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CR-120,037
VOLUME I
JANUARY 1972

—SPACE SHUTTLE—

SURFACE PRESSURE AND INVISCID FLOW FIELD PROPERTIES OF THE McDONNELL-DOUGLAS DELTA-WING ORBITER FOR NOMINAL MACH NUMBER OF 8

by

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VFK 50-INCH HYPERSONIC TUNNEL B

Arnold Engineering Development Center

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEM

CONTRACT NAS8-4016
MARSHALL SPACE FLIGHT CENTER

SPACE DIVISION CHRYSLER CORPORATION

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VOLUME I
January, 1972

SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: McDonnell-Douglas Delta Wing Orbiter

TEST PURPOSE: To Determine Surface Pressures and Inviscid Flow Field Properties at Mach Number 8

TEST FACILITY: AEDC VKF 50-Inch Hypersonic Tunnel B

TESTING AGENCY: AEDC-MSFC

TEST NO. & DATE: VT 1162-5; June, 1971

FACILITY COORDINATOR: Mr. L. L. Trimmer, ARO, INC.

PROJECT ENGINEER(S): Mr. R. K. Matthews, ARO, INC.
Mr. W. R. Martindale, ARO, INC.
Mr. J. D. Warmbrod, NASA-MSFC

DATA MANAGEMENT SERVICES

LIAISON: NA

DATA OPERATIONS: J. R. Zider

RELEASE APPROVAL: N. D. Kemp, Supervisor
Aero Thermo Data Group

CONTRACT NAS 8-4016 AMENDMENT 153 DRL 184-58

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A B S T R A C T

This report presents the results of a wind tunnel test program to determine surface pressures and flow field properties on the McDonnell Douglas Orbiter configuration. The tests were conducted at the Arnold Engineering Development Center (AEDC) in Tunnel B of the von Karman Gas Dynamics Facility (VKF). The tests were conducted in May and September 1971.

Data were obtained at a nominal Mach number of 8 and a freestream unit Reynolds number of 3.7×10^6 per foot. Angle of attack was varied from 10 to 60 deg. in 10-deg. increments.

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SUMMARY

Presented herein are the results of a wind tunnel test program to determine surface pressures and flow field properties employing a 0.011 scale model of the McDonnell-Douglas Orbiter configuration. The tests were conducted at Arnold Engineering Development Center, AEDC, in Tunnel B of the von Karman Facility.

Data were obtained at a nominal freestream Mach and Reynolds number of 8 and 3.7×10^6 per foot, respectively. The angle of attack range was varied from 10 degrees to 60 degrees in 10 degree increments.

The model flow field was surveyed with pitot-pressure and single shield total temperature probe rakes. The rakes were mounted so that pressure and temperature measurements could be made simultaneously. Pitot-pressure and total temperature measurements were attempted at X/L stations 0.3 and 0.5 at 50 degrees and 60 degrees angle of attack; however, the rakes and support hardware distorted the flow field, as observed in shadowgraph photographs, and therefore these measurements are not presented. The total temperature probes were quite delicate and subject to failure. In cases where the probes failed and could not be replaced readily the measurement does not appear as plotted or tabulated data. The plotted data for the model surface pressures and flow field properties are arranged by increasing angle of attack. The tabulated values for the plotted data are arranged by increasing angle of attack and are located in the Appendix of this document.

CONFIGURATION INVESTIGATED

A 0.011 scale replica of the McDonnell-Douglas Orbiter was employed during this wind tunnel investigation. Configuration details are tabulated in Table 2. A sketch and a photograph of the model is presented as Figure 1 and 2, respectively.

MODEL INSTRUMENTATION

The model flow field was surveyed with pitot-pressure and single shield total temperature probe rakes. The rakes were mounted so that pressure and temperature measurements could be made simultaneously. The rakes and support mechanism used for the majority of the measurements are shown in Fig. 3. These rakes failed during the tests and new rakes and support mechanism were fabricated. The new rake geometry was similar to the first with only small changes in probe spacing. Probe spacing for both rake-support combinations is given in Fig. 3.

Static and pitot-probe pressures were measured with 15 psid transducers referenced to a near vacuum for pressures less than 15 psia and to atmospheric pressure for pressures greater than 15 psia. The atmospheric reference pressure was also measured with a 15 psid transducer.

Pitot pressure and total temperature measurements were attempted at model X/L stations 0.3 and 0.5 at 50 and 60 degrees angle of attack; however, the rakes and support mechanism distorted the flow field, as observed in shadowgraph photographs, therefore these measurements are not presented.

The total temperature probes were quite delicate and subject to failure, and if the probe failed and could not be replaced immediately the measurement does not appear in the plotted or tabulated data sections.

TEST FACILITY DESCRIPTION

Tunnel B is a continuous, closed-circuit, variable density wind tunnel with an axisymmetric contoured nozzle and a 50-in.-diam. test section. The tunnel can be operated at a nominal Mach number of 6 or 8 at stagnation pressures from 20 to 300 and 50 to 900 psia, respectively, at stagnation temperatures up to 1350°R. The model may be injected into the tunnel for a test run and then retracted for model cooling or model changes without interrupting the tunnel flow.

TEST CONDITIONS

Nominal test conditions are presented in Table I, Test Data Summary Sheets and the specific test conditions for each run are provided at the top of the data tabulation sheet for that run.

Table 1
TEST DATA SUMMARY SHEETS

TEST TITLE: MDAC-DWO Flow Field Tests

TEST NUMBER: VT1162 **TEST FACILITY:** AEDC-Tunnel B

TEST DATE: May, September 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Rake-Support	Re/ft x 10^{-6}	Data Type*	Model Position (degrees) α	Model Position (degrees) ϕ	Flow Field Survey Station X/L
13	MDAC-DWO	0.011	8.0	860	1340	1	3.7	SP	10	0	180	---
12									20		
11									30		
28									40		
29									50		
30									60		
27								FF	10		0.3
23											0.5
20											0.7
14											0.916
25									20		0.3
22											0.5
19											0.7

*SP - Surface Pressure
FF - Flow Field

Table 1 - Concluded
TEST DATA SUMMARY SHEETS

TEST TITLE: MDAC-DWO Flow Field Tests

TEST NUMBER: VT1162 **TEST FACILITY:** AEDC-Tunnel B

TEST DATE: May, September 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^{o}R)	Rake-Support	Re/ft x 10^{-6}	Data Type*	Model Position (degrees)			Flow Field Survey Station X/L
									α	β	ϕ	
15	MDAC-DWO	0.011	8.0	860	1340	1	3.7	FF	20	0	180	0.916
24									30			0.3
21												0.5
18												0.7
16												0.916
343						2			40			0.3
341						2						0.5
34						1						0.7
33												0.916
35									50			0.7
32												0.916
36									60			0.7
31												0.916

*SP - Surface Pressure
FF - Flow Field

DATA REDUCTION

By assuming the flow-field static pressure equal to the wall static pressure, the local Mach number (ML) was calculated from the Rayleigh pitot formula,

$$\frac{PR}{PML} = \left(\frac{6ML^2}{5}\right)^{7/2} \left(\frac{6}{7ML^2-1}\right)^{5/2}, \text{ for } ML \geq 1$$

or from the compressible Bernoulli equation,

$$\frac{PR}{PML} = (1 + 0.2\ ML^2)^{7/2}, \text{ for } ML < 1.$$

The assumption of constant static pressure becomes less valid as the distance from the model surface increases.

The equations for the other flow field parameters are:

Parameter	Equation	Units
TL	$TL = \frac{TO}{(1 + 0.2\ ML^2)}$	^oR
UL	$UL = (49.02)(ML)\sqrt{TL}$	ft/sec
RHOL	$RHOL = \frac{(2.70)\ (PML}{TL}$	LBM/ft^3
MUL	$MUL = \frac{2.27\ (TL)^{3/2}}{TL + 198.6} \times 10^{-8}$	$lb\text{-}sec/ft^2$
REL	$REL = \frac{(RHOL)\ (UL)}{(32.17)\ (MUL)}$	ft^{-1}

The quantities calculated using TL are not valid in the model boundary layer since TTR is less than TO and, of course, none of the calculated parameters are meaningful outside the model shock layer.

DATA PRECISION

Estimated uncertainties of the primary measurements are given

Parameter	Uncertainty
PML	±0.015 psia
PO	±1.8 psia
PO1	±0.021 psia
PR	±0.015 psia (for PR ≤ 15 psia)
	±0.021 psia (for PR > 15 psia)
TO	±10°R
TTR	±25°R

SUMMARY DATA PLOT INDEX

TYPE OF DATA	PAGES	ANGLE OF ATTACK - DEGREES						FLOW FIELD SURVEY STATION (X/L)			
		10	20	30	40	50	60	0.3	0.5	0.7	0.916
SP	26	X									
	27		X								
	28			X							
	29				X						
	30					X					
SP	31						X				
FF	32	X						X			
	33	X							X		
	34	X								X	
	35	X									X
	36		X					X			
	37		X						X		
	38		X							X	
	39		X								X
	40			X				X			
	41			X					X		
	42			X						X	
	43			X							X
	44				X			X			
	45				X				X		
	46				X					X	
	47				X						X
	48					X				X	
	49					X					X
	50						X			X	
FF	51						X				X

SP

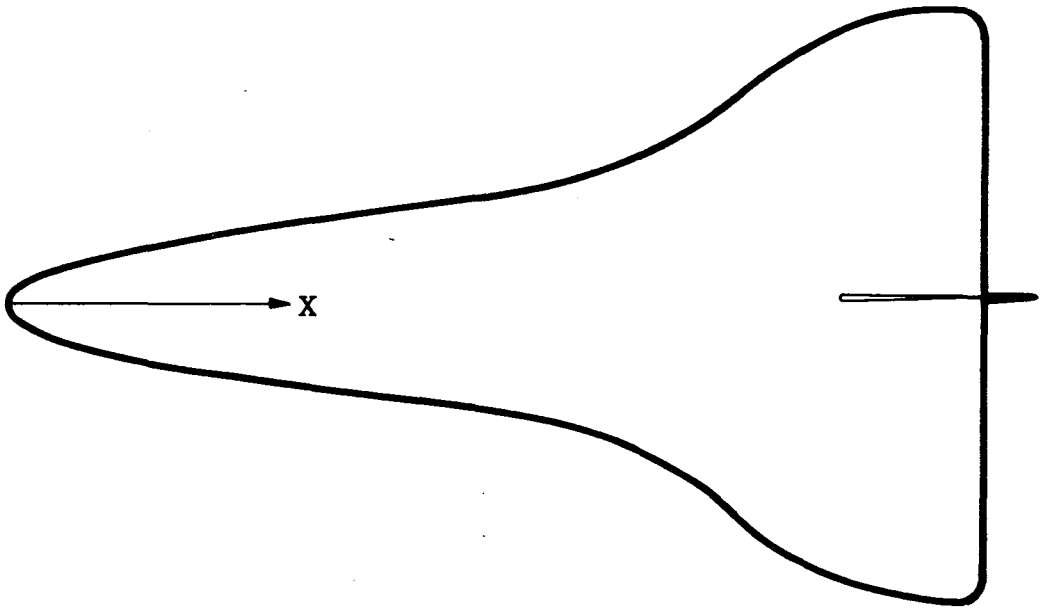
PM/P01 vs. X/L

FF

PR/P01 vs. X/L
TTR/TO vs. X/L
ML vs. X/L

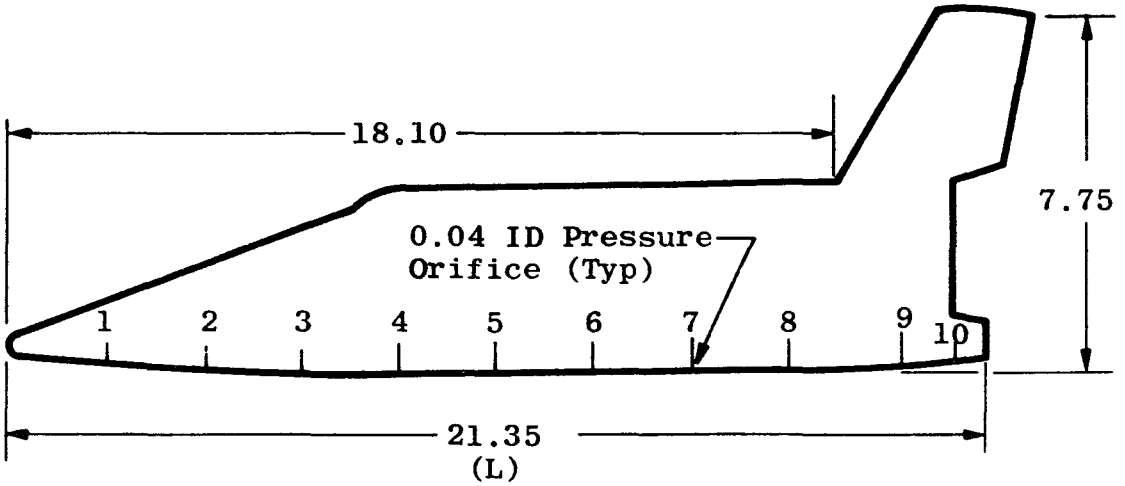
UL/U-INF vs. X/L
RHOUL/RHOU-INF vs. X/L

F I G U R E S



Pressure Orifice	X/L
1	0.1
2	0.2
3	0.3
4	0.4
5	0.5
6	0.6
7	0.7
8	0.8
9	0.916
10	0.970

All Dimensions in Inches



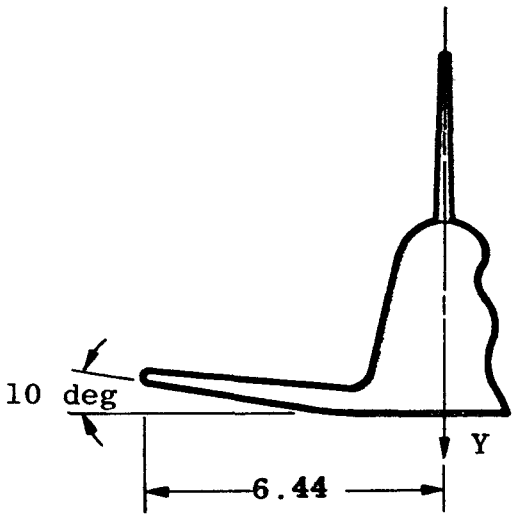


Fig. 1 McDonnell Douglas Delta Wing Orbiter Model Sketch (0.011 Scale)

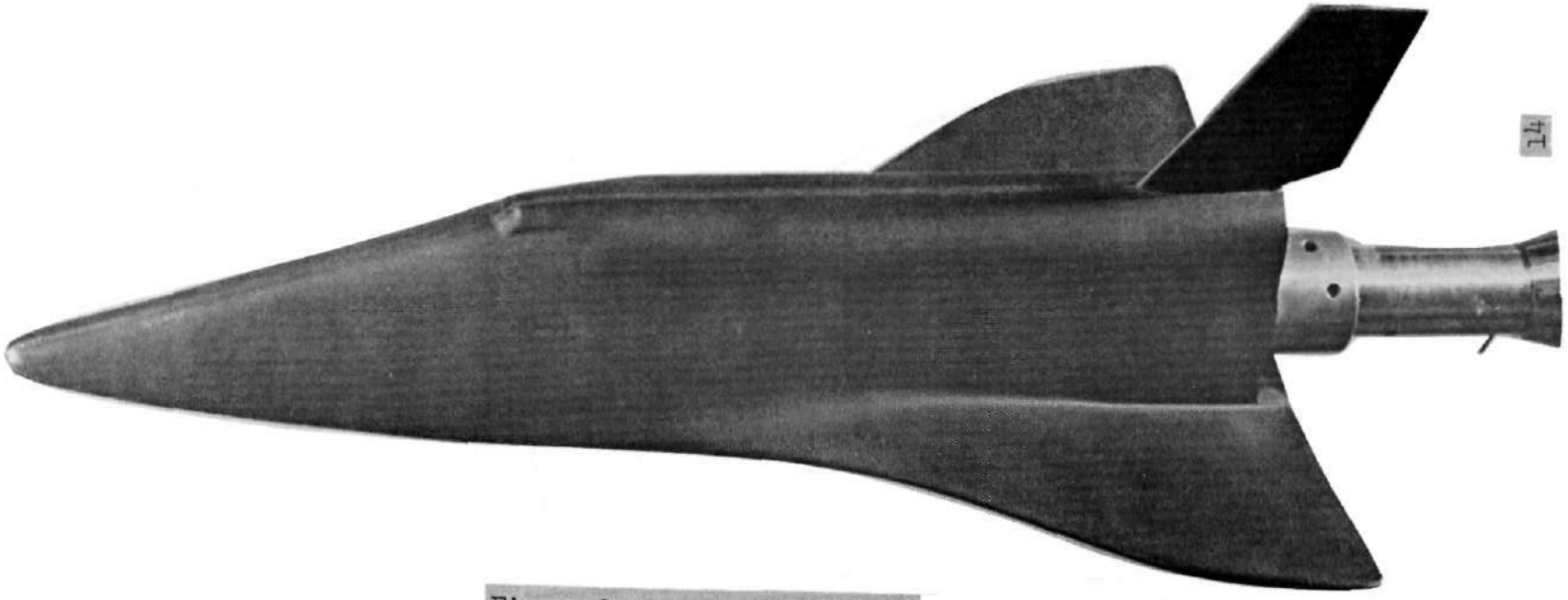
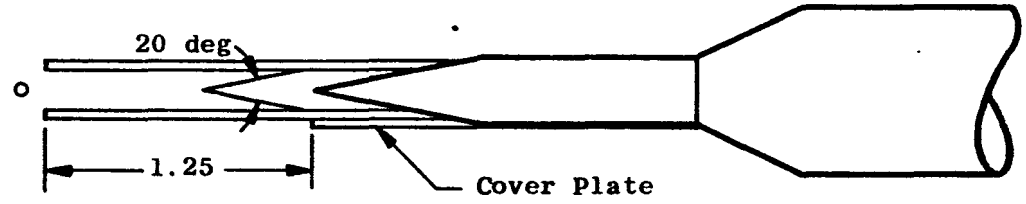


Figure 2. Model Photograph

No.	PROBE HEIGHT, Y, IN.			
	Pressure Probes		Temperature Probes	
	Rake No. 1	Rake No. 2	Rake No. 1	Rake No. 2
1	0.014	0.014	0.046	0.051
2	0.065	0.066	0.151	0.131
3	0.111	0.112	0.226	0.202
4	0.158	0.163	0.324	0.303
5	0.207	0.216	0.426	0.402
6	0.254	0.258	0.629	0.599
7	0.308	0.313		
8	0.363	0.365		
9	0.414	0.415		
10	0.501	0.499		
11	0.598	0.606		
12	0.701	0.702		
13	0.807	0.802		
14	0.899	0.892		
15	1.000	0.981		

All Dimensions in Inches.



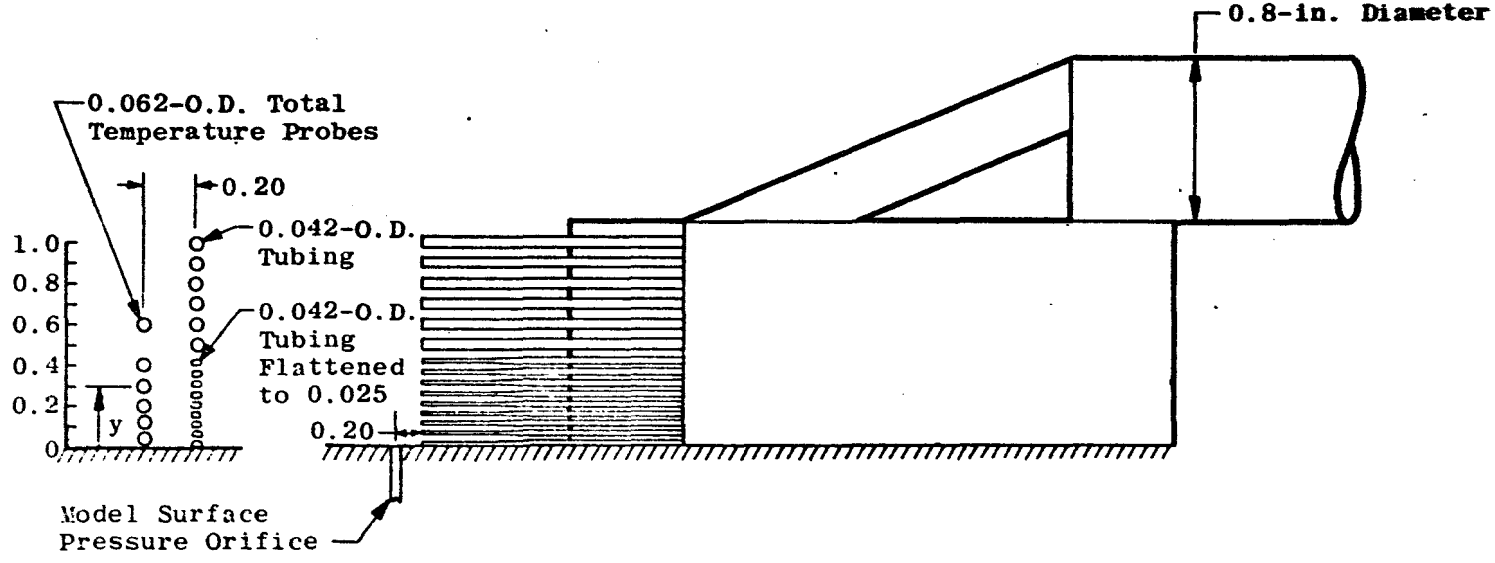


Fig. 3 Probe-Rakes and Support

MODEL COMPONENT DESCRIPTION SHEETS

Table 2

Configuration Description Details

MODEL COMPONENT: BODY - MDAC Orbiter

GENERAL DESCRIPTION: Basic fuselage contours including canopy.

Model Scale: 0.011

DRAWING NUMBER: 255 BJ 00050, Rev. B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length (ft.)	156.4	1.720
Max. Width	27.1	.298
Max. Depth	30.3	.333
Fineness Ratio		
Area ($ft.^2$)		
Max. Cross-Sectional	627.4	.0759
Planform	3790.0	.459
Wetted	12520.0	1.515
Base	447.0	.0541

Note: All units are ft. or sq. ft.
These data include both sides of the vehicle.

Table 2 - continued

MODEL COMPONENT: Elevon - MDAC Orbiter

GENERAL DESCRIPTION: Model Scale: 0.011

DRAWING NUMBER: 255 BJ 00050, Rev. B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area, $ft.^2$	963.	.117
Span (equivalent), ft.	73.7	.811
Inb'd equivalent chord, ft.	12.8	.141
Outb'd equivalent chord, ft.	12.8	.141
Ratio Elevator chord/horizontal tail chord		
At Inb'd equiv. chord		
At Outb'd equiv. chord		
Sweep Back Angles, degrees		
Leading Edge	0.0	0.0
Tailing Edge	0.0	0.0
Hingeline	0.0	0.0
Area Moment (Normal to hinge line)		

Note: All units are ft., sq. ft., or degrees.
These data include both sides of vehicle.

Table 2 - continued

MODEL COMPONENT: Body Flap - MDAC Orbiter

GENERAL DESCRIPTION: Model Scale: 0.011

DRAWING NUMBER: 255 BJ 00050, Rev. B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area, $ft.^2$	140.88	.0170
Span (equivalent) , ft.	23.81	.262
Inb'd equivalent chord, ft.	5.333	.0587
Outb'd equivalent chord , ft.	12.80	.141
Ratio Elevator chord/horizontal tail chord		
At Inb'd equiv. chord		
At Outb'd equiv. chord		
Sweep Back Angles, degrees		
Leading Edge	0.0	0.0
Tailing Edge	0.0	0.0
Hingeline	0.0	0.0
Area Moment (Normal to hinge line)		

Note: All dimensions in ft., sq. ft., or degrees. These data include both sides of vehicle.

Table 2 - continued

MODEL COMPONENT: Wing - MDAC Orbiter

GENERAL DESCRIPTION: Model Scale: 0.011

DRAWING NUMBER: 255 BJ 00050, Rev. B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area, ft.^{2}		
Planform	5330.	.645
Wetted		
Span (equivalent), ft.	97.5	1.073
Aspect Ratio	1.68	1.68
Rate of Taper		
Taper Ratio	0.230	.230
Diehedral Angle, degrees	10.0	10.0
Incidence Angle, degrees	2.0	2.0
Aerodynamic Twist, degrees	0	0
Toe-In Angle	0	0
Cant Angle	0	0
Sweep Back Angles, degrees		
Leading Edge	55.0	55.0
Trailing Edge	0	0
0.25 Element Line	47.0	47.0
Chords: (ft.)		
Root (Wing Sta. 0.0)	90.43	.995
Tip, (equivalent)	20.80	.229
MAC, inches	63.30	.696
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
Airfoil Section		
Root	0010-64	0010-64
Tip	0012-64	0012-64
EXPOSED DATA		
Area, ft.^{2}	3147.3	.381
Span, (equivalent), ft.	70.5	.776
Aspect Ratio	1.47	1.47
Taper Ratio		
Chords (ft.)		
Root	71.25	.784
Tip	20.80	.229
MAC	52.20	.574
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		

Note: All units are ft., sq. ft., or degrees.

Table 2 - continued

MODEL COMPONENT: Rudder - MDAC Delta Wing Orbiter

GENERAL DESCRIPTION: Model Scale: 0.011

DRAWING NUMBER: 255 BJ 00050, Rev. B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area, $ft.^2$	213.9	.0259
Span (equivalent), ft.	27.5	.303
Inb'd equivalent chord, ft.	9.50	.105
Outb'd equivalent chord, ft.	6.10	.0671
Ratio Elevator chord/horizontal tail chord		
At Inb'd equiv. chord	.369	.369
At Outb'd equiv. chord	.369	.369
Sweep Back Angles, degrees		
Leading Edge	30.0	30.0
Tailing Edge	13.38	13.38
Hingeline	19.95	19.95
Area Moment (Normal to hinge line)		

Note: All units are ft., sq. ft., or degrees.

Table 2 - concluded

MODEL COMPONENT: Vertical Tail - MDAC Orbiter

GENERAL DESCRIPTION: Model Scale: 0.011

DRAWING NUMBER: 255 BJ 00050, Rev. B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area, $ft.^2$		
Planform	580.0	.702
Wetted		
Span (equivalent), ft.	27.5	.303
Aspect Ratio	1.30	1.30
Rate of Taper		
Taper Ratio	.638	.638
Diehedral Angle, degrees	0	0
Incidence Angle, degrees	0	0
Aerodynamic Twist, degrees	0	0
Toe-In Angle	0	0
Cant Angle	0	0
Sweep Back Angles, degrees		
Leading Edge	30.0	30.0
Trailing Edge	13.4	13.4
0.25 Element Line	26.2	26.2
Chords:		
Root (Wing Sta. 0.0)	25.75	.283
Tip, (equivalent)	16.42	.181
MAC, inches	21.43	.236
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
Airfoil Section		
Root	0009-64	0009-64
Tip	0009-64	0009-64
EXPOSED DATA		
Area, $ft.^2$	580.	.702
Span, (equivalent), ft.	27.5	.303
Aspect Ratio	1.30	1.30
Taper Ratio	.638	.638
Chords (ft.)		
Root	25.75	.283
Tip	16.42	.181
MAC	21.43	.236
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		

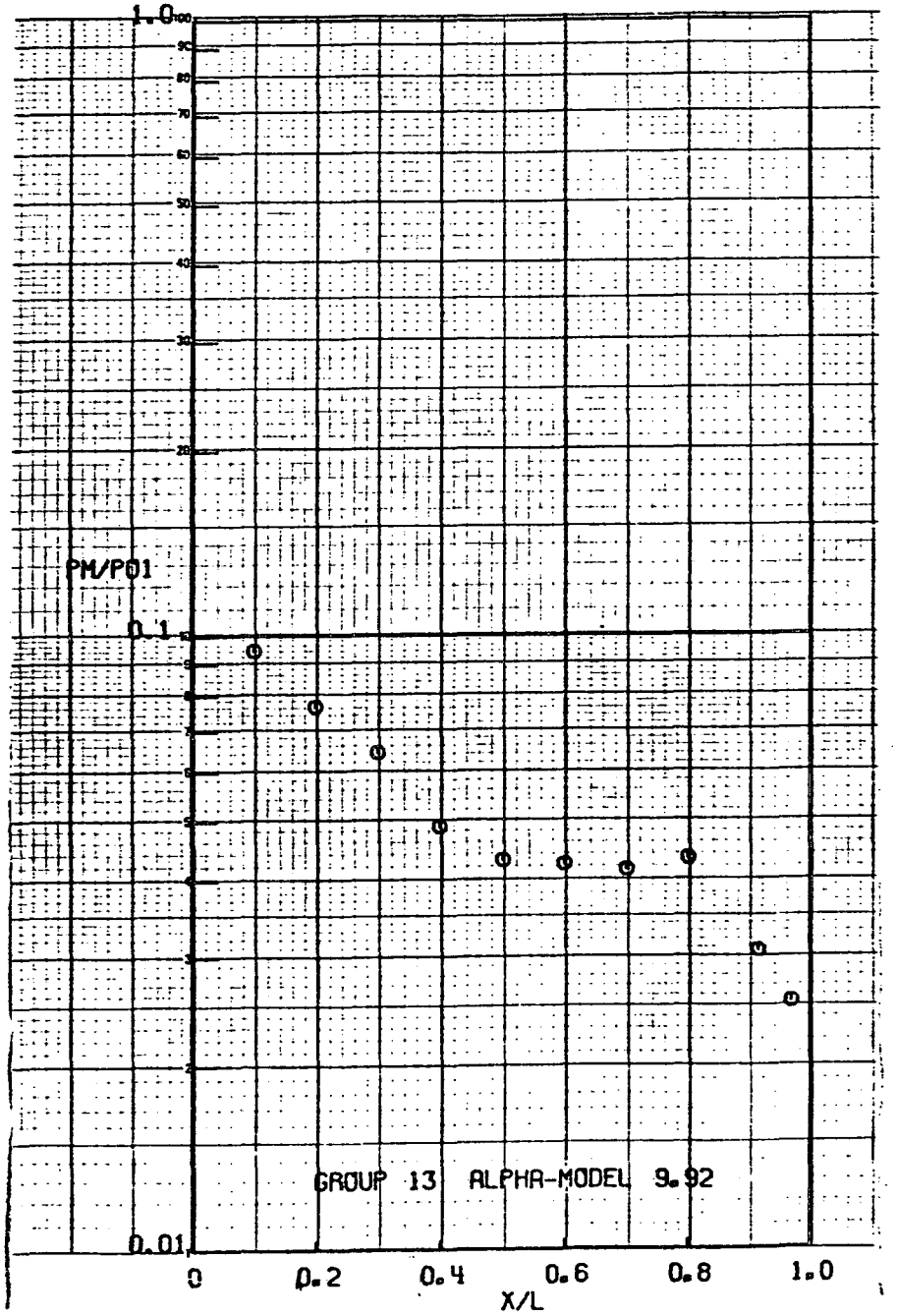
NOMENCLATURE

ALPHA-MODEL (α)	Model angle of attack, deg
ALPHA-PREBEND	Sting prebend angle, deg
ALPHA-SECTOR	Tunnel sector angle, deg
CP	Pressure coefficient, (PM-(P-INF))/Q-INF
CP-MAX	Pressure coefficient based on P01, (P01-(P-INF))/Q-INF
L	Model length (21.35 in.)
MACH NO.	Free-stream Mach number
ML	Local Mach number
MU-INF	Free-stream viscosity, lb-sec/ft^2
MUL	Local viscosity, lb-sec/ft^2
P-INF	Free-stream pressure, psia
PM	Model surface pressure, psia
PML	Local model surface pressure, psia
PO	Tunnel stilling chamber pressure, psia
P01	Stagnation pressure downstream of a normal shock, psia
PR	Rake probe stagnation pressure, psia
Q-INF	Free-stream dynamic pressure, psia
RE/FT	Free-stream unit Reynolds number, ft^{-1}
REL	Local unit Reynolds number, ft^{-1}
RHO-INF	Free-stream density, LBM/ft^3
RHOL	Local density, LBM/ft^3
RHOUL	Local density-velocity product, LBM/ft^2-sec

NOMENCLATURE
(Continued)

ROLL-MODEL (ϕ)	Model roll angle, deg
T-INF	Free-stream temperature, ^{o}R
TL	Local temperature, ^{o}R
TO	Tunnel stilling chamber temperature, ^{o}R
TTR	Total temperature measured by rake probes, ^{o}R
U-INF	Free-stream velocity, ft/sec
UL	Local velocity, ft/sec
X	Axial coordinate (see Fig. 1), in.
Y	Distance from model surface or probe height (see Figs. 1 and 3), in.
YAW	Model yaw angle, deg.

P L O T T E D D A T A


1.0
PM/P01
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0.01
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0.2
0.4
0.6
0.8
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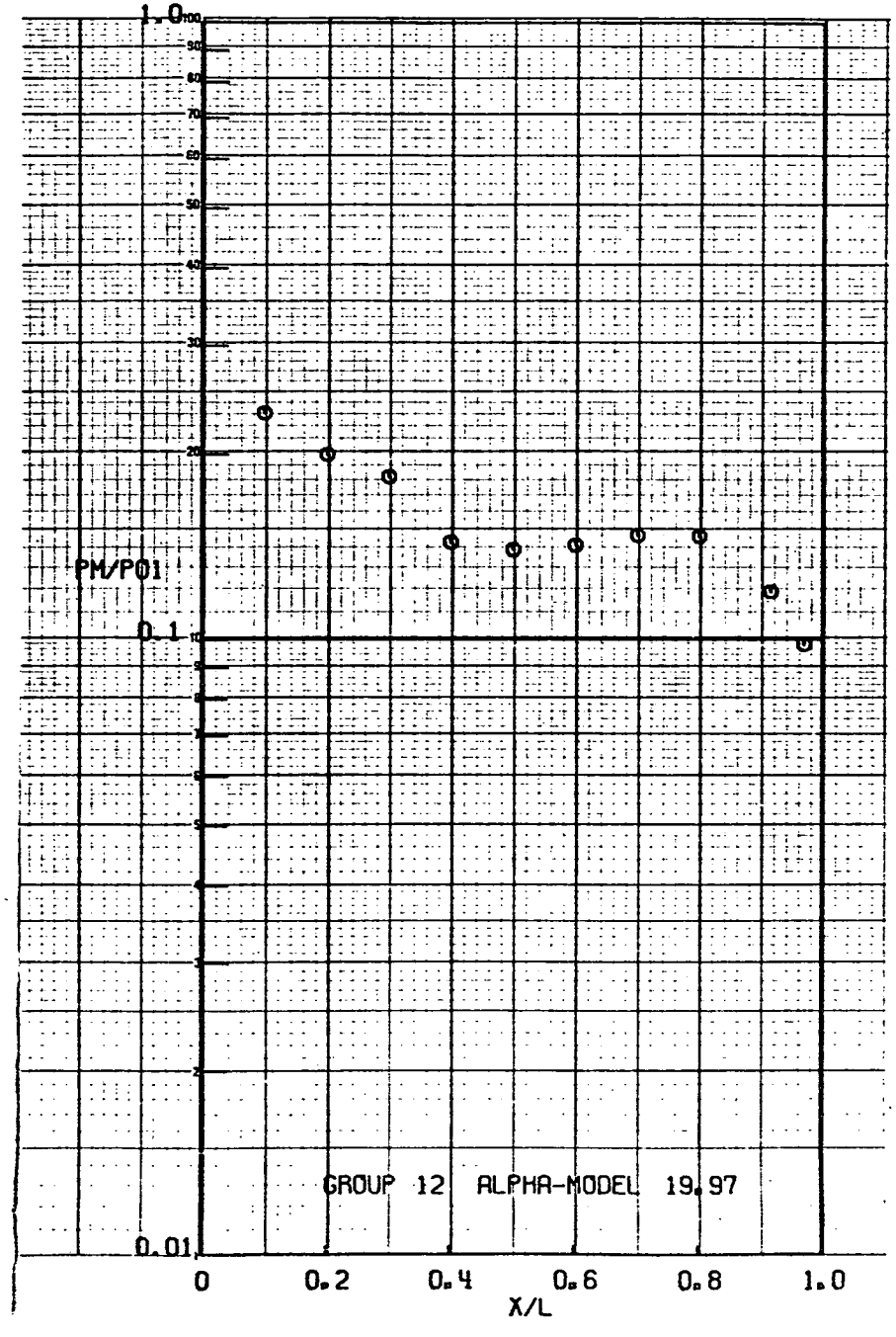
X/L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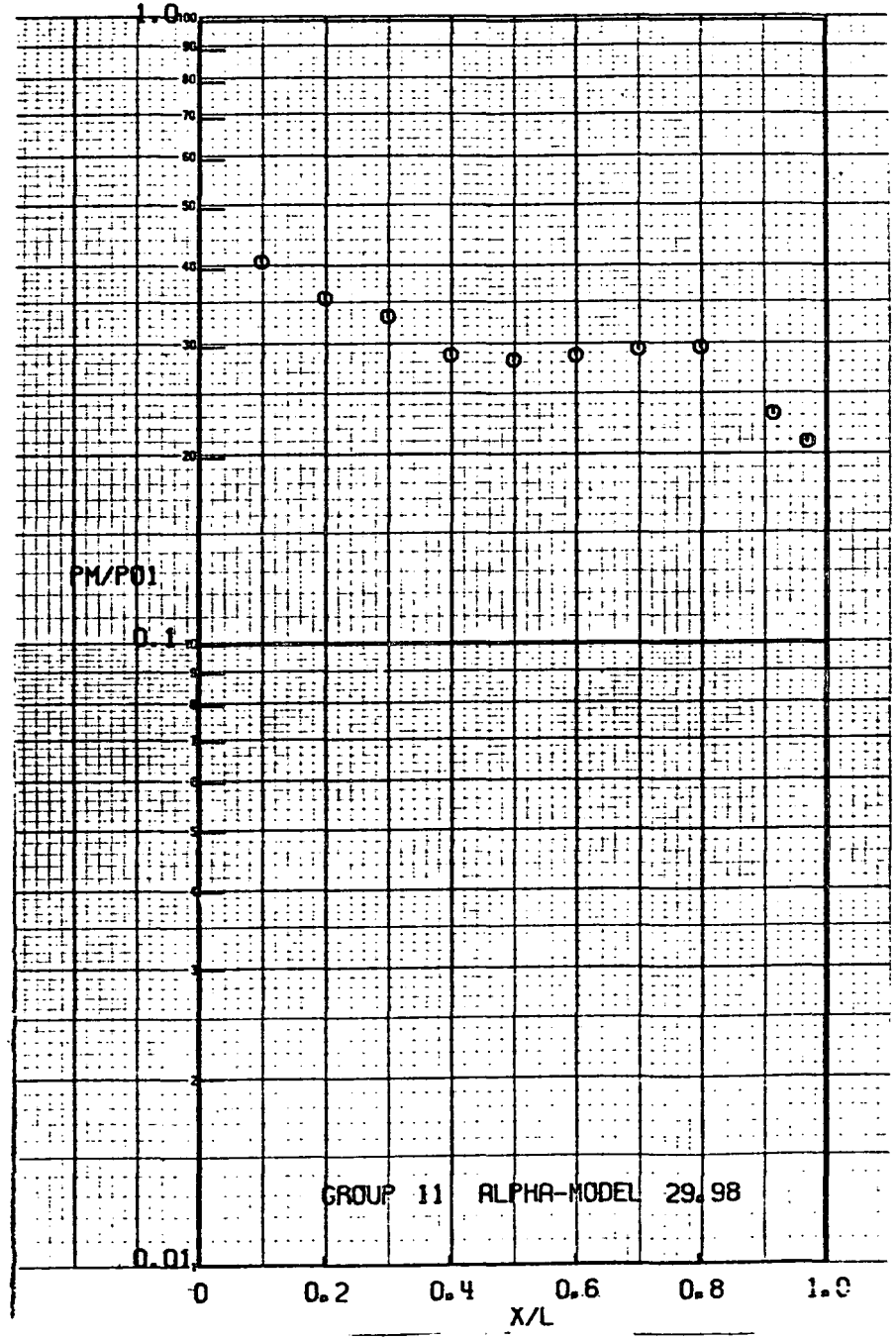
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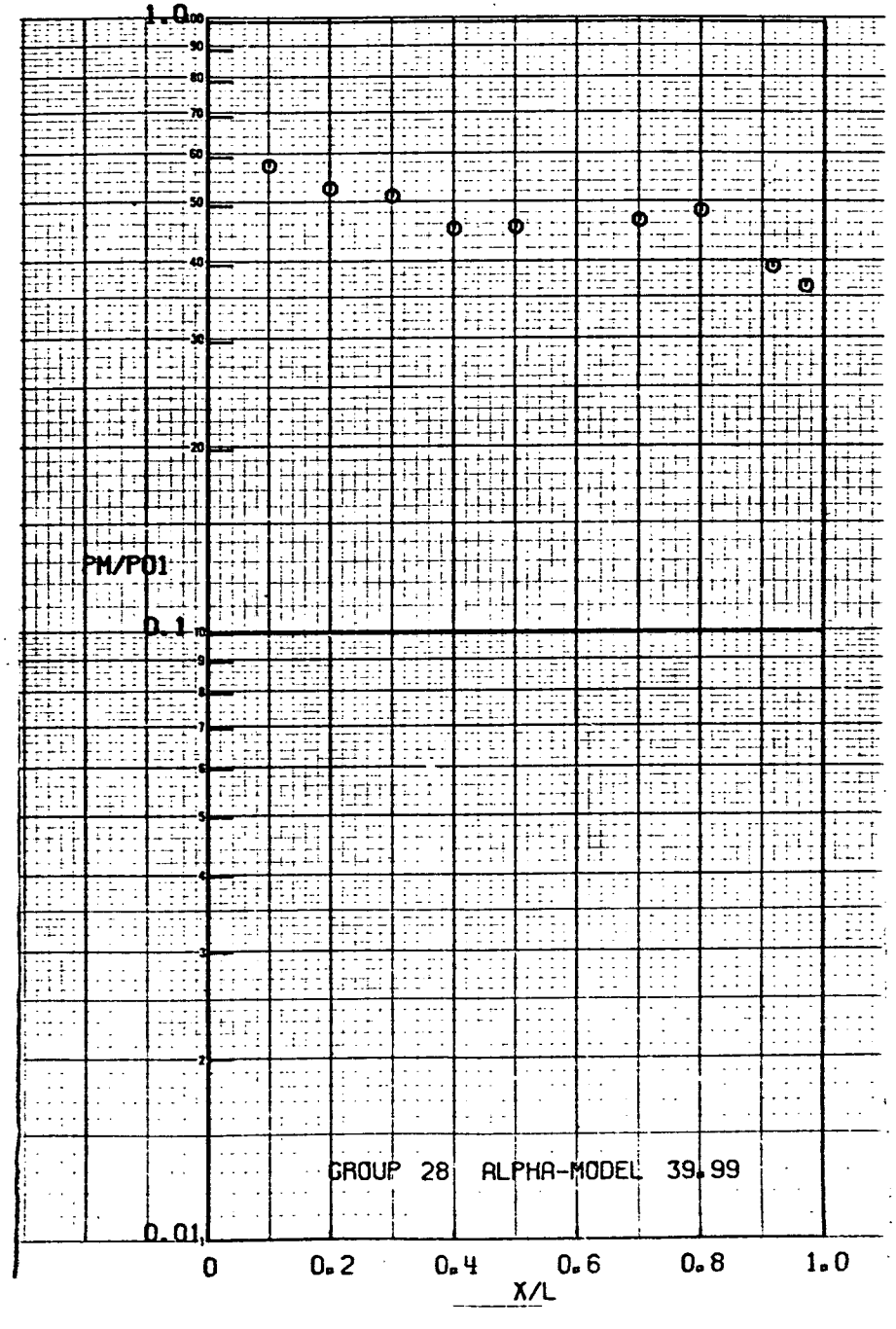
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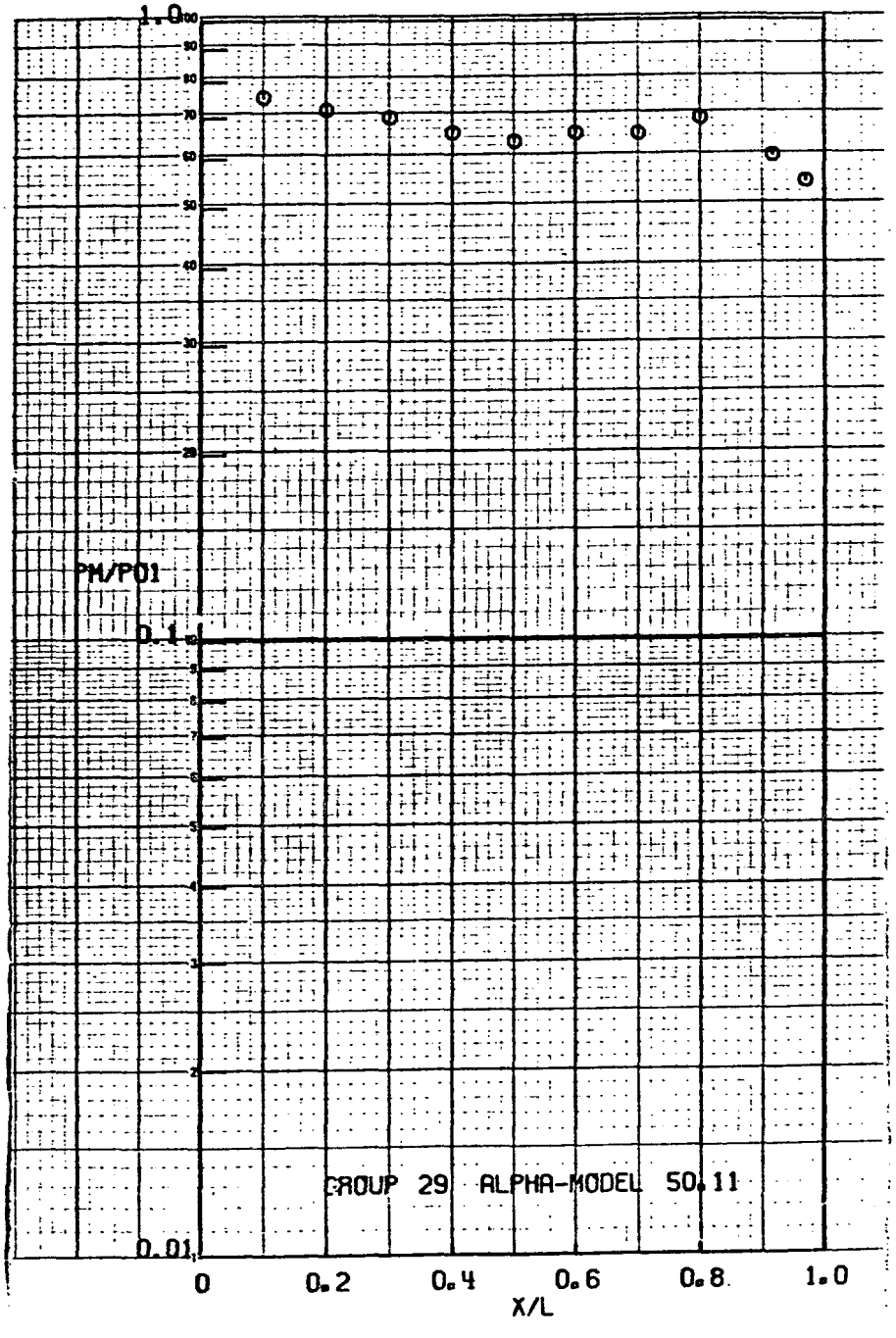
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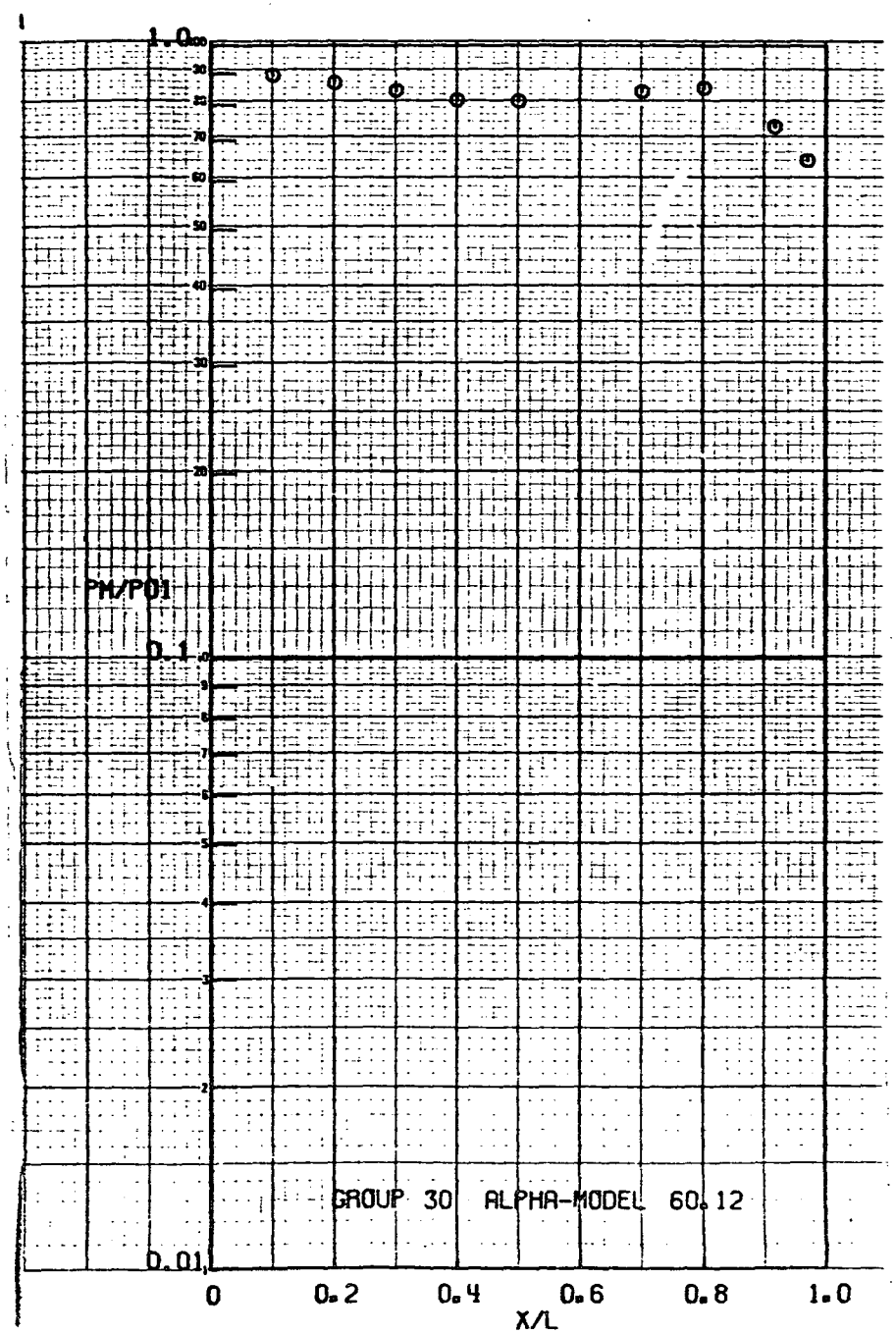
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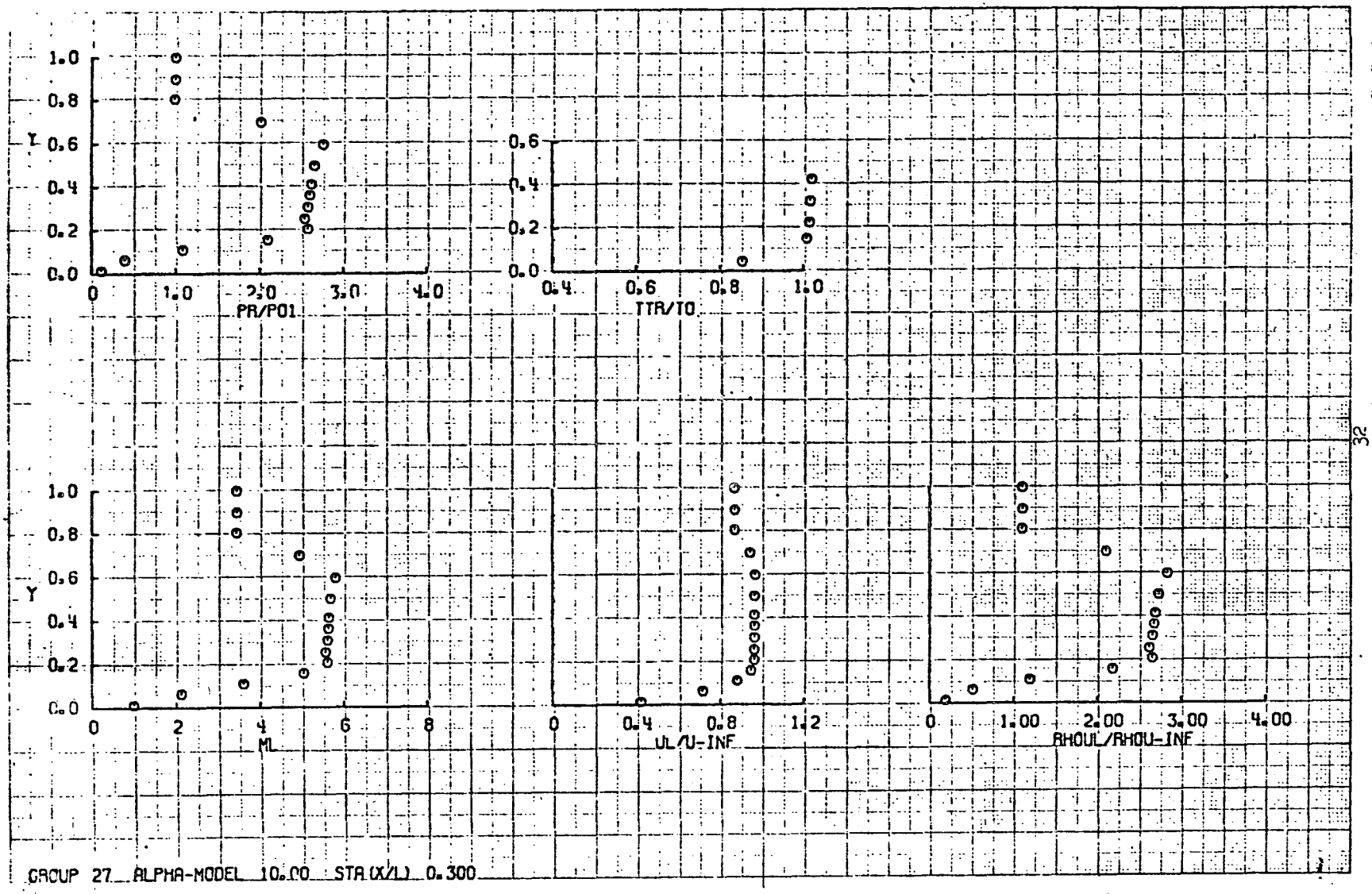
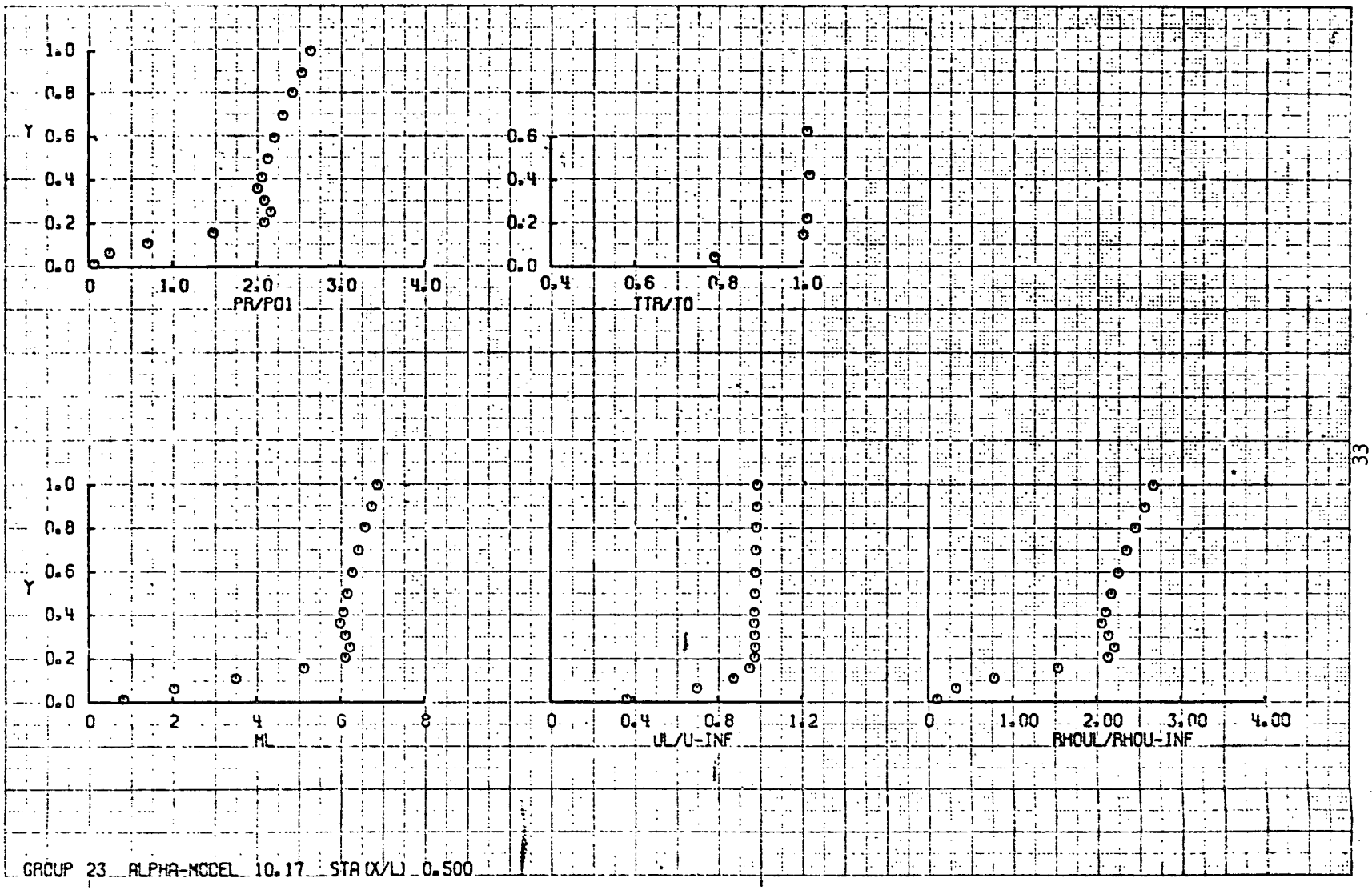
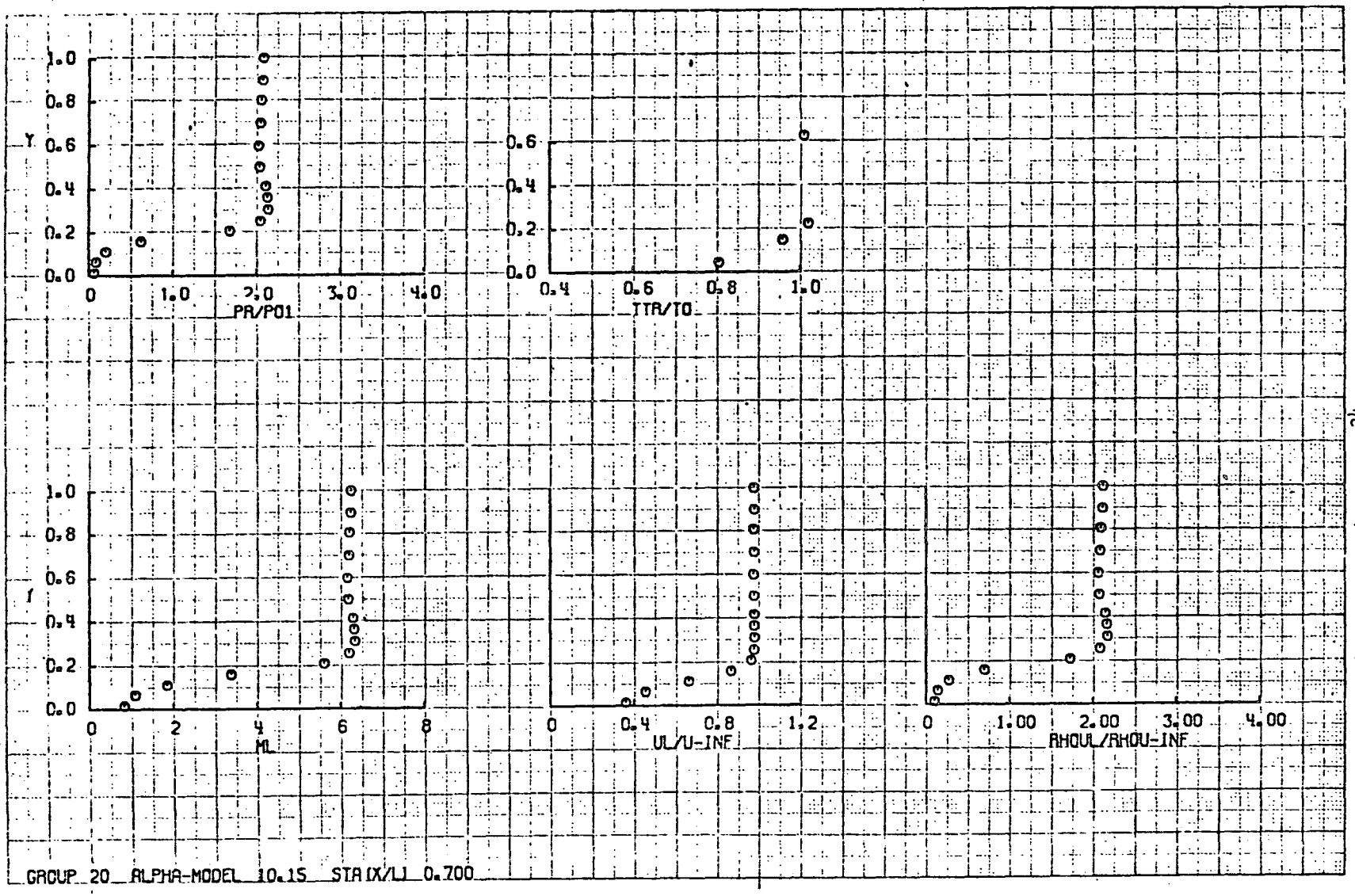
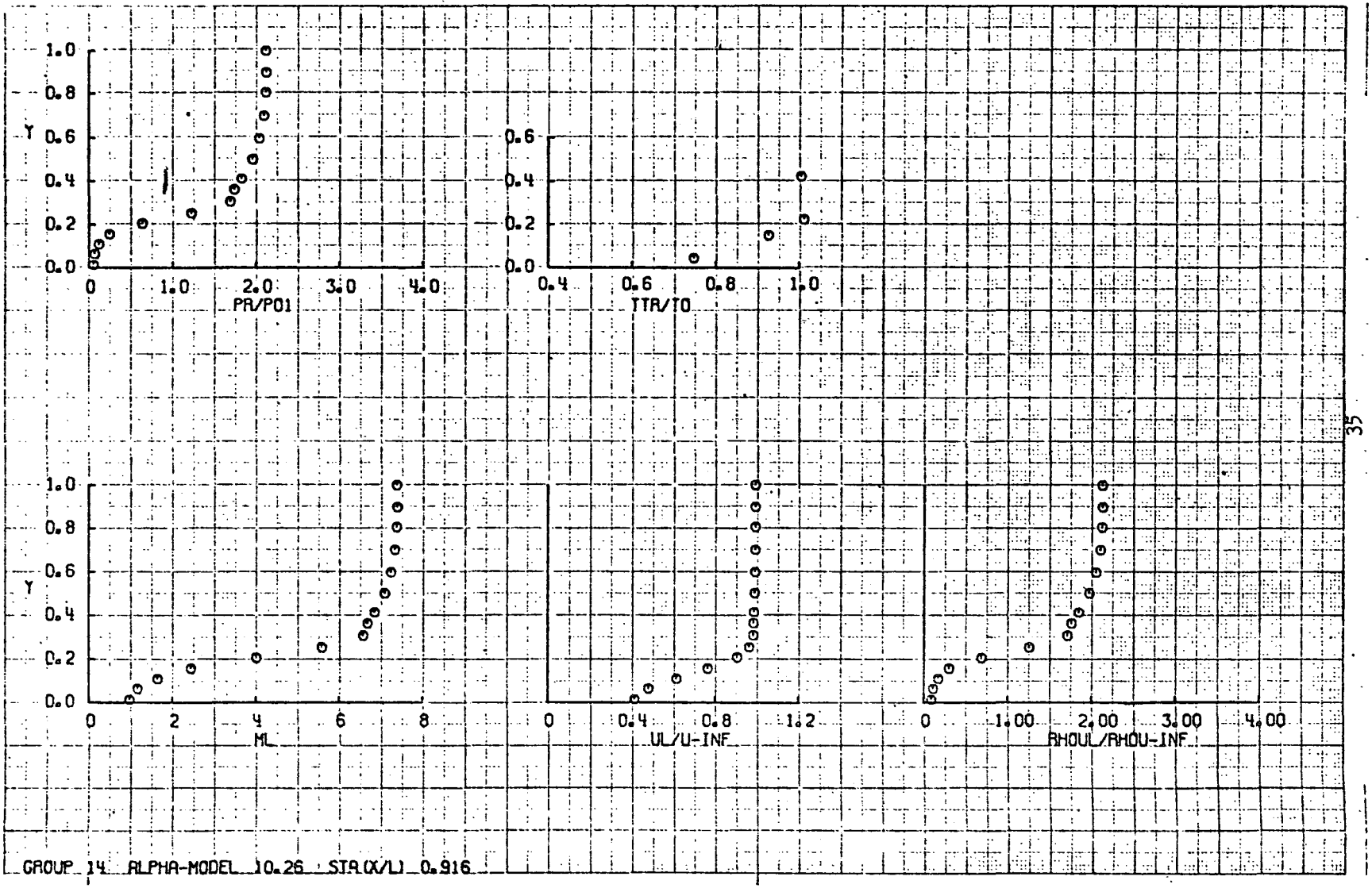
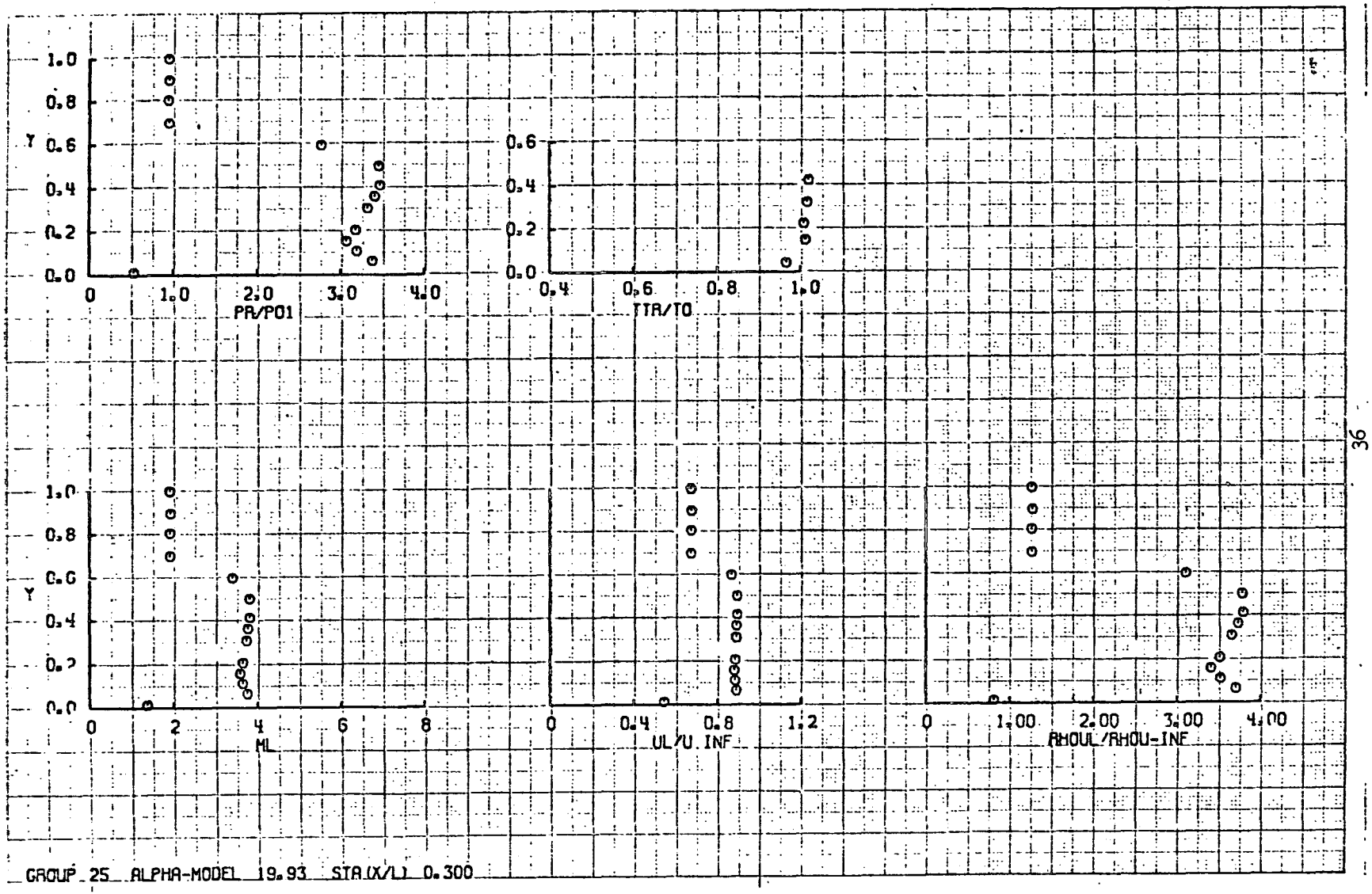
X/L


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 27 ALPHA-MODEL 10.00 STA(X/L) 0.300

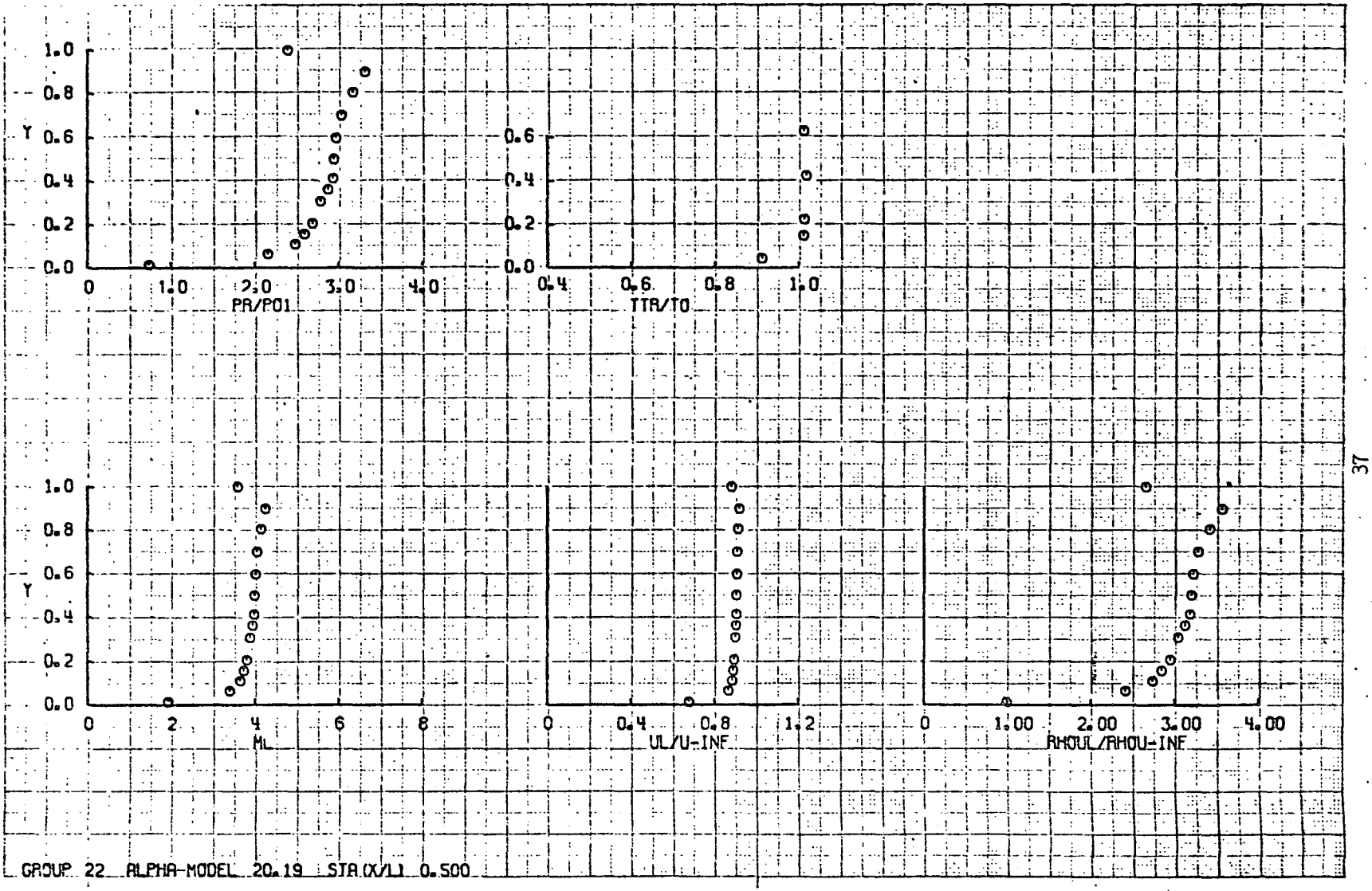

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/PO1
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 23 ALPHA-MODEL 10.17 STA (X/L) 0.500

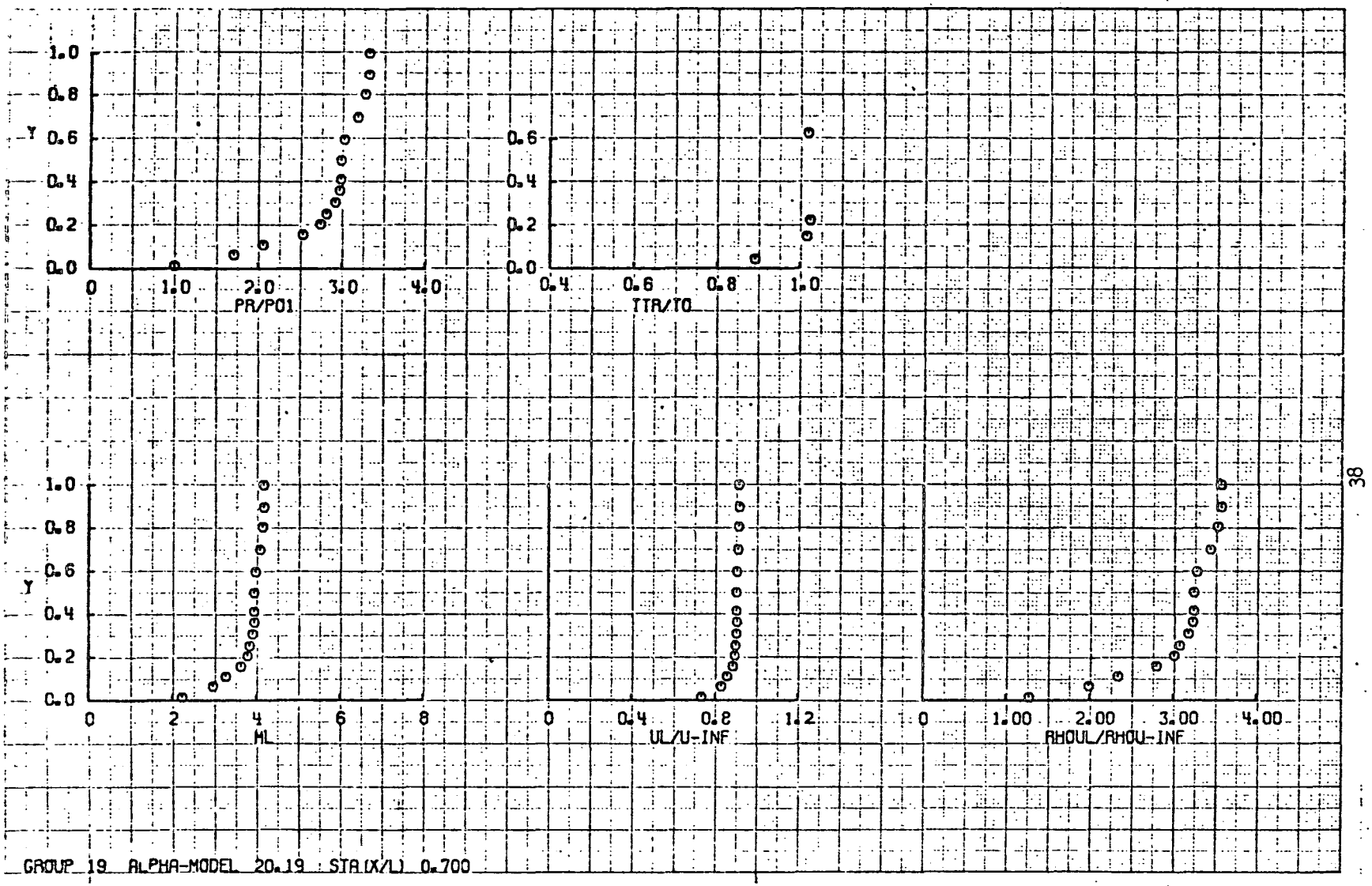

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 20 ALPHA-MODEL 10.15 STATX/L1 0.700

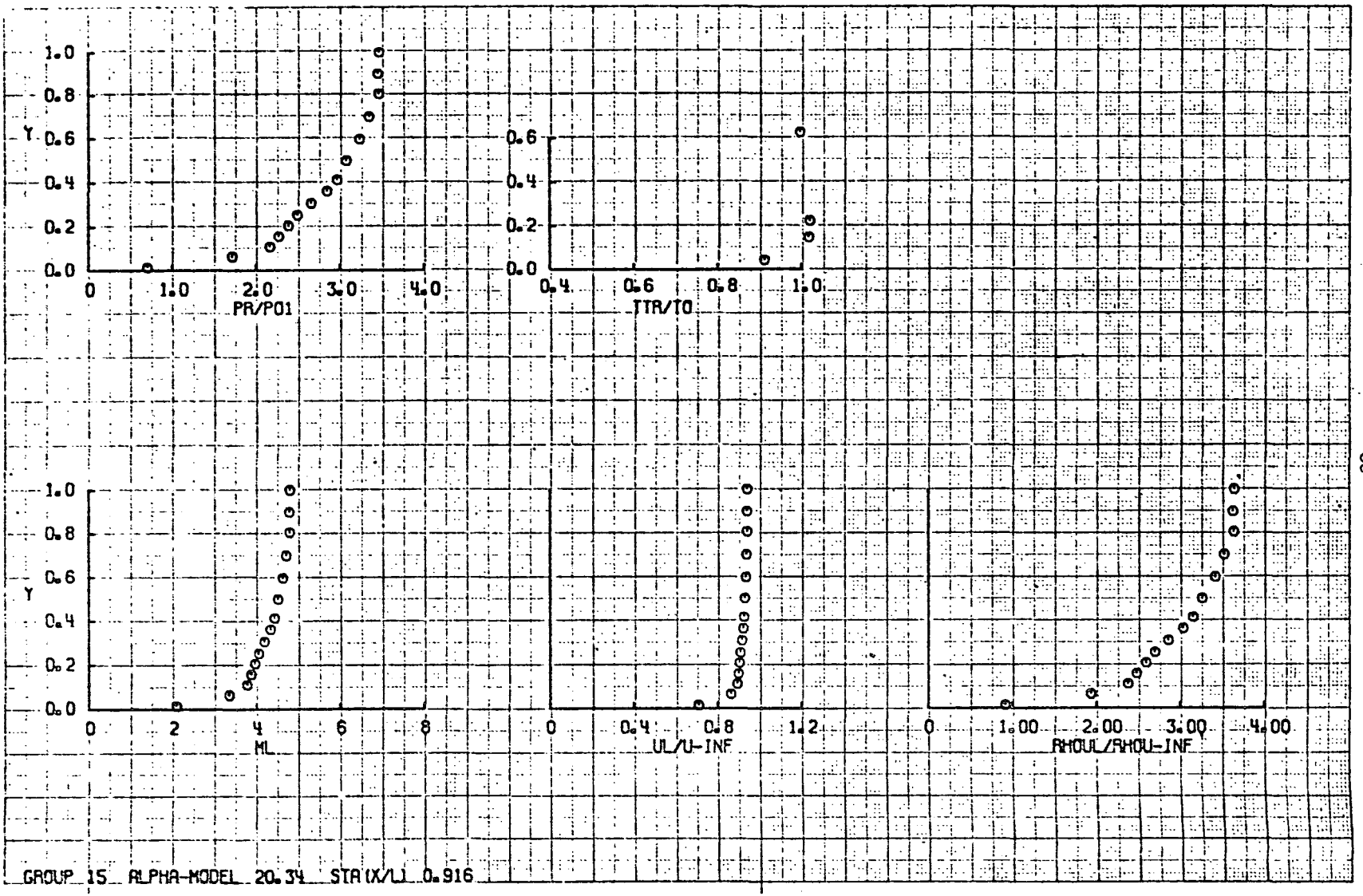

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/T0
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 14 ALPHA-MODEL 10.26 STA(X/L) 0.916

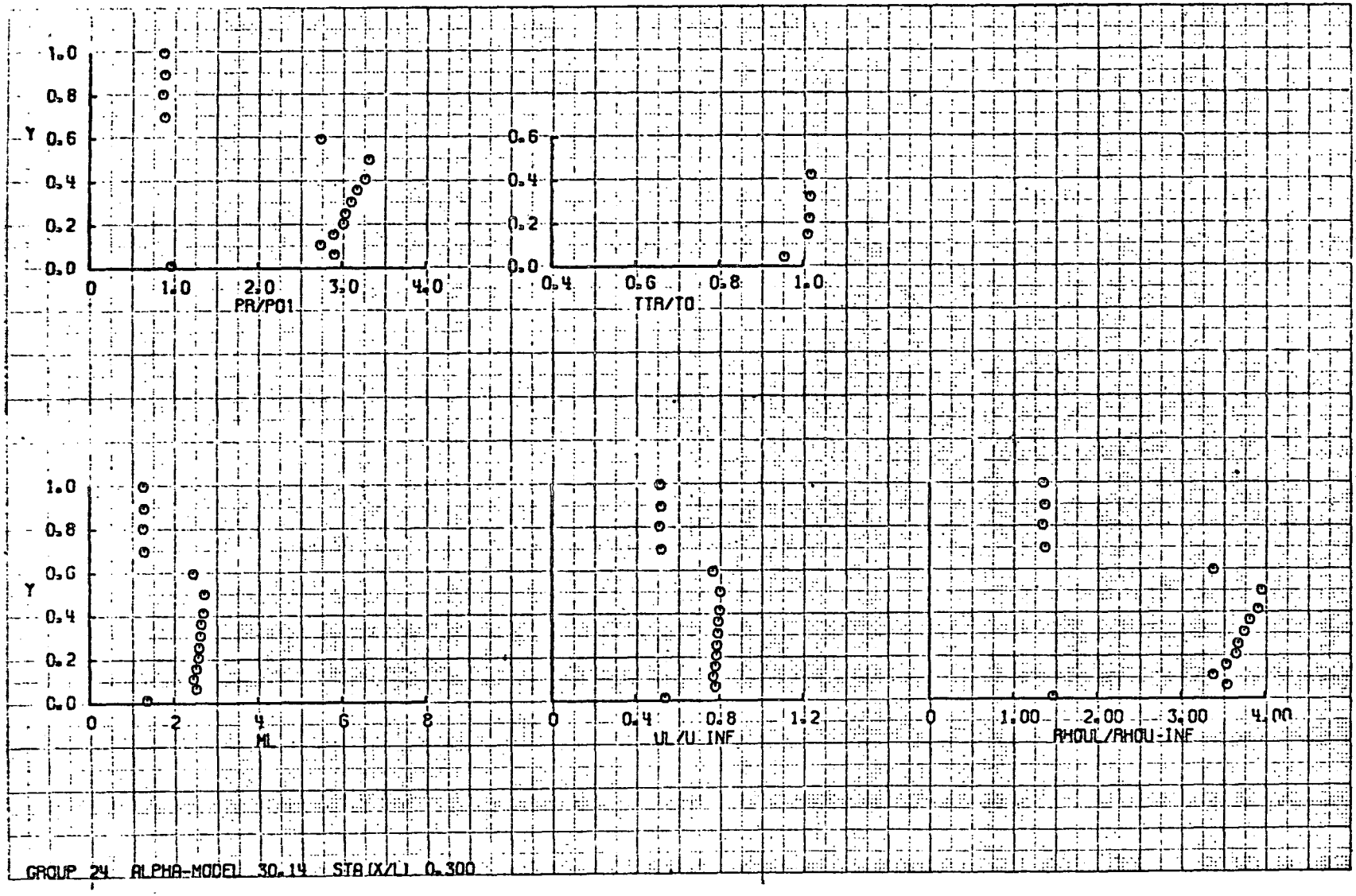


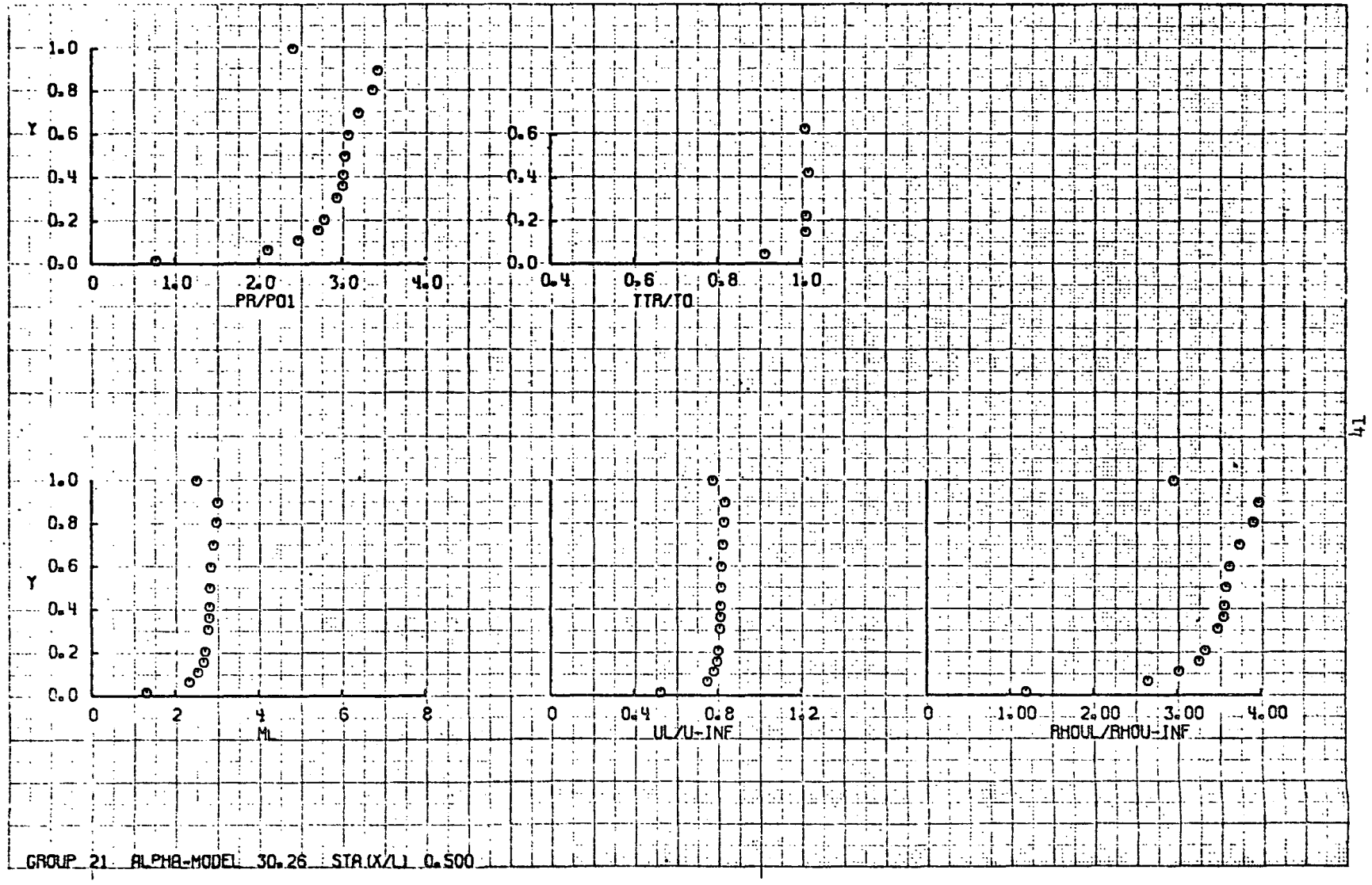
GROUP 25 ALPHA-MODEL 19.93 STA(X/L) 0.300

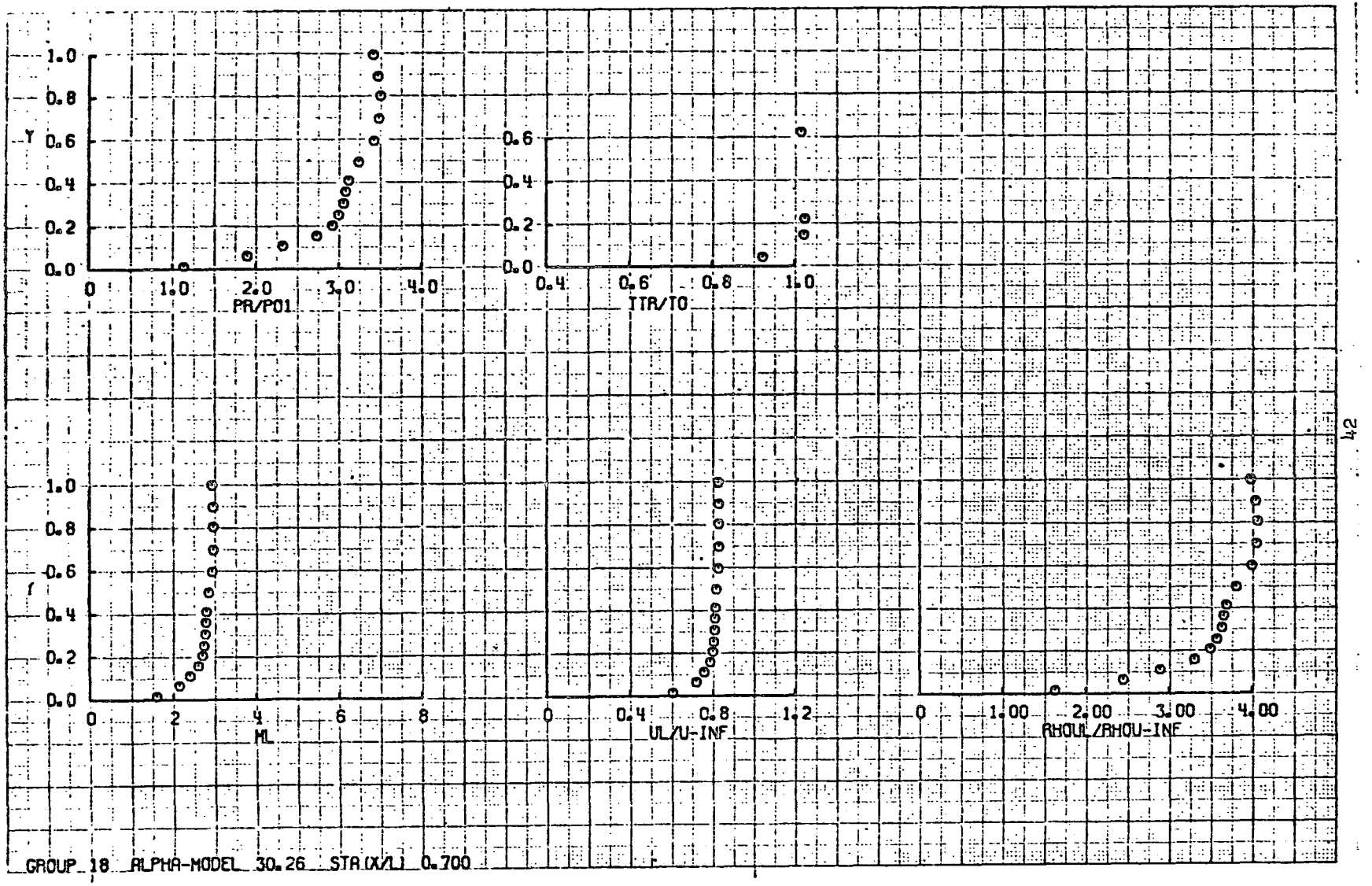

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/T0
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 22 ALPHA-MODEL 20.19 STA(X/L) 0.500


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 19 ALPHA-MODEL 20.19 STA(X/L) 0.700

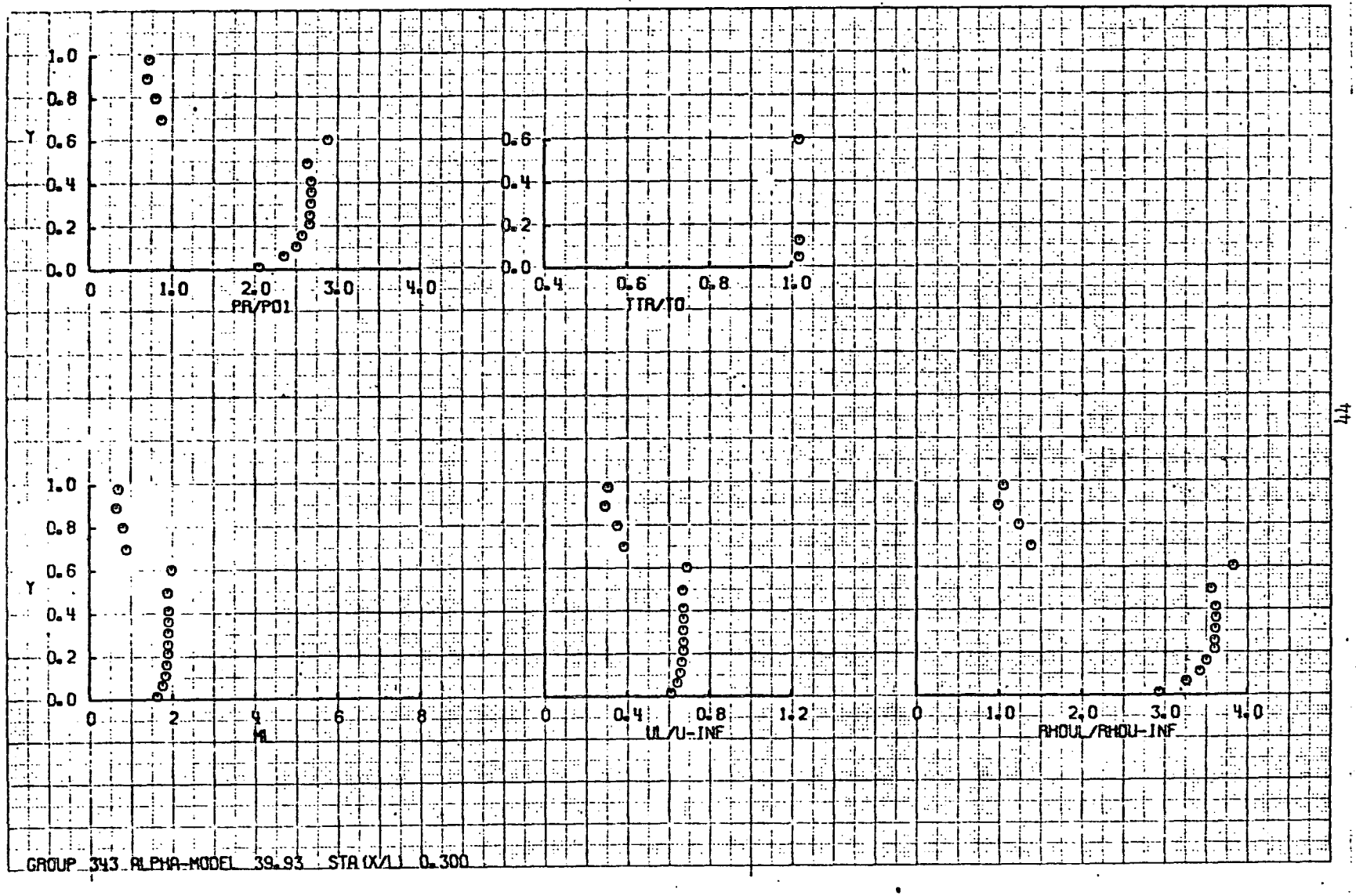

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/T0
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 15 ALPHA-MODEL 20.34 STA(X/L) 0.916

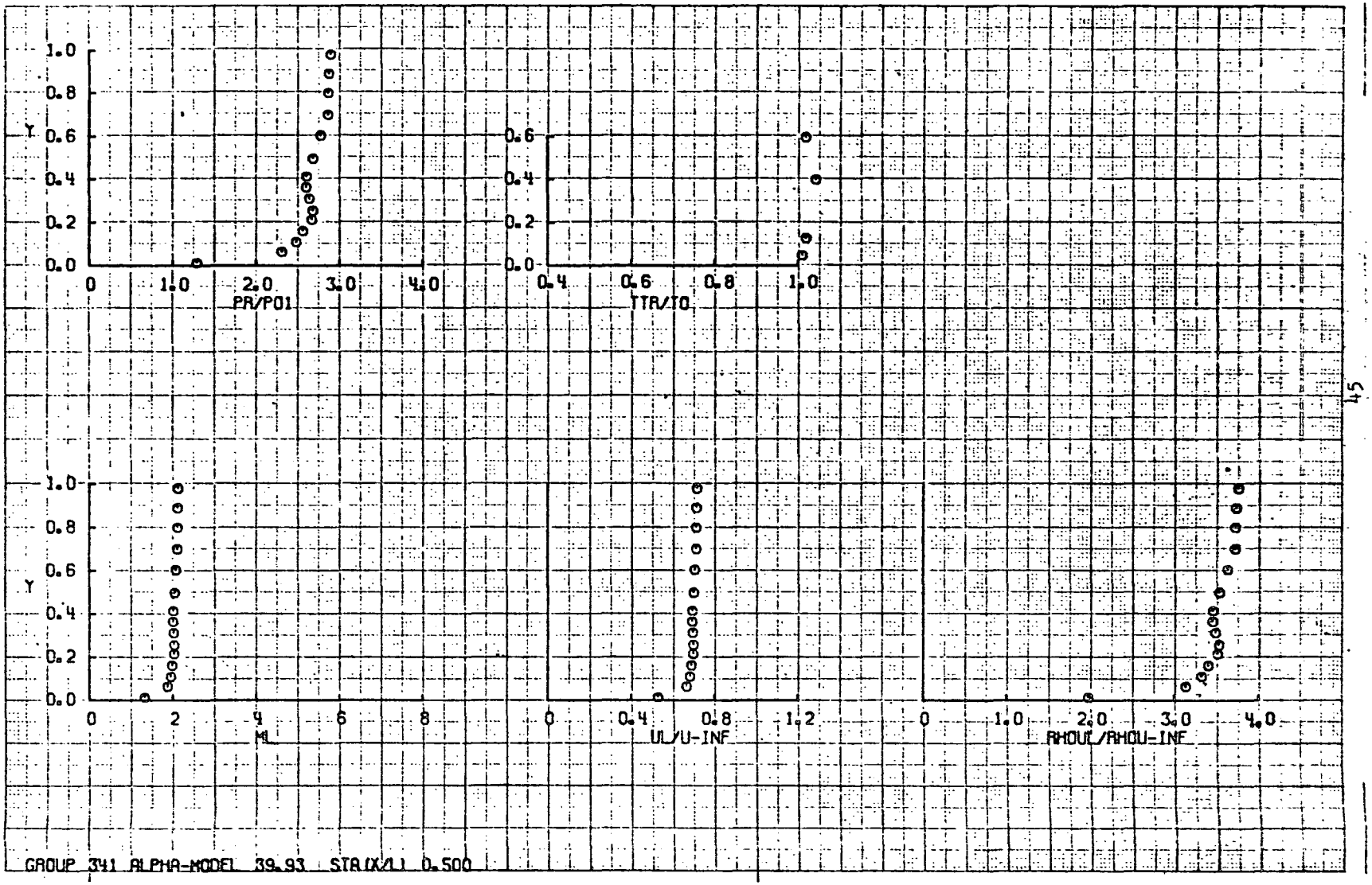

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 24 ALPHA-MODEL 30.14 STA(X/L) 0.300

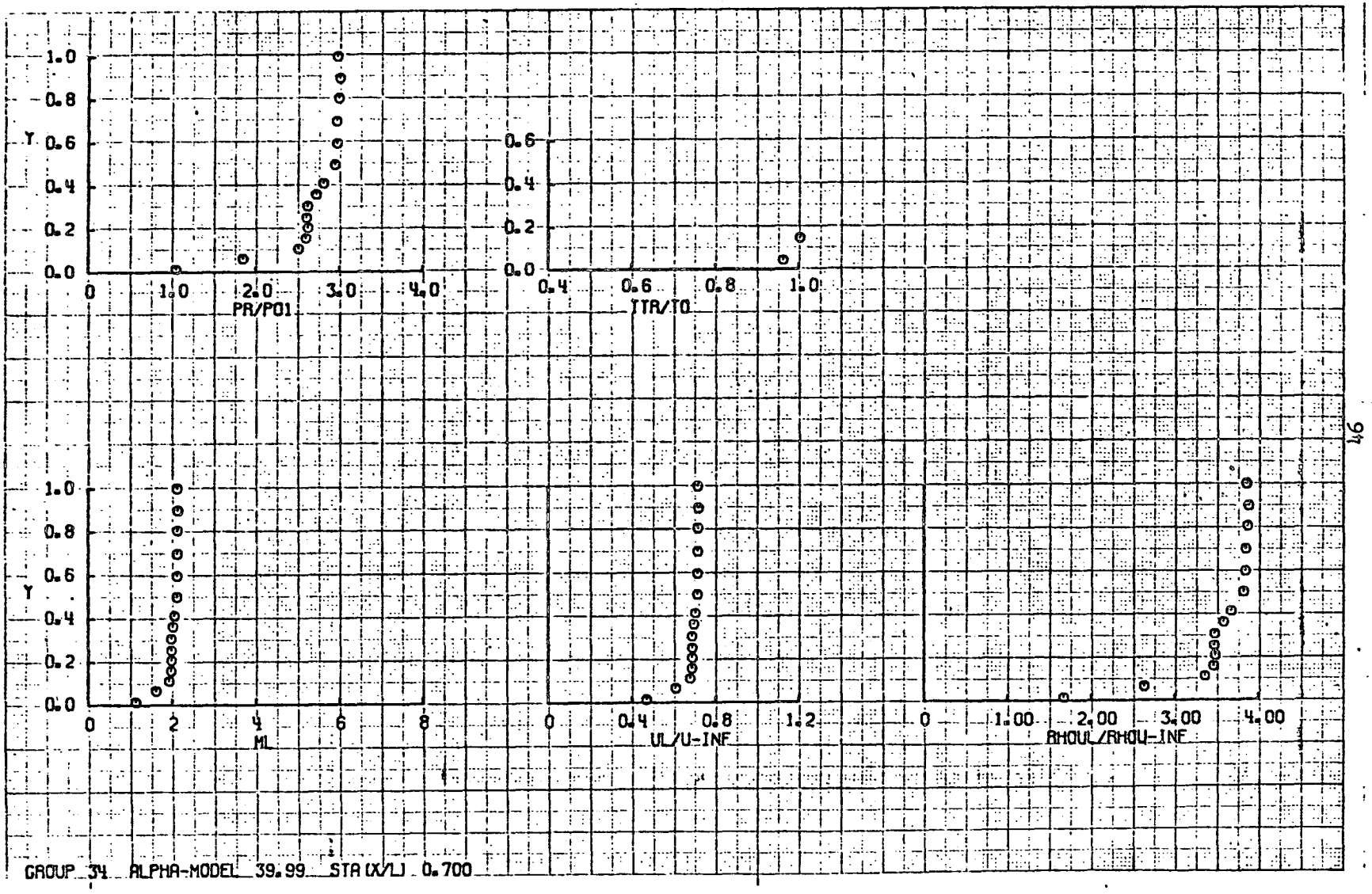

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 21 ALPHA-MODEL 30.26 STA(X/L) 0.500

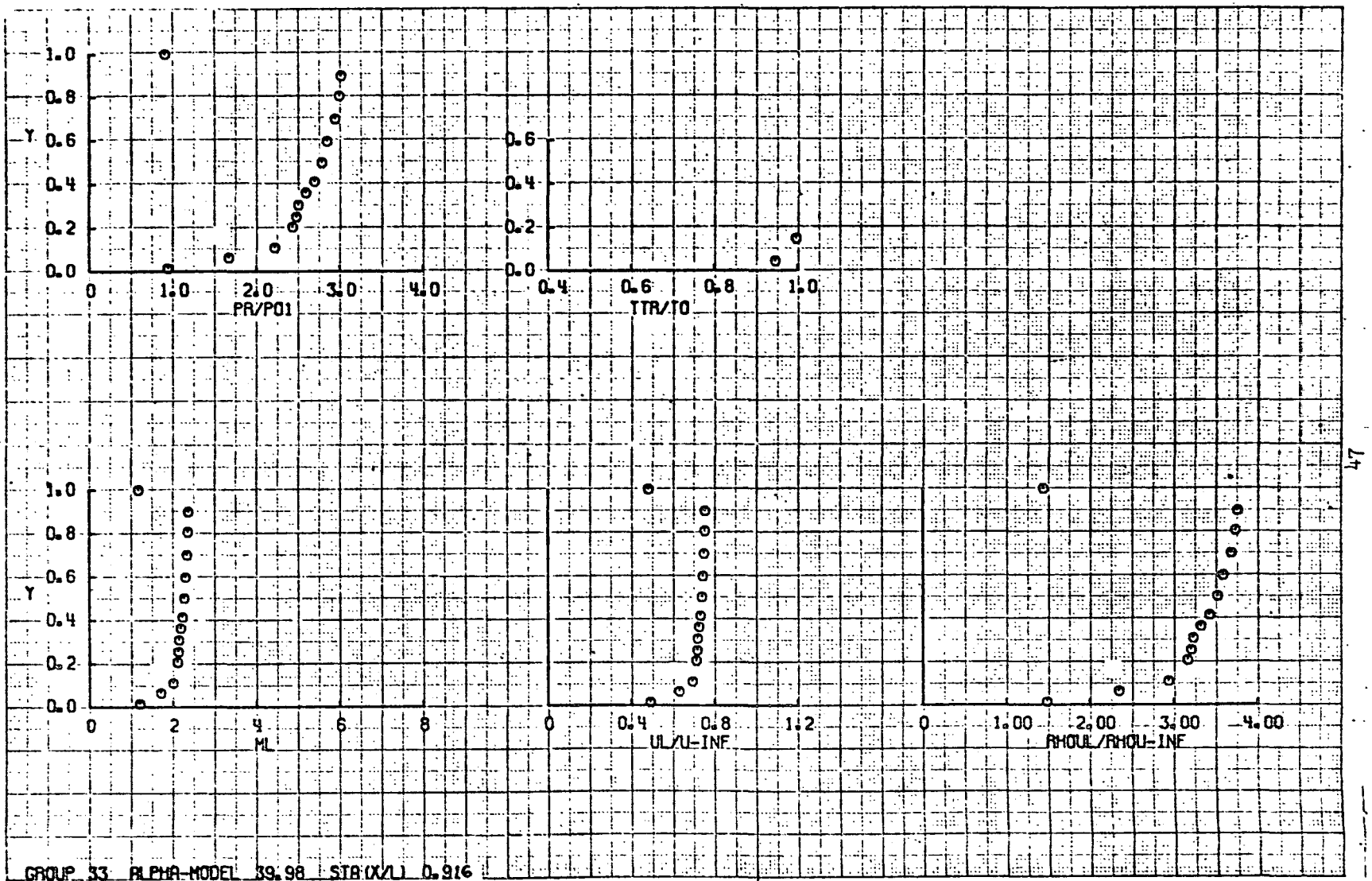

Y
PR/P01
TTR/TO
f
ML
UL/U-INF
RHOUL/RHOU-INF
GROUP 18 ALPHA-MODEL 30.26 STA(X/L) 0.700

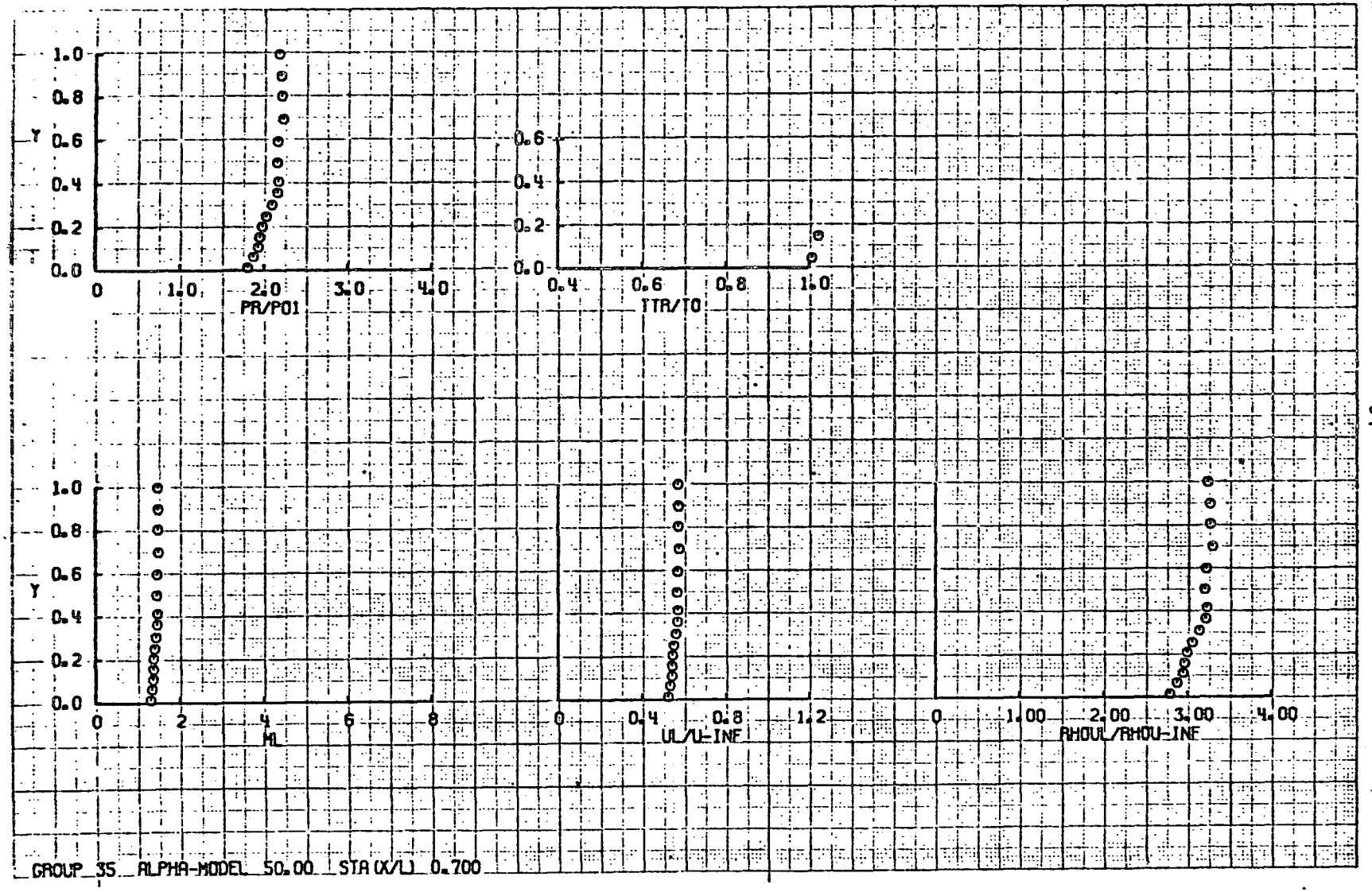

Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/T0
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 16 ALPHA-MODEL 30.38 STA(X/L) 0.916

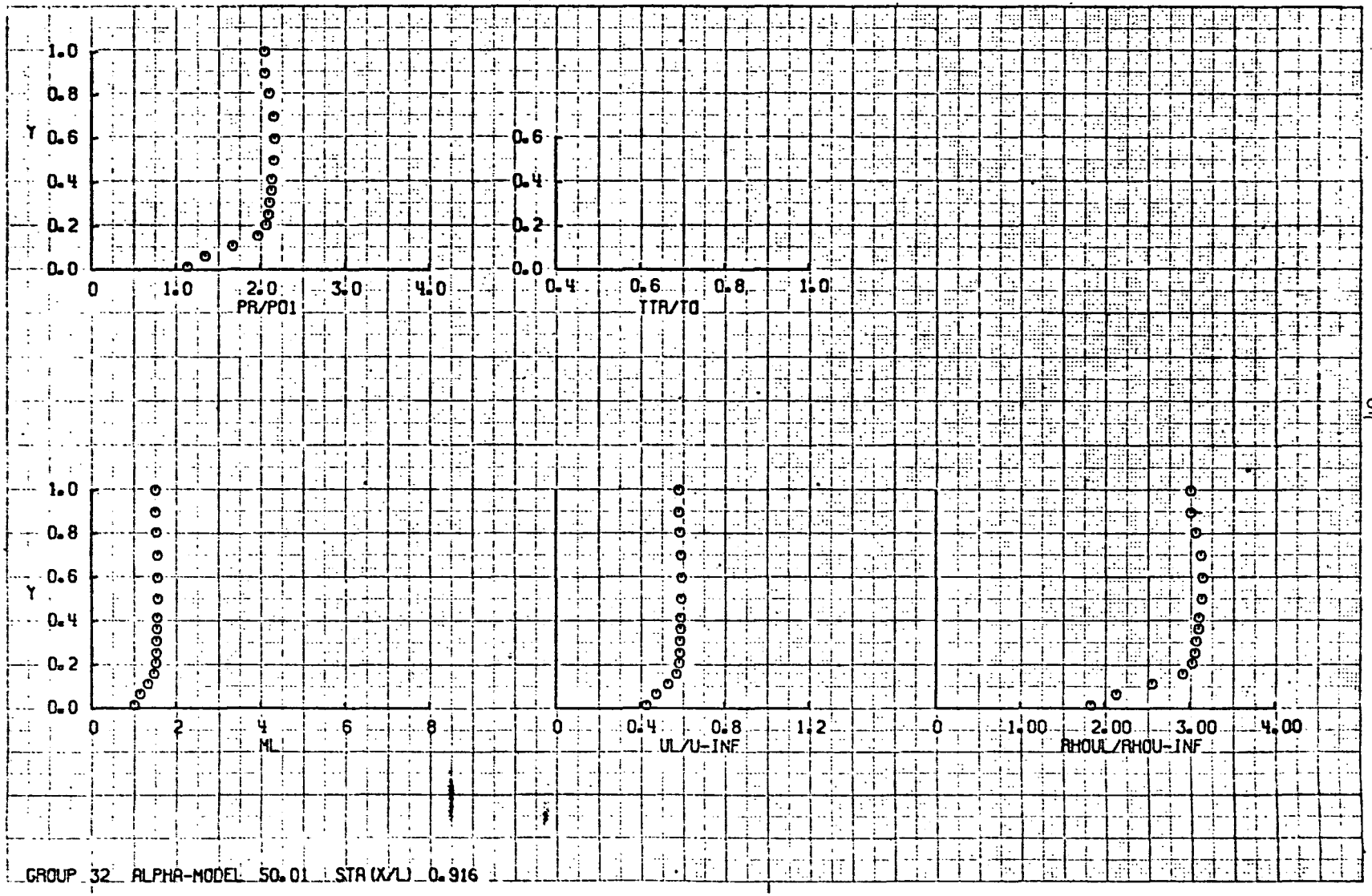

Y
PR/P01
TTR/TO
Y
M
UL/U-INF
RHOUL/RHOU-INF
GROUP 343 ALPHA-MODEL 39.93 STA(X/L) 0.300

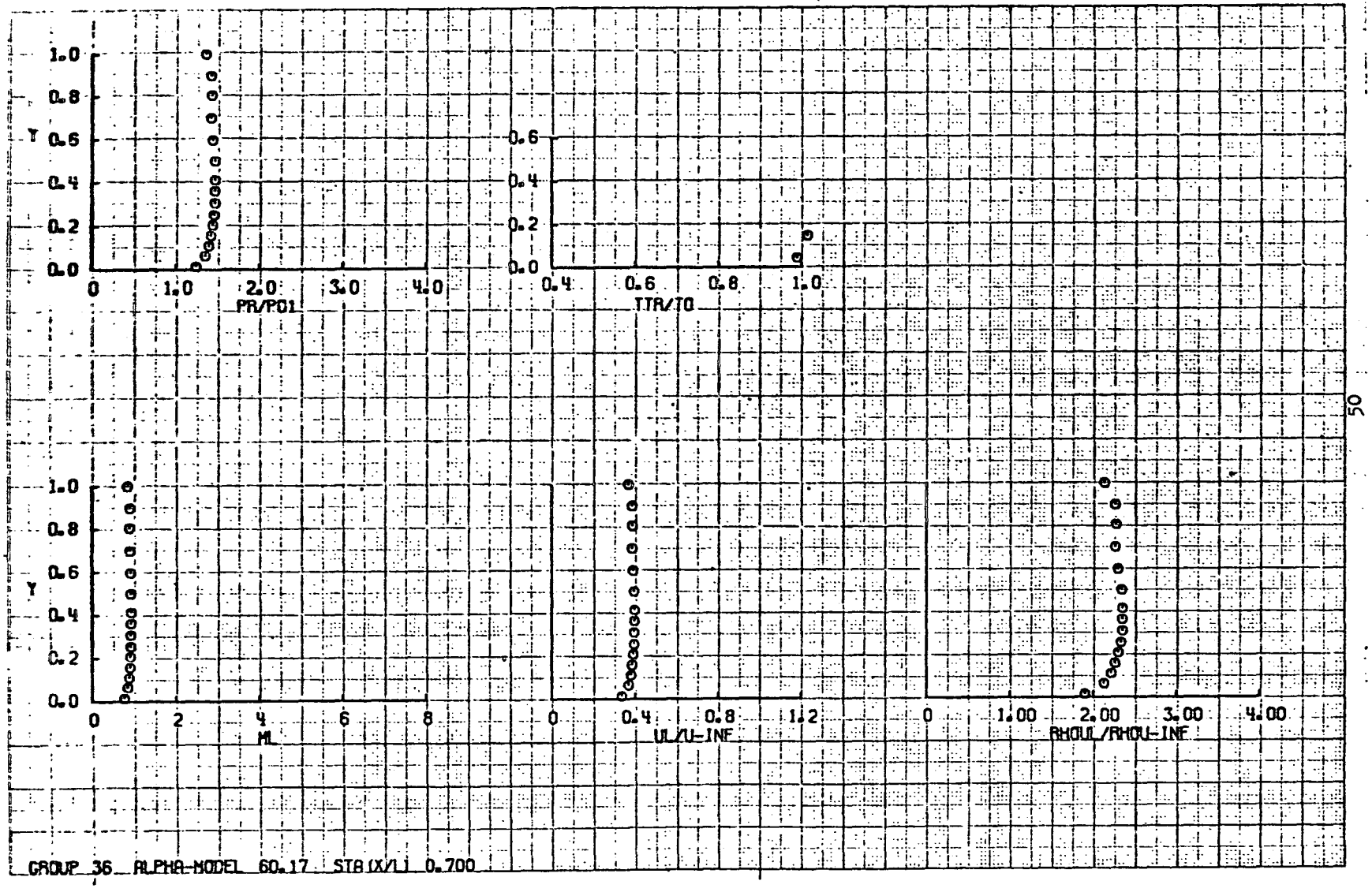

Y
PR/P01
TTR/TO
Y
ML
UL/U-INF
RHOUL/RHOU-INF
GROUP 341 ALPHA-MODEL 39.93 STA(X/L) 0.500

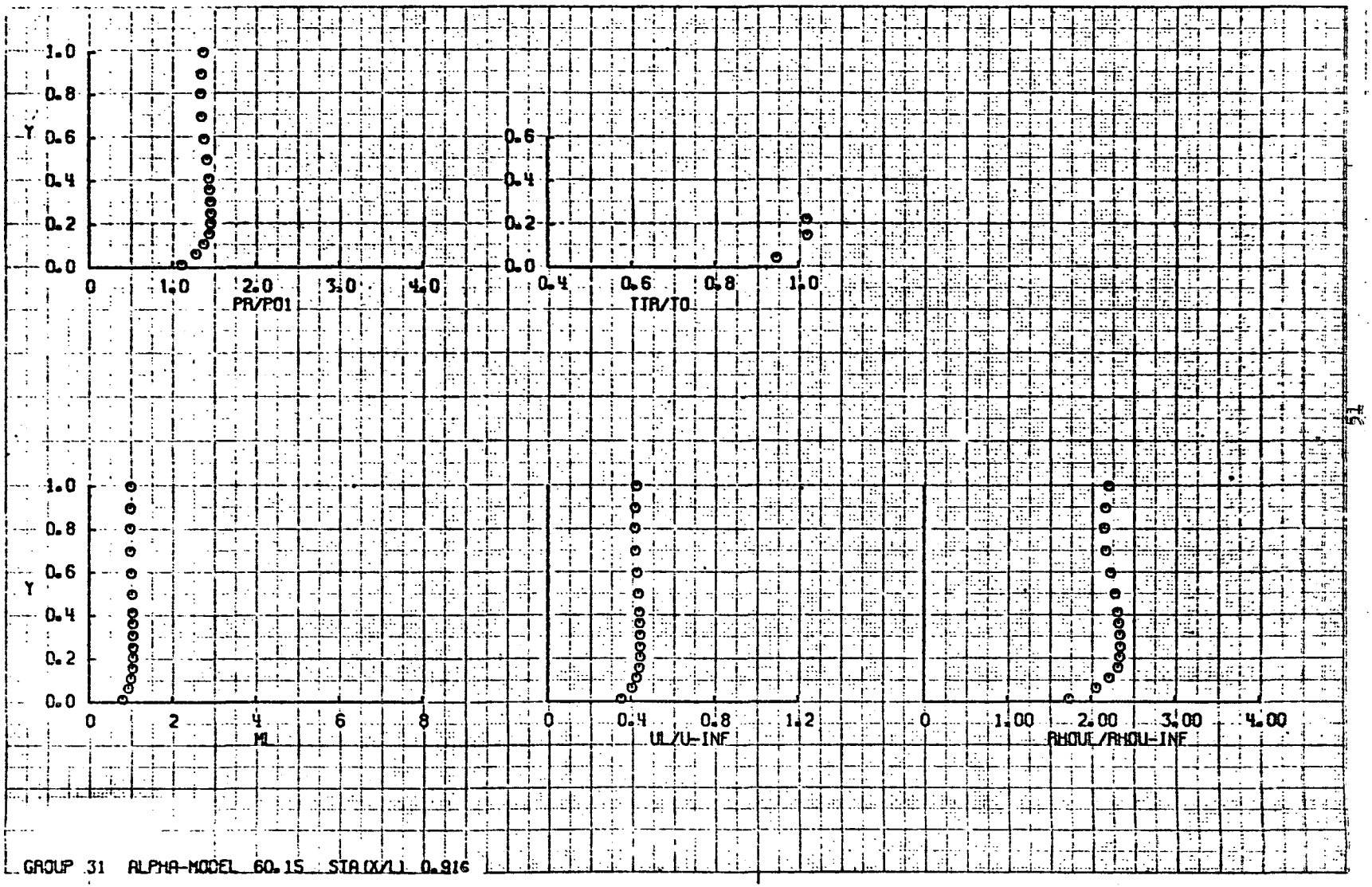

Y
PR/P01
TTR/T0
M
UL/U-INF
RHOU/RHOU-INF
GROUP 34 ALPHA-MODEL 39.99 STA (X/L) 0.700


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/T0
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 33 ALPHA-MODEL 39.98 STA(X/L) 0.916


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/T0
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 35 ALPHA-MODEL 50.00 STA (X/L) 0.700


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.4
0.6
0.8
1.0
TTR/T0
Y
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 32 ALPHA-MODEL 50.01 STA (X/L) 0.916


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/PO1
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
ML
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 36 ALPHA-MODEL 60.17 STA(X/L) 0.700


Y
1.0
0.8
0.6
0.4
0.2
0.0
0
1.0
2.0
3.0
4.0
PR/P01
0.6
0.4
0.2
0.0
0.4
0.6
0.8
1.0
TTR/TO
Y
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
M
0
0.4
0.8
1.2
UL/U-INF
0
1.00
2.00
3.00
4.00
RHOUL/RHOU-INF
GROUP 31 ALPHA-MODEL 60.15 STA(X/L) 0.916

A P P E N D I X

10/14/71

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
13	22	MDAC-DMU	8.00	855.5	1342	9.92	13.08	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	V-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	L (IN)
97	8.795E-02	7.201	3.926	3867	2.432E-03	7.829E-08	3.735E 06	21.35

CP	POS	TAP	PM (PSIA)	PM/PO	PM/P01	PM/P-INF	CP	CP/CP-MAX	X/L
1	2	1	6.891E-01	8.043E-04	9.476E-02	7.852E 00	1.530E-01	8.370E-02	.100
2	2	2	5.569E-01	6.509E-04	7.669E-02	6.355E 00	1.195E-01	6.541E-02	.200
3	2	3	4.655E-01	5.488E-04	6.466E-02	5.358E 00	9.727E-02	5.323E-02	.300
4	2	4	3.953E-01	4.153E-04	4.893E-02	4.054E 00	6.818E-02	3.731E-02	.400
5	2	5	3.426E-01	3.656E-04	4.307E-02	3.569E 00	5.735E-02	3.139E-02	.500
6	2	6	3.042E-01	3.603E-04	4.245E-02	3.517E 00	5.619E-02	3.075E-02	.600
7	2	7	3.014E-01	3.523E-04	4.151E-02	3.440E 00	5.446E-02	2.980E-02	.700
8	2	8	3.147E-01	3.679E-04	4.334E-02	3.592E 00	5.785E-02	3.166E-02	.800
9	2	9	2.229E-01	2.605E-04	3.069E-02	2.544E 00	3.445E-02	1.885E-02	.916
10	2	10	1.842E-01	2.153E-04	2.536E-02	2.102E 00	2.459E-02	1.346E-02	.970

GROUP
13

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL H
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PC PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PHIBEND	ROLL-MODEL	YAW
12	22	MDAC-UNU	8.00	855.6	1344	19.97	3.03	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	V-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	L (IN)
97	8.76E-02	7.262	3.926	3870	2.429E-03	7.841E-08	3.727E 06	21.35

C=	POS	TAP	PM (PSIA)	PM/PO	PM/P01	PM/P-INF	CP	CP/CP-MAX	X/L
1	2	1	1.691E 00	1.977E-03	2.329E-01	1.93CE 01	4.085E-01	2.235E-01	.100
2	2	2	1.451E 00	1.695E-03	1.997E-01	1.655E 01	3.471E-01	1.900E-01	.200
3	2	3	1.335E 00	1.560E-03	1.838E-01	1.523E 01	3.177E-01	1.739E-01	.300
4	2	4	1.044E 00	1.220E-03	1.438E-01	1.191E 01	2.436E-01	1.333E-01	.400
5	2	5	1.016E 00	1.188E-03	1.399E-01	1.16CE 01	2.365E-01	1.294E-01	.500
6	2	6	1.033E 00	1.207E-03	1.422E-01	1.17EE 01	2.407E-01	1.317E-01	.600
7	2	7	1.071E 00	1.252E-03	1.475E-01	1.222E 01	2.505E-01	1.371E-01	.700
8	2	8	1.068E 00	1.248E-03	1.470E-01	1.21EE 01	2.496E-01	1.366E-01	.800
9	2	9	8.690E-01	1.016E-03	1.197E-01	9.916E 00	1.990E-01	1.089E-01	.916
10	2	10	7.138E-01	8.342E-04	9.829E-02	8.145E 00	1.595E-01	8.727E-02	.970

GROUP
12

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
11	22	MDAC-DWU	8.00	858.9	1346	29.98	-6.98	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	V-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	L (IN)
98	8.80E-02	7.290	3.941	3873	2.435E-03	7.853E-08	3.733E 06	21.35

CP	POS	TAP	PM (PSIA)	PM/PO	PM/P01	PM/P-INF	CP	CP/CP-MAX	X/L
1	2	1	2.990E 00	3.481E-03	4.101E-01	3.395E 01	7.363E-01	4.029E-01	.100
2	2	2	2.612E 00	3.041E-03	3.582E-01	2.968E 01	6.403E-01	3.504E-01	.200
3	2	3	2.443E 00	2.844E-03	3.351E-01	2.777E 01	5.975E-01	3.270E-01	.300
4	2	4	2.118E 00	2.466E-03	2.905E-01	2.408E 01	5.151E-01	2.819E-01	.400
5	2	5	2.077E 00	2.419E-03	2.849E-01	2.361E 01	5.047E-01	2.762E-01	.500
6	2	6	2.114E 00	2.462E-03	2.901E-01	2.404E 01	5.142E-01	2.814E-01	.600
7	2	7	2.162E 00	2.517E-03	2.966E-01	2.458E 01	5.262E-01	2.880E-01	.700
8	2	8	2.174E 00	2.531E-03	2.982E-01	2.471E 01	5.293E-01	2.897E-01	.800
9	2	9	1.787E 00	1.987E-03	2.341E-01	1.940E 01	4.107E-01	2.248E-01	.916
10	2	10	1.536E 00	1.788E-03	2.107E-01	1.746E 01	3.674E-01	2.010E-01	.970

GROUP
11

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
28	22	MDAC-DWV	8.00	857.1	1348	39.99	10.01	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	V-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	L (IN)
95	8.78E-02	7.275	3.933	3875	2.426E-03	7.864E-08	3.717E 06	21.35

CH	POS	TAP	PM (PSIA)	PM/PO	PM/PO1	PM/P-INF	CP	CP/CP-MAX	X/L
1	2	1	4.229E 00	4.934E-03	5.813E-01	4.817E 01	1.053E 00	5.762E-01	.100
2	2	2	3.877E 00	4.523E-03	5.329E-01	4.416E 01	9.633E-01	5.272E-01	.200
3	2	3	3.767E 00	4.394E-03	5.177E-01	4.290E 01	9.353E-01	5.118E-01	.300
4	2	4	3.327E 00	3.881E-03	4.573E-01	3.789E 01	8.235E-01	4.506E-01	.400
5	2	5	3.349E 00	3.908E-03	4.604E-01	3.815E 01	8.292E-01	4.538E-01	.500
7	2	7	3.434E 00	4.006E-03	4.719E-01	3.911E 01	8.506E-01	4.655E-01	.700
8	2	8	3.560E 00	4.153E-03	4.893E-01	4.054E 01	8.827E-01	4.830E-01	.800
9	2	9	2.883E 00	3.363E-03	3.962E-01	3.283E 01	7.105E-01	3.888E-01	.916
10	2	10	2.673E 00	3.118E-03	3.674E-01	3.044E 01	6.572E-01	3.597E-01	.970

GROUP
28

70246

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
29	22	MDAC-DWU	8.00	857.1	1350	50.12	-.12	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	V-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	L (IN)
98	8.785-02	7.275	3.933	3878	2.422E-03	7.876E-08	3.709E 06	21.35

CH	POS	TAP	PM (PSIA)	PM/PO	PM/PO1	PM/P-INF	CP	CP/CP-MAX	X/L
1	2	1	5.472E 00	6.384E-03	7.522E-01	6.233E 01	1.369E 00	7.491E-01	.100
2	2	2	5.226E 00	6.097E-03	7.184E-01	5.953E 01	1.306E 00	7.149E-01	.200
3	2	3	5.077E 00	5.924E-03	6.979E-01	5.783E 01	1.269E 00	6.942E-01	.300
4	2	4	4.792E 00	5.591E-03	6.588E-01	5.459E 01	1.194E 00	6.546E-01	.400
5	2	5	4.638E 00	5.412E-03	6.376E-01	5.284E 01	1.157E 00	6.332E-01	.500
6	2	6	4.775E 00	5.572E-03	6.565E-01	5.440E 01	1.192E 00	6.523E-01	.600
7	2	7	4.760E 00	5.554E-03	6.543E-01	5.422E 01	1.188E 00	6.501E-01	.700
8	2	8	5.042E 00	5.883E-03	6.931E-01	5.744E 01	1.260E 00	6.894E-01	.800
9	2	9	4.392E 00	5.124E-03	6.037E-01	5.003E 01	1.094E 00	5.989E-01	.916
10	2	10	3.989E 00	4.655E-03	5.484E-01	4.544E 01	9.920E-01	5.429E-01	.970

GROUP
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AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
30	22	MDAC-DMU	8.00	854.1	1346	60.13	-10.13	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	V-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	L (IN)
98	8.75E-02	7.249	3.919	3873	2.421E-03	7.853E-08	3.712E 06	21.35

CH	POS	TAP	PM (PSIA)	PM/PO	PM/PO1	PM/P-INF	CP	CP/CP-MAX	X/L
1	2	1	6.472E 00	7.578E-03	8.928E-01	7.398E 01	1.629E 00	8.915E-01	.100
2	2	2	6.292E 00	7.367E-03	8.679E-01	7.192E 01	1.583E 00	8.663E-01	.200
3	2	3	6.114E 00	7.159E-03	8.435E-01	6.989E 01	1.538E 00	8.415E-01	.300
4	2	4	5.901E 00	6.909E-03	8.140E-01	6.745E 01	1.483E 00	8.117E-01	.400
5	2	5	5.868E 00	6.871E-03	8.095E-01	6.708E 01	1.475E 00	8.072E-01	.500
7	2	7	6.093E 00	7.134E-03	8.405E-01	6.965E 01	1.532E 00	8.386E-01	.700
8	2	8	6.172E 00	7.226E-03	8.513E-01	7.055E 01	1.552E 00	8.495E-01	.800
9	2	9	5.335E 00	6.247E-03	7.360E-01	6.099E 01	1.339E 00	7.328E-01	.916
10	2	10	4.700E 00	5.504E-03	6.484E-01	5.373E 01	1.177E 00	6.441E-01	.970

GROUP
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AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
27	22	MDAC-DWU	8.00	855.8	1340	10.00	13.00	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LB/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.77E-02	7.264	3.927	3864	2.437E-03	7.818E-08	3.745E 06	.300	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PWL/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	8.618E-01	1.186E-01	.014	5.310E-01	.996	8.695E 04	11.517	.422	.4533	.1915	8.246
2	3	2	2.884E 00	3.970E-01	.065	1.587E-01	2.126	3.212E 05	7.248	.716	.7203	.5154	6.008
3	3	3	7.881E 00	1.085E 00	.111	5.806E-02	3.606	1.233E 06	3.832	.883	1.3623	1.2024	3.652
4	3	4	1.520E 01	2.093E 00	.158	3.010E-02	5.044	3.616E 06	2.267	.949	2.3031	2.1865	2.264
5	3	5	1.873E 01	2.578E 00	.207	2.443E-02	5.606	5.259E 06	1.894	.965	2.7564	2.6587	1.893
7	3	7	1.873E 01	2.579E 00	.308	2.443E-02	5.606	5.259E 06	1.894	.965	2.7564	2.6587	1.893
8	3	8	1.888E 01	2.599E 00	.363	2.424E-02	5.628	5.332E 06	1.881	.965	2.7747	2.6777	1.881
9	3	9	1.902E 01	2.618E 00	.414	2.406E-02	5.649	5.406E 06	1.869	.966	2.7930	2.6968	1.868
10	3	10	1.930E 01	2.657E 00	.501	2.371E-02	5.690	5.551E 06	1.846	.967	2.8282	2.7335	1.844
11	3	11	2.005E 01	2.760E 00	.598	2.282E-02	5.802	5.958E 06	1.785	.969	2.9250	2.8342	1.781
12	3	12	1.461E 01	2.011E 00	.701	3.133E-02	4.942	3.371E 06	2.345	.946	2.2264	2.1065	2.340
13	3	13	7.175E 00	9.878E-01	.807	6.378E-02	3.437	1.071E 06	4.105	.870	1.2718	1.1070	3.869
14	3	14	7.214E 00	9.932E-01	.899	6.343E-02	3.446	1.080E 06	4.088	.871	1.2769	1.1123	3.856
15	3	15	7.213E 00	9.930E-01	1.000	6.344E-02	3.446	1.080E 06	4.088	.871	1.2769	1.1123	3.856

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PWL/PO1
1	1	1144	.8537	.046	6.300E-02
2	2	1350	1.0075	.151	
3	3	1360	1.0149	.226	
4	4	1362	1.0164	.324	
5	5	1366	1.0194	.426	

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GROUP
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AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
23	22	MDAC-DWU	8.00	854.0	1343	10.17	12.83	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.75E-02	7.248	3.919	3868	2.426E-03	7.835E-08	3.724E 06	.500	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	4.944E-01	6.821E-02	.014	6.304E-01	.839	4.708E 04	12.095	.365	.2946	.1075	8.505
2	3	2	1.820E 00	2.511E-01	.065	1.712E-01	2.038	1.994E 05	7.538	.700	.4727	.3307	6.175
3	3	3	5.103E 00	7.040E-01	.111	6.108E-02	3.515	7.764E 05	3.976	.876	.8961	.7851	3.766
4	3	4	1.075E 01	1.483E 00	.158	2.900E-02	5.140	2.620E 06	2.196	.952	1.6223	1.5448	2.196
5	3	5	1.519E 01	2.095E 00	.207	2.052E-02	6.122	4.936E 06	1.624	.975	2.1936	2.1397	1.614
6	3	6	1.575E 01	2.173E 00	.254	1.979E-02	6.235	5.289E 06	1.572	.977	2.2659	2.2149	1.560
7	3	7	1.520E 01	2.097E 00	.308	2.050E-02	6.126	4.948E 06	1.622	.975	2.1961	2.1423	1.612
8	3	8	1.459E 01	2.013E 00	.363	2.136E-02	6.001	4.582E 06	1.682	.973	2.1178	2.0609	1.675
9	3	9	1.497E 01	2.066E 00	.414	2.091E-02	6.079	4.808E 06	1.645	.975	2.1666	2.1116	1.636
10	3	10	1.546E 01	2.133E 00	.501	2.016E-02	6.179	5.110E 06	1.598	.976	2.2296	2.1772	1.587
11	3	11	1.605E 01	2.215E 00	.598	1.941E-02	6.296	5.485E 06	1.546	.979	2.3051	2.2557	1.532
12	3	12	1.678E 01	2.315E 00	.701	1.857E-02	6.438	5.973E 06	1.485	.981	2.3989	2.3532	1.467
13	3	13	1.760E 01	2.428E 00	.807	1.771E-02	6.595	6.548E 06	1.423	.983	2.5040	2.4626	1.401
14	3	14	1.841E 01	2.540E 00	.899	1.693E-02	6.747	7.152E 06	1.366	.986	2.6090	2.5718	1.339
15	3	15	1.918E 01	2.645E 00	1.000	1.625E-02	6.886	7.742E 06	1.316	.988	2.7066	2.6733	1.286

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1062	.7908	.046	4.300E-02
2	2	1346	1.0022	.151	
3	3	1359	1.0119	.226	
5	5	1367	1.0179	.426	
6	6	1359	1.0119	.629	

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GROUP
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AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
20	22	MDAC-DMO	8.00	858.1	1340	10.16	12.84	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.79E-02	7.283	3.938	3864	2.443E-03	7.818E-08	3.755E 06	.700	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	4.713E-01	6.472E-02	.014	6.335E-01	.835	4.489E 04	12.113	.363	.2805	.1018	8.520
2	3	2	6.304E-01	8.655E-02	.065	4.737E-01	1.091	6.455E 04	11.147	.455	.3048	.1388	8.072
3	3	3	1.469E 00	2.017E-01	.111	2.033E-01	1.853	1.577E 05	8.183	.663	.4152	.2751	6.548
4	3	4	4.539E 00	6.232E-01	.158	6.579E-02	3.382	6.678E 05	4.198	.866	.8093	.7010	3.942
5	3	5	1.224E 01	1.681E 00	.207	2.439E-02	5.610	3.440E 06	1.892	.965	1.7960	1.7325	1.891
6	3	6	1.490E 01	2.046E 00	.254	2.004E-02	6.196	4.966E 06	1.590	.977	2.1366	2.0870	1.578
7	3	7	1.556E 01	2.137E 00	.308	1.919E-02	6.333	5.393E 06	1.530	.979	2.2210	2.1748	1.514
8	3	8	1.552E 01	2.131E 00	.363	1.924E-02	6.325	5.368E 06	1.533	.979	2.2161	2.1697	1.518
9	3	9	1.536E 01	2.110E 00	.414	1.944E-02	6.294	5.268E 06	1.547	.979	2.1967	2.1495	1.532
10	3	10	1.482E 01	2.034E 00	.501	2.015E-02	6.179	4.913E 06	1.598	.976	2.1259	2.0759	1.587
11	3	11	1.475E 01	2.026E 00	.598	2.024E-02	6.165	4.872E 06	1.604	.976	2.1176	2.0673	1.593
12	3	12	1.489E 01	2.044E 00	.701	2.006E-02	6.194	4.960E 06	1.591	.977	2.1354	2.0858	1.579
13	3	13	1.499E 01	2.059E 00	.807	1.992E-02	6.216	5.025E 06	1.581	.977	2.1486	2.0995	1.569
14	3	14	1.511E 01	2.075E 00	.899	1.976E-02	6.241	5.103E 06	1.570	.978	2.1641	2.1157	1.557
15	3	15	1.518E 01	2.084E 00	1.000	1.967E-02	6.255	5.145E 06	1.564	.978	2.1726	2.1244	1.550

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1077	.8037	.046	4.100E-02
2	2	1284	.9582	.151	
3	3	1365	1.0187	.226	
6	6	1352	1.0090	.629	

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
14	22	MDAC-DWU	8.00	857.2	1342	10.26	12.74	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.78E-02	7.276	3.934	3867	2.437E-03	7.829E-08	3.743E 06	.916	28.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	4.023E-01	5.530E-02	.014	5.425E-01	.977	4.035E 04	11.588	.416	.2145	.0892	8.274
2	3	2	5.070E-01	6.969E-02	.065	4.305E-01	1.171	5.227E 04	10.830	.482	.2295	.1106	7.917
3	3	3	8.741E-01	1.201E-01	.111	2.497E-01	1.649	9.223E 04	8.937	.616	.2782	.1715	6.958
4	3	4	1.784E 00	2.452E-01	.158	1.224E-01	2.444	2.095E 05	6.287	.766	.3954	.3030	5.411
5	3	5	4.626E 00	6.358E-01	.207	4.718E-02	4.013	8.110E 05	3.270	.907	.7602	.6896	3.183
6	3	6	8.888E 00	1.222E 00	.254	2.456E-02	5.591	2.478E 06	1.903	.964	1.3063	1.2595	1.903
7	3	7	1.229E 01	1.689E 00	.308	1.776E-02	6.585	4.565E 06	1.427	.983	1.7424	1.7133	1.405
8	3	8	1.267E 01	1.741E 00	.363	1.723E-02	6.687	4.843E 06	1.388	.985	1.7909	1.7638	1.363
9	3	9	1.332E 01	1.830E 00	.414	1.639E-02	6.858	5.345E 06	1.326	.987	1.8748	1.8510	1.296
10	3	10	1.427E 01	1.962E 00	.501	1.529E-02	7.101	6.125E 06	1.245	.990	1.9966	1.9776	1.208
11	3	11	1.486E 01	2.042E 00	.598	1.469E-02	7.247	6.642E 06	1.200	.992	2.0723	2.0563	1.159
12	3	12	1.525E 01	2.097E 00	.701	1.431E-02	7.343	6.998E 06	1.171	.993	2.1226	2.1086	1.128
13	3	13	1.541E 01	2.119E 00	.807	1.416E-02	7.382	7.148E 06	1.160	.994	2.1433	2.1302	1.115
14	3	14	1.545E 01	2.124E 00	.899	1.412E-02	7.392	7.186E 06	1.157	.994	2.1485	2.1356	1.112
15	3	15	1.543E 01	2.120E 00	1.000	1.415E-02	7.384	7.156E 06	1.159	.994	2.1444	2.1313	1.115

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1003	.7474	.046	3.000E-02
2	2	1243	.9262	.151	
3	3	1357	1.0112	.226	
5	5	1350	1.0060	.426	

GROUP
14

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
25	22	MDAC-DWU	8.00	855.1	1346	19.93	3.07	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
98	8.76E-02	7.258	3.924	3873	2.424E-03	7.853E-08	3.717E 06	.300	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	3.893E 00	5.364E-01	.014	3.356E-01	1.380	4.034E 05	9.994	.545	1.4924	.8139	7.498
2	3	2	2.452E 01	3.379E 00	.065	5.328E-02	3.771	3.995E 06	3.591	.893	4.1540	3.7103	3.452
3	3	3	2.316E 01	3.191E 00	.111	5.640E-02	3.661	3.658E 06	3.749	.886	3.9783	3.5257	3.582
4	3	4	2.232E 01	3.075E 00	.158	5.854E-02	3.593	3.460E 06	3.853	.882	3.8711	3.4129	3.666
5	3	5	2.309E 01	3.182E 00	.207	5.657E-02	3.655	3.640E 06	3.758	.886	3.9690	3.5159	3.589
7	3	7	2.411E 01	3.321E 00	.308	5.419E-02	3.737	3.890E 06	3.638	.891	4.1001	3.6537	3.491
8	3	8	2.473E 01	3.408E 00	.363	5.282E-02	3.786	4.045E 06	3.569	.894	4.1795	3.7371	3.434
9	3	9	2.517E 01	3.468E 00	.414	5.190E-02	3.821	4.160E 06	3.520	.896	4.2374	3.7978	3.393
10	3	10	2.508E 01	3.456E 00	.501	5.209E-02	3.813	4.134E 06	3.531	.896	4.2245	3.7843	3.402
11	3	11	2.007E 01	2.765E 00	.598	6.509E-02	3.401	2.952E 06	4.164	.868	3.5817	3.1080	3.913
12	3	12	6.862E 00	9.455E-01	.701	1.904E-01	1.923	7.394E 05	7.933	.677	1.8801	1.2730	6.399
13	3	13	6.844E 00	9.430E-01	.807	1.909E-01	1.919	7.363E 05	7.947	.676	1.8768	1.2693	6.407
14	3	14	6.884E 00	9.486E-01	.899	1.898E-01	1.927	7.424E 05	7.920	.678	1.8833	1.2766	6.391
15	3	15	6.856E 00	9.447E-01	1.000	1.905E-01	1.921	7.378E 05	7.940	.677	1.8785	1.2711	6.403

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1300	.9658	.046	1.800E-01
2	2	1361	1.0111	.151	
3	3	1357	1.0082	.226	
4	4	1368	1.0163	.324	
5	5	1372	1.0193	.426	

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
22	22	MDAC-DWU	8.00	854.1	1342	20.19	2.81	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.75E-02	7.249	3.919	3867	2.42AE-03	7.829E-08	3.729E 06	.500	21.35

CH	PAS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	5.378E 00	7.419E-01	.014	1.887E-01	1.933	5.824E 05	7.899	.679	1.4686	.9973	6.305
2	3	2	1.561E 01	2.154E 00	.065	6.500E-02	3.403	2.306E 06	4.161	.868	2.7880	2.4197	3.912
3	3	3	1.799E 01	2.481E 00	.111	5.642E-02	3.661	2.853E 06	3.749	.886	3.0942	2.7422	3.584
4	3	4	1.881E 01	2.594E 00	.158	5.397E-02	3.745	3.053E 06	3.627	.892	3.1988	2.8521	3.483
5	3	5	1.952E 01	2.693E 00	.207	5.199E-02	3.817	3.235E 06	3.525	.896	3.2907	2.9486	3.399
7	3	7	2.022E 01	2.790E 00	.308	5.018E-02	3.888	3.420E 06	3.430	.900	3.3818	3.0442	3.319
8	3	8	2.084E 01	2.875E 00	.363	4.870E-02	3.948	3.586E 06	3.351	.904	3.4616	3.1279	3.252
9	3	9	2.128E 01	2.936E 00	.414	4.769E-02	3.991	3.708E 06	3.297	.906	3.5189	3.1880	3.206
10	3	10	2.137E 01	2.948E 00	.501	4.749E-02	3.999	3.731E 06	3.287	.906	3.5294	3.1990	3.197
11	3	11	2.156E 01	2.975E 00	.598	4.706E-02	4.017	3.782E 06	3.265	.907	3.5531	3.2238	3.178
12	3	12	2.202E 01	3.037E 00	.701	4.610E-02	4.060	3.910E 06	3.212	.910	3.6114	3.2849	3.133
13	3	13	2.301E 01	3.174E 00	.807	4.411E-02	4.153	4.201E 06	3.101	.914	3.7409	3.4205	3.036
14	3	14	2.409E 01	3.323E 00	.899	4.213E-02	4.251	4.524E 06	2.991	.919	3.8789	3.5649	2.938
15	3	15	1.736E 01	2.395E 00	1.000	5.846E-02	3.595	2.703E 06	3.850	.882	3.0132	2.6570	3.666

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1224	.9121	.046	1.400E-01
2	2	1367	1.0112	.151	
3	3	1360	1.0134	.226	
5	5	1366	1.0179	.426	
6	6	1358	1.0119	.629	

GROUP
22

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
19	22	MDAC-DWU	8.00	855.5	1341	20.19	2.81	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.76E-02	7.261	3.926	3865	2.434E-03	7.823E-08	3.739E 06	.700	21.35

CH	POS	TAP	PR (PSIA)	PR/P01	Y(IN)	PWL/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	7.296E 00	1.005E 00	.014	1.443E-01	2.237	8.259E 05	6.896	.734	1.7423	1.2797	5.794
2	3	2	1.243E 01	1.712E 00	.065	8.469E-02	2.968	1.643E 06	4.997	.829	2.4044	1.9942	4.538
3	3	3	1.502E 01	2.068E 00	.111	7.011E-02	3.272	2.144E 06	4.392	.857	2.7355	2.3454	4.091
4	3	4	1.839E 01	2.533E 00	.158	5.724E-02	3.634	2.898E 06	3.790	.884	3.1700	2.8036	3.618
5	3	5	1.996E 01	2.748E 00	.207	5.276E-02	3.790	3.287E 06	3.563	.894	3.3720	3.0159	3.431
6	3	6	2.047E 01	2.819E 00	.254	5.144E-02	3.839	3.417E 06	3.496	.897	3.4369	3.0840	3.375
7	3	7	2.123E 01	2.924E 00	.308	4.959E-02	3.911	3.618E 06	3.400	.902	3.5344	3.1863	3.294
8	3	8	2.161E 01	2.976E 00	.363	4.872E-02	3.946	3.719E 06	3.354	.903	3.5825	3.2368	3.255
9	3	9	2.171E 01	2.989E 00	.414	4.851E-02	3.956	3.747E 06	3.341	.904	3.5959	3.2508	3.244
10	3	10	2.170E 01	2.988E 00	.501	4.852E-02	3.956	3.747E 06	3.341	.904	3.5959	3.2508	3.244
11	3	11	2.198E 01	3.027E 00	.598	4.791E-02	3.981	3.822E 06	3.309	.905	3.6310	3.2876	3.216
12	3	12	2.315E 01	3.188E 00	.701	4.549E-02	4.089	4.153E 06	3.177	.911	3.7820	3.4458	3.102
13	3	13	2.381E 01	3.280E 00	.807	4.421E-02	4.147	4.344E 06	3.108	.914	3.8660	3.5338	3.042
14	3	14	2.412E 01	3.321E 00	.899	4.366E-02	4.175	4.435E 06	3.076	.915	3.9057	3.5753	3.014
15	3	15	2.412E 01	3.322E 00	1.000	4.365E-02	4.175	4.435E 06	3.076	.915	3.9057	3.5753	3.014

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PWL/P01
1	1	1196	.8919	.046	1.450E-01
2	2	1363	1.0164	.151	
3	3	1375	1.0254	.226	
6	6	1367	1.0194	.629	

GROUP
19

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL A
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
15	22	MDAC-DWU	8.00	857.7	1342	20.37	2.63	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (M/L)	L (IN)
97	8.79E-02	7.280	3.936	3867	2.438E-03	7.829E-08	3.745E 06	.916	21.35

CH	POS	TAP	PR (PSIA)	PR/P01	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	5.135E 00	7.053E-01	.014	1.630E-01	2.095	5.682E 05	7.350	.710	1.2965	.9205	6.066
2	3	2	1.250E 01	1.717E 00	.065	8.696E-02	3.353	1.823E 06	4.249	.864	2.2428	1.9376	3.980
3	3	3	1.578E 01	2.168E 00	.111	5.305E-02	3.778	2.586E 06	3.580	.894	2.6621	2.3790	3.404
4	3	4	1.655E 01	2.273E 00	.158	5.059E-02	3.872	2.786E 06	3.451	.899	2.7612	2.4830	3.337
5	3	5	1.738E 01	2.388E 00	.207	4.817E-02	3.970	3.008E 06	3.324	.905	2.8669	2.5939	3.229
6	3	6	1.816E 01	2.495E 00	.254	4.610E-02	4.060	3.225E 06	3.212	.910	2.9665	2.6983	3.133
7	3	7	1.936E 01	2.659E 00	.308	4.325E-02	4.194	3.576E 06	3.054	.916	3.1202	2.8592	2.994
8	3	8	2.069E 01	2.842E 00	.363	4.047E-02	4.339	3.986E 06	2.896	.923	3.2905	3.0374	2.853
9	3	9	2.157E 01	2.963E 00	.414	3.881E-02	4.433	4.273E 06	2.799	.927	3.4041	3.1561	2.766
10	3	10	2.239E 01	3.075E 00	.501	3.740E-02	4.517	4.544E 06	2.717	.931	3.5079	3.2646	2.690
11	3	11	2.355E 01	3.235E 00	.598	3.554E-02	4.636	4.954E 06	2.605	.935	3.6505	3.4218	2.587
12	3	12	2.437E 01	3.348E 00	.701	3.435E-02	4.716	5.247E 06	2.533	.938	3.7619	3.5298	2.519
13	3	13	2.523E 01	3.465E 00	.807	3.319E-02	4.800	5.569E 06	2.461	.941	3.8722	3.6450	2.451
14	3	14	2.513E 01	3.451E 00	.899	3.332E-02	4.790	5.530E 06	2.469	.941	3.8593	3.6315	2.459
15	3	15	2.526E 01	3.470E 00	1.000	3.314E-02	4.804	5.584E 06	2.458	.941	3.8774	3.6504	2.448

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/P01
1	1	1224	.9121	.046	1.150E-01
2	2	1365	1.0171	.151	
3	3	1369	1.0201	.226	
6	6	1338	.9970	.629	

GROUP
15

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
24	22	MDAC-DWO	8.00	857.7	1347	30.14	-7.14	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
98	8.79E-02	7.280	3.936	3874	2.430E-03	7.858E-08	3.724E 06	.300	21.35

CH	POS	TAP	PR (PSIA)	PR/P01	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	7.067E 00	9.707E-01	.014	3.400E-01	1.368	7.310E 05	10.041	.542	2.7234	1.4760	7.519
2	3	2	2.117E 01	2.908E 00	.065	1.135E-01	2.544	2.525E 06	6.015	.780	4.5463	3.5460	5.230
3	3	3	1.998E 01	2.744E 00	.111	1.203E-01	2.468	2.348E 06	6.222	.770	4.3950	3.3821	5.364
4	3	4	2.110E 01	2.898E 00	.158	1.139E-01	2.540	2.516E 06	6.025	.779	4.5384	3.5375	5.237
5	3	5	2.199E 01	3.020E 00	.207	1.093E-01	2.595	2.649E 06	5.881	.787	4.6497	3.6577	5.142
7	3	7	2.262E 01	3.107E 00	.308	1.062E-01	2.636	2.753E 06	5.775	.792	4.7347	3.7493	5.072
8	3	8	2.313E 01	3.177E 00	.363	1.039E-01	2.665	2.829E 06	5.701	.796	4.7963	3.8155	5.022
9	3	9	2.385E 01	3.276E 00	.414	1.007E-01	2.710	2.950E 06	5.590	.801	4.8920	3.9184	4.947
10	3	10	2.416E 01	3.319E 00	.501	9.944E-02	2.728	2.998E 06	5.547	.803	4.9298	3.9590	4.918
11	3	11	2.002E 01	2.751E 00	.598	1.200E-01	2.470	2.352E 06	6.216	.770	4.3988	3.3862	5.361
12	3	12	6.501E 00	8.930E-01	.701	3.695E-01	1.298	6.714E 05	10.323	.521	2.6491	1.3809	7.659
13	3	13	6.349E 00	8.720E-01	.807	3.784E-01	1.278	6.555E 05	10.401	.515	2.6291	1.3550	7.698
14	3	14	6.487E 00	8.910E-01	.899	3.704E-01	1.296	6.698E 05	10.330	.521	2.6471	1.3783	7.663
15	3	15	6.416E 00	8.813E-01	1.000	3.744E-01	1.286	6.619E 05	10.369	.518	2.6371	1.3654	7.682

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/P01
1	1	1286	.9547	.046	3.300E-01
2	2	1360	1.0097	.151	
3	3	1367	1.0148	.226	
4	4	1369	1.0163	.324	
5	5	1372	1.0186	.426	

GROUP
24

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
21	22	MDAC-DWU	8.00	857.4	1341	30.27	-7.27	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.78E-02	7.278	3.935	3865	2.440E-03	7.823E-08	3.748E 06	.500	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	5.648E 00	7.760E-01	.014	3.608E-01	1.317	5.863E 05	10.244	.527	2.2649	1.1939	7.632
2	3	2	1.538E 01	2.113E 00	.065	1.325E-01	2.343	1.774E 06	6.579	.751	3.5269	2.6494	5.597
3	3	3	1.803E 01	2.478E 00	.111	1.130E-01	2.550	2.166E 06	5.999	.781	3.8675	3.0196	5.225
4	3	4	1.977E 01	2.717E 00	.158	1.031E-01	2.677	2.440E 06	5.672	.797	4.0906	3.2601	5.008
5	3	5	2.031E 01	2.790E 00	.207	1.004E-01	2.714	2.525E 06	5.580	.801	4.1579	3.3323	4.945
7	3	7	2.138E 01	2.937E 00	.308	9.533E-02	2.788	2.704E 06	5.402	.810	4.2952	3.4795	4.823
8	3	8	2.192E 01	3.012E 00	.363	9.295E-02	2.825	2.797E 06	5.315	.814	4.3652	3.5545	4.763
9	3	9	2.198E 01	3.020E 00	.414	9.272E-02	2.829	2.807E 06	5.306	.815	4.3727	3.5624	4.757
10	3	10	2.210E 01	3.036E 00	.501	9.223E-02	2.837	2.827E 06	5.288	.816	4.3875	3.5783	4.744
11	3	11	2.240E 01	3.078E 00	.598	9.097E-02	2.858	2.883E 06	5.239	.818	4.4287	3.6223	4.710
12	3	12	2.327E 01	3.197E 00	.701	8.759E-02	2.915	3.034E 06	5.112	.824	4.5386	3.7396	4.620
13	3	13	2.452E 01	3.368E 00	.807	8.312E-02	2.995	3.259E 06	4.939	.832	4.6978	3.9092	4.496
14	3	14	2.496E 01	3.429E 00	.899	8.165E-02	3.024	3.344E 06	4.877	.835	4.7571	3.9722	4.451
15	3	15	1.754E 01	2.410E 00	1.000	1.162E-01	2.513	2.091E 06	6.099	.776	3.8043	2.9512	5.291

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1224	.9128	.046	2.800E-01
2	2	1355	1.0104	.151	
3	3	1356	1.0112	.226	
5	5	1365	1.0179	.426	
6	6	1352	1.0082	.629	

GROUP
21

69652

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
1B	22	MDAC-DWU	8.00	857.3	1351	30.26	-7.26	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
98	8.78E-02	7.277	3.934	3880	2.421E-03	7.882E-08	3.706E 06	.700	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	8.263E 00	1.136E 00	.014	2.598E-01	1.610	8.615E 05	9.087	.607	2.6901	1.6325	7.022
2	3	2	1.380E 01	1.896E 00	.065	1.556E-01	2.147	1.525E 06	7.179	.719	3.4051	2.4493	5.953
3	3	3	1.693E 01	2.327E 00	.111	1.268E-01	2.397	1.953E 06	6.420	.759	3.8077	2.8916	5.487
4	3	4	1.990E 01	2.735E 00	.158	1.078E-01	2.614	2.402E 06	5.830	.789	4.1926	3.3086	5.105
5	3	5	2.128E 01	2.924E 00	.207	1.009E-01	2.708	2.621E 06	5.595	.801	4.3694	3.4988	4.947
6	3	6	2.184E 01	3.001E 00	.254	9.829E-02	2.745	2.712E 06	5.504	.805	4.4411	3.5757	4.885
7	3	7	2.228E 01	3.062E 00	.308	9.633E-02	2.774	2.786E 06	5.434	.809	4.4983	3.6371	4.837
8	3	8	2.244E 01	3.084E 00	.363	9.565E-02	2.784	2.811E 06	5.411	.810	4.5176	3.6577	4.821
9	3	9	2.270E 01	3.119E 00	.414	9.458E-02	2.800	2.852E 06	5.374	.811	4.5485	3.6908	4.796
10	3	10	2.357E 01	3.240E 00	.501	9.106E-02	2.856	3.002E 06	5.243	.818	4.6620	3.8121	4.705
11	3	11	2.493E 01	3.426E 00	.598	8.611E-02	2.942	3.244E 06	5.052	.827	4.8385	4.0005	4.570
12	3	12	2.533E 01	3.482E 00	.701	8.473E-02	2.966	3.312E 06	5.001	.829	4.8876	4.0527	4.534
13	3	13	2.547E 01	3.500E 00	.807	8.428E-02	2.974	3.336E 06	4.985	.830	4.9040	4.0702	4.522
14	3	14	2.525E 01	3.471E 00	.899	8.500E-02	2.962	3.301E 06	5.010	.829	4.8794	4.0440	4.540
15	3	15	2.482E 01	3.411E 00	1.000	8.648E-02	2.935	3.221E 06	5.069	.826	4.8223	3.9831	4.582

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1246	.9223	.046	2.950E-01
2	2	1380	1.0215	.151	
3	3	1384	1.0244	.226	
6	6	1372	1.0155	.629	

95969

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
16	22	MDAC-DWU	8.00	858.0	1341	30.39	-7.39	-23.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.79E-02	7.282	3.937	3865	2.441E-03	7.823E-08	3.750E 06	.916	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	4.970E 00	6.824E-01	.014	3.370E-01	1.376	5.171E 05	10.010	.544	1.9040	1.0362	7.515
2	3	2	1.569E 01	2.154E 00	.065	1.068E-01	2.628	1.916E 06	5.795	.791	3.2886	2.6009	5.090
3	3	3	1.852E 01	2.544E 00	.111	9.042E-02	2.868	2.390E 06	5.217	.819	3.6533	2.9919	4.694
4	3	4	1.983E 01	2.723E 00	.158	8.446E-02	2.972	2.623E 06	4.989	.830	3.8203	3.1700	4.532
5	3	5	2.037E 01	2.798E 00	.207	8.222E-02	3.013	2.721E 06	4.902	.834	3.8881	3.2421	4.469
6	3	6	2.042E 01	2.804E 00	.254	8.203E-02	3.017	2.730E 06	4.894	.834	3.8946	3.2490	4.463
7	3	7	2.047E 01	2.811E 00	.308	8.183E-02	3.021	2.739E 06	4.885	.835	3.9011	3.2560	4.457
8	3	8	2.099E 01	2.882E 00	.363	7.979E-02	3.060	2.836E 06	4.805	.838	3.9667	3.3257	4.399
9	3	9	2.202E 01	3.023E 00	.414	7.607E-02	3.138	3.036E 06	4.648	.846	4.1004	3.4676	4.283
10	3	10	2.435E 01	3.344E 00	.501	6.879E-02	3.306	3.508E 06	4.332	.860	4.3994	3.7841	4.045
11	3	11	2.581E 01	3.544E 00	.598	6.491E-02	3.405	3.816E 06	4.158	.868	4.5840	3.9791	3.910
12	3	12	2.605E 01	3.577E 00	.701	6.430E-02	3.423	3.873E 06	4.128	.869	4.6172	4.0140	3.887
13	3	13	2.605E 01	3.576E 00	.807	6.431E-02	3.423	3.873E 06	4.128	.869	4.6172	4.0140	3.887
14	3	14	2.596E 01	3.564E 00	.899	6.453E-02	3.417	3.856E 06	4.138	.869	4.6061	4.0024	3.896
15	3	15	2.588E 01	3.553E 00	1.000	6.473E-02	3.411	3.835E 06	4.148	.868	4.5950	3.9907	3.902

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1258	.9381	.046	2.300E-01
2	2	1368	1.0201	.151	
3	3	1370	1.0216	.226	
6	6	1344	1.0022	.629	

GROUP
16

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT11B2

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
343	22	MDAC-DWU	8.00	862.2	1342	39.93	10.07	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.935E-02	7.319	3.957	3867	2.451E-03	7.829E-08	3.765E 06	.300	21.35

CH	POS	TAP	PH (PSIA)	PH/PO1	Y(IN)	PML/PH	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	1.504E 01	2.055E 00	.019	2.521E-01	1.690	1.585E 06	8.975	.619	4.7828	2.9370	6.978
2	3	2	1.727E 01	2.360E 00	.066	2.195E-01	1.774	1.683E 06	8.468	.646	5.0690	3.2721	6.703
3	3	3	1.836E 01	2.508E 00	.112	2.065E-01	1.837	1.766E 06	8.240	.659	5.2095	3.4339	6.577
4	3	4	1.866E 01	2.577E 00	.163	2.010E-01	1.866	2.02AE 06	8.134	.665	5.2769	3.5112	6.518
5	3	5	1.955E 01	2.671E 00	.216	1.939E-01	1.903	2.109E 06	8.002	.673	5.3640	3.6105	6.444
6	3	6	1.955E 01	2.672E 00	.258	1.939E-01	1.903	2.109E 06	8.002	.673	5.3640	3.6105	6.444
7	3	7	1.962E 01	2.681E 00	.313	1.932E-01	1.907	2.118E 06	7.988	.674	5.3732	3.6210	6.436
8	3	8	1.966E 01	2.686E 00	.365	1.929E-01	1.909	2.122E 06	7.982	.674	5.3779	3.6263	6.432
9	3	9	1.963E 01	2.683E 00	.415	1.931E-01	1.907	2.119E 06	7.988	.674	5.3732	3.6210	6.436
10	3	10	1.931E 01	2.639E 00	.499	1.963E-01	1.890	2.079E 06	8.051	.670	5.3317	3.5737	6.471
11	3	11	2.105E 01	2.881E 00	.706	1.794E-01	1.985	2.299E 06	7.717	.689	5.5624	3.8351	6.280
12	3	12	6.366E 00	8.699E-01	.702	5.955E-01	.893	6.215E 05	11.900	.385	3.6070	1.3898	8.418
13	3	13	5.918E 00	7.949E-01	.902	6.516E-01	.807	5.949E 05	12.211	.352	3.5152	1.2388	8.559
14	3	14	5.082E 00	6.945E-01	.892	7.459E-01	.661	4.272E 05	12.691	.294	3.3822	.9956	8.774
15	3	15	5.244E 00	7.165E-01	.881	7.230E-01	.697	4.556E 05	12.578	.309	3.4125	1.0543	8.724

CH	TC	TTH (DEG R)	TH/TC (DEG R)	Y(IN)	PML/PO1
1	1	1367	1.0186	.051	5.180E-01
2	2	1368	1.0194	.131	
~~3~~	~~3~~	~~1366~~	~~1.0175~~	~~.209~~	
~~5~~	~~5~~	~~1365~~	~~1.0167~~	~~.402~~	
6	6	1366	1.0179	.599	

GROUP
343

AEDC (AND, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1102

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
341	22	MDAC-OMU	8.00	861.2	1337	39.93	10.07	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.825E-02	7.310	3.952	3860	2.458E-03	7.800E-08	3.781E 06	.500	21.35

CH	POS	TAP	PH (PSIA)	PH/PO1	Y(IN)	PML/PH	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOL-INF	MUL/MU-INF
1	3	1	9.417E 00	1.298E 00	.014	3.571E-01	1.327	9.824E 05	10.205	.530	3.7351	1.9797	7.920
2	3	2	1.688E 01	2.309E 00	.066	1.992E-01	1.874	1.022E 06	8.106	.667	4.7022	3.1365	6.510
3	3	3	1.814E 01	2.491E 00	.112	1.854E-01	1.952	1.979E 06	7.831	.683	4.8674	3.3242	6.353
4	3	4	1.873E 01	2.569E 00	.163	1.795E-01	1.985	2.046E 06	7.717	.689	4.9396	3.4057	6.287
5	3	5	1.895E 01	2.597E 00	.216	1.775E-01	2.030	2.146E 06	7.564	.698	5.0392	3.5177	6.198
6	3	6	1.959E 01	2.679E 00	.258	1.717E-01	2.036	2.159E 06	7.544	.699	5.0524	3.5325	6.187
7	3	7	1.942E 01	2.663E 00	.313	1.745E-01	2.019	2.120E 06	7.604	.696	5.0130	3.4883	6.222
8	3	8	1.964E 01	2.695E 00	.365	1.760E-01	2.005	2.090E 06	7.650	.693	4.9826	3.4541	6.249
9	3	9	1.907E 01	2.609E 00	.415	1.763E-01	2.007	2.095E 06	7.643	.694	4.9870	3.4590	6.245
10	3	10	1.963E 01	2.685E 00	.499	1.713E-01	2.038	2.163E 06	7.538	.700	5.0568	3.5374	6.183
11	3	11	2.031E 01	2.778E 00	.606	1.656E-01	2.077	2.252E 06	7.408	.707	5.1456	3.6367	6.107
12	3	12	2.094E 01	2.865E 00	.702	1.606E-01	2.112	2.334E 06	7.292	.713	5.2270	3.7274	6.038
13	3	13	2.095E 01	2.867E 00	.802	1.604E-01	2.112	2.334E 06	7.292	.713	5.2270	3.7274	6.038
14	3	14	2.101E 01	2.874E 00	.892	1.601E-01	2.116	2.344E 06	7.280	.714	5.2361	3.7375	6.031
15	3	15	2.125E 01	2.900E 00	.981	1.586E-01	2.126	2.367E 06	7.248	.716	5.2590	3.7630	6.012

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1350	1.0097	.051	4.600E-01
2	2	1362	1.0187	.131	
5	5	1394	1.0426	.402	
6	6	1362	1.0187	.599	

GROUP
341

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
34	22	MDAC-DWO	8.00	857.3	1342	39.99	10.01	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.78E-02	7.277	3.934	3867	2.437E-03	7.829E-08	3.743E 06	.700	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	7.647E 00	1.051E 00	.014	4.473E-01	1.140	7.868E 05	10.954	.472	3.5553	1.6765	7.976
2	3	2	1.343E 01	1.846E 00	.065	2.546E-01	1.630	1.414E 06	9.012	.612	4.3216	2.6435	6.997
3	3	3	1.827E 01	2.511E 00	.111	1.872E-01	1.940	1.979E 06	7.872	.681	4.9474	3.3673	6.370
4	3	4	1.896E 01	2.605E 00	.158	1.804E-01	1.981	2.066E 06	7.730	.689	5.0382	3.4699	6.288
5	3	5	1.911E 01	2.626E 00	.207	1.790E-01	1.989	2.082E 06	7.703	.690	5.0557	3.4896	6.273
7	3	7	1.907E 01	2.621E 00	.308	1.793E-01	1.987	2.078E 06	7.710	.690	5.0513	3.4847	6.277
8	3	8	1.980E 01	2.721E 00	.363	1.727E-01	2.028	2.168E 06	7.571	.698	5.1443	3.5892	6.196
9	3	9	2.043E 01	2.807E 00	.414	1.675E-01	2.063	2.248E 06	7.453	.704	5.2255	3.6801	6.127
10	3	10	2.144E 01	2.946E 00	.501	1.596E-01	2.118	2.378E 06	7.273	.714	5.3546	3.8240	6.021
11	3	11	2.162E 01	2.971E 00	.598	1.582E-01	2.128	2.401E 06	7.242	.716	5.3780	3.8500	6.002
12	3	12	2.160E 01	2.968E 00	.701	1.583E-01	2.128	2.401E 06	7.242	.716	5.3780	3.8500	6.002
13	3	13	2.178E 01	2.993E 00	.807	1.570E-01	2.138	2.425E 06	7.210	.718	5.4015	3.8761	5.983
14	3	14	2.186E 01	3.004E 00	.899	1.565E-01	2.142	2.435E 06	7.198	.718	5.4109	3.8866	5.975
15	3	15	2.166E 01	2.977E 00	1.000	1.579E-01	2.132	2.411E 06	7.229	.717	5.3874	3.8604	5.994

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1292	.9627	.046	4.700E-01
2	2	1346	1.0030	.151	

GROUP
34

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
33	22	MDAC-DWU	8.00	852.4	1340	39.98	10.02	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (IN/L)	L (IN)
97	8.73E-02	7.235	3.911	3864	2.427E-03	7.818E-08	3.730E 06	.916	21.35

C>	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	6.837E 00	9.451E-01	.014	4.127E-01	1.206	7.078E 05	10.690	.493	3.0231	1.4903	7.853
2	3	2	1.210E 01	1.672E 00	.065	2.332E-01	1.714	1.283E 06	8.693	.632	3.7175	2.3484	6.829
3	3	3	1.607E 01	2.222E 00	.111	1.755E-01	2.011	1.760E 06	7.630	.694	4.2354	2.9409	6.233
5	3	5	1.763E 01	2.437E 00	.207	1.600E-01	2.116	1.961E 06	7.280	.714	4.4393	3.1688	6.027
7	3	7	1.814E 01	2.507E 00	.308	1.556E-01	2.147	2.026E 06	7.179	.719	4.5017	3.2381	5.966
8	3	8	1.876E 01	2.592E 00	.363	1.504E-01	2.188	2.110E 06	7.048	.726	4.5850	3.3303	5.888
9	3	9	1.950E 01	2.695E 00	.414	1.447E-01	2.233	2.207E 06	6.908	.734	4.6780	3.4330	5.803
10	3	10	2.015E 01	2.785E 00	.501	1.400E-01	2.274	2.298E 06	6.783	.741	4.7646	3.5282	5.725
11	3	11	2.060E 01	2.848E 00	.598	1.369E-01	2.302	2.361E 06	6.700	.745	4.8232	3.5926	5.674
12	3	12	2.131E 01	2.945E 00	.701	1.324E-01	2.343	2.459E 06	6.579	.751	4.9124	3.6902	5.598
13	3	13	2.166E 01	2.994E 00	.807	1.303E-01	2.364	2.511E 06	6.516	.754	4.9598	3.7420	5.559
14	3	14	2.183E 01	3.017E 00	.899	1.293E-01	2.374	2.535E 06	6.487	.756	4.9815	3.7657	5.541
15	3	15	6.617E 00	9.146E-01	1.000	4.264E-01	1.179	6.837E 05	10.799	.484	2.9925	1.4491	7.906

C>	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1268	.9463	.046	3.900E-01
2	2	1336	.9970	.151	

GROUP
33

69640

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
35	22	MDAC-DBU	8.00	856.3	1342	50.00	-.00	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.77E-02	7.268	3.929	3867	2.434E-03	7.829E-08	3.738E 06	.700	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	1.317E 01	1.812E 00	.014	3.643E-01	1.310	1.366E 06	10.276	.525	5.3224	2.7932	7.646
2	3	2	1.365E 01	1.878E 00	.065	3.514E-01	1.341	1.418E 06	10.150	.534	5.3880	2.8774	7.583
3	3	3	1.407E 01	1.936E 00	.111	3.409E-01	1.366	1.462E 06	10.049	.541	5.4625	2.9467	7.533
4	3	4	1.418E 01	1.951E 00	.158	3.383E-01	1.372	1.473E 06	10.025	.543	5.4552	2.9628	7.521
5	3	5	1.440E 01	1.982E 00	.207	3.331E-01	1.386	1.497E 06	9.971	.547	5.4851	3.0005	7.493
7	3	7	1.525E 01	2.099E 00	.308	3.144E-01	1.437	1.590E 06	9.768	.561	5.5987	3.1425	7.391
8	3	8	1.572E 01	2.163E 00	.363	3.051E-01	1.466	1.641E 06	9.660	.569	5.6615	3.2202	7.336
9	3	9	1.580E 01	2.174E 00	.414	3.036E-01	1.468	1.649E 06	9.644	.570	5.6706	3.2314	7.328
10	3	10	1.567E 01	2.156E 00	.501	3.061E-01	1.460	1.636E 06	9.675	.568	5.6525	3.2091	7.343
11	3	11	1.576E 01	2.168E 00	.598	3.044E-01	1.466	1.645E 06	9.652	.569	5.6661	3.2258	7.332
12	3	12	1.622E 01	2.232E 00	.701	2.956E-01	1.491	1.694E 06	9.552	.576	5.7256	3.2989	7.280
13	3	13	1.608E 01	2.212E 00	.807	2.984E-01	1.483	1.679E 06	9.583	.574	5.7072	3.2763	7.296
14	3	14	1.603E 01	2.206E 00	.899	2.992E-01	1.481	1.675E 06	9.590	.574	5.7026	3.2707	7.300
15	3	15	1.585E 01	2.181E 00	1.000	3.026E-01	1.472	1.656E 06	9.629	.571	5.6797	3.2426	7.320

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1350	1.0060	.046	6.600E-01
2	2	1370	1.0209	.151	

GROUP
35

69638

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
32	22	MDAC-DWU	8.00	858.9	1340	50.02	-.02	-50.00	180.00	.00

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (M/L)	L (IN)
97	8.80E-02	7.291	3.942	3864	2.446E-03	7.818E-08	3.759E 06	.916	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PWL/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	8.301E 00	1.139E 00	.014	5.182E-01	1.017	8.413E 05	11.436	.430	4.2750	1.0373	8.200
2	3	2	9.802E 00	1.344E 00	.065	4.388E-01	1.155	1.011E 06	10.892	.477	4.4884	2.1390	7.950
3	3	3	1.219E 01	1.672E 00	.111	3.528E-01	1.337	1.268E 06	10.166	.533	4.8091	2.9620	7.595
4	3	4	1.434E 01	1.967E 00	.158	2.999E-01	1.479	1.501E 06	9.598	.573	5.0937	2.9180	7.307
5	3	5	1.505E 01	2.065E 00	.207	2.858E-01	1.522	1.578E 06	9.429	.584	5.1851	3.0303	7.220
7	3	7	1.534E 01	2.104E 00	.308	2.805E-01	1.540	1.610E 06	9.360	.589	5.2232	3.0766	7.184
8	3	8	1.550E 01	2.126E 00	.363	2.775E-01	1.550	1.628E 06	9.322	.592	5.2446	3.1024	7.164
9	3	9	1.555E 01	2.133E 00	.414	2.766E-01	1.552	1.631E 06	9.314	.592	5.2489	3.1076	7.160
10	3	10	1.575E 01	2.160E 00	.501	2.731E-01	1.563	1.653E 06	9.269	.595	5.2747	3.1388	7.136
11	3	11	1.582E 01	2.169E 00	.598	2.720E-01	1.567	1.660E 06	9.253	.596	5.2834	3.1492	7.128
12	3	12	1.571E 01	2.155E 00	.701	2.738E-01	1.562	1.649E 06	9.276	.595	5.2704	3.1336	7.140
13	3	13	1.531E 01	2.100E 00	.807	2.810E-01	1.538	1.606E 06	9.368	.589	5.2189	3.0714	7.188
14	3	14	1.491E 01	2.044E 00	.899	2.886E-01	1.515	1.563E 06	9.460	.582	5.1682	3.0099	7.236
15	3	15	1.494E 01	2.049E 00	1.000	2.880E-01	1.515	1.563E 06	9.460	.582	5.1682	3.0099	7.236

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PWL/PO1
					5.900E-01

GROUP
32

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL B
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	YAW
36	22	MDAC-DWU	8.00	857.4	1345	60.17	-10.17	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	P01 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (X/L)	L (IN)
97	8.78E-02	7.278	3.935	3871	2.432E-03	7.847E-08	3.731E 06	.700	21.35

CH	POS	TAP	PR (PSIA)	PR/P01	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	9.028E 00	1.241E 00	.014	6.771E-01	.768	8.235E 05	12.345	.337	5.6382	1.9010	8.613
2	3	2	9.798E 00	1.346E 00	.065	6.239E-01	.849	9.359E 05	12.060	.369	5.7716	2.1282	8.485
3	3	3	1.011E 01	1.390E 00	.111	6.045E-01	.879	9.791E 05	11.952	.380	5.8240	2.2135	8.435
4	3	4	1.030E 01	1.415E 00	.158	5.938E-01	.896	1.004E 06	11.891	.386	5.8539	2.2612	8.407
5	3	5	1.045E 01	1.436E 00	.207	5.850E-01	.910	1.024E 06	11.840	.391	5.8790	2.3009	8.384
7	3	7	1.063E 01	1.461E 00	.308	5.751E-01	.925	1.047E 06	11.782	.397	5.9076	2.3456	8.358
8	3	8	1.065E 01	1.463E 00	.363	5.741E-01	.927	1.050E 06	11.776	.398	5.9106	2.3504	8.355
9	3	9	1.065E 01	1.463E 00	.414	5.741E-01	.927	1.050E 06	11.777	.398	5.9105	2.3502	8.355
10	3	10	1.062E 01	1.460E 00	.501	5.754E-01	.925	1.046E 06	11.786	.397	5.9067	2.3443	8.359
11	3	11	1.044E 01	1.434E 00	.598	5.858E-01	.909	1.022E 06	11.844	.391	5.8767	2.2973	8.386
12	3	12	1.032E 01	1.418E 00	.701	5.925E-01	.898	1.007E 06	11.883	.387	5.8576	2.2671	8.404
13	3	13	1.035E 01	1.422E 00	.807	5.909E-01	.901	1.010E 06	11.874	.388	5.8620	2.2741	8.400
14	3	14	1.032E 01	1.418E 00	.899	5.925E-01	.898	1.006E 06	11.883	.387	5.8575	2.2669	8.404
15	3	15	9.815E 00	1.349E 00	1.000	6.228E-01	.851	9.383E 05	12.054	.369	5.7745	2.1330	8.482

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/P01
1	1	1331	.9896	.046	8.400E-01
2	2	1364	1.0141	.151	

GROUP
36

AEDC (ARO, INC.) ARNOLD AFS, TENNESSEE
VON KARMAN GAS DYNAMICS FACILITY
50 INCH HYPERSONIC TUNNEL 8
VT1162

GROUP	CONFIG	MODEL	MACH NO.	PO PSIA	TO DEG R	ALPHA-MODEL	ALPHA-SECTOR	ALPHA-PREBEND	ROLL-MODEL	VAR
31	22	MDAC-DWO	8.00	855.1	1339	60.16	-10.16	-50.00	180.00	.0

T-INF (DEG R)	P-INF (PSIA)	PO1 (PSIA)	Q-INF (PSIA)	U-INF (FT/SEC)	RHO-INF (LBM/FT3)	MU-INF (LB-SEC/FT2)	RE/FT (FT-1)	MODEL STA (IN/L)	L (IN)
97	8.76E-02	7.258	3.924	3862	2.436E-03	7.812E-08	3.746E 06	.916	21.35

CH	POS	TAP	PR (PSIA)	PR/PO1	Y(IN)	PML/PR	ML	REL (FT-1)	TL/T-INF	UL/U-INF	RHOL/RHO-INF	RHOUL/RHOU-INF	MUL/MU-INF
1	3	1	8.076E 00	1.113E 00	.014	6.471E-01	.814	7.613E 05	12.186	.355	4.8959	1.7387	0.555
2	3	2	9.301E 00	1.282E 00	.065	5.618E-01	.946	9.272E 05	11.704	.405	5.0976	2.0631	0.335
3	3	3	9.976E 00	1.375E 00	.111	5.238E-01	1.007	1.009E 06	11.474	.426	5.1999	2.2170	0.229
4	3	4	1.047E 01	1.442E 00	.158	4.992E-01	1.048	1.067E 06	11.315	.441	5.2727	2.3234	0.154
5	3	5	1.057E 01	1.457E 00	.207	4.942E-01	1.056	1.079E 06	11.285	.443	5.2869	2.3439	0.139
7	3	7	1.055E 01	1.454E 00	.308	4.952E-01	1.056	1.079E 06	11.285	.443	5.2869	2.3439	0.139
8	3	8	1.050E 01	1.447E 00	.363	4.975E-01	1.052	1.073E 06	11.300	.442	5.2798	2.3336	0.146
9	3	9	1.044E 01	1.439E 00	.414	5.003E-01	1.046	1.065E 06	11.323	.440	5.2692	2.3183	0.157
10	3	10	1.029E 01	1.418E 00	.501	5.077E-01	1.034	1.048E 06	11.368	.436	5.2481	2.2877	0.178
11	3	11	1.003E 01	1.383E 00	.598	5.208E-01	1.013	1.017E 06	11.451	.428	5.2101	2.2321	0.217
12	3	12	9.788E 00	1.349E 00	.701	5.338E-01	.991	9.874E 05	11.536	.421	5.1725	2.1764	0.256
13	3	13	9.717E 00	1.339E 00	.807	5.378E-01	.985	9.787E 05	11.559	.419	5.1617	2.1602	0.267
14	3	14	9.770E 00	1.346E 00	.899	5.349E-01	.989	9.851E 05	11.541	.420	5.1697	2.1721	0.259
15	3	15	9.955E 00	1.372E 00	1.000	5.249E-01	1.005	1.007E 06	11.481	.426	5.1965	2.2120	0.231

CH	TC	TTR (DEG R)	TTR/TC (DEG R)	Y(IN)	PML/PO1
1	1	1268	.9470	.046	7.200E-01
2	2	1366	1.0202	.151	
3	3	1364	1.0187	.226	

GROUP
31

69642