tangent to the top of the picture is now tangent to the side of the picture. (If the width is not sufficient, set the Expanded Width Selector Switch to the center or the clockwise end position.) Adjust the Horizontal Drive and the Horizontal Linearity Control until the pattern is symmetrical from left to right. In general, the core of the Linearity Control Coil should be between ½ to all the way out of the coil.

Set the "Electronic Magnifier" switch to the normal size position. Observe to see if the picture width is correct. If it is not, adjust either the Series Width Control Coil L121, or the Shunt Width Control Coil L115 until the picture is the correct width. If the Series Width Coil core is out too far, the picture will "ring" on the left half. This ring will be shown as one or more faint light or dark vertical bars somewhere on the left half of the picture with resulting poor horizontal linearity.

When the proper width is obtained, switch to the expanded picture position, wait for a few seconds then switch back to the normal position. Observe if the top of the picture immediately assumes its final position or if it takes several seconds to come to a stop. If the picture requires more than a second to become still, adjust the core of L115 or L121 in and the other out while maintaining the proper width. Repeat the above test and observe if the picture immediately comes to rest when switched to the normal size position. Continue to adjust L115 and L121 until this condition is satisfied and the picture is the proper width. Observe the picture horizontal linearity and if necessary retouch Horizontal Drive, Linearity and Width Controls L115 and L121.

With the "Electronic Magnifier" switch in normal position, adjust the Height (R155) and the Vertical Linearity control (R162) as usual in order to obtain good vertical linearity. In addition, if difficulty is experienced in obtaining good vertical linearity at the top one-half inch of the picture, slightly adjust the Vertical Peaking Control L119.

Switch to the expanded picture position and note if the proper aspect ratio is obtained. If not, adjust L112 and/or S104.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

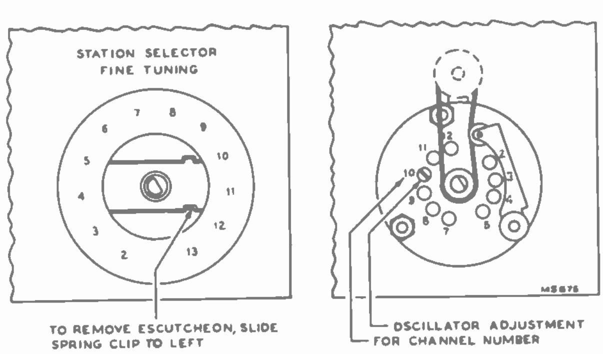


Figure 4—R-F Oscillator Adjustments

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the back and the knobs, unplug all cables and remove the chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

As may be seen by inspection, the radio dial lights and dial pointer are attached to the cabinet front panel. The dial cord is attached to the receiver chassis. The method of attachment may be seen in Figure 5.

Slide the dial pointer to the stop on the high frequency end of the dial. Turn the radio tuning shaft until the gang is completely unmeshed.

To replace the chassis in the cabinet, first tighten the cross recessed head screw on the kinescope strap. Slide the chassis into the cabinet until there is sufficient slack in the pilot light cable then attach the pilot light sockets to the pilot light bracket.

Insert the chassis to its proper position, then install the six chassis bolts and tighten. Loosen the kinescope strap from the rear of the chassis. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare then tighten the cushion adjusting screws. Push the yoke forward and tighten Tighten the kinescope strap. Replace the control knobs.

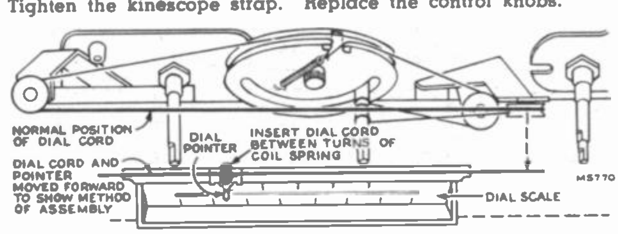


Figure 5—Dial Cord and Pointer Assembly

To hook up the dial pointer, reach over the television chassis to the radio and press the dial cord well into the coil spring.

Turn the set on and to radio position to see that the dial lighting is correct. If it is not, adjust the dial lights and shields. Tune in a station of known frequency and check the dial calibration.

CABINET ANTENNA.—A cabinet antenna is provided which may be employed in strong signal areas in which no reflections are experienced. The antenna leads are brought out near the receiver antenna terminal board.

The link on the antenna terminal board is for use in case it is desirable to connect a separate "A" band antenna.

9TW309

CHASSIS TOP VIEW

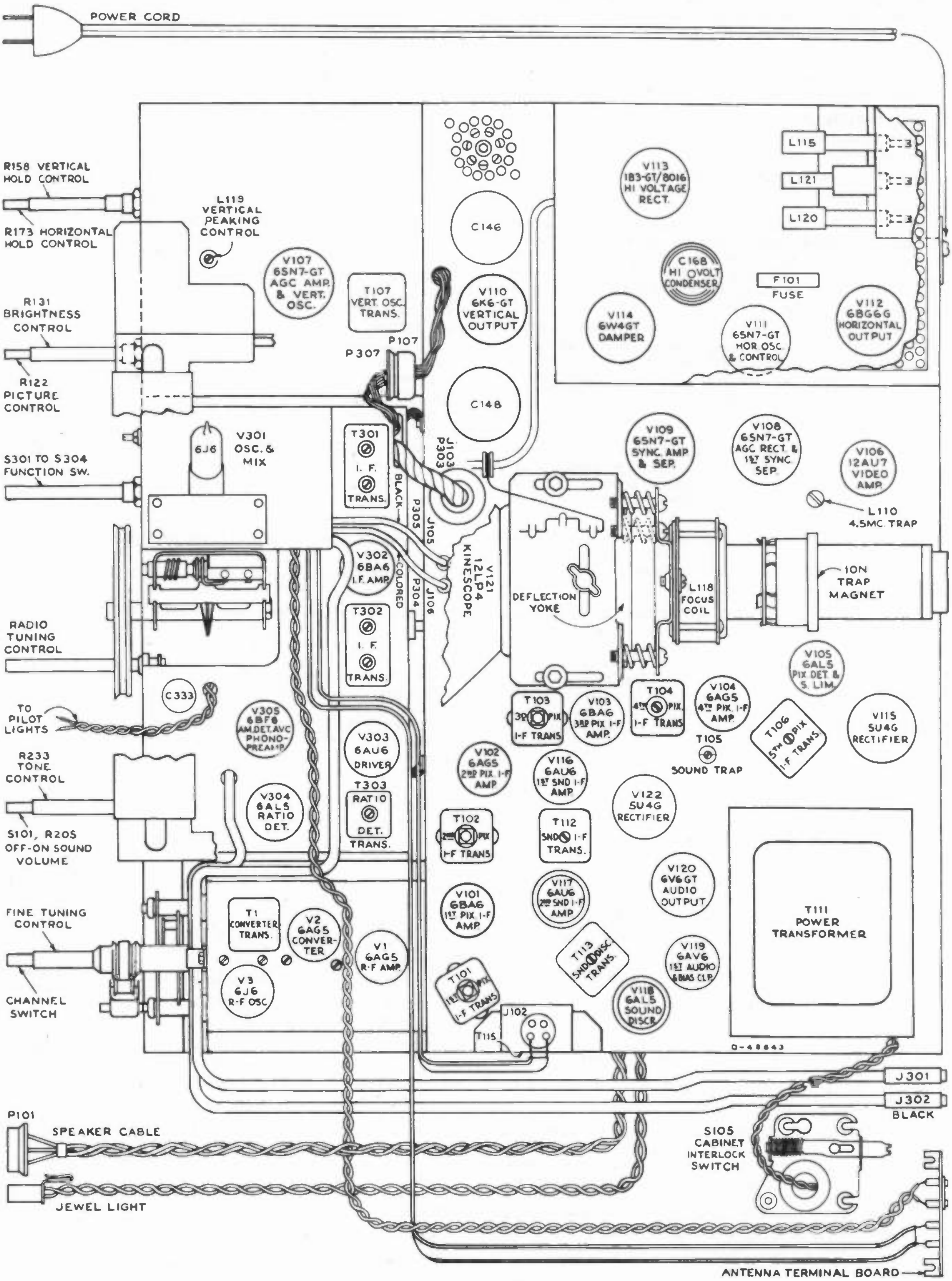


Figure 6—Chassis Top View

CHASSIS BOTTOM VIEW

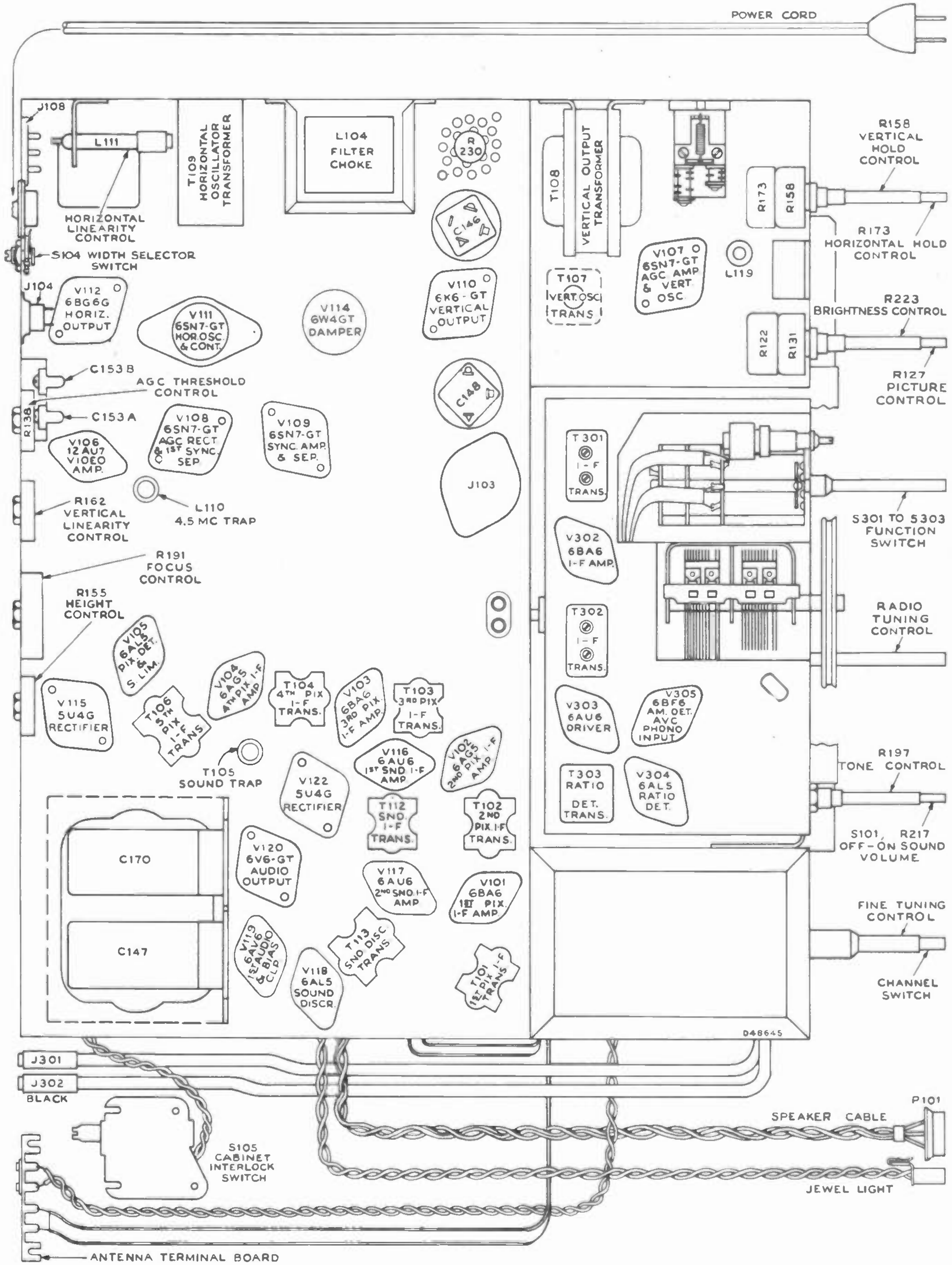


Figure 7—Chassis Bottom View

RADIO CHASSIS WIRING DIAGRAM

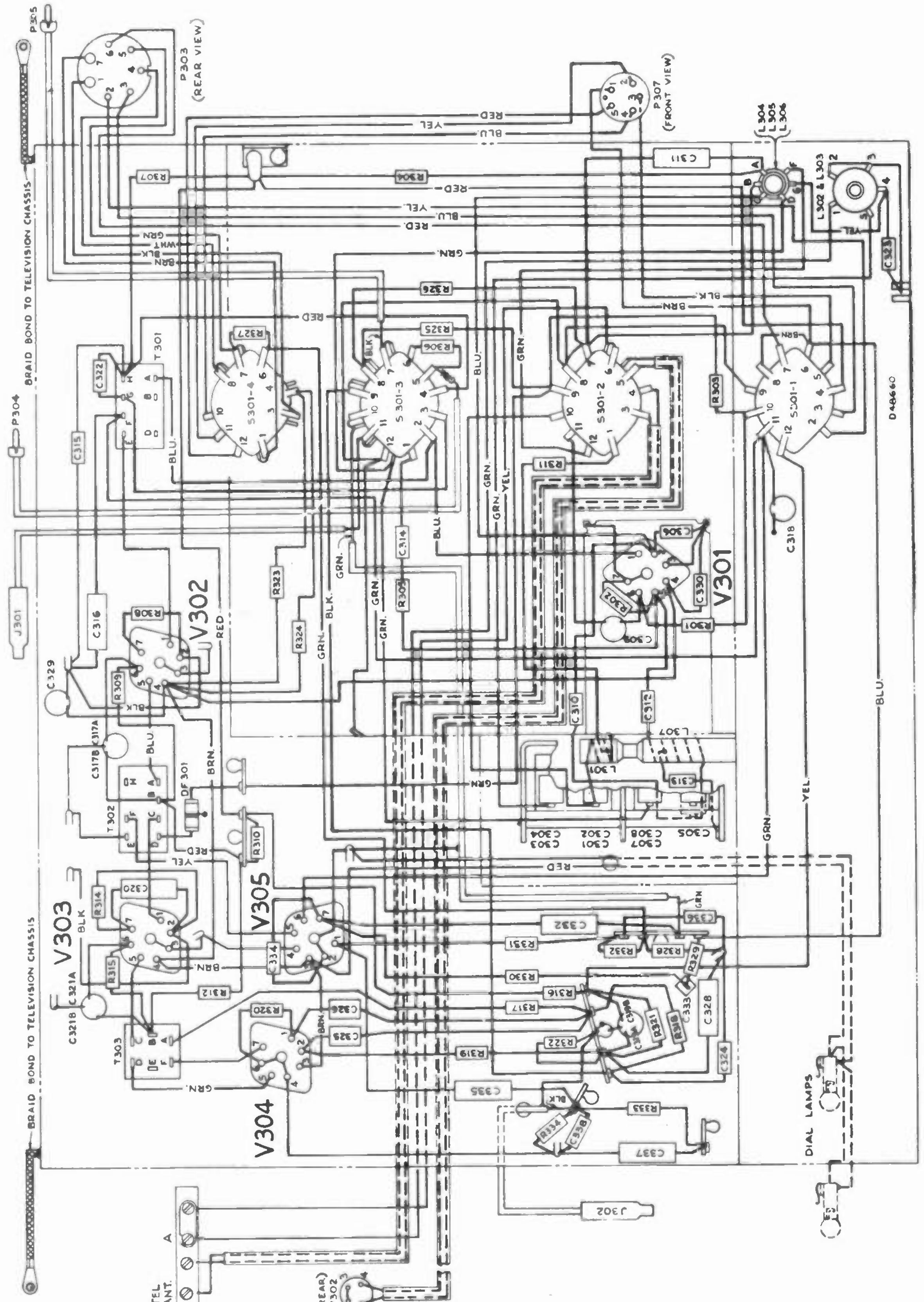


Figure 8—Radio Chassis Wiring Diagram (RK135C)

9TW309 RADIO ALIGNMENT PROCEDURE

If any lead dressing is necessary, it should be done before aligning the receiver. When making a complete alignment follow the table below in sequence. If only a portion of the circuit is to be aligned select the portion required and follow with the remaining steps in the section. Any adjustments made on the 455 kc. I-F's make it necessary to adjust the 10.7 mc. I-F's.

"AM" R-F—I-F ALIGNMENT

Test-Oscillator.—For all alignment operations, connect low side of the test-osc. to the receiver chassis, and keep the osc. output as low as possible to avoid a-v-c action. **Output Meter.**—Connect the meter across the speaker voice coil, and turn the receiver volume control to max.

Steps	Connect the High Side of the Test. Osc. to—	Tune Test Osc. to—	Function Switch	Turn Radio Dial to—	Adjust the following
1	Antenna terminal in series with .01 mfd.	455 kc. Modulated	AM	Low Freq. end of Dial	†Top and bot. cores of T301 and T302. (For max. voltage across voice coil.)
2	Ant. terminal through dummy ant. of 200 mmfs.	1,620 kc.	AM	Min. capacity	Osc. C308 for maximum output.
3		1,400 kc.	AM	Tune to signal	Ant. C304 for maximum output.
4		600 kc.	AM	600 kc.	Osc. L306 and Ant. L303.
5	Repeat steps 2, 3 and 4 for maximum output.				

† Use alternate loading. Connect an 18,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 18,000-ohm resistor while the plate winding is being peaked.

RATIO DETECTOR ALIGNMENT

Connect probe of "VoltOhmyst" to negative side of C328 and low side to chassis. Connect output meter across speaker voice coil.

Steps	Connect the High side of the Test. Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
6	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.	10.7 mc. 30% AM Modulated	FM	———	Top of T303 for maximum DC on "VoltOhmyst."
7	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.		FM	———	Bottom of T303 for minimum audio output on meter.
8	Repeat steps 6 and 7 as necessary making final adjustment with r-f input level set to give approximately −3.0 volts d-c on "VoltOhmyst."				

"FM" R-F—I-F ALIGNMENT

Steps	Connect the High Side of the Test. Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
9	Terminal 3 of S202 rear through 270 ohms.	10.7 mc.	FM	88 mc.	*T301 and T302 with r-f input set to give −3 volts on "VoltOhmyst."
10	Terminal 3 of S202 rear through 270 ohms.	106 mc	FM	106 mc.	Set C302 to max. capacity. Squeeze L307 and adjust C302 for maximum.
11	Terminal 3 of S202 rear through 270 ohms.	90 mc.	FM	Tune to signal	Squeeze L301 and rock gang for maximum output.
12	Repeat steps 10 and 11 as required.				

* Use a 680-ohm resistor to load the plate winding while the grid winding of the same transformer is being peaked. Then the grid winding is loaded with 680-ohm resistor while the plate winding is being peaked.

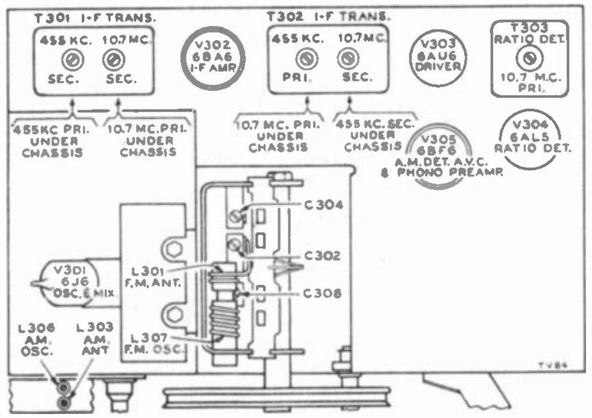


Figure 9—Chassis, Top View, Showing Adjustments

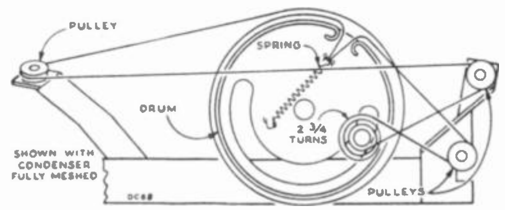


Figure 10—Dial and Drive Cord Assembly

CRITICAL LEAD DRESS:

1. Ground lead on pin 2 of V302 and V303 should be dressed down flat on chassis.
2. Dual .005 mfd. capacitors and diode filter should be dressed to clear the bottom of the cabinet.
3. Dress C329 across V302 sockets with short and direct leads.
4. Dress V302 plate lead from pin 5 down to the chassis.
5. Dress AVC lead from R321 to switch down to chassis and against back of gang mounting plate.
6. Dress lead from pin 6 of V305 down to chassis and against back of gang mounting plate.
7. Dress AVC lead from 1st I-F to switch against chassis and against gang mounting plate.
8. Dress lead from switch to pin 1 of V301 against plate supporting gang.
9. Dress all insulated F-M leads down to chassis.
10. Connect C309 with short lead to pin 6 of V301 keeping body of cap away from plate lead and switch terminals.
11. The coupling between L301 and L307 should be adjusted to give proper injection voltage to the mixer grid. This has been found to be correct when the distance between adjacent end turns is 3/8" to 7/16" measured at top of the form.
12. Dress cabled leads away from antenna transmission lines.
13. Dress all uninsulated bus wire so as to avoid short circuits.

9TW309 VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	*6	142	2 & 7	0	1	−2.4	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	−.4	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*−3.0 to −7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*−2.0 to −6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*−5.1 to −7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	130	6	130	7	.3	1	−12.5	2.8	1.3	
			No Signal	5	100	6	100	7	1.7	1	+.3	7.5	3.5	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	120	6	120	2 & 7	.75	1	0	8.2	2.5	
			No Signal	5	112	6	112	2 & 7	.65	1	0	6.8	2.1	
V103	6BA6	3d Pix I-F Amplifier	2200 Mu. V. Signal	5	90	6	120	7	.5	1	−2.4	4.0	3.8	
			No Signal	5	70	6	100	7	.75 .6	1	−.4	11.0	4.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	170	6	135	2 & 7	1.35	1	0	6.5	2.0	
			No Signal	5	165	6	115	2 & 7	1.1	1	0	5.9	1.8	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	−115	—	—	1	−112	—	—	.48	—	
			No Signal	7	−118	—	—	1	−120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	−107	—	—	5	−56	—	—	—	—	
			No Signal	2	−60	—	—	5	−60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	−9	—	—	3	−111	2	−115	4.38	—	
			No Signal	1	−28	—	—	3	−114	2	−116	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*135	—	—	8	*−.1	7	−4.5	6.2	—	*At max. contrast
			No Signal	6	*195	—	—	8	*−.6	7	−17	6.9	—	
V107 A	6SN7 GT	ACG Amplifier	2200 Mu. V. Signal	5	−12.6	—	—	6	−55.5	4	−56.5	.9	—	
			No Signal	5	+.3	—	—	6	−60	4	−66	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	86	—	—	3	−115	1	−170	.2	—	
			No Signal	2	72	—	—	3	−120	1	−170	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	87	—	—	6	+.3	4	−8.5	3	—	
			No Signal	5	90	—	—	6	−26	4	−35	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	89	—	—	3	1.35	1	−8.5	.1	—	
			No Signal	2	76	—	—	3	−21	1	−27	.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	153	—	—	3	0	1	−4.7	5.25	—	
			No Signal	2	160	—	—	3	0	1	−5.2	3.75	—	

VOLTAGE CHART

Tube No.	Tuba Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	220	—	—	6	–51	4	–106	.4	—	
			No Signal	5	215	—	—	6	–51	4	–62	.35	—	
V110	6K6–GT	Vertical Output	2200 Mu. V. Signal	3	205	4	205	8	–72	5	–91		*7.85	*Screen connected to plate
			No Signal	3	200	4	200	8	–79	5	–101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*34	—	—	3	–105	1	–95	.2	—	*Variation of hold gives –21.9 to +56 volts on plate
			No Signal	2	*23	—	—	3	–110	1	–110	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	90	—	—	6	–120	4	–175	2.4	—	
			No Signal	5	77	—	—	6	–120	4	–175	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	150	3	–105	5	–125	72	9.4	
			No Signal	Cap	Do Not Meas.	8	145	3	–110	5	–125	70	9.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	10200	—	—	0	—	
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	9700	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	295	—	—	66	—	
			No Signal	5	Do Not Meas.	—	—	3	280 295	—	—	65		
V115 V122	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	335			2 & 8	235	—	—	245	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	335			2 & 8	230	—	—	250	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.75	1	–.15	8.2	3.3	
			No Signal	5	110	6	110	7	.8	1	–.2	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	133	6	81	7	0	1	–9	1.6	.8	
			No Signal	5	120	6	65	7	0	1	–.4	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V Signal	2	–8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	–.4	—	—	5	.1	—	—	—	—	
			2200 Mu. V. Signal	7	–3.7	—	—	1	0	—	—	—	—	
			No Signal	7	–.4	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	90	—	—	2	0	1	–18	.49	—	
			No Signal	7	90	—	—	2	0	1	–.8	.4	—	
V120	6V6-GT	Audio Output	2200 Mu. V. Signal	3	70	4	90	8	–99	5	–110	19.3	3.3	
			No Signal	3	60	4	80	8	–111	5	–120	18	3	
V121	12LP4	Kinescope	2200 Mu. V. Signal	Cap	9700	10	285	11	40	2	6	.1	—	*Average Brightness
			No Signal	Cap	9500	10	285	11	42	2	14	—	—	*Average Brightness
V301	6J6	Mixer and Oscillator	No Signal	1 2	110 95	— —	— —	7	0	6 5	–2.0 –5.0	— —	— —	
V302	6BA6	Radio I-F Amplifier	No Signal	5	195	6	90	7	.8	1	–0.2	—	—	Function switch in F-M position
V303	6AV6	Radio F-M Driver	No Signal	5	190	6	135	7	1.3	1	0	—	—	
V304	6AL5	Radio Radio Det.	No Signal	2 7	–0.2 –0.2	—	—	5 1	–0.2 –0.1	— —	— —	— —	— —	
V305	6BF6	Radio A-M Det.	No Signal	7	100	—	—	2	0	1	–6.2		—	

R-F UNIT WIRING DIAGRAM

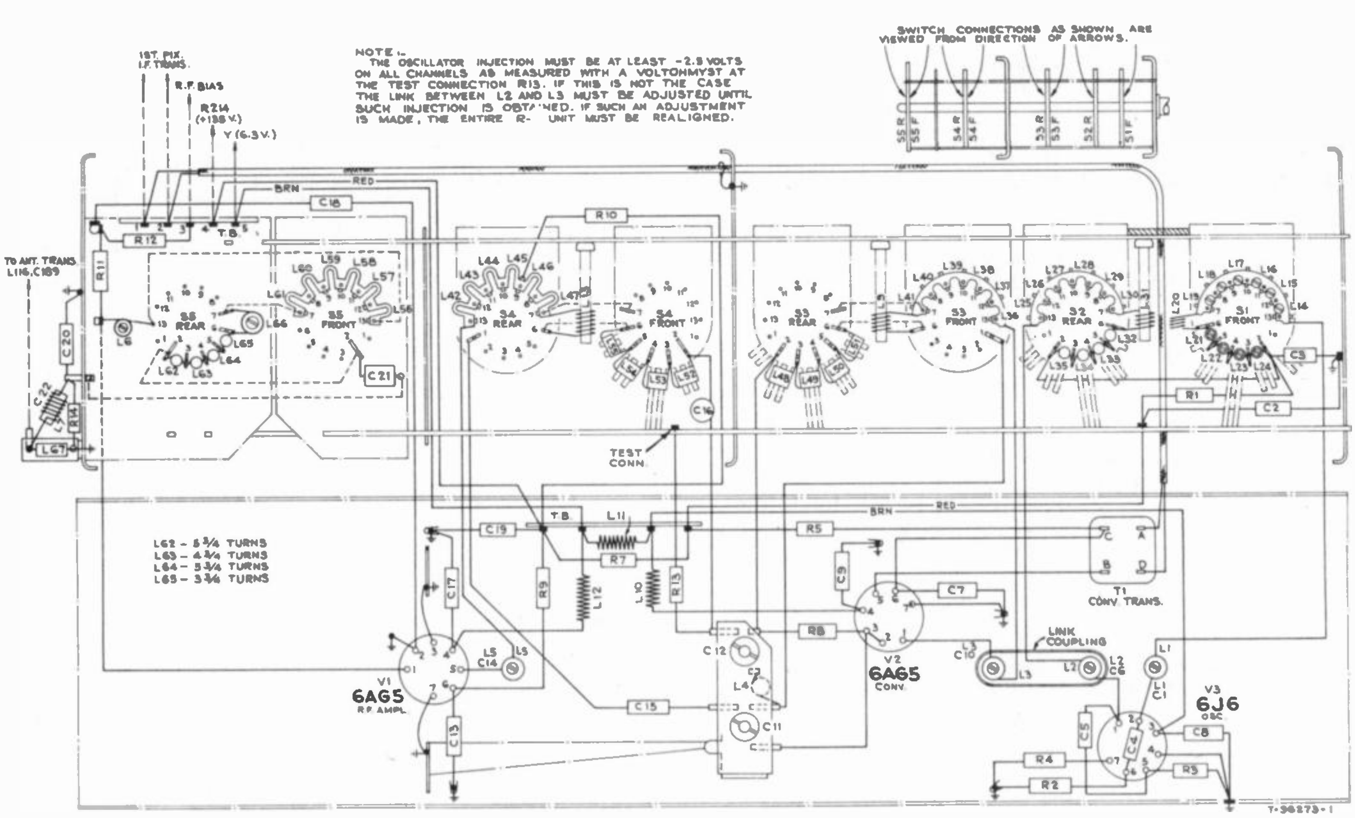


Figure 11—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress C129 and C130 up and away from the chassis.
9. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
10. Dress the green lead from pin 2 of V106 away from the chassis.
11. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
12. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
13. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from the width control coils away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 12.

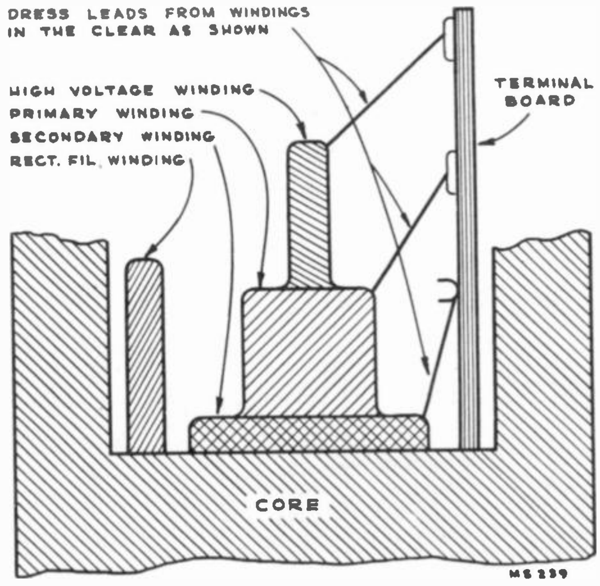


Figure 12—T110 Lead Dress

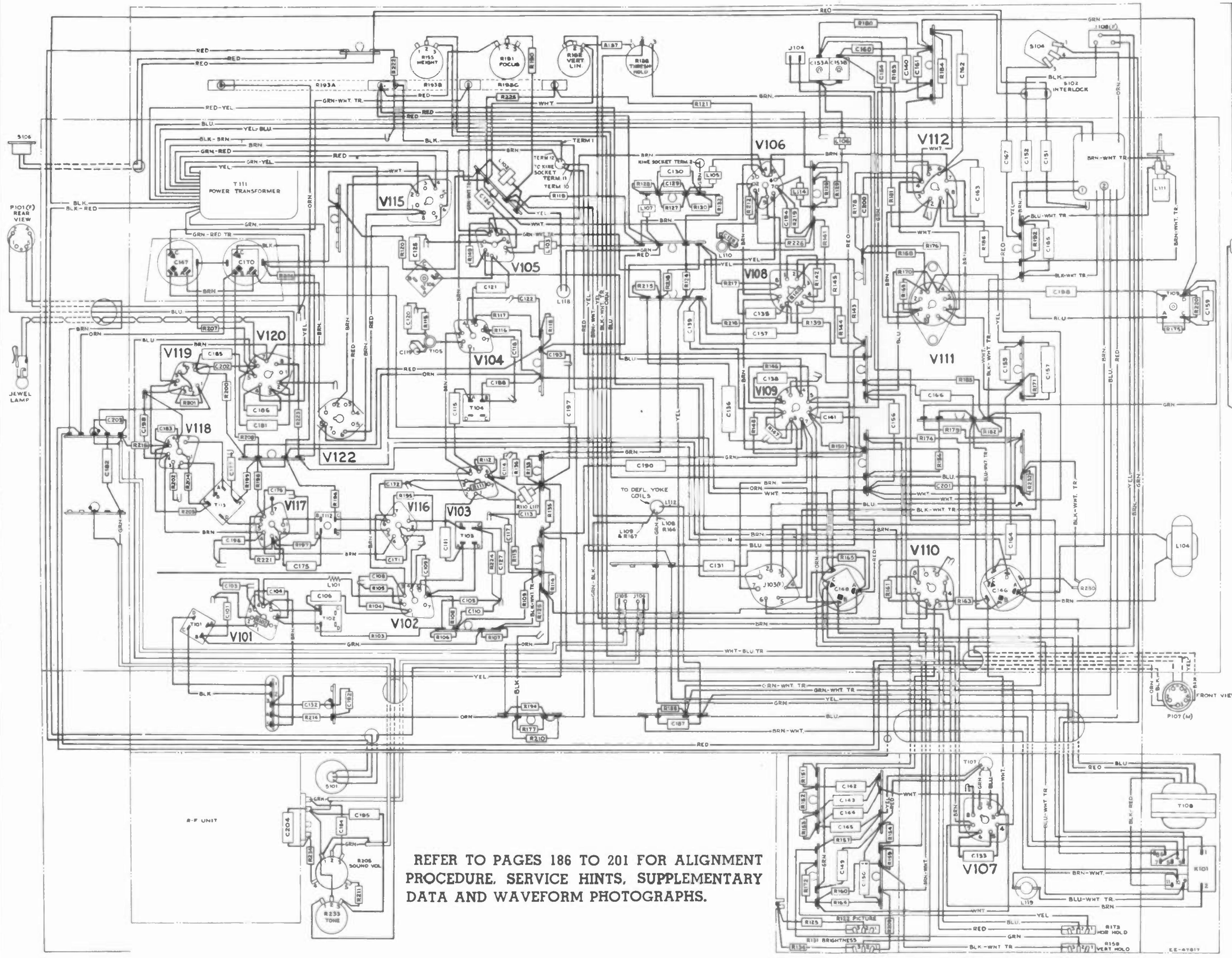
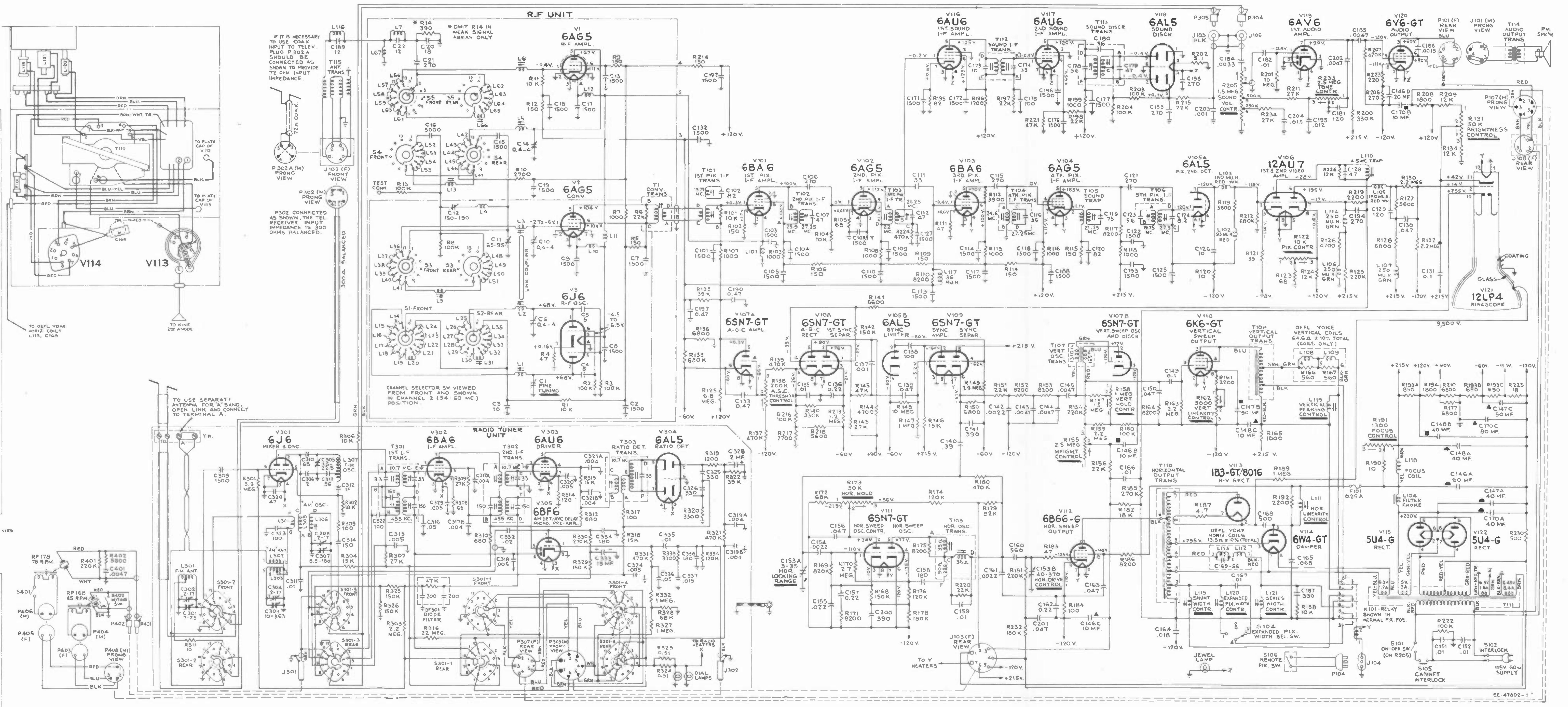


Figure 13—Chassis Wiring Diagram



Function switch S301 viewed from front and shown in Number 1 (maximum counterclockwise position).

Switch position 1—Television.
Switch position 2—AM.
Switch position 3—FM.
Switch position 4—Phono 45 RPM.
Switch position 5—Phono 78 RPM.

All resistance values in ohms. K = 1,000.

All capacitance values less than 1 in MF and above 1 in MMF unless noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "VoltOhmyst," no signal input with 117 v. a-c supply with the pix control fully clockwise and the brightness control set for average brightness.

Some receivers have been field modified to replace the RP178 changer with type 960282. Compensation was changed by adding a .0068 mfd capacitor in parallel with C184, another .0068 mfd capacitor in parallel with C185 and a 120K resistor in parallel with R334.

Figure 14—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK5
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (W1)
73441	Cam—Fine tuning adjustment
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5000 mmf. (C16)
73460	Coil—R-F plate coil for channel 6 (L13)
73461	Coil—Rear section—Oscillator plate coil for channel 6 (L20)
73462	Coil—Coupling inductance coil (L4)
73475	Coil—Antenna filter shunt coil (C67)
73476	Coil—I-F trap (L7, C22)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Front section—Oscillator plate coil for channel 6 (L31)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (plunger adjustment) (L1, C1)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment for oscillator section or converter section) (L2, L3, C6, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f amplifier section (L5, C14)
73455	Core—Sliding core for fine tuning control trimmer
74187	Core—Adjustable core for coil L9
71493	Connector—Oscillator segment connector
73440	Detent—R-F unit detent mechanism and fibre shaft
71487	Form—Coil form for coil L31
73453	Form—Coil form assembly for L9, L13
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to convertor trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73436	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition:—
	47 ohms ±20%, ½ watt (B4)
	150 ohms ±20%, ½ watt (R5, R9, R12)
	390 ohms ±10%, ½ watt (R14)
	1000 ohms ±20%, ½ watt (R7)
	2700 ohms ±10%, ½ watt (R10)
	10,000 ohms ±20%, ½ watt (R1, R11)
	100,000 ohms ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer ring for fine tuning stud
70881	Screw—#4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
73640	Screw—#4-40 x ⅝" adjusting screw for L66
71475	Screw—#4-40 x 15/32" adjusting screw for coils L21, L22, L23, L24
74575	Screw—#4-40 x 17/32" adjusting screw for L6
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
73439	Shaft—Actuating shaft for fine tuning control
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F Unit
71494	Socket—Tube socket, moulded, 7 prong
73450	Socket—Tube socket, ceramic, 7 prong
74576	Spacer—Insulating spacer for front plate (4 req'd)
73457	Spring—Return spring for fine tuning control core
74188	Spring—Retaining spring for adjustable core RCA 74187
74578	Spring—Retaining spring for adjusting screws RCA 73640 and RCA 74575
75068	Spring—Retaining spring for r-f oscillator tube shield
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Convertor stator complete with rotor and coils (S3, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55)
75446	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q"
73448	Transformer—Convertor transformer (T1, R6)
73466	Washer—Insulating washer for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft or fine tuning shaft and cam
	TELEVISION CHASSIS ASSEMBLIES
	KCS 41-1
74593	Capacitor—Mica trimmer, 1 section of 3-35 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
74726	Capacitor—Mica, 39 mmf. (C140)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75060	Capacitor—Mica, 100 mmf. (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
39630	Capacitor—Mica, 120 mmf. (C181)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
39640	Capacitor—Mica, 330 mmf. (C187)
39642	Capacitor—Mica, 390 mmf. (C141, 200)
74153	Capacitor—Hi-voltage 500 mmf., 15,000 volts (C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C127, C132, C171, C172, C176, C177, C188, C192, C193, C196)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, 148B, 148C)
73582	Capacitor—Electrolytic, 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, V170C)
73583	Capacitor—Electrolytic, 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts, and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 600 volts (C137, C203)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 1000 volts (C186)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 600 volts (C142, C154, C161)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C184)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C143, C144, C145, C202)
73805	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 1000 volts (C185)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C135, C166, C167, C182)
73565	Capacitor—Tubular, moulded paper, .01 mfd., 600 volts (C151, C152)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C159)

STOCK No.	DESCRIPTION
74938	Capacitor—Tubular, paper, oil impregnated, .012 mfd., 200 volts (C195)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd., 600 volts (C204)
74727	Capacitor—Tubular, moulded paper, oil impregnated, .018 mfd., 1000 volts (C164)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C155)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C130, C139, C201)
73592	Capacitor—Tubular, moulded paper, oil impregnated, .047 mfd., 600 volts (C150, C156)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1000 volts (C163)
73815	Capacitor—Tubular, moulded paper, oil impregnated, .068 mfd., 1000 volts (C165)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C131)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd., 400 volts (C136, C157, C162)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C133, C190, C197)
73154	Choke—Filter choke (L104)
74585	Coil—Focus coil (L118)
71449	Coil—Horizontal linearity control coil (L111)
71429	Coil—Width control coil (L115, L120)
74877	Coil—Vertical peaking coil (L119)
74878	Coil—Series width coil (L121)
74170	Coil—Peaking coil (36 mh.) (L117, R110)
71527	Coil—Peaking coil (93 mh.) (L102)
74214	Coil—Peaking coil (180 mh.) (L103, L105)
71526	Coil—Peaking coil (250 mh.) (L106, L107, L114)
73477	Coil—Filament choke coil (L101)
74879	Connector—2 contact (polarized) female connector for electronic magnifier cable (J104)
72108	Connector—7 contact female connector (J103)
74594	Connector—2 contact male connector for power cord
72172	Connector—3 contact female connector (J108)
5040	Connector—4 contact female connector for speaker cable (P101)
71789	Connector—Anode connector
71521	Connector—Hi-voltage capacitor connector
14786	Connector—5 contact male connector (P107)
72734	Control—Horizontal and vertical hold control (R158, R173)
74047	Control—Brightness and picture control (R122, R131)
74359	Control—Tone control, volume control and power switch (R205, R233, S101)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
74597	Control—Focus control (R191)
74475	Control—AGC threshold control (R138)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432 and #73581
74811	Cushion—Rubber cushion for kinescope mounting
73590	Cushion—Rubber cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F101)
71799	Grommet—Rubber grommet for yoke horizontal lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)
74030	Grommet—Rubber grommet for mounting radio chassis (3 required)
72283	Grommet—Rubber grommet for mounting relay (2 required)
74823	Magnet—Ion trap magnet (PM type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics
33514	Receptacle—2 contact female receptacle for audio cable and switching cable (J105, J106)
74873	Relay—Electronic Magnifier relay (K101)
72633	Resistor—Wire wound, 4.7 ohms, ⅓ watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
18471	Resistor—Wire wound, 10 ohms, ½ watt (R190)
74049	Resistor—Wire wound, 500 ohms, 20 watts (R230)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, 193B, 193C)
	Resistor—Fixed, composition:—
	10 ohms, ±20%, ½ watt (R120)
	18 ohms, ±10%, ½ watt (R225)
	39 ohms, ±10%, ½ watt (R121)
	47 ohms, ±5%, ½ watt (R111)
	47 ohms, ±20%, ½ watt (R183)
	68 ohms, ±10%, ½ watt (R105)
	68 ohms, ±20%, ½ watt (R123)
	82 ohms, ±10%, ½ watt (R195)
	100 ohms, ±10%, 2 watt (R184)
	150 ohms, ±5%, ½ watt (R102)
	150 ohms, ±10%, ½ watt (R115)
	150 ohms, ±20%, ½ watt (R106, R109, R114, R214)
	220 ohms, ±10%, 1 watt (R223)
	270 ohms, ±10%, 1 watt (R206)
	1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R199)
	1200 ohms, ±10%, ½ watt (R196)
	1800 ohms, ±10%, 2 watt (R194, R208)
	2200 ohms, ±10%, ½ watt (R219)
	2200 ohms, ±10%, 1 watt (R161, R192)
	2700 ohms, ±10%, ½ watt (R217)
	3900 ohms, ±5%, ½ watt (R112)
	4700 ohms, ±5%, ½ watt (R126)
	4700 ohms, ±10%, ½ watt (R144)
	5600 ohms, ±5%, ½ watt (R119)
	5600 ohms, ±10%, ½ watt (R141, R218)
	5600 ohms, ±10%, 1 watt (R127)
	6800 ohms, ±5%, ½ watt (R136)
	6800 ohms, ±10%, ½ watt (R150)
	6800 ohms, ±5%, 1 watt (R128)
	6800 ohms, ±10%, 2 watt (R177, R210)
	8200 ohms, ±5%, ½ watt (R164, R175)
	8200 ohms, ±10%, ½ watt (R152, R153, R171)
	8200 ohms, ±5%, 1 watt (R117)
	8200 ohms, ±10%, 2 watt (R186)
	10,000 ohms, ±5%, ½ watt (R104)
	10,000 ohms, ±10%, ½ watt (R188)
	12,000 ohms, ±10%, ½ watt (R134, R209, R226)
	12,000 ohms, ±10%, 2 watt (R124)
	15,000 ohms, ±10%, 1 watt (R146)
	18,000 ohms, ±10%, 1 watt (R182)
	22,000 ohms, ±10%, ½ watt (R151, R156, R197, R220)
	22,000 ohms, ±20%, ½ watt (R198, R215)
	27,000 ohms, ±10%, ½ watt (R143, R234, R211)
	39,000 ohms, ±5%, ½ watt (R135)
	47,000 ohms, ±10%, ½ watt (R145)
	47,000 ohms, ±20%, ½ watt (R221)
	68,000 ohms, ±10%, ½ watt (R172)
	82,000 ohms, ±10%, 1 watt (R179)
	100,000 ohms, ±5%, ½ watt (R203, R204)
	100,000 ohms, ±10%, ½ watt (R160, R216)
	100,000 ohms, ±20%, 1 watt (R222)
	120,000 ohms, ±5%, 1 watt (R176)
	120,000 ohms, ±10%, 1 watt (R174)
	150,000 ohms, ±10%, ½ watt (R168)
	150,000 ohms, ±20%, ½ watt (R142)
	180,000 ohms, ±10%, ½ watt (R232)
	180,000 ohms, ±5%, 1 watt (R178)
	220,000 ohms, ±10%, ½ watt (R129, R154, R181)
	270,000 ohms, ±10%, ½ watt (R185)
	330,000 ohms, ±10%, ½ watt (R140, R200)
	470,000 ohms, ±10%, ½ watt (R137, R139, R224, R180)
	470,000 ohms, ±20%, ½ watt (R207)
	560,000 ohms, ±10%, ½ watt (R212)
	680,000 ohms, ±10%, ½ watt (R133)
	820,000 ohms, ±5%, ½ watt (R169)
	1 megohm, ±10%, ½ watt (R147)
	1 megohm, ±20%, 1 watt (R189)
	1.2 megohm, ±5%, ½ watt (R213)
	1.5 megohm, ±5%, ½ watt (R157)
	2.2 megohm, ±10%, ½ watt (R130, R132, R159, R163)
	2.7 megohm, ±5%, 1 watt (R170)
	3.9 megohm, ±10%, ½ watt (R149)
	6.8 megohm, ±10%, ½ watt (R125)
	10 megohm, ±10%, ½ watt (R148)
	10 megohm, ±20%, ½ watt (R201)

STOCK No.	DESCRIPTION
74416	Screw—#10/32 x 1¾" cross recessed round head screw for kinescope retaining strap
71456	Screw—#8/32 wing screw for deflection yoke
74601	Screw—#8/32 x ⅜" cross recessed binder head screw for focus coil mounting (2 required)
74602	Screw—10/32 x 1¼" cross recessed binder head screw for focus coil adjustment (3 required)
73584	Shield—Tube shield
74937	Sleeve—Rubber sleeve for focus coil
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
31251	Socket—Tube socket octal, wafer
73249	Socket—Tube socket, octal, ceramic, plate mounted
71508	Socket—Tube socket for 8016
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket
73586	Spring—Compression spring used under centering control screws (3 required)
74595	Spring—Anode lead spring
74936	Spring—Suspension spring for kinescope tube socket leads
74893	Strap—Kinescope retaining strap
74596	Support—Bakelite supports (1 set) for mounting hi-voltage rectifier tube mounting plate
74872	Switch—Width selector switch (S104)
74157	Switch—Interlock switch (S105)
74892	Transformer—Power transformer 117 volt, 60 cycle (T111)
74875	Transformer—Vertical output transformer (T108)
73569	Transformer—Vertical oscillator transformer (T107)
74588	Transformer—Horizontal output and hi-voltage transformer (T110)
74589	Transformer—First pix, i-f transformer (T101, C102, R101)
74590	Transformer—Second pix, i-f transformer (T102, C107)
74591	Transformer—Third pix, i-f transformer (T103, C112)
74592	Transformer—Fourth pix, i-f transformer (T104, C116)
73575	Transformer—Fifth pix, i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113 (C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
73578	Transformer—Antenna transformer, complete with socket and bracket (T115, J102)
73577	Trap—4.5 mc. trap (L110, C128)
71778	Trap—Sound trap (T105 (C119)
73476	Trap—I-F trap (L116, C189)
74262	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	RADIO CHASSIS ASSEMBLIES
	RK 135C
74039	Board—"Tel-Ant" terminal board (TB301)
74026	Bracket—Drive cord bracket complete with two pulleys—R.H.
74027	Bracket—Drive cord bracket complete with pulley—L.H.
74911	Cable—Shielded cable complete with female connector (W307, 311)
71105	Cable—Shielded cable complete with pin plug (W301, W302)
74017	Capacitor—Variable tuning capacitor (C301, 302, 303, 304, 305, 307, 308)
73866	Capacitor—Ceramic, 2 mmf. (C306)
39044	Capacitor—Ceramic, 15 mmf. (C312)
39042	Capacitor—Ceramic, 47 mmf. (C330)
73867	Capacitor—Ceramic, 56 mmf. (C313)
33379	Capacitor—Ceramic, 68 mmf. (C310)
39396	Capacitor—Ceramic, 100 mmf. (C322, 323)
48125	Capacitor—Ceramic, 150 mmf. (C314)
71922	Capacitor—Ceramic, 180 mmf. (C334, 338)
39640	Capacitor—Mica, 330 mmf. (C325, 326)
73748	Capacitor—Ceramic, 1500 mmf. (C309)
74009	Capacitor—Ceramic, dual, 4,000 mmf. (C317, C319, C321)
73473	Capacitor—Ceramic, 5000 mmf. (C318, 329)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C328)
32223	Capacitor—Electrolytic, 15 mfd., 300 volts (C333)
71553	Capacitor—Tubular, paper, .005 mfd., 400 volts (C315, C320, C324)
71923	Capacitor—Tubular, paper, .01 mfd., 200 volts (C335)
71925	Capacitor—Tubular, paper, .01 mfd., 400 volts (C311)
70572	Capacitor—Tubular, paper, .015 mfd., 400 volts (C337)
71928	Capacitor—Tubular, paper, .02 mfd., 200 volts (C332)
72596	Capacitor—Tubular, paper, .05 mfd., 200 volts (C336)
74455	Capacitor—Tubular, paper, .05 mfd., 400 volts (C316)
74020	Coil—Antenna coil—AM (L302, L303)
73744	Coil—Oscillator coil—AM (L304, L305, L306)
74024	Coil—Antenna coil—FM (L301)
74025	Coil—Oscillator coil—FM (L307)
36395	Connector—7 contact male connector (P103)
12493	Connector—5 contact female connector (P107B)
39153	Connector—4 prong male connector (P102)
72953	Cord—Drive cord (approx. 42" overall)
74011	Filter—Diode filter, dual 200 mmf. and 47,000 ohms (DF301)
74023	Resistor—Wire wound, 0.51 ohms, 1 watt (R323, 324)
	Resistor—Fixed, composition:—
	10 ohms, ±20%, ½ watt (R311)
	68 ohms, ±20%, ½ watt (R308)
	100 ohms, ±20%, ½ watt (R305, R317)
	120 ohms, ±10%, ½ watt (R314)
	680 ohms, ±20%, ½ watt (R310, R312)
	1200 ohms, ±5%, ½ watt (R319)
	3300 ohms, ±5%, ½ watt (R320)
	3300 ohms, ±10%, ½ watt (R333)
	10,000 ohms, ±20%, ½ watt (R306)
	15,000 ohms, ±10%, ½ watt (R304)
	15,000 ohms, ±20%, ½ watt (R315, R318)
	18,000 ohms, ±10%, ½ watt (R302)
	27,000 ohms, ±10%, ½ watt (R307, R309)
	39,000 ohms, ±10%, ½ watt (R322)
	68,000 ohms, ±10%, ½ watt (R328)
	120,000 ohms, ±10%, ½ watt (R334)
	150,000 ohms, ±10%, ½ watt (R325, R326, R329)
	270,000 ohms, ±10%, ½ watt (R330)
	470,000 ohms, ±10%, ½ watt (R331)
	470,000 ohms, ±20%, ½ watt (R321)
	1 megohm, ±10%, ½ watt (R327, 332)
	2.2 megohm, ±20%, ½ watt (R303)
	3.9 megohm, ±10%, ½ watt (R301)
	22 megohm, ±20%, ½ watt (R316)
74028	Shaft—Tuning knob shaft
73632	Shield—Tube shield
73117	Socket—Tube socket, 7 pin, miniature for V301, V304, V305
74179	Socket—Tube socket, 7 pin, miniature for V302, V303
31364	Socket—Dial lamp socket
74038	Spring—Drive cord spring
74894	Switch—Selector switch (S301)
73745	Transformer—First i-f transformer dual (T301)
74019	Transformer—Second i-f transformer dual (T302)
73743	Transformer—Ratio detector transformer (T303)
33726	Washer—"C" washer for tuning shaft (rear)
34457	Washer—Spring washer for tuning shaft (front)
74172	Washer—Fibre washer to prevent drive cord slippage

STOCK No.	DESCRIPTION
	SPEAKER ASSEMBLIES
	92569-8W
	RL-111-10
	RMA—#274
13867	Cap—Dust cap
74901	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 prong male connector (J101)
74900	Speaker—12" P.M. (6.8 oz.) speaker complete with cone and voice coil (3.2 ohms) less transformer and plug
74902	Transformer—Output transformer (T114)
	Note: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instruments, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74895	Back—Cabinet back
74054	Bracket—Dial lamp bracket (2 required)
71599	Bracket—Pilot lamp bracket
72457	Cable—Shielded pickup cable complete with pin plug for 45 RPM changer
74296	Cable—Shielded pickup cable complete with pin plug for 78 RPM changer
13103	Cap—Pilot lamp cap
73920	Capacitor—Tubular, paper, .0047 mfd., 600 volts (C401)
74883	Case—Plastic case and bottom cover for electronic magnifier switch
71892	Catch—Bullet catch and strike for doors (3 required)
74055	Clip—Spring clip for dial and bezel assembly (2 required)
X3067	Cloth—Grille cloth for mahogany or walnut instruments
X3068	Cloth—Grille cloth for toasted mahogany instruments
74882	Connector—3 contact male connector for electronic magnifier cable (P104)
30868	Connector—2 contact female connector for motor cable
14782	Connector—3 contact male connector for motor cable
30870	Connector—2 contact male connector for motor cable
74581	Cover—Mounting screw cover (plug-in type) for 45 RPM changer (3 required)
74891	Cushion—Vinylite cushion (edging) for making panel
74898	Decal—Control panel function decal for mahogany or walnut instruments
74899	Decal—Control panel function decal for toasted mahogany instruments
71984	Decal—Trade mark decal (RCA Victor)
74273	Decal—Trade mark decal (Victrola)
74052	Dial—Dial scale and bezel assembly
74809	Emblem—"RCA Victor" emblem
73642	Escutcheon—Channel marker escutcheon for mahogany or walnut instruments
73740	Escutcheon—Channel marker escutcheon for toasted mahogany instruments
74755	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker (4 required)
72856	Grommet—Rubber grommet to mount 78 RPM changer (3 required)
74308	Hinge—Television compartment door hinge (1 set)
74896	Hinge—Record storage compartment door hinge (1 set)
70166	Hinge—Speaker compartment door hinge—upper
73200	Hinge—Speaker compartment door hinge—lower
74051	Indicator—Station selector indicator
73994	Knob—Fine tuning knob—dark—for mahogany or walnut instruments (outer)
73995	Knob—Fine tuning knob—light—for toasted mahogany instruments (outer)
73996	Knob—Channel selector knob—dark—for mahogany or walnut instruments (inner)
73997	Knob—Channel selector knob—light—for toasted mahogany instruments (inner)
73998	Knob—Vertical hold control, brightness control or tone control knob—dark—for mahogany or walnut instruments (outer)
73999	Knob—Vertical hold control, brightness control or tone control knob—light—for toasted mahogany instruments (outer)
74056	Knob—Tuning or selector switch knob—dark—for mahogany or walnut instruments
74057	Knob—Tuning or selector switch knob—light—for toasted mahogany instruments
74000	Knob—Horizontal hold control, picture control or volume control and power switch knob—dark—for mahogany or walnut instruments (inner)
74001	Knob—Horizontal hold control, picture control or volume control and power switch knob—light—for toasted mahogany instruments (inner)
11765	Lamp—Dial or pilot lamp—Mazda 51
74208	Nut—Tee nut to mount 45 RPM changer (3 required)
73109	Nut—Tee nut to mount 78 RPM changer (3 required)
74162	Plate—Mounting plate for interlock switch
74897	Pull—Door pull (4 required)
	Resistor—Fixed, composition:
	5600 ohms, ±10%, ½ watt (B402)
	220,000 ohms, ±10%, ½ watt (B401)
73741	Screw—¼-20 x 2" fillister head screw for mounting 78 RPM changer (3 required)
74582	Screw—#8-32 x 1¾" special head screw to mount 45 RPM changer (3 required)
74269	Screw—#8-32 x ¾" trimit head screw for door pull (2 required for each pull)
74050	Slide—Station indicator slide
74835	Slide—Slide mechanism for 45 RPM drawer
74736	Slide—Slide mechanism for 78 RPM drawer
73643	Spring—Spring clip for channel marker escutcheons
72845	Spring—Retaining spring for knobs #73994 and 73995
14270	Spring—Retaining spring for knobs #73996, 73997, 73998, 73999, 74056 and 74057
30330	Spring—Retaining spring for knobs #74000 and 74001
74421	Spring—Conical spring to mount 45 RPM changer—upper—R.H. (1 required)
74422	Spring—Conical spring to mount 45 RPM changer—upper—L.H. (2 required)
74423	Spring—Conical spring to mount 45 RPM changer—lower (3 required)
74161	Stud—Locating stud for back cover (2 required)
74881	Switch—Electronic magnifier switch (S106)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

RCA VICTOR

TELEVISION, AM-FM RADIO, PHONOGRAPH COMBINATION

MODEL 9TW333

Chassis Nos. KCS30-1 and RC616N

Mfr. No. 274

SERVICE DATA

— 1949 No. T3 —

Model 9TW333 Walnut, Mahogany or Toasted Mahogany

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 9TW333 is a thirty-three tube Television, AM-FM Radio, Phonograph console combination. The television receiver employs twenty tubes plus two rectifiers and a 10BP4 Kinescope. The AM-FM radio chassis employs nine tubes plus one rectifier.

Two automatic record changers are provided. One is a 78 RPM center post push-off type (RP178); the other is a 45 RPM type (RP168-1) which plays RCA seven-inch fine-groove records.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

RADIO TUNING RANGE

Broadcast .... 540-1,600 kc
Frequency Modulation .... 88-108 mc
Intermediate Frequency—AM .... 455 kc
Intermediate Frequency—FM .... 10.7 mc

PICTURE SIZE .... 6⅜" x 8½"

TELEVISION RADIO-FREQUENCY RANGE

All 12 television channels, 54 mc to 88 mc, 174 mc to 216 mc

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

POWER SUPPLY RATING

Television Operation .... 115 volts, 310 watts
Radio Operation .... 115 volts, 70 watts
Phonograph Operation .... 115 volts, 95 watts

AUDIO POWER OUTPUT RATING

Maximum Power Output .... 6.5 watts

CHASSIS DESIGNATIONS

Television Chassis .... KCS 30-1
Radio Chassis RC616N

LOUDSPEAKER (92569-5W)

Type .... 12-inch PM Dynamic
Voice Coil Impedance .... 3.2 ohms at 400 cycles

RECORD PLAYERS

RP178...... Refer to Service Data RP178 Series for information
RP168-1..... Refer to Service Data RP168 Series for information

DIMENSIONS (inches)	Length	Height	Depth
Cabinet (outside) 9TW333	40½	40	22½

SHIPPING WEIGHT (less kinescope)

9TW333 .... 242 lbs.

RCA TUBE COMPLEMENT

(KCS 30-1)

Tube Used	Function
(1) RCA 6AG5	R-F Amplifier
(2) RCA 6J6	R-F Oscillator
(3) RCA 6AG5	Converter
(4) RCA 6AU6	1st Sound I-F Amplifier
(5) RCA 6AU6	2nd Sound I-F Amplifier
(6) RCA 6AL5	Sound Discriminator
(7) RCA 6AV6	Bias Clamp
(8) RCA 6AG5	1st Picture I-F Amplifier
(9) RCA 6AG5	2nd Picture I-F Amplifier
(10) RCA 6AG5	3rd Picture I-F Amplifier
(11) RCA 6AG5	4th Picture I-F Amplifier
(12) RCA 6AL5	Picture 2nd Detector and Sync Limiter
(13) RCA 12AU7	1st and 2nd Video Amplifier
(14) RCA 6SN7GT	AGC Amplifier and Vertical Sweep Oscillator
(15) RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(16) RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(17) RCA 6K6GT	Vertical Sweep Output
(18) RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(19) RCA 6BG6G	Horizontal Sweep Output
(20) RCA 5V4G	Damper
(21) RCA 1B3-GT/8016	High Voltage Rectifier
(22) RCA 5U4G	Power Supply Rectifier
(23) RCA 10BP4	Kinescope

(RC616N)

Tube Used	Function
(1) RCA 6J6	Mixer and Oscillator
(2) RCA 6BA6	I-F Amplifier
(3) RCA 6AU6	Driver
(4) RCA 6AL5	Ratio Detector
(5) RCA 6AV6	AM Detector and Phase Inverter
(6) RCA 6BF6	Phono Preamplifier
(7) RCA 6AV6	Audio Amplifier
(8) RCA 6V6GT	Audio Output (2 tubes)
(9) RCA 6X5GT	Rectifier

Specifications continued on page 2

REFER TO PAGES 186 TO 201 FOR TELEVISION ALIGNMENT PROCEDURE SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency	25.75 mc
Adjacent Channel Sound Trap	27.25 mc
Accompanying Sound Traps	21.25 mc
Adjacent Channel Picture Carrier Trap	19.75 mc

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency	21.25 mc
Sound Discriminator Band Width between peaks	350 kc

VIDEO RESPONSE	To 4 mc
FOCUS	Magnetic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SCANNING FREQUENCY	15,750 cps
VERTICAL SCANNING FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

TELEVISION OPERATING CONTROLS (front panel)

Channel Selector / Fine Tuning	Dual Control Knobs
Picture	Single Control Knob
Picture Horizontal Hold / Picture Vertical Hold	Dual Control Knobs
Brightness	Single Control Knob

TELEVISION NON-OPERATING CONTROLS (not including r-f and i-f adjustments)

Horizontal Centering	top chassis screwdriver adjustment
Vertical Centering	top chassis screwdriver adjustment
Width	rear chassis screwdriver adjustment
Height	rear chassis adjustment
Horizontal Linearity	rear chassis screwdriver adjustment
Vertical Linearity	rear chassis adjustment
Horizontal Drive	rear chassis screwdriver adjustment
Horizontal Locking Range	rear chassis screwdriver adjustment
Horizontal Oscillator Frequency	bottom chassis adjustment
Horizontal Oscillator Waveform	side chassis adjustment
Focus	rear chassis adjustment
Ion Trap Magnet	top chassis adjustment
Deflection Coil	top chassis wing nut adjustment
AGC Threshold Control	top chassis adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH-VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH-VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE, OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE KINESCOPES ARE BEING HANDLED. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched, or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

TELEVISION OPERATION

The following adjustments are necessary when turning the receiver on for the first time:

1. Turn the radio FUNCTION switch to TEL.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity.

5. Adjust SOUND VOLUME for suitable volume.

6. Turn the BRIGHTNESS control fully counterclockwise, then clockwise until a light pattern appears on the screen.

7. Adjust the VERTICAL hold control until the pattern stops vertical movement.

8. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

9. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.

10. Adjust the PICTURE control for suitable picture contrast.

11. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

12. In switching from one station to another, it may be necessary to repeat steps numbers 9 and 10.

13. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

14. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 2 through 10.

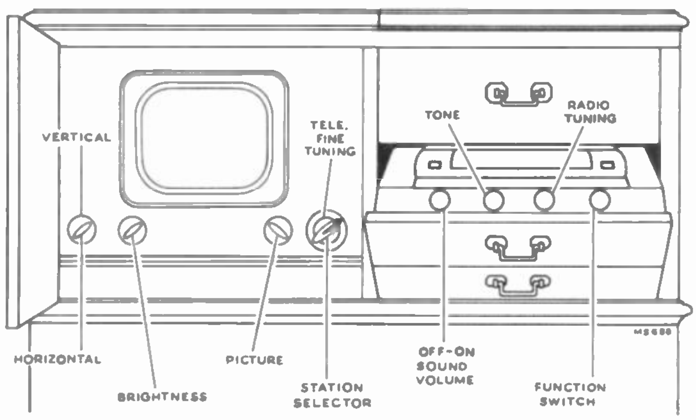


Figure 1— Receiver Operating Controls

RADIO OPERATION

1. Turn the radio FUNCTION switch to the desired band (AM or FM).

2. Tune in the desired station with the TUNING control.

78 RPM PHONOGRAPH OPERATION

1. Turn the radio FUNCTION switch to PH.

MANUAL:

1. Slide the record support shelf toward the center post for 10-inch records or away from the center post for 12-inch records.

2. Place the record to be played on the turntable and turn the power switch on.

3. Place the pickup on the start of the record.

NOTE: The mechanism should be allowed to complete its cycle before attempting to move the tone arm to the rest position.

4. Turn the power switch off manually.

5. Remove the record by raising it straight up without tilting.

AUTOMATIC:

1. With the power switch in the off position slide the record support shelf as required for 10- or 12-inch records.

2. Place the records to be played in a stack with the desired selections upward and in proper sequence with the last record on top. Load them on the changer by placing them over the center post and resting them on the record support shelf. Place the record stabilizing clamp on top of the record stack.

3. Turn the power switch on and press the reject button. The changer will play automatically one side of each record in the stack. The tone arm can be moved to the rest position any time the mechanism is not in cycle.

4. Turn the power switch off, lift the stabilizing clamp and remove the stack from the turntable by placing the fingers of both hands on opposite sides of the turntable and under the stack. Lift the stack of records straight up. Do not tilt or squeeze the stack while removing.

45 RPM PHONOGRAPH OPERATION

1. Place a stack of records over the center post, with the desired selections upward and the last record to be played on top.

2. Turn the radio FUNCTION switch to XPH.

3. Push the "start-reject" knob to start, then let go. The mechanism will automatically play in sequence one side of each record stacked on the separator shelves.

4. To reject a record being played push the "start-reject" knob to "reject."

5. As the last record is being repeated, lift the tone arm and place it on the rest.

INSTALLATION INSTRUCTIONS

Model 9TW333 television receiver is shipped complete in one carton except for the 10BP4 kinescope. The kinescope is shipped in a special carton and should not be unpacked until ready for installation.

UNPACKING. — The 9TW333 may be shipped in either a cardboard carton or a plywood case. If it is shipped in a cardboard carton, turn the carton on its side and tear open the carton bottom flaps. Fold the flaps up along the side of the carton and turn the carton back up. Lift the carton up and off the cabinet.

If the receiver is shipped in a plywood case, remove the front side as indicated on the case. If the front is removed by prying, do not permit the prying tool to enter the case as the cabinet may become scratched. Remove the shipping case rail across the front of the cabinet. Do not remove the two rail support screws on each side of the cabinet. Slide the cabinet out of the case by pulling on each side of the cabinet shipping skid.

A flat skid is attached to the bottom of the receiver cabinet which will permit the cabinet to be moved about without danger of breaking a cabinet leg or stressing the cabinet joints. This skid should be left on the cabinet until the receiver is placed on display or installed in the home. To remove the skid, take off the cabinet back and remove two nuts on the inside of the cabinet as shown in Figure 2. Then, with a man at each end of the cabinet, lift the cabinet off the skid.

Caution: The radio panel is held in the closed position by two wood screws in a shipping bracket attached to the radio chassis. The radio panel must not be tipped out until these screws are removed as it may cause the cabinet front to be split or the radio chassis to be badly deformed. Remove the screws shown at Detail B in Figure 2 and take out the two red brackets.

Remove the red shipping brackets which prevent the 78-rpm record changer from sliding forward (see Figure 2 for location). Loosen the three phillips-head screws which may be seen on top of the 78-rpm record-changer motor board.

Loosen the three screws on top of the 45-rpm record-changer motor board (the screw covers must first be removed, or alternatively, the tee nuts under the motor board may be loosened). Remove the two wooden packing strips from under the motor board.

Remove the sapphire guard clips from both record-changer tone arms.

Take off the television compartment back grille. Remove the front panel by loosening the two wing nuts in back of the panel.

Remove the protective cardboard shield from the 5U4G rectifier. Make sure all tubes are in place and are firmly seated in their sockets.

The operating control knobs are packed in a paper bag which is taped to the cabinet back rail. Remove the bag.

Remove the two self-tapping screws from the deflection yoke mounting as shown in Figure 4.

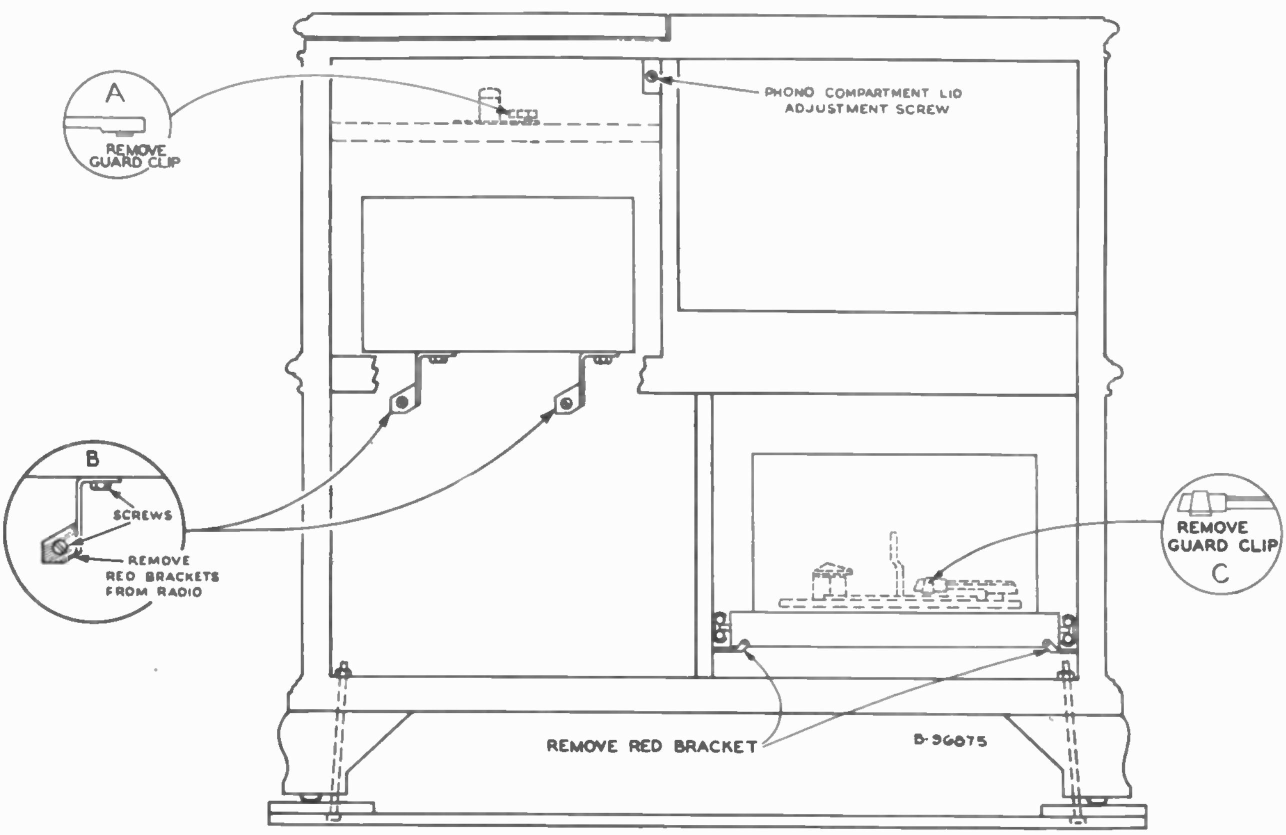


Figure 2—Removal of Shipping Material

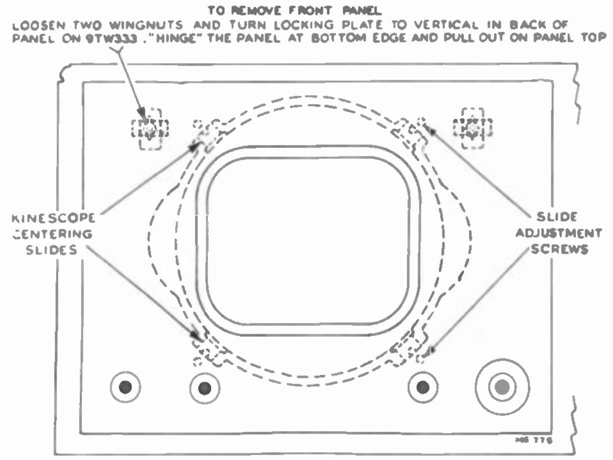


Figure 3—Front Panel Removal

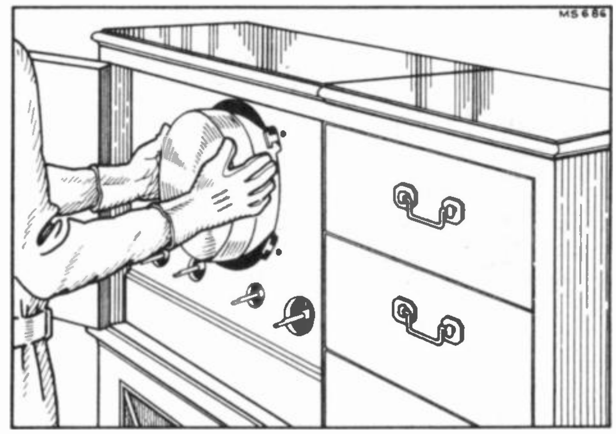


Figure 5—Kinescope Insertion

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten. See Figure 4 for the location of the cushion and yoke adjustments.

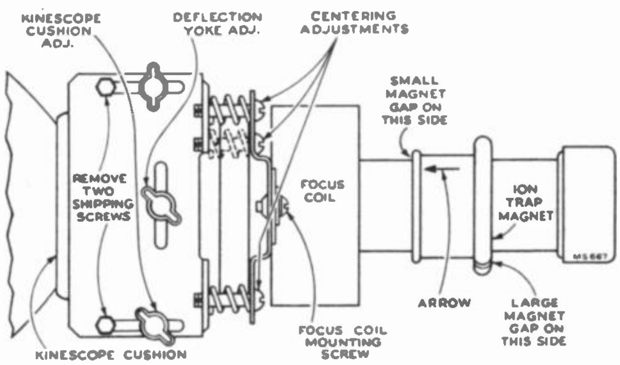


Figure 4—Yoke and Focus Coil Adjustments

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the two focus coil mounting screws and move the coil until alignment is obtained. Tighten the mounting screws with the coil in this position.

Loosen the two lower kinescope face centering slides, and set them at approximately mid-position. See Figure 3 for location of the slides and their adjustment screws.

KINESCOPE HANDLING PRECAUTION. — Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. People not so equipped should be kept away while kinescopes are being handled. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.

INSTALLATION OF KINESCOPE. — The kinescope second-anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but inclined approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils as shown in Figure 5. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope with the large magnet toward the base of the kinescope. The gap of the large magnet should be to the left (as seen from the back of the cabinet) and the gap of the small magnet should be to the right.

The final orientation of the ion trap magnet will be determined by the position of the ion-trap flags. Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags, as shown in Figure 6. The magnet must be installed so that the rear magnet is approximately over the flags and is oriented as shown in Figure 4.

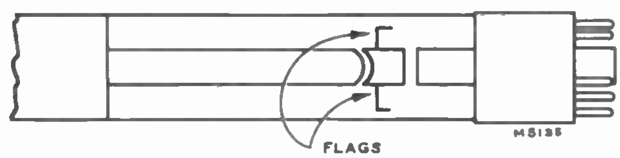


Figure 6—Ion-Trap Flags

Connect the kinescope socket to the tube base.

Position the kinescope so that the face of the tube protrudes approximately one-quarter of an inch outside the front of the cabinet. Adjust the four centering slides until the face of the kinescope is in the center of the cabinet opening. Tighten the four slides securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel by reversal of the procedure indicated in Figure 3. Install the control knobs on the control shafts.

Check all chassis interconnecting cables to make sure that all are plugged into the proper sockets as shown in Figure 7.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible.

Connect the high-voltage lead to the kinescope second anode socket. The glass-to-metal seal of this connector is fragile and care should be used in making the connection. Only a small amount of pressure should be applied to the connector when inserting the clip. If appreciable pressure is applied the seal may be fractured, permitting air to leak into the tube thus ruining the kinescope.

The antenna and power connections should now be made.

Turn the power switch to the "on" position, the function switch to the television position, the brightness control fully clockwise, and the picture control counterclockwise.

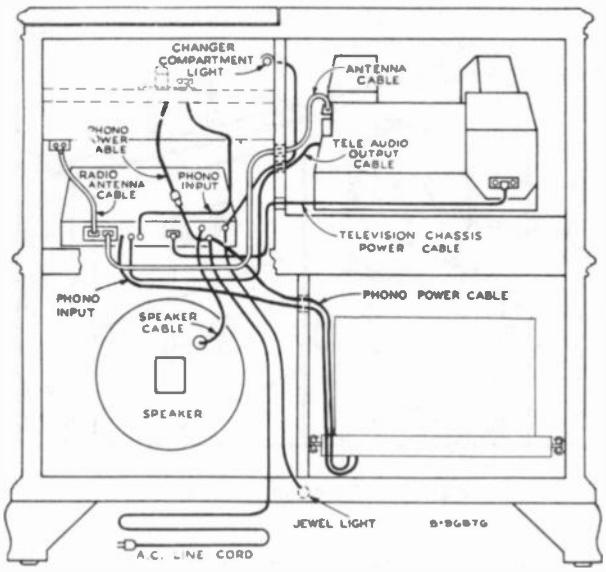


Figure 7—Chassis Interconnecting Cables

ION TRAP MAGNET ADJUSTMENT. — The ion trap rear-magnet poles should be approximately over the ion-trap flags. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

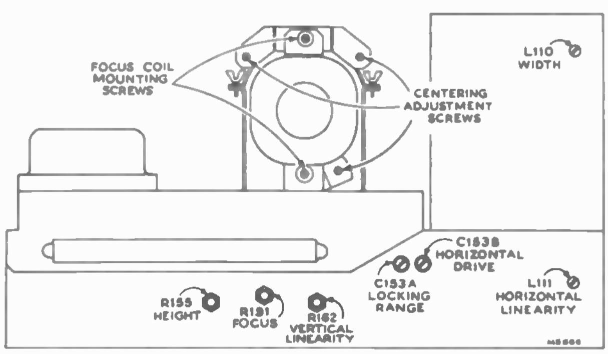


Figure 8—Rear Chassis Adjustments

DEFLECTION YOKE ADJUSTMENT. — If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS. — It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 2 through 8 of the receiver operating instructions on page 3.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 (on top of the chassis, see Figure 10) counterclockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT. — Turn the horizontal hold control to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control.

Pull in should occur when the control is approximately 90 degrees from the extreme counterclockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counterclockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment. — Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment. — Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the picture control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENT. — No electrical centering controls are provided. Centering is obtained by mechanically orienting the focus coil with the three adjustment screws shown in Figure 8. Center the picture on the screen by adjustment of these screws. The focus coil should be approximately concentric around the neck of the kinescope to prevent curvature of the raster.

FOCUS COIL ADJUSTMENTS. — If, after making the centering adjustments in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 8) and change the position of the coil to eliminate the shadow. Recenter the picture by adjustment of the centering screws.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS. — Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically (6$\frac{3}{8}$ inches). Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjusment of the other. Adjust centering to align the picture with the mask.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS. — Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS. — Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMBSCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL ADJUSTMENT. — The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counterclockwise until the vertical retrace lines are just invisible.

Momentarily remove the signal by switching off channel then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully counterclockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 clockwise until there is a very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 counterclockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 clockwise until the snow in the picture becomes more pronounced, then counterclockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far clockwise on a weak signal, then the receiver may overload when a strong signal is received. If it is not set sufficiently clockwise then the sync noise immunity is decreased.

CHECK OF R-F OSCILLATOR ADJUSTMENTS. — Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 9. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

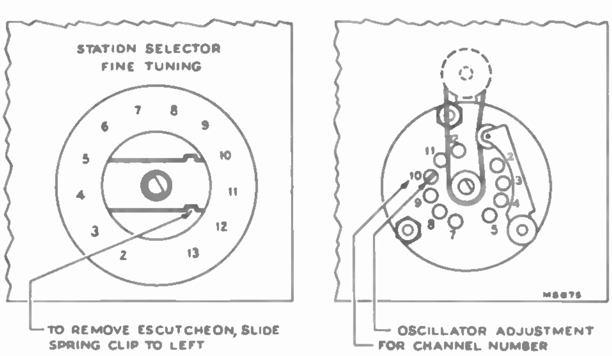


Figure 9—R-F Oscillator Adjustments

Observe the picture on all stations for detail, for proper interlacing and for the presence of interference or reflections.

RADIO OPERATION. — Turn the receiver function switch to AM and FM positions and check the radio for proper operation. In switching from radio to television or from television to radio, approximately 30 seconds warm-up time is required.

RECORD CHANGER OPERATION. — Check both record changers according to the procedure given on page 3.

Replace the television receiver metal back grille. Replace the cabinet back. Make sure that the screws holding both backs are up tight otherwise the backs may rattle or buzz when the receiver is operating at high volume.

Advise the customer to keep all packing cartons and hardware for use in case of future moves.

RECEIVER LOCATION. — The owner should be advised of the importance of placing the receiver in the proper location in the room.

The location should be chosen

—Away from bright windows and so that no bright light will fall directly on the screen. (Some illumination in the room is desirable, however.)

—To give easy access for operation and comfortable viewing.

—To permit convenient connection to the antenna.

—Convenient to an electrical outlet.

—To allow adequate ventilation.

ANTENNAS. — The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to use a correctly designed antenna, and to use care in its installation.

REFLECTIONS. — Multiple images, sometimes known as echoes or ghosts, are caused by the signal arriving at the antenna by two or more routes. The second or subsequent image occurs when a signal arrives at the antenna after being reflected off a building, a hill or other object. In severe cases of reflections, even the sound may be distorted. In less severe cases, reflections may occur that are not noticeable as reflections, but that will instead cause a loss of definition in the picture.

Depending upon the circumstances, it may be possible to eliminate the reflections by rotating the antenna or by moving it to a new location. In extreme cases, it may be impossible to eliminate the reflection.

INTERFERENCE. — Auto ignition, street cars, electrical machinery and diathermy apparatus may cause interference which spoils the picture. Whenever possible, the antenna location should be removed as far as possible from highways, hospitals, doctors' offices, and similar sources of interference.

Short-wave radio transmitting and receiving equipment may cause interference in the picture in the form of moving ripples. In some instances it may be possible to eliminate the interference by the use of a trap in the antenna transmission line. However, if the interfering signal is on the same frequency as the television station, a trap will provide no improvement.

WEAK PICTURE. — When the installation is near the limit of the area served by the transmitting station, the picture may be speckled, having a "snow" effect, and may not hold steady on the screen. This condition is due to lack of signal strength from the transmitter.

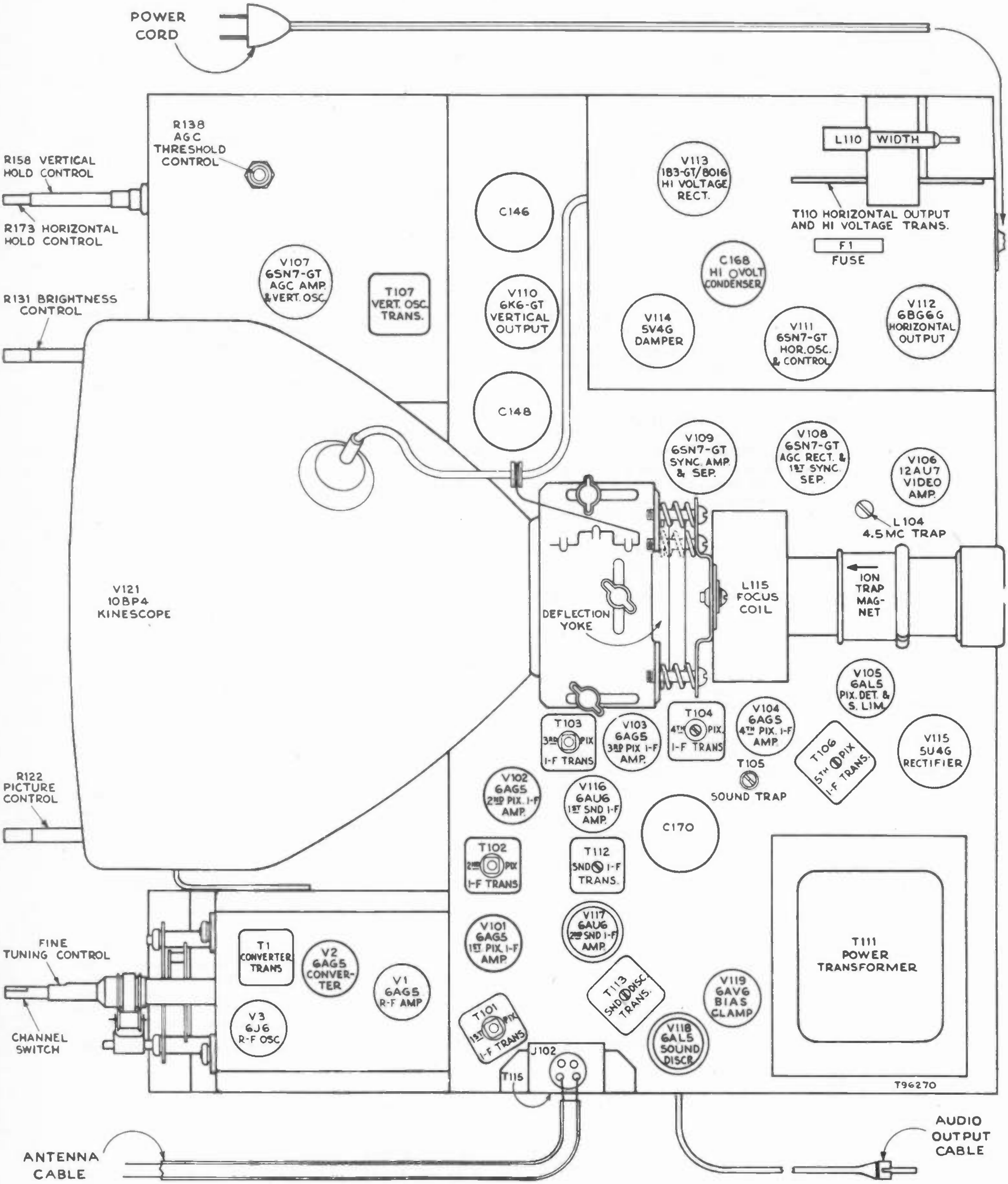


Figure 10—Television Chassis Top View

TELEVISION CHASSIS BOTTOM VIEW

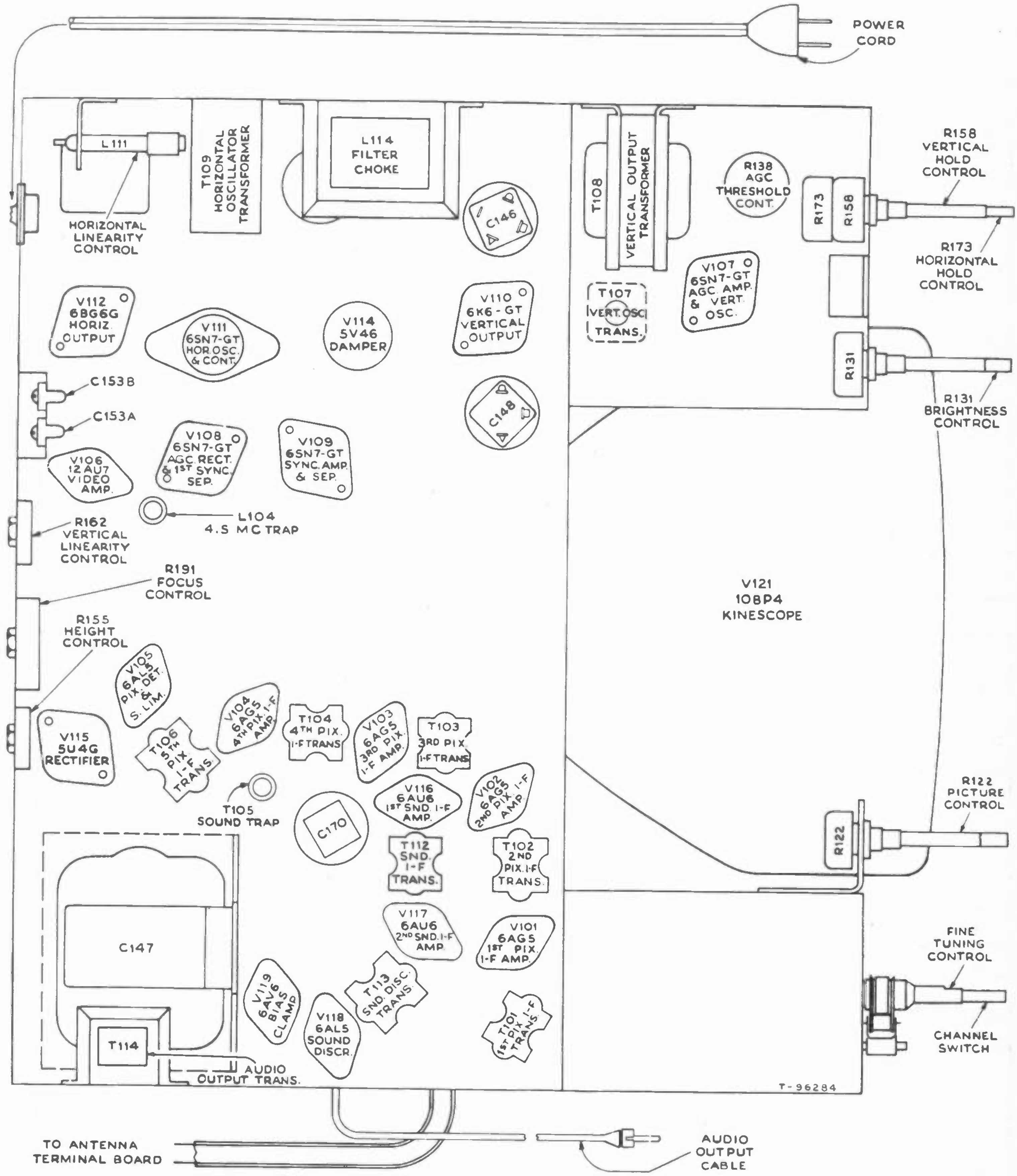


Figure 11—Television Chassis Bottom View

9TW333 TELEVISION VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC threshold control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V1	6AG5	R-F Amplifier	2200 Mu.V. Signal	5	146	6	148	2 & 7	0	1	−4.9	.72	.33	
			No Signal	5	85	6	120	2 & 7	0	1	−0.4v	12.0	4.0	
V2	6AG5	Converter	2200 Mu.V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*−3.0 to −7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*−2.0 to −6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu.V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*−5.1 to −7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*−4.5 to −6.6	*1.8 to 2.1	—	
V101	6AG5	1st Pix. I-F Amplifier	2200 Mu.V. Signal	5	141	6	141	2 & 7	.07	1	−3.9	.8	.22	
			No Signal	5	108	6	108	2 & 7	.11	1	−.09	4.97	1.73	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu.V. Signal	5	130	6	130	2 & 7	.86	1	0	9.48	3.12	
			No Signal	5	106	6	106	2 & 7	.6	1	0	7.6	2.6	
V103	6AG5	3d Pix. I-F Amplifier	2200 Mu.V. Signal	5	130	6	140	2 & 7	.03	1	−3.9	.51	.09	
			No Signal	5	94	6	109	2 & 7	.11	1	−.09	3.92	1.5	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu.V. Signal	5	175	6	145	2 & 7	1.38	1	0	7.0	2.0	
			No Signal	5	167	6	109	2 & 7	.95	1	0	5.7	1.5	
V105 A	6AL5	Picture 2d Det.	2200 Mu.V. Signal	7	−113	—	—	1	−112	—	—	.48	—	
			No Signal	7	−120	—	—	1	−120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu.V. Signal	2	−107	—	—	5	−56	—	—	—	—	
			No Signal	2	−80	—	—	5	−60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu.V. Signal	1	−23.2	—	—	3	−111	2	−113	4.38	—	
			No Signal	1	−19.2	—	—	3	−117	2	−120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu.V. Signal	6	*166	—	—	8	*−5.3	7	*−12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*−5.6	7	*−10.3	6.9	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu.V. Signal	5	−17.9	—	—	6	−55.5	4	−56.5	.9	—	
			No Signal	5	−5.2	—	—	6	−60	4	−64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu.V. Signal	2	76	—	—	3	−111	1	−158	.2	—	
			No Signal	2	62	—	—	3	−120	1	−169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu.V. Signal	5	97	—	—	6	−3.4	4	−19.3	.3	—	
			No Signal	5	81	—	—	6	−8.7	4	−19.3	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu.V. Signal	2	96	—	—	3	−1.8	1	−19.5	.1	—	
			No Signal	2	81	—	—	3	−9.7	1	−19.3	.1	—	

TELEVISION VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V109	6SN7 GT	Sync Amplifier	2200 Mu.V. Signal	2	158	—	—	3	0	1	−4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	−5.2	3.75	—	
V109	6SN7 GT	Sync Separator	2200 Mu.V. Signal	5	230	—	—	6	−51	4	−106	.4	—	
			No Signal	5	215	—	—	6	−59	4	−80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu.V. Signal	3	223	4	223	8	−67	5	−91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	−79	5	−101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu.V. Signal	2	*48	—	—	3	−110	1	−92	.2	—	*Variation of hold gives −21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	−120	1	−108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu.V. Signal	5	70	—	—	6	−111	4	−185	2.4	—	
			No Signal	5	54	—	—	6	−120	4	−192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu.V. Signal	Cap	*	8	160	3	−104	5	−101	93.5	11.5	*5200 volt pulse present
			No Signal	Cap	Do Not Meas.	8	142	3	−113	5	−112	90.8	11.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	8500	—	-	0	—	*8500 volt pulse present
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	8400	—	—	.1	—	
V114	5V4G	Damper	2200 Mu.V. Signal	4 & 6	*	—	—	2 & 8	339	—	—	94.5	—	*1200 volt pulse present
			No Signal	4 & 6	Do Not Meas.	—	—	2 & 8	322	—	—	92	—	
V115	5U4G	Rectifier	2200 Mu.V. Signal	4 & 6	*390	—	—	2 & 8	291	—	—	225	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	*390	—	—	2 & 8	272	—	—	230	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu.V. Signal	5	134	6	134	7	.9	1	0	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	0	5.7	2.6	
V117	6AU6	2d Sound I-F Amplifier	2200 Mu.V. Signal	5	148	6	90	7	0	1	−9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	−.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu.V. Signal	2	−8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	−2.0	—	—	5	.41	—	—	—	—	
			2200 Mu.V. Signal	7	−3.7	—	—	1	0	—	—	—	—	
			No Signal	7	−1.08	—	—	1	0	—	—	—	—	
V119	6AV6	Bias Clamp	2200 Mu.V. Signal	7	0	—	—	2	0	1	0	—	—	
			No Signal	7	0	—	—	2	0	1	0	—	—	
V121	10BP4	Kinescope	2200 Mu.V. Signal	Cap	*8400	10	339	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	—	10	322	11	42	2	14	—	—	Average Brightness
			2200 Mu.V. Signal	Cap	—	10	339	11	0	2	0	.4	—	Maximum Brightness
			2200 Mu.V. Signal	Cap	*8500	10	339	11	100	2	20	0	—	*Minimum Brightness

If any lead dressing is necessary, it should be done before aligning the receiver. See Critical Lead Dress on page 13.

Before aligning set, completely mesh the gang and set the dial pointer to calibration point at extreme left end of dial.

When making a complete alignment follow the tabulated form below in sequence. If only a portion of the circuit is to be aligned, select the portion required and follow with the remaining steps in the chart. Any adjustments made on the AM 455 kc. I-F's make it necessary to adjust the FM 10.7 mc. I-F's.

AM I-F, OSC, R-F AND ANT ALIGNMENT

Test-Oscillator. — For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action. Set the oscillator to 30% 400-cycle modulation.

Output Meter. — Connect the meter across the speaker voice coil, and turn the receiver volume control to maximum.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Turn Radio Dial to—	Adjust the following for peak output on the meter
1	C3 in series with .01 mfd.	455 kc.	Quiet point at low freq. end of dial	*AM windings T3 bottom core (sec.) T3 top core (pri.)
2				AM windings T2 bottom core (pri.) T2 top core (sec.)
3	Terminal 1 of antenna board in series with 220 mmf.	1,400 kc.	1,400 kc.	C13 Oscillator C4 Antenna
4		600 kc.	600 kc.	L4 Oscillator L9 Antenna
5	Repeat steps 3 and 4.			

*Use alternate loading. This method involves the use of a 47,000-ohm resistor to load the primary winding while the secondary winding of the same transformer is being peaked. Then the secondary winding is loaded with the 47,000-ohm resistor while the primary winding is being peaked. Remove the 47,000-ohm resistor after T2 and T3 have been aligned.

FM RATIO DETECTOR, I-F, OSC, R-F AND ANT ALIGNMENT

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Turn Radio Dial to—	Adjust the following
1	Connect "VoltOhmyst" d-c probe to negative lead of C33, and the meter common lead to chassis ground.			
2	Pin 1 of V3 (6AU6) in series with .01 mfd.	10.7 mc. AM mod., .05 V out.	Low freq. end of dial	T4 top core for max. d-c voltage across C33 T4 bottom core for minimum audio output**
3	Terminal 1 of antenna board in series with 300 ohms	10.7 mc. output adjusted to give 2 to 3 volts on "VoltOhmyst"	Low freq. end of dial	FM windings for maximum d-c voltage across C33*** T3 top core (sec.) T3 bottom core (pri.)
4			Low freq. end of dial	FM windings for maximum d-c*** T2 top core (sec.) T2 bottom core (pri.)
5	Terminal 1 of antenna board in series with 300 ohms	106 mc.	106 mc.	C2 Antenna L2 Oscillator**** (Set C2 at maximum capacity while adjusting L2)
6		90 mc.	90 mc.	L1 Antenna**** (Rock gang)
7	Repeat steps 5 and 6 until further adjustment provides no improvement in calibration.			

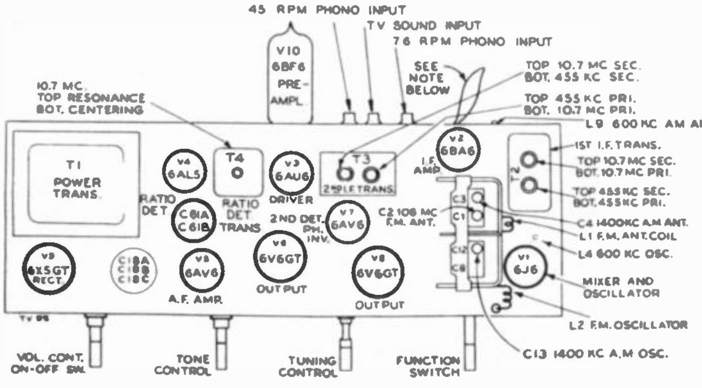
**Two or more points may be found which give reductions in the audio output. At the correct tuning point, the minimum audio output is approached rapidly and the output is much less than at any incorrect point.

***Align T2 and T3 by the use of alternate loading. Use a 680-ohm resistor to load the primary winding while the secondary winding of the same transformer is being peaked. Then load the secondary winding with the 680-ohm resistor while the primary winding is being peaked.

****L1 and L2 are adjusted by increasing or decreasing the spacing between turns of the coils.

NOTE.—The FM alignment may be checked by means of an FM sweep generator and cathode ray oscilloscope. Set the sweep generator to 10.7 mc center frequency and connect the output lead to the mixer grid Pin 5 of V1 (6J6). Set the signal generator to 10.7 mc and loosely couple it to the mixer grid to provide a marker. To observe the I-F response, disconnect the 2 mfd capacitor C33 from the ratio detector circuit. Connect the oscilloscope to the junction of R25 and R26.

To observe the Ratio Detector response, reconnect C33 and connect the oscilloscope across the volume control R14.



NOTE.—If it is desired to use a separate "A" band antenna, cut the green loop of wire extending from the chassis as shown above and connect the antenna to the wire which permits greatest sensitivity.

Figure 12 —Chassis, Top View, Showing Adjustments

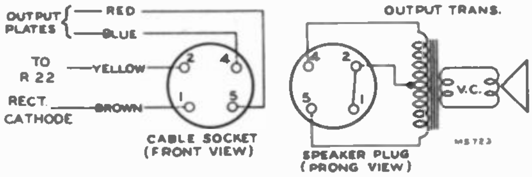


Figure 13 —Speaker Connections

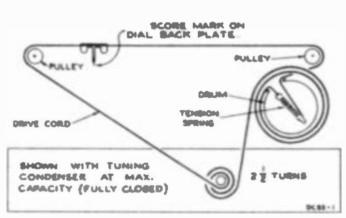
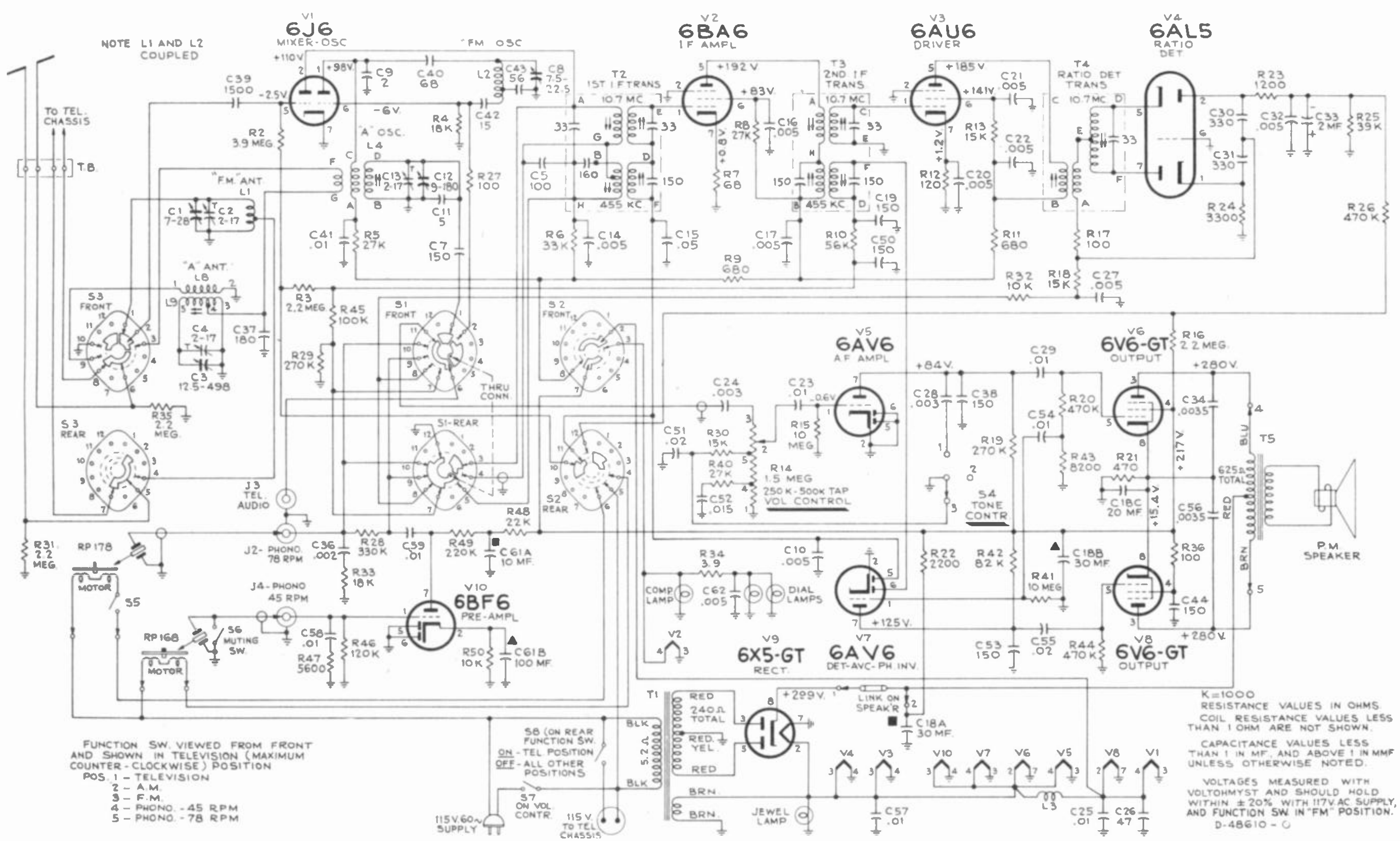


Figure 14 —Dial and Drive Cord Assembly



RADIO CRITICAL LEAD DRESS

1. Keep leads of C7 short.
2. Dress R27 away from range switch and pin No. 5 of V1.
3. The ground lead of pin No. 2 of V2 and V3 should be down against chassis. Its length is critical.
4. The AVC lead from R26 to range switch should be dressed against chassis.
5. C43 should have short leads and the color code of the capacitor should go to the coil L4. The capacitor should be cemented down with polystyrene cement at the same time L2 is cemented.
6. Lead from pin No. 2 of V1 to terminal "A" of 1st I. F. transformer should be dressed against the chassis.
7. Connect C40 directly between the gang condenser and pin No. 1 of V1.
8. Make all FM leads as short as possible.
9. Dress lead from pin No. 5 of V2 to terminal "A" of 2nd I. F. transformer down against chassis.
10. Dress resistor R15 near chassis base.
11. Dress all A. C. leads away from volume control.
12. The lead from "FM" terminal of antenna terminal board to L1 tap should be dressed away from V2.
13. The taps on L1 and L2 are critical. L1 tap should be 3/4 turn from the ground end. L2 tap should be 2½ turns from the gang condenser C8.
14. Dress C25 and C26 against the chassis with the shortest lead length possible.
15. The position of L1 and L2 is critical. L1 should be midway between V1 and the 1st I. F. transformer. The end of L2 should be approximately 3/16" from V1.
16. Coupling between pins 5 and 6 of V1 and the components attached should be kept to a minimum.

Figure 15—Radio Schematic Diagram

9TW333 TELEVISION R-F UNIT WIRING DIAGRAM

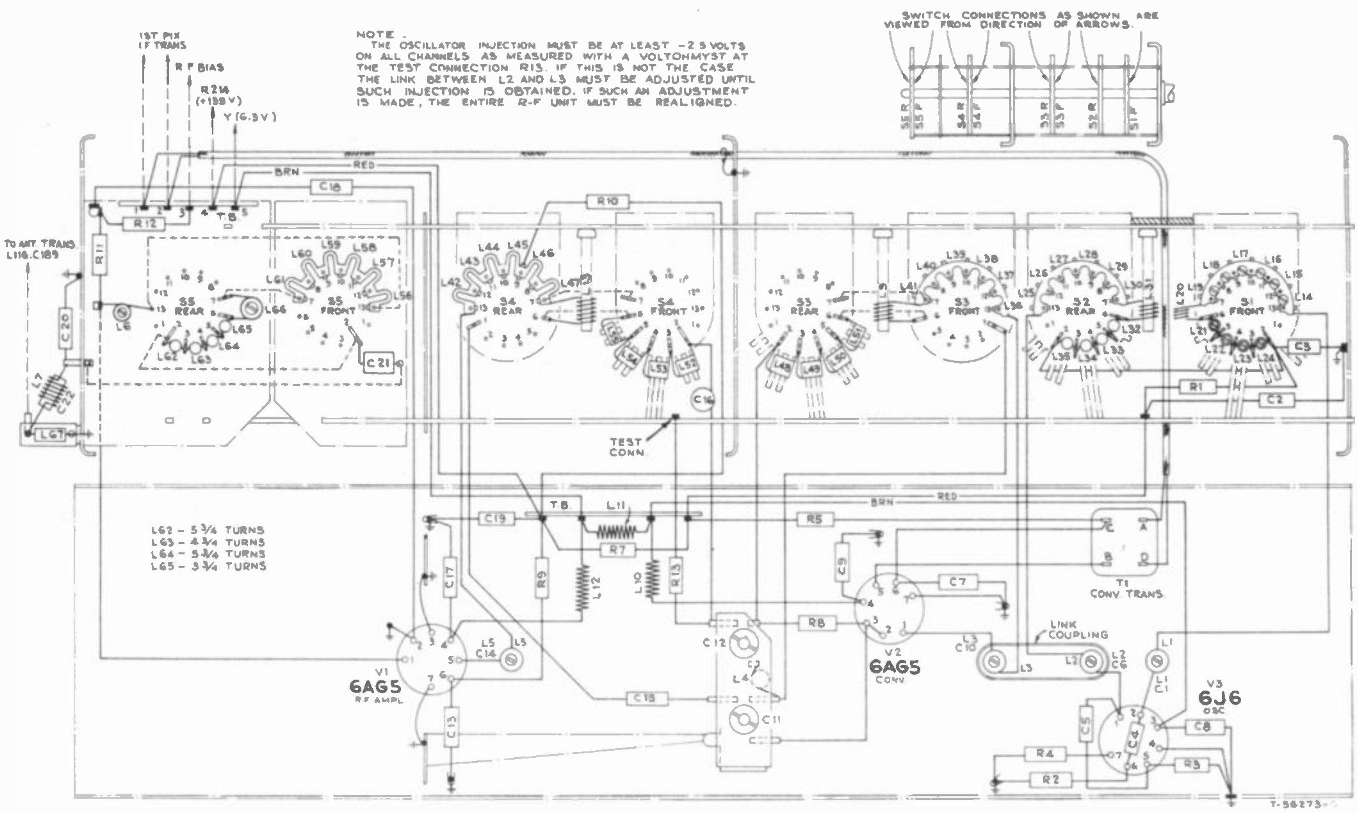


Figure 16— R-F Unit Wiring Diagram

TELEVISION CRITICAL LEAD DRESS

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117 and V118 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1,500 mmf capacitors in the picture i-f circuits the lead length must be kept as short as possible.
4. The picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress the blue leads from pin 5 of V119 down against the chassis.
9. Dress C129 and C130 up and away from the chassis.
10. Dress the yellow lead from the picture control away from the chassis. Dress the yellow lead from pin 8 of V106 away from the chassis.
11. Dress the green lead from pin 2 of V106 away from the chassis.
12. Dress R168, R169, R170, R176 and R178 up and away from the chassis. In the event that it is necessary to replace one of these resistors, the resistor leads should not be clipped but should be bent and soldered into place in the same manner as the original unit. Strains or excessive heat should not be applied to the leads or bodies of the resistors associated with the horizontal oscillator and control circuits. Such conditions may cause excessive changes of resistance with age.
13. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from L110 (width control coil) away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 17.

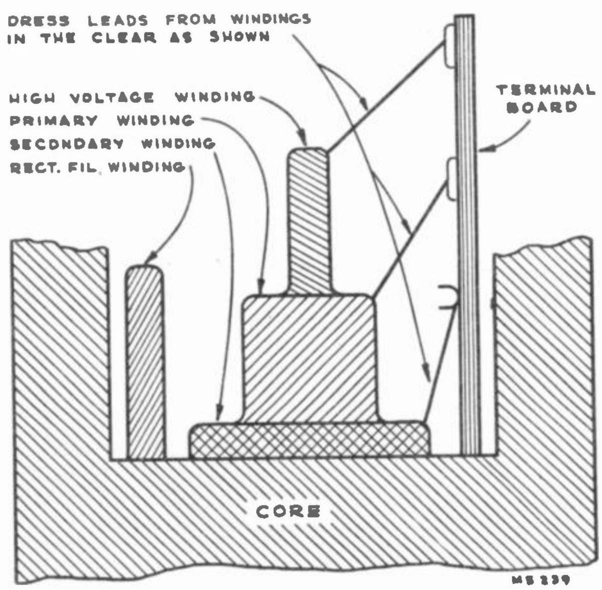


Figure 17—T110 Lead Dress

TELEVISION CIRCUIT SCHEMATIC DIAGRAM

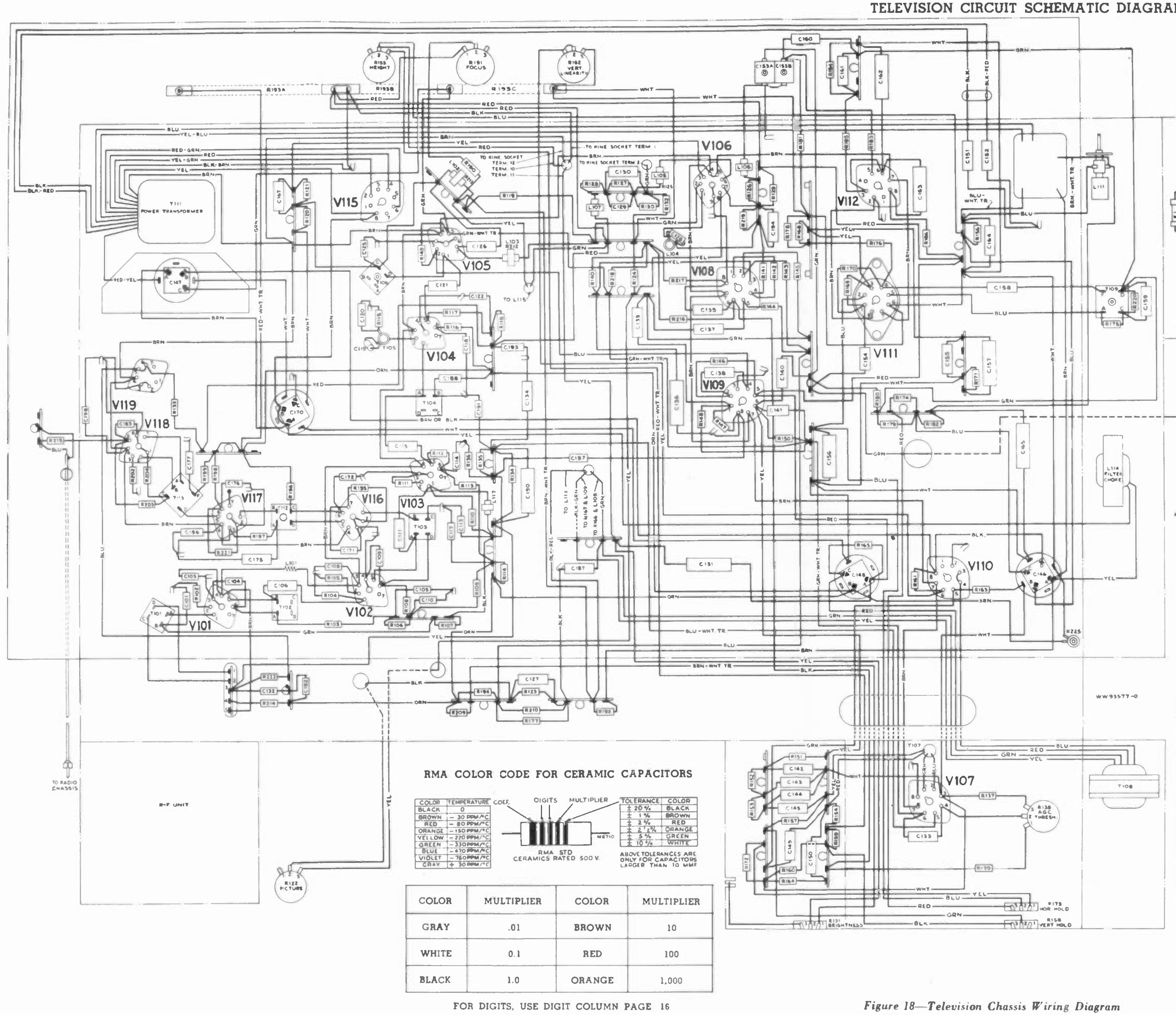


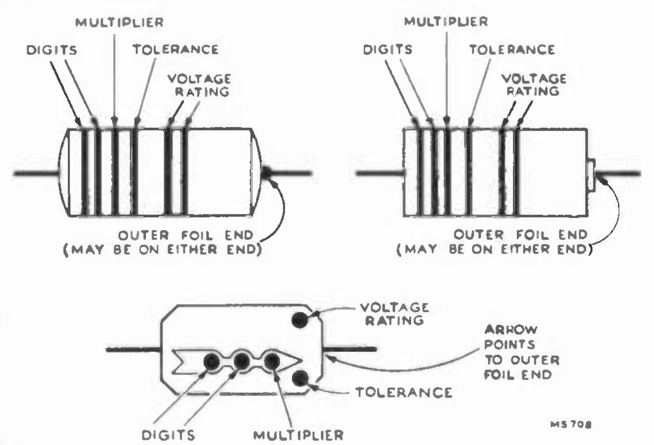
Figure 18—Television Chassis Wiring Diagram

RMA COLOR CODE FOR CERAMIC CAPACITORS

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	0.1	RED	100
BLACK	1.0	ORANGE	1,000

FOR DIGITS, USE DIGIT COLUMN PAGE 16

COLOR CODE FOR MOULDED PAPER CAPACITORS



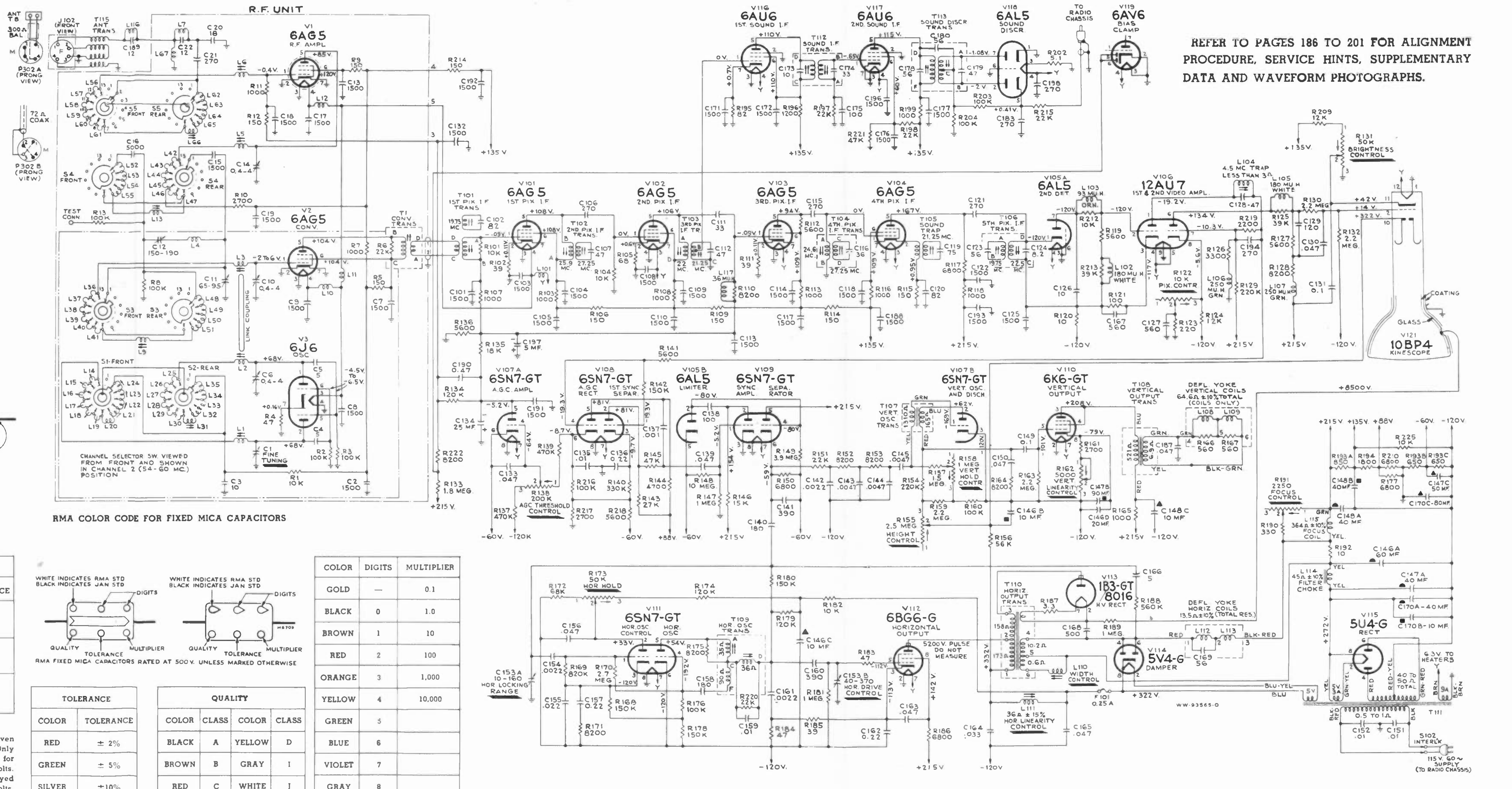
CAPACITY VALUE IN MMF		
COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE	
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	± 5%

The voltage rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digits column to read voltage ratings.

TELEVISION CHASSIS WIRING DIAGRAM

REFER TO PAGES 186 TO 201 FOR ALIGNMENT PROCEDURE, SERVICE HINTS, SUPPLEMENTARY DATA AND WAVEFORM PHOTOGRAPHS.



RMA COLOR CODE FOR FIXED MICA CAPACITORS

RMA FIXED MICA CAPACITORS RATED AT 500 V. UNLESS MARKED OTHERWISE

TOLERANCE	
COLOR	TOLERANCE
RED	± 2%
GREEN	± 5%
SILVER	±10%
BLACK	±20%

QUALITY			
COLOR	CLASS	COLOR	CLASS
BLACK	A	YELLOW	D
BROWN	B	GRAY	I
RED	C	WHITE	J
ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	0.1
BLACK	0	1.0
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

All resistance values in ohms. K = 1000. All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown. Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 19—Television Circuit Schematic Diagram

Stock No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK5
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board (5 contact)
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission cable (4⅞") (W1)
73441	Cam—Fine tuning adjustment cam
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1,500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
73475	Coil—Antenna filter shunt coil (L67)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Converter grid coil for channel No. 6 (L9, L31)
73462	Coil—Coupling inductance coil (L4)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (threaded bushing type with plunger adjustment) (L1, C1)
73443	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (smooth bushing type with plunger adjustment) (L1, C1)
73476	Coil—I-F trap (L7, C22)
73461	Coil—Oscillator plate coil (4 turns) for channel No. 6 (L20)
73460	Coil—R-F plate coil for channel No. 6 (L13)
74109	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (threaded bushing type with screw adjustment) for oscillator section or converter section (L2, C6, L3, C10)
73444	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (smooth bushing type with screw adjustment) for oscillator section or converter section (L2, C6, L3, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (threaded bushing type with screw adjustment) for r-f amplifier section (L5, C14)
73446	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (smooth bushing type with screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
74187	Core—Adjustable core for L31
73455	Core—Sliding core for fine tuning control trimmer
73440	Detent—R-F unit detent mechanism and fibre shaft
73453	Form—Coil form assembly for L9, L13
71487	Form—Coil form for oscillator plate coil L31
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to converter trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73467	Nut—Speed nut to mount trimmer coils 73443, 73444 and 73446
73436	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 1,000 ohms ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 1,000 ohms, ±10%, ½ watt (R11)
	Resistor—Fixed, composition, 2,700 ohms, ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms, ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer for fine tuning link stud
71476	Screw—No. 4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
71475	Screw—No. 4-40 x .296 adjusting screw for coils L6, L21, L22, L23, L24
73640	Screw—No. 4-40 x ⅜" adjusting screw for L66
73439	Shaft—Actuating shaft for fine tuning control
73437	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F unit
71494	Socket—Tube Socket
73450	Socket—Tube socket, ceramic, 7 prong bottom mounted

Stock No.	DESCRIPTION
74576	Spacer—Insulating spacer for front plate (4 required)
75068	Spring—Retaining spring for r-f oscillator tube shield
74188	Spring—Retaining spring for adjustable core No. 74187
73457	Spring—Return spring for fine tuning control core
73456	Spring—Tension spring for drive belt shield
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Converter stator complete with rotor and coils (S3, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55)
75446	Stud—Capacitor stud—brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 or 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass, No. 4-40 x 13/16" with 3/64" screwdriver slot for trimmer coils 74109 or 74110 coded numerically or coded "HiQ"
73448	Transformer—Converter transformer (T1, R6)
73466	Washer—Insulating washers for front shield (1 set)
2917	Washer—"C" washer for channel selector shaft
	R-F — I-F CHASSIS ASSEMBLIES
	KCS 30
72437	Cable—Shielded audio cable complete with pin plug
72809	Capacitor—Mica, 5 mmf. (C166)
39604	Capacitor—Mica, 10 mmf. (C126)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C175)
75050	Capacitor—Ceramic, 100 mmf., 1,000 volts (C138)
73921	Capacitor—Ceramic, 120 mmf. (C129)
51416	Capacitor—Mica, 180 mmf. (C140)
73102	Capacitor—Mica, 180 mmf. (C158)
73922	Capacitor—Ceramic, 270 mmf. (C183, C194, C198)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121)
39642	Capacitor—Mica, 390 mmf. (C141, C160)
71450	Capacitor—Mica, 500 mmf., 15,000 volts (C168)
39646	Capacitor—Mica, 560 mmf. (C127, C167)
73580	Capacitor—Mica trimmer, comprising 1 section of 10-160 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
71501	Capacitor—Ceramic, 1,500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C132, C171, C172, C176, C177, C188, C191, C192, C193, C196)
73801	Capacitor—Tubular, moulded paper, .001 mfd., 600 volts (C137)
73595	Capacitor—Tubular, moulded paper, oil filled, .0022 mfd., 600 volts (C142, C154, C161)
73550	Capacitor—Tubular, moulded paper, .0047 mfd., 600 volts (C143, C144)
73920	Capacitor—Tubular, moulded paper, oil filled, .0047 mfd., 600 volts (C145)
73561	Capacitor—Tubular, moulded paper, .01 mfd., 400 volts (C135, C151, C152)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd., 600 volts (C159)
73562	Capacitor—Tubular, moulded paper, .022 mfd., 400 volts (C155)
73596	Capacitor—Tubular, moulded paper, oil filled, .033 mfd., 1,000 volts (C164)
73558	Capacitor—Tubular, moulded paper, .047 mfd., 200 volts (C133, C187)
73553	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C130, C139)
73592	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 600 volts (C150, C156)
73564	Capacitor—Tubular, moulded paper, .047 mfd., 1,000 volts (C163)
73597	Capacitor—Tubular, moulded paper, oil filled, .047 mfd., 1,000 volts (C165)
73551	Capacitor—Tubular, moulded paper, 0.1 mfd., 400 volts (C149)
73557	Capacitor—Tubular, moulded paper, 0.1 mfd., 600 volts (C131)
73560	Capacitor—Tubular, moulded paper, 0.22 mfd., 200 volts (C136)
73593	Capacitor—Tubular, moulded paper, 0.22 mfd., 400 volts (C157, C162)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd., 200 volts (C190)
74106	Capacitor—Electrolytic, 5 mfd., 50 volts (C197)
53147	Capacitor—Electrolytic, 25 mfd., 50 volts (C134)

Stock No.	DESCRIPTION
73581	Capacitor—Electrolytic, comprising 1 section of 60 mfd., 450 volts, 2 sections of 10 mfd., 450 volts and 1 section of 20 mfd., 150 volts (C146A, C146B, C146C, C146D)
73583	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 90 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C147A, C147B, C147C)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts and 1 section of 10 mfd., 450 volts (C148A, C148B, C148C)
73582	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts and 1 section of 80 mfd., 200 volts (C170A, C170B, C170C)
73154	Choke—Filter choke (L114)
73591	Coil—Antenna matching coil less mounting bracket and socket (2 required)
73578	Coil—Antenna matching coil complete with bracket and socket (T115)
71778	Coil—Cathode trap coil (T105, C119)
73477	Coil—Choke coil (L101)
73566	Coil—Focus coil (L115)
71449	Coil—Horizontal linearity control coil (L111)
73476	Coil—I-F trap (L116, C189)
74140	Coil—Peaking coil (35 muh.) (L117, R110)
72619	Coil—Peaking coil (93 muh.) (L103, R212)
71528	Coil—Peaking coil (180 muh.) (L102, L105, R213, R125)
71525	Coil—Peaking coil (250 muh.) (L106, L107)
73577	Coil—Video trap (L104, C128)
71429	Coil—Width control coil (L110)
71521	Connector—Hi-voltage capacitor connector
71789	Connector—Kinescope anode connector
73579	Control—AGC threshold control (R138)
73156	Control—Brightness control (R131)
72735	Control—Focus control (R191)
71440	Control—Height control (R155)
72734	Control—Horizontal hold and vertical hold control (R158, R173)
73663	Control—Picture control (R122)
71441	Control—Vertical linearity control (R162)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytic No. 71432, 73581 and 73582
73590	Cushion—Cushion for deflection yoke hood (2 required)
73600	Fuse—0.25 amp., 250 volts (F1)
71799	Grommet—Rubber grommet for horizontal yoke lead exit and 2nd anode connector
37396	Grommet—Rubber grommet for mounting ceramic tube socket
73301	Magnet—Ion trap magnet (P. M. type)
73587	Nut—Speed nut to mount hi-voltage capacitor
18469	Plate—Mounting plate—bakelite—for electrolytics
71448	Plug—2 prong male plug for power cable
71513	Resistor—Wire wound, 3.3 ohms, 1/3 watt (R187)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R202)
	Resistor—Fixed, composition, 10 ohms ±20%, ½ watt (R120, R192)
	Resistor—Fixed, composition, 39 ohms ±10%, ½ watt (R102, R111)
	Resistor—Fixed, composition, 39 ohms ±10%, 1 watt (R185)
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R183)
	Resistor—Fixed, composition, 47 ohms ±10%, 1 watt (R184)
	Resistor—Fixed, composition, 68 ohms ±10%, ½ watt (R105)
	Resistor—Fixed, composition, 82 ohms ±10%, ½ watt (R195)
	Resistor—Fixed, composition, 100 ohms ±10%, ½ watt (R121)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R106, R109, R114, R214)
	Resistor—Fixed, composition, 150 ohms ±10%, ½ watt (R115)
	Resistor—Fixed, composition, 220 ohms ±10%, ½ watt (R123)
37502	Resistor—Wire wound, 330 ohms, 2 watts (R190)
73588	Resistor—Voltage divider, comprising 1 section of 850 ohms, 12 watts and 2 sections of 650 ohms, 6 watts (R193A, R193B, R193C)
	Resistor—Fixed, composition, 1,000 ohms ±20%, ½ watt (R103, R-107, R108, R113, R116, R118, R165, R199)
	Resistor—Fixed, composition, 1,200 ohms, ±10%, ½ watt (R196)

Stock No.	DESCRIPTION
	Resistor—Fixed, composition, 1,800 ohms ±10%, 2 watts (R194)
	Resistor—Fixed, composition, 2,200 ohms ±10%, ½ watt (R219)
	Resistor—Fixed, composition, 2,700 ohms ±10%, ½ watt (R161, R217)
	Resistor—Fixed, composition, 3,300 ohms ±5%, ½ watt (R126)
	Resistor—Fixed, composition, 4,700 ohms ±10%, ½ watt (R144)
	Resistor—Fixed, composition, 5,600 ohms ±10%, ½ watt (R141, R218)
	Resistor—Fixed, composition, 5,600 ohms ±5%, ½ watt (R112, R119, R136)
	Resistor—Fixed, composition, 5,600 ohms ±10%, 1 watt (R127)
	Resistor—Fixed, composition, 6,800 ohms ±10%, ½ watt (R150)
	Resistor—Fixed, composition, 6,800 ohms ±10%, 1 watt (R186)
	Resistor—Fixed, composition, 6,800 ohms ±5%, 1 watt (R117)
	Resistor—Fixed, composition, 6,800 ohms ±10%, 2 watts (R177, R210)
	Resistor—Fixed, composition, 8,200 ohms ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed, composition, 8,200 ohms ±5%, ½ watt (R164, R175, R222)
	Resistor—Fixed, composition, 8,200 ohms ±5%, 1 watt (R128)
	Resistor—Fixed, composition, 10,000 ohms ±10%, ½ watt (R182)
	Resistor—Fixed, composition, 10,000 ohms ±5%, ½ watt (R104)
51869	Resistor—Wire wound, 10,000 ohms, 10 watts (R225)
	Resistor—Fixed, composition, 12,000 ohms ±10%, ½ watt (R209)
	Resistor—Fixed, composition, 12,000 ohms ±10%, 2 watts (R124)
	Resistor—Fixed, composition, 15,000 ohms ±10%, 1 watt (R146)
	Resistor—Fixed, composition, 18,000 ohms ±5%, ½ watt (R135)
	Resistor—Fixed, composition, 22,000 ohms ±20%, ½ watt (R198, R215)
	Resistor—Fixed, composition, 22,000 ohms ±10%, ½ watt (R151, R197, R220)
	Resistor—Fixed, composition, 27,000 ohms ±10%, ½ watt (R143)
	Resistor—Fixed, composition, 47,000 ohms ±20%, ½ watt (R221)
	Resistor—Fixed, composition, 47,000 ohms ±10%, ½ watt (R145)
	Resistor—Fixed, composition, 56,000 ohms ±10%, ½ watt (R156)
	Resistor—Fixed, composition, 68,000 ohms ±10%, ½ watt (R172)
	Resistor—Fixed, composition, 100,000 ohms ±10%, ½ watt (R160, R216)
	Resistor—Fixed, composition, 100,000 ohms ±5%, ½ watt (R203, R204)
	Resistor—Fixed, composition, 100,000 ohms ±5%, 1 watt (R176)
	Resistor—Fixed, composition, 120,000 ohms ±5%, ½ watt, (R134)
	Resistor—Fixed, composition, 120,000 ohms ±10%, 1 watt (R174, R179)
	Resistor—Fixed, composition, 150,000 ohms ±20%, ½ watt (R142)
	Resistor—Fixed, composition, 150,000 ohms ±10%, ½ watt (R168, R180)
	Resistor—Fixed, composition, 150,000 ohms ±5%, 1 watt (R178)
	Resistor—Fixed, composition, 220,000 ohms ±10%, ½ watt (R129, R154)
	Resistor—Fixed, composition, 330,000 ohms ±20%, ½ watt (R140)
	Resistor—Fixed, composition, 470,000 ohms ±10%, ½ watt (R137, R139)
	Resistor—Fixed, composition, 560,000 ohms ±10%, ½ watt (R188)
	Resistor—Fixed, composition, 820,000 ohms ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 1 megohm ±10%, ½ watt (R147, R181)

Stock No.	DESCRIPTION
	Resistor—Fixed, composition, 1 megohm ±20%, 1 watt (R189)
	Resistor—Fixed, composition, 1.5 megohm ±5%, ½ watt (R157)
	Resistor—Fixed, composition, 1.8 megohm ±5%, ½ watt (R133)
	Resistor—Fixed, composition, 2.2 megohms ±10%, ½ watt (R130, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohms ±5%, 1 watt (R170)
	Resistor—Fixed, composition, 3.9 megohms ±10%, ½ watt (R149)
	Resistor—Fixed, composition, 10 megohms ±10%, ½ watt (R148)
71456	Screw—No. 8-32 wing screw to mount yoke and hood (3 required)
73584	Shield—Tube shield for V117 and V118
72741	Socket—Kinescope socket
38853	Socket—Four pin wafer socket (J102)
71508	Socket—Tube socket for 8016
73117	Socket—Tube socket, 7 pin, miniature
72927	Socket—Tube socket, 9 pin, miniature
73249	Socket—Tube socket, octal, ceramic, plate mounted
31251	Socket—Tube socket, octal, wafer
73586	Spring—Hood and yoke pressure spring (3 required)
73571	Transformer—First pix I-F transformer (T102, C102, R101)
73572	Transformer—Second pix I-F transformer (T102, C107)
73573	Transformer—Third pix I-F transformer (T103, C112)
73574	Transformer—Fourth pix I-F transformer (T104, C116)
73575	Transformer—Fifth pix I-F transformer (T106, C123, C124)
73569	Transformer—Vertical oscillator transformer (T107)
73568	Transformer—Vertical output transformer (T108)
73576	Transformer—Synchroguide transformer (T109)
73570	Transformer—Horizontal output and hi-voltage transformer (T110)
73567	Transformer—Power transformer, 117 volt, 60 cycle (T111)
71424	Transformer—Sound I-F transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
71420	Yoke—Deflection yoke (L108, L109, L112, L113, C169, R166, R167)
	CHASSIS ASSEMBLIES
	RC 616N
72853	Board—"Antenna-Television" board
73607	Capacitor—Variable tuning capacitor (C1, C2, C3, C4, C8, C12, C13)
73866	Capacitor—Ceramic, 2 mmf. (C9)
93056	Capacitor—Ceramic, 5 mmf. (C11)
31353	Capacitor—Ceramic, 15 mmf. (C42)
39042	Capacitor—Ceramic, 47 mmf. (C26)
73867	Capacitor—Ceramic, 56 mmf. (C43)
33103	Capacitor—Ceramic, 68 mmf. (C40)
39396	Capacitor—Ceramic, 100 mmf. (C5)
48125	Capacitor—Ceramic, 150 mmf. (C7, C19, C38, C44, C50, C53)
71922	Capacitor—Ceramic, 180 mmf. (C37)
39640	Capacitor—Mica, 330 mmf. (C30, C31)
73748	Capacitor—Ceramic, 1,500 mmf. (C39)
73473	Capacitor—Ceramic, 5,000 mmf. (C10)
73750	Capacitor—Tubular, .002 mfd., 200 volts (C36)
73659	Capacitor—Tubular, .003 mfd., 200 volts (C24)
72573	Capacitor—Tubular, .003 mfd., 400 volts (C28)
70346	Capacitor—Tubular, .0035 mfd., 1,000 volts (C34, C56)
71926	Capacitor—Tubular, .005 mfd., 200 volts (C62)
71553	Capacitor—Tubular, .005 mfd., 400 volts (C14, C16, C17, C21, C22)
71923	Capacitor—Tubular, .01 mfd., 200 volts (C23, C25, C57)
71925	Capacitor—Tubular, .01 mfd., 400 volts (C29, C41, C54)
73561	Capacitor—Tubular, .01 mfd., 400 volts (C58, C59)
72120	Capacitor—Tubular, .015 mfd., 200 volts (C52)
71928	Capacitor, Tubular, .02 mfd., 200 volts (C51)
73638	Capacitor—Tubular, .02 mfd., 400 volts (C55)
71551	Capacitor—Tubular, .05 mfd., 200 volts (C15)
73747	Capacitor—Electrolytic, 2 mfd., 50 volts (C33)

Stock No.	DESCRIPTION
73372	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 350 volts, 1 section of 30 mfd., 300 volts and 1 section of 20 mfd., 250 volts (C18A, C18B, C18C)
74200	Capacitor—Electrolytic, comprising 1 section of 10 mfd., 300 volts and 1 section of 100 mfd., 10 volts (C61A, C61B)
73918	Coil—Antenna coil—F.M. (No. 16 buss tinned, 8 turns per inch, 1¾ turns L. H.—.469" I. D.) (L1)
73661	Coil—Antenna coil—A.M. (L8, L9)
71942	Coil—Filament choke coil (L3)
73916	Coil—Oscillator coil—F.M. (No. 16 buss tinned, 7 turns per inch, 4¾ turns R. H.—.469" I. D.) (L2)
73744	Coil—Oscillator coil—A.M. (L4)
73662	Control—Volume control and power switch (R14, S7)
72953	Cord—Drive cord (approx. 38" overall length)
70392	Cord—Power cord and plug
72069	Grommet—Rubber grommet for rear mounting feet (2 required)
16058	Grommet—Rubber grommet for mounting R-F shelf (4 required)
73710	Indicator—Station selector indicator
73044	Plate—Dial back plate
30868	Plug—2 contact female plug for motor cable
5040	Plug—4 contact female plug for speaker cable
71637	Receptacle—Phono receptacle
52131	Receptacle—A. C. receptacle
70250	Resistor—Wire wound, 3.9 ohms, 1 watt (R34)
	Resistor—Fixed, composition, 68 ohms ±10%, ½ watt (R7)
	Resistor—Fixed, composition, 100 ohms ±10%, ½ watt (R36)
	Resistor—Fixed, composition, 120 ohms ±10%, ½ watt (R12)
	Resistor—Fixed, composition, 470 ohms ±10%, 2 watts (R21)
	Resistor—Fixed, composition, 680 ohms ±20%, ½ watt (R9, R11)
	Resistor—Fixed, composition, 1,200 ohms ±5%, ½ watt (R23)
73637	Resistor—Wire wound, 2,200 ohms, 5 watts (R22)
	Resistor—Fixed, composition, 3,300 ohms ±5%, ½ watt (R24)
	Resistor—Fixed, composition, 5,600 ohms ±10%, ½ watt (R47)
	Resistor—Fixed, composition, 8,200 ohms ±10%, ½ watt (R43)
	Resistor—Fixed, composition, 10,000 ohms ±10%, ½ watt (R50)
	Resistor—Fixed, composition, 15,000 ohms ±10%, ½ watt (R13, R18, R30)
	Resistor—Fixed, composition, 18,000 ohms ±10%, ½ watt (R33)
	Resistor—Fixed, composition, 22,000 ohms ±10%, ½ watt (R48)
	Resistor—Fixed, composition, 27,000 ohms ±10%, ½ watt (R8, R40)
	Resistor—Fixed, composition, 27,000 ohms ±10%, 1 watt (R5)
	Resistor—Fixed, composition, 33,000 ohms ±10%, ½ watt (R6)
	Resistor—Fixed, composition, 39,000 ohms ±10%, ½ watt (R25)
	Resistor—Fixed, composition, 56,000 ohms ±10%, 1 watt (R10)
	Resistor—Fixed, composition, 82,000 ohms ±10%, ½ watt (R42)
	Resistor—Fixed, composition, 100,000 ohms ±10%, ½ watt (R45)
	Resistor—Fixed, composition, 120,000 ohms ±10%, ½ watt (R46)
	Resistor—Fixed, composition, 220,000 ohms ±10%, ½ watt (R49)
	Resistor—Fixed, composition, 270,000 ohms ±10%, ½ watt (R19, R29)
	Resistor—Fixed, composition, 330,000 ohms ±10%, ½ watt (R28)
	Resistor—Fixed, composition, 470,000 ohms ±10%, ½ watt (R20, R26, R44)
	Resistor—Fixed, composition, 2.2 megohms ±20%, ½ watt (R3, R31, R35)
	Resistor—Fixed, composition, 3.9 megohms ±10%, ½ watt (R2)
	Resistor—Fixed, composition, 10 megohms ±20%, ½ watt (R15, R41)

Stock No.	DESCRIPTION
	Resistor—Fixed, composition, 22 megohms ±20%, ½ watt (R16)
73605	Shaft—Tuning knob shaft
31364	Socket—Lamp socket
72516	Socket—Tube socket, 7 contact, miniature
73117	Socket—Tube socket, 7 pin, miniature for V10
31251	Socket—Tube socket, octal, wafer
74305	Spring—Drive cord spring
74215	Switch—Selector switch (S1, S2, S3, S8)
73602	Switch—Tone control switch (S4)
73603	Support—Dial plate mounting support complete with pulley—R. H.
73604	Support—Dial plate mounting support complete with pulley—L. H.
74202	Support—Polystyrene coil support complete with bracket
73601	Transformer—Power transformer, 117 volt, 60 cycle (T1)
73745	Transformer—First I-F transformer—dual (T2)
74019	Transformer—Second I-F transformer—dual (T3)
73743	Transformer—Ratio detector transformer (T4)
33726	Washer—"C" washer for tuning knob shaft
	SPEAKER ASSEMBLIES
	92569-5W or 92569-5K
	RL 103B5
13867	Cap—Dust cap
73934	Cone—Cone complete with voice coil for 92569-5W
75642	Cone—Cone and voice coil assembly for 92569-5K
5039	Plug—4 prong male plug for speaker
73635	Speaker—12" P.M. speaker complete with cone and voice coil less output transformer and plug
71145	Suspension—Metal cone suspension for 92569-5W
73636	Transformer—Output transformer (T5)
	MISCELLANEOUS
73641	Back—Cabinet back for television chassis portion of cabinet
74255	Board—"Antenna" board
71599	Bracket—Pilot lamp bracket
72437	Cable—Shielded pickup lead complete with pin plug for RP168A changer
74296	Cable—Shielded pickup lead complete with pin plug for RP178 changer
13103	Cap—Pilot lamp jewel
71892	Catch—Bullet catch and strike for television compartment door
71820	Check—Radio compartment door check
73643	Clip—Spring clip for channel marker escutcheon
X1632	Cloth—Grille cloth for walnut instruments
X1639	Cloth—Grille cloth for mahogany instruments
74209	Cover—Cover for RP168A record changer mounting screw (3 required)
74409	Cushion—Lid cushion
74249	Decal—Radio control panel function decal
73775	Decal—Television control panel function decal
71966	Decal—Trade mark decal (Victrola)
71768	Decal—Trade mark decal (RCA Victor)
73628	Dial—Glass dial scale
73180	Emblem—"RCA Victor" emblem
73627	Escutcheon—Dial scale escutcheon less dial
73740	Escutcheon—Television channel marker escutcheon for toasted mahogany instruments
73642	Escutcheon—Television channel marker escutcheon for walnut or mahogany instruments
73779	Glass—Safety glass
11889	Grommet—Rubber grommet for front apron of radio chassis (2 required)
37396	Grommet—Rubber grommet to mount speaker (3 required)
72856	Grommet—Rubber grommet for mounting RP178 record changer (3 required)
30698	Hinge—Cabinet lid hinge

Stock No.	DESCRIPTION
73735	Hinge—Radio compartment drop door hinge (2 required)
73903	Hinge—Television compartment door hinge (1 set)
72824	Knob—Radio tone control or selector switch knob—tan—for toasted mahogany instruments
71822	Knob—Radio tone control or selector switch knob—dark—for walnut or mahogany instruments
71821	Knob—Radio tuning or volume control knob—dark—for walnut or mahogany instruments
72824	Knob—Radio tuning or volume control knob—tan—for toasted mahogany instruments
73224	Knob—Television channel selector knob — dark — for walnut or mahogany instruments
73225	Knob—Television channel selector knob—tan—for toasted mahogany instruments (inner)
73222	Knob—Television fine tuning knob — dark — for walnut or mahogany instruments
73223	Knob—Television fine tuning knob—tan—for toasted mahogany instruments
73228	Knob—Television horizontal hold control knob—dark—for walnut or mahogany instruments
73229	Knob—Television horizontal hold control knob—tan—for toasted mahogany instruments
73226	Knob—Television picture control, brightness control, or vertical hold control knob—dark—for walnut or mahogany instruments (outer)
73227	Knob—Television picture control, brightness control, or vertical hold control knob—tan—for toasted mahogany instruments (outer)
73230	Knob—Television picture control or brightness control knob—dark—for walnut or mahogany instruments (inner)
73231	Knob—Television picture control or brightness control knob—tan—for toasted mahogany instruments (inner)
11765	Lamp—Dial lamp
73109	Nut—Tee nut for mounting RP178 record changer (3 required)
74208	Nut—Tee nut for mounting RP168A record changer (3 required)
71819	Plate—Mounting plate for radio compartment door check
72817	Plate—Retaining plate complete with wing nut and spring for television front panel (2 required)
30868	Plug—2 contact female plug for motor cable
30870	Plug—2 prong male plug for motor cable
72850	Plug—2 prong male plug for antenna cable
39153	Plug—4 prong male plug
73770	Pull—Door pull for television and radio compartments (6 required)
73771	Pull—Door pull for record changer and speaker compartments
73184	Runner—Record changer motor board runner—R. H.
73183	Runner—Record changer motor board runner—L. H.
73741	Screw—¼-20 x 2" fillister head screw for mounting RP178 record changer (3 required)
74424	Screw—No. 8-32 x 1¾" special screw for mounting RP168A changer (3 required)
72324	Shade—Lamp shade
71539	Slide—Kinescope centering slide (4 required)
73026	Spring—Cabinet lid support spring
72581	Spring—Radio compartment door check spring
72845	Spring—Retaining spring for knobs Nos. 73222, 73223
30900	Spring—Retaining spring for knobs Nos. 71821, 71822, 72824
14270	Spring—Retaining spring for knobs Nos. 73224 73225, 73226, 73227, 73230, 73231
30330	Spring—Retaining spring for knobs Nos. 73228, 73229
74421	Spring—Conical mounting spring (upper R. H. side) for RP168A changer (1 required)
74422	Spring—Conical mounting spring (upper L. H. side) for RP168A changer (2 required)
74423	Spring—Conical mounting spring (lower) for RP168A changer (3 required)
73185	Stop—Metal stop for motor board runners (2 required)
70158	Support—Cabinet lid support—L. H.
73182	Track—Record changer compartment track (2 required)
71814	Washer—Rubber washer for radio compartment door check

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS

Model 9TW390 Walnut, Mahogany or Toasted Mahogany

RCA VICTOR

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL 9TW390

Chassis Nos. KCS31-1 and RC617A
Mfr. No. 274

SERVICE DATA

— 1949 No. T7 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 9TW390 is a deluxe 16 inch television and AM-FM radio receiver. Two record changers are provided to play 78 RPM and 45 RPM records. The "MAGIC MONITOR," an automatic scratch suppressor, is provided to permit improved reproduction from old or worn records. The instrument employs 34 tubes plus 4 rectifiers and a 16AP4 kinescope.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc band width for picture channel and reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE............146 square inches on a 16 inch kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range ....±250 kc on chan. 2, ±650 kc on chan. 13
Picture Carrier Frequency.. 25.75 mc.
Sound Carrier Frequency.. 21.25 mc.

VIDEO RESPONSE.. To 4 Mc.

SWEEP DEFLECTION.. Magnetic

FOCUS.. Magnetic

RADIO TUNING RANGE

Broadcast.. 540-1,600 kc
Short Wave.. 9.2-16 mc.
Frequency Modulation..88-108 mc.
Intermediate Frequency—AM... 455 kc
Intermediate Frequency—FM... 10.7 mc.

POWER SUPPLY RATING............ 115 volts, 60 cycles, 310 watts

AUDIO POWER OUTPUT RATING.......................... 11 watts max.

CHASSIS DESIGNATIONS

Television Chassis.. KCS31-1
Radio Chassis.. RC617A
78 RPM Record Changer.. RP177B
45 RPM Record Changer.. RP168A-1

Refer to Service Data RP177 or RP168 for information on the record changers.

Some receivers have been field modified to replace the RP177 changer with type 960285.

LOUDSPEAKER 92569-6............................... 12 inch PM Dynamic
Voice Coil Impedance............................... 3.2 ohms at 400 cycles

DIMENSIONS (inches)

	Width	Height	Depth
Cabinet (outside)..	39½	43½	24¾

WEIGHT

Chassis with Tubes in Cabinet... 228 lbs.
Shipping Weight.. 305 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE....300 ohms balanced
If desired, television chassis may be fed from 72 ohm co-ax.

RCA TUBE COMPLEMENT

Tube Used	(Television Chassis)	Function
(1)	RCA 6AG5	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator
(3)	RCA 6AG5	Converter
(4)	RCA 6AU6	1st Sound I-F Amplifier
(5)	RCA 6AU6	2nd Sound I-F Amplifier
(6)	RCA 6AL5	Sound Discriminator
(7)	RCA 6AV6	Bias Clamp
(8)	RCA 6AG5	1st Picture I-F Amplifier
(9)	RCA 6AG5	2nd Picture I-F Amplifier
(10)	RCA 6AG5	3rd Picture I-F Amplifier
(11)	RCA 6AG5	4th Picture I-F Amplifier
(12)	RCA 6AL5	Picture 2nd Detector and Sync Limiter
(13)	RCA 6AU6	1st Video Amplifier
(14)	RCA 6K6GT	2nd Video Amplifier
(15)	RCA 6SN7GT	AGC Amplifier and Vert. Sweep Osc.
(16)	RCA 6SN7GT	AGC Rectifier and 1st Sync Separator
(17)	RCA 6SN7GT	Sync Amplifier and 2nd Sync Separator
(18)	RCA 6K6GT	Vertical Sweep Output
(19)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G	Horizontal Sweep Output
(21)	RCA 5V4G	Damper
(22)	RCA 1B3-GT/8016	H. V. Rectifier (2 tubes)
(23)	RCA 5U4G	Power Supply Rectifier (2 tubes)
(24)	RCA 16AP4	Kinescope

(Radio Tuner Chassis)

(1)	RCA 6BA6	R-F Amplifier
(2)	RCA 6BA6	Mixer
(3)	RCA 6BE6	Oscillator
(4)	RCA 6BA6	I-F Amplifier
(5)	RCA 6AU6	F-M Driver
(6)	RCA 6AL5	Ratio Detector
(7)	RCA 6AV6	AM Detector, AVC, AF Amplifier
(8)	RCA 6C4	Phase Invertor
(9)	RCA 6V6GT	Audio Output (2 tubes)
(10)	RCA 6BA6	MM Band Pass Amplifier
(11)	RCA 6BF6	MM Amplifier and Rectifier
(12)	RCA 6BA6	MM Reactance Tube

REFER TO PAGES 242 TO 255 FOR TELEVISION ALIGNMENT PROCEDURE, SERVICE HINTS AND WAVEFORM PHOTOGRAPHS.

TELEVISION OPERATION

The following adjustments are necessary when tuning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.
2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.
3. Set the STATION SELECTOR to the desired channel.
4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.
5. Turn the PICTURE control to mid-position.
6. Turn the BRIGHTNESS control fully counterclockwise then clockwise until a light pattern appears on the screen.
7. Adjust the VERTICAL hold control until the pattern stops vertical movement.
8. Adjust the HORIZONTAL hold control until a picture is obtained and centered.
9. Turn the BRIGHTNESS control counterclockwise until the retrace lines just disappear.
10. Adjust the PICTURE control for suitable picture contrast.
11. After the receiver has been on for some time it may be necessary to readjust FINE TUNING control for improved sound fidelity.
12. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 10.
13. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.
14. If the position of the controls has been changed, it may be necessary to repeat steps numbers 2 through 10.

RADIO OPERATION

1. Turn the radio FUNCTION switch to the desired band.
2. Tune in the desired station with the TUNING control.

PUSH BUTTON OPERATION

1. Turn the radio FUNCTION switch to PB
2. Push the appropriate button to receive the desired station.

PHONOGRAPH OPERATION

1. Turn the radio FUNCTION switch to Ph for operation of the 78 RPM changer or to XPh. for operation of the 45 RPM changer.
2. Place a record on the appropriate changer and slip the changer power switch to "ON".

"MAGIC MONITOR"

The MAGIC MONITOR operates only when the function switch is in the phono position.

1. Push the gold push button to turn MM on.
2. Push the gold push button a second time to turn MM off.

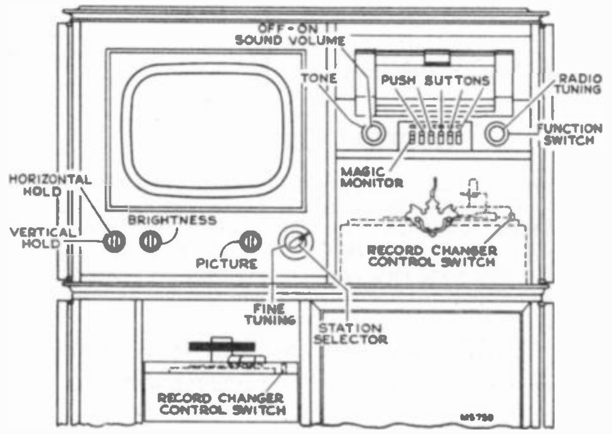


Figure 1—Receiver Operating Controls

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES, AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

The model 9TW390 is shipped in a plywood box put together with nails. Open the box by removal of the side as designated on the carton. If the side is removed by prying, do not permit the prying tool to enter the box, as the cabinet may become scratched. Slip the cabinet out of the carton.

A flat skid is attached to the bottom of the receiver cabinet which will permit the cabinet to be moved about without stressing the cabinet joints. To remove the skid, take off the cabinet back and remove the nuts from the two bolts that hold the cabinet on the skid. With a man at each end of the cabinet, lift the cabinet off the skid.

From the rear of the cabinet remove the single wood screw which holds the RP168A record changer drawer in the closed position. Slide the drawer out. From the top of the changer, remove the three filler plugs from over the motorboard mounting screws. Loosen these three screws just enough to permit removal of two wooden shipping strips under the edge of the motorboard. Tighten the screws just enough to keep the motorboard springs from rattling and replace the filler plugs.

Remove the two red brackets which hold the RP177B changer drawer in the closed position. Open the drawer and from the front of the cabinet, pull out two cardboard strips from under the changer motorboard. The motorboard should then be free floating. In the event that it is ever necessary to remove the RP177B, disconnect the changer cables, pull the carriage all the way out then lift up on the front edge. Replace it by a reversal of this procedure.

Remove the two red angle brackets which hold the radio chassis to the cabinet.

Remove the envelope containing the control knobs, ion trap magnet and station call letter tabs.

Remove all miscellaneous shipping material.

Remove the television front panel by loosening the two wingnuts inside the cabinet and by turning the two locking plates as shown in Figure 2. Hinge the panel at the bottom and tilt it out at the top.

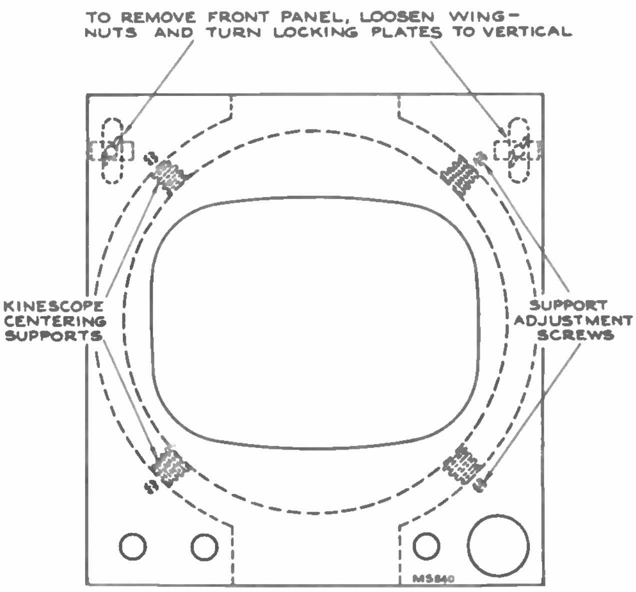


Figure 2—Television Panel, Front View

Remove the two self-tapping screws from the kinescope-cushion slide as shown in Figure 3.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the two focus coil mounting screws and move the coil until alignment is obtained. Tighten the mounting screws with the coil in this position.

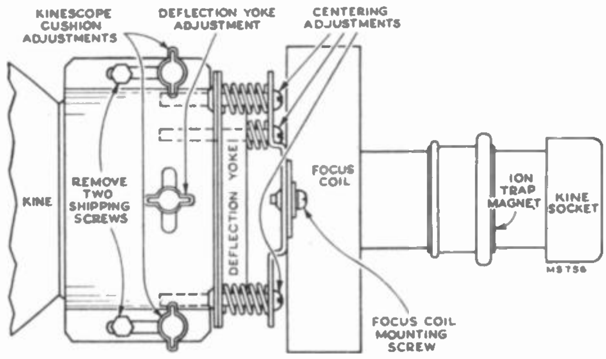


Figure 3—Yoke and Focus Coil Adjustments

Loosen the two lower kinescope face centering supports, and set them at approximately mid-position. See Figure 2 for location of the supports and their adjustment screws. Loosen the two upper supports (from inside the cabinet), slip them up as far as possible and tighten.

Check the centering supports. There should be a small wire clip on the inner surface of each. The clip in the lower left corner should be connected to the high voltage lead.

KINESCOPE HANDLING PRECAUTION.—Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatter-proof goggles and heavy gloves are worn. Persons not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.

Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

KINESCOPE INSTALLATION.—Slip the Vinylite boot over the metal cone of the kinescope, turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection and focus coils as shown in Figure 4. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

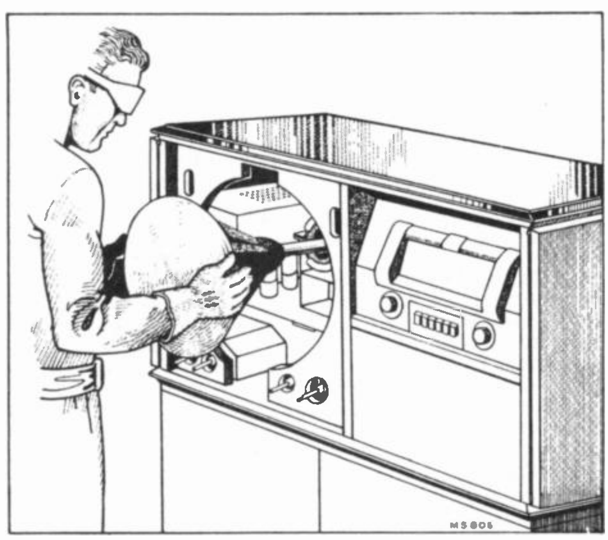


Figure 4—Kinescope Insertion

Slip the ion trap magnet assembly over the neck of the kinescope with the large magnet towards the base of the tube.

Connect the kinescope socket to the tube base.

Adjust the four centering supports until the face of the kinescope is in the center of the cabinet opening. Tighten the four supports securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel by reversal of the procedure indicated in Figure 2. Fasten the two bars in back of the panel and tighten the wingnuts.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap magnet and focus coil because of shadows on the corner of the raster.

The antenna and power connections should now be made. Install the front panel control knobs.

Make sure that all tubes are firmly seated in their sockets and all cable plugs are in the proper sockets as shown in Figure 5.

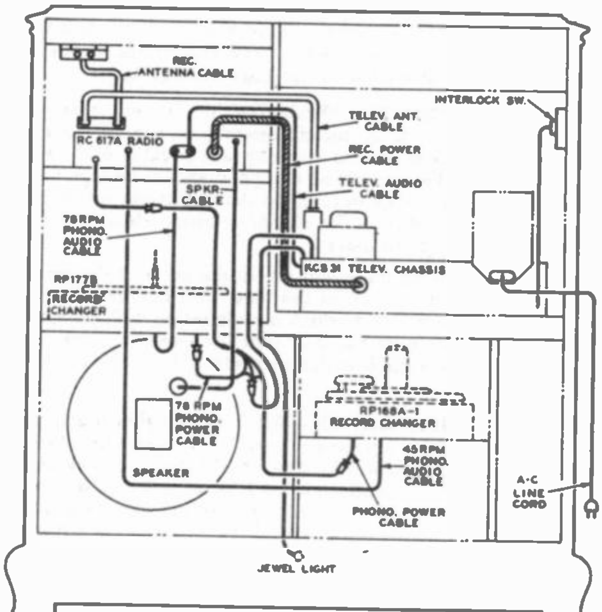


Figure 5—Interconnecting Cable Diagram

WARNING.—The high voltage supply in this receiver delivers 12,000 volts! If it is necessary to remove the kinescope after the receiver has been operating, short the kinescope cone to the chassis before attempting removal of or adjustments to the kinescope. A.C. interlocks are provided at the back of the set so that when the back is removed—so is the power.

Turn the power switch to the "on" position, the brightness control fully clockwise, and picture control counterclockwise.

ION TRAP MAGNET ADJUSTMENT.—Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags. The ion trap rear magnet poles should be approximately over these flags. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R201 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

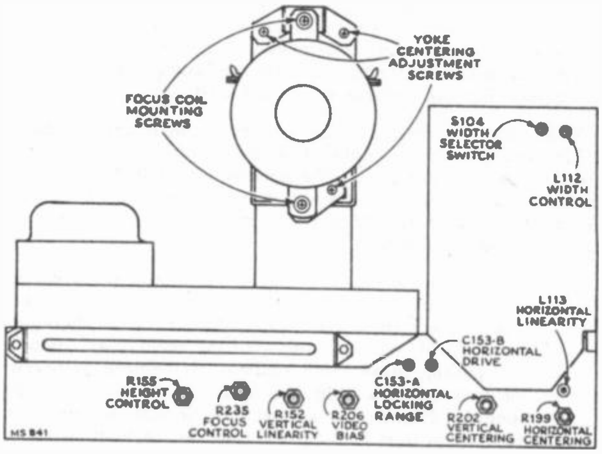


Figure 6—Rear Chassis Adjustments

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 2 through 10 of the television receiver operating instructions on page 2.

If the Horizontal Oscillator is operating properly, it should be possible to sync the picture at this point.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counterclockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Centering Adjustment."

ALIGNMENT OF HOLIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counterclockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counterclockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counterclockwise. Turn the picture control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is operating properly it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure. For field purposes paragraph "A" under Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENTS.—Centering is obtained by adjustment of the centering controls and by mechanically orienting the focus coil with three adjustment screws shown in Figure 3. The focus coil should be concentric around the neck of the kinescope to prevent curvature of the raster.

Adjust the focus coil until it is at right angles to the neck of the kinescope. Center the picture with the electrical centering controls. If a shadow appears on a corner of the picture, adjust the focus coil centering screws to eliminate the shadow and re-center the picture with the electrical centering controls.

FOCUS COIL ADJUSTMENTS.—If, after making the centering adjustments in the above paragraph, a corner of the picture is shadowed, it will be necessary to loosen the focus coil mounting screws (shown in Figure 3) and change the position of the coil to eliminate the shadow. Re-center the picture by adjustment of the electrical centering controls and the focus coil centering adjustments.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust vertical centering to align the picture with the mask.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjust the horizontal drive control C153B to give a picture of maximum width within the limits of good linearity. Adjust the horizontal linearity control L113 to provide best linearity.

A width control coil and a width selector switch are provided. With the switch in position 1 (fully counterclockwise), adjust the width coil until the picture fills the mask. On low line voltages it may not be possible to get sufficient width by adjustment of the width coil. In this case turn the width selector switch clockwise to position 2. In this position the width coil is disconnected, and adjustment of the width coil will have no effect. For still greater width, turn the width selector switch fully clockwise to position 3. In this position, the 6BG6G screen voltage is increased as well as disconnecting the width control coil.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R235) on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

CHECK to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

VIDEO BIAS CONTROL.—Normally the video bias control (R206) should be in the fully clockwise position. To check to see if this is the correct position, turn the picture control clockwise and adjust the brightness control until the retrace lines just disappear. If the whites are compressed as indicated by a "washed out" appearance in light areas, turn the video bias control counterclockwise until the picture appears normal.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure. The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 7. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

In the event that it becomes necessary to adjust the channel 6 oscillator, the core may be reached through a hole through the cabinet partition in back of the RP177B record changer.

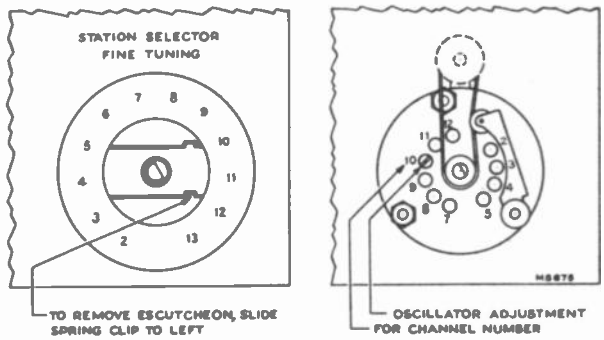


Figure 7—R-F Oscillator Adjustments

RADIO OPERATION—Turn the receiver function switch to AM and FM positions and check the radio for proper operation. In switching from radio to television or from television to radio, approximately 30 seconds warm-up time is required.

PUSH-BUTTON ADJUSTMENT—To adjust the radio push buttons, set the function switch to the broadcast band position, tune the receiver to the desired station and identify the program. Turn the function switch to the push button position and push the appropriate push button. Adjust the corresponding oscillator core until the desired station is heard. Adjust the corresponding antenna trimmer for maximum output. Proceed in the same manner to adjust the remaining push buttons. Figure 10 shows the location of the push-button adjustments and the range which the adjustments will cover.

Select the proper station call letter marker, moisten the back of the marker and insert in the appropriate recess in the push button bezel. Place marker celluloid cover in the recess over the marker.

RECORD CHANGER OPERATION—Turn the receiver function switch to each phono position and check each record player for proper operation.

Replace the cabinet back and make sure that the screws holding it are up tight, otherwise it may rattle or buzz when the receiver is operated at high volume.

WEAK SIGNAL AREA OPERATION—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain, is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

On early production receivers R11 was 1000 ohms and R14 was omitted. In order to "peak" these units it will be necessary to remove the unit from the receiver and change R11 to 10,000 ohms. Once the unit is removed from the chassis R11 is easily accessible on the unit rear wafer. When making this change, if the channel number 2 r-f coil L62 consists of 5¾ turns, the outside turn should be "knifed" one wire diameter away from the rest of the coil in order to provide peak response on channel 2. The unit should then be replaced and L66 peaked as described above.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

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TELEVISION CHASSIS TOP VIEW

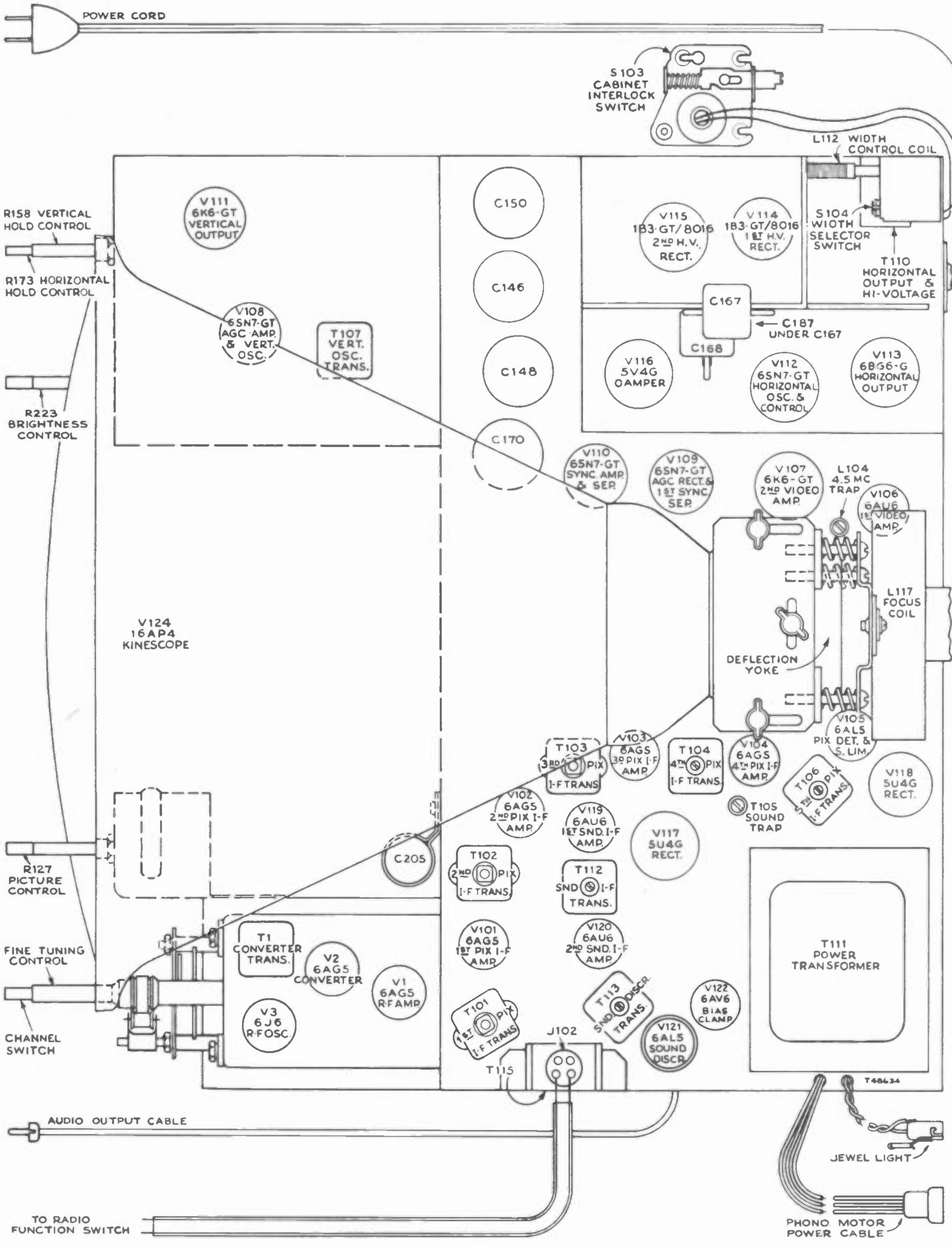


Figure 8—Chassis Top View

TELEVISION CHASSIS BOTTOM VIEW

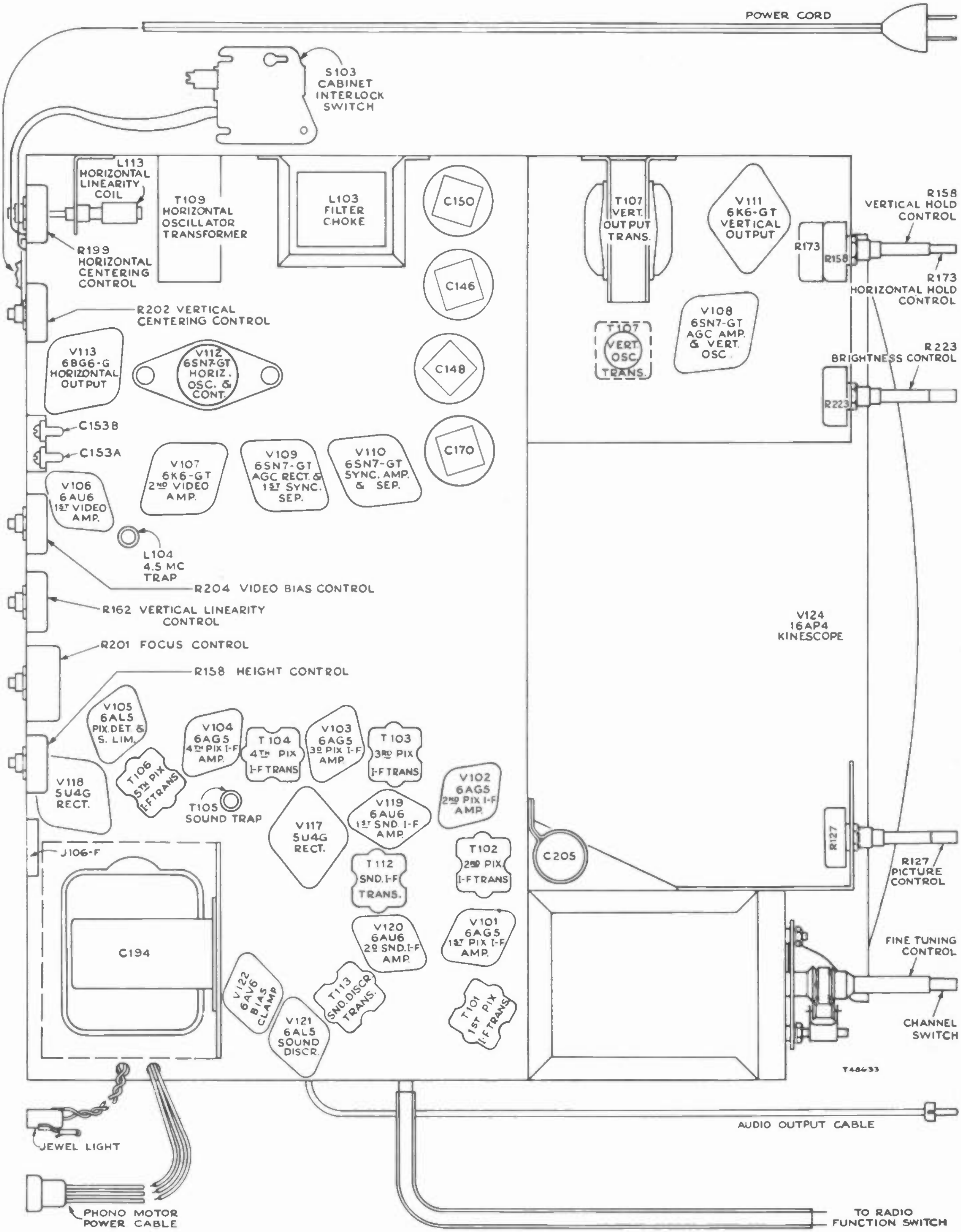


Figure 9—Chassis Bottom View

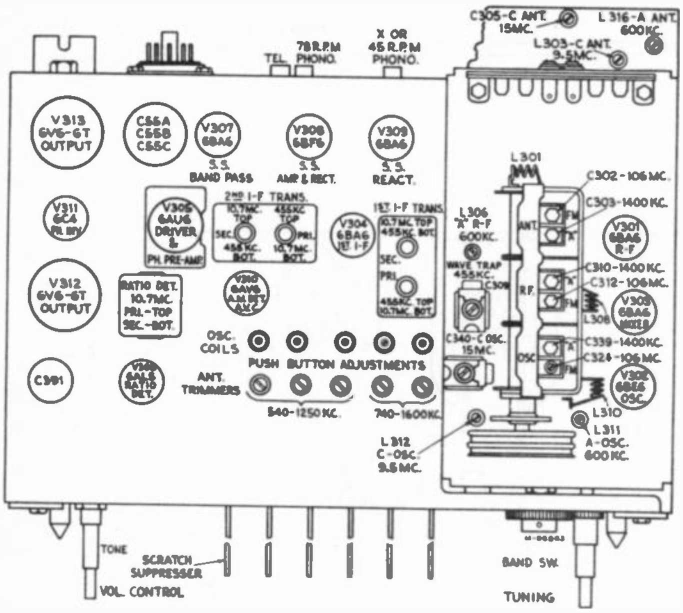


Figure 10—Chassis, Top View, Showing Adjustments

CRITICAL LEAD DRESS

The lead from terminal 5, switch S304, front, to terminal on switch S307, must be dressed between the main base and r-f shelf.

Dress all other leads away from the lead between T301 and S303 front.

Dress lead from pin 1 V305 to T302 down along chassis base.

Keep R327 dressed down along chassis base.

Keep the leads of C329 as short as possible.

The lead from pin 2 V304 must be dressed close to be dressed close to base. This lead provides degeneration for the i-f stage and neither its length or the point at which it is grounded to the chassis should be changed.

All the r-f and i-f wiring in the receiver is critical as to length and placement and should not be changed unless necessary.

PUSH BUTTON ADJUSTMENT

Make a list of the desired stations, arranged in order from low to high frequencies.

Turn the range switch to the broadcast position and manually tune in the first station on the list.

Turn range switch to push-button position and press in the second from the left-hand button.

Adjust the oscillator core rod to receive the first station.

Adjust the antenna trimmer screw for peak output on the first station.

Proceed in the same manner to adjust for the remaining stations.

Repeat adjustments for best results.

RADIO VOLTAGE CHART

Voltages measured in respect to ground, using a "VoltOhmyst."

Tube	Type	Element	Pin	Tel.	Phono.	FM
V301	6BA6	Plate	5	—	175	168
		Scg.	6	—	86	87
V302	6BE6	Plate	5	—	—	130
		G 2, 3, 4	6 & 7	—	—	120
		G.	1	—	—	−7.8
V303	6BA6	Plate	5	—	—	250
		Scg.	6	—	30	52
		Grid	1	—	−.52	−.45
		Cath.	7	—	.42	1.1
V304	6BA6	Plate	5	—	228	215
		Scg.	6	—	1.0	110
		Cath.	7	—	1.15	1.0
V305	6AU6	Plate	5	—	0	250
		Scg.	6	—	145	184
V306	6AL5	—	—	—	—	—
V307	6BA6	Plate	5	—	211	197
		Scg.	6	—	72	68
		Grid	1	—	0	0
		Cath.	7	—	8.3	7.5
V308	6BF6	Plate	7	—	127	118
		Cath.	2	—	6.6	6.2
V309	6BA6	Plate	5	—	62	60
		Scg.	6	—	22	123
V310	6AV6	Plate	7	88	95	84
		Grid	1	−.8	−.8	−.8
V311	6C4	Plate	1 & 5	170	145	182
		Grid	6	+39	+47	+25.5
		Cath.	7	48	57.5	5.2
V312 V313	6V6GT	Plate	3	240	290	270
		Scg.	4	90	195	175
		Grid	5	−122	−79	−91.5
		Cath.	8	−109	−61	−75

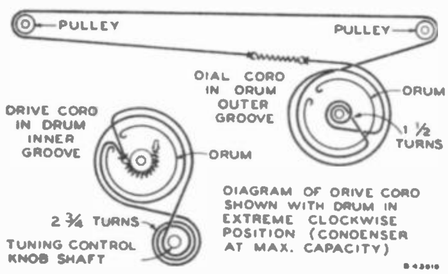
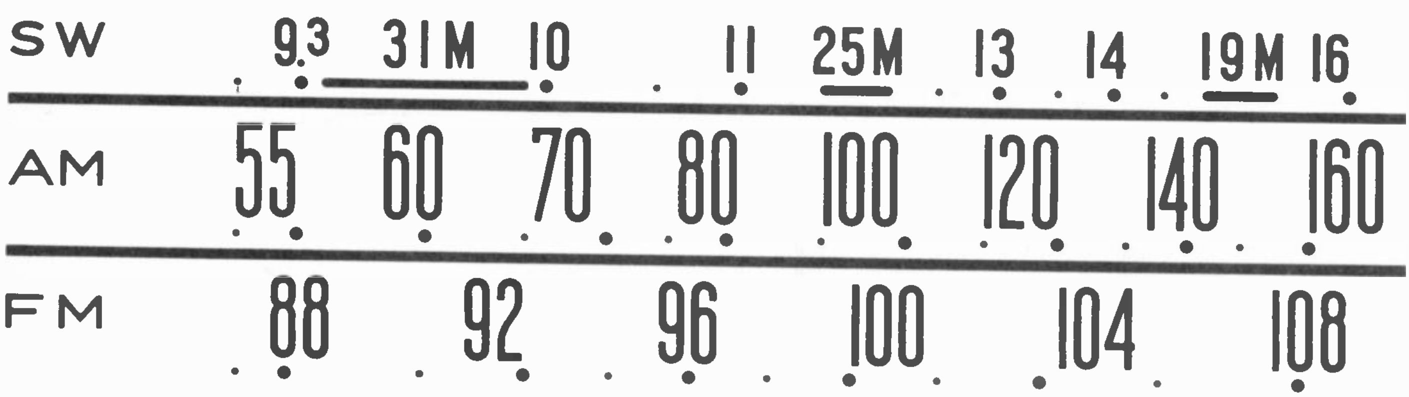


Figure 11—Dial and Drive Cord Assembly

Figure 12 —Partial Dial Scale (Exact Size, May Be Used During Alignment).



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RADIO ALIGNMENT PROCEDURE

If any lead dressing is necessary, it should be done before aligning the receiver. See Critical Lead Dress on page 8. Before aligning set, completely mesh the gang and set the dial pointer to the mechanical max. calibration point at extreme left end of dial. When making a complete alignment follow the tabulated form below in sequence. If only a portion of the circuit is to be aligned select the portion required and follow the remaining steps in the chart. Any adjustments made on the FM 10.7 mc. I-F's make it necessary to adjust the AM 455 kc. I-F's.

FM ALIGNMENT

Steps	Connect High Side of Osc. to—	Tune Osc. to—	Radio Dial Tuned to—	Adjust
1	Set the receiver function switch to the FM position. Connect d-c probe of a "VoltOhmyst" to the negative lead of the 5 mfd electrolytic capacitor C372. Connect the common lead of the meter to chassis.			
2	Driver grid, pin 1, of V5 in series with .01 mfd	10.7 mc., .1 volts output	——	Ratio Detector transformer T303 top for maximum d-c voltage across C372. (Approx. 2.5 v.)
3	Remove meter leads. Connect 68,000-ohm resistors (within 1% of each other) in series, across the 10,000-ohm ratio detector load resistor R365. Connect the common lead of the "VoltOhmyst" to junction of the 68,000-ohm resistors and the d-c probe to the junction of R335 and R361.			
4	Same as step 2	Same as step 2	——	With "VoltOhmyst" connected as in step 3, adjust T303 bottom core for zero d-c balance on the meter.
5	Repeat steps 2 and 4 until no change occurs with further core adjustments.			
6	Remove the 68,000 ohm resistors. Connect "VoltOhymst" d-c probe to C372 negative lead and the meter common lead to chassis.			
7	Mixer grid pin #1 of 6BA6 in series with a .01 mfd capacitor. Keep leads to grid and ground very short.	10.7 mc. Keep the osc. output adjusted to provide 2 to 3 volts across C372.	——	** T302 top and bottom FM cores alternately loading pri. and sec. with 680 ohms while the opposite side of the transformer is being adjusted for maximum voltage across C372. T301 top and bottom FM cores same as above.
8	To tap of antenna coil L301 in series with 270 ohms.	106 mc.	106 mc.	OSC. C324 for maximum voltage across C372.
9		90 mc.	90 mc.	OSC. L310 for maximum voltage across C372.
10	Repeat steps 8 and 9 for exact calibration. Check a 95 mc. signal against dial calibration to insure against alignment to image.			
11	Same as step 8	106 mc.	106 mc.	R-F C312 for maximum voltage across C372.
12		90 mc.	90 mc.	R-F L308 for maximum voltage across C372.
13	Repeat steps 11 and 12 for maximum output. Repeat steps 8 and 9 then 11 and 12 if necessary.			
14	Same as step 8	106 mc.	106 mc.	ANT. C302 for maximum voltage across C372.
15		90 mc.	90 mc.	ANT. L301 for maximum voltage across C372.
16	Repeat steps 14 and 15 for maximum output.			

* Near the correct core position the zero point is approached rapidly and continued adjustment causes the indicated polarity to reverse. A slow approach to the zero point is an indication of severe detuning, and the bottom core should be turned in the opposite direction.

** This method, which is known as alternate loading, involves the use of a 680-ohm resistor to load the plate winding while the grid winding of the same transformer is being peaked. Then the grid winding is loaded with 680-ohm resistor while the plate winding is being peaked.

When windings are loaded, it is necessary to increase the 10.7 mc. input, since gain will decrease and voltage across C372 will be less.

AM ALIGNMENT

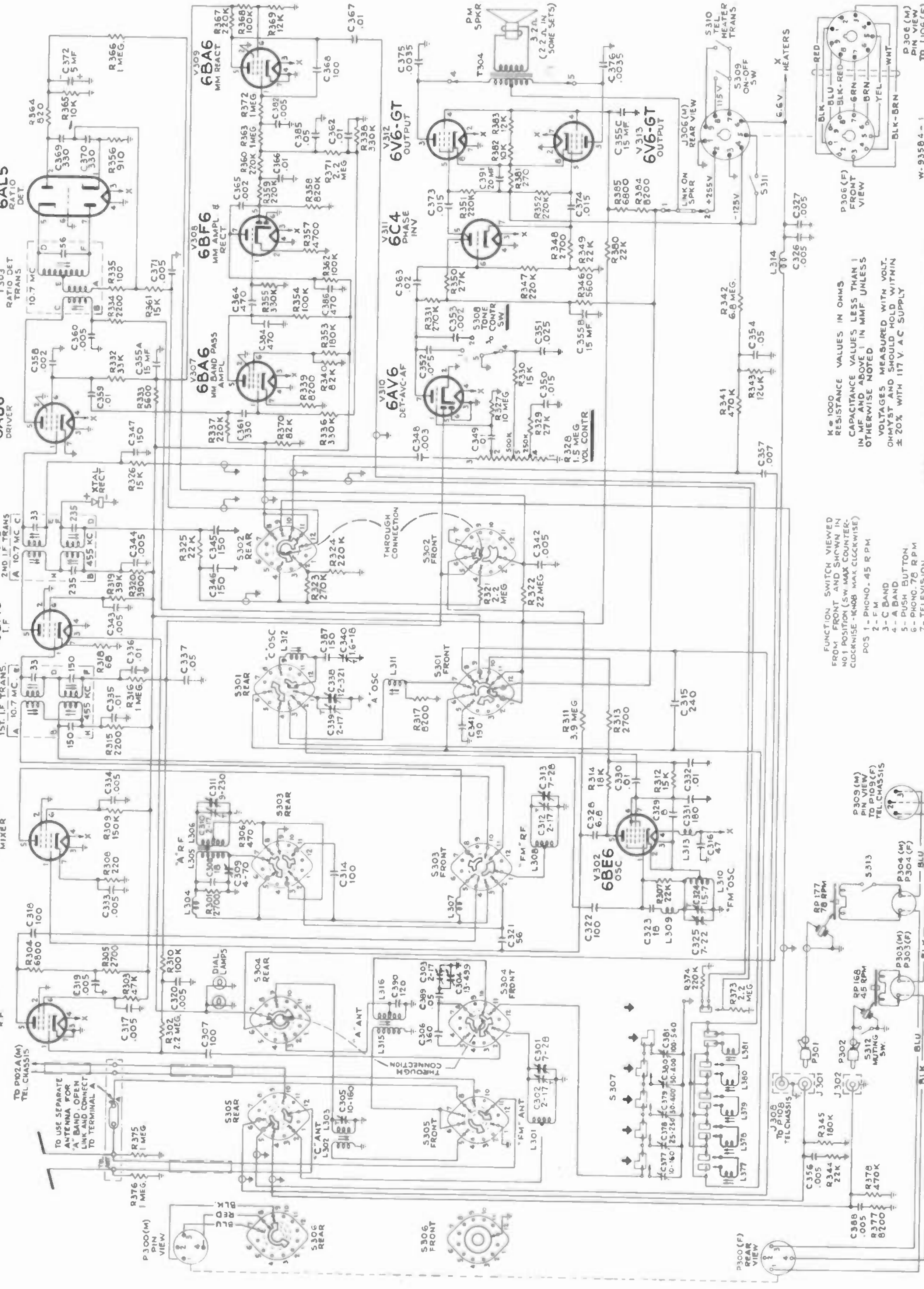
Connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output low to avoid a-v-c action. Connect an output meter across the speaker voice coil, and turn the receiver volume control to maximum. "A" band must be aligned before "C" band.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Range Switch	Turn Radio Dial to—	Adjust the following
1	Pin #1 of 6BA6 (V303) in series with a 5.6 mmfd capacitor	455 kc. 30% 400 cy. mod.	"A" Band	Low Freq. end of Dial	* Top and bottom AM cores of T301 and T302. (For max. voltage across voice coil.)
2	"A" band ant. coil pri. through dummy ant. comprised of 200 mmf	455 kc. 30% mod.	Push Button	"	Adj. I-F Trap C309 for minimum voltage across voice coil.
3	"	1400 kc. 30% mod.	"A" Band	1400 kc.	OSC., C339—R-F, C310—ANT., C303 (For max. voltage across voice coil.)
4	"	600 kc. 30% mod.	"A" Band	600 kc.	OSC., L311—R-F, L306—ANT., L316 (For max. voltage across voice coil.)
5	Repeat steps 3 and 4 for maximum output and until further adjustment does not improve response.				
6	"A" band ant. coil pri. through dummy ant. of 25 mmfs in series with 150 ohms	15.2 mc.	"C" Band	15.2 mc.	**OSC., C340—ANT., C305 for max.
7		9.5 mc.	"C" Band	9.5 mc.	OSC., L312—ANT., L303 for max.
8	Repeat steps 6 and 7 for maximum output and until further adjustment does not improve response.***				

* It is necessary to alternately load the primary and secondary of each 455-kc. i-f transformer with 22,000 ohms while the opposite side of the same transformer is being adjusted.

** To guard against the possibility of alignment to image frequencies increase the test oscillator output at 15.2 mc. and tune the receiver to approx. 14.3 mc. on the dial. The oscillator signal should be heard, though perhaps only faintly. Tune the oscillator to 9.5 mc. and the receiver to 10.6 mc. In this case, the oscillator signal should not be heard. If these conditions are not satisfied, the receiver is incorrectly aligned.

RADIO SCHEMATIC DIAGRAM



C389 was omitted in early chassis.

Figure 13 —Radio Schematic Diagram

RADIO CIRCUIT DESCRIPTION

The function switch (S301, S302, S303, S304, S305, S306) controls the following:

S306	AC power input to phono motors
S305F	Ant. selections
S305R	Ant. selection and record changer audio input to T302
S304R	Ant. tuning and 6.3 V. to dial lamps and V304 heater
S304F	Ant. tuning
S303R	R.F. tuning
S303F	R.F. tuning and lst I.F. trans. primary
S301R	Osc. tuning
S301F	Osc. tuning and "B" plus input to V305 plate
S302F	AVC selection and distribution
S302R	TV sound input from J308
	AM sound input from T302
	FM sound input from ratio detector
	Phono sound input from V305 screen grid

Switch S310 controls A.C. input to the television heater transformer (on TV Chassis) and S311 changes grid bias on the Hor. Sweep Output tube (V113 on TV chassis). Both switches are actuated by the function switch.

The RF stage is untuned on "Push Button" and "C" positions and is tuned on "A" and "FM" positions.

The audio input from the record changers is applied to the secondary of T302 and is amplified by V305. This amplified audio signal appears at the screen grid of V305 and is applied to S302 rear and to the "Magic Monitor". The "Magic Monitor" is made operative (phono input only) or inoperative by a push button (S307A) on the front panel.

OPERATION OF THE "MAGIC MONITOR"

This section has three tubes and is located at the rear of the chassis and it operates to control the high frequency components of the audio signal during phono operation.

The audio signal is amplified by V307 and V308 and is rectified by a diode of V308. This rectified voltage is applied to the grid circuit of the reactance tube V309.

The audio signal is also applied to the plate of the reactance tube V309 thru S307A and C367.

When the control voltage on V309 is below a predetermined level the tube will act as a shunt capacity between the audio signal and the chassis thereby attenuating the high frequencies.

Any serious defects in Magic Monitor operation will be made evident by the following tests. An audio oscillator and an a-c voltmeter flat to 3,000 cycles are needed for the tests.

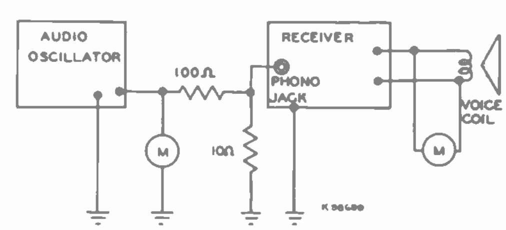
1. Set up the equipment as shown in the illustration below. Although two voltmeters are shown, one meter can be used for both positions.

2. Turn the receiver function switch to PH. Set the audio oscillator to 400 cycles and adjust its output to 0.2 volt (measured across the oscillator output terminals). Adjust the receiver volume control for reading of 1 volt (measured at the voice coil). There should be little or no change in receiver output when the MM push button is actuated.

3. Repeat Step 2 except using oscillator output of 1 volt, 400 cycles. There should be little or no change in receiver output when the MM push button is actuated.

4. Repeat Step 2 except using oscillator output of 1 volt, 3000 cycles. There should be little or no change in receiver output when the MM push button is actuated.

5. Repeat Step 2 except using oscillator output of 0.2 volt, 3000 cycles. With MM push button in the ON position, the output should decrease to approximately 1/5 of that obtained with MM push button in the OFF position.



Magic Monitor Test Set-up.

Resistors of different values may be used but should be selected to give the same ratio and approximate the output impedance of the audio oscillator. The two resistors in series should not exceed 500 ohms.

TELEVISION VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 mircovolt test pattern signal was fed into the receiver, the picture synced. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	6	142	2 & 7	0	1	-4.9	7	3	
			No Signal	5	67	6	111	2 & 7	0	1	-0.3	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	137	6	137	2 & 7	0	1	*-5.4	—	—	*Depending upon channel
			No Signal	5	108	6	108	2 & 7	0	1	*-2.0 to -7.0	*6.0 to 10	*1.5 to 3.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	90.5	—	—	7	.19	5 & 6	*-7.0	—	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*-4.5 to -6.6	*1.8 to 2.1	—	
V101	6AG5	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	136	6	136	2 & 7	<0.1	1	-4.2	0.5	0.1	
			No Signal	5	110	6	103	2 & 7	0.17	1	-1.5	3.8	0.6	
V102	6AG5	2d Pix. I-F Amplifier	2200 Mu. V. Signal	5	122	6	122	2 & 7	0.9	1	0	10.3	2.9	
			No Signal	5	96	6	100	2 & 7	0.6	1	0	6.8	2.0	
V103	6AG5	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	130	6	137	2 & 7	<0.1	1	-4.2	1.0	3	
			No Signal	5	95	6	106	2 & 7	0.17	1	-1.5	3.6	8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	194	6	137	2 & 7	1.6	1	0	8.3	2.7	
			No Signal	5	200	6	113	2 & 7	1.2	1	0	7.1	1.4	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	-117	—	—	1	-115	—	—	0.2	—	
			No Signal	7	-130	—	—	1	-125	—	—	0.3	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	-131	—	—	5	-46	—	—	<0.1	—	
			No Signal	2	-100	—	—	5	-52	—	—	<0.1	—	
V106	6AU6	1st Video Amplifier	2200 Mu. V. Signal	5	-68	6	27	7	-114.5	1	-117	3.9	1.8	
			No Signal	5	-72	6	25	7	-124	1	-130	3.7	1.6	
V107	6K6 GT	2d Video Amplifier	2200 Mu. V. Signal	3	*68	4	140	8	-47	5	-68	10.0	2.5	Maximum contrast
			No Signal	3	*34	4	120	8	-52	5	-72	11.0	2.3	
V108 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	-24	—	—	6	-50	4	-51	0.4	—	
			No Signal	5	-7	—	—	6	-56	4	-60	<0.1	—	
V108 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	54	—	—	3	-110	1	-157	0.32	—	
			No Signal	2	39	—	—	3	-125	1	-171	0.32	—	
V109	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	27	—	—	6	-51	4	-68	0.25	—	
			No Signal	5	19	—	—	6	-59	4	-70	0.25	—	
V109	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	23	—	—	3	-52	1	-68	0.13	—	
			No Signal	2	18	—	—	3	-63	1	-70	0.18	—	

TELEVISION VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate Pin No.	E. Plate Volts	E. Screen Pin No.	E. Screen Volts	E. Cathode Pin No.	E. Cathode Volts	E. Grid Pin No.	E. Grid Volts	I Plate (ma.)	I Screen (ma.)	Notes on Measurements
V110	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	81	—	—	3	-46	1	-48	10.8	—	
			No Signal	2	71	—	—	3	-50	1	-54	10.8	—	
V110	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	210	—	—	6	-44	4	-131	0.34	—	
			No Signal	5	200	—	—	6	-51	4	-100	0.15	—	
V111	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	197	4	*197	8	-76	5	-96	7.7	1.3	*Screen connected to plate
			No Signal	3	185	4	*185	8	-93	5	-110	7.6	1.3	
V112	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	25	—	—	3	-120	1	-110	0.24	—	Horizontal hold control completely clockwise
			No Signal	2	-8	—	—	3	-146	1	-128	0.1	—	
			No Signal	2	+60	—	—	3	-130	1	-114	0.13	—	Hold control counterclockwise
V112	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	75	—	—	6	-115	4	-190	2.3	—	
			No Signal	5	60	—	—	6	-125	4	-204	1.5	—	
V113	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	*	8	180	3	-100	5	-120	90.0	10.0	*5200 volt pulse present
			No Signal	Cap	Do Not Meas.	8	160	3	-112	5	-126	92.6	10.4	
V114	1B3GT/8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	6400	—	—	—	—	*6000 volt pulse present
			Brightness Max.	Cap	Do Not Meas.	—	—	2 & 7	6100	—	—	—	—	
V115	1B3GT/8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	11700	—	—	—	—	*6000 volt pulse present
			Brightness Max.	Cap	Do Not Meas.	—	—	2 & 7	11600	—	—	—	—	
V116	5V4G	Damper	2200 Mu. V. Signal	4 & 6	*	—	—	2 & 8	350	—	—	93.0	—	*1200 volt pulse present
			No Signal	4 & 6	Do Not Meas.	—	—	2 & 8	340	—	—	92.0	—	
V117 V118	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	*385	—	—	2 & 8	277	—	—	†125	—	†Per tube *A-C measured from plate to trans. center tap
			No Signal	4 & 6	*365	—	—	2 & 8	264	—	—	†130	—	
V119	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	131	6	131	7	0.65	1	0	6.0		
			No Signal	5	106	6	106	7	0.55	1	0	4.9		
V120	6AU6	2d Sound I-F Amplifier	2200 Mu. V. Signal	5	136	6	80	7	0	1	-0.6	3.5		
			No Signal	5	111	6	62	7	0	1	-0.7	3.0		
V121	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	-1.4	—	—	5	0	—	—	—	—	
			No Signal	2	-0.7	—	—	5	0	—	—	—	—	
V122	6AV6	Bias Clamp	2200 Mu. V. Signal	7	—	—	—	2	0	1	—	—	—	
			No Signal	7	—	—	—	2	0	1	—	—	—	
V124	16AP4	Kinescope	2200 Mu. V. Signal	Cap	11700	10	320	11	26	2	-29	0.08	—	Average Brightness
			No Signal	Cap	11600	10	305	11	11	2	-47	0.08	—	Average Brightness

9TW390

TELEVISION R-F UNIT WIRING DIAGRAM

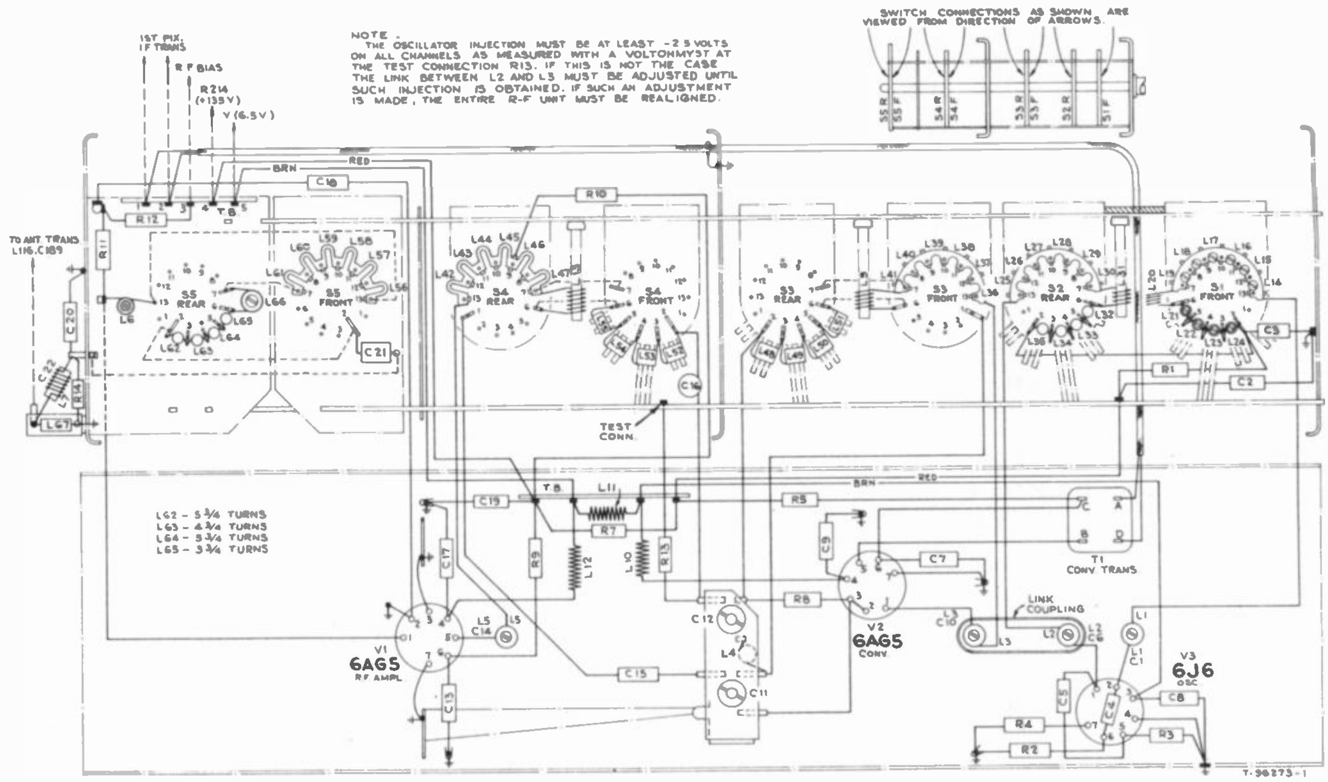


Figure 14 —R-F Unit Wiring Diagram

TELEVISION CRITICAL LEAD DRESS:

1. The ground bus from pin 2 and the center shield of V120 socket should not be shortened or rerouted.

2. Dress the body of R195 as close to tube pin as possible.

3. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V120, V121 and V122 should be down against the chassis and away from grid or plate leads.

4. Dress all leads crossing the i-f circuits close to the chassis and held so they cannot move and change alignment.

5. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.

6. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.

7. Leads to L102 and L103 must be as short as possible.

8. Dress peaking coils L105, L106, L107, L108 and L109 up and away from the chassis.

9. Dress R129 away from L109.

10. Dress C183 across V121 tube pins 5 and 6 with leads not exceeding ⅜ inch.

11. Dress the blue lead from pin 5 of V122 down against the chassis and under two shielded leads.

12. Dress C129 and C199 up and away from the chassis.

13. Dress the yellow lead from the picture control away from the chassis. Dress the yellow lead from pin 8 of V106 away from the chassis.

14. Dress the green lead from pin 8 of V107 away from the chassis.

15. Dress R168, R169, R170, R176 and R178 up and away from the chassis.

16. The leads to the volume control should be dressed down against the chassis and away from V119 and V120.

17. Dress the yoke red horizontal deflection lead under the clips of the fixed H. V. shield.

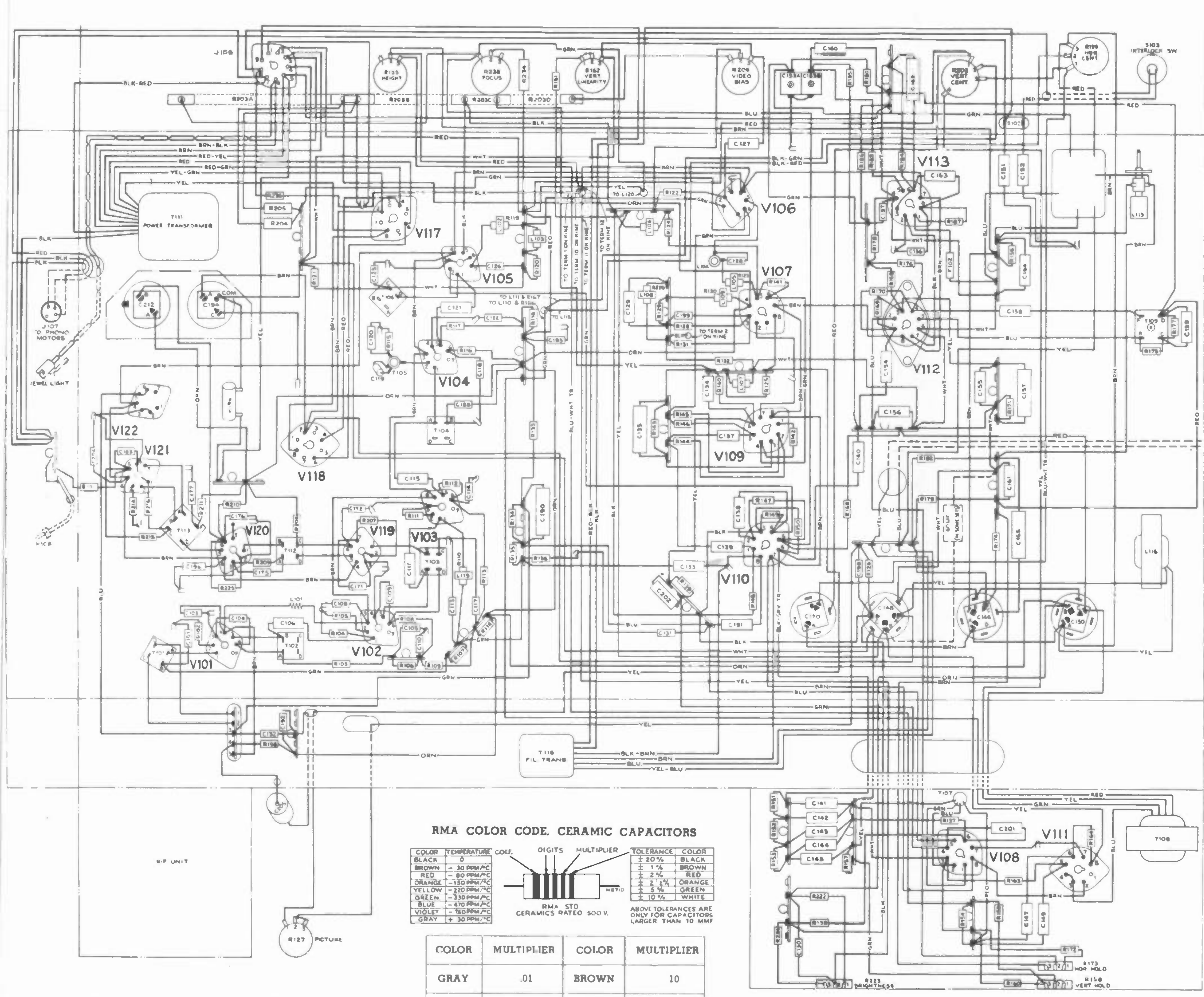
18. Dress the green lead from C166 close to the chassis and away from the red lead connected to T110-4.

19. Insert the red lead into T110-4 from the top of the terminal.

20. All soldered connections in the high voltage compartment should be free of sharp points.

21. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.

TELEVISION CHASSIS WIRING DIAGRAM



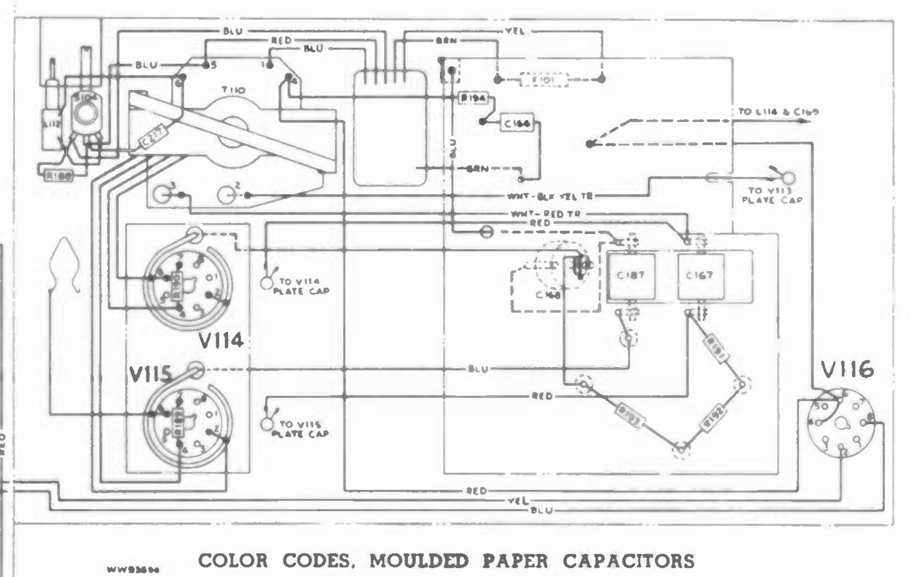


Figure 15—Television Chassis Wiring Diagram

RMA COLOR CODE, CERAMIC CAPACITORS

COEF. DIGITS MULTIPLIER

RMA STD CERAMICS RATED 500 V.

COLOR	TEMPERATURE
BLACK	0
BROWN	− 30 PPM/°C
RED	− 80 PPM/°C
ORANGE	−150 PPM/°C
YELLOW	−220 PPM/°C
GREEN	−330 PPM/°C
BLUE	−470 PPM/°C
VIOLET	−750 PPM/°C
GRAY	+ 30 PPM/°C

TOLERANCE	COLOR
± 20%	BLACK
± 1%	BROWN
± 2%	RED
± 2½%	ORANGE
± 5%	GREEN
± 10%	WHITE

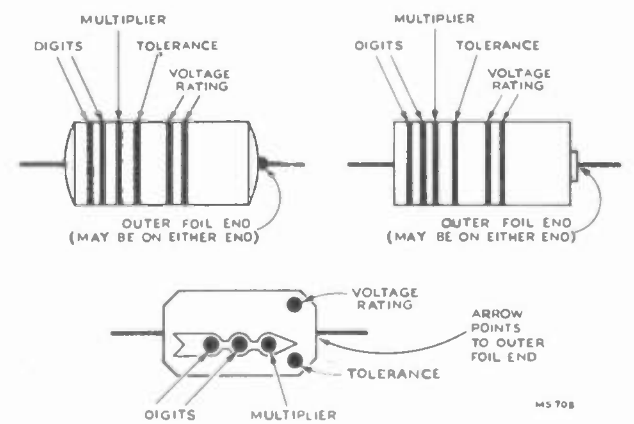
ABOVE TOLERANCES ARE ONLY FOR CAPACITORS LARGER THAN 10 MMF

COLOR	MULTIPLIER	COLOR	MULTIPLIER
GRAY	.01	BROWN	10
WHITE	.1	RED	100
BLACK	1.	ORANGE	1,000

For digits, use digit column, page 16

In some receivers, a four color ceramic capacitor color code is employed. It reads the same as the RMA color code except that the tolerance stripe is omitted. If the coefficient stripe is silver, it indicates that the capacitor has a very large temperature coefficient and is to be employed for bypass or other usages where a wide variation of capacity is unimportant. Silver striped capacitors are rated at 350 volts unless otherwise marked.

COLOR CODES, MOULDED PAPER CAPACITORS



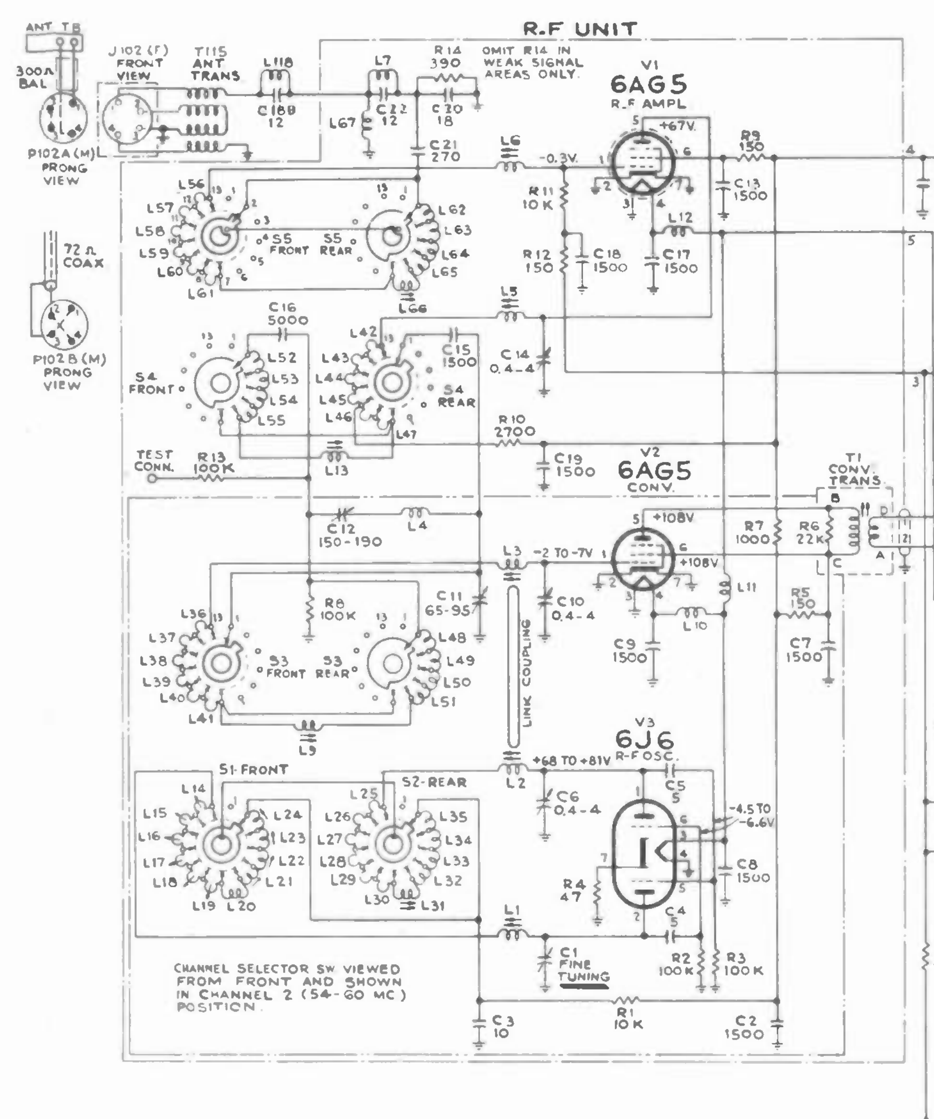
CAPACITY VALUE IN MMF

COLOR	DIGITS	MULTIPLIER
BLACK	0	1
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TOLERANCE

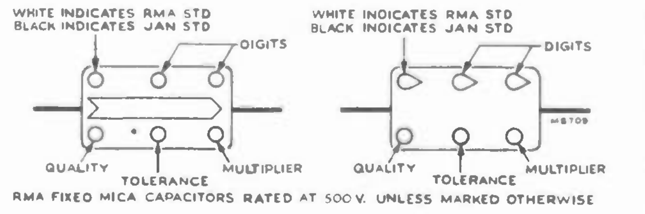
COLOR	TOLERANCE
BLACK BAND OR NONE	±20%
WHITE OR SILVER	±10%
YELLOW OR GOLD	±5%

The Voltage Rating is given in hundreds of volts. Only one band is employed for ratings under 1,000 volts. Two bands are employed for ratings over 1,000 volts. Use digit column to read voltage rating.



REFER TO PAGES 242 TO 255 FOR ALIGNMENT PROCEDURE, SERVICE HINTS AND WAVEFORM PHOTOGRAPHS.

RMA COLOR CODE, FIXED MICA CAPACITORS

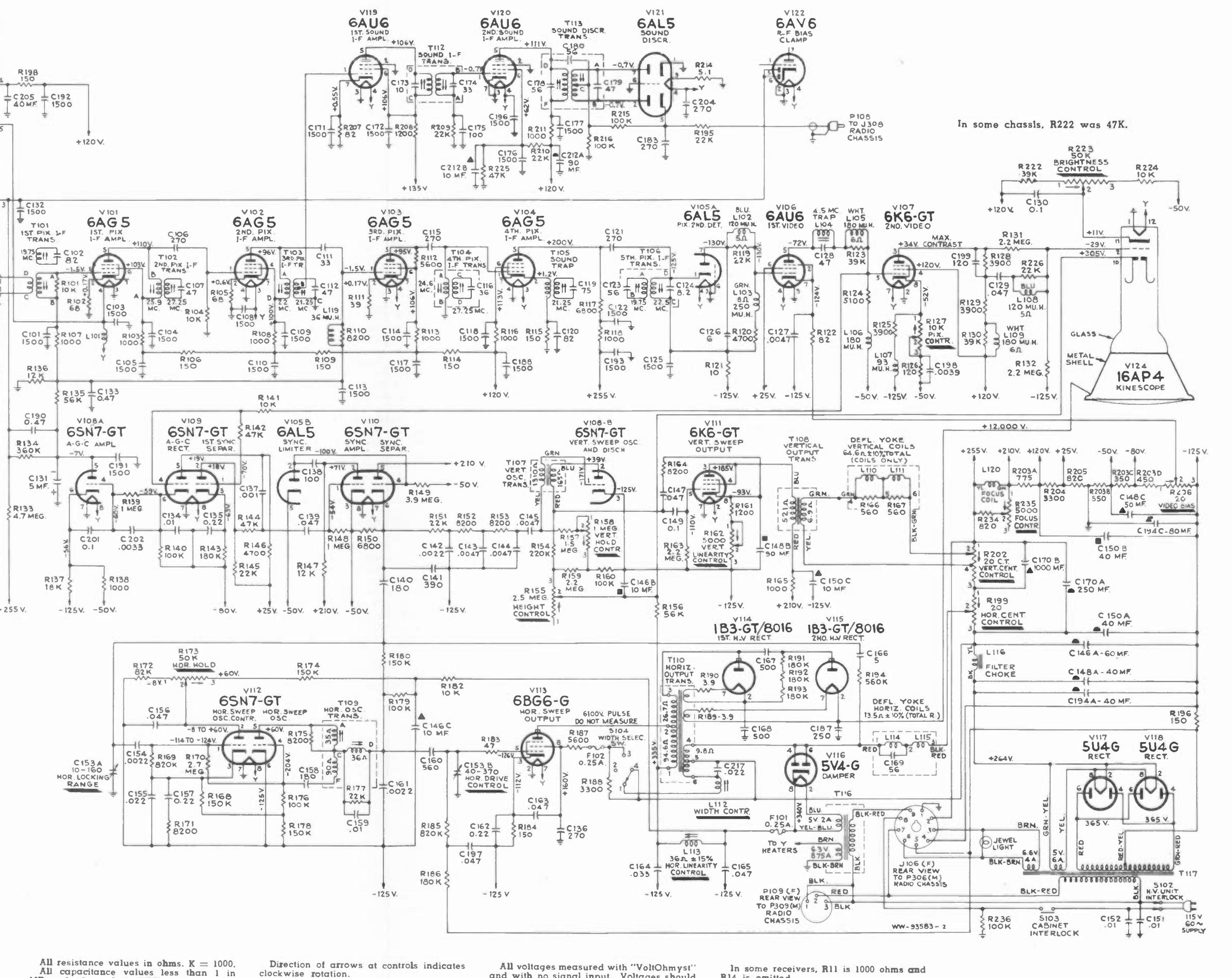


RMA FIXED MICA CAPACITORS RATED AT 500 V. UNLESS MARKED OTHERWISE

TOLERANCE		QUALITY			
COLOR	TOLERANCE	COLOR	CLASS	COLOR	CLASS
RED	±2%	BLACK	A	YELLOW	D
GREEN	±5%	BROWN	B	GRAY	I
SILVER	±10%	RED	C	WHITE	J
BLACK	±20%	ORANGE	D		

COLOR	DIGITS	MULTIPLIER
GOLD	—	.1
BLACK	0	1.
BROWN	1	10
RED	2	100
ORANGE	3	1,000
YELLOW	4	10,000
GREEN	5	
BLUE	6	
VIOLET	7	
GRAY	8	
WHITE	9	

TELEVISION CIRCUIT SCHEMATIC DIAGRAM



All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "VoltOhmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers C148B was 10 MF and a 60 MF tubular condenser was connected in parallel with it.

In some receivers, R11 is 1000 ohms and R14 is omitted.

In weak signal areas, R14 may be disconnected and L66 peaked for best picture on the weakest low channel station.

Figure 16—Television Circuit Schematic Diagram

9TW390 REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	R. F. UNIT ASSEMBLIES KRK5 A
73465	Belt—Drive belt
75069	Board—R-F unit power connection terminal board (5 contact)
75067	Bracket—Vertical bracket for holding r-f oscillator tube shield
73478	Cable—I-F transmission (4⅞") (W1)
73441	Cam—Fine tuning adjustment cam
74035	Capacitor—Ceramic, 5 mmf. (C4, C5)
53511	Capacitor—Ceramic, 10 mmf. (C3)
54207	Capacitor—Ceramic, 18 mmf. (C20)
73449	Capacitor—Ceramic trimmer, comprising 1 section of 150-190 mmf. and 1 section of 65-95 mmf. (C11, C12)
73091	Capacitor—Ceramic, 270 mmf. (C21)
71501	Capacitor—Ceramic, 1500 mmf. (C2, C7, C8, C9, C13, C15, C17, C18, C19)
73473	Capacitor—Ceramic, 5,000 mmf. (C16)
X3033	Cloth—Grille cloth for mahogany instruments
73475	Coil—Antenna filter shunt coil (L67)
73477	Coil—Choke coil (L10, L11, L12)
73874	Coil—Convertor grid coil for channel #6 (L9, L31)
73462	Coil—Coupling inductance coil (L4)
74108	Coil—Fine tuning coil (1½ turns) with adjustable inductance core and capacitor stud (threaded bushing type with plunger adjustment) (L1, C1)
73476	Coil—I-F trap (L7, C22)
73461	Coil—Oscillator plate coil (4 turns) for channel #6 (L20)
73460	Coil—R-F plate coil for channel #6 (L13)
74109	Coil—Trimmer coil (1½ turns) with adj. inductance core and capacitor stud (threaded bushing type with screw adjustment) for oscillator section or convertor section (L2, C6, L3, C10)
74110	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (threaded bushing type with screw adjustment) for r-f amplifier section (L5, C14)
71493	Connector—Oscillator segment connector
74187	Core—Adjustable core for L31
73455	Core—Sliding core for fine tuning control trimmer
73440	Detent—R-F unit detent mechanism and fibre shaft
73453	Form—Coil form assembly for L9, L13
71487	Form—Coil form for oscillator plate coil L31
73442	Link—Link assembly for fine tuning
71462	Loop—Oscillator to convertor trimmer loop connector
73634	Nut—Speed nut for drive belt shield
73467	Nut—Speed nut to mount trimmer coils 73443, 73444 and 73446
74166	Plate—Front plate and bushing
73464	Pulley—Idler pulley
	Resistor—Fixed, composition, 47 ohms ±20%, ½ watt (R4)
	Resistor—Fixed, composition, 150 ohms ±20%, ½ watt (R5, R9, R12)
	Resistor—Fixed, composition, 1,000 ohms ±20%, ½ watt (R7)
	Resistor—Fixed, composition, 1,000 ohms ±10%, ½ watt (R11)
	Resistor—Fixed, composition, 2,700 ohms ±10%, ½ watt (R10)
	Resistor—Fixed, composition, 10,000 ohms ±20%, ½ watt (R1)
	Resistor—Fixed, composition, 100,000 ohms ±20%, ½ watt (R2, R3, R8, R13)
14343	Retainer—Channel selector shaft retaining ring
30340	Retainer—Retainer for fine tuning link stud
71476	Screw—#4-40 x ¼" binder head screw for adjusting coils L14, L15, L16, L17, L18, L19
71475	Screw—#4-40 x .296 adjusting screw for coils L6, L21, L22, L23, L24
73640	Screw—#4-40 x ⅜" adjusting screw for L66
74167	Shaft—Actuating shaft for fine tuning control
74168	Shaft—Channel selector shaft complete with pawl and stud
73438	Shaft—Fine tuning control shaft and pulley
72951	Shield—Metal tube shield for V3
73454	Shield—Metal shield for drive belt
73632	Shield—Metal tube shield for V1
75443	Shield—"U" shape shield for bottom of R-F Unit
71494	Socket—Tube socket
73450	Socket—Tube socket, ceramic, 7 prong bottom mounted
75068	Spring—Retaining spring for oscillator tube shield
74188	Spring—Retaining spring for adjustable core #74187
73457	Spring—Return spring for fine tuning control core
73456	Spring—Tension spring for drive belt shield
73633	Stator—Antenna stator complete with rotor and coils (S5, L6, L56, L57, L58, L59, L60, L61, L62, L63, L64, L65, L66, C21)
73470	Stator—Convertor stator complete with rotor and coils (S3, L36, L37, L38, L39, L40, L41, L48, L49, L50, L51)
73468	Stator—Front oscillator section stator complete with rotor, segment, coils and adjusting screws (S1, L14, L15, L16, L17, L18, L19, L21, L22, L23, L24)
73469	Stator—Rear oscillator section stator complete with rotor, segment and coils (S2, L25, L26, L27, L28, L29, L30, L32, L33, L34, L35)
73471	Stator—R-F amplifier stator complete with rotor and coils (S4, L42, L43, L44, L45, L46, L47, L52, L53, L54, L55)
75446	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 uncoded or coded "ER"
75447	Stud—Capacitor stud—brass #4-40 x 13/16" with 3/64" screw driver slot for trimmer coils 74109 and 74110 coded numerically or "Hi Q"
2917	Washer—"C" washer for channel selector shaft
73466	Washer—Insulating washers for front shield (1 set)
73448	Transformer—Convertor transformer (T1 (R6))
	TELEVISION CHASSIS ASSEMBLIES KCS31
72437	Cable—Shielded audio cable complete with pin plug
73414	Cap—Hi-voltage rectifier and horizontal output plate cap
72809	Capacitor—Mica, 5 mmf. (C166)
74182	Capacitor—Ceramic, 6 mmf. (C126)
73580	Capacitor—Mica trimmer, comprising 1 section of 10-160 mmf. and 1 section of 40-370 mmf. (C153A, C153B)
74105	Capacitor—Mica, 33 mmf. (C111)
64062	Capacitor—Ceramic, 82 mmf. (C120)
75060	Capacitor—Mica, 100 mmf. 1000 v. (C138)
39396	Capacitor—Ceramic, 100 mmf. (C175)
73921	Capacitor—Ceramic, 120 mmf. (C199)
51416	Capacitor—Mica, 180 mmf. (C140)
73102	Capacitor—Mica, 180 mmf. (C158)
74154	Capacitor—Ceramic, 250 mmf., 20,000 volts (C187)
73091	Capacitor—Mica, 270 mmf. (C106, C115, C121, C136)
73922	Capacitor—Ceramic, 270 mmf. (C183, C204)
39642	Capacitor—Mica, 390 mmf. (C141)
74153	Capacitor—Ceramic, 500 mmf. 15,000 volts (C167, C168)
74250	Capacitor—Mica, 560 mmf. (C160)
71501	Capacitor—Ceramic, 1500 mmf. (C101, C103, C104, C105, C108, C109, C110, C113, C114, C117, C118, C122, C125, C132, C171, C172, C176, C177, C188, C191, C192, C193, C196)
73801	Capacitor—Tubular, moulded paper, .001 mfd, 600 volts (C137)
73803	Capacitor—Tubular, moulded paper, .0022 mfd, 600 volts (C142, C154)
73595	Capacitor—Tubular, moulded paper, oil filled, .0022 mfd, 600 volts (C161)
73795	Capacitor—Tubular, moulded paper, .0033 mfd, 600 volts (C202)
73796	Capactor—Tubular, moulded paper, .0039 mfd, 600 volts (C198)
73550	Capacitor—Tubular, moulded paper, .0047 mfd, 600 volts (C127, C143, C144)
73920	Capacitor—Tubular, moulded paper, oil filled, .0047 mfd, 600 volts (C145)
73561	Capacitor—Tubular, moulded paper, .01 mfd, 400 volts (C134, C151, C152)
73594	Capacitor—Tubular, moulded paper, oil filled, .01 mfd, 600 volts (C159)
73562	Capacitor—Tubular, moulded paper, .022 mfd, 400 volts (C155, C217)
73596	Capactor—Tubular, moulded paper, oil filled, .033 mfd, 1000 volts (C164)
73553	Capacitor—Tubular, moulded paper, .047 mfd, 400 volts (C129, C139, C197)
73592	Capacitor—Tubular, moulded paper, oil filled, .047 mfd, 600 volts (C147, C156)
73564	Capacitor—Tubular, moulded paper, .047 mfd, 1000 volts (C163)
73597	Capacitor—Tubular, moulded paper, oil filled, .047 mfd, 1000 volts (C165)
73784	Capacitor—Tubular, moulded paper, 0.1 mfd, 200 volts (C201)
73551	Capacior—Tubular, moulded paper, 0.1 mfd, 400 volts (C130, C149)
73560	Capacitor—Tubular, moulded paper, 0.22 mfd, 200 volts (C135)
73794	Capacitor—Tubular, moulded paper, 0.22 mfd, 400 volts (C157, C162)
73787	Capacitor—Tubular, moulded paper, 0.47 mfd, 200 volts (C133, C190)
74106	Capacitor—Electrolytic 5 mfd, 50 volts (C131)
71432	Capacitor—Electrolytic comprising 2 sections of 40 mfd, 450 volts and 1 section of 10 mfd, 450 volts (C150 A, C150 B, C150 C)
73582	Capacitor—Electrolytic comprising 1 section of 40 mfd, 450 volts, 1 section of 10 mfd, 450 volts and 1 section of 80 mfd, 200 volts (B section not used) (C194 A, C194 B, C194 C)
73583	Capacitor—Electrolytic comprising 1 section of 40 mfd, 450 volts, 1 section of 90 mfd, 450 volts and 1 section of 50 mfd, 150 volts (C148 A, C148 B, C148 C)
74266	Capacitor—Electrolytic 40 mfd, 400 volts (C205)
73581	Capacitor—Electrolytic comprising 1 section of 60 mfd, 450 volts, 2 sections of 10 mfd, 450 volts and 1 section of 20 mfd, 150 volts (D section not used) (C146 A, C146 B, C146 C, C146 D)
74433	Capacitor—Electrolytic comprising 1 section of 90 mfd, 350 volts and 1 section of 10 mfd, 350 volts (C212 A, C212 B)
71436	Capacitor—Electrolytic comprising 1 section of 250 mfd, 10 volts and 1 section of 1000 mfd, 6 volts (C170 A, C170 B)
73578	Coil—Antenna matching coils complete with socket and bracket (T115, J102)
73577	Coil—Video trap (L104, C128)
71449	Coil—Horizontal linearity control coil (L113)
71429	Coil—Width control coil (L112)
71778	Coil—Sound trap (T105, C119)
74570	Coil—Focus coil (L120)
73476	Coil—I-F trap (L118, C189)
71529	Coil—Peaking coil (120 mh) (L102, L108, R119, R226)
71528	Coil—Peaking coil (180 mh) (L105, L109, R123, R130)
73477	Coil—Choke coil (L101)
71526	Coil—Peaking coil (250 mh) (L103)
74214	Coil—Peaking coil (180 mh) (L106)
71527	Coil—Peaking coil (93 mh) (L107)
74170	Coil—Peaking coil (36 mh) (L119, R110)
74160	Connector—Anode connector
71521	Contact—Hi-voltage capacitor contact
72734	Control—Horizontal and vertical hold control (R158, R173)
73156	Control—Brightness control (R223)
73663	Control—Picture control (R127)
71441	Control—Vertical linearity control (R162)
71440	Control—Height control (R155)
71443	Control—Vertical centering control (R202).
74146	Control—Horizontal centering or video bias control (R199, R206)
74442	Control—Focus control (R235)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71432, 73581 and 73583
72772	Cover—Insulating cover for electrolytic 71436
73590	Cushion—Deflection yoke hook cushion (2 req'd)
73600	Fuse—0.25 amperes, 250 volts (F101, F102)
71799	Grommet—Rubber grommet for 2nd anode lead
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 req'd)
74148	Magnet—Ion trap magnet (P.M. type)
18469	Plate—Bakelite mounting plate for electrolytics
71448	Plug—Male plug for power cable
31572	Plug—3 contact female plug for motor cable
31048	Plug—Pin plug for shield audio cable
73154	Reactor—Filter choke
74156	Resistor—Wire wound, 3.9 ohms, ⅓ watt (R189, R190)
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R214)
	Resistor—Fixed, compostiion, 10 ohms, ±20%, ½ watt (R121)
	Resistor—Fixed, composition, 39 ohms, ±10%, ½ watt (R111)
	Resistor—Fixed, composition, 47 ohms, ±20%, ½ watt (R183)
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R105, R102)
	Resistor—Fixed, composition, 82 ohms, ±5%, ½ watt (R122)
	Resistor—Fixed, composition, 82 ohms, ±10%, ½ watt (R207)
	Resistor—Fixed, composition, 120 ohms, ±10%, ½ watt (R126)
	Resistor—Fixed, composition, 150 ohms, ±10%, ½ watt (R115)
	Resistor—Fixed, composition, 150 ohms, ±20%, ½ watt (R106, R109, R114, R199)
	Resistor—Fixed, composition, 150 ohms, ±10%, 2 watt (R184)
74375	Resistor—Wire wound, 150 ohms, 20 watt (R196)
74155	Resistor—Voltage divider comprising 1 section of 775 ohms, 9.5 watts, 1 section of 550 ohms, 5 watts, 1 section of 350 ohms, 3 watts and 1 section of 450 ohms, 5 watts (R203 A, R203 B, R203 C, R203 D)
74213	Resistor—Wire wound, 820 ohms, 4 watt (R205, R234)
	Resistor—Fixed, composition, 1000 ohms, ±10%, ½ watt (R138)
	Resistor—Fixed, composition, 1000 ohms, ±20%, ½ watt (R103, R107, R108, R113, R116, R118, R165, R211)
	Resistor—Fixed, composition, 1200 ohms, ±10%, ½ watt (R161, R208)
	Resistor—Fixed, composition, 3300 ohms, ±10%, ½ watt (R188)
48207	Resistor—Wire wound, 3300 ohms, 10 watt (R204)
	Resistor—Fixed, composition, 3900 ohms, ±5%, 2 watt (R125, R129, R128)
	Resistor—Fixed, composition, 4700 ohms, ±5%, ½ watt (R120)
	Resistor—Fixed, composition, 4700 ohms, ±10% ½ watt (R146)
	Resistor—Fixed, composition, 5100 ohms, ±5%, ½ watt (R124)
	Resistor—Fixed, composition, 5600 ohms, ±5%, ½ watt (R112)
	Resistor—Fixed, composition, 5600 ohms, ±10%, 1 watt (R187)
	Resistor—Fixed, composition, 6800 ohms, ±10%, ½ Watt (R150)
	Resistor—Fixed, composition, 6800 ohms, ±5%, 1 watt (R117)
	Resistor—Fixed, composition, 8200 ohms, ±5%, ½ watt (R164, R175)
	Resistor—Fixed, composition, 8200 ohms, ±10%, ½ watt (R152, R153, R171)
	Resistor—Fixed, composition, 10,000 ohms, ±5%, ½ watt (R104)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, ½ watt (R141, R182, R224)
	Resistor—Fixed, composition, 12,000 ohms, ±5%, ½ watt (R136)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, 2 watt (R147)
	Resistor—Fixed, composition, 18,000 ohms, ±10%, ½ watt (R137)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R145, R151, R177)
	Resistor—Fixed, composition, 22,000 ohms, ±20%, ½ watt (R195, R209, R210)
	Resistor—Fixed, composition, 39,000 ohms, ±10%, ½ watt (R222)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt (R142, R144)
	Resistor—Fixed, composition, 47,000 ohms, ±20%, ½ watt (R225)
	Resistor—Fixed, composition, 56,000 ohms, ±5%, ½ watt (R135)
	Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt (R156)
	Resistor—Fixed, composition, 82,000 ohms, ±10%, ½ watt (R172)
	Resistor—Fixed, composition, 100,000 ohms, ±5%, ½ watt (R215, R216)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R140, R160)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, 1 watt (R176, R179)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, 2 watt (R236)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, ½ watt (R168, R180)
	Resistor—Fixed, composition, 150,000 ohms, ±5%, 1 watt (R178)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, 1 watt (R174)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt (R143, R186)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, 2 watt (R191, R192, R193)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R154)
	Resistor—Fixed, composition, 360,000 ohms, ±5%, ½ watt (R134)
	Resistor—Fixed, composition, 560,000 ohms, ±10%, ½ watt (R194)
	Resistor—Fixed, composition, 820,000 ohms, ±5%, ½ watt (R169)
	Resistor—Fixed, composition, 820,000 ohms, ±10%, ½ watt (185)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R139, R148)
	Resistor—Fixed, composition, 1.5 megohm, ±5%, ½ watt (R157)
	Resistor—Fixed, composition, 2.2 megohm, ±10%, ½ watt (R131, R132, R159, R163)
	Resistor—Fixed, composition, 2.7 megohm, ±5%, 1 watt (R170)
	Resistor—Fixed, composition, 3.9 megohm, ±10%, ½ watt (R149)
	Resistor—Fixed, composition, 4.7 megohm, ±5%, 1 watt (R133)
71456	Screw—#8-32 wing screw to mount hood and yoke (3 req'd)
73584	Shield—Tube shield for V120 and V121
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
73249	Socket—Tube socket, ceramic, octal, plate mounted
31319	Socket—Tube socket, moulded, octal, saddle mounted
71508	Socket—Tube socket for 8016
70561	Socket—9 pin socket—moulded
31364	Socket—Pilot lamp socket
74251	Socket—Kinescope socket
74151	Spacer—Bakelite spacer to mount moulded tube socket
74936	Spring—Spring for kinescope socket leads
72190	Spring—Hood and yoke pressure spring (3 req'd)
74152	Spring—Anode spring
74150	Support—Vertical plate support (bakelite)
74425	Support—Bakelite support for 2nd anode lead
74147	Switch—Width control coil switch (S104)
74157	Switch—Interlock switch (S103)
74194	Transformer—Power transformer 115 volt, 60 cycle (T117)
73568	Transformer—Vertical output transformer (T108)
74144	Transformer—Vertical oscillator transformer (T107)
74145	Transformer—Horizintal output and hi-voltage (T110)
73571	Transformer—First pix i-f transformer (T101, C102, R101)
73572	Transformer—Second pix i-f transformer (T102, C107)
73573	Transformer—Third pix i-f transformer (T103, C112)
73574	Transformer—Fourth pix i-f transformer (T104, C116)
73575	Transformer—Fifth pix i-f transformer (T106, C123, C124)
71424	Transformer—Sound i-f transformer (T112, C173, C174)
71427	Transformer—Sound discriminator transformer (T113, C178, C179, C180)
73576	Transformer—Horizontal oscillator transformer (T109)
74195	Transformer—Filament transformer 117 volt, 60 cycle (T116)
74141	Yoke—Deflection yoke (L110, L111, L114, L115, C169, R166, R167)
	RADIO CHASSIS ASSEMBLY RC 617A
74534	Board—"Tel-"A"Ant." terminal board with link
73673	Capacitor—Variable tuning capacitor (C301, C302, C303, C304, C310, C311, C312, C313, C325, C338, C339)
73685	Capacitor—Trimmer 1.5-7 mmf. (C324)
71809	Capacitor—Adjustable trimmer—1.6-18 mmf. (C340)
72334	Capacitor—Adjustable trimmer—4.70 mmf. (C309)
39043	Capacitor—Ceramic, 6.8 mmf. (C328)
73686	Capacitor—Ceramic, 8 mmf. (C329)
71807	Capacitor—Adjustable trimmer—10-160 mmf. (C305)
36463	Capacitor—Ceramic, 18 mmf. (C308)
39042	Capacitor—Ceramic, 47 mmf. (C316)
39622	Capacitor—Mica, 56 mmf. (C321)
39396	Capacitor—Ceramic, 100 mmf. (C307, C314, C322, C368)
39628	Capacitor—Mica, 100 mmf. (C318)
73682	Capacitor—Mica trimmer consisting of 1 section of 100-540 mmf., 2 sections of 50-400 mmf., 1 section of 25-250 mmf., and 1 section of 10-160 mmf. (C377, C378, C379, C380, C381)
71614	Capacitor—Ceramic, 120 mmf. (C390)
48125	Capacitor—Ceramic, 150 mmf. (C345, C346, C347, C387)
71933	Capacitor—Mica, 180 mmf. (C331)
73687	Capacitor—Ceramic, 190 mmf. (C341)
72789	Capacitor—Mica, 240 mmf. (C315)
39640	Capacitor—Mica, 330 mmf. (C361, C369, C370)
64641	Capacitor—Mica, 360 mmf. (C306)
39644	Capacitor—Mica, 470 mmf. (C364, C384, C386)
72121	Capacitor—Electrolytic 5 mfd, 50 volts (C372)
74532	Capacitor—Electrolytic, triple, 15 mfd, 450 volts (C355 A, C355 B, C355 C)
74533	Capacitor—Electrolytic, 20 mfd, 25 volts (C391)
71927	Capacitor—Tubular .002 mfd, 400 volts (C353, C358, C365)
71921	Capacitor—Tubular .003 mfd, 200 volts (C348)
70646	Capacitor—Tubular 0035 mfd, 1000 volts (C375, C376)
71926	Capacitor—Tubular .005 mfd, 200 volts (C320, C326, C327, C333, C342, C356, C371, C382, C388, C389)
72791	Capacitor—Tubular, .005 mfd, 400 volts (C317, C319, C334, C343, C344, C352, C360)
70608	Capacitor—Tubular, .007 mfd, 400 volts (C357)
71923	Capacitor—Tubular, .01 mfd, 200 volts (C336, C349, C366)
72827	Capacitor—Tubular, .01 mfd, 400 volts (C330, C332, C335, C359, C367)
72120	Capacitor—Tubular, .015 mfd, 200 volts (C350)
73797	Capacitor—Tubular, .015 mfd, 400 volts (C373, C374)
73638	Capacitor—Tubular, .02 mfd, 400 volts (C363)
73554	Capacitor—Tubular, .025 mfd, 400 volts (C351)
71551	Capacitor—Tubular, .05 mfd, 200 volts (C337, C354, C362, C385, C389)
73676	Coil—Oscillator coil complete with core and stud—"C" band (L312)
73677	Coil—R-F coil complete with core and stud—"A" band (L305, L306)
73383	Coil—Oscillator coil complete with core and stud—"A" band (L311)
73661	Coil—Antenna coil complete with core and stud—"A" band (L315, L316)
73678	Coil—Antenna coil complete with core and stud—"C" band (L302, L303)
73679	Coil—Low pass filter coil (L307)
72050	Coil—P.B. oscillator coil complete with core and stud—H.F. (L377, L378)
72051	Coil—P.B. oscillator coil complete with core and stud—L.F. (L379, L380, L381)
74536	Coil—Antenna coil—F.M. #16 buss tinned, 8 turns per inch 3¼ (L301)
74537	Coil—R.F. coil—F.M. #16 buss tinned, 8 turns per inch 4 turns R.H. (L308)
74538	Coil—Oscillator coil F.M. #16 buss tinned, 8 turns per inch 3½ turns R.R. (L310)
72574	Coil—Choke coil (L313)
71942	Coil—Choke coil (L314)
73688	Coil—Peaking coil (L304)
75062	Connector—9 prong male connector for interconnecting power supply cable (between television and radio chassis) (J406)
5040	Connector—4 contact female plug for speaker cable
35384	Connector—5 contact male plug for phono cable
72145	Control—Volume control, tone control and power switch (R328, S308, S309)
72953	Cord—Tuning drive cord (approx. 22" overall)
72953	Cord—Indicator drive cord (approx. 40" overall)
71941	Coupling—F.M. coupling unit (L309, R307, C323)
72043	Drum—Drive drum
73758	Gear—Selector switch drive gear
72042	Gear—Sleeve gear
73767	Gear—Scissor gear for tuning capacitor
72069	Grommet—Rubber grommet for rear mounting feet (2 req'd)
70930	Grommet—Rubber grommet for mounting R-F shelf (4 req'd)
70429	Grommet—Rubber grommet for mounting tube socket (4 req'd)
33514	Jack—Phono-television input jack
35787	Jack—Phono input jack for RP168A changer
73766	Pinion—Pinion and shaft for tuning capacitor
72035	Plate—Dial back plate
19820	Plate—Mounting plate for electrolytic #74533
72602	Pulley—Drive cord pulley
54374	Rectifier—Crystal rectifier
	Resistor—Fixed, composition, 68 ohms, ±10%, ½ watt (R318)
	Resistor—Fixed, composition, 100 ohms, ±10%, ½ watt (R335)
	Resistor—Fixed, composition, 220 ohms, ±10%, ½ watt (R308)
	Resistor—Fixed, composition, 270 ohms, ±10%, 2 watt (R381)
	Resistor—Fixed, composition, 470 ohms, ±10%, ½ watt (R306)
	Resistor—Fixed, composition, 820 ohms, ±10%, ½ watt (R364)
	Resistor—Fixed, composition, 910 ohms, ±5%, ½ watt (R356)
	Resistor—Fixed, composition, 2200 ohms, ±10%, ½ watt (R315, R334)
	Resistor—Fixed, composition, 2700 ohms, ±10%, ½ watt (R301, R305, R348)
	Resistor—Fixed, composition, 2700 ohms, ±10%, 1 watt (R313)
	Resistor—Fixed, composition, 3900 ohms, ±10%, 1 watt (R320)
	Resistor—Fixed, composition, 4700 ohms, ±10%, ½ watt (R357)
	Resistor—Fixed, composition, 5600 ohms, ±10%, ½ watt (R333, R346)
	Resistor—Fixed, composition, 6800 ohms, ±10%, 1 watt (R304)
	Resistor—Fixed, composition, 6800 ohms, ±10%, 2 watt (R385)
	Resistor—Fixed, composition, 8200 ohms, ±10%, ½ watt (R317, R339, R377)
	Resistor—Fixed, composition, 8200 ohms, ±10%, 2 watt (R384)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, ½ watt (R365)
	Resistor—Fixed, composition, 10,000 ohms, ±10%, 2 watt (R382)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, ½ watt (R369)
	Resistor—Fixed, composition, 12,000 ohms, ±10%, 2 watt (R383)
	Resistor—Fixed, composition, 15,000 ohms, ±10%, ½ watt (R326, R330, R361)
	Resistor—Fixed, composition, 18,000 ohms, ±10%, 1 watt (R314)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt (R325, R344, R349)
	Resistor—Fixed, composition, 22,000 ohms, ±10%, 1 watt (R380)
	Resistor—Fixed, composition, 27,000 ohms, ±10%, ½ watt (R329, R350)
	Resistor—Fixed, composition, 33,000 ohms, ±10%, ½ watt (R332)
	Resistor—Fixed, composition, 39,000 ohms, ±10%, 1 watt (R319)
	Resistor—Fixed, composition, 47,000 ohms, ±10%, 1 watt (R303)
	Resistor—Fixed, composition, 82,000 ohms, ±10%, ½ watt (R340, R370)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt (R354, R362)
	Resistor—Fixed, composition, 100,000 ohms, ±20%, ½ watt (R310)
	Resistor—Fixed, composition, 100,000 ohms, ±10%, 1 watt (R368)
	Resistor—Fixed, composition, 120,000 ohms, ±10%, ½ watt (R343)
	Resistor—Fixed, composition, 150,000 ohms, ±10%, 1 watt (R309)
	Resistor—Fixed, composition, 180,000 ohms, ±10%, ½ watt (R345, R353)
	Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt (R324, R337, R347, R351, R352, R359, R360, R367, R374)
	Resistor—Fixed, composition, 270,000 ohms, ±10%, ½ watt (R323, R331)
	Resistor—Fixed, composition, 330,000 ohms, ±10%, ½ watt (R336, R338, R355)
	Resistor—Fixed, composition, 470,000 ohms, ±10%, ½ watt (R341, R378)
	Resistor—Fixed, composition, 820,000 ohms, ±10%, ½ watt (R358)
	Resistor—Fixed, composition, 1 megohm, ±20%, ½ watt (R316, R363, R366, R372, R375, R376)
	Resistor—Fixed, composition, 2.2 megohm, ±20%, ½ watt (R302, R321, R371, R373)
	Resistor—Fixed, composition, 3.9 megohm, ±10%, ½ watt (R311)
	Resistor—Fixed, composition, 6.8 megohm, ±10%, ½ watt (R342)
	Resistor—Fixed, composition, 10 megohm, ±20%, ½ watt (R327)
	Resistor—Fixed, composition, 22 megohm, ±20%, ½ watt (R322)
14343	Retainer—Retainer ring for tuning knob shaft
31611	Screw—#8-32 x ¼" set screw for drive drum
73675	Shaft—Tuning knob shaft
72951	Shield—Tube shield
71850	Socket—Tube socket complete with base and shield
73117	Socket—Tube socket, 7 pin, miniature, wafer
31251	Socket—Tube socket wafer
31364	Socket—Dial lamp socket

STOCK No.	DESCRIPTION
74483	Socket—Tube socket
31416	Spring—Tuning drive cord spring or Indicator drive cord spring
73671	Support—Dial back plate support bracket complete with drive cord pulley and lamp bracket—L.H.
73672	Support—Dial back plate support bracket complete with drive cord pulley and lamp bracket—R.H.
74535	Switch—Selector switch including filaments switch (S301, S302, S303, S304, S305, S306, S310, S311)
73683	Switch—P.B. switch complete less coils and trimmer (S307, S307A)
72889	Transformer—Ratio detector transformer (T303)
73376	Transformer—First i-f transformer—dual (T301)
74019	Transformer—Second i-f transformer—dual (T302)
	SPEAKER ASSEMBLY 92569-6W RL103B6
13867	Cap—Dust cap
73934	Cone—Cone and voice coil assembly
5039	Connector—4 contact male connector for speaker
74753	Speaker—12" P.M. (6.8 oz.) speaker complete with cone and voice coil (3.2 ohm) less output transformer and plug
71145	Suspension—Metal cone suspension
73636	Transformer—Output transformer
	NOTE: If stamping in instruments does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
74158	Back—Television chassis back cover
74540	Back—Radio chassis back cover
74541	Back—Cabinet bottom back cover
72146	Bezel—P.B. bezel—black—for mahogany or walnut instruments
74544	Bezel—Radio dial scale bezel less dial
72857	Board—"Antenna" terminal board
71599	Bracket—Pilot lamp bracket
72151	Button—Station selector push button—black
73696	Button—"Magic Monitor" push button—gold
72583	Cable—Shielded pickup cable complete with pin plug for RP177B record changer
74525	Cable—Shielded pickup cable complete with pin plug for RP168A record changer
13103	Cap—Pilot lamp jewel
74614	Carriage—RP177B record changer carriage less slides
71892	Catch—Bullet catch and strike (4 req'd)
72157	Clip—P.B. bezel spring clip (2 req'd)
74160	Connector—Anode connector (3 req'd)
72850	Connector—2 contact male connector for television to radio chassis cable or antenna cable
39153	Connector—4 contact male connector for television to radio chassis cable
75063	Connector—9 contact male connector for power cable
75064	Connector—9 contact female connector for power cable
31567	Connector—3 contact male plug for motor cable
30868	Connector—2 contact female plug motor cables (3 req'd)
35352	Connector—4 contact female plug for motor cable
30870	Connector—2 contact male plug for interconnecting motor cable for RP168A record changer
74539	Cover—Bottom cover for standard record changer
74209	Cover—Mounting screw cover for RP168A record changer (3 req'd)
36765	Cover—Celluloid cover for station call letter markers and "Magic Monitor" marker
74619	Cover—Bottom cover for RP168A record changer
71984	Decal—Trade mark decal (RCA Victor)
74612	Decal—Television control panel decal for mahogany or walnut instruments
72695	Decal—Function decal for radio control panel (L.H.) for mahogany or walnut instruments. (Tone control, volume control and power switch)
74613	Decal—Function decal for radio control panel (R.H.) for mahogany or walnut instruments. (Selector switch and tuning control)
74273	Decal—Trade mark decal (Victrola)
73705	Dial—Radio glass dial scale
73180	Emblem—"RCA Victor" emblem
73642	Escutcheon—Television channel marker escutcheon for mahogany or walnut instruments
74609	Glass—Safety glass
37396	Grommet—Rubber grommet for mounting speaker (4 req'd)
73699	Grommet—Rubber grommet for mounting RP177B record changer (4 req'd)
11889	Grommet—Rubber grommet for mounting radio chassis (2 req'd)
74308	Hinge—Cabinet door hinges (1 set) (4 req'd)
72036	Indicator—Station selector indicator
73222	Knob—Television fine tuning knob—dark—for mahogany or walnut instruments (outer)
72147	Knob—Radio selector switch knob—dark—for mahogany or walnut instruments (outer)
73224	Knob—Television channel selector knob—dark—for mahogany or walnut instruments (inner)
73226	Knob—Television picture control, vertical hold control or brightness control knob—dark—for mahogany or walnut instruments (outer)
73230	Knob—Television picture control or brightness control knob—dark—for mahogany or walnut instruments (inner)
72148	Knob—Radio tune control knob—dark—for mahogany or walnut instruments (outer)
73228	Knob—Television horizontal hold control knob—dark—for mahogany or walnut instruments (inner)
72150	Knob—Radio volume control and power switch knob—dark—for mahogany or walnut instruments (inner)
72149	Knob—Radio tuning knob—dark—for mahogany or walnut instruments (inner)
11765	Lamp—Dial or pilot lamp—Mazda 51
74543	Marker—"Magic Monitor" marker tab
72563	Markers—Station call letter markers
74605	Mask—Kinescope mask
74542	Nut—Tee nut for mounting RP177B record changer (2 req'd)
74208	Nut—Tee nut for mounting RP168A record changer (3 req'd)
74162	Plate—Mounting plate for interlock switch
74124	Plate—Stud plate and wing nut for control panel (2 req'd)
73771	Pull—Door pull for upper doors (2 req'd)
73760	Pull—Door pull for lower doors (4 req'd) or for RP117B record changer compartment drawer
74271	Runner—RP168A record changer runner—R.H.
74272	Runner—RP168A record changer runner—L.H.
74424	Screw—#8-32 x 1¾" special screw for mounting RP168A changer (3 req'd)
74279	Screw—#8-32 x ⅞" trimit head screw for upper doors door pull
74269	Screw—#8-32 x ¾" trimit head screw for lower doors door pull (2 req'd for each pull)
74615	Slide—RP177B record changer carriage slide R.H. (assembled to carriage)
74616	Slide—RP177B record changer carriage slide L.H. (assembled to carriage)
74617	Slide—RP177B record changer carriage slide and bracket assembly—R.H. (assembled to cabinet)
74618	Slide—RP177B record changer carriage slide and bracket assembly—R.H. (assembled to cabinet)
34053	Spring—Retaining spring for push buttons
72845	Spring—Retaining spring for knobs #72147, 72917, 73222 and 73223
14270	Spring—Retaining spring for knobs #72148, 72918, 73224, 73225, 73226, 73227, 73230 and 73231
30330	Spring—Retaining spring for knobs #72150, 72920, 73228 and 73229
30900	Spring—Retaining spring for knobs 72149 and 72919
73643	Spring—Spring clip for channel marker escutcheon
72156	Spring—Push button bezel spring
73697	Spring—Conical spring for mounting RP117B record changer (4 req'd)
74421	Spring—Conical mounting spring (upper-tone arm slide) for RP168A changer (1 req'd)
74422	Spring—Conical mounting spring (upper—L.H. side) for RP168A changer (2 req'd)
74423	Spring—Conical mounting spring (lower) for RP168A changer (3 req'd)
72936	Stop—Door stop (3 req'd)
73185	Stop—Metal stop for RP168A record changer runners (2 req'd)
74161	Stud—Locating stud for cabinet back (2 req'd)
74159	Support—Moulded support for kinescope (4 req'd)
73182	Track—RP168A record changer compartment track (2 req'd)

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS