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Royce D. Moore, George W. Lewis, Jr.,
and Walter M. Osborn

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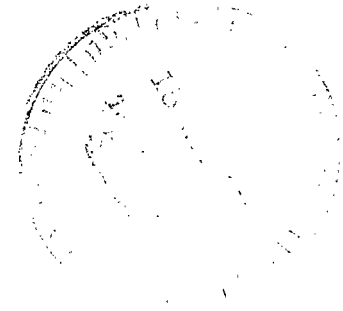

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PERFORMANCE OF A TRANSONIC FAN STAGE DESIGNED FOR A LOW MERIDIONAL VELOCITY RATIO

by Royce D. Moore, George W. Lewis, Jr., and Walter M. Osborn

Lewis Research Center

SUMMARY

This report presents both the aerodynamic design parameters and the performance of a transonic fan stage having a meridional velocity ratio of 0.8 across the tip of the stage. The stage was designed for a pressure ratio of 1.57 at a flow of 29.5 kilograms per second and a tip speed of 426 meters per second. Detailed radial surveys were obtained over the stable operating range from 50 to 100 percent of design speed.

The stage peak efficiency (0.81) at design speed occurred at a pressure ratio of 1.58 and a flow of 28.7 kilograms per second. The stage stall margin was 11 percent, based on conditions at peak efficiency and stall. Rotor peak efficiency (0.84) occurred at a pressure ratio of 1.61 and the same flow as stage peak efficiency.

INTRODUCTION

The axial-flow fan and compressor research program for advanced airbreathing engines being conducted at Lewis is primarily directed toward reducing the size and weight of fans and compressors while maintaining high levels of performance. In support of this objective, experimental studies are being conducted to evaluate the effects of blade solidity, blade aspect ratio, blade loading, area margin above choke, blade airfoil shape, weight flow per unit annulus area, velocity ratio, and blade spacing on efficiency and flow range. The aerodynamic performance of the axial-flow fan stage designed for a stage tip velocity ratio of 0.8 is presented herein. Performance of a similar stage having a tip meridional velocity ratio of 1.0 was reported in reference 1. The velocity ratio was varied by changing the stage tip contour while maintaining the same hub contour. Both stages were designed for a pressure ratio of 1.57 and a tip speed of 425 meters per second. This report presents the aerodynamic design parameters and the overall and blade-element performance. Data were obtained at a near-stall point for six rotative speeds from 50 to 100 percent of design speed and over the stable operating

range of 70, 90, and 100 percent of design speed.

Blade-element data were obtained for the rotor and the stator at 11 radial positions. The stage discussed in this report has been designated stage 20-17 (rotor 20 and stator 17). The data in this report are presented in tabular and in machine-plotted form. The symbols and equations are given in appendixes A and B, and the definitions and units used for the tabular data are presented in appendix C.

AERODYNAMIC DESIGN

Three computer programs (refs. 2 and 3) were used to design this compressor stage: the streamline analysis program, the blade geometry program, and the blade coordinate program. Only a brief description of each is presented herein.

The streamline-analysis program was used to calculate the flow-field parameters at several axial locations, including planes approximating the blade leading and trailing edges for both the rotor and stator. The weight flow, rotative speed, flow path geometry, and radial distributions of total pressure are inputs in this program. Total loss, which is calculated within the program, is based on a calculated shock loss and a profile loss. Profile loss as a function of diffusion factor and radial position is an input. The program accounts for both streamline curvature and entropy gradients; boundary-layer blockage factors are also included.

The distribution of velocity vector, total pressure, and total temperature calculated in the streamline-analysis program are used in the blade-geometry program to compute blade-geometry parameters. The blade-geometry parameters are used in the blade coordinate program (ref. 4) to compute blade elements on conical surfaces passing through the blade. The blade elements are then stacked on a line passing through their centers of gravity, and Cartesian blade coordinates, which are used directly in fabrication, are computed.

The overall design parameters for stage 20-17 are listed in table I, and the flow path is shown in figure 1. This stage was designed for an overall pressure ratio of 1.57 at a weight flow of 29.5 kilograms per second (196.4 kg/sec/m^2 of annulus area). The design tip speed was 426 meters per second. The inlet relative Mach number is 1.4 at the rotor tip. Since the stage was designed for a tip solidity of 1.3 for both rotor and stator, the rotor had 44 blades with an aspect ratio of 2.5, and the stator had 48 blades with an aspect ratio of 2.4.

The blade-element design parameters for rotor 20 are presented in table II. This rotor was designed for a radially constant total-pressure ratio of 1.60. The stator blade-element design parameters are given in table III. The blade geometry is presented in table IV for rotor 20 and in table V for stator 17. Both the rotor and stator used multiple-circular-arc blade shapes.

APPARATUS AND PROCEDURE

Compressor Test Facility

The compressor stage was tested in the Lewis single-stage compressor facility (described in detail in ref. 4 and shown in fig. 2 herein). Atmospheric air enters the test facility at an inlet on the roof of the building and flows through the flow measuring orifice and into the plenum chamber upstream of the test stage. It then passes through the experimental compressor stage and into the collector from which it is exhausted to the atmosphere.

Test Stage

Photographs of the rotor and stator are shown in figures 3 and 4. Each rotor blade has a vibration damper located at about 57 percent of span from the outlet rotor tip. The maximum thickness of the damper was 0.215 centimeter. The radial tip clearance of the rotor was a nominal 0.050 centimeter at ambient, nonrotating conditions. The axial spacing between the rotor hub trailing edge and the stator hub leading edge was 3.428 centimeters, to provide for instrumentation between rotor and stator.

Instrumentation

The compressor weight flow rate was measured using a calibrated thin-plate orifice. The orifice temperature was determined from an average of two Chromel/constantan thermocouples. Orifice pressures were measured by calibrated transducers.

Radial surveys of the flow were made upstream of the rotor, between the rotor and stator, and downstream of the stator (fig. 1). Photographs of the survey probes are shown in figure 5. Total pressure, total temperature, and flow angle were measured with the combination probe (fig. 5(a)), and the static pressure was measured with an 8° C-shaped wedge probe (fig. 5(b)). Each probe was positioned with a null-balancing, stream-directional-sensitive control system that automatically alined the probe to the direction of flow. The thermocouple was Chromel/constantan. The probes were alined in an air-calibration tunnel. Two combination probes and two wedge static probes were used at each of the three measuring stations.

Inner- and outer-wall static-pressure taps were located at the same axial stations as the survey probes. The circumferential locations of both types of survey probes and of the inner- and outer-wall static-pressure taps are shown in figure 6. The combination probe downstream of the stator (station 3) traversed circumferentially one stator

blade passage (7.5°) counterclockwise from the nominal value shown. An electronic speed counter, in conjunction with a magnetic pickup, measured rotative speed (rpm). Strain gages mounted on both the rotor and stator blades monitored stresses and vibrations. The estimated errors of the data based on inherent accuracies of the instrumentation and recording system are as follows:

Weight flow, kg/sec	±0.3
Rotative speed, rpm	±30
Flow angle, deg	±1
Temperature, K	±0.6
Rotor-inlet total pressure, N/cm^2	±0.01
Rotor-outlet total pressure, N/cm^2	±0.10
Stator-outlet total pressure, N/cm^2	±0.10
Rotor-inlet static pressure, N/cm^2	±0.04
Rotor-outlet static pressure, N/cm^2	±0.07
Stator-outlet static pressure, N/cm^2	±0.07

An indication of the consistency of the data can be observed by comparing the integrated weight flows at each measuring station with the orifice weight flow in table VI.

Test Procedure

The stage survey data were taken over a range of weight flows from maximum flow to the near stall. At 70, 90, and 100 percent of design speed, radial surveys were taken at five weight flows. At 50, 60, and 80 percent of design speed, radial surveys were taken for the near-stall weight flow only. Data were recorded at 11 radial positions for each speed and weight flow.

At each radial position the combination probe behind the stator was traversed circumferentially to nine locations across the stator gap. The wedge probe was set at midgap because previous studies showed that the static pressure across the stator gap was constant. The pressure, temperature, and flow angle were recorded at each circumferential position. At the last circumferential position pressure, temperature, and flow angle were also recorded at stations 1 and 2. All probes were then traversed to the next radial position, and the circumferential traverse procedure was repeated.

At each of the six rotative speeds the back pressure on the stage was increased by closing the sleeve valve in the collector until a stall was indicated by a sudden drop in stage-outlet total pressure. This pressure was measured by a probe at midpassage and was recorded on an X-Y plotter. Stall was corroborated by large increases in the blade stresses on both rotor and stator along with a sudden increase in noise.

Calculation Procedure

The measured total temperatures and pressures were corrected for Mach number and streamline slope. These corrections were based on the instrument probe calibrations given in reference 5. The stream static pressures were corrected for Mach number and streamline slope based on an average calibration for the wedge probes used.

Because of the physical construction of the C-shaped static-pressure wedges, it was not possible to obtain static-pressure measurements at 5, 10, and 95 percent of span. The static pressure at 95 percent span was obtained by assuming a linear variation in static pressure between the values at the inner wall and the probe measurement at 90 percent span. A similar variation was assumed between the static-pressure measurements at the outer wall and the 30 percent span to obtain the static pressure at 5 and 10 percent span.

At each radial position for station 3, averaged values of the nine circumferential measurements of pressure, temperature, and flow angle were obtained. The nine total temperatures were mass averaged to obtain the stator-outlet total temperature. The nine total pressures were energy averaged (i. e., converted to their enthalpy equivalent and then mass-averaged). The measured pressures, temperatures, and flow angles were used to calculate axial and tangential velocities at each circumferential position. Mass averages of these velocities were used to calculate the flow angles at each radial position presented herein. To obtain the overall performance, the radial values of total temperatures were mass-averaged, and radial values of total pressures were energy-averaged. At each measuring station, the integrated weight flow was computed based on the survey data. The data, measured at the three measuring stations, were translated to the blade leading and trailing edges by the method presented in reference 4.

The weight flow at stall was obtained in the following manner: During operation at near-stall, the sleeve valve was closed in small decrements. After each decrement the weight flow was obtained. The weight flow obtained just before stall occurred is called the stall weight flow. The pressure ratio at stall was obtained by extrapolating the total pressure obtained from the survey data to the stall weight flow.

Orifice weight flow, total pressures, static pressures, and temperatures were all corrected to sea-level conditions based on the rotor inlet conditions.

RESULTS AND DISCUSSION

The results from this investigation will be presented in three main sections. The overall performances for the rotor and the stage are given first. Radial distributions of several performance parameters are then presented for the rotor and stator followed by the blade-element data. Because the data presented are machine plotted, an oc-

casional point will be omitted because it falls outside the range of the parameters shown in the figure. A brief comparison of these results and those from a high-velocity ratio stage is included. The plotted data, together with some additional performance parameters, are also tabulated: The overall performance data are given in table VI; and the blade-element data are presented for the rotor in table VII and for the stator in table VIII. The definitions and units used in the tables are listed in appendix C.

Overall Performance

The overall performance for rotor 20 and for stage 20-17 are presented in figures 7 and 8 for speeds from 50 to 100 percent of design. Design-point values are shown as solid symbols in both figures. The stall line (dashed line) shown in figure 8 was determined using the method discussed in the section Calculation Procedure.

Rotor. - The design-speed peak efficiency for rotor 20 was 0.838, which occurred at a weight flow of 28.7 kilograms per second. Although the pressure ratio at peak efficiency was only slightly greater than the design value, it occurred at a flow less than the design value. At 70 percent of design speed, efficiencies up to 0.87 were obtained for this rotor.

Stage. - At design speed the stage peak efficiency of 0.813 occurred at the same weight flow as peak efficiency for the rotor. The measured pressure ratio (1.582) was slightly higher than the design value (1.574). And the calculated stall margin was approximately 11 percent based on conditions at stall and peak efficiency. At the lower speeds efficiencies ranged up to 0.84.

Radial Distributions

The radial distributions of several parameters are presented for design speed in figure 9 for rotor 20 and in figure 10 for stator 17. The data are presented for three weight flows: maximum flow, peak efficiency, and near stall. The design values are shown by the solid symbols. A line is faired through the peak efficiency data. Temperature-rise efficiency, temperature ratio, pressure ratio, suction-surface incidence angle, meridional velocity ratio, deviation angle, total loss parameter, total loss coefficient, and diffusion factor are presented as functions of percent span from the blade tip.

Rotor. - As the weight flow was reduced, the pressure ratio and temperature ratio increased across the entire rotor blade span with the larger increases occurring in the tip region. The blade loading (diffusion factor) also continued to increase with decreasing weight flow. The effect of the damper (57 percent span) on efficiency is evident at

all three weights.

At the peak efficiency weight flow of 28.7 kilograms per second, the pressure ratio was greater than design from the tip to 50 percent span and was less than design from there to the hub. The efficiency shows a large deviation from design from the region of the damper to the hub. There is a radial shift in the flow toward the blade tip with higher than design meridional velocity ratios from the tip to 30 percent span.

Stator. - At the peak efficiency condition the stator deviation angles were essentially equal to design except in the hub and tip regions. In the stator hub region, there was a large increase in losses from the 90 to 95 percent span indicating probable separation. This occurred at all three flows. The losses in the tip region were significantly greater than design.

Variation with Incidence Angle

The variation of selected rotor and stator blade-element performance parameters with incidence angle are presented in figures 11 and 12. The data are presented for 70, 90, and 100 percent of design speed at blade elements located at 5, 10, 30, 50, 70, 90, and 95 percent spans. Design values are shown by solid symbols.

Rotor. - The rotor blade elements were designed for a suction surface incidence angle of zero. At the design incidence angle the pressure ratio was higher than design at 5, 10, and 30 percent spans apparently because the flow turns more in these regions as indicated by the less-than-design deviation angles. At 50 percent span the pressure ratio and deviation angles are equal to design values. At 70, 90, and 95 percent span the blades under turned the flow (higher than design deviation angles); therefore the pressure ratio was less than design.

At 5 and 10 percent span the minimum loss incidence angle was not defined. At 30 percent span the minimum loss was approximately equal to design; however, it occurred at less than design incidence angle. At 50, 70, and 90 percent span minimum loss occurred near design incidence angle of zero; however, the values were significantly greater than design values. At 95 percent span minimum loss occurred at a greater than design incidence angle and its value was also greater than design.

Stators. - Except at the 5 and 95 percent span locations, minimum losses were equal to or less than design and generally occurred at negative incidence angles. At the 5 percent span location, there were high losses and deviation angles over the incidence angle range. At the 10 and 95 percent span, there was an increase in losses at the low incidence angles. Deviation angles exceeded design values at 5, 10, 90, and 95 percent span locations.

Comparison with Higher-Velocity-Ratio Stage

The performance of stage 20-17 may be compared with that of stage 11-4 of reference 1, which had a velocity ratio of 1.0 across the stage tip. The velocity ratio was reduced to 0.8 in stage 20-17 by changing the outer flow path contour while keeping the same inner flow path contour. The radial distribution of blade solidity, blade chord, leading and trailing edge thicknesses, maximum thickness, X-factors, and rotor blade minimum area ratios were held constant between the stages. The axial locations of the transition point and maximum thickness were also held constant. The stages were designed for a pressure ratio of 1.57 at a nominal specific flow of 198 kilograms per second per square meter of annulus area and a nominal tip speed of 425 meters per second.

The change in stage tip meridional velocity ratio had very little effect on overall performance. At design speed and flow the stage efficiency was essentially the same for both stages. The pressure ratio was slightly higher for the stage with the 1.0 velocity ratio. The same changes were observed for the two rotors. The stall margin based on conditions at the peak efficiency point and the stall point for the 1.0 velocity ratio stage was 19 percent but was only 11 percent for the 0.8 velocity ratio stage. However, if stall margin is based on conditions at the design flow point and stall point, both stages would have a stall margin of 19 percent, and the efficiency for the 0.8 velocity ratio stage would be less than 0.5 percentage point below its peak value.

SUMMARY OF RESULTS

This report presents both the aerodynamic design parameters and the performance of a transonic fan stage having a meridional velocity ratio of 0.8 across the stage tip. This stage was designed for a pressure ratio of 1.57 at a flow of 29.5 kilograms per second and a tip speed of 426 meters per second. Detailed radial surveys of the flow conditions in front of the rotor, between the rotor and stator, and downstream of the stator were made over the stable operating flow range at rotative speeds from 50 to 100 percent of design speed. This investigation yielded the following principle results:

1. At design speed the stage peak efficiency of 0.81 occurred at a flow of 28.7 kilograms per second and a pressure ratio of 1.58. Stage stall margin was 11 percent based on the flow and pressure ratio at peak efficiency and stall.

2. At design speed a rotor peak efficiency of 0.84 occurred at a pressure ratio of 1.61 and the same flow as for stage peak efficiency.

3. At the design incidence angle the measured rotor pressure ratio in the tip re-

gion was higher than design as a result of more turning (deviation angles less than design). In the hub region there was less turning and lower pressure ratio.

Lewis Research Center,
National Aeronautics and Space Administration,
Cleveland, Ohio, May 11, 1978,
505-04.

APPENDIX A

SYMBOLS

A_{an}	annulus area at rotor leading edge, m^2
A_f	frontal area at rotor leading edge, m^2
C_p	specific heat at constant pressure, 1004 J/kg-K
c	aerodynamic chord, cm
D	diffusion factor
i_{mc}	mean incidence angle, angle between inlet air direction and line tangent to blade mean camber line at leading edge, deg
i_{ss}	suction-surface incidence angle, angle between inlet air direction and line tangent to blade suction surface at leading edge, deg
J	mechanical equivalent of heat
N	rotative speed, rpm
P	total pressure, N/cm^2
p	static pressure, N/cm^2
r	radius, cm
SM	stall margin
T	total temperature, K
U	wheel speed, m/sec
V	air velocity, m/sec
W	weight flow, kg/sec
Z	axial distance referenced from rotor blade hub leading edge, cm
α_c	cone angle, deg
α_s	slope of streamline, deg
β	air angle, angle between air velocity and axial direction, deg
β'_c	relative meridional air angle based on cone angle, $\arctan(\tan \beta'_m \cos \alpha_c / \cos \alpha_s)$, deg
γ	ratio of specific heats (1.40)

δ	ratio of rotor-inlet total pressure to standard pressure of 10.13 N/cm^2
δ^o	deviation angle, angle between exit air direction and tangent to blade mean camber line at trailing edge, deg
η	efficiency
θ	ratio of rotor-inlet total temperature to standard temperature of 288.2 K
κ_{mc}	angle between blade mean camber line and meridional plane, deg
κ_{ss}	angle between the blade suction surface at leading edge and the meridional plane, deg
σ	solidity, ratio of chord to spacing
$\overline{\omega}$	total-loss coefficient
$\overline{\omega}_p$	profile-loss coefficient
$\overline{\omega}_s$	shock-loss coefficient

Subscripts:

ad	adiabatic (temperature rise)
id	ideal
LE	blade leading edge
m	meridional direction
mom	momentum rise
p	polytropic
ref	reference
TE	blade trailing edge
z	axial direction
θ	tangential direction
1	instrumentation plane upstream of rotor
2	instrumentation plane between rotor and stator
3	instrumentation plane downstream of stator

Superscript:

'	relative to blade

APPENDIX B

EQUATIONS

Suction-surface incidence angle:

$$i_{ss} = (\beta'_c)_{LE} - \kappa_{ss} \tag{B1}$$

Mean incidence angle:

$$i_{mc} = (\beta'_c)_{LE} - (\kappa_{mc})_{LE} \tag{B2}$$

Deviation angle:

$$\delta^o = (\beta'_c)_{TE} - (\kappa_{mc})_{TE} \tag{B3}$$

Diffusion factor:

$$D = 1 - \frac{V'_{TE}}{V'_{LE}} + \left| \frac{(rV_\theta)_{TE} - (rV_\theta)_{LE}}{(r_{TE} + r_{LE})\sigma (V'_{LE})} \right| \tag{B4}$$

Total loss coefficient:

$$\bar{\omega} = \frac{(P'_{id})_{TE} - P'_{TE}}{P'_{LE} - p_{LE}} \tag{B5}$$

Profile loss coefficient:

$$\bar{\omega}_p = \bar{\omega} - \bar{\omega}_s \tag{B6}$$

Total loss parameter:

$$\frac{\bar{\omega} \cos (\beta'_m)_{TE}}{2\sigma} \tag{B7}$$

Profile-loss parameter:

$$\frac{\bar{\omega}_p \cos (\beta'_m)_{TE}}{2\sigma} \tag{B8}$$

Adiabatic (temperature rise) efficiency:

$$\eta_{ad} = \frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1}{\frac{T_{TE}}{T_{LE}} - 1} \tag{B9}$$

Momentum-rise efficiency:

$$\eta_{mom} = \frac{\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1}{\frac{(UV_\theta)_{TE} - (UV_\theta)_{LE}}{T_{LE} g J C_p}} \tag{B10}$$

Equivalent weight flow:

$$\frac{W\sqrt{\theta}}{\delta} \tag{B11}$$

Equivalent rotative speed:

$$\frac{N}{\sqrt{\theta}} \tag{B12}$$

Mass flow per unit annulus area:

$$\frac{\frac{W\sqrt{\theta}}{\delta}}{A_{an}} \tag{B13}$$

Mass flow per unit frontal area:

$$\frac{\frac{W\sqrt{\theta}}{\delta}}{A_f} \tag{B14}$$

Head-rise coefficient:

$$\frac{gJC_pT_{LE}}{U_{tip}^2}\left[\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma} - 1\right] \tag{B15}$$

Flow coefficient:

$$\left(\frac{V_z}{U_{tip}}\right)_{LE} \tag{B16}$$

Stall margin:

$$SM = \left[\frac{\left(\frac{P_{TE}}{P_{LE}}\right)_{stall}}{\left(\frac{P_{TE}}{P_{LE}}\right)_{ref}} \times \frac{\left(\frac{W\sqrt{\theta}}{\delta}\right)_{ref}}{\left(\frac{W\sqrt{\theta}}{\delta}\right)_{stall}} - 1\right] \times 100 \tag{B17}$$

Polytropic efficiency:

$$\eta_p = \frac{\ln\left(\frac{P_{TE}}{P_{LE}}\right)^{(\gamma-1)/\gamma}}{\ln\left(\frac{T_{TE}}{T_{LE}}\right)} \tag{B18}$$

APPENDIX C

DEFINITIONS AND UNITS USED IN TABLES

ABS	absolute
AERO CHORD	aerodynamic chord, cm
AREA RATIO	ratio of actual flow area to critical area (where local Mach number is one)
BETAM	meridional air angle, deg
CONE ANGLE	angle between axial direction and conical surface representing blade element, deg
DELTA INC	difference between mean camber blade angle and suction-surface blade angle at leading edge, deg
DEV	deviation angle (defined by eq. (B3)), deg
D-FACT	diffusion factor (defined by eq. (B4))
EFF	adiabatic efficiency (defined by eq. (B9))
IN	inlet (leading edge of blade)
INCIDENCE	incidence angle (suction surface defined by eq. (B1) and mean by eq. (B2))
KIC	angle between blade mean camber line at leading edge and meridional plane, deg
KOC	angle between blade mean camber line at trailing edge and meridional plane, deg
KTC	angle between blade mean camber line at transition point and meridional plane, deg
LOSS COEFF	loss coefficient (total defined by eq. (B5) and profile by eq. (B6))
LOSS PARAM	loss parameter (total defined by eq. (B7) and profile by eq. (B8))
MERID	meridional
MERID VEL R	meridional velocity ratio
OUT	outlet (trailing edge of blade)
PERCENT SPAN	percent blade span from tip at rotor outlet
PHISS	suction-surface camber ahead of assumed shock location, deg

PRESS	pressure, N/cm^2
PROF	profile
RADII	radius, cm
REL	relative to blade
RI	inlet radius (leading edge of blade), cm
RO	outlet radius (trailing edge of blade), cm
RP	radial position
RPM	equivalent rotative speed, rpm
SETTING ANGLE	angle between aerodynamic chord and meridional plane, deg
SOLIDITY	ratio of aerodynamic chord to blade spacing
SPEED	speed, m/sec
SS	suction surface
STREAMLINE SLOPE	slope of streamline, deg
TANG	tangential
TEMP	temperature, K
TI	thickness of blade at leading edge, cm
TM	thickness of blade at maximum thickness, cm
TO	thickness of blade at trailing edge, cm
TOT	total
TOTAL CAMBER	difference between inlet and outlet blade mean camber line angle, deg
VEL	velocity, m/sec
WT FLOW	equivalent weight flow, kg/sec
X FACTOR	ratio of suction-surface camber ahead of assumed shock location of multiple-circular-arc blade section to that of double circular-arc blade section
ZIC	axial distance from inlet to blade leading edge, cm
ZMC	axial distance from inlet to blade maximum thickness point, cm
ZOC	axial distance from inlet to blade trailing edge, cm
ZTC	axial distance from inlet to transition point, cm

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TABLE I. - DESIGN OVERALL PARAMETERS

FOR STAGE 20-17

ROTOR TOTAL PRESSURE RATIO	1.601
STAGE TOTAL PRESSURE RATIO	1.574
ROTOR TOTAL TEMPERATURE RATIO	1.163
STAGE TOTAL TEMPERATURE RATIO	1.163
ROTOR ADIABATIC EFFICIENCY	0.881
STAGE ADIABATIC EFFICIENCY	0.847
ROTOR POLYTROPIC EFFICIENCY	0.888
STAGE POLYTROPIC EFFICIENCY	0.856
ROTOR HEAD RISE COEFFICIENT	0.229
STAGE HEAD RISE COEFFICIENT	0.220
FLOW COEFFICIENT	0.449
WT FLOW PER UNIT FRONTAL AREA	146.845
WT FLOW PER UNIT ANNULUS AREA	196.411
WT FLOW	29.484
RPM	16100.000
TIP SPEED	426.228

TABLE II. - DESIGN BLADE-ELEMENT PARAMETERS FOR ROTOR 20

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
TIP	25.281	25.171	0.	45.7	66.5	64.6	288.2	1.204	10.13	1.601
1	24.724	24.614	-0.	43.4	65.7	63.6	288.2	1.190	10.13	1.601
2	24.156	24.057	0.	41.9	64.9	62.6	288.2	1.181	10.13	1.601
3	21.810	21.829	0.	40.8	61.9	58.1	288.2	1.164	10.13	1.601
4	19.385	19.601	0.	42.0	58.9	51.8	288.2	1.157	10.13	1.601
5	18.764	19.044	0.	42.5	58.1	49.8	288.2	1.155	10.13	1.601
6	18.451	18.766	0.	42.7	57.7	48.7	288.2	1.155	10.13	1.601
7	18.136	18.487	0.	43.0	57.3	47.5	288.2	1.154	10.13	1.601
8	17.819	18.209	0.	43.2	56.9	46.3	288.2	1.154	10.13	1.601
9	16.851	17.373	0.	44.1	55.6	42.3	288.2	1.153	10.13	1.601
10	14.130	15.145	0.	47.7	51.8	27.1	288.2	1.154	10.13	1.601
11	13.408	14.568	0.	49.1	50.6	21.6	288.2	1.155	10.13	1.601
HUB	12.700	14.031	0.	50.6	49.4	15.3	288.2	1.158	10.13	1.601

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	185.6	194.1	464.9	316.0	185.6	135.6	0.	138.9	426.2	424.4
1	188.4	193.1	457.5	315.1	188.4	140.2	-0.	132.6	410.9	415.0
2	190.9	193.0	449.8	311.8	190.9	143.7	0.	128.9	407.3	405.6
3	196.3	197.1	416.8	282.0	196.3	149.2	0.	128.8	367.7	368.0
4	196.9	204.9	381.6	246.1	196.9	152.3	0.	137.1	326.8	330.5
5	196.6	207.6	372.5	237.0	196.6	153.1	0.	140.2	316.4	321.1
6	196.3	208.9	367.9	232.5	196.3	153.5	0.	141.8	311.1	316.4
7	196.0	210.4	363.2	228.1	196.0	153.9	0.	143.4	305.8	311.7
8	195.7	211.9	358.5	223.7	195.7	154.4	0.	145.2	300.4	307.0
9	194.2	217.0	344.2	210.7	194.2	155.8	0.	151.1	284.1	292.9
10	187.7	235.7	303.3	178.0	187.7	158.5	0.	174.4	238.2	255.3
11	185.7	242.3	292.6	170.6	185.7	158.7	0.	183.1	226.1	246.0
HUB	183.8	249.9	282.2	164.5	183.8	158.6	0.	193.1	214.1	236.6

	ABS MACH NO		REL MACH NO		MERID MACH NO		STREAMLINE SLOPE		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
TIP	0.563	0.535	1.409	0.871	0.563	0.373	-2.68	-1.58	0.730	1.528
1	0.572	0.535	1.388	0.873	0.572	0.388	-2.24	-1.43	0.744	1.519
2	0.580	0.537	1.366	0.867	0.580	0.400	-1.70	-1.14	0.753	1.510
3	0.597	0.553	1.268	0.791	0.597	0.419	1.22	1.06	0.760	1.490
4	0.599	0.578	1.161	0.695	0.599	0.430	4.65	3.98	0.773	1.477
5	0.598	0.587	1.133	0.670	0.598	0.433	5.88	4.80	0.779	1.476
6	0.597	0.591	1.119	0.658	0.597	0.434	6.43	5.23	0.782	1.476
7	0.596	0.596	1.105	0.646	0.596	0.436	7.00	5.66	0.785	1.476
8	0.595	0.600	1.090	0.634	0.595	0.437	7.58	6.11	0.789	1.477
9	0.590	0.616	1.046	0.598	0.590	0.442	9.47	7.54	0.802	1.481
10	0.569	0.673	0.920	0.509	0.569	0.453	15.94	11.97	0.844	1.403
11	0.563	0.694	0.887	0.488	0.563	0.454	18.03	13.24	0.854	1.365
HUB	0.557	0.717	0.855	0.472	0.557	0.455	20.24	14.58	0.863	1.328

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
TIP	0.	2.5	0.0	5.4	0.435	0.706	0.235	0.148	0.039	0.024
1	5.00	2.8	-0.0	4.8	0.420	0.755	0.191	0.108	0.032	0.018
2	10.00	3.0	0.0	4.4	0.412	0.796	0.156	0.078	0.026	0.013
3	30.00	4.1	0.0	2.9	0.427	0.878	0.094	0.035	0.017	0.006
4	50.00	5.2	0.0	2.6	0.462	0.919	0.068	0.025	0.012	0.005
5	55.00	5.5	0.0	2.8	0.473	0.925	0.065	0.026	0.012	0.005
6	57.50	5.6	0.0	2.9	0.478	0.928	0.063	0.026	0.012	0.005
7	60.00	5.7	0.0	2.9	0.483	0.931	0.061	0.025	0.011	0.005
8	62.50	5.9	0.0	3.0	0.488	0.934	0.059	0.025	0.011	0.005
9	70.00	6.3	0.0	3.6	0.504	0.941	0.056	0.027	0.011	0.005
10	90.00	7.2	0.0	6.2	0.543	0.935	0.074	0.065	0.014	0.013
11	95.00	7.5	0.0	7.0	0.552	0.925	0.092	0.087	0.018	0.017
HUB	100.00	7.7	0.0	7.8	0.558	0.911	0.117	0.115	0.022	0.022

TABLE III. - DESIGN BLADE-ELEMENT PARAMETERS FOR STATOR 17

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
TIP	25.146	25.146	44.7	0.	44.7	0.	347.0	1.001	16.22	0.976
1	24.587	24.600	42.0	-0.	42.0	-0.	345.0	1.000	16.22	0.982
2	24.057	24.110	40.3	0.	40.3	0.	340.2	1.000	16.22	0.985
3	21.962	22.133	38.6	0.	38.6	0.	335.3	1.000	16.22	0.989
4	19.882	20.160	39.4	0.	39.4	0.	333.3	1.000	16.22	0.987
5	19.364	19.670	39.8	0.	39.8	0.	333.0	1.000	16.22	0.986
6	19.105	19.426	40.0	0.	40.0	0.	332.8	1.000	16.22	0.986
7	18.846	19.182	40.2	0.	40.2	0.	332.7	1.000	16.22	0.986
8	18.588	18.939	40.5	0.	40.5	0.	332.5	1.000	16.22	0.985
9	17.812	18.213	41.2	0.	41.2	0.	332.2	1.000	16.22	0.984
10	15.750	16.298	44.5	0.	44.5	0.	332.5	1.000	16.22	0.970
11	15.238	15.815	45.7	0.	45.7	0.	333.0	1.000	16.22	0.959
HUB	14.732	15.240	47.1	-0.	47.1	-0.	333.6	1.000	16.22	0.942

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
TIP	198.2	151.4	198.2	151.4	140.9	151.4	139.4	0.	0.	0.
1	198.5	153.8	198.5	153.8	147.4	153.8	132.9	-0.	0.	0.
2	199.4	155.6	199.4	155.6	152.2	155.6	128.9	0.	0.	0.
3	205.3	158.8	205.3	158.8	160.5	158.8	128.0	0.	0.	0.
4	212.8	160.3	212.8	160.3	164.4	160.3	135.2	0.	0.	0.
5	215.2	160.7	215.2	160.7	165.3	160.7	137.8	0.	0.	0.
6	216.5	161.0	216.5	161.0	165.7	161.0	139.2	0.	0.	0.
7	217.8	161.3	217.8	161.3	166.2	161.3	140.7	0.	0.	0.
8	219.1	161.7	219.1	161.7	166.7	161.7	142.2	0.	0.	0.
9	223.5	162.5	223.5	162.5	168.1	162.5	147.4	0.	0.	0.
10	239.4	158.7	239.4	158.7	170.9	158.7	167.7	0.	0.	0.
11	245.0	155.1	245.0	155.1	171.1	155.1	175.3	0.	0.	0.
HUB	251.2	149.6	251.2	149.6	171.1	149.6	183.9	-0.	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		STREAMLINE SLOPE		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
TIP	0.547	0.412	0.547	0.412	0.389	0.412	0.13	-0.53	1.075	0.850
1	0.551	0.422	0.551	0.422	0.409	0.422	0.75	0.02	1.044	0.827
2	0.556	0.428	0.556	0.428	0.424	0.428	1.26	0.44	1.022	0.814
3	0.578	0.441	0.578	0.441	0.452	0.441	2.86	1.67	0.989	0.815
4	0.602	0.447	0.602	0.447	0.465	0.447	4.50	2.65	0.975	0.841
5	0.610	0.448	0.610	0.448	0.468	0.448	4.96	2.88	0.973	0.851
6	0.614	0.449	0.614	0.449	0.470	0.449	5.21	3.00	0.972	0.856
7	0.618	0.450	0.618	0.450	0.472	0.450	5.46	3.12	0.971	0.861
8	0.622	0.451	0.622	0.451	0.473	0.451	5.72	3.24	0.970	0.866
9	0.636	0.454	0.636	0.454	0.478	0.454	6.57	3.62	0.967	0.885
10	0.685	0.443	0.685	0.443	0.489	0.443	9.30	4.55	0.929	0.958
11	0.702	0.432	0.702	0.432	0.490	0.432	10.06	4.62	0.906	0.986
HUB	0.721	0.416	0.721	0.416	0.491	0.416	10.83	4.62	0.875	1.020

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
TIP	0.	6.1	0.0	14.2	0.513	0.	0.141	0.141	0.056	0.056
1	5.00	6.1	0.0	12.3	0.483	0.	0.098	0.098	0.038	0.038
2	10.00	6.2	0.0	11.1	0.463	0.	0.077	0.077	0.029	0.029
3	30.00	6.2	0.0	9.4	0.441	0.	0.055	0.055	0.019	0.019
4	50.00	6.2	0.0	8.9	0.444	0.	0.060	0.060	0.019	0.019
5	55.00	6.2	0.0	8.8	0.447	0.	0.062	0.062	0.019	0.019
6	57.50	6.2	0.0	8.8	0.448	0.	0.063	0.063	0.019	0.019
7	60.00	6.1	0.0	8.8	0.449	0.	0.064	0.064	0.019	0.019
8	62.50	6.1	0.0	8.7	0.450	0.	0.065	0.065	0.019	0.019
9	70.00	6.1	0.0	8.7	0.456	0.	0.067	0.067	0.019	0.019
10	90.00	6.1	0.0	8.8	0.509	0.	0.110	0.110	0.027	0.027
11	95.00	6.1	0.0	8.9	0.536	0.	0.146	0.146	0.035	0.035
HUB	100.00	6.1	0.1	9.1	0.572	0.	0.202	0.202	0.047	0.047

TABLE IV. - BLADE GEOMETRY FOR ROTOR 20

RP	PERCENT SPAN	RADII RI	RADII RO	BLADE ANGLES KIC	BLADE ANGLES KTC	BLADE ANGLES KOC	DELTA INC	CONE ANGLE
TIP	0.	25.281	25.171	63.94	63.97	59.17	2.52	-3.006
1	5.	24.724	24.614	62.90	62.83	58.74	2.77	-2.925
2	10.	24.156	24.057	61.85	61.62	58.16	3.03	-2.520
3	30.	21.810	21.829	57.80	56.14	55.16	4.11	0.434
4	50.	19.385	19.601	53.76	50.05	49.12	5.19	4.227
5	55.	18.764	19.044	52.71	48.42	46.96	5.46	5.281
6	58.	18.451	18.766	52.18	47.58	45.80	5.59	5.834
7	60.	18.136	18.487	51.64	46.73	44.57	5.73	6.399
8	63.	17.819	18.209	51.09	45.86	43.29	5.86	6.974
9	70.	16.851	17.373	49.43	43.22	38.64	6.26	8.822
10	90.	14.130	15.145	44.69	36.03	20.60	7.25	14.611
11	95.	13.408	14.588	43.40	34.05	14.33	7.46	16.271
HUB	100.	12.700	14.031	42.12	32.06	7.30	7.64	17.597

RP	BLADE THICKNESSES TI	BLADE THICKNESSES TM	BLADE THICKNESSES TO	AXIAL DIMENSIONS ZIC	AXIAL DIMENSIONS ZMC	AXIAL DIMENSIONS ZTC	AXIAL DIMENSIONS ZOC
TIP	0.051	0.153	0.051	1.017	2.032	2.437	3.097
1	0.051	0.163	0.051	0.980	2.034	2.409	3.135
2	0.051	0.173	0.051	0.942	2.035	2.376	3.175
3	0.051	0.217	0.051	0.780	2.037	2.204	3.340
4	0.051	0.261	0.051	0.609	2.037	1.957	3.534
5	0.051	0.272	0.051	0.563	2.035	1.882	3.590
6	0.051	0.278	0.051	0.539	2.034	1.842	3.619
7	0.051	0.284	0.051	0.514	2.033	1.800	3.648
8	0.051	0.290	0.051	0.490	2.032	1.757	3.678
9	0.051	0.307	0.051	0.419	2.025	1.617	3.775
10	0.051	0.358	0.051	0.163	1.991	1.161	4.058
11	0.051	0.372	0.051	0.084	1.977	1.021	4.128
HUB	0.051	0.385	0.051	0.000	1.961	0.875	4.196

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR	PHISS	AREA RATIO
TIP	4.676	63.24	4.77	1.298	0.646	3.50	1.043
1	4.676	62.19	4.16	1.327	0.710	3.82	1.044
2	4.676	61.10	3.69	1.358	0.775	4.20	1.044
3	4.675	56.39	2.64	1.500	1.023	6.30	1.041
4	4.680	50.68	4.64	1.681	1.140	8.60	1.040
5	4.683	48.98	5.74	1.735	1.152	9.18	1.040
6	4.686	48.09	6.38	1.763	1.158	9.47	1.040
7	4.688	47.16	7.07	1.793	1.163	9.77	1.040
8	4.691	46.19	7.81	1.824	1.167	10.06	1.041
9	4.704	42.98	10.79	1.925	1.173	10.91	1.042
10	4.784	31.74	24.09	2.289	1.135	12.65	1.046
11	4.820	27.96	29.07	2.412	1.131	13.07	1.048
HUB	4.862	23.78	34.82	2.547	1.130	13.46	1.050

TABLE V. - BLADE GEOMETRY FOR STATOR 17

RP	PERCENT SPAN	RADII RI	RADII RO	BLADE ANGLES KIC	BLADE ANGLES KTC	BLADE ANGLES KOC	DELTA INC	CONE ANGLE
TIP	0.	25.146	25.146	38.58	30.24	-14.15	6.11	0.057
1	5.	24.587	24.600	35.90	28.80	-12.31	6.14	0.190
2	10.	24.057	24.110	34.10	27.85	-11.10	6.16	0.763
3	30.	21.962	22.133	32.40	27.20	-9.40	6.18	2.467
4	50.	19.882	20.160	33.28	28.23	-8.88	6.16	4.012
5	55.	19.364	19.670	33.70	28.63	-8.82	6.15	4.418
6	58.	19.105	19.426	33.91	28.84	-8.78	6.15	4.632
7	60.	18.846	19.182	34.13	29.05	-8.75	6.15	4.852
8	63.	18.588	18.939	34.35	29.27	-8.72	6.14	5.077
9	70.	17.812	18.213	35.15	30.01	-8.66	6.13	5.805
10	90.	15.750	16.298	38.48	32.94	-8.79	6.07	7.976
11	95.	15.238	15.815	39.76	34.02	-8.93	6.05	8.430
HUB	100.	14.732	15.240	41.21	35.22	-9.14	6.03	7.472

RP	BLADE THICKNESSES TI	BLADE THICKNESSES TM	BLADE THICKNESSES TO	AXIAL DIMENSIONS ZIC	AXIAL DIMENSIONS ZMC	AXIAL DIMENSIONS ZTC	AXIAL DIMENSIONS ZOC
TIP	0.051	0.279	0.051	7.612	9.388	9.114	11.507
1	0.051	0.279	0.051	7.578	9.395	9.003	11.507
2	0.051	0.279	0.051	7.556	9.400	8.919	11.507
3	0.051	0.279	0.051	7.537	9.407	8.755	11.508
4	0.051	0.279	0.051	7.543	9.405	8.668	11.506
5	0.051	0.279	0.051	7.546	9.404	8.651	11.505
6	0.051	0.279	0.051	7.547	9.404	8.642	11.504
7	0.051	0.279	0.051	7.549	9.403	8.633	11.504
8	0.051	0.279	0.051	7.551	9.403	8.625	11.504
9	0.051	0.279	0.051	7.559	9.401	8.601	11.503
10	0.051	0.279	0.051	7.593	9.394	8.557	11.500
11	0.051	0.279	0.051	7.607	9.391	8.552	11.499
HUB	0.051	0.279	0.051	7.624	9.387	8.549	11.497

RP	AERO CHORD	SETTING ANGLE	TOTAL CAMBER	SOLIDITY	X FACTOR	PHISS	AREA RATIO
TIP	4.179	19.35	52.73	1.270	0.600	13.51	1.339
1	4.178	17.85	48.20	1.298	0.600	11.95	1.311
2	4.180	16.88	45.20	1.326	0.600	10.86	1.290
3	4.183	15.86	41.80	1.449	0.600	9.31	1.244
4	4.169	16.23	42.16	1.598	0.600	8.87	1.207
5	4.191	16.42	42.51	1.640	0.600	8.83	1.198
6	4.192	16.52	42.69	1.662	0.600	8.80	1.193
7	4.193	16.62	42.88	1.685	0.600	8.78	1.188
8	4.194	16.73	43.08	1.708	0.600	8.76	1.183
9	4.199	17.10	43.81	1.781	0.600	8.73	1.167
10	4.216	18.70	47.27	2.010	0.600	8.93	1.132
11	4.220	19.32	48.69	2.076	0.600	9.10	1.123
HUB	4.209	20.02	50.35	2.146	0.600	9.31	1.114

TABLE VI. - OVERALL PERFORMANCE FOR

STAGE 20-17

(a) 50 Percent of design speed.

READING NUMBER	2837
ROTOR TOTAL PRESSURE RATIO	1.130
STAGE TOTAL PRESSURE RATIO	1.123
ROTOR TOTAL TEMPERATURE RATIO	1.045
STAGE TOTAL TEMPERATURE RATIO	1.045
ROTOR TEMP. RISE EFFICIENCY	0.794
STAGE TEMP. RISE EFFICIENCY	0.751
ROTOR MOMENTUM RISE EFFICIENCY	0.820
ROTOR HEAD RISE COEFFICIENT	0.226
STAGE HEAD RISE COEFFICIENT	0.216
FLOW COEFFICIENT	0.299
WT FLOW PER UNIT FRONTAL AREA	58.56
WT FLOW PER UNIT ANNULUS AREA	78.32
WT FLOW AT ORIFICE	11.76
WT FLOW AT ROTOR INLET	11.92
WT FLOW AT ROTOR OUTLET	12.14
WT FLOW AT STATOR OUTLET	12.71
ROTATIVE SPEED	8042.4
PERCENT OF DESIGN SPEED	50.0

(b) 60 Percent of design speed.

READING NUMBER	2835
ROTOR TOTAL PRESSURE RATIO	1.191
STAGE TOTAL PRESSURE RATIO	1.179
ROTOR TOTAL TEMPERATURE RATIO	1.064
STAGE TOTAL TEMPERATURE RATIO	1.064
ROTOR TEMP. RISE EFFICIENCY	0.799
STAGE TEMP. RISE EFFICIENCY	0.755
ROTOR MOMENTUM RISE EFFICIENCY	0.821
ROTOR HEAD RISE COEFFICIENT	0.228
STAGE HEAD RISE COEFFICIENT	0.215
FLOW COEFFICIENT	0.307
WT FLOW PER UNIT FRONTAL AREA	71.11
WT FLOW PER UNIT ANNULUS AREA	95.11
WT FLOW AT ORIFICE	14.28
WT FLOW AT ROTOR INLET	14.50
WT FLOW AT ROTOR OUTLET	14.83
WT FLOW AT STATOR OUTLET	15.36
ROTATIVE SPEED	9628.7
PERCENT OF DESIGN SPEED	59.8

(c) 70 Percent of design speed.

READING NUMBER	2917	2832	2831	2830	2829
ROTOR TOTAL PRESSURE RATIO	1.151	1.198	1.232	1.258	1.273
STAGE TOTAL PRESSURE RATIO	1.130	1.188	1.221	1.244	1.253
ROTOR TOTAL TEMPERATURE RATIO	1.048	1.061	1.071	1.081	1.090
STAGE TOTAL TEMPERATURE RATIO	1.048	1.060	1.070	1.080	1.090
ROTOR TEMP. RISE EFFICIENCY	0.860	0.872	0.859	0.838	0.790
STAGE TEMP. RISE EFFICIENCY	0.737	0.837	0.836	0.804	0.740
ROTOR MOMENTUM RISE EFFICIENCY	0.895	0.924	0.906	0.864	0.804
ROTOR HEAD RISE COEFFICIENT	0.133	0.173	0.201	0.219	0.232
STAGE HEAD RISE COEFFICIENT	0.115	0.164	0.193	0.208	0.217
FLOW COEFFICIENT	0.441	0.410	0.377	0.345	0.307
WT FLOW PER UNIT FRONTAL AREA	113.73	106.92	98.92	91.99	82.68
WT FLOW PER UNIT ANNULUS AREA	152.12	143.01	132.31	123.04	110.58
WT FLOW AT ORIFICE	22.83	21.47	19.86	18.47	16.60
WT FLOW AT ROTOR INLET	23.21	21.76	20.15	18.72	16.79
WT FLOW AT ROTOR OUTLET	23.32	22.04	20.52	19.22	17.24
WT FLOW AT STATOR OUTLET	23.87	22.32	20.75	19.42	18.04
ROTATIVE SPEED	11284.2	11256.7	11228.2	11295.1	11262.0
PERCENT OF DESIGN SPEED	70.1	69.9	69.7	70.2	70.0

TABLE VI. - Concluded.

(d) 80 Percent of design speed.

READING NUMBER	2814
ROTOR TOTAL PRESSURE RATIO	1.375
STAGE TOTAL PRESSURE RATIO	1.350
ROTOR TOTAL TEMPERATURE RATIO	1.119
STAGE TOTAL TEMPERATURE RATIO	1.118
ROTOR TEMP. RISE EFFICIENCY	0.801
STAGE TEMP. RISE EFFICIENCY	0.756
ROTOR MOMENTUM RISE EFFICIENCY	0.800
ROTOR HEAD RISE COEFFICIENT	0.235
STAGE HEAD RISE COEFFICIENT	0.221
FLOW COEFFICIENT	0.317
WT FLOW PER UNIT FRONTAL AREA	96.58
WT FLOW PER UNIT ANNULUS AREA	129.18
WT FLOW AT ORIFICE	19.39
WT FLOW AT ROTOR INLET	19.60
WT FLOW AT ROTOR OUTLET	19.95
WT FLOW AT STATOR OUTLET	21.58
ROTATIVE SPEED	12936.0
PERCENT OF DESIGN SPEED	80.3

(e) 90 Percent of design speed.

READING NUMBER	2820	2821	2822	2824	2839
ROTOR TOTAL PRESSURE RATIO	1.360	1.428	1.475	1.497	1.497
STAGE TOTAL PRESSURE RATIO	1.344	1.413	1.454	1.464	1.455
ROTOR TOTAL TEMPERATURE RATIO	1.109	1.125	1.137	1.147	1.151
STAGE TOTAL TEMPERATURE RATIO	1.109	1.124	1.136	1.145	1.149
ROTOR TEMP. RISE EFFICIENCY	0.841	0.858	0.855	0.830	0.809
STAGE TEMP. RISE EFFICIENCY	0.806	0.839	0.830	0.792	0.758
ROTOR MOMENTUM RISE EFFICIENCY	0.872	0.893	0.885	0.846	0.818
ROTOR HEAD RISE COEFFICIENT	0.178	0.208	0.228	0.238	0.240
STAGE HEAD RISE COEFFICIENT	0.170	0.202	0.219	0.224	0.222
FLOW COEFFICIENT	0.436	0.419	0.396	0.360	0.338
WT FLOW PER UNIT FRONTAL AREA	138.82	134.21	128.30	118.94	112.18
WT FLOW PER UNIT ANNULUS AREA	185.68	179.52	171.60	159.08	150.05
WT FLOW AT ORIFICE	27.87	26.95	25.76	23.88	22.52
WT FLOW AT ROTOR INLET	28.27	27.38	26.21	24.26	22.89
WT FLOW AT ROTOR OUTLET	28.50	27.78	26.67	24.77	23.39
WT FLOW AT STATOR OUTLET	29.51	28.72	27.56	25.83	24.76
ROTATIVE SPEED	14619.0	14579.0	14582.1	14571.9	14500.8
PERCENT OF DESIGN SPEED	90.8	90.6	90.6	90.5	90.1

(f) 100 Percent of design speed.

READING NUMBER	2819	2818	2913	2914	2817
ROTOR TOTAL PRESSURE RATIO	1.418	1.536	1.614	1.642	1.665
STAGE TOTAL PRESSURE RATIO	1.393	1.515	1.582	1.602	1.615
ROTOR TOTAL TEMPERATURE RATIO	1.132	1.157	1.175	1.182	1.190
STAGE TOTAL TEMPERATURE RATIO	1.132	1.156	1.172	1.179	1.187
ROTOR TEMP. RISE EFFICIENCY	0.795	0.830	0.833	0.837	0.824
STAGE TEMP. RISE EFFICIENCY	0.749	0.808	0.815	0.807	0.784
ROTOR MOMENTUM RISE EFFICIENCY	0.817	0.865	0.869	0.865	0.851
ROTOR HEAD RISE COEFFICIENT	0.167	0.208	0.234	0.242	0.250
STAGE HEAD RISE COEFFICIENT	0.158	0.201	0.225	0.229	0.235
FLOW COEFFICIENT	0.436	0.428	0.412	0.401	0.377
WT FLOW PER UNIT FRONTAL AREA	148.82	147.25	142.77	139.88	133.49
WT FLOW PER UNIT ANNULUS AREA	199.05	196.96	190.96	187.09	178.54
WT FLOW AT ORIFICE	29.88	29.57	28.67	28.09	26.80
WT FLOW AT ROTOR INLET	30.25	29.90	29.09	28.53	27.20
WT FLOW AT ROTOR OUTLET	30.29	30.23	29.46	28.96	28.04
WT FLOW AT STATOR OUTLET	31.42	31.35	30.68	30.35	29.84
ROTATIVE SPEED	16091.8	16106.4	16103.9	16118.0	16078.5
PERCENT OF DESIGN SPEED	99.9	100.0	100.0	100.1	99.9

TABLE VII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR ROTOR 20

(a) 50 Percent of design speed; reading 2837

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.724	24.615	-0.0	48.0	72.7	63.3	289.0	1.055	10.12	1.137
2	24.155	24.056	-0.0	43.0	71.8	60.8	288.6	1.052	10.13	1.138
3	21.811	21.829	-0.0	42.7	69.4	58.6	288.2	1.044	10.13	1.129
4	19.385	19.601	-0.0	47.7	67.3	52.9	288.0	1.043	10.13	1.128
5	18.766	19.045	-0.0	50.1	66.8	51.9	288.0	1.043	10.13	1.126
6	18.451	18.766	-0.0	51.8	66.4	52.1	287.8	1.043	10.13	1.123
7	18.136	18.486	-0.0	53.2	66.1	51.3	287.8	1.043	10.13	1.122
8	17.818	18.209	-0.0	53.8	65.7	50.7	287.8	1.043	10.14	1.121
9	16.850	17.374	-0.0	51.3	64.6	45.4	287.8	1.041	10.13	1.122
10	14.130	15.146	-0.0	47.1	60.5	30.6	287.8	1.038	10.13	1.127
11	13.409	14.587	-0.0	48.9	60.4	22.2	287.7	1.040	10.13	1.134

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	65.1	100.2	218.6	149.1	65.1	67.0	-0.0	74.5	208.7	207.8
2	67.1	101.7	214.4	152.8	67.1	74.4	-0.0	69.3	203.6	202.8
3	69.0	97.6	196.2	137.7	69.0	71.7	-0.0	66.2	183.6	183.8
4	68.3	101.1	176.7	112.9	68.3	68.1	-0.0	74.8	163.0	164.8
5	67.9	101.3	172.1	105.2	67.9	65.0	-0.0	77.8	158.2	160.5
6	68.0	100.3	170.0	100.9	68.0	62.0	-0.0	78.9	155.8	158.5
7	67.7	100.5	166.9	96.2	67.7	60.1	-0.0	80.5	152.6	155.5
8	67.6	100.4	164.7	93.6	67.6	59.3	-0.0	81.0	150.1	153.4
9	67.5	103.4	157.1	92.1	67.5	64.7	-0.0	80.7	141.8	146.2
10	67.3	112.0	136.5	88.6	67.3	76.2	-0.0	82.1	118.8	127.3
11	64.1	120.1	129.8	85.4	64.1	79.0	-0.0	90.4	112.8	122.7

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.192	0.289	0.644	0.430	0.192	0.193	1.029 0.942
2	0.198	0.294	0.632	0.441	0.198	0.215	1.110 0.930
3	0.204	0.283	0.579	0.399	0.204	0.208	1.039 0.905
4	0.202	0.294	0.522	0.328	0.202	0.198	0.997 0.877
5	0.200	0.294	0.508	0.305	0.200	0.189	0.957 0.863
6	0.201	0.291	0.502	0.293	0.201	0.180	0.912 0.859
7	0.200	0.292	0.493	0.279	0.200	0.175	0.889 0.850
8	0.200	0.292	0.486	0.272	0.200	0.172	0.877 0.844
9	0.199	0.301	0.464	0.268	0.199	0.188	0.958 0.820
10	0.199	0.327	0.403	0.258	0.199	0.222	1.132 0.734
11	0.189	0.351	0.383	0.249	0.189	0.231	1.232 0.718

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	9.8	7.0	4.5	0.446	0.679	0.236	0.236	0.040	0.040
2	10.00	9.9	6.9	2.7	0.406	0.731	0.192	0.192	0.034	0.034
3	30.00	11.6	7.5	3.4	0.411	0.808	0.137	0.137	0.024	0.024
4	50.00	13.5	8.3	3.8	0.488	0.811	0.160	0.160	0.029	0.029
5	55.00	14.1	8.6	4.9	0.520	0.801	0.177	0.177	0.031	0.031
6	57.50	14.3	8.7	6.3	0.539	0.785	0.195	0.195	0.034	0.034
7	60.00	14.5	8.7	6.7	0.560	0.777	0.209	0.209	0.036	0.036
8	62.50	14.7	8.8	7.3	0.568	0.776	0.214	0.214	0.037	0.037
9	70.00	15.2	8.9	6.6	0.549	0.808	0.194	0.194	0.035	0.035
10	90.00	15.9	8.7	9.8	0.487	0.923	0.093	0.093	0.017	0.017
11	95.00	17.2	9.8	7.6	0.493	0.918	0.115	0.115	0.022	0.022

TABLE VII. - Continued.

(b) 60 Percent of design speed; reading 2835

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	48.4	72.3	63.1	288.7	1.081	10.11	1.201
2	24.155	24.056	-0.0	43.2	71.3	60.8	288.6	1.075	10.13	1.204
3	21.811	21.829	-0.0	42.6	68.9	58.6	288.3	1.062	10.14	1.189
4	19.385	19.601	-0.0	47.9	66.8	53.2	288.0	1.061	10.13	1.186
5	18.766	19.045	-0.0	50.6	66.3	51.9	287.9	1.062	10.13	1.183
6	18.451	18.766	-0.0	52.0	65.9	51.7	287.9	1.061	10.13	1.180
7	18.136	18.486	-0.0	53.5	65.6	51.0	287.9	1.061	10.14	1.180
8	17.818	18.209	-0.0	53.9	65.2	50.1	287.9	1.061	10.13	1.177
9	16.850	17.374	-0.0	51.0	64.0	44.5	287.8	1.060	10.13	1.182
10	14.130	15.146	-0.0	47.4	59.9	28.9	287.8	1.055	10.13	1.192
11	13.409	14.587	-0.0	48.8	59.7	21.2	287.8	1.057	10.13	1.200

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	79.5	120.5	261.7	177.1	79.5	80.0	-0.0	90.2	249.3	248.2
2	82.7	122.3	257.5	182.3	82.7	89.1	-0.0	83.7	243.8	242.8
3	84.8	117.0	235.7	165.0	84.8	86.1	-0.0	79.3	219.9	220.1
4	83.9	120.6	212.6	134.9	83.9	80.8	-0.0	89.5	195.3	197.5
5	83.1	121.2	206.5	124.7	83.1	76.9	-0.0	93.6	189.0	191.8
6	83.1	120.6	203.6	119.7	83.1	74.1	-0.0	95.1	185.8	189.0
7	82.9	121.2	201.0	114.7	82.9	72.1	-0.0	97.4	183.1	186.6
8	82.9	121.3	197.9	111.5	82.9	71.5	-0.0	98.0	179.6	183.6
9	83.0	125.6	189.3	111.0	83.0	79.1	-0.0	97.6	170.1	175.4
10	82.5	137.5	164.6	106.3	82.5	93.0	-0.0	101.3	142.5	152.7
11	79.1	145.9	156.7	103.1	79.1	96.1	-0.0	109.8	135.2	147.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.235	0.344	0.772	0.506	0.235	0.229	1.007	1.121
2	0.244	0.351	0.761	0.523	0.244	0.255	1.078	1.107
3	0.251	0.337	0.697	0.476	0.251	0.248	1.015	1.078
4	0.248	0.348	0.629	0.389	0.248	0.233	0.963	1.039
5	0.246	0.350	0.611	0.360	0.246	0.222	0.925	1.028
6	0.246	0.348	0.602	0.346	0.246	0.214	0.892	1.020
7	0.245	0.350	0.594	0.331	0.245	0.208	0.870	1.016
8	0.245	0.350	0.585	0.322	0.245	0.206	0.862	1.006
9	0.245	0.364	0.560	0.321	0.245	0.229	0.954	0.980
10	0.244	0.400	0.487	0.309	0.244	0.271	1.128	0.878
11	0.234	0.425	0.463	0.300	0.234	0.280	1.215	0.856

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	9.4	6.6	4.4	0.453	0.668	0.257	0.257	0.044	0.044
2	10.00	9.4	6.4	2.6	0.411	0.727	0.203	0.203	0.037	0.037
3	30.00	11.1	7.0	3.4	0.412	0.818	0.133	0.133	0.023	0.023
4	50.00	13.0	7.8	4.1	0.492	0.811	0.162	0.162	0.029	0.029
5	55.00	13.6	8.1	5.0	0.528	0.800	0.180	0.180	0.032	0.032
6	57.50	13.7	8.2	5.9	0.546	0.790	0.194	0.194	0.034	0.034
7	60.00	14.0	8.3	6.4	0.566	0.792	0.196	0.196	0.034	0.034
8	62.50	14.2	8.3	6.8	0.574	0.783	0.209	0.209	0.037	0.037
9	70.00	14.6	8.4	5.8	0.550	0.820	0.185	0.185	0.034	0.034
10	90.00	15.4	8.1	8.1	0.494	0.942	0.072	0.072	0.014	0.014
11	95.00	16.5	9.0	6.6	0.493	0.935	0.092	0.092	0.018	0.018

TABLE VII. - Continued.

(c) 70 Percent of design speed; reading 2829

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	50.0	72.3	63.2	289.2	1.114	10.11	1.288
2	24.155	24.056	-0.0	45.9	71.4	61.0	288.8	1.106	10.13	1.290
3	21.811	21.829	-0.0	45.0	68.9	58.1	288.2	1.089	10.13	1.274
4	19.385	19.601	-0.0	50.2	66.8	52.5	287.8	1.088	10.13	1.269
5	18.766	19.045	-0.0	52.3	66.2	51.4	287.8	1.087	10.13	1.263
6	18.451	18.766	-0.0	53.6	65.9	51.4	287.8	1.086	10.14	1.259
7	18.136	18.486	-0.0	54.7	65.5	51.1	287.8	1.086	10.14	1.255
8	17.818	18.209	-0.0	55.3	65.2	49.9	287.8	1.085	10.14	1.254
9	16.850	17.374	-0.0	51.8	63.9	44.3	287.8	1.082	10.13	1.258
10	14.130	15.146	-0.0	48.1	59.7	30.2	287.7	1.074	10.13	1.265
11	13.409	14.587	-0.0	49.6	59.4	21.7	287.7	1.078	10.13	1.278

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	92.9	142.2	305.7	202.8	92.9	91.4	-0.0	108.9	291.2	289.9
2	96.1	143.8	300.6	206.2	96.1	100.0	-0.0	103.3	284.8	283.7
3	99.3	139.7	275.9	187.0	99.3	98.7	-0.0	98.8	257.4	257.7
4	98.0	144.3	249.0	151.7	98.0	92.3	-0.0	111.0	228.9	231.4
5	97.5	143.9	241.5	141.2	97.5	88.0	-0.0	113.8	220.9	224.2
6	97.5	143.1	238.5	135.9	97.5	84.9	-0.0	115.2	217.7	221.4
7	97.4	142.4	235.1	130.9	97.4	82.3	-0.0	116.2	214.8	218.1
8	97.3	143.4	231.7	126.7	97.3	81.6	-0.0	117.9	210.3	214.9
9	97.5	147.6	221.5	127.5	97.5	91.2	-0.0	116.0	198.8	205.0
10	97.3	157.6	192.9	121.9	97.3	105.3	-0.0	117.2	166.6	178.6
11	93.5	168.7	183.7	117.8	93.5	109.4	-0.0	128.4	158.1	172.0

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.275	0.401	0.904	0.573	0.275	0.258	0.984	1.311
2	0.284	0.408	0.890	0.585	0.284	0.284	1.041	1.297
3	0.294	0.400	0.818	0.535	0.294	0.282	0.995	1.266
4	0.291	0.414	0.738	0.435	0.291	0.265	0.942	1.222
5	0.289	0.413	0.716	0.405	0.289	0.252	0.903	1.203
6	0.289	0.410	0.707	0.390	0.289	0.243	0.879	1.197
7	0.289	0.409	0.697	0.376	0.289	0.236	0.845	1.188
8	0.289	0.411	0.687	0.364	0.289	0.234	0.838	1.179
9	0.289	0.425	0.657	0.367	0.289	0.263	0.936	1.146
10	0.289	0.456	0.572	0.353	0.289	0.305	1.082	1.027
11	0.277	0.489	0.544	0.342	0.277	0.317	1.171	1.001

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	9.4	6.6	4.5	0.471	0.659	0.283	0.279	0.048	0.047
2	10.00	9.5	6.5	2.8	0.440	0.711	0.233	0.231	0.042	0.041
3	30.00	11.1	7.0	3.0	0.442	0.804	0.155	0.154	0.027	0.027
4	50.00	13.1	7.9	3.4	0.524	0.801	0.183	0.183	0.033	0.033
5	55.00	13.5	8.0	4.5	0.552	0.794	0.196	0.196	0.035	0.035
6	57.50	13.7	8.1	5.5	0.568	0.787	0.206	0.206	0.037	0.037
7	60.00	13.9	8.2	6.5	0.582	0.782	0.215	0.215	0.038	0.038
8	62.50	14.1	8.2	6.6	0.594	0.782	0.219	0.219	0.039	0.039
9	70.00	14.5	8.2	5.6	0.563	0.824	0.186	0.186	0.035	0.035
10	90.00	15.2	7.9	9.3	0.506	0.944	0.069	0.069	0.013	0.013
11	95.00	16.2	8.8	7.1	0.510	0.932	0.096	0.096	0.018	0.018

TABLE VII. - Continued.

(d) 70 Percent of design speed; reading 2830

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	37.0	69.9	60.9	289.0	1.093	10.11	1.271
2	24.155	24.056	-0.0	36.6	68.9	59.9	288.8	1.089	10.13	1.276
3	21.811	21.829	-0.0	39.1	66.4	58.5	288.2	1.079	10.14	1.252
4	19.385	19.601	-0.0	42.9	64.2	52.8	287.8	1.078	10.14	1.250
5	18.766	19.045	-0.0	45.6	63.6	51.2	287.8	1.079	10.14	1.249
6	18.451	18.766	-0.0	47.2	63.3	50.5	287.7	1.080	10.14	1.245
7	18.136	18.486	-0.0	48.4	63.0	50.2	287.8	1.079	10.14	1.241
8	17.818	18.209	-0.0	48.4	62.6	48.8	287.9	1.079	10.14	1.240
9	16.850	17.374	-0.0	45.9	61.4	44.0	287.8	1.077	10.13	1.248
10	14.130	15.146	-0.0	45.7	57.5	29.7	287.7	1.072	10.13	1.258
11	13.409	14.587	-0.0	47.5	57.2	21.6	287.7	1.077	10.13	1.272

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	107.1	142.5	310.9	234.3	107.1	113.8	-0.0	85.8	291.8	290.6
2	110.3	143.9	306.5	230.2	110.3	115.6	-0.0	85.7	285.9	284.7
3	112.6	135.9	281.2	201.9	112.6	105.4	-0.0	85.8	257.7	257.9
4	110.8	140.8	254.6	170.6	110.8	103.1	-0.0	95.9	229.2	231.8
5	110.3	142.4	248.2	159.0	110.3	99.7	-0.0	101.7	222.3	225.6
6	109.7	142.3	244.1	152.2	109.7	96.7	-0.0	104.3	218.1	221.8
7	109.6	141.6	241.1	146.9	109.6	94.0	-0.0	106.0	214.7	218.9
8	109.4	142.9	237.4	144.0	109.4	94.8	-0.0	106.9	210.7	215.3
9	108.8	147.8	227.2	143.1	108.8	102.8	-0.0	106.1	199.4	205.6
10	106.5	161.0	198.3	129.5	106.5	112.5	-0.0	115.1	167.2	179.2
11	102.3	171.8	188.9	124.9	102.3	116.1	-0.0	126.7	158.7	172.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.317	0.407	0.922	0.668	0.317	0.325	1.063	1.258
2	0.327	0.412	0.909	0.658	0.327	0.331	1.048	1.249
3	0.335	0.390	0.836	0.580	0.335	0.303	0.936	1.222
4	0.329	0.405	0.757	0.491	0.329	0.297	0.930	1.185
5	0.328	0.410	0.737	0.458	0.328	0.287	0.904	1.175
6	0.326	0.409	0.726	0.438	0.326	0.278	0.882	1.165
7	0.326	0.408	0.717	0.423	0.326	0.270	0.857	1.159
8	0.325	0.411	0.705	0.414	0.325	0.273	0.866	1.148
9	0.323	0.426	0.675	0.413	0.323	0.297	0.946	1.127
10	0.316	0.467	0.589	0.376	0.316	0.326	1.057	1.013
11	0.304	0.499	0.561	0.363	0.304	0.337	1.135	0.988

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	6.9	4.2	2.2	0.350	0.760	0.165	0.163	0.030	0.030
2	10.00	7.1	4.0	1.7	0.352	0.813	0.125	0.124	0.023	0.023
3	30.00	8.6	4.5	3.4	0.384	0.840	0.110	0.109	0.019	0.019
4	50.00	10.5	5.3	3.7	0.443	0.841	0.127	0.127	0.023	0.023
5	55.00	10.9	5.5	4.2	0.478	0.828	0.144	0.144	0.026	0.026
6	57.50	11.1	5.6	4.7	0.499	0.813	0.161	0.161	0.029	0.029
7	60.00	11.3	5.6	5.6	0.515	0.801	0.175	0.175	0.031	0.031
8	62.50	11.5	5.6	5.5	0.518	0.799	0.182	0.182	0.033	0.033
9	70.00	12.0	5.7	5.3	0.493	0.855	0.137	0.137	0.026	0.026
10	90.00	13.0	5.7	8.8	0.478	0.938	0.071	0.071	0.014	0.014
11	95.00	14.0	6.6	7.0	0.484	0.922	0.103	0.103	0.020	0.020

TABLE VII. - Continued.

(e) 70 Percent of design speed; reading 2831

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	31.5	68.1	59.9	288.9	1.083	10.11	1.244
2	24.155	24.056	-0.0	29.8	67.2	60.1	288.9	1.074	10.13	1.238
3	21.811	21.829	-0.0	32.2	64.4	58.6	288.3	1.067	10.14	1.223
4	19.385	19.601	-0.0	36.4	62.0	53.0	287.9	1.068	10.13	1.222
5	18.766	19.045	-0.0	38.1	61.4	50.5	287.8	1.070	10.14	1.227
6	19.451	18.766	-0.0	39.8	61.0	50.0	287.8	1.072	10.14	1.223
7	18.136	18.486	-0.0	41.8	60.7	49.7	287.8	1.072	10.13	1.218
8	17.818	18.209	-0.0	41.6	60.3	48.3	287.8	1.072	10.13	1.219
9	16.850	17.374	-0.0	39.9	59.1	44.3	287.7	1.069	10.14	1.226
10	14.130	15.146	-0.0	42.6	55.5	29.6	287.7	1.070	10.13	1.243
11	13.409	14.587	-0.0	44.6	55.1	21.9	287.7	1.075	10.13	1.258

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	116.7	145.0	312.8	246.5	116.7	123.7	-0.0	75.7	290.2	288.9
2	119.3	140.9	307.7	245.0	119.3	122.3	-0.0	70.1	283.6	282.4
3	122.6	133.8	284.1	217.0	122.6	113.2	-0.0	71.3	256.3	256.5
4	121.2	138.8	258.3	185.5	121.2	111.7	-0.0	82.5	228.1	230.6
5	120.5	142.6	251.6	176.5	120.5	112.3	-0.0	88.0	220.8	224.1
6	120.1	141.7	248.0	169.5	120.1	108.9	-0.0	90.7	216.9	220.6
7	119.8	140.7	244.7	162.1	119.8	104.9	-0.0	93.8	213.3	217.4
8	119.6	142.5	241.4	160.1	119.6	106.5	-0.0	94.6	209.6	214.2
9	118.4	147.0	230.8	157.5	118.4	112.8	-0.0	94.3	198.1	204.3
10	114.4	163.1	202.0	138.1	114.4	120.2	-0.0	110.3	166.5	178.4
11	110.0	173.7	192.3	133.3	110.0	123.7	-0.0	121.9	157.7	171.5

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.347	0.416	0.929	0.707	0.347	0.355	1.059	1.210
2	0.355	0.406	0.914	0.705	0.355	0.352	1.025	1.199
3	0.365	0.386	0.846	0.626	0.365	0.327	0.924	1.180
4	0.361	0.401	0.769	0.536	0.361	0.323	0.921	1.148
5	0.359	0.412	0.749	0.510	0.359	0.324	0.932	1.137
6	0.358	0.409	0.739	0.490	0.358	0.314	0.906	1.129
7	0.357	0.406	0.729	0.468	0.357	0.303	0.876	1.123
8	0.356	0.411	0.719	0.462	0.356	0.308	0.890	1.115
9	0.352	0.426	0.687	0.456	0.352	0.327	0.953	1.089
10	0.340	0.474	0.601	0.402	0.340	0.349	1.050	0.992
11	0.327	0.505	0.572	0.388	0.327	0.360	1.124	0.967

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	5.2	2.4	1.1	0.303	0.779	0.135	0.134	0.026	0.025
2	10.00	5.3	2.3	1.9	0.287	0.854	0.083	0.082	0.015	0.015
3	30.00	6.6	2.5	3.4	0.320	0.879	0.071	0.071	0.012	0.012
4	50.00	8.3	3.1	3.9	0.377	0.864	0.093	0.093	0.017	0.017
5	55.00	8.7	3.2	3.5	0.400	0.855	0.107	0.107	0.020	0.020
6	57.50	8.9	3.3	4.2	0.421	0.828	0.132	0.132	0.024	0.024
7	60.00	9.1	3.3	5.1	0.445	0.800	0.158	0.158	0.028	0.028
8	62.50	9.2	3.4	5.0	0.445	0.812	0.151	0.151	0.027	0.027
9	70.00	9.8	3.5	5.5	0.425	0.866	0.112	0.112	0.021	0.021
10	90.00	11.0	3.7	8.7	0.440	0.918	0.088	0.088	0.017	0.017
11	95.00	12.0	4.5	7.3	0.444	0.910	0.113	0.113	0.022	0.022

TABLE VII. - Continued.

(f) 70 Percent of design speed; reading 2832

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	24.7	66.6	59.7	289.1	1.066	10.09	1.200
2	24.155	24.056	-0.0	23.4	65.5	60.3	288.9	1.059	10.13	1.191
3	21.811	21.829	-0.0	24.8	62.5	58.2	288.2	1.055	10.14	1.185
4	19.385	19.601	-0.0	29.4	59.8	52.9	287.9	1.058	10.14	1.188
5	18.766	19.045	-0.0	30.6	59.1	50.6	287.8	1.059	10.14	1.192
6	18.451	18.766	-0.0	32.1	58.7	49.5	287.8	1.061	10.14	1.193
7	18.136	18.486	-0.0	34.3	58.3	48.8	287.8	1.063	10.14	1.189
8	17.818	18.209	-0.0	33.7	58.0	47.8	287.7	1.062	10.14	1.191
9	16.850	17.374	-0.0	32.9	56.7	44.0	287.7	1.061	10.14	1.203
10	14.130	15.146	-0.0	37.7	53.1	29.7	287.7	1.065	10.13	1.224
11	13.409	14.587	-0.0	40.1	52.9	22.9	287.8	1.071	10.12	1.241

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	126.5	147.2	318.1	265.3	126.5	133.8	-0.0	61.4	291.8	290.5
2	129.6	140.9	312.4	261.5	129.6	129.4	-0.0	55.9	284.3	283.1
3	133.7	136.8	289.9	235.5	133.7	124.2	-0.0	57.3	257.1	257.3
4	132.9	140.9	264.6	203.3	132.9	122.7	-0.0	69.2	228.7	231.3
5	132.2	144.1	257.8	195.5	132.2	124.0	-0.0	73.4	221.2	224.5
6	131.8	144.9	254.0	189.0	131.8	122.7	-0.0	77.1	217.1	220.8
7	131.6	144.4	250.8	181.1	131.6	119.3	-0.0	81.3	213.4	217.5
8	131.2	145.6	247.4	180.2	131.2	121.1	-0.0	80.8	209.7	214.3
9	130.6	151.6	238.1	176.9	130.6	127.3	-0.0	82.4	199.0	205.2
10	125.2	168.0	208.4	153.0	125.2	132.9	-0.0	102.7	166.6	178.6
11	119.8	178.1	198.7	148.0	119.8	136.3	-0.0	114.7	158.5	172.4

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.376	0.426	0.946	0.767	0.376	0.387	1.058	1.178
2	0.386	0.409	0.931	0.758	0.386	0.375	0.998	1.162
3	0.399	0.398	0.865	0.684	0.399	0.361	0.929	1.148
4	0.397	0.409	0.790	0.591	0.397	0.357	0.923	1.120
5	0.395	0.419	0.770	0.568	0.395	0.361	0.938	1.109
6	0.393	0.421	0.758	0.549	0.393	0.356	0.931	1.101
7	0.393	0.419	0.749	0.525	0.393	0.346	0.906	1.094
8	0.392	0.423	0.739	0.523	0.392	0.352	0.922	1.088
9	0.390	0.441	0.711	0.515	0.390	0.370	0.975	1.068
10	0.373	0.490	0.621	0.446	0.373	0.388	1.061	0.975
11	0.357	0.520	0.592	0.432	0.357	0.398	1.138	0.957

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	3.7	0.9	0.9	0.239	0.813	0.090	0.090	0.017	0.017
2	10.00	3.6	0.6	2.2	0.229	0.864	0.062	0.061	0.011	0.011
3	30.00	4.7	0.6	3.0	0.254	0.896	0.049	0.049	0.009	0.009
4	50.00	6.1	0.9	3.7	0.310	0.867	0.075	0.075	0.014	0.014
5	55.00	6.5	1.0	3.6	0.324	0.868	0.080	0.080	0.015	0.015
6	57.50	6.6	1.0	3.7	0.343	0.847	0.097	0.097	0.018	0.018
7	60.00	6.7	1.0	4.2	0.369	0.804	0.131	0.131	0.024	0.024
8	62.50	6.9	1.0	4.4	0.362	0.820	0.122	0.122	0.022	0.022
9	70.00	7.3	1.1	5.2	0.348	0.889	0.079	0.079	0.015	0.015
10	90.00	8.6	1.3	8.9	0.377	0.911	0.085	0.085	0.016	0.016
11	95.00	9.8	2.3	8.3	0.380	0.901	0.110	0.110	0.021	0.021

TABLE VII. - Continued.

(g) 70 Percent of design speed; reading 2917

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.724	24.615	-0.0	15.9	65.0	60.4	289.6	1.044	10.09	1.132
2	24.155	24.056	-0.0	16.1	64.0	60.6	289.2	1.041	10.13	1.130
3	21.811	21.829	-0.0	17.4	61.0	57.9	288.1	1.041	10.14	1.131
4	19.385	19.601	-0.0	22.3	58.1	52.1	287.9	1.046	10.13	1.143
5	18.766	19.045	-0.0	23.4	57.3	50.3	287.8	1.047	10.14	1.145
6	18.451	18.766	-0.0	24.9	56.9	49.2	287.4	1.049	10.14	1.147
7	18.136	18.486	-0.0	27.2	56.3	48.1	287.7	1.053	10.13	1.149
8	17.818	18.209	-0.0	27.0	55.9	47.4	287.4	1.052	10.14	1.149
9	16.850	17.374	-0.0	26.4	54.5	43.8	287.6	1.051	10.13	1.166
10	14.130	15.146	-0.0	32.2	50.4	29.2	287.5	1.059	10.13	1.201
11	13.409	14.587	-0.0	35.4	50.0	23.6	287.6	1.063	10.13	1.209

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	136.6	147.9	322.8	288.3	136.6	142.2	-0.0	40.4	292.4	291.1
2	139.7	143.6	318.2	281.1	139.7	138.0	-0.1	39.8	285.8	284.7
3	142.1	141.4	293.6	253.7	142.1	134.9	-0.1	42.3	256.8	257.1
4	142.7	147.9	270.1	222.7	142.7	136.8	-0.1	56.1	229.3	231.8
5	142.2	149.7	263.5	215.2	142.2	137.4	-0.1	59.4	221.8	225.1
6	142.4	150.7	260.6	209.2	142.4	136.6	-0.1	63.5	218.3	222.0
7	143.2	151.2	258.3	201.6	143.2	134.6	-0.0	69.0	215.0	219.1
8	142.7	151.2	254.4	199.2	142.7	134.8	-0.1	68.5	210.6	215.2
9	142.2	157.6	244.8	195.5	142.2	141.2	-0.1	70.1	199.2	205.3
10	137.9	177.5	216.4	172.2	137.9	150.3	-0.1	94.6	166.7	178.7
11	132.8	183.6	206.5	163.3	132.8	149.6	-0.0	106.5	158.1	171.9

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.407	0.432	0.962	0.842	0.407	0.416	1.041	1.136
2	0.417	0.420	0.949	0.822	0.417	0.404	0.988	1.128
3	0.425	0.414	0.878	0.743	0.425	0.395	0.949	1.118
4	0.427	0.433	0.808	0.652	0.427	0.401	0.959	1.098
5	0.426	0.438	0.789	0.630	0.426	0.402	0.966	1.087
6	0.427	0.441	0.781	0.613	0.427	0.400	0.959	1.083
7	0.429	0.442	0.774	0.589	0.429	0.395	0.940	1.077
8	0.428	0.442	0.762	0.582	0.428	0.394	0.945	1.068
9	0.426	0.462	0.733	0.573	0.426	0.414	0.993	1.046
10	0.413	0.521	0.647	0.506	0.413	0.441	1.090	0.958
11	0.397	0.539	0.617	0.479	0.397	0.439	1.126	0.937

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	2.1	-0.7	1.7	0.154	0.815	0.060	0.060	0.011	0.011
2	10.00	2.1	-0.9	2.4	0.163	0.863	0.042	0.042	0.008	0.008
3	30.00	3.3	-0.9	2.7	0.184	0.872	0.045	0.045	0.008	0.008
4	50.00	4.4	-0.8	3.0	0.238	0.848	0.067	0.067	0.012	0.012
5	55.00	4.6	-0.8	3.3	0.249	0.840	0.075	0.075	0.014	0.014
6	57.50	4.7	-0.9	3.4	0.267	0.816	0.091	0.091	0.017	0.017
7	60.00	4.7	-1.0	3.5	0.295	0.769	0.123	0.123	0.023	0.023
8	62.50	4.8	-1.0	4.1	0.292	0.775	0.122	0.122	0.023	0.023
9	70.00	5.1	-1.2	5.0	0.277	0.883	0.066	0.066	0.012	0.012
10	90.00	5.9	-1.3	8.4	0.303	0.909	0.074	0.074	0.014	0.014
11	95.00	6.8	-0.6	9.0	0.321	0.880	0.112	0.112	0.021	0.021

TABLE VII. - Continued.

(h) 80 Percent of design speed; reading 2814

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	47.4	71.8	61.8	292.4	1.133	10.08	1.413
2	24.155	24.056	-0.1	44.9	70.7	60.2	291.0	1.130	10.12	1.409
3	21.811	21.829	-0.1	48.0	68.1	58.6	287.6	1.121	10.14	1.373
4	19.385	19.601	-0.1	51.6	66.2	52.8	287.1	1.118	10.14	1.367
5	18.766	19.045	-0.1	54.0	65.6	52.5	287.1	1.116	10.14	1.356
6	18.451	18.766	-0.1	55.3	65.2	52.5	287.1	1.116	10.14	1.349
7	18.136	18.486	-0.1	56.5	64.9	52.2	287.0	1.115	10.14	1.343
8	17.818	18.209	-0.1	56.5	64.4	51.1	287.0	1.114	10.14	1.341
9	16.850	17.374	-0.1	53.5	63.2	45.5	286.9	1.111	10.14	1.346
10	14.130	15.146	-0.0	48.6	59.0	31.3	286.8	1.100	10.14	1.356
11	13.409	14.587	-0.0	49.9	58.8	20.8	286.9	1.106	10.13	1.389

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	110.2	166.7	352.2	238.6	110.2	112.8	-0.1	122.7	334.4	333.0
2	114.2	167.4	345.9	238.5	114.2	118.5	-0.1	118.2	326.4	325.1
3	118.6	160.5	317.7	205.8	118.6	107.3	-0.1	119.3	294.7	294.9
4	116.0	165.7	286.9	170.1	116.0	103.0	-0.1	129.8	262.3	265.2
5	115.7	163.7	279.5	158.4	115.7	96.3	-0.1	132.4	254.4	258.2
6	115.7	162.7	275.9	152.4	115.7	92.7	-0.1	133.7	250.3	254.6
7	115.2	161.8	271.4	146.0	115.2	89.4	-0.1	134.9	245.6	250.3
8	115.6	162.7	268.0	143.1	115.6	89.9	-0.1	135.6	241.7	247.3
9	115.4	167.1	256.0	141.9	115.4	99.5	-0.1	134.3	228.4	235.5
10	115.2	178.4	223.8	138.2	115.2	118.1	-0.1	133.7	191.8	205.6
11	110.4	196.1	213.0	135.2	110.4	126.4	-0.1	149.9	182.0	198.3

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.325	0.467	1.038	0.668	0.325	0.316	1.024	1.443
2	0.338	0.471	1.023	0.670	0.338	0.333	1.038	1.442
3	0.353	0.455	0.946	0.583	0.353	0.304	0.905	1.438
4	0.346	0.471	0.855	0.484	0.346	0.293	0.888	1.395
5	0.345	0.466	0.833	0.451	0.345	0.274	0.833	1.387
6	0.345	0.463	0.822	0.434	0.345	0.264	0.801	1.373
7	0.343	0.461	0.808	0.416	0.343	0.255	0.776	1.367
8	0.344	0.463	0.798	0.408	0.344	0.256	0.778	1.357
9	0.344	0.477	0.763	0.406	0.344	0.284	0.862	1.374
10	0.343	0.514	0.667	0.398	0.343	0.340	1.025	1.481
11	0.329	0.567	0.634	0.391	0.329	0.365	1.145	1.552

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	8.9	6.1	3.0	0.454	0.778	0.178	0.154	0.032	0.027
2	10.00	8.9	5.8	2.0	0.436	0.793	0.166	0.143	0.030	0.026
3	30.00	10.3	6.2	3.4	0.478	0.781	0.184	0.169	0.032	0.029
4	50.00	12.4	7.2	3.6	0.542	0.790	0.201	0.195	0.036	0.035
5	55.00	12.9	7.4	5.6	0.571	0.781	0.215	0.212	0.038	0.037
6	57.50	13.1	7.5	6.7	0.586	0.773	0.226	0.223	0.039	0.038
7	60.00	13.3	7.5	7.6	0.602	0.766	0.237	0.235	0.041	0.040
8	62.50	13.4	7.5	7.8	0.606	0.764	0.243	0.242	0.042	0.042
9	70.00	13.8	7.6	6.8	0.584	0.799	0.218	0.218	0.040	0.040
10	90.00	14.5	7.2	10.4	0.518	0.909	0.114	0.114	0.021	0.021
11	95.00	15.6	8.2	6.2	0.517	0.929	0.103	0.103	0.020	0.020

TABLE VII. - Continued.

(i) 90 Percent of design speed; reading 2820

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	28.5	65.0	59.5	289.6	1.126	10.07	1.378
2	24.155	24.056	-0.1	26.7	63.9	60.4	289.3	1.112	10.12	1.357
3	21.811	21.829	-0.1	28.2	60.9	57.2	288.3	1.104	10.14	1.354
4	19.385	19.601	-0.1	33.9	58.0	50.4	287.7	1.111	10.14	1.366
5	18.766	19.045	-0.0	34.0	57.2	51.2	287.6	1.106	10.15	1.334
6	18.451	18.766	-0.1	34.4	56.8	50.9	287.7	1.104	10.14	1.329
7	18.136	18.486	-0.0	35.1	56.4	51.0	287.4	1.103	10.14	1.318
8	17.818	18.209	-0.0	35.4	56.0	50.2	287.3	1.102	10.14	1.318
9	16.850	17.374	-0.0	34.4	54.7	45.2	287.5	1.101	10.14	1.351
10	14.130	15.146	-0.0	38.9	50.9	31.2	287.4	1.108	10.14	1.378
11	13.409	14.587	-0.0	41.2	50.7	23.5	287.4	1.119	10.13	1.413

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	177.2	191.9	418.7	332.0	177.2	168.7	-0.2	91.5	379.1	377.4
2	181.2	182.3	412.0	329.4	181.2	162.8	-0.2	82.0	369.8	368.3
3	185.9	181.4	382.1	295.4	185.9	160.0	-0.2	85.6	333.7	333.9
4	185.7	192.0	350.0	250.0	185.7	159.3	-0.2	107.2	296.6	299.9
5	185.6	183.8	342.6	243.1	185.6	152.4	-0.1	102.7	287.8	292.1
6	185.0	181.6	337.8	237.9	185.0	149.9	-0.2	102.6	282.4	287.2
7	184.4	178.7	333.6	232.2	184.4	146.2	-0.2	102.8	277.9	283.2
8	184.1	179.1	329.2	227.7	184.1	145.9	-0.1	103.9	272.7	278.7
9	182.9	190.5	316.4	223.2	182.9	157.2	-0.2	107.6	258.0	266.0
10	175.4	210.5	278.4	191.5	175.4	163.8	-0.1	132.3	216.0	231.6
11	167.9	226.1	265.1	185.4	167.9	170.0	-0.1	149.0	204.9	223.0

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.534	0.546	1.262	0.944	0.534	0.480	0.952	1.374
2	0.547	0.521	1.244	0.941	0.547	0.465	0.899	1.362
3	0.563	0.521	1.158	0.848	0.563	0.459	0.861	1.360
4	0.563	0.552	1.062	0.719	0.563	0.458	0.858	1.376
5	0.563	0.528	1.039	0.699	0.563	0.438	0.821	1.386
6	0.561	0.522	1.024	0.684	0.561	0.431	0.810	1.390
7	0.559	0.514	1.012	0.667	0.559	0.420	0.792	1.398
8	0.558	0.515	0.999	0.655	0.558	0.420	0.792	1.403
9	0.554	0.550	0.959	0.645	0.554	0.454	0.860	1.375
10	0.530	0.610	0.842	0.555	0.530	0.474	0.934	1.261
11	0.507	0.655	0.800	0.537	0.507	0.493	1.012	1.234

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	2.0	-0.7	0.7	0.289	0.763	0.143	0.105	0.027	0.020
2	10.00	2.0	-1.0	2.2	0.274	0.814	0.105	0.070	0.019	0.013
3	30.00	3.1	-1.0	2.1	0.302	0.870	0.075	0.050	0.014	0.009
4	50.00	4.2	-1.0	1.3	0.377	0.842	0.107	0.089	0.020	0.017
5	55.00	4.5	-0.9	4.2	0.378	0.810	0.127	0.110	0.023	0.020
6	57.50	4.6	-0.9	5.1	0.383	0.812	0.127	0.111	0.023	0.020
7	60.00	4.8	-0.9	6.4	0.391	0.793	0.140	0.124	0.025	0.022
8	62.50	4.9	-0.9	6.8	0.396	0.804	0.134	0.119	0.024	0.021
9	70.00	5.3	-0.9	6.5	0.384	0.887	0.082	0.073	0.015	0.013
10	90.00	6.4	-0.8	10.4	0.419	0.885	0.108	0.108	0.020	0.020
11	95.00	7.6	0.1	8.9	0.422	0.875	0.139	0.139	0.026	0.026

TABLE VII. - Continued.

(j) 90 Percent of design speed; reading 2821

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	34.9	65.8	58.4	289.7	1.155	10.05	1.484
2	24.155	24.056	-0.1	32.4	64.7	59.6	289.3	1.136	10.12	1.450
3	21.811	21.829	-0.1	33.4	61.7	57.4	288.4	1.119	10.15	1.424
4	19.385	19.601	-0.1	38.4	59.0	51.0	287.7	1.122	10.14	1.424
5	18.766	19.045	-0.1	38.6	58.3	51.1	287.5	1.119	10.14	1.398
6	18.451	18.766	-0.1	39.2	57.9	50.1	287.6	1.119	10.14	1.399
7	18.136	18.486	-0.1	40.7	57.6	50.0	287.4	1.118	10.14	1.390
8	17.818	18.209	-0.1	40.4	57.2	49.1	287.4	1.116	10.14	1.384
9	16.850	17.374	-0.1	39.6	56.0	44.9	287.4	1.113	10.14	1.400
10	14.130	15.146	-0.0	43.2	52.5	30.8	287.4	1.117	10.14	1.416
11	13.409	14.587	-0.1	45.7	52.1	21.7	287.4	1.127	10.13	1.454

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	169.9	197.4	414.4	309.1	169.9	162.0	-0.2	112.8	377.8	376.1
2	174.4	185.9	408.0	310.3	174.4	157.0	-0.2	99.5	368.7	367.2
3	178.9	179.4	377.9	278.1	178.9	149.8	-0.2	98.6	332.7	332.9
4	177.7	188.5	345.4	234.5	177.7	147.7	-0.2	117.1	296.0	299.3
5	177.2	182.6	337.2	227.5	177.2	142.8	-0.2	113.8	286.7	291.0
6	176.5	183.7	332.5	221.9	176.5	142.3	-0.2	116.2	281.7	286.5
7	176.3	181.9	329.0	214.4	176.3	137.8	-0.2	118.6	277.5	282.9
8	175.1	181.5	323.2	211.2	175.1	138.2	-0.2	117.7	271.5	277.4
9	173.3	188.6	310.1	205.2	173.3	145.4	-0.2	120.2	257.0	265.0
10	166.0	206.9	272.4	175.6	166.0	150.9	-0.1	141.6	215.9	231.5
11	159.2	224.1	259.4	168.6	159.2	156.6	-0.1	160.3	204.6	222.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.511	0.555	1.246	0.869	0.511	0.455	0.953	1.388
2	0.526	0.526	1.229	0.877	0.526	0.444	0.900	1.376
3	0.541	0.511	1.142	0.792	0.541	0.427	0.838	1.377
4	0.538	0.539	1.045	0.670	0.538	0.422	0.831	1.404
5	0.536	0.521	1.020	0.650	0.536	0.408	0.806	1.416
6	0.534	0.525	1.006	0.634	0.534	0.406	0.806	1.424
7	0.534	0.520	0.995	0.613	0.534	0.394	0.782	1.429
8	0.529	0.519	0.977	0.604	0.529	0.395	0.789	1.414
9	0.524	0.541	0.937	0.589	0.524	0.417	0.839	1.386
10	0.500	0.596	0.822	0.506	0.500	0.435	0.909	1.273
11	0.479	0.647	0.781	0.486	0.479	0.452	0.984	1.242

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	2.9	0.1	-0.4	0.356	0.772	0.167	0.128	0.033	0.025
2	10.00	2.8	-0.2	1.4	0.329	0.826	0.117	0.082	0.022	0.015
3	30.00	3.9	-0.2	2.2	0.351	0.895	0.070	0.044	0.012	0.008
4	50.00	5.3	0.1	1.8	0.423	0.874	0.095	0.076	0.018	0.014
5	55.00	5.6	0.2	4.2	0.423	0.844	0.119	0.100	0.021	0.018
6	57.50	5.8	0.2	4.3	0.433	0.849	0.117	0.099	0.021	0.018
7	60.00	6.0	0.2	5.4	0.450	0.834	0.130	0.112	0.023	0.020
8	62.50	6.1	0.3	5.8	0.448	0.836	0.130	0.115	0.023	0.021
9	70.00	6.6	0.4	6.2	0.441	0.897	0.085	0.075	0.016	0.014
10	90.00	8.0	0.7	9.9	0.473	0.894	0.112	0.111	0.021	0.021
11	95.00	9.0	1.5	7.1	0.484	0.886	0.139	0.139	0.027	0.027

TABLE VII. - Continued.

(k) 90 Percent of design speed; reading 2822

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	40.1	67.1	58.8	290.3	1.172	10.06	1.543
2	24.155	24.056	-0.1	37.4	66.0	59.3	289.8	1.153	10.10	1.518
3	21.811	21.829	-0.1	37.5	63.0	57.2	288.2	1.133	10.15	1.478
4	19.385	19.601	-0.1	42.3	60.4	51.3	287.5	1.131	10.15	1.466
5	18.766	19.045	-0.0	42.9	59.8	51.2	287.4	1.130	10.15	1.443
6	18.451	18.766	-0.1	44.6	59.5	50.4	287.3	1.131	10.15	1.440
7	18.136	18.486	-0.1	46.4	59.1	50.0	287.2	1.132	10.15	1.431
8	17.818	18.209	-0.1	45.5	58.8	49.1	287.2	1.128	10.15	1.425
9	16.850	17.374	-0.1	44.9	57.7	45.8	287.3	1.123	10.14	1.425
10	14.130	15.146	-0.0	47.0	54.4	30.5	287.3	1.123	10.15	1.445
11	13.409	14.587	-0.0	48.5	54.2	20.9	287.3	1.133	10.13	1.484

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	159.9	197.3	410.1	290.8	159.9	150.8	-0.2	127.2	377.5	375.9
2	164.3	188.7	404.3	294.3	164.3	150.0	-0.2	114.5	369.2	367.7
3	170.2	181.4	374.6	265.7	170.2	143.9	-0.2	110.4	333.6	333.8
4	168.5	187.6	341.1	222.3	168.5	138.8	-0.2	126.1	296.4	299.7
5	167.4	183.1	332.4	213.8	167.4	134.0	-0.1	124.7	287.0	291.3
6	166.5	183.7	327.8	205.0	166.5	130.7	-0.1	129.0	282.2	287.0
7	165.6	182.5	322.9	195.9	165.6	125.9	-0.1	132.2	277.0	282.4
8	164.8	182.6	318.0	195.2	164.8	127.8	-0.1	130.3	271.8	277.8
9	163.1	185.1	304.9	188.1	163.1	131.2	-0.2	130.7	257.5	265.5
10	154.4	204.2	265.6	161.7	154.4	139.3	-0.1	149.3	215.9	231.4
11	148.0	222.3	252.8	157.8	148.0	147.4	-0.1	166.5	204.8	222.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.479	0.550	1.228	0.810	0.479	0.420	0.943	1.416
2	0.493	0.529	1.213	0.825	0.493	0.421	0.913	1.408
3	0.513	0.514	1.129	0.753	0.513	0.408	0.846	1.411
4	0.508	0.534	1.029	0.632	0.508	0.395	0.824	1.445
5	0.505	0.520	1.003	0.608	0.505	0.381	0.801	1.463
6	0.502	0.522	0.989	0.583	0.502	0.371	0.785	1.459
7	0.499	0.519	0.974	0.557	0.499	0.358	0.760	1.450
8	0.497	0.519	0.959	0.555	0.497	0.364	0.776	1.439
9	0.491	0.528	0.919	0.537	0.491	0.374	0.804	1.410
10	0.464	0.586	0.798	0.464	0.464	0.400	0.902	1.290
11	0.444	0.639	0.759	0.454	0.444	0.424	0.996	1.259

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	4.1	1.4	-0.0	0.408	0.768	0.188	0.147	0.037	0.029
2	10.00	4.2	1.1	1.2	0.376	0.830	0.128	0.091	0.024	0.017
3	30.00	5.2	1.1	2.1	0.389	0.891	0.080	0.051	0.014	0.009
4	50.00	6.7	1.5	2.2	0.459	0.883	0.096	0.073	0.018	0.014
5	55.00	7.1	1.6	4.2	0.466	0.851	0.125	0.103	0.023	0.019
6	57.50	7.3	1.7	4.6	0.487	0.839	0.139	0.118	0.025	0.021
7	60.00	7.5	1.8	5.4	0.509	0.818	0.161	0.142	0.029	0.026
8	62.50	7.7	1.9	5.7	0.500	0.833	0.147	0.131	0.026	0.024
9	70.00	8.3	2.0	7.1	0.496	0.864	0.124	0.114	0.023	0.021
10	90.00	9.9	2.7	9.7	0.518	0.898	0.118	0.117	0.022	0.022
11	95.00	11.0	3.6	6.3	0.518	0.897	0.137	0.137	0.026	0.026

TABLE VII. - Continued.

(l) 90 Percent of design speed; reading 2824

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	44.5	69.0	59.2	291.4	1.179	10.05	1.575
2	24.155	24.056	-0.1	41.8	68.0	58.7	290.9	1.164	10.09	1.562
3	21.811	21.829	-0.0	41.5	65.1	57.8	288.1	1.141	10.15	1.492
4	19.385	19.601	-0.1	48.3	62.9	53.0	287.1	1.142	10.15	1.471
5	18.766	19.045	-0.1	51.2	62.4	52.6	287.0	1.143	10.15	1.456
6	18.451	18.766	-0.1	52.8	62.1	52.3	287.0	1.143	10.15	1.446
7	18.136	18.486	-0.1	54.3	61.8	51.8	286.9	1.143	10.15	1.442
8	17.818	18.209	-0.1	53.9	61.5	50.0	287.0	1.142	10.15	1.445
9	16.850	17.374	-0.1	51.1	60.4	45.6	286.9	1.136	10.15	1.446
10	14.130	15.146	-0.1	48.1	56.6	30.7	286.8	1.128	10.15	1.464
11	13.409	14.587	-0.1	49.6	56.3	21.0	286.8	1.135	10.13	1.497

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	145.1	198.0	403.9	275.3	145.1	141.1	-0.1	138.9	376.9	375.2
2	149.0	193.8	397.4	278.0	149.0	144.5	-0.1	129.2	368.2	366.7
3	154.4	179.5	366.7	252.4	154.4	134.3	-0.1	119.1	332.5	332.8
4	151.6	183.6	332.9	203.3	151.6	122.2	-0.1	137.1	296.3	299.6
5	150.3	182.0	324.0	187.8	150.3	114.1	-0.1	141.9	286.9	291.1
6	149.3	181.2	318.8	179.2	149.3	109.5	-0.1	144.4	281.5	286.3
7	148.4	181.8	314.4	171.7	148.4	106.2	-0.1	147.5	277.1	282.4
8	148.0	184.2	309.8	168.7	148.0	108.5	-0.1	148.9	272.1	278.0
9	146.1	186.8	296.0	167.8	146.1	117.4	-0.1	145.3	257.3	265.2
10	142.0	202.4	258.3	157.3	142.0	135.2	-0.1	150.7	215.6	231.1
11	136.3	219.9	245.6	152.8	136.3	142.6	-0.1	167.3	204.2	222.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.432	0.549	1.202	0.763	0.432	0.391	0.973	1.459
2	0.444	0.541	1.185	0.775	0.444	0.403	0.970	1.452
3	0.463	0.506	1.101	0.712	0.463	0.379	0.870	1.464
4	0.455	0.519	1.000	0.575	0.455	0.346	0.806	1.523
5	0.451	0.515	0.973	0.531	0.451	0.322	0.759	1.509
6	0.448	0.512	0.957	0.506	0.448	0.309	0.733	1.497
7	0.446	0.514	0.944	0.485	0.446	0.300	0.716	1.492
8	0.444	0.521	0.930	0.477	0.444	0.307	0.733	1.481
9	0.439	0.531	0.888	0.477	0.439	0.334	0.804	1.446
10	0.426	0.580	0.774	0.451	0.426	0.387	0.952	1.309
11	0.408	0.632	0.735	0.439	0.408	0.410	1.047	1.274

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	6.0	3.3	0.4	0.448	0.773	0.195	0.151	0.038	0.029
2	10.00	6.1	3.1	0.5	0.420	0.829	0.140	0.099	0.027	0.019
3	30.00	7.3	3.2	2.7	0.420	0.861	0.111	0.078	0.020	0.014
4	50.00	9.2	4.0	3.9	0.512	0.820	0.163	0.132	0.029	0.024
5	55.00	9.7	4.2	5.6	0.547	0.795	0.193	0.167	0.034	0.029
6	57.50	9.9	4.3	6.5	0.567	0.779	0.213	0.190	0.037	0.033
7	60.00	10.2	4.5	7.2	0.586	0.773	0.223	0.202	0.038	0.035
8	62.50	10.4	4.5	6.6	0.589	0.781	0.218	0.200	0.039	0.035
9	70.00	11.0	4.8	6.9	0.563	0.818	0.188	0.177	0.034	0.032
10	90.00	12.1	4.9	9.9	0.523	0.902	0.122	0.122	0.023	0.023
11	95.00	13.1	5.7	6.4	0.525	0.909	0.129	0.129	0.025	0.025

TABLE VII. - Continued.

(m) 90 Percent of design speed; reading 2839

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	46.6	70.2	60.2	292.3	1.179	10.05	1.570
2	24.155	24.056	-0.0	44.1	69.3	58.9	291.3	1.168	10.09	1.564
3	21.811	21.829	-0.0	45.9	66.6	58.7	287.9	1.148	10.15	1.488
4	19.385	19.601	-0.0	52.9	64.6	53.3	287.0	1.150	10.15	1.475
5	18.766	19.045	-0.0	55.1	64.1	53.1	286.8	1.148	10.15	1.457
6	18.451	18.766	-0.0	56.1	63.8	52.9	286.7	1.146	10.15	1.450
7	18.136	18.486	-0.0	56.7	63.5	52.2	286.8	1.145	10.15	1.445
8	17.818	18.209	-0.0	56.5	63.2	50.8	286.9	1.144	10.15	1.444
9	16.850	17.374	-0.0	52.5	61.9	45.7	286.8	1.138	10.15	1.448
10	14.130	15.146	-0.0	48.6	57.8	30.7	286.6	1.128	10.15	1.467
11	13.409	14.587	-0.0	49.9	57.6	20.9	286.5	1.135	10.14	1.503

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	135.0	194.1	398.8	268.0	135.0	133.3	-0.0	141.1	375.2	373.6
2	138.2	193.6	391.9	269.0	138.2	139.0	-0.0	134.8	366.7	365.1
3	143.5	178.0	361.1	238.5	143.5	124.0	-0.0	127.8	331.3	331.6
4	139.5	185.1	325.7	186.8	139.5	111.6	-0.0	147.7	294.3	297.5
5	138.2	182.7	316.5	174.1	138.2	104.7	-0.0	149.8	284.7	288.9
6	137.7	181.7	312.1	168.1	137.7	101.4	-0.0	150.8	280.1	284.8
7	137.3	181.5	307.5	162.9	137.3	99.7	-0.0	151.7	275.1	280.4
8	136.9	182.9	303.3	160.0	136.9	101.0	-0.0	152.4	270.6	276.5
9	136.6	186.3	290.2	162.3	136.6	113.4	-0.0	147.9	256.0	263.9
10	135.0	201.3	253.6	154.9	135.0	133.2	-0.0	151.0	214.7	230.1
11	129.5	219.8	241.8	151.4	129.5	141.5	-0.0	168.1	204.1	222.1

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.400	0.536	1.182	0.740	0.400	0.368	0.988	1.486
2	0.411	0.539	1.165	0.748	0.411	0.387	1.005	1.482
3	0.430	0.501	1.081	0.671	0.430	0.349	0.864	1.502
4	0.418	0.522	0.976	0.527	0.418	0.315	0.800	1.543
5	0.414	0.516	0.948	0.491	0.414	0.295	0.757	1.526
6	0.413	0.513	0.935	0.475	0.413	0.286	0.737	1.518
7	0.411	0.513	0.921	0.460	0.411	0.282	0.726	1.506
8	0.410	0.517	0.908	0.452	0.410	0.286	0.738	1.497
9	0.409	0.529	0.869	0.460	0.409	0.322	0.830	1.459
10	0.404	0.577	0.759	0.444	0.404	0.382	0.986	1.314
11	0.387	0.632	0.723	0.435	0.387	0.407	1.092	1.285

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	7.3	4.5	1.4	0.461	0.766	0.205	0.158	0.038	0.030
2	10.00	7.5	4.5	0.7	0.440	0.810	0.162	0.118	0.031	0.023
3	30.00	8.8	4.7	3.5	0.458	0.815	0.156	0.119	0.027	0.021
4	50.00	10.9	5.7	4.2	0.562	0.783	0.212	0.181	0.038	0.032
5	55.00	11.4	6.0	6.1	0.587	0.770	0.230	0.205	0.040	0.035
6	57.50	11.7	6.1	7.1	0.599	0.766	0.236	0.213	0.040	0.036
7	60.00	11.9	6.1	7.6	0.609	0.763	0.244	0.224	0.042	0.038
8	62.50	12.1	6.2	7.5	0.612	0.767	0.244	0.226	0.042	0.039
9	70.00	12.5	6.3	6.9	0.575	0.810	0.206	0.195	0.037	0.035
10	90.00	13.3	6.1	9.8	0.524	0.907	0.118	0.118	0.022	0.022
11	95.00	14.4	7.0	6.3	0.524	0.915	0.124	0.124	0.024	0.024

TABLE VII. - Continued.

(n) 100 Percent of design speed; reading 2817

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	48.0	68.1	59.8	289.9	1.244	10.05	1.768
2	24.155	24.056	-0.1	44.7	67.2	58.5	289.5	1.226	10.10	1.755
3	21.811	21.829	-0.1	44.5	64.2	56.9	288.3	1.187	10.14	1.679
4	19.385	19.601	-0.1	48.4	61.4	51.8	287.7	1.176	10.15	1.639
5	18.766	19.045	-0.1	50.2	60.9	51.7	287.5	1.176	10.16	1.610
6	18.451	18.766	-0.1	52.3	60.5	51.6	287.4	1.176	10.15	1.597
7	18.136	18.486	-0.1	53.2	60.1	50.6	287.6	1.177	10.15	1.593
8	17.818	18.209	-0.1	52.3	59.8	48.7	287.2	1.174	10.15	1.597
9	16.850	17.374	-0.1	50.4	58.7	45.2	287.4	1.165	10.15	1.589
10	14.130	15.146	-0.0	51.0	55.5	30.9	287.2	1.160	10.14	1.593
11	13.409	14.587	-0.0	51.5	55.3	20.0	287.3	1.169	10.13	1.646

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	167.3	218.8	448.5	291.0	167.3	146.4	-0.2	162.7	416.0	414.2
2	171.3	217.4	441.5	295.8	171.3	154.6	-0.2	152.9	406.8	405.1
3	177.5	204.7	408.0	267.5	177.5	146.0	-0.2	143.4	367.2	367.5
4	177.7	207.4	371.7	222.7	177.7	137.8	-0.2	155.0	326.3	329.9
5	176.4	203.2	362.2	210.0	176.4	130.1	-0.2	156.1	316.2	320.9
6	175.9	202.3	357.1	198.9	175.9	123.6	-0.2	160.1	310.6	315.9
7	175.7	203.5	352.4	191.8	175.7	121.7	-0.2	163.0	305.3	311.2
8	174.9	206.0	347.4	190.9	174.9	125.9	-0.2	163.0	300.0	306.6
9	172.5	207.2	332.3	187.4	172.5	132.0	-0.2	159.7	283.9	292.7
10	163.4	220.9	288.6	162.2	163.4	139.1	-0.1	171.6	237.8	254.9
11	156.6	243.3	274.9	161.1	156.6	151.4	-0.1	190.5	225.8	245.7

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.502	0.595	1.347	0.791	0.502	0.398	0.875	1.567
2	0.515	0.596	1.328	0.811	0.515	0.424	0.902	1.552
3	0.536	0.570	1.233	0.745	0.536	0.406	0.823	1.537
4	0.537	0.581	1.124	0.624	0.537	0.386	0.776	1.535
5	0.533	0.569	1.096	0.588	0.533	0.364	0.738	1.542
6	0.532	0.566	1.080	0.557	0.532	0.346	0.703	1.544
7	0.531	0.569	1.066	0.537	0.531	0.341	0.693	1.546
8	0.529	0.578	1.051	0.536	0.529	0.353	0.720	1.551
9	0.521	0.584	1.004	0.528	0.521	0.372	0.765	1.571
10	0.492	0.627	0.870	0.460	0.492	0.395	0.852	1.437
11	0.471	0.694	0.827	0.459	0.471	0.431	0.967	1.404

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	5.2	2.4	1.0	0.488	0.723	0.267	0.181	0.051	0.034
2	10.00	5.3	2.3	0.3	0.458	0.773	0.211	0.131	0.041	0.025
3	30.00	6.4	2.3	1.8	0.462	0.855	0.128	0.065	0.023	0.012
4	50.00	7.7	2.5	2.6	0.526	0.863	0.130	0.082	0.024	0.015
5	55.00	8.2	2.7	4.7	0.545	0.829	0.166	0.120	0.030	0.022
6	57.50	8.3	2.8	5.7	0.571	0.811	0.187	0.144	0.033	0.025
7	60.00	8.5	2.8	6.0	0.586	0.805	0.197	0.155	0.035	0.027
8	62.50	8.7	2.9	5.4	0.581	0.823	0.180	0.139	0.033	0.025
9	70.00	9.3	3.1	6.5	0.563	0.857	0.150	0.111	0.027	0.020
10	90.00	11.0	3.8	10.0	0.573	0.888	0.143	0.134	0.027	0.025
11	95.00	12.1	4.7	5.4	0.564	0.906	0.136	0.131	0.026	0.026

TABLE VII. - Continued.

(o) 100 Percent of design speed; reading 2818

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	37.8	65.2	59.1	289.4	1.199	10.08	1.605
2	24.155	24.056	-0.1	33.7	64.2	59.6	289.3	1.173	10.12	1.580
3	21.811	21.829	-0.1	35.2	61.2	57.1	288.4	1.155	10.15	1.551
4	19.385	19.601	-0.1	41.3	58.3	51.3	287.8	1.154	10.14	1.531
5	18.766	19.045	-0.1	41.4	57.6	53.1	287.6	1.146	10.13	1.474
6	18.451	18.766	-0.1	42.1	57.4	53.4	287.6	1.143	10.11	1.461
7	18.136	18.486	-0.1	43.1	56.9	53.2	287.5	1.142	10.13	1.452
8	17.818	18.209	-0.1	42.7	56.4	51.6	287.5	1.141	10.13	1.457
9	16.850	17.374	-0.1	40.5	55.1	45.6	287.4	1.139	10.14	1.498
10	14.130	15.146	-0.1	43.4	51.5	33.3	287.4	1.137	10.13	1.495
11	13.409	14.587	-0.0	46.6	51.2	22.9	287.5	1.153	10.13	1.549

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	193.0	214.6	459.5	330.4	193.0	169.6	-0.2	131.5	416.8	415.0
2	197.3	205.7	452.8	338.2	197.3	171.1	-0.2	114.0	407.4	405.7
3	202.8	200.2	420.6	301.4	202.8	163.5	-0.2	115.5	368.3	368.6
4	202.3	207.1	385.0	248.9	202.3	155.6	-0.2	136.7	327.4	331.0
5	200.8	193.5	375.2	242.0	200.8	145.2	-0.2	127.9	316.7	321.4
6	199.6	189.8	369.9	236.1	199.6	140.9	-0.2	127.1	311.3	316.6
7	199.8	188.0	365.5	229.1	199.8	137.3	-0.2	128.4	305.9	311.8
8	199.5	191.2	360.6	226.0	199.5	140.5	-0.2	129.7	300.1	306.7
9	198.7	205.6	346.9	223.4	198.7	156.4	-0.2	133.5	284.2	293.0
10	189.8	219.3	304.7	190.7	189.8	159.4	-0.2	150.6	238.2	255.3
11	181.8	241.8	290.1	180.5	181.8	166.2	-0.2	175.6	226.0	245.8

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.585	0.595	1.393	0.916	0.585	0.470	0.879	1.506
2	0.599	0.575	1.375	0.945	0.599	0.478	0.867	1.495
3	0.618	0.564	1.282	0.850	0.618	0.461	0.807	1.478
4	0.617	0.586	1.174	0.704	0.617	0.440	0.769	1.466
5	0.613	0.547	1.144	0.685	0.613	0.411	0.723	1.467
6	0.608	0.537	1.128	0.668	0.608	0.399	0.706	1.468
7	0.609	0.532	1.115	0.648	0.609	0.389	0.687	1.467
8	0.608	0.542	1.099	0.640	0.608	0.398	0.704	1.465
9	0.606	0.586	1.058	0.637	0.606	0.446	0.787	1.467
10	0.577	0.629	0.926	0.547	0.577	0.457	0.839	1.403
11	0.551	0.694	0.879	0.518	0.551	0.477	0.915	1.372

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	2.3	-0.5	0.3	0.389	0.727	0.218	0.137	0.042	0.027
2	10.00	2.3	-0.7	1.4	0.346	0.806	0.143	0.067	0.027	0.012
3	30.00	3.4	-0.7	2.0	0.375	0.863	0.100	0.042	0.018	0.008
4	50.00	4.6	-0.6	2.2	0.460	0.839	0.129	0.087	0.024	0.016
5	55.00	5.0	-0.5	6.1	0.454	0.803	0.156	0.117	0.027	0.020
6	57.50	5.2	-0.4	7.5	0.460	0.800	0.158	0.121	0.027	0.020
7	60.00	5.3	-0.5	8.6	0.472	0.789	0.168	0.133	0.028	0.022
8	62.50	5.3	-0.5	8.2	0.473	0.805	0.158	0.124	0.027	0.021
9	70.00	5.7	-0.6	6.8	0.458	0.880	0.102	0.074	0.019	0.013
10	90.00	7.0	-0.3	12.4	0.486	0.887	0.115	0.105	0.021	0.019
11	95.00	8.1	0.6	8.3	0.509	0.872	0.155	0.150	0.030	0.029

TABLE VII. - Continued.

(p) 100 Percent of design speed; reading 2819

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.1	30.0	64.8	60.9	289.5	1.151	10.07	1.429
2	24.155	24.056	-0.0	28.2	63.9	60.4	289.3	1.139	10.12	1.432
3	21.811	21.829	-0.1	29.2	60.9	57.9	288.3	1.128	10.14	1.415
4	19.385	19.601	-0.1	36.5	57.8	51.1	287.8	1.135	10.14	1.420
5	18.766	19.045	-0.1	36.2	57.0	54.5	287.8	1.124	10.15	1.345
6	18.451	18.766	-0.0	35.7	56.6	54.9	287.6	1.119	10.14	1.332
7	18.136	18.486	-0.1	36.3	56.2	54.5	287.6	1.119	10.15	1.331
8	17.818	18.209	-0.1	36.8	55.7	53.0	287.5	1.120	10.14	1.339
9	16.850	17.374	-0.1	34.5	54.4	46.1	287.4	1.120	10.14	1.408
10	14.130	15.146	-0.1	38.3	50.6	31.8	287.3	1.129	10.14	1.458
11	13.409	14.587	-0.0	41.1	50.4	24.8	287.3	1.141	10.12	1.482

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	196.1	202.0	461.3	359.8	196.1	174.9	-0.2	101.0	417.3	415.5
2	199.9	200.4	453.8	357.4	199.9	176.5	-0.2	94.8	407.2	405.5
3	204.8	196.0	421.0	321.5	204.8	171.0	-0.2	95.7	367.7	368.0
4	205.8	207.3	386.2	265.8	205.8	166.8	-0.2	123.2	326.6	330.2
5	205.6	186.8	377.7	259.4	205.6	150.8	-0.2	110.2	316.7	321.4
6	204.9	181.9	372.5	256.7	204.9	147.7	-0.2	106.2	310.9	316.2
7	204.8	181.0	367.9	250.7	204.8	145.8	-0.2	107.3	305.4	311.3
8	204.4	184.3	363.0	245.5	204.4	147.6	-0.2	110.3	299.8	306.4
9	203.5	205.6	349.4	244.4	203.5	169.4	-0.2	116.5	283.9	292.7
10	195.9	230.5	308.4	212.9	195.9	180.9	-0.2	142.9	238.1	255.2
11	187.1	244.1	293.4	202.7	187.1	183.9	-0.2	160.5	225.8	245.6

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK VEL R	MERID PEAK MACH NO
1	0.595	0.570	1.400	1.015	0.595	0.493	0.892	1.502
2	0.608	0.568	1.379	1.013	0.608	0.500	0.883	1.488
3	0.625	0.559	1.284	0.917	0.625	0.488	0.835	1.470
4	0.629	0.592	1.180	0.759	0.629	0.476	0.810	1.453
5	0.628	0.533	1.154	0.740	0.628	0.430	0.733	1.453
6	0.626	0.519	1.138	0.733	0.626	0.422	0.721	1.451
7	0.626	0.516	1.124	0.716	0.626	0.416	0.712	1.449
8	0.624	0.526	1.109	0.701	0.624	0.422	0.722	1.448
9	0.622	0.591	1.067	0.703	0.622	0.487	0.832	1.449
10	0.597	0.666	0.940	0.615	0.597	0.523	0.923	1.395
11	0.568	0.705	0.891	0.585	0.568	0.531	0.983	1.365

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	1.9	-0.8	2.2	0.302	0.712	0.182	0.101	0.033	0.019
2	10.00	2.0	-1.0	2.2	0.289	0.775	0.137	0.062	0.025	0.011
3	30.00	3.1	-1.0	2.7	0.312	0.818	0.112	0.054	0.020	0.010
4	50.00	4.1	-1.1	2.0	0.407	0.778	0.157	0.116	0.029	0.022
5	55.00	4.3	-1.1	7.5	0.398	0.713	0.192	0.154	0.032	0.026
6	57.50	4.5	-1.1	9.1	0.393	0.719	0.185	0.150	0.030	0.024
7	60.00	4.6	-1.2	9.8	0.401	0.714	0.192	0.159	0.031	0.026
8	62.50	4.7	-1.2	9.7	0.408	0.723	0.191	0.159	0.031	0.026
9	70.00	5.0	-1.3	7.4	0.389	0.853	0.109	0.081	0.020	0.015
10	90.00	6.1	-1.2	11.0	0.415	0.880	0.114	0.104	0.021	0.019
11	95.00	7.2	-0.2	10.2	0.427	0.843	0.173	0.168	0.033	0.032

TABLE VII. - Continued.

(q) 100 Percent of design speed; reading 2914

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.724	24.615	-0.0	45.1	66.7	59.4	289.5	1.236	10.08	1.732
2	24.155	24.056	-0.0	41.8	65.7	58.9	289.1	1.211	10.11	1.720
3	21.811	21.829	-0.0	42.4	62.7	57.0	288.2	1.180	10.14	1.656
4	19.385	19.601	-0.0	46.3	60.0	51.5	287.7	1.170	10.14	1.624
5	18.766	19.045	-0.0	46.8	59.4	51.6	287.7	1.168	10.14	1.589
6	18.451	18.766	-0.0	48.3	59.0	51.1	287.7	1.168	10.14	1.582
7	18.136	18.486	-0.0	49.6	58.6	50.9	287.7	1.167	10.14	1.569
8	17.818	18.209	-0.0	49.0	58.2	49.3	287.6	1.165	10.14	1.573
9	16.850	17.374	-0.0	47.3	57.0	44.5	287.7	1.159	10.14	1.586
10	14.130	15.146	-0.0	49.5	53.7	33.0	287.5	1.153	10.14	1.561
11	13.409	14.587	-0.0	50.9	53.4	20.7	287.5	1.165	10.12	1.629

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	179.6	218.2	453.6	302.2	179.6	154.1	-0.1	154.6	416.4	414.6
2	183.7	213.2	446.8	307.5	183.7	158.9	-0.1	142.2	407.2	405.5
3	189.5	203.1	413.7	275.4	189.5	149.9	-0.1	137.0	367.7	368.0
4	188.8	207.9	378.0	231.0	188.8	143.7	-0.1	150.2	327.4	331.0
5	187.4	201.8	367.9	222.2	187.4	138.1	-0.1	147.2	316.6	321.3
6	187.3	201.5	363.5	213.8	187.3	134.1	-0.1	150.3	311.5	316.8
7	186.5	200.1	358.3	205.5	186.5	129.7	-0.1	152.4	305.9	311.8
8	186.4	202.5	354.0	203.7	186.4	132.8	-0.1	152.9	300.9	307.5
9	184.7	209.5	339.3	198.9	184.7	141.9	-0.1	154.1	284.6	293.4
10	176.0	216.8	297.0	167.8	176.0	140.7	-0.1	164.9	239.2	256.3
11	168.6	242.9	282.5	163.7	168.6	153.1	-0.1	188.6	226.7	246.6

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.542	0.596	1.368	0.825	0.542	0.421	0.858 1.533
2	0.555	0.588	1.351	0.848	0.555	0.438	0.865 1.524
3	0.575	0.567	1.255	0.769	0.575	0.418	0.791 1.507
4	0.573	0.584	1.148	0.649	0.573	0.404	0.761 1.504
5	0.569	0.567	1.117	0.624	0.569	0.388	0.737 1.506
6	0.568	0.566	1.103	0.600	0.568	0.377	0.716 1.507
7	0.566	0.562	1.087	0.577	0.566	0.364	0.695 1.509
8	0.566	0.570	1.074	0.573	0.566	0.373	0.712 1.511
9	0.560	0.592	1.029	0.562	0.560	0.401	0.768 1.520
10	0.532	0.616	0.898	0.477	0.532	0.400	0.799 1.427
11	0.509	0.693	0.852	0.467	0.509	0.437	0.908 1.392

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	3.8	1.0	0.6	0.462	0.722	0.257	0.174	0.049	0.033
2	10.00	3.9	0.8	0.7	0.429	0.796	0.178	0.101	0.034	0.019
3	30.00	4.9	0.8	1.9	0.445	0.864	0.115	0.054	0.021	0.010
4	50.00	6.3	1.1	2.4	0.508	0.872	0.116	0.070	0.021	0.013
5	55.00	6.7	1.2	4.6	0.512	0.844	0.143	0.101	0.026	0.018
6	57.50	6.8	1.3	5.3	0.530	0.836	0.152	0.112	0.027	0.020
7	60.00	7.0	1.3	6.3	0.546	0.821	0.169	0.131	0.030	0.023
8	62.50	7.2	1.3	6.0	0.544	0.838	0.154	0.116	0.027	0.021
9	70.00	7.6	1.4	5.7	0.534	0.886	0.112	0.078	0.021	0.015
10	90.00	9.1	1.9	12.1	0.561	0.887	0.132	0.122	0.024	0.022
11	95.00	10.2	2.8	6.1	0.565	0.905	0.129	0.124	0.025	0.024

TABLE VII. - Concluded.

(r) 100 Percent of design speed; reading 2918

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.724	24.615	-0.0	43.1	65.9	59.0	289.3	1.227	10.09	1.707
2	24.155	24.056	-0.0	38.9	65.0	58.9	289.2	1.198	10.12	1.682
3	21.811	21.829	-0.0	40.6	62.0	57.2	288.3	1.173	10.14	1.629
4	19.385	19.601	-0.0	44.7	59.3	51.5	287.8	1.166	10.14	1.601
5	18.766	19.045	-0.0	45.4	58.6	51.8	287.6	1.162	10.14	1.562
6	18.451	18.766	-0.0	46.5	58.3	51.2	287.2	1.161	10.14	1.554
7	18.136	18.486	-0.0	47.7	57.9	51.3	287.6	1.161	10.14	1.541
8	17.818	18.209	-0.0	47.2	57.6	50.0	287.3	1.158	10.14	1.540
9	16.850	17.374	-0.0	45.6	56.4	44.8	287.5	1.154	10.14	1.558
10	14.130	15.146	-0.0	48.0	52.9	32.3	287.6	1.149	10.14	1.544
11	13.409	14.587	-0.0	49.6	52.7	21.0	287.6	1.162	10.12	1.608

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	186.5	218.8	457.3	310.2	186.5	159.6	-0.1	149.6	417.4	415.6
2	189.8	211.5	449.3	318.7	189.8	164.7	-0.1	132.7	407.2	405.5
3	195.9	201.7	417.6	282.7	195.9	153.1	-0.1	131.3	368.7	369.0
4	194.6	207.1	381.0	236.9	194.6	147.3	-0.1	145.6	327.5	331.1
5	193.3	200.4	371.4	227.7	193.3	140.7	-0.1	142.7	317.1	321.8
6	191.7	199.6	365.0	219.4	191.7	137.4	-0.1	144.7	310.5	315.8
7	191.6	197.6	361.0	212.3	191.6	132.9	-0.1	146.2	305.9	311.8
8	190.7	198.9	355.8	210.1	190.7	135.0	-0.1	146.0	300.3	306.9
9	188.8	207.6	340.8	204.5	188.8	145.1	-0.1	148.4	283.7	292.5
10	179.8	218.6	298.1	172.9	179.8	146.2	-0.1	162.5	237.8	254.9
11	172.1	243.3	284.1	168.9	172.1	157.6	-0.1	185.3	226.0	245.9

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.564	0.600	1.383	0.850	0.564	0.438	0.856	1.523
2	0.575	0.586	1.361	0.883	0.575	0.456	0.868	1.510
3	0.596	0.564	1.270	0.791	0.596	0.428	0.782	1.495
4	0.592	0.583	1.159	0.667	0.592	0.414	0.757	1.488
5	0.588	0.564	1.130	0.641	0.588	0.396	0.728	1.490
6	0.583	0.562	1.110	0.618	0.583	0.387	0.717	1.489
7	0.582	0.556	1.097	0.597	0.582	0.374	0.694	1.492
8	0.580	0.561	1.082	0.592	0.580	0.381	0.708	1.494
9	0.573	0.588	1.035	0.579	0.573	0.411	0.769	1.501
10	0.544	0.623	0.903	0.493	0.544	0.417	0.813	1.412
11	0.520	0.695	0.858	0.483	0.520	0.450	0.916	1.383

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	3.0	0.2	0.3	0.445	0.728	0.241	0.159	0.047	0.031
2	10.00	3.2	0.1	0.7	0.399	0.807	0.159	0.083	0.030	0.016
3	30.00	4.2	0.1	2.1	0.428	0.864	0.110	0.049	0.020	0.009
4	50.00	5.5	0.4	2.4	0.493	0.866	0.116	0.072	0.022	0.013
5	55.00	6.0	0.5	4.9	0.498	0.838	0.143	0.102	0.025	0.018
6	57.50	6.2	0.6	5.4	0.512	0.833	0.149	0.110	0.026	0.020
7	60.00	6.3	0.6	6.7	0.526	0.818	0.164	0.127	0.029	0.022
8	62.50	6.5	0.7	6.7	0.523	0.831	0.154	0.118	0.027	0.021
9	70.00	7.0	0.7	6.1	0.515	0.880	0.115	0.083	0.021	0.015
10	90.00	8.4	1.1	11.4	0.543	0.889	0.126	0.117	0.023	0.022
11	95.00	9.6	2.1	6.4	0.547	0.899	0.134	0.129	0.026	0.025

TABLE VIII. - BLADE-ELEMENT DATA AT BLADE EDGES FOR STATOR 17

(a) 50 Percent of design speed; reading 2837

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.587	24.600	46.8	7.8	46.8	7.8	304.9	0.999	11.51	0.995
2	24.056	24.110	41.5	4.7	41.5	4.7	303.5	1.000	11.53	0.993
3	21.961	22.134	40.7	0.8	40.7	0.8	300.8	1.000	11.45	0.996
4	19.883	20.160	45.4	1.9	45.4	1.9	300.4	1.000	11.43	0.993
5	19.365	19.670	47.8	1.6	47.8	1.6	300.4	1.000	11.41	0.993
6	19.106	19.426	49.5	1.3	49.5	1.3	300.1	1.000	11.38	0.994
7	18.847	19.182	50.9	1.0	50.9	1.0	300.2	0.999	11.37	0.994
8	18.588	18.938	51.4	0.9	51.4	0.9	300.1	0.999	11.36	0.995
9	17.813	18.214	48.6	1.2	48.6	1.2	299.8	1.000	11.37	0.994
10	15.751	16.297	44.0	2.8	44.0	2.8	298.6	1.004	11.42	0.999
11	15.237	15.814	45.6	3.1	45.6	3.1	299.1	1.003	11.48	0.986

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	102.3	84.5	102.3	84.5	70.0	83.7	74.6	11.4	0.	0.
2	104.6	84.7	104.6	84.7	78.3	84.4	69.3	7.0	0.	0.
3	100.9	81.0	100.9	81.0	76.4	81.0	65.8	1.1	0.	0.
4	103.5	77.3	103.5	77.3	72.7	77.3	73.7	2.6	0.	0.
5	103.2	76.0	103.2	76.0	69.4	76.0	76.5	2.2	0.	0.
6	101.9	74.9	101.9	74.9	66.2	74.9	77.5	1.7	0.	0.
7	101.7	74.0	101.7	74.0	64.2	74.0	78.9	1.3	0.	0.
8	101.5	73.6	101.5	73.6	63.3	73.6	79.4	1.2	0.	0.
9	104.9	75.1	104.9	75.1	69.4	75.1	78.7	1.5	0.	0.
10	113.6	88.3	113.6	88.3	81.7	88.2	79.0	4.3	0.	0.
11	121.2	82.5	121.2	82.5	84.8	82.4	86.6	4.5	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS
RP	IN	OUT	IN	OUT	IN	OUT	VEL R MACH NO
1	0.295	0.243	0.295	0.243	0.202	0.241	1.196 0.490
2	0.302	0.244	0.302	0.244	0.226	0.243	1.078 0.455
3	0.293	0.234	0.293	0.234	0.222	0.234	1.060 0.435
4	0.301	0.224	0.301	0.224	0.211	0.224	1.064 0.481
5	0.300	0.220	0.300	0.220	0.201	0.220	1.096 0.499
6	0.296	0.217	0.296	0.217	0.192	0.217	1.132 0.508
7	0.295	0.214	0.295	0.214	0.186	0.214	1.153 0.519
8	0.295	0.213	0.295	0.213	0.184	0.213	1.162 0.521
9	0.305	0.218	0.305	0.218	0.202	0.217	1.083 0.501
10	0.332	0.256	0.332	0.256	0.238	0.256	1.079 0.459
11	0.354	0.239	0.354	0.239	0.248	0.239	0.971 0.561

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	10.9	4.8	20.1	0.412	0.	0.080	0.080	0.031	0.031
2	10.00	7.4	1.3	15.8	0.414	0.	0.116	0.116	0.044	0.044
3	30.00	8.4	2.2	10.2	0.418	0.	0.069	0.069	0.024	0.024
4	50.00	12.1	6.0	10.8	0.466	0.	0.115	0.115	0.036	0.036
5	55.00	14.1	8.0	10.5	0.481	0.	0.118	0.118	0.036	0.036
6	57.50	15.6	9.5	10.0	0.487	0.	0.094	0.094	0.028	0.028
7	60.00	16.8	10.6	9.7	0.497	0.	0.094	0.094	0.028	0.028
8	62.50	17.1	11.0	9.6	0.498	0.	0.090	0.090	0.026	0.026
9	70.00	13.5	7.4	9.8	0.488	0.	0.102	0.102	0.029	0.029
10	90.00	5.7	-0.4	11.6	0.383	0.	0.016	0.016	0.004	0.004
11	95.00	6.0	5.4	12.0	0.479	0.	0.164	0.164	0.039	0.039

TABLE VIII. - Continued.

(b) 60 Percent of design speed; reading 2835

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	47.2	7.7	47.2	7.7	312.0	0.998	12.15	0.993
2	24.056	24.110	41.7	4.6	41.7	4.6	310.1	0.999	12.20	0.989
3	21.961	22.134	40.7	0.8	40.7	0.8	306.2	1.000	12.05	0.994
4	19.883	20.160	45.6	1.8	45.6	1.8	305.7	0.999	12.01	0.990
5	19.365	19.670	48.3	1.5	48.3	1.5	305.6	0.999	11.99	0.989
6	19.106	19.426	49.7	1.1	49.7	1.1	305.5	0.999	11.96	0.991
7	18.847	19.182	51.1	0.9	51.1	0.9	305.5	0.999	11.96	0.990
8	18.588	18.938	51.5	0.6	51.5	0.6	305.4	0.998	11.93	0.991
9	17.813	18.214	48.3	1.0	48.3	1.0	305.0	0.999	11.98	0.988
10	15.751	16.297	44.3	2.8	44.3	2.8	303.5	1.003	12.08	0.991
11	15.237	15.814	45.5	2.9	45.5	2.9	304.3	1.002	12.15	0.976

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	123.1	101.0	123.1	101.0	83.7	100.1	90.3	13.6	0.	0.
2	125.7	101.4	125.7	101.4	93.8	101.1	83.7	8.2	0.	0.
3	121.0	96.5	121.0	96.5	91.8	96.5	78.8	1.4	0.	0.
4	123.4	91.2	123.4	91.2	86.3	91.2	88.2	2.9	0.	0.
5	123.4	89.2	123.4	89.2	82.1	89.2	92.1	2.4	0.	0.
6	122.4	88.0	122.4	88.0	79.2	88.0	93.4	1.7	0.	0.
7	122.7	87.2	122.7	87.2	77.0	87.2	95.5	1.3	0.	0.
8	122.6	86.5	122.6	86.5	76.3	86.5	96.0	1.0	0.	0.
9	127.6	88.2	127.6	88.2	84.9	88.2	95.2	1.6	0.	0.
10	139.4	103.7	139.4	103.7	99.8	103.5	97.4	5.0	0.	0.
11	147.4	96.2	147.4	96.2	103.3	96.1	105.1	4.8	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.352	0.288	0.352	0.288	0.239	0.285	1.196	0.589
2	0.361	0.290	0.361	0.290	0.269	0.289	1.078	0.547
3	0.349	0.277	0.349	0.277	0.265	0.277	1.052	0.517
4	0.357	0.262	0.357	0.262	0.249	0.262	1.056	0.573
5	0.357	0.256	0.357	0.256	0.237	0.256	1.085	0.599
6	0.354	0.253	0.354	0.253	0.229	0.253	1.112	0.609
7	0.355	0.251	0.355	0.251	0.222	0.250	1.132	0.625
8	0.354	0.249	0.354	0.249	0.221	0.249	1.133	0.627
9	0.369	0.254	0.369	0.254	0.246	0.254	1.038	0.602
10	0.406	0.299	0.406	0.299	0.290	0.299	1.038	0.565
11	0.429	0.277	0.429	0.277	0.301	0.277	0.930	0.680

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	11.3	5.1	20.0	0.420	0.	0.085	0.085	0.032	0.032
2	10.00	7.7	1.5	15.7	0.420	0.	0.126	0.126	0.047	0.047
3	30.00	8.3	2.1	10.2	0.422	0.	0.074	0.074	0.026	0.026
4	50.00	12.4	6.2	10.7	0.476	0.	0.119	0.119	0.037	0.037
5	55.00	14.6	8.4	10.3	0.497	0.	0.127	0.127	0.039	0.039
6	57.50	15.8	9.7	9.9	0.504	0.	0.115	0.115	0.034	0.034
7	60.00	17.0	10.9	9.6	0.515	0.	0.124	0.124	0.037	0.037
8	62.50	17.2	11.1	9.4	0.520	0.	0.106	0.106	0.031	0.031
9	70.00	13.2	7.0	9.7	0.512	0.	0.134	0.134	0.038	0.038
10	90.00	5.9	-0.1	11.5	0.418	0.	0.081	0.081	0.020	0.020
11	95.00	5.9	5.3	11.8	0.508	0.	0.206	0.206	0.049	0.049

TABLE VIII. - Continued.

(c) 70 Percent of design speed; reading 2829

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	48.8	7.6	48.8	7.6	322.1	0.997	13.02	0.987
2	24.056	24.110	44.4	5.0	44.4	5.0	319.5	0.999	13.07	0.983
3	21.961	22.134	43.0	1.5	43.0	1.5	313.9	0.999	12.91	0.987
4	19.883	20.160	47.9	1.9	47.9	1.9	313.1	0.998	12.86	0.980
5	19.365	19.670	50.0	1.6	50.0	1.6	312.8	0.998	12.80	0.981
6	19.106	19.426	51.3	1.3	51.3	1.3	312.7	0.998	12.76	0.983
7	18.847	19.182	52.4	1.1	52.4	1.1	312.5	0.998	12.72	0.985
8	18.588	18.938	53.0	1.2	53.0	1.2	312.4	0.997	12.71	0.985
9	17.813	18.214	49.1	1.8	49.1	1.8	311.4	0.999	12.75	0.983
10	15.751	16.297	44.9	3.1	44.9	3.1	308.9	1.005	12.82	0.991
11	15.237	15.814	46.3	2.8	46.3	2.8	310.2	1.002	12.95	0.968

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	145.0	116.5	145.0	116.5	95.6	115.5	109.0	15.4	0.	0.
2	147.6	117.1	147.6	117.1	105.4	116.7	103.3	10.1	0.	0.
3	144.1	111.4	144.1	111.4	105.4	111.4	98.2	2.9	0.	0.
4	147.3	103.8	147.3	103.8	98.7	103.7	109.4	3.4	0.	0.
5	146.2	101.2	146.2	101.2	94.0	101.1	111.9	2.8	0.	0.
6	145.0	99.9	145.0	99.9	90.6	99.9	113.2	2.3	0.	0.
7	144.0	99.3	144.0	99.3	87.9	99.3	114.0	2.0	0.	0.
8	144.7	98.7	144.7	98.7	87.1	98.7	115.5	2.1	0.	0.
9	149.7	101.5	149.7	101.5	98.0	101.5	113.1	3.2	0.	0.
10	159.6	117.5	159.6	117.5	113.0	117.3	112.7	6.3	0.	0.
11	170.2	107.7	170.2	107.7	117.6	107.6	123.0	5.3	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.410	0.328	0.410	0.328	0.270	0.325	1.208	0.709
2	0.419	0.331	0.419	0.331	0.299	0.330	1.107	0.673
3	0.412	0.317	0.412	0.317	0.302	0.317	1.057	0.644
4	0.423	0.295	0.423	0.295	0.283	0.295	1.051	0.713
5	0.420	0.288	0.420	0.288	0.270	0.288	1.076	0.730
6	0.416	0.284	0.416	0.284	0.260	0.284	1.102	0.742
7	0.413	0.283	0.413	0.283	0.252	0.283	1.129	0.746
8	0.415	0.281	0.415	0.281	0.250	0.281	1.133	0.755
9	0.431	0.290	0.431	0.290	0.282	0.289	1.036	0.715
10	0.463	0.336	0.463	0.336	0.328	0.336	1.038	0.654
11	0.494	0.308	0.494	0.308	0.341	0.307	0.915	0.794

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	12.9	6.7	19.9	0.445	0.	0.124	0.124	0.047	0.047
2	10.00	10.3	4.2	16.1	0.444	0.	0.147	0.147	0.055	0.055
3	30.00	10.6	4.4	10.9	0.454	0.	0.114	0.114	0.039	0.039
4	50.00	14.7	8.5	10.8	0.519	0.	0.170	0.170	0.053	0.053
5	55.00	16.3	10.1	10.4	0.534	0.	0.163	0.163	0.050	0.050
6	57.50	17.4	11.3	10.1	0.539	0.	0.153	0.153	0.046	0.046
7	60.00	18.3	12.1	9.9	0.539	0.	0.138	0.138	0.041	0.041
8	62.50	18.7	12.5	9.9	0.545	0.	0.138	0.138	0.040	0.040
9	70.00	14.0	7.9	10.5	0.525	0.	0.139	0.139	0.039	0.039
10	90.00	6.5	0.5	11.9	0.427	0.	0.064	0.064	0.016	0.016
11	95.00	6.6	6.0	11.7	0.530	0.	0.210	0.210	0.051	0.051

TABLE VIII. - Continued.

(d) 70 Percent of design speed; reading 2830

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	35.7	5.8	35.7	5.8	315.9	1.001	12.85	0.987
2	24.056	24.110	35.1	4.6	35.1	4.6	314.4	1.001	12.92	0.990
3	21.961	22.134	37.1	0.1	37.1	0.1	310.9	0.999	12.68	0.995
4	19.883	20.160	40.6	0.5	40.6	0.5	310.4	0.999	12.67	0.991
5	19.365	19.670	43.1	0.5	43.1	0.5	310.6	0.997	12.66	0.989
6	19.106	19.426	44.7	0.2	44.7	0.2	310.6	0.997	12.62	0.989
7	18.847	19.182	46.0	-0.0	46.0	-0.0	310.6	0.997	12.58	0.991
8	18.588	18.938	45.9	-0.4	45.9	-0.4	310.8	0.996	12.57	0.991
9	17.813	18.214	43.1	-0.8	43.1	-0.8	309.8	0.998	12.65	0.984
10	15.751	16.297	42.5	1.9	42.5	1.9	308.5	1.002	12.75	0.989
11	15.237	15.814	44.1	3.7	44.1	3.7	309.9	1.001	12.88	0.970

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	147.0	119.3	147.0	119.3	119.3	118.7	85.9	12.1	0.	0.
2	149.1	126.2	149.1	126.2	122.0	125.8	85.7	10.0	0.	0.
3	141.3	117.5	141.3	117.5	112.7	117.5	85.2	0.2	0.	0.
4	145.4	115.4	145.4	115.4	110.5	115.4	94.5	1.0	0.	0.
5	146.3	114.3	146.3	114.3	106.7	114.3	100.0	1.0	0.	0.
6	145.7	112.6	145.7	112.6	103.5	112.6	102.5	0.5	0.	0.
7	144.6	111.4	144.6	111.4	100.5	111.4	104.0	-0.1	0.	0.
8	145.8	110.8	145.8	110.8	101.4	110.8	104.8	-0.7	0.	0.
9	151.5	111.5	151.5	111.5	110.7	111.5	103.5	-1.5	0.	0.
10	163.9	127.1	163.9	127.1	120.9	127.0	110.7	4.2	0.	0.
11	174.1	122.0	174.1	122.0	125.0	121.8	121.3	7.9	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.420	0.339	0.420	0.339	0.341	0.337	0.995	0.538
2	0.427	0.360	0.427	0.360	0.350	0.358	1.031	0.548
3	0.406	0.336	0.406	0.336	0.324	0.336	1.043	0.553
4	0.419	0.330	0.419	0.330	0.318	0.330	1.044	0.607
5	0.421	0.327	0.421	0.327	0.307	0.327	1.071	0.635
6	0.420	0.323	0.420	0.323	0.298	0.323	1.088	0.652
7	0.416	0.319	0.416	0.319	0.289	0.319	1.108	0.661
8	0.420	0.317	0.420	0.317	0.292	0.317	1.093	0.663
9	0.438	0.320	0.438	0.320	0.320	0.320	1.007	0.637
10	0.476	0.365	0.476	0.365	0.351	0.365	1.050	0.632
11	0.506	0.350	0.506	0.350	0.363	0.349	0.974	0.778

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-0.2	-6.3	18.1	0.381	0.	0.114	0.114	0.044	0.044
2	10.00	1.0	-5.2	15.7	0.345	0.	0.083	0.083	0.031	0.031
3	30.00	4.7	-1.5	9.5	0.375	0.	0.046	0.046	0.016	0.016
4	50.00	7.3	1.1	9.4	0.406	0.	0.081	0.081	0.025	0.025
5	55.00	9.5	3.3	9.3	0.423	0.	0.094	0.094	0.029	0.029
6	57.50	10.8	4.7	9.0	0.436	0.	0.093	0.093	0.028	0.028
7	60.00	11.9	5.7	8.7	0.442	0.	0.081	0.081	0.024	0.024
8	62.50	11.6	5.5	8.3	0.450	0.	0.082	0.082	0.024	0.024
9	70.00	8.0	1.8	7.9	0.456	0.	0.132	0.132	0.037	0.037
10	90.00	4.1	-2.0	10.7	0.383	0.	0.073	0.073	0.018	0.018
11	95.00	4.5	3.9	12.6	0.453	0.	0.188	0.188	0.045	0.045

TABLE VIII. - Continued.

(e) 70 Percent of design speed; reading 2831

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	30.3	5.2	30.3	5.2	312.9	0.999	12.58	0.980
2	24.056	24.110	28.5	3.5	28.5	3.5	310.2	1.002	12.54	0.993
3	21.961	22.134	30.3	-1.0	30.3	-1.0	307.7	0.999	12.40	0.998
4	19.883	20.160	34.2	-0.9	34.2	-0.9	307.5	0.999	12.38	0.996
5	19.365	19.670	35.7	-0.3	35.7	-0.3	308.1	0.998	12.44	0.992
6	19.106	19.426	37.4	-0.3	37.4	-0.3	308.4	0.997	12.40	0.994
7	18.847	19.182	39.3	-0.5	39.3	-0.5	308.7	0.996	12.34	0.998
8	18.588	18.938	39.1	-0.6	39.1	-0.6	308.4	0.997	12.35	0.996
9	17.813	18.214	37.1	-1.3	37.1	-1.3	307.6	0.998	12.43	0.991
10	15.751	16.297	39.3	0.5	39.3	0.5	307.8	1.000	12.59	0.992
11	15.237	15.814	41.2	3.3	41.2	3.3	309.1	0.999	12.74	0.969

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	150.3	122.4	150.3	122.4	129.8	121.9	75.8	11.1	0.	0.
2	147.0	130.7	147.0	130.7	129.2	130.5	70.1	8.0	0.	0.
3	140.4	126.1	140.4	126.1	121.2	126.1	70.9	-2.2	0.	0.
4	144.8	126.1	144.8	126.1	119.8	126.0	81.3	-1.9	0.	0.
5	148.3	127.2	148.3	127.2	120.5	127.2	86.5	-0.7	0.	0.
6	146.9	126.8	146.9	126.8	116.8	126.8	89.1	-0.6	0.	0.
7	145.3	126.6	145.3	126.6	112.5	126.6	92.0	-1.0	0.	0.
8	147.1	126.5	147.1	126.5	114.2	126.5	92.7	-1.4	0.	0.
9	152.5	128.3	152.5	128.3	121.7	128.2	92.0	-2.9	0.	0.
10	167.3	142.8	167.3	142.8	129.4	142.8	106.1	1.3	0.	0.
11	177.2	137.8	177.2	137.8	133.4	137.6	116.7	7.8	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.432	0.350	0.432	0.350	0.373	0.348	0.939	0.443
2	0.424	0.375	0.424	0.375	0.373	0.374	1.010	0.424
3	0.406	0.363	0.406	0.363	0.350	0.363	1.040	0.441
4	0.419	0.363	0.419	0.363	0.347	0.363	1.052	0.504
5	0.429	0.367	0.429	0.367	0.349	0.367	1.056	0.534
6	0.425	0.365	0.425	0.365	0.338	0.365	1.086	0.551
7	0.420	0.365	0.420	0.365	0.325	0.365	1.126	0.571
8	0.425	0.365	0.425	0.365	0.330	0.365	1.108	0.571
9	0.442	0.370	0.442	0.370	0.353	0.370	1.054	0.548
10	0.487	0.413	0.487	0.413	0.376	0.413	1.104	0.590
11	0.516	0.397	0.516	0.397	0.388	0.397	1.031	0.742

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-5.6	-11.8	17.5	0.351	0.	0.165	0.165	0.063	0.063
2	10.00	-5.6	-11.8	14.6	0.269	0.	0.058	0.058	0.022	0.022
3	30.00	-2.1	-8.2	8.4	0.281	0.	0.022	0.022	0.007	0.007
4	50.00	0.9	-5.3	8.0	0.308	0.	0.037	0.037	0.012	0.012
5	55.00	2.0	-4.2	8.5	0.320	0.	0.064	0.064	0.019	0.019
6	57.50	3.5	-2.7	8.5	0.319	0.	0.048	0.048	0.015	0.015
7	60.00	5.2	-1.0	8.3	0.317	0.	0.015	0.015	0.005	0.005
8	62.50	4.8	-1.4	8.1	0.326	0.	0.032	0.032	0.009	0.009
9	70.00	2.0	-4.2	7.3	0.332	0.	0.070	0.070	0.020	0.020
10	90.00	1.0	-5.1	9.3	0.300	0.	0.055	0.055	0.014	0.014
11	95.00	1.6	1.0	12.2	0.367	0.	0.185	0.185	0.044	0.044

TABLE VIII. - Continued.

(f) 70 Percent of design speed; reading 2832

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	23.6	4.6	23.6	4.6	308.1	1.000	12.12	0.972
2	24.056	24.110	22.2	2.2	22.2	2.2	306.0	1.002	12.07	0.994
3	21.961	22.134	23.2	-1.8	23.2	-1.8	304.1	1.000	12.01	0.998
4	19.883	20.160	27.3	-2.4	27.3	-2.4	304.6	0.998	12.04	0.995
5	19.365	19.670	28.4	-1.9	28.4	-1.9	304.9	0.999	12.09	0.994
6	19.106	19.426	29.8	-1.7	29.8	-1.7	305.4	0.998	12.09	0.995
7	18.847	19.182	31.9	-1.5	31.9	-1.5	306.0	0.996	12.06	0.998
8	18.588	18.938	31.3	-1.4	31.3	-1.4	305.7	0.998	12.07	0.998
9	17.813	18.214	30.3	-2.2	30.3	-2.2	305.3	0.998	12.19	0.992
10	15.751	16.297	34.5	-0.3	34.5	-0.3	306.5	1.000	12.41	0.994
11	15.237	15.814	36.7	2.5	36.7	2.5	308.2	0.999	12.56	0.963

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	153.5	126.9	153.5	126.9	140.6	126.5	61.5	10.3	0.	0.
2	147.8	139.2	147.8	139.2	136.9	139.1	55.9	5.4	0.	0.
3	144.9	139.1	144.9	139.1	133.2	139.0	57.0	-4.3	0.	0.
4	148.5	140.9	148.5	140.9	132.0	140.8	68.2	-6.0	0.	0.
5	151.7	143.5	151.7	143.5	133.5	143.4	72.2	-4.7	0.	0.
6	152.1	144.8	152.1	144.8	131.9	144.8	75.7	-4.2	0.	0.
7	151.0	145.3	151.0	145.3	128.2	145.3	79.7	-3.7	0.	0.
8	152.4	145.9	152.4	145.9	130.2	145.9	79.2	-3.5	0.	0.
9	159.5	149.8	159.5	149.8	137.8	149.7	80.3	-5.6	0.	0.
10	174.3	166.5	174.3	166.5	143.6	166.5	98.7	-0.8	0.	0.
11	183.9	158.0	183.9	158.0	147.5	157.9	109.8	6.9	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.445	0.365	0.445	0.365	0.407	0.364	0.900	0.445
2	0.429	0.403	0.429	0.403	0.397	0.403	1.016	0.429
3	0.422	0.404	0.422	0.404	0.388	0.404	1.043	0.422
4	0.432	0.410	0.432	0.410	0.384	0.409	1.067	0.432
5	0.442	0.417	0.442	0.417	0.389	0.417	1.075	0.442
6	0.443	0.421	0.443	0.421	0.384	0.421	1.097	0.443
7	0.439	0.423	0.439	0.423	0.373	0.422	1.133	0.458
8	0.443	0.424	0.443	0.424	0.379	0.424	1.121	0.443
9	0.465	0.436	0.465	0.436	0.402	0.436	1.086	0.465
10	0.509	0.486	0.509	0.486	0.420	0.486	1.160	0.509
11	0.537	0.459	0.537	0.459	0.431	0.458	1.070	0.686

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-12.3	-18.4	16.9	0.302	0.	0.221	0.221	0.085	0.085
2	10.00	-11.9	-18.1	13.3	0.187	0.	0.053	0.053	0.020	0.020
3	30.00	-9.2	-15.4	7.6	0.186	0.	0.020	0.020	0.007	0.007
4	50.00	-5.9	-12.1	6.4	0.207	0.	0.042	0.042	0.013	0.013
5	55.00	-5.3	-11.4	6.9	0.208	0.	0.047	0.047	0.014	0.014
6	57.50	-4.0	-10.2	7.1	0.205	0.	0.038	0.038	0.011	0.011
7	60.00	-2.2	-8.4	7.3	0.200	0.	0.013	0.013	0.004	0.004
8	62.50	-3.0	-9.2	7.4	0.200	0.	0.017	0.017	0.005	0.005
9	70.00	-4.9	-11.0	6.5	0.211	0.	0.057	0.057	0.016	0.016
10	90.00	-3.9	-9.9	8.5	0.184	0.	0.035	0.035	0.009	0.009
11	95.00	-3.0	-3.6	11.4	0.273	0.	0.208	0.208	0.050	0.050

TABLE VIII. - Continued.

(g) 70 Percent of design speed; reading 2917

	RADII		ABS BETAM		REL BETAM		TOTAL TEMP		TOTAL PRESS	
RP	IN	OUT	IN	OUT	IN	OUT	IN	RATIO	IN	RATIO
1	24.587	24.600	15.1	5.6	15.1	5.6	302.4	1.003	11.42	0.945
2	24.056	24.110	15.2	2.7	15.2	2.7	301.1	1.003	11.45	0.979
3	21.961	22.134	16.2	-1.6	16.2	-1.6	300.0	1.000	11.47	0.986
4	19.883	20.160	20.5	-3.0	20.5	-3.0	301.1	0.993	11.58	0.985
5	19.365	19.670	21.5	-4.1	21.5	-4.1	301.3	0.998	11.61	0.989
6	19.106	19.426	22.9	-3.6	22.9	-3.6	301.5	0.998	11.63	0.991
7	18.847	19.182	25.0	-2.0	25.0	-2.0	302.8	0.996	11.64	0.994
8	18.588	18.938	24.8	-2.7	24.8	-2.7	302.4	0.998	11.65	0.996
9	17.813	18.214	24.0	-2.6	24.0	-2.6	302.1	1.000	11.81	0.988
10	15.751	16.297	29.1	0.5	29.1	0.5	304.3	1.002	12.17	0.988
11	15.237	15.814	32.1	3.5	32.1	3.5	305.8	1.000	12.24	0.940

	ABS VEL		REL VEL		MERID VEL		TANG VEL		WHEEL SPEED	
RP	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
1	155.1	130.3	155.1	130.3	149.7	129.6	40.4	13.1	0.	0.
2	151.6	152.3	151.6	152.3	146.3	152.2	39.6	7.1	0.	0.
3	151.0	156.7	151.0	156.7	145.0	156.6	42.0	-4.4	0.	0.
4	157.6	164.0	157.6	164.0	147.6	163.7	55.3	-8.5	0.	0.
5	159.5	167.5	159.5	167.5	148.4	167.1	58.4	-12.1	0.	0.
6	160.1	169.9	160.1	169.9	147.5	169.6	62.4	-10.6	0.	0.
7	160.2	172.8	160.2	172.8	145.2	172.7	67.7	-6.0	0.	0.
8	160.2	174.9	160.2	174.9	145.5	174.8	67.1	-8.1	0.	0.
9	168.0	179.7	168.0	179.7	153.5	179.5	68.4	-8.3	0.	0.
10	186.8	202.8	186.8	202.8	163.2	202.8	90.9	1.7	0.	0.
11	192.0	185.3	192.0	185.3	162.6	185.0	101.9	11.3	0.	0.

	ABS MACH NO		REL MACH NO		MERID MACH NO		MERID PEAK SS	
RP	IN	OUT	IN	OUT	IN	OUT	VEL R	MACH NO
1	0.454	0.378	0.454	0.378	0.438	0.376	0.866	0.454
2	0.444	0.446	0.444	0.446	0.429	0.445	1.040	0.444
3	0.443	0.461	0.443	0.461	0.426	0.461	1.080	0.443
4	0.463	0.483	0.463	0.483	0.433	0.482	1.109	0.463
5	0.468	0.493	0.468	0.493	0.436	0.492	1.126	0.468
6	0.470	0.501	0.470	0.501	0.433	0.500	1.150	0.470
7	0.469	0.509	0.469	0.509	0.425	0.509	1.190	0.469
8	0.470	0.516	0.470	0.516	0.426	0.515	1.201	0.470
9	0.494	0.530	0.494	0.530	0.451	0.529	1.169	0.494
10	0.550	0.599	0.550	0.599	0.480	0.599	1.243	0.550
11	0.565	0.544	0.565	0.544	0.479	0.543	1.137	0.609

	PERCENT	INCIDENCE		DEV	D-FACT	EFF	LOSS COEFF		LOSS PARAM	
RP	SPAN	MEAN	SS				TOT	PROF	TOT	PROF
1	5.00	-20.8	-26.9	18.1	0.228	0.	0.418	0.418	0.160	0.160
2	10.00	-18.9	-25.0	13.8	0.076	0.	0.166	0.166	0.063	0.063
3	30.00	-16.2	-22.4	7.8	0.068	0.	0.108	0.108	0.037	0.037
4	50.00	-12.7	-18.9	5.9	0.066	0.	0.103	0.108	0.034	0.034
5	55.00	-12.2	-18.3	4.7	0.064	0.	0.081	0.081	0.025	0.025
6	57.50	-11.0	-17.1	5.2	0.076	0.	0.068	0.068	0.020	0.020
7	60.00	-9.1	-15.3	6.8	0.057	0.	0.045	0.045	0.013	0.013
8	62.50	-9.6	-15.7	6.1	0.044	0.	0.027	0.027	0.008	0.008
9	70.00	-11.1	-17.2	6.0	0.058	0.	0.081	0.081	0.023	0.023
10	90.00	-9.3	-15.3	9.3	0.031	0.	0.062	0.062	0.015	0.015
11	95.00	-7.6	-8.2	12.4	0.146	0.	0.311	0.311	0.075	0.075

TABLE VIII. - Continued.

(h) 80 Percent of design speed; reading 2814

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	46.1	8.0	46.1	8.0	331.4	0.998	14.23	0.983
2	24.056	24.110	43.4	5.8	43.4	5.8	328.7	0.998	14.26	0.980
3	21.961	22.134	46.0	1.9	46.0	1.9	322.5	0.999	13.92	0.984
4	19.883	20.160	49.3	1.8	49.3	1.8	321.0	0.998	13.86	0.976
5	19.365	19.670	51.7	1.1	51.7	1.1	320.5	0.998	13.75	0.981
6	19.106	19.426	53.0	0.8	53.0	0.8	320.3	0.998	13.68	0.984
7	18.847	19.182	54.2	0.7	54.2	0.7	319.9	0.998	13.62	0.987
8	18.588	18.938	54.1	0.7	54.1	0.7	319.9	0.997	13.60	0.987
9	17.813	18.214	50.8	1.6	50.8	1.6	318.7	0.999	13.64	0.986
10	15.751	16.297	45.4	3.4	45.4	3.4	315.5	1.005	13.75	0.992
11	15.237	15.814	46.6	3.1	46.6	3.1	317.3	1.002	14.07	0.954

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	170.5	140.4	170.5	140.4	118.3	139.0	122.9	19.5	0.	0.
2	172.2	139.9	172.2	139.9	125.2	139.2	118.2	14.1	0.	0.
3	164.9	126.9	164.9	126.9	114.6	126.8	118.6	4.2	0.	0.
4	168.8	118.7	168.8	118.7	110.2	118.6	127.9	3.8	0.	0.
5	166.0	116.3	166.0	116.3	103.0	116.3	130.2	2.3	0.	0.
6	164.4	115.0	164.4	115.0	99.0	115.0	131.3	1.6	0.	0.
7	163.2	114.2	163.2	114.2	95.5	114.2	132.3	1.4	0.	0.
8	163.9	114.0	163.9	114.0	96.0	114.0	132.8	1.3	0.	0.
9	169.0	116.9	169.0	116.9	106.9	116.8	130.9	3.2	0.	0.
10	180.6	132.9	180.6	132.9	126.8	132.6	128.6	8.0	0.	0.
11	197.7	123.3	197.7	123.3	135.9	123.1	143.5	6.7	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.478	0.391	0.478	0.391	0.331	0.387	1.175	0.783
2	0.485	0.391	0.485	0.391	0.352	0.389	1.112	0.767
3	0.468	0.357	0.468	0.357	0.325	0.357	1.106	0.778
4	0.481	0.334	0.481	0.334	0.314	0.334	1.077	0.832
5	0.473	0.328	0.473	0.328	0.293	0.328	1.130	0.850
6	0.468	0.324	0.468	0.324	0.282	0.324	1.161	0.859
7	0.465	0.322	0.465	0.322	0.272	0.322	1.196	0.869
8	0.467	0.322	0.467	0.322	0.274	0.322	1.187	0.868
9	0.483	0.330	0.483	0.330	0.306	0.330	1.093	0.829
10	0.521	0.377	0.521	0.377	0.366	0.377	1.046	0.745
11	0.571	0.349	0.571	0.349	0.393	0.349	0.906	0.925

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	10.2	4.1	20.3	0.410	0.	0.118	0.118	0.045	0.045
2	10.00	9.3	3.1	16.9	0.415	0.	0.135	0.135	0.051	0.051
3	30.00	13.6	7.4	11.3	0.469	0.	0.115	0.115	0.040	0.040
4	50.00	16.0	9.8	10.7	0.525	0.	0.161	0.161	0.050	0.050
5	55.00	18.0	11.8	9.9	0.532	0.	0.137	0.137	0.042	0.042
6	57.50	19.1	12.9	9.6	0.536	0.	0.117	0.117	0.035	0.035
7	60.00	20.1	13.9	9.5	0.536	0.	0.096	0.096	0.028	0.028
8	62.50	19.8	13.7	9.4	0.537	0.	0.092	0.092	0.027	0.027
9	70.00	15.7	9.5	10.2	0.518	0.	0.094	0.094	0.026	0.026
10	90.00	7.0	1.0	12.2	0.427	0.	0.046	0.046	0.011	0.011
11	95.00	6.9	6.3	12.0	0.540	0.	0.231	0.231	0.055	0.055

TABLE VIII. - Continued.

(i) 90 Percent of design speed; reading 2820

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	36.3	6.3	36.3	6.3	347.0	0.995	16.17	0.963
2	24.056	24.110	32.0	3.5	32.0	3.5	339.4	1.003	16.00	0.988
3	21.961	22.134	33.0	-0.1	33.0	-0.1	333.1	0.998	15.75	0.992
4	19.883	20.160	38.7	1.8	38.7	1.8	332.1	0.996	15.52	0.986
5	19.365	19.670	38.8	-1.3	38.8	-1.3	329.6	0.999	14.93	1.000
6	19.106	19.426	39.4	-2.6	39.4	-2.6	328.8	0.998	14.78	1.002
7	18.847	19.182	40.4	-2.3	40.4	-2.3	328.5	0.998	14.70	1.006
8	18.588	18.938	40.0	-1.5	40.0	-1.5	328.0	0.999	14.76	1.006
9	17.813	18.214	37.4	-0.4	37.4	-0.4	327.4	0.999	15.19	0.994
10	15.751	16.297	40.0	1.5	40.0	1.5	326.8	1.008	15.15	1.000
11	15.237	15.814	43.1	3.8	43.1	3.8	331.3	1.001	15.68	0.936

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	222.4	181.8	222.4	181.8	179.2	180.7	131.6	20.1	0.	0.
2	215.1	189.9	215.1	189.9	182.4	189.5	114.0	11.4	0.	0.
3	210.7	184.6	210.7	184.6	176.7	184.6	114.8	-0.4	0.	0.
4	215.4	178.5	215.4	178.5	168.1	178.5	134.8	5.5	0.	0.
5	200.8	165.9	200.8	165.9	156.5	165.9	125.8	-3.9	0.	0.
6	196.5	161.6	196.5	161.6	151.8	161.4	124.9	-7.3	0.	0.
7	194.2	161.7	194.2	161.7	147.8	161.5	126.0	-6.4	0.	0.
8	197.6	164.6	197.6	164.6	151.3	164.6	127.1	-4.3	0.	0.
9	214.1	175.2	214.1	175.2	170.0	175.2	130.2	-1.2	0.	0.
10	225.2	184.7	225.2	184.7	172.4	184.6	144.8	4.7	0.	0.
11	246.2	171.7	246.2	171.7	179.9	171.4	168.1	11.3	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.618	0.500	0.618	0.500	0.498	0.497	1.008	0.804
2	0.603	0.528	0.603	0.528	0.512	0.527	1.039	0.700
3	0.596	0.519	0.596	0.519	0.500	0.519	1.045	0.720
4	0.611	0.502	0.611	0.502	0.477	0.502	1.062	0.838
5	0.569	0.466	0.569	0.466	0.444	0.466	1.060	0.773
6	0.557	0.454	0.557	0.454	0.430	0.454	1.064	0.765
7	0.551	0.455	0.551	0.455	0.419	0.454	1.093	0.770
8	0.561	0.463	0.561	0.463	0.430	0.463	1.088	0.773
9	0.612	0.495	0.612	0.495	0.486	0.495	1.031	0.767
10	0.647	0.521	0.647	0.521	0.495	0.521	1.071	0.801
11	0.708	0.481	0.708	0.481	0.517	0.480	0.953	1.062

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	0.4	-5.7	18.6	0.376	0.	0.164	0.164	0.063	0.063
2	10.00	-2.1	-8.2	14.6	0.297	0.	0.057	0.057	0.021	0.021
3	30.00	0.6	-5.6	9.3	0.312	0.	0.035	0.035	0.012	0.012
4	50.00	5.5	-0.7	10.7	0.358	0.	0.065	0.065	0.020	0.020
5	55.00	5.1	-1.1	7.5	0.369	0.	0.002	0.002	0.001	0.001
6	57.50	5.6	-0.6	6.2	0.379	0.	-0.009	-0.009	-0.003	-0.003
7	60.00	6.3	0.2	6.5	0.368	0.	-0.033	-0.033	-0.010	-0.010
8	62.50	5.7	-0.4	7.2	0.360	0.	-0.031	-0.031	-0.009	-0.009
9	70.00	2.3	-3.8	8.3	0.352	0.	0.029	0.029	0.008	0.008
10	90.00	1.6	-4.4	10.2	0.332	0.	0.000	0.000	0.000	0.000
11	95.00	3.4	2.8	12.7	0.453	0.	0.224	0.224	0.054	0.054

TABLE VIII. - Continued.

(j) 90 Percent of design speed, reading 2821

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	28.7	5.1	28.7	5.1	333.1	1.002	14.39	0.957
2	24.056	24.110	26.7	2.6	26.7	2.6	329.7	1.003	14.49	0.980
3	21.961	22.134	27.2	-1.6	27.2	-1.6	325.1	1.000	14.35	0.997
4	19.883	20.160	33.9	0.6	33.9	0.6	326.8	0.995	14.40	0.982
5	19.365	19.670	33.6	-2.1	33.6	-2.1	323.5	0.999	13.65	1.005
6	19.106	19.426	33.2	-3.5	33.2	-3.5	321.8	1.001	13.51	1.006
7	18.847	19.182	33.8	-3.4	33.8	-3.4	321.9	0.999	13.50	1.008
8	18.588	18.938	34.1	-2.4	34.1	-2.4	322.1	1.000	13.58	1.010
9	17.813	18.214	31.5	-1.3	31.5	-1.3	322.0	1.001	14.28	0.995
10	15.751	16.297	34.8	2.4	34.8	2.4	324.4	1.007	14.78	0.977
11	15.237	15.814	37.4	6.1	37.4	6.1	327.9	1.002	15.00	0.904

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	210.9	181.0	210.9	181.0	185.1	180.3	101.2	16.0	0.	0.
2	211.0	195.9	211.0	195.9	188.5	195.7	94.8	8.8	0.	0.
3	208.4	199.2	208.4	199.2	185.4	199.1	95.1	-5.6	0.	0.
4	217.9	198.5	217.9	198.5	181.0	198.5	121.4	2.0	0.	0.
5	195.7	184.8	195.7	184.8	162.9	184.7	108.4	-6.9	0.	0.
6	190.6	180.9	190.6	180.9	159.5	180.6	104.3	-11.1	0.	0.
7	189.3	182.1	189.3	182.1	157.4	181.8	105.2	-10.8	0.	0.
8	192.6	186.5	192.6	186.5	159.4	186.4	108.1	-7.7	0.	0.
9	217.3	205.5	217.3	205.5	185.2	205.4	113.6	-4.5	0.	0.
10	240.6	222.3	240.6	222.3	197.5	222.1	137.4	9.4	0.	0.
11	252.9	200.2	252.9	200.2	200.9	199.0	153.6	21.2	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.597	0.507	0.597	0.507	0.524	0.505	0.974	0.597
2	0.600	0.554	0.600	0.554	0.536	0.553	1.038	0.600
3	0.597	0.569	0.597	0.569	0.531	0.568	1.074	0.597
4	0.624	0.567	0.624	0.567	0.518	0.567	1.097	0.743
5	0.560	0.527	0.560	0.527	0.466	0.527	1.134	0.650
6	0.546	0.516	0.546	0.516	0.457	0.515	1.132	0.617
7	0.542	0.520	0.542	0.520	0.450	0.519	1.155	0.621
8	0.551	0.533	0.551	0.533	0.456	0.533	1.169	0.635
9	0.627	0.590	0.627	0.590	0.535	0.590	1.109	0.627
10	0.698	0.638	0.698	0.638	0.573	0.637	1.125	0.698
11	0.733	0.568	0.733	0.568	0.583	0.565	0.991	0.956

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-7.2	-13.4	17.4	0.297	0.	0.200	0.200	0.077	0.077
2	10.00	-7.4	-13.6	13.7	0.225	0.	0.091	0.091	0.034	0.034
3	30.00	-5.2	-11.4	7.8	0.210	0.	0.016	0.016	0.005	0.005
4	50.00	0.6	-5.6	9.4	0.259	0.	0.078	0.078	0.024	0.024
5	55.00	-0.0	-6.2	6.7	0.234	0.	-0.025	-0.025	-0.008	-0.008
6	57.50	-0.7	-6.8	5.3	0.232	0.	-0.032	-0.032	-0.010	-0.010
7	60.00	-0.3	-6.5	5.3	0.219	0.	-0.046	-0.046	-0.014	-0.014
8	62.50	-0.2	-6.3	6.4	0.206	0.	-0.053	-0.053	-0.016	-0.016
9	70.00	-3.6	-9.7	7.4	0.205	0.	0.020	0.020	0.006	0.006
10	90.00	-3.5	-9.6	11.2	0.206	0.	0.083	0.083	0.021	0.021
11	95.00	-2.2	-2.8	15.0	0.332	0.	0.320	0.320	0.077	0.077

TABLE VIII. - Continued.

(k) 90 Percent of design speed; reading 2822

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	27.2	5.1	27.2	5.1	325.9	0.998	13.88	0.956
2	24.056	24.110	25.3	2.8	25.3	2.8	321.7	1.003	13.73	0.991
3	21.961	22.134	26.2	-1.4	26.2	-1.4	318.3	1.000	13.73	0.993
4	19.883	20.160	31.5	-0.1	31.5	-0.1	319.6	0.996	13.86	0.988
5	19.365	19.670	31.5	-0.9	31.5	-0.9	318.1	0.999	13.54	1.004
6	19.106	19.426	31.9	-1.7	31.9	-1.7	317.6	0.999	13.48	1.004
7	18.847	19.182	32.6	-1.6	32.6	-1.6	317.1	0.999	13.37	1.011
8	18.588	18.938	32.8	-1.4	32.8	-1.4	316.6	1.001	13.36	1.012
9	17.813	18.214	31.5	-1.8	31.5	-1.8	316.6	1.001	13.70	1.000
10	15.751	16.297	35.6	1.1	35.6	1.1	318.6	1.006	13.97	0.993
11	15.237	15.814	37.6	4.6	37.6	4.6	321.5	1.002	14.32	0.929

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	200.5	167.1	200.5	167.1	178.3	166.5	91.6	14.8	0.	0.
2	191.8	180.9	191.8	180.9	173.3	180.7	82.0	8.9	0.	0.
3	192.7	182.0	192.7	182.0	172.9	181.9	85.1	-4.4	0.	0.
4	202.4	187.4	202.4	187.4	172.6	187.4	105.7	-0.3	0.	0.
5	193.3	184.8	193.3	184.8	164.8	184.7	101.0	-3.0	0.	0.
6	190.8	182.9	190.8	182.9	162.1	182.8	100.7	-5.3	0.	0.
7	187.3	182.8	187.3	182.8	157.9	182.7	100.8	-5.2	0.	0.
8	187.6	183.8	187.6	183.8	157.6	183.8	101.8	-4.5	0.	0.
9	200.9	191.9	200.9	191.9	171.3	191.8	104.9	-6.2	0.	0.
10	218.7	207.3	218.7	207.3	177.9	207.3	127.2	4.1	0.	0.
11	233.7	191.8	233.7	191.8	185.0	191.2	142.7	15.5	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.572	0.473	0.572	0.473	0.509	0.471	0.934	0.572
2	0.549	0.516	0.549	0.516	0.496	0.515	1.042	0.549
3	0.555	0.523	0.555	0.523	0.498	0.522	1.052	0.555
4	0.584	0.539	0.584	0.539	0.498	0.539	1.086	0.629
5	0.557	0.531	0.557	0.531	0.475	0.531	1.121	0.585
6	0.550	0.526	0.550	0.526	0.467	0.526	1.128	0.583
7	0.540	0.526	0.540	0.526	0.455	0.526	1.157	0.586
8	0.541	0.529	0.541	0.529	0.455	0.529	1.166	0.590
9	0.582	0.554	0.582	0.554	0.496	0.554	1.120	0.582
10	0.635	0.598	0.635	0.598	0.517	0.598	1.165	0.641
11	0.679	0.549	0.679	0.549	0.538	0.547	1.033	0.891

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-8.7	-14.8	17.4	0.314	0.	0.220	0.220	0.084	0.084
2	10.00	-8.8	-14.9	13.9	0.200	0.	0.048	0.048	0.018	0.018
3	30.00	-6.2	-12.4	8.0	0.215	0.	0.036	0.036	0.012	0.012
4	50.00	-1.8	-8.0	8.8	0.237	0.	0.058	0.058	0.018	0.018
5	55.00	-2.2	-8.3	7.9	0.207	0.	-0.021	-0.021	-0.006	-0.006
6	57.50	-2.0	-8.2	7.1	0.207	0.	-0.021	-0.021	-0.006	-0.006
7	60.00	-1.5	-7.7	7.1	0.191	0.	-0.061	-0.061	-0.018	-0.018
8	62.50	-1.5	-7.6	7.3	0.184	0.	-0.065	-0.065	-0.019	-0.019
9	70.00	-3.6	-9.8	6.8	0.199	0.	0.001	0.001	0.000	0.000
10	90.00	-2.8	-8.9	9.9	0.189	0.	0.027	0.027	0.007	0.007
11	95.00	-2.0	-2.6	13.5	0.307	0.	0.267	0.267	0.064	0.064

TABLE VIII. - Continued.

(l) 90 Percent of design speed; reading 2824

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	33.4	6.4	33.4	6.4	334.5	0.994	14.92	0.962
2	24.056	24.110	30.8	4.2	30.8	4.2	328.6	1.002	14.67	0.994
3	21.961	22.134	31.3	-0.2	31.3	-0.2	322.6	1.000	14.45	0.995
4	19.883	20.160	35.9	0.4	35.9	0.4	322.6	0.997	14.44	0.991
5	19.365	19.670	36.0	-0.3	36.0	-0.3	321.7	0.999	14.17	1.004
6	19.106	19.426	36.7	-0.5	36.7	-0.5	321.7	0.998	14.19	1.001
7	18.847	19.182	38.1	-0.1	38.1	-0.1	321.4	0.999	14.10	1.006
8	18.588	18.938	37.8	-0.0	37.8	-0.0	320.8	1.000	14.04	1.010
9	17.813	18.214	36.6	-0.9	36.6	-0.9	319.7	1.000	14.21	0.998
10	15.751	16.297	39.9	0.8	39.9	0.8	321.0	1.003	14.36	0.993
11	15.237	15.814	42.2	3.6	42.2	3.6	324.0	0.999	14.73	0.945

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	204.9	165.9	204.9	165.9	171.0	164.8	112.9	18.5	0.	0.
2	194.3	174.6	194.3	174.6	166.9	174.2	99.5	12.8	0.	0.
3	188.8	167.5	188.8	167.5	161.4	167.5	98.0	-0.6	0.	0.
4	196.9	169.0	196.9	169.0	159.5	169.0	115.5	1.2	0.	0.
5	190.3	166.5	190.3	166.5	153.9	166.5	111.9	-0.8	0.	0.
6	191.2	166.0	191.2	166.0	153.4	166.0	114.1	-1.4	0.	0.
7	188.6	166.2	188.6	166.2	148.5	166.2	116.4	-0.3	0.	0.
8	188.3	166.1	188.3	166.1	148.9	166.1	115.3	-0.1	0.	0.
9	196.5	168.6	196.5	168.6	157.7	168.6	117.2	-2.7	0.	0.
10	212.4	179.1	212.4	179.1	163.0	179.1	136.1	2.6	0.	0.
11	228.6	169.1	228.6	169.1	169.4	168.8	153.5	10.6	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK VEL R	MERID PEAK SS MACH NO
1	0.577	0.463	0.577	0.463	0.482	0.461	0.964	0.688
2	0.551	0.492	0.551	0.492	0.473	0.490	1.044	0.608
3	0.540	0.476	0.540	0.476	0.461	0.476	1.038	0.611
4	0.564	0.481	0.564	0.481	0.457	0.481	1.060	0.776
5	0.545	0.474	0.545	0.474	0.441	0.474	1.082	0.685
6	0.547	0.472	0.547	0.472	0.439	0.472	1.082	0.696
7	0.540	0.473	0.540	0.473	0.425	0.473	1.120	0.711
8	0.540	0.473	0.540	0.473	0.427	0.473	1.116	0.699
9	0.565	0.481	0.565	0.481	0.454	0.481	1.069	0.691
10	0.613	0.511	0.613	0.511	0.471	0.511	1.098	0.755
11	0.661	0.480	0.661	0.480	0.490	0.479	0.996	0.972

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	-2.5	-8.6	18.7	0.368	0.	0.186	0.186	0.071	0.071
2	10.00	-3.3	-9.4	15.3	0.269	0.	0.032	0.032	0.012	0.012
3	30.00	-1.1	-7.3	9.2	0.292	0.	0.028	0.028	0.010	0.010
4	50.00	2.6	-3.5	9.3	0.322	0.	0.047	0.047	0.015	0.015
5	55.00	2.3	-3.8	8.5	0.304	0.	-0.021	-0.021	-0.006	-0.006
6	57.50	2.8	-3.4	8.3	0.312	0.	-0.004	-0.004	-0.001	-0.001
7	60.00	4.0	-2.2	8.6	0.301	0.	-0.036	-0.036	-0.011	-0.011
8	62.50	3.4	-2.7	8.7	0.296	0.	-0.053	-0.053	-0.015	-0.015
9	70.00	1.5	-4.6	7.7	0.311	0.	0.008	0.008	0.002	0.002
10	90.00	1.5	-4.6	9.6	0.311	0.	0.031	0.031	0.008	0.008
11	95.00	2.5	1.9	12.5	0.407	0.	0.219	0.219	0.053	0.053

TABLE VIII. - Continued.

(m) 90 Percent of design speed; reading 2839

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	38.7	7.1	38.7	7.1	340.1	0.994	15.51	0.966
2	24.056	24.110	35.7	5.2	35.7	5.2	334.1	1.001	15.34	0.989
3	21.961	22.134	35.4	0.4	35.4	0.4	326.4	0.999	15.00	0.993
4	19.883	20.160	39.8	1.3	39.8	1.3	325.1	0.998	14.88	0.990
5	19.365	19.670	40.4	0.7	40.4	0.7	324.7	0.999	14.64	0.997
6	19.106	19.426	42.1	0.6	42.1	0.6	324.9	0.997	14.61	0.994
7	18.847	19.182	43.8	0.6	43.8	0.6	325.0	0.996	14.52	0.998
8	18.588	18.938	42.9	0.3	42.9	0.3	323.9	0.998	14.46	0.997
9	17.813	18.214	42.0	-1.0	42.0	-1.0	322.7	0.999	14.46	0.992
10	15.751	16.297	43.7	1.7	43.7	1.7	322.7	1.003	14.66	0.986
11	15.237	15.814	45.1	3.8	45.1	3.8	325.5	0.999	15.03	0.946

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	203.6	163.1	203.6	163.1	158.9	161.8	127.4	20.2	0.	0.
2	196.1	169.8	196.1	169.8	159.2	169.1	114.5	15.3	0.	0.
3	189.7	159.8	189.7	159.8	154.7	159.8	109.8	1.1	0.	0.
4	194.4	157.2	194.4	157.2	149.5	157.2	124.3	3.5	0.	0.
5	189.3	153.0	189.3	153.0	144.2	153.0	122.7	2.0	0.	0.
6	189.2	151.0	189.2	151.0	140.5	151.0	126.7	1.6	0.	0.
7	187.3	150.1	187.3	150.1	135.2	150.1	129.7	1.7	0.	0.
8	187.5	148.1	187.5	148.1	137.3	148.1	127.7	0.9	0.	0.
9	190.5	145.9	190.5	145.9	141.7	145.8	127.4	-2.6	0.	0.
10	207.6	157.1	207.6	157.1	150.0	157.0	143.6	4.6	0.	0.
11	225.0	150.1	225.0	150.1	158.9	149.7	159.4	9.9	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK VEL R	MERID PEAK MACH NO
1	0.568	0.451	0.568	0.451	0.443	0.448	1.019	0.789
2	0.551	0.473	0.551	0.473	0.447	0.472	1.063	0.725
3	0.539	0.450	0.539	0.450	0.439	0.450	1.033	0.699
4	0.554	0.444	0.554	0.444	0.426	0.444	1.051	0.780
5	0.539	0.432	0.539	0.432	0.411	0.432	1.061	0.762
6	0.539	0.426	0.539	0.426	0.400	0.426	1.075	0.788
7	0.533	0.424	0.533	0.424	0.384	0.423	1.110	0.807
8	0.534	0.418	0.534	0.418	0.391	0.418	1.078	0.789
9	0.545	0.412	0.545	0.412	0.405	0.412	1.029	0.772
10	0.597	0.444	0.597	0.444	0.431	0.444	1.047	0.820
11	0.648	0.423	0.648	0.423	0.457	0.422	0.943	1.017

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	2.8	-3.3	19.4	0.402	0.	0.171	0.171	0.065	0.065
2	10.00	1.6	-4.5	16.3	0.325	0.	0.057	0.057	0.021	0.021
3	30.00	3.0	-3.2	9.8	0.354	0.	0.042	0.042	0.014	0.014
4	50.00	6.5	0.3	10.1	0.385	0.	0.056	0.056	0.017	0.017
5	55.00	6.7	0.6	9.6	0.384	0.	0.018	0.018	0.005	0.005
6	57.50	8.2	2.0	9.4	0.399	0.	0.034	0.034	0.010	0.010
7	60.00	9.7	3.6	9.4	0.400	0.	0.011	0.011	0.003	0.003
8	62.50	8.6	2.5	9.1	0.406	0.	0.016	0.016	0.005	0.005
9	70.00	6.9	0.7	7.6	0.424	0.	0.046	0.046	0.013	0.013
10	90.00	5.4	-0.7	10.4	0.407	0.	0.068	0.068	0.017	0.017
11	95.00	5.5	4.9	12.7	0.490	0.	0.222	0.222	0.053	0.053

TABLE VIII. - Continued.

(n) 100 Percent of design speed; reading 2817

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	43.1	7.5	43.1	7.5	343.7	0.994	15.83	0.972
2	24.056	24.110	40.2	5.5	40.2	5.5	338.5	0.999	15.77	0.981
3	21.961	22.134	39.4	1.1	39.4	1.1	328.6	0.999	15.15	0.986
4	19.883	20.160	45.9	2.0	45.9	2.0	327.9	0.997	14.93	0.974
5	19.365	19.670	48.8	1.5	48.8	1.5	328.0	0.996	14.78	0.978
6	19.106	19.426	50.4	1.4	50.4	1.4	328.0	0.995	14.68	0.982
7	18.847	19.182	51.9	1.3	51.9	1.3	327.9	0.995	14.64	0.983
8	18.588	18.938	51.5	1.2	51.5	1.2	327.7	0.995	14.66	0.979
9	17.813	18.214	48.3	1.5	48.3	1.5	325.8	0.998	14.68	0.977
10	15.751	16.297	44.9	2.9	44.9	2.9	323.4	1.004	14.85	0.983
11	15.237	15.814	46.2	3.0	46.2	3.0	325.3	1.000	15.17	0.944

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	203.3	165.9	203.3	165.9	148.4	164.4	139.0	21.7	0.	0.
2	200.3	168.8	200.3	168.8	153.1	168.0	129.2	16.1	0.	0.
3	186.5	149.7	186.5	149.7	144.1	149.6	118.3	2.8	0.	0.
4	188.3	135.0	188.3	135.0	131.1	134.9	135.1	4.6	0.	0.
5	185.5	131.3	185.5	131.3	122.2	131.3	139.5	3.5	0.	0.
6	184.0	129.8	184.0	129.8	117.2	129.8	141.9	3.1	0.	0.
7	183.9	128.3	183.9	128.3	113.5	128.3	144.7	3.0	0.	0.
8	186.4	127.7	186.4	127.7	116.1	127.7	145.9	2.7	0.	0.
9	189.9	129.0	189.9	129.0	126.4	128.9	141.7	3.3	0.	0.
10	205.3	148.2	205.3	148.2	145.3	148.0	144.9	7.4	0.	0.
11	221.9	137.8	221.9	137.8	153.6	137.6	160.2	7.3	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID VEL R	PEAK SS MACH NO
1	0.564	0.457	0.564	0.457	0.412	0.453	1.108	0.868
2	0.560	0.468	0.560	0.468	0.428	0.466	1.097	0.878
3	0.527	0.419	0.527	0.419	0.408	0.419	1.038	0.759
4	0.533	0.378	0.533	0.378	0.371	0.378	1.029	0.867
5	0.525	0.367	0.525	0.367	0.346	0.367	1.075	0.892
6	0.520	0.363	0.520	0.363	0.331	0.363	1.108	0.909
7	0.520	0.359	0.520	0.359	0.321	0.359	1.130	0.931
8	0.528	0.357	0.528	0.357	0.329	0.357	1.100	0.933
9	0.540	0.361	0.540	0.361	0.359	0.361	1.020	0.880
10	0.589	0.418	0.589	0.418	0.417	0.417	1.019	0.833
11	0.638	0.387	0.638	0.387	0.442	0.386	0.896	1.026

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	7.2	1.1	19.8	0.406	0.	0.143	0.143	0.055	0.055
2	10.00	6.1	-0.1	16.6	0.370	0.	0.104	0.104	0.039	0.039
3	30.00	7.0	0.8	10.5	0.410	0.	0.080	0.080	0.027	0.027
4	50.00	12.6	6.4	10.8	0.498	0.	0.146	0.146	0.046	0.046
5	55.00	15.1	9.0	10.3	0.514	0.	0.128	0.128	0.039	0.039
6	57.50	16.6	10.4	10.2	0.519	0.	0.104	0.104	0.031	0.031
7	60.00	17.8	11.6	10.1	0.529	0.	0.103	0.103	0.031	0.031
8	62.50	17.2	11.0	9.9	0.538	0.	0.124	0.124	0.036	0.036
9	70.00	13.2	7.0	10.1	0.523	0.	0.130	0.130	0.037	0.037
10	90.00	6.5	0.5	11.6	0.441	0.	0.083	0.083	0.021	0.021
11	95.00	6.6	6.0	11.9	0.542	0.	0.236	0.236	0.057	0.057

TABLE VIII. - Continued.

(o) 100 Percent of design speed; reading 2818

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	45.3	7.7	45.3	7.7	344.7	0.994	15.77	0.972
2	24.056	24.110	42.5	5.7	42.5	5.7	340.3	0.997	15.78	0.971
3	21.961	22.134	43.7	1.8	43.7	1.8	330.4	0.999	15.10	0.977
4	19.883	20.160	50.6	1.6	50.6	1.6	330.0	0.995	14.97	0.966
5	19.365	19.670	52.8	1.2	52.8	1.2	329.2	0.996	14.79	0.971
6	19.106	19.426	53.8	1.0	53.8	1.0	328.6	0.997	14.72	0.974
7	18.847	19.182	54.4	1.0	54.4	1.0	328.5	0.996	14.67	0.976
8	18.588	18.938	54.1	0.9	54.1	0.9	328.3	0.996	14.66	0.975
9	17.813	18.214	49.8	1.5	49.8	1.5	326.3	0.999	14.69	0.975
10	15.751	16.297	45.4	3.4	45.4	3.4	323.2	1.004	14.89	0.979
11	15.237	15.814	46.6	2.7	46.6	2.7	325.2	1.000	15.24	0.938

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	198.9	163.9	198.9	163.9	140.0	162.4	141.3	22.0	0.	0.
2	199.5	163.4	199.5	163.4	147.1	162.5	134.8	16.3	0.	0.
3	183.7	141.0	183.7	141.0	132.7	140.9	127.0	4.3	0.	0.
4	188.3	128.6	188.3	128.6	119.4	128.6	145.6	3.7	0.	0.
5	185.0	124.9	185.0	124.9	111.9	124.8	147.3	2.7	0.	0.
6	183.5	123.9	183.5	123.9	108.4	123.9	148.1	2.2	0.	0.
7	183.0	123.0	183.0	123.0	106.6	123.0	148.8	2.2	0.	0.
8	184.3	122.7	184.3	122.7	108.0	122.7	149.3	2.0	0.	0.
9	188.8	125.4	188.8	125.4	121.9	125.4	144.2	3.4	0.	0.
10	203.9	144.3	203.9	144.3	143.1	144.0	145.2	8.7	0.	0.
11	221.6	133.1	221.6	133.1	152.3	132.9	161.0	6.2	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.550	0.450	0.550	0.450	0.387	0.446	1.160	0.887
2	0.556	0.451	0.556	0.451	0.410	0.449	1.105	0.857
3	0.518	0.393	0.518	0.393	0.374	0.393	1.062	0.822
4	0.532	0.359	0.532	0.359	0.337	0.359	1.077	0.945
5	0.522	0.348	0.522	0.348	0.316	0.348	1.115	0.959
6	0.518	0.346	0.518	0.346	0.306	0.345	1.143	0.966
7	0.517	0.343	0.517	0.343	0.301	0.343	1.154	0.970
8	0.521	0.342	0.521	0.342	0.305	0.342	1.136	0.969
9	0.536	0.351	0.536	0.351	0.346	0.351	1.029	0.902
10	0.585	0.406	0.585	0.406	0.411	0.405	1.006	0.837
11	0.637	0.373	0.637	0.373	0.438	0.373	0.873	1.033

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	9.4	3.2	20.0	0.407	0.	0.149	0.149	0.057	0.057
2	10.00	8.4	2.2	16.8	0.405	0.	0.153	0.153	0.058	0.058
3	30.00	11.4	5.2	11.2	0.462	0.	0.135	0.135	0.047	0.047
4	50.00	17.4	11.2	10.5	0.551	0.	0.195	0.195	0.061	0.061
5	55.00	19.1	12.9	10.1	0.561	0.	0.169	0.169	0.051	0.051
6	57.50	19.9	13.8	9.8	0.562	0.	0.153	0.153	0.046	0.046
7	60.00	20.3	14.1	9.8	0.564	0.	0.142	0.142	0.042	0.042
8	62.50	19.8	13.7	9.7	0.566	0.	0.145	0.145	0.043	0.043
9	70.00	14.7	8.6	10.2	0.543	0.	0.140	0.140	0.039	0.039
10	90.00	7.0	1.0	12.2	0.456	0.	0.102	0.102	0.025	0.025
11	95.00	7.0	6.4	11.6	0.564	0.	0.261	0.261	0.063	0.063

TABLE VIII. - Continued.

(p) 100 Percent of design speed; reading 2819

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	46.6	7.4	46.6	7.4	360.7	0.992	17.77	0.964
2	24.056	24.110	43.0	4.9	43.0	4.9	354.8	0.996	17.74	0.967
3	21.961	22.134	42.2	1.8	42.2	1.8	342.1	0.997	17.32	0.978
4	19.883	20.160	45.9	2.3	45.9	2.3	338.3	0.997	16.64	0.970
5	19.365	19.670	47.7	1.1	47.7	1.1	338.0	0.996	16.35	0.974
6	19.106	19.426	49.9	1.0	49.9	1.0	338.1	0.994	16.21	0.977
7	18.847	19.182	50.8	1.2	50.8	1.2	338.4	0.993	16.17	0.977
8	18.588	18.938	49.8	1.3	49.8	1.3	337.1	0.995	16.21	0.972
9	17.813	18.214	47.6	1.3	47.6	1.3	334.8	0.997	16.13	0.971
10	15.751	16.297	47.9	3.8	47.9	3.8	333.3	1.004	16.15	0.971
11	15.237	15.814	48.3	3.5	48.3	3.5	335.8	1.000	16.67	0.922

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	224.1	185.7	224.1	185.7	154.0	184.1	162.8	23.9	0.	0.
2	224.2	186.2	224.2	186.2	164.0	185.5	152.9	16.0	0.	0.
3	212.0	169.6	212.0	169.6	156.9	169.5	142.5	5.3	0.	0.
4	212.9	154.8	212.9	154.8	148.2	154.6	152.8	6.2	0.	0.
5	207.5	147.4	207.5	147.4	139.7	147.4	153.5	2.8	0.	0.
6	205.6	144.9	205.6	144.9	132.5	144.8	157.3	2.5	0.	0.
7	206.3	143.9	206.3	143.9	130.4	143.9	159.9	2.9	0.	0.
8	209.1	142.3	209.1	142.3	134.9	142.3	159.7	3.1	0.	0.
9	210.9	139.8	210.9	139.8	142.3	139.8	155.8	3.1	0.	0.
10	222.6	149.8	222.6	149.8	149.4	149.5	165.0	9.9	0.	0.
11	244.4	139.5	244.4	139.5	162.7	139.2	182.4	8.5	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.610	0.502	0.610	0.502	0.419	0.498	1.196	1.010
2	0.616	0.507	0.616	0.507	0.451	0.505	1.131	0.959
3	0.591	0.468	0.591	0.468	0.438	0.468	1.080	0.909
4	0.598	0.428	0.598	0.428	0.416	0.428	1.044	0.966
5	0.582	0.407	0.582	0.407	0.392	0.407	1.055	0.967
6	0.576	0.400	0.576	0.400	0.371	0.400	1.094	0.996
7	0.578	0.398	0.578	0.398	0.365	0.398	1.103	1.012
8	0.587	0.394	0.587	0.394	0.379	0.394	1.055	1.005
9	0.595	0.388	0.595	0.388	0.401	0.387	0.983	0.957
10	0.632	0.416	0.632	0.416	0.424	0.415	1.001	0.957
11	0.697	0.385	0.697	0.385	0.464	0.385	0.856	1.169

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	10.7	4.6	19.7	0.410	0.	0.160	0.160	0.061	0.061
2	10.00	8.9	2.7	16.0	0.399	0.	0.144	0.144	0.054	0.054
3	30.00	9.9	3.7	11.2	0.422	0.	0.107	0.107	0.037	0.037
4	50.00	12.6	6.5	11.2	0.487	0.	0.142	0.142	0.044	0.044
5	55.00	14.0	7.9	9.9	0.509	0.	0.126	0.126	0.038	0.038
6	57.50	16.0	9.9	9.8	0.520	0.	0.112	0.112	0.034	0.034
7	60.00	16.7	10.6	9.9	0.526	0.	0.112	0.112	0.033	0.033
8	62.50	15.5	9.4	10.0	0.537	0.	0.135	0.135	0.040	0.040
9	70.00	12.5	6.4	9.9	0.538	0.	0.135	0.135	0.038	0.038
10	90.00	9.5	3.4	12.6	0.497	0.	0.122	0.122	0.030	0.030
11	95.00	8.6	8.0	12.4	0.597	0.	0.281	0.281	0.067	0.067

TABLE VIII. - Continued.

(q) 100 Percent of design speed; reading 2914

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	43.6	6.8	43.6	6.8	357.7	0.990	17.46	0.961
2	24.056	24.110	40.1	4.5	40.1	4.5	350.0	0.999	17.39	0.972
3	21.961	22.134	40.2	0.7	40.2	0.7	339.9	0.997	16.80	0.984
4	19.883	20.160	43.7	1.4	43.7	1.4	336.8	0.997	16.47	0.977
5	19.365	19.670	44.3	-0.1	44.3	-0.1	335.9	0.997	16.12	0.986
6	19.106	19.426	45.7	-0.2	45.7	-0.2	335.8	0.996	16.05	0.986
7	18.847	19.182	47.0	0.1	47.0	0.1	335.8	0.995	15.92	0.993
8	18.588	18.938	46.4	0.1	46.4	0.1	335.0	0.996	15.96	0.991
9	17.813	18.214	44.4	0.7	44.4	0.7	333.4	0.996	16.09	0.982
10	15.751	16.297	46.4	2.4	46.4	2.4	331.5	1.005	15.83	0.978
11	15.237	15.814	47.6	3.4	47.6	3.4	335.0	0.999	16.49	0.921

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	224.2	178.2	224.2	178.2	162.3	176.9	154.8	21.0	0.	0.
2	220.7	182.9	220.7	182.9	168.7	182.4	142.2	14.3	0.	0.
3	211.1	171.1	211.1	171.1	161.3	171.1	136.2	2.1	0.	0.
4	214.2	161.7	214.2	161.7	154.7	161.6	148.1	4.0	0.	0.
5	207.4	155.3	207.4	155.3	148.5	155.3	144.8	-0.3	0.	0.
6	206.3	153.6	206.3	153.6	144.1	153.6	147.7	-0.5	0.	0.
7	204.2	153.5	204.2	153.5	139.2	153.5	149.4	0.3	0.	0.
8	206.8	153.7	206.8	153.7	142.5	153.7	149.8	0.4	0.	0.
9	214.7	155.1	214.7	155.1	153.4	155.1	150.3	1.9	0.	0.
10	219.1	150.7	219.1	150.7	151.2	150.6	158.6	6.3	0.	0.
11	244.4	140.6	244.4	140.6	164.7	140.4	180.6	8.4	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.613	0.483	0.613	0.483	0.444	0.480	1.090	0.954
2	0.610	0.500	0.610	0.500	0.466	0.499	1.081	0.893
3	0.591	0.474	0.591	0.474	0.451	0.474	1.061	0.866
4	0.603	0.449	0.603	0.449	0.436	0.449	1.045	0.931
5	0.583	0.431	0.583	0.431	0.418	0.431	1.046	0.902
6	0.580	0.427	0.580	0.427	0.405	0.427	1.066	0.921
7	0.574	0.427	0.574	0.427	0.391	0.427	1.103	0.932
8	0.582	0.427	0.582	0.427	0.401	0.427	1.078	0.929
9	0.608	0.432	0.608	0.432	0.434	0.432	1.011	0.912
10	0.623	0.419	0.623	0.419	0.430	0.419	0.996	0.913
11	0.698	0.389	0.698	0.389	0.470	0.389	0.852	1.155

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	7.7	1.6	19.1	0.435	0.	0.174	0.174	0.067	0.067
2	10.00	6.0	-0.1	15.6	0.389	0.	0.126	0.126	0.047	0.047
3	30.00	7.8	1.6	10.1	0.408	0.	0.075	0.075	0.026	0.026
4	50.00	10.5	4.3	10.3	0.454	0.	0.107	0.107	0.034	0.034
5	55.00	10.6	4.5	8.7	0.463	0.	0.066	0.066	0.020	0.020
6	57.50	11.8	5.7	8.6	0.470	0.	0.067	0.067	0.020	0.020
7	60.00	12.9	6.8	8.9	0.463	0.	0.033	0.033	0.010	0.010
8	62.50	12.1	6.0	8.9	0.466	0.	0.045	0.045	0.013	0.013
9	70.00	9.3	3.2	9.3	0.470	0.	0.082	0.082	0.023	0.023
10	90.00	8.0	1.9	11.2	0.482	0.	0.094	0.094	0.023	0.023
11	95.00	8.0	7.4	12.3	0.591	0.	0.286	0.286	0.069	0.069

TABLE VIII. - Concluded.

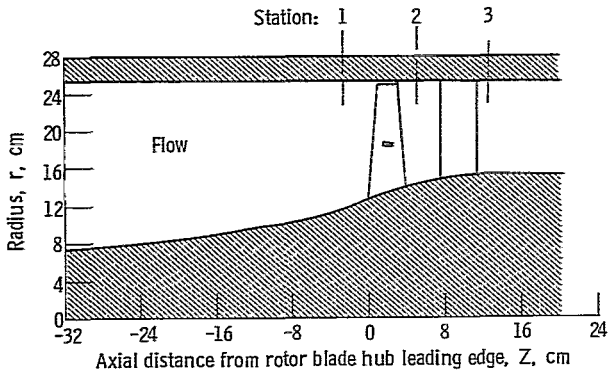
(r) 100 Percent of design speed; reading 2918

RP	RADII IN	RADII OUT	ABS BETAM IN	ABS BETAM OUT	REL BETAM IN	REL BETAM OUT	TOTAL TEMP IN	TOTAL TEMP RATIO	TOTAL PRESS IN	TOTAL PRESS RATIO
1	24.587	24.600	41.7	6.7	41.7	6.7	354.9	0.991	17.22	0.958
2	24.056	24.110	37.1	4.2	37.1	4.2	346.6	1.001	17.02	0.978
3	21.961	22.154	38.4	0.6	38.4	0.6	338.3	0.998	16.52	0.991
4	19.883	20.160	42.1	1.3	42.1	1.3	335.6	0.997	16.23	0.983
5	19.365	19.670	42.8	-0.5	42.8	-0.5	334.3	0.997	15.85	0.991
6	19.106	19.426	43.9	-0.7	43.9	-0.7	333.5	0.997	15.76	0.992
7	18.847	19.182	45.1	-0.4	45.1	-0.4	333.9	0.996	15.64	0.998
8	18.588	18.938	44.6	-0.3	44.6	-0.3	332.7	0.999	15.62	0.999
9	17.813	18.214	42.7	0.3	42.7	0.3	331.6	0.997	15.80	0.990
10	15.751	16.297	44.8	1.6	44.8	1.6	330.3	1.004	15.65	0.979
11	15.237	15.814	46.2	3.4	46.2	3.4	334.1	0.998	16.28	0.922

RP	ABS VEL IN	ABS VEL OUT	REL VEL IN	REL VEL OUT	MERID VEL IN	MERID VEL OUT	TANG VEL IN	TANG VEL OUT	WHEEL SPEED IN	WHEEL SPEED OUT
1	225.3	178.2	225.3	178.2	168.3	177.0	149.8	20.7	0.	0.
2	219.8	183.2	219.8	183.2	175.2	182.7	132.7	13.3	0.	0.
3	210.3	174.5	210.3	174.5	164.9	174.5	130.5	1.9	0.	0.
4	214.0	166.1	214.0	166.1	158.7	166.1	143.6	3.7	0.	0.
5	206.4	158.6	206.4	158.6	151.4	158.6	140.4	-1.3	0.	0.
6	205.0	156.9	205.0	156.9	147.8	156.9	142.2	-1.9	0.	0.
7	202.3	156.9	202.3	156.9	142.7	156.9	143.4	-1.0	0.	0.
8	203.7	157.6	203.7	157.6	145.1	157.6	143.0	-0.8	0.	0.
9	213.6	161.3	213.6	161.3	157.1	161.3	144.8	0.8	0.	0.
10	221.8	157.7	221.8	157.7	157.4	157.6	156.3	4.4	0.	0.
11	245.6	148.0	245.6	148.0	169.9	147.8	177.4	8.7	0.	0.

RP	ABS MACH NO IN	ABS MACH NO OUT	REL MACH NO IN	REL MACH NO OUT	MERID MACH NO IN	MERID MACH NO OUT	MERID PEAK SS VEL R	MERID PEAK SS MACH NO
1	0.619	0.485	0.619	0.485	0.462	0.482	1.052	0.922
2	0.610	0.503	0.610	0.503	0.487	0.502	1.043	0.828
3	0.590	0.485	0.590	0.485	0.463	0.485	1.058	0.828
4	0.604	0.463	0.604	0.463	0.448	0.463	1.046	0.899
5	0.582	0.442	0.582	0.442	0.427	0.442	1.048	0.872
6	0.579	0.437	0.579	0.437	0.417	0.437	1.062	0.883
7	0.570	0.437	0.570	0.437	0.402	0.437	1.099	0.889
8	0.575	0.440	0.575	0.440	0.410	0.440	1.086	0.882
9	0.606	0.452	0.606	0.452	0.446	0.452	1.027	0.873
10	0.633	0.440	0.633	0.440	0.449	0.440	1.002	0.892
11	0.703	0.411	0.703	0.411	0.486	0.410	0.870	1.130

RP	PERCENT SPAN	INCIDENCE MEAN	INCIDENCE SS	DEV	D-FACT	EFF	LOSS COEFF TOT	LOSS COEFF PROF	LOSS PARAM TOT	LOSS PARAM PROF
1	5.00	5.8	-0.4	19.0	0.430	0.	0.186	0.186	0.071	0.071
2	10.00	3.0	-3.1	15.3	0.371	0.	0.098	0.098	0.037	0.037
3	30.00	6.0	-0.2	10.0	0.381	0.	0.042	0.042	0.015	0.015
4	50.00	8.9	2.7	10.2	0.427	0.	0.080	0.080	0.025	0.025
5	55.00	9.2	3.0	8.4	0.439	0.	0.045	0.045	0.014	0.014
6	57.50	10.0	3.9	8.1	0.445	0.	0.040	0.040	0.012	0.012
7	60.00	11.0	4.9	8.4	0.434	0.	0.009	0.009	0.003	0.003
8	62.50	10.3	4.1	8.4	0.431	0.	0.006	0.006	0.002	0.002
9	70.00	7.6	1.4	8.9	0.432	0.	0.047	0.047	0.013	0.013
10	90.00	6.4	0.4	10.4	0.456	0.	0.087	0.087	0.022	0.022
11	95.00	6.6	6.0	12.3	0.559	0.	0.277	0.277	0.067	0.067



Flow path coordinates

Axial distance, Z, cm	Radius, r, cm	
	Inner	Outer
-35.560	7.302	25.400
-30.480	7.302	
-25.400	7.493	
-20.320	8.255	
-15.240	9.144	
-12.700	9.589	
-10.160	10.096	
-7.620	10.515	
-5.080	11.049	
[a]-2.540	11.747	
0	12.668	25.390
4.064	13.970	25.146
[a]5.080	14.336	
7.620	14.732	
10.973	15.240	
[a]12.700		
15.240		
17.780		
20.320		

[a]Measuring station.

Figure 1. - Flow path for stage 20-17 showing instrumentation location.

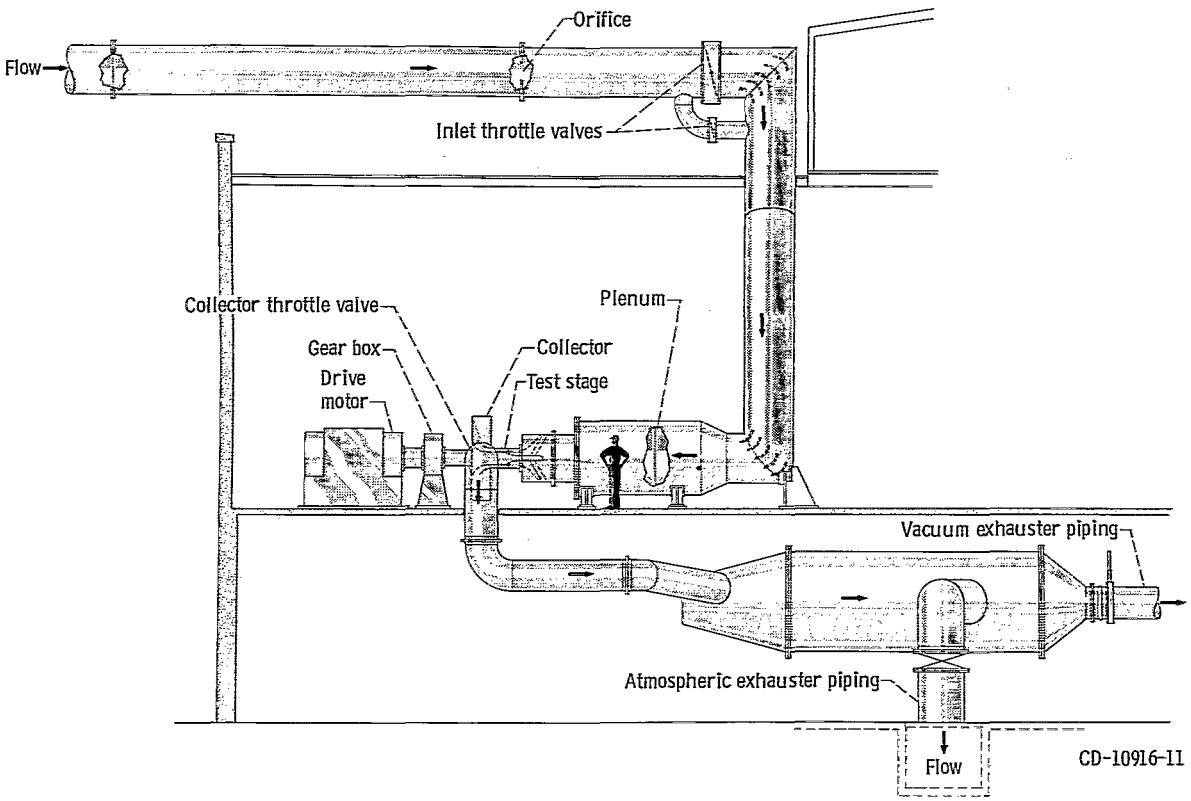


Figure 2. - Single-stage compressor facility.

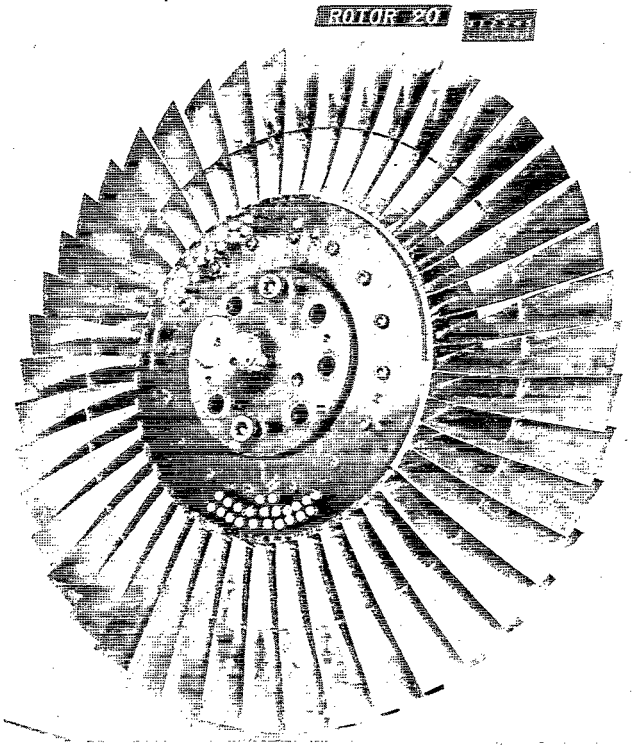


Figure 3. - Rotor 20.

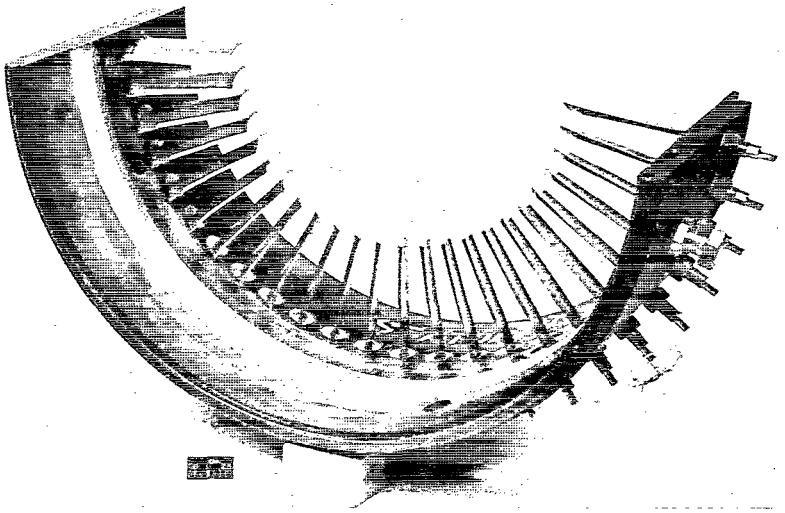
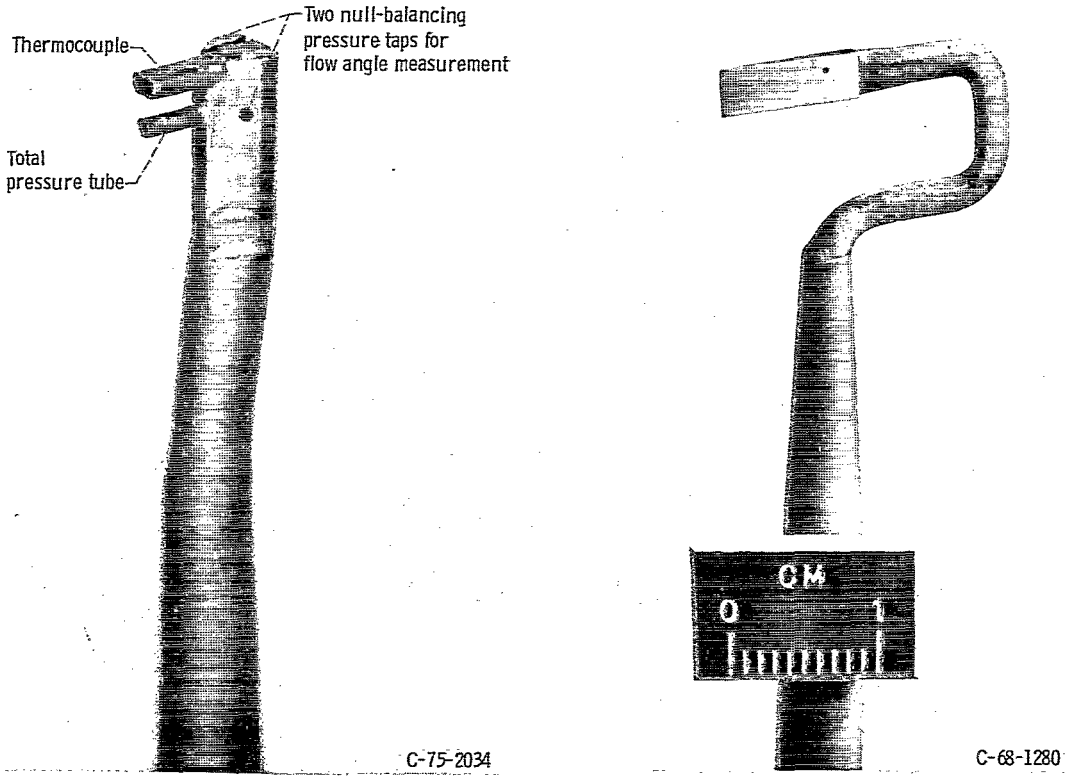


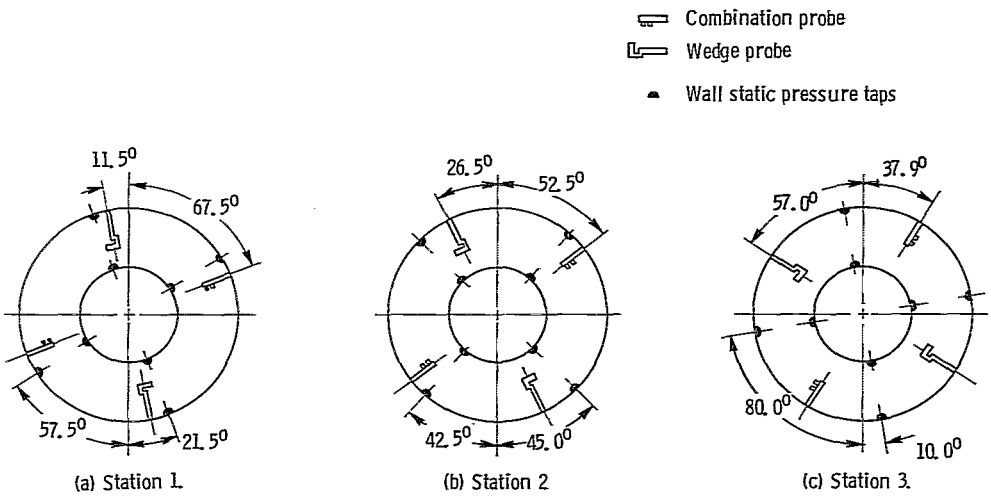
Figure 4. - Stator 17.



(a) Combination total pressure, total temperature, and flow angle probe.

(b) Static pressure probe; 8° C-shaped wedge.

Figure 5. - Survey probes.



(a) Station 1.

(b) Station 2

(c) Station 3.

Figure 6. - Circumferential location of instrumentation at measuring stations (looking downstream).

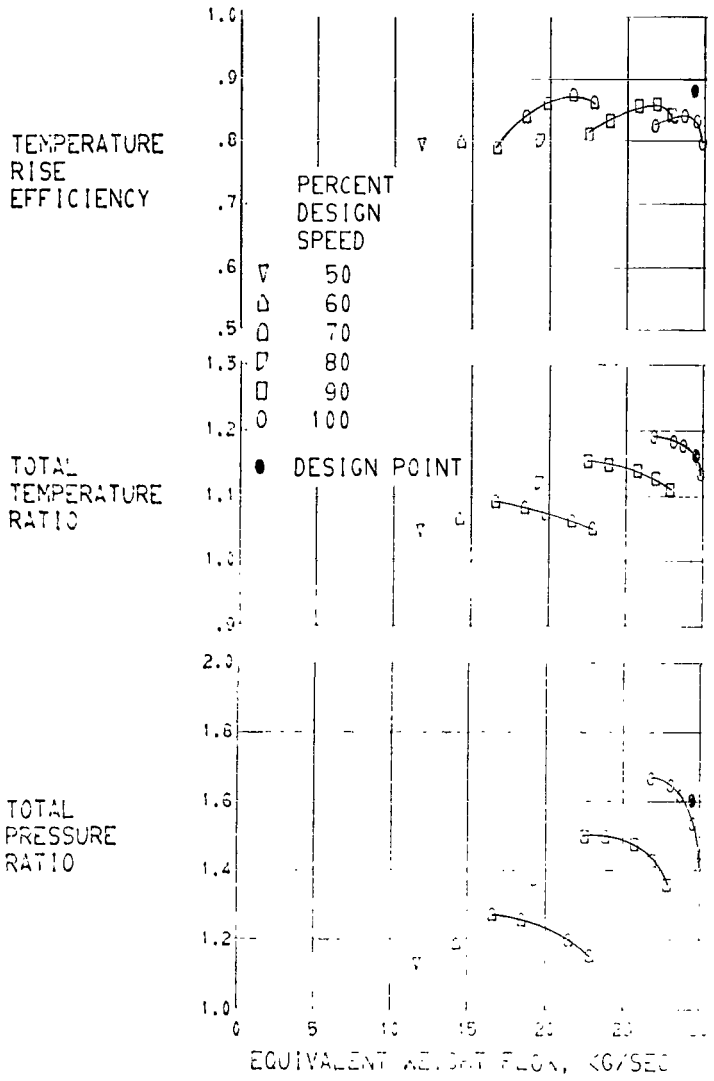


FIGURE 7. - OVERALL PERFORMANCE FOR ROTOR 20.

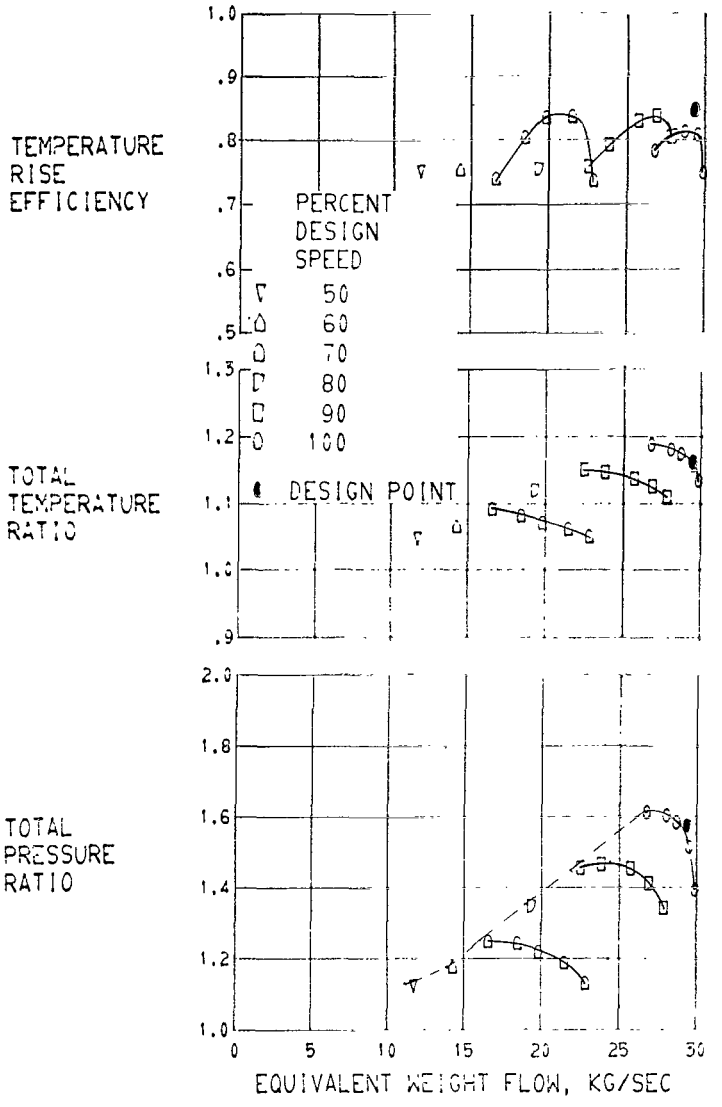


FIGURE 8. - OVERALL PERFORMANCE FOR STAGE 20-17.

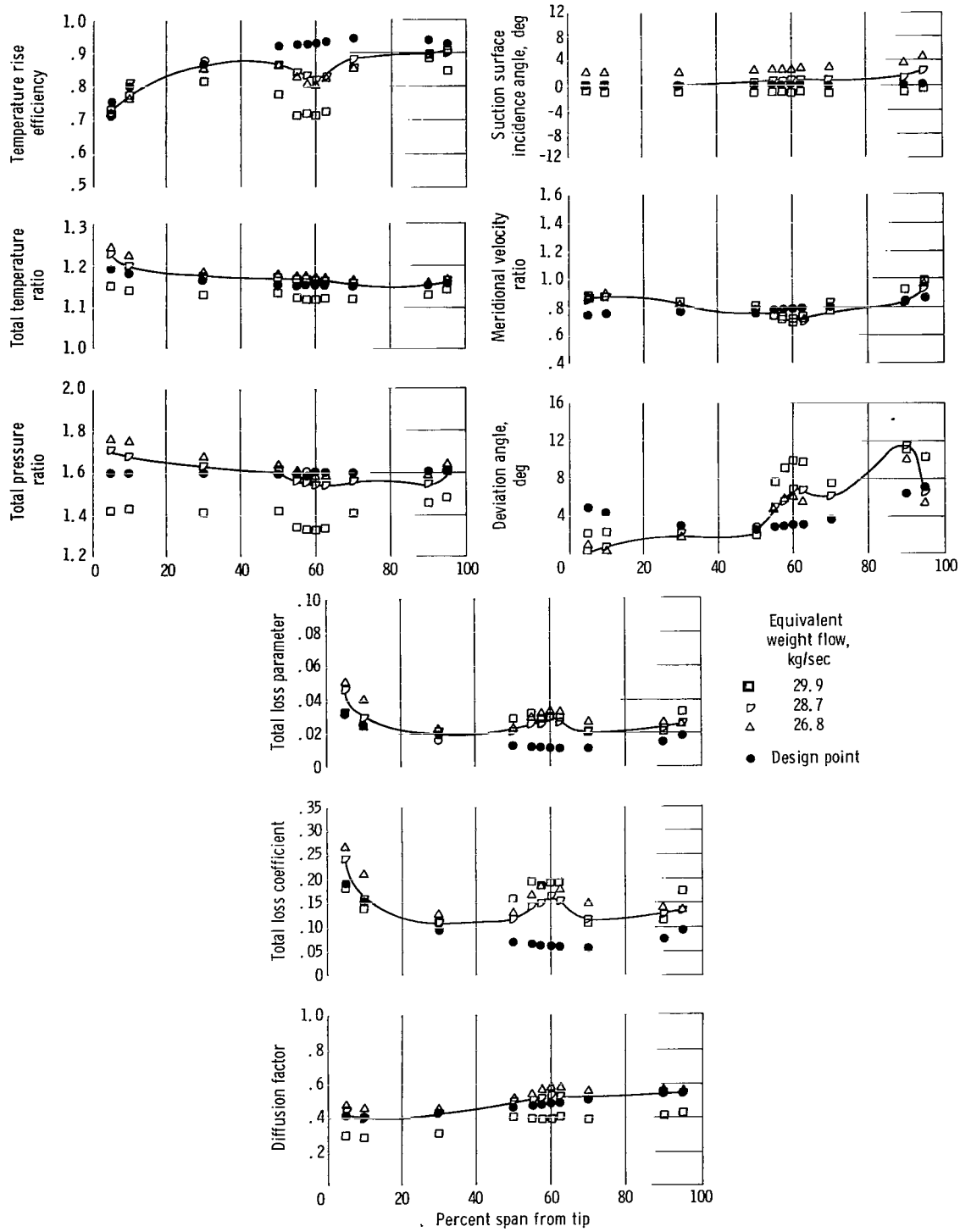


Figure 9. - Radial distribution of performance for rotor 20 at 100 percent of design speed.

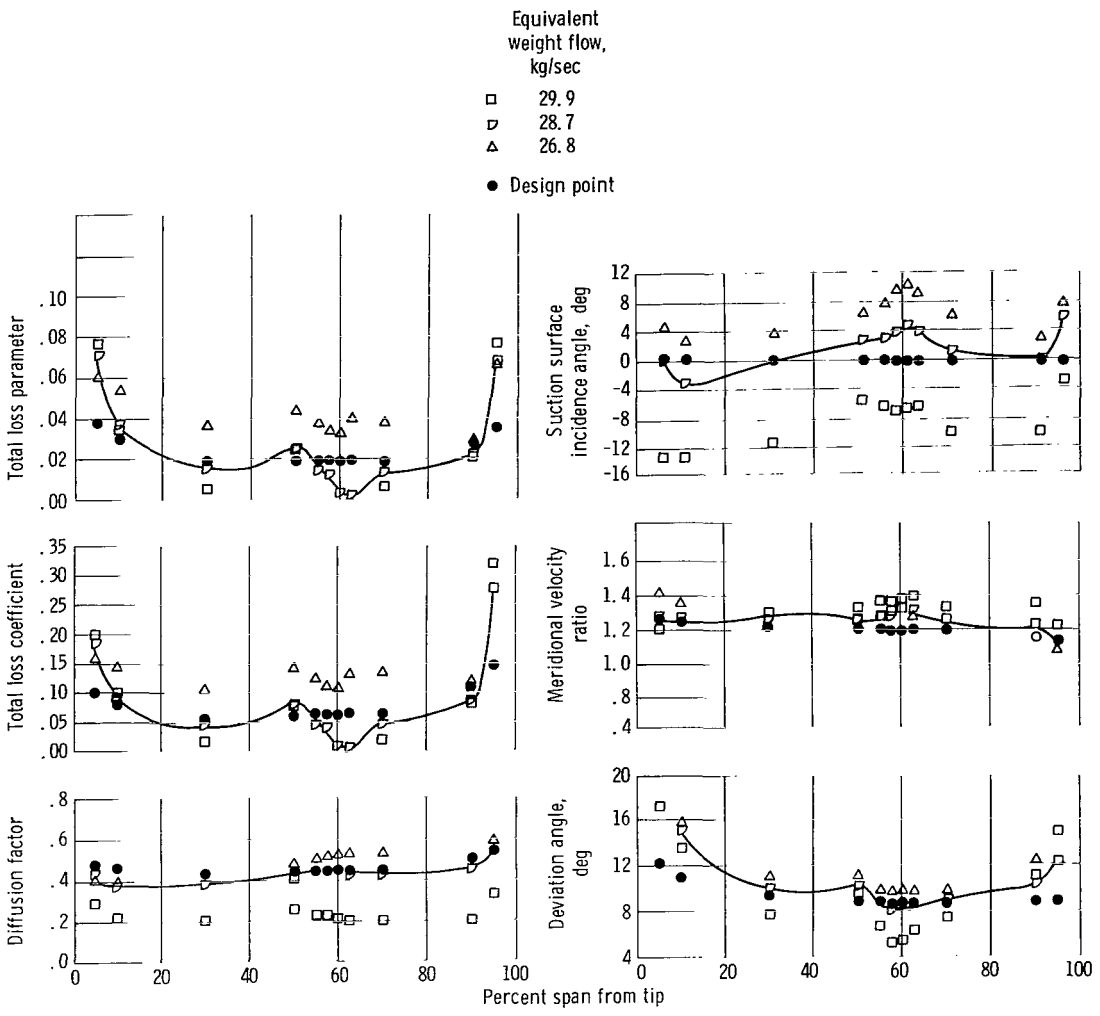
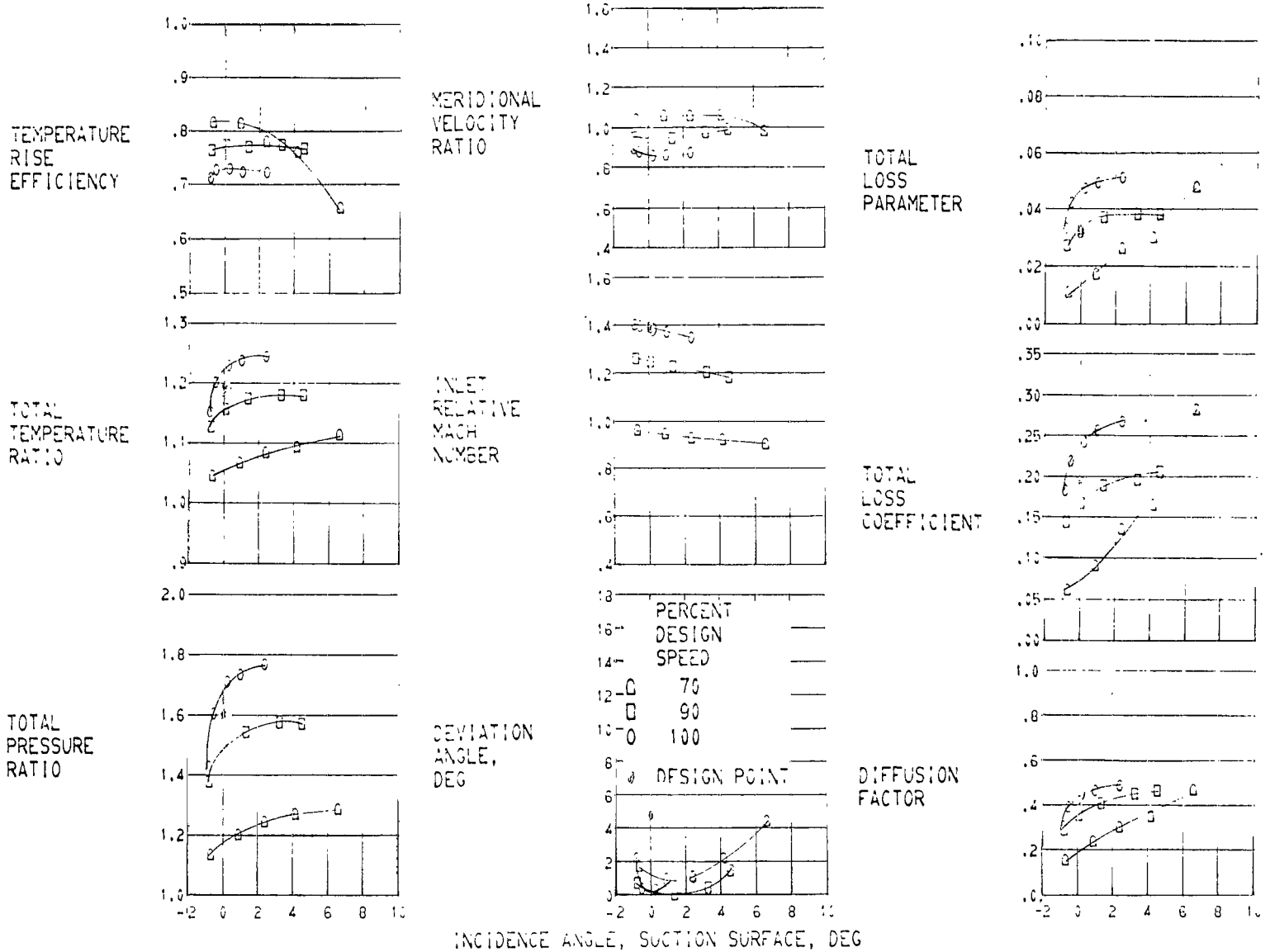
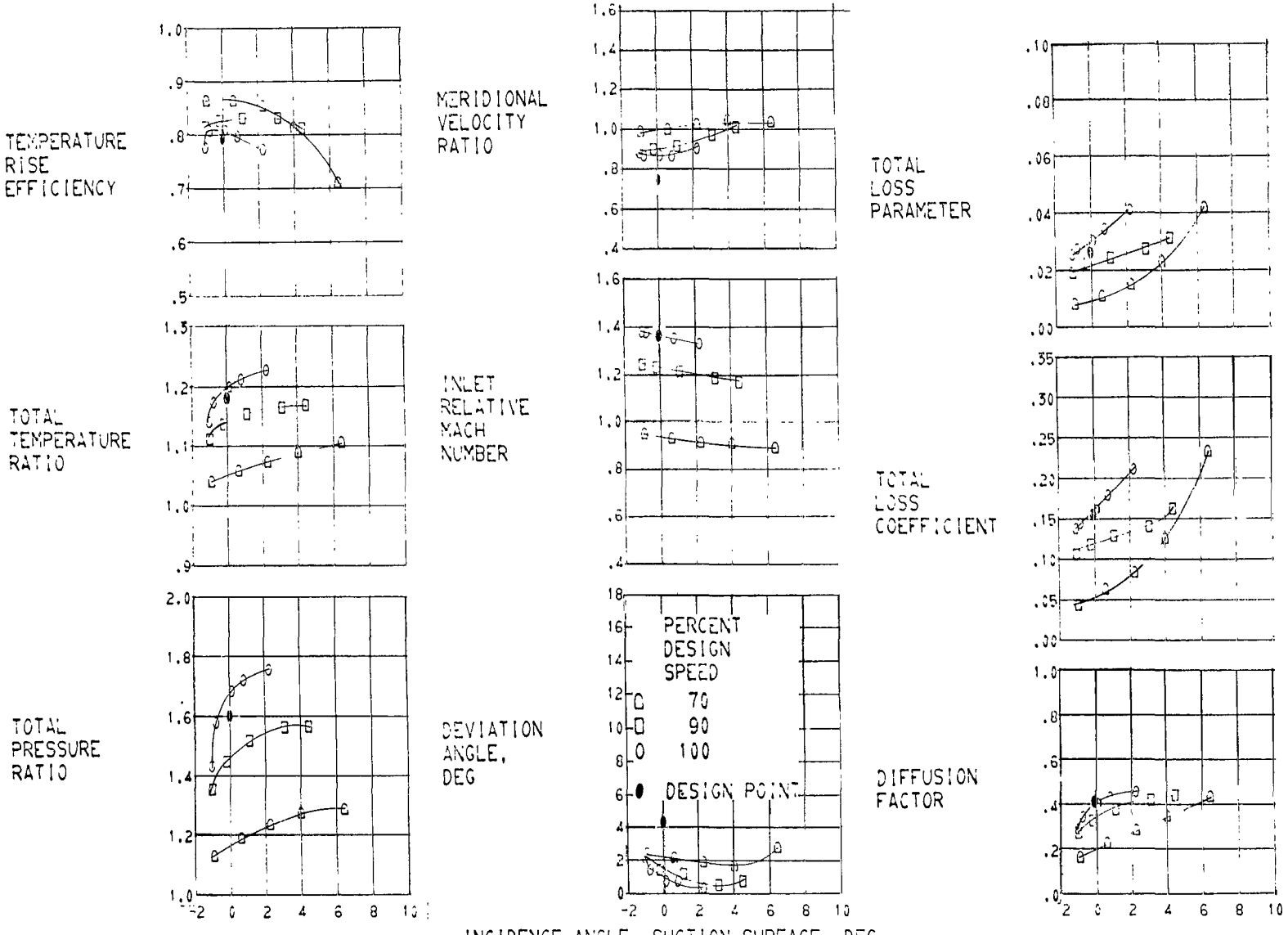


Figure 10. - Radial distribution of performance for stator 17 at 100 percent of design speed.



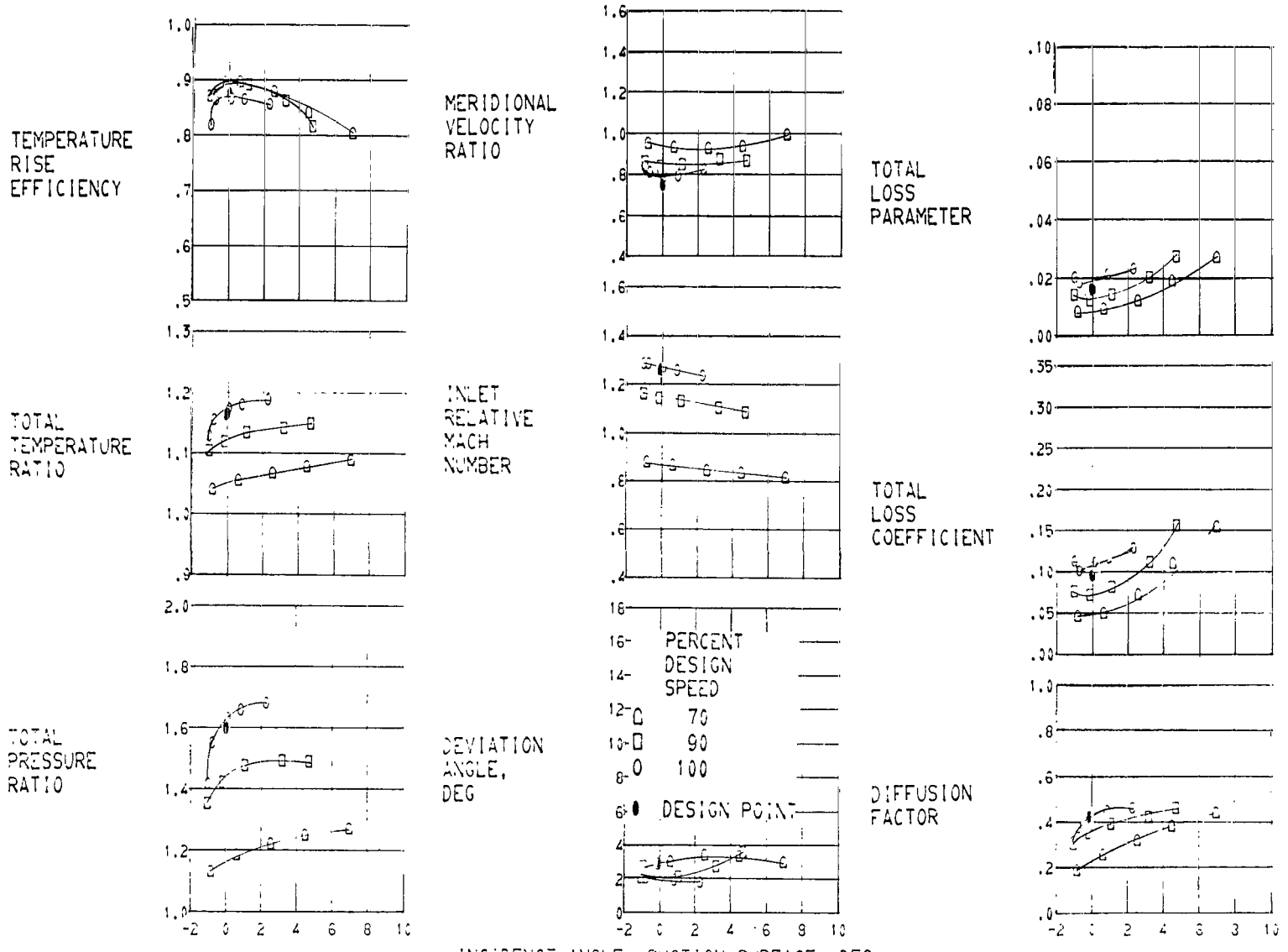
(A) 5 PERCENT SPAN.

FIGURE 11. - BLADE ELEMENT PERFORMANCE FOR ROTOR 20.



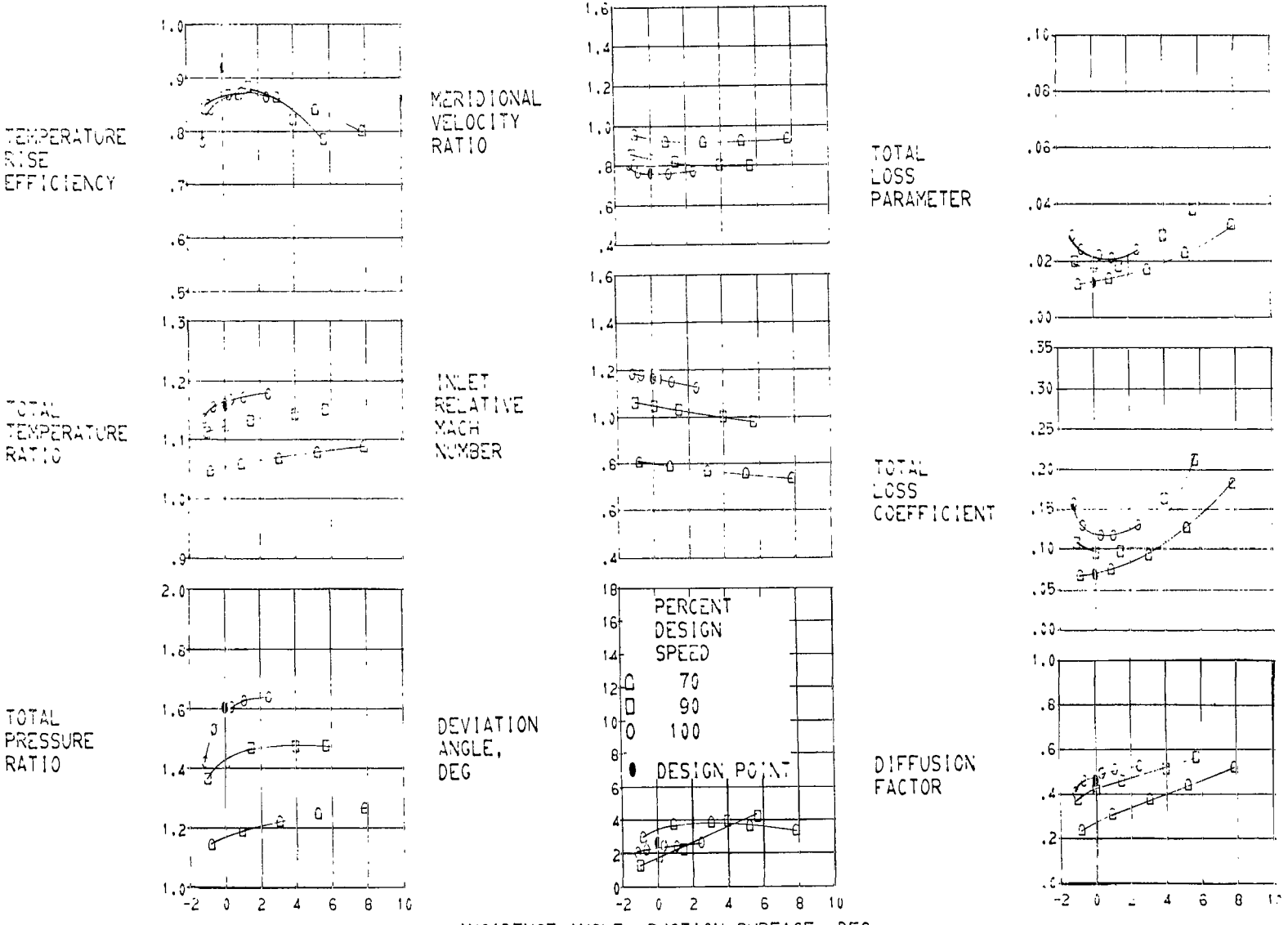
(B) 10 PERCENT SPAN.

FIGURE 11. - CONTINUED.



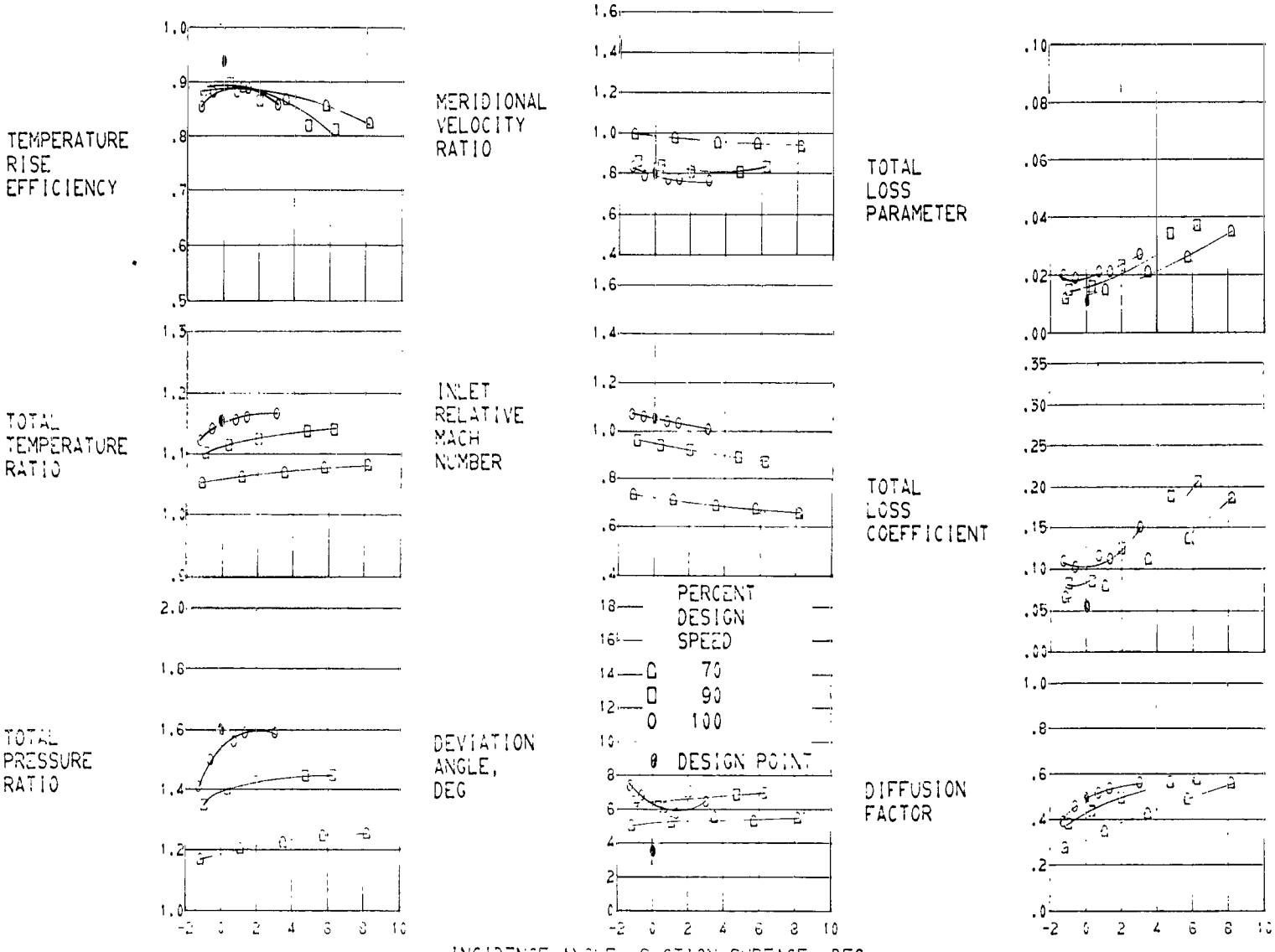
(C) 30 PERCENT SPAN.

FIGURE 11. - CONTINUED.



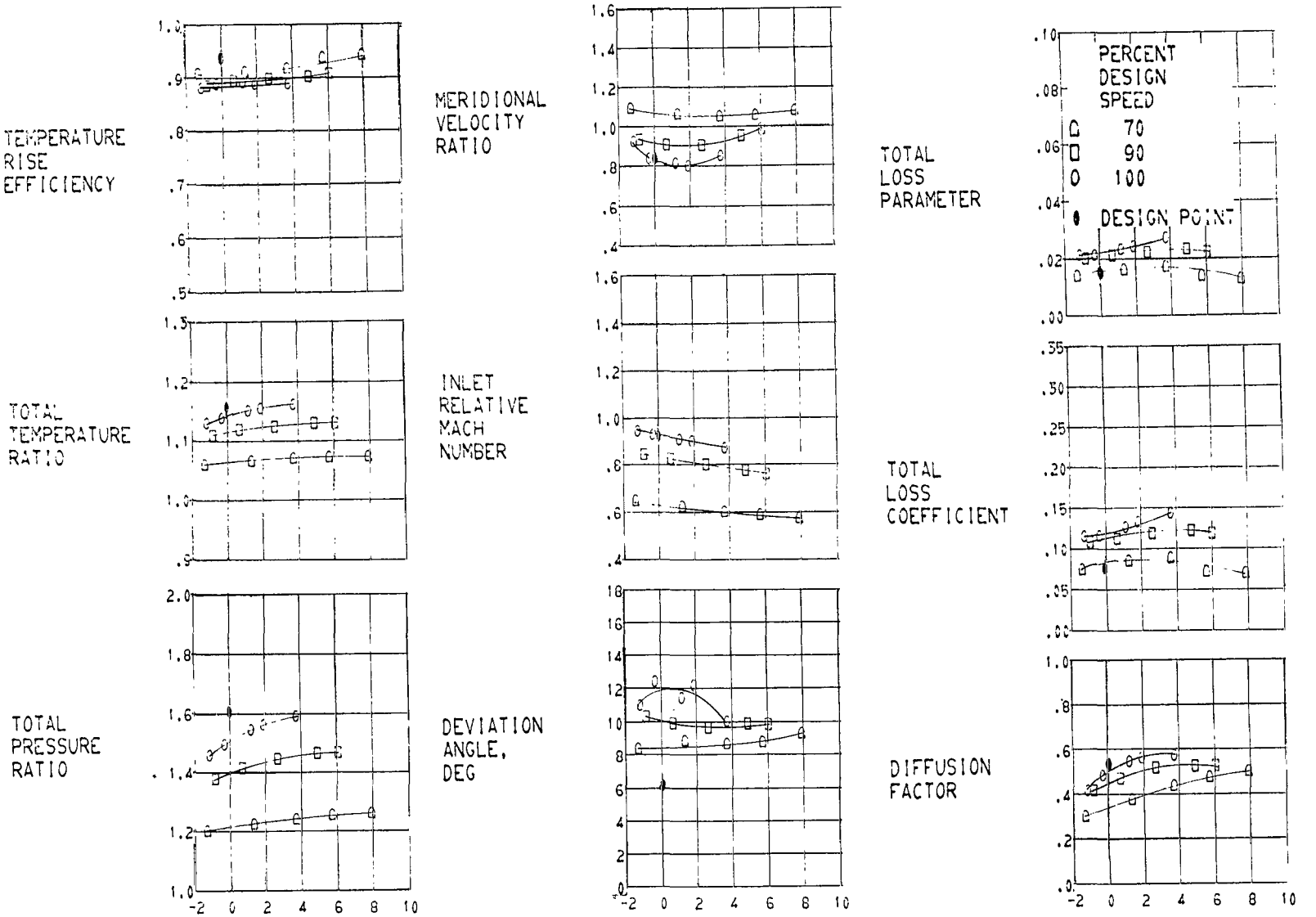
(D) 50 PERCENT SPAN.

FIGURE 11. - CONTINUED.



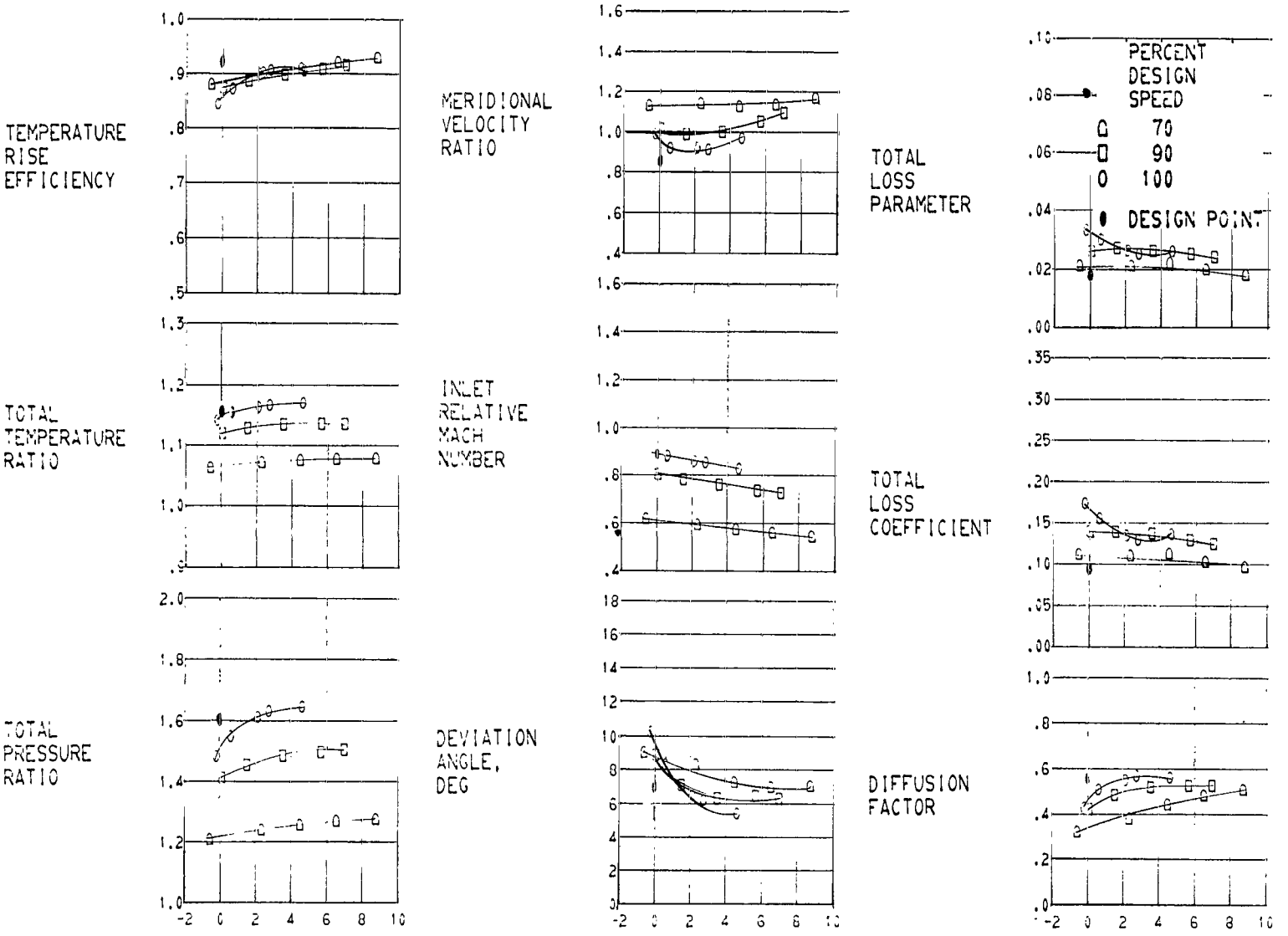
(E) 70 PERCENT SPAN.

FIGURE 11. - CONTINUED.



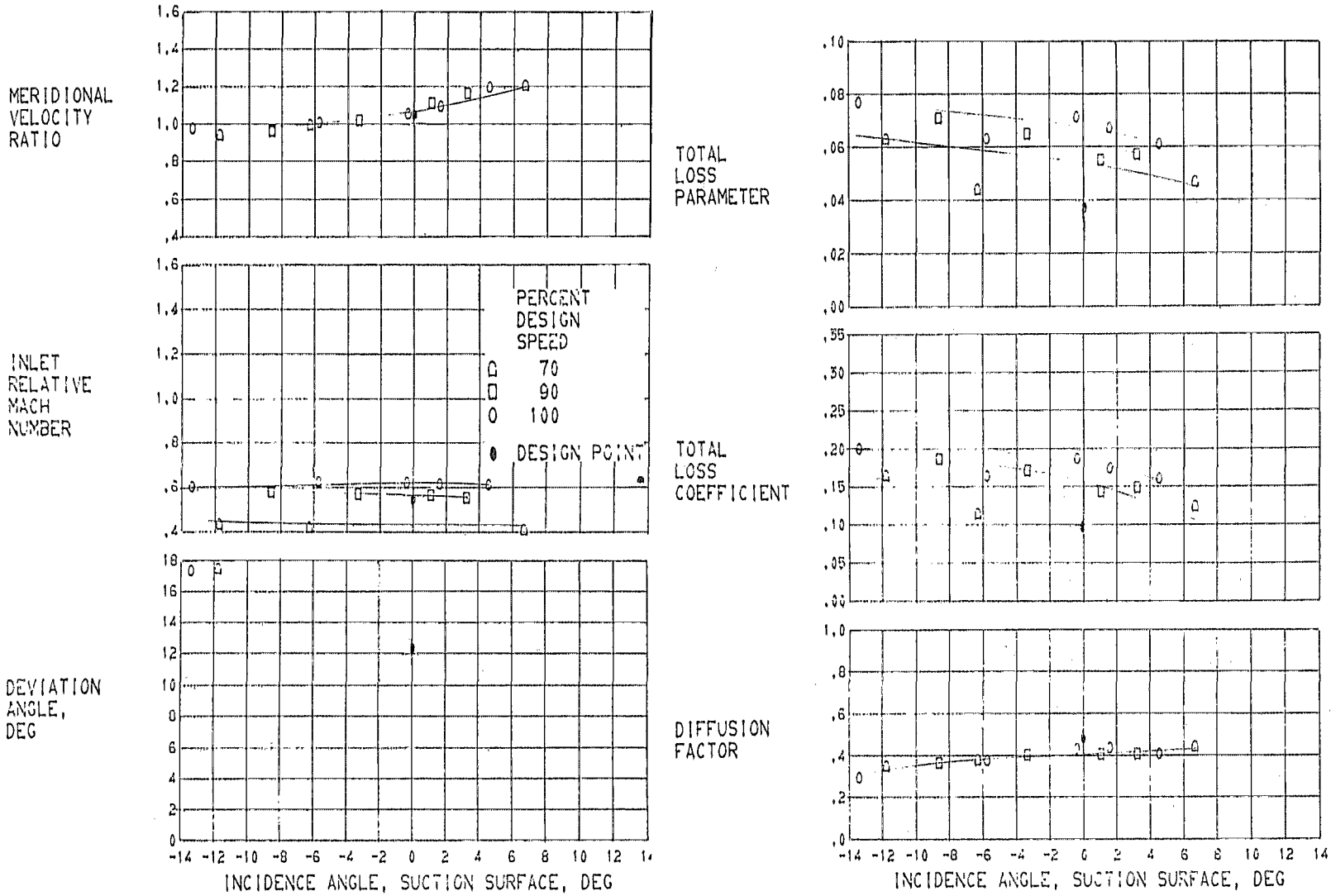
(F) 90 PERCENT SPAN.

FIGURE 11. - CONTINUED.



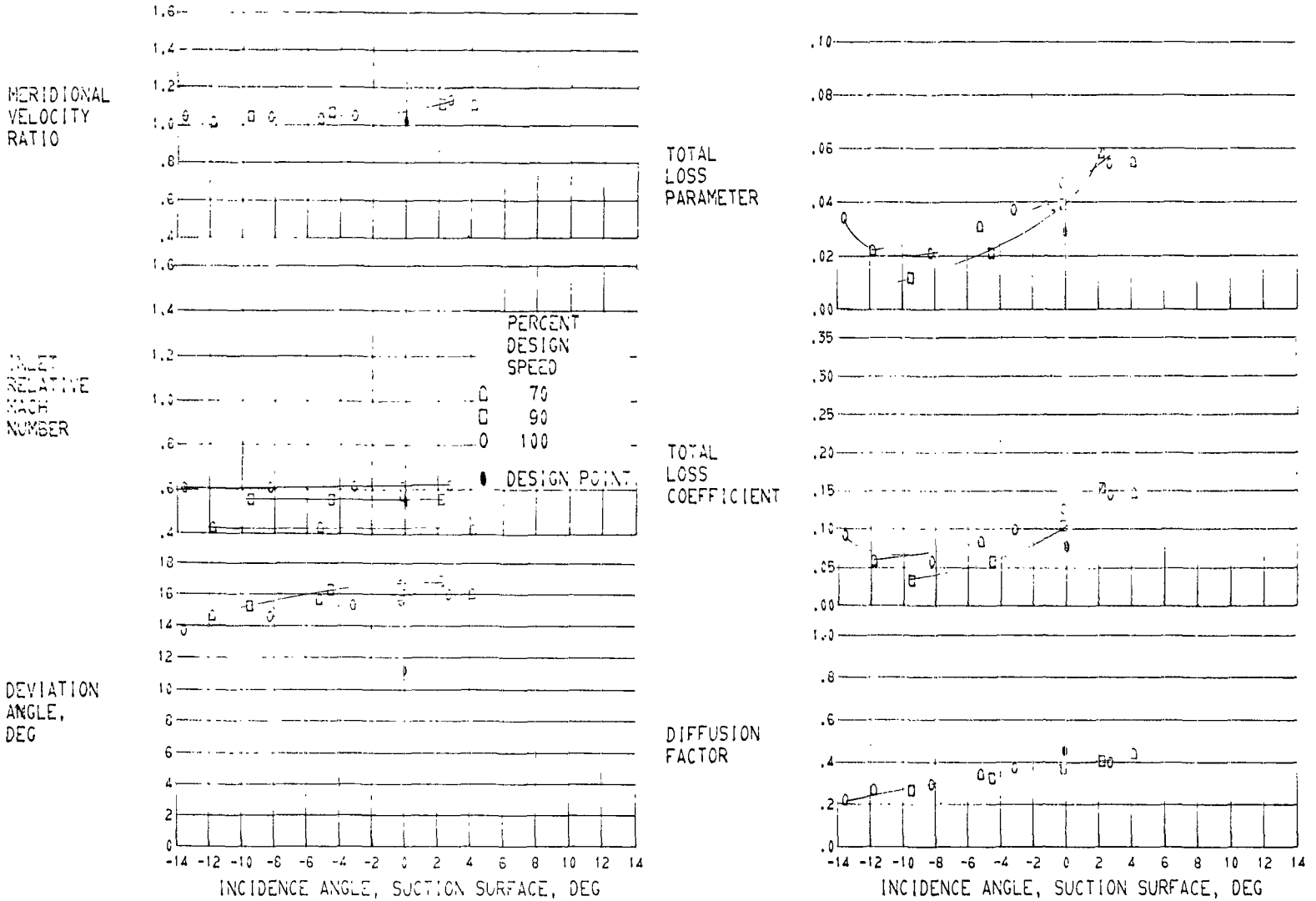
(G) 95 PERCENT SPAN.

FIGURE 11. - CONCLUDED.



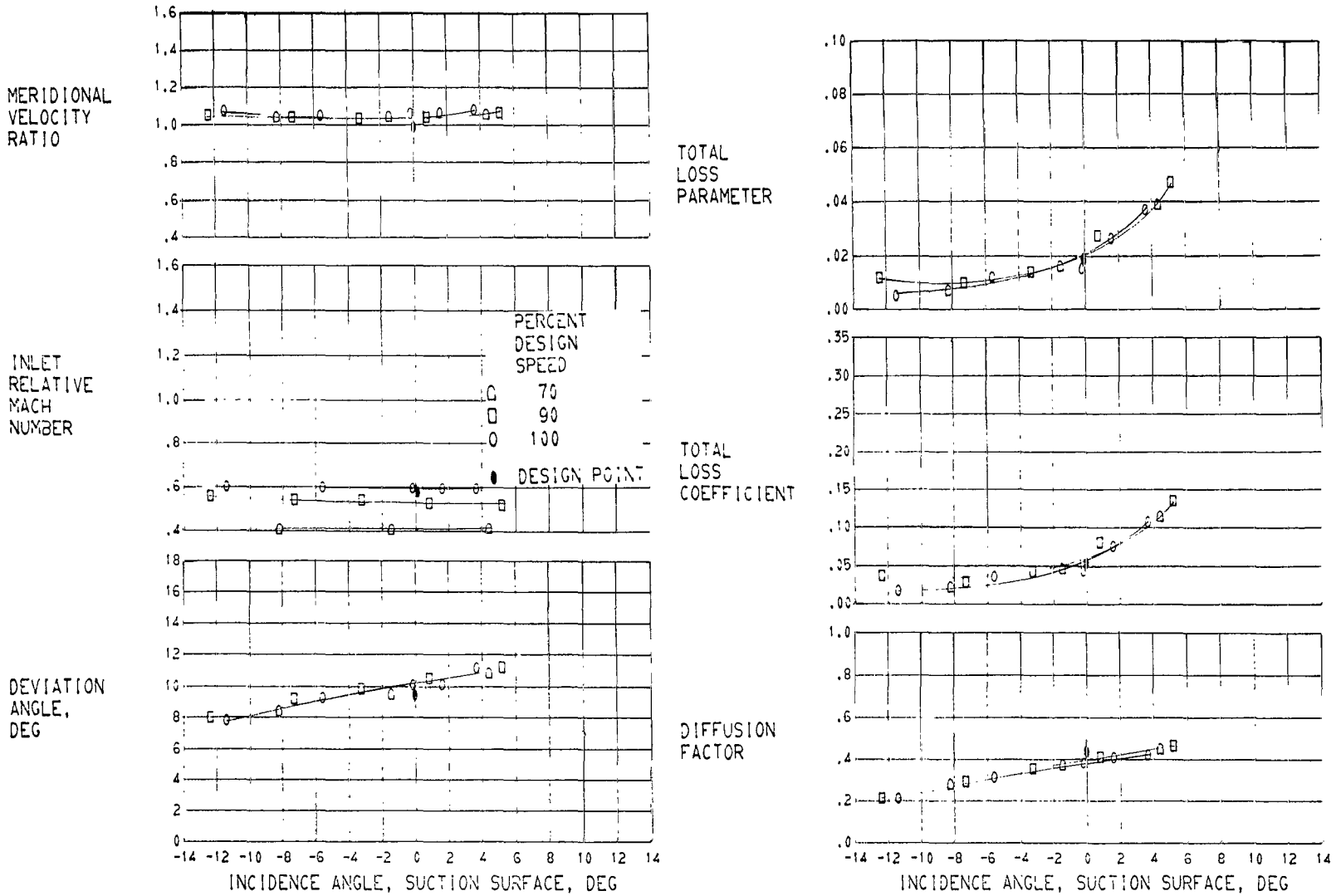
(A) 5 PERCENT SPAN.

FIGURE 12. - BLADE-ELEMENT PERFORMANCE FOR STATOR 17.



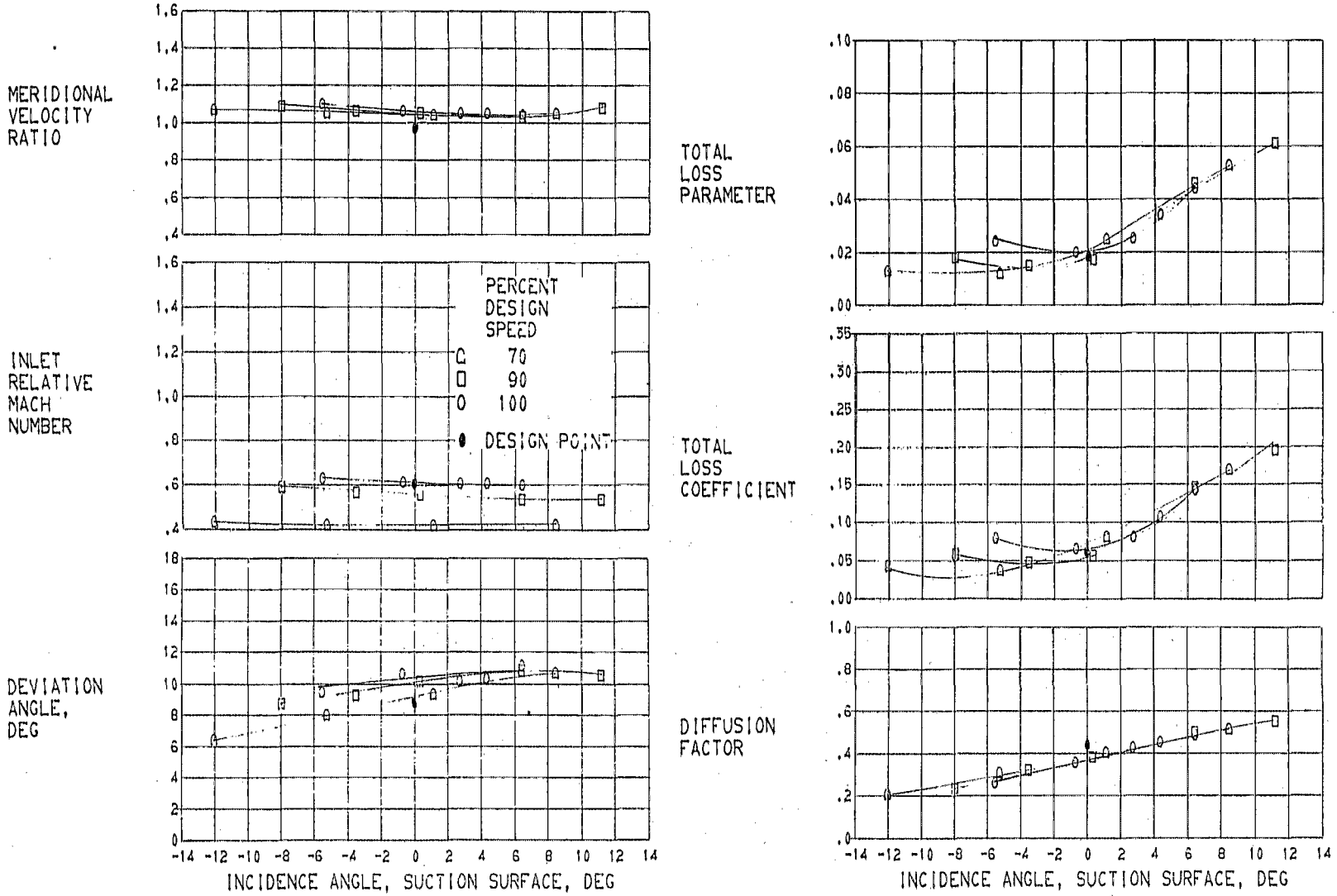
(B) 10 PERCENT SPAN.

FIGURE 12. - CONTINUED.



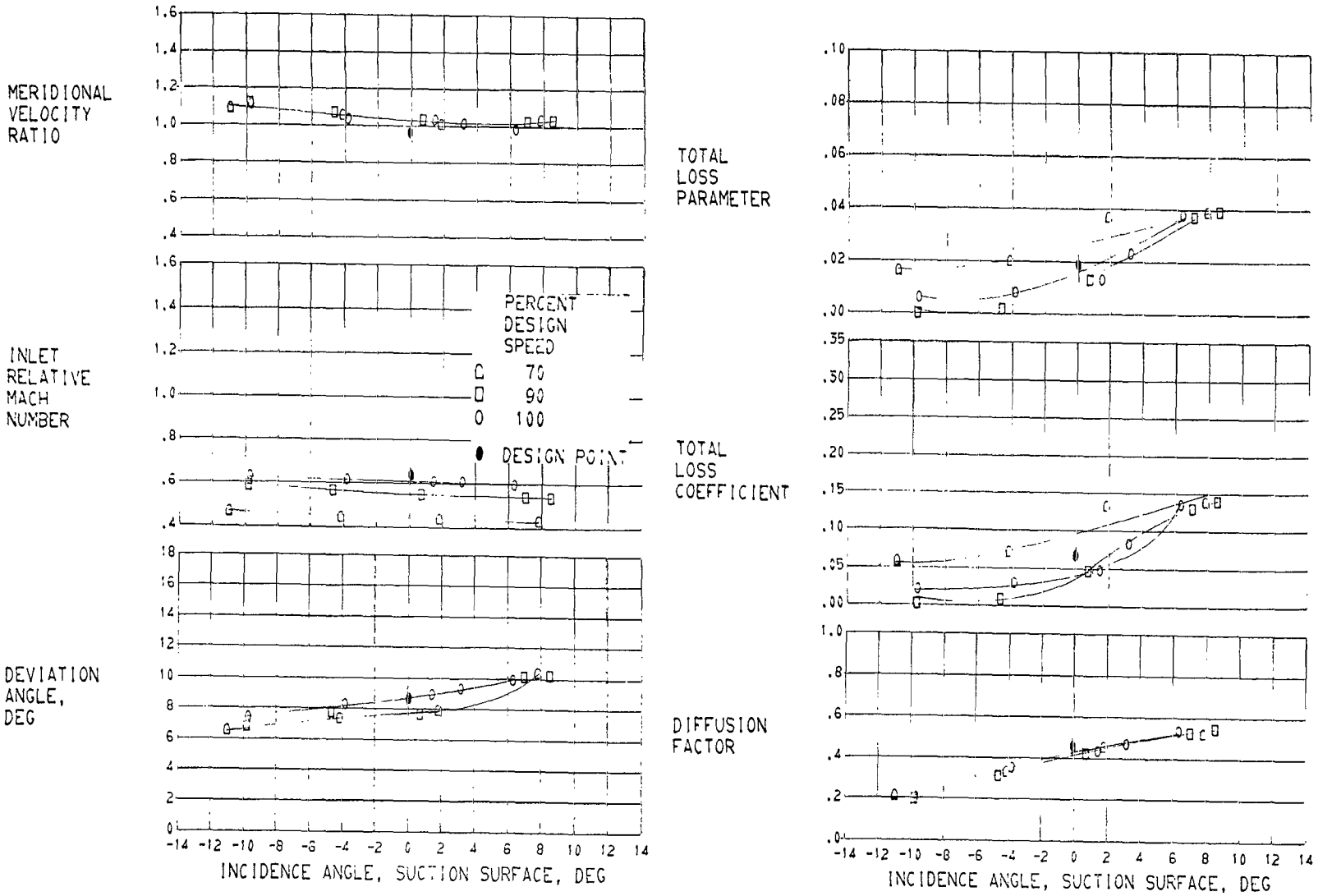
(C) 30 PERCENT SPAN.

FIGURE 12. - CONTINUED.



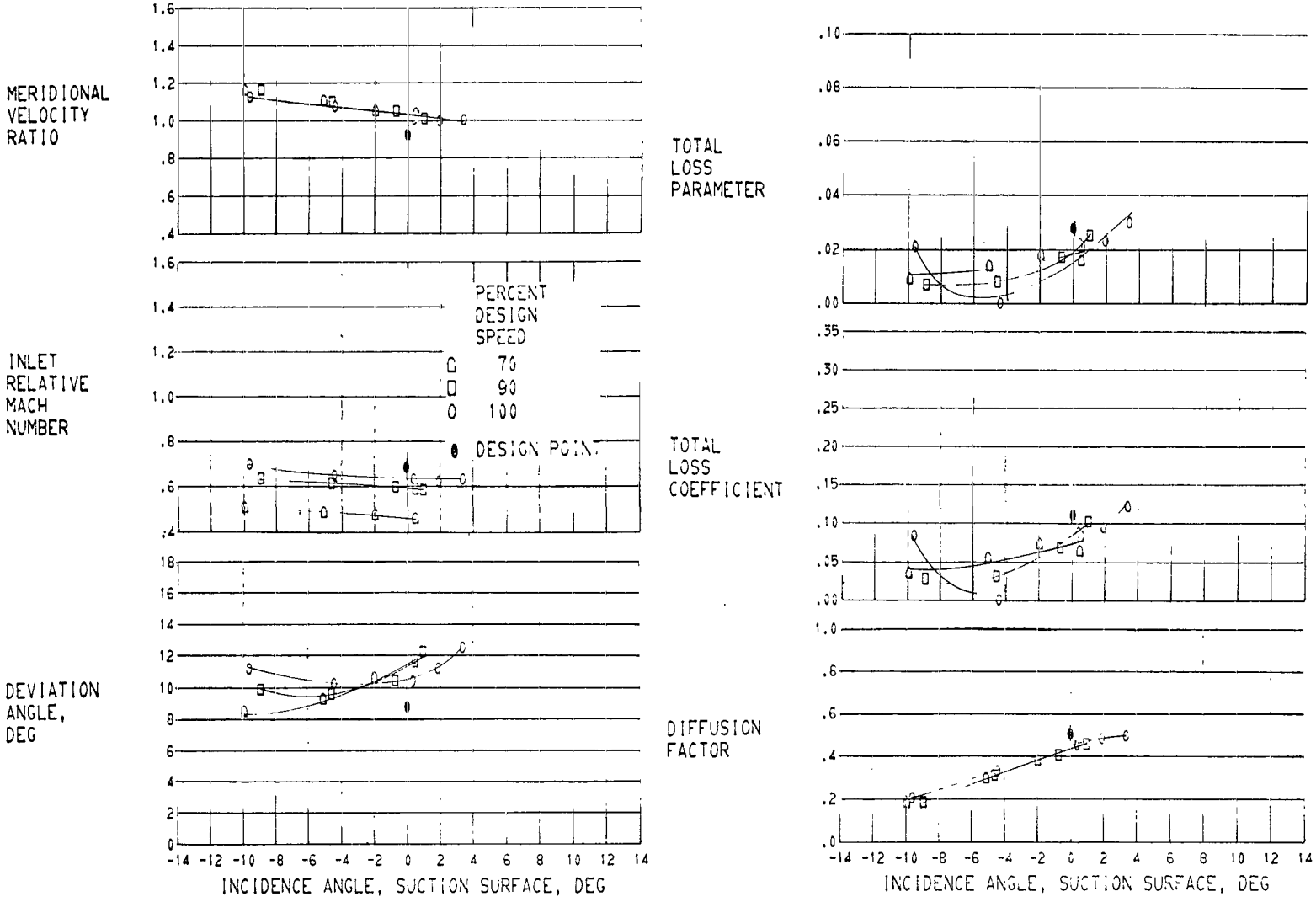
(D) 50 PERCENT SPAN.

FIGURE 12. - CONTINUED.



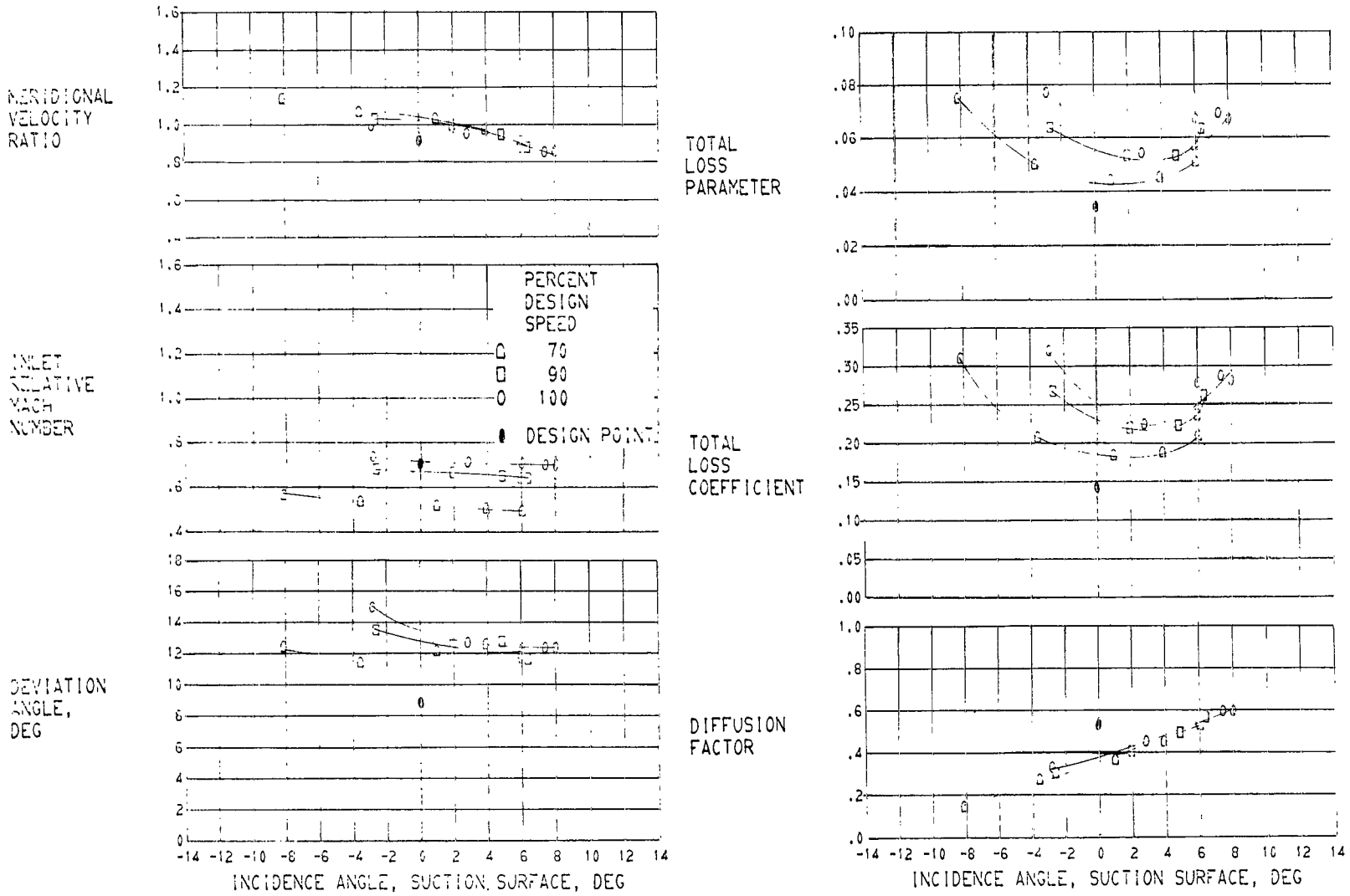
(E) 70 PERCENT SPAN.

FIGURE 12. - CONTINUED.



(F) 90 PERCENT SPAN.

FIGURE 12. - CONTINUED.



(G) 95 PERCENT SPAN.

FIGURE 12. - CONCLUDED.

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16. Abstract

This report presents the aerodynamic performance and design parameters of a transonic fan stage designed for a meridional velocity ratio of 0.8 across the tip of the stage, a pressure ratio of 1.57, a flow of 29.5 kilograms per second, and a tip speed of 426 meters per second. Radial surveys were obtained over the stable operating range from 50 to 100 percent of design speed. The measured, peak efficiency (0.81) of the stage occurred at a pressure ratio of 1.58 and a flow of 28.7 kilograms per second.

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