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FLOW FIELD MEASUREMENTS AROUND AN
OGIVE-CYLINDER AT ANGLES OF ATTACK UP
TO 15 DEGREES FOR MACH NUMBERS 3.5 AND 4

William C. Ragsdale

Naval Ordnance Laboratory
White Oak, Maryland

24 August 1972

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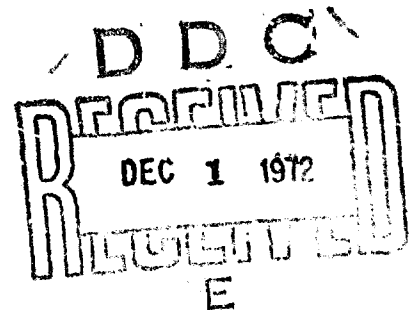
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NOLTR 72-198

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By
W. C. Ragsdale

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NAVAL ORDNANCE LABORATORY, WHITE OAK, SILVER SPRING, MARYLAND

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DOCUMENT CONTROL DATA - R & D

Security Classification of title, body of abstract and indexing annotation must be entered when the overall report is classified

1. ORIGINATING ACTIVITY (Corporate author) Naval Ordnance Laboratory White Oak, Silver Spring, Maryland 20910		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	
		2b. GROUP	
3. REPORT TITLE FLOW FIELD MEASUREMENTS AROUND AN OGIVE-CYLINDER AT ANGLES OF ATTACK UP TO 15 DEGREES FOR MACH NUMBERS 3.5 AND 4			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates)			
5. AUTHOR(S) (First name, middle initial, last name) William C. Ragsdale			
6. REPORT DATE 24 August 1972		7a. TOTAL NO OF PAGES 120	7b. NO OF REFS 14
8a. CONTRACT OR GRANT NO		9a. ORIGINATOR'S REPORT NUMBER(S) NOLTR 72-198	
b. PROJECT NO A310-310A/WR02-403-001			
c.		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
d.			
10. DISTRIBUTION STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY Naval Air Systems Command Washington, D. C. 20360	
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DD FORM 1473 (PAGE 1)

S/N 0101-807-6801

1

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14

KEY WORDS

Flow Field
Boundary Layer
Static Pressure
Separation
Cone Probe

LINK A

LINK B

LINK C

ROLE

WT

ROLE

WT

ROLE

WT

DD FORM 1473 (BACK)
1 NOV 65

(PAGE 2)

UNCLASSIFIED
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The flow field at one station on an ogive-cylinder was surveyed
with Pitot tubes and cone pressure probes at Mach numbers of
3.5 and 4.07.

This project was performed for the Naval Air Systems Command
(Code 310) under Airtask Number A3130/292/69R0100402.

The author wishes to acknowledge the support and assistance
of the staff of the Aerodynamics Department of the Naval Ordnance
Laboratory.

ROBERT WILLIAMSON II
Captain, USN
Commander

L. H. Schindel
L. H. SCHINDEL
By direction

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SYMBOLS

D	model diameter
M	Mach number
P	static pressure
PP	Pitot pressure
q	dynamic pressure
R	radial distance from model axis
RB	body radius
Re _D	Reynolds number based on wind tunnel free stream conditions and model diameter
Re _ℓ	Reynolds number based on local conditions and distance along cone probe from probe tip to static pressure tap
t	time
X	axial distance from model nose tip, for a sharp nose
α	angle of attack
β	circumferential position, measured from windward meridian (see Figure 6)
ε	total flow angle (see Figure 6)
φ	crossflow direction angle measured from reference plane (see Figure 6)
φ'	crossflow direction angle used in cone probe calibrations (see Figure A-2)

SYMBOLS (Cont)

χ viscous interaction parameter

subscripts

∞ wind tunnel free stream

1,2,

3,4,5 cone probe pressure taps (see Figure A-2)

0 stagnation value

INTRODUCTION

The work reported here was part of an investigation of the leeward side performance of aft-entry inlets for ramjet powered missiles. One of the objectives of this investigation was to correlate leeward side aft-inlet performance with the average flow properties in the local flow approaching the inlet.

The problem of correlating leeward side aft-inlet performance with local flow field properties was approached experimentally, by surveying the flow field at one longitudinal station on a typical ogive-cylinder body and measuring the performance of an aft-inlet operating in this flow field.

The flow field survey data and surface pressure data obtained during the investigation are of more general interest than the inlet performance data, and should be of use to those concerned with flow fields and aerodynamics of axisymmetric bodies. Consequently, these data are being published here separately from the other results of the investigation. The flow field around the ogive-cylinder configuration used in this investigation has been studied in two previous investigations (references 1 and 2). The three investigations generally supplement each other in spite of some overlap. Some of the results of the three investigations are compared in this report.

A number of similar investigations of flow fields around axisymmetric bodies have been reported. Some of these are listed in references 3 through 8.

TEST FACILITY

The experimental work reported here was performed in Naval Ordnance Laboratory (NOL) Supersonic Wind Tunnel No. 2. This tunnel operates in the Mach number range from 1.5 to 5 with either continuous recirculating operation or intermittent blowdown operation, depending on the pressure level desired. Various Mach numbers are obtained by means of interchangeable nozzles. The blowdown mode of operation was used for the tests reported here.

TEST EQUIPMENT AND INSTRUMENTATION

WIND TUNNEL MODEL AND FLOW-FIELD SURVEY EQUIPMENT. The configuration used in the flow field survey tests was an ogive-cylinder

having a tangent ogive nose with a fineness ratio of 4. The flow-field surveys were made in a plane 6.5 diameters aft of the theoretical location of a sharp nose - the wind tunnel model nose being slightly blunted. The total length of the model, based on a sharp nose, was 7 diameters and the model base diameter was 3 inches. The wind tunnel model was instrumented with a single longitudinal row of static pressure taps. The first tap was located 0.5 inches aft of the theoretical sharp nose tip, and taps were spaced one inch apart (axially) aft of this location, with the last tap located at the flow field survey plane.

The flow field survey data were obtained with Pitot tubes and cone pressure probes spaced radially on fixed rakes at the aft end of the model. Four cone probes were mounted on one rake and nine Pitot tubes were mounted on a second rake. The two rakes were spaced 90 degrees apart around the periphery of the model. The wind tunnel model and flow survey rakes were mounted on a sting attached to the wind tunnel carriage - this arrangement is shown in Figure 1. Using the wind tunnel carriage, the model could be pitched to various angles of attack with respect to the wind tunnel flow, and the model and flow survey rakes could be rolled together to obtain surface pressure data and flow field data at various circumferential locations. With the rakes spaced 90 degrees apart, it was possible to survey the entire (symmetrical) leeward or windward flow field with both Pitot tubes and cone probes while rolling the model through an angle of 90 degrees.

FLOW FIELD SURVEY INSTRUMENTATION. A photograph of the Pitot tube rake is shown in Figure 2. The nine Pitot tubes were spaced 0.2 inch apart along the rake, and the centerline of the innermost tube was 0.1 inch from the model surface with the rake mounted on the model. The centerline of the outermost tube was 1.7 inches from the model surface.

The ends of the Pitot tubes were internally chamfered, with a chamfer angle of 15 degrees. This was done to reduce the sensitivity of the measured pressures to the angle of the approaching flow. The Pitot tubes had an outside diameter of .032 inch and an inside diameter of .020 inch.

A photograph of the cone pressure probe rake is shown in Figure 3. The cone probes were spaced 0.5 inch apart along the rake and the rake could be mounted in two positions so that the center of the innermost probe was either 0.25 inch or 0.5 inch from the surface of the model.

The cone probes had a Pitot pressure port at the probe tip and four static pressure ports spaced equally around the conical face, as shown in Figure 3. The static pressure ports were aligned with the rake as accurately as possible.

The cone pressure probes were old probes which had been constructed for other flow field investigations, and were refurbished for the present investigation. The probes were not identical in size, but all had a total included cone angle of 30 degrees. While the exact dimensions of the probes were not determined, typical dimensions for probes of this type are shown in Figure 4.

The cone pressure probes were used to determine the local Mach number, static pressure and flow direction and had to be calibrated against known values of these quantities in a uniform stream. The probe calibrations and the correlation of the calibration data are discussed in Appendix A.

TEST CONDITIONS AND PROCEDURE

Flow field surveys were made at Mach numbers of 3.52 and 4.07, and angles of attack of 0, 5, 10, and 15 degrees. The wind tunnel free-stream Reynolds number was approximately 12 million per foot for all tests.

The procedure used to obtain flow field survey data was to pitch the model to the desired angle of attack and then roll the model and probes to a series of roll positions, pausing at each roll position to obtain data from the flow field survey probes and the surface static pressure taps. The response of the pressure taps and lines, particularly those on the cone probes, was too slow to allow continuous rolling of the model and probes.

The reference for determining the roll position of the model and probes was the vertical or pitch plane, as indicated by an accurate clinometer. The roll angle readout potentiometer on the wind tunnel carriage was calibrated by resting the clinometer against the flat side of the cone probe rake and reading both the clinometer and the readout potentiometer at various roll positions. The accuracy of the clinometer was ± 1 to ± 2 minutes of arc. The angle of attack readout potentiometer was calibrated in similar fashion.

The angle between the cone probe rake and Pitot tube rake was also measured with the clinometer and was found to be $90^\circ 50'$.

The strain gage pressure transducers used in the investigation were calibrated with an accurate mercury manometer (± 1 mm) and a dead weight calibration apparatus.

Most of the flow field survey data and surface pressure data were taken on the leeward side of the model. The pattern of measurements in the flow field survey plane is shown in Figure 5. Leeward side data at a given angle of attack and Mach number were usually taken in two wind tunnel runs. In one run, the cone probe rake was mounted in the outer position and data were taken at roll positions 10 degrees apart. In a second run the rake was mounted in the inner position and again data were taken at roll positions 10 degrees apart. The roll positions for the second run were located roughly midway between

the roll positions for the first run so that cone probe data, Pitot pressure data and surface pressure data were obtained at roll increments of roughly 5 degrees. Usually during the first run the windward side data indicated in Figure 5 were obtained by reversing the model pitch angle and also, a set of zero angle of attack data were obtained at one roll position. There were two exceptions to this pattern of measurements. In case of the Mach 3.52, 10-degree angle of attack flow field survey, the windward side data were obtained with the cone probe rake in the inner position rather than the outer position. In the case of the Mach 4.07, 5-degree angle of attack survey, leeward side data were only obtained with the cone probe rake in the outer position with roll increments of 10 degrees.

DATA AND RESULTS

DATA REDUCTION PROCEDURES. Most of the data reduction procedures were straightforward, but some of the conventions used in reporting the results require explanation.

In reporting the results, circumferential locations around the body have been denoted by the angle β , which is arbitrarily given a value of 0 degree on the windward meridian and 180 degrees on the leeward meridian. The flow field and surface pressure distribution were assumed to be symmetrical with respect to the angle of attack plane and the results are reported for one side of the body. Only Pitot pressures were measured on both sides of the body.

The radial positions of flow field survey data points are reported in terms of a dimensionless radial coordinate, $(R-R_B)/R_B$, where R_B is the body radius (1.5 inches).

As mentioned previously, all the flow field survey measurements were made in a plane 6.5 diameters aft of a sharp nose. The axial location of the surface pressure measurements is reported in terms of station numbers, with station 1 located 0.5 inch aft of the theoretical sharp nose, and station 20 located at the flow field survey plane. The stations were spaced 1 inch apart in the axial direction.

The measured surface pressures were converted to pressure ratios, P/P_∞ and pressure coefficients, $(P-P_\infty)/q_\infty$, based on the wind tunnel free stream static and dynamic pressures, P_∞ and q_∞ . The results are reported in this form.

The measured Pitot pressures were converted to pressure ratios PP/PP_∞ , based on the wind tunnel free stream Pitot pressure and are reported in this form.

The cone probe pressure measurements were used to determine local values of Mach number, static pressure and flow direction. The details of the calibration of the probes and the data reduction technique are discussed in Appendix A. The local static pressure

measurements were converted to pressure ratios based on the wind tunnel free stream static pressure, P/P_∞ , and are reported in this form.

The direction of the local velocity vector, or local flow direction, has been described by two angles, as follows:

1. a total flow angle, ϵ , defined as the angle between the local velocity vector and the cone probe (or body) axis;
2. a flow direction angle, ϕ , defined as the angle between a reference plane through the cone probe axis and the plane containing the cone probe axis and the local velocity vector.

Sketches illustrating these conventions are shown in Figure 6. The flow direction angle, ϕ , can also be thought of as the flow direction in the plane of the flow field measurements, or crossflow plane. The reference plane for measuring, ϕ , was taken to be the vertical, or pitch plane.

TABULATED RESULTS. A set of tables listing all the flow field survey and surface pressure results are included in Appendix B. The results listed are as follows:

TABLE I: Surface Pressure Ratio, P/P_∞
Surface Pressure Coefficient, $(P-P_\infty)/q_\infty$

TABLE II: Pitot Pressure Ratio, PP/PP_∞

TABLE III: Mach Number, M
Total Flow Angle, ϵ
Flow Direction Angle, ϕ
Static Pressure Ratio, P/P_∞

Some of the surface static pressure results have been deleted from Table I. The measurements deleted at stations 1, 2, 4 and 12 were in error due to faulty pressure transducer readings. The measurements deleted at stations 18, 19 and 20 were in error due to a base interference effect which is discussed on page 11.

Some values of Mach number and static pressure ratio have been deleted from Table III. Mach numbers were not computed outside the range 1.5 to 5 as it was felt any values outside these limits would be inaccurate. Some values of Mach number and static pressure were obviously out of line with the rest of the data due to base interference or other effects and were also deleted from the table.

PLOTTED RESULTS. Plots of surface pressure ratio, P/P_∞ , versus axial position (X/D) are shown in Figures 7 through 14. Comparisons are made in some of the figures with pressures computed with a method of characteristics computer program. These comparisons are discussed on page 8. Results are shown for only three values of β : 0° ; 90° ; and 180° . In some cases, several surface pressure readings were

made at a given location during the course of several flow field survey tests. These replicate readings are indicated in the Figures. Plots of surface pressure ratio versus circumferential position at the flow field survey plane ($X/D = 6.5$) are shown in Figures 15 and 16.

In order to present the flow field Pitot pressure data in a concise way and to illustrate the features of the flow field on the leeward side of the body, maps were prepared showing a cross section of the body and contours of constant Pitot pressure ratio at the flow field survey plane. These maps are shown in Figures 17 through 22.

In the construction of the Pitot pressure maps, a computer was used to interpolate within the grid of measured values to determine points of constant Pitot pressure ratio in the flow field survey plane. Contours were drawn through these points by hand and consequently, the results are subject to some judgement and/or bias.

In constructing the Pitot pressure ratio map for the Mach 3.52, 15-degree angle of attack flow field it was reasonably clear what part of the flow field had been affected by base interference. The Pitot pressure ratio contours were extrapolated across this region rather than following the interpolated points. The boundaries of this region have been indicated in Figure 19. No clear indication of the extent of base interference could be detected in the Mach 4.07, 15 degree angle of attack Pitot pressure contours and consequently, this map was not edited. The 5 and 10 degree angle of attack data are thought to be free of any base interference effects.

In the 10 and 15 degree angle of attack flow fields the Pitot pressure data indicated clearly an embedded shock wave in the leeward flow field. The Mach 4.07, 15 degree angle of attack data indicated the presence of two embedded shock waves. The positions of all the embedded shock waves indicated by the data are shown in Figures 18, 19, 21, and 22.

The cone probe results were used to prepare maps similar to the Pitot pressure ratio maps, using the same method of construction. Maps of Mach number, static pressure ratio, total flow angle and flow direction angle are shown in Figures 23 through 46. The flow direction angle has been indicated by small arrows at each measurement point rather than contours.

There was no clear indication of embedded shock waves or of base interference effects in the cone probe results. Consequently, the maps shown in Figures 23 through 46 were not edited and the shock wave positions shown are those obtained from the Pitot pressure data. The second embedded shock indicated by the Mach 4.07, 15 degree angle of attack Pitot pressure data has not been noted on the other maps, as it was not clear how the fairing of the contours would be affected.

It is important to note here that the Pitot pressure ratio maps, Mach number maps and static pressure ratio maps were constructed

individually from the experimental data and the fairing of the contours through the interpolated points was done by hand with no cross checking for consistency between the maps. As a result, values of Pitot pressure ratio, Mach number and static pressure ratio read from the maps for the same position in the flow field may not be consistent. The maps are intended primarily to give a qualitative look at the flow fields surveyed. Readers desiring quantitative information should refer to the tabulated data in Appendix B.

DISCUSSION OF RESULTS

COMPARISONS WITH CALCULATED VALUES AND OTHER EXPERIMENTAL DATA. The flow field around the ogive-cylinder configuration used in this investigation has been studied in two previous investigations, reported in references 1 and 2. Some of the data from the three investigations overlap, but substantial portions of the data do not. Thus, the three investigations tend to supplement each other.

A summary of the test conditions for the three investigations is given in the table below:

Invest- igation	$\frac{X}{D}$ Survey Plane	$\frac{R-RB}{RB}$	M_∞	α deg	$Re_D \times 10^{-6}$	Type of Data
Ref 1	7.5	.39 .59, .79	3.5	0,5 10,15	.5	Cone Probe
Ref 2	5.5 6.5	0-1.2	2.49 3.5 4.3	0,5 10	3-4.5	Cone Probe; Pitot Pressure; Surface Pressure
Pre- sent Invest- igation	6.5	.167- 1.33	3.52 4.07	0,5 10,15	3	Cone Probe; Pitot Pressure; Surface Pressure

In all three investigations the nose tips of the wind tunnel models were essentially sharp, with nose bluntnesses between one and three percent.

Some comparisons have been made of data from the three investigations to determine roughly whether or not the data are consistent. In addition, the inviscid flow field around the ogive-cylinder configuration was computed using a method of characteristics computer program obtained from NASA (reference 9). The inviscid flow field was

calculated for a Mach number of 3.5 and angles of attack of 0, 5 and 10 degrees. The calculations should be accurate in all portions of the flow field not affected by boundary layer separation and provide a standard of comparison for the experimental results where applicable.

Surface static pressures computed with the method of characteristics program are compared with the experimental values for Mach 3.52 and 0, 5 and 10 degrees angle of attack in Figures 7, 8 and 9. The agreement between the computed and experimental values is generally quite good. The experimental values for the windward meridian ($\beta=0$) at 10 degrees angle of attack are five to ten percent higher than the computed values. It has been found that positive errors of this magnitude can occur when the size of static pressure taps is comparable to the displacement thickness of the boundary layer (reference 10). This would most likely occur on the windward side of the model and may offer an explanation for the observed difference between the calculated and experimental values. The computed values on the leeward meridian at 10 degrees angle of attack are higher than the experimental values toward the end of the body, but in this region the flow field is affected substantially by boundary layer separation.

A comparison of Pitot pressure data from reference 1 and the present investigation is shown in Figure 47. The data from the two investigations are in good agreement, even though the flow field survey stations differed by one body diameter. This result, along with the fact that the axial variation in static pressure toward the end of the body is small, indicates that the flow field develops quite slowly in the axial direction at this distance from the nose (6.5 to 7.5 diameters). The difference in Reynolds number by a factor of five between the two investigations should not have affected the data in the parts of the flow field unaffected by boundary layer separation. It is surprising, however, that the data are in agreement even in regions of the flow fields affected by separation.

A comparison of Pitot pressure data from the present investigation and reference 2 with computed Pitot pressures for Mach 3.5 and angles of attack of 5 and 10 degrees is shown in Figures 48 and 49. This comparison indicates that the experimental data and computed values agree to within ten percent except in the boundary layer and regions of the flow field affected by boundary layer separation. In the outer part of the flow field at $\beta=135$ and $\beta=180$ degrees and 10 degrees angle of attack good agreement is obtained with the computed values even in the presence of boundary layer separation. The variation of Pitot pressure within the flow fields at 5 and 10 degrees angle of attack appears fairly small except in the attached and separated boundary layer flow.

A comparison of total flow angle and flow direction angle measurements from all three investigations with computed values from the method of characteristics program is shown in Figures 50 through 53.

The measured and computed total flow angles generally agree within 2 degrees in the flow field outside the boundary layer and not affected by separation. At $\beta=135$ degrees and 10 degrees angle of attack where an effect of flow separation is expected the computed and experimental values differ by 3 to 4 degrees, but appear to follow the same trend in the radial direction. At $\beta=180$ degrees the trends are different.

The measured and computed flow direction angles agree to within 10 to 15 degrees in the regions where comparisons are valid. The experimental values on the leeward meridian at 10 degrees angle of attack were greatly affected by the strong flow divergence in the separated boundary layer flow. The effect of the embedded shock on the flow direction appears fairly substantial.

Finally, measured Mach numbers from reference 1 and the present investigation are compared in Figure 54. The agreement is generally good despite the fact that the measurements were made at different axial and radial locations. The comparison should still be valid as the measurements indicated only a small variation of Mach number in the radial direction in the regions unaffected by separation, and it should be safe to assume small variations in the axial direction also. Computed values of Mach number are shown for the 5 and 10 degree angle of attack flow fields and are in good agreement with the measured values where a comparison is valid.

In summary, the experimental data from the three experimental investigations are in reasonably good agreement and are consistent with computed values for the inviscid flow field in all parts of the flow field where a valid comparison can be made. It should be possible to use the data from all three investigations together in comparisons with theory or in empirical analyses of the flow field.

EXPERIMENTAL PROBLEMS AND SOURCES OF ERROR. The accuracy of the cone probe calibrations is discussed in some detail in Appendix A. A general statement concerning the accuracy of the calibrations is as follows:

1. Mach numbers are accurate to about ± 5 percent,
2. total flow angles are accurate to about ± 2 degrees,
3. flow direction angles are accurate to about ± 7.5 degrees.

The comparisons with other data and with theoretical inviscid values discussed above indicate that these accuracies were achieved in most regions of the flow fields surveyed where there was no effect of boundary layer separation. The comparisons also indicate the measured Pitot pressures were quite accurate.

Since the Pitot rake and cone probe rake surveyed the flow field on opposite sides of the body, the symmetry of the flow field is of some concern. A comparison of Pitot pressure data from the cone probe rake with corresponding data from the Pitot rake is shown in

Figure 55. The pressures compared are in good agreement, indicating the flow field was symmetrical to within the accuracy of the data. Comparisons similar to the one shown were made for all the flow fields surveyed and in all cases the Pitot pressures from opposite sides of the body were in good agreement.

Two sources of error could have affected the experimental measurements to a greater extent in the regions of separated flow than in other parts of the flow field. These are: (1) viscous effects; and (2) the effect of Mach number and pressure gradients.

Viscous effects on the cone probe and Pitot pressure readings are thought to be negligible. An estimate of the viscous interaction parameter $\chi = M^3/\sqrt{Re_L}$ was made for the cone pressure probe at the point of minimum Reynolds number in the Mach 4.07, 15 degree angle of attack flow field. Assuming a total flow angle of zero, a value of χ less than 0.1 was obtained. It was concluded that viscous effects on the cone pressure readings were probably negligible (reference 11). A similar estimate was made of the minimum Reynolds number based on Pitot tube diameter and the resulting value was found to be greater than 1000. Accordingly, viscous effects on the Pitot pressure readings should have been negligible (reference 12).

Since the diameter of the Pitot tubes was quite small (.032 inch) compared to the size of the flow field surveyed the effect of Mach number and pressure gradients on the Pitot pressure measurements should have been negligible. This is probably not the case for the cone probes, however, which were much larger in diameter (about .19 inch).

Unfortunately, no accepted method for correcting cone probe readings for the effect of Mach number and pressure gradients is available. Consequently, no attempt has been made to correct the cone probe measurements for this effect.

Two experimental problems were encountered which may have affected some of the experimental measurements in the region of separated flow.

In some cases the pressure in the tubes connecting the cone probes with the pressure transducers had not steadied out during the period when the pressure data were recorded. Most of the unsteady pressure data recorded occurred in the separated flow regions, where pressures were lowest. Where unsteady readings were encountered, an effort was made to estimate steady values of pressure by curve fitting the following type equation to several successive pressure readings (a number of readings were recorded at each survey point):

$$P = a + be^{-ct}$$

Where: a, b, c = constants determined during the curve fitting process
 t = time

The estimated steady pressure reading is given by the constant a . The accuracy of the estimated steady values appeared to be good in some cases and poor in others. In some cases the equation above did not appear to describe the trend of the data and could not be used, in which case the final value recorded was used. At any rate, the Mach numbers and flow angles computed from the cone pressure data were related to correlation parameters involving four pressure readings and should not have been highly sensitive to errors in a single reading.

The second experimental problem encountered was a base interference effect which affected some of the surface pressure data and flow field data at 15 degrees angle of attack. The base interference was due to an overly large connecting nut which was used on the two piece sting support used in the tests. Unfortunately, the interference effect was not identified until after the flow field tests had been completed.

The effect of base interference on the surface static pressure at the flow field survey station ($X/D = 6.5$) is shown in Figure 56. According to these measurements the flow field at the model surface was affected from $\beta \approx 125^\circ$ to $\beta \approx 155^\circ$, for $M = 3.52$ and $\beta \approx 125^\circ$ to $\beta \approx 165^\circ$ for $M = 4.07$. At 10 degrees angle of attack, the surface static pressures were free of any interference effect.

Oil flow photographs were taken after the flow field survey tests to study the location of boundary layer separation along the model. These photographs were taken at Mach 4.07 and 10 and 15 degrees angle of attack and illustrate clearly the extent of the base interference effect on the model surface. The two photographs are shown in Figures 57 and 58, and confirm that the interference did not quite reach the flow field survey plane at 10 degrees angle of attack, but reached a point well ahead of the flow field survey plane at 15 degrees angle of attack.

As mentioned previously, the effect of the base interference was apparent in the Pitot pressure contours obtained from the $M = 3.52$ 15 degree angle of attack Pitot pressure data, and the Pitot pressure map for this case was corrected by extrapolating the data across the region of base interference. The effect of interference was not apparent in any of the other contour plots and no further corrections were made. Individual data points which appeared to be obviously incorrect due to the base interference or otherwise have been deleted from the tabulated data given in Appendix B.

Comparison of the surface static pressure data with static pressures measured in the flow field near the surface indicates agreement is not too good, particularly in the 5 degree angle of attack cases. This should not be too surprising since the static pressure ratios in the flow field were computed from the measured Mach number and Pitot pressure, and the error in static pressure will range from two to seven times the error in the Mach number depending upon the Mach number. It is hoped that the flow field static pressure results at least indicate the correct trends.

CONCLUDING REMARKS

The flow field at one station ($X/D = 6.5$) on an ogive cylinder of fineness ratio 4 was surveyed at Mach 3.52 and 4.07 and angles of attack of 0, 5, 10 and 15 degrees.

The experimental results have been compared with those of two previous investigations and with theoretical values for the inviscid flow field calculated by the method of characteristics. The experimental results from all three investigations are reasonably consistent and in fairly good agreement with the theoretical results in regions of the flow fields where comparisons are valid.

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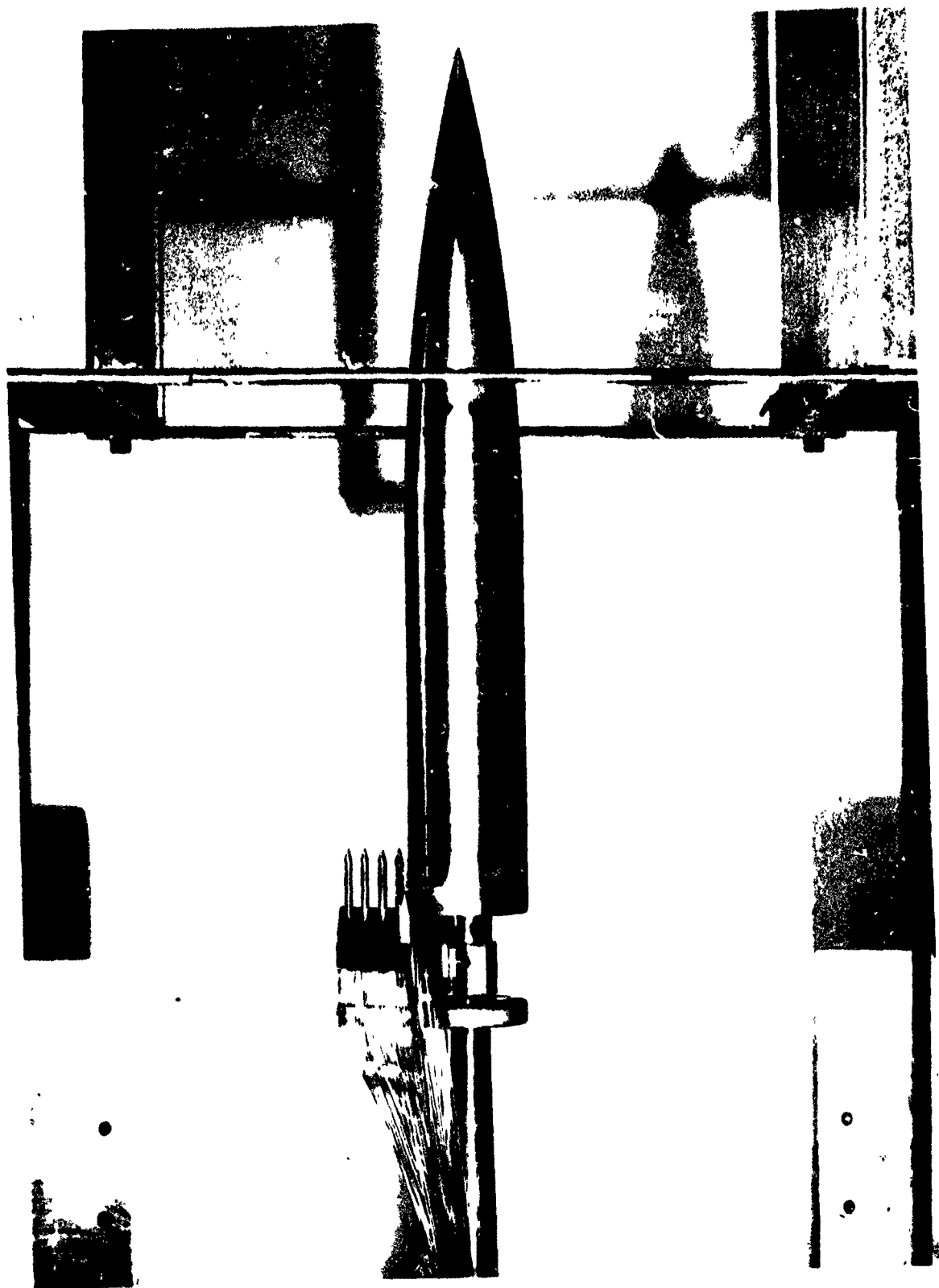


FIG. 1 FLOW FIELD SURVEY APPARATUS IN WIND TUNNEL

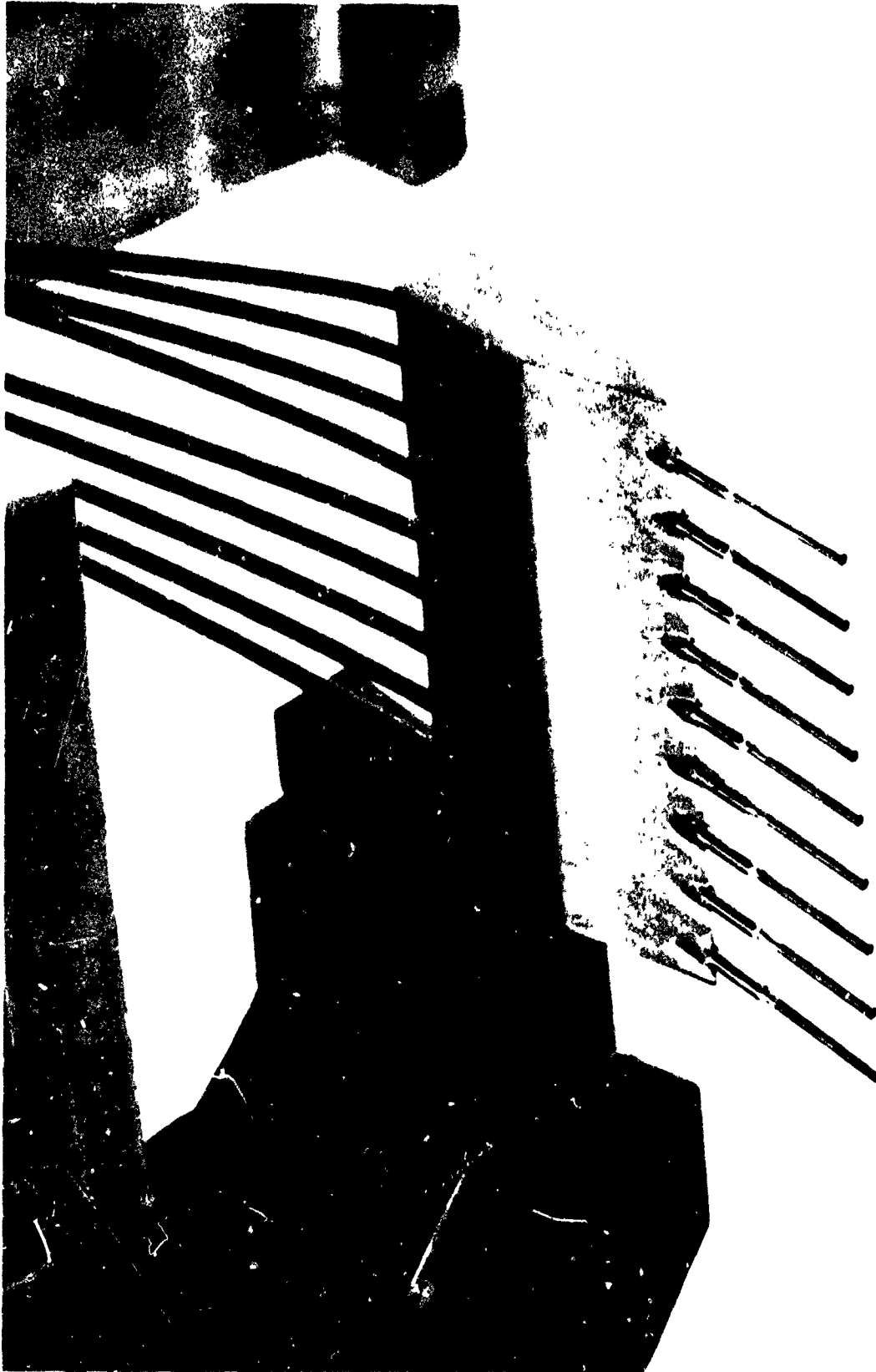


FIG. 2 PITOT TUBE RAKE



FIG. 3 CONE PROBE RAKE

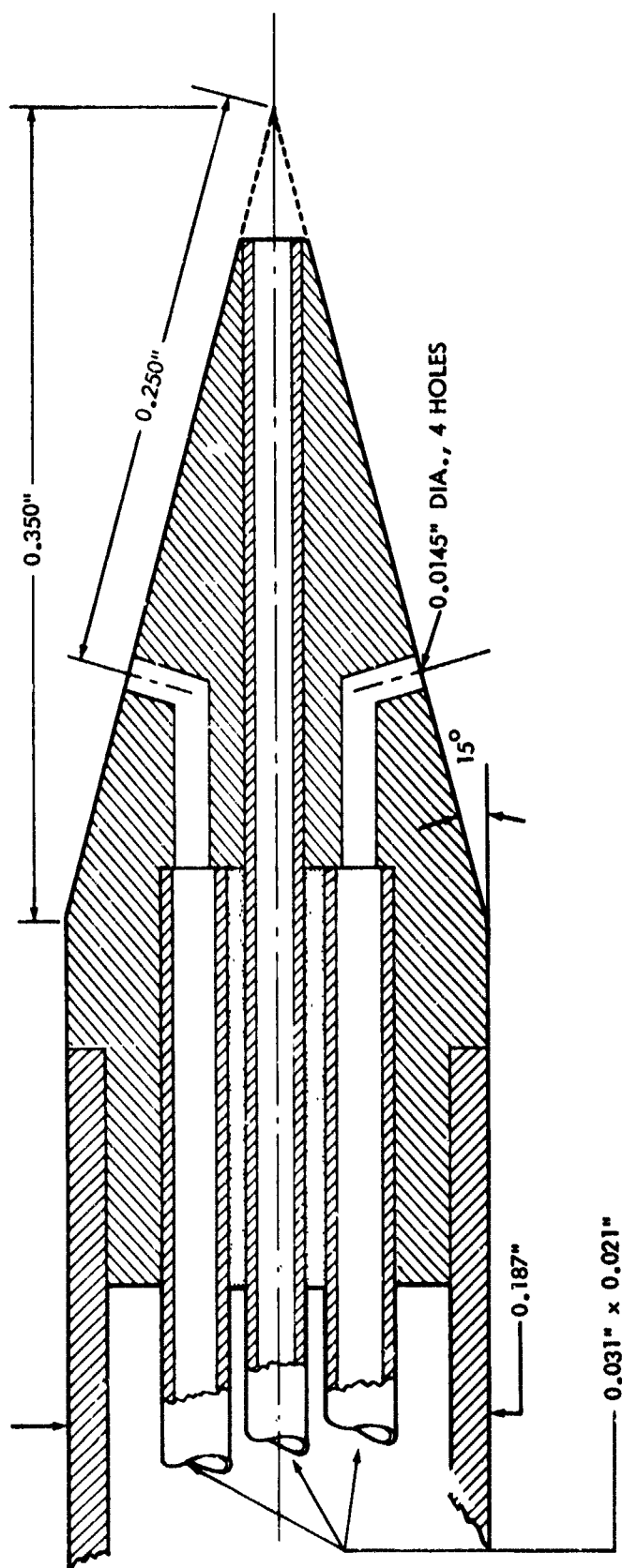


FIG. 4 TYPICAL CONE PROBE DIMENSIONS

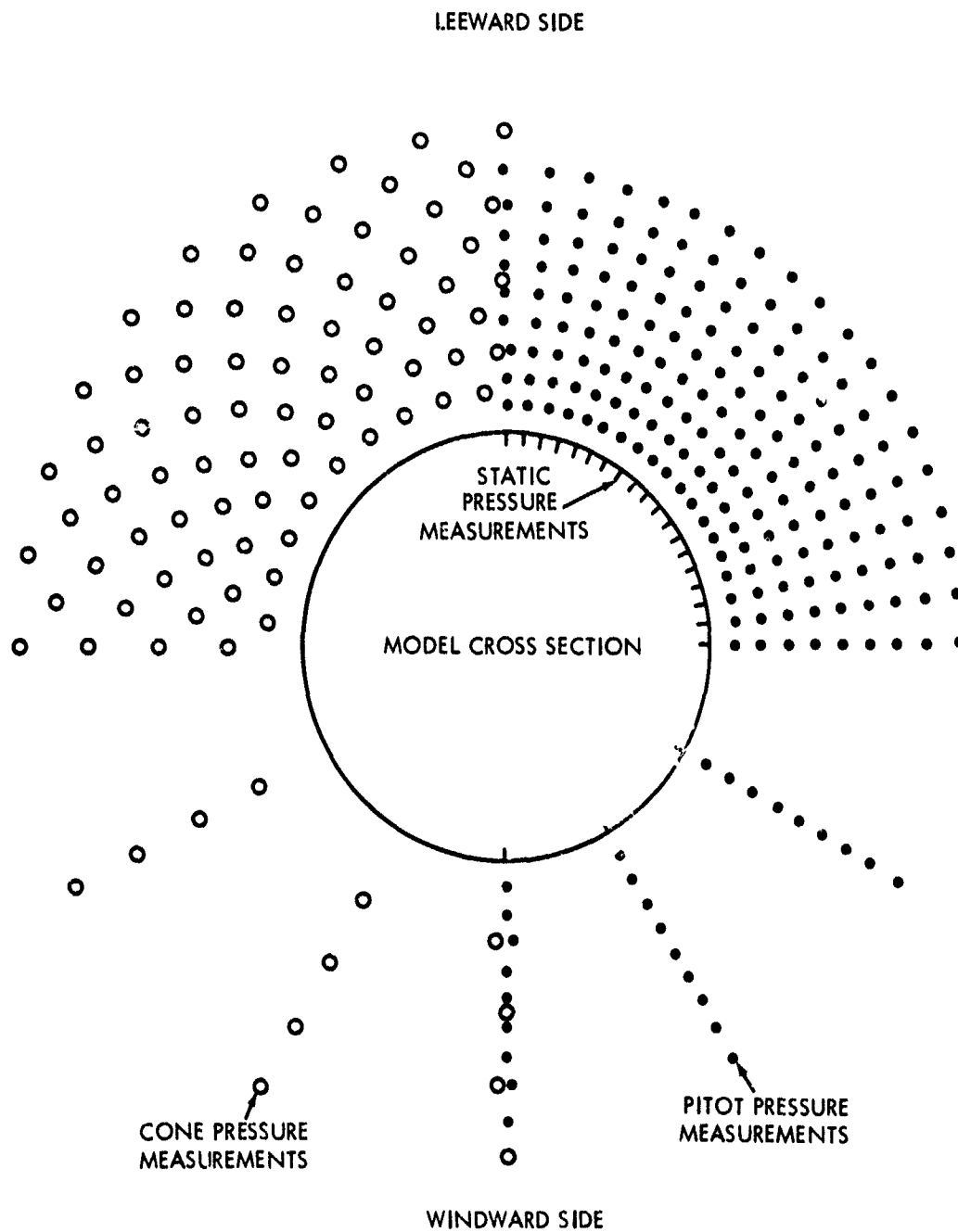


FIG. 5 PATTERN OF PRESSURE MEASUREMENTS FOR FLOW-FIELD SURVEY TESTS

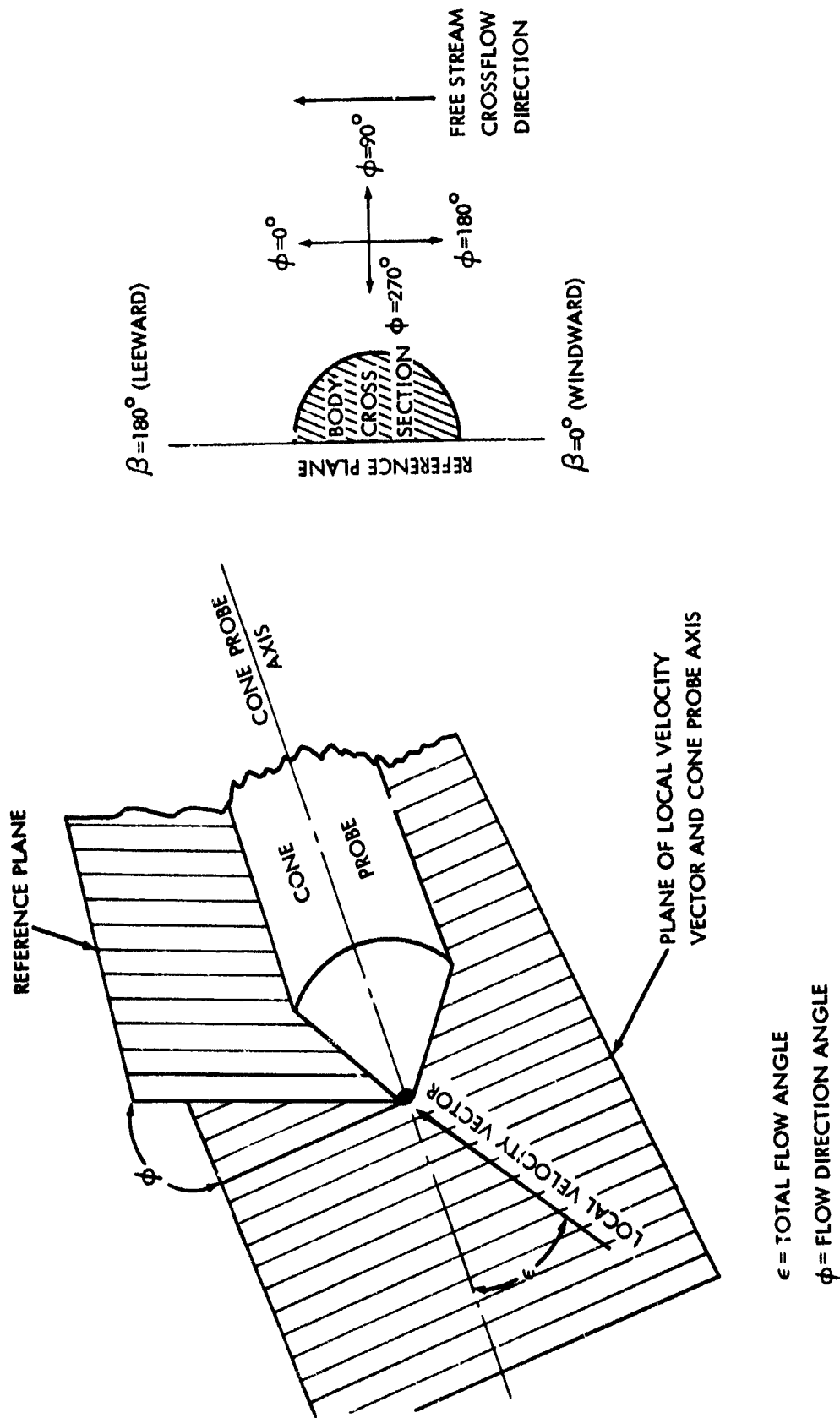


FIG. 6 FLOW DIRECTION CONVENTIONS

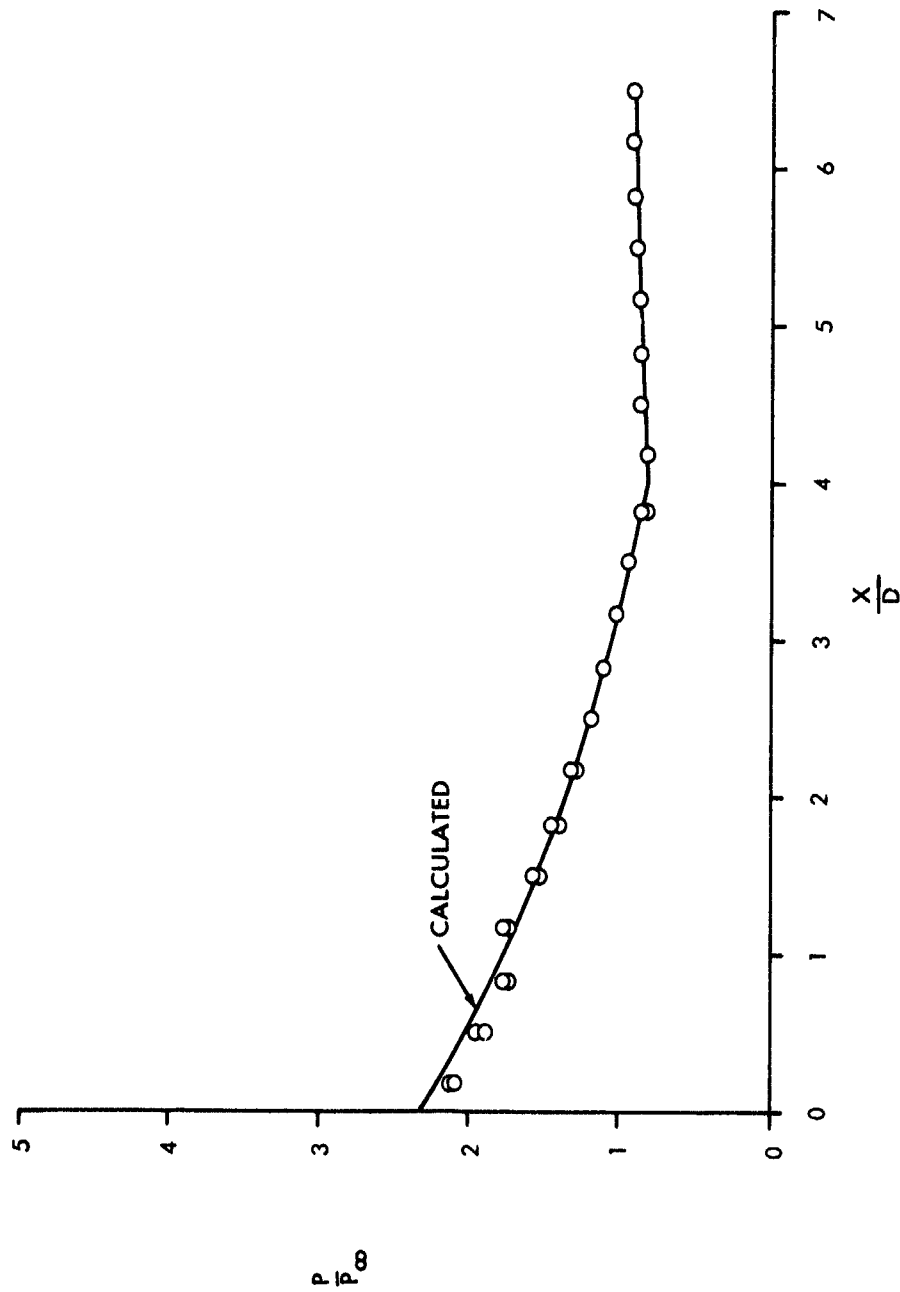


FIG. 7 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 3.52$ AND $\alpha = 0^\circ$

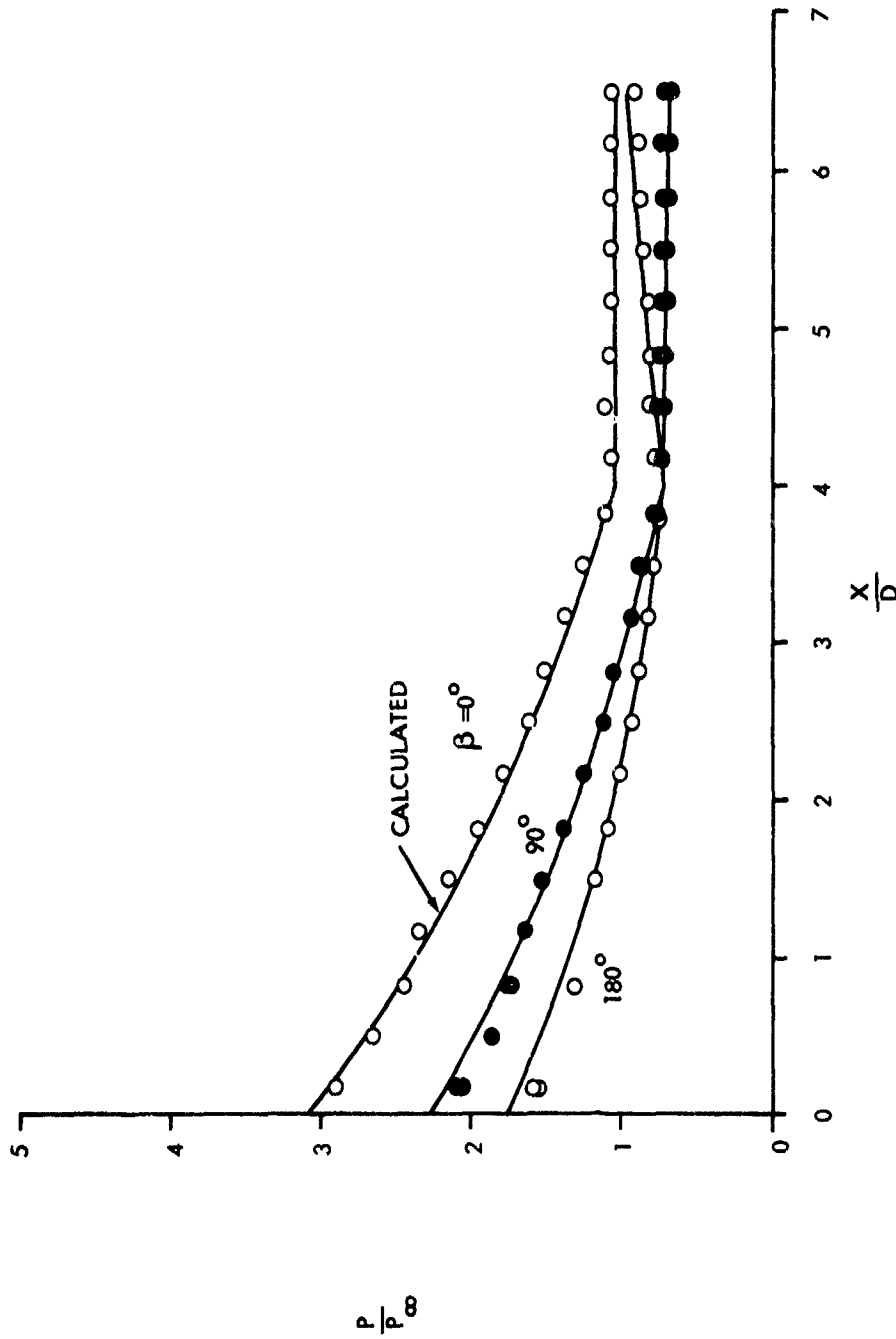


FIG. 8 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 3.52$ AND $\alpha = 5^\circ$

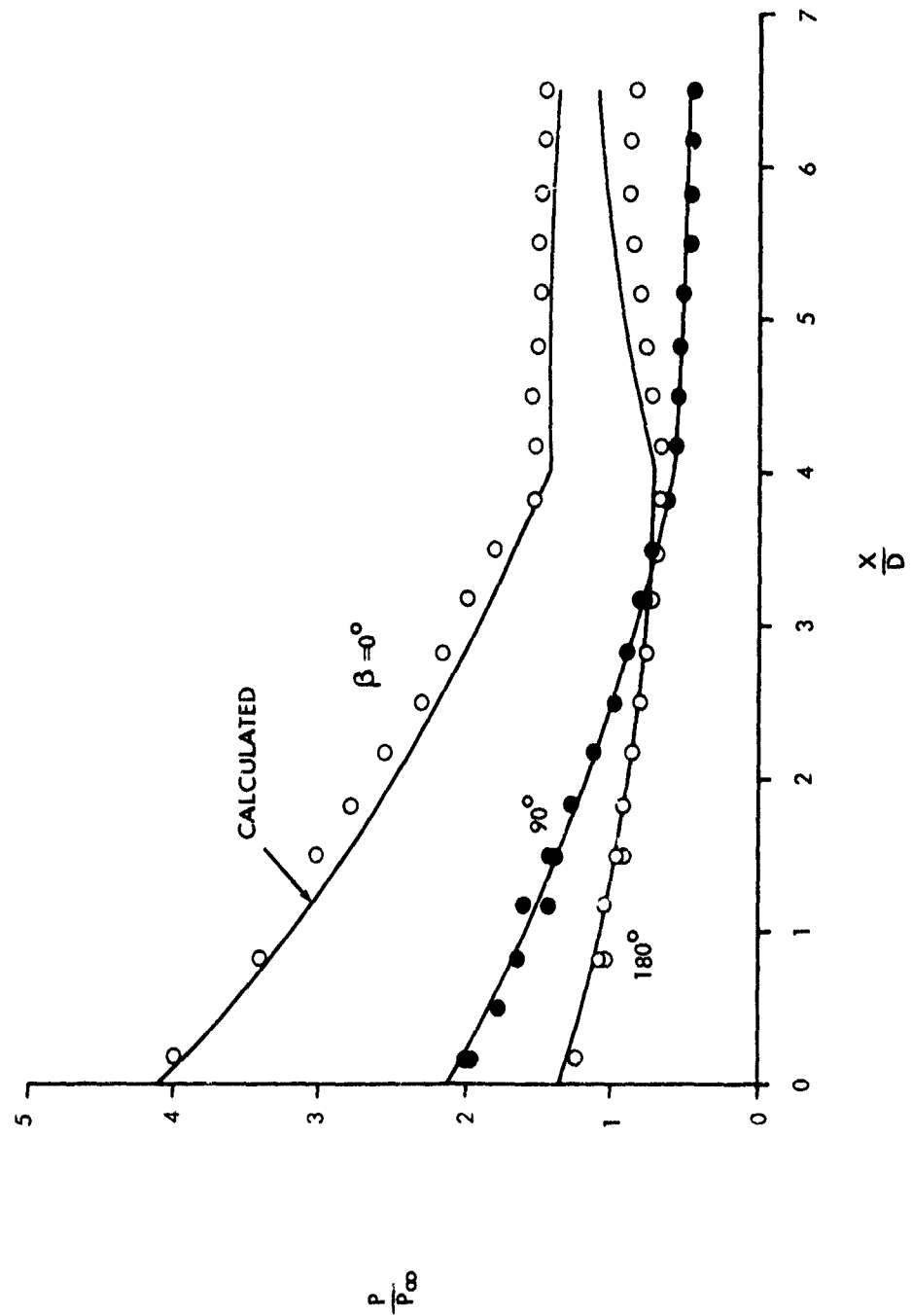


FIG. 9 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 3.52$ AND $\alpha = 10^\circ$

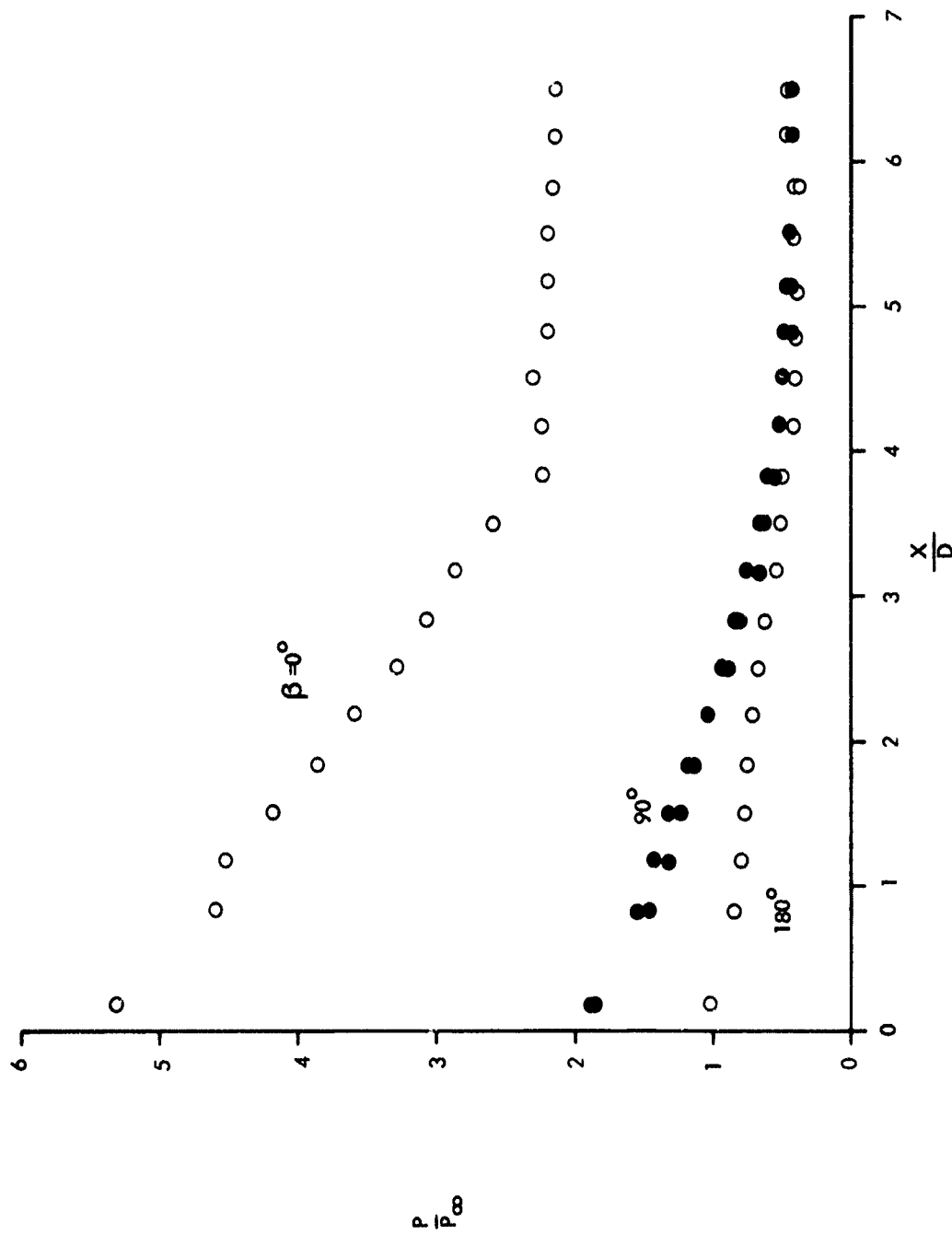


FIG. 10 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 3.52$ AND $\alpha = 15^\circ$

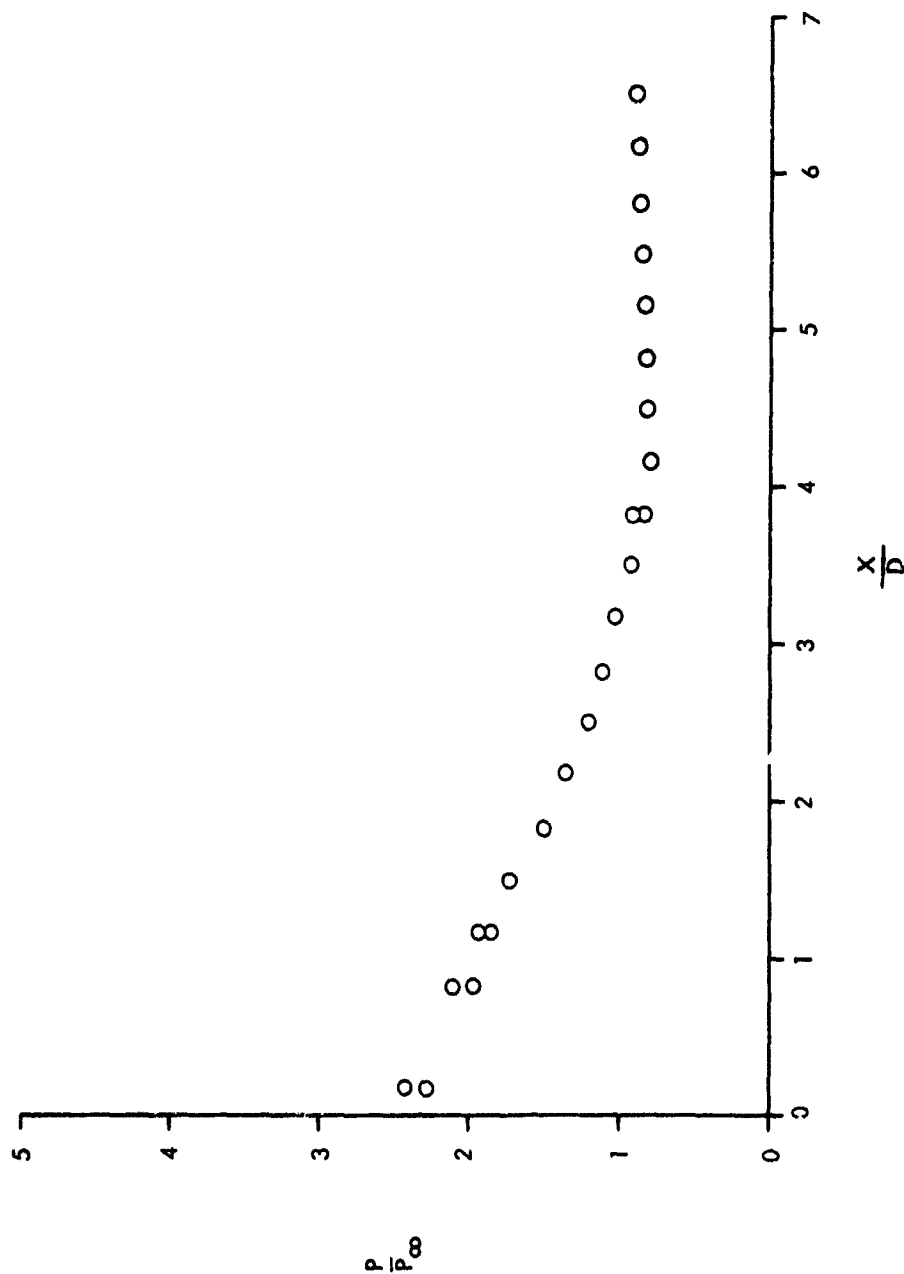


FIG. 11 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 4.07$ AND $\alpha = 0^\circ$

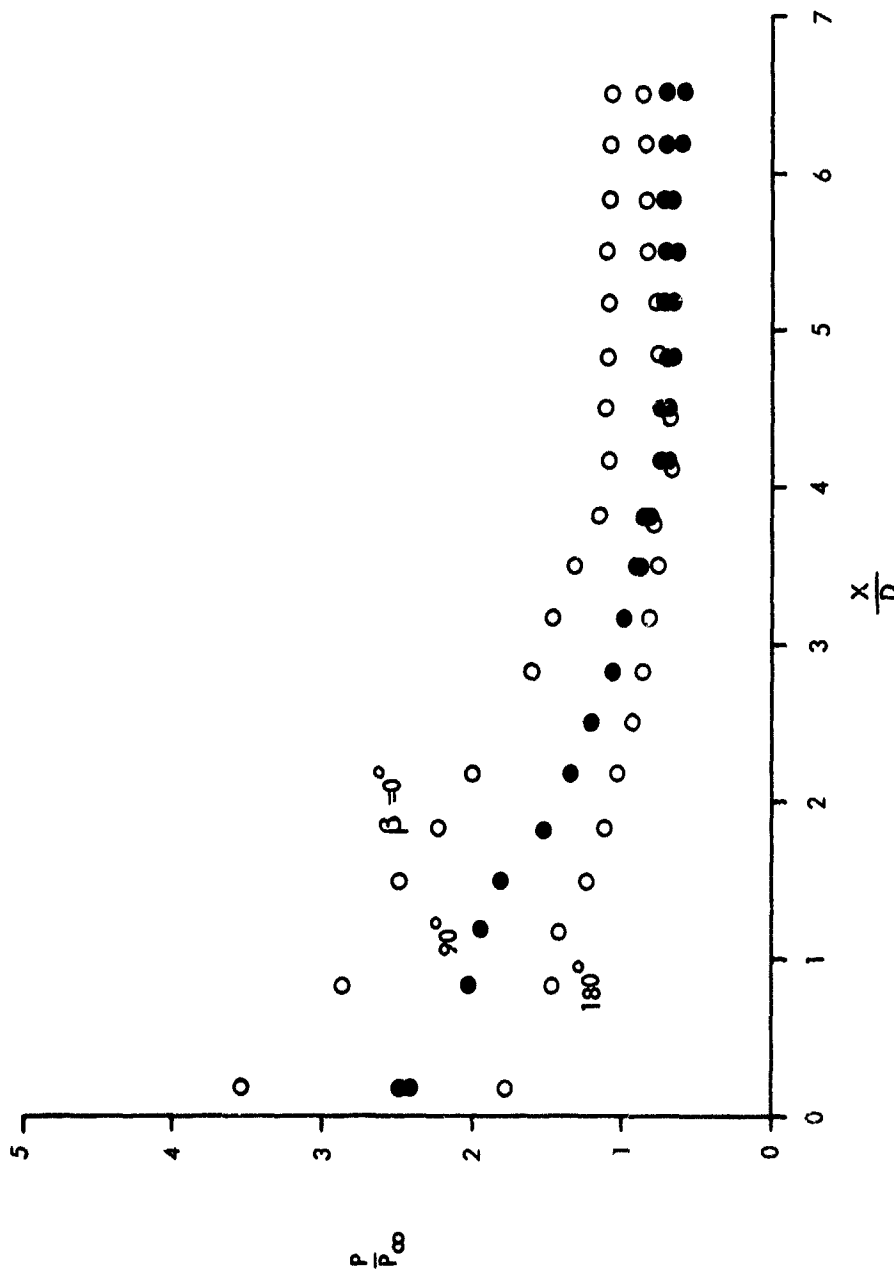


FIG. 12 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 4.07$ AND $\alpha = 5^\circ$

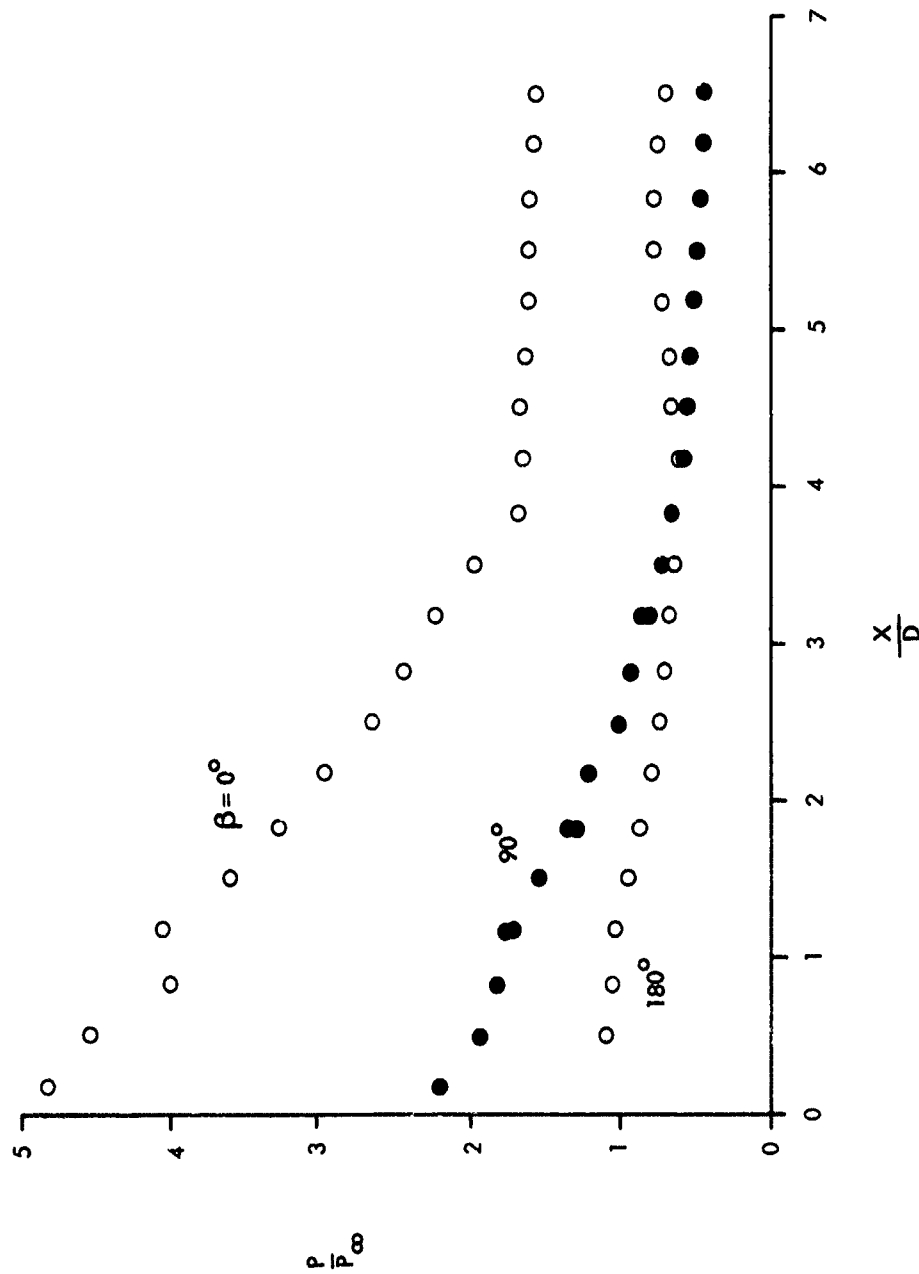


FIG. 13 STATIC PRESSURE ALONG MODEL SURFACE, $M_{\infty} = 4.07$ AND $\alpha = 10^\circ$

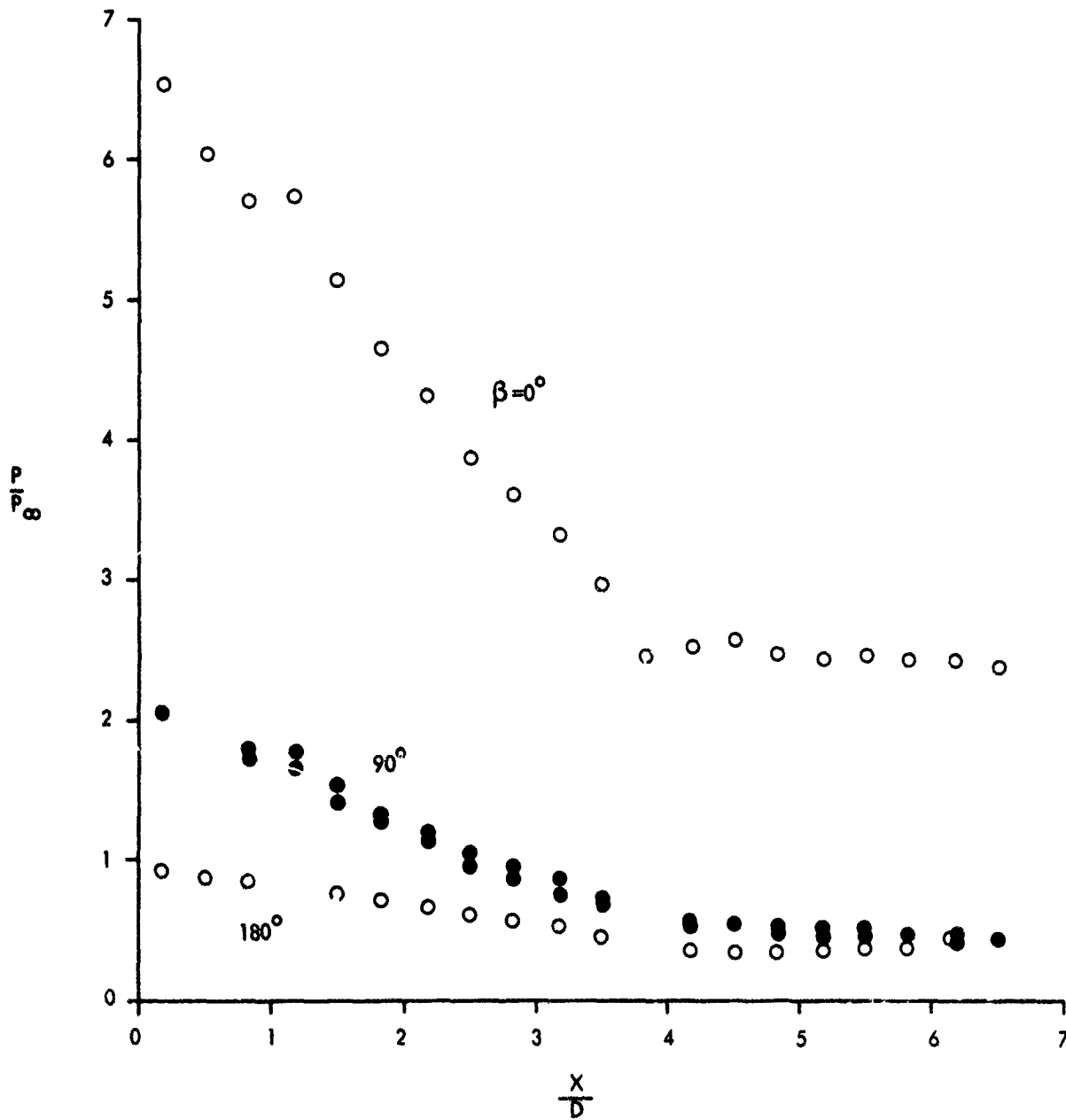


FIG. 14 STATIC PRESSURE ALONG MODEL SURFACE, $M_\infty = 4.07$ AND $\alpha = 15^\circ$

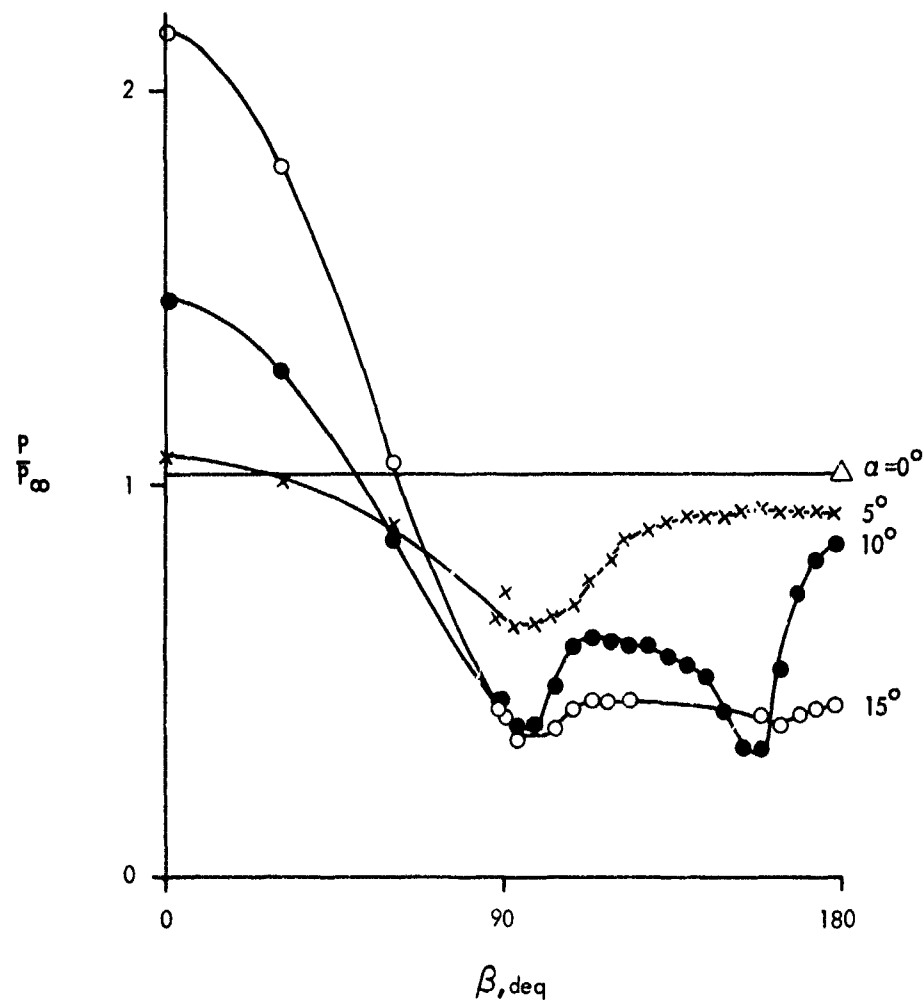


FIG. 15 SURFACE STATIC PRESSURE DISTRIBUTION AT $\frac{x}{D} = 6.5$, $M_\infty = 3.52$

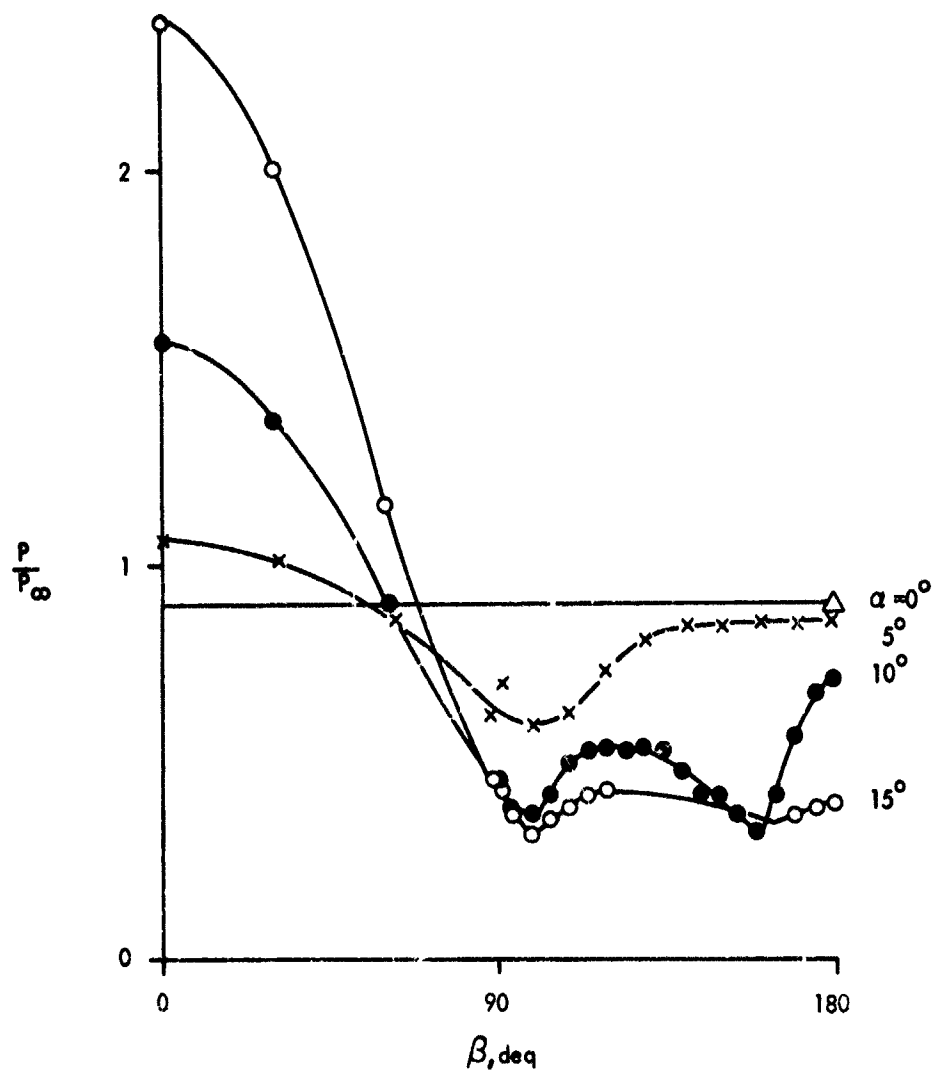


FIG. 16 SURFACE STATIC PRESSURE DISTRIBUTION AT $\frac{X}{D} = 6.5$, $M_\infty = 4.07$

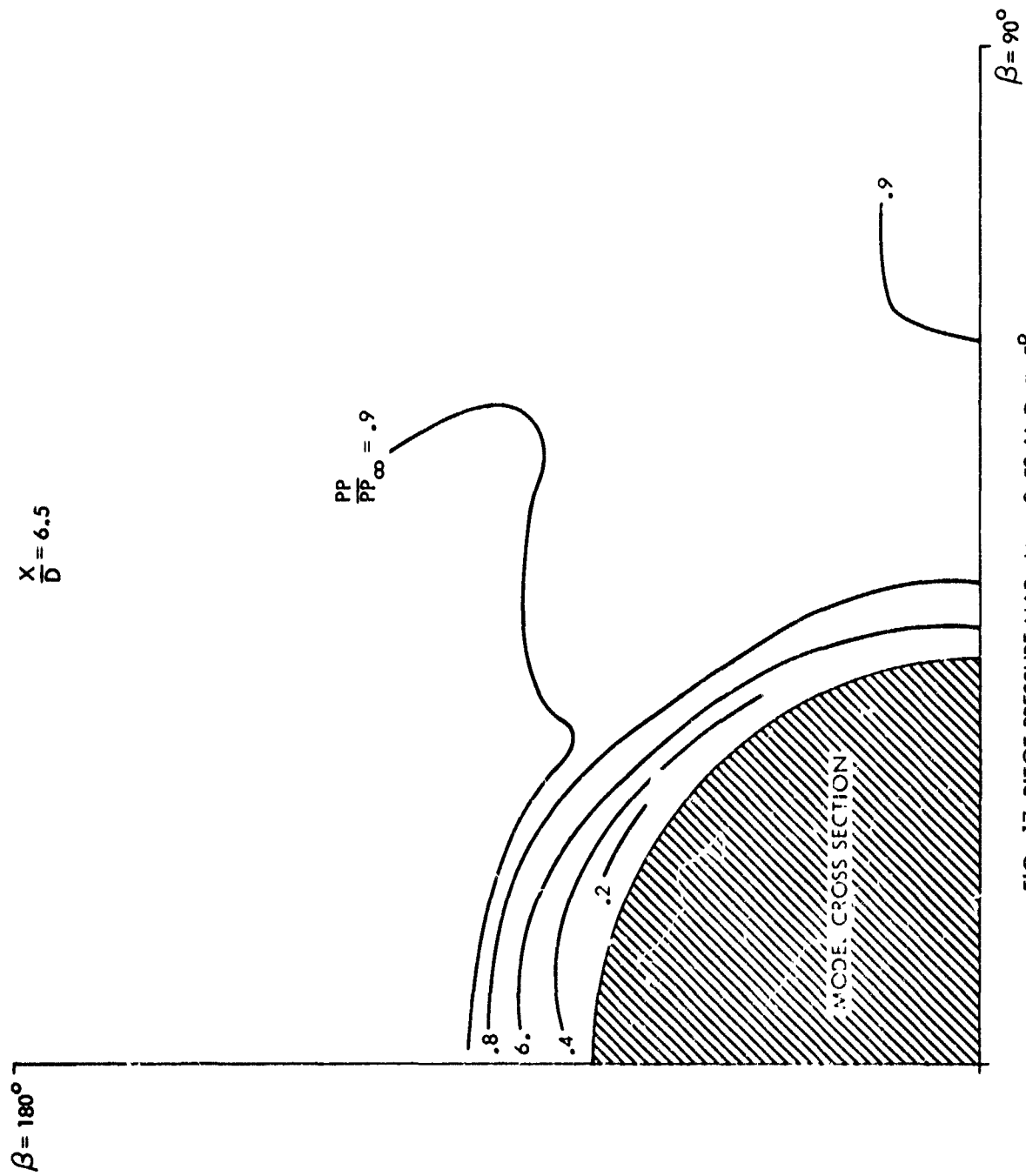


FIG. 17 PITOT PRESSURE MAP, $M_\infty = 3.52$ AT $\alpha = 5^\circ$

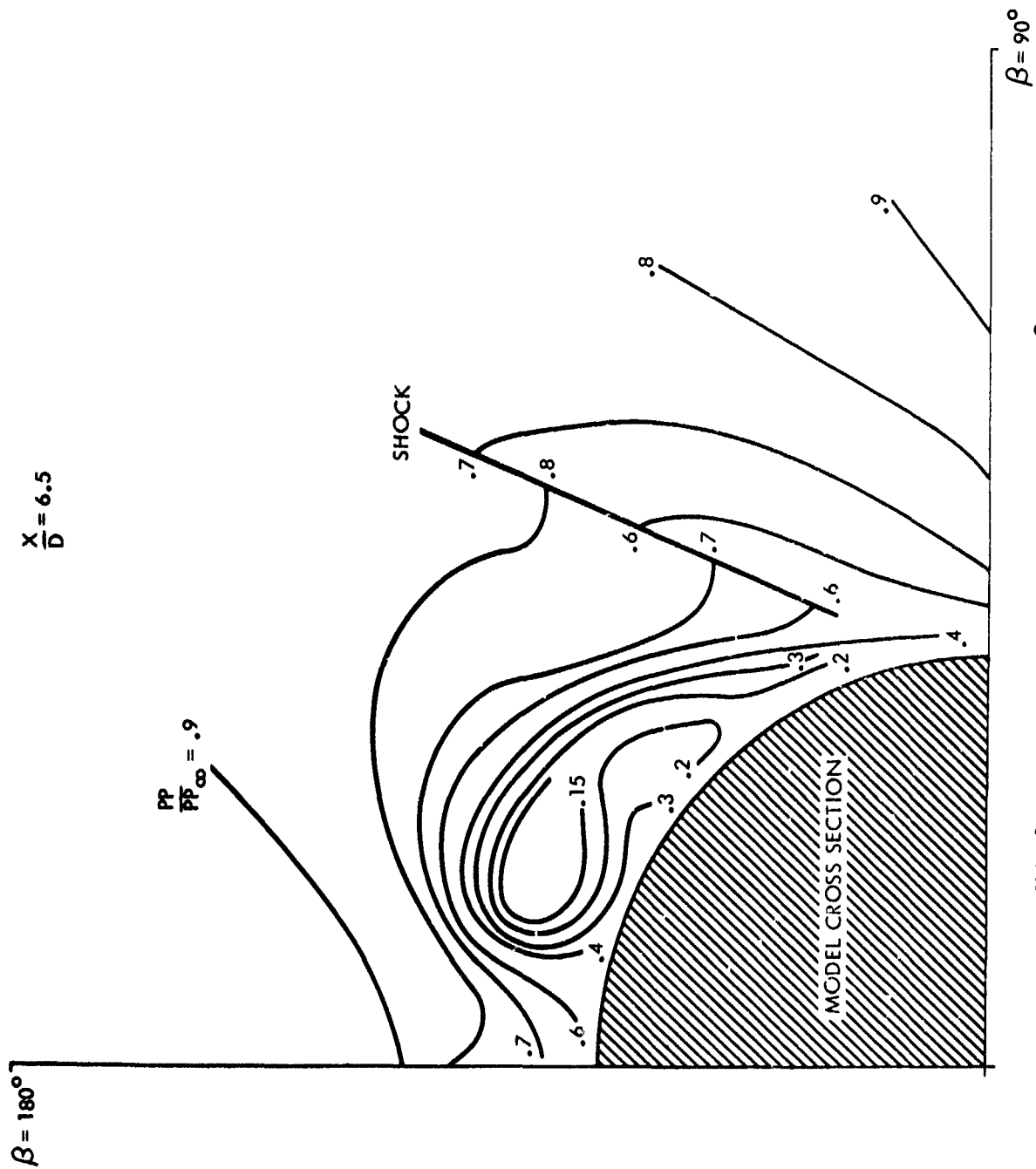


FIG. 18 PITOT PRESSURE MAP, $M_\infty = 3.52$ AND $\alpha = 10^\circ$

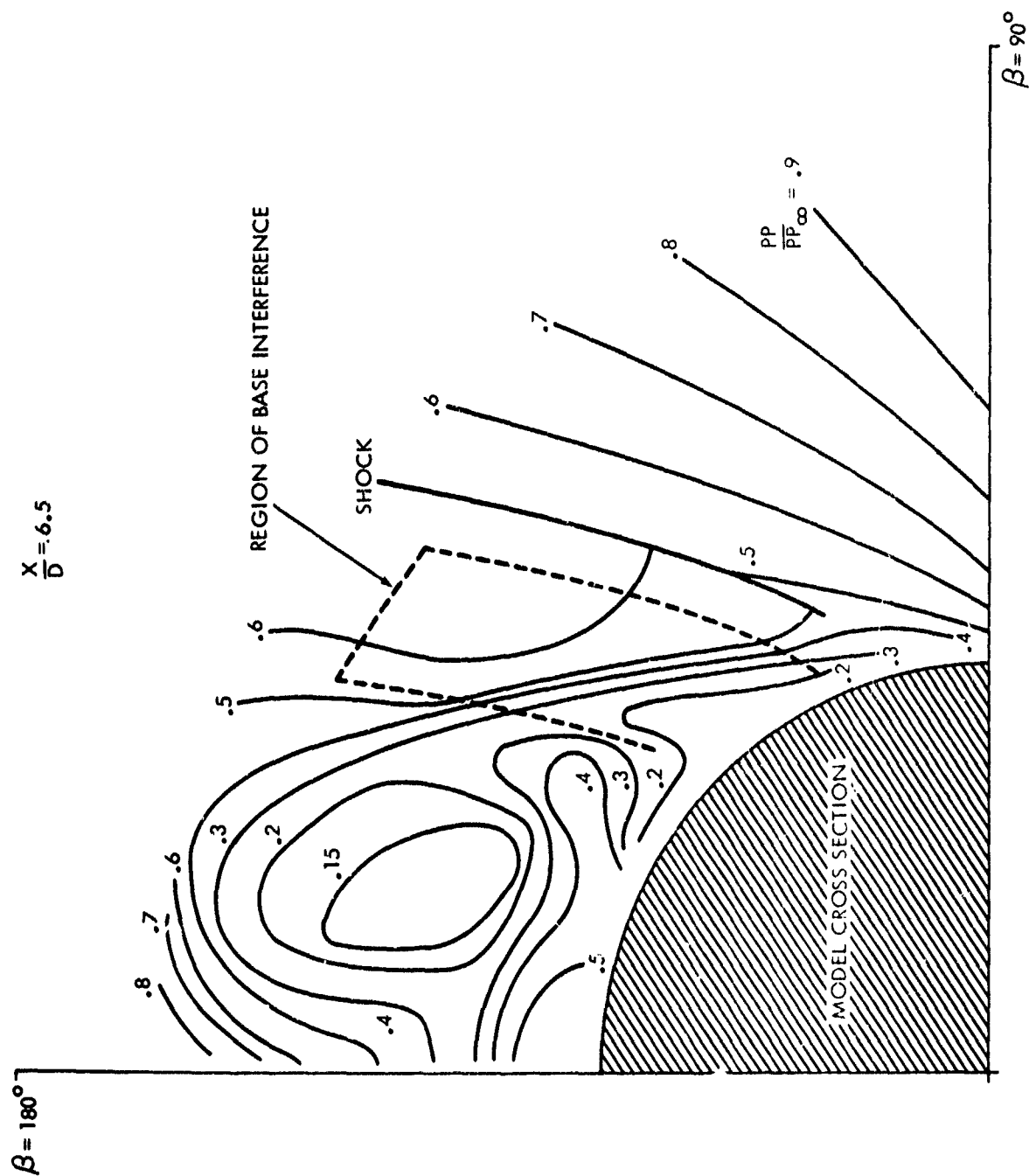


FIG. 19 PITOT PRESSURE MAP, $M_\infty = 3.52$ AND $\alpha = 15^\circ$

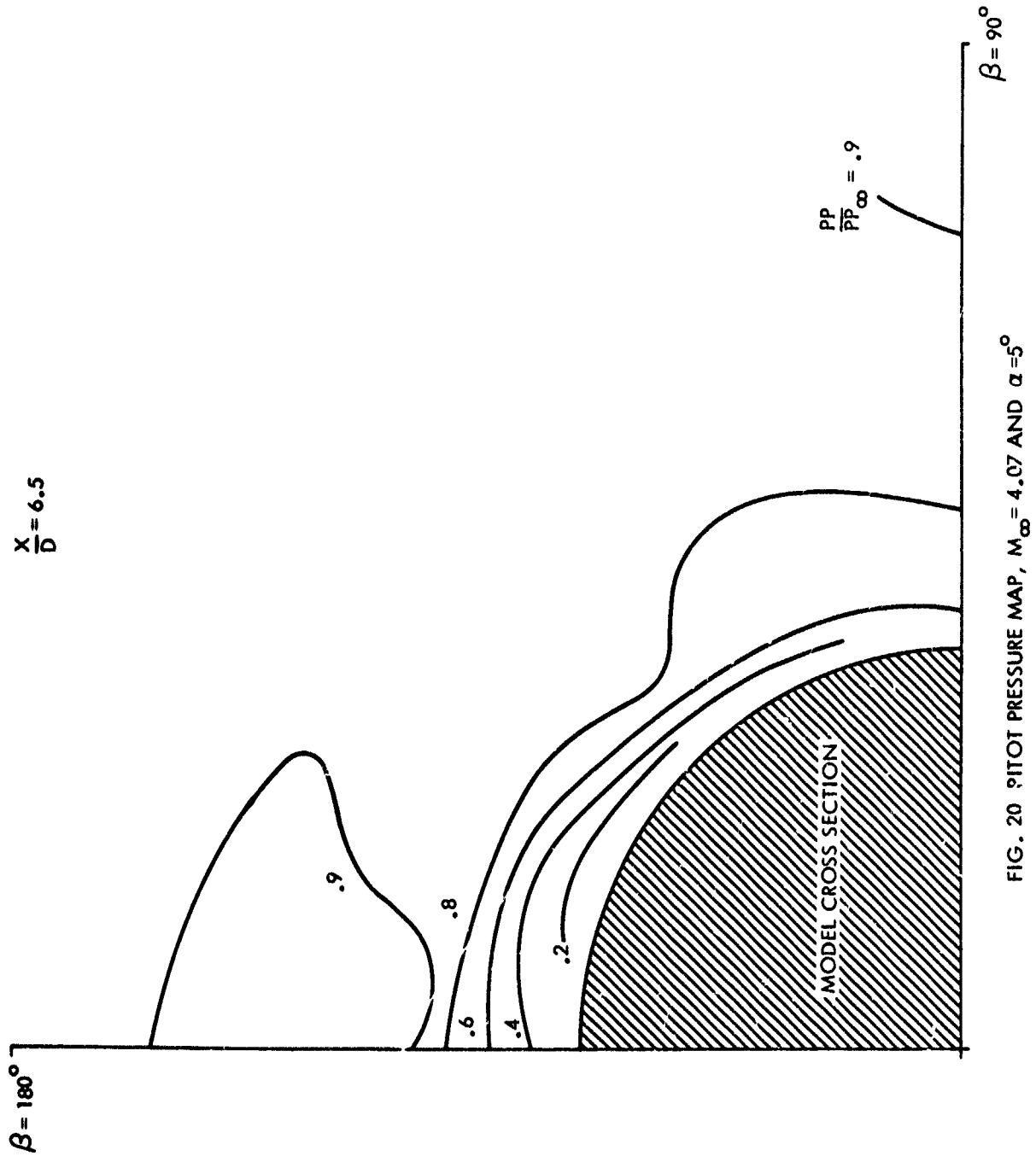


FIG. 20 PITOT PRESSURE MAP, $M_{\infty} = 4.07$ AND $\alpha = 5^\circ$

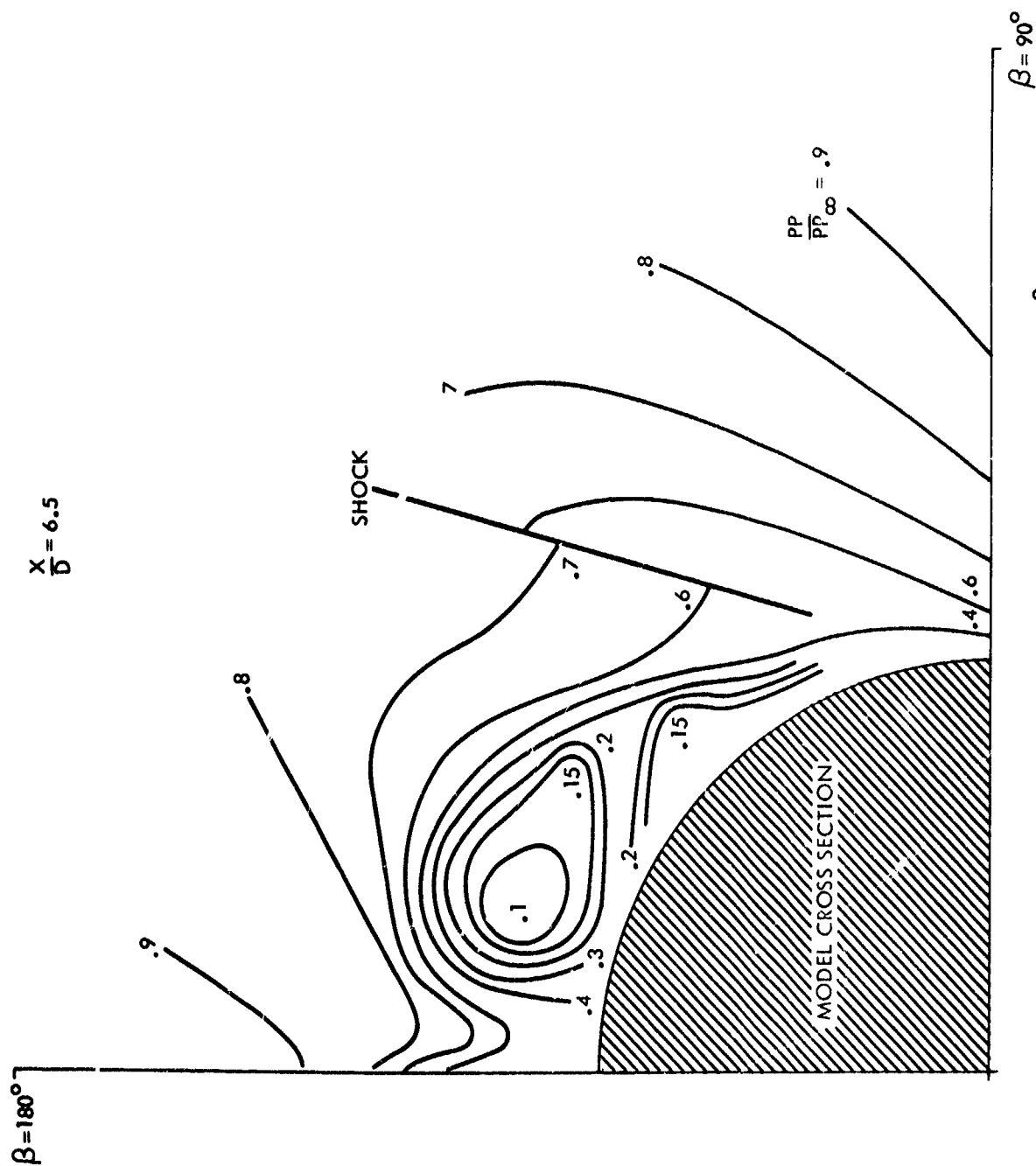


FIG. 21 PITOT PRESSURE MAP, $M_\infty = 4.07$ AND $\alpha = 10^\circ$

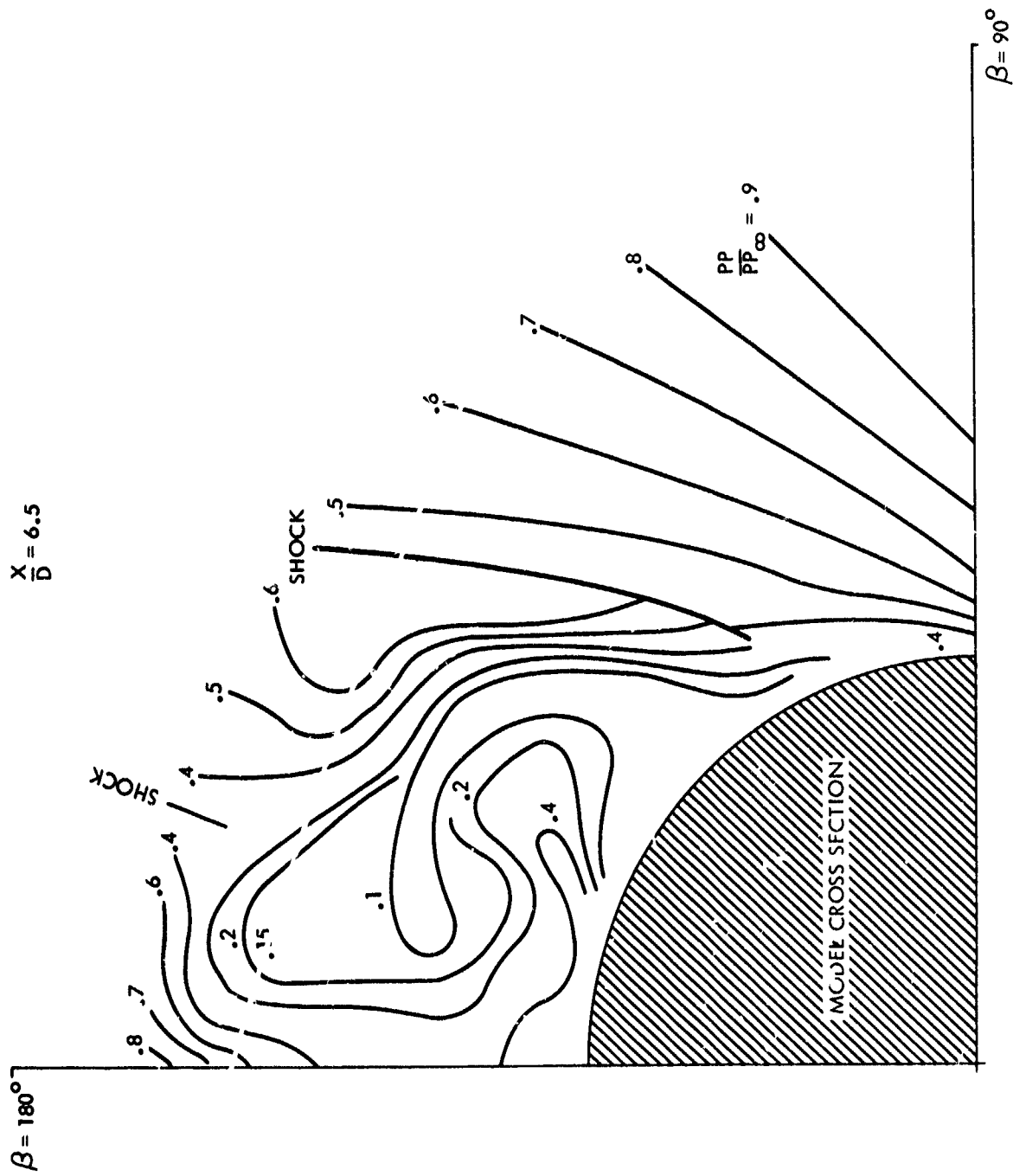


FIG. 22 PITOT PRESSURE MAP, $M_\infty = 4.07$ AND $\alpha = 15^\circ$

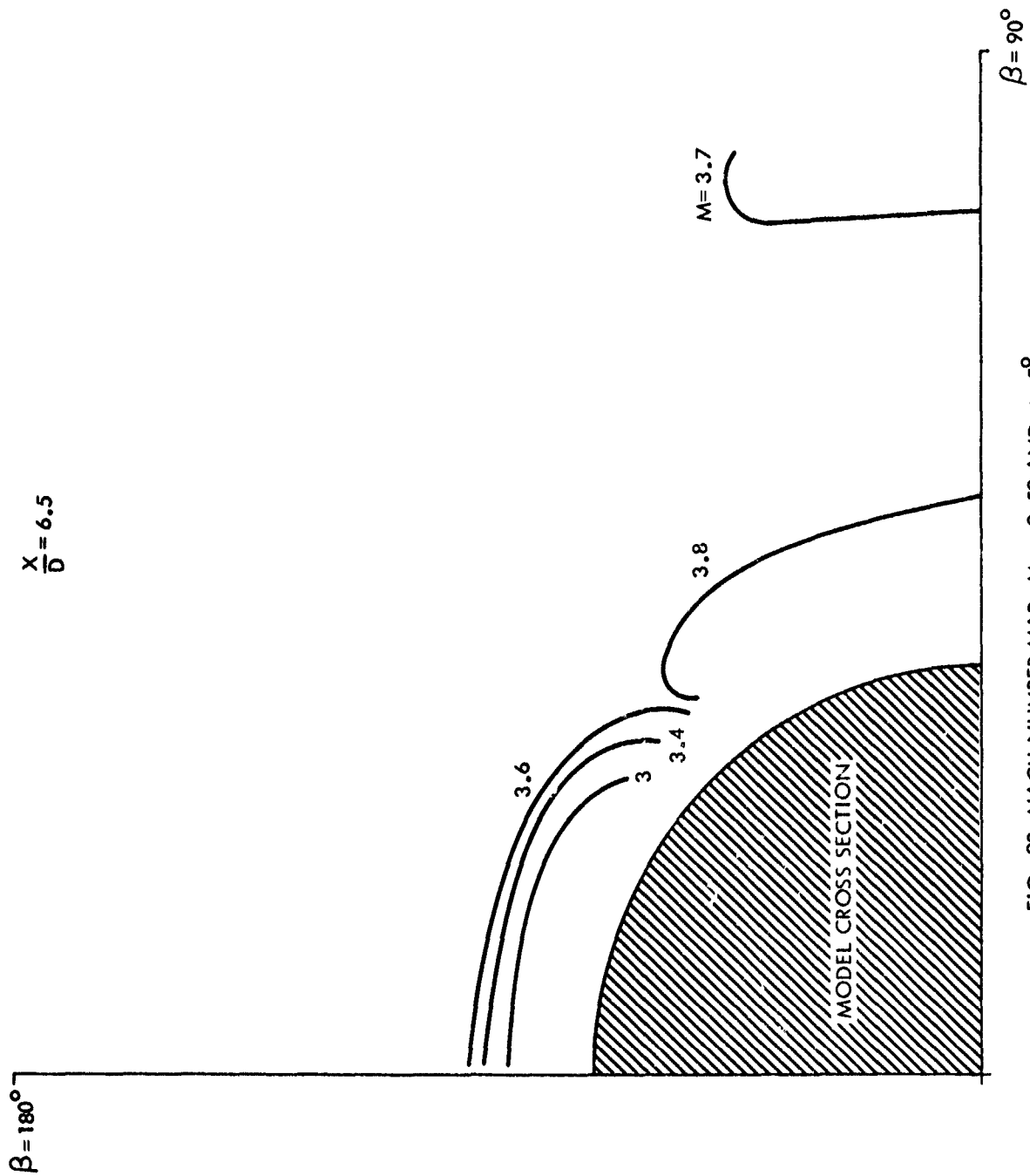


FIG. 23 MACH NUMBER MAP, $M_\infty = 3.52$ AND $\alpha = 5^\circ$

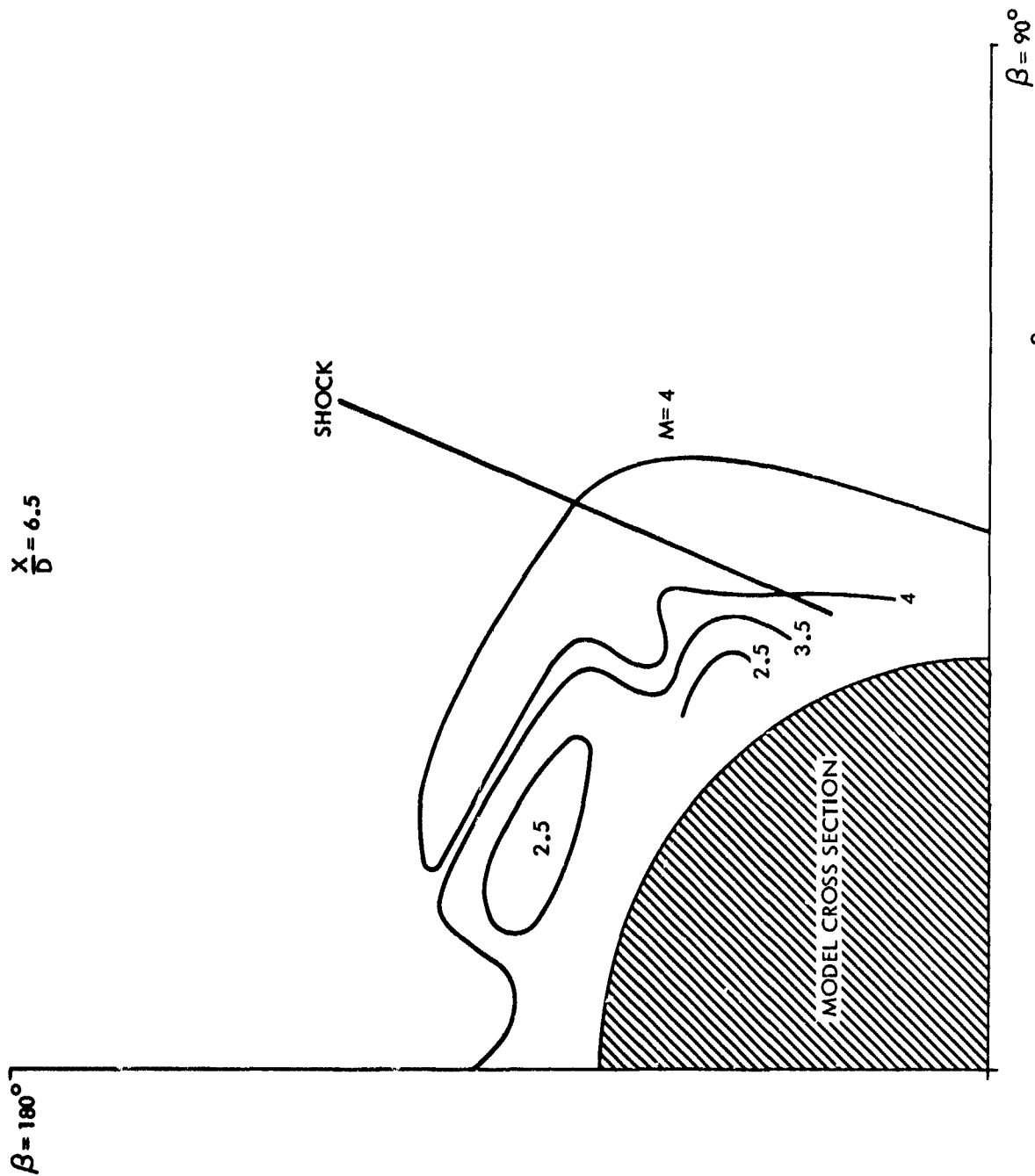


FIG. 24 MACH NUMBER MAP, $M_\infty = 3.52$ AND $\alpha = 10^\circ$

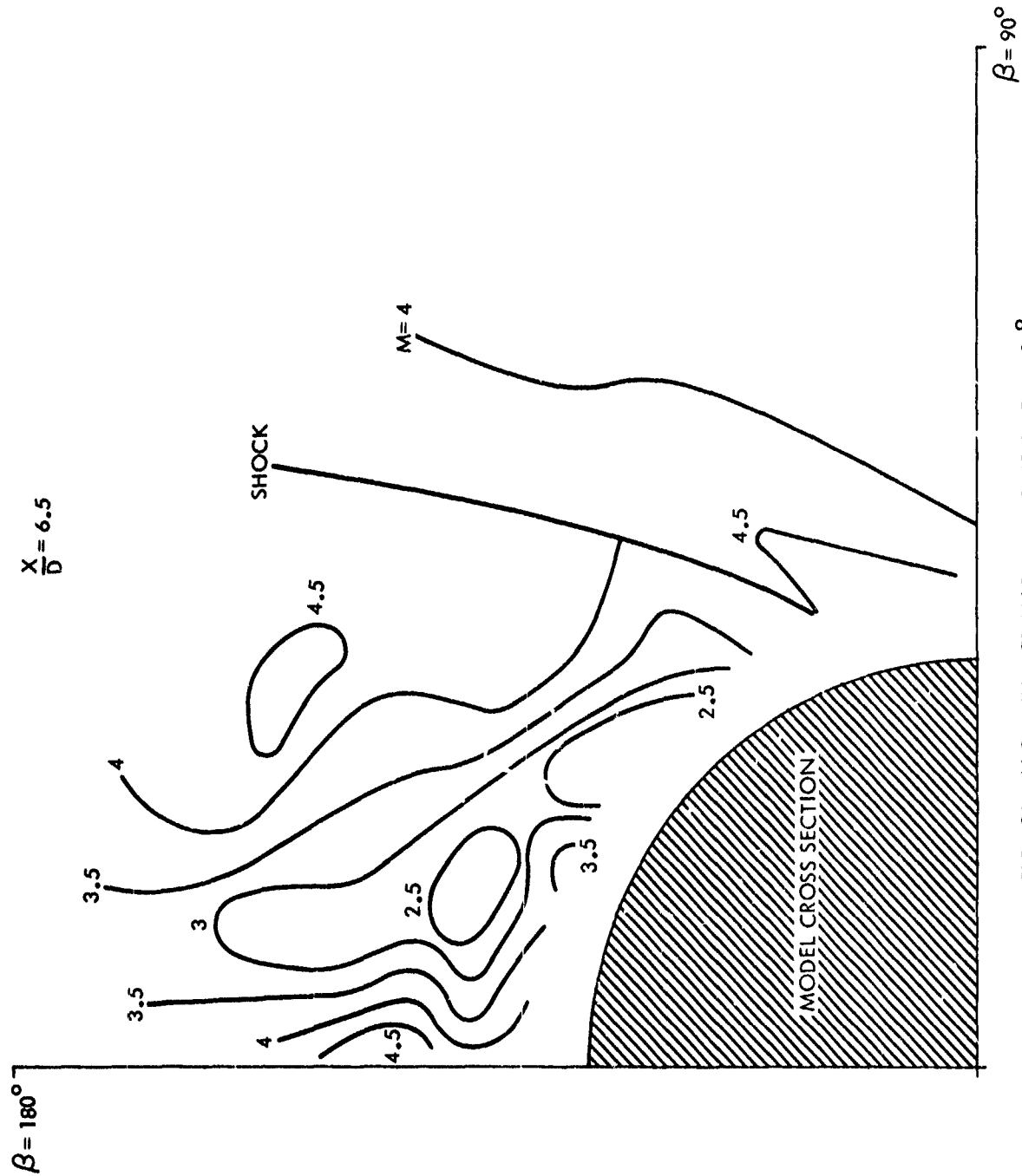


FIG. 25 MACH NUMBER MAP, $M_\infty = 3.52$ AND $\alpha = 15^\circ$

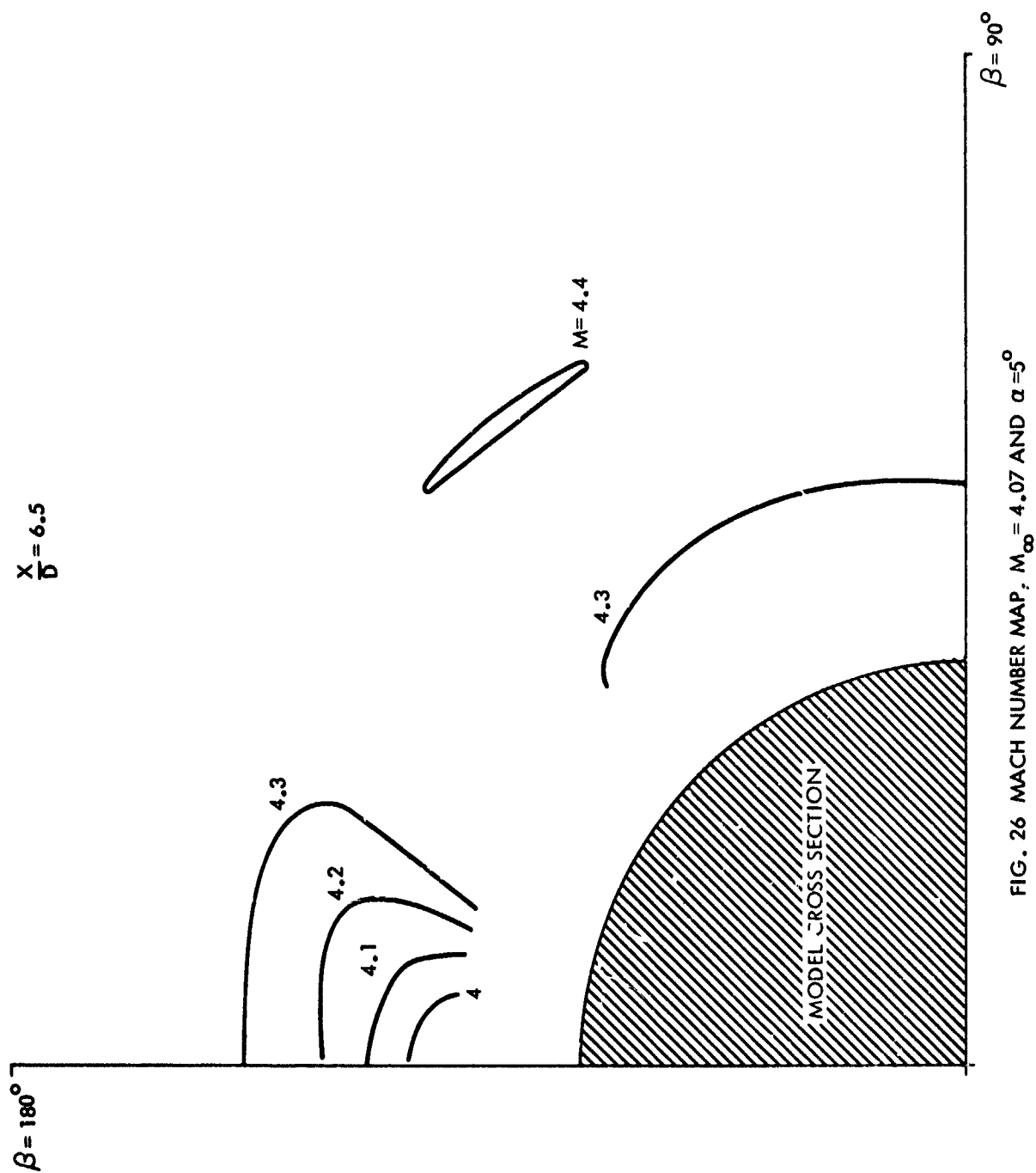
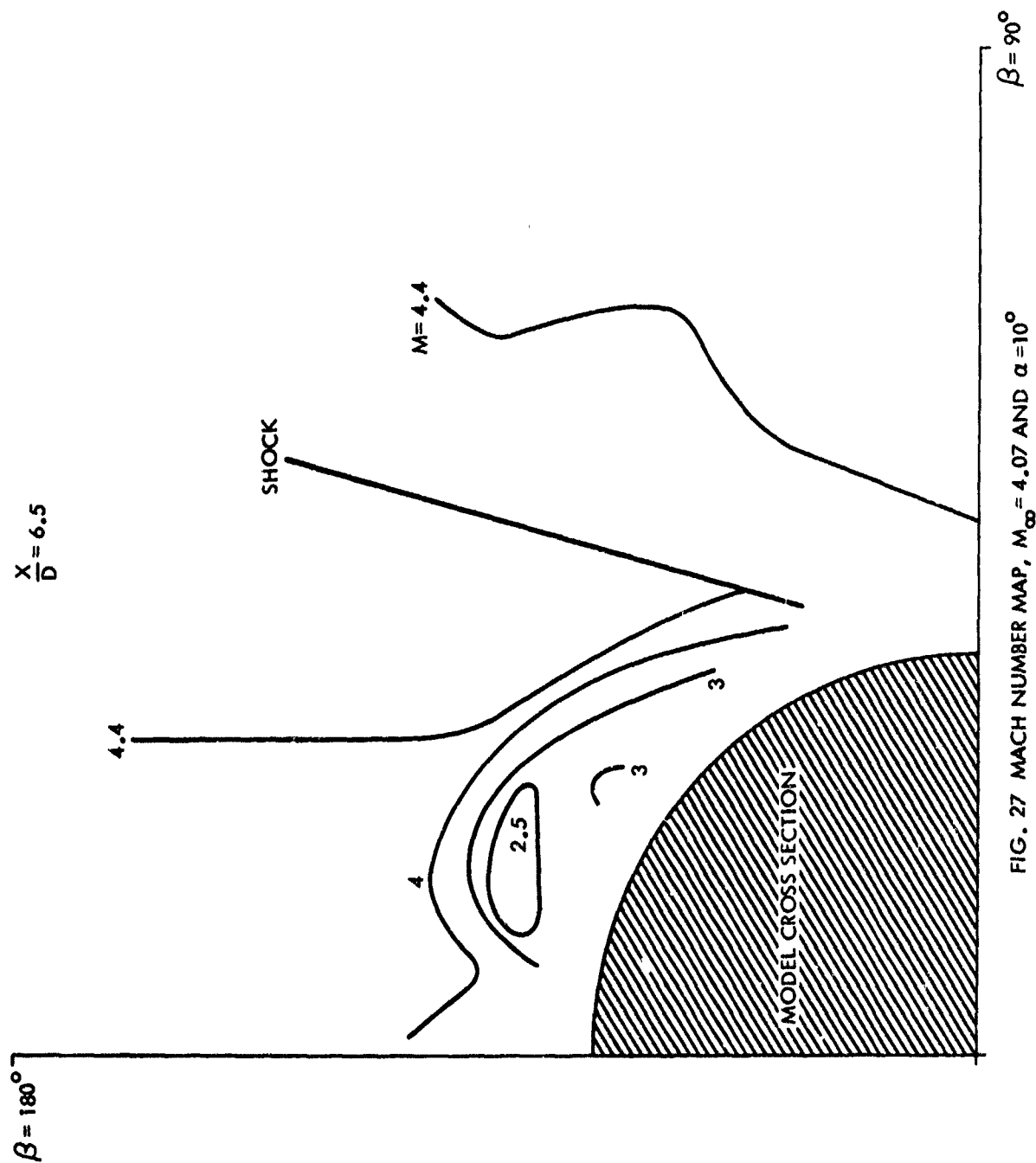


FIG. 26 MACH NUMBER MAP, $M_\infty = 4.07$ AND $\alpha = 5^\circ$



$\beta = 90^\circ$

FIG. 27 MACH NUMBER MAP, $M_\infty = 4.07$ AND $\alpha = 10^\circ$

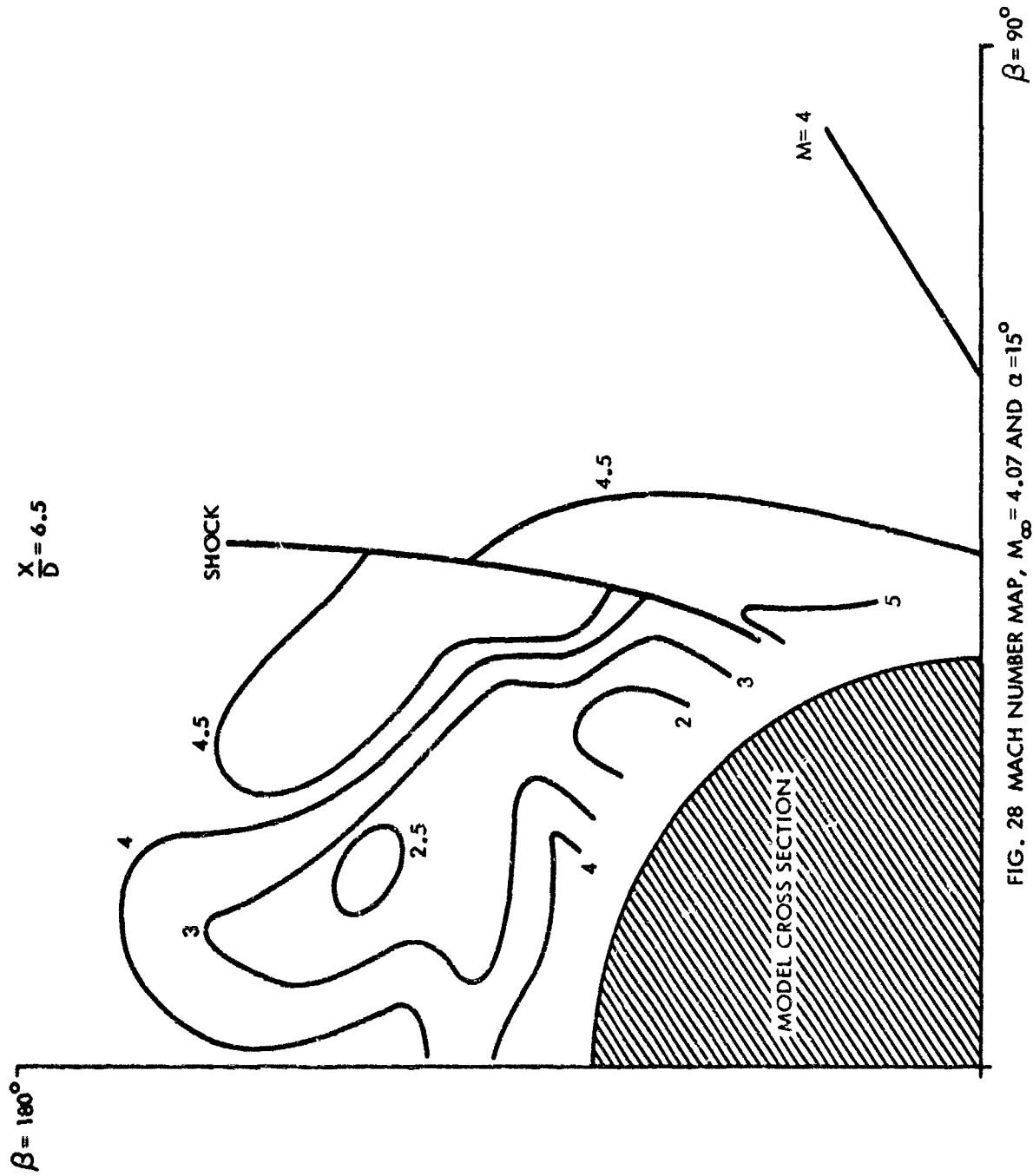


FIG. 28 MACH NUMBER MAP, $M_\infty = 4.07$ AND $\alpha = 15^\circ$

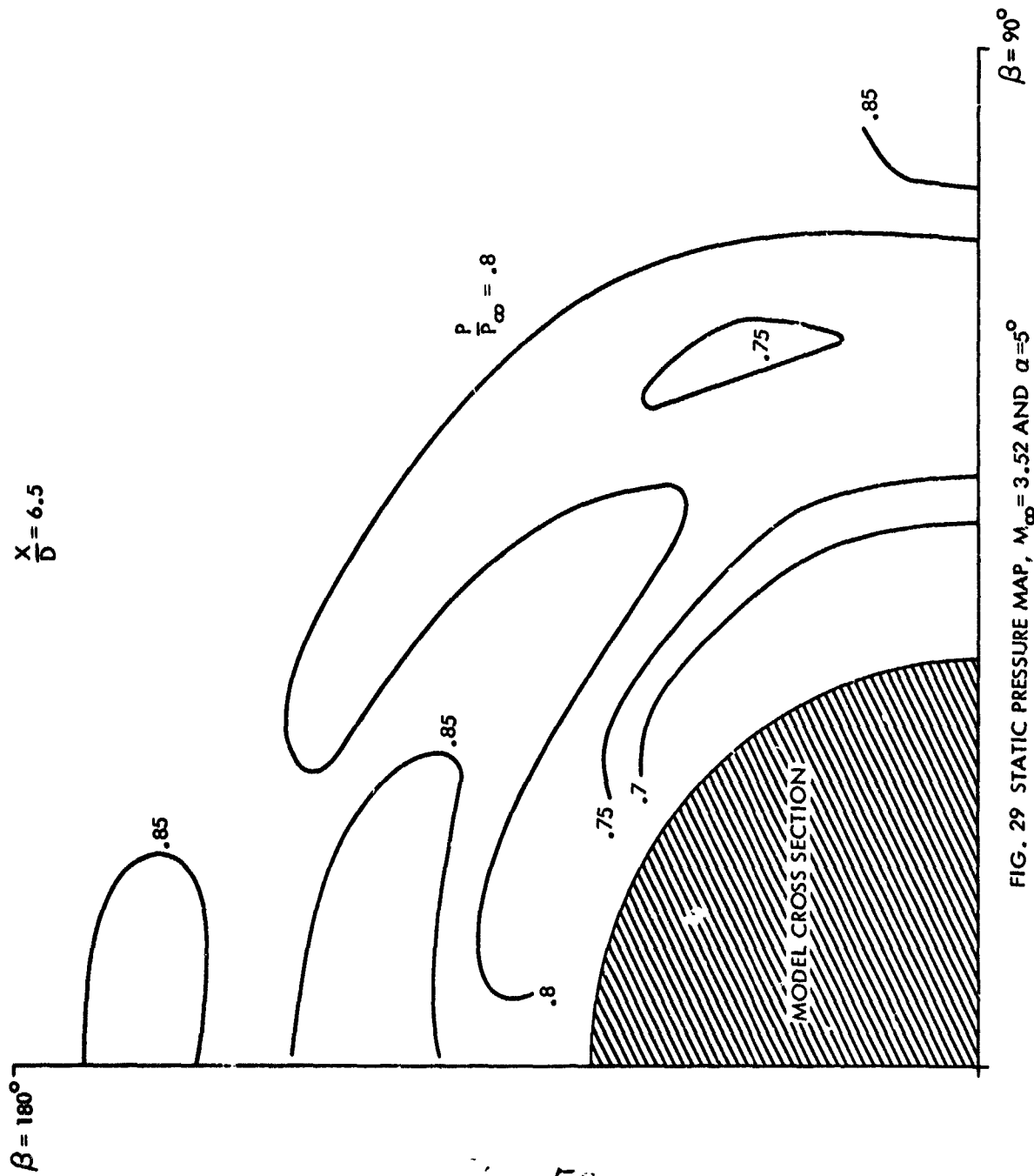


FIG. 29 STATIC PRESSURE MAP, $M_\infty = 3.52$ AND $\alpha = 5^\circ$

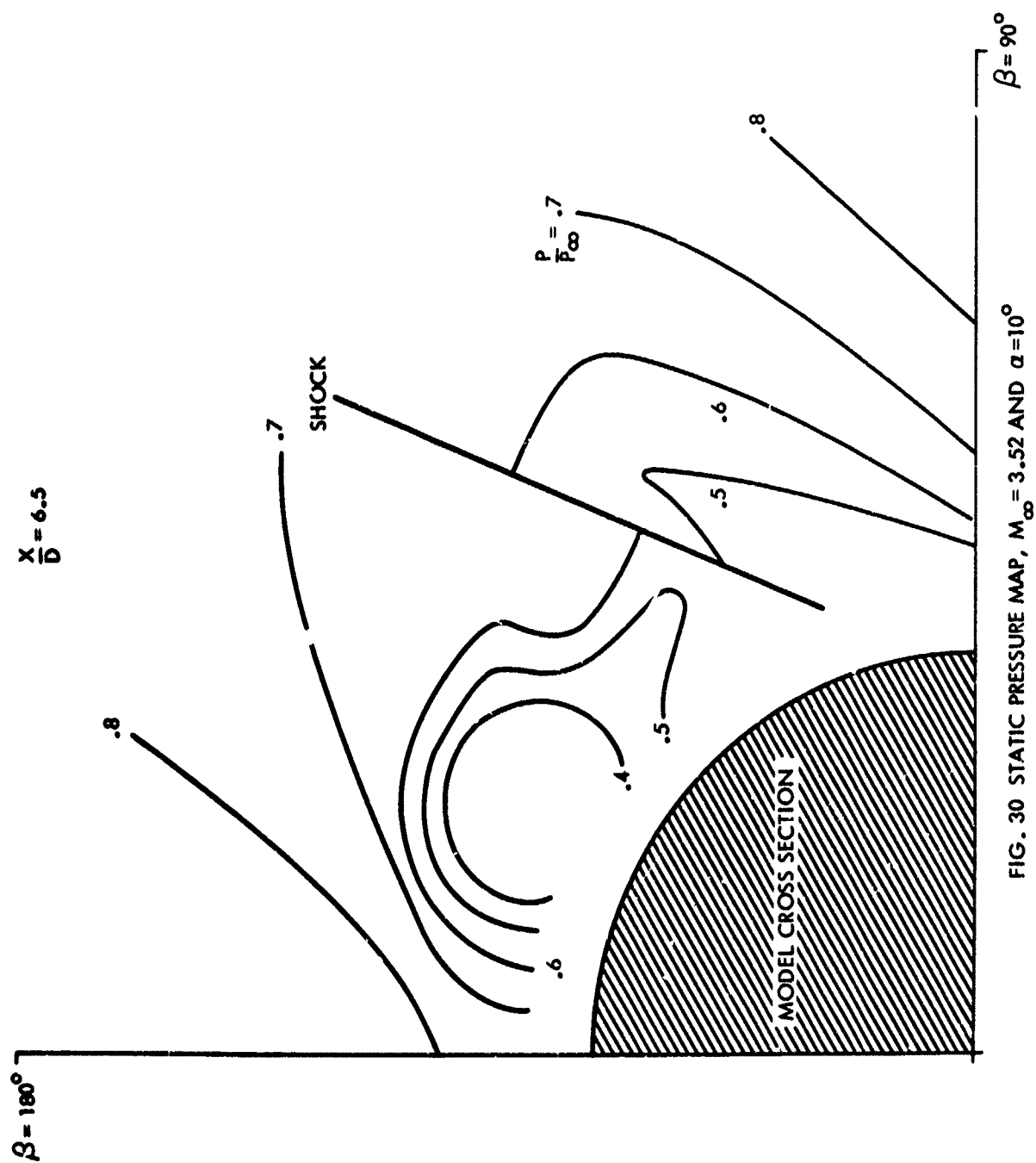


FIG. 30 STATIC PRESSURE MAP, $M_\infty = 3.52$ AND $\alpha = 10^\circ$

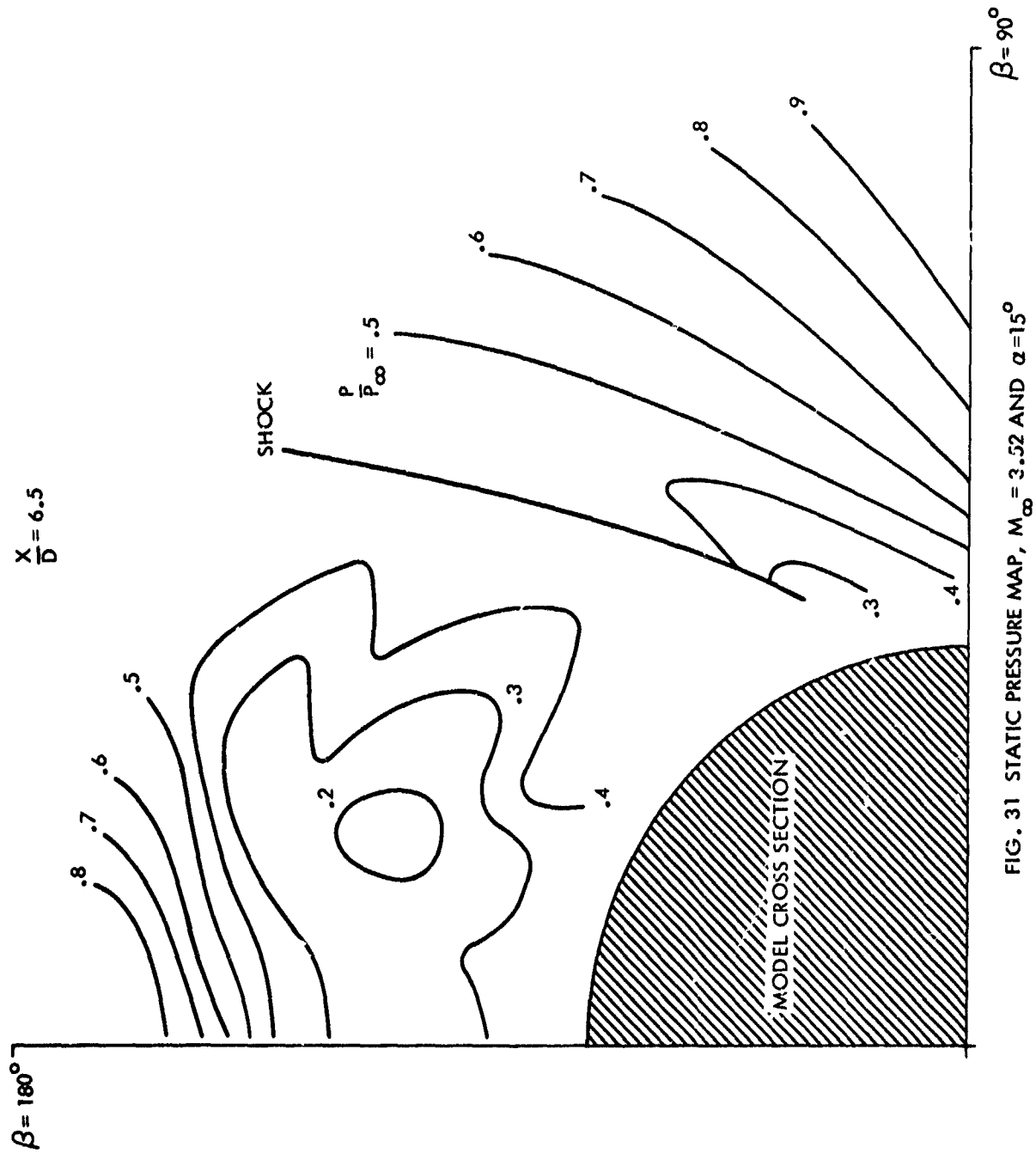


FIG. 31 STATIC PRESSURE MAP, $M_\infty = 3.52$ AND $\alpha = 15^\circ$

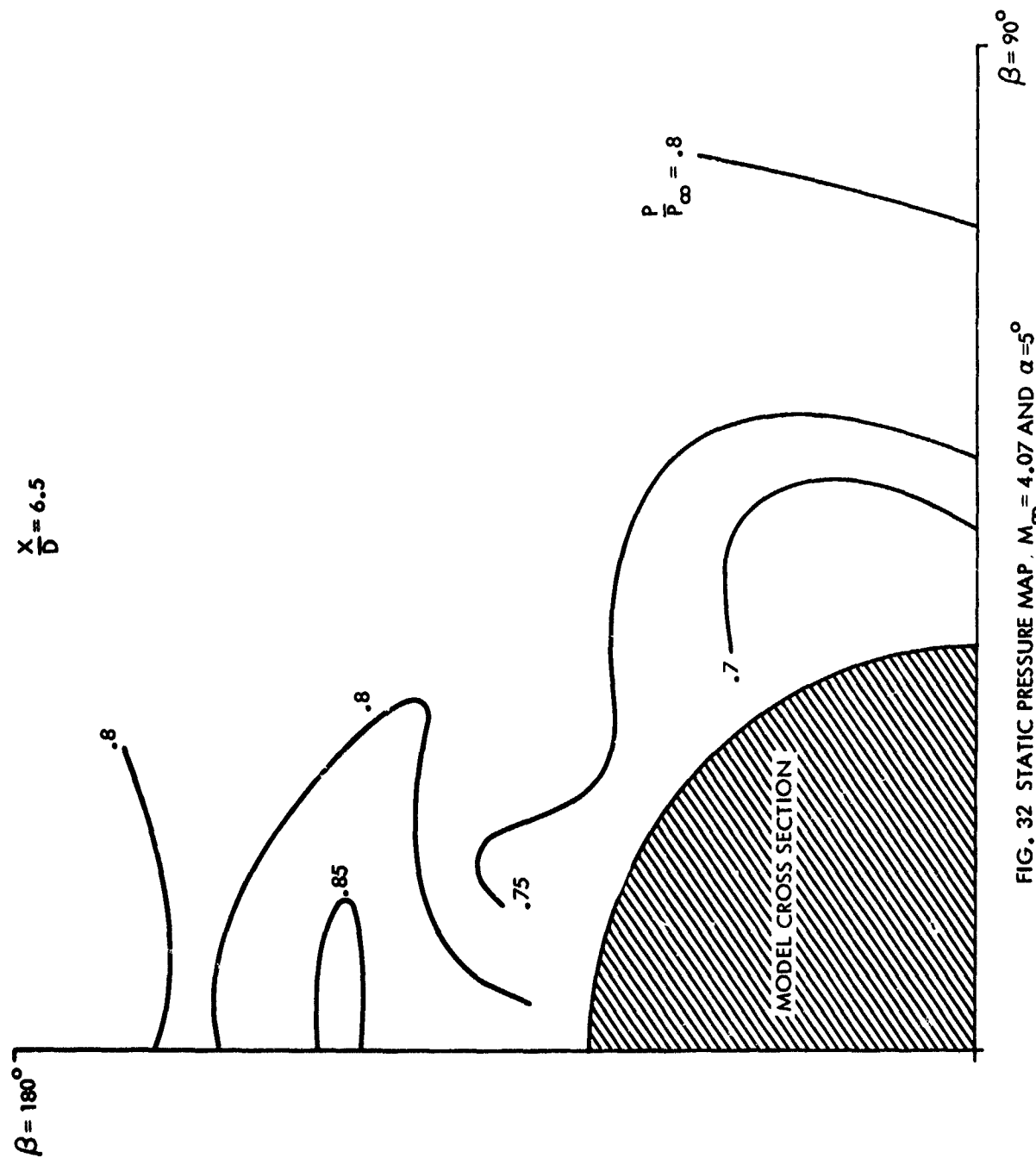


FIG. 32 STATIC PRESSURE MAP, $M_\infty = 4.07$ AND $\alpha = 5^\circ$

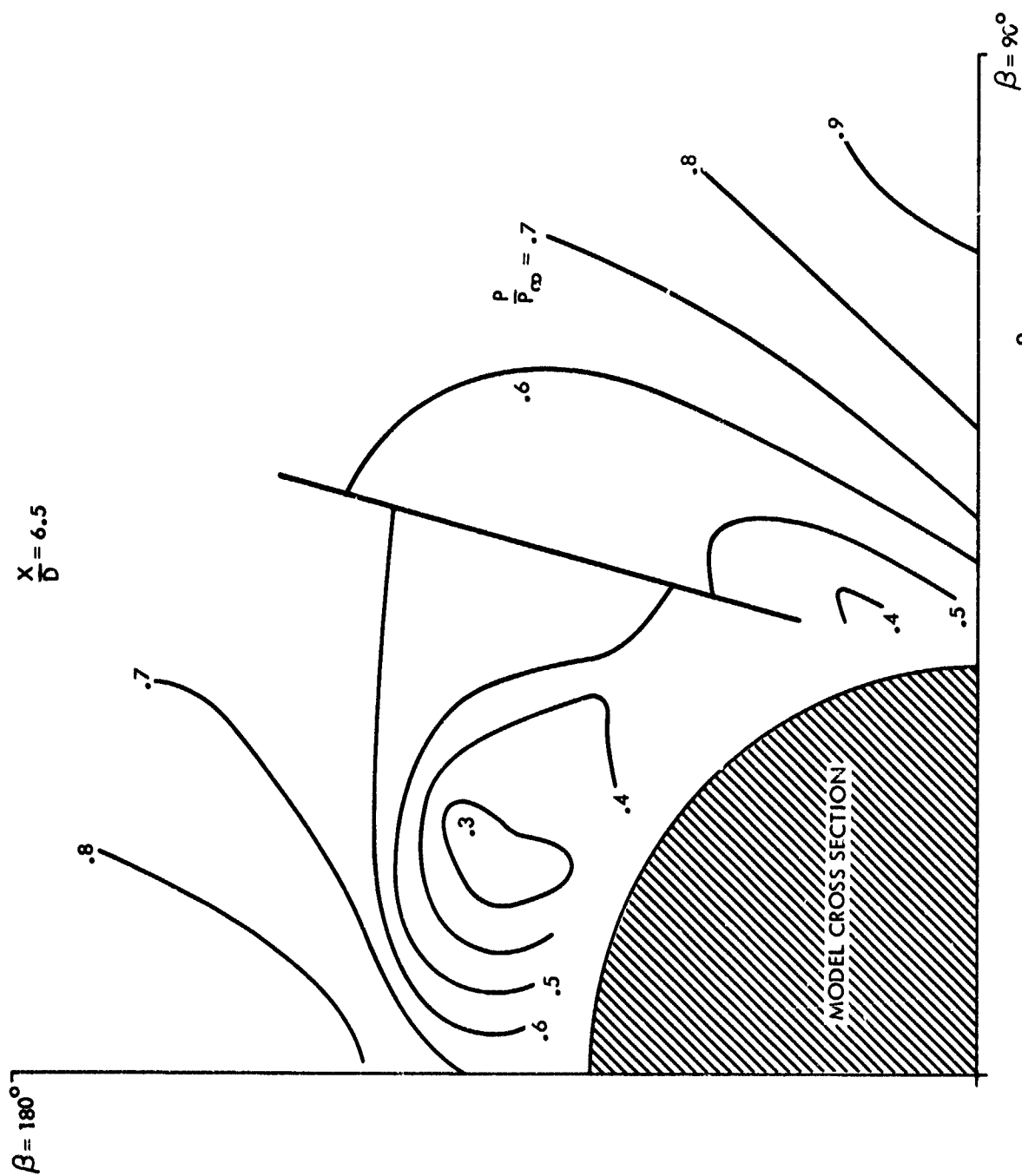


FIG. 33 STATIC PRESSURE MAP, $M_\infty = 4.07$ AND $\alpha = 10^\circ$

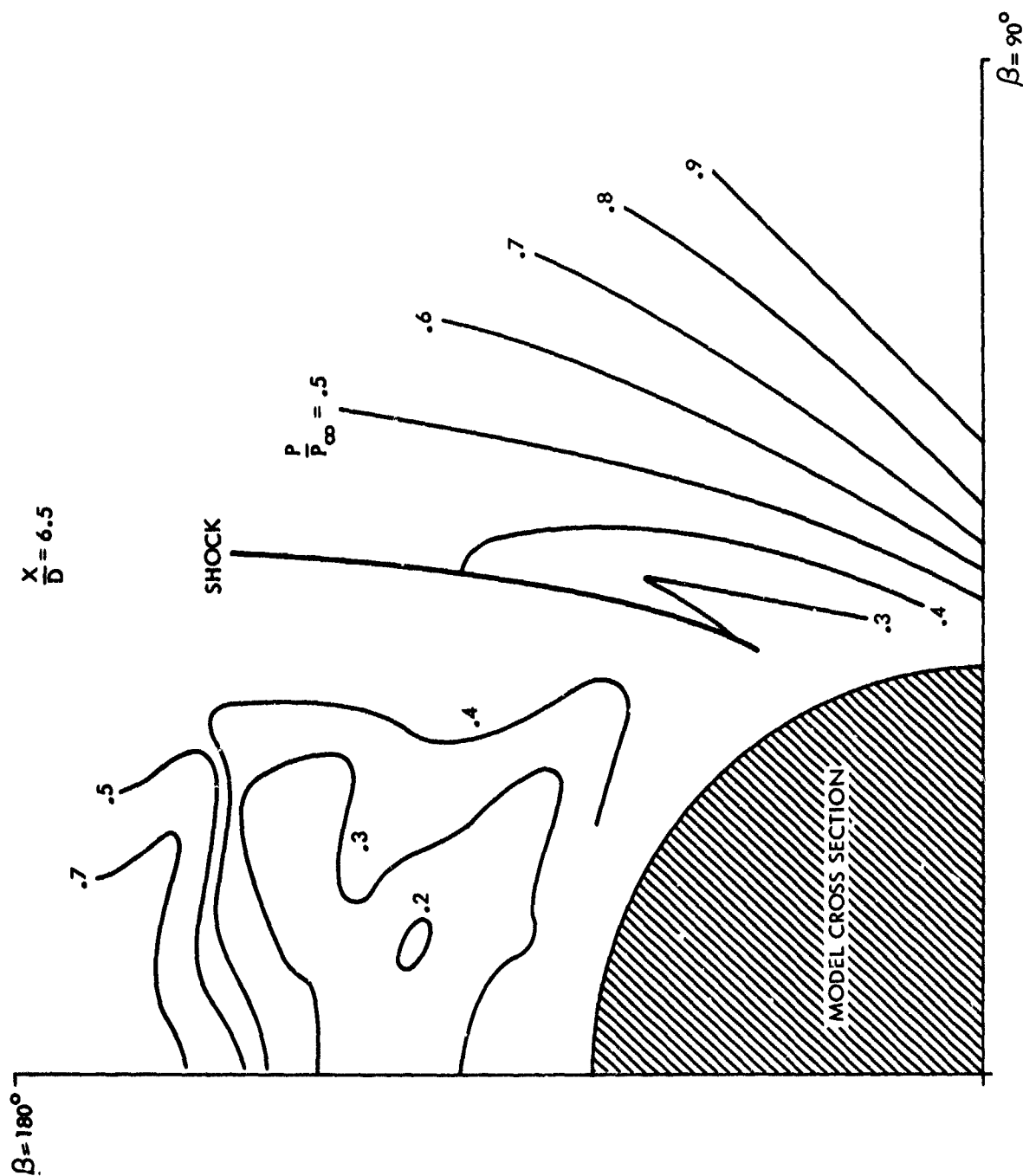


FIG. 34 STATIC PRESSURE MAP, $M_\infty = 4.07$ AND $\alpha = 15^\circ$

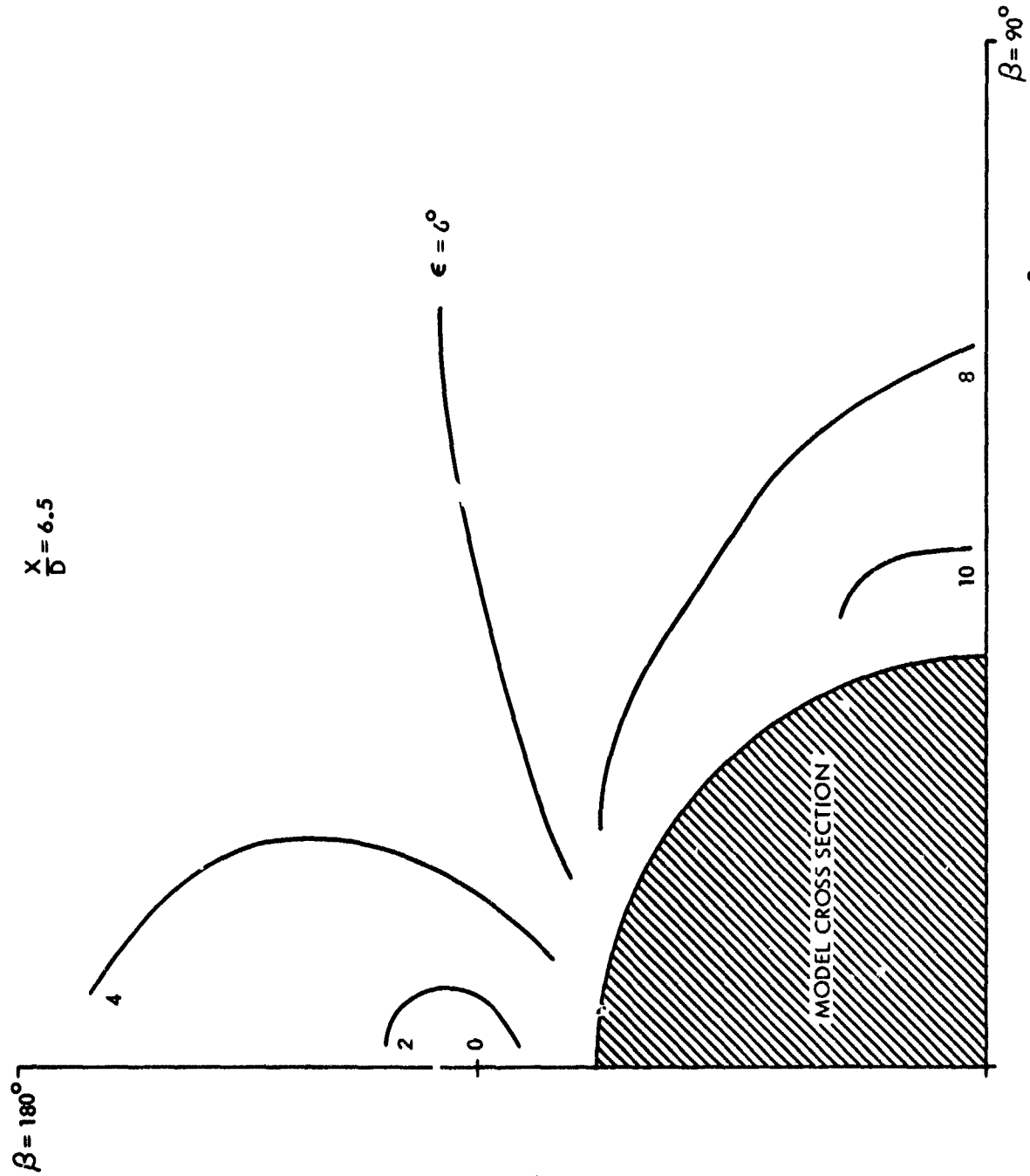


FIG. 35 FLOW ANGLE MAP, $M_\infty = 3.52$ AND $\alpha = 5^\circ$

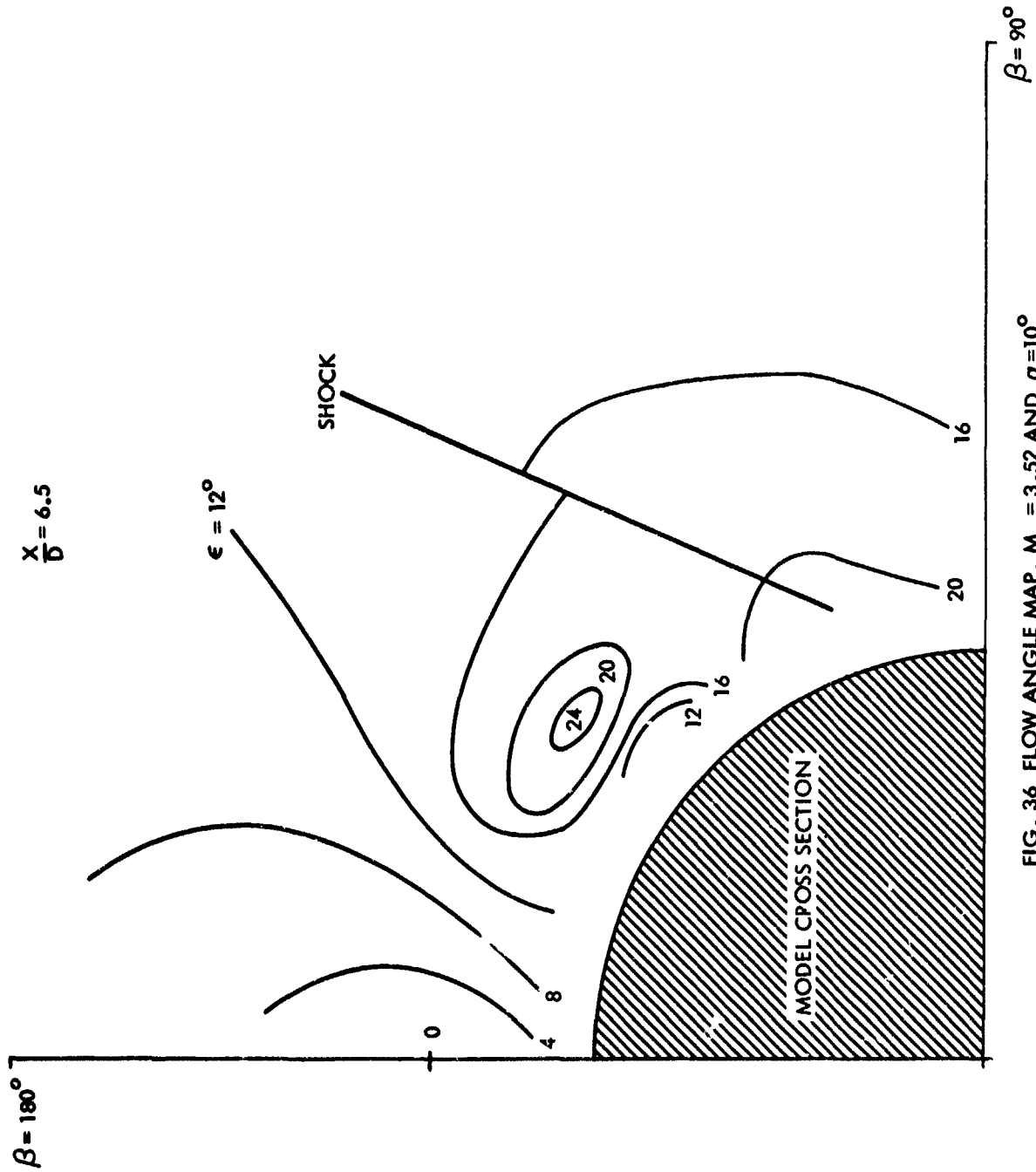


FIG. 36 FLOW ANGLE MAP, $M_\infty = 3.52$ AND $\alpha = 10^\circ$

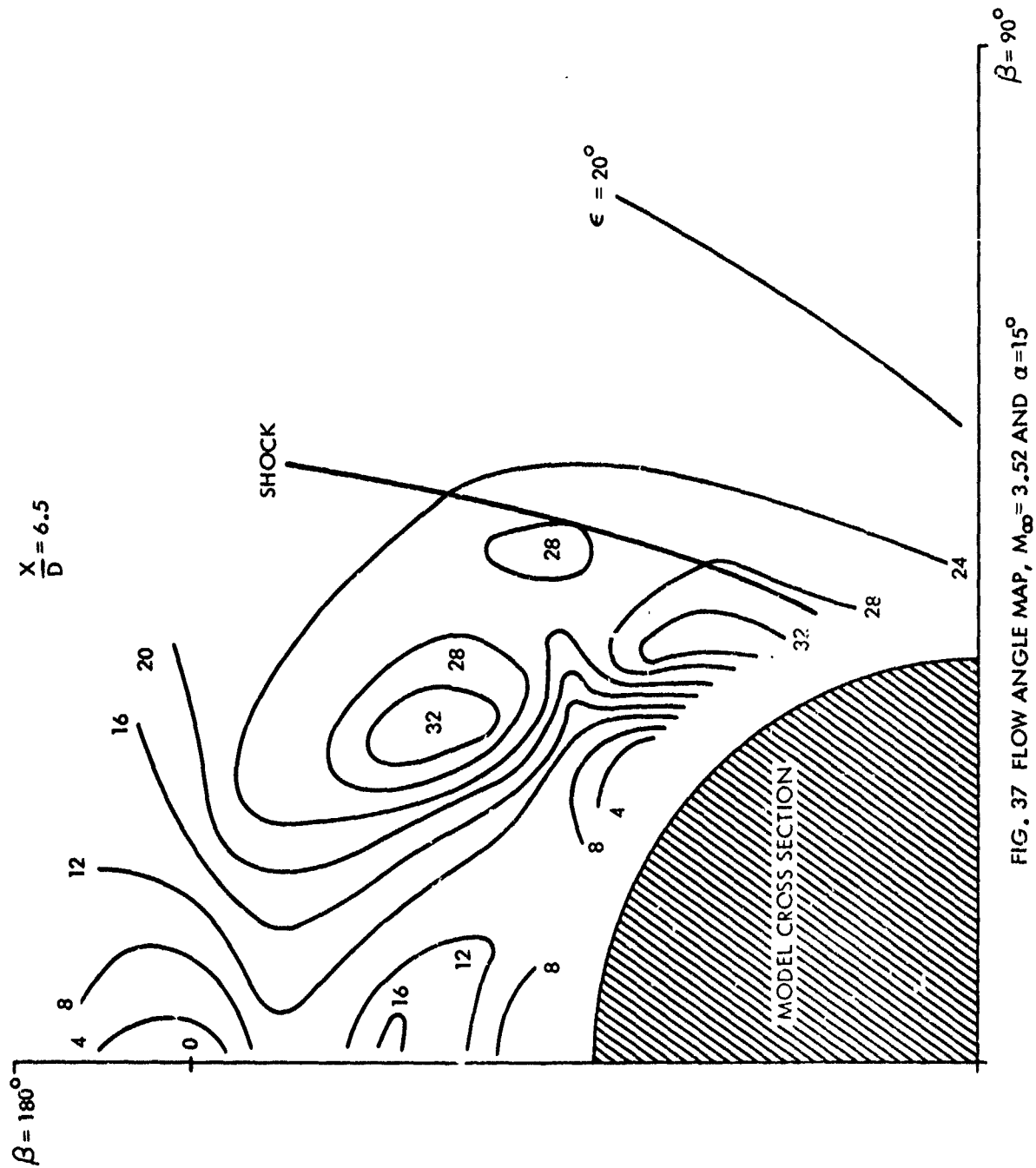


FIG. 37 FLOW ANGLE MAP, $M_\infty = 3.52$ AND $\alpha = 15^\circ$

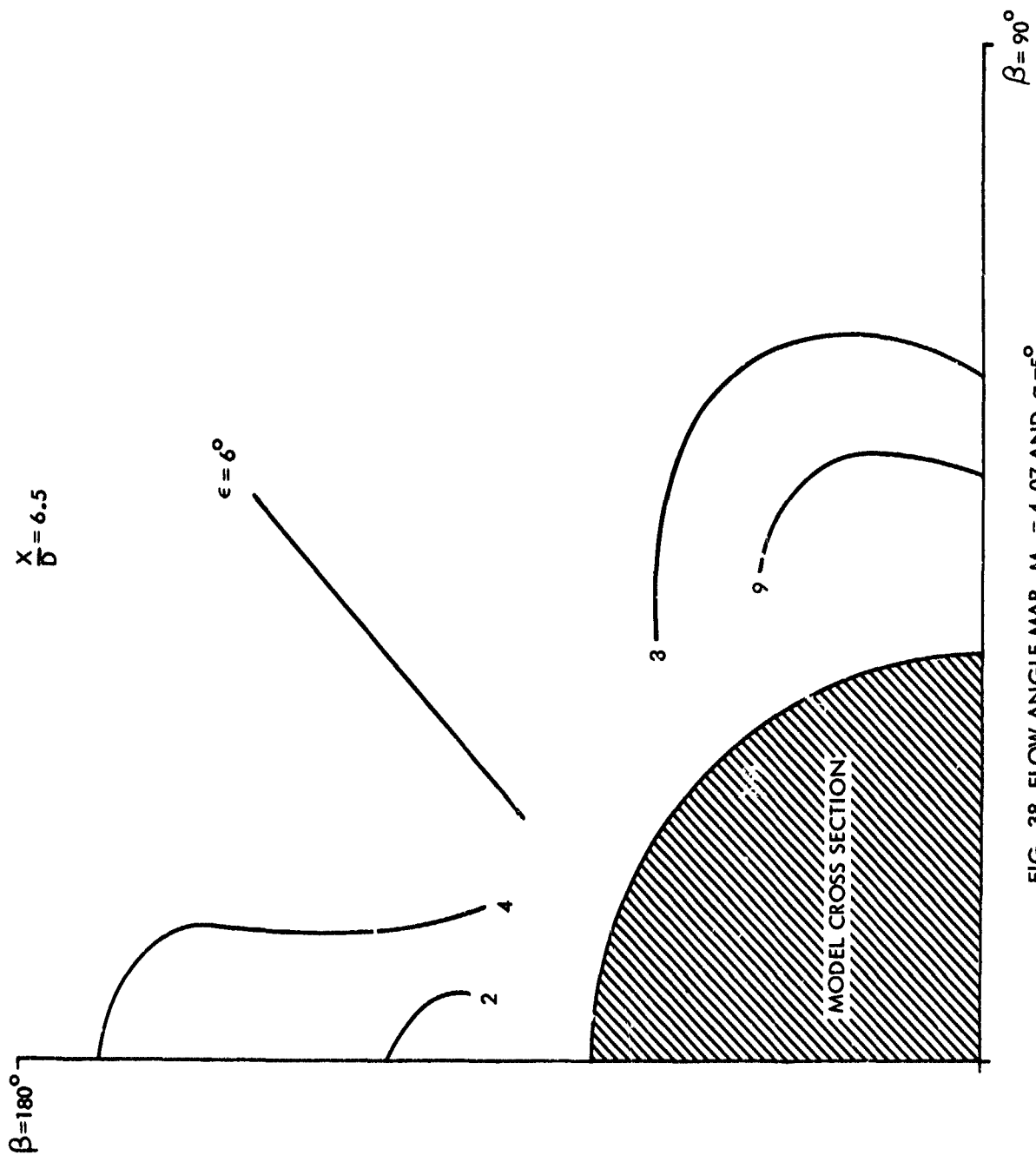


FIG. 38 FLOW ANGLE MAP, $M_\infty = 4.07$ AND $\alpha = 5^\circ$

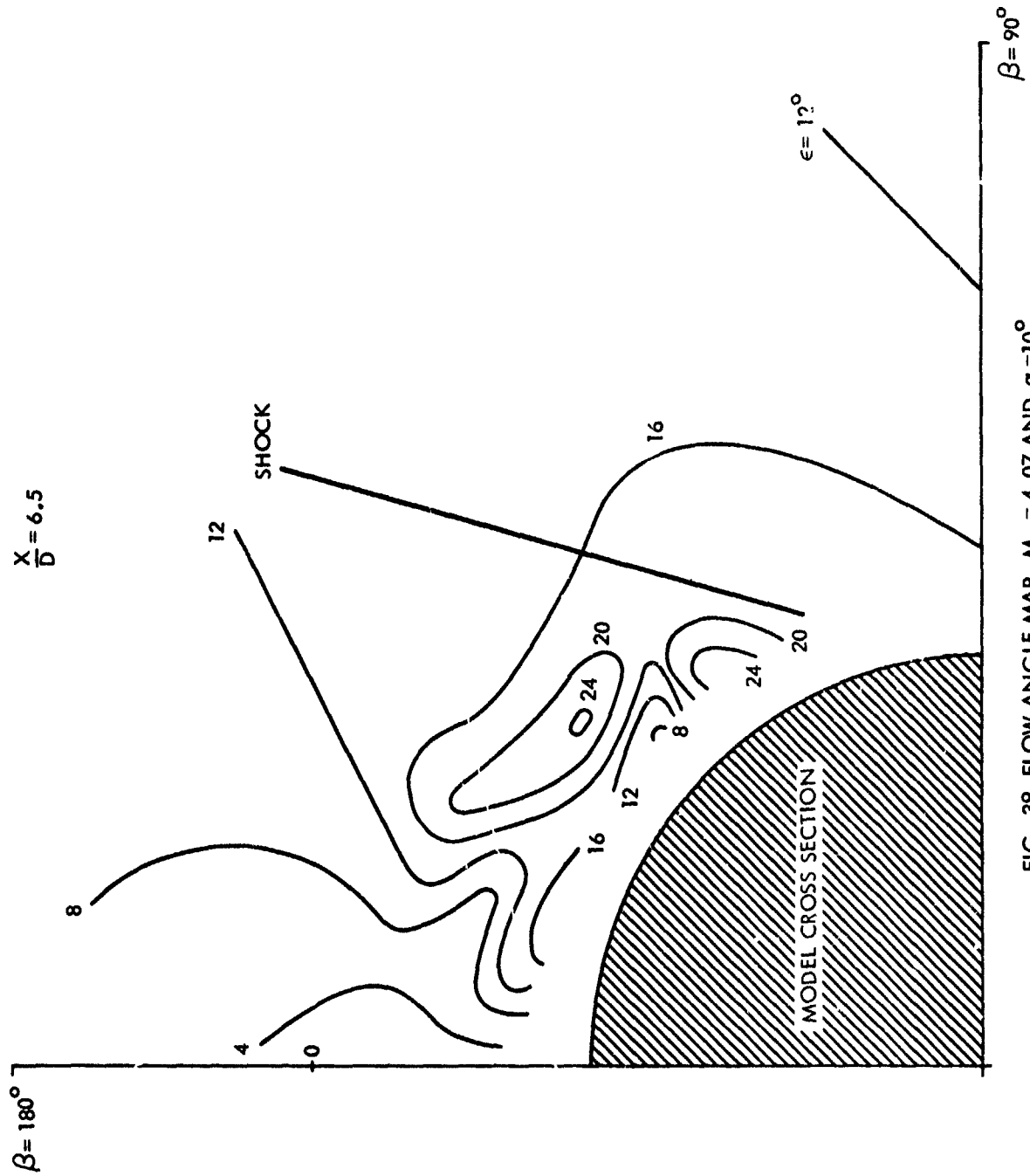


FIG. 39 FLOW ANGLE MAP, $M_\infty = 4.07$ AND $\alpha = 10^\circ$

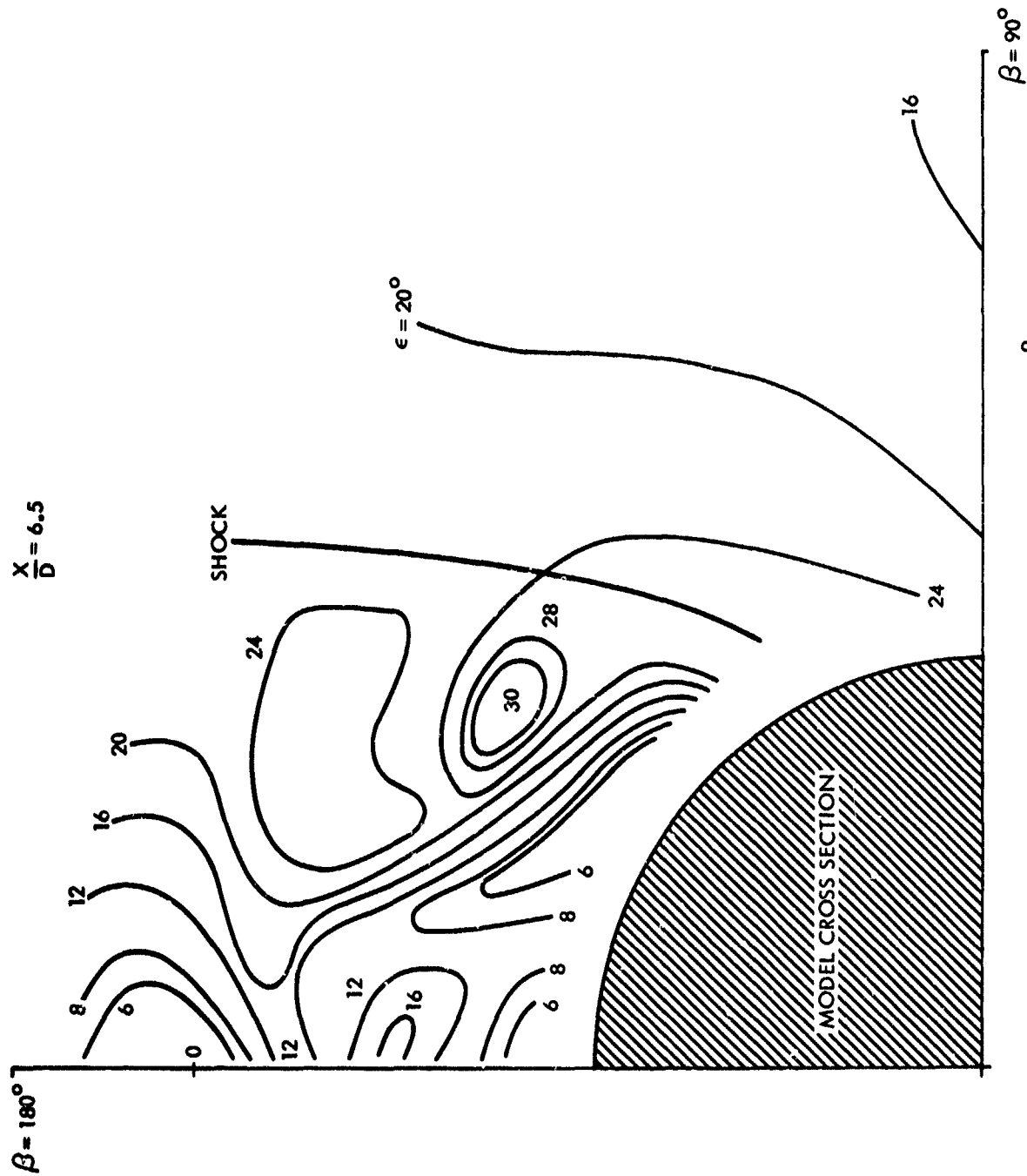


FIG. 40 FLOW ANGLE MAP, $M_\infty = 4.07$ AND $\alpha = 15^\circ$

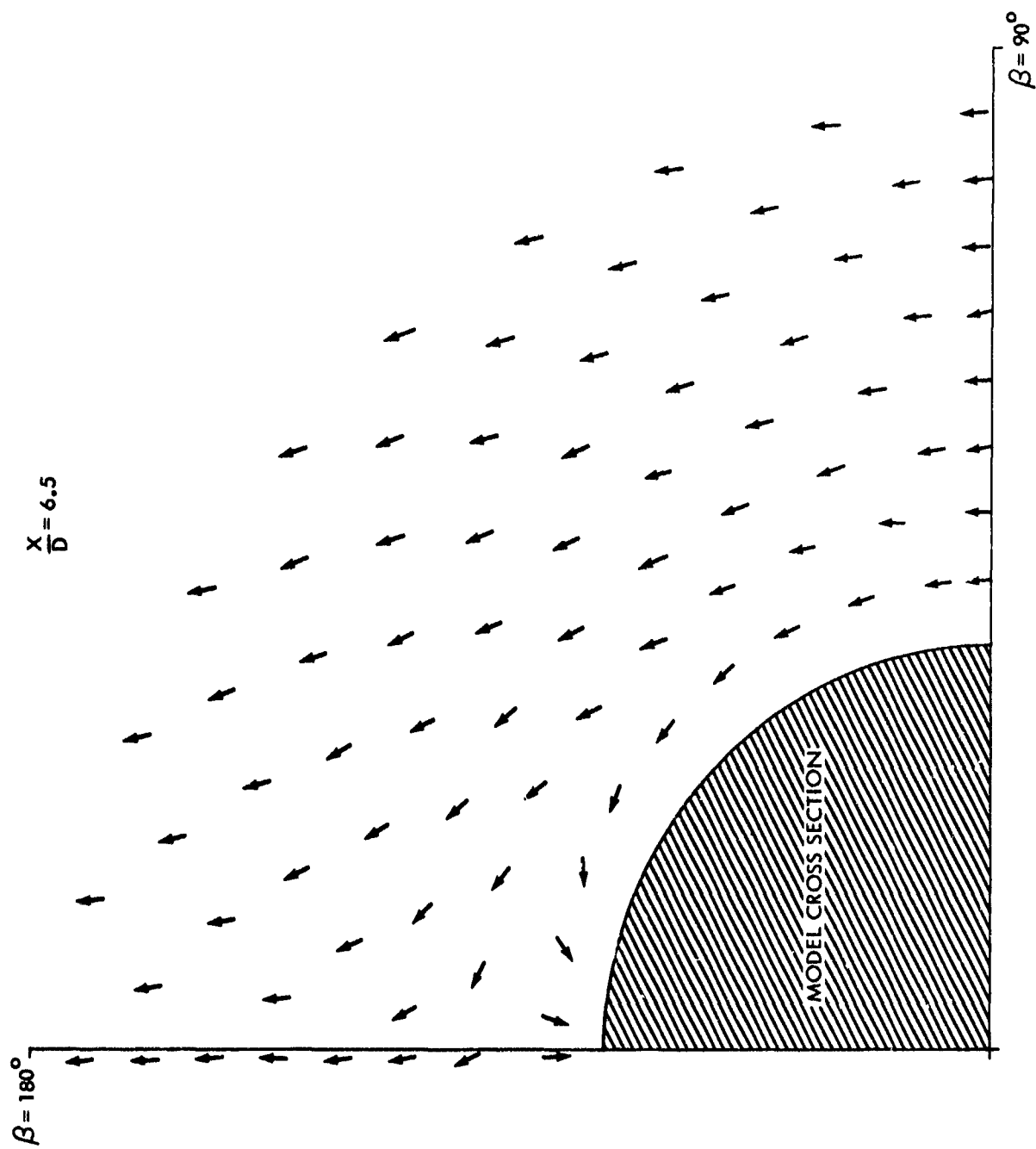


FIG. 41 CROSSFLOW DIRECTION MAP, $M_\infty = 3.52$ AND $\alpha = 5^\circ$

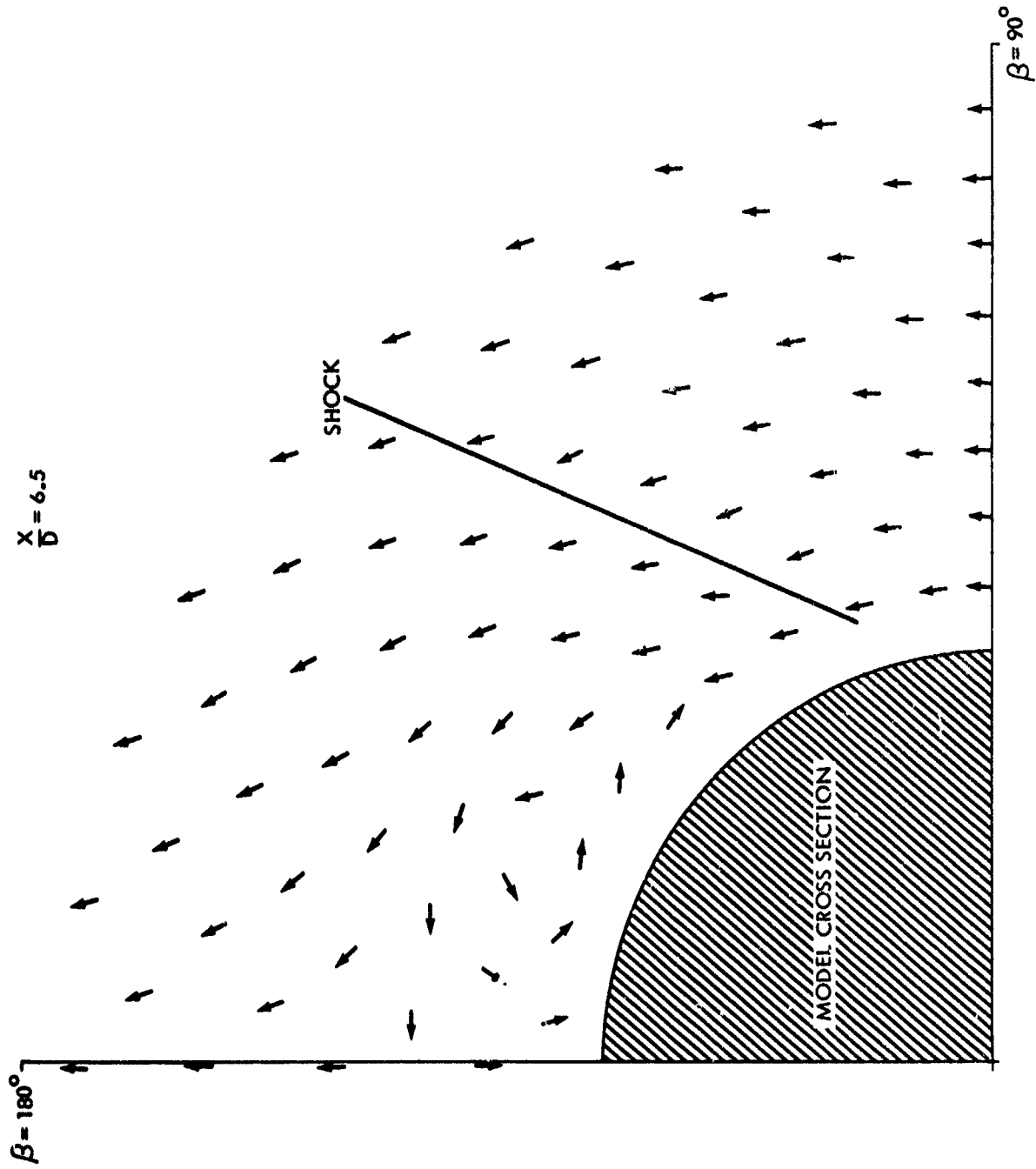


FIG. 42 CROSSFLOW DIRECTION MAP, $M_\infty = 3.52$ AND $\alpha = 10^\circ$

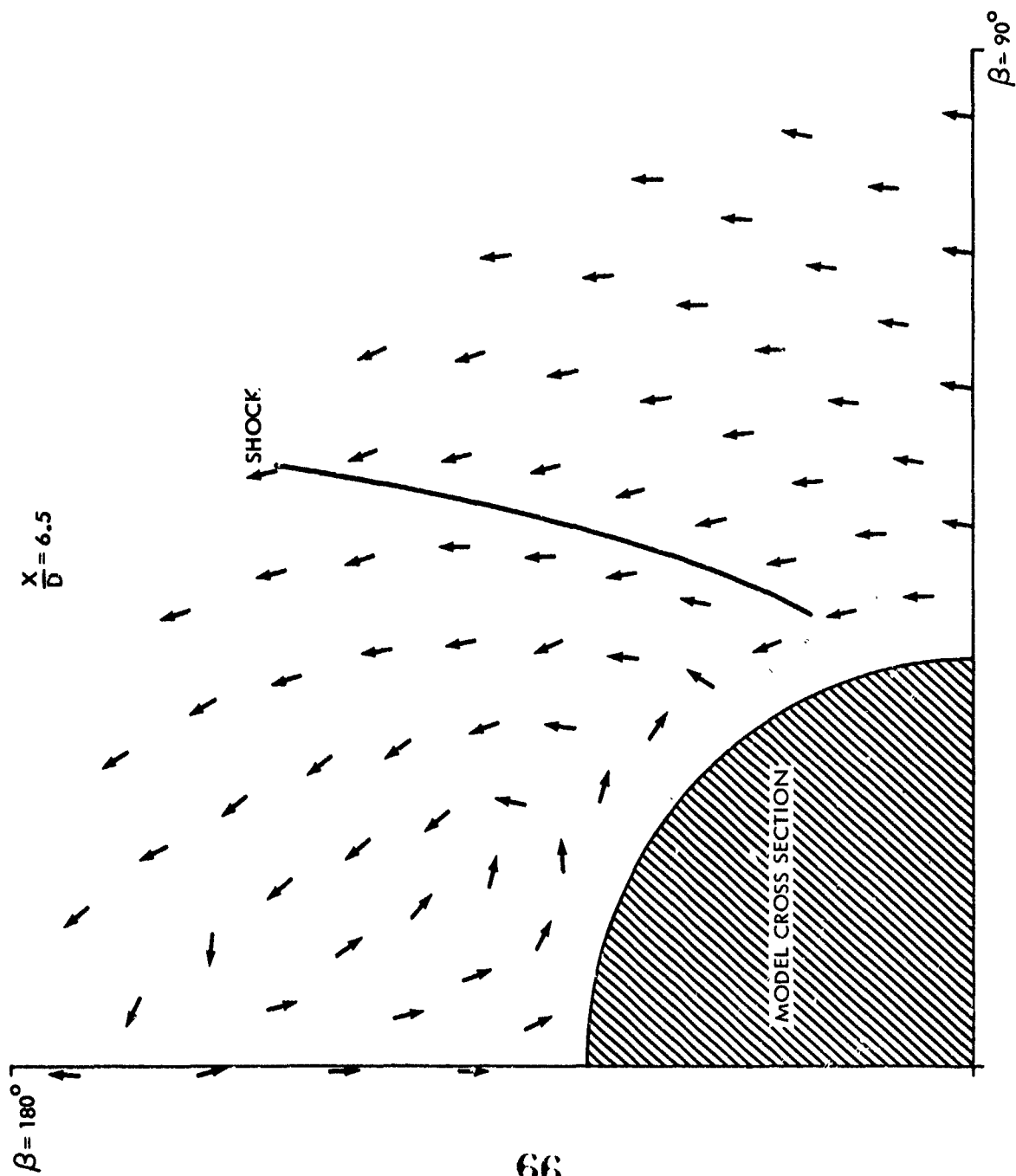


FIG. 43 CROSSFLOW DIRECTION MAP, $M_\infty = 3.52$ AND $\alpha = 15^\circ$

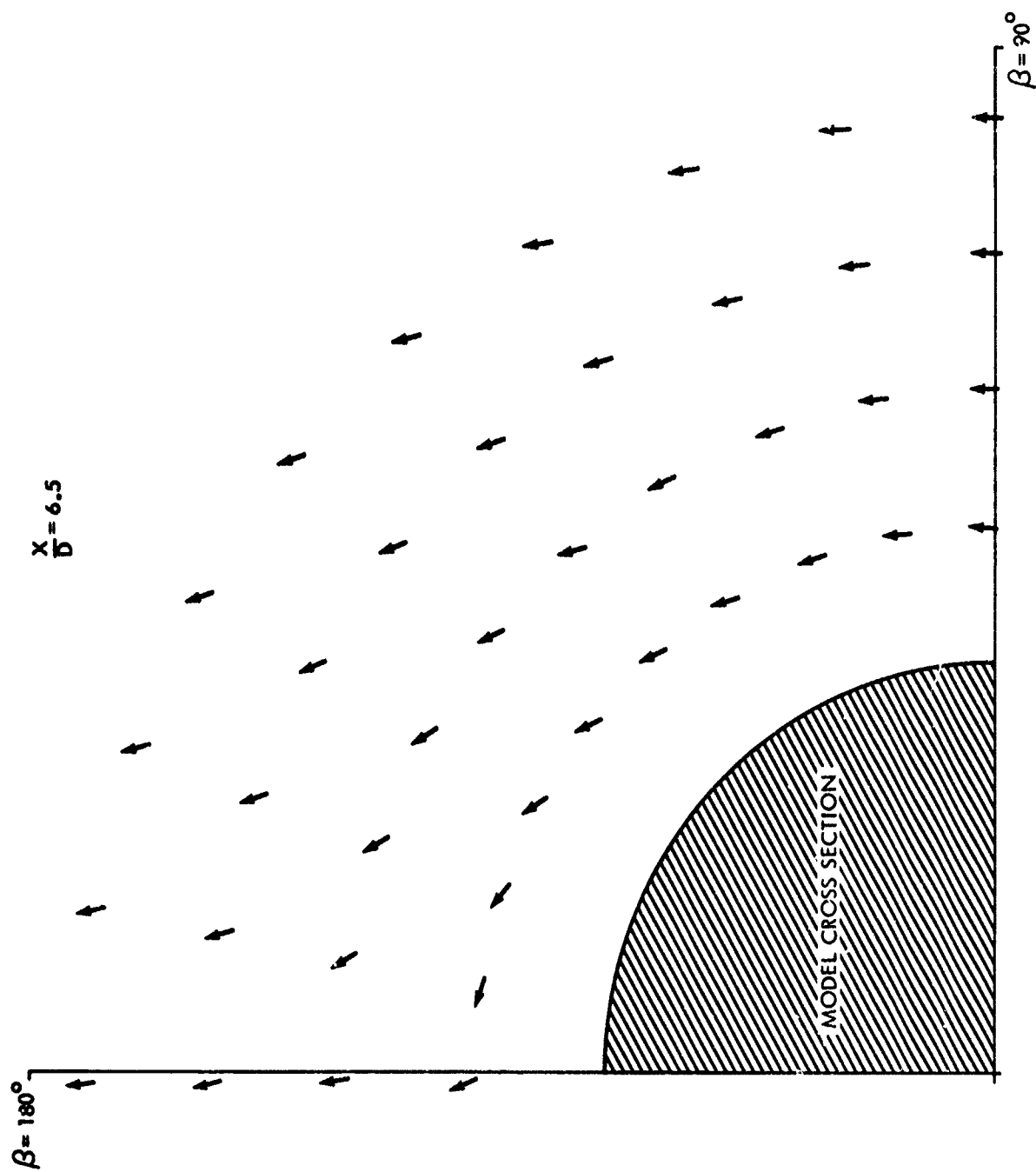


FIG. 44 CROSSFLOW DIRECTION MAP, $M_\infty = 4.07$ AND $\alpha = 5^\circ$

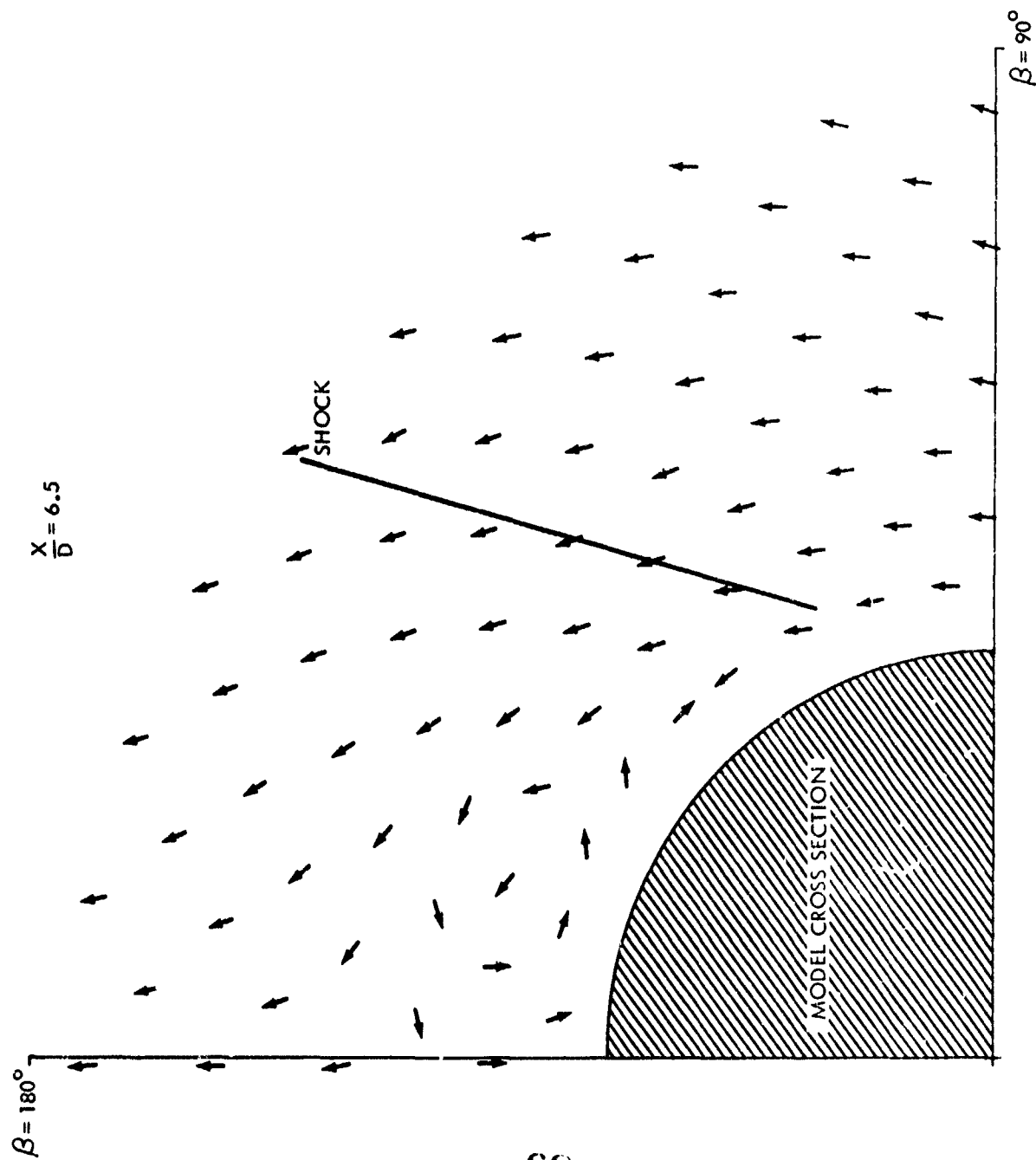


FIG. 45 CROSSFLOW DIRECTION MAP, $M_\infty = 4.07$ AND $\alpha = 10^\circ$

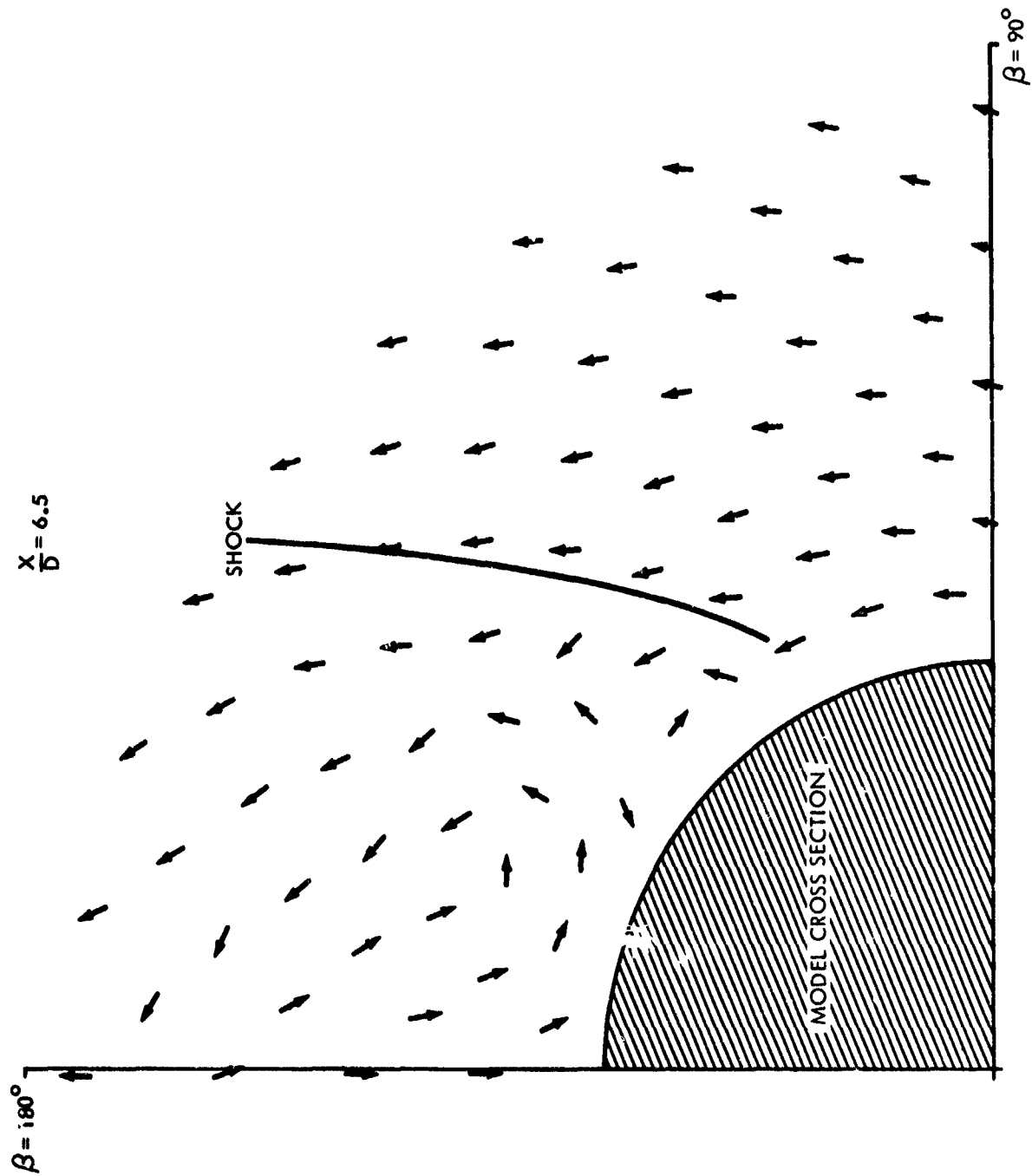


FIG. 46 CROSSFLOW DIRECTION MAP, $M_\infty = 4.07$ AND $\alpha = 15^\circ$

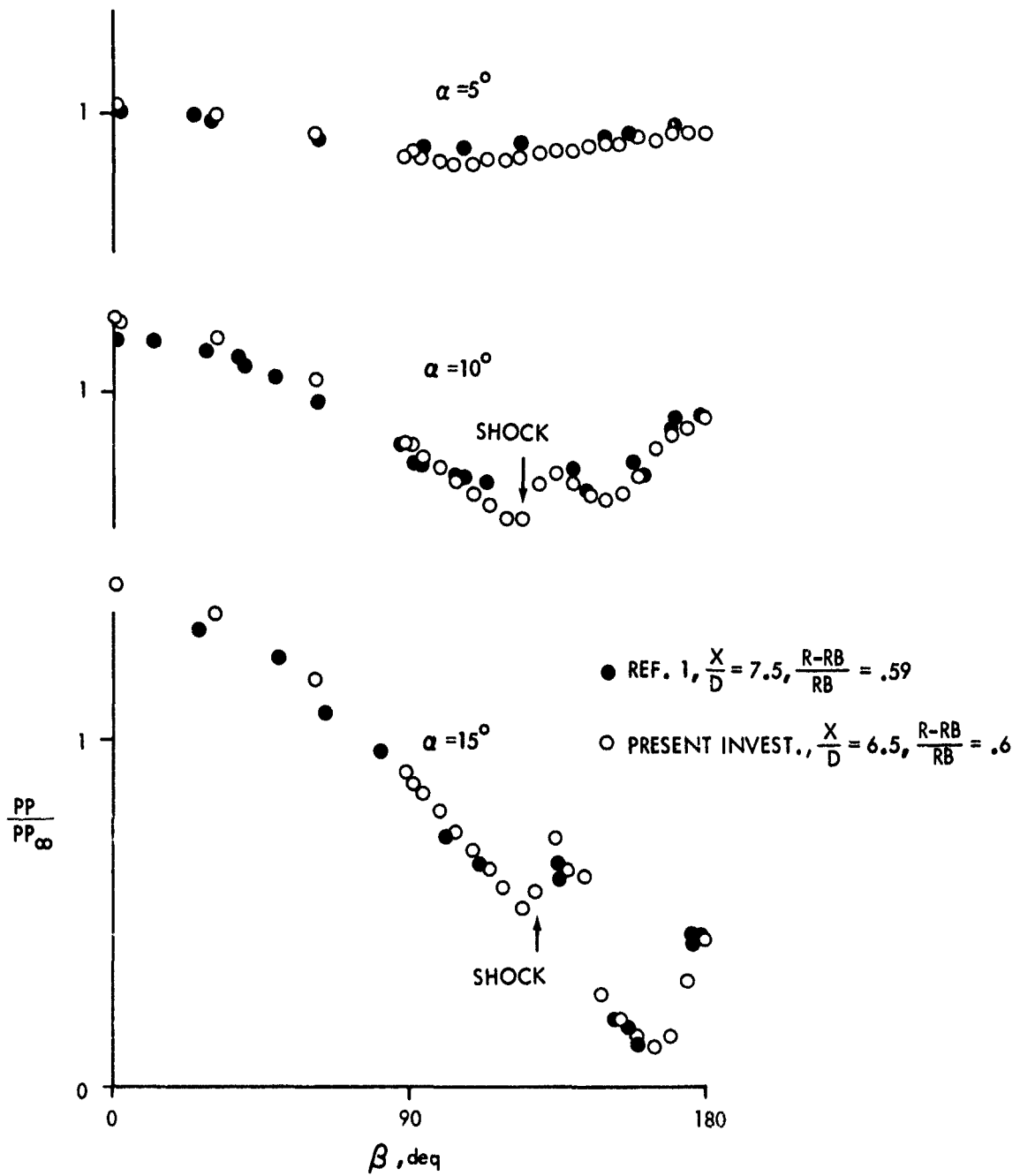


FIG. 47 COMPARISON OF PITOT PRESSURE DATA, $M_{\infty} = 3.5$

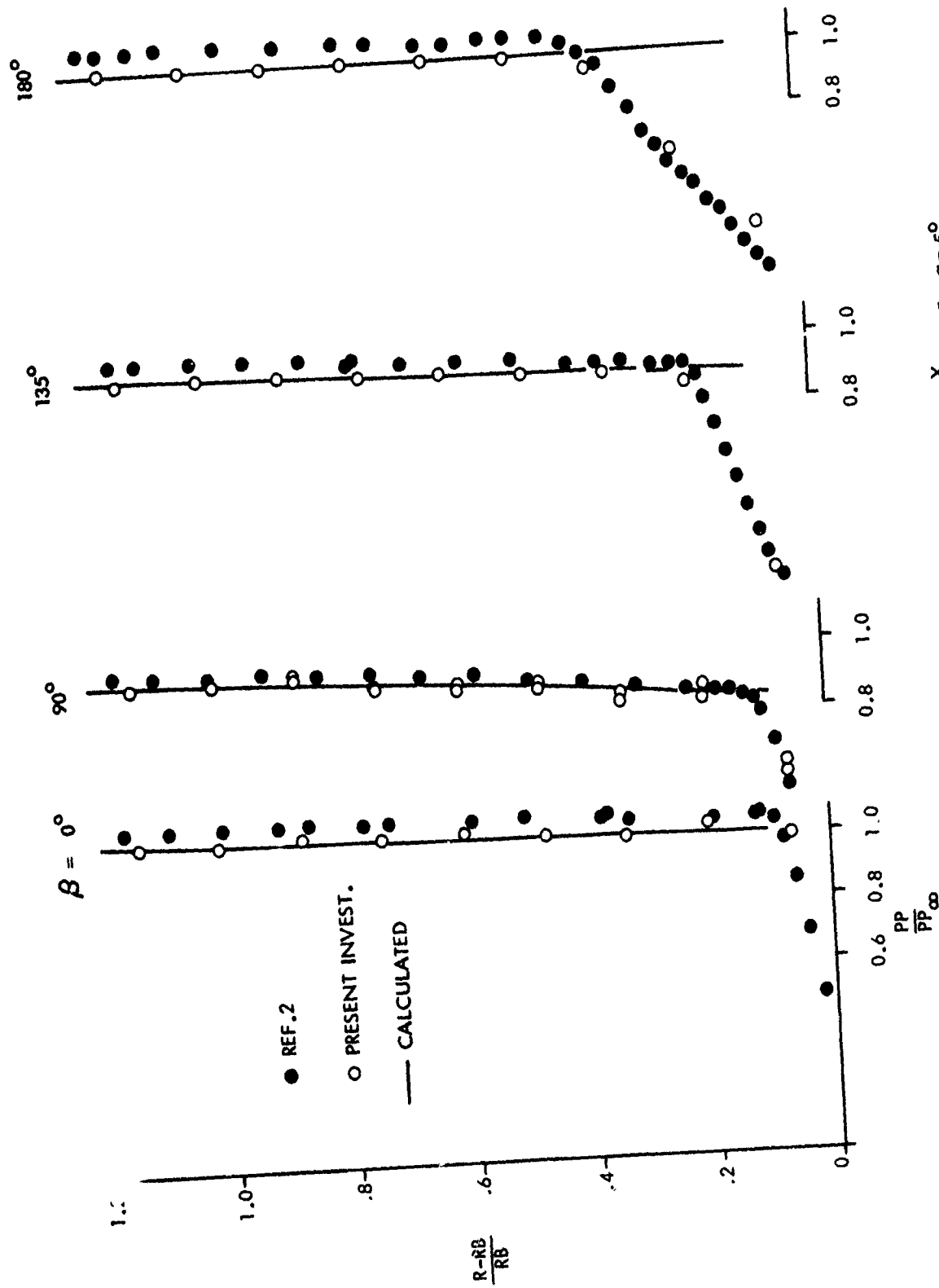


FIG. 48 COMPARISON OF PITOT PRESSURE DATA, $M_\infty = 3.5$, $\frac{X}{D} = 6.5$, $\alpha = 5^\circ$

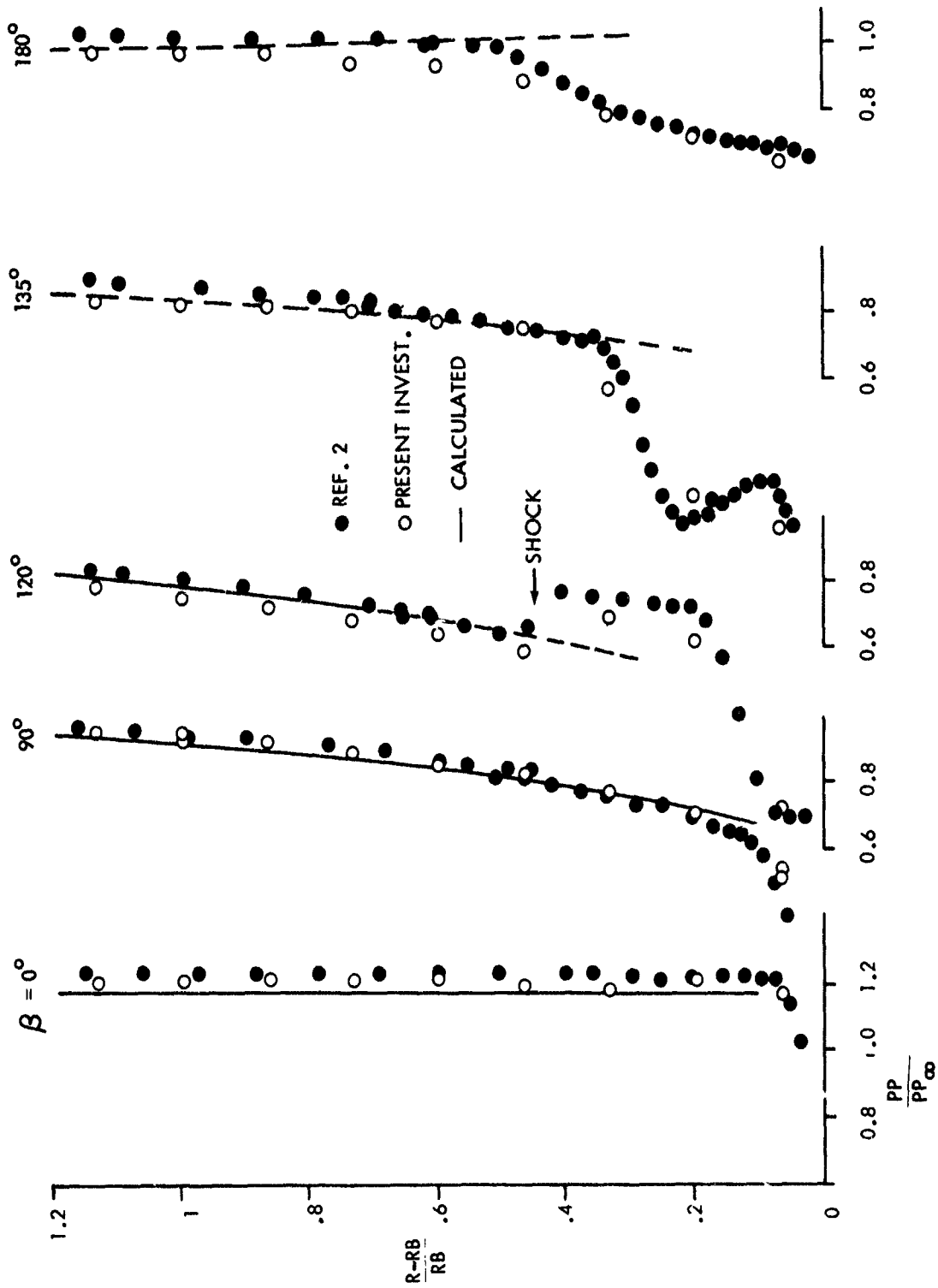


FIG. 49 COMPARISON OF PITOT PRESSURE DATA, $M_\infty = 3.5$, $\frac{X}{D} = 6.5$, $\alpha = 10^\circ$

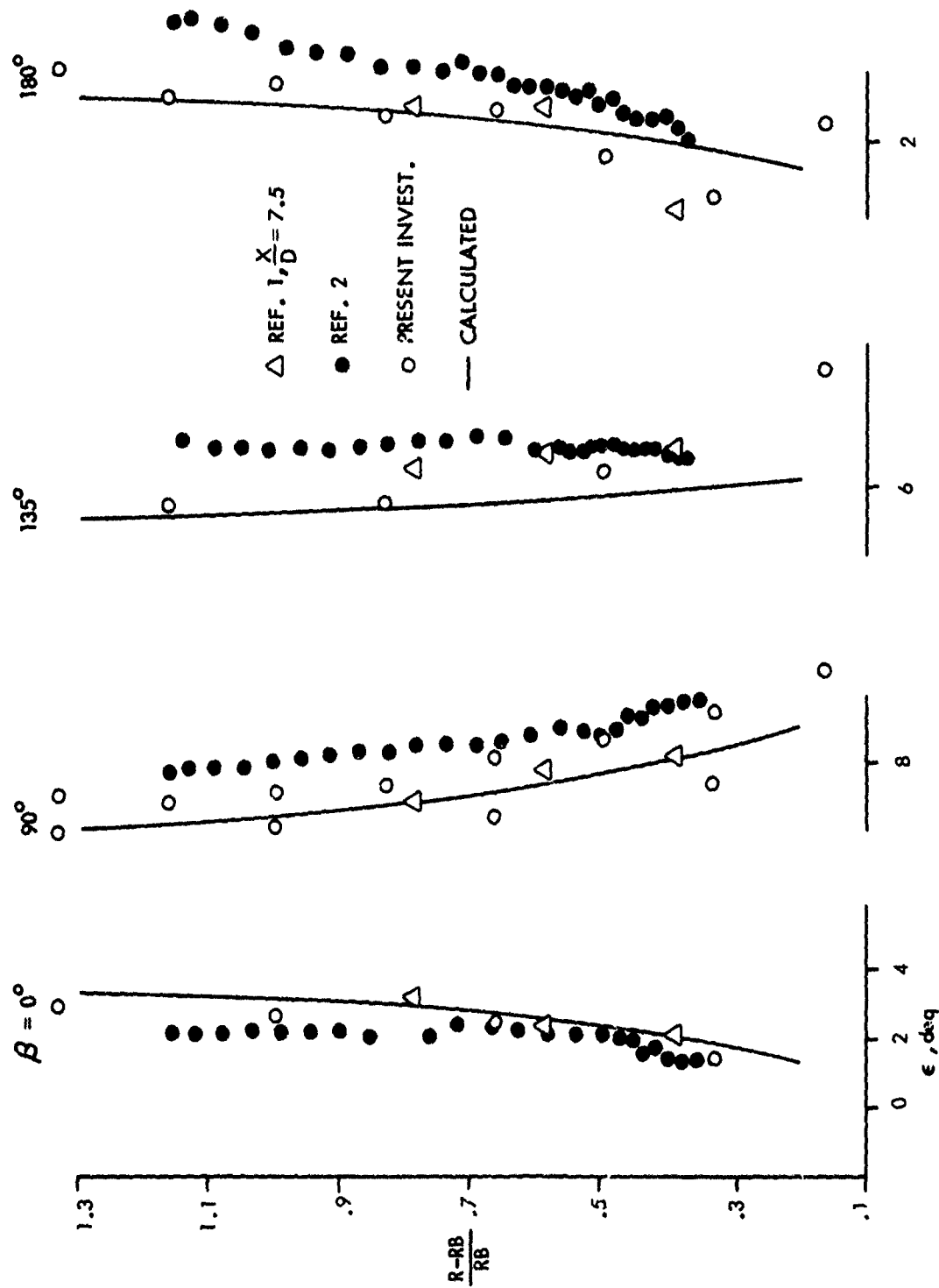


FIG. 50 COMPARISON OF FLOW ANGLE DATA, $M_\infty = 3.5$, $\frac{X}{D} = 6.5$, $\alpha = 5^\circ$

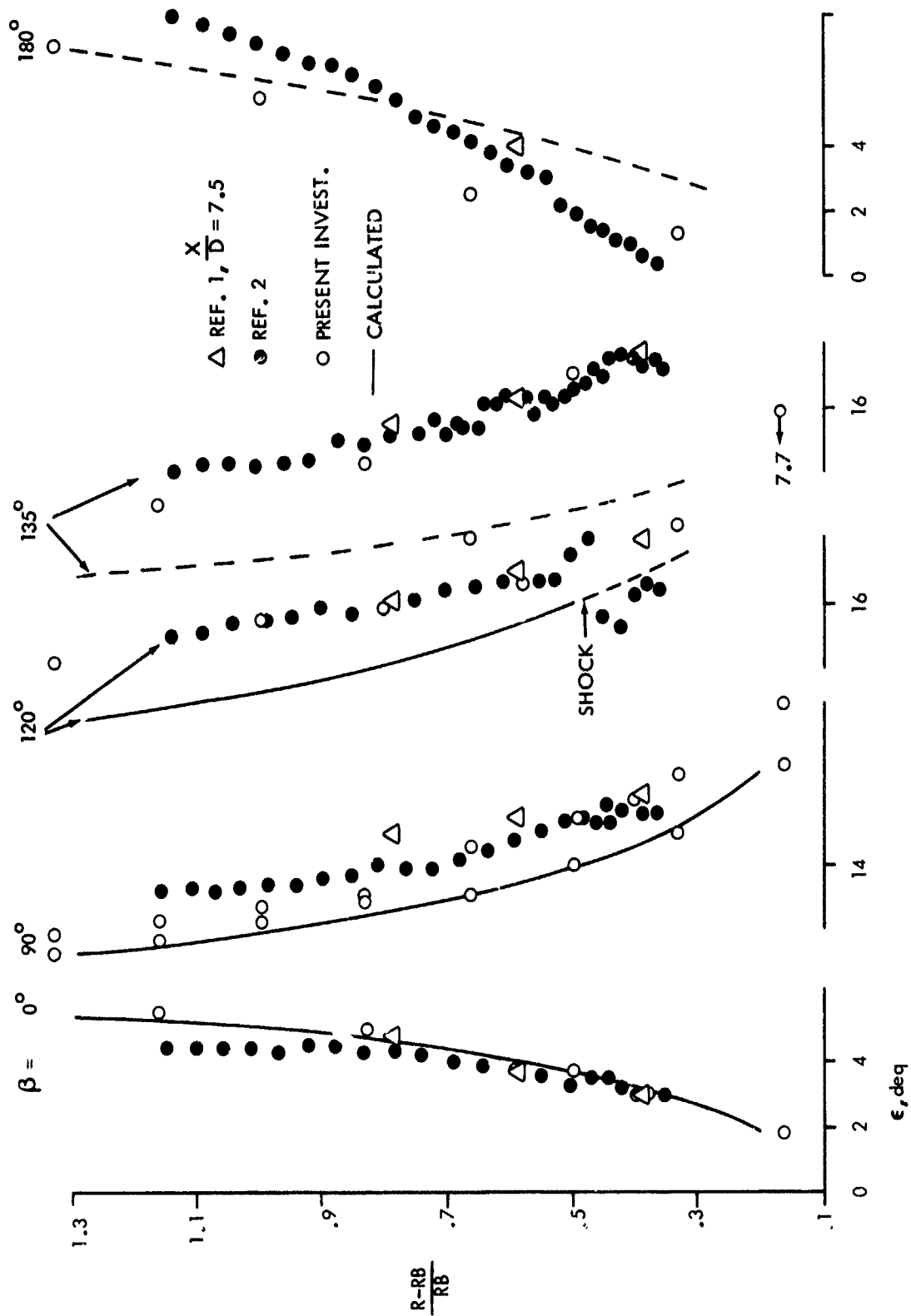


FIG. 51 COMPARISON OF FLOW ANGLE DATA, $M_\infty = 3.5$, $\frac{X}{D} = 6.5$, $\alpha = 10^\circ$

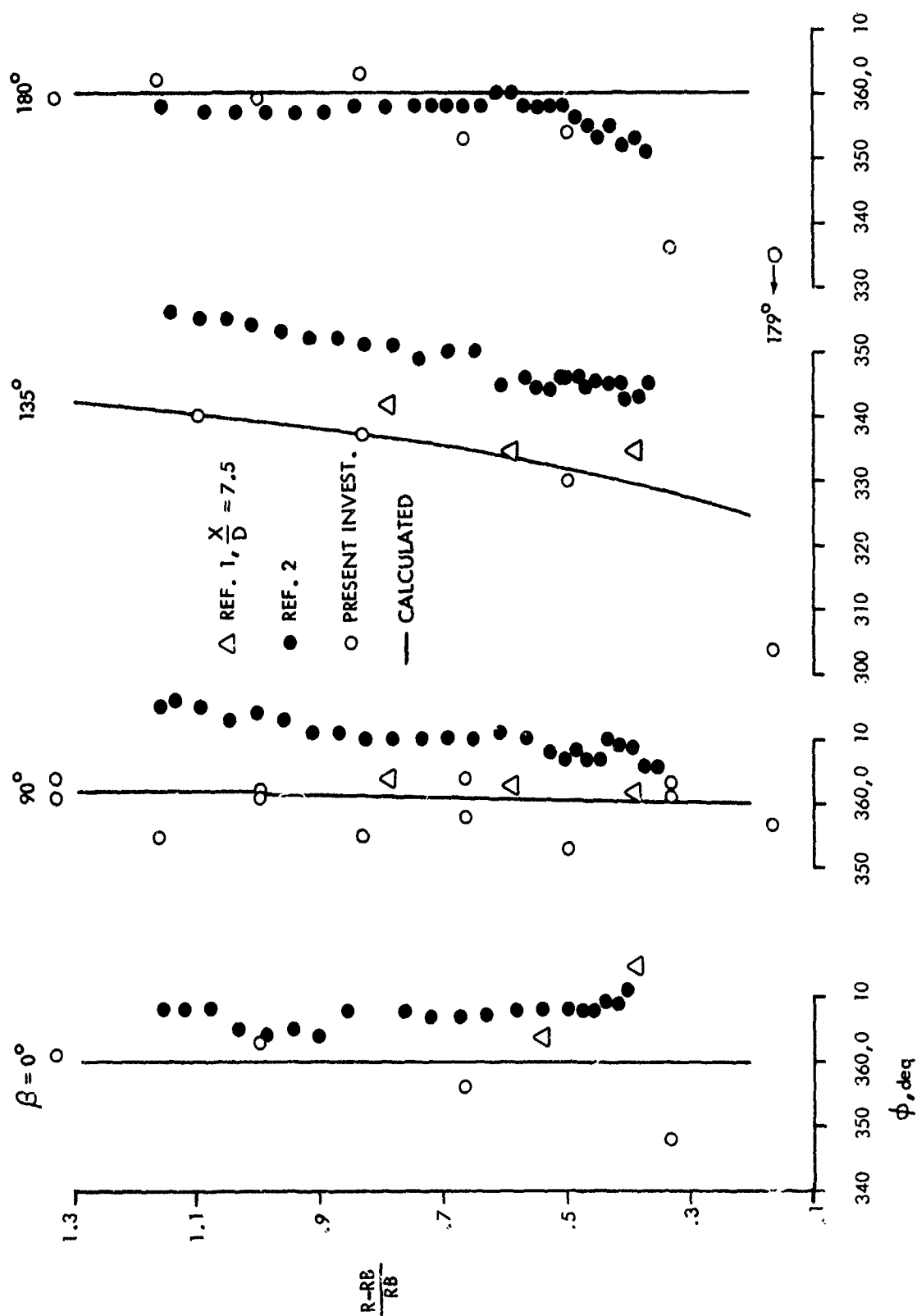


FIG. 52 COMPARISON OF CROSSFLOW DIRECTION DATA, $M_\infty = 3.5$, $\frac{X}{D} = 6.5$, $\alpha = 5^\circ$

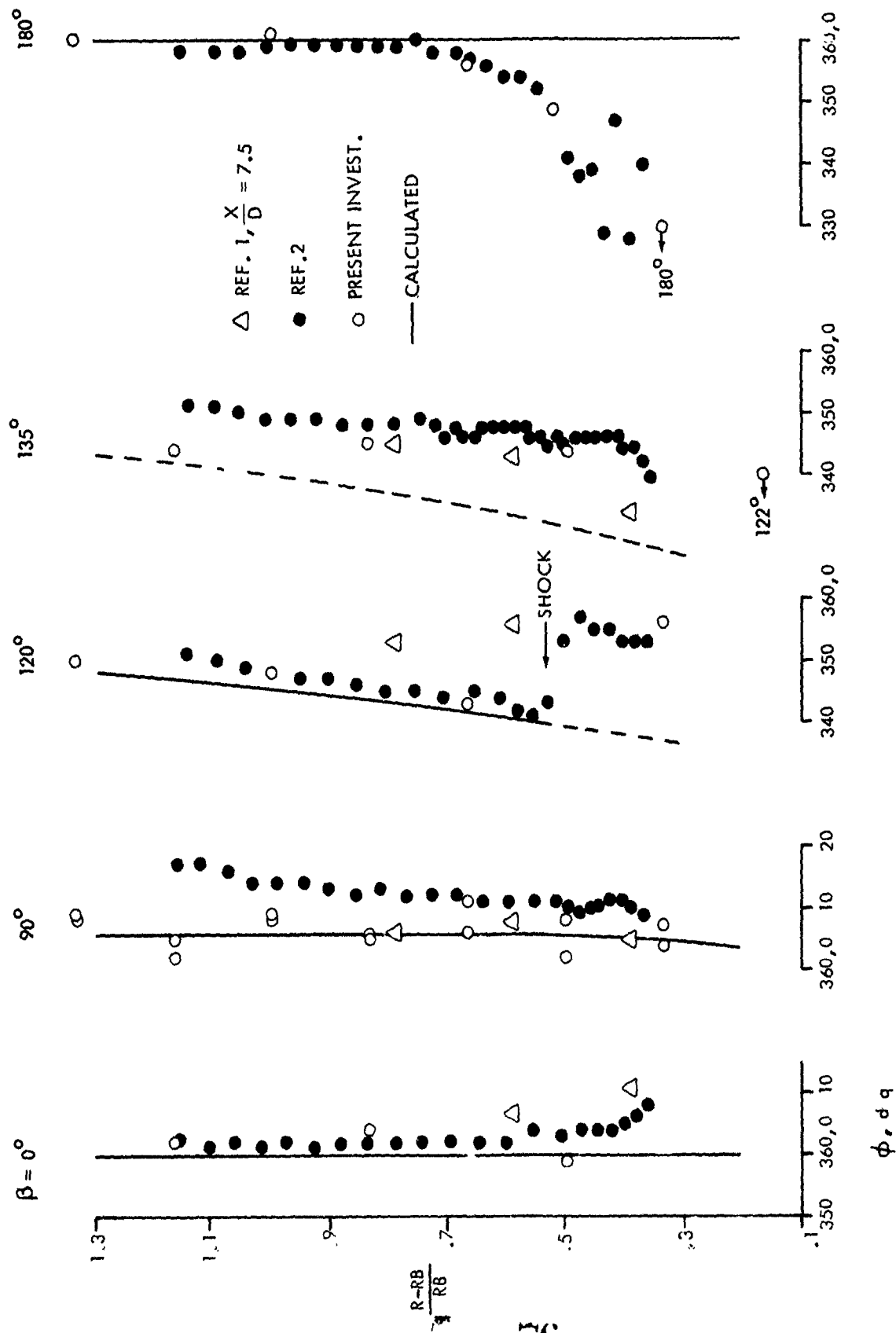


FIG. 53 COMPARISON OF CROSSFLOW DIRECTION DATA, $M_\infty = 3.5$, $\frac{X}{D} = 6.5$, $\alpha = 10^\circ$

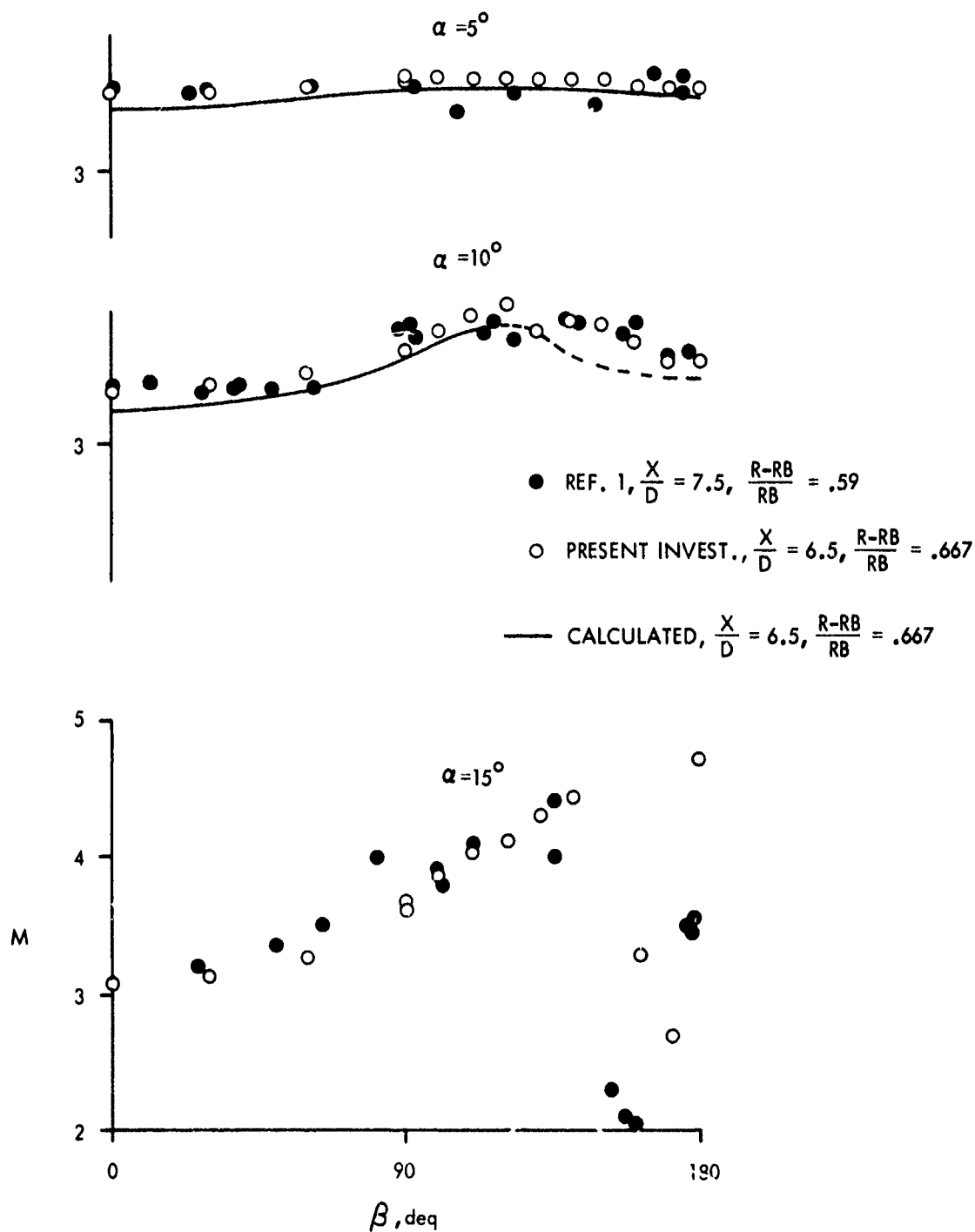


FIG. 54 COMPARISON OF MACH NUMBER DATA, $M_\infty = 3.5$

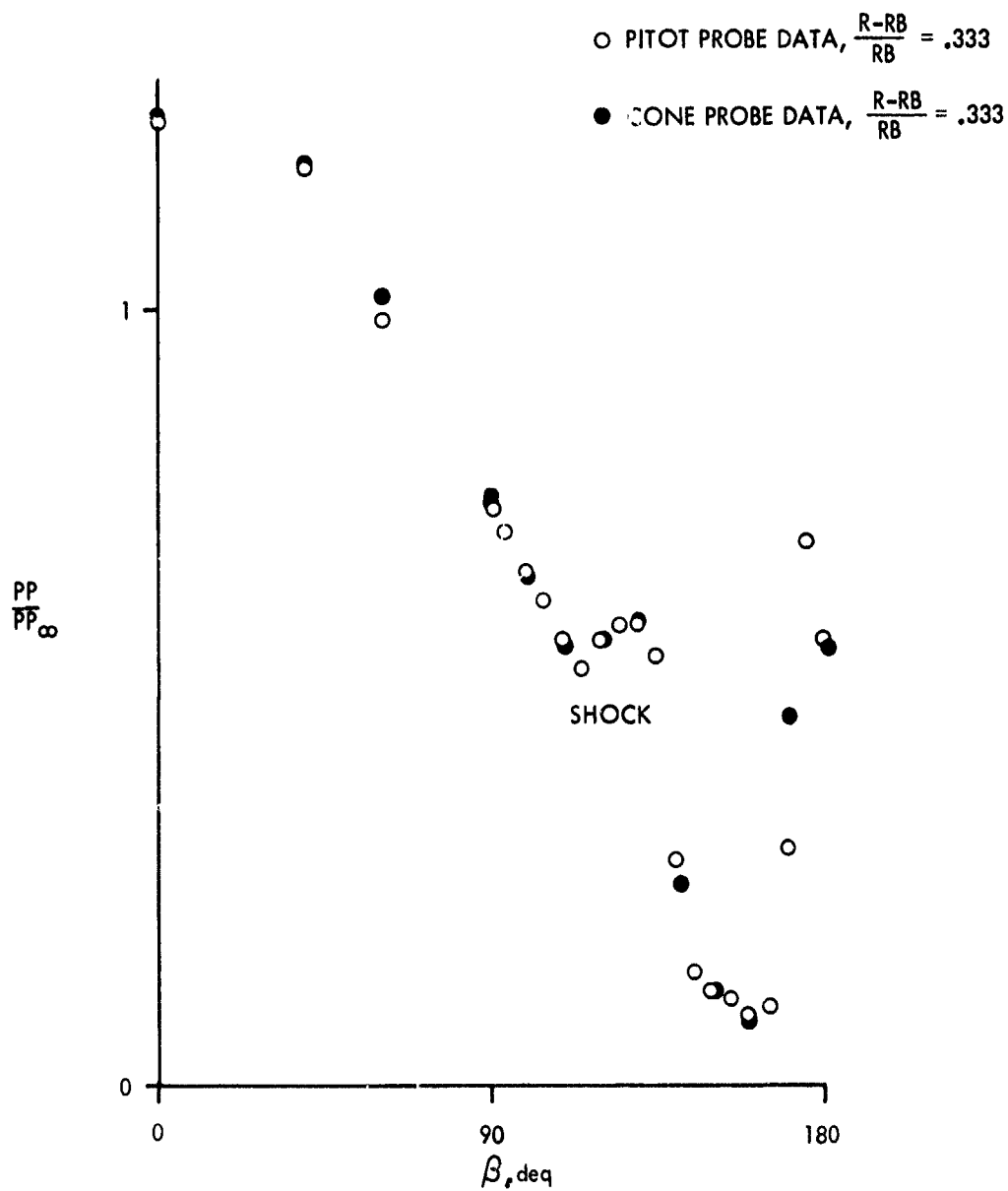


FIG. 55 COMPARISON OF PITOT PRESSURE DATA FROM OPPOSITE SIDES OF MODEL, $M_\infty = 4.07$
AND $\alpha = 10^\circ$

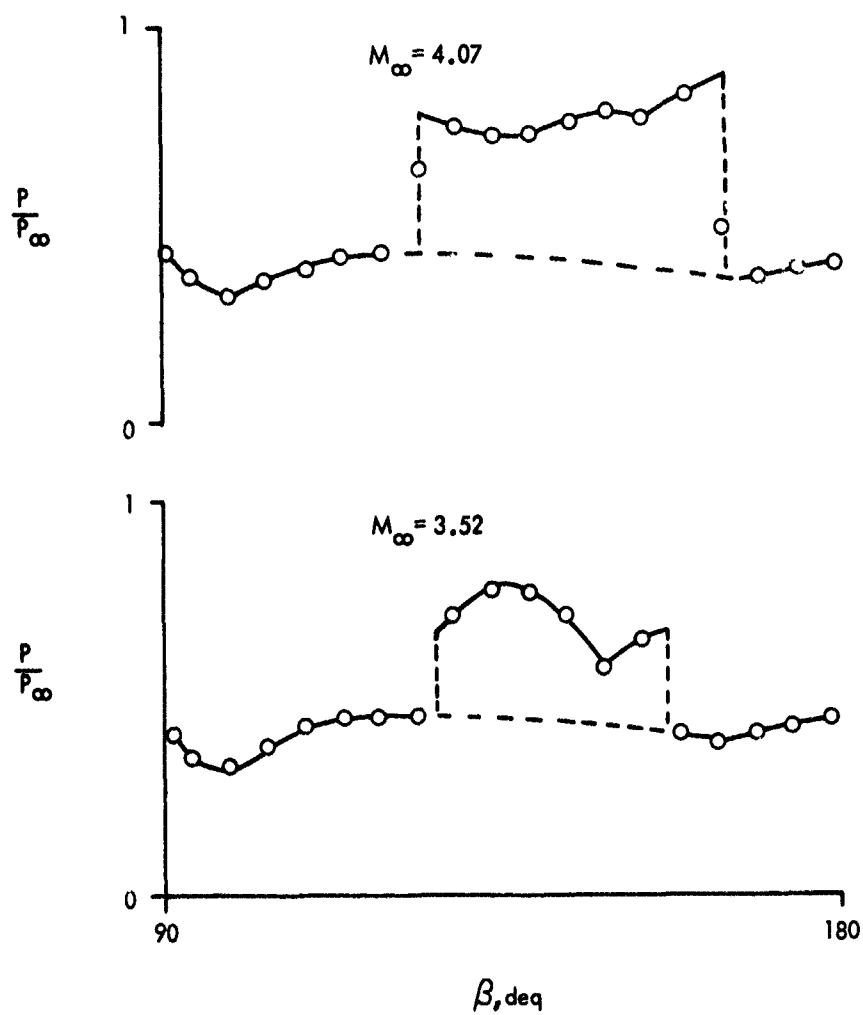


FIG. 56 EFFECT OF BASE INTERFERENCE ON SURFACE STATIC PRESSURE AT FLOW FIELD SURVEY
STATION ($\frac{X}{D} = 6.5$), $\alpha = 15^\circ$

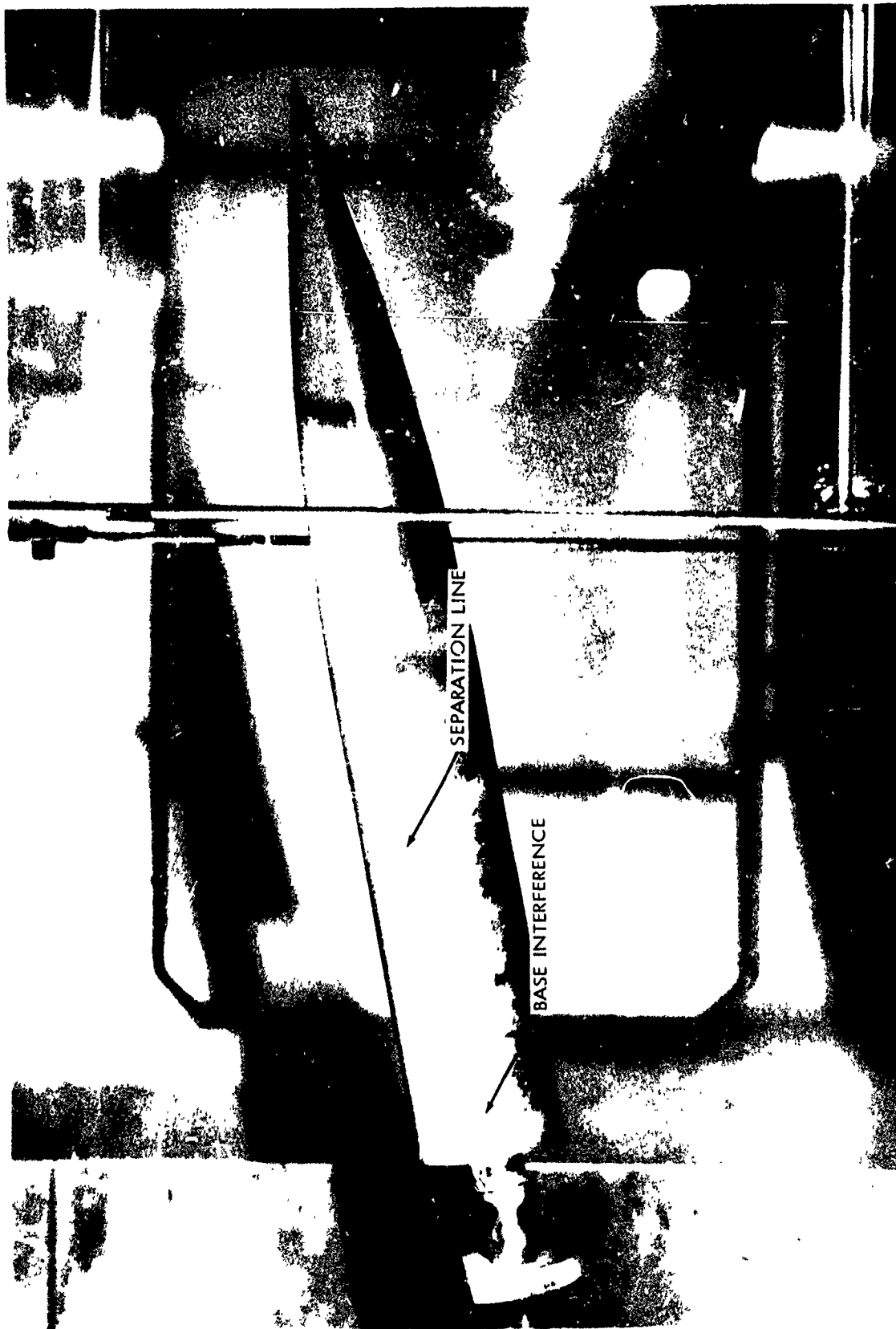


FIG. 57 OIL FLOW PATTERNS ON OGIVE-CYLINDER MODEL, $M = 4.07$ AND $\alpha = 10^\circ$

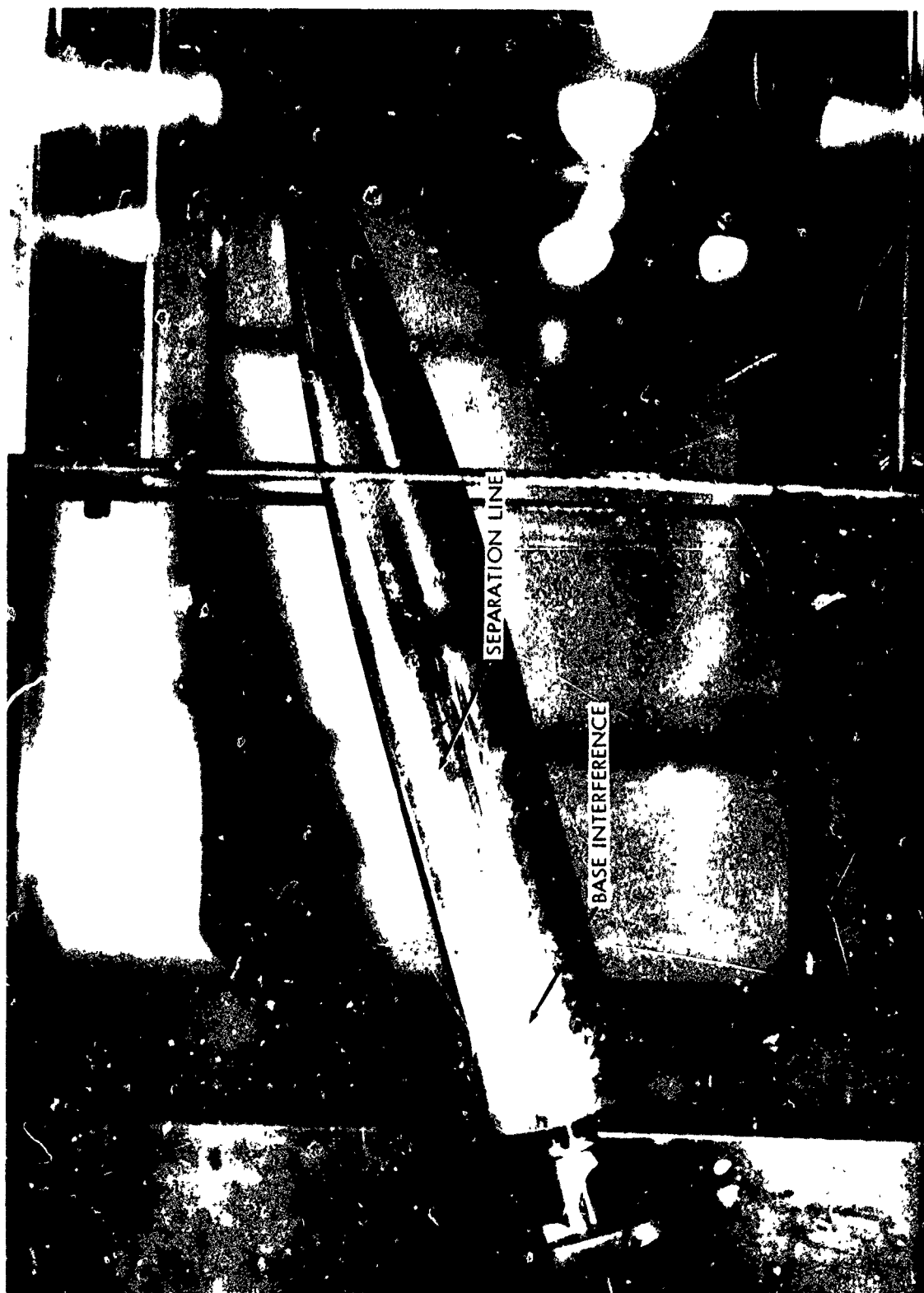


FIG. 58 OIL FLOW PATTERNS ON OGIVE-CYLINDER MODEL, $M=4.07$ AND $\alpha=15^\circ$

APPENDIX A

CONE PROBE CALIBRATION AND DATA REDUCTION

CALIBRATION PROCEDURE. The cone probes used in the flow field surveys were calibrated by removing the ogive-cylinder model from the sting support and exposing the probes to the uniform wind tunnel flow at various angles of attack and roll positions. The calibration test setup is shown in Figure A-1. Calibration data were taken at Mach numbers of 2.06, 3.05 and 4.08. The calibration test setup allowed the probes to be rolled through an angle of 180 degrees, starting in the pitch plane as shown in Figure A-1 and ending in the pitch plane opposite the position shown. The sting support could be pitched from -12 degrees downward to 22 degrees upward. This range of pitch and roll allowed calibration data to be taken with flow approaching the probes from each quadrant. The probe rake was rolled in the same direction during the calibration tests as in the flow field survey tests.

In the case of cone probes with four static pressure orifices spaced 90 degrees apart around the cone surface, first order cone flow theory gives the following relations:

$$\left(\frac{P_1 + P_2 + P_3 + P_4}{P_o} \right) = f_1(M) \quad (A1)$$

$$\sqrt{\left(\frac{P_1 - P_3}{P_o} \right)^2 + \left(\frac{P_2 - P_4}{P_o} \right)^2} = \epsilon f_2(M) \quad (A2)$$

$$\left(\frac{P_1 - P_3}{P_o} \right) / \left(\frac{P_2 - P_4}{P_o} \right) = \tan \phi' \quad (A3)$$

Where: P_1 , P_2 , P_3 , and P_4 denote the pressures measured at the four orifices

P_o = the local total pressure

The functional relationships are not changed if the local Pitot pressure is used rather than the total pressure. Ignoring flow

angularity effects, the local Pitot pressure is measured by the fifth orifice located at the tip of the probe. The layout of the cone probe orifices and the definition of the flow direction angle ϕ' is illustrated in Figure A-2.

Examination of the probe calibration data led to the following functional relationships:

$$\left(\frac{P_1 + P_2 + P_3 + P_4}{P_5} \right) = f_3(\epsilon, M) \quad (A4)$$

$$\sqrt{\left(\frac{P_1 - P_3}{P_5} \right)^2 + \left(\frac{P_2 - P_4}{P_5} \right)^2} = A + B\epsilon \quad (A5)$$

$$\left(\frac{P_1 - P_3}{P_5} \right) / \left(\frac{P_2 - P_4}{P_5} \right) = \tan \phi' \quad (A6)$$

Where A and B are constants.

Relations (A4) and (A5) were established by curve fitting the experimental calibration data. The range of the calibrations was extended to $M=5$ by using some previous NOL calibration data for similar probes and some theoretical values from the AGARD cone tables (reference 13). Data from both of these sources were in reasonably good agreement with the $M=4.08$ calibration data of this investigation. The relationships resulting from curve fitting the data are shown in Figures A-3a and A-3b.

It appeared that no significant improvement in accuracy would be gained by using separate calibrations for each probe. Some influence of ϕ' was noted in Relation (A4) and likewise an influence of both ϕ' and M was noted in Relation (A5). The data indicated, however, that these effects were small and would be very hard to correlate. According to reference 14, some improvement in probe calibration accuracy was achieved in similar probe calibrations by considering the quadrant of the flow direction as an additional parameter. It did not appear that this would significantly improve the accuracy of the calibrations in this investigation.

ACCURACY Accuracy of the probe calibrations was estimated by comparing Relations (A4), (A5) and (A6) with the individual calibration data points. Values of root mean square deviation of the individual data points from the final calibrations are given in the table below:

<u>Mach No.</u>	<u>ΔM (%)</u>	<u>$\Delta \epsilon$ (deg)</u>	<u>$\Delta \phi'$ (deg)</u>
2.06	± 1.1	± 1.2	± 2.7
3.05	1.8	.7	3.2
4.08	2.0	.6	2.7

The maximum (+) and (-) deviations of the data points from the calibrations are shown in Figures A-4a, A-4b and A-4c as functions of Mach number and total flow angle. The rms deviations are indicated on the graphs. In general, it is seen that the overall spread of the data was about 2 to 3 times the rms deviation. Small trends with respect to Mach number and total flow angle can also be seen.

For a general statement as to the accuracy of the probe calibrations it can be said that:

1. Mach numbers are accurate to about ± 5 percent,
2. total flow angles are accurate to about ± 2 degrees,
3. flow direction angles are accurate to about ± 7.5 degrees.

DATA REDUCTION PROCEDURE. Data reduction using Equations (A4), (A5) and (A6) was straightforward, with no iterations required. The procedure was to compute ϕ' and ϵ first, using Equations (A6) and (A5) and then compute M , using Equation (A4).

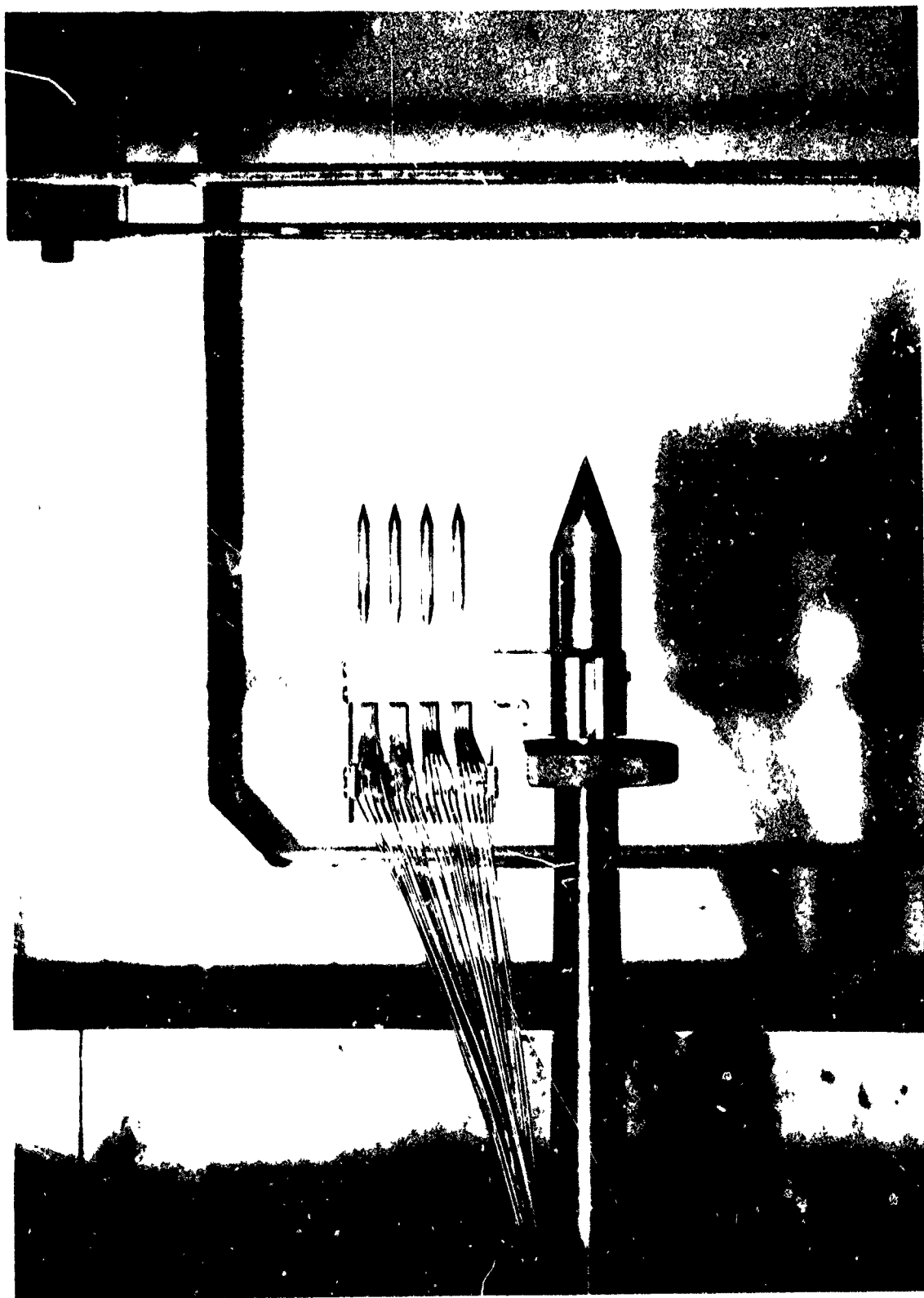
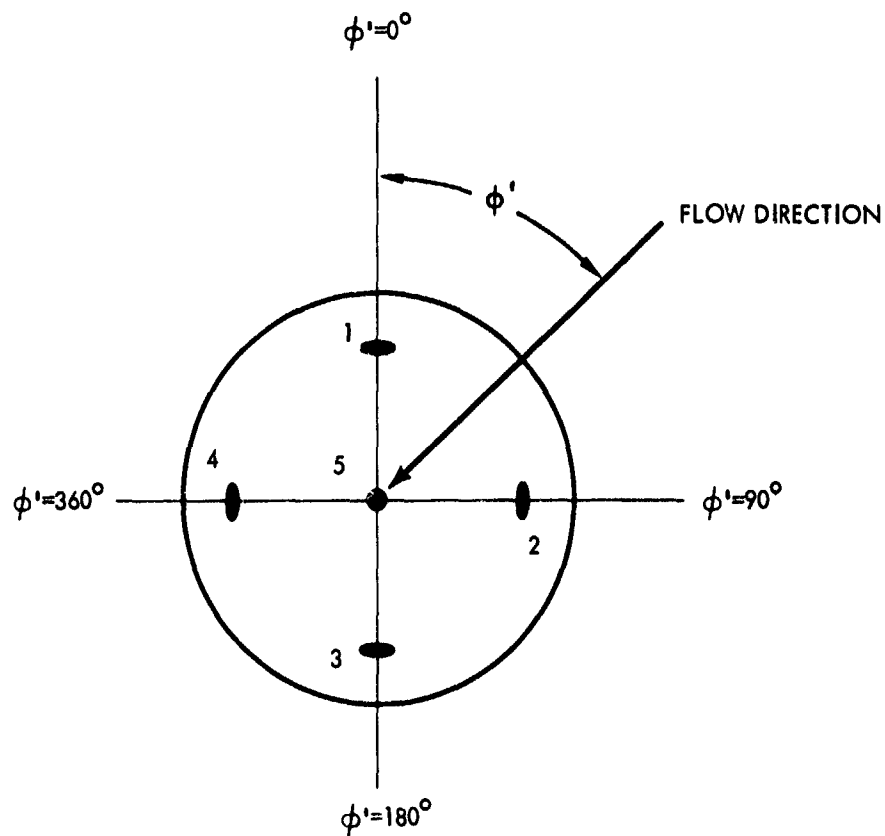


FIG. A-1 CONE PROBE CALIBRATION APPARATUS IN WIND TUNNEL



FRONT VIEW OF CONE PROBE

FIG. A-2 FLOW DIRECTION CONVECTION USED IN CONE PROBE CALIBRATIONS

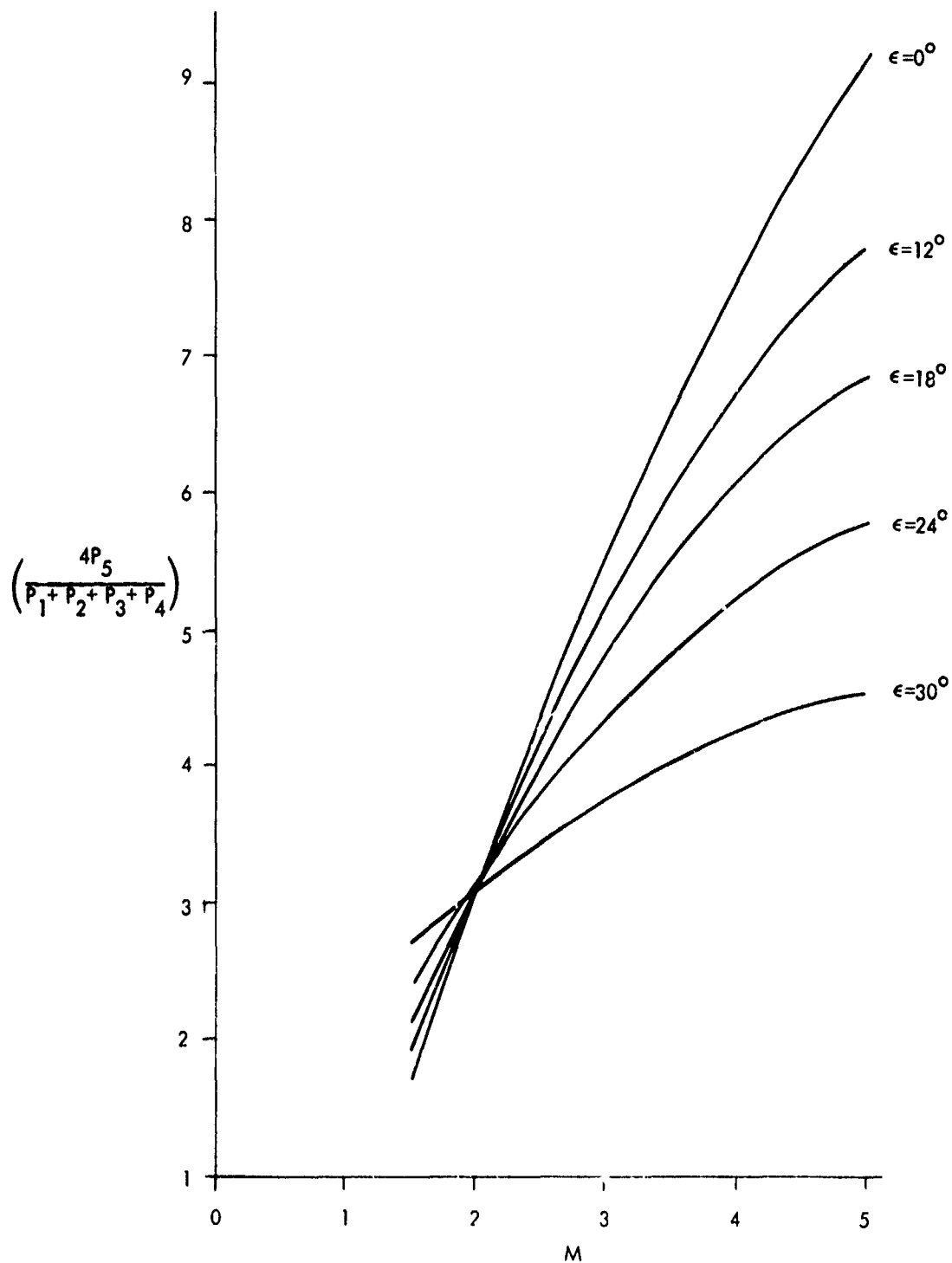


FIG. A-3a CORRELATION OF CONE PROBE CALIBRATION DATA

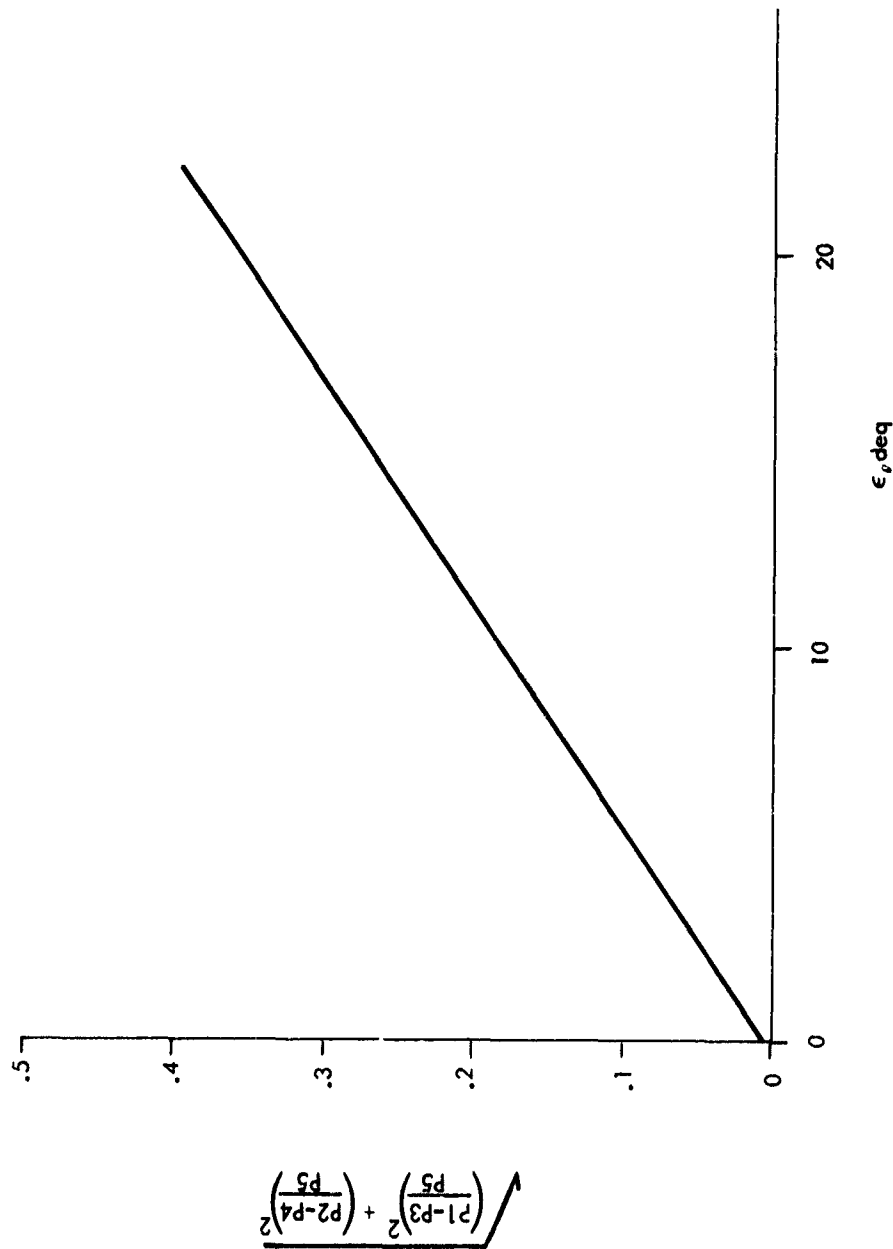


FIG. A-3b CORRELATION OF CONE PROBE CALIBRATION DATA

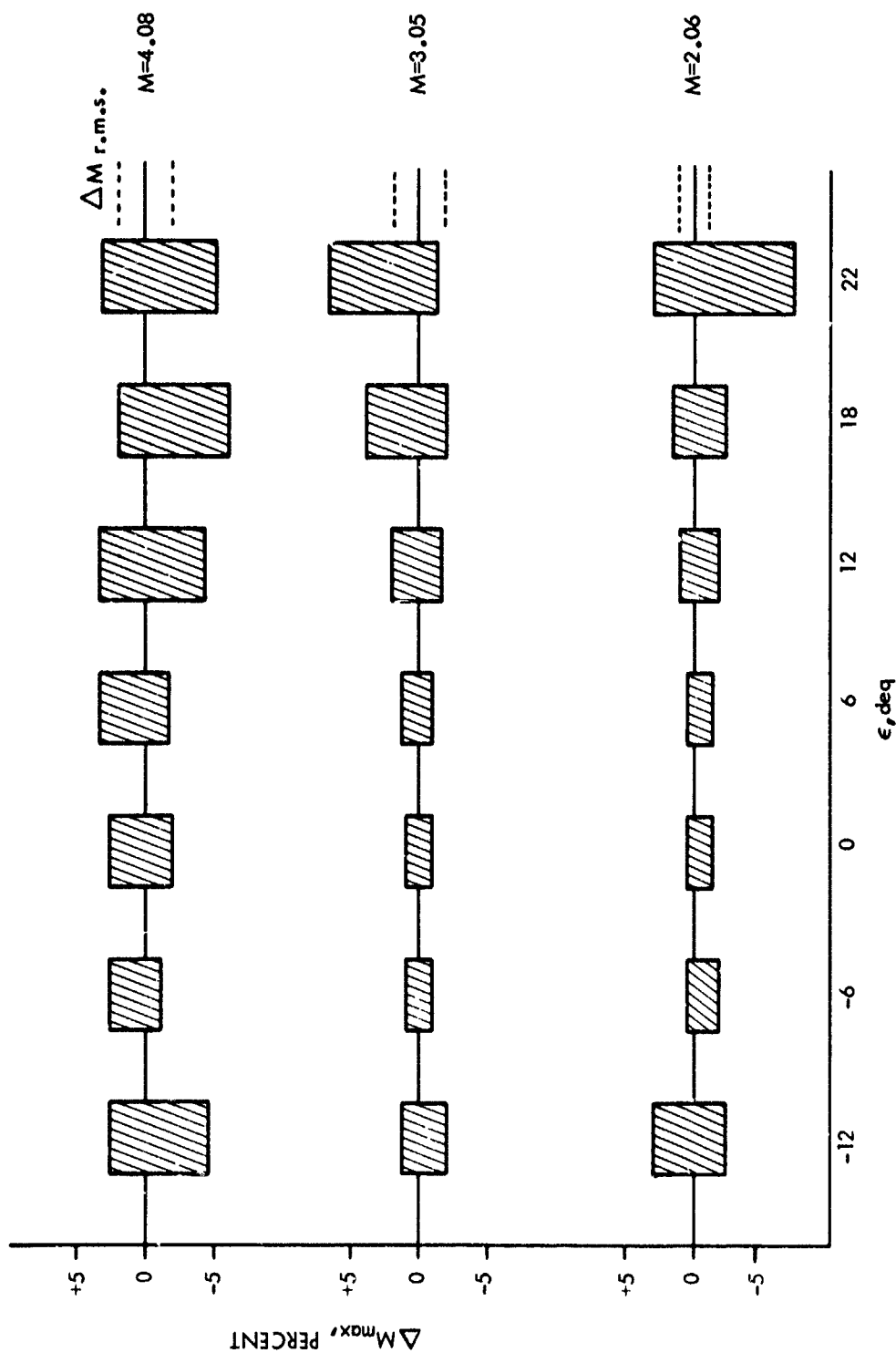


FIG. A-4a MAXIMUM DEVIATION OF CONE PROBE CALIBRATION DATA FROM CORRELATION

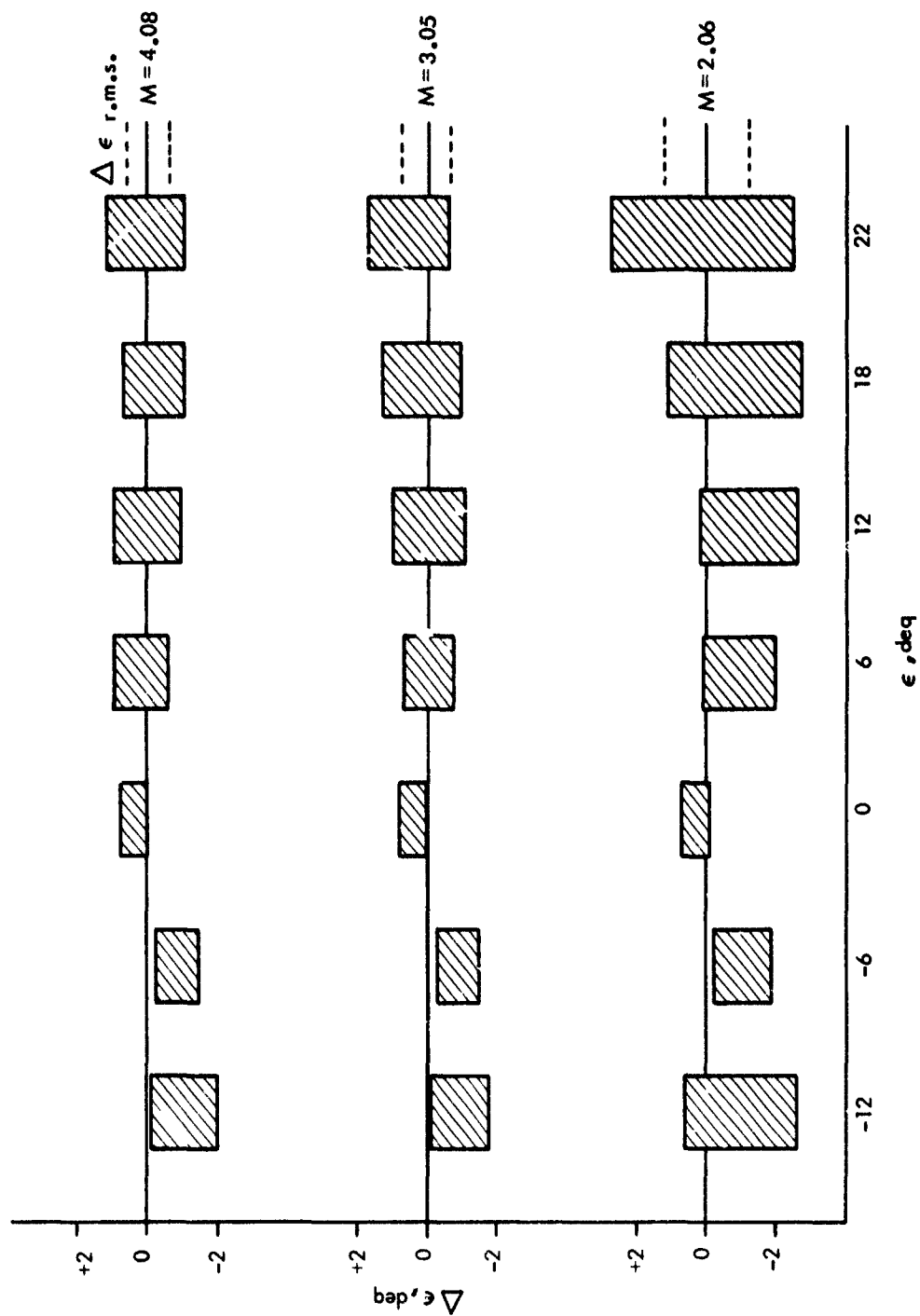


FIG. A-4b MAXIMUM DEVIATION OF CONE PROBE CALIBRATION DATA FROM CORRELATION

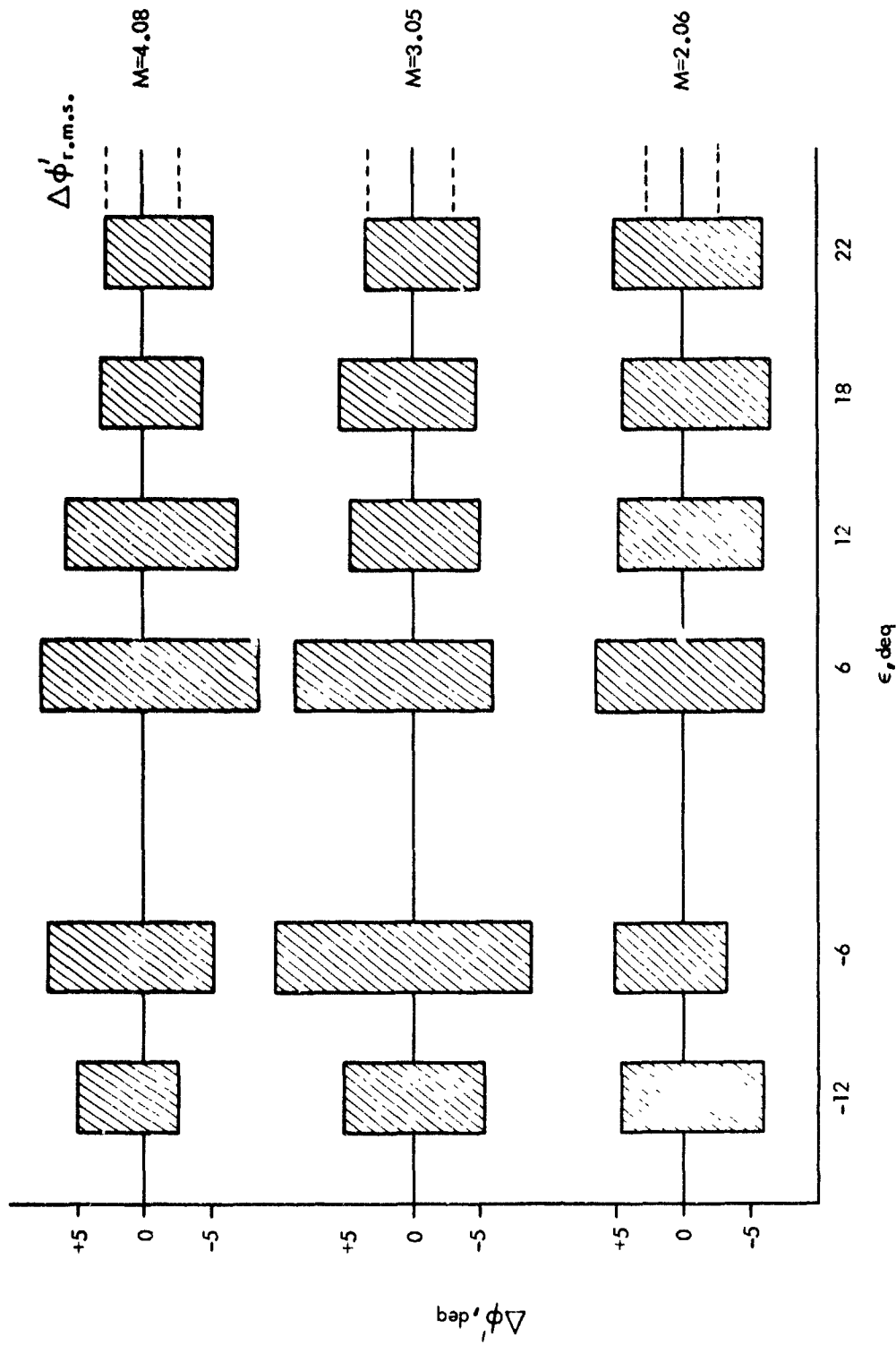


FIG. A-4c MAXIMUM DEVIATION OF CONE PROBE CALIBRATION DATA FROM CORRELATION

NOLTR 72-198

APPENDIX B
TABULATED RESULTS

NOLTR 72-198

TABLE I
SURFACE PRESSURE RATIO
SURFACE PRESSURE COEFFICIENT

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 3 DEGREES

BETA DEG	1	2	3	4	STATION NUMBER					
					5	6	7	8	9	10
179.2	2.1218 0.1293 2.0810	1.9193 0.1060 1.8997	55 883 -7451	1.7781 0.0897 1.7443	1.5733 0.0661 1.5474	1.4524 0.0522 1.4597	1.3159 0.0354 1.3049	1.2013 0.0232 1.1951	1.1182 0.0136 1.1087	1.0318 0.0037 1.0334
178.6	0.1246 2.1280	0.1037 1.9491	0.0859 1.7679	0.0858 1.6870	0.0631 1.5615	0.0529 1.4234	0.0352 1.3055	0.0225 1.1864	0.0125 1.1095	0.0039 1.0240
178.9	0.1301 2.0990	0.1094 1.8981	0.0885 1.7404	0.0792 1.7365	0.0647 1.5639	0.0488 1.4305	0.0353 1.3065	0.0215 1.1951	0.0126 1.1174	0.0028 1.0279
178.7	0.1267	0.1036	0.0854	0.0849	0.0650	0.0496	0.0353	0.0225	0.0135	0.0032

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 3 DEGREES

BETA DEG	STATION NUMBER									
	11	12	13	14	15	16	17	18	19	20
179.2	0.9549 -0.0052	0.8474 -0.0176	0.8420 -0.0182	0.8796 -0.0139	0.8765 -0.0142	0.8857 -0.0131	0.9079 -0.0126	0.9173 -0.0120	0.9281 -0.0083	0.9432 -0.0066
178.6	0.9495 -0.0058	0.8247 -0.0202	0.8357 -0.0189	0.8757 -0.0143	0.8702 -0.0150	0.8820 -0.0136	0.8932 -0.0116	0.9155 -0.0096	0.9320 -0.0073	0.9469 -0.0051
178.9	0.9432 -0.0066	0.8467 -0.0177	0.8333 -0.0192	0.8749 -0.0144	0.8718 -0.0148	0.8834 -0.0138	0.9016 -0.0113	0.9197 -0.0105	0.9367 -0.0085	0.9541 -0.0074
178.7	0.9518 -0.0056	0.8561 -0.0166	0.8404 -0.0184	0.8796 -0.0139	0.8718 -0.0148	0.8851 -0.0132	0.9047 -0.0110	0.9157 -0.0097	0.9251 -0.0086	0.9377 -0.0072

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 5 DEGREES

BETA DEG	1	2	3	4	5	6	7	8	9	10
1.1	2.9080 0.2200 2.7770	2.6608 0.1915	2.4529 0.1675 2.3415	2.3619 0.1570 2.1681	2.1728 0.1352 2.0456	1.9758 0.1125 1.8733	1.9316 0.0924 1.7231	1.5358 0.2734 1.5456	1.5191 0.5999 1.4336	1.3881 0.0447 1.3065
31.1	0.2049 2.6749 0.1700	0.1235 0.0896 1.7773	0.1547 2.0715 0.1235	0.1347 0.1206 1.8275	0.1206 0.0954 1.5387	0.1014 0.0762 1.3999	0.0834 0.0589 1.2743	0.0633 0.0346 1.1425	0.0500 0.0294 1.0585	0.0353 0.0148 0.9400
63.9	2.0919 0.1259 2.0708	1.8636 0.0896 1.8746	1.7475 0.0862 1.7553	1.6694 0.0749 1.5372	1.5333 0.0615 1.3855	1.3944 0.0455 1.2594	1.2596 0.0298 1.1331	1.1334 0.0154 1.0131	1.0567 0.0060 0.9057	0.9069 0.0651 0.8040
89.4	0.1235 2.0982 0.1266	0.0896 1.8746 0.1008	0.0871 1.6988 0.0806	0.0769 1.5152 0.0594	0.0619 1.4799 0.0553	0.0466 1.3559 0.0410	0.0352 1.2194 0.0253	0.0276 1.1225 0.0118	0.0207 1.0248 0.0029	0.0111 0.9416 0.0067
93.2	0.1171 1.9742 0.1123	0.0897 1.7318 0.0844	0.0769 1.6666 0.0769	0.0695 1.4367 0.0504	0.0619 1.4038 0.0466	0.0466 1.2751 0.0317	0.0352 1.1495 0.0276	0.0276 1.0337 0.0166	0.0207 0.9367 0.0067	0.0111 0.8859 0.0032
103.3	0.1028 1.8636 0.0996	0.0695 1.5670 0.0654	0.0528 1.4391 0.0506	0.0459 1.3120 0.0360	0.0313 1.2523 0.0291	0.0199 1.1498 0.0172	0.0139 1.0954 0.0110	0.0119 0.9953 0.0086	0.0119 0.8953 0.0079	0.0119 0.8192 0.0106
108.6	0.0807 1.7004 0.0724	0.0528 1.4391 0.0506	0.0459 1.3120 0.0360	0.0366 1.2523 0.0291	0.0276 1.1498 0.0172	0.0199 1.0954 0.0110	0.0139 1.0337 0.0110	0.0119 0.9953 0.0086	0.0119 0.8953 0.0079	0.0119 0.8192 0.0106
113.3	0.0899 1.7718 0.0890	0.0596 1.4948 0.0570	0.0459 1.3120 0.0360	0.0366 1.2523 0.0291	0.0276 1.1498 0.0172	0.0199 1.0954 0.0110	0.0139 1.0337 0.0110	0.0119 0.9953 0.0086	0.0119 0.8953 0.0079	0.0119 0.8192 0.0106
118.5	0.0890 1.6996 0.0807	0.0570 1.4579 0.0528	0.0459 1.3120 0.0360	0.0366 1.2523 0.0291	0.0276 1.1498 0.0172	0.0199 1.0954 0.0110	0.0139 1.0337 0.0110	0.0119 0.9953 0.0086	0.0119 0.8953 0.0079	0.0119 0.8192 0.0106
123.2	0.0807 1.7004 0.0724	0.0528 1.4391 0.0506	0.0459 1.3120 0.0360	0.0366 1.2523 0.0291	0.0276 1.1498 0.0172	0.0199 1.0954 0.0110	0.0139 1.0337 0.0110	0.0119 0.9953 0.0086	0.0119 0.8953 0.0079	0.0119 0.8192 0.0106
128.6	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
133.5	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
138.6	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
143.7	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
148.7	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
153.3	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
158.5	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
163.6	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
168.7	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
173.9	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
179.7	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724
179.0	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724	0.0808 1.6282 0.0724

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 5 DEGREES

BETA	STATION NUMBER									
DEG	11	12	13	14	15	16	17	18	19	20
1.1	1.2712	1.1080	1.0828	1.1150	1.0852	1.0836	1.0937	1.0835	1.0781	1.0742
31.1	0.0313	0.0124	0.0096	0.0133	0.0098	0.0096	0.0105	0.0093	0.0090	0.0086
	1.2053	1.0444	1.0232	1.0546	1.0256	1.0177	1.0264	1.0130	1.0146	1.0122
60.9	0.0237	0.0051	0.0027	0.0063	0.0029	0.0020	0.0030	0.0015	0.0017	0.0014
	1.0475	0.9251	0.8937	0.9181	0.8875	0.8812	0.8828	0.8694	0.8694	0.8624
90.8	0.0055	-0.0086	-0.0123	-0.0094	-0.0130	-0.0137	-0.0135	-0.0151	-0.0151	-0.0113
	0.8882	0.7886	0.7556	0.7767	0.7534	0.7455	0.7497	0.7319	0.7527	0.7319
89.4	-0.0129	-0.0244	-0.0282	-0.0257	-0.0284	-0.0292	-0.0290	-0.0301	-0.0285	-0.0309
	0.8663	0.7644	0.7283	0.7358	0.7213	0.7104	0.6977	0.6886	0.6886	0.6610
88.5	-0.0154	-0.0272	-0.0313	-0.0305	-0.0321	-0.0334	-0.0349	-0.0355	-0.0359	-0.0491
	0.8631	0.7672	0.7283	0.7341	0.7192	0.7093	0.6954	0.6835	0.6847	0.6590
93.2	-0.0158	-0.0268	-0.0313	-0.0307	-0.0324	-0.0335	-0.0351	-0.0358	-0.0364	-0.0393
	0.8412	0.7493	0.7096	0.7168	0.7002	0.6913	0.6806	0.6659	0.6659	0.6498
98.5	-0.0183	-0.0289	-0.0335	-0.0327	-0.0346	-0.0355	-0.0377	-0.0385	-0.0385	-0.0404
	0.8176	0.7279	0.6882	0.6940	0.6794	0.6734	0.6553	0.6501	0.6501	0.6461
103.3	-0.0210	-0.0314	-0.0359	-0.0353	-0.0370	-0.0377	-0.0386	-0.0401	-0.0401	-0.0408
	0.7988	0.7133	0.6754	0.6822	0.6693	0.6671	0.6597	0.6538	0.6538	0.6662
109.6	-0.0232	-0.0331	-0.0374	-0.0366	-0.0381	-0.0394	-0.0402	-0.0411	-0.0411	-0.0422
	0.7770	0.6990	0.6594	0.6696	0.6623	0.6609	0.6511	0.6450	0.6450	0.6660
113.3	-0.0257	-0.0347	-0.0393	-0.0381	-0.0399	-0.0409	-0.0419	-0.0430	-0.0430	-0.0442
	0.7665	0.6926	0.6578	0.6725	0.6666	0.6695	0.6579	0.6514	0.6514	0.6758
119.5	-0.0269	-0.0354	-0.0395	-0.0378	-0.0394	-0.0403	-0.0413	-0.0423	-0.0423	-0.0439
	0.7607	0.6926	0.6576	0.6713	0.6736	0.6739	0.6594	0.6530	0.6530	0.6737
123.2	-0.0276	-0.0354	-0.0395	-0.0375	-0.0396	-0.0403	-0.0413	-0.0423	-0.0423	-0.0439
	0.7556	0.6933	0.6650	0.6853	0.6893	0.7013	0.7139	0.7431	0.7731	0.8561
129.6	-0.0282	-0.0354	-0.0386	-0.0363	-0.0388	-0.0394	-0.0403	-0.0413	-0.0413	-0.0422
	0.7577	0.6988	0.6725	0.6993	0.7075	0.7232	0.7520	0.7747	0.8074	0.8945
133.5	-0.0279	-0.0347	-0.0378	-0.0347	-0.0377	-0.0382	-0.0392	-0.0402	-0.0402	-0.0412
	0.7595	0.6971	0.6809	0.7133	0.7244	0.7428	0.7697	0.7917	0.8270	0.9094
138.6	-0.0277	-0.0349	-0.0368	-0.0331	-0.0368	-0.0374	-0.0384	-0.0390	-0.0390	-0.0404
	0.7625	0.7103	0.6884	0.7275	0.7424	0.7596	0.7909	0.8180	0.8517	0.9157
143.7	-0.0274	-0.0334	-0.0359	-0.0314	-0.0351	-0.0357	-0.0367	-0.0372	-0.0372	-0.0387
	0.7673	0.7150	0.7035	0.7431	0.7571	0.7755	0.8051	0.8323	0.8584	0.9212
149.7	-0.0268	-0.0329	-0.0342	-0.0342	-0.0342	-0.0342	-0.0342	-0.0342	-0.0342	-0.0342
	0.7721	0.7244	0.7119	0.7538	0.7686	0.7835	0.8153	0.8427	0.8616	0.9243
153.3	-0.0263	-0.0318	-0.0332	-0.0284	-0.0327	-0.0334	-0.0344	-0.0354	-0.0354	-0.0367
	0.7827	0.7260	0.7210	0.7635	0.7805	0.8004	0.8231	0.8494	0.8710	0.9330
159.5	-0.0251	-0.0316	-0.0322	-0.0273	-0.0323	-0.0330	-0.0340	-0.0350	-0.0350	-0.0364
	0.7902	0.7407	0.7312	0.7790	0.7917	0.8121	0.8404	0.8616	0.8816	0.9408
153.5	-0.0242	-0.0299	-0.0310	-0.0255	-0.0304	-0.0311	-0.0321	-0.0331	-0.0331	-0.0345
	0.7933	0.7375	0.7363	0.7829	0.7980	0.8175	0.8459	0.8710	0.8914	0.9517
159.9	-0.0238	-0.0303	-0.0304	-0.0250	-0.0303	-0.0310	-0.0320	-0.0330	-0.0330	-0.0344
	0.8019	0.7505	0.7464	0.7957	0.8082	0.8310	0.8624	0.8816	0.9016	0.9618
173.3	-0.0228	-0.0288	-0.0292	-0.0236	-0.0292	-0.0299	-0.0309	-0.0319	-0.0319	-0.0333
	0.8035	0.7443	0.7497	0.7941	0.8114	0.8375	0.8671	0.8912	0.9177	0.9805
179.7	-0.0227	-0.0295	-0.0289	-0.0237	-0.0295	-0.0303	-0.0313	-0.0323	-0.0323	-0.0337
	0.8027	0.7526	0.7519	0.8004	0.8145	0.8395	0.8733	0.8938	0.9209	0.9883
173.0	-0.0227	-0.0285	-0.0286	-0.0230	-0.0294	-0.0302	-0.0312	-0.0322	-0.0322	-0.0336
	0.8019	0.7425	0.7499	0.7949	0.8137	0.8359	0.8710	0.8957	0.9224	0.9920
	-0.0228	-0.0297	-0.0289	-0.0237	-0.0295	-0.0303	-0.0313	-0.0323	-0.0323	-0.0337

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 10 DEGREES

BETA	1	2	3	4	5	6	7	8	9	10
DEG	1	2	3	4	5	6	7	8	9	10
3.5	4.0003		3.4102		3.0320	2.8013	2.5555	2.3035	2.1555	1.9462
	0.3659		0.2779		0.2343	0.2077	0.1735	0.1504	0.1332	0.1149
1.4	3.9814	3.5742	3.4063	3.2478	3.0343	2.8152	2.5620	2.3101	2.1484	2.0009
	0.3637	0.2968	0.2774	0.2542	0.2346	0.2034	0.1801	0.1510	0.1324	0.1154
30.7	3.6723		3.1120	2.9802	2.7756	2.5561	2.3283	2.0838	1.9248	1.7804
	0.3081		0.2435	0.2243	0.2047	0.1732	1.1532	1.1255	0.1066	0.0900
60.7	2.8688		2.4019	2.1454	2.1249	1.9350	1.7420	1.5442	1.4163	1.2798
	0.2155		0.1616	0.1551	0.1297	0.1078	0.0855	0.0627	0.0490	0.0323
90.3	1.9735		1.6470	1.4112	1.4242	1.2727	1.1315	0.9832	0.8867	0.7828
	0.1122		0.0746	0.0497	0.0449	0.0314	0.0152	0.0028	0.0019	0.0008
89.7	1.9954	1.7741	1.6486	1.5149	1.3847	1.2924	1.2055	1.1228	1.0471	0.9698
	0.1148		0.0748	0.0709	0.0449	0.0337	0.0139	0.0033	0.0017	0.0019
93.6	1.8581	1.5709	1.5011	1.3551	1.2461	1.1913	1.0249	0.9114	0.8263	0.7499
	0.0989	0.0658	0.0578	0.0409	0.0284	0.0222	0.0029	0.0014	0.0009	0.0008
99.9	1.7498		1.4312	1.3475	1.1343	1.0970	0.9479	0.8412	0.7611	0.6707
	0.0865		0.0497	0.0458	0.0224	0.0112	0.0050	0.0013	0.0008	0.0008
103.7	1.6313		1.3065	1.1346	1.0749	1.0255	0.8749	0.7712	0.6977	0.6248
	0.0728		0.0453	0.0160	0.0091	0.0029	0.0014	0.0009	0.0008	0.0008
109.1	1.5301		1.2476	1.1966	1.0209	0.9314	0.8043	0.7033	0.6289	0.5492
	0.0611		0.0227	0.0114	0.0024	0.0007	0.0007	0.0007	0.0007	0.0007
113.7	1.4281		1.1417	1.0114	0.9267	0.8843	0.7450	0.6525	0.5843	0.5191
	0.0494		0.0163	0.0013	0.0005	0.0003	0.0003	0.0003	0.0003	0.0003
119.8	1.3575		1.1080	1.0554	0.9087	0.8270	0.7025	0.6134	0.5407	0.4666
	0.0342		0.0124	0.0024	0.0005	0.0003	0.0003	0.0003	0.0003	0.0003
123.6	1.2947		1.0318	0.9024	0.8380	0.8034	0.6751	0.5938	0.5249	0.4630
	0.0340		0.0037	0.0013	0.0005	0.0003	0.0003	0.0003	0.0003	0.0003
128.8	1.2508		1.0039	0.9989	0.8514	0.7777	0.6553	0.5991	0.5249	0.4563
	0.0289		0.0039	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
133.8	1.2178		0.9950	0.8765	0.7862	0.7972	0.6822	0.6073	0.5604	0.5237
	0.0251		0.0006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
139.0	1.2084		1.0185	0.9769	0.8624	0.7834	0.7073	0.6438	0.6098	0.5696
	0.0240		0.0021	0.0007	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
143.7	1.1990		0.9769	0.8576	0.8380	0.8338	0.7351	0.6813	0.6528	0.6258
	0.0229		0.0027	0.0016	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
148.5	1.2084		1.0216	0.9957	0.8969	0.8427	0.7680	0.7148	0.6394	0.6394
	0.0240		0.0025	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
153.7	1.2013		0.9965	0.9479	0.8655	0.8812	0.7917	0.7443	0.7064	0.6725
	0.0232		0.0004	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
158.9	1.2304		1.0420	1.0256	0.9330	0.8892	0.8158	0.7558	0.7261	0.6778
	0.0266		0.0048	0.0024	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
163.7	1.2202		1.0146	1.0114	0.9024	0.9037	0.8253	0.7758	0.7376	0.7001
	0.0254		0.0017	0.0013	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
169.0	1.2476		1.0593	1.0491	0.9699	0.9102	0.8412	0.7873	0.7484	0.7011
	0.0286		0.0068	0.0057	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
173.5	1.2374		1.0350	1.0216	0.9110	0.9345	0.8396	0.7737	0.7552	0.7232
	0.0274		0.0040	0.0025	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
179.2	1.2523		1.0774	1.0632	0.9699	0.9191	0.8553	0.8027	0.7616	0.7277
	0.0291		0.0089	0.0073	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
179.9	1.2406		1.0530	1.0405	0.9322	0.9377	0.8474	0.8027	0.7656	0.7371
	0.0277		0.0061	0.0047	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 10 DEGREES

BETA DEG	STATION NUMBER									
	11	12	13	14	15	16	17	18	19	20
0.5	1.8079 0.0931 1.8047	1.5364 0.0618 1.4799	1.5411 0.0624 1.5403	1.5646 0.0651 1.5646	1.5168 0.0596 1.5168	1.5034 0.0590 1.5056	1.5183 0.0593 1.5128	1.4987 0.0575 1.4956	1.4846 0.0559 1.4807	1.4768 0.0550 1.4736
1.4	0.0928 1.6156 0.0710	0.0553 1.3230 0.0372	0.0623 1.3716 0.0428	0.0651 1.4022 0.0464	0.0596 1.3418 0.0394	0.0584 1.3235 0.0379	0.0591 1.3339 0.0395	0.0571 1.3080 0.0356	0.0554 1.3175 0.0355	0.0546 1.2916 0.0336
35.7	0.0710 1.1660 0.0191	0.0372 0.9644 -0.0041	0.0428 0.9738 -0.0030	0.0464 0.9879 -0.0014	0.0394 0.9879 -0.0008	0.0379 0.9157 -0.0037	0.0395 0.9165 -0.0036	0.0356 0.9828 -0.0127	0.0355 0.8828 -0.0135	0.0336 0.8631 -0.0158
65.7	0.0712 -0.0331 0.7245	0.0624 -0.0431 0.6369	0.0570 -0.0488 0.5727	0.0567 -0.0498 0.5531	0.0532 -0.0538 0.5397	0.0506 -0.0557 0.5195	0.0498 -0.0582 0.4902	0.4739 -0.0637 0.4741	0.4576 -0.0625 0.4506	0.4510 -0.0633 0.4437
88.7	0.0318 0.6554 -0.0397	0.0419 0.5915 0.0471	0.0493 0.5091 0.0566	0.0515 0.4940 0.0583	0.0531 0.4761 0.0604	0.0554 0.4599 0.0623	0.0588 0.4311 0.0656	0.0636 0.4159 0.0673	0.0633 0.4020 0.0689	0.0639 0.3855 0.0708
93.6	0.0397 0.5981 -0.0463	0.0471 0.5485 0.0521	0.0566 0.4620 0.0620	0.0583 0.4400 0.0646	0.0604 0.4223 0.0666	0.0623 0.4045 0.0687	0.0656 0.3797 0.0715	0.0673 0.3649 0.0732	0.0689 0.3602 0.0738	0.0708 0.354 0.0709
98.9	0.0463 0.5413 -0.0529	0.0521 0.5197 0.0554	0.0620 0.4712 0.0677	0.0646 0.4393 0.0700	0.0666 0.4129 0.0723	0.0687 0.3876 0.0745	0.0715 0.3631 0.0769	0.0732 0.3351 0.0797	0.0738 0.3052 0.0835	0.0709 0.2738 0.0874
103.7	0.0529 0.4852 -0.0594	0.0554 0.4663 0.0615	0.0677 0.3684 0.0728	0.0700 0.3438 0.0757	0.0723 0.3265 0.0783	0.0745 0.3155 0.0811	0.0769 0.3051 0.0832	0.0797 0.2874 0.0859	0.0835 0.2615 0.0889	0.0874 0.2375 0.0924
109.1	0.0594 0.4444 -0.0641	0.0615 0.4667 0.0615	0.0728 0.3288 0.0774	0.0757 0.3112 0.0794	0.0783 0.2943 0.0829	0.0811 0.2789 0.0860	0.0832 0.2641 0.0893	0.0859 0.2415 0.0911	0.0889 0.2175 0.0955	0.0924 0.1935 0.0993
113.7	0.0641 0.4068 -0.0684	0.0615 0.4112 0.0679	0.0774 0.3127 0.0792	0.0794 0.2973 0.0833	0.0829 0.2829 0.0869	0.0860 0.2681 0.0901	0.0893 0.2533 0.0933	0.0911 0.2385 0.0973	0.0955 0.2145 0.1011	0.0993 0.1905 0.1057
118.8	0.0684 0.3865 -0.0707	0.0679 0.4504 0.0634	0.0792 0.3531 0.0746	0.0833 0.4138 0.0676	0.0869 0.4549 0.0629	0.0901 0.4954 0.0581	0.0933 0.5359 0.0547	0.0973 0.5765 0.0511	0.1011 0.6171 0.0475	0.1057 0.6577 0.0439
123.6	0.0707 0.4109 -0.0679	0.0634 0.4553 0.0628	0.0746 0.4254 0.0663	0.0676 0.4598 0.0623	0.0629 0.4954 0.0581	0.0581 0.5359 0.0547	0.0547 0.5765 0.0511	0.0511 0.6171 0.0475	0.0475 0.6577 0.0439	0.0439 0.6989 0.0403
128.8	0.0679 0.4894 -0.0589	0.0628 0.5261 0.0546	0.0663 0.4617 0.0621	0.0623 0.4779 0.0602	0.0581 0.4954 0.0547	0.0547 0.5359 0.0511	0.0511 0.5765 0.0475	0.0475 0.6171 0.0439	0.0439 0.6577 0.0403	0.0403 0.6989 0.0367
133.8	0.05504 -0.0518 0.5872	0.0478 -0.0522 0.5787	0.0540 -0.0593 0.5104	0.0566 -0.0603 0.4907	0.0581 -0.0619 0.4633	0.0593 -0.0639 0.4369	0.0603 -0.0651 0.4105	0.0619 -0.0669 0.3841	0.0639 -0.0689 0.3517	0.0657 -0.0709 0.3183
139.0	0.0476 -0.0608 0.6098	0.0486 -0.0585 0.5855	0.0540 -0.0560 0.5318	0.0566 -0.0566 0.5089	0.0581 -0.0581 0.4855	0.0593 -0.0593 0.4621	0.0603 -0.0603 0.4387	0.0619 -0.0619 0.4153	0.0639 -0.0639 0.3919	0.0657 -0.0657 0.3685
143.7	0.0450 -0.06310 0.6310	0.0478 -0.06051 0.5489	0.0540 -0.0560 0.5089	0.0566 -0.0566 0.4855	0.0581 -0.0581 0.4621	0.0593 -0.0593 0.4387	0.0603 -0.0603 0.4153	0.0619 -0.0619 0.3919	0.0639 -0.0639 0.3685	0.0657 -0.0657 0.3451
148.5	0.0425 -0.06448 0.6448	0.0455 -0.06100 0.6100	0.0520 -0.05683 0.5683	0.0530 -0.05596 0.5596	0.0545 -0.0585 0.5505	0.0560 -0.0616 0.5413	0.0575 -0.0631 0.5321	0.0590 -0.0647 0.5229	0.0605 -0.0664 0.5137	0.0620 -0.0683 0.5045
153.7	0.0395 -0.06576 0.6576	0.0433 -0.06245 0.6245	0.0508 -0.05854 0.5854	0.0508 -0.05854 0.5854	0.0523 -0.06007 0.5753	0.0538 -0.0616 0.5651	0.0553 -0.0624 0.5548	0.0568 -0.0631 0.5445	0.0583 -0.0639 0.5342	0.0598 -0.0647 0.5239
158.9	0.0377 -0.06734 0.6734	0.0418 -0.06041 0.6041	0.0508 -0.05854 0.5854	0.0508 -0.05854 0.5854	0.0523 -0.06007 0.5753	0.0538 -0.0616 0.5651	0.0553 -0.0624 0.5548	0.0568 -0.0631 0.5445	0.0583 -0.0639 0.5342	0.0598 -0.0647 0.5239
163.7	0.0356 -0.06915 0.6915	0.0395 -0.06245 0.6245	0.0508 -0.05854 0.5854	0.0508 -0.05854 0.5854	0.0523 -0.06007 0.5753	0.0538 -0.0616 0.5651	0.0553 -0.0624 0.5548	0.0568 -0.0631 0.5445	0.0583 -0.0639 0.5342	0.0598 -0.0647 0.5239
169.0	0.0336 -0.07088 0.7088	0.0377 -0.06418 0.6418	0.0508 -0.05854 0.5854	0.0508 -0.05854 0.5854	0.0523 -0.06007 0.5753	0.0538 -0.0616 0.5651	0.0553 -0.0624 0.5548	0.0568 -0.0631 0.5445	0.0583 -0.0639 0.5342	0.0598 -0.0647 0.5239
173.5	0.0317 -0.07261 0.7261	0.0356 -0.06597 0.6597	0.0508 -0.05854 0.5854	0.0508 -0.05854 0.5854	0.0523 -0.06007 0.5753	0.0538 -0.0616 0.5651	0.0553 -0.0624 0.5548	0.0568 -0.0631 0.5445	0.0583 -0.0639 0.5342	0.0598 -0.0647 0.5239
179.9	0.0297 -0.07428 0.7428	0.0336 -0.06782 0.6782	0.0508 -0.05854 0.5854	0.0508 -0.05854 0.5854	0.0523 -0.06007 0.5753	0.0538 -0.0616 0.5651	0.0553 -0.0624 0.5548	0.0568 -0.0631 0.5445	0.0583 -0.0639 0.5342	0.0598 -0.0647 0.5239

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 15 DEGREES

BETA DEG	1	2	3	4	5	6	7	8	9	10
3.9	5.3311	4.6123	4.5260	4.1917	3.8841	3.5111	3.2372	3.0822	2.8695	
3.8	0.4994	0.4165	0.4065	0.3680	0.3325	0.3010	0.2549	0.2401	0.2156	
	4.7810	4.0497	3.9163	3.6495	3.3926	3.1544	2.9515	2.6593	2.4576	
63.9	0.4359	0.3516	0.3362	0.3055	0.2756	0.2484	0.2135	0.1913	0.1681	
	3.3529	2.7864	2.6569	2.4309	2.2347	2.0692	1.8448	1.7020	1.5309	
	0.2713	0.2060	0.1910	0.1650	0.1428	0.1233	0.0974	0.0809	0.0612	
91.1	1.8573	1.4893	1.3434	1.2531	1.1258	1.0324	0.8857	0.8043	0.6873	
	0.5988	0.0564	0.0396	0.0292	0.0166	0.0038	-0.0131	-0.0226	-0.0361	
99.6	1.9122	1.5466	1.4352	1.2773	1.1923	1.0431	0.9377	0.8529	0.7662	
	0.1052	0.0630	0.0502	0.0354	0.0219	0.0057	-0.0072	-0.0170	-0.0270	
93.6	1.7318	1.3700	1.2523	1.1566	1.0420	0.9212	0.8129	0.7390	0.6567	
	0.5844	0.0427	0.0291	0.0181	0.0048	-0.0091	-0.0216	-0.0301	-0.0396	
98.6	1.5348	1.2186	1.1080	1.0028	0.9118	0.7933	0.7033	0.6415	0.5663	
	0.5617	0.0252	0.0124	0.0003	-0.0102	-0.0238	-0.0345	-0.0413	-0.0500	
103.6	1.3771	1.0679	0.9722	0.8765	0.7878	0.6882	0.5944	0.5463	0.4779	
	0.5435	0.0078	-0.0032	-0.0142	-0.0245	-0.0350	-0.0456	-0.0523	-0.0602	
109.6	1.2272	0.9659	0.8678	0.7728	0.6927	0.5955	0.5298	0.4740	0.4149	
	0.5262	-0.0039	-0.0152	-0.0262	-0.0354	-0.0466	-0.0543	-0.0606	-0.0675	
113.8	1.1119	0.8318	0.7237	0.6659	0.5835	0.5119	0.4438	0.3978	0.3496	
	0.0129	-0.0194	-0.0319	-0.0385	-0.0473	-0.0553	-0.0641	-0.0694	-0.0750	
119.1	0.9957	0.7596	0.6572	0.5840	0.5255	0.4422	0.3909	0.3433	0.3006	
	-0.0005	-0.0277	-0.0395	-0.0480	-0.0547	-0.0608	-0.0672	-0.0757	-0.0806	
123.5	0.9259	0.6553	0.5493	0.5013	0.4319	0.3757	0.3250	0.3087	0.3204	
	-0.0085	-0.0397	-0.0520	-0.0575	-0.0655	-0.0720	-0.0777	-0.0797	-0.0784	
128.2	0.8592	0.5936	0.4876	0.4274	0.3852	0.3482	0.3039	0.3647	0.3644	
	-0.0162	-0.0469	-0.0591	-0.0660	-0.0708	-0.0751	-0.0777	-0.0732	-0.0733	
133.7	0.8576	0.5371	0.4441	0.4437	0.4237	0.4131	0.3920	0.3981	0.3812	
	-0.0164	-0.0534	-0.0641	-0.0641	-0.0654	-0.0677	-0.0693	-0.0694	-0.0713	
138.4	0.8600	0.5940	0.5257	0.5141	0.4832	0.4575	0.4293	0.4068	0.3928	
	-0.0161	-0.0468	-0.0547	-0.0560	-0.0535	-0.0625	-0.0659	-0.0684	-0.0700	
143.4	0.8953	0.6289	0.5524	0.5490	0.5155	0.4800	0.4371	0.4164	0.3992	
	-0.0121	-0.0428	-0.0516	-0.0520	-0.0559	-0.0570	-0.0542	-0.0673	-0.0693	
148.2	0.8890	0.6790	0.6073	0.5862	0.5329	0.4825	0.4514	0.4197	0.3897	
	-0.0128	-0.0370	-0.0453	-0.0477	-0.0539	-0.0577	-0.0534	-0.0669	-0.0704	
153.5	0.9094	0.7235	0.6320	0.5846	0.5473	0.4870	0.4357	0.4020	0.3639	
	-0.0104	-0.0319	-0.0424	-0.0479	-0.0522	-0.0570	-0.0551	-0.0689	-0.0733	
159.7	0.9134	0.7748	0.6717	0.6147	0.5350	0.4655	0.4050	0.3544	0.3173	
	-0.0100	-0.0260	-0.0379	-0.0444	-0.0535	-0.0515	-0.0536	-0.0744	-0.0787	
163.7	0.9549	0.7964	0.6905	0.6343	0.5637	0.4723	0.3908	0.3316	0.2892	
	-0.0052	-0.0235	-0.0357	-0.0422	-0.0501	-0.0508	-0.0712	-0.0771	-0.0819	
168.8	0.9730	0.8129	0.7475	0.7006	0.5335	0.4744	0.4132	0.4826	0.4473	
	-0.0031	-0.0216	-0.0291	-0.0345	-0.0423	-0.0491	-0.0551	-0.0597	-0.0637	
173.8	1.0295	0.8129	0.7541	0.7366	0.7301	0.5934	0.5470	0.6187	0.5581	
	0.5034	-0.0216	-0.0284	-0.0304	-0.0311	-0.0359	-0.0437	-0.0440	-0.0510	
178.8	1.0310	0.8514	0.8051	0.7894	0.7520	0.7279	0.5781	0.6430	0.5934	
	0.5037	-0.0171	-0.0225	-0.0243	-0.0278	-0.0314	-0.0371	-0.0412	-0.0469	

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT

FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 15 DEGREES

BETA DEG	11	12	13	14	15	16	17	18	19	20
3.9	2.6043 0.1850 2.2379	2.2512 0.1443 1.9319	2.2559 0.1448 1.9374	2.3046 0.1505 1.9782	2.2120 0.1397 1.8911	2.2013 0.1335 1.8589	2.2136 0.1339 1.8746	2.1936 0.1351 1.8448	2.1626 0.1340 1.8416	2.1508 0.1327 1.8110
33.8	0.1427 1.4022 0.0464	0.1074 1.2053 0.0237	0.1081 1.1872 0.0216	0.1128 1.1625 0.0164	0.1027 1.1372 0.0124	0.0930 1.1156 0.0134	0.1308 1.1156 0.0134	0.1308 1.1156 0.0134	0.1308 1.1156 0.0134	0.0935 1.0562 0.0065
63.9	0.6319 0.0424 0.6749	0.5790 -0.0485 0.6337	0.5147 -0.0560 0.5330	0.5018 -0.0574 0.5144	0.4616 -0.0618 0.5011	0.4635 -0.0635 0.4856	0.4635 -0.0635 0.4856	0.4635 -0.0635 0.4856	0.4635 -0.0635 0.4856	0.4089 -0.0682 0.4252
91.1	0.0375 0.5792 0.0465	-0.0422 0.5803 -0.0484	-0.0538 0.4539 -0.0630	-0.0560 0.4338 -0.0653	-0.0573 0.4239 -0.0664	-0.0593 0.4050 -0.0683	-0.0593 0.4050 -0.0683	-0.0593 0.4050 -0.0683	-0.0593 0.4050 -0.0683	0.3491 -0.0750 0.3260
89.6	0.4965 -0.0581 0.4161	0.5076 -0.0568 0.4161	0.3838 -0.0710 0.3195	0.3631 -0.0734 0.2914	0.3532 -0.0746 0.2614	0.3373 -0.0754 0.2813	0.3137 -0.0764 0.2833	0.3137 -0.0764 0.2833	0.2997 -0.0807 0.3301	0.3260 -0.0777 0.3301
103.6	0.3578 0.0374 0.0814	0.3578 0.0374 0.0814	0.2757 -0.0835 0.2880	0.2729 -0.0838 0.2880	0.2609 -0.0809 0.3405	0.2829 -0.0829 0.3150	0.2829 -0.0829 0.3150	0.2829 -0.0829 0.3150	0.2829 -0.0829 0.3150	0.4343 -0.0652 0.4524
123.6	0.2777 0.0324 0.0779	0.2777 0.0324 0.0779	0.0791 -0.0763 0.3470	0.0766 -0.0744 0.3700	0.0734 -0.0714 0.3700	0.0723 -0.0719 0.3755	0.0723 -0.0719 0.3755	0.0723 -0.0719 0.3755	0.0723 -0.0719 0.3755	0.4343 -0.0652 0.4524
123.5	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.3492 -0.0750 0.3584	0.4538 -0.0630 0.4538
128.2	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
133.7	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
138.4	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
143.6	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
149.2	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
153.5	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
159.7	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
153.7	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
169.8	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
173.8	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538
178.8	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.3740 0.0372 0.0723	0.4538 -0.0630 0.4538

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 3 DEGREES

BETA DEG	STATION NUMBER									
	1	2	3	4	5	6	7	8	9	10
179.5	2.4260 0.1230 2.2910		2.0011 0.0863 2.1210	1.9311 0.0803 1.8811	1.7173 0.0619 1.7228	1.5232 0.0451 1.5031	1.3643 0.0315 1.3696	1.2038 0.0191 1.2066	1.1185 0.0102 1.1210	1.0387 0.0033 1.0334
179.5	0.1113 2.2760 0.1100		0.0967 1.9944 0.0858	0.0760 1.9094 0.0784	0.0623 1.7178 0.0619	0.0431 1.5114 0.0441	0.0319 1.3609 0.0311	0.0178 1.2090 0.0193	0.0104 1.1162 0.0100	0.0029 1.0365 0.0032

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SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 3 DEGREES

BETA DEG	STATION NUMBER									
	11	12	13	14	15	16	17	18	19	20
179.5	0.9287 -0.0061	0.8966 -0.0089	0.8043 -0.0169	0.8321 -0.0145	0.8374 -0.0140	0.8522 -0.0127	0.8767 -0.0106	0.8897 -0.0096	0.8894 -0.0095	0.9061 -0.0081
179.0	0.9254 -0.0034	0.9147 -0.0074	0.8043 -0.0169	0.8331 -0.0144	0.8321 -0.0145	0.8456 -0.0133	0.8635 -0.0112	0.8711 -0.0111	0.8894 -0.0095	0.8969 -0.0089
179.5	0.9276 -0.0051	0.8702 -0.0112	0.8073 -0.0166	0.8323 -0.0145	0.8324 -0.0145	0.8438 -0.0137	0.8646 -0.0117	0.8702 -0.0112	0.8909 -0.0094	0.8977 -0.0088

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 5 DEGREES

BETA DEG	STATION NUMBER									
	1	2	3	4	5	6	7	8	9	10
3.6	3.5456		2.8642		2.4926	2.2177	1.9977	1.7528	1.6014	1.4631
	0.2195		0.1608		0.1287	0.1050	0.0863	0.0669	0.0519	0.0399
31.2	3.3557		2.7609	2.6892	2.3576	2.1110	1.8878	1.5643	1.5201	1.3866
	0.2032		0.1519	0.1457	0.1171	0.0958	0.0766	0.0573	0.0468	0.0333
61.5	2.8341		2.4310	2.3426	2.0461	1.8278	1.6284	1.4357	1.3051	1.1845
	0.1668		0.1234	0.1158	0.0902	0.0714	0.0542	0.0377	0.0263	0.0159
91.3	2.4809		2.0477	1.9728	1.7178	1.5335	1.3569	1.2058	1.0943	0.9864
	0.1271		0.0904	0.0839	0.0619	0.0458	0.0328	0.0177	0.0081	-0.0012
88.4	2.4343		2.0311	1.9444	1.6995	1.5192	1.3446	1.1890	1.0772	-0.0014
	0.1237		0.0889	0.0814	0.0603	0.0447	0.0297	0.0152	0.0067	-0.0014
93.1	2.3093		1.9061	1.8161	1.5832	1.4139	1.2526	1.1048	1.0052	0.9161
	0.1129		0.0781	0.0704	0.0503	0.0357	0.0216	0.0090	0.0004	-0.0072
109.1	2.1360		1.7895	1.6962	1.4667	1.3239	1.1652	1.0330	0.9384	0.8606
	0.0980		0.0661	0.0500	0.0403	0.0277	0.0142	0.0026	-0.0053	-0.0120
119.2	1.9861		1.6795	1.5859	1.3876	1.2350	1.0963	0.9722	0.8876	0.8168
	0.0850		0.0586	0.0505	0.0354	0.0234	0.0083	-0.0024	-0.0097	-0.0158
129.4	1.8994		1.5672	1.5236	1.3113	1.1728	1.0553	0.9336	0.8609	0.7963
	0.0776		0.0489	0.0453	0.0286	0.0149	0.0048	-0.0053	-0.0120	-0.0176
139.6	1.8428		1.5152	1.4701	1.2840	1.1492	1.0297	0.9211	0.8546	0.7979
	0.0727		0.0444	0.0405	0.0245	0.0128	0.0026	-0.0058	-0.0125	-0.0174
149.6	1.8178		1.4862	1.4229	1.2591	1.1338	1.0174	0.9144	0.8559	0.8058
	0.0705		0.0415	0.0365	0.0273	0.0115	0.0015	-0.0074	-0.0124	-0.0168
159.8	1.7878		1.4821	1.4063	1.2430	1.1122	1.0129	0.9152	0.8571	0.8121
	0.0679		0.0416	0.0350	0.0210	0.0097	0.0011	-0.0072	-0.0123	-0.0162
169.5	1.7928		1.4542	1.4063	1.2356	1.1155	1.0159	0.9222	0.8596	0.8209
	0.0684		0.0392	0.0350	0.0203	0.0120	0.0014	-0.0057	-0.0121	-0.0154
179.3	1.7928		1.4556	1.4121	1.2446	1.1138	1.0172	0.9249	0.8589	0.8201
	0.0684		0.0393	0.0355	0.0211	0.0096	0.0015	-0.0055	-0.0122	-0.0155

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 5 DEGREES

BETA	STATION NUMBER									
	11	12	13	14	15	16	17	18	19	20
NEG										
3.6	1.3164	1.1545	1.0940	1.1135	1.0912	1.0925	1.1025	1.0835	1.0813	1.0709
	0.0273	0.0133	0.0081	0.0098	0.0079	0.0090	0.0097	0.0072	0.0070	0.0061
31.2	1.2378	1.0868	1.0325	1.0519	1.0265	1.0274	1.0357	1.0149	1.0145	1.0155
	0.0205	0.0075	0.0028	0.0045	0.0023	0.0024	0.0030	0.0013	0.0013	0.0013
61.5	1.0714	0.9556	0.8851	0.9042	0.8769	0.8751	0.8791	0.8631	0.8579	0.8652
	0.0062	-0.0038	-0.0099	0.0083	-0.0106	-0.0128	-0.0105	-0.0118	-0.0123	-0.0113
91.3	0.8921	0.8416	0.7394	0.7506	0.7310	0.7296	0.7323	0.7258	0.7163	0.7075
	-0.0093	-0.0137	-0.0225	-0.0215	-0.0232	-0.0234	-0.0233	-0.0236	-0.0245	-0.0252
88.4	0.8647	0.7884	0.7050	0.7025	0.6918	0.6830	0.6655	0.6591	0.6338	0.6311
	-0.0117	-0.0182	-0.0254	-0.0257	-0.0266	-0.0273	-0.0287	-0.0294	-0.0316	-0.0318
99.1	0.8079	0.7603	0.6605	0.6566	0.6421	0.6376	0.6255	0.6223	0.5930	0.5980
	-0.0166	-0.0207	-0.0293	-0.0296	-0.0309	-0.0312	-0.0322	-0.0327	-0.0351	-0.0347
109.1	0.7546	0.7320	0.6253	0.6213	0.6142	0.6093	0.6029	0.5952	0.5913	0.6328
	-0.0210	-0.0231	-0.0323	-0.0327	-0.0333	-0.0337	-0.0343	-0.0341	-0.0352	-0.0317
119.2	0.7230	0.7176	0.6102	0.6127	0.6093	0.6153	0.6326	0.5536	0.6620	0.7459
	-0.0239	-0.0244	-0.0336	-0.0334	-0.0337	-0.0331	-0.0319	-0.0331	-0.0292	-0.0219
129.4	0.7153	0.7241	0.6182	0.6331	0.6426	0.6630	0.5913	0.7185	0.7295	0.8218
	-0.0246	-0.0238	-0.0329	-0.0316	-0.0308	-0.0293	-0.0256	-0.0243	-0.0233	-0.0154
139.6	0.7230	0.7496	0.6411	0.6648	0.6786	0.7050	0.7361	0.7536	0.7666	0.8453
	-0.0239	-0.0216	-0.0309	-0.0289	-0.0277	-0.0254	-0.0228	-0.0207	-0.0201	-0.0133
149.6	0.7365	0.7734	0.6660	0.6915	0.7103	0.7336	0.7639	0.7839	0.7839	0.8519
	-0.0227	-0.0195	-0.0288	-0.0266	-0.0250	-0.0230	-0.0224	-0.0215	-0.0186	-0.0128
159.8	0.7548	0.7903	0.6838	0.7168	0.7341	0.7554	0.7896	0.8044	0.8016	0.8562
	-0.0211	-0.0181	-0.0273	-0.0244	-0.0229	-0.0211	-0.0181	-0.0159	-0.0171	-0.0124
169.5	0.7631	0.8031	0.6973	0.7311	0.7516	0.7758	0.8135	0.8271	0.8266	0.8569
	-0.0204	-0.0170	-0.0261	-0.0232	-0.0214	-0.0193	-0.0163	-0.0149	-0.0150	-0.0123
179.3	0.7631	0.8019	0.6990	0.7373	0.7583	0.7853	0.8269	0.8441	0.8498	0.8716
	-0.0204	-0.0171	-0.0260	-0.0227	-0.0208	-0.0193	-0.0169	-0.0134	-0.0130	-0.0111

8-15

BETA	STATION NUMBER									
DEG	1	2	3	4	5	6	7	8	9	10
3.4	4.8352 0.3308	4.5520 0.3063 3.9288 0.2576	4.0105 0.2596 3.7472 0.2369 2.8208	4.0571 0.2637 0.3673 0.2274 2.7442	3.5956 0.2238 3.2357 0.1928 2.3810	3.2857 0.1971 2.9558 0.1687 2.1527	2.9841 0.1711 2.6393 0.1467 1.9478	2.5559 0.1428 2.3693 0.1131 1.7128	2.4476 0.1248 2.1744 0.1013 1.5542	2.2377 0.1067 1.9728 0.0839 1.3353
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.5			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0.0934 1.3174 0.3274 1.3571 1.1452 0.0125 1.0517	0.0617 0.3617 1.2063 1.2178 1.2186 1.3149 0.3013 0.9078	0.3615 0.3265 1.3595 0.3035 0.3551 0.4547 0.3339 0.9799 0.3134 0.7956	0.3478 0.3927 -0.3063 0.9650 -0.3030 0.8722 -0.3110 0.7979 -0.3174 0.7190	0.3332 0.0332 0.0169 -0.8686 -0.0113 0.7701 -0.0198 0.7108 -0.0249 0.6296
30.6			1.8245 0.0711 1.8378 1.6552 0.0565 1.5645 0.9487 1.4093	1.7562 0.0652 1.7895 1.6272 0.0541 1.5181 0.0447 1.3969	1.5307 0.0458 1.5567 1.3721 0.0371 1.2876 0.0248 1.1715	0.0934 0				

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 10 DEGREES

BETA DEG	STATION NUMBER									
	11	12	13	14	15	16	17	18	19	20
3.4	1.9894 0.0853 1.7695 0.0664 1.2495 0.0215 0.7175 -0.0244 0.7423 -0.0222 0.6636 -0.0290 0.6057 -0.0340 0.5422 -0.0395 0.4814 -0.0447 0.4337 -0.0488 0.3826 -0.0532 0.3521 -0.0559 0.3586 -0.0553 0.4050 -0.0513 0.4625 -0.0546 0.5113 -0.0521 0.5623 -0.0537 0.6113 -0.0542 0.6603 -0.0553 0.7098 -0.0563 0.7598 -0.0573 0.8098 -0.0583 0.8598 -0.0593 0.9098 -0.0603 0.9598 -0.0613 1.0098 -0.0623 1.0598 -0.0633 1.1098 -0.0643 1.1598 -0.0653 1.2098 -0.0663 1.2598 -0.0673 1.3098 -0.0683 1.3598 -0.0693 1.4098 -0.0703 1.4598 -0.0713 1.5098 -0.0723 1.5598 -0.0733 1.6098 -0.0743 1.6598 -0.0753 1.7098 -0.0763 1.7598 -0.0773 1.8098 -0.0783 1.8598 -0.0793 1.9098 -0.0803 1.9598 -0.0813 2.0098 -0.0823 2.0598 -0.0833 2.1098 -0.0843 2.1598 -0.0853 2.2098 -0.0863 2.2598 -0.0873 2.3098 -0.0883 2.3598 -0.0893 2.4098 -0.0903 2.4598 -0.0913 2.5098 -0.0923 2.5598 -0.0933 2.6098 -0.0943 2.6598 -0.0953 2.7098 -0.0963 2.7598 -0.0973 2.8098 -0.0983 2.8598 -0.0993 2.9098 -0.1003 2.9598 -0.1013 3.0098 -0.1023 3.0598 -0.1033 3.1098 -0.1043 3.1598 -0.1053 3.2098 -0.1063 3.2598 -0.1073 3.3098 -0.1083 3.3598 -0.1093 3.4098 -0.1103 3.4598 -0.1113 3.5098 -0.1123 3.5598 -0.1133 3.6098 -0.1143 3.6598 -0.1153 3.7098 -0.1163 3.7598 -0.1173 3.8098 -0.1183 3.8598 -0.1193 3.9098 -0.1203 3.9598 -0.1213 4.0098 -0.1223 4.0598 -0.1233 4.1098 -0.1243 4.1598 -0.1253 4.2098 -0.1263 4.2598 -0.1273 4.3098 -0.1283 4.3598 -0.1293 4.4098 -0.1303 4.4598 -0.1313 4.5098 -0.1323 4.5598 -0.1333 4.6098 -0.1343 4.6598 -0.1353 4.7098 -0.1363 4.7598 -0.1373 4.8098 -0.1383 4.8598 -0.1393 4.9098 -0.1403 4.9598 -0.1413 5.0098 -0.1423 5.0598 -0.1433 5.1098 -0.1443 5.1598 -0.1453 5.2098 -0.1463 5.2598 -0.1473 5.3098 -0.1483 5.3598 -0.1493 5.4098 -0.1503 5.4598 -0.1513 5.5098 -0.1523 5.5598 -0.1533 5.6098 -0.1543 5.6598 -0.1553 5.7098 -0.1563 5.7598 -0.1573 5.8098 -0.1583 5.8598 -0.1593 5.9098 -0.1603 5.9598 -0.1613 6.0098 -0.1623 6.0598 -0.1633 6.1098 -0.1643 6.1598 -0.1653 6.2098 -0.1663 6.2598 -0.1673 6.3098 -0.1683 6.3598 -0.1693 6.4098 -0.1703 6.4598 -0.1713 6.5098 -0.1723 6.5598 -0.1733 6.6098 -0.1743 6.6598 -0.1753 6.7098 -0.1763 6.7598 -0.1773 6.8098 -0.1783 6.8598 -0.1793 6.9098 -0.1803 6.9598 -0.1813 7.0098 -0.1823 7.0598 -0.1833 7.1098 -0.1843 7.1598 -0.1853 7.2098 -0.1863 7.2598 -0.1873 7.3098 -0.1883 7.3598 -0.1893 7.4098 -0.1903 7.4598 -0.1913 7.5098 -0.1923 7.5598 -0.1933 7.6098 -0.1943 7.6598 -0.1953 7.7098 -0.1963 7.7598 -0.1973 7.8098 -0.1983 7.8598 -0.1993 7.9098 -0.2003 7.9598 -0.2013 8.0098 -0.2023 8.0598 -0.2033 8.1098 -0.2043 8.1598 -0.2053 8.2098 -0.2063 8.2598 -0.2073 8.3098 -0.2083 8.3598 -0.2093 8.4098 -0.2103 8.4598 -0.2113 8.5098 -0.2123 8.5598 -0.2133 8.6098 -0.2143 8.6598 -0.2153 8.7098 -0.2163 8.7598 -0.2173 8.8098 -0.2183 8.8598 -0.2193 8.9098 -0.2203 8.9598 -0.2213 9.0098 -0.2223 9.0598 -0.2233 9.1098 -0.2243 9.1598 -0.2253 9.2098 -0.2263 9.2598 -0.2273 9.3098 -0.2283 9.3598 -0.2293 9.4098 -0.2303 9.4598 -0.2313 9.5098 -0.2323 9.5598 -0.2333 9.6098 -0.2343 9.6598 -0.2353 9.7098 -0.2363 9.7598 -0.2373 9.8098 -0.2383 9.8598 -0.2393 9.9098 -0.2403 9.9598 -0.2413 10.0098 -0.2423 10.0598 -0.2433 10.1098 -0.2443 10.1598 -0.2453 10.2098 -0.2463 10.2598 -0.2473 10.3098 -0.2483 10.3598 -0.2493 10.4098 -0.2503 10.4598 -0.2513 10.5098 -0.2523 10.5598 -0.2533 10.6098 -0.2543 10.6598 -0.2553 10.7098 -0.2563 10.7598 -0.2573 10.8098 -0.2583 10.8598 -0.2593 10.9098 -0.2603 10.9598 -0.2613 11.0098 -0.2623 11.0598 -0.2633 11.1098 -0.2643 11.1598 -0.2653 11.2098 -0.2663 11.2598 -0.2673 11.3098 -0.2683 11.3598 -0.2693 11.4098 -0.2703 11.4598 -0.2713 11.5098 -0.2723 11.5598 -0.2733 11.6098 -0.2743 11.6598 -0.2753 11.7098 -0.2763 11.7598 -0.2773 11.8098 -0.2783 11.8598 -0.2793 11.9098 -0.2803 11.9598 -0.2813 12.0098 -0.2823 12.0598 -0.2833 12.1098 -0.2843 12.1598 -0.2853 12.2098 -0.2863 12.2598 -0.2873 12.3098 -0.2883 12.3598 -0.2893 12.4098 -0.2903 12.4598 -0.2913 12.5098 -0.2923 12.5598 -0.2933 12.6098 -0.2943 12.6598 -0.2953 12.7098 -0.2963 12.7598 -0.2973 12.8098 -0.2983 12.8598 -0.2993 12.9098 -0.3003 12.9598 -0.3013 13.0098 -0.3023 13.0598 -0.3033 13.1098 -0.3043 13.1598 -0.3053 13.2098 -0.3063 13.2598 -0.3073 13.3098 -0.3083 13.3598 -0.3093 13.4098 -0.3103 13.4598 -0.3113 13.5098 -0.3123 13.5598 -0.3133 13.6098 -0.3143 13.6598 -0.3153 13.7098 -0.3163 13.7598 -0.3173 13.8098 -0.3183 13.8598 -0.3193 13.9098 -0.3203 13.9598 -0.3213 14.0098 -0.3223 14.0598 -0.3233 14.1098 -0.3243 14.1598 -0.3253 14.2098 -0.3263 14.2598 -0.3273 14.3098 -0.3283 14.3598 -0.3293 14.4098 -0.3303 14.4598 -0.3313 14.5098 -0.3323 14.5598 -0.3333 14.6098 -0.3343 14.6598 -0.3353 14.7098 -0.3363 14.7598 -0.3373 14.8098 -0.3383 14.8598 -0.3393 14.9098 -0.3403 14.9598 -0.3413 15.0098 -0.3423 15.0598 -0.3433 15.1098 -0.3443 15.1598 -0.3453 15.2098 -0.3463 15.2598 -0.3473 15.3098 -0.3483 15.3598 -0.3493 15.4098 -0.3503 15.4598 -0.3513 15.5098 -0.3523 15.5598 -0.3533 15.6098 -0.3543 15.6598 -0.3553 15.7098 -0.3563 15.7598 -0.3573 15.8098 -0.3583 15.8598 -0.3593 15.9098 -0.3603 15.9598 -0.3613 16.0098 -0.3623 16.0598 -0.3633 16.1098 -0.3643 16.1598 -0.3653 16.2098 -0.3663 16.2598 -0.3673 16.3098 -0.3683 16.3598 -0.3693 16.4098 -0.3703 16.4598 -0.3713 16.5098 -0.3723 16.5598 -0.3733 16.6098 -0.3743 16.6598 -0.3753 16.7098 -0.3763 16.7598 -0.3773 16.8098 -0.3783 16.8598 -0.3793 16.9098 -0.3803 16.9598 -0.3813 17.0098 -0.3823 17.0598 -0.3833 17.1098 -0.3843 17.1598 -0.3853 17.2098 -0.3863 17.2598 -0.3873 17.3098 -0.3883 17.3598 -0.3893 17.4098 -0.3903 17.4598 -0.3913 17.5098 -0.3923 17.5598 -0.3933 17.6098 -0.3943 17.6598 -0.3953 17.7098 -0.3963 17.7598 -0.3973 17.8098 -0.3983 17.8598 -0.3993 17.9098 -0.4003 17.9598 -0.4013 18.0098 -0.4023 18.0598 -0.4033 18.1098 -0.4043 18.1598 -0.4053 18.2098 -0.4063 18.2598 -0.4073 18.3098 -0.4083 18.3598 -0.4093 18.4098 -0.4103 18.4598 -0.4113 18.5098 -0.4123 18.5598 -0.4133 18.6098 -0.4143 18.6598 -0.4153 18.7098 -0.4163 18.7598 -0.4173 18.8098 -0.4183 18.8598 -0.4193 18.9098 -0.4203 18.9598 -0.4213 19.0098 -0.4223 19.0598 -0.4233 19.1098 -0.4243 19.1598 -0.4253 19.2098 -0.4263 19.2598 -0.4273 19.3098 -0.4283 19.3598 -0.4293 19.4098 -0.4303 19.4598 -0.4313 19.5098 -0.4323 19.5598 -0.4333 19.6098 -0.4343 19.6598 -0.4353 19.7098 -0.4363 19.7598 -0.4373 19.8098 -0.4383 19.8598 -0.4393 19.9098 -0.4403 19.9598 -0.4413 20.0098 -0.4423 20.0598 -0.4433 20.1098 -0.4443 20.1598 -0.4453 20.2098 -0.4463 20.2598 -0.4473 20.3098 -0.4483 20.3598 -0.4493 20.4098 -0.4503 20.4598 -0.4513 20.5098 -0.4523 20.5598 -0.4533 20.6098 -0.4543 20.6598 -0.4553 20.7098 -0.4563 20.7598 -0.4573 20.8098 -0.4583 20.8598 -0.4593 20.9098 -0.4603 20.9598 -0.4613 21.0098 -0.4623 21.0598 -0.4633 21.1098 -0.4643 21.1598 -0.4653 21.2098 -0.4663 21.2598 -0.4673 21.3098 -0.4683 21.3598 -0.4693 21.4098 -0.4703 21.4598 -0.4713 21.5098 -0.4723 21.5598 -0.4733 21.6098 -0.4743 21.6598 -0.4753 21.7098 -0.4763 21.7598 -0.4773 21.8098 -0.4783 21.8598 -0.4793 21.9098 -0.4803 21.9598 -0.4813 22.0098 -0.4823 22.0598 -0.4833 22.1098 -0.4843 22.1598 -0.4853 22.2098 -0.4863 22.2598 -0.4873 22.3098 -0.4883 22.3598 -0.4893 22.4098 -0.4903 22.4598 -0.4913 22.5098 -0.4923 22.5598 -0.4933 22.6098 -0.4943 22.6598 -0.4953 22.7098 -0.4963 22.7598 -0.4973 22.8098 -0.4983 22.8598 -0.4993 22.9098 -0.5003 22.9598 -0.5013 23.0098 -0.5023 23.0598 -0.5033 23.1098 -0.5043 23.1598 -0.5053 23.2098 -0.5063 23.2598 -0.5073 23.3098 -0.5083 23.3598 -0.5093 23.4098 -0.5103 23.4598 -0.5113 23.5098 -0.5123 23.5598 -0.5133 23.6098 -0.5143 23.6598 -0.5153 23.7098 -0.5163 23.7598 -0.5173 23.8098 -0.5183 23.8598 -0.5193 23.9098 -0.5203 23.9598 -0.5213 24.0098 -0.5223 24.0598 -0.5233 24.1098 -0.5243 24.1598 -0.5253 24.2098 -0.5263 24.2598 -0.5273 24.3098 -0.5283 24.3598 -0.5293 24.4098 -0.5303 24.4598 -0.5313 24.5098 -0.5323 24.5598 -0.5333 24.6098 -0.5343 24.6598 -0.5353 24.7098 -0.5363 24.7598 -0.5373 24.8098 -0.5383 24.8598 -0.5393 24.9098 -0.5403 24.9598 -0.5413 25.0098 -0.5423 25.0598 -0.5433 25.1098 -0.5443 25.1598 -0.5453 25.2098 -0.5463 25.2598 -0.5473 25.3098 -0.5483 25.3598 -0.5493 25.4098 -0.5503 25.4598 -0.5513 25.5098 -0.5523 25.5598 -0.5533 25.6098 -0.5543 25.6598 -0.5553 25.7098 -0.5563 25.7598 -0.5573 25.8098 -0.5583 25.8598 -0.5593 25.9098 -0.5603 25.9598 -0.5613 26.0098 -0.5623 26.0598 -0.5633 26.1098 -0.5643 26.1598 -0.5653 26.2098 -0.5663 26.2598 -0.5673 26.3098 -0.5683 26.3598 -0.5693 26.4098 -0.5703 26.4598 -0.5713 26.5098 -0.5723 26.5598 -0.5733 26.6098 -0.5743 26.6598 -0.5753 26.7098 -0.5763 26.7598 -0.5773 26.8098 -0.5783 26.8598 -0.5793 26.9098 -0.5803 26.9598 -0.5813 27.0098 -0.5823 27.0598 -0.5833 27.1098 -0.5843 27.1598 -0.5853 27.2098 -0.5863 27.2598 -0.5873 27.3098 -0.5883 27.3598 -0.5893 27.4098 -0.5903 27.4598 -0.5913 27.5098 -0.5923 27.5598 -0.5933 27.6098 -0.5943 27.6598 -0.5953 27.7098 -0.5963 27.7598 -0.5973 27.8098 -0.5983 27.8598 -0.5993 27.9098 -0.6003 27.9598 -0.6013 28.0098 -0.6023 28.0598 -0.6033 28.1098 -0.6043 28.1598 -0.6053 28.2098 -0.6063 28.2598 -0.6073 28.3098 -0.6083 28.3598 -0.6093 28.4098 -0.6103 28.4598 -0.6113 28.5098 -0.6123 28.5598 -0.6133 28.6098 -0.6143 28.6598 -0.6153 28.7098 -0.6163 28.7598 -0.6173 28.8098 -0.6183 28.8598 -0.6193 28.9098 -0.6203 28.9598 -0.6213 29.0098 -0.6223 29.0598 -0.6233 29.1098 -0.6243 29.1598 -0.6253 29.2098 -0.6263 29.2598 -0.6273 29.3098 -0.6283 29.3598 -0.6293 29.4098 -0.6303 29.4598 -0.6313 29.5098 -0.6323 29.5598 -0.6333 29.6098 -0.6343 29.6598 -0.6353 29.7098 -0.6363 29.7598 -0.6373 29.8098 -0.6383 29.8598 -0.6393 29.9098 -0.6403 29.9598 -0.6413 30.0098 -0.6423 30.0598 -0.6433 30.1098 -0.6443 30.1598 -0.6453 30.2098 -0.6463 30.2598 -0.6473 30.3098 -0.6483 30.3598 -0.6493 30.4098 -0.6503 30.4598 -0.6513 30.5098 -0.6523 30.5598 -0.6533 30.6098 -0.6543 30.6598 -0.6553 30.7098 -0.6563 30.7598 -0.6573 30.8098 -0.6583 30.8598 -0.6593 30.9098 -0.6603 30.9598 -0.6613 31.0098 -0.6623 31.0598 -0.6633 31.1098 -0.6643 31.1598 -0.6653 31.2098 -0.6663 31.2598 -0.6673 31.3098 -0.6683 31.3598 -0.6693 31.4098 -0.6703 31.4598 -0.6713 31.5098 -0.6723 31.5598 -0.6733 31.6098 -0.6743 31.6598 -0.6753 31.7098 -0.6763 31.7598 -0.6773 31.8098 -0.6783 31.8598 -0.6793 31.9098 -0.6803 31.9598 -0.6813 32.0098 -0.6823 32.0598 -0.6833 32.1098 -0.6843 32.1598 -0.6853 32.2098 -0.6863 32.2598 -0.6873 32.3098 -0.6883 32.3598 -0.6893 32.4098 -0.6903 32.4598 -0.6913 32.5098 -0.6923 32.5598 -0.6933 32.6098 -0.6943 32.6598 -0.6953 32.7098 -0.6963 32.7598 -0.6973 32.8098 -0.6983 32.8598 -0.6993 32.9098 -0.7003 32.9598 -0.7013 33.0098 -0.7023 33.0598 -0.7033 33.1098 -0.7043 33.1598 -0.7053 33.2098 -0.7063 33.2598 -0.7073 33.3098 -0.7083 33.3598 -0.7093 33.4098 -0.7103 33.4598 -0.7113 33.5098 -0.7123 33.5598 -0.7133 33.6098 -0.7143 33.6598 -0.7153 33									

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 15 DEGREES

BETA DEG	STATION NUMBER									
	1	2	3	4	5	6	7	8	9	10
0.2	6.5381	6.0399	5.7067	5.7450	5.1502	4.6586	4.3171	3.9772	3.6106	3.1407
	0.4776	0.4346	0.4059	0.4092	0.3579	0.3135	0.2861	0.2681	0.2251	0.2019
32.0	5.7750	5.0019	5.0019	5.0269	4.4487	4.3471	3.7455	3.3357	3.0858	2.8175
	0.4118	0.3451	0.3473	0.3473	0.2974	0.2628	0.2363	0.2014	0.1799	0.1545
60.3	3.9238	3.3374	3.3374	3.2107	2.8775	2.6276	2.3826	2.3364	1.9261	1.7194
	0.2522	0.2016	0.2016	0.1907	0.1619	0.1436	0.1132	0.3344	0.3799	0.0620
90.6	2.0511	1.7245	1.7245	1.6745	1.4279	1.2840	1.1327	0.9770	0.8706	0.7478
	0.0906	0.0625	0.0625	0.0502	0.0369	0.0245	0.0114	-0.0220	-0.0212	-0.0218
88.6		1.8028	1.8028	1.7745	1.5291	1.3241	1.1906	1.3327	0.9439	0.8454
		0.0692	0.0692	0.0668	0.0456	0.0230	0.0164	-0.0334	-0.0340	-0.0116
93.9	1.8411		1.6014	1.5594	1.3334	1.1135	1.0149	0.8912	0.6081	0.7266
	0.3725		0.0519	0.0482	0.0288	0.0138	0.0013	-0.0334	-0.0316	-0.0236
98.9	1.6812	1.4464	1.3863	1.3246	1.1563	0.9950	0.8847	0.7544	0.6994	0.6295
	0.0587	0.0385	0.0333	0.0280	0.0115	0.0022	-0.0099	-0.0233	-0.0299	-0.0320
103.6	1.4604	1.2906	1.2303	1.1463	1.0014	0.8729	0.7715	0.6466	0.6040	0.5377
	0.0397	0.0251	0.0199	0.0126	0.0003	-0.0110	-0.0317	-0.0329	-0.0312	-0.0349
109.1	1.2630	1.1980	1.0585	0.8919	0.8696	0.7441	0.6350	0.5612	0.5064	0.4405
	0.0244	0.0171	0.0050	-0.0093	-0.0112	-0.0221	-0.0328	-0.0378	-0.0426	-0.0474
113.8	1.1030	1.0372	0.9389	0.8231	0.7441	0.6348	0.5508	0.4770	0.4260	0.3739
	0.0089	0.0032	-0.0053	-0.0153	-0.0217	-0.0298	-0.0387	-0.0451	-0.0495	-0.0540
119.1	0.9790	0.9517	0.8248	0.6348	0.6233	0.5470	0.4659	0.3874	0.3374	0.3167
	0.0254	0.0167	0.0069	0.0132	0.0132	0.0150	0.0159	0.0151	0.0154	0.0169
124.0	0.8254	0.8069	0.7355	0.6821	0.5392	0.4590	0.3911	0.3349	0.3211	0.3129
	0.0151	0.0042	-0.0151	-0.0315	-0.0325	-0.0371	-0.0450	-0.0520	-0.0586	-0.0593
129.0	0.7981	0.7851	0.6210	0.4799	0.4799	0.4150	0.3599	0.3321	0.3367	0.3546
	0.0174	0.0145	0.0327	0.0334	0.0449	0.0534	0.0552	0.0559	0.0548	0.0557
134.1	0.7348	0.6761	0.5902	0.6065	0.4859	0.4147	0.3517	0.3366	0.3721	0.3549
	0.0229	0.0279	0.0353	0.0339	0.0443	0.0525	0.0535	0.0531	0.0542	0.0546
139.0	0.7614	0.7008	0.5585	0.5628	0.5049	0.4794	0.4130	0.3951	0.3777	0.3592
	0.0206	0.0258	0.0381	0.0377	0.0427	0.0450	0.0489	0.0522	0.0537	0.0553
144.3	0.7654	0.8298	0.6490	0.5665	0.5687	0.4810	0.4457	0.3972	0.3724	0.3612
	0.0201	0.0147	0.0303	0.0374	0.0372	0.0448	0.0477	0.0520	0.0541	0.0551
149.2	0.7948	0.7631	0.6485	0.5882	0.5405	0.5024	0.4447	0.4332	0.3817	0.3604
	0.0177	0.0204	0.0303	0.0345	0.0396	0.0429	0.0479	0.0509	0.0531	0.0549
153.9	0.7964	0.7841	0.6786	0.5815	0.5687	0.4932	0.4524	0.4350	0.3654	0.3354
	0.0176	0.0186	0.0277	0.0361	0.0372	0.0437	0.0472	0.0513	0.0547	0.0573
159.6	0.7981	0.8101	0.7376	0.6560	0.5415	0.5037	0.4235	0.3751	0.3436	0.3179
	0.0174	0.0164	0.0226	0.0297	0.0395	0.0428	0.0437	0.0536	0.0566	0.0588
164.4	0.8281	0.8541	0.7663	0.7014	0.5647	0.4412	0.4477	0.3654	0.3137	0.2833
	0.0148	0.0122	0.0202	0.0257	0.0372	0.0417	0.0511	0.0554	0.0592	0.0618
169.2	0.8597	0.8604	0.7973	0.8048	0.6520	0.5203	0.4935	0.4739	0.3641	0.3441
	0.0121	0.0120	0.0175	0.0168	0.0300	0.0332	0.0437	0.0520	0.0569	0.0546
174.7		0.8343	0.8031	0.7328	0.7328	0.7023	0.374	0.5473	0.5412	0.4819
		0.0143	0.0170	0.0230	0.0230	0.0258	0.0312	0.0356	0.0396	0.0447
179.5	0.9181	0.8819	0.8532	0.7599	0.7599	0.7215	0.5715	0.5132	0.5637	0.5175
	0.0071	0.0102	0.0127	0.0207	0.0207	0.0240	0.0324	0.0334	0.0376	0.0416

SURFACE STATIC PRESSURE RATIO AND PRESSURE COEFFICIENT
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 15 DEGREES

BETA DEG	11	12	13	14	15	16	17	19	19	20
5.2	2.9825	2.4659	2.5309	2.5759	2.4776	2.4526	2.4759	2.4293	2.4260	2.3843
	0.1710	0.1264	0.1320	0.1359	0.1274	0.1253	0.1273	0.1233	0.1230	0.1194
35.0	2.5459	2.0877	2.1644	2.1944	2.0977	2.0677	2.0911	2.0427	2.0527	2.0111
	0.1333	0.0938	0.1004	0.1030	0.0947	0.0921	0.0941	0.0898	0.0908	0.0872
60.3	1.5542	1.3138	1.3020	1.3076	1.2466	1.2036	1.2108	1.1778	1.1772	1.1567
	0.0478	0.0271	0.0260	0.0265	0.0213	0.0181	0.0182	0.0153	0.0153	0.0135
90.5	0.6801		0.5490	0.5340	0.4887	0.4679	0.4609	0.4450	0.4310	0.4267
	0.0276		-0.0389	-0.0402	-0.0441	-0.0459	-0.0465	-0.0479	-0.0491	-0.0494
88.6	0.7391		0.5798	0.5562	0.5437	0.5245	0.5039	0.4822	0.4754	0.4579
	0.0225		-0.0362	-0.0381	-0.0394	-0.0410	-0.0430	-0.0447	-0.0452	-0.0468
93.9	0.6288		0.4872	0.4594	0.4494	0.4277	0.4032	0.3847	0.3847	0.3731
	0.0320		-0.0442	-0.0466	-0.0475	-0.0494	-0.0509	-0.0522	-0.0531	-0.0541
98.9	0.5343		0.4077	0.3842	0.3717	0.3551	0.3326	0.3247	0.3151	0.3222
	0.0402		-0.0511	-0.0531	-0.0542	-0.0555	-0.0575	-0.0583	-0.0591	-0.0585
103.6	0.4567		0.3466	0.3232	0.3114	0.2937	0.2859	0.2851	0.2932	0.3599
	0.0469		-0.0564	-0.0584	-0.0594	-0.0604	-0.0615	-0.0616	-0.0610	-0.0552
109.1	0.3776		0.2821	0.2701	0.2683	0.2859	0.3116	0.3257	0.3394	0.3902
	0.0537		-0.0619	-0.0629	-0.0631	-0.0613	-0.0594	-0.0581	-0.0570	-0.0526
113.8	0.3201		0.2813	0.2931	0.3121	0.3224	0.3346	0.3484	0.3522	0.4199
	0.0586		-0.0620	-0.0610	-0.0593	-0.0584	-0.0574	-0.0552	-0.0559	-0.0500
119.1	0.2773		0.2999	0.3117	0.3241	0.3336	0.3434	0.3474	0.3586	0.4339
	0.0623		-0.0604	-0.0594	-0.0583	-0.0575	-0.0555	-0.0551	-0.0553	-0.0488
124.0	0.3192		0.3107	0.3159	0.3286	0.3391	0.3432	0.3531	0.3574	
	0.0587		-0.0594	-0.0590	-0.0579	-0.0571	-0.0566	-0.0553	-0.0554	
129.0	0.3321		0.3122	0.3289	0.3246	0.3387	0.3436	0.3539	0.3767	
	0.0576		-0.0593	-0.0579	-0.0582	-0.0570	-0.0551	-0.0552	-0.0538	
134.1	0.3321		0.3062	0.3317	0.3334	0.3294	0.3549	0.3594		
	0.0576		-0.0598	-0.0576	-0.0575	-0.0579	-0.0556	-0.0553		
139.0	0.3306		0.3041	0.3302	0.3334	0.3371	0.3477	0.3547		
	0.0577		-0.0600	-0.0578	-0.0575	-0.0572	-0.0553	-0.0551		
144.3	0.3384		0.3116	0.3371	0.3351	0.3349	0.3464			
	0.0571		-0.0594	-0.0572	-0.0573	-0.0570	-0.0564			
149.2	0.3382		0.2959	0.3216	0.3126	0.3331	0.3384	0.3551		
	0.0571		-0.0607	-0.0585	-0.0593	-0.0575	-0.0571	-0.0548		
153.9	0.3089		0.2982	0.3159	0.3147	0.3336	0.3349	0.3522		
	0.0596		-0.0605	-0.0589	-0.0591	-0.0575	-0.0570	-0.0550		
159.6	0.3021		0.2823	0.3069	0.3021	0.3229	0.3227	0.3341		
	0.0602		-0.0619	-0.0598	-0.0602	-0.0594	-0.0584	-0.0574	0.3442	
164.4	0.2711		0.2641	0.2914	0.2962	0.3124	0.3273	0.3334	0.3426	
	0.0629		-0.0635	-0.0611	-0.0607	-0.0593	-0.0580	-0.0571	-0.0566	
169.2	0.3344		0.2946	0.3054	0.3136	0.3282	0.3409	0.3456	0.3649	
	0.0574		-0.0608	-0.0599	-0.0592	-0.0579	-0.0551	-0.0546	-0.0548	
174.7	0.4242		0.3389	0.3392	0.3449	0.3551	0.3822	0.4034	0.3934	
	0.0497		-0.0570	-0.0570	-0.0565	-0.0555	-0.0533	-0.0517	-0.0523	
179.5	0.4469		0.3522	0.3524	0.3519	0.3609	0.3855	0.4032	0.4014	
	0.0477		-0.0559	-0.0558	-0.0559	-0.0551	-0.0529	-0.0517	-0.0516	

NOLTR 72-198

TABLE II
PITOT PRESSURE RATIO

PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 0 DEGREES

REF A	0.1667	0.2100	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
179.2	0.5495	0.9484	0.9351	0.9494	0.9699	0.9308	0.9532	0.9441	0.9351
178.4	0.5428	0.9427	0.9427	0.9427	0.9441	0.9241	0.9484	0.9370	0.9284
178.9	0.5533	0.9408	0.9224	0.9408	0.9403	0.9217	0.9408	0.9351	0.9265
178.7	0.5400	0.9480	0.9303	0.9446	0.9470	0.9279	0.9480	0.9408	0.9312

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PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 5 DEGREES

RETA	0.0667	0.2000	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
UEG									
1.1	0.4443	1.0287	0.9462	1.0096	1.0263	1.0206	1.0320	1.0148	1.0230
31.1	0.4487	0.9468	0.9490	0.9943	1.0019	1.0125	1.0129	0.9981	1.0058
60.9	0.7807	0.9293	0.9136	0.9456	0.9537	0.9542	0.9709	0.9680	0.9685
90.8	0.4192	0.4591	0.4519	0.4877	0.4987	0.4947	0.4274	0.9174	0.9183
88.4	0.5929	0.4232	0.4404	0.4667	0.4849	0.4930	0.9212	0.9179	0.9124
88.5	0.5953	0.4228	0.4309	0.4653	0.4844	0.4935	0.9202	0.9193	0.9145
93.2	0.5667	0.4123	0.4290	0.4586	0.4768	0.4834	0.9088	0.9078	0.9059
98.5	0.5380	0.4008	0.4175	0.4486	0.4658	0.4739	0.8978	0.8978	0.8973
103.3	0.5151	0.4017	0.4275	0.457	0.4814	0.4905	0.8949	0.8921	0.8925
108.6	0.4936	0.4086	0.4223	0.4395	0.4576	0.4667	0.8892	0.8882	0.8911
113.3	0.4651	0.4223	0.4486	0.4510	0.4662	0.4701	0.8892	0.8887	0.8901
118.5	0.4235	0.4367	0.4610	0.4629	0.4701	0.4753	0.8892	0.8877	0.8949
123.2	0.3780	0.4667	0.4758	0.4744	0.4834	0.4868	0.8935	0.8964	0.8968
128.6	0.3151	0.4510	0.4746	0.4849	0.4916	0.4916	0.9030	0.9021	0.8978
133.5	0.2647	0.4671	0.4944	0.4949	0.4968	0.9007	0.9073	0.9059	0.8992
138.6	0.2217	0.4861	0.4911	0.4973	0.9021	0.9116	0.9116	0.9050	0.9064
143.7	0.1975	0.7353	0.4950	0.9021	0.9126	0.9159	0.9140	0.9107	0.9112
148.7	0.1867	0.4594	0.9097	0.9016	0.9155	0.9198	0.9131	0.9164	0.9155
153.3	0.1974	0.6192	0.9241	0.9140	0.9245	0.9260	0.9188	0.9241	0.9188
158.5	0.2182	0.5826	0.9126	0.9202	0.9437	0.9437	0.9322	0.9346	0.9341
163.6	0.2589	0.5805	0.9265	0.9207	0.9336	0.9355	0.9265	0.9298	0.9298
168.9	0.3063	0.5401	0.9317	0.9365	0.9465	0.9484	0.9351	0.9394	0.9374
173.9	0.3566	0.6106	0.9403	0.9417	0.9460	0.9470	0.9346	0.9379	0.9360
178.7	0.4106	0.6666	0.9265	0.9484	0.9513	0.9527	0.9374	0.9422	0.9389
179.0	0.4125	0.6517	0.9308	0.9441	0.9470	0.9475	0.9346	0.9374	0.9361

1 2



PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 10 DEGREES

ALTA	0.0667	0.2000	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
0.5	1.1744	1.2084	1.1824	1.1924	1.2094	1.2074	1.2088	1.1926	1.1964
1.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
1.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
2.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
2.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
3.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
3.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
4.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
4.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
5.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
5.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
6.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
6.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
7.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
7.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
8.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
8.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
9.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
9.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
10.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
10.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
11.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
11.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
12.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
12.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
13.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
13.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
14.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
14.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
15.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
15.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
16.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
16.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
17.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
17.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
18.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
18.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
19.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
19.5	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931
20.0	1.1697	1.2055	1.1844	1.1854	1.2041	1.2021	1.2074	1.1878	1.1931

PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 15 DEGREES

BETA	0.0667	0.2000	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
0.9	1.3823	1.4238	1.3923	1.4162	1.4458	1.4138	1.4358	1.4004	1.4076
30.8	1.2901	1.3449	1.3369	1.3612	1.3727	1.3665	1.4009	1.3799	1.3789
40.9	0.9757	1.0765	1.1060	1.1658	1.1804	1.2060	1.2394	1.2266	1.2466
91.1	0.5055	0.6909	0.7635	0.8424	0.8849	0.9212	0.9628	0.9824	1.0019
98.6	0.4298	0.7038	0.7788	0.8514	0.9073	0.9460	0.9881	1.0048	1.0263
93.6	0.4170	0.6398	0.7200	0.7931	0.8495	0.8916	0.9331	0.9556	0.9804
98.6	0.3456	0.5784	0.6618	0.7372	0.7960	0.8390	0.8825	0.9064	0.9317
103.6	0.3081	0.5232	0.6030	0.6785	0.7458	0.7826	0.8237	0.8519	0.8796
108.6	0.2793	0.4735	0.5509	0.6288	0.6861	0.7334	0.7759	0.8066	0.8318
113.6	0.1194	0.5117	0.4917	0.5676	0.6250	0.6727	0.7157	0.7478	0.7740
118.1	0.0985	0.5108	0.5074	0.5213	0.5791	0.6273	0.6699	0.7038	0.7296
123.5	0.1664	0.3514	0.5375	0.5542	0.5165	0.5657	0.6082	0.6431	0.6704
128.2	0.2007	0.1939	0.5714	0.5753	0.5691	0.5179	0.5595	0.5949	0.6245
133.7	0.0881	0.1813	0.1860	0.3824	0.7177	0.6699	0.5925	0.5399	0.5695
138.6	0.2518	0.2563	0.1764	0.5456	0.4314	0.5662	0.5781	0.5992	0.6073
143.6	0.2038	0.3759	0.3885	0.1948	0.6144	0.6431	0.6207	0.5987	0.5863
148.2	0.1714	0.4718	0.4018	0.3152	0.2726	0.5342	0.5657	0.5925	0.6183
153.5	0.4656	0.3851	0.1724	0.1791	0.2021	0.2712	0.4424	0.4845	0.5227
158.7	0.4926	0.3257	0.1225	0.1146	0.1528	0.1592	0.2664	0.3818	0.4572
163.7	0.4902	0.3614	0.1543	0.1190	0.1203	0.1592	0.1779	0.2839	0.4176
168.8	0.5155	0.4528	0.2129	0.1685	0.1454	0.1497	0.1914	0.2645	0.6880
173.8	0.5332	0.4983	0.2538	0.2900	0.3068	0.3062	0.3373	0.5638	0.7989
178.8	0.5528	0.5337	0.2675	0.3396	0.4263	0.5509	0.6942	0.8089	0.6782

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PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 0 DEGREES

BETA	0.0667	0.2000	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
NEG									
175.5	0.4649	0.9227	0.9005	0.9120	0.9336	0.9151	0.9265	0.9090	0.9097
179.5	0.4747	0.9273	0.8921	0.9151	0.9372	0.9212	0.9204	0.9120	0.9120
179.5	0.4654	0.9227	0.8761	0.9120	0.9342	0.9158	0.9212	0.9097	0.9105

PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 5 DEGREES

MFT	0.0667	0.2000	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
11.6	0.9674	1.0124	1.0114	1.0183	1.0091	1.0167	1.0290	1.0259	1.0290
31.2	0.8317	0.9906	0.9831	0.9986	0.9831	1.0037	1.0175	1.0106	0.9969
61.6	0.6932	0.9097	0.9027	0.9369	0.9288	0.9524	0.9709	0.9602	0.9793
91.3	0.5667	0.8266	0.8223	0.8677	0.8715	0.8921	0.9090	0.9005	0.9189
120.4	0.4997	0.7876	0.7850	0.8478	0.8656	0.8860	0.9051	0.8975	0.9151
149.4	0.4329	0.7525	0.7507	0.8218	0.8477	0.8570	0.8807	0.8766	0.8929
179.3	0.3887	0.7397	0.7386	0.8112	0.8371	0.8360	0.8616	0.8562	0.8707
209.2	0.3314	0.7236	0.7229	0.8062	0.8321	0.8266	0.8516	0.8447	0.8524
239.4	0.2584	0.7012	0.7014	0.7802	0.8071	0.8036	0.8283	0.8201	0.8347
269.4	0.1616	0.7042	0.7036	0.7539	0.7804	0.7769	0.8007	0.7905	0.8093
299.4	0.1318	0.5321	0.5319	0.6486	0.6707	0.6730	0.6883	0.6766	0.6856
329.4	0.1566	0.4189	0.4186	0.5437	0.5621	0.5690	0.5951	0.5937	0.6045
359.4	0.2342	0.4398	0.4409	0.5036	0.5251	0.5351	0.5681	0.5628	0.5967
389.3	0.3362	0.5284	0.5287	0.6235	0.6428	0.6521	0.6835	0.6867	0.6998

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PITOT PRESSURE RATIO
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 10 DEGREES

BETA	0.0667	0.2000	0.3333	0.4667	0.6000	0.7333	0.8667	1.0000	1.1333
DFG									
0.4	1.2025	1.2530	1.2441	1.2614	1.2491	1.2369	1.2614	1.2606	1.2736
30.1	1.1146	1.1857	1.1842	1.2056	1.2248	1.2140	1.2289	1.2285	1.2147
60.5	0.8402	0.9793	0.9877	1.0466	1.0634	1.0909	1.1047	1.1070	1.1307
90.6	0.4679	0.6958	0.7442	0.8203	0.8593	0.8883	0.9151	0.9365	0.9556
98.5	0.345	0.7026	0.7489	0.8310	0.8692	0.9046	0.9411	0.9579	0.9716
93.7	0.3685	0.6490	0.7149	0.7659	0.8272	0.8623	0.9028	0.9143	0.9342
98.9	0.3209	0.6050	0.6649	0.7454	0.7892	0.8287	0.8641	0.8822	0.9044
104.0	0.2904	0.5562	0.6275	0.6989	0.7444	0.7882	0.8226	0.8424	0.8677
109.0	0.2611	0.5076	0.5776	0.6533	0.7015	0.7468	0.7813	0.8058	0.8317
114.1	0.1374	0.5537	0.5393	0.6121	0.6429	0.7055	0.7437	0.7689	0.7973
119.1	0.0781	0.5535	0.5791	0.5643	0.6187	0.6441	0.6999	0.7316	0.7594
124.1	0.1041	0.4230	0.5974	0.5800	0.5831	0.6292	0.6695	0.6993	0.7305
129.2	0.1570	0.2236	0.5983	0.6315	0.6382	0.5925	0.6352	0.6709	0.7013
134.2	0.1800	0.1336	0.5564	0.6410	0.6487	0.6475	0.6357	0.6510	0.6853
139.1	0.1483	0.2243	0.2936	0.6387	0.6986	0.7243	0.7417	0.7564	0.7612
144.3	0.1250	0.2154	0.1476	0.5913	0.6573	0.6982	0.7273	0.7434	0.7636
149.2	0.2037	0.1564	0.1271	0.3780	0.6169	0.6950	0.7300	0.7595	0.7790
154.5	0.2569	0.1074	0.1151	0.2416	0.5850	0.6904	0.7354	0.7843	0.8019
159.4	0.2041	0.0830	0.0953	0.1828	0.6294	0.7460	0.7981	0.8172	0.8287
164.5	0.2693	0.0983	0.1008	0.2680	0.7294	0.8027	0.8348	0.8531	0.8649
169.5	0.3786	0.3140	0.3080	0.6035	0.8012	0.8440	0.8715	0.8822	0.8868
174.6	0.4413	0.5764	0.7003	0.8004	0.8325	0.8730	0.9221	0.9013	0.9151
179.3	0.4737	0.5219	0.5759	0.6740	0.8371	0.8967	0.9342	0.9414	0.9357

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TABLE III
MACH NUMBER
TOTAL FLOW ANGLE
FLOW DIRECTION ANGLE
STATIC PRESSURE RATIO

MACH NUMBER, FLOW ANGLE, CROSSFLOW DIRECTION AND STATIC PRESSURE RATIO
 FREE STREAM MACH NUMBER = 3.52 ANGLE OF ATTACK = 0 DEGREES

HETA	DISTANCE FROM BODY SURFACE, (R-PB)/RB				
DFG	0.1667	0.3333	0.5000	0.6667	0.8333
89.9					1.0000
		3.72	3.65	3.73	3.67
		0.9	0.8	0.3	0.4
		13.	19.	1.	354.
		0.8488	0.8830	0.8452	0.8675
90.5	3.83				
	1.6		3.65	3.73	3.68
	315.		0.8	0.5	0.6
	0.7841		347.	317.	316.
			0.8768	0.8392	0.8629
90.3					
		3.71	3.65	3.72	3.66
		0.9	0.8	0.5	0.6
		18.	21.	1.	0.
		0.8459	0.8754	0.8432	0.8641
90.4					
		3.72	3.62	3.74	3.42
		0.9	0.7	0.3	0.4
		16.	0.	3.	360.
		0.8458	0.8950	0.8378	0.9267

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SWAY DESIGN MOD. NO. 10 = 1.51 AMPL. OF STAGE = 10 DEGREES

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MACH NUMBER, FLIGHT ANGLE, CROSSFLOW VELOCITY, & STATIC PRESSURE RATIO

FREE STREAM MACH NUMBER = 5.52, FLIGHT ANGLE = 0.0000

DATA	DISTANCE FROM NOSE SURFACE (INCHES)					
	0.1007	0.3333	0.5000	0.6667	0.8333	1.0000
0.3		2.92 3.2 350. 1.9370		3.00 3.2 357. 1.9397	3.13 3.5 360. 1.7761	3.17 3.3 358. 1.7762
20.0		3.00 3.0 30. 1.7057		3.16 3.0 31. 1.7009	3.17 3.0 33. 1.6811	3.19 3.2 31. 1.6607
60.1		3.20 3.0 30. 1.2652		3.27 3.0 31. 1.3739	3.22 3.0 28. 1.4579	3.20 3.0 28. 1.4726
80.9		3.71 20.0 9. 0.8997		3.41 10.4 16. 0.8844	3.48 17.4 15. 1.0054	3.47 16.5 15. 1.0562
90.0		4.01 21.4 10. 0.6034		3.68 19.2 10. 0.8370	3.49 17.5 13. 0.9540	3.52 16.6 14. 1.0510
99.4	4.67 29.8 350. 0.3326		3.84 21.2 3. 0.6459		3.68 19.9 7. 0.8274	3.57 17.9 6. 0.9451
100.4		4.28 23.7 1. 0.4473		3.86 21.0 3. 0.6676	3.75 19.3 7. 0.7879	3.64 18.2 6. 0.8935
109.4	27.9 340.		4.00 23.0 350. 0.5006		3.89 20.4 0. 0.8034	3.70 19.4 3. 0.7862
110.4		4.69 29.4 351. 0.3127		4.04 22.8 356. 0.6223	3.80 20.7 0. 0.8867	3.79 19.6 3. 0.7696
119.7	32.0 350.		4.34 24.0 367. 0.4640		4.03 22.0 359. 0.8184	3.84 20.7 356. 0.8171
121.0		31.0 0.		4.17 24.2 367. 0.6173		3.85 21.8 357. 0.8340
129.7	25.2 29.		3.83 24.5 354. 0.4675		4.17 23.5 345. 0.4082	3.98 22.0 340. 0.5126
130.0		32.9 3.		4.31 25.3 0. 0.5968		4.19 23.3 345. 0.4194
139.5	1.92 3.3 123. 0.4698		2.20 22.0 337. 0.3834		4.20 22.7 359. 0.4834	4.14 23.0 341. 0.4018
141.0		1.99 12.0 6.		4.44 27.7 355. 0.3880		4.15 23.5 346. 0.4218
149.6	2.13 2.8 103.		1.97 22.0 340.		4.20 24.6 351. 0.4309	4.17 22.6 349. 0.4521
151.1		2.71 13.0 11. 0.4076		36.4 324.		4.74 26.8 342. 0.2979
155.4	3.81 11.6 84. 0.3634		2.77 17.6 320. 0.2104		28.5 322.	4.29 22.0 335. 0.3575
160.6		2.63 8.9 105.		3.28 20.4 320. 0.1725		4.38 23.5 323. 0.2248
169.6	3.93 9.2 120. 0.3531		2.40 8.2 136. 0.2061		2.98 19.6 327. 0.2276	3.87 19.6 335. 0.6023
170.6		2.88 13.1 164. 0.3044		2.49 11.3 142. 0.2501		2.49 10.5 275. 0.4814
175.6	4.09 9.0 154. 0.1915		4.49 16.3 164. 0.1991		3.73 12.6 167. 0.1976	3.67 9.0 301. 0.2117
180.5		3.95 12.4 182. 0.2301		4.72 10.9 177. 0.2107		3.69 9.8 182. 0.2107

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MACH NUMBER, FLOW ANGLE, CROSSFLOW DIRECTION AND STATIC PRESSURE RATIO
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 0 DEGREES

BETA	0.1667	0.3333	0.5000	0.6667	0.8333	1.0000	1.1667	1.3333
DFG								
89.7	4.22 1.2 14. 0.8475	4.22 1.2 14. 0.8475	4.22 1.2 14. 0.8475	4.14 1.1 3. 0.8895	4.28 1.0 352. 0.8320	4.28 1.0 352. 0.8320	4.22 0.8 353. 0.8603	4.22 0.8 353. 0.8603
89.6	4.25 1.0 11. 0.8365	4.25 1.0 11. 0.8365	4.25 1.0 11. 0.8365	4.16 0.8 12. 0.8826	4.32 0.4 351. 0.8190	4.32 0.4 351. 0.8190	4.28 0.5 341. 0.8382	4.28 0.5 341. 0.8382
89.7	4.27 1.0 12. 0.8295	4.27 1.0 12. 0.8295	4.27 1.0 12. 0.8295	4.15 0.9 9. 0.8845	4.31 0.6 353. 0.8213	4.31 0.6 353. 0.8213	4.26 0.6 346. 0.8445	4.26 0.6 346. 0.8445

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MACH NUMBER, FLOW ANGLE, CROSSFLOW DIRECTION AND STATIC PRESSURE RATIO
 FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 5 DEGREES

BETA DEG	DISTANCE FROM BODY SURFACE, (R-RB)/RB							
	0.1667	0.3333	0.5000	0.6667	0.8333	1.0000	1.1667	1.3333
-0.5		4.08 1.0 342. 1.0096		4.04 1.8 353. 1.0347		4.17 2.3 357. 0.9805		4.08 1.9 356. 1.0674
29.3		4.14 2.7 38. 0.9627		4.08 2.7 27. 1.0005		4.18 3.0 18. 0.9628		4.11 2.6 21. 1.0305
59.7		4.17 5.2 23. 0.8814		4.14 4.5 22. 0.9198		4.21 4.2 15. 0.9101		4.17 3.9 17. 0.9543
90.2		4.29 6.8 1. 0.7654		4.20 5.8 6. 0.8310		4.22 5.3 0. 0.8453		4.24 4.8 3. 0.8587
89.8		4.31 9.5 4. 0.7154		4.22 8.0 1. 0.8076		4.34 7.1 2. 0.7920		4.21 6.4 3. 0.8650
99.6		4.37 9.6 356. 0.6690		4.23 8.4 354. 0.7783		4.36 7.4 356. 0.7682		4.25 6.8 357. 0.8274
109.4		4.37 9.5 349. 0.6585		4.25 8.4 348. 0.7508		4.39 7.5 351. 0.7347		4.27 6.9 354. 0.7961
119.6		4.31 8.7 345. 0.6997		4.25 7.9 343. 0.7487		4.40 7.3 345. 0.7218		4.28 6.8 349. 0.7752
129.5		4.32 8.0 341. 0.7333		4.25 7.4 340. 0.7712		4.41 7.0 341. 0.7257		4.25 6. 345. 0.7754
139.8		4.28 7.4 335. 0.7606		4.26 6.8 337. 0.7865		4.39 6.4 338. 0.741		4.28 6.2 342. 0.7717
150.0		4.30 6.4 326. 0.7681		4.26 6.0 334. 0.8019		4.40 5.5 338. 0.7552		4.29 5.6 342. 0.7827
160.0		4.40 4.6 308. 0.7342		4.22 4.9 332. 0.8304		4.37 4.8 339. 0.7781		4.27 5.0 343. 0.7982
170.1		4.03 2.6 287. 0.7542		4.19 3.9 336. 0.8580		4.35 4.0 344. 0.7932		4.25 4.3 349. 0.8126
180.8		3.89 0.0 338. 0.8265		4.20 3.2 351. 0.8561		4.36 3.5 353. 0.7896		4.25 4.1 354. 0.8161

MACH NUMBER, FLOW ANGLE, CROSSLFLOW DIRECTION AND STATIC PRESSURE RATIO
FREE STREAM MACH NUMBER = 4.07 ANGLE OF ATTACK = 10 DEGREES

BETA		DISTANCE FROM WING SURFACE, (X-P)/L						
DEG		0.1467	0.3333	0.5000	0.6667	0.8333	1.0000	1.1667
0.2			3.84 2.2 347, 1.4029		3.81 3.5 354, 1.4280		3.92 4.3 2, 1.7616	
30.3			3.90 3.2 37, 1.2038		3.87 3.3 30, 1.3337		3.96 4.0 23, 1.2961	
60.7			4.03 3.5 28, 1.0149		3.95 3.6 28, 1.1445		4.03 4.5 21, 1.1457	
90.5			4.25 13.7 5, 0.7052		4.13 12.1 12, 0.8499		4.24 11.4 10, 0.9072	
99.8			4.38 15.4 7, 0.6562		4.16 13.3 8, 0.8466		4.18 11.8 11, 0.8983	
99.6		4.58 17.7 359, 0.4817		4.24 16.6 2, 0.7261		4.22 12.5 7, 0.8218		4.11 11.7 8, 0.9225
99.6			4.53 16.8 360, 0.5339		4.25 14.6 1, 0.7511		4.26 12.8 5, 0.8012	
104.6		4.76 19.1 349, 0.3735		4.40 15.8 354, 0.5914		4.29 13.7 359, 0.7213		4.22 12.6 0, 0.8897
109.7			4.64 17.9 351, 0.4384		4.39 15.7 353, 0.6075		4.35 13.8 354, 0.6941	
114.6		4.24 18.4 352, 0.4858		4.48 14.8 346, 0.4995		4.43 14.4 352, 0.8194		4.31 13.3 354, 0.7059
120.0			4.40 14.8 350, 0.4972		4.45 14.4 344, 0.5232		4.44 14.4 350, 0.4944	
124.9		2.84 29.9 328, 0.2888		4.29 15.9 349, 0.5406		4.47 13.1 346, 0.5347		4.39 13.8 346, 0.6248
130.1			4.63 17.3 348, 0.4692		4.31 14.6 347, 0.5572		4.52 14.9 342, 0.5384	
134.9		2.54 7.5 131, 0.5068		4.36 16.4 346, 0.5555		4.37 14.2 345, 0.5922		4.41 13.7 339, 0.5893
140.0			3.53 24.7 325, 0.3476		4.41 15.4 342, 0.4987		4.52 13.5 344, 0.6111	
145.1		3.14 12.8 99, 0.3704		4.86 16.2 328, 0.6159		4.53 13.6 339, 0.5815		4.47 12.1 340, 0.6343
150.1			2.50 19.8 349, 0.3209		4.44 14.2 329, 0.5417		4.50 12.5 338, 0.6226	
155.1		2.67 16.7 86, 0.2859		4.15 20.1 295, 0.2838		4.40 11.5 327, 0.6457		4.41 10.3 337, 0.6996
160.2			2.27 8.0 306, 0.2655		4.50 10.5 314, 0.8554		4.36 7.7 334, 0.7315	
165.2		2.54 17.4 113, 0.4193		4.22 10.0 251, 0.6566		4.30 7.3 325, 0.7554		4.27 8.0 334, 0.7989
170.2			4.03 8.1 180, 0.4733		4.17 5.4 111, 0.8026		4.27 6.9 111, 0.8111	
175.5		3.48 5.7 164, 0.4146		4.20 2.0 254, 0.7412		4.24 4.3 341, 0.8185		4.21 4.1 341, 0.6572
180.6			3.62 1.7 175, 0.7122		4.15 2.1 356, 0.6411		4.10 4.1 360, 0.6181	
								4.25 6.9 348, 0.8505

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MACH NUMBER, FLOW ANGLE, CROSSFLOW DIRECTION AND STATIC PRESSURE RATIO
 FREE STREAM MACH NUMBER = 4.17 ANGLE OF ATTACK = 15 DEGREES

BETA	DISTANCE FROM HOOD SURFACE, (R-R0)/R0						
DEG	0.1667	0.3333	0.5000	0.6667	0.8333	1.0000	1.1667
0.2		3.50 7.0 352. 2.0640		3.42 6.8 357. 2.0345		3.40 6.8 357. 1.9638	3.48 6.2 357. 2.11510
30.5		3.40 7.0 30. 1.8502		3.47 7.2 30. 1.9141		3.44 6.2 23. 1.8537	3.71 6.2 27. 1.8424
60.8		3.78 12.6 29. 1.3859		3.68 11.3 21. 1.5512		3.71 11.4 25. 1.5465	3.89 11.0 25. 1.8441
90.6		4.15 18.4 10. 0.7726		4.00 16.3 14. 0.9814		3.91 15.6 14. 1.1220	3.94 14.9 15. 1.1767
89.6		4.32 19.9 10. 0.7101		4.00 17.5 12. 0.9783		3.95 16.0 15. 1.1096	3.88 15.4 14. 1.2234
94.9	4.79 21.2 359. 0.4278		4.13 19.3 10. 0.7889		4.02 17.1 9. 0.9657		3.95 16.1 11. 1.0861
99.9		4.51 21.7 2. 0.5340		4.15 19.3 9. 0.7859		4.09 17.5 9. 0.9114	4.00 16.7 10. 1.0289
104.7	25.5 349.		4.34 21.7 357. 0.5918		4.17 18.7 2. 0.7771		4.07 17.5 2. 0.8998
109.6		4.75 23.3 354. 0.5923		4.29 20.9 357. 0.4211		4.21 19.0 2. 0.7498	4.13 17.9 4. 0.8598
115.3	26.2 337.		4.56 22.7 348. 0.4141		4.31 20.1 354. 0.4044		4.19 18.4 358. 0.7251
120.0		5.03 24.4 10. 0.4514		4.45 22.2 348. 0.4714		4.35 20.1 18. 0.4937	4.24 18.2 357. 0.4928
124.9	25.7 20.		4.68 25.1 349. 0.4389		4.39 21.2 347. 0.4873		4.15 18.4 351. 0.5717
130.2		2.53 26.5 334. 0.4045		3.94 27.5 357. 0.4825		4.44 21.2 344. 0.4706	4.14 20.2 350. 0.5543
135.1	6.4 128.		4.73 25.3 325.		4.13 24.7 358. 0.5423		4.40 20.4 344. 0.4444
140.2		1.71 21.8 41.		4.79 24.0 349. 0.4411		4.29 23.0 349. 0.4748	4.45 21.1 347. 0.4455
145.2	2.30 1.3 243. 0.4781		34.2 11.		4.53 24.4 353. 0.5113		4.28 22.7 347. 0.4788
150.1		3.42 15.2 30.		3.97 19.9 319.		4.42 22.5 349. 0.4558	4.36 22.0 344. 0.4526
155.3	4.51 9.8 95. 0.3661		2.99 21.6 327. 0.3205		4.77 27.2 335. 0.2745		4.48 22.2 339. 0.3745
160.0		2.55 5.8 92. 0.2240		2.31 27.4 316. 0.3424		4.57 24.0 371. 0.2771	4.46 20.3 344. 0.4180
165.6	3.96 9.3 113. 0.3198		2.67 6.9 160. 0.1960		2.65 25.3 322. 0.2402		2.72 14.2 327. 0.7454
170.3		2.91 11.4 142. 0.2884		2.99 4.2 148. 0.2554		2.44 14.3 317. 0.5922	4.08 11.2 333. 0.7882
175.3	4.54 6.4 152. 0.3516		4.21 16.3 167. 0.2049		3.20 14.7 154. 0.3450		4.01 4.9 304. 0.7804
180.5		3.50 4.3 143. 0.3014		11.1 107.		4.44 1.2 160. 0.4594	4.11 4.1 1. 1.4039

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