



TASK I STAGE FINAL REPORT

VOLUME II

**EVALUATION OF RANGE AND DISTORTION TOLERANCE
FOR HIGH MACH NUMBER TRANSONIC FAN STAGES**

By

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16. Abstract This report documents the performance and discusses the results of testing a single-stage 1400 ft/sec tip speed transonic compressor. Objectives of the program were to investigate efficiency, weight flow range, and tolerance to distorted inlet airflows. Tests were conducted with undistorted inlet flow and with both radial and circumferential inlet flow distortions. With undistorted inlet flow, the stage demonstrated a peak adiabatic efficiency at 100% design speed of 0.852 at a total-pressure ratio of 1.624 and an inlet corrected weight flow of 217.2 lb/sec. Stall margin of over 20% was obtained at the above operating condition. Radial and circumferential inlet flow distortions caused substantial reductions in unstalled weight flow range and efficiency. Volume I (NASA CR-72806) of this report contains a description of test apparatus and procedure, presentation and analysis of the experimental results, and graphical presentations of the data. Volume II contains tabulations of the computer output of the data reduction programs. Overall performance data are listed for all undistorted and distorted inlet flow tests; blade element data are listed for both undistorted and radial distortion tests; and, vector diagram data are listed for tests with circumferential inlet flow distortion.			
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APPENDIX A

SYMBOLS

APPENDIX A

SYMBOLS

Symbol	Description	Units
A	Annulus or streamtube area	In. ²
a	Length along chord line to location of maximum displacement between camber line and chord line	In.
C	Chord length of cylindrical section	In.
C _h	Enthalpy - equivalent static-pressure-rise coefficient:	
	$C_h = \frac{2gJ c_p t_1 \left[\left(\frac{p_2}{p_1} \right)^{\frac{\gamma-1}{\gamma}} - 1 \right] - (U_2^2 - U_1^2)}{v_1'^2}$	---
C _p	Static-pressure-rise coefficient:	
	$C_p = \frac{p_2 - p_1}{p_1' - p_1}$	---
c _p	Specific heat at constant pressure	Btu/Lb-° R
D	Diffusion factor:	
	$D_{rotor} = 1 - \frac{v_2'}{v_1'} + \frac{r_2 V_{\theta 2} - r_1 V_{\theta 1}}{2\bar{r} \sigma v_1'}$	---
	$D_{stator} = 1 - \frac{V_2}{V_1} + \frac{r_1 V_{\theta 1} - r_2 V_{\theta 2}}{2\bar{r} \sigma V_1}$	---
g	Acceleration due to gravity	32.174 Ft/Sec ²
i	Incidence angle, difference between flow angle and camber line angle at leading edge in cascade projection	Degrees

Symbol	Description	Units
i_{SS}	Suction surface incidence angle, difference between flow angle and leading edge suction surface	Degrees
J	Mechanical equivalent of heat	778.161 Ft-Lb/Btu
M	Mach number	---
N	Rotational speed	RPM
P	Total or stagnation pressure	PSIA
p	Static pressure	PSIA
r	Radius	In.
\bar{r}	Mean radius, average of streamline leading-trailing edge radii	In.
T	Total or stagnation temperature	° R
ΔT	Total temperature rise	° R
t	Static temperature	° R
t_e	Airfoil edge thickness	In.
t_m	Airfoil maximum thickness	In.
U	Rotor speed	Ft/Sec
V	Air velocity	Ft/Sec
W	Weight flow	Lbs/Sec
Z	Displacement along compressor axis	In.
β	Flow angle, angle whose tangent is the ratio of tangential-to-axial velocity	Degrees
$\Delta\beta$	Air-turning angle, $\Delta\beta = \beta_1 - \beta_2$	Degrees
γ°	Blade-chord angle (stagger), angle in cascade projection between blade chord and axial direction	Degrees
γ	Ratio of specific heats	---
δ°	Deviation angle, difference between flow angle and camber-line angle at trailing edge in cascade projection	Degrees

<u>Symbol</u>	<u>Description</u>	<u>Units</u>
δ	Pressure correction, $\frac{P_{\text{actual}}}{14.696 \text{ PSIA}}$	---
ϵ°	Slope of meridional streamline	Degrees
θ	Temperature correction, $\frac{T_{\text{actual}}}{518.7^\circ \text{ R}}$	---
θ°	Circumferential position from top center	Degrees
η	Efficiency	---
κ°	Angle between tangent to blade meanline and the axial direction	Degrees
σ	Solidity, ratio of chord to spacing	---
$\bar{\epsilon}^\circ$	Camber angle, difference between angles in cascade projection of tangents to camber line at extremes of camber-line arc	Degrees
φ	Flow coefficient	---
ψ	Work coefficient	---
\bar{w}	Total-pressure-loss coefficient:	
	Rotor, $\bar{w}' = \frac{P_{2id}' - P_2'}{P_1' - p_1}$	---
	Stator, $\bar{w} = \frac{P_1 - P_2}{P_1 - p_1}$	---
$\frac{\bar{w} \cos \beta_2}{2\sigma}$	Total-pressure-loss parameter	---

Subscripts

ad	Adiabatic
an	Annulus
cor	Corrected to unity axial velocity ratio
d	Downstream measurement plane (Table V)

<u>Subscripts</u>	<u>Description</u>
e	Edge of blade (Figure 10)
h	Hub
id	Ideal
j	Immersion
m	Meridional direction
p	Polytropic
S	Measurement plane (Figure 10)
SS	Suction surface
t	Tip at Station 1.0
u	Upstream measurement plane (Table V)
z	Axial direction
θ	Tangential direction
o	Corrected to zero inlet swirl
1	Leading edge
2	Trailing edge
0.01, 0.18, 0.95, 1.51, 2.20	} Measurement station designations (Figures 7 and 8)

Superscripts

- ' Relative to rotor
- * Critical flow condition

APPENDIX B

DUPLICATE LISTING OF TABLE VII,
OVERALL PERFORMANCE DATA

The overall performance data for the stage and for the rotor are presented in Table VII which is repeated here from Volume I for convenience.

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Table VII. Listing of Overall Performance Data.

(a) Shakedown Test With Undistorted Inlet

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*	Stator Setting (deg)
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency		
1	50.3	50	125.62	1.0786	0.7572	1.0910	0.8728	O.P.	0
2	50.0	50	125.20	1.0780	0.7297	1.0903	0.8417	O.P.	0
3	50.1	2	89.41	1.1376	0.7752	1.1426	0.8018	O.P.	0
4	70.1	50	172.11	1.1509	0.7148	1.1809	0.8491	O.P.	0
5	70.1	3	130.21	1.2820	0.7918	1.2918	0.8171	O.P.	0
6	90.1	30	205.73	1.2683	0.6795	1.3242	0.8078	O.P.	0
7	90.1	6	183.53	1.5319	0.8457	1.5510	0.8718	O.P.	0
8	100.2	25	221.12	1.3440	0.7135	1.3894	0.7976	O.P.	-3
9	100.1	15	220.61	1.4617	0.8148	1.4804	0.8438	O.P.	-3
10	100.0	15	219.52	1.4600	0.8100	1.4796	0.8400	B.E.	-3
11	100.0	9	216.48	1.6190	0.8391	1.6445	0.8674	B.E.	-3
12	100.1	9	216.51	1.6208	0.8322	1.6570	0.8731	O.P.	-8
13	100.2	9	217.29	1.6218	0.8363	1.6428	0.8602	O.P.	0
14	100.0	9	217.29	1.6262	0.8460	1.6463	0.8689	O.P.	+4
15	100.0	9	216.50	1.6428	0.8553	1.6617	0.8764	O.P.	+8
16	100.0	15	221.67	1.4601	0.7902	1.4826	0.8240	O.P.	0
17	99.8	6.15	204.95	1.7034	0.8427	1.7346	0.8737	O.P.	0
18	100.0	6.15	202.98	1.6932	0.8324	1.7359	0.8614	O.P.	-3
19	100.1	9	213.81	1.6547	0.8455	1.6810	0.8740	O.P.	+11
20	100.0	6.15	206.83	1.7194	0.8478	1.7397	0.8676	O.P.	+8
21	110.1	9	230.38	1.7088	0.8100	1.7359	0.8358	O.P.	0
22	90.1	9	196.74	1.4830	0.8680	1.4992	0.8933	O.P.	0
23	80.1	9	175.28	1.3567	0.8762	1.3688	0.9030	O.P.	0
24	80.1	3.5	149.79	1.3890	0.7952	1.4053	0.8248	O.P.	0

*The following symbols indicate the type of data recorded:

- OP - Overall Performance Data From Fixed Instruments
- BE - Blade Element Traverse Data Plus Overall Performance
- CT - Continuous Traverse Data Plus Overall Performance
- SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Continued).

(b) Undistorted Inlet Performance Test

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
25	100.0	15	221.89	1.4587	0.8111	1.4811	0.8457	B.E.
26	100.0	15	221.12	1.4589	0.7964	1.4814	0.8305	O.P.
27	100.0	9	217.17	1.6239	0.8518	1.6463	0.8776	B.E.
28	100.0	6	204.03	1.7037	0.8281	1.7377	0.8613	B.E.
29	100.1	7.5	212.65	1.6761	0.8504	1.7020	0.8776	B.E.
30	100.1	11	219.33	1.5630	0.8461	1.5805	0.8686	B.E.
31	90.2	15	204.39	1.3761	0.8212	1.3946	0.8574	B.E.
32	90.0	9	196.56	1.4863	0.8739	1.5001	0.8955	B.E.
33	90.0	7.5	192.81	1.5105	0.8706	1.5256	0.8928	B.E.
34	90.0	6	183.44	1.5269	0.8465	1.5457	0.8726	B.E.
35	90.1	30	205.36	1.2726	0.7030	1.3206	0.8153	B.E.
36	50.1	30	123.15	1.0861	0.8127	1.0958	0.9012	B.E.
37	50.1	30	123.20	1.0860	0.8095	1.0957	0.8983	O.P.
38	50.0	15	114.70	1.1073	0.8463	1.1129	0.8889	B.E.
39	50.0	11	109.34	1.1166	0.8796	1.1210	0.9115	B.E.
40	50.0	9	106.75	1.1213	0.8831	1.1251	0.9094	O.P.
41	50.1	6	100.80	1.1288	0.8504	1.1321	0.8712	B.E.
42	50.1	2	89.28	1.1369	0.8065	1.1416	0.8333	B.E.
43	70.1	30	169.98	1.1674	0.7937	1.1910	0.8989	B.E.
44	70.1	15	160.99	1.2193	0.8858	1.2311	0.9304	B.E.
45	70.0	9	151.55	1.2548	0.8909	1.2628	0.9166	B.E.
46	70.0	6	141.97	1.2712	0.8465	1.2788	0.8682	B.E.
47	70.1	3	128.91	1.2809	0.7950	1.2910	0.8212	B.E.
48	80.1	30	188.52	1.2131	0.7417	1.2442	0.8420	B.E.
49	80.1	15	185.71	1.2927	0.8507	1.3087	0.8930	B.E.
50	80.0	9	174.54	1.3534	0.8755	1.3642	0.8996	B.E.
51	80.1	6	162.43	1.3814	0.8468	1.3927	0.8691	B.E.
52	80.1	3.5	150.16	1.3864	0.7942	1.4026	0.8237	B.E.
53	90.1	11	199.43	1.4435	0.8666	1.4587	0.8927	O.P.
54	100.1	25	220.48	1.3419	0.6839	1.4000	0.7872	O.P.

*The following symbols indicate the type of data recorded:

- OP - Overall Performance Data From Fixed Instruments
- BE - Blade Element Traverse Data Plus Overall Performance
- CT - Continuous Traverse Data Plus Overall Performance
- SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Continued).

(b) Undistorted Inlet Performance Test (Concluded)

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
55	100.1	15	219.94	1.4643	0.8087	1.4860	0.8416	C.T.
56	100.1	9	216.33	1.6144	0.8474	1.6335	0.8698	C.T.
58	100.0	6	202.06	1.6934	0.8356	1.7279	0.8701	C.T.
59	50.0	4	96.17	1.1350	0.8271	1.1411	0.8625	O.P.
60	50.1	4	95.00	1.1331	0.8045	1.1364	0.8237	O.P.
61	70.0	3	129.66	1.2808	0.7886	1.2913	0.8155	O.P.
62	80.0	2.45	143.40	1.3852	0.7693	1.4057	0.8057	O.P.
63	90.1	5	176.81	1.5292	0.8140	1.5521	0.8443	O.P.
64	100.0	5.5	198.11	1.6968	0.8064	1.7370	0.8451	O.P.
65	110.2	9	230.47	1.7044	0.8073	1.7305	0.8322	O.P.
66	110.1	7	226.68	1.8307	0.8101	1.8738	0.8441	O.P.
67	109.9	9	229.89	1.7045	0.8079	1.7298	0.8320	B.E.
68	109.9	9	230.02	1.7049	0.8119	1.7304	0.8363	O.P.
69	110.3	6.75	225.55	1.8502	0.8030	1.9015	0.8421	B.E.
70	110.1	7.25	228.61	1.8148	0.8168	1.8554	0.8498	B.E.
71	110.0	8	228.43	1.7584	0.8155	1.7884	0.8420	B.E.
72	110.2	13	230.69	1.5656	0.7764	1.5920	0.8074	B.E.
73	50.0	15	114.97	1.1067	0.8471	1.1121	0.8887	O.P.
74	80.1	11	179.07	1.3353	0.8795	1.3468	0.9067	O.P.

*The following symbols indicate the type of data recorded:

- OP - Overall Performance Data From Fixed Instruments
- BE - Blade Element Traverse Data Plus Overall Performance
- CT - Continuous Traverse Data Plus Overall Performance
- SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Continued).

(c) Undistorted Inlet Test with Long Inlet Duct

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
132	70.0	30	168.95	1.184	0.8056	1.199	0.8750	O.P.
133	70.1	9	146.34	1.259	0.8229	1.268	0.8750	O.P.
134	70.1	3	126.37	1.275	0.7568	1.288	0.8018	C.T.
135	100.1	15	220.37	1.486	0.8294	1.506	0.8588	O.P.
136	100.1	9	214.61	1.633	0.8510	1.658	0.8846	O.P.
137	100.1	6.5	202.34	1.681	0.8333	1.722	0.8728	C.T.
138	90.0	30	204.18	1.290	0.7521	1.321	0.8376	O.P.
139	90.1	9	194.21	1.484	0.8554	1.500	0.8795	O.P.
140	90.1	5.5	177.75	1.525	0.8162	1.541	0.8432	C.T.

*The following symbols indicate the type of data recorded:

- OP - Overall Performance Data From Fixed Instruments
- BE - Blade Element Traverse Data Plus Overall Performance
- CT - Continuous Traverse Data Plus Overall Performance
- SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Continued).

(d) Radial Inlet Distortion Test

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency	
75	70.0	50	167.99	1.1878	0.7761	1.2078	0.8534	O.P.
76	70.0	10	148.40	1.2657	0.8385	1.2745	0.8639	O.P.
77	70.0	15	156.89	1.2440	0.8235	1.2546	0.8671	O.P.
78	90.1	50	202.87	1.2882	0.6989	1.3236	0.7769	O.P.
79	90.0	11	195.05	1.4623	0.8259	1.4777	0.8500	O.P.
80	90.0	15	198.33	1.4139	0.8130	1.4309	0.8424	O.P.
81	100.0	50	216.41	1.3359	0.6650	1.3803	0.7436	B.E.
82	100.0	10.5	212.58	1.5914	0.8003	1.6129	0.8251	B.E.
83	100.0	14	215.95	1.5168	0.7854	1.5377	0.8130	B.E.

*The following symbols indicate the type of data recorded:

- OP - Overall Performance Data From Fixed Instruments
- BE - Blade Element Traverse Data Plus Overall Performance
- CT - Continuous Traverse Data Plus Overall Performance
- SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

Table VII. Listing of Overall Performance Data (Concluded).

(e) Circumferential Inlet Distortion Test

Reading Number	Percent Design Speed	Throttle Setting	Inlet Corrected Weight Flow (lbs/sec)	Stage		Rotor		Type Point*	Dist. Screen And Position (deg. From TDC)
				Total Pressure Ratio	Adiabatic Efficiency	Total Pressure Ratio	Adiabatic Efficiency		
84	70	50	165.2	1.192	.746	1.214	.826	O.P.	195
85	70	5	130.8	1.285	.757	1.300	.793	O.P.	↓
86	70	10	146.6	1.269	.818	1.283	.857	O.P.	
87	90	50	204.4	1.319	.763	1.358	.848	O.P.	
88	90	7.5	179.0	1.501	.818	1.526	.853	O.P.	
89	90	11	192.1	1.469	.831	1.494	.870	O.P.	
90	100	50	220.1	1.390	.738	1.445	.829	O.P.	
91	100	9.6	204.6	1.604	.820	1.638	.858	O.P.	
92	100	13	213.5	1.556	.830	1.583	.865	O.P.	
93-104	100	9.6	205.3	1.602	.816	1.638	.853	SRT	
105	100	9.6	205.8	1.602	.814	1.637	.854	O.P.	
106-117	100	50	219.2	1.389	.736	1.447	.828	SRT	
118	100	50	218.3	1.389	.736	1.448	.833	O.P.	
119-130	100	13	211.9	1.555	.828	1.582	.862	SRT	
131	100	13	212.3	1.555	.831	1.583	.867	O.P.	

*The following symbols indicate the type of data recorded:

- OP - Overall Performance Data From Fixed Instruments
- BE - Blade Element Traverse Data Plus Overall Performance
- CT - Continuous Traverse Data Plus Overall Performance
- SRT - Screen Rotation Test for Circumferential Distortion Traverse Data Plus Overall Performance

APPENDIX C

SYMBOLIC LISTING OF ROTOR AND
STATOR BLADE ELEMENT DATA

Symbolic identification for the various column headings in the tabulation of blade element data to be presented in Appendixes D and E is presented in Table VI. This table is repeated here from Volume I for convenience.

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TABLE VI SYMBOLIC LISTING OF BLADE ELEMENT DATA

ROTOR BLADE ROW - NASA TASK I										
RADIAL POSITION	BLADE ELEMENT PERFORMANCE RESULTS									
	POINT NUMBER			READING NUMBER		DATE				
	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMR LN LE ANGLE	INCID ANG MN CMR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1										
2										
3										
4	β_1'	β_1	α_1^o	1	1 _{SS}	V_1	V_1'	V_{z1}	$V_{\theta 1}$	$V_{\theta 1}'$
5										
6										
7										
	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1										
2										
3										
4	β_2'	β_2	α_2^o	δ^o	$\Delta\theta'$	V_2	V_2'	V_{z2}	$V_{\theta 2}$	$V_{\theta 2}'$
5										
6										
7										
	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR TL PRESS LOSS PARAM	T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CH1
1										
2										
3	U_1	M_1	M_1'	$\frac{V_{z2}}{V_{z1}}$	$\bar{\omega}'$	$\frac{\bar{\omega}' \cos \beta_2'}{2\sigma}$	η_{ad}	η_p	D	C_h
4										
5										
6										
7										
	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	AUR EFFICIENCY	POLY MOMEN EFFICIENCY	RISE / HEAS T RISE	STAT PRESS RISE COEFF
1										
2										
3	U_2	M_2	M_2'	σ	$\bar{\omega}'$	$\frac{\bar{\omega}' \cos \beta_2'}{2\sigma}$	η_{ad}	η_p	$\frac{U_2 V_{\theta 2} - U_1 V_{\theta 1}}{J g c_p \Delta T}$	C_p
4										
5										
6										
7										
	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000					PERFORMANCE PARAMETERS				
2	10.0000					Total Pressure Ratio =	STAGE DATA	ROTOR DATA	ROTOR DATA	
3	30.0000	$\frac{P_{1.51}}{P_{0.95}}$	$\frac{T_{1.51}}{T_{0.95}}$	$\frac{P_{1.51}}{P_{0.95}}$	$\frac{T_{1.51}}{T_{0.95}}$	=	FIXED INST. $P_{2.20}^{0.18}$	FIXED INST. $P_{1.51}^{0.95}$	TRAV. INST. $P_{1.51}^{0.95}$	
4	50.0000					Adiabatic Efficiency =	η_{ad}	η_{ad}	η_{ad}	
5	70.0000					Polytropic Efficiency =	η_p	η_p	η_p	
6	90.0000					Percent Design Speed = $\frac{\%N\sqrt{\sigma}}{W\sqrt{\delta}}$	Discharge Valve Setting =			
7	95.0000					Cor. Nozzle Weight Flow = $\frac{W\sqrt{\delta}}{W\sqrt{\delta}}$	Vane Schedule =			Stator
						LE Check Flow/Noz. Flow =	TE Check Flow/Noz. Flow =			
						Assumed LE Flow Coeff. =	Assumed TE Flow Coeff. =			

TABLE VI SYMBOLIC LISTING OF BLADE ELEMENT DATA (Concluded)

STATOR BLADE ROW * NASA TASK I										
BLADE ELEMENT PERFORMANCE RESULTS										
POINT NUMBER READING NUMBER DATE										
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1										
2										
3	*N/A	β_1	α_1^o	1	N/A	V_1	N/A	V_{z1}	$V_{\theta 1}$	N/A
4										
5										
6										
7										
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURV ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1										
2										
3	N/A	β_2	α_2^o	δ	$\Delta\beta$	V_2	N/A	V_{z2}	$V_{\theta 2}$	N/A
4										
5										
6										
7										
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	LOSS COEFFICIENT		TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMFN RISE/ EFFICIENCY MEAS	STAT PRESS RISE COEFF
1										
2										
3	N/A	M_1	N/A	$\frac{V_{z2}}{V_{z1}}$					D	C_h
4										
5										
6										
7										
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMFN RISE/ EFFICIENCY MEAS	STAT PRESS RISE COEFF	
1										
2										
3	N/A	M_2	N/A	σ	\bar{w}	$\frac{\bar{w} \cos \beta_2}{2\sigma}$	N/A	η_p	N/A	C_p
4										
5										
6										
7										
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEHP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000					PERFORMANCE PARAMETERS				
2	10.0000					STAGE DATA		STATOR DATA		STATOR DATA
3	30.0000	$\frac{P_{2.2}}{P_{1.51}}$	$\frac{T_{2.2}}{T_{1.51}}$	$\frac{P_{2.2}}{P_{1.51}}$	$\frac{T_{2.2}}{T_{1.51}}$	FIXED INST.	FIXED INST.	TRAV. INST.	TRAV. INST.	TRAV. INST.
4	50.0000					Total Pressure Ratio =	$\frac{P_{2.20}/P_{0.18}}{P_{1.51}}$	$\frac{P_{2.20}/P_{1.51}}{P_{1.51}}$	$\frac{P_{2.20}/P_{1.51}}{P_{1.51}}$	$\frac{P_{2.20}/P_{1.51}}{P_{1.51}}$
5	70.0000					Polytropic Efficiency =	η_p	η_p		
6	90.0000					Percent Design Speed =	$\frac{N}{N\sqrt{\delta}}$	Discharge Valve Setting =		
7	95.0000					Cor. Nozzle Weight Flow =	$w\sqrt{\delta}$	Vane Schedule = Stator		
						LE Check Flow/Noz.Flow =		TE Check Flow/Noz.Flow =		
						Assumed LE Flow Coeff. =		Assumed TE Flow Coeff. =		

* Not Applicable: NA

APPENDIX D

TABULATIONS OF BLADE ELEMENT DATA
FOR UNDISTORTED INLET TESTING

The blade element data for rotor and stator for undistorted inlet flow testing, obtained from fixed and traverse instruments, are presented in this appendix. The readings are arranged in an ascending order of speed and at each speed in an ascending order of stage total pressure ratio.

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Blade Element Data For Undistorted Inlet Testing

ROTOR BLADE ROW - NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 1 READING NUMBER 36 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCTY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.73	0.	60.60	4.13	1.43	323.31	752.55	320.83	0.	679.56
2	63.68	0.	59.61	4.07	1.04	329.92	741.98	328.76	0.	664.59
3	60.72	0.	56.01	4.71	0.25	336.28	687.62	336.27	0.	599.78
4	58.07	0.	52.36	5.51	-0.33	333.90	630.04	332.94	0.	534.28
5	55.36	0.	49.71	5.65	-1.14	327.63	571.04	323.09	0.	467.71
6	53.17	0.	47.11	6.06	-1.60	307.26	499.49	294.91	0.	393.80
7	51.68	0.	46.13	5.55	-2.35	308.82	483.07	293.54	0.	371.46

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VEL
1	58.97	19.43	54.80	4.07	5.85	336.21	648.22	334.74	118.08	554.30
2	58.38	19.86	54.42	3.96	5.30	353.33	632.61	331.35	119.72	538.23
3	54.19	21.94	50.68	3.51	6.53	360.92	572.11	334.68	134.82	463.93
4	47.67	24.69	43.79	3.88	10.41	380.66	513.76	345.96	150.87	379.74
5	37.07	29.62	32.15	4.92	18.30	416.60	453.70	361.22	205.36	272.87
6	22.70	35.92	14.29	8.41	30.47	456.69	402.09	366.04	265.20	153.10
7	19.01	34.94	8.00	11.01	32.67	479.23	417.60	386.94	270.29	133.34

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	GM1
1	679.56	0.292	0.679	1.043	0.197	0.209
2	664.59	0.298	0.670	1.008	0.206	0.229
3	599.78	0.304	0.621	0.995	0.233	0.281
4	534.28	0.302	0.569	1.039	0.260	0.315
5	467.71	0.296	0.516	1.118	0.301	0.337
6	393.80	0.277	0.451	1.241	0.318	0.280
7	371.46	0.279	0.436	1.318	0.260	0.256

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS	STAY PRESS RISE	COEFF
1	672.38	0.317	0.577	1.3340	0.116	0.072	0.6666	0.6716	0.8246	0.175	
2	657.95	0.315	0.564	1.3690	0.043	0.008	0.8750	0.8765	0.8665	0.195	
3	599.75	0.322	0.510	1.5080	0.032	0.006	0.9200	0.9210	0.8601	0.260	
4	538.81	0.339	0.458	1.6840	0.048	0.010	0.9048	0.9060	0.8605	0.310	
5	478.23	0.372	0.405	1.9060	0.036	0.007	0.9428	0.9436	0.9048	0.353	
6	418.30	0.408	0.359	2.2170	0.044	0.009	0.9510	0.9518	0.9692	0.349	
7	403.63	0.429	0.373	2.3390	0.075	0.015	0.9247	0.9260	0.9026	0.352	

RADIAL POSITION	PERCENT EXCESSIVE	TRAV TOT		FIXED TOT		OVERALL PERFORMANCE SUMMARY					
		PRESS RATIO	TEMP RATIO	PRESS RATIO	TEMP RATIO	PERFORMANCE PARAMETERS		STAGE DATA	ROTOR DATA	ROTOR DATA	
1	5.0000	1.075	1.031	1.066	1.028			FIXED INST.	FIXED INST.	TRAV. INST.	
2	10.0000	1.076	1.029	1.083	1.026	Total Pressure Ratio =	1.0861	1.0958	1.0955		
3	30.0000	1.086	1.030	1.089	1.027	Adiabatic Efficiency =	0.8127	0.9012	0.8108		
4	50.0000	1.094	1.032	1.096	1.029	Polytropic Efficiency =	0.8149	0.9025	0.8133		
5	70.0000	1.108	1.035	1.104	1.030	Percent Design Speed =	50.1	Discharge Valve Setting =	30.0		
6	90.0000	1.119	1.037	1.119	1.034	Cor. Nozzle Weight Flow =	123.15	Vane Schedule =		0.0	
7	99.0000	1.128	1.039	1.121	1.036	LE Check Flow/Noz.Flow =	1.0101	TE Check Flow/Noz.Flow =	0.9693		
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.990		

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 1 READING NUMBER 36 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCD ANG MN CHBR LN	INCD ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		19.34	39.47	-20.13		357.92		337.73	118.51	
2		19.54	39.11	-19.57		359.25		338.55	120.15	
3		20.80	39.01	-18.71		379.47		354.50	134.69	
4		23.07	39.80	-16.73		402.92		369.73	157.49	
5		27.57	40.86	-13.29		437.17		384.98	201.02	
6		33.64	42.22	-8.58		466.85		384.31	255.69	
7		32.67	42.76	-10.09		487.17		404.73	259.50	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.74	-11.13	10.39	20.08	339.45		339.42	-4.40	
2		-1.13	-10.10	8.97	20.67	380.98		380.89	-7.51	
3		-3.02	-8.87	5.85	23.83	388.39		387.89	-20.46	
4		-2.40	-8.75	6.35	25.47	406.98		406.17	-17.01	
5		-2.73	-9.10	6.37	30.31	432.16		430.74	-20.57	
6		-1.49	-10.58	9.09	35.13	483.67		482.02	-12.55	
7		-0.12	-12.36	12.24	32.79	494.16		492.57	-1.05	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.319		1.005	0.164	-0.146
2		0.320		1.125	0.054	-0.154
3		0.339		1.094	0.102	-0.142
4		0.360		1.099	0.114	-0.098
5		0.391		1.119	0.145	-0.096
6		0.418		1.254	0.102	-0.145
7		0.436		1.217	0.111	-0.146

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN HEAS T RISE	STAT PRESS RISE COEFF
1		0.302		1.5230	0.137	0.045		-1.4996		-0.142
2		0.341		1.5440	0.116	0.037		1.2037		-0.149
3		0.347		1.6310	0.143	0.044		2.8012		-0.138
4		0.364		1.7420	0.093	0.027		4.2828		-0.095
5		0.387		1.8800	0.081	0.021		-5.2070		-0.092
6		0.434		2.0510	0.076	0.019		1.9074		-0.138
7		0.443		2.0980	0.069	0.016		4.5678		-0.138

RADIAL POSITION	PERCENT INTERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.983	0.997	0.991	1.000
2	10.0000	0.998	0.997	0.992	1.000
3	30.0000	0.993	0.997	0.989	1.000
4	50.0000	0.993	0.997	0.992	1.000
5	70.0000	0.988	0.996	0.992	1.000
6	90.0000	0.992	0.998	0.991	1.000
7	95.0000	0.985	0.997	0.991	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.0861	0.9887	0.9913
Polytropic Efficiency =	0.8149	0.9029	-----
Percent Design Speed =	50.1	Discharge Valve Setting =	30.0
Cor. Nozzle Weight Flow =	123.15	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9744	TE Check Flow/Noz.Flow =	0.9900
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

 BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 2 READING NUMBER 38 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.34	0.	60.60	5.74	3.04	299.77	742.31	297.47	0.	679.09
2	65.30	0.	59.61	5.69	2.66	306.47	731.43	305.39	0.	664.12
3	62.60	0.	56.01	6.59	2.13	310.69	675.10	310.68	0.	599.36
4	60.11	0.	52.56	7.55	1.71	307.72	616.24	306.83	0.	538.91
5	57.70	0.	49.71	7.99	1.20	299.67	555.20	295.51	0.	467.38
6	55.62	0.	47.11	8.51	0.85	280.49	483.26	269.22	0.	393.53
7	54.55	0.	46.13	8.42	0.92	278.04	463.78	264.28	0.	371.20
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.60	26.34	54.80	3.80	7.74	352.52	605.13	314.90	155.93	515.98
2	58.29	25.78	54.42	3.87	7.02	348.39	595.76	312.89	151.13	506.36
3	54.33	28.41	50.68	3.65	8.27	351.81	530.55	309.35	167.37	430.96
4	48.02	29.45	43.79	4.23	12.09	368.99	480.34	321.24	181.39	357.05
5	37.94	34.66	32.15	5.69	19.85	396.60	413.01	325.44	225.04	252.85
6	23.73	39.42	14.29	9.44	31.89	432.94	366.74	331.35	272.32	145.68
7	16.84	42.00	8.00	8.84	37.72	456.85	357.58	335.27	301.90	101.45
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1	679.09	0.270	0.669	1.059	0.263	0.277				
2	664.12	0.276	0.660	1.025	0.261	0.295				
3	599.36	0.280	0.609	0.996	0.296	0.347				
4	533.91	0.278	0.556	1.047	0.308	0.385				
5	467.38	0.270	0.501	1.101	0.363	0.412				
6	393.53	0.253	0.435	1.231	0.371	0.370				
7	371.20	0.250	0.418	1.269	0.374	0.344				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY WOMEN EFFICIENCY	RISE/ T RISE	STAT PRESS RISE COEFF
1	671.91	0.312	0.536	1.3340	0.136	0.027	0.7146	0.7184	0.8408	0.239
2	657.49	0.309	0.529	1.3690	0.059	0.011	0.8681	0.8701	0.8569	0.258
3	598.33	0.312	0.471	1.5080	0.040	0.008	0.9189	0.9202	0.8687	0.324
4	538.44	0.328	0.427	1.6840	0.068	0.014	0.8890	0.8907	0.8555	0.380
5	477.89	0.353	0.367	1.9060	0.063	0.013	0.9164	0.9177	0.9079	0.429
6	418.00	0.386	0.327	2.2170	0.068	0.014	0.9340	0.9351	0.9173	0.443
7	403.35	0.407	0.319	2.3390	0.100	0.021	0.9136	0.9151	0.9366	0.450
RADIAL POSITION	PERCENT EXERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO					
1	5.0000	1.102	1.040	1.096	1.037					
2	10.0000	1.102	1.037	1.108	1.034					
3	30.0000	1.107	1.037	1.109	1.033					
4	50.0000	1.112	1.037	1.112	1.035					
5	70.0000	1.119	1.038	1.116	1.037					
6	90.0000	1.125	1.040	1.126	1.037					
7	95.0000	1.135	1.042	1.129	1.039					

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	ROTOR DATA	ROTOR DATA
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.1073	1.1129	1.1126
Adiabatic Efficiency =	0.8463	0.8889	0.8149
Polytropic Efficiency =	0.8485	0.8906	0.8177
Percent Design Speed =	50.0	Discharge Valve Setting =	15.0
Cor. Nozzle Weight Flow =	114.70	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0049	TE Check Flow/Noz.Flow =	0.9714
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

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Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 2 READING NUMBER 38 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		26,23	39,47	-13,24		354,15		317,69	156,50	
2		25,39	39,11	-13,72		353,80		319,62	151,68	
3		27,06	39,01	-11,95		367,81		327,37	167,21	
4		27,64	39,80	-12,16		388,05		342,93	179,59	
5		32,46	40,86	-8,40		412,88		346,30	220,29	
6		37,07	42,22	-5,15		440,09		347,49	262,56	
7		39,61	42,76	-3,15		459,65		350,19	289,85	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0,76	-11,13	10,37	26,99	310,15		310,11	-4,12	
2		-1,52	-10,10	8,58	26,91	344,37		344,22	-9,15	
3		-2,35	-8,87	6,52	29,41	349,19		348,75	-14,31	
4		-2,33	-8,75	6,42	29,97	359,54		358,84	-14,61	
5		-2,68	-9,10	6,42	35,14	381,45		380,22	-17,79	
6		-0,65	-10,58	9,93	37,72	418,90		417,58	-4,70	
7		-0,66	-12,36	11,70	40,28	423,97		422,58	-4,90	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,314		0,576	0,273	0,031
2		0,314		1,077	0,174	0,038
3		0,327		1,065	0,202	0,050
4		0,345		1,046	0,216	0,090
5		0,368		1,098	0,228	0,086
6		0,392		1,202	0,194	0,054
7		0,410		1,207	0,228	0,040

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MCHEN EFFICIENCY	RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,275		1,5230	0,128	0,042		0,1339		0,030
2		0,306		1,5440	0,086	0,028		0,7643		0,037
3		0,311		1,6310	0,078	0,024		0,5264		0,049
4		0,320		1,7420	0,050	0,014		0,6431		0,087
5		0,340		1,8800	0,034	0,009		0,6009		0,084
6		0,373		2,0510	0,049	0,012		0,5925		0,052
7		0,378		2,0980	0,066	0,016		0,2727		0,038

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO		FIXED TOT PRESS RATIO		FIXED TOT TEMP RATIO	
			TEMP RATIO	TEMP RATIO	PRESS RATIO	PRESS RATIO	TEMP RATIO	TEMP RATIO
1	5,0000	0,986	0,997	0,991	0,991	1,000		
2	10,0000	0,999	0,997	0,994	0,994	1,000		
3	30,0000	0,997	0,996	0,994	0,994	1,000		
4	50,0000	0,996	0,998	0,996	0,996	1,000		
5	70,0000	0,995	0,997	0,997	0,997	1,000		
6	90,0000	0,996	0,997	0,995	0,995	1,000		
7	95,0000	0,988	0,997	0,993	0,993	1,000		

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA			STATOR DATA	
	FIXED INST.	FIXED INST.	TRAV. INST.	STATOR DATA	STATOR DATA
Total Pressure Ratio =	1.1073	0.9950	0.9950		
Polytropic Efficiency =	0.8485	0.9402	-----		
Percent Design Speed =	50.0	Discharge Valve Setting =	15.0		
Cor. Nozzle Weight Flow =	114.70	Vane Schedule =	0.0		
LE Check Flow/Noz.Flow =	0.9765	TE Check Flow/Noz.Flow =	0.9724		
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935		

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 3 READING NUMBER 39 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67.16	0.	60.60	6756	3.86	288.26	737.87	286.05	0.	679.23
2	66.35	0.	59.61	6774	3.71	291.88	725.56	296.86	0.	664.27
3	63.68	0.	56.01	7767	3.21	296.62	668.86	296.61	0.	599.49
4	61.37	0.	52.56	8781	2.97	292.42	608.84	291.58	0.	534.02
5	59.79	0.	49.71	9708	2.29	287.26	548.69	283.28	0.	467.48
6	56.78	0.	47.11	9767	2.01	268.53	476.49	257.74	0.	393.61
7	59.55	0.	46.13	9742	1.52	267.96	457.87	254.70	0.	371.28

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.42	31.03	54.80	3.62	8.74	352.96	576.54	301.57	181.42	490.44
2	58.17	30.10	54.42	3.75	8.19	347.88	569.72	300.24	174.04	483.59
3	54.32	31.84	50.68	3.64	9.36	349.94	509.58	297.19	184.58	413.87
4	48.06	33.94	43.79	4.27	13.30	363.52	451.24	304.54	202.92	335.63
5	38.04	37.16	32.15	5.89	20.75	390.25	394.89	310.35	235.19	242.81
6	23.62	42.06	14.29	9.33	33.16	424.00	349.11	312.06	281.60	136.49
7	17.15	42.60	8.00	9.15	38.39	451.74	350.87	328.44	302.05	101.39

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	679.23	0.260	0.665	1.057	0.310	0.308
2	664.27	0.263	0.654	1.032	0.302	0.325
3	599.49	0.267	0.603	1.002	0.330	0.377
4	534.02	0.264	0.549	1.034	0.358	0.415
5	467.48	0.299	0.494	1.096	0.394	0.447
6	393.61	0.242	0.429	1.211	0.412	0.416
7	371.28	0.241	0.412	1.290	0.381	0.396

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS	ADB EFFICIENCY	POLY MCHEN EFFICIENCY	RISE/ RISE	STAT PRESS RISE COEFF
1	672.06	0.312	0.510	1.3340	0.138	0.027	0.7396	0.7435	0.8613	0.269
2	657.63	0.308	0.505	1.3690	0.070	0.013	0.8609	0.8631	0.8904	0.266
3	598.45	0.310	0.452	1.5000	0.028	0.005	0.9471	0.9480	0.9058	0.354
4	539.55	0.323	0.400	1.6840	0.058	0.012	0.9111	0.9125	0.9022	0.410
5	478.00	0.347	0.351	1.9060	0.034	0.007	0.9558	0.9566	0.9028	0.465
6	418.09	0.377	0.307	2.2170	0.038	0.008	0.9641	0.9648	0.9457	0.492
7	403.43	0.402	0.333	2.3390	0.066	0.013	0.9455	0.9465	0.9186	0.569

RADIAL POSITION	PERCENT IMMERISION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.116	1.046	1.111	1.041
2	10.0000	1.115	1.041	1.118	1.038
3	30.0000	1.118	1.039	1.119	1.035
4	50.0000	1.120	1.039	1.119	1.036
5	70.0000	1.125	1.040	1.122	1.035
6	90.0000	1.130	1.040	1.130	1.037
7	95.0000	1.141	1.043	1.136	1.039

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.1166	1.1210	1.1215
Adiabatic Efficiency =	0.8796	0.9115	0.8245
Polytropic Efficiency =	0.8815	0.9130	0.8273
Percent Design Speed =	50.0	Discharge Valve Setting =	11.0
Cor. Nozzle Weight Flow =	109.34	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0106	TE Check Flow/Noz.Flow =	0.9785
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 3 READING NUMBER 39 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		30.90	39.47	8.57		354.56		304.23	182.07	
2		29.67	39.11	-9.44		352.93		306.65	174.67	
3		30.39	39.81	-8.62		364.67		314.39	184.41	
4		31.99	39.80	-7.81		380.07		321.65	200.90	
5		34.90	40.86	-5.96		404.67		330.03	230.22	
6		39.70	42.22	-2.52		429.23		327.09	271.51	
7		40.21	42.76	-2.55		454.08		343.00	289.99	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.32	-11.13	11.45	30.58	296.71		296.70	1.67	
2		-1.50	-10.10	8.60	31.17	330.51		330.38	-8.65	
3		-1.82	-8.87	7.05	32.21	335.02		334.72	-10.61	
4		-1.81	-8.75	6.94	33.80	336.38		337.93	-10.67	
5		-2.59	-9.10	6.51	37.49	354.43		353.31	-15.97	
6		-0.68	-10.58	9.90	40.37	385.83		384.62	-4.54	
7		-0.70	-12.36	11.66	40.91	393.14		391.84	-4.75	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.313		0.975	0.330	0.094
2		0.313		1.077	0.231	0.101
3		0.324		1.065	0.245	0.120
4		0.338		1.050	0.269	0.172
5		0.360		1.071	0.265	0.178
6		0.382		1.176	0.255	0.152
7		0.405		1.142	0.286	0.132

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOY PRESS LOSS PARAM	ADB EFFICIENCY	POLY HOMOEN EFFICIENCY	RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.262		1.5230	0.139	0.046		0.3190		0.092
2		0.293		1.5440	0.062	0.020		0.8420		0.099
3		0.297		1.6310	0.048	0.015		0.7896		0.117
4		0.300		1.7420	0.031	0.009		0.8384		0.168
5		0.315		1.8800	0.027	0.007		0.7793		0.174
6		0.343		2.0510	0.045	0.011		0.8001		0.147
7		0.349		2.0980	0.081	0.019		0.5354		0.128

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.986	0.996	0.991	1.000
2	10.0000	0.999	0.996	0.996	1.000
3	30.0000	0.998	0.995	0.997	1.000
4	50.0000	0.997	0.997	0.998	1.000
5	70.0000	0.995	0.995	0.998	1.000
6	90.0000	0.996	0.997	0.996	1.000
7	95.0000	0.987	0.997	0.991	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA/ TRAV. INST.
Total Pressure Ratio =	1.1166	0.9961	0.9956
Polytropic Efficiency =	0.8815	0.9655	-----
Percent Design Speed =	50.0	Discharge Valve Setting =	11.0
Cor. Nozzle Weight Flow =	109.34	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9836	TE Check Flow/Noz.Flow =	0.9755
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 5 READING NUMBER 49 DATE 3/ 2/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VFL	INLET REL TANG VFL
1	69.00	0.	60.60	8.40	5.70	262.93	728.94	260.91	0.	679.47
2	68.02	0.	59.61	8.41	5.38	269.27	717.35	264.33	0.	664.89
3	65.66	0.	56.01	9.65	5.19	271.41	658.58	271.40	0.	600.05
4	63.55	0.	52.56	10.99	5.15	266.66	597.35	265.89	0.	534.53
5	61.14	0.	49.71	11.43	4.44	261.49	536.03	257.87	0.	467.92
6	59.19	0.	47.11	12.08	4.42	244.82	463.85	234.98	0.	393.98
7	59.31	0.	46.13	12.16	4.28	241.34	443.11	229.40	0.	371.63
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DFV ANG TF	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VFL
1	59.14	37.59	54.80	4.34	9.86	148.29	537.29	275.29	211.94	460.75
2	57.63	36.45	54.42	3.21	10.40	154.08	531.32	284.22	209.92	448.33
3	54.60	37.02	50.68	3.92	11.06	147.21	478.52	277.16	209.00	390.02
4	48.45	40.80	43.79	4.66	15.10	157.60	408.15	270.66	233.63	304.53
5	39.32	42.60	32.15	6.17	22.82	180.86	357.44	279.84	257.29	221.15
6	24.10	46.45	14.29	9.81	35.09	408.16	309.78	279.11	293.43	124.85
7	14.67	48.88	2.00	6.67	43.64	440.62	302.91	286.93	328.68	75.13
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1	679.87	0.237	0.656	1.055	0.371	0.347				
2	664.89	0.242	0.646	1.059	0.346	0.345				
3	600.05	0.244	0.593	1.021	0.379	0.416				
4	534.53	0.240	0.538	1.018	0.433	0.455				
5	467.92	0.235	0.487	1.085	0.460	0.494				
6	393.98	0.220	0.417	1.188	0.479	0.483				
7	371.63	0.217	0.399	1.251	0.482	0.461				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MCHEN EFFICIENCY	RISE/MEAS T RISE	STAT PRESS RISE COEFF
1	672.69	0.307	0.473	1.3140	0.148	0.032	0.7324	0.7370	0.8677	0.306
2	658.25	0.312	0.469	1.3490	0.130	0.025	0.7902	0.7939	0.8915	0.325
3	599.12	0.307	0.423	1.5880	0.053	0.010	0.9147	0.9162	0.9126	0.393
4	539.06	0.316	0.361	1.6440	0.114	0.022	0.8522	0.8547	0.9217	0.451
5	478.45	0.338	0.317	1.9060	0.066	0.014	0.9250	0.9263	0.9455	0.515
6	418.49	0.363	0.276	2.2170	0.055	0.011	0.9530	0.9538	0.9983	0.546
7	403.81	0.392	0.270	2.3190	0.044	0.013	0.9526	0.9536	0.9872	0.578
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.132	1.053	1.129	1.048	PERFORMANCE PARAMETERS				
2	10.0000	1.135	1.050	1.133	1.046	STAGE DATA			ROTOR DATA	
3	30.0000	1.132	1.044	1.132	1.040	FIXED INST.			FIXED INST. TRAV. INST.	
4	50.0000	1.131	1.044	1.128	1.041	Total Pressure Ratio =	1.1288	1.1321	1.1340	
5	70.0000	1.134	1.042	1.131	1.039	Adiabatic Efficiency =	0.8504	0.8712	0.8174	
6	90.0000	1.135	1.040	1.136	1.039	Polytropic Efficiency =	0.8530	0.8735	0.8207	
7	95.0000	1.148	1.043	1.144	1.041	Percent Design Speed =	50.1	Discharge Valve Setting =	06.0	
						Cor. Nozzle Weight Flow =	100.80	Vane Schedule =	0.0	
						LE Check Flow/Noz.Flow =	1.0067	TE Check Flow/Noz.Flow =	0.9713	
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 5 READING NUMBER 41 DATE 3/ 2/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMRR LN	INCID ANG SUCT SJRF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		37.45	39.47	2.02		149.80		277.70	212.70	
2		35.98	39.11	3.13		358.65		290.24	210.68	
3		35.47	39.01	3.54		159.97		293.02	208.80	
4		38.73	39.80	1.07		170.39		288.40	231.30	
5		40.27	40.86	0.59		191.52		297.27	251.85	
6		44.09	42.22	1.87		410.38		292.30	288.11	
7		46.51	42.76	3.75		438.87		299.39	315.56	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.16	-11.13	10.97	37.61	978.86		278.85	-0.79	
2		-0.56	-10.10	9.54	36.53	107.77		307.74	-2.98	
3		-2.99	-8.87	5.88	38.46	107.49		306.94	-16.03	
4		-1.62	-8.75	7.13	40.35	100.12		299.66	-8.49	
5		-2.55	-9.10	6.55	42.83	112.03		311.06	-13.87	
6		-0.85	-10.58	10.53	44.14	137.94		336.90	-0.30	
7		-1.03	-12.36	11.33	47.93	145.99		344.82	-6.19	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO	DIFFUSION FACTOR	CHI
1		0.308		1.004	0.403	0.199
2		0.316		1.000	0.335	0.201
3		0.319		1.048	0.337	0.241
4		0.328		1.039	0.374	0.294
5		0.348		1.046	0.382	0.305
6		0.365		1.153	0.342	0.292
7		0.390		1.152	0.383	0.294

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY HOMOEN RISE/ REAS Y RISE	STAY PRESS RISE COEFF
1		0.245		1.5230	0.129	0.042		0.5524	0.196
2		0.271		1.5440	0.035	0.011		0.7692	0.197
3		0.272		1.6310	0.029	0.009		0.9010	0.236
4		0.265		1.7420	0.017	0.005		0.8616	0.249
5		0.276		1.8800	0.022	0.006		0.8413	0.299
6		0.299		2.0510	0.036	0.009		0.9103	0.285
7		0.306		2.0980	0.092	0.022		0.6745	0.247

RADIAL POSITION	PERCENT DIVERGENCE	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.989	0.996	0.992	1.000
2	10.0000	0.996	0.996	0.996	1.000
3	30.0000	0.998	0.996	0.998	1.000
4	50.0000	0.996	0.997	0.999	1.000
5	70.0000	0.995	0.997	0.998	1.000
6	90.0000	0.997	0.999	0.997	1.000
7	95.0000	0.987	0.998	0.991	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA			STATOR DATA		
	FIXED INST.	FIXED INST.	TRAV. INST.	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.1288	0.9971	0.9955			
Polytropic Efficiency =	0.8530	0.9765	-----			
Percent Design Speed =	50.1	Discharge Valve Setting=	06.0			
Cor. Nozzle Weight Flow=	100.80	Vane Schedule =	0.0			
LE Check Flow/Noz.Flow =	0.9824	TE Check Flow/Noz.Flow =	0.9688			
Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935			

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW * NASA TASK I										
BLADE ELEMENT PERFORMANCE RESULTS										
POINT NUMBER 6 READING NUMBER 42 DATE 3/ 1/1970										
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	71.58	0.	60.60	10.98	8.28	228.10	717.06	226.36	0.	679.81
2	70.64	0.	59.61	11.03	8.00	234.43	704.95	233.61	0.	664.83
3	68.43	0.	56.01	12.42	7.96	237.21	645.19	237.20	0.	600.00
4	66.39	0.	52.56	13.83	7.99	234.33	583.59	233.65	0.	534.48
5	63.89	0.	49.71	14.18	7.39	232.50	522.46	229.28	0.	467.88
6	61.63	0.	47.11	14.92	6.86	221.63	452.01	212.72	0.	393.94
7	60.65	0.	46.13	14.52	6.62	219.86	431.76	208.98	0.	371.59
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.42	51.30	54.80	5.62	11.16	357.97	453.12	223.46	278.95	393.68
2	57.14	43.15	54.42	2.72	13.50	363.57	488.50	264.79	248.23	409.96
3	54.87	43.02	50.68	4.19	13.56	348.02	442.13	254.39	237.41	361.55
4	49.11	47.64	43.79	5.32	17.28	355.36	365.73	239.40	262.57	276.44
5	38.96	47.17	32.15	6.81	24.93	373.44	326.68	253.49	273.41	204.99
6	25.91	40.80	14.29	11.62	39.72	392.86	289.38	257.01	293.58	124.87
7	15.34	50.75	8.00	7.34	49.31	429.85	285.36	269.49	329.85	73.92
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO	DIFFUSION		CM1			
1	679.81	0.205	0.645	0.987	FACTOR					
2	664.83	0.211	0.634	1.133	0.513		0.365			
3	600.06	0.213	0.580	1.072	0.435		0.380			
4	534.48	0.211	0.525	1.025	0.437		0.438			
5	467.88	0.209	0.470	1.106	0.507		0.477			
6	393.94	0.199	0.406	1.208	0.513		0.532			
7	371.59	0.198	0.388	1.290	0.510		0.558			
					0.510		0.554			
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS	STAT PRESS RISE COEFF
1	672.63	0.313	0.397	1.3340	0.215	0.040	0.7091	0.7147	0.9049	0.323
2	658.19	0.319	0.429	1.3690	0.199	0.040	0.7330	0.7382	0.8707	0.340
3	598.96	0.307	0.390	1.5080	0.104	0.020	0.8583	0.8610	0.9181	0.415
4	539.01	0.313	0.323	1.6840	0.164	0.032	0.8151	0.8184	0.8973	0.474
5	478.40	0.330	0.289	1.9060	0.086	0.017	0.9137	0.9153	0.8960	0.556
6	418.45	0.348	0.257	2.2170	0.050	0.010	0.9603	0.9610	0.8928	0.646
7	403.78	0.382	0.253	2.3390	0.091	0.019	0.9378	0.9391	0.8993	0.680
RADIAL POSITION	PERCENT DIVERGENCE	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.148	1.067	1.146	1.056	PERFORMANCE PARAMETERS				
2	10.0000	1.150	1.060	1.147	1.055	STAGE DATA			ROTOR DATA	ROTOR DATA
3	30.0000	1.144	1.050	1.142	1.045	FIXED INST.	FIXED INST.	FIXED INST.	TRAV. INST.	
4	90.0000	1.140	1.051	1.136	1.046	Total Pressure Ratio =	1.1369	1.1416	1.1444	
5	70.0000	1.141	1.047	1.138	1.041	Adiabatic Efficiency =	0.8065	0.8333	0.7614	
6	90.0000	1.140	1.044	1.141	1.040	Polytropic Efficiency =	0.8101	0.8365	0.7659	
7	99.0000	1.156	1.047	1.147	1.043	Percent Design Speed =	50.1	Discharge Valve Setting=	02.0	
						Cor. Nozzle Weight Flow=	89.28	Vane Schedule	=	0.0
						LE Check Flow/Noz.Flow =	1.0084	TE Check Flow/Noz.Flow =	1.0000	
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 6 READING NUMBER 42 DATE 3/ 1/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		51.16	39.47	11.69		359.41		225.38	279.95		
2		42.66	39.11	3.55		367.65		270.35	249.13		
3		41.43	39.01	2.42		358.61		268.78	237.18		
4		45.57	39.80	5.77		364.59		254.85	259.96		
5		44.85	40.86	3.99		381.11		269.06	267.63		
6		46.46	42.22	4.24		393.55		269.02	283.06		
7		48.41	42.76	5.65		426.96		281.10	316.69		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		3.20	11.13	14.33	47.96	268.47		268.05	14.99		
2		1.67	10.10	11.77	40.99	285.00		284.86	8.30		
3		-1.46	8.87	7.41	42.89	278.31		278.10	-7.11		
4		-0.14	8.75	8.61	45.71	258.30		258.02	-0.64		
5		-0.90	9.10	8.20	45.75	271.64		271.03	-4.27		
6		1.82	10.58	12.40	44.64	291.45		290.41	9.23		
7		-0.78	12.36	11.58	49.18	299.69		298.70	-4.04		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO				DIFFUSION FACTOR	CH1		
1		0.315		1.189				0.495	0.288		
2		0.323		1.054				0.437	0.288		
3		0.316		1.035				0.432	0.335		
4		0.322		1.012				0.495	0.406		
5		0.337		1.007				0.475	0.416		
6		0.349		1.079				0.426	0.405		
7		0.379		1.063				0.474	0.345		
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ HEAS T RISE	STAT PRESS RISE COEFF	
1		0.235		1.5230	0.121	0.040		0.6666		0.283	
2		0.250		1.5440	0.070	0.023		0.7298		0.283	
3		0.245		1.6310	0.034	0.010		0.8480		0.329	
4		0.227		1.7420	0.052	0.015		0.8198		0.400	
5		0.240		1.8800	0.045	0.012		0.8516		0.409	
6		0.258		2.0510	0.049	0.012		0.9017		0.398	
7		0.265		2.0980	0.086	0.021		0.6854		0.337	
RADIAL POSITION	PERCENT DIVERGION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.990	0.990	0.992	1.000	PERFORMANCE PARAMETERS					
2	10.0000	0.992	0.995	0.995	1.000	STAGE DATA STATOR DATA					
3	30.0000	0.996	0.996	0.998	1.000	FIXED INST. FIXED INST. TRAV. INST.					
4	50.0000	0.994	0.995	0.996	1.000	Total Pressure Ratio =	1.1369	0.9959	0.9934		
5	70.0000	0.994	0.995	0.997	1.000	Polytropic Efficiency =	0.8101	0.9684	-----		
6	90.0000	0.996	0.996	0.996	1.000	Percent Design Speed =	50.1	Discharge Valve Setting=	02.0		
7	95.0000	0.984	0.996	0.992	1.000	Cor. Nozzle Weight Flow=	89.28	Vane Schedule	=	0.0	
						LE Check Flow/Noz.Flow =	1.0052	TE Check Flow/Noz.Flow =	0.9857		
						Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935		

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I.											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 7 READING NUMBER 43 DATE 3/ 1/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LB ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1	64.05	0.	60.60	3.45	0.75	466.94	1060.46	463.36	0.	952.13	
2	63.08	0.	59.61	3.47	0.44	474.39	1045.03	472.73	0.	931.15	
3	60.10	0.	56.01	4.09	-0.37	483.21	969.37	483.20	0.	840.35	
4	57.54	0.	52.56	4.98	-0.86	477.37	887.94	476.19	0.	748.58	
5	54.91	0.	49.71	5.20	-1.59	466.81	804.57	460.34	0.	655.30	
6	52.82	0.	47.11	5.71	-1.95	436.08	703.27	418.55	0.	551.75	
7	51.68	0.	46.13	5.95	-2.39	432.72	676.83	411.30	0.	520.44	
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TR ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1	59.32	19.84	54.80	4.52	4.72	491.06	903.20	460.31	166.05	776.02	
2	58.47	20.16	54.42	4.05	4.61	493.10	883.44	461.57	169.49	752.35	
3	54.47	21.88	50.68	3.79	5.63	501.85	801.18	465.56	186.98	651.92	
4	48.36	25.48	43.79	4.57	9.18	522.36	709.63	471.46	224.66	530.27	
5	38.27	29.49	32.15	6.12	16.64	569.78	631.40	494.65	279.79	390.25	
6	24.59	35.82	14.29	10.30	28.22	619.13	593.54	496.85	358.65	227.42	
7	17.81	38.81	8.00	9.81	33.88	653.80	538.60	502.52	404.13	161.39	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO					DIFFUSION FACTOR	CHI	
1	952.13	0.426	0.966	0.993					0.207	0.224	
2	931.15	0.433	0.953	0.976					0.214	0.243	
3	840.35	0.441	0.885	0.964					0.237	0.301	
4	748.58	0.436	0.810	0.990					0.276	0.330	
5	659.30	0.425	0.733	1.075					0.307	0.365	
6	551.75	0.396	0.639	1.187					0.331	0.319	
7	520.44	0.393	0.615	1.222					0.337	0.291	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ MEAS Y	STAT PRESS RISE COEFF	
1	942.07	0.436	0.802	1.3340	0.099	0.019	0.7221	0.7269	0.8943	0.173	
2	921.84	0.438	0.785	1.3690	0.047	0.009	0.8769	0.8795	0.9448	0.192	
3	838.89	0.445	0.711	1.5080	0.023	0.004	0.9476	0.9489	0.8720	0.261	
4	754.92	0.464	0.630	1.6840	0.064	0.013	0.8837	0.8866	0.9209	0.316	
5	670.04	0.507	0.562	1.9060	0.041	0.009	0.9360	0.9377	0.9238	0.365	
6	586.07	0.592	0.493	2.2170	0.074	0.015	0.9194	0.9218	0.9543	0.374	
7	569.52	0.584	0.481	2.3390	0.120	0.024	0.8860	0.8895	0.9921	0.376	
OVERALL PERFORMANCE SUMMARY											
PERFORMANCE PARAMETERS						STAGE DATA ROTOR DATA ROTOR DATA					
						FIXED INST.		FIXED INST.		TRAV. INST.	
Total Pressure Ratio =							1.1674	1.1910	1.1924		
Adiabatic Efficiency =							0.7937	0.8089	0.8462		
Polytropic Efficiency =							0.7982	0.9014	0.850		
Percent Design Speed =	70.1						Discharge Valve Setting =		30.0		
Cor. Nozzle Weight Flow =	169.98						Vane Schedule =		0.0		
LE Check Flow/Noz.Flow =	0.9994						TE Check Flow/Noz.Flow =	0.9682			
Assumed LE Flow Coeff. =	0.985						Assumed TE Flow Coeff. =	0.950			
RADIAL POSITION	PERCENT DISERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO						
1	5.0000	1.149	1.056	1.130	1.049						
2	10.0000	1.156	1.053	1.166	1.051						
3	30.0000	1.177	1.058	1.182	1.052						
4	50.0000	1.191	1.057	1.194	1.059						
5	70.0000	1.217	1.055	1.205	1.059						
6	90.0000	1.235	1.071	1.231	1.067						
7	99.0000	1.236	1.074	1.240	1.072						

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 7 READING NUMBER 43 DATE 3/ 1/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCLD ANG MN CHBR LN	INCLD ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		19.73	39.47	-19.74		493.52		464.64	166.65		
2		19.80	39.11	-19.31		502.16		472.44	170.10		
3		20.63	39.01	-18.38		530.55		496.22	186.80		
4		23.66	39.80	-16.14		555.68		507.66	222.42		
5		27.25	40.86	-13.61		602.18		531.84	273.87		
6		33.37	42.22	-8.85		639.37		525.03	345.80		
7		36.29	42.76	-6.47		663.53		528.37	388.00		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		-0.87	511.13	10.26	20.60	472.49		472.43	-7.19		
2		-0.84	510.10	9.26	20.64	539.42		539.33	-7.90		
3		-2.99	58.87	5.88	23.62	547.97		547.00	28.58		
4		-1.49	58.75	7.26	25.15	572.05		571.23	14.88		
5		-3.10	59.10	6.00	30.35	598.33		598.18	32.32		
6		-0.95	510.58	9.63	34.32	668.96		666.81	11.03		
7		-0.40	512.36	11.96	36.69	692.81		690.57	-4.77		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO				DIFFUSION FACTOR		CW1	
1		0.438		1.017				0.158		-0.212	
2		0.447		1.142				0.040		-0.203	
3		0.472		1.102				0.091		-0.193	
4		0.495		1.125				0.092		-0.192	
5		0.537		1.121				0.141		-0.142	
6		0.568		1.270				0.082		-0.213	
7		0.593		1.307				0.094		-0.229	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAH	ADP EFFICIENCY	POLY HOMOEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF		
1		0.420		1.5230	0.177	0.058		-2.7356	-0.200		
2		0.482		1.5440	0.117	0.038		1.3025	-0.191		
3		0.490		1.6310	0.167	0.051		2.4527	-0.180		
4		0.511		1.7420	0.119	0.034		2.5363	-0.142		
5		0.535		1.8800	0.109	0.029		-22.3844	-0.131		
6		0.600		2.0510	0.102	0.025		1.9248	-0.193		
7		0.622		2.0980	0.095	0.023		2.4786	-0.205		
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.962	0.994	0.978	1.000	PERFORMANCE PARAMETERS			STAGE DATA	STATOR DATA	STATOR DATA
2	10.0000	0.993	0.998	0.985	1.000				FIXED INST.	FIXED INST.	TRAV. INST.
3	30.0000	0.981	0.994	0.977	1.000	Total Pressure Ratio =	1.1674	0.9802	0.9787		
4	50.0000	0.984	1.000	0.982	1.000	Polytropic Efficiency =	0.7982	0.8829	-----		
5	70.0000	0.970	0.994	0.980	1.000	Percent Design Speed =	70.1	Discharge Valve Setting =	30.0		
6	90.0000	0.977	0.996	0.980	1.000	Cor. Nozzle Weight Flow =	169.98	Vane Schedule =	0.0		
7	95.0000	0.967	0.998	0.980	1.000	LE Check Flow/Noz.Flow =	0.9733	TE Check Flow/Noz.Flow =	0.9871		
						Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935		

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I

 BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 8 READING NUMBER 44 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.26	0.	60.60	4.66	1.96	441.73	1048.97	438.35	0.	951.42
2	64.24	0.	59.61	4.63	1.60	450.53	1033.80	448.95	0.	930.46
3	61.48	0.	56.01	5.47	1.01	456.24	955.66	456.23	0.	839.72
4	59.12	0.	52.56	6.56	0.72	448.59	872.22	447.30	0.	748.02
5	56.68	0.	49.71	6.97	0.18	436.46	786.94	430.41	0.	654.81
6	54.56	0.	47.11	7.45	-0.21	408.88	686.41	392.45	0.	551.34
7	53.23	0.	46.13	7.10	-0.80	408.81	661.50	388.58	0.	520.06

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.53	27.38	54.80	3.73	6.74	494.29	838.96	437.54	226.61	714.76
2	57.98	27.25	54.42	3.56	6.26	491.32	822.51	439.68	224.40	696.76
3	54.14	28.82	50.68	3.46	7.35	494.96	740.16	433.56	238.50	599.77
4	48.24	31.36	43.79	4.45	10.88	510.85	655.02	436.16	265.78	488.59
5	38.03	34.90	32.15	5.88	18.65	552.93	575.63	452.42	315.64	353.90
6	24.06	40.74	14.29	9.77	30.50	596.35	696.83	447.77	385.70	199.93
7	16.76	43.25	8.00	8.76	36.47	632.34	685.18	459.08	428.06	137.04

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	951.42	0.402	0.954	0.998	0.281	0.299
2	930.46	0.410	0.941	0.970	0.283	0.318
3	839.72	0.419	0.870	0.950	0.308	0.375
4	748.02	0.408	0.794	0.975	0.340	0.413
5	654.81	0.397	0.715	1.051	0.375	0.444
6	551.34	0.371	0.623	1.141	0.406	0.415
7	520.06	0.371	0.600	1.171	0.411	0.398

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS	RISE/STAT	STAT PRESS RISE COEFF
1	941.37	0.435	0.738	1.3340	0.101	0.020	0.7936	0.7989	0.9031	0.240	
2	921.16	0.433	0.725	1.3690	0.053	0.010	0.8918	0.8949	0.9566	0.260	
3	838.27	0.437	0.653	1.5080	0.015	0.003	0.9717	0.9726	0.9325	0.332	
4	754.36	0.451	0.579	1.6840	0.048	0.010	0.9246	0.9269	0.9301	0.390	
5	669.54	0.490	0.510	1.9060	0.020	0.004	0.9722	0.9730	0.9606	0.446	
6	585.64	0.529	0.441	2.2170	0.045	0.009	0.9549	0.9563	0.9514	0.475	
7	565.10	0.562	0.431	2.3390	0.092	0.019	0.9192	0.9219	0.9789	0.488	

RADIAL POSITION	PERCENT IMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
1	5.0000	1.214	1.076	1.201	1.068	PERFORMANCE PARAMETERS			
2	10.0000	1.216	1.070	1.222	1.066	STAGE DATA			
3	30.0000	1.227	1.069	1.229	1.063	ROTOR DATA			
4	50.0000	1.231	1.069	1.231	1.066	ROTOR DATA			
5	70.0000	1.249	1.071	1.235	1.064	FIXED INST. FIXED INST. TRAV. INST.			
6	90.0000	1.256	1.076	1.251	1.069	Total Pressure Ratio =	1.2193	1.2311	1.235
7	95.0000	1.279	1.080	1.259	1.074	Adiabatic Efficiency =	0.8858	0.9304	0.8714
						Polytropic Efficiency =	0.8690	0.9325	0.8735
						Percent Design Speed =	70.1	Discharge Valve Setting =	15.0
						Cor. Nozzle Weight Flow =	160.99	Vane Schedule =	0.0
						LE Check Flow/Noz.Flow =	1.0042	TE Check Flow/Noz.Flow =	0.9765
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE RJH - NASA TASK I											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 8 READING NUMBER 44 DATE 3/ 1/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		27.25	39.47	-12.22		496.72		441.60	227.43		
2		26.81	39.11	-12.30		499.42		445.73	225.21		
3		27.32	39.01	-11.69		519.42		461.21	238.27		
4		29.33	39.80	-10.47		538.52		468.41	263.13		
5		32.51	40.86	-8.35		578.29		484.77	308.97		
6		38.24	42.22	-3.98		606.87		471.86	371.88		
7		40.72	42.76	-2.04		636.74		477.42	410.98		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		-1.32	11.13	9.81	28.57	432.22		432.10	-9.07		
2		-1.30	10.10	8.80	28.11	480.48		480.33	-10.90		
3		-2.05	8.87	6.82	29.37	487.57		487.06	-17.42		
4		-2.01	8.75	6.74	31.34	495.76		494.91	-17.40		
5		-2.80	9.10	6.30	35.31	520.70		518.97	-25.37		
6		-1.33	10.98	9.25	39.57	567.54		565.64	-13.14		
7		-0.06	12.36	12.30	40.78	579.85		577.98	-0.57		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO				DIFFUSION FACTOR	CR1		
1		0.437		0.979				0.287	0.036		
2		0.441		1.078				0.191	0.040		
3		0.459		1.056				0.212	0.051		
4		0.477		1.057				0.228	0.093		
5		0.513		1.071				0.252	0.092		
6		0.539		1.199				0.217	0.050		
7		0.566		1.211				0.240	0.034		
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ MEAS T RISE	STAT PRESS RISE COEFF	
1		0.380		1.5230	0.128	0.042		0.1533		0.035	
2		0.424		1.5440	0.070	0.023		0.5574		0.038	
3		0.431		1.6310	0.079	0.024		0.4512		0.049	
4		0.438		1.7420	0.061	0.018		0.6175		0.088	
5		0.461		1.8800	0.035	0.009		0.4987		0.086	
6		0.504		2.0510	0.055	0.013		0.4212		0.047	
7		0.514		2.0980	0.071	0.017		0.2062		0.032	
RADIAL POSITION	PERCENT IMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.974	0.992	0.984	1.000	PERFORMANCE PARAMETERS					
2	10.0000	0.996	0.997	0.991	1.000	STAGE DATA			STATOR DATA	STATOR DATA	
3	30.0000	0.991	0.994	0.989	1.000	FIXED INST.			FIXED INST.	TRAV. INST.	
4	50.0000	0.991	0.997	0.991	1.000	Total Pressure Ratio =	1.2193	0.9904	0.9871		
5	70.0000	0.983	0.994	0.994	1.000	Polytropic Efficiency =	0.8890	0.9534	-----		
6	90.0000	0.986	0.994	0.990	1.000	Percent Design Speed =	70.1	Discharge Valve Setting =	15.0		
7	95.0000	0.971	0.995	0.986	1.000	Cor. Nozzle Weight Flow =	160.99	Vane Schedule	=	0.0	
						IE Check Flow/Noz.Flow =	0.9816	TE Check Flow/Noz.Flow =	0.9772		
						Assumed IE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935		

Blade Element Data For Undistorted Inlet Testing (Continued)

030270

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 9 READING NUMBER 45 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	67.03	0.	60.60	6.43	3.73	409.90	1033.35	402.79	0.	950.30
2	65.81	0.	59.61	6.20	3.17	418.87	1019.39	417.40	0.	929.36
3	63.34	0.	56.01	7.33	2.87	421.15	938.53	421.14	0.	838.73
4	61.22	0.	52.56	8.66	2.82	411.54	852.99	410.36	0.	747.14
5	58.85	0.	49.71	9.14	2.35	400.91	767.14	395.35	0.	654.04
6	56.83	0.	47.11	9.72	2.06	374.97	666.23	359.90	0.	550.69
7	55.53	0.	46.13	9.40	1.90	379.15	640.75	356.58	0.	519.44
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.15	34.66	54.80	3.35	8.88	498.16	775.16	408.64	282.57	657.89
2	57.64	33.65	54.42	3.22	8.18	493.74	766.81	410.09	272.98	647.09
3	54.15	34.81	50.68	3.47	9.19	490.61	687.66	402.73	280.00	557.29
4	48.77	37.54	43.79	4.98	12.45	497.71	598.76	394.59	303.21	450.26
5	39.13	39.98	32.15	6.98	19.72	529.33	522.95	404.80	339.39	329.36
6	25.20	44.24	14.29	10.91	31.63	569.85	453.34	404.96	394.37	190.58
7	16.50	46.98	8.00	8.90	39.03	611.28	439.39	412.67	442.20	122.24
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1				
1	950.30	0.368	0.938	1.015	0.352	0.352				
2	929.36	0.380	0.926	0.982	0.345	0.372				
3	838.73	0.382	0.852	0.956	0.366	0.429				
4	747.14	0.374	0.774	0.962	0.404	0.468				
5	654.04	0.364	0.696	1.024	0.435	0.505				
6	550.69	0.340	0.603	1.125	0.456	0.495				
7	519.44	0.340	0.580	1.157	0.468	0.484				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MACH EFFICIENCY	WOMEN HEAS RISE	STAT PRESS RISE COEFF
1	940.26	0.435	0.677	1.3340	0.117	0.023	0.8069	0.8131	0.9462	0.290
2	920.07	0.432	0.670	1.3690	0.086	0.017	0.8590	0.8637	0.9182	0.311
3	837.28	0.430	0.603	1.5080	0.028	0.006	0.9545	0.9560	0.9253	0.386
4	753.47	0.437	0.526	1.6840	0.068	0.013	0.9080	0.9110	0.9269	0.446
5	668.75	0.466	0.460	1.9060	0.038	0.008	0.9559	0.9574	0.9198	0.510
6	584.94	0.503	0.400	2.2170	0.045	0.009	0.9592	0.9605	0.9230	0.561
7	564.43	0.541	0.389	2.3390	0.063	0.013	0.9495	0.9512	0.9633	0.583
RADIAL POSITION	PERCENT DISPERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.267	1.090	1.256	1.084	PERFORMANCE PARAMETERS				
2	10.0000	1.265	1.088	1.267	1.082	STAGE DATA			ROTOR DATA	
3	30.0000	1.267	1.082	1.264	1.073	FIXED INST.	FIXED INST.	TRAV. INST.		
4	50.0000	1.260	1.079	1.256	1.074	Total Pressure Ratio =	1.2548	1.2638	1.2671	
5	70.0000	1.266	1.079	1.260	1.072	Adiabatic Efficiency =	0.8909	0.9166	0.5505	
6	90.0000	1.270	1.080	1.267	1.073	Polytropic Efficiency =	0.8944	0.9193	0.8554	
7	95.0000	1.295	1.083	1.279	1.077	Percent Design Speed =	70.0	Discharge Valve Setting =	09.0	
						Cor. Nozzle Weight Flow =	151.55	Vane Schedule	= 0.0	
						LE Check Flow/Noz.Flow =	0.9944	TE Check Flow/Noz.Flow =	0.9712	
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK 1											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 9 READING NUMBER 45 DATE 3/ 1/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		34.52	39.47	-4.95		500.47		412.37	283.59		
2		33.16	39.11	-5.95		500.94		419.36	273.97		
3		33.19	39.01	-5.82		511.30		427.69	279.73		
4		35.38	39.80	-4.42		519.48		422.65	300.20		
5		37.54	40.86	-3.32		548.18		432.41	332.22		
6		41.76	42.22	-0.46		576.18		425.93	380.23		
7		44.49	42.76	1.73		611.67		432.25	424.55		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		-0.19	=11.13	10.94	34.71	407.02		407.01	-1.38		
2		-0.92	=10.10	9.18	34.08	451.89		451.81	-7.25		
3		-2.62	=8.87	6.25	35.81	446.82		446.17	=20.43		
4		-2.20	=8.75	6.55	37.98	439.84		439.03	=16.84		
5		-2.14	=9.10	6.96	39.68	459.82		454.93	=17.02		
6		-1.07	=10.58	9.51	42.82	487.89		486.30	-9.06		
7		-0.45	=12.36	11.91	44.94	501.72		500.09	-3.96		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO				DIFFUSION FACTOR		CM1	
1		0.437		0.987				0.374		0.137	
2		0.438		1.077				0.279		0.155	
3		0.449		1.043				0.306		0.177	
4		0.457		1.039				0.327		0.233	
5		0.483		1.051				0.336		0.250	
6		0.509		1.142				0.315		0.229	
7		0.541		1.157				0.343		0.196	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ HEAS T RISE	STAT PRESS RISE COEFF	
1		0.394		1.5230	0.138	0.045		0.4120		0.132	
2		0.395		1.5440	0.041	0.013		0.8529		0.148	
3		0.392		1.6310	0.037	0.011		0.7690		0.169	
4		0.386		1.7420	0.024	0.007		0.8356		0.224	
5		0.400		1.8800	0.032	0.008		0.8238		0.239	
6		0.429		2.0510	0.044	0.011		0.8243		0.218	
7		0.441		2.0980	0.073	0.017		0.6088		0.185	
RADIAL POSITION	PERCENT DEBERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.974	0.994	0.983	1.000	PERFORMANCE PARAMETERS			STAGE DATA STATOR DATA		
2	10.0000	0.996	0.994	0.995	1.000	FIXED INST.	FIXED INST.	TRAV. INST.	STATOR DATA	STATOR DATA	STATOR DATA
3	30.0000	0.993	0.992	0.995	1.000	Total Pressure Ratio =	1.2548	0.9937	0.9904		
4	50.0000	0.993	0.995	0.997	1.000	Polytropic Efficiency =	0.8944	0.9729	-----		
5	70.0000	0.991	0.993	0.995	1.000	Percent Design Speed =	70.0	Discharge Valve Setting=	09.0		
6	90.0000	0.991	0.993	0.993	1.000	Cor. Nozzle Weight Flow=	151.55	Vane Schedule	=	0.0	
7	95.0000	0.975	0.994	0.987	1.000	IE Check Flow/Noz.Flow =	0.9763	TE Check Flow/Noz.Flow =	0.9721		
						Assumed IE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935		

NOT REPRODUCIBLE

030270

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE RLM - NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 46 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	68.30	0.	60.60	7.70	5.00	381.36	1024.55	378.43	0.	950.93
2	67.40	0.	59.61	7.79	4.76	388.56	1007.89	387.20	0.	929.98
3	65.06	0.	56.01	9.05	4.59	390.32	925.61	390.31	0.	839.29
4	63.12	0.	52.56	10.56	4.72	380.05	838.69	378.95	0.	747.64
5	60.84	0.	49.71	11.13	4.34	370.26	751.95	365.13	0.	654.48
6	58.70	0.	47.11	11.59	3.93	349.13	652.34	335.10	0.	551.06
7	57.40	0.	46.13	11.27	3.37	349.70	626.47	332.39	0.	519.79
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEY ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.35	38.98	54.80	3.55	9.95	498.99	738.27	386.99	313.11	627.77
2	57.38	37.76	54.42	2.96	10.01	499.26	731.53	393.92	305.09	619.59
3	54.62	39.22	50.68	3.94	10.44	486.28	650.63	376.66	307.41	530.43
4	48.71	42.39	43.79	4.92	14.42	497.73	557.06	367.57	335.49	418.49
5	39.53	43.94	32.15	7.38	21.31	320.44	486.02	374.10	360.48	308.71
6	26.15	46.95	14.29	11.86	32.55	553.18	422.93	374.88	401.27	184.06
7	16.10	49.43	8.00	8.10	41.30	601.98	412.07	387.77	452.89	111.92
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET RE. MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1				
1	950.93	0.345	0.928	1.023	0.393	0.375				
2	929.98	0.352	0.913	1.017	0.384	0.392				
3	839.29	0.354	0.839	0.965	0.407	0.446				
4	747.64	0.344	0.760	0.970	0.455	0.488				
5	654.48	0.335	0.681	1.025	0.480	0.532				
6	551.06	0.316	0.590	1.119	0.494	0.546				
7	519.79	0.316	0.565	1.167	0.504	0.541				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY HOMOEN EFFICIENCY	RISE/ RISE	STAT PRESS RISE COEFF
1	940.88	0.434	0.642	1.3340	0.161	0.032	0.7686	0.7767	0.9395	0.312
2	920.68	0.435	0.637	1.3690	0.133	0.026	0.8101	0.8169	0.9268	0.330
3	837.84	0.425	0.968	1.5090	0.077	0.015	0.8910	0.8948	0.9381	0.403
4	753.97	0.435	0.487	1.6840	0.121	0.024	0.8546	0.8594	0.9177	0.467
5	669.20	0.497	0.427	1.9060	0.077	0.016	0.9186	0.9213	0.9324	0.540
6	585.33	0.487	0.373	2.2170	0.073	0.015	0.9404	0.9424	0.9185	0.618
7	564.81	0.532	0.364	2.3390	0.107	0.022	0.9215	0.9242	0.9566	0.648
RADIAL POSITION	PERCENT IMPEMENSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.292	1.101	1.285	1.097	PERFORMANCE PARAMETERS				
2	10.0000	1.293	1.098	1.294	1.095	STAGE DATA		ROTOR DATA		ROTOR DATA
3	30.0000	1.283	1.088	1.280	1.082	FIXED INST.		FIXED INST.		TRAV. INST.
4	50.0000	1.278	1.089	1.268	1.082	Total Pressure Ratio =	1.2712	1.2768	1.2844	
5	70.0000	1.277	1.083	1.271	1.077	Adiabatic Efficiency =	0.8465	0.8692	0.8319	
6	90.0000	1.278	1.082	1.278	1.078	Polytropic Efficiency =	0.8517	0.8728	0.8377	
7	95.0000	1.310	1.086	1.286	1.081	Percent Design Speed =	70.0	Discharge Valve Setting =	06.0	
						Cor. Nozzle Weight Flow =	141.97	Vane Schedule	=	0.0
						LE Check Flow/Noz.Flow =	0.9941	TE Check Flow/Noz.Flow =	0.9805	
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 10 READING NUMBER 46 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		38.83	39.47	-0.64		501.23		390.48	314.24	
2		37.25	39.11	-1.86		505.91		402.70	306.20	
3		37.55	39.01	-1.46		504.14		399.51	307.11	
4		40.19	39.80	0.39		515.60		393.14	332.15	
5		41.49	40.86	0.63		535.12		398.95	352.86	
6		44.49	42.22	2.27		556.69		393.82	386.89	
7		46.97	42.76	4.21		600.00		405.85	434.82	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.24	=11.13	11.37	38.58	389.00		389.00	1.65	
2		0.25	=10.10	10.35	36.99	434.40		434.37	1.93	
3		-2.57	=8.87	6.30	40.12	415.90		415.31	=10.69	
4		-1.24	=8.75	7.51	41.43	398.09		397.55	-8.62	
5		-1.81	=9.10	7.29	43.30	411.87		410.78	=12.99	
6		0.57	=10.58	11.15	43.92	442.58		441.19	4.39	
7		-0.55	=12.36	11.81	47.52	446.88		444.62	-4.24	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.436		0.996	0.429	0.214
2		0.441		1.079	0.336	0.227
3		0.441		1.040	0.373	0.269
4		0.451		1.011	0.416	0.326
5		0.470		1.030	0.410	0.346
6		0.491		1.120	0.369	0.326
7		0.530		1.096	0.428	0.281

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY HOMOEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0.336		1.5230	0.148	0.048		0.5433	0.206
2		0.377		1.5440	0.044	0.014		0.8728	0.219
3		0.363		1.6310	0.030	0.009		0.8521	0.289
4		0.347		1.7420	0.023	0.007		0.8148	0.315
5		0.360		1.8800	0.026	0.007		0.8566	0.334
6		0.387		2.0510	0.043	0.010		0.8950	0.313
7		0.390		2.0980	0.073	0.017		0.6345	0.267

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
1	5.0000	0.976	0.996	0.982	1.000	PERFORMANCE PARAMETERS			
2	10.0000	0.996	0.997	0.995	1.000	STAGE DATA STATOR DATA STATOR DATA			
3	30.0000	0.994	0.994	0.996	1.000	FIXED INST. FIXED INST. TRAV. INST.			
4	50.0000	0.990	0.994	0.997	1.000	Total Pressure Ratio =	1.2712	0.9941	0.9899
5	70.0000	0.991	0.995	0.996	1.000	Polytropic Efficiency =	0.8517	0.9758	-----
6	90.0000	0.994	0.996	0.994	1.000	Percent Design Speed =	70.0	Discharge Valve Setting=	06.0
7	95.0000	0.969	0.995	0.987	1.000	Cor. Nozzle Weight Flow=	141.97	Vane Schedule =	0.0

IE Check Flow/Noz.Flow = 0.9856 TE Check Flow/Noz.Flow = 0.9746
 Assumed IE Flow Coeff. = 0.955 Assumed TE Flow Coeff. = 0.935

030320

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 11 SEADING NUMBER 47 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT SUCT	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	70.33	0.	60.40	9.73	7.03	342.98	1011.88	340.27	0.	951.80
2	69.42	0.	59.41	9.81	6.78	350.77	994.73	349.54	0.	930.83
3	67.35	0.	56.01	11.34	6.83	390.51	910.25	350.50	0.	840.06
4	65.32	0.	52.56	12.76	6.92	344.85	823.96	343.86	0.	748.32
5	62.77	0.	49.71	13.06	6.77	341.81	738.49	337.07	0.	655.08
6	60.62	0.	47.11	13.51	5.85	323.50	639.43	310.50	0.	551.56
7	59.77	0.	46.13	13.44	5.74	318.94	610.23	303.16	0.	520.26

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.17	45.86	54.98	4.37	11.15	500.69	679.75	347.99	358.65	583.09
2	57.05	43.92	54.42	2.43	12.37	511.30	676.81	367.75	354.11	567.41
3	55.35	43.47	50.68	4.67	12.09	482.87	614.22	349.19	333.39	505.22
4	49.08	48.24	43.79	5.29	16.24	498.43	508.29	331.91	371.76	382.90
5	39.76	48.77	32.15	7.61	28.01	517.68	460.96	353.32	379.85	293.96
6	27.27	48.50	14.29	12.98	38.36	580.98	405.45	355.96	402.41	183.46
7	15.80	52.00	8.08	7.80	48.97	592.68	383.85	361.73	462.94	102.39

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL PAT10	DIFFUSION FACTOR	CM1
1	951.80	0.310	0.914	1.023	0.460	0.382
2	930.83	0.317	0.899	1.052	0.449	0.397
3	840.06	0.317	0.828	0.996	0.447	0.453
4	748.32	0.312	0.745	0.948	0.519	0.491
5	655.08	0.309	0.668	1.048	0.511	0.553
6	551.56	0.292	0.577	1.148	0.512	0.587
7	520.26	0.288	0.551	1.198	0.540	0.584

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MCHEN EFFICIENCY	RISE/MEAS Y RISE	STAT PRESS RISE COEFF
1	941.74	0.432	0.587	1.3340	0.231	0.044	0.7088	0.7194	0.9436	0.319
2	921.53	0.443	0.586	1.3690	0.207	0.041	0.7401	0.7498	0.9350	0.336
3	838.41	0.470	0.538	1.5080	0.141	0.027	0.8254	0.8317	0.9354	0.411
4	754.66	0.434	0.441	1.6840	0.168	0.033	0.8172	0.8235	0.9275	0.473
5	669.81	0.453	0.403	1.9080	0.121	0.024	0.8841	0.8881	0.9236	0.563
6	585.87	0.476	0.356	2.2170	0.078	0.016	0.9397	0.9419	0.9027	0.645
7	565.33	0.522	0.338	2.3390	0.043	0.017	0.9427	0.9448	0.9554	0.700

RADIAL POSITION	PERCENT DIVERGION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY
1	5.0000	1.308	1.115	1.301	1.111	PERFORMANCE PARAMETERS STAGE DATA ROTOR DATA ROTOR DATA FIXED INST. FIXED INST. TRAV. INST. Total Pressure Ratio = 1.2809 1.2910 1.2974 Adiabatic Efficiency = 0.7950 0.8212 0.7955 Polytropic Efficiency = 0.8021 0.8276 0.8030 Percent Design Speed = 70.10 Discharge Valve Setting = 03.0 Cor. Nozzle Weight Flow = 128.91 Vane Schedule = 0.0 LE Check Flow/Noz.Flow = 1.0051 TE Check Flow/Noz.Flow = 1.0044 Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950
2	10.0000	1.315	1.112	1.306	1.107	
3	30.0000	1.296	1.096	1.292	1.092	
4	50.0000	1.288	1.097	1.279	1.089	
5	70.0000	1.289	1.088	1.283	1.084	
6	90.0000	1.286	1.084	1.286	1.080	
7	95.0000	1.320	1.088	1.298	1.082	

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW 6 NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 11 READING NUMBER 47 DATE 3/ 17/1970

RADIAL POSITION	REL INLET FLOW ANG	ARS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCT BLRE	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		46,71	39,47	6,24		502,81		351,07	359,95	
2		43,40	39,11	4,29		517,27		375,83	355,40	
3		42,00	39,01	2,99		498,80		369,97	333,07	
4		46,08	39,80	6,28		511,74		354,44	368,07	
5		44,34	40,86	3,48		528,63		376,44	367,91	
6		46,07	42,22	3,85		542,96		373,71	387,98	
7		49,60	42,76	6,84		583,29		378,32	444,47	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		1,64	=11,13	12,77	44,07	371,86		370,90	10,65	
2		1,44	=10,10	11,74	41,78	403,88		403,69	11,58	
3		=0,83	=8,97	8,84	42,82	389,80		384,80	=5,56	
4		0,46	=8,75	9,21	45,82	358,99		357,68	=2,86	
5		=1,43	=9,10	7,67	45,77	374,13		373,21	=9,30	
6		2,05	=10,53	12,63	44,02	395,54		394,07	14,12	
7		=1,35	=12,36	11,01	50,95	406,77		405,35	=9,55	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,434		1,056	0,490	0,283
2		0,448		1,078	0,434	0,284
3		0,474		1,040	0,435	0,343
4		0,446		1,099	0,504	0,410
5		0,463		0,991	0,480	0,422
6		0,477		1,054	0,436	0,415
7		0,518		1,071	0,489	0,347

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	ROLY MOMEN MEAS	RISE/RISE	STAT PRESS RISE CCEFF
1		0,318		1,5270	0,138	0,045		0,6272		0,274
2		0,348		1,5440	0,061	0,020		0,7393		0,274
3		0,333		1,6310	0,039	0,012		0,8575		0,332
4		0,310		1,7420	0,047	0,014		0,8117		0,399
5		0,325		1,8870	0,047	0,012		0,8497		0,409
6		0,345		2,0510	0,057	0,014		0,8908		0,402
7		0,354		2,0980	0,059	0,021		0,6725		0,833

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT ARRES RATIO	TRAV TOT TEMP RATIO	FIXED TOT ARRES RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
1	5,0000	0,978	0,996	0,983	1,000	PERFORMANCE PARAMETERS			
2	10,0000	0,996	0,996	0,992	1,000	STAGE DATA STATOR DATA STATOR DATA			
3	30,0000	0,993	0,997	0,995	1,000	FIXED INST. FIXED INST. TRAV. INST.			
4	50,0000	0,997	0,993	0,974	1,000	Total Pressure Ratio =	1.2809	0.9922	0.9871
5	70,0000	0,999	0,996	0,976	1,000	Polytropic Efficiency =	0.8021	0.9692	-----
6	90,0000	0,992	0,996	0,972	1,000	Percent Design Speed =	70.1	Discharge Valve Setting=	03.0
7	95,0000	0,999	0,995	0,985	1,000	Cor. Nozzle Weight Flow=	128.91	Vane Schedule =	0.0

LE Check Flow/Noz.Flow = 1.0097 TE Check Flow/Noz.Flow = 0.9945
Assumed LE Flow Coeff. = 0.955 Assumed TE Flow Coeff. = 0.935

NOT REPRODUCIBLE

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW 3 NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
 ROW NUMBER 12 READING NUMBER 48 DATE 3/ 1/1978

RADIAL POSITION	BEL INLET FLOW ANG	ABS INLET FLOW ANG	CHMB LN LE ANGLE	INCID ANG MM CHMB LN	INCID ANG SURF SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.18	0.	60.60	5.58	0.38	530.51	1210.31	524.44	0.	1087.85
2	63.05	0.	59.61	3.44	0.41	547.82	1194.35	540.90	0.	1063.88
3	60.14	0.	56.701	4.13	0.13	551.19	1107.10	551.17	0.	960.13
4	57.93	0.	52.56	4.97	0.07	545.91	1014.66	544.34	0.	855.28
5	55.02	0.	49.71	5.31	1.48	531.19	918.00	523.83	0.	748.71
6	53.07	0.	47.11	5.96	1.70	493.73	808.73	473.89	0.	630.40
7	51.97	0.	46.13	5.84	2.06	489.31	778.07	465.10	0.	594.63
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMB LN TE ANGLE	RFL DFV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.35	20.70	54.86	5.55	8.43	540.98	1020.29	504.31	190.55	885.80
2	59.38	20.49	54.42	4.02	3.71	547.14	1003.20	511.08	190.97	862.28
3	55.56	22.56	50.68	4.88	4.88	554.83	984.57	511.48	212.51	745.96
4	46.70	28.74	43.79	2.51	11.23	617.80	782.92	540.88	296.62	565.92
5	38.93	30.28	32.18	6.78	16.49	647.81	718.52	554.63	323.65	441.70
6	24.87	36.26	14.29	10.58	20.49	700.84	624.58	559.39	410.28	259.13
7	17.43	40.17	8.00	9.48	24.98	739.87	596.88	557.92	470.99	175.15
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET RFL MACH NO	AXIAL VFL RATIO	DIFFUSION FACTOR	CW1				
1	1087.85	0.496	1.109	0.958	0.216	0.217				
2	1063.88	0.498	1.095	0.945	0.218	0.237				
3	760.13	0.506	1.016	0.928	0.247	0.300				
4	555.28	0.511	0.931	0.904	0.315	0.376				
5	748.71	0.487	0.841	1.059	0.319	0.377				
6	630.40	0.451	0.731	1.180	0.339	0.341				
7	594.63	0.447	0.703	1.200	0.361	0.314				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT RFL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	ROLY MOMEN EFFICIENCY	RISE/MEAS	STAT PRESS RISE COEFF
1	1076.35	0.479	0.908	1.3348	0.148	0.027	0.8172	0.6247	0.9445	0.158
2	1051.25	0.485	0.899	1.3090	0.096	0.018	0.7673	0.7732	0.9477	0.177
3	759.47	0.491	0.871	1.5080	0.042	0.012	0.8676	0.8714	0.9207	0.250
4	862.93	0.545	0.692	1.6640	0.213	0.023	0.8142	0.8200	0.9457	0.304
5	765.55	0.572	0.631	1.9040	0.060	0.012	0.9119	0.9149	0.9556	0.348
6	630.40	0.623	0.556	2.2170	0.049	0.018	0.9065	0.9100	0.9629	0.349
7	646.13	0.659	0.532	2.3390	0.206	0.022	0.9013	0.9051	0.9996	0.394
RADIAL POSITION	PERCENT IMERSION	TRAV TOT PRES	TRAV TOT RATIO	FIXED TOT PRES	FIXED TOT RATIO	TEMP RATIO	TEMP RATIO	TEMP RATIO	TEMP RATIO	
1	9.0000	1.177	1.070	1.149	1.046	1.066	1.066	1.066	1.066	
2	10.0000	1.189	1.048	1.197	1.069	1.070	1.070	1.070	1.070	
3	30.0000	1.220	1.071	1.227	1.070	1.082	1.082	1.082	1.082	
4	90.0000	1.267	1.047	1.292	1.078	1.078	1.078	1.078	1.078	
5	70.0000	1.292	1.083	1.271	1.088	1.088	1.088	1.088	1.088	
6	90.0000	1.319	1.092	1.306	1.092	1.092	1.092	1.092	1.092	
7	95.0000	1.347	1.098	1.322	1.092	1.092	1.092	1.092	1.092	

OVERALL PERFORMANCE SUMMARY			
PERFORMANCE PARAMETERS			
STAGE DATA	ROTOR DATA	ROTOR DATA	ROTOR DATA
FIXED INST.	FIXED INST.	TRAV. INST.	TRAV. INST.
Total Pressure Ratio =	1.2131	1.2442	1.2525
Adiabatic Efficiency =	0.7417	0.8420	0.8320
Polytropic Efficiency =	0.7487	0.8469	0.8373
Percent Design Speed =	80.1	Discharge Valve Setting =	30.0
Cor. Nozzle Weight Flow =	188.52	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9989	TE Check Flow/Noz.Flow =	0.9765
Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 12 READING NUMBER 48 DATE 3/1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG HN CHBR LN	INCID ANG SUCT GUIDE	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		20.59	39.47	=18.88		543.89		509.16	191.24		
2		20.10	39.11	=19.01		557.65		523.65	191.66		
3		21.72	39.01	=17.79		587.00		546.87	212.31		
4		26.62	39.80	=13.18		657.10		586.01	293.67		
5		27.96	40.80	=13.00		687.91		592.83	317.01		
6		33.67	42.22	=8.55		721.62		593.81	395.58		
7		37.53	42.76	=5.76		751.07		588.67	452.19		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN LE ANGLE	DEV ANG	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		20.70	=11.13	10.43	21.39	520.74		520.70	-4.40		
2		20.18	=20.10	9.22	20.29	594.78		994.74	=1.89		
3		23.23	=8.87	5.64	24.45	611.32		610.10	=34.44		
4		28.28	=8.75	9.03	26.34	664.34		663.59	3.20		
5		23.50	=9.13	6.60	38.36	677.27		675.18	=29.48		
6		21.92	=10.55	9.56	34.69	757.89		755.40	13.46		
7		20.25	=12.36	12.11	32.78	793.11		790.55	3.42		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI					
1		0.482		1.023	0.162	0.218					
2		0.495		1.136	0.046	0.205					
3		0.521		1.110	0.087	0.215					
4		0.583		1.132	0.115	0.127					
5		0.609		1.176	0.142	0.166					
6		0.643		1.272	0.086	0.256					
7		0.670		1.343	0.086	0.287					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	YGT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	POLY MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF	
1		0.441		1.5230	0.161	0.053		2.7502		0.203	
2		0.529		1.5440	0.121	0.019		1.9078		0.191	
3		0.545		1.6310	0.121	0.030		2.5089		0.198	
4		0.592		1.7428	0.099	0.017		4.6801		0.116	
5		0.605		1.9800	0.134	0.036		14.5778		0.149	
6		0.680		2.0510	0.138	0.034		2.4049		0.225	
7		0.713		2.0990	0.127	0.030		2.3967		0.249	
RADIAL POSITION	PERCENT DIMENSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	0.0000	0.953	0.996	0.976	0.990	PERFORMANCE PARAMETERS			STAGE DATA		STATOR DATA
2	10.0000	0.998	1.001	0.982	1.000	Total Pressure Ratio =	1.2131	0.9750	0.9681	STATOR DATA	
3	30.0000	0.976	0.999	0.969	1.000	Polytropic Efficiency =	0.7487	0.8640	-----	TRAV. INST.	
4	50.0000	0.976	0.995	0.948	1.000	Percent Design Speed =	80.1	Discharge Valve Setting =	30.0		
5	70.0000	0.955	0.995	0.976	1.000	Cor. Nozzle Weight Flow =	188.52	Vane Schedule	=	0.0	
6	90.0000	0.957	0.996	0.966	1.000	LE Check Flow/Noz.Flow =	0.9816	TE Check Flow/Noz.Flow =	0.9897		
7	95.0000	0.948	0.995	0.966	1.000	Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935		

NOT REPRODUCIBLE

030320

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW 2 NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 13 READING NUMBER 49 DATE 3/ 1/1970

RADIAL POSITION	BEL INLET FLOW ANG	ARS INLET FLOW ANG	CHMR LN LE ANGLE	INCLD ANG MN CHMR LN	INGID ANG SUCT SURF	INLET ARS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1	64.60	0.	60.60	4.06	1.36	518.44	1704.01	514.86	0.	1087.15	
2	63.50	0.	57.61	3.49	0.86	531.98	1188.85	530.11	0.	1063.19	
3	60.78	0.	56.01	4.77	0.31	538.62	1099.38	536.01	0.	959.51	
4	58.36	0.	52.56	5.18	0.04	528.10	1004.72	526.58	0.	854.73	
5	55.49	0.	49.71	6.18	0.61	513.92	907.72	506.80	0.	748.23	
6	54.10	0.	47.11	6.99	0.67	475.20	789.11	456.10	0.	629.99	
7	52.96	0.	46.13	6.83	0.07	471.37	758.81	448.52	0.	594.25	
RADIAL POSITION	BEL EXIT FLOW ANG	ARS EXIT FLOW ANG	CHMR LN TE ANGLE	REL DEV ANG TE	REL TWRH ANGLE	EXIT ARS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1	58.73	28.80	54.80	3.93	5.93	560.53	944.49	489.76	269.22	806.44	
2	58.28	27.45	54.42	3.86	5.72	556.44	937.50	492.53	259.86	798.71	
3	54.27	29.01	50.68	3.59	6.52	563.41	843.57	492.59	273.17	684.68	
4	48.30	31.34	43.79	4.51	10.06	583.82	748.45	497.84	303.22	558.76	
5	39.09	35.14	32.15	6.94	16.80	612.46	651.46	504.59	355.14	409.92	
6	25.76	40.39	14.29	11.47	28.34	665.00	564.44	501.93	428.97	242.21	
7	17.51	43.97	8.00	9.51	35.45	709.81	541.20	505.67	486.18	159.53	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ARS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI					
1	1087.15	0.475	1.102	0.991	0.299	0.312					
2	1063.19	0.447	1.099	0.979	0.290	0.333					
3	959.51	0.492	1.008	0.918	0.315	0.392					
4	854.73	0.444	0.920	0.945	0.345	0.433					
5	748.23	0.470	0.838	0.996	0.386	0.444					
6	629.99	0.433	0.770	1.110	0.410	0.435					
7	594.25	0.410	0.692	1.127	0.430	0.415					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ARS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ANR EFFICIENCY	POLY NOMEN EFFICIENCY	RISE/MEAS	STAT PRESS RISE	COEFF
1	1075.66	0.490	0.825	1.3340	0.132	0.076	0.7554	0.7636	0.9203	0.240	0.240
2	1052.57	0.488	0.822	1.3690	0.093	0.018	0.8612	0.8373	0.9450	0.261	0.261
3	957.86	0.405	0.740	1.5090	0.149	0.010	0.9158	0.9189	0.9210	0.335	0.335
4	861.98	0.513	0.658	1.6848	0.096	0.011	0.9172	0.9204	0.9196	0.398	0.398
5	765.06	0.545	0.574	1.9080	0.094	0.011	0.9299	0.9325	0.9402	0.454	0.454
6	669.16	0.568	0.499	2.2170	0.076	0.015	0.9259	0.9289	0.9445	0.486	0.486
7	645.72	0.629	0.479	2.3390	0.103	0.021	0.9096	0.9133	0.9881	0.497	0.497
RADIAL POSITION	PERCENT DISERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	1.286	1.101	1.289	1.094	PERFORMANCE PARAMETERS					
2	10.0000	1.290	1.092	1.296	1.093	STAGE DATA			ROTOR DATA		
3	30.0000	1.308	1.091	1.309	1.088	FIXED INST.			FIXED INST.		
4	50.0000	1.315	1.091	1.313	1.088	Total Pressure Ratio =	1.2927	1.3087	1.3136		
5	70.0000	1.326	1.090	1.310	1.086	Adiabatic Efficiency =	0.8507	0.8930	0.8660		
6	90.0000	1.333	1.097	1.310	1.086	Polytropic Efficiency =	0.8560	0.8970	0.8711		
7	95.0000	1.365	1.102	1.339	1.094	Percent Design Speed =	80.1	Discharge Valve Setting =	15.0		
						Cor. Nozzle Weight Flow =	185.71	Vane Schedule =	0.0		
						LE Check Flow/Noz.Flow =	0.9913	TE Check Flow/Noz.Flow =	0.9683		
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950		

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

 BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 13 READING NUMBER 49 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT BLRT	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		28.46	39.47	=10.81		563.47		494.35	270.19	
2		26.98	39.11	=12.18		566.91		504.39	258.78	
3		27.43	39.01	=11.58		592.75		525.80	272.91	
4		29.20	39.80	=10.60		616.73		537.07	300.70	
5		32.54	40.86	=8.22		648.45		542.83	347.63	
6		37.81	42.22	=4.41		678.43		530.57	411.67	
7		41.27	42.76	=1.49		715.18		531.89	466.78	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		=0.10	=11.13	11.03	28.76	486.49		486.49	=0.82	
2		=0.73	=10.10	9.37	27.71	542.30		542.28	=4.90	
3		=2.20	=8.87	6.67	29.63	594.42		553.78	=21.28	
4		=1.31	=8.75	7.44	30.52	565.85		565.08	=12.93	
5		=2.76	=9.10	6.34	35.39	576.75		574.85	=27.69	
6		=1.02	=10.58	9.56	38.82	630.88		628.84	=11.16	
7		=0.01	=12.30	12.39	41.28	647.76		645.67	=0.15	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.492		0.994	0.294	0.040
2		0.497		1.079	0.192	0.048
3		0.522		1.053	0.216	0.059
4		0.544		1.052	0.227	0.103
5		0.573		1.059	0.263	0.113
6		0.601		1.185	0.219	0.066
7		0.634		1.214	0.247	0.041

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY WOMEN EFFICIENCY	RISE/RISE	STAT PRESS COEFF
1		0.424		3.5230	0.139	0.046		0.1635		0.038
2		0.475		1.5440	0.072	0.023		0.5767		0.045
3		0.497		1.6310	0.079	0.024		0.4810		0.055
4		0.498		1.7420	0.048	0.014		0.6632		0.097
5		0.598		1.8000	0.042	0.011		0.5579		0.106
6		0.557		2.0510	0.065	0.016		0.5023		0.060
7		0.572		2.0980	0.074	0.018		0.2381		0.038

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	9.0000	0.965	0.993	0.978	1.000	PERFORMANCE PARAMETERS				
2	10.0000	0.994	1.001	0.989	1.000	STAGE DATA STATOR DATA STATOR DATA				
3	30.0000	0.988	0.997	0.947	1.000	FIXED INST. FIXED INST. TRAV. INST.				
4	50.0000	0.989	0.997	0.991	1.000	Total Pressure Ratio =	1.2927	0.9878	0.9839	
5	70.0000	0.980	0.994	0.992	1.000	Polytropic Efficiency =	0.8560	0.9543	-----	
6	90.0000	0.984	0.995	0.988	1.000	Percent Design Speed =	80.1	Discharge Valve Setting =	15.0	
7	95.0000	0.963	0.994	0.982	1.000	Cor. Nozzle Weight Flow =	185.71	Vane Schedule =	0.0	
						IE Check Flow/Noz.Flow =	0.9733	IE Check Flow/Noz.Flow =	0.9663	
						Assumed IE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935	

NOT REPRODUCIBLE

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW : NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 14 READING NUMBER 50 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCID ANG MN CHMR LN	INCID ANG SUCT 90°	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	86.99	0.	50.50	5.49	1.79	485.52	1190.23	481.80	0.	1086.69
2	65.15	0.	59.61	5.54	2.51	494.01	1171.96	492.28	0.	1062.75
3	62.40	0.	56.01	6.39	1.93	501.37	1089.25	501.36	0.	959.11
4	60.19	0.	52.58	7.46	1.79	490.93	985.38	489.52	0.	854.37
5	58.99	0.	49.71	8.38	1.59	472.20	884.50	465.65	0.	747.92
6	56.28	0.	47.11	9.17	1.51	437.87	767.00	420.27	0.	629.73
7	55.15	0.	46.13	9.92	1.12	435.21	736.37	413.67	0.	594.00

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN VE ANGLE	REL DEV ANG VE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.98	36.69	54.80	2.78	8.41	579.57	865.59	463.57	345.39	729.82
2	57.63	34.52	54.42	3.21	7.42	564.96	868.32	464.48	319.44	732.69
3	54.04	35.35	50.68	3.36	8.36	562.39	781.02	458.57	325.34	637.12
4	48.77	37.82	43.79	4.98	13.42	568.95	681.87	449.34	348.84	512.78
5	40.21	41.15	38.15	8.16	17.88	591.86	583.62	444.88	388.70	376.04
6	26.38	45.39	14.29	12.09	29.98	635.83	500.63	443.07	449.15	219.75
7	16.79	48.96	8.00	8.79	38.36	684.43	474.52	445.01	511.18	134.27

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1086.69	0.443	1.086	0.982	0.381	0.378
2	1062.75	0.451	1.078	0.944	0.358	0.395
3	959.11	0.458	0.989	0.915	0.378	0.457
4	854.37	0.448	0.908	0.918	0.413	0.502
5	747.92	0.430	0.806	0.955	0.456	0.536
6	629.73	0.398	0.697	1.054	0.482	0.531
7	594.00	0.396	0.669	1.076	0.511	0.522

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	LOSS PARAM	ADP EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ HEAS T RISE	STAY PRESS RISE COEFF
1	1075.21	0.501	0.748	1.3340	0.142	0.028	0.7894	0.7985	0.9428	0.301
2	1052.13	0.491	0.754	1.3600	0.149	0.021	0.8378	0.8449	0.9412	0.320
3	957.46	0.490	0.680	1.5080	0.083	0.010	0.9233	0.9267	0.9293	0.390
4	861.62	0.496	0.595	1.6040	0.094	0.011	0.9306	0.9331	0.9166	0.468
5	764.74	0.519	0.511	1.9040	0.084	0.013	0.9271	0.9302	0.9494	0.531
6	668.90	0.559	0.448	2.2170	0.071	0.014	0.9383	0.9409	0.9351	0.590
7	645.45	0.603	0.418	2.3390	0.102	0.021	0.9199	0.9234	0.9828	0.615

RADIAL POSITION	PERCENT DIMENSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
						PERFORMANCE PARAMETERS	STAGE DATA	ROTOR DATA	ROTOR DATA
1	5.0000	1.381	1.127	1.362	1.117				
2	10.0000	1.872	1.115	1.374	1.114				
3	30.0000	1.375	1.108	1.374	1.103	Total Pressure Ratio =	1.3534	1.3642	1.3695
4	50.0000	1.365	1.106	1.344	1.100	Adiabatic Efficiency =	0.8755	0.8996	0.8680
5	70.0000	1.358	1.101	1.347	1.096	Polytropic Efficiency =	0.8808	0.9039	0.8738
6	90.0000	1.360	1.108	1.356	1.098	Percent Design Speed =	80.0	Discharge Valve Setting =	09.0
7	95.0000	1.395	1.108	1.368	1.102	Cor. Nozzle Weight Flow =	174.54	Vane Schedule =	0.0
						LE Check Flow/Noz.Flow =	0.9942	TE Check Flow/Noz.Flow =	0.9726
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW 6 NASA TASK 1

 BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 14 READING NUMBER 50 DATE 3/1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMB LN LE ANGLE	INCID ANG MN CHMB LN	INCID HG SUCT TURP	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		36,53	39,47	=2,94		582,31		467,89	346,64	
2		34,00	39,11	=5,11		573,39		475,36	320,60	
3		33,65	39,01	=5,36		586,89		488,31	325,03	
4		35,98	39,80	=4,22		594,85		482,82	345,37	
5		38,82	40,86	=2,74		612,72		476,27	380,48	
6		42,85	42,22	0,63		642,41		466,85	433,05	
7		45,43	42,76	3,67		683,39		466,83	490,78	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMB LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		=0,06	=11,13	11,07	36,59	456,78		456,77	=0,48	
2		=1,04	=10,18	9,06	35,04	508,97		508,86	=9,23	
3		=2,35	=9,87	6,52	36,00	507,58		500,94	=20,78	
4		=1,77	=8,75	6,98	37,35	498,69		497,90	=15,37	
5		=2,90	=9,10	6,20	41,92	489,06		487,39	=24,66	
6		=0,34	=10,58	10,24	43,19	526,57		524,94	=3,13	
7		=1,05	=12,36	11,31	47,49	537,65		535,82	=9,85	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MAGN NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0,504		0,976	0,411	0,162
2		0,498		1,070	0,298	0,181
3		0,512		1,038	0,315	0,209
4		0,520		1,031	0,335	0,265
5		0,538		1,028	0,376	0,301
6		0,565		1,128	0,343	0,278
7		0,602		1,148	0,385	0,233

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MAGN NO	SOLIDITY	COEFFICIENT	LOSS	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN RISE/ MEAS T RISE	STAT PRESS RISE COEFF
1		0,393		1,5238	0,171	0,050	0,050	0,4287	0,153	
2		0,440		1,5440	0,041	0,013	0,013	0,8584	0,172	
3		0,441		1,6310	0,040	0,012	0,012	0,8415	0,198	
4		0,434		1,7420	0,028	0,008	0,008	0,9050	0,253	
5		0,426		1,8800	0,022	0,006	0,006	0,8382	0,286	
6		0,459		2,0510	0,047	0,011	0,011	0,8581	0,263	
7		0,469		2,0980	0,071	0,017	0,017	0,6196	0,217	

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT BRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT BRESS RATIO	FIXED TOT TEMP RATIO
1	5,0000	0,963	0,992	0,976	1,000
2	10,0000	0,995	0,999	0,994	1,000
3	30,0000	0,993	0,996	0,994	1,000
4	50,0000	0,995	0,995	0,995	1,000
5	70,0000	0,988	0,996	0,996	1,000
6	90,0000	0,990	0,995	0,991	1,000
7	95,0000	0,965	0,995	0,988	1,000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.3534	0.9921	0.9883
Polytropic Efficiency =	0.8808	0.9744	-----
Percent Design Speed =	80.0	Discharge Valve Setting=	09.0
Cor. Nozzle Weight Flow=	174.54	Vane Schedule	= 0.0
LE Check Flow/Noz.Flow =	0.9777	TE Check Flow/Noz.Flow =	0.9708
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

033370

Blade Element Data For Undistorted Inlet Testing (Continued)

MOTOR BLADE ROW NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 15 READING NUMBER 51 DATE 3/ 1/1970

RADIAL POSITION	BEL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR L LE ANGLE	INCLD ANG MN CHMR LW	INCLD ANG SUCT BRK	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1	67.75	0.	60.60	7.15	4.15	448.32	1176.06	444.88	0.	1087.26	
2	68.71	0.	59.61	7.18	4.07	450.35	1158.28	457.74	0.	1063.30	
3	64.15	0.	56.01	8.14	3.68	464.98	1066.33	464.96	0.	959.61	
4	62.20	0.	52.56	9.64	3.80	452.03	966.98	450.73	0.	854.82	
5	60.15	0.	49.71	10.44	3.65	435.41	865.76	429.37	0.	748.30	
6	58.31	0.	47.11	11.20	3.94	405.29	749.15	389.00	0.	630.66	
7	57.21	0.	46.13	11.08	3.58	402.74	717.91	382.81	0.	594.31	
RADIAL POSITION	BEL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN LE ANGLE	REL DEV ANG TB	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1	56.97	42.73	54.80	2.17	18.78	594.70	802.69	437.03	403.66	677.11	
2	57.23	38.41	54.42	2.41	9.48	574.13	829.86	446.92	359.11	693.57	
3	54.12	39.58	50.68	3.48	18.03	562.69	739.99	433.62	358.42	599.53	
4	50.15	43.17	43.79	8.36	12.05	593.39	629.87	403.56	378.54	483.53	
5	40.05	42.92	32.15	7.90	20.21	584.15	534.70	408.49	421.79	343.35	
6	27.47	48.49	14.29	13.18	30.93	614.29	462.89	405.62	458.33	210.92	
7	17.14	51.57	0.00	9.14	40.08	668.19	439.76	411.69	518.85	126.94	
RADIAL POSITION	MOTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO	DIFFUSION FACTOR	CH1					
1	1087.26	0.406	1.070	0.982	0.445	0.403					
2	1063.30	0.418	1.059	0.979	0.400	0.421					
3	959.61	0.424	0.972	0.933	0.417	0.484					
4	854.82	0.411	0.890	0.895	0.465	0.528					
5	748.30	0.396	0.787	0.951	0.511	0.571					
6	630.66	0.368	0.660	1.043	0.524	0.599					
7	594.31	0.365	0.651	1.075	0.549	0.604					
RADIAL POSITION	MOTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY HOWER EFFICIENCY	RISE/ HEAS	STAT PRESS RISE	
1	1075.77	0.511	0.698	1.3340	0.181	0.037	0.7642	0.7753	0.9445	0.325	
2	1057.47	0.494	0.711	1.3698	0.140	0.030	0.8040	0.8134	0.9005	0.345	
3	957.95	0.488	0.641	1.5080	0.076	0.015	0.9028	0.9074	0.9368	0.428	
4	862.07	0.470	0.547	1.6840	0.109	0.021	0.8729	0.8745	0.9290	0.497	
5	765.13	0.453	0.456	1.9060	0.093	0.019	0.9063	0.9105	0.9345	0.570	
6	669.25	0.519	0.405	2.2170	0.083	0.017	0.9332	0.9362	0.9066	0.666	
7	645.78	0.526	0.386	2.3390	0.112	0.023	0.9193	0.9229	0.9477	0.708	
RADIAL POSITION	PERCENT DIMENSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	1.433	1.148	1.407	1.154	PERFORMANCE PARAMETERS			STAGE DATA		ROTOR DATA
2	10.0000	1.416	1.135	1.415	1.130				FIXED INST.	FIXED INST.	TRAV. INST.
3	30.0000	1.410	1.118	1.409	1.114	Total Pressure Ratio =	1.3814	1.3927	1.4006		
4	50.0000	1.382	1.113	1.374	1.109	Adiabatic Efficiency =	0.8468	0.8691	0.8427		
5	70.0000	1.383	1.111	1.373	1.105	Polytropic Efficiency =	0.8537	0.8751	0.8500		
6	90.0000	1.378	1.109	1.377	1.103	Percent Design Speed =	80.1	Discharge Valve Setting =	06.0		
7	99.0000	1.420	1.114	1.388	1.106	Cor. Nozzle Weight Flow =	162.43	Vane Schedule =	0.0		
						LE Check Flow/Noz.Flow =	1.0019	TE Check Flow/Noz.Flow =	0.9860		
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500		

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
PCINY NUMBER 15 READING NUMBER 51 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCLD ANG HN CMBR LN	INCLD ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		42.57	39.47	3.10		598.86		441.03	409.11	
2		38.27	39.11	40.84		581.88		456.81	360.41	
3		37.83	39.01	41.18		584.06		461.09	358.08	
4		40.92	39.80	1.12		573.22		432.39	374.77	
5		43.41	40.86	2.55		603.44		436.42	412.87	
6		46.00	42.22	3.78		619.15		426.68	441.90	
7		49.11	42.76	6.35		664.25		431.34	498.14	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.70	41.13	11.83	41.86	439.51		439.47	5.40	
2		40.61	40.10	9.49	38.88	487.35		487.30	45.17	
3		41.29	40.87	7.58	39.12	479.09		478.77	40.77	
4		41.28	40.75	7.47	42.19	432.37		431.79	49.61	
5		41.25	40.10	7.85	44.66	436.38		437.34	49.53	
6		41.48	40.58	12.06	44.93	461.98		460.40	11.86	
7		41.43	42.36	10.73	50.75	464.19		462.51	13.20	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.514		0.996	0.485	0.227
2		0.501		1.067	0.366	0.258
3		0.567		1.038	0.373	0.290
4		0.496		0.999	0.437	0.368
5		0.527		1.002	0.458	0.398
6		0.542		1.079	0.420	0.385
7		0.582		1.072	0.481	0.321

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	COEFFICIENT	LOSS PARAM	ANP EFFICIENCY	POLY ROMEN EFFICIENCY	RISE/MEAS Y RISE	STAT PRESS RISE COEFF
1		0.375		1.5230	0.137	0.045		0.5036		0.216
2		0.418		1.5440	0.037	0.012		0.8745		0.246
3		0.413		1.6310	0.034	0.010		0.8950		0.278
4		0.373		1.7420	0.029	0.008		0.8595		0.354
5		0.379		1.8880	0.033	0.009		0.8496		0.381
6		0.400		2.0510	0.043	0.013		0.8774		0.368
7		0.402		2.0980	0.044	0.020		0.6361		0.303

RADIAL POSITION	PERCENT DIVERGENCE	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	9.0000	0.960	0.988	0.977	1.000	PERFORMANCE PARAMETERS				
2	10.0000	0.994	0.996	0.994	1.000	STAGE DATA		STATOR DATA		STATOR DATA
3	30.0000	0.994	0.997	0.995	1.000	FIXED INST.		FIXED INST.		TRAV. INST.
4	40.0000	0.990	0.997	0.995	1.000	Total Pressure Ratio =	1.3814	0.9919	0.9863	
5	70.0000	0.986	0.996	0.994	1.000	Polytropic Efficiency =	0.8537	0.9755	-----	
6	90.0000	0.989	0.994	0.998	1.000	Percent Design Speed =	80.1	Discharge Valve Setting =	06.0	
7	95.0000	0.958	0.993	0.992	1.000	Cor. Nozzle Weight Flow =	162.43	Vane Schedule =	0.0	
						LE Check Flow/Noz.Flow =	0.9777	TE Check Flow/Noz.Flow =	0.9912	
						Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350	

030370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK 3											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 10 READING NUMBER 52 DATE 3/ 17/1970											
RADIAL POSITION	BEL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCID ANG MN CHMR LN	INCID ANG SUCT SUFF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1	69.72	0.	60.750	9.12	6.42	404.92	1168.13	401.82	0.	1087.17	
2	68.64	0.	59.61	0.03	6.00	417.34	1142.19	415.88	0.	1063.21	
3	66.40	0.	56.01	10.39	5.93	419.12	1047.08	419.11	0.	959.53	
4	64.72	0.	52.54	12.14	6.30	405.25	945.95	404.08	0.	854.75	
5	62.78	0.	49.71	12.67	5.83	394.98	847.03	391.48	0.	748.24	
6	60.23	0.	47.11	13.12	5.46	379.41	733.38	360.32	0.	630.00	
7	59.21	0.	46.13	13.08	5.18	372.61	708.41	354.17	0.	594.26	
RADIAL POSITION	BEL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN LE ANGLE	REL DEV ANG YE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1	59.38	46.22	54.85	3.98	11.34	581.90	769.91	403.21	420.79	654.89	
2	56.86	43.22	54.42	2.44	11.72	589.41	774.82	423.86	400.21	652.37	
3	55.28	44.14	50.63	4.40	12.13	597.19	696.83	394.89	385.21	572.67	
4	50.17	50.29	47.77	6.38	14.53	561.49	560.10	358.70	431.90	430.10	
5	40.81	48.38	32.15	8.66	21.97	580.81	509.23	384.67	432.91	332.16	
6	28.14	49.94	14.29	13.85	32.09	607.04	445.61	388.17	461.56	207.63	
7	17.25	52.84	8.00	9.25	41.99	661.32	423.40	396.13	522.70	123.03	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	GH1					
1	1087.17	0.367	1.052	1.003							
2	1063.21	0.379	1.037	1.024		0.471	0.402				
3	959.53	0.391	0.951	0.747		0.445	0.420				
4	854.75	0.348	0.892	0.688		0.456	0.480				
5	748.24	0.340	0.768	0.483		0.544	0.516				
6	630.00	0.318	0.664	1.072		0.534	0.579				
7	594.26	0.337	0.632	1.118		0.538	0.619				
						0.563	0.636				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY NOMEN EFFICIENCY	RISE/MEAS	STAT PRESS RISE	LOSS COEFF
1	1075.58	0.498	0.657	1.3340	0.231	0.049	0.7271	0.7406	0.9329	0.326	
2	1052.59	0.502	0.667	1.3690	0.169	0.040	0.7649	0.7763	0.9271	0.345	
3	957.88	0.477	0.601	1.4080	0.137	0.026	0.8378	0.8452	0.9284	0.426	
4	862.00	0.494	0.483	1.4840	0.178	0.034	0.8138	0.8216	0.9307	0.487	
5	765.07	0.574	0.443	1.4040	0.136	0.027	0.8748	0.8797	0.9258	0.581	
6	669.19	0.530	0.389	2.2170	0.090	0.019	0.9277	0.9309	0.9051	0.692	
7	649.73	0.579	0.371	2.3390	0.112	0.023	0.9239	0.9275	0.9389	0.748	
RADIAL POSITION	PERCENT IMMERISION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	1.436	1.156	1.429	1.148	PERFORMANCE PARAMETERS					
2	10.0000	1.439	1.140	1.436	1.143	STAGE DATA			ROTOR DATA		ROTOR DATA
3	30.0000	1.413	1.128	1.407	1.123	FIXED INST.	FIXED INST.	TRAV. INST.			
4	50.0000	1.392	1.127	1.381	1.119	Total Pressure Ratio =	1.3964	1.4026	1.4095		
5	70.0000	1.390	1.115	1.383	1.111	Adiabatic Efficiency =	0.7942	0.8237	0.8018		
6	90.0000	1.385	1.110	1.384	1.109	Polytropic Efficiency =	0.8035	0.8320	0.8112		
7	99.0000	1.431	1.116	1.395	1.108	Percent Design Speed =	80.1	Discharge Valve Setting=	03.5		
						Cor. Nozzle Weight Flow=	150.16	Vane Schedule	=	0.0	
						LE Check Flow/Noz.Flow =	0.9977	TE Check Flow/Noz.Flow =	0.9907		
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500		

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE RPH & NASA TASK 3

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 10 READING NUMBER 53 DATE 3/ 1/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCLD ANG MN CHMR LN	INCLD ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		46.07	39.47	6.60		586.41		406.85	422.31	
2		42.68	39.11	3.57		597.47		435.51	403.67	
3		42.41	39.01	3.40		570.79		421.23	384.84	
4		48.12	39.88	8.22		575.15		383.46	427.60	
5		48.92	40.86	5.86		592.34		410.42	423.76	
6		47.48	42.22	5.26		608.30		406.03	445.02	
7		50.42	42.76	7.66		696.87		414.82	501.84	
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		1.70	11.13	17.83	44.36	437.82		436.82	13.00	
2		1.72	10.10	11.92	40.97	478.99		478.75	14.34	
3		0.79	8.87	8.08	43.21	430.67		430.45	5.97	
4		0.79	8.75	7.96	48.92	387.66		387.19	5.37	
5		0.77	9.18	8.33	48.68	407.81		406.10	5.45	
6		3.23	10.58	13.81	44.26	426.64		424.66	23.94	
7		1.56	12.36	10.88	52.98	433.17		431.61	11.76	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1		0.500		1.074	0.484	0.280				
2		0.508		1.099	0.403	0.287				
3		0.493		1.072	0.455	0.344				
4		0.497		1.018	0.541	0.432				
5		0.515		0.989	0.504	0.449				
6		0.531		1.041	0.464	0.438				
7		0.574		1.040	0.523	0.360				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY MOMEN RISE/ HEAS T RISE	STAT PRESS RISE COEFF	
1		0.570		1.5278	0.142	0.046		0.4391	0.248	
2		0.408		1.5440	0.050	0.016		0.8355	0.274	
3		0.369		1.6310	0.062	0.019		0.8056	0.300	
4		0.332		1.7420	0.071	0.020		0.8000	0.417	
5		0.350		1.8220	0.050	0.015		0.8550	0.433	
6		0.368		2.0510	0.070	0.017		0.8684	0.421	
7		0.374		2.0986	0.093	0.022		0.8454	0.341	
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	0.973	0.993	0.978	1.000	PERFORMANCE PARAMETERS				
2	16.0000	0.990	0.997	0.992	1.000	STAGE DATA STATOR DATA STATOR DATA				
3	30.0000	0.986	0.995	0.991	1.000	FIXED INST. FIXED INST. TRAV. INST.				
4	50.0000	0.982	0.992	0.989	1.000	Total Pressure Ratio =	1.3864	0.9885	0.9832	
5	70.0000	0.986	0.997	0.991	1.000	Polytropic Efficiency =	0.8035	0.9763	-----	
6	90.0000	0.987	0.996	0.988	1.000	Percent Design Speed =	80.1	Discharge Valve Setting=	03.5	
7	95.0000	0.956	0.993	0.981	1.000	Cor. Nozzle Weight Flow=	150.16	Vane Schedule	= 0.0	
						LE Check Flow/Noz.Flow =	0.9960	TE Check Flow/Noz.Flow =	0.9907	
						Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350	

NOT REPRODUCIBLE

822876

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I										
BLADE ELEMENT PERFORMANCE RESULTS										
POINT NUMBER 10 READING NUMBER 35 DATE 2/27/1976										
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCLD ANG MN CHMR LN	INCLD ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	63.96	0.	60.60	3.36	0.66	602.05	1362.89	597.44	0.	1222.70
2	62.94	0.	59.61	3.33	0.30	613.12	1343.79	610.97	0.	1195.76
3	60.13	0.	56.01	4.12	-0.34	619.90	1244.53	619.89	0.	1079.16
4	57.54	0.	52.56	4.98	-0.86	613.17	1140.22	611.41	0.	961.31
5	54.97	0.	49.71	5.26	-1.53	598.26	1032.51	589.97	0.	841.52
6	53.18	0.	47.11	6.07	-1.99	552.71	898.63	530.50	0.	708.55
7	52.11	0.	46.13	5.98	-1.92	547.13	863.73	520.66	0.	668.34
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.90	22.44	54.80	5.10	4.06	614.27	1129.41	565.84	233.65	976.13
2	59.38	22.23	54.42	4.96	3.56	611.16	1108.59	564.17	230.99	953.22
3	55.91	24.45	50.68	5.23	4.21	609.33	973.27	545.40	271.33	805.97
4	46.30	32.46	43.79	2.51	11.24	682.94	834.05	576.12	366.50	605.96
5	38.78	33.08	32.15	6.63	16.19	707.56	760.26	591.43	385.27	475.18
6	25.26	38.76	14.29	10.97	27.92	764.47	661.27	590.44	474.06	278.56
7	16.52	43.38	8.00	8.52	35.59	814.48	622.85	584.91	552.75	173.48
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1	1222.70	0.555	1.257	0.947	0.235	0.229				
2	1195.76	0.566	1.241	0.923	0.237	0.249				
3	1079.16	0.573	1.150	0.880	0.290	0.311				
4	961.31	0.566	1.053	0.942	0.364	0.354				
5	841.52	0.552	0.952	1.002	0.362	0.406				
6	708.55	0.507	0.825	1.113	0.386	0.377				
7	668.34	0.502	0.793	1.125	0.427	0.353				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MACHN RISE	STAT PRESS RISE	EFF
1	1209.79	0.542	0.996	1.3340	0.164	0.031	0.6285	0.6384	0.9891	0.157
2	1183.81	0.540	0.979	1.3690	0.099	0.038	0.7806	0.7878	0.9964	0.176
3	1077.29	0.534	0.856	1.5080	0.102	0.019	0.8074	0.8144	0.9784	0.248
4	969.46	0.599	0.732	1.6840	0.141	0.029	0.7934	0.8019	0.9904	0.309
5	860.45	0.626	0.673	1.9060	0.075	0.015	0.8973	0.9016	1.0235	0.386
6	752.62	0.677	0.586	2.2170	0.172	0.027	0.8680	0.8740	0.9938	0.418
7	726.23	0.722	0.552	2.3390	0.155	0.032	0.8661	0.8666	1.0141	0.425
OVERALL PERFORMANCE SUMMARY										
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	PERFORMANCE PARAMETERS		STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
1	5.0000	1.242	1.092	1.211	1.090	Total Pressure Ratio =	1.2726	1.3206	1.3285	
2	10.0000	1.251	1.088	1.265	1.089	Adiabatic Efficiency =	0.7030	0.8153	0.8151	
3	30.0000	1.281	1.096	1.296	1.095	Polytropic Efficiency =	0.7129	0.8225	0.8224	
4	50.0000	1.348	1.115	1.345	1.112	Percent Design Speed =	90.1	Discharge Valve Setting =	30.0	
5	70.0000	1.383	1.104	1.354	1.101	Cor. Nozzle Weight Flow =	205.36	Vane Schedule =	0.0	
6	90.0000	1.409	1.116	1.386	1.113	LE Check Flow/Noz.Flow =	0.9993	TE Check Flow/Noz.Flow =	0.9711	
7	95.0000	1.451	1.127	1.401	1.118	Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 10 READING NUMBER 35 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHRR LN LE ANGLE	INCID ANG MN CHRR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		22.31	39.47	-17.16		617.74		571.50	234.50	
2		21.79	39.11	-17.32		623.36		578.78	231.43	
3		24.88	39.01	-14.13		644.74		584.47	271.06	
4		30.08	39.80	-9.72		725.64		626.46	362.85	
5		30.41	40.86	-10.45		749.64		642.48	377.13	
6		34.03	42.22	-6.19		785.49		628.52	457.07	
7		40.63	42.76	-6.13		823.77		618.47	530.69	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHRR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.29	-11.13	11.42	22.02	604.92		604.90	3.06	
2		0.32	-10.10	10.42	21.48	685.70		685.46	3.77	
3		-2.66	-8.87	8.21	27.53	707.54		706.49	-32.78	
4		0.55	-8.75	9.30	29.53	771.23		770.34	7.41	
5		0.28	-9.10	5.82	33.70	779.97		777.03	-44.59	
6		0.31	-10.58	9.27	37.34	840.08		837.27	-19.14	
7		-0.22	-12.36	12.14	40.85	846.82		843.89	-3.26	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.545		1.058	0.144	-0.280
2		0.551		1.185	0.018	-0.282
3		0.569		1.209	0.047	-0.302
4		0.640		1.230	0.077	-0.209
5		0.667		1.209	0.108	-0.268
6		0.698		1.332	0.076	-0.384
7		0.731		1.364	0.124	-0.378

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.533		1.5230	0.217	0.071	-7.2194		-0.255
2		0.610		1.5440	0.145	0.047	1.3553		-0.256
3		0.629		1.6310	0.170	0.052	1.4798		-0.272
4		0.685		1.7420	0.082	0.023	1.5710		-0.185
5		0.697		1.8800	0.136	0.036	3.1546		-0.233
6		0.752		2.0510	0.229	0.056	2.6570		-0.325
7		0.757		2.0980	0.262	0.062	5.8890		-0.315

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT		FIXED TOT		FIXED TOT	
		PRESS RATIO	TEMP RATIO	PRESS RATIO	TEMP RATIO	PRESS RATIO	TEMP RATIO
1	5.0000	0.935	0.998	0.959	1.000		
2	10.0000	0.984	1.001	0.973	1.000		
3	30.0000	0.978	0.999	0.967	1.000		
4	50.0000	0.978	0.997	0.980	1.000		
5	70.0000	0.944	0.997	0.964	1.000		
6	90.0000	0.920	0.998	0.935	1.000		
7	95.0000	0.887	0.992	0.919	1.000		

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA STATOR DATA		
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.2726	0.9637	0.9579
Polytropic Efficiency =	0.7129	0.8667	-----
Percent Design Speed =	90.1	Discharge Valve Setting=	30.0
Cor. Nozzle Weight Flow=	205.36	Vane Schedule	= 0.0
LE Check Flow/Noz.Flow =	0.9762	TE Check Flow/Noz.Flow =	1.0183
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

NOT REPRODUCIBLE

Blade Element Data For Undistorted Inlet Testing (Continued)

822870

ROTOR BLADE ROW - NASA TASK I

 BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 8 READING NUMBER 31 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMRR LN LE ANGLE	INCID ANG MN CMRR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.38		60.60	3.78	1.08	591.96	1360.30	587.42	0.	1224.75
2	63.17		59.61	3.56	0.53	607.86	1343.18	605.73	0.	1197.76
3	60.49		56.01	4.48	0.02	611.74	1242.07	611.75	0.	1080.96
4	58.01		52.56	5.45	-0.39	603.15	1136.22	601.41	0.	947.01
5	55.13		49.71	5.42	-1.37	595.69	1032.17	587.43	0.	847.93
6	51.87		47.11	6.76	-0.90	539.78	891.67	518.88	0.	709.73
7	52.75		46.13	8.62	-1.23	535.61	857.36	509.11	0.	660.46
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMRR LN TE ANGLE	REL DEV AVG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	59.66	29.76	54.80	4.86	4.71	613.90	1053.13	531.76	303.79	908.62
2	58.91	29.74	54.42	4.49	4.26	613.93	1030.80	531.78	303.79	882.00
3	54.80	32.14	50.68	4.12	5.69	623.02	915.17	527.43	331.32	747.77
4	46.39	35.39	43.79	2.60	11.62	676.84	799.93	551.66	391.94	570.14
5	39.22	36.93	32.15	7.07	15.91	690.90	716.10	553.65	410.05	451.84
6	25.90	41.66	14.29	11.61	27.97	740.23	617.20	548.22	487.71	264.17
7	16.87	46.00	8.00	8.87	35.88	790.81	579.62	543.35	562.66	164.78
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	LOSS SOLIDITY	TOT PRESS LOSS	ADJ EFFICIENCY	POI'Y MOMEN EFFICIENCY	RISE/ RISE	STAT PRESS RISE/ RISE
1	1224.75	0.546	1.254	0.905	0.147	0.028	0.7381	0.7445	0.9660	0.227
2	1197.76	0.561	1.240	0.878	0.109	0.021	0.8084	0.8167	0.9867	0.247
3	1080.96	0.565	1.147	0.862	0.097	0.018	0.8485	0.8554	0.9583	0.322
4	962.91	0.556	1.048	0.917	0.125	0.026	0.8330	0.8409	0.9734	0.387
5	847.93	0.549	0.952	0.942	0.048	0.010	0.9400	0.9429	0.9671	0.456
6	709.73	0.495	0.818	1.058	0.087	0.018	0.9164	0.9205	0.9620	0.490
7	669.46	0.491	0.786	1.067	0.124	0.025	0.8931	0.8984	0.9896	0.506
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS	ADJ EFFICIENCY	POI'Y MOMEN EFFICIENCY	RISE/ RISE	STAT PRESS RISE/ RISE
1	1211.81	0.533	0.915	1.3340	0.147	0.028	0.7381	0.7445	0.9660	0.227
2	1185.79	0.535	0.898	1.3690	0.109	0.021	0.8084	0.8167	0.9867	0.247
3	1079.09	0.542	0.797	1.5080	0.097	0.018	0.8485	0.8554	0.9583	0.322
4	971.08	0.591	0.698	1.4840	0.125	0.026	0.8330	0.8409	0.9734	0.387
5	861.88	0.606	0.628	1.9060	0.048	0.010	0.9400	0.9429	0.9671	0.456
6	753.89	0.657	0.543	2.2170	0.087	0.018	0.9164	0.9205	0.9620	0.490
7	727.44	0.697	0.511	2.3390	0.124	0.025	0.8931	0.8984	0.9896	0.506
RADIAL POSITION	PERCENT DILUTION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	2.0000	1.353	1.123	1.332	1.116	PERFORMANCE PARAMETERS				
2	10.0000	1.359	1.117	1.364	1.115	STAGE DATA			ROTOR DATA	
3	30.0000	1.385	1.120	1.380	1.116	FIXED INST.			FIXED INST. TRAV. INST.	
4	50.0000	1.425	1.126	1.415	1.123	Total Pressure Ratio =	1.3761	1.3946	1.4022	
5	70.0000	1.421	1.118	1.412	1.114	Adiabatic Efficiency =	0.8212	0.8574	0.8356	
6	90.0000	1.429	1.123	1.422	1.116	Polytropic Efficiency =	0.8292	0.8639	0.8433	
7	95.0000	1.472	1.133	1.431	1.116	Percent Design Speed =	90.2	Discharge Valve Setting =	15.0	
					1.2	Cor. Nozzle Weight Flow =	204.39	Vane Schedule =	0.0	
						LE Check Flow/Noz.Flow =	0.9946	TE Check Flow/Noz.Flow =	0.9663	
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

02287

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 6 READING NUMBER 31 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMGR LN LE ANGLE	INCID ANG MN CMGR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		29.61	39.47	39.86		617.09		536.51	304.88	
2		29.22	39.11	39.89		624.50		544.99	304.89	
3		30.40	39.01	39.61		654.51		564.23	331.01	
4		32.98	39.00	39.02		714.42		598.00	388.04	
5		33.85	40.86	39.01		724.74		598.42	401.38	
6		33.97	42.22	39.25		755.19		581.40	470.23	
7		43.32	42.76	0.56		795.24		572.88	540.21	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMGR LN TE ANGLE	DEV ANGLE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.54	-11.13	10.59	30.15	511.22		511.19	4.86	
2		0.54	-10.10	9.56	29.76	576.79		576.73	5.40	
3		-1.43	-8.87	7.44	31.83	608.56		607.92	-15.19	
4		-0.36	-8.75	9.11	32.62	634.14		633.42	3.93	
5		-2.08	-9.10	7.02	35.93	646.23		644.43	-23.37	
6		-0.37	-10.58	10.01	39.54	687.56		685.41	-6.83	
7		0.41	-12.36	12.77	42.91	706.85		704.06	5.04	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.536		0.953	0.336	0.087
2		0.544		1.058	0.237	0.097
3		0.572		1.077	0.232	0.096
4		0.626		1.059	0.246	0.138
5		0.638		1.077	0.263	0.135
6		0.666		1.179	0.241	0.087
7		0.701		1.229	0.269	0.051

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY TROPIC EFFICIENCY	MONFN NEAR T RISE	STAT PRESS RISE	PRESS COEFF
1		0.442		1.5230	0.157	0.051		0.2876			0.082
2		0.501		1.5440	0.076	0.025		0.6698			0.091
3		0.530		1.6310	0.056	0.017		0.7242			0.089
4		0.592		1.7420	0.024	0.007		0.6547			0.127
5		0.586		1.8000	0.050	0.013		0.6803			0.124
6		0.604		2.0510	0.072	0.018		0.5283			0.079
7		0.620		2.0980	0.080	0.019		0.2550			0.046

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.957	0.994	0.972	1.000
2	10.0000	0.997	0.998	0.986	1.000
3	30.0000	0.992	0.997	0.989	1.000
4	50.0000	0.981	0.997	0.994	1.000
5	70.0000	0.982	0.994	0.988	1.000
6	90.0000	0.976	0.994	0.981	1.000
7	95.0000	0.950	0.989	0.977	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.3761	0.9867	0.9806
Polytropic Efficiency =	0.8292	0.9598	-----
Percent Design Speed =	90.2	Discharge Valve Setting =	15.0
Cor. Nozzle Weight Flow =	204.39	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9714	TE Check Flow/Noz.Flow =	0.9776
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

NOT REPRODUCIBLE

h22876

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW - NASA TASK I										
BLADE ELEMENT PERFORMANCE RESULTS										
POINT NUMBER 7 READING NUMBER 32 DATE 2/27/1970										
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMB LN LE ANGLE	INCID ANG MN CHMB LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.22	60.60	60.60	4.62	1.92	568.35	1347.61	564.00	0.	1221.89
2	64.17	59.61	59.61	4.56	1.53	580.57	1328.54	578.53	0.	1194.97
3	61.53	56.01	56.01	5.52	1.06	584.73	1226.76	584.72	0.	1078.44
4	59.37	52.56	52.56	4.81	0.97	570.37	1117.23	568.73	0.	967.67
5	57.17	49.71	49.71	7.46	0.47	550.25	1004.99	542.43	0.	849.96
6	55.31	47.11	47.11	8.20	0.54	510.69	873.02	490.16	0.	708.08
7	54.25	46.13	46.13	8.12	0.22	505.85	837.84	480.81	0.	667.90
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMB LN TE ANGLE	REL DEV AVG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.56	39.78	54.80	2.76	7.66	655.39	937.81	502.46	418.40	799.58
2	57.58	37.44	54.42	3.16	6.59	637.99	943.79	505.51	387.08	795.95
3	53.89	39.08	50.68	3.01	7.84	638.57	836.73	495.41	402.39	674.18
4	48.10	41.20	43.79	4.31	11.27	647.13	729.12	486.86	426.17	542.44
5	40.26	43.94	32.15	8.11	16.91	660.75	623.65	474.97	457.65	402.23
6	29.45	47.66	14.29	14.16	24.86	676.70	525.86	452.51	496.65	255.47
7	14.40	51.78	8.00	8.40	37.85	756.53	493.77	463.98	589.71	136.54
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR		CHI			
1	1221.89	0.523	1.239	0.891	0.420	0.410				
2	1194.97	0.534	1.223	0.874	0.396	0.429				
3	1078.44	0.538	1.130	0.847	0.427	0.491				
4	967.67	0.524	1.027	0.856	0.461	0.541				
5	849.96	0.505	0.922	0.875	0.500	0.579				
6	708.08	0.467	0.798	0.923	0.529	0.592				
7	667.90	0.462	0.766	0.965	0.568	0.547				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY MOMEN. RISE/ RISE	STAT PRESS RISE COEFF	
1	1209.98	0.560	0.802	1.3340	0.190	0.030	0.7970	0.8085	0.9803	
2	1183.03	0.548	0.811	1.3690	0.116	0.023	0.8430	0.8521	0.9749	
3	1076.58	0.549	0.720	1.5080	0.067	0.013	0.9130	0.9181	0.9412	
4	968.81	0.559	0.630	1.6840	0.066	0.013	0.9215	0.9259	0.9412	
5	859.88	0.575	0.543	1.9060	0.059	0.012	0.9357	0.9391	0.9828	
6	752.12	0.590	0.459	2.2170	0.099	0.019	0.9142	0.9187	0.9500	
7	725.75	0.661	0.431	2.3390	0.107	0.022	0.9163	0.9209	0.9644	
OVERALL PERFORMANCE SUMMARY										
PERFORMANCE PARAMETERS						STAGE DATA		ROTOR DATA		ROTOR DATA
						FIXED INST.		FIXED INST.		TRAV. INST.
Total Pressure Ratio =						1.4863		1.5001		1.5073
Adiabatic Efficiency =						0.8739		0.8955		0.8709
Polytropic Efficiency =						0.8807		0.9013		0.8782
Percent Design Speed =						90.0		Discharge Valve Setting =		09.0
Cor. Nozzle Weight Flow =						196.56		Vane Schedule =		0.0
LE Check Flow/Noz.Flow =						0.9943		TE Check Flow/Noz.Flow =		0.9605
Assumed LE Flow Coeff. =						0.9850		Assumed TE Flow Coeff. =		0.9500

822870

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 7 READING NUMBER 32 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		39.62	39.47	0.13		658.48		507.20	419.91	
2		36.89	39.11	2.22		647.26		517.49	388.48	
3		37.25	39.01	1.76		664.88		528.97	402.01	
4		38.82	39.00	0.18		674.37		524.45	421.93	
5		41.32	40.86	0.46		681.74		509.61	447.98	
6		45.11	42.22	2.89		681.44		477.02	478.85	
7		49.26	42.76	6.50		752.97		487.22	565.69	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG. TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.12	11.13	11.01	39.74	500.60		500.60	21.00	
2		0.11	-10.10	9.99	36.99	558.67		558.64	-1.06	
3		1.13	8.87	7.74	38.39	558.32		557.98	-11.02	
4		1.08	8.75	7.67	39.90	543.57		542.87	-10.23	
5		1.98	9.10	7.12	43.30	516.87		515.45	-17.81	
6		10.36	10.94	10.94	44.75	529.75		528.11	-3.28	
7		11.36	-12.36	11.00	50.62	435.07		533.20	-12.67	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.563		0.987	0.450	0.206
2		0.557		1.079	0.331	0.230
3		0.573		1.056	0.350	0.264
4		0.584		1.035	0.377	0.306
5		0.595		1.011	0.422	0.353
6		0.595		1.107	0.390	0.369
7		0.657		1.094	0.469	0.302

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADR EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/MEAS T RISE	STAT PRESS RISE COEFF
1		0.424		1.5230	0.158	0.052		0.4985		0.194
2		0.477		1.5440	0.042	0.014		0.7013		0.217
3		0.479		1.6310	0.037	0.011		0.9138		0.248
4		0.467		1.7420	0.022	0.006		0.8850		0.288
5		0.445		1.8800	0.023	0.006		0.8378		0.334
6		0.456		2.0510	0.036	0.009		0.9373		0.350
7		0.460		2.0980	0.082	0.020		0.6243		0.281

RADIAL POSITION	PERCENT REVERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.955	0.992	0.969	1.000
2	10.0000	0.995	1.001	0.992	1.000
3	30.0000	0.994	0.993	0.993	1.000
4	50.0000	0.994	0.994	0.995	1.000
5	70.0000	0.983	0.996	0.995	1.000
6	90.0000	0.994	0.999	0.992	1.000
7	95.0000	0.947	0.988	0.979	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.4863	0.9908	0.9859
Polytropic Efficiency =	0.8807	0.9771	-----
Percent Design Speed =	90.0	Discharge Valve Setting =	09.0
Cor. Nozzle Weight Flow =	196.56	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9655	TE Check Flow/Noz.Flow =	0.9757
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

822876

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 8 READING NUMBER 33 DATE 2/27/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.12	0.	60.60	5.32	2.82	545.03	1337.58	540.85	0.	1227.50
2	65.18	0.	59.61	5.37	2.54	554.42	1316.98	552.48	0.	1194.59
3	62.42	0.	56.01	6.41	1.95	563.13	1216.31	563.12	0.	1078.10
4	60.22	0.	52.56	7.66	1.82	551.17	1107.29	549.58	0.	968.36
5	58.32	0.	49.71	8.61	1.82	526.12	991.76	518.83	0.	848.70
6	56.72	0.	47.11	9.61	1.95	484.04	857.53	464.59	0.	707.85
7	56.27	0.	46.13	10.14	2.24	468.93	815.00	445.72	0.	667.59

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV AVG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	56.80	42.71	54.80	2.00	9.31	672.39	901.51	493.00	455.12	751.48
2	57.12	40.17	54.42	2.70	8.06	648.49	911.88	494.56	417.56	765.09
3	53.77	41.32	50.68	3.09	8.65	638.78	811.54	479.62	421.72	654.52
4	48.09	43.40	43.79	4.30	12.13	647.24	704.01	470.21	444.65	521.85
5	41.68	45.93	32.15	9.53	14.64	643.64	599.55	446.92	461.69	397.92
6	29.96	49.80	14.29	18.67	26.77	666.34	498.99	427.27	505.63	244.25
7	16.42	53.36	8.00	8.42	39.85	747.97	471.96	443.42	594.81	138.71

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1221.50	0.500	1.227	0.912	0.453	0.423
2	1194.59	0.509	1.209	0.895	0.423	0.442
3	1078.10	0.517	1.118	0.852	0.448	0.509
4	968.36	0.506	1.016	0.856	0.484	0.560
5	848.70	0.482	0.908	0.861	0.519	0.602
6	707.85	0.442	0.783	0.920	0.555	0.627
7	667.59	0.427	0.744	0.995	0.584	0.621

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	AD ₉₀ EFFICIENCY	POLY NOMEN RISE/ RISE	STAY PRESS RISE COEFF
1	1208.60	0.579	0.767	1.3340	0.163	0.033	0.7937	0.8040	0.9833
2	1182.65	0.554	0.779	1.3690	0.132	0.026	0.8327	0.8429	0.9619
3	1076.23	0.548	0.697	1.5080	0.072	0.014	0.9119	0.9172	0.9515
4	968.51	0.558	0.607	1.6840	0.048	0.013	0.9229	0.9274	0.9574
5	859.61	0.558	0.519	1.9060	0.069	0.013	0.9267	0.9326	0.9464
6	751.88	0.579	0.434	2.2170	0.081	0.016	0.9333	0.9370	0.9274
7	725.92	0.652	0.412	2.3390	0.102	0.021	0.9256	0.9298	0.9610

RADIAL POSITION	PERCENT DISERSION	TRAV TOT PRESS	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
1	5.0000	1.576	1.180	1.545	1.167	Total Pressure Ratio =	1.5105	1.5256	1.5338
2	10.0000	1.557	1.165	1.558	1.143	Adiabatic Efficiency =	0.8706	0.8928	0.8660
3	30.0000	1.551	1.153	1.552	1.147	Polytropic Efficiency =	0.8779	0.8991	0.8739
4	50.0000	1.534	1.145	1.523	1.139	Percent Design Speed =	90.0	Discharge Valve Setting =	07.5
5	70.0000	1.494	1.135	1.481	1.128	Cor. Nozzle Weight Flow =	192.81	Vane Schedule =	0.0
6	90.0000	1.473	1.132	1.482	1.128	LE Check Flow/Noz.Flow =	0.9811	TE Check Flow/Noz.Flow =	0.9547
7	95.0000	1.547	1.144	1.494	1.132	Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.5105	1.5256	1.5338
Adiabatic Efficiency =	0.8706	0.8928	0.8660
Polytropic Efficiency =	0.8779	0.8991	0.8739
Percent Design Speed =	90.0	Discharge Valve Setting =	07.5
Cor. Nozzle Weight Flow =	192.81	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9811	TE Check Flow/Noz.Flow =	0.9547
Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500

#22876

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 8 READING NUMBER 33 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		42.55	39.47	3.08		675.47		497.42	456.76	
2		39.61	39.11	0.50		657.29		506.33	419.08	
3		39.90	39.01	0.49		662.70		511.17	421.31	
4		41.03	39.00	1.23		671.77		505.85	440.23	
5		43.36	40.06	2.50		661.15		478.46	451.93	
6		47.30	42.22	5.08		668.40		449.90	487.51	
7		50.83	42.76	8.07		742.15		465.78	571.07	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TR ANGLE	DFV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.58	-11.13	11.71	41.97	493.26		493.22	-5.00	
2		0.40	-10.10	9.70	40.01	550.94		550.90	-3.81	
3		0.33	-8.87	8.54	39.83	545.90		545.66	-3.15	
4		0.31	-8.75	8.44	41.34	519.75		519.17	-2.77	
5		0.33	-9.10	7.77	44.69	479.72		478.57	-11.09	
6		0.49	-10.58	13.07	44.81	491.55		489.98	-21.30	
7		0.25	-12.36	11.11	52.07	491.44		489.74	-10.64	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.575		0.991	0.489	0.234
2		0.562		1.088	0.370	0.261
3		0.570		1.067	0.372	0.291
4		0.541		1.026	0.414	0.343
5		0.574		1.000	0.459	0.409
6		0.581		1.088	0.431	0.423
7		0.647		1.053	0.571	0.348

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MERN RISE EFFICIENCY	WHRN RISE	STAT PRESS RISE	STAT PRESS COEFF
1		0.416		1.5230	0.151	0.050		0.5129			0.220
2		0.467		1.5440	0.042	0.014		0.8854			0.247
3		0.466		1.4310	0.034	0.010		0.9178			0.275
4		0.445		1.7420	0.023	0.006		0.8676			0.325
5		0.411		1.8800	0.026	0.007		0.8773			0.390
6		0.422		2.0510	0.067	0.016		0.9268			0.403
7		0.421		2.0980	0.097	0.023		0.6267			0.323

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
						PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA
1	5.0000	0.950	0.989	0.969	1.000				
2	10.0000	0.993	0.998	0.992	1.000				
3	30.0000	0.994	0.995	0.993	1.000				
4	50.0000	0.987	0.995	0.995	1.000				
5	70.0000	0.986	0.994	0.995	1.000				
6	90.0000	0.992	0.996	0.986	1.000				
7	95.0000	0.942	0.989	0.975	1.000				

PERFORMANCE PARAMETERS
 STAGE DATA: FIXED INST. 1.5105, TRAV. INST. 0.9846
 STATOR DATA: FIXED INST. 0.9901, TRAV. INST. 0.9764
 Total Pressure Ratio = 1.5105
 Polytropic Efficiency = 0.8779
 Percent Design Speed = 90.0
 Cor. Nozzle Weight Flow = 192.81
 Discharge Valve Setting = 07.5
 Vane Schedule = 0.0
 LE Check Flow/Noz.Flow = 0.9597
 Assumed LE Flow Coeff. = 0.9550
 TE Check Flow/Noz.Flow = 0.9725
 Assumed TE Flow Coeff. = 0.9350

NOT REPRODUCIBLE

Blade Element Data For Undistorted Inlet Testing (Continued)

622870

ROTOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READING NUMBER 34 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMR LN LE ANGLE	INCID ANG MN CHR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VFL	INLET REL TANG VEL
1	67.03	0.00	68.60	4.43	3.73	521.74	1328.37	517.74	0.	1221.62
2	66.00	0.00	59.61	6.39	3.36	533.71	1308.49	531.84	0.	1194.70
3	63.55	0.00	56.01	7.54	3.08	536.52	1204.31	536.50	0.	1078.20
4	61.65	0.00	52.56	9.09	2.25	519.83	1092.11	518.43	0.	968.45
5	59.57	0.00	49.71	9.86	3.07	500.82	978.63	493.88	0.	848.78
6	57.71	0.00	47.11	10.60	2.94	466.12	847.59	447.48	0.	707.92
7	56.49	0.00	46.13	10.36	2.46	465.19	813.81	442.17	0.	667.75

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMR LN TE ANGLE	REL DEW ANGLE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VEL
1	57.10	45.17	54.80	2.30	9.93	673.16	873.15	473.47	476.43	732.28
2	57.05	42.56	54.42	2.63	8.95	653.56	884.48	480.58	441.23	741.53
3	53.77	43.43	50.68	3.09	9.78	641.52	787.99	465.47	440.78	635.55
4	48.88	45.84	43.79	3.09	12.77	639.26	676.91	445.12	458.72	509.88
5	42.95	48.32	32.15	10.80	16.62	630.39	572.90	418.58	470.08	389.61
6	31.00	51.61	14.29	16.71	24.71	653.42	476.39	403.66	509.40	242.55
7	16.59	54.61	8.00	8.59	39.90	740.21	453.21	425.45	598.82	126.76

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL QAT'D	DIFFUSION FACTOR	CM1
1	1221.62	0.478	1.216	0.915	0.476	0.436
2	1194.70	0.489	1.199	0.904	0.447	0.454
3	1078.20	0.492	1.104	0.868	0.467	0.521
4	968.45	0.476	1.000	0.859	0.505	0.571
5	848.78	0.458	0.894	0.848	0.542	0.619
6	707.92	0.425	0.772	0.902	0.577	0.667
7	667.75	0.424	0.742	0.962	0.607	0.674

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS	AD8 EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS	STAT PRESS RISE	EFF
1	1208.71	0.578	0.740	1.3340	0.192	0.039	0.7724	0.7866	0.9715	0.341	
2	1182.76	0.557	0.754	1.3690	0.155	0.031	0.8156	0.8273	0.9688	0.361	
3	1076.33	0.549	0.674	1.5080	0.091	0.018	0.8947	0.9013	0.9462	0.451	
4	968.60	0.550	0.582	1.6840	0.091	0.018	0.9019	0.9077	0.9562	0.529	
5	859.69	0.544	0.495	1.9060	0.100	0.019	0.9024	0.9077	0.9324	0.611	
6	751.95	0.567	0.413	2.2170	0.090	0.017	0.9295	0.9314	0.9092	0.730	
7	725.58	0.644	0.394	2.3390	0.118	0.024	0.9161	0.9268	0.9463	0.775	

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	1.604	1.191	1.579	1.181	PERFORMANCE PARAMETERS					
2	10.0000	1.587	1.173	1.588	1.174	STAGE DATA			ROTOR DATA		ROTOR DATA
3	30.0000	1.578	1.161	1.574	1.155	FIXED INST.			FIXED INST.	TRAV. INST.	
4	50.0000	1.549	1.149	1.535	1.145	Total Pressure Ratio =	1.5269	1.5457	1.5540		
5	70.0000	1.500	1.139	1.492	1.135	Adiabatic Efficiency =	0.8465	0.8726	0.8570		
6	90.0000	1.487	1.136	1.494	1.131	Polytropic Efficiency =	0.8554	0.8802	0.8656		
7	95.0000	1.567	1.148	1.503	1.135	Percent Design Speed =	90.0	Discharge Valve Setting =	06.0		
						Cor. Nozzle Weight Flow =	183.44	Vané Schedule =	0.0		
						LE Check Flow/Noz.Flow =	0.9962	TE Check Flow/Noz.Flow =	0.9694		
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500		

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROM - NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READING NUMBER 34 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET IX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		45.01	39.47	5.54		676.15		478.06	478.15	
2		42.00	39.11	2.89		661.87		491.87	442.84	
3		41.61	39.01	2.60		663.43		495.85	440.36	
4		41.53	39.80	3.73		660.45		478.04	454.16	
5		45.60	40.86	4.94		644.42		447.41	460.14	
6		49.15	42.22	6.93		653.83		424.63	491.15	
7		52.19	42.76	9.43		732.86		446.13	574.92	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT IX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		0.90	-11.13	12.03	44.11	495.55		495.49	7.77	
2		-0.02	-10.10	10.08	42.02	545.64		545.61	-0.21	
3		0.03	-8.87	8.90	41.57	528.19		527.98	0.32	
4		0.05	-8.75	8.80	43.48	482.21		481.67	0.44	
5		-1.33	-9.10	7.77	47.14	441.97		440.91	-10.25	
6		-4.12	-10.98	14.70	45.04	454.28		451.72	-32.52	
7		-1.97	-12.36	10.39	54.16	451.81		450.09	-15.52	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO	DIFFUSION FACTOR	CHI
1		0.573		1.036	0.495	0.256
2		0.564		1.109	0.392	0.285
3		0.569		1.065	0.407	0.313
4		0.569		1.008	0.466	0.379
5		0.557		0.985	0.506	0.462
6		0.567		1.064	0.473	0.461
7		0.637		1.009	0.572	0.367

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY EFFICIENCY	MOMEN RISE MPAS	RISE T RISE	STAT PRESS RISE COEFF
1		0.415		1.5230	0.144	0.047		0.5624			0.241
2		0.461		1.5440	0.043	0.014		0.8909			0.269
3		0.449		1.6310	0.045	0.014		0.8645			0.296
4		0.410		1.7420	0.049	0.014		0.8191			0.361
5		0.377		1.8800	0.041	0.011		0.8789			0.444
6		0.388		2.0510	0.086	0.021		0.8973			0.442
7		0.385		2.0980	0.103	0.025		0.6010			0.345

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.996	0.992	0.971	1.000	PERFORMANCE PARAMETERS STAGE DATA STATOR DATA STATOR DATA FIXED INST. FIXED INST. TRAV. INST. Total Pressure Ratio = 1.5269 0.9878 0.9819 Polytropic Efficiency = 0.8554 0.9728 ----- Percent Design Speed = 90.0 Discharge Valve Setting = 06.0 Cor. Nozzle Weight Flow = 183.44 Vane Schedule = 0.0 LE Check Flow/Noz.Flow = 0.9745 TE Check Flow/Noz.Flow = 0.9860 Assumed LE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350					
2	10.0000	0.992	1.000	0.992	1.000						
3	30.0000	0.989	0.995	0.991	1.000						
4	50.0000	0.981	0.996	0.990	1.000						
5	70.0000	0.986	0.996	0.992	1.000						
6	90.0000	0.988	0.996	0.983	1.000						
7	95.0000	0.934	0.989	0.974	1.000						

NOT REPRODUCIBLE

822770

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 1 READING NUMBER 25 DATE 2/27/1978

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VFL	INLET REL TANG VFL
1	64.06		60.60	3.46	0.76	665.73	1512.47	660.43	0.	1358.07
2	62.78		59.61	3.17	0.14	685.81	1494.62	683.11	0.	1328.15
3	59.99		56.01	3.98	-0.48	692.20	1384.14	692.18	0.	1198.63
4	57.60		52.56	5.04	-0.80	679.50	1265.61	677.54	0.	1067.73
5	55.07		49.71	5.36	-1.43	662.07	1145.42	652.89	0.	934.69
6	53.67		47.11	6.56	-1.10	603.00	991.44	578.76	0.	788.99
7	53.35		46.13	7.22	-0.68	581.15	942.76	552.39	0.	747.33
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV AVG TE	REL YURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VFL
1	59.77	29.37	54.90	4.97	4.29	678.73	1172.35	589.72	331.86	1011.66
2	59.33	29.04	54.42	4.91	3.45	672.66	1151.00	586.44	325.71	980.16
3	56.07	32.69	50.68	5.39	3.92	668.20	1007.43	562.25	360.75	839.81
4	48.41	37.44	43.79	4.62	9.19	716.72	857.36	569.01	439.60	641.19
5	40.34	37.20	32.15	8.19	14.73	747.73	781.24	594.32	451.06	504.66
6	27.24	41.77	14.29	12.95	26.43	803.02	676.11	593.71	530.25	365.69
7	19.38	46.59	8.00	11.38	33.97	842.16	619.27	572.99	609.23	201.41
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO	DIFFUSION FACTOR	CM1				
1	1359.07	0.618	1.405	0.893	0.307	0.323				
2	1328.15	0.638	1.392	0.859	0.309	0.345				
3	1198.63	0.645	1.290	0.812	0.358	0.401				
4	1067.73	0.632	1.176	0.840	0.425	0.438				
5	934.69	0.615	1.064	0.910	0.422	0.481				
6	788.99	0.556	0.915	1.026	0.442	0.459				
7	742.33	0.535	0.868	1.037	0.486	0.436				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADP EFFICIENCY	POLY MOMEN RISE/ EFFICIENCY	STAT PRESS RISE	STAT PRESS COEFF
1	1343.72	0.585	1.010	1.3340	0.153	0.029	0.7440	0.7564	0.0255	0.222
2	1314.87	0.592	0.996	1.3690	0.104	0.019	0.8280	0.8371	0.9628	0.243
3	1196.56	0.577	0.870	1.5080	0.103	0.019	0.8444	0.8528	0.9481	0.315
4	1076.79	0.618	0.740	1.6840	0.165	0.033	0.7821	0.7935	0.9443	0.376
5	955.71	0.653	0.683	1.9060	0.057	0.011	0.9311	0.9351	0.9932	0.448
6	835.94	0.704	0.592	2.2170	0.107	0.021	0.8976	0.9034	0.9621	0.492
7	806.63	0.736	0.541	2.3390	0.114	0.023	0.9015	0.9072	0.9642	0.505
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.457	1.155	1.421	1.142	PERFORMANCE PARAMETERS				
2	10.0000	1.456	1.143	1.468	1.140	STAGE DATA ROTOR DATA ROTOR DATA				
3	30.0000	1.465	1.146	1.480	1.141	FIXED INST. FIXED INST. TRAV. INST.				
4	50.0000	1.493	1.160	1.463	1.147	Total Pressure Ratio =	1.4587	1.4811	1.4883	
5	70.0000	1.514	1.140	1.512	1.135	Adiabatic Efficiency =	0.8111	0.8457	0.8082	
6	90.0000	1.527	1.148	1.509	1.138	Polytropic Efficiency =	0.8209	0.8541	0.8187	
7	95.0000	1.558	1.163	1.521	1.141	Percent Design Speed =	100.0	Discharge Valve Setting =	15.0	
						Cor. Nozzle Weight Flow =	221.89	Vane Schedule =	0.0	
						LE Check Flow/Noz.Flow =	0.9880	TE Check Flow/Noz.Flow =	0.9651	
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 1 READING NUMBER 23 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ARS TANG VEL	INLET REL TANG VEL
1		29.21	39.47	10.26		682.44		595.64	333.06	
2		28.50	39.11	10.61		685.06		602.00	324.90	
3		30.87	39.01	8.14		702.90		603.03	360.41	
4		34.93	39.80	4.87		754.81		617.86	431.27	
5		34.38	40.86	6.48		786.40		645.33	441.52	
6		38.97	42.22	3.25		820.94		631.97	511.24	
7		44.85	42.76	1.09		846.89		604.78	581.07	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ARS TANG VEL	EXIT REL TANG VEL
1		10.66	-11.13	10.47	29.87	548.52		548.48	-64.74	
2		11.26	-10.10	8.84	29.77	627.09		626.90	-13.82	
3		11.81	-8.87	7.06	32.67	643.55		642.97	-20.79	
4		11.47	-8.75	7.28	36.40	635.94		635.02	-16.31	
5		11.08	-9.10	7.02	36.46	691.18		689.25	-25.00	
6		11.56	-10.58	0.02	40.53	719.84		717.35	-19.50	
7		11.10	-12.36	11.26	44.96	728.06		725.58	-13.98	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.588		0.921	0.359	0.122
2		0.594		1.041	0.245	0.131
3		0.609		1.066	0.250	0.150
4		0.654		1.028	0.327	0.184
5		0.690		1.068	0.277	0.183
6		0.721		1.135	0.278	0.132
7		0.741		1.200	0.305	0.094

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY EFFICIENCY	MOHFN MEAS T RISE	RISE/ RISE	STAT PRESS RISE COEFF
1		0.470		1.5230	0.149	0.049		0.3550			0.113
2		0.541		1.5440	0.073	0.024		0.8216			0.122
3		0.586		1.6310	0.054	0.017		0.9570			0.139
4		0.547		1.7420	0.033	0.009		0.6553			0.169
5		0.602		1.8800	0.045	0.012		0.8179			0.166
6		0.628		2.0510	0.061	0.015		0.5974			0.118
7		0.634		2.0990	0.104	0.025		0.3848			0.083

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.948	0.989	0.968	1.000
2	10.0000	0.993	0.998	0.985	1.000
3	30.0000	0.998	0.995	0.988	1.000
4	50.0000	0.977	0.989	0.992	1.000
5	70.0000	0.986	0.996	0.988	1.000
6	90.0000	0.968	0.991	0.982	1.000
7	95.0000	0.944	0.982	0.967	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.4587	0.9848	0.9796
Polytropic Efficiency =	0.8209	0.9611	-----
Percent Design Speed =	100.0	Discharge Valve Setting =	15.0
Cor. Nozzle Weight Flow =	221.89	Vane Schedule =	0.0
IE Check Flow/Noz.Flow =	0.9702	TE Check Flow/Noz.Flow =	0.9709
Assumed IE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

NOT REPRODUCIBLE

Blade Element Data For Undistorted Inlet Testing (Continued)

822870

ROTOR BLADE ROW - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 5 READING NUMBER 30 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.07	0.0	60.60	7.47	0.77	665.82	1512.98	660.71	0.	1358.60
2	62.94	0.0	59.61	7.33	0.30	681.03	1493.03	678.65	0.	1328.66
3	60.21	0.0	56.01	4.20	-0.28	686.57	1381.74	686.55	0.	1199.10
4	57.91	0.0	52.56	5.35	-0.49	671.60	1261.74	669.47	0.	1068.13
5	55.47	0.0	49.71	5.76	-1.03	652.37	1140.14	643.33	0.	935.05
6	53.73	0.0	47.11	6.62	-1.04	601.91	991.02	577.71	0.	787.30
7	52.55	0.	46.13	6.42	-1.48	598.31	953.66	568.71	0.	747.62
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.97	34.69	54.80	4.17	5.09	695.10	1084.35	558.76	416.04	928.20
2	58.90	34.59	54.42	4.48	4.04	682.10	1085.86	560.32	386.35	929.03
3	53.35	34.44	50.68	2.67	4.86	715.11	938.20	560.03	444.45	752.58
4	48.65	40.46	43.79	4.86	9.27	711.86	819.78	541.54	461.88	615.33
5	41.03	41.14	32.15	8.88	14.44	729.47	728.18	548.25	479.03	477.06
6	30.05	45.73	14.29	15.76	23.48	752.54	609.29	521.26	534.77	307.50
7	19.97	50.00	8.00	11.97	32.58	814.88	563.23	518.93	618.35	188.39
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CW1				
1	1358.60	0.618	1.405	0.845	0.386	0.393				
2	1328.66	0.634	1.389	0.826	0.367	0.412				
3	1199.10	0.639	1.287	0.816	0.428	0.471				
4	1068.15	0.624	1.173	0.809	0.459	0.517				
5	935.05	0.605	1.057	0.852	0.472	0.556				
6	787.30	0.595	0.914	0.932	0.510	0.561				
7	747.62	0.552	0.879	0.912	0.554	0.558				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY HOMFN EFFICIENCY	RISE T RISE	STAT PRESS RISE COEFF
1	1344.24	0.593	0.921	1.3340	0.153	0.030	0.7835	0.7947	0.9405	0.283
2	1315.38	0.585	0.931	1.1690	0.117	0.022	0.8355	0.8459	0.9860	0.303
3	1197.02	0.613	0.804	1.5080	0.098	0.019	0.8741	0.8823	0.9813	0.382
4	1077.21	0.612	0.704	1.6840	0.123	0.024	0.8529	0.8620	0.9547	0.454
5	956.08	0.633	0.632	1.9060	0.055	0.011	0.9384	0.9422	0.9737	0.525
6	836.27	0.655	0.530	2.2170	0.118	0.023	0.8924	0.8988	0.9562	0.997
7	806.95	0.708	0.489	2.3390	0.136	0.027	0.8858	0.8926	0.9511	0.627
OVERALL PERFORMANCE SUMMARY										
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.	
1	5.0000	1.592	1.191	1.561	1.174	Total Pressure Ratio =	1.5630	1.5805	1.5905	
2	10.0000	1.584	1.166	1.591	1.170	Adiabatic Efficiency =	0.8461	0.8626	0.8533	
3	30.0000	1.622	1.174	1.620	1.149	Polytropic Efficiency =	0.8555	0.8763	0.8626	
4	50.0000	1.593	1.168	1.572	1.162	Percent Design Speed =	100.1	Discharge Valve Setting =	11.0	
5	70.0000	1.574	1.152	1.571	1.147	Cor. Nozzle Weight Flow =	219.33	Vane Schedule =	0.0	
6	90.0000	1.545	1.150	1.536	1.147	LE Check Flow/Noz.Flow =	0.9959	TE Check Flow/Noz.Flow =	0.9744	
7	95.0000	1.603	1.169	1.546	1.150	Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 5 READING NUMBER 30 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCID ANG MN CHMR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		36.52	39.47	2.95		701.59		563.80	417.54	
2		34.02	39.11	5.09		693.11		574.46	387.76	
3		36.49	39.01	2.92		747.00		600.27	444.02	
4		37.97	39.80	1.83		744.70		585.06	457.28	
5		38.39	40.86	2.47		759.04		591.92	468.90	
6		43.07	42.22	0.85		761.71		551.44	515.60	
7		47.38	42.76	4.62		813.76		546.32	593.68	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		51.73	-11.13	9.40	38.26	532.59		532.34	-16.10	
2		42.61	-10.10	7.49	36.63	603.32		602.66	-27.45	
3		0.91	-8.07	9.78	35.58	629.63		629.29	-10.03	
4		51.74	-8.75	7.01	39.71	592.17		591.24	-17.97	
5		51.70	-9.10	7.40	40.09	605.25		603.49	-17.92	
6		51.69	-10.58	8.89	44.76	594.13		592.05	-17.48	
7		47.46	-12.36	9.90	49.84	590.83		587.89	-25.31	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH1
1		0.596		0.944	0.444	0.203
2		0.595		1.049	0.323	0.226
3		0.642		1.048	0.335	0.243
4		0.642		1.009	0.387	0.298
5		0.661		1.020	0.372	0.333
6		0.663		1.073	0.388	0.334
7		0.707		1.076	0.453	0.284

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	AEB EFFICIENCY	POLY MACHN EFFICIENCY	POW MEAS RISE	STAY PRESS RISE	STAY PRESS COEFF
1		0.449		1.5230	0.145	0.047		0.4029			0.189
2		0.512		1.5440	0.043	0.014		0.9228			0.211
3		0.536		1.6310	0.044	0.014		0.8501			0.225
4		0.504		1.7420	0.023	0.007		0.8208			0.278
5		0.520		1.8800	0.025	0.007		0.9227			0.310
6		0.510		2.0510	0.040	0.010		0.8617			0.311
7		0.505		2.0980	0.083	0.020		0.6173			0.260

RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.950	0.985	0.968	1.000	PERFORMANCE PARAMETERS STAGE DATA STATOR DATA STATOR DATA FIXED INST. FIXED INST. TRAV. INST. Total Pressure Ratio = 1.5630 0.9889 0.9823 Polytropic Efficiency = 0.8555 0.9757 ----- Percent Design Speed = 100.1 Discharge Valve Setting = 11.0 Cor. Nozzle Weight Flow = 219.33 Vane Schedule = 0.0 IE Check Flow/Noz.Flow = 0.9795 TE Check Flow/Noz.Flow = 0.9784 Assumed IE Flow Coeff. = 0.9550 Assumed TE Flow Coeff. = 0.9350					
2	10.0000	0.995	1.004	0.991	1.000						
3	30.0000	0.988	0.996	0.989	1.000						
4	50.0000	0.981	0.995	0.994	1.000						
5	70.0000	0.991	0.996	0.994	1.000						
6	90.0000	0.984	0.997	0.990	1.000						
7	95.0000	0.941	0.984	0.976	1.000						

NOT REPRODUCIBLE

822770

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NACA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 2 READING NUMBER 27 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCID ANG MN CHMR LN	INCID ANG SUCTY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.86	100.00	60.60	4.00	1.30	649.95	1509.62	644.97	0.	1358.11
2	63.32	100.00	59.61	3.71	0.68	669.66	1487.45	667.31	0.	1328.49
3	60.77	100.00	56.01	4.76	0.30	670.63	1373.52	670.61	0.	1194.67
4	58.63	100.00	52.56	6.07	0.23	652.98	1251.60	651.10	0.	1067.77
5	56.04	100.00	49.71	4.33	-0.46	638.39	1131.92	629.54	0.	934.72
6	54.35	100.00	47.11	7.24	-0.42	588.10	982.47	564.46	0.	787.01
7	53.47	100.00	46.13	7.34	-0.56	578.47	941.13	549.85	0.	742.36
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN TE ANGLE	REL DEV ANGR TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.72	40.90	54.80	9.92	6.88	727.48	1028.42	548.59	475.26	868.50
2	57.34	38.28	54.42	3.12	5.78	710.77	1038.47	556.81	439.48	875.43
3	52.07	41.63	50.68	1.39	4.70	737.21	896.34	550.90	489.68	706.91
4	49.17	43.84	43.79	5.38	9.45	705.07	777.83	508.47	488.31	588.21
5	41.37	43.83	32.15	9.22	14.67	721.02	693.19	519.18	498.46	457.28
6	32.42	44.73	14.29	18.13	21.93	719.05	564.28	471.02	536.78	299.18
7	1A.91	53.25	8.00	10.91	34.56	608.01	517.35	479.65	642.31	164.35
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1	1358.11	0.603	1.396	0.831	0.434	0.426				
2	1328.49	0.622	1.382	0.834	0.409	0.448				
3	1194.67	0.623	1.277	0.821	0.465	0.510				
4	1067.77	0.606	1.161	0.781	0.495	0.559				
5	934.72	0.591	1.048	0.825	0.504	0.607				
6	787.01	0.542	0.905	0.834	0.552	0.628				
7	742.36	0.532	0.866	0.872	0.603	0.628				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLINITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS T RISE	STAT PRESS RISE COEFF
1	1343.76	0.614	0.868	1.3340	0.165	0.033	0.7909	0.8052	0.9706	0.313
2	1314.91	0.605	0.884	1.3690	0.129	0.025	0.8361	0.8477	0.9932	0.336
3	1196.60	0.627	0.763	1.5040	0.094	0.019	0.8890	0.8971	0.9642	0.421
4	1078.82	0.603	0.665	1.6840	0.102	0.020	0.8848	0.8925	0.9548	0.499
5	955.74	0.621	0.598	1.9060	0.058	0.012	0.9380	0.9420	0.9409	0.580
6	835.97	0.622	0.488	2.2170	0.118	0.022	0.8970	0.9033	0.9261	0.671
7	806.66	0.699	0.448	2.3390	0.146	0.029	0.8844	0.8916	0.9465	0.706
RADIAL POSITION	PERCENT DISPERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.694	1.212	1.659	1.197	PERFORMANCE PARAMETERS				
2	10.0000	1.684	1.187	1.681	1.192	STAGE DATA		ROTOR DATA		ROTOR DATA
3	30.0000	1.715	1.195	1.704	1.185	FIXED INST.	FIXED INST.	TRAV. INST.	INST.	
4	50.0000	1.648	1.177	1.632	1.170	Total Pressure Ratio =	1.6239	1.6463	1.6611	
5	70.0000	1.621	1.163	1.604	1.154	Adiabatic Efficiency =	0.8518	0.8776	0.8607	
6	90.0000	1.563	1.156	1.561	1.152	Polytropic Efficiency =	0.8616	0.8859	0.8703	
7	95.0000	1.653	1.176	1.572	1.157	Percent Design Speed =	100.0	Discharge Valve Setting =	09.0	
						Cor. Nozzle Weight Flow =	217.17	Vane Schedule	= 0.0	
						LE Check Flow/Noz.Flow =	0.9908	TE Check Flow/Noz.Flow =	0.9719	
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

622770

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

 BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 2 READING NUMBER 27 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		40.73	39.47	1.26		730.96		553.88	476.98		
2		37.70	39.11	-1.41		721.35		570.75	441.0A		
3		39.67	39.01	0.66		766.66		589.86	489.21		
4		41.39	39.80	1.59		732.41		548.48	483.46		
5		41.12	40.86	0.26		745.44		558.87	487.92		
6		46.16	42.22	3.94		723.18		496.97	517.55		
7		50.74	42.76	7.98		802.50		504.10	616.67		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV AVG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		02.43	-11.13	8.70	43.17	533.99		533.51	22.67		
2		02.40	-10.10	7.70	40.10	597.02		596.46	25.02		
3		1.98	-8.87	10.45	38.09	620.51		620.02	17.10		
4		1.41	-8.75	7.34	42.81	554.94		553.76	13.65		
5		1.38	-9.10	7.72	42.50	536.63		535.33	17.85		
6		0.23	-10.58	10.35	46.39	513.27		511.68	2.08		
7		02.51	-12.36	9.85	53.24	504.55		502.45	21.99		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO				DIFFUSION FACTOR		CHI	
1		0.617		0.963				0.494		0.241	
2		0.615		1.045				0.381		0.263	
3		0.655		1.051				0.379		0.277	
4		0.628		1.010				0.436		0.359	
5		0.644		0.958				0.457		0.402	
6		0.626		1.030				0.462		0.445	
7		0.694		0.997				0.557		0.360	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLINITY COEFFICIENT	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY WOMEN EFFICIENCY	RISE HEAS T RISE	STAT PRESS RISE COEFF	
1		0.446		1.5230	0.154	0.950		0.5289		0.224	
2		0.502		1.5440	0.053	0.017		0.8320		0.246	
3		0.524		1.4310	0.047	0.014		0.8178		0.236	
4		0.469		1.7420	0.056	0.010		0.8418		0.333	
5		0.456		1.4800	0.041	0.011		0.8453		0.378	
6		0.436		2.0510	0.052	0.013		0.9029		0.422	
7		0.428		2.0980	0.092	0.022		0.6183		0.334	
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.945	0.988	0.964	1.000	PERFORMANCE PARAMETERS			STAGE DATA		STATOR DATA
2	10.0000	0.986	1.004	0.988	1.000	FIXED INST.			FIXED INST.	TRAV. INST.	
3	30.0000	0.982	0.992	0.988	1.000	Total Pressure Ratio =	1.6239	0.9863	0.9768		
4	50.0000	0.982	0.994	0.992	1.000	Polytropic Efficiency =	0.8616	0.9725	-----		
5	70.0000	0.979	0.993	0.990	1.000	Percent Design Speed =	100.0	Discharge Valve Setting =	09.0		
6	90.0000	0.987	0.996	0.988	1.000	Cor. Nozzle Weight Flow =	217.17	Vane Schedule =	0.0		
7	95.0000	0.926	0.983	0.974	1.000	IE Check Flow/Noz.Flow =	0.9770	TE Check Flow/Noz.Flow =	0.9705		
						Assumed IE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350		

NOT REPRODUCIBLE

822870

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW 5 NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 4 READING NUMBER 29 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VFL	INLET REL TANG VFL
1	65.17		60.60	4.57	1.87	633.92	1499.01	628.66	0.	1358.56
2	64.27		59.61	4.66	1.43	642.65	1475.88	640.39	0.	1328.62
3	61.74		56.01	5.73	1.27	644.64	1361.36	644.43	0.	1199.06
4	60.00		52.56	7.44	1.60	618.58	1234.31	616.40	0.	1068.12
5	57.88		49.71	8.17	1.38	595.16	1108.37	586.91	0.	935.02
6	56.00		47.11	8.89	1.23	553.20	962.20	530.96	0.	787.27
7	54.80		46.13	8.67	0.77	351.08	924.74	323.21	0.	742.28
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VFL
1	56.54	44.04	54.80	1.74	8.43	755.58	984.21	542.06	524.14	828.66
2	57.05	41.40	54.42	2.63	7.22	724.58	998.49	542.56	478.26	837.08
3	52.78	44.54	50.68	2.10	8.96	730.10	860.25	520.27	512.03	684.95
4	48.99	46.40	43.79	5.20	11.00	710.01	746.22	489.57	514.11	565.06
5	41.85	47.35	32.15	9.70	16.03	713.31	649.02	482.50	523.83	437.22
6	34.88	52.36	14.29	28.59	21.12	690.83	516.69	419.40	543.85	292.39
7	17.97	54.67	8.00	9.97	36.83	810.86	498.93	465.02	456.12	150.00
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL QATIO	DIFFUSION FACTOR	CHI				
1	1358.56	0.586	1.387	0.862	0.474	0.451				
2	1328.62	0.595	1.367	0.847	0.441	0.470				
3	1199.06	0.597	1.262	0.807	0.493	0.536				
4	1068.12	0.577	1.141	0.794	0.570	0.545				
5	935.02	0.549	1.022	0.822	0.539	0.638				
6	787.27	0.508	0.883	0.790	0.594	0.685				
7	742.60	0.506	0.849	0.888	0.619	0.681				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT. PRESS LOSS PARAM	ADB EFFICIENCY	POLY T RISE/ RISE	MOMEN T RISE	STAY PRESS RISE COEFF
1	1344.20	0.633	0.825	1.3340	0.182	0.038	0.7886	0.8644	0.9654	0.337
2	1315.34	0.612	0.844	1.3690	0.136	0.027	0.8409	0.8531	0.9734	0.358
3	1196.99	0.619	0.729	1.5090	0.101	0.070	0.8872	0.8957	0.9714	0.449
4	1077.17	0.605	0.636	1.6840	0.101	0.020	0.8945	0.9020	0.9552	0.528
5	956.05	0.612	0.557	1.9060	0.065	0.013	0.9358	0.9402	0.9453	0.618
6	836.24	0.595	0.445	2.2170	0.116	0.021	0.9062	0.9122	0.9269	0.738
7	806.92	0.698	0.430	2.3390	0.159	0.032	0.8821	0.8897	0.9148	0.770
RADIAL POSITION	PERCENT DECELERATION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.781	1.235	1.738	1.218	PERFORMANCE PARAMETERS				
2	10.0000	1.754	1.208	1.758	1.208	STAGE DATA ROTOR DATA ROTOR DATA				
3	30.0000	1.761	1.203	1.750	1.196	FIXED INST. FIXED INST. TRAV. INST.				
4	50.0000	1.702	1.186	1.689	1.181	Total Pressure Ratio =	1.6761	1.7020	1.7144	
5	70.0000	1.661	1.170	1.640	1.163	Adiabatic Efficiency =	0.8704	0.8776	0.8630	
6	90.0000	1.586	1.158	1.600	1.199	-Polytropic Efficiency =	0.8609	0.8865	0.8730	
7	95.0000	1.702	1.186	1.601	1.164	Percent Design Speed =	100.1	Discharge Valve Setting =	7.5	
						Cor. Nozzle Weight Flow =	212.65	Vane Schedule	=	0.0
						LE Check Flow/Noz.Flow =	0.9793	TE Check Flow/Noz.Flow =	0.9653	
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 4 READING NUMBER 29 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCTY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		41.87	39.47	4.40		759.07		547.24	526.04	
2		40.81	39.11	1.70		734.50		555.03	480.00	
3		42.63	39.01	3.62		755.63		555.74	511.94	
4		41.99	39.80	4.19		734.01		527.23	509.00	
5		44.72	40.86	3.86		731.84		517.82	517.76	
6		49.90	42.22	7.68		690.14		441.48	524.36	
7		52.21	42.76	9.45		802.73		488.41	629.93	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV AVG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VFL
1		41.31	-11.13	9.82	45.17	552.20		552.05	-12.58	
2		41.29	-10.10	8.81	42.09	609.49		609.10	-13.69	
3		41.61	-8.87	9.48	42.02	601.97		601.49	4.37	
4		41.63	-8.75	9.38	43.36	543.33		542.69	5.97	
5		41.21	-9.10	10.31	43.51	499.08		497.90	10.51	
6		41.10	-10.58	12.68	47.80	461.88		460.15	16.90	
7		44.04	-12.36	8.32	56.25	456.20		453.61	-32.03	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VFL RATIO	DIFFUSION FACTOR	CM1
1		0.636		1.009	0.505	0.256
2		0.621		1.096	0.388	0.278
3		0.642		1.083	0.408	0.295
4		0.627		1.029	0.455	0.379
5		0.629		0.962	0.499	0.432
6		0.594		1.042	0.507	0.503
7		0.691		0.929	0.625	0.387

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SLICINITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	A0B EFFICIENCY	POI Y MOMEN RISE/ MFA9 Y RISE	STAT PRESS RISE COEFF
1		0.458		1.9230	0.131	0.043	0.5543		0.238
2		0.509		1.5440	0.047	0.015	0.8941		0.260
3		0.505		1.6310	0.049	0.015	0.8197		0.275
4		0.457		1.7420	0.048	0.014	0.8441		0.357
5		0.422		1.8800	0.059	0.016	0.8172		0.409
6		0.390		2.0510	0.097	0.024	0.9113		0.482
7		0.384		2.0980	0.098	0.023	0.5850		0.360

RADIAL POSITION	PERCENT DIMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	0.945	0.986	0.968	1.000
2	10.0000	0.991	1.000	0.989	1.000
3	30.0000	0.981	0.994	0.988	1.000
4	50.0000	0.981	0.995	0.989	1.000
5	70.0000	0.974	0.993	0.986	1.000
6	90.0000	0.988	1.001	0.980	1.000
7	95.0000	0.914	0.981	0.971	1.000

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	STATOR DATA FIXED INST.	STATOR DATA TRAV. INST.
Total Pressure Ratio =	1.6761	0.9847	0.9762
Polytropic Efficiency =	0.8609	0.9711	-----
Percent Design Speed =	100.1	Discharge Valve Setting =	7.5
Cor. Nozzle Weight Flow =	212.65	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	0.9704	TE Check Flow/Noz.Flow =	0.9885
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

622875

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 3 READING NUMBER 28 DATE 2/27/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCID ANG MN CHMR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ARS TANG VEL	INLET REL TANG VEL
1	66.37	0.	60.60	9.77	3.07	598.79	1484.18	594.70	0.	1358.03
2	65.41	0.	59.61	9.80	2.77	609.88	1461.44	607.74	0.	1328.11
3	61.94	0.	56.01	9.93	1.47	638.94	1358.76	638.92	0.	1198.59
4	62.13	0.	52.56	9.57	3.73	566.24	1208.56	564.61	0.	1067.70
5	59.19	0.	49.71	9.48	2.49	565.15	1092.24	557.32	0.	934.66
6	57.63	0.	47.11	10.52	2.86	519.75	943.11	498.86	0.	786.97
7	56.36	0.	46.13	10.43	2.53	515.86	903.84	490.14	0.	742.31

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN TE ANGLE	REL DEV ANGLE TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ARS TANG VEL	EXIT REL TANG VEL
1	56.17	48.16	54.80	1.37	10.20	773.48	926.28	515.08	575.19	768.49
2	56.09	45.15	54.42	1.67	9.32	749.13	946.35	527.46	530.26	784.57
3	53.34	46.57	50.68	2.66	8.60	725.36	835.13	498.58	526.69	669.84
4	48.59	49.06	43.79	4.80	13.54	718.65	711.98	470.15	542.91	933.94
5	43.09	49.66	32.15	10.94	16.11	699.78	620.48	452.32	537.61	423.07
6	36.20	54.84	14.29	21.91	21.43	678.17	486.43	388.52	551.53	284.39
7	17.70	56.06	8.00	9.70	38.86	806.06	478.72	446.83	664.00	142.61

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1	1358.03	0.552	1.369	0.867	0.570	0.459
2	1328.11	0.563	1.349	0.868	0.464	0.477
3	1198.59	0.592	1.258	0.790	0.514	0.558
4	1067.70	0.520	1.111	0.834	0.545	0.596
5	934.66	0.519	1.004	0.812	0.561	0.642
6	786.97	0.476	0.863	0.779	0.620	0.719
7	742.31	0.472	0.827	0.912	0.634	0.733

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POI Y MOMEN EFFICIENCY	RISE/RISE	STAT PRESS RISE COEFF
1	1343.68	0.644	0.771	1.3340	0.207	0.043	0.7761	0.7918	0.9799	0.346
2	1314.83	0.629	0.794	1.3690	0.173	0.035	0.8110	0.8240	0.9759	0.367
3	1196.52	0.612	0.705	1.5080	0.119	0.024	0.8722	0.8822	0.9668	0.471
4	1076.76	0.609	0.604	1.6840	0.110	0.022	0.8916	0.8996	0.9461	0.544
5	956.68	0.598	0.530	1.9060	0.086	0.016	0.9203	0.9258	0.9276	0.646
6	835.92	0.582	0.417	2.2170	0.126	0.023	0.9039	0.9103	0.9121	0.781
7	806.61	0.692	0.411	2.3390	0.186	0.038	0.8702	0.8787	0.9007	0.835

RADIAL POSITION	PERCENT DIVERGENCE	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO
1	5.0000	1.835	1.254	1.801	1.236
2	10.0000	1.811	1.230	1.804	1.227
3	30.0000	1.792	1.210	1.779	1.205
4	50.0000	1.745	1.199	1.723	1.189
5	70.0000	1.678	1.176	1.660	1.170
6	90.0000	1.605	1.163	1.620	1.164
7	95.0000	1.743	1.191	1.611	1.168

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA FIXED INST.	ROTOR DATA FIXED INST.	ROTOR DATA TRAV. INST.
Total Pressure Ratio =	1.7037	1.7377	1.7517
Adiabatic Efficiency =	0.8281	0.8613	0.8505
Polytropic Efficiency =	0.8405	0.8717	0.8619
Percent Design Speed =	100.0	Discharge Valve Setting =	6.0
Cor. Nozzle Weight Flow =	204.03	Vane Schedule =	0.0
LE Check Flow/Noz.Flow =	1.0773	TE Check Flow/Noz.Flow =	0.9718
Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE ROW 2, NASA TASK 1											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 3 READING NUMBER 28 DATE 2/27/1978											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMBR LN LE ANGLE	INCID ANG MN CHMBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		47.99	39.47	8.52		776.89		519.91	977.27		
2		44.57	39.11	5.46		758.36		540.24	932.18		
3		44.70	39.01	5.69		748.36		531.75	924.18		
4		44.70	39.80	4.90		739.45		506.35	937.41		
5		47.10	40.86	6.24		714.44		484.42	921.35		
6		52.47	42.22	10.25		674.64		408.48	931.76		
7		53.66	42.76	10.90		796.67		469.00	637.90		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMBR LN TE ANGLE	DEV AVG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		-0.22	-11.13	10.91	48.21	573.87		573.86	62.18		
2		-0.19	-10.10	9.91	44.76	616.13		616.10	67.83		
3		1.01	-8.87	9.88	43.69	586.77		586.44	10.30		
4		1.02	-8.75	9.77	45.68	529.51		528.84	9.45		
5		1.01	-9.10	10.11	46.09	470.42		469.34	8.31		
6		3.18	-10.58	13.76	49.29	419.69		417.76	23.18		
7		-3.78	-12.36	8.58	57.44	408.84		406.64	-26.85		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI					
1		0.647		1.104	0.506	0.251					
2		0.637		1.140	0.415	0.278					
3		0.633		1.103	0.427	0.296					
4		0.628		1.044	0.487	0.363					
5		0.612		0.969	0.531	0.453					
6		0.579		1.023	0.558	0.530					
7		0.684		0.867	0.682	0.380					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF		
1		0.473		1.9230	0.244	0.047		0.5644	0.233		
2		0.511		1.5440	0.091	0.017		0.8244	0.259		
3		0.490		1.6310	0.068	0.021		0.7742	0.276		
4		0.443		1.7420	0.041	0.023		0.7552	0.341		
5		0.394		1.8800	0.075	0.020		0.8047	0.431		
6		0.353		2.0510	0.138	0.034		0.8675	0.510		
7		0.343		2.0990	0.165	0.025		0.5246	0.354		
OVERALL PERFORMANCE SUMMARY											
PERFORMANCE PARAMETERS						STAGE DATA STATOR DATA STATOR DATA					
						FIXED INST.		FIXED INST.		TRAV. INST.	
Total Pressure Ratio =						1.7037		0.9804		0.9698	
Polytropic Efficiency =						0.8405		0.9751		-----	
Percent Design Speed =						100.0		Discharge Valve Setting =		6.0	
Cor. Nozzle Weight Flow =						204.03		Vane Schedule =		0.0	
LE Check Flow/Noz.Flow =						0.9769		TE Check Flow/Noz.Flow =		1.0139	
Assumed LE Flow Coeff. =						0.9550		Assumed TE Flow Coeff. =		0.9350	
RADIAL POSITION	PERCENT THICKNESS	TRAV. TOT PRESS RATIO	TRAV. TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO						
1	5.0000	0.946	0.986	0.964	1.000						
2	10.0000	0.984	0.998	0.988	1.000						
3	30.0000	0.976	0.997	0.984	1.000						
4	50.0000	0.968	0.992	0.981	1.000						
5	70.0000	0.972	0.994	0.983	1.000						
6	90.0000	0.981	1.001	0.972	1.000						
7	95.0000	0.896	0.981	0.970	1.000						

NOT REPRODUCIBLE

n30370

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 30# • NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 12 READING NUMBER 72 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMB LN LE ANGLE	INCID ANG MN CHMB LN	INCID ANG BODY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.41	0.	60.80	3.81	1.11	722708	1661.22	716.54	0.	1496.08
2	63.37	0.	59.61	3.76	8.73	736717	1637.88	733.59	0.	1443.12
3	60.71	0.	56.01	4.78	8.24	740773	1514.02	740.71	0.	1320.44
4	58.59	0.	52.56	6.03	8.19	720735	1379.29	718.28	0.	1176.24
5	56.26	0.	49.71	6.55	8.24	697747	1243.66	687.80	0.	1029.68
6	54.59	0.	47.11	7.48	8.18	642704	1078.82	616.24	0.	866.97
7	53.54	0.	46.13	7.41	8.69	635774	1035.92	604.28	0.	817.77

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMB LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	61.35	33.25	54.80	6.55	3.06	713799	1243.03	595.42	390.43	1089.85
2	60.42	30.45	54.42	6.00	2.95	716777	1249.87	616.44	362.36	1086.14
3	56.53	34.60	50.68	5.85	4.18	727733	1085.40	598.59	412.87	905.29
4	49.56	38.68	43.79	5.77	9.03	769791	926.60	600.96	481.06	705.16
5	41.96	39.62	32.15	9.81	14.29	793700	821.40	609.60	504.64	548.29
6	29.41	43.73	14.29	15.12	18.19	845719	703.70	605.77	579.44	341.45
7	22.56	48.35	0.00	14.56	28.98	877711	636.97	577.03	648.89	239.72

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	1496.08	0.675	1.554	0.831	0.339	0.338
2	1463.12	0.690	1.535	0.848	0.317	0.355
3	1320.44	0.694	1.419	0.808	0.373	0.413
4	1176.24	0.674	1.290	0.837	0.432	0.447
5	1029.68	0.650	1.160	0.886	0.447	0.490
6	866.97	0.595	0.999	0.983	0.472	0.481
7	817.77	0.589	0.999	0.955	0.525	0.463

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	LOSS SOLIDITY	LOSS COEFFICIENT	TOY PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS T	RISE COEFF	STAY PRESS RISE COEFF
1	1480.28	0.601	1.047	1.3346	0.210	0.038	0.6891	0.7070	0.8753	0.221	
2	1448.50	0.609	1.063	1.3698	0.151	0.029	0.7622	0.7769	0.8785	0.238	
3	1318.16	0.621	0.927	1.5086	0.125	0.023	0.8287	0.8398	0.9498	0.312	
4	1186.22	0.657	0.791	1.6840	0.137	0.036	0.7653	0.7795	0.9398	0.373	
5	1052.84	0.683	0.707	1.9066	0.125	0.024	0.8615	0.8766	0.9377	0.448	
6	920.89	0.733	0.611	2.2178	0.142	0.028	0.8740	0.8825	0.9525	0.568	
7	888.61	0.759	0.551	2.3398	0.178	0.035	0.8497	0.8594	0.9579	0.524	

RADIAL POSITION	PERCENT IMMERSSION	TRAV TOY PRESS RATIO	TRAV TOY TEMP RATIO	FIXED TOY PRESS RATIO	FIXED TOY TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	1.558	1.212	1.523	1.136	PERFORMANCE PARAMETERS STAGE DATA ROTOR DATA ROTOR DATA FIXED INST. FIXED INST. TRAV. INST. Total Pressure Ratio = 1.5656 1.5920 1.6091 Adiabatic Efficiency = 0.7764 0.8074 0.7685 Polytropic Efficiency = 0.7901 0.8196 0.7835 Percent Design Speed = 110.2 Discharge Valve Setting = 13.0 Cor. Nozzle Weight Flow = 230.69 Vane Schedule = 0.0 LE Check Flow/Noz.Flow = 0.9878 TE Check Flow/Noz.Flow = 0.9901 Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500					
2	10.0000	1.572	1.192	1.571	1.181						
3	30.0000	1.606	1.184	1.613	1.177						
4	50.0000	1.623	1.195	1.556	1.176						
5	70.0000	1.628	1.182	1.617	1.171						
6	90.0000	1.636	1.180	1.640	1.174						
7	95.0000	1.649	1.194	1.607	1.171						

h30390

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE 20H - NABA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 12 READING NUMBER 72 DATE 8/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SOCY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		33.89	39.47	-6.38		717776		601.36	391.84	
2		29.88	39.11	-9.23		729397		632.90	363.67	
3		32.65	39.81	-6.36		784797		643.77	412.47	
4		36.85	39.80	-3.79		810188		654.25	476.27	
5		36.71	40.86	-4.15		830792		662.58	493.98	
6		40.88	42.22	-1.34		861758		645.33	558.67	
7		45.62	42.76	2.86		879763		609.58	622.99	

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN LE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		-0.95	-11.13	10.18	34.04	829764		829.46	-8.81	
2		-0.91	-10.10	9.19	30.79	820742		820.31	-9.88	
3		-0.44	-8.87	9.34	32.20	855746		855.16	5.07	
4		-1.67	-8.75	7.08	37.72	807799		807.86	-17.70	
5		-0.85	-9.10	8.25	37.96	886743		884.89	-10.18	
6		0.81	-10.50	11.39	40.08	726759		724.08	10.19	
7		-1.50	-12.36	10.86	47.13	896789		894.47	-18.22	

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI
1		0.603		0.880	0.445	0.287
2		0.621		0.989	0.316	0.221
3		0.656		1.018	0.306	0.228
4		0.696		0.928	0.424	0.263
5		0.719		1.034	0.334	0.266
6		0.749		1.122	0.309	0.219
7		0.762		1.139	0.378	0.211

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT LOSS PARAM	ADD EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.444		1.5238	0.160	0.092		0.4721		0.193
2		0.525		1.5440	0.096	0.018		0.8282		0.206
3		0.558		1.6310	0.096	0.017		0.8738		0.210
4		0.515		1.7420	0.040	0.011		0.4200		0.241
5		0.587		1.8800	0.032	0.008		0.8587		0.242
6		0.623		2.0510	0.089	0.022		0.7783		0.196
7		0.597		2.0988	0.099	0.024		0.5930		0.189

RADIAL POSITION	PERCENT INCEPSTION	TRAV TOT		FIXED TOT		FIXED TOT	
		PRESS RATIO	YEMP RATIO	PRESS RATIO	YEMP RATIO	PRESS RATIO	YEMP RATIO
1	5.0000	0.943	0.978	0.964	1.000		
2	10.0000	0.987	0.991	0.987	1.000		
3	30.0000	0.990	0.994	0.986	1.000		
4	50.0000	0.947	0.984	0.988	1.000		
5	70.0000	0.964	0.991	0.991	1.000		
6	90.0000	0.975	0.995	0.972	1.000		
7	95.0000	0.943	0.981	0.988	1.000		

OVERALL PERFORMANCE SUMMARY

PERFORMANCE PARAMETERS	STAGE DATA	STATOR DATA	STATOR DATA
	FIXED INST.	FIXED INST.	TRAV. INST.
Total Pressure Ratio =	1.5656	0.9834	0.9724
Polytropic Efficiency =	0.7901	0.9640	-----
Percent Design Speed =	110.2	Discharge Valve Setting =	13.0
Cor. Nozzle Weight Flow =	230.69	Vane Schedule	= 0.0
LE Check Flow/Noz.Flow =	0.9953	TE Check Flow/Noz.Flow =	0.9684
Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350

NOT REPRODUCIBLE

630390

Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 90W - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 8 READING NUMBER 57 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG SUCTY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS YANG VEL	INLET REL YANG VEL
1	64.43	0.	60.60	3.83	1.13	719.70	1657.01	714.18	0.	1492.55
2	63.26	0.	59.61	3.65	0.62	737.98	1635.61	735.39	0.	1459.66
3	60.68	0.	56.01	4.47	0.21	739.96	1510.92	739.94	0.	1317.32
4	58.46	0.	52.56	5.90	0.06	722.22	1377.90	720.14	0.	1173.47
5	56.12	0.	49.71	6.41	0.38	699.48	1242.78	689.78	0.	1027.25
6	54.53	0.	47.11	7.42	0.24	647.81	1077.16	616.20	0.	864.92
7	53.42	0.	40.13	7.29	0.61	637.03	1035.09	605.51	0.	815.84
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	REL DEV ANG DE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS YANG VEL	EXIT REL YANG VEL
1	60.36	42.48	54.80	5.56	4.07	750.66	1118.15	552.41	505.87	970.92
2	59.15	38.61	54.42	4.73	4.11	749.32	1140.61	466.67	466.67	978.41
3	54.58	39.57	50.68	3.90	6.10	764.32	1016.53	589.09	486.75	828.29
4	48.59	42.82	43.79	4.80	9.87	783.07	868.33	574.26	532.22	651.20
5	40.66	43.01	32.15	8.51	18.46	803.20	774.31	586.25	546.87	503.48
6	34.64	48.68	14.29	20.35	19.89	766.24	647.30	502.48	571.51	347.21
7	24.49	52.11	9.00	16.49	18.93	834.48	570.28	509.36	654.46	232.84
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1	1492.55	0.673	1.549	0.773	0.439	0.404				
2	1459.66	0.692	1.533	0.795	0.406	0.425				
3	1317.32	0.694	1.416	0.796	0.434	0.488				
4	1173.47	0.675	1.289	0.797	0.485	0.534				
5	1027.25	0.652	1.159	0.856	0.493	0.584				
6	864.92	0.595	0.998	0.815	0.550	0.609				
7	815.84	0.590	0.958	0.841	0.590	0.620				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS Y RISE	STAT PRESS RISE COEFF
1	1476.78	0.623	0.928	1.3346	0.227	0.042	0.7167	0.7371	0.9409	0.277
2	1445.68	0.630	0.959	1.3690	0.192	0.036	0.7617	0.7795	0.9619	0.298
3	1315.05	0.645	0.898	1.5080	0.126	0.024	0.8503	0.8618	0.9413	0.383
4	1183.42	0.664	0.736	1.6846	0.152	0.030	0.8324	0.8448	0.9417	0.458
5	1050.35	0.687	0.662	1.9060	0.093	0.018	0.9057	0.9128	0.9195	0.545
6	918.72	0.658	0.550	2.2176	0.147	0.027	0.8731	0.8819	0.9220	0.643
7	886.51	0.716	0.488	2.3398	0.176	0.034	0.8580	0.8677	0.9057	0.691
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.743	1.255	1.701	1.229	PERFORMANCE PARAMETERS				
2	10.0000	1.756	1.225	1.748	1.226	STAGE DATA				
3	30.0000	1.789	1.219	1.776	1.209	ROTOR DATA				
4	50.0000	1.774	1.215	1.726	1.203	ROTOR DATA				
5	70.0000	1.760	1.201	1.735	1.189	FIXED INST. FIXED INST. TRAV. INST.				
6	90.0000	1.654	1.183	1.664	1.180	Total Pressure Ratio =	1.7045	1.7298	1.7556	
7	95.0000	1.731	1.267	1.653	1.171	Adiabatic Efficiency =	0.8079	0.8320	0.8129	
						Polytropic Efficiency =	0.8218	0.8445	0.8271	
						Percent Design Speed =	110.0	Discharge Valve Setting =	9.0	
						Cor. Nozzle Weight Flow =	229.89	Vane Schedule =	0.0	
						LE Check Flow/Noz.Flow =	0.9918	TE Check Flow/Noz.Flow =	0.9985	
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

Blade Element Data For Undistorted Inlet Testing (Continued)
 STATOR BLADE ROW - NACA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER		READING NUMBER		DATE		3/ 3/1970					
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG ROCY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		42.31	39.47	2.84		754719		557.71	507.69		
2		38.81	39.11	21.18		760765		599.33	468.36		
3		37.55	39.01	1.46		798725		632.58	486.29		
4		40.22	39.80	0.42		817749		623.03	526.03		
5		40.13	40.06	-0.75		834769		635.10	535.31		
6		46.06	42.22	3.84		771734		531.06	591.02		
7		49.54	42.76	6.78		832740		539.93	628.35		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN TE ANGLE	DEV ANG E	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		2.64	-11.13	8.49	44.95	918717		518.01	-23.86		
2		-1.21	-10.10	8.89	39.22	585753		585.37	-12.58		
3		0.55	-8.87	9.42	37.00	619721		618.92	5.96		
4		-1.05	-8.75	7.70	41.27	588771		587.96	-10.76		
5		0.25	-9.10	9.39	39.88	606709		604.79	2.42		
6		0.64	-10.88	11.22	45.42	549726		547.48	6.07		
7		-4.12	-12.36	8.24	53.66	526728		523.24	-37.65		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1					
1		0.626	0.929	0.977	0.544	0.307					
2		0.640	0.977	0.978	0.435	0.315					
3		0.677	0.978	0.944	0.408	0.310					
4		0.696	0.944	0.952	0.467	0.371					
5		0.716	0.952	1.031	0.442	0.392					
6		0.662	1.031	0.976	0.457	0.441					
7		0.713	0.976		0.555	0.369					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOY PRESS LOSS PARAM	ADD EFFICIENCY	POLY EFFICIENCY	MOMEN MEAS	RISE/RISE	STAT PRESS COEFF
1		0.427	1.5238	0.132	0.043	0.6005					0.287
2		0.485	1.5448	0.068	0.022	0.7781					0.294
3		0.518	1.6318	0.047	0.014	0.8135					0.295
4		0.492	1.7420	0.022	0.006	0.7847					0.344
5		0.511	1.8808	0.039	0.010	0.8441					0.363
6		0.462	2.0518	0.081	0.020	0.9005					0.415
7		0.442	2.0988	0.098	0.023	0.6313					0.341
OVERALL PERFORMANCE SUMMARY											
PERFORMANCE PARAMETERS						STAGE DATA		STATOR DATA		STATOR DATA	
						FIXED INST.	FIXED INST.	TRAV. INST.	TRAV. INST.		
Total Pressure Ratio =						1.7045	0.9853	0.9701			
Polytropic Efficiency =						0.8218	0.9731	-----			
Percent Design Speed =						110.0	Discharge Valve Setting =	9.0			
Cor. Nozzle Weight Flow =						229.89	Vane Schedule	0.0			
LE Check Flow/Noz.Flow =						1.0037	TE Check Flow/Noz.Flow =	0.9679			
Assumed LE Flow Coeff. =						0.9550	Assumed TE Flow Coeff. =	0.9350			

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 80M * NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 11 READING NUMBER 71 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	INCID ANG ROCY SJRP	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.65	0.	60.60	4.05	1.35	713733	1655.70	707.86	0.	1494.15
2	63.52	0.	59.61	3.91	0.88	730760	1633.70	728.04	0.	1461.23
3	60.75	0.	58.01	4.74	0.28	738747	1511.43	738.46	0.	1318.74
4	58.73	0.	52.56	6.17	0.33	715143	1375.44	713.37	0.	1174.72
5	56.39	0.	49.71	6.88	0.11	693720	1240.17	683.59	0.	1028.35
6	54.91	0.	47.11	7.80	0.14	633778	1073.02	608.31	0.	865.85
7	53.93	0.	46.13	7.80	0.10	225798	1029.02	595.00	0.	816.72
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN LE ANGLE	REL DEV ANG LE	REL TORN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	61.58	47.42	54.80	6.78	3.07	745759	1058.82	503.34	548.03	930.33
2	58.15	39.72	54.42	3.73	3.37	772713	1124.33	592.79	492.45	954.18
3	53.20	41.34	50.68	2.52	7.55	791726	991.61	593.95	522.56	793.90
4	48.93	43.95	43.79	8.14	9.80	779745	854.06	581.07	540.91	643.78
5	41.10	44.79	32.15	8.95	15.28	799774	749.62	563.76	559.63	491.85
6	36.86	50.65	17.29	22.97	18.05	741722	589.59	467.00	569.55	350.15
7	24.24	54.60	0.00	16.24	19.69	831715	533.87	477.77	672.36	215.10
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI				
1	1494.15	0.666	1.547	0.711	0.484	0.423				
2	1461.23	0.684	1.530	0.814	0.421	0.443				
3	1318.74	0.692	1.417	0.804	0.458	0.512				
4	1174.72	0.669	1.285	0.787	0.496	0.560				
5	1028.35	0.646	1.156	0.825	0.515	0.612				
6	865.85	0.587	0.993	0.768	0.573	0.654				
7	816.72	0.579	0.932	0.803	0.627	0.664				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOY PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/MEAS T RISE	STAT PRESS RISE COEFF
1	1478.37	0.614	0.872	1.3340	0.244	0.043	0.7127	0.7346	0.9567	0.294
2	1446.63	0.646	0.941	1.3690	0.198	0.038	0.7680	0.7865	0.9463	0.315
3	1316.46	0.666	0.835	1.5080	0.122	0.024	0.8627	0.8741	0.9581	0.407
4	1184.69	0.659	0.722	1.6840	0.136	0.027	0.8553	0.8666	0.9419	0.486
5	1051.48	0.679	0.640	1.9068	0.083	0.016	0.9178	0.9241	0.9316	0.575
6	919.71	0.634	0.504	2.2170	0.138	0.025	0.8839	0.8922	0.9077	0.664
7	887.46	0.709	0.456	2.3398	0.166	0.032	0.8711	0.8803	0.9056	0.741
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	1.781	1.272	1.764	1.245	PERFORMANCE PARAMETERS				
2	10.0000	1.831	1.242	1.810	1.241	STAGE DATA			ROTOR DATA	
3	30.0000	1.876	1.233	1.847	1.223	FIXED INST.			FIXED INST. TRAV. INST.	
4	50.0000	1.820	1.219	1.784	1.211	Total Pressure Ratio =	1.7584	1.7884	1.8106	
5	70.0000	1.792	1.203	1.771	1.194	Adiabatic Efficiency =	0.8155	0.8420	0.8262	
6	90.0000	1.671	1.186	1.589	1.153	Polytropic Efficiency =	0.8295	0.8544	0.8401	
7	95.0000	1.768	1.211	1.689	1.186	Percent Design Speed =	110.0	Discharge Valve Setting =	8.0	
						Cor. Nozzle Weight Flow =	228.43	Vane Schedule	=	0.0
						LE Check Flow/Noz.Flow =	0.9932	TE Check Flow/Noz.Flow =	1.0013	
						Assumed LE Flow Coeff. =	0.9850	Assumed TE Flow Coeff. =	0.9500	

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE R08 - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 11 READING NUMBER 21 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG ROCT SURF.	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		47.26	39.47	7.79		748787		508.22	550.01		
2		39.11	39.11	0.00		783760		408.04	494.24		
3		39.29	39.01	0.28		824771		637.97	522.06		
4		41.38	39.80	1.58		811747		607.79	535.53		
5		41.96	40.86	1.10		823710		609.23	547.80		
6		48.11	42.22	5.89		743711		492.58	549.14		
7		52.13	42.76	9.37		823794		501.99	645.53		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		2.78	-11.13	8.35	80.04	522.36		521.74	-25.30		
2		1.11	-10.10	8.99	88.21	587.99		587.85	-11.35		
3		1.70	-9.87	10.57	87.59	629.76		629.22	18.67		
4		0.73	-9.75	8.02	42.12	584.95		584.25	7.49		
5		1.40	-9.10	10.56	48.96	573720		571.80	13.95		
6		0.63	-10.58	11.21	47.48	499.47		497.90	5.47		
7		4.83	-12.86	7.58	86.06	480788		486.28	41.13		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CHI					
1		0.617		1.027	0.555	0.349					
2		0.656		0.967	0.458	0.328					
3		0.697		0.986	0.423	0.321					
4		0.689		0.961	0.470	0.392					
5		0.705		0.939	0.474	0.426					
6		0.635		1.011	0.503	0.499					
7		0.702		0.960	0.601	0.401					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY HORNEN RISE/ MEAS Y RISE	STAT PRESS RISE	COEFF	
1		0.426		1.5230	0.131	0.843		0.6987		0.328	
2		0.484		1.5440	0.079	0.025		0.7572		0.306	
3		0.524		1.6310	0.052	0.016		0.7840		0.296	
4		0.487		1.7420	0.025	0.007		0.8269		0.365	
5		0.481		1.8800	0.058	0.015		0.8376		0.397	
6		0.418		2.0510	0.100	0.024		0.9152		0.475	
7		0.409		2.0980	0.107	0.026		0.6367		0.373	
RADIAL POSITION	PERCENT RECEPTION	TRAV TOT PRESS RATIO	TRAV TOT TEMR RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMR RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.961	0.981	0.978	1.000	PERFORMANCE PARAMETERS					
2	10.0000	0.969	0.999	0.980	1.000	STAGE DATA STATOR DATA STATOR DATA					
3	30.0000	0.971	0.992	0.985	1.000	FIXED INST. FIXED INST. TRAV. INST.					
4	50.0000	0.973	0.993	0.993	1.000	Total Pressure Ratio =	1.7584	0.9832	0.9699		
5	70.0000	0.972	0.992	0.984	1.000	Polytropic Efficiency =	0.8295	0.9708	-----		
6	90.0000	0.987	0.998	0.976	1.000	Percent Design Speed =	110.0	Discharge Valve Setting =	8.0		
7	95.0000	0.929	0.979	0.968	0.001	Cor. Nozzle Weight Flow =	228.43	Vane Schedule =	0.0		
							LE Check Flow/Noz.Flow =	1.0066	TE Check Flow/Noz.Flow =	0.9822	
							Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350	

030390

Blade Element Data For Undistorted Inlet Testing (Continued)
 ROTOR BLADE 90# - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
 POINT NUMBER 10 READING NUMBER 70 DATE 3/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	66.83	0.	60.60	6.28	3.53	644.90	1628.27	639.95	0.	1495.12
2	68.10	0.	59.61	8.49	5.46	589.85	1576.67	587.78	0.	1462.18
3	65.38	0.	56.01	9.37	6.91	604.74	1451.56	604.72	0.	1319.59
4	62.27	0.	52.56	9.71	3.87	619.70	1328.83	617.91	0.	1175.48
5	58.97	0.	49.71	7.26	0.47	678.42	1232.53	669.02	0.	1029.01
6	55.47	0.	47.11	8.36	0.70	621.89	1066.03	596.12	0.	866.41
7	54.21	0.	46.13	8.08	0.18	419.79	1025.69	589.12	0.	817.25

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEF ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	60.98	51.04	54.80	6.18	5.85	775.30	1004.33	486.74	601.90	877.42
2	57.19	41.52	54.42	2.77	10.91	794.88	1097.54	594.08	525.95	921.61
3	51.55	43.90	50.68	0.87	18.83	822.98	953.69	592.04	570.51	746.80
4	49.95	46.26	43.79	6.16	12.32	767.42	824.59	530.56	554.34	631.12
5	42.06	47.12	32.15	9.91	14.91	782.44	717.38	531.56	572.45	479.71
6	39.59	52.79	14.29	25.38	19.88	713.90	542.26	429.20	565.32	354.98
7	23.20	55.49	4.00	15.28	31.01	838.90	522.99	471.62	685.88	202.16

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	1495.12	0.598	1.509	0.761	0.521	0.425
2	1462.18	0.543	1.453	1.011	0.425	0.425
3	1319.59	0.558	1.339	0.981	0.473	0.498
4	1175.48	0.573	1.228	0.859	0.504	0.562
5	1029.01	0.631	1.147	0.795	0.541	0.642
6	866.41	0.574	0.985	0.720	0.595	0.701
7	817.25	0.573	0.948	0.801	0.639	0.718

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	LOSS TOY PRESS SOLIDITY COEFFICIENT	LOSS TOY PRESS LOSS PARAM	ADB EFFICIENCY	POLY HOMOEN RISE/ EFFICIENCY MEAS	STAT PHSS RISE COEFF
1	1479.32	0.633	0.820	1.3340	0.243	0.044	0.7828	0.9485
2	1447.56	0.651	0.913	1.3698	0.209	0.041	0.7770	0.9336
3	1317.31	0.689	0.799	1.5080	0.121	0.025	0.8748	0.9573
4	1185.45	0.646	0.694	1.6840	0.127	0.024	0.8756	0.9337
5	1052.16	0.664	0.609	1.9066	0.088	0.017	0.9463	0.9100
6	920.30	0.608	0.479	2.2178	0.145	0.025	0.8825	0.8868
7	888.03	0.712	0.444	2.3390	0.184	0.036	0.8621	0.8741

RADIAL POSITION	PERCENT DIMENSION	TRAV TOY PRESS RATIO	TRAV TOY TEMP RATIO	FIXED TOY PRESS RATIO	FIXED TOY TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
1	5.0000	1.865	1.302	1.852	1.263	PERFORMANCE PARAMETERS			
2	10.0000	1.913	1.262	1.896	1.239	STAGE DATA ROTOR DATA ROTOR DATA			
3	30.0000	1.972	1.252	1.937	1.238	FIXED INST. FIXED INST. TRAV. INST			
4	50.0000	1.857	1.226	1.842	1.218	Total Pressure Ratio =	1.8143	1.8554	1.8721
5	90.0000	1.820	1.213	1.801	1.200	Adiabatic Efficiency =	0.8168	0.8498	0.8218
6	90.0000	1.688	1.189	1.714	1.189	Polytropic Efficiency =	0.8315	0.8623	0.8368
7	95.0000	1.830	1.224	1.713	1.193	Percent Design Speed =	110.1	Discharge Valve Setting =	7.2
						Cor. Nozzle Weight Flow =	228.61	Vane Schedule =	0.0

LE Check Flow/Noz.Flow = 0.9222 TE Check Flow/Noz.Flow = 0.9874
 Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

Blade Element Data For Undistorted Inlet Testing (Continued)

STATOR BLADE 80N - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 10 READING NUMBER 70 DATE 8/ 3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMR LN LE ANGLE	INCID ANG MN CMR LN	INCID ANG SOCY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1		30.88	39.47	11.41		778759		491.21	604.07		
2		40.90	39.11	1.79		806719		609.32	527.86		
3		41.84	39.81	2.83		894786		636.66	569.96		
4		43.76	39.80	3.96		794772		573.01	548.82		
5		44.38	40.86	3.52		804758		572.52	568.35		
6		50.34	42.22	8.12		712779		451.92	545.86		
7		53.84	42.76	18.28		829766		499442	658.90		
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMR LN TE ANGLE	DEG ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1		-2.51	-11.13	8.62	33.39	553783		553.29	-24.21		
2		-0.98	-10.10	9.12	41.89	608776		608.64	-10.44		
3		-2.25	-8.87	11.12	39.59	650769		649.93	25.49		
4		-0.03	-8.75	8.72	43.80	578796		578.31	-0.33		
5		2.37	-9.10	11.47	42.02	542776		541.13	22.39		
6		1.83	-10.58	12.41	48.50	436771		455.07	14.58		
7		-8.58	-12.36	5.78	39.63	496762		451.97	-52.17		
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1					
1		0.636		1.126	0.554	0.344					
2		0.671		0.999	0.461	0.324					
3		0.719		1.021	0.433	0.304					
4		0.671		1.009	0.469	0.390					
5		0.684		0.945	0.301	0.430					
6		0.807		1.007	0.537	0.541					
7		0.704		0.912	0.651	0.395					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY MOMEN EFFICIENCY	MEAS RISE	STAT PRESS RISE	COEFF
1		0.450		1.9230	0.122	0.040		0.7253			0.322
2		0.498		1.5440	0.087	0.028		0.7619			0.301
3		0.539		1.6310	0.068	0.021		0.7402			0.278
4		0.481		1.7428	0.037	0.016		0.8415			0.364
5		0.453		1.8800	0.088	0.023		0.8025			0.403
6		0.380		2.0518	0.126	0.031		0.9194			0.518
7		0.380		2.0980	0.101	0.024		0.5822			0.347
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	0.984	0.970	0.971	1.000	PERFORMANCE PARAMETERS					
2	10.0000	0.969	0.977	0.977	1.000	STAGE DATA STATOR DATA STATOR DATA					
3	30.0000	0.962	0.988	0.988	1.000	FIXED INST. FIXED INST. TRAV. INST.					
4	50.0000	0.977	0.993	0.985	1.000	Total Pressure Ratio =	1.8148	0.9781	0.9673		
5	70.0000	0.966	0.990	0.976	1.000	Polytropic Efficiency =	0.8315	0.9642	-----		
6	90.0000	0.988	1.000	0.973	1.000	Percent Design Speed =	110.1	Discharge Valve Setting =	7.2		
7	95.0000	0.988	0.975	0.978	1.000	Cor. Nozzle Weight Flow =	228.61	Vane Schedule =	0.0		
						LE Check Flow/Noz.Flow =	0.9926	TE Check Flow/Noz.Flow =	0.9992		
						Assumed LE Flow Coeff. =	0.9550	Assumed TE Flow Coeff. =	0.9350		

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Blade Element Data For Undistorted Inlet Testing (Continued)

ROTOR BLADE 30W - NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
POINT NUMBER 9 READINGS NUMBER 69 DATE 3/3/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMB LN CE ANGLE	INCID ANG MN CHMB LN	INCID ANG SDBY S. 37	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	65.11	0.	60.40	4.51	1.31	700741	1653.43	695.04	0.	1497.75
2	63.90	0.	59.61	4.29	1.26	720712	1632.19	717.60	0.	1464.75
3	61.52	0.	56.01	5.51	1.35	717713	1503.91	717.14	0.	1321.91
4	59.86	0.	52.96	7.38	1.46	685780	1362.70	683.83	0.	1177.55
5	57.69	0.	49.71	7.98	1.19	661714	1224.62	651.98	0.	1030.82
6	56.33	0.	47.11	9.02	1.36	607781	1059.14	582.61	0.	867.93
7	54.93	0.	45.13	8.90	0.90	604767	1017.78	574.75	0.	818.68

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMB LN CE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	58.61	51.11	54.80	3.81	6.69	821721	989.40	514.74	638.22	843.71
2	56.09	43.29	54.42	1.67	7.81	821734	1070.94	596.85	562.20	887.91
3	51.09	45.53	50.68	0.41	16.43	834758	930.78	584.56	595.46	724.16
4	49.89	48.30	43.79	6.18	9.97	773707	778.27	514.26	577.10	610.44
5	43.06	48.81	32.15	10.91	14.62	771781	695.77	507.38	579.80	474.21
6	41.49	53.37	18.29	27.28	14.64	697703	556.90	413.52	556.26	365.66
7	21.26	56.63	8.00	13.26	22.67	683777	510.35	466.39	708.10	181.49

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CM1
1	1497.75	0.653	1.542	0.741	0.545	0.456
2	1464.75	0.673	1.526	0.832	0.469	0.478
3	1321.91	0.670	1.406	0.815	0.512	0.549
4	1177.55	0.639	1.269	0.752	0.540	0.603
5	1030.82	0.614	1.137	0.778	0.557	0.665
6	867.93	0.580	0.978	0.718	0.596	0.727
7	818.68	0.558	0.939	0.811	0.654	0.736

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	MEAS RISE	STAT PRESS RISE	COEFF
1	1481.92	0.669	0.808	1.3348	0.237	0.846	0.7476	0.7699	0.9565	0.325	0.325
2	1450.11	0.682	0.899	1.3690	0.205	0.842	0.7823	0.8019	0.9640	0.348	0.348
3	1319.63	0.697	0.777	1.5080	0.125	0.826	0.8716	0.8833	0.9608	0.445	0.445
4	1187.54	0.648	0.669	1.6840	0.131	0.825	0.8714	0.8823	0.9312	0.534	0.534
5	1054.01	0.653	0.589	1.9068	0.103	0.820	0.9051	0.9128	0.9084	0.636	0.636
6	921.92	0.591	0.472	2.2170	0.198	0.833	0.8443	0.8556	0.8571	0.780	0.780
7	889.59	0.724	0.433	2.3390	0.245	0.849	0.8227	0.8356	0.8744	0.827	0.827

RADIAL POSITION	PERCENT DEPRESSION	TRAV TOT PRESS RATIO	TRAV TOT TWR RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY			
1	5.0000	1.969	1.318	1.943	1.280	PERFORMANCE PARAMETERS			
2	10.0000	1.995	1.272	1.978	1.274	STAGE DATA ROTOR DATA ROTOR DATA			
3	30.0000	2.029	1.263	1.982	1.248	FIXED INST. FIXED INST. TRAV. INST.			
4	50.0000	1.900	1.237	1.877	1.227	Total Pressure Ratio =	1.8502	1.9015	1.9253
5	70.0000	1.845	1.216	1.822	1.207	Adiabatic Efficiency =	0.8030	0.8421	0.8382
6	90.0000	1.698	1.192	1.708	1.196	Polytropic Efficiency =	0.8193	0.8557	0.8433
7	95.0000	1.875	1.232	1.707	1.201	Percent Design Speed =	110.30	Discharge Valve Setting =	6.7
						Cor. Nozzle Weight Flow =	225.55	Vane Schedule =	0.0

LE Check Flow/Noz.Flow = 0.9863 TE Check Flow/Noz.Flow = 1.0013
Assumed LE Flow Coeff. = 0.9850 Assumed TE Flow Coeff. = 0.9500

630370

Blade Element Data For Undistorted Inlet Testing (Concluded)

STATOR BLADE ROW • NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS															
POINT NUMBER		READING NUMBER 69 DATE 3/ 3/1970													
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CMBR LN LE ANGLE	INCID ANG MN CMBR LN	IMBID ANG SDCY SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL					
1		50.95	39.47	11.48		824.73		519.52	640.52						
2		42.67	39.11	3.56		832.57		612.18	564.24						
3		43.49	39.01	4.48		864.73		627.13	594.89						
4		45.95	39.80	6.05		797.47		554.61	571.36						
5		46.14	40.86	5.28		790.28		545.37	567.54						
6		50.95	42.22	8.73		695.13		435.09	536.32						
7		54.22	42.76	11.46		843.35		489.89	679.84						
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CMBR LN LE ANGLE	DEG ANG TE	TWRN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL					
1		0.46	-11.13	10.87	31.42	610.26		610.23	-4.91						
2		0.41	-10.10	9.69	43.08	648.02		647.96	-4.64						
3		1.74	-8.87	10.64	41.75	649.24		648.67	19.68						
4		0.26	-8.75	9.04	45.59	565.22		564.59	2.56						
5		1.27	-9.10	10.37	44.87	525.21		523.96	11.59						
6		1.18	-10.58	11.76	49.77	420.07		418.69	8.60						
7		0.83	-12.36	7.33	59.26	420.99		418.03	-36.83						
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO					DIFFUSION FACTOR	CHI					
1		0.672		1.175					0.517	0.287					
2		0.692		1.058					0.443	0.283					
3		0.725		1.034					0.452	0.281					
4		0.671		1.018					0.495	0.368					
5		0.670		0.961					0.521	0.418					
6		0.590		0.962					0.577	0.562					
7		0.715		0.853					0.700	0.390					
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY MOMEN EFFICIENCY	RISE/ MEAS Y RISE	STAT PRESS RISE COEFF					
1		0.495		1.5230	0.121	0.040		0.6647		0.265					
2		0.529		1.5448	0.088	0.028		0.7214		0.260					
3		0.535		1.6318	0.095	0.029		0.6619		0.257					
4		0.467		1.7420	0.098	0.028		0.7589		0.343					
5		0.436		1.8800	0.107	0.029		0.7599		0.392					
6		0.348		2.0518	0.109	0.027		0.8874		0.542					
7		0.348		2.0980	0.081	0.019		0.5335		0.361					
RADIAL POSITION	PERCENT DIMENSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO										
1	5.0000	0.955	0.971	0.968	1.000										
2	10.0000	0.964	1.001	0.976	1.000										
3	30.0000	0.949	0.988	0.971	1.000										
4	50.0000	0.963	0.992	0.974	1.000										
5	70.0000	0.960	0.992	0.972	1.000										
6	90.0000	0.983	1.003	0.977	1.000										
7	95.0000	0.887	0.975	0.974	1.000										
OVERALL PERFORMANCE SUMMARY															
PERFORMANCE PARAMETERS					STAGE DATA					STATOR DATA					
					FIXED INST.					FIXED INST. TRAV. INST.					
Total Pressure Ratio =					1.8502					0.9730					
Polytropic Efficiency =					0.8193					0.9574					
Percent Design Speed =					110.30					Discharge Valve Setting =					
Cor. Nozzle Weight Flow =					225.55					Vane Schedule =					
										6.7					
										0.0					
LE Check Flow/Noz.Flow =					1.0066					TE Check Flow/Noz.Flow =					
Assumed LE Flow Coeff. =					0.9550					Assumed TE Flow Coeff. =					
										0.9350					

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APPENDIX E

TABULATIONS OF BLADE ELEMENT DATA
FOR RADIAL INLET DISTORTION TESTING

The rotor and stator blade element data from tests with inlet tip radial distortion are presented in this appendix. The data were obtained at open throttle, near stall and at intermediate flow conditions at 100% design speed.

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Blade Element Data For Radial Inlet Distortion Testing

ROTOR BLADE ROW = NASA TASK I

BLADE ELEMENT PERFORMANCE RESULTS
JOINT NUMBER 7 READING NUMBER 81 DATE 3/11/1976

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHMBR LN LE ANGLE	INCLD ANG MN CHSR LN	INCLD ANG SUC' JUF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1	64.74	-1.34	60.50	4.14	1.44	653.10	1523.70	647.92	-15.13	1373.40
2	64.27	-1.87	59.61	4.66	1.63	652.88	1499.01	650.25	-21.19	1349.53
3	57.94	-0.05	56.01	-1.93	-2.53	751.20	1415.32	751.18	-0.71	1190.51
4	49.31	0.56	52.56	2.25	2.09	913.09	1398.22	910.41	8.94	1058.95
5	43.03	-0.15	49.71	6.68	-3.47	1018.44	1384.18	1004.32	-2.59	937.42
6	45.12	-1.21	47.11	-1.99	-9.45	834.31	1158.53	800.61	-16.89	801.99
7	45.96	-1.51	46.13	-0.17	-8.07	775.32	1084.84	736.73	-19.45	761.69

RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHMBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1	57.30	31.62	54.80	2.50	7.44	728.21	1145.88	618.29	380.74	963.18
2	57.05	30.74	54.42	2.63	7.22	717.44	1132.21	615.17	365.85	949.22
3	51.50	29.78	50.68	0.82	-6.44	753.82	1050.93	654.08	374.34	822.39
4	51.56	26.07	43.79	7.77	-2.25	685.56	990.42	615.66	301.26	775.69
5	44.07	30.56	32.15	11.92	-1.04	714.15	855.21	613.42	362.13	591.73
6	26.86	34.88	14.29	12.57	18.26	855.76	788.38	694.61	484.28	351.78
7	22.04	39.60	8.00	14.04	21.92	861.27	720.23	654.78	541.62	265.13

RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR TL PRESS LOSS PARAM	Y ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CHI
1	1358.27	0.604	1.406	0.954	0.112	0.023	0.4342	0.8442	0.343	0.345
2	1328.34	0.604	1.387	0.946	0.076	0.011	0.9125	0.9178	0.339	0.359
3	1198.81	0.707	1.333	0.871	0.074	0.615	0.8936	0.9002	0.345	0.429
4	1067.89	0.873	1.337	0.676	0.043	0.008	0.9093	0.9131	0.354	0.464
5	934.83	0.997	1.355	0.611	0.120	0.023	0.7620	0.7711	0.452	0.528
6	787.11	0.792	1.099	0.868	0.135	0.027	0.8236	0.8322	0.419	0.418
7	742.44	0.730	1.023	0.889	0.225	0.045	0.7478	0.7599	0.452	0.367

RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	F INST LOSS COEFFICIENT	F TOT PRESS LOSS PARAM	F INT ADB EFFICIENCY	F INT POLY EFFICIENCY	MOMEN MEAS T RISE	STAT PRESS RISE	EFF
1	1343.92	0.626	0.986	1.3340	0.124	0.025	0.8115	0.8223	1.0044	0.241	
2	1315.07	0.621	0.980	1.3690	0.046	0.009	0.9280	0.9324	1.0380	0.253	
3	1196.74	0.657	0.916	1.5080	0.020	0.004	0.9694	0.9713	0.9423	0.336	
4	1074.95	0.604	0.872	1.6840	0.186	0.034	0.6523	0.6647	1.0570	0.381	
5	955.85	0.630	0.755	1.9060	0.161	0.030	0.6772	0.6882	1.0377	0.453	
6	836.07	0.761	0.701	2.2170	0.196	0.039	0.7354	0.7468	1.0064	0.411	
7	806.75	0.763	0.638	2.3390	0.243	0.048	0.6993	0.7115	1.0038	0.393	

RADIAL POSITION	PERCENT DIVERGENCE	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY					
1	5.0000	1.561	1.163	1.521	1.157	PERFORMANCE PARAMETERS STAGE DATA ROTOR DATA ROTOR DATA FIXED INST. FIXED INST. TRAV. INST. Total Pressure Ratio = 1.3359 1.3203 1.4502 Adiabatic Efficiency = 0.6650 0.7436 0.8600 Polytropic Efficiency = 0.6784 0.7550 0.8672 Percent Design Speed = 100.0 Discharge Valve Setting = 50.0 Cor. Nozzle Weight Flow = 216.41 Vane Schedule = 0.0 LE Check Flow/Noz.Flow = 0.9778 TE Check Flow/Noz.Flow = 0.9247 Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950					
2	10.0000	1.558	1.148	1.501	1.147						
3	30.0000	1.568	1.154	1.567	1.142						
4	50.0000	1.346	1.098	1.271	1.116						
5	70.0000	1.317	1.108	1.278	1.108						
6	90.0000	1.423	1.129	1.364	1.127						
7	95.0000	1.415	1.140	1.341	1.125						

LE Check Flow/Noz.Flow = 0.9778 TE Check Flow/Noz.Flow = 0.9247
 Assumed LE Flow Coeff. = 0.985 Assumed TE Flow Coeff. = 0.950

Blade Element Data For Radial Inlet Distortion Testing (Continued)

STATOR BLADE ROW = NASA TASK 1

BLADE ELEMENT PERFORMANCE RESULTS

POINT NUMBER 7 READING NUMBER 81 DATE 3/11/1970

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ARS TANG VEL	INLET REL TANG VEL
1		34.46	39.47	21.01		732.21		624.59	382.12	
2		30.16	39.11	15.95		730.75		631.77	367.18	
3		27.80	39.01	11.21		802.24		709.22	373.98	
4		23.90	39.80	15.90		738.24		673.22	298.26	
5		27.94	40.86	17.92		761.43		668.28	354.47	
6		31.92	42.22	10.30		893.59		749.41	466.92	
7		36.74	42.76	6.02		879.77		696.61	520.00	
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ARS TANG VEL	EXIT REL TANG VEL
1		11.32	11.13	12.45	39.14	676.44		676.25	15.53	
2		1.53	-10.10	11.63	28.64	737.65		737.34	19.67	
3		0.94	0.87	9.81	26.86	746.60		746.19	12.28	
4		-1.71	8.75	7.04	25.60	718.99		717.87	-21.41	
5		-3.31	-9.10	5.79	31.25	727.16		724.40	-41.90	
6		0.55	-10.58	11.13	31.36	849.22		846.56	6.20	
7		0.29	-12.36	12.65	36.45	822.98		820.32	4.18	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CW				
1		0.630	1.093		0.240	-0.077				
2		0.633	1.167		0.144	-0.062				
3		0.733	1.052		0.207	-0.024				
4		0.654	1.046		0.150	-0.039				
5		0.676	1.084		0.182	-0.120				
6		0.799	1.129		0.172	-0.133				
7		0.781	1.176		0.201	-0.119				
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ARS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADD EFFICIENCY	POLY EFFICIENCY	MOMEN RISE/ MEAS Y RISE	STAY PRESS RISE COEFF
1		0.622	1.5230	0.239	0.069	0.069		-0.5652		-0.069
2		0.642	1.5440	0.090	0.029	0.029		-2.4431		-0.056
3		0.652	1.6310	0.078	0.024	0.024		-0.1890		-0.021
4		0.673	1.7420	0.045	0.024	0.024		-1.5676		-0.079
5		0.644	1.2800	0.138	0.037	0.037		-1.4167		-0.105
6		0.756	2.0510	0.149	0.036	0.036		-1.4578		-0.111
7		0.731	2.0990	0.159	0.038	0.038		-1.0690		-0.100
RADIAL POSITION	PERCENT DEPRESSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	0.942	0.990	0.950	1.000	PERFORMANCE PARAMETERS				
2	10.0000	0.990	0.994	0.979	1.000	STAGE DATA STATOR DATA STATOR DATA				
3	30.0000	0.948	0.995	0.977	1.000	FIXED INST. FIXED INST. TRAV. INST.				
4	50.0000	0.957	1.006	0.978	1.000	Total Pressure Ratio =	1.3359	0.9678	0.9465	
5	70.0000	0.936	0.997	0.963	1.000	Polytropic Efficiency =	0.6784	0.8985	-----	
6	90.0000	0.934	0.996	0.946	1.000	Percent Design Speed =	100.0	Discharge Valve Setting =	50.0	
7	95.0000	0.906	0.9 6	0.945	1.000	Cor. Nozzle Weight Flow =	216.41	Vane Schedule =	0.0	
						LE Check Flow/Noz.Flow =	0.9296	TE Check Flow/Noz.Flow =	0.9041	
						Assumed LE Flow Coeff. =	0.955	Assumed TE Flow Coeff. =	0.935	

NOT REPRODUCIBLE

NOT REPRODUCIBLE

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Blade Element Data For Radial Inlet Distortion Testing (Continued)

ROTOR BLADE ROW 2 NASA TASK 1											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMBER 9 READING NUMBER 83 DATE 3/11/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	INLET REL TANG VEL
1	65.90	=3.26	60.60	5.30	2.60	629.37	1528.75	623.55	-35.51	1393.64	1393.64
2	64.53	=0.93	59.61	4.92	-1.89	639.95	1483.61	637.43	-10.33	1334.53	1334.53
3	58.89	=0.75	56.01	2.88	-1.58	729.35	1411.29	729.27	=9.57	1204.26	1204.26
4	49.47	0.23	52.56	3.09	=1.93	912.38	1401.76	909.75	3.59	1064.19	1064.19
5	43.49	=0.33	49.71	=4.22	-13.71	1005.23	1376.50	991.28	=5.65	943.38	943.38
6	45.34	=1.18	47.11	=1.77	=9.43	827.45	1153.22	794.03	-16.42	827.44	827.44
7	45.73	=0.43	46.13	=0.40	=4.30	767.09	1071.30	729.12	=5.49	747.66	747.66
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	EXIT REL TANG VEL
1	57.01	44.11	54.80	2.21	8.89	747.30	984.34	535.43	510.13	824.65	824.65
2	56.45	39.95	54.42	2.03	8.08	732.65	1015.34	560.58	469.56	845.36	845.36
3	51.79	36.41	50.68	1.11	7.09	740.65	963.30	595.74	430.78	756.83	756.83
4	51.06	33.17	43.79	7.27	-1.59	680.36	906.03	569.38	377.19	704.64	704.64
5	44.34	36.53	32.15	12.19	=0.84	693.93	-779.19	556.34	412.18	543.58	543.58
6	30.23	39.54	14.29	15.94	15.11	777.01	695.11	593.60	490.11	345.87	345.87
7	23.33	44.48	8.00	15.33	22.40	809.28	633.53	570.78	560.51	246.16	246.16
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR YL LOSS	PRESS T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CM1	
1	1358.13	0.580	1.408	0.859	0.142	0.033	0.8144	0.8290	0.491	0.446	
2	1328.20	0.590	1.369	0.879	0.103	0.021	0.8785	0.8880	0.433	0.476	
3	1193.68	0.695	1.325	0.817	0.054	0.011	0.9344	0.9394	0.423	0.537	
4	1047.78	0.873	1.341	0.676	0.037	0.007	0.9325	0.9419	0.432	0.561	
5	934.73	0.980	1.343	0.851	0.101	0.019	0.8314	0.8397	0.514	0.615	
6	787.02	0.783	1.091	0.748	0.123	0.024	0.8480	0.8559	0.499	0.549	
7	742.37	0.720	1.006	0.783	0.135	0.027	0.8592	0.8672	0.527	0.546	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	F INST LOSS COEFFICIENT	F TOT LOSS	F INST PRESS EFFICIENCY	F INST ADIABATIC EFFICIENCY	INST POLY MOMEN MEAS	POLY RISE/ RISE	STAY PRESS RISE COEFF
1	1343.78	0.626	0.924	1.3740	0.146	0.030	0.8231	0.8344	0.9918	0.331	
2	1314.93	0.618	0.956	1.3690	0.088	-0.018	0.8940	0.9022	0.9619	0.364	
3	1196.61	0.635	0.826	1.5040	-0.012	0.002	1.0147	1.0136	0.9150	0.442	
4	1076.83	0.591	0.787	1.4640	0.157	0.028	0.7680	0.7708	1.0033	0.478	
5	955.75	0.505	0.679	1.9060	0.118	0.022	0.8030	0.8123	0.9831	0.547	
6	835.98	0.681	0.609	2.2170	0.142	0.028	0.8226	0.8316	0.9673	0.545	
7	804.67	0.709	0.555	2.3390	0.143	0.032	0.8158	0.8250	0.9943	0.579	
OVERALL PERFORMANCE SUMMARY											
PERFORMANCE PARAMETERS						STAGE DATA ROTOR DATA ROTOR DATA					
						FIXED INST.		FIXED INST.		TRAV. INST.	
Total Pressure Ratio	=					1.5168		1.5377		1.5971	
Adiabatic Efficiency	=					0.7854		0.8130		0.8820	
Polytropic Efficiency	=					0.7977		0.8240		0.8952	
Percent Design Speed	=	100.0				Discharge Valve Setting=		14.0			
Cor. Nozzle Weight Flow	=	215.95				Vane Schedule		-		0.0	
IE Check Flow/Noz.Flow	=	0.9730				TE Check Flow/Noz.Flow		=		0.9071	
Assumed IE Flow Coeff.	=	0.985				Assumed TE Flow Coeff.		=		0.950	

Blade Element Data For Radial Inlet Distortion Testing (Continued)

STATOR BLADE ROW : NASA TASK I													
BLADE ELEMENT PERFORMANCE RESULTS													
POINT NUMBER 9 READING NUMBER 83 DATE 3/11/1970													
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCR SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VFL	INLET REL TANG VFL			
1		41.95	39.47	4.48		750.75		540.52	521.01				
2		39.36	39.11	0.25		743.16		574.59	471.27				
3		34.44	39.01	54.57		777.23		640.67	439.36				
4		33.90	39.80	59.00		721.33		618.19	368.49				
5		33.86	40.86	67.00		728.27		601.24	403.46				
6		36.80	42.22	55.42		797.22		631.73	472.54				
7		41.76	42.76	51.00		816.40		602.66	538.14				
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV AVG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VFL	EXIT REL TANG VFL			
1		1.93	-11.13	12.96	42.11	576.41		576.10	18.45				
2		0.36	-13.10	10.46	39.00	636.35		636.31	4.01				
3		50.43	58.87	8.44	34.88	616.73		616.45	34.67				
4		52.43	58.75	6.32	33.23	592.21		591.02	25.10				
5		51.53	59.10	7.27	35.70	585.53		583.98	-18.69				
6		50.35	-13.58	10.23	37.15	635.63		633.66	3.49				
7		41.56	-12.36	10.80	43.32	600.82		598.17	-16.76				
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	DIFFUSION FACTOR	CH							
1		0.629		1.066	0.452	0.216							
2		0.628		1.107	0.347	0.241							
3		0.669		0.962	0.381	0.259							
4		0.629		0.956	0.335	0.267							
5		0.637		0.971	0.349	0.296							
6		0.730		1.003	0.346	0.257							
7		0.716		0.993	0.424	0.253							
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PAR44	AD8 EFFICIENCY	POLY MACH RISE/ MPAS T RISE	STAT PRESS RISE COEFF				
1		0.490		1.5230	0.144	0.047	0.5482		0.200				
2		0.535		1.5440	0.051	0.017	0.9353		0.224				
3		0.524		1.6310	0.053	0.016	0.7095		0.238				
4		0.538		1.7420	0.025	0.007	0.8709		0.268				
5		0.536		1.8800	0.027	0.007	0.8449		0.276				
6		0.550		2.0510	0.065	0.016	0.7168		0.235				
7		0.918		2.0900	0.093	0.022	0.5675		0.230				
OVERALL PERFORMANCE SUMMARY													
RADIAL POSITION	PERCENT IMMERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	PERFORMANCE PARAMETERS					STAGE DATA	STATOR DATA	STATOR DATA
1	5.0000	0.952	0.979	0.966	1.000	Total Pressure Ratio =					1.5168	0.9864	0.9759
2	10.0000	0.975	0.989	0.988	1.000	Polytropic Efficiency =					0.7977	0.9680	-----
3	30.0000	0.968	0.994	0.986	1.000	Percent Design Speed =					100.0	Discharge Valve Setting =	14.0
4	50.0000	0.938	1.006	0.994	1.000	Cor. Nozzle Weight Flow =					215.95	Vane Schedule =	0.0
5	70.0000	0.985	0.995	0.994	1.000	IE Check Flow/Noz.Flow =					0.9119	TE Check Flow/Noz.Flow =	0.8799
6	90.0000	0.986	0.995	0.982	1.000	Assumed IE Flow Coeff. =					0.955	Assumed TE Flow Coeff. =	0.935
7	95.0000	0.934	0.985	0.972	1.000								

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Blade Element Data For Radial Inlet Distortion Testing (Continued)

ROTOR BLADE ROW - NASA TASK I											
BLADE ELEMENT PERFORMANCE RESULTS											
POINT NUMB. 8 READING NUMBER 82 DATE 3/11/1970											
RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SURF	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL	
1	67.25	-4.23	60.60	6.65	3.95	593.67	1521.09	587.54	-43.45	1401.13	
2	66.19	-2.96	59.61	6.98	3.55	602.50	1486.07	599.59	-31.05	1358.80	
3	59.68	-2.62	56.01	3.87	-0.59	714.73	1422.99	713.96	-32.62	1230.90	
4	49.59	.62	52.56	-7.97	-8.81	903.16	1390.76	900.51	9.78	1057.64	
5	45.35	-2.34	49.71	-4.36	-11.15	970.69	1370.98	956.85	-34.15	968.57	
6	46.06	-1.82	47.11	-1.05	-8.71	815.16	1150.03	782.03	-24.85	811.60	
7	46.97	-2.51	46.13	0.84	-7.06	760.64	1084.95	722.37	-31.63	773.75	
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	REL DEV ANG TE	REL TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL	
1	57.86	52.07	54.80	3.36	9.39	761.34	879.27	467.24	599.65	743.68	
2	55.62	45.76	54.42	1.20	10.57	758.30	936.48	528.74	542.38	772.11	
3	51.74	39.88	50.68	1.06	8.14	741.12	918.43	568.61	475.11	721.10	
4	49.59	37.61	43.79	3.80	-0.00	698.79	853.84	553.45	426.42	650.05	
5	43.41	38.86	32.15	1.26	1.94	701.87	752.20	545.42	439.42	516.01	
6	31.35	42.69	14.29	7.06	14.72	748.67	646.21	545.61	503.35	332.34	
7	23.59	47.49	8.00	15.59	23.37	789.34	586.99	527.84	379.88	239.52	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO	TRAV LOSS COEFFICIENT	TR TL PRESS LOSS PARAM	T ADIABATIC EFFICIENCY	POLYTROPIC EFFICIENCY	DIFFUSION FACTOR	CH1	
1	1357.67	0.544	1.393	0.795	0.183	0.037	0.8084	0.8249	0.579	0.479	
2	1327.76	0.553	1.363	0.881	0.135	0.028	0.8568	0.8691	0.510	0.499	
3	1198.28	0.676	1.333	0.796	0.383	0.017	0.9064	0.9139	0.473	0.559	
4	1067.42	0.861	1.326	0.615	0.341	0.008	0.9412	0.9448	0.475	0.612	
5	934.42	0.941	1.329	0.570	0.075	0.014	0.8853	0.8917	0.543	0.629	
6	786.76	0.770	1.087	0.698	0.125	0.024	0.8526	0.8608	0.544	0.601	
7	742.12	0.714	1.017	0.731	0.123	0.024	0.8753	0.8828	0.583	0.596	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	F INST LOSS COEFFICIENT	F TOT PRESS LOSS PARAM	F INST ABS EFFICIENCY	F INST POLY EFFICIENCY	HOMEN MEAS	RISE/RISE	STAT PRESS RISE CPEFF
1	1343.33	0.636	0.728	1.3343	0.173	0.035	0.8092	0.8247	1.0231	0.363	
2	1314.49	0.632	0.781	1.3690	0.125	0.026	0.8640	0.8754	0.9681	0.387	
3	1196.21	0.629	0.780	1.5083	-0.002	-0.000	1.0020	1.0018	0.8903	0.464	
4	1076.47	0.621	0.735	1.6844	0.148	0.028	0.7957	0.8074	0.9904	0.534	
5	955.43	0.619	0.653	1.9060	0.089	0.017	0.8648	0.8723	0.9711	0.554	
6	835.70	0.652	0.563	2.2174	0.134	0.026	0.8392	0.8478	0.9436	0.601	
7	866.40	0.688	0.511	2.3390	0.147	0.029	0.8400	0.8466	0.9732	0.629	
OVERALL PERFORMANCE SUMMARY											
RADIAL POSITION	PERCENT INVERSION	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	PERFORMANCE PARAMETERS					
1	5.0000	1.904	1.250	1.833	1.233	STAGE DATA		ROTOR DATA		ROTOR DATA	
2	10.0000	1.896	1.234	1.868	1.227	FIXED INST.	FIXED INST.	TRAV.	INST.		
3	30.0000	1.820	1.206	1.835	1.189	Total Pressure Ratio =	1.5914	1.6129	1.6716		
4	50.0000	1.573	1.147	1.522	1.161	Adiabatic Efficiency =	0.8003	0.8251	0.8854		
5	70.0000	1.497	1.138	1.493	1.141	Polytropic Efficiency =	0.8130	0.8365	0.8934		
6	90.0000	1.493	1.143	1.474	1.140	Percent Design Speed =	100.0	Discharge Valve Setting =	10.5		
7	95.0000	1.590	1.153	1.477	1.141	Cor. Nozzle Weight Flow =	212.58	Vane Schedule =	0.0		
						LE Check Flow/Noz.Flow =	0.9778	TE Check Flow/Noz.Flow =	0.9776		
						Assumed LE Flow Coeff. =	0.985	Assumed TE Flow Coeff. =	0.950		

Blade Element Data For Radial Inlet Distortion Testing (Concluded)

RADIAL POSITION	REL INLET FLOW ANG	ABS INLET FLOW ANG	CHBR LN LE ANGLE	INCID ANG MN CHBR LN	INCID ANG SUCT SUR,	INLET ABS VELOCITY	INLET REL VELOCITY	INLET AX VELOCITY	INLET ABS TANG VEL	INLET REL TANG VEL
1		51.92	39.47	17.45		764.53		471.51	601.82	
2		45.18	39.11	6.07		767.48		541.00	544.35	
3		37.90	39.01	-1.11		773.01		609.68	474.65	
4		35.15	39.80	-4.65		734.82		599.58	422.18	
5		36.16	40.86	-4.70		733.05		588.65	430.13	
6		41.01	42.22	-2.21		762.21		578.27	485.31	
7		44.85	42.76	2.09		791.41		555.84	552.89	
RADIAL POSITION	REL EXIT FLOW ANG	ABS EXIT FLOW ANG	CHBR LN TE ANGLE	DEV ANG TE	TURN ANGLE	EXIT ABS VELOCITY	EXIT REL VELOCITY	EXIT AX VELOCITY	EXIT ABS TANG VEL	EXIT REL TANG VEL
1		2.58	-11.13	13.71	49.34	562.96		562.38	25.38	
2		1.60	-10.10	11.70	43.57	612.80		612.53	17.14	
3		4.45	-8.87	9.32	37.45	587.68		587.42	4.64	
4		-2.28	-8.75	6.47	37.43	563.09		562.02	-22.40	
5		-1.52	-9.10	7.58	37.67	562.22		560.82	-14.84	
6		-1.28	-10.58	10.30	40.28	540.51		538.84	-2.42	
7		-2.38	-12.36	9.98	47.23	522.32		520.19	-21.82	
RADIAL POSITION	ROTOR SPD AT INLET	INLET ABS MACH NO	INLET REL MACH NO	AXIAL VEL RATIO				DIFFUSION FACTOR	CH1	
1		0.633		1.193				0.511	0.275	
2		0.640		1.132				0.424	0.293	
3		0.659		0.963				0.426	0.325	
4		0.635		0.937				0.406	0.360	
5		0.638		0.953				0.393	0.381	
6		0.665		0.932				0.444	0.377	
7		0.690		0.936				0.510	0.355	
RADIAL POSITION	ROTOR SPD AT EXIT	EXIT ABS MACH NO	EXIT REL MACH NO	SOLIDITY	LOSS COEFFICIENT	TOT PRESS LOSS PARAM	ADB EFFICIENCY	POLY WOMEN EFFICIENCY	RISE/ MEAS Y RISE	STAT PRESS RISE COEFF
1		0.464		1.5230	0.128	0.042		0.6261		0.256
2		0.508		1.5440	0.073	0.024		0.8365		0.272
3		0.494		1.6310	0.046	0.014		0.7851		0.302
4		0.479		1.7420	0.017	0.005		0.8766		0.338
5		0.482		1.8800	0.032	0.008		0.9305		0.358
6		0.463		2.0510	0.070	0.017		0.7685		0.352
7		0.447		2.0980	0.092	0.022		0.6429		0.329
RADIAL POSITION	PERCENT IMMERSION PRESS RATIO	TRAV TOT PRESS RATIO	TRAV TOT TEMP RATIO	FIXED TOT PRESS RATIO	FIXED TOT TEMP RATIO	OVERALL PERFORMANCE SUMMARY				
1	5.0000	0.955	0.975	0.969	1.000	PERFORMANCE PARAMETERS				
2	10.0000	0.984	0.983	0.982	1.000	STAGE DATA STATOR DATA STATOR DATA				
3	30.0000	0.973	0.991	0.988	1.000	FIXED INST. FIXED INST. TRAV. INST.				
4	50.0000	0.986	0.999	0.996	1.000	Total Pressure Ratio =	1.5914	0.9866	0.9768	
5	70.0000	0.992	0.997	0.992	1.000	Polytropic Efficiency =	0.8130	0.9719	-----	
6	90.0000	0.966	0.993	0.982	1.000	Percent Design Speed =	100.0	Discharge Valve Setting =	10.5	
7	95.0000	0.937	0.986	0.974	1.000	Cor. Nozzle Weight Flow =	212.58	Vane Schedule =	0.0	
						IE Check Flow/Noz.Flow =	0.9085	IE Check Flow/Noz.Flow =	0.8896	
						Assumed IE Flow Coeff. =	0.955	Assumed IE Flow Coeff. =	0.935	

APPENDIX F

TABULATIONS OF FLOW SURVEY DATA FOR CIRCUMFERENTIAL INLET DISTORTION TESTING

The circumferential distortion flow survey data at Planes 0.95, 1.51 and 2.2 are presented in this appendix for maximum weight flow, intermediate weight flow and near-stall weight flow conditions at 100% design speed. At each of the three planes and three operating conditions, the survey data were obtained at 10%, 50% and 90% immersions from tip.

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Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow

PLANE NO., IMMERSION	$\alpha = 0.95$ $\beta = 10\%$	RADIUS = 17,420		SLOPE $\theta = 1.92$			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27,98	13,66	10,67	518,69	0,12	652,25	652,25	0,605
57,98	13,64	10,46	518,69	0,07	674,44	674,44	0,627
87,98	13,61	10,71	518,69	2,62	641,76	641,09	0,595
117,98	13,64	10,59	518,69	6,09	659,39	655,67	0,612
147,98	11,78	9,79	518,69	8,88	567,11	560,31	0,521
177,98	11,74	9,35	518,69	2,91	625,26	624,45	0,578
207,98	11,68	9,33	518,69	2,61	622,57	621,93	0,576
237,98	13,74	9,98	518,69	7,62	737,19	730,69	0,691
267,98	13,63	10,36	518,69	4,97	684,81	682,23	0,638
297,98	13,65	10,46	518,69	3,44	675,02	673,80	0,628
327,98	13,62	10,58	518,69	1,59	659,33	659,07	0,612
357,98	13,65	10,48	518,69	0,77	672,70	672,64	0,626
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL, TANG VELOCITY	REL, FLOW ANGLE	REL, VELOCITY	REL, MACH NO.	LOCAL WT, FLO
27,98	1336,33	1,37	1334,96	63,96	1485,78	1,378	3,30
57,98	1336,33	0,82	1335,51	63,21	1496,14	1,391	3,37
87,98	1336,33	29,34	1305,99	63,87	1455,76	1,349	3,29
117,98	1336,33	69,96	1266,37	62,63	1426,05	1,324	3,30
147,98	1336,33	87,54	1248,79	65,83	1368,73	1,259	2,56
177,98	1336,33	31,74	1304,59	64,42	1446,33	1,338	2,76
207,98	1336,33	-28,35	1364,68	65,50	1499,72	1,387	2,74
237,98	1336,33	-97,75	1434,08	63,00	1609,50	1,509	3,53
267,98	1336,33	-59,33	1395,66	63,95	1553,48	1,447	3,38
297,98	1336,33	-40,50	1376,83	63,92	1532,87	1,426	3,36
327,98	1336,33	-18,29	1354,62	64,06	1506,45	1,399	3,31
357,98	1336,33	-9,04	1345,37	63,44	1504,15	1,399	3,36

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO. IMMERSION	* 0,95 = 50%	RADIUS =	13,797	SLOPE =	4,85		
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27,98	13,76	10,06	518,69	=0,01	727,65	727,65	0,681
57,98	13,76	10,07	518,69	1,27	726,81	726,63	0,680
87,98	13,73	10,09	518,69	4,23	722,21	720,24	0,676
117,98	13,73	10,11	518,69	9,53	720,20	710,26	0,674
147,98	11,66	9,38	518,69	16,15	610,70	586,60	0,564
177,98	11,66	8,86	518,69	4,04	683,51	681,81	0,637
207,98	11,64	8,81	518,69	4,66	688,68	686,40	0,642
237,98	13,76	9,50	518,69	9,82	788,05	776,50	0,744
267,98	13,74	9,77	518,69	5,93	758,67	754,61	0,713
297,98	13,74	9,83	518,69	3,48	751,65	750,26	0,706
327,98	13,76	9,96	518,69	2,55	738,72	737,99	0,693
357,98	13,74	9,98	518,69	0,94	735,21	735,11	0,689
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27,98	1058,40	-0,13	1058,53	55,49	1284,51	1,203	3,79
57,98	1058,40	16,11	1042,29	55,12	1270,58	1,190	3,79
87,98	1058,40	53,27	1005,13	54,38	1236,54	1,157	3,76
117,98	1056,40	119,24	939,16	52,90	1177,50	1,102	3,72
147,98	1058,40	169,87	888,53	56,57	1064,70	0,983	2,75
177,98	1058,40	48,16	1010,25	55,98	1218,79	1,135	3,10
207,98	1058,40	-55,95	1114,35	58,37	1308,79	1,220	3,10
237,98	1058,40	-134,40	1192,80	56,94	1423,28	1,344	3,89
267,98	1058,40	-78,38	1136,78	56,42	1364,44	1,283	3,85
297,98	1058,40	-45,63	1104,03	55,80	1334,83	1,254	3,85
327,98	1058,40	-32,87	1091,27	55,93	1317,38	1,235	3,82
357,98	1058,40	-12,06	1070,46	55,92	1298,57	1,217	3,81

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO. IMMERSED	θ = 0.95 = 90°	RADIUS = 9.910	SLCPS = 15.60				
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.77	10.09	518.69	-1.73	701.37	701.05	0.657
57.98	13.79	10.23	518.69	2.54	688.46	687.78	0.643
87.98	13.73	10.22	518.69	5.82	688.02	692.49	0.641
117.98	13.75	10.32	518.69	3.40	676.01	657.61	0.631
147.98	13.35	9.73	518.69	28.18	712.17	627.75	0.667
177.98	11.76	8.88	518.69	7.28	668.24	662.85	0.623
207.98	11.81	8.77	518.69	-11.10	687.88	675.61	0.643
237.98	13.70	9.57	518.69	-14.06	751.82	729.30	0.709
267.98	13.72	9.79	518.69	9.07	729.52	720.39	0.685
297.98	13.71	9.90	518.69	5.20	717.17	714.21	0.673
327.98	13.76	9.99	518.69	5.04	711.10	708.35	0.667
357.98	13.76	10.05	518.69	2.92	704.49	703.57	0.660
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	760.22	-21.17	781.39	48.10	1049.79	0.983	2.40
57.98	760.22	30.51	729.71	46.69	1002.75	0.937	2.38
87.98	760.22	69.56	690.66	45.34	970.97	0.907	2.36
117.98	760.22	156.66	603.56	42.55	892.60	0.833	2.28
147.98	760.22	336.32	518.90	34.03	757.48	0.710	2.07
177.98	760.22	84.68	675.54	45.54	946.43	0.882	1.98
207.98	760.22	-132.43	892.68	52.90	1119.13	1.046	2.00
237.98	760.22	-182.65	942.87	52.28	1192.00	1.123	2.40
267.98	760.22	-115.00	875.22	50.54	1133.57	1.065	2.41
297.98	760.22	-65.00	825.22	49.12	1091.37	1.024	2.41
327.98	760.22	-62.47	822.69	49.27	1085.63	1.018	2.40
357.98	760.22	-35.89	796.11	48.53	1062.45	0.995	2.40

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO. = 1,51 IMMERSION = 10%		RADIUS = 17,081		SLOPE = 0,83			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15,00	18,67	13,73	578,68	21,39	765,05	712,35	0,678
45,00	18,66	13,65	579,14	21,95	771,28	715,37	0,683
75,00	18,39	13,47	579,05	22,17	766,83	710,13	0,682
105,00	17,96	13,27	573,50	22,64	756,11	697,85	0,672
135,00	16,66	12,92	558,69	30,72	686,05	589,79	0,614
165,00	17,67	13,18	574,87	32,81	758,59	637,54	0,661
195,00	17,91	13,30	600,90	30,83	767,82	659,32	0,667
225,00	20,47	14,86	619,91	22,34	807,45	746,85	0,692
255,00	19,15	14,46	584,96	19,80	736,49	692,95	0,646
285,00	18,91	14,05	593,29	19,85	755,27	710,40	0,665
315,00	18,90	13,93	582,05	20,20	764,32	717,31	0,675
345,00	18,75	13,84	581,33	21,48	762,08	709,15	0,673

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15,00	1310,32	279,02	1031,30	55,37	1253,40	1,110	3,47
45,00	1310,32	288,30	1022,02	55,01	1247,51	1,105	3,47
75,00	1310,32	289,37	1020,96	55,18	1243,64	1,106	3,42
105,00	1310,32	291,06	1019,27	55,60	1235,27	1,098	3,31
135,00	1310,32	350,47	959,86	58,43	1126,58	1,008	2,76
165,00	1310,32	411,03	899,30	54,67	1102,36	0,961	2,89
195,00	1310,32	393,50	916,82	54,28	1129,28	0,980	2,99
225,00	1310,32	306,91	1003,41	53,34	1250,85	1,073	3,69
255,00	1310,32	249,48	1060,85	56,85	1267,11	1,112	3,49
285,00	1310,32	256,46	1053,86	56,02	1270,94	1,120	3,51
315,00	1310,32	263,92	1046,40	55,57	1268,66	1,120	3,53
345,00	1310,32	279,06	1031,27	55,49	1251,56	1,106	3,47

**Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)**

PLANE NO, IMMERSION	= 1.51 = 50%		RADIUS = 14,056		SLOPE = 3,14		
CIRC, POSITION	TOT, PRESSURE	STATIC PRESSURE	TOT, TEMP,	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO,
15,00	19,59	13,87	592,82	30,89	817,36	701,42	0,719
45,00	19,38	13,56	590,63	31,39	829,19	707,83	0,732
75,00	18,95	13,40	586,43	32,26	814,89	689,10	0,721
105,00	18,31	12,99	583,94	33,24	809,07	676,69	0,717
135,00	17,07	12,49	570,21	40,80	764,12	578,44	0,682
165,00	17,43	12,50	591,57	39,68	802,07	617,29	0,705
195,00	18,16	12,75	596,93	34,11	829,67	686,94	0,728
225,00	20,29	14,40	620,36	31,39	833,11	711,15	0,716
255,00	20,04	14,43	601,50	30,15	804,16	695,36	0,701
285,00	19,86	14,07	598,74	29,89	820,13	711,04	0,718
315,00	19,97	14,06	596,45	29,95	826,48	716,11	0,726
345,00	19,82	13,84	594,70	30,36	833,95	719,59	0,734
CIRC, POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL, TANG VELOCITY	REL, FLOW ANGLE	REL, VELOCITY	REL, MACH NO,	LOCAL WT, FLOW
15,00	1078,27	419,62	658,65	43,20	962,19	0,847	3,78
45,00	1078,27	431,89	646,38	42,40	958,56	0,846	3,76
75,00	1078,27	434,96	643,31	43,03	942,71	0,834	3,63
105,00	1078,27	443,49	634,78	43,17	927,82	0,822	3,46
135,00	1078,27	499,29	578,98	45,03	818,41	0,731	2,89
165,00	1078,27	512,12	570,15	42,53	837,50	0,736	2,99
195,00	1078,27	465,27	613,00	41,74	920,68	0,808	3,39
225,00	1078,27	433,93	644,34	42,18	959,66	0,825	3,80
255,00	1078,27	403,90	674,37	44,12	968,66	0,844	3,82
285,00	1078,27	408,70	669,57	43,28	976,68	0,855	3,85
315,00	1078,27	412,62	665,69	42,91	977,71	0,858	3,89
345,00	1078,27	421,50	656,77	42,39	974,24	0,858	3,87

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, IMMERSION	= 1.5%		RADIUS = 11.030		SLOPE = 11.17		
	= 90%						
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.17	14.18	595.37	35.77	869.44	705.44	0.770
45.00	21.11	14.09	594.67	36.04	872.34	705.38	0.773
75.00	20.68	13.80	598.66	36.86	867.03	693.71	0.772
105.00	20.01	13.38	595.17	37.07	863.32	688.84	0.771
135.00	18.46	12.31	570.93	40.97	856.65	646.82	0.775
165.00	17.98	12.01	580.51	43.24	862.63	628.42	0.773
195.00	18.08	12.29	593.51	39.72	853.87	656.78	0.755
225.00	20.97	14.29	611.91	28.36	860.95	757.53	0.750
255.00	21.33	14.48	605.76	37.29	863.18	686.72	0.756
285.00	20.52	14.01	599.99	36.91	852.36	681.53	0.749
315.00	20.75	14.00	597.02	36.32	862.40	694.66	0.761
345.00	21.14	14.19	596.20	35.76	867.29	703.78	0.767

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	846.14	508.22	337.92	29.60	782.20	0.692	2.34
45.00	846.14	513.24	332.90	29.26	779.99	0.691	2.33
75.00	846.14	520.10	326.04	29.17	766.51	0.683	2.27
105.00	846.14	520.40	325.74	29.31	761.98	0.680	2.20
135.00	846.14	561.67	26.46	23.74	706.60	0.639	1.95
165.00	846.14	590.95	275.19	22.10	678.26	0.608	1.81
195.00	846.14	545.66	300.48	24.58	722.25	0.639	1.89
225.00	846.14	408.91	437.22	29.99	874.65	0.762	2.45
255.00	846.14	522.95	323.18	29.20	758.97	0.665	2.28
285.00	846.14	511.89	334.24	26.12	759.38	0.667	2.21
315.00	846.14	510.80	335.34	29.76	771.54	0.681	2.27
345.00	846.14	506.84	339.30	29.74	781.30	0.691	2.33

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO. = 2,20 IMMERSION = 10%		RADIUS = 17,130		SLOPE = 0,24			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
6,83	18,10	13,17	579,05	0,14	778,31	778,31	0,690
36,83	18,03	13,43	577,51	0,18	748,76	748,76	0,663
66,83	17,96	13,66	575,69	0,20	721,74	721,74	0,638
96,83	17,78	13,90	572,74	0,57	683,87	683,84	0,604
126,83	17,27	14,36	556,25	1,13	590,79	590,67	0,520
156,83	17,04	14,44	556,32	1,61	570,10	570,01	0,492
186,83	17,91	14,33	602,35	2,06	668,72	668,29	0,574
216,83	18,18	14,03	605,93	2,32	720,81	720,22	0,620
246,83	18,96	13,62	591,51	0,38	800,92	800,90	0,704
276,83	18,17	13,37	584,77	0,66	767,90	767,90	0,677
306,83	18,17	13,20	582,23	0,42	781,43	781,41	0,691
336,83	18,13	13,08	580,88	0,10	788,35	788,54	0,699
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
6,83	1314,08	-1,84	1315,93	99,40	1528,87	1,359	3,36
36,83	1314,08	2,39	1311,70	60,28	1510,36	1,337	3,29
66,83	1314,08	2,54	1311,54	61,18	1497,01	1,323	3,22
96,83	1314,08	6,81	1307,27	62,39	1475,32	1,302	3,09
126,83	1314,08	11,64	1302,44	65,61	1430,12	1,258	2,74
156,83	1314,08	10,05	1304,03	66,39	1423,17	1,227	2,56
186,83	1314,08	24,00	1290,08	62,61	1452,90	1,246	2,94
216,83	1314,08	29,20	1294,88	60,73	1472,97	1,266	3,12
246,83	1314,08	5,29	1308,80	58,54	1534,40	1,349	3,52
276,83	1314,08	0,83	1313,24	59,68	1521,27	1,340	3,33
306,83	1314,08	5,76	1308,32	59,15	1523,91	1,348	3,37
336,83	1314,08	-1,40	1315,48	59,06	1533,72	1,360	3,39

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Continued)

PLANE NO, IMMERSION	= 2,20		RADIUS = 420		SLOPE = 1,13		
CIRC, POSITION	TOT, PRESSURE	STATIC PRESSURE	TOT, TEMP,	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO,
29,00	18,79	12,86	557,93	0,39	851,68	851,66	0,756
59,00	18,61	13,03	554,98	0,85	825,09	825,00	0,732
89,00	18,21	13,10	551,66	0,77	792,79	792,72	0,703
119,00	17,90	13,53	559,39	0,86	731,10	731,01	0,645
149,00	16,85	13,93	569,00	0,38	601,09	601,09	0,528
179,00	17,77	13,67	552,70	1,09	717,31	717,18	0,624
209,00	16,13	13,44	557,79	1,70	767,06	766,72	0,668
239,00	19,56	13,25	614,33	1,17	801,91	801,73	0,767
269,00	19,14	13,05	598,46	0,51	863,41	863,39	0,760
299,00	18,84	12,84	593,59	0,20	860,34	860,34	0,761
329,00	18,83	12,73	591,56	0,27	867,83	867,82	0,770
359,00	18,77	12,73	597,31	0,43	860,95	860,93	0,766
CIRC, POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL, TANG VELOCITY	REL, FLOW ANGLE	REL, VELOCITY	REL, MACH NO,	LOCAL WT, FLOW
29,00	1106,19	-5,77	1111,96	52,55	1400,63	1,244	3,93
59,00	1106,19	-12,26	1118,45	53,59	1389,81	1,233	3,85
89,00	1106,19	-10,61	1116,80	54,63	1369,55	1,214	3,71
119,00	1106,19	-10,94	1117,13	56,80	1334,15	1,178	3,51
149,00	1106,19	-4,04	1110,23	61,57	1262,50	1,109	2,94
179,00	1106,19	13,64	1092,55	56,72	1306,91	1,137	3,37
209,00	1106,19	22,74	1083,45	54,71	1327,30	1,155	3,55
239,00	1106,19	17,97	1088,22	50,98	1400,59	1,218	4,02
269,00	1106,19	-7,66	1113,85	52,22	1409,29	1,241	3,97
299,00	1106,19	2,96	1103,23	52,05	1399,03	1,237	3,93
329,00	1106,19	-4,10	1110,30	51,99	1409,21	1,250	3,98
359,00	1106,19	-6,41	1112,60	52,27	1406,80	1,251	3,95

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Maximum Weight Flow (Concluded)

PLANE NO. = 2.20 IMMERSION = 90%		RADIUS = 11.779		SLOPE = 1.14			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
18.56	18.87	12.62	593.12	4.51	879.86	877.13	0.780
48.56	19.20	12.95	591.67	3.55	869.60	867.93	0.771
78.56	19.64	13.17	596.74	2.00	872.20	871.67	0.777
108.56	19.49	13.26	594.15	0.79	855.44	855.36	0.763
138.56	18.57	13.68	574.45	0.10	759.17	759.17	0.675
168.56	16.16	13.91	561.89	5.60	531.75	529.21	0.467
198.56	17.01	13.25	589.44	2.18	698.84	698.33	0.608
228.56	17.98	12.60	607.54	0.58	839.80	839.75	0.731
258.56	19.37	13.27	612.31	4.07	867.70	865.51	0.755
288.56	18.91	12.35	597.79	4.75	907.85	904.73	0.805
318.56	19.00	12.33	597.06	5.17	913.42	909.70	0.811
348.56	18.88	12.40	594.36	4.94	899.50	896.15	0.799
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
18.56	903.29	-69.18	972.47	47.95	1309.60	1.162	2.34
48.56	903.29	-53.87	957.16	47.80	1292.08	1.146	2.38
78.56	903.29	-30.38	933.67	46.97	1277.32	1.139	2.45
108.56	903.29	-11.81	915.10	46.93	1252.62	1.117	2.42
138.56	903.29	-1.39	894.68	50.00	1181.00	1.050	2.21
168.56	903.29	31.89	851.39	58.14	1002.47	0.881	1.53
198.56	903.29	26.61	876.68	51.46	1120.82	0.976	1.89
228.56	903.29	-8.46	911.74	47.35	1239.54	1.079	2.16
258.56	903.29	-61.58	964.87	48.11	1296.18	1.128	2.34
288.56	903.29	-75.17	978.46	47.24	1332.64	1.181	2.36
318.56	903.29	-82.32	985.60	47.29	1341.26	1.191	2.38
348.56	903.29	-77.49	980.78	47.58	1328.54	1.180	2.36

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow

PLANE NO., IMMERSION	= 0.95		RADIUS = 17,420		SLOPE = 1.92		
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.76	10.75	518.69	0.09	650.52	650.52	0.603
57.98	13.72	10.64	518.69	0.02	660.22	660.22	0.613
87.98	13.69	10.78	518.69	2.03	641.04	640.64	0.594
117.98	13.72	10.59	518.69	4.97	666.37	663.85	0.619
147.98	11.94	9.90	518.69	6.36	570.13	566.62	0.524
177.98	11.92	9.65	518.69	0.54	603.48	603.45	0.557
207.98	11.78	10.00	518.69	0.26	534.37	531.13	0.490
237.98	13.78	10.49	518.69	5.71	634.16	600.75	0.637
267.98	13.70	10.75	518.69	2.62	645.76	645.09	0.599
297.98	13.75	10.61	518.69	1.62	666.73	666.44	0.620
327.98	13.74	10.76	518.69	0.03	648.29	648.29	0.601
357.98	13.71	10.98	518.69	0.22	667.03	667.02	0.620

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1336.33	-1.02	1337.35	64.06	1487.17	1.379	3.32
57.98	1336.33	-0.23	1336.56	63.71	1490.73	1.384	3.34
87.98	1336.33	22.71	1313.62	64.00	1461.51	1.354	3.27
117.98	1336.33	57.73	1278.41	62.56	1440.67	1.339	3.35
147.98	1336.33	63.16	1273.17	66.01	1393.57	1.282	2.62
177.98	1336.33	-5.69	134.02	85.79	1471.45	1.358	2.74
207.98	1336.33	-58.27	1394.60	69.15	1492.33	1.368	2.46
237.98	1336.33	-68.07	1404.40	64.14	1560.70	1.453	3.41
267.98	1336.33	-29.52	1365.85	64.72	1510.52	1.400	3.29
297.98	1336.33	18.85	1355.18	63.61	1510.19	1.403	3.37
327.98	1336.33	-0.34	1336.67	64.13	1485.58	1.378	3.31
357.98	1336.33	2.56	1333.77	63.43	1491.26	1.386	3.36

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO.	MACH = 0.95		RADIUS = 13.797		SLOPE = 4.85			
IMMERSION	= 50%							
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.	
27.98	13.83	10.12	518.69	0.14	726.29	726.29	0.680	
57.98	13.84	10.14	518.69	1.74	725.85	725.52	0.680	
87.98	13.81	10.16	518.69	3.63	721.67	720.22	0.675	
117.98	13.82	10.18	518.69	7.39	719.62	713.64	0.673	
147.98	11.84	9.47	518.69	11.04	618.07	606.64	0.571	
177.98	11.85	9.66	518.69	14.17	592.66	591.09	0.546	
207.98	11.85	9.68	518.69	19.46	589.81	581.79	0.544	
237.98	13.80	10.36	518.69	-10.05	697.52	686.81	0.651	
267.98	13.81	10.16	518.69	14.98	720.98	718.26	0.675	
297.98	13.82	10.05	518.69	12.23	733.92	733.36	0.688	
327.98	13.84	10.11	518.69	10.66	728.98	728.93	0.683	
357.98	13.83	10.08	518.69	10.33	731.74	731.73	0.686	
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW	
27.98	1058.40	1.77	1056.63	55.50	1282.17	1.200	3.81	
57.98	1058.40	22.04	1036.36	55.01	1265.08	1.184	3.81	
87.98	1058.40	45.69	1012.71	54.58	1242.70	1.163	3.79	
117.98	1058.40	92.56	965.84	53.54	1200.89	1.123	3.76	
147.98	1058.40	118.36	941.14	57.11	1118.79	1.034	2.90	
177.98	1058.40	-43.10	1111.50	61.78	1250.07	1.153	2.87	
207.98	1058.40	-96.94	1151.34	63.27	1293.56	1.192	2.83	
237.98	1058.40	-121.72	1180.12	59.80	1365.43	1.274	3.66	
267.98	1058.40	-62.59	1120.99	57.35	1331.36	1.246	3.78	
297.98	1058.40	-28.56	1080.96	55.99	1311.22	1.229	3.83	
327.98	1058.40	-8.40	1066.80	55.66	1292.05	1.210	3.82	
357.98	1058.40	-4.21	1062.62	55.45	1290.18	1.209	3.83	

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO, IMMERSION	* 0.9%	RADIUS *	9.910	SLOPE *	15.60		
CIRC, POSITION	TOT, PRESSURE	STATIC PRESSURE	TOT, TEMP;	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO,
27.98	13.84	10.15	518.69	11.48	699.67	699.44	0.655
57.98	13.86	10.31	518.69	1.82	685.04	684.70	0.640
87.98	13.81	10.29	518.69	5.28	683.39	680.49	0.638
117.98	13.83	10.43	518.69	11.65	671.10	657.28	0.626
147.98	12.96	9.81	518.69	26.57	669.83	599.09	0.624
177.98	11.97	9.75	518.69	7.47	574.43	569.55	0.530
207.98	12.14	9.75	518.69	-18.47	595.42	564.75	0.550
237.98	13.80	10.24	518.69	-15.39	689.35	664.64	0.644
267.98	13.81	10.28	518.69	16.80	683.92	679.11	0.639
297.98	13.78	10.13	518.69	12.88	698.34	697.45	0.653
327.98	13.83	10.15	518.69	12.24	699.16	698.63	0.654
357.98	13.83	10.19	518.69	12.51	695.75	695.09	0.651

CIRC, POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL, TANG VELOCITY	REL, FLOW ANGLE	REL, VELOCITY	REL, MACH NO,	LOCAL WT, FLOW
27.98	760.22	-18.07	778.29	48.09	1046.40	0.979	2.41
57.98	760.22	21.76	738.46	47.16	1007.04	0.941	2.39
87.98	760.22	62.89	697.33	45.70	974.34	0.910	2.36
117.98	760.22	135.52	624.70	43.54	906.79	0.845	2.30
147.98	760.22	299.61	460.61	37.55	755.69	0.704	1.97
177.98	760.22	-74.68	834.90	55.70	1010.67	0.932	1.83
207.98	760.22	-188.64	948.86	59.24	1104.21	1.020	1.82
237.98	760.22	-182.95	943.17	54.83	1153.62	1.078	2.30
267.98	760.22	-80.98	841.20	51.09	1081.11	1.010	2.36
297.98	760.22	-35.09	795.31	48.75	1057.81	0.990	2.39
327.98	760.22	-27.33	787.55	48.42	1052.77	0.985	2.40
357.98	760.22	-30.47	790.69	48.68	1052.77	0.985	2.40

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO; IMMERSION	* 1.51 = 10%	RADIUS = 17,081		SLOPE = +0.83			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15,00	20,87	15,83	596,88	29,14	737,85	644,46	0,641
45,00	20,90	15,96	597,36	30,18	729,59	630,69	0,633
75,00	20,89	15,96	596,67	30,82	728,67	625,77	0,632
105,00	20,65	15,67	596,04	31,73	737,29	627,09	0,641
135,00	19,69	15,72	595,17	39,13	662,58	513,99	0,577
165,00	22,32	16,71	632,94	42,11	777,35	576,69	0,657
195,00	22,56	16,52	642,55	43,71	811,10	586,30	0,682
225,00	23,89	16,97	657,00	38,40	857,52	672,03	0,716
255,00	21,20	15,87	605,92	30,26	760,59	656,96	0,657
285,00	20,89	15,92	598,15	28,09	732,40	646,13	0,635
315,00	20,88	15,93	595,26	28,38	730,00	642,26	0,634
345,00	20,85	15,95	597,82	29,11	727,49	635,60	0,630
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15,00	1310,32	359,29	951,03	55,88	1148,82	0,998	3,48
45,00	1310,32	366,78	943,55	56,24	1134,93	0,984	3,42
75,00	1310,32	373,33	937,00	56,26	1126,74	0,978	3,40
105,00	1310,32	387,75	922,57	55,80	1115,52	0,969	3,36
135,00	1310,32	418,14	892,18	60,05	1029,64	0,896	2,77
165,00	1310,32	521,25	789,07	53,84	977,34	0,826	3,11
195,00	1310,32	560,49	749,89	51,98	951,85	0,801	3,10
225,00	1310,32	532,65	777,68	49,17	1027,82	0,959	3,60
255,00	1310,32	383,28	927,04	54,68	1136,22	0,981	3,52
285,00	1310,32	344,86	965,47	56,21	1161,73	1,007	3,50
315,00	1310,32	346,98	963,35	56,31	1157,81	1,006	3,49
345,00	1310,32	353,91	956,41	56,39	1148,35	0,995	3,45

Flow Survey Data For Circumferential Inlet Distortion Testing ~
100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO., IMMERSION	■ 1.51 = 50%		RADIUS ■ 14'0"6		SLCPE ■ 3.14		
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.17	15.28	600.97	35.88	800.81	648.85	0.698
45.00	21.19	15.24	600.46	36.21	804.99	649.51	0.702
75.00	21.06	15.21	598.89	37.33	798.63	639.04	0.697
105.00	20.82	14.94	597.81	37.88	805.53	635.80	0.705
135.00	19.88	14.84	595.22	44.43	750.11	535.66	0.659
165.00	21.32	15.54	618.44	45.91	800.59	557.04	0.687
195.00	21.26	15.16	629.59	49.79	834.30	538.62	0.712
225.00	22.51	15.67	636.33	42.73	866.73	636.66	0.738
255.00	20.90	14.92	608.61	36.43	818.93	658.90	0.710
285.00	21.51	15.39	605.29	36.63	813.90	653.16	0.708
315.00	21.24	15.34	605.24	36.54	802.78	644.99	0.697
345.00	21.23	15.29	603.01	35.79	804.43	652.52	0.700
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1078.27	469.35	608.92	43.18	889.83	0.776	3.78
45.00	1078.27	475.55	602.72	42.86	886.08	0.773	3.78
75.00	1078.27	484.29	593.97	43.09	869.53	0.759	3.69
105.00	1078.27	494.60	583.67	42.55	863.08	0.755	3.65
135.00	1078.27	525.11	553.16	45.92	770.01	0.677	3.08
165.00	1078.27	575.02	503.25	42.10	750.70	0.644	3.20
195.00	1078.27	637.14	441.13	39.32	696.21	0.594	2.98
225.00	1078.27	588.11	490.16	37.59	603.49	0.684	3.63
255.00	1078.27	486.32	591.99	41.94	885.75	0.768	3.71
285.00	1078.27	485.61	592.66	42.22	881.97	0.767	3.81
315.00	1078.27	477.96	600.31	42.95	881.12	0.765	3.74
345.00	1078.27	470.44	607.83	42.97	891.76	0.776	3.79

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO. IMMERSION	= 1.51		RADIUS = 1.030		SLOPE = 11.17		
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	IST. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15,00	21,30	14,67	595,48	39,09	840,46	652,33	0,741
45,00	21,47	14,73	595,99	39,07	845,22	656,21	0,745
75,00	21,14	14,61	592,99	40,92	836,18	635,65	0,738
105,00	20,80	14,40	591,25	41,28	832,96	625,96	0,736
135,00	19,60	14,29	579,92	46,90	769,16	525,54	0,681
165,00	20,76	14,60	596,39	51,93	822,34	507,07	0,722
195,00	19,94	14,42	608,80	57,39	799,62	430,93	0,692
225,00	21,30	14,52	621,49	42,90	871,27	638,24	0,753
255,00	21,22	14,58	605,11	39,92	850,03	651,92	0,743
285,00	21,20	14,73	597,42	39,57	832,33	641,60	0,732
315,00	21,32	14,69	596,56	39,01	840,97	653,46	0,741
345,00	21,24	14,67	597,23	38,61	839,17	655,74	0,738
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL HY. FLOW
15,00	846,14	529,94	316,20	25,86	724,92	0,639	2,22
45,00	846,14	532,72	313,42	25,53	727,22	0,641	2,25
75,00	846,14	543,28	302,86	25,48	704,11	0,622	2,16
105,00	846,14	549,53	296,60	25,35	692,68	0,612	2,10
135,00	846,14	561,61	284,53	28,43	597,62	0,529	1,76
165,00	846,14	647,39	198,75	21,40	544,63	0,478	1,71
195,00	846,14	673,57	172,57	21,82	464,20	0,402	1,39
225,00	846,14	593,09	253,04	21,63	686,58	0,593	2,07
255,00	846,14	545,48	300,66	24,76	717,91	0,628	2,17
285,00	846,14	530,21	315,93	26,22	715,16	0,629	2,18
315,00	846,14	529,35	316,79	25,86	726,20	0,639	2,22
345,00	846,14	523,66	322,48	26,19	730,74	0,643	2,22

Flow Survey Data For Circumferential Inlet Distortion Testing -
 . 100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO. * 2,20 IMPRESSION = 10%		RADIUS = 17,130		SLOPE = 0,24			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
6,83	20,77	17,02	599,14	0,45	631,15	631,13	0,541
36,83	20,70	17,04	599,20	0,58	623,53	623,50	0,535
66,83	20,69	17,10	598,46	0,44	618,10	618,09	0,529
96,83	20,61	17,22	597,11	0,16	598,88	598,89	0,513
126,83	20,08	17,32	593,07	1,11	543,52	543,41	0,465
156,83	20,67	17,34	614,90	1,80	602,05	601,75	0,508
186,83	22,35	17,14	637,73	1,94	748,54	748,11	0,628
216,83	22,49	17,06	648,57	1,79	769,44	769,06	0,641
246,83	22,10	16,84	625,49	1,61	749,75	749,46	0,636
276,83	20,75	16,87	603,34	0,73	645,80	645,83	0,552
306,83	20,67	16,94	598,72	0,45	630,61	630,59	0,541
336,83	20,66	16,93	599,10	0,35	630,15	630,14	0,541

CIRC. POSITION	WHELL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
6,83	1314,08	4,95	1309,14	64,26	1453,33	1,246	3,29
36,83	1314,08	6,34	1307,74	64,51	1448,77	1,242	3,26
66,83	1314,08	4,78	1309,30	64,73	1447,96	1,240	3,24
96,83	1314,08	1,65	1312,43	65,47	1442,61	1,235	3,16
126,83	1314,08	10,56	1303,52	67,37	1412,26	1,208	2,87
156,83	1314,08	18,88	1295,20	65,08	1428,16	1,204	3,10
186,83	1314,08	25,40	1288,68	59,86	1490,09	1,250	3,77
216,83	1314,08	24,09	1259,99	59,20	1501,54	1,251	3,80
246,83	1314,08	21,00	1293,08	59,90	1494,57	1,267	3,79
276,83	1314,08	8,25	1305,84	63,68	1496,81	1,246	3,33
306,83	1314,08	4,91	1309,17	64,28	1453,12	1,246	3,28
336,83	1314,08	3,89	1310,19	64,31	1453,65	1,247	3,28

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow (Continued)

PLANE NO. = 2,20 IMMERSION = 50%		RADIUS = 420		SLOPE = 1,13			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
29,00	20,75	16,34	598,62	0,20	688,46	688,46	0,594
59,00	20,65	16,41	596,75	0,29	674,90	674,89	0,582
89,00	20,53	16,55	596,70	0,33	654,30	654,29	0,563
119,00	20,49	16,75	593,95	0,33	632,40	632,39	0,545
149,00	19,29	16,85	582,95	0,46	515,39	515,37	0,444
179,00	20,36	16,65	609,98	3,05	639,78	638,83	0,544
209,00	20,10	16,24	618,69	0,89	662,91	662,82	0,560
239,00	21,85	16,07	632,70	0,91	799,50	799,40	0,677
269,00	20,40	16,07	599,86	0,07	689,73	689,73	0,594
299,00	20,71	16,20	601,06	0,14	699,20	699,20	0,602
329,00	20,82	16,23	599,86	0,09	703,52	703,52	0,607
359,00	20,66	16,31	598,77	0,07	685,87	685,87	0,591
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
29,00	1106,19	-2,46	1108,69	58,16	1305,02	1,125	3,81
59,00	1106,19	-3,42	1109,61	58,69	1298,73	1,120	3,75
89,00	1106,19	-3,76	1109,95	59,48	1288,45	1,109	3,65
119,00	1106,19	3,64	1102,55	60,16	1271,04	1,095	3,58
149,00	1106,19	-4,10	1110,29	65,10	1224,07	1,054	2,93
179,00	1106,19	-34,02	1140,21	60,74	1307,00	1,111	3,50
209,00	1106,19	-10,33	1116,52	59,30	1298,45	1,097	3,50
239,00	1106,19	12,76	1093,44	53,83	1354,49	1,147	4,19
269,00	1106,19	0,80	1105,39	58,04	1302,93	1,123	3,74
299,00	1106,19	1,68	1104,51	57,66	1307,22	1,126	3,83
329,00	1106,19	-1,07	1107,26	97,57	1311,86	1,132	3,87
359,00	1106,19	-0,85	1107,04	58,22	1302,29	1,123	3,78

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Intermediate Weight Flow (Concluded)

PLANE NO. * 2,20
IMMERSION = 90%

RADIUS = 11.775

SLOPE = 1.14

CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
18,56	20,64	15,95	593,22	0,20	723,99	723,98	0,630
48,56	20,90	15,96	592,76	0,50	726,46	726,43	0,632
78,56	20,66	16,17	599,85	0,79	692,19	692,12	0,602
108,56	20,47	16,37	598,87	0,63	661,33	661,29	0,574
138,56	19,66	16,64	582,90	0,53	570,74	570,72	0,494
168,56	17,77	17,30	575,38	-15,64	229,74	221,23	0,196
198,56	17,49	17,02	598,46	-14,92	235,50	227,56	0,197
228,56	19,63	16,64	616,46	1,38	563,71	563,55	0,473
258,56	21,48	15,72	609,25	0,65	790,22	790,17	0,683
288,56	21,13	15,80	597,27	0,17	756,63	756,62	0,658
318,56	21,00	15,77	594,99	0,44	749,09	749,07	0,652
348,56	20,87	15,86	594,52	0,08	734,44	734,44	0,639

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
18,56	903,29	-2,57	905,85	51,37	1159,62	1,009	2,35
48,56	903,29	-6,38	909,67	51,39	1164,13	1,013	2,36
78,56	903,29	-9,51	912,80	52,63	1145,53	0,996	2,28
108,56	903,29	-7,32	910,61	54,01	1125,39	0,976	2,19
138,56	903,29	5,26	898,03	57,56	1064,04	0,920	1,91
168,56	903,29	-61,94	965,23	77,09	990,26	0,943	0,75
198,56	903,29	-60,62	963,91	76,72	990,41	0,829	0,73
228,56	903,29	13,55	889,74	57,65	1053,20	0,964	1,80
258,56	903,29	-8,94	912,22	49,10	1206,86	1,043	2,49
288,56	903,29	-2,28	905,57	50,12	1180,06	1,026	2,43
318,56	903,29	-5,79	909,08	50,51	1177,94	1,026	2,41
348,56	903,29	-0,96	904,29	50,92	1164,93	1,013	2,37

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow

PLANE NO. IMMERSION	$\alpha = 0.95$ $\beta = 10\%$	RADIUS = 7.420	SLOPE = -1.92				
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.84	10.90	518.69	0.75	640.70	640.64	0.594
57.98	13.82	10.86	518.69	0.13	643.90	643.90	0.597
87.98	13.73	10.90	518.69	1.43	635.95	635.35	0.588
117.98	13.84	10.79	518.69	4.46	653.61	651.63	0.606
147.98	12.12	10.13	518.69	4.13	567.67	566.20	0.522
177.98	12.13	10.66	518.69	-3.92	568.68	567.35	0.523
207.98	12.03	10.41	518.69	-11.98	502.95	491.60	0.459
237.98	13.73	11.60	518.69	-10.70	541.63	532.22	0.497
267.98	13.63	11.45	518.69	-1.49	550.41	550.22	0.505
297.98	13.83	10.84	518.69	0.39	643.48	643.46	0.596
327.98	13.83	10.99	518.69	1.71	629.41	629.13	0.582
357.98	13.81	10.88	518.69	0.58	640.73	640.70	0.594
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1336.33	8.39	1327.94	64.25	1474.40	1.366	3.31
57.98	1336.33	1.46	1334.87	64.25	1482.05	1.374	3.31
87.98	1336.33	15.86	1320.47	64.31	1465.37	1.357	3.28
117.98	1336.33	50.83	1285.50	63.12	1441.23	1.337	3.34
147.98	1336.33	40.88	1295.45	66.39	1413.78	1.300	2.67
177.98	1336.33	-38.88	1375.21	67.98	1487.64	1.368	2.66
207.98	1336.33	-104.31	1440.64	71.16	1522.21	1.392	2.36
237.98	1336.33	-100.56	1436.89	69.68	1532.29	1.406	2.87
267.98	1336.33	-14.31	1350.64	67.84	1458.42	1.339	2.93
297.98	1336.33	4.38	1331.95	64.21	1479.23	1.371	3.31
327.98	1336.33	18.78	1317.55	64.48	1460.05	1.351	3.27
357.98	1336.33	6.49	1329.84	64.28	1476.14	1.368	3.30

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. IMMERSED	= 0.95	RADIUS	= .797	SLOPE	= 4.85		
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ARS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.91	10.26	517.69	0.57	718.23	718.19	0.672
57.98	13.91	10.27	518.69	1.53	716.99	716.74	0.670
87.98	13.90	10.28	513.69	2.73	714.83	714.02	0.668
117.98	13.91	10.31	514.69	6.16	717.78	708.67	0.666
147.98	12.13	9.68	515.49	6.47	625.14	621.16	0.578
177.98	12.13	9.94	518.69	-8.40	584.32	578.05	0.538
207.98	12.11	10.23	518.69	-15.33	538.04	518.90	0.493
237.98	13.84	11.32	518.69	-10.93	568.53	577.86	0.542
267.98	13.87	10.69	516.69	-2.87	643.17	642.36	0.596
297.98	13.90	10.49	515.69	-0.97	692.02	691.93	0.645
327.98	13.91	10.39	518.69	-0.16	762.85	702.85	0.656
357.98	13.92	10.28	514.69	0.42	716.85	716.83	0.670

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	1058.40	7.15	1051.26	55.66	1273.16	1.191	3.81
57.98	1058.40	19.14	1039.26	55.41	1262.44	1.181	3.81
87.98	1058.40	34.25	1024.35	55.12	1248.65	1.167	3.79
117.98	1058.40	76.49	981.92	54.28	1210.94	1.132	3.77
147.98	1058.40	73.44	987.96	57.84	1167.00	1.080	3.04
177.98	1058.40	-85.36	1143.76	63.19	1281.53	1.181	2.88
207.98	1058.40	-142.29	1233.69	66.63	1307.96	1.200	2.64
237.98	1058.40	-111.59	1169.99	63.72	1304.91	1.203	3.28
267.98	1058.40	-32.20	1090.60	59.50	1265.72	1.173	3.55
297.98	1058.40	-11.72	1070.12	57.11	1274.33	1.188	3.73
327.98	1058.40	-1.96	1040.36	56.46	1272.15	1.187	3.76
357.98	1058.40	5.25	1053.15	55.76	1273.95	1.191	3.81

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO., IMMERISION	= 0.75 = 90%	RADIUS =	9.910	SLOPE =	15.60		
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
27.98	13.90	10.41	518.69	0.53	677.12	677.09	0.632
57.98	13.92	10.51	518.69	1.39	668.41	668.21	0.623
87.98	13.90	10.51	518.69	4.02	666.89	665.25	0.622
117.98	13.92	10.64	518.69	9.71	654.43	645.06	0.609
147.98	12.57	10.07	518.69	19.75	598.46	563.25	0.553
177.98	12.25	10.10	518.69	-11.86	558.42	546.50	0.514
207.98	12.71	10.30	518.69	-25.71	583.72	525.93	0.539
237.98	13.91	10.79	518.69	-18.38	638.82	606.23	0.593
267.98	13.92	10.85	518.69	-5.29	629.78	627.10	0.584
297.98	13.89	10.63	518.69	-0.83	652.35	652.28	0.607
327.98	13.89	10.46	518.69	-0.80	671.22	671.15	0.626
357.98	13.90	10.45	518.69	-0.18	673.10	673.10	0.628
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
27.98	760.22	6.26	753.96	48.07	1013.36	0.946	2.37
57.98	760.22	16.21	744.01	48.07	1000.03	0.932	2.36
87.98	760.22	46.75	713.47	47.00	975.49	0.909	2.35
117.98	760.22	110.38	649.84	45.21	915.64	0.852	2.30
147.98	760.22	202.23	577.99	44.73	792.85	0.733	1.87
177.98	760.22	-114.77	874.99	58.01	1031.63	0.950	1.81
207.98	760.22	-253.23	1013.49	62.57	1141.79	1.053	1.78
237.98	760.22	-201.43	961.65	57.77	1136.79	1.056	2.18
267.98	760.22	-58.06	818.28	52.53	1030.94	0.956	2.27
297.98	760.22	-9.45	769.67	49.72	1008.89	0.939	2.32
327.98	760.22	-9.37	769.59	48.91	1021.14	0.952	2.36
357.98	760.22	-2.11	762.33	48.56	1016.96	0.949	2.37

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. IMPERSTION	$\alpha = 1.51$ $\beta = 10\%$	RADIUS = 17,081		SLOPE = -0.83			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ARS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.91	16.61	603.88	32.71	742.68	624.90	0.641
45.00	22.00	16.65	605.20	33.00	745.66	625.36	0.643
75.00	21.70	16.54	604.69	31.30	748.07	625.25	0.646
105.00	21.85	16.49	604.35	34.15	748.91	619.78	0.647
135.00	20.84	16.66	593.99	40.51	664.98	505.58	0.574
165.00	23.72	17.78	639.29	43.06	779.64	569.64	0.655
195.00	24.00	17.86	657.41	45.24	800.36	563.57	0.664
225.00	24.96	17.69	680.22	43.46	875.37	635.39	0.719
255.00	21.99	16.28	636.20	39.28	794.94	615.33	0.670
285.00	22.26	16.38	615.17	38.45	787.44	616.68	0.676
315.00	22.01	16.97	606.88	34.35	753.97	622.48	0.650
345.00	21.93	16.63	604.88	33.47	743.21	619.97	0.641

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1310.32	401.33	998.99	55.49	1103.07	0.952	3.50
45.00	1310.32	406.11	994.21	55.33	1099.40	0.948	3.51
75.00	1310.32	410.71	899.61	55.20	1095.55	0.946	3.49
105.00	1310.32	420.41	889.92	55.14	1084.47	0.937	3.45
135.00	1310.32	431.96	878.37	60.08	1013.48	0.876	2.84
165.00	1310.32	532.31	778.01	53.79	964.26	0.810	3.24
195.00	1310.32	568.31	742.02	52.78	931.77	0.773	3.13
225.00	1310.32	602.12	708.21	48.10	951.46	0.782	3.43
255.00	1310.32	503.28	807.04	52.68	1014.86	0.855	3.22
285.00	1310.32	489.65	820.67	53.08	1026.55	0.882	3.37
315.00	1310.32	425.43	884.90	54.88	1081.91	0.933	3.47
345.00	1310.32	409.88	900.44	55.45	1093.23	0.943	3.47

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. # 1,91 IMMERSION # 50%		RADIUS # 14,056		SLOPE # 3.14			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	22.14	15.86	609.60	37.95	814.92	642.61	0.708
45.00	22.14	15.86	603.89	37.81	811.07	640.79	0.706
75.00	21.96	15.79	603.11	38.30	806.35	632.80	0.702
105.00	21.82	15.65	599.25	39.92	807.55	627.41	0.706
135.00	20.75	15.74	593.14	44.93	733.40	519.22	0.640
165.00	22.60	16.47	623.48	46.67	804.83	552.27	0.688
195.00	22.60	16.28	641.22	52.90	830.36	500.88	0.701
225.00	23.84	16.48	654.12	49.93	888.42	571.90	0.747
255.00	21.27	15.51	625.94	45.89	807.17	561.82	0.687
285.00	21.82	15.57	606.97	40.77	817.94	619.45	0.710
315.00	22.17	15.90	605.43	38.64	811.20	633.62	0.705
345.00	22.29	15.91	604.44	38.27	816.47	641.01	0.711
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
15.00	1078.27	551.14	577.11	41.93	863.71	0.751	3.86
45.00	1078.27	497.22	581.05	42.20	866.00	0.753	3.86
75.00	1078.27	499.76	578.51	42.43	857.39	0.746	3.80
105.00	1078.27	508.43	569.84	42.25	847.56	0.740	3.76
135.00	1078.27	517.95	560.31	47.18	763.90	0.667	3.13
165.00	1078.27	585.44	492.83	41.74	740.19	0.633	3.33
195.00	1078.27	662.28	415.99	39.71	651.10	0.550	2.91
225.00	1078.27	679.87	398.40	34.86	696.98	0.586	3.34
255.00	1078.27	579.55	498.72	41.59	751.24	0.639	3.16
285.00	1078.27	534.13	544.14	41.30	824.50	0.716	3.65
315.00	1078.27	506.54	571.73	42.06	853.44	0.742	3.82
345.00	1078.27	505.69	572.57	41.77	859.50	0.748	3.88

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO, IMMERSION	= 1.51		RADIUS = 11,030		SLURC = 11.17		
	= 90°						
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
15.00	21.37	14.97	591.86	40.94	822.36	621.21	0.724
45.00	21.43	14.99	594.05	41.31	823.58	618.63	0.725
75.00	21.28	14.93	593.29	42.29	820.51	606.97	0.723
105.00	21.06	14.91	591.11	43.67	808.92	590.93	0.713
135.00	19.75	15.07	581.13	48.96	727.67	477.78	0.641
165.00	21.23	15.35	598.39	54.76	793.06	457.60	0.692
195.00	20.77	15.58	611.22	57.29	758.10	469.67	0.657
225.00	22.13	15.20	632.43	48.58	875.07	581.21	0.749
255.00	21.63	15.22	607.45	41.11	825.12	622.44	0.718
285.00	22.09	15.26	602.07	42.94	841.70	616.18	0.737
315.00	21.51	15.05	595.43	42.21	825.27	611.27	0.726
345.00	21.48	15.07	595.14	42.00	821.62	610.58	0.723

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WY. FLOW
15.00	846.14	538.87	307.27	26.32	693.05	0.610	2.15
45.00	846.14	543.67	302.47	26.06	685.61	0.606	2.15
75.00	846.14	552.11	294.03	25.85	674.44	0.594	2.10
105.00	846.14	552.40	293.73	26.43	659.91	0.582	2.04
135.00	846.14	548.84	297.29	31.89	562.72	0.496	1.67
165.00	846.14	647.73	198.41	23.44	498.76	0.435	1.60
195.00	846.14	637.89	203.26	20.95	459.56	0.395	1.41
225.00	846.14	654.17	191.97	18.26	612.09	0.524	1.93
255.00	846.14	543.18	302.96	25.95	692.25	0.602	2.14
285.00	846.14	573.40	272.74	23.88	673.85	0.590	2.16
315.00	846.14	554.46	291.68	25.51	677.29	0.596	2.12
345.00	846.14	549.77	296.37	25.89	678.71	0.597	2.13

NOT REPRODUCIBLE

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO, IMMERSION	= 2.20 = 10%	RADIUS = 17,130		SLOPE 3.24			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
6.83	21.78	18.97	606.71	0.60	615.39	615.35	0.523
36.83	21.82	18.36	606.66	0.44	617.77	617.75	0.525
66.83	21.73	18.14	605.72	0.37	604.98	604.97	0.514
96.83	21.69	18.26	605.36	0.31	590.74	590.73	0.502
126.83	21.31	18.27	602.34	0.72	558.63	558.58	0.475
156.83	21.99	18.18	622.74	1.79	629.62	629.32	0.529
186.83	23.69	18.02	547.27	2.29	765.20	764.59	0.638
216.83	23.68	17.94	663.51	2.21	779.92	779.34	0.642
246.83	22.06	17.93	655.21	2.58	673.14	672.46	0.552
276.83	21.91	18.02	629.48	2.32	641.29	640.77	0.536
306.83	21.67	18.59	617.33	1.42	609.36	609.17	0.515
336.83	21.62	18.09	606.55	0.71	601.87	601.82	0.511
CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
6.83	1314.08	6.46	1307.62	64.80	1445.18	1.229	3.36
36.83	1314.08	4.76	1309.33	64.74	1447.74	1.231	3.37
66.83	1314.08	3.90	1310.19	65.22	1443.11	1.227	3.31
96.83	1314.08	3.15	1310.94	65.74	1437.89	1.221	3.25
126.83	1314.08	7.05	1307.03	65.86	1421.39	1.208	3.08
156.83	1314.08	19.69	1294.39	64.07	1439.27	1.209	3.37
186.83	1314.08	30.56	1283.52	59.22	1494.00	1.245	4.00
216.83	1314.08	30.04	1284.02	58.74	1502.03	1.237	3.96
246.83	1314.08	30.31	1283.78	62.35	1449.23	1.189	3.39
276.83	1314.08	25.97	1288.12	63.55	1438.69	1.203	3.37
306.83	1314.08	15.11	1298.98	64.88	1434.72	1.213	3.29
336.83	1314.08	7.44	1306.64	65.27	1438.58	1.222	3.28

Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Continued)

PLANE NO. IMPRESSION	2.20 50%	RADIUS = 14.420		SLOPE = 1.13			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
29.00	21.69	17.37	602.22	0.46	667.46	667.44	0.572
59.00	21.65	17.47	602.51	0.31	656.01	656.00	0.562
89.00	21.53	17.60	601.32	0.48	638.42	638.40	0.545
119.00	21.36	17.71	599.08	1.07	612.53	612.42	0.524
149.00	20.22	17.78	589.44	-0.34	504.53	506.52	0.413
179.00	21.21	17.67	616.05	-4.41	614.07	612.25	0.518
209.00	21.51	17.29	623.15	-5.14	597.57	595.17	0.500
239.00	22.32	17.27	642.65	-3.62	738.38	736.91	0.616
269.00	23.74	17.56	617.06	-1.33	587.86	587.71	0.494
299.00	21.66	17.41	604.17	-0.53	662.79	662.76	0.567
329.00	21.76	17.36	603.13	0.64	672.54	672.50	0.577
359.00	21.68	17.34	603.75	0.90	669.66	669.57	0.574

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
29.00	1106.19	5.33	1100.86	58.77	1287.39	1.104	3.88
59.00	1106.19	3.59	1102.60	59.25	1282.99	1.099	3.83
89.00	1106.19	5.13	1100.87	59.97	1271.98	1.088	3.73
119.00	1106.19	11.43	1094.76	60.78	1254.41	1.073	3.61
149.00	1106.19	-3.22	1109.21	65.46	1219.39	1.043	3.00
179.00	1106.19	-47.22	1153.42	62.04	1305.84	1.101	3.50
209.00	1106.19	-53.51	1159.71	62.63	1303.51	1.091	3.28
239.00	1106.19	-46.88	1152.87	57.41	1368.27	1.142	4.03
269.00	1106.19	-13.60	1119.79	62.31	1264.64	1.062	3.31
299.00	1106.19	-6.16	1112.35	59.21	1294.83	1.108	3.85
329.00	1106.19	7.91	1098.69	58.53	1288.16	1.105	3.91
359.00	1106.19	10.54	1095.65	58.57	1284.05	1.100	3.86

NOT REPRODUCIBLE

NOT REPRODUCIBLE

**Flow Survey Data For Circumferential Inlet Distortion Testing -
100% Design Speed, Near Stalling Weight Flow (Concluded)**

PLANE NO. = 2.20 IMMERSION = 90%		RADIUS = 11,775		SLOP2 = 1,14			
CIRC. POSITION	TOT. PRESSURE	STATIC PRESSURE	TOT. TEMP.	ABS FLOW ANGLE	ABS VELOCITY	AXIAL VELOCITY	ABS MACH NO.
18.56	21.15	17.12	593.12	-0.22	646.30	646.29	0.558
48.56	21.15	17.13	593.64	-0.62	646.07	646.04	0.557
78.56	21.00	17.26	591.51	-0.31	627.51	622.50	0.537
108.56	20.88	17.40	591.51	0.53	600.67	600.64	0.517
138.56	20.21	17.75	587.67	2.12	507.00	506.65	0.434
168.56	18.51	18.17	582.69	3.25	193.06	192.75	0.164
198.56	18.25	17.95	603.13	-36.19	185.54	149.73	0.154
228.56	19.33	17.87	622.84	-10.88	407.66	401.36	0.337
258.56	21.75	17.23	611.59	-1.69	688.19	687.89	0.587
288.56	21.94	17.61	600.50	-0.33	712.01	711.99	0.614
318.56	21.31	17.12	597.96	-0.28	657.12	657.05	0.568
348.56	21.13	17.07	594.11	-0.58	650.44	650.40	0.561

CIRC. POSITION	WHEEL SPEED	ABS TANG VELOCITY	REL. TANG VELOCITY	REL. FLOW ANGLE	REL. VELOCITY	REL. MACH NO.	LOCAL WT. FLOW
18.56	903.29	-2.47	905.75	54.49	1112.69	0.960	2.22
48.56	903.29	-6.97	910.26	54.64	1116.21	0.963	2.21
78.56	903.29	-3.42	906.71	55.53	1099.83	0.948	2.15
108.56	903.29	5.52	897.77	56.22	1080.17	0.930	2.08
138.56	903.29	18.79	884.49	60.20	1019.33	0.874	1.78
168.56	903.29	10.95	892.34	77.81	912.92	0.773	0.68
198.56	903.29	-109.56	1012.85	81.59	1023.86	0.852	0.50
228.56	903.29	-71.37	974.66	67.62	1054.06	0.871	1.32
258.56	903.29	-20.26	923.55	53.32	1151.58	0.982	2.32
288.56	903.29	-4.05	907.33	51.88	1153.34	0.995	2.42
318.56	903.29	-10.06	913.35	54.27	1125.13	0.972	2.26
348.56	903.29	-6.61	909.90	54.44	1118.46	0.965	2.22

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