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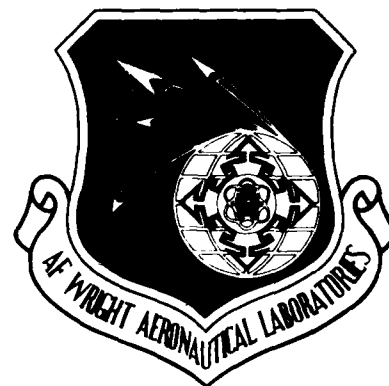
TWO AXIAL COMPRESSOR DESIGNS FOR
A STAGE MATCHING INVESTIGATION

C. Herbert Law
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Technology Branch
Turbine Engine Division

March 1989

Interim Report for Period 1 January 1988 - 30 September 1988

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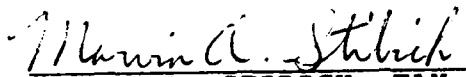
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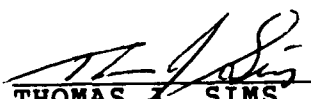
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For a Stage Matching Investigation

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PREFACE

This report was prepared by Dr. C. Herbert Law and Arthur J. Wennerstrom of the Technology Branch, Turbine Engine Division, Aero Propulsion Laboratory, Air Force Wright Aeronautical Laboratories, Wright-Patterson AFB, Ohio. The work was accomplished between 1 January 1988 and 30 September 1988.

This report represents results from a portion of the effort of the Compressor Research Group, supervised by Dr. Arthur J. Wennerstrom, and was conducted under Work Unit 27, Task S1, of Project 2307, "Turbomachinery Fluid Mechanics."

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SECTION I

INTRODUCTION

This report presents the results of an analytical investigation to design two single-stage axial-flow compressors for a stage matching investigation (Reference 1), the purpose of which is to develop a data base and design techniques necessary to match supersonic blade rows in turbomachinery compression systems. It is hoped that the results of testing these stages with a matrix of wakes artificially generated upstream will provide guidance which designers can use to correctly predict the flow-swallowing capacity of transonic or supersonic stages which are not an inlet stage. Two compressor designs are required to investigate both fan-type and core-type compression systems, since each configuration has unique aerodynamic and performance characteristics.

Several advanced axial compressors designed within the past decade have operated at wheel speeds high enough to cause several blade rows to operate at transonic and/or supersonic relative Mach numbers. In a number of cases, Reference 2 for example, the second-stage, and sometimes the third stage, passed more flow than the design intent causing a serious mismatch of the stages. Numerical studies (References 3 and 4) have shown this to be caused by the periodic non-steady flow associated with the transonic or supersonic rotor chopping wakes from the upstream stage. Evidence

is needed for design purposes to identify which parameters this phenomenon is sensitive to and to quantify the magnitude of the corrections needed under differing circumstances.

The approach to be used in this investigation will be to use the latest aerodynamic and mechanical design techniques to design two supersonic stages to be tested in an environment typical of the second-stage of an advanced military fan and an advanced military core compressor. Use of the term military here is simply to distinguish the characteristics of such a compression system from those of a commercial high-bypass turbofan. Methods for simulating the environment of interest in a test rig will also be investigated. The compressor configurations and test rig will then be fabricated and tested and the results will be analyzed in detail. This report presents the results of the detailed aerodynamic design of the two compressor stages.

SECTION II

FAN DESIGN

1. PRELIMINARY DESIGN

a. Criteria

All of the criteria defining the basic parameters of this compressor resulted from the design goals of a hypothetical turbofan engine of which this compressor stage comprised the second stage of the fan. It is assumed that this single-stage compressor (fan) is operating in the discharge plane of a highly loaded axial compressor (fan) stage, although in the actual test rig, the first stage wakes will be artificially generated. A hub/tip inlet radius ratio of 0.75 was specified at the outset as was the flow per unit inlet annulus area of 40.0 lb/sec/ft**2. Selecting a constant annulus outer diameter of 19.0 inches produced a rotor hub inlet diameter of 14.25 inches and a total flow rate of 34.46 lb/sec at standard inlet conditions. Selecting a compressor corrected tip speed of 1360 ft/sec with standard conditions at the compressor inlet produced supersonic relative velocities at the rotor leading edge with relative Mach numbers of 1.100 at the hub and 1.389 at the tip. Most of the rest of the compressor characteristics resulted from the overall objective of designing a highly loaded, efficient, state-of-the-art compressor. An overall stage pressure of 2.0 or greater and an efficiency of 86 percent or greater were considered to be moderate performance goals.

b. Procedure

The preliminary design of the single-stage compressor (fan) was accomplished with the computer program described in Reference 5. This computer program performs an axisymmetric, full radial equilibrium analysis of the compressor flow field using the streamline curvature solution technique. The program maximizes the compressor performance based on specified aerodynamic limits for each (only one, in this case) stage of the compressor. Initially, relatively conservative values for the aerodynamic limits were specified. The controlling limits were then gradually raised and adjustments were made to the radial distributions of rotor work, axial velocity distribution, etc. until the desired overall pressure ratio was achieved. Final fine tuning was accomplished with the compressor annulus geometry frozen to obtain the best configuration with the target efficiency.

c. Loss Assumptions

The losses attributed to each blade/vane element and expressed as a relative total pressure loss coefficient were assumed to be equal to the sum of two components, one associated with diffusion occurring in the profile boundary layers and one related to the presence of shock waves in each blade/vane passage. The losses resulting from diffusion were predicted in the Lieblien manner by a relative total pressure loss parameter verses diffusion factor relationship. This relationship was defined separately for the rotor and stator at 10, 50, and 90-percent spans. The loss

parameter correlation data was taken from Reference 6 which included a revised correlation for the Lieblien loss parameter relationship with diffusion factor in addition to a three-dimensional shock loss model. Detailed rotor as well as stage performance data obtained from tests of three axial compressor designs which shared the common characteristics of low aspect ratio and high tip relative Mach numbers and efficiency were used to calibrate the loss parameter correlations. The loss parameter/diffusion factor relationships used for both the preliminary and final detailed aerodynamic designs are shown in Figure 1.*

d. Design Philosophy

The axial velocity ratios were considered to be influential in achieving the desired stage pressure ratio consistent with reasonable off-design performance and the design efficiency objective. An overall axial velocity ratio near unity was chosen with the rotor having a ratio less than unity (0.9) and the stator having a ratio greater than unity (1.1). The spanwise total pressure distribution was found to have little influence on overall compressor performance; the distribution finally chosen produced the rotor exit total enthalpy distribution shown in Figure 2.

Many factors were considered in choosing the compressor annulus geometry and blade aspect ratios consistent with the compressor performance objectives. Lower aspect ratios led to

* Figures are located at end of report.

reduced hub ramp angles and were favored because of their tendency to improve compressor stall margin and ruggedness. Aspect ratios for each blade/vane row were chosen to be 1.0. The compressor casing diameter was assumed constant. The contraction along the hub was achieved primarily through the rotor; the rotor hub ramp angle was about 16 degrees and the stator hub ramp angle was about 10 degrees. The stage exit hub ramp angle was assumed to be 0.0 degrees and the flow was assumed to exit the stage axially.

e. Results

The final results of the preliminary design of the single-stage compressor (fan) are summarized in the following pages. The diffusion factor at the rotor tip proved to be the limiting parameter in the preliminary design, with a final value near 0.535 across the entire annulus. The resulting Mach number relative to the rotor leading edge varied from 1.10 at the hub to 1.39 at the tip. The Mach number relative to the stator leading edge was subsonic everywhere, varying from 0.83 at the hub to 0.70 at the case. The stator diffusion factor was also nearing constant across the annulus with a value of about 0.515.

The performance predicted for the single-stage compressor (fan) was a total pressure ratio of 2.15 and an isentropic efficiency of 88.7 percent. The predicted rotor total pressure ratio and efficiency were 2.19 and 91.3 percent respectively.

WAKE INVESTIGATION, FAN STAGE

****--*** ADVANCED MULTISTAGE AXIAL-FLOW COMPRESSOR ***--****
 -- ANALYSIS AT DESIGN CONDITIONS **--**
 ----I N P U T D A T A----

THE MACHINE IS TO HAVE NO MORE THAN 1 STAGES
 A TOTAL PRESSURE RATIO OF 2.000 IS DESIRED
 CALCULATIONS ARE TO BE PERFORMED AT 11 STREAMLINES
 THE INLET TOTAL PRESSURE IS 14.70 LBS/SQ IN.
 THE INLET MASS FLOW RATE IS 34.46 LB/SEC
 THE INLET TOTAL TEMPERATURE IS 518.69 DEG. R
 MOLECULAR WEIGHT OF THE FLUID IS 28.97
 THE TIP SPEED IS 1360.0 FT./SEC.
 AXIAL VELOCITY TOLERANCE IS .0100
 THE LOADING LIMIT TOLERANCE IS .0330
 THE EFFICIENCY TOLERANCE IS .0100
 THE CONTINUITY TOLERANCE IS .0005
 THE AXIAL VELOCITY RATIO TOLERANCE IS .0100

THE FRACTION OF THE TOTAL MASS FLOW BETWEEN THE HUB AND THE J-TH S.L. IS:
 0.000 .100 .200 .300 .400 .500 .600 .700 .800 .900 1.000

THE IGV LOSS COEFFICIENTS FOR THE 11 STREAMLINES ARE (FROM HUB TO TIP)
 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

THE INLET GUIDE VANE EXIT TANGENTIAL VELOCITY IS SPECIFIED BY
 A =0. B =0. C =0. D =0. E =0.

THE SPECIFIC HEAT POLYNOMIAL IS IN THE FOLLOWING FORM
 $CP = .23747E+00 + .21962E-04*T + -.87791E-07*T**2 +$
 $.13991E-09*T**3 + -.78056E-13*T**4 + .15043E-16*T**5$

THE RATIO OF THE AREAS OF THE LAST 3 STATIONS TO THE AREA OF THE LAST
 STATOR EXIT ARE 1.0000, 1.0000, 1.0000 .

----INLET DESCRIPTION----

STATION NO.	AXIAL COORDINATE (IN.)	HUB RADIUS (IN.)	HUB BLOCKAGE FACTOR	TIP RADIUS (IN.)	TIP BLOCKAGE FACTOR
1	-12.000	7.125	1.000	9.500	1.000
2	-9.000	7.125	1.000	9.500	.990
3	-6.000	7.125	.990	9.500	.990
4	-3.000	7.125	.990	9.500	.990
5	0.000	7.125	.990	9.500	.990

---- GEOMETRIC PARAMETERS ----

BLADE ROW EXIT STA.	AX. VEL. RATIO	ASP. RAT.	HUB RAMP ANG. LIM.	HUB BLOCK. FACTOR	TIP RAMP ANG. LIM.	TIP BLOCK. FACTOR
6	.900	1.000	25.000	.970	0.000	.970
7	1.100	1.000	15.000	.950	0.000	.950

.... LOSS DATA SET NUMBER 1

D-FACTOR	AT 10 PERCENT	AT 50 PERCENT	AT 90 PERCENT
0.000	.0050	.0050	.0050
.100	.0050	.0050	.0050
.150	.0050	.0050	.0050
.200	.0050	.0050	.0050
.250	.0050	.0050	.0050
.300	.0050	.0050	.0050
.350	.0052	.0052	.0052
.400	.0056	.0056	.0058
.450	.0061	.0061	.0070
.500	.0071	.0071	.0089
.550	.0087	.0087	.0119
.600	.0112	.0112	.0164
.650	.0149	.0149	.0230
.700	.0205	.0205	.0337
.750	.0288	.0288	.0463
.800	.0380	.0380	.0590
.850	.0480	.0480	.0718
.900	.0587	.0587	.0843
.950	.0697	.0697	.0968
1.000	.0810	.0810	.1093

.... LOSS DATA SET NUMBER 2

D-FACTOR	AT 10 PERCENT	AT 50 PERCENT	AT 90 PERCENT
0.000	.0034	.0034	.0034
.100	.0045	.0045	.0045
.150	.0051	.0051	.0051
.200	.0060	.0060	.0060
.250	.0072	.0072	.0072
.300	.0085	.0085	.0085
.350	.0102	.0102	.0102
.400	.0120	.0120	.0120
.450	.0145	.0145	.0145
.500	.0172	.0172	.0172
.550	.0217	.0217	.0217
.600	.0264	.0264	.0264
.650	.0318	.0318	.0318
.700	.0387	.0387	.0387
.750	.0470	.0470	.0470
.800	.0564	.0564	.0564
.850	.0673	.0673	.0673
.900	.0792	.0792	.0792
.950	.0911	.0911	.0911
1.000	.1030	.1030	.1030

-----STATION NUMBER 1 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1250	.563	609.74	609.74	0.0000	0.00
2	7.3969	.563	609.74	609.74	0.0000	0.00
3	7.6591	.563	609.74	609.74	0.0000	0.00
4	7.9127	.563	609.74	609.74	0.0000	0.00
5	8.1584	.563	609.74	609.74	0.0000	0.00
6	8.3969	.563	609.74	609.74	0.0000	0.00
7	8.6288	.563	609.74	609.74	0.0000	0.00
8	8.8546	.563	609.74	609.74	0.0000	0.00
9	9.0749	.563	609.74	609.74	0.0000	0.00
10	9.2899	.563	609.74	609.74	0.0000	0.00
11	9.5000	.563	609.74	609.74	0.0000	0.00

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1250	14.70	518.69	0.00000	0.0
2	7.3969	14.70	518.69	0.00000	0.0
3	7.6591	14.70	518.69	0.00000	0.0
4	7.9127	14.70	518.69	0.00000	0.0
5	8.1584	14.70	518.69	0.00000	0.0
6	8.3969	14.70	518.69	0.00000	0.0
7	8.6288	14.70	518.69	0.00000	0.0
8	8.8546	14.70	518.69	0.00000	0.0
9	9.0749	14.70	518.69	0.00000	0.0
10	9.2899	14.70	518.69	0.00000	0.0
11	9.5000	14.70	518.69	0.00000	0.0

-----STATION NUMBER 2 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1250	.572	618.40	618.40	2.8503	.26
2	7.3943	.572	618.53	618.53	2.2003	.20
3	7.6542	.572	618.65	618.65	1.5992	.15
4	7.9054	.572	618.75	618.75	1.0386	.10
5	8.1489	.572	618.84	618.84	.5121	.05
6	8.3853	.572	618.91	618.91	.0147	.00
7	8.6153	.572	618.97	618.97	-.4573	-.04
8	8.8392	.572	619.02	619.02	-.9071	-.08
9	9.0575	.572	619.05	619.05	-1.3373	-.12
10	9.2708	.572	619.07	619.06	-1.7498	-.16
11	9.4792	.572	619.07	619.07	-2.1465	-.20

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1250	14.70	518.69	.00307	0.0
2	7.3943	14.70	518.69	.00294	0.0
3	7.6542	14.70	518.69	.00283	0.0
4	7.9054	14.70	518.69	.00273	0.0
5	8.1489	14.70	518.69	.00265	0.0
6	8.3853	14.70	518.69	.00258	0.0
7	8.6153	14.70	518.69	.00252	0.0
8	8.8392	14.70	518.69	.00246	0.0
9	9.0575	14.70	518.69	.00241	0.0
10	9.2708	14.70	518.69	.00236	0.0
11	9.4792	14.70	518.69	.00231	0.0

-----STATION NUMBER 3 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1527	.581	628.33	628.32	2.8960	.26
2	7.4182	.581	628.24	628.23	2.7811	.25
3	7.6747	.581	628.20	628.20	2.5832	.24
4	7.9228	.581	628.21	628.20	2.3259	.21
5	8.1634	.581	628.24	628.23	2.0273	.18
6	8.3970	.581	628.28	628.28	1.7017	.15
7	8.6244	.581	628.34	628.34	1.3607	.12
8	8.8458	.581	628.41	628.40	1.0132	.09
9	9.0619	.581	628.47	628.47	.6669	.06
10	9.2729	.582	628.54	628.54	.3275	.03
11	9.4792	.582	628.62	628.62	0.0000	0.00

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1527	14.70	518.69	-.00307	0.0
2	7.4182	14.70	518.69	-.00236	0.0
3	7.6747	14.70	518.69	-.00182	0.0
4	7.9228	14.70	518.69	-.00139	0.0
5	8.1634	14.70	518.69	-.00106	0.0
6	8.3970	14.70	518.69	-.00080	0.0
7	8.6244	14.70	518.69	-.00059	0.0
8	8.8458	14.70	518.69	-.00041	0.0
9	9.0619	14.70	518.69	-.00026	0.0
10	9.2729	14.70	518.69	-.00013	0.0
11	9.4792	14.70	518.69	0.00000	0.0

-----STATION NUMBER 4 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1527	.572	618.37	618.37	0.0000	0.00
2	7.4209	.575	621.65	621.64	.8060	.07
3	7.6788	.577	624.38	624.38	1.2627	.11
4	7.9276	.580	626.64	626.63	1.4635	.13
5	8.1682	.581	628.46	628.46	1.4790	.13
6	8.4015	.583	629.89	629.89	1.3631	.12
7	8.6282	.584	630.97	630.97	1.1575	.10
8	8.8488	.585	631.73	631.73	.8950	.08
9	9.0639	.585	632.21	632.21	.6015	.05
10	9.2739	.585	632.44	632.44	.2977	.03
11	9.4792	.585	632.44	632.44	0.0000	0.00

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1527	14.70	518.69	0.00000	0.0
2	7.4209	14.70	518.69	.00026	0.0
3	7.6788	14.70	518.69	.00040	0.0
4	7.9276	14.70	518.69	.00046	0.0
5	8.1682	14.70	518.69	.00046	0.0
6	8.4015	14.70	518.69	.00042	0.0
7	8.6282	14.70	518.69	.00035	0.0
8	8.8488	14.70	518.69	.00027	0.0
9	9.0639	14.70	518.69	.00018	0.0
10	9.2739	14.70	518.69	.00009	0.0
11	9.4792	14.70	518.69	0.00000	0.0

----STATION NUMBER 5 ---- (INLET GUIDE VANE EXIT)

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1527	.563	609.44	604.19	79.8133	7.52
2	7.4259	.570	616.75	612.77	69.9503	6.51
3	7.6866	.576	622.67	619.74	60.3265	5.56
4	7.9365	.580	627.42	625.35	51.0102	4.66
5	8.1772	.584	631.18	629.78	42.0428	3.82
6	8.4098	.587	634.08	633.20	33.4488	3.02
7	8.6352	.589	636.24	635.74	25.2471	2.27
8	8.8542	.591	637.76	637.52	17.4637	1.57
9	9.0675	.592	638.70	638.62	10.1253	.91
10	9.2757	.592	639.13	639.13	3.2694	.29
11	9.4792	.592	639.13	639.12	-3.0427	-.27

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1527	14.70	518.69	.10838	0.0
2	7.4259	14.70	518.69	.09287	0.0
3	7.6866	14.70	518.69	.07863	0.0
4	7.9365	14.70	518.69	.06548	0.0
5	8.1772	14.70	518.69	.05329	0.0
6	8.4098	14.70	518.69	.04194	0.0
7	8.6352	14.70	518.69	.03136	0.0
8	8.8542	14.70	518.69	.02148	0.0
9	9.0675	14.70	518.69	.01229	0.0
10	9.2757	14.70	518.69	.00378	0.0
11	9.4792	14.70	518.69	-.00401	0.0

S.L. NO.	STREAMLINE RADIUS (IN.)	REL. VEL. (FT/SEC)	WHIRL VEL. (FT/SEC)	RELATIVE MACH NO.	REL. FLOW ANG. (DEG)	WHEEL SPEED (FT/SEC)
1	7.1527	1191.60	0.00	1.100	59.240	1023.959
2	7.4259	1229.02	0.00	1.136	59.880	1063.072
3	7.6866	1264.35	0.00	1.169	60.496	1100.391
4	7.9365	1297.90	0.00	1.201	61.091	1136.175
5	8.1772	1329.95	0.00	1.231	61.667	1170.631
6	8.4098	1360.70	0.00	1.260	62.225	1203.924
7	8.6352	1390.31	0.00	1.287	62.766	1236.191
8	8.8542	1418.94	0.00	1.314	63.291	1267.546
9	9.0675	1446.70	0.00	1.340	63.801	1298.083
10	9.2757	1473.69	0.00	1.365	64.298	1327.885
11	9.4792	1500.00	0.00	1.389	64.781	1357.022

ITERATION ON LOADING WAS TAKING PLACE

-- FINAL FLOW PARAMETERS FOR STAGE NUMBER 1 ***--***

*** STAGE INPUT PARAMETERS ***

ROTOR TIP D-FACTOR LIMIT	.5200
HUB RELATIVE FLOW ANGLE LIMIT AT THE ROTOR EXIT	-10.0
STATOR HUB MACH NUMBER LIMIT (IN)	1.0500
STATOR HUB D-FACTOR LIMIT	.6000
MAXIMUM TIP TANGENTIAL VELOCITY	800.0

---ROTOR---

	PRESSURE PROFILE	DELTA B, IN- LET TO SHOCK	SOLIDITY
A	0.	0.	0.
B	.100000E+01	.100000E+01	.100000E+01
C	.104000E+01	.120000E+02	.200000E+01
D	-.600000E-01	-.100000E+02	-.200000E+00
E	.200000E-01	0.	0.

---STATOR---

	WHIRL VELOCITY	DELTA B, IN- LET TO SHOCK	SOLIDITY
A	0.	0.	0.
B	.100000E+01	.100000E+01	.100000E+01
C	0.	.150000E+02	.180000E+01
D	0.	0.	-.200000E+00
E	0.	0.	0.

*** STAGE SCALER QUANTITIES ***

	--ROTOR--	--STATOR--
ASPECT RATIO	1.0000	1.0000
GEOMETRIC HUB RADIUS (IN.)	7.8065	8.1237
GEOMETRIC TIP RADIUS (IN.)	9.5000	9.5000
HUB RAMP ANGLE (DEG)	16.0105	10.6091
TIP RAMP ANGLE (DEG)	0.0000	0.0000
AXIAL LENGTH (IN.)	2.3750	1.6935
MASS FLOW (LB/SEC)	34.4570	34.4570
MASS AVE. ADIABATIC EFF.	.9133	.8874
VEL. RATIO AT THE MEAN	.9083	1.1079
HUB BLOCKAGE FACTOR	.9700	.9500
TIP BLOCKAGE FACTOR	.9700	.9500
MASS AVE. PRESSURE RATIO	2.1919	2.1486
MASS AVE. TEMPERATURE RATIO	1.2748	1.2749
CUMULATIVE MASS AVE. PR. RATIO	2.1919	2.1486
CUMULATIVE MASS AVE. TEMP. RATIO	1.2748	1.2749
CUMULATIVE MASS AVE. ADIABATIC EFF.	.9133	.8874
LOSS DATA SET USED	1	2

----- R O T O R E X I T **-----**

SL. NO.	RADIUS (INS.)	AX. VEL. (FT/SEC)	WH. VEL. (FT/SEC)	RD. VEL. (FT/SEC)	ABS. VEL. (FT/SEC)	ABS. M NUMBER	ABS. FLOW ANG(DEG)	REL. FLOW ANG(DEG)
1	7.8626	597.364	759.471	153.46	978.361	.8270	50.920	30.694
2	8.0343	594.374	741.779	131.14	959.539	.8093	50.629	33.860
3	8.2017	590.568	725.564	110.67	942.052	.7930	50.371	36.744
4	8.3657	585.787	711.036	91.82	925.824	.7778	50.175	39.373
5	8.5267	580.592	697.650	74.48	910.686	.7637	50.002	41.781
6	8.6851	575.125	685.295	58.49	896.560	.7506	49.850	43.989
7	8.8413	568.877	674.548	43.67	883.484	.7383	49.775	46.016
8	8.9957	561.544	665.691	29.89	871.418	.7269	49.811	47.889
9	9.1488	552.569	659.291	17.09	860.400	.7163	50.019	49.637
10	9.3012	542.623	654.487	5.26	850.189	.7062	50.337	51.288
11	9.4536	530.510	652.245	-5.64	840.771	.6966	50.875	52.885

SL. NO.	RADIUS (INS.)	TOT. T. RATIO	TOT. P. RATIO	ADIAB. EFF.	DIF. FACTOR	W. SPEED (FT/SEC)	SOLID ITY	A*/S	LOSS COEFF.
1	7.8626	1.2740	2.2396	.9443	.5371	1125.59	1.996	.5201	.0842
2	8.0343	1.2735	2.2272	.9388	.5392	1150.17	1.974	.5083	.0881
3	8.2017	1.2731	2.2160	.9336	.5395	1174.14	1.953	.4963	.0915
4	8.3657	1.2730	2.2058	.9279	.5390	1197.62	1.933	.4843	.0954
5	8.5267	1.2730	2.1966	.9224	.5376	1220.66	1.913	.4724	.0990
6	8.6851	1.2731	2.1883	.9169	.5353	1243.34	1.894	.4605	.1023
7	8.8413	1.2737	2.1808	.9106	.5333	1265.70	1.875	.4487	.1067
8	8.9957	1.2748	2.1742	.9030	.5319	1287.81	1.857	.4371	.1127
9	9.1488	1.2768	2.1683	.8930	.5320	1309.73	1.839	.4259	.1212
10	9.3012	1.2793	2.1632	.8818	.5326	1331.54	1.821	.4147	.1310
11	9.4536	1.2829	2.1587	.8680	.5351	1353.36	1.803	.4037	.1437

SL. NO.	RADIUS (INS.)	TOT. T. (DEG.)	TOT. P. (PSI.)	ST. T. (DEG.)	ST. P. (PSI.)	SLOPE (DEG)	CURVAT. (1/IN.)	REL. VEL. (FT/SEC)	REL. M NUMBER
1	7.8626	660.81	32.92	581.34	21.00	14.41	-.04505	717.2455	.6069
2	8.0343	660.53	32.74	534.10	21.27	12.45	-.03901	732.9792	.6188
3	8.2017	660.33	32.57	586.65	21.51	10.62	-.03303	749.8277	.6317
4	8.3657	660.27	32.42	589.11	21.73	8.91	-.02723	767.0321	.6448
5	8.5267	660.28	32.29	591.43	21.94	7.31	-.02169	784.9702	.6586
6	8.6851	660.35	32.17	593.63	22.13	5.81	-.01648	803.4954	.6729
7	8.8413	660.64	32.06	595.85	22.32	4.39	-.01169	821.5773	.6868
8	8.9957	661.22	31.96	598.20	22.49	3.05	-.00744	838.6012	.6997
9	9.1488	662.24	31.87	600.81	22.65	1.77	-.00389	853.6354	.7107
10	9.3012	663.57	31.80	603.59	22.80	.56	-.00126	867.6829	.7207
11	9.4536	665.43	31.73	606.78	22.95	-.61	.00017	879.2234	.7284

----- S T A T O R E X I T **-----**

SL. NO.	RADIUS (INS.)	AX. VEL. (FT/SEC)	WH. VEL. (FT/SEC)	RD. VEL. (FT/SEC)	ABS. VEL. (FT/SEC)	ABS. M NUMBER	ABS. FLOW ANG(DEG)	REL. FLOW ANG(DEG)
1	8.1980	684.022	.122	64.74	687.079	.5624	.010	59.651
2	8.3237	672.528	.120	55.18	674.788	.5519	.010	60.475
3	8.4492	662.003	.118	46.72	663.650	.5423	.010	61.246
4	8.5745	652.567	.117	39.16	653.741	.5338	.010	61.959
5	8.6993	644.283	.115	32.33	645.093	.5264	.010	62.614
6	8.8238	637.183	.113	26.09	637.717	.5200	.010	63.211
7	8.9476	631.267	.112	20.32	631.593	.5146	.010	63.751
8	9.0709	626.524	.110	14.87	626.700	.5102	.010	64.236
9	9.1934	622.925	.109	9.62	623.000	.5066	.010	64.667
10	9.3151	620.431	.107	4.43	620.447	.5039	.010	65.047
11	9.4360	619.049	.106	-.88	619.050	.5020	.010	65.378

SL. NO.	RADIUS (INS.)	TOT. T. RATIO	TOT. P. RATIO	ADIAB. EFF.	DIF. FACTOR	W. SPEED (FT/SEC)	SOLID ITY	A*/S	LOSS COEFF.
1	8.1980	1.0000	.9755	.9119	.5147	1173.61	1.792	.6135	.0678
2	8.3237	1.0000	.9768	.9081	.5153	1191.61	1.772	.6133	.0664
3	8.4492	1.0000	.9778	.9042	.5157	1209.58	1.753	.6126	.0654
4	8.5745	1.0000	.9787	.8998	.5160	1227.50	1.734	.6110	.0647
5	8.6993	1.0000	.9796	.8954	.5157	1245.38	1.716	.6092	.0639
6	8.8238	1.0000	.9804	.8912	.5148	1263.19	1.697	.6071	.0629
7	8.9476	1.0000	.9812	.8860	.5135	1280.93	1.679	.6040	.0618
8	9.0709	1.0000	.9820	.8795	.5120	1298.57	1.661	.5996	.0607
9	9.1934	1.0000	.9828	.8707	.5104	1316.11	1.643	.5932	.0596
10	9.3151	1.0000	.9835	.8607	.5084	1333.53	1.625	.5856	.0584
11	9.4360	1.0000	.9842	.8480	.5064	1350.83	1.607	.5753	.0571

SL. NO.	RADIUS (INS.)	TOT. T. (DEG.)	TOT. P. (PSI.)	ST. T. (DEG.)	ST. P. (PSI.)	SLOPE (DEG)	CURVAT. (1/IN.)	REL. VEL. (FT/SEC)	REL. M NUMBER
1	8.1980	660.81	32.12	621.65	25.92	5.41	-.12049	1359.8346	1.1132
2	8.3237	660.53	31.98	622.76	26.01	4.69	-.10389	1369.3012	1.1199
3	8.4492	660.33	31.85	623.80	26.08	4.04	-.08854	1379.5718	1.1274
4	8.5745	660.27	31.73	624.82	26.14	3.44	-.07423	1390.6301	1.1355
5	8.6993	660.28	31.63	625.76	26.19	2.88	-.06081	1402.4356	1.1443
6	8.8238	660.35	31.54	626.62	26.23	2.35	-.04812	1414.9370	1.1537
7	8.9476	660.64	31.46	627.55	26.26	1.85	-.03601	1428.0736	1.1636
8	9.0709	661.22	31.39	628.65	26.28	1.36	-.02429	1441.7870	1.1737
9	9.1934	662.24	31.32	630.06	26.30	.89	-.01276	1456.0175	1.1840
10	9.3151	663.57	31.27	631.65	26.30	.41	-.00122	1470.7072	1.1945
11	9.4360	665.43	31.23	633.65	26.30	-.08	.01063	1485.8270	1.2049

-- OUTLET FLOW PARAMETERS ***--***

STA NO.	AXIAL COORDINATE (IN.)	GEOMETRIC HUB RADIUS (IN.)	GEOMETRIC TIP RADIUS (IN.)	HUB BLOCKAGE FACTOR	TIP BLOCKAGE FACTOR
8	5.762	8.124	9.500	.960	.960
9	7.456	8.124	9.500	.970	.970
10	9.149	8.124	9.500	.980	.980

STATION NUMBER 8

SL. NO.	RADIUS (INS.)	AX. VEL. (FT/SEC)	WH. VEL. (FT/SEC)	RD. VEL. (FT/SEC)	ABS. VEL. (FT/SEC)	ABS. M NUMBER	TOT. T. (DEG.)	TOT. P. (PSI.)
1	8.1832	658.512	.122	-5.76	658.537	.5377	660.81	32.12
2	8.3123	648.959	.120	-4.33	648.974	.5296	660.53	31.98
3	8.4409	640.139	.118	-3.03	640.146	.5221	660.33	31.85
4	8.5692	632.150	.117	-1.85	632.153	.5152	660.27	31.73
5	8.6969	625.052	.115	-.77	625.052	.5092	660.28	31.63
6	8.8241	618.878	.113	.23	618.878	.5038	660.35	31.54
7	8.9506	613.631	.112	1.16	613.632	.4993	660.64	31.46
8	9.0764	609.310	.110	2.04	609.313	.4953	661.22	31.39
9	9.2014	605.900	.109	2.90	605.906	.4920	662.24	31.32
10	9.3255	603.390	.107	3.73	603.402	.4894	663.57	31.27
11	9.4488	601.820	.106	4.56	601.837	.4874	665.43	31.23

STATION NUMBER 9

1	8.1684	633.763	.122	-5.56	633.788	.5164	660.81	32.12
2	8.3012	626.611	.120	-4.30	626.626	.5104	660.53	31.98
3	8.4332	619.776	.119	-3.13	619.784	.5046	660.33	31.85
4	8.5646	613.399	.117	-2.04	613.403	.4992	660.27	31.73
5	8.6952	607.580	.115	-1.00	607.581	.4942	660.28	31.63
6	8.8250	602.381	.113	-.02	602.381	.4898	660.35	31.54
7	8.9540	597.825	.112	.93	597.826	.4858	660.64	31.46
8	9.0822	593.927	.110	1.83	593.930	.4823	661.22	31.39
9	9.2096	590.683	.109	2.72	590.689	.4791	662.24	31.32
10	9.3361	588.093	.107	3.58	588.104	.4764	663.57	31.27
11	9.4616	586.194	.106	4.44	586.211	.4742	665.43	31.23

STATION NUMBER 10

1	8.1535	618.622	.123	0.00	618.622	.5034	660.81	32.12
2	8.2890	611.066	.121	0.00	611.066	.4971	660.53	31.98
3	8.4238	603.885	.119	0.00	603.885	.4911	660.33	31.85
4	8.5579	597.219	.117	0.00	597.219	.4854	660.27	31.73
5	8.6913	591.169	.115	0.00	591.169	.4803	660.28	31.63
6	8.8239	585.796	.113	0.00	585.796	.4757	660.35	31.54
7	8.9558	581.118	.112	0.00	581.118	.4716	660.64	31.46
8	9.0868	577.145	.110	0.00	577.145	.4680	661.22	31.39
9	9.2169	573.870	.108	0.00	573.870	.4649	662.24	31.32
10	9.3462	571.295	.107	0.00	571.295	.4622	663.57	31.27
11	9.4744	569.451	.106	0.00	569.451	.4600	665.43	31.23

2. DETAILED AERODYNAMIC DESIGN

a. Computational Method

The detailed aerodynamic design of the single-stage compressor (fan) was accomplished using the computer program described in Reference 7, which employed the "streamline curvature" method of computation. Although conceptually similar to the method employed for the preliminary aerodynamic design, much greater precision was incorporated into the detailed design by adding computing stations between blade rows and within each blade row. The detailed design program also permitted the use of curvilinear computing stations, providing better representation of the actual blade row edges. The computing station/annulus geometry used is shown in Figure 3. Twenty-one computing stations were used; the first three and last computing stations are not shown in Figure 3. Rotor blade leading and trailing edges are represented by computing stations 5 and 10 respectively. Stator vane leading and trailing edges are represented by computing stations 13 and 18 respectively.

The detailed aerodynamic design program described in Reference 7 assumes the flow to be axisymmetric with the flow being described by a series of concentric streamsurfaces across which no mass or momentum is transferred. A solution is obtained through an iterative numerical procedure to simultaneously satisfy the equations of momentum, continuity and energy at each streamsurface/computing-station intersection point. The form of the momentum equation used satisfies "full" radial equilibrium and

includes the effects of streamline curvature, entropy gradients, and blade forces within each blade row. Solution of the continuity equation includes the effects of boundary layer blockage (to account for boundary layer development on both blades and annulus walls) and blade metal blockage within each blade row.

The detailed design program provides several options for the specification of the work distributions through each blade row. The method of approach used for this design involved the specification of total enthalpy distributions through the rotor and radius-times-swirl-velocity distributions through the stator to produce sets of relative flow angle distributions along streamsurfaces to define airfoil geometries. The final design objectives were then achieved by simultaneously optimizing the aerodynamic behavior and the airfoil geometries through each blade row, consistent with the results of the preliminary design at the blade edges.

b. Optimization Criteria

The axial distribution of static pressure along each streamsurface, as computed by the axisymmetric flow analysis, was selected as the most appropriate parameter to optimize for this design. The "optimum" axial distribution of static pressure along each streamsurface was considered to be one which was approximately linear over the first three quarters of a blade row and then declined smoothly to nearly zero slope at the trailing edge. This distribution was felt to provide minimum static pressure gradients

while simultaneously minimizing deviation angles and losses. The two design parameters which were most influential in determining the static pressure distributions were the specified work distributions and the annulus geometries through each blade row. The specific objectives of this design were to maximize the radii of curvature of the annulus walls and to provide smooth distributions of work through each blade row, while simultaneously optimizing the axial static pressure distributions. The procedure of arbitrarily specifying blade geometry provided the best means to simultaneously optimize the static pressure distributions and airfoil shapes while retaining good aerodynamic characteristics.

c. Airfoil Selection

In the design approach using arbitrary airfoils, the blade geometries are a result of the calculation and generally bear little resemblance to traditional analytically specified airfoils. Using this technique, the designer assumes the work distributions along streamlines and the aerodynamic analysis then produces a set of relative flow angles to which the airfoils are matched. The smoothness of the specified work distribution will ultimately determine the smoothness of the airfoil shape. The mechanical and aerodynamic properties of the resultant airfoil shape must be independently determined.

In addition to the specification of relative flow angles from the aerodynamic analysis, the designer must also supply information which defines the blade thickness distribution and

section stacking geometry. Calculations are then performed by the design program described in Reference 7 to determine blade metal blockages and lean angles which are used in the aerodynamic analysis. The aerodynamic analysis is repeated with the new airfoil geometry until the blade aerodynamic input data are mutually consistent with those calculated by the blade design program. This procedure is iteratively repeated until the optimization criteria are met over the full span.

d. Aerodynamic Assumptions

Besides the geometry-type data, the detailed design program requires other, more fundamental, aerodynamic input data. These include, but are not limited to, the specification of meridional distributions of deviation angle, boundary layer blockage, and losses. There is little experimental data available from which to define these distributions and, hence, their specification is partly empirical, but largely dependent upon engineering judgement. Deviation angle distributions were assumed which matched the leading edge incidence angle, were extremely small in the covered portion of the passage, and matched the predicted value at the trailing edge. The deviation angle at the trailing edge was predicted according to a method developed by NACA; a shape correction factor of 0.7 was used and the predicted values were increased by 1.0 degrees at all radii for the stator and from 5.0 degrees at the hub to 1.0 degrees at the tip for the rotor.

At each computing station, the flow blockage was assumed to be made up of annulus wall boundary layer blockage, blade metal blockage, and blade boundary layer or wake blockage. The detailed design program provides a simplified method for calculating the annulus wall boundary layer blockage from attached turbulent boundary layer theory, and the blade design results provide the blade metal blockage data. The distribution of blockage due to blade boundary layers or wakes is determined by empirical correlation of data obtained from similar designs which have been successful, and is strongly influenced by engineering judgement.

The method used to calculate aerodynamic losses was consistent with that used in the preliminary design described in Section II.1.c. Total pressure losses were linearly distributed through each blade row. Shock losses were calculated by the method described in Reference 6. The loss parameter correlation data was the same as that used for the preliminary design and shown in Figure 1.

e. Results

(1) Aerodynamic Analysis

The final aerodynamic design computing station/streamsurface geometry for the single-stage compressor (fan) is shown in Figure 3. The flowpath outer diameter is constant from inlet to exit at 19.0 inches. Other pertinent geometric data were as follows:

Rotor Inlet Hub/Tip Radius Ratio	=	0.750
Number of Rotor Blades	=	28
Number of Stator Vanes	=	49
Average Rotor Aspect Ratio	=	0.916
Average Stator Aspect Ratio	=	0.824

The aerodynamic analysis incorporated four internal computing stations within each blade row and one computing station representing each blade edge. The rotor is represented by computing stations 5 through 10 and the stator is represented by computing stations 13 through 18.

The final design point specifications were as follows:

Flowrate	=	34.460 lb/sec
Flow Per Unit Frontal Area	=	17.502 lb/sec/ft**2
Flow Per Unit Annulus Area	=	40.000 lb/sec/ft**2
Rotor Total Pressure Ratio	=	2.1828
Stage Total Pressure Ratio	=	2.1298
Rotor Isentropic Efficiency	=	0.9085
Stage Isentropic Efficiency	=	0.8767

The final streamwise distributions of non-dimensional total enthalpy through the rotor and non-dimensional radius-times-swirl-velocity through the stator are shown in Figures 4 and 5 respectively. The aerodynamic blockage distributions are presented in Figure 6. Shown are the distributions of annulus wall boundary layer blockage and total aerodynamic blockage, consisting

of wall blockage and blade boundary layer or wake blockage, along the mid-span streamsurface. The blade boundary layer or wake blockage was distributed evenly across the annulus.

The results of the detailed aerodynamic design are presented in Figures 7 through 13. The streamwise distributions of static pressure along the hub, middle, and case streamsurfaces are presented in Figure 7. Spanwise distributions of inlet relative (absolute for the stator) Mach number, diffusion factor, loss coefficient, total pressure ratio, isentropic efficiency, and turning angle for the rotor and stator are presented in Figures 8 through 13.

The details of the aerodynamic flowfield throughout the single-stage compressor (fan) are presented in the following pages of printout from the aerodynamic design program.

PROGRAM UDO300 - COMPRESSOR DESIGN - CONTROL SECTION

TITLE = STAGE MATCHING INVESTIGATION - FAN DESIGN
THERE WILL BE AN ENTRY TO THE AERODYNAMIC SECTION
NUMBER OF ARBITRARY MEANLINE BLADEROWS = 2
NUMBER OF BLADE DESIGN PASSES = 2
AN ENTRY TO RECALCULATE WORK DISTRIBUTIONS WILL BE MADE
THIS OUTPUT FOR BLADE PASS NUMBER 2

PROGRAM UDO300 - VERSION 1.10 - AERODYNAMIC SECTION

INPUT DATA

TITLE

- FINAL DESIGN RUN

IDEAL GAS PROPERTIES SPECIFICATION

GAS CONSTANT = 53.320

GRAVITATIONAL ACCELERATION = 32.174

JOULES EQUIVALENT = 778.160

$CP = CP(1) + CP(2) * T + CP(3) * T^2 + CP(4) * T^3 + CP(5) * T^4 + CP(6) * T^5$

N	CP(N)
1	.240000E+00
2	0.
3	0.
4	0.
5	0.
6	0.

NUMBER OF STATIONS	= 21
NUMBER OF STREAMLINES	= 11
MAX NUMBER OF PASSES	= 80
MAX NUMBER OF ARBITRARY PASSES	= 10
BOUNDARY LAYER CALC INDICATOR	= 0
NUMBER OF RUNNING POINTS	= 1
STREAMLINE DISTRIBUTION INDICATOR	= 1
NUMBER OF LOSS/D-FACTOR CURVE SETS	= 2
NUMBER OF LOSS/T.E.LOSS CURVE SETS	= 1
STREAMLINE INPUT INDICATOR	= 1
STREAMLINE OUTPUT INDICATOR	= 0
PRECISION PLOT INDICATOR	= 0
MAX NUMBER OF LINES/PAGE	= 60
WAKE TRANSPORT CALC INDICATOR	= 0
MAINSTREAM MIXING CALC INDICATOR	= 0
NO OF STATIONS FROM ANALYTIC SECN	= 0
LINE-PRINTER PLOT INDICATOR	= 0
MOMENTUM EQUATION FORM INDICATOR	= 2

GRAVITATIONAL CONSTANT	= 32.1740
JOULES EQUIVALENT	= 778.160
LINEAR DIMENSION SCALE FACTOR	= 12.0000
BASIC TOLERANCE	= .00100
KINEMATIC VISCOSITY	= .00018
B.L. SHAPE FACTOR	= .70000

PLOTTING SCALE FOR DIMENSIONS	= 1.000
PLOTTING SCALE FOR PRESSURES	= 2.000
MINIMUM RADIUS ON PLOT	= 0.000
MINIMUM PRESSURE ON PLOT	= 8.000
MAXIMUM M-SQUARED IN RELAXATION FACTOR	= .6000
CONSTANT IN RELAXATION FACTOR	= 4.0000

WAKE TRANSFER CONSTANT	= 0.00000
TURBULENT MIXING CONSTANT	= 0.00000

POINTS TO BE COMPUTED

NO	FLOWRATE	SPEED FACTOR
1	34.460	1.000

ANNULUS / COMPUTING STATION GEOMETRY

STATION 1 SPECIFIED BY 2 POINTS

XSTN	RSTN
-9.0000	7.1250
-9.0000	9.5000

STATION 2 SPECIFIED BY 2 POINTS

XSTN	RSTN
-6.0000	7.1250
-6.0000	9.5000

STATION 3 SPECIFIED BY 2 POINTS

XSTN	RSTN
-3.0000	7.1250
-3.0000	9.5000

STATION 4 SPECIFIED BY 2 POINTS

XSTN	RSTN
-.4500	7.1250
-.4500	9.5000

STATION 5 SPECIFIED BY 2 POINTS

XSTN	RSTN
0.0000	7.1250
0.0000	9.5000

STATION 6 SPECIFIED BY 2 POINTS

XSTN	RSTN
.4500	7.1750
.4500	9.5000

STATION 7 SPECIFIED BY 2 POINTS

XSTN	RSTN
.9000	7.2850
.9000	9.5000

STATION 8 SPECIFIED BY 2 POINTS

XSTN	RSTN
1.3500	7.4150
1.3500	9.5000

STATION 9 SPECIFIED BY 2 POINTS

XSTN	RSTN
1.8000	7.5740
1.8000	9.5000

STATION 10 SPECIFIED BY 2 POINTS

XSTN	RSTN
2.2500	7.7540
2.2500	9.5000

STATION 11 SPECIFIED BY 11 POINTS

XSTN	RSTN
2.3750	7.8070
2.3950	7.9770
2.4090	8.1460
2.4160	8.3130
2.4180	8.4820
2.4160	8.6520
2.4110	8.8230
2.4040	8.9910
2.3960	9.1610
2.3860	9.3300
2.3750	9.5000

STATION 12 SPECIFIED BY 11 POINTS

XSTN	RSTN
2.5000	7.8600
2.5400	8.0230
2.5680	8.1880
2.5820	8.3500
2.5850	8.5130
2.5820	8.6790
2.5720	8.8440
2.5580	9.0080
2.5420	9.1720
2.5220	9.3340
2.5000	9.5000

STATION 13 SPECIFIED BY 11 POINTS

XSTN	RSTN
2.6250	7.9120
2.6850	8.0710
2.7270	8.2300
2.7480	8.3880
2.7530	8.5470
2.7480	8.7060
2.7330	8.8650
2.7120	9.0240
2.6880	9.1820
2.6580	9.3410
2.6250	9.5000

STATION 14 SPECIFIED BY 11 POINTS

XSTN	RSTN
3.0000	8.0220
3.0480	8.1620
3.0820	8.3070
3.0980	8.4460
3.1020	8.5880
3.0980	8.7270
3.0860	8.8820
3.0700	9.0380
3.0500	9.1910
3.0260	9.3430
3.0000	9.5000

STATION 15 SPECIFIED BY 11 POINTS

XSTN	RSTN
3.3750	8.0770
3.4110	8.2100
3.4360	8.3480
3.4490	8.4800
3.4520	8.6180
3.4490	8.7490
3.4400	8.9000
3.4270	9.0500
3.4130	9.2000
3.3950	9.3490
3.3750	9.5000

STATION 16 SPECIFIED BY 11 POINTS

XSTN	RSTN
3.7500	8.1090
3.7740	8.2370
3.7910	8.3710
3.7990	8.5030
3.8010	8.6410
3.7990	8.7690
3.7930	8.9180
3.7850	9.0620
3.7750	9.2090
3.7630	9.3530
3.7500	9.5000

STATION 17 SPECIFIED BY 11 POINTS

XSTN	RSTN
4.1250	8.1220
4.1370	8.2520
4.1450	8.3870
4.1500	8.5220
4.1510	8.6600
4.1500	8.7900
4.1470	8.9340
4.1420	9.0740
4.1380	9.2170
4.1320	9.3580
4.1250	9.5000

STATION 18 SPECIFIED BY 2 POINTS

XSTN	RSTN
4.5000	8.1240
4.5000	9.5000

STATION 19 SPECIFIED BY 2 POINTS

XSTN	RSTN
4.8750	8.1240
4.8750	9.5000

STATION 20 SPECIFIED BY 2 POINTS

XSTN	RSTN
6.0000	8.1240
6.0000	9.5000

STATION 21 SPECIFIED BY 2 POINTS

XSTN	RSTN
7.1250	8.1240
7.1250	9.5000

STATION CALCULATION DATA

STATION 1 NDATA= 1 NTERP= 0 NDIMEN= 0 NMACH= 0 NPLT1= 0 NPLT2= 0

DATA	TOTAL PRESSURE	TOTAL TEMPERATURE	WHIRL ANGLE
0.0000	14.7000	518.690	0.000

STATION 2

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLT1= 0 NPLT2= 0 NPLT3= 0 NPLT4= 0 NPLT5= 0 NBLEED= 0

STATION 3

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLT1= 0 NPLT2= 0 NPLT3= 0 NPLT4= 0 NPLT5= 0 NBLEED= 0

STATION 4

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLT1= 0 NPLT2= 0 NPLT3= 0 NPLT4= 0 NPLT5= 0 NBLEED= 0

STATION 5

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLT1= 0 NPLT2= 0 NPLT3= 0 NPLT4= 0 NPLT5= 0 NBLEED= 0

STATION 6

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -1 NL2 = -1 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 28 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 16404.69

DATA6	DATA1	DATA2	DATA6
7.1750	131.310	0.000000	0.0000
7.6400	131.290	0.000000	0.0000
8.1050	131.290	0.000000	0.0000
8.5700	131.300	0.000000	0.0000
9.0350	131.380	0.000000	0.0000
9.5000	131.530	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.1750	4.2682	.13938	2.03245	-57.6154
7.6956	1.2052	.12049	1.94600	-57.3405
8.1739	-.0605	.11010	1.91419	-58.0579
8.6307	-2.9317	.10152	1.90014	-58.9583
9.0720	-2.0588	.09346	1.88954	-59.7248
9.5000	-.8102	.08441	1.86882	-60.1375

STATION 7

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -2 NL2 = -2 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 28 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 16404.69

DATA6	DATA1	DATA2	DATA6
7.2850	138.130	0.000000	0.0000
7.7280	138.090	0.000000	0.0000
8.1710	138.090	0.000000	0.0000
8.6140	138.110	0.000000	0.0000
9.0570	138.270	0.000000	0.0000
9.5000	138.570	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.2850	-2.2328	.18252	2.03245	-51.6369
7.7784	-1.9321	.16490	1.94600	-52.2695
8.2342	-.9136	.15498	1.91419	-53.6329
8.6710	-4.3100	.14614	1.90014	-55.1606
9.0927	-3.4606	.13645	1.88954	-56.2854
9.5000	-4.9527	.12371	1.86882	-56.8041

STATION 8

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -3 NL2 = -3 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 28 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 16404.69

DATA6	DATA1	DATA2	DATA6
7.4150	144.950	0.000000	0.0000
7.8320	144.880	0.000000	0.0000
8.2490	144.880	0.000000	0.0000
8.6660	144.930	0.000000	0.0000
9.0830	145.160	0.000000	0.0000
9.5000	145.620	0.000000	0.0000

DATA2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.4150	-4.3349	.16284	2.03245	-45.0003
7.8720	-2.2646	.15099	1.94600	-46.1171
8.2963	.7263	.14537	1.91419	-48.2535
8.7070	-3.6474	.14051	1.90014	-50.7326
9.1080	-3.4178	.13421	1.88954	-52.5529
9.5000	-7.3142	.12479	1.86882	-53.7182

STATION 9

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -4 NL2 = -4 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 28 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 16404.69

DATA6	DATA1	DATA2	DATA6
7.5740	151.770	0.000000	0.0000
7.9590	151.680	0.000000	0.0000
8.3440	151.670	0.000000	0.0000
8.7300	151.740	0.000000	0.0000
9.1150	152.050	0.000000	0.0000
9.5000	152.660	0.000000	0.0000

DATA2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.5740	-4.1577	.09704	2.03245	-34.5185
7.9782	.2970	.09300	1.94600	-37.2556
8.3632	5.1988	.09182	1.91419	-40.8731
8.7425	-.2631	.09146	1.90014	-45.1079
9.1202	-.6462	.09055	1.88954	-48.3266
9.5000	-5.8338	.08860	1.86882	-51.0677

STATION 10

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 1
 NL1 = -5 NL2 = -5 NEVAL = 1 NCURVE= 0 NLITER= 0 NDEL = -2
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 28 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 16404.69

DATA6	DATA1	DATA2	DATA6
7.7540	158.590	.084200	0.0000
8.1030	158.480	.091500	0.0000
8.4520	158.470	.099000	0.0000
8.8020	158.550	.106700	0.0000
9.1510	158.940	.121200	0.0000
9.5000	159.700	.143700	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.7540	2.7057	.00574	2.03245	-17.6568
8.1009	7.8782	.00575	1.94600	-24.2238
8.4415	13.8243	.00585	1.91419	-30.8391
8.7851	7.2962	.00593	1.90014	-38.2569
9.1360	6.5108	.00605	1.88954	-43.8818
9.5000	1.7612	.00619	1.86882	-49.0880

DELC	DELTA
7.1250	5.0000
9.5000	5.0000

STATION 11

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 12

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 13

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 14

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -1 NL2 = -1 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA2	DATA1	DATA6
8.0220	4777.140	0.000000	0.0000
8.3070	4760.690	0.000000	0.0000
8.5880	4758.920	0.000000	0.0000
8.8820	4771.100	0.000000	0.0000
9.1910	4825.380	0.000000	0.0000
9.5000	4932.850	0.000000	0.0000

DATA6	DATA2	DATA1	DATA6	DATA21
8.0220	-3.2181	.06043	1.93960	34.6027
8.2934	-2.9320	.06050	1.76417	34.6336
8.5724	-2.0360	.06311	1.67869	34.6970
8.8650	-1.0465	.06653	1.63762	34.9447
9.1740	-.2534	.07101	1.62252	35.2403
9.5000	-.4821	.07668	1.62697	35.6498

DAT2C DAT23 DAT24 DAT25 NWORK=0,5,OR 6 ONLY- DAT21

DATA6	DATA2	DATA1	DATA6	DATA21
8.0220	-3.2181	.06043	1.93960	34.6027
8.2934	-2.9320	.06050	1.76417	34.6336
8.5724	-2.0360	.06311	1.67869	34.6970
8.8650	-1.0465	.06653	1.63762	34.9447
9.1740	-.2534	.07101	1.62252	35.2403
9.5000	-.4821	.07668	1.62697	35.6498

STATION 15

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -2 NL2 = -2 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA2	DATA1	DATA6
8.0770	3582.850	0.000000	0.0000
8.3480	3570.520	0.000000	0.0000
8.6180	3569.190	0.000000	0.0000
8.9000	3578.330	0.000000	0.0000
9.2000	3619.030	0.000000	0.0000
9.5000	3699.640	0.000000	0.0000

DATA6	DATA2	DATA1	DATA6	DATA21
8.0770	-1.7433	.07912	1.93960	22.3839
8.3316	-1.7862	.07962	1.76417	22.7683
8.6003	-1.2004	.08298	1.67869	22.7787
8.8844	-.5990	.08780	1.63762	22.8545
9.1844	-.5974	.09377	1.62252	22.8997
9.5000	-.5013	.10093	1.62697	22.9968

DAT2C DAT23 DAT24 DAT25 NWORK=0,5,OR 6 ONLY- DAT21

DATA6	DATA2	DATA1	DATA6	DATA21
8.0770	-1.7433	.07912	1.93960	22.3839
8.3316	-1.7862	.07962	1.76417	22.7683
8.6003	-1.2004	.08298	1.67869	22.7787
8.8844	-.5990	.08780	1.63762	22.8545
9.1844	-.5974	.09377	1.62252	22.8997
9.5000	-.5013	.10093	1.62697	22.9968

STATION 16

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -3 NL2 = -3 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
8.1090	2388.570	0.000000	0.0000
8.3710	2380.340	0.000000	0.0000
8.6410	2379.460	0.000000	0.0000
8.9180	2385.550	0.000000	0.0000
9.2090	2412.690	0.000000	0.0000
9.5000	2466.420	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

8.1090	-.3035	.07554	1.93960	10.6117
8.3556	-.5848	.07604	1.76417	10.8086
8.6185	-.5501	.07907	1.67869	10.7979
8.8975	-.4075	.08366	1.63762	10.7576
9.1918	-.4278	.08931	1.62252	10.6978
9.5000	-.6499	.09594	1.62697	10.6409

STATION 17

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -4 NL2 = -4 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
8.1220	1194.280	0.000000	0.0000
8.3870	1190.170	0.000000	0.0000
8.6600	1189.730	0.000000	0.0000
8.9340	1192.780	0.000000	0.0000
9.2170	1206.340	0.000000	0.0000
9.5000	1233.210	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

8.1220	.1686	.05277	1.93960	.1197
8.3674	-.1076	.05317	1.76417	.0158
8.6290	-.2096	.05495	1.67869	-.2082
8.9059	-.2183	.05787	1.63762	-.3629
9.1969	-.2955	.06153	1.62252	-.5071
9.5000	-.5046	.06584	1.62697	-.6915

STATION 18

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 1
 NL1 = -5 NL2 = -5 NEVAL = 2 NCURVE= 0 NLITER= 0 NDEL = -2
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
8.1240	0.000	.067800	0.0000
8.3990	0.000	.065400	0.0000
8.6740	0.000	.063900	0.0000
8.9500	0.000	.061800	0.0000
9.2250	0.000	.059600	0.0000
9.5000	0.000	.057100	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
8.1240	0.0000	.00963	1.93960	-8.0473
8.3718	0.0000	.00939	1.76417	-8.5821
8.6343	0.0000	.00912	1.67869	-9.0727
8.9108	0.0000	.00880	1.63762	-9.4348
9.2001	0.0000	.00850	1.62252	-9.7791
9.5000	0.0000	.00821	1.62697	-10.2447

DELC	DELTA
7.9120	5.0000
9.5000	5.0000

STATION 19

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 20

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 21

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

BLOCKAGE FACTOR SPECIFICATIONS

STATION	WALL BLOCKAGE	WAKE BLOCKAGE	WAKE DISTRIBUTION FACTOR
1	0.00000	0.00000	1.000
2	.00050	0.00000	1.000
3	.00100	0.00000	1.000
4	.00150	0.00000	1.000
5	.00230	0.00000	1.000
6	.00340	.00500	1.000
7	.00450	.01000	1.000
8	.00640	.02000	1.000
9	.00800	.03500	1.000
10	.01200	.05000	1.000
11	.01300	.05000	1.000
12	.01400	.05000	1.000
13	.01550	.05000	1.000
14	.01530	.05400	1.000
15	.01410	.05800	1.000
16	.01410	.06200	1.000
17	.01630	.06600	1.000
18	.01880	.07000	1.000
19	.01900	.07000	1.000
20	.01950	.07000	1.000
21	.01970	.07000	1.000

LOSS PARAMETER / DIFFUSION FACTOR CURVES FOR BLADE TYPE 1 (15 D-FACTORS GIVEN)

DIFFUSION FACTORS	L O S S HUB	P A R A M E T E R S MID	TIP
0.000	.00500	.00500	.00500
.050	.00500	.00500	.00500
.100	.00500	.00500	.00500
.150	.00500	.00500	.00500
.200	.00500	.00500	.00500
.250	.00500	.00500	.00500
.300	.00500	.00500	.00500
.350	.00520	.00520	.00520
.400	.00560	.00560	.00580
.450	.00610	.00610	.00700
.500	.00710	.00710	.00890
.550	.00870	.00870	.01190
.600	.01120	.01120	.01640
.650	.01490	.01490	.02300
.700	.02050	.02050	.03370

LOSS PARAMETER / DIFFUSION FACTOR CURVES FOR BLADE TYPE 2
(15 D-FACTORS GIVEN)

DIFFUSION FACTORS	L O S S P A R A M E T E R S		
	HUB	MID	TIP
0.000	.00340	.00340	.00340
.050	.00390	.00390	.00390
.100	.00450	.00450	.00450
.150	.00510	.00510	.00510
.200	.00600	.00600	.00600
.250	.00720	.00720	.00720
.300	.00850	.00850	.00850
.350	.01020	.01020	.01020
.400	.01200	.01200	.01200
.450	.01450	.01450	.01450
.500	.01720	.01720	.01720
.550	.02170	.02170	.02170
.600	.02640	.02640	.02640
.650	.03180	.03180	.03180
.700	.03870	.03870	.03870

FRACTIONAL LOSS DISTRIBUTION CURVES FOR BLADE CLASS 1

6 POINTS GIVEN AT 1 RADIAL LOCATIONS

FRACTION OF COMPUTING STATION LENGTH AT BLADE EXIT = .5000

FRACTION OF MERIDIONAL CHORD LOSS/LOSS AT TRAILING EDGE

0.0000	0.0000
.2000	.2000
.4000	.4000
.6000	.6000
.8000	.8000
1.0000	1.0000

 WORK DISTRIBUTIONS HAVE BEEN CALCULATED FOR 2 BLADE ROWS

*****THE WORK DISTRIBUTION FOR THE BLADE ROW BETWEEN STATION 5
 *****AND STATION 10 CONSISTS OF A BASELINE DISTRIBUTION
 *****ONLY.

*****THE FOLLOWING EDGE DATA WERE USED TO DEFINE THE
 WORK DISTRIBUTION

LEADING EDGE		***TRAILING EDGE***	
SPAN	WORK	SPAN	WORK
0.0000	124.4900	0.0000	158.5900
.1174	124.4900	.1079	158.5300
.2295	124.4900	.2131	158.4800
.3369	124.4900	.3162	158.4600
.4404	124.4900	.4174	158.4700
.5403	124.4900	.5170	158.4800
.6372	124.4900	.6151	158.5500
.7314	124.4900	.7122	158.6900
.8230	124.4900	.8084	158.9400
.9125	124.4900	.9042	159.2600
1.0000	124.4900	1.0000	159.7000

*****THE BASELINE WORK DISTRIBUTION WAS COMPUTED USING
 *****THE FOLLOWING SLOPE COEFFICIENTS

A1H= 1.0300	A2H= .5000	A1T= 1.2000
A2T= 0.0000	A1D= 1.0000	A2D= 1.0000

*****THE COMPUTED TOTAL WORK DISTRIBUTION IS AS FOLLOWS

	(COMPUTING STATION)					
	5	6	7	8	9	10
(S.L.)						
11	124.49	133.56	142.97	151.36	157.39	159.70
10	124.49	133.32	142.48	150.70	156.69	159.21
9	124.49	133.11	142.08	150.16	156.14	158.88
8	124.49	132.93	141.72	149.69	155.68	158.64
7	124.49	132.77	141.42	149.30	155.33	158.52
6	124.49	132.62	141.14	148.95	155.05	158.47
5	124.49	132.47	140.86	148.62	154.80	158.47
4	124.49	132.31	140.56	148.28	154.54	158.46
3	124.49	132.14	140.25	147.93	154.30	158.49
2	124.49	131.94	139.92	147.57	154.06	158.54
1	124.49	131.71	139.54	147.14	153.80	158.59

*****INPUT DATA HAVE BEEN UPDATED AS FOLLOWS

STATION 6	
DATA1	DATA2
7.1750	131.7111
7.6400	132.0964
8.1050	132.4282
8.5700	132.7328
9.0350	133.0797
9.5000	133.5601

STATION 7	
DATA1	DATA2
7.2850	139.5352
7.7280	140.1858
8.1710	140.7770
8.6140	141.3424
9.0570	142.0150
9.5000	142.9682

STATION 8	
DATA1	DATA2
7.4150	147.1450
7.8320	147.8692
8.2490	148.5476
8.6660	149.2267
9.0830	150.0947
9.5000	151.3623

STATION 9	
DATA1	DATA2
7.5740	153.7981
7.9590	154.2744
8.3440	154.7710
8.7300	155.3145
9.1150	156.1269
9.5000	157.3902

STATION 10	
DATA1	DATA2
7.7540	158.5900
8.1030	158.4888
8.4520	158.4667
8.8020	158.5264
9.1510	158.9008
9.5000	159.7000

*****THE WORK DISTRIBUTION FOR THE BLADE ROW BETWEEN STATION 13
 *****AND STATION 18 CONSISTS OF A BASELINE DISTRIBUTION
 *****ONLY.

*****THE FOLLOWING EDGE DATA WERE USED TO DEFINE
 THE WORK DISTRIBUTIONS

LEADING EDGE		***TRAILING EDGE***	
SPAN	WORK	SPAN	WORK
0.0000	5971.4200	0.0000	0.0000
.1079	5959.6800	.1015	0.0000
.2131	5950.8600	.2029	0.0000
.3162	5948.3100	.3041	0.0000
.4174	5948.6500	.4049	0.0000
.5170	5951.8600	.5054	0.0000
.6151	5963.8800	.6055	0.0000
.7122	5988.3600	.7051	0.0000
.8084	6031.7200	.8040	0.0000
.9042	6087.5100	.9023	0.0000
1.0000	6166.0600	1.0000	0.0000

*****THE BASELINE WORK DISTRIBUTION WAS COMPUTED USING
 *****THE FOLLOWING SLOPE COEFFICIENTS

A1H= 1.3000	A2H= 0.0000	A1T= 1.3000
A2T= 0.0000	A1D= 1.0000	A2D= 1.0000

*****THE COMPUTED TOTAL WORK DISTRIBUTION IS AS FOLLOWS

	(COMPUTING STATION)					
	13	14	15	16	17	18
(S.L.)						
11	6166.06	4498.76	2841.32	1400.93	384.76	0.00
10	6075.95	4439.24	2801.46	1382.40	378.43	0.00
9	6016.47	4393.55	2773.66	1367.91	374.73	0.00
8	5975.92	4360.25	2755.98	1357.19	373.23	0.00
7	5956.87	4349.50	2743.73	1352.79	369.83	0.00
6	5949.53	4340.05	2737.13	1349.50	369.27	0.00
5	5948.30	4333.43	2731.19	1346.64	368.56	0.00
4	5948.76	4331.65	2730.02	1345.63	368.98	0.00
3	5952.98	4332.08	2734.16	1344.77	370.47	0.00
2	5961.61	4329.80	2728.41	1342.27	368.60	0.00
1	5971.42	4306.84	2706.24	1329.94	364.63	0.00

*****INPUT DATA HAVE BEEN UPDATED AS FOLLOWS

STATION 14

DATA1	DATA2
8.0220	4306.8430
8.3070	4331.9112
8.5880	4333.8844
8.8820	4350.3336
9.1910	4397.9761
9.5000	4498.7574

STATION 15

DATA1	DATA2
8.0770	2706.2391
8.3480	2733.8490
8.6180	2731.8067
8.9000	2744.7320
9.2000	2775.9152
9.5000	2841.3204

STATION 16

DATA1	DATA2
8.1090	1329.9415
8.3710	1344.8295
8.6410	1346.9823
8.9180	1353.2361
9.2090	1369.3908
9.5000	1400.9288

STATION 17

DATA1	DATA2
8.1220	364.6311
8.3870	370.3876
8.6600	368.7190
8.9340	370.3654
9.2170	375.0241
9.5000	384.7621

STATION 18

DATA1	DATA2
8.1240	0.0000
8.3990	0.0000
8.6740	0.0000
8.9500	0.0000
9.2250	0.0000
9.5000	0.0000

STATION 1 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	609.56	0.00	609.56	0.00	609.56
2	7.3625	609.56	0.00	609.56	.00	609.56
3	7.6000	609.56	0.00	609.56	.00	609.56
4	7.8375	609.56	0.00	609.56	.00	609.56
5	8.0750	609.56	0.00	609.56	.01	609.56
6	8.3125	609.56	0.00	609.56	.01	609.56
7	8.5500	609.56	0.00	609.56	.01	609.56
8	8.7875	609.56	0.00	609.56	.00	609.56
9	9.0250	609.56	0.00	609.56	.00	609.56
10	9.2625	609.56	0.00	609.56	.00	609.56
11	9.5000	609.56	0.00	609.56	0.00	609.56

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1250	-9.0000	0.0000	0.00	0.000		0.000
2	7.3625	-9.0000	.2375	0.00	.000		0.000
3	7.6000	-9.0000	.4750	0.00	.000		0.000
4	7.8375	-9.0000	.7125	0.00	.000		0.000
5	8.0750	-9.0000	.9500	0.00	.001		0.000
6	8.3125	-9.0000	1.1875	0.00	.001		0.000
7	8.5500	-9.0000	1.4250	0.00	.001		0.000
8	8.7875	-9.0000	1.6625	0.00	.000		0.000
9	9.0250	-9.0000	1.9000	0.00	.000		0.000
10	9.2625	-9.0000	2.1375	0.00	.000		0.000
11	9.5000	-9.0000	2.3750	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5633	14.7000	11.8530	518.690	487.771	.065627
2	7.3625	.5633	14.7000	11.8530	518.690	487.771	.065627
3	7.6000	.5633	14.7000	11.8530	518.690	487.771	.065627
4	7.8375	.5633	14.7000	11.8530	518.690	487.771	.065627
5	8.0750	.5633	14.7000	11.8530	518.690	487.771	.065627
6	8.3125	.5633	14.7000	11.8530	518.690	487.771	.065627
7	8.5500	.5633	14.7000	11.8530	518.690	487.771	.065627
8	8.7875	.5633	14.7000	11.8530	518.690	487.771	.065627
9	9.0250	.5633	14.7000	11.8530	518.690	487.771	.065627
10	9.2625	.5633	14.7000	11.8530	518.690	487.771	.065627
11	9.5000	.5633	14.7000	11.8530	518.690	487.771	.065627

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.065	.975606	0.000	0.000
2	7.3625	124.486	117.065	.975606	0.000	.000
3	7.6000	124.486	117.065	.975606	0.000	.000
4	7.8375	124.486	117.065	.975606	0.000	.000
5	8.0750	124.486	117.065	.975606	0.000	.001
6	8.3125	124.486	117.065	.975606	0.000	.001
7	8.5500	124.486	117.065	.975606	0.000	.001
8	8.7875	124.486	117.065	.975606	0.000	.000
9	9.0250	124.486	117.065	.975606	0.000	.000
10	9.2625	124.486	117.065	.975606	0.000	.000
11	9.5000	124.486	117.065	.975606	0.000	0.000

STATION 2 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	609.97	0.00	609.97	0.00	609.97
2	7.3625	609.98	0.00	609.98	.02	609.98
3	7.6000	609.98	0.00	609.98	.05	609.98
4	7.8375	609.99	0.00	609.99	.06	609.99
5	8.0750	610.00	0.00	610.00	.07	610.00
6	8.3125	610.01	0.00	610.01	.07	610.01
7	8.5500	610.02	0.00	610.02	.07	610.02
8	8.7875	610.03	0.00	610.03	.06	610.03
9	9.0250	610.04	0.00	610.04	.04	610.04
10	9.2625	610.04	0.00	610.04	.02	610.04
11	9.5000	610.04	0.00	610.04	0.00	610.04

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1250	-6.0000	0.0000	0.00	0.000		0.000
2	7.3625	-6.0000	.2375	40014.40	.002		0.000
3	7.6000	-6.0000	.4750	21446.60	.004		0.000
4	7.8375	-6.0000	.7125	15907.81	.006		0.000
5	8.0750	-6.0000	.9500	13823.80	.007		0.000
6	8.3125	-6.0000	1.1875	13428.64	.007		0.000
7	8.5500	-6.0000	1.4250	14409.95	.006		0.000
8	8.7875	-6.0000	1.6625	17264.66	.005		0.000
9	9.0250	-6.0000	1.9000	24176.58	.004		0.000
10	9.2625	-6.0000	2.1375	46696.09	.002		0.000
11	9.5000	-6.0000	2.3750	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5637	14.7000	11.8494	518.690	487.729	.065613
2	7.3625	.5637	14.7000	11.8494	518.690	487.729	.065613
3	7.6000	.5637	14.7000	11.8494	518.690	487.729	.065613
4	7.8375	.5637	14.7000	11.8493	518.690	487.728	.065613
5	8.0750	.5637	14.7000	11.8492	518.690	487.727	.065612
6	8.3125	.5637	14.7000	11.8491	518.690	487.726	.065612
7	8.5500	.5637	14.7000	11.8490	518.690	487.725	.065611
8	8.7875	.5637	14.7000	11.8489	518.690	487.724	.065611
9	9.0250	.5637	14.7000	11.8489	518.690	487.723	.065611
10	9.2625	.5637	14.7000	11.8488	518.690	487.723	.065611
11	9.5000	.5637	14.7000	11.8488	518.690	487.723	.065611

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.055	.975606	0.000	0.000
2	7.3625	124.486	117.055	.975606	0.000	.002
3	7.6000	124.486	117.055	.975606	0.000	.004
4	7.8375	124.486	117.055	.975606	0.000	.006
5	8.0750	124.486	117.054	.975606	0.000	.007
6	8.3125	124.486	117.054	.975606	0.000	.007
7	8.5500	124.486	117.054	.975606	0.000	.006
8	8.7875	124.486	117.054	.975606	0.000	.005
9	9.0250	124.486	117.054	.975606	0.000	.004
10	9.2625	124.486	117.053	.975606	0.000	.002
11	9.5000	124.486	117.053	.975606	0.000	0.000

STATION 3 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	609.50	0.00	609.50	0.00	609.50
2	7.3627	609.55	0.00	609.55	.64	609.55
3	7.6005	609.70	0.00	609.69	1.18	609.70
4	7.8381	609.91	0.00	609.91	1.55	609.91
5	8.0757	610.17	0.00	610.17	1.74	610.17
6	8.3132	610.44	0.00	610.44	1.75	610.44
7	8.5507	610.71	0.00	610.70	1.60	610.71
8	8.7881	610.93	0.00	610.93	1.31	610.93
9	9.0254	611.11	0.00	611.11	.93	611.11
10	9.2627	611.22	0.00	611.22	.48	611.22
11	9.5000	611.26	0.00	611.26	0.00	611.26

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
RADIUS	X-COORD	L-COORD		
1	7.1250	-3.0000	0.0000	0.000
2	7.3627	-3.0000	.2377	0.000
3	7.6005	-3.0000	.4755	0.000
4	7.8381	-3.0000	.7131	0.000
5	8.0757	-3.0000	.9507	0.000
6	8.3132	-3.0000	1.1882	0.000
7	8.5507	-3.0000	1.4257	0.000
8	8.7881	-3.0000	1.6631	0.000
9	9.0254	-3.0000	1.9004	0.000
10	9.2627	-3.0000	2.1377	0.000
11	9.5000	-3.0000	2.3750	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5632	14.7000	11.8535	518.690	487.777	.065629
2	7.3627	.5633	14.7000	11.8531	518.690	487.772	.065627
3	7.6005	.5634	14.7000	11.8518	518.690	487.758	.065623
4	7.8381	.5636	14.7000	11.8500	518.690	487.736	.065615
5	8.0757	.5639	14.7000	11.8477	518.690	487.710	.065606
6	8.3132	.5641	14.7000	11.8454	518.690	487.682	.065597
7	8.5507	.5644	14.7000	11.8431	518.690	487.655	.065588
8	8.7881	.5646	14.7000	11.8411	518.690	487.632	.065580
9	9.0254	.5648	14.7000	11.8396	518.690	487.614	.065574
10	9.2627	.5649	14.7000	11.8386	518.690	487.603	.065570
11	9.5000	.5649	14.7000	11.8383	518.690	487.599	.065569

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.067	.975606	0.000	0.000
2	7.3627	124.486	117.065	.975606	0.000	.060
3	7.6005	124.486	117.062	.975606	0.000	.110
4	7.8381	124.486	117.057	.975606	0.000	.145
5	8.0757	124.486	117.050	.975606	0.000	.163
6	8.3132	124.486	117.044	.975606	0.000	.164
7	8.5507	124.486	117.037	.975606	0.000	.150
8	8.7881	124.486	117.032	.975606	0.000	.123
9	9.0254	124.486	117.027	.975606	0.000	.087
10	9.2627	124.486	117.025	.975606	0.000	.045
11	9.5000	124.486	117.024	.975606	0.000	0.000

STATION 4 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	590.33	0.00	590.33	0.00	590.33
2	7.3679	591.89	0.00	591.77	11.71	591.89
3	7.6099	595.91	0.00	595.64	17.92	595.91
4	7.8505	601.15	0.00	600.80	20.60	601.15
5	8.0896	606.77	0.00	606.41	20.94	606.77
6	8.3272	612.21	0.00	611.89	19.62	612.21
7	8.5635	617.09	0.00	616.85	17.10	617.09
8	8.7986	621.16	0.00	621.01	13.65	621.16
9	9.0328	624.21	0.00	624.14	9.50	624.21
10	9.2665	626.11	0.00	626.09	4.86	626.11
11	9.5000	626.75	0.00	626.75	0.00	626.75

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE		STATION LEAN ANGLE
		X-COORD	L-COORD				
1	7.1250	-.4500	0.0000	0.00	0.000		0.000
2	7.3679	-.4500	.2429	42.22	1.134		0.000
3	7.6099	-.4500	.4849	28.46	1.723		0.000
4	7.8505	-.4500	.7255	25.52	1.964		0.000
5	8.0896	-.4500	.9646	25.83	1.977		0.000
6	8.3272	-.4500	1.2022	28.24	1.837		0.000
7	8.5635	-.4500	1.4385	33.05	1.588		0.000
8	8.7986	-.4500	1.6736	41.98	1.259		0.000
9	9.0328	-.4500	1.9078	60.88	.872		0.000
10	9.2665	-.4500	2.1415	119.55	.445		0.000
11	9.5000	-.4500	2.3750	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5444	14.7000	12.0172	518.690	489.691	.066276
2	7.3679	.5459	14.7000	12.0041	518.690	489.538	.066224
3	7.6099	.5499	14.7000	11.9699	518.690	489.140	.066089
4	7.8505	.5550	14.7000	11.9252	518.690	488.619	.065913
5	8.0896	.5605	14.7000	11.8771	518.690	488.054	.065722
6	8.3272	.5659	14.7000	11.8301	518.690	487.502	.065537
7	8.5635	.5707	14.7000	11.7877	518.690	487.003	.065369
8	8.7986	.5747	14.7000	11.7522	518.690	486.584	.065228
9	9.0328	.5777	14.7000	11.7254	518.690	486.267	.065122
10	9.2665	.5796	14.7000	11.7088	518.690	486.070	.065056
11	9.5000	.5802	14.7000	11.7031	518.690	486.003	.065033

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.526	.975606	0.000	0.000
2	7.3679	124.486	117.489	.975606	0.000	1.134
3	7.6099	124.486	117.394	.975606	0.000	1.723
4	7.8505	124.486	117.268	.975606	0.000	1.964
5	8.0896	124.486	117.133	.975606	0.000	1.977
6	8.3272	124.486	117.001	.975606	0.000	1.837
7	8.5635	124.486	116.881	.975606	0.000	1.588
8	8.7986	124.486	116.780	.975606	0.000	1.259
9	9.0328	124.486	116.704	.975606	0.000	.872
10	9.2665	124.486	116.657	.975606	0.000	.445
11	9.5000	124.486	116.641	.975606	0.000	0.000

STATION 5 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	525.63	0.00	524.82	29.07	525.63
2	7.3848	555.18	0.00	553.41	44.36	555.18
3	7.6353	578.45	0.00	576.15	51.51	578.45
4	7.8792	597.00	0.00	594.63	53.18	597.00
5	8.1183	611.95	0.00	609.81	51.21	611.95
6	8.3536	624.17	0.00	622.42	46.74	624.17
7	8.5862	634.26	0.00	632.97	40.37	634.26
8	8.8165	642.52	0.00	641.71	32.41	642.52
9	9.0452	648.99	0.00	648.58	22.97	648.99
10	9.2728	653.34	0.00	653.22	12.08	653.34
11	9.5000	654.92	0.00	654.92	0.00	654.92

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1250	0.0000	0.0000	4.08	3.170	0.000	0.000
2	7.3848	0.0000	.2598	5.32	4.583	0.000	0.000
3	7.6353	0.0000	.5103	6.90	5.109	0.000	0.000
4	7.8792	0.0000	.7542	8.86	5.111	0.000	0.000
5	8.1183	0.0000	.9933	11.17	4.800	0.000	0.000
6	8.3536	0.0000	1.2286	13.82	4.294	0.000	0.000
7	8.5862	0.0000	1.4612	16.97	3.649	0.000	0.000
8	8.8165	0.0000	1.6915	21.23	2.891	0.000	0.000
9	9.0452	0.0000	1.9202	28.68	2.028	0.000	0.000
10	9.2728	0.0000	2.1478	50.56	1.060	0.000	0.000
11	9.5000	0.0000	2.3750	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.4818	14.7000	12.5416	518.690	495.700	.068329
2	7.3848	.5103	14.7000	12.3077	518.690	493.042	.067416
3	7.6353	.5328	14.7000	12.1168	518.690	490.847	.066668
4	7.8792	.5509	14.7000	11.9607	518.690	489.032	.066053
5	8.1183	.5656	14.7000	11.8323	518.690	487.528	.065545
6	8.3536	.5777	14.7000	11.7258	518.690	486.272	.065123
7	8.5862	.5876	14.7000	11.6369	518.690	485.216	.064770
8	8.8165	.5958	14.7000	11.5632	518.690	484.337	.064477
9	9.0452	.6023	14.7000	11.5053	518.690	483.642	.064246
10	9.2728	.6066	14.7000	11.4660	518.690	483.171	.064089
11	9.5000	.6082	14.7000	11.4517	518.690	482.998	.064032

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	118.968	.975606	0.000	3.170
2	7.3848	124.486	118.330	.975606	0.000	4.583
3	7.6353	124.486	117.803	.975606	0.000	5.109
4	7.8792	124.486	117.368	.975606	0.000	5.111
5	8.1183	124.486	117.007	.975606	0.000	4.800
6	8.3536	124.486	116.705	.975606	0.000	4.294
7	8.5862	124.486	116.452	.975606	0.000	3.649
8	8.8165	124.486	116.241	.975606	0.000	2.891
9	9.0452	124.486	116.074	.975606	0.000	2.028
10	9.2728	124.486	115.961	.975606	0.000	1.060
11	9.5000	124.486	115.920	.975606	0.000	0.000

STATION 5 IS AT THE LEADING EDGE OF A BLADE
 ROTATING AT 16404.7 RPM. NUMBER OF BLADES IN ROW = 28.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	INCIDENCE ANGLE
1	7.1250	1020.00	1147.47	1.0518	-62.737	0.000
2	7.3848	1057.20	1194.11	1.0975	-62.294	0.000
3	7.6353	1093.06	1236.68	1.1392	-62.112	0.000
4	7.8792	1127.98	1276.22	1.1778	-62.109	0.000
5	8.1183	1162.20	1313.46	1.2140	-62.231	0.000
6	8.3536	1195.89	1348.98	1.2484	-62.439	0.000
7	8.5862	1229.18	1383.17	1.2815	-62.706	0.000
8	8.8165	1262.15	1416.28	1.3133	-63.021	0.000
9	9.0452	1294.89	1448.42	1.3441	-63.380	0.000
10	9.2728	1327.48	1479.54	1.3737	-63.795	0.000
11	9.5000	1360.00	1509.48	1.4017	-64.286	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE
1	7.1250	0.000	0.000	4.7619
2	7.3848	0.000	0.000	5.0928
3	7.6353	0.000	0.000	5.3656
4	7.8792	0.000	0.000	5.5947
5	8.1183	0.000	0.000	5.7911
6	8.3536	0.000	0.000	5.9561
7	8.5862	0.000	0.000	6.0981
8	8.8165	0.000	0.000	6.2309
9	9.0452	0.000	0.000	6.3667
10	9.2728	0.000	0.000	6.5033
11	9.5000	0.000	0.000	6.5982

STATION 6 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1750	525.86	176.12	517.81	91.66	554.57
2	7.4402	560.28	175.12	552.75	91.55	587.01
3	7.6905	584.24	173.96	577.74	86.96	609.59
4	7.9311	601.20	172.53	595.93	79.43	625.47
5	8.1653	613.19	170.97	609.16	70.18	636.58
6	8.3948	622.02	169.42	619.12	60.06	644.68
7	8.6209	629.44	167.99	627.49	49.51	651.47
8	8.8440	635.91	166.86	634.74	38.53	657.44
9	9.0647	641.36	166.33	640.80	26.85	662.58
10	9.2832	646.02	166.51	645.87	14.06	667.14
11	9.5000	648.67	167.05	648.67	0.00	669.83

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF		STREAMLINE		STATION
RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE	ANGLE	LEAN ANGLE
1	7.1750	.4500	0.0000	3.55	10.038	0.000
2	7.4402	.4500	.2652	5.47	9.404	0.000
3	7.6905	.4500	.5155	8.28	8.560	0.000
4	7.9311	.4500	.7561	12.76	7.592	0.000
5	8.1653	.4500	.9903	21.16	6.572	0.000
6	8.3948	.4500	1.2198	41.63	5.541	0.000
7	8.6209	.4500	1.4459	128.15	4.512	0.000
8	8.8440	.4500	1.6690	-504.56	3.473	0.000
9	9.0647	.4500	1.8897	-164.59	2.399	0.000
10	9.2832	.4500	2.1082	-191.57	1.247	0.000
11	9.5000	.4500	2.3250	0.00	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1750	.4948	17.8196	15.0750	548.796	523.205	.077814
2	7.4402	.5248	17.9059	14.8426	549.731	521.058	.076930
3	7.6905	.5457	17.9755	14.6809	550.563	519.641	.076300
4	7.9311	.5604	18.0347	14.5721	551.291	518.737	.075866
5	8.1653	.5707	18.0869	14.5034	551.951	518.230	.075582
6	8.3948	.5781	18.1279	14.4555	552.576	517.991	.075367
7	8.6209	.5842	18.1609	14.4141	553.194	517.878	.075168
8	8.8440	.5896	18.1949	14.3819	553.848	517.882	.074999
9	9.0647	.5941	18.2371	14.3651	554.611	518.080	.074883
10	9.2832	.5979	18.2861	14.3605	555.518	518.482	.074801
11	9.5000	.6000	18.3138	14.3595	556.500	519.165	.074698

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1750	131.711	125.569	.975960	18.516	10.038
2	7.4402	131.936	125.054	.976038	17.357	9.404
3	7.6905	132.135	124.714	.976135	16.581	8.560
4	7.9311	132.310	124.497	.976226	16.012	7.592
5	8.1653	132.468	124.375	.976316	15.580	6.572
6	8.3948	132.618	124.318	.976432	15.236	5.541
7	8.6209	132.767	124.291	.976575	14.943	4.512
8	8.8440	132.923	124.292	.976731	14.702	3.473
9	9.0647	133.107	124.339	.976903	14.539	2.399
10	9.2832	133.324	124.436	.977111	14.453	1.247
11	9.5000	133.560	124.600	.977431	14.442	0.000

STATION 6 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 16404.7 RPM. NUMBER OF BLADES IN ROW = 28.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.1750	1027.16	1000.40	.8926	-58.288	0.000
2	7.4402	1065.12	1051.68	.9402	-57.808	0.000
3	7.6905	1100.95	1095.75	.9810	-57.779	0.000
4	7.9311	1135.40	1135.15	1.0171	-58.020	0.000
5	8.1653	1168.92	1171.28	1.0500	-58.431	0.000
6	8.3948	1201.79	1205.27	1.0808	-58.930	0.000
7	8.6209	1234.15	1238.09	1.1103	-59.443	0.000
8	8.8440	1266.09	1269.92	1.1388	-59.950	0.000
9	9.0647	1297.68	1300.50	1.1660	-60.451	0.000
10	9.2832	1328.96	1329.90	1.1919	-60.937	0.000
11	9.5000	1360.00	1357.90	1.2162	-61.465	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.1750	0.000	4.268	5.5705	.01031	.1644	.1995
2	7.4402	0.000	2.443	6.0112	.01194	.1546	.1826
3	7.6905	0.000	1.222	6.3424	.01399	.1485	.1704
4	7.9311	0.000	.704	6.6045	.01579	.1441	.1611
5	8.1653	0.000	-.016	6.8168	.01744	.1409	.1536
6	8.3948	0.000	-1.583	6.9840	.01967	.1383	.1469
7	8.6209	0.000	-2.903	7.1253	.02243	.1359	.1403
8	8.8440	0.000	-2.874	7.2620	.02534	.1337	.1338
9	9.0647	0.000	-2.086	7.4084	.02849	.1320	.1279
10	9.2832	0.000	-1.377	7.5640	.03229	.1308	.1222
11	9.5000	0.000	-.810	7.6577	.03830	.1300	.1160

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 6 DELTA H ON H1	STATION 5 PRESS RATIO	5 THRU ISENT EFF	STATION 6 DELTA H ON H1
MEAN	VALUES-	1.2326	.9364	.0657	1.2326	.9364	.0657
1	7.1750	1.2122	.9731	.0580	1.2122	.9731	.0580
2	7.4402	1.2181	.9682	.0598	1.2181	.9682	.0598
3	7.6905	1.2228	.9620	.0614	1.2228	.9620	.0614
4	7.9311	1.2268	.9563	.0629	1.2268	.9563	.0629
5	8.1653	1.2304	.9510	.0641	1.2304	.9510	.0641
6	8.3948	1.2332	.9440	.0653	1.2332	.9440	.0653
7	8.6209	1.2354	.9354	.0665	1.2354	.9354	.0665
8	8.8440	1.2378	.9263	.0678	1.2378	.9263	.0678
9	9.0647	1.2406	.9168	.0693	1.2406	.9168	.0693
10	9.2832	1.2440	.9057	.0710	1.2440	.9057	.0710
11	9.5000	1.2458	.8885	.0729	1.2458	.8885	.0729

STATION 7 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.2850	541.17	361.29	522.91	139.38	650.69
2	7.5341	563.93	357.95	550.00	124.55	667.94
3	7.7709	581.06	354.69	570.78	108.83	680.76
4	7.9992	593.02	351.31	585.76	92.55	689.27
5	8.2220	600.68	347.91	595.82	76.23	694.16
6	8.4409	605.38	344.63	602.34	60.53	696.60
7	8.6572	609.28	341.69	607.54	46.07	698.55
8	8.8711	613.12	339.43	612.23	32.93	700.80
9	9.0829	616.90	338.46	616.55	20.93	703.65
10	9.2924	621.57	338.98	621.50	9.88	708.00
11	9.5000	625.09	340.25	625.09	0.00	711.70

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	7.2850	.9000	0.0000	11.23	14.925	0.000	0.000
2	7.5341	.9000	.2491	13.68	12.760	0.000	0.000
3	7.7709	.9000	.4859	19.86	10.795	0.000	0.000
4	7.9992	.9000	.7142	35.60	8.979	0.000	0.000
5	8.2220	.9000	.9370	123.73	7.290	0.000	0.000
6	8.4409	.9000	1.1559	-113.80	5.738	0.000	0.000
7	8.6572	.9000	1.3722	-46.80	4.336	0.000	0.000
8	8.8711	.9000	1.5861	-34.98	3.079	0.000	0.000
9	9.0829	.9000	1.7979	-34.28	1.945	0.000	0.000
10	9.2924	.9000	2.0074	-47.96	.911	0.000	0.000
11	9.5000	.9000	2.2150	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.2850	.5682	21.6991	17.4322	581.397	546.166	.086199
2	7.5341	.5835	21.8530	17.3545	582.943	545.818	.085869
3	7.7709	.5947	21.9773	17.3031	584.358	545.794	.085618
4	7.9992	.6019	22.0879	17.2918	585.644	546.110	.085513
5	8.2220	.6059	22.1885	17.3170	586.841	546.745	.085538
6	8.4409	.6075	22.2655	17.3545	587.996	547.618	.085587
7	8.6572	.6087	22.3256	17.3851	589.165	548.559	.085591
8	8.8711	.6101	22.3902	17.4160	590.429	549.562	.085586
9	9.0829	.6119	22.4746	17.4562	591.931	550.731	.085602
10	9.2924	.6150	22.5743	17.4908	593.737	552.026	.085570
11	9.5000	.6173	22.6171	17.4909	595.701	553.553	.085335

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.2850	139.535	131.080	.976313	33.727	14.925
2	7.5341	139.906	130.996	.976466	32.405	12.760
3	7.7709	140.246	130.991	.976659	31.401	10.795
4	7.9992	140.555	131.066	.976843	30.643	8.979
5	8.2220	140.842	131.219	.977022	30.079	7.290
6	8.4409	141.119	131.428	.977256	29.652	5.738
7	8.6572	141.399	131.654	.977548	29.284	4.336
8	8.8711	141.703	131.895	.977864	28.969	3.079
9	9.0829	142.064	132.175	.978216	28.751	1.945
10	9.2924	142.497	132.486	.978644	28.606	.911
11	9.5000	142.968	132.853	.979307	28.560	0.000

STATION 7 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 16404.7 RPM. NUMBER OF BLADES IN ROW = 28.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.2850	1042.91	870.32	.7600	-51.552	0.000
2	7.5341	1078.57	915.05	.7993	-51.955	0.000
3	7.7709	1112.47	954.91	.8342	-52.519	0.000
4	7.9992	1145.16	990.89	.8653	-53.239	0.000
5	8.2220	1177.04	1023.85	.8936	-54.078	0.000
6	8.4409	1208.39	1054.78	.9199	-54.975	0.000
7	8.6572	1239.34	1084.90	.9453	-55.833	0.000
8	8.8711	1269.97	1114.37	.9701	-56.620	0.000
9	9.0829	1300.29	1142.67	.9937	-57.325	0.000
10	9.2924	1330.29	1170.06	1.0163	-57.911	0.000
11	9.5000	1360.00	1196.09	1.0375	-58.492	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.2850	0.000	-2.233	6.3950	.02087	.3141	.3851
2	7.5341	0.000	-2.349	6.7479	.02405	.3047	.3635
3	7.7709	0.000	-1.958	7.0186	.02809	.2975	.3446
4	7.9992	0.000	-1.004	7.2308	.03165	.2915	.3288
5	8.2220	0.000	-.865	7.3933	.03492	.2867	.3155
6	8.4409	0.000	-2.547	7.5009	.03935	.2827	.3029
7	8.6572	0.000	-4.258	7.5809	.04487	.2787	.2903
8	8.8711	0.000	-4.159	7.6625	.05067	.2749	.2779
9	9.0829	0.000	-3.473	7.7602	.05697	.2719	.2662
10	9.2924	0.000	-3.830	7.8777	.06458	.2696	.2543
11	9.5000	0.000	-4.953	7.9127	.07660	.2679	.2409

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 7 DELTA H ON H1	STATION PRESS RATIO	5 THRU ISENT EFF	STATION 7 DELTA H ON H1
MEAN VALUES-		1.5136	.9338	.1345	1.5136	.9338	.1345
1	7.2850	1.4761	.9727	.1209	1.4761	.9727	.1209
2	7.5341	1.4866	.9675	.1239	1.4866	.9675	.1239
3	7.7709	1.4951	.9610	.1266	1.4951	.9610	.1266
4	7.9992	1.5026	.9550	.1291	1.5026	.9550	.1291
5	8.2220	1.5094	.9494	.1314	1.5094	.9494	.1314
6	8.4409	1.5147	.9419	.1336	1.5147	.9419	.1336
7	8.6572	1.5188	.9326	.1359	1.5188	.9326	.1359
8	8.8711	1.5231	.9229	.1383	1.5231	.9229	.1383
9	9.0829	1.5289	.9126	.1412	1.5289	.9126	.1412
10	9.2924	1.5357	.9005	.1447	1.5357	.9005	.1447
11	9.5000	1.5386	.8816	.1485	1.5386	.8816	.1485

STATION 8 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.4150	535.25	534.44	509.66	163.50	756.38
2	7.6441	558.35	527.62	539.63	143.34	768.20
3	7.8621	573.25	521.28	560.19	121.66	774.82
4	8.0733	582.55	515.16	573.92	99.91	777.66
5	8.2804	587.41	509.26	582.12	78.68	777.43
6	8.4853	588.71	503.69	585.77	58.69	774.78
7	8.6891	588.91	498.78	587.49	40.88	771.75
8	8.8924	589.24	494.97	588.68	25.67	769.55
9	9.0952	589.58	493.04	589.43	13.30	768.57
10	9.2975	590.49	493.32	590.47	4.25	769.44
11	9.5000	587.47	494.78	587.47	0.00	768.07

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.4150	1.3500	0.0000	8.10	17.787	0.000	0.000
2	7.6441	1.3500	.2291	11.60	14.876	0.000	0.000
3	7.8621	1.3500	.4471	16.53	12.253	0.000	0.000
4	8.0733	1.3500	.6583	24.69	9.875	0.000	0.000
5	8.2804	1.3500	.8654	43.01	7.698	0.000	0.000
6	8.4853	1.3500	1.0703	132.63	5.722	0.000	0.000
7	8.6891	1.3500	1.2741	-162.06	3.980	0.000	0.000
8	8.8924	1.3500	1.4774	-60.77	2.497	0.000	0.000
9	9.0952	1.3500	1.6802	-46.73	1.292	0.000	0.000
10	9.2975	1.3500	1.8825	-55.98	.412	0.000	0.000
11	9.5000	1.3500	2.0850	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.4150	.6491	26.0037	19.5921	613.104	565.498	.093567
2	7.6441	.6592	26.1660	19.5482	614.779	565.673	.093328
3	7.8621	.6644	26.2872	19.5508	616.332	566.376	.093225
4	8.0733	.6662	26.3971	19.6024	617.778	567.456	.093293
5	8.2804	.6652	26.4987	19.6950	619.156	568.863	.093502
6	8.4853	.6620	26.5646	19.7990	620.517	570.566	.093715
7	8.6891	.6583	26.6063	19.8915	621.946	572.385	.093854
8	8.8924	.6554	26.6586	19.9806	623.555	574.277	.093963
9	9.0952	.6533	26.7429	20.0780	625.527	576.374	.094078
10	9.2975	.6528	26.8497	20.1679	627.966	578.701	.094120
11	9.5000	.6500	26.8536	20.2181	630.676	581.587	.093885

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.4150	147.145	135.719	.976657	44.956	17.787
2	7.6441	147.547	135.762	.976885	43.379	14.876
3	7.8621	147.920	135.930	.977175	42.281	12.253
4	8.0733	148.267	136.189	.977451	41.487	9.875
5	8.2804	148.597	136.527	.977722	40.924	7.698
6	8.4853	148.924	136.936	.978079	40.550	5.722
7	8.6891	149.267	137.373	.978524	40.263	3.980
8	8.8924	149.653	137.826	.979009	40.031	2.497
9	9.0952	150.127	138.330	.979551	39.904	1.292
10	9.2975	150.712	138.888	.980211	39.877	.412
11	9.5000	151.362	139.581	.981235	40.105	0.000

STATION 8 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 16404.7 RPM. NUMBER OF BLADES IN ROW = 28.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.4150	1061.52	751.20	.6447	-44.559	0.000
2	7.6441	1094.31	795.55	.6826	-45.425	0.000
3	7.8621	1125.52	832.90	.7142	-46.508	0.000
4	8.0733	1155.76	865.87	.7418	-47.717	0.000
5	8.2804	1185.40	895.67	.7664	-49.017	0.000
6	8.4853	1214.73	923.12	.7887	-50.377	0.000
7	8.6891	1243.92	949.76	.8102	-51.679	0.000
8	8.8924	1273.02	975.99	.8312	-52.862	0.000
9	9.0952	1302.06	1001.06	.8510	-53.917	0.000
10	9.2975	1331.01	1024.89	.8695	-54.820	0.000
11	9.5000	1360.00	1045.82	.8850	-55.824	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.4150	0.000	-4.335	6.2323	.03154	.4510	.5552
2	7.6441	0.000	-3.695	6.4850	.03625	.4373	.5214
3	7.8621	0.000	-2.354	6.6230	.04226	.4280	.4939
4	8.0733	0.000	-.191	6.7011	.04755	.4207	.4713
5	8.2804	0.000	.773	6.7297	.05241	.4147	.4522
6	8.4853	0.000	-1.117	6.6907	.05903	.4099	.4345
7	8.6891	0.000	-3.527	6.6152	.06729	.4054	.4169
8	8.8924	0.000	-3.770	6.5405	.07599	.4010	.3997
9	9.0952	0.000	-3.395	6.4711	.08544	.3976	.3835
10	9.2975	0.000	-4.721	6.4054	.09686	.3953	.3673
11	9.5000	0.000	-7.314	6.2158	.11490	.3949	.3496

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 8 DELTA H ON H1	STATION 5 PRESS RATIO	THRU ISENT EFF	STATION 8 DELTA H ON H1
MEAN VALUES-		1.8055	.9286	.1979	1.8055	.9286	.1979
1	7.4150	1.7690	.9716	.1820	1.7690	.9716	.1820
2	7.6441	1.7800	.9660	.1853	1.7800	.9660	.1853
3	7.8621	1.7882	.9589	.1882	1.7882	.9589	.1882
4	8.0733	1.7957	.9523	.1910	1.7957	.9523	.1910
5	8.2804	1.8026	.9459	.1937	1.8026	.9459	.1937
6	8.4853	1.8071	.9375	.1963	1.8071	.9375	.1963
7	8.6891	1.8100	.9272	.1991	1.8100	.9272	.1991
8	8.8924	1.8135	.9163	.2022	1.8135	.9163	.2022
9	9.0952	1.8192	.9045	.2060	1.8192	.9045	.2060
10	9.2975	1.8265	.8908	.2107	1.8265	.8908	.2107
11	9.5000	1.8268	.8694	.2159	1.8268	.8694	.2159

STATION 9 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.5740	558.33	676.84	522.52	196.72	877.41
2	7.7733	571.49	664.99	545.96	168.91	876.82
3	7.9664	579.00	654.16	561.48	141.35	873.59
4	8.1559	583.03	644.17	571.60	114.88	868.84
5	8.3436	583.98	634.79	577.05	89.68	862.55
6	8.5311	581.07	625.93	577.31	66.00	854.07
7	8.7198	576.24	617.98	574.50	44.74	844.96
8	8.9104	571.18	611.51	570.56	26.65	836.78
9	9.1032	565.32	607.26	565.19	12.24	829.67
10	9.2989	557.68	605.71	557.68	2.47	823.34
11	9.5000	539.30	605.75	539.30	0.00	811.03

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	7.5740	1.8000	0.0000	11.77	20.631		0.000
2	7.7733	1.8000	.1993	11.58	17.191		0.000
3	7.9664	1.8000	.3924	12.32	14.131		0.000
4	8.1559	1.8000	.5819	13.72	11.364		0.000
5	8.3436	1.8000	.7696	15.66	8.834		0.000
6	8.5311	1.8000	.9571	18.48	6.522		0.000
7	8.7198	1.8000	1.1458	23.39	4.453		0.000
8	8.9104	1.8000	1.3364	33.11	2.675		0.000
9	9.1032	1.8000	1.5292	57.41	1.241		0.000
10	9.2989	1.8000	1.7249	179.93	.253		0.000
11	9.5000	1.8000	1.9260	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.5740	.7456	30.2128	20.8920	640.825	576.765	.097826
2	7.7733	.7444	30.2476	20.9399	641.845	577.870	.097862
3	7.9664	.7407	30.2432	21.0092	642.849	579.345	.097937
4	8.1559	.7356	30.2462	21.1116	643.861	581.047	.098125
5	8.3436	.7291	30.2513	21.2431	644.877	582.969	.098411
6	8.5311	.7205	30.2078	21.3799	645.912	585.215	.098665
7	8.7198	.7113	30.1316	21.5044	647.075	587.665	.098826
8	8.9104	.7029	30.0733	21.6262	648.507	590.242	.098951
9	9.1032	.6952	30.0535	21.7600	650.395	593.115	.099081
10	9.2989	.6880	30.0577	21.9029	652.881	596.472	.099171
11	9.5000	.6751	29.9110	22.0423	655.793	601.058	.099041

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.5740	153.798	138.424	.976991	50.481	20.631
2	7.7733	154.043	138.689	.977293	49.324	17.191
3	7.9664	154.284	139.043	.977678	48.488	14.131
4	8.1559	154.527	139.451	.978049	47.852	11.364
5	8.3436	154.771	139.913	.978416	47.387	8.834
6	8.5311	155.019	140.452	.978900	47.129	6.522
7	8.7198	155.298	141.040	.979504	47.002	4.453
8	8.9104	155.642	141.658	.980167	46.953	2.675
9	9.1032	156.095	142.348	.980910	47.049	1.241
10	9.2989	156.691	143.153	.981816	47.364	.253
11	9.5000	157.390	144.254	.983219	48.321	0.000

STATION 9 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 16404.7 RPM. NUMBER OF BLADES IN ROW = 28.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.5740	1084.28	691.19	.5874	-36.120	0.000
2	7.7733	1112.81	726.05	.6164	-38.082	0.000
3	7.9664	1140.45	756.12	.6411	-40.027	0.000
4	8.1559	1167.59	783.51	.6633	-41.916	0.000
5	8.3436	1194.46	808.86	.6837	-43.783	0.000
6	8.5311	1221.30	831.93	.7018	-45.697	0.000
7	8.7198	1248.31	854.03	.7190	-47.567	0.000
8	8.9104	1275.59	875.93	.7358	-49.301	0.000
9	9.1032	1303.20	896.61	.7513	-50.912	0.000
10	9.2989	1331.21	915.08	.7647	-52.451	0.000
11	9.5000	1360.00	927.22	.7718	-54.435	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.5740	0.000	-4.158	5.3446	.04241	.5290	.6575
2	7.7733	0.000	-2.384	5.3103	.04858	.5205	.6217
3	7.9664	0.000	.104	5.1869	.05651	.5145	.5908
4	8.1559	0.000	3.458	5.0289	.06349	.5090	.5644
5	8.3436	0.000	5.232	4.8393	.06993	.5039	.5413
6	8.5311	0.000	3.181	4.5812	.07872	.5000	.5196
7	8.7198	0.000	-.014	4.2747	.08970	.4964	.4983
8	8.9104	0.000	-.769	3.9589	.10130	.4929	.4779
9	9.1032	0.000	-.591	3.6267	.11391	.4904	.4587
10	9.2989	0.000	-2.381	3.2611	.12914	.4897	.4405
11	9.5000	0.000	-5.834	2.7395	.15319	.4931	.4224

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 9 DELTA H ON H1	STATION 5 PRESS RATIO	THRU ISENT EFF	STATION 9 DELTA H ON H1
MEAN	VALUES-	2.0512	.9205	.2473	2.0512	.9205	.2473
1	7.5740	2.0553	.9698	.2355	2.0553	.9698	.2355
2	7.7733	2.0577	.9635	.2374	2.0577	.9635	.2374
3	7.9664	2.0574	.9555	.2394	2.0574	.9555	.2394
4	8.1559	2.0576	.9479	.2413	2.0576	.9479	.2413
5	8.3436	2.0579	.9405	.2433	2.0579	.9405	.2433
6	8.5311	2.0550	.9308	.2453	2.0550	.9308	.2453
7	8.7198	2.0498	.9188	.2475	2.0498	.9188	.2475
8	8.9104	2.0458	.9059	.2503	2.0458	.9059	.2503
9	9.1032	2.0445	.8921	.2539	2.0445	.8921	.2539
10	9.2989	2.0447	.8757	.2587	2.0447	.8757	.2587
11	9.5000	2.0348	.8506	.2643	2.0348	.8506	.2643

STATION 10 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.7540	599.46	769.21	554.27	228.33	975.21
2	7.9226	604.91	751.59	572.24	196.12	964.79
3	8.0888	604.69	735.24	582.09	163.79	951.96
4	8.2542	601.71	720.07	586.70	133.53	938.38
5	8.4203	596.74	705.78	587.30	105.71	924.24
6	8.5882	587.56	692.06	582.09	80.01	907.84
7	8.7592	575.35	679.28	572.54	56.88	890.20
8	8.9345	562.75	668.11	561.53	37.00	873.53
9	9.1147	549.20	659.16	548.82	20.56	857.97
10	9.3015	531.64	652.89	531.58	7.90	841.96
11	9.5000	493.20	648.27	493.20	0.00	814.55

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.7540	2.2500	0.0000	15.12	22.389		0.000
2	7.9226	2.2500	.1686	16.01	18.918		0.000
3	8.0888	2.2500	.3348	17.90	15.716		0.000
4	8.2542	2.2500	.5002	18.09	12.822		0.000
5	8.4203	2.2500	.6663	16.76	10.203		0.000
6	8.5882	2.2500	.8342	14.79	7.826		0.000
7	8.7592	2.2500	1.0052	13.20	5.674		0.000
8	8.9345	2.2500	1.1805	12.32	3.770		0.000
9	9.1147	2.2500	1.3607	12.61	2.145		0.000
10	9.3015	2.2500	1.5475	15.99	.851		0.000
11	9.5000	2.2500	1.7460	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.7540	.8252	33.4845	21.4191	660.792	581.655	.099451
2	7.9226	.8154	33.2598	21.4882	660.558	583.103	.099524
3	8.0888	.8033	32.9960	21.5783	660.381	584.972	.099622
4	8.2542	.7904	32.7573	21.6963	660.297	587.025	.099816
5	8.4203	.7771	32.5327	21.8303	660.278	589.197	.100063
6	8.5882	.7617	32.2455	21.9610	660.296	591.714	.100233
7	8.7592	.7451	31.9106	22.0764	660.449	594.507	.100287
8	8.9345	.7294	31.5937	22.1796	660.907	597.411	.100266
9	9.1147	.7145	31.3092	22.2813	661.832	600.579	.100194
10	9.3015	.6989	31.0320	22.3948	663.374	604.385	.100070
11	9.5000	.6730	30.5522	22.5571	665.417	610.206	.099834

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.7540	158.590	139.597	.977309	52.070	22.389
2	7.9226	158.534	139.945	.977686	51.171	18.918
3	8.0888	158.491	140.393	.978167	50.565	15.716
4	8.2542	158.471	140.886	.978634	50.117	12.822
5	8.4203	158.467	141.407	.979098	49.785	10.203
6	8.5882	158.471	142.011	.979712	49.669	7.826
7	8.7592	158.508	142.682	.980483	49.735	5.674
8	8.9345	158.618	143.379	.981333	49.893	3.770
9	9.1147	158.840	144.139	.982289	50.200	2.145
10	9.3015	159.210	145.052	.983457	50.845	.851
11	9.5000	159.700	146.449	.985263	52.737	0.000

STATION 10 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 16404.7 RPM. NUMBER OF BLADES IN ROW = 28.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.7540	1110.05	689.58	.5835	-29.622	0.000
2	7.9226	1134.19	715.75	.6049	-32.313	0.000
3	8.0888	1157.97	737.80	.6226	-34.957	0.000
4	8.2542	1181.66	758.37	.6388	-37.494	0.000
5	8.4203	1205.43	778.30	.6544	-39.940	0.000
6	8.5882	1229.46	796.26	.6680	-42.447	0.000
7	8.7592	1253.95	813.19	.6806	-44.966	0.000
8	8.9345	1279.04	830.61	.6935	-47.351	0.000
9	9.1147	1304.85	847.66	.7059	-49.617	0.000
10	9.3015	1331.58	862.12	.7157	-51.927	0.000
11	9.5000	1360.00	865.91	.7154	-55.280	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.7540	0.000	2.706	2.4196	.05345	.5446	.6990
2	7.9226	0.000	4.747	2.3110	.06106	.5429	.6611
3	8.0888	0.000	7.613	2.1613	.07090	.5425	.6286
4	8.2542	0.000	11.556	1.9986	.07955	.5413	.6004
5	8.4203	0.000	13.842	1.8262	.08753	.5391	.5750
6	8.5882	0.000	11.647	1.6224	.09846	.5377	.5509
7	8.7592	0.000	7.718	1.3931	.11215	.5365	.5272
8	8.9345	0.000	6.394	1.1596	.12663	.5348	.5041
9	9.1147	0.000	6.562	.9183	.14238	.5333	.4820
10	9.3015	0.000	5.037	.6571	.16142	.5339	.4613
11	9.5000	0.000	1.761	.3245	.19149	.5413	.4429

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 10 DELTA H ON H1	STATION PRESS RATIO	5 THRU ISENT EFF	STATION 10 DELTA H ON H1
MEAN	VALUES-	2.1828	.9085	.2748	2.1828	.9085	.2748
1	7.7540	2.2779	.9671	.2740	2.2779	.9671	.2740
2	7.9226	2.2626	.9598	.2735	2.2626	.9598	.2735
3	8.0888	2.2446	.9505	.2732	2.2446	.9505	.2732
4	8.2542	2.2284	.9415	.2730	2.2284	.9415	.2730
5	8.4203	2.2131	.9326	.2730	2.2131	.9326	.2730
6	8.5882	2.1936	.9209	.2730	2.1936	.9209	.2730
7	8.7592	2.1708	.9063	.2733	2.1708	.9063	.2733
8	8.9345	2.1492	.8904	.2742	2.1492	.8904	.2742
9	9.1147	2.1299	.8730	.2760	2.1299	.8730	.2760
10	9.3015	2.1110	.8524	.2789	2.1110	.8524	.2789
11	9.5000	2.0784	.8211	.2829	2.0784	.8211	.2829

STATION 11 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.8070	633.83	763.98	583.54	247.42	992.68
2	7.9738	645.41	746.77	609.57	212.08	987.03
3	8.1348	644.08	731.08	619.65	175.72	974.33
4	8.2934	636.68	716.67	620.44	142.85	958.63
5	8.4521	626.93	703.12	616.42	114.32	942.03
6	8.6129	613.15	690.08	606.72	88.56	923.13
7	8.7773	596.08	677.89	592.44	65.75	902.68
8	8.9467	578.61	667.20	576.79	45.86	883.14
9	9.1220	560.64	658.64	559.90	28.71	864.94
10	9.3048	539.21	652.66	539.04	13.78	846.59
11	9.5000	498.95	648.27	498.95	0.00	818.05

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF		STREAMLINE		STATION
RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE	ANGLE	LEAN ANGLE
1	7.8070	2.3750	0.0000*****	22.977		7.099
2	7.9738	2.3947	.1680	-14.89	19.184	5.973
3	8.1348	2.4083	.3295	-12.14	15.832	3.659
4	8.2934	2.4155	.4883	-13.70	12.966	1.656
5	8.4521	2.4180	.6471	-20.95	10.507	.183
6	8.6129	2.4168	.8078	-38.90	8.305	-.974
7	8.7773	2.4126	.9722	-544.83	6.333	-1.918
8	8.9467	2.4059	1.1418	63.78	4.546	-2.431
9	9.1220	2.3980	1.3173	38.64	2.935	-2.894
10	9.3048	2.3876	1.5003	45.52	1.464	-3.542
11	9.5000	2.3750	1.6960	0.00	0.000	-3.764

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.8070	.8421	33.4845	21.0524	660.792	578.794	.098231
2	7.9738	.8368	33.2598	21.0255	660.558	579.491	.097988
3	8.1348	.8247	32.9960	21.1185	660.381	581.387	.098100
4	8.2934	.8097	32.7573	21.2852	660.297	583.828	.098461
5	8.4521	.7939	32.5327	21.4739	660.278	586.435	.098893
6	8.6129	.7760	32.2455	21.6598	660.296	589.385	.099249
7	8.7773	.7567	31.9106	21.8352	660.449	592.645	.099503
8	8.9467	.7383	31.5937	21.9974	660.907	596.006	.099677
9	9.1220	.7209	31.3092	22.1518	661.832	599.580	.099778
10	9.3048	.7032	31.0320	22.3106	663.374	603.735	.099802
11	9.5000	.6761	30.5522	22.4957	665.417	609.731	.099640

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.8070	158.590	138.911	.977309	50.320	30.076
2	7.9738	158.534	139.078	.977686	49.164	25.157
3	8.1348	158.491	139.533	.978167	48.620	19.491
4	8.2934	158.471	140.119	.978634	48.383	14.622
5	8.4521	158.467	140.744	.979098	48.278	10.690
6	8.6129	158.471	141.453	.979712	48.378	7.331
7	8.7773	158.508	142.235	.980483	48.674	4.415
8	8.9467	158.618	143.041	.981333	49.068	2.115
9	9.1220	158.840	143.899	.982289	49.595	.041
10	9.3048	159.210	144.897	.983457	50.437	-2.077
11	9.5000	159.700	146.335	.985263	52.416	-3.764

STATION 12 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.8600	684.09	758.83	630.72	264.90	1021.67
2	8.0236	698.84	742.14	664.54	216.24	1019.39
3	8.1786	689.83	727.16	667.55	173.89	1002.31
4	8.3304	675.59	713.48	660.95	139.91	982.59
5	8.4824	660.19	700.61	650.63	111.98	962.66
6	8.6368	641.58	688.17	635.58	87.52	940.85
7	8.7953	620.30	676.49	616.77	66.11	917.84
8	8.9593	598.83	666.26	596.96	47.21	895.82
9	9.1299	577.25	658.07	576.45	30.47	875.37
10	9.3085	552.82	652.40	552.61	15.05	855.12
11	9.5000	511.08	648.27	511.08	0.00	825.50

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.8600	2.5000	0.0000	-19.94	22.782		14.616
2	8.0236	2.5401	.1684	-5.05	18.025		12.097
3	8.1786	2.5668	.3257	-5.55	14.600		7.487
4	8.3304	2.5810	.4782	-7.34	11.952		3.184
5	8.4824	2.5850	.6303	-9.59	9.766		.308
6	8.6368	2.5834	.7847	-14.17	7.840		-1.654
7	8.7953	2.5756	.9434	-22.85	6.118		-3.908
8	8.9593	2.5624	1.1079	-47.34	4.521		-4.973
9	9.1299	2.5465	1.2792	-216.12	3.025		-5.975
10	9.3085	2.5253	1.4590	412.52	1.560		-7.300
11	9.5000	2.5000	1.6522	0.00	0.000		-7.652

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.8600	.8703	33.4845	20.4398	660.792	573.935	.096181
2	8.0236	.8683	33.2598	20.3469	660.558	574.089	.095718
3	8.1786	.8517	32.9960	20.5387	660.381	576.784	.096168
4	8.3304	.8327	32.7573	20.7951	660.297	579.957	.096836
5	8.4824	.8135	32.5327	21.0575	660.278	583.165	.097519
6	8.6368	.7928	32.2455	21.3080	660.296	586.637	.098095
7	8.7953	.7709	31.9106	21.5403	660.449	590.349	.098541
8	8.9593	.7500	31.5937	21.7558	660.907	594.129	.098893
9	9.1299	.7305	31.3092	21.9569	661.832	598.070	.099150
10	9.3085	.7110	31.0320	22.1546	663.374	602.527	.099302
11	9.5000	.6828	30.5522	22.3643	665.417	608.712	.099224

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.8600	158.590	137.744	.977309	47.965	37.398
2	8.0236	158.534	137.781	.977686	46.721	30.122
3	8.1786	158.491	138.428	.978167	46.509	22.087
4	8.3304	158.471	139.190	.978634	46.562	15.136
5	8.4824	158.467	139.960	.979098	46.701	10.074
6	8.6368	158.471	140.793	.979712	47.007	6.186
7	8.7953	158.508	141.684	.980483	47.481	2.211
8	8.9593	158.618	142.591	.981333	48.051	-.452
9	9.1299	158.840	143.537	.982289	48.743	-2.950
10	9.3085	159.210	144.607	.983457	49.723	-5.739
11	9.5000	159.700	146.091	.985263	51.749	-7.652

STATION 13 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9120	750.88	753.85	707.95	250.25	1064.01
2	8.0680	743.65	738.05	717.89	194.05	1047.73
3	8.2172	728.28	723.75	711.85	153.85	1026.75
4	8.3634	710.02	710.67	699.18	123.59	1004.58
5	8.5098	690.70	698.36	683.55	99.12	982.23
6	8.6588	668.45	686.42	663.84	78.36	958.12
7	8.8123	643.66	675.20	640.84	60.23	932.84
8	8.9714	619.00	665.36	617.42	44.22	908.77
9	9.1378	594.69	657.50	593.95	29.57	886.55
10	9.3123	567.95	652.13	567.75	15.28	864.78
11	9.5000	524.30	648.27	524.30	0.00	833.75

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.9120	2.6250	0.0000	-2.42	19.468		21.809
2	8.0680	2.6840	.1668	-3.67	15.126		18.487
3	8.2172	2.7244	.3213	-4.79	12.196		11.691
4	8.3634	2.7459	.4691	-5.90	10.025		5.204
5	8.5098	2.7529	.6157	-7.42	8.251		.710
6	8.6588	2.7505	.7647	-9.69	6.732		-2.606
7	8.8123	2.7389	.9186	-13.60	5.369		-5.927
8	8.9714	2.7193	1.0790	-22.32	4.097		-7.676
9	9.1378	2.6952	1.2470	-46.91	2.850		-9.127
10	9.3123	2.6638	1.4244	-256.90	1.542		-11.134
11	9.5000	2.6250	1.6160	0.00	0.000		-11.933

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9120	.9122	33.4845	19.5378	660.792	566.587	.093128
2	8.0680	.8962	33.2598	19.7481	660.558	569.213	.093696
3	8.2172	.8756	32.9960	20.0287	660.381	572.658	.094456
4	8.3634	.8540	32.7573	20.3419	660.297	576.320	.095324
5	8.5098	.8323	32.5327	20.6596	660.278	579.998	.096198
6	8.6588	.8092	32.2455	20.9628	660.296	583.908	.096957
7	8.8123	.7851	31.9106	21.2465	660.449	588.039	.097578
8	8.9714	.7621	31.5937	21.5074	660.907	592.185	.098085
9	9.1378	.7408	31.3092	21.7469	661.832	596.431	.098471
10	9.3123	.7198	31.0320	21.9771	663.374	601.145	.098733
11	9.5000	.6903	30.5522	22.2181	665.417	607.573	.098760

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9120	158.590	135.981	.977309	45.113	41.276
2	8.0680	158.534	136.611	.977686	44.784	33.613
3	8.2172	158.491	137.438	.978167	44.821	23.887
4	8.3634	158.471	138.317	.978634	45.026	15.229
5	8.5098	158.467	139.200	.979098	45.316	8.961
6	8.6588	158.471	140.138	.979712	45.760	4.125
7	8.8123	158.508	141.129	.980483	46.370	-.557
8	8.9714	158.618	142.124	.981333	47.067	-3.579
9	9.1378	158.840	143.143	.982289	47.872	-6.277
10	9.3123	159.210	144.275	.983457	48.947	-9.592
11	9.5000	159.700	145.818	.985263	51.035	-11.933

STATION 13 IS AT THE LEADING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	INCIDENCE ANGLE
1	7.9120	0.00	1064.01	.9122	45.113	0.000
2	8.0680	0.00	1047.73	.8962	44.784	0.000
3	8.2172	0.00	1026.75	.8756	44.821	0.000
4	8.3634	0.00	1004.58	.8540	45.026	0.000
5	8.5098	0.00	982.23	.8323	45.316	0.000
6	8.6588	0.00	958.12	.8092	45.760	0.000
7	8.8123	0.00	932.84	.7851	46.370	0.000
8	8.9714	0.00	908.77	.7621	47.067	0.000
9	9.1378	0.00	886.55	.7408	47.872	0.000
10	9.3123	0.00	864.78	.7198	48.947	0.000
11	9.5000	0.00	833.75	.6903	51.035	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE
1	7.9120	0.000	0.000	-8.0599
2	8.0680	0.000	0.000	-8.3489
3	8.2172	0.000	0.000	-8.3929
4	8.3634	0.000	0.000	-8.3419
5	8.5098	0.000	0.000	-8.2367
6	8.6588	0.000	0.000	-8.0437
7	8.8123	0.000	0.000	-7.7597
8	8.9714	0.000	0.000	-7.4278
9	9.1378	0.000	0.000	-7.1347
10	9.3123	0.000	0.000	-6.8044
11	9.5000	0.000	0.000	-6.2030

STATION 14 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.0220	867.80	536.88	847.73	185.55	1020.45
2	8.1519	830.05	530.03	817.13	145.90	984.85
3	8.2835	795.40	522.83	786.83	116.43	951.84
4	8.4173	766.07	514.87	760.24	94.35	923.02
5	8.5541	741.24	506.61	737.23	77.08	897.83
6	8.6953	716.29	498.79	713.57	62.36	872.85
7	8.8419	690.65	491.62	688.89	49.25	847.75
8	8.9949	666.70	485.00	665.65	37.28	824.45
9	9.1547	644.44	479.49	643.92	25.75	803.25
10	9.3220	621.56	475.86	621.41	13.85	782.80
11	9.5000	585.46	473.55	585.46	0.00	753.00

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	8.0220	3.0000	0.0000	-2.76	12.346		20.049
2	8.1519	3.0449	.1375	-3.56	10.124		17.107
3	8.2835	3.0778	.2731	-4.63	8.417		10.792
4	8.4173	3.0958	.4081	-6.02	7.074		4.827
5	8.5541	3.1019	.5451	-7.90	5.968		.627
6	8.6953	3.0995	.6862	-10.38	4.995		-2.549
7	8.8419	3.0896	.8331	-13.73	4.089		-4.864
8	8.9949	3.0748	.9868	-18.17	3.205		-6.188
9	9.1547	3.0552	1.1479	-25.54	2.290		-7.935
10	9.3220	3.0295	1.3171	-44.42	1.277		-9.250
11	9.5000	3.0000	1.4976	0.00	0.000		-9.465

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	8.0220	.8691	33.2881	20.3456	660.792	574.142	.095703
2	8.1519	.8347	33.0746	20.9537	660.558	579.849	.097593
3	8.2835	.8031	32.8090	21.4584	660.381	584.991	.099065
4	8.4173	.7759	32.5707	21.8805	660.297	589.403	.100257
5	8.5541	.7523	32.3559	22.2330	660.278	593.202	.101220
6	8.6953	.7291	32.0829	22.5283	660.296	596.899	.101929
7	8.8419	.7059	31.7624	22.7789	660.449	600.646	.102421
8	8.9949	.6844	31.4567	22.9944	660.907	604.346	.102756
9	9.1547	.6647	31.1806	23.1842	661.832	608.143	.102957
10	9.3220	.6456	30.9097	23.3579	663.374	612.384	.103010
11	9.5000	.6180	30.4312	23.5204	665.417	618.235	.102746

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	8.0220	158.590	137.794	.977712	31.744	32.395
2	8.1519	158.534	139.164	.978068	32.560	27.230
3	8.2835	158.491	140.398	.978556	33.317	19.209
4	8.4173	158.471	141.457	.979025	33.905	11.901
5	8.5541	158.467	142.368	.979472	34.351	6.595
6	8.6953	158.471	143.256	.980059	34.852	2.446
7	8.8419	158.508	144.155	.980802	35.444	-.775
8	8.9949	158.618	145.043	.981631	36.035	-2.983
9	9.1547	158.840	145.954	.982571	36.651	-5.645
10	9.3220	159.210	146.972	.983728	37.437	-7.972
11	9.5000	159.700	148.376	.985535	38.968	-9.465

STATION 14 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	8.0220	0.00	1020.45	.8691	31.744	0.000
2	8.1519	0.00	984.85	.8347	32.560	0.000
3	8.2835	0.00	951.84	.8031	33.317	0.000
4	8.4173	0.00	923.02	.7759	33.905	0.000
5	8.5541	0.00	897.83	.7523	34.351	0.000
6	8.6953	0.00	872.85	.7291	34.852	0.000
7	8.8419	0.00	847.75	.7059	35.444	0.000
8	8.9949	0.00	824.45	.6844	36.035	0.000
9	9.1547	0.00	803.25	.6647	36.651	0.000
10	9.3220	0.00	782.80	.6456	37.437	0.000
11	9.5000	0.00	753.00	.6180	38.968	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	8.0220	0.000	-3.218	-9.5870	.01408	.0935	.0579
2	8.1519	0.000	-3.137	-9.6911	.01370	.1138	.0892
3	8.2835	0.000	-2.953	-9.6238	.01441	.1283	.1103
4	8.4173	0.000	-2.585	-9.4748	.01503	.1380	.1239
5	8.5541	0.000	-2.102	-9.3062	.01489	.1440	.1325
6	8.6953	0.000	-1.611	-9.0646	.01441	.1481	.1387
7	8.8419	0.000	-1.123	-8.7379	.01389	.1512	.1437
8	8.9949	0.000	-.630	-8.4057	.01359	.1537	.1474
9	9.1547	0.000	-.275	-8.0873	.01346	.1558	.1503
10	9.3220	0.000	-.252	-7.7533	.01351	.1576	.1525
11	9.5000	0.000	-.482	-7.2151	.01452	.1612	.1563

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 14 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 14 ISENT EFF	STATION 14 DELTA H ON H1
MEAN VALUES-		2.1722	.9022	.2748	.9951	0.0000	0.0000
1	8.0220	2.2645	.9594	.2740	.9941	0.0000	0.0000
2	8.1519	2.2500	.9525	.2735	.9944	0.0000	0.0000
3	8.2835	2.2319	.9431	.2732	.9943	0.0000	0.0000
4	8.4173	2.2157	.9340	.2730	.9943	0.0000	0.0000
5	8.5541	2.2011	.9255	.2730	.9946	0.0000	0.0000
6	8.6953	2.1825	.9143	.2730	.9950	0.0000	0.0000
7	8.8419	2.1607	.9002	.2733	.9954	0.0000	0.0000
8	8.9949	2.1399	.8848	.2742	.9957	0.0000	0.0000
9	9.1547	2.1211	.8677	.2760	.9959	0.0000	0.0000
10	9.3220	2.1027	.8474	.2789	.9961	0.0000	0.0000
11	9.5000	2.0701	.8162	.2829	.9960	0.0000	0.0000

STATION 15 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.0770	837.17	335.05	831.60	96.38	901.73
2	8.1975	810.56	332.01	806.47	81.27	875.92
3	8.3220	784.41	328.36	781.40	68.65	850.36
4	8.4504	761.86	323.61	759.61	58.48	827.74
5	8.5829	742.62	318.31	740.95	49.89	807.97
6	8.7200	722.15	313.54	720.94	41.82	787.28
7	8.8626	700.30	309.40	699.47	33.93	765.60
8	9.0113	679.76	305.55	679.25	26.09	745.27
9	9.1666	660.97	302.27	660.72	18.08	726.80
10	9.3286	642.46	300.23	642.39	9.63	709.15
11	9.5000	612.18	299.09	612.18	0.00	681.33

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
	RADIUS X-COORD L-COORD			
1	8.0770 3.3750 0.0000	-6.24	6.611	16.212
2	8.1975 3.4080 .1250	-7.46	5.754	13.540
3	8.3220 3.4323 .2518	-8.67	5.021	8.727
4	8.4504 3.4470 .3810	-10.19	4.403	4.263
5	8.5829 3.4520 .5136	-11.92	3.852	.433
6	8.7200 3.4501 .6507	-14.25	3.320	-1.911
7	8.8626 3.4427 .7935	-17.56	2.777	-4.005
8	9.0113 3.4305 .9427	-23.01	2.200	-4.977
9	9.1666 3.4164 1.0986	-32.60	1.567	-5.777
10	9.3286 3.3976 1.2618	-58.11	.859	-7.226
11	9.5000 3.3750 1.4346	0.00	0.000	-7.675

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---	---TEMPERATURES---	SPECIFIC WEIGHT
			TOTAL STATIC	TOTAL STATIC	
1	8.0770	.7556	33.0977 22.6713	660.792 593.131	.103228
2	8.1975	.7318	32.8918 23.0392	660.558 596.715	.104273
3	8.3220	.7084	32.6237 23.3455	660.381 600.209	.105044
4	8.4504	.6878	32.3848 23.6036	660.297 603.284	.105664
5	8.5829	.6698	32.1794 23.8222	660.278 605.957	.106173
6	8.7200	.6512	31.9200 24.0077	660.296 608.720	.106513
7	8.8626	.6318	31.6135 24.1641	660.449 611.675	.106690
8	9.0113	.6135	31.3197 24.2962	660.907 614.689	.106747
9	9.1666	.5967	31.0515 24.4086	661.832 617.876	.106687
10	9.3286	.5805	30.7865 24.5044	663.374 621.528	.106477
11	9.5000	.5554	30.3102 24.5820	665.417 626.789	.105918

STREAM LINE	RADIUS	---ENTHALPIES---	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL STATIC			
1	8.0770	158.590 142.351	.978105	21.812	22.823
2	8.1975	158.534 143.212	.978448	22.274	19.294
3	8.3220	158.491 144.050	.978945	22.715	13.748
4	8.4504	158.471 144.788	.979417	23.014	8.665
5	8.5829	158.467 145.430	.979847	23.201	4.285
6	8.7200	158.471 146.093	.980407	23.469	1.409
7	8.8626	158.508 146.802	.981124	23.837	-1.228
8	9.0113	158.618 147.525	.981930	24.204	-2.777
9	9.1666	158.840 148.290	.982856	24.576	-4.210
10	9.3286	159.210 149.167	.984001	25.047	-6.367
11	9.5000	159.700 150.429	.985808	26.038	-7.675

STATION 15 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	8.0770	0.00	901.73	.7556	21.812	0.000
2	8.1975	0.00	875.92	.7318	22.274	0.000
3	8.3220	0.00	850.36	.7084	22.715	0.000
4	8.4504	0.00	827.74	.6878	23.014	0.000
5	8.5829	0.00	807.97	.6698	23.201	0.000
6	8.7200	0.00	787.28	.6512	23.469	0.000
7	8.8626	0.00	765.60	.6318	23.837	0.000
8	9.0113	0.00	745.27	.6135	24.204	0.000
9	9.1666	0.00	726.80	.5967	24.576	0.000
10	9.3286	0.00	709.15	.5805	25.047	0.000
11	9.5000	0.00	681.33	.5554	26.038	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	8.0770	0.000	-1.743	-9.3007	.02773	.2540	.2247
2	8.1975	0.000	-1.818	-9.4157	.02724	.2688	.2436
3	8.3220	0.000	-1.795	-9.4033	.02871	.2806	.2558
4	8.4504	0.000	-1.588	-9.3021	.03000	.2883	.2627
5	8.5829	0.000	-1.248	-9.1519	.02976	.2924	.2664
6	8.7200	0.000	-.889	-8.9271	.02884	.2957	.2699
7	8.8626	0.000	-.623	-8.6330	.02786	.2988	.2736
8	9.0113	0.000	-.553	-8.3346	.02717	.3015	.2765
9	9.1666	0.000	-.594	-8.0391	.02695	.3036	.2784
10	9.3286	0.000	-.581	-7.7410	.02711	.3053	.2791
11	9.5000	0.000	-.501	-7.2867	.02903	.3115	.2836

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 15 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 15 ISENT EFF	STATION 15 DELTA H ON H1
MEAN	VALUES-	2.1616	.8958	.2748	.9903	0.0000	0.0000
1	8.0770	2.2515	.9518	.2740	.9884	0.0000	0.0000
2	8.1975	2.2375	.9452	.2735	.9889	0.0000	0.0000
3	8.3220	2.2193	.9356	.2732	.9887	0.0000	0.0000
4	8.4504	2.2030	.9265	.2730	.9886	0.0000	0.0000
5	8.5829	2.1891	.9183	.2730	.9891	0.0000	0.0000
6	8.7200	2.1714	.9076	.2730	.9899	0.0000	0.0000
7	8.8626	2.1506	.8941	.2733	.9907	0.0000	0.0000
8	9.0113	2.1306	.8791	.2742	.9913	0.0000	0.0000
9	9.1666	2.1123	.8624	.2760	.9918	0.0000	0.0000
10	9.3286	2.0943	.8424	.2789	.9921	0.0000	0.0000
11	9.5000	2.0619	.8113	.2829	.9921	0.0000	0.0000

STATION 16 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.1090	815.87	164.01	814.41	48.83	832.19
2	8.2252	794.27	162.65	793.09	43.32	810.75
3	8.3460	771.38	161.03	770.44	38.03	788.01
4	8.4713	751.38	158.95	750.63	33.61	768.01
5	8.6012	734.58	156.58	733.99	29.60	751.09
6	8.7359	716.59	154.33	716.14	25.51	733.02
7	8.8761	697.20	152.30	696.88	21.14	713.64
8	9.0222	678.92	150.46	678.72	16.52	695.40
9	9.1745	662.44	148.96	662.34	11.50	678.98
10	9.3330	646.64	148.02	646.62	6.06	663.37
11	9.5000	619.17	147.47	619.17	0.00	636.49

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
RADIUS	X-COORD L-COORD			
1	8.1090 3.7500 0.0000	-7.45	3.431	11.301
2	8.2252 3.7720 .1183	-8.54	3.127	9.600
3	8.3460 3.7886 .2402	-10.04	2.826	5.941
4	8.4713 3.7977 .3659	-11.86	2.564	2.629
5	8.6012 3.8009 .4958	-14.30	2.309	.377
6	8.7359 3.7998 .6305	-17.45	2.040	-1.280
7	8.8761 3.7950 .7707	-21.82	1.737	-2.566
8	9.0222 3.7874 .9171	-28.29	1.394	-3.318
9	9.1745 3.7776 1.0696	-40.60	.995	-4.164
10	9.3330 3.7647 1.2287	-74.72	.537	-4.932
11	9.5000 3.7500 1.3963	0.00	0.000	-5.103

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---	---TEMPERATURES---	SPECIFIC WEIGHT
			TOTAL STATIC	TOTAL STATIC	
1	8.1090	.6915	32.9086 23.9058	660.792 603.164	.107039
2	8.2252	.6722	32.7093 24.1653	660.558 605.862	.107719
3	8.3460	.6518	32.4380 24.3848	660.381 608.711	.108188
4	8.4713	.6340	32.1996 24.5672	660.297 611.215	.108551
5	8.6012	.6189	32.0039 24.7183	660.278 613.336	.108841
6	8.7359	.6029	31.7578 24.8424	660.296 615.584	.108988
7	8.8761	.5858	31.4651 24.9431	660.449 618.071	.108989
8	9.0222	.5696	31.1823 25.0237	660.907 620.667	.108884
9	9.1745	.5550	30.9225 25.0868	661.832 623.470	.108668
10	9.3330	.5408	30.6638 25.1334	663.374 626.756	.108299
11	9.5000	.5168	30.1892 25.1633	665.417 631.706	.107578

STREAM LINE	RADIUS	---ENTHALPIES---	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL STATIC			
1	8.1090	158.590 144.759	.978498	11.366	14.733
2	8.2252	158.534 145.407	.978829	11.573	12.727
3	8.3460	158.491 146.091	.979336	11.792	8.767
4	8.4713	158.471 146.692	.979810	11.945	5.193
5	8.6012	158.467 147.201	.980221	12.033	2.686
6	8.7359	158.471 147.740	.980757	12.154	.760
7	8.8761	158.508 148.337	.981447	12.322	-.829
8	9.0222	158.618 148.960	.982232	12.496	-1.924
9	9.1745	158.840 149.633	.983141	12.673	-3.169
10	9.3330	159.210 150.422	.984275	12.893	-4.395
11	9.5000	159.700 151.609	.986082	13.396	-5.103

STATION 16 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	8.1090	0.00	832.19	.6915	11.366	0.000
2	8.2252	0.00	810.75	.6722	11.573	0.000
3	8.3460	0.00	788.01	.6518	11.792	0.000
4	8.4713	0.00	768.01	.6340	11.945	0.000
5	8.6012	0.00	751.09	.6189	12.033	0.000
6	8.7359	0.00	733.02	.6029	12.154	0.000
7	8.8761	0.00	713.64	.5858	12.322	0.000
8	9.0222	0.00	695.40	.5696	12.496	0.000
9	9.1745	0.00	678.98	.5550	12.673	0.000
10	9.3330	0.00	663.37	.5408	12.893	0.000
11	9.5000	0.00	636.49	.5168	13.396	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	8.1090	0.000	-.304	-7.4550	.04129	.3608	.3132
2	8.2252	0.000	-.463	-7.5667	.04074	.3747	.3269
3	8.3460	0.000	-.579	-7.5739	.04303	.3874	.3359
4	8.4713	0.000	-.606	-7.5074	.04492	.3956	.3403
5	8.6012	0.000	-.559	-7.3881	.04454	.3993	.3418
6	8.7359	0.000	-.483	-7.2120	.04322	.4024	.3439
7	8.8761	0.000	-.415	-6.9896	.04177	.4059	.3466
8	9.0222	0.000	-.388	-6.7549	.04080	.4088	.3486
9	9.1745	0.000	-.420	-6.5334	.04044	.4109	.3493
10	9.3330	0.000	-.514	-6.3136	.04066	.4125	.3486
11	9.5000	0.000	-.650	-5.9645	.04355	.4212	.3534

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 16 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 16 ISENT EFF	STATION 16 DELTA H ON H1
MEAN	VALUES-	2.1510	.8894	.2748	.9854	0.0000	0.0000
1	8.1090	2.2387	.9443	.2740	.9828	0.0000	0.0000
2	8.2252	2.2251	.9379	.2735	.9835	0.0000	0.0000
3	8.3460	2.2067	.9281	.2732	.9831	0.0000	0.0000
4	8.4713	2.1905	.9190	.2730	.9830	0.0000	0.0000
5	8.6012	2.1771	.9112	.2730	.9837	0.0000	0.0000
6	8.7359	2.1604	.9010	.2730	.9849	0.0000	0.0000
7	8.8761	2.1405	.8880	.2733	.9860	0.0000	0.0000
8	9.0222	2.1212	.8735	.2742	.9870	0.0000	0.0000
9	9.1745	2.1036	.8571	.2760	.9876	0.0000	0.0000
10	9.3330	2.0860	.8373	.2789	.9881	0.0000	0.0000
11	9.5000	2.0537	.8063	.2829	.9881	0.0000	0.0000

STATION 17 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.1220	778.13	44.89	777.98	15.56	779.43
2	8.2373	762.15	44.66	761.99	15.65	763.45
3	8.3572	743.34	44.29	743.18	15.31	744.65
4	8.4819	726.64	43.65	726.49	14.87	727.95
5	8.6111	712.92	42.86	712.78	14.17	714.21
6	8.7449	697.52	42.16	697.40	12.89	698.79
7	8.8840	680.21	41.63	680.12	11.06	681.48
8	9.0286	663.64	41.15	663.58	8.79	664.91
9	9.1791	648.50	40.76	648.47	6.10	649.78
10	9.3355	633.88	40.56	633.87	3.07	635.17
11	9.5000	607.07	40.50	607.07	0.00	608.42

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	8.1220	4.1250	0.0000	-12.79	1.146		5.748
2	8.2373	4.1358	.1158	-14.35	1.176		4.603
3	8.3572	4.1435	.2359	-16.18	1.180		3.021
4	8.4819	4.1489	.3607	-18.55	1.173		1.744
5	8.6111	4.1510	.4900	-21.33	1.139		.236
6	8.7449	4.1505	.6238	-24.74	1.059		-.517
7	8.8840	4.1484	.7629	-29.47	.931		-1.473
8	9.0286	4.1436	.9076	-37.19	.759		-1.871
9	9.1791	4.1391	1.0582	-51.49	.539		-1.816
10	9.3355	4.1331	1.2147	-88.93	.277		-2.582
11	9.5000	4.1250	1.3794	0.00	0.000		-2.925

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	8.1220	.6439	32.7200	24.7600	660.792	610.240	.109578
2	8.2373	.6298	32.5275	24.9028	660.558	612.057	.109882
3	8.3572	.6132	32.2533	25.0261	660.381	614.239	.110034
4	8.4819	.5985	32.0145	25.1311	660.297	616.202	.110144
5	8.6111	.5864	31.8279	25.2195	660.278	617.833	.110240
6	8.7449	.5729	31.5953	25.2935	660.296	619.662	.110237
7	8.8840	.5577	31.3163	25.3543	660.449	621.804	.110121
8	9.0286	.5432	31.0452	25.4023	660.907	624.118	.109920
9	9.1791	.5297	30.7934	25.4382	661.832	626.699	.109622
10	9.3355	.5165	30.5406	25.4613	663.374	629.803	.109181
11	9.5000	.4929	30.0682	25.4688	665.417	634.613	.108386

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	8.1220	158.590	146.458	.978892	3.302	6.893
2	8.2373	158.534	146.894	.979211	3.354	5.779
3	8.3572	158.491	147.417	.979727	3.410	4.201
4	8.4819	158.471	147.888	.980205	3.438	2.917
5	8.6111	158.467	148.280	.980599	3.440	1.375
6	8.7449	158.471	148.719	.981108	3.459	.542
7	8.8840	158.508	149.233	.981772	3.502	-.542
8	9.0286	158.618	149.788	.982534	3.548	-1.112
9	9.1791	158.840	150.408	.983428	3.596	-1.277
10	9.3355	159.210	151.153	.984551	3.661	-2.305
11	9.5000	159.700	152.307	.986357	3.817	-2.925

STATION 17 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	8.1220	0.00	779.43	.6439	3.302	0.000
2	8.2373	0.00	763.45	.6298	3.354	0.000
3	8.3572	0.00	744.65	.6132	3.410	0.000
4	8.4819	0.00	727.95	.5985	3.438	0.000
5	8.6111	0.00	714.21	.5864	3.440	0.000
6	8.7449	0.00	698.79	.5729	3.459	0.000
7	8.8840	0.00	681.48	.5577	3.502	0.000
8	9.0286	0.00	664.91	.5432	3.548	0.000
9	9.1791	0.00	649.78	.5297	3.596	0.000
10	9.3355	0.00	635.17	.5165	3.661	0.000
11	9.5000	0.00	608.42	.4929	3.817	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	8.1220	0.000	.169	-4.1601	.05481	.4392	.3744
2	8.2373	0.000	.024	-4.2352	.05420	.4503	.3815
3	8.3572	0.000	-.099	-4.2532	.05727	.4617	.3854
4	8.4819	0.000	-.175	-4.2187	.05983	.4689	.3857
5	8.6111	0.000	-.208	-4.1601	.05936	.4712	.3841
6	8.7449	0.000	-.215	-4.0686	.05763	.4734	.3838
7	8.8840	0.000	-.217	-3.9463	.05573	.4765	.3852
8	9.0286	0.000	-.236	-3.8235	.05439	.4793	.3862
9	9.1791	0.000	-.287	-3.6984	.05394	.4814	.3860
10	9.3355	0.000	-.380	-3.5745	.05426	.4834	.3848
11	9.5000	0.000	-.505	-3.3795	.05807	.4943	.3901

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 17 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 17 ISENT EFF	STATION 17 DELTA H ON H1
MEAN VALUES-		2.1403	.8831	.2748	.9805	0.0000	0.0000
1	8.1220	2.2259	.9368	.2740	.9772	0.0000	0.0000
2	8.2373	2.2128	.9306	.2735	.9780	0.0000	0.0000
3	8.3572	2.1941	.9207	.2732	.9775	0.0000	0.0000
4	8.4819	2.1779	.9115	.2730	.9773	0.0000	0.0000
5	8.6111	2.1652	.9040	.2730	.9783	0.0000	0.0000
6	8.7449	2.1493	.8943	.2730	.9798	0.0000	0.0000
7	8.8840	2.1304	.8818	.2733	.9814	0.0000	0.0000
8	9.0286	2.1119	.8678	.2742	.9826	0.0000	0.0000
9	9.1791	2.0948	.8517	.2760	.9835	0.0000	0.0000
10	9.3355	2.0776	.8323	.2789	.9842	0.0000	0.0000
11	9.5000	2.0455	.8013	.2829	.9842	0.0000	0.0000

STATION 18 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.1240	720.49	0.00	720.49	1.92	720.49
2	8.2402	710.48	0.00	710.47	3.19	710.48
3	8.3606	695.69	0.00	695.68	4.09	695.69
4	8.4857	682.22	0.00	682.20	4.77	682.22
5	8.6151	671.40	0.00	671.38	5.09	671.40
6	8.7489	658.21	0.00	658.19	4.94	658.21
7	8.8876	642.44	0.00	642.42	4.39	642.44
8	9.0317	626.83	0.00	626.82	3.54	626.83
9	9.1813	612.25	0.00	612.24	2.41	612.25
10	9.3365	597.73	0.00	597.73	1.12	597.73
11	9.5000	569.22	0.00	569.22	0.00	569.22

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	8.1240	4.5000	0.0000	-70.31	.153	0.000	0.000
2	8.2402	4.5000	.1162	-55.23	.258	0.000	0.000
3	8.3606	4.5000	.2366	-49.15	.337	0.000	0.000
4	8.4857	4.5000	.3617	-45.22	.401	0.000	0.000
5	8.6151	4.5000	.4911	-44.16	.434	0.000	0.000
6	8.7489	4.5000	.6249	-46.48	.430	0.000	0.000
7	8.8876	4.5000	.7636	-52.77	.391	0.000	0.000
8	9.0317	4.5000	.9077	-65.04	.323	0.000	0.000
9	9.1813	4.5000	1.0573	-94.08	.226	0.000	0.000
10	9.3365	4.5000	1.2125	-204.53	.107	0.000	0.000
11	9.5000	4.5000	1.3760	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	8.1240	.5917	32.5316	25.6726	660.792	617.596	.112263
2	8.2402	.5830	32.3455	25.6965	660.558	618.554	.112194
3	8.3606	.5701	32.0680	25.7250	660.381	620.108	.112037
4	8.4857	.5584	31.8294	25.7563	660.297	621.568	.111910
5	8.6151	.5491	31.6525	25.7893	660.278	622.768	.111837
6	8.7489	.5376	31.4333	25.8218	660.296	624.245	.111713
7	8.8876	.5240	31.1682	25.8512	660.449	626.105	.111508
8	9.0317	.5104	30.9080	25.8758	660.907	628.211	.111240
9	9.1813	.4976	30.6646	25.8941	661.832	630.641	.110890
10	9.3365	.4846	30.4179	25.9049	663.374	633.644	.110410
11	9.5000	.4597	29.9472	25.9082	665.417	638.455	.109592

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	8.1240	158.590	148.223	.979287	0.000	.153
2	8.2402	158.534	148.453	.979596	0.000	.258
3	8.3606	158.491	148.826	.980122	0.000	.337
4	8.4857	158.471	149.176	.980603	0.000	.401
5	8.6151	158.467	149.464	.980978	0.000	.434
6	8.7489	158.471	149.819	.981460	0.000	.430
7	8.8876	158.508	150.265	.982096	0.000	.391
8	9.0317	158.618	150.771	.982837	0.000	.323
9	9.1813	158.840	151.354	.983715	0.000	.226
10	9.3365	159.210	152.075	.984827	0.000	.107
11	9.5000	159.700	153.229	.986633	0.000	0.000

STATION 18 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	8.1240	0.00	720.49	.5917	0.000	0.000
2	8.2402	0.00	710.48	.5830	0.000	0.000
3	8.3606	0.00	695.69	.5701	0.000	0.000
4	8.4857	0.00	682.22	.5584	0.000	0.000
5	8.6151	0.00	671.40	.5491	0.000	0.000
6	8.7489	0.00	658.21	.5376	0.000	0.000
7	8.8876	0.00	642.44	.5240	0.000	0.000
8	9.0317	0.00	626.83	.5104	0.000	0.000
9	9.1813	0.00	612.25	.4976	0.000	0.000
10	9.3365	0.00	597.73	.4846	0.000	0.000
11	9.5000	0.00	569.22	.4597	0.000	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	8.1240	0.000	0.000	-1.0883	.06832	.5055	.4399
2	8.2402	0.000	0.000	-1.1143	.06766	.5123	.4402
3	8.3606	0.000	0.000	-1.1200	.07156	.5215	.4393
4	8.4857	0.000	0.000	-1.1140	.07474	.5270	.4361
5	8.6151	0.000	0.000	-1.0988	.07413	.5277	.4320
6	8.7489	0.000	0.000	-1.0734	.07198	.5290	.4307
7	8.8876	0.000	0.000	-1.0425	.06961	.5320	.4318
8	9.0317	0.000	0.000	-1.0058	.06798	.5351	.4331
9	9.1813	0.000	0.000	-.9740	.06742	.5379	.4337
10	9.3365	0.000	0.000	-.9424	.06781	.5411	.4338
11	9.5000	0.000	0.000	-.8857	.07258	.5562	.4428

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 18 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 18 ISENT EFF	STATION 18 DELTA H ON H1
MEAN	VALUES-	2.1298	.8767	.2748	.9757	0.0000	0.0000
1	8.1240	2.2130	.9292	.2740	.9715	0.0000	0.0000
2	8.2402	2.2004	.9232	.2735	.9725	0.0000	0.0000
3	8.3606	2.1815	.9131	.2732	.9719	0.0000	0.0000
4	8.4857	2.1653	.9039	.2730	.9717	0.0000	0.0000
5	8.6151	2.1532	.8968	.2730	.9729	0.0000	0.0000
6	8.7489	2.1383	.8876	.2730	.9748	0.0000	0.0000
7	8.8876	2.1203	.8757	.2733	.9767	0.0000	0.0000
8	9.0317	2.1026	.8621	.2742	.9783	0.0000	0.0000
9	9.1813	2.0860	.8464	.2760	.9794	0.0000	0.0000
10	9.3365	2.0692	.8272	.2789	.9802	0.0000	0.0000
11	9.5000	2.0372	.7963	.2829	.9802	0.0000	0.0000

STATION 19 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.1240	704.90	0.00	704.90	0.00	704.90
2	8.2406	696.02	0.00	696.01	.45	696.02
3	8.3614	682.44	0.00	682.44	.83	682.44
4	8.4868	670.36	0.00	670.36	1.13	670.36
5	8.6165	661.08	0.00	661.07	1.32	661.08
6	8.7502	649.36	0.00	649.36	1.36	649.36
7	8.8888	634.92	0.00	634.92	1.26	634.92
8	9.0327	620.45	0.00	620.45	1.05	620.45
9	9.1820	606.72	0.00	606.71	.74	606.72
10	9.3369	592.66	0.00	592.66	.37	592.66
11	9.5000	564.06	0.00	564.06	0.00	564.06

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF		STREAMLINE		STATION
RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE	ANGLE	LEAN ANGLE
1	8.1240	4.8750	0.0000	0.00	0.000	0.000
2	8.2406	4.8750	.1166	-744.14	.037	0.000
3	8.3614	4.8750	.2374	-399.04	.070	0.000
4	8.4868	4.8750	.3628	-291.37	.097	0.000
5	8.6165	4.8750	.4925	-251.45	.114	0.000
6	8.7502	4.8750	.6262	-245.65	.120	0.000
7	8.8888	4.8750	.7648	-267.03	.114	0.000
8	9.0327	4.8750	.9087	-328.45	.097	0.000
9	9.1820	4.8750	1.0580	-490.31	.070	0.000
10	9.3369	4.8750	1.2129	-1122.09	.036	0.000
11	9.5000	4.8750	1.3760	0.00	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	8.1240	.5780	32.5316	25.9427	660.792	619.445	.113106
2	8.2406	.5703	32.3455	25.9437	660.558	620.247	.112964
3	8.3614	.5586	32.0680	25.9464	660.381	621.627	.112725
4	8.4868	.5482	31.8294	25.9506	660.297	622.903	.112512
5	8.6165	.5401	31.6525	25.9558	660.278	623.913	.112352
6	8.7502	.5300	31.4333	25.9614	660.296	625.207	.112144
7	8.8888	.5175	31.1682	25.9669	660.449	626.904	.111864
8	9.0327	.5049	30.9080	25.9715	660.907	628.874	.111534
9	9.1820	.4928	30.6646	25.9749	661.832	631.202	.111137
10	9.3369	.4803	30.4179	25.9769	663.374	634.146	.110629
11	9.5000	.4554	29.9472	25.9775	665.417	638.942	.109802

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	8.1240	158.590	148.667	.979287	0.000	0.000
2	8.2406	158.534	148.859	.979596	0.000	.037
3	8.3614	158.491	149.190	.980122	0.000	.070
4	8.4868	158.471	149.497	.980603	0.000	.097
5	8.6165	158.467	149.739	.980978	0.000	.114
6	8.7502	158.471	150.050	.981460	0.000	.120
7	8.8888	158.508	150.457	.982096	0.000	.114
8	9.0327	158.618	150.930	.982837	0.000	.097
9	9.1820	158.840	151.488	.983715	0.000	.070
10	9.3369	159.210	152.195	.984827	0.000	.036
11	9.5000	159.700	153.346	.986633	0.000	0.000

STATION 20 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.1240	704.17	0.00	704.17	0.00	704.17
2	8.2408	695.33	0.00	695.33	.06	695.33
3	8.3617	681.89	0.00	681.89	.11	681.89
4	8.4873	670.03	0.00	670.03	.15	670.03
5	8.6170	661.03	0.00	661.03	.19	661.03
6	8.7509	649.65	0.00	649.65	.21	649.65
7	8.8895	635.52	0.00	635.52	.21	635.52
8	9.0333	621.34	0.00	621.34	.19	621.34
9	9.1825	607.82	0.00	607.82	.16	607.82
10	9.3372	593.91	0.00	593.91	.10	593.91
11	9.5000	565.42	0.00	565.42	0.00	565.42

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	8.1240	6.0000	0.0000	0.00	0.000		0.000
2	8.2408	6.0000	.1168	-9204.97	.005		0.000
3	8.3617	6.0000	.2377	-4634.99	.009		0.000
4	8.4873	6.0000	.3633	-3210.41	.013		0.000
5	8.6170	6.0000	.4930	-2589.10	.016		0.000
6	8.7509	6.0000	.6269	-2310.85	.018		0.000
7	8.8895	6.0000	.7655	-2241.80	.019		0.000
8	9.0333	6.0000	.9093	-2372.63	.018		0.000
9	9.1825	6.0000	1.0585	-2826.96	.015		0.000
10	9.3372	6.0000	1.2132	-4323.21	.009		0.000
11	9.5000	6.0000	1.3760	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	8.1240	.5774	32.5316	25.9553	660.792	619.530	.113145
2	8.2408	.5697	32.3455	25.9553	660.558	620.327	.113000
3	8.3617	.5581	32.0680	25.9556	660.381	621.690	.112753
4	8.4873	.5479	31.8294	25.9559	660.297	622.940	.112529
5	8.6170	.5401	31.6525	25.9564	660.278	623.917	.112354
6	8.7509	.5302	31.4333	25.9570	660.296	625.177	.112131
7	8.8895	.5180	31.1682	25.9576	660.449	626.840	.111836
8	9.0333	.5057	30.9080	25.9582	660.907	628.782	.111493
9	9.1825	.4938	30.6646	25.9588	661.832	631.090	.111088
10	9.3372	.4814	30.4179	25.9592	663.374	634.023	.110575
11	9.5000	.4565	29.9472	25.9594	665.417	638.814	.109747

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	8.1240	158.590	148.687	.979287	0.000	0.000
2	8.2408	158.534	148.878	.979596	0.000	.005
3	8.3617	158.491	149.206	.980122	0.000	.009
4	8.4873	158.471	149.506	.980603	0.000	.013
5	8.6170	158.467	149.740	.980978	0.000	.016
6	8.7509	158.471	150.042	.981460	0.000	.018
7	8.8895	158.508	150.442	.982096	0.000	.019
8	9.0333	158.618	150.908	.982837	0.000	.018
9	9.1825	158.840	151.462	.983715	0.000	.015
10	9.3372	159.210	152.166	.984827	0.000	.009
11	9.5000	159.700	153.315	.986633	0.000	0.000

STATION 21 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	8.1240	704.21	0.00	704.21	0.00	704.21
2	8.2408	695.37	0.00	695.37	.01	695.37
3	8.3618	681.95	0.00	681.95	.03	681.95
4	8.4874	670.11	0.00	670.11	.04	670.11
5	8.6171	661.15	0.00	661.15	.04	661.15
6	8.7510	649.79	0.00	649.79	.05	649.79
7	8.8896	635.72	0.00	635.72	.05	635.72
8	9.0334	621.57	0.00	621.57	.04	621.57
9	9.1826	608.11	0.00	608.11	.03	608.11
10	9.3373	594.23	0.00	594.23	.02	594.23
11	9.5000	565.76	0.00	565.76	0.00	565.76

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	8.1240	7.1250	0.0000	0.00	0.000	0.000	0.000
2	8.2408	7.1250	.1168	0.00	.001	0.000	0.000
3	8.3618	7.1250	.2378	0.00	.002	0.000	0.000
4	8.4874	7.1250	.3634	0.00	.003	0.000	0.000
5	8.6171	7.1250	.4931	0.00	.004	0.000	0.000
6	8.7510	7.1250	.6270	0.00	.004	0.000	0.000
7	8.8896	7.1250	.7656	0.00	.004	0.000	0.000
8	9.0334	7.1250	.9094	0.00	.004	0.000	0.000
9	9.1826	7.1250	1.0586	0.00	.003	0.000	0.000
10	9.3373	7.1250	1.2133	0.00	.002	0.000	0.000
11	9.5000	7.1250	1.3760	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	8.1240	.5774	32.5316	25.9547	660.792	619.526	.113143
2	8.2408	.5698	32.3455	25.9547	660.558	620.322	.112998
3	8.3618	.5582	32.0680	25.9547	660.381	621.684	.112750
4	8.4874	.5479	31.8294	25.9547	660.297	622.931	.112525
5	8.6171	.5402	31.6525	25.9547	660.278	623.905	.112349
6	8.7510	.5304	31.4333	25.9547	660.296	625.161	.112123
7	8.8896	.5182	31.1682	25.9547	660.449	626.820	.111827
8	9.0334	.5059	30.9080	25.9547	660.907	628.757	.111482
9	9.1826	.4940	30.6646	25.9547	661.832	631.061	.111075
10	9.3373	.4816	30.4179	25.9547	663.374	633.992	.110562
11	9.5000	.4568	29.9472	25.9547	665.417	638.781	.109733

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	8.1240	158.590	148.686	.979287	0.000	0.000
2	8.2408	158.534	148.877	.979596	0.000	.001
3	8.3618	158.491	149.204	.980122	0.000	.002
4	8.4874	158.471	149.503	.980603	0.000	.003
5	8.6171	158.467	149.737	.980978	0.000	.004
6	8.7510	158.471	150.039	.981460	0.000	.004
7	8.8896	158.508	150.437	.982096	0.000	.004
8	9.0334	158.618	150.902	.982837	0.000	.004
9	9.1826	158.840	151.455	.983715	0.000	.003
10	9.3373	159.210	152.158	.984827	0.000	.002
11	9.5000	159.700	153.308	.986633	0.000	0.000

POINT NO 1 PASS 35 THE CALCULATION IS CONVERGED

SPEED FACTOR = 1.000 FLOW = 34.460 TOTAL PRESSURE RATIO = 2.130

ISENTROPIC EFFICIENCY = .8767 POWER = .1668E+04

LOSS COEFFICIENT DETERMINATION FOR BLADE BETWEEN STATIONS 5 AND 10
AS INCORPORATED IN ABOVE RESULTS, BLADE TYPE 1

STREAM LINE	INLET RADIUS	OUTLET RADIUS	CASCADE SOLIDITY	DIFF FACTOR	LOSS PARAM	DIFF LOSS	BLADE ANGLE
1	7.125	7.754	2.0324	.5446	.00868	.04058	0.000
2	7.385	7.923	1.9854	.5429	.00843	.03960	0.000
3	7.635	8.089	1.9481	.5425	.00825	.03921	0.000
4	7.879	8.254	1.9264	.5413	.00810	.03932	0.000
5	8.118	8.420	1.9153	.5391	.00803	.04013	0.000
6	8.354	8.588	1.9074	.5377	.00816	.04219	0.000
7	8.586	8.759	1.9010	.5365	.00852	.04580	0.000
8	8.816	8.934	1.8960	.5348	.00906	.05072	0.000
9	9.045	9.115	1.8904	.5333	.00976	.05694	0.000
10	9.273	9.301	1.8812	.5339	.01066	.06506	0.000
11	9.500	9.500	1.8688	.5413	.01218	.07993	0.000

STREAM LINE	INCID ANGLE	EXPAN ANGLE	INLET M.NO.	EXPAND M. NO.	SHOCK LOSS	TOTAL LOSS
1	0.000	8.076	1.0518	1.3861	.01290	.05348
2	0.000	8.205	1.0975	1.4175	.02149	.06109
3	0.000	8.119	1.1392	1.4439	.03171	.07093
4	0.000	7.753	1.1778	1.4614	.04025	.07957
5	0.000	7.270	1.2140	1.4751	.04742	.08755
6	0.000	6.874	1.2484	1.4917	.05629	.09848
7	0.000	6.617	1.2815	1.5128	.06637	.11216
8	0.000	6.422	1.3133	1.5357	.07590	.12662
9	0.000	6.314	1.3441	1.5610	.08542	.14236
10	0.000	6.449	1.3737	1.5939	.09632	.16137
11	0.000	6.959	1.4017	1.6383	.11144	.19137

SHOCK SURFACE SWEEP CALCULATION PARAMETERS

STREAM -LINE	LE RADIUS	LE SWEEP	SHOCK SWEEP * SUCT SURF	SHOCK P/P	CALCULATED EXP ANG
1	7.125000	12.500679	20.357935	.993508	8.076298
2	7.384818	10.475387	17.509189	.988607	8.205214
3	7.635336	7.619021	14.401466	.982431	8.118927
4	7.879246	5.896309	12.099952	.976837	7.753494
5	8.118282	4.974706	10.766736	.971783	7.269860
6	8.353635	3.323213	8.577064	.965492	6.874004
7	8.586157	1.195591	6.029178	.958199	6.616746
8	8.816498	.260925	4.957174	.951003	6.421997
9	9.045210	.811938	5.434619	.943604	6.313651
10	9.272838	1.680772	6.822896	.935093	6.449270
11	9.500000	1.197883	6.835100	.923502	6.959432

LOSS COEFFICIENT DETERMINATION FOR BLADE BETWEEN STATIONS 13 AND 18
AS INCORPORATED IN ABOVE RESULTS, BLADE TYPE 2

STREAM LINE	INLET RADIUS	OUTLET RADIUS	CASCADE SOLIDITY	DIFF FACTOR	LOSS PARAM	DIFF LOSS	BLADE ANGLE
1	7.912	8.124	1.9396	.5055	.01761	.06832	0.000
2	8.068	8.240	1.8493	.5123	.01817	.06720	0.000
3	8.217	8.361	1.7702	.5215	.01898	.06719	0.000
4	8.363	8.486	1.7161	.5270	.01949	.06688	0.000
5	8.510	8.615	1.6826	.5277	.01955	.06580	0.000
6	8.659	8.749	1.6583	.5290	.01968	.06526	0.000
7	8.812	8.888	1.6400	.5320	.01996	.06546	0.000
8	8.971	9.032	1.6282	.5351	.02026	.06596	0.000
9	9.138	9.181	1.6228	.5379	.02053	.06663	0.000
10	9.312	9.337	1.6231	.5411	.02084	.06765	0.000
11	9.500	9.500	1.6270	.5562	.02229	.07254	0.000

STREAM LINE	INCID ANGLE	EXPAN ANGLE	INLET M.NO.	EXPAND M. NO.	SHOCK LOSS	TOTAL LOSS
1	0.000	18.687	.9122	1.7297	0.00000	.06832
2	0.000	18.854	.8962	1.7355	.00046	.06767
3	0.000	19.286	.8756	1.7503	.00437	.07156
4	0.000	19.811	.8540	1.7683	.00785	.07474
5	0.000	20.436	.8323	1.7898	.00833	.07414
6	0.000	21.031	.8092	1.8104	.00673	.07199
7	0.000	21.521	.7851	1.8274	.00416	.06962
8	0.000	22.016	.7621	1.8446	.00203	.06800
9	0.000	22.584	.7408	1.8645	.00079	.06742
10	0.000	23.230	.7198	1.8872	.00016	.06781
11	0.000	23.990	.6903	1.9140	0.00000	.07254

SHOCK SURFACE SWEEP CALCULATION PARAMETERS

STREAM -LINE	LE RADIUS	LE SWEEP	SHOCK SWEEP * SUCT SURF	SHOCK P/P	CALCULATED EXP ANG
1	7.912000	34.650654	38.669781	1.000000	18.686961
2	8.068006	28.387538	32.929718	.999812	18.854379
3	8.217185	19.934004	23.594230	.998284	19.286275
4	8.363390	12.938991	16.099999	.997024	19.810818
5	8.509788	8.082773	10.730869	.996959	20.435743
6	8.658825	3.979135	6.284545	.997647	21.030874
7	8.812258	-.050077	2.066029	.998611	21.520524
8	8.971450	-2.296415	.136937	.999350	22.015502
9	9.137751	-4.674820	-1.771414	.999758	22.584106
10	9.312288	-7.571752	-4.233184	.999954	23.229944
11	9.500000	-9.112378	-5.366495	1.000000	23.990373

(2) Rotor Design

The rotor geometry was defined using the arbitrary camberline blade design section of the computer program described in Reference 7. The blade sections were first defined on each streamsurface by specifying the relative flow angle at a number of points along the meridional chordline, the incidence angle at the leading edge, and the variation of deviation angle within the blade. The design program iterated on the cascade solidity to provide a consistent trailing edge deviation angle. The streamsurface section surfaces were defined by applying a two-part cubic thickness distribution to each meanline, by specifying the location of the point of maximum section thickness, and by specifying the magnitudes of the section leading and trailing edge thicknesses and maximum section thickness.

The stacking of the blade was accomplished by locating each of the streamsurfaces on the appropriate surface of revolution to form a three-dimensional blade definition. The streamsurface sections were stacked on (or offset by specified amounts from) the two-dimensional section centroids. The manufacturing section surface coordinates (on specified manufacturing planes) were obtained by spline-fitting the blade surface coordinates on the streamsurface sections.

The blade design program printout on the following pages presents the detailed data on all streamsurface and manufacturing sections, excluding actual blade section surface coordinates. The

input data are listed first, including data to define the computing station geometry (identical to the corresponding blade geometry for the aerodynamic design presented in Figure 3), the streamsurface locations and relative air angles defined by the aerodynamic analysis, and data to define the thickness distributions and section stacking on each streamsurface. Next, details of the 11 streamsurface sections are presented. Only a summary listing of the ordinarily lengthy and detailed printout have been included here. Finally, summary details of the manufacturing sections are presented.

The rotor leading edge incidence angle (relative to the streamsurface section meanline) was specified as an approximately linear variation of from 6.1 degrees at the hub to 4.7 degrees at the tip, as shown in Figure 14. This distribution produced an incidence angle relative to the streamsurface section suction surface of approximately 2.0 degrees, constant from hub to tip. Local deviation angles were computed according to the fraction of trailing edge deviation verses fraction of axial chord distributions presented in Figure 15. Extra deviation of from 5.0 degrees at the hub to 1.0 degrees at the tip was added at the trailing edge. The leading edge radius and trailing edge half-thickness-to-chord ratios were specified to produce a constant 0.005-inch leading edge radius and a constant 0.005-inch trailing edge half-thickness from hub to tip. Blade maximum thickness was decreased linearly (as a function of streamsurface number) from 6-percent chord at the hub to 4-percent chord at the tip. The location of maximum thickness was

specified as a constant 60-percent chord from hub to tip. The spanwise distributions of solidity and trailing edge deviation angle for the rotor are presented in Figures 16 and 17 respectively.

PROGRAM UDO300 - VERSION 1.10 - ARBITRARY MEANLINE BLADE SECTION

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TITLE                                -FAN DESIGN - ROTOR
NUMBER OF STREAMSURFACES             = 11
NUMBER OF STATIONS                   = 8
NUMBER OF CONSTANT-Z PLANES         = 11
NUMBER OF BLADE DATA POINTS        = 11
NUMBER OF POINTS PER SEGMENT         = 30
NUMBER OF BLADES IN BLADE ROW        = 28
ISTAK                                = 2
IPUNCH                               = 1
IFPLOT                               = 0
IPRINT                               = 0
ISPLIT                               = 0
INAST                                = 0
JSPUN                                = 1
JZPUN                                = 1
ZINNER                               = 7.1000
ZOUTER                               = 9.5000
SCALE                                = 1.0000
STACKX                               = 1.1050
PLTSZ                                = 1.0000
TOLLE                                = .0020
LEADING EDGE STATION NUMBER          = 2
TRAILING EDGE STATION NUMBER         = 7
RADII SPECIFYING DEVIATION           = 1
RADII SPECIFYING INCIDENCE           = 5
SENSE OF ROTATION INDICATOR          = -1
DEVIATION CALCULATION INDEX          = 1
IDELET                               = 1
IFLDEG                               = 1

SHAPE FACTOR                         = .7000
SOLIDITY TOLERANCE                   = .1000
  
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DEVIATION CURVE 1 NUMBER OF POINTS = 5 RADIUS = 0.0000

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	0.0000	.1000
2	.2500	.1100
3	.5000	.1700
4	.7500	.3200
5	1.0000	1.0000

INCIDENCE AND EXTRA DEVIATION DISTRIBUTION

INLET RADIUS	INCIDENCE	EXTRA DEVIATION
7.1000	6.100	5.000
7.7000	5.750	4.000
8.3000	5.400	3.000
8.9000	5.050	2.000
9.5000	4.700	1.000

STREAMSURFACE GEOMETRY SPECIFICATION

COMPUTING STATION 1 NUMBER OF DESCRIBING POINTS= 2 IFANGS(1)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
-.4500	7.1250	1	7.1250	0.0000
-.4500	9.5000	2	7.3679	0.0000
		3	7.6099	0.0000
		4	7.8505	0.0000
		5	8.0896	0.0000
		6	8.3272	0.0000
		7	8.5635	0.0000
		8	8.7986	0.0000
		9	9.0328	0.0000
		10	9.2665	0.0000
		11	9.5000	0.0000

COMPUTING STATION 2 NUMBER OF DESCRIBING POINTS= 2 IFANGS(2)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
0.0000	7.1250	1	7.1250	-62.7370
0.0000	9.5000	2	7.3848	-62.2939
		3	7.6353	-62.1120
		4	7.8792	-62.1092
		5	8.1183	-62.2310
		6	8.3536	-62.4386
		7	8.5862	-62.7062
		8	8.8165	-63.0207
		9	9.0452	-63.3804
		10	9.2728	-63.7953
		11	9.5000	-64.2864

COMPUTING STATION 3 NUMBER OF DESCRIBING POINTS= 2 IFANGS(3)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
.4500	7.1750	1	7.1750	-58.2878
.4500	9.5000	2	7.4402	-57.8084
		3	7.6905	-57.7786
		4	7.9311	-58.0199
		5	8.1653	-58.4312
		6	8.3948	-58.9300
		7	8.6209	-59.4432
		8	8.8440	-59.9504
		9	9.0647	-60.4513
		10	9.2832	-60.9372
		11	9.5000	-61.4648

COMPUTING STATION 4 NUMBER OF DESCRIBING POINTS= 2 IFANGS(4)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
.9000	7.2850	1	7.2850	-51.5522
.9000	9.5000	2	7.5341	-51.9546
		3	7.7709	-52.5192
		4	7.9992	-53.2392
		5	8.2220	-54.0779
		6	8.4409	-54.9748
		7	8.6572	-55.8333
		8	8.8711	-56.6200
		9	9.0829	-57.3246
		10	9.2924	-57.9112
		11	9.5000	-58.4922

COMPUTING STATION 5 NUMBER OF DESCRIBING POINTS= 2 IFANGS(5)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
1.3500	7.4150	1	7.4150	-44.5594
1.3500	9.5000	2	7.6441	-45.4251
		3	7.8621	-46.5076
		4	8.0733	-47.7172
		5	8.2804	-49.0170
		6	8.4853	-50.3767
		7	8.6891	-51.6793
		8	8.8924	-52.8622
		9	9.0952	-53.9167
		10	9.2975	-54.8198
		11	9.5000	-55.8241

COMPUTING STATION 6 NUMBER OF DESCRIBING POINTS= 2 IFANGS(6)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
1.8000	7.5740	1	7.5740	-36.1200
1.8000	9.5000	2	7.7733	-38.0823
		3	7.9664	-40.0265
		4	8.1559	-41.9162
		5	8.3436	-43.7824
		6	8.5311	-45.6964
		7	8.7198	-47.5664
		8	8.9104	-49.3007
		9	9.1032	-50.9124
		10	9.2989	-52.4511
		11	9.5000	-54.4348

COMPUTING STATION 7 NUMBER OF DESCRIBING POINTS= 2 IFANGS(7)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
2.2500	7.7540	1	7.7540	-29.6217
2.2500	9.5000	2	7.9226	-32.3124
		3	8.0888	-34.9568
		4	8.2542	-37.4931
		5	8.4203	-39.9397
		6	8.5882	-42.4469
		7	8.7592	-44.9657
		8	8.9345	-47.3508
		9	9.1147	-49.6165
		10	9.3015	-51.9272
		11	9.5000	-55.2799

COMPUTING STATION 8 NUMBER OF DESCRIBING POINTS= 11 IFANGS(8)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
2.3750	7.8070	1	7.8070	50.3199
2.3950	7.9770	2	7.9738	49.1641
2.4090	8.1460	3	8.1348	48.6197
2.4160	8.3130	4	8.2934	48.3825
2.4180	8.4820	5	8.4521	48.2783
2.4160	8.6520	6	8.6129	48.3782
2.4110	8.8230	7	8.7773	48.6744
2.4040	8.9910	8	8.9467	49.0675
2.3960	9.1610	9	9.1220	49.5951
2.3860	9.3300	10	9.3048	50.4373
2.3750	9.5000	11	9.5000	52.4158

SECTION GEOMETRY SPECIFICATIONS

STREAM LINE	SOLID MOD	LE RAD /CHORD	MAX TK /CHORD	TE THK /CHORD	PT OF MAX TK	X STAK OFFSET	Y STAK OFFSET
1.0	0.000	.00148	.06000	.00148	.60000	0.00000	-.01000
2.0	0.000	.00148	.05800	.00148	.60000	0.00000	-.01100
3.0	0.000	.00147	.05600	.00147	.60000	0.00000	-.01200
4.0	0.000	.00145	.05400	.00145	.60000	0.00000	-.00800
5.0	0.000	.00143	.05200	.00143	.60000	0.00000	0.00000
6.0	0.000	.00140	.05000	.00140	.60000	0.00000	.00900
7.0	0.000	.00136	.04800	.00136	.60000	0.00000	.00800
8.0	0.000	.00133	.04600	.00133	.60000	0.00000	.00400
9.0	0.000	.00129	.04400	.00129	.60000	0.00000	.00100
10.0	0.000	.00126	.04200	.00126	.60000	0.00000	.00100
11.0	0.000	.00122	.04000	.00122	.60000	0.00000	-.00300

STREAMSURFACE 1 ITERATION 1 DEVIATION = 13.393 SOLIDITY = 2.0303
ITERATION 1 DEVIATION = 13.393 SOLIDITY = 2.0303

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 1

BETA1 = -56.652 (BLADE INLET ANGLE)
BETA2 = -16.228 (BLADE OUTLET ANGLE)
YZERO = .00148 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .06000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00148 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.3468 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.34787E+00

L.E.RADIUS = 4.95485E-03 CENTERED AT X= -1.1043E+00 Y= 1.4660E+00

SECTION AREA= 4.59675E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.47537E-01
IY = 1.29059E-01
IXY = -1.34932E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.73546E-01 (AT 43.042 WITH (X) AXIS)
IPY = 3.04966E-03 (AT 43.042 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0200 NEW DELX = .0200

CARTESIAN COORDINATES ON STREAMSURFACE 1

LEADING EDGE COORDINATES = (6.9772, -1.1050, 1.4436)
TRAILING EDGE COORDINATES = (7.6958, 1.1449, -.9478)

STREAMSURFACE 2 ITERATION 1 DEVIATION = 12.132 SOLIDITY = 1.9910
ITERATION 1 DEVIATION = 12.132 SOLIDITY = 1.9910

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 2

BETA1 = -56.360 (BLADE INLET ANGLE)
BETA2 = -20.181 (BLADE OUTLET ANGLE)
YZERO = .00148 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00148 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.3189 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.35524E+00

L.E.RADIUS = 4.96575E-03 CENTERED AT X= -1.1016E+00 Y= 1.4664E+00

SECTION AREA= 4.44795E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.45632E-01
IY = 1.21858E-01
IXY = -1.30677E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.64962E-01 (AT 42.401 WITH (X) AXIS)
IPY = 2.52806E-03 (AT 42.401 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0174 NEW DELX = .0174

CARTESIAN COORDINATES ON STREAMSURFACE 2

LEADING EDGE COORDINATES = (7.2422, -1.1050, 1.4446)

TRAILING EDGE COORDINATES= (7.8620, 1.1450, -.9783)

STREAMSURFACE 3 ITERATION 1 DEVIATION = 10.990 SOLIDITY = 1.9671
ITERATION 1 DEVIATION = 10.990 SOLIDITY = 1.9671

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 3

BETA1 = -56.324 (BLADE INLET ANGLE)
BETA2 = -23.967 (BLADE OUTLET ANGLE)
YZERO = .00147 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00147 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2980 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.38760E+00

L.E.RADIUS = 4.97978E-03 CENTERED AT X= -1.0997E+00 Y= 1.4849E+00

SECTION AREA= 4.36678E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.49203E-01
IY = 1.17509E-01
IXY = -1.30212E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.64529E-01 (AT 41.531 WITH (X) AXIS)
IPY = 2.18268E-03 (AT 41.531 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0148 NEW DELX = .0148

CARTESIAN COORDINATES ON STREAMSURFACE 3

LEADING EDGE COORDINATES = (7.4937, -1.1049, 1.4639)
TRAILING EDGE COORDINATES = (8.0244, 1.1450, -1.0186)

STREAMSURFACE 4 ITERATION 1 DEVIATION = 9.942 SOLIDITY = 1.9535
ITERATION 1 DEVIATION = 9.942 SOLIDITY = 1.9535

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 4

BETA1 = -56.464 (BLADE INLET ANGLE)
BETA2 = -27.551 (BLADE OUTLET ANGLE)
YZERO = .00145 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00145 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2824 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.43851E+00

L.E.RADIUS = 4.98584E-03 CENTERED AT X= -1.0990E+00 Y= 1.5111E+00

SECTION AREA= 4.32988E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.56734E-01
IY = 1.14950E-01
IXY = -1.32263E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.69745E-01 (AT 40.512 WITH (X) AXIS)
IPY = 1.93890E-03 (AT 40.512 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0118 NEW DELX = .0118

CARTESIAN COORDINATES ON STREAMSURFACE 4

LEADING EDGE COORDINATES = (7.7368, -1.1050, 1.4913)
TRAILING EDGE COORDINATES= (8.1845, 1.1450, -1.0708)

STREAMSURFACE 5 ITERATION 1 DEVIATION = 8.956 SOLIDITY = 1.9481
ITERATION 1 DEVIATION = 8.956 SOLIDITY = 1.9481

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 5

BETA1 = -56.725 (BLADE INLET ANGLE)
BETA2 = -30.983 (BLADE OUTLET ANGLE)
YZERO = .00143 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00143 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2707 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.50536E+00

L.E.RADIUS = 5.01267E-03 CENTERED AT X= -1.0995E+00 Y= 1.5436E+00

SECTION AREA= 4.32707E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.67843E-01
IY = 1.13744E-01
IXY = -1.36381E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.79830E-01 (AT 39.391 WITH (X) AXIS)
IPY = 1.75612E-03 (AT 39.391 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0082 NEW DELX = .0082

CARTESIAN COORDINATES ON STREAMSURFACE 5

LEADING EDGE COORDINATES = (7.9738, -1.1050, 1.5249)
TRAILING EDGE COORDINATES = (8.3437, 1.1450, -1.1330)

STREAMSURFACE 6 ITERATION 1 DEVIATION = 7.980 SOLIDITY = 1.9525
ITERATION 1 DEVIATION = 7.980 SOLIDITY = 1.9525

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 6

BETA1 = -57.070 (BLADE INLET ANGLE)
BETA2 = -34.467 (BLADE OUTLET ANGLE)
YZERO = .00140 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00140 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2624 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.58763E+00

L.E.RADIUS = 5.02268E-03 CENTERED AT X= -1.1019E+00 Y= 1.5838E+00

SECTION AREA= 4.35247E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.82453E-01
IY = 1.13660E-01
IXY = -1.42356E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.94509E-01 (AT 38.208 WITH (X) AXIS)
IPY = 1.60445E-03 (AT 38.208 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0033 NEW DELX = .0033

CARTESIAN COORDINATES ON STREAMSURFACE 6

LEADING EDGE COORDINATES = (8.2056, -1.1050, 1.5656)
TRAILING EDGE COORDINATES= (8.5035, 1.1450, -1.2028)

STREAMSURFACE 7 ITERATION 1 DEVIATION = 7.015 SOLIDITY = 1.9651
ITERATION 1 DEVIATION = 7.015 SOLIDITY = 1.9651

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 7

BETA1 = -57.473 (BLADE INLET ANGLE)
BETA2 = -37.950 (BLADE OUTLET ANGLE)
YZERO = .00136 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00136 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2567 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.57951E+00

L.E.RADIUS = 5.00414E-03 CENTERED AT X= -1.1063E+00 Y= 1.6389E+00

SECTION AREA= 4.38974E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.99278E-01
IY = 1.14276E-01
IXY = -1.49378E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.12084E-01 (AT 37.059 WITH (X) AXIS)
IPY = 1.47042E-03 (AT 37.059 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0029 NEW DELX = -.0029

CARTESIAN COORDINATES ON STREAMSURFACE 7

LEADING EDGE COORDINATES = (8.4316, -1.1050, 1.6216)

TRAILING EDGE COORDINATES = (8.6673, 1.1450, -1.2658)

STREAMSURFACE 8 ITERATION 1 DEVIATION = 6.096 SOLIDITY = 1.9816
ITERATION 1 DEVIATION = 6.096 SOLIDITY = 1.9816

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 8

BETA1 = -57.922 (BLADE INLET ANGLE)
BETA2 = -41.255 (BLADE OUTLET ANGLE)
YZERO = .00133 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00133 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2532 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.77603E+00

L.E.RADIUS = 5.02212E-03 CENTERED AT X= -1.1117E+00 Y= 1.6991E+00

SECTION AREA= 4.42738E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.17427E-01
IY = 1.15304E-01
IXY = -1.56915E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.31379E-01 (AT 35.987 WITH (X) AXIS)
IPY = 1.35171E-03 (AT 35.987 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0098 NEW DELX = -.0098

CARTESIAN COORDINATES ON STREAMSURFACE 8

LEADING EDGE COORDINATES = (8.6544, -1.1050, 1.6826)

TRAILING EDGE COORDINATES= (8.8355, 1.1450, -1.3262)

STREAMSURFACE 9 ITERATION 1 DEVIATION = 5.216 SOLIDITY = 2.0017
ITERATION 1 DEVIATION = 5.216 SOLIDITY = 2.0017

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 9

BETA1 = -58.415 (BLADE INLET ANGLE)
BETA2 = -44.401 (BLADE OUTLET ANGLE)
YZERO = .00129 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00129 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2512 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.87618E+00

L.E.RADIUS = 5.00027E-03 CENTERED AT X= -1.1180E+00 Y= 1.7601E+00

SECTION AREA= 4.45977E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.36364E-01
IY = 1.16495E-01
IXY = -1.64616E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.51617E-01 (AT 34.997 WITH (X) AXIS)
IPY = 1.24253E-03 (AT 34.997 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0171 NEW DELX = -.0171

CARTESIAN COORDINATES ON STREAMSURFACE 9

LEADING EDGE COORDINATES = (8.8754, -1.1050, 1.7446)
TRAILING EDGE COORDINATES = (9.0085, 1.1450, -1.3879)

STREAMSURFACE 10 ITERATION 1 DEVIATION = 4.340 SOLIDITY = 2.0297
ITERATION 1 DEVIATION = 4.340 SOLIDITY = 2.0297

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 10

BETA1 = -58.963 (BLADE INLET ANGLE)
BETA2 = -47.587 (BLADE OUTLET ANGLE)
YZERO = .00126 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00126 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2503 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.97992E+00

L.E.RADIUS = 5.01470E-03 CENTERED AT X= -1.1254E+00 Y= 1.8192E+00

SECTION AREA= 4.48719E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.56189E-01
IY = 1.18041E-01
IXY = -1.72674E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.73092E-01 (AT 34.099 WITH (X) AXIS)
IPY = 1.13798E-03 (AT 34.099 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0252 NEW DELX = -.0252

CARTESIAN COORDINATES ON STREAMSURFACE 10

LEADING EDGE COORDINATES = (9.0954, -1.1050, 1.8052)
TRAILING EDGE COORDINATES= (9.1871, 1.1450, -1.4540)

STREAMSURFACE 11 ITERATION 1 DEVIATION = 3.250 SOLIDITY = 2.0972
ITERATION 1 DEVIATION = 3.250 SOLIDITY = 2.0972

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 11

BETA1 = -59.586 (BLADE INLET ANGLE)
BETA2 = -52.030 (BLADE OUTLET ANGLE)
YZERO = .00122 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00122 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2500 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 4.11885E+00

L.E.RADIUS = 5.02500E-03 CENTERED AT X= -1.1387E+00 Y= 1.9003E+00

SECTION AREA= 4.57493E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.86388E-01
IY = 1.21999E-01
IXY = -1.85798E-01

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 4.07360E-01 (AT 33.068 WITH (X) AXIS)
IPY = 1.02675E-03 (AT 33.068 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0388 NEW DELX = -.0388

CARTESIAN COORDINATES ON STREAMSURFACE 11

LEADING EDGE COORDINATES = (9.3106, -1.1050, 1.8875)
TRAILING EDGE COORDINATES = (9.3745, 1.1450, -1.5393)

VOLUME OF BLADE SECTION = 9.2933E-01

BLADE CALCULATIONS FOR AERODYNAMIC ANALYSIS

STATION 3 NUMBER OF RADII= 11				
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.1750	4.4169	.1364	2.0079	-57.1701
7.4402	2.6145	.1256	1.9563	-56.8534
7.6905	.9863	.1182	1.9232	-56.9523
7.9311	.4883	.1127	1.9029	-57.2520
8.1653	-.2579	.1083	1.8927	-57.7253
8.3948	-3.0672	.1047	1.8913	-58.3436
8.6209	-5.6011	.1013	1.8949	-58.9470
8.8440	-6.0508	.0981	1.9004	-59.4874
9.0647	-4.6551	.0949	1.9071	-60.0009
9.2832	-7.1273	.0918	1.9147	-60.5464
9.5000	-10.9279	.0892	1.9375	-61.1375

STATION 4 NUMBER OF RADII= 11				
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.2850	-2.0630	.1779	2.0079	-50.9595
7.5341	-2.3065	.1681	1.9563	-51.2141
7.7709	-1.8475	.1610	1.9232	-51.6405
7.9992	-.9716	.1557	1.9029	-52.2568
8.2220	-.6427	.1516	1.8927	-53.0782
8.4409	-3.0044	.1485	1.8913	-54.0957
8.6572	-5.5397	.1455	1.8949	-55.0626
8.8711	-5.9064	.1424	1.9004	-55.9018
9.0829	-4.6812	.1390	1.9071	-56.6557
9.2924	-6.9507	.1351	1.9147	-57.3402
9.5000	-10.4243	.1321	1.9375	-58.0417

STATION 5 NUMBER OF RADII= 11				
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.4150	-4.2165	.1588	2.0079	-44.1665
7.6441	-3.6690	.1521	1.9563	-44.6254
7.8621	-1.8784	.1474	1.9232	-45.2996
8.0733	.1439	.1441	1.9029	-46.2523
8.2804	1.5039	.1419	1.8927	-47.4846
8.4853	-.4357	.1406	1.8913	-49.0182
8.6891	-3.1744	.1395	1.8949	-50.4964
8.8924	-3.6585	.1383	1.9004	-51.7843
9.0952	-3.0383	.1367	1.9071	-52.9518
9.2975	-5.1772	.1347	1.9147	-54.0036
9.5000	-8.1048	.1342	1.9375	-55.2022

STATION 6 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.5740	-4.0806	.0951	2.0079	-33.5427
7.7733	-2.4474	.0925	1.9563	-34.8640
7.9664	.9621	.0909	1.9232	-36.1717
8.1559	3.9988	.0898	1.9029	-37.8293
8.3436	6.4008	.0894	1.8927	-39.7834
8.5311	5.0377	.0897	1.8913	-42.2075
8.7198	2.0947	.0904	1.8949	-44.6039
8.9104	1.5275	.0912	1.9004	-46.7164
9.1032	1.5499	.0921	1.9071	-48.6964
9.2989	.7134	.0931	1.9147	-50.6142
9.5000	-.4163	.0970	1.9375	-53.0658

STATION 7 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.7540	2.6918	.0057	2.0079	-16.3847
7.9226	4.7375	.0056	1.9563	-19.7091
8.0888	8.8755	.0056	1.9232	-22.5492
8.2542	12.2935	.0057	1.9029	-25.7457
8.4203	15.3891	.0057	1.8927	-29.1108
8.5882	14.7327	.0058	1.8913	-33.1405
8.7592	11.7449	.0059	1.8949	-37.2153
8.9345	11.2035	.0060	1.9004	-40.7756
9.1147	10.7296	.0061	1.9071	-44.1154
9.3015	13.4450	.0064	1.9147	-47.4208
9.5000	16.3960	.0067	1.9375	-52.0164

BLADE SURFACE GEOMETRY IN CARTESIAN COORD. AT SPECIFIED VALUES OF (Z)

SECTION PROPERTIES FOR SECTION NUMBER 1 (Z) = 7.1000
 SECTION AREA = 4.4889E-01

LOCATION OF CENTROID XBAR= -2.7607E-02
 RELATIVE TO STACK AXIS YBAR= 7.1648E-03

SECOND MOMENTS OF AREA IX = 1.4208E-01
 ABOUT CENTROID IY = 1.1566E-01
 IXY = -1.2621E-01

PRINCIPAL SECOND MOMENTS IPX = 2.5576E-01 (AT 42.01 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 1.9722E-03 (AT 42.01 DEG. TO (Y))

TORSIONAL CONSTANT = 4.0708E-03

SECTION PROPERTIES FOR SECTION NUMBER 2 (Z) = 7.3400
 SECTION AREA = 4.3843E-01

LOCATION OF CENTROID XBAR= -2.3863E-02
 RELATIVE TO STACK AXIS YBAR= 9.0180E-03

SECOND MOMENTS OF AREA IX = 1.4087E-01
 ABOUT CENTROID IY = 1.1281E-01
 IXY = -1.2437E-01

PRINCIPAL SECOND MOMENTS IPX = 2.5200E-01 (AT 41.78 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 1.6866E-03 (AT 41.78 DEG. TO (Y))

TORSIONAL CONSTANT = 3.7730E-03

SECTION PROPERTIES FOR SECTION NUMBER 3 (Z) = 7.5800
 SECTION AREA = 4.3063E-01

LOCATION OF CENTROID XBAR= -2.1300E-02
 RELATIVE TO STACK AXIS YBAR= 1.4416E-02

SECOND MOMENTS OF AREA IX = 1.4262E-01
 ABOUT CENTROID IY = 1.1092E-01
 IXY = -1.2426E-01

PRINCIPAL SECOND MOMENTS IPX = 2.5204E-01 (AT 41.37 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 1.5079E-03 (AT 41.37 DEG. TO (Y))

TORSIONAL CONSTANT = 3.5214E-03

SECTION PROPERTIES FOR SECTION NUMBER 4 (Z) = 7.8200
SECTION AREA = 4.2722E-01

LOCATION OF CENTROID XBAR= -1.7754E-02
RELATIVE TO STACK AXIS YBAR= 1.7875E-02

SECOND MOMENTS OF AREA IX = 1.4738E-01
ABOUT CENTROID IY = 1.1017E-01
IXY = -1.2603E-01

PRINCIPAL SECOND MOMENTS IPX = 2.5617E-01 (AT 40.80 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.3817E-03 (AT 40.80 DEG. TO (Y))

TORSIONAL CONSTANT = 3.3649E-03

SECTION PROPERTIES FOR SECTION NUMBER 5 (Z) = 8.0600
SECTION AREA = 4.2805E-01

LOCATION OF CENTROID XBAR= -1.2603E-02
RELATIVE TO STACK AXIS YBAR= 1.3250E-02

SECOND MOMENTS OF AREA IX = 1.5730E-01
ABOUT CENTROID IY = 1.1072E-01
IXY = -1.3069E-01

PRINCIPAL SECOND MOMENTS IPX = 2.6676E-01 (AT 39.95 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.2655E-03 (AT 39.95 DEG. TO (Y))

TORSIONAL CONSTANT = 3.2649E-03

SECTION PROPERTIES FOR SECTION NUMBER 6 (Z) = 8.3000
SECTION AREA = 4.3213E-01

LOCATION OF CENTROID XBAR= -7.1165E-03
RELATIVE TO STACK AXIS YBAR= 3.0507E-03

SECOND MOMENTS OF AREA IX = 1.7325E-01
ABOUT CENTROID IY = 1.1222E-01
IXY = -1.3827E-01

PRINCIPAL SECOND MOMENTS IPX = 2.8434E-01 (AT 38.78 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.1368E-03 (AT 38.78 DEG. TO (Y))

TORSIONAL CONSTANT = 3.1895E-03

SECTION PROPERTIES FOR SECTION NUMBER 7 (Z) = 8.5400
SECTION AREA = 4.3777E-01

LOCATION OF CENTROID XBAR= -1.4978E-03
RELATIVE TO STACK AXIS YBAR= -3.0198E-03

SECOND MOMENTS OF AREA IX = 1.9496E-01
ABOUT CENTROID IY = 1.1400E-01
IXY = -1.4806E-01

PRINCIPAL SECOND MOMENTS IPX = 3.0797E-01 (AT 37.35 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 9.8644E-04 (AT 37.35 DEG. TO (Y))

TORSIONAL CONSTANT = 3.1057E-03

SECTION PROPERTIES FOR SECTION NUMBER 8 (Z) = 8.7800
SECTION AREA = 4.4339E-01

LOCATION OF CENTROID XBAR= 6.2133E-03
RELATIVE TO STACK AXIS YBAR= -5.1596E-04

SECOND MOMENTS OF AREA IX = 2.1676E-01
ABOUT CENTROID IY = 1.1592E-01
IXY = -1.5764E-01

PRINCIPAL SECOND MOMENTS IPX = 3.3184E-01 (AT 36.13 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 8.3450E-04 (AT 36.13 DEG. TO (Y))

TORSIONAL CONSTANT = 3.0371E-03

SECTION PROPERTIES FOR SECTION NUMBER 9 (Z) = 9.0200
SECTION AREA = 4.4822E-01

LOCATION OF CENTROID XBAR= 1.5699E-02
RELATIVE TO STACK AXIS YBAR= 7.7293E-04

SECOND MOMENTS OF AREA IX = 2.3904E-01
ABOUT CENTROID IY = 1.1779E-01
IXY = -1.6707E-01

PRINCIPAL SECOND MOMENTS IPX = 3.5614E-01 (AT 35.03 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 6.9093E-04 (AT 35.03 DEG. TO (Y))

TORSIONAL CONSTANT = 2.9578E-03

SECTION PROPERTIES FOR SECTION NUMBER 10 (Z) = 9.2600

SECTION AREA = 4.5338E-01

LOCATION OF CENTROID XBAR= 2.3970E-02
RELATIVE TO STACK AXIS YBAR= 2.1658E-03

SECOND MOMENTS OF AREA IX = 2.6651E-01
ABOUT CENTROID IY = 1.2099E-01
IXY = -1.7891E-01

PRINCIPAL SECOND MOMENTS IPX = 3.8689E-01 (AT 33.93 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 6.0998E-04 (AT 33.93 DEG. TO (Y))

TORSIONAL CONSTANT = 2.8540E-03

SECTION PROPERTIES FOR SECTION NUMBER 11 (Z) = 9.5000

SECTION AREA = 4.6522E-01

LOCATION OF CENTROID XBAR= 3.9877E-02
RELATIVE TO STACK AXIS YBAR= 5.9298E-03

SECOND MOMENTS OF AREA IX = 3.0639E-01
ABOUT CENTROID IY = 1.2672E-01
IXY = -1.9649E-01

PRINCIPAL SECOND MOMENTS IPX = 4.3261E-01 (AT 32.72 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 4.9746E-04 (AT 32.72 DEG. TO (Y))

TORSIONAL CONSTANT = 2.8302E-03

(3) Stator Design

The stator geometry was defined using the same procedure as that used for the rotor. The printout on the following pages presents the input data and summarized results for all streamsurface and manufacturing sections. The stator leading edge incidence angle was specified as a constant 3.0 degrees from hub to tip, as shown in Figure 14. Local deviation angles were computed according to the fraction of trailing edge deviation verses fraction of axial chord distribution shown in Figure 15. Extra deviation of 1.0 degrees was added from hub to tip at the trailing edge. The leading edge radius and trailing edge half-thickness-to-chord ratios were specified to produce a constant 0.005-inch leading edge radius and a constant 0.005-inch trailing edge half-thickness from hub to tip. Blade maximum thickness was increased linearly (as a function of streamsurface number) from 4-percent chord at the hub to 6-percent at the tip. The location of maximum thickness was specified as a constant 55-percent chord from hub to tip. The vane sections were all stacked on the radial trailing edge; no axial or circumferential offsets were specified. The spanwise distributions of solidity and trailing edge deviation are shown in Figures 16 and 17.

PROGRAM UD0300 - VERSION 1.10 - ARBITRARY MEANLINE BLADE SECTION

TITLE	=FAN DESIGN - STATOR
NUMBER OF STREAMSURFACES	= 11
NUMBER OF STATIONS	= 8
NUMBER OF CONSTANT-Z PLANES	= 11
NUMBER OF BLADE DATA POINTS	= 11
NUMBER OF POINTS PER SEGMENT	= 30
NUMBER OF BLADES IN BLADE ROW	= 49
ISTAK	= 1
IPUNCH	= 1
IFPLOT	= 0
IPRINT	= 0
ISPLIT	= 0
INAST	= 0
JSPUN	= 1
JZPUN	= 1
ZINNER	= 8.0000
ZOUTER	= 9.5000
SCALE	= 1.0000
STACKX	= 4.5000
PLTSE	= 1.0000
TOLLE	= 0.0000
LEADING EDGE STATION NUMBER	= 2
TRAILING EDGE STATION NUMBER	= 7
RADII SPECIFYING DEVIATION	= 1
RADII SPECIFYING INCIDENCE	= 1
SENSE OF ROTATION INDICATOR	= 1
DEVIATION CALCULATION INDEX	= 1
IDELET	= 1
IFLDEG	= 0
SHAPE FACTOR	= .7000
SOLIDITY TOLERANCE	= .0100

DEVIATION CURVE 1 NUMBER OF POINTS = 5 RADIUS = 0.0000

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	0.0000	.1000
2	.2500	.1100
3	.5000	.1700
4	.7500	.3200
5	1.0000	1.0000

INCIDENCE AND EXTRA DEVIATION DISTRIBUTION

INLET RADIUS	INCIDENCE	EXTRA DEVIATION
0.0000	3.000	1.000

STREAMSURFACE GEOMETRY SPECIFICATION

COMPUTING STATION 1 NUMBER OF DESCRIBING POINTS= 11 IFANGS(1)= 0

DESCRIPTION		STREAMLINE NUMBER	RADII	AIR ANGLE
X	R			
2.5000	7.8600	1	7.8600	47.9653
2.5400	8.0230	2	8.0236	46.7212
2.5680	8.1880	3	8.1786	46.5093
2.5820	8.3500	4	8.3304	46.5624
2.5850	8.5130	5	8.4824	46.7011
2.5820	8.6790	6	8.6368	47.0065
2.5720	8.8440	7	8.7953	47.4811
2.5580	9.0080	8	8.9593	48.0512
2.5420	9.1720	9	9.1299	48.7430
2.5220	9.3340	10	9.3085	49.7232
2.5000	9.5000	11	9.5000	51.7488

COMPUTING STATION 2 NUMBER OF DESCRIBING POINTS= 11 IFANGS(2)= 0

DESCRIPTION		STREAMLINE NUMBER	RADII	AIR ANGLE
X	R			
2.6250	7.9120	1	7.9120	45.1128
2.6850	8.0710	2	8.0680	44.7835
2.7270	8.2300	3	8.2172	44.8212
2.7480	8.3880	4	8.3634	45.0263
2.7530	8.5470	5	8.5098	45.3157
2.7480	8.7060	6	8.6588	45.7599
2.7330	8.8650	7	8.8123	46.3698
2.7120	9.0240	8	8.9714	47.0671
2.6880	9.1820	9	9.1378	47.8719
2.6580	9.3410	10	9.3123	48.9469
2.6250	9.5000	11	9.5000	51.0354

COMPUTING STATION 3 NUMBER OF DESCRIBING POINTS= 11 IFANGS(3)= 1

DESCRIPTION		STREAMLINE NUMBER	RADII	AIR ANGLE
X	R			
3.0000	8.0220	1	8.0220	31.7437
3.0480	8.1620	2	8.1519	32.5602
3.0820	8.3070	3	8.2835	33.3175
3.0980	8.4460	4	8.4173	33.9048
3.1020	8.5880	5	8.5541	34.3508
3.0980	8.7270	6	8.6953	34.8517
3.0860	8.8820	7	8.8419	35.4439
3.0700	9.0380	8	8.9949	36.0349
3.0500	9.1910	9	9.1547	36.6507
3.0260	9.3430	10	9.3220	37.4370
3.0000	9.5000	11	9.5000	38.9681

COMPUTING STATION 4 NUMBER OF DESCRIBING POINTS= 11 IFANGS(4)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
3.3750	8.0770	1	8.0770	21.8124
3.4110	8.2100	2	8.1975	22.2744
3.4360	8.3480	3	8.3220	22.7149
3.4490	8.4800	4	8.4504	23.0138
3.4520	8.6180	5	8.5829	23.2014
3.4490	8.7490	6	8.7200	23.4690
3.4400	8.9000	7	8.8626	23.8367
3.4270	9.0500	8	9.0113	24.2037
3.4130	9.2000	9	9.1666	24.5755
3.3950	9.3490	10	9.3286	25.0473
3.3750	9.5000	11	9.5000	26.0384

COMPUTING STATION 5 NUMBER OF DESCRIBING POINTS= 11 IFANGS(5)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
3.7500	8.1090	1	8.1090	11.3662
3.7740	8.2370	2	8.2252	11.5728
3.7910	8.3710	3	8.3460	11.7919
3.7990	8.5030	4	8.4713	11.9445
3.8010	8.6410	5	8.6012	12.0331
3.7990	8.7690	6	8.7359	12.1537
3.7930	8.9180	7	8.8761	12.3223
3.7850	9.0620	8	9.0222	12.4959
3.7750	9.2090	9	9.1745	12.6732
3.7630	9.3530	10	9.3330	12.8930
3.7500	9.5000	11	9.5000	13.3964

COMPUTING STATION 6 NUMBER OF DESCRIBING POINTS= 11 IFANGS(6)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
4.1250	8.1220	1	8.1220	3.3020
4.1370	8.2520	2	8.2373	3.3537
4.1450	8.3870	3	8.3572	3.4099
4.1500	8.5220	4	8.4819	3.4378
4.1510	8.6600	5	8.6111	3.4402
4.1500	8.7900	6	8.7449	3.4591
4.1470	8.9340	7	8.8840	3.5019
4.1420	9.0740	8	9.0286	3.5482
4.1380	9.2170	9	9.1791	3.5963
4.1320	9.3580	10	9.3355	3.6609
4.1250	9.5000	11	9.5000	3.8169

COMPUTING STATION 7 NUMBER OF DESCRIBING POINTS= 2 IFANGS(7)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
4.5000	8.1240	1	8.1240	0.0000
4.5000	9.5000	2	8.2402	0.0000
		3	8.3606	0.0000
		4	8.4857	0.0000
		5	8.6151	0.0000
		6	8.7489	0.0000
		7	8.8876	0.0000
		8	9.0317	0.0000
		9	9.1813	0.0000
		10	9.3365	0.0000
		11	9.5000	0.0000

COMPUTING STATION 8 NUMBER OF DESCRIBING POINTS= 2 IFANGS(8)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
4.8750	8.1240	1	8.1240	0.0000
4.8750	9.5000	2	8.2406	0.0000
		3	8.3614	0.0000
		4	8.4868	0.0000
		5	8.6165	0.0000
		6	8.7502	0.0000
		7	8.8888	0.0000
		8	9.0327	0.0000
		9	9.1820	0.0000
		10	9.3369	0.0000
		11	9.5000	0.0000

SECTION GEOMETRY SPECIFICATIONS

STREAM LINE	SOLID MOD	LE RAD /CHORD	MAX TK /CHORD	TE THK /CHORD	PT OF MAX TK	X STAK OFFSET	Y STAK OFFSET
1.0	0.000	.00252	.04000	.00252	.55000	0.00000	0.00000
2.0	0.000	.00262	.04200	.00262	.55000	0.00000	0.00000
3.0	0.000	.00269	.04400	.00269	.55000	0.00000	0.00000
4.0	0.000	.00273	.04600	.00273	.55000	0.00000	0.00000
5.0	0.000	.00274	.04800	.00274	.55000	0.00000	0.00000
6.0	0.000	.00273	.05000	.00273	.55000	0.00000	0.00000
7.0	0.000	.00271	.05200	.00271	.55000	0.00000	0.00000
8.0	0.000	.00268	.05400	.00268	.55000	0.00000	0.00000
9.0	0.000	.00264	.05600	.00264	.55000	0.00000	0.00000
10.0	0.000	.00259	.05800	.00259	.55000	0.00000	0.00000
11.0	0.000	.00254	.06000	.00254	.55000	0.00000	0.00000

STREAMSURFACE 1 ITERATION 1 DEVIATION = 7.482 SOLIDITY = 1.9978
ITERATION 2 DEVIATION = 7.674 SOLIDITY = 1.9312
ITERATION 2 DEVIATION = 7.674 SOLIDITY = 1.9312

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 1

BETA1 = 42.113 (BLADE INLET ANGLE)
BETA2 = -7.674 (BLADE OUTLET ANGLE)
YZERO = .00252 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00252 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 1.8969 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.98409E+00

L.E.RADIUS = 4.99990E-03 CENTERED AT X= -1.8919E+00 Y= -5.8326E-01

SECTION AREA= 1.11971E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.41552E-03
IY = 2.28460E-02
IXY = 6.75989E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.81386E-04 (AT 16.747 WITH (X) AXIS)
IPY = 2.48802E-02 (AT 16.747 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 1

LEADING EDGE COORDINATES = (7.8910, -1.8748, -.5777)

TRAILING EDGE COORDINATES= (8.1240, -.0000, .0050)

STREAMSURFACE	2	ITERATION	1	DEVIATION =	7.718	SOLIDITY =	1.8929
		ITERATION	2	DEVIATION =	7.907	SOLIDITY =	1.8336
		ITERATION	2	DEVIATION =	7.907	SOLIDITY =	1.8336

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 2

BETA1	=	41.784	(BLADE INLET ANGLE)
BETA2	=	-7.907	(BLADE OUTLET ANGLE)
YZERO	=	.00262	(BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T	=	.04200	(BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE	=	.00262	(BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z	=	.5500	(LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD	=	1.8300	(MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.91568E+00

L.E.RADIUS = 5.01908E-03 CENTERED AT X= -1.8250E+00 Y= -5.6798E-01

SECTION AREA= 1.09598E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX	=	2.26393E-03
IY	=	2.07750E-02
IXY	=	6.22932E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX	=	3.62879E-04	(AT 16.971 WITH (X) AXIS)
IPY	=	2.26760E-02	(AT 16.971 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 2

LEADING EDGE COORDINATES	=	(8.0483, -1.8159, -.5643)
TRAILING EDGE COORDINATES	=	(8.2402, -.0000, .0051)

STREAMSURFACE 3 ITERATION 1 DEVIATION = 7.995 SOLIDITY = 1.8166
 ITERATION 2 DEVIATION = 8.185 SOLIDITY = 1.7618
 ITERATION 2 DEVIATION = 8.185 SOLIDITY = 1.7618

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 3

BETA1 = 41.821 (BLADE INLET ANGLE)
 BETA2 = -8.185 (BLADE OUTLET ANGLE)
 YZERO = .00269 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00269 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7850 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.87109E+00

L.E.RADIUS = 5.03323E-03 CENTERED AT X= -1.7800E+00 Y= -5.6256E-01

SECTION AREA= 1.09504E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.23469E-03
 IY = 1.97071E-02
 IXY = 6.01938E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.61736E-04 (AT 17.284 WITH (X) AXIS)
 IPY = 2.15801E-02 (AT 17.284 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 3

LEADING EDGE COORDINATES = (8.1981, -1.7755, -.5602)
 TRAILING EDGE COORDINATES= (8.3606, -.0000, .0051)

STREAMSURFACE 4 ITERATION 1 DEVIATION = 8.260 SOLIDITY = 1.7643
 ITERATION 2 DEVIATION = 8.454 SOLIDITY = 1.7119
 ITERATION 2 DEVIATION = 8.454 SOLIDITY = 1.7119

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 4

BETA1 = 42.026 (BLADE INLET ANGLE)
 BETA2 = -8.454 (BLADE OUTLET ANGLE)
 YZERO = .00273 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00273 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7606 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.84778E+00

L.E.RADIUS = 5.04443E-03 CENTERED AT X= -1.7556E+00 Y= -5.6229E-01

SECTION AREA= 1.11555E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.28213E-03
 IY = 1.94813E-02
 IXY = 6.03921E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.73387E-04 (AT 17.540 WITH (X) AXIS)
 IPY = 2.13900E-02 (AT 17.540 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 4

LEADING EDGE COORDINATES = (8.3446, -1.7540, -.5608)
 TRAILING EDGE COORDINATES= (8.4857, -.0000, .0051)

STREAMSURFACE 5 ITERATION 1 DEVIATION = 8.501 SOLIDITY = 1.7290
 ITERATION 2 DEVIATION = 8.702 SOLIDITY = 1.6774
 ITERATION 2 DEVIATION = 8.702 SOLIDITY = 1.6774

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 5

BETA1 = 42.316 (BLADE INLET ANGLE)
 BETA2 = -8.702 (BLADE OUTLET ANGLE)
 YZERO = .00274 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00274 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7518 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.84011E+00

L.E.RADIUS = 5.04191E-03 CENTERED AT X= -1.7468E+00 Y= -5.6473E-01

SECTION AREA= 1.15283E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.37907E-03
 IY = 1.98711E-02
 IXY = 6.21654E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.94840E-04 (AT 17.702 WITH (X) AXIS)
 IPY = 2.18554E-02 (AT 17.702 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 5

LEADING EDGE COORDINATES = (8.4911, -1.7471, -.5639)
 TRAILING EDGE COORDINATES= (8.6151, -.0000, .0051)

STREAMSURFACE 6 ITERATION 1 DEVIATION = 8.759 SOLIDITY = 1.7046
ITERATION 2 DEVIATION = 8.970 SOLIDITY = 1.6529
ITERATION 2 DEVIATION = 8.970 SOLIDITY = 1.6529

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 6

BETA1 = 42.760 (BLADE INLET ANGLE)
BETA2 = -8.970 (BLADE OUTLET ANGLE)
YZERO = .00273 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00273 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 1.7528 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.84315E+00

L.E.RADIUS = 5.03181E-03 CENTERED AT X= -1.7477E+00 Y= -5.7168E-01

SECTION AREA= 1.20316E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.54238E-03
IY = 2.06976E-02
IXY = 6.54752E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 4.27443E-04 (AT 17.901 WITH (X) AXIS)
IPY = 2.28125E-02 (AT 17.901 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 6

LEADING EDGE COORDINATES = (8.6400, -1.7495, -.5714)
TRAILING EDGE COORDINATES= (8.7489, -.0000, .0051)

STREAMSURFACE 7 ITERATION 1 DEVIATION = 9.040 SOLIDITY = 1.6904
 ITERATION 2 DEVIATION = 9.262 SOLIDITY = 1.6381
 ITERATION 2 DEVIATION = 9.262 SOLIDITY = 1.6381

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 7

BETA1 = 43.370 (BLADE INLET ANGLE)
 BETA2 = -9.262 (BLADE OUTLET ANGLE)
 YZERO = .00271 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .05200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00271 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7633 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.85723E+00

L.E.RADIUS = 5.03308E-03 CENTERED AT X= -1.7583E+00 Y= -5.8466E-01

SECTION AREA= 1.26902E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.80283E-03
 IY = 2.20315E-02
 IXY = 7.08322E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 4.75326E-04 (AT 18.190 WITH (X) AXIS)
 IPY = 2.43590E-02 (AT 18.190 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 7

LEADING EDGE COORDINATES = (8.7928, -1.7611, -.5849)
 TRAILING EDGE COORDINATES= (8.8876, -.0000, .0051)

STREAMSURFACE	8	ITERATION	1	DEVIATION =	9.330	SOLIDITY =	1.6840
		ITERATION	2	DEVIATION =	9.564	SOLIDITY =	1.6306
		ITERATION	2	DEVIATION =	9.564	SOLIDITY =	1.6306

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 8

BETA1	= 44.067	(BLADE INLET ANGLE)
BETA2	= -9.564	(BLADE OUTLET ANGLE)
YZERO	= .00268	(BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T	= .05400	(BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE	= .00268	(BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z	= .5500	(LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD	= 1.7821	(MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.88034E+00

L.E.RADIUS = 5.03930E-03 CENTERED AT X= -1.7771E+00 Y= -6.0149E-01

SECTION AREA= 1.34954E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX	= 3.15161E-03
IY	= 2.38687E-02
IXY	= 7.80709E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX	= 5.39029E-04	(AT 18.502 WITH (X) AXIS)
IPY	= 2.64813E-02	(AT 18.502 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 8

LEADING EDGE COORDINATES	= (8.9512, -1.7807, -.6023)
TRAILING EDGE COORDINATES	= (9.0317, -.0000, .0051)

STREAMSURFACE 9 ITERATION 1 DEVIATION = 9.651 SOLIDITY = 1.6819
 ITERATION 2 DEVIATION = 9.900 SOLIDITY = 1.6268
 ITERATION 2 DEVIATION = 9.900 SOLIDITY = 1.6268

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 9

BETA1 = 44.872 (BLADE INLET ANGLE)
 BETA2 = -9.900 (BLADE OUTLET ANGLE)
 YZERO = .00264 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .05600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00264 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.8055 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.90871E+00

L.E.RADIUS = 5.03900E-03 CENTERED AT X= -1.8005E+00 Y= -6.2084E-01

SECTION AREA= 1.44089E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 3.58014E-03
 IY = 2.60964E-02
 IXY = 8.68894E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 6.17047E-04 (AT 18.830 WITH (X) AXIS)
 IPY = 2.90595E-02 (AT 18.830 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 9

LEADING EDGE COORDINATES = (9.1165, -1.8048, -.6222)
 TRAILING EDGE COORDINATES= (9.1813, -.0000, .0051)

STREAMSURFACE 11 ITERATION 1 DEVIATION = 10.844 SOLIDITY = 1.7056
 ITERATION 2 DEVIATION = 11.151 SOLIDITY = 1.6430
 ITERATION 2 DEVIATION = 11.151 SOLIDITY = 1.6430

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 11

BETA1 = 48.035 (BLADE INLET ANGLE)
 BETA2 = -11.151 (BLADE OUTLET ANGLE)
 YZERO = .00254 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .06000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00254 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.8750 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.99900E+00

L.E.RADIUS = 5.07747E-03 CENTERED AT X= -1.8699E+00 Y= -6.9484E-01

SECTION AREA= 1.69703E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 5.29151E-03
 IY = 3.31271E-02
 IXY = 1.18726E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 9.15461E-04 (AT 20.233 WITH (X) AXIS)
 IPY = 3.75032E-02 (AT 20.233 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 11

LEADING EDGE COORDINATES = (9.4744, -1.8750, -.6973)
 TRAILING EDGE COORDINATES= (9.5000, -.0000, .0052)

VOLUME OF BLADE SECTION = 1.8279E-01

BLADE CALCULATIONS FOR AERODYNAMIC ANALYSIS

STATION 3		NUMBER OF RADII= 11		
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
8.0220	-3.0145	.0588	1.9307	33.2197
8.1519	-2.6196	.0585	1.8331	33.4213
8.2835	-2.0004	.0591	1.7613	33.4805
8.4173	-1.8338	.0603	1.7114	33.5610
8.5541	-1.3312	.0619	1.6769	33.7474
8.6953	.0506	.0638	1.6524	34.1565
8.8419	.6067	.0661	1.6376	34.6491
8.9949	.7598	.0689	1.6301	35.1884
9.1547	1.2735	.0719	1.6261	35.7672
9.3220	2.8241	.0754	1.6290	36.5565
9.5000	4.3247	.0813	1.6421	38.0645

STATION 4		NUMBER OF RADII= 11		
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
8.0770	-1.6183	.0780	1.9307	21.3856
8.1975	-1.3977	.0780	1.8331	21.6966
8.3220	-1.3164	.0788	1.7613	21.9131
8.4504	-1.3785	.0803	1.7114	22.0352
8.5829	-.9771	.0823	1.6769	22.1062
8.7200	-.4026	.0847	1.6524	22.3198
8.8626	-.0699	.0875	1.6376	22.6261
9.0113	-.0722	.0908	1.6301	22.9412
9.1666	-.0944	.0943	1.6261	23.2724
9.3286	.3445	.0984	1.6290	23.6985
9.5000	.7309	.1037	1.6421	24.6037

STATION 5		NUMBER OF RADII= 11		
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
8.1090	-.2610	.0752	1.9307	10.1052
8.2252	-.3606	.0753	1.8331	10.2469
8.3460	-.4595	.0759	1.7613	10.3720
8.4713	-.5139	.0772	1.7114	10.4430
8.6012	-.5436	.0790	1.6769	10.4662
8.7359	-.4355	.0811	1.6524	10.5308
8.8761	-.4240	.0837	1.6376	10.6395
9.0222	-.4680	.0865	1.6301	10.7544
9.1745	-.4549	.0895	1.6261	10.8712
9.3330	-.7829	.0928	1.6290	11.0140
9.5000	-1.1062	.0966	1.6421	11.3739

STATION 6		NUMBER OF RADII= 11		
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
8.1220	.1798	.0528	1.9307	.0903
8.2373	.0361	.0529	1.8331	.0652
8.3572	-.1227	.0533	1.7613	.0150
8.4819	-.1821	.0540	1.7114	-.0759
8.6111	-.2733	.0551	1.6769	-.1835
8.7449	-.3270	.0564	1.6524	-.2741
8.8840	-.3966	.0579	1.6376	-.3545
9.0286	-.4592	.0598	1.6301	-.4225
9.1791	-.4723	.0616	1.6261	-.5172
9.3355	-.9248	.0636	1.6290	-.6325
9.5000	-1.3747	.0658	1.6421	-.8153

STATION 7		NUMBER OF RADII= 11		
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
8.1240	-.0000	.0096	1.9307	-7.6996
8.2402	-.0000	.0095	1.8331	-7.9351
8.3606	-.0000	.0094	1.7613	-8.2161
8.4857	.0000	.0092	1.7114	-8.4871
8.6151	.0000	.0091	1.6769	-8.7373
8.7489	.0000	.0089	1.6524	-9.0068
8.8876	.0000	.0088	1.6376	-9.3010
9.0317	.0000	.0087	1.6301	-9.6043
9.1813	.0000	.0085	1.6261	-9.9427
9.3365	.0000	.0084	1.6290	-10.3691
9.5000	.0000	.0083	1.6421	-11.2022

BLADE SURFACE GEOMETRY IN CARTESIAN COORD. AT SPECIFIED VALUES OF (Z)

SECTION PROPERTIES FOR SECTION NUMBER 1 (Z) = 8.0000
 SECTION AREA = 1.0859E-01

LOCATION OF CENTROID XBAR= -9.5327E-01
 RELATIVE TO STACK AXIS YBAR= -1.0294E-01

SECOND MOMENTS OF AREA IX = 2.1300E-03
 ABOUT CENTROID IY = 2.1037E-02
 IXY = 6.0605E-03

PRINCIPAL SECOND MOMENTS IPX = 3.5410E-04 (AT 16.33 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 2.2813E-02 (AT 16.33 DEG. TO (Y))

TORSIONAL CONSTANT = 1.5086E-04

SECTION PROPERTIES FOR SECTION NUMBER 2 (Z) = 8.1500
 SECTION AREA = 1.0701E-01

LOCATION OF CENTROID XBAR= -9.2200E-01
 RELATIVE TO STACK AXIS YBAR= -1.0272E-01

SECOND MOMENTS OF AREA IX = 2.0901E-03
 ABOUT CENTROID IY = 1.9540E-02
 IXY = 5.8008E-03

PRINCIPAL SECOND MOMENTS IPX = 3.3770E-04 (AT 16.81 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 2.1292E-02 (AT 16.81 DEG. TO (Y))

TORSIONAL CONSTANT = 1.5260E-04

SECTION PROPERTIES FOR SECTION NUMBER 3 (Z) = 8.3000
 SECTION AREA = 1.0776E-01

LOCATION OF CENTROID XBAR= -9.0317E-01
 RELATIVE TO STACK AXIS YBAR= -1.0435E-01

SECOND MOMENTS OF AREA IX = 2.1418E-03
 ABOUT CENTROID IY = 1.8981E-02
 IXY = 5.8089E-03

PRINCIPAL SECOND MOMENTS IPX = 3.3232E-04 (AT 17.30 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 2.0790E-02 (AT 17.30 DEG. TO (Y))

TORSIONAL CONSTANT = 1.6082E-04

SECTION PROPERTIES FOR SECTION NUMBER 4 (Z) = 8.4500
SECTION AREA = 1.1088E-01

LOCATION OF CENTROID XBAR= -8.9514E-01
RELATIVE TO STACK AXIS YBAR= -1.0538E-01

SECOND MOMENTS OF AREA IX = 2.2434E-03
ABOUT CENTROID IY = 1.9195E-02
IXY = 5.9920E-03

PRINCIPAL SECOND MOMENTS IPX = 3.3924E-04 (AT 17.63 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.1099E-02 (AT 17.63 DEG. TO (Y))

TORSIONAL CONSTANT = 1.7779E-04

SECTION PROPERTIES FOR SECTION NUMBER 5 (Z) = 8.6000
SECTION AREA = 1.1568E-01

LOCATION OF CENTROID XBAR= -8.9429E-01
RELATIVE TO STACK AXIS YBAR= -1.0571E-01

SECOND MOMENTS OF AREA IX = 2.3891E-03
ABOUT CENTROID IY = 1.9944E-02
IXY = 6.3034E-03

PRINCIPAL SECOND MOMENTS IPX = 3.6022E-04 (AT 17.84 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.1973E-02 (AT 17.84 DEG. TO (Y))

TORSIONAL CONSTANT = 2.0229E-04

SECTION PROPERTIES FOR SECTION NUMBER 6 (Z) = 8.7500
SECTION AREA = 1.2181E-01

LOCATION OF CENTROID XBAR= -8.9891E-01
RELATIVE TO STACK AXIS YBAR= -1.0698E-01

SECOND MOMENTS OF AREA IX = 2.6167E-03
ABOUT CENTROID IY = 2.1137E-02
IXY = 6.7886E-03

PRINCIPAL SECOND MOMENTS IPX = 3.9484E-04 (AT 18.12 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.3358E-02 (AT 18.12 DEG. TO (Y))

TORSIONAL CONSTANT = 2.3382E-04

SECTION PROPERTIES FOR SECTION NUMBER 7 (Z) = 8.9000

SECTION AREA = 1.2931E-01

LOCATION OF CENTROID XBAR= -9.0830E-01
RELATIVE TO STACK AXIS YBAR= -1.0917E-01

SECOND MOMENTS OF AREA IX = 2.9264E-03
ABOUT CENTROID IY = 2.2796E-02
IXY = 7.4536E-03

PRINCIPAL SECOND MOMENTS IPX = 4.4112E-04 (AT 18.44 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.5281E-02 (AT 18.44 DEG. TO (Y))

TORSIONAL CONSTANT = 2.7416E-04

SECTION PROPERTIES FOR SECTION NUMBER 8 (Z) = 9.0500

SECTION AREA = 1.3771E-01

LOCATION OF CENTROID XBAR= -9.2025E-01
RELATIVE TO STACK AXIS YBAR= -1.1140E-01

SECOND MOMENTS OF AREA IX = 3.2946E-03
ABOUT CENTROID IY = 2.4779E-02
IXY = 8.2401E-03

PRINCIPAL SECOND MOMENTS IPX = 4.9825E-04 (AT 18.75 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.7576E-02 (AT 18.75 DEG. TO (Y))

TORSIONAL CONSTANT = 3.2301E-04

SECTION PROPERTIES FOR SECTION NUMBER 9 (Z) = 9.2000

SECTION AREA = 1.4684E-01

LOCATION OF CENTROID XBAR= -9.3421E-01
RELATIVE TO STACK AXIS YBAR= -1.1388E-01

SECOND MOMENTS OF AREA IX = 3.7262E-03
ABOUT CENTROID IY = 2.7082E-02
IXY = 9.1555E-03

PRINCIPAL SECOND MOMENTS IPX = 5.6510E-04 (AT 19.05 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 3.0243E-02 (AT 19.05 DEG. TO (Y))

TORSIONAL CONSTANT = 3.8037E-04

SECTION PROPERTIES FOR SECTION NUMBER 10 (Z) = 9.3500
SECTION AREA = 1.5762E-01

LOCATION OF CENTROID XBAR= -9.5255E-01
RELATIVE TO STACK AXIS YBAR= -1.1798E-01

SECOND MOMENTS OF AREA IX = 4.3650E-03
ABOUT CENTROID IY = 3.0010E-02
IXY = 1.0417E-02

PRINCIPAL SECOND MOMENTS IPX = 6.6665E-04 (AT 19.55 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 3.3709E-02 (AT 19.55 DEG. TO (Y))

TORSIONAL CONSTANT = 4.5226E-04

SECTION PROPERTIES FOR SECTION NUMBER 11 (Z) = 9.5000
SECTION AREA = 1.7043E-01

LOCATION OF CENTROID XBAR= -9.7486E-01
RELATIVE TO STACK AXIS YBAR= -1.2463E-01

SECOND MOMENTS OF AREA IX = 5.3606E-03
ABOUT CENTROID IY = 3.3612E-02
IXY = 1.2202E-02

PRINCIPAL SECOND MOMENTS IPX = 8.2012E-04 (AT 20.41 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 3.8153E-02 (AT 20.41 DEG. TO (Y))

TORSIONAL CONSTANT = 5.4403E-04

SECTION III

CORE DESIGN

1. PRELIMINARY DESIGN

a. Criteria, Procedures and Assumptions

All of the criteria defining the basic parameters of this compressor resulted from the design goals of a hypothetical turbofan engine of which this compressor stage comprised the second stage of the core. It is assumed that this single-stage compressor (core) is operating in the discharge plane of a highly loaded axial compressor (core) stage, although in the actual test rig, the first stage wakes will be artificially generated. A hub/tip inlet radius ratio of 0.75 was specified at the outset as was the flow per unit inlet annulus area of 40.0 lb/sec/ft**2. Selecting a constant annulus outer diameter of 19.0 inches produced a rotor hub inlet diameter of 14.25 inches and a total flow rate of 34.46 lb/sec at standard inlet conditions. Selecting a compressor corrected tip speed of 1120 ft/sec with standard conditions at the compressor inlet produced transonic relative velocities at the rotor leading edge with relative Mach numbers of 0.963 at the hub and 1.191 at the tip. Most of the rest of the compressor characteristics resulted from the overall objective of designing a highly loaded, efficient, state-of-the-art compressor. An overall stage pressure of 1.8 or greater and an efficiency of 88 percent or greater were considered to be moderate performance goals.

The preliminary design of the single-stage compressor (core) was accomplished with the computer program described in Reference 5 and the procedure described in Section II.1.b of this report. The loss assumptions used were the same as those described in Section II.1.c. and the design philosophy was similar to that described in Section II.1.d. The rotor exit total enthalpy distribution finally chosen is shown in Figure 18. The contraction along the hub was achieved nearly equally through rotor and stator; the rotor hub ramp angle was about 11.5 degrees and the stator hub ramp angle was about 10 degrees.

b. Results

The final results of the preliminary design of the single-stage compressor (core) are summarized in the following pages. The diffusion factor at the rotor tip proved to be the limiting parameter in the preliminary design, with a final value varying from 0.565 at the hub to 0.550 at the tip. The resulting Mach number relative to the rotor leading edge varied from 0.96 at the hub to 1.19 at the tip. The Mach number relative to the stator leading edge was subsonic everywhere, varying from 0.82 at the hub to 0.69 at the case. The stator diffusion factor varied from 0.50 at the hub to 0.47 at the case.

The performance predicted for the single-stage compressor (core) was a total pressure ratio of 1.85 and an isentropic efficiency of 90.9 percent. The predicted rotor total pressure ratio and efficiency were 1.88 and 93.7 percent respectively.

WAKE INVESTIGATION, CORE STAGE

*****--*** ADVANCED MULTISTAGE AXIAL-FLOW COMPRESSOR ***--*****
 --- ANALYSIS AT DESIGN CONDITIONS **---**
 ----I N P U T D A T A----

THE MACHINE IS TO HAVE NO MORE THAN 1 STAGES
 A TOTAL PRESSURE RATIO OF 1.800 IS DESIRED
 CALCULATIONS ARE TO BE PERFORMED AT 11 STREAMLINES
 THE INLET TOTAL PRESSURE IS 14.70 LBS/SQ IN.
 THE INLET MASS FLOW RATE IS 34.46 LB/SEC
 THE INLET TOTAL TEMPERATURE IS 518.69 DEG. R
 MOLECULAR WEIGHT OF THE FLUID IS 28.97
 THE TIP SPEED IS 1120.0 FT./SEC.
 AXIAL VELOCITY TOLERANCE IS .0100
 THE LOADING LIMIT TOLERANCE IS .0330
 THE EFFICIENCY TOLERANCE IS .0100
 THE CONTINUITY TOLERANCE IS .0005
 THE AXIAL VELOCITY RATIO TOLERANCE IS .0100

THE FRACTION OF THE TOTAL MASS FLOW BETWEEN THE HUB AND THE J-TH S.L. IS:
 0.000 .100 .200 .300 .400 .500 .600 .700 .800 .900 1.000

THE IGV LOSS COEFFICIENTS FOR THE 11 STREAMLINES ARE (FROM HUB TO TIP)
 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

THE INLET GUIDE VANE EXIT TANGENTIAL VELOCITY IS SPECIFIED BY
 A =0. B =0. C =0. D =0. E =0.

THE SPECIFIC HEAT POLYNOMIAL IS IN THE FOLLOWING FORM
 $CP = .23747E+00 + .21962E-04*T + -.87791E-07*T**2 +$
 $.13991E-09*T**3 + -.78056E-13*T**4 + .15043E-16*T**5$

THE RATIO OF THE AREAS OF THE LAST 3 STATIONS TO THE AREA OF THE LAST
 STATOR EXIT ARE 1.0000, 1.0000, 1.0000 .

----INLET DESCRIPTION----

STATION NO.	AXIAL COORDINATE (IN.)	HUB RADIUS (IN.)	HUB BLOCKAGE FACTOR	TIP RADIUS (IN.)	TIP BLOCKAGE FACTOR
1	-12.000	7.125	1.000	9.500	1.000
2	-9.000	7.125	1.000	9.500	.990
3	-6.000	7.125	.990	9.500	.990
4	-3.000	7.125	.990	9.500	.990
5	0.000	7.125	.990	9.500	.990

---- GEOMETRIC PARAMETERS ----

BLADE ROW EXIT STA.	AX. VEL. RATIO	ASP. RAT.	HUB RAMP ANG. LIM.	HUB BLOCK. FACTOR	TIP RAMP ANG. LIM.	TIP BLOCK. FACTOR
6	.900	1.000	25.000	.970	0.000	.970
7	1.100	1.000	15.000	.950	0.000	.950

.... LOSS DATA SET NUMBER 1

D-FACTOR	AT 10 PERCENT	AT 50 PERCENT	AT 90 PERCENT
0.000	.0050	.0050	.0050
.100	.0050	.0050	.0050
.150	.0050	.0050	.0050
.200	.0050	.0050	.0050
.250	.0050	.0050	.0050
.300	.0050	.0050	.0050
.350	.0052	.0052	.0052
.400	.0056	.0056	.0058
.450	.0061	.0061	.0070
.500	.0071	.0071	.0089
.550	.0087	.0087	.0119
.600	.0112	.0112	.0164
.650	.0149	.0149	.0230
.700	.0205	.0205	.0337
.750	.0288	.0288	.0463
.800	.0380	.0380	.0590
.850	.0480	.0480	.0718
.900	.0587	.0587	.0843
.950	.0697	.0697	.0968
1.000	.0810	.0810	.1093

.... LOSS DATA SET NUMBER 2

D-FACTOR	AT 10 PERCENT	AT 50 PERCENT	AT 90 PERCENT
0.000	.0034	.0034	.0034
.100	.0045	.0045	.0045
.150	.0051	.0051	.0051
.200	.0060	.0060	.0060
.250	.0072	.0072	.0072
.300	.0085	.0085	.0085
.350	.0102	.0102	.0102
.400	.0120	.0120	.0120
.450	.0145	.0145	.0145
.500	.0172	.0172	.0172
.550	.0217	.0217	.0217
.600	.0264	.0264	.0264
.650	.0318	.0318	.0318
.700	.0387	.0387	.0387
.750	.0470	.0470	.0470
.800	.0564	.0564	.0564
.850	.0673	.0673	.0673
.900	.0792	.0792	.0792
.950	.0911	.0911	.0911
1.000	.1030	.1030	.1030

-----STATION NUMBER 1 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1250	.563	609.74	609.74	0.0000	0.00
2	7.3969	.563	609.74	609.74	0.0000	0.00
3	7.6591	.563	609.74	609.74	0.0000	0.00
4	7.9127	.563	609.74	609.74	0.0000	0.00
5	8.1584	.563	609.74	609.74	0.0000	0.00
6	8.3969	.563	609.74	609.74	0.0000	0.00
7	8.6288	.563	609.74	609.74	0.0000	0.00
8	8.8546	.563	609.74	609.74	0.0000	0.00
9	9.0749	.563	609.74	609.74	0.0000	0.00
10	9.2899	.563	609.74	609.74	0.0000	0.00
11	9.5000	.563	609.74	609.74	0.0000	0.00

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1250	14.70	518.69	0.00000	0.0
2	7.3969	14.70	518.69	0.00000	0.0
3	7.6591	14.70	518.69	0.00000	0.0
4	7.9127	14.70	518.69	0.00000	0.0
5	8.1584	14.70	518.69	0.00000	0.0
6	8.3969	14.70	518.69	0.00000	0.0
7	8.6288	14.70	518.69	0.00000	0.0
8	8.8546	14.70	518.69	0.00000	0.0
9	9.0749	14.70	518.69	0.00000	0.0
10	9.2899	14.70	518.69	0.00000	0.0
11	9.5000	14.70	518.69	0.00000	0.0

-----STATION NUMBER 2 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1250	.572	618.42	618.42	2.8503	.26
2	7.3943	.572	618.55	618.54	2.1990	.20
3	7.6542	.572	618.66	618.66	1.5968	.15
4	7.9054	.572	618.76	618.76	1.0354	.10
5	8.1489	.572	618.84	618.84	.5086	.05
6	8.3853	.572	618.91	618.91	.0113	.00
7	8.6152	.572	618.97	618.97	-.4604	-.04
8	8.8392	.572	619.01	619.01	-.9096	-.08
9	9.0575	.572	619.04	619.03	-1.3389	-.12
10	9.2708	.572	619.05	619.05	-1.7506	-.16
11	9.4792	.572	619.06	619.05	-2.1465	-.20

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1250	14.70	518.69	.00307	0.0
2	7.3943	14.70	518.69	.00294	0.0
3	7.6542	14.70	518.69	.00283	0.0
4	7.9054	14.70	518.69	.00273	0.0
5	8.1489	14.70	518.69	.00265	0.0
6	8.3853	14.70	518.69	.00258	0.0
7	8.6152	14.70	518.69	.00252	0.0
8	8.8392	14.70	518.69	.00246	0.0
9	9.0575	14.70	518.69	.00241	0.0
10	9.2708	14.70	518.69	.00236	0.0
11	9.4792	14.70	518.69	.00231	0.0

-----STATION NUMBER 3 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1527	.581	628.38	628.38	2.8963	.26
2	7.4182	.581	628.29	628.28	2.7118	.25
3	7.6746	.581	628.24	628.24	2.4732	.23
4	7.9227	.581	628.23	628.23	2.1969	.20
5	8.1633	.581	628.24	628.24	1.8953	.17
6	8.3970	.581	628.28	628.27	1.5786	.14
7	8.6243	.581	628.32	628.32	1.2547	.11
8	8.8458	.581	628.38	628.38	.9302	.08
9	9.0619	.581	628.44	628.44	.6102	.06
10	9.2729	.582	628.50	628.50	.2990	.03
11	9.4792	.582	628.58	628.58	0.0000	0.00

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1527	14.70	518.69	-.00307	0.0
2	7.4182	14.70	518.69	-.00244	0.0
3	7.6746	14.70	518.69	-.00193	0.0
4	7.9227	14.70	518.69	-.00152	0.0
5	8.1633	14.70	518.69	-.00120	0.0
6	8.3970	14.70	518.69	-.00093	0.0
7	8.6243	14.70	518.69	-.00070	0.0
8	8.8458	14.70	518.69	-.00050	0.0
9	9.0619	14.70	518.69	-.00032	0.0
10	9.2729	14.70	518.69	-.00016	0.0
11	9.4792	14.70	518.69	0.00000	0.0

-----STATION NUMBER 4 -----

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1527	.574	621.19	621.19	0.0000	0.00
2	7.4202	.577	623.56	623.56	.5973	.05
3	7.6777	.579	625.54	625.54	.9356	.08
4	7.9263	.580	627.16	627.16	1.0841	.10
5	8.1670	.581	628.46	628.46	1.0947	.10
6	8.4003	.582	629.47	629.47	1.0076	.09
7	8.6272	.583	630.22	630.22	.8539	.08
8	8.8480	.584	630.74	630.74	.6585	.06
9	9.0633	.584	631.05	631.05	.4411	.04
10	9.2736	.584	631.17	631.17	.2174	.02
11	9.4792	.584	631.13	631.13	0.0000	0.00

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1527	14.70	518.69	0.00000	0.0
2	7.4202	14.70	518.69	.00019	0.0
3	7.6777	14.70	518.69	.00029	0.0
4	7.9263	14.70	518.69	.00033	0.0
5	8.1670	14.70	518.69	.00033	0.0
6	8.4003	14.70	518.69	.00030	0.0
7	8.6272	14.70	518.69	.00026	0.0
8	8.8480	14.70	518.69	.00020	0.0
9	9.0633	14.70	518.69	.00013	0.0
10	9.2736	14.70	518.69	.00007	0.0
11	9.4792	14.70	518.69	0.00000	0.0

-----STATION NUMBER 5 ----- (INLET GUIDE VANE EXIT)

S.L. NO.	STREAMLINE RADIUS (IN.)	ABS. MACH NUMBER	ABS. VEL. (FT/SEC)	AXIAL VEL. (FT/SEC)	RADIAL VEL. (FT/SEC)	STREAMLINE SLOPE (DEGS)
1	7.1527	.566	613.07	610.22	59.0825	5.53
2	7.4239	.572	618.77	616.62	51.6018	4.78
3	7.6834	.576	623.38	621.80	44.3581	4.08
4	7.9329	.580	627.08	625.96	37.3444	3.41
5	8.1735	.583	629.99	629.25	30.5690	2.78
6	8.4064	.585	632.23	631.78	24.0535	2.18
7	8.6323	.587	633.89	633.64	17.8228	1.61
8	8.8519	.588	635.03	634.92	11.9063	1.07
9	9.0660	.589	635.72	635.69	6.3409	.57
10	9.2749	.589	636.00	636.00	1.1592	.10
11	9.4792	.589	635.92	635.91	-3.5974	-.32

S.L. NO.	STREAMLINE RADIUS (IN.)	TOTAL PRES. (LB/SQ IN.)	TOTAL TEMP. (DEGREES)	STREAMLINE CURVATURE	FLOW ANGLE (DEGREES)
1	7.1527	14.70	518.69	.08040	0.0
2	7.4239	14.70	518.69	.06871	0.0
3	7.6834	14.70	518.69	.05801	0.0
4	7.9329	14.70	518.69	.04812	0.0
5	8.1735	14.70	518.69	.03890	0.0
6	8.4064	14.70	518.69	.03027	0.0
7	8.6323	14.70	518.69	.02220	0.0
8	8.8519	14.70	518.69	.01465	0.0
9	9.0660	14.70	518.69	.00764	0.0
10	9.2749	14.70	518.69	.00116	0.0
11	9.4792	14.70	518.69	-.00476	0.0

S.L. NO.	STREAMLINE RADIUS (IN.)	REL. VEL. (FT/SEC)	WHIRL VEL. (FT/SEC)	RELATIVE MACH NO.	REL. FLOW ANG. (DEG)	WHEEL SPEED (FT/SEC)
1	7.1527	1042.57	0.00	.963	53.982	843.260
2	7.4239	1071.87	0.00	.991	54.740	875.233
3	7.6834	1099.61	0.00	1.017	55.465	905.834
4	7.9329	1126.02	0.00	1.042	56.158	935.247
5	8.1735	1151.28	0.00	1.065	56.824	963.618
6	8.4064	1175.56	0.00	1.088	57.465	991.070
7	8.6323	1198.97	0.00	1.110	58.083	1017.702
8	8.8519	1221.62	0.00	1.131	58.679	1043.598
9	9.0660	1243.60	0.00	1.152	59.257	1068.832
10	9.2749	1264.97	0.00	1.171	59.816	1093.464
11	9.4792	1285.81	0.00	1.191	60.359	1117.547

ITERATION ON LOADING WAS TAKING PLACE

-- FINAL FLOW PARAMETERS FOR STAGE NUMBER 1 ***--***

*** STAGE INPUT PARAMETERS ***

ROTOR TIP D-FACTOR LIMIT	.5500
HUB RELATIVE FLOW ANGLE LIMIT AT THE ROTOR EXIT	-10.0
STATOR HUB MACH NUMBER LIMIT (IN)	1.0500
STATOR HUB D-FACTOR LIMIT	.6000
MAXIMUM TIP TANGENTIAL VELOCITY	800.0

---ROTOR---

	PRESSURE PROFILE	DELTA B, IN- LET TO SHOCK	SOLIDITY
A	0.	0.	0.
B	.100000E+01	.100000E+01	.100000E+01
C	.104000E+01	.120000E+02	.200000E+01
D	-.600000E-01	-.600000E+01	-.200000E+00
E	.200000E-01	0.	0.

---STATOR---

	WHIRL VELOCITY	DELTA B, IN- LET TO SHOCK	SOLIDITY
A	0.	0.	0.
B	.100000E+01	.100000E+01	.100000E+01
C	0.	.150000E+02	.180000E+01
D	0.	0.	-.200000E+00
E	0.	0.	0.

*** STAGE SCALER QUANTITIES ***

	--ROTOR--	--STATOR--
ASPECT RATIO	1.0000	1.0000
GEOMETRIC HUB RADIUS (IN.)	7.6095	7.9478
GEOMETRIC TIP RADIUS (IN.)	9.5000	9.5000
HUB RAMP ANGLE (DEG)	11.5312	10.1448
TIP RAMP ANGLE (DEG)	0.0000	0.0000
AXIAL LENGTH (IN.)	2.3750	1.8905
MASS FLOW (LB/SEC)	34.4570	34.4570
MASS AVE. ADIABATIC EFF.	.9368	.9086
VEL. RATIO AT THE MEAN	.9063	1.1070
HUB BLOCKAGE FACTOR	.9700	.9500
TIP BLOCKAGE FACTOR	.9700	.9500
MASS AVE. PRESSURE RATIO	1.8817	1.8492
MASS AVE. TEMPERATURE RATIO	1.2112	1.2112
CUMULATIVE MASS AVE. PR. RATIO	1.8817	1.8492
CUMULATIVE MASS AVE. TEMP. RATIO	1.2112	1.2112
CUMULATIVE MASS AVE. ADIABATIC EFF.	.9368	.9086
LOSS DATA SET USED	1	2

----- R O T O R E X I T **-----**

SL. NO.	RADIUS (INS.)	AX. VEL. (FT/SEC)	WH. VEL. (FT/SEC)	RD. VEL. (FT/SEC)	ABS. VEL. (FT/SEC)	ABS. M NUMBER	ABS. FLOW ANG(DEG)	REL. FLOW ANG(DEG)
1	7.6730	586.952	737.380	121.08	950.212	.8214	50.897	15.591
2	7.8699	583.483	716.761	103.02	929.952	.8021	50.421	19.607
3	8.0610	581.007	696.487	86.76	911.148	.7844	49.854	23.372
4	8.2469	578.632	677.453	71.89	893.826	.7682	49.282	26.821
5	8.4279	576.007	659.954	58.16	877.899	.7534	48.742	29.956
6	8.6048	572.575	644.506	45.40	863.303	.7398	48.293	32.786
7	8.7782	568.616	630.740	33.53	849.872	.7273	47.916	35.358
8	8.9487	563.308	619.439	22.45	837.571	.7157	47.695	37.690
9	9.1168	556.869	610.223	12.11	826.209	.7048	47.611	39.832
10	9.2833	549.145	603.433	2.49	815.903	.6947	47.696	41.802
11	9.4488	540.269	598.434	-6.43	806.260	.6851	47.922	43.656

SL. NO.	RADIUS (INS.)	TOT. T. RATIO	TOT. P. RATIO	ADIAB. EFF.	DIF. FACTOR	W. SPEED (FT/SEC)	SOLID ITY	A*/S	LOSS COEFF.
1	7.6730	1.2139	1.9230	.9596	.5652	904.61	1.996	.5918	.0561
2	7.8699	1.2133	1.9121	.9533	.5698	927.82	1.974	.5831	.0623
3	8.0610	1.2123	1.9023	.9494	.5696	950.35	1.953	.5733	.0648
4	8.2469	1.2113	1.8934	.9466	.5668	972.26	1.932	.5630	.0660
5	8.4279	1.2103	1.8855	.9440	.5626	993.61	1.912	.5526	.0669
6	8.6048	1.2097	1.8785	.9406	.5584	1014.46	1.893	.5423	.0687
7	8.7782	1.2094	1.8722	.9367	.5541	1034.90	1.875	.5319	.0711
8	8.9487	1.2096	1.8666	.9307	.5512	1055.00	1.856	.5217	.0758
9	9.1168	1.2104	1.8616	.9231	.5494	1074.83	1.838	.5115	.0823
10	9.2833	1.2118	1.8573	.9130	.5489	1094.46	1.821	.5016	.0913
11	9.4488	1.2138	1.8536	.9013	.5495	1113.96	1.803	.4916	.1018

SL. NO.	RADIUS (INS.)	TOT. T. (DEG.)	TOT. P. (PSI.)	ST. T. (DEG.)	ST. P. (PSI.)	SLOPE (DEG)	CURVAT. (1/IN.)	REL. VEL. (FT/SEC)	REL. M NUMBER
1	7.6730	629.66	28.27	554.60	18.12	11.66	-.01275	622.2059	.5390
2	7.8699	629.33	28.11	557.44	18.37	10.01	-.01138	628.9761	.5435
3	8.0610	628.81	27.96	559.80	18.61	8.49	-.00990	639.9570	.5518
4	8.2469	628.27	27.83	561.86	18.82	7.08	-.00823	653.3722	.5623
5	8.4279	627.78	27.72	563.73	19.01	5.77	-.00639	668.2006	.5741
6	8.6048	627.47	27.61	565.52	19.18	4.53	-.00447	683.2075	.5861
7	8.7782	627.29	27.52	567.26	19.34	3.38	-.00259	698.4257	.5983
8	8.9487	627.41	27.44	569.11	19.49	2.28	-.00093	712.4134	.6092
9	9.1168	627.81	27.37	571.08	19.64	1.25	.00035	725.3328	.6192
10	9.2833	628.56	27.30	573.24	19.77	.26	.00104	736.6625	.6277
11	9.4488	629.59	27.25	575.57	19.90	-.68	.00096	746.7947	.6351

----- S T A T O R E X I T **-----**

SL. NO.	RADIUS (INS.)	AX. VEL. (FT/SEC)	WH. VEL. (FT/SEC)	RD. VEL. (FT/SEC)	ABS. VEL. (FT/SEC)	ABS. M NUMBER	ABS. FLOW ANG(DEG)	REL. FLOW ANG(DEG)
1	8.0325	675.354	.124	61.20	678.121	.5690	.011	54.391
2	8.1769	665.385	.122	51.71	667.391	.5595	.010	55.302
3	8.3204	656.053	.120	43.32	657.482	.5510	.010	56.164
4	8.4628	647.621	.118	35.91	648.616	.5434	.010	56.969
5	8.6042	640.201	.116	29.33	640.873	.5367	.010	57.713
6	8.7446	633.820	.114	23.43	634.253	.5310	.010	58.397
7	8.8838	628.426	.113	18.05	628.685	.5262	.010	59.023
8	9.0219	624.058	.111	13.06	624.195	.5221	.010	59.591
9	9.1587	620.682	.109	8.31	620.738	.5189	.010	60.104
10	9.2943	618.261	.108	3.67	618.272	.5164	.010	60.564
11	9.4285	616.774	.106	-.98	616.775	.5147	.010	60.973

SL. NO.	RADIUS (INS.)	TOT. T. RATIO	TOT. P. RATIO	ADIAB. EFF.	DIF. FACTOR	W. SPEED (FT/SEC)	SOLID ITY	A*/S	LOSS COEFF.
1	8.0325	1.0000	.9773	.9227	.5023	947.00	1.791	.6126	.0634
2	8.1769	1.0000	.9789	.9190	.4994	964.02	1.772	.6142	.0611
3	8.3204	1.0000	.9801	.9170	.4962	980.93	1.752	.6169	.0596
4	8.4628	1.0000	.9812	.9158	.4927	997.72	1.733	.6196	.0583
5	8.6042	1.0000	.9821	.9147	.4891	1014.40	1.714	.6218	.0569
6	8.7446	1.0000	.9830	.9128	.4853	1030.94	1.696	.6228	.0557
7	8.8838	1.0000	.9839	.9102	.4814	1047.36	1.678	.6229	.0543
8	9.0219	1.0000	.9846	.9056	.4777	1063.63	1.660	.6212	.0531
9	9.1587	1.0000	.9854	.8992	.4738	1079.77	1.642	.6179	.0518
10	9.2943	1.0000	.9860	.8904	.4701	1095.74	1.625	.6128	.0506
11	9.4285	1.0000	.9867	.8800	.4661	1111.57	1.607	.6061	.0494

SL. NO.	RADIUS (INS.)	TOT. T. (DEG.)	TOT. P. (PSI.)	ST. T. (DEG.)	ST. P. (PSI.)	SLOPE (DEG)	CURVAT. (1/IN.)	REL. VEL. (FT/SEC)	REL. M NUMBER
1	8.0325	629.66	27.63	591.46	22.18	5.18	-.10403	1164.6510	.9772
2	8.1769	629.33	27.51	592.33	22.25	4.44	-.08880	1172.3934	.9829
3	8.3204	628.81	27.41	592.90	22.30	3.78	-.07479	1180.7908	.9895
4	8.4628	628.27	27.31	593.32	22.34	3.17	-.06192	1189.9231	.9968
5	8.6042	627.78	27.22	593.67	22.38	2.62	-.05006	1199.7836	1.0048
6	8.7446	627.47	27.14	594.05	22.40	2.12	-.03904	1210.3238	1.0133
7	8.8838	627.29	27.08	594.46	22.42	1.65	-.02869	1221.4617	1.0223
8	9.0219	627.41	27.02	595.05	22.44	1.20	-.01883	1233.1672	1.0316
9	9.1587	627.81	26.97	595.80	22.44	.77	-.00927	1245.3805	1.0411
10	9.2943	628.56	26.92	596.81	22.45	.34	.00018	1258.0462	1.0508
11	9.4285	629.59	26.89	598.00	22.44	-.09	.00970	1271.1232	1.0607

-- OUTLET FLOW PARAMETERS ***--***

STA NO.	AXIAL COORDINATE (IN.)	GEOMETRIC HUB RADIUS (IN.)	GEOMETRIC TIP RADIUS (IN.)	HUB BLOCKAGE FACTOR	TIP BLOCKAGE FACTOR
8	6.156	7.948	9.500	.960	.960
9	8.046	7.948	9.500	.970	.970
10	9.937	7.948	9.500	.980	.980

STATION NUMBER 8

SL. NO.	RADIUS (INS.)	AX. VEL. (FT/SEC)	WH. VEL. (FT/SEC)	RD. VEL. (FT/SEC)	ABS. VEL. (FT/SEC)	ABS. M NUMBER	TOT. T. (DEG.)	TOT. P. (PSI.)
1	8.0157	652.556	.125	-5.83	652.582	.5462	629.66	27.63
2	8.1637	643.644	.122	-4.39	643.659	.5385	629.33	27.51
3	8.3107	635.261	.120	-3.09	635.269	.5313	628.81	27.41
4	8.4565	627.655	.118	-1.90	627.658	.5248	628.27	27.31
5	8.6011	620.921	.116	-.82	620.921	.5191	627.78	27.22
6	8.7446	615.065	.114	.19	615.065	.5141	627.47	27.14
7	8.8868	610.033	.113	1.12	610.034	.5097	627.29	27.08
8	9.0278	605.858	.111	2.01	605.861	.5060	627.41	27.02
9	9.1675	602.517	.109	2.87	602.524	.5029	627.81	26.97
10	9.3058	599.987	.107	3.71	599.999	.5004	628.56	26.92
11	9.4428	598.274	.106	4.54	598.292	.4985	629.59	26.89

STATION NUMBER 9

1	7.9988	627.972	.125	-5.62	627.997	.5245	629.66	27.63
2	8.1511	621.433	.123	-4.32	621.448	.5189	629.33	27.51
3	8.3020	614.986	.120	-3.12	614.994	.5134	628.81	27.41
4	8.4513	608.931	.118	-2.00	608.935	.5084	628.27	27.31
5	8.5992	603.407	.116	-.96	603.408	.5037	627.78	27.22
6	8.7457	598.455	.114	.03	598.455	.4995	627.47	27.14
7	8.8908	594.048	.112	.97	594.048	.4957	627.29	27.08
8	9.0344	590.239	.111	1.86	590.242	.4923	627.41	27.02
9	9.1767	587.023	.109	2.73	587.029	.4894	627.81	26.97
10	9.3176	584.388	.107	3.58	584.399	.4868	628.56	26.92
11	9.4571	582.347	.106	4.41	582.364	.4846	629.59	26.89

STATION NUMBER 10

1	7.9818	612.674	.125	0.00	612.674	.5110	629.66	27.63
2	8.1374	605.738	.123	0.00	605.738	.5051	629.33	27.51
3	8.2914	598.957	.121	0.00	598.957	.4994	628.81	27.41
4	8.4440	592.631	.118	0.00	592.631	.4941	628.27	27.31
5	8.5951	586.894	.116	0.00	586.894	.4893	627.78	27.22
6	8.7447	581.783	.114	0.00	581.783	.4849	627.47	27.14
7	8.8929	577.267	.112	0.00	577.267	.4811	627.29	27.08
8	9.0397	573.396	.111	0.00	573.396	.4776	627.41	27.02
9	9.1850	570.162	.109	0.00	570.162	.4747	627.81	26.97
10	9.3290	567.552	.107	0.00	567.552	.4721	628.56	26.92
11	9.4714	565.578	.106	0.00	565.578	.4700	629.59	26.89

2. DETAILED AERODYNAMIC DESIGN

a. Computational Methods and Assumptions

The detailed aerodynamic design of the single-stage compressor (core) was accomplished using the computer program described in Reference 7 and Section II.2.a of this report. The optimization criteria, airfoil selection, and aerodynamic assumptions used were similar to those described in Sections II.2.b-d.

b. Results

(1) Aerodynamic Analysis

The final aerodynamic design computing station/streamsurface geometry for the single-stage compressor (core) is shown in Figure 19. The flowpath outer diameter is constant from inlet to exit at 19.0 inches. Other pertinent geometric data were as follows:

Rotor Inlet Hub/Tip Radius Ratio	=	0.750
Number of Rotor Blades	=	33
Number of Stator Vanes	=	49
Average Rotor Aspect Ratio	=	0.961
Average Stator Aspect Ratio	=	0.892

The aerodynamic analysis incorporated four internal computing stations within each blade row and one computing station representing each blade edge. The rotor is represented by computing stations 5 through 10 and the stator is represented by computing stations 13 through 18.

The final design point specifications were as follows:

Flowrate	=	34.460 lb/sec
Flow Per Unit Frontal Area	=	17.502 lb/sec/ft**2
Flow Per Unit Annulus Area	=	40.000 lb/sec/ft**2
Rotor Total Pressure Ratio	=	1.8802
Stage Total Pressure Ratio	=	1.8398
Rotor Isentropic Efficiency	=	0.9353
Stage Isentropic Efficiency	=	0.9002

The final streamwise distributions of non-dimensional total enthalpy through the rotor and non-dimensional radius-times-swirl-velocity through the stator are shown in Figures 20 and 21 respectively. The aerodynamic blockage distributions are presented in Figure 22. Shown are the distributions of annulus wall boundary layer blockage and total aerodynamic blockage, consisting of wall blockage and blade boundary layer or wake blockage, along the mid-span streamsurface. The blade boundary layer or wake blockage was distributed evenly across the annulus.

The results of the detailed aerodynamic design are presented in Figures 23 through 29. The streamwise distributions of static pressure along the hub, middle, and case streamsurfaces are presented in Figure 23. Spanwise distributions of inlet relative (absolute for the stator) Mach number, diffusion factor, loss coefficient, total pressure ratio, isentropic efficiency, and turning angle for the rotor and stator are presented in Figures 24 through 29.

The details of the aerodynamic flowfield throughout the single-stage compressor (core) are presented in the following pages of printout from the aerodynamic design program.

PROGRAM UDO300 - COMPRESSOR DESIGN - CONTROL SECTION

TITLE = STAGE MATCHING INVESTIGATION - CORE DESIGN
THERE WILL BE AN ENTRY TO THE AERODYNAMIC SECTION
NUMBER OF ARBITRARY MEANLINE BLADEROWS = 2
NUMBER OF BLADE DESIGN PASSES = 2
AN ENTRY TO RECALCULATE WORK DISTRIBUTIONS WILL BE MADE
THIS OUTPUT FOR BLADE PASS NUMBER 2

PROGRAM UDO300 - VERSION 1.10 - AERODYNAMIC SECTION

 INPUT DATA

TITLE - FINAL DESIGN RUN

IDEAL GAS PROPERTIES SPECIFICATION

GAS CONSTANT = 53.320
 GRAVITATIONAL ACCELERATION = 32.174
 JOULES EQUIVALENT = 778.160

$$CP = CP(1) + CP(2) * T + CP(3) * T^{**2} + CP(4) * T^{**3} + CP(5) * T^{**4} + CP(6) * T^{**5}$$

N	CP(N)
1	.240000E+00
2	0.
3	0.
4	0.
5	0.
6	0.

NUMBER OF STATIONS	= 21
NUMBER OF STREAMLINES	= 11
MAX NUMBER OF PASSES	= 80
MAX NUMBER OF ARBITRARY PASSES	= 10
BOUNDARY LAYER CALC INDICATOR	= 0
NUMBER OF RUNNING POINTS	= 1
STREAMLINE DISTRIBUTION INDICATOR	= 1
NUMBER OF LOSS/D-FACTOR CURVE SETS	= 2
NUMBER OF LOSS/T.E.LOSS CURVE SETS	= 1
STREAMLINE INPUT INDICATOR	= 1
STREAMLINE OUTPUT INDICATOR	= 0
PRECISION PLOT INDICATOR	= 0
MAX NUMBER OF LINES/PAGE	= 60
WAKE TRANSPORT CALC INDICATOR	= 0
MAINSTREAM MIXING CALC INDICATOR	= 0
NO OF STATIONS FROM ANALYTIC SECN	= 0
LINE-PRINTER PLOT INDICATOR	= 0
MOMENTUM EQUATION FORM INDICATOR	= 2
GRAVITATIONAL CONSTANT	= 32.1740
JOULES EQUIVALENT	= 778.160
LINEAR DIMENSION SCALE FACTOR	= 12.0000
BASIC TOLERANCE	= .00100
KINEMATIC VISCOSITY	= .00018
B.L. SHAPE FACTOR	= .70000
PLOTTING SCALE FOR DIMENSIONS	= 1.000
PLOTTING SCALE FOR PRESSURES	= 2.000
MINIMUM RADIUS ON PLOT	= 0.000
MINIMUM PRESSURE ON PLOT	= 8.000
MAXIMUM M-SQUARED IN RELAXATION FACTOR	= .6000
CONSTANT IN RELAXATION FACTOR	= 4.0000
WAKE TRANSFER CONSTANT	= 0.00000
TURBULENT MIXING CONSTANT	= 0.00000

POINTS TO BE COMPUTED

NO	FLOWRATE	SPEED FACTOR
1	34.460	1.000

ANNULUS / COMPUTING STATION GEOMETRY

STATION 1 SPECIFIED BY 2 POINTS

XSTN	RSTN
-9.0000	7.1250
-9.0000	9.5000

STATION 2 SPECIFIED BY 2 POINTS

XSTN	RSTN
-6.0000	7.1250
-6.0000	9.5000

STATION 3 SPECIFIED BY 2 POINTS

XSTN	RSTN
-3.0000	7.1250
-3.0000	9.5000

STATION 4 SPECIFIED BY 2 POINTS

XSTN	RSTN
-.4500	7.1250
-.4500	9.5000

STATION 5 SPECIFIED BY 2 POINTS

XSTN	RSTN
0.0000	7.1250
0.0000	9.5000

STATION 6 SPECIFIED BY 2 POINTS

XSTN	RSTN
.4500	7.1710
.4500	9.5000

STATION 7 SPECIFIED BY 2 POINTS

XSTN	RSTN
.9000	7.2590
.9000	9.5000

STATION 8 SPECIFIED BY 2 POINTS

XSTN	RSTN
1.3500	7.3610
1.3500	9.5000

STATION 9 SPECIFIED BY 2 POINTS

XSTN	RSTN
1.8000	7.4840
1.8000	9.5000

STATION 10 SPECIFIED BY 2 POINTS

XSTN	RSTN
2.2500	7.6220
2.2500	9.5000

STATION 11 SPECIFIED BY 11 POINTS

XSTN	RSTN
2.3750	7.6640
2.3950	7.8460
2.4090	8.0300
2.4160	8.2110
2.4180	8.3950
2.4160	8.5800
2.4110	8.7650
2.4040	8.9480
2.3960	9.1320
2.3860	9.3160
2.3750	9.5000

STATION 12 SPECIFIED BY 11 POINTS

XSTN	RSTN
2.5000	7.7080
2.5400	7.8890
2.5680	8.0690
2.5820	8.2460
2.5850	8.4240
2.5820	8.6050
2.5720	8.7850
2.5580	8.9640
2.5420	9.1430
2.5220	9.3200
2.5000	9.5000

STATION 13 SPECIFIED BY 11 POINTS

XSTN	RSTN
2.6250	7.7510
2.6850	7.9250
2.7270	8.1000
2.7480	8.2750
2.7530	8.4500
2.7480	8.6250
2.7330	8.8000
2.7120	8.9750
2.6880	9.1500
2.6580	9.3250
2.6250	9.5000

STATION 14 SPECIFIED BY 11 POINTS

XSTN	RSTN
3.0000	7.8560
3.0480	8.0140
3.0820	8.1760
3.0980	8.3310
3.1020	8.4900
3.0980	8.6450
3.0860	8.8160
3.0700	8.9890
3.0500	9.1580
3.0260	9.3270
3.0000	9.5000

STATION 15 SPECIFIED BY 11 POINTS

XSTN	RSTN
3.3750	7.9220
3.4110	8.0700
3.4360	8.2230
3.4490	8.3710
3.4520	8.5240
3.4490	8.6710
3.4400	8.8380
3.4270	9.0030
3.4130	9.1690
3.3950	9.3330
3.3750	9.5000

STATION 16 SPECIFIED BY 11 POINTS

XSTN	RSTN
3.7500	7.9440
3.7740	8.0860
3.7910	8.2370
3.7990	8.3850
3.8010	8.5400
3.7990	8.6850
3.7930	8.8510
3.7850	9.0120
3.7750	9.1750
3.7630	9.3360
3.7500	9.5000

STATION 17 SPECIFIED BY 11 POINTS

XSTN	RSTN
4.1250	7.9460
4.1370	8.0900
4.1450	8.2430
4.1500	8.3960
4.1510	8.5520
4.1500	8.7000
4.1470	8.8620
4.1420	9.0200
4.1380	9.1810
4.1320	9.3400
4.1250	9.5000

STATION 18 SPECIFIED BY 2 POINTS

XSTN	RSTN
4.5000	7.9480
4.5000	9.5000

STATION 19 SPECIFIED BY 2 POINTS

XSTN	RSTN
4.8750	7.9480
4.8750	9.5000

STATION 20 SPECIFIED BY 2 POINTS

XSTN	RSTN
6.0000	7.9480
6.0000	9.5000

STATION 21 SPECIFIED BY 2 POINTS

XSTN	RSTN
7.1250	7.9480
7.1250	9.5000

STATION CALCULATION DATA

STATION 1 NDATA= 1 NTERP= 0 NDIMEN= 0 NMACH= 0 NPLLOT1= 0 NPLLOT2= 0

DATA C	TOTAL PRESSURE	TOTAL TEMPERATURE	WHIRL ANGLE
0.0000	14.7000	518.690	0.000

STATION 2

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLLOT1= 0 NPLLOT2= 0 NPLLOT3= 0 NPLLOT4= 0 NPLLOT5= 0 NBLEED= 0

STATION 3

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLLOT1= 0 NPLLOT2= 0 NPLLOT3= 0 NPLLOT4= 0 NPLLOT5= 0 NBLEED= 0

STATION 4

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLLOT1= 0 NPLLOT2= 0 NPLLOT3= 0 NPLLOT4= 0 NPLLOT5= 0 NBLEED= 0

STATION 5

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLLOT1= 0 NPLLOT2= 0 NPLLOT3= 0 NPLLOT4= 0 NPLLOT5= 0 NBLEED= 0

STATION 6

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -1 NL2 = -1 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 33 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 13509.74

DATA6	DATA1	DATA2	DATA6	
7.1710	131.310	0.000000	0.0000	
7.6700	131.290	0.000000	0.0000	
8.1470	131.290	0.000000	0.0000	
8.6100	131.300	0.000000	0.0000	
9.0620	131.380	0.000000	0.0000	
9.5000	131.530	0.000000	0.0000	

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.1710	-.1555	.11562	2.00961	-50.1976
7.6797	-.2509	.10369	1.95309	-50.5024
8.1566	-4.7498	.09542	1.92137	-51.6645
8.6147	-3.1287	.08850	1.90387	-52.7370
9.0616	-3.1415	.08246	1.89776	-54.0045
9.5000	-2.1479	.07608	1.88643	-55.0490

STATION 7

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -2 NL2 = -2 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 33 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 13509.74

DATA6	DATA1	DATA2	DATA6	
7.2590	138.130	0.000000	0.0000	
7.7350	138.090	0.000000	0.0000	
8.1920	138.090	0.000000	0.0000	
8.6400	138.110	0.000000	0.0000	
9.0770	138.270	0.000000	0.0000	
9.5000	138.570	0.000000	0.0000	

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.2590	-2.9411	.15016	2.00961	-41.3429
7.7445	-.9091	.14006	1.95309	-43.2220
8.2044	-5.4239	.13178	1.92137	-45.5171
8.6463	-2.6361	.12435	1.90387	-47.3240
9.0778	-3.0442	.11746	1.89776	-49.2619
9.5000	-2.7370	.10883	1.88643	-50.6228

STATION 8

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -3 NL2 = -3 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 33 NDATA2= 11 NSKIP = 2
 NPLO11= 0 NPLO22= 0 NPLO33= 0 NPLO44= 0 NPLO55= 0 NBLEED= 0

SPEED = 13509.74

DATA1	DATA2	DATA6	
7.3610	144.950	0.000000	0.0000
7.8090	144.880	0.000000	0.0000
8.2410	144.880	0.000000	0.0000
8.6670	144.930	0.000000	0.0000
9.0880	145.160	0.000000	0.0000
9.5000	145.620	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.3610	-1.2722	.13643	2.00961	-30.6079
7.8174	1.4216	.12943	1.95309	-34.1984
8.2535	-3.9552	.12391	1.92137	-38.1648
8.6755	-.1852	.11891	1.90387	-41.0497
9.0906	-1.4678	.11416	1.89776	-43.9820
9.5000	-2.1136	.10745	1.88643	-46.0996

STATION 9

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 4
 NL1 = -4 NL2 = -4 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 33 NDATA2= 11 NSKIP = 2
 NPLO11= 0 NPLO22= 0 NPLO33= 0 NPLO44= 0 NPLO55= 0 NBLEED= 0

SPEED = 13509.74

DATA1	DATA2	DATA6	
7.4840	151.770	0.000000	0.0000
7.8930	151.680	0.000000	0.0000
8.2950	151.670	0.000000	0.0000
8.6970	151.740	0.000000	0.0000
9.1000	152.050	0.000000	0.0000
9.5000	152.660	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.4840	3.8200	.08841	2.00961	-15.5037
7.9009	6.8204	.08375	1.95309	-22.1384
8.3070	.0653	.08080	1.92137	-28.9325
8.7052	4.4965	.07870	1.90387	-33.5766
9.1019	2.1718	.07702	1.89776	-38.1162
9.5000	.7310	.07454	1.88643	-41.6979

STATION 10

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 2 NLOSS = 1
 NL1 = -5 NL2 = -5 NEVAL = 1 NCURVE= 0 NLITER= 0 NDEL = -2
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 33 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 13509.74

DATAC	DATA1	DATA2	DATA6
7.6220	158.590	.056100	0.0000
7.9900	158.480	.064800	0.0000
8.3590	158.470	.066900	0.0000
8.7340	158.550	.071100	0.0000
9.1150	158.940	.082300	0.0000
9.5000	159.700	.101800	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.6220	14.4662	.00687	2.00961	3.8989
7.9984	16.2360	.00653	1.95309	-7.0375
8.3698	7.7464	.00635	1.92137	-18.0795
8.7404	12.1224	.00630	1.90387	-25.4758
9.1157	8.6931	.00635	1.89776	-32.4347
9.5000	6.8984	.00647	1.88643	-38.2334

DELC	DELTA
7.1250	5.0000
9.5000	5.0000

STATION 11

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 12

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 13

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 14

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -1 NL2 = -1 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
7.8560	4777.140	0.000000	0.0000
8.1600	4760.690	0.000000	0.0000
8.4720	4758.920	0.000000	0.0000
8.8000	4771.100	0.000000	0.0000
9.1450	4825.380	0.000000	0.0000
9.5000	4932.850	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.8560	-2.7926	.06149	1.97582	34.6545
8.1661	-2.8198	.06006	1.78266	33.5894
8.4794	-2.3591	.06161	1.68691	33.1084
8.8045	-1.5162	.06425	1.63849	33.0427
9.1446	-.7562	.06778	1.61581	33.0227
9.5000	-.5762	.07240	1.61240	33.2504

STATION 15

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -2 NL2 = -2 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
7.9220	3582.850	0.000000	0.0000
8.1990	3570.520	0.000000	0.0000
8.4980	3569.190	0.000000	0.0000
8.8180	3578.330	0.000000	0.0000
9.1540	3619.030	0.000000	0.0000
9.5000	3699.640	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.9220	-.5836	.07957	1.97582	20.7427
8.2053	-1.3527	.07949	1.78266	21.4612
8.5051	-1.2071	.08230	1.68691	21.4542
8.8212	-.7044	.08658	1.63849	21.3938
9.1534	-.6396	.09183	1.61581	21.2656
9.5000	-.4656	.09816	1.61240	21.2170

STATION 16

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -3 NL2 = -3 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLLOT1= 0 NPLLOT2= 0 NPLLOT3= 0 NPLLOT4= 0 NPLLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
7.9440	2388.570	0.000000	0.0000
8.2150	2380.340	0.000000	0.0000
8.5120	2379.460	0.000000	0.0000
8.8280	2385.550	0.000000	0.0000
9.1610	2412.690	0.000000	0.0000
9.5000	2466.420	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.9440	-.0423	.07682	1.97582	10.0301
8.2227	-.3986	.07687	1.78266	10.3377
8.5191	-.4307	.07954	1.68691	10.2352
8.8317	-.3170	.08381	1.63849	10.0812
9.1593	-.2850	.08906	1.61581	9.9189
9.5000	-.3787	.09522	1.61240	9.7766

STATION 17

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 4
 NL1 = -4 NL2 = -4 NEVAL = 0 NCURVE= 1 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLLOT1= 0 NPLLOT2= 0 NPLLOT3= 0 NPLLOT4= 0 NPLLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA6	DATA1	DATA2	DATA6
7.9460	1194.280	0.000000	0.0000
8.2470	1190.170	0.000000	0.0000
8.5550	1189.730	0.000000	0.0000
8.8640	1192.780	0.000000	0.0000
9.1820	1206.340	0.000000	0.0000
9.5000	1233.210	0.000000	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21

7.9460	.3946	.05387	1.97582	.1180
8.2286	.1076	.05396	1.78266	.0559
8.5262	-.0282	.05556	1.68691	-.1299
8.8380	-.0710	.05833	1.63849	-.2648
9.1633	-.1158	.06180	1.61581	-.3785
9.5000	-.2277	.06588	1.61240	-.5005

STATION 18

NDATA = 6 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 3 NLOSS = 1
 NL1 = -5 NL2 = -5 NEVAL = 2 NCURVE= 0 NLITER= 0 NDEL = -2
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 49 NDATA2= 11 NSKIP = 2
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

SPEED = 0.00

DATA C	DATA1	DATA2	DATA6
7.9480	0.000	.063400	0.0000
8.2590	0.000	.059600	0.0000
8.5690	0.000	.056900	0.0000
8.8800	0.000	.054300	0.0000
9.1900	0.000	.051800	0.0000
9.5000	0.000	.049400	0.0000

DAT2C	DAT23	DAT24	DAT25	NWORK=0,5,OR 6 ONLY- DAT21
7.9480	0.0000	.00978	1.97582	-8.0033
8.2318	0.0000	.00942	1.78266	-8.2696
8.5301	0.0000	.00910	1.68691	-8.5086
8.8417	0.0000	.00878	1.63849	-8.6841
9.1658	0.0000	.00843	1.61581	-8.8473
9.5000	0.0000	.00813	1.61240	-9.0766

DELC	DELTA
7.9120	5.0000
9.5000	5.0000

STATION 19

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 1 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 20

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

STATION 21

NDATA = 0 NTERP = 0 NDIMEN= 0 NMACH = 0 NWORK = 0 NLOSS = 0
 NL1 = 0 NL2 = 0 NEVAL = 0 NCURVE= 0 NLITER= 0 NDEL = 0
 NOUT1 = 0 NOUT2 = 0 NOUT3 = 0 NBLADE= 0 NDATA2= 0 NSKIP = 0
 NPLOT1= 0 NPLOT2= 0 NPLOT3= 0 NPLOT4= 0 NPLOT5= 0 NBLEED= 0

BLOCKAGE FACTOR SPECIFICATIONS

STATION	WALL BLOCKAGE	WAKE BLOCKAGE	WAKE DISTRIBUTION FACTOR
1	0.00000	0.00000	1.000
2	.00050	0.00000	1.000
3	.00100	0.00000	1.000
4	.00150	0.00000	1.000
5	.00230	0.00000	1.000
6	.00340	.00500	1.000
7	.00450	.01000	1.000
8	.00640	.02000	1.000
9	.00800	.03500	1.000
10	.01200	.05000	1.000
11	.01300	.05000	1.000
12	.01400	.05000	1.000
13	.01550	.05000	1.000
14	.01530	.05400	1.000
15	.01410	.05800	1.000
16	.01410	.06200	1.000
17	.01630	.06600	1.000
18	.01880	.07000	1.000
19	.01900	.07000	1.000
20	.01950	.07000	1.000
21	.01970	.07000	1.000

LOSS PARAMETER / DIFFUSION FACTOR CURVES FOR BLADE TYPE 1 (15 D-FACTORS GIVEN)

DIFFUSION FACTORS	L O S S HUB	P A R A M E T E R S MID	TIP
0.000	.00500	.00500	.00500
.050	.00500	.00500	.00500
.100	.00500	.00500	.00500
.150	.00500	.00500	.00500
.200	.00500	.00500	.00500
.250	.00500	.00500	.00500
.300	.00500	.00500	.00500
.350	.00520	.00520	.00520
.400	.00560	.00560	.00580
.450	.00610	.00610	.00700
.500	.00710	.00710	.00890
.550	.00870	.00870	.01190
.600	.01120	.01120	.01640
.650	.01490	.01490	.02300
.700	.02050	.02050	.03370

LOSS PARAMETER / DIFFUSION FACTOR CURVES FOR BLADE TYPE 2
(15 D-FACTORS GIVEN)

DIFFUSION FACTORS	L O S S HUB	P A R A M E T E R S MID	TIP
0.000	.00340	.00340	.00340
.050	.00390	.00390	.00390
.100	.00450	.00450	.00450
.150	.00510	.00510	.00510
.200	.00600	.00600	.00600
.250	.00720	.00720	.00720
.300	.00850	.00850	.00850
.350	.01020	.01020	.01020
.400	.01200	.01200	.01200
.450	.01450	.01450	.01450
.500	.01720	.01720	.01720
.550	.02170	.02170	.02170
.600	.02640	.02640	.02640
.650	.03180	.03180	.03180
.700	.03870	.03870	.03870

FRACTIONAL LOSS DISTRIBUTION CURVES FOR BLADE CLASS 1

6 POINTS GIVEN AT 1 RADIAL LOCATIONS

FRACTION OF COMPUTING STATION LENGTH AT BLADE EXIT = .5000

FRACTION OF MERIDIONAL CHORD LOSS/LOSS AT TRAILING EDGE

0.0000	0.0000
.2000	.2000
.4000	.4000
.6000	.6000
.8000	.8000
1.0000	1.0000

 WORK DISTRIBUTIONS HAVE BEEN CALCULATED FOR 2 BLADE ROWS

*****THE WORK DISTRIBUTION FOR THE BLADE ROW BETWEEN STATION 5
 *****AND STATION 10 CONSISTS OF A BASELINE DISTRIBUTION
 *****ONLY.

*****THE FOLLOWING EDGE DATA WERE USED TO DEFINE
 THE WORK DISTRIBUTION

LEADING EDGE		***TRAILING EDGE***	
SPAN	WORK	SPAN	WORK
0.0000	124.4900	0.0000	151.1200
.1166	124.4900	.1109	151.0400
.2281	124.4900	.2185	150.9100
.3354	124.4900	.3232	150.7800
.4388	124.4900	.4251	150.6700
.5389	124.4900	.5247	150.5900
.6360	124.4900	.6224	150.5500
.7304	124.4900	.7184	150.5800
.8224	124.4900	.8130	150.6700
.9122	124.4900	.9068	150.8500
1.0000	124.4900	1.0000	151.1000

*****THE BASELINE WORK DISTRIBUTION WAS COMPUTED USING
 *****THE FOLLOWING SLOPE COEFFICIENTS

A1H= 1.0300 A2H= .5000 A1T= 1.2000
 A2T= 0.0000 A1D= 1.0000 A2D= 1.0000

*****THE COMPUTED TOTAL WORK DISTRIBUTION IS AS FOLLOWS

	(COMPUTING STATION)					
	5	6	7	8	9	10
(S.L.)						
11	124.49	131.34	138.45	144.80	149.35	151.10
10	124.49	131.18	138.13	144.36	148.91	150.82
9	124.49	131.04	137.86	144.00	148.56	150.64
8	124.49	130.93	137.64	143.72	148.31	150.56
7	124.49	130.83	137.45	143.49	148.12	150.56
6	124.49	130.74	137.28	143.29	147.99	150.61
5	124.49	130.66	137.12	143.12	147.88	150.70
4	124.49	130.57	136.96	142.94	147.79	150.82
3	124.49	130.47	136.79	142.76	147.70	150.94
2	124.49	130.36	136.60	142.55	147.59	151.05
1	124.49	130.22	136.36	142.30	147.44	151.12

*****INPUT DATA HAVE BEEN UPDATED AS FOLLOWS

STATION 6
DATAC DATA1
7.1710 130.2178
7.6700 130.4664
8.1470 130.6524
8.6100 130.8269
9.0620 131.0421
9.5000 131.3447

STATION 7
DATAC DATA1
7.2590 136.3629
7.7350 136.7847
8.1920 137.1144
8.6400 137.4400
9.0770 137.8570
9.5000 138.4549

STATION 8
DATAC DATA1
7.3610 142.2994
7.8090 142.7542
8.2410 143.1062
8.6670 143.4776
9.0880 144.0009
9.5000 144.7988

STATION 9
DATAC DATA1
7.4840 147.4393
7.8930 147.6976
8.2950 147.8780
8.6970 148.1153
9.1000 148.5615
9.5000 149.3544

STATION 10
DATAC DATA1
7.6220 151.1200
7.9900 150.9470
8.3590 150.7102
8.7340 150.5576
9.1150 150.6428
9.5000 151.1000

*****THE WORK DISTRIBUTION FOR THE BLADE ROW BETWEEN STATION 13
 *****AND STATION 18 CONSISTS OF A BASELINE DISTRIBUTION
 *****ONLY.

*****THE FOLLOWING EDGE DATA WERE USED TO DEFINE
 THE WORK DISTRIBUTION

LEADING EDGE		***TRAILING EDGE***	
SPAN	WORK	SPAN	WORK
0.0000	5657.9200	0.0000	0.0000
.1109	5640.8400	.1034	0.0000
.2185	5614.3800	.2062	0.0000
.3232	5586.8900	.3082	0.0000
.4251	5562.0300	.4095	0.0000
.5247	5545.8500	.5101	0.0000
.6224	5536.7600	.6098	0.0000
.7184	5543.1700	.7087	0.0000
.8130	5563.2800	.8067	0.0000
.9068	5601.8500	.9039	0.0000
1.0000	5654.4800	1.0000	0.0000

*****THE BASELINE WORK DISTRIBUTION WAS COMPUTED USING
 *****THE FOLLOWING SLOPE COEFFICIENTS

A1H= 1.3000	A2H= 0.0000	A1T= 1.3000
A2T= 0.0000	A1D= 1.0000	A2D= 1.0000

*****THE COMPUTED TOTAL WORK DISTRIBUTION IS AS FOLLOWS

	(COMPUTING STATION)					
	13	14	15	16	17	18
(S.L.)						
11	5654.48	4125.51	2605.58	1284.70	352.84	0.00
10	5594.08	4085.41	2577.70	1272.03	348.28	0.00
9	5555.43	4055.72	2558.85	1262.33	345.84	0.00
8	5538.81	4039.60	2552.00	1256.94	345.87	0.00
7	5539.50	4043.91	2549.48	1257.49	343.99	0.00
6	5552.70	4051.24	2554.35	1259.82	344.86	0.00
5	5572.59	4061.70	2560.32	1262.72	345.69	0.00
4	5597.72	4078.69	2572.00	1267.86	347.50	0.00
3	5622.87	4095.38	2586.36	1272.15	350.23	0.00
2	5644.35	4103.60	2585.87	1271.91	349.04	0.00
1	5657.92	4085.91	2561.86	1260.13	345.68	0.00

*****INPUT DATA HAVE BEEN UPDATED AS FOLLOWS

STATION 14

DATA1	DATA2
7.8560	4085.9130
8.1600	4095.9841
8.4720	4062.3710
8.8000	4044.1243
9.1450	4055.7676
9.5000	4125.5086

STATION 15

DATA1	DATA2
7.9220	2561.8606
8.1990	2586.7887
8.4980	2560.7017
8.8180	2549.5113
9.1540	2558.8933
9.5000	2605.5844

STATION 16

DATA1	DATA2
7.9440	1260.1291
8.2150	1272.3251
8.5120	1262.9214
8.8280	1257.5425
9.1610	1262.4100
9.5000	1284.6979

STATION 17

DATA1	DATA2
7.9460	345.6844
8.2470	350.0427
8.5550	345.5303
8.8640	344.1899
9.1820	345.9278
9.5000	352.8396

STATION 18

DATA1	DATA2
7.9480	0.0000
8.2590	0.0000
8.5690	0.0000
8.8800	0.0000
9.1900	0.0000
9.5000	0.0000

STATION 1 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	609.56	0.00	609.56	0.00	609.56
2	7.3625	609.56	0.00	609.56	.00	609.56
3	7.6000	609.56	0.00	609.56	.00	609.56
4	7.8375	609.56	0.00	609.56	.00	609.56
5	8.0750	609.56	0.00	609.56	.00	609.56
6	8.3125	609.56	0.00	609.56	.01	609.56
7	8.5500	609.56	0.00	609.56	.00	609.56
8	8.7875	609.56	0.00	609.56	.00	609.56
9	9.0250	609.56	0.00	609.56	.00	609.56
10	9.2625	609.56	0.00	609.56	.00	609.56
11	9.5000	609.56	0.00	609.56	0.00	609.56

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1250	-9.0000	0.0000	0.00	0.000	0.000	0.000
2	7.3625	-9.0000	.2375	0.00	.000	.000	0.000
3	7.6000	-9.0000	.4750	0.00	.000	.000	0.000
4	7.8375	-9.0000	.7125	0.00	.000	.000	0.000
5	8.0750	-9.0000	.9500	0.00	.000	.000	0.000
6	8.3125	-9.0000	1.1875	0.00	.000	.000	0.000
7	8.5500	-9.0000	1.4250	0.00	.000	.000	0.000
8	8.7875	-9.0000	1.6625	0.00	.000	.000	0.000
9	9.0250	-9.0000	1.9000	0.00	.000	.000	0.000
10	9.2625	-9.0000	2.1375	0.00	.000	.000	0.000
11	9.5000	-9.0000	2.3750	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5633	14.7000	11.8530	518.690	487.771	.065627
2	7.3625	.5633	14.7000	11.8530	518.690	487.771	.065627
3	7.6000	.5633	14.7000	11.8530	518.690	487.771	.065627
4	7.8375	.5633	14.7000	11.8530	518.690	487.771	.065627
5	8.0750	.5633	14.7000	11.8530	518.690	487.771	.065627
6	8.3125	.5633	14.7000	11.8530	518.690	487.771	.065627
7	8.5500	.5633	14.7000	11.8530	518.690	487.771	.065627
8	8.7875	.5633	14.7000	11.8530	518.690	487.771	.065627
9	9.0250	.5633	14.7000	11.8530	518.690	487.771	.065627
10	9.2625	.5633	14.7000	11.8530	518.690	487.771	.065627
11	9.5000	.5633	14.7000	11.8530	518.690	487.771	.065627

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.065	.975606	0.000	0.000
2	7.3625	124.486	117.065	.975606	0.000	.000
3	7.6000	124.486	117.065	.975606	0.000	.000
4	7.8375	124.486	117.065	.975606	0.000	.000
5	8.0750	124.486	117.065	.975606	0.000	.000
6	8.3125	124.486	117.065	.975606	0.000	.000
7	8.5500	124.486	117.065	.975606	0.000	.000
8	8.7875	124.486	117.065	.975606	0.000	.000
9	9.0250	124.486	117.065	.975606	0.000	.000
10	9.2625	124.486	117.065	.975606	0.000	.000
11	9.5000	124.486	117.065	.975606	0.000	0.000

STATION 2 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	609.98	0.00	609.98	0.00	609.98
2	7.3625	609.98	0.00	609.98	.02	609.98
3	7.6000	609.99	0.00	609.99	.04	609.99
4	7.8375	609.99	0.00	609.99	.05	609.99
5	8.0750	610.00	0.00	610.00	.06	610.00
6	8.3125	610.01	0.00	610.01	.06	610.01
7	8.5500	610.02	0.00	610.02	.06	610.02
8	8.7875	610.03	0.00	610.03	.05	610.03
9	9.0250	610.03	0.00	610.03	.04	610.03
10	9.2625	610.04	0.00	610.04	.02	610.04
11	9.5000	610.04	0.00	610.04	0.00	610.04

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE		STATION LEAN ANGLE
		X-COORD	L-COORD				
1	7.1250	-6.0000	0.0000	0.00	0.000		0.000
2	7.3625	-6.0000	.2375	46035.11	.002		0.000
3	7.6000	-6.0000	.4750	24672.85	.004		0.000
4	7.8375	-6.0000	.7125	18299.51	.005		0.000
5	8.0750	-6.0000	.9500	15900.15	.006		0.000
6	8.3125	-6.0000	1.1875	15443.02	.006		0.000
7	8.5500	-6.0000	1.4250	16568.42	.006		0.000
8	8.7875	-6.0000	1.6625	19847.21	.005		0.000
9	9.0250	-6.0000	1.9000	27788.99	.003		0.000
10	9.2625	-6.0000	2.1375	53668.18	.002		0.000
11	9.5000	-6.0000	2.3750	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5637	14.7000	11.8494	518.690	487.729	.065613
2	7.3625	.5637	14.7000	11.8494	518.690	487.729	.065613
3	7.6000	.5637	14.7000	11.8493	518.690	487.728	.065613
4	7.8375	.5637	14.7000	11.8493	518.690	487.728	.065612
5	8.0750	.5637	14.7000	11.8492	518.690	487.727	.065612
6	8.3125	.5637	14.7000	11.8491	518.690	487.726	.065612
7	8.5500	.5637	14.7000	11.8490	518.690	487.725	.065612
8	8.7875	.5637	14.7000	11.8490	518.690	487.724	.065611
9	9.0250	.5637	14.7000	11.8489	518.690	487.723	.065611
10	9.2625	.5637	14.7000	11.8489	518.690	487.723	.065611
11	9.5000	.5637	14.7000	11.8489	518.690	487.723	.065611

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.055	.975606	0.000	0.000
2	7.3625	124.486	117.055	.975606	0.000	.002
3	7.6000	124.486	117.055	.975606	0.000	.004
4	7.8375	124.486	117.055	.975606	0.000	.005
5	8.0750	124.486	117.054	.975606	0.000	.006
6	8.3125	124.486	117.054	.975606	0.000	.006
7	8.5500	124.486	117.054	.975606	0.000	.006
8	8.7875	124.486	117.054	.975606	0.000	.005
9	9.0250	124.486	117.054	.975606	0.000	.003
10	9.2625	124.486	117.054	.975606	0.000	.002
11	9.5000	124.486	117.054	.975606	0.000	0.000

STATION 3 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	609.63	0.00	609.63	0.00	609.63
2	7.3627	609.67	0.00	609.67	.56	609.67
3	7.6004	609.79	0.00	609.79	1.02	609.79
4	7.8380	609.98	0.00	609.98	1.34	609.98
5	8.0756	610.21	0.00	610.20	1.51	610.21
6	8.3131	610.44	0.00	610.44	1.52	610.44
7	8.5506	610.67	0.00	610.67	1.39	610.67
8	8.7880	610.87	0.00	610.87	1.14	610.87
9	9.0254	611.03	0.00	611.02	.81	611.03
10	9.2627	611.12	0.00	611.12	.42	611.12
11	9.5000	611.15	0.00	611.15	0.00	611.15

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1250	-3.0000	0.0000	0.00	0.000		0.000
2	7.3627	-3.0000	.2377	1642.92	.052		0.000
3	7.6004	-3.0000	.4754	897.87	.096		0.000
4	7.8380	-3.0000	.7130	683.44	.126		0.000
5	8.0756	-3.0000	.9506	609.95	.142		0.000
6	8.3131	-3.0000	1.1881	607.12	.143		0.000
7	8.5506	-3.0000	1.4256	664.97	.130		0.000
8	8.7880	-3.0000	1.6630	809.43	.107		0.000
9	9.0254	-3.0000	1.9004	1146.02	.076		0.000
10	9.2627	-3.0000	2.1377	2227.51	.039		0.000
11	9.5000	-3.0000	2.3750	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5633	14.7000	11.8524	518.690	487.765	.065625
2	7.3627	.5634	14.7000	11.8520	518.690	487.760	.065623
3	7.6004	.5635	14.7000	11.8510	518.690	487.748	.065619
4	7.8380	.5637	14.7000	11.8494	518.690	487.729	.065613
5	8.0756	.5639	14.7000	11.8474	518.690	487.706	.065605
6	8.3131	.5641	14.7000	11.8454	518.690	487.682	.065597
7	8.5506	.5644	14.7000	11.8434	518.690	487.659	.065589
8	8.7880	.5646	14.7000	11.8417	518.690	487.638	.065582
9	9.0254	.5647	14.7000	11.8403	518.690	487.623	.065577
10	9.2627	.5648	14.7000	11.8395	518.690	487.613	.065574
11	9.5000	.5648	14.7000	11.8392	518.690	487.610	.065573

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.064	.975606	0.000	0.000
2	7.3627	124.486	117.062	.975606	0.000	.052
3	7.6004	124.486	117.059	.975606	0.000	.096
4	7.3380	124.486	117.055	.975606	0.000	.126
5	8.0756	124.486	117.049	.975606	0.000	.142
6	8.3131	124.486	117.044	.975606	0.000	.143
7	8.5506	124.486	117.038	.975606	0.000	.130
8	8.7880	124.486	117.033	.975606	0.000	.107
9	9.0254	124.486	117.029	.975606	0.000	.076
10	9.2627	124.486	117.027	.975606	0.000	.039
11	9.5000	124.486	117.026	.975606	0.000	0.000

STATION 4 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	592.96	0.00	592.96	0.00	592.96
2	7.3672	594.32	0.00	594.23	10.14	594.32
3	7.6086	597.81	0.00	597.61	15.47	597.81
4	7.8488	602.34	0.00	602.07	17.83	602.34
5	8.0877	607.20	0.00	606.93	18.21	607.20
6	8.3253	611.93	0.00	611.69	17.13	611.93
7	8.5617	616.19	0.00	616.01	14.97	616.19
8	8.7971	619.75	0.00	619.63	11.98	619.75
9	9.0318	622.43	0.00	622.37	8.36	622.43
10	9.2660	624.10	0.00	624.08	4.29	624.10
11	9.5000	624.66	0.00	624.66	0.00	624.66

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1250	-.4500	0.0000	0.00	0.000	0.000	0.000
2	7.3672	-.4500	.2422	49.02	.977		0.000
3	7.6086	-.4500	.4836	33.10	1.483		0.000
4	7.8488	-.4500	.7238	29.56	1.697		0.000
5	8.0877	-.4500	.9627	29.72	1.718		0.000
6	8.3253	-.4500	1.2003	32.30	1.604		0.000
7	8.5617	-.4500	1.4367	37.63	1.392		0.000
8	8.7971	-.4500	1.6721	47.65	1.107		0.000
9	9.0318	-.4500	1.9068	68.86	.769		0.000
10	9.2660	-.4500	2.1410	134.76	.394		0.000
11	9.5000	-.4500	2.3750	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.5470	14.7000	11.9950	518.690	489.432	.066188
2	7.3672	.5483	14.7000	11.9834	518.690	489.298	.066142
3	7.6086	.5517	14.7000	11.9538	518.690	488.952	.066025
4	7.8488	.5562	14.7000	11.9151	518.690	488.500	.065873
5	8.0877	.5609	14.7000	11.8733	518.690	488.010	.065708
6	8.3253	.5656	14.7000	11.8325	518.690	487.531	.065546
7	8.5617	.5698	14.7000	11.7955	518.690	487.095	.065400
8	8.7971	.5733	14.7000	11.7645	518.690	486.729	.065277
9	9.0318	.5759	14.7000	11.7411	518.690	486.452	.065184
10	9.2660	.5776	14.7000	11.7265	518.690	486.279	.065126
11	9.5000	.5781	14.7000	11.7215	518.690	486.221	.065106

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	117.464	.975606	0.000	0.000
2	7.3672	124.486	117.432	.975606	0.000	.977
3	7.6086	124.486	117.348	.975606	0.000	1.483
4	7.8488	124.486	117.240	.975606	0.000	1.697
5	8.0877	124.486	117.123	.975606	0.000	1.718
6	8.3253	124.486	117.007	.975606	0.000	1.604
7	8.5617	124.486	116.903	.975606	0.000	1.392
8	8.7971	124.486	116.815	.975606	0.000	1.107
9	9.0318	124.486	116.749	.975606	0.000	.769
10	9.2660	124.486	116.707	.975606	0.000	.394
11	9.5000	124.486	116.693	.975606	0.000	0.000

STATION 5 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1250	535.38	0.00	534.69	27.26	535.38
2	7.3818	562.20	0.00	560.87	38.74	562.20
3	7.6305	582.23	0.00	580.55	44.18	582.23
4	7.8736	597.94	0.00	596.19	45.79	597.94
5	8.1126	610.90	0.00	609.27	44.58	610.90
6	8.3484	621.78	0.00	620.43	40.89	621.78
7	8.5816	630.79	0.00	629.80	35.29	630.79
8	8.8129	638.11	0.00	637.48	28.33	638.11
9	9.0428	643.84	0.00	643.52	20.20	643.84
10	9.2716	647.80	0.00	647.71	10.79	647.80
11	9.5000	649.30	0.00	649.30	0.00	649.30

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF		STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE	ANGLE	ANGLE	
1	7.1250	0.0000	0.0000	4.43	2.918			0.000
2	7.3818	0.0000	.2568	6.17	3.951			0.000
3	7.6305	0.0000	.5055	8.24	4.352			0.000
4	7.8736	0.0000	.7486	10.42	4.392			0.000
5	8.1126	0.0000	.9876	12.67	4.185			0.000
6	8.3484	0.0000	1.2234	15.47	3.771			0.000
7	8.5816	0.0000	1.4566	19.18	3.207			0.000
8	8.8129	0.0000	1.6879	24.12	2.544			0.000
9	9.0428	0.0000	1.9178	31.91	1.798			0.000
10	9.2716	0.0000	2.1466	53.33	.954			0.000
11	9.5000	0.0000	2.3750	0.00	0.000			0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1250	.4912	14.7000	12.4655	518.690	494.839	.068033
2	7.3818	.5171	14.7000	12.2507	518.690	492.389	.067193
3	7.6305	.5365	14.7000	12.0853	518.690	490.482	.066544
4	7.8736	.5519	14.7000	11.9526	518.690	488.939	.066021
5	8.1126	.5646	14.7000	11.8414	518.690	487.635	.065581
6	8.3484	.5753	14.7000	11.7468	518.690	486.519	.065206
7	8.5816	.5842	14.7000	11.6675	518.690	485.580	.064892
8	8.8129	.5914	14.7000	11.6027	518.690	484.808	.064634
9	9.0428	.5971	14.7000	11.5515	518.690	484.196	.064430
10	9.2716	.6011	14.7000	11.5159	518.690	483.770	.064288
11	9.5000	.6026	14.7000	11.5025	518.690	483.609	.064235

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1250	124.486	118.761	.975606	0.000	2.918
2	7.3818	124.486	118.173	.975606	0.000	3.951
3	7.6305	124.486	117.716	.975606	0.000	4.352
4	7.8736	124.486	117.345	.975606	0.000	4.392
5	8.1126	124.486	117.032	.975606	0.000	4.185
6	8.3484	124.486	116.765	.975606	0.000	3.771
7	8.5816	124.486	116.539	.975606	0.000	3.207
8	8.8129	124.486	116.354	.975606	0.000	2.544
9	9.0428	124.486	116.207	.975606	0.000	1.798
10	9.2716	124.486	116.105	.975606	0.000	.954
11	9.5000	124.486	116.066	.975606	0.000	0.000

STATION 5 IS AT THE LEADING EDGE OF A BLADE
 ROTATING AT 13509.7 RPM. NUMBER OF BLADES IN ROW = 33.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	INCIDENCE ANGLE
1	7.1250	840.00	996.11	.9139	-57.488	0.000
2	7.3818	870.27	1036.07	.9529	-57.137	0.000
3	7.6305	899.59	1071.57	.9874	-57.089	0.000
4	7.8736	928.26	1104.17	1.0191	-57.212	0.000
5	8.1126	956.43	1134.88	1.0488	-57.432	0.000
6	8.3484	984.23	1164.18	1.0771	-57.718	0.000
7	8.5816	1011.73	1192.26	1.1042	-58.057	0.000
8	8.8129	1039.00	1219.30	1.1301	-58.444	0.000
9	9.0428	1066.09	1245.43	1.1551	-58.871	0.000
10	9.2716	1093.07	1270.61	1.1790	-59.347	0.000
11	9.5000	1120.00	1294.60	1.2014	-59.898	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE
1	7.1250	0.000	0.000	3.9737
2	7.3818	0.000	0.000	4.2070
3	7.6305	0.000	0.000	4.3915
4	7.8736	0.000	0.000	4.5214
5	8.1126	0.000	0.000	4.6483
6	8.3484	0.000	0.000	4.7634
7	8.5816	0.000	0.000	4.8682
8	8.8129	0.000	0.000	4.9665
9	9.0428	0.000	0.000	5.0684
10	9.2716	0.000	0.000	5.1769
11	9.5000	0.000	0.000	5.2750

STATION 6 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.1710	547.30	169.75	541.36	80.43	573.02
2	7.4294	575.58	167.68	570.37	77.28	599.51
3	7.6771	594.16	165.53	589.76	72.20	616.79
4	7.9180	607.11	163.13	603.48	66.24	628.64
5	8.1536	620.32	160.68	617.43	59.80	640.79
6	8.3846	631.48	158.40	629.33	52.02	651.04
7	8.6122	639.24	156.39	637.79	43.12	658.09
8	8.8371	644.69	154.73	643.81	33.62	663.00
9	9.0601	649.83	153.66	649.40	23.62	667.75
10	9.2810	655.36	153.30	655.24	12.61	673.05
11	9.5000	660.84	153.33	660.84	0.00	678.39

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	7.1710	.4500	0.0000	4.99	8.451	0.000	0.000
2	7.4294	.4500	.2584	7.80	7.716	0.000	0.000
3	7.6771	.4500	.5061	12.28	6.980	0.000	0.000
4	7.9180	.4500	.7470	20.58	6.264	0.000	0.000
5	8.1536	.4500	.9826	39.72	5.532	0.000	0.000
6	8.3846	.4500	1.2136	108.02	4.726	0.000	0.000
7	8.6122	.4500	1.4412	-1050.36	3.868	0.000	0.000
8	8.8371	.4500	1.6661	-143.46	2.989	0.000	0.000
9	9.0601	.4500	1.8891	-108.26	2.083	0.000	0.000
10	9.2810	.4500	2.1100	-137.36	1.102	0.000	0.000
11	9.5000	.4500	2.3290	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.1710	.5152	17.1554	14.3154	542.574	515.251	.075034
2	7.4294	.5401	17.2063	14.1102	543.133	513.226	.074250
3	7.6771	.5563	17.2486	13.9794	543.623	511.967	.073743
4	7.9180	.5675	17.2651	13.8779	544.032	511.148	.073325
5	8.1536	.5789	17.2954	13.7826	544.395	510.227	.072952
6	8.3846	.5886	17.3246	13.7038	544.749	509.479	.072642
7	8.6122	.5952	17.3523	13.6557	545.116	509.078	.072444
8	8.8371	.5998	17.3803	13.6296	545.518	508.941	.072325
9	9.0601	.6041	17.4142	13.6099	546.004	508.901	.072226
10	9.2810	.6089	17.4561	13.5911	546.605	508.911	.072125
11	9.5000	.6137	17.4981	13.5719	547.270	508.975	.072014

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.1710	130.218	123.660	.975826	17.232	8.451
2	7.4294	130.352	123.174	.975870	16.242	7.716
3	7.6771	130.470	122.872	.975919	15.567	6.980
4	7.9180	130.568	122.675	.976034	15.040	6.264
5	8.1536	130.655	122.455	.976073	14.522	5.532
6	8.3846	130.740	122.275	.976114	14.082	4.726
7	8.6122	130.828	122.179	.976166	13.747	3.868
8	8.8371	130.924	122.146	.976232	13.496	2.989
9	9.0601	131.041	122.136	.976313	13.303	2.083
10	9.2810	131.185	122.139	.976412	13.166	1.102
11	9.5000	131.345	122.154	.976539	13.063	0.000

STATION 6 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 13509.7 RPM. NUMBER OF BLADES IN ROW = 33.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.1710	845.42	869.52	.7818	-50.992	0.000
2	7.4294	875.89	912.61	.8221	-50.899	0.000
3	7.6771	905.09	948.68	.8557	-51.222	0.000
4	7.9180	933.49	980.84	.8854	-51.759	0.000
5	8.1536	961.27	1012.79	.9150	-52.230	0.000
6	8.3846	988.50	1042.99	.9430	-52.739	0.000
7	8.6122	1015.33	1070.70	.9685	-53.343	0.000
8	8.8371	1041.85	1096.64	.9920	-53.993	0.000
9	9.0601	1068.13	1121.85	1.0149	-54.602	0.000
10	9.2810	1094.18	1146.63	1.0373	-55.141	0.000
11	9.5000	1120.00	1170.96	1.0592	-55.643	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.1710	0.000	-.156	4.6049	.00773	.1681	.2070
2	7.4294	0.000	.490	4.8844	.00874	.1587	.1914
3	7.6771	0.000	-.232	5.0873	.00987	.1529	.1811
4	7.9180	0.000	-2.746	5.2131	.01294	.1487	.1722
5	8.1536	0.000	-4.740	5.3620	.01363	.1433	.1630
6	8.3846	0.000	-4.328	5.4972	.01431	.1387	.1549
7	8.6122	0.000	-3.138	5.6106	.01529	.1356	.1487
8	8.8371	0.000	-2.943	5.7121	.01663	.1334	.1436
9	9.0601	0.000	-3.141	5.8260	.01827	.1313	.1383
10	9.2810	0.000	-2.831	5.9613	.02033	.1292	.1326
11	9.5000	0.000	-2.148	6.0980	.02299	.1269	.1259

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 6 DELTA H ON H1	STATION 5 PRESS RATIO	THRU ISENT EFF	STATION 6 DELTA H ON H1
MEAN	VALUES-	1.1792	.9532	.0506	1.1792	.9532	.0506
1	7.1710	1.1670	.9792	.0460	1.1670	.9792	.0460
2	7.4294	1.1705	.9756	.0471	1.1705	.9756	.0471
3	7.6771	1.1734	.9716	.0481	1.1734	.9716	.0481
4	7.9180	1.1745	.9618	.0489	1.1745	.9618	.0489
5	8.1536	1.1766	.9588	.0496	1.1766	.9588	.0496
6	8.3846	1.1785	.9558	.0502	1.1785	.9558	.0502
7	8.6122	1.1804	.9519	.0509	1.1804	.9519	.0509
8	8.8371	1.1823	.9470	.0517	1.1823	.9470	.0517
9	9.0601	1.1846	.9412	.0527	1.1846	.9412	.0527
10	9.2810	1.1875	.9343	.0538	1.1875	.9343	.0538
11	9.5000	1.1903	.9257	.0551	1.1903	.9257	.0551

STATION 7 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.2590	565.46	347.47	553.27	116.77	663.69
2	7.5038	581.85	342.49	572.81	102.14	675.17
3	7.7407	593.26	337.55	586.67	88.17	682.56
4	7.9724	600.04	332.34	595.33	75.00	685.93
5	8.1998	610.51	327.21	607.22	63.31	692.67
6	8.4228	619.62	322.50	617.46	51.77	698.53
7	8.6425	625.18	318.36	623.88	40.36	701.57
8	8.8599	628.49	314.99	627.80	29.47	703.01
9	9.0755	632.34	312.84	632.05	19.26	705.50
10	9.2889	637.71	312.16	637.64	9.50	710.01
11	9.5000	643.79	312.27	643.79	0.00	715.53

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE SLOPE ANGLE	STATION LEAN ANGLE
		X-COORD	L-COORD			
1	7.2590	.9000	0.0000	15.44	11.918	0.000
2	7.5038	.9000	.2448	18.02	10.111	0.000
3	7.7407	.9000	.4817	25.58	8.547	0.000
4	7.9724	.9000	.7134	45.38	7.180	0.000
5	8.1998	.9000	.9408	137.78	5.952	0.000
6	8.4228	.9000	1.1638	-246.16	4.793	0.000
7	8.6425	.9000	1.3835	-83.91	3.702	0.000
8	8.8599	.9000	1.6009	-60.91	2.688	0.000
9	9.0755	.9000	1.8165	-59.05	1.745	0.000
10	9.2889	.9000	2.0299	-83.29	.854	0.000
11	9.5000	.9000	2.2410	0.00	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.2590	.5875	20.0978	15.9115	568.179	531.526	.080846
2	7.5038	.5978	20.1884	15.8555	569.115	531.183	.080613
3	7.7407	.6044	20.2643	15.8335	569.955	531.188	.080501
4	7.9724	.6072	20.2860	15.8156	570.676	531.525	.080359
5	8.1998	.6132	20.3442	15.7850	571.332	531.408	.080221
6	8.4228	.6184	20.4014	15.7637	571.986	531.383	.080117
7	8.6425	.6209	20.4564	15.7743	572.675	531.717	.080120
8	8.8599	.6218	20.5127	15.8060	573.447	532.322	.080190
9	9.0755	.6237	20.5829	15.8368	574.396	532.980	.080247
10	9.2889	.6273	20.6710	15.8581	575.582	533.634	.080257
11	9.5000	.6317	20.7582	15.8669	576.896	534.293	.080202

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.2590	136.363	127.566	.976046	31.571	11.918
2	7.5038	136.508	127.484	.976133	30.482	10.111
3	7.7407	136.789	127.485	.976230	29.639	8.547
4	7.9724	136.962	127.566	.976460	28.981	7.180
5	8.1998	137.120	127.538	.976540	28.189	5.952
6	8.4228	137.277	127.532	.976621	27.496	4.793
7	8.6425	137.442	127.612	.976726	26.987	3.702
8	8.8599	137.627	127.757	.976861	26.619	2.688
9	9.0755	137.855	127.915	.977024	26.323	1.745
10	9.2889	138.140	128.072	.977227	26.082	.854
11	9.5000	138.455	128.230	.977485	25.876	0.000

STATION 7 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 13509.7 RPM. NUMBER OF BLADES IN ROW = 33.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.2590	855.80	760.35	.6731	-41.954	0.000
2	7.5038	884.66	795.29	.7042	-42.978	0.000
3	7.7407	912.59	826.21	.7316	-44.107	0.000
4	7.9724	939.90	853.92	.7559	-45.357	0.000
5	8.1998	966.71	884.13	.7827	-46.328	0.000
6	8.4228	993.00	912.97	.8083	-47.258	0.000
7	8.6425	1018.90	938.94	.8310	-48.253	0.000
8	8.8599	1044.54	962.93	.8517	-49.256	0.000
9	9.0755	1069.95	986.44	.8720	-50.131	0.000
10	9.2889	1095.11	1009.80	.8921	-50.838	0.000
11	9.5000	1120.00	1032.91	.9120	-51.444	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.2590	0.000	-2.941	5.1641	.01556	.3195	.3856
2	7.5038	0.000	-.964	5.3635	.01755	.3124	.3710
3	7.7407	0.000	-.885	5.5113	.01978	.3065	.3584
4	7.9724	0.000	-3.377	5.5761	.02590	.3017	.3454
5	8.1998	0.000	-5.413	5.6991	.02727	.2936	.3312
6	8.4228	0.000	-4.444	5.8122	.02863	.2863	.3179
7	8.6425	0.000	-2.656	5.8989	.03058	.2810	.3072
8	8.8599	0.000	-2.466	5.9715	.03325	.2770	.2977
9	9.0755	0.000	-3.040	6.0619	.03653	.2733	.2880
10	9.2889	0.000	-3.098	6.1811	.04066	.2697	.2774
11	9.5000	0.000	-2.737	6.3041	.04598	.2661	.2655

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 7 DELTA H ON H1	STATION 5 PRESS RATIO	THRU ISENT EFF	STATION 7 DELTA H ON H1
MEAN VALUES-		1.3896	.9519	.1035	1.3896	.9519	.1035
1	7.2590	1.3672	.9789	.0954	1.3672	.9789	.0954
2	7.5038	1.3734	.9752	.0972	1.3734	.9752	.0972
3	7.7407	1.3785	.9711	.0988	1.3785	.9711	.0988
4	7.9724	1.3800	.9610	.1002	1.3800	.9610	.1002
5	8.1998	1.3840	.9578	.1015	1.3840	.9578	.1015
6	8.4228	1.3879	.9547	.1028	1.3879	.9547	.1028
7	8.6425	1.3916	.9506	.1041	1.3916	.9506	.1041
8	8.8599	1.3954	.9454	.1056	1.3954	.9454	.1056
9	9.0755	1.4002	.9392	.1074	1.4002	.9392	.1074
10	9.2889	1.4062	.9319	.1097	1.4062	.9319	.1097
11	9.5000	1.4121	.9227	.1122	1.4121	.9227	.1122

STATION 8 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.3610	569.04	513.92	552.07	137.95	766.76
2	7.5900	582.59	505.18	570.35	118.79	771.12
3	7.8124	590.29	496.68	581.78	99.90	771.45
4	8.0314	592.08	488.00	586.39	81.85	767.27
5	8.2474	599.84	479.59	596.17	66.30	768.00
6	8.4601	606.49	471.95	604.28	51.76	768.48
7	8.6704	609.44	465.25	608.24	38.18	766.73
8	8.8794	610.02	459.74	609.47	25.92	763.86
9	9.0875	611.22	456.03	611.03	15.31	762.60
10	9.2944	613.88	454.46	613.84	6.56	763.79
11	9.5000	616.63	454.08	616.63	0.00	765.78

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.3610	1.3500	0.0000	10.56	14.029	0.000	0.000
2	7.5900	1.3500	.2290	14.19	11.765	0.000	0.000
3	7.8124	1.3500	.4514	19.04	9.744	0.000	0.000
4	8.0314	1.3500	.6704	27.16	7.946	0.000	0.000
5	8.2474	1.3500	.8864	43.34	6.346	0.000	0.000
6	8.4601	1.3500	1.0991	83.17	4.896	0.000	0.000
7	8.6704	1.3500	1.3094	293.42	3.592	0.000	0.000
8	8.8794	1.3500	1.5184	-317.84	2.435	0.000	0.000
9	9.0875	1.3500	1.7265	-141.70	1.436	0.000	0.000
10	9.2944	1.3500	1.9334	-149.83	.613	0.000	0.000
11	9.5000	1.3500	2.1390	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.3610	.6709	23.2590	17.2027	592.914	543.992	.085404
2	7.5900	.6744	23.3535	17.2200	593.921	544.442	.085419
3	7.8124	.6742	23.4280	17.2785	594.822	545.300	.085574
4	8.0314	.6698	23.4159	17.3360	595.589	546.602	.085655
5	8.2474	.6700	23.4721	17.3737	596.297	547.217	.085744
6	8.4601	.6700	23.5306	17.4169	597.029	547.887	.085852
7	8.6704	.6679	23.5875	17.4915	597.837	548.919	.086058
8	8.8794	.6646	23.6477	17.5856	598.784	550.232	.086315
9	9.0875	.6626	23.7301	17.6759	600.000	551.608	.086541
10	9.2944	.6628	23.8402	17.7550	601.566	553.022	.086706
11	9.5000	.6637	23.9474	17.8224	603.328	554.531	.086799

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.3610	142.299	130.558	.976264	42.086	14.029
2	7.5900	142.541	130.666	.976393	40.930	11.765
3	7.8124	142.757	130.872	.976539	40.077	9.744
4	8.0314	142.941	131.185	.976884	39.496	7.946
5	8.2474	143.111	131.332	.977005	38.643	6.346
6	8.4601	143.287	131.493	.977128	37.889	4.896
7	8.6704	143.481	131.741	.977287	37.359	3.592
8	8.8794	143.708	132.056	.977493	37.003	2.435
9	9.0875	144.000	132.386	.977741	36.726	1.436
10	9.2944	144.376	132.725	.978050	36.513	.613
11	9.5000	144.799	133.087	.978444	36.368	0.000

STATION 8 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 13509.7 RPM. NUMBER OF BLADES IN ROW = 33.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.3610	867.82	670.12	.5863	-31.878	0.000
2	7.5900	894.82	700.87	.6130	-33.774	0.000
3	7.8124	921.04	727.00	.6354	-35.713	0.000
4	8.0314	946.86	749.07	.6539	-37.775	0.000
5	8.2474	972.33	776.27	.6772	-39.401	0.000
6	8.4601	997.40	802.45	.6996	-40.905	0.000
7	8.6704	1022.19	825.59	.7191	-42.423	0.000
8	8.8794	1046.83	846.64	.7366	-43.903	0.000
9	9.0875	1071.37	867.31	.7536	-45.192	0.000
10	9.2944	1095.76	887.75	.7704	-46.252	0.000
11	9.5000	1120.00	907.57	.7865	-47.201	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.3610	0.000	-1.272	4.9916	.02344	.4487	.5301
2	7.5900	0.000	1.249	5.0989	.02640	.4407	.5115
3	7.8124	0.000	1.459	5.1480	.02972	.4351	.4966
4	8.0314	0.000	-1.519	5.1015	.03889	.4314	.4814
5	8.2474	0.000	-3.941	5.1342	.04091	.4223	.4647
6	8.4601	0.000	-2.545	5.1592	.04295	.4138	.4488
7	8.6704	0.000	-.217	5.1569	.04586	.4077	.4356
8	8.8794	0.000	-.234	5.1379	.04987	.4031	.4238
9	9.0875	0.000	-1.452	5.1313	.05480	.3990	.4116
10	9.2944	0.000	-2.055	5.1450	.06098	.3952	.3986
11	9.5000	0.000	-2.114	5.1534	.06897	.3919	.3845

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 8 DELTA H ON H1	STATION 5 PRESS RATIO	5 THRU ISENT EFF	STATION 8 DELTA H ON H1
MEAN	VALUES-	1.6038	.9488	.1522	1.6038	.9488	.1522
1	7.3610	1.5822	.9781	.1431	1.5822	.9781	.1431
2	7.5900	1.5887	.9741	.1450	1.5887	.9741	.1450
3	7.8124	1.5937	.9697	.1468	1.5937	.9697	.1468
4	8.0314	1.5929	.9589	.1483	1.5929	.9589	.1483
5	8.2474	1.5967	.9554	.1496	1.5967	.9554	.1496
6	8.4601	1.6007	.9518	.1510	1.6007	.9518	.1510
7	8.6704	1.6046	.9473	.1526	1.6046	.9473	.1526
8	8.8794	1.6087	.9415	.1544	1.6087	.9415	.1544
9	9.0875	1.6143	.9346	.1568	1.6143	.9346	.1568
10	9.2944	1.6218	.9265	.1598	1.6218	.9265	.1598
11	9.5000	1.6291	.9162	.1632	1.6291	.9162	.1632

STATION 9 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.4840	592.41	651.33	568.98	164.96	880.44
2	7.6913	595.54	637.61	578.71	140.59	872.48
3	7.8953	596.67	624.38	584.99	117.51	863.63
4	8.0980	592.00	611.21	584.34	94.98	850.91
5	8.2999	595.49	598.58	590.66	75.65	844.34
6	8.4999	598.23	587.08	595.40	58.06	838.18
7	8.6990	597.76	576.90	596.27	42.08	830.74
8	8.8982	595.02	568.27	594.37	27.87	822.79
9	9.0980	592.42	561.90	592.20	15.79	816.51
10	9.2985	590.17	558.15	590.13	6.29	812.30
11	9.5000	586.24	555.92	586.24	0.00	807.91

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE ANGLE	
1	7.4840	1.8000	0.0000	15.24	16.168	0.000
2	7.6913	1.8000	.2073	13.79	13.655	0.000
3	7.8953	1.8000	.4113	14.19	11.358	0.000
4	8.0980	1.8000	.6140	16.18	9.233	0.000
5	8.2999	1.8000	.8159	19.89	7.298	0.000
6	8.4999	1.8000	1.0159	24.98	5.570	0.000
7	8.6990	1.8000	1.2150	32.24	4.037	0.000
8	8.8982	1.8000	1.4142	44.48	2.685	0.000
9	9.0980	1.8000	1.6140	70.45	1.528	0.000
10	9.2985	1.8000	1.8145	153.76	.610	0.000
11	9.5000	1.8000	2.0160	0.00	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.4840	.7663	26.2550	17.8020	614.331	549.826	.087441
2	7.6913	.7582	26.2759	17.9552	614.911	551.568	.087915
3	7.8953	.7493	26.2764	18.1075	615.412	553.347	.088376
4	8.0980	.7368	26.1588	18.2388	615.804	555.554	.088663
5	8.2999	.7302	26.1507	18.3441	616.168	556.846	.088968
6	8.4999	.7240	26.1509	18.4486	616.598	558.139	.089267
7	8.6990	.7166	26.1512	18.5748	617.153	559.727	.089623
8	8.8982	.7086	26.1564	18.7138	617.903	561.570	.089997
9	9.0980	.7020	26.1893	18.8492	618.993	563.517	.090335
10	9.2985	.6970	26.2556	18.9799	620.521	565.615	.090624
11	9.5000	.6918	26.3157	19.1115	622.310	567.996	.090870

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.4840	147.439	131.958	.976478	47.712	16.168
2	7.6913	147.579	132.376	.976650	46.954	13.655
3	7.8953	147.699	132.803	.976844	46.300	11.358
4	8.0980	147.793	133.333	.977304	45.914	9.233
5	8.2999	147.880	133.643	.977467	45.149	7.298
6	8.4999	147.984	133.953	.977634	44.461	5.570
7	8.6990	148.117	134.335	.977849	43.983	4.037
8	8.8982	148.297	134.777	.978127	43.683	2.685
9	9.0980	148.558	135.244	.978464	43.486	1.528
10	9.2985	148.925	135.748	.978882	43.403	.610
11	9.5000	149.354	136.319	.979417	43.479	0.000

STATION 9 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 13509.7 RPM. NUMBER OF BLADES IN ROW = 33.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.4840	882.32	635.86	.5534	-21.302	0.000
2	7.6913	906.76	653.54	.5679	-24.320	0.000
3	7.8953	930.81	670.76	.5819	-27.184	0.000
4	8.0980	954.71	684.44	.5926	-30.124	0.000
5	8.2999	978.51	706.36	.6109	-32.539	0.000
6	8.4999	1002.09	728.09	.6289	-34.751	0.000
7	8.6990	1025.56	747.41	.6447	-36.892	0.000
8	8.8982	1049.05	764.98	.6588	-38.938	0.000
9	9.0980	1072.61	782.17	.6724	-40.764	0.000
10	9.2985	1096.25	798.65	.6853	-42.358	0.000
11	9.5000	1120.00	813.55	.6967	-43.896	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.4840	0.000	3.820	4.2016	.03141	.5138	.5972
2	7.6913	0.000	6.693	4.1164	.03531	.5158	.5872
3	7.8953	0.000	6.878	4.0004	.03971	.5157	.5759
4	8.0980	0.000	3.193	3.8000	.05190	.5170	.5621
5	8.2999	0.000	.091	3.6775	.05457	.5098	.5462
6	8.4999	0.000	1.692	3.5490	.05727	.5025	.5304
7	8.6990	0.000	4.452	3.3991	.06115	.4971	.5166
8	8.8982	0.000	4.140	3.2329	.06649	.4931	.5037
9	9.0980	0.000	2.205	3.0650	.07306	.4895	.4905
10	9.2985	0.000	1.092	2.8958	.08131	.4868	.4768
11	9.5000	0.000	.731	2.7062	.09196	.4854	.4629

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 9 DELTA H ON H1	STATION 5 PRESS RATIO	THRU ISENT EFF	STATION 9 DELTA H ON H1
MEAN VALUES-		1.7826	.9435	.1902	1.7826	.9435	.1902
1	7.4840	1.7861	.9767	.1844	1.7861	.9767	.1844
2	7.6913	1.7875	.9723	.1855	1.7875	.9723	.1855
3	7.8953	1.7875	.9673	.1865	1.7875	.9673	.1865
4	8.0980	1.7795	.9553	.1872	1.7795	.9553	.1872
5	8.2999	1.7790	.9512	.1879	1.7790	.9512	.1879
6	8.4999	1.7790	.9470	.1888	1.7790	.9470	.1888
7	8.6990	1.7790	.9417	.1898	1.7790	.9417	.1898
8	8.8982	1.7793	.9349	.1913	1.7793	.9349	.1913
9	9.0980	1.7816	.9269	.1934	1.7816	.9269	.1934
10	9.2985	1.7861	.9174	.1963	1.7861	.9174	.1963
11	9.5000	1.7902	.9054	.1998	1.7902	.9054	.1998

STATION 10 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.6220	603.32	742.08	574.40	184.54	956.39
2	7.8087	606.43	722.16	584.80	160.49	943.01
3	7.9933	607.16	702.96	592.00	134.87	928.87
4	8.1777	597.88	684.05	587.92	108.65	908.50
5	8.3627	596.18	665.89	589.91	86.28	893.78
6	8.5479	593.65	649.12	589.91	66.54	879.64
7	8.7339	589.07	633.93	587.02	49.06	865.37
8	8.9216	582.88	620.55	581.92	33.60	851.37
9	9.1115	576.40	609.59	576.04	20.20	838.95
10	9.3040	569.06	601.43	568.99	9.03	827.98
11	9.5000	557.61	594.94	557.61	0.00	815.40

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	7.6220	2.2500	0.0000	11.33	17.811		0.000
2	7.8087	2.2500	.1867	12.12	15.346		0.000
3	7.9933	2.2500	.3713	16.28	12.834		0.000
4	8.1777	2.2500	.5557	20.82	10.471		0.000
5	8.3627	2.2500	.7407	24.18	8.321		0.000
6	8.5479	2.2500	.9259	25.55	6.436		0.000
7	8.7339	2.2500	1.1119	25.84	4.778		0.000
8	8.9216	2.2500	1.2996	26.28	3.305		0.000
9	9.1115	2.2500	1.4895	28.70	2.009		0.000
10	9.3040	2.2500	1.6820	39.16	.909		0.000
11	9.5000	2.2500	1.8780	0.00	0.000		0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.6220	.8296	28.5361	18.1729	629.667	553.554	.088662
2	7.8087	.8167	28.3941	18.3209	629.333	555.335	.089097
3	7.9933	.8031	28.2316	18.4651	628.938	557.142	.089507
4	8.1777	.7837	27.9190	18.6145	628.447	559.766	.089808
5	8.3627	.7698	27.7582	18.7581	627.950	561.477	.090225
6	8.5479	.7565	27.6116	18.8982	627.557	563.170	.090626
7	8.7339	.7430	27.4660	19.0393	627.323	565.009	.091006
8	8.9216	.7297	27.3236	19.1763	627.315	567.000	.091339
9	9.1115	.7177	27.2070	19.3054	627.667	569.100	.091614
10	9.3040	.7069	27.1194	19.4328	628.481	571.435	.091842
11	9.5000	.6944	27.0169	19.5758	629.583	574.257	.092063

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.6220	151.120	132.853	.976687	50.889	17.811
2	7.8087	151.040	133.280	.976901	49.979	15.346
3	7.9933	150.945	133.714	.977144	49.182	12.834
4	8.1777	150.827	134.344	.977720	48.846	10.471
5	8.3627	150.708	134.754	.977926	48.161	8.321
6	8.5479	150.614	135.161	.978138	47.556	6.436
7	8.7339	150.558	135.602	.978411	47.101	4.778
8	8.9216	150.556	136.080	.978764	46.793	3.305
9	9.1115	150.640	136.584	.979192	46.603	2.009
10	9.3040	150.835	137.144	.979724	46.584	.909
11	9.5000	151.100	137.822	.980404	46.855	0.000

STATION 10 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 13509.7 RPM. NUMBER OF BLADES IN ROW = 33.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.6220	898.59	623.29	.5406	-14.543	0.000
2	7.8087	920.60	638.07	.5526	-18.120	0.000
3	7.9933	942.36	652.66	.5643	-21.519	0.000
4	8.1777	964.11	660.22	.5695	-25.100	0.000
5	8.3627	985.92	676.65	.5828	-28.228	0.000
6	8.5479	1007.75	693.57	.5964	-31.137	0.000
7	8.7339	1029.68	709.66	.6093	-33.895	0.000
8	8.9216	1051.81	725.08	.6214	-36.497	0.000
9	9.1115	1074.20	740.33	.6333	-38.871	0.000
10	9.3040	1096.89	754.53	.6442	-41.045	0.000
11	9.5000	1120.00	765.91	.6523	-43.278	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.6220	0.000	14.466	1.8045	.03945	.5450	.6387
2	7.8087	0.000	16.802	1.7230	.04429	.5479	.6248
3	7.9933	0.000	16.317	1.6259	.04975	.5486	.6101
4	8.1777	0.000	11.707	1.4818	.06497	.5538	.5957
5	8.3627	0.000	7.794	1.3691	.06827	.5497	.5809
6	8.5479	0.000	9.234	1.2537	.07162	.5448	.5660
7	8.7339	0.000	12.077	1.1319	.07645	.5405	.5513
8	8.9216	0.000	11.344	1.0040	.08311	.5365	.5365
9	9.1115	0.000	8.743	.8725	.09132	.5328	.5211
10	9.3040	0.000	7.299	.7356	.10163	.5304	.5058
11	9.5000	0.000	6.898	.5862	.11494	.5302	.4911

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 10 DELTA H ON H1	STATION PRESS RATIO	5 THRU ISENT EFF	STATION 10 DELTA H ON H1
MEAN VALUES-		1.8802	.9353	.2112	1.8802	.9353	.2112
1	7.6220	1.9412	.9745	.2140	1.9412	.9745	.2140
2	7.8087	1.9316	.9694	.2133	1.9316	.9694	.2133
3	7.9933	1.9205	.9636	.2126	1.9205	.9636	.2126
4	8.1777	1.8992	.9498	.2116	1.8992	.9498	.2116
5	8.3627	1.8383	.9447	.2106	1.8883	.9447	.2106
6	8.5479	1.8783	.9395	.2099	1.8783	.9395	.2099
7	8.7339	1.8684	.9329	.2094	1.8684	.9329	.2094
8	8.9216	1.8588	.9245	.2094	1.8588	.9245	.2094
9	9.1115	1.8508	.9146	.2101	1.8508	.9146	.2101
10	9.3040	1.8449	.9026	.2117	1.8449	.9026	.2117
11	9.5000	1.8379	.8876	.2138	1.8379	.8876	.2138

STATION 11 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.6640	619.02	738.02	585.36	201.35	963.25
2	7.8506	633.86	718.31	609.52	173.97	957.99
3	8.0311	634.64	699.65	618.05	144.16	944.61
4	8.2097	622.68	681.39	611.91	115.32	923.05
5	8.3884	616.97	663.85	610.13	91.56	906.28
6	8.5676	610.48	647.62	606.35	70.87	890.00
7	8.7484	602.62	632.88	600.28	53.05	873.90
8	8.9314	593.69	619.87	592.52	37.31	858.31
9	9.1174	584.58	609.19	584.11	23.52	844.30
10	9.3067	574.91	601.26	574.80	11.28	831.89
11	9.5000	562.55	594.94	562.55	0.00	818.79

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF		STATION
	RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE ANGLE	
1	7.6640	2.3750	0.0000	9.24	18.982	6.649
2	7.8506	2.3954	.1877	-29.96	15.930	5.455
3	8.0311	2.4091	.3687	-18.41	13.129	3.192
4	8.2097	2.4160	.5474	-21.17	10.673	1.354
5	8.3884	2.4180	.7262	-30.92	8.534	-.007
6	8.5676	2.4162	.9054	-41.05	6.667	-1.062
7	8.7484	2.4116	1.0862	-68.69	5.050	-1.886
8	8.9314	2.4047	1.2694	-136.92	3.603	-2.299
9	9.1174	2.3967	1.4555	-4874.44	2.306	-2.740
10	9.3067	2.3865	1.6451	4440.16	1.124	-3.314
11	9.5000	2.3750	1.8388	0.00	0.000	-3.468

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.6640	.8364	28.5361	18.0471	629.667	552.458	.088223
2	7.8506	.8314	28.3941	18.0486	629.333	552.965	.088149
3	8.0311	.8185	28.2316	18.1819	628.938	554.689	.088524
4	8.2097	.7978	27.9190	18.3576	628.447	557.549	.088921
5	8.3884	.7819	27.7582	18.5399	627.950	559.605	.089474
6	8.5676	.7664	27.6116	18.7197	627.557	561.645	.090014
7	8.7484	.7511	27.4660	18.8941	627.323	563.775	.090509
8	8.9314	.7363	27.3236	19.0596	627.315	566.012	.090941
9	9.1174	.7228	27.2070	19.2163	627.667	568.350	.091312
10	9.3067	.7105	27.1194	19.3685	628.481	570.895	.091625
11	9.5000	.6976	27.0169	19.5208	629.583	573.796	.091878

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.6640	151.120	132.590	.976687	50.011	25.631
2	7.8506	151.040	132.712	.976901	48.574	21.385
3	8.0311	150.945	133.125	.977144	47.789	16.321
4	8.2097	150.827	133.812	.977720	47.578	12.027
5	8.3884	150.708	134.305	.977926	47.096	8.528
6	8.5676	150.614	134.795	.978138	46.691	5.604
7	8.7484	150.558	135.306	.978411	46.403	3.164
8	8.9314	150.556	135.843	.978764	46.236	1.304
9	9.1174	150.640	136.404	.979192	46.181	-.434
10	9.3067	150.835	137.015	.979724	46.283	-2.190
11	9.5000	151.100	137.711	.980404	46.603	-3.468

STATION 12 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.7080	660.72	733.81	624.02	217.16	987.43
2	7.8916	671.55	714.58	647.89	176.70	980.61
3	8.0674	668.05	696.51	652.54	143.10	965.09
4	8.2402	652.78	678.86	642.83	113.53	941.79
5	8.4130	643.04	661.91	636.75	89.71	922.84
6	8.5867	632.76	646.18	628.95	69.34	904.40
7	8.7625	621.70	631.86	619.52	52.01	886.43
8	8.9411	609.92	619.19	608.81	36.75	869.14
9	9.1233	598.37	608.80	597.91	23.41	853.62
10	9.3094	586.64	601.09	586.53	11.22	839.91
11	9.5000	572.88	594.94	572.88	0.00	825.92

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.7080	2.5000	0.0000	-18.55	19.188		13.172
2	7.8916	2.5405	.1880	-8.15	15.255		10.966
3	8.0674	2.5678	.3659	-9.21	12.369		6.676
4	8.2402	2.5817	.5393	-11.26	10.016		2.589
5	8.4130	2.5850	.7121	-13.53	8.019		.034
6	8.5867	2.5826	.8859	-18.57	6.292		-1.843
7	8.7625	2.5736	1.0618	-25.41	4.799		-3.867
8	8.9411	2.5599	1.2410	-38.52	3.454		-4.655
9	9.1233	2.5440	1.4239	-67.30	2.242		-5.635
10	9.3094	2.5233	1.6111	-134.82	1.096		-6.807
11	9.5000	2.5000	1.8031	0.00	0.000		-7.039

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		---TEMPERATURES---		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.7080	.8604	28.5361	17.6020	629.667	548.533	.086663
2	7.8916	.8539	28.3941	17.6348	629.333	549.316	.086700
3	8.0674	.8387	28.2316	17.8109	628.938	551.434	.087230
4	8.2402	.8161	27.9190	18.0243	628.447	554.640	.087764
5	8.4130	.7979	27.7582	18.2491	627.950	557.085	.088470
6	8.5867	.7803	27.6116	18.4698	627.557	559.495	.089154
7	8.7625	.7631	27.4660	18.6794	627.323	561.939	.089773
8	8.9411	.7466	27.3236	18.8767	627.315	564.456	.090317
9	9.1233	.7316	27.2070	19.0609	627.667	567.033	.090783
10	9.3094	.7181	27.1194	19.2363	628.481	569.780	.091177
11	9.5000	.7043	27.0169	19.4048	629.583	572.821	.091488

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.7080	151.120	131.648	.976687	48.000	32.360
2	7.8916	151.040	131.836	.976901	46.778	26.222
3	8.0674	150.945	132.344	.977144	46.195	19.045
4	8.2402	150.827	133.114	.977720	46.122	12.605
5	8.4130	150.708	133.700	.977926	45.828	8.054
6	8.5867	150.614	134.279	.978138	45.601	4.449
7	8.7625	150.558	134.865	.978411	45.465	.932
8	8.9411	150.556	135.470	.978764	45.432	-1.200
9	9.1233	150.640	136.088	.979192	45.495	-3.392
10	9.3094	150.835	136.747	.979724	45.697	-5.711
11	9.5000	151.100	137.477	.980404	46.082	-7.039

STATION 13 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.7510	702.78	729.73	670.94	209.14	1013.12
2	7.9300	705.99	711.12	686.38	165.25	1002.05
3	8.1009	700.47	693.63	688.05	131.32	985.79
4	8.2682	682.27	676.56	674.48	102.77	960.85
5	8.4356	668.92	660.14	664.06	80.44	939.80
6	8.6043	655.25	644.86	652.29	62.16	919.34
7	8.7756	641.00	630.92	639.30	46.74	899.42
8	8.9502	626.59	618.57	625.70	33.41	880.48
9	9.1289	612.84	608.42	612.46	21.56	863.57
10	9.3119	599.13	600.92	599.04	10.51	848.57
11	9.5000	583.37	594.94	583.37	0.00	833.23

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF CURVATURE	STREAMLINE SLOPE	STATION LEAN ANGLE
RADIUS	X-COORD L-COORD		ANGLE	
1	7.7510 2.6250 0.0000	-4.47	17.313	20.076
2	7.9300 2.6865 .1892	-6.27	13.537	16.692
3	8.1009 2.7272 .3649	-7.06	10.806	10.021
4	8.2682 2.7475 .5335	-8.08	8.664	4.066
5	8.4356 2.7530 .7009	-9.88	6.906	.138
6	8.6043 2.7491 .8697	-12.58	5.443	-2.941
7	8.7756 2.7356 1.0415	-16.97	4.181	-5.871
8	8.9502 2.7152 1.2173	-26.06	3.057	-7.132
9	9.1289 2.6912 1.3976	-44.45	2.016	-8.522
10	9.3119 2.6604 1.5832	-116.14	1.005	-10.312
11	9.5000 2.6250 1.7746	0.00	0.000	-10.832

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.7510	.8863	28.5361	17.1261	629.667	544.257	.084982
2	7.9300	.8754	28.3941	17.2403	629.333	545.779	.085310
3	8.1009	.8593	28.2316	17.4338	628.938	548.075	.085906
4	8.2682	.8349	27.9190	17.6833	628.447	551.624	.086575
5	8.4356	.8145	27.7582	17.9492	627.950	554.455	.087428
6	8.6043	.7948	27.6116	18.2089	627.557	557.226	.088252
7	8.7756	.7756	27.4660	18.4557	627.323	560.009	.089004
8	8.9502	.7574	27.3236	18.6841	627.315	562.806	.089657
9	9.1289	.7410	27.2070	18.8940	627.667	565.612	.090215
10	9.3119	.7263	27.1194	19.0928	628.481	568.563	.090691
11	9.5000	.7111	27.0169	19.2853	629.583	571.811	.091085

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.7510	151.120	130.622	.976687	46.078	37.389
2	7.9300	151.040	130.987	.976901	45.207	30.229
3	8.1009	150.945	131.538	.977144	44.719	20.827
4	8.2682	150.827	132.390	.977720	44.759	12.730
5	8.4356	150.708	133.069	.977926	44.622	7.044
6	8.6043	150.614	133.734	.978138	44.542	2.502
7	8.7756	150.558	134.402	.978411	44.546	-1.690
8	8.9502	150.556	135.073	.978764	44.631	-4.076
9	9.1289	150.640	135.747	.979192	44.793	-6.506
10	9.3119	150.835	136.455	.979724	45.085	-9.307
11	9.5000	151.100	137.235	.980404	45.562	-10.832

STATION 13 IS AT THE LEADING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	INCIDENCE ANGLE
1	7.7510	0.00	1013.12	.8863	46.078	0.000
2	7.9300	0.00	1002.05	.8754	45.207	0.000
3	8.1009	0.00	985.79	.8593	44.719	0.000
4	8.2682	0.00	960.85	.8349	44.759	0.000
5	8.4356	0.00	939.80	.8145	44.622	0.000
6	8.6043	0.00	919.34	.7948	44.542	0.000
7	8.7756	0.00	899.42	.7756	44.546	0.000
8	8.9502	0.00	880.48	.7574	44.631	0.000
9	9.1289	0.00	863.57	.7410	44.793	0.000
10	9.3119	0.00	848.57	.7263	45.085	0.000
11	9.5000	0.00	833.23	.7111	45.562	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE
1	7.7510	0.000	0.000	-6.5419
2	7.9300	0.000	0.000	-6.8522
3	8.1009	0.000	0.000	-6.9552
4	8.2682	0.000	0.000	-6.8704
5	8.4356	0.000	0.000	-6.8122
6	8.6043	0.000	0.000	-6.7148
7	8.7756	0.000	0.000	-6.5657
8	8.9502	0.000	0.000	-6.3800
9	9.1289	0.000	0.000	-6.2433
10	9.3119	0.000	0.000	-6.0922
11	9.5000	0.000	0.000	-5.8901

STATION 14 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.8560	815.92	520.10	795.61	180.93	967.59
2	8.0088	792.53	511.38	780.13	139.64	943.19
3	8.1614	768.13	501.86	760.52	107.85	917.55
4	8.3157	738.94	490.82	734.24	83.25	887.10
5	8.4732	719.18	479.42	716.21	65.30	864.33
6	8.6340	701.86	469.05	700.01	50.98	844.16
7	8.7986	686.12	459.63	685.01	38.97	825.85
8	8.9675	671.87	450.95	671.27	28.48	809.18
9	9.1406	659.62	443.65	659.35	18.85	794.94
10	9.3180	648.78	438.34	648.71	9.55	782.59
11	9.5000	636.92	434.26	636.92	0.00	770.88

STREAM LINE	-----MESH-POINT COORDS-----			RADIUS OF		STATION
	RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE ANGLE	
1	7.8560	3.0000	0.0000	-3.90	12.812	17.875
2	8.0088	3.0466	.1597	-4.78	10.148	15.111
3	8.1614	3.0797	.3159	-6.09	8.072	9.249
4	8.3157	3.0970	.4712	-7.94	6.469	3.822
5	8.4732	3.1020	.6287	-10.67	5.210	.149
6	8.6340	3.0985	.7896	-14.61	4.165	-2.691
7	8.7986	3.0874	.9546	-20.66	3.256	-4.634
8	8.9675	3.0722	1.1241	-29.65	2.430	-5.785
9	9.1406	3.0523	1.2984	-48.48	1.636	-7.373
10	9.3180	3.0273	1.4775	-105.96	.843	-8.411
11	9.5000	3.0000	1.6616	0.00	0.000	-8.606

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.8560	.8407	28.3756	17.8664	629.667	551.761	.087450
2	8.0088	.8168	28.2420	18.2196	629.333	555.307	.088609
3	8.1614	.7921	28.0803	18.5679	628.938	558.882	.089725
4	8.3157	.7630	27.7729	18.8903	628.447	562.964	.090622
5	8.4732	.7416	27.6241	19.1740	627.950	565.785	.091524
6	8.6340	.7227	27.4903	19.4176	627.557	568.259	.092283
7	8.7986	.7056	27.3563	19.6252	627.323	570.571	.092892
8	8.9675	.6900	27.2226	19.8024	627.315	572.830	.093361
9	9.1406	.6765	27.1133	19.9567	627.667	575.084	.093720
10	9.3180	.6650	27.0317	20.0955	628.481	577.467	.093982
11	9.5000	.6532	26.9342	20.2243	629.583	580.134	.094150

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.8560	151.120	132.423	.977073	32.515	30.687
2	8.0088	151.040	133.274	.977269	32.832	25.259
3	8.1614	150.945	134.132	.977512	33.159	17.321
4	8.3157	150.827	135.111	.978079	33.593	10.291
5	8.4732	150.708	135.788	.978257	33.688	5.359
6	8.6340	150.614	136.382	.978439	33.755	1.475
7	8.7986	150.558	136.937	.978685	33.818	-1.378
8	8.9675	150.556	137.479	.979018	33.869	-3.355
9	9.1406	150.640	138.020	.979428	33.924	-5.736
10	9.3180	150.835	138.592	.979946	34.044	-7.568
11	9.5000	151.100	139.232	.980614	34.287	-8.606

STATION 14 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.8560	0.00	967.59	.8407	32.515	0.000
2	8.0088	0.00	943.19	.8168	32.832	0.000
3	8.1614	0.00	917.55	.7921	33.159	0.000
4	8.3157	0.00	887.10	.7630	33.593	0.000
5	8.4732	0.00	864.33	.7416	33.688	0.000
6	8.6340	0.00	844.16	.7227	33.755	0.000
7	8.7986	0.00	825.85	.7056	33.818	0.000
8	8.9675	0.00	809.18	.6900	33.869	0.000
9	9.1406	0.00	794.94	.6765	33.924	0.000
10	9.3180	0.00	782.99	.6650	34.044	0.000
11	9.5000	0.00	770.88	.6532	34.287	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.8560	0.000	-2.793	-7.8151	.01407	.0973	.0649
2	8.0088	0.000	-2.845	-7.9747	.01363	.1120	.0878
3	8.1614	0.000	-2.822	-7.9735	.01401	.1237	.1050
4	8.3157	0.000	-2.664	-7.7953	.01427	.1328	.1179
5	8.4732	0.000	-2.373	-7.6729	.01367	.1373	.1249
6	8.6340	0.000	-1.980	-7.5243	.01290	.1394	.1285
7	8.7986	0.000	-1.532	-7.3354	.01218	.1399	.1298
8	8.9675	0.000	-1.095	-7.1471	.01169	.1396	.1294
9	9.1406	0.000	-.762	-6.9765	.01127	.1385	.1278
10	9.3180	0.000	-.610	-6.8215	.01092	.1367	.1249
11	9.5000	0.000	-.576	-6.6473	.01070	.1346	.1215

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 14 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 14 ISENT EFF	STATION 14 DELTA H ON H1
MEAN	VALUES-	1.8721	.9283	.2112	.9957	0.0000	0.0000
1	7.8560	1.9303	.9654	.2140	.9944	0.0000	0.0000
2	8.0088	1.9212	.9607	.2133	.9946	0.0000	0.0000
3	8.1614	1.9102	.9549	.2126	.9946	0.0000	0.0000
4	8.3157	1.8893	.9413	.2116	.9948	0.0000	0.0000
5	8.4732	1.8792	.9369	.2106	.9952	0.0000	0.0000
6	8.6340	1.8701	.9323	.2099	.9956	0.0000	0.0000
7	8.7986	1.8610	.9264	.2094	.9960	0.0000	0.0000
8	8.9675	1.8519	.9185	.2094	.9963	0.0000	0.0000
9	9.1406	1.8444	.9090	.2101	.9966	0.0000	0.0000
10	9.3180	1.8389	.8974	.2117	.9968	0.0000	0.0000
11	9.5000	1.8323	.8828	.2138	.9969	0.0000	0.0000

STATION 15 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	V E L O C I T I E S				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9220	852.45	323.39	846.68	99.01	911.73
2	8.0593	814.76	320.03	811.02	77.98	875.36
3	8.2010	782.59	315.42	780.09	62.43	843.76
4	8.3476	749.87	308.70	748.16	50.56	810.93
5	8.4993	729.32	301.27	728.12	41.80	789.10
6	8.6553	712.64	294.81	711.81	34.30	771.21
7	8.8157	698.26	289.20	697.72	27.38	755.78
8	8.9804	685.73	284.01	685.42	20.72	742.21
9	9.1496	675.66	279.63	675.51	14.11	731.24
10	9.3227	667.87	276.55	667.83	7.35	722.86
11	9.5000	659.99	274.27	659.99	0.00	714.71

STREAM LINE	MESH-POINT COORDS			RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
	RADIUS	X-COORD	L-COORD		SLOPE	ANGLE	
1	7.9220	3.3750	0.0000	-3.27	6.670		14.619
2	8.0593	3.4087	.1414	-4.26	5.492		12.141
3	8.2010	3.4332	.2852	-5.61	4.576		7.665
4	8.3476	3.4477	.4325	-7.56	3.866		3.532
5	8.4993	3.4520	.5843	-10.22	3.286		.154
6	8.6553	3.4495	.7403	-14.01	2.759		-1.911
7	8.8157	3.4415	.9009	-19.54	2.248		-3.826
8	8.9804	3.4288	1.0661	-28.95	1.731		-4.564
9	9.1496	3.4148	1.2358	-45.70	1.197		-5.343
10	9.3227	3.3962	1.4100	-93.39	.631		-6.654
11	9.5000	3.3750	1.5885	0.00	0.000		-6.907

STREAM LINE	RADIUS	MACH NUMBER	PRESSURES		TEMPERATURES		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9220	.7859	28.2186	18.7725	629.667	560.497	.090453
2	8.0593	.7512	28.0912	19.3231	629.333	565.572	.092270
3	8.2010	.7214	27.9299	19.7508	628.938	569.697	.093630
4	8.3476	.6909	27.6272	20.0799	628.447	573.727	.094521
5	8.4993	.6709	27.4899	20.3319	627.950	576.136	.095307
6	8.6553	.6546	27.3687	20.5256	627.557	578.065	.095894
7	8.8157	.6406	27.2459	20.6751	627.323	579.793	.096304
8	8.9804	.6282	27.1218	20.7918	627.315	581.475	.096568
9	9.1496	.6180	27.0193	20.8848	627.667	583.174	.096717
10	9.3227	.6099	26.9436	20.9603	628.481	585.000	.096764
11	9.5000	.6020	26.8514	21.0202	629.583	587.078	.096697

STREAM LINE	RADIUS	ENTHALPIES		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9220	151.120	134.519	.977453	20.775	21.288
2	8.0593	151.040	135.737	.977636	21.445	17.634
3	8.2010	150.945	136.727	.977880	21.952	12.240
4	8.3476	150.827	137.694	.978439	22.376	7.399
5	8.4993	150.708	138.273	.978591	22.445	3.440
6	8.6553	150.614	138.736	.978743	22.475	.848
7	8.8157	150.558	139.150	.978962	22.498	-1.578
8	8.9804	150.556	139.554	.979272	22.498	-2.833
9	9.1496	150.640	139.962	.979666	22.483	-4.146
10	9.3227	150.835	140.400	.980169	22.493	-6.023
11	9.5000	151.100	140.899	.980825	22.566	-6.907

STATION 15 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.9220	0.00	911.73	.7859	20.775	0.000
2	8.0593	0.00	875.36	.7512	21.445	0.000
3	8.2010	0.00	843.76	.7214	21.952	0.000
4	8.3476	0.00	810.93	.6909	22.376	0.000
5	8.4993	0.00	789.10	.6709	22.445	0.000
6	8.6553	0.00	771.21	.6546	22.475	0.000
7	8.8157	0.00	755.78	.6406	22.498	0.000
8	8.9804	0.00	742.21	.6282	22.498	0.000
9	9.1496	0.00	731.24	.6180	22.483	0.000
10	9.3227	0.00	722.86	.6099	22.493	0.000
11	9.5000	0.00	714.71	.6020	22.566	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.9220	0.000	-.584	-7.8762	.02783	.2016	.1443
2	8.0593	0.000	-1.033	-7.9543	.02715	.2306	.1867
3	8.2010	0.000	-1.347	-7.9302	.02793	.2516	.2146
4	8.3476	0.000	-1.392	-7.7334	.02851	.2670	.2341
5	8.4993	0.000	-1.217	-7.5807	.02734	.2735	.2429
6	8.6553	0.000	-.941	-7.4190	.02583	.2758	.2464
7	8.8157	0.000	-.710	-7.2377	.02443	.2756	.2463
8	8.9804	0.000	-.639	-7.0594	.02337	.2740	.2440
9	9.1496	0.000	-.640	-6.8916	.02258	.2710	.2395
10	9.3227	0.000	-.580	-6.7518	.02190	.2667	.2327
11	9.5000	0.000	-.466	-6.6158	.02140	.2616	.2244

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 15 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 15 ISENT EFF	STATION 15 DELTA H ON H1
MEAN VALUES-		1.8640	.9213	.2112	.9914	0.0000	0.0000
1	7.9220	1.9196	.9565	.2140	.9889	0.0000	0.0000
2	8.0593	1.9110	.9521	.2133	.9893	0.0000	0.0000
3	8.2010	1.9000	.9462	.2126	.9893	0.0000	0.0000
4	8.3476	1.8794	.9328	.2116	.9895	0.0000	0.0000
5	8.4993	1.8701	.9290	.2106	.9903	0.0000	0.0000
6	8.6553	1.8618	.9251	.2099	.9912	0.0000	0.0000
7	8.8157	1.8535	.9193	.2094	.9920	0.0000	0.0000
8	8.9804	1.8450	.9125	.2094	.9926	0.0000	0.0000
9	9.1496	1.8380	.9034	.2101	.9931	0.0000	0.0000
10	9.3227	1.8329	.8922	.2117	.9935	0.0000	0.0000
11	9.5000	1.8266	.8779	.2138	.9939	0.0000	0.0000

STATION 16 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9440	798.66	158.63	798.25	25.53	814.26
2	8.0787	775.90	156.99	775.50	25.05	791.63
3	8.2182	754.95	154.82	754.57	24.02	770.66
4	8.3631	730.09	151.76	729.73	22.76	745.69
5	8.5134	715.59	148.34	715.27	21.38	730.80
6	8.6678	703.54	145.24	703.28	19.34	718.38
7	8.8264	692.71	142.48	692.51	16.61	707.21
8	8.9890	682.85	139.96	682.72	13.30	697.04
9	9.1557	675.15	137.86	675.09	9.41	689.08
10	9.3261	669.88	136.36	669.86	5.04	683.62
11	9.5000	664.52	135.23	664.52	0.00	678.14

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF		STREAMLINE		STATION
	RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE ANGLE	LEAN ANGLE
1	7.9440	3.7500	0.0000	-7.05	1.832	10.232
2	8.0787	3.7729	.1366	-8.79	1.850	8.498
3	8.2182	3.7894	.2771	-10.91	1.823	5.037
4	8.3631	3.7983	.4223	-13.45	1.787	2.117
5	8.5134	3.8010	.5726	-16.91	1.712	.148
6	8.6678	3.7994	.7270	-21.55	1.576	-1.318
7	8.8264	3.7941	.8857	-28.46	1.374	-2.416
8	8.9890	3.7862	1.0485	-39.03	1.116	-3.061
9	9.1557	3.7763	1.2155	-60.61	.799	-3.834
10	9.3261	3.7638	1.3863	-121.88	.431	-4.450
11	9.5000	3.7500	1.5608	0.00	0.000	-4.568

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9440	.6933	28.0638	20.3544	629.667	574.496	.095685
2	8.0787	.6725	27.9408	20.6380	629.333	577.186	.096566
3	8.2182	.6533	27.7792	20.8560	628.938	579.517	.097194
4	8.3631	.6307	27.4819	21.0238	628.447	582.176	.097528
5	8.5134	.6174	27.3565	21.1547	627.950	583.509	.097911
6	8.6678	.6063	27.2477	21.2572	627.557	584.614	.098199
7	8.8264	.5964	27.1361	21.3366	627.323	585.705	.098383
8	8.9890	.5872	27.0207	21.3972	627.315	586.885	.098464
9	9.1557	.5799	26.9255	21.4418	627.667	588.156	.098456
10	9.3261	.5746	26.8557	21.4722	628.481	589.593	.098355
11	9.5000	.5691	26.7687	21.4901	629.583	591.316	.098150

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9440	151.120	137.879	.977831	11.234	12.064
2	8.0787	151.040	138.525	.978004	11.438	10.349
3	8.2182	150.945	139.084	.978251	11.589	6.861
4	8.3631	150.827	139.722	.978801	11.743	3.904
5	8.5134	150.708	140.042	.978924	11.711	1.860
6	8.6678	150.614	140.307	.979047	11.664	.258
7	8.8264	150.558	140.569	.979239	11.622	-1.042
8	8.9890	150.556	140.852	.979528	11.583	-1.945
9	9.1557	150.640	141.157	.979904	11.541	-3.035
10	9.3261	150.835	141.502	.980393	11.506	-4.019
11	9.5000	151.100	141.916	.981036	11.503	-4.568

STATION 16 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.9440	0.00	814.26	.6933	11.234	0.000
2	8.0787	0.00	791.63	.6725	11.438	0.000
3	8.2182	0.00	770.66	.6533	11.589	0.000
4	8.3631	0.00	745.69	.6307	11.743	0.000
5	8.5134	0.00	730.80	.6174	11.711	0.000
6	8.6678	0.00	718.38	.6063	11.664	0.000
7	8.8264	0.00	707.21	.5964	11.622	0.000
8	8.9890	0.00	697.04	.5872	11.583	0.000
9	9.1557	0.00	689.08	.5799	11.541	0.000
10	9.3261	0.00	683.62	.5746	11.506	0.000
11	9.5000	0.00	678.14	.5691	11.503	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.9440	0.000	-.042	-6.1852	.04140	.3389	.2829
2	8.0787	0.000	-.242	-6.2884	.04063	.3576	.3046
3	8.2182	0.000	-.395	-6.3160	.04190	.3713	.3169
4	8.3631	0.000	-.453	-6.1865	.04270	.3822	.3264
5	8.5134	0.000	-.432	-6.0776	.04095	.3837	.3268
6	8.6678	0.000	-.377	-5.9626	.03871	.3823	.3242
7	8.8264	0.000	-.319	-5.8350	.03662	.3794	.3197
8	8.9890	0.000	-.284	-5.6970	.03506	.3756	.3140
9	9.1557	0.000	-.285	-5.5779	.03386	.3707	.3065
10	9.3261	0.000	-.321	-5.4735	.03285	.3641	.2964
11	9.5000	0.000	-.379	-5.3799	.03211	.3572	.2852

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 16 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 16 ISENT EFF	STATION 16 DELTA H ON H1
MEAN VALUES--		1.8559	.9143	.2112	.9871	0.0000	0.0000
1	7.9440	1.9091	.9477	.2140	.9854	0.0000	0.0000
2	8.0787	1.9007	.9434	.2133	.9840	0.0000	0.0000
3	8.2182	1.8897	.9375	.2126	.9840	0.0000	0.0000
4	8.3631	1.8695	.9243	.2116	.9843	0.0000	0.0000
5	8.5134	1.8610	.9211	.2106	.9855	0.0000	0.0000
6	8.6678	1.8536	.9179	.2099	.9863	0.0000	0.0000
7	8.8264	1.8460	.9132	.2094	.9880	0.0000	0.0000
8	8.9890	1.8381	.9064	.2094	.9889	0.0000	0.0000
9	9.1557	1.8317	.8978	.2101	.9897	0.0000	0.0000
10	9.3261	1.8269	.8870	.2117	.9903	0.0000	0.0000
11	9.5000	1.8210	.8730	.2138	.9908	0.0000	0.0000

STATION 17 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	V E L O C I T I E S				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9460	734.73	43.50	734.72	3.92	736.02
2	8.0829	726.74	43.12	726.71	6.57	728.02
3	8.2237	715.65	42.57	715.61	8.29	716.92
4	8.3695	697.17	41.67	697.11	9.53	698.42
5	8.5202	687.84	40.62	687.76	10.35	689.04
6	8.6746	679.62	39.71	679.55	10.32	680.78
7	8.8326	671.57	38.97	671.50	9.47	672.70
8	8.9944	663.71	38.29	663.66	7.95	664.81
9	9.1597	657.46	37.73	657.44	5.85	658.55
10	9.3283	653.44	37.37	653.43	3.21	654.51
11	9.5000	649.20	37.14	649.20	0.00	650.26

STREAM LINE	RADIUS	MESH-POINT COORDS		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.9460	4.1250	0.0000	0.00	.306		5.193
2	8.0829	4.1365	.1374	-71.63	.518		4.021
3	8.2237	4.1442	.2784	-45.16	.664		2.535
4	8.3695	4.1494	.4243	-39.35	.783		1.366
5	8.5202	4.1510	.5750	-38.91	.862		.048
6	8.6746	4.1503	.7294	-41.84	.870		-.544
7	8.8326	4.1478	.8875	-43.10	.808		-1.458
8	8.9944	4.1428	1.0492	-51.12	.686		-1.643
9	9.1597	4.1386	1.2146	-87.83	.510		-1.628
10	9.3283	4.1325	1.3833	-167.31	.282		-2.380
11	9.5000	4.1250	1.5552	0.00	0.000		-2.561

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9460	.6212	27.9092	21.5156	629.667	584.589	.099397
2	8.0829	.6142	27.7909	21.5468	629.333	585.230	.099432
3	8.2237	.6043	27.6291	21.5894	628.938	586.169	.099470
4	8.3695	.5879	27.3365	21.6361	628.447	587.857	.099399
5	8.5202	.5797	27.2228	21.6814	627.950	588.443	.099507
6	8.6746	.5725	27.1263	21.7227	627.557	588.991	.099604
7	8.8326	.5653	27.0260	21.7580	627.323	589.668	.099651
8	8.9944	.5583	26.9200	21.7858	627.315	590.537	.099632
9	9.1597	.5526	26.8316	21.8058	627.667	591.580	.099548
10	9.3283	.5486	26.7676	21.8167	628.481	592.835	.099387
11	9.5000	.5443	26.6859	21.8173	629.583	594.398	.099128

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9460	151.120	140.301	.978209	3.389	5.499
2	8.0829	151.040	140.455	.978373	3.396	4.539
3	8.2237	150.945	140.681	.978622	3.404	3.199
4	8.3695	150.827	141.086	.979164	3.421	2.150
5	8.5202	150.708	141.226	.979260	3.379	.910
6	8.6746	150.614	141.358	.979353	3.344	.326
7	8.8326	150.558	141.520	.979518	3.321	-.650
8	8.9944	150.556	141.729	.979784	3.302	-.956
9	9.1597	150.640	141.979	.980144	3.285	-1.118
10	9.3283	150.835	142.280	.980618	3.273	-2.098
11	9.5000	151.100	142.656	.981248	3.274	-2.561

STATION 17 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.9460	0.00	736.02	.6212	3.389	0.000
2	8.0829	0.00	728.02	.6142	3.396	0.000
3	8.2237	0.00	716.92	.6043	3.404	0.000
4	8.3695	0.00	698.42	.5879	3.421	0.000
5	8.5202	0.00	689.04	.5797	3.379	0.000
6	8.6746	0.00	680.78	.5725	3.344	0.000
7	8.8326	0.00	672.70	.5653	3.321	0.000
8	8.9944	0.00	664.81	.5583	3.302	0.000
9	9.1597	0.00	658.55	.5526	3.285	0.000
10	9.3283	0.00	654.51	.5486	3.273	0.000
11	9.5000	0.00	650.26	.5443	3.274	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.9460	0.000	.395	-3.3769	.05495	.4449	.3847
2	8.0829	0.000	.242	-3.4685	.05408	.4514	.3861
3	8.2237	0.000	.111	-3.5091	.05579	.4577	.3849
4	8.3695	0.000	.023	-3.4462	.05690	.4646	.3862
5	8.5202	0.000	-.027	-3.4000	.05458	.4621	.3805
6	8.6746	0.000	-.054	-3.3458	.05161	.4577	.3737
7	8.8326	0.000	-.070	-3.2796	.04884	.4523	.3665
8	8.9944	0.000	-.087	-3.2119	.04672	.4478	.3590
9	9.1597	0.000	-.115	-3.1432	.04517	.4419	.3503
10	9.3283	0.000	-.164	-3.0891	.04382	.4346	.3394
11	9.5000	0.000	-.228	-3.0384	.04281	.4272	.3275

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 17 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 17 ISENT EFF	STATION 17 DELTA H ON H1
MEAN	VALUES-	1.8478	.9073	.2112	.9828	0.0000	0.0000
1	7.9460	1.8986	.9338	.2140	.9780	0.0000	0.0000
2	8.0829	1.8905	.9348	.2133	.9788	0.0000	0.0000
3	8.2237	1.8795	.9288	.2126	.9787	0.0000	0.0000
4	8.3695	1.8596	.9157	.2116	.9791	0.0000	0.0000
5	8.5202	1.8519	.9132	.2106	.9807	0.0000	0.0000
6	8.6746	1.8453	.9107	.2099	.9824	0.0000	0.0000
7	8.8326	1.8385	.9066	.2094	.9840	0.0000	0.0000
8	8.9944	1.8313	.9003	.2094	.9852	0.0000	0.0000
9	9.1597	1.8253	.8921	.2101	.9862	0.0000	0.0000
10	9.3283	1.8209	.8817	.2117	.9870	0.0000	0.0000
11	9.5000	1.8154	.8681	.2138	.9877	0.0000	0.0000

STATION 18 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9480	689.39	0.00	689.39	1.34	689.39
2	8.0852	681.78	0.00	681.78	2.65	681.78
3	8.2264	671.33	0.00	671.32	3.35	671.33
4	8.3727	653.39	0.00	653.38	4.08	653.39
5	8.5239	645.50	0.00	645.48	4.71	645.50
6	8.6785	638.50	0.00	638.48	4.90	638.50
7	8.8363	631.24	0.00	631.22	4.63	631.24
8	8.9976	623.68	0.00	623.67	3.97	623.68
9	9.1622	617.49	0.00	617.48	2.94	617.49
10	9.3297	613.33	0.00	613.33	1.60	613.33
11	9.5000	608.69	0.00	608.59	0.00	608.69

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF		STREAMLINE		STATION
RADIUS	X-COORD	L-COORD	CURVATURE	SLOPE	ANGLE	LEAN ANGLE
1	7.9480	4.5000	0.0000	-70.31	.153	0.000
2	8.0852	4.5000	.1372	-70.50	.222	0.000
3	8.2264	4.5000	.2784	-68.57	.286	0.000
4	8.3727	4.5000	.4247	-61.18	.358	0.000
5	8.5239	4.5000	.5759	-55.49	.418	0.000
6	8.6785	4.5000	.7305	-54.71	.440	0.000
7	8.8363	4.5000	.8883	-58.74	.420	0.000
8	8.9976	4.5000	1.0496	-67.88	.365	0.000
9	9.1622	4.5000	1.2142	-88.91	.273	0.000
10	9.3297	4.5000	1.3817	-154.69	.150	0.000
11	9.5000	4.5000	1.5520	0.00	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9480	.5792	27.7546	22.1138	629.667	590.120	.101204
2	8.0852	.5725	27.6410	22.1343	629.333	590.654	.101206
3	8.2264	.5634	27.4787	22.1552	628.938	591.436	.101168
4	8.3727	.5476	27.1914	22.1777	628.447	592.922	.101016
5	8.5239	.5408	27.0894	22.2025	627.950	593.278	.101069
6	8.6785	.5348	27.0054	22.2287	627.557	593.633	.101128
7	8.8363	.5285	26.9163	22.2542	627.323	594.166	.101153
8	8.9976	.5218	26.8190	22.2771	627.315	594.947	.101124
9	9.1622	.5162	26.7379	22.2957	627.667	595.939	.101040
10	9.3297	.5122	26.6798	22.3084	628.481	597.179	.100887
11	9.5000	.5077	26.6032	22.3130	629.583	598.753	.100643

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9480	151.120	141.629	.978590	0.000	.153
2	8.0852	151.040	141.757	.978743	0.000	.222
3	8.2264	150.945	141.945	.978996	0.000	.286
4	8.3727	150.827	142.301	.979529	0.000	.358
5	8.5239	150.708	142.387	.979597	0.000	.418
6	8.6785	150.614	142.472	.979659	0.000	.440
7	8.8363	150.558	142.600	.979796	0.000	.420
8	8.9976	150.556	142.787	.980041	0.000	.365
9	9.1622	150.640	143.025	.980384	0.000	.273
10	9.3297	150.835	143.323	.980843	0.000	.150
11	9.5000	151.100	143.701	.981461	0.000	0.000

STATION 18 IS WITHIN OR AT THE TRAILING EDGE OF A BLADE
 ROTATING AT 0.0 RPM. NUMBER OF BLADES IN ROW = 49.

STREAM LINE	RADIUS	BLADE SPEED	RELATIVE VELOCITY	RELATIVE MACH NO.	RELATIVE FLOW ANGLE	DEVIATION ANGLE
1	7.9480	0.00	689.39	.5792	0.000	0.000
2	8.0852	0.00	681.78	.5725	0.000	0.000
3	8.2264	0.00	671.33	.5634	0.000	0.000
4	8.3727	0.00	653.39	.5476	0.000	0.000
5	8.5239	0.00	645.50	.5408	0.000	0.000
6	8.6785	0.00	638.50	.5348	0.000	0.000
7	8.8363	0.00	631.24	.5285	0.000	0.000
8	8.9976	0.00	623.68	.5218	0.000	0.000
9	9.1622	0.00	617.49	.5162	0.000	0.000
10	9.3297	0.00	613.33	.5122	0.000	0.000
11	9.5000	0.00	608.69	.5077	0.000	0.000

STREAM LINE	RADIUS	BLADE ANGLE	LEAN ANGLE	DELTA P A-BLADE	LOSS COEFF	DIFF FACTOR	DELTA P ON Q
1	7.9480	0.000	0.000	-.8900	.06850	.5018	.4371
2	8.0852	0.000	0.000	-.9156	.06752	.5090	.4388
3	8.2264	0.000	0.000	-.9246	.06972	.5160	.4373
4	8.3727	0.000	0.000	-.9086	.07103	.5240	.4391
5	8.5239	0.000	0.000	-.8953	.06818	.5212	.4336
6	8.6785	0.000	0.000	-.8799	.06447	.5167	.4275
7	8.8363	0.000	0.000	-.8633	.06101	.5122	.4216
8	8.9976	0.000	0.000	-.8415	.05841	.5079	.4159
9	9.1622	0.000	0.000	-.8257	.05644	.5030	.4092
10	9.3297	0.000	0.000	-.8123	.05476	.4968	.4006
11	9.5000	0.000	0.000	-.7976	.05351	.4909	.3916

STREAM LINE	RADIUS	INLET PRESS RATIO	THROUGH ISENT EFF	STATION 18 DELTA H ON H1	STATION 13 THRU PRESS RATIO	STATION 18 ISENT EFF	STATION 18 DELTA H ON H1
MEAN VALUES--		1.8398	.9002	.2112	.9725	0.0000	0.0000
1	7.9480	1.8881	.9299	.2140	.9726	0.0000	0.0000
2	8.0852	1.8803	.9261	.2133	.9735	0.0000	0.0000
3	8.2264	1.8693	.9200	.2126	.9733	0.0000	0.0000
4	8.3727	1.8478	.9072	.2116	.9739	0.0000	0.0000
5	8.5239	1.8428	.9052	.2106	.9759	0.0000	0.0000
6	8.6785	1.8371	.9035	.2099	.9780	0.0000	0.0000
7	8.8363	1.8310	.9001	.2094	.9800	0.0000	0.0000
8	8.9976	1.8244	.8943	.2094	.9815	0.0000	0.0000
9	9.1622	1.8189	.8865	.2101	.9828	0.0000	0.0000
10	9.3297	1.8150	.8764	.2117	.9638	0.0000	0.0000
11	9.5000	1.8097	.8632	.2138	.9847	0.0000	0.0000

STATION 19 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9480	674.79	0.00	674.79	0.00	674.79
2	8.0857	663.35	0.00	668.35	.48	668.35
3	8.2273	658.93	0.00	658.93	.89	658.93
4	8.3740	641.92	0.00	641.91	1.22	641.92
5	8.5254	635.27	0.00	635.26	1.49	635.27
6	8.6801	629.59	0.00	629.59	1.60	629.59
7	8.8379	623.62	0.00	623.61	1.54	623.62
8	8.9990	617.21	0.00	617.21	1.32	617.21
9	9.1632	611.98	0.00	611.98	.97	611.98
10	9.3302	608.50	0.00	608.50	.51	608.50
11	9.5000	604.08	0.00	604.08	0.00	604.08

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.9480	4.8750	0.0000	0.00	0.000	0.000	0.000
2	8.0857	4.8750	.1377	-696.46	.041	0.000	0.000
3	8.2273	4.8750	.2793	-382.77	.077	0.000	0.000
4	8.3740	4.8750	.4260	-271.74	.109	0.000	0.000
5	8.5254	4.8750	.5774	-221.09	.134	0.000	0.000
6	8.6801	4.8750	.7321	-204.74	.145	0.000	0.000
7	8.8379	4.8750	.8899	-211.93	.142	0.000	0.000
8	8.9990	4.8750	1.0510	-246.11	.123	0.000	0.000
9	9.1632	4.8750	1.2152	-336.38	.091	0.000	0.000
10	9.3302	4.8750	1.3822	-645.98	.048	0.000	0.000
11	9.5000	4.8750	1.5520	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		---TEMPERATURES---		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9480	.5661	27.7546	22.3321	629.667	591.776	.101916
2	8.0857	.5605	27.6410	22.3331	629.333	592.163	.101854
3	8.2273	.5523	27.4787	22.3359	628.938	592.808	.101756
4	8.3740	.5374	27.1914	22.3402	628.447	594.159	.101545
5	8.5254	.5318	27.0894	22.3458	627.950	594.369	.101534
6	8.6801	.5269	27.0054	22.3523	627.557	594.573	.101529
7	8.8379	.5218	26.9163	22.3588	627.323	594.962	.101492
8	8.9990	.5161	26.8190	22.3648	627.315	595.615	.101408
9	9.1632	.5114	26.7379	22.3696	627.667	596.503	.101279
10	9.3302	.5080	26.6798	22.3727	628.481	597.670	.101095
11	9.5000	.5036	26.6032	22.3738	629.583	599.218	.100838

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9480	151.120	142.026	.978590	0.000	0.000
2	8.0857	151.040	142.119	.978743	0.000	.041
3	8.2273	150.945	142.274	.978996	0.000	.077
4	8.3740	150.827	142.598	.979529	0.000	.109
5	8.5254	150.708	142.649	.979597	0.000	.134
6	8.6801	150.614	142.697	.979659	0.000	.145
7	8.8379	150.558	142.791	.979796	0.000	.142
8	8.9990	150.556	142.948	.980041	0.000	.123
9	9.1632	150.640	143.161	.980384	0.000	.091
10	9.3302	150.835	143.441	.980843	0.000	.048
11	9.5000	151.100	143.812	.981461	0.000	0.000

STATION 20 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDIONAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9480	673.83	0.00	673.83	0.00	673.83
2	8.0859	667.43	0.00	667.43	.07	667.43
3	8.2277	658.17	0.00	658.17	.14	658.17
4	8.3746	641.41	0.00	641.41	.19	641.41
5	8.5261	635.12	0.00	635.12	.23	635.12
6	8.6809	629.86	0.00	629.86	.25	629.86
7	8.8387	624.31	0.00	624.31	.25	624.31
8	8.9997	618.31	0.00	618.31	.22	618.31
9	9.1637	613.41	0.00	613.41	.16	613.41
10	9.3305	610.14	0.00	610.14	.09	610.14
11	9.5000	605.80	0.00	605.80	0.00	605.80

STREAM LINE	-----MESH-POINT COORDS-----	RADIUS OF CURVATURE	STREAMLINE SLOPE	STATION LEAN
	RADIUS X-COORD L-COORD		ANGLE	ANGLE
1	7.9480 6.0000 0.0000	0.00	0.000	0.000
2	8.0859 6.0000 .1379	-7026.48	.006	0.000
3	8.2277 6.0000 .2797	-3578.16	.012	0.000
4	8.3746 6.0000 .4266	-2484.56	.017	0.000
5	8.5261 6.0000 .5781	-2013.04	.021	0.000
6	8.6809 6.0000 .7329	-1833.18	.023	0.000
7	8.8387 6.0000 .8907	-1850.08	.023	0.000
8	8.9997 6.0000 1.0517	-2090.08	.020	0.000
9	9.1637 6.0000 1.2157	-2766.39	.015	0.000
10	9.3305 6.0000 1.3825	-5051.70	.008	0.000
11	9.5000 6.0000 1.5520	0.00	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---	---TEMPERATURES---	SPECIFIC WEIGHT
			TOTAL STATIC	TOTAL STATIC	
1	7.9480	.5652	27.7546 22.3464	629.667 591.885	.101963
2	8.0859	.5597	27.6410 22.3465	629.333 592.265	.101898
3	8.2277	.5516	27.4787 22.3468	628.938 592.891	.101792
4	8.3746	.5370	27.1914 22.3473	628.447 594.213	.101568
5	8.5261	.5316	27.0894 22.3479	627.950 594.384	.101541
6	8.6809	.5272	27.0054 22.3486	627.557 594.545	.101517
7	8.8387	.5224	26.9163 22.3493	627.323 594.890	.101461
8	8.9997	.5171	26.8190 22.3500	627.315 595.503	.101360
9	9.1637	.5126	26.7379 22.3506	627.667 596.358	.101217
10	9.3305	.5094	26.6798 22.3510	628.481 597.504	.101025
11	9.5000	.5051	26.6032 22.3511	629.583 599.045	.100766

STREAM LINE	RADIUS	---ENTHALPIES---	ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL STATIC			
1	7.9480	151.120 142.052	.978590	0.000	0.000
2	8.0859	151.040 142.144	.978743	0.000	.006
3	8.2277	150.945 142.294	.978996	0.000	.012
4	8.3746	150.827 142.611	.979529	0.000	.017
5	8.5261	150.708 142.652	.979597	0.000	.021
6	8.6809	150.614 142.691	.979659	0.000	.023
7	8.8387	150.558 142.774	.979796	0.000	.023
8	8.9997	150.556 142.921	.980041	0.000	.020
9	9.1637	150.640 143.126	.980384	0.000	.015
10	9.3305	150.835 143.401	.980843	0.000	.008
11	9.5000	151.100 143.771	.981461	0.000	0.000

STATION 21 FLOW-FIELD DESCRIPTION

STREAM LINE	RADIUS	-----V E L O C I T I E S-----				
		MERIDICNAL	TANGENTIAL	AXIAL	RADIAL	TOTAL
1	7.9480	673.83	0.00	673.83	0.00	673.83
2	8.0860	667.44	0.00	667.44	.02	667.44
3	8.2278	658.20	0.00	658.20	.03	658.20
4	8.3746	641.48	0.00	641.48	.05	641.48
5	8.5262	635.23	0.00	635.23	.05	635.23
6	8.6810	630.02	0.00	630.02	.06	630.02
7	8.8388	624.53	0.00	624.53	.06	624.53
8	8.9997	618.58	0.00	618.58	.05	618.58
9	9.1638	613.72	0.00	613.72	.04	613.72
10	9.3305	610.48	0.00	610.48	.02	610.48
11	9.5000	606.16	0.00	606.16	0.00	606.16

STREAM LINE	RADIUS	-----MESH-POINT COORDS-----		RADIUS OF CURVATURE	STREAMLINE		STATION LEAN ANGLE
		X-COORD	L-COORD		SLOPE	ANGLE	
1	7.9480	7.1250	0.0000	0.00	0.000	0.000	0.000
2	8.0860	7.1250	.1380	0.00	.001	0.000	0.000
3	8.2278	7.1250	.2798	0.00	.003	0.000	0.000
4	8.3746	7.1250	.4266	0.00	.004	0.000	0.000
5	8.5262	7.1250	.5722	0.00	.005	0.000	0.000
6	8.6810	7.1250	.7330	0.00	.005	0.000	0.000
7	8.8388	7.1250	.8908	0.00	.005	0.000	0.000
8	8.9997	7.1250	1.0517	0.00	.005	0.000	0.000
9	9.1638	7.1250	1.2158	0.00	.003	0.000	0.000
10	9.3305	7.1250	1.3825	0.00	.002	0.000	0.000
11	9.5000	7.1250	1.5520	0.00	0.000	0.000	0.000

STREAM LINE	RADIUS	MACH NUMBER	---PRESSURES---		--TEMPERATURES--		SPECIFIC WEIGHT
			TOTAL	STATIC	TOTAL	STATIC	
1	7.9480	.5652	27.7546	22.3464	629.667	591.885	.101963
2	8.0860	.5597	27.6410	22.3464	629.333	592.264	.101898
3	8.2278	.5517	27.4787	22.3464	628.938	592.888	.101790
4	8.3746	.5371	27.1914	22.3464	628.447	594.206	.101565
5	8.5262	.5317	27.0894	22.3464	627.950	594.373	.101536
6	8.6810	.5273	27.0054	22.3463	627.557	594.528	.101510
7	8.8388	.5226	26.9163	22.3463	627.323	594.868	.101452
8	8.9997	.5173	26.8190	22.3463	627.315	595.475	.101348
9	9.1638	.5129	26.7379	22.3463	627.667	596.325	.101204
10	9.3305	.5097	26.6798	22.3463	628.481	597.469	.101010
11	9.5000	.5054	26.6032	22.3463	629.583	599.009	.100750

STREAM LINE	RADIUS	---ENTHALPIES---		ENTROPY	FLOW ANGLE	(PHI+GAMMA)
		TOTAL	STATIC			
1	7.9480	151.120	142.052	.978590	0.000	0.000
2	8.0860	151.040	142.143	.978743	0.000	.001
3	8.2278	150.945	142.293	.978996	0.000	.003
4	8.3746	150.827	142.609	.979529	0.000	.004
5	8.5262	150.708	142.649	.979597	0.000	.005
6	8.6810	150.614	142.687	.979659	0.000	.005
7	8.8388	150.558	142.768	.979796	0.000	.005
8	8.9997	150.556	142.914	.980041	0.000	.005
9	9.1638	150.640	143.118	.980384	0.000	.003
10	9.3305	150.835	143.392	.980843	0.000	.002
11	9.5000	151.100	143.762	.981461	0.000	0.000

POINT NO 1 PASS 29 THE CALCULATION IS CONVERGED

SPEED FACTOR = 1.000 FLOW = 34.460 TOTAL PRESSURE R/ 20 = 1.840

ISENTROPIC EFFICIENCY = .9002 POWER = .1282E+04

LOSS COEFFICIENT DETERMINATION FOR BLADE BETWEEN STATIONS 5 AND 10
AS INCORPORATED IN ABOVE RESULTS, BLADE TYPE 1

STREAM LINE	INLET RADIUS	OUTLET RADIUS	CASCADE SOLIDITY	DIFF FACTOR	LOSS PARAM	DIFF LOSS	BLADE ANGLE
1	7.125	7.622	2.0096	.5450	.00869	.03609	0.000
2	7.382	7.809	1.9794	.5479	.00862	.03590	0.000
3	7.630	7.993	1.9537	.5486	.00846	.03555	0.000
4	7.874	8.178	1.9351	.5537	.00854	.03652	0.000
5	8.113	8.363	1.9218	.5497	.00842	.03672	0.000
6	8.348	8.548	1.9113	.5448	.00847	.03783	0.000
7	8.582	8.734	1.9040	.5404	.00877	.04024	0.000
8	8.813	8.922	1.9005	.5365	.00925	.04374	0.000
9	9.043	9.111	1.8978	.5328	.00984	.04796	0.000
10	9.272	9.304	1.8930	.5304	.01052	.05283	0.000
11	9.500	9.500	1.8864	.5302	.01135	.05881	0.000

STREAM LINE	INCID ANGLE	EXPAN ANGLE	INLET M.NO.	EXPAND M. NO.	SHOCK LOSS	TOTAL LOSS
1	0.000	10.986	.9139	1.4686	.00337	.03947
2	0.000	10.611	.9529	1.4558	.00841	.04431
3	0.000	10.178	.9874	1.4410	.01423	.04978
4	0.000	9.796	1.0191	1.4319	.02848	.06499
5	0.000	9.498	1.0488	1.4338	.03156	.06828
6	0.000	9.183	1.0771	1.4384	.03379	.07162
7	0.000	8.790	1.1042	1.4420	.03621	.07644
8	0.000	8.402	1.1301	1.4469	.03936	.08311
9	0.000	8.165	1.1551	1.4575	.04334	.09130
10	0.000	8.147	1.1790	1.4758	.04878	.10161
11	0.000	8.329	1.2014	1.5005	.05610	.11491

SHOCK SURFACE SWEEP CALCULATION PARAMETERS

STREAM -LINE	LE RADIUS	LE SWEEP	SHOCK SWEEP * SUCT SURF	SHOCK P/P	CALCULATED EXP ANG
1	7.125000	5.990560	14.385882	.998591	10.986065
2	7.381760	5.039737	12.389206	.996279	10.611465
3	7.630462	4.519090	11.385416	.993398	10.177850
4	7.873595	2.225655	8.848646	.986234	9.796031
5	8.112595	-.143125	6.150988	.984176	9.498208
6	8.348377	.240470	6.183819	.982490	9.182565
7	8.581628	.162434	5.831679	.980664	8.790032
8	8.812923	-.890949	4.474342	.978394	8.402311
9	9.042759	-1.071889	4.240461	.975603	8.164763
10	9.271604	-.748054	4.727016	.971895	8.147001
11	9.500000	-1.494045	4.150220	.966997	8.329439

LOSS COEFFICIENT DETERMINATION FOR BLADE BETWEEN STATIONS 13 AND 18
AS INCORPORATED IN ABOVE RESULTS, BLADE TYPE 2

STREAM LINE	INLET RADIUS	OUTLET RADIUS	CASCADE SOLIDITY	DIFF FACTOR	LOSS PARAM	DIFF LOSS	BLADE ANGLE
1	7.751	7.948	1.9758	.5018	.01733	.06849	0.000
2	7.930	8.085	1.8736	.5090	.01789	.06704	0.000
3	8.101	8.226	1.7854	.5160	.01849	.06602	0.000
4	8.268	8.373	1.7257	.5240	.01921	.06628	0.000
5	8.430	8.524	1.6882	.5212	.01895	.06398	0.000
6	8.604	8.678	1.6603	.5167	.01855	.06159	0.000
7	8.776	8.836	1.6391	.5122	.01815	.05951	0.000
8	8.950	8.998	1.6244	.5079	.01780	.05784	0.000
9	9.129	9.162	1.6159	.5030	.01742	.05629	0.000
10	9.312	9.330	1.6127	.4968	.01697	.05475	0.000
11	9.500	9.500	1.6124	.4909	.01659	.05351	0.000

STREAM LINE	INCID ANGLE	EXPAN ANGLE	INLET M.NO.	EXPAND M. NO.	SHOCK LOSS	TOTAL LOSS
1	0.000	19.673	.8863	1.7635	0.00000	.06849
2	0.000	19.446	.8754	1.7557	.00047	.06751
3	0.000	19.385	.8593	1.7536	.00370	.06972
4	0.000	19.435	.8349	1.7554	.00480	.07108
5	0.000	19.611	.8145	1.7614	.00420	.06818
6	0.000	19.826	.7948	1.7688	.00289	.06448
7	0.000	20.012	.7756	1.7752	.00151	.06102
8	0.000	20.244	.7574	1.7832	.00058	.05841
9	0.000	20.557	.7410	1.7940	.00015	.05645
10	0.000	20.926	.7263	1.8067	.00001	.05476
11	0.000	21.324	.7111	1.8205	0.00000	.05351

SHOCK SURFACE SWEEP CALCULATION PARAMETERS

STREAM -LINE	LE RADIUS	LE SWEEP	SHOCK SWEEP * SUCT SURF	SHOCK P/P	CALCULATED EXP ANG
1	7.751000	32.962720	37.758091	1.000000	19.672735
2	7.929953	27.128864	31.040046	.999816	19.445901
3	8.100852	19.106595	21.296383	.998585	19.384652
4	8.268221	12.695312	13.931297	.998241	19.435473
5	8.435582	8.018716	8.955388	.998515	19.610856
6	8.604343	3.960399	4.953564	.999016	19.825887
7	8.775569	.295704	1.289098	.999505	20.012327
8	8.950154	-1.598208	-.265337	.999817	20.243688
9	9.128923	-3.843057	-1.965073	.999953	20.557210
10	9.311914	-6.576524	-4.322394	.999996	20.925966
11	9.500000	-7.881607	-5.440349	1.000000	21.323656

(2) Rotor Design

The rotor geometry was defined using the arbitrary camberline blade design section of the computer program described in Reference 7 and the procedure described in Section II.2.e(2) of this report.

The blade design program printout on the following pages presents the detailed data on all streamsurface and manufacturing sections, excluding actual blade section surface coordinates. The input data are listed first, including data to define the computing station geometry (identical to the corresponding blade geometry for the aerodynamic design presented in Figure 19), the streamsurface locations and relative air angles defined by the aerodynamic analysis, and data to define the thickness distributions and section stacking on each streamsurface. Next, details of the 11 streamsurface sections are presented. Only a summary listing of the ordinarily lengthy and detailed printout have been included here. Finally, summary details of the manufacturing sections are presented.

The rotor leading edge incidence angle (relative to the streamsurface section meanline) was specified as an approximately linear variation of from 6.1 degrees at the hub to 4.7 degrees at the tip, as shown in Figure 30. This distribution produced an incidence angle relative to the streamsurface section suction surface of approximately 2.0 degrees, constant from hub to tip. Local deviation angles were computed according to the fraction of

trailing edge deviation verses fraction of axial chord distributions presented in Figure 31. Extra deviation of from 5.0 degrees at the hub to 1.0 degrees at the tip was added at the trailing edge. The leading edge radius and trailing edge half-thickness-to-chord ratios were specified to produce a constant 0.005-inch leading edge radius and a constant 0.005-inch trailing edge half-thickness from hub to tip. Blade maximum thickness was decreased linearly (as a function of streamsurface number) from 6-percent chord at the hub to 4-percent chord at the tip. The location of maximum thickness was specified as a constant 60-percent chord from hub to tip. The spanwise distributions of solidity and trailing edge deviation angle for the rotor are presented in Figures 32 and 33 respectively.

PROGRAM UDO300 - VERSION 1.10 - ARBITRARY MEANLINE BLADE SECTION

TITLE	=CORE DESIGN - ROTOR
NUMBER OF STREAMSURFACES	= 11
NUMBER OF STATIONS	= 8
NUMBER OF CONSTANT-Z PLANES	= 11
NUMBER OF BLADE DATA POINTS	= 11
NUMBER OF POINTS PER SEGMENT	= 30
NUMBER OF BLADES IN BLADE ROW	= 33
ISTAK	= 2
IPUNCH	= 1
IFPLOT	= 0
IPRINT	= 0
ISPLIT	= 0
INAST	= 0
JSPUN	= 1
JZPUN	= 1
ZINNER	= 7.1000
ZOUTER	= 9.5000
SCALE	= 1.0000
STACKX	= 1.1020
PLTSZE	= 1.0000
TOLLE	= .0020
LEADING EDGE STATION NUMBER	= 2
TRAILING EDGE STATION NUMBER	= 7
RADII SPECIFYING DEVIATION	= 1
RADII SPECIFYING INCIDENCE	= 5
SENSE OF ROTATION INDICATOR	= -1
DEVIATION CALCULATION INDEX	= 1
IDELET	= 1
IFLDEG	= 1
SHAPE FACTOR	= .7000
SOLIDITY TOLERANCE	= .1000

DEVIATION CURVE 1 NUMBER OF POINTS = 5 RADIUS = 0.0000

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	0.0000	.1000
2	.2500	.1100
3	.5000	.1700
4	.7500	.3200
5	1.0000	1.0000

INCIDENCE AND EXTRA DEVIATION DISTRIBUTION

INLET RADIUS	INCIDENCE	EXTRA DEVIATION
7.1000	6.100	5.000
7.7000	5.750	4.000
8.3000	5.400	3.000
8.9000	5.050	2.000
9.5000	4.700	1.000

STREAMSURFACE GEOMETRY SPECIFICATION

COMPUTING STATION 1 NUMBER OF DESCRIBING POINTS= 2 IFANGS(1)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
-.4500	7.1250	1	7.1250	0.0000
-.4500	9.5000	2	7.3672	0.0000
		3	7.6086	0.0000
		4	7.8488	0.0000
		5	8.0877	0.0000
		6	8.3253	0.0000
		7	8.5617	0.0000
		8	8.7971	0.0000
		9	9.0318	0.0000
		10	9.2660	0.0000
		11	9.5000	0.0000

COMPUTING STATION 2 NUMBER OF DESCRIBING POINTS= 2 IFANGS(2)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
0.0000	7.1250	1	7.1250	-57.4881
0.0000	9.5000	2	7.3818	-57.1371
		3	7.6305	-57.0886
		4	7.8736	-57.2120
		5	8.1126	-57.4325
		6	8.3484	-57.7176
		7	8.5816	-58.0573
		8	8.8129	-58.4436
		9	9.0428	-58.8712
		10	9.2716	-59.3471
		11	9.5000	-59.8978

COMPUTING STATION 3 NUMBER OF DESCRIBING POINTS= 2 IFANGS(3)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
.4500	7.1710	1	7.1710	-50.9920
.4500	9.5000	2	7.4294	-50.8985
		3	7.6771	-51.2219
		4	7.9180	-51.7590
		5	8.1536	-52.2304
		6	8.3846	-52.7388
		7	8.6122	-53.3425
		8	8.8371	-53.9933
		9	9.0601	-54.6022
		10	9.2810	-55.1414
		11	9.5000	-55.6427

COMPUTING STATION 4 NUMBER OF DESCRIBING POINTS= 2 IFANGS(4)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
.9000	7.2590	1	7.2590	-41.9544
.9000	9.5000	2	7.5038	-42.9780
		3	7.7407	-44.1068
		4	7.9724	-45.3568
		5	8.1998	-46.3284
		6	8.4228	-47.2584
		7	8.6425	-48.2534
		8	8.8599	-49.2556
		9	9.0755	-50.1312
		10	9.2889	-50.8376
		11	9.5000	-51.4438

COMPUTING STATION 5 NUMBER OF DESCRIBING POINTS= 2 IFANGS(5)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
1.3500	7.3610	1	7.3610	-31.8783
1.3500	9.5000	2	7.5900	-33.7743
		3	7.8124	-35.7126
		4	8.0314	-37.7753
		5	8.2474	-39.4009
		6	8.4601	-40.9052
		7	8.6704	-42.4231
		8	8.8794	-43.9031
		9	9.0875	-45.1922
		10	9.2944	-46.2515
		11	9.5000	-47.2008

COMPUTING STATION 6 NUMBER OF DESCRIBING POINTS= 2 IFANGS(6)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
1.8000	7.4840	1	7.4840	-21.3021
1.8000	9.5000	2	7.6913	-24.3202
		3	7.8953	-27.1836
		4	8.0930	-30.1240
		5	8.2999	-32.5383
		6	8.4999	-34.7503
		7	8.6990	-36.8914
		8	8.8982	-38.9380
		9	9.0980	-40.7642
		10	9.2935	-42.3576
		11	9.5000	-43.8964

COMPUTING STATION 7 NUMBER OF DESCRIBING POINTS= 2 IFANGS(7)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
2.2500	7.6220	1	7.6220	-14.5427
2.2500	9.5000	2	7.8087	-18.1194
		3	7.9933	-21.5188
		4	8.1777	-25.0994
		5	8.3627	-28.2269
		6	8.5479	-31.1367
		7	8.7339	-33.8941
		8	8.9216	-36.4967
		9	9.1115	-38.8708
		10	9.3040	-41.0450
		11	9.5000	-43.2780

COMPUTING STATION 8 NUMBER OF DESCRIBING POINTS= 11 IFANGS(8)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
2.3750	7.6640	1	7.6640	50.0114
2.3950	7.8460	2	7.8506	48.5736
2.4090	8.0300	3	8.0311	47.7893
2.4160	8.2110	4	8.2097	47.5775
2.4180	8.3950	5	8.3884	47.0964
2.4160	8.5800	6	8.5676	46.6912
2.4110	8.7650	7	8.7484	46.4031
2.4040	8.9480	8	8.9314	46.2356
2.3960	9.1320	9	9.1174	46.1811
2.3860	9.3160	10	9.3067	46.2831
2.3750	9.5000	11	9.5000	46.6026

SECTION GEOMETRY SPECIFICATIONS

STREAM LINE	SOLID MOD	LE RAD /CHORD	MAX TK /CHORD	TE THK /CHORD	PT OF MAX TK	X STAK OFFSET	Y STAK OFFSET
1.0	0.000	.00178	.06000	.00178	.60000	0.00000	.00900
2.0	0.000	.00176	.05800	.00176	.60000	0.00000	.01000
3.0	0.000	.00173	.05600	.00173	.60000	0.00000	.01400
4.0	0.000	.00170	.05400	.00170	.60000	0.00000	.02000
5.0	0.000	.00166	.05200	.00166	.60000	0.00000	.01000
6.0	0.000	.00163	.05000	.00163	.60000	0.00000	.00200
7.0	0.000	.00159	.04800	.00159	.60000	0.00000	.00100
8.0	0.000	.00156	.04600	.00156	.60000	0.00000	.00300
9.0	0.000	.00152	.04400	.00152	.60000	0.00000	.00100
10.0	0.000	.00149	.04200	.00149	.60000	0.00000	.00100
11.0	0.000	.00146	.04000	.00146	.60000	0.00000	0.00000

STREAMSURFACE 1 ITERATION 1 DEVIATION = 13.895 SOLIDITY = 2.0340
ITERATION 1 DEVIATION = 13.895 SOLIDITY = 2.0340

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 1

BETA1 = -51.403 (BLADE INLET ANGLE)
BETA2 = -.648 (BLADE OUTLET ANGLE)
YZERO = .00178 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .06000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00178 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.3097 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 2.81203E+00

L.E.RADIUS = 5.00541E-03 CENTERED AT X= -1.1051E+00 Y= 1.0728E+00

SECTION AREA= 3.30804E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 5.08827E-02
IY = 9.37625E-02
IXY = -6.64978E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.45395E-03 (AT-36.065 WITH (X) AXIS)
IPY = 1.42191E-01 (AT-36.065 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0078 NEW DELX = .0078

CARTESIAN COORDINATES ON STREAMSURFACE 1

LEADING EDGE COORDINATES = (7.0453, -1.1020, 1.0626)
TRAILING EDGE COORDINATES= (7.6026, 1.1479, -.5423)

STREAMSURFACE 2 ITERATION 1 DEVIATION = 12.638 SOLIDITY = 2.0023
ITERATION 1 DEVIATION = 12.638 SOLIDITY = 2.0023

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 2

BETA1 = -51.202 (BLADE INLET ANGLE)
BETA2 = -5.481 (BLADE OUTLET ANGLE)
YZERO = .00176 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00176 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2932 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 2.84504E+00

L.E.RADIUS = 5.00727E-03 CENTERED AT X= -1.1022E+00 Y= 1.0898E+00

SECTION AREA= 3.25232E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 5.39763E-02
IY = 9.02727E-02
IXY = -6.76881E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 2.04568E-03 (AT-37.496 WITH (X) AXIS)
IPY = 1.42203E-01 (AT-37.496 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0070 NEW DELX = .0070

CARTESIAN COORDINATES ON STREAMSURFACE 2

LEADING EDGE COORDINATES = (7.3024, -1.1020, 1.0795)
TRAILING EDGE COORDINATES= (7.7853, 1.1479, -.6030)

STREAMSURFACE 3 ITERATION 1 DEVIATION = 11.527 SOLIDITY = 1.9816
ITERATION 1 DEVIATION = 11.527 SOLIDITY = 1.9816

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 3

BETA1 = -51.298 (BLADE INLET ANGLE)
BETA2 = -9.992 (BLADE OUTLET ANGLE)
YZERO = .00173 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00173 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2807 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 2.69114E+00

L.E.RADIUS = 5.00167E-03 CENTERED AT X= -1.0998E+00 Y= 1.1153E+00

SECTION AREA= 3.22715E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 5.86288E-02
IY = 8.81664E-02
IXY = -7.00917E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.76682E-03 (AT-39.051 WITH (X) AXIS)
IPY = 1.45028E-01 (AT-39.051 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0065 NEW DELX = .0065

CARTESIAN COORDINATES ON STREAMSURFACE 3

LEADING EDGE COORDINATES = (7.5500, -1.1020, 1.1051)
TRAILING EDGE COORDINATES= (7.9652, 1.1480, -.6685)

STREAMSURFACE 4 ITERATION 1 DEVIATION = 10.422 SOLIDITY = 1.9741
ITERATION 1 DEVIATION = 10.422 SOLIDITY = 1.9741

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 4

BETA1 = -51.553 (BLADE INLET ANGLE)
BETA2 = -14.677 (BLADE OUTLET ANGLE)
YZERO = .00170 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00170 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2713 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 2.95166E+00

L.E.RADIUS = 5.01782E-03 CENTERED AT X= -1.0992E+00 Y= 1.1483E+00

SECTION AREA= 3.23037E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 6.50718E-02
IY = 8.71985E-02
IXY = -7.37626E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.54755E-03 (AT-40.735 WITH (X) AXIS)
IPY = 1.50723E-01 (AT-40.735 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0049 NEW DELX = .0049

CARTESIAN COORDINATES ON STREAMSURFACE 4

LEADING EDGE COORDINATES = (7.7909, -1.1020, 1.1383)
TRAILING EDGE COORDINATES= (8.1440, 1.1480, -.7419)

STREAMSURFACE 5 ITERATION 1 DEVIATION = 9.436 SOLIDITY = 1.9684
ITERATION 1 DEVIATION = 9.436 SOLIDITY = 1.9684

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 5

BETA1 = -51.923 (BLADE INLET ANGLE)
BETA2 = -18.791 (BLADE OUTLET ANGLE)
YZERO = .00166 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00166 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2642 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.00777E+00

L.E.RADIUS = 4.99289E-03 CENTERED AT X= -1.0997E+00 Y= 1.1937E+00

SECTION AREA= 3.22043E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 7.06529E-02
IY = 8.62885E-02
IXY = -7.66998E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.37349E-03 (AT-42.090 WITH (X) AXIS)
IPY = 1.55568E-01 (AT-42.090 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = -.0026 NEW DELX = .0026

CARTESIAN COORDINATES ON STREAMSURFACE 5

LEADING EDGE COORDINATES = (8.0258, -1.1020, 1.1838)

TRAILING EDGE COORDINATES= (8.3254, 1.1480, -.7890)

STREAMSURFACE 6 ITERATION 1 DEVIATION = 8.504 SOLIDITY = 1.9665
ITERATION 1 DEVIATION = 8.504 SOLIDITY = 1.9665

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 6

BETA1 = -52.346 (BLADE INLET ANGLE)
BETA2 = -22.633 (BLADE OUTLET ANGLE)
YZERO = .00163 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00163 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2589 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.06727E+00

L.E.RADIUS = 4.99966E-03 CENTERED AT X= -1.1012E+00 Y= 1.2391E+00

SECTION AREA= 3.21357E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 7.66450E-02
IY = 8.57381E-02
IXY = -7.98312E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.23102E-03 (AT-43.370 WITH (X) AXIS)
IPY = 1.61152E-01 (AT-43.370 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 6

LEADING EDGE COORDINATES = (8.2573, -1.1025, 1.2295)

TRAILING EDGE COORDINATES= (8.5068, 1.1475, -.8366)

STREAMSURFACE 7 ITERATION 1 DEVIATION = 7.610 SOLIDITY = 1.9686
ITERATION 1 DEVIATION = 7.610 SOLIDITY = 1.9686

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 7

BETA1 = -52.822 (BLADE INLET ANGLE)
BETA2 = -26.284 (BLADE OUTLET ANGLE)
YZERO = .00159 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00159 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2552 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.13464E+00

L.E.RADIUS = 4.98408E-03 CENTERED AT X= -1.1035E+00 Y= 1.2826E+00

SECTION AREA= 3.21637E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 8.37481E-02
IY = 8.55667E-02
IXY = -8.25396E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.11283E-03 (AT-44.688 WITH (X) AXIS)
IPY = 1.68202E-01 (AT-44.688 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0040 NEW DELX = -.0040

CARTESIAN COORDINATES ON STREAMSURFACE 7

LEADING EDGE COORDINATES = (8.4866, -1.1020, 1.2736)
TRAILING EDGE COORDINATES = (8.6821, 1.1480, -.8936)

STREAMSURFACE 8 ITERATION 1 DEVIATION = 6.754 SOLIDITY = 1.9738
ITERATION 1 DEVIATION = 6.754 SOLIDITY = 1.9738

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 8

BETA1 = -53.343 (BLADE INLET ANGLE)
BETA2 = -29.743 (BLADE OUTLET ANGLE)
YZERO = .00156 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00156 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2527 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.20799E+00

L.E.RADIUS = 5.00447E-03 CENTERED AT X= -1.1064E+00 Y= 1.3267E+00

SECTION AREA= 3.22474E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 9.18167E-02
IY = 8.57176E-02
IXY = -8.77021E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.76522E-01 (AT 44.004 WITH (X) AXIS)
IPY = 1.01207E-03 (AT 44.004 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0080 NEW DELX = -.0080

CARTESIAN COORDINATES ON STREAMSURFACE 8

LEADING EDGE COORDINATES = (8.7138, -1.1020, 1.3183)

TRAILING EDGE COORDINATES= (8.9704, 1.1480, -.9547)

STREAMSURFACE 9 ITERATION 1 DEVIATION = 5.949 SOLIDITY = 1.9802
ITERATION 1 DEVIATION = 5.949 SOLIDITY = 1.9802

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 9

BETA1 = -53.905 (BLADE INLET ANGLE)
BETA2 = -32.922 (BLADE OUTLET ANGLE)
YZERO = .00152 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00152 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2511 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.28065E+00

L.E.RADIUS = 4.98659E-03 CENTERED AT X= -1.1099E+00 Y= 1.3737E+00

SECTION AREA= 3.22304E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 9.95940E-02
IY = 8.57592E-02
IXY = -9.14941E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.84432E-01 (AT 42.838 WITH (X) AXIS)
IPY = 9.21392E-04 (AT 42.838 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0122 NEW DELX = -.0122

CARTESIAN COORDINATES ON STREAMSURFACE 9

LEADING EDGE COORDINATES = (8.9390, -1.1020, 1.3662)

TRAILING EDGE COORDINATES= (9.0555, 1.1480, -1.0085)

STREAMSURFACE 10 ITERATION 1 DEVIATION = 5.192 SOLIDITY = 1.9878
ITERATION 1 DEVIATION = 5.192 SOLIDITY = 1.9878

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 10

BETA1 = -54.514 (BLADE INLET ANGLE)
BETA2 = -35.853 (BLADE OUTLET ANGLE)
YZERO = .00149 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00149 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CCRD = 2.2503 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.34974E+00

L.E.RADIUS = 4.99111E-03 CENTERED AT X= -1.1135E+00 Y= 1.4159E+00

SECTION AREA= 3.20667E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.06583E-01
IY = 8.56460E-02
IXY = -9.46995E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.91391E-01 (AT 41.846 WITH (X) AXIS)
IPY = 8.38092E-04 (AT 41.846 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0163 NEW DELX = -.0163

CARTESIAN COORDINATES ON STREAMSURFACE 10

LEADING EDGE COORDINATES = (9.1638, -1.1020, 1.4095)
TRAILING EDGE COORDINATES= (9.2434, 1.1480, -1.0600)

STREAMSURFACE 11 ITERATION 1 DEVIATION = 4.434 SOLIDITY = 2.0021
ITERATION 1 DEVIATION = 4.434 SOLIDITY = 2.0021

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 11

BETA1 = -55.198 (BLADE INLET ANGLE)
BETA2 = -38.844 (BLADE OUTLET ANGLE)
YZERO = .00146 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .04000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00146 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .6000 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 2.2500 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 3.42094E+00

L.E.RADIUS = 4.99457E-03 CENTERED AT X= -1.1180E+00 Y= 1.4595E+00

SECTION AREA= 3.18509E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 1.13575E-01
IY = 8.56060E-02
IXY = -9.78390E-02

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 1.98424E-01 (AT 40.933 WITH (X) AXIS)
IPY = 7.56945E-04 (AT 40.933 WITH (Y) AXIS)

LEADING EDGE AXIAL DIFFERENCE = .0210 NEW DELX = -.0210

CARTESIAN COORDINATES ON STREAMSURFACE 11

LEADING EDGE COORDINATES = (9.3880, -1.1020, 1.4544)
TRAILING EDGE COORDINATES= (9.4848, 1.1490, -1.1111)

VOLUME OF BLADE SECTION = 6.9677E-01

BLADE CALCULATIONS FOR AERODYNAMIC ANALYSIS

STATION 3 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.1710	-.0451	.1148	2.0038	-50.0036
7.4294	-.4548	.1080	1.9686	-49.9808
7.5771	-.8407	.1030	1.9454	-50.3689
7.9180	-3.3166	.0992	1.9337	-51.0710
8.1536	-4.8372	.0953	1.9201	-51.6368
8.3846	-3.9069	.0918	1.9096	-52.1335
8.6122	-3.3202	.0886	1.9046	-52.7518
8.8371	-3.8021	.0857	1.9035	-53.4467
9.0601	-3.4099	.0828	1.9018	-54.0848
9.2810	-2.5472	.0797	1.8981	-54.6578
9.5000	-2.9523	.0767	1.8954	-55.2135

STATION 4 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.2590	-2.8581	.1491	2.0038	-41.0761
7.5038	-2.2782	.1434	1.9686	-41.9484
7.7407	-1.0366	.1389	1.9454	-42.9413
7.9724	-3.4982	.1356	1.9337	-44.3795
8.1998	-5.4767	.1316	1.9201	-45.4646
8.4228	-3.8937	.1278	1.9096	-46.3311
8.6425	-2.6707	.1245	1.9046	-47.3381
8.8599	-3.1219	.1214	1.9035	-48.4159
9.0755	-3.1599	.1179	1.9018	-49.3621
9.2889	-2.6504	.1140	1.8981	-50.1411
9.5000	-3.1576	.1098	1.8954	-50.8357

STATION 5 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.3610	-1.2707	.1357	2.0038	-30.3318
7.5900	-.4995	.1315	1.9686	-32.0757
7.8124	1.7846	.1284	1.9454	-33.7585
8.0314	-1.0098	.1264	1.9337	-36.1900
8.2474	-3.9503	.1237	1.9201	-38.0760
8.4601	-1.7979	.1211	1.9096	-39.4949
8.6704	-.0653	.1190	1.9046	-41.0492
8.8794	-.6582	.1170	1.9035	-42.6698
9.0875	-1.4187	.1146	1.9018	-44.0946
9.2944	-1.4516	.1116	1.8981	-45.2776
9.5000	-2.1157	.1085	1.8954	-46.3595

STATION 6 NUMBER OF RADII= 11				
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.4840	3.6985	.0882	2.0038	-15.3048
7.6913	4.4539	.0854	1.9686	-18.7151
7.8953	7.6617	.0832	1.9454	-21.5222
8.0980	4.3541	.0820	1.9337	-25.5279
8.2999	.0910	.0807	1.9201	-28.7936
8.4999	2.7080	.0795	1.9096	-31.1106
8.6990	4.7812	.0787	1.9046	-33.5310
8.8982	3.9512	.0781	1.9035	-36.0072
9.0980	2.3888	.0773	1.9018	-38.2282
9.2985	1.9414	.0763	1.8981	-40.1568
9.5000	1.2490	.0753	1.8954	-42.0239

STATION 7 NUMBER OF RADII= 11				
RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.6220	14.1710	.0069	2.0038	4.0980
7.8087	14.1565	.0067	1.9686	-1.5946
7.9933	17.5446	.0065	1.9454	-6.0494
8.1777	13.6675	.0064	1.9337	-12.3628
8.3627	7.7911	.0063	1.9201	-17.8518
8.5479	10.5738	.0062	1.9096	-21.6153
8.7339	12.6299	.0063	1.9046	-25.3889
8.9216	11.4666	.0064	1.9035	-29.1797
9.1115	9.1388	.0064	1.9018	-32.6292
9.3040	8.6080	.0064	1.8981	-35.7007
9.5000	8.1803	.0065	1.8954	-38.8035

BLADE SURFACE GEOMETRY IN CARTESIAN COORD. AT SPECIFIED VALUES OF (Z)

SECTION PROPERTIES FOR SECTION NUMBER 1 (Z) = 7.1000
 SECTION AREA = 3.2738E-01

LOCATION OF CENTROID XBAR= -8.0330E-03
 RELATIVE TO STACK AXIS YBAR= -2.0273E-03

SECOND MOMENTS OF AREA IX = 4.6855E-02
 ABOUT CENTROID IY = 8.9775E-02
 IXY = -6.2048E-02

PRINCIPAL SECOND MOMENTS IPX = 2.6601E-03 (AT -35.46 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 1.3397E-01 (AT -35.46 DEG. TO (Y))

TORSIONAL CONSTANT = 2.1400E-03

SECTION PROPERTIES FOR SECTION NUMBER 2 (Z) = 7.3400
 SECTION AREA = 3.2263E-01

LOCATION OF CENTROID XBAR= -8.4920E-03
 RELATIVE TO STACK AXIS YBAR= -2.7152E-03

SECOND MOMENTS OF AREA IX = 4.9818E-02
 ABOUT CENTROID IY = 8.7421E-02
 IXY = -6.3777E-02

PRINCIPAL SECOND MOMENTS IPX = 2.1287E-03 (AT -36.79 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 1.3511E-01 (AT -36.79 DEG. TO (Y))

TORSIONAL CONSTANT = 2.0215E-03

SECTION PROPERTIES FOR SECTION NUMBER 3 (Z) = 7.5800
 SECTION AREA = 3.1992E-01

LOCATION OF CENTROID XBAR= -8.3547E-03
 RELATIVE TO STACK AXIS YBAR= -3.5196E-03

SECOND MOMENTS OF AREA IX = 5.3738E-02
 ABOUT CENTROID IY = 8.6036E-02
 IXY = -6.6194E-02

PRINCIPAL SECOND MOMENTS IPX = 1.7520E-03 (AT -38.14 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 1.3802E-01 (AT -38.14 DEG. TO (Y))

TORSIONAL CONSTANT = 1.9285E-03

SECTION PROPERTIES FOR SECTION NUMBER 4 (Z) = 7.8200
SECTION AREA = 3.2017E-01

LOCATION OF CENTROID XBAR= -7.7000E-03
RELATIVE TO STACK AXIS YBAR= -7.7528E-03

SECOND MOMENTS OF AREA IX = 5.9321E-02
ABOUT CENTROID IY = 8.5670E-02
IXY = -6.9740E-02

PRINCIPAL SECOND MOMENTS IPX = 1.5225E-03 (AT -39.65 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.4347E-01 (AT -39.65 DEG. TO (Y))

TORSIONAL CONSTANT = 1.8722E-03

SECTION PROPERTIES FOR SECTION NUMBER 5 (Z) = 8.0600
SECTION AREA = 3.2157E-01

LOCATION OF CENTROID XBAR= -5.1974E-03
RELATIVE TO STACK AXIS YBAR= -1.1578E-02

SECOND MOMENTS OF AREA IX = 6.7830E-02
ABOUT CENTROID IY = 8.5747E-02
IXY = -7.4991E-02

PRINCIPAL SECOND MOMENTS IPX = 1.2642E-03 (AT -41.59 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.5231E-01 (AT -41.59 DEG. TO (Y))

TORSIONAL CONSTANT = 1.8032E-03

SECTION PROPERTIES FOR SECTION NUMBER 6 (Z) = 8.3000
SECTION AREA = 3.2091E-01

LOCATION OF CENTROID XBAR= -2.8551E-03
RELATIVE TO STACK AXIS YBAR= -1.0377E-03

SECOND MOMENTS OF AREA IX = 7.4121E-02
ABOUT CENTROID IY = 8.5357E-02
IXY = -7.6508E-02

PRINCIPAL SECOND MOMENTS IPX = 1.0306E-03 (AT -42.95 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.5845E-01 (AT -42.95 DEG. TO (Y))

TORSIONAL CONSTANT = 1.7260E-03

SECTION PROPERTIES FOR SECTION NUMBER 7 (Z) = 8.5400

SECTION AREA = 3.2160E-01

LOCATION OF CENTROID XBAR= 1.9787E-03
RELATIVE TO STACK AXIS YBAR= 2.8361E-03

SECOND MOMENTS OF AREA IX = 8.1202E-02
ABOUT CENTROID IY = 8.5572E-02
IXY = -8.2468E-02

PRINCIPAL SECOND MOMENTS IPX = 8.9043E-04 (AT -44.24 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 1.6588E-01 (AT -44.24 DEG. TO (Y))

TORSIONAL CONSTANT = 1.6677E-03

SECTION PROPERTIES FOR SECTION NUMBER 8 (Z) = 8.7800

SECTION AREA = 3.2335E-01

LOCATION OF CENTROID XBAR= 7.0788E-03
RELATIVE TO STACK AXIS YBAR= -8.9266E-05

SECOND MOMENTS OF AREA IX = 9.0385E-02
ABOUT CENTROID IY = 8.6263E-02
IXY = -8.7534E-02

PRINCIPAL SECOND MOMENTS IPX = 1.7588E-01 (AT 44.33 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 7.6496E-04 (AT 44.33 DEG. TO (Y))

TORSIONAL CONSTANT = 1.6115E-03

SECTION PROPERTIES FOR SECTION NUMBER 9 (Z) = 9.0200

SECTION AREA = 3.2371E-01

LOCATION OF CENTROID XBAR= 1.1550E-02
RELATIVE TO STACK AXIS YBAR= 1.1652E-05

SECOND MOMENTS OF AREA IX = 9.9602E-02
ABOUT CENTROID IY = 8.6451E-02
IXY = -9.2139E-02

PRINCIPAL SECOND MOMENTS IPX = 1.8540E-01 (AT 42.96 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 6.5280E-04 (AT 42.96 DEG. TO (Y))

TORSIONAL CONSTANT = 1.5378E-03

SECTION PROPERTIES FOR SECTION NUMBER 10 (Z) = 9.2600
SECTION AREA = 3.2225E-01

LOCATION OF CENTROID XBAR= 1.6416E-02
RELATIVE TO STACK AXIS YBAR= -4.7919E-04

SECOND MOMENTS OF AREA IX = 1.0776E-01
ABOUT CENTROID IY = 8.6458E-02
IXY = -9.5960E-02

PRINCIPAL SECOND MOMENTS IPX = 1.9366E-01 (AT 41.83 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 5.6117E-04 (AT 41.83 DEG. TO (Y))

TORSIONAL CONSTANT = 1.4476E-03

SECTION PROPERTIES FOR SECTION NUMBER 11 (Z) = 9.5000
SECTION AREA = 3.1989E-01

LOCATION OF CENTROID XBAR= 2.1521E-02
RELATIVE TO STACK AXIS YBAR= 3.8523E-04

SECOND MOMENTS OF AREA IX = 1.1602E-01
ABOUT CENTROID IY = 8.6491E-02
IXY = -9.9681E-02

PRINCIPAL SECOND MOMENTS IPX = 2.0202E-01 (AT 40.79 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 4.8560E-04 (AT 40.79 DEG. TO (Y))

TORSIONAL CONSTANT = 1.3487E-03

(3) Stator Design

The stator geometry was defined using the same procedure as that used for the rotor. The printout on the following pages presents the input data and summarized results for all streamsurface and manufacturing sections. The stator leading edge incidence angle was specified as a constant 3.0 degrees from hub to tip, as shown in Figure 30. Local deviation angles were computed according to the fraction of trailing edge deviation verses fraction of axial chord distribution shown in Figure 31. Extra deviation of 1.0 degrees was added from hub to tip at the trailing edge. The leading edge radius and trailing edge half-thickness-to-chord ratios were specified to produce a constant 0.005-inch leading edge radius and a constant 0.005-inch trailing edge half-thickness from hub to tip. Blade maximum thickness was increased linearly (as a function of streamsurface number) from 4-percent chord at the hub to 6-percent at the tip. The location of maximum thickness was specified as a constant 55-percent chord from hub to tip. The vane sections were all stacked on the radial trailing edge; no axial or circumferential offsets were specified. The spanwise distributions of solidity and trailing edge deviation are shown in Figures 32 and 33.

PROGRAM UDO300 - VERSION 1.10 - ARBITRARY MEANLINE BLADE SECTION

TITLE	=CORE DESIGN - STATOR
NUMBER OF STREAMSURFACES	= 11
NUMBER OF STATIONS	= 8
NUMBER OF CONSTANT-Z PLANES	= 11
NUMBER OF BLADE DATA POINTS	= 11
NUMBER OF POINTS PER SEGMENT	= 30
NUMBER OF BLADES IN BLADE ROW	= 49
ISTAK	= 1
IPUNCH	= 1
IFPLOT	= 0
IPRINT	= 0
ISPLIT	= 0
INAST	= 0
JSPUN	= 1
JZPUN	= 1
ZINNER	= 7.7000
ZOUTER	= 9.5000
SCALE	= 1.0000
STACKX	= 4.5000
PLTSZ	= 1.0000
TOLLE	= 0.0000
LEADING EDGE STATION NUMBER	= 2
TRAILING EDGE STATION NUMBER	= 7
RADII SPECIFYING DEVIATION	= 1
RADII SPECIFYING INCIDENCE	= 1
SENSE OF ROTATION INDICATOR	= 1
DEVIATION CALCULATION INDEX	= 1
IDELET	= 1
IFLDEG	= 0
SHAPE FACTOR	= .7000
SOLIDITY TOLERANCE	= .0100

DEVIATION CURVE 1 NUMBER OF POINTS = 5 RADIUS = 0.0000

POINT	NORMALIZED MERIDIONAL CHORD	NORMALIZED DEVIATION DISTRIBUTION
1	0.0000	.1000
2	.2500	.1100
3	.5000	.1700
4	.7500	.3200
5	1.0000	1.0000

INCIDENCE AND EXTRA DEVIATION DISTRIBUTION

INLET RADIUS	INCIDENCE	EXTRA DEVIATION
0.0000	3.000	1.000

STREAMSURFACE GEOMETRY SPECIFICATION

COMPUTING STATION 1 NUMBER OF DESCRIBING POINTS= 11 IFANGS(1)= 0

DESCRIPTION		STREAMLINE NUMBER	RADII	AIR ANGLE
X	R			
2.5000	7.7080	1	7.7080	47.9998
2.5400	7.8890	2	7.8916	46.7778
2.5680	8.0690	3	8.0674	46.1948
2.5820	8.2460	4	8.2402	46.1218
2.5850	8.4240	5	8.4130	45.8284
2.5820	8.6050	6	8.5867	45.6012
2.5720	8.7850	7	8.7625	45.4646
2.5580	8.9640	8	8.9411	45.4324
2.5420	9.1430	9	9.1233	45.4951
2.5220	9.3200	10	9.3094	45.6971
2.5000	9.5000	11	9.5000	46.0822

COMPUTING STATION 2 NUMBER OF DESCRIBING POINTS= 11 IFANGS(2)= 0

DESCRIPTION		STREAMLINE NUMBER	RADII	AIR ANGLE
X	R			
2.6250	7.7510	1	7.7510	46.0781
2.6850	7.9250	2	7.9300	45.2073
2.7270	8.1000	3	8.1009	44.7190
2.7480	8.2750	4	8.2682	44.7594
2.7530	8.4500	5	8.4356	44.6216
2.7480	8.6250	6	8.6043	44.5422
2.7330	8.8000	7	8.7756	44.5460
2.7120	8.9750	8	8.9502	44.6310
2.6880	9.1500	9	9.1289	44.7927
2.6580	9.3250	10	9.3119	45.0853
2.6250	9.5000	11	9.5000	45.5624

COMPUTING STATION 3 NUMBER OF DESCRIBING POINTS= 11 IFANGS(3)= 1

DESCRIPTION		STREAMLINE NUMBER	RADII	AIR ANGLE
X	R			
3.0000	7.8560	1	7.8560	32.5150
3.0480	8.0140	2	8.0088	32.8322
3.0820	8.1760	3	8.1614	33.1588
3.0980	8.3310	4	8.3157	33.5930
3.1020	8.4900	5	8.4732	33.6882
3.0980	8.6450	6	8.6340	33.7545
3.0860	8.8160	7	8.7986	33.8184
3.0700	8.9890	8	8.9675	33.8691
3.0500	9.1580	9	9.1406	33.9243
3.0260	9.3270	10	9.3180	34.0445
3.0000	9.5000	11	9.5000	34.2867

COMPUTING STATION 4 NUMBER OF DESCRIBING POINTS= 11 IFANGS(4)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
3.3750	7.9220	1	7.9220	20.7747
3.4110	8.0700	2	8.0593	21.4446
3.4360	8.2230	3	8.2010	21.9518
3.4490	8.3710	4	8.3476	22.3759
3.4520	8.5240	5	8.4993	22.4446
3.4490	8.6710	6	8.6553	22.4745
3.4400	8.8380	7	8.8157	22.4982
3.4270	9.0030	8	8.9804	22.4977
3.4130	9.1690	9	9.1496	22.4832
3.3950	9.3330	10	9.3227	22.4934
3.3750	9.5000	11	9.5000	22.5662

COMPUTING STATION 5 NUMBER OF DESCRIBING POINTS= 11 IFANGS(5)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
3.7500	7.9440	1	7.9440	11.2337
3.7740	8.0860	2	8.0787	11.4381
3.7910	8.2370	3	8.2182	11.5891
3.7990	8.3850	4	8.3631	11.7426
3.8010	8.5400	5	8.5134	11.7114
3.7990	8.6850	6	8.6678	11.6643
3.7930	8.8510	7	8.8264	11.6225
3.7850	9.0120	8	8.9890	11.5829
3.7750	9.1750	9	9.1557	11.5405
3.7630	9.3360	10	9.3261	11.5058
3.7500	9.5000	11	9.5000	11.5028

COMPUTING STATION 6 NUMBER OF DESCRIBING POINTS= 11 IFANGS(6)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
4.1250	7.9460	1	7.9460	3.3886
4.1370	8.0900	2	8.0829	3.3960
4.1450	8.2430	3	8.2237	3.4039
4.1500	8.3960	4	8.3695	3.4207
4.1510	8.5520	5	8.5202	3.3794
4.1500	8.7000	6	8.6746	3.3436
4.1470	8.8620	7	8.8326	3.3207
4.1420	9.0200	8	8.9944	3.3022
4.1380	9.1810	9	9.1597	3.2849
4.1320	9.3400	10	9.3283	3.2734
4.1250	9.5000	11	9.5000	3.2743

COMPUTING STATION 7 NUMBER OF DESCRIBING POINTS= 2 IFANGS(7)= 1

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
4.5000	7.9480	1	7.9480	0.0000
4.5000	9.5000	2	8.0852	0.0000
		3	8.2264	0.0000
		4	8.3727	0.0000
		5	8.5239	0.0000
		6	8.6785	0.0000
		7	8.8363	0.0000
		8	8.9976	0.0000
		9	9.1622	0.0000
		10	9.3297	0.0000
		11	9.5000	0.0000

COMPUTING STATION 8 NUMBER OF DESCRIBING POINTS= 2 IFANGS(8)= 0

DESCRIPTION X	R	STREAMLINE NUMBER	RADII	AIR ANGLE
4.8750	7.9480	1	7.9480	0.0000
4.8750	9.5000	2	8.0857	0.0000
		3	8.2273	0.0000
		4	8.3740	0.0000
		5	8.5254	0.0000
		6	8.6801	0.0000
		7	8.8379	0.0000
		8	8.9990	0.0000
		9	9.1632	0.0000
		10	9.3302	0.0000
		11	9.5000	0.0000

SECTION GEOMETRY SPECIFICATIONS

STREAM LINE	SOLID MOD	LE RAD /CHORD	MAX TK /CHORD	TE THK /CHORD	PT OF MAX TK	X STAK OFFSET	Y STAK OFFSET
1.0	0.000	.00251	.04000	.00251	.55000	0.00000	0.00000
2.0	0.000	.00261	.04200	.00261	.55000	0.00000	0.00000
3.0	0.000	.00267	.04400	.00267	.55000	0.00000	0.00000
4.0	0.000	.00271	.04600	.00271	.55000	0.00000	0.00000
5.0	0.000	.00272	.04800	.00272	.55000	0.00000	0.00000
6.0	0.000	.00272	.05000	.00272	.55000	0.00000	0.00000
7.0	0.000	.00270	.05200	.00270	.55000	0.00000	0.00000
8.0	0.000	.00267	.05400	.00267	.55000	0.00000	0.00000
9.0	0.000	.00263	.05600	.00263	.55000	0.00000	0.00000
10.0	0.000	.00259	.05800	.00259	.55000	0.00000	0.00000
11.0	0.000	.00254	.06000	.00254	.55000	0.00000	0.00000

STREAMSURFACE 1 ITERATION 1 DEVIATION = 7.615 SOLIDITY = 2.0473
 ITERATION 2 DEVIATION = 7.826 SOLIDITY = 1.9731
 ITERATION 2 DEVIATION = 7.826 SOLIDITY = 1.9731

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 1

BETA1 = 43.078 (BLADE INLET ANGLE)
 BETA2 = -7.826 (BLADE OUTLET ANGLE)
 YZERO = .00251 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00251 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.8963 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.98447E+00

L.E.RADIUS = 4.98103E-03 CENTERED AT X= -1.8913E+00 Y= -5.8648E-01

SECTION AREA= 1.12177E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.39392E-03
 IY = 2.29813E-02
 IXY = 6.72020E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.94470E-04 (AT 16.569 WITH (X) AXIS)
 IPY = 2.49807E-02 (AT 16.569 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 1

LEADING EDGE COORDINATES = (7.7292, -1.8749, -.5812)
 TRAILING EDGE COORDINATES= (7.9480, -.0000, .0050)

STREAMSURFACE 2 ITERATION 1 DEVIATION = 7.736 SOLIDITY = 1.9267
 ITERATION 2 DEVIATION = 7.935 SOLIDITY = 1.8626
 ITERATION 2 DEVIATION = 7.935 SOLIDITY = 1.8626

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 2

BETA1 = 42.207 (BLADE INLET ANGLE)
 BETA2 = -7.935 (BLADE OUTLET ANGLE)
 YZERO = .00261 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00261 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.8263 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.91108E+00

L.E.RADIUS = 4.98793E-03 CENTERED AT X= -1.8213E+00 Y= -5.6428E-01

SECTION AREA= 1.09108E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.18852E-03
 IY = 2.06529E-02
 IXY = 6.09048E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.60546E-04 (AT 16.706 WITH (X) AXIS)
 IPY = 2.24809E-02 (AT 16.706 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 2

LEADING EDGE COORDINATES = (7.9101, -1.8135, -.5609)
 TRAILING EDGE COORDINATES= (8.0852, -.0000, .0050)

STREAMSURFACE 3 ITERATION 1 DEVIATION = 7.890 SOLIDITY = 1.8395
 ITERATION 2 DEVIATION = 8.083 SOLIDITY = 1.7823
 ITERATION 2 DEVIATION = 8.083 SOLIDITY = 1.7823

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 3

BETA1 = 41.719 (BLADE INLET ANGLE)
 BETA2 = -8.083 (BLADE OUTLET ANGLE)
 YZERO = .00267 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00267 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7808 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.86424E+00
 L.E.RADIUS = 4.97753E-03 CENTERED AT X= -1.7759E+00 Y= -5.5291E-01
 SECTION AREA= 1.08610E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.11369E-03
 IY = 1.94657E-02
 IXY = 5.80760E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.49329E-04 (AT 16.899 WITH (X) AXIS)
 IPY = 2.12301E-02 (AT 16.899 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 3

LEADING EDGE COORDINATES = (8.0821, -1.7728, -.5508)
 TRAILING EDGE COORDINATES = (8.2264, -.0000, .0050)

STREAMSURFACE 4 ITERATION 1 DEVIATION = 8.118 SOLIDITY = 1.7816
 ITERATION 2 DEVIATION = 8.312 SOLIDITY = 1.7277
 ITERATION 2 DEVIATION = 8.312 SOLIDITY = 1.7277

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 4

BETA1 = 41.759 (BLADE INLET ANGLE)
 BETA2 = -8.312 (BLADE OUTLET ANGLE)
 YZERO = .00271 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00271 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7576 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.84184E+00

L.E.RADIUS = 4.99138E-03 CENTERED AT X= -1.7526E+00 Y= -5.5210E-01

SECTION AREA= 1.10709E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.16212E-03
 IY = 1.92634E-02
 IXY = 5.83819E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.59120E-04 (AT 17.162 WITH (X) AXIS)
 IPY = 2.10664E-02 (AT 17.162 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 4

LEADING EDGE COORDINATES = (8.2498, -1.7525, -.5510)
 TRAILING EDGE COORDINATES= (8.3727, -.0000, .0050)

STREAMSURFACE 5 ITERATION 1 DEVIATION = 8.246 SOLIDITY = 1.7401
 ITERATION 2 DEVIATION = 8.442 SOLIDITY = 1.6881
 ITERATION 2 DEVIATION = 8.442 SOLIDITY = 1.6881

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 5

BETA1 = 41.622 (BLADE INLET ANGLE)
 BETA2 = -8.442 (BLADE OUTLET ANGLE)
 YZERO = .00272 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .04800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00272 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7504 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.83400E+00

L.E.RADIUS = 4.98849E-03 CENTERED AT X= -1.7454E+00 Y= -5.4900E-01

SECTION AREA= 1.14295E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.20909E-03
 IY = 1.96442E-02
 IXY = 5.94871E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.72837E-04 (AT 17.155 WITH (X) AXIS)
 IPY = 2.14804E-02 (AT 17.155 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 5

LEADING EDGE COORDINATES = (8.4177, -1.7470, -.5485)
 TRAILING EDGE COORDINATES= (8.5239, -.0000, .0050)

STREAMSURFACE 6 ITERATION 1 DEVIATION = 8.356 SOLIDITY = 1.7097
 ITERATION 2 DEVIATION = 8.555 SOLIDITY = 1.6587
 ITERATION 2 DEVIATION = 8.555 SOLIDITY = 1.6587

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 6

BETA1 = 41.542 (BLADE INLET ANGLE)
 BETA2 = -8.555 (BLADE OUTLET ANGLE)
 YZERO = .00272 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .05000 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00272 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7531 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.83638E+00

L.E.RADIUS = 4.99496E-03 CENTERED AT X=-1.7481E+00 Y= -5.4831E-01

SECTION AREA= 1.19103E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.29465E-03
 IY = 2.04545E-02
 IXY = 6.17442E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 3.94210E-04 (AT 17.108 WITH (X) AXIS)
 IPY = 2.23550E-02 (AT 17.108 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 6

LEADING EDGE COORDINATES = (8.5868, -1.7509, -.5484)
 TRAILING EDGE COORDINATES= (8.6784, -.0000, .0050)

STREAMSURFACE 7 ITERATION 1 DEVIATION = 8.454 SOLIDITY = 1.6899
 ITERATION 2 DEVIATION = 8.656 SOLIDITY = 1.6393
 ITERATION 2 DEVIATION = 8.656 SOLIDITY = 1.6393

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 7

BETA1 = 41.546 (BLADE INLET ANGLE)
 BETA2 = -8.656 (BLADE OUTLET ANGLE)
 YZERO = .00270 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .05200 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00270 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7658 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.84948E+00

L.E.RADIUS = 4.99360E-03 CENTERED AT X= -1.7608E+00 Y= -5.5154E-01

SECTION AREA= 1.25342E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.43849E-03
 IY = 2.17506E-02
 IXY = 6.55154E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 4.25698E-04 (AT 17.078 WITH (X) AXIS)
 IPY = 2.37634E-02 (AT 17.078 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 7

LEADING EDGE COORDINATES = (8.7582, -1.7644, -.5521)
 TRAILING EDGE COORDINATES= (8.8363, -.0000, .0050)

STREAMSURFACE 8 ITERATION 1 DEVIATION = 8.551 SOLIDITY = 1.6774
 ITERATION 2 DEVIATION = 8.758 SOLIDITY = 1.6266
 ITERATION 2 DEVIATION = 8.758 SOLIDITY = 1.6266

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 8

BETA1 = 41.631 (BLADE INLET ANGLE)
 BETA2 = -8.758 (BLADE OUTLET ANGLE)
 YZERO = .00267 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .05400 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00267 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.7857 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.87013E+00

L.E.RADIUS = 4.99326E-03 CENTERED AT X=-1.7807E+00 Y= -5.5737E-01

SECTION AREA= 1.32784E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.63060E-03
 IY = 2.34724E-02
 IXY = 7.05485E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 4.67138E-04 (AT 17.049 WITH (X) AXIS)
 IPY = 2.56358E-02 (AT 17.049 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 8

LEADING EDGE COORDINATES = (8.9327, -1.7848, -.5583)

TRAILING EDGE COORDINATES= (8.9976, -.0000, .0050)

STREAMSURFACE 9 ITERATION 1 DEVIATION = 8.659 SOLIDITY = 1.6686
ITERATION 2 DEVIATION = 8.873 SOLIDITY = 1.6170
ITERATION 2 DEVIATION = 8.873 SOLIDITY = 1.6170

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 9

BETA1 = 41.793 (BLADE INLET ANGLE)
BETA2 = -8.873 (BLADE OUTLET ANGLE)
YZERO = .00263 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
T = .05600 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
YONE = .00263 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
CORD = 1.8092 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.89465E+00

L.E.RADIUS = 4.98294E-03 CENTERED AT X= -1.8042E+00 Y= -5.6428E-01

SECTION AREA= 1.41015E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 2.85313E-03
IY = 2.54934E-02
IXY = 7.64165E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 5.15294E-04 (AT 17.011 WITH (X) AXIS)
IPY = 2.78312E-02 (AT 17.011 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 9

LEADING EDGE COORDINATES = (9.1114, -1.8088, -.5656)
TRAILING EDGE COORDINATES= (9.1622, -.0000, .0050)

STREAMSURFACE 10 ITERATION 1 DEVIATION = 8.784 SOLIDITY = 1.6666
 ITERATION 2 DEVIATION = 9.006 SOLIDITY = 1.6136
 ITERATION 2 DEVIATION = 9.006 SOLIDITY = 1.6136

STREAMSURFACE GEOMETRY ON STREAMLINE NUMBER 10

BETA1 = 42.085 (BLADE INLET ANGLE)
 BETA2 = -9.006 (BLADE OUTLET ANGLE)
 YZERO = .00259 (BLADE LEADING EDGE RADIUS AS A FRACTION OF CHORD)
 T = .05800 (BLADE MAXIMUM THICKNESS AS A FRACTION OF CHORD)
 YONE = .00259 (BLADE TRAIL. EDGE HALF-THICK. AS A FRAC. OF CHORD)
 Z = .5500 (LOCATION OF MAX. THICK. AS A FRACTION OF MEAN LINE)
 CORD = 1.8397 (MERIDIONAL CHORD OF SECTION)

DIMENSIONAL RESULTS - ALL RESULTS REFER TO A BLADE OF SPECIFIED CHORD

BLADE CHORD = 1.92688E+00

L.E.RADIUS = 4.99061E-03 CENTERED AT X= -1.8347E+00 Y= -5.7474E-01

SECTION AREA= 1.50777E-01

SECOND MOMENTS OF AREA ABOUT CENTROID

IX = 3.15300E-03
 IY = 2.80977E-02
 IXY = 8.41517E-03

PRINCIPAL SECOND MOMENTS OF AREA ABOUT CENTROID

IPX = 5.79601E-04 (AT 17.004 WITH (X) AXIS)
 IPY = 3.06711E-02 (AT 17.004 WITH (Y) AXIS)

CARTESIAN COORDINATES ON STREAMSURFACE 10

LEADING EDGE COORDINATES = (9.2941, -1.8396, -.5765)
 TRAILING EDGE COORDINATES= (9.3297, -.0000, .0050)

BLADE CALCULATIONS FOR AERODYNAMIC ANALYSIS

STATION 3 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.8560	-2.8285	.0609	1.9725	34.1537
8.0088	-2.8726	.0596	1.8621	33.6079
8.1614	-1.9130	.0596	1.7818	33.2390
8.3157	-1.9032	.0605	1.7272	33.1774
8.4732	-2.4364	.0615	1.6876	32.9985
8.6340	-1.5128	.0627	1.6582	32.9996
8.7986	-1.3247	.0642	1.6388	33.0152
8.9675	-1.1183	.0662	1.6261	33.0646
9.1406	-.6083	.0680	1.6165	33.1302
9.3180	-.3227	.0702	1.6131	33.2773
9.5000	-.1225	.0729	1.6140	33.5593

STATION 4 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.9220	-.6252	.0792	1.9725	20.3826
8.0593	-.8569	.0787	1.8621	20.8426
8.2010	-.9677	.0792	1.7818	21.1361
8.3476	-1.1719	.0806	1.7272	21.3954
8.4993	-1.2590	.0823	1.6876	21.3613
8.6553	-.8772	.0842	1.6582	21.3613
8.8157	-.6611	.0866	1.6388	21.3571
8.9804	-.6396	.0892	1.6261	21.3440
9.1496	-.5973	.0919	1.6165	21.3218
9.3227	-.4074	.0950	1.6131	21.3269
9.5000	-.3488	.0985	1.6140	21.3998

STATION 5 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.9440	-.0582	.0767	1.9725	9.8473
8.0787	-.2016	.0764	1.8621	10.0438
8.2182	-.3525	.0768	1.7818	10.1583
8.3631	-.4317	.0780	1.7272	10.2575
8.5134	-.4611	.0796	1.6876	10.1924
8.6678	-.3494	.0815	1.6582	10.1213
8.8264	-.3372	.0838	1.6388	10.0566
8.9890	-.3267	.0864	1.6261	9.9964
9.1557	-.2990	.0891	1.6165	9.9339
9.3261	-.3789	.0921	1.6131	9.8766
9.5000	-.4217	.0953	1.6140	9.8449

STATION 6 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.9460	.3889	.0539	1.9725	.1118
8.0829	.2779	.0537	1.8621	.0974
8.2237	.0310	.0540	1.7818	.0562
8.3695	-.0573	.0546	1.7272	-.0301
8.5202	-.0379	.0556	1.6876	-.1279
8.6746	-.0587	.0569	1.6582	-.2091
8.8326	-.1026	.0583	1.6388	-.2758
8.9944	-.1281	.0601	1.6261	-.3260
9.1597	-.1414	.0618	1.6165	-.3977
9.3283	-.2497	.0637	1.6131	-.4655
9.5000	-.3083	.0659	1.6140	-.5339

STATION 7 NUMBER OF RADII= 11

RADIUS	LEAN ANGLE	BLOCKAGE	SOLIDITY	BLADE ANGLE
7.9480	-.0000	.0098	1.9725	-7.8527
8.0852	-.0000	.0096	1.8621	-7.9637
8.2264	-.0000	.0094	1.7818	-8.1124
8.3727	-.0000	.0093	1.7272	-8.3442
8.5239	-.0000	.0091	1.6876	-8.4748
8.6785	.0000	.0089	1.6582	-8.5883
8.8363	.0000	.0088	1.6388	-8.6901
8.9976	.0000	.0086	1.6261	-8.7917
9.1622	.0000	.0084	1.6165	-8.9067
9.3297	.0000	.0083	1.6131	-9.0401
9.5000	.0000	.0081	1.6140	-9.2193

BLADE SURFACE GEOMETRY IN CARTESIAN COORD. AT SPECIFIED VALUES OF (Z)

SECTION PROPERTIES FOR SECTION NUMBER 1 (Z) = 7.7000
 SECTION AREA = 1.1147E-01

LOCATION OF CENTROID XBAR= -9.8462E-01
 RELATIVE TO STACK AXIS YBAR= -1.0158E-01

SECOND MOMENTS OF AREA IX = 2.2437E-03
 ABOUT CENTROID IY = 2.3025E-02
 IXY = 6.4508E-03

PRINCIPAL SECOND MOMENTS IPX = 4.0407E-04 (AT 15.92 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 2.4864E-02 (AT 15.92 DEG. TO (Y))

TORSIONAL CONSTANT = 1.5338E-04

SECTION PROPERTIES FOR SECTION NUMBER 2 (Z) = 7.8800
 SECTION AREA = 1.0849E-01

LOCATION OF CENTROID XBAR= -9.4480E-01
 RELATIVE TO STACK AXIS YBAR= -9.9899E-02

SECOND MOMENTS OF AREA IX = 2.0857E-03
 ABOUT CENTROID IY = 2.0759E-02
 IXY = 5.9341E-03

PRINCIPAL SECOND MOMENTS IPX = 3.5948E-04 (AT 16.22 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 2.2485E-02 (AT 16.22 DEG. TO (Y))

TORSIONAL CONSTANT = 1.5250E-04

SECTION PROPERTIES FOR SECTION NUMBER 3 (Z) = 8.0600
 SECTION AREA = 1.0667E-01

LOCATION OF CENTROID XBAR= -9.1286E-01
 RELATIVE TO STACK AXIS YBAR= -1.0029E-01

SECOND MOMENTS OF AREA IX = 2.0115E-03
 ABOUT CENTROID IY = 1.9239E-02
 IXY = 5.6474E-03

PRINCIPAL SECOND MOMENTS IPX = 3.2530E-04 (AT 16.62 DEG. TO (X))
 OF AREA ABOUT CENTROID IPY = 2.0925E-02 (AT 16.62 DEG. TO (Y))

TORSIONAL CONSTANT = 1.5356E-04

SECTION PROPERTIES FOR SECTION NUMBER 4 (Z) = 8.2400
SECTION AREA = 1.0810E-01

LOCATION OF CENTROID XBAR= -8.9671E-01
RELATIVE TO STACK AXIS YBAR= -1.0188E-01

SECOND MOMENTS OF AREA IX = 2.0669E-03
ABOUT CENTROID IY = 1.8873E-02
IXY = 5.6919E-03

PRINCIPAL SECOND MOMENTS IPX = 3.2060E-04 (AT 17.06 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.0619E-02 (AT 17.06 DEG. TO (Y))

TORSIONAL CONSTANT = 1.6451E-04

SECTION PROPERTIES FOR SECTION NUMBER 5 (Z) = 8.4200
SECTION AREA = 1.1199E-01

LOCATION OF CENTROID XBAR= -8.9099E-01
RELATIVE TO STACK AXIS YBAR= -1.0180E-01

SECOND MOMENTS OF AREA IX = 2.1429E-03
ABOUT CENTROID IY = 1.9288E-02
IXY = 5.8725E-03

PRINCIPAL SECOND MOMENTS IPX = 3.2436E-04 (AT 17.21 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.1107E-02 (AT 17.21 DEG. TO (Y))

TORSIONAL CONSTANT = 1.8533E-04

SECTION PROPERTIES FOR SECTION NUMBER 6 (Z) = 8.6000
SECTION AREA = 1.1728E-01

LOCATION OF CENTROID XBAR= -8.9168E-01
RELATIVE TO STACK AXIS YBAR= -1.0058E-01

SECOND MOMENTS OF AREA IX = 2.2382E-03
ABOUT CENTROID IY = 2.0201E-02
IXY = 6.1395E-03

PRINCIPAL SECOND MOMENTS IPX = 3.4034E-04 (AT 17.18 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.2099E-02 (AT 17.18 DEG. TO (Y))

TORSIONAL CONSTANT = 2.1309E-04

SECTION PROPERTIES FOR SECTION NUMBER 7 (Z) = 8.7800
SECTION AREA = 1.2409E-01

LOCATION OF CENTROID XBAR= -8.9821E-01
RELATIVE TO STACK AXIS YBAR= -1.0022E-01

SECOND MOMENTS OF AREA IX = 2.3943E-03
ABOUT CENTROID IY = 2.1639E-02
IXY = 6.5692E-03

PRINCIPAL SECOND MOMENTS IPX = 3.6575E-04 (AT 17.16 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.3667E-02 (AT 17.16 DEG. TO (Y))

TORSIONAL CONSTANT = 2.4952E-04

SECTION PROPERTIES FOR SECTION NUMBER 8 (Z) = 8.9600
SECTION AREA = 1.3215E-01

LOCATION OF CENTROID XBAR= -9.0867E-01
RELATIVE TO STACK AXIS YBAR= -1.0004E-01

SECOND MOMENTS OF AREA IX = 2.5948E-03
ABOUT CENTROID IY = 2.3508E-02
IXY = 7.1218E-03

PRINCIPAL SECOND MOMENTS IPX = 3.9992E-04 (AT 17.13 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.5703E-02 (AT 17.13 DEG. TO (Y))

TORSIONAL CONSTANT = 2.9558E-04

SECTION PROPERTIES FOR SECTION NUMBER 9 (Z) = 9.1400
SECTION AREA = 1.4088E-01

LOCATION OF CENTROID XBAR= -9.2091E-01
RELATIVE TO STACK AXIS YBAR= -9.9993E-02

SECOND MOMENTS OF AREA IX = 2.8229E-03
ABOUT CENTROID IY = 2.5662E-02
IXY = 7.7541E-03

PRINCIPAL SECOND MOMENTS IPX = 4.3914E-04 (AT 17.09 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 2.8046E-02 (AT 17.09 DEG. TO (Y))

TORSIONAL CONSTANT = 3.5004E-04

SECTION PROPERTIES FOR SECTION NUMBER 10 (Z) = 9.3200
SECTION AREA = 1.5101E-01

LOCATION OF CENTROID XBAR= -9.3679E-01
RELATIVE TO STACK AXIS YBAR= -1.0047E-01

SECOND MOMENTS OF AREA IX = 3.1250E-03
ABOUT CENTROID IY = 2.8373E-02
IXY = 8.5683E-03

PRINCIPAL SECOND MOMENTS IPX = 4.9183E-04 (AT 17.08 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 3.1006E-02 (AT 17.08 DEG. TO (Y))

TORSIONAL CONSTANT = 4.1796E-04

SECTION PROPERTIES FOR SECTION NUMBER 11 (Z) = 9.5000
SECTION AREA = 1.6231E-01

LOCATION OF CENTROID XBAR= -9.5493E-01
RELATIVE TO STACK AXIS YBAR= -1.0152E-01

SECOND MOMENTS OF AREA IX = 3.5134E-03
ABOUT CENTROID IY = 3.1556E-02
IXY = 9.5679E-03

PRINCIPAL SECOND MOMENTS IPX = 5.6003E-04 (AT 17.15 DEG. TO (X))
OF AREA ABOUT CENTROID IPY = 3.4510E-02 (AT 17.15 DEG. TO (Y))

TORSIONAL CONSTANT = 5.0100E-04

SECTION IV

SUMMARY

Details of the designs of two single-stage axial compressors have been presented. At some future date, these stages will be fabricated and tested with a matrix of wakes artificially generated upstream. Hopefully, the results of this experimental investigation will provide guidance which designers can use to correctly predict the flow-swallowing capacity of transonic or supersonic stages having periodic non-uniform inlet flow. The performance of these two stages and the success of the future investigations will be evaluated in more detail at that time.

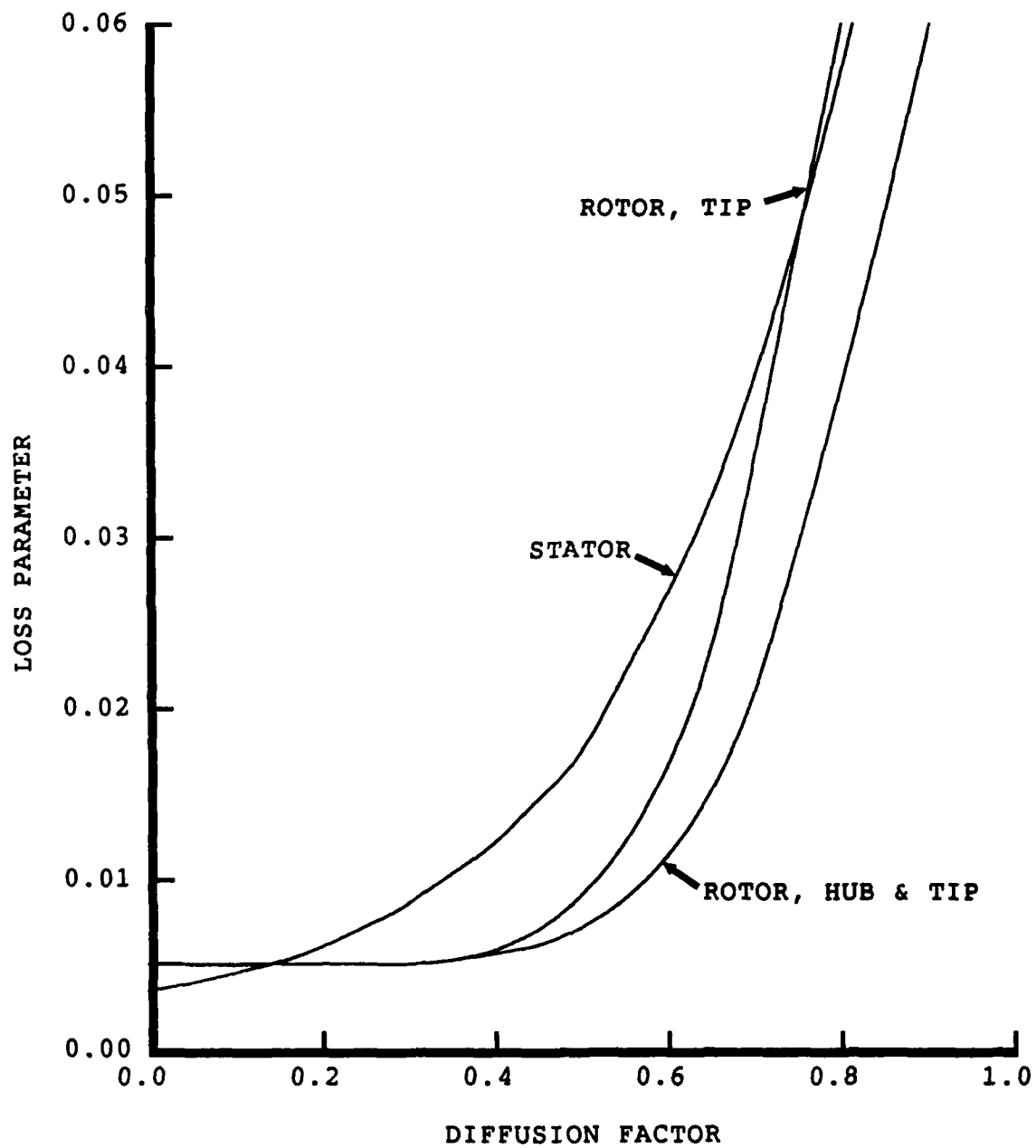


Figure 1. Assumed Relationships Between Total Pressure Loss Parameter and Diffusion Factor

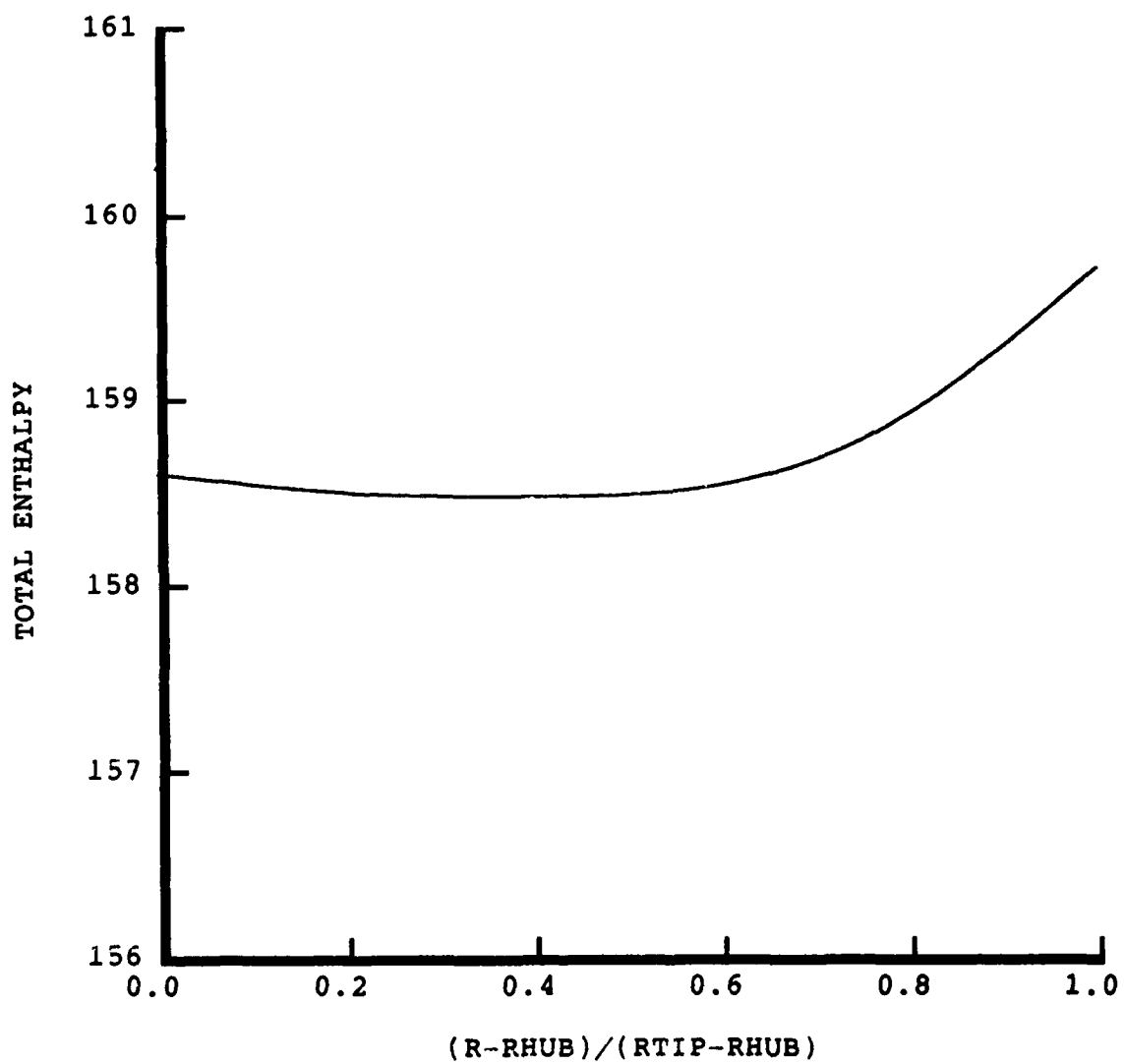


Figure 2. Radial Variation of Total Enthalpy Across the Rotor Exit (Fan)

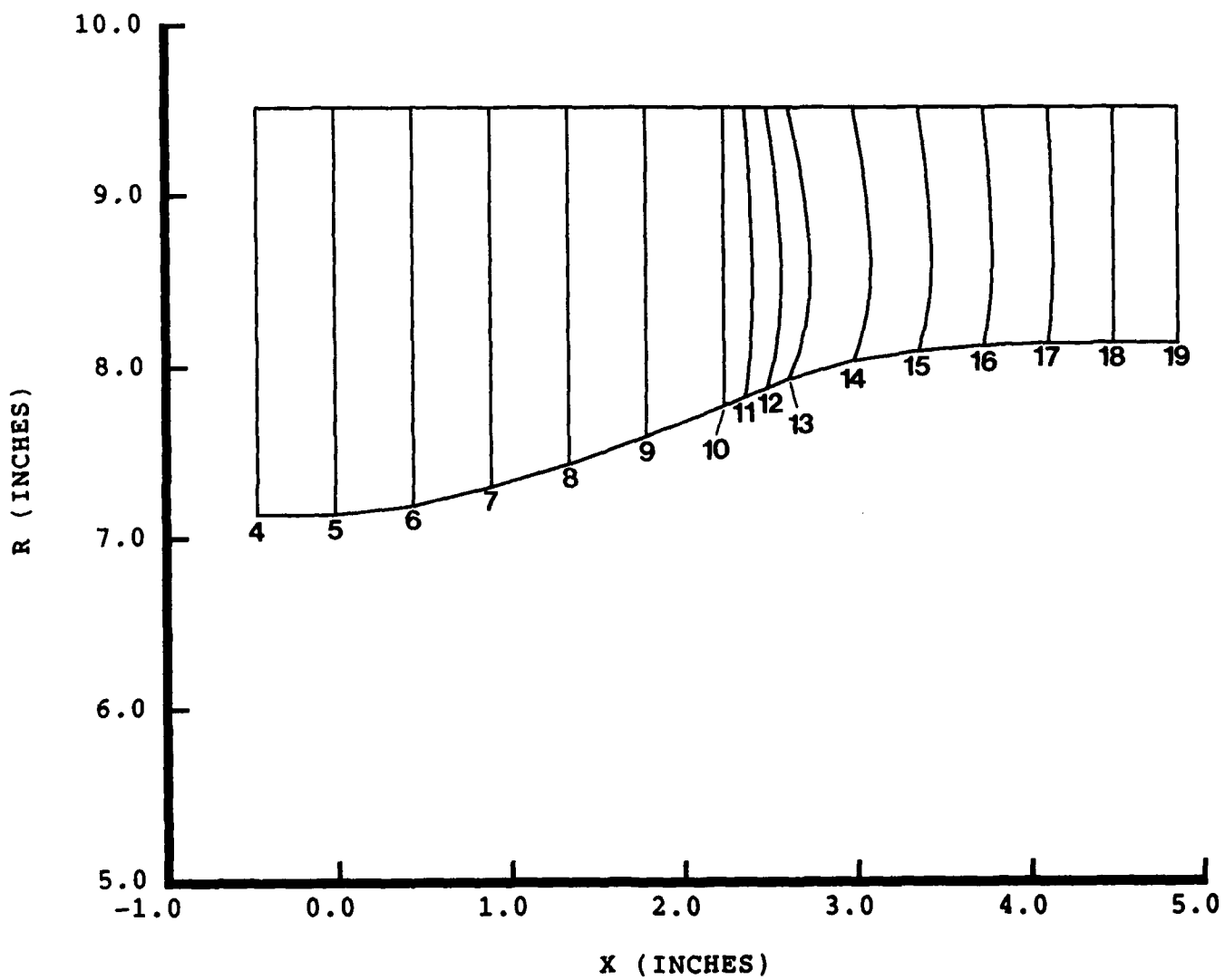


Figure 3. Detailed Aerodynamic Design Computing Station Geometry (Fan)

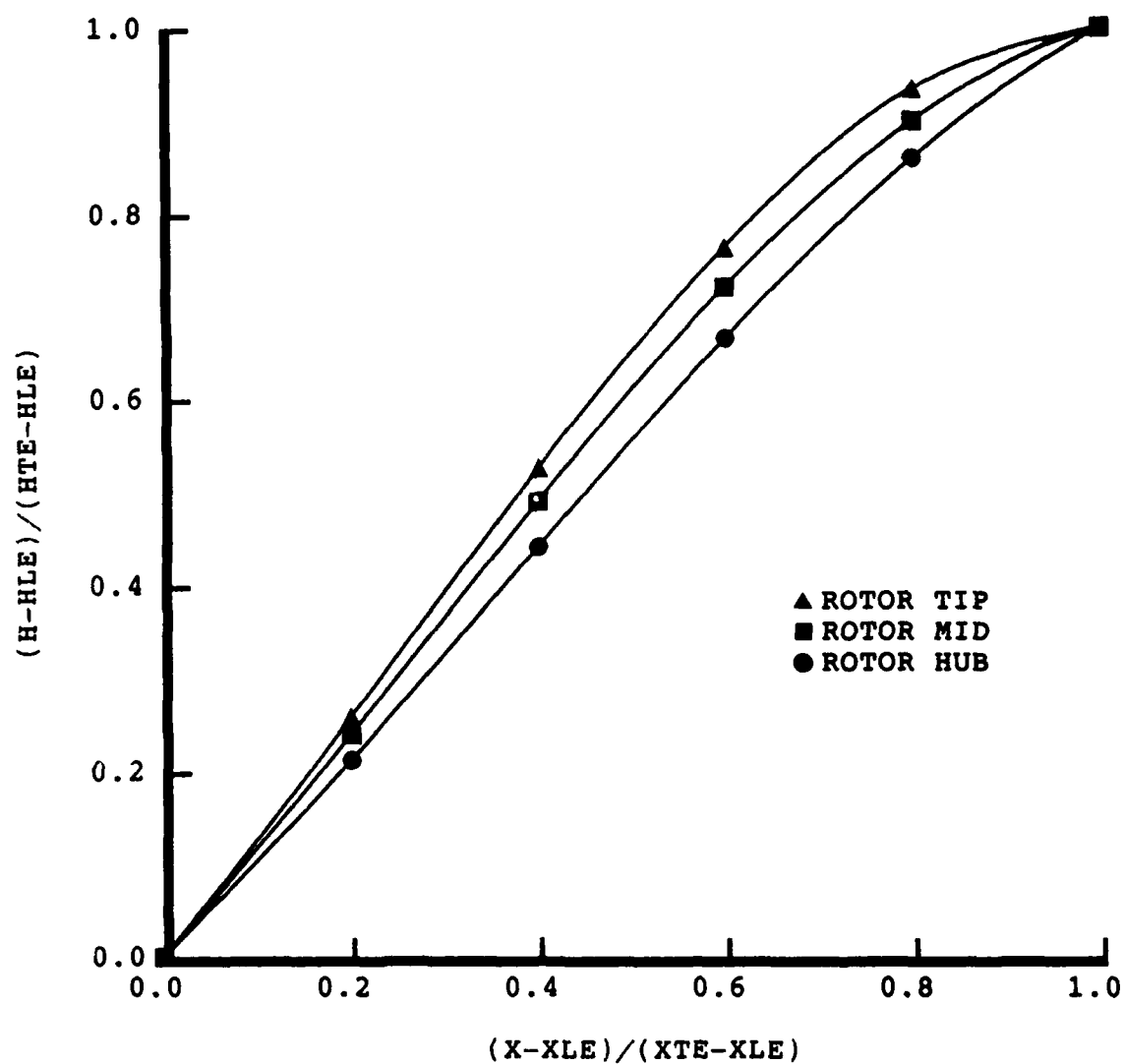


Figure 4. Streamwise Distributions of Non-dimensional Total Enthalpy Through Rotor (Fan)

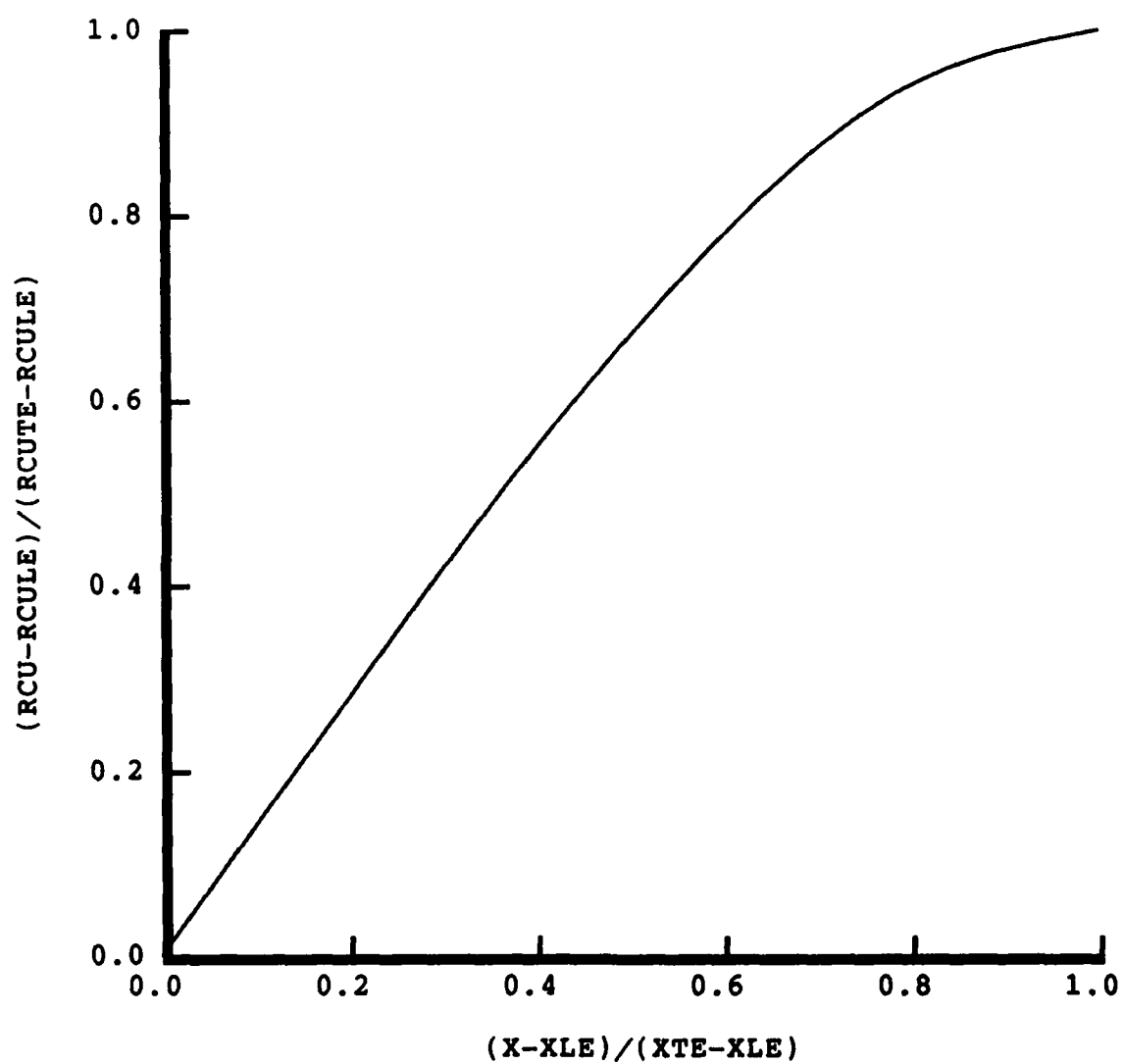


Figure 5. Streamwise Distribution of Non-dimensional Radius-Times-Swirl Velocity Through Stator (Fan)

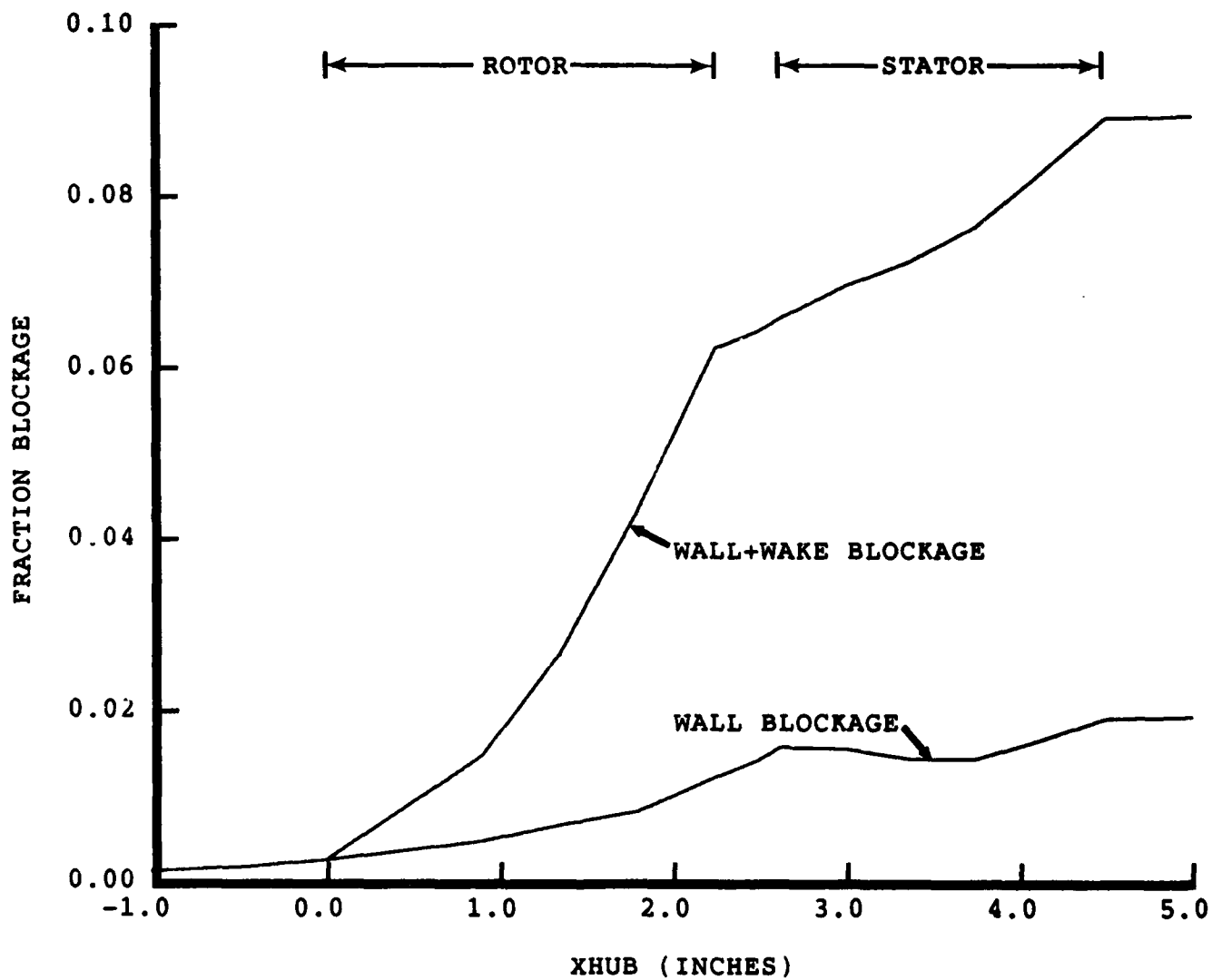


Figure 6. Axial Distribution of Aerodynamic Blockage (Fan)

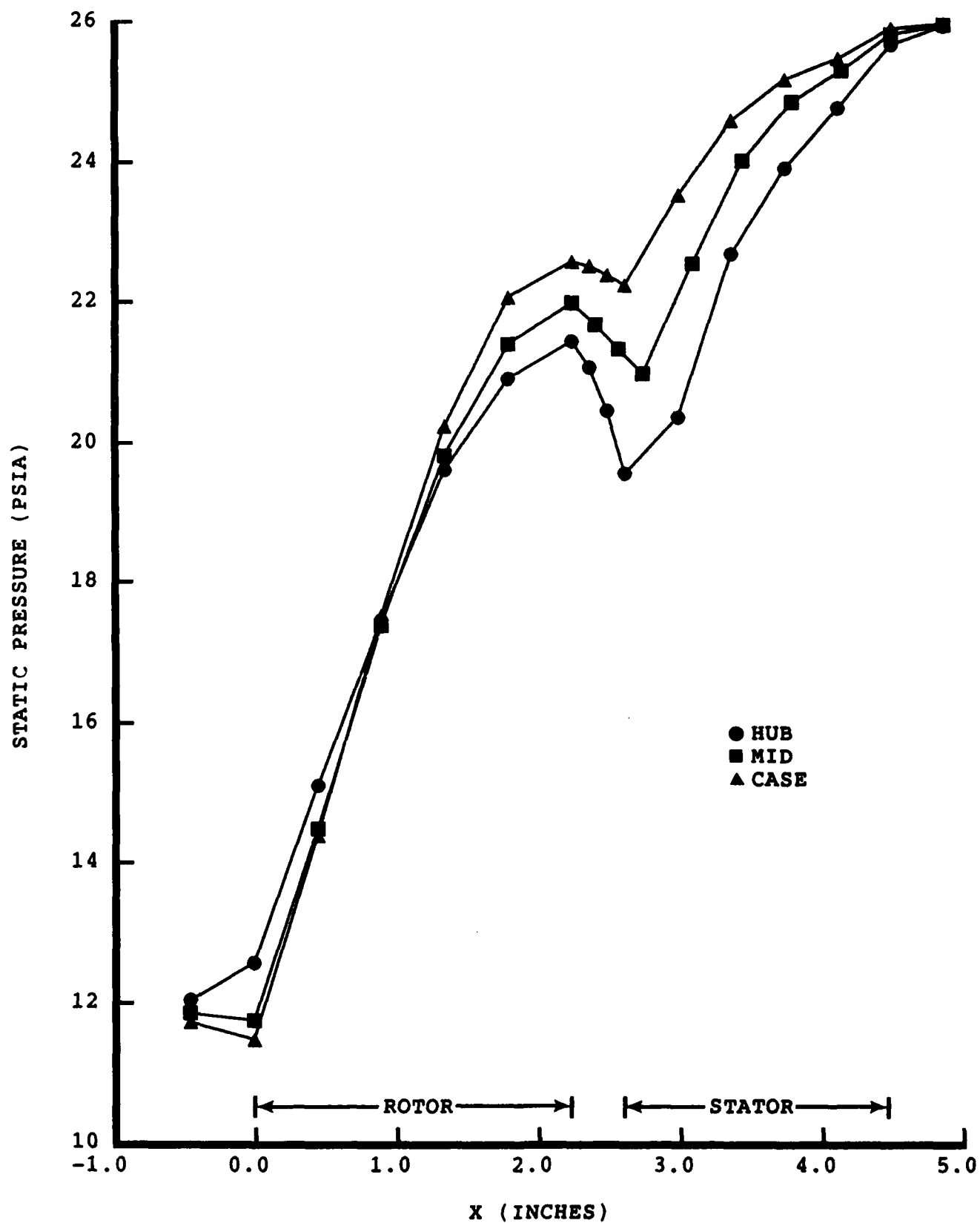


Figure 7. Axial Distributions of Static Pressure along the Hub, Mid, and Case Streamsurfaces (Fan)

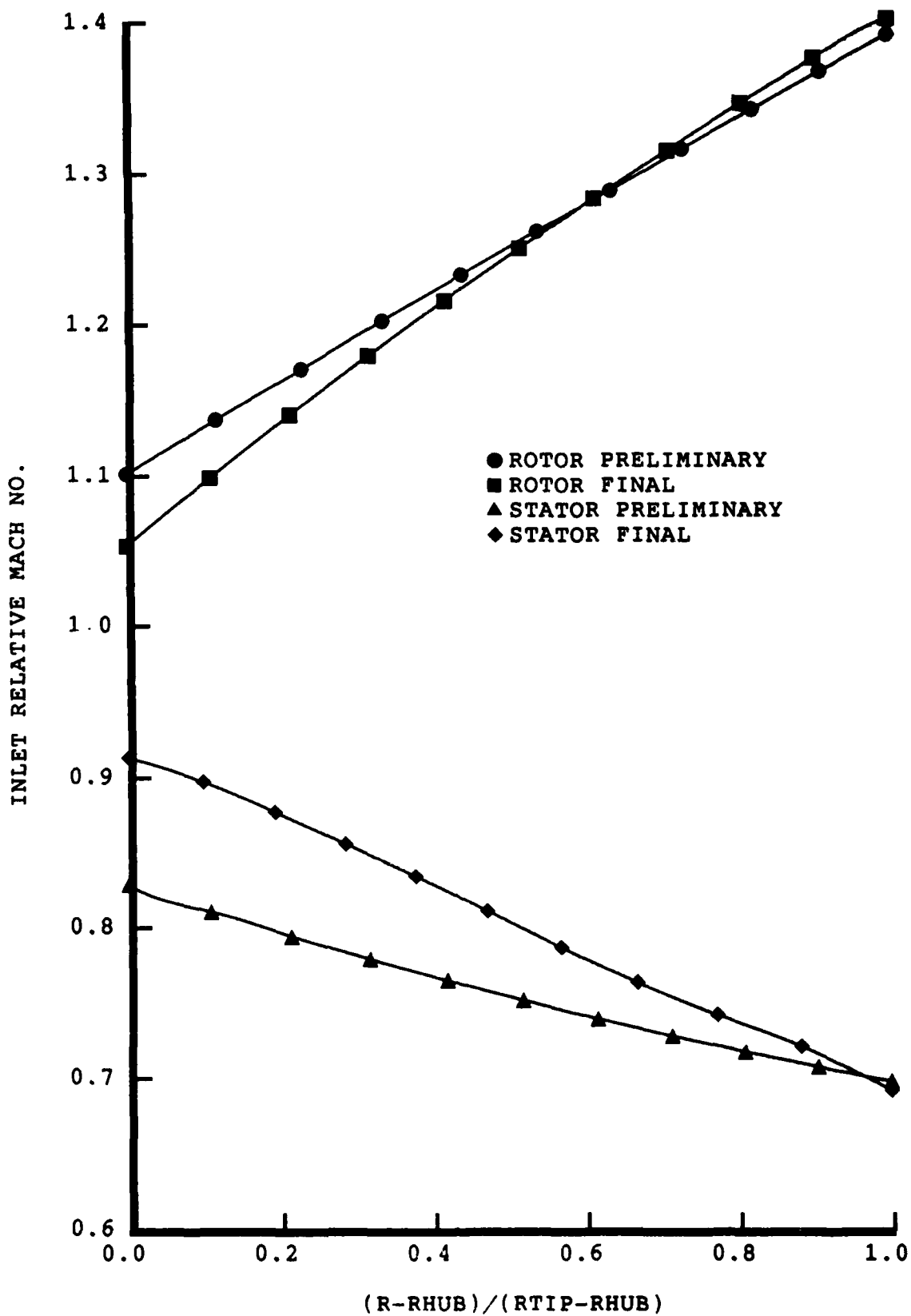


Figure 8. Relative Inlet Mach Number Distributions at Rotor and Stator Leading Edges (Fan)

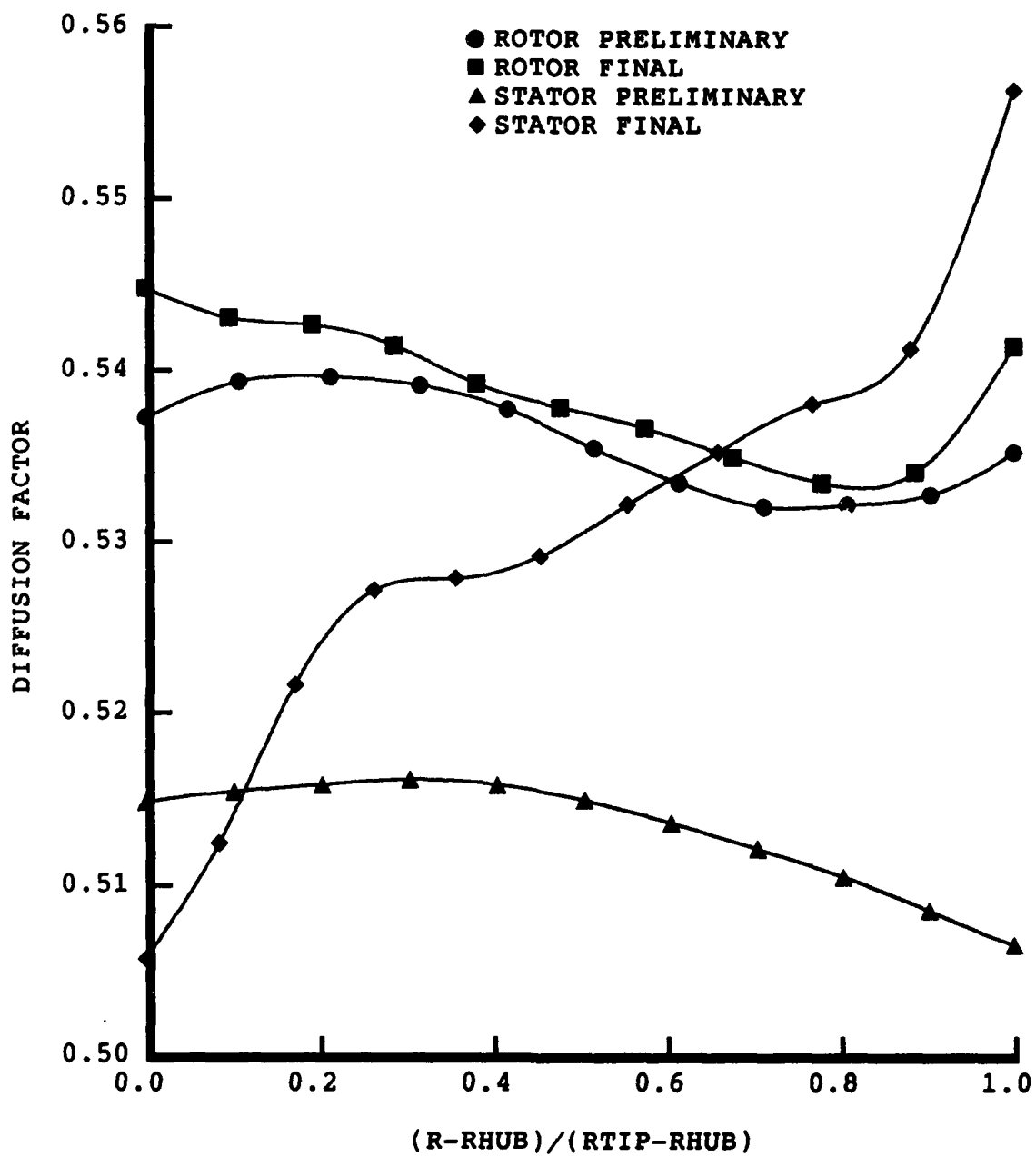


Figure 9. Diffusion Factor Distributions for Rotor and Stator (Fan)

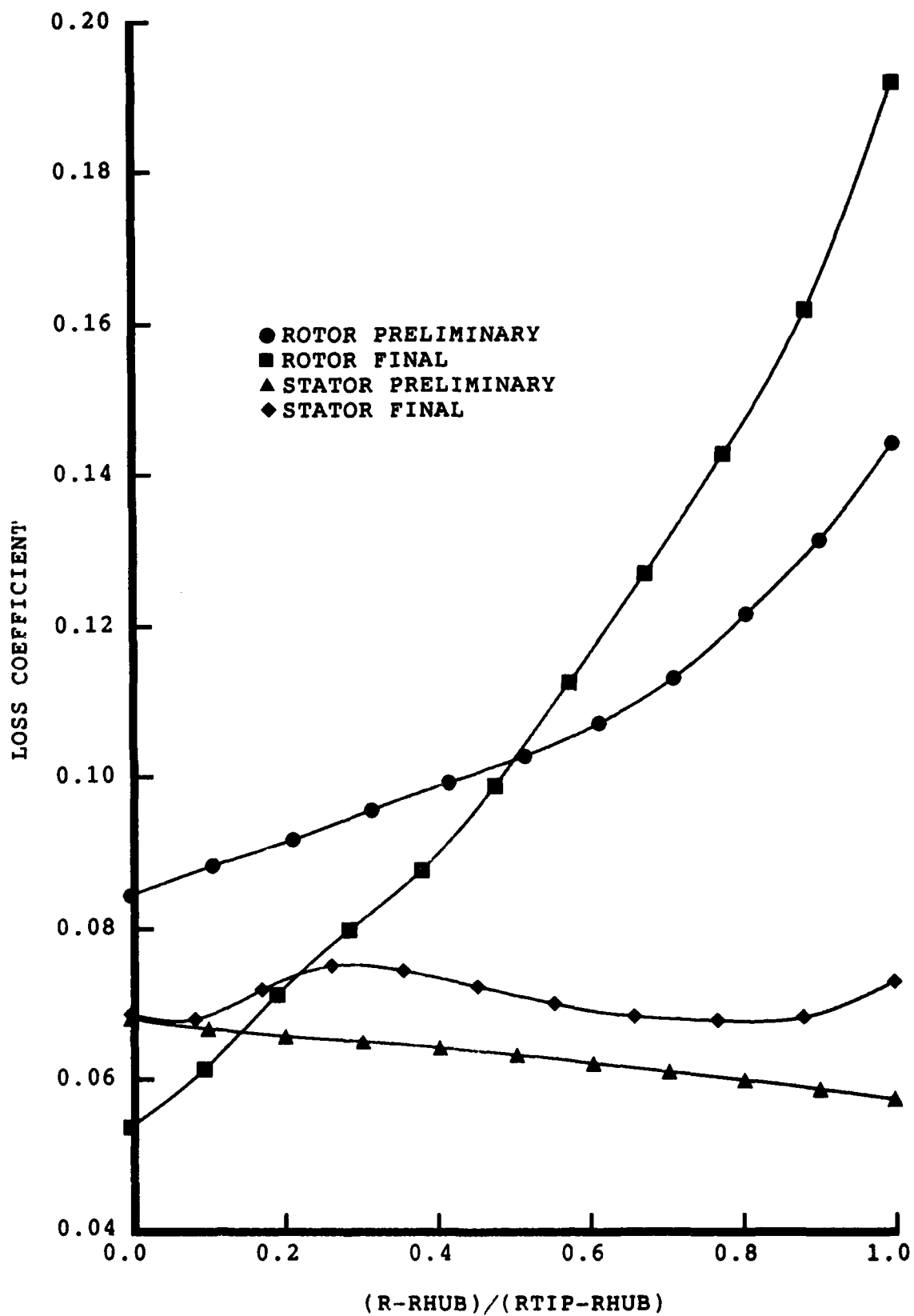


Figure 10. Total Pressure Loss Coefficient Distributions for Rotor and Stator (Fan)

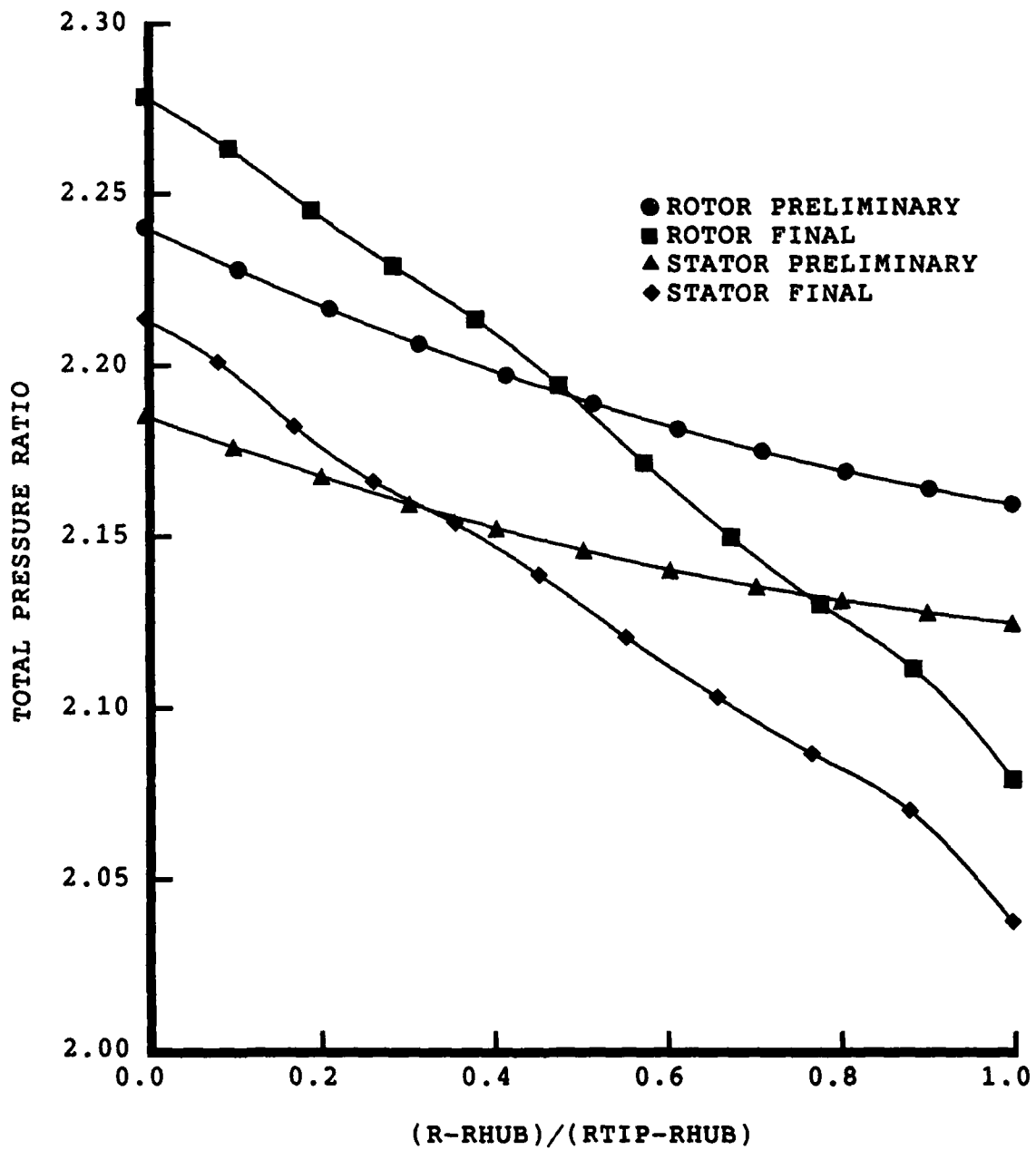


Figure 11. Total Pressure Ratio Distributions at Rotor and Stator Trailing Edges (Fan)

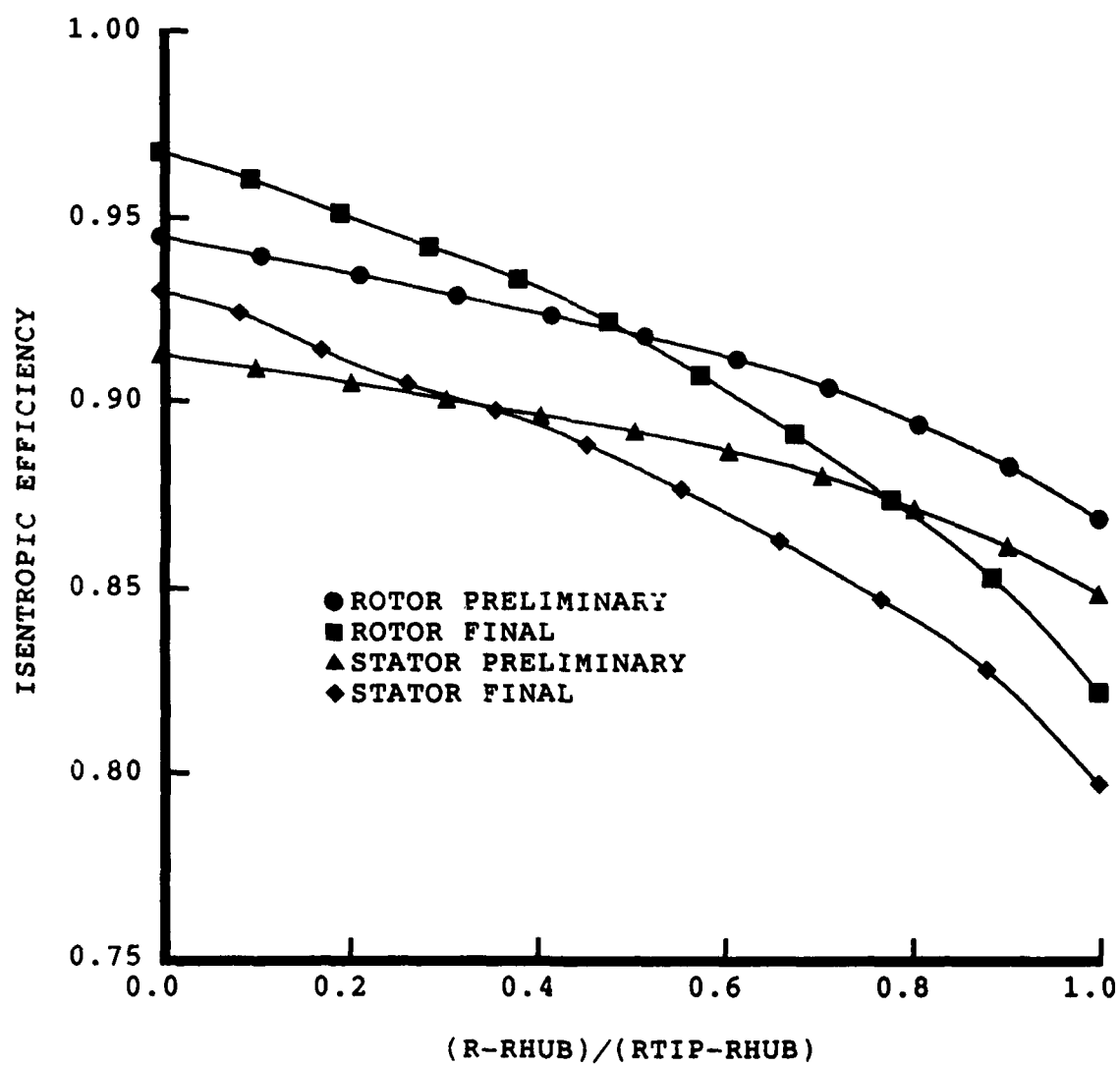


Figure 12. Isentropic Efficiency Distributions for Rotor and Stator (Fan)

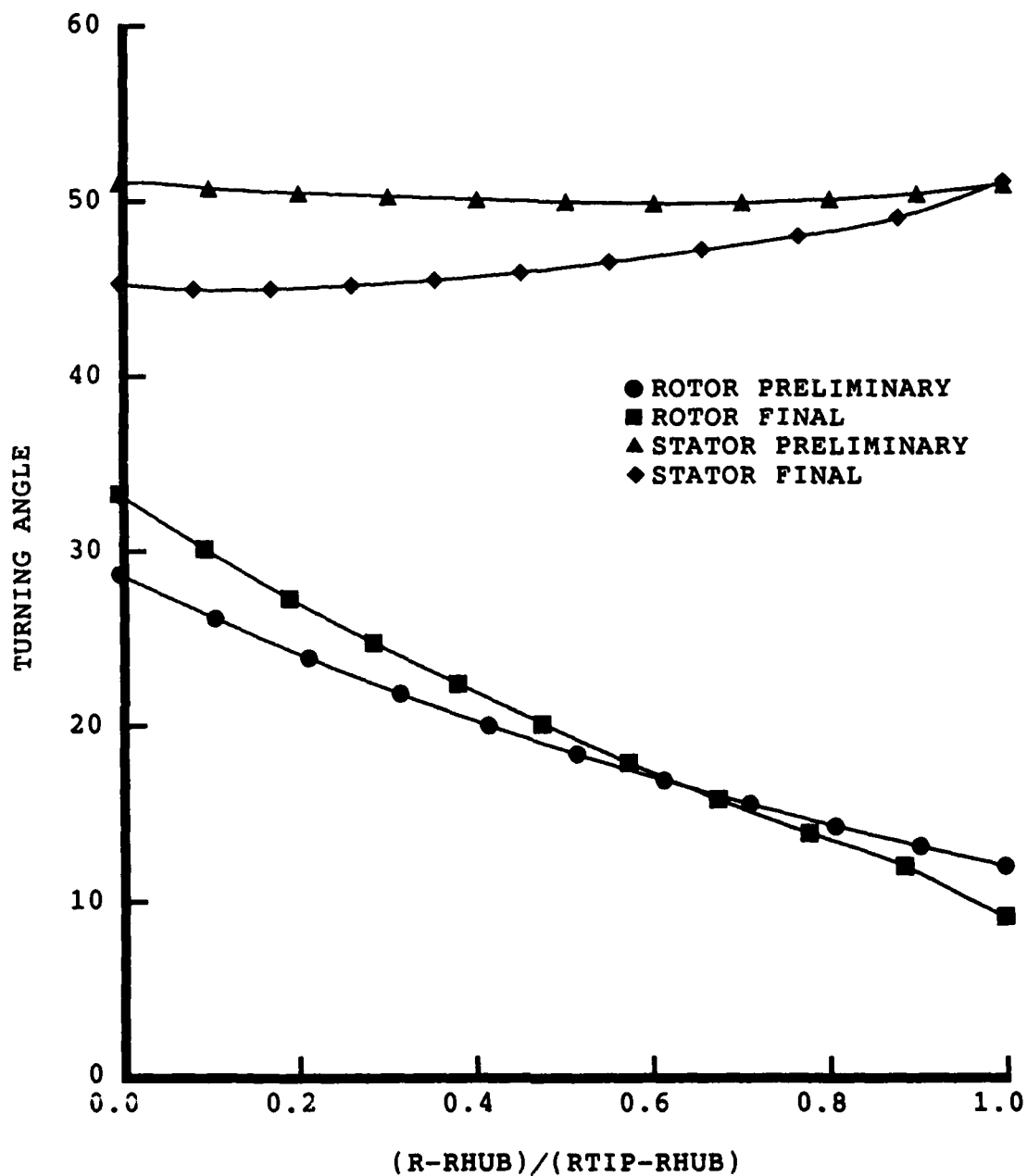


Figure 13. Turning Angle Distributions for Rotor and Stator (Fan)

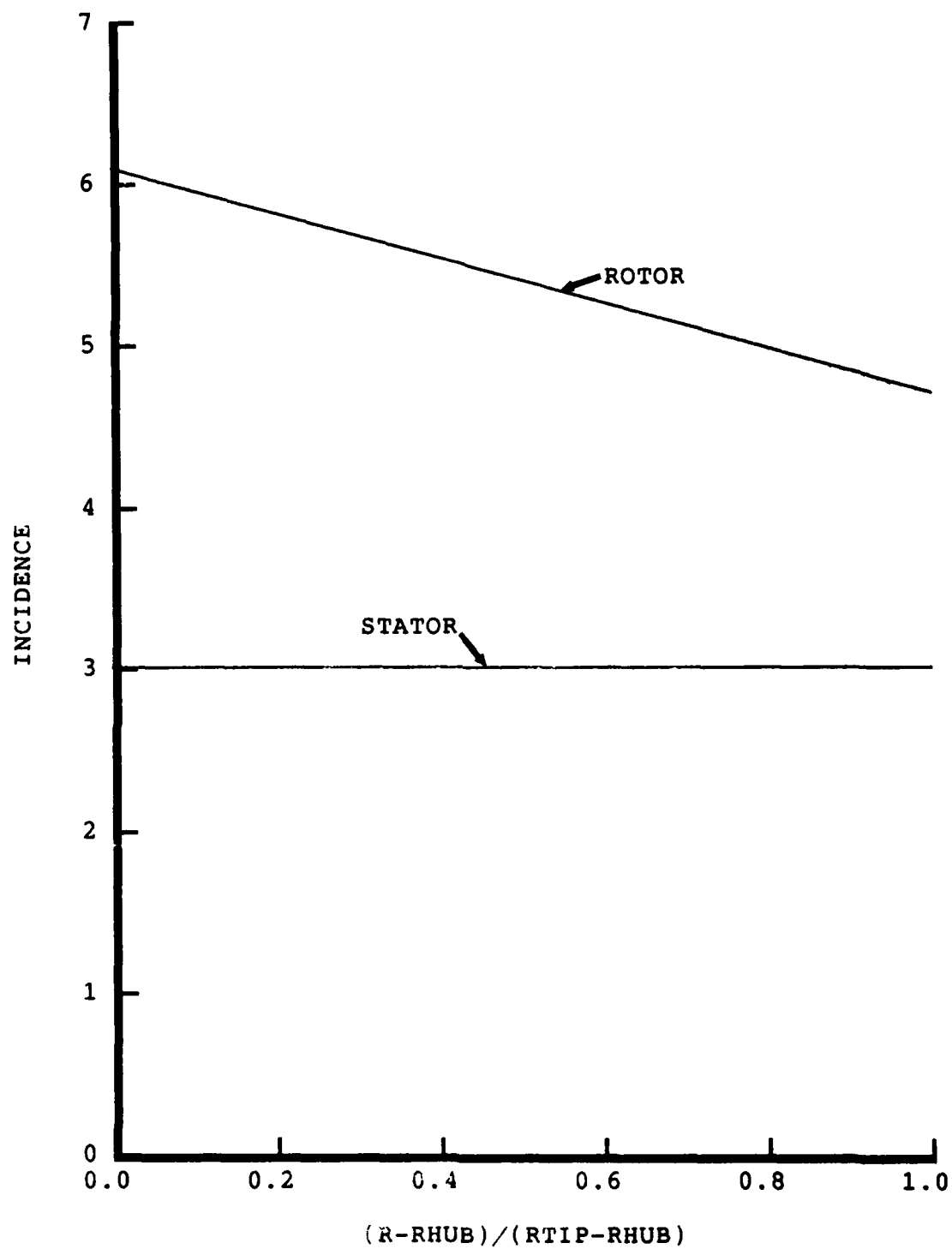


Figure 14. Incidence Angle Distributions for Rotor and Stator (Fan)

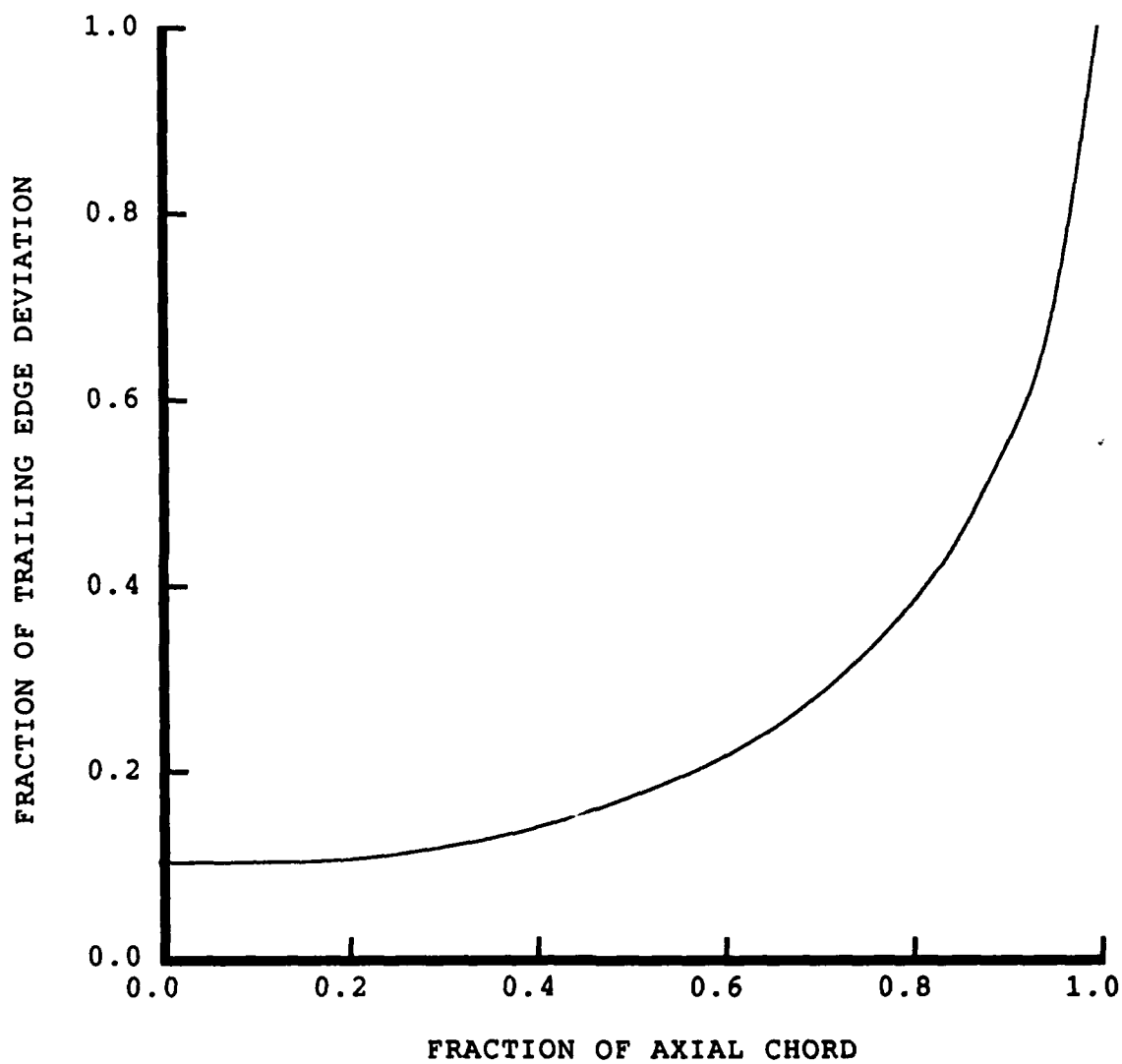


Figure 15. Fraction of Trailing Edge Deviation Verses Fraction of Axial Chord for Rotor and Stator (Fan)

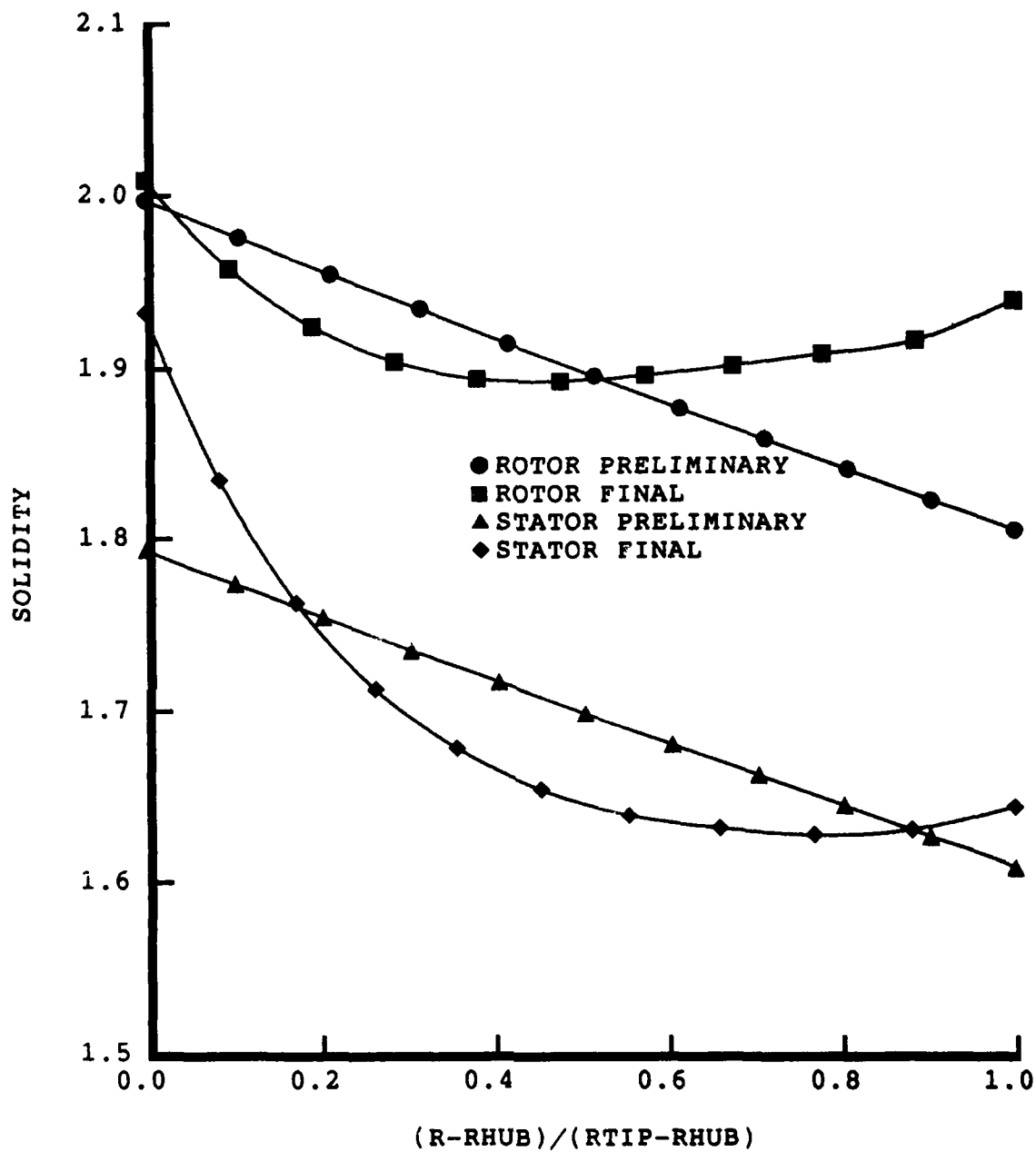


Figure 16. Solidity Distributions for Rotor and Stator (Fan)

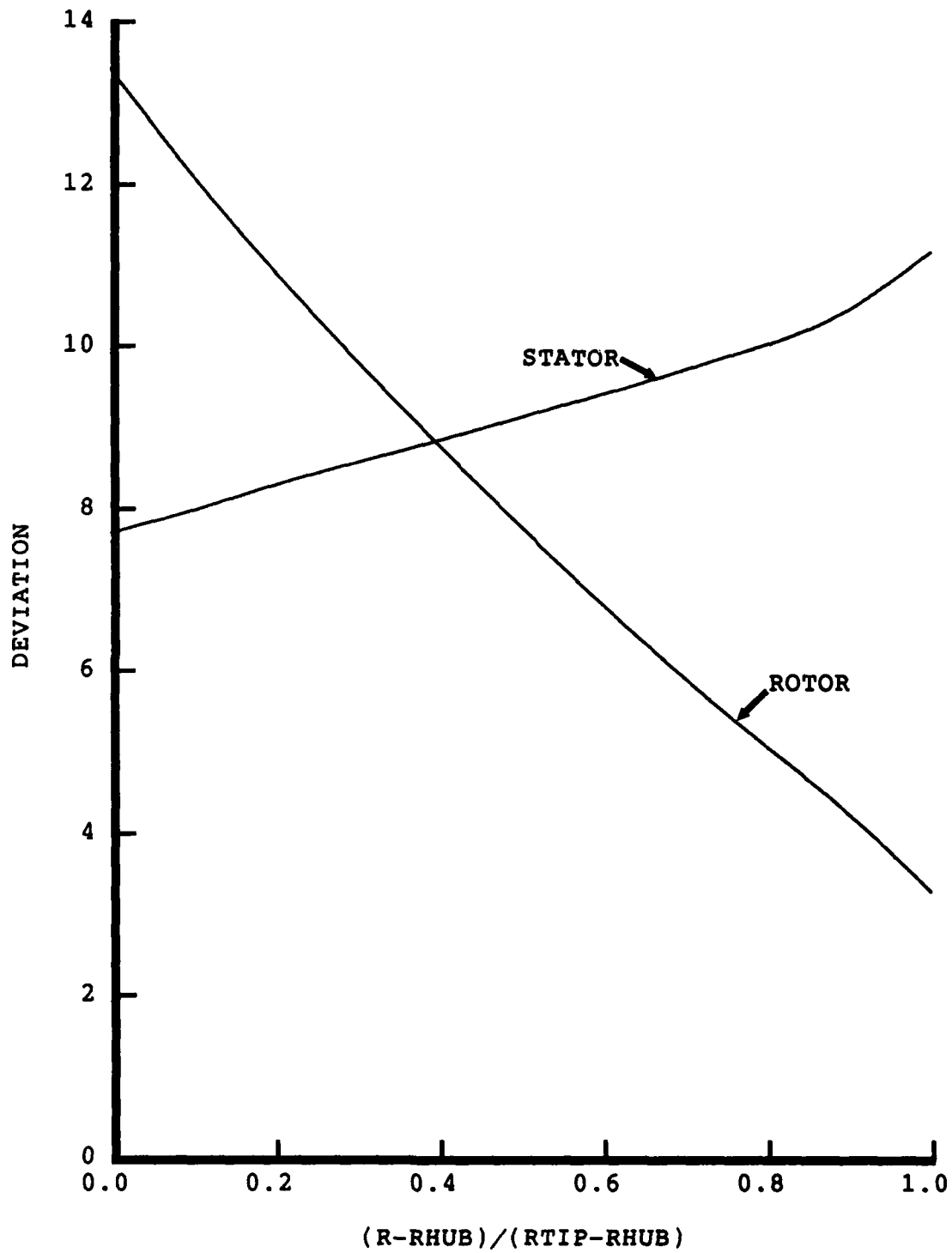


Figure 17. Deviation Angle Distributions for Rotor and Stator (Fan)

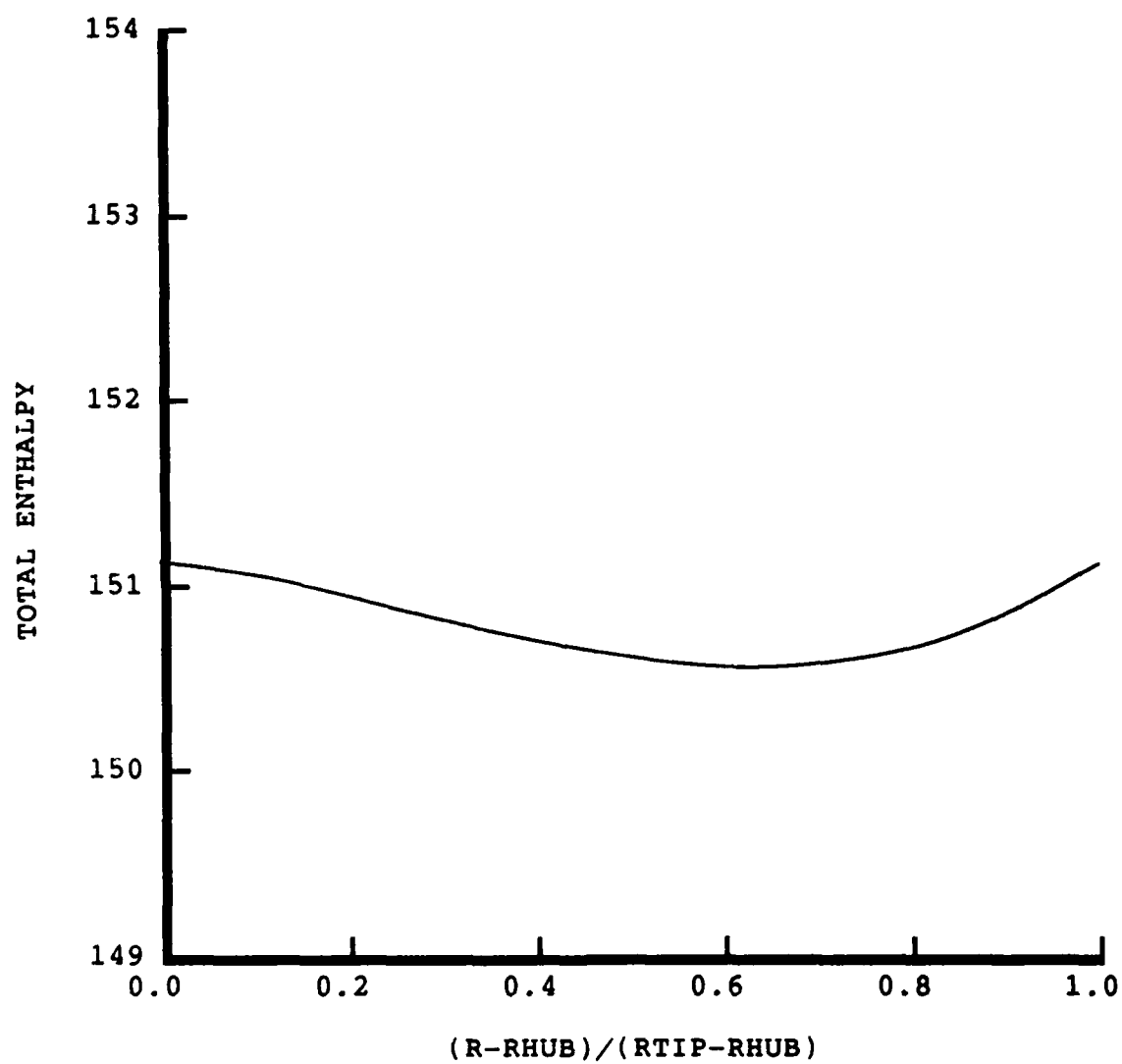


Figure 18. Radial Variation of Total Enthalpy Across the Rotor Exit (Core)

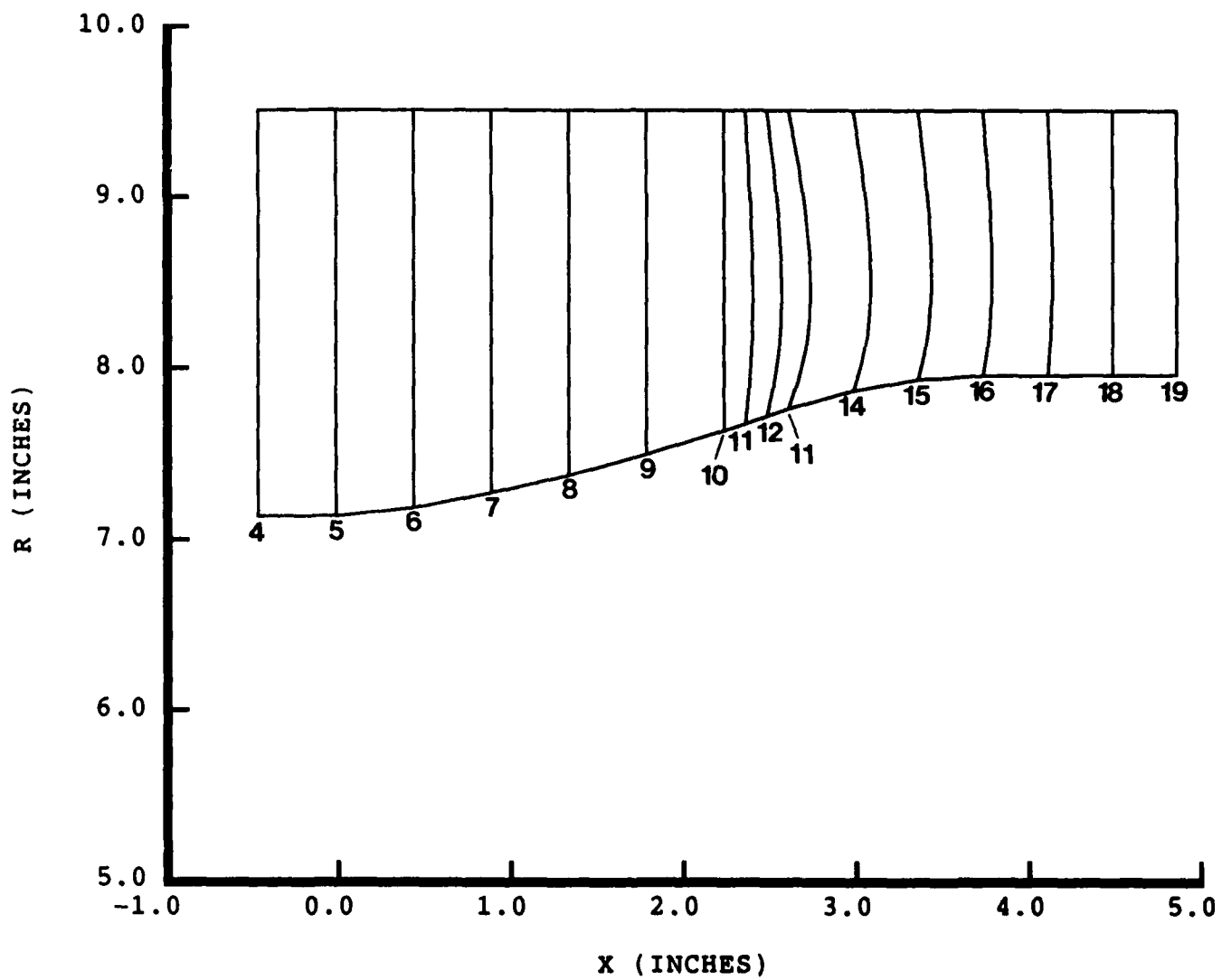


Figure 19. Detailed Aerodynamic Design Computing Station Geometry (Core)

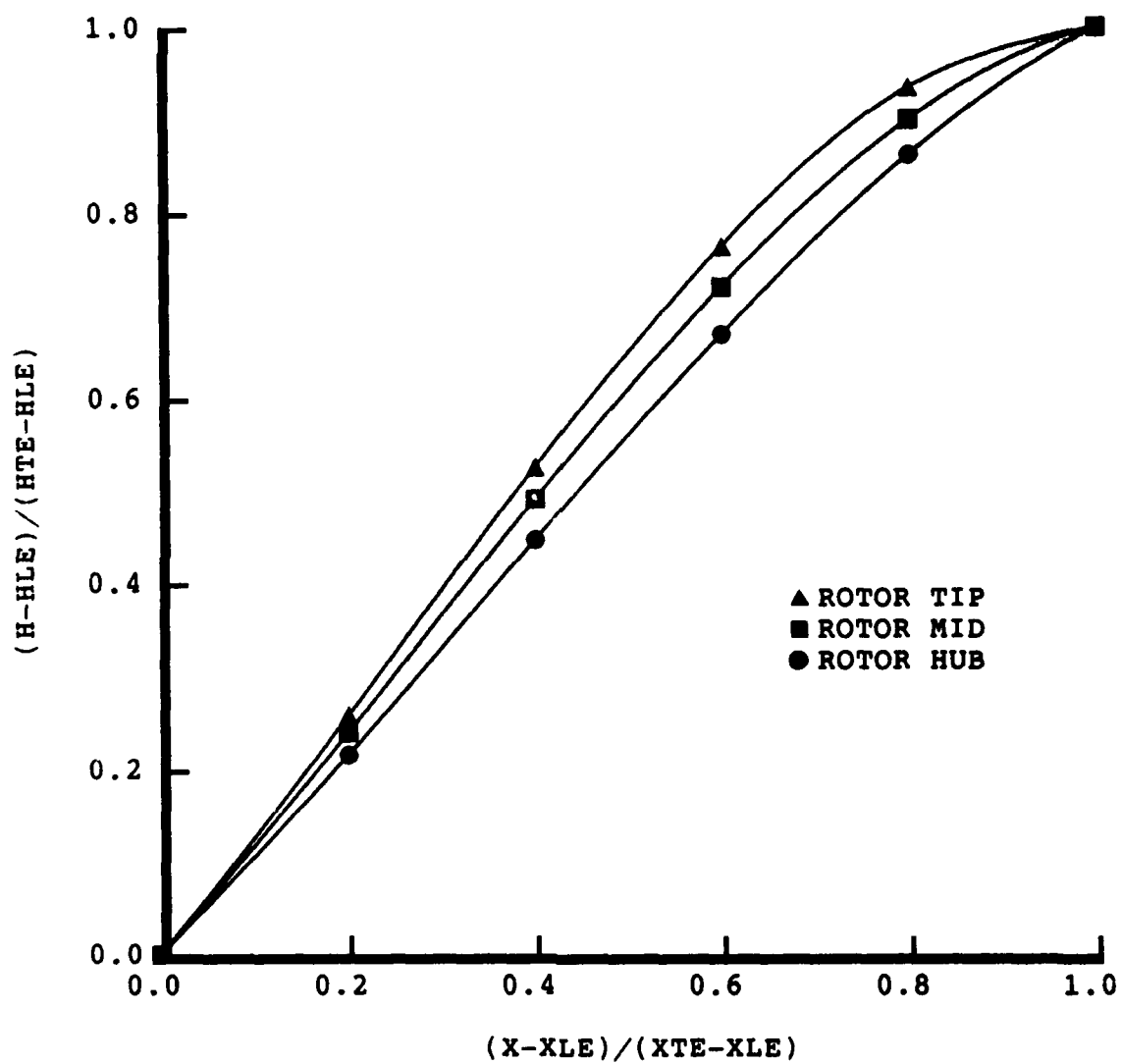


Figure 20. Streamwise Distributions of Non-dimensional Total Enthalpy Through Rotor (Core)

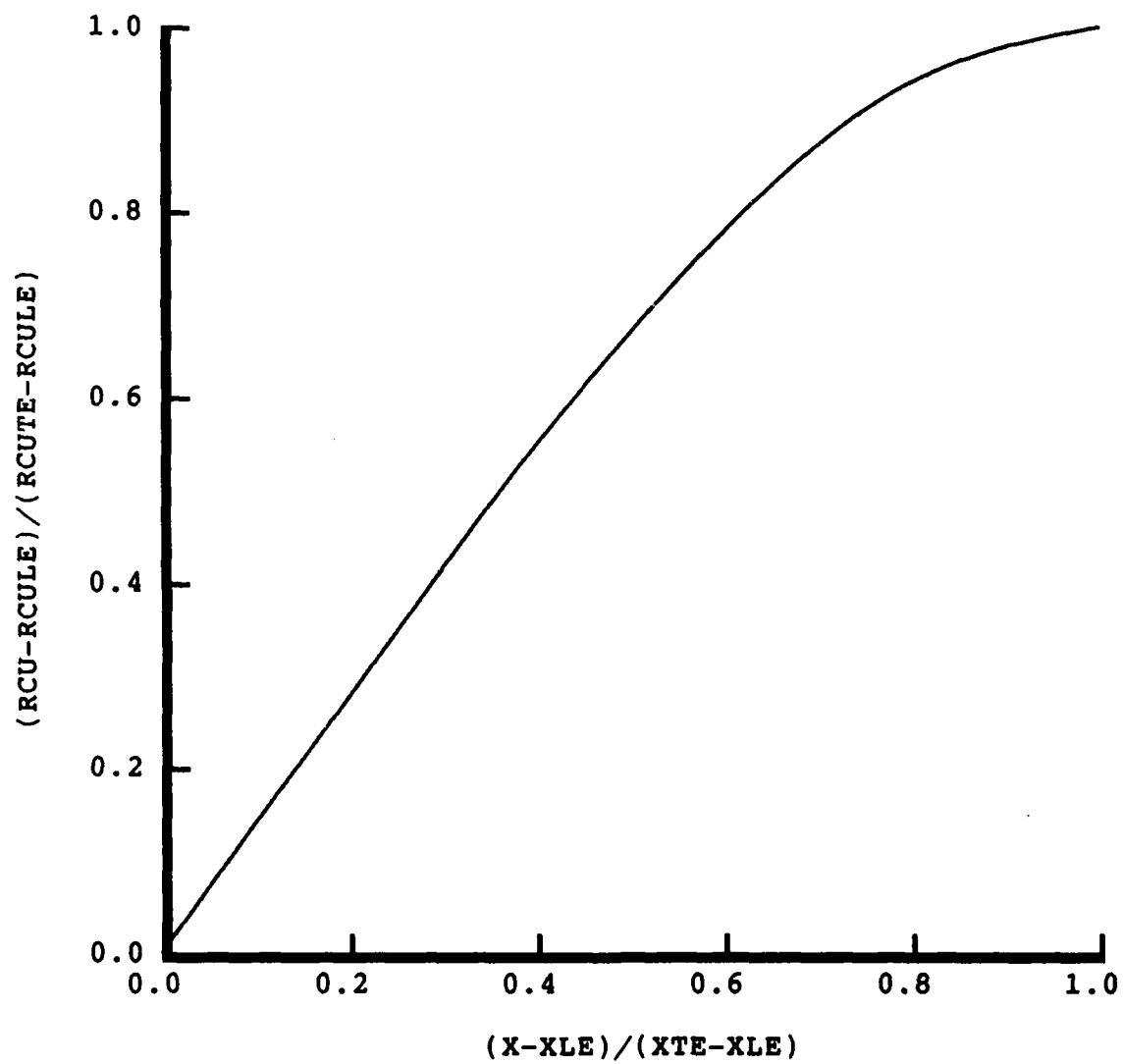


Figure 21. Streamwise Distribution of Non-dimensional Radius-Times-Swirl Velocity Through Stator (Core)

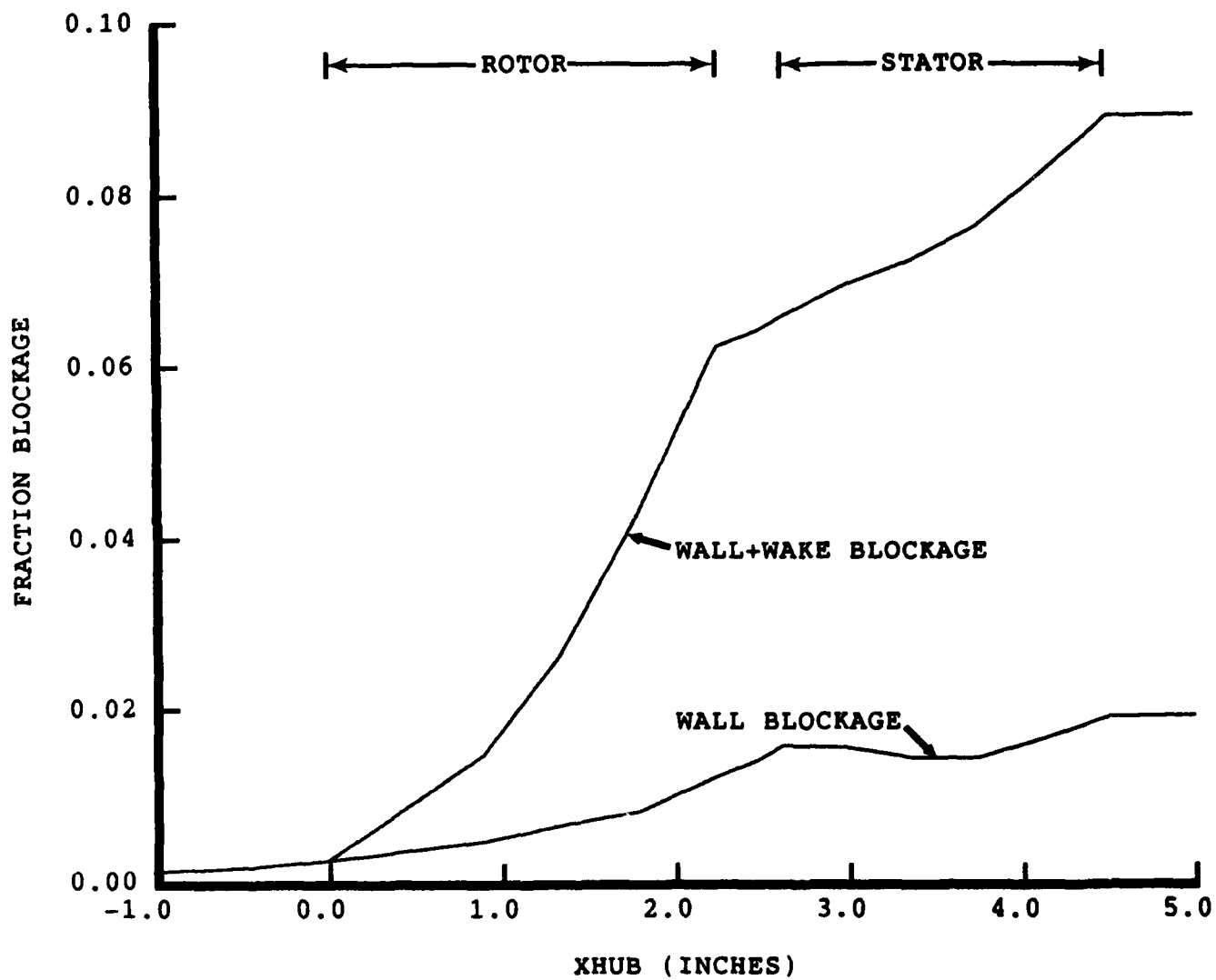


Figure 22. Axial Distribution of Aerodynamic Blockage (Core)

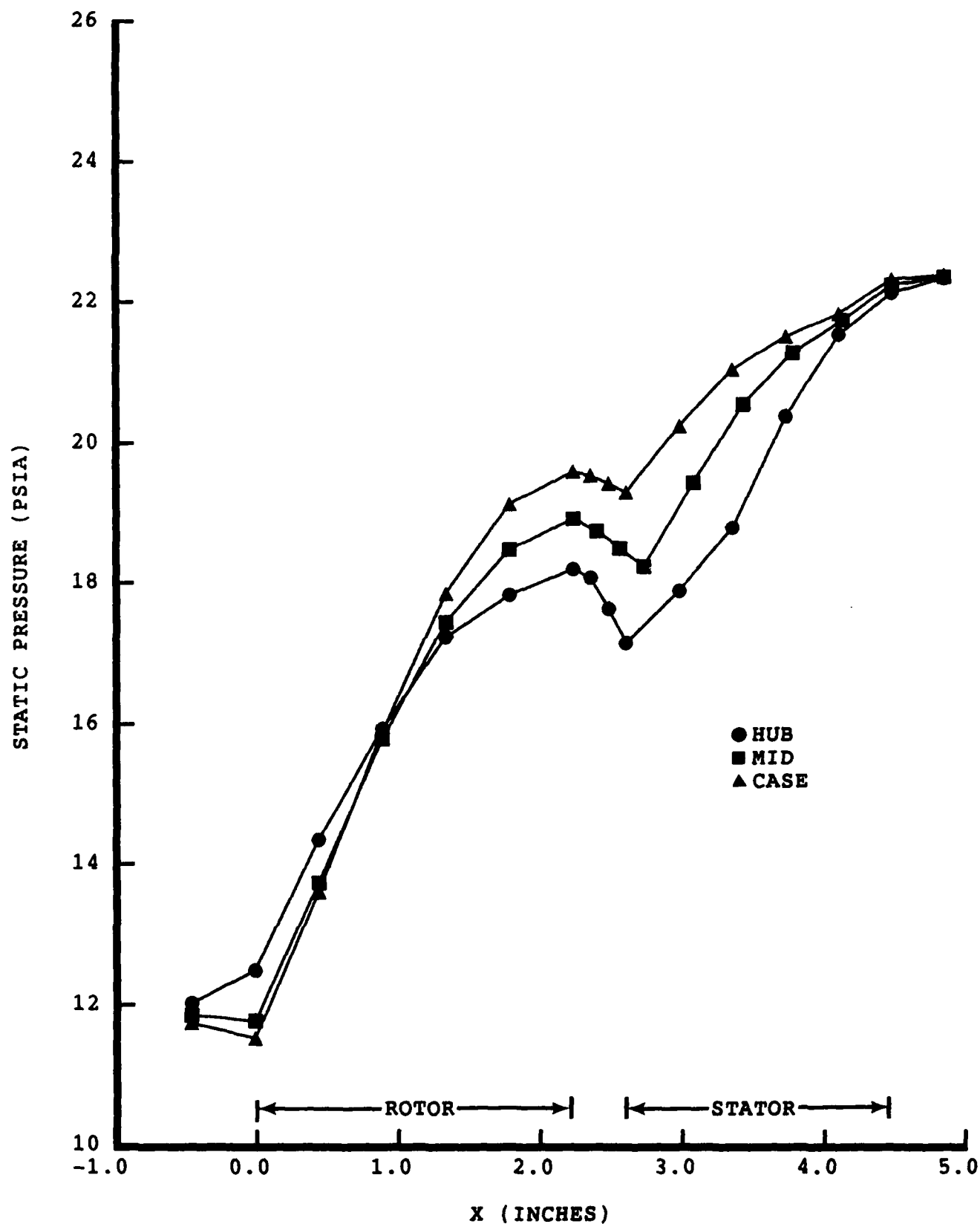


Figure 23. Axial Distributions of Static Pressure along the Hub, Mid, and Case Streamsurfaces (Core)

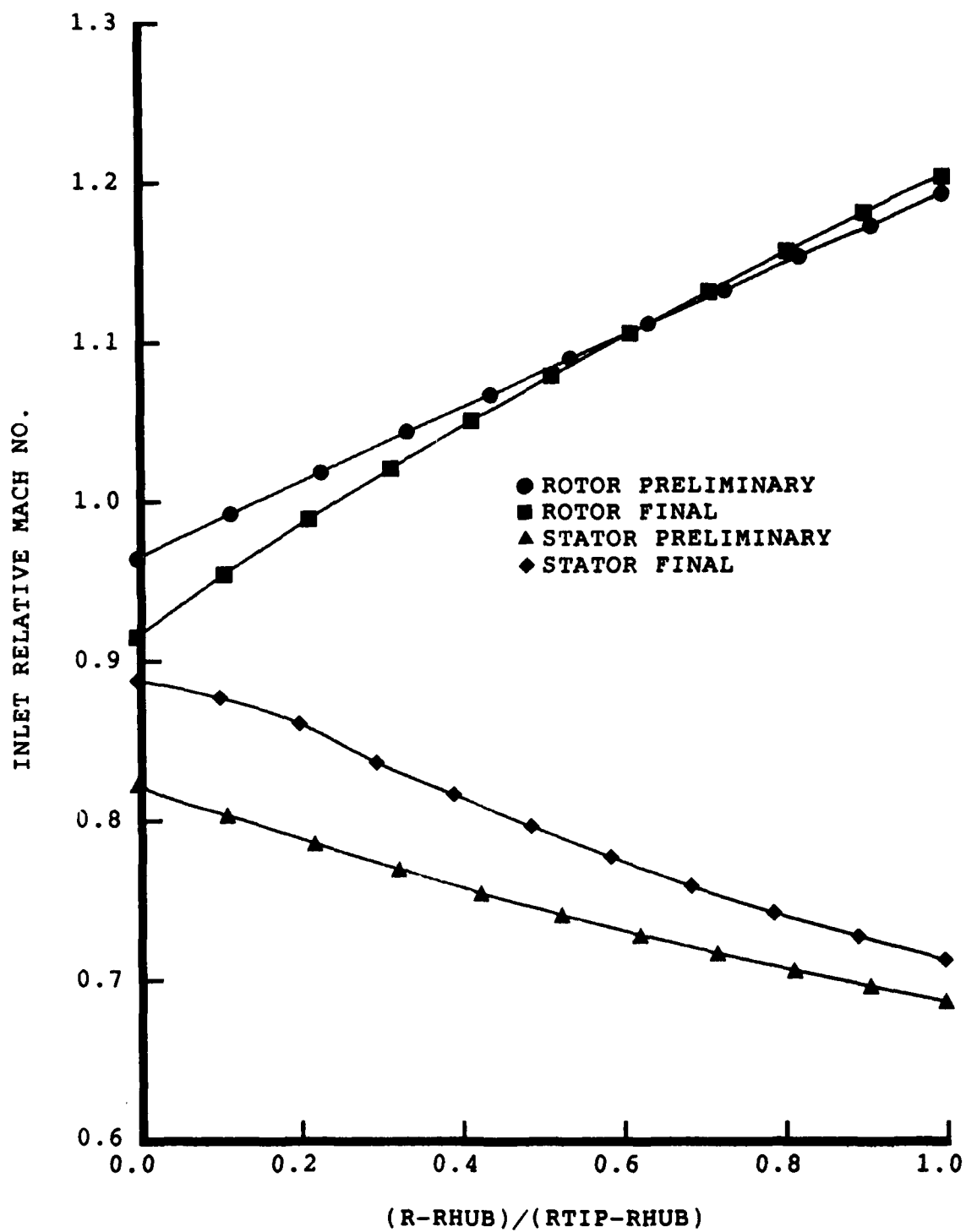


Figure 24. Relative Inlet Mach Number Distributions at Rotor and Stator Leading Edges (Core)

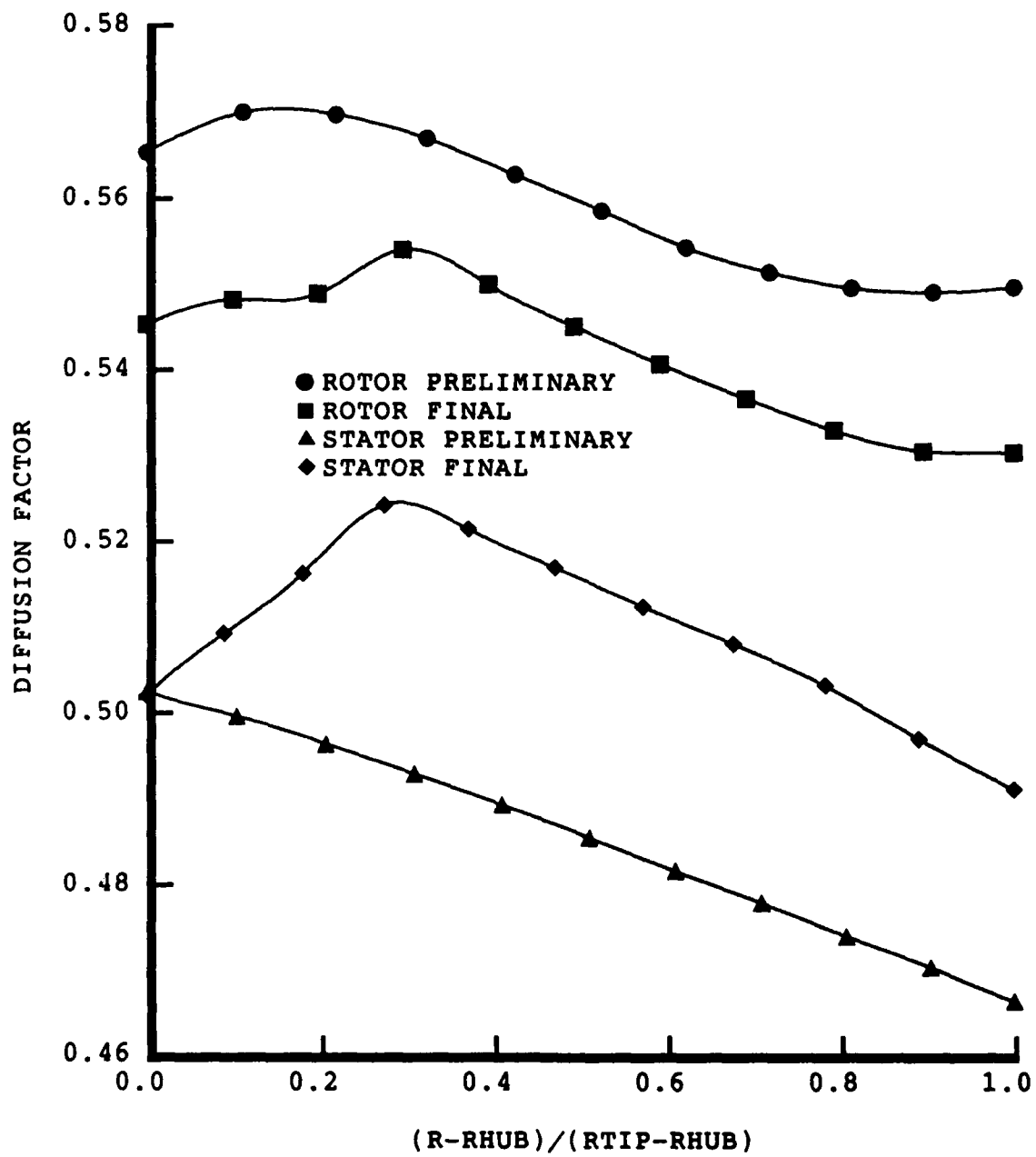


Figure 25. Diffusion Factor Distributions for Rotor and Stator (Core)

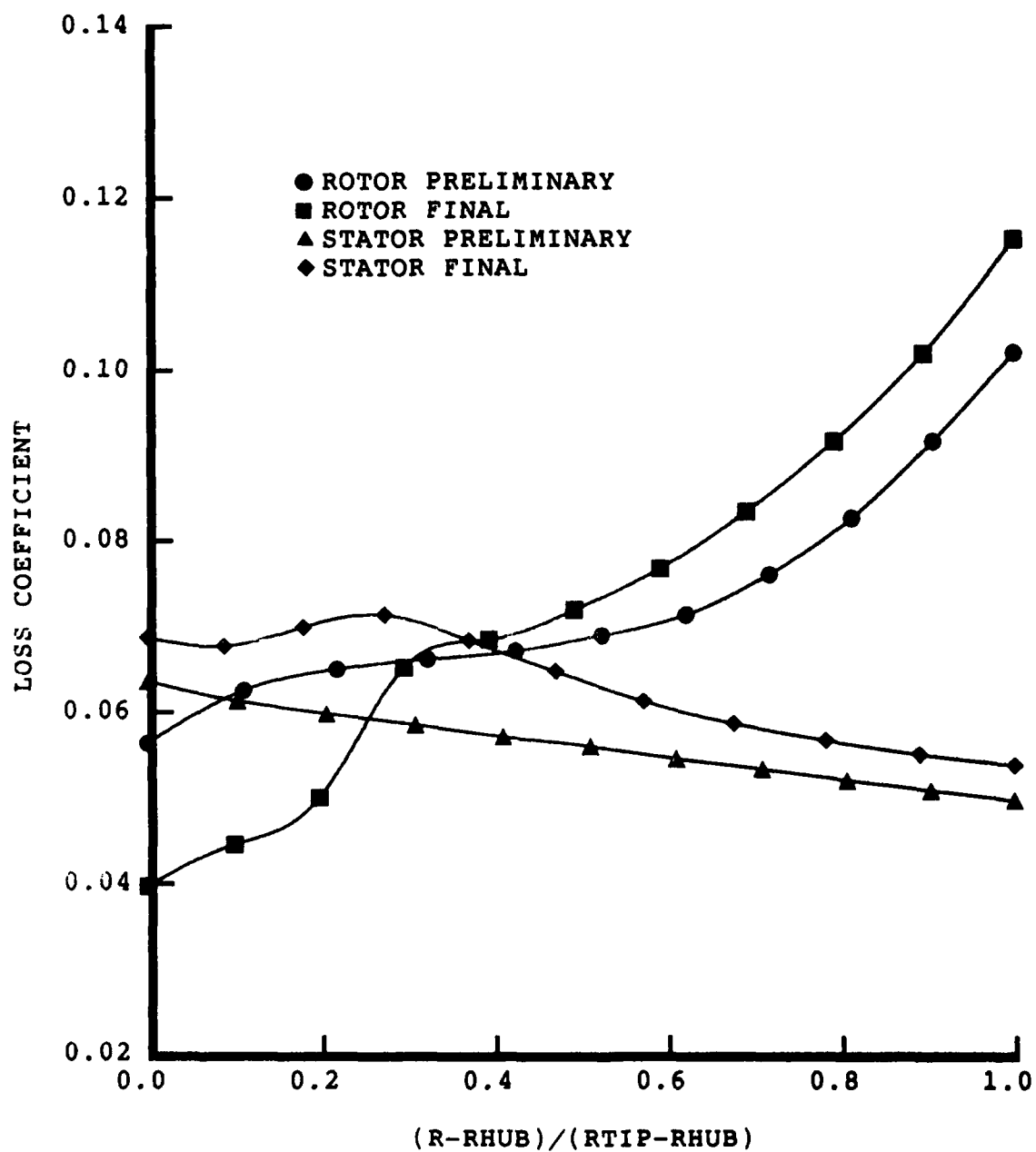


Figure 26. Total Pressure Loss Coefficient Distributions for Rotor and Stator (Core)

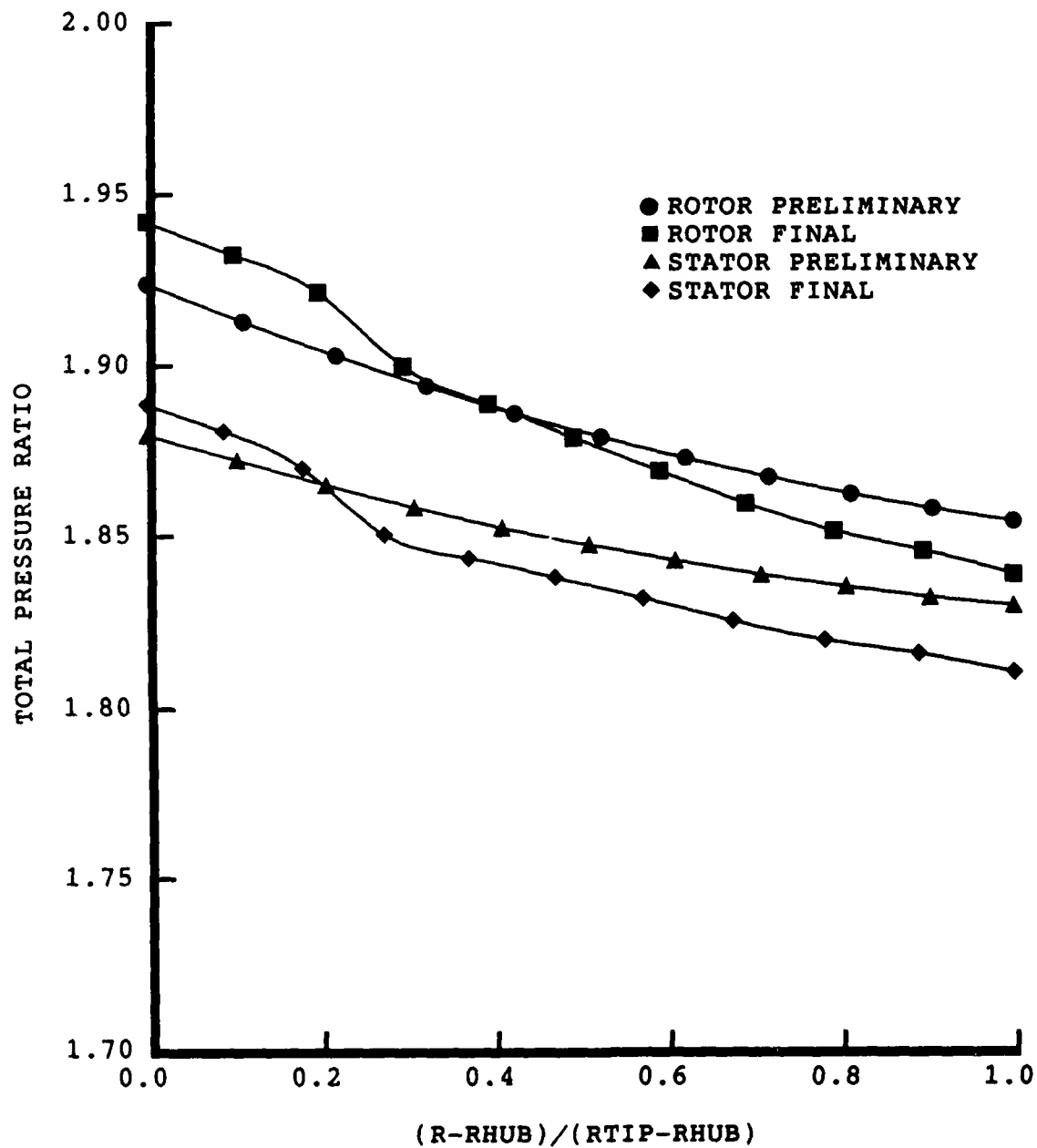


Figure 27. Total Pressure Ratio Distributions at Rotor and Stator Trailing Edges (Core)

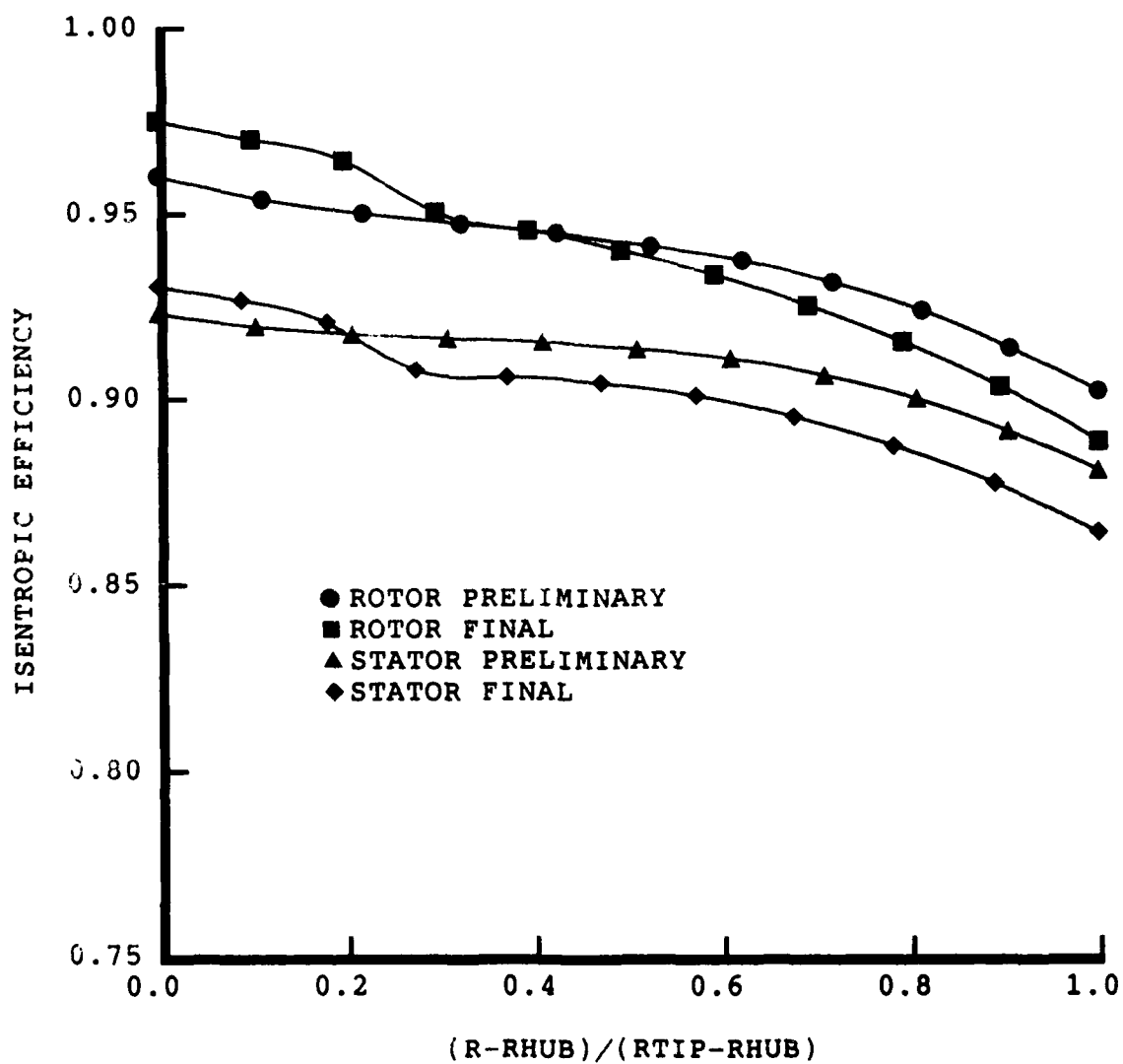


Figure 28. Isentropic Efficiency Distributions for Rotor and Stator (Core)

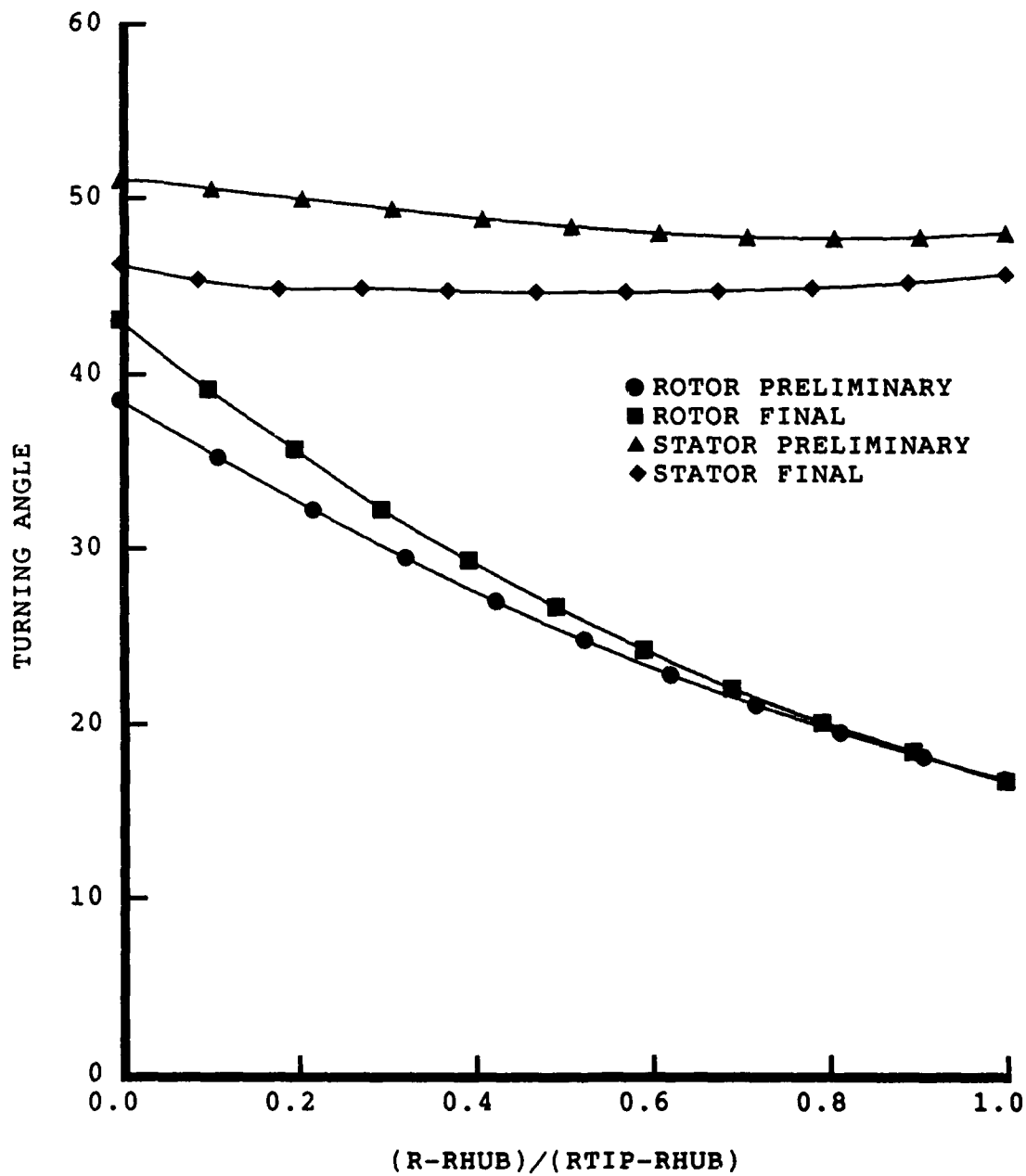


Figure 29. Turning Angle Distributions for Rotor and Stator (Core)

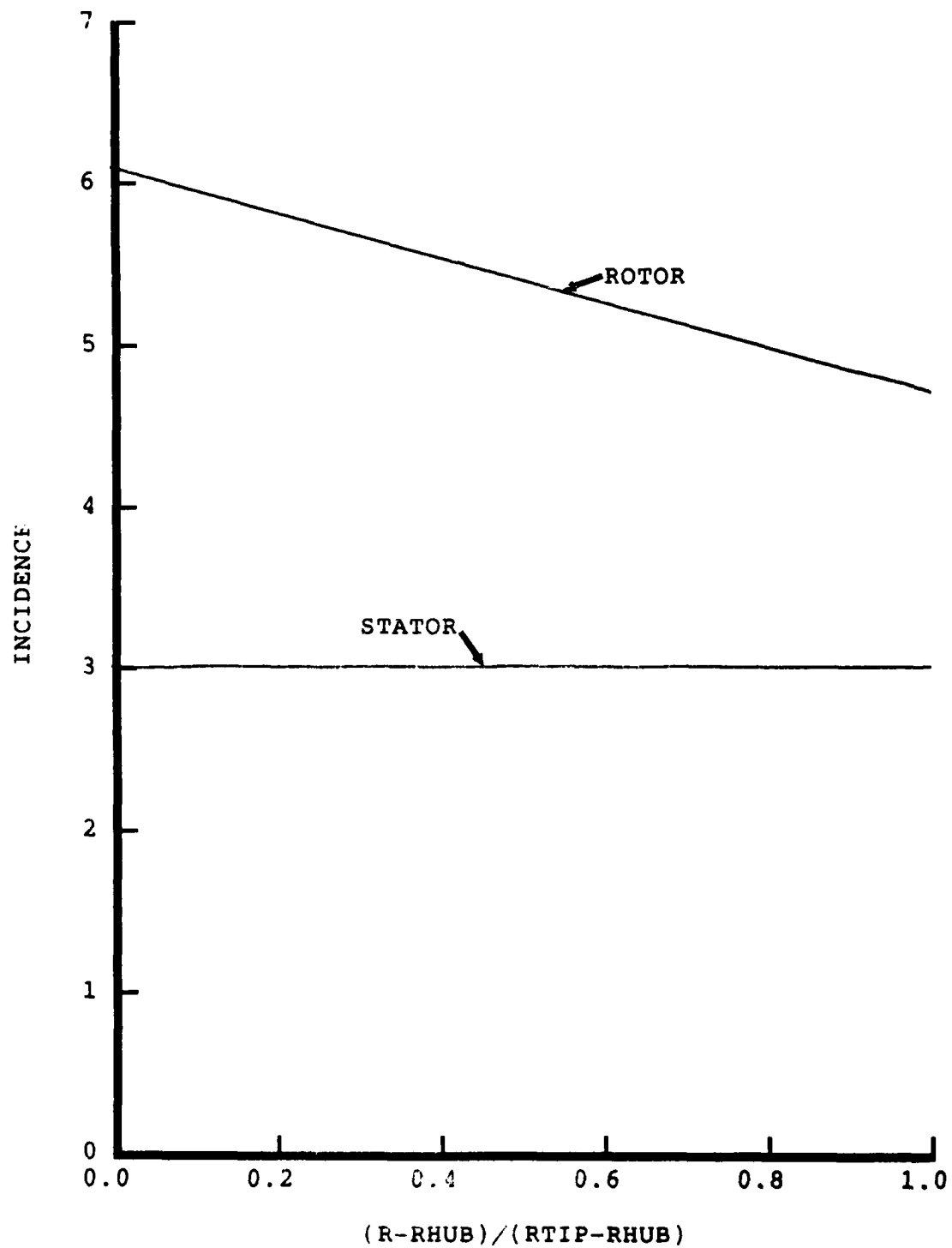


Figure 30. Incidence Angle Distributions for Rotor and Stator (Core)

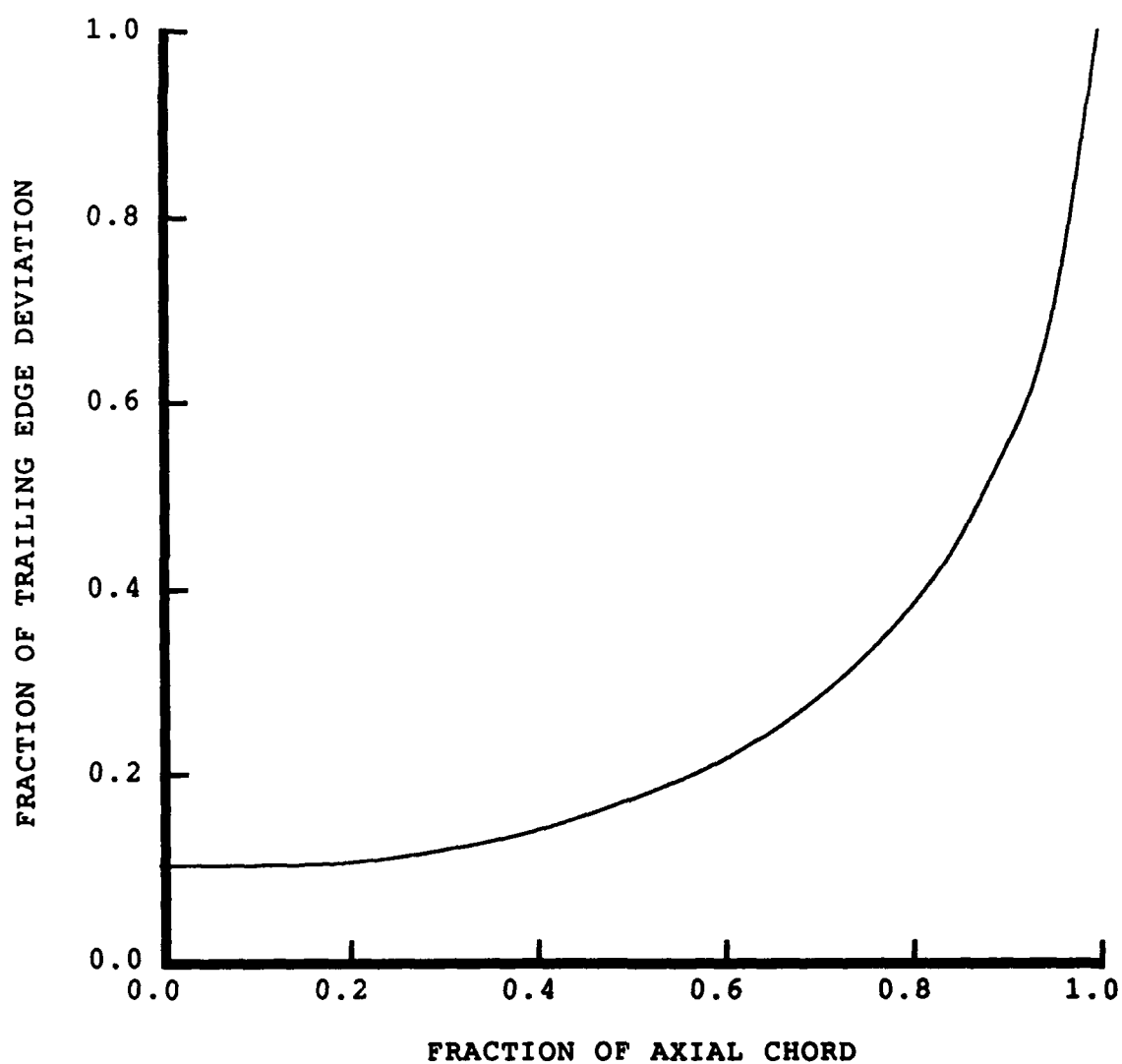


Figure 31. Fraction of Trailing Edge Deviation Verses Fraction of Axial Chord for Rotor and Stator (Core)

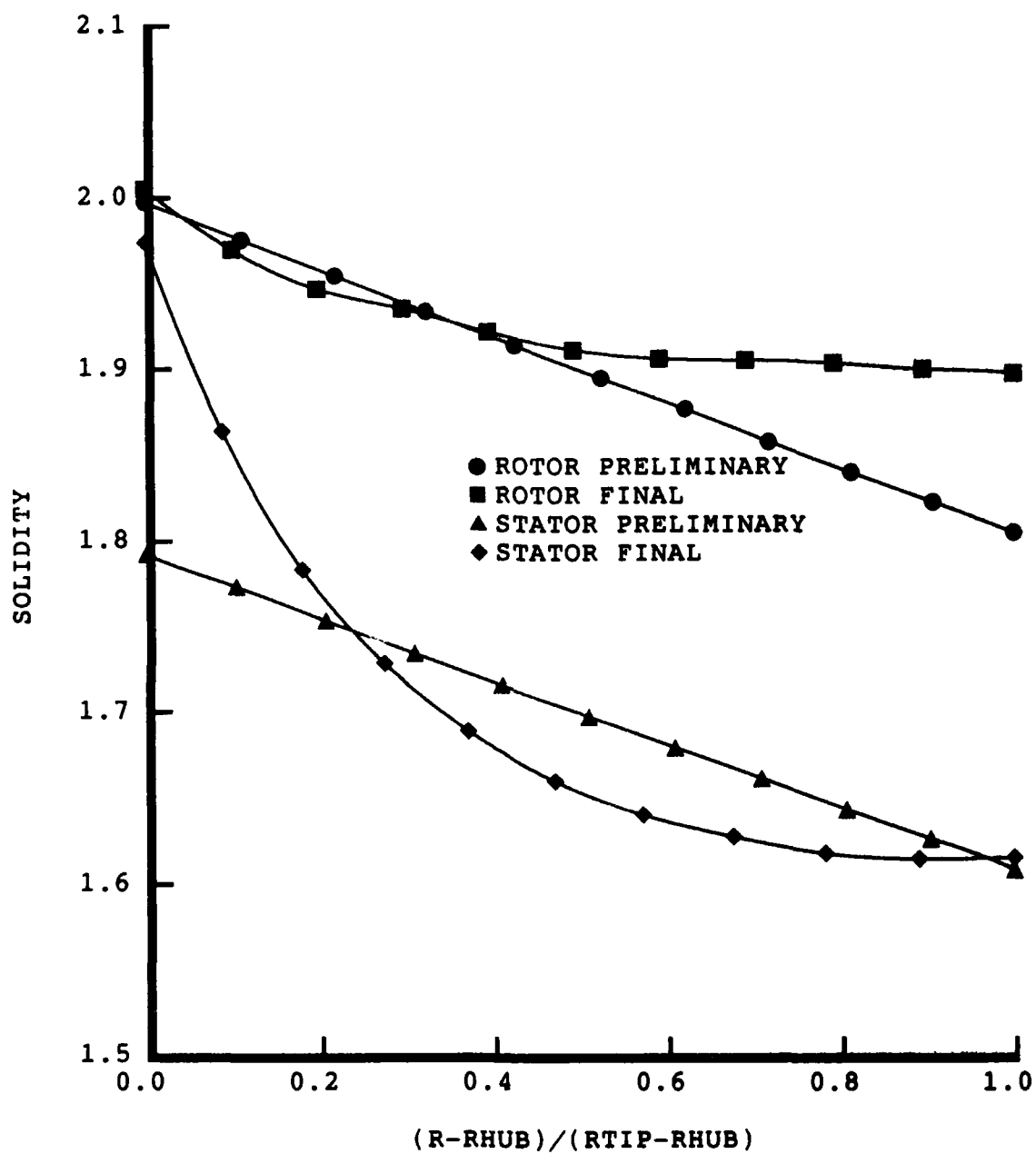


Figure 32. Solidity Distributions for Rotor and Stator (Core)

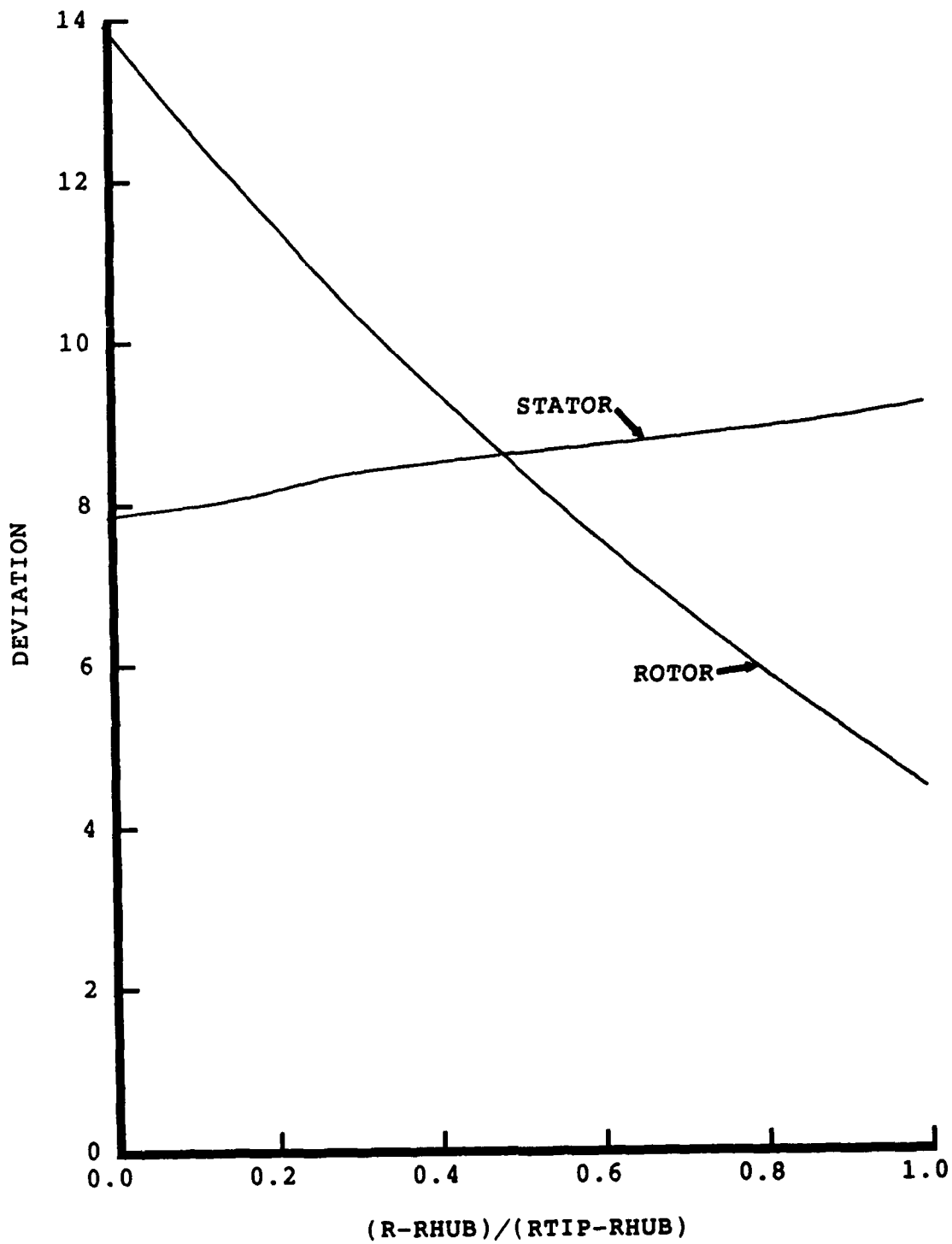


Figure 33. Deviation Angle Distributions for Rotor and Stator (Core)

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