1967

A HOWARD W. SAMS PUBLICATION



The Broadcast Industry

A comprehensive directory of products and services for the broadcast-communications industry . . . containing: complete alphabetical product and service listing, manufacturer listing with products and services, and addresses of manufacturers and their representatives.

Prepared by the staff of Broadcast Engineering*

World Radio History

RIKER IS





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For finest color and monochrome inserts
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Dublisher Howard W. Sams

general manager Donald W. Bradley

> editor William E. Burke

managing editor James M. Moore

associate editor Harold E. Hale

research librarian Bonny Howland

production

Esther M. Rainey, Manager

circulation

Pat Osborne, Manager

advertising sales offices Hugh Wallace, Sales Manager

central and midwestern

Roy Henry Howard W. Sams & Co., Inc. 4300 West 62nd St. Indianapolis, Ind. 46206 291-3100

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SAN FRANCISCO OFFICE The Maurice A. Kimball Co., Inc. 580 Market St., Room 400 San Francisco 4, California EX 2-3365

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Prepared by the staff of

Broadcast Engineering^{*}

the broadcast industry

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EIMAC POWER GRID TUBES and Accessories

Tube Type 3CX20,000A3 3CX20,000H3 3W5000A1/8240 3W5000A3/8242

Socket Type SK-1300

User Price

Socket Price

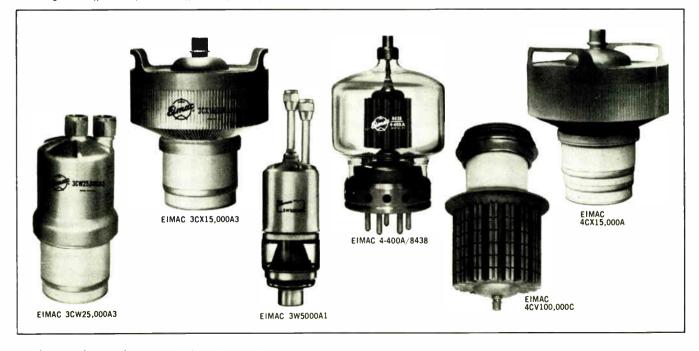
Chimney Chimney Type Price

(24 hour factory delivery on most distributor orders)

At EIMAC you'll find the most complete line of power grid tubes available today: triodes, tetrodes, pulse modulators, diodes, zero-bias tubes, ceramic tubes, glass tubes, air cooled, water cooled and vapor cooled tubes. And there are more to come! Continuing EIMAC projects are ever increasing the

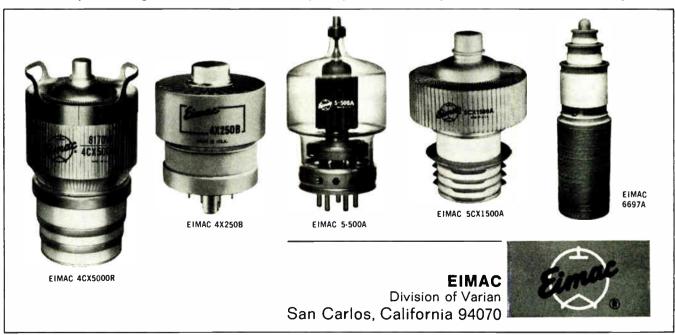
| 110 21111110 300 | | | | | | Туре | Price | Туре | Price | Type | Price |
|----------------------------|------------|----------------|-----------|------------|----------------|--------------------------------|-------------|----------------------|---------------|-----------|---------|
| tubes available | | | | | | 3CX20,000A3 | 580.00 | SK-1300 | 78.50 | None | |
| diodes, zero-bia | s tubes i | ceramic tube | s glass t | ubes air | cooled. | 3CX20,000H3 | 580.00 | None | | None | • • • • |
| | | | | | | 3W5000A1/8240 | 280.00 | (See Note 1) | | None | • • • • |
| water cooled a | nd vapor | cooled tube | s. And tr | iere are i | nore to | 3W5000A1/8240 3W5000A3/8242 | 245.00 | (See Note 1) | | None | |
| come! Continu | iing FIM. | AC projects | are ever | increasi | ing the | 3W5000H3/024Z | 260.00 | None | | None | |
| | | | | iiici cas | ing the | 3W5000F1/8241 | 250.00 | | | | |
| scope of power | r grid tub | oe capabilitio | €S. | | | 3W5000F3/8243 | 250.00 | None (Coo Note 1) | | None | |
| | • | • | | | | 3X3000A1/8238 | 210.00 | (See Note 1) | | None | |
| Tube | User | Socket | Socket | Chimney | Chimney | 3X3000A7 | 255.00 | (See Note 1) | | None | |
| | | | | | | 3X3000F1/8239 | 220.00 | None | | None | |
| Туре | Price | Туре | Price | Type | Price | 3X3000F7/8162 | 260.00 | None | | None | 6.50 |
| 2-01C | \$ 18.00 | None | \$ | None | \$ | 3-400Z/8163 | 34.00 | SK-410 | 6.50 | SK-416 | 6.50 |
| 2C39A | 20.75 | Jettron | | None | | 3-1000Z/8164 | 78.00 | SK-510 | 6.50 | SK-516 | 12.00 |
| | | No. 76-020 | | | | 4-65A/8165 | 27.00 | E. F. Johnson | | None | |
| 3CPN10A5/7815 | 30.75 | Jettron | | None | | | | No. 122-101 | | | |
| | | No. 76-020 | | | | 4-125A | 36.00 | SK-400 | 17.50 | SK-406 | 6.50 |
| 3CPX100A5/7815R | 30.75 | Jettron | | None | | | | SK-410 | 6.50 | SK-406 | 6.50 |
| 001 /1100110/ / 01011 | ••••• | No. 76-020 | | | | 4-250A | 46.50 | SK-400 | 17.50 | SK-406 | 6.50 |
| 3CV30,000A1 | 710.00 | SK-1300 | 78.50 | None | | | | SK-410 | 6.50 | SK-406 | 6.50 |
| 3CV30,000A3 | 590.00 | SK-1300 | 78.50 | None | | 4-400A/8438 | 48.00 | SK-400 | 17.50 | SK-406 | 6.50 |
| 3CW5000A1 | 280.00 | (See Note 1) | | None | | | | SK-410 | 6.50 | SK-406 | 6.50 |
| 3CW5000A3 | 245.00 | (See Note 1) | | None | | 4-1000A/8166 | 131.50 | SK-500 | 24.30 | SK-506 | 12.00 |
| 3CW5000F1 | 260.00 | None | | None | | | | SK-510 | 6.50 | SK-506 | 12.00 |
| 3CW5000F3 | 250.00 | None | | None | | | | SK-740 | 10.70 | None | |
| 3CW5000H3 | 240.00 | None | | None | | 4CPX250K | 68.50 | (See Note 2) | | None | |
| 3CW10,000H3 | 356.00 | None | | None | | 4CS250H | 69.50 | None | | None | |
| 3CW20,000A1 | 560.00 | SK-1300 | 78.50 | None | | 4CV8000A | 470.00 | SK-1490 | 88.50 | None | |
| 3CW20,000A1 | 455.00 | SK-1300 | 78.50 | None | | 4CV20,000A | 590.00 | SK-310 | 114.00 | None | |
| 3CW20,000A3 | 710.00 | SK-1300 | 78.50 | None | | 4CV35,000A | 825.00 | SK-310 | 114.00 | None | |
| 3CW20,000H3 | 455.00 | None | 70.50 | None | | 4CV100.000C/8351 | | SK-1510 | 250.00 | None | |
| | 480.00 | SK-1300 | 78.50 | None | | 4CW800A | 331.00 | None | | None | |
| 3CW25,000A3 3CW30,000H3 | 510.00 | | | None | | 4CW2000A/8244 | 220.00 | SK-800B | 54.00 | SK-806 | 8.50 |
| | | None | | | | 4C112000A/ 8244 | 220.00 | SK-810B | 56.00 | SK-806 | 8.50 |
| 3CW40,000H3 | 620.00 | None | | None | | | | SK-890B | 65.00 | SK-806 | 8.50 |
| 3CW100,000H3 | 2,320.00 | None | | None | | 4CW10,000A | 610.00 | SK-300 | 103.00 | SK-306 | 6.50 |
| 3CX100A5/7289 | 26.50 | Jettron | | None | | 4C#10,000A | 010.00 | SK-300A | 103.00 | SK-316 | 9.65 |
| | 04.00 | No. 76-020 | | M | | 4CW25,000A | 825.00 | SK-300 | 103.00 | SK-306 | 6.50 |
| 3CX100F5/8250 | 34.00 | Jettron | | None | | 4CW25,000A | 823.00 | SK-300A | 103.00 | SK-316 | 9.65 |
| | 050.00 | No. 76-020 | 20.00 | CV 010 | 7.00 | 4CW50.000C/8350 | 2,100.00 | SK-1500 | 220.00 | None | |
| 3CX1000A7/8283 | 250.00 | SK-860 | 38.00 | SK-816 | 7.00 | | 2,100.00 | SK-1500 | 220.00 | None | • • • • |
| | | SK-870 | 40.00 | SK-816 | 7.00 | 4CW100,000D | 2,100.00 | SK-1510 | 250.00 | None | |
| 3CX2500A3 | 200.00 | (See Note 1) | | None | | 40V2E0B /7202 | 25.60 | *See SK-600 S | arias Socka | t Lieting | |
| 3CX2500F3 | 205.00 | None | | None | | 4CX250B/7203 | 35.60 | *See SK-600 S | | | |
| 3CX2500H3 | 240.00 | None | | None | | 4CX250F/7204 | 38.00 | | eries socke | | |
| 3CX3000A1 | 210.00 | (See Note 1) | | None | | 4CX250K/8245 | 64.00 | None | Santal Calaba | None | • • • • |
| 3CX3000A7 | 255.00 | (See Note 1) | | None | | 4CX250R/7580W | 44.50 | *See SK-600 S | Series Socke | Listing | |
| 3CX3000F1 | 220.00 | None | | None | | 4CX300A/8167 | 54.00 | *See 4CX1250 | Socket Lis | ting | |
| 3CX3000F7 | 260.00 | None | 2011 | None | | 4CX300Y | 105.00 | *See 4CX1250 | Socket Lis | ting | |
| 3CX5000A3 | 356.00 | SK-1300 | 78.50 | None | | 4CX350A/8321 | 48.50 | *See SK-600 S | Series Sucke | t Listing | |
| 3CX5000H3 | 356.00 | None | 20111 | None | W11 | 4CX350F/8322 | 51.50 | *See SK-600 S | series Socke | | |
| 3CX10,000A1/8158 | 490.00 | SK-1300 | 78.50 | SK-1306 | 6.50 | 4CX600A | 319.00 | None | 54.00 | None | 8.50 |
| 3CX10,000A3/8159 | 490.00 | SK-1300 | 78.50 | SK-1306 | 6.50 | 4CX1000A/8168 | 181.00 | SK-800B | 54.00 | SK-806 | 8.50 |
| 3CX10,000A7/8160 | 530.00 | SK-1300 | 78.50 | SK-1306 | 6.50 | | | SK-810B | 56.00 | SK-806 | 8.50 |
| 3CX10,000H3 | 455.00 | None | 22.23 | None | 6.50 | 101110001/0050 | 102.00 | SK-890B | 65.00 | SK-806 | 8.50 |
| 3CX15,000A3 | 510.00 | SK-1300 | 78.50 | SK-1306 | 6.50 | 4CX1000K/8352 | 193.00 | SK-820 | 140.00 | SK-806 | 8.50 |
| 3CX15,000H3 | 510.00 | None | | None | | | | SK-830 | 178.00 | SK-806 | 8.50 |
| | | 11 - 4 | -11-61- 4 | C14440 14 | 0575 (innedian | dilament collety, 140576 | fouter line | filament collet) | | | |

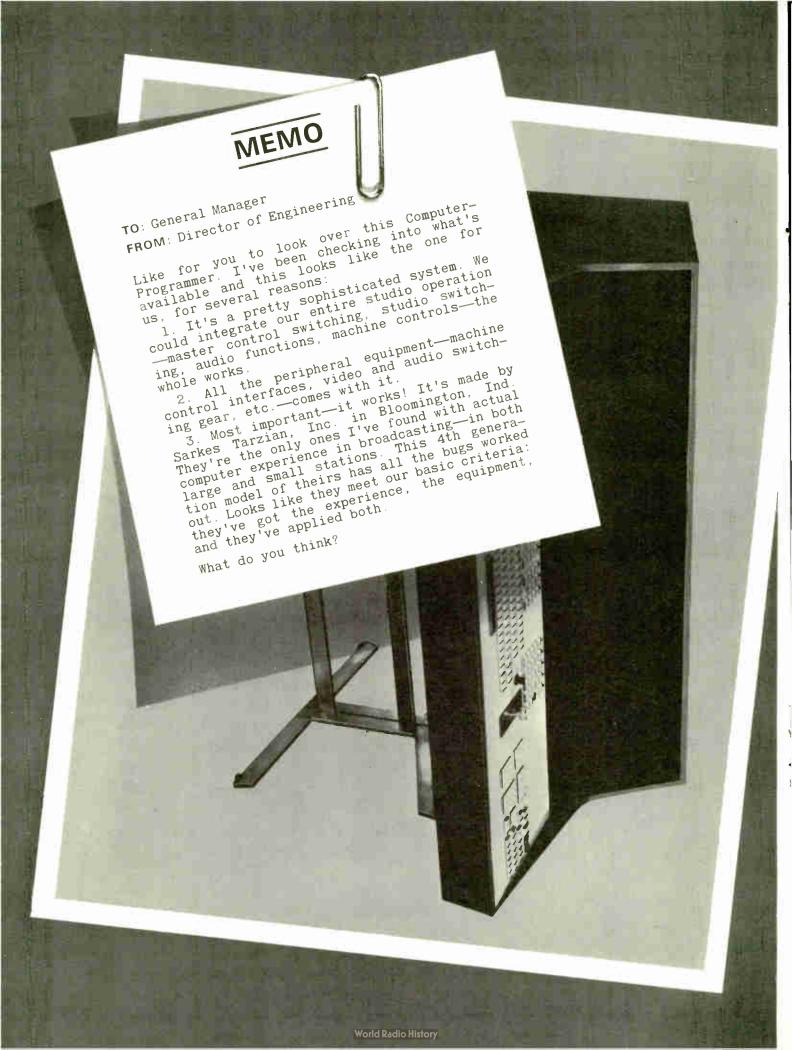
Note (1): None, but the following collets are available from EIMAC: 149575 (innerline filament collet); 149576 (outer line filament collet) Note (2): None, but the following collets are available from EIMAC: 008290 (heater pin connection); 008291 (cathode collet); 008292 (control grid collet); 008294 (anode collet); 882931 (screen grid collet)



| Tube Type | User Price | Socket Type | Socket Price | Chimney Type | Chimney Price | Tube Type | User Price | Socket Type | Socket Price | Chimney Type | Chimney Price |
|---------------------------------|-------------------|----------------------------------|------------------------------|--------------------|------------------|---|----------------------|--------------------------------|------------------|--------------------|------------------|
| 4CX1500B/8660 4CX3000A/8169 | 205.00 420.00 | *See 4CX100A SK-1400A | 107.00 | SK-1406 | 6.50 | 8166/4-1000A | 131.50 | SK-500 SK-510 | 24.30 6.50 | SK-506 SK-506 | 12.00 12.00 |
| 4CX5000A/8170 | 495.00 | SK-1470A SK-300 | 107.00 103.00 | SK-1406 SK-306 | 6.50 6.50 | 8167/4CX300A 8168/4CX1000A | 54.00 181.00 | *See 4CX125C SK-800B | 54.00 | SK-806 | 8.50 |
| 4CX5000R/8170W | 705.00 | SK-300A SK-300 | 103.00 103.00 | SK-316 SK-306 | 9.65 6.50 | | | SK-810ii SK-890ii | 56.00 65.00 | SK-806 SK-806 | 8.50 8.50 |
| 4CX10,000D/8171 | 550.00 | SK-300A SK-300 | 103.00 103.00 | SK-316 SK-306 | 9.65 6.50 | 8169/4CX3000A | 420,00 | SK-1400A SK-1470A | 107.00 107.00 | SK-1406 SK-1406 | 6.50 6.50 |
| 4CX15,000A/8281 | 695.00 | SK-300A SK-300 | 103.00 103.00 | SK-316 SK-306 | 9.65 6.50 | 8170W/4CX5000R | 705.00 | SK-300 | 103.00 | SK-306 SK-316 | 6.50 9.65 |
| 40,113,000,78281 | 093.00 | SK-300A | 103.00 | SK-316 SK-1306 | 9.65 6.50 | 8171/4CX10,000D | 550.00 | SK-300 | 103.00 | SK-306 SK-316 | 6.50 9.65 |
| 4CX35,000C/8349 | 1,765.00 | SK-1500 SK-1510 | 220.00 250.00 | None None | | 8172/4X150G 8173/4W20,000A | 58.00 2,030.00 | None | | None | |
| 4E27A/5-125B | 45.00 | E. F. Johnson | 230.00 | None | | 8238/3X3000A1 | 210.00 | None None | | None None | |
| 4W20,000A/8173 | 2,030.00 | No. 122-237 None | | None | | 8239/3X3000F1 8240/3W5000A1 8241/3W5000F1 | 220.00 280.00 | None None | | None None | |
| 4X150A/7034 4X150D/7035 | 23.15 29.00 | *See SK-600 Se *See SK-600 Se | eries Socket eries Socket | Listing Listing | | 8241/3W5000F1 8242/3W5000A3 | 260.00 245.00 | None None | | None None | • • • • |
| 4X150G/8172 | 58.00 | None | | None | • • • • | 8243/3W5000F3 | 250.00 | None | | None | |
| 4X250B 4X250F | 35.60 35.60 | *See SK-600 Se *See SK-600 Se | | | | 8244/4CW2000A | 220.00 | SK-800B SK-810B | 54.00 56.00 | None None | |
| 4X500A | 127.50 | SK-900 | 68.50 | SK-906 | 15.00 | 0045 /4040504 | | SK-890B | 65.00 | None | |
| 5-500A | 58.50 | SK-400 SK-410 | 17.50 6.50 | None None | | 8245/4CX250K 8250/3CX100F5 | 64.00 34.00 | None Jettron | | None None | • • • • |
| 5CX1500A | 218.00 | SK-840 | 61.25 | SK-806 | 8.50 | | | No. 76-020 | | | |
| 5CX3000A 304TH | 437.00 83.00 | Y-386 E. F. Johnson | 114.00 | None None | | 8281/4CX15,000A | 695.00 | SK-300A | 103,00 | SK-306 SK-316 | 6.50 9.65 |
| | | No. 124-213 | | | •••• | | | | | SK-1306 | 6.50 |
| 304TL | 83.00 | E. F. Johnson No. 124-213 | • • • • | None | •••• | 8283/3CX1000A7 | 250.00 | SK-860 SK-870 | 38.00 40.00 | SK-816 SK-816 | 7.00 7.00 |
| 450TH | 85.00 | E. F. Johnson No. 123-211 | • • • • | None | • • • • | 8321/4CX350A 8322/4CX350F | 48.50 51.50 | *See SK-600 S *See SK-600 S | eries Socket | Listing | |
| 450TL | 85.00 | E. F. Johnson No. 123-211 | • • • • | None | •••• | 8349/4CX35,000C 8350/4CW50,000C | 1,765.00 2,100.00 | SK-1500 SK-1500 | 220.00 220.00 | None None | |
| 575A | 20.15 | E. F. Johnson No. 123-211 | •••• | None | •••• | 8351/4CV100,000C 8352/4CX1000K | 2,350.00 193.00 | SK-1510 SK-820 | 250.00 140.00 | None SK-806 | 8.50 |
| 592/3-200A3 673 | 55.00 20.15 | None E. F. Johnson | • • • • | None None | • • • • | 8438/4-400A | 48.00 | SK-830 SK-400 | 178.00 17.50 | SK-806 SK-406 | 8.50 6.50 |
| | | No. 123-206 | • • • • | | •••• | · | | SK-410 | 6.50 | SK-406 | 6.50 |
| 750TL | 224.00 | E. F. Johnson No. 124-214 | • • • • | None | • • • • | 8561/4CX300Y | 105.00 | SK-711A SK-760 | 25.70 10.70 | SK-606 None | 0.75 |
| 869B 869B/L | 138.00 138.00 | None None | • • • • | None None | | 8660/4CX1500B | 205.00 | SK-770 SK-800B | 10.70 54.00 | None SK-806 | 8.50 |
| 5867A | 30.60 | SK-410 | 6.50 | SK-406 | 6.50 | 0000/ 40/1300B | 203.00 | SK-810B | 56.00 | SK-806 | 8.50 |
| 6155 6156 | 36.00 42.00 | SK-410 SK-410 | 6.50 6.50 | SK-406 SK-406 | 6.50 6.50 | KY21A | 33.80 | SK-890B E. F. Johnson | 65.00 | SK-806 None | 8.50 |
| 6696A | 1,105,00 | None | | None | | | | No. 122-225 | | | •••• |
| 6697A 7034/4X150A | 1,330.00 23.15 | None *See SK-600 Se | ries Socket | None Listing | • • • • | RX21A | 32.80 | E. F. Johnson No. 122-225 | • • • • | None | • • • • |
| 7035/4X150D 7203/4CX250B | 29.00 35.60 | *See SK-600 Se *See SK-600 Se | ries Socket | Listing | | | | | | | |
| 7204/4CX250F 7211 | 35.60 88.50 | *See SK-600 Se Jettron | ries Socket | None | | *SK-600 Series Soc | ket Listing | | | | |
| | | No. 76-020 | | | •••• | For the following t | ubes, use the | e socket and chin | nney schedu | le shown b | elow: |
| 7257 7289/3CX100A5 | 45.00 26.50 | SK-410 Jettron | 6.50 | None None | • • • • | | | Socket | Socket | Chimney | |
| · | | No. 76-020 | | | •••• | Tubes | A17 | Туре | Price | Туре | Price |
| 7480 7580W/4CX250R | 1,590.00 44.50 | None *See SK-600 Se | ries Socket | None Listing | • • • • | 4X150A/7034 4X150D/7035 | 1 | | | | |
| 7698 | 88.50 | Jettron | | None | | 4X250B | 1 | SK-600 | 11.25 | SK-606 | 0.75 |
| 7815/3CPN10A5 | 30.75 | No. 76-020 Jettron | • • • • | None | | 4X250F 4CX250B/7203 | 1 | SK-600A SK-610 | 11.25 11.25 | SK-606 SK-606 | 0.75 0.75 |
| | 30.75 | No. 76-020 Jettron | | | | 4CX250F/7204 4CX250R/7580W | 1 | SK-620 | 12.00 | SK-606 SK-636B | 0.75 11.00 |
| 7815R/3CPX100A5 | | No. 76-020 | • • • • | None | •••• | 4CX350A/8321 | } | SK-620A | 15.00 | SK-626 | 0.75 |
| 7843 8158/3CX10,000A1 | 51.00 490.00 | None SK-1300 | 78.50 | None SK-1306 | 6.50 | 4CX350F/8322 7203/4CX250B | | | | SK-636B SK-636B | 11.00 11.00 |
| 8159/3CX10,000A3 | 490.00 | SK-1300 | 78.50 | SK-1306 | 6.50 | 7204/4CX250F | 1 | SK-63DA | 15.00 | SK-626 | 0.75 |
| 8160/3CX10,000A7 8163/3-400Z | 530.00 34.00 | SK-1300 SK-410 | 78.50 6.50 | SK-1306 SK-416 | 6.50 6.50 | 7580W/4CX250R 8321/4CX350A | 1 | SK-64D | 6.90 | SK-636B SK-606 | 11.00 0.75 |
| 8164/3-1000Z | 78.00 | SK-510 | 6.50 | SK-516 | 12.00 | 8322/4CX350F | | SK-650 | 8.50 | None | |
| 8165/4-65A | 27.00 | E. F. Johnson No. 122-101 | | None | **** | 7034/4X150A 7035/4X150D | 1 | | | | |
| | | | | | | | | | | | |

Prices subject to change without notice. Write for complete specifications on any tube to Power Grid Tube Marketing.







The listings in this section have been compiled from questionnaires completed by manufacturers and service organizations across the nation. It contains over 650 major product classifications. For a specific manufacturer, see Guide to Manufacturers.

ACOUSTIC MATERIALS

ATLAS SOUND
HARTLEY PRODUCTS
ROBINS INQUSTRIES CORP.
SINGER PRODUCTS CO.

ADAPTERS, CONNECTOR

AMECO, INC.

AMERICAN CABLE ELECTRONICS

AMPHENOL DISTRIBUTOR OIVISION

APPLIEO ELECTRO-MECHANICS APPLIED ELECTRO-MECHANICS
ATLAS SOUND
BIRNS & SAMYER
BLONDFR-TONGUE LABORATORIES
G C ELECTRONICS COMPANY
GENERAL RADIO CO
HEMLETI-PACKARO CO.
IMPEX ELECTRONICS CORP
JERROLD ELECTRONICS CORP
MICROWAVE ASSOCIATES, INC.
PRODELIN. INCORPORATEO
ROBINS INOUSTRIES CORP.
SWITCHCRAFT, INC.
THE TECHNICAL MATERIEL CORP
TROMPFIFR ELECTRONICS

ADAPTERS. FM STERED
CALBEST ELECTRONICS
G C ELECTRONICS COMPANY
HEATH CO
IMPEX ELECTRONICS CORP KARG LABORATORIES MCMARTIN INDUSTRIES SINGER PRODUCTS CO

AOAPTERS, TFST
AMECO, INC.
RIRNBACH CO
OELTA ELECTRONICS, INC.
G C ELECTRONICS COMPANY
HEWLETT-PACKARO CO.
JERROLD ELECTRONICS CORP
MICROLAB / FXR

AOAPTERS. TUBE EIMAC DIVISION OF VARIAN

ALARM. FAULT

RIONIC INSTRUMENTS. INC.
BIRD ELECTRONIC CORPORATION
MOUSTON FLECTRONICS CO.
HUGHEY & PHILLIPS
JERROLD ELECTRONICS CORP
MALLORY DISTRIBUTOR PRODUCTS
MOSELEY ASSOCIATES INC.
SINGER PRODUCTS CO.
SPENCER-KENNEDY LABORATORIES
JEFPAC CORPORATION OF AMERICA TREPAC CORPORATION OF AMERICA

ALARM. INTRUDER
BIONIC INSTRUMENTS. INC.
FLECTRONICS ESSENTIALS OF CCC
THE JAMES FLOYO FORO CO

HOUSTON ELECTRONICS CO.

ALARM. SIGNAL
BIONIC INSTRUMENTS. INC.
OELTA ELFCTRONICS. INC.
THE JAMES FLOYD FORD CO
MINNESOTA MINING - 3 M
SINGER PRODUCTS CO.
TREPAC CORPORATION OF AMERICA

AMMETERS, AC ALLIEO ELECTRONICS CORP ALLIEO ELECTRONICS CORP
API INSTRUMENTS CO.
COLUMBIA ELECTRIC MFG CO
G E INOUSTRIAL SALES OPERATION
GENERAL ELECTRIC CO
MEMLETT-PACKARO CO.
MICKOK ELECTRICAL INSTRUMENT
INSTRUMENT LABORATORIFS CORP
THE SINGER CO - METRICS OIV
TRIPLETT ELECTRICAL INSTRUMENT
YOROGAWA ELECTRIC WORKS

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Great solid-state profit-boosters! They let you realize the full potential of your transmitter. And any one or all will work for 30 days free! If they haven't proved their worth by then, ship them back. We'll even pay the freight.

30 day trial offer limited to U.S.A. only. Audimax is an automatic level control guaranteed to outperform ordinary compressors, limiters or AGCs. It can increase effective program power up to 4:1.

Volumax is an automatic peak controller that overcomes the inherent limitations of peak limiters. Its microsecond regulation virtually doubles the efficiency of Audimax. Result: a combined increase in effective program power of up to 8:1.

The FM Volumax is a totally new concept in automatic peak control that solves FM overmodulation problems created by pre-emphasized audio signals. It offers positive prevention of FM overmodulation and SCA crosstalk without distortion.

Audimax thinks smart. Its solid state logic circuitry monitors Incoming signal and compares It with Its memory of average program content over a preceding period of time. This gives

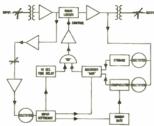


Audimax the ability to adapt to changing program gain situations and react in the same way a human engineer would.

Its remarkable <u>Gated Gain Stabilizer</u> enables Audimax to maintain constant gain during prolonged program pauses. It eliminates the fade-out of background effects or "swish-up" of background noise.

A special <u>Return-to-Zero</u> function

operates when standby conditions occur. Audimax waits about 10 seconds, keeping gain steady at the last correct setting.



When its memory is convinced that the program has ended, it slowly returns to normal gain. Background effects are held at natural levels, and proper level is assured upon resumption of program.

Audimax boosts overall average levels while automating control functions. Average modulation can be increased by 6 dB, which represents a 300% increase in radiated program power. Specifications: Audimax III, Mod. 444, \$665. Frequency Response, flat within 1 dB. from 50 to 15,000 cps; Harmonic Distortion, less than 1% from 50 to 15,000 cps at +16 dBm output; Noise Level, below -60 dBm at normal gain; Control Characteristic, ±10 dB of gain control; Gated Gain Stabilizer, threshold adjustable from -24 dB to normal output; Return-to-Zero Function, returns gain to normal during pauses greater than 10 seconds; Maximum Gain, 50 dB; Input and Output Impedance, 600 ohms, balanced or unbalanced (150 ohms optional); Normal Output Level, +11 VU: Maximum Output, +25 dBm; Minimum Input Level, -30 VU; Physical Dimensions, standard 19" rack mounting, $3\frac{1}{2}$ " high, 95%" deep; Power Requirements, 15 watts at 115/230 volts AC, 50/60 cps; Shipping Weight, 17 lbs.; Audimax III S,

Model 445, specially coupled for Stereophonic Operation, \$1390.

Volumax makes each watt work

harder. The only similarity between Volumax and conventional peak limiters is that it also prevents overmodulation by instantaneous program peaks. But with conventional limiters, program level must be reduced so that limiting of peaks won't cause drastic distortion and "pumping". Conventional limiters usually moderate pumping by using long recovery times. Thus, in intervals immediately following high peaks, valuable modulation capability is wasted as limiter recovers from reduced gain.

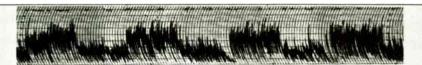


Volumax, however, analyzes all program material, <u>automatically</u> chooses the most appropriate regulation speed and limiting action is gentle or micro-second fast, depending on the nature of the program waveform. Result: a more even, pleasant sound that can be safely transmitted at twice the program power usually expected with conventional limiters.

While <u>Audimax</u> controls average program levels, <u>Volumax</u> precisely controls transmitter modulation. Used together, they can raise effective program power by factor of nearly 8:1.

Bonus for AM Broadcasters: Since Volumax can be operated asymmetrically at the user's option, limiting levels for negative peaks may be kept below the 100% modulation level, while positive peaks may be allowed to exceed 100%, thus boosting effective coverage still further.

onth's work



Under carefully controlled test conditions, the performance of a Volumax was compared with a popular conventional peak limiter by a non-CBS affiliated broadcasting network. Both devices were adjusted for comparable limiting and peak output resulting in 100% modulation. At five-minute intervals the two units were alternately switched into the transmission circuit and the off-the-air demodulated signals were compared in a monitoring receiver. The above chart of a recording VU meter shows the results. Volumax provided nearly twice the modulation level of the conventional limiter.

Specifications: Volumax, Mod. 400, \$665. Input and Output Impedance, 600 ohms, balanced or unbalanced; Input level, -24 to +8 dBm; Maximum Output Level, controlled peaks +21 dBm; noncontrolled peaks +25 dBm; Maximum Gain, 50 dB: Noise Level, below -70 dB re +21 dBm output; Frequency Response, flat within 1 dB, 50 to 15,000 cps throughout normal control range; Attack Time, less than 1 microsecond or 2 milliseconds, depending on program waveform; Recovery Time, 140 milliseconds; Maximum Operating Temperature, 55° C; Power Requirements, 15 watts at 115/230 volts AC, 50/60 cps; Physical Dimensions, fits standard 19" rack, 31/2" high, 95%" deep; Shipping Weight, 17 lbs.

FM Volumax now solves the classic FM pre-emphasis dilemma. Musical effects such as cymbal crashes can easily cause overmodulation up to 300%.



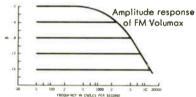
(Diagram and oscilloscope photos show audio peak levels of cymbal crash with and without pre-emphasis.) To transmit such a signal safely, an FM broadcaster would have to reduce his low frequency modulation level to approximately 35% and operate with less than 1/8 of his authorized maximum program power. Varlous methods of control have been tried from time to time. Limiting before pre-emphasis, controls low frequencies but doesn't permlt much increase In program levels. Limiting after pre-emphasis, controls overmodulation, but often means severe pumping and sudden losses In level. Clipping after pre-emphasis, removes only offending peaks, and creates new problems of serious distortion.



Solution: the new FM Volumax works like a recording-session engineer who moves certain instruments away from the microphones and requires others to play softer. It uses time-varying functions to control low and high frequency amplitudes separately, and instantaneous final limiting to prevent overmodulation. A new method of dynamic frequency compensation adjusts high frequency levels and processes all frequencies at reference level, without distortion.

Amplitude response of FM Volumax. At low levels, frequency response is flat over

entire range. At maximum levels, response is the inverse of the pre-emphasis slope. Thus, maximum output is always precisely equal to the 100% modulation level, after transmitter pre-emphasis.



Specifications: FM Volumax, Mod. 410, \$695. Input and Output Impedance, 600 ohms, balanced or unbalanced (150 ohms optional); Input Level, -24 to +8 dBm; Maximum Peak Output Level. +21 dBm; Maximum Gain, 50 dB; Noise Level, below -70 dB re +21 dBm output; Frequency Response, flat within 1 dB, 50 to 15,000 cps, 20 dB below maximum level: 75 microsecond slope at maximum; 50 microsecond or other contours possible with simple field modification; Harmonic Distortion, less than 1% from 50 to 15,000 cps throughout entire control range; Attack Time, less than one microsecond or 2 milliseconds depending on program waveform; Recovery Time, 140 milliseconds (low frequencies), 10 milliseconds (high frequencies); Maximum Operating Temperature, 55° C; Power Requirements, 15 watts, at 115/230 Volts AC, 50/60 cps; Physical Dimensions. standard 19" rack, 31/2" high, 9%" deep; Shipping Weight, 18 lbs.; FM Volumax, Model 411, specially coupled for Stereophonic Operation, \$1390.

All prices F.O.B. Stamford, Connecticut.



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ANTENNA PRODUCTS COMPANY
APPARATUS DEVELOPMENT CO
BLONDER-TONGUE LABORATORIES
BROWNING LABORATORIES, INC.
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
THE FINNEY CO
GATES RADIO COMPANY
G C ELECTRONICS COMPANY
JAMPRO ANTENNA COMPANY
JERROLD ELECTRONICS CORP
LINDSAY SPECIALTY PRODUCTS
MCMARTIN INDUSTRIES
RCA BROADCAST PRODS.
ROBINS INDUSTRIES CORP.
SCALA RADIO CORPORATION
SINGER PRODUCTS CO
SITCO ANTENNA CD.
TECHNICAL APPLIANCE CORP
TECHNICAL APPLIANCE CORP
TECHNICAL APPLIANCE CORP
TECHNICAL APPLIANCE CORP
TECHNICAL APPLIANCE CORP VISUAL ELECTRONICS CORP

ANTENNAS, LF

MULTRONICS

ANTENNAS, MICROMAVE
ADVANCE INDUSTRIES
AMECO, INC.
AMERICAN ELECTRONIC LABS
ANDREW CORPORATION
FORT WORTH TOWER CO.. INC.
JERROLD ELECTRONICS CORP
LITTON EDUCATIONAL TELE DIV
MICRO-LINK SYSTEMS/VARIAN ASSO
MOTOROLA COMMUNICATIONS NATDA MICROWAVE CORPORATION PRODELIN. INCORPORATED RAYTHEON CO EQUIPMENT DIVISION

for TOP PERFORMANCE in TV ANTENNAS

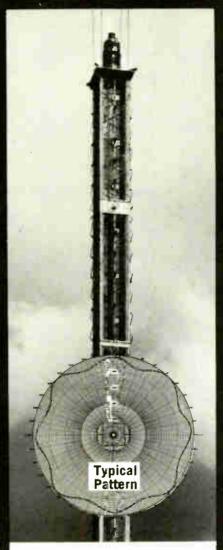
VHF SUPER TURNSTILE

UHF ZIG ZAG

CORNER REFLECTORS







DESCRIPTION Simple panel construction All copper elements All Teflon insulated Low VSWR Inputs to 60 kw Gain of about 30 per panel



DESCRIPTION Wide variety of frequencies from Channel 2 through 83 Low VSWR Versatile for fill in or directionals Gains of generally around 10 per corner

- TV Antennas
- Coax Switches
- Notch Diplexers
- FM Antennas
- Harmonic Filters
- ETV Antennas

ANTENNA

6939 POWER INN ROAD

COMPANY SACRAMENTO CALIFORNIA RCA BRDADCAST PRODS.
ROHDE & SCHWARZ SALES CD. -USA
SCIENTIFIC-ATLANTA SCIENTIFIC-ATLANTA SINGER PRODUCTS CO STAINLESS. INC. TECHNICAL APPLIANCE CORP VISUAL ELECTRONICS CORP

ANTENNAS, MOBILE

ANDREW CORPORATION
F 6 M SYSTEMS COMPANY
GATES RADIO CDMPANY
G C ELECTRONICS COMPANY
HY-GAIN RELECTRONICS
JERROLD ELECTRONICS CORP
HFBB KRECKMAN CO
LINDSAY SPECIALTY PRODUCTS LINDSAY SPECIALTY PRODUCT
MARTI ELECTRONICS
MOTOROLA COMMUNICATIONS
PROBELIN, INCORPORATED
RCA BROADCAST PRODS.
SINGER PRODUCTS CO
TECHNICAL APPLIANCE CORP
UTICA CORPORATION
WATERS MANUFACTURING

ANTENNAS. REMOTE PICKUP

ANTENNAS. TV

ALFORD MANUFACTURING COMPANY
ALLIED ELECTRONICS CORP
BLONDER-TONGUE LABORATORIES
FMCEE
THE FINNEY CO
GATES RADIO COMPANY
G C VISUAL COMMUNICATIONS PROD
JAMPRO ANTENNA COMPANY
JERROLD ELECTRONICS CORP
LINDSAY SPECIALTY PRODUCTS
MARCONI DIVISION
PACIFIC TOWER CO
RCA BROADCAST PRODS.
SCALA RADIO CORPORATION
SINGER PRODUCTS CO.
TECHNICAL APPLIANCE CORP
THOMSON ELECTRONICS CORP
OVISUAL ELECTRONICS CORP

ATTENNAS, TV. MASIER-COMMUNITY
AMECO. INC.
AMPLIVISION CORPORATION
ANTENNA PRODUCTS COMPANY
BENCO TELEVISION ASSOCIATES
BLONDER-TONGUE LABORATORIES
CUSM CRAFT
THE FINNEY CO THE FINNEY CO
JERROLO ELECTRONICS CORP
LINDSAY SPECIALTY PRODUCTS
SCALA RADIO CORPORATION
SCIENTIFIC-ATLANTA
SITCO ANTENNA CO.
STAINLESS. INC
TECHNICAL APPLIANCE CORP

TECHNICAL APPLIANCE CORP
ANTENNAS, 2500 MHZ
ALFORD MANUFACTURING COMPANY
AMERICAN ELECTRONIC LABS
ANDREW CORPORATION
JAMPRO ANTENNA COMPANY
JERROLD ELECTRONICS CORP
LITTON EDUCATIONAL TELE DIV
NARDA MICROWAVE CORPORATION
PRODELIN, INCORPORATED
RATTHEON CO EQUIPMENT DIVISION
RCA BROADCAST PROOS,
SCIENTIFIC-ATLANTA
TECHNICAL APPLIANCE CORP

ANTENNAS. SYSTEMS. HE DELTA ELECTRONICS INC

ARMS . PHONOGRAPH -SEE ARMS . TONE

ARMS. TONE
THE ASTATIC CORPORATION THE ASTATIC CORPORATION EUPHONICS MARKETING GATES RADIO COMPANY GOTHAM AUDIO CORPORATION GRAY RESEARCH & DEVELOPMENT CO KOSS ELECTRONICS. INC. RCA BROACCAST PRODS. SHURE BROTHERS. INC. SINGER PRODUCTS CO SONY CORPORATION OF AMERICA

ATTENUATORS. AUDIO ALTEC LANSING
AMECO. INC.
CENTRALAB
FAIRCHILD RECORDING EQUIPMENT
GENERAL RADIO CO
MEMLETT-PACKARD CO.
JOROAN ELECTRIC COMPANY
LANGEVIN LANGEVIN
MALLORY DISTRIBUTOR PRODUCTS
MICROLAB / FXR
MICROLAB / FXR
PAINTON INCORPORATED
ROMDE 6 SCHMARZ SALES CO. "USA
SOUNDCRAFT INDUSTRIES
SOUTHMESTERN COMMUNICATIONS
STEPHENS ELECTRONICS
TEONIC INDUSTRIES
TROMPETER ELECTRONICS

ATTENUATORS. FIXED

ALTEC LANSING
BIRD ELECTRONIC CORPORATION
GENERAL MICROWAVE CORPORATION
GENERAL RADIO CO GENERAL RADIO CO
GOTHAM AUDIO CORPORATION
HEWLETT-PACKARD CO.
HOLLAND ELECTRONICS INC
JERROLD ELECTRONICS CORP
JORDAN ELECTRIC COMPANY

LANGEVIN
MICROLAB / FXR
MICROWAVE ASSOCIATES, INC.
NARDA MICROWAVE CORPORATION
PAINTON INCORPORATED
RCA BROADCAST PRODS.
ROMDE 6 SCHWARZ SALES CO. -USA
THE SINGER CO - METRICS DIV
SOUTHWESTERN COMMUNICATIONS
TROMPETER ELECTRONICS

ATTENUATORS: IMPEDANCE MATCHING
ALTEC LANSING
AMECO: INC.
HOLLAND ELECTRONICS INC
JERROLD ELECTRONICS CORP
MICROWAVE ASSOCIATES: INC.
NARDA MICROWAVE CORPORATION
OMHITE MANUFACTURING COMPANY
PAINTON INCORPORATED
ROMDE 6 SCHWARZ SALES CO. -USA
SOUTHWESTERN COMMUNICATIONS
TROMPETER ELECTRONICS

ATTENUATORS, MICROWAVE

AMECO, INC.

DEMORNAY - BONARDI OIVISION
GENERAL MICROWAVE CORPORATION
GENERAL HICROWAVE CORPORATION
HEVLETI-PACKARD CO.

JERROLD ELECTRONICS CORP
MICROWAVE ASSOCIATES, INC.
NARDA MICROWAVE CORPORATION
PRODELIN, INCORPORATED
ROHDE 6 SCHWARZ SALES CD. -USA
SCIENTIFIC-ATLANTA
THE SINGER CO - METRICS DIV
TELONIC INDUSTRIES

TELONIC INDUSTRIES

ATTENUATORS. RF

AMECOS. INC.
BENCO TELEVISION ASSOCIATES
BIRD ELECTRONIC CORPORATION
RLONDER-TONGUE LABORATORIES
GENERAL MICROWAVE CORPORATION
GENERAL RADIO CO.
HEMLETT-PACKARD CO.
HOLLAND ELECTRONICS INC
JERROLD ELECTRONICS INC
JERROLD ELECTRONICS INC
MARCONI INSTRUMENTS
MICROLAB / FER
MICROWAVE ASSOCIATES, INC.
NARDA MICROWAVE CORPORATION
PAINTON INCORPORATEO
PRODELIN, INCORPORATEO
ROMDE 6 SCHWARZ SALES CO. -USA
SCIENTIFIC-ATLANTA
THE SINGER CO. - METRICS DIV
SINGER PRODUCTS CO.
TELONIC INDUSTRIES
TOWNSEND ASSOCIATES
TROMPETER ELECTRONICS
WATERS MANUFACTURING

ATTENUATORS. VIDEO

ATTENUATORS. VIDEO

AMECO. INC.
CFNTRAL DYNAMICS CORPORATION
HOLLAND FLECTRONICS INC
NARDA MICROWAVE CORPORATION
PAINTON INCORPORATED
ROMDE 6 SCHWARZ SALES CO. -USA
SARKES-TARZIAN
SCIENTIFIC-ATLANTA
TELONIC INDUSTRIES
TROMPETER ELECTRONICS

AUTOMATION . EQUIPMENT AITKEN COMMUNICATIONS

AUTOMATION. EQUIPMENT
ATTEN COMMUNICATIONS

AMECO. INC.
BROADCAST ELECTRONICS. INC
BROADCAST PRODUCTS COMPANY
CCA FLECTRONICS CORPORATION
CCA FLECTRONICS CORPORATION
CHORNAL OVYAMICS CORPORATION
CHRONO-LOG CORPORATION
CHRONO-LOG CORPORATION
CHRONO-LOG CORPORATION
CHRONO-LOG CORPORATION
CHRONO-LOG CORPORATION
CHRONO-LOG CORPORATION
F 6 M SYSTEMS COMPANY
GATES RADIO COMPANY
HANCOCK TELECONTROL
INTERNATIONAL GOOD MUSIC
KRS INSTRUMENTS DIVISION
MACARTA INC.
MACKENZIE LABORATORIES
MACKENZIE LABORATORIES
MACKENZIE LABORATORIES
CHAFFE RECT ARZIAN
SCHAFFE RECTRONICS
SCHAFFE RECTRONICS
SCULLY RECORDING INSTRUMENTS
SINGER PRODUCTS CO
S. STERLING COMPANY
TAPECASTER ELECTRONICS
TELESIS CORPORATION
TREPAC CORPORATION
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BACKGROUND MUSIC SERVICE
AMECO. INC.
ASCO SONOCRAFT CORP
BROWNING LABORATORIES. INC.
CCA ELECTRONICS CORPORATION
CINF SONIC SOUND
THE JAMFS FLOYD FORD CO
INTERNATIONAL GOOD MUSIC
MAGNE-TRONICS. INC.
MCMARTIN INDUSTRIES
MINNESOTA MINING - 3 M
MOTOROLA COMMUNICATIONS
ORBIT RADIO ORBIT RADIO SCHAFER ELECTRONICS

SINGER PRODUCTS CO SOUTHWESTERN COMMUNICATIONS ALBERT SCHULTZ+ INC

RALLASTS. LAMP

GENFRAL ELECTRIC CO
SOLA ELECTRIC

BALUNS
AMECO. INC.
AMERICAN ELECTRONIC LABS
KEITH ANDERSON CO
ANTENNA PRODUCTS COMPANY
APPARATUS DEVELOPMENT CO
RICONDER-TONGUE LABORATORIES
THE FINNEY CO
GEMERAL RADIO CO
JERROLD ELECTRONICS CORP
RIKER VIDEO INDUSTRIES
ROMDE & SCHWARZ SALES CO. -USA
SCALA RADIO CORPORATION
SINGER PRODUCTS CO.
SITCO ANTENNA CD.
STANDARD ELECTRONICS CORP
THE TECHNICAL MATERIEL CORP
TELDNIC INDUSTRIES
TRYLON INCORPORATED

BASE STATIONS
GATES RADIO COMPANY MARTI ELECTRONICS RCA BROADCAST PRODS. SINGER PRODUCTS CO UTICA CORPORATION

RATTERIES, DRY CELL RURGESS BATTERY COMPANY RCA ELECTRONIC COMPONENTS

MATTERIES. LEAD ACID
TMPEX ELECTRONICS CORP
SINGER PRODUCTS CO

BATTERIES, NICKEL CADMIUM BERKEY TECHNICAL CORP BERKEY TECHNICAL CORP BIRNS & SAWYER COLORTRAN INDUSTRIES - BERKEY G E CAPACITOR DEPARTMENT GFMERAL ELECTRIC CO IMPEX ELECTRONICS CORP SINGER PRODUCTS CO.

MATTERIES OTHER

BLOWERS AND FANS

AMECO. INC.
BUD RADIO. INC
OYANCOOL MANUFACTURING CO
ENCLOSURE CORP
RCA BROADCAST PROOS.
ROTRON MANUFACTURING COMPANY
SIGMA INDUSTRIES
SINGER PRODUCTS CO.

BOXES, DECADE, CAPACITOR
AEROVOX CORP.
GENERAL RADIO CO
HEATH CO

BOXES. DECADE. INDUCTOR GENERAL RADIO CO UNITED TRANSFORMER COMPANY

ROXES. DECADE, RESISTOR
AEROVOX CORP.
GENERAL RADID CO
HEATH CO
JORDAN ELECTRIC COMPANY
OMMITE MANUFACTURING COMPANY

RRIDGES
ALFORD MANUFACTURING COMPANY ALFORD MANUFACTURING COMPANY
ALFEC LANSING
AMECO. INC.
BLONDER-TONGUE LABORATORIES
DELTA ELECTRONICS INC
GENERAL ELECTRIC CO
GENERAL MICROWAVE CORPORATION
GENERAL MICROWAVE CORPORATION
HEATH CO
HEMLETT-PACKARD CO.
HICKOK ELECTRICAL INSTRUMENT
JERROLO ELECTRONICS CORP
MARCONI INSTRUMENTS
ONDE 6 SCHWARZ SALES CO. -USA
YOKOGAWA ELECTRIC WORKS

RROADCAST PROGRAMMING SERVICE
AMECO, INC.
ASCO SOMOCRAFT CORP
BISCAYME AUDIO COMPANY
THE JAMES FLOYD FORD CO
HOUSTON ELECTRONICS CO.
INTERNATIONAL GOOD MUSIC
ORBIT RADIO
SCMAFER ELECTRONICS
ALBERT SCHULTZ. INC
TELEMATION, INC.

BUILDINGS, PREFABRICATED -SEE PREFABRICATED BUILDINGS

CABINETS. METAL
ACRE VISIBLE RECORDS
ALLIED ELECTRONICS CORP
AMECO. INC.
BUD RADIO. INC
BURKE 6 JAMES
CCA ELECTRONICS CORPORATION
COOK ELECTRIC COMPANY
DATA INSTRUMENT DIVISION
ENCLOSURE CORP
GATES RADIO COMPANY

G E VISUAL COMMUNICATIONS PROD HARWOOD MFG. CO. JERROLD ELECTRONICS CORP LANG ELECTRONICS. INC MCMARTIN INDUSTRIES METROPOLITAN ELECTRIC MFG CO NEUMADE PRODUCTS CORPORATION RCA BROADCAST PRODS. RCA BROADCAST PRODS.
SCHAFER ELECTRONICS
SCIENTIFIC-ATLANTA
SPENCER-KENNEDY LABORATORIES
VENT-RAK INCORPORATED
WABER ELECTRONICS. INC.

CABINETS. PLASTIC

CABINETS, STORAGE, DISC ACME VISIBLE RECORDS GATES RADIO COMPANY GRINNAN FIXTURE COMPANY HARWALD COMPANY MEUMADE PRODUCTS CORPORATION WALLACH & ASSOCIATES

CABINETS, STORAGE, FILM
ACME VISIBLE RECORDS
GRINNAN FIXTURE COMPANY
HARWALD COMPANY
MINNESOTA MINING - 3 M
NEUMADE PRODUCTS CORPORATION
RCA BROADCAST PRODS.
WALLACH & ASSOCIATES

CABINETS, STORAGE

MAGNETIC TAPE
ACME VISIBLE RECORDS
BROADCAST ELECTRONICS, INC
BURKE 6 JAMES
COOK ELECTRIC COMPANY
GRINNAN FIXTURE COMPANY
MINNESOTA MINING - 3 M
RUMADE PRODUCTS CORPORATION
RCA BROADCAST PRODS. SINGER PRODUCTS CO WALLACH & ASSOCIATES

CABINETS, STORAGE.

MAGNETIC TAPE, CARTRIDGE
BROADCAST ELECTRONICS, INC
BROADCAST PRODUCTS COMPANY
SPARTA ELECTRONIC CORPORATION

CABINETS, STORAGE, SLIDE

BROADCAST PRODUCTS COMPANY
BURKE 6 JAMES
GATES RADIO COMPANY
GRINNAN FIXTURE COMPANY
LANG ELECTRONICS. INC
LITTLE JOE ENTERPRISES
MARANTZ COMPANY
SETCHELL CARLSON INCORPORATED

CABLE, ARMORED
ALLIED ELECTRONICS CORP
ALPHA WIRE
AMPHENOL DISTRIBUTOR DIVISION
BIRNBACH CO
BOSTON INSULATED WIRE 6 CABLE
PHELPS DODGE
SUPERIOR CABLE CORPORATION

CABLE. ASSEMBLIES CABLE. ASSEMBLIES

ALPHA WIRE

MECO. INC.
AMPHENOL DISTRIBUTOR DIVISION
ANDREW CORPORATION
BOSTON INSULATED WIRE & CABLE
COMU ELECTRONICS
D & B ELECTRONICS COMPANY
GENERAL RADIO CO
GIBBS MFG. AND RESEARCH CORP.
ITT CANNON ELECTROICS CORP
PHELPS DODGE
ROBINS INDUSTRIES CORP.
ROME CABLE DIV OF ALCOA
SAXTON PRODUCTS
SINGER PRODUCTS
SINGER PRODUCTS
SUPERIOR CABLE CORPORATION
TIMES WIRE AND CABLE
TROMPETER ELECTRONICS DIV
TIMES WIRE AND CABLE
TROMPETER ELECTRONICS
WECKESSER COMPANY, INC.

CABLE . CAMERA BOSTON INSULATED WIRE & CABLE

BOSTON INSULATED WIRE & CABLE

CABLE. CATV. MARDWARE

AMECO, INC.
AMPHENOL DISTRIBUTOR DIVISION
AMPLIVISION COMPORATION
ANACONDA ASTRODATA CO
ANDREW CORPORATION
COPPERWELD STEEL COMPANY
CRAFISMAN ELECTRONICS PRODUCTS
DIAMOND EXPANSION BOLT CO INC
JERROLD ELECTRONICS CORP
KAISER-COX
PHELPS DODGE
PRODELIN. INCORPORATEO
SIGMA INDUSTRIES
SUPERIOR CABLE CORPORATION
TELEMET COMPANY
TELEGUIP CORPORATION
TIMES WIRE AND CABLE

CABLE . COAXIAL . FLEXIBLE

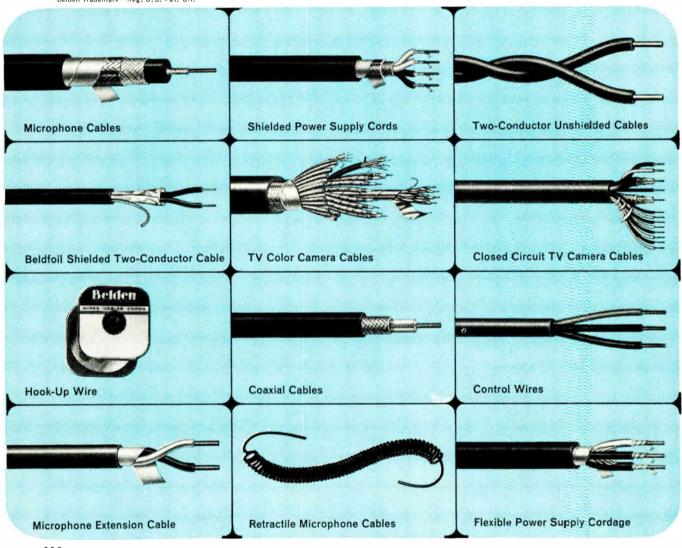
Why is Belden specified by most broadcast engineers?

Belden designs and manufactures a complete line of audio, camera, and control cables to meet every TV and radio broadcasting, recording studio, and remote control need.

Many Belden Audio and Broadcast Cables feature Beldfoil* shielding. This superior cable shield provides 100% protection against crosstalk...increases electrical reliability...reduces cable diameter and weight...is easier to terminate... usually lower in cost.

Here is just a part of this complete line, available from stock. Ask your Belden Electronics Distributor for complete information. Request also a copy of the latest Belden Electronics Catalog.





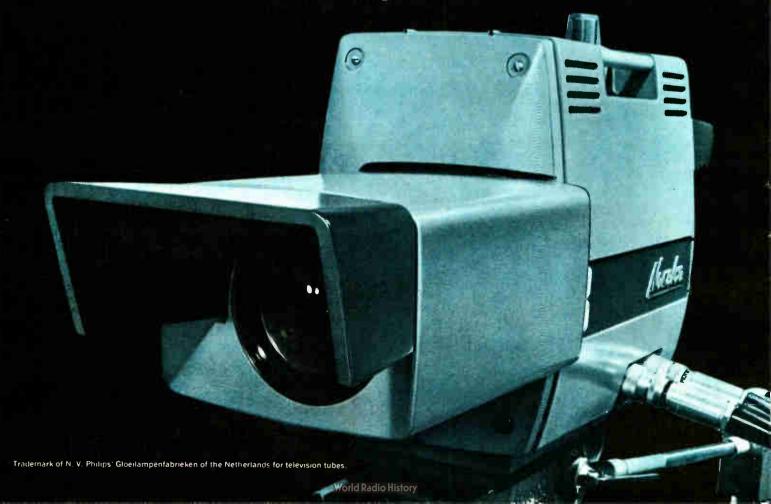
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^{*}Belden U.S. Pat. 3,032,604 Belden Trademark—Reg. U.S. Pat. Off.

Two of the three major networks use Norelco cameras for their prime-time color shows.

If that doesn't convince you to buy a Norelco 3-tube Plumbicon* color camera, take a trip on us.



This is an invitation to discover—at our expense—the practical, everyday reasons why you should now be using the new Norelco 3-tube Plumbicon rather than any other color TV camera on the market. Do this. Call, or write us direct. We'll schedule and pay for a trip to a station now using the Norelco 3-tube Plumbicon TV camera—subject to the availability of the station's time and technical personnel. They'll tell you and show you why they chose the new Norelco. You'll see it in program action. You'll learn for yourself—at no cost to yourself—why the Norelco Plumbicon TV camera is used for more programming than all other new generation makes.

Here's a partial list of stations now using the new Norelco

EAST **STATION**

LOCATION New Haven.

WNHC-TV WNEW-TV

Connecticut **New York**

REEVES SOUND STUDIO

New York

SOUTH

WAGA-TV.

Atlanta. Georgia

WJBF-TV

Augusta, Georgia

WCYB-TV

Bristol, Virginia/Tenn.

WKRG-TV

Mobile,

Alabama Spartanburg,

WSPA-TV

S.C.

MIDWEST

WFIE-TV

Evansville. Indiana

WFRV-TV

Green Bay,

Wisconsin

WISH-TV

Indianapolis. Indiana

WEST

KABC-TV

Los Angeles, California

KTTV

Los Angeles, California

KXTV

Sacramento, California

When you visit one of these stations you'll be able to separate the facts from the fiction regarding color TV cameras. Facts and fiction like this:

FICTION: A 4-tube camera produces a sharper picture than a 3-tube color camera.

FACT: This concept is as obsolete as the 12-cylinder car. The Norelco 3-tube PC-70 Plumbicon Color Camera produces a sharper color and monochrome picture than any 4-tube camera. Reason: the first practical application of the unique "contours-out-ofgreen'' principle provides both horizontal and vertical aperture correction. The contour signal produced from the green channel, is simply fed to all three channels.

RESULT: A startling increase in color and monochrome sharpness — on the home receiver—plus the same tolerance to misregistration that a fourth tube provides. All with one less tube, less maintenance, minimum operational make-ready time and trouble-free color matching.

FICTION: "Contours-outof-green" creates an excessive noise problem.

FACT: Absolutely not. But some 4-tube cameras do have a noise problem. Check the "specs." You'll discover that these 4-tube models recommend a fixed gamma of 0.5. We provide continuously variable gamma and recommend an 0.45 operating point. This stretches blacks and gives vou more detail in dark areas and shadows. A gamma of 0.5 hides noise by compressing blacks. Result: the 4-tube camera loses dark area detail and literally demands the use of flat lighting.

FICTION: By this time next year Norelco will be selling a



STUDIO EQUIPMENT DIVISION

NORTH AMERICAN PHILIPS COMPANY, INC. 900 South Columbus Avenue, Mount Vernon, New York 10550

four tube camera.

FACT: Definitely not. We made the best possible 4-tube camera but decided not to sell it. While using it to compare 3-tube vs. 4-tube, we discovered what every 4-tube manufacturer has since learned: 4-tube resolution is inherently less than 3-tube; that extra light split to the Y channel. reduces the light to the RGB channels, causing noticeable lag. (Try moving a light object against a dark background with a camera using 4 photo conductor pick-up tubes. You'll see what we mean.)

FICTION: The Norelco PC-70 is made in Holland and won't be in full production for

years.

FACT: The PC-70 camera is made by Norelco in Mt. Vernon, N. Y., where existing and constantly expanding facilities are meeting the demand for the most economical, easiest to use and maintain, color TV camera available today.

Other reasons to choose the Norelco PC-70:

A simple but remarkable 3-way beam split prism that eliminates the need for shading controls. (Because of their complicated beam split, many 4-tube models require as many as 16 shading con-

No magenta cast, a problem even some of the newest 4-tube cameras haven't solved.

Lens interchangeability.

No set-up operating controls in the camera head except for tube-focus and back-focus positions. Eliminates the need for a two-man set-up and for hectic on-theset adjustments.

Now get all the reasons to choose the Norelco PC-70. Get them from the men behind the camera, Today, call our sales representative, Visual Electronics, or call us directly.

AMFCO. INC.

AMPHENOL DISTRIBUTOR DIVISION
ANACONDA ASTRODATA CO
ANDREW CORPORATION
ANSONIA WIRE AND CABLE CO
RELDEN MANUFACTURLING CG
BOSTUN INSULATED WIRE & CABLE
GENERAL RADIO CO
GOTHAM AUDIO CORPORATION
JAMPHO ANTENNA COMPANY
JERROLD ELECTRONICS CORP
PHELPS DOUGE
PRODELIN. INCORPORATED
RCA BROADCAST PRODS.
ROME CABLE DIV OF ALCOA
SAXTON PRODUCTS. ROME CABLE DIV OF ALCOA SAXTON PRODUCTS SINGER PRODUCTS CO-SPENCER-KENNEDY LABONATORIES SUPERIOR CABLE COMPORATION TELEGUIP CORPORATION TENSOLITE INSULATED WIRE CO-TIMES WIRE AND CABLE VISUAL ELECTRONICS CORP

CABLE. COAXIAL. RIGID
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ANDREW COMPORATION
ANTENNA PRODUCTS COMPANY
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JAMPHO ANTENNA COMPANY
JERROLD ELECTRONICS CORP
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PRODELIN. INCORPORATED
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SINGER PRODUCTS
SIPERIOR CARLE CORPORATION SINGER PRODUCTS CO.
SUPERIOR CAPLE CORPORATION
TECHNICAL APPLIANCE CORP
TELEQUIP CORPORATION
THES WIRE AND CAPLE
VISUAL ELECTRONICS CORP

VISUAL ELECTRONICS CORP

CABLE, DIRECT-BURIAL
ALPHA WIRE
AMECO, INC.
AMPHENOL DISTRIBUTOR DIVISION
ANACONDA ASTRODATA CO
ANDREW CORPORATION
BELDEN MANUFACTURING CO
BIRNBACH CO
11T WIRE & CABLE DIVISION
JERROLD ELECTRONICS CORP
PHELPS DODGE
ROME CABLE DIV OF ALCOA
SAXTON PRODUCTS
SUPERIOR CABLE CURPORATION
TELEGUIP CORPORATION
TIMES WIRE AND CARLE TIMES WIRE AND CARLE

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ALLIED ELECTRONICS CORP
ALPHA WIRE
AMPHENDL DISTRIBUTOR DIVISION
BELDEN MANUFACTURING CO
BIRNHACH CO
BOSTON INSULATED WIRE 6 CABLE
G C ELECTRONICS COMPANY
G E VISUAL COMMUNICATIONS PROD
GOTHAM AUDIO CORPORATION
LENZ FLECTRIC MANUFACTURING CO
RCA BROADCAST PRODS.
ROBINS INDUSTRIES CORP.
ROME CABLE DIV OF ALCOA
SAXTON PRODUCTS SAXTON PRODUCTS SINGER PRODUCTS CO. SUPERIOR CABLE CORPORATION TELEGUIP CORPORATION TENSOLITE INSULATED WIRE CO.

CABLE. TELEPHONE ALPHA WIRE
AMFCO» INC.
ANSONIA WIRE AND CABLE CO
BELDEN MANUFACTURING CO
BIRNBACH CO
FISHER BERKELEY CORPORATION
ITT WIRE & CABLE OIVISION
LENZ ELECTRIC MANUFACTURING CO
ROME CABLE OIV OF ALCOA
SAXTON PRODUCTS
SUPERIOR CABLE CORPORATION

CALIBRATION SERVICE. FREQUENCY EIDSON ELECTRONIC COMPANY ELECTRONICS ESSENTIALS OF CCC F & M SYSTEMS COMPANY HERB FITZGERALD COMMUNICATIONS AND ELECTRONICS
HEWLETT-PACKARD CO.
RADIO AIDS
S. STERLING COMPANY

CALIBRATION SERVICE. INSTRUMENT DATA INSTRUMENT DIVISION DATA INSTRUMENT DIVISION ELECTRONICS COMPANY ELECTRONICS ESSENTIALS OF CCC THE JAMES FLOYD FORD CO HEWLETT-PACKARD CO. INSTRUMENT LABORATORIES CORP S. STERLING COMPANY

CALORIMETERS
BIRD ELECTRONIC CORPORATION
THE ENGLISH ELECTRIC CORP.
MARCONI INSTRUMENTS
NARDA MICROWAVE CORPORATION
RCA BROADCAST PRODS.

CAMERA - MOUNTING EQUIPMENT AMECO - INC -E J daughman CO BERKEY TECHNICAL CORP BIRNS & SAWYER BURKE & JAMES

COHU ELECTRONICS COLORTRAN INDUSTRIES - BERKEY HOUSTON FEARLESS CORPORATION MOTOROLA COMMUNICATIONS MOTOROLA COMMUNICATIONS
POWER-OPTICS INCORPORATED
RCA RROADCAST PRODS.
SYLVANIA-COMM. ELECTRONICS DIV
TELEQUIP CORPORATION
TELLEVISION UTILITIES CORP
TRAID CORPORATION UP-RIGHT SCAFFOLDS VISUAL ELECTRONICS CORP

CAMERA. REMOTE
CONTROL EQUIPMENT
AMECO. INC.
AMPLIVISION CORPOPATION
COMU ELECTRONICS
DELTA ELECTRONICS, INC.
MOTOROLA COMMUNICATIONS
POWER-OPTICS INCORPORATIO
SYLVANIA-COMM. ELECTRONICS DIV
TELEQUIP CORPORATION
TELEFUSION LITLITIES CORP TELEVISION UTILITIES CORP VISUAL ELECTRONICS CORP

CAMERAS, FILM, CINE
AMECO: INC.
ARRIFLEX CORP OF AMERICA
BECKMAN & WHITLEY
BLONDFR-TONGUE LABORATORIES
BUNKE & JAMES
EASTMAN KODAK COMPANY
D. B. MILLIKEN COMPANY
MINNESOTA MINING - 3 M
NORTH AMERICAN PHILIPS CO
PRECISION LABORATORIES
RCA SROADCAST PRODS.
TFLEVISION UTILITIES CORP
TRAID CORPORATION
VISUAL ELECTRONICS CORP

CAMERAS» FILM» STILL
BIRNS & SAWYER
BLONDER - TONGUE LABORATORIES
RURKE & JAMES
EASTMAN KODAK COMPANY
MINNESOTA MINING - 3 M
NORTH AMERICAN PHILIPS CO
PRECISION LABORATORIES

CAMERAS. OSCILLOSCOPE
AMECO. INC.
BENRUS
HEWLETT-PACKARD CO.
D. B. MILLIKEN COMPANY
THE SINGER CO. — METRICS DIV
TEKTRONIX INC. TRAID CORPORATION

CAMERAS, TV. COLOR

AMECO. INC.

AMPEX CORPORATION

AMPLIVISION CORPORATION

ASCO SONOCRAFT CORP

BLONDER-TONGUE LABORATORIES

COHU ELECTRONICS

G E VISUAL COMMUNICATIONS PROD

MARCONI DIVISION

NORTH AMERICAN PHILIPS CO

RCA BROADCAST PRODS.

SARKES-TARZIAN

VISUAL ELECTRONICS CORP

CAMERAS, TV, MONOCHROME

AMECO, INC.
AMPEX CORPORATION

AMPLIVISION CORPORATION

BLONDER-TONGUE LABORATORIES

COMU ELECTRONICS COMU ELECTRONICS
COLORADO VIDEO
DAGE BELL CORPORATION
DIAMOND ELECTRONICS
DIECRAFT, INC
G F VISUAL COMMUNICATIONS PROD
MARCONI OIVISION
MARYLAND TELECOMMUNICATIONS
MOTOROLA COMMUNICATIONS
NORTH AMERICAN PHILIPS CO
RCA BROADCAST PRODS.
SARKES-TARZIAN
SONY CORPORATION OF AMERICA
SYLVANIA-COMM. ELECTRONICS OIV
TELEMATION. INC.
TELEVISION UTILITIES CORP
THOMSON ELECTRONICS CORP

CAPACITORS, FIXED, GENERAL

CAPACITORS. FIXED. AIR
G E CAPACITOR DEPARTMENT GENERAL RADIO CO TRW ELECTRONICS

CAPACITORS+ FIXED+ CERAMIC AEROVOX CORP+ AMERICAN ELITE CENTRALAB CENTRALAB
CORNELL-DUBILIER ELECTRONICS
G E CAPACITOR DEPARTMENT
JENNINGS RADIO MANUFACTURING
MALLORY DISTRIBUTOR PRODUCTS
MINNESOTA MINING - 3 M
SINGER PRODUCTS CO.
TRW ELECTRONICS

CAPACITORS. FIXED. ELECTROLYTIC
AFROVOX CORP. AEROVOX CORP.

AMERICAN ELITE

AMPEREX ELECTRONIC CORP

CORMELL-DUBILIER ELECTRONICS

GENERAL ELECTRIC CO

MALLORY OISTRIBUTOR PRODUCTS

OHMITE MANUFACTURING COMPANY SINGER PRODUCTS CO.

CAPACITORS, FIXED, FILM
AFROVOX CORP,
AMERICAN ELITE
AMPEREX ELECTRONIC COMP
CORNELL-DUBILIER ELECTRONICS
DEARBORN ELECTRONICS INC
GENERAL FLECTRIC CO
MALLORY DISTRIBUTOR PRODUCTS
THE NOVA COMPANY
SINGER PRODUCTS CO.
TEXAS INSTRUMENTS TEXAS INSTRUMENTS TRW ELECTRONICS

CAPACITORS» FIXED» METALLIZED
AEROVOX CORP»
ALTEC LANSING
CENTRALAR CENTRALAM
CORNELL-DUBILIER ELECTRONICS
DEARBORN ELECTRONICS INC
THE NOVA COMPANY
THW ELECTRONICS

CAPACITORS, FIXED, MICA AEROVOX CORP, ALTEC LANSING CORNEL-DUBILIER ELECTRONICS G E CAPACITOR DEPARTMENT GENERAL RADIO CO MINNESOTA MINING - 3 M SINGER PRODUCTS CO.

CAPACITORS, FIXED, DIL-FILLED
AEROVOX CORP.
ALTEC LANSING
DEARBORN LLECTRONICS INC
ENGINFERING ASSOCIATES
G E CAPACITOR DEPARTMENT
GENERAL ELECTRIC CO
SINGER PRODUCTS CO.

CAPACITORS. FIXED. PAPER
ACROVOX CORP.
ALTEC LANSING
CORNELL-DUBILIER ELECTRONICS
DEAREORN ELECTRONICS INC
GENERAL ELECTRIC CO
SINGER PRODUCTS CO.

CAPACITORS, FIXED, OTHER
AEROVOX CORP.
ALTEC LANSING
AMPEREX FLECTRONIC CORP
COOK FLECTRIC COMPANY
CORNELL-DUBILLER ELECTRONICS
DEARHORN ELECTRONICS INC
G E CAPACITOR DEPARTMENT
GENERAL ELECTRIC CO
GENERAL RADIO CO
JENNINGS RADIO MANUFACTURING JENNINGS RADIO MANUFACTURING MALLORY DISTRIBUTOR PRODUCTS

CAPACITORS, VARIABLE

ALTEC LANSING

AMERICAN ELITE

BUD RADIO, INC

CARDWELL CONDENSER CORP

CENTRALAB

GENERAL RADIO CO

JENNINGS RADIO MANUFACTURING

F JOHNSON COMPANY

ROANWELL CORPORATION

SARKES-TARZIAN

SINGER PRODUCTS CO.

SOLITRON DEVICES

TRW ELECTRONICS TRW ELECTRONICS

CARRIER CURRENT EQUIPMENT
BAUER ELECTRONICS COMPORATION LOW POWER ORBIT RADIO

CARTRIOGES. MAGNETIC TAPE

AMERLINE CORPORATION
AUDIO DEVICES
BROADCAST ELECTRONICS. INC
CIME SONIC SOUNO
DISPLAY TECHNOLOGIES INC
GATES RADIO COMPANY
INTERNATIONAL GOOD MUSIC
JOA CARTRIDGE SERVICE
KRS INSTRUMENTS DIVISION
MACARTA INC. RRS INSTRUMENTS DIVISION
MACARTA INC.
MACKERIE LABORAIONILS
MAGNETIC MEDIA CORPORATION
MARATHON PRODUCTS COMP.
MILES REPRODUCER CO
MINNESOTA MINING. - 3 M
RCA BROADCAST PRODS.
REEVES SOUNDCRAFT
SHURE BROTHERS. INC.
SINGER PRODUCTS CO.
SPARTA ELECTRONIC COMPORATION
TAPECASTER LLECTRONICS
VIKING OF MINNESDLIS
VISUAL ELECTRONICS CORP

CARTRIDGES, PHONO
THE ASTATIC COMPORATION
BENJAMIN ELECTRONIC SOUND CORP
ELECTRO-VOICE INC
EUPHONICS MARKETING
FAIRCHILD RECORDING EQUIPMENT
G E DISTRIBUTOR SALES FORCE
GOTHAM AUDIO CORPORATION
GRADO LABORATORIES, INC
RCA BROADCAST PRODS.
SHURE BROTHERS, INC.
SINGER PRODUCTS CO
SONY CORPORATION OF AMERICA
SPARTA ELECTRONIC CORPORATION

CARTRIDGES. TAPE.
RECORDING SERVICE
AMPEX CORPORATION
CINE SONIC SOUND
MARATHON PRODUCTS CORP.
ORBIT RADIO

CASES. PORTABLE

ELECTRONIC EQUIPMENT

ENCLOSURE CORP

HEWLETT-PACKARD CO.

MEMLETT-PACKARD CO.

CATY EQUIPMENT & COMPONENTS ALSO SEE OTHER CATEGORIES.
AMECO, INC.
AMERICAN CABLE ELECTHONICS
AMPLIVISION CORPORATION
ANACONDA ASTRODATA CO
BALL BROTHERS RESEARCH
BENCO TELEVISION ASSOCIATES
BLONDER-TONGUE LABORATORIES
C-COR ELECTRONICS
CHECTRONICS
ELECTROLINE TV EQUIPMENT INC.
ENTRON INC
JERROLD FLECTRONICS CORP
KAISER-COX
PRUZAN COMPANY
SIGMA INDUSTRIES
SPENCEN-KENNEDY LABORATORIES
TAPE-ATHON CORPONATION
TELEVATION. INC.
TELEGUIP CORPUNATION
TELEVISION UTILITIES CORP
TRW ELECTRONICS
UTILITY TOWER CO.

CATV, CABLE TERMINALS
AMECO, INC.
AMERICAN PAMCOR, INC
AMERICAN PAMCOR, INC
AMACONDA ASTRODATA CU
BENCO TELEVISION ASSOCIATES
ENTRON INC
JERNOLD ELECTRONICS CORP
KAISER-COX
SIGMA INDUSTRIES
SUPERIOR CABLE CORPORATION
TELEMET COMPANY
TELEGUIP CORPORATION
UTILITY PRODUCTS CO.

CATV. CHANNEL AMPLIFIERS

AMECO. INC.
AMERICAN ELECTRONIC LABS

AMPLIVISION CORPORATION

ANACONDA ASTRODATA CO

KEITH ANGERSON CO

BENCO TELEVISION ASSOCIATES

GLONDFA-TONGUE LABORATORIES

C-COR ELECTRONICS

ENTRON INC

JERROLD ELECTRONICS CORP

KAISER-COX SER-COX SPENCER-KENNEDY LABORATORIES TELESIS CORPORATION

TELESIS CORPORATION

CATV. HEAD-END FOUIPMENT
AMECO. INC.
AMERICAN ELECTRONIC LABS
AMPLIVISION CORPORATION
ANACONDA ASTRODATA CO
KEITH ANDERSON CO
BENCO TELEVISION ASSOCIATES
BLONDER-TONGUE LABORATORIES
C-COR ELECTRONICS
DYNAIR ELECTRONICS, INC.
ENTRON INC
INTERNATIONAL GOOD MUSIC
JERROLD ELECTRONICS CORP
KAISER-COX
ROHN MANUFACTURING CO.
SPENCER-KENNEDY LABORATORIES
TELEMET COMPANY
TELESIS CORPORATION
TELEVISION UTILITIES CORP

CATV. ORIGINATION EQUIPMENT AMECO. INC. AMERICAN CABLE ELECTRONICS AMERICAN ELECTRONIC LABS AMPEX CORPORATION BLONDER-TONGUE LABORATORIES CATE: COMPANY BLONGER-TONGUE LABORATORIES
CATEL COMPANY
CENTRAL DYNAMICS CORPORATION
COMU ELECTRONICS
JERROLD ELECTRONICS CORP
KAISER-COX
TELEMATION, INC.
TELEGUIP CORPORATION
TELESIS CORPORATION
TELEVISION UTILITIES CORP

CAVITIES, MICROWAVE

AMPEREX FLECTRONIC CORP
DEMORNAY - BONAROI DIVISION
MICROLAR / FXR
MICRO-LINK SYSTEMS/VARIAN ASSO
MICROWAVE ASSOCIATES, INC.
NAROA MICROWAVE CORPORATION
RCA ELECTRONIC COMPONENTS

CHARGERS, BATTERY
AMPHENOL DISTRIBUTOR DIVISION
BIRNS & SAWYER
COLORTRAN INOUSTRIES - BERKEY
G C ELECTRONICS COMPANY
GENERAL ELECTRIC CO
IMPEX ELECTRONICS CORP
ONAN DIVISION
SINGER PRODUCTS CO

CHASSIS - SEE HARDWARE

World Radio History

CHOKES. WAVEGUIDE

OEMORNAY - BONAROI DIVISION

MICRO-LINK SYSIEMS/VARIAN ASSO

MICROWAVE ASSOCIATES. INC. MAROA MICROWAVE CORPORATION PAINTON INCORPORATEO

CHOPPERS

OAK MANUFACTURING CO
TOWNSENO ASSOCIATES

CIRCUIT BREAKERS
CCA ELECTRONICS CORPORATION
G C ELECTRONICS COMPANY
G E INOUSTRIAL SALES OPERATION
GENERAL ELECTRIC CO
HOUSTON FLECTRONICS CO. LITTLELEUSE INC.
MALLORY OISTRIBUTOR PRODUCTS

CIRCUITS, PRINTED

AMECO, INC.

SINGER PRODUCTS CO. SOLITRON DEVICES
TOWNSEND ASSOCIATES
TREPAC CORPORATION OF AMERICA
VITRO ELECTRONICS

CLAMPS. CABLE

AMECO. INC.
ANDREW CORPORATION
BIRNBACH CO
OIAMOND EXPANSION BOLT CO INC
G C ELECTRONICS COMPANY
SUPERIOR CABLE CORPORATION
THE THOMAS 6 BETTS CO
WECKESSER COMPANY, INC.

CLAMPS. COMPONENT FLECTROVERT, INCORPORATEO TELEMET COMPANY THE THOMAS 5 BETTS CO

CLAMPS. GROUND

AMECO, INC.

THE THOMAS & BETTS CO

CLAMPS - TUBE THE THOMAS & BETTS CO

CLEANERS. CHEMICAL -ALSO SEE SOLVENIS BROADCAST ELECTRONICS. INC G C ELECTRONICS COMPANY J W GIBSON CO. INC

CLEANERS . LENS DUOTONE COMPANY INC THE TEXWIPE COMPANY

CLEAMERS + OTHER ALSO SEE SOLVENTS
OUDTONE COMPANY INC
G C FLECTRONICS COMPANY
REUMADF PRODUCTS CORPORATION
THE TEXWIPE COMPANY

CLIPS, TEST
BIRNBACH CO
ELECTRONICS ESSENTIALS OF CCC
G C ELECTRONICS COMPANY
HEWLETT-PACKARO CO.
INOUSTRIAL OEVICES, INC.

CLOCKS & CHRONOGRAPHS

CCA ELECTRONICS CORPORATION
CENTRAL OYNAMICS CORPORATION
CHRONO-LOG CORPORATION
G E SUPPLY COMPANY
GENERAL RADIO CO
GIBBS MFG. AND RESEARCH CORP.
RCA BROAOCAST PRODS.
RIKER VIOLED INOUSTRIES
TEXAS FLECTRONICS

COILS - ALSO SEE INDUCTANCES

COILS. ANTENNA LOADING
BARKER & WILLIAMSON
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
OELTA ELECTRONICS INC
GATES RADIO COMPANY
MULTRONICS
PRODELIN. INCORPORATEO
RCA BROADCAST PRODS.
TRW ELECTRONICS

ADC PRODUCTS ALTEC LANSING PERMOPLUX CORPORATION TRW ELECTRONICS UNITED TRANSFORMER COMPANY

ALTEC LANSING ALTEC LANSING
BARKER & WILLIAMSON
CALBEST ELECTRONICS
CCA ELECTRONICS COMPORATION
O & B ELECTRONICS COMPANY
GATES RAOIO COMPANY
E F JOHNSON COMPANY
TRW ELECTRONICS

COILS+ DEFLECTION AND FOCUSING AMERICAN ELITE CLEVELAND ELECTRONICS DEFLECTION COMPONENTS DIV LAKE ELECTRONICS. INC. SINGER PRODUCTS CO. SINGER PRODUCTS CO. TELEGUIP CORPORATION TRW ELECTRONICS

G C ELECTRONICS COMPANY

COILS. HYBRIO ALTEC LANSING RCA BROADCAST PROOS. UNITED TRANSFORMER COMPANY

COILS. TELEPHONE ALTEC LANSING
RCA BROADCAST PROOS.
SINGER PRODUCTS CO.
UNITED TRANSFORMER COMPANY

COMMUNICATIONS SYSTEMS. CB COMMUNICATIONS SYSTEMS. CB
ALTEC LANSING
AMPHENCL DISTRIBUTOR DIVISION
BROWNING LARORATORIES. INC.
COURIER COMMUNICATIONS
F 6 M SYSTEMS COMPANY
HEATH CO
F JOHNSON COMPANY
MILES REPRODUCER CO
MOSELEY ASSOCIATES INC.
THE NOVA COMPANY
PRODELIN. INCORPORATED
RCA ELECTRONIC COMPONENTS
SINGER PRODUCTS CO.
UTICA CORPORATION

COMMUNICATIONS SYSTEMS.
INTERCOM. WIRED
ALTEC LANSING ALTEC LANSING
AMERICAN ELITE
AMERICAN GELOSO ELECTRONICS
ASCO SONOCRAFT CORP
ATLAS SOUND
CALBEST ELECTRONICS
CENTRAL OYNAMICS CORPORATION
OELTA ELECTRONICS. INC.
F 6 M SYSTEMS COMPANY
FISHER RERKELEY CORPORATION
THE JAMES FLOVO FORD CO
HEATH CO
ITT TELECOMMUNICATIONS
MCMARTIN INDUSTRIES
MILES REPRODUCES
OUTHWESTERN COMMUNICATIONS
SOUTHWESTERN COMMUNICATIONS
ULTRA AUDIO PRODUCTS SOUTHWESTERN COMMUNICATION: ULTRA AUDIO PRODUCTS VISUAL ELECTRONICS CORP WARD ELECTRONIC INDUSTRIES

COMMUNICATIONS SYSTEMS.

INTERCOM. WIRELES.
ASCO SONOCRAFT CORP
DELTA ELECTRONICS. INC.
F 6 M SYSTEMS COMPANY
FISHER SERKELEY CORPORATION
THE JAMES FLOYO FORO CO
HEATH CO
E F JOHNSON COMPANY
MILES REPRODUCER CO
ROUND HILL ASSOCIATES
SOUTHWESTERN COMMUNICATIONS
HILLA COPPORATION UTICA CORPORATION

UTICA CORPORATION

COMMUNICATIONS SYSTEMS.
LAND MOBILE
ALTEC LANSING
AMERICAN ELITE
AMPEX CORPORATION
ATLAS SOUNG
CCA ELECTRONICS CORPORATION
F & M SYSTEMS COMPANY
THE JAMES FLOVO FORD CO
J M ELECTRONICS COMPANY
E F JOHNSON COMPANY
MARTI ELECTRONICS
MILES REPRODUCEP CO
MOSFLEY ASSOCIATES INC.
MULTRONICS
THE NOVA COMPANY
PRODELIN. INCORPORATED
RCA BROADCAST PROOS.
SINGER PRODUCTS CO
SOUTH SHORE RADIO TELEPHONE
UTICA CORPORATION

COMMUNICATIONS SYSTEMS. COMMUNICATIONS SYSTEMS.

HICROMAYE
ALTEC LANSING
AMERICAN ELICITE
AMPLIVISION CORPORATION
F 6 M SYSTEMS COMPANY
ITT TELECOMMUNICATIONS
JERROLO ELECTRONICS CORP
LENKURT ELECTRONICS CORP
LENKURT ELECTRONICS ON MARTI ELECTRONICS
MARTI ELECTRONICS
MICROLABY FAX
MICROLINK SYSTEMS/VARIAN ASSMICROLABY ASSOCIATES. INC.
MOSELEY ASSOCIATES. INC.
MOSELEY ASSOCIATES INC.
PRODELIN. INCORPORATEO
RCA BROADCAST PRODS.
RHG ELECTRONICS LABORATORY
SARKES—TARZIAN SARKES-TARZIAN STAINLESS+ INC.

COMMUNICATIONS SYSTEMS.

MULTIPLEX
AMERICAN ELITE
BELAR ELECTRONICS LABORATORY
RROWNING LABORATORIFS. INC.
F & M SYSTEMS COMPANY
ITT TFLECOMMUNICATIONS
LENKURT ELECTRIC CO.. INC.
MCMARTIN INDUSTRIES
MOSELEY ASSOCIATES INC.
RCA BROADCAST PROOS.
RHG ELECTRONICS LABORATORY
SINGER PRODUCTS CO.
TOWNSFRO ASSOCIATES TOWNSENO ASSOCIATES

FULL COLOR FIDELITY WITH COLORVUE SOLID-STATE CATV TRUNK-LINE AMPLIFIERS



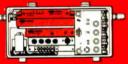
Looking for high-grade color distribution, plus easy field maintenance and low inventory costs?

Then see COLORVUE . . . the solid-state amplifier with the 48dbmv output and 26db operating gain over all 12 channels, low noise figure and VSWR, ±0.25db response flatness and 5C to 220MH_z bandwidth.

And it's truly modular! Just one basic housing and five individual units that plug in-in the field-in seconds and with 1 to 4 feeder lines.



Basic housing with Trunk Amplifier / DC Power Supply (2 modules).



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Yes, COLORVUE is great . . . the result of AEL's exceptional capabilities. Want to know more? Drop us a line or call us at 215/822-2929



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GENERAL ELECTRIC CO
MANCOCK TELECONTROL
MARVEY RADID CO. INC.
HEATH CO.
MINNESOTA MINING - 3 M
SARKES-TARZIAN
S. STERLING COMPANY

COMPUTER SERVICES

ACME VISIBLE RECORDS
THE JAMES FLOYD FORD CO
S. STERLING COMPANY

CONNECTORS. AF 6 MICROPHONE
AMPHENOL DISTRIBUTOR DIVISION
DIALIGHT CORPORATION
ELECTRONICS ESSENTIALS OF CCC
G C ELECTRONICS COMPANY
GENERAL RADIO CO
GOTHAM AUDIO CORPORATION
ITT CANNON ELECTRIC
RCA BROADCAST PRODS.
SMITCHCRAFT, INC.
TROMPETER ELECTRONICS

CONNECTORS. ANTENNA
AMÉCO. INC.
AMÉRICAN PAMCOR, INC
AMPHENOL DISTRIBUTOR DIVISION
AMPLIVISION CORPORATION
BLONDER-TONGUE LABORATORIES
G C ELECTRONICS COMPANY
ITT CANNON ELECTRIC
JERROLD ELECTRONICS CORP
PHELPS DODGE
PRODELIN, INCORPORATED
ROMDE & SCHWARZ SALES CO. -USA
THE TECHNICAL MATERIEL CORP
TROMPFTER ELECTRONICS

CONNECTORS. COAXIAL CABLE

AMERICAN CABLE ELECTRONICS

AMERICAN PAMCOR, INC

AMPHENOL DISTRIBUTOR DIVISION

ANACONDA ASTRODATA CO

ANDREW CORPORATION

BENCO TELEVISION ASSOCIATES

BLONDER-TONGUE LABORATORIES

BLONDER-TONGUE LABORATORIES

BLONDER-TONGUE LABORATORIES

BLONDER-TONGUE LABORATORIES

BLONDER-TONGUE LABORATORIES

BLONDER-TONGUE LABORATORIES

ENGINEERING ASSOCIATES

ENTRON INC

GC ELECTRONICS COMPANY

GENERAL RADIO CO

ITT CANNON ELECTRIC

JERROLO ELECTRONICS CORP

KAISER-COX

NARDA MICROWAVE CORPORATION

PHELPS DODGE

PRODELIN, INCORPORATED

RCA BROADCAST PRODS.

SIMGER PRODUCTS CO.

SPENCER-KENNEDY LABORATORIES

SUPERIDE CABLE CORPORATION

THE TECHNICAL MATERIEL CORP

TELETRONIX

THE THOMAS 6 BETTS CO

TIMES WIRE AND CABLE

TROMPETER ELECTRONICS

VISUAL ELECTRONICS

CONNECTORS. POWER

CONNECTORS. POWER

AMECO. INC.

AMERICAN PAMCOR. INC

AMPHENOL DISTRIBUTOR DIVISION

ITI CANNON ELECTRIC

ROHDE & SCHWARZ SALES CO. -USA

THE THOMAS & BETTS CO

WABER ELECTRONICS, INC.

CONNECTORS. RE
AMECO. INC.
AMERICAN PAMCOR, INC
AMPHENDL DISTRIBUTOR DIVISION
AMPLIVISION CORPORATION
BIRD ELECTRONIC CORPORATION
CRAFTSMAN ELECTRONICS PRODUCTS
ENGINEERING ASSOCIATES
ENTRON INC
GENERAL RADIO CO
ITT CAMNON ELECTRIC
JERROLO ELECTRONICS CORP
MICROWAVE ASSOCIATES, INC.
NARDA MICROWAVE CORPORATION
PHELPS DOOGE
PRODELIN. INCORPORATED
ROMDE 6 SCHWARZ SALES CO. -USA
SUPERIOR CABLE CORPORATION
SWITCHCRAFT, INC.
THE TECHNICAL MATERIEL CORP
THE THOMAS 6 BETTS CO
TIMES WIRE AND CABLE
TROMPETER ELECTRONICS
VITNO ELECTRONICS

CONSOLE, AUDIO: AM
ALMA ENGINEERING INC
AMPEX CORPORATION
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION

COLLINS RADIO COMPANY
CROWN INTERNATIONAL
FAIRCHILD RECORDING EQUIPMENT
G E VISUAL COMMUNICATIONS PROD
GOTHAM AUDIO CORPORATION
HOUSTON ELECTRONICS CO.
IMPEX ELECTRONICS CORP
MID AMERICA ELECTRONICS CORP
RCA BROADCAST PROOS.
SINGER PRODUCTS CO
SPARTA ELECTRONIC CORPORATION
STEPHEMS ELECTRONICS
TELETRONIX
UNITED RADIO SUPPLY, INC
VISUAL ELECTRONICS CORP
WILKINSON ELECTRONICS. INC

WILKINSON ELECTRONICS. INC

CONSOLE: AUDIO: FM
ALMA ENGINEERING INC
ALTEC LANSING
AMPEX CORPORATION
CCA ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
FAIRCHILD RECORDING EQUIPMENT
GATES RADIO COMPANY
GOTHAM AUDIO CORPORATION
HARVEY RADIO CO. INC.
HOUSTON ELECTRONICS CO.
HMEX ELECTRONICS CO.
HMEX ELECTRONICS COP
LITTLE JOE ENTERPRISES.
MID AMERICA ELECTRONICS CORP
CRBIT RADIO
RCA BROACCAST PRODS.
SINGER PRODUCTS CO
SOUTHWESTERN COMMUNICATIONS
SPARTA ELECTRONIC CORPORATION
STANDARD ELECTRONICS CORP.
STEPHENS ELECTRONIC CORPORATION
STEPHENS ELECTRONICS CORP.
STEPHENS ELECTRONICS CORP.
WARD AUDIO PRODUCTS
VISUAL ELECTRONICS CORP
WARD ELECTRONICS INC

CONSOLE, AUDIO, PORTABLE
ALMA ENGINEERING INC
ALTEC LANSING
AMPEX CORPORATION
CCA ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
DATA INSTRUMENT DIVISION
DELTA ELECTRONICS, INC.
GATES RADIO COMPANY
G E VISUAL COMMUNICATIONS PROD
GOTHAM AUDIO CORPORATION
HARVEY RADIO CO. INC.
HOUSTON ELECTRONICS CORP
LANG ELECTRONICS CORP
LANG ELECTRONICS CORP
LANG ELECTRONICS CORP
ORTH AMERICA PHILIPS CO
ORBIT RADIO
ORA BROADCAST PRODS.
SINGER PRODUCTS CO
SOUTHWESTERN COMMUNICATIONS
SPARTA ELECTRONIC CORPORATION
STEPHENS ELECTRONICS
STEPHENS ELECTRONICS
VISUAL ELECTRONICS
VISUAL ELECTRONICS
VISUAL ELECTRONICS
VISUAL ELECTRONICS
VISUAL ELECTRONICS CORP
MARD ELECTRONICIS CORP

CONSOLE: AUDIO: RECORDING

ALMA ENGINEERING INC
ALTEC LANSING
AMERICAN ELITE
AMPEX CORPORATION
ANCHA ELECTRONICS
ASCO SOMOCRAFT CORP
BAUER ELECTRONICS CORPORATION
OATA INSTRUMENT DIVISION
FAIRCHILD RECORDING EQUIPMENT
GATES RADIO COMPANY
GE VISUAL COMMUNICATIONS PROD
GOTHAM AUDIO CORPORATION
HARVEY RADIO CO. INC.
HUDESTON ELECTRONICS CORP
LANG ELECTRONICS, INC
LITTLE JOE ENTERPRISES
MID AMERICA ELECTRONICS CORP
NORTH AMERICAN PHILIPS CO
ORBIT RADIO
RCA BROADCAST PRODS.
SINGER PRODUCTS
CONTINUESTERN COMMUNICATIONS
SPARTA ELECTRONICS
TELETRONIX
ULTRA AUDIO PRODUCTS
UNITED RADIO SUPPLY. INC
VISUAL ELECTRONICS CORP
UNITED RADIO SUPPLY. INC
VISUAL ELECTRONICS CORP
WARD ELECTRONICS INC

CONSOLE, AUDIO, TY

ALMA ENGINEERING INC
ALTEC LANSING
AMPEX CORPORATION
ANCHA ELECTRONICS CORPORATION
BLONDER-TONGUE LABORATORIES
CCA ELECTRONICS CORPORATION
CENTRAL DYNAMICS CORPORATION
COLLINS RADIO COMPANY
OATA INSTRUMENT DIVISION
FAIRCHILD RECORDING EQUIPMENT
GATES RADIO COMPANY
G E VISUAL COMMUNICATIONS PROD

GOTHAM AUDID CORPORATION
HOUSTON ELECTRONICS CO .
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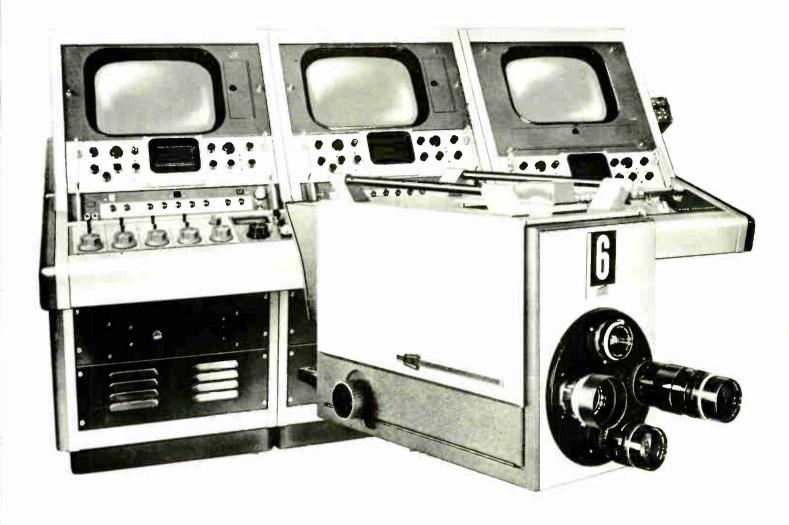
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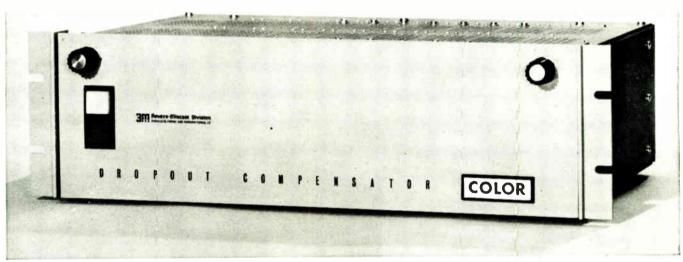
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Revere-Mincom conquers the Color Dropout Problem

When color VTR is subjected to ordinary dropout compensation techniques, some improvement may result. Often, however, these primitive techniques generate effects more distracting than the dropout itself. Two examples: 1. Switching transients due to FM substitution. 2. Color phase inversion caused by one-line information delay.

Revere-Mincom's Color Dropout Compensator solves the problem of keeping the Danube blue, Hornets green, and signals in the pink. It's compatible with all time correction units, Hi-Band, Low Band, Color and Monochrome.

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0 & B ELECTRONICS COMPANY
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ANACONDA ASTRODATA CO
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BLONDER-TONGUE LABORATORIES
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AUDIO DEVICES
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GOTHAM AUDIO CORPORATION
KOSS ELECTRONICS. INC.
LIPPS. INC.
SCULLY RECORDING INSTRUMENTS
SINGER PRODUCTS CO.

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FAIRCHILD RECORDING EQUIPMENT
JOA CARTRIDGE SERVICE
LIPPS, INC.
MAGNA-TECH CORPORATION
NORTRONICS COMPANY. INC
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SCULLY RECORDING INSTRUMENTS
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STABILIZATION SYSTEM
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INDUCTANCES. FIXED INDUCTANCES. FIXED

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G C ELECTRONICS COMPANY
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TREPAC CORPORATION OF AMERICA
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The Broadcast Industry's Source for **Direct Replacement Tape Heads**

■ FOR PROFESSIONAL REEL-TO-REEL MACHINES

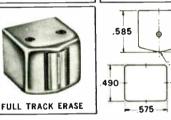


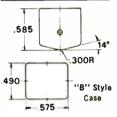






2-TRACK MONO R/P





■ Head Mounting Brackets for Professional Machines



OK-76 contains all hardware and illustrated in-structions necessary to original Ampex equipment...Net Each

QK-35 is a special base-mount bracket kit for

FOR CARTRIDGE MACHINES



YOUR LOCAL DISTRIBUTOR STOCKS THE FULL LINE OF NORTRONICS TAPE HEADS AND ACCESSORIES

QUIK-KITS (Head Mounting Assemblies)—Tape Guides -Alignment Tape-Connector Assemblies-Bias Oscillator Transformers-Replacement Heads for over 1500 models . . . Consult your distributor for full information.

| Manufacturer and Model | Original Function | Nortronics | Net,† Less |
|---|--|--|---|
| Numbers | | Head + Quik-Kit | Quik-Kit |
| | Record, Full Track | 8001 + 76 | \$36.00 |
| | Play, Full Track | 8000 + 76 | 36.00 |
| | Erase, Full Track (for all but 300 series) | 8109 + 76 | 30.00 |
| | Erase, Full Track (for 300 series only) | 8106 + 76 | 30.00 |
| 300, 350, 354, 400 Series NOTE: On PR-10, 600. | Record Mono, 2-Track | 8401 + 76 | 22.00 |
| | Play Mono, 2-Track | 8400 + 76 | 22.00 |
| | Erase Mono, 2-Track | 8504 + 76 | 18.00 |
| 900 and 1200 Series, | Record Stereo, 2-Track | 8201 + 76 | 32.00 |
| use QK-66 instead | Play Stereo, 2 Track | 8200 + 76 | 32.00 |
| of QK-76. | Erase Stereo, 2-Track | 8304 + 76 | 26.00 |
| | Record Stereo, 4-Track | 8604 + 76 | 30.00 |
| | Play Stereo, 4-Track | 8600 + 76 | 30.00 |
| | Erase Stereo, 4-Track | 8701 + 76 | 26,00 |
| 3200 | Record, Full Track Play, Full Track Record Stereo, 2-Track Play Stereo, 2-Track Record Stereo, 4-Track Play Stereo, 4-Track Play Stereo, 4-Track Record Mono, 2-Track Play Mono, 2-Track | 8004 + 76 8008 + 76 8214 + 76 8210 + 76 8614 + 76 8610 + 76 8414 + 76 8402 + 76 | 40.00 36.00 32.00 32.00 30.00 22.00 22.00 |
| CROWN 701, 801, BX801, 1001, 1401 | Play only or Record/Play, Full Track Record, Full Track Erase, Full Track | 8006 + 35 8001 + 35 8102 + 35 | 36.00 36.00 30.00 |
| 712, 822, BX822, 1022, 1422/8 | Play only or Record/Play Stereo, 2-Track | 8209 + 35 | 32.00 |
| | Record Stereo, 2-Track | 8201 + 35 | 32.00 |
| | Erase Stereo, 2-Track | 8304 + 38 | 26.00 |
| 702, 802, BX802, 1002, 1402/8 | Play only or Record/Play Mono, 2-Track | 8403 + 35 | 22.00 |
| | Record Mono, 2-Track | 8404 + 35 | 22.00 |
| | Erase Mono, 2-Track | 8504 + 38 | 18.00 |
| A51, A314 | Play only Mono, 2-Track | 8406 + 66 | 22.00 |
| A54, A324 | Play only Stereo, 4-Track | 8608 + 66 | 30.00 |
| 714C, 824, BX824, 1024, 1424 | Play only or Record/Play Stereo, 4-Track | 8608 + 66 | 30.00 |
| | Record Stereo, 4-Track | 8608 + 66 | 30.00 |
| | Erase Stereo, 4-Track | 8701 + 38 | 26.00 |
| MAGNECORD 1021 *No QK required | Record, Full Track Play Mono, 2-Track Erase, Full Track Play, Full Track (Optional) | 8005 * 8408 * 8102 * 8006 * | 40.00 22.00 30.00 36.00 |
| 1022 *No QK required | Record Stereo, 2-Track Play Stereo, 2-Track Erase Stereo, 2-Track | 8203 * 8202 * 8302 * | 35.00 35.00 26.00 |
| 1024 *No QK required | Record Stereo, 4-Track Play Stereo, 4-Track Erase Stereo, 4-Track | 8602 * 8607 * 8702 * | 30.00 30.00 26.00 |
| P60, P75, M90 *No QK required | Record, Full Track Play, Full Track Erase, Full Track | 8001 + 35 8000 + 35 8105 + 35 | 36.00 36.00 30.00 |
| R.C.A. | Record, Full Track | 8002 * | 68.00 |
| | Play, Full Track | 8003 * | 54.00 |
| | Erase, Full Track | 8110 * | 68.00 |
| RT21 *No QK required | Record Stereo, 2-Track Play Stereo, 2-Track Erase Stereo, 2-Track | 8206 * 8205 * 8307 * | 42.00 54.00 48.00 |

NO-MOUNT and REAR-MOUNT HEADS FOR ATC, Collins, Gates, KRS, Macarta, RCA, Sparta, Tapecaster

FOR REPLACEMENT OR NAB CONVERSION. FULL LISTINGS IN NORTRONICS BULLETIN 7230A. SEND FOR YOUR COPY.

■ No-Mount Head Bracket Assembly for Cartridge Machines

OK-114 installs two no-mount dual channel heads for monophonic use, or two no-mount three channel heads for stereo operation. Left head is for recording; right head for playback. Requires heads similar to 2000 Series. Com-

OK-115 installs two no-mount monophonic 2-track heads (see monitor conversion information below). Requires heads similar to 3000 Series. Completely

BOTH QK-114 AND QK-115 FURNISHED WITH CARTRIDGE HOLD-DOWN SPRING AND CARTRIDGE GUIDE RAIL.

NAB CONVERSION TO MONITOR-As all professional users of tape equipment know, superior results can be achieved by using a special record-only head plus a separate playback head. Professionals also appreciate the ability to be able to monitor a tape as it is being recorded. Nortronics offers a conversion to monitor operation to update cartridge machines,

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MARCONI INSTRUMENTS
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OELTA ELECTRONICS INC
OEMORNAY - BONAROI OIVISION
ENGINEER ING ASSOCIATES
GENERAL MICROWAVE CORPORATION
HEWLETT-PACKARO CO.
NAROA MICROWAVE CORPORATION
ROMOE & SCHWARZ SALES CO. -USA
STANDARO ELECTRONICS CORP THE TECHNICAL MATERIEL CORP

METERS - SEE SPECIFIC TYPE
API INSTRUMENTS CO.
COMU ELECTRONICS
HEWLETT-PACKARO CO.
HICKOK ELECTRICAL INSTRUMENT
LAMPKIN LABORATORIES INC
MCMARTIN INOUSTRIES
THE SINGER CO - METRICS OIV

MICROPHONE HARDWARE
ALTEC LANSING
AMECO. INC.
AMERICAN GELOSO ELECTRONICS
ELECTRONICS ESSENTIALS OF CCC
G C ELECTRONICS COMPANY
GOTHAM AUDIO CORPORATION
NORTH AMERICAN PHILIPS CO
RCA BROADCAST PROOS.
RCA ELECTRONIC COMPOMENTS
ROBINS INOUSTRIES CORP.
SHURE BROTHERS, INC.
SYLVANIA-COMM. ELECTRONICS DIV
TRUSONIC
TURNER MICROPHONE CO
VISUAL ELECTRONICS CORP

VISUAL ELECTRONICS CORP

MICROPHONE STANDS & BOOMS
ALTEC LANSING
AMERICAN GELOSO ELECTRONICS
THE ASTATIC CORPORATION
E J BAUGHMAN CO
CENTURY LIGHTING. INC.
G C ELECTRONICS COMPANY
GOTHAM AUDIO CORPORATION
MOLE-RICHAROSON CO.
NORTH AMERICAN PHILIPS CO
RCA BROADCAST PROOS.
RCA ELECTRONIC COMPONENTS
SHURE BROTHERS. INC.
SYLVANIA-COMM. ELECTRONICS DIV
TELEVISION UTILITIES CORP
TURNER MICROPHONE CO
VISUAL ELECTRONICS CORP

MICROPHONES, CONDENSER
ALTEC LANSING
AMERICAN ELITE
GOTHAM AUDIO CORPORATION
NORTH AMERICAN PHILIPS CO
RCA ELECTRONIC COMPONENTS
SINGER PRODUCTS CO.
SONY CORPORATION OF AMERICA
SPARTA ELECTRONIC CORPORATION
SYNCRON CORPORATION
TRUSONIC
VEGA ELECTRONICS CORPORATION
VISUAL ELECTRONICS CORP

MICROPHONES, DYNAMIC ALTEC LANSING AMERICAN ELITE AMERICAN GELOSO ELECTRONICS AMPEX CORPORATION
THE ASTATIC CORPORATION
CALIFONE/ROBERTS
ELECTRO-VOICE INC
GATES RAOIO COMPANY
GC ELECTRONICS COMPANY
MCMARTIN INOUSTRIES
MILES REPRODUCER CO
NORTH AMERICAN PHILIPS CO
PERMOFLUX CORPORATION
RCA BROADCAST PRODS.
RCA ELECTRONIC COMPONENTS
ROBINS INOUSTRIES CORP.
SHURE BROTHERS. INC.
SINGER PRODUCTS CO
SONY CORPORATION OF AMERICA
SPARTA ELECTRONIC CORPORATION
SYLVANIA-COMM. ELECTRONICS OIV
TURNER MICROPHONE CO
VISUAL ELECTRONICS CORP

MICROPHONES. VELOCITY
RCA BROACCAST PROOS.
RCA ELECTRONIC COMPONENTS
SINGER PRODUCTS CO.
VISUAL ELECTRONICS CORP

MICROPHONES, WIRELESS
AMERICAN GELOSO ELECTRONICS
MILES REPRODUCER CO
SINGER PRODUCTS CO
SONY CORPORATION OF AMERICA
SPARTA ELECTRONIC CORPORATION
TRUSONIC
VEGA ELECTRONICS CORPORATION
VISUAL ELECTRONICS CORP

MICROWAVE COMPONENTS

ALFORD MANUFACTURING COMPANY
AMECO, INC.

AMERICAN ELITE
AMPFREX ELECTRONIC CORP
ANDREW CORPORATION
BIRD FLECTRONIC CORPORATION
CAROWELL CONDENSER CORP
OF COMPONENT CORPORATION
EIMAC OLVISION OF VARIAN
ENGINEERING ASSOCIATES
ELECTRONICS ESSENTIALS OF CCC
GENERAL ELECTRIC CO
GENERAL FOR CO.

JERNOLO ELECTRONICS CORP
LITTON FOUCATIONAL TELE OLV
MICROLAB / FXR
MICROLINK SYSTEMS/VARIAN ASSOMICROWAVE ASSOCIATES. INC.
MOTOROLA SEMICONDUCTOR
NAROA MICROWAVE ASSOCIATES. INC.
MOTOROLA SEMICONDUCTOR
NAROA MICROWAVE ASSOCIATES. INC.
MOTOROLA SEMICONDUCTOR
NAROA MICROWAVE ASSOCIATES.

MICROLINK SYSTEMS/VARIAN ASSOMICROWAVE ASSOCIATES.

MICROLINK SYSTEMS/VARIAN ASSOMICROWAVE ASSOCIATES.

MICROLING JETTONICS CORPORATION
PHELPS OOOGE
PRODELIN, INCORPORATEO
RAYTHEON CO EQUIPMENT OIVISION
RCA BROADCAST PROOS.

RMG ELECTRONICS LABORATORY
ROHOE 6 SCHWARZ SALES CO. -USA
SCIENTIFIC—ATLANTA
SOLITRON OEVICES
SYLVANIA—SEMICONOUCTOR OIV.

TEXAS INSTRUMENTS

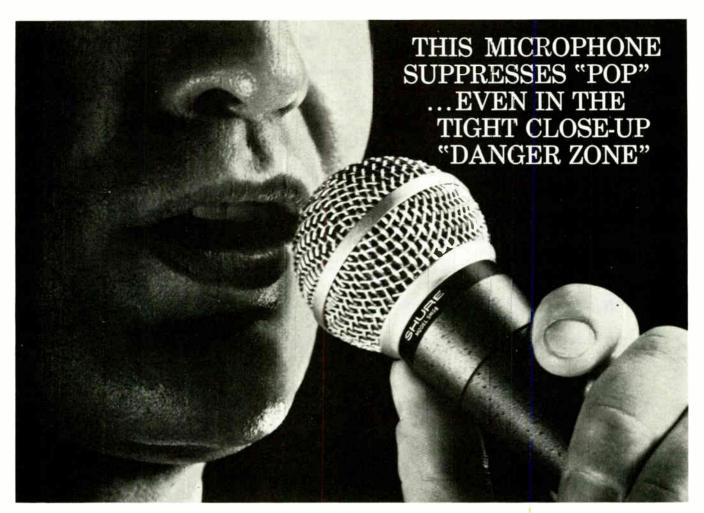
ICROWAVE SYSTEMS. STL

AMECO. INC.
COLLIMS RADIO COMPANY
OEMORNAY - BONAROI OIVISION
F 6 M SYSTEMS COMPANY
JERROLO ELECTRONICS CORP
LENKURT ELECTRIC CO.. INC.
LITTON EDUCATIONAL TELE OIV
MARTI ELECTRONICS
MICROLAB / FXR
MICRO-LINK SYSTEMS/VARIAN ASSO
MICROWAVE ASSOCIATES. INC.
MOSELEY ASSOCIATES. INC.
MOSELEY ASSOCIATES INC.
PRODELIN. INCORPORATEO
RAYTHEON CO EQUIPMENT OIVISION
RCA BROADCAST PROOS.
RIG ELECTRONICS LABORATORY
SARKES-TARZIAN
SINGER PROOUCTS CO
TELETRONIX

MICROWAVE SYSTEMS, 2500 MHZ

AMERICAN ELITE
OFMORMAY - BONAROI OIVISION
EMCEE
F & M SYSTEMS COMPANY
ITT TELECOMMUNICATIONS
JERROLO ELECTRONICS CORP
LITTON EOUCATIONAL TELE OIV
MICROLAB / FXR
MICRO-LINK SYSTEMS/VARIAN ASSO
PRODELIN. INCORPORATEO
RAYTHEON CO EQUIPMENT OIVISION
RCA BROADCAST PROOS.
RHG ELECTRONICS LABORATORY

MICROWAVE SYSTEMS, OTHER
CARDWELL CONDENSER CORP
EMCEE
F 6 M SYSTEMS COMPANY
JERROLD ELECTRONICS CORP
MICROLAB / FXR
MICRO-LINK SYSTEMS/VARIAN ASSO
MICROWAVE ASSOCIATES, INC.
NAROA MICROWAVE CORPORATION
RAYTHEON CO EQUIPMENT OIVISION
RCA BROADCAST PROOS.
RHG ELECTRONICS LABORATORY
MIXERS - ALSO SEE CONSOLES.
AMERICAN GELOSO ELECTRONICS
BAUER ELECTRONICS CORPORATION
BIRNS & SAWYER
BLONDER-TONGUE LABORATORIES
CENTRAL OYNAMICS CORPORATION



The Shure SM58 self-windscreened unidirectional microphone is ideal for broadcast uses such as remote news, sports, interview and vocal recordings because it eliminates or minimizes the irritating "pop" caused by explosive breath sounds. With the SM58 you will have the peace-of-mind assurance that you're delivering the quality audio that goes with pop-free pickup. It's great for studio announcing, too---or wherever the announcer or vocalist has the audio-degrading habit of "mouthing" the microphone. Of course, the same filters that eliminate pop also do away with the necessity for an add-on windscreen in outdoor uses.

On the other hand, the unusually effective unidirectional cardioid pickup pattern (uniform at all frequencies, in all planes) means that it is a real problem-solver where background noise is high or where the microphone must be operated at some distance from the performer, incidentally,

but very important, the SM58 tends to control the low frequency "boominess" that is usually accented by closeup microphones.

All in all, close up or at a distance, the Shure SM58 solves the kind of ever-present perplexing problems the audio engineer may have felt were necessary evils. The SM58 might well be the finest all-purpose hand-held microphone in manufacture today. And, all things considered, it is moderate in cost.

Other features: the complete pop-proof filter assembly is instantly replaceable in the field, without tools. Filters can be easily cleaned, too. Stand or hand operation. Detachable cable. Rubber-mounted cartridge minimizes handling noise. Special TV-tested non-glare finish.

For additional information, write directly to Mr. Robert Carr, Manager of Professional Products Division, Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois 60204.

SELF-WINDSCREENED UNIDIRECTIONAL DYNAMIC MICROPHONE

OTHER SHURE PROFESSIONAL MICROPHONES...FOR SUPERIOR AUDIO



MODEL SM5 CARDIOID BOOM DYNAMIC

Because its cardioid directional pattern is uniquely uniform with frequency and symmetrical about its axis, the SM5 is singularly independent of the effects of environment. Even in extreme shooting situations (such as with tight sets, low ceilings, hard walls, low microphone angles, traffic or air-conditioner noise and rumble and changing distance) the SM5 minimizes sound coloration and ambient noise pickuo. minimizes sound coloration and ambient noise pickup.

MODEL SM76 34" OMNIDIRECTIONAL DYNAMIC

Ideal for interviews and audience participation, yet unusually smooth wide range response (40-20 KC) for critical music reproduction. Instantly detachable from stand. Steel case with Cannon



MODEL SM50 **OMNIDIRECTIONAL** DYNAMIC

Self-windscreened and pop-free for news, sports, remotes, and interviews. Also ideal for many studio and control room applications. Comfortably balanced for hand or stand use. Natural response.

FAIRCHILD RECORDING EQUIPMENT
GOTHAM AUDIO CORPORATION
HARVEY RADIO CO. INC.
HOUSTON ELECTRONICS CO.
LAMG ELECTRONICS. INC
MICROLAB / FXR
NORTH AMERICAN PHILIPS CO
ORBIT RADIO
RCA BROADCAST PROOS.
SHURE BROTHERS, INC.
SINGER PRODUCTS CO
SOUNDCRAFT INDUSTRIES
SOUTHMESTERN COMMUNICATIONS
SPARTA ELECTRONIC CORPORATION

MOBILE EQUIPMENT

AMERICAN ELITE

AMERICAN GELOSD ELECTRONICS

AMPEX CORPORATION

ANDREW CORPORATION

ATLAS SOUND

CENTRAL DYNAMICS CORPORATION

COURIFR COMMUNICATIONS

F & M SYSTEMS COMPANY

G E COMMUNICATION PRODUCTS

J M ELECTRONICS COMPANY

E F JOHNSON COMPANY

MARTI ELECTRONICS

MICROWAVE ASSOCIATES INC.

MOSELEY ASSOCIATES INC.

THE NOVA COMPANY

TCA BROADCAST PRODS.

SINGER PRODUCTS CO

SYLVANIA-COMM. ELECTRONICS DIV

UTICA CORPORATION

H. WILSON CORPORATION

MOBILE EQUIPMENT. TV ELECTRONIC MOBILE UNITS TELE - DEVICES CD.

MODULATORS: TY
AMECO: INC:
BLONDER-TONGIE LABDRATORIES
CATEL COMPANY
DYNAIR ELECTRONICS: INC:
EMCEE
INTERNATIONAL NUCLEAR CORP:
JERROLD ELECTRONICS CORP
MARCONI DIVISION
ROMDE & SCHWARZ SALES CO: -USA
STANDARD ELECTRONICS CORP :
SYLVANIA-COMM: ELECTRONICS DIV
TELEQUIP CORPORATION
TOWNSEND ASSOCIATES

MONITORS: AM SYSTEMS
ALTEC LANSING
BELAR ELECTRONICS LABDRATDRY
CCA ELECTRONICS CORPORATION
COLLINS RADID COMPANY
GATES RADIO COMPANY
GE VISUAL COMMUNICATIONS PROD
MELCOR ELECTRONICS
RCA BROADCAST PRODS.
SINGER PRODUCTS CO
SOUTHMESTERN COMMUNICATIONS
TREPAC CORPORATION OF AMERICA
VISUAL ELECTRONICS
WILKINSON ELECTRONICS
WILKINSON ELECTRONICS.

MONITORS, FM SYSTEMS, MONO
ALTEC LANSING
AMECO, INC.
BELAR ELECTRONICS LABORATORY
BROWNING LABDRATORIES, INC.
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
HEWLETT-PACKARD CD.
KARG LABDRATORIES
MCMARTIN INDUSTRIES
MELCOR ELECTRONICS
RCA BROADCAST PRODS.
SINGER PRODUCTS CD.
SDUTHWESTERN COMMUNICATIONS
UTICA CORPORATION
VISUAL ELECTRONICS

MONITORS, FM SYSTEMS, SCA
BELAR ELECTRONICS LABORATORY
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
MCMARTIN INDUSTRIES
RCA BROADCAST PRODS.
SINGER PRODUCTS CO
VISUAL ELECTRONICS CORP

MONITORS. FM SYSTEMS. STEREO
AMECD. INC.
BELAR ELECTRONICS LABORATORY
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
GOTHAM AUDIO CORPORATION
KARG LABORATORIES
MCMARTIN INDUSTRIES
MELOR ELECTRONICS
RCA BROADCAST PRODS.
SINGER PRODUCTS CO.
VISUAL ELECTRONICS CORP

WONITORS: FREQUENCY
AMECO: INC.
BELAR ELECTRONICS LABORATORY
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
G E VISUAL COMMUNICATIONS PROD
HEWLETT-PACKARD CO.
LAMPKIN LABORATORIES INC
MCMARTIN INDUSTRIES

MICROLAB / FXR
RCA BROADCAST PRODS.
THE SINGER CO - METRICS DIV
SINGER PRODUCTS CO
TELETRONIX
VISUAL ELECTRONICS CORP
WILKINSON ELECTRONICS: INC

MONITORS, MODULATION LAMPKIN LABORATORIES INC

MONITORS, PHASE
GATES RADIO COMPANY
MICROLAR / FXR
MULTRONICS
RCA BROADCAST PRODS.
VISUAL ELECTRONICS CORP

MONITORS: POWER
F W BELL: INC
BIRD ELECTRONIC CORPORATION

BIRD ELECTRONIC CORPORATION

MONITORS, VIDEO

AMECO. INC.
AMPEX CORPORATION
AMPLIVISION CORPORATION
REDNORE-TONGUE LABORATORIES
COMH ELECTRONICS
CORRAC
DIAMOND ELECTRONICS
GBC AMERICA COMPORATION
G E VISUAL COMMUNICATIONS PROD
LAKE ELECTRONICS. INC.
LAVIOLETTE ELECTRONICS
MARYLAND TELECOMMUNICATIONS
MIRATEL ELECTRONICS, INC
RCA BROADCAST PRODOS.
SARKES-TARZIAN
SETCHELL CARLSON INCORPORATED
THE SINGER CD - METRICS DIV
SONY CORPORATION DF AMERICA
SYLVANIA-COMM. ELECTRONICS DIV
TELEQUIP CORPORATION
TELEQUIP CORPORATION
TELEQUIP CORPORATION
TELEQUIP CORPORATION
TELEVISION UTILITIES CORP
MONITORS. WAVEFORM

MONITORS. WAVEFORM
COLDRADO VIDED
HEWLETT-PACKARD CD.
MARCOMI DIVISION
RCA BROADCAST PRODS.
THE SINGER CO - METRICS DIV
SONY CORPORATION OF AMERICA
SYLVANIA-COMM. ELECTRONICS DIV
TEXTRONIX INC.
VISUAL ELECTRONICS CORP

MOTORS: ELECTRIC - SEE HARDWARE TOWNSEND ASSOCIATES

MOUNTS: ANTENNA: FIXED

AMCOD, INC.

ANDREW CORPORATION
GATES RADIO COMPANY
G C ELECTRONICS COMPANY
JERROLD ELECTRONICS CORP
LIBERTY TOWER MFG. CD
PRODELIN: INCORPORATED
RAYTHEON CD EQUIPMENT DIVISION
RCA BROADCAST PRODS.
ROHN MANUFACTURING CO.
SCIENTIFIC-ATLANTA
TECHNICAL APPLIANCE CORP
TELEQUIP CORPORATION

MOUNTS, ANTENNA, MOBILE
GATES RADIO COMPANY
G C ELECTRONICS COMPANY
PRODELIN, INCORPORATED
RAYTHEDN CO EQUIPMENT DIVISION
RCA BROADCAST PRODS.
IECHNICAL APPLIANCE CORP
TELEGUIP CORPORATION
UTICA CORPORATION
WATERS MANUFACTURING

MOUNTS, INSTRUMENT ATLAS SOUND BIRNS & SAWYER TELEQUIP CORPORATION UTICA CORPORATION

MOUNTS. VIBRATION AND SHOCK ELECTROVERT. INCORPORATED MINNESDTA MINING - 3 M

MULTIPLEXERS

DAGE BELL CORPORATION
RCA BRADCAST PRODS.
SYLVANIA-COMM. ELECTRONICS DIV
TELEMATION. INC.
VIDEON CORPORATION

NAMEPLATES

D & B ELECTRONICS COMPANY
MINNESOTA MINING - 3 M

NARROW BAND FM EQUIPMENT AMECO. INC. AMPLIVISION CORPORATION COURTER COMMUNICATIONS MARTI ELECTRONICS MOSELEY ASSOCIATES INC. SINGER PRODUCTS CO STANDARD ELECTRONICS CORP TOWNSEND ASSOCIATES UTICA CORPORATION

NEEDLES + CUTTING - SEE STYLE

NEEDLES+ PLAYBACK - SEE STYLT

NETWORKS, MATCHING, AUDIO ALTEC LANSING GATES RADIO COMPANY
HARTLEY PRODUCTS
LANGEVIN
SOUTHWESTERN COMMUNICATIONS
STEPHENS ELECTRONICS

NETWORKS, MATCHING. RE ALFORD MANUFACTURING COMPANY AMECO, INC. AMPLIVISION CORPORATION CCA ELECTRONICS CORPORATION NARDA MICROWAVE CORPORATION TELDNIC INDUSTRIES

NETWORKS. PHASING

AMERICAN ELECTRONIC LABS
AMPLIVISION CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
JERROLD ELECTRONICS CORP
MULTRONICS
RCA BROADCAST PRODS.
SINGER PRODUCTS CO.
SOUTHMESTERN COMMUNICATIONS
WARD ELECTRONIC INDUSTRIES

OHMMETERS
COMU ELECTRONICS
EMGINEERING ASSOCIATES
GOTHAM AUDID CORPORATION
HEATH CO
HEWLETT-PACKARD CO.
HICKOK ELECTRICAL INSTRUMENT
INSTRUMENT LABORATORIES CORP
RCA ELECTRONIC COMPOMENTS
TRIPLETIT ELECTRICAL INSTRUMENT
YOKOGAWA ELECTRIC WORKS

OSCILLATORS, AF AND RF.

ALSO SEE GENERATORS
BENRUS
CCA FLECTRONICS CORPDRATION
ENGINEERING ASSOCIATES
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GIRBS MFG. AND RESEARCH CORP.
HEATH CO.
HENLETT-PACKARD CD.
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MICROLAB / FXR
NARDA MICROWAVE CORPORATION
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ROHDE 6 SCHWARZ SALES CO. -USA
SCIENTIFIC-ATLANTA
SOUNDCRAFT INDUSTRIES
TREPAC CORPORATION DF AMERICA
WAMFEORMS, INCORPORATED

OSCILLATORS: AM
CCA ELECTRONICS CORPDRATION
ELECTRONIC RESEARCH COMPANY
ENGINEERING ASSOCIATES
GATES RADIO COMPANY
GENERAL RADIO CD
GIBBS MFG. AND RESEARCH CDRP.
HEATH CO.
HICKOK ELECTRICAL INSTRUMENT
MARCONI INSTRUMENTS
ROHDE 6 SCHWARZ SALES CO. -USA
SOUTHWESTERN COMMUNICATIONS

OSCILLATORS. FM
BELAR ELECTRONICS LABORATORY
CCA ELECTRONICS CORPORATION
ELECTRONIC RESEARCH COMPANY
GATES RADID COMPANY
GATES RADID COMPANY
GIBBS MFG. AND RESEARCH CORP.
HEATH CD
HICKOK ELECTRICAL INSTRUMENT
MARCONI INSTRUMENTS
ROHDE & SCHWARZ SALES CD. - USA
SOUTHWESTERN COMMUNICATIONS
STANDARD ELECTRONICS CORP.

OSCILLATORS, TV
GATES RADIO COMPANY
GIBBS MFG. AND RESEARCH CORP.
HEATH CD
HICKOK ELECTRICAL INSTRUMENT
RIKER VIDEO INDUSTRIES
ROHDE & SCHWARZ SALES CD. -USA
STANDARD ELECTRONICS CORP
TELEMET COMPANY
VIDEON CORPORATION

OSCILLATORS, OTHER
EIMAC DIVISION DF VARIAN
ELECTRONIC RESEARCH COMPANY
ENGINEERING ASSOCIATES
GIBBS MFG. AND RESEARCH CORP.
MARCONI INSTRUMENTS
NARDA MICROWAVE CORPORATION
ROHDE 6 SCHWARZ SALES CD. -USA
TELONIC INDUSTRIES
WAVEFORMS. INCORPORATED

OSCILLOSCOPES
ALLIED ELECTRONICS CDRP
BENRUS
COLDRADD VIDED
DATA INSTRUMENT DIVISION
ENGINEERING ASSOCIATES
HEATH CO
HICKOK ELECTRICAL INSTRUMENT
ITI ELECTRONICS, INC.
RCA BROADCAST PRODS.
RCA ELECTRONIC COMPONENTS
TEKTRONIX INC
TELEGUIP CORPORATION

OVENS: CRYSTAL

ELECTRONIC RESEARCH COMPANY
SINGER PRODUCTS CO.
TRW ELECTRONICS

PANELS - SEE HAROWARE

PANELS. INSTRUMENT;
FOR RACK MOUNTING ALSO SEE HARDWARE
BUD RADIO: INC
COLDRYRAN INOUSTRIES - BERKEY
GENERAL ELECTRIC CO
SOUTHWESTERN COMMUNICATIONS
TELEGUIP CORPORATION
YENT-RAK INCORPORATED
YOKOGAWA ELECTRIC WORKS

PAPER, CHART AND GRAPH ENGINEERING ASSOCIATES MINNESOTA MINING - 3 M SCIENTIFIC-ATLANTA

PHASING UNITS SEE

PHONOGRAPH TURNTABLES -SEE TURNTABLES

CUSTOM CRAFT DESIGNS

PLOWS: CABLE LAYING

PLUGS. COAXIAL
ADC PRODUCTS
AMECO. INC.
AMERICAN PAMCDR. INC
AMPHENDL DISTRIBUTOR DIVISION
ENGINEERING ASSOCIATES
ELECTRONICS ESSENTIALS DF CCC
GENERAL RADIO CO
JAMPRO ANTENNA COMPANY
PHELPS DODGE
RCA BROADCAST PRODS.
ROBINS INDUSTRIES CORP.
SINGER PRODUCTS CO.
THE TECHNICAL MATERIEL CORP
TROMPETER ELECTRONICS

PLUGS. PHONE

ADC PRODUCTS
AMPHENOL DISTRIBUTOR DIVISION
AUDIO ACCESSORIES
BIRNBACH CO
G. CELECTRONICS COMPANY
MALLORY DISTRIBUTOR PRODUCTS
RCA BROADCAST PRODS.
ROBINS INDUSTRIES CORP.
SYITCHCRAFT. INC.

POLE CLIMBING EQUIPMENT AMECO+ INC+ PRUZAN COMPANY

POTENTIOMETERS, CARBON

AMERICAN ELITE
AMPHENOL DISTRIBUTOR DIVISION
CENTRALAB
GOTHAM AUDIO CORPORATION
IRC. INC.
OHMITE MANUFACTURING COMPANY
SINGER PRODUCTS CO.

POTENTIOMETERS, WIREWOUND
ALTEC LANSING
AMPHEMOL DISTRIBUTOR DIVISION
CENTRALAB
ENGINEERING ASSOCIATES
GENERAL RADIO CO
IRC. INC.
OHHITE MANUFACTURING COMPANY
PAINTON INCORPORATED
SINGER PRODUCTS CO.
WATERS MANUFACTURING

WATERS MANUFACTURING

POWER SUPPLIES, AC.

ADC PRODUCTS
ALTEC LANSING
AMECO. INC.
ANACONDA ASTRDDATA CD
BIRNS & SAWYER
BLONDER-TONGUE LABORATORIES
COMU ELECTRONICS
CORNELL-DUBILIER ELECTRONICS
D & B ELECTRONICS COMPANY
ENGINEERING ASSOCIATES
FAIRCHILD RECORDING EQUIPMENT
GATES RADIO COMPANY
GENERAL ELECTRIC CO
GENERAL RADIO CO
GENERAL RADIO COD
GENERAL RADIO COD
HEATH CO
JERDLD ELECTRONICS CORP
POWER SOURCES
THE SINGER CO - METRICS DIV
SOLA ELECTRIC
SORENSON OPERATION—RAYTHEON CD
STACO. INC.
STANDARD ELECTRONICS CORP
TELEGUIP CORPORATION
TREPAC CORPORATION OF AMERICA

POWER SUPPLIES, DC

ADC PRODUCTS
ALMA ENGINEERING INC
ALTEC LANSING
AMECO- INC.
BIRNS & SAWYER
BLOWDER-TONGUE LABORATORIES
CENTURY PROJECTOR CORPORATION
COMU ELECTRONICS
CORNELL-OUBILIER ELECTRONICS
DELTA ELECTRONICS. INC.
ELECTRO PRODUCTS LABORATORIES
ENGINEERING ASSOCIATES

Tektronix Television Instruments

Type 526 Vectorscope **Chroma-Signal Displays**

color encoder adjustments differential phase measurements differential gain measurements vertical-interval-test-signal (VITS) displays

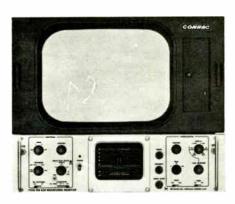
video tape-recorder setup



Measuring amplitude changes and phase shifts can be done accurately, conveniently, and independently with the Vectorscope. The Vectorscope presents relative phase

and amplitude displays (of chrominance information in the N.T.S.C. color signal). Dual-trace capability permits simultaneous display of two color signals for precise matching of phase and amplitude. In addition to the vector display, the Vectorscope can present the chroma signal demodulated along any phase-angle with respect to time.

Type 526 Vectorscope Size is $8\frac{3}{4}$ " high, 19" wide, and 18" deep. Weight is \sim 45 pounds. Designed for rack mounting.





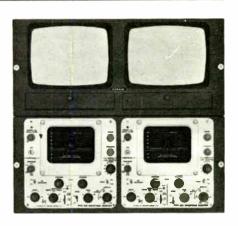
Type 529/RM529 for **Waveform Monitoring**

vertical-interval-test-signal (VITS) displays

sine-squared pulse and bar testing transmitter modulation monitoring YRBG or RBG displays (with colorprocessing amplifiers)

video signal-level monitoring bandwidth measurements differential-gain measurements

In waveform-monitoring applications, the Type 529 and RM529 offer 2 LINE and 2 FIELD displays plus calibrated sweep rates of 0.25 H/cm, 0.125 H/cm, 0.025 H/cm with X5 Magnifier, and 0.005 H/cm with X25 Magnifier. They provide 4 response characteristics necessary to monitor VITS-FLAT to 8 MHz (which assures excellent waveform fidelity for sine-squared testing with 2T, T, and 1/2T pulses), HIGH PASS 3.58 MHz, center frequency, LOW PASS-18 dB at 500 kHz, and IEEE 1958 STD 23-S-1. Other characteristics include a backporch type DC restorer, a positive-going field selector, and a full-field line-selector including digital VIT line selection.





Type 529 Waveform Monitor , po 323 vs avelorm monitor . . . \$1050 $(8\frac{1}{4}$ " high, $8\frac{1}{2}$ " wide, 19" deep, weighs 24 pounds.)

Rack Mount Type RM529 \$1100 (51/4" high, 19" wide, 20" deep, weighs 27 pounds.)

Power consumption of each model is ~80 watts — no fan used.

U.S. Sales Prices, f.o.b. Beaverton, Oregon

Tektronix, Inc.



For complete information, contact your nearby Tektronix field engineer or write: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005 ENTRON INC
FAIRCHILD RECORDING EQUIPMENT
FISHER BERKELEY CORPORATION
GATES RADIO COMPANY
G E VISUAL COMMUNICATIONS PROD
GENERAL ELECTRIC CO
GENERAL RADIO CO
HEATH CO
HEWLETT-PACKARD CO.
INTERNATIONAL NUCLEAR CORP.
LANGEY INTERNATIONAL NUCLEAR CORP.
LANGFVIN
MELCOR ELECTRONICS
POWER SOURCES
RCA BROADCAST PRODS.
SOLA ELECTRIC
SORENSON OPERATION—RAYTHEON CO
SOUNDCRAFT INDUSTRIES
SOUTHWESTERN COMMUNICATIONS
STACO. INC.
STANDARD ELECTRONICS CORP.
STEPHENS ELECTRONICS CORP.
STEPHENS ELECTRONICS DIV
TELEGUIP CORPORATION
TOWNSEND ASSOCIATES
TREPAC CORPORATION OF AMERICA
VIDEON CORPORATION

POWER SUPPLIES, PRECISION
ALTEC LANSING
COMU FLECTRONICS
FINGINFERING ASSOCIATES
GIBRS MEG. AND RESEARCH CORP.
HEATH CO
HEWLETT-PACKARD CO. SOLA ELECTRIC
TELEOUIP CORPORATION
TRW ELECTRONICS
VIDEON CORPORATION

TRM ELECTRONICS
VIDEON CORPORATION

PREAMPLIFIERS, AUDIO
AITKEN COMMUNICATIONS
ALMA FNGINEFRING INC
ALTEC LANSING
AMECO, INC.
AUDIO INSTRIMENT CO
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
CENTRAL DYNAMICS CORPORATION
CENTRAL DYNAMICS CORPORATION
CENTRAL DYNAMICS CORPORATION
CENTRAL DYNAMICS INC.
FAIRCHILD RECORDING EDUIPMENT
GE VISUAL COMMUNICATIONS PROD
GFRERAL RADIO CO
GREGORY AMPLIFIER CORP
KOSS ELECTRONICS, INC.
LANGEVIN
MARANTZ COMPANY
MARTI ELECTRONICS
MICROWAYE ASSOCIATES, INC.
MILES REPRODUCER CO
ONGITH AMERICAN PHILIPS CO
ONGITH AMERICAN PHILIPS CO
ORGIT RADIO
O R K ELECTRONICS MICROWAYE ASSOCIATES, INC.
MILES REPRODUCER CO
ONGITH AMERICAN PHILIPS CO
ORGIT RADIO
O R K ELECTRONIC PRODUCTS
RCA BROADCAST PRODS,
RECORDING EQUIPMENT COMPANY
RUSSCO ELECTRONICS
MICROWAYE ASSOCIATES, INC.
SCHAFER ELECTRONIC SMGG,
SCHAFER ELECTRONIC SMGG,
SCHAFER ELECTRONICS
H, H, SCOTT, INCORPORATED
SCULLY RECORDING INSTRUMENTS
SHURE BROTHERS, INC.
SONY CORPORATION
SPARTA ELECTRONIC CORPORATION
STANCIL—HOFFMAN CORPORATION

PREAMPLIFIERS. VIDEO
AMCCO. INC.
ALONDER-TONGUE LABORATORIES
CENTRAL DYNAMICS CORPORATION
GATES RADIO COMPANY
INTERNATIONAL NUCLEAR CORP.
JERROLD FLECTRONICS CORP
TELEGUIP CORPORATION
VIDEON CORPORATION
WARD ELECTRONIC INDUSTRIES

PREFABRICATED BUILDINGS
FORT WORTH TOWER CO.. INC.
UTILITY TOWER CO.

PRESSURIZATION EQUIPMENT.
TRANSMISSION LINE
ANDREW CORPORATION
GATES RADIO COMPANY
THE MCINTIRE COMPANY
RCA BROADCAST PRODS.
SIGMA INDUSTRIES

PRINTERS, TELETYPE SINGER PRODUCTS CO TREPAC CORPORATION OF AMERICA

PROBES, OSCILLOSCOPE
DATA INSTRUMENT DIVISION
ELFCTRONICS ESSENTIALS OF
GC ELECTRONICS COMPANY
HEMLETT-PACKARD CO.
RCA ELECTRONIC COMPONENTS
TEXTRONIX INC
TELEMET COMPANY

PROBES: TEST LEAD
F W BELL. INC
ELECTRONICS ESSENTIALS OF CCC
E-Z-HOOK TEST PRODUCTS
G C FLECTRONICS COMPANY
HEWLETT-PACKARD CO.

E F JOHNSON COMPANY RCA ELECTRONIC COMPONENTS

PROCESSORS. FILM. 8 6 M RURKE & JAMES THE JAMES FLOYD FORD CO HOUSTON FERRLESS CORPORATION MICRO RECORD CORP. RCA BROADCAST PRODS.

PROCESSORS. FILM. COLOR

RURKE & JAMES

HOUSTON FEARLESS CORPORATION
MICRO RECORD CORP.

RCA BRDADCAST PRODS.

IFLEVISION ZOOMAR

PROJECTORS FILM
ARRIFLEX-SIEMENS
BIRNS 6 SANYER
BURKE 6 JAMES
CENTURY PROJECTOR CORPORATION
EASTMAN KODAK COMPANY
THE KALART COMPANY
MARCONI DIVISION
PRECISION LABORATORIES
RCA BROADCAST PRODS.
SINGER PRODUCTS CO.
SYLVANIA-COMM. ELECTRONICS DIV
TELEVISION UTILITIES CORP
TRAID CORPORATION
VISUAL ELECTRONICS CORP VISUAL ELECTRONICS CORP

PROJECTORS. SLIDE

AMPLIFIER CORP OF AMERICA
BURKE & JAMES
DISPLAY TECHNOLOGIES INC
EASTMAN KODAK COMPANY
GRAY RESEARCH & DEVELOPMENT CO
HARWALD COMPANY
THE KALART COMPANY
PRECISION LABORATORIES
RCA BROADCAST PRODS.
SINGER PRODUCTS CO.
SYLVANIA-COMM. ELECTRONICS DIV
VISUAL ELECTRONICS CORP
ZOLOMATICS CORPORATION

PROJECTORS. FILM. REAR
ROBINS INDUSTRIES CORP.

PROJECTORS: TV: LARGE SCREEN GENERAL TELEVISION NETWORK

RACKS, MOUNTING ALSO SEE HARDWARE
AMECO. INC.
BUD RADIO. INC
CENTURY PROJECTOR CORPORATION
COOK ELECTRIC COMPANY
DATA INSTRUMENT DIVISION
FAIRCHILD RECORDING EQUIPMENT
GATES RADIO COMPANY
G E VISUAL COMMUNICATIONS PROD
MICROWAVE ASSOCIATES, INC.
NEUMADE PRODUCTS CORPORATION
RATHERON CO EQUIPMENT DIVISION
RCA BROADCAST PRODS.
SCHAFER ELECTRONICS SCHAFER ELECTRONICS WABER ELECTRONICS INC.

RADAR, WEATHER
RCA BROADCAST PRODS.

RADOMES
ANDREW CORPORATION
FORT WORTH TOWER CO., INC.
JERROLD ELECTRONICS CORP
PRODELIN. INCORPORATED
SCIENTIFIC-ATLANTA
TECHNICAL APPLIANCE CORP

RECEIVERS. AM
ALLIED ELECTRONICS CORP ALLIED ELECTRONICS CORP
AMERICAN ELITE
BENJAMIN ELECTRONIC SOUND CORP
CALBEST ELECTRONICS CORPORATION
DELCO RADIO DIV
ELECTRO-VOICE INC
G F SUPPLY COMPANY
HEATH CO
KANN RESEARCH LABORATORIES
MAPCOMI INSCRIPENTS KAHN RESTARCH LABORATORIES
MARCONI INSTRUMENTS
NORTH AMERICAN PHILIPS CO
ROMDE & SCHWARZ SALES CO. -US
SETCHELL CARLSON INCORPORATEO
SINGER PRODUCTS CO
TELECTRO INDUSTRIES CORP
UTICA CORPORATION
VITRO ELECTRONICS

RECEIVERS, FM
ALLIED ELECTRONICS CORP
ALTEC LANSING
AMECO, INC.
AMERICAN ELLIE
BELAR ELECTRONICS LABORATORY
BENJAMIN ELECTRONICS SOUND CORP
CALBEST ELECTRONICS SOUND CORP
CCA ELECTRONICS CORPORATION
DATTON ELECTRONIC PRODUCTS CO
DELCO RADIO DIV
ELECTRO-VOICE INC
GATES RADIO COMPANY ELECTRO-VOICE INC
GATES RADIO COMPANY
HEATH CO
JOHNSON FLECTRONICS. INC.
KARG LABORATORIES
MARANTZ COMPANY
MARCONI INSTRUMENTS
MARTI ELECTRONICS MARTI ELECTRONICS
MCMARTIN INOUSTRIES
MILES REPRODUCER CO
NORTH AMERICAN PHILIPS CO
RHG ELECTRONICS LABORATORY
ROMDE & SCHWARZ SALES CO. -USA

H. H. SCOTT. INCORPORATED
SETCHFLL CARLSON INCORPORATED
SINGER PRODUCTS CO
SONY CORPORATION OF AMERICA
TELECTRO INDUSTRIES CORP
UTICA CORPORATION
VEGA ELECTRONICS CORPORATION
VITRO ELECTRONICS

RECEIVERS, HF

AMERICAN ELECTRONIC LABS
AMERICAN ELITE
BENJAMIN ELECTRONIC SOUND CORP
JOHNSON ELECTRONICS, INC,
KAHN RESEARCH LABORATORIES
MARCONI OIVISION
MARCONI INSTRUMENTS
NARDA MICROWAVE CORPORATION
RHG ELECTRONICS LABORATORY
ROHOE 6 SCHWARZ SALES CO. -USA
SCIENTIFIC-ATLANTA
SINGER PRODUCTS CO
THE TECHNICAL MATERIEL CORP
TELECTRO INDUSTRIES CORP
VITRO ELECTRONICS RECEIVERS. HF

RECEIVERS, MULTIPLEX
BELAR ELECTRONICS LABORATORY
BROWNING LABORATORIES, INC.
CCA ELECTRONICS CORPORATION
CONRAC CONRAC
ELFCTRO-VOICE INC
HEATH CO
JOHNSON ELECTRONICS, INC.
JOHNSON FLECTRONICS, INC.
KARG LABORATORIES
MARANIZ COMPANY
MCMARTIN INDUSTRIES
H. H. SCOTT, INCORPORATED
SINGER PRODUCTS CO
TELECTRO INDUSTRIES COPP
VITRO ELECTRONICS

RECEIVERS. SCA
BELAR ELFCTRONICS LABORATORY
BROWNING LABORATORIES. INC.
CCALBEST ELFCTRONICS
CCA FLECTRONICS CORPORATION
DAYTON FLECTRONIC PRODUCTS CO
KARG LABORATORIES
MARTI ELECTRONICS
MCMARTIN INOUSTRIES
SINGER PRODUCTS CO

AMECO. INC.
CONRAC CONRAC G F SALES AND DISTRIBUTION HEATH CO SETCHFLL CARLSON INCORPORATED

RECEIVERS, TV. MONOCHROME AMECO. INC. CONRAC CONNAC G E SALES AND OISTRIBUTION HEATH CO SETCHFLL CARLSON INCORPORATED SONY CORPORATION OF AMERICA SYLVANIA-COMM. ELECTRONICS DIV

RECORDERS, 015C+ MAGNETIC
AMPEX CORPORATION COLORADO VIDEO
FAIRCHILD RECORDING EQUIPMENT
MILES REPRODUCER CO
MVR CORPORATION

RECORDERS. FILM. LIGHT
MINNESOTA MINING - 3 M
TELEVISION UTILITIES CORP

RECORDERS, FILM. MAGNETIC
CENTURY PROJECTOR CORPORATION
MINNESOTA MINING - 3 M
STANCIL-HOFFWAN CORPORATION
TELEVISION UTILITIES CORP

RECORDERS, MAGNETIC TAPE:
AUDIO,
ALLIED ELECTRONICS CORP
AMERICAN ELITE
AMERICAN GELOSO ELECTRONICS
AMPFIX CORPORATION
AMPLIFIER CORP OF AMERICA
AUDIO INSTRUMENT CO
BROADCAST ELECTRONICS, INC
CALIFONE/ROBERTS
COMPUTRON INC
CROWN INTERNATIONAL
FAIRCHILD RECORDING EQUIPMEN COMPUTRON INC
CROWN INTERNATIONAL
FAIRCHILD RECORDING EQUIPMENT
GENERAL RADIO CO
GOTHAM AUDIO CORPORATION
HEATH CO
IMPEX ELFCTRONICS CORP
INTERNATIONAL GOOD MUSIC
JETRONIC INOUSTRIES, INC.
JOA CARTRIDGE SERVICE
KRS INSTRUMENTS OIVISION
MACARTA INC.
MACKENZIE LABORATORIES
MACKATIZE LABORATORIES
MACKATIZE LABORATORIES
MACKATIZE LABORATORIES
MACKATIZE LABORATORIES
MACKATIZE LABORATORIES
MACKATIZE LABORATORIES
MACKATIZE
MILES REPRODUCER CO
MILES REPRODUCER CO
MILES REPRODUCER CO
MININFSOTA MINING - 3 M
NORTH AMERICAN PHILIPS CO
RCA BROADCAST PRODS.
SCHAFER FLECTRONICS
SCULLY RECORDING INSTRUMENTS
SONY CORPORATION OF AMERICA
THE SOUND SCRIBER CORP.
STANCIL-HOFFMAN CORPORATION
STEPHENS ELECTRONICS
MATTHEM STUART & CO. INC
TAPECASTER ELECTRONICS
TAPF-ATHON CORPORATION TELECTRO INDUSTRIES CORP VIKING OF MINNEAPOLIS VISUAL ELECTRONICS CORP

RECORDERS, MAGNETIC TAPE,
AUDIO, CARTRIDGE
BROADCAST ELECTRONICS, INC
COLLINS RADIO COMPANY
GATES RADIO COMPANY
KRS INSTRUMENTS DIVISION
LACROSSE ELECTRONICS, INC.
MACKENZIE LABORATORIES
RCA BROADCAST PRODS,
SPARTA ELECTRONIC CORPORATION
TAPECASTER ELECTRONICS
VIKING OF MINNEAPOLIS

RECORDERS, MAGNETIC TAPE,
LOGGING
AMPEX CORPORATION
CROWN INTERNATIONAL CROWN INTERNATIONAL
KRS INSTRUMENTS DIVISION
MAGNECORD
METROTECH INCORPORATED
MILES REPRODUCER CO
MINNESOTA MINING - 3 M
SCHAFER ELECTRONICS
THE SOUND SCRIBER CORPSTANCIL-HOFFMAN CORPORATION
TAPE-ATHON CORPORATION TELECTRO INDUSTRIES CORP

RECORDERS. MAGNETIC TAPE. VIDEO AMPEX CORPORATION AMPEX CORPORATION
AMPLIVISION CORPORATION
MINNESOTA MINING - 3 M
MVR CORPORATION
NORTH AMERICAN PHILIPS CO
RCA BROADCAST PRODS.
SONY CORPORATION OF AMERICA
TELECTRO INDUSTRIES CORP
VISUAL ELECTRONICS CORP

RECORDERS. PAPER RECORDERS, PAPER
LOGGING AND GRAPHIC
API INSTRUMENTS CO.
BAUER ELECTRONICS CORPORATION
ENGINEERING ASSOCIATES
GENERAL ELECTRIC CO
GENERAL RADIO CO
HEATH CO
HEATH CO
HEWLETT-PACKARO CO.
NESCO INSTRUMENTS DIV.
ROHDE 6 SCHWARZ SALES CO. -USA
SCIENTIFIC-ATLANTA
YOKOGAWA ELECTRIC WORKS

RECORDERS, VIDEO, KINESCOPE VUE-TRONICS INC.

THE JAMES FLOYD FORD CO

RECORD PLAYERS - SEE TURNTABLES

RECORDS. BLANK. ACETATE.
FOR RECORDING
ASCO SONOCRAFT CORP
DUOTONE COMPANY INC
SINGER PRODUCTS CO.
TRANSCO PRODUCTS. INTL

RECORDS. BLANK. LACOUER.
FOR RECORDING
AUDIO DEVICES
REEVES SOUNDCRAFT
SINGER PRODUCTS CO.
TRANSCO PRODUCTS. INTL

SPEEDY-Q ENTERPRISES

RECORDS. TEST

RECTIFIERS - ALSO SEE SEMICONDUCTORS SEMICONDUCTORS
CCA EÉECTRONICS CORPORATION
EIMAC DIVISION OF VARIAN
GENERAL ELECTRIC CO
HEINTZ & KAUFMAN+ LTD
INTERNATIONAL RECTIFIER
MOTOROLA SEMICONDUCTOR
SARKES-TARZIAN SARRES-TARCIAN
SOLITRON OEVICES
STANOARD ELECTRONICS CORP.
TEXAS INSTRUMENTS
WILKINSON ELECTRONICS. INC

RECTIFIERS SELENIUM AMERICAN ELITE GENERAL ELECTRIC CO INTERNATIONAL RECTIFIER IRC. INC. SARKES-TARZIAN SINGER PRODUCTS CO.

REELS. CABLE. AUTOMATIC INOUSTRIAL DEVICES. INC. INOUSTRIAL ELECTRIC RFELS VENT-RAK INCORPORATED

REELS. FILM
AMERLINE CORPORATION
BIRNS & SAWYER
BURKE & JAMES
HARWALD COMPANY
NEUMADE PRODUCTS CORPORATION
STANCIL-HOFFMAN CORPORATION

REELS. TAPE AMERLINE CORPORATION AUDIO DEVICES

SPARTA-MATIC TAPE CARTRIDGE SYSTEMS*



800C SERIES

Space saving, compact, table-top convenience • Transistorized modular electronics • Super-silent operation • Hinged lid for easy internal ACCESS



300C SERIES

Rack, table-top or cab-inet mounting • Tran-sistorized plug-in mod-ules • 2nd and 3rd tone cue option • Separate record amplifier • Full remote operation





Direct motor capstan drive eliminates belt driven assembly • Hysteresis synchronous motor with lifetime lubricated ball bearings • Exclusive super-silent solenoid system • Precision crafted for years of maintenance free service

MULTI-CARTRIDGE PLAYBACK

Provides four independent plug-in CH-5 tape carridge trans-ports • Compact design for ta-ble-top (illustrated) or rack mount installation • Individual transis-torized electronics • Manual or sequential operation • Multi tone and audio switcher options



CD-15 TIME DELAY & REVERB UNIT

Time delay of 3 seconds to 31 minutes • Provides "beforeair" censorship of conversa-tional programing • Selec-tive reverberation effects.



ALL SPARTAMATIC SYSTEMS EXCEED NAB **STANDARDS**

BP-211C BRIEFCASE CARTRIDGE PLAYBACK

Provides quick and convenient tape cartridge auditioning • Excellent sales aid unit • Rechargeable battery and A/C operation • Extension speaker • Cartridge storage • Samsonite attache case with business paper portfolio

ALL SPARTA CONSOLES EXCEED FCC PROOF OF PERFORMANCE SPECIFICATIONS

SPARTA AUDIO EQUIPMENT AND ACCESSORIES †



STEREO AUDIO CONSOLE

ive stereo mixer channels 14 stereo audio inputs • Moni-tor, cueing & muting terminal facilities provided • All transistorized modular electronics Selectable stereo/mono mode



RA-5 REMOTE MIXER

Two mixers • 3 audio inputs
• Line test oscillator • P.A.
output • 30 hour battery operation • Shoulder strap carry-ing case included



FIDELIPAC TAPE CARTRIDGES

All sizes and standard lengths in stock • Cartridge recondiin stock • Cartridge recordion and reloading service.



CARTRIDGE ERASER

Faster and total erasing of cartridges and reels up to 101/2"



A-20 STUDIO CONTROL CONSOLE

Full facility audio control center • All transistorized • Eight mixers • Twenty-two inputs • Self-contained power supply • 5 watt monitor and .5 watt cue amplifier • Accomodates eight preamps (three supplied) • Individual electronic modules • Studio talkback provisions • Functional, space-saving compactness • All inputs and output are transformer balanced output are transformer balanced





5851 FLORIN-PERKINS ROAD, SACRAMENTO, CALIFORNIA 95828 (916) 383-5353

World Radio History

EXPORT SALES:

SPARTA INTERNATIONAL CORPORATION 95 BROAD STREET, NEW YORK, N.Y. 10004



A-15 AUDIO CONSOLE

A-15 AUDIO CONSOLE
14 audio inputs • Five mixing
channels • Built in monitor, cueing & muting systems • All transistorized modular electronics •
Three line outputs plus P.A., headphose & external speaker output •
Accomodates up to four preamps



SHOWCASE CABINETRY

Console Desk • Dual & Single turn-table Returns • Utility Returns with Cartridge Hutch • Mix'n Match for a Clustom Look



TC-12 CUSTOM TURNTABLE

Instant acceleration • Heavy-duty professional quality • Positive 3-speed lever control • Plays 45's vithout adapter . Trouble free performance

All prices subject to change

BIRNS 6 SAWYER BROADCAST ELECTRONICS, INC EASTMAN KODAK COMPANY MAGNECORD MINNESOTA MINING - 3 M MINNESOTA MINING - 3 M REEVES SOUNDCRAFT ROBINS INDUSTRIES CORP. SONY CORPORATION OF AMERICA STANDARD RECORD MFG. CO, WIDE RESPONSE

REFLECTORS. PASSIVE
ADVANCE INDUSTRIES
FORT WORTH TOWER CO.. INC.
MASTER TOWER CO
MICROFLECT COMPANY INC.
RCA BROADCAST PRODS.
ROHN MANUFACTURING CO. STAINLESS. INC. UTILITY TOWER CO.

REGULATORS - CURRENT G E SUPPLY COMPANY GENERAL FLECTRIC CO SOLA ELECTRIC

REGULATORS, VOLTAGE
ALTEC LANSING
CCA ELECTRONICS CORPORATION
G F, SUPPLY COMPANY
GENERAL FLECTRIC CO
GENERAL RADIO CO
SOLA ELECTRIC
STACO- INC.

RELAYS: ANTENNA COOK ELECTRIC COMPANY E F JOHNSON COMPANY

RELAYS. BREAK IN ESSEX WIRE CORPORATION

RELAYS, COAXIAL
FRGINEFRING ASSOCIATES
JENNINGS RADIO MANUFACTURING
STRUITHERS-DUNN
TROMPETER ELECTRONICS
VISUAL ELECTRONICS CORP

RELAYS, GENERAL PURPOSE
ALLIED ELECTRONICS CORP
COOK ELECTRIC COMPANY
CORNELL-DUBILIER ELECTRONICS
ESSEX WIRE CORPORATION
GENERAL ELECTRIC CO
JENNINGS RADIO MANUFACTURING
OMMITE MANUFACTURING COMPANY
RBM CONTROLS
SIGMA INSTRUMENTS INC.
STRUTHERS-DUNN

RELAYS. LATCHING
AMERICAN ELITE
CORNELL-DUBILIER ELECTRONICS
GENERAL ELECTRIC CO
JENNINGS RADIO MANUFACTURING
OHMITE MANUFACTURING COMPANY
REM CONTROLS
SIGMA INSTRUMENTS INC.
STRUTHERS-DUNN

RELAYS. LIGHT INDICATING
HUGHEY & PHILLIPS
OHMITE MANUFACTURING COMPANY

RELAYS, OVERLOAD

API INSTRUMENTS CO.
CORNELL-DUBILIER ELECTRONICS
FINGINFERING ASSOCIATES
FSSFX WIRF CORPORATION
GENERAL ELECTRIC CO
G-V CONTROLS INC.
JENNINGS RADIO MANUFACTURING
OHMITE MANUFACTURING COMPANY
SIGMA INSTRUMENTS INC.
STRUTHERS-OUNN

RELAYS. PHOTOELECTRIC
CORNELL-DUBILTER ELECTRONICS
GENERAL ELECTRIC CO
HOUSTON ELECTRONICS CO.
HUGHEY & PHILLIPS
SIGMA INSTRUMENTS INC.
STEPHENS ELECTRONICS

RELAYS, PLUG IN CORNELL-DUBILIER ELECTRONICS ESSEX WIRE CORPORATION RBM CONTROLS RBM CONTROLS SIGMA INSTRUMENTS INC. STEPHENS ELECTRONICS STRUTHERS-DUNN. TREPAC CORPORATION OF AMERICA

RELAYS, POWER

CORNELL-DUBILIER ELECTRONICS
EMGINEERING ASSOCIATES
ESSEX WIRE CORPORATION
GENERAL FLECTRIC CO
JENNINGS RADIO MANUFACTURING
OMMITE MANUFACTURING COMPANY
RBM CONTROLS
SIGMA INSTRUMENTS INC.
STRUTHERS-DUNN

RELAYS, SEQUENCING

CORNELL-OUBLIFE ELECTRONICS
ESSEX WIRE CORPORATION
SIGMA INSTRUMENTS INC.
STRUTHERS-DUMN.
TREPAC CORPORATION OF AMERICA
TROMPETER ELECTRONICS

CORNELL-OUBILIER ELECTRONICS

ENGINEERING ASSOCIATES
JENNINGS RADIO MANUFACTURING
STRUTHERS-DUNN *
TROMPETER ELECTRONICS

RELAYS, TELEPHONE
COOK ELECTRIC COMPANY
CORNELL-DUBLILER ELECTRONICS
ENGINEERING ASSOCIATES
ESSEX WIRE CORPORATION
ITT TELECOMUNICATIONS
RPM CONTROLS
SIGMA INSTRUMENTS INC.

RELAYS. THERMAL
BLONDFR-TONGUE LABORATORIES
DIALIGHT CORPORATION
ESSEX WIRE CORPORATION
GENERAL ELECTRIC O
G-V CONTROLS INC.

RELAYS. TIME DELAY
AMPERITE CO
CORNELL-DUBILIER ELECTRONICS
DIALIGHT CORPORATION
ENGINEERING ASSOCIATES
ESSEX WIRE CORPORATION
GENERAL FLECTRIC CO
HOUSTON ELECTRONICS CO.
OMHITE MANUFACTURING COMPANY
RIM CONTROLS
STRUITHERS-DUINN
TREPAC CORPORATION OF AMERICA
G-V CONTROLS INC.
MOLE-RICHARDSON CO.

MOLE-RICHARDSON CO.

REMOTE CONTROL SYSTEMS
ALBION OPTICAL COMPANY
BAILER ELECTRONICS CORPORATION
ANDREW CORPORATION
BIONIC INSTRUMENTS. INC.
CENTRAL DYNAMICS CORPORATION
CONTINENTAL ELECTRONICS MFG
DELTA ELECTRONICS. INC.
ENGINEERING ASSOCIATES
F 6 M SYSTEMS COMPANY
GATES RADIO COMPANY
GENERAL ELECTRIC CD
HANCOCK TELECONTROL
MARTI ELECTRONICS
MOSELEY ASSOCIATES INC.
ORBIT RADIO
SCHAFER ELECTRONICS
SINGER PRODUCTS CO.
SOUTHWESTERN COMMUNICATIONS
TELETRONIX
VISUAL ELECTRONICS COPP
TISPAC CORPORATION OF AMERICA

RESISTORS. FIXED. CARBON
AFROVOX CORP.
AMERICAN ELITE
AMPEREX ELECTRONIC CORP
G C ELECTRONICS COMPANY
IRC. INC.
OMMITE MANUFACTURING COMPANY
PAINTON INCORPORATED
SINGER PRODUCTS CO.
TEXAS INSTRUMENTS

RESISTORS, FIXED, NONINDUCTIVE GENERAL RADIO CO IRC, INC, OHMITE MANUFACTURING COMPANY VISHAY RESISTOR PRODUCTS DIV

RESISTORS, FIXED, PRECISION
AEROVOX CORP,
AMPHENDL DISTRIBUTOR DIVISION
GENERAL RADIO CO
IRC, INC.
JORDAN ELECTRIC COMPANY
MALLORY DISTRIBUTOR PRODUCTS
OHMITE MANUFACTURING COMPANY
PAINTON INCORPORATED
TEXAS INSTRUMENTS
VISHAY RESISTOR PRODUCTS DIV

RESISTORS: FIXED. WIREWOUND
AMPHENOL DISTRIBUTOR DIVISION
GENERAL ELECTRIC CO
GENERAL RADIO CO
HAMILTON HALL RESISTOR CORP.
JORDAN ELECTRIC COMPANY
HALLORY DISTRIBUTOR PRODUCTS
OHMITE MANUFACTURING COMPANY
PAINTON INCORPORATED
SINGER PRODUCTS CO.

RESISTORS, FIXED, DTHER AEROVOX CORP. AMPEREX ELECTRONIC CORP GENERAL ELECTRIC CO IRC - INC -OHMITE MANUFACTURING COMPANY PAINTON INCORPORATED

RESISTORS, VARIABLE, CARBON AMPHENOL DISTRIBUTOR DIVISION MALLORY OISTRIBUTOR PRODUCTS OHMITE MANUFACTURING COMPANY SINGER PRODUCTS CO.

RESISTORS. VARIABLE. WIREWOUND
AMPHENOL DISTRIBUTOR DIVISION
ENGINEERING ASSOCIATES
G C FLECTRONICS COMPANY
GENERAL RADIO CO IRC. INC.
MALLORY DISTRIBUTOR PRODUCTS MALLORY DISTRIBUTOR PRODUCTS OHMITE MANUFACTURING COMPANY PAINTON INCORPORATED WATERS MANUFACTURING

REVERBERATION DEVICES ALSO SEE AMPLIFIERS
AMPLIFIER CORP OF AMERICA
BAUER ELECTRONICS CORPORATION BAUER ELECTRONICS CORPORATION
CLEVELAND ELECTRONICS
SPEAKER DIVISION
FAIRCHILD RECORDING EQUIPMENT
GOTHAM AUDIO CORPORATION
GREGORY AMPLIFIER CORP
LITTLE JOE ENTERPRISES
ORBIT RADIO
SINGER PRODUCTS CO
STEPHENS ELECTRONICS
VISUAL ELECTRONICS CORP

REWINDERS, FILM
RURKE 6 JAMES
CENTURY PROJECTOR CORPORATION
HARWALD COMPANY
VELMADE PRODUCTS CORPORATION
RCA BROADCAST PRODS.

HEWINDERS : TAPE HARVEY RADIO CO. INC.

RHEOSTATS ENGINEERING ASSOCIATES ENGINEERING ASSOCIATES
GENERAL ELECTRIC CO
GENERAL RADIO CO
MALLORY DISTRIBUTOR PRODUCTS
NEUMADE PRODUCTS CORPORATION
OHMITE MANUFACTURING COMPANY

RINGS, RETAINING - SEE HARDWARE

RODS: GROUND AMPLIVISION CORPORATION

SAFETY DEVICES CLIMBING AIR SPACE DEVICES PRUZAN COMPANY

SEE EDUCATION FACILITIES

SCRAMBLERS. SPEECH SINGER PRODUCTS CO TREPAC CORPORATION OF AMERICA

SCREENS PROJECTION FRONT ASCO SONOCRAFT CORP RIRNS 6 SAWYER RURKE 6 JAMES RAVEN SCREEN CORPORATION VISUAL ELECTRONICS CORP

SCREENS, PROJECTION, REAR BURKE & JAMES DISPLAY TECHNOLOGIES INC RAVEN SCREEN CORPORATION VISUAL ELECTRONICS CORP H. WILSON CORPORATION

SEMICONDUCTOR DIOGES

AMERICAN ELECTRONIC LABS
AMFRICAN ELITE
AMPEREX ELECTRONIC CORP
GE DISTRIBUTOR SALES FORCE
GENERAL ELECTRIC CO
HEWLETT-PACKARD CO,
INTERNATIONAL RECTIFIER INTERNATIONAL RECTIFIER
IRC. INC.
MICROLAB / FXR
MICROWAYE ASSOCIATES. INC.
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SOLITRON DEVICES
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SEMICONDUCTOR RECTIFIERS:

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INTERNATIONAL RECTIFIER
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SINGER PRODUCTS CO,
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AMPEREX ELECTRONIC CORP
DELCO RADIO DIV
G E DISTRIBUTOR SALES FORCE
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LAKE FLECTRONICS. INC.
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SINGER PRODUCTS CO.
SOLITRON DEVICES
SYLVANIA-SEMICONDUCTOR DIV.
TEXAS INSTRUMENTS
THOR ELECTRONICS

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AMPEREX ELECTRONIC CORP
G E DISTRIBUTOR SALES FORCE
MOTOROLA SEMICONDUCTOR
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RCA ELECTRONIC COMPONENTS
SOLITRON DEVICES
SYLVANIA—SEMICONDUCTOR OIV.
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THE THOMAS & BETTS CO

TODLS, CUTTERS
MATHIAS KLEIN & SONS
H. K. PORTER INC.
THE THOMAS & BETTS CO
XCELITE INCORPORATED

TOOLS, HAND

ELECTRONICS ESSENTIALS OF CCC
HOLLINGSWORTH SOLDERLESS
TERMINAL CO
MATHIAS KLEIN & SONS
H. K. PORTER INC.
SINGER PRODUCTS CO.
THE THOMAS & BETTS CO
UPSON BROS.
XCELITE INCORPORATED

TDOLS. PLIERS
MATHIAS KLEIN & SONS
SINGER PRODUCTS CO.
XCELITE INCORPORATED

TOOLS. PUNCH. CHASSIS

TOOLS. SCREWDRIVERS
ELECTRONICS ESSENTIALS OF CCC
G C ELECTRONICS COMPANY
MATHIAS KLEIN G SONS
SINGER PRODUCTS CO.
UPSON BROS.
XCELITE INCORPORATED

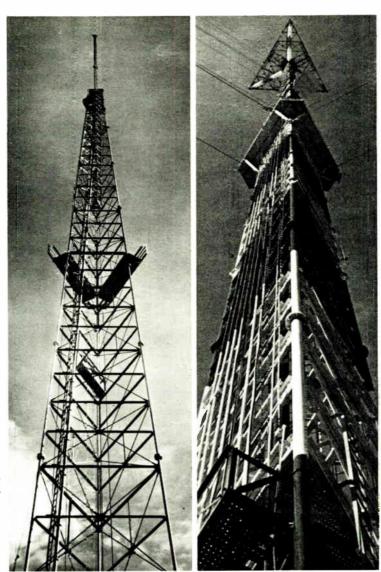
TOOLS: SOLDERING IRONS: GUN

TOOLS+ SOLDERING IRONS+ INDUSTRIAL SINGER PRODUCTS CO-UNGAR ELECTRIC TOOLS

TOOLS: WRENCHES
ELECTRONICS ESSENTIALS OF CCC
MATHIAS KLEIN & SONS
XCELITE INCORPORATED

TOWERS, ANTENNA,

CATY, HEAD-END
ADVANCE INDUSTRIES
AMECO, INC.
AMPLIVISION CORPORATION
ANTENNA PRODUCTS COMPANY
BLAW-KNOX COMPANY
DRESSER CRAME HOIST & TOWER
FORT WORTH TOWER CO. INC.
HY-GAIN ELECTRONICS
JERROLD ELECTRONICS CORP
KLINE IRON & STEEL COMPANY
LIBERTY TOWER MFG. CO



At Rochester, N. Y., this self-supporting tower gives the WOKR antenna 306.5' elevation above the ground,

Candelabra® tower carries 3 antenna as high as 1549' above ground for KCRA-TV, KOVR, KXTV.

TOWERS BY DRESSER FOR TV, RADIO, MICROWAVE, RADAR

TV AND RADIO BROADCAST ANTENNA TOWERS—Types: guyed or self-supporting. Can be insulated. Guyed available with fixed or pivoted base. Heights: available in any height. Wind Loads: 20 lb. through 90 lb. available as standard. Heavier loads available when required. Antenna Loads: designs available for any single TV or radio antenna, or any combination of antennas in stacked, side-mounted, or Candelabra (R) arrangements.

MICROWAVE TOWERS-Types: guyed or selfsupporting. Heights: 50' through 300' available as standard. Greater heights available when required. Wind Loads: 30 lb. and 40 lb. loads standard. Heavier loads available when required. Antenna Loads: design available to support any combination of microwave equipment.

RADAR TOWERS—Types, heights and loads custom-designed to meet any requirement for support of radar equipment. Extensive experience in the design of radar structures for the Government.

SPECIAL DESIGNS—Large, experienced engineering staff and well-equipped fabricating plant capable of creating and fabricating towers of any kind, height or type for any requirement.

TOWER ELEVATORS—All steel elevator for TV and radio towers, rated for 750 lb. load, radio controlled, completely equipped with automatic safeties.

TOWER ERECTION AND INSPECTION— Complete tower erection and inspection service under supervision of graduate engineers.



CRANE, HOIST & TOWER DIVISION

one of the Dresser Industries (formerly Dresser-ideco Co.)

885 Michigan Ave., Columbus, Ohio 43215 Phone area 614, 299-2123 • TWX 614-759-0672 Branch: 2314 Redondo Beach Blvd., Gardena, Calif. 90247 LITTLE JOE ENTERPRISES
MASTER TOWER CO
MICROFLECT COMPANY INC.
PACIFIC TOWER CO,
STAINLESS, INC.
SWAGER TOWER CORPORATION
UNITED STATES TOWERS
UP-RIGHT SCAFFOLDS
UTILITY TOWER CO.

UTILITY TOWER CO.

TOWERS. ANTENNA. RECEIVING
ADVANCE INDUSTRIES
AMECO. INC.
ANTENNA PRODUCTS COMPANY
DRESSER FRANE HOIST 6 TOWER
FORT YORTH TOWER CO.. INC.
YILINE IPAN 6 STEEL COMPANY
LIRERTY TOWER WEG. CO
LITTLE TAE ENTERPRITES
MASTER TOWER CO
MICROFLECT COMPANY INC.
PACIFIC TOWER CO.
SINGER PRODUCTS CO.
SINGER PRODUCTS CO.
STATULESS. INC.
SWAGER IDWER CORPORATION
TRYLON INCOMPORTED
UNITED STATES TOWERS
UP-RIGHT SCAFFOLDS
TILLITY TOWER CO.
TOWERS. ANTENNA.

TOWERS. ANTENNA.

TRANSMITTING. AM
ADVANCE INDUSTRIES
ANTENNA PRODUCTS COMPANY
BLAW-KNOX COMPANY
CCA ELECTRONICS CORPANT
DRESSER CRANE HOLST 6 TOWER
FORT **DRITH TOWER CO.** INC.
GATES RANIO COMPANY
JAMPRO ANTENNA COMPANY
JAMPRO ANTENNA COMPANY
LINETY TOWER WEG. CO
LITTLE JOE ENTERPRISES
MASTER TOWER CO
MICROFLECT COMPANY INC.
GUNNAR A OLSEN CORP
PACIFIC TOWER CO
RCA RRADACAST PRODS.
ROWN MANUFACTURING CO.
STAINLESS, INC.
SWAGER TOWER CO
STAINLESS, INC.
SWAGER TOWER CO
TRYLOR TOWER CO
STAINLESS, INC.
SWAGER TOWER CO
TOWERS TOWER CO.
VISUAL ELECTRONICS CORP
TOWERS. ANTENNA.

VISUAL ELECTRONICS CDRP

TOWERS. ANTENNA.
TRANSMITING. FM
ADVANCE INDUSTRIES
ANTENNA PRODUCTS COMPANY
BLAW-KNOX COMPANY
CCA ELECTRONICS CORPORATION
DRESSER CRANE HOIST & TOWER
FORT WORTH TOWER CD. INC.
GATFS RADIO COMPANY
JAMPRO ANTENNA COMPANY
KLINE IRON & STEEL COMPANY
LIBERTY TOWER MFG. CD
LITTLE JOE ENTERPRISES
MASTER TOWER CO
MICROFLECT COMPANY INC.
GUNNAR A OLSEN CORP
PACIFIC TOWER CO
RCA BROADCAST PROOS.
ROMN MANUFACTURING CO.
STAINLESS, INC.
SWAGER TOWER CORPORATION
TRYLON INCORPORATEO
UNITED STATES TOWERS
UP-RICHT SCAFFOLDS
UTILITY TOWER CD.
VISUAL ELECTRONICS CORP

TOWERS. ANTENNA.
TRANSMITTING. TV
ADVANCE INDUSTRIES
ANTENNA PRODUCTS COMPANY
BLAW-KNOX COMPANY
DRESSER CRAME MOIST & TOWER
FORT WORTH TOWER CO., INC.
GATES RADIO COMPANY
KLINE IRON & STEEL COMPANY
KLINE IRON & COMPANY
INCOMPANY
KLINE IRON & COMPANY
KLINE IRON
MASTER TOWER CO
MICROFLECT COMPANY
INCOMPANY
FOR MANUFACTURING CO.
STAINLESS, INC.
SWAGER TOWER CORPORATION
TRYLON INCORPORATED
UNITED STATES TOWERS
UP-RIGHT SCAFFOLOS
UTILLITY TOWER CO.
VISUAL ELECTRONICS CORP

TRANSFORMERS, AUDIO, ISOLATION
AOC PRODUCTS
ALLIED ELECTRONICS CORP
ALTEC LANSING
ESSEX WIRE CORPORATION
GOTHAM AUDIO CORPORATION
LAFAYETTE RADIO ELECTRONICS
PERMOFLUX CORPORATION
RCA BROACAST PRODS.
ROHDE 6 SCHWARZ SALES CO. -USA
STACO, INC.

TRW ELECTRONICS UNITED TRANSFORMER COMPANY

TRANSFORMERS, AUDIO, MATCHING
ADC PRODUCTS
ALLIED ELECTRONICS CORP
ALTEC LANSING
ATLAS SOUND
555EX WIRE CORPORATION
GENERAL PAOLO CO
GOTHAM AUDIO CORPORATION
LAFAVEITE RADIO ELECTRONICS
LAKE FLECTRONICS. INC.
PFRMOFLUX CORPORATION
RCA BROADCAST PRODS.
ROHDE 6 SCHWARZ SALES CO. -HSA
STACO. INC.
TRN FLECTRONICS
TV CAPLE SUPPLY CO
HNITED TRANSFORMER COMPANY

IRANSFORMERS, AUDIO.

PONER GUITPUT
ADC PRODUCTS

ALLIFD ELECTRONICS CORP
ALTEC LANSING
ESSEX WIRE CORPORATION
LAFAYETTE RADIO ELECTRONICS
LAKE ELECTRONICS, INC.
MILES REPROPUCTE CO
PERMOFLUX CORPORATION
STACC, INC.
THE ELECTRONICS
UNITED TRANSFORMER COMPANY

TRANSFORMERS. AUTO

ADC PRODUCTS
ALLIED ELECTRONICS CORP
ALTEC LAMSING
CRAFTSMAN ELECTRONICS PRODUCTS
ESSEX WIRE CORPORATION
GENERAL FLECTRIC CO
GENERAL RADIO CO
HUGHEY & PHILLIPS
LAFAYETTY RADIO ELECTRONICS
PERMELUX CORPORATION
SINGER PRODUCTS CO.
SOLA ELECTRIC
STACO. INC.
TRW ELECTRONICS
UNITED TRANSFORMER COMPANY

TRANSFORMERS, COUPLING
ADC PRODUCTS
ALTEC LANSING
ESSEX WIRE CORPORATION
PERMOFLUX CORPORATION
TRW ELECTRONICS
UNITED TRANSFORMER COMPANY

TRANSFORMERS, FILAMENT
ADC PRODUCTS
ALLIED ELECTRONICS CORP
ALTFC LANSING
ENGINFERING ASSOCIATES
ESSEX WIRE CORPORATION
GENERAL ELECTRIC CO
LAFAYETTF RADIO ELECTRONICS
LAKE ELECTRONICS, INC.
PERMOFLUX CORPORATION
SOLA ELECTRIC
STACO. INC.
THY ELECTRONICS
UNITED TRANSFORMER COMPANY

UNITED TRANSFORMER COMPANY

TRANSFORMERS, GENERAL

AND PRODUCTS

ALLIED ELECTRONICS COPP

ALTEC LANSING

ANACONDA ASTRODATA CO

FSSEX WIRE CORPORATION

GE INDUSTRIAL SALES OPERATION

GENERAL ELECTRIC CO

LAFAYETTE RADIO ELECTRONICS

LAFAYETTE RADIO SECTION

SINGER PRODUCTS CO.

SOLA ELECTRIC

STACO, INC.

TRY FLECTRONICS

TV CARLE SUPPLY CO

UNITED TRANSFORMER COMPANY

TRANSFORMERS. PLATE
ADC PRODUCTS
ALLIED ELECTRONICS CORP
ALTEC LANSING
ESSEX WIRE CORPORATION
LAKE ELECTRONICS, INC.
PERMOFLUX CORPORATION
SOLA ELECTRIC
STACO. INC.
TRW ELECTRONICS
LINITED TRANSFORMER COMPANY

TRANSFORMERS, POWER

ADC PRODUCTS
ALLIED ELECTRONICS CORP
ALTEC LANSING
ENGINEERING ASSOCIATES
ESSEX WIRE CORPORATION
GENERAL ELECTRIC CD
HUGHEY & PHILLIPS
LAFAYETTE RADIO ELECTRONICS
LAKE ELECTRONICS, INC.
PERMOFLUX CORPORATION
SOLA FLECTRIC
STACO. INC.
TRW ELECTRONICS
UNITED TRANSFORMER COMPANY

TRANSFORMERS+ RF

ADC PRODUCTS
ALLIED ELECTRONICS CORP
AMERICAN CABLE ELECTRONICS
ANTENNA PRODUCTS COMPANY

BARKER & WILLIAMSON
BLONDER-TOMGUE LABORATORIES
CRAFISMAN ELECTRONICS PRODUCTS
D & B ELECTRONICS COMPANY
ESSEX WIRE COPPDRATION
KAPPA METWORKS, INC
LAKE ELECTRONICS, INC.
MICROLAB / FXR
J. W. MILLER CO.
THE TECHNICAL MATERIEL CORP

TRANSFORMERS, TRANSISTOR

ADC PRODUCTS

ALLIED FLECTRONICS CORP
FSSFX WIRE CORPORATION
GOTHAM AUDIO CORPORATION
LAFAYETIF RADIO ELECTRONICS
LAKE FLECTRONICS, INC.
STACO, INC.
TRX ELECTRONICS
UNITED TRANSFORMER COMPANY

TRANSFORMERS, VARIABLE
ALLIFF ELECTRONICS COPP
FMGINFERING ASSOCIATES
ESSEX WIPE CORPORATION
GFNFRAL FLECTRIC CD
GFNFRAL RADIO CO
LAKE FLECTRONICS. INC.
OHMITE MANUFACTURING COMPANY
STACO. INC.
TRW ELECTRONICS
UNITED TRANSFORMER COMPANY

TRANSISTORS -

TRANSLATOR SYSTEMS
AMPLIVITION CORPORATION
KEITH ANNERSON CO
AFNCO TELEVISION ASSOCIATES
CATEL COMPANY
EMCEE
F, M SYSTEMS COMPANY
LITTON EDUCATIONAL TELE DIV
TOWNSEND ASSOCIATES

TRANSMISSION LINES

AMECO. INC.

AMDREW CORPORATION
ANTERNA PRODUCTS COMPANY
COPPERWELD STEFL COMPANY
GATES RADIO COMPANY
JAMPRO ANTERNA COMPANY
JERROLD ELECTRONICS CORP
MICROWAVE ASSOCIATES. INC.
NARDA MICROWAVE CORPORATION
PHELPS ODDOGE
RCA BROADCAST PROOS.
TRYLON INCORPORATED
VISUAL FLECTRONICS CORP

TRANSMISSION TEST SETS
NARDA MICROWAVE CORPORATION
PHELPS ONDGE
RCA BROADCAST PRODS.
RIKER VIDEO INDUSTRIES
VISUAL ELECTRONICS CORP
WAVEFORMS, INCORPORATEO

IRANSMITTER KITS
ALLIED ELECTRONICS CORP
AAURE ELECTRONICS CORPORATION
CCA FLECTRONICS CORPORATION
GATES RADIO COMPANY
F F JOHNSON COMPANY
MILES REPRODUCER CO
SINGER PRODUCTS CO

TRANSMITTERS, AM, LOW POWER BAUER ELECTRONICS CORPORATION LOW POWER

TRANSMITTERS, AM. 25° WATT

AMERICAN ELECTRONIC LABS
RAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLINS PADIO COMPANY
E F JOHNSON COMPANY
SINGER PRODUCTS CO
TELETRONIX

TRANSMITTERS. AM. 1KM
AMERICAN ELECTRONIC LABS
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
E F JOHNSON COMPANY
MARCONI DIVISION
RCA BROADCAST PROOS.
SINGER PRODUCTS CO
TELETRONIX
VISUAL ELECTRONICS CORP
MILKINSON ELECTRONICS. INC

TRANSMITTERS, AM, 5KM

AMERICAN ELECTRONIC LABS
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
CONTINENTAL ELECTRONICS MFG
GATES RADIO COMPANY
RCA BROADCAST PROOS.
ROHOE & SCHWARZ SALES CO. -USA
SINGER PROOUCTS CO
TELETRONIX
VISUAL ELECTRONICS CORP
MILKINSON ELECTRONICS, INC

TRANSMITTERS: AM: 10KW

AMERICAN ELECTRONIC LABS

AMERICAN ELITE

BAUER ELECTRONICS CORPORATION

CCA ELECTRONICS CDRPORATION
CDLLINS RADID COMPANY
CONTINENTAL ELECTRONICS MFG
GATES RADID COMPANY
MARCONI DIVISION
RCA BROADCAST PRODS.
ROMDE 6 SCHWARZ SALES CO. -USA
SINGER PRODUCTS CO
TELETRONIX
VISUAL ELECTRONICS CORP
MILKINSON ELECTRONICS. INC

TRANSMITTERS. AM. 25 KM
AMERICAN ELECTRONIC LABS
BAUER ELECTRONICS CORPDRATION
CCA ELECTRONICS CORPDRATION
CONTINENTAL ELECTRONICS MFG
GATES RADIO COMPANY
RCA BROADCAST PRODS.
SINGER PRODUCTS CO
VISUAL ELECTRONICS CORP

TRANSMITTERS. AM. 50 KM

AMERICAN ELECTRONIC LABS
AMERICAN ELITE
BAURE FLECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
CONTINENTAL ELECTRONICS MFG
GATES RADID COMPANY
MARCONI DIVISION
RCA BROADCAST PRODS.
SINGER PRODUCTS CO
TELETRONIX
VISUAL ELECTRONICS CDRP

TRANSMITTERS: AM: OVER 50 KM
AMERICAN ELITE
CCA ELECTRONICS CORPORATION
CONTINENTAL ELECTRONICS MFG
GATES RADIO COMPANY
MARCONI DIVISION
SINGER PRODUCTS CO

TRANSMITTERS, AM. TO ORDER

TRANSMITTERS. FM
MILES REPRODUCER CO
ROHDE & SCHWARZ SALES CO. -USA
THOMSON ELECTRIC CO

TRANSMITTERS, FM, 10 WATTS
AMERICAN ELECTRONIC LABS
CCA ELECTRONICS CORPORATION
GATES RADIO COMPANY
MARTI ELECTRONICS
MOSELEY ASSOCIATES INC.
SINGER PRODUCTS CO

TRANSMITTERS. FM. 50 WATTS

TRANSMITTERS. FM. 100 WATTS
CCA ELECTRONICS CORPORATION
MARTI ELECTRONICS
RHG ELECTRONICS LABORATORY
SINGER PRODUCTS CD

TRANSMITTERS: FM: 250 WATTS
AMERICAN ELECTRONIC LABS
CCA ELECTRONICS CORPORATION
GATES RADIO COMPANY
SINGER PRODUCTS CO
STANDARD ELECTRONICS CORP.
TELETRONIX

TRANSMITTERS: FM. 1 KW

AMERICAN ELECTRONIC LABS
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS PAOIO COMPANY
MARCONI DIVISION
RCA BROACCAST PRODS
RMG ELECTRONICS LABORATORY
SINGER PRODUCTS CO
STANDARD ELECTRONICS CORP.
TELETRONIX
WILKINSON ELECTRONICS, INC

TRANSMITTERS : FM : 3 KW
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
GATES RADIO COMPANY
TELETRONIX
VISUAL ELECTRONICS CORP

TRANSMITTERS: FM: 5 KW

AMERICAN ELECTRONIC LABS
AMERICAN ELITE
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
MARCONI DIVISION
RCA BROADCAST PRODS
SINGER PRODUCTS CO
STANDARD ELECTRONICS CORP.
TELETRONIX
VISUAL ELECTRONICS CORP
MILKINSON ELECTRONICS INC

TRANSMITTERS. FM. 7.5 KM
AMERICAN ELECTRONIC LABS
BAUER ELECTRONICS CORPORATION
GATES RAOIO COMPANY
WILKINSON ELECTRONICS. INC

IRANSMITTERS. FM. 10 KM

AMERICAN ELECTRONIC LABS
AMERICAN ELITE
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
RCA BROADCAST PRODS

CONTINENTAL'S TYPE 317C.

Within 18 months following its introduction, Continental had sold 13 Type 317C transmitters. Here's why:

OVERALL EFFICIENCY: 62% or better

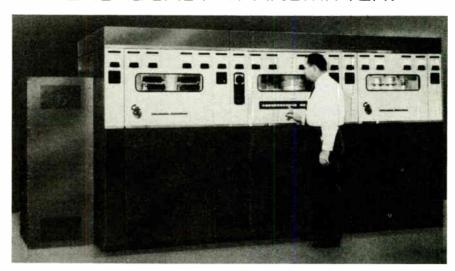
PLATE EFFICIENCY: 80% or better

POWER CONSUMPTION:

82 kw @ 0 modulation 92 kw @ 30% modulation 120 kw @ 100% modulation

SELF-CONTAINED: compact design assures minimum installation cost. The 317C uses only 62 sq. ft. of total floor space. Blower is contained within transmitter cabinet. One neat package for the world's most efficient 50 kw AM broadcast transmitter.

THE WORLD'S MOST EFFICIENT 50KW AM BROADCAST TRANSMITTER!



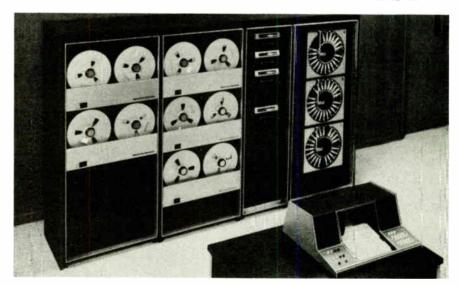
OTHER CONTINENTAL BROADCAST TRANSMITTERS range in power from 5,000 watts to 1,000,000 watts.

CONTINENTAL'S PROLOG-AUTOMATIC

Prolog uses your station log to provide any degree or combination of unattended, automatic or manual-live operation desired. Your log can be prepared on any standard electric typewriter, or you can use any of the autotyping, IBM punch-card and similar equipment in use today. PROLOG uses your established programming format; nothing changes unless you want to change it. That's PROLOG: simple and flexible!

For additional information on Continental transmitters or PROLOG Systems, write Commercial Sales Dept; Continental Electronics Mfg. Co.; Box 17040, Dallas, Texas 75217

PROGRAMMING & LOGGING AS EASY AS TYPING UP YOUR STATION LOG!





RHG ELECTRONICS LABORATORY STANDARD ELECTRONICS CORP. TELETRONIX VISUAL ELECTRONICS CORP WILKINSON ELECTRONICS+ INC

TRANSMITTERS. FM. 15 KW
CCA ELECTRONICS CORPORATION
GATES RADIO COMPANY

TRANSMITTERS . FM . 20 KW TRANSMITTERS. FM. 20 KM

AMERICAN ELECTRONIC LABS
BAUER ELECTRONICS CORPORATION
CCA ELECTRONICS CORPORATION
COLLINS RADIO COMPANY
GATES RADIO COMPANY
RCA BROADCAST PRODS
SINGER PRODUCTS CO
STANDARD ELECTRONICS CORP. ELECTRONICS CORP WILKINSON ELECTRONICS. INC

TRANSMITTERS: FM: 40 KM
CCA ELECTRONICS CORPORATION
GATES RADIO COMPANY
RCA BROADCAST PRODS

TRANSMITTERS. FM. 50 KW

TRANSMITTERS. FM. 100 KW AMERICAN ELITE

TRANSMITTERS. FM. TO DRDER

TRANSMITTERS. TV ROHDE & SCHWARZ SALFS CO. -USA THOMSON ELECTRIC CO

TRANSMITTERS. TV. 1 WATT KEITH ANDERSON CO EMCEF

TRANSMITTERS: IV: 10 WATTS KEITH ANDERSON CO

TRANSMITTERS. TV. 20 WATTS

TRANSMITTERS. TV. 60 WATTS
UTICA CORPORATION

TRANSMITTERS. TV. 100 WATTS EMCFF GATES RADIO COMPANY

TRANSMITTERS. TV. 500 WATTS
GATES RADIO COMPANY
STANDARD ELECTRONICS CORP

TRANSMITTERS. TV. 1 KW MARCONI DIVISION FMCEE SARKES-TARZIAN

TRANSMITTERS . TV + 2 KW

TRANSMITTERS. TV. 3 KW TOWNSEND ASSOCIATES

TRANSMITTERS. TV. 5 KW GATES RADIO COMPANY MARCONI DIVISION RCA BROADCAST PRODS STANDARD ELECTRONICS CORP .

TRANSMITTERS. TV. 6 KW RCA BROADCAST PRODS

TRANSMITTERS. TV. 10 KM
G F VISUAL COMMUNICATIONS PROD
MARCONI DIVISION
STANDARD ELECTRONICS CORP .

TRANSMITTERS, IV. 11 5W

RCA BROADCAST PRODS

TRANSMITTERS . TV . 15 KW TOWNSEND ASSOCIATES VISUAL ELECTRONICS CORP

TRANSMITTERS, TV. 25 KW
MARCONI DIVISION
RCA BROADCAST PRODS
STANDARD ELFCTRONICS CORP .

TRANSMITTERS: TV: 30 KM
G E VISUAL COMMUNICATIONS PROD
RCA BROADCAST PRODS
TOWNSEND ASSOCIATES
VISUAL ELECTRONICS CORP

TRANSMITTERS. TV. 35 KW STANDARD ELECTRONICS CORP .

TRANSMITTERS, TV. 50 KW
G F VISUAL COMMUNICATIONS PROD
RCA BROADCAST PRODS
STANDARD ELECTRONICS CORP .

TRANSMITTERS. TV. 55 KW TOWNSEND ASSOCIATES VISUAL ELECTRONICS CORP

TRANSMITTERS. TV. 70 KW STANDARD ELECTRONICS CORP .

TRANSMITTERS. TV. 100 KW
G E VISUAL COMMUNICATIONS PROD
TOWNSEND ASSOCIATES

TRANSMITTERS. TV. 150 KW

TRANSMITTERS. TV. TO ORDER

TUBING - SEE HARDWARE

TURNTABLES. PHONOGRAPH
BENJAMIN ELECTRONIC SOUND CORP
DISPLAY TECHNOLOGIES INC
FAIRCHILD RECORDING EQUIPMENT
GOTHAM AUDIO CORPORATION
GRAY REFARCH & DEVFLOPMENT CO
KOSS ELECTRONICS. INC.
MARANIZ COMBANY KOSS FLECTRONICS. INC.
MARANIZ COMPANY
OR K ELFCTRONIC PRODUCTS
RCA RROADCAST PRODS.
RUSSCOE ELECTRONICS MEG.
SINGER PRODUCTS CO.
SONY CORPORATION OF AMERICA
SPARTA ELECTRONIC CORPORATION
TELFCTRO INDUSTRIES CORP
VISUAL FLECTRONICS CORP
THE SINGER CO - METRICS DIV

VISUAL FLECTRONICS CORP
THE SINGER CO - METRICS DIV

TV SYSTEMS, CLDSED CIRCUIT
AMECO. INC.
AMERICAN CASLE SLECTRONICS
AMPEX CORPORATION
AMDLIVISION CORPORATION
AMOLIVISION CORPORATION
ANACONDA ASTRODATA CO
RALL PROTHERS PESEARCH
RIONIC INSTRUMENTS. INC.
RLONDER-TONGUE LABDRATORIES
CENTRAL DYNAMICS CORPORATION
COMU ELECTRONICS
COLORADO VIDEO
DAGE RELL CORPORATION
DIAMOND FLECTRONICS
DIFCRAFT. INC
F 5 M SYSTEMS COMPANY
THE JAMPS FLOVE FORD CO
GRC AMERICA CORPORATIONS
OF FVISUAL COMMUNICATIONS PROD
GENERAL FLECTRIC CO
JERNOLD ELECTRONICS CORP
JM ELECTRONICS COMPANY
KAISER-COX
THE KALART COMPANY
LITTON EDUCATIONAL TELE DIV
MARCONI DIVISION
MARYLAND TELECOMMINICATIONS
MICRO-LINK SYSTEMS/VARIAN ASSO
MIRATEL FLECTRONICS. INC
MYR CARPORATION
RCA BROADCAST PRODS.
RIKER VIDEO INDUSTRIES
SARKES-TARZIAN
SETCHEL CARPSON INCORPORATED
SIOMA INQUISTRIES
SONY CORPORATION OF AVERICA
SPENCER-KENNEDY LARGRATORIES
STANDARD ELECTRONICS CORP.
S. STERLING COMPANY
SYLVANIAL-COMM. ELECTRONICS DIV
TELEGUIP CORPORATION
THE MATCH TELEGUIP CORPORATION
THOMAN TELEGUIP CORPORATION
TELEGUIP CORPORATION
TELEGUIP CORPORATION
TELEGUIP CORPORATION
TELEGUIP CORP

VACUUM TUBES, BALLAST
AMPERITE CO
LEWIS AND KAUFMAN, LTD.
THOR FLECTRONICS

VACUUM TUBES. CAMERA.

IMAGE-ORTHICON
AMPEREX FLECTRONIC CORP
THE ENGLISH ELECTRIC CORP.
G E PICKUP TUBE OPERATION
RCA ELECTRONIC COMPONENTS
TELEGUIP CORPORATION
THOR ELECTRONICS
VISUAL ELECTRONICS CORP
WESTINGHOUSE ELECTRIC CORP

VACUUM TURES, CAMERA, PLUMRICON AMPEREX ELECTRONIC CORP NORTH AMERICAN PHILIPS CO VISUAL ELECTRONICS CORP

VACUUM TURES, CAMERA, VIOICON
AMPEREX ELECTRONIC CORP
THE ENGLISM ELECTRIC CORP.
GRC AMERICA CORPORATION
G E PICKUP TUBE OPERATION
LEWIS AND KAUFMAN, LTD.
NORTH AMFRICAN PHILIPS CO
RCA ELECTRONIC COMPONENTS
TELEGUIP CORPORATION
TELEVISION UTILITIES CORP
THOR ELECTRONICS
VISUAL ELECTRONICS CORP
WESTINGHOUSE FLECTRIC CORP

VACUUM TUBES, CATHODE RAY, OSCILLOSCOPE TEXTRONIX INC

VACUUM TURES, CATHODE RAY,

TV+ COLOR
G E DISTRIBUTOR SALES FORCE RCA ELECTRONIC COMPONENTS SINGER PRODUCTS CO. THOR FLECTRONICS WESTINGHOUSE ELECTRIC CORP

VACUUM TUBES, CATHODE RAY,
TY, MONOCHROME
AMERICAN ELITE CONRAC G F DISTRIBUTOR SALFS FORCE LEWIS AND KAUFMAN, LTD.
RCA FLECTROMIC COMPONENTS
SINGER PRODUCTS CO.
THOR ELECTRONICS WESTINGHOUSE ELECTRIC CORP

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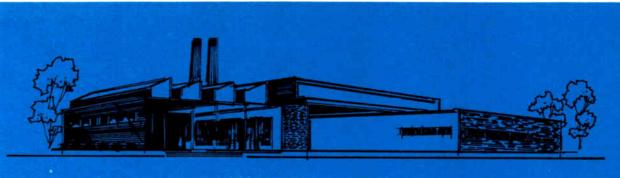
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FILTERS, RF
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ANTENNAS, TY
CABINETS, METAL
CABLE, ARMORED
CABLE, SHIELDED, AUDIO
KITS OSCILLOSCOPES

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RECORDERS, MAGNETIC TAPE,
AUDIO
RELAYS, GENERAL PURPOSE
TAPE, MAGNETIC RECORDING,
AUDIO
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ISOLATION
TRANSFORMERS. AUDIO, MATCHING
TRANSFORMERS. AUDIO,
POWER OUTPUT
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COMSOLE, AUDIO, FM
COMSOLE, AUDIO, FM
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CONSOLE, AUDIO, TO
CONSOLE, AUDIO, TO
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CONSOLE, VIDEO, PORTABLE
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COMMUNICATIONS SYSTEMS,
LAND MOBILE
COMMUNICATIONS SYSTEMS,
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CONSOLE, AUDIO, FM
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TRANSMITTERS, AM, 5 KW
TRANSMITTERS, AM, 5 KW
TRANSMITTERS, AM, 5 KW
TRANSMITTERS, AM, 10 KW
TRANSMITTERS, AM, 10 KW
TRANSMITTERS, FM, 10 WATTS
TRANSMITTERS, FM, 10 WATTS
TRANSMITTERS, FM, 15 KW
TRANSMITTERS, FM, 10 KW
TRANSMITTERS, TM, 10 KW
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SEMICONDUCTORS. GEMERAL
SEMICOMDUCTORS,
TRANSISTORS. RF
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IMAGE-ORTHICOM
VACUUM TUBES. CAMERA.
PLUMBICOM R
VACUUM TUBES. CAMERA. VIDICOM
VACUUM TUBES. TRANSMITTING
VACUUM TUBES. TRANSMITTING

AMPERITE CO.
RELAYS. TIME DELAY
VACUUM TUBES. BALLAST

VACUUM TUBES, BALLAST

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CAMERAS, TV. COLOR
CAMERAS, TV. COLOR
CAMERAS, TV. MONOCHROME
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RECOROING SERVICE
CATY, ORIGINATION EQUIPMENT
COMMUNICATIONS SYSTEMS,
LAND MOBILE
COMPUTER EQUIPMENT
COMSOLE, AUDIO, AM
COMSOLE, AUDIO, FM
COMSOLE, AUDIO, FE
CONSOLE, AUDIO, PECORDING
COMSOLE, AUDIO, PECORDING
COMSOLE, AUDIO, TV
COMSOLE, AUDIO, SECONDING
COMSOLE, AUDIO, SECONDING
COMSOLE, VIDEO, STUDIO
DEMAGNETIZERS, BULK TAPE
DEMAGNETIZERS, MEAD
DROPOUT COMPENSATOR, DEMAGNETIZERS, BULK TAPE
DEMAGNETIZERS, HAD
DROPOUT COMPENSATOR,
VIOCO TAPE
EARPHONES, HEADPHONES
EDITORS, AUDID TAPE
ELITORS, VIOED TAPE
HEADS, ERASE, MAGNETIC
INDUSTRIAL TV
LENSES, OPTICAL, ZOOM
HAINTEMANCE SERVICES, AM
HAINTEMANCE SERVICES, FM
HAINTEMANCE SERVICES, FM
HAINTEMANCE SERVICES, TV
MICROPHONES, DYMAMIC
HOBILE EQUIPMENT
MONITORS, VIDEO
RECORDERS, HAGNETIC TAPE,
AUDIO
RECORDERS, MAGNETIC TAPE,
LOGGIMG
RECORDERS, MAGNETIC TAPE,
VIDEO VIDEO SOUND SYSTEMS. OUTDOOR SOUND SYSTEMS. PORTABLE SOUND SYSTEMS. THEATER SPEAKERS SPEAKERS
TAPE DECKS, MAGMETIC
TAPE DUPLICATORS
TAPE, MAGMETIC RECORDING,
AUDIO
TAPE, MAGNETIC RECORDING,
COMPUTER
TAPE, MAGNETIC RECORDING,
TEST TAPE. MAGNETIC RECORDING. VIDEO TV SYSTEMS. CLOSED CIRCUIT

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CABLE. ASSEMBLIES

CABLE. CATV. HARDWARE

CABLE. COAXIAL. FLEXIBLE

CABLE. COAXIAL. RIGID

CABLE. SINIELDED. AUDIO

CHARGERS. BATTERY

COMMUNICATIONS SYSTEMS. CB

CONNECTORS. AF & MICROPHOME

CONNECTORS. COAXIAL CABLE

CONNECTORS. COAXIAL CABLE

CONNECTORS. FF

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GENERATORS. SIGNAL. COLOR BAR

GENERATORS. SIGNAL. COLOR BAR

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PLUGS. COAXIAL METERS. FIELD STRENGTH
PLUGS. COAXIAL
PLUGS. PHONE
POTENTIOMETERS. CARBON
POTENTIOMETERS. WIREWOUND
RESISTORS. FIXED. PRECISION
RESISTORS. FIXED. WIREWOUND
RESISTORS. FIXED. WIREWOUND
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AMPLIFIER. AF. AGC
AMPLIFIER. AF. COMPRESSING
AMPLIFIER. AF.
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AMPLIFIER. AF. REVERBERATION
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DEMAGNETIZERS. HEAD
METERS. FLUTTER & WOW
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AUDID AUDID REVERBERATION DEVICES

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AMPLIFIER: RATY
AMPLIFIER, CATY
AMPLIFIER, CATY
AMPLIFIER, ST.,
GEMERAL PURPOSE
AMPLIFIER, TV. BOOSTER
AMPLIFIER, TV. VIDEO
AMPLIFIER, TV. VIDEO
AMPLIFIER, VIDEO, SWEEP
ANTENNAS, TV.
MASTER-COMMUNITY
CABLE, CATY, HARDWARE
CAMERA, REMOTE
CONTROL EQUIPMENT
CAMERAS, TV. COLOR
CAMERAS, TV. COLOR
CAMERAS, TV. MONOCHROME
CATY EQUIPMENT - ALSO SEE
OTHER CATEORIES
CATY, HEAD-END EQUIPMENT
COMMUNICATIONS SYSTEMS,
MICROWAYE
CONNECTORS, ANTENNA
CONNECTORS, COAZIAL CABLE
CONNOLE, VIDEO, PORTABLE
CONSOLE, VIDEO
MARGOM-BAND FM EQUIPMENT
NETWORKS, MATCHING, RF
NETWORKS, PHASING
RECOROERS, MAGNETIC TAPE,
VIDEO
ROOSS, GROUND AMPLIFIER. BRIDGING RODS, GROUND TAPE DECKS, MAGNETIC TAPE, MAGNETIC RECORDING, VIOEO VIDEO VIDEU
TOWERS. ANTENNA.
CATV. HEAD-END
TRANSLATOR SYSTEMS
TV SYSTEMS. CLOSED CIRCUIT

AMACONDA ASTRODATA CD.

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AMPLIFIER. CATV
AMPLIFIER. DISTRIBUTION
AMPLIFIER. TV. BOOSTER
CABLE. CATV. MARDWARE
CABLE. COAXIAL. FLEXIBLE
CABLE. DOAXIAL. FLEXIBLE
CATV EQUIPMENT — ALSO SEE
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CATV. CABLE TERMIMALS
CATV. CHANNEL AMPLIFIERS
CATV. HEAD-END EQUIPMENT
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COMSOLE, AUDIO, FM
COMSOLE, AUDID, RECOROING
COMSOLE, AUDIO, TV
COMSOLE, AUDIO, AM

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WIND AND THERMOELECTRIC
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TRANSMITTERS. TV. 10 WATTS

TRANSMITTERS, TV. 10 MATTS

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ANTENNAS, MOBILE
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CABLE. CASTAL, FLEXIBLE
CABLE. COAXIAL, FLEXIBLE
CABLE. COAXIAL, RIGID
CABLE. DIRECT-BURIAL
CLAMPS, CABLE
CONNECTORS, COAXIAL CABLE
CONNECTORS, COAXIAL CABLE
CONNECTORS, RF
DELAY LINES
JOINTS, ROTARY, WAVEGUIDE
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MOBILE EQUIPMENT
MOUNTS, ANTENNA, FIXED
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RADOMES
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SWITCHES, COAXIAL
SWITCHES, WAVEGUIDE
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SWITCHING MATRIXES
SWITCHING SYSTEMS
TRANSMISSION LINES
WAVEGUIDE AND
ASSOCIATED COMPONENTS

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INSULATORS, STAND-OFF
TOWERS, ANTENNA,
CATY HEAD-END
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
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TOWERS, ANTENNA,
TRANSMITTING, TY
TRANSFORMERS, FF BALUNS TRANSFORMERS, RF TRANSMISSION LINES

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WIRING AND CABLING SERVICES

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ANDLIFTER. DISTRIBUTION
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BROADCAST PROGRAMMING SERVICE BACKGROUMD MUSIC SERVICE
BROADCAST PROGRAMMING SERVI
CAMERAS, TV, COLOR
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRELESS
CONSOLE, AUDIO, RECORDING
COMSOLE, CABINETS
AND HARDWARE
EARPHOMES, MEADPHONES
EDITORS, AUDIO TAPE
EQUICATION FACILITIES, EOPT
ENCLOSURES, SPEAKER
MAINTEMANCE SERVICES, AM
MAINTEMANCE SERVICES, AM
MAINTEMANCE SERVICES, FM
RECORDS, BLANK, ACETATE,
FOR RECORDING
SCREMS, PROJECTION, FRONT
TAPE DUCLICATORS
TAPE, WAGNETIC RECORDING,
TAPE, WAGNETIC RECORDING, TAPE. MAGNETIC RECORDING. TAPE, MAGNETIC RECORDING, VIDEO

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ARMS. TONE

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EARPHONES, HEADPHONES
MICROPHONE STANDS & BOOMS
MICROPHONES, DYNAMIC
STYLI, CUTTING
STYLI, PLAYBACK
TAPE, MAGNETIC RECORDING,
AUDIO

ATLAS SOUND ACOUSTIC MATERIALS ACOUSTIC MATERIALS
ADAPTERS, CONNECTOR
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS,
LAND MOBILE
LAMP ASSEMBLIES
MOBILE EQUIPMENT
MOUNTS, INSTRUMENT
SOUND SYSTEMS, OUTDOOR
SOUND SYSTEMS, THEATER
SPEAKERS
SPEAKERS
SPEAKERS
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TRANSFORMERS, AUDIO, MATCHING

AUDIO ACCESSORIES CORDS, PATCH JACK PANEL ASSEMBLIES JACKS LAMPS, PANEL PLUGS, PHONE SOCKETS. LAMP WIRING AND CABLING SERVICES

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HEADS DISC RECORDING MEADS. DISC RECORDING
RECORDS. BLANK. LACQUER.
FOR RECORDING
REELS. TAPE
TAPE, MAGNETIC RECORDING.
AUDID
TAPE, MAGNETIC RECORDING.
AUDIO. CARTRIDGE
TAPE, MAGNETIC RECORDING.
COMPUTER
TABE. MAGNETIC PECORDING. TAPE. MAGNETIC RECORDING. TEST

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AMALYZERS. DISTORTION
ANALYZERS. INTERMODULATION
DELAY LINES
EDUCATION FACILITIES. EOPT
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RECORDERS. MAGNETIC TAPE. AUD I O SOUND SYSTEMS, OUTDOOR SOUND SYSTEMS, THEATER TAPE DECKS, MAGNETIC TELEPHONE EQUIPMENT

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AMPLIFIER, CATV
AMPLIFIER, DISTRIBUTION
AMPLIFIER, STABILIZING
AMPLIFIER, TV, VIDED
CATV EQUIPMENT - ALSO SEE
OTHER CATEGORIES
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SPECIAL EFFECT
INDUSTRIAL TV DUSTRIAL TV SYSTEMS. CLOSED CIRCUIT

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AMPLIFIER, AF,
GEMERAL PURPOSE
AMPLIFIER, AF,
PEAK LIMITING, AM
AMPLIFIER, AF,
PEAK LIMITING, AM
AMPLIFIER, AF,
PEAK LIMITING, FM
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, STEREO
CAMPLIFIER, AF, STEREO
CAMPLIFIER, AF, COMPANDED
COMPOSITION OF COMPANDED
COMPOSITION OF COMPANDED
COMSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, TY
COMSOLE, CABINETS
AND HARDWARE
CONSOLE, KITS
DELAY DEVICES, AF AND MARDMARE
CONSOLE, KITS
DELAY DEVICES, AF
MIXERS - ALSO SEE CONSOLES
PREAMPLIFIERS, AUDIO
RECORDERS, PAPER,
LOGGING AND GRAPHIC
REMOTE CONTROL SYSTEMS
REVERBERATION DEVICES
TRANSMITTER KITS
TRANSMITTERS, AM, LOW POWER
TRANSMITTERS, AM, 250 WATT
TRANSMITTERS, AM, 5 KW
TRANSMITTERS, AM, 5 KW
TRANSMITTERS, AM, 10 KW

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LAP AMPLIFIERS—Here's the new LDA-series of lap-dissolve amplifiers that AEM developed especially for color. Photo-electric cells, remotely controlled by DC circuitry, assure a velvety transition between two inputs. All solid state (silicon semiconductors exclusively), the LDA provides the signal handling characteristics of a high performance distribution amplifier. Differential phase and gain do not change even during the lap interval. Embarrassing color shifts and level changes become a thing of the past. And the price is just as attractive as the performance: LDA-1, \$555.00; LDA-2 (sync adding), \$585.00.

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MONITORS, FM SYSTEMS, MONO
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, STEREO
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AMPLIFIER, TV, BOOSTER

ANTENNAS, TV,

MASTER-COMMUNITY

ATTENUATORS, RF

CATV EQUIPMENT - ALSO SEE

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CATV, CABLE TERNINALS

CATV, CHANNEL AMPLIFIERS

CATV, MEAD-END EQUIPMENT

CONNECTORS, COAXIAL CABLE

CONVERTERS

FILTERS, ANTENNA CONVERTERS
FILTERS, ANTENNA
HEAD-END EQUIPMENT
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HOUSINGS, ANTENNA
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FILTERS, POWER
METERS, POWER
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CABLE. ARMORED
CABLE. DIRECT-BURIAL
CABLE. SHIELDED, AUDIO
CABLE. TELEPHONE

CLAMPS, CABLE
CLIPS, TEST
CORDS, DIAL
CORDS, LACING
CORDS, PATCH
CORDS, SET
MARDWARE, GENERAL
MARDWARE, GENERAL
MARDWARE, RACK
MARDWARE, TUBING, PLASTIC
MFAT SINKS MARDWARE, TUBING, PLASTIMENT SINKS
INSULATORS, ANTENNA
INSULATORS, FEED THROUGH
INSULATORS, STAND-OFF
INSULATORS, OTHER
JACKS JACKS
KNOBS
LIGHTNING ARRESTERS
PLUGS, PHONE
SWITCHES, KNIFE
SWITCHES, FOR THE SWITCHES, PUSHBUTTON,
NONILLUMINATED
SWITCHES, SLIDE
SWITCHES, TOGGLE
TERNINALSTRIPS
TERNINALS, LUG
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AMPLIFIER, DC
BATTERIES, NICKEL CADMIUM
CAMERA, MOUNTING EQUIPMENT
CAMERAS, FILM, CINE
CAMERAS, FILM, CINE
CAMERAS, FILM, STILL
CHARGERS, BATTERY
CONVERTERS
DOLLIES, CAMERA
EDITORS, AUDIO TAPE
EDITORS, FILM
EDITORS, POTICAL, ZOOM
LIGHTING, TV. COMPONENTS
MIXERS — ALSO SEE COMSOLES
MOUNTS, INSTRUMENT
POWER SUPPLIES, AC
POWER SUPPLIES, AC
POWER SUPPLIES, DC
PROJECTORS, FILM
REELS, FILM
REELS, TAPE
SCREENS, PROJECTION, FRONT
SPLICERS, MAGNETIC TAPE
AND FILM
TAPE, MAGNETIC RECORDING,
AUDIO

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CATV, HEAD-END
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, TV

TOWERS, ANTENNA,
TRANSMITTING, TV
BLONDER TONGUE LABORATORIES
ADAPTERS, CONNECTOR
AMPLIFIER, CATV
AMPLIFIER, DISTRIBUTION
AMPLIFIER, FY,
GENERAL PURPOSE
AMPLIFIER, TV, BOOSTER
AMPLIFIER, TV, STOED
AMPLIFIER, TV, SWEEP
AMTENNAS, CATV
AMETINNAS, TW
AMTENNAS, TV
AMTENNAS, TV,
MASTER—COMMUNITY
ATTENUATORS, RF
BALUNS
BRIDGES
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CAMERAS, FILM, STILL
CAMERAS, TV, COLOR
CAMERAS, TV, MONOCHROME
CATV EQUIPMENT — ALSO SEE
OTHER CATEGORIES
CATV, CHANNEL AMPLIFIERS
CATV, MEAD—END EQUIPMENT
CATV, MEAD—END EQUIPMENT
CATV, ORIGINATION EQUIPMENT
CATV, ORIGINATION EQUIPMENT
CATV, ORIGINATION EQUIPMENT
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CONVERTERS
DETECTORS, STANDING WAVE

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CONVERTERS
DETECTORS, STANDING WAVE
DIPLEXERS
DISPLAY EQUIPMENT, TV
DOLLIES, CAMERA
FILTERS, ANTENNA
FILTERS, RF
GENERATORS, SIGMAL, MARKER
GENERATORS, SIGMAL, RF
GENERATORS, SIGMAL, RF
GENERATORS, SIGMAL, TV
SYNCHRONIZING
MEAD-END EQUIPMENT,
SEE CATV HEAD-END EQUIPMENT
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METERS, FREQUENCY
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MODULATORS, TV
MONITORS, VIOCO
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HARDWARE, FIXTURES, HOLOING
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HARDWARE, MOUNTS
HARDWARE, MARCH
HARDWARE, RACK
PANELS, INSTRUMENT,
FOR RACK MOUNTING
RACKS, MOUNTING
RACKS, MOUNTING
SLIDES, CHASSIS

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BATTERIES, DRY CELL
TAPE, MAGNETIC RECORDING,
AUDIO

AUDIO

BURKE 6 JAMES
CABINETS, METAL
CABINETS, STORAGE,
MAGNETIC TAPE
CABINETS, WOOD
CAMERA, MOUNTING EQUIPMENT
CAMERAS, FILM, CINE
CAMERAS, FILM, STILL
DUCTS, VENTILATION
EDITORS, FILM
FILTERS, OTHER
LENSES, OPTICAL, FIXED
LENSES, OPTICAL, ZOOM
LIGHTING, TV, COMPONENTS
METERS, LIGHT
PROCESSORS, FILM, B-M
PROCESSORS, FILM, B-M
PROCESSORS, FILM, COLOR
PROJECTORS, FILM
PROJECTORS, SLIDE

REELS, FILM
REMINDERS, FILM
SCREEMS, PROJECTION, FRONT
SCREEMS, PROJECTION, REAR
SPLICERS, MAGNETIC TAPE
AND FILM
TIMERS, ELECTRIC

CALBEST ELECTRONICS
ADAPTERS, FM STEREO
AMPLIFIER, AF, STEREO
COILS, CHOKE, RF
COMMUNICATIONS SYSTEMS
INTERCOM, WIRED
RECEIVERS, AM
RECEIVERS, FM
RECEIVERS, SCA SPEAKER COMPONENTS

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APPLIFIER. AF.
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AMPLIFIER. AF.
PEAK LIMITING. FM
AMPLIFIER. MASKING
DISPLAY COULPMENT. TV
ENHANCERS. TV IMAGE
METERS. DB AND VU
METERS. DB AND VU RECORDS. TEST

STL EQUIPMENT TOWERS: ANTENNA: TRANSMITTING: A TOMERS, ANTENNA,
TRANSMITTING, AM
TOMERS, ANTENNA,
TRANSMITTING, FM
TRANSMITTERS (AM) 250 WATT
TRANSMITTERS, AM) 1 KW
TRANSMITTERS, AM) 5 KW
TRANSMITTERS, AM) 10 KW
TRANSMITTERS, AM, 10 KW
TRANSMITTERS, AM, 25 KW
TRANSMITTERS, AM, 26 KW
TRANSMITTERS, AM, 27 KW
TRANSMITTERS, AM, 20 KW
TRANSMITTERS, AM, 20 KW
TRANSMITTERS, FM, 10 WATTS
TRANSMITTERS, FM, 10 WATTS
TRANSMITTERS, FM, 12 W
TRANSMITTERS, FM, 250 WATTS
TRANSMITTERS, FM, 15 KW
TRANSMITTERS, FM, 5 KW
TRANSMITTERS, FM, 5 KW
TRANSMITTERS, FM, 15 KW
TRANSMITTERS, FM, 16 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, FM, 40 KW
TRANSMITTERS, FM, 50 KW
TR

C-COR ELECTRONICS
AMPLIFIER, BRIDGING
AMPLIFIER, CATV
AMPLIFIER, DUSTRIBUTION
AMPLIFIER, PUNSE
AMPLIFIER, PUNSE
AMPLIFIER, PUNSE
AMPLIFIER, FF,
GENERAL PURPDSE
AMPLIFIER, TV, WIDED
CATV EQUIPMENT - ALSO SEE
OTHER CATEGORIES
CATV, CHANNEL AMPLIFIERS
CATV, CHANNEL AMPLIFIERS
CATV, CHANNEL AMPLIFIERS
CATV, HEAD-END EQUIPMENT
MEAD-END EQUIPMENT
SEE CATV MEAD-END EQUIPMENT

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CAPACITORS, FIXED, CERAMIC
CAPACITORS, FIXED, METALLIZED
CAPACITORS, FIXED, METALLIZED
CAPACITORS, VARIABLE
INSULATORS, VARIABLE
INSULATORS, STAND-OFF
INSULATORS, STAND-OFF
INSULATORS, OTHER
INTEGRATED CIRCUITS
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POTENTIOMETERS, WIREWOUND
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AMPLIFIER. FM.
GENERAL PURPOSE
AMPLIFIER. AF. STEREO
AMPLIFIER. AF. STEREO
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ATTENUATORS. VIDEO
ATTENUATORS. VIDEO
ATTENUATORS. VIDEO
CATV. ORIGINATION EQUIPMENT
CLOCKS.
COMMUNICATIONS SYSTEMS.
INTERCOM, WIRED CLOCKS
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
CONSOLE, AUDIO, TV
CONSOLE, VIDEO, PORTABLE
CONSOLE, VIDEO, PORTABLE
CONSOLE, VIDEO, STUDIO
CORDS, PATCH
DELAY LINES
DISPLAY EQUIPMENT, TV
EDUCATION FACILITIES, EQPT
GENERATORS, SIGNAL,
SPECIAL EFFECT
GENERATORS, SIGNAL,
TV SYNCHRONIZING
GENERATORS, SIGNAL,
VITS
INDUSTRIAL TV
JACK PANEL ASSEMBLIES
JACKS
MAINTENANCE SERVICES, TV
MIXERS - ALSO SEE CONSOLES
MOBILE EQUIPMENT
PREAMPLIFIERS, AUDIO
PREAMPLIFIERS, AUDIO
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SWITCHERS
SWITCHING MYSTEMS
TY SYSTEMS, CLOSED CIRCUIT

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LIGHTING. TV. CONTROLS
LIGHTING. TV. SYSTEMS
MICROPHONE STANDS & BOOMS

TV SYSTEMS. CLOSED CIRCUIT

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AMPLIFIER, DC

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OTHER CATEGORIES

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LENSES, OPTICAL, ZOOM
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POWER SUPPLIES, PRECISION
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MONITORS, FM SYSTEMS, MONO
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, STEREO
MONITORS, FREQUENCY
NETWORKS, PHASING
RECORDERS, MAGNETIC TAPE,
AUDIO, CARTRIDGE
STL EQUIPMENT
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TRANSMITTERS, AM, 1 KW
TRANSMITTERS, AM, 10 KW
TRANSMITTERS, FM, 5 KW
TRANSMITTERS, FM, 10 KW
TRANSMITTERS, FM, 5 KW
TRANSMITTERS, FM, 20 KW

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CAMERAS, TV. MONOCHROME
DISPLAY EQUIPMENT, TV
ENHANCERS, TV IMAGE
GEMERATORS, SIGNAL,
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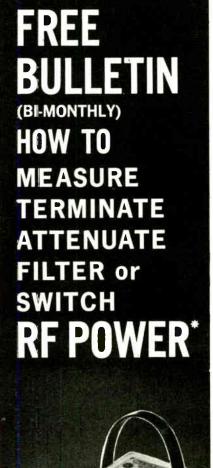
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CAPACITORS, FIXED, MICA
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CONSOLE, AUDIO, TV
CONSOLE, CABINETS
AND HARDWARE
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, VIDEO, PORTABLE
CONSOLE, VIDEO, STUDIO
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GENERAL

GENERAL

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INTERCOM. WIRED
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DUMMY LOAD
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METERS, STANDING WAVE
MICROWAVE COMPONENTS
MICROWAVE SYSTEMS, STO
MICROWAVE SYSTEMS, SWITCHES, WAVEGUIDE
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CONNECTORS, AF 6 MICROPHONE
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PLUGS, CHASSIS
SOCKETS, LAMP
SOCKETS, TUBE
SILDES, CHASSIS
SOCKETS, LAMP
SOCKETS, TUBE
SILDES, CHASSIS
SOCKETS, LAMP
SOCKETS, TUBE
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SOCKETS, LAMP
SOCKETS, TUBE
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TERMINALS, BARRIER
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TERMINALS, BARRIER
TERMINALS, SOLDER
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DIVIDERS, POWER
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MICROWAVE SYSTEMS, OTHER
MODULATORS, TV
TRANSLATOR SYSTEMS
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TRANSMITTERS, TV, 100 WATTS
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METERS, FREQUENCY
METERS, FREQUENCY
METERS, PREQUENCY
METERS, PHASE ANGLE
METERS, PMASE ANGLE
METERS, POWER
MICROWAVE COMPONENTS
OMMMETERS
OSCILLATORS, AF AND RF,
SEE GENERATORS
OSCILLATORS, AM
OSCILLATORS, OTHER
OSCILLATORS
O

THE ENGLISH ELECTRIC CORP,
CALORIMETERS
VACUUM TUBES, CAMERA,
IMAGE-ORTHICON
VACUUM TUBES, CAMERA, VIDICON
VACUUM TUBES, TRANSMITTING

ENTRON. INC.
AMPLIFIER. CATV
CATV EQUIPMENT - ALSO SEE
OTHER CATEGORIES
CATV. CABLE TERMINALS
CATV. CHANNEL AMPLIFIERS
CATV. MEAD-END EQUIPMENT
CONNECTORS. CDAXIAL CABLE
CONNECTORS. RF
FILTERS. OTHER
HEAD-END EQUIPMENT.
SEE CATV MEAD-END EQUIPMENT
PDWER SUPPLIES. DC

ESSEX WIRE CORPORATION
RELAYS. BREAK-IN
RELAYS. GENERAL PURPDSE
RELAYS. OVERLOAD
RELAYS. POWER
RELAYS. POWER
RELAYS. TELEPHONE
RELAYS. THERMAL
RELAYS. TIME DELAY
TRANSFORMERS. AUDIO.
ISOLATION TRANSFORMERS, AUDIO,
ISOLATION
TRANSFORMERS, AUDIO, MATCHING
TRANSFORMERS, AUDID,
POWER OUTPUT
TRANSFORMERS, AUTO
TRANSFORMERS, COUPLING
TRANSFORMERS, FILAMENT
TRANSFORMERS, FILAMENT
TRANSFORMERS, POWER
TRANSFORMERS, POWER
TRANSFORMERS, TRANSISTOR
TRANSFORMERS, TRANSISTOR
TRANSFORMERS, VARIABLE EUPHONICS MARKETING ARMS. TONE CARTRIDGES. PHONO

E-Z-HOOK TEST PRODUCTS LEADS. TEST PROBES. TEST LEAD

PROBES, TEST LEAD

FAIRCHILD RECORDING EQUIPMENT
AMPLIFIER. AF.
GENERAL PURPOSE
AMPLIFIER. AF.
PEAK LIMITING. AM
AMPLIFIER. AF.
PEAK LIMITING. FM
ATTENDATORS. AUDIO
CARTRIDGES. PHONO
CONSOLE. AUDIO. AM
CONSOLE. AUDIO. FM
CONSOLE. AUDIO. TV
CONSOLE. TIS
MEADS. RECORDING
MIXERS - ALSO SEE CONSOLES
POWER SUPPLIES. AC
POWER SUPPLIES. AC
PREAMPLIFIERS. AUDIO
RACKS. MOUNTING
RECORDERS. MAGNETIC
RECORDERS. MAGNETIC TAPE.
AUDIO
REVERBERATION DEVICES AUDIO REVERBERATION DEVICES TURNTABLES. PHONOGRAPH

THE FINNEY CO.

AMPLIFIER. TV. BOOSTER
ANTENNAS. FM
ANTENNAS. TV.
ANTENNAS. TV.
MASTER-COMMUNITY
GALLING

F 6 M SYSTEMS COMPANY ANTENNAS. MOBILE AUTOMATION EQUIPMENT CALIBRATION SERVICE. AUTOMATION EQUIPMENT
CALIBRATION SERVICE,
FREQUENCY
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRELESS
COMMUNICATIONS SYSTEMS,
LAND MOBILE
COMMUNICATIONS SYSTEMS,
MICROMAVE
COMMUNICATIONS SYSTEMS,
MULTIPLEX
COMMUNICATIONS SYSTEMS,
TELEPRINTER
MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, OTHER
MOBILE EQUIPMENT
REMOTE CONTROL SYSTEMS
TRANSLATOR SYSTEMS
TO SYSTEMS
TO STRANSLATOR SYSTEMS
TO SYSTEMS
TO SYSTEMS
TO STRANSLATOR SYSTEMS
TO SYSTEMS
TO SYSTEMS
TO STRANSLATOR STRANSLATOR STRANSLATOR SYSTEMS
TO STRANSLATOR STRANSLATO

FISHER BERKELEY CORPORATION
AMPLIFIER. AF.
GENERAL PURPOSE
CABLE. TELEPHONE
COMMUNICATIONS SYSTEMS.
INTERCOM. WIRED
COMMUNICATIONS SYSTEMS.
INTERCOM. WIRELESS
POWER SUPPLIES. DC

HERB FITZGERALD COMMUNICATIONS
AND ELECTRONICS CALIBRATION SERVICE. FREQUENCY

THE JAMES FLOYD FORD COMPANY
ALARM. INTRUDER
ALARM. SIGNAL
BACKGROUND MUSIC SERVICE
BROADCAST PROGRAMMING SERVICE
CALIBRATION SERVICE.
INSTRUMENT
COMMUNICATIONS SYSTEMS.
INTERCOM. MIRED
COMMUNICATIONS SYSTEMS.
INTERCOM. WIRELESS
COMMUNICATIONS SYSTEMS.
LAND MOBILE COMMUNICATIONS SYSTEMS.
LAND MOBILE
COMPUTER SERVICES
MAINTENANCE SERVICES, TV
PROCESSORS, FILM, B-W
RECORDING SERVICE, AUDIO, TAPE
TELEPHONE EQUIPMENT
TV SYSTEMS. CLOSED CIRCUIT

FORT WORTH TOWER CO.
ANTENNAS. MICROWAVE
PREFABRICATED BUILDINGS
RADOMES.
REFLECTORS. PASSIVE
TOWERS. ANTENNA.
CATV. MEAD-END
TOWERS. ANTENNA. RECEIVING
TOWERS. ANTENNA.
TRANSMITTING. AM
TOWERS. ANTENNA.
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. TV

METERS LIGHT

GATES RADIO COMPANY
AMPLIFIER, AF, AGC
AMPLIFIER, AF, AGC
AMPLIFIER, AF, COMPRESSING
AMPLIFIER, AF, COMPRESSING
AMPLIFIER, AF, MONAURAL
AMPLIFIER, AF, MONAURAL
AMPLIFIER, AF, PEAK LIMITING, AM
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, GEMOTE
AMPLIFIER, AF, GEMENA
AMPLIFIER, FR, OWER
AMPLIFIER, AF, GEMERAL
AMPLIFIER, FR, OWER
AMPLIFIER, FR, OWER
AMPLIFIER, FR, OWER
AMTENNAS, AM
ANTENNAS, AM
ANTENNAS, AM
ANTENNAS, AM
ANTENNAS, MAGNEL
ANTENNAS, MODIL
ANTENNAS, MODIL
CABINETS, WETAL
CABINETS, WOOD
CARTRIDGES, MAGNETIC TAPE
COILS, CHOKE, AF
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, AM
DIVIDERS, POWER
DUMMY LOAD
EXCITERS, FM
FILTERS, ANTENNA
FILTERS, ANTENNA
FILTERS, RF
FLASHERS, TOWER
GENERATORS, FM, STEREO
MONITORS, AM SYSTEMS, MONO
MONITORS, AM SYSTEMS, STEREO
MONITORS, PM SYSTEMS
MONITORS, PM SYSTEMS
MONITORS, PM SYSTEMS
MOUNTS, ANTENNA, MOBILE
METWORKS, MATCHING, AUDIO
METWORKS, PM SYSTEMS
MONITORS, PM SYSTEMS TAPE, MAGNETIC RECORDING,
TEST
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, TV
TRANSMITTING, TV
TRANSMITTERS, TAMPER TOWERS,
TRANSMITTERS, AMP 1 KW
TRANSMITTERS, AMP 1 KW
TRANSMITTERS, AMP 10 KW
TRANSMITTERS, AMP 10 KW
TRANSMITTERS, AMP 20 KW
TRANSMITTERS, AMP 20 KW
TRANSMITTERS, AMP 20 KW
TRANSMITTERS, AMP 20 KW
TRANSMITTERS, FMP 10 WATTS
TRANSMITTERS, FMP 10 WATTS
TRANSMITTERS, FMP 10 WATTS
TRANSMITTERS, FMP 10 WATTS
TRANSMITTERS, FMP 1 KW
TRANSMITTERS, FMP 10 KW
TRANSMITTERS, TVP 100 WATTS
TRANSMITTERS, TVP 100 WATTS
TRANSMITTERS, TVP 5 KW

BBC AMERICA CORP

GBC AMERICA CORP. AMPLIFIER, TV. VIDEO INDUSTRIAL TV
MONITORS, VIDED
TV SYSTEMS, CLOSED CIRCUIT
VACUUM TUBES, CAMERA, VIDICON

G C ELECTRONICS COMPANY
ADAPTERS. CONNECTOR
ADAPTERS. FM STEREO
ADAPTERS. TEST
ANCHORS. GUY
ANTENNAS. FM
ANTENNAS. TV
CABLE. ASSEMBLIES
CABLE. SHIELDED. AUDIO
CHARGERS. BATTERY
CIRCUIT BREAKERS

CLAMPS. CABLE
CLEANERS. CHEMICAL
CLEANERS. DTMER
CLIPS. TEST
COILS. DEGAUSSING
CONNECTORS. AF & MICROPHONE
CONNECTORS. ANTENNA
CONNECTORS. COAXIAL CABLE
COROS. DIAL
COROS. LACING
COUPLERS
DECALCOMANIAS COUPLERS
DECALCOMANIAS
DEMAGNETIZERS. BULK TAPE
DEMAGNETIZERS. HEAD
DESICCANTS
DIALS. INSTRUMENT
EARPHONES. HEADPHONES
ENHANCERS. TV IMAGE EARPHONES, HEADHONES
ENHANCERS, TY IMAGE
FUSES
HARDWARE, CHASSIS
HARDWARE, DIAL POINTERS
HARDWARE, GEMERAL
HARDWARE, GROMMETS
HARDWARE, TOOLS
HARDWARE
HARDWARE
HARDWARE
HARDWARE
HARDWARE
HARDWARE
HOUNTS, ANTENNA, FIXED
MOUNTS, ANTENNA, MOBILE
HOUNTS, ANTENNA, MOBILE
HOUNTS, ANTENNA, MOBILE
HOUNTS, HARDWARE
HARDWAR
HARDWAR
HARDWAR
HARDWAR
HARDWAR
HARDWAR
HARDWAR
HARD SOCKETS, TUBE
SOLDER
SOLVENTS AND CLEANERS
SPLICERS, MAGNETIC TAPE
AND FILM
STROBE DISCS
STROBE. LIGHTS
SWITCHES, KNIFE
SWITCHES, PUSHBOTTON,
NONILLUMINATED
SWITCHES, SLIDE
SWITCHES, TOGGLE
TERNIALS, LUG
TERNIALS, SOLDER
TERNIALS, SOLDER
TERNIALS, SOLDER
TERNIALS, SOLDER SOLDER

TERMINALS. SOLDERLESS
TOOLS. SCREWDRIVERS

GE VISUAL COMMUNICATIONS PROD
AMPLIFIER. AF.
GENERAL PURPOSE
AMPLIFIER. AF. MONAURAL
AMPLIFIER. AF.
PEAK LIMITING. AM
AMPLIFIER. AF.
PEAK LIMITING. FM
AMPLIFIER. AF. STEREO
AMPLIFIER. FW. VIDEO
ANTENNAS. TV
CABLES SHIELDED. AUDIO
CAMERAS. TV. COLOR
CAMERAS. TV. WONOCHROME
COMSOLE. AUDIO. AM
CONSOLE. AUDIO. FM
CONSOLE. AUDIO. FM
DEMODULATORS
DIPLEXERS
EQUALIZERS. AUDIO EMPHASIS
FILTERS. AUF
STILTERS. AUF
GENERATORS. SIGMAL.
TV SYNCHRONIZING
INDUSTRIAL TV
MONITORS. AM SYSTEMS
MONITORS. PREQUENCY
MONITORS. PREQUENCY
MONITORS. VIDEO
POWER SUPPLIES. DC
PREAMPLIFIERS. AUDIO
RACKS. MOUNTING
SWITCHESS
TRANSMITTERS. TV. 10 KW
TRANSMITTERS. TV. 10 KW
TRANSMITTERS. TV. 50 KW
TRANSMITTERS. TV. 50 KW
TRANSMITTERS. TV. 50 KW
TRANSMITTERS. TV. 500 KM
TRANSMITTERS. TV. 500 KM
TRANSMITTERS. TV. 500 KM
TRANSMITTERS. TV. 500 CE
CITCUIT
VESTIGIAL SIDEBAND FILTERS

GE DISTRIBUTOR SALES FORCE

G E DISTRIBUTOR SALES FORCE
VACUUM TUBES
CARTRIDGES, PHONO
CRYSTALS, PIEZOELECTRIC CRYSTALS, PIEZOELECTRIC
LAMPS, GLOW
LAMPS, EXCITER
LAMPS, PANEL
LAMPS, PROJECTION
SEMICONDUCTOR OIODES
SEMICONDUCTOR RECTIFIERS,
GENERAL
SEMICONOUCTOR RECTIFIERS,
HIGM VOLTAGE
SEMICONDUCTOR RECTIFIERS,
POWER





FAIRCHILD MASTER TAPE IMPROVEMENT SYSTEM

FAIRCHILD MTIS with "focused-gap" head design reduces bias-induced noise to a point where it is no greater than 2 db than the noise of virgin or bulk-erased tape. FAIRCHILD MTIS has an S/N ratio of 72 db on one track of a 4-track 1/2" tape. FAIRCHILD MTIS increases the recording level by 4 db over present standards, with the lowest harmonic, intermodulation, and cross-modulation distortion of only .5%. Only the FAIRCHILD MTIS comes in a compatible, convertible package allowing you to update your present tape transports to the highest quality "state of-the-art" recording standards.



FAIRCHILD CONAX

The world-accepted standard to control high frequency spillovers due to preemphasis. Maintain high levels even with brass and crashing cymbals in FM and recording.

THE REVERBERTRON

The new compact reverberation system which gives your station that real pig voice. With the Reverbertron you can have that Carnegie Hall



effect as close as the gain control on the Reverbertron. And there's the added plus of an increase in apparent loudness of your station sound due to reverberation, as originally

described by Dr. Maxfield.

FAIRCHILD COMPACT COMPRESSOR MODEL 663

Allows creation of those up tight levels that contribute materially to presence

and loudness combined with overload protection. The FAIR-CHILD Model 663 Compact Compressor produces no distortion despite the amount of compression used . . . no thumps, no noise. The 663 prono vides adjustable release time and up to 20 db of compression. Model 663 NL comes with unity gain and additional gain if needed with +18 dbm output.



FAIRCHILD PROGRAM **EQUALIZER MODEL 664NL**



An ideal no loss equalizer for broadcast and recording. The FAIRCHILD Model 664NL allows the production of the "hot, solid commercial" sound standard with major recording studies; transforms any conventional console into 'Big Board sound'. 1½" x 5¼" high unit provides equalization up

to 10 db at 4, 6, 8, 10, or 15 KHZ and low end equalization up to 10 db. Rolloffs also provided. The Model 664NLB has equal-ization at 2, 3, 4, 5, and 7.5 KHZ for motion picture demands. The FAIRCHILD Program Equalizer contains equalization plus 18 dbm amplifier output. Put life into your sound with the FAIRCHILD Equalizer.

FAIRCHILD LIMITER MODEL 670

Fast attack Stereo Limiter (50 microseconds) with low distortion and absence of thumps. Sum and difference limiting position eliminates floating stered image. In-



cludes regular channel A and B limiting. Dual controls, dual meters provided. Used throughout the world. Flexible re-lease times make it indispensable in stereo recording and broadcasting.

Write to FAIRCHILD — the pacemaker in professional audio products — for complete details.

FAIRCHILD

RECORDING EQUIPMENT CORPORATION 10-40 45th Ave., Long Island City 1, N.Y.

Why are 6 FAIRCHILD CONAX'S on top of the EMPIRE STATE BUILDING?

Several New York FM and TV stations. including WNEW-TV, WPIX-FM, WPIX-TV, WOR-FM, WOR-TY, and WQXR-FM, value their transmission location on top of the Empire State Building and they also value their audience. The FAIRCHILD CONAX allows these stations to maintain high average listening levels without danger of over-modulation caused by high frequency spikes and thereby increasing fringe area coverage. The super-fast attack and release times of the FAIRCHILD CONAX makes this instantaneous control inaudible to the listener's ear. 🔲 The FAIRCHILD CONAX does not "muddyup" the top in an effort to control it. Easily integrated into existing systems, the FAIRCHILD CONAX does not obsolete conventional compressors or limiters - it actually improves their performance. Only the FAIRCHILD CONAX is the world accepted solution for high frequency pre-emphasis problems. Join the "1000 Club"... the satisfied users of the FAIRCHILD CONAX in recording and broadcasting throughout the world. Mrite to FAIRCHILD the pacemaker in professional audio products — for complete details.

RECORDING EQUIPMENT CORPORATION 10-40 45th Ave., Long Island City 1, N.Y.

SEMICONDUCTOR RECTIFIERS, SILICON CONTROLLED - SCR SEMICONDUCTORS, THYRISTORS SEMICONDUCTORS, TRANSISTORS, AF TRANSISTORS, AF
SEMICONDUCTORS,
TRANSISTORS, FE
SEMICONDUCTORS, TRANSISTORS,
GENERAL
SEMICONDUCTORS,
TRANSISTORS, RF
VACUUM TUBES, CATHODE RAY,
TV. COLDR VACUUM TUBES» CATHODE RAY»
TV» MONOCHROME
VACUUM TUBES» RECEIVING
VACUUM TUBES» TRANSMITTING

G E CAPACITOR DEPARTMENT
BATTERIES. NICKEL CADMIUM
CAPACITORS, FIXED, AIR
CAPACITORS, FIXED, CERAMIC
CAPACITORS, FIXED, MICA
CAPACITORS, FIXED, DIL-FILLED
CAPACITORS, FIXED, OTHER

G E SUPPLY COMPANY CLOCKS METERS. LIGHT RECEIVERS, AM REGULATORS. CURRENT REGULATORS. VOLTAGE

G E SALES AND DISTRIBUTION
RECEIVERS. TV. COLOR
RECEIVERS. TV. MONOCHROME

G E COMMUNICATION PRODUCTS
MOBILE EQUIPMENT

G E PICKUP TUBE DPERATION
VACUUM TUBES. CAMERA.
IMAGE-ORTHICON
VACUUM TUBES. CAMERA. VIDICON

GENERAL ELECTRIC COMPANY
AMMETERS, AC
AMMETERS, DC
BALLASTS, LAMP
BATTERIES, NICKEL CADMIUM
BATTERIES, OTHER BRIDGES CAPACITORS. FIXED. CAPACITORS. FIXED.

ELECTROLYTIC
CAPACITORS. FIXED. FILM
CAPACITORS. FIXED. FILM
CAPACITORS. FIXED. DIH-FILLED
CAPACITORS. FIXED. DTHER
CAPACITORS. FIXED. DTHER
CAPACITORS. FIXED.
CHARGERS. BATTERY
CIRCUIT BREAKERS
COMPUTER EQUIPMENT
CONVERTERS
DETECTORS. MICROWAVE
DIVIDERS. FREQUENCY
DIVIDERS. FREQUENCY
DIVIDERS. VOLTAGE
FUSES DIVIDERS, FREQUENCY
DIVIDERS, FREQUENCY
DIVIDERS, VOLTAGE
FUSES
GENERATORS, POWER,
ELECTRIC MOTOR
HEATING ELEMENTS
INDUSTRIAL TV
INTEGRATED CIRCUITS
LIGHTNING ARRESTERS
HETERS, PHASE ANGLE
MICROWAVE COMPONENTS
PANELS, INSTRUMENT,
FOR RACK MOUNTING
POWER SUPPLIES, OC
POWER SUPPLIES, OC
RECORDERS, PAPER,
LOGGING AND GRAPHIC
RECTIFIERS - ALSO SEE SEMICONDUCTORS 6 VACUUM TUBES
RECTIFIERS, SELENIUM
REGULATORS, CURRENT
REGULATORS, CURRENT
REGULATORS, VOLTAGE
RELAYS, GENERAL PURPOSE
RELAYS, POWER
RELAYS, POWER
RELAYS, POWER
RELAYS, THEMAL
RELAYS, THERMAL
RELAYS, THERMAL
RELAYS, THERMAL
RESISTORS, FIXED, WIREWOUND
RESISTORS, FIXED, WIREWOUND
RESISTORS, FIXED, OTHER
RHOSTATS
SEMICONDUCTOR RECTIFIERS,
GENERAL
SEMICONDUCTOR RECTIFIERS,
GENERAL
SEMICONDUCTOR RECTIFIERS,

SWITCHES, PUSHBUTTON, NONILLUMINATED SWITCHES, ROTARY SWITCHES, ROTARY SWITCHES, SMAP SWITCHES, SMAP SWITCHES, THERMAL SWITCHES, TORGLE TERMINAL BLOCKS TERMINAL BLOCKS TERMINAL BOARDS TESTERS, BATTERY TESTERS, INSULATION TIMERS, ELECTRIC TRANSFORMERS, FILAMENT TRANSFORMERS, FILAMENT TRANSFORMERS, FULLENT TRANSFORMERS, PUSHER TRANSFORMERS, VARIABLE TV SYSTEMS, CLOSED CIRCUIT VOLTMETERS, AC VOLTMETERS, DC WATTMETERS

GENERAL MICROWAVE CORPORATION
ANALYZERS, NDISE
ATTENUATORS, FIXED
ATTENUATORS, MICROWAVE
ATTENUATORS, RF METERS, POWER
METERS, STANDING WAVE
WATTMETERS WAVEGUIDE AND ASSOCIATED COMPONENTS

ASSOCIATED COMPONENTS

GENERAL RADID COMPANY
ADAPTERS, CONNECTOR
AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, DC
AMPLIFIER, PT,
GENERAL PURPOSE
AMPLIFIER, RF,
GENERAL PURPOSE
AMPLIFIER, RF, POWER
ANALYZERS, DISTORTION
ANALYZERS, HORMONIC
ANALYZERS, HORMONIC
ANALYZERS, HORMONIC
ANALYZERS, HORMONIC
ANTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, MICROWAVE
BOXES, DECADE, CAPACITOR
BOXES, DECADE, RESISTOR
BRIDGES
CANIE, ASSEMBILES

BOXES, DECADE, RESISTOR BRIDGES CABLE, CASSEMBLIES CABLE, COAXIAL, FLEXIBLE CAPACITORS, FIXED, MICA CAPACITORS, FIXED, OTHER CAPACITORS, FIXED, OTHER CAPACITORS, VARIABLE

CAPACITORS, FIRED, DITTER
CAPACITORS, VARIABLE
CLOCKS
CONNECTORS, AF 6 MICROPHONE
CONNECTORS, COAXIAL CABLE
CONNECTORS, RF
COUNTERS, FREGUENCY
DELAY LINES
DETECTORS, MICROWAVE
DITTERS, FREGUENCY
DIALS, INSTRUMENT
DIVIOERS, FREGUENCY
DIVIDERS, VOLTAGE
FILTERS, AUDIO
FILTERS, AUDIO
FILTERS, AUDIO
FILTERS, AUDIO
FILTERS, SIGNAL, AF
GENERATORS, SIGNAL, RF
GENERATORS, SIGNAL, RF
GENERATORS, SIGNAL, RF
GENERATORS, SIGNAL, RF
GENERATORS, SIGNAL, SUARE
MAYE
INDUCTANCES, FIXED
INDUCTANCES, VARIABLE
JACKS
JOINTS, ROTARY, COAXIAL

JOINTS ROTARY COAXIAL
KNOBS
METERS FREQUENCY
METERS FREQUENCY CALIBRATING
MICROWAYE COMPONENTS
DSCILLATORS AF AND RF,

OSCILLATORS, AF AND RF,
SEE GENERATORS
OSCILLATORS, AM
PLUGS, CDAXIAL
POTENTIOMETERS, WIREWOUND
POWER SUPPLIES, AC
POWER SUPPLIES, OC
PREAMPLIFIERS, AUDIO
RECORDERS, MAGNETIC TAPE,
AUDIO

PREAMPLIFIERS, AUDID

RECORDERS, MAGNETIC TAPE,
AUDIO

RECORDERS, PAPER,
LOGGING AND GRAPHIC
REGULATORS, VOLTAGE
RESISTORS, FIXED,
NONINDUCTIVE
RESISTORS, FIXED, WIREWOUND
RESISTORS, VARIABLE,
WIREWOUND
RHEOSTATS
STROBE, LIGHTS
TESTERS, CAPACITOR
TESTERS, INSULATION
TRANSFORMERS, AUDID, MATCHING
TRANSFORMERS, AUDID, MATCHING
TRANSFORMERS, VARIABLE
VOLTMETERS, OC
VOLTMETERS, OC
VOLTMETERS, VACUUM TUBE
GENERAL TELEVISION NETWORK

GENERAL TELEVISION NETWORK
PROJECTORS. TV. LARGE SCREEN
STANDS. TELEVISION MONITOR

GIBBS MFG. & RESEARCH CORP.

CABLE. ASSEMBLIES
CLOCKS
CONVERTERS
GEMERATORS, FM. SUBCARRIER
GENERATORS, SIGNAL, AF

GENERATORS. SIGNAL, MARKER GENERATORS. SIGNAL. PULSE GENERATORS. SIGNAL. RF GENERATORS. SIGNAL. GENERATORS, SIGNAL, SOUARE WAVE INVERTERS, DC TO AC, CHOPPER DSCILLATORS, AF AND RF, SEE GENERATORS DSCILLATORS, AM OSCILLATORS, FM DSCILLATORS. TV DSCILLATORS. DTHER POWER SUPPLIES+ AC
POWER SUPPLIES+ PRECISION
TIMERS+ ELECTRIC

J W GIBSON CO. INC.

CLEAMERS, CHEMICAL

GOTHAM AUDIO CORPORATION

ARMS, TOME

ATTENUATORS, FIXED

CABLE, COAXIAL, FLEXIBLE

CABLE, SHIELDED, AUDID

CARTRIDGES, PHOND

CONNECTORS, AF 6 MICROPHONE

CONSOLE, AUDIO, FM

CONSOLE, AUDIO, FM

CONSOLE, AUDIO, PORTABLE

CONSOLE, AUDIO, TY

CONSOLE, DHMMETERS
POTENTIOMETERS, CARBON
RECORDERS, MAGNETIC TAPE,
AUDIO
REVERBERATION DEVICES TESTERS. BATTERY TESTERS. INSULATION TESTERS, INSULATION
TRANSFORMERS, AUDID.
ISOLATION
TRANSFORMERS, AUDID. MATCHING
TRANSFORMERS, TRANSISTOR
TURNTABLES, PHONOGRAPH
VOLTMETERS, AC

MOUSTON FEARLESS CORP,
CAMERA, MOUNTING EQUIPMENT
DOLLIES, CAMERA
MICROPHONE STANDS & BODMS
PROCESSORS, FILM, B-W
PROCESSORS, FILM, COLDR

GRADO LABORATORIES, INC.

GRANTHAM SCHOOLS
EDUCATION FACILITIES. SCHOOLS

GRAY RESEARCH & DEVELOPMENT CO ARMS, TONE EQUALIZERS, AUDID EMPHASIS LENSES DETICAL FIXED
PROJECTORS SLIDE
TURNTABLES PHONOGRAPH

TOOLS PUNCH, CHASSIS

GREGORY AMPLIFIER CORP
AMPLIFIER, AF, MONAURAL
AMPLIFIER, AF, REVERBERATION
POWER SUPPLIES, AC
PREAMPLIFIERS, AUDID
REVERBERATION DEVICES
SOUND SYSTEMS, DUTDOR
SOUND SYSTEMS, PORTABLE
SOUND SYSTEMS, THEATER
SPEAKERS

GRIMMAN FIXTURE COMPANY
CABINETS, STORAGE, DISC
CABINETS, STORAGE, FILM
CABINETS, STORAGE,
MAGNETIC TAPE
CABINETS, WOOD
CONSOLE, CABINETS
AND HARDWARE
DISPLAY EQUIPMENT, TV
SERVICES, INSTALLATION

GULF ELECTRO-SALES. INC. SERVICES. INSTALLATION

G-V CONTROLS INC. RELAYS. THEMAL RELAYS. THEMAL RELAYS. THE DELAY SWITCHES. THERMAL TIMERS. ELECTRIC

RESISTORS FIXED WIREWOUND

HANCOCK TELECONTROL AUTOMATION EQUIPMENT COMPUTER EQUIPMENT REMOTE CONTROL SYSTEMS SWITCHING SYSTEMS

HARTLEY PRODUCTS
ACOUSTIC MATERIALS
ENCLOSURES, SPEAKER
NETWORKS, MATCHING, AUDID

SPEAKERS

HARVEY RADIO CD.. INC.
COMPUTER EQUIPMENT
CONSOLE. AUDIO. FM
CONSOLE. AUDIO. PORTABLE
CONSOLE. AUDIO. RECORDING
CONSOLE. AUDIO. AM
MIXERS - ALSO SEE CONSOLES MIXERS - ALSO SEE CONSO REWINDERS, TAPE SOUND SYSTEMS, DUTDOOR SOUND SYSTEMS, PORTABLE SOUND SYSTEMS, THEATER TAPE DUPLICATORS

MARWALD COMPANY
CABINETS, STORAGE, DISC
CABINETS, STORAGE, FILM
EDITORS, FILM
EDUCATION FACILITIES, EQPT
PROJECTORS, SLIDE
REELS, FILM
SCUVENTS AND CLEANERS
SPLICERS, MAGNETIC TAPE
AND FILM

HARWOOD MFG. CO.

CABINETS. METAL
LAMP ASSEMBLIES
LIGHTING. TV. COMPONENTS

HAYDEN BOOK COMPANY
EDUCATION FACILITIES .
PUBLISHERS

PUBLISHERS

HEATH COMPANY
ADAPTERS, FM STERED
AMPLIFIER, AF, STERED
BOXES, DECADE, CAPACITOR
BOXES, DECADE, RESISTOR
BRIDGES
COMMUNICATIONS SYSTEMS, CB
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRE
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRE
EAPPHONES, HEADPHONES
GENERATORS, FM, STERED
GENERATORS, SIGNAL, AF
GENERATORS, SIGNAL, DOT BAR
GEMERATORS, SIGNAL, COLOR BAR
GEMERATORS, SIGNAL, F
GENERATORS, SIGNAL, SOUNCE
COMMUNICATIONS, SIGNAL, COLOR BAR
GEMERATORS, SIGNAL, SOUNCE
COMPANDED

GENERATORS, SIGNAL, COLOR BAR
GEMERATORS, SIGNAL, SOUNCE
KITS
OMMMETERS
DSCILLATORS, AF AND RF,
CESE CEMERATORS OHMMETERS

SCILLATORS, AF AND RF,
SEE GENERATORS

DSCILLATORS, AM
DSCILLATORS, FM DSCILLATORS, TV DSCILLOSCOPES OSCILLOSCOPES
POWER SUPPLIES, AC
POWER SUPPLIES, DC
POMER SUPPLIES, PRECISION
RECEIVERS, AM
RECEIVERS, FM
RECEIVERS, MULTIPLEX
RECEIVERS, TV, COLOR
RECEIVERS, TV, MONOCHROME
RECORDERS, MAGNETIC TAPE,
AUDIO RECORDERS, MAGNETIC TAPI AUDIO RECORDERS, PAPER, LOGGING AND GRAPHIC VOLTMETERS, AC VOLTMETERS, DC VOLTMETERS, VACUUM TUBE

MEINTZ & KAUFMAN, LTD RECTIFIERS - VACUUM TUBES VACUUM TUBES. RECEIVING VACUUM TUBES, TRANSMITTING

HEWLETT - PACKARD CO. ADAPTERS. CONNECTOR ADAPTERS. TEST AMMETERS. AC ADAPIERS, 1631
AMMETERS, AC
AMMETERS, DC
AMMETERS, DC
AMMETERS, DISTORTION
ANALYZERS, DISTORTION
ANALYZERS, NOISE
ANALYZERS, VIDED
ATTENUATORS, AUDIO
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, PS
BRIDGES
CALIBRATION SERVICE,
FREQUENCY
CALIBRATION SERVICE,
INSTRUMENT FREQUENCY
CALIBRATION SERVICE,
INSTRUMENT
CAMERAS, DSCILLDSCOPE
CASES, PORTABLE,
ELECTRONIC EQUIPMENT
CLIPS, TEST
CDUNTERS, FREQUENCY
DEMAGNETIZERS, BULK TAPE
DETECTORS, MICROWAVE
GENERATORS, STANDING WAVE
GENERATORS, STANDING WAVE
GENERATORS, SIGNAL, PULSE
GENERATORS, SIGNAL, PULSE
GENERATORS, SIGNAL, PULSE
GENERATORS, SIGNAL, PULSE
GENERATORS, FREQUENCY
METERS, FREQUENCY
METERS, FREQUENCY
METERS, FREQUENCY
METERS, POWER
METERS, STANDING WAVE
MICROWAVE COMPONENTS
MONITORS, FM SYSTEMS, MOND
MONITORS, FREQUENCY

GENERAL

SEMICONDUCTOR RECTIFIERS.

POWER
SEMICONDUCTOR RECTIFIERS,
STLICON CONTROLLED - SCR
SEMICOMOUCTORS, TRANSISTORS,
GENERAL
SHUNTS, METER
SWITCHES, FOOT
SWITCHES, INTERLOCK
SWITCHES, LEVER
SWITCHES, MECHANICALLY
ACTUATED

get complete coverage and combination rates in your Domestic and Foreign Markets

Look at the facts below to see how BROADCAST ENGINEERING and RADIO y TELEVISION give you complete coverage, both domestic and foreign, of the ever-expanding broadcast-communications market. And this complete coverage—almost 30,000 total circulation*—is now available with money-saving combination rates in both magazines.

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*November figures are projected totals based on business before adjustments. Any variation on the December 31st statement will be minimal.

CIRCULATION FACTS

Broadcast Engineering

November, 1966

123% INCREASE SINCE 1963—Circulation has increased almost 12,000 since 1963, giving you the most complete coverage of management and technical personnel of AM, FM, CATV and TV broadcast stations

| BUSINESS AND INDUSTRY | NOV |
|--|--------------|
| RADIO & TV STATIONS | |
| and NETWORKS: Owners, Presidents, Vice Presidents, | |
| general managers, and station man- | |
| # ≟ agers | 5,418 |
| EF Chief engineers, engineers, supervi- | |
| sors and technicians | 9,202 624 |
| Owners, Presidents, Vice Presidents, and station managers Chief engineers, engineers, supervisors and technicians Company and other copies SUB TOTAL | 15,244 |
| CONSULTING ENGINEERS | 817 |
| RECORDING STUDIOS | 688 |
| MANUFACTURERS & DISTRIBUTORS of Elec- | |
| tronic & other Broadcasting Equipment | 1,914 |
| GOVERNMENT AGENCIES, | |
| LIBRARIES & SCHOOLS | 1,075 |
| STUDENTS | 194 |
| CLOSED CIRCUIT TV | 21 |
| COMMUNITY ANTENNA & | |
| TELEVISION SYSTEMS | 1,547 |
| TOTAL | 21,500 |

Radio y Television

November, 1966

Circulation is controlled with 8120 going to owners, management and technical personnel at all AM, FM and TV stations in Latin American countries, Spain and other Spanish and Portuguese-speaking areas of the world. In addition, RADIO y TELEVISION goes to wholesalers, agents, distributors and manufacturers of broadcast-related electronic equipment in all these countries . . . plus radio and television stations in the United States with Spanish and Portuguese programming. Portuguese programming.

| Argentina 598 | Nicaragua 105 |
|------------------------|-----------------|
| Bolivia 168 | Panama 200 |
| Brazil1081 | Paraguay 79 |
| Colombia 477 | Peru 471 |
| Costa Rica 143 | Philippines 46 |
| Chile 363 | Portugal 176 |
| Dominican Republic 175 | Puerto Rico 238 |
| Ecuador 342 | Spain 490 |
| El Salvador 120 | Uruguay 216 |
| Guatemala 188 | USA (Spanish |
| Honduras161 | Stations) 687 |
| Mexico1048 | Venezuela 400 |
| Miscellaneous 148 | TOTAL 8120 |

Reach this Combined Circulation of 29.620 at Lower Cost with Combination Rates

Combination rates with BROADCAST ENGINEERING and RADIO y TELE-VISION are available on request. EXAMPLE: 12 insertions in each publication earn the 24-time rate in both, or 6 insertions in each earn the 12-time rate in both.

MONITORS, WAVEFORM OHMMETERS OSCILLATORS, AF AND RF, SEE GENERATORS SEE GENERATORS
OSCILLOSCOPES
POWER SUPPLIES, DC
POWER SUPPLIES, PRECISION
PROBES, OSCILLOSCOPE
PROBES, TEST LEAD
RECORDERS, PAPER,
LOGGING AND GRAPHIC
SEMICONDUCTOR O100ES
TELEPHONE EQUIPMENT
VOLTMETERS, AC
VOLTMETERS, VACUUM TUBE
WAVEGUIDE AND
ASSOCIATED COMPONENTS

HICKOK ELECTRICAL INSTRUMENTS
AMMETERS. AC
AMMETERS. DC BRIDGES COUNTERS. FREQUENCY COUNTERS, FREQUENCY
GENERATORS, FM, STEREO
GENERATORS, SIGNAL, AF
GENERATORS, SIGNAL, COLOR BAR
GENERATORS, SIGNAL, DOT BAR
GENERATORS, SIGNAL, DOT BAR
GENERATORS, SIGNAL, PULSE
GENERATORS, PROGUENCY
METERS, PHASE ANGLE
METERS, SEE SPECIFIC TYPES
OMHMETERS
OSCILLATORS, AM
OSCILLATORS, TW
OSCILLATORS, TV
OSCILLOSCOPES OSCILLATORS, TV
OSCILLOSCOPES
SWITCHES, MULTICONTACT
TESTERS, BATTERY
TESTERS, CAPACITOR
TESTERS, SEMICONDUCTOR
TESTERS, VACUUM TUBE
TIMERS, ELECTRIC VOLTMETERS. AC VOLTMETERS. DC VOLTMETERS. VACUUM TUBE

S. HIMMELSTEIN AND COMPANY

ATTENUATORS, FIXED ATTENUATORS, FIXED ATTENUATORS, IMPEDANCE MATCHING ATTENUATORS. RI ATTENUATORS, VIDEO CORDS, PATCH FILTERS, RF JACK PANEL ASSEMBLIES

HOLLINGSWORTH SOLDERLESS
TERMINAL COMPANY
TERMINALS, LUG
TERMINALS, SOLOERLESS
TOOLS, CRIMPERS
TOOLS, HAND

TOOLS, HAND

HOUSTON ELECTRONICS CO,
ALARM, FAULT
ALARM, FAULT
ALARM, INTRUDER
AMPLIFIER, SENSING
BROADCAST PROGRAMMING SERVICE
CIRCUIT BREAKERS
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, TV
FLASHERS, TOWER
LIGHTING, TV, CONTROLS
MIXERS - ALSO SEE CONSOLES
RELAYS, PHOTOELECTRIC
RELAYS, TIME DELAY
SOUND SYSTEMS, OUTDOOR
SOUND SYSTEMS, OUTDOOR
SOUND SYSTEMS, PORTABLE
SOUND SYSTEMS, PORTABLE

HUGHEY & PHILLIPS
ALARM, FAULT
FLASHERS, TOWER
LAMP ASSEMBLIES
RELAYS, LIGHT-INDICATING
RELAYS, PHOTOELECTRIC TRANSFORMERS. AUTO TRANSFORMERS. POWER

HUNT-PIERCE CORP LIFTS AERIAL, TRUCK-MOUNTED

MY-GAIN ELECTRONICS ANTENNAS, CATV ANTENNAS, MOBILE TOWERS, ANTENNA, CATV, HEAD-END

IMPEX ELECTRONICS
ADAPTERS, CONNECTOR
ADAPTERS, FM SIEREO
BATTERIES, LEAD ACID
BATTERIES, NICKEL CADMIUM
CHARGERS, BATTERY
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, PECOROING
RECORDERS, MAGNETIC TAPE,
AUDIO TAPE DECKS. MAGNETIC TAPE. MAGNETIC RECORDING. AUDIO

CLIPS. TEST LAMP ASSEMBLIES

LAMPS, GLOW LAMPS, PANEL REELS, CABLE, AUTOMATIC SWITCHES, ROTARY

REELS, CABLE, AUTOMATIC

INSTRUMENT LABORATORIES CURP.
AMMETERS, AC
AMMETERS, DC
CALIBRATION SERVICE,
INSTRUMENT
GENERATORS, SIGNAL, AF

VOLIMETERS, VACUUM TUBE

INTERNATIONAL GOOD MUSIC

AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, SENSING
AUTOMATION EQUIPMENT
BACKGROUNO MUSIC SERVICE
BROADCAST PROGRAMMING SERVICE
CATRINGES, MAGNETIC TAPE
CATV, HEAD-END EQUIPMENT
GENERATORS, SIGNAL, AF
RECORDERS, MAGNETIC TAPE,
AUDIO
SWITCHERS

SWITCHERS SWITCHING SYSTEMS TAPE OECKS, MAGNETIC

INTERNATIONAL NUCLEAR CORP
AMPLIFIER, BRIDGING
AMPLIFIER, DISTRIBUTION
AMPLIFIER, FULSE
AMPLIFIER, STABILIZING
AMPLIFIER, TV, VIDEO
CONSOLE, AUDIO, TV
MODULATORS, TV
POWER SUPPLIES, DC
DPSAMPLIFIES, VIDEO PREAMPLIFIERS, VIDEO SWITCHERS SWITCHES: CROSSBAR SWITCHING MATRIXES SWITCHING SYSTEMS

INTERNATIONAL RECTIFIER

HEAT SINKS
RECTIFIERS - ALSO
SEE SEMICONDUCTORS
RECTIFIERS, SELENIUM
SEMICONDUCTOR DIODES
SEMICONDUCTOR RECTIFIERS,
GENERAL SEMICONDUCTOR RECTIFIERS, HIGH VOLTAGE SEMICONDUCTOR RECTIFIERS, POWER SEMICONDUCTOR RECTIFIERS, SILICON CONTROLLED - SCR

SEMICONDUCTORS, THYRISTORS SEMICONOUCTORS, TRANSISTORS. AF SEMICONDUCTORS. TRANSISTORS. GENERAL SEMICONDUCTORS, TRANSISTORS, RF

IRC. NO.

DIVIDERS. VOLFAGE
POTENTIOMETERS, CARBON
POTENTIOMETERS, MIREWOUND
RECTIFIERS, SELENIUM
RESISTORS, FIXED, CARBON
RESISTORS, FIXED, PRECISION
RESISTORS, FIXED, PRECISION
RESISTORS, FIXED, VIREWOUND
RESISTORS, FIXED, OTHER
RESISTORS, VARIABLE.
WIREWOUND
SEMICONDUCTOR DIODES
SEMICONDUCTOR RECTIFIERS.
GENERAL GENERAL
SEMICONDUCTOR RECTIFIERS,
SILICON CONTROLLED - SCR
SEMICONDUCTORS, THYRISTORS

DISPLAY EQUIPMENT. TV INDUSTRIAL TV INVERTERS. DC TO AC. SOLID STATE OSCILLOSCOPES

ITT CANNON ELECTRIC
CABLE: ASSEMBLIES
CONNECTORS, AF & MICROPHONE
CONNECTORS, ANTENNA
CONNECTORS, COAXIAL CABLE
CONNECTORS, POWER
CONNECTORS, PF
FILTERS, RF
INTEGRATED CIRCUITS
WIRING AND CABLING SERVICES

ITT TELECOMMUNICATIONS
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS, MICROWAVE
COMMUNICATIONS SYSTEMS, COMMUNICATIONS SYSTEMS, MULTIPLEX DIALS, TELEPHONE MICROWAVE SYSTEMS, 2500 MHZ RELAYS, TELEPHONE SWITCHES, CROSSBAR SWITCHES, TELEPHONE TYPE SWITCHING SYSTEMS, TELEPHONE TELEPH

CABLE, COAXIAL, FLEXIBLE

World Radio History

CABLE. COAXIAL. RIGID
CABLE. DIRECT-BURIAL
CABLE. TELEPHONE
CORDS. SET
FUSES
WIRE. INSULATED. HIGH VOLTAGE
WIRE. INSULATED. HOOKUP
WIRE, SHIELDED WIRE, SHIELDED

JAMPRO ANTENNA COMPANY
ANTENNAS, AM
ANTENNAS, CATV
ANTENNAS, FM
ANTENNAS, TV
ANTENNAS, TV
ANTENNAS, TV
ANTENNAS, 2500 MHZ
CABLE, COAXIAL, RIGIO
DIPLEXERS
DUMMY LOAD
FILTERS, ANTENNA
FILTERS, FF
FILTERS, HYBRID
PLUGS, COAXIAL
SWITCHES, COAXIAL
SWITCHES, COAXIAL
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, TV

JENNINGS RADIO

CAPACITORS, FIXED, CERAMIC
CAPACITORS, FIXED, OTHER
CAPACITORS, VARIABLE
DIVIDERS, VOLTAGE
RELAYS, COAXIAL
RELAYS, GENERAL PURPOSE
RELAYS, LATCHING
RELAYS, DVERLOAD
RELAYS, POWER
RELAYS, STEPPING
SWITCHERS
SWITCHERS SWITCHERS
SWITCHES, COAXIAL
SWITCHES, CROSSBAR
SWITCHES, MECHANICALLY
ACTUATED
SWITCHES, ROTARY
SWITCHING MATRIXES
SWITCHING SYSTEMS

TRANSMISSION LINES
VESTIGIAL SIDEBAND FILTERS
WIRE, BARE, COPPER
WIRE, BARE, COPPER STRAP

JENSEN MANUFACTURING DIVISION
EARPHONES. HEADPHONES
EDUCATION FACILITIES.
PUBLISHERS
EDUCATION FACILITIES. EQPT
SOUND SYSTEMS. OUTDOOR
SOUND SYSTEMS. PORTABLE
SOUND SYSTEMS. PORTABLE
SOUND SYSTEMS. PORTABLE
SPEAKER COMPONENTS SPEAKERS

SPEAKERS

JEROLD ELECTRONICS

ADAPTERS, CONNECTOR
ADAPTERS, TEST
ALARM, FAULT
AMPLIFIER, BRIOGING
AMPLIFIER, DISTRIBUTION
AMPLIFIER, CATV
AMPLIFIER, TV, BOOSTER
ANTENNAS, AM
ANTENNAS, FM
ANTENNAS, MICROWAVE
ANTENNAS, MICROWAVE
ANTENNAS, TV,
MASTER—COMMUNITY
ANTENNAS, TV,
MASTER—COMMUNITY
ANTENNAS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, RF
BALUNS
BRIDGES ATTENDATIONS OF BALUNS
BRIDGES
CABINETS, METAL
CABLE, ASSEMBLIES
CABLE, CATV, MAROWARE
CABLE, COAXIAL, FLEXIBLE
CABLE, COAXIAL, FLEXIBLE
CABLE, DIRECT-BURIAL
CATV EQUIPMENT - ALSO SEE
OTHER CATEGORIES
CATV, CABLE TERMINALS
CATV, CABLE TERMINALS
CATV, CABLE TERMINALS
CATV, MEAD-END EQUIPMENT
CATV, ORIGINATION EQUIPMENT
COMMUNICATIONS SYSTEMS,
MICROWAVE MICROWAVE
CONNECTORS, ANTENNA
CONNECTORS, COAXIAL CABLE
CONVECTORS, RF
CONVERTERS CONVERTERS
DELAY LINES
DEMODULATORS
DETECTORS, MICROWAVE
FILTERS, ANTENNA
FILTERS, RF
GENERATORS, SIGMAL, AF
GENERATORS, SIGMAL, MARKER
GENERATORS, SIGMAL, RF
GENERATORS, SIGMAL, RF
GENERATORS, SIGMAL, RF
GENERATORS, SIGMAL, SQUARE WAVE
MEAD—END EQUIPMENT,
SEC CATV HEAD—END EQUIPMENT
INDUSTRIAL TV
METERS, FIELD STRENGTH
MICROWAVE COMPONENTS
MICROWAVE SYSTEMS, STL MICROWAVE SYSTEMS, 2500 MHZ
MICROWAVE SYSTEMS, OTHER
MODULATORS, TV
MOUNTS, ANTENNA, FIXED
NETWORKS, PHASING
POWER SUPPLIES, AC
PREAMPLIFIERS, VIDEO
RADOMES
STL EQUIPMENT
SWITCHES, COAXIAL
SWITCHES, ROTARY
TOWERS, ANTENNA,
CATV, HEAD-END
TRANSMISSION LINES
TV SYSTEMS, CLOSED CIRCUIT
WAVEGUIDE AND
ASSOCIATED COMPONENTS

JETRONIC INDUSTRIES

AMPLIFIER. AF. MONAURAL

AMPLIFIER. AF. STEREO

RECORDERS. MAGNETIC TAPE. AUDIO TAPE DECKS. MAGNETIC

J M ELECTRONICS CO.

COMMUNICATIONS SYSTEMS.

LAND MOBILE

MOBILE EQUIPMENT

TV SYSTEMS. CLOSED CIRCUIT

JOA CARTRIDGE SERVICE
CARTRIDGES, MAGNETIC TAPE
DEMAGNETIZERS, BULK TAPE
DEMAGNETIZERS, HEAD
HEADS, ERASE, MAGNETIC
HEADS, RECORDING, MAGNETIC
MAINTENANCE SERVICES,
CARTRIDGE, TAPE
RECORDERS, MAGNETIC TAPE,
AUDIO
TAPE, MAGNETIC RECORDING,
AUDIO
VACUUM TUBES, TRANSPORTER VACUUM TUBES. TRANSMITTING

VALUUM IUBES, TRANSMITTING

E F JOHNSON COMPANY
AMPLIFIER. RF, POWER
CAPACITORS, VARIABLE
COILS, CHOKE, RF
COMMUNICATIONS SYSTEMS, CB
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRELESS
COMMUNICATIONS SYSTEMS,
LAND MOBILE
COUPLERS
MARDWARE, PANEL
HOLDERS, CRYSTAL
INDUCTANCES, FIXED
INDUCTANCES, FIXED
INDUCTANCES, VARIABLE
INSULATORS, OTHER
INSULATORS, OTHER
JACKS
MARLY E FOLLOWERS
MARLY E FOLLOWE INSULATORS, OTHER
JACKS
MOBILE EQUIPMENT
PROBES, TEST LEAD
RELAYS, ANTENNA
SOCKETS, CRYSTAL
SOCKETS, LAMP
SOCKETS, LAMP
SOCKETS, TUBE
SWITCHES, KNIFE
SWITCHES, SNAP
TRANSMITTER S, LIS
TRANSMITTERS, AM, 250 WATT
TRANSMITTERS, AM, 1 KW

JOHNSON ELECTRONICS. INC.
AMPLIFIER. AF. MONAURAL
RECEIVERS. FM
RECEIVERS. MF
RECEIVERS. MULTIPLEX RECEIVERS. MULTIPLEX

JORDAN ELECTRIC COMPANY
ATTENUATORS, AUDIO
ATTENUATORS, FIXED
BOXES, DECADE, RESISTOR
RESISTORS, FIXED, PRECISION
RESISTORS, FIXED, WIREWOUND

KAHN RESEARCH LABORATORIES
AMPLIFIER. AF.
PEAK LIMITING. AM
CONVERTERS
EXCITERS. FM RECEIVERS. AM RECEIVERS. HF

KAISER-COX
AMPLIFIER. CATV
ANTENNAS. CATV
CABLE. CATV. HAROWARE
CATV EQUIPMENT - ALSO SEE
OTHER CATEGORIES
CATV. CABLE TERMINALS
CATV. CHANNEL AMPLIFIERS
CATV. HEAD-ENO EQUIPMENT
CATV. ORIGINATION EQUIPMENT
CONNECTORS. COAXIAL CABLE
MEAD-END EQUIPMENT
SEE CATV HEAD-ENO EQUIPMENT
TV SYSTEMS. CLOSED CIRCUIT

THE KALART COMPANY EDITORS, FILM PROJECTORS, FILM PROJECTORS, SLIDE
SPLICERS, MAGNETIC TAPE
AND FILM
TV SYSTEMS, CLOSEO CIRCUIT,
PROJECTORS

KAPPA NETWORKS, INC DELAY LINES FILTERS, RF INDUCTANCES, FIXED

INDUCTANCES. VARIABLE TRANSFORMERS. RF

RARG LABORATORIES

ADAPTERS. FM STEREO
AMPLIFIER, AF, STEREO
GENERATORS, FM, STEREO
MONITORS, FM SYSTEMS, MONO
MONITORS, FM SYSTEMS, STEREO
RECEIVERS, FM
RECEIVERS, MULTIPLEX
RECEIVERS, SCA

MATHIAS KLEIN & SONS
TOOLS, CRIMPERS
TOOLS, CUTTERS
TOOLS, HAND
TOOLS, PLIERS
TOOLS, SCREWDRIVERS
TOOLS, WRENCHES

KLINE IRON 6 STEEL COMPANY
TOWERS ANTENNA
CATV HEAD-END
TOWERS ANTENNA, RECEIVING
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS ANTENNA
TRANSMITTING, FM
TOWERS ANTENNA
TRANSMITTING, TV

APPLIFIER, AF, STEREO ARMS, TONE EARPHONES, HEADPHONES HEADS, DISC RECORDING LATHE, DISC RECORDING PREAMPLIFIERS, AUDIO SPEAKERS TURNTABLES PHONOGRAPH

MERB KRECKMAN CO ANTENNAS, MOBILE ANTENNAS, REMOTE PICKUP

KRS INSTRUMENTS DIVISION
ANALYZERS, VIDEO
AUTOMATION EQUIPMENT
CARTRIDGES, MAGNETIC TAPE
EDUCATION FACILITIES, EGPT
RECORDERS, MAGNETIC TAPE,
AUDIO
RECORDERS, MAGNETIC TAPE,
AUDIO_CAPTEIDGE AUDIO, CARTRIDGE RECORDERS, MAGNETIC TAPE, LOGGING
TAPE DECKS. MAGNETIC
TAPE, RECORDING. GRAPHIC

RECORDERS. MAGNETIC TAPE. AU010. CARTRIDGE

LAFAYETTE RADIO ELECTRONICS TRANSFORMERS. AU010. RANSFORMERS, AUDIO,
ISOLATION
IRANSFORMERS, AUDIO, MATCHING
TRANSFORMERS, AUDIO, MATCHING
TRANSFORMERS, AUDIO
TRANSFORMERS, AUTO
TRANSFORMERS, FILAMENT
TRANSFORMERS, GENERAL
TRANSFORMERS, TRANSISTOR
TRANSFORMERS, TRANSISTOR

LAKE ELECTRONICS, INC.
COILS. DEFLECTION
AND FOCUSING
CONSOLE, AUDIO. TV
GENERATORS. SIGNAL. DOT BAR
GENERATORS. SIGNAL. MARKER
GENERATORS. SIGNAL. PULSE
GENERATORS. SIGNAL.
SOUARE WAVE SQUARE WAVE
GENERATORS, SIGNAL,
TV. SYNCHRONIZING
INDUCTANCES, FIXEO
INDUSTRIAL TV
LENSES, OPTICAL, ZOOM
MONITORS, VIDEO
SEMICONDUCTORS,
TRANSICTORS SEMICONDUCTORS.
TRANSISTORS, AF
SEMICONDUCTORS. TRANSISTERS,
GENERAL
SPEAKERS
TRANSFORMERS. AUOIO. MATCHING
TRANSFORMERS. AUOIO. MATCHING
TRANSFORMERS. FILAMENT
TRANSFORMERS. FILAMENT
TRANSFORMERS. PLATE
TRANSFORMERS. PLATE
TRANSFORMERS. PLATE
TRANSFORMERS. PLATE
TRANSFORMERS. RF
TRANSFORMERS. RF
TRANSFORMERS. VARIABLE
YOKES. DEFLECTION

LAMPKIN LABORATORIES

METERS. FREQUENCY
METERS - SEE SPECIFIC TYPES
MONITORS. FREQUENCY
MONITORS. MODULATION

LANG ELECTRONICS, INC
AMPLIFIER, AF,
GENERAL PURPOSE
CABINETS, METAL
CABINETS, WOOD
CONSOLE, AUDIO, PORTABLE
COMSOLE, AUDIO, RECORDING
COMSOLE, CABINETS
AND HARDWARE
MIXERS - ALSO SEE CONSOLES
STROBE, DISCS
TAPE DUPLICATORS

World Radio History

LANGEVIN

AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF, MONAURAL
AMPLIFIER, AF, REMOTE
AMPLIFIER, BRIDGING
ATTENUATORS, AUDIO
ATTENUATORS, FIXED
EQUALIZERS, AUDIO EMPHASIS
FILTERS, AUDIO
NETWORKS, MATCHING, AUDIO
POWER SUPPLIES, DC
PREAMPLIFIERS, AUDIO
SWITCHES, MULTICONTACT
SWITCHES, MULTICONTACT

JAMES B LANSING SOUND CO AMPLIFIER, AF, STEREO SOUND SYSTEMS, OUTDOOR SOUND SYSTEMS, THEATER SPEAKER COMPONENTS

MONITORS. VIDEO

LENKURT ELECTRIC CO
COMMUNICATIONS SYSTEMS,
MICROWAVE
COMMUNICATIONS SYSTEMS,
MULTIPLEX
MICROWAVE SYSTEMS, STL

LENZ ELECTRIC MFG. COMPANY
CABLE. SHIELDED. AUDIO
CABLE. TELEPHONE
WIRE. INSULATED. HIGH VOLTAGE
WIRE. INSULATED. HOOKUP
WIRE, SHIELDED

LEWIS AND KAUFMAN LTD.

VACUUM TUBES, BALLAST
VACUUM TUBES, CAMERA, VIDICON
VACUUM TUBES, CATHODE RAY,
TV. MONOCHROME
VACUUM TUBES, RECEIVING
VACUUM TUBES, TRANSMITTING

LIBERTY TOWER MFG. CO ANCHORS. GUY MAINTENANCE SERVICES. AM MAINTENANCE SERVICES. FM MAINTENANCE SERVICES. MAINTENANCE SERVICES,
MICROWAVE
MAINTENANCE SERVICES,
STEEPLEJACK
MOUNTS, ANTENNA, FIXED
TOWERS, ANTENNA,
CATV. MEAD-END
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, TV

LIGHTING & ELECTRONICS
LIGHTING, TV. COMPONENTS
LIGHTING, TV. CONTROLS
LIGHTING, TV. SYSTEMS LIGHTING, TV. SYSTEMS
LINDSAY SPECIALTY PRODUCTS LTD
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AMPLIFIER. CATV
AMPLIFIER. TV. BOOSTER
ANTENNAS. CATV
ANTENNAS. FM
ANTENNAS. MOBILE
ANTENNAS. TV
ANTENNAS. TV
ANTENNAS. TV
ANTENNAS. TV
ANTENNAS. TV
MASTER-COMMUNITY

LIPPS, INC.

MEADS, DISC RECORDING

HEADS, ERASE, MAGNETIC

HEADS, RECORDING, MAGNETIC

CIRCUIT BREAKERS FUSES HOLDERS, FUSE

LITTLE JOE ENTERPRISES
ANCHORS, GUY
CABINETS, WOOD
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, TO
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, AM
DUMMY LOAD
MAINTENANCE SERVICES, AM
MAINTENANCE SERVICES, FM
MAINTENANCE SERVICES,
STEEPLEJACK
REVERBERATION DEVICES STEPLEJACK
REVERBERATION DEVICES
TOWERS. ANTENNA.
(ATV. HEAD-END
TOWERS. ANTENNA, RECEIVING
TOWERS. ANTENNA,
TRANSMITTING, AM
TOWERS. ANTENNA,
TRANSMITTING, FM

LITTEN EDUCATIONAL TELEVISION ANTENNAS, MICROWAVE ANTENNAS, 2500 MHZ MICROWAVE COMPONENTS MICROWAVE SYSTEMS, 5TL MICROWAVE SYSTEMS, 2500 MHZ TOANCL ATOD SYSTEMS TRANSLATOR SYSTEMS TV SYSTEMS, CLOSED CIRCUIT

for TOP PERFORMANCE in FM ANTENNAS

DUAL POLARIZED

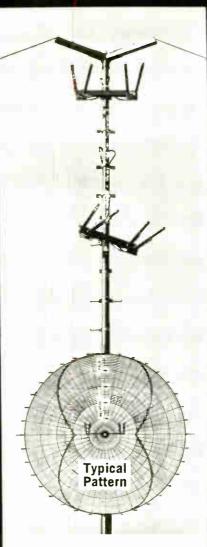
DIRECTIONALIZED

HORIZONTAL





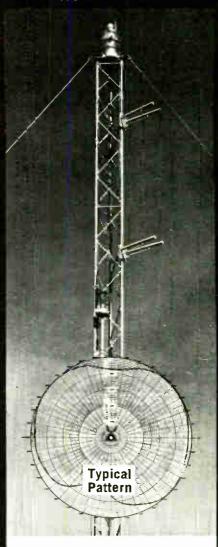
Any combination of elements Any power split from 50-50 to 30-70 Can be mounted, interlace, stacked or back to back Mounting hardware furnished for your tower.



DESCRIPTION

Phased directional (shown) Parasitic Directional Can be made for pole or tower mount. Complete filing information furnished along with

certified pattern



DESCRIPTION

Basic Jampro design with in phase signal over full modulation swing by use of power divider feed system. Input power up to 50 kw Complete with all hardware

World Radio History

- TV Antennas
- Coax Switches
- Notch Diplexers
- FM Antennas
- Harmonic Filters
- ETV Antennas

6939 POWER INN ROAD

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SACRAMENTO CALIFORNIA

PHONE AREA CODE 916 422-1177

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TAPE, MAGNETIC RECORDING,
AUDIO

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VACUUM TUBES. TRANSMITTING

MACKENZIE LABORATORIES
AUTOMATION EQUIPMENT
CARTRIDGES, MAGNETIC TAPE
RECORDERS, MAGNETIC TAPE, AUDIO AUDIO RECORDERS. MAGNETIC TAPE. AUDIO. CARTRIDGE TAPE DECKS. MAGNETIC

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TAPE DECKS+ MAGNETIC
TAPE DUPLICATORS

MAGNECORD

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AMPLIFIER, AF, STEREO

RECORDERS, MAGNETIC TAPE, AUDIO RECORDERS. MAGNETIC TAPE. LOGGING REELS+ TAPE TAPE DECKS. MAGNETIC TAPE DUPLICATORS

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TAPE, MAGNETIC RECORDING,
AUDIO TAPE, MAGNETIC RECORDING, COMPUTER TAPE: MAGNETIC RECORDING: VIDEO

MAGNE-TRONICS: INC.
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ALARM FAULT
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CAPACITORS, FIXED,
ELECTROLYTIC
CAPACITORS, FIXED, OTHER
CIRCUIT BREAKERS
DIALS, INSTRUMENT
JACKS
KNOBS
PLUGS, PHONE
RESISTORS, FIXED, WIREWOUND
RESISTORS, FIXED, WIREWOUND
RESISTORS, VARIABLE,
MIREWOUND WIREWOUND RHEOSTATS SEMICONOUCTOR RECTIFIERS. GENERAL SEMICONOUCTOR RECTIFIERS. POWER
SWITCHES. LEVER
SWITCHES. PUSHBUTTON.
NONILLUMINATED

MARANTZ COMPANY
AMPLIFIER. AF.
GENERAL PURPOSE
AMPLIFIER. AF. MONAURAL
AMPLIFIER. AF. STEREO
CABINETS. WOOD
PREAMPLIFIERS. AUOIO
RECEIVERS. FM
RECEIVERS. MULTIPLEX
TURNTABLES. PHONOGRAPH

SWITCHES, ROTARY TESTERS, BATTERY TIMERS, ELECTRIC

MARATHON PRODUCTS CORP.

CARTRIDGES. MAGNETIC TAPE
CARTRIDGES. TAPE.

RECORDING SERVICE

MARCONI DIVISION
AMPLIFIER, DISTRIBUTION
AMPLIFIER, PULSE
AMPLIFIER, STABILIZING
AMPLIFIER, TV, VIDEO
ANTENNAS, TV
CAMERAS, TV. COLOR
CAMERAS, TV. MONOCHROME
DISPLAY EQUIPMENT, TV
EMHANCERS, TV IMAGE
EXCITERS, FM
GEMERATORS, SIGNAL, DOT BAR
GEMERATORS, SIGNAL, DOT BAR
GEMERATORS, SIGNAL,
TV SYNCHRONIZING GENERATORS, SIGNAL.
TV SYNCHRONIZING
INDUSTRIAL TV
MODULATORS, TV
MONITORS, VIDEO
MONITORS, WAVEFORM
PROJECTORS, FILM RECEIVERS. HF TRANSMITTERS. AM. 1 KW TRANSMITTERS. AM. 10 KW TRANSMITTERS. AM. 50 KW

TRANSMITTERS. AM. OVER 50 KW
TRANSMITTERS. FM. 1 KW
TRANSMITTERS. FM. 5 KW
TRANSMITTERS. TV. 1 KW
TRANSMITTERS. TV. 5 KW
TRANSMITTERS. TV. 10 KW
TRANSMITTERS. TV. 25 KW
TRANSMITTERS. TV. 25 KW TV SYSTEMS. CLOSED CIRCUIT

MARCONI INSTRUMENTS
ANALYZERS DISTORTION
ANALYZERS HARMONIC
ATTENUATORS RF ATTENUATORS, RF
BRIDGES
CALORIMETERS
GENERATORS, FM, STEREO
GENERATORS, SIGNAL, AF
GENERATORS, SIGNAL, AF
METERS, POWER
SCILLATORS, AF AND RF,
SEE GENERATORS
OSCILLATORS, AM
OSCILLATORS, AM
RECEIVERS, FM
RECEIVERS, FM
RECEIVERS, FM RECEIVERS. HE

MARTI ELECTRONICS

AMPLIFIER, AF, AGC
AMPLIFIER, AF, COMPRESSING
AMPLIFIER, AF,
GENERAL PURPOSE
ANTENNAS, FM
ANTENNAS, MOBILE
BASE STATIONS
COMMUNICATIONS SYSTEMS,
LAND MOBILE
COMMUNICATIONS SYSTEMS,
MICROWAVE COMMUNICATIONS SYSTEMS,
MICROWAVE
EXCITERS, FM
GENERATORS, FM, SUBCARRIER
MICROWAVE SYSTEMS, STL
MOBILE EQUIPMENT
NARROW-BAND FM EQUIPMENT
PREAMPLIFIERS, AUDIO
RECEIVERS, FM
RECEIVERS, SCA
REMOTE CONTROL SYSTEMS
STL EQUIPMENT
TRANSMITTERS, FM, 10 WATTS
TRANSMITTERS, FM, 100 WATTS

MARYLAND TELECOMMUNICATIONS
CAMERAS, TV, MONOCHROME
CONSOLE, AUDIO, TV
CONSOLE, VIDEO, STUDIO
DISPLAY EQUIPMENT, TV
GENERATORS, SIGNAL,
TV SYNCHRONIZING
INDUSTRIAL TV
MONITORS, VIDEO
TV SYSTEMS, CLOSED CIRCUIT

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TOWERS. ANTENNA.
CATV. MEAD—END
TOWERS. ANTENNA. RECEIVING
TOWERS. ANTENNA.
TRANSMITTING. AM
TOWERS. ANTENNA.
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. TV

J. G. MCALISTER
LAMPS. PANEL
LIGHTING. TV. COMPONENTS
LIGHTING. TV. SYSTEMS

THE MCINTIRE COMPANY
PRESSURIZATION EQUIPMENT.
TRANSMISSION LINE

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AMPLIFIER, AF, ADAPTERS, FM STEREO
AMPLIFIER, AF,
GEMERAL PURPOSE
AMPLIFIER, AF, MONAURAL
AMPLIFIER, DISTRIBUTION
AMPLIFIER, FR, FR
GENERAL PURPOSE
AMPLIFIER, RF, PEAK LIMITING
AMPLIFIER, RF, POWER
ANTENNAS, FM
BACKGROUNO MUSIC SERVICE
CABINETS, METAL
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRCO
COMMUNICATIONS SYSTEMS,
MULTIPLEX
HARDWARE, RACK
METERS, DB AND VU
METERS, FIELD STRENGTH
METERS, FIELD STRENGTH
METERS, FIELD STRENGTH
METERS, FREQUENCY
MONITORS, FM SYSTEMS, MONO
MONITORS, FM SYSTEMS, MONO
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, STEREO
MONITORS, FM SYSTEMS, STEREO
MONITORS, FM SYSTEMS, STEREO
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, STEREO
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, STEREO
MONITORS, FM SYSTEMS,

MELCOR ELECTRONICS

AMPLIFIER. AF. AGC

AMPLIFIER. AF. COMPRESSING

AMPLIFIER. AF,
GEMERAL PURPOSE
AMPLIFIER. AF, MONAURAL
AMPLIFIER. AF, STEREO
AMPLIFIER. DC
AMPLIFIER. DISTRIBUTION
EQUALIZERS. AUDIO EMPMASIS
MONITORS. AM SYSTEMS.
MONITORS. FM SYSTEMS, MONO
MONITIRS. FM SYSTEMS. STEREO
POWER SUPPLIES. DC
PREAMPLIFIERS. AUDIO

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TAPE, MAGNETIC RECORDING,
VIDEO

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LIGHTING. TV. COMPONENTS
LIGHTING. TV. CONTROLS
LIGHTING. TV. SYSTEMS
SWITCHES, KNIFE

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RECORDERS. MAGNETIC TAPE. AUDIO RECORDERS. MAGNETIC TAPE.

MICOM. INC. METERS. FLUTTER & WOW

MICROFLECT CO.. INC.

REFLECTORS. PASSIVE
TOWERS. ANTEMNA.

CATV. MEAD-END
TOWERS. ANTEMNA.

TRANSMITTING.

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ATTENUATORS, FLXED
ATTENUATORS, FLXED
ATTENUATORS, HIXED
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
COMMUNICATIONS SYSTEMS,
MICROWAVE
COMPLERS
DETECTORS, MICROWAVE
DETECTORS, STANDING WAVE
DIPLEKERS DETECTORS, MICROWAVE
DETECTORS, STANDING WAVE
DIPLEXERS
DIVIDERS, POWER
DUMMY LOAD
FILTERS, RF
HOLDERS, CRYSTAL
METERS, FREQUENCY
METERS, FREQUENCY
METERS, FREQUENCY
MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, OTHER
MIXERS - ALSO SEE CONSOLES
MONITORS, FREQUENCY
MONITORS, FREQUENCY
MONITORS, PHASE
OSCILLATORS, AF AND RF,
SEE GENERATORS
SEMICOMDUCTOR DIODES
SLOTTED SECTIOMS
SWITCHES, COAXIAL
SWITCHES, COAXIAL
SWITCHES, MAYEGUIDE
TRANSFORMERS, RF
WAVEGUIDE AND
ASSOCIATED COMPONENTS

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ANTENNAS, MICROWAVE
CAVITIES, MICROWAVE
CHOKES, WAVEGUIDE
COMMUNICATIONS SYSTEMS, COMMUNICATIONS SYSTEMS,
MICROWAVE
DETECTORS, MICROWAVE
DETECTORS, MICROWAVE
OETECTORS, STANDING WAVE
OISPLAY EQUIPMENT. TV
JOINTS, ROTARY, COAXIAL
JOINTS, ROTARY, WAVEGUIDE
MICROWAVE COMPONENTS
MICROWAVE SYSTEMS, STANDICATE
MICROWAVE SYSTEMS, OTHER
SLOTIED SECTIONS
STL EQUIPMENT
TV SYSTEMS, CLOSED CIRCUIT
WAVEGUIDE AND
ASSOCIATED COMPONENTS

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AMPLIFIER CATV

AMPLIFIER RF.

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PROCESSORS. FILM. COLOR

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AMPLIFIER, PULSE
AMPLIFIER, RF. PEAK LIMITING
AMPLIFIER, TV. BOOSTER
ATTEMUATORS, FIXEO
ATTEMUATORS, IMPEDANCE MATCHING
ATTEMUATORS, RE

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COMMUNICATIONS SYSTEMS.
MICROWAVE
CONNECTORS. RF
CONVERTERS
COUPLERS
DELAY LINES
DETECTORS. MICROWAVE
DIPLEXES
DIVIOERS. FREQUENCY
FILTERS. RF
GENERATORS. SIGNAL. RF
HOLDERS. CRYSTAL
INTEGRATED CIRCUITS.
MICROWAVE
MICROWAVE COMPONENTS
MICROWAVE SYSTEMS. STL

MID AMERICA ELECTRONICS CORP

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GENERAL PURPOSE
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CONSOLE, AUDIO, FM
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, TY
CONSOLE, AUDIO, TY
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SOUND SYSTEMS, THEATER

MILES REPRODUCER CO

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AMPLIFIER, FF, POWER

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INTERCOM, WIRED

COMMUNICATIONS SYSTEMS,

INTERCOM, WIRELSS

COMMUNICATIONS SYSTEMS,

INTERCOM, WIRELESS

COMMUNICATIONS SYSTEMS,

LAND MOBILE

EQUALIZERS, AUDIO EMPHASIS

MICROPHONES, DYNAMIC

MICROPHONES, WIRELESS

PREAMPLIFIERS, AUDIO

RECEIVERS, FM

RECORDERS, DISC, MAGNETIC

RECORDERS, MAGNETIC TAPE,

AUDIO

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LOGGING

TRANSFORMERS, AUDIO,

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INDUCTANCES. VARIABLE
TRANSFORMERS. RF

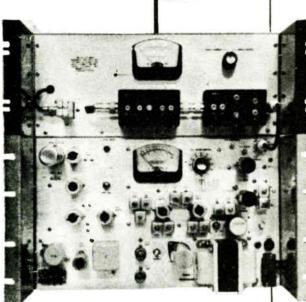
D. B. MILLIKEN COMPANY
CAMERAS. FILM. CINE
CAMERAS. OSCILLOSCOPE

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MEADS. ERASE. MAGNETIC
MEADS. RECORDING. MAGNETIC
TAPE. MAGNETIC RECORDING.
TEST

TAPE, MAGNETIC RECORDING,
TEST

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ALARM. SIGNAL
BACKGROUND MUSIC SERVICE
CABINETS. STORAGE. FILM
CABINETS. STORAGE.
MAGNETIC TAPE
CAMERAS. FILM. CIME
CAPACITORS. FIXED. CERMIC
CAPACITORS. FIXED. MICA
CAPACITORS. FIXED.
MICA
CAPACITORS. FIXED
FIXED. MICA
FIXED
MICA
MAGNARE. TUBLING. MAGNETIC
LENSES. OPTICAL. FIXED
LENSES. OPTICAL. FIXED
LENSES. OPTICAL. FIXED
LENSES. OPTICAL. FIXED
MOUNTS. VIBRATION AND SHOCK
NAMEPLATES.
PAPER. CHART AND GRAPH
RECORDERS. FILM. MAGNETIC
RECORDERS. FILM. MAGNETIC
RECORDERS. FILM. MAGNETIC
RECORDERS. MAGNETIC TAPE.
AUDIO
RECORDERS. MAGNETIC TAPE.
LOGGING
RECORDERS. MAGNETIC TAPE. LOGGING RECORDERS+ MAGNETIC TAPE+ VIDEO
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VIDEO
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COMMUNICATIONS SYSTEMS,
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MICROWAVE
COMMUNICATIONS SYSTEMS,
MULTIPLEX
EXCITERS, FM, STEREO
GEMERATORS, FM, SUBCARRIER
MICROWAVE SYSTEMS, STL
MOBILE EQUIPMENT
NARROW-BAND FM EQUIPMENT
REMOTE CONTROL SYSTEMS
STL
EQUIPMENT
TRANSMITTERS, FM, 10 WATTS

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SWITCHES, INTERLOCK
SWITCHES, LEVER
SWITCHES, MULTICONTACT
SWITCHES, MULTICONTACT
SWITCHES, PUSHBUTTON,
NONILLUMINATED
SWITCHES, TELEPHONE TYPE

MOTOROLA COMMUNICATIONS
ANTENNAS, MICROWAVE
ANTENNAS, MOBILE
BACKGROUND MUSIC SERVICE
CAMERA, MOUNTING EQUIPMENT
CAMERA, REMOTE
CONTROL EQUIPMENT
CAMERAS, TV, MONOCHROME
VOLTMETERS, AC
VOLTMETERS, DC
WATTMETERS

MOTORQLA SEMICONDUCTOR

PRODUCTS, INC.

INTEGRATED CIRCUITS

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GENERAL
SEMICONDUCTOR RECTIFIERS,
HIGH VOLTAGE
SEMICONDUCTOR RECTIFIERS,
POWER
SEMICONDUCTOR RECTIFIERS,
SEMICONDUCTOR RECTIFIERS,
SEMICONDUCTORS, THYRISTORS
SEMICONDUCTORS, THYRISTORS
SEMICONDUCTORS, THYRISTORS
SEMICONDUCTORS,
TRANSISTORS, AF
SEMICONDUCTORS,
TRANSISTORS, FE
SEMICONDUCTORS,
TRANSISTORS, RF

AMPLIFIER. AF.
GENERAL PURPOSE
AMPLIFIER, RF.
GENERAL PURPOSE
AMPLIFIER, RF.
GENERAL PURPOSE
AMPLIFIER. RF.
ONE
AMPLIFIER. RF.
OODLE
AMPLIFIER. RF.
OODLE
OUPLERS
INDUCTANCES. FIXED
INDUCTANCES. FIXED
INDUCTANCES. VARIABLE
MONITORS. PHASE
NOTIONS. PHASE
NETWORS. PHASING
SWITCHING MATRIXES

MYR CORPORATION
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RECORDERS. MAGNETIC TAPE.
VIDEO
TV SYSTEMS. CLOSED CIRCUIT

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ANTENNAS. MICROWAVE
ANTENNAS. 2500 MHZ

ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, WIOEO
CALORIMETERS
CAVITIES, MICROWAVE
CHOKES, WAVEGUIDE
CONNECTORS, COAXIAL CABLE
CONNECTORS, COAXIAL CABLE
CONNECTORS, STANDING WAVE
DIVIDERS, POWER
FILTERS, FF
GENERATORS, SIGNAL, PULSE
GENERATORS, SIGNAL, PULSE
GENERATORS, SIGNAL, FF
METERS, FREQUENCY
METERS, FREQUENCY
METERS, FREQUENCY
METERS, STANDING WAVE
MICROWAVE COMPONENTS
MICROWAVE SYSTEMS, OTHER
METENS, ATACHING, RF
OSCILLATORS, AF AND RF,
SEE GENERATORS
SCILLATORS, AF AND RF,
SEE GENERATORS
SCILLATORS, MICROWAVE
SUSTICHES, PMASE, MICROWAVE
SLOTTED SECTIONS
SWITCHES, COAXIAL
TRANSMISSION TIEST SETS

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LOGGING AND GRAPHIC

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CABINETS, STORAGE, DISC
CABINETS, STORAGE, FILM
CABINETS, STORAGE,
MAGNETIC TAPE
CLEANERS, OTHER
EDITORS, FILM
FILM, PHOTOGRAPHIC
RACKS, MOUNTING
REELS, FILM
REWINDERS, FILM
REWINDERS, FILM
REWINDERS, FILM
REMINDERS, MAGNETIC TAPE
AND FILM

MORTHEAST ELECTRONICS
ANALYZERS, DISTORTION
ANALYZERS, NOISE
GENERATORS, SIGNAL, AF
METERS, DB AND VU

METERS, DB AND VU

NOTH AMERICAN PHILIPS COMPANY
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GENERAL PURPOSE
AMPLIFIER, AF, REVERBERATION
AMPLIFIER, DISTRIBUTION
CAMERAS, FILM, CINE
CAMERAS, FILM, STILL
CAMERAS, TV, COLOR
CAMERAS, TV, COLOR
CAMERAS, TV, COLOR
COMSOLE, AUDIO, PORTABLE
COMSOLE, AUDIO, PORTABLE
COMSOLE, AUDIO, PORTABLE
COMSOLE, AUDIO, RECORDING
EARPHONES, HEADPHONES
EDUCATION FACILITIES,
PUBLISHERS
EDUCATION FACILITIES, EQPT
ENCLOSURES, SPEAKER
MICROPHONE HARDWARE
MICROPHONES, COMDENSER
MICROPHONES, COMDENSER
MICROPHONES, COMDENSER
MICROPHONES, COMDENSER
MICROPHONES, AUDIO
RECCEIVERS, AM
RECEIVERS, AM
RECEIVERS, FM
RECORDERS, MAGNETIC TAPE,
AUDIO
RECORDERS, MAGNETIC TAPE,
VIDEO
SOUND SYSTEMS, OUTDOOR
SOUND SYSTEMS, NOTABLE
SPEAKERS
SPEAKERS
SPEAKER
SPEAKER
VACUUM TUBES, CAMERA,
PLUMBICON R
VACUUM TUBES, CAMERA, VIDICON

NORTRONICS COMPANY, INC.
HEADS, ERASE, MAGNETIC
HEADS, RECORDING, MAGNETIC
TAPE, MAGNETIC RECORDING,
TEST

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CAPACITORS, FIXED, METALLIZED
COMMUNICATIONS SYSTEMS, CB
COMMUNICATIONS SYSTEMS,
LAND MOBILE
MOBILE EQUIPMENT

MOBILE EQUIPMENT

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SWITCHES- INTERLOCK
SWITCHES- LEVER
SWITCHES- MECHANICALLY
ACTUATED
SWITCHES- MULTICONTACT
SWITCHES- PUSHBUTTONNONILLUMINATED
SWITCHES- ROTARY
SWITCHES- SLIDE
SWITCHES- SLAP

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SPEAKERS

SPEAKERS

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ATTENUATORS,
IMPEDANCE MATCHING
BOXES, DECADE, RESISTOR
CAPACITORS, FIXED,
ELECTROLYTIC
KNOBS
POTENTIOMETERS, CARBON
POTENTIOMETERS, MIREWOUND
RELAYS, GENERAL PURPOSE
RELAYS, LATCHING
RELAYS, LATCHING
RELAYS, DOWNER
RELAYS, LATCHING
RELAYS, TIME DELAY
RESISTORS, FIXED, CARBON
RESISTORS, FIXED, CARBON
RESISTORS, FIXED, PRECISION
RESISTORS, FIXED, WIREWOUND
RESISTORS, FIXED, OTHER
RESISTORS, VARIABLE, CARBON
RESISTORS, VARIABLE,
MIREWOUND
RESISTORS, WARIABLE,
MIREWOUND
RESISTORS, MECHANICALLY
ACTUATED
SWITCHES, ROTARY
TRANSFORMERS, VARIABLE

GUNNAR A. OLSEN CORP.
TOWERS. ANTENNA.
TRANSMITTING. AM
TOWERS. ANTENNA,
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. TV

ONAN DIVISION
CHARGERS, BATTERY
GENERATORS, POWER,
GASOLINE ENGINE

GRENAIUNS, POMER,
GASOLINE ENGINE

ORBIT RADIO

AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF,
MONAURAL
AMPLIFIER, AF, REWERBERATION
AMPLIFIER, AF, REVERBERATION
AMPLIFIER, AF, STEREO
AMPLIFIER, BRIDGING
AMPLIFIER, DISTRIBUTION
AUTOMATION EQUIPMENT
BACKGROUND MUSIC SERVICE
BROADCAST PROGRAMMING SERVICE
CARRIER-CURRENT EQUIPMENT
CARTIER-CURRENT EQUIPMENT
CARTIEDGES, TAPE,
RECORDING SERVICE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, AM
EDITORS, AUDIO AM
EDITORS, AUDIO TAPE
FILTERS, AUDIO
MAINTENANCE SERVICES, AM
MAINTENANCE SERVICES, AM
MAINTENANCE SERVICES, FM
MIXERS - ALSO SEE CONSOLES
PREAMPLIFIERS, AUDIO
REMOTE CONTROL SYSTEMS
REVERBERATION DEVICES
SOUND SYSTEMS, PORTABLE
TAPE, MAGNETIC RECORDING,
TEST

PACIFIC IOWER CO.

ANTENNAS, TV
LIGHTING, TV, COMPONENTS
LIGHTING, TV, SYSTEMS
TOWERS, ANTENNA,
CATV, MEAD-END
TOWERS, ANTENNA, RECEIVING
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, TW
TOWERS, ANTENNA,
TRANSMITTING, TW
THENSMITTING, TV
WIRE, BARE, COPPER

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ATTENUATORS, AUDIO
ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, RF
ATTENUATORS, RF
ATTENUATORS, VIDEO
CHOKES, WAVEGUIDE
KNOBS
POTENTIOMETERS, WIREWOUND
RESISTORS, FIXED, CARBON
RESISTORS, FIXED, PRECISION
RESISTORS, FIXED, WIREWOUND
RESISTORS, FIXED, WIREWOUND
RESISTORS, VARIABLE,
WIREWOUND
SWITCHES, MULTICONTACT
SWITCHES, PUSHBOTTON,
NONILLUMINATED
SWITCHES, ROTARY
SWITCHES, TOGGLE

PALL TRINITY MICRO CORP.
DEMUMIDIFIERS
DESICCANTS
FILTERS. OTHER
WIRING AND CABLING SERVICES

PERMOFLUX CORPORATION

AMPLIFIER . AF .

GENERAL PURPOSE

AMPLIFIER, AF, MONAURAL
AMPLIFIER, AF, REMOTE
AMPLIFIER, AF, STEREO
COLLS, CHOKE, AF
EARPHONES, MEADPHONES
MICROPHONES, DYNAMIC
PREAMPLIFIERS, AUDIO
SPEAKER COMPONENTS
SPEAKERS
TRANSFORMERS, AUDIO,
ISOLATION
TRANSFORMERS, AUDIO,
MATCHING
TRANSFORMERS, AUDIO
TRANSFORMERS, AUDIO
TRANSFORMERS, COUPLING
TRANSFORMERS, COUPLING
TRANSFORMERS, FLAMENT
TRANSFORMERS, FLAMENT
TRANSFORMERS, PLATE
TRANSFORMERS, PLATE
TRANSFORMERS, POWER

PHELPS DODGE

CABLE. ARMORED
CABLE. ASSEMBLIES
CABLE. CATV. MARDWARE
CABLE. CATV. MARDWARE
CABLE. CATV. MARDWARE
CABLE. COAXIAL. RIGID
CABLE. DIRECT-BURIAL
CONNECTORS. ANTENNA
CONNECTORS. COAXIAL CABLE
CONNECTORS. FOR
OUTPLEXERS
JACK PANEL ASSEMBLIES
JACK PANEL ASSEMBLIES
JACK PANEL ASSEMBLIES
JACK PANEL ASSEMBLIES
TARASMISSION LINES
TRANSMISSION LINES
TRANSMISSION LINES
TRANSMISSION TEST SETS
ASSOCIATED COMPONENTS
WAVEGUIDE AND

PIEZO CRYSTAL CO. CRYSTALS. PIEZOELECTRIC FILTERS. OTHER

M K PORTER INC HARDWARE, TOOLS TOOLS, CRIMPERS TOOLS, CUTTERS TOOLS, HAND

POMER-OPTICS INCORPORATED
CAMERA: MOUNTING EQUIPMENT
CAMERA: REMOTE
CONTROL EQUIPMENT
INDUSTRIAL TV
LENSES: OPTICAL: FIXED
LENSES: OPTICAL, ZOOM

POWER SOURCES
INVERTERS. OC TO AC.,
SOLID STATE
POWER SUPPLIES. AC
POWER SUPPLIES. DC

PRECISION LABORATORIES
CAMERAS, FILM, CINE
CAMERAS, FILM, STILL
EDITORS, FILM
EDITORS, FILM
EDITORS, VIDEO TAPE
HEADS, RECORDING, MAGNETIC
PROJECTORS, FILM
PROJECTORS, FILM
PROJECTORS, SLIDE
SPLICERS, MAGNETIC TAPE
AND FILM

CRYSTALS, PIEZOELECTRIC

CRYSTALS, PIEZOELECTRIC

PRODELIN, INCORPORATED
ADAPTERS, CONNECTOR
ANTENNAS, MOBILE
ANTENNAS, MOBILE
ANTENNAS, 2500 MHZ
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
CABLE, CATV. HARDWARE
CABLE, CATV. HARDWARE
CABLE, COAXIAL, RIGID
COLLS, ANTENNA LOADING
COMMUNICATIONS SYSTEMS,
LAND MOBILE
COMMUNICATIONS SYSTEMS,
MICROWAVE
CONNECTORS, ANTENNA
CONNECTORS, ANTENNA
CONNECTORS, COAXIAL CABLE
CONNECTORS, COAXIAL CABLE
CONNECTORS, POWER
DUMMY LOAD
FILTERS, ANTENNA
FILTERS, RF
MICROWAVE COMPONENTS
MICROWAVE SYSTEMS, 2500 MHZ
MOUNTS, ANTENNA, FIXED
MOUNTS, ANTENNA, FIXED
MOUNTS, ANTENNA, MOBILE
RADOMES
SHIFTERS, PHASE, MICROWAVE
SSTEMS, PHASE, MICROWAVE
SUTTHER

PRO-TEX REEL BAND COMPANY
LEADER. FILM

PRUZAN COMPANY
CATV, HARDWARE
POLE CLIMBING EQUIPMENT
SAFETY DEVICES, CLIMBING





Scala PR-450 Antenna

AURAL STUDIO-TRANSMITTER LINKS

FOR FM - AM - TV - INTERCITY RELAY

Six years of continuous operation in broadcast service and 150 units in the field have established the Moseley STL as the accepted industry standard.

Model PCL-2B Low distortion, wide frequency response, and exceptionally good transient response. Designed for continuous duty, the PCL-2B is rated at 8 watts maximum output. For FM stereo use DUAL MODEL PCL-2B, a concept pioneered by Moseley Associates, Inc.

SOLID-STATE REMOTE CONTROL SYSTEMS

RADIO and WIRE

Model PBR-21 All transistorized 21 channel deluxe control system can be operated over single wire line or radio circuit. DC line continuity not required. A complete line of control subcarrier generators and detectors is available to adapt the PBR-21 to STL systems for radio control. All FM radio remote control systems compatible with stereophonic and SCA program operation. (Write for Technical Bulletin 213). PBR-21 Studio Control Unit illustrated at right.



Model PBR-21

Model WRC-10T Designed to operate over a SINGLE DC wire pair, this 10 channel all solid-state control system is dependable, accurate, and economical. 4" rectangular meter provided for easy readout.

Model SCS-1 Status/Control System Employing plug-in modules, this solid-state 8 channel system can be used as status indicator, fault reporting, or one-way control system. Will operate over single telephone line or narrow band radio channel.

FM TRANSMISSION EQUIPMENT

LPE-10 SCG-3 SCG-4T

The Model SCG-4T SCA Subcarrier Generator illustrated is the newest FM product of Moseley Associates. Of all solid-state design, the Model SCG-4T contains a peak reading deviation meter calibrated directly in KHz. Muting circuitry is all electronic (no relays) for maximum reliability.



Model SCG-4T

The Model LPE-10 direct FM 10 watt Exciter is FCC Type Accepted for stereo and SCA service as well as an educational transmitter (LPT-10). It is ideal as replacement exciter when updating old style FM transmitters. Model SCG-3 FM Stereo Generator connects directly into exciter. Wideband input capability of LPE-10 assures maximum transmission linearity of composite stereo waveform from SCG-3.



Model RPL-1T

BROADCAST REMOTE PICKUP SYSTEMS

Model RPL-1 Designed for continuous duty, 30 watt high quality broadcast remote pickup transmitter provides studio sound away from home. Operating in the 148-174 MHz band, the RPL-1 Remote Pickup System has low distortion and wide frequency response, making it an excellent choice for FM stations.

450 MHz Solid-state Remote Pickup System Newly designed, this all solid-state system provides the broadcaster with a modern, high quality remote pickup unit for use on any of the 20 channels in Group N. Only JEDEC-registered silicon semiconductors used.

MOSELEY ASSOCIATES, INC.

135 NOGAL DRIVE, SANTA BARBARA, CALIFORNIA 93105 TELEPHONE 805-967-0424

DUMMY LOAD
EARPHONES, HEADPHONES
EDITORS, FILM
EDITORS, VIDEO TAPE
ENCLOSURES, SPEAKER
EQUALIZERS, AUDIO EMPHASIS
EXCITERS, FM
FILTERS, AUDIO
FILTERS, OTHER
FLASHERS, TOWER
GENERATORS, FM, STEREO
GENERATORS, FM, SUBCARRIER
GENERATORS, SIGNAL, AF
GENERATORS, SIGNAL, OLOR BAR
GENERATORS, SIGNAL, OLOR BAR
GENERATORS, SIGNAL, TO SYNCHEROLIZE
GENERATORS, SIGNAL,
TV SYNCHRONIZING
MEADS, ERASE, MAGNETIC
HEADS, RECORDING, MAGNETIC
HEADS, RECORDING, MAGNETIC
HEADS, RECORDING, MAGNETIC
HEADS, POTICAL, ZOOM
LIGHTING, TV, COMPONENTS
LIGHTING, TV, CONTROLS
LIGHTING, TV, COMPONENTS
LIGHTING, TV, SYSTEMS
MCTROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, SYSTEMS, STA
MONITORS, AM SYSTEMS, MONO
MONITORS, FM SYSTEMS, SCA PULSE TECHNIQUES
EQUALIZERS. AUDIO EMPHASIS GENERATORS, SIGNAL, SPECIAL EFFECT GENERATORS, SIGNAL, TV, SYNCHRONIZING GENERATORS, SIGNAL, VITS INDUSTRIAL TV OSCILLATORS, TV TV SYSTEMS. CLOSED CIRCUIT WATTMETERS WATTMETERS
WAVEGUIDE AND
ASSOCIATED COMPONENTS
WIRE, BARE, COPPER
WIRE, BARE, COPPER
WIRE, SHIELDED Q R K ELECTRONIC PRODUCTS
PREAMPLIFIERS, AUDIO
TURNTABLES, PHONOGRAPH WIRE, SHIELDED

RCA ELECTRONIC COMPONENTS
BATTERIES, DAY CELL
CAVITIES, MICROMAVE
COMMUNICATIONS SYSTEMS, CB
GENERATORS, FM, STEREO
GENERATORS, SIGNAL, COLOR BAR
GENERATORS, SIGNAL, DOT BAR
GENERATORS, SIGNAL, DOT BAR
GENERATORS, SIGNAL, DOT BAR
GENERATORS, SIGNAL, MARKER
GENERATORS, SIGNAL, BOT
MICROPHONE S, SIGNAL, BAR
INTEGRATED CIRCUITS
MICROPHONE STANDS 6 BOOMS
MICROPHONES TONDEMSER
MICROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, VELOCITY
OMMMETERS
OSCILLOSCOPES
PROBES, 1EST LEAD
SEMICONDUCTOR RECTIFIERS,
GENERAL
SEMICONDUCTOR RECTIFIERS,
HIGH VOLTAGE
SEMICONDUCTOR RECTIFIERS,
POWER
SEMICONDUCTOR RECTIFIERS,
POWER
SEMICONDUCTOR RECTIFIERS,
POWER
SEMICONDUCTOR RECTIFIERS,
POWER SWITCHERS
SWITCHING SYSTEMS
TRANSMISSION TEST SETS
TV SYSTEMS+ CLOSED CIRCUIT JULES RACINE CO. . INC. ROANWELL CORPORATION CAPACITORS, VARIABLE EARPHONES, HEADPHONES TELEPHONE EQUIPMENT RADIO AIDS

CALIBRATION SERVICE.

FREQUENCY LARPHONES, HEADPHONES
TELEPHONE EQUIPMENT

ROBINS INDUSTRIES CORP
ACOUSTIC MATERIALS
ADAPTERS, CONNECTOR
ANTENNAS, FM
CABLE, ASSEMBLIES
CABLE, SHIELDED, AUDIO
CORDS, PATCH
DEMAGNETIZERS, BULK TAPE
DEMAGNETIZERS, HEAD
EDITORS, AUDIO TAPE
HARDWARE, MOUNTS
HEADS, RECORDING, MAGNETIC
HEADS, RECORDING, MAGNETIC
JACKS
LAMP ASSEMBLIES
LOG BOOKS OR SHEETS
METERS, OB AND VU
MICROPHONE HARDWARE
MICROPHONES, DYNAMIC
PLUGS, COAXIAL
PLUGS, PHONE
PROJECTORS, FILM, REAR
REELS, TAPE
SOLVENTS AND CLEANERS
SPLICERS, MAGNETIC TAPE
AND FILM
STROBE, DISCS
STROBE, LIGHTS
SWITCHES, SHAGNETIC TAPE
AND FILM
STROBE, DISCS
STROBE, LIGHTS
SWITCHES, SNAP
SMITCHES, SNAP
SMITCHES, NAP
MICROPHONE, TOPPER
MICROPHONE, TOPPER
MICROPHONES, DYNAMIC
PLUGS, CHASSIS
SOLVENTS AND CLEANERS
SPLICERS, MAGNETIC TAPE
AND FILM
STROBE, DISCS
STROBE, LIGHTS
SWITCHES, SNAP
SMITCHES, SNAP
MITCHES, SNAP
MITCHES, SNAP
MIRCH, BUSULATED, HOOKUP
WIRE, SHIELDED RAVEN SCREEN CORPORATION
SCREENS, PROJECTION, FRONT
SCREENS, PROJECTION, REAR RAYTHEON CO., EQUIPMENT DIV.
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AMPLIFIER: TV. VIDEO
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ANTENNAS, MICROWAVE
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MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, OTHER
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MOUNTS, ANTENNA, MOBILE
RACKS, MOUNTING RBM CONTROLS

RELAYS. GENERAL PURPOSE
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RELAYS. PLUG-IN
RELAYS. POWER
RELAYS. TELEPHONE
RELAYS. TELEPHONE
RELAYS. TIME DELAY POWER
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SILICON CONTROLLED - SCR
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TRANSISTORS,
AF MIXERS - ALSO SEE CONSOLES
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MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, SCA
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MONITORS, FM SYSTEMS, STEREO
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MOUNTS, ANTENNA, MOBILE
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SEE GENERATORS
OSCILLATORS, AF AND RF,
SEE GENERATORS
OSCILLATORS, AF AND
PLUGS, PHONE
PUGS, PHONE
PUGS, PHONE
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PRESSURIZATION EQUIPMENT,
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PROCESSORS, FILM, COLOR
PROJECTORS, FILM
PROJECTORS, SLIGE
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VACUUM TUBES, CAMERA, VIDICON
VACUUM TUBES, CATHODE RAY,
TV, COLOR
VACUUM TUBES, CATHODE RAY,
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AMPLIFIER, AF, STEREO
AMPLIFIER, BRIDGING
AMPLIFIER, BRIDGING
AMPLIFIER, BRIDGING
AMPLIFIER, BRIDGING
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CABINETS, STORAGE,
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CABLE, COAXIAL, FLEXIBLE
CABLE, SHIELDED, AUDIO
CALORINGTERS
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CARTRIDGES, MAGNETIC TAPE
CAMERAS, TV, WONOCHOME
CARTRIDGES, MAGNETIC TAPE
CAMERAS, TV, WONOCHOME
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CAMERAS, TV, WONOCHOME
CARTRIDGES, MAGNETIC TAPE
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COILS, ANTENNA LOADING
COILS, MYBRID MIRE, INSULATED, HOOKUP
WIRE, SHIELDED

ROHDE & SCHWARZ SALES CO-USA
AMPLIFIER, RF, PEAK LIMITING
AMPLIFIER, VIOCO, SWEEP
ANALYZERS, DISTORTION
ANALYZERS, NOISE
ANALYZERS, NOISE
ANALYZERS, VIDEO
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ATTENUATORS, TIXED
ATTENUATORS, TIXED
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ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, MICROWAVE
ATTENUATORS, WICROWAVE
ATTENUATORS, POBER
COMMECTORS, VIDEO
BALUNS
BRIDGES
COMMECTORS, ROHER
COMNECTORS, POWER
COMNECTORS, POWER
COMNECTORS, POWER
COMNECTORS, REQUENCY
DUMMY LOAD
FILTERS, AUDIO
FILTERS, AUDIO
FILTERS, AUDIO
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FILTERS, FREQUENCY
DUMMY LOAD
FILTERS, FIELD STRENGTH
METERS, FREQUENCY
METERS, PHASE ANGLE
METERS, PHASE ANGLE
METERS, PHASE ANGLE
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SCILLATORS, AF
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RECORDERS, MAGNETIC TAPE,
AUDIO, CARTRIDGE
RECORDERS, MAGNETIC TAPE,
VIDEO
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REWINDERS, FILM
SOUND SYSTEMS, OUTGOOR
SOUND SYSTEMS, PORTABLE
SOUND SYSTEMS, PORTABLE
SOUND SYSTEMS, THEATER
SPEAKER
SPEAKER
SPEAKER
AND FILM
STL EQUIPMENT
SWITCHERS
SWITCHING, SYSTEMS RECORDING EQUIPMENT COMPANY
AMPLIFIER, AF, MONAURAL
FILTERS, AUDIO
FILTERS, RF
PREAMPLIFIERS, AUDIO REEVES SOUNDCRAFT
CARTRIDGES, MAGNETIC TAPE
RECORDS, BLANK, LACQUER,
FOR RECORDING FOR RECORDING REELS, TAPE TAPE, MAGNETIC RECORDING, AUDIO TAPE, MAGNETIC RECORDING, COMPUTER TAPE, MAGNETIC RECORDING, VIDEO SWITCHERS
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TAPE, MAGNETIC RECORDING,
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GENERAL PURPOSE
AMPLIFIER: RF. POWER
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MICROWAVE
COMMUNICATIONS SYSTEMS,
MULTIPLEX
EXCITERS, FM
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MICROWAVE SYSTEMS, STL
MICROWAVE SYSTEMS, 2500 MHZ
MICROWAVE SYSTEMS, 0THER
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RECEIVERS, FM
RECEIVERS, FM
RECEIVERS, HF
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TAPE, MAGNETIC RECORDING,
AUDIO
TAPE, MAGNETIC RECORDING,
VIDEO
TERMINAL BLOCKS
TERMINAL BLOCKS
TERMINAL STAPS
TERMINAL CATRIDGES, MAGNETIC TAPE
CATRIDGES, PHONO
CLOCKS
COILS, ANTENNA LOADING
COILS, TELEPHONE
COILS, TELEPHONE
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS,
LAND MOBILE
COMMUNICATIONS SYSTEMS,
MICROWAVE
COMMUNICATIONS SYSTEMS,
MULTIPLEX
CONNECTORS, F & MICROPHONE
CONNECTORS, COAXIAL CABLE
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, TV
CONSOLE, VIDEO, STUDIO
CORGS, PATCH
COUPLERS TRANSMITTERS. FM. 100 WATTS TRANSMITTERS. FM. 1 KW TRANSMITTERS. FM. 1 KW TRANSMITTERS. FM. 10 KW RECEIVERS. AM RECEIVERS. FM RECEIVERS. HF RIKER VIDEO INDUSTRIES

AMPLIFIER. DISTRIBUTION

AMPLIFIER. KEYING

AMPLIFIER. MASKING

AMPLIFIER. PULSE

AMPLIFIER. SENSING

AMPLIFIER. STABILIZING

AMPLIFIER. TV. VIDEO

AUTOMATION EQUIPMENT RECORDERS. PAPER. LOGGING AND GRAPHIC SLOTTED SECTIONS
TESTERS, CAPACITOR
TESTERS, INSULATION
TESTERS, SEMICONDUCTOR
TRANSFORMERS, AUDIO, COROS. PATCH
COUPLERS
CRYSTALS. PIEZOELECTRIC
DELAY LINES
DEMAGNETIZERS. BULK TAPE
DEMAGRETIZERS. HEAD ISOLATION
TRANSFORMERS, AUDIO, MATCHING
TRANSMITTERS, AM, 5 KW AUTOMATION EQUIPMENT
BALUNS
CLOCKS
COMSOLE, VIDEO, PORTABLE
COMSOLE, VIDEO, STUDIO
DROPOUT COMPENSATOR,
VIDEO TAPE
GEMERATORS, SIGNAL, COLOR BAR
GEMERATORS, SIGNAL, DOT BAR
GEMERATORS, SIGNAL, DUSE TRANSMITTERS AM 10 KW TRANSMITTERS FM TRANSMITTERS TV DEMODULATORS DIPLEXERS DOLLIES, CAMERA
DOLLIES, TEST EQUIPMENT
DROPOUT COMPENSATOR,
VIDEO TAPE VOLTMETERS. AC VOLTMETERS, VACUUM TUBE

World Radio History

WATTMETERS

ROHN MANUFACTURING COMPANY
CATV. HEAD-END EQUIPMENT
HEAD-END EQUIPMENT
SEE CATV HEAD-END EQUIPMENT
LIGHTS. TOWER. OBSTRUCTION
MOUNTS. ANTENNA. FIXED
REFLECTORS. PASSIVE
TOWERS. ANTENNA.
CATV. HEAD-END
TOWERS. ANTENNA.
TEANSMITTING. AM
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TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. TV TRANSMITTING. TV

ROME CABLE DIV. OF ALCOA
CABLE. ASSEMBLIES
CABLE. COAXIAL. FLEXIBLE
CABLE. DIRECT-BURIAL
CABLE. SHIELDED. AUDIO
CABLE. TELEPHONE

ROTRON MANUFACTURING COMPANY BLOWERS AND FANS

ROUND HILL ASSOCIATES

AMPLIFIER. AF. AGC

AMPLIFIER. AF. CONPRESSING

AMPLIFIER. AF.

GENERAL PURPOSE

AMPLIFIER. AF.

MONAURAL

AMPLIFIER. AF.

PEAK LIMITING. AM

AMPLIFIER. AF.

PEAK LIMITING. FM

AMPLIFIER. AF.

MEMOTE

AMPLIFIER. AF.

STEREO

AMPLIFIER. AF.

AMPLIFIER. AF.

AMPLIFIER. AF.

AMPLIFIER. AF.

AMPLIFIER. BRIDGING

AMPLIFIER. BRIDGING

AMPLIFIER. BRIDGING

AMPLIFIER. DISTRIBUTION

COMMUNICATIONS SYSTEMS.

INTERCOM. WIRELESS ROUND HILL ASSOCIATES

RUSSCO ELECTRONICS MFG.
AMPLIFIER. AF. MONAURAL
AMPLIFIER. AF. STEREO
PREAMPLIFIERS. AUDIO
TURNTABLES. PHONOGRAPH

PLOWS CABLE LAYING

HOWARD W SAMS & CO INC EDUCATION FACILITIES . PUBLISHERS EDUCATION FACILITIES . SCHOOLS

PUBLISHERS
EDUCATION FACILITIES, SCHOO

SARKES-TARZIAN
AMPLIFIER, DISTRIBUTION
AMPLIFIER, PULSE
AMPLIFIER, TV. VIDEO
ATTENUATORS, VIDEO
AUTOMATION EQUIPMENT
CAMERAS, TV. COLOR
CAMERAS, TV. COLOR
CAMERAS, TV. MONOCHROME
CAPACITORS, VARIABLE
COMMUNICATIONS SYSTEMS,
MICROWAVE
COMPUTER EQUIPMENT
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, TV
CONSOLE, VIDEO, STUDIO
COROS, PATCH
DISPLAY EQUIPMENT, TV
ENHANCERS, TV IMAGE
GENERATORS, SIGNAL,
TV SYNCHRONIZING
HARDWARE, RACK
JACK PANEL ASSEMBLIES
MAINTEMANCE SERVICES, TV
MICROWAVE SYSTEMS, STL
MONITORS, VIDEO
RECTIFIERS, ALSO SEE SEMICONDUCTORS 6 VACUUM TUBES
RECTIFIERS, SELENIUM
SEMICOMDUCTOR RECTIFIERS,
GEMERAL
SEMICOMDUCTOR RECTIFIERS,
HIGH VOLTAGE
SEMICOMDUCTOR RECTIFIERS,
POWER
SEMICOMDUCTOR RECTIFIERS,
SHICOMOUCTOR RECTIFIERS,
POWER
SEMICOMOUCTOR RECTIFIERS,
SILICON CONTROLLER SCO POWER
SEMICONDUCTOR RECTIFIERS.
SILICON CONTROLLED - SCR
STL EQUIPMENT
SWITCHING MATRIXES
SWITCHING SYSTEMS
TAPE. MAGNETIC RECORDING. AUDIO TRANSMITTERS. TV. 1 KW
TV SYSTEMS. CLOSED CIRCUIT

SAXTON PRODUCTS INC
CABLE ASSEMBLIES
CABLE COAXIAL FLEXIBLE
CABLE COAXIAL RIGID
CABLE DIRECT-BURIAL CABLE. DIRECT-BURIAL
CABLE. SHIELDED. AUDIO
CABLE. TELEPHONE
WIRE. BARE. COPPER
WIRE. BARE. COPPER STRAP
WIRE. BARE. STEEL
WIRE. INSULATED. HIGH VOLTAGE
WIRE. INSULATED. HOOKUP
WIRE. SHIELDED
WIRING AND CABLING SERVICES

SCALA RADIO CORPORATION ANTENNAS. AM ANTENNAS. CATV ANTENNAS. FM ANTENNAS. TV

ANTENNAS. TV. MASTER-COMMUNITY BALUNS

SCHAPER ELECTRONICS
AMPLIFIER. SENSING
AUTOMATION EQUIPMENT
BACKGROUND MUSIC SERVICE
BROADCAST PROGRAMMING SERVICE
CABINETS. METAL
PREAMPLIFIERS. AUDIO
RACKS. MOUNTING
RECORDERS. MAGNETIC TAPE. AUDIO RECORDERS. MAGNETIC TAPE. RECORDERS. MAGNETIC TAI LOGGING REMOTE CONTROL SYSTEMS SWITCHING MATRIXES TAPE DECKS. MAGNETIC

ALBERT SCHULTZ. INC.

BACKGROUND MUSIC SERVICE
BROADCAST PROGRAMMING SERVICE

BROAGLAST PROGRAMMING SE

SCIENTIFIC ATLANTA
ANTENNAS. CATV
ANTENNAS. TAV
ANTENNAS. TV.
MASTER-COMMUNITY
ANTENNAS. Z500 M/Z
ATTENUATORS. MICROWAVE
ATTENUATORS. WIDEO
CABINETS. METAL
CONSOLE. CABINETS
AND HARDWARE
DIVIOERS. POWER
JOINTS. ROTARY. COAXIAL
MICROWAVE COMPONENTS
MOUNTS. ANTENNA. FIXED
OSCILLATORS. AT AND RF.
SEE GENERATORS
PAPER. CHART AND GRAPH
RADOMES PAPER. CHART AND GRAPH RADOMES RECEIVERS. HF RECORDERS. PAPER. LOGGING AND GRAPHIC WAVEGUIDE AND ASSOCIATED COMPONENTS

H. H. SCOTT. INC.

AMPLIFIER. AF.
GENERAL PURPOSE
AMPLIFIER. AF. MONAURAL
AMPLIFIER. AF. STEREO
AMPLIFIER. BRIDGING
AMALYZERS. NOISE
GENERATORS. FM. STEREO
GENERATORS. FM. STEREO
GENERATORS. FM. SUBCARRIER
GENERATORS. FM. SUBCARRIER
GENERATORS. FM. SUBCARRIER
GENERATORS. FM. SUBCARRIER
GENERATORS. SIGNAL.
SPECIAL EFFECT. NOISE
METERS. DB AND VU. WIDE RANGE
PREAMPLIFIERS. AUOIO
RECEIVERS. FM
RECEIVERS. FM.
RECEIVERS. MULTIPLEX
SCULLY RECORDING INSTRIMENTS

RECEIVERS, MULTIPLEX

SCULLY RECORDING INSTRUMENTS

AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF, STEREO
AUTOMATION EQUIPMENT
EDITORS, AUDIO TAPE
HEADS, DISC RECORDING
HEADS, ERASE, MAGNETIC
LATHE, DISC RECORDING
PREAMPLIFIERS, AUDIO
RECORDERS, MAGNETIC TAPE,
AUDIO AUD 10

SELA ELECTRONICS CO.

SETCHELL CARLSON. INC.
AMPLIFIER. AF. STERED
CABINETS. WOOD
INDUSTRIAL TV
MONITORS. VIDEO
RECEIVERS. AM
RECEIVERS. FM
RECEIVERS. TV. COLOR
RECEIVERS. TV. MONOCHROME
SPEAKERS
TV SYSTEMS. CLOSED CIRCUIT

IV SYSTEMS, CLOSED CIRCUIT SHURE BROTHERS
ARMS. TONE
CARTRIDGES. MAGNETIC TAPE
CARTRIDGES. PHONO
MICROPHONE HARDWARE
MICROPHONE STANOS & BOOMS
MICROPHONES. DYNAMIC
MIXERS - ALSO SEE CONSOLES
PREAMPLIFIERS. AUDIO
STYLI. PLAYBACK

SIGMA INDUSTRIES
BLOWERS AND FANS
CABLE, CATV. HARDWARE
CATV EQUIPMENT - ALSO SEE
OTHER CATEGORIES
CATV. CABLE TERMINALS
CONNECTORS. COAXIAL CABLE
HARGWARE, TUBING. PLASTIC
PRESSURIZATION EQUIPMENT.
TRANSMISSION LINE
TV SYSTEMS. CLOSED CIRCUIT

SIGMA INSTRUMENTS INC RELAYS. GENERAL PURPOSE RELAYS. LATCHING RELAYS. OVERLOAD RELAYS. PHOTOELECTRIC

RELAYS. PLUG-IN RELAYS. POWER RELAYS. SEQUENCING RELAYS. TELEPHONE RELAYS, SEQUENCING
RELAYS, TELEPHONE
THE SINGER CO - METRICS DIV
AMMETERS, AC
AMMETERS, AC
AMMETERS, AC
AMMETERS, DC
AMMETERS, DC
AMMETERS, DS
ANALYZERS, DISTORTION
ANALYZERS, HISTORTION
ANALYZERS, INTERMODULATION
ANALYZERS, NOISE
ANALYZERS, NOISE
ANALYZERS, SIDEBAND
ANALYZERS, VIDEO
ATTENUATORS, FIXED
ATTENUATORS, FIXED
ATTENUATORS, FIXED
DIVIDERS, OSCILLOSCOPE
CONVENTERS
DIVIDERS, VOLTAGE
DOLLIES, TEST EQUIPMENT
GENERATORS, SIGNAL, AF
METERS, FIELD STRENGTH
METERS, FREQUENCY
METERS, POWER
METERS, POWER
METERS, POWER
METERS, POWER
METERS, POWER
METERS, POWER
MONITORS, WICEO
MONITORS, WICEO
MONITORS, WICEO
MONITORS, METER
TURNITABLES, PHONOGRAPH
VOLTMETERS, AC
SHUNTS, METER
TURNITABLES, PHONOGRAPH
VOLTMETERS, AC
VOLTMETERS, AC
VOLTMETERS, DC
WATTMETERS

SINGER PRODUCTS CO.

ACOUSTIC MATERIALS
AOAPTERS. FM STEREO
ALARM. FAULT
ALARM. SIGNAL ALARM, SIGNAL

AMPLIFIER, AF, COMPRESSING

AMPLIFIER, AF,

PEAK LIMITING, FM

AMPLIFIER, AF,

PEAK LIMITING, FM

AMPLIFIER, AF,

REWERBERATION

AMPLIFIER, BRIDGING

AMPLIFIER, B AMPLIFIER. RF. POWER
ANTENNAS. AM
ANTENNAS. FM
ANTENNAS. MICROWAVE
ANTENNAS. MOBILE
ANTENNAS. TV
ARMS. TONE
ATTENUATORS. RF
AUTOMATION EQUIPMENT
BACKGROUND MUSIC SERVICE
BALUNS BACKGROUND MUSIC SERVICE
BALUNS
BASE STATIONS
BATTERIES. LICAE ACID
BATTERIES. NICKEL CADMIUM
BLOWERS AND FAMS
CABINETS. STORAGE.
MAGNETIC TAPE
CABLE. ASSEMBLIES
CABLE. COAXIAL. RIGID
CABLE. SHIELDED. AUDIO
CAPACITORS. FIXED. CERAMIC
CAPACITORS. FIXED. CAPACITORS. FIXED. CERAMIC
CAPACITORS. FIXED. CERAMIC
CAPACITORS. FIXED. ELECTROLYTIC
CAPACITORS. FIXED. MICA
CAPACITORS. FIXED. MICA
CAPACITORS. FIXED. MICA
CAPACITORS. FIXED. DAPER
CAPACITORS. FIXED. PAPER
CAPACITORS. WARIABLE
CARTRIDGES. MAGNETIC TAPE
CORTOR TO PROVIDE TO THE CONTROL TO PROVIDE TO THE COMMUNICATIONS SYSTEMS.
LAND MOBILE
COMMUNICATIONS SYSTEMS.
MULTIPLEX
COMMUNICATIONS SYSTEMS.
TELEPRINTER
CONNECTORS. COAXIAL CABLE
CONSOLE. AUDIO. FM
CONSOLE. AUDIO. TV
CONSOLE. AUDIO. TV
CONSOLE. CABINETS
AND MARDWARE
CORDS. DIAL
CORDS. DIAL
CORDS. DIAL
CORDS. PATCH AND MARDWARE

CORDS. DIAL

CORDS. PATCH

CORDS. PATCH

CORDS. SET

CORES. TRANSFORMER AND COIL

COUPLERS

DELAY DEVICES. AF

DEMAGNETIZERS. BULK TAPE

EARPHONES. HEADPHONES

EXCITERS. FM

FACSIMILE EQUIPMENT

FUSES

GENERATORS. FM. SUBCARRIER

HARDWARE. TOOLS

HEADS. DISC RECORDING

HEADS. ERASE. MAGNETIC

HEADS. FRASE. MAGNETIC

HEADS. FRASE. MAGNETIC

HOLDERS. FUSE

INVERTERS. DC TO AC. INVERTERS. DC TO AC.
SOLID STATE
JACKS
KNOBS
LAMPS. PANEL
LATHE. DISC RECORDING
MICROPHONES. CONDENSER
MICROPHONES. CONDENSER
MICROPHONES. CONDENSER
MICROPHONES. DYNAMIC
MICROPHONES. DYNAMIC
MICROPHONES. WIRELESS
MICROWAVE SYSTEMS. STL
MIXERS - ALSO SEE CONSOLES
MOBILE EQUIPMENT
MONITORS. FM SYSTEMS. MONO
MONITORS. FM SYSTEMS. STEREO
MONITORS. FROUDENCY
NAROW-BAND FM EQUIPMENT
METWORKS. PHOSING
POTENTIOMETERS. CARBON
POTENTIOMETERS. CARBON
POTENTIOMETERS. WIREWOUND
PRINTERS. TELETYPE
PROJECTORS. FILM
PROJECTORS. FLIM
PROJECTORS. FLIM
PROJECTORS. FLIM
RECEIVERS. FM
RECEIVERS. MA
RECEIVERS. FM
RECEIVERS. SCA
RECOROS. BLANK. ACCETATE.
FOR RECORDING
RECORDING
RECORDING
RECORDING
RECORDING
RECORDING
RECORDING
RESISTORS. FIXED. WIREWOUND
RESISTORS. FIXED. WIREWOUND DEMICUMDUCTORS. TRANSISTOR GENERAL SOLDER SOUND SYSTEMS, PORTABLE SPEAKER COMPONENTS SPEAKERS STL EQUIPMENT STYLI. CUTTING SWITCHES. COAXIAL SWITCHES. ROTARY SWITCHES. SLIDE SWITCHES. SNAP SWITCHES. TORGLE TAPE DECKS. MAGNETIC TAPE DUPLICATORS TAPE, MAGNETIC RECORDING, AUDIO TERMINAL BLOCKS TAPE DUPLICATORS
TAPE, MAGNETIC RECORDING,
AUDIO
TERMINAL BLOCKS
TERMINAL BLOCKS
TERMINALS, BLOCKS
TERMINALS, SOLDER
TERMINALS, SOLDER
TERMINALS, SOLDER
TERMINALS, SOLDERLESS
TESTERS, BATTERY
TESTERS, BATTERY
TESTERS, INSULATION
TOOLS, PLIERS
TOOLS, SCREWDRIVERS
TOOLS, SOLDERING IRONS, GUN
TOOLS, SOLDERING IRONS, GUN
TOOLS, SOLDERING IRONS,
INDUSTRIAL
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, TM
TOWERS, ANTENNA,
TRANSMITTIRG, TM
TOWERS, ANTENNA,
TRANSMITTERS, AM, 25 M
TRANSMITTERS, THANSMITTERS, AM, 25 M
TRANSMITTERS, AM, 5 M
TRANSMITTERS, AM, 5 M
TRANSMITTERS, AM, 5 M
TRANSMITTERS, FM, 1D WATTS
TRANSMITTERS, FM, 20 W
TRANSMITTERS,

SITCO ANTENNA COMPANY ANTENNAS, CATV ANTENNAS, FM ANTENNAS, TV, MASTER-COMMUNITY

HOLDERS. FUSE

SOLA ELECTRIC

BALLASTS. LAMP
POWER SUPPLIES. AC
POWER SUPPLIES. DC
POWER SUPPLIES. PRECISION
REGULATORS. CURRENT
REGULATORS. VOLTAGE
TRANSFORMERS. AUTO
TRANSFORMERS. FILAMENT
TRANSFORMERS. GEMERAL
TRANSFORMERS. PLATE
TRANSFORMERS. POWER

SOLITRON DEVICES
CAPACITORS, VARIABLE
CIRCUITS, PRINTED
HEAT SINKS
MICROWAVE COMPONENTS
RECTIFIERS - ALSO SEE SEMICONDUCTORS & VACUUM TUBES
SEMICONDUCTOR DIODES
SEMICONDUCTOR RECTIFIERS,
GENERAL
SEMICONDUCTOR RECTIFIERS,
HIGH VOLTAGE
SEMICONDUCTOR RECTIFIERS,
POWER POWER SEMICONDUCTORS. TRANSISTORS. AF SEMICONDUCTORS. TRANSISTORS. GENERAL SEMICONDUCTORS.
TRANSISTORS. RF
TESTERS. SEMICONDUCTOR

TESTERS, SEMICONDUCTOR

SONY CORPORATION OF AMERICA
AMPLIFIER, AF, STEREO
ARMS, TONE
CAMERAS, TV, MONOCHROME
CAMERAS, TV, MONOCHROME
CANTRIDGES, PHONO
CONSOLE, VIDEO, PORTABLE
CONSOLE, VIDEO, STUDIO
HEADS, REASE, MAGNETIC
HEADS, RECORDING, MAGNETIC
INDUSTRIAL TV
INVERTERS, DC TO AC,
VIBRATORS
MICROPHOMES, CONDENSER
MICROPHOMES, WIRELESS
MONITORS, WIDEO
MONITORS, WIDEO
MONITORS, WAVEFORM
PREAMPLIFIERS, AUDIO
RECCEIVERS, TM
RECEIVERS, TW, MONOCHROME
RECORDERS, MAGNETIC TAPE,
AUDIO
RECORDERS, MAGNETIC TAPE,
VIDEO
RELS, TAPE
SOUND SYSTEMS, PORTABLE
SPEAKERS
TAPE, MAGNETIC RECORDING, SPEAKER COMPONENTS
SPEAKERS
TAPE, MAGNETIC RECORDING,
VIDEO
TURNTABLES, PHONOGRAPH
TV SYSTEMS, CLOSED CIRCUIT

SORENSON OPERATION
POWER SUPPLIES. AC
POWER SUPPLIES. DC

SOUNDCRAFT INDUSTRIES
AMPLIFIER. AF.
GENERAL PURPOSE
AMPLIFIER. BRIDGING
ATTENUATORS. AUDIO
MIXERS - ALSO SEE CONSOLES
OSCILLATORS. AF AND RF.
SEE GENERATORS
POWER SUPPLIES. DC
PREAMPLIFIERS. AUDIO

THE SOUNDSCRIBER CORPORATION
DEMAGNETIZERS. BULK TAPE
RECORDERS. MAGNETIC TAPE.
AUDIO
RECORDERS. MAGNETIC TAPE.
LOGGING

SOUTH SHORE RADIO-TELEPHONE COMMUNICATIONS SYSTEMS, LAND MOBILE

CAND MOBILE

SOUTHWESTERN COMMUNICATIONS

AMPLIFIER. AF.
GENERAL PURPOSE

AMPLIFIER. AF.
PEAK LIMITING. AM
AMPLIFIER. AF.
PEAK LIMITING. FA

AMPLIFIER. AF. REMOTE

AMPLIFIER. AF. REVERBERATION

AMPLIFIER. AF. STEREO

AMPLIFIER. BRIDGING

ATTENUATORS. FIXED

ATTENUATORS.
IMPEDAMEE MATCHING IMPEDANCE MATCHING BACKGROUND MUSIC SERVICE CABLE. ASSEMBLIES COMMUNICATIONS SYSTEMS. COMMUNICATIONS SYSTEMS,
INTERCOM, WIRED
COMMUNICATIONS SYSTEMS,
INTERCOM, WIRELESS
COMSOLE, AUDIO, FM
COMSOLE, AUDIO, FM
COMSOLE, AUDIO, FM
COMSOLE, AUDIO, TO
COMSOLE, AUDIO, TO
COMSOLE, AUDIO, AM
EQUALIZERS, AUDIO EMPMASIS
JACK PANEL ASSEMBLIES
LATHE, DISC RECORDING
MAINTEMANCE SERVICES, AM

MAINTENANCE SERVICES, FM
MIXERS - ALSO SEE CONSOLES
MONITORS, AM SYSTEMS
MONITORS, FM SYSTEMS, MONO
NETWORKS, FM SYSTEMS, MONO
NETWORKS, PHASING
OSCILLATORS, AM
OSCILLATORS, FM
PANELS, INSTRUMENT,
FOR RACK MOUNTING
POWER SUPPLIES, DC
PREAMPLIFIERS, AUDIO
REMOTE CONTROL SYSTEMS
SOUND SYSTEMS, OUTDOOR
SOUND SYSTEMS, PORTABLE
SWITCHERS SWITCHERS.

SPARTA ELECTRONIC CORPORATION
CABINETS. STORAGE,
MAGNETIC TAPE, CARTRIDGE
CARTRIDGES, MAGNETIC TAPE
CARTRIDGES, PHOND
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PECORDING
CONSOLE, AUDIO, RECORDING
CONSOLE, AUDIO, RECORDING
CONSOLE, AUDIO, RECORDING
AND HARDWARE COMSOLE, ADDINGTS
AND HARDWARE
EMAGNETIZERS, BULK TAPE
DEMAGNETIZERS, BULK TAPE
DEMAGNETIZERS, HEAD
MEADS, RECORDING, MAGNETIC
MICROPHONES, DYNAMIC
MICROPHONES, DYNAMIC
MICROPHONES, WIRELESS
MIKERS - ALSO SEE COMSOLES
PREAMPLIFIERS, AUDIO
RECORDERS, MAGNETIC TAPE,
AUDIO CARTRIDGE
SPLICERS, MAGNETIC TAPE
AND FILM
TAPE, MAGNETIC TAPE
AND FILM
TAPE, MAGNETIC RECORDING,
AUDIO, CARTRIDGE
TURNTABLES, PHONOGRAPH

SPEEDY-Q ENTERPRISES
RECORDS. SOUND EFFECT

RECORDS, SOUND EFFECT

SPENCER-KENNEDY LABORATORIES
ALARM, FAULT
AMPLIFIER, BRIDGING
AMPLIFIER, CATY
AMPLIFIER, DISTRIBUTION
CABINETS, METAL
CABLE, CATY, MARDWARE
CABLE, CATY, HARDWARE
CATOLOGUIPHENT - ALSO SEE
OTHER CATEGORIES
CATY, CHANNEL AMPLIFIERS
CATY, CHANNEL AMPLIFIERS
CATY, HEAD-END EQUIPMENT
CONNECTORS, COAXIAL CABLE
GEMERATORS, SIGNAL, PULSE
HEAD-END EQUIPMENT,
SEE CATY MEAD-END EQUIPMENT
SEE CATY MEAD-END EQUIPMENT
STEMS, CLOSED CIRCUIT
STACO, INC.

POWER SUPPLIES. AC POWER SUPPLIES. DC REGULATORS. VOLTAGE TAPE DECKS. MAGNETIC TRANSFORMERS. AUDIO. TRANSFORMERS, AUDIO.
1SOLATION
TRANSFORMERS, AUDIO.
PARMERS, AUDIO.
TRANSFORMERS, AUTO
TRANSFORMERS, AUTO
TRANSFORMERS, FILAMENT
TRANSFORMERS, GENERAL
TRANSFORMERS, POWER
TRANSFORMERS, POWER
TRANSFORMERS, TRANSISTOR
TRANSFORMERS, VARIABLE

TRANSFORMENS, VARIABLE

STAINLESS, INC.
ANTERNAS, AM
ANTERNAS, AM
ANTERNAS, TV.
MASTER-COMMUNITY
COMMUNICATIONS SYSTEMS.
MICROWAVE
REFLECTORS. PASSIVE
TOWERS, ANTERNA.
CATV. HEAD-END
TOWERS, ANTERNA.
TRANSMITTING, AM
TOWERS, ANTERNA.
TRANSMITTING, FM
TOWERS, ANTERNA.
TRANSMITTING, FM
TOWERS, ANTERNA.
TRANSMITTING, FM
TOWERS, ANTERNA.
TRANSMITTING, TV

STANCIL-HOFFMAN CORPORATION
AMPLIFIER: AF. COMPRESSING
AMPLIFIER: AF.
GENERAL PURPOSE
AMPLIFIER: AF. MONAURAL
AMPLIFIER: AF. MONAURAL
AMPLIFIER: AF. MONEY
AMPLIFIER: BRIDGING
PREAMPLIFIERS: AUDIO
RECORDERS: FILM: MAGNETIC
RECORDERS: MAGNETIC TAPE:
AUDIO
RECORDERS: MAGNETIC TAPE:
LOGGING
REELS: FILM
TAPE DECKS: MAGNETIC

STANDARO ELECTRONICS CORP AMPLIFIER. RF. GENERAL PURPOSE AMPLIFIER. TV. VIOEO BALUMS
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, TV
CONSOLE, VIDED, STUDIO

COUPLERS
TOEMODULATORS
DIPLEXERS
DIVIDERS, POWER
DUMMY LOAD
EXCITERS, FM
FILTERS, GTHER
FILTERS, OTHER
GENERATORS, FOWSTEREO
MAINTEMANCE SERVICES, FM
MAINTEMANCE SERVICES, TW
METERS, STANDING WAVE
MODULATORS, TV
NARROW-BAND FM EQUIPMENT
OSCILLATORS, FM
OSCILLATORS, FW
TRANGUITERS, FW, 250 WATTS
TRANSHITTERS, FW, 250 WATTS
TRANSHITTERS, FW, 250 WATTS
TRANSHITTERS, FW, 20 KW
TRANSMITTERS, FW, 20 KW
TRANSMITTERS, TW, 50 WATTS
TRANSMITTERS, TW, 50 KW
TRANSMITTERS, TV, 50 KW
TRANSMITTERS, TV, 55 KW
TRANSMITTERS, TV, 70 KW
TRA

STANDARD KOLLSMAN INDUSTRIES
CONVERTERS

STANDARD RECORD MFG. CO. REELS. TAPE

STEPHENS ELECTRONICS
AMPLIFIER, AF, AGC
AMPLIFIER, AF, COMPRESSING
AMPLIFIER, AF,
GENERAL PURPOSE AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF, REMOTE
AMPLIFIER, AF, REMOTE
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, STEREO
AMPLIFIER, AF, STEREO
AMPLIFIER, BRIDGING
AMPLIFIER, BRIDGING
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, FM
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO TO
CONSOLE, AUDIO GEORATION
CONSOLE, AUDIO TO
CONSOLE, AUDIO GEORATION
CONSOLE, AUDIO TO
CONSOLE, AUDIO CONSOLE, AUDIO
CONSOLE, AUDIO CONSOLE, AUDIO
CONSOLE, AUDIO CONSOLE, AUDIO
CONSOLE, AUDIO GENERATORS, SIGNAL, AF
NETWORKS, MATCHING, AUDIO
POWER SUPPLIES, AUDIO
RECORDERS, MAGNETIC TAPE,
AUDIO AUDIO
RELAYS. PHOTOELECTRIC
RELAYS. PHOTOELECTRIC
REVERBERATION DEVICES
SWITCHES. ILLUMINATED
SWITCHING SYSTEMS

S+ STERLING CO+ AUTOMATION EQUIPMENT CALIBRATION SERVICE+ FREQUENCY CALIBRATION SERVICE+ CALIBRATION SERVICE.
INSTRUMENT
COMPUTER EQUIPMENT
COMPUTER SERVICES
COMSOLE. AUDIO. TV
COMSOLE. VIDEO. STUDIO
INDUSTRIAL TV
JACK PAREL ASSEMBLIES
SWITCHING SYSTEMS
TV SYSTEMS. CLOSED CIRCUIT

STRUTHERS-DUNN
RELAYS. COAXIAL
RELAYS. GENERAL PURPOSE
RELAYS. LATCHING
RELAYS. OVERLOAD
RELAYS. PLUG-IN
RELAYS. POMER
RELAYS. SEQUENCING
RELAYS. SEQUENCING
RELAYS. STEPPING
RELAYS. TIME DELAY

MATTHEW STUART & CO. RECORDERS. MAGNETIC TAPE. AUDID

SUPERIOR CABLE CORPORATION
CABLE, ARMORED
CABLE, ASSEMBLIES
CABLE, CATY, HARDWARE
CABLE, COAXIAL, FLEXIBLE
CABLE, COAXIAL, RIGID
CABLE, DIRECT-BURIAL
CABLE, SHIELDED, AUDIO
CABLE, TELEPHONE
CATY, CABLE TERMINALS
CLAMPS, CABLE CLAMPS. CABLE
CONNECTORS. COAXIAL CABLE
CONNECTORS. RF
WIRE. INSULATEO, HOOKUP

SWAGER TOWER CORPORATION ANTERNÁS: AM' FLASHERS: TOWER MAINTENANCE SERVICES: STEEPLEJACK TOWERS. ANTENNA. CATV. HEAD-ENO

TOWERS, ANTENNA, RECEIVING TOWERS, ANTENNA, TRANSMITTING, AM TOWERS, ANTENNA, TRANSMITTING, FM TOWERS, ANTENNA, TRANSMITTING, TV WHRE, BARE, COPPER STRAP

WIRE, BARE, COPPER STRAP

SWITCHCRAFT: INC.
ADAPTERS, CONNECTOR
CONNECTORS, AF & MICROPHONE
SWITCHES, PHONE
SWITCHES, ILLUMINATED
SWITCHES, MULTICONTACT
SWITCHES, MULTICONTACT
SWITCHES, MULTICONTACT
SWITCHES, MULTICONTACT
SWITCHES, MULTICONTACT
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UTILITY PRODUCTS CO CATY, CABLE TERMINALS TERMINAL BOARDS

UTILITY TOWER CO
CATV EQUIPMENT — ALSD SEE
DTHER CATEGORIES
INSULATORS. TOWER BASE
MAINTENANCE SERVICES.
STEEPLEJACK
PREFABRICATED BUILDINGS
REFLECTORS. PASSIVE
TOWERS. ANTENNA.
CATV. HEAD—END
TOWERS. ANTENNA.
TRANSMITTING. AM
TOWERS. ANTENNA.
TRANSMITTING. FM
TOWERS. ANTENNA.
TRANSMITTING. TM
TOWERS. BARE. COPPER
WIRE. BARE. COPPER

DRAFTING EQUIPMENT

VEGA ELECTRONICS CORP

AMPLIFIER, AF, COMPRESSING
MICROPHONES, CONDENSER
MICROPHONES, WIRELESS
RECEIVERS, FM

VENT-RAK INCORPORATED
CABINETS METAL
CONSOLE CABINETS
AND HARDWARE
HARDWARE, CHASSIS
LAMP ASSEMBLIES
PANELS, INSTRUMENT,
FOR RACK MOUNTING
REELS, CABLE AUTOMATIC
SLIDES CHASSIS

VIDEON CORPORATION

AMPLIFIER, DC

AMPLIFIER, DC

AMPLIFIER, DC

AMPLIFIER, TV, VIDED

ANALYZERS, VIDEO

DIVIORS, FREQUENCY

GEMERATORS, SIGNAL, DDT BAR

GEMERATORS, SIGNAL, DDT BAR

GEMERATORS, SIGNAL, PULSE

GEMERATORS, SIGNAL, PULSE

GEMERATORS, SIGNAL,

SPECIAL EFFECT

GEMERATORS, SIGNAL,

SOUARE WAVE

GEMERATORS, SIGNAL,

TV SYNCHRONIZING

GEMERATORS, SIGNAL,

TV SYNCHRONIZING

GEMERATORS, SIGNAL,

TV STOCHRONIZING

GEMERATORS, SIGNAL,

TV STOCHRONIZING

SOCILLATORS, TV

PDWER SUPPLIES, DC

POWER SUPPLIES, PRECISION

PREAMPLIFIERS, VIDEO

SWITCHERS SWITCHING SYSTEMS

VIKING OF MINNEAPDLIS

AMPLIFIER, AF, MONAURAL

AMPLIFIER, AF, STEREO

CARTRIDGES, MAGNETIC TAPE

RECORDERS, MAGNETIC TAPE,

RECORDERS, MAGNETIC TAPE, AUDIO AUDIO, CARTRIDGE RECORDERS, MAGNETIC TAPE, TAPE DECKS, MAGNETIC TAPE DUPLICATORS

VISHAY RESISTOR PRODUCTS
RESISTORS, FIXED,
NONINDUCTIVE
RESISTORS, FIXED, PRECISION

VISUAL ELECTRONICS CORP AMPLIFIER, AF, AGC AMPLIFIER, AF, COMPRESSING AMPLIFIER, AF, AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF,
PEAK LIMITING, AM
AMPLIFIER, AF,
PEAK LIMITING, AM
AMPLIFIER, AF,
PEAK LIMITING, FM
AMPLIFIER, AF,
PEAK LIMITING, FM
AMPLIFIER, AF, REWOTE
AMPLIFIER, AF, REVERBERATION
AMPLIFIER, DISTRIBUTION
AMPLIFIER, VIVIOED
CAMTENNAS, AM
ANTENNAS, AM
ANTENNAS, AM
ANTENNAS, MICROWAVE
ANTENNAS, FILA
CABLE, COAXIAL, FIEXIBLE
CABLE, COAXIAL, FIEXIBLE
CABLE, COAXIAL, FIEXIBLE
CAMERA, FILM, CINE
CAMERAS, FILM, CINE
CAMERAS, TVV, MONOCHROME
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, FLORDING
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, TV
CONSOLE, AUDIO, TV
CONSOLE, VIDEO, STUDIO
DIPLEXERS
DOLLIES, CAMERA
DROPOUT COMPENSATOR,
VIOEO TAPE
EDITORS, VIDEO TAPE
EXCITERS, FM
GENERATORS, SIGNAL, COLOR BAR
GENERATORS, SIGNAL, COLOR BAR
GENERATORS, SIGNAL, ODT BAR
GENERATORS, SIGNAL, SPECIAL EFFECT
GENERATORS, SIGNAL, TV
SYNCHRONIZING
GENERATORS, SIGNAL,
VY SYNCHRONIZING
GENERATORS,

MICROPHONES, WIRELESS
MICROWAVE SYSTEMS, STL
MONITORS, AM SYSTEMS, MONITORS, FM SYSTEMS, MONO
MONITORS, FM SYSTEMS, SCA
MONITORS, FM SYSTEMS, STERED
MONITORS, FREQUENCY
MONITORS, PHASE
MONITORS, VIOED
MONITORS, VIOED
MONITORS, WAVEFORM
PROJECTORS, FILM
PROJECTORS, FILM
PROJECTORS, SLIDE
RECORDERS, MAGNETIC TAPE,
AUDIO AUDIO
RECORDERS, MAGNETIC TAPE,
VIDEO
RELAYS, CDAXIAL
REMOTE CONTROL SYSTEMS
REVERBERATION DEVICES
SCREENS, PROJECTION, FRONT
SCREENS, PROJECTION, FRONT
SCREENS, PROJECTION, FRONT
SCREENS, PROJECTION, FRONT
SWITCHERS
SWITCHING SYSTEMS
TAPE DECKS, MAGNETIC
TAPE DUPLICATORS
TOWERS, ANTENNA,
TRANSMITTING, AM
TOWERS, ANTENNA,
TRANSMITTING, FM
TOWERS, ANTENNA,
TRANSMITTING, TV
TRANSMISSION LINES
TRANSMITTERS, AM, 1 KW
TRANSMITTERS, AM, 1 KW
TRANSMITTERS, AM, 25 KW
TRANSMITTERS, AM, 25 KW
TRANSMITTERS, AM, 25 KW
TRANSMITTERS, AM, 25 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, FM, 3 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, FM, 20 KW
TRANSMITTERS, TM, 30 KW AUDIO RECORDERS, MAGNETIC TAPE, TRANSMITIERS, TV, 55 %
TURNTABLES, PHONOGRAPH
VACUUM TUBES, CAMERA,
IMAGE-ORTHICON
VACUUM TUBES, CAMERA,
PLUMBICON R
VACUUM TUBES, CAMERA,
VACUUM TUBES, CAMERA,
VIDICON
VESTIGIAL SIDEBAND FILTERS

VITAL INDUSTRIES

AMPLIFIER, DISTRIBUTION
AMPLIFIER, STABILIZING
AMPLIFIER, TV, VIDEO
SWITCHING SYSTEMS

VITRO ELECTRONICS
CIRCUITS, PRINTED
CONNECTORS, COAXIAL CABLE
CONNECTORS, RF
COROS, PATCH
HARDWARE, PANEL
HARDWARE, RACK INTEGRATED CIRCUITS
JACK PANEL ASSEMBLIES
JACKS
METERS, FIELD STRENGTH METERS. FIELD STRENGTH
MONITORS, AM SYSTEMS, MONO
MONITORS, FM SYSTEMS, MONO
MONITORS, PHASE
RECEIVERS, AM
RECEIVERS, FM
RECEIVERS, FF
RECEIVERS, MULTIPLEX
TERMINAL STRIPS
HERING AND CABLING SERVICES WIRING AND CABLING SERVICES

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RECORDERS. VIDEO.
FILM. KINESCOPE

WABER ELECTRONICS INC.
CABINETS, METAL CONNECTORS POWER CORDS SET

COUPLERS
DOLLIES, CAMERA
DOLLIES, TEST EQUIPMENT
DUCTS, WIRING
KITS
RACKS, MOUNTING
SWITCHES, MECHANICALLY
ACTUATED VOLTMETERS, AC

MALLACH & ASSOCIATES

CABINETS, STORAGE, DISC
CABINETS, STORAGE, FILM
CABINETS, STORAGE,
MAGNETIC TAPE
CABINETS, STORAGE, SLIDE

WARD ELECTRONIC INDUSTRIES
AMPLIFIER. AF. AGC
AMPLIFIER. AF. COMPRESSING
AMPLIFIER. AF. AMPLIFIER, AF, COMPRESSING
AMPLIFIER, AF,
GENERAL PURPOSE
AMPLIFIER, AF,
PEAK LIMITING, AM
AMPLIFIER, AF, REMOTE
AMPLIFIER, BENDGING
AMPLIFIER, BENDGING
AMPLIFIER, DILSE
AMPLIFIER, PULSE
AMPLIFIER, STABILIZING
COMSOLE, AUDIO, PERSTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, PORTABLE
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, AM
CONSOLE, AUDIO, STUDIO
DEMODULATORS
CONSOLE, VIDEO, STUDIO
DEMODULATORS
NETWORKS, PHASING
PREAMPLIFIERS, AUDIO
PREAMPLIFIERS, AUDIO
PREAMPLIFIERS, VIDEO
SWITCHING MATRIXES
SWITCHING SYSTEMS
MATERS MANUFACTURING

MATERS MANUFACTURING
ANTENNAS, MOBILE
ATTENUATORS, RF
DUMMY LOAD
FILTERS, DTHER
METERS, FREDUENCY
MOUNTS, ANTENNA, MOBILE
POTENTIOMETERS, WIREWOUND
RESISTORS, VARIABLE,
WIREWOUND SWITCHES. COAXIAL WATTMETERS

WAVEFORMS. INCORPORATED MAVEFORMS, INCORPORATED
ANALYZERS, DISTORTION
GENERATORS, SIGNAL, AF
GENERATORS, SIGNAL,
SQUARE WAVE
METERS, FREQUENCY
OSCILLATORS, AF AND RF,
SEE GENERATORS
OSCILLATORS, OTHER
TRANSMISSION TEST SETS
VOLTMETERS, AC
VDLTMETERS, ACVUM TUBE

WECKESSER COMPANY CABLE, ASSEMBLIES CLAMPS, CABLE

WESTINGHOUSE ELECTRIC CORP.
VACUUM TUBES, CAMERA, VACUUM TUBES, CAMERA,
IMAGE-ORTHICON
VACUUM TUBES, CAMERA, VIDICON
VACUUM TUBES, CATHODE RAY,
TV, COLOR
VACUUM TUBES, CATHODE RAY,
TV, MONOCHROME
VACUUM TUBES, CATHODE RAY,
TV, MONOCHROME VACUUM TUBES, RECEIVING VACUUM TUBES, TRANSMITTING

WIDE RESPONSE

REELS: TAPE

TAPE, MAGNETIC RECORDING:
AUDID

AUDID

WILKINSON ELECTRONICS, INC

AMPLIFIER, AF, AGC

AMPLIFIER, AF, MONAURAL

AMPLIFIER, AF,
PEAK LIMITING, AM

AMPLIFIER, AF,
PEAK LIMITING, FM

CONSOLE, AUDIO, FM

GENERATORS, FM, SUBCARRIER

GENERATORS, FM, SUBCARRIER

GENERATORS, FIELD STRENGTH

MONITORS, AM SYSTEMS

MONITORS, FIELD STRENGTH

MONITORS, FIELD STRENGTH

MONITORS, FIELD STRENGTH

MONITORS, FREQUENCY

RECTIFIERS - ALSO SEE

SEMICONDUCTOR RECTIFIERS,
GENERAL

SEMICONDUCTOR RECTIFIERS,
HIGH VOLTAGE

SEMICONDUCTOR RECTIFIERS,
HIGH VOLTAGE

SEMICONDUCTOR RECTIFIERS, HIGH VOLTAGE SEMICONDUCTOR RECTIFIERS. SEMICONDUCTOR RECTIFIERS POWER
TRANSMITTERS, AM. 1 KW
TRANSMITTERS, AM. 5 KW
TRANSMITTERS, FM. 1 KW
TRANSMITTERS, FM. 1 KW
TRANSMITTERS, FM. 7 KW
TRANSMITTERS, FM. 7 KW
TRANSMITTERS, FM. 7 KW
TRANSMITTERS, FM. 20 KW
TRANSMITTERS, FM. 20 KW
TRANSMITTERS, FM. 20 KW

H. WILSON CORPORATION
HARDWARE, MOUNTS LAMPS, PROJECTION
MOBILE EQUIPMENT
SCREENS, PROJECTION, REAR

XCELITE INCORPORATED
HARDWARE, TOOLS
100LS, CUTTERS
100LS, HAND
100LS, PLIERS
100LS, SCREWDRIVERS
100LS, WRENCHES

YOKOGAWA ELECTRIC WORKS

AMMETERS, AC

AMMETERS, AC, THERMOCDUPLE

AMMETERS, DC AMMETERS, DC
AMMETERS, RF
BRIDGES
METERS, DB AND VU
METERS, DB AND VU, WIDE RANGE
METERS, FIELD STRENGTH
METERS, FREQUENCY
METERS, LIGHT
METERS, PHASE ANGLE
METERS, POWER
OHMMETERS
POMER
OHMMETERS
PAGE S, INSTRIMENT. OHMMETERS
PANELS, INSTRUMENT,
FOR RACK MOUNTING
RECORDERS, PAPER,
LOGGING AND GRAPHIC
TESTERS, INSULATION
VOLTMETERS, AC
VOLTMETERS, DC
WATTMETERS

ZOLOMATICS CORPORATION LENSES, OPTICAL, FIXED LENSES, OPTICAL, ZOOM PROJECTORS, SLIDE

ZOOMAR, INC.

LENSES, OPTICAL, FIXED
LENSES, OPTICAL, ZOOM
METERS, LIGHT

Here's one way to kill a Teltron tube



Teltron image orthicons have long life characteristics. You'll grow old trying to wear them out. These tubes offer performance features surpassing the finest image orthicon's manufactured (monochrome or color applications) at a savings of 35% to 65% (computed on average hourly cost basis). Teltron tubes are guaranteed as long or longer than any competitors product, (for just about everything but smashing them with a hammer). Join the list of satisfied Teltron users. You'll agree that Teltron is the "Answer to a need".

Teltron tubes are die-hards.



7 BALA AVENUE, BALA CYNWYD, PA. 19004 Telephone 215-664-6672

When leading broadcast engineers insist on genuine EEV camera tubes, they must have good reasons.

They do. Plenty of them, in fact.

Television broadcasters the world over have come to rely almost exclusively on the unique combination of tube quality and long-life economy that only English Electric Valve — the world's foremost camera tube manufacturer --- can provide.

Typical of this foremost camera tube line are . . .

ELCON-Target Image Orthicons

- Long life 3 to 4 times longer
- Stable, non-stick target
- Uniform sensitivity and gamma throughout extended tube life
- No burn-in



ELCON Color-Matched Tubes

Matched color sets of ELCON Image Orthicon tubes are selected on the basis of camera control operating parameters, as well as tube sensitivities and signal current outputs. And, in most cases, the need for trimming with neutral density filters is completely eliminated . . . orbiting is not required . . . and sensitivity is improved.

| _ | |
|----|----|
| Tv | 20 |
| ., | μc |

Description

3" tube-field mesh; matched 4415E/ 4416E set of three tubes.



ELCON 3" Image Orthicon

Non-field mesh and field mesh tubes with effective operational life of 3,000 to 5,000 hours. Full target warranty of 1,200 hours.

| Type | Description |
|---------|------------------------|
| 5820A/E | 3" tube—non-field mesh |
| 7293B | 3" tube—field mesh |

3" tube-field mesh; with close 8093A/E target-to-mesh spacing



ELCON 41/2" Image Orthicon

ELCON Target - JEDEC-designated; 3,000-5,000/hour operational life; 1,200/hour tar-

| get war | ranty. | |
|---------|-------------|--|
| Type | Description | |

7295C 41/2" tube - field mesh. 7389C 41/2"tube - field mesh; with close mesh-to-target spacing.

1-inch Vidicons



1-inch Vidicons, Integral Mesh

| _ | |
|-------|---|
| Type | Description |
| P860 | Utilizes new photosurface (similar to 8625, 8626) for high sensitivity, minimum lag; film or studio applications; monochrome or color |
| 7038 | Monochrome or color film camera applications; 600 ma filament |
| 7735A | For studio and remote cameras; high sensitivity; 600 ma filament |

1-inch Vidicons, Separate Mesh

| Highest quality mal shading | pictures | with | mini- |
|-----------------------------|----------|------|-------|
|-----------------------------|----------|------|-------|

- Low lag; reduced long-term sticking.
- Lower light level operation
- Photo-surface of 8625 and 8626 vidicons combine high "blue" sen-sitivity and reduced "red" sensi-tivity for correct panchromatic response to standard tungsten lighting
- Resolution exceeds 1,000 lines
- Beam landing errors minimized for improved signal output

| Descri | ntion | |
|--------|-------|--|

Type

8625 High sensitivity photosurface; preferred spectral response of 7038 type, 600 ma filament

Equivalent to 8625, with 95 ma 8626 filament for transistorized cameras

8507 Low lag, high sensitivity characteristics; 600 ma filament

Equivalent to 8507, with 95 ma 8541 filament for transistorized cameras 8572

Low lag characteristics for film application, monochrome or color; 600 ma filament

the \mathbf{Blue} Ribbon Line

Other tubes available for specific applications. World-wide patents applied for.

For complete information and prices on the Blue Ribbon quality EEV camera tube line, contact

VISUAL ELECTRONICS CORPORATION

356 west 40th street • new york, n.y. 10018 • (212) 736-5840

FIRST BY ANY STANDARD



A new way to keep your signal clean.

CBS Laboratories presents its new Model 600 Wide Range Program Monitor.

This remarkable instrument can't censor "blue" comics, but it can keep you from transmitting cross-talk, studio noise and other sounds that may clutter your signal.

In fact, it's the first monitor to combine the latest developments in audio technology with the reliability of solid-state design for accurate audio measurement and analysis on a single 60 dB-wide scale.

Where the standard Volume Indicator measures only the top 23 dB of signal level logarithmically, this new Program Monitor displays information from +3 to -57 dB on a single linear, decibei scale, thus permitting accurate reading of low level audio material as well as line noise during program pauses. The 0 dB reference settings are adjustable from +18 to -22 dBm.

The 600 is also equipped with a separate DC output for graphic logging over the full 60 dB range or to drive a second meter for remote monitoring. It is also available in a standard 19-inch mounting rack from which it can be easily removed for portable use.

While not intended as a replacement for the standard Volume Indicator, the 600's meter ballistics are such that its readings are compatible with VU indications. It's a practical studio monitor as well as a valuable measuring tool.

SPECIFICATIONS:

Model 600 Wide Range Program Monitor, \$345. As shown above, without standard 19-inch mounting enclosure, \$305.

Reference Deflection (O dB) Internal Noise Level

Total Measurable Range

Scale DC Output

Linearity
Input Impedance
Maximum Operating
Temperature
Dimensions

Frequency Range

Power Requirements Shipping Weight Adjustable from +18 to -22 dBm

At least 15 dB below the -57 dB reading

—79 to +21 dBm

Linear 60 dB-wide scale from -57 to +3 dB Linear volts dB output is 6 volts maximum at 5500 ohms impedance. Calibrated to provide

remote monitoring 50 to 15,000 cps

 $\pm~1~\text{dB}$ 15,000 onms, bridging, balanced or unbalanced

In enclosure: 19" wide, 7" high, 10" deep Out of enclosure: 9" wide, 5" high, 10" deep

12 watts, 115/230 volts AC With enclosure: 14 lbs. Without enclosure: 9 lbs.

Technical series Professional Test records

Unique, high-precisior tools designed to help audio and quality control engineers and test and service technicians to evaluate audio components, equipment and systems.

Each record has a complete series of tests. These eliminate the need for certain equipment, save hours of time, and make the record a productive tool in the laboratory, on the production line, and in field testing.

BTR 150 BROADCAST TEST RECORD Developed especially to meet needs of broadcast engineers seeking a convenient signal source for testing and adjusting all audio equipment. It contains Volume Indicator ballistic calibration signals and is an essential tool for measuring phonographic pickup response. In providing complex waveforms for special tests, it replaces elaborate instrumentation generally unavailable in broadcast stations. Can be used to advantage by all AM, FM, TV and FM-Stereo broadcasters. BTR 150, Net Ea. \$10.00



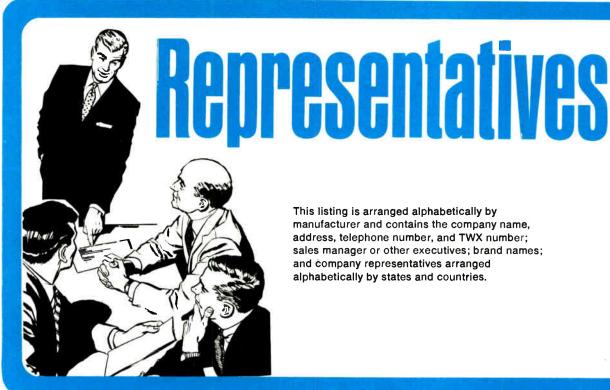
STR 130 RIAA FREQUENCY RESPONSE TEST RECORD

Designed for calibration of professional recording equipment and for testing response of professional and consumer record reproduction equipment. Rapid, accurate procedures replace lengthy and tedious adjustments. Time for production testing and quality control is reduced to a fraction of time required with conventional methods. Suitable for use with automatic curve tracer to provide permanent, visible records for precise evaluation. Instruction for use without automatic curve tracing included. STR 130, Net Ea. \$10.00

STR 100 STEREOPHONIC FREQUENCY TEST RECORD

Designed for evaluation of pickups and systems, it was recorded with a constant amplitude characteristic below 500 cps and a constant velocity characteristic above 500 cps. Tests include: Sweep Frequency (with the sweep rate synchronized with the General Radio Type 1521 A Recorder); Spct Frequency (with voice announcements); Channel Separation; Wavelength Loss and Stylus Wear (to pinpoint oversize or worn-out styli, and excessive pickup tracking force); Compliance; Phasing; Vertical and Lateral Tracking Tone Arm Resonance (to check system performance at low and sub-audible frequencies and thus reveal undamped resonances which may cause equipment over-loading). STR 100, Net Ea. \$8.50





This listing is arranged alphabetically by manufacturer and contains the company name, address, telephone number, and TWX number; sales manager or other executives; brand names; and company representatives arranged alphabetically by states and countries.

ACME FILM 6 VIDEGTAPE

LABORATORIES
GENERAL MANAGER
MEL SAWELSON
COMPANY ADDRESS
1161 NORTH HIGHLAND AVE
LOS ANGELES, CÆLIF. 90038
COMPANY REPRESENTATIVES
BOB TROUP, VP EASTERN SALES
400 MADISON AVENUE
MEW YORK, N. Y.
212 421-3400

ACME VISIBLE RECORDS. INC. SALES MANAGER J. B. HINCH BRAND NAMES FLEXOLINE ELECTROFILE ORDA-FLO VERI-VISIBLE CENTRAC ASTROMATIC VERI-VISIBLE
CENTRAC
ASTRDMATIC
SUPER-VISIBLE
COMPANY ADDRESS
CROZET: VIRGINEA 22932
COMPANY REPRESENTATIVES
W. B. SHEA. R. MGR.
1111 CRENSHAW BLUD.
LOS ANGELES. CALIF. 90019
213-933-8595
B. E. SMITH. R. MGR.
675 CALIFORNIA STREET
SAN FRANCISCO. CALIF. 94108
415-761-5253
R. B. EVANS. R. MGR.
934 BANK OF GEORGIA BLDG.
ATLANTA. GA. 30303
404-521-0195
R. O. SHEALOR. R. MGR.
405 PARK AVENUE
NEW YORK. N.Y. 10022
212-PL9-3330
W. H. BRENT. R. MGR.
3121 EUCLID AVENUE
CLEVELAND. OMIO 44115
216-881-6660
D. D. SAGGESE. R. MGR.
BARCLAY BLDG.
BALA-CYNMYD. PA. 19004
219-TE9-6020
R. E. WEBB
REGIONAL MANAGER
7701 STEMMONS FREEWAY STE 131
DALLAS. TEXAS 75247
214-ME7-1330
REPS. IN OTHER COUNTRIES
R. B. MCARDELL, SALES MGR.
ACME SEELEY BUSINESS
SYSTEMS LTD.
32 MENDOTA ROAD
1000101 18 ONTARIO
416 259-8435 ADC PRODUCTS
SALES MANAGER
W. J. MOLMBECK
COMPANY ADDRESS
6405 CAMBRIDGE STREET
MINNEAPOLIS. MINN 55426
COMPANY REPRESENTATIVES
ADC SOUTHWESTERN SALES OFFICE
99 EAST MAGNOLIA BLVD.
SUITE 301
BURBANK, CALIFORNIA 91502
213-849-5821
ALLEN I. WILLIAMS COMPANY YO LAST WAGNOLIA BLVDSUITE 301
BURBANK. CALIFORNIA 91502
213-849-5821
ALLEN I. WILLIAMS COMPANY
4971 JACKSON STREET
DENVER, COLORADO 80222
303-388-4391
CES ASSOCIATES
P.O. BOX 1152
MELBOURNE, FLORIDA 32902
305-AL4-2103
JAY C. ANGEL 6 COMPANY
2743 PETERSON AVE. WEST
CMICAGO, ILLINOIS
312 UP 8-0653
V. J. HUNTOON 6 ASSOCIATES
908 BELMONT AVENUE
SPRINGFIELD, 8 MASS
413-ST8-8516
V. J. HUNTOON 6 ASSOCIATES
272 CENTRE STREET
NEWTON, MASS. 02158
617-244-2278
R. G. RAGON, INC.
1136 WEST LARPENTEUR AVENUE
ST. PAUL. MINNESOTA 55113
612-488-6653
R. R. BURTON SALES CO., INC.
7946 TROOST AVENUE, RM. 20
P.O. BOX 5324
KANSAS CITY, MISSOURI 64131
816 JA 3-7865
R. R. BURTON SALES CO., INC.
SUITE 201. WOODSON PARK BLDG
2050 WOODSON ROAD
57. LOUIS. MISSOURI 63114
314-JA6-2226
ALEN I. WILLIAMS COMPANY
3221 SILVER AVENUE, SE
ALBUQUEROUE, NEW MEXICO 87106
505-AL5-9632
R. A. INCORPORATED
330 GREAT NECK ROAD
SOMESTER. NEW YORK 11021
516-MUZ-9320
T. FERGUSON SALES. INC.
228 WINTON ROAD NORTH
P.O. BOX 3893
ROCHESTER. NEW YORK 14610
716-482-7757
J. F. WULFETANGE DIVISION
P.O. BOX 293
314 EAST GENESEE STREET
DEWITT. NEW YORK 13214

315-446-3330 K. O. BROWN & COMPANY P.O. BOX 1791 GREENSBORO. N.C. 27402 919-BR3-5973 GRENSBORO, N.C. 27402
919-BR3-5973
JAMES W. MURRAY & ASSOCIATES
P.O. BOX 11028
BEL RUE CREST CENTER
CINCINNATI. OHIO 45211
513-MO2-1616
C. A. ROBINSON COMPANY. INC.
P.O. BOX 51
4225 MAYFIELD ROAD
CLEVELAND. OHIO 44121
216-EV1-9049
T. J. RAY & COMPANY
P.O. BOX 5417
TULSA. OKLAHOMA 74104
918-NA7-1515
DANCO CORPORATION
GERMANTOWN PIKE AND
QUARRY HALL ROAD
FAIRVIEW VILLAGE. PA.
215-BR5-2600
JOHN A. GREEN COMPANY
TOLLAS. TEXAS 75247
214 ME 1-7450
JOHN A. GREEN COMPANY
P.O. BOX 66506
ROOM 110. 3400 MONTROSE
HOUSTON. TEXAS 77006
T13-JA6-2959
ALLEN I. WILLIAMS COMPANY
2461 SOUTH MAIN STREET 713-JA6-2959
ALLEN I, WILLIAMS COMPANY
2461 SOUTH MAIN STREET
SALT LAKE CITY, UTAM 84115
801-466-8709
JON 8. JOLLY
69 MARION STREET
SEATTLE, WASHINGTON 98104
MA3-7060 MA3-7060
REPS. IN OTHER COUNTRIES
WILLER ENGINEERING & SALES CO
1800 AVENUE ROAD
TORONTO 12. ONTARIO
416-783-3373

ADVANCE INDUSTRIES
SALES MANAGER
G. S. CHESEN
COMPANY ADDRESS
705 DOUGLAS ST.
SIOUX CITY. IOWA 51101
712-252-4475

AEROVOX CORP.
SALES MAMAGER
MATT SIMON
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AEROGLAZE
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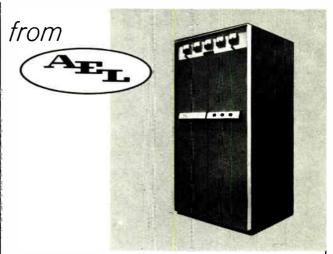
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TUSE DIVISION
JOHN MESSERSCHMITT
SENICOMOUCTOR DIVISION
ED MEAGHER
COMPANY AOORESS
TUBE DIVISION
HICKSVILLE, N. Y. 11802
SEMICOMDUCTOR DIVISION
SLATERSVILLE, N. Y. 11802
SEMICOMDUCTOR DIVISION
SLATERSVILLE, N. Y. 1280
COMPANY REPRESENTATIVES
A. B. ANDREWS
1308 S. 28TH ST. APT. 206
81RMINGHAM, ALABAMA
205-251-4540
AMPEREX ELECTRONIC CORP.
801 E. CMARLESTON ROAD
PALO ALTO. CALIF. 94303
415 327 0461
W. J. BARRON COMPANY
1406 S. GRANO AVENUE
LOS ANGELES. CALIF. 90015
213 748 6191
SHEPHARO WINTERS STERN. INC.
4109 BURBANK BLVD.
BURBANK. CALIF. 91505
213 849 6671
TWX 910 498 2208
R. W. THOMPSON ASSOCIATES
4135 EL CAMINO WAY
PALO ALTO. CALIF.
415 321 6383
TWX 415 192 9308
R. W. THOMPSON ASSOCIATES
17071 VENTURA BLVD.
ENCINO. CALIF. 91316
213-783-4480
WILLIAM J. PURDY AGENTS
312 SEVENTH STREET
SAN FRANCISCO. CALIF. 94103
A15-UN 3-3300
WILLIAM J. PURDY AGENTS
6527 WESTBROOK DRIVE
CITRUS HEIGHTS. CALIF. 95610
916-725-4065
MEL PEARSON 6 COMPANY
1860 SO. ACOMA STREET
OENVER. COLO. 80223
303-77-7078 6 777-8646
GERBER SALES COMPANY. INC.
PO. BOX 2917. 31 BROADWAY
NEW HAVEN. CONN. 06515
203-597-6279
VECTOR SALES
662 BRIDGEPORT AVE.
MILFORD. CONN. AMPEREX ELECTRONIC CORP. POUL DOX ZY17. 31 BROADWAY
NEW HAVEN. CONN. 06515
203-SP7-6279
VECTOR SALES
62 BRIDGEPORT AVE.
MILFORO. CONN.
203-TRA-2112
MECHTRONICS SALES. INC.
7600 GEORGE AVE. NW RM. 208
WASHINGTON. D.C. 20012
202-291-6004
A. B. ANDREWS
BOX 124. ROUTE 5
ORLANDO. FLORIDA
305-PA3-8333
MILLAR HUTTO ASSOC.. INC.
P.O. BOX 1603
WINTER PARK. FLA. 32790
305-MI 7-7407
HILLAR HUTTO ASSOC.. INC.
P.O. BOX 7116. STATION C.
1036 PEACHTREE STREET N.E.
ATLANTA. GA. 30309
AO4-876-0919 OR 872-6212
AMPEREX ELECTRONIC CORP.
360 EAST NORTH AVENUE
MORTHLAKE. ILL. 60164
312-562-1060. 61
DWIGHT SMITH ASSOCIATES. INC.
32 S. RIVER STREET
AURORA. ILL. 60504
312-TW 6-0028
THOMAS 6 SUKUP. INC.
2060 E. 54TH STREET
INDIANAPOLIS. IND. 46220
317-CL 1-4574-5
TWX 317-633-8075
TATURIGHT 6 BEAM
1812 BULLARD AVE.
METAIRIE. LA.
504-887-0482
BROTHERS 6 CONNEEN ASSOCIATES 504-887-0402
BROTHERS & CONNEEN ASSOCIATES
6302 LINCOLN AVENUE
BALTIMORE. MD. 21209
301-764-7189
BROTHERS & CONNEEN ASSOCIATES
1808 GLEN RIDGE ROAD
BALTIMORE 34. MO.
301-764-7189
MECHTRONICS SALES. INC.
1123 MEADOWLARK DRIVE
BALTIMORE. MD.
301-222-6123
SCIENTIFIC SYSTEMS SALES CORP
8138 15TH AVENUE
HYATTSVILLE. MO. 20783
301-445-1130
GERBER SALES COMPANY. INC. GERBER SALES COMPANY. INC. 176 SECOND AVENUE WALTHAM. MASS. 02154 617-891-8040 GERBER SALES COMPANY. INC. P.O. BOX 447. 26 MAPLE COURT E. LONGMEADOW. MASS. 01028 413-LA 5-3059

VECTOR SALES
774 PLEASANT STREET
BELMONT. MASS. 02178
617-489-1400
JACK M. THORPE CO.
640 HIDDEN LANE
OETROIT. MICH. 48236
313-884-4360
AMPEREX ELECTRONIC CORP.
8053 BLOOMINGTON FREEMAY
MINNEAPOLIS. MINN. 55420
612-888-4681
CLARK R. GIBB CO. 612-888-4681
CLARK R. GIBB CO.
2400 HENNEPIN AVE.
MINNEAPOLIS. MINN. 55405
612-377-1200
TWX 612-321-1460
OIPRO. INC.
P.O. BOX 1427
ANTYLANO MEIGHTS. MO. 63042
314-632-3444
R. W. FARRIS CO. IMC.
1715 BALTIMORE AVE.
KANSAS CITY. MO. 64108
816-MA 1-1757
TWX 314-872-896
BROTHERS G CONNEEN ASSOCIATES
813 FORDHAM STREET
RIVERSIDE. N.J.
215-KI 3-8641
MICHAEL PAGE 6 ASSOCIATES
209 SAN PABLO. S.E.
ALBUQUERQUE. N.M. 87108
505-265-8526
KAHGAN SALES CORPORATION
1261 BROADWAY
NEW YORK. N.Y. 10001
212-MU 4-7772-3-4-5-6-7
TWX 710-581-2729
PASTON-HUNTER CO. INC.
3307 ERIE BLVO. E
P. O. BOX 129
DEWITT STATION
SYRACUSE. N. Y. 13214
315-646-2180
R. W. MITSCHER CO., INC.
496 ELLICOTT SO. BLDG.
BUFFALD. NEW YORK 14203
716-854-2517
TWX 716-856-1144
R. W. MITSCHER CO., INC.
496 ELLICOTT SO. BLDG.
8UFFALD. NEW YORK 14203
716-854-2517
TWX 716-856-1144
R. W. MITSCHER CO., INC.
496 ELLICOTT SO. BLDG.
8UFFALD. NEW YORK 14203
716-854-2517
TWX 716-856-1144
R. W. MITSCHER CO., INC.
496 ELLICOTT SO. BLDG.
8UFFALD. NEW YORK 14203
716-858-1321
SCIENTIFIC SYSTEMS SALES CORP
376 GREAT NECK. L. I. N.Y.
316 466-0763
TWX 516 466-0762
R. W. MITSCHER CO., INC.
606 FOREST ORIVE
N. SYRACUSE. N. Y.
315 458-1321
SCIENTIFIC SYSTEMS SALES CORP
376 GREAT NECK ROAD
GREAT NECK. L. I. N.Y.
316 466-0763
TWX 516 466-0762
R. W. MITSCHER CO., INC.
606 FOREST ORIVE
N. SYRACUSE. N.Y.
315 456-13976
R. W. MITSCHER CO., INC.
607 FOREST ORIVE
LIVERPOOL. NEW YORK
315-646-5976
R. W. MITSCHER CO., INC.
6022 ARBOR WAY
CHARLOTTE. N.C. 28211
704-EM 6-2061
MULLIGAN FATHARER. INC.
3623 JACKSOMWALD AVE.
READING. FATHARER. INC.
3623 JACKSOMWALD AVE.
READING. PA. 19606
215-779-2610
PARAGON SALES COMPANY
111 SOUTH PAND. PANE. 19103
215-10-37-7060
ROAL 17315
717-272-4071
BEIL & WHITAKER. INC.
3623 JACKSOMWALD AVE.
READING. PA. 19606
215-779-2610
PARAGON SALES COMPANY
111 SOUTH PAND. PANE. 19103
215-10-37-7060
ROAL 17315
717-272-4071
BEIL & WHITAKER. INC.
3623 JACKSOMWALD AVE.
READING. PA. 19606
215-779-2610
PARAGON SALES.
000HA ASSOCIATES
177 MEADOWS BLOG.
00LLAS. FEAS. 79201
214-10-

AUSTIN TEXAS 78756
512-452-9503
LUND 6 COMPANY
P.O. BOX 36256
HOUSTON TEXAS 77036
713-523-6736
MICHAEL PAGE & ASSOCIATES
BRANIFF BLOG. SUITE 435
EXCHANGE PARK
DALLAS TEXAS 75235
214-351-4795
MEL PEARSON & COMPANY
288 CANYON ROAD
SALT CITY UTAH 84103
801-364-7524 AMPEX CORPORATION
UP GEN MGR MARKETING DIVISION
ROBERT R. OWEN
SALES MANAGER
THOMAS W. HARLEMAN
BRAND NAMES BRAND NAMES
AMPEX
MARCONI
COMPANY ADDRESS
401 BROADWAY
REOWOOD CITY* CALIF 94063
415 367-2011
COMPANY REPRESENTATIVES
DISTRICT OFFICE
3222 S MEMORIAL PARKWAY
HOLIDAY OFF CTR. SUITE 27
HUNTSVILLE, ALA 39801
205 881 4271
TWX 205 533-2820
A A SROKA
MESTERN AREA MKTG MGR
8467 BEVERLY BLVO
LOS ANGELES, CALIF 90048
213 0L 3 1610
TWX 213 655-6535
K THOMPSON
SAN FRANCISCO REG MGR
2220 BAY ROAD
REDWOOD CITY* CALIF 94063
415 367 3861
TWX 415 364-9034
W BRUSS
LOS ANGELES REG MGR.
COMMERCIAL 6 GOV. PRODUCTS
8467 BEVERLY BLVO
LOS ANGELES REG MGR.
COMMERCIAL 6 GOV. PRODUCTS
8467 BEVERLY BLVO
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COMMERCIAL 6 GOV. PRODUCTS
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BLVO
LOS ANGELES REG MGR
8467 BE AMPEX MARCONI G SUDDUTH ATLANTA REG MGR 3376 PEACHTREE RD N E ATLANTA. GA 404 231 3480 TWX 404 231-1637 L HASE CHICAGO REG MGR 10 KING ST TWM 404 231-1637
L HASE
CHICAGO REG MGR
10 KING ST
ELK GROVE VILLAGE, ILL 60007
312 439 4600
TWM 910 222-2864
N. SCHMIDT
BOSTON REG. MGR.
235 BEAR HILL RO.
WALTHAM. MASS. 02154
617 899-2040
TWM 710 324-0364
E MENDT
MINNEAPOLIS REG MGR
4010 W 65TH ST
MINNEAPOLIS REG MGR
4010 W 65TH ST
MINNEAPOLIS REG MGR
4010 W 65TH ST
MINNEAPOLIS REG MGR
612 WA 7 5638
TMM 910 576-2806
WILLIAM SLOVER
EASTERN AREA MKTG MGR
75 COMMERCE WAY
MACKENSACK. N J 07661
201 489 7400
TWM 201 488-6715
R SERNE
ALBUQUERQUE REG MGR
75 COMMERCE WAY
MACKENSACK. N J 07661
201 489 7400
TMM 201 488-6715
R BEENE
ALBUQUERQUE REG MGR
14 SAN MATEO BLVD. NE
ALBUQUERQUE REG MGR
14 SAN MATEO BLVD. NE
ALBUQUERQUE REG MGR
33 W IST ST. SUITE 338
DAYTON. OHIO 45402
513 BA 8 5117
TWM 810 459-1714
G SULLIVAN
PHILADELPHIA REG MGR
947 YORK ROAD
ABINGTON. PA 19001
215 TU 7 7650

TWX 215 884-2822
W MEYWOOD
DALLAS REG MGR
2626 W MOCKINGBIRD LANE
SUITE 290
DALLAS. TEXAS 75235
214 FL 7 0481
TWX 214 899-9001
DISTRICT OFFICE
6001 GULF FREEWAY. ST C-134
MOUSTON. TEXAS 77023
713 WA 8 3741
TWX 713 571-1494
W CRAIG
WASHINGTON. O C REG MGR
3620 S 27TH ST
ARLINGTON. VA 22206
703 671 4000
TWX 710 955-9832
J HOPKINS
SEATTLE REG MGR
8434 RAINIER AVE
S SEATTLE. WASH 98118
206 PA 3 3170
TWX 206 998-9014 AMPHENOL OISTRIBUTOR DIVISION
SALES MANAGER

W. T. ADAMS
COMPANY ADDRESS
2875 SOUTH 25TH AVE.
BROAOVIEW. ILL. 60153
COMPANY REPRESENTATIVES
DON DE BASIO
401 EAST INDIAN SCHOOL ROAD
SUITE 209
PHOENIX. ARIZONA
602-264-9397-98
RICHARO COLT
17000 VENTURA. SUITE 306
ENCINO. CALIF.
213-788-8560
JAMES V. CLARIZIO
01STRICT SALES OFFICE
1826 INDUSTRIAL WAY. SUITE 8
REDWOOD CITY. CALIF.
415-369-2981
RALPH MOFFKE
DISTRICT SALES OFFICE
709 W. LITTLETON BLVD..
SUITE 200A
LITTLETON. COLO.
303-794-4269
EDMUND LEHMANN
DISTRICT SALES OFFICE
601 N. NEW YORK AVENUE. N.W.
WASHINGTON. D.C.
272-829-9000
CMARLES W. KUCERA
01STRICT SALES OFFICE
601 N. NEW YORK AVENUE.
SUITE 5
WINTER PARK. FLORIDA
305-647-5504
DISTRICT SALES OFFICE
3224 PEACHTREE RD.. N.E.
ATLANTA. GEORGIA
404-233-1369
EARL ASSOCIATES
P.O. BOX 2845: 1638 KONA ST.
HONOLUU. HAMMII
808-996-953
JOHN N. KOYS
2801 S. 25TH AVENUE
BROADVIEW. ILLINOIS
312-261-2000
LESLIE M. DEVOE CO.
4010 WASHINGTON BLVD.
INDIAMAPOLIS. INDIAMA
317-283-1395
RICHARD PURINTON. INC.
11 MUZZY STRET
LEXINGTON 73. MASS.
617-862-8300
ALLEN P. NEMET2
DISTRICT SALES OFFICE
960 E. MAPLE RO.. SUITE 116
BIRMINGHAM. MICHIGAN
313-646-1262
ROGER JENNE
7701 NORMANDALE ROAD
MINNEAPOLIS. MINNA.
612-927-6589
JOSEPH B. SVENLA
DISTRICT SALES OFFICE
940 E. MAPLE RO.. SUITE 116
BIRMINGHAM. MICHIGAN
313-646-1262
ROGER JENNE
7701 NORMANDALE ROAD
MINNEAPOLIS. MINNA.
612-927-6589
JOSEPH B. SVENLA
DISTRICT SALES OFFICE
940 E. MAPLE RO.. SUITE 116
BIRMINGHAM. MICHIGAN
313-646-1262
ROGER JENNE
7701 NORMANDALE ROAD
MINNEAPOLIS. MINNA.
612-927-6589
JOSEPH B. SVENLA
DISTRICT SALES OFFICE
940 E. MAPLE RO.. SUITE 116
BIRMINGHAM. MICHIGAN
313-646-1262
ROGER JENNE
7701 NORMANDALE ROAD
MINNEAPOLIS. MINNA.
612-927-6589
JOSEPH B. SVENLA
DISTRICT SALES OFFICE
2 LAGRANGE AVENUE
POUGHKEEPSIE. M. Y.
914-65-830
ON THE SALES OFFICE
2 LAGRANGE AVENUE
POUGHKEEPSIE. M. Y.
914-65-830
ON THE SALES OFFICE
2 LAGRANGE AVENUE
DUGHKEEPSIE. M. Y.
914-65-830
ON THE SALES OFFICE
2 LAGRANGE AVENUE
DUGHKEEPSIE. M. Y.
914-65-830-990
ONDAD B. SMITH
ONDAD B.

AMPERITE COMPANY
SALES MANAGER
T. WHALEN
COMPANY ADDRESS
600 PALISADE AVE.
UNION CITY. NEW JERSEY 07087

DISTRICT SALES DFFICE 811 S. CENTRAL EXPRESSWAY. SUITE 295 RICHARDSON. TEXAS B11 S. CENTRAL EXPRESSWAY.
SUITE 295
RICHARDSON. TEXAS
214-235-8318
DONALD C. PERCELL
DISTRICT SALES DFICE
14444 SUNSET HIGHWAY 6 CD
P D 8DX 726
BELLEVUE. WASHINGTON
206 746-5363
REPS. IN DIHER COUNTRIES
DAI ICHI DENSHI KDGYD. KK#20.
3 CHDME. YDYDGI. SHIBUYA-KU
TOKYD. JAPAN
UMD - USINE METALLURGIQUE
DOLDISE. S.A.
17 AVENUE NIEL 75
PARIS. FRANCE
UMD - USINE METALLURGIQUE
DOLDISE. S.A.
92 A98 AVENUE DE GRAY 39
DDLE. FRANCE
AMPHENDL-BDRG ELECTRONICSGMBM
80 24 DEISENHDFEN
8EI MUNICH. W. GERMANY
AMPHENDL LIMITED. THAMET WAY
WHITSTABLE. KENT. ENGLAND
AMPHENDL CANADA LIMITED
44 METROPOLITIAN ROAD
SCARBORDUGH. ONT.
AMPHENDL CANADA LIMITED
42 AYLMER AVENUE
DITIAMA. DNITARID
AMPHENDL CANADA LIMITED
42 AYLMER AVENUE
DITAMA. DNITARID
AMPHENDL CANADA LIMITED
43285 CAVENDISH BLVD. RM 160
MONTREAL. GUEBEC
AMPHENDL S.A.DE C.V.
CALLE DE PUENTE NO. 6
MEXICO 22. D.F.. MEXICO
UMPLIFIER CORP DF AMERICA
SALES MANAGER

AMPLIFIER CORP OF AMERICA SALES MANAGER SALES MANAGER

A. J. GILLETTE
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MAGNERASER
MAGNERASER JR
MAGNEMATIC PROJECTOR
COMPANY ADDRESS
75 FROST STREET
WESTBURY. L. I.. N. Y. 11590
SALES REPRESENTATIVES
ARTRONICS
650 CLEVELAND. AVE
RIVER VALE. N. J.

AMPLIVISION CORPORATION SALES MANAGER SALES MANAGER
GEORGE BROWNSTEIN
BRAND NAMES
AMPLI-VISION
BENCD
GILBER GILBER
SDNY
COMPANY ADDRESS
2000 STDNER
LOS ANGELES. CALIF. 90025
GR 8-7751
COMPANY REPRESENTATIVES WM LASKY WN LASKY
2000 STONER
LOS ANGELES, CALIF, 90025
GR 8-7751
LEANORD COMEN
C/O AMPLIVISION
PARAMOUNT BLDG SUITE 1300
1501 BRDADWAY
NEW YORK, NEW YORK
BR 9-8700

ANACONDA ASTRODATA CO VP SALES & MKTG A. L. GINTY MKTG MGR. CATV MKTG MGR. CATV
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SALES MGR CATV SYSTEMS
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MGR. DISTRIBUTION SALES, CATV
P. LAZANICH
BRAND NAMES SNAND MAMES
XDR
COMPANY ADDRESS
1430 SOUTH ANAHEIM BLVD.
P. D. BOX 3772
ANAHEIM. CALIF. 92803
714-635-0150
COMPANY REPRESENTATIVES COMPANY REPRESENTATIVES
C R MANN
SALES MGR WESTERN REGION
1419 BONNIE DOONE TERRACE
CORONA DEL MAR. CALIF
714 675 1015
R. O. DOYLE
SALES MGR S. E. REGION
400 PINETREE STREET
FOREST PARK. GA.
404-366-7576
P. KJOS
SALES MGR CENTRAL REGION
RED NO. 3
FDRT DOOGE, 10WA
515-576-1313
C. C. MOODY 513-576-1313 C. C. MOODY SALES MGR. N. CENTRAL REGION 13008 STEBENS ROAD BURNSVILLE, MINN 612 890-2017 D. WATERS SALES MGR. N. E. REGION P. D. ADY 629 SALES MGR. N. E. REGION
P. D. BDX 629
THOUSAND ISLAND PARK. N. Y.
315 482-9396
L. FELTS
SALES MGR. S. CENTRAL REGION
7839 CLAREMONT DRIVE

DALLAS. TEXAS

ANCHA FLECTRONICS INC
PRESIDENT
ROBERT F. ANCHA
COMPANY ADDRESS
7011 WEST HIGGINS AVE.
CHICAGO, ILL. 60656

KEITH ANDERSON CD SALES MANAGER KEITH ANDERSON COMPANY ADDRESS P. 0. 80X 18 BLACK HAWK. S. DAKDTA 57718 CDMPANY REPRESENTATIVES JUAN M. DATIZ BDX 532 GUAYAMA. PHERESON BDX 592
GUAYAMA. PUERTD RICD
REPS. IN DTHER CDUNTRIES
JOHN NANCE
SKEENA BROADCASTERS
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TERRACE. B. C.
L. D. STEWART
WESTERN TELDNICS
110 BAYS WATER ROAD
RUSHCUTTERS BAY
N. S. WAS AUSTRALIA N. S. W. AUSTRALIA 31 64 34

31 64 34

ANDREW CORPORATION
SALES MANAGER
ROBERT C. BICKEL
BRAND NAMES
HELIAX
HUBLOC
UNIPOLE
COMPANY ADDRESS
P.O. BOX 807
CHICAGO, ILL. 60642
COMPANY REPRESENTATIVES
ANDREW CALIFORNIA CORPORATION
941 E. MARYLIND
CLAREMONT. CALIF.
714-626-3505
ANDREW CALIFDRNIA CORPORATION
701 WELCH ROAD
PALD ALTO. CALIF.
415-323-3139
ANDREW CORPORATION TO I WELCH ROAD
PALD ALTO, CALIF.
415-323-3139
ANDREW CORPORATION
P.O. BOX 5897
WASHINGTON, D.C.
202-654-7540
ANDREW INTERNATIONAL CDRP.
P.O. BOX 787
CHICAGO, ILL.
312-349-3300
ANDREW CORPORATION
P.O. BOX 416
RIDGEWOOD. N.J.
201-445-2500
ANDREW CORPORATION
P.O. BOX 30506
DALLAS, TEXAS
214-235-1279
REPS. IN DIHER COUNTRIES
ANDREW ANTENNA SYSTEMS
LOCHGELLY, FIFE. G.B.
LOCHGELLY, FIFE. G.B.
LOCHGELLY, FIFE.
COUNTAINS TOWN STREET
COOUTTAINS NEW WESTMINSTER.
BRITISH COLUMBIA
604-936-6421
ANDREW ANTENNA COMPANY, LTD.
P.D. BOX 177
WHITDY, ONTARIO
416-668-3348
ANDREW ANTENNA COMPANY, LTD.
P.D. BOX 177
WHITDY, ONTARIO
416-668-3348
ANDREW ANTENNA COMPANY, LTD.
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WHITDY, ONTARIO
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WHITDY, ONTARIO
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ANDREW ANTENNA COMPANY, LTD.
P.LITE ROCK AVENUE

416-668-3348
ANDREW ANTENNA COMPANY, LTD.
35 LITTLE ROCK AVENUE
POINTE CLAIRE
LACHINE, GUEBEC
514 695-5365
ANDREW ANTENNAS PTY», LTD.
437 ST KILDA RD. MELBDURNE
VICTORIA, AUSTRALIA
26-2824 ANSONIA WIRE & CABLE CO SALES MANAGER DDN W. HOFFMAN BRAND NAMES BRAND NAMES ANKOSEAL ANKOBOND COMPANY ADDRESS 111 MARTIN STREET ASHTON, R. I. D2864 401-724-6400

ANTENNA PRODUCTS COMPANY
DIVISION DF ALL PRODUCTS CD
SALES MANAGER DIVISION OF ALL PRODUCTS CD
SALES MANAGER
GRAY W MAVENER
COMPANY ADDRESS
P.O. BOX 520
MINERAL WELLS. TEXAS 76067
COMPANY REPRESENTATIVES
WALTER A. LAUKAITIS
618 ELLSWORTH DR.
SILVER SPRING. MD.
301 JU 5-9931
ASSDCIATED ELECTRONICS. INC.
119 THE GREAT RD.
BEDFORD. MASS.
617 275-9020
TELESCO INTERNATIONAL CORP.
171 MADISON AVENUE
NEW YORK. N.Y.
212 MU 3-9420
M. J. FEIN 6 CO.
MARWDOD BLDG.
SCARSDALE. N.Y.
914 GR 2-110C
EAC ASSDCIATES
53-11 90TH STREET
ELMHURST. N.Y. 11373
212 DE 5-0606 ELMHURST. N.Y. 11373 212 DE 5-0606

API INSTRUMENTS CO

SALES MANAGER
ROBERT H. PUGSLEY
COMPANY ADDRESS
7100 WILSON MILLS RDAD
CHESTERLAND, DHID 44026
216 423-3131
CDMPANY REPRESENTATIVES
API INSTRUMENTS CD
175 W WIEUCA RD N E
ATLANTA. GA
404 252-276
API INSTRUMENTS CD
1008 E NDRTHWEST HMY
MT PRDSPECT, ILL 60057
312 392-5770
THUNDERBIRD ENG CO
4014 A WEST 95TH ST
PRAIRIE VILLAGE, KANSAS
913 642-7220
THUNDERBIRD ENG CD
6405 E KELLDGG
WICHITA. KANSAS
316 684-3941
SAUL COMEN
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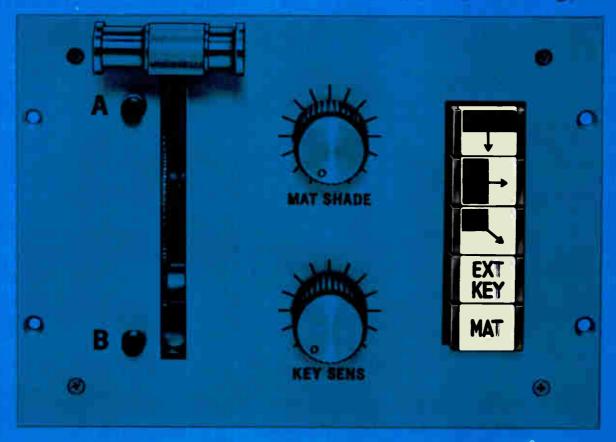
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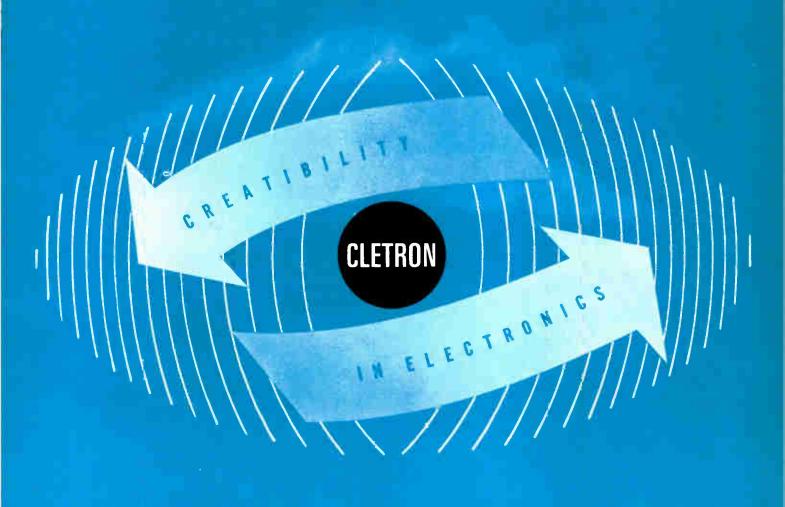
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COMPANY ADDRESS
7300 CRESCENT BLVD.
PENNSAUKEN. NEW JERSEY DB11D
COMPANY REPRESENTATIVES
W K GEIST CO
1205 A BRWAY AVENUE
GLENDALE. CALIF
213 245 9501
CRANE ASSOC CRANE ASSOC 15419 KESWICK STREET VAN NUYS+ CALIF 213 ST D 7972

REYNOLDS 6 ASSOC
PO BOX 1032
EAU GALLIE, FLORIDA
305 354 0320
KENNETH W MEYERS CO
7256 TOUHY AVENUE
CHICAGO, ILLINOIS
312 SP 4 6440
MALONE ENG ASSOC
7640 W NORTH AVENUE
ELMMOOD PARK, ILLINOIS
312 456 4031
INDUSTRIAL SALES CO
418 E BERRY STREET
FI WAYNE, INDIANA
219 742 7009
BROGER INST SALES INC
176 2ND STREET
WALTHAM, MASS
617 TW 1 8045
JAMES LEE CO
4241 TOLEDO AVENUE
MINNEAPOLIS, MINN
612 920 1525
LEEMARK ASSOC
2001 BIG BEN BLVD
ST LOUIS, MISSOURI
314 MI 5 1470
L6 M ASSOC
511 VICTOR STREET
2D1 843 87DD
FRANK TYLINSKI CO
338 NORTHERN BLVD
GREAT NECK, NEW YORK
516 466 907D
M FRIEDMAN ASSOC
7 HEATHER ROAD
BALA CYNWYD, PENNSYLVANIA
215 TE 9 3450 7 HEATHER ROAD
BALA CYNWYD. PENNSYLVANIA
215 TE 9 3450
WEISS INST
0 BARTON DRIVE
PITTSBURGH. PENNA
412 371 3020
OATRONICS INC
7800 WEST GLEN DRIVE
HDUSTON. TEXAS
713 SD 2 9851
ARVA INC
1320 PROSPECT STREET
SEATTLE. WASH
206 MA 2 0177

DATAPULSE OIVISION
OF DATAPULSE, INC.
SALES MANAGER
M. B. COX, JR.
COMPANY ADDRESS
509 HINDRY AVE.
INGLEWOOD, CALIF, 90306
213 671-4334
TWX 910 328-6109
COMPANY REPRESENTATIVES
BCS ASSOCIATES, INC
2317 BOB MALLACE AVE., S W
HUNTSVILLE, ALA. 35805
HYYRONIC MEASUREMENTS
1017 NORTH THIRD STREET
PHOENIX. ARIZONA 85004
JOHN OMALLORAN 6 ASSOCIATES
3268 ROSECRANS BLVD
SAN DIEGO, CALIF. 92110
JOHN OMALLORAN 6 ASSOCIATES
3921 E BAYSHORE BLVD
ALD ALTO, CALIF. 9210
JOHN OMALLORAN 6 ASSOCIATES
3921 E BAYSHORE BLVD
N. HOLLYMOCD, CALIF. 91604
HYTRONIC MEASUREMENTS, INC.
1295 SOUTH BANNOCK STREET
DENVER, COLORADO 80223
INSTRUMENT CONSULTANTS, INC
1295 SOUTH BANNOCK STREET
DENVER, COLORADO 80223
INSTRUMENT CONSULTANTS, INC
1295 SOUTH BANNOCK STREET
DENVER, COLORADO 80223
INSTRUMENT CONSULTANTS, INC
1296 WHITNEY AVENUE
HAMDEN, CONN. 06518
BCS ASSOCIATES, INC
3759 N HARLEM AVENUE
CHICAGO, ILLINOIS 60634
LEEMARK ASSOCIATES, INC
3759 N HARLEM AVENUE
CHICAGO, ILLINOIS 60634
LEEMARK ASSOCIATES, INC
3759 N HARLEM AVENUE
CHICAGO, ILLINOIS 60634
LEEMARK ASSOCIATES, INC
3759 N HARLEM AVENUE
CHICAGO, ILLINOIS 60634
LEEMARK ASSOCIATES, INC
3759 N HARLEM AVENUE
CHICAGO, ILLINOIS 60634
LEEMARK ASSOCIATES, INC
3759 N HARLEM AVENUE
CHICAGO, ILLINOIS 6074
BEI MBER G ASSOCIATES, INC
110 E PENNSYLVANIA AVENUE
TOWSON, MARYLAND 21204
BRIMBER G ASSOCIATES, INC
110 E PENNSYLVANIA AVENUE
SILVER SPRINGS, MD. 20910
INSTRUMENT CONSULTANTS, INC
10 AND 25
WABAN, MASS. 02168
RIDGWAY ASSOCIATES, INC
1720 MORGAN AVENUE, SOUTH
MINNEAPOLIS, MINN. 55423
LEEMARK ASSOCIATES, INC
2010 BIG BEND BLVD
ST, LOUIS, MON 63117
C CURTIS ENGEL & ASSOCIATES
210 S BROAD STREET
RIDGEWOOD, KEN JERSEY 07451
HYTRONIC MEASUREMENTS, INC
205 SAN PABLO. S E
ALBUQUERQUE, N. M. 87108
J D RYERSON ASSOCIATES, INC
1039 E WENDOVER AVENUE
GREENSBORO, N. C.
RIDGWAY ASSOCIATES, INC
1039 E WENDOVER AVENUE
CALBUQUERQUE, N. M. 87108
J D RYERSON ASSOCIATES, INC
1039 E WENDOVER AVENUE
CALBUQUERQUE, N. M. 87108
J D RYERSON ASSOCIATES, INC
1039 E WENDOVER AVENUE
CALBUQUERQUE, N. M. 87108

22811 LDRAIN ROAD FAIRVIEW PARK. OHIO 44126

RIDGWAY ASSOCIATES, INC
2400 E DOROTHY LANE
DAYTON, OHIO 45420
AIREP ELECTRONICS, INC
8119 BELLAIRE BLUD
HOUSTON, TEXAS 77036
AIREP ELECTRONICS, INC
P 0 BOX 9555
OALLAS, TEXAS 75214
HYTRONIC MEASUREMENTS, INC
2022 S MAIN STREET
SALT LAKE CITY, UTAH 84115
HARRY LEVINSON
1211 E DENNY WAY
SEATTLE, WASH, 98122
REPS, IN OTHER COUNTRIES
TOSHNIWAL BROS PRV LTO
198 JAMSHEDJI TATA ROAD
HOMBAY 1, INDIA
TAIVO SHOJI COMPANY, INC.
16, 5 CHOME, SHIBA-SHIMBASHI
MINATO-KU, TOKYO, JAPAN
BELRAM ELECTRONICS
83, AVENUE DES MIMOSAS
BRUSSELS, BELGIUM
OLTRONIX A/S
MALTEGRARDEVEJ 18
GENTOFF, DENMARK
OY FINDIP
MANNERHEIMINTIE 29, C
HELSINKI 25, FINLAND
TECHNIQUE ET PRODUITS
63, BIS RUE D AGUESSEAU
BDULGORE-S/-SEINE, FRANCE
NEUMULLER & CO CMBM
SCHRAUDOLPHYSTRASSE 2A
R MUNICH 13, WEST GERMANY
DYNAMCO INSTRUMENTS, LTD
25 SALISBURY GROVE
MYTCHETT, CAMBERLEY
SUBREY, ENGLAND
SPECIAL-IND
VIA D, MANIN 33
MILAN, ITALY
ELOFYSICA N V-AMSTERDAM
WFTERINGSCHANS 120
AMSTERDAM-C HOLLAND
OATAMATIK
GRONLANDESLEIRET 31
OSLO, NDRWAY
UNITRONICS OATAMATIK GRONLANDESLEIRET 31 OSLO: NORMAY UNITRONICS TOREE DE MADRID PISO 12-DFICINA 9 PLAZA DE ESPANA MADRID 13: SPAIN SCANTELF AB TENDDANLSGATAN 24 STOCKHOLM, SUFDEN SCANTELF AB
TENGAMILSGATAN 24
STDCKHOLM, SWEDEN
MAFRLDCHER AG
FOERRITAUCKSTRASSE 110
ZURICM BOZID, SWITZERLAND
EASTRONICS LTD
22 MAZE STREET
TEL AVIV, ISRAEL 22867
ATLAS INSTRUMENTS CORP
DIV OF ATLAS ELECTRONICS LTD
50 WINGOLD AVENUE
TORONTO, ONTARIO
ATLAS INSTRUMENTS CORP
DIV DF ATLAS ELECTRONICS LTD
342 1/2 ELGIN STREET
OTTAWA, ONTARIO
ATLAS, INSTRUMENTS CORP
333 CAVENOISM BLVD,
SUITE 390
MONTREAL, QUEBEC
SAMPLE ELECTRONICS PTY LTO
4 GROSE STREET GLEBE
SYDNEY, N.S.W., AUSTRALIA
SAMPLE ELECTRONICS PTY LTO
9/11 CREMORNE STREET
RICHMOND E. I.,
VICTORIA, AUSTRALIA

DAYTON ELECTRONIC PRODUCTS CO COMMERCIAL SALES MANAGER HANK JOSEFCZYK COMPANY ADDRESS 117 E. HELENA ST. DAYTON. OHIO 45404 513 461 4951

D & B ELECTRONICS CO SALES MANAGER SALES MANAGEN
VICTOR BRUNO
COMPANY ADDRESS
36 11 ESSEX LANE
PHILADELPHIA. PA. 19114
215-NE7-2786

215-MET-2786

DEARBORN ELECTRIC S. INC
SUBSID SPRAGUE ELECTRIC CO
MARKETING MANAGER
CHARLES T. LITTLE
COMPANY ADDRESS
P.O. BOX 530
ORLANDO. FLORIDA 32802
COMPANY REPRESENTATIVES
SPRAGUE ELECTRIC CO
3550 N CENTRAL AVENUE
PHOENIX, ARIZONA 85012
602 279 3435
MM J PURDY OF CALIF
312 7TH STREET
SAN FRANCISCO. CALIF 94103
415 863 3300
SPRAGUE ELECTRIC CO
12870 PANAMA STREET
LOS ANGELES. CALIF 90066
213 870 0161
SPRAGUE ELECTRIC CO
5670 E EVANS AVENUE
DENVER, COLO 80222
303 756 3611
SPRAGUE ELECTRIC CO
3900 WISCONSIN AVE NM 3900 WISCONSIN AVE NW

WASHINGTON, D. C. 20016
202 244 6006
W BEN WIMBERLY CO
532 S FORT HARRISON
CLEARWATER, FLORIDA 33516
813 446 7072
W BEN WIMBERLY CO
500 S OSCEOLA STREET
ORLANDO, FLORIDA 32801
305 425 3083
SPRAGUE ELECTRIC CO
5912 W MONTROSE AVENUE
CHICAGO, ILLINOIS 60634
312 685 6400
SPRAGUE ELECTRIC CO
2511 E 465TH STREET
INDIANAPOLIS, INDIANA 46205
317 546 4911
ROTHENHEBER 6 CO., INC.
14211 CHESTERFIELO ROAD
ROCKVILLE, MO 2083
301 929 3388
TOM CRAWFORD AND SON
PO BOX 264
NORMOOD, MASS 02D62
617 762 6914
SPRAGUE ELECTRIC CO
MORTH ADAMS, MASS 01248
413 664 4411
SPRAGUE ELECTRIC CD
259 COLLINGWODD
ANN ARBOR, MICH 461D3
313 761 408D
DAYTON FOR SALES
1820 FAIRFIELO ROAD S
MINNETORICA, MINN 55343
612 545 2221
SPRAGUE ELECTRIC CO
391D LINDELL BLVD
ST LOUIS MO 631D8
314 535 7239
CLARFIELD—STDLLMACK ASSDC
175 MESTWOOD AVENUE
WESTWOOD N J 07675
201 666 8989
C T CARLBERG 6 ASSOC
PD BOX 3177, STA D
ALBUGUERQUE, N M 87110
505 265 1579
JOSEPH F RIZZD CD — EXPORT
ROOM 5710
EMPIRE STATE BLDG
NEW YORK N Y 10001
212 736 0398
SPRAGUE ELECTRIC CO
298 BURKE STREET
WINSTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 722 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 725 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 725 5151
SPRAGUE ELECTRIC CO
24 N MAIN STREET
WASTON-SALEM, N.C. 27101
919 725 5151
SPRAGUE ELECTRIC CO
260 AND AND SALES
SPRAGUE ELECTRIC CO
260 AND AND SALES
SPRAGUE ELECTRIC CO
260 AND AND SALES
SPRAGUE ELECTRIC CO
26

SIA 384 1420

DELCO RADID OIV.
GENERAL MOTORS CORP.
SALES MANAGER
P A SANDBERG
COMPANY ADDRESS
700 E FIRMIN ST
KOKOMO, IND 46901
457 8461
BRANCH OFFICES
726 SANTA MONICA BLVD
SANTA MONICA. CALIF 90401
393 1465
5151 N HARLEM AVENUE
CHICAGO, ILL 60656
775 5411
57 HARPER STREET
DETROIT, MICH 48202
873 6560
324 CHESTNUT STREET
UNION, N. J 07083 324 CHESTNUT STREET UNION: N J 07083 687 3770 1054 JAMES STREET SYRACUSE: N Y 13203 474 6255

DELTA ELECTRONICS. INC. SALES MANAGER
LARRY HANCOCK
COMPANY ADDRESS
145 FAYETTE ST
WINSTON-SALEM, N.C. 27101
COMPANY REPRESENTATIVES
LONG ENGINEERING CO
961 BURKE STREET
WINSTON-SALEM, N.C. 27101
725-2306

DELTA ELECTRONICS INC SALES MANAGER ROBERT H FOLEY COMPANY ADDRESS 4206 WHEELER AVENUE

ALEXANDRIA, VA 22304
COMPANY REPRESENTATIVES
REVNOLDS & ASSOC INC
P O BOX 1043
EAU GALLIE, FLA
305 254 0520
M J FEIN & CO
HARMOOD BLOG P O BOX 28
SCARSDALE, NEW YORK
914 GR Z 1100
ROCKE INTERNATIONAL CORP
13 EAST 40TH ST
NEW YORK, NEW YORK
MU 9 0200
ASMBY ASSOCIATES INC
CLAYPOOL BLOG SUITE 155 CLAYPOOL BLOG SUITE 155 4130 LINOEN AVE OAYTON: OHIO 513 224-D561

DIV. OF DATAPULSE. INC.

SALES MANAGER
PAUL A. LIST
COMPANY ADDRESS
1313 N. LINCOLN AVE.
PASADENA. CALIF. 91103
213 681-7416
TMX 910 388-3282
COMPANY REPRESENTATIVES
WA BROWN & ASSOCIATES. INC.
1314 BUFORD STREET. N W
HUNTSVILLE. ALA. 35801
R F ASSOCIATES. INC.
1621 PONTIUS AVENUE
LOS ANGELES. CALIF. 90025
RF ASSOCIATES. INC
1621 PONTIUS AVENUE
LOS ANGELES. CALIF. 94303
KELLEY ENTERPRISES
336 E 4TH STREET
LDVELAND. COLDRADD 80537
WA BROWN & ASSOCIATES. INC
222 WEBER AVENUE
DRIANDD. FLA. 32803
WA BROWN & ASSOCIATES. INC
3039 N & 2 32ND AVENUE
FT. LAUDERDALE. FLA. 33308
RIDGWAY ASSOCIATES. INC
3039 N & E 32ND AVENUE
FT. LAUDERDALE. FLA. 33308
RIDGWAY ASSOCIATES. INC
3759 N HARLEM AVENUE
CHICAGO. ILLINOIS 60634
PENZNER ASSOCIATES. INC
3759 N HARLEM AVENUE
CHICAGO. ILLINOIS 60634
PENZNER ASSOCIATES. INC
3040 PARK, KANSAS 66204
CONNAUGHTON & COMPANY
18 BOTHMELL ROAD
BRIGHTEN. MASS. 02135
RIDGWAY ASSOCIATES. INC
7720 MORGAN AVENUE SOUTH
MINNEAPOLIS. MINNESDIA 55423
PENZNER ASSOCIATES. INC
40 NOEAN STREET
PLAINVIEW, LI. I. N.Y. 11803
JD RYERSON ASSOCIATES INC
11 COMMERCIAL STREET
PLAINVIEW, LI. I. N.Y. 11803
JD RYERSON ASSOCIATES INC
11 COMMERCIAL STREET
PLAINVIEW, LI. I. N.Y. 11803
JD RYERSON ASSOCIATES INC
11 COMMERCIAL STREET
PLAINVIEW, LI. I. N.Y. 11803
JD RYERSON ASSOCIATES INC
11 COMMERCIAL STREET
PLAINVIEW, LI. I. N.Y. 11803
JD RYERSON ASSOCIATES INC
1201 NORTHAL ASSOCIATES
107 FOREST
2400 E DOROTHY LANE
DAYTON. OHIO 45320
RIDGWAY ASSOCIATES
107 FOREST AVENUE
FORT WORTH, TEXAS 76115
MITCHELL SPEAIRS COMPANY
HOUSTON. OFFICE CENTER
NO 23. CHUNG-CHENG ROAD
TAINAN, TAIWAN
HOUSTON OFFICE CENTER
NO 23. CHUNG-CHENG ROAD
TAINAN, TAIWAN
DANI HONDASHI
173 TOKYO JAPAN
DANIEL DELGAY S A
BOUTE POSTATE 919
58A CHAUSSEE DE CHARLEROL
BOMBAY-I, INDIA
PO BOX NIHONBASHI
173 TOKYO JAPAN
DANIEL DELGAY S A
BOITE POSTATE 919
58A CHAUSSEE DE CHARLEROL
BURDAY ASSOCIATES
UND THE COUNTRIES
TOSMINIAL BROS PRV LTD
198, JAMSHEDJI TATA ROAD
BOMBAY-I, INDIA
PO BOX NIHONBASHI
173 TOKYO JAPAN
DANIEL DELGAY S A
BOITE POSTATE 919
58A CHAUSSEE DE

WESTMINISTER
LDNDDN, SWI, ENGLAND
SPECIAL-IND
VIA D MANIN 33
MILAN, ITALY
ELOFYSICA N V-AMSTERDAM
WETERINOSCHANS 120
AMSTERDAM-C. HOLLAND
TELEINSTRUMENT AB
P O BOX 14
VALLINGBY, SWEDEN
MEGEX-ZURICH CO.. LTD
BADEMERSTRASSE 588
ZURICH. SWITZERLAND
H KOCHN
P. O. BOX 1447
JERUSALEM, ISRAEL
BRH ASSOCIATES
P O BDX 214
STATION Q
TORONTO. ONTARID
BRH ASSOCIATES
6338 VICTORIA AVENUE
MONTREAL 26. QUEBEC
B W COULTER & COMPANY
BOX 4198. GPD
N S W. AUSTRALIA

PIALIGHT CORPDRATION
SALES MANAGER
H. W. GOODMAN
BRAND NAMES
DIALCO
OIALTRON
COMPANY ADDRESS
60 STEWART AVE.
BROOKLYN. NEW YORK 11237
COMPANY REPRESENTATIVES
F W MOULTROP C ASSOC
1530 E 12 STREET

DIALIGHT CORPORATION
SALES MANAGER
H. W. GOODMAN
BRAND NAMES
DIALCO
OIMALTON
COMPANY ADDRESS
60 STEWART AVE.
BROOKLYN. NEW YORK 11237
CDMPANY REPRESENTATIVES
F W MOULTHROP 6 ASSOC
1530 E 12 STREET
OAKLAND. CALIF 94606
AN 1 7676
JACK BERMAN CD
1751 S LA CIENEGA BLYD
LOS ANGELES. CALIF 99035
UP 0 4711
HYDE ELECTRONICS CO
888 S LIPAN STREET
0ENVER COLO 80223
936 3456
HILL 6 GRAY. INC
821 GARFIELD
OAK PARK. ILL 60304
ES 8 7050
CHARLES SEGEL CO
799 WASHINGTON STREET
NEWTONVILLE, MASS 02160
96 6900
RC MERCHANT 6 CO
18411 W MC NICHOLS
DETROIT. MICH 48219
535 6000
RC MERCHANT 6 CO
18411 W MC NICHOLS
DETROIT. MICH 48219
535 6000
RC MERCHANT 6 CO
136 W LARPENTEUR AVENUE
ST PAUL. MINN 55113
A88 6634
ROBERT HORNE ASSOC
235 WANAGUE AVE
POMPTON LAKES, N. J. 07442
835 7400
ARTHUR PERKINS CO
OARTHUR OHE SER PIKE
BROOMALL. PA 19008
EL 6 5300
CARTWRIGHT 6 BEAN
560 S COOPER
MEMPHIS, TENN 38104
BR 5 1914
DIAMOND ELECTRONICS
SALES MANAGER — CCTU
R M PERKES M M PERKES M M PERKES M P

MEMPHIS. TENN 38104
BR 5 1914

DIAMOND ELECTRONICS
SALES MANAGER - CCTV
R H RENKO
COMPANY ADDRESS
P O BOX 415
LANCASTER, OHIO 43130
COMPANY REPRESENTATIVES
W. E. SANDERSON 6 ASSOC.
5045 N. 12TH STREET
PHOENIX. ARIZONA 85014
277-0077
KING ENGINEERING CO. INC.
13720 VENTURA BLVD.
SUITE #416
ENCINO. CALIF. 91316
981 0161
ROSS EQUIPMENT CO.
7015 WEST 38TH AVE.
MHEAT RIDGE. COLORADO 80033
303 422-1845
EQUIPMENT SALES CO. INC.
P O BOX 6098
NEW HAVEN. COMN.
INDUSTRIAL ELECTRONICS. INC.
1389 SPRING STREET. MW
ATLANTA. GA. 30309
A04 873-5504
DELTA SALES. INC.
1407 N. ILLINOIS STREET
INDIANAPOLIS. INDIANA
504 522-8302
DELTA ASSOCIATES
2801 BROADWAY
NEW ORLEANS. LOUISIANA
594 522-8302
AMERICAN MICH.
356-1510
IMPALA. INC.
ROOM 3
47 VILLAGE SQ. SHOPPING CTR.
MAZELWOOD, MO.

314 JA 2-1600
SENECA AUGID-VISUAL
1880 HERTEL AVE.
BUFFALO. N.Y. 14214
855-5600
SOUIRES. INC.
474 YEARLING ROAD
COLUMBUS. DHIO 43213
614 237-8635
MARCO ELECTRONICS INC.
4623 FIFIEENTH STREET
PHILADELPHIA. PA. 19140
DA 4-2820
J. E. WOOD CO.
FREEDOM ROAD
MARS. PA.
412 PR 6-1800
SOUND PHOTO EQUIPMENT CO.
2107 BROADWAY
LUBBOCK. TEXAS 79401
806 PD 3-1997
TAFT BROADCASTING CD.
4801 SAN FELIPE
HOUSTON. TEXAS
TECHNO-LINK. INC.
4922 ELLENSBURG DRIVE
DALLAS. TEXAS
214 AD 9-3452
BERKNESS CONTRDL 6 EQUIPMENT
308 WEST CARY STREET
RICHMOND. VIRGINIA
703 643-2537
SEATRONICS. INC.
5931-4TH AVENUE. SOUTH
SEATILE. WASH. 98108
206 PA 5-4328
PHOTOARY VISUAL SERVICE
840-44 N. PLANKINTON AVE.
HILWAUKEE. WISC. 53203
271-2252

DIAMOND EXPANSION BOLT CD INC
DIV. OF GENERAL CABLE CORP
VP SALES
C. W. FUMRER
ASSI. SALES MGR.
R. C. NEARING
COMPANY ADDRESS
500 MORTH AVENUE
GARMOOD. NEW JERSEY 07027
COMPANY REPRESENTATIVES
E W CDURTNEY
336 RITCH STRET
SAN FRANCISCO, CALIF
A15 761 2753
J WRIGHT
2170 DE FOOR HILLS RO NW
ATLANTA. GEORGIA
404 355 9727
0 KUFFER
3002 N HARLEM AVENUE
CHICAGO
312 237 1106
L SMITH
25 WARREN STREET
MEW YORK CITY. N Y
212 BA 7 6647
R LEISINGER
2001 PREBLE AVENUE
PITTSBURGH, PA
412 322 4008
R B WILBER
106 EXPRESS STREET
DALLAS, TEXAS
214 RI 8 6145
DIECRAFT, INCORPORATED

DIECRAFT, INCORPORATED
SUBSIO OF BAUSCH & LDMB
SALES MANAGER
W. P. OCONNOR
BRAND NAMES
RAYSCAN
COMPANY ADDRESS
SPARKS, MARYLAND 21152

DISPLAY TECHNOLOGIES INC.
SUBSID TELEPRO INDUSTRIES.INC
SALES MANAGER
HERBERT NETTLETON
67 W 44TH STREET
NEW YORK. N Y
BRAND NAMES
FIDELIPAC
PORTA-TAPE
PORTA-TAPE
PORTA-TEREO
PROJECTOR
STUDENT RESPONDER
TELEPRO
TELE PROMPTER
TV BLUE
WEATHERS
COMPANY ADDRESS
CHERRY HILL. N. J. 08034

DRESSER-CRANE HOIST & TOMER DIV ONE OF THE DRESSER INDUSTRIES SALES MANAGER R. Q. SLOAD 875 MICHIGAN AVE COLUMBUS, OHIO 43215 BRAND NAMES CANDELABRA-R DRESSER COMPANY ADDRESS 2314 REDONDO BEACH BLVD GARDENA. CALIF. 90247 COMPANY REPRESENTATIVES JOHN F MC VEY. JR MGR - WESTERN DIVISION 2314 REDONDO BEACH BLVD GARDENA, CALIF 321 9850 W. ROBERT MCKINNEY J. ROGER MAYDEN J. K. GROSECLOSE 875 MICHIGAN AVE. CDLUMBUS+ OHIO 43224 614 299-2123

OUOTONE COMPANY INC SALES MANAGER STEPHEN NESTER BRAND NAMES DUTOME
OUOTAPE
OUOTAPE
OUOTAPE
DUODISC
COMPANY ADORESS
6875 S W 81ST STREET
SOUTH MIAMI, FLA, 33143
COMPANY REPRESENTATIVES
LOGAN SALES
463 BREWSTER AVENUE
REDWODD CITY, CALIF 94063
415 369-6726
ROSS SALES CO
5007 LANKERSHIM BLVD
MORTH HOLLTWOOD, CALIF
766-8109
NELSON COMPANY INC
1294 SOUTH BANNOCK
DENVER, COLORADO 80223
303 733-5528
MINFIELD ELECTRONIC SALES CD
666 N E 125TH STREET
MORTH MIAMI, FLORIDA
PL 1-5566
PAUL HAYDEN ASSDCIATES
PO BOX 331
EAST POINT, GEORGIA
404-PO6-0261
MICHAEL ZINGELL
6434 N WASHTENAW AVE
CHICAGO 45 ILL
312 BR 4-7175
CHARLES SCHEFFLER CD
1133 NAVAJO TRAIL, RR 14
HOLAMPOLIS, IND 46260 DUOTONE CHICAGO 45 ILL
312 BR 4-7175
CHARLES SCHEFFLER CD
1133 NAVAJO TRAIL RR 14
INDIANAPOLIS. IND 46260
317 CL3-6337
ALBERT N REINHERZ
59 HAMILTON RDAD
BELMONT 78. MASS.
617 484-7784
CARLEM COMPANY
1926 WELLESLEY AVE
5T. PAUL. MINN 55105
612 699-8004
KELLY-SCHMITZ-WINKELER ASSOC
7546 TROOST AVENUE
KAMSAS CITY. MISSDURI
816 EM3-5651
THE NEWHOPE CORPORATION
6 EAST 39TH STREET
NEW YORK. NEW YORK 10016
212 592-7372
MAURY FARBER ASSOCIATES
203 JACKSON BUILDING
220 DELAWARE AVENUE
BUFFALO. NEW YORK
716 TL6-3543
MELCO SALES CO INC
74 FIFTH AVENUE
NEW YORK. NEW YORK 10011
212 AL5-8850
SINGER PRODUCTS CO INC
95 BRDAD ST
NEW YORK N Y
212 MH4-8700
PERRY LOMSE 6 CO
529 RICHMOND RO
CLEVELAND 24. ONIO
381-7788
JOHN MUSTICO CD.
BOX 624- 206 BEWLEY ROAD
HAVERTON. PA.
213 H16-1961
THE TEXPORT COMPANY
2411 FARRINGTON STREET 215 H16-1961 THE TEXPORT COMPANY 2411 FARRINGTON STREET DALLAS. TEXAS 75207 214 ME1-6270 JAMES J BACKER CO. 221 W GALER ST P O BOX 9077 SEATTLE 99 WASH 206 AT3-6470

206 AT3-6470

DYANCOOL MANUFACTURING
COMPANY INC
SALES MANAGER
FRANK STANGARONE
COMPANY ADDRESS
1 RUSSELL STREET
SAUGERITIES» NEW YORK 12477
COMPANY REPRESENTATIVES
R J MC CARDLE
40 TANNER STREET
HADDONFIELD» N.J.
609 429 8895
TOM MARDIN
315 SOUTHFIELD RD
FAYETTEVILLE» N.Y.
315 446 9280

DYNAIR ELECTRONICS» INC

DYMAIR ELECTRONICS, INC SALES MANAGER DWAIN A. KELLER COMPANY ADDRESS 6360 FEDERAL BOULEVARD SAN DIEGO. CALIF. 92114 DYNASCIENCES CORPORATION

SAN DIEGO. CALIF. 92114

DYNASCIENCES CORPORATION
SALES MANAGER
CHARLES E. IRVIN
BRAND NAMES
DYNASCIENCES
COMPANY ADDRESS
TOWNSHIP LINE RDAO
BLUE BELL. PA 19422
COMPANY REPRESENTATIVES
ALBION OPTICAL CO
15 W VIRGINIA AVE
WEST NYACK. N.Y. 10994
914 EL 8 4450

FASTMAN KODAK COMPANY
MOTION PICTURE AND EDUCATION
MARKETS DIVISION
K. M. MASON - SLS MGR
N Y SALES & ENGINEERING OFC
200 PARK AVENUE
NEW YORK NEW YORK 10017
212 MU 7 7080
E. M. STIFLE - SLS MGR
CHICAGO SALES & FNGR. OFC.
130 FAST RANDOLPH DRIVE
CHICAGO SALES & FNGR. OFC.
130 FAST RANDOLPH DRIVE
CHICAGO - ILLINOIS 60601
312 236 7234
W. L. FARLEY. JR.- - SLS MGR
HOLLYWOOD SALES & ENGR. DFC.
6697 SANTA MONICA BLVO
HOLLYWOOD. CAL. 90038
213-464-6131
BRAND NAMES
KODAK
FASTMAN
FXECUTIVF OFFICE ADDRESS
343 STATE STREET
ROCHFSTER. NEW YORK 14650
FILM DISTRIBUTION CENTERS
R GRANT
3250 VAN NESS AVE
SAN FRANCISCO, CALIF 94119
415 PR 6 6035
E MYLER
5315 PEACHTREE INOSTRL BLVO
CHAMRLEF. GA 30005
404 GL 7 5711
R URRAN
6300 CEDAR SPRINGS RD
DALLAS, TFXAS 75235
214 FL 1 3221

EIOSON ELECTRONIC COMPANY
SALES MANAGER
MERRILL EIDSON
COMPANY ADDRESS
1902 N. THIRD ST
TEMPLE. TEXAS 76501
817-PR3-3901

EIMAC DIVISION

DF VARIAN ASSOCIATES
SALES MANAGER SALES MANAGER
GEORGE M W BADGER
DIVISIONS & SUBSIDIARIES
DF VARIAN ELECTRON
ELECTRON TUBE AND
OEVICE GROUP
BOMAC DIVISION
SALEM ROAD
BEVERLY, MASS. 01915
617 922-6000
TWX 617 922-1987
CALIFORNIA AVE. OPERATION
601 CALIFORNIA AVENUE
PALO ALTO. CALIF. 94304
415 326-4000
TWX 415 492-9253
LEL DIVISION
AKRON STREET
COPIAGUE. L.I., N.Y. 11726
516 264-2220
TWX 516 691-5085
MATIONAL ELECTRONICS. INC.
A VARIAN SUBSIDIARY
GENEVA, ILL. 60134
312 232-4300
TWX 312 232-6300
TWX 312 232-6300
TWX 312 732-64000
TWX 315 492-9253
S-F-D LABORATORIES. INC.
A VARIAN SUBSIDIARY
800 RAHWAY AVENUE
UNION. N.J. 07083
201 687-0253
TWX 201 687-0333
VARIAN ASSOC. OF CANADA. LTD.
45 RIVER ROAD
GEORGETOWN, ONTARID
416 877-6901
TWX 02-95628
COMPANY ADDRESS
301 INDUSTRIAL WAY
SAN CARLOS, CALIF 94070
592 1221
TWX 415 594 8842
SALES OFFICES
TUBE 6 DEVICE GROUP
OF VARIAN ASSOCIATES
TO VARIAN ASSOCIATES
TO VARIAN ASSOCIATES
TO THE OUTSTRIAL WAY
SAN CARLOS, CALIF 94070
592 1221
TWX 415 594 8842
SALES OFFICES
TUBE 6 DEVICE GROUP
OF VARIAN ASSOCIATES
TO THEN AVENUE. WEST
SCOTISDALE. ARIZONA 85251
602 947-75661
TWX 602 949-0165
7901 WILSHIRE BLVD
SANTA MONICA, CALIF
213 451 5877
TWX 213 5877
TWX 213 5877
TWX 213 5876 213 451 5877
TWX 213 468-1166
435 HARROR BLVD.
BELMONT, CALIF. 94002
415 592-1841
TWX 415 594-8884
314 5001H MISSOURI
CLEARWATER. FLA. 33516
813 446-8513
TWX 813 442-2270
3110 MAPLE OR N E
SUITE 103
ATLANTA, GA 30305
404 261 4572
TWX 404 231 4881
EXECUTIVE PLAZA OFFICE BLDG.
205 W. TOUHY AVENUE
PARK RIDGE. ILL. 60068
312 825-6686
TWX 312 825-3334
400 WYMAN STREET
WALTHAM, MASS. 02154

617 891-4560
TMX 617-894-8594
2009 RDUTE 22
CDRRER FAIRWAY DRIVE
UNION, N.J. 07083
201 688-8800
TMX 201 687-9514
1500 KINGS HIGHWAY
CHERRY HILL, N.J. 08034
609 428-6800
TMX 609 429-4105
847 JAMES STREET
SYRACUSES, N.Y. 13203
315 472-7051
TMX 319 477-1240
SOUTHMOOR BUILDING
10 SOUTHMOOR CIRCLE
DAYYDM, OHIO 45429
513 298-7318
TMX 513 944-0546 513 298-7318
TMX 513 944-0546
FIRST BANK 6 TRUST BLDG.
P 0 BOX 689
RICHARDSON. TEXAS 75081
214 235-2385
TMX 214 231-1403
1678 SOUTH PIONEER ROAD
SALT LAKE CITY. UTAH
801 487 7561
714 CHURCH STREET
ALEXANDRIA. VIRGINIA 22314
703 549-8205
TMX 703 931-4210

SALES MANAGER SALES MANAGER
GEORGE E. EITEL
BRAND NAMES
EITELCO
COMPANY ADDRESS
P O BOX 830
211 E SHELDON
PRESCOTT. ARIZONA 86301
602 445 0691

ELECTROLINE TELEVISION EQUIPMENT INC PRESIDENT PRESIDENT
MAURICE OLFMAN
980 NE 170 ST
N MIAMI BACCH+ FLA 33161
305 949 0933
COMPANY ADDRESS COMPANY ADDRESS
BOX 324
ULETA, FLA 33164
COMPANY REPRESENTATIVES
JEROME GUARDINO
16 EAST 23RO STREET
NEW YORK, N.Y. 10010
212 OR 3-5670
REPS. IN OTHER COUNTRIES
HENRY PALL
COMINION SQUARE BLDG.
MONTREAL OUEBEC
514 878-9489

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JAMES V, DANIELS
BRAND NAMES
SURGELITE
STROBELITE
COMPANY ADDRESS
1713 NORTH ASHLAND AVE
CHICAGO+ ILL 60622

ELECTRONIC MOBILE UNITS COMPANY ADDRESS 788 PATERSON AVE EAST RUTHERFORD N J 201 933 3555

EAST RUTHERFORD. N J
201 933 3555

ELECTRONIC RESEARCH COMPANY
SALES MANAGER
H. M. DANZIG
COMPANY ADDRESS
10000 WEST 75TH STREET
OVERLAND PARK. KANSAS 66204
COMPANY REPRESENTATIVES
WM J PURDY CO
312 SEVENTH ST
SAN FRANCISCO. CALIF
419 863 3300
SHEPHARD WINTERS CO
4109 BURBANK BLVD
BURBANK CALIF
213 849 6671
STAN PIERCE. INC
115 BALD HILL ROAD
NEW CANAAN. CONN
203 966 4630
ORBE. INC
300 31ST ST N. SUITE 439
ST PETERSBURG. FLA
813 894 0687
ORBE. INC
1020 GREGORY DR
MAITLAND. FLA
305 424 0978
ORBE. INC
476 LORIDANS DR. NE
ATLANTA. GA
404 233 6453
WHITMORE ASSOCIATES. INC
4750 N MILWAUKEE
CHICAGO, ILL
312 286 2442
FLORENCE 5 MEYER. INC
2900 WOODLAND
MICHITAL KANSAS
316 TE 8 7226
HARRY J WHITE CO
320 HILLEN RD
TOMSON. MD 21204
301 VA 8 6373
STAN PIERCE. INC

24 LINDEN ST NORWOOD. MASS 02062 617 762 3164 FLORENCE & MEYER. INC 406 W 34TH ST KANSAS CITY, MO 816 LD 1 7282 FLORENCE & MEYER. INC BDX 5806 BERKLEY, MO 63134 314 JA 1 6800 COMP TECH SALES BDX 50 RIVERDALE. N J 07457 BDX 50
RIVERDALE, N J 07457
201 835 0332
INTERNATIONAL ELECTRO-COMP COT
BOX 353
PINE BROOK, N J 07058
201 335 1822
HARRY J WHITE CO
801 W MARLTON PIKE
CHERRY HILL, N J
609 428 2304
COMP TECH SALES
BOX 384
LYMBRODK, N Y 11563
516 593 2628
LAWRENCE SALES CO
BOX 1038
RICHARDSON, TEXAS
214 AD 5 5504
REPS IN OTHER COUNTRIES
ELECTROCESIGN, LTD
9124 ST LAWRENCE BLYO
MONTREAL, QUEBEC
514 389 5914 RIVERDALE. N J 07457 201 835 0332

ELECTRONICS ESSENTIALS
OF CCC. INC.
PRESIDENT
JOSEPH V MITCHELL
BRAND NAMES
VERAVOX COMPANY ADDRESS 4424 FURMAN AVE BRONX: N Y 10466

EMCEE ELECTRONICS, MISSILES,
COMMUNICATIONS, INC
SALES MANAGER
GARR JOHNSON
BRAND NAMES
EMCEE
COMPANY ADDRESS
160-E-3 STREET
MT. VERNON, NEW YORK

ELECTRONIC SYSTEM ENGINEERING SALES MANAGER SALES MANAGER
A. A. KAMINSHINE
BRAND NAMES
LIMPANDER
SPEEDMASTER
COMPANY ADDRESS
120 1/2 N CLEVELAND
CUSHING. OKLAHOMA 74023

LECTRO PRODUCTS
LABORATORIES; INC
SALES MANAGER
R. H. NOVIC
BRAND NAMES
ELECTRO
COMPANY ADDRESS
6125 W. HOWARD
CHICAGO, ILLINDIS 60648
COMPANY REPRESENTATIVES
HYDE ELECTRONICS CO. INC
4710 N 16TH ST. SUITE 109
PHOENIX. ARIZ
602 264 5609
CARTER 6 ROSSNEY ASSOC
2600 W OLIVE AVE
BURBANK. CALIF
213 843 3292
LOGAN SALES CO
463 BREWSTER AVE
REDWOOD CITY. CALIF
415 369 6726
HYDE ELECTRONICS CO. INC
888 S LIPAN ST
DENVER. COLO
303 936 3456
COAKLEY. BOYD 6 ABBETT. INC
6 GAYWOOD DR
WATERBURY. CONN
203 756 8766
MURPHY 6 COTA
712 W VASSAR AVE
ORLANDO. FLA
305 424 2167
MURPHY 6 COTA
586 ARMOUR CIRCLE. N E
ATLANTA. GA
AOA 875 2525
GETTLEMAN 6 LITITEKEN CO
3736 DEMPSTER ST
SKOKTE. ILL
312 588 0030
FISHMAN ASSOCIATES 3736 DEMPSTER ST SKOKIE. ILL 312 588 0030 FISHMAN ASSOCIATES 2060 E 54TH ST UNIT # 1 INDIANAPOLIS. IND 317 251 2401 COAKLEY. BOYD 6 ABBETT. INC 1424 HIGHLAND AVE NEEDHAM. MASS 617 444 5470 DAVID MILSK CO 20110 OLYMPIA AVE DETROIT. MICH DETROIT: MICH 313 535 4012 A J WARNER CD 5022 29TH AVENUE S

MINNEAPOLIS, MINN
612 729 7371
PAUL G SCHOLZ CO
7309 E 109 TERRACE
KANSAS CITY, MD
816 761 6522
HYDE ELECTRONICS CO, INC
5206 CONSTITUTION AVE N E
ALBUQUERQUE, N M
505 265 8895
CALLAHAM-FERGUSON CO
107 GREENHEDGE DR
CAMILLUS, N Y GALLAHAN-FERGUSON CO
107 GREENHEDGE DR
CAMILLUS, N Y
315 488 5518
MURPHY & COTA
P O BOX 6365
GREENSBORO, N C
919 273 6288
LES A MORROW CO
3123 W 117TH ST
CLEVELAND, OHIO
216 251 5700
JOHN MUSTICO CO
312 BEMLEY ROAD
HAVERTOWN. PA
215 464 1961
JAMES H PODOLNY CO
5912 PENN AVE
PITTSBURGH, PA
412 441 0800
THE TEXPORT CO
5104 CAPEN ST
MEMPHIS, TENN
901 682 4777
THE TEXPORT CO
2411 FARRINGTON ST
DALLAS, TEXAS
214 631 657
THE TEXPORT CO
8811 GAYLOR ROOM 206
HOUSTON, TEXAS
713 464 3031
HYDE ELECTRONICS CO, INC
3081 DELSA DR
SALT LAKE CITY, UTAH HYDE ELECTRONICS CO. I 3081 DELSA DR SALT LAKE CITY. UTAH 801 278 4465 DOM SMITH SALES CO 2320 N 45TH ST SEATTLE. WASH 206 633 3160 STEVE FISHER SALES CO 121 CEDAR LANE TEAMECK. NEW JERSEY 201 836 6661

ELECTRO-SOUND ACOUSTICS:

DIVISION OF RAYCO SOUND CO
SALES MANAGER & PRESIDENT
RAYMOND L. IHNDRIS
BRAND NAMES PRO-CLASSIC
FUSISTANCE
ELECTRO-SOUND ACOUSTICS
COMPANY ADDRESS
128 WHITMOOR TERRACE
SILVER SPRING MARYLAND 20901
301 593 6455
COMPANY REPRESENTATIVES
BETTER ELECTRONICS CO
7114 WOODLAND AVE
TAKOMA PARK. MD 20012
301 589 8610

ELECTROVERT INC

SALES MANAGER

F. J. FARRELL
BRAND NAMES

CRADLECLIP
SPIROBAND
GROMMET STRIP
COMPANY ADDRESS
86 HARTFORD AVE
MT. VERNON. NEW YORK 10553
COMPANY REPRESENTATIVES
CONSTRUCTION SPECIALTIES
10 EAST SECOND STREET
SCOTISDALE. ARIZONA
CLIFFORD L WOOLSEY
1029 N BRIGHTON ST
BURBANK. CALIF 91506
213 849 5341
J. A WAUGAMAN ASSOC INC
2785 NORTH SPEER
DENVER. COLO 80211
303 292 3926
H. R. GROSS 6 CO
314 SOUTH MISSOURI AVE
P. O. BOX 1427
CLEARWATER. FLA 33517
813 446 6649
LOUIS E BRUNS CO
2210 MORTH SOTH TERRACE
KANAS CITY. KANSAS
913 289 5242
ANSELL ENGINEERING CO
816 THAYER AVE
SILVER SPRING. MD
301 588 4222
CONTACT ASSOCIATES
7 CYPRESS DRIVE
BURLINGTON. MASS
617 272 5051-2-3
MURRAY A PERCIVAL CO
22511 SOUTHFIELD ROAD
SOUTHFIELD. MICH 48075
313 356 5710
MOOD CLEMONS CO
6701 PENNSYLVANIA AVE SO.
MINNEAPOLIS 23. MINN
612 866 3401
LOUIS E BRUNS CO
514 PARKMOOD AVE
KIRKMOOD. MISSOURI
J. P DEARIE CO
P 0 BOX 66 ELECTROVERT INC

MOUNTAIN LAKES, N J
201 334 4848
J B CLOUGH CD
4614 PROSPECT AVE
CLEVELAND, OHIO
216 431 2700
J B CLDUGH CO
3035 PORTSMOUTH AVE
CINCINNATI, OHIO
513 321 0478
HILLIARD ASSOCIATES
766 0LD YORK ROAD
JENKINTOWN, PENN
215 884 6100
WALTER N LASKA
530 SIXTH AVE
PITTSBURGH, PENN
412 471 0490
MORRIS SALISS
P D BOX 464
ROOSEVELT, PUERTO RICO
PHIL J SCANLON CO
PO BOX 70
RICHARDSON, TEXAS 75081
214 231 4661
DWIGHT SMITH ASSOC
32 SOUTH RIVER STREET
AURORA, ILL 60504
313 896 0828
BILL WADDELL CO
10211 N.E. 31ST PLACE
BELLEVUE, WASH
206 822 3660

ELECTRO-VOICE. INC

VP SALES
LAWRENCE LEKASHMAN
BRAND NAMES
AR 15TOCRAT R
CARDILINE R
ACOUSTIFOAM
ACOUSTALLOY R
CDP R
SONOCASTER
CV-D SONOCASTER
CV-D
STEREON R
FEATHERIDE R
LINE RADIATOR
SONOPHASE SOUND SPOT R SOUND SPOT I MICHIGAN MUSICASTER RADAX PATRICIAN R POWER POINT SENTRY SUPER-SONAX SUPER-SONAX
VARIABLE-D R
WOLVERINE R
COMPANY ADDRESS
638 CECIL STREET
BUCHAMAN, MICHIGAN 49107
616 695 6831
COMPANY REPRESENTATIVES
EDWARD CAIN
3238 CAHABA HEIGHTS ROAD
BIRMINGHAM, ALABAMA 35243
205 967 3080
DICK BELLEW SALES COMPANY
1005 WEST 4TH STREET
EL DORADO, ARKANSAS
501 UN 3 8325
JACK CARTER
DICK SCHNEPP
2600 W OLIVE
BURBANK, CALIFORNIA 91505
213 843 3292
MEYER, ROSS 6 FLEMING
113 TENTH STREET
SAN FRANCISCO, CALIFORNIA
415 ME 1 0652
MC LOUD 6 RAYMOND
2151 S GRAPE STREET
P 0 BOX 22044
DENVER, COLORADD
303 736 1589
JOSEPH F HELLAUER, JR
46 ROCKEFFER AVENUE
WEST HAVEN, CONNECTICUT 06516
203 923 0261
JACK SPROCH
3320 W BROWARD BOULEVARD
FT LAUDERDALE, FLA 33312
305 587 3792
MAITLAND K SMITH COMPANY
31 16TH STREET NM
ATLANTA, GEORGIA 30309
404 875 8031
BILL KOLANS 6 COMPANY
P 0 BOX 2098, 158 NOKAUEA
HONOLULU, HAWAII
811 628
J D BOSWELL SALES
5 PINE TRAIL
CASEYVILLE, ILLINOIS 62232
314 GE 6 2042
GENE CLEARS
20200 ASHLAND AVE
CHICAGO HEIGHTS, ILL
312 755 0055
HARRISON BLIND 6 ASSOCIATES
1635 GENT STREET NORTH
MOIAMAPOLIS, INDIANA 46202
317 ME 5 6291
ELECTRONIC SALES CO
1310 HERIZ DRIVE, SE
CEDOR RAPIDS, 10MA 52403
319 364 4342
DICK BELLEW, JR
5042 D ST, ANTHONY AVE
NEW ORDERNS, LOUISIANA 70122
504 28 9629
DAVE BROTHERS
6302 LINCOLN AVENUE
BALTIMORE, MARYLAND
301 RO 4 7189

JOE RADIMAK
1808 GLEN RIDGE RDAD
TDMSDN, MARYLAND
301 661 0713
MICHAEL SCOTT 6 COMPANY
336 WASHINGTON
WELLESLEY HILLS, MASS
617 CE 5 0102
RICHARD FLORA
294 HOMEY CREEK AVENUE
ADA, MICHIGAN
616 676 1854
RILEY 6 PETCHELL
ELECTRONIC SALES
13209 FENKELL
DETROIT, MICHIGAN
313 VE 8 9100
RAY RIPLEY 6 ASSOC
6838 PILLSBURY AVE SO
MINNEAPOLIS, MINNESOTA
612 UN 6 8682
CHARLES SMITH
813 FORDHAM ROAD
RIVERSIDE, NEW JERSEY
609 HO 1 4581
M 6 S ASSOCIATES - MILITARY
P O BOX 185
HADDOANFIELD, NEW JERSEY
609 HO 1 4591
M 6 S ASSOCIATES - MILITARY
P O BOX 185
HADDOANFIELD, NEW JERSEY
609 HO 9 7055
CARDUNER SALES CORPORATION
P O BOX 900
PO BOX 900
PO BOX 900
ROY ON CHARO PARK
PHELPS, NEW YORK
516 333 8170
GORON LE ROY
ORCHARO PARK
PHELPS, NEW YORK
315 548 4891
JAMES SCHMITTER
109 EASTON AVENUE
BUFFALO, NEW YORK
716 892 6551
OAVID E COON
218 EAST LAKE ROAD
OE RUYTER, NEW YORK
716 892 6551
OAVID E COON
218 EAST LAKE ROAD
OE RUYTER, NEW YORK
716 892 6551
CATOMANA WENUE
CHARLOTTE, N CAROLINA
704 FR 6 5951
C L PUGH COMPANY
2144 RIVERSIDE ORIVE
COLUMBUS, OHIO 43221
614 486 9678
GEORGE CONNEEN
131 HARNED ROAD
SPRINGFIELD, OELAWARE CO, PA
215 543 8641
ELECTRO VOICE TENNESSEE
615 623 2356
EDWARD MILLER
SUITE 251, HELSHIRE BLDG
1450 PRESTON FOREST SQUARE
DALLAS, TEXAS, 75230
214 AD 9 3789
HUGH PUTMAN
914 WATEKAMAY
RICHAROSON, TEXAS
214 AO 1 4353
JIM HANNOCK 214 AO 1 4353
JIM HANKOCK
6022 WIGTON
HOUSTON, TEXAS 77035
713 PA 9 0824
WM R LANPHEAR SALES
4031 STONEWAY AVE, NORTH
SEATTLE, WASHINGTON 98103
206 ME 3 4900
REPS IN OTHER COUNTRIES
ELECTRO TEC MARKETERS
1624 W THIRO STREET
VANCOUVER, B C
604 RE 6 6377
R C KAHNERT
359 ENFORO ROAD
RICHMOND HILLS, ONTARIO
416 884 4574
AURELE DES JAROINES
P 0 BOX 885
MONTREAL, GUEBEC
514 677 5033

THE ELMOR COMPANY
SALES MANAGER SALES MANAGE S. WEINER BRAND NAMES GALLET GALCO GUINANO SECURITY
COMPANY AGORESS
29 E. MAGISON ST
CHICAGO, ILLINOIS

PRESIDENT ENCLOSURE CORP
PRESIDENT

R. D. ECELMAN
COMPANY ADDRESS
1701 INDUSTRIAL BLVO.
PENMSAUKEN, N. J. 08110
COMPANY REPRESENTATIVES
LEE ASSOCIATES
8100 S MEMORIAL PARKWAY
HUNTSVILLE, ALABAMA
205 881 0461
LEE ASSOCIATES
200 E MARKS STREET
ORLANDO, FLA
305 241 4445
LEE ASSOCIATES
12250 WILKINS AVENUE
ROCKVILLE, MARYLAND
301 949 488D
MECHANICAL MARKETING ENG
20 CONGRESS AVENUE
CHELSEA, MASSACHUSETTS 617 889 2279 LEE ASSOCIATES 432 WEST END BOULEVARD WINSTDN-SALEM, NORTH CAROLINA 919 724 2406 C E SNOW 613 CHELTENHAM AVENUE PHILADELPHIA, PENNSYLVANIA 215 CA 4 2626

ENGINEERING ASSOCIATES
COMPANY ADDRESS
434 PATTERSON ROAD
DAYTON, OHIO 45419
OFC AX3-1662 LAB AX 3-1462

ENGLISH ELECTRIC VALVE DIVISION THE ENGLISH ELECTRIC CORP COMPANY ADDRESS COMPANY ADDRESS
ONE PARK AVE
NEW YORK, N Y 10016
DIRECT ALL INQUIRES
AS INOICATED
SOLE U S DISTRIBUTOR FOR
IMAGE-ORTHICON & VIDICON IMAGE-ORTHICON 6 VIDICON CAMERA TUBES VISUAL ELECTRONICS CORP 356 WEST 40TH ST MEW YORK, N Y 10018 SOLE U S DISTRIBUTOR FOR VACUUM TUBES, TRANSMITTING CALVERT ELECTRONICS, INC 220 EAST 23RD STREET NEW YORK, N Y 10010

NEW YORK, N Y 10010

ENTRON, INC

SALES MANAGER
JOHN RUSSELL
COMPANY ADDRESS
2141 INDUSTRIAL PKWY
SILVER SPRING, MARYLAND 20904
COMPANY REPRESENTATIVES
PAUL MC INNISH
231 B STOKES STREET
HUNTSVILLE, ALABAMA 35805
205 536 7259
WILLIAM JONES
3706 MONTGOMERY ORIVE
SANTA ROSA, CALIF 95404
RAY LA RUE
ATLANTA, GEORGIA 30319
404 634 4089
WILLIAM SAILOR
4983 HARBOR BOULEVARD
COLUMBUS, OHIO 43227
614 837 3259
ROBERT TAYLOR
P O BOX 1037
RICHAROSON, TEXAS 75080
214 AD 5 7472
REPS IN OTHER COUNTRIES
OMER GIRARO
15 0 ST PATRICE STREET
MAGOG, GUEBEC
ELECTRONIC MARKETING OIVISION

15 O ST PATRICE STREET MAGOG, QUEBEC

ELECTRONIC MARKETING OIVISION
ESSEX WIRE CORPORATION
OON ABERDEEN
BRANAGER
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BRAND NAMES
STANCOR
RBM
COMPANY ADDRESS
3501 W. ADDISON
CHICAGO, ILLINOIS 60618
463 7400
SALES OFFICES
444 CAMELBACK ROAD WEST
PHEONIX, ARIZONA 85017
602 264 3578
112 GLASGOW AVENUE
INGLEWOOD, CALIFORNIA 90301
213 678 4711
165 ELEVENTH STREET
SAN FRANCISCO, CALIF 94103
415 863 7880
721 SOUTH BROADWAY
DENVER, COLORADO 80209
303 722 4641
3308 13TH STREET, NW
WASHINGTON, O C 20010
202 265 3938
1010 EXECUTIVE CENTER DRIVE
ORLANDOD, FLORIDA 32803
305 241 5401
3098 PIEDMONT ROAD, NE
ATLANTA, GEORGIA 30305
&04 261 5838
156 MOKAUEA
HONDULUL HAWAII 96803
815 649 404 261 5838
156 MOKAUEA
156 MOKAUEA
156 MOKAUEA
156 MOKAUEA
815 649
309 AVONDALE ORIVE
EAST PEORITA. ILLINOIS 61611
309 699 3301
349 MORTH ASHLAND AVENUE
RIVER FOREST. ILLINOIS 60305
312 261 0342
1605 K AVENUE. ME
CEDAR RAPIOS. 10WA 52402
319 362 7825
5450 BUENA VISTA DRIVE
SHAWNEE MISSION. KANS 66205
913 492 2131
1812 BULLARD AVENUE
METAIRIE. LOUISIANA 70003
504 887 0482
5500 HARFORD ROAD
BALTIMORE. MARYLAND 21214
301 254 3380
336 WASHINGTON STREET
WELLESLEY HILLS, MASS D2181
617 235 D102
23529 WOODWARD AVENUE
FERNDALE. MICHIGAN 48220
313 547 4771
5364 KIMBALL AVENUE, SE GRAND RAPIDS, MICHIGAN 49508
616 243 7606
516 243 7606
3749 WEST BRDADWAY
MINNEAPOLIS, MINNESOTA 55422
612 588 4663
47 VILLAGE SQUARE
HAZELWODO, MISSOURI 63042
314 838 6446
2611 QUINCY STREET, NE
ALBOUDERQUE, NEW MEX 87110
505 265 1579
496 ELLICOTT SQUARE BUILDING
BUFFALO, NEW YORK 14203
716 854 2517
311 MEACHAM AVENUE
ELMONT, LI, NEW YORK 11003
516 437 8150
431 GREENWICH STREET-EXPORT
NEW YORK, NEW YORK 10013
212 966 2130
6717 WOODSTOCK ORIVE
CHARLOTTE, NO CAROLINA 28210
704 523 3327
150 EAST BROAD STREET
COLUMBUS, OHIO 43215
614 221 3363
510 N W 19TH AVENUE
P O BOX 2827
PORTLAND, OREGON 97208
503 226 4184
1531 SPRUCE STREET
PHILADELPHIA, PENN 19102
215 545 1205
106 NELBON AVENUE
PITTSBURGH, PENN 19235
412 241 7025
605 COOPER STREET
MEMPHIS, TENNESSEE 38104
901 276 4442
2930 MERRELL ROAD
OALLAS, TEXAS 75220
214 357 4601
4810 HAZARO
HOUSTON, TEXAS 77006
713 529 3811
31 SOUTH THIRD, EAST
SALT LAKE CITY, UTAH 84111
801 364 4632
422 FIRST AVENUE, WEST
PO 80X 9285
SEATTLE, WASHINGTON 98119
206 284 1121
928 EAST WISCONSIN AVENUE
PEWAUKEE, WISCONSIN 53072
414 691 0622

EUPHONICS MARKETING SALES MANAGER HOWARD SOUTHER BRAND NAMES MINICONIC COMPANY ADORESS 173 W. MADISON ST CHICAGO, ILLINOIS 60602

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BRAND NAMES
E-Z-HOOK
COMPANY ADORESS
1536 MOODBURN AVE
COVINGTON, KY 41012
COMPANY REPRESENTATIVES
ASH M. WOOD CO.
P O BOX 1158
ARCADIA, CALIF,
AT 7-0449 AND CU 3-1201
ROYAL A, STEMM CO.
662 IRVING PARK RD.
CHICAGO, ILL.
LA 5-8333
REPS IN OTHER COUNTRIES
LEN FINKLER LTD.
2 TYCOS ORIVE
TORONTO 19, ONTARIO
416 781-5231

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CORPORATION
SALES ADMINISTRATOR
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BALANCE/GARD
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LUMITEN
MTIS
REVERBERTRON
COMPANY AODRESS
10-40 45TH AVENUE
LONG ISLAND CITY. N Y 11101
SALES REPRESENTATIVES
WORLD WIDE PRODUCTS CO
BOX 429
N MIAMI BEACH. FLA
LOREN GREEN ASSOCIATES
5218 W DIVERSEY AVE
CHICAGO. ILLINOIS
MARTIN VOGT
2817 BAMLET ROAD
ROYAL OAK, MICHIGAN
BEN JOSEPH ASSOCIATES
BOX 486
GREAT NECK, LI. NEW YORK
H H SEAY COMPANY
3850 FAIRLINGTON OR
COLUMBUS, OHIO
ANTLE SMITH SALES CO
2721 BROOKFIELD AVE

DALLAS, TEXAS WILLIAM K WOOD CD 5908 CALIFORNIA AVE SEATTLE, WASHINGTON

THE FINNEY COMPANY
SALES MANAGER SALES MANAGER
TOM PFEIFFER
BRAND NAMES
FINCO
COMPANY ADDRESS
34 W. INTERSTATE ST.
BEDFORD, OHIO 44014

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F 6 M SYSTEMS CO. DIVISION OF
FISCHBACH 6 MOORE, INC
MARKETING MANAGER
M. C. BAIRD, JR.
COMPANY ADDRESS
2525 WALNUT HILL LANE
DALLAS, TEXAS 75220
COMPANY REPRESENTATIVES
J MORRIS
646 MORTH BEACHWOOD DRIVE
LOS ANGELES, CALIF 90004
213 466 2151
J DOUGLAS ANO
H ALSOP
1019 22ND ST. N W
WASHINGTON, D.C. 20037
202 333-0800
J LUTRELL
2525 WALNUT HILL LANE
DALLAS, TEXAS 75220
214 CH 1 2121

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FISHER BERKELEY CORPORATION
SALES MANAGER
RAPP BRUSH
BRANO NAMES
EXTACOM
COMPANY ADORESS
1475 POWELL STREET
EMERYVILLE, CALIF, 94608
COMPANY REPRESENTATIVES
ELLARD E STRASSNER CO
3121 LOS FELIZ BLVD
LOS ANGELES, CALIF
213 666 1511
JIM PIPER ASSOCIATES
10 HAVEN ST
DOVER, MASS
617 449 1144
CLARK R GIBB CO
2400 HENNEPIN AVENUE
MINNEAPOLIS, MINN
612 FR 7 1200
ROBERT FINLAY SALES CO
45 NORTH BROAD ST
RIDGEWOOD, N J
201 652 0088
JOHN O OLSEN CO
16201 SHAKER BLVD
CLEVELAND, OHIO
216 752 5444
WILLIAM L METCALFE
116 W FRANKLIN
CENTERVILLE, OHIO 45459
513 885 3722
RICHARO A STONE
1843 MAYDELL ST
PITTSBURGH 16, PA
412 341 8391
FECHNO ASSOCIATES
P O BOX 20544
DALLAS, TEXAS
214 FL 7 9213

MERB FITZGERALD COMMUNICATIO

HERB FITZGERALD COMMUNICATIONS
ELECTRONICS
SALES MANAGER
HERB FITZGERALD
COMPANY ADDRESS
635 E. 185TH ST.
CLEVELANO, OHIO 44119

THE JAMES FLOYO FORD COMPANY
GENERAL MANAGER
COMPANY ADDRESS
JFFCO BUILDING P.O.DRWR 839
CAPE GIRARDEAU, MO. 63701
314-334-6308
COMPANY REPRESENTATIVES
JAMES FLOYD FORD CO
BOX 761
CHICO, CALIFORNIA 95926

FORT MORTH TOWER CO, INC
PRESIDENT
T. W. MOORE
COMPANY ADDRESS
5201 BRIDGE ST PO BOX 8597
FORT WORTH, TEXAS 76112
817 536 5676
COMPANY REPRESENTATIVES
A C TILTON
5201 BRIDGE ST
FORT WORTH, TEXAS
817 536 5676

GAMMA SCIENTIFIC, INCORPORATED
SALES MANAGER SALES MANAGER

HAROLD P. FIELD

COMPANY ADORESS
5841 MISSION GORGE RD.
SAN OIEGO, CALIF. 92120

COMPANY REPRESENTATIVES

GRIOT ASSOCIATES
3002 MIOVALE AVENUE

LOS ANGELES. CALIF. 9DD34
213 474-1587

GRIOT ASSOCIATES
56D SAN ANTONIO ROAD

PALO ALTO. CALIF. 94306
415 327-3996

NORTHEAST ASSOCIATES BOX 1242 STAMFORD CONN. 06904 STAMFORD. CONN. 06904 203 323-3814 NORTHEAST ASSOCIATES BOX 31 MARBLEHEAD. MASS. 01946 617 631-3688 KING ASSOCIATES 8012 CINDY LANE BETHESDA. MD. 20034 301 469-7610

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ATC
AUTOMATIC TAPE CONTROL DIV
COMPANY ADDRESS
123 HAMPSHIRE STREET
QUINCY: ILLINOIS 62301
217-222-8202 123 MAMPSHIME STREET
QUINCY, ILLINOIS 62301
217-222-8202
U. S. BRANCH OFFICES
ED MILDER
1945 S FIGUEROA
LOS ANGELES. CALIF 90007
213 747 7129
EDWARD SHUEY
BROADCAST SALES
730 FEDERAL BLDG
1522 K STREET. N. W.
WASHINGTON. D. C.
202 223 5508
JOE FOLE
800 SECOND AVENUE
NEW YORK. NEW YORK 10017
212 667 7971
JOE WOODS
STORE MANAGER
4019 RICHMOND AVENUE
HOUSTON. TEXAS 77027
713 666 4333
EXPORT
ARNE CLAPP
BROADCAST PRODUCT MGR
637 CRAIG STREET. WEST
MONTREAL. QUEBEC
514 866 6755
ROCKE INTERNATL CORP
TOM TUKER. ASSI MGR
COMMUNICATIONS DEPT
13 EAST 40TH STREET
NEW YORK. N.Y. 10016
212 MU 9 0200
TERRITORY MANAGERS
WILLIAM MOATS
PO BOX 20160

NEW YORK, N.Y. 10016
212 MW 9 0 200
TERRITORY MANAGERS
WILLIAM MOATS
PO BOX 20160
3220 MOCKINGBIRD LANE
BIRMINGHAM, ALA 35216
205 822 3625
ROBERT STEIGER
PO BOX 1914
SACRAMENTO, CALIF 95809
916 446 4470
HOWARD DEMPSEY
8171 ORCHARD DRIVE
DENVER, COLORADO 80221
303 429 5758
RICHARD SPRUILL
PO BOX 8735
JACKSONVILLE, FLORIDA 32211
904 721 2779
CLARENCE MORGAN
22W235 BURDETTE STREET
GLEN ELLYN, ILLINOIS 60137
312 469 0847
PAUL TIMPE
19 WINDY HILL
QUINCY, ILLINOIS 62301
217 223 4701
STANLEY WHITMAN
BOX 2397, STATION A
MATERLOO, 10WA 50705
319 223 0561
THOMAS SCHOONOVER
11 RIDGECREST
LATHAM, NEW YORK 12110
518 785 3914
ROBERT MALLENBECK
11 RIDGECREST
LATHAM, NEW YORK 12110
518 785 9144
URLIN WHITMAN
2719 S HUDSON AVENUE
TULSA, OKLAMOMA 74114
918 836 4835
LEWIS DENES
BOX 584A, ROUTE 2
BORING, OREGON 97009

10LSA, ONLANDRA 74114
918 836 4835
LEWIS DENES
BOX 584A, ROUTE 2
BORING, OREGON 97009
513 658 2684
NEIL ARVESCHOUG
PO BOX 414
GRANVILLE, PENNSYLVANIA 43023
614 294 2594
RAFAEL ACOSTA
PO BOX 89
R10 PIEDRAS, PUERTO RICO
JOE COLE
PO BOX 246
HALIFAX, VIRGINIA 24558
703 476 4514

GBC AMERICA CORPORATION SALES MANAGER HARRY LEFKOWITZ BRAND NAMES

GBC
COMPANY ADDRESS
89 FRANKLIN STREET
NEW YORK NEW YORK 10013
COMPANY REPRESENTATIVES
R MARK MARKMAN CO
4142 LANKERSHIM BLVD NO HOLLYWOOD, CALIF

F W MOULTHROP ASSOC 1530 E 12TH ST OAKLAND, CALIF 415 261 7676 KOETHER-COX CO IS25 INCA ST
DENVER, COLO
303 733 5561
J E JOYNER ASSOC
P O BOX 10821- STA A
ATLANTA- GA
404 758 7496
KLEM-STEFFEN INC
709 GARFIELD ST
OAK PARK- ILL
312 921 1200
GENE ROSEN ASSOC
9501 WADSWORTH DRIVE
BETHESDA- MD
301 365 511
COAKLEY BOYD
1424 HIGHLAND AVE
NEEDHAM, MASS 1325 INCA ST COAKLEY BOYD & ABBETT
1424 HIGHLAND AVE
NEEDHAM, MASS
617 444 5470
MAUREY E BETTIS CO
3706 BROADWAY
KANSAS CITY, MO
816 LO 1 0772
JOHN OLSEN CO
16201 SHAKER BLVD
CLEVELAND, OHIO
216 752 5444
MAYMARD SALES CO
158 EXPRESS ST
DALLAS, TEXAS
214 R1 2 2384
DAVE MILLER SALES CO
2323 NO 457H ST
SEATTLE, WASH
206 ME 7 7070
REPS. IN OTHER COUNTRIES
ROBERT J BUCKLAND CO
P 0 BOX 367 STAT B
LONDON, ONTARIO
519 432 7731
G C ELECTRONICS COMPANY

G C ELECTRONICS COMPANY SALES MANAGER ED GALLAGHER BRAND NAMES AUDIOTEX ELECTROCRAFT G C ELECTRONICS SPEEDEX SPEEDEX
WALSCO
COLORMAGIC ANTENNA CO
COMPANY ADDRESS
400 S. WYMAN STREET
ROCKFORD. ILLINDIS 61101
COMPANY REPRESENTATIVES
JACK LOGAN 6 ASSOCIATES
801 MAHLER RD
BURLINGAME, CALIF
WESTERN ELECTRIC COMPONENTS
4301 BIRCH ST BURLINGAME. CALIF
WESTERN ELECTRIC COMPONENTS
4301 BIRCH ST
NEWPORT BEACH. CALIF
ROCKMOUNT ENTERPRISES
3268 ZINNIA CT
GOLDEN. COLORADO
W F HAMILTON CO
5130 N ELSTON AVE
CHICAGO. ILLINOIS
D W MARCUS
P O BOX 453. 33 IRVING RD
NATICK. MASS
CHARLES F VANDERVOORT
1279 OSAGE ST
ST PAUL. MINN
PETERSON-RUDNICK ASSOCIATION
P O BOX 822
W CALOWELL. N J
JUD LEBRUN W CALDWELL. N J JUD LEBRUN 1123 SW YAMHILL ST PORTLAND. OREGON MFG MKTG SERVICE 10202 BROCKBANK DR DALLAS. TEXAS

G E VISUAL COMMUNICATIONS PROD
SALES MANAGER BROADCAST SALES
ROBERT E LAUTERBACH
SALES MANAGER, FIELD SALES
ROBERT W COCHARM
COMPANY AODRESS
SYRACUSE, NEW YORK
COMPANY REPRESENTATIVES
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MHELAN BLOG, 701 WELCH RD
PALO ALTO. CALIF 94304
A15 323 4108
R DONALD PETERSON
232 N LAKE AVE
PASADENA, CALIF 91101
213 795 1209
JOHN F WATTER
777 14TH ST N W
MASHINGTON, D C 20005
202 393 3600
JAMES M COMER, JR
RM 517
1330 W PEACHTREE ST NW
ATLANTA, GA 30309
404 875 6691
THOMAS F BOST, JR
117 SOUTH MAIN ST
MT PROSPECT, ILL 60056
312 255 3200
CURTIS I KRING
3628 W 95TH ST
SHAWNEE MISSION, KANS 66206
913 649 7131 3628 w 957H ST SHAWNEE MISSION, KANS 66206 913 649 7131 GE VISUAL COMM PRODUCTS DEPT 6501 E NEVADA ST DETROIT, MICH 48234 313 892 7600

HAROLD W MORSE

BOX 1021

SYRACUSE: N Y 13201

315 456 7738

JOHN H PAINTER
P 0 BOX 1021

SYRACUSE: N Y 13201

315 456 7309

LEWIS F PAGE
GRAYBAR BLDG 420 LEXINGTON
NEW YORK: N Y 10017

212 751 1311

EARL H PLATT
910 WILLIAMSON BLDG
CLEVELAND, OHIO 44114
216 781 6822

JAMES H DOUGLAS
4447 N CENTRAL EXPWY
DALLAS. TEXAS 75205
214 526 0426

G E DISTRIBUTOR SALES FORCE
COMPANY ADDRESS
GENERAL ELECTRIC COMPANY
OWENSBORO • KENTUCKY

G E INDUSTRIAL SALES OPERATION

GENERAL ELECTRIC COMPANY SCHENECTADY, N Y

G E CAPACITOR DEPARTMENT
COMPANY ADDRESS
GENERAL ELECTRIC COMPANY
HUDSON FALLS: N Y G E SUPPLY COMPANY COMPANY ADDRESS GENERAL ELECTRIC SUPPLY CO BOSTON. MASS

G E SALES AND DISTRIBUTION COMPANY ADDRESS GENERAL ELECTRIC COMPANY LOUISVILLE. KENTUCKY

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COMMUNICATION PRODUCTS DEPT.
MANAGER MARKET DEVELOPMENT MANAGER MARKET DEVELOPMEN J. A. LIGHTMER COMPANY ADDRESS GENERAL ELECTRIC COMPANY P O BOX 4197 LYNCHBURG, VA 24502

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GEMERAL ELECTRIC COMPANY MANAGER BROADCAST SALES
E T CHACE
COMPANY ADDRESS
ELECTRONICS PARK
BLDG 6, ROOM 128
SYRACUSE, NEW YORK 13201
COMPANY REPRESENTATIVES
THEO M MEICKER
555 VETERANS BLYD
REDWOOD CITY. CALIF
415 369 7151
AVERY P LONG
201 UNIVERSITY AVE
DENVER, COLO
303 388 5771
VICTOR S SYZDEK
410 ASYLUM STREET
HARTFORD, CONN
203 527 0135
DONALD G REIK
777 14 TH ST N W
WASHINGTON, D C
202 EX 3 3600
ROBERT P FISHER
2104 S LOIS AVE
TAMPA, FLA
813 877-8691
JAMES H CHRYSLER AND
OTHOR HELLENBERGER
3800 N MILWAUKEE AVE
CHICAGO, ILL.
312 777-1600
JAMES D BROOKS
613 HIBERNIA NATL BANK BLDG
NEW GREANS, LA
504 525 4324
ROBERT A SECKLER
31 ST JAMES AVENUE
BOSTON, MASS
617 482 1800
RICHARD E LEVITRE
17220 W 8 MILE ROAD
SOUTHFIELD, MICH
313 444 8977
CARL A JOHNSON
4900 VIKING DRIVE
MINNEAPOLIS, MINN
612 927 5458
JOHN SIEBER
104 1471

4900 VIKING DRIVE MINNEAPOLIS, MINN 612 927 5458 JOHN SIEBER 106 W 141H STREET KANSAS CITY, MO 816 221 4033 GARY H EVANS 1530 FAIRVIEW

1530 FAIRVIEWS
ST LOUIS. MO
314 429 6930
MAROLD F BOREIKO G
JOHN E SULLIYAN
200 MAIN AVENUE
CLIFTON. N J
201 472 8100
CLAUDE B CODDINGTON
N. CONCOURSE OFFICE BLDG.
SYRACUSE. N Y
315 456 3412

LYNN E GREELEY
129 W TRADE ST
CMARLOTITE N C
704 375 5571
ARTHUR M EFFRON
2621 VICTORY PARKWAY
CINCINNATI, OHIO
513 AV 1 2547
NORMAN YON ALLMEN
25000 EUCLID AVENUE
CLEVELAND. OHIO
216 266 2900
FLOYD S ANDERSON
3 PENN CENTER PLAZA
PHILADELPHIA. PA
215 LO 8 1800
CLAUDE F PEHOWSKI
875 GREENIREE ROAD
3 PARKWAY CENTER
PITTSBURGH. PA
412 921 8594
E KYLE COOPER
4647 N CENTRAL EXPRESSWAY
DALLAS. TEXAS
214 LA 1 1931
DAVID F BOOTH
3100 RICHMOND AVE
HOUSTON. TEXAS
713 524 3061

EMERAL ELECTRIC COMPANY

GENERAL ELECTRIC COMPANY
ELECTRONIC COMPONENTS SLS OPR
BRAND NAMES
ALUGARD
ALUMALYTIC
BONUS LINE
HI-BREAK
INDUCTROL
BYRANOL
TANTALYTIC
THE BIG LOOK TANTALYTIC
THE BIG LOOK
VAC-U-SEL
VOLT-PAC
COMPANY ADDRESS
1 RIVER ROAD
SCHENECTADY, NEW YORK 12305
SALES OFFICES
3550 N. CENTRAL AVENUE
SUITE 712. GUARANTY BANK BLD
PHOENIX. ARIZONA 85012
602 264-1751
11840 W. OLYMPIC BLVD.
LOS ANGELES. CALIF. 90064
213 BR 2-8566
555 VETERANS BLVD.
REDWOOD CITY. CALIF. 94063
415 369-7151
201 UNIVERSITY BLVD.
DENVER. COLO. 80206
303 388-5771
1285 BOSTON AVENUE
BRIDGEPORT. CONN. 06602
203 ED 4-1012
777 14TH STREET. N W
MASHINGTON. D. C. 20005
202 EX 3-3600
14 WEST GORE STREET
ORLANDO. FLORIDA 32806
305 425-8634
2106 S. LOIS AVENUE
P O BOX 105.77
TAMPA. FLORIDA 33609
813 877-8311
3800 N. MILAUKEE AVENUE
CHICAGO, ILL. 60641
312 777-1600
3606 S. CALHOUN STREET
FORT WAYNE. IND. 46806
219 744-2346
3750 N. MERIDIAN STREET
FORT MAYNE. IND. 46806
319 364-9149
31 ST. JAMES AVENUE
BOSTON. MASS. 0217
617 482-1800
17220 WEST 8 MILE ROAD
SOUTHFIELD. MICH. 78075
313 448-8977
4900 VIKING DRIVE. ROOM 108
MINNEAPOLIS. HICH. 78075
313 448-8977
4900 VIKING DRIVE. ROOM 108
MINNEAPOLIS. HICH. 78075
313 448-8977
4900 VIKING DRIVE. ROOM 108
MINNEAPOLIS. MINN. 55424
612 927-5458
106 W. 14TH STREET
KANSAS CITY. MO. 64105
816 221-4033
200 MAIN AVENUE
BUFFALO. N. Y. 14240
716 883-9210
425 MORTHERN BLVD.
GREAT NECK. N. Y. 11021
516 HN 6-8800
NORTHERN CONCOURSE OFFICE BLD
ROOM 112 516 HN 6-8800
NORTHERN CONCOURSE OFFICE BL
ROOM 112
NORTH SYRACUSE. N.Y. 13212
315 456-3612
129 TRADE ST.. P O BOX 1969
CHARLOTTE. N.C. 28201
704 375-5571
25000 EUCLID AVENUE
CLEVELAND. OHIO 44117
216 266-2900
3430 S. DIXIE HIGHWAY
DAYTON. OHIO 45439
513 298-0311
3022 N W EXPRESSWAY
MAY-EX BLDG.
OKLAHOMA CITY. OKLA. 73112
405 943-9015
3 PENN CENTER PLAZA
PHILADELPHIA. PA. 19102
215 LO 8-1800

875 GREENTREE RDAD 3 PARKWAY CENTER PITTSBURGH. PA. 15220 412 921-8594 PITTSBURGH- PA. 15220
412 921-8594
1420 UNION AVENUE. RODM 202
MEMPHIS. TENN. 38104
901 272-9641
4447 N. CENTRAL EXPRESSWAY
DALLAS. TEXAS 75205
214 LA 1-1931
CARROLL AVE. P D BOX 4217
LYNCHBURG. VA. 24501
703 846-7311
112 ANDOVER PARK EAST
P O BOX 6100
SEATTLE. WASH. 78051
206 CH 4-7750
615 EAST MICHIGAN STREET
MILWAUKEE. WISC. 53202
414 271-5000

GENERAL MICROWAVE CORPORATION
SALES MANAGER
MOR WIND
BRAND NAMES TFT
COMPANY ADDRESS
155 MARINE STREET
FARMINGDALE, NEW YORK 11735
COMPANY REPRESENTATIVES 155 MARINE STREET
FARMINGDALE, NEW YORK 11735
COMPANY REPRESENTATIVES
R F ASSOCIATES, INC
1621 PONTIUS AVE
LOS ANGELES, CALIF 90025
213 478 1586
BURLINGAME ASSOCIATES
7 WELLINGTON ST
WALTHAM, MASS 02154
617 89 1955
PALATINE ENG SALES, INC
8587 ST CHARLES ROCK RD
ST LOUIS, MD 63114
314 126 7055
BENNEWITZ ASSOCIATES
8310 CUTLER, NE
ALBWOUERQUE, N M 87110
505 299 8651
BERNEWITZ ASSOCIATES
8310 CUTLER, NE
ALBWOUERQUE, N M 87110
505 299 8651
BERTRAM D AARON 6 CO
P 0 BOX 186
ROSLYN, N Y 11576
516 621 0630
DOOLITILE ELECTRONICS CORP
P 0 BOX 97
FAYETTEVILLE, N Y 13066
315 637 3222
SYLVAN GINSBURY, LTD
72 W 45TH ST
NEW YORK, N Y 10036
212 MU 7 3213
M J MCDONALD CO
ROUTE 1
PFAFFIOWN, N C 27040
919 924 2182
ELECTRO SALES ASSOCIATES
DABEL STATION, BOX 143
DAYTON, OHID 45420
513 426 5551
5 6 5 ASSOCIATES
BORO LINE ROAD
KING DP PRUSSIA, PA 19406
215 265 3450
ARTHUR ENG SALES CO
11216 W MALLORY AVE
MALES CORNERS, WISC, 53130
A16 GA 5 5919
REPS, IN OTHER COUNTRIES
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Impedance:

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better than .25% for T or 2T sin2 pulse for both American and European systems

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Delay: 50 Nanoseconds to 1 second Bandwidth: DC to 250 MHZ Rise Time: As low as 2 Nanoseconds Impedance: 25 ohms to 50 K ohms

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Variable delays available between input and output terminals in dec-ade steps. Each decade has eleven (11) switch contacts and ten (10) delay increments so that the dial

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Tap Spacing: 1.45 #sec, or as required Tap Tolerance: ± .05, or as required Delay-to-Rise-Time Ratio: 100 max.
Temperature Stability: 50 ppm. °C or less

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Delay/Rise Time: 10 max Attenuation: .2 db max. Fully encapsulated

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Distortion at Output: 2% max.
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Distortion Limit: As low as 0.1% if required Delay Range: up to 100 usec.

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Delay Range: to $3\,\mu sec.$ Standard Tolerance: \pm 5% on Delay Delay-to-Rise-Time Ratio: $11\,$ max. Distortion: \pm 5% (typical), \pm 10% max.

PRECISION AUDIO **DELAY LINES** SERIES A



Delay Range: from 500 µsec to 1 sec. Bandwidth: 70 KHZ (max.) Delay Linearity: nominally within ± 0.25%: available to within ± 0.05%

DELAY TRIMMERS: TINY TRIM* SERIES



Size: 1/4 Cubic Inch

| PART NUMBER | RANGE @ 3.58 MHZ DEG. | DELAY (Nano- sec.) | RISE TIME (Nano- sec.) | IMPED- ANCE (ohms) |
|----------------------------------|--------------------------------|--------------------------|---------------------------------|--------------------------|
| TT20D TT30C TT40D TT50C | 25 38 50 64 | 20 30 40 50 | 5 7.5 10 12.5 | 500 390 500 390 |
| TT60C | 75 | 60 | 15 | 330 |

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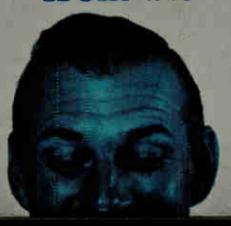
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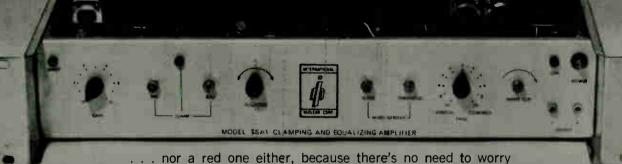
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COMPANY ADDRESS
970 MCLAUGHLIN AVENUE
SAN JOSE: CALIF. 95108
COMPANY REPRESENTATIVES
JOHN J FISKE
PO BOX 585
ARCADIA. CALIF. 91066
213 447-7655
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215 BROOKSIDE AVE
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JENSEN MANUFACTURING DIVISION.
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FRANK D. LINTERN
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6601 SOUTH LARAMIE AVE.
CHICAGO, ILLINOIS 60638

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404 873-5546
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R. A. MEYER
COMPANY ADDRESS
MAIN 6 COTTON STREETS
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COMPANY ADDRESS
772 EAST 53RD STREET
BROOKLYN. NEW YORK 11203

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216-KE-1-3411
T J HARRINGTON
BOX 12471
MEMPHIS, TENN 38112
901 452 2606
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613-588-2424
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SALES MANAGER SALES MANAGER
JAMES F. LOCKETT
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HOUSTON. TEXAS 77036
COMPANY REPRESENTATIVES
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HOUSTON TEXAS
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878-7491
FRANK W. MORRIS
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EXPORT
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CHICAGO. ILL
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FISHMAN ASSOC.
BOX 40308
INDIANAPOLIS. INO.
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OL 7-6659
PASTON-HUNTER CO. INC.
2002 TEALL AVE
SYRACUSES. N. Y.
A37-2992
F. OMMAN F. OHMAN TWINSBURG. 0HIO 216-425-7445

IDEO

TEST TERMINATIONS







Type PL 259

Type N

HOLLAND ELECTRONICS Precision Test Terminations provide a simple, convenient method for accurately terminating pulse, video and RF coaxial cables. These terminations eliminate undesirable reflections and provide an easily accessible test terminal for checking waveform and level

The terminating elements are low noise 1% metal film resistors and can be supplied in any value required.

TEST TERMINATION PLUGS







Tip Jack

Front View

Solder Lug

HOLLAND ELECTRONICS Coaxial Test Termination Plugs are designed for use in Pulse, Video and RF patching systems. These terminations provide a means of properly terminating a line in its characteristic impedance and in addition have access to the center conductor for examina-tion of signal under terminated conditions.

Plugs contain a ½W, 1% tolerance low noise resistor. All contact surfaces are heavy gold plated. Choice of test terminal between solder lug or pin tip jack (for 0.080 dia. test probes) color coded, Green 50 ohms, Violet 75 ohms, White 93 ohms. Plugs are compatible with RCA or W.E. patching systems.

FIXED PAD ATTENUATORS







Type AUHF

Type AN

Type ABNC

HOLLAND ELECTRONICS Fixed Pad Attenuators are precision coaxial assemblies designed for use in pulse, video and RF circuits. Fully enclosed ruggedized metal construction provides shielding and protects the low noise 1% tolerance metal film resistors used in the attenuation networks. Careful design assures good high frequency response to 250 megacycles.

Attenuators are available in any desired db value from 1 through 60 db in 1 db steps. Standard impedances are 50, 75 and 93 ohms. Standard connectors are UHF, N and BNC. Type UHF and BNC attenuators are rated at ½ watt; type N at 1 watt. Special units can be supplied with any impedance or attenuation, multiple outputs, different input and output connectors, type TNC and C connectors, test terminals, etc. Impedance matching attenuators are also available.

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WASECA. MINNESOTA 56093
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JOHNSON ELECTRONICS. INC. SALES MANAGER
RALPH L. WEBER
BRAND NAMES
JOHNSON-AIR
COMPANY ADDRESS
P.O. BOX 7. HWY. 17-92
CASSELBERRY, FLORIOA 32707
305 838-2111
COMPANY REPRESENTATIVES
MIKE NEWYON 305 838-2111
COMPANY REPRESENTATIVES
MIKE NEWTON
HYDE ELECTRONICS CO., INC
4710 N 16TH STREET
SUITE 109
HOENIX, ARIZONA 85015
602 264-5609
WAYNE WAINWRIGHT
TELEPACIFICOM
PO BOX 926
LOS GATOS., CALIF
408 394-1411
DICK HYDE
HYDE ELECTRONICS CO., INC
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HYDE ELECTRONICS CO.. INC
5206 CONSTITUTION AVE.. NE
ALBUQUERQUE. N MEXICO 87110
505 265-8895
ERNEST L WILKS
EL MILCO
PO BOX 14466
DALLAS. TEXAS 75234
214 242-5321
PAUL POWERS
HYDE ELECTRONICS CO.. INC
2422 CANINO MAY
SALT LAKE CITY. UTAM 84121
801 278-4465

JORDAN ELECTRIC COMPANY
SALES MANAGER
BOYD M, BARTON
COMPANY ADDRESS
14707 KESWICK STREET
VAN NUYS CALIF, 91405

KAMN RESEARCH LABORATORIES INC. BRAND NAMES ECHOPLEX

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KAISER-COX CORPORATION
SALES MANAGER
WALT BAXTER
505 SO WOOOBURY RO
PITMAN, N J 08071
609 589 0330
BRAND NAMES
PHONECIAN
KASIER-COX
THUNDERBIRD
OMPANY ADDRESS
2216 W. PEORIA AVE. BOX 9728
PHOENIX, ARIZONA 85020
COMPANY REPRESENTATIVES
JAMES TAGLIA COMPANY REPRESENTATIVES
JAMES TAGLIA
2292 N PEACHTREE COURT
CHAMBLEE GEORGIA 30005
404 451 0011
CHARLES LEVRER
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COLUMBUS OHIO
GEORGE E BARRY
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DALLAS TEXAS 75234
214 247 4223

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BRONX 58* NEW YORK

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COMPANY ADDRESS
165 ROOSEVELT AVENUE
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COMPANY REPRESENTATIVES
RAYMARG
P O BOX 515
SANTA CLARA. CALIF
248 5199
WESTERN ELECTRONIC COMPONENTS
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P O BOX 186
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MA 1 0630
JOHN D OLSEN CO
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CLEVELAND. ONIO
732 5444
JOHN O OLSEN CO
5539 STOKESWOOD COURT
CINCINNATI. OHIO
922 2176
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FALLS CHURCH. VIRGINIA
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COMPANY ADDRESS
162 ELY AVENUE
SOUTH NORWALK. CONN. 06856

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MATHIAS KLEIN 6 SONS
SALES MANAGER
C. F. CASTINO
COMPANY ADDRESS
7200 MCCORMICK RD. CHICAGO, ILLINOIS 60645

KLINE IRON 6 STEEL COMPANY
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J. R. TROTTER
1225 MUGER STREET
COLUMBIA. S. C. 29202
AL 4-0301
BRAND NAMES
KIMCO KIMCO COMPANY ADDRESS P O BOX 1013 O BOX 1013 COLUMBIA. S. C. 29202

KOSS ELECTRONICS INC

SALES MANAGER
GREG CORNEHLS
BRAND NAMES
ACOUSTECH
REK-O-KUT
KOSS
COMPANY ADDRESS
2227 NORTH 31 STREET
MILWAUKEE, WISCONSIN 53208
COMPANY ADDRESS
1227 NORTH 31 STREET
MILWAUKEE, WISCONSIN 53208
COMPANY REPRESENTATIVES
F W MOULTHROP 6 ASSOC
1530 EAST 12 STREET
OAKLAND. CALIFORNIA 94606
415 261 7676
SHEPHARD WINTERS STERN
4109 BURBANK BLVO
BURBANK BLVO
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213 849 6671
JOHN ROWE 6 ASSOC
88 6 VALLEY HWY. SUITE 2170
0ENVER. COLO 80216
303 429 4595
JOSEPH ANDERSON
3138 BRINKLEY ROAD. APT 3
WASHINGTON. D. C. 20031
202 894-3455
DOW FITZGERALD
6231 SOUTH CHURCH
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813 834 3981
R A CHALHERS
349 PEACHTREE HILLS AVE. NE
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404 233 3208
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216 621 5074
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PHILADELPHIA. PENN 19131
215 473 3654 BRENDAN OHARA
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PHILADELPHIA. PENN 19131
215 473 3654
MAYMARD SALES CO
158 EXPRESS STREET
DALLAS. TEXAS 75207
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VECTOR CORP
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BOX 305
HADDONFIELD, N. J.
609 429 0087
CHESTER DREXLER
3 LEE DRIVE S LEE DRIVE
SO FARMINGDALE, L.I. N.Y.
516 249 8206
OHIO ASSOC
BOX 728
LIMA. OHIO
VAUGASYILLE 6500
WYBORNY SALES CO
BOX 17070
DALLAS. TEXAS
214 381 4645
DON KONLER
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206 363 1439

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213 601 7416
TWX 910 588 3282
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HUNTSVILLE, ALABAMA 25801
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THE THORSEN COMPANY
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ORLANDO. FLORIDA 32803
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4518 WEST 89TH STREET
PRAIRIE VILLAGE, KAN. 66207
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3919 WILLOW OR
WICHITA. KANSAS
BRIMBERG ASSOCIATES. INC
110 E PENNSYLVANITA AVE
TOMSON. MO. 2120A
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TOMSON. MO. 2120A
BRIMBERG ASSOCIATES. INC
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TOMSON. MO. 2120A
BRIMBERG ASSOCIATES. INC
110 E PENNSYLVANITA TOR
111 E PENNSYLVANITA TOR
11 TO ELECTRONICS
1919 WILLOW OR
WICHITA. KANSAS
BRIMBERG ASSOCIATES. INC
110 E PENNSYLVANITA TOR
110 E PENNSYLVANITA TOR 2022 SOUTH MAIN STREET
SALT LAKE CITY, UTAH 84115
WA BROWN 6 ASSOCIATES, INC
325 FIRST STREET
ALEXANDRIA, VA 22314
THE THORSEN COMPANY
1767 15TH AVENUE SOUTH
SEATTLE, WASH 98144
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DELTA EQUIPMENT S A
28 RUE DE TABELLION
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LAKE-GERHARD
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213 01 3 1605
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303 SH 4 2501
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868 YORK AVE. SW
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A04 758 7496
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312 AV 2 6835
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TOPSFIELD. MASS
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RILEY 6 PETCHELL ELECT SALES
13209 FENKELL
DETROIT 27. MICH.
313 VE 8 9100
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157 CHAMBERS ST
MEW YORK. NEW YORK
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EXPORT THE M. SIMONS & SON CO.. I EXPORT
130 BROADWAY
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214 AD 1 1426
WILLIAM R. LANPHEAR CO
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90 ROX 1126
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13209 FENKELL AVENUE
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212 657-6659

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212 MU 9-0200
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1605 CHATHAM AVE.
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704 376-3951
CL PUGH CO.
2144 RIVERSIDE DRIVE
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614 486-9678
TWX 614 759-0084
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WEATHERLY BLOG., SUITE 306
PORTLAND. OREGON 97214
503 234-0686
RROTHERS 6 CONNEEN ASSOCS.
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SPRINGFIELD. DEL. CO., PA.
215 KI 3-8641
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214 631-8860
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TWX 214 631-8860
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2711 BROAD STREET
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512 342-0251
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1933 SO BROADWAY
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LOS ANGELES. CALIFORNIA
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235 LINCOLN ROAD
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3807 GRAND AVENUE SOUTH
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612 824 6266
MALT LANDOME
75 PLANDOME
MANNASSET, NEW YORK
516 MA 7 6620
MAURY FRABER
22D DELAWARE AVENUF
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716 TL 6 3543
LUKE RODDEY
115 EAST BOULEVARD
CHARLOTTE, N CAROLINA
WHITE ASSOCIATES
465 FAST HANLEY ROAD
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FRANK YARUSSI
312 ROCKFIELD ROAD
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BRENDON O MARA
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PHILADELPHIA, PENNSYLVANIA
215 473 3654
KENNETH WYBORNY
WYBORNY ASSOCIATES
P O BOX 17070
DALLAS, TEXAS
214 381 4645
WILLIAM K WOOD
P O BOX 46046
5908 CALIFORNIA AVENUE, SW
SEATILE 16, WASH,
206 WE 5-9400 MAGNE-TRONICS INC.
SALES MANAGER
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COMPANY ADDRESS
B50 THIRD AVENUE
NEW YORK, N Y 10022

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COMPANY ADDRESS
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MARANTZ
COMPANY ADDRESS
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D-202ES—THE MOST NOTABLE ADVANCEMENT IN DYNAMIC MICROPHONE DEVELOPMENT

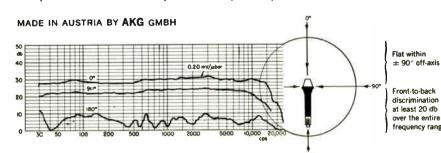


For Boom Operation—No frequency discriminating characteristics in off-axis pickup.

In the D-202ES, two independent microphone capsules are incorporated in a single microphone housing, connected by means of a cross-over network, free of phase distortion. Each of the capsules is optimally adjusted to a specific frequency pickup range; one for low frequencies, and the other for high frequencies. The cross-over is at 500 cps.

This unique arrangement achieves a wide, smooth frequency range (30-15,000 cps ± 2 db) and a cardioid pattern with a front-to-back discrimination of never less than 20 db over the entire frequency range. In addition, the microphone offers a 90° off-axis response which is completely parallel to the 0° (on-axis) curve.

These features offer several advantages in practical applications: The flat frequency response enables control of feedback at any frequency. The uniform front-to-back discrimination of at least 20 db virtually eliminates feedback and offers almost complete freedom in microphone and speaker placement.



The parallel 90° off-axis response is of particular importance in sound reinforcement and recording applications, to achieve a natural reproduction of all frequencies introduced to the microphone ± 90° off-axis.

The D-202ES utilizes a sintered bronze screen which is extremely rugged and protects the microphone systems from iron particles and dust. It also acts as a windscreen and is waterproof.

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4699 OLD FREDERICK ROAD METAIRIE. LOUISIANA 70003
504 887-1723
J W SMEFFER
4609 OLD FREDERICK ROAD
BALTIMORE, MARYLAND 21229
301 CE 3 0606-7
RICHARD PURINTON INC
11 MUZZEY STREET
LEXINGTON, MASS. 02173
617 862-8300
LOYD F MURPHY 6 ASSOC
730 CHICAGO AVENUE
MINNEAPOLIS, MINNESOTA 55415
612 333 4511
TMX 612 321-0894
ROBERT BARTOS
804 E ESSEX AVENUE
GLENDALE, MO. 63122
314 CH 1-4331
HENRY RICHTER, INC.
1376 U S HIGHWAY NO 22
MOUNTAINSIDE, N.J. 07092
201 AO 3-4615
GRAY-WILLIAMS ASSOC
8 E MT VERNON AVENUE
HAODONFIELO, N.J. 08033
609 429 -3773
HENRY G RICHTER INC
0 8 EMT VERNON AVENUE
HAODONFIELO, N.J. 08033
609 429 -3773
HENRY G RICHTER INC
0 80 251
FAYETTEVILLE, NEW YORK 13066
315 637-6713
HENRY G RICHTER INC
D 0 80X 251
FAYETTEVILLE, NEW YORK 13066
315 637-6713
HENRY G RICHTER INC
D 10 80X 194
HUNTINGTON BAY, L.I.,
NEW YORK 11:01
516 MA 1-1393
EUGENE J SCHOMBERG CO
3100 MONROE AVENUE
ROCHESTER, NEW YORK 14618
716 LU 6-0725
TMX 716 221-1513
WILLIAM J COLE
838 CARINI LANE 716 LU 6-0725
TWX 716 221-1513
WILLIAM J COLE
838 CARINI LANE
CINCINNATI, OMIO 4521B
513 825-8516
JACK F MC KINNEY SALES CO
P O BOX 3958
TULSA, OKLAHOMA 74150
918 622-2967
CARTWRIGHT 6 BEAN
560 SOUTH COOPER STREET
P O BOX 4760
MEMPHIS, TENNESSEE 38104
901 276-448
701 276-485
JACK F MC KINNEY SALES CO
1303 CHEMICAL STREET
DALLAS, TEXAS 75207
214 631-9450
JACK F MC KINNEY SALES CO
P O BOX 1026
BELLAIRE, TEXAS 77402
713 664-3653
M K WIOOEKIND CO, INC
815 W EWING STREET
SEATTLE, WASHINGTON 98119
206 284-8020

SEATTLE, WASHINGTON 98119
206 284-8020

OAKTRON INDUSTRIES INC
SALES MANAGER
C. E. MATTHEWS
COMPANY ADDRESS
HWY 69 SOUTH
MORNOC, WISCONSIN 53566
608 325 2121
COMPANY REPRESENTATIVES
ROBERT FISSELL COMPANY
4614 N 7TH STREET
PHEONIX, ARIZOMA
602 264-4031
CARTER 6 ROSSNEY ASSOC. INC
2600 WEST OLIVE AVENUE
BURBANK. CALIFORNIA 91505
213 843-3292
EWING ASSOCIATES
939 TERMINAL WAY
SAN CARLOS. CALIFORNIA
415 591-0309
COMNORS, INC
2241 STACEY DRIVE
DENVER. COLORADO 80221
303 428-1575
WINFIELD ELECTRONIC SALES
666 NE 125TH STREET
NORTH MIAMI, FLORIDA
305 751-5566
MILLAR HUTTO ASSOCIATES
1036 PEACHTREE STREET
NORTH MIAMI, FLORIDA
404 876-0919
KLEM STEFFEN. INC
417 HARRISON STREET
OAK PARK, ILL. 60204
KNAGGS, COLLINS,
NAVERCAMP, AND HEMPE INC,
NO. 6 BANK SQUARE

THOMASVILLE, N C
A W GREESON
VISUAL ELECTRONICS CORP
219 HOMEWOOD AVENUE
GREENSBORO+ N C
P D THOMPSON
VISUAL ELECTRONICS CORP
2550 MEYMOUTH ROAD
WINSTON-SALEM+ N C

E. ST. LOUIS. ILLINOIS 618 EX 7-2398 KNAGGS. CDLLINS. HAVERCAMP. AND HEMPE INC. KNAGGS COLLINS HAVERCAMP, AND HEMPE INC.
5818 N. DAK TRAFFIC WAY
KANSAS CITY. MD.
816 453-3203
CHARLES LIENAU COMPANY
11411 AMPERST AVENUE
WHEATDN. MARYLAND
301 949-6464
KEENE SALES COMPANY
RODM 14G PROFESSSIONAL BLOG
156 BROAD STREET
LYNN. MASSACHUSETTS
617 595-1001
DAVIO MILSK COMPANY
20110 OLMPIA AVENUF
0ETRDIT. MICHIGAN
313 535-4012
H M RICHARDSDN COMPANY
9 EAST 22ND STREET
MINNEAPOLIS. MINNESOTA
612 335-7734
JACK BROWN ASSOCIATES
207 ROSEOALE ROAD
VDNKERS. NEW YORK
914 SP 9-7330
LSM ASSOCIATES
PHEIPS. NEW YORK 914 SP 9-7330 LSM ASSOCIATES PHELPS, NEW YORK 315 548-4891 SHAMROCK ELECTRONIC SALES INC 1755 WEST MARKET STREET AKRDN. OHIO 44313 216 864-3090 216 864-3090
TANNER COMPANY
486 BROADMOOR AVENUE
PITTSBURGH. PENN. 15228
412 561-4687
THE TEXPORT COMPANY
2411 FARRINGTON STREET
DALLAS. TEXAS 75207
214 631-6277
214 631-6277
RK WIDDEKIND COMPANY. INC
815 W EWING STREET
SEATTLE. WASHINGTON 98119
206 284-8020

OHMITE MANUFACTURING COMPANY
SALES MANAGER
TOM OAVIS
BRAND NAMES BROWN DEVIL R TUBEOHM R TUBEOHM R
CORRIB R
POWR-RIB R
DIVIDOHM R
OETERMOHM R
LITTLE DEVIL R
OHMITE R OMMITE R
OHMITRAN R
RITEOHM R
TAN-O-MITE R
TALLY TAPE R
WIREWATT R

WIREWATT R
V. T. R
COMPANY ADDRESS
3601 HOWARD STREET
SKDKIE, ILL 60076
312 675-2600
TWX 312 677-6704
COMPANY REPRESENTATIVES
SHEFLER-KAHN COMPANY
P 0 80X 1587
PHOENIX, ARIZONA 85001
602 AL 8-7893
TWX 602 255-0226 FAX
OHMITE MANUFACTURING COMPANY
201 TDWN 6 COUNTRY VILLAGE
PALO ALTO, CALIFORNIA 94301
A15 DA 1-693
OHMITE MANUFACTURING CD.
6115 SELMA AVENUE
HOLLYWOOD, CALIF. 90028
213 466-3434
MC LOUD 6 RAYMOND COMPANY
P 0 80X 22044
DENVER, COLORADO 80222
303 SK 6-1589
TWX 303 292-2931
STANLEY K WALLACE ASSOCIATES
P 0 8DX 67
LUTZ, FLORIOA 33549
813 949-1817
VAL SKOL SALES, INCORPORATED
510 FT WAYNE, INDIANA 46802
219 742-9122
PAUL R. STURGEON CO., INC.
1330 BOYLSTON STREET
CHESTNUT HILL, MASS. 02167
617 734-7710
OHMITE MANUFACTURING CO
P 0 80X 4773
DETROIT, MICHIGAN 48219
313 537 3960
FRED B HILL COMPANY
610 EXCELSIOR BOULEVARD
MINNEAPOLIS, MINNESOTA 55416
612 929 6727
TWX 910 576-2924
H A ROES AND COMPANY
2601 CHERRY STREET
KANSAS CITY, MISSOURI 64108
B16 BA1 U866
TWX 816 556-2428
RUSS D SEBRIGHT & COMPANY
7120 MEST FLORISSANT AVENUE
ST LOUIS, MISSOURI 63136
CO 1-0055
OMHITE MANUFACTURING CO
P 0 80X 148
RUSS D SEBRIGHT & COMPANY
7120 MEST FLORISSANT AVENUE
ST LOUIS, MISSOURI 63136
CO 1-0055
OMHITE MANUFACTURING CO
P 0 80X 148
PALLSADES PARK, N.J. 07650
201 947-1777
OMHITE MANUFACTURING COMPANY
3700 EAST AVENUE

RDCHESTER, NEW YORK 14618 716 381 1890 TWX 716 221-1510 OHMITE MANUFACTURING CD P D 80X 3084 P D BOX 3084 CLEVELAND, DHID 44117 216 IV 1-7626 SAMUEL K MACODNALD, INC 1531 SPRUCE STREET PHILADELPHIA, PENN 19102 KI 5-1205 CARTWRIGHT & BEAN CARTWRIGHT 6 BEAN
P O BDX 760
CRDSSTOWN STATION
MEMPHIS» TENNESSEE 38104
901 276-4442
J EARL SMITH COMPANY
1393 CHEMICAL STREET
OALLAS» TEXAS 75207
214 ME 1-1727
R K SQUIBB» INC
655 N E NORTHLAKE PLACE
SEATILE» WASHINGTON 98105
206 ME 2-2450
REPS» IN OTHER COUNTRIES
C M ROBINSON AGENCIES
1550 ERIN STREET C M ROBINSON AGENCIES
1550 ERIN STREET
WINNIPEG 3. MANITORA
SP 4-1855-6
A C SIMMONDS & SONS LTD
100 MERTON STREET
TORONTO 7. ONTARID

GUNNAR A OLSEN CORPORATION COMPANY ADDRESS 215-11 42ND AVE. BAYSIDE. N.Y. 11361

416 485-9111

ONAN DIVISION OF STUDEBAKER CORPORATION VP MARKETING ROY E. MULLIN SALES MANAGER WILLIAM J. AUGER BRAND NAMES ONAN
COMPANY ACORESS
2515 UNIVERSITY AVE. S E
MINNEAPOLIS. MINN 55414

SALES MANAGER
S. A. CISLER
BRAND NAMES
ORBEX
ORBIX
COMPANY ADDRESS
P. O. BOX 1644
1863 ARLINGTON ST
LOUISVILLE. KY 40201
895 1143

VICE PRESIDENT-SALES GILBERT NIELSEN
COMPANY AODRESS
6100 N. E. COLUMBIA BLVD.
PDRTLAND. OREGON 97218

PAINTON INCORPORATED
SALES MANAGER
HOWARD M. LAYTON
COMPANY ADORESS
109 WHEELER AVE.
PLEASANTVILLE. NEW YORK 10570
914-769-1103

PALL TRINITY MICRO CORPORATION VICE. PRES. SALES NICHOLAS NICKOLAUS BRAND NAMES AMLOC-TM
EPOCEL-R
CERTIMESH-R
DELTADYNE-R DELTADYNE-R
GRAVITAIN-R
HEAT-LES-R
HX-R
PETROSORB-R
PSS-R
RIGIMESH-R
SUPRAMESH-R
SURFAMAX-R
TRINOX-R SURFAMAX-R
TRINOX-R
ULTIPOR-R
ULTIPOR-R
ULTIPOR-R
COMPANY ADDRESS
ROUTE 281
CORTLAND, NEW YORK 13046
COMPANY REPRESENTATIVES
GEO S EDWARDS CO., INC
PO BOX 5913
1913-27TH AVE S
BIRMINGHAM, ALABAMA 35209
205 879 1633
TWX 205 328 3826
FRANK A THOMAS CO
PO BOX 6415
1805 LIBERTY STREET
MOBILE, ALABAMA 36606
205 471 1593
TWX 205 342 5837
BROWNLEE 6 MORROW ENGR
1016 S 15TH STREET
PO BOX 3245-A
BIRMINGHAM, ALABAMA 35205
205 328 5650
205 328 5650 BIRMINGHAM. ALABAMA 35205 205 328 5650 TRIDENT ENGR CO. 16 BEALE STREET SAN FRANCISCO. CALIF 94105 415 986 6558 RUBLY ENGINEERING CO., INC. 1787 LARK LANE

PD BDX 2156 SUNNYVALE, CALIF 94087 408 253 6106 TWX 408 287 6624 PALL WESTERN CORP A I C 8LOG— SOUTH
8050 FLORENCE AVE
DOWNEY. CALIF 90240
213 861 1297
TIMX 213 531 7059
RROOKES ENGINEERING CO
1122-12TH STREET
0ENVER. COLDRADD 80204
303 222 5791
PONO TECH SALES. INC
3013 DIXWELL AVENUE
HAMDEN. CONN 06518
208 288 32780
PU KILL COMPANY. INC
PO 80X 927
MAITLAND. FLOROIA 32751
305 647 4288
THOMAS ENGINEERING CO
222-14TH STREET. NW
ATLANTA. GEDRGIA 30318
404 874 4291
ENPRO. INCORPORATED
1214 SOUTH 17TH AVE
MAYWODD. ILLINOIS 60153
312 345 1613
HG KLUG CD.. INC
CO TECHNICAL ENGR
821 RRITON AVENUE
DIXON. ILLINOIS
815 288 1265
LADT ENGINEERING CO
PO 80X 1256
AVONDALE STATION
PADUCAH. KENTUCKY 42002
502 444 6494
PAUL CONOIT CO.. INC
PO 80X 25796
2744 LOCKWOOD STREET
BATON ROUGE, LA
500 375 5511
JAMES R CHISHOLM CORP
92 HUTCHINSON STREET
CORNER ROUTE C-1
REVERE. MASS 22151
617 278 9100
STEPHEN E LORD CO
PO 80X 239
LEXINGTON. MASS 02173
617 727 7302
H A REED CO
19465 JAMES COUZENS HWY
0ETROIT. MICHIGAN 48235
313 347 7474
THE INDUSTRA COMPANY
6504 WALKER STREET
MINNEAPOLIS MINN 55426
612 979 6224
THE CONDIT CO
OF SOX 239
LEXINGTON. MASS 02173
617 727 7302
H A REED CO
19465 JAMES COUZENS HWY
0ETROIT. MICHIGAN 48235
313 347 7474
THE INDUSTRA COMPANY
6504 WALKER STREET
MINNEAPOLIS MINN 55426
612 979 6224
THE CONDIT CO
ON BOX 139
LEXINGTON. MASS 02173
617 127 7302
H A REED CO
19465 JAMES COUZENS HWY
0ETROIT. MICHIGAN 48235
313 347 7474
THE INDUSTRA COMPANY
6504 WALKER STREET
MINNEAPOLIS MINN 55426
612 979 6224
THE CONDIT CO
0 80X 739
LEXINGTON. MASS 02173
617 727 7302
H A REED CO
19465 JAMES COUZENS HWY
0ETROIT. MICHIGAN 48235
313 349 7476
HICHOUSTRA COMPONITION
000 FERSIONAL BLDQ
0000 FERSIONAL BLDQ
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0000 FERSIONAL BLDQ
0000 FERSIONAL BLDQ
0000 FERSIONAL AMERICAN TRADING CO.. INC
2 BROADMAY
NEW YORK. NEW YORK 10004
212 HA 5-6300
ABERNATHY-THOMAS ENGR. CO
38-99 WEDNA AVENUE
CHARLDTIE. N. CAROLINA 28209
704 525-2072
THE LESTER JOHNSON CO
3909 EAST 123RD ST
CLEVELAND, OHIO 44105
216 751 7040
TWX 216 752 8024
THE LESTER JOHNSON CO
PO BOX 41197
9870 SPRINGFIELD PIKE

CINCINNATI. DHID 45241 513 771 2270 THE LESTER JOHNSON CD PO BOX B WDRTHINGTON. DHIO 43085 PO BOX 8
WORTHINGTON, DHIO 43085
614 889 8447
THE CONDIT CD
PO BOX 4753
3120 SD WINSTON AVENUE
TULSA, DKLAHOMA 74114
918 743 6651
TWX 918 923 3288
RILTMORE PRODUCTS CD., INC
PO ROX 7963
466 CASTLE SHANNDN BLVO
PITTSBURGH, PENN 15234
412 563 3808
G L CLAPPER
7019 MEADE STREET
PITTSBURGH, PA 15208
412 241-3737
PORTILLA CORP
PO BOX 4349
376 RARBOSA AVENUE
SAN JUAN, PUERTO RICD 00905
766 6100
ABERNATHY-HOMAS ENGR. CO
41-3454 WARKET STREET 766 6190
ABERNATHY-THOMAS ENGR. CO
341-345 W MARKET STREET
DRAWER A
KINGSPORT. TENN 37662
615 245 6151
TWX 615 221-5109
ABERNATHY-THOMAS ENGR. CO ABFRNATHY-THOMAS ENGR. PO BOX 8506 NASHVILLE. TENN 37211 615 833-2480 PAUL CONDIT CO.. INC PO RCX 20094 1025 LEMALL HOUSTON. TEXAS 77025 713 747-0802.334 TOUSION, IEXAS T7025
T13 747-0802-34,
ENGINEERED EQUIPMENT INC
PO HOX 12125
409 EXEC PARK BLVD
ROOM 205
EL PASO, TEXAS 79912
915 533-4221
ENGINEERED EQUIPMENT, INC
3617 W STOREY
MIDLAND, TEXAS 79702
915 694-4997
OYNAMATION, INC.
PO BOX 3191
BON AIR, VIRGINIA 23235
TC3 272-5000
CANE JESSUP CO., INC
1433-130TH NE
PO BOX 250 1433-130TH NE
PO BOX 250
BELLEVUE. WASHINGTON 98004
206 454 0691
TWX 206 742-0809
BILTMORE PRODUCTS CO., INC
411-1/2 D STREET
PO BOX 8643 411-1/2 D STREET
PO BOX 8643
S CHARLESTON. W. VA. 25303
304 744-9432
ALLIED CONTROLS CO
PO BOX 8283
4840 MAC CORKLE AVE., SW
S CMARLESTON. W. VA. 25303
304 768-7313.4
CHIPLEY & JENSEN. INC
3500 N SHERMAN BLVO
MILWAUKEE. WISCONSIN 53216
414-442-8170
REPS. IN OTHER COUNTRIES
MARUSHO INDUSTRIAL CO., LTD.
144-CHOMSHI
CHOLM TOKYO. JAPAN
JOONGWON & CO., LTD.
60, 1-KANYUNG-DONG
CHUNG-KU. SEOUL. KOREA
8-4325
EUCO ENGINEERS. LTD. B-4325 EUCO ENGINEERS, LTD. LEE WAH BANK BLDG MEDAN PASAR KUALA LUMPUR, MALAYSIA SHAHI TRADING CORP 110, TAMIZ MARKET NANDANKANAN CHITTAGONG NANDAMKANAN CHITTAGONG
EAST PAKISTAN
PALL U. K.
273-281 KING STREET
HAMMERSHITH.
LONDON W. 6. ENGLAND
RIVERSIOE 8924-8
INTL. PROCESS CONTROLS-HELLAS
15 VOULIS STREET
PD BOX 400
ATHENS 126. GREECE
238 536
INTERNATL PROCESS CONTROLS
INTERNATL PROCESS CONTROLS
ENTERNATL STREET
TEL AVIV. ISRAEL
233893 TEL AVIV. ISRAEL
233893
GRAHAM INSTRUMENTS. LTD.
4508-6TH STREET NE
CALGARY. ALBERTA
403 276-1275
THOMAS W MAC KAY & CON. LTD
1807 FIR STREET
VANCOUVER. BRITISH COLUMBIA
604 731-6561
SCARBOROUGH & GRANT CO
12 LE PAGE COURT
DOWNSVIEW. ONTARIO
416 633-4130
ASSOC INSTRUMENTATION 6
CONTROLS. LTO. ASSOC INSTRUMENTATION 6 CONTROLS, LTO. 2261 ROCKLAND ROAD MONTREAL 16. QUEBEC 514 738-1167 PALL 5. A. APARTADO POSTAL NO. 199 CD. NAUCALPAN DE JUAREZ

EDD. DE MEXICO. MEXICO
27 11 37
PALL S. A.
EDIF. SANTOS DESP 405
MONTERREY. N.L., MEXICO
6 37 80
CASUCCI S C A
PUEYRREDON 225-6 P
BUENDS AIRES, ARGINTINA
FERRETERIA AMERICANA
CALLE 12 N. 9-66
BOGDTA. COLOMBIA
LIGOLD INGENIEROS, S.A.
C/D JAVIER OTTO GOLD
AV. MILITAR 2576
LINCE. LIMA, PERU
INDOQUIP C A
APARTADO 10518
SABANA GRANDE
CARACAS, VENEZUELA
34 44 11 EDD. DE MEXICO. MEXICO

PERMOFLUX CORPORATION SALES MANAGER SALES MANAGER
L. M. HEINEMAN
BRAND NAMES
DIMENCI-FONES
DUO-FONES
DIMINUETTE
EARSPEAKERS LARGO ROYAL BLUE ROYAL BLUE STERED-FONES TRUE STEREO COMPANY ADDRESS 4111 SAN FERNANDO ROAD P. O. BOX 6364 GLENDALE: CALIF. 91204

PHELPS DODGE ELECTRONIC
PRODUCTS CORPORATION
SALES MANAGER
DAVID H, MCGALLIARD
BRAND NAMES
FOAMPLEX
HELICAL MEMBRANE
RIGID LINE
SPIRAFIL
STYROFIL
STYROFLEX
TAPERLOX TAPERLOK WIRELOK COMPANY ADDRESS 60 DODGE AVE. PO BOX 187 NORTH HAVEN. CONN. 06473

PIEZO CRYSTAL COMPANY COMPANY ADDRESS 100 K STREET CARLISLE. PA. 17013

W. S. BOSWORTH COMPANY ADDRESS 74 FOLEY ST. SOMERVILLE. MASS. 02143

POWER-OPTICS INCORPORATED
SALES MANAGER
JACK LITTLER
BRAND NAMES
EVERSHED
POWER-OPTICS
COMPANY ADDRESS
PLYMOUTH MEETING, PA. 19462

POWER SOURCES
OLV TECHNICAL DPERATIONS. INC
SALES MANAGER
ROBERT R. SMYTH
BRAND NAMES
SINEVERTER
COMPANY ADDRESS
SOUTH AVENUE
BURLINGTON. MASS. 01803

PRECISION LABORATORIES
DIV. OF PRECISION
CINE EQUIPMENT CORP.
SALES MANAGER.
IRWIN R SHELDON
BRAND NAMES
PRECISION
COMPANY ADDRESS COMPANY ADDRESS
928-930 EAST 51ST STREET
BROOKLYN+ N+Y+ 11203

PRECISION PIEZO SERVICE SALES MANAGER C. E. PEARCE COMPANY ADDRESS 427 MAYFLOWER ST.
BATON ROUGE . LA. 70802

PRODELIN INCORPORATED
SALES MANAGER
J. H. LEVERGOOD
BRAND NAMES BRAND NAMES
RIGIO 800
SPIR-O-LINF
SPIR-O-LOK
COMPANY ADDRESS
P. O. BOX 131
HIGHTSTOWN, NEW JERSEY 08520
COMPANY REPRESENTATIVES J. H. HAMILTON
2126 BANGOR WAY
ANAHEIM. CALIF 92805
714 776-3769 714 776-3769
PRODELIN. INC.
9D1 AMERICAN STREET
SAN CARLOS, CALIF 94D70
415 593-8277
C. E. LINDBERG

2654 SOUTH KRAMERIA 2654 SOUTH KRAMERIA
DENVER, COLORADO 80200
303 757-6489
GENE PIETY FACTORS, INC.
PD BOX 2903
160 MOKAUEA STREET
HONOLULU, HAWAII 96800
808 837-185
BENNEWITZ ASSOC. BOB 837-185
BENNFWITZ ASSOC.
BENNFWITZ ASSOC.
8310 CUTLER, N.E.
ALBHOWERQUE, N M 87110
505 299-8651
APPLIED ENGRING SALES
SUITE 200
FIRST BANK 6 TRUST BLOG
RICHARDSON, TEXAS 75080
214 AD 1-1922
C C S BUTT
PO BOX 18045
HOUSTON, TEXAS 77023
713 JA 6-3101
FLECTRONIC SALES CORP
PO BOX 6535
6969 SW CALIFORNIA STREET
SEATTLE, WASH. 98116
206 WE 2-0330
ELECTRONIC PRODUCTS, INC.
3612 N GREENBAY AVENUE
MILWAUKEE, WISCONSIN 53212
414 264-3380
REPS. IN OTHER COUNTRIES
AFRD-SPACE TRONICS, LTD.
1080 PORT ROYAL AVENUE, W
MONTREAL 12, OUEBEC
514 331-6100
PRO-TEX REEL HAND COMPANY

PRO-TEX REEL HAND COMPANY
BRAND NAMES
PRO-TEX
SEALEDREEL BAND VINYLBAND COMPANY ADDRESS 200 FILM BUILDING CLEVFLAND, OHIO 44114

PRUZAN COMPANY
VICE PRESIDENT - SALES
RUBIN SALANT
BRAND NAMES
PRUZAN
COMPANY ADDRESS
1963 1ST AVE SOUTH
SEATTLE, WASH 98134

PULSE TECHNIQUES. INC. SALES MANAGER

NO ON SUMMERLIN
BRAND NAMES
PULTEC
COMPANY ADDRESS
1411 PALISADE AVENUE
WEST ENGLEWOOD, N. J. D7666

Q R K ELECTRONIC PRODUCTS INC SALFS MANAGER BERT WILLIAMSON COMPANY ADDRESS 2125 N BARTON AVE. FRESNO, CALIF. 93703

O-TV SALES & DISTRIBUTING CORP
BRAND NAMES
O PROMPTER SYSTEMS
O VIDEOTYPERS
O TAPE DISPATCHER SYSTEM
O VERTICAL CRAWL SYSTEM
VIDEOBOND PROMPTER PAPER
O DELUXE CRAWLS
COMPANY ADDRESS
342 W 40TM STREET
NEW YORK+ NEW YORK 10018

JULES RACINE CO. INC SALES MANAGER
MORGAN F. SMITH
BRAND NAMES
GALLET
GALCO
RACINE RACINE SECURITY COMPANY ADDRESS 521 FIFTH AVENUE NEW YORK CITY' N Y 10017 687 3060 COMPANY REPRESENTATIVES JAMES DAWSON 215 W FIFTH STREET LOS ANGELES CALIF. JOHN LA FRUIT 19 E MADISON STREET CHICAGO ILL.

RADIO AIDS COMPANY ADDRESS 528 RAVINE AVE. LAKE BLUFF, 1LL. 60044

RAVEN SCREEN CORPORATION
SALES MANAGER
ERNEST D. REIF
BRAND NAMES
RAVEN SCREENS
COMPANY ADDRESS
124 EAST 124TH STREET
NEW YORK NEW YORK 10035
212 LF 4-PARDRE? 212 LE 4-8408-9

RAYTHEON CO...
EQUIPMENT DIVISION
SALES MANAGER
JACK E. BANISTER
COMPANY ADDRESS
1415 BOSTONPROVIDENCE TURNPIKE

NDRWOOD, MASS. 02062
617 762-6700
CDMPANY REPRESENTATIVES
DARYL HAFFIELD
P. O. BOX 280
MOUNTAIN VIEW. CALIF.
415 968-8177
JOHN BARBER 6 PHIL CASS
349 PFACHTREE HILLS RD., N E
ATLANTA, GEDRGIA
404 231-3350
ROBERT KANNEY
3158 DES PLAINES AVENUE
DES PLAINES, ILLINDIS
312 296-6677
ROBERT KELLER
P.O. BOX 9117
KANSAS CITY, MD.
816 SH 1-1560

RBM CONTROLS

DIV OF ESSEX WIRE CORP
SALFS MANAGER
WILLIAM T HOPKINS
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Measure Vital Characteristics of Broadcasting Systems*

VIDEO NOISE

GROUP DELAY

FIELD STRENGTH

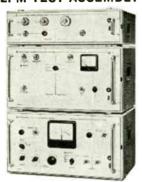
UPSF VIDEO NOISE METER



Designed for noise voltage measurements on TV cameras, film scanners, video tape recorders, radio links, coaxial lines, TV transmitters, receivers and transposer, with synch. Signals.

- 40 Hz to 5 MHz
- 7 Measurement Ranges: 1/3/10/30/100/300/1000
- True RMS or Peak-to-Peak Indications

LFM TEST ASSEMBLY



Determine group (envelope) delay of video and TV transmission systems.

- 0.1 10 MHz and 25-250 MHz (ext. to 1 GHz)
- ± 10 to ± 1000 nsec.
- Using Type SWOF sweep system group delay is instantaneously displayed on CRT.

HUZ FIELD STRENGTH METER

Covers FM, TV, aircraft, police and mobile radio bands for determining propagation conditions, polarization and radiation patterns. Used as a selective voltmeter, it measures antenna gain and cable attenuation.

- 47 to 225 MHz
- 1 µV to 100 mV
- FM & AM Detection
- Portable, Weights only 9 lbs.
- Includes Built-In Rechargeable **Batteries**



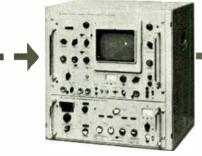
ANALYSIS VESTIGIAL SIDEBAND

In the presence of synch. signals

SWEEP GENERATOR/RECEIVER

HIGH QUALITY 1/2 W. X-MITTER





SWOF VIDEOSKOP A video sweep generator, tracking selective (3 kHz) receiver, and display unit. Range: Frequency, 20 kHz to 20 MHz, (1 GHz with sideband adapter); Sweep Width: 1 to 16 MHz, continuously variable: sweep duration 50 ms to 5.5 s.



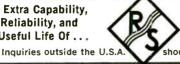
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N SYRACUSE. N Y
315 458 7470
NEAL BEAR CORP
3435 STREETSBORO RD
W RICHFIELD. OHIO
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1974 GREGORY AVE
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DIXIE ELECTRONIC ASSOC I
P O BOX 220
MADISON. TENN
619 895 5666
MARION ATHANS
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214 231 3481
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205 239 6470
REPS. IN DIHER CDUNTRIES
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604 922 1169
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317 AT 3 1395
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913 NI 2 7220
THUNDERBIRD SALES
6405 E KELLOGG
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316 684 3941
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201 CHESTNUT TOMSON, MARYLAND 21204
301 VA 5 4441
JOE RYAN
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413 325 6353
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176 2NO AVENUE
WALTHAM, MASS 02154
617 891 8040
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PO BOX 447
EAST LONG MEADOW, MASS01461
413 325 3059
GRANT SHAFFER CO
14241 FENKELL AVENUE
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313 BR 3 5390
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5209 W 60TH STREET
MINNEAPOLIS, MINNESOTA 55423
612 929 2985
THUNDERBIRO SALES
PO BOX 6156 THUMDERBIRO SALES
PO BOX 6156
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314 TE 8 6688
SIMBERROFF SALES INC
71 VALLEY STREET
SOUTH ORANGE. NEW JERSEY
201 763 7900
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P 0 BOX 159

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1085 CLARENDON CRESCENT
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303 633 799
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713 JA 6 3101
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SCIENTIFIC ATLANTA INC
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7800 KENTING AVE SO
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7800 KENTING AVE SO
MINNEAPOLIS. MINN 57419
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TWX 214 631 8962
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SCULLY RECORDING INSTRUMENTS
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VICE PRESIDENT
H. H. BROSIOUS
RRAND NAMES
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COMPANY ADDRESS
480 BUNNELL STREET
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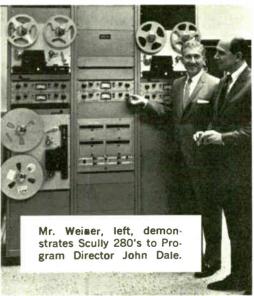
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2101 MOHAWK TRAIL
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201 MOHAWK TRAIL
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2101 MOHAWK TRAIL
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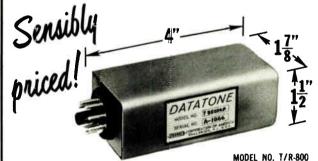
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The output power "switches" either off or on as desired when audio level drops for a specific length of time. In the absence of a signal, the unit will "switch" off after a fixed duration. Whenever audio programming seturns to its nominal level, the output control "switches" on. All "switching" is done automatically.

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OAKLAND 6. CALIF.
AN 1-7676
ROLAND OLANDER 6 COMPANY
6313 SANTA MONICA BLVO
LOS ANGELES 38. CALIF.
213 MO 9-6313
HYDE ELECTRONICS COMPANY
888 SOUTH LIPAN STREET
OENUER 23. COLORADO
303 936-3465/6/7

OREN H SMITH COMPANY
5255 NORTH LAMLER
CHICAGO, ILLINOIS 60630
286-4476
K 6 M SALES COMPANY
DAVIDSON BLDG
1627 MAIN STREET SUITE 50D
KANSAS CITY 8 MISSOURI
GR 1-1355
HYDE ELECTRONICS COMPANY
5206 CONSTITUTION AVE N E
ALBBUORROUE, N.M.
505 268-111
ROYAL SOUND COMPANY INC
114 EAST FORTIETH STREET
NEW YORK, N.Y. 10D16
212 697-6837
MIKE ROTH SALES COMPANY
678 SOUTH GREEN ROAD
CLEVELAND 21, 0H10
EV 2-9709
BUSHNELL SALES COMPANY
P 0 BOX 20714
DALLAS, 1EXAS 75220
214 FL 2-1845
RON MERRITT COMPANY
1320 PROSPECT STREET
SEATILE, WASH, 98109
NU 2-7337
REPS, IN OTHER COUNTRIES
ENGINEERED SOUND SYSTEMS INC
167 KIPLING AVENUE SOUTH
TORONITO 18, ONTARIO

IRW ELECTRONICS
MARKETING MANAGER
R. L. ASHLEY
COMPANY ADORESS
11CO GLENDON AVENUE
LOS ANGELES. CALIF. 90024
COMPANY REPRESENTATIVES
HECHT-HENSCHEN & ASSOC.
3825 NORTH 39TH AVENUE
PHOENIX. ARIZONA
602 272-6677
TRW SEMICONDUCTORS INC 3825 NORTH 39TH AVENUE
PHOENIX. ARIZONA
602 272-6677
TRW SEMICONDUCTORS INC
650 N SEPULVEDA
EL SEGUNDO. CALIF. 90245
213 322-6685
GENE STRAUBE ASSOCIATES
483 WILLOW ROAD
MENLO PARK. CALIF.
415 841-4450
STRAUBE ASSOCIATES
P O BOX 1649
BOULOER. COLORADO
303 443-860C
CARTWRIGHT & BEAN
20100 N E 25TH COURT
NO MIAMI BEACH. FLA. 33160
305 677-3480
FLORIDA ELECTRONIC ENGR.
609 E COLONIAL ORIVE
ORLANDO. FLORIDA 32803
305 425-0732
CARTWRIGHT & BEAN
305 477-3480
CARTWRIGHT & BEAN
395 TRITON ROAD
ORMOND BEACH. FLORIDA
305 677-3480
CARTWRIGHT & BEAN
3223 CAINS HILL PLACE
ATLANTA. GEORGIA 30305
404 237-273
JOHN G TWIST COMPANY
5222 DIVERSEY AVENUE
CHICAGO. ILL. 60639
312 SP 7-2250
TW 312 265-1165
R O WHITESELL ASSOC.
CENTRAL BLOG RM 272
FORT WAYNE. 1ND. 46802
219 743-4411
TW 219 241-0894
R O WHITESELL ASSOC
HEADOUARTERS
6620 E WASHINGTON ST
INDIANAPOLIS. IND. 46219 TWX 219 241-0894
R O WHITESELL ASSOC
HEADDUARTERS
6620 E WASHINGTON ST
INDIANAPOLIS+ INO. 46219
317 359-5374
TWX 317 635-9766
HERBERT B KIRKLAND ASSOC
210 FIFTH ST SE
CEOAR RAPIDS+ IOWA 52401
319 363-6425
R O WHITESELL ASSOC
3620 LEXINGTON RD
LEX MANOR BLDG RM 223
LOUISVILLE, KY.
502 893-7303
CARTWRIGHT 6 BEAN
1812 BULLARO AVENUE
METAIRTE+ LOUISIANA 70003
504 834-8312
TRW SEMICONDUCTORS INC
PO BOX 5654
BALTIMORE+ MO. 21210
301 323-43D0
TRW SEMICONDUCTORS INC
PO BOX 5654
BALTIMORE+ MO. 21210
301 323-43D0
TRW SEMICONDUCTORS INC
PO BOX 663
NORMOOO. MASS.
617 275-6076
R O WHITESELL ASSOC
303 FIOELITY BLOG
BENTON HARBOR+ MICHIGAN
616 927-2041
R O WHITESELL ASSOC
16801 WYOMING AVE
0ETROIT-, MICHIGAN
313 862-2225
TWX 313 342-0668
E A OICKINSON ASSOC
PO BOX F
EXCELSIOR, MINN• 55331

E A DICKINSON ASSOC P O BOX F EXCELSIOR, MINN, 55331 612 474-5273 TWX 612 961-0471 L R HARRY ASSOC P O BOX 588

GRANDVIEW. MO. 64D30 816 763-3634 L R HARRY ASSOC 7603 FORSYTHE 7603 FORSYME CLAYTON, MO. 631D5
314 727-6123
TRW SEMICONDUCTORS INC PO BOX 554
MONTVALE, N.J. 07645
201 484-5616
TRW SEMICONDUCTORS INC PO BOX 66
EAST 1SLIP, N.Y. 11730
516 433-3342
TRW SEMICONDUCTORS INC PO BOX 24
CAMILLUS, NEW YORK 315 454-4451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-4451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW SEMICONDUCTORS INC PO BOX 64
YORKVILLE, N.Y. 315 454-6451
TRW 5131 577-1750
CATTRIGHT 6 BEAN 525 HARWYN ORIVE CHARLOTTE, N.C. 28205
704 537-7965
TO WHITESELL ASSOC 1172 W GALBRAITH CINCINNATI, OHIO 45231
TIMS 513 577-1750
RO WHITESELL ASSOC 21139 LORAIN AVENUE MAGEK BLDG.
CLEVELAND, OHIO 44126
216 333-3255
TWX 216 333-3250
TWX 115 514 AVENUE COLUMBUS, OHIO 514 488-9731 135' W FIFTH AVENUE
COLUMBUS, OHIO
514 488-9731
TWX 614 759-0680
R O WHITESELL ASSOC
4133 S DIXIE AVENUE
OAYTOM, OHIO 45439
513 298-9546
TWX 513 944-0526
ARNESON ASSOC
P O BOX 12067
PORTLANO. OREGON 97212
503 646-3416
TAW SEMICONDUCTORS INC
P O BOX 11587
PHILADELPHIA, PA. 19116
215 687-1700
R O WHITSELL ASSOC
PENN CENTER BLOG
201 PENN CENTER BLVO
PITTSBURGH, PA. 15235
412 742-0100
CARTWRIGHT 6 BEAN
760 SOUTH COOPER STREET
P O BOX 760
MEMPHIS, TENN, 381C4
901 276-4442
VISTA ENGINEERING
FIRST BANK 6 TRUST BLOG
SUITE 430
RICHARDSON, TEXAS 75080
214 235-4547
TWX 214 231-1400
VISTA ENGINEERING
FOOT ARTON ORIVE
HOUSTON, TEXAS 75080
ARNESON ASSOCS
AS LUCILE STREET
SEATTLE, WASH, 98134
206 725-7664
E A OICKINSON ASSOC INC
3612 GREENBAY AVENUE
MILWAUKEE, WISCONSIN 53212
416 264-1080
REPS. IN OTHER COUNTRIES
MITSUBISHI TRW COMPANY
MITSUBISHI DENGT 18 0.06 MILWAUKCE, WISCUNSIN 33212
414 264-1080
REPS, IN OTHER COUNTRIES
MITSUBISHI TRW COMPANY
MITSUBISHI DENKI BLOG
2-12 MARUNOUCHI CHIYOOO-KU
TOKYO, JAPAN
212-6111
E V JOHANSSEN A/S
ST KONGENSGADE 93
COPENNAGEN K, DENMARK
PALACE 7510
TECHNIQUE ET PRODUITS
63 BIS RUE D AGUESSEAU
BOULOOKE, SUR SEINE, FRANCE
408-14-00
HEK-GMBH LUBBECK
2400 LUEBECK MEK-GMBH LUBECK
2400 LUBECK
POSTLACH 1817. WEST GERMANY
52991
M C P ELECTRONICS
STATION WHARF WORKS
ALPERTON. WEMBLEY
MIDDLESEX. ENGLANO
WEMBLY 1191 TELEINSTRUMENT AB BOX 14. VALLINGBY. SWEDEN 870345

RAERLOCHER AG
ZURICH. SWITZERLAND
51-429900

E G LOMAS LTO
27 LAURIER AVE W
OTTAWA. ONTARIO
613 CE 2-7106
JACORY. MITCHELL
469-475 KENT STREET
5YDNEY. N.S.W.. AUSTRALIA
26-2651

TRYLON. INCORPORATED

OIRECTOR OF MARKETING
THOMAS R. HUMPHREY
BRAND NAMES
TRYLON
COMPANY ADDRESS
ELVERSON. PA. 19520
COMPANY ...ORESENTATIVES
SAM G HARRIS
2437 JACKSON PKWY
VIENNA. VA.
703 56C-4545

T T ELECTRONICS. INC.
SALES MANAGER
J. F. SODARO

T T ELECTRONICS. ENC.
SALES MANAGER
J. F. SODARO
COMPANY ADDRESS
BOX 180
CULVER CITY. CALIF. 90230

TURNER MICROPHONE COMPANY
SALES MANAGER
DOUG BATTIN
BRAND NAMES BRAND NAMES TURNER COMPANY ADDRESS 909 17TH STREET CEDAR REPIDS. 10WA 52402 COMPANY REPRESENTATIVES MORRIS F TAYLOR COMPANY 2328 3RD WAY NE 31RMINGHAM. ALA. 35215 205 853-3673 WES ALDERSON COMPANY 205 853-3673
WES ALDERSON COMPANY
8548 WASHINGTON BLVD
CIULVER CITY, CALIF. 97231
213 VE 7-1398
LOGAN SALES COMPANY
463 RREWSTER AVENUE BOX 1219
REOWOOD CITY. CALIF. 94063
4153 059-6726
GORDON MOSS ELECTRONICS INC
1530 137H AVENUE
P O BOX J
GRELEY, COLORADO
363 353-1452
GOROON MOSS ELECTRONICS INC
P O BOX 26172
DENYFR, COLORADO
303 936-4C27
COALEY BOYD 6 ABBETT INC
6 GAYMOOD ORIVE
MATERBURY, CONN.
203 756-8766
MORRIS F TAYLOR COMPANY
940 LAKE ELBERT ORIVE
WINTER HAVEN, FLORIDA 33880
813 CY 4-2941
MORRIS F TAYLOR COMPANY
PO BOX 458 - MAIL
261 LAKE TRIPLET DR.
CASSELBERRY, FLORIDA
305 838-0821
MORRIS F TAYLOR COMPANY
5908 KENNETH AVENUE
TAMPA, FLORIDA
313 238 2738
WM M LINZ 6 ASSOC
4001 WEST OEVON
CHICAGO, ILLINOIS 60646
312 MU 5-6060
MORRIS-CUNNINGHAM 6 ASSOC
6208 NORTH COLLEGE AVENUE
INDIANAPOLIS, INDIANA 46220
317 CL 5-2458
KELLY-SCHMITZ-WINKFLER ASSOC
3831 4390 STREET
0ES MOINES, IOWA
515 CR 9-9235
KCOTT ORMSBY SALES
230 20TH STREET
THEW ORLEANS, LOUISIANA 70124
504 488-2414
MORRIS F TAYLOR COMPANY
9431 GFORGIA AVENUE BOX 111
SILVER SPRING, MAYLANO 20907
317 JU 9-402
MORRIS F TAYLOR COMPANY
9431 GFORGIA AVENUE BOX 111
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
9431 GFORGIA AVENUE BOX 111
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
9431 GFORGIA AVENUE BOX 111
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
9431 GFORGIA AVENUE BOX 111
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
9431 GFORGIA AVENUE BOX 111
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
1001 AOAMS ORIVE
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
1001 AOAMS ORIVE
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
1001 AOAMS ORIVE
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
1001 AOAMS ORIVE
SILVER SPRING, MAYLANO 20907
31 JU 9-402
MORRIS F TAYLOR COMPANY
1001 AOAMS ORIVE
SILVER SPRING, MAYLANO
1007
MEDITON, MAYLANO
1007
MEDITON, MAYLOR ORIVE
1007
MAYLOR ORIVE
1007
MAYLOR ORIVE
1007
MAYLOR ORIVE MARLTON. N. J. 08053

215 MA 2-0383
GORDON MOSS ELECTRONICS INC
2418 BARCELOMA DRIVE S W
ALBUDUERQUE. N.AW. 87105
505 877-0392
WILLGOLD ELECTRONIC SALES
100 NORTH VILLAGE AVE
ROCKVILLE CENTRE. N.Y. 11571
516 764-022
MARSEY SALES INC
206 PARK AVENUE
RDCHESTER. N.Y. 14607
716 442-9700
MORRIS F TAYLOR COMPANY
1224 DRESDEN DR.. WEST
CHARLDTIE. N.C. 28205
704 KE 7-4878
LES A MORROW COMPANY
3123 WEST 117TH STREET
CLEVELAND. DHIO 44111
216 CL 1-5700
MORRIS F TAYLOR COMPANY
201 PENN CENTER BLVD.
PITTSBURGH. PA. 15235
412 823-8400
MORRIS F TAYLOR COMPANY
APT 105, 9 RICHLAND LANE
CAMP HILL. PA. 17011
717 233-3112 APT 105, 9 RICHLAND LANE
CAMP HILL, PA. 17011
717 233-3112
ERNEST L WILKS COMPANY
1821 NORTH BROADWAY
CARROLLTON, TEXAS
214 CH 2-5321
GORDON MOSS ELECTRONICS INC
1502 PRESIDN STREET
BOX 8022 FOOTHILLS STATION
SALT LAKE CITY 8, UTAH
801 485-2870
M K WIDDEKIND COMPANY
815 W EWING STREET
SEATILE, WASH. 98119
AT 4-8020

TV CABLE SUPPLY COMPANY
SALES MANAGER
JAMES E. MORTON
BRAND NAMES TVC VIDEO INSTRUMENT COMPANY ADDRESS BOX 38 CARLISLE. PA. 17013

ULTRA AUDIO PRODUCTS
FLOON INDUSTRIES, INC
SALES MANAGER
DDN OLIVER
RRAND NAMES
SOUNDESIGN
CUSTOMIXER
CIRCUITESTEP CIRCUITESTER

SPECTACULITE
COMPANY ADDRESS
1140 S. ROBERTSON BLVD.
LOS ANGELES. CALIF. 90035 UNGAR ELECTRIC TOOLS

ELECTRONIC DIVISION OF

ELDON INDUSTRIES. INC

SALES MANAGER

SALES MANAGER
W. L. NEHRENZ
BRAND NAMES
IMPERIAL
MINI-TIP
MICRO-TIP
PRINCESS
UNGAR COMPANY ADDRESS
2701 w. EL SEGUNDD BLVD.
HAWTHORNE, CALIF., 90252
213 757-2151
COMPANY REPRESENTATIVES
MORRIS F TAYLOR CD
2328 3RD WAY. NE
BIRMINGHAM. ALA. 35215
205 853-3673
UNGAR SALES ASSOC
317 GLASGOW AVE
INGLEWOOD, CALIF 9D3D1
213 678-5371
ELVEY-PROCTOR CD
1650 LAUREL ST COMPANY ADDRESS ELVEY-PROCTOR CO 1650 LAUREL ST SAN CARLOS, CALIF 94071 415 593-1121 KOETHER-COX CO 1325 SOUTH INCA ST DENVER, COLO 80223 303 773-5561 MORRIS F TAYLOR CO MORRIS F TAYLOR CO 5908 KENNETH AVE TAMPA. FLORIDA 33604 813 238-2738 G MCL COLE CO 651a WEST HIGGIMS ROAD CHICAGO, ILL. 60656 312 774-3555 CHICAGO. ILL. 60656
312 774-3535
FRANK MCSWEENEY CO
4123 N KEYSTONE BLVD
INDIANAPOLIS, IND 46205
317 347-2112
STANLEY A HARRIS CD
60 DEDHAM AVE
NEEDHAM MASS 02192
617 444-4780
ROBERT MILSK CO
19375 JAMES COUZENS HWY
DETROIT, HICH 48235
313 342-6660
RAY RIPLEY & ASSOC
6338 PILLSBURY AVE SO
MINNEAPDLIS, MINN 55423
612 866-8682
L R MASSEY CO
304 E JEFFERSON ST
GREENMOOO, MISS 38930

GREENWOOD. MISS 38930

601 443-3038
DIPRO INC
P D ROX 1427
MARYLAND HEIGHTS, MO 63042
314 432-3444
R W FARRIS CO INC
1715 BALTIMORE AVE
KANSAS CITY, MO 64108
816 421-1751
MORRIS F TAYLOR CO
P D BOX 23
MARLTON, N. J. 08053
609 983-1712
811 TIAN ASSOC INC
381 SUNRISE HWY
LYNBROOK + LONG ISLAND, N Y
516 593-3833
LOUIS W APPFLL CO
11 WARREN ST
NEW YORK, N Y 10707
212 964-4255
LEDNARD D ALLEN CD
P O RDX 205
NORTH SYRACUSE, N Y 13212
315 478-7470
MORRIS F TAYLDR CD
1224 DRESDEN OR, W
CHARLOTITE, N. C. 28205
704 537-4878
AFHR-GREENLEAF & ASSOC
1470C DETROIT AVE
CLFVELAND, DHID 44107
216 221-9030
MORRIS F TAYLDR CO
4341 CARLISLE PIKE
CAMP HILL, PA. 17011
717 761-2958
MORRIS F TAYLDR CO
4341 CARLISLE PIKE
CAMP HILL, PA. 17011
717 761-2958
MORRIS F TAYLOR CO
201 PENN CENTER BLVD.
PITISBURGH, PA. 15235
412 823-8500
M F KLICPERA CO
P O BOX 2668
MOUSTON, TEXAS 77001
713 748-0874
JAMES J BACKER CD
2211 W GALER ST
SEATILE, WASH 99119
206 283-6470
JNITED RADID SUPPLY INC
INDUSTRIAL DIVISION 601 443-3038

UNITED RADID SUPPLY INC INDUSTRIAL DIVISION SALES MANAGER JOHN RIES BRAND NAMES KUSTOM ELECTRONICS
COMPANY ADDRESS
829 W. BURNSIDE
PORTLAND. OREGON 97209
503-226-6334

UNITED STATES PLASTIC ROPE INC
VICE PRESIDENT - SALES
PETER M. LIND
BRAND NAMES
GLASTRAN
COMPANY ADDRESS
711 HAMILTON AVE.
MENLO PARK, CALIF. 94025
415-322-1881

UNITED STATES TOWERS
OWNER
JOHN J. HOKE
COMPANY ADDRESS
249 BARTOW LANE PETERSBURG. VA. 732-9350

UNITED TRANSFORMER COMPANY
SALES MANAGER
J. R. BARRECA
BRAND NAMES BRAND NAMES
CAT
CDMPACT
DECIOUNCER
DI-T
DI-T200
DO-T
DO-T400 HIPERMALLOY HIPERMALLOY
HIT
HVC VARIDUCTOR
HVV VARIDUCTOR
LAB
LINEAR STANDARD MAT MET MINIDUCTOR
MINIFILTER
OUNCER
PIP
S SERIES
SPECIAL SERIES
SUBOUNCER
SUBO-SUBOUNCER
TELE-MINIFILTER
TVC VARIDUCTOR
ULTRA-COMPACT
UNITED
UTC MINIDUCTOR VARIDUCTOR VARIMATCH VARIPOWER VARITRAN VIC VARIDUCTOR VIC VARIDUCTOR
PIL
MAS
FLATS
FE
FI
FO
COMPANY ADDRESS
150 VARICK STREET
NEW YORK NEW YORK 10013
212-AL5-3500 COMPANY REPRESENTATIVES
CARTER ASSOCIATES INC
P D BOX 94
SCDITSDALE ARIZ 85252
602 947-4355
RECHT ASSOC
175 S SAN ANTONIO RD
LOS ALTOS. CALIF
415 941-0336
ELLARD F STRASSNER
3121 LOS FELIZ SLVO
LOS ANGFLES. CALIF
213 666-1511
UTC PACIFIC DIV.
3630 EASTHAM ORIVE
CULVER CITY. CALIF
213 870-9755
FRANKLIN SALES CO
2149 SOUTH CLERMONT ST
ORNVER. COLO. 80222
303 757-1371
GERBER SALES CO INC
31 BROADMAY
NEW HAVEN. CONN 06515
203 777-6279
MILLAR-HUTTO ASSOC INC
PO 8DX 1603
MINTER PARK. FLA 32790
375 647-7407
MILLAR-HUTTO ASSOC INC
1036 PEACHTREE ST N F
PO 80X 7116. STA C
ATLANTA. GA 30309
404 876-0919
WHITMORE ASSOC
4750 N MILMAUKE AVE
CHICAGO. ILL 60630
312 286-2442
LORENZ SALES INC
220 361H STREET S
ECDAR RAPIOS. IOWA 52403
319 366-0774
L D LOWERY INC
620G ANNAPOLIS RO
HYATTSVILLE. MD 20784
301 773-4977
GERBER SALES CO INC
176 SECOND AVE
WALTHAM, MASS 02154
617 891-8040
FRED B HILL CD
6110 EXCELSION BLVD
MINNERPOLIS. MINN 55416
612 929-6727
HARRIS-HANSON CO
2814 S SRENTWOOD BLVO
ST LOUIS. MO 63144
314 647-4350
FRANK W TAYLOR CO INC
4455 EAST GENESEE ST
DEWITT. N Y 13214
315 446-0422
COMTRONIC ASSOC
1551 FRANKLIN AVE
MINECULA 11. L I. N Y
516 741-8966
BEN MILLER
D D 80X 72
LITTLE NECK. N Y 11363
221 224-4673
MILLAR-HUTTO ASSOC INC
1315 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 224-4673
MILLAR-HUTTO ASSOC INC
1315 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 224-4673
MILLAR-HUTTO ASSOC INC
1315 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 224-4673
MILLAR-HUTTO ASSOC INC
1315 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 224-6673
MILLAR-HUTTO ASSOC INC
1315 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 224-6673
MILLAR-HUTTO ASSOC INC
1315 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 224-6673
MILLAR-HUTTO ASSOC INC
1375 OS SHARON AMITY RD
D OBX 72
LITTLE NECK. N Y 11363
221 234-65739

D LOWERY INC
2801 354-5300

D LOWERY INC
2801 354-5300 2801 WEST CHESTER PIKE
RROOMALL PA 19008
215 356-5300
8215 356-5300
6ENE S ROOT & CO
809 WAINWRIGHT ORTVE
PITTSBURCH- PA 15228
412 561-4125
J Y SCHOONMAKER CO INC
5328 REDFIELD 80X 35266
DALLAS- TEXAS 75235
214 631-8480
J Y SCHOONMAKER CO INC
6001 GUIF FREEWAY
HOUSTON. TEXAS 77023
713 926-9510
JAS- J BACKER CO
221 WEST GALER ST
P 0 80X 9327
SEATTLE, WASH 98119
206 283-6470

UP-RIGHT SCAFFOLDS SALES MANAGER R. L. ESKEN UP-RIGHT TOTA-LOCK
COMPANY ADDRESS
1013 PARDEE STREET
BERKELEY. CALIF. 94710

UPSON BROTHERS INCORPORATED SALES MANAGER SALES MANAGER

H. VELEPEC
BRAND NAMES
HOLD-E-ZEE
ROL-TITE
COMPANY ADDRESS
65 BROAD STREET
ROCHESTER, N. V. 14614
COMPANY REPRESENTATIVES
G C RATCLIFF
1738 E GRANGE OR
PHOENIX, ARIZ 85016
602 266-8238
DONALO E SAVARD CO

126 E VALLEY BLVD
ALHAMBRA, CALIF 91801
283-05^4
WILLARD IHLEFELO & ASSOC
1201 SAN MARCO BLVD
JACKSDNYJLLE, FLA 32217
305 FL 9-5282
ANDERSON SALES CO
23 W CALENDAR AVE
LAGRANGE, ILL 60525
312 FL 2-1514
F T HARSH CO LAGRANGE. ILL 60529
312 FL 2-1514
F T HARSH CO
15 FARM HILLS LANE.
HINGHAM, MASS 02049
617 749-3555
SIFMERS, GDDDEN. OLSON
324 N FIRST ST
MINNEAPOLIS. MINN 55401
612 FE 2-7793
CHAS H KOSLOWSKY CD
406 W 34TH ST
KANSAS CITY. MO 64111
816 WE 1-8088
FKPDRT AGENCIES CDRP
EXPORT ONLY
50 BROADWAY
NEW YORK. N.Y. 10004
212 WH 4-1141
HIPKISS 6 HULBERT INC
P O BOX 148
KENT. DHIO 40240
216 673-4416
G W K VOIGHT CO.
333 W STATE ST
ME01A. PA 19063
215 LD 6-9021
D R WERER
P O ROX 534
NORRISTOMN. PA 19001
215 BR 5-4049
LYNN 6 HEMPHILL
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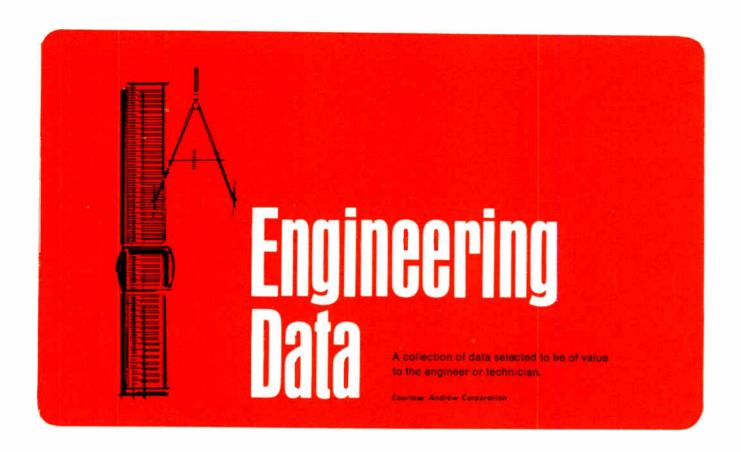


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AUDIO

NETWORKS

Unbalanced Configurations

Unbalanced networks encompass the T-type, taper pads, bridged-T, L-type, pi, ladder, and potentiometer.

You will notice, when looking through the network design equations, that the factor k appears in all equations. The kfactor represents the ratio of current, voltage, or power corresponding to a given value of attenuation expressed in decibels.

To simplify the calculation of attenuator networks, the values of the most frequently used expressions, as tabulated by P. K. McElroy, are given in Table 1. Values for the expressions are substituted in the equations, thus saving much time and resulting in greater accuracy.

It is recommended, when large amounts of attenuation are required, that the loss be divided between two or more attenuator networks. This reduces the possibility of leakage at the higher frequencies and simplifies the construction, because some circuit element values become quite small as the attenuation is increased. As an example, if 80 dB of attenuation is required, it is far more practical to employ two tandem-connected 40-dB pads than to construct one of 80-dB loss. The 80dB pad would require a shunt resistor of 0.12 ohms for a T-type attenuator, whereas in the 40-dB network it would be 12 ohms.

The given loss of an attenuator can only be obtained when the input and output circuits of the attenuator network are terminated in the design impedance. Although the terms input and output are frequently used in the discussion of attenuators, in reality there is no input or output to an attenuator; it makes no difference to the network which side is connected to the source or terminating circuit as long as the impedance match is satisfied. If a pad designed to operate between 600 ohms and 250 ohms is reversed, the pad will operate; however, the mismatch will cause a loss of level and may result in serious frequency distortion because of the impedance mismatch. The actual loss in decibels, for a given mismatch of impedance, is shown graphically in Fig. 1.

Material for the section "Audio Networks" has been adapted from the Howard W. Sams book Passive Audio Network Design, by Howard M. Tremaine.

T Configuration

A T-configuration network consists of three noninductive resistors, as shown in Fig. 2. T-type networks may be designed to operate between impedances of equal or unequal values. When properly designed, they will present an impedance match to both the source and load impedances regardless of the amount of loss. If the input and output impedance are of the same value, they are designated by the symbol Z. If they are of unequal values, symbols Z_1 and Z_2 are used. Symbols R_1 , R_2 , and R are used only with unequal impedances. For equal impedance R₁ appears in both the input and output sides, and the shunt resistor is then designated as R₂ (Fig. 2A). The resistor values for a pad to operate between equal impedances may be calculated:

$$R_1 = \left(\frac{k-1}{k+1}\right) Z$$

$$R_2 = \left(\frac{k}{k^2 - 1}\right) 2Z$$

where.

Z is the input and output impedance,

R₁ is the series resistor,

R₂ is the shunt resistor.

As an illustration, assume an attenuator is to be designed for a loss of 10 dB and is to operate in a 600-ohm circuit. Referring to Table 1, the k factor for \mathbb{R}_1 at a loss of 10 dB is 0.519, and for R₂ it is 0.351; therefore:

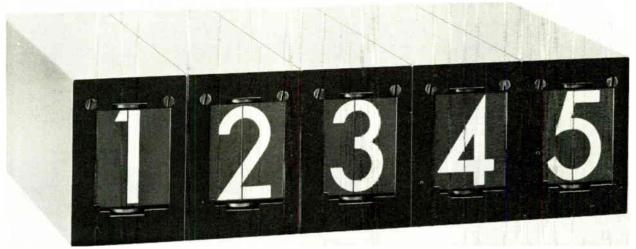
$$R_r = 0.519 \times 600$$

= 311.4 ohms
 $R_z = 0.351 \times 1200$
= 421.2 ohms

Practical construction of this network would require two 310ohm and one 420-ohm resistors.

Table 1. K Factors for Calculating Attenuator Loss Values

| | Table 1. K Factors for Calculating Attenuator Loss Values | | | | | | | | | | | | |
|--------------------------------------|---|--|---|---|---|--|------------------|--|---|---|---|--|--------------------------------------|
| #(dB) | $r=\frac{1}{k}$ | k | k² | $\frac{k-1}{k+1}$. | $\frac{k+1}{k-1}$ | k k ² -1 | <u>k²-1</u> k | =k-r | k ² -1 | $\frac{k-1}{k} = 1 - r$ | $\frac{k}{k-1} = \frac{1}{1-r}$ | 1 k-1 | n(dB) |
| 0.05 | 0.994260 | 1.0057731 | 1.011579 | 0.0028783 | 347.43 | 86.8618 | | 0.011513 | 173.73 | 0.0057395 | 174.22 | 173.22 | 0.05 |
| 0.1 | 0.98855 | 1.011579 | 1.023292 | 0.0057562 | 173.73 | 43.4303 | | 0.023029 | 86.866 | 0.011448 | 87.363 | 86.363 | 0.1 |
| 0.2 | 0.97724 | 1.023292 | 1.047128 | 0.011512 | 86.866 | 21.713 | | 0.046052 | 43.437 | 0.022762 | 33.933 | 32.933 | 0.2 |
| 0.3 | 0.96605 | 1.035143 | 1.071520 | 0.017268 | 57.911 | 14.473 | | 0.069093 | 28.965 | 0.033949 | 19.455 | 18.455 | 0.3 |
| 0.4 | 0.95499 | 1.047128 | 1.096477 | 0.023022 | 43.437 | 10.854 | | 0.092138 | 21.730 | 0.045007 | 22.219 | 21.219 | 0.4 |
| 0.5 | 0.94406 | 1.059254 | 1.12202 | 0.028774 | 34.754 | 8.6810 | | 0.11519 | 17.391 | 0.055939 | 17.877 | 16.877 | 0.5 |
| 0.6 | 0.93325 | 1.071520 | 1.14815 | 0.034525 | 28.965 | 7.2427 | | 0.13827 | 14.499 | 0.066746 | 14.982 | 13.982 | 0.6 |
| 0.7 | 0.92257 | 1.083928 | 1.17490 | 0.040274 | 24.830 | 6.1974 | | 0.16136 | 12.435 | 0.077428 | 12.915 | 11.915 | 0.7 |
| 0.8 | 0.91201 | 1.096477 | 1.20227 | 0.046019 | 21.730 | 5.4209 | | 0.18447 | 10.888 | 0.087988 | 11.365 | 10.365 | 0.8 |
| 0.9 | 0.90157 | 1.10917 | 1.23027 | 0.051763 | 19.319 | 4.8168 | | 0.20760 | 9.6853 | 0.098429 | 10.160 | 9.1600 | 0.9 |
| 1.0 | 0.89125 | 1.12202 | 1.25893 | 0.057502 | 17.391 | 4.3335 | | 0.23077 | 8.7237 | 0.10875 | 9.1954 | 8.1954 | 1.0 |
| 1.1 | 0.88105 | 1.13501 | 1.28825 | 0.063237 | 15.814 | 3.9376 | | 0.25396 | 7.9384 | 0.11895 | 8.4069 | 7.4069 | 1.1 |
| 1.2 | 0.87096 | 1.14815 | 1.31826 | 0.068968 | 14.499 | 3.6076 | | 0.27719 | 7.2842 | 0.12904 | 7.7499 | 6.7499 | 1.2 |
| 1.3 | 0.86099 | 1.16145 | 1.34896 | 0.074695 | 13.388 | 3.3283 | | 0.30046 | 6.7313 | 0.13901 | 7.1939 | 6.1939 | 1.3 |
| 1.4 | 0.85114 | 1.17490 | 1.38038 | 0.080418 | 12.435 | 3.0888 | | 0.32376 | 6.2579 | 0.14886 | 6.7176 | 5.7176 | 1.4 |
| 1.5 | 0.84139 | 1.18850 | 1.41254 | 0.086132 | 11.610 | 2.8809 | | 0.34711 | 5.8480 | 0.15861 | 6.3050 | 5.3050 | 1.5 |
| 1.6 | 0.83176 | 1.20227 | 1.44544 | 0.091846 | 10.888 | 2.6991 | | 0.37051 | 5.4899 | 0.16824 | 5.9439 | 4.9439 | 1.6 |
| 1.7 | 0.82224 | 1.21618 | 1.47911 | 0.097551 | 10.251 | 2.5384 | | 0.39394 | 5.1744 | 0.17776 | 5.6258 | 4.6258 | 1.7 |
| 1.8 | 0.81283 | 1.23027 | 1.51356 | 0.103249 | 9.6853 | 2.3956 | | 0.41744 | 4.8944 | 0.18717 | 5.3427 | 4.3427 | 1.8 |
| 1.9 | 0.80353 | 1.24452 | 1.54882 | 0.108939 | 9.1794 | 2.2676 | | 0.44099 | 4.6442 | 0.19647 | 5.0897 | 4.0897 | 1.9 |
| 2.0 | 0.79433 | 1.25893 | 1.58489 | 0.11463 | 8.7241 | 2.1523 | | 0.46460 | 4.4195 | 0.20567 | 4.8620 | 3.8620 | 2.0 |
| 2.2 | 0.77625 | 1.28825 | 1.65959 | 0.12597 | 7.9384 | 1.9531 | | 0.51200 | 4.0322 | 0.22375 | 4.4692 | 3.4692 | 2.2 |
| 2.4 | 0.75858 | 1.31826 | 1.73780 | 0.13728 | 7.2842 | 1.7867 | | 0.55968 | 3.7108 | 0.24142 | 4.1421 | 3.1421 | 2.4 |
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| 2.6 | 0.74131 | 1.34896 | 1.81970 | 0.14856 | 6.7313 | 1.6457 | | 0.60765 | 3.4399 | 0.25829 | 3.8657 | 2.8657 | 2.6 |
| 2.8 | 0.72444 | 1.38038 | 1.90546 | 0.15980 | 6.2579 | 1.5245 | | 0.65594 | 3.2088 | 0.27556 | 3.6289 | 2.6289 | 2.8 |
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| 3.4 | 0.67608 | 1.47911 | 2.18776 | 0.19326 | 5.1744 | 1.2453 | | 0.80302 | 2.6838 | 0.32392 | 3.0872 | 2.0872 | 3.4 |
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| 3.6 | 0.66069 | 1.51356 | 2.2909 | 0.20432 | 4.8944 | 1.1725 | | 0.85289 | 2.5493 | 0.33931 | 2.9472 | 1.9472 | 3.6 |
| 3.8 | 0.64565 | 1.54882 | 2.3988 | 0.21532 | 4.6442 | 1.1072 | | 0.90314 | 2.4298 | 0.35435 | 2.8221 | 1.8221 | 3.8 |
| 4.0 | 0.63096 | 1.58489 | 2.5119 | 0.22627 | 4.4194 | 1.0483 | | 0.95393 | 2.3229 | 0.36904 | 2.7097 | 1.7097 | 4.0 |
| 4.5 | 0.59566 | 1.67880 | 2.8184 | 0.25340 | 3.9464 | 0.92323 | | 1.08314 | 2.0999 | 0.40434 | 2.4732 | 1.4732 | 4.5 |
| 5.0 | 0.56234 | 1.77828 | 3.1623 | 0.28013 | 3.5698 | 0.82241 | | 1.21594 | 1.9249 | 0.43766 | 2.2849 | 1.2849 | 5.0 |
| 5.5 | 0.53088 | 1.88365 | 3.5481 | 0.30643 | 3.2633 | 0.73922 | | 1.35277 | 1.7849 | 0.46912 | 2.1317 | 1.1317 | 5.5 |
| 6.0 | 0.50119 | 1.99526 | 3.9811 | 0.33228 | 3.0095 | 0.66932 | | 1,49407 | 1.6709 | 0.49881 | 2.0048 | 1.0048 | 6.0 |
| 6.5 | 0.47315 | 2.1135 | 4.4668 | 0.35764 | 2.7961 | 0.60964 | | 1.6403 | 1.5769 | 0.52685 | 1.89807 | 0.89807 | 6.5 |
| 7.0 | 0.44668 | 2.2387 | 5.0119 | 0.38246 | 2.6146 | 0.55801 | | 1.7920 | 1.4985 | 0.55332 | 1.80730 | 0.80730 | 7.0 |
| 7.5 | 0.42170 | 2.3714 | 5.6234 | 0.40677 | 2.4584 | 0.51291 | | 1.9497 | 1.4326 | 0.57830 | 1.72918 | 0.72918 | 7.5 |
| 8.0 | 0.39811 | 2.5119 | 6.3096 | 0.43051 | 2.3228 | 0.47309 | | 2.1138 | 1.3767 | 0.60189 | 1.66142 | 0.66142 | 8.0 |
| 8.5 | 0.37584 | 2.6607 | 7.0795 | 0.45366 | 2.2043 | 0.43765 | | 2.2849 | 1.3290 | 0.62416 | 1.60216 | 0.60216 | 8.5 |
| 9.0 | 0.35481 | 2.8184 | 7.9433 | 0.47622 | 2.0999 | 0.40592 | | 2.4636 | 1.2880 | 0.64519 | 1.54993 | 0.54993 | 9.0 |
| 9.5 | 0.33497 | 2.9854 | 8.9125 | 0.49817 | 2.0074 | 0.37730 | | 2.6504 | 1.2528 | 0.66503 | 1.50368 | 0.50368 | 9.5 |
| 10.0 | 0.31623 | 3.1623 | 10.000 | 0.51950 | 1.9249 | 0.35137 | | 2.85 0 1 | 1.2222 | 0.68377 | 1.46247 | 0.46247 | 10.0 |
| 10.5 | 0.29854 | 3.3497 | 11.220 | 0.54020 | 1.8512 | 0.32775 | | 3.0512 | 1.1957 | 0.70146 | 1.42559 | 0.42559 | 10.5 |
| 11.0 | 0.28184 | 3.5481 | 12.589 | 0.56026 | 1.7849 | 0.30616 | | 3.2663 | 1.1726 | 0.71816 | 1.39245 | 0.39245 | 11.0 |
| 11.5 | 0.26607 | 3.7584 | 14.125 | 0.57969 | 1.7251 | 0.28635 | | 3.4923 | 1.1524 | 0.73393 | 1.36253 | 0.36253 | 11.5 |
| 12.0 | 0.25119 | 3.9811 | 15.849 | 0.59848 | 1.6709 | 0.26811 | | 3.7299 | 1.1347 | 0.74881 | 1.33545 | 0.33545 | 12.0 |
| 12.5 | 0.23714 | 4.2170 | 17.783 | 0.61664 | 1.6217 | 0.25127 | | 3.9799 | 1.1192 | 0.76286 | 1.31085 | 0.31085 | 12.5 |
| 13.0 | 0.22387 | 4.4668 | 19.953 | 0.63416 | 1.5769 | 0.23568 | | 4.2429 | 1.1055 | 0.77613 | 1.28845 | 0.28845 | 13.0 |
| 13.5 | 0.21135 | 4.7315 | 22.387 | 0.65105 | 1.5360 | 0.22123 | | 4.5202 | 1.0935 | 0.78865 | 1.26799 | 0.26799 | 13.5 |
| 14.0 | 0.19953 | 5.0119 | 25.119 | 0.66733 | 1.4985 | 0.20780 | | 4.8124 | 1.0829 | 0.80047 | 1.24926 | 0.24926 | 14.0 |
| 14.5 | 0.18836 | 5.3088 | 28.184 | 0.68298 | 1.4642 | 0.19529 | | 5.1204 | 1.0736 | 0.81164 | 1.23208 | 0.23208 | 14.5 |
| 15.0 | 0.17783 | 5.6234 | 31.623 | 0.69804 | 1.4326 | 0.18363 | | 5.4456 | 1.0653 | 0.82217 | 1.21629 | 0.21629 | 15.0 |
| 15.5 | 0.16788 | 5.9566 | 35.481 | 0.71250 | 1.4035 | 0.17275 | | 5.7887 | 1.0580 | 0.83212 | 1.20175 | 0.20175 | 15.5 |
| 16.0 | 0.15849 | 6.3096 | 39.811 | 0.72639 | 1.3767 | 0.16257 | | 6.1511 | 1.0515 | 0.84151 | 1.18834 | 0.18834 | 16.0 |
| 16.5 | 0.14962 | 6.6834 | 44.668 | 0.73970 | 1.3519 | 0.15305 | | 6.5338 | 1.0458 | 0.85038 | 1.17595 | 0.17595 | 16.5 |
| 17.0 | 0.14125 | 7.0795 | 50.119 | 0.75246 | 1.3290 | 0.14413 | | 6.9382 | 1.04071 | 0.85875 | 1.16449 | 0.16449 | 17.0 |
| 17.5 | 0.13335 | 7.4989 | 56.234 | 0.76468 | 1.3077 | 0.13577 | | 7.3655 | 1.03621 | 0.86665 | 1.15387 | 0.15387 | 17.5 |
| 18.0 | 0.12589 | 7,9433 | 63.096 | 0.77637 | 1.2880 | 0.12792 | | 7.8174 | 1.03220 | 0.87411 | 1.14402 | 0.14402 | 18.0 |
| 18.5 | 0.118850 | 8.4139 | 70.795 | 0.78755 | 1.2698 | 0.12055 | | 8.2950 | 1.02866 | 0.88115 | 1.13488 | 0.13488 | 18.5 |
| 19.0 | 0.112202 | 8.9125 | 79.433 | 0.79823 | 1.2528 | 0.11363 | | 8.8003 | 1.02550 | 0.88780 | 1.12638 | 0.12638 | 19.0 |
| 19.5 | 0.105925 | 9.4406 | 89.125 | 0.80844 | 1.2369 | 0.10713 | | 9.3347 | 1.02269 | 0.89407 | 1.11847 | 0.11847 | 19.5 |
| 20.0 | 0.100000 | 10.0000 | 100.000 | 0.81818 | 1.2222 | 0.10101 | | 9.9000 | 1.02020 | 0.90000 | 1.11111 | 0.11111 | 20.0 |
| 20.5 | 0.094406 | 10.5925 | 112.202 | 0.82747 | 1.2085 | 0.095255 | | 10.498 | 1.01799 | 0.90559 | 1.10425 | 0.10425 | 20.5 |
| 21.0 | 0.089125 | 11.2202 | 125.893 | 0.83634 | 1.1957 | 0.089841 | | 11.131 | 1.01601 | 0.91087 | 1.09785 | 0.097845 | 21.0 |
| 21.5 | 0.084139 | 11.8850 | 141.254 | 0.84478 | 1.1837 | 0.084739 | | 11.801 | 1.01426 | 0.91586 | 1.09187 | 0.091870 | 21.5 |
| 22.0 | 0.079433 | 12.589 | 158.49 | 0.85282 | 1.1726 | 0.079935 | | 12.510 | 1.01270 | 0.92057 | 1.08629 | 0.086291 | 22.0 |
| 22.5 | 0.074989 | 13.335 | 177.83 | 0.86048 | 1.1621 | 0.075411 | | 13.260 | 1.01126 | 0.92501 | 1.08107 | 0.081070 | 22.5 |
| 23.0 23.5 24.0 24.5 25.0 | 0 070795 0.066834 0.063096 0.059566 0.056234 | 14.125 14.962 15.849 16.788 17.783 | 199.53 223.87 251.19 281.84 316.23 | 0.86777 0.87470 0.88130 0.88756 0.89352 | 1.1524 1.1432 1.1347 1.1267 1.1192 | 0.071148 0.067133 0.063348 0.059778 0.056413 | | 14.054 14.895 15.786 16.728 17.727 | 1.01007 1.00897 1.00799 1.00712 1.00634 | 0.93690 0.94043 | 1.07619 1.07162 1.06734 1.06334 1.05958 | 0.076190 0.071623 0.067345 0.063339 0.059584 | 23.0 23.5 24.0 24.5 25.0 |
| 25.5 | 0.053088 | 18.836 | 354.81 | 0.89917 | 1.1121 | 0.053238 | | 18.783 | 1.00565 | 0.94691 | 1.05607 | 0.056066 | 25.5 |
| 26.0 | 0.050119 | 19.953 | 398.11 | 0.90455 | 1.1055 | 0.050246 | | 19.903 | 1.00504 | 0.94988 | 1.05276 | 0.052762 | 26.0 |
| 26.5 | 0.047315 | 21.135 | 446.68 | 0.90965 | 1.0993 | 0.047422 | | 21.088 | 1.00449 | 0.95268 | 1.04966 | 0.049665 | 26.5 |
| 27.0 | 0.044668 | 22.387 | 501.19 | 0.91448 | 1.0935 | 0.044757 | | 22.342 | 1.00400 | 0.95533 | 1.04676 | 0.046757 | 27.0 |
| 27.5 | 0.042170 | 23.714 | 562.34 | 0.91907 | 1.0881 | 0.042245 | | 23.672 | 1.00356 | 0.95783 | 1.04403 | 0.044026 | 27.5 |
| 28.0 28.5 29.0 29.5 30.0 | 0.039811 0.037584 0.035481 0.033497 0.031623 | 25.119 26.607 28.184 29.854 31.623 | 630.96 707.95 794.33 891.25 1,000.0 | 0.92343 0.92755 0.93147 0.93518 0.93869 | 1.0829 1.0781 1.0736 1.0693 1.0653 | 0.039874 0.037636 0.035526 0.033534 0.031655 | | 25.079 26.569 28.149 29.821 31.591 | 1.00317 1.00283 1.00252 1.00225 | 0.96019 0.96242 0.96452 0.96650 0.96836 | 1.04146 1.03905 1.03679 1.03466 1.03266 | 0.041461 0.039052 0.036786 0.034657 0.032655 | 28.0 28.5 29.0 29.5 30.0 |
| 31.0 31.5 32.0 33.0 34.0 | 0.028184 0.026607 0.025119 0.022387 0.019953 | 35.481 37.584 39.811 44.668 50.119 | 1,258.9 1,412.5 1,584.9 1,995.3 2,511.9 | 0.94518 0.94817 0.95099 0.95621 0.96088 | 1.0580 1.0547 1.0515 1.0458 1.04072 | 0.028207 0.026627 0.025135 0.022398 0.019961 | | 35.453 37.558 39.786 44.646 50.099 | 1.00159 1.00142 1.00126 1.00100 1.00080 | 0.97339 0.97488 0.97761 | 1.02900 1.02733 1.02577 1.02290 1.02036 | 0.029001 0.027334 0.025766 0.022900 0.020359 | 31.0 31.5 32.0 33.0 34.0 |



Numbers your TV cameras can read without eye-strain.

Numbers, letters, symbols. If they're in lights, they can cause problems. Ghosts appear and bulbs burn out. Their images may permanently damage camera tubes. Now CBS Laboratories offers the way out: Model DDU-1A electro-mechanical indicator units with characters displayed on a flat plane for optimum readability with viewing angles as high as 145°.

Here's the perfect way to display election return figures, ball scores, stock market or commodity ex-

change quotations and similar information.

A vertical split-flap "book page" mechanism provides uniform reflectivity and maximum character clarity under both high and low ambient lighting conditions.

Our Digital Display Units are the business end of a complete digital display system, including power supply

and a compact digital display control that allow rapid selection of up to 192 digits, letters or symbols.

Operating power of only 2.7 watts per unit means cool

operation and low power control circuitry. No power at all is required between postings

Modular construction permits high packing density with significant space savings and maximum flexibility. Custom characters and colors are available on special order.

The DDU-1As are priced from \$32.50 to \$50.00 each, depending on quantity ordered. Our Model 192 Digital Display Control is priced at \$1094. Custom design controls for special applications are no problem. Our Display System Engineers will help to plan your total

SPECIFICATIONS:

Character Description Maximum of 12 characters; digits 1 through 9, 0 and 2 blank positions supplied on

standard unit

Character Dimensions Height: 11/2 inches Width: 11/4 inches **Unit Dimensions**

Height: 2% inches Width: 2 inches Length: 7 inches

Unit Weight

11/2 lbs. **Power Requirements**

Motor: 60 cycle, 115 volts, AC

Relay: 24 volts, DC

Maximum of 2.7 watts **Operating Power**

required

Operating Speed

Consecutive change: 0.25 seconds

Complete 12-step cycle:

3.0 seconds

Mounting

Bottom mounting holes:

2 front, 2 rear

Connections

Jones Type P-318-AB

Connector.

Model 192 Digital Display Control features fail-safe truth circuitry, automatic homing control, and provides positive control of up to 192 DDU-1As. Custom controls for larger systems are available.



LABORATORIES

Stamford, Connecticut. A Division of Columbia Broadcasting System, Inc.

| | _ | | | | | | | | | | | |
|---|--|---|--|--|--|--|--|--|--|--|--|--------------------------------------|
| 34.5 | 0.018836 | 53.088 | 2,818.4 | 0.96302 | 1.03840 | 0.018843 | 53.069 | 1.00071 | 0.98116 | 1.01920 | 0.019198 | 34.5 |
| 35.0 | 0.017783 | 56.234 | 3,162.3 | 0.96506 | 1.03621 | 0.017788 | 56.216 | 1.00063 | 0.98222 | 1.01810 | 0.018105 | 35.0 |
| 36.0 | 0.015849 | 63.096 | 3,981.1 | 0.96880 | 1.03221 | 0.015853 | 63.080 | 1.00050 | 0.98415 | 1.01610 | 0.016104 | 36.0 |
| 37.0 | 0.014125 | 70.795 | 5,011.9 | 0.97214 | 1.02866 | 0.014128 | 70.781 | 1.00040 | 0.98588 | 1.01433 | 0.014328 | 37.0 |
| 37.5 | 0.013335 | 74.989 | 5,623.4 | 0.97368 | 1.02703 | 0.013338 | 74.976 | 1.00036 | 0.98666 | 1.01352 | 0.013516 | 37.5 |
| 38.0 | 0.012589 | 79.433 | 6,309.6 | 0.97513 | 1.02550 | 0.012591 | 79.420 | 1.00032 | 0.98741 | 1.01275 | 0.012750 | 38.0 |
| 39.0 | 0.0112202 | 89.125 | 7,943.3 | 0.97781 | 1.02270 | 0.0112216 | 89.114 | 1.00025 | 0.98878 | 1.01135 | 0.011348 | 39.0 |
| 40.0 | 0.0100000 | 100.000 | 10,000. | 0.98020 | 1.02020 | 0.0100010 | 99.990 | 1.00020 | 0.99000 | 1.01010 | 0.010101 | 40.0 |
| 40.5 | 0.0094406 | 105.925 | 11,220. | 0.98130 | 1.01906 | 0.0094414 | 105.916 | 1.00018 | 0.99056 | 1.00953 | 0.0095306 | 40.5 |
| 41.0 | 0.0089125 | 112.202 | 12,589. | 0.98233 | 0.01799 | 0.0089134 | 112.193 | 1.00016 | 0.99109 | 1.00899 | 0.0089926 | 41.0 |
| 42.0 | 0.0079433 | 125.89 | 15,849. | 0.98424 | 1.01601 | 0.0079436 | 125.88 | 1.00013 | 0.99206 | 1.00801 | 0.0080070 | 42.0 |
| 43.0 | 0.0070795 | 141.25 | 19,953. | 0.98594 | 1.01426 | 0.0070795 | 141.24 | 1.00010 | 0.99292 | 1.00713 | 0.0071301 | 43.0 |
| 43.5 | 0.0066834 | 149.62 | 22,387. | 0.98672 | 1.01346 | 0.0066834 | 149.61 | 1.00009 | 0.99332 | 1.00673 | 0.0067286 | 43.5 |
| 44.0 | 0.0063096 | 158.49 | 25,119. | 0.98746 | 1.01270 | 0.0063096 | 158.49 | 1.00008 | 0.99369 | 1.00635 | 0.0063496 | 44.0 |
| 45.0 | 0.0056234 | 177.83 | 31,623. | 0.98887 | 1.01131 | 0.0056234 | 177.83 | 1.00006 | 0.99438 | 1.00566 | 0.0056551 | 45.0 |
| 46.0 | 0.0050119 | 199.53 | 39,811. | 0.99003 | 1.01007 | 0.0050119 | 199.53 | 1.00005 | 0.99499 | 1.00504 | 0.0050370 | 46.0 |
| 46.5 | 0.0047315 | 211.35 | 44,668. | 0.99058 | 1.00951 | 0.0047315 | 211.35 | 1.000045 | 0.99527 | 1.00475 | 0.0047540 | 46.5 |
| 47.0 | 0.0044668 | 223.87 | 50,119. | 0.99111 | 1.00897 | 0.0044668 | 223.87 | 1.000040 | 0.99553 | 1.00449 | 0.0044869 | 47.0 |
| 48.0 | 0.0039811 | 251.19 | 63,096. | 0.99207 | 1.00799 | 0.0039811 | 251.19 | 1.000032 | 0.99602 | 1.00400 | 0.0039970 | 48.0 |
| 49.0 | 0.0035481 | 281.84 | 79,433. | 0.99293 | 1.00712 | 0.0035481 | 281.84 | 1.000025 | 0.99645 | 1.00356 | 0.0035607 | 49.0 |
| 50.0 | 0.0031623 | 316.23 | 100,000. | 0.99370 | 1.00634 | 0.0031623 | 316.23 | 1.000020 | 0.99684 | 1.00317 | 0.0031723 | 50.0 |
| 51.0 | 0.0028184 | 354.81 | 125,890. | 0.99438 | 1.00565 | 0.0028184 | 354.81 | 1.000016 | 0.99718 | 1.00283 | 0.0028264 | 51.0 |
| 52.0 | 0.0025119 | 398.11 | 158,490. | 0.99499 | 1.00504 | 0.0025119 | 398.11 | 1.000013 | 0.99749 | 1.00252 | 0.0025182 | 52.0 |
| 54.0 | 0.0019953 | 501.19 | 251,190. | 0.99602 | 1.00400 | 0.0019953 | 501.19 | 1.000008 | 0.99801 | 1.00200 | 0.0019992 | 54.0 |
| 55.0 | 0.0017783 | 562.34 | 316,230. | 0.99645 | 1.00356 | 0.0017783 | 562.34 | 1.000006 | 0.99822 | 1.00178 | 0.0017815 | 55.0 |
| 56.0 | 0.0015849 | 630.96 | 398,110. | 0.99684 | 1.00317 | 0.0015849 | 630.96 | 1.000005 | 0.99842 | 1.00159 | 0.0015874 | 56.0 |
| 57.0 58.0 60.0 65.0 70.0 | 0.0014125 0.0012589 0.0010000 0.00056234 0.00031623 | 707.95 794.33 1,000.0 1,778.3 3,162.3 | 501,190. 630,960. 10 ⁶ 3.1623×10 ⁶ | 0.99718 0.99749 0.99800 0.99888 0.99937 | 1,00283 1,00252 1,00200 1,00112 1,00063 | 0.0014125 0.0012589 0.0010000 0.00056234 0.00031623 | 707.95 794.33 1,000.0 1.778.3 3,162.3 | 1.000004 1.000003 1.000002 1.000001 1.000000 | 0.99859 0.99874 0.99900 0.99944 0.99968 | 1.00141 1.00126 1.00100 1.00056 1.00032 | 0.0014145 0.0012605 0.0010010 0.00056265 0.00031633 | 57.0 58.0 60.0 65.0 70.0 |
| 75.0 80.0 85.0 90.0 95.0 100.0 | 0.00017783 0.00010000 0.000056234 0.000031623 0.000017783 0.000010000 | 5,623.4 10,000. 17,783. 31,623. 56,234. | 3.1623×10^{7} 10^{8} 3.1623×10^{9} 10^{9} 3.1623×10^{9} 10^{10} | 0.99964 0.99980 0.99989 0.99994 0.99996 0.99998 | 1,00036 1,00020 1,00011 1,00006 1,00004 1,00002 | 0.00017783 0.00010000 0.000056234 0.000031623 0.000017783 0.000010000 | 5,623.4 10,000. 17,783. 31,623. 56,234. 10 ⁶ | 1.000000 1.000000 1.000000 1.000000 1.000000 1.000000 | 0.99982 0.99990 0.99994 0.99997 0.99998 0.99999 | 1.00018 1.00010 1.00006 1.00003 1.00002 1.00001 | 0.00017786 0.00010001 0.000056237 0.000031624 0.000017783 0.000010000 | |

(Courtesy Proceedings of the IRE.)

Taper Configuration

A taper pad is a T configuration (Fig. 2B) designed to operate between two circuits of *unequal* impedance. In this instance the symbols for the impedances become Z_1 and Z_2 , with Z_1 being the larger of the two. The resistor values may be equated:

$$\begin{split} R_1 &= Z_1 \bigg(\frac{k^2 + 1}{k^2 - 1} \bigg) - 2 \sqrt{Z_1 Z_2} \left(\frac{k}{k^2 - 1} \right) \\ R_2 &= Z_4 \bigg(\frac{k^2 + 1}{k^2 - 1} \bigg) - 2 \sqrt{Z_1 Z_2} \left(\frac{k}{k^2 - 1} \right) \\ R_3 &= 2 \sqrt{Z_1 Z_2} \bigg(\frac{k}{k^2 - 1} \bigg) \end{split}$$

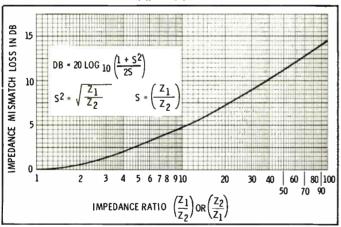


Fig. 1. Loss in level because of impedance mismatch.

As an example, assume a taper pad is to be designed to operate between a 500- and 250-ohm impedance, with a loss of 20 dB. First, it must be determined if a pad of 20-dB loss can be designed for an impedance ratio of two. This is determined by referring to the graph in Fig. 3. Entering the graph at the bottom, at a ratio of two, and following the line up to where it intersects the diagonal line, the minimum loss is read on the left margin as 7.8 dB. Therefore, the pad may be constructed without difficulty. If the desired loss was to be on

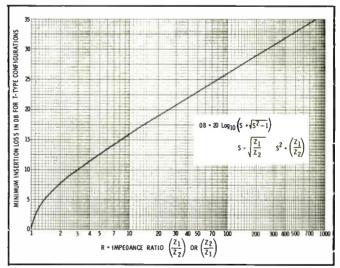


Fig. 3. Minimum loss chart for networks of unequal impedances.

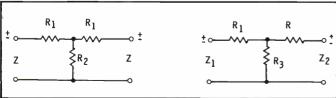


Fig. 2. Symbols used in the design of T-configuration networks.

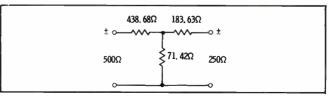


Fig. 4. Connections and circuit-element values for a 500- to 250-ohm taper pad with a 20-dB insertion loss.

Practical values for the resistors would be 440, 185, and 72 ohms. The resistors are connected as shown in Fig. 4. If the 500-ohm side of the network is terminated in 500 ohms and an ohmmeter is connected across the 250-ohm side, the internal resistance will measure 250 ohms; when the procedure is reversed, the 500-ohm side will measure 500 ohms.

Bridged-T Configuration

The bridged-T attenuator is quite similar to the basic T network. The only difference in the configuration is the addition of the bridging resistor (R5), as shown in Fig. 5A. However, a bridged-T attenuator may only be used between circuits of equal impedance. In this network there are two resistors designated as R₁, each resistor having a value equal to the line impedance; hence these values are known. This leaves only the bridging resistor (R₅) and the shunt resistor (R₆) to be determined. They are calculated as follows:

$$\mathbf{R}_{s} = (\mathbf{k} - 1) \mathbf{Z}$$

$$R_6 = \left(\frac{1}{k-1}\right) Z$$

Assume that a bridge-T pad of 12-dB loss to work in a 600-ohm line circuit is to be designed. R1 will automatically equal 600 ohms. Solving for Rs:

$$R_s = (3.981 - 1) \times 600$$

= 2.981 × 600
= 1788.6 ohms

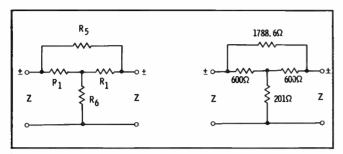


Fig. 5. Symbols and circuit-element values for a 600-ohm bridged-T attenuator with a 12-dB insertion loss.

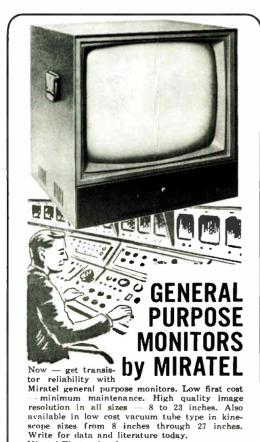
the order of 6 dB, it could not be designed for such a loss. Using Table 1, the resistor values may now be calculated:

$$\begin{array}{l} R_1 = 500(1.0202) - 2(\sqrt{125,000}) \times 0.10101 \\ = 510.1 - 2(353.55) \times 0.10101 \\ = 510.1 - 71.42 \\ = 438.68 \text{ ohms} \end{array}$$

$$R_2 = 250(1.0202) - 2(\sqrt{125,000}) \times 0.10101$$

= 255.05 - 2(353.55) × 0.10101
= 255.05 - 71.42
= 183.63 ohms

 $R_s = 2(\sqrt{125,000}) \times 0.10101$ $= 2(353.55) \times 0.10101$ = 71.42 ohms



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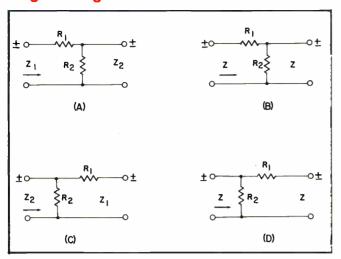


Fig. 6. L-type configurations.

Solving for R6:

$$R_6 = 0.335 \times 600$$

= 201 ohms

For this problem, the first k factor was taken from column three and the second factor from column 12 of Table 1. The resistors are connected as shown in Fig. 5B.

L Configuration

An L configuration consists of two circuit elements connected to form an inverted letter L. Actually there are four variations of this basic configuration, as shown in Fig. 6. An L-type attenuator has a minimum loss like the taper pad described previously. L-type attenuators cannot be designed to reflect an impedance match in both directions, only in the direction indicated by the arrows in the illustrations.

If an L-type network is inserted into a circuit that is impedance sensitive, the circuit characteristics could be affected. L configurations should not be used, except when a minimum loss that cannot be satisfied by a T-type configuration is required. The minimum loss for an L-type network may be determined from the graph in Fig. 7. The procedure for using this graph is the same as described for the T configuration in Fig. 3.

For unequal impedances the match may be in the direction of the larger or smaller impedance, but not both, as shown in Figs. 6A and C. When an L-type network is connected to circuits of equal impedance (Figs. 6B and D), the circuits are matched in one direction, but not in the other. However, the network may be designed to match either of the terminating impedances.

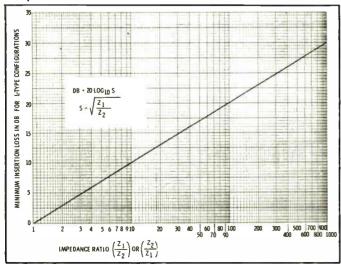


Fig. 7. Minimum loss graph for L-type attenuators.

The arrows in the illustrations indicate the direction of the impedance match. If the network is designed to match the impedance in the direction of the series resistor, the mismatch is always toward the shunt resistor. Impedance mismatch increases with an increase of loss. In some instances the ohmic value of the shunt resistor may become a fraction of an ohm, which can seriously affect the circuit in which it has been connected.

The configuration for an L-type network operating between unequal values of impedances $(Z_1 \text{ and } Z_2)$ is shown in Fig. 6A. Here the impedance match is toward the larger of the two (Z_1) . The values of the resistors may be equated:

$$R_1 = \left(\frac{Z_1}{S}\right) \cdot \left(\frac{kS - 1}{k}\right)$$

$$R_2 = \left(\frac{Z_1}{S}\right) \quad \left(\frac{1}{k-S}\right)$$

where,

$$S = \sqrt{\frac{\overline{Z_1}}{Z_2}}$$

For a condition where the impedances are equal and the impedance match is in the direction of the arrow (Fig. 6B), the values of the resistors are calculated:

$$R_1 = \left(\frac{k-1}{k}\right) Z$$

$$R_2 = \left(\frac{1}{k-1}\right) Z$$

If the impedances are unequal, and the impedance match is toward the smaller of the two impedances (Fig. 6C), the values of the resistors are determined by:

$$R_1 = \left(\frac{Z_1}{S}\right) (k - S)$$

$$R_2 = \left(\frac{Z_1}{S}\right) \left(\frac{k}{kS-1}\right)$$

where,

$$S = \frac{\sqrt{Z_1}}{\sqrt{Z_2}}$$

When the impedances are equal and the impedance match is in the direction of the shunt arm (Fig. 6D), the resistors are calculated by the following:

$$\mathbf{R}_{\scriptscriptstyle 1} = (\mathbf{k} - \mathbf{1}) \, \mathbf{Z}$$

$$R_2 = \left(\frac{k}{k-1}\right) Z$$

When selecting an L configuration, due consideration should be given to the effect it may have on the circuit into which it is to be connected. For example, if the series resistor is around 600 ohms, the shunt resistor approximately 60 ohms, and the configuration is used as an input or output termination for a transformer of an amplifier, there is no doubt that the frequency and distortion characteristics of the amplifier would be adversely affected. If the equipment terminated by the 60 ohms should happen to be a filter or equalizer, the frequency characteristics of these units would be seriously affected. Therefore, before considering the use of the L-type network, due consideration should be given to the effect on the circuit into which the network is to be connected.

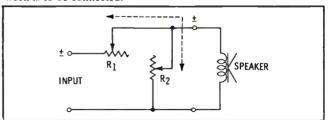
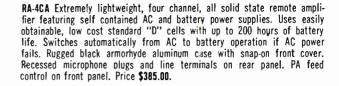


Fig. 8. L-type configuration used as speaker volume control.

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The question then arises as to why the L-type configuration is used at all. Contrary to the disadvantages of the L-type network, it does have certain advantages if employed in a circuit such as a volume control, voltage divider, volume indicator meter attenuator (multiplier), or in any circuit where the impedance match is not of great importance. However, the L-attenuator network cannot be employed for the VU meter; this instrument must see a constant impedance of 3,900 ohms.

The circuit for a speaker volume control using an L pad is given in Fig. 8. It will be observed, the series resistor of the network is toward the output of the amplifier. Mechanically, the two arms are mounted on a common shaft, and R_1 and R_2 are varied inversely with respect to each other.

Pi Configuration

The pi configuration, sometimes referred to as a delta pad (Fig. 9), may be designed to operate between equal or unequal impedances, balanced or unbalanced. The pi attenuator is not usually found in commercial sound installations, but it is used quite extensively in the telephone industry. The resistance values for impedance of equal values (Fig. 9A) may be calculated with the following formulas:

$$R_1 = \left(\frac{k+1}{k-1}\right) \quad Z$$

$$R_2 = \left(\frac{Z}{2}\right) \left(\frac{k_2 - 1}{k}\right)$$

where,

R₁ is the series resistor,

R₂ is the shunt resistor,

Z is the input and output impedance.

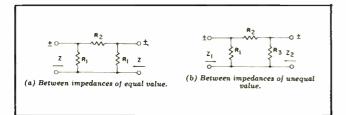


Fig. 9. Pi-type configurations.

For impedances of *unequal* values (Fig. 9B), the resistor values may be determined by the formulas:

$$R_{1} = \left(\frac{k^{2} - 1}{k^{2} - 2kS + 1}\right) Z$$

$$R_{2} = \left(\frac{\sqrt{Z_{1}} Z_{2}}{2}\right) \left(\frac{k^{2} - 1}{k}\right)$$

$$R_{3} = \left(\frac{k^{2} - 1}{k^{2} - 2\frac{k}{C} + 1}\right) Z_{2}$$

where.

R₁ and R₃ are the shunt resistors,

R₂ is the series resistor,

Z₁ is the input impedance,

Z₂ is the output impedance,

S is equal to
$$\frac{/Z_1}{\sqrt{Z_2}}$$

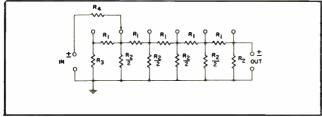


Fig. 10. Configuration for a ladder-type sound-mixer control.

Ladder Configuration

The ladder configuration consists of a group of pi pads connected in tandem; it is designed to operate between impedances of the same value. Attenuators using this configuration, which are only manufactured in variable form, are used extensively for sound-mixer controls.

One disadvantage of the ladder-type configuration (Fig. 10) is that it has a fixed insertion loss of 6 dB. This 6-dB loss is exclusive of the variable attenuation. The insertion loss is caused by the series and shunt resistors and the resistor in the slide-arm circuit. The 6-dB loss is divided as follows: 3.5 dB in the ladder network resistors (R1, R2, and R3) and 2.5 dB in the series resistor (R4).

Another disadvantage of the ladder configuration is that the impedance is not constant over the entire operating range; however, this is of no great consequence since it occurs at the maximum and minimum loss positions. In a sound mixer the controls are fed into a combining network which prevents the slight mismatch of the impedances from being reflected to the output of the mixer.

Ladder networks have better attenuation characteristics, allowing virtually an infinite cutoff to about 120 dB of loss; whereas the T type extends downward in the order of 100 dB. The advantages of the ladder configuration are: (1) as the attenuation is increased the contact noise decreases in proportion (contact noise remains constant with the T type), and (2) impedance mismatch effects decrease in a direct proportion to the number of controls in a mixer-combining network. (With four controls the impedance mismatch is negligible.) The values for the components of a ladder configuration may be calculated:

$$R_1 = \left(\frac{k^2 - 1}{2k}\right) Z$$

$$R_2 = \left(\frac{k + 1}{k - 1}\right) Z$$

$$R_3 = \frac{R_2 \times Z}{R_2 + Z}$$

$$R_4 = \frac{Z}{2}$$

where.

R₁ is the series resistor,

R₂ is the shunt resistor,

R: is the input shunt resistor,

R₊ is the series resistor in the contact arm,

Z is the impedance.

Note: The value of k is dependent on the loss per step and not the total loss. The loss per step should not exceed 1.3 dB. Also, the value of R_2 is halved for all but the output shunt resistor.

Ladder attenuators must be grounded at the low-potential side to prevent leakage at the higher frequencies.

Minimum-Loss Configuration

A minimum-loss pad is a network designed to operate between circuits of *unequal* impedance with a *minimum* insertion loss for a given impedance ratio. Minimum-loss ratios are given for L-type configurations in Fig. 7, and for the T configuration in Fig. 3. However, for those desiring to solve the minimum loss mathematically, the L pad may be calculated:

$$dB = 20 \log_{10} (S)$$

where,

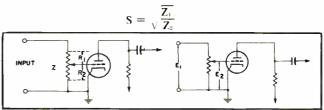


Fig. 11. Grid-circuit potentiometers.



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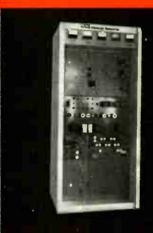
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For the T (taper-pad) configuration:

$$dB = 20 \log_{10} (S + \sqrt{S^2 - 1})$$

$$S^2 = \frac{Z_1}{Z_2}$$

where,

 Z_1 and Z_2 are the input and output impedances, Z_1 being the larger of the two.

Grid-Circuit Potentiometers

A grid-circuit potentiometer (abbreviated pot) is actually an L-type configuration and is used primarily for controlling the gain in a circuit where the load on the slider or unmatched side is practically an open circuit, such as the control grid of a vacuum tube (Fig. 11). The total resistance of such controls varies from 50,000 ohms to 1 megohm or greater. To illustrate the design procedure, assume a potentiometer having a resistance of 100,000 ohms with a total attenuation of 30 dB in steps of 10 dB is required. It will be noted in Fig. 11A that the upper portion of the control is designated as R_1 and the lower portion R_2 . Therefore:

$$R_1 = \left(\frac{1}{k}\right) Z$$

$$R_2 = (Z - R_1)$$

where,

Z is the total resistance of the potentiometer,

R₁ and R₂ are the upper and lower portions of the resistance, depending on the position of the slider arm.

The factor (1/k) is taken from Table 1. Solving for the first 10-dB step:

$$R_1 = 0.3162 \times 100,000$$

= 31,620 ohms

$$R_2 = 100,000 - 31,620$$

$$=68,380 \text{ ohms}$$

the second step (20 dB):

 $R_1 = 0.100 \times 100,000$

= 10,000 ohms

 $R_2 = 100,000 - 10,000$

= 90,000 ohms

and the third step (30 dB):

 $R_1 = 0.03162 \times 100,000$

= 3,162 ohms

 $R_2 = 100,000 - 3,162$

= 96,838 ohms

Taps will occur at 3,162 ohms, 10,000 ohms, and 31,620 ohms, upward from ground. The final design will consist of four resistors of 3,162, 6,838, 21,620, and 68,380 ohms for a total of 100,000 ohms. The resistors may consist of four carbon or wirewound noninductive resistors, mounted on a switch frame.

Potentiometers may also be calibrated to indicate in terms of voltage, as shown in Fig. 11B. The voltage for any position may be computed:

$$E_2 = E_1 \left(\frac{R_1}{R_1 \times R_2} \right)$$

Table 2. Work Sheet for Calculating Resistor Values

| | | R ₅ | 1 | R ₆ |
|------|--------|----------------|--------|----------------|
| Loss | k-1 | (Ohms) | k-1 | (Ohms) |
| 0 | | Zero | _ | Infinite |
| 1 | 1.122 | 30.5 | 8.195 | 2048.7 |
| 2 | 1.258 | 64.5 | 3.862 | 965.5 |
| 4 | 1.584 | 146.0 | 1,700 | 425.0 |
| 6 | 1.995 | 248.0 | 1.004 | 221.0 |
| 10 | 3.162 | 540.5 | 0.462 | 115.5 |
| 15 | 5.623 | 1155.8 | 0.216 | 54.0 |
| 20 | 10.000 | 2250.0 | 0.111 | 27.8 |
| 25 | 17.783 | 4200.0 | 0.059 | 14.8 |
| 30 | 31.623 | 7650.0 | 0.0326 | 8.15 |

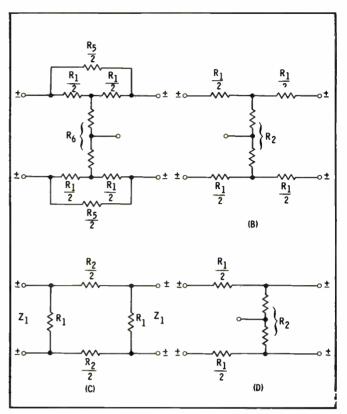


Fig. 12. Balanced networks.

As a rule, nonprofessional equipment uses potentiometers ranging from 100,000 ohms to 1 megohm in resistance. However, it is the practice in commercial equipment to keep the overall resistance to 50,000 ohms or less. To insure calibration accuracy, such controls are operated in the control grid of an amplifier stage, biased for class-A operation. In choosing the resistance value of a potentiometer, several factors must be considered. For example, if the control is to be used in the input of a high-gain triode, where the input impedance of the tube may be quite low at the higher frequencies, a low value of resistance is required. In addition, the input capacity to ground has a marked effect on the attenuation of the high frequencies; therefore, the lower the value of the potentiometer, the smaller this effect becomes. If grid current is permitted to flow in the input of a tube, the potentiometer will generate noise each time it is changed. Whenever possible, an input transformer with a potentiometer connected across the secondary of the transformer is recommended. When connected across a transformer, the potentiometer resistance is usually made equal to the secondary impedance of the transformer.

Variable Attenuator Design

In reality the design of a variable attenuator consists of designing a group of fixed attenuators that may be switched in and out of a circuit at will. Before starting a design, the impedance and configuration are selected. A table similar to that shown in Table 2 is prepared, and the desired values of loss, k-factors, and the calculated values of resistances are then entered in the appropriate column.

Assume a bridged-T attenuator of 250 ohms impedance, having a total loss of -30 dB which is variable in steps of 1 dB, is to be designed, using the equations given under the heading "Bridge-T Configuration." The value of k is taken from Column 3 and the value of 1/k - 1 from Column 12 of Table 1. Since R_1 equals the 250-ohm line impedance, only R_5 and R_6 require calculation. For the sake of brevity, only nine of the loss steps have been calculated in Table 2.

It should be noted at the zero-loss position, R₅ has zero resistance and R₆ is infinite. In practice, at zero attenuation a high value of resistance is switched in R₆ to keep the circuit closed and to prevent contact noise. The value of the resistance depends on the impedance and loss of the network, but it should be of such a value that the pad is effectively out of the circuit.

The resistors are noninductively wound and mounted on a switch frame, with or without a detent. If possible, the entire unit should be mounted in a metal case to prevent damage to the resistors and reduce the possibility of pickup from extraneous electrical fields. The two switch arms are mounted on a common shaft, and the resistors are inserted inversely to each other, as for the L-type network. If over 40 dB of attenuation is required, the resistor coils must be carefully placed to reduce the possibility of leakage at the higher frequencies.

Variable attenuators can also be designed to match two impedances of unequal value, using a taper network as discussed under the heading "Taper Configuration." Such networks, however, are the exception rather than the rule. The procedure for their design is the same as for the equal-impedance network described previously.

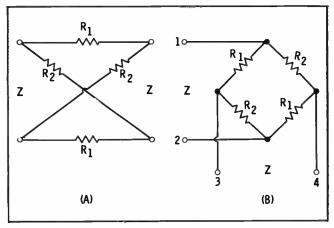


Fig. 13. Lattice network and its equivalent circuit.

Balanced Configurations

Basically a balanced configuration consists of designing an unbalanced network, dividing the values of the series resistors in half, and connecting the halves on each side of the configuration. Balanced configurations include the bridged-T, H, O, U. lattice, and ladder networks. If the network is to be grounded, the shunt resistor is tapped in the exact electrical center and connected to ground. It will be noted that only the values of series resistors are divided; the shunt resistor remains as for the unbalanced network.

Bridged-T, H, O, and U Configurations

The balanced bridged-T configuration is given in Fig. 12A. Here you will notice that series resistors R₁ (equal to the line impedance) are divided and connected in each side of the configuration. Resistor R₅ is treated in the same manner. The value of R₆ remains the same as for the unbalanced configuration, except that a tap has been added for the ground connection. For ease in winding, R₆ may be made into two separate resistors connected in series. The balanced configuration will exhibit the same characteristics as the unbalanced version.

The balanced T, or H pad as it is commonly known, is shown in Fig. 12B. Like the bridged-T, its series resistors are divided and connected in each half of the configuration. Except for being balanced, the H pad is similar in all other respects to the T configuration. H-type configurations may be designed for matching impedances of unequal value, as described for the taper pad.

The O configuration (Fig. 12C) is in reality a balanced pi pad. The addition of one resistor converts the pi pad into a balanced configuration. Only the series resistors (R₂) are divided. Resistors R1 remain as for the pi pad. This configuration does not adapt itself to grounding; however, it may be used in any circuit where a balanced to ground pad is employed, or in a symmetrical circuit free from ground. The O network may be designed for circuits of equal or unequal impedances.

U pads (Fig. 12D) are balanced L configurations. The rules for impedance matching for the L configuration apply equally for the balanced U configuration.

Lattice Configuration

The lattice network is a true balanced configuration. Therefore individual treatment is required for solving its circuit element values. If it is used in an unbalanced configuration, it degenerates into a pi configuration.

The configuration for the lattice network is shown in Fig. 13A. The difference between this network and the O configuration is that the shunt resistors (R2) are crossed over and connected to both the input and output circuits. The circuit element values may be calculated:

$$R_1 = \left(\frac{k-1}{k+1}\right)Z$$

$$R_2 = \left(\frac{k+1}{k-1}\right)Z$$

where.

R₁ is the series resistor.

R2 is the shunt resistor,

Z is the line impedance.

Lattice networks can only be employed in ungrounded circuits of equal impedance.

If an equivalent circuit is drawn for the lattice pad (Fig. 13B), it resembles a balanced bridge circuit. The principal difference is that resistors R1 are lower in value than R2. This difference unbalances the bridge and permits the signal to pass attenuated in an amount controlled by the ratio of resistors R₁ and R2.

Ladder Configuration

It was mentioned earlier that the ladder configuration is only manufactured in the variable form and that it is used extensively in sound-mixer circuits. Ladder networks may also be designed for balanced operation. This is accomplished by connecting two unbalanced networks side by side as shown in Fig. 14. However, the circuit elements do not divide in the same manner as for other networks. If the unbalanced configuration in Fig. 10 is compared with the balanced network of Fig. 14, it will be observed that resistors R₁ are divided by two, but resistors R2 are no longer R2/2; instead, R2 is now twice the value at the output as for the unbalanced configuration. R3 remains at its original value each side of ground.

Bridging Configurations

A bridging (paralleling) pad is a special type of attenuator network designed to bridge one circuit while feeding another, without disturbing the impedance or frequency characteristics of the circuit bridged. In addition, the network can absorb only a fractional amount of power from the circuit bridged.

Two such networks are shown in Fig. 15. Fig. 15A is an unbalanced-L configuration. The difference between this configuration and the normal L configuration is that at the input side of the bridging pad (Z_1) the impedance is very high (10,000to 30,000 ohms) while the other side (Z₂) matches the input impedance of the device being fed by the pad.

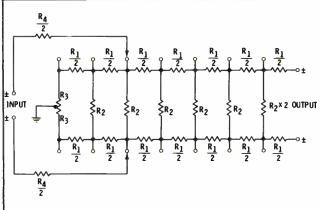


Fig. 14. A balanced ladder network.

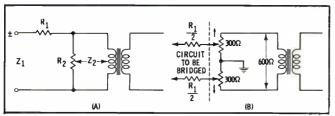


Fig. 15. Bridging input networks.

The loss of a bridging pad is stated for a given set of conditions; e.g., 40 dB of loss when bridging a 600-ohm circuit and feeding a 600-ohm circuit. If either the impedance bridged or series resistor R₁ is changed in value, the insertion loss of the pad will change. Resistor values for the more commonly used pads and insertion losses are given in Table 3. The stated loss of these networks will only be valid when they are bridging 600 ohms and feeding 600 ohms. The loss for the same configuration, but using other values of R1 and impedance Z2, may be equated:

$$dB = 10 \log_{10} \left(\frac{Z_1}{Z_2} \right) + 20 \log_{10} \sqrt{\frac{Z_1}{Z_2}} + \sqrt{\frac{Z_1}{Z_2}} - 1$$

where,

Z_i is the impedance of the circuit to be bridged,

Z₂ is the impedance of the circuit fed by the network.

Bridging networks should be designed to have an input resistance of at least ten times that of the circuit to be bridged.

The configuration in Fig. 15A may be converted to a balanced network by dividing resistor R₁ by two and placing half in each side of the configuration. A variable 30,000- to 600-ohm pad is shown in Fig. 15B.

When a bridging pad is connected across a circuit, a slight loss of level (usually ignored) takes place in the circuit being bridged. However, this loss may be computed:

$$dB = 20 \log_{10} \frac{2B_R + R}{2B_R}$$

where.

 $B_{\mathbb{R}}$ is the bridging input of the pad, R is the impedance of the circuit bridged.

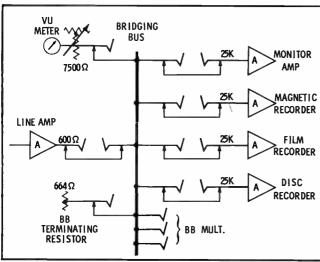


Fig. 16. A typical bridging-bus circuit.

Thus, for a pad of 10,000 to 600 ohms, bridged across a circuit of 600 ohms, the loss is

$$dB = 20 \log_{10} \frac{20,000 + 600}{20,000}$$
= 20 log 1.03
= 20 × 0.013
= 0.26 dB

Therefore, when a bridging pad of 10,000 ohms is connected across a circuit impedance of 600 ohms, the level in the 600ohm circuit will drop 0.26 dB.

When the bridging pad is connected across a 600-ohm circuit, the impedance of the 600-ohm circuit will be lowered only 1 to 3%. This impedance reduction is of small consequence. This is the principal reason for using a bridging impedance of 20,000 to 30,000 ohms, although it may insert a considerable amount of loss. If the insertion loss of a bridging pad is too great, it may be replaced with a bridging transformer which has an insertion loss of 18 to 20 dB; however, if sufficient gain is available, the pad is the most economical.

A typical recording or broadcast studio-type bridging bus is shown in Fig. 16. The purpose of a bridging bus is to provide a circuit in the system where additional equipment may be connected The bridging-bus circuit is a group of jacks connected in parallel and driven by an amplifier. It will be observed that the bridging bus and the equipment connected across the bus act as a load impedance for the amplifier driving the bus. The first step in bus-circuit design is to decide how many pieces of equipment will be permanently connected (normalled) across the bus.

For this illustration four bridging impedances of 25,000 ohms and a 7,500-ohm VU meter have been selected. A terminating resistor and three sets of bridging-bus multiple jacks for patching additional equipment are connected in parallel with the bridging bus. It will be assumed that any additional equipment to be patched across the bus will have a bridging impedance of at least 25,000 ohms and that the output impedance of the amplifier driving the bus is 600 ohms. First, the total impedance of the equipment permanently connected across the bus (exclusive of the bridging-bus termination) is determined. The four 25,000-ohm bridging inputs connected across the bus present a load resistance of 6,250 ohms. In parallel with this is the 7,500-ohm VU meter panel. Using Ohm's law for parallel circuits:

$$R_1 = \frac{6.250 \times 7,500}{6.250 + 7,500}$$

$$= \frac{4.68 \times 10^{3}}{1.37 \times 10^{3}}$$

$$= \frac{4.68 \times 10^{3}}{1.37}$$

$$= 3.416 \text{ ohms}$$

The next step is to determine the value of the bridging-bus terminating resistor which, when connected in parallel with 3.416 ohms, will reflect an impedance of 600 ohms. Again using Ohm's law for parallel resistors:

$$BB = \frac{3.416 \times 600}{3.416 - 600}$$

$$= \frac{2.05 \times 10^{6}}{2.81 \times 10^{3}}$$

$$= \frac{2.05 \times 10^{3}}{2.81}$$

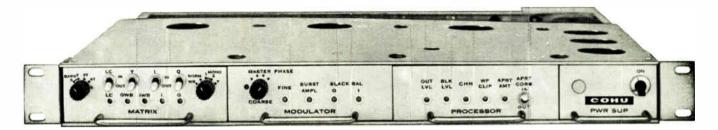
$$= 729.53 \text{ ohms}$$

Therefore, if the resistor of 729.53 ohms is connected in parallel with the bus and the foregoing load impedances, the amplifier will see 600 ohms.

Table 3. Resistor Values for Bridging Attenuators

| R ₁ (Ohms) | Loss (dB) | R ₂ (Ohms) | | | | | |
|--------------------------|--------------|--------------------------|--|--|--|--|--|
| 30,000 | 40.1 | 600 | | | | | |
| 25,000 | 38.5 | 600 | | | | | |
| 20,000 | 36.8 | 600 | | | | | |
| 15,000 | 34.2 | 600 | | | | | |
| 10,000 | 30.7 | 600 | | | | | |
| 7,500 | 28.3 | 600 | | | | | |
| 5,000 | 24.9 | 600 | | | | | |
| 3,000 | 20.8 | 600 | | | | | |

Color!



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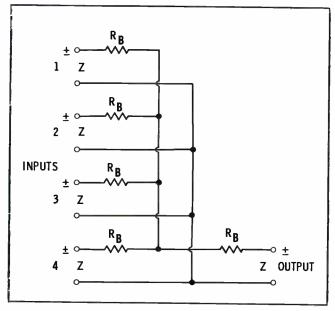


Fig. 17. A four-position combining network.

As a rule it is safe to load the output of a well designed amplifier to within 90% of its rated output impedance, which would be 540 ohms for a 600-ohm output impedance. This means that several more pieces of equipment could be patched across the bus without affecting the amplifier characteristics. If the bridging impedance is greater than 25,000 ohms, more equipment could be driven from the bus. Usually the bus impedance is set for around 625 ohms to permit additional equipment to be patched across the bus without loading the amplifier below 600 ohms.

If the bus is grounded on one side, unbalanced configurations are used. If the bus is balanced to ground or symmetrical, a balanced-type network is used. Standard bridging impedances used by the recording and broadcast industries include 7,500, 10,000, 25,000, and 30,000 ohms.

Combining Networks

Combining networks are employed to combine the inputs of several devices or lines. One of the most common uses for this type of configuration is in a sound-mixer circuit. Combining networks may be balanced or unbalanced, and they are usually confined to a common value of impedance.

The signal may consist of dialogue, music, and/or sound effects. The source may be a broadcast line, photographic film, or magnetic tape reproducers, phonograph records, a live pick-up, or a combination of all. The network must be designed so that changing the level of any one of the inputs has no effect on the level or frequency characteristics of the other signal sources. For broadcast and recording at least 10 positions are

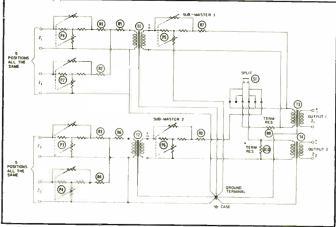


Fig. 19. A 10-position, split mixer network with keyswitch for combining the two sections into a single network.

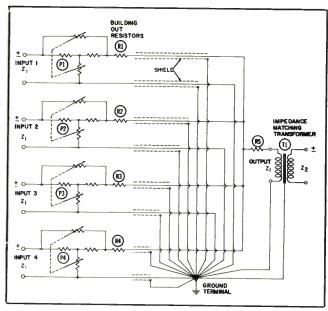


Fig. 18. A four-position, parallel-connected, unbalanced mixer network.

required; in many instances 20 or more are necessary. For recording purposes, equalizers, filters, and other devices are operated in conjunction with the combining networks, as shown in Fig. 17. The network consists of 5 resistors, designated as $R_{\rm B}$. If the circuit is traced, it will be apparent that the five circuits are in parallel. The resistors provide isolation between the four input circuits and an impedance match for the four inputs and the output circuit. The value of the building-out resistors ($R_{\rm B}$) may be calculated:

$$R_B = \left(\frac{N-1}{N+1}\right) Z$$

where.

R_B is the building-out resistor,

N is the number of input circuits,

Z is the circuit impedance.

The loss of the network through any two branches is:

where,

N is the total number of circuits (4 inputs and 1 output).

Using this equation, the loss for a four-position network is 12 dB. Unused circuits of a combining network must be terminated in a resistive load that is equal to the normal terminating impedance. This type of combining network is often used in sound mixers similar to the one shown in the schematic diagram of Fig. 18.

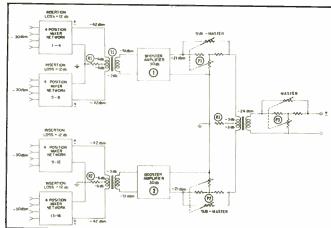


Fig. 20. A 16-position hybrid-coil mixer network.

A more elaborate mixer network and its associated equipment is shown in Fig 19. This network is termed a "split-mixer"; that is, it may be divided into two separate sections by means of a key switch (S1), or combined into a 10-position mixer. The ten positions are shown split into two groups of five positions each. Building-out resistors (R7 and R8) and submaster controls (P5 and P6) for adjusting the overall level of each group are located at the output of each group. Output transformers T3 and T4 may be used to feed a single or two separate recording channels. Such mixers are often used for recording where a vocal group and a large orchestra are located on separate stages during the recording session.

The controls may be of any configuration, provided they are unbalanced and therefore satisfy the impedance requirements. The common side of each mixer control is brought to a common ground point, using individual ground wires which are shielded and covered with a protective plastic or cloth braid to prevent ground loops.

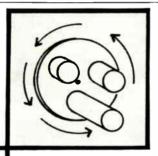
The unbalanced configuration may be changed to a balanced one by connecting half of each resistor in each side of the network as explained for other balanced networks. Of course, the mixer controls must also be changed to balanced configurations. Combining networks have a fixed loss caused by the resistance of the building-out resistors (R_B). Increasing the number of mixer positions increases the insertion loss of the network.

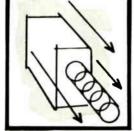
To simplify the design procedure of a mixer network, the values of the building-out resistors for networks of 150, 200, 500, and 600 ohms are tabulated in Table 4. For mixer networks of 12 positions or more it is recommended that the controls be separated into groups of four and then combined by means of hybrid coils, as shown in Fig. 20. (The loss and amplifier gains shown in Fig. 20 are for a typical mixer.)

Table 4. Values of Building-Out Resistors and Insertion Loss for Parallel Sound-Mixer Networks

| Mixer Positions | Impedance 15012 | | | Impedance 200\(\frac{1}{2}\) | | | Impedance 250 ¹ 2 | | | Impedance 500Ω | | | Impedance 600 [©] 2 | | |
|--------------------|--------------------|----------------------|-------|---------------------------------|-------|----------------------|---------------------------------|----------------------------------|-------|----------------------|-------|-------|---------------------------------|----------------------|-------|
| | | Insertion Loss—dB | | R _B | | Insertion Loss—dB | | Insertion R _B Loss—dB | | Insertion RB Loss—dB | | | RB | Insertion Loss—dB | |
| | Ohms— | BT, T | Lad. | Ohms - | BT, T | Lad. | Ohms = | Ohms BT, T | Lad. | Ohms = | BT, T | Lad. | Ohms — | BT, T | Lad. |
| 2 | 50.0 | 6.00 | 12.00 | 66.6 | 6.00 | 12.00 | 83.3 | 6.00 | 12.00 | 166.0 | 6.00 | 12.00 | 200.0 | 6.00 | 12.00 |
| 3 | 75.0 | 9.50 | 15.50 | 125.0 | 9.50 | 15.50 | 100.0 | 9.50 | 15.50 | 250.0 | 9.50 | 15.50 | 300.0 | 9.50 | 15.50 |
| 4 | 90.0 | 12.00 | 18.00 | 120.0 | 12.00 | 18.00 | 150.0 | 12.00 | 18.00 | 300.0 | 12.00 | 18.00 | 360.0 | 12.00 | 18.00 |
| 5 | 100.0 | 14.00 | 20.00 | 133.0 | 14.00 | 20.00 | 166.0 | 14.00 | 20.00 | 333.0 | 14.00 | 20.00 | 400.0 | 14.00 | 20.00 |
| 6 | 107.0 | 15.60 | 21.60 | 142.8 | 15.60 | 21.60 | 178.5 | 15.60 | 21.60 | 357.0 | 15.60 | 21.60 | 428.4 | 15.60 | 21.60 |
| 7 | 112.5 | 16.90 | 22.90 | 150.0 | 16.90 | 22,90 | 187.5 | 16.90 | 22.90 | 375.0 | 16.90 | 22.90 | 450.0 | 16.90 | 22.90 |
| 8 | 116.6 | 18.10 | 24.10 | 155.5 | 18.10 | 24.10 | 194.0 | 18.10 | 24.10 | 388.0 | 18.10 | 24.10 | 466.0 | 18.10 | 24.10 |
| 9 | 120.0 | 19.08 | 25.08 | 160.0 | 19.08 | 25.08 | 200.0 | 19.08 | 25.08 | 400.0 | 19.08 | 25.08 | 480.0 | 19.08 | 25.08 |
| 10 | 123.0 | 20.00 | 26.00 | 163.8 | 20.00 | 26.00 | 202.2 | 20.00 | 26.00 | 409.0 | 20.00 | 26.00 | 491.0 | 20.00 | 26.00 |
| 11 | 124.9 | 20.82 | 26.82 | 166.5 | 20.82 | 26.82 | 208.0 | 20.82 | 26.82 | 416.0 | 20.82 | 26.82 | 499.0 | 20.82 | 26.82 |
| 12 | 127.0 | 21.58 | 27.58 | 169.1 | 21.58 | 27.58 | 210.8 | 21.58 | 27.58 | 422.5 | 21.58 | 27.58 | 507.0 | 21.58 | 27.58 |







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DECIBEL TABLE

Courtesy Jampro Antenna Company

GIVEN: Decibels

TO FIND: Power and {Voltage Current}

TO ACCOUNT FOR THE SIGN OF THE DECIBEL

For negative (-) values of the decibel—Both voltage and power ratios are less than unity. Use the two left-hand columns.

-dB+

For positive (+) values of the decibel—Both voltage and power ratios are greater than unity. Use the two right-hand columns.

-dB+

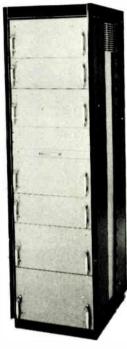
| | | ← → | | | | | — dB + → | | |
|------------------|----------------|------------|------------------|----------------|------------------|----------------|------------|------------------|----------------|
| Voltage Ratio | Power Ratio | dB | Voltage Ratio | Power Ratio | Voltage Ratio | Power Ratio | dB | Voltage Ratio | Power Ratio |
| .9886 | .9772 | .1 | 1.012 | 1.023 | .4732 | .2239 | 6.5 | 2.113 | 4.467 |
| .9772 | .9550 | .2 | 1.028 | 1.047 | .4677 | .2188 | 6.6 | 2.138 | 4.571 |
| .9661 | .9333 | .3 | 1.035 | 1.072 | .4624 | .2138 | 6.7 | 2.163 | 4.677 |
| .9550 | .9120 | .4 | 1.047 | 1.096 | .4571 | .2089 | 6.8 | 2.188 | 4.786 |
| .9441 | .8913 | .5 | 1.059 | 1.122 | .4519 | .2042 | 6.9 | 2.213 | 4.898 |
| .9333 | .8710 | .6 | 1.072 | 1.148 | .4467 | .1995 | 7.0 | 2,239 | 5.012 |
| .9226 | .8511 | .7 | 1.084 | 1.175 | .4416 | .1950 | 7.1 | 2.265 | 5.129 |
| .9120 | .8318 | .8 | 1.096 | 1.202 | .4365 | .1905 | 7.2 | 2.291 | 5.248 |
| .9016 | .8128 | .9 | 1.109 | 1.230 | .4315 | .1862 | 7.3 | 2.317 | 5.370 |
| .8913 | .7943 | 1.0 | 1.122 | 1.259 | .4266 | .1820 | 7.4 | 2.344 | 5.495 |
| .8810 | .7762 | 1.1 | 1,135 | 1.288 | .4217 | .1778 | 7.5 | 2.371 | 5.623 |
| .8710 | .7586 | 1.2 | 1.148 | 1.318 | .4169 | .1738 | 7.6 | 2.399 | 5.754 |
| .8610 | .7413 | 1.3 | 1.161 | 1.349 | .4121 | .1698 | 7.7 | 2.427 | 5.888 |
| .8511 | .7244 | 1.4 | 1,175 | 1.380 | .4074 | .1660 | 7.8 | 2.455 | 6.026 |
| .8414 | .7079 | 1.5 | 1.189 | 1.413 | .4027 | .1622 | 7.9 | 2.483 | 6.166 |
| .8318 | .6918 | 1.6 | 1.202 | 1.445 | .3981 | .1585 | 8.0 | 2.512 | 6.310 |
| .8222 | .6761 | 1.7 | 1.216 | 1.479 | .3936 | .1549 | 8.1 | 2.541 | 6.457 |
| .8128 | .6607 | 1.8 | 1.230 | 1.514 | .3890 | .1514 | 8.2 | 2.570 | 6.607 |
| .8035 | .6457 | 1.9 | 1.245 | 1.549 | .3846 | .1479 | 8.3 | 2.600 | 6.761 |
| .7943 | .6310 | 2.0 | 1.239 | 1.585 | .3802 | .1445 | 8.4 | 2.630 | 6.918 |
| .7852 | .6166 | 2.1 | 1.274 | 1.622 | .3758 | .1413 | 8.5 | 2.661 | 7.079 |
| .7762 | .6026 | 2.2 | 1.288 | 1.660 | .3715 | .1380 | 8.6 | 2.692 | 7.244 |
| .7674 | .5888 | 2.3 | 1.303 | 1.698 | .3673 | .1349 | 8.7 | 2.723 | 7.413 |
| .7586 | .5754 | 2.4 | 1.318 | 1.738 | .3631 | .1318 | 8.8 | 2.754 | 7.586 |
| .7499 | .5623 | 2.5 | 1.334 | 1.778 | .3589 | .1288 | 8.9 | 2.786 | 7.762 |
| .7413 | .5495 | 2.6 | 1.349 | 1.820 | .3548 .3508 | .1259 .1230 | 9.0 | 2.818 | 7.943 |
| .7328 | .5370 | 2.7 | 1.365 | 1.862 | .3467 | .1202 | 9.1 9.2 | 2.851 | 8.128 |
| .7244 | .5248 | 2.8 | 1.380 | 1.905 | .3428 | .1175 | 9.2 | 2.884 2.917 | 8.318 |
| .7161 | .5129 | 2.9 | 1.396 | 1.950 | .3388 | .11/3 | 9.3 9.4 | 2.917 | 8.511 |
| .7079 | .5012 | 3.0 | 1,413 | 1.995 | .3350 | .1122 | 9.5 | 2.985 | 8.710 8.913 |
| .6998 | .4898 | 3.1 | 1.429 | 2.042 | .3311 | .1096 | 9.6 | 3.020 | 9.120 |
| .6918 .6839 | .4786 | 3.2 | 1.445 | 2.089 | .3273 | .1072 | 9.7 | 3.055 | 9.333 |
| .6761 | .4677 | 3.3 | 1.462 | 2.138 | .3236 | .1047 | 9.8 | 3.090 | 9.550 |
| | .4571 | 3.4 | 1.479 | 2.188 | .3199 | .1023 | 9.9 | 3.126 | 9.772 |
| .6683 | .4467 | 3.5 | 1.496 | 2.239 | .3162 | .1000 | 10.0 | 3.162 | 10.000 |
| .6607 .6531 | .4365 .4266 | 3.6 3.7 | 1.514 1.531 | 2.291 | .3126 | .09772 | 10.1 | 3.190 | 10.23 |
| .6457 | .4169 | 3.8 | 1.549 | 2.344 2.399 | .3090 | .09550 | 10.2 | 3.236 | 10.47 |
| .6383 | .4074 | 3.9 | 1.567 | 2.455 | .3055 | .09333 | 10.3 | 3.273 | 10.72 |
| .6310 | .3981 | 4.0 | 1.585 | 2.512 | .3020 | .09120 | 10.4 | 3.311 | 10.96 |
| .6237 | .3890 | 4.0 | 1.603 | 2.570 | .2985 | .08913 | 10,5 | 3.350 | 11.22 |
| .6166 | .3802 | 4.2 | 1.622 | 2.630 | .2951 | .08710 | 10.6 | 3.388 | 11.48 |
| .6095 | .3715 | 4.2 | 1.641 | 2.692 | .2917 | .08511 | 10.7 | 3.428 | 11.75 |
| .6026 | .3631 | 4.4 | 1.660 | 2.754 | .2884 | .08318 | 10.8 | 3.467 | 12.02 |
| .5957 | .3548 | 4.5 | 1.679 | 2.818 | .2851 | .08128 | 10.9 | 3.508 | 12.30 |
| .5888 | .3467 | 4.5 | 1,698 | 2.884 | .2818 | .07943 | 11.0 | 3.548 | 12.59 |
| .5821 | .3388 | 4.7 | 1.718 | 2.951 | .2786 | .07762 | 11.1 | 3.589 | 12.88 |
| .5754 | .3311 | 4.7 | 1.738 | 3.020 | .2754 | .07586 | 11.2 | 3.631 | 13.18 |
| .5689 | .3236 | 4.9 | 1.758 | 3.090 | .2723 | .07413 | 11.3 | 3.673 | 13.49 |
| .5623 | .3162 | 5.0 | 1.788 | | .2692 | .07244 | 11.4 | 3,715 | 13.80 |
| .5559 | .3090 | 5.1 | 1.799 | 3.162 3.236 | .2661 | .07079 | 11.5 | 3.758 | 14.13 |
| .5495 | .3020 | 5.2 | 1.820 | 3.311 | .2630 | .06918 | 11.6 | 3.802 | 14.45 |
| .5433 | .2951 | 5.3 | 1.841 | 3.388 | .2600 | .06761 | 11.7 | 3.846 | 14.79 |
| .5370 | .2884 | 5.4 | 1.862 | 3.467 | .2570 | .06607 | 11.8 | 3.890 | 15.14 |
| .5309 | .2818 | 5.5 | 1.884 | 3.548 | .2541 | .06457 | 11.9 | 3.936 | 15.49 |
| .5248 | .2754 | 5.6 | 1.905 | 3.631 | .2512 | .06310 | 12.0 | 3.981 | 15.85 |
| .5188 | .2692 | 5.7 | 1.928 | 3.715 | .2483 | .06106 | 12.1 | 4.027 | 16.22 |
| .5129 | .2630 | 5.8 | 1.950 | 3.802 | .2455 | .06026 | 12.2 | 4.074 | 16.60 |
| .5070 | .2570 | 5.9 | 1.972 | 3.890 | .2427 | .05888 | 12.3 | 4.121 | 16.98 |
| .5012 | .2512 | 6.0 | 1.995 | 3.981 | .2399 | .05754 | 12.4 | 4.169 | 17.38 |
| .4955 | .2455 | 6.1 | 2.018 | 4.074 | .2371 | .05623 | 12.5 | 4.217 | 17.78 |
| .4898 | .2399 | 6.2 | 2.042 | 4.169 | .2344 | .05495 | 12.6 | 4.266 | 18.20 |
| | .2344 | 6.3 | 2.065 | 4.266 | .2317 | .05370 | 12.7 | 4.315 | 18.62 |
| .4842 | .2344 | | | | .2317 | | | 4.313 | ומחי |

Engineering Data

| Voltage | Power | | Voltage | Power |
|---------|--------|------|---------|-------|
| Ratio | Ratio | dB | Ratio | Ratio |
| .2265 | .05129 | 12.9 | 4.416 | 19.50 |
| .2239 | .05012 | 13.0 | 4.467 | 19.95 |
| .2213 | .04898 | 13.1 | 4.519 | 20.42 |
| .2188 | .04786 | 13.2 | 4.571 | 20.89 |
| ,2163 | .04677 | 13.3 | 4.624 | 21.38 |
| .2138 | .04571 | 13.4 | 4.677 | 21.88 |
| .2113 | .04467 | 13.5 | 4.732 | 22.39 |
| .2089 | .04365 | 13.6 | 4.786 | 22.91 |
| .2065 | .04266 | 13.7 | 4.842 | 23,44 |
| .2042 | .04169 | 13.8 | 4.898 | 23.99 |
| .2018 | .04074 | 13.9 | 4.955 | 24.55 |
| .1995 | .03981 | 14.0 | 5.012 | 25.12 |
| .1972 | .03890 | 14.1 | 5.070 | 25.70 |
| .1950 | .03802 | 14.2 | 5.129 | 26.30 |
| .1928 | .03715 | 14.3 | 5.188 | 26.92 |
| .1905 | .03631 | 14.4 | 5.248 | 27.54 |
| .1884 | .03548 | 14.5 | 5.309 | 28.18 |
| .1862 | .03467 | 14.6 | 5.370 | 28.84 |
| .1841 | .03388 | 14.7 | 5.433 | 29.51 |
| .1820 | .03311 | 14.8 | 5.495 | 30.20 |
| .1799 | .03236 | 14.9 | 5.559 | 30.90 |
| .1778 | .03162 | 15.0 | 5.623 | 31.62 |
| .1758 | .03090 | 15.1 | 5.689 | 32.36 |
| .1738 | .03020 | 15.2 | 5.754 | 33.11 |
| .1718 | .02951 | 15.3 | 5.821 | 33.88 |
| .1698 | .02884 | 15.4 | 5.888 | 34.67 |
| .1679 | .02818 | 15.5 | 5.957 | 35.48 |
| .1660 | .02754 | 15.6 | 6.026 | 36.31 |
| .1641 | .02692 | 15.7 | 6.095 | 37.15 |
| .1622 | .02630 | 15.8 | 6.166 | 38.02 |
| .1603 | .02570 | 15.9 | 6.237 | 38.90 |
| .1585 | .02512 | 16.0 | 6.310 | 39.81 |
| .1567 | .02455 | 16.1 | 6.383 | 40.74 |
| .1549 | .02399 | 16.2 | 6.457 | 41.69 |
| .1531 | .02344 | 16.3 | 6.531 | 42.66 |
| .1514 | .02291 | 16.4 | 6.607 | 43.65 |

| | | -dB+ | | |
|-------|--------|------|--------|--------|
| | | ← → | | |
| | | | | |
| | | | | |
| .1496 | .02239 | 16.5 | 6.683 | 44.67 |
| .1479 | .02188 | 16.6 | 6.761 | 45.71 |
| .1462 | .02138 | 16.7 | 6.839 | 46.77 |
| .1445 | .02089 | 16.8 | 6.918 | 47.86 |
| .1429 | .02042 | 16.9 | 6.998 | 48.98 |
| .1413 | .01995 | 17.0 | 7.079 | 50.12 |
| .1396 | .01950 | 17.1 | 7.161 | 51.29 |
| .1380 | .01905 | 17.2 | 7.244 | 52.48 |
| .1365 | .01862 | 17.3 | 7.328 | 53.70 |
| .1349 | .01820 | 17.4 | 7.413 | 54.95 |
| .1334 | .01778 | 17.5 | 7.499 | 56.23 |
| .1318 | .01738 | 17.6 | 7.586 | 57.54 |
| .1303 | .01698 | 17.7 | 7.674 | 58.88 |
| .1288 | .01660 | 17.8 | 7.762 | 60.26 |
| .1274 | .01622 | 17.9 | 7.852 | 61.66 |
| .1259 | .01585 | 18.0 | 7.943 | 63.10 |
| .1245 | .01549 | 18.1 | 8.035 | 64.57 |
| .1230 | .01514 | 18.2 | 8.128 | 66.07 |
| .1216 | .01479 | 18.3 | 8.233 | 67.61 |
| .1202 | .01445 | 18.4 | 8.318 | 69.18 |
| .1189 | .01413 | 18.5 | 8.414 | 70.79 |
| .1175 | .01380 | 18.6 | 8.511 | 72.44 |
| .1161 | .01349 | 18.7 | 8.610 | 74.13 |
| .1148 | .01318 | 18.8 | 8.710 | 75.86 |
| .1135 | .01288 | 18.9 | 8.811 | 77.62 |
| .1122 | .01269 | 19.0 | 8.913 | 79.43 |
| .1109 | .01230 | 19.1 | 9.016 | 81.28 |
| .1096 | .01202 | 19.2 | 9,120 | 83.18 |
| .1084 | .01175 | 19.3 | 9.226 | 85.11 |
| .1072 | .01148 | 19.4 | 9.333 | 87.10 |
| .1059 | .01122 | 19.5 | 9.441 | 89.13 |
| .1047 | .01096 | 19.6 | 9.550 | 91.20 |
| .1035 | .01072 | 19.7 | 9.661 | 93.33 |
| .1023 | .01047 | 19.8 | 9.772 | 95.50 |
| .1012 | .01023 | 19.9 | 9.886 | 97.72 |
| .1000 | .01000 | 20.0 | 10,000 | 100.00 |





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VARIATION OF ATTENUATION

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EFFECT OF LOAD VSWR

ON LINE ATTENUATION

VSWR AT TERMINATION

VSWR IMPROVEMENT DUE TO

LINE ATTENUATION

CNE LOSS F. II

VSWR AT LOAD

60

30 4O 5O COPPER OR ALUMINUM TRANSMISSION LINE

Ξ

COAXIAL CABLE DATA

Coaxial Transmission Line Attenuation and Power Rating



The following pages show the attenuation versus frequency characteristics of all standard Andrew rigid and HELIAX transmission lines. The values shown are for 24°C (75°F) ambient, and increase slightly with higher temperature or applied power. up to approximately 13% above the curves at full average power rating. The curve at left shows this relationship. Inner and outer conductor temperature rise is also shown for reference.

Effect of VSWR on Attenuation

When transmission line is attached to an antenna. the VSWR of the antenna increases the attenuation of the line. This effect is quite small for normal conditions. The curve shows increase in line loss versus VSWR.

Effect of Attenuation on VSWR

Antenna VSWR, as measured at the input to the connecting transmission line, is reduced by the attenuation of the line. The curves show this relationship.

Power Ratings

Peak and average power ratings are both required to describe fully the capabilities of a given transmission line. Typically, peak power ratings limit the line for low frequency or pulse usage while average power ratings limit the higher frequency usage.

Standard Peak Power Ratings

The permissible voltage between inner and outer conductor of a coaxial cable determines the peak power rating.

Voltage breakdown is independent of frequency. but varies with line pressure and VSWR Peak power ratings are therefore generally stated for the following conditions: Unity VSWR, no modulation. and one atmosphere absolute dry air pressure. 100% AM modulation reduces the peak power rating by a factor of 4. Peak power rating is given by the following expression.

$$P_{pk} = \frac{(E_{rf})^2}{Z_n(1+M)^2 \text{ VSWR}} \text{ (Sd)}^2 \text{ watts}$$

Where M is modulation percentage expressed decimally, VSWR is voltage standing wave ratio on the line, S_i is dielectric strength of the pressurizing medium relative to air, Erf is determined as follows: Err 0.247 E. E. is the DC production test voltage (the values in the table below are typical), and the constant 0.247 includes factors to relate DC voltage to RF voltage, to adjust to rms value, and includes a safety factor of 2. All of these factors are empirical and have been extensively verified.

| Outer Conductor OD, Inches | 3% | 1% | 3 | 31/6 | 6 | 616 | • |
|----------------------------------|-------|--------|--------|--------|--------|--------|--------|
| E _p volts | 6,000 | 11,000 | 16,000 | 19,000 | 26,000 | 35,000 | 50,000 |

INCREASED PEAK POWER RATINGS can be obtained through pressurization or the use of high dielectric strength gases or both. Variation of peak power rating with absolute pressure and use of dry air and Sulfur Hexafluoride (SF.) is shown at the right. These curves are based on voltagepressure tests conducted on transmission lines and components.

STANDARD AVERAGE POWER RATINGS are determined by the safe long term operating temperature of the inner conductor when the cable is operated in a 40°C (104 F) ambient. The ratings are based upon an inner conductor temperature of 100°C (212°F) for HELIAX air dielectric coaxial cable (polyethylene) and 79°C (175°F) for foam HELIAX coaxial cable. Rigid line ratings are based upon an inner conductor temperature of 101°C (216 F).

The curve at the right indicates the variation of average power rating with ambient temperature. Average power rating may be calculated from the following:

 $P_{av} = \frac{16,380 \text{ d D}}{4b}$ watts db,

where Pay average power rating for conditions described above.

D is OD of line in inches: dB, is measured attenuation derated for increase in loss at elevated temperature; and d is heat emissivity coefficient of outer conductor in watts/in."

For CW, AM, or FM applications, the average power rating of a cable is determined by derating the presented power curves according to VSWR. See expression below. SSB transmitters are generally rated by peak envelope power (PEP). Average power for these applications is considerably lower, typically about half the PEP. Television transmitter ratings are based on sync peak video power. Average power output for transmission line evaluation is 83% of nominal rating.

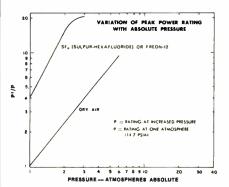
DERATING AVERAGE POWER FOR VSWR is accomplished by use of the derating factor (DF) calculated from the following formula.

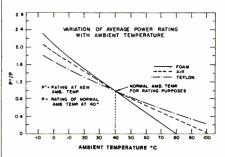
$$\frac{\text{D.F.}}{\text{(2 VSWR}^2 + 1)} \cdot + \text{FI} \frac{\text{(VSWR}^2 - 1)}{\text{(2 VSWR)}}$$

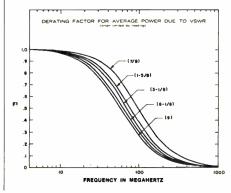
where F1 is a factor that varies with frequency and line size. Select the factor from the curve at right.

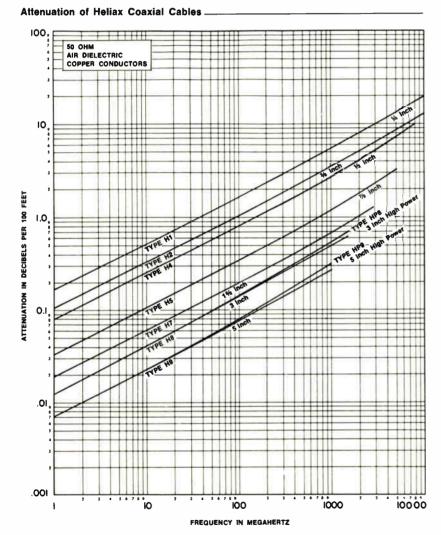
INCREASED AVERAGE POWER RATINGS are achievable by (1) treating the conductor surfaces for greater heat emissivity, (2) pressurizing the line, (3) using a gas with a larger heat transfer coefficient and (4) combination of these. For special applications your Andrew sales engineer will supply complete information.

Courtesy Andrew Corporation







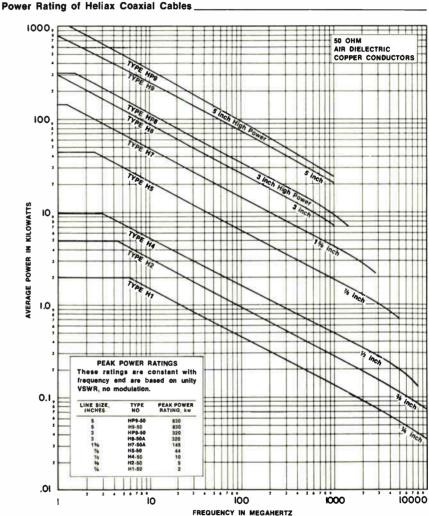


Attenuation curves based on:

1967/The

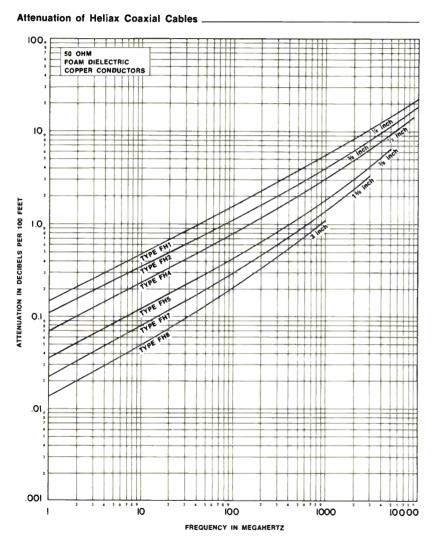
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VSWR 1.0:1.0 Ambient Temperature 24°C (75°F) Conversion Data: 1 dB/100 feet = 3.28 dB/100 meters For 75 ohm cables, multiply values by .95.

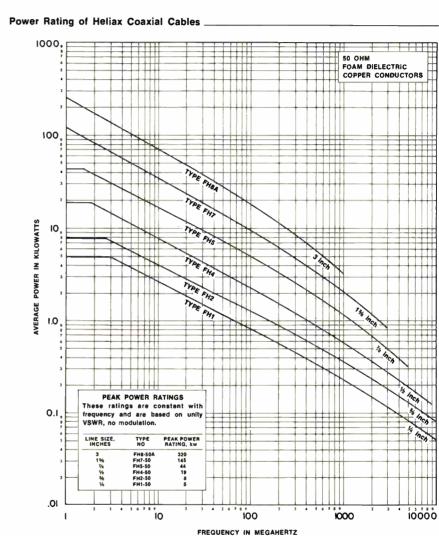


Power ratings based on: VSWR 1.0:1.0 Ambient Temperature 40°C (104°F) Inner conductor temperature 100°C (212°F) One atmosphere absolute dry air pressure Conversion Data:
For 75 ohm cables, multiply values by .70.
For ambient temperature 35 C (95°F), multiply values by 1.08

Courtesy Andrew Corporation



Attenuation curves based on: VSWR 1.0:1.0 Ambient Temperature 24 C (75°F) Conversion Data: 1 dB/100 feet = 3.28 dB/100 meters For 75 ohm cables, multiply values by .95.



Power Ratings based on: VSWR 1.0:1.0 Ambient Temperature 40 C (104 F) Inner conductor temperature 79°C (175°F)

Conversion Data: For ambient temperature 35°C (95°F), multiply values by 1.13

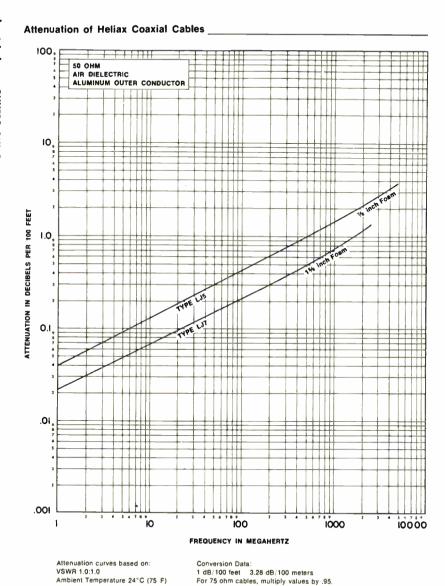
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ALUMINUM OUTER CONDUCTOR

50 OHM

AIR DIELECTRIC



O.I.

PEAK POWER RATINGS
These ratings are constant with frequency.

LINE SIZE, TYPE PEAK POWER NATINGLES WATER AND PEAK POWER NATINGLES WATER PEAK POWER NATINGLES WATER PEAK POWER PEAK POWER NATINGLES WATER PEAK POWER PEAK POWER PEAK POWER PEAK POWER PEAK POWER PEAK POWER PEAK

100

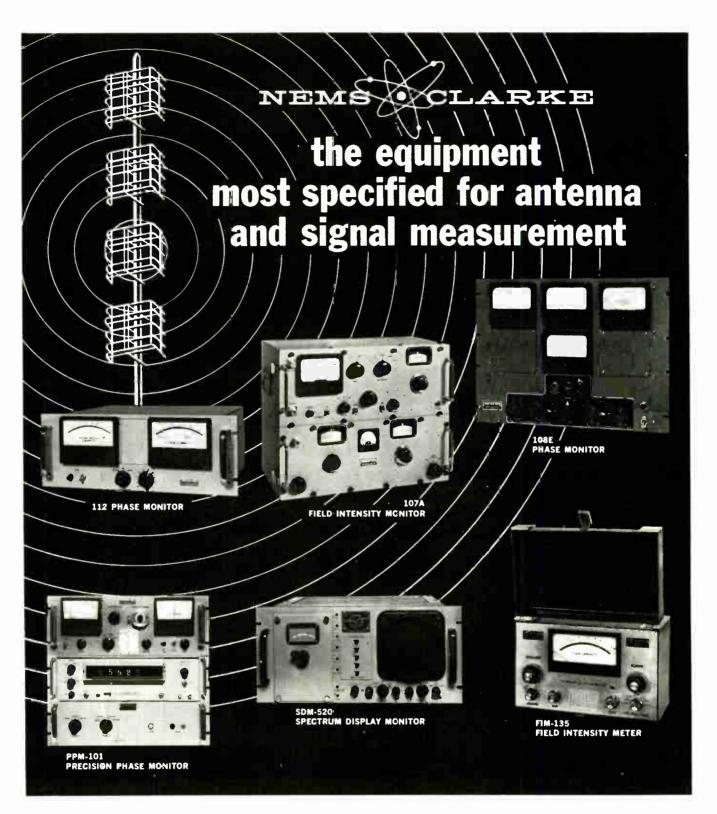
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Power ratings based on:
VSWR 1.0:1.0

Ambient Temperature 40°C (104°F)
Inner conductor temperature 100°C (212°F)
One atmosphere absolute dry air pressure

Conversion Data:
For 75 ohm cables, multiply values by .7C.
For ambient temperature 35°C (95 F), multiply values by 1,08





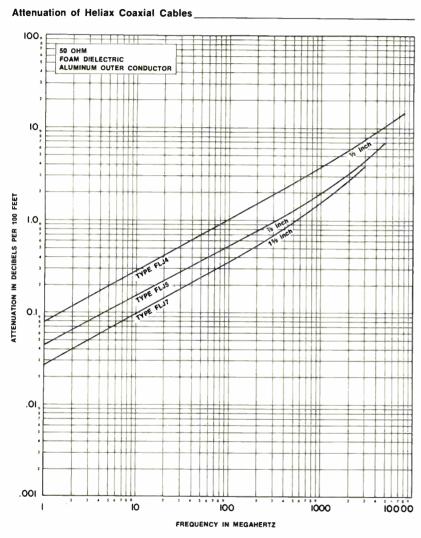
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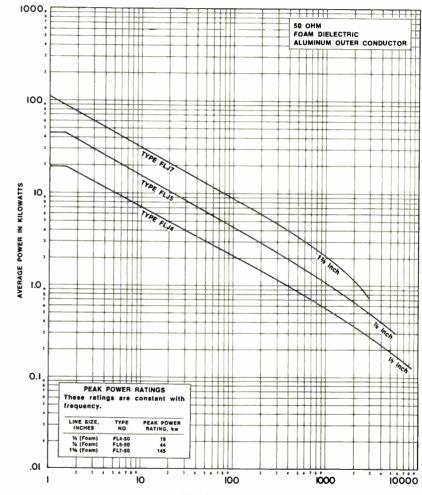
Courtesy Andrew Corporation



Attenuation curves based on: VSWR 1.0:1.0 Ambient Temperature 24°C (75°F)

Conversion Data: 1 dB/100 feet = 3.28 dB/100 meters For 75 ohm cables, multiply values by .95.

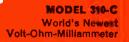
Power Rating of Heliax Coaxial Cables



FREQUENCY IN MEGAHERTZ

Power ratings based on: VSWR 1.0:1.0 Ambient Temperature 40°C (104°F) Inner conductor temperature 79°C (175°F) Conversion Data: For ambient temperature 35 C (95 F), multiply values by 1.13

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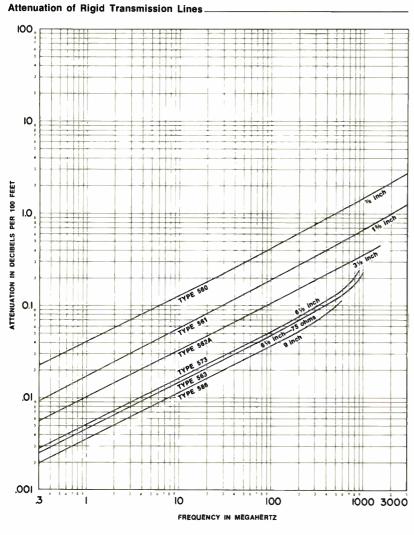
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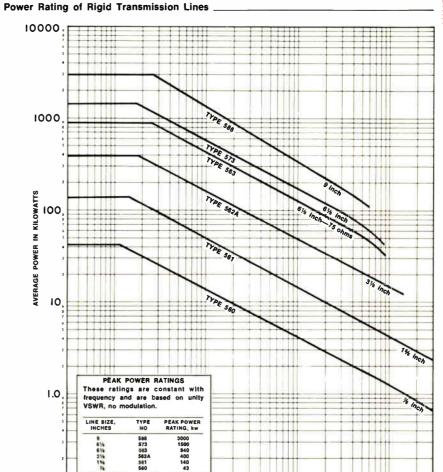


 Attenuation curves based on:
 Cor

 VSWR 1.0:1.0
 1 d

 Ambient Temperature 24°C (75°F)
 Am

Conversion Data: 1 dB/100 feet - 3.28 dB/100 meters Ambient Temperature 35 C (95 F)



Power ratings based on: VSWR 1.0:1.0 Ambient Temperature 40°C (104°F) Inner conductor temperature 102°C (216°F) One atmosphere absolute dry air pressure Conversion Data: For ambient temperature 35 C (95 F), multiply values by 1.08

1000 3000

100

FREQUENCY IN MEGAHERTZ

0.1

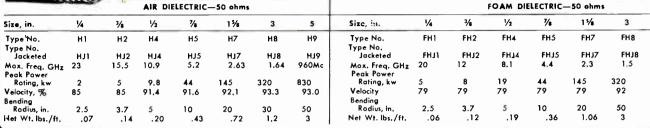
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|------------------------|-----|-------------|-----|------|------|------------------------|-----|--------------|------|-----|------|-------------|--------------------|-----|
| Size, in. | 1/4 | 3/6 | 1/2 | 7∕₃ | 15/8 | 3 | 5 | Size, in. | 1/4 | 3/8 | 1/2 | 7∕8 | 1 1/8 | 3 |
| ElA Fionge | | | | 75AR | 87R | 78R | 79R | EIA Flonge | _ | | 44AR | 45AR | 47R | 48R |
| "N" Jack | 71N | 72N | 74N | 75AN | 87N | _ | _ | "N" Jock | 41N | 42N | 44AN | 45AN | 47N | _ |
| "N" Plug | 71W | 72 W | 74W | 75AW | _ | _ | _ | "N" Plug | 41 W | 42W | 44AW | 45AW | 47 W | _ |
| UHF Jock | _ | _ | 74U | 75AU | 87U | _ | - | UHF Jock | 41 U | _ | 44AU | 45AU | _ | _ |
| LC Jock | _ | _ | _ | 75AL | 87L | 78L | | LC Jock | _ | _ | 44AL | 45AL | 47L | _ |
| LC Plug | _ | _ | | 75AM | 87 M | _ | | LC Plug | _ | _ | 44AM | 45AM | _ | _ |
| End Terminal | 71T | _ | 74T | 75AT | 87T | _ | | End Terminol | _ | _ | 44AT | 45AT | _ | _ |
| Splice | 71Z | 72 Z | 74Z | 75AZ | 87Z | 78Z | 79Z | Splice | _ | | 44AZ | 45AZ | 47 Z | 48Z |
| · - | • | • == | | | | | | UHF Plug | 41P | 42P | 44AP | 45AP | _ | _ |

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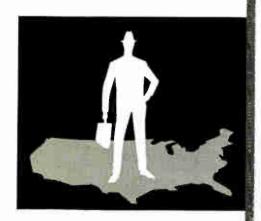
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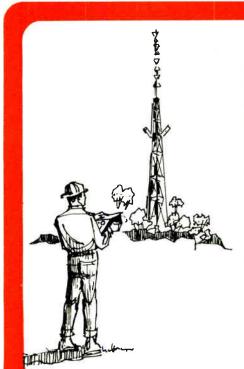
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MODEL 400A (RECORDER/REPRODUCER)





MODEL 500BS - STEREO



MODEL 605B (REPRODUCER):



MODEL 610B (REPRODUCER)

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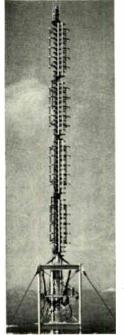
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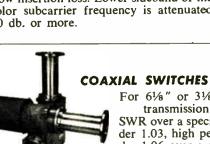


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