

**MODAL COUPLING PROCEDURES ADAPTED TO NASTRAN  
ANALYSIS OF THE 1/8-SCALE SHUTTLE STRUCTURAL  
DYNAMICS MODEL**

**Volume II – Supporting Data**

Prepared Under Contract NAS 1-10635-21

for the

Langley Research Center  
National Aeronautics and Space Administration  
Hampton, Virginia 23665

by

J. Zalesak

Grumman Aerospace Corporation  
Bethpage, New York 11714

July 1975

VOLUME I CONTENTS

	<u>Page</u>
Introduction . . . . .	1
Orbiter Finite Element Model. . . . .	7
Substructuring Procedure . . . . .	8
Results and Discussion . . . . .	12
• Phase I Component Modes Results	
• Final System Orbiter Results (Symmetric Modes)	
Computing Time . . . . .	47
Observations and Recommendations . . . . .	50
References . . . . .	53
 <u>Appendixes</u>	
A NASTRAN Component Modes Analysis General Theory . . . . .	A-1
B1 NASTRAN Component Modes Analysis - Alters to Rigid Format 3; Phases 1, 2, and 3 . . . . .	B1-1
B2 Phase 1, 2 & 3 Alters to Rigid Format 3 - Component Modes, Sub- structuring Analysis Modified Subroutine GPWG . . . . .	B2-1
B3 Input Bulk Data/Phase 1 Analysis: Model II Fuselage. . . . .	B3-1

VOLUME I ILLUSTRATIONS

<u>Figure</u>		<u>Page</u>
1	Assembled 1/8-Scale Shuttle Model (View Looking Down) . . . . .	3
2	Assembled 1/8-Scale Shuttle Model (Side View) . . . . .	4
3	Flow Diagram for Nastran Substructuring (Component Modes Method) to Obtain Orbiter Normal Modes . . . . .	10
4	Fictitious Wing Mode Caused by Not Omitting Degrees of Freedom in Direction of Minimal Rod Line . . . . .	13
5	Flaws in Model II Idealization (Bottom Wing Cover Shown) . . . . .	15
6	Revised Wing (Mode 1) . . . . .	16
7	Revised Wing (Mode 2) . . . . .	17
8	Revised Wing (Mode 3) . . . . .	18
9	Revised Wing (Mode 4) . . . . .	19
10	Revised Wing (Mode 5) . . . . .	20
11	Revised Wing (Mode 6) . . . . .	21
12	Revised Wing (Mode 7) . . . . .	22
13	Revised Wing (Mode 8) . . . . .	23
14	Revised Wing (Mode 9) . . . . .	24
15	Revised Wing (Mode 10) . . . . .	25
16	Revised Cargo Door (Mode 1) . . . . .	35
17	Revised Cargo Door (Mode 2) . . . . .	36
18	Revised Cargo Door (Mode 3) . . . . .	37
19	Revised Cargo Door (Mode 4) . . . . .	38
20	Revised Cargo Door (Mode 5) . . . . .	39
21	Revised Cargo Door (Mode 6) . . . . .	40
22	Revised Cargo Door (Mode 7) . . . . .	41
23	Revised Cargo Door (Mode 8) . . . . .	42
24	Revised Cargo Door (Mode 9) . . . . .	43
25	Revised Cargo Door (Mode 10) . . . . .	44
26	Revised Cargo Door (Mode 11) . . . . .	45
27	Revised Cargo Door (Mode 12) . . . . .	46
28	Average Time Spent in READ Module Extracting 1 Mode . . . . .	52

VOLUME I TABLES

<u>No.</u>		<u>Page</u>
1	Statistical Description of 1/8-Scale Orbiter-Model II-Symmetric Case Comparison between Modal Synthesis and Direct Elimination Approach . . . . .	5
2	Wing Substructure Component Modes Comparison of Model II (Before and After Fix-Up) . . . . .	26
3	Comparison of Analytical Results Between Substructuring Methods for Symmetrical Free-Free Normal Modes (1/8-Scale Model II). . . . .	29
4	Substructure Contribution to Generalized Stiffness and Mass of Orbiter for Symmetric Free-Free Modes (1/8-Scale Model II). . . . .	30
5	Contribution Factors (Generalized Modal Coordinate Values) of Substructure Component Modes to Orbiter Symmetrical Free-Free Modes (1/8-Scale Model II) . . . . .	31
6	Substructure Component Modes (Symmetrical Case) 1/8-Scale Model II . . . . .	32
7	Summation of Substructure Momentum Forces About Basic Origin for Orbiter Symmetric Free-Free Modes (1/8-Scale Model II) . . . . .	33
8	Cargo Door Substructure Component Modes (Symmetrical Case) Comparison of Model II (Before and After Fix-Up) . . . . .	34
9	Computing Time to Obtain Orbiter Symmetric Modes Comparison Between Modal Synthesis and Direct Elimination Method . . . . .	49

VOLUME II CONTENTS

<u>Appendixes</u>	<u>Page</u>
B4	Plots of Symmetric Component Modes/Phase 1 Analysis: Model II Fuselage. . . . . B4-1
B5	Input Bulk Data/Phase 1 Analysis: Model II Wing . . . . . B5-1
B6	Plots of Component Modes/Phase 1 Analysis: Model II Wing . . . . . B6-1
B7	Input Bulk Data/Phase 1 Analysis: Model II Cargo Doors . . . . . B7-1
B8	Plots of Symmetric Component Modes/Phase 1 Analysis: Model II Cargo Doors . . . . . B8-1
B9	Input Bulk Data/Phase 1 Analysis: Model II Fin . . . . . B9-1
B10	Plots of Symmetric Component Modes/Phase 1 Analysis: Model II Fin . . . . . B10-1
B11	Input Bulk Data/Phase 1 Analysis: Model II Payload . . . . . B11-1
B12	Plots of Symmetric Component Modes/Phase 1 Analysis: Model II Payload . . . . . B12-1
B13	Input Bulk Data/Pre-Phase 2 Copy Run and Phase 2 Analysis: Model II Orbiter . . . . . B13-1
B14	Input and Plots/Phase 3 Analysis: Model II Fuselage - Symmetric Free-Free Orbiter Modes . . . . . B14-1
B15	Input and Plots/Phase 3 Analysis: Model II Wing - Symmetric Free-Free Orbiter Modes . . . . . B15-1
B16	Input and Plots/Phase 3 Analysis: Model II Cargo Doors - Symmetric Free-Free Orbiter Modes . . . . . B16-1
B17	Input and Plots/Phase 3 Analysis: Model II Fin - Symmetric Free-Free Orbiter Modes . . . . . B17-1
B18	Input and Plots/Phase 3 Analysis: Model II Payload - Symmetric Free-Free Orbiter Modes. . . . . B18-1

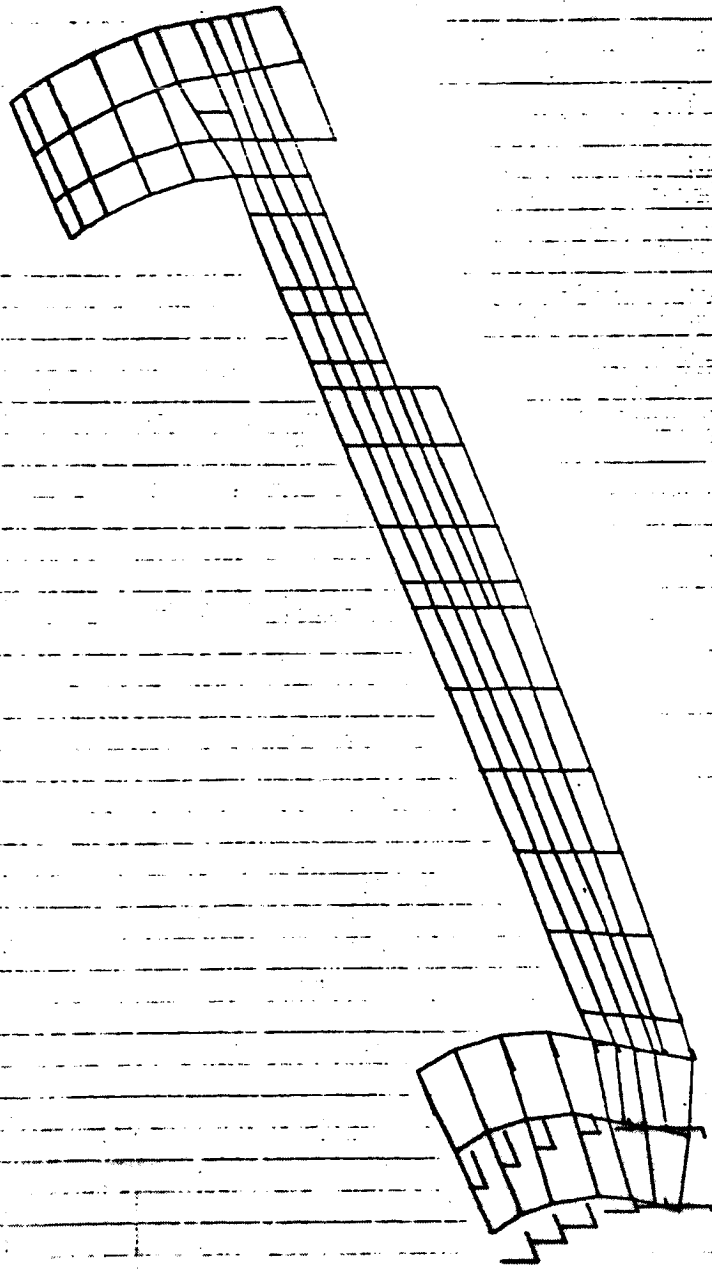
## ABSTRACT

A dynamic substructuring analysis, utilizing the component modes technique, of the 1/8 scale Space Shuttle Orbiter finite element model is presented. The analysis was accomplished in 3 phases, using NASTRAN RIGID FORMAT 3 (Level 15.5.1), with appropriate Alters, on the IBM 360-370 (Model 165). The Orbiter was divided into 5 substructures, each of which was reduced to interface degrees of freedom and generalized normal modes. The reduced substructures were then coupled in Phase 2 to yield the first 23 symmetric free-free orbiter modes. The eigenvectors in the original grid point degree of freedom lineup were then recovered in Phase 3. A comparison is then made with an analysis which was performed with the same model using the direct coordinate elimination approach under NASA contract NAS 1-10635-12 (Reference 1). Eigenvalues were extracted using the inverse power method.

**Appendix B4**  
**PLOTS OF SYMMETRIC COMPONENT MODES/PHASE I**  
**ANALYSIS MODEL II FUSELAGE**

2-1

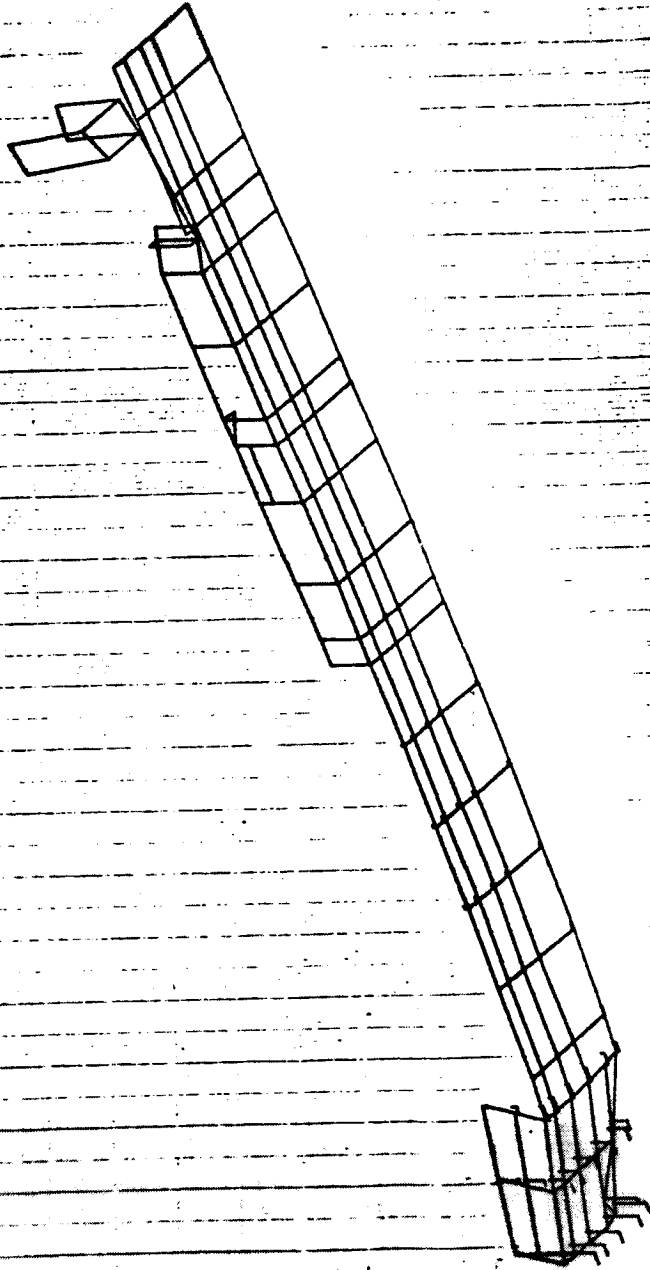
10/18/74 1000-007. 0 1.00000000



PHASE 1 ORBITER PURCHASE-BYAM CASE) MODEL 2  
 SKING HALF EFF.LONG.85 ( EFF. TRANS.AT WING (8-8/2EFF.)  
 FREE MODES FINES AT INTERFACE  
 MODAL DETER. SURFACE 1 MODE 1 FREQ. 88.90704



4 00000000 00000000 00000000



PHASE 1 ORBITER FUSelage-STIM CASE) MODEL 2  
SKINS HALF OFF, LAMP, .08 ( STP, TRANS, AT WING (0-8/REFF.)  
FREE MODES FIXED AT INTERFACE  
MODAL DETOR. SUBCASE 1 MODE 1 FREQ. 88.407104





00

00 10/10/74 1000-007. = 1.01740000

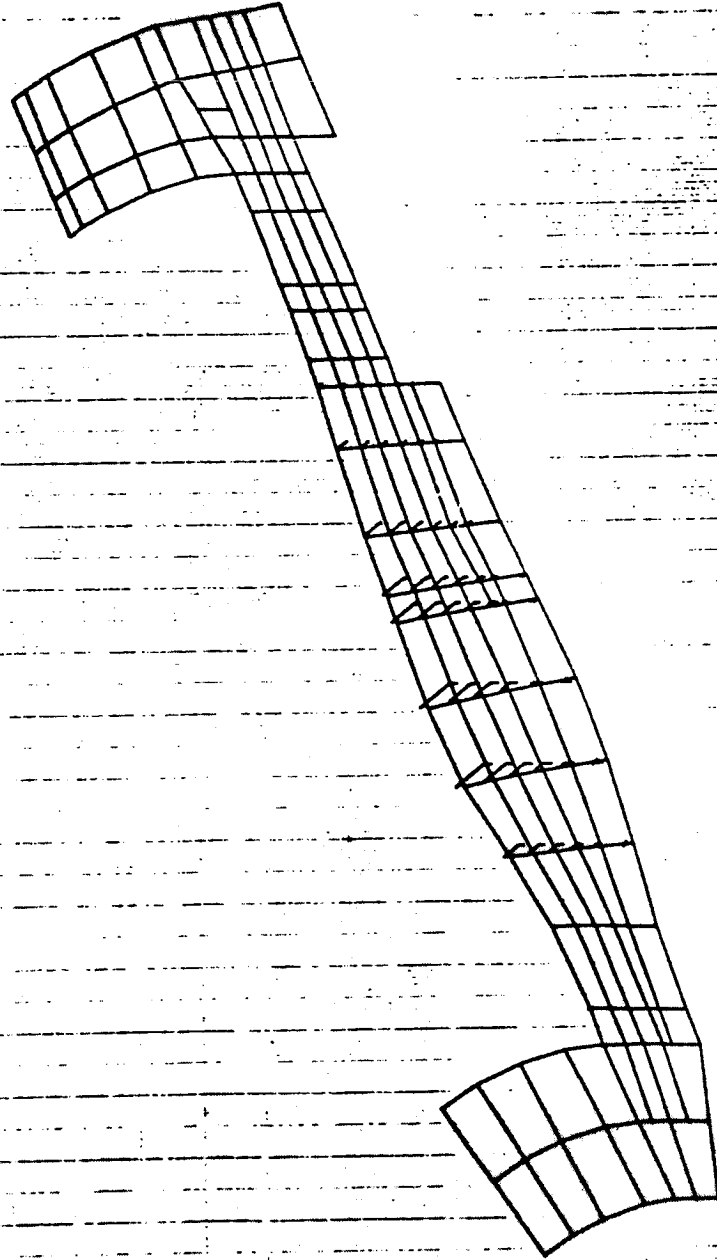
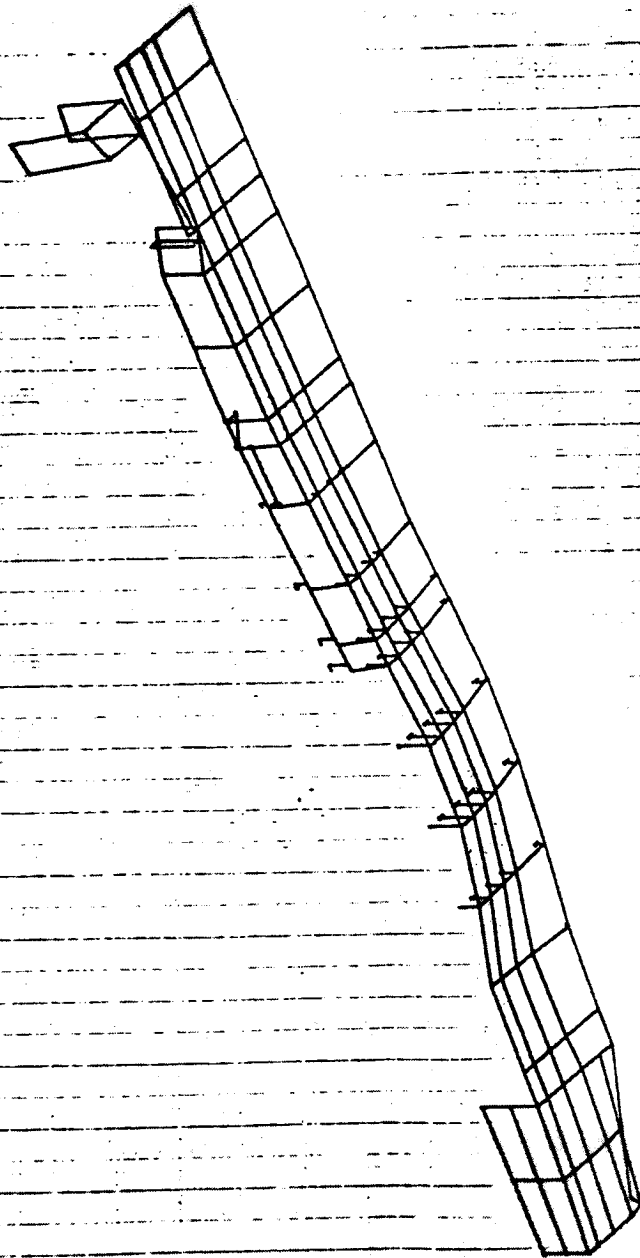
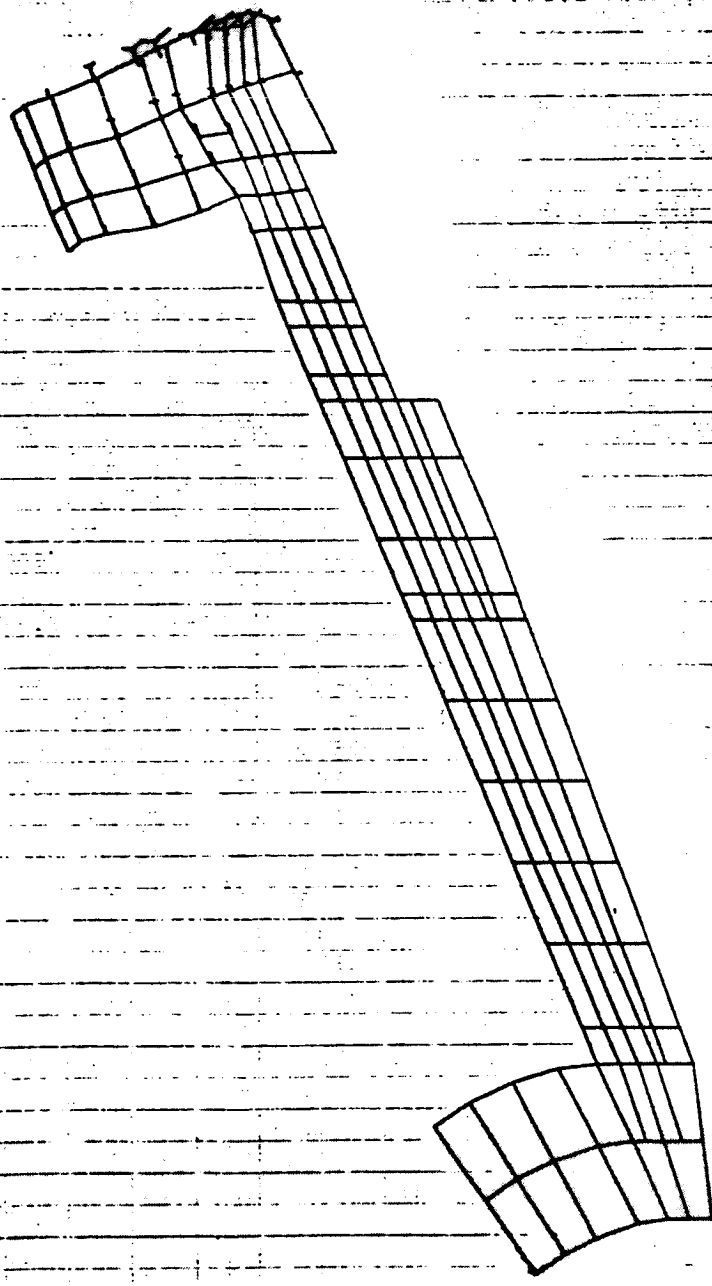


FIGURE 1. CONTOUR OF WING PLANFORM - 0.7500 (0.7500) INCHES  
 SKIN HALF EFF. LENGTH - 0.80 (0.80) INCHES  
 FREE HINGES PLACED AT INTERFACES  
 MODAL DEFOR. SUBSCRIBE 3 MODE 3 FREQ. 248.8784

2 10/18/74 MW-027, s 1.0170-050

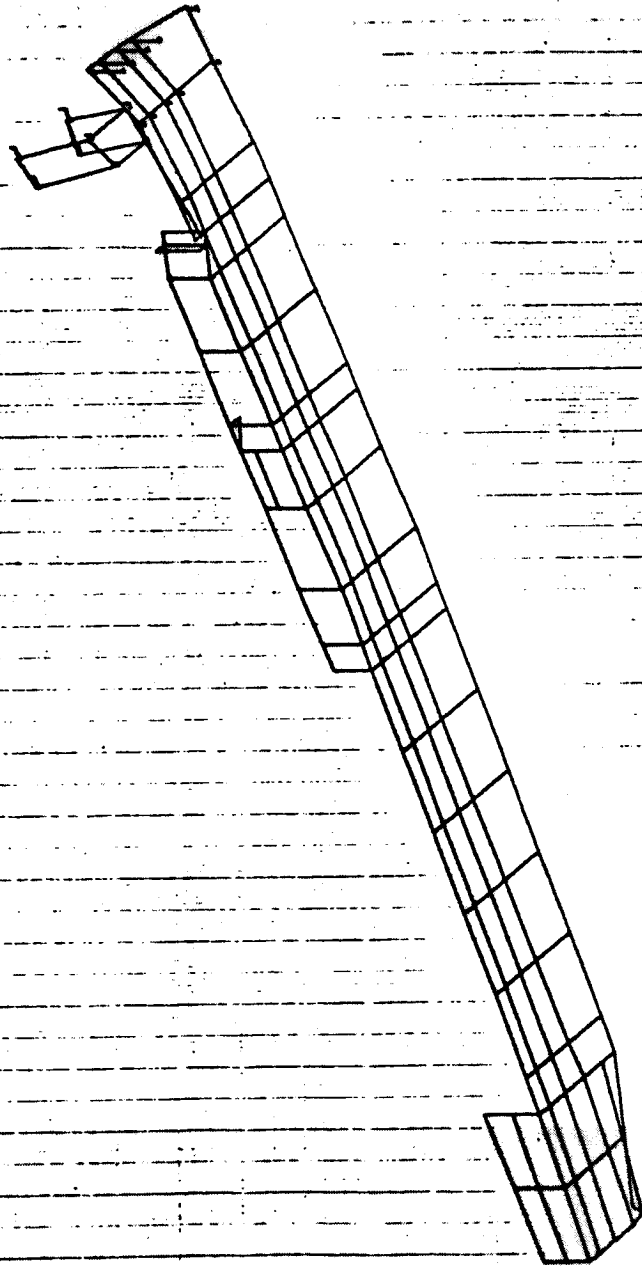


PHASE 1 (SUBCUBE FURGLARE-DYAN CASE) MODEL 2  
SKIN HALF EFF. LONG. (88 ( EFF. TRANS. AT WING (0-2/2EFF.))  
FREE MODES FIXED AT INTERFACE  
MODAL DEFON. SUBCASE 2 MODE 3 FREQ. 248.8724



PHASE 1 CONSTITES PERFLAGE-STYMA CASE) MODEL 2  
 ON 10 HALP EFF. LONG. 001 EFF. TRANS. AT WING 00-2/SEFF. 1  
 FREE MOVED FINES AT INTERFACE  
 MODAL DEFORM. SUBCASE 4 MODE 4 FREQ. 270.8716

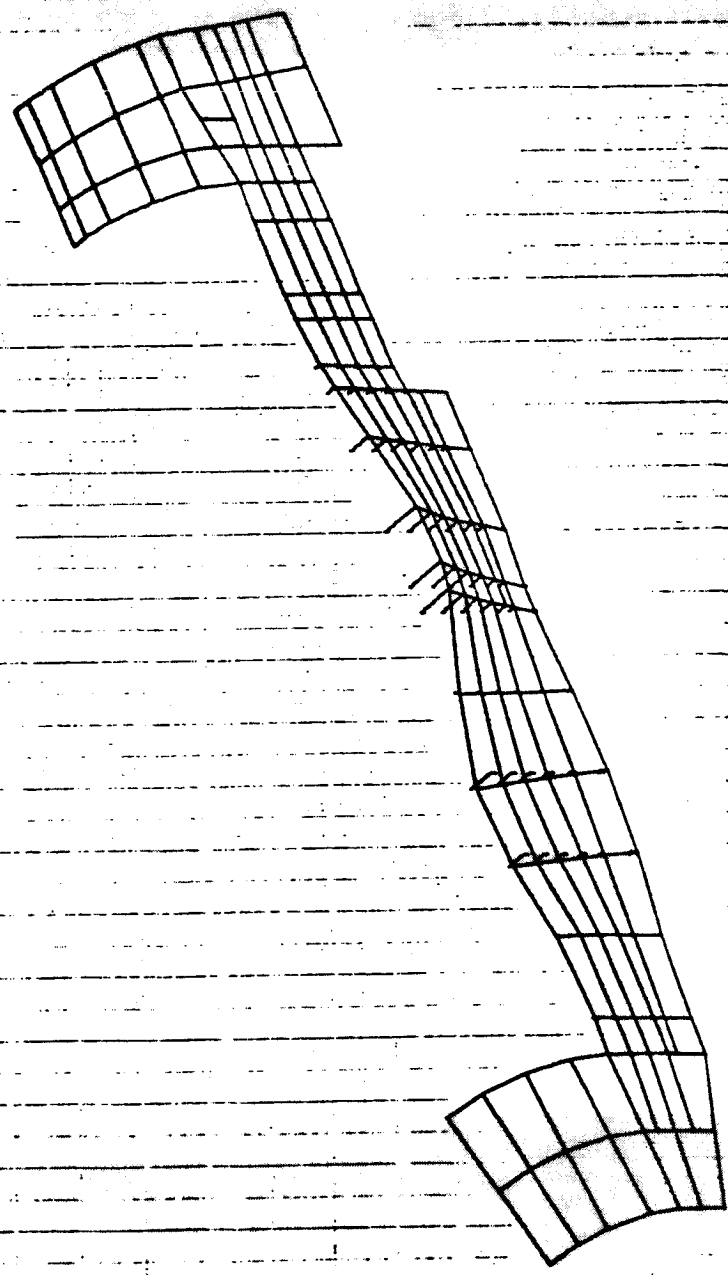
10/18/74 001-007, s 1,000-0000



PHASE 3 ORBITER FUSELAGE-STYAM CASE) MODEL 2  
SKIN HALF OFF LAMP. 001 (OFF TRANS. AT WING 00-2/0077.1)  
FREE MODES FIXED AT INTERFACE  
MODAL ORDER. SURFACE 4 MODE 4 FREQ. 270.8794

68

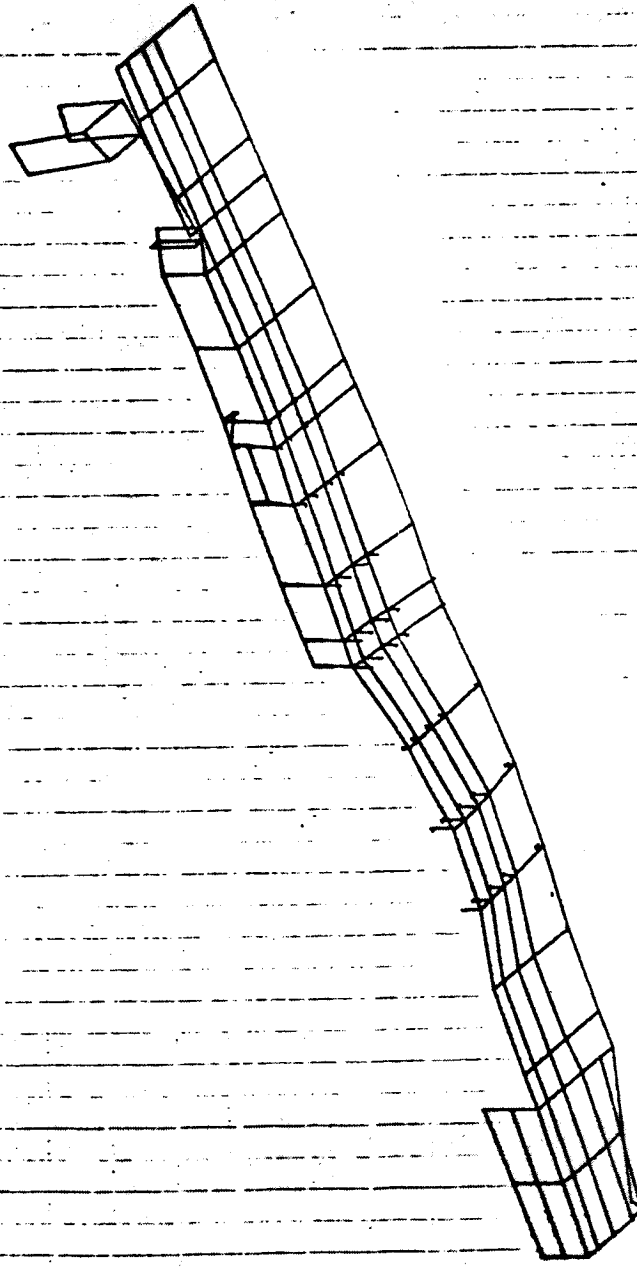
02 18/10/74 14:00:00 0.1.00000000



PHASE 1 (ORBITER FORWARD-SEAS CASE) MODEL 2  
 BEING HALF OFF-LOAD, SEE (EFF. TRANS. AT WING CD=0.8/REF.1)  
 FREE MODES FIXED AT INTERFACE  
 MODAL ORDER, SURFACE 8 MODE 8 FREQ. 260.7184

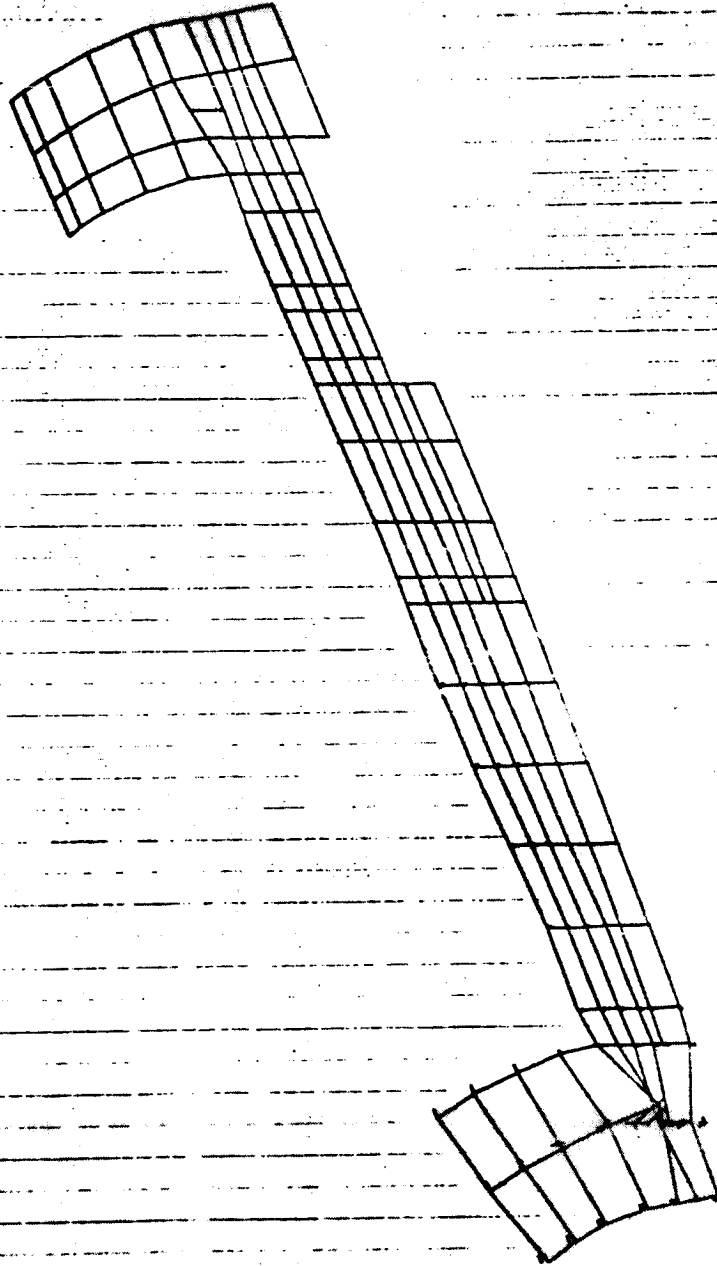


10/10/74 2400-007, s 1.00000000



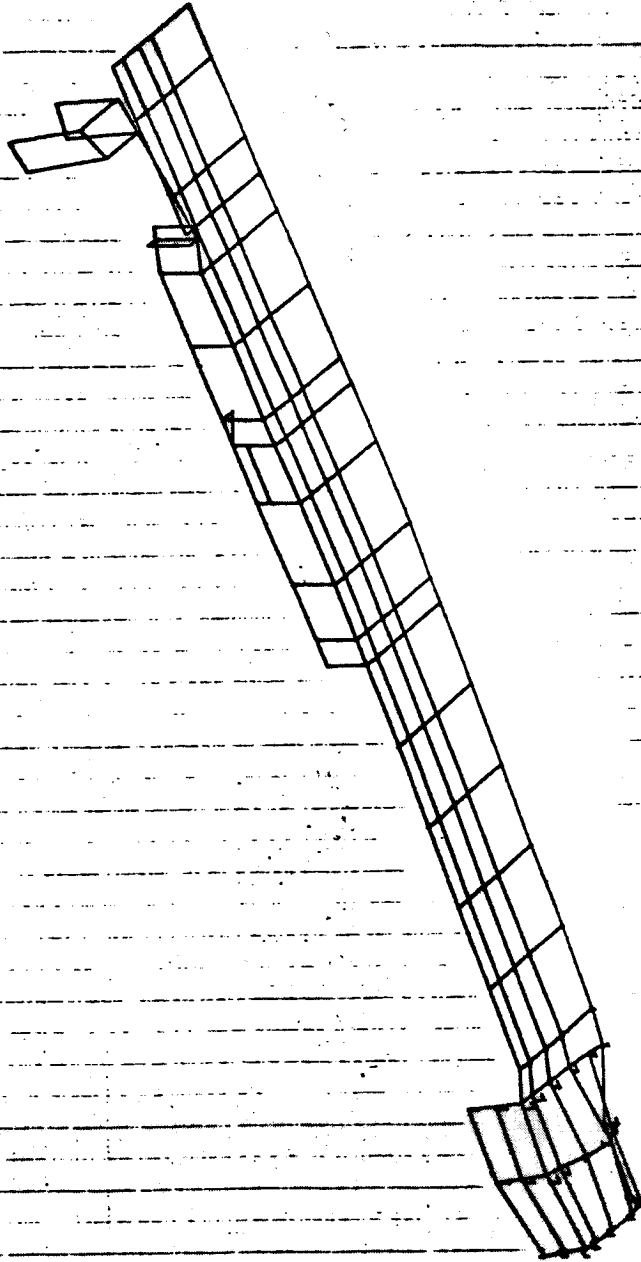
PHASE 1 SUBCAGE SUBCAGE-5THM CASE) MODEL 2  
SKINS HALF EFF. LONG. 0.88 (EFF. TRANS. AT WING 0.8/2/2EFF.)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFOR. SUBCAGE 5 MODE 5 FREQ. 260.7724

88 10/10/74 0000-007, 0 2, 077-00040



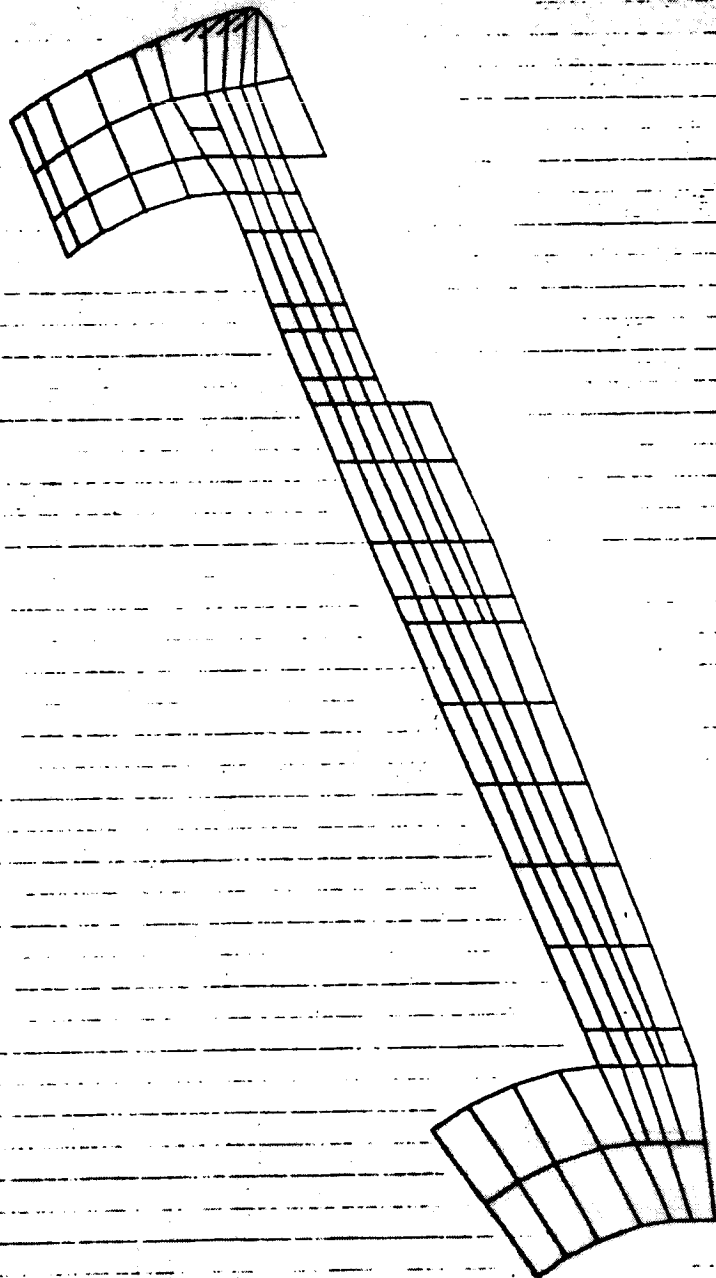
PLANET COMPUTER FUSelage-07MM CASE) MODEL 2  
SERIES HALF EFF. LENS - 081 EFF. TRANS. AT WIND 1-3, 10/10/74  
FREQ. MODEL FIND BY INTERFACE  
MODAL DETON. BUSIANT 0 MODE 0 FREQ. 333 10/10/74

10/10/74 000-007. 8.0770000



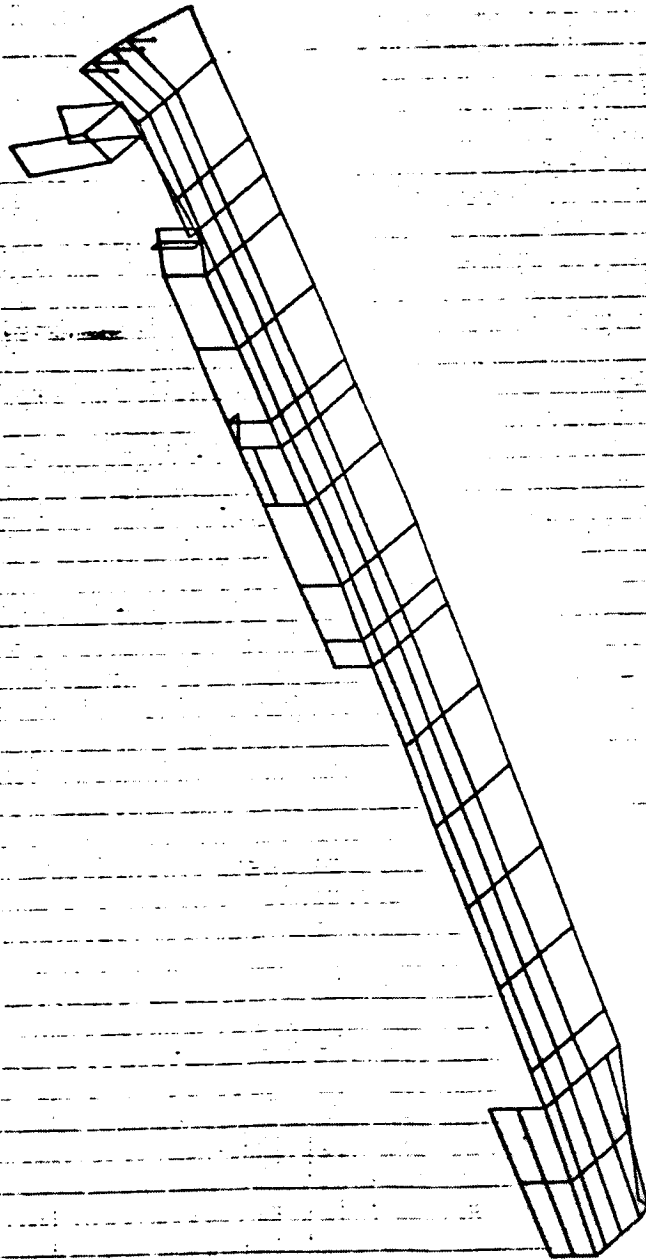
PLANE 1 CONTAINS PUBLISHED-SYMA CASE) MODEL 2  
SKIN HALF EFF. LONG. 1001 EFF. TRANS. AT WIND 00-02/0077.  
FREE MEMES FINED AT INTERFACE  
MOVAL DEPOS. SUBCASE 9 MOOC 9 FREO. 303.7810

64 -- 10/10/76 1000-007. 0 1.10000000



PHASE 1 CORRIGED FINISHING-SYMA CASE) MODEL 2  
 SKINS HALF EFF. LEAD. 001 EFF. TRAIL. AT WING 00-2/0077.1  
 FREE MODES FIXED AT INTERFACE  
 MODAL DEFEN. SURFACE 7 MODE 7 FREQ. 299.0011

10/10/74 100-207. 1.1000000



PHASE 1 CORBITER PURCHASE-5700 CASE) MODEL 2  
SKING HALF EFF.LONG..881 CFF.TRANS.AT WING 08-02/0877.)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFOS. SUBCASE 7 MODE 7 FREQ. 331.8811

00 10/10/74 1000-007. = 1.0000000

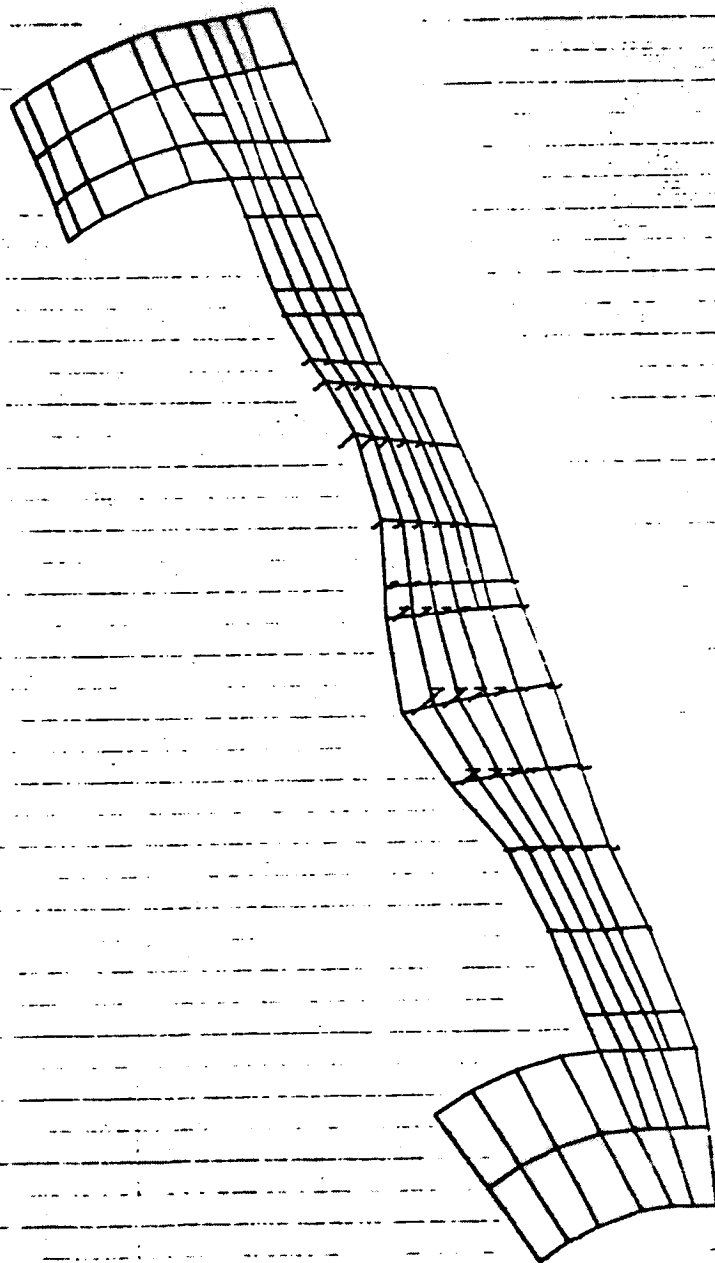
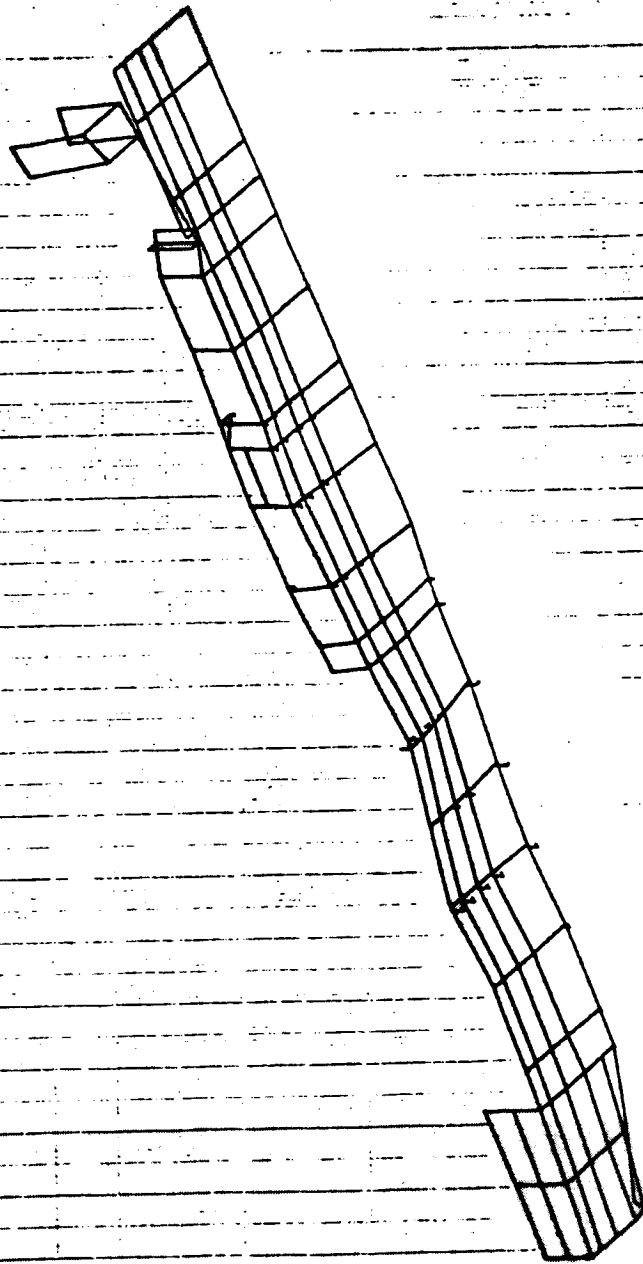


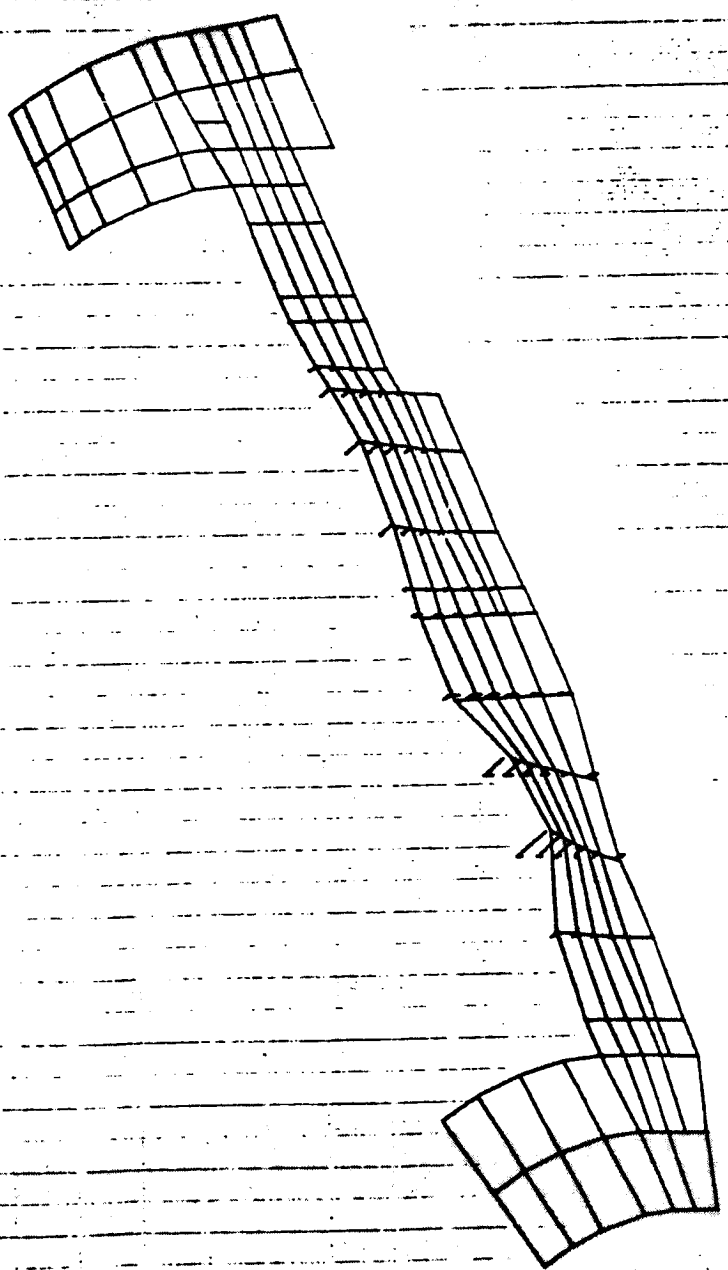
PLATE 3 CURVED FIBERGLASS CYCLE MODEL 1  
 OF A HALF CYCLE OF DEFLECTION AT WIND SPEED 1  
 P. MOFFS FINED INTERFACE  
 M. W. DEYON, SUBRAY 2 MODE 8 P.10. 379 1021

10/13/74 1410-207.0 1.00000000



PHASE 1 ORBITER FINELINE-3700 CASE) MODEL 2  
BEING HALF EFF. LINE, 00 ( EFF. TRANS. AT WIND 00-2/0027 )  
FREE MODES PLOTTED AT INTERFACE  
MEDAL BEFOR. MESSAGE 0 MODE 0 PNO. 370.9482

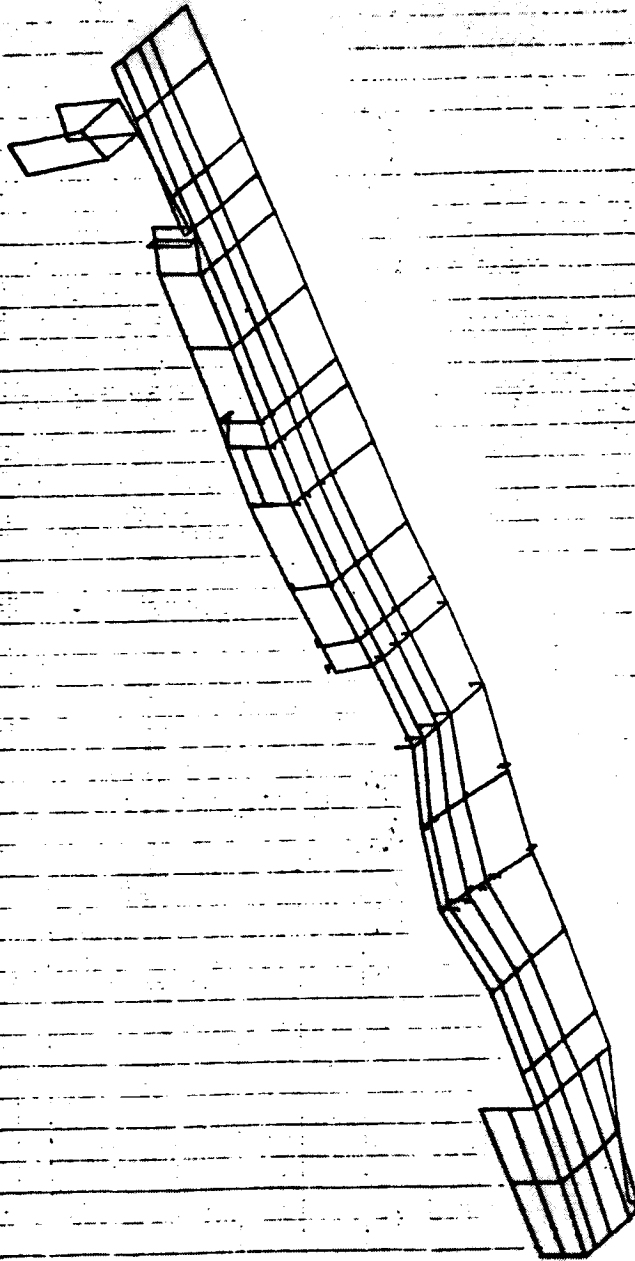
00 10/10/74 MMH-827, 0 1.01000110



PHASE 1 ORBITER FORWARD-VIEW CASE) MODEL 2  
BEING MADE EFFICIENT. SEE EFF. TRAM. AT WIND 08-08/0877.  
FREE MODEL FINED AT INTERFACE  
ACDAL SECTOR. SURFACE 1 MODE 1 FREQ. 011.0412



10/15/74 001-007. = 1.0100110

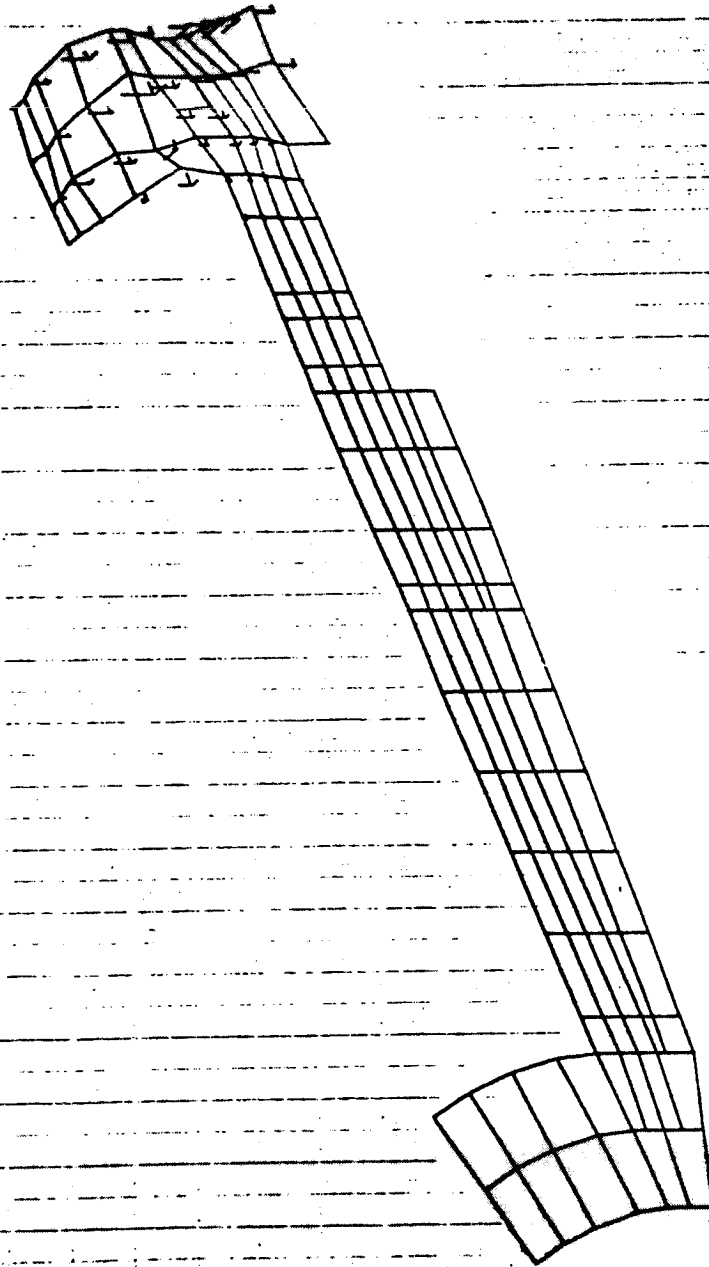


PHASE 1 COMPUTER PROGRAM-SYAM CASE) MODEL 2  
SKIN HALF EFF. LONG. 88 ( EFF. TRANS. AT WING 0-2/3077.)  
FREE NODES FIXED AT INTERFACE  
MODAL SECT. SURFACE 1 MODE 1 FREQ. 311.0412

67

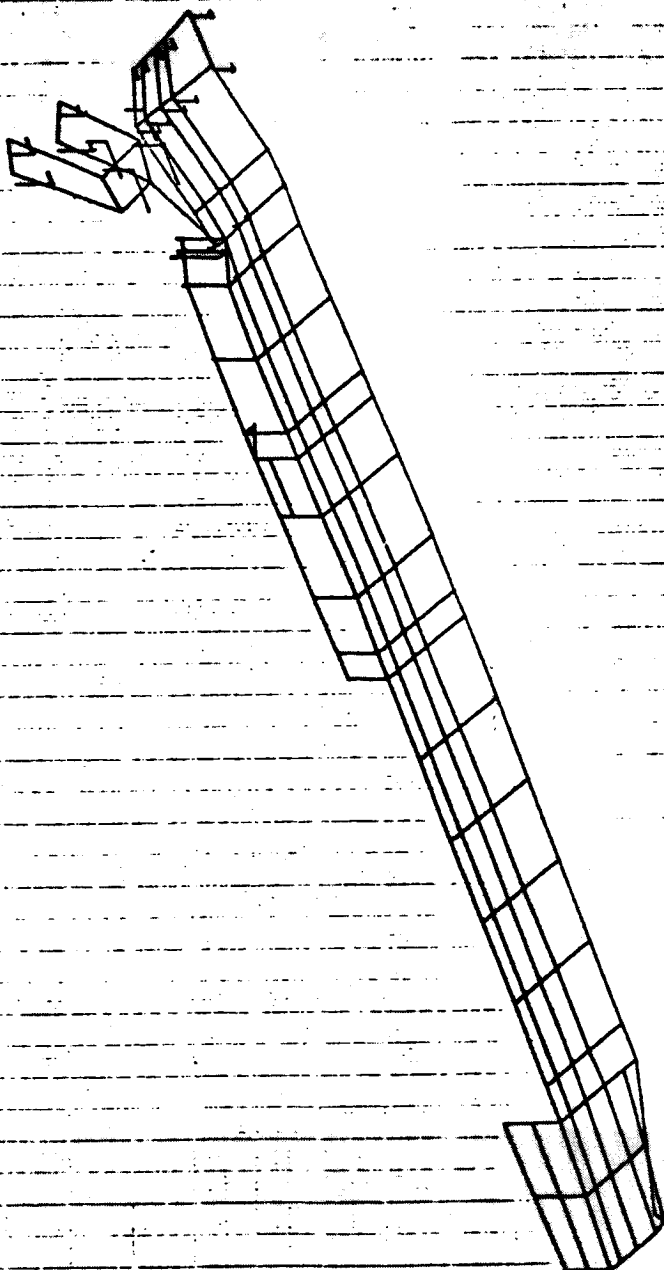
10/15/74 144-027. 0 1.177000

67



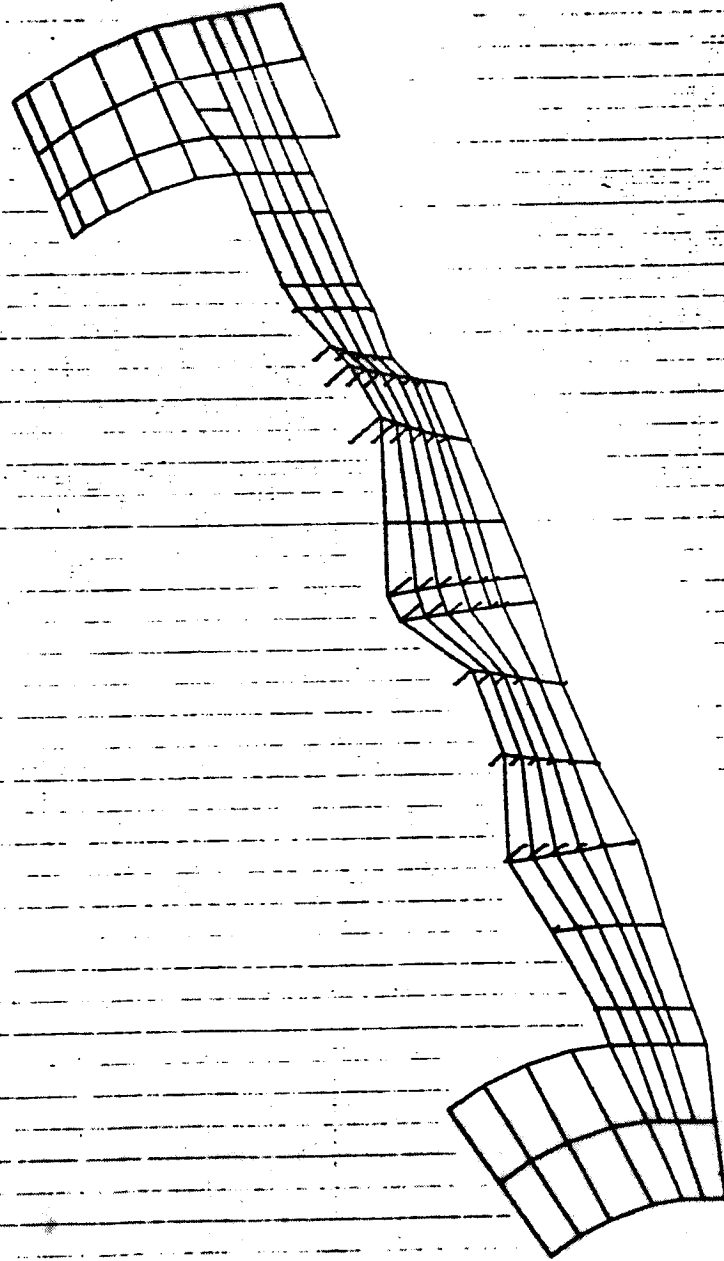
PHASE 1 COMPLETE PANELAR-BYAM CASE) MODEL 2  
 SKINS MAP SET, LAMB., 881 EFF. TRANS. AT WING (0.3/3EFF.)  
 FREE BONES FINED AT INTERFACE  
 LOCAL SETOR, SUBCASE 10 MODE 10 FREQ. 419.849

10 10/20/70 10/20/70 10/20/70



PHASE 1 AIRCRAFT PURCHASE-27000 CARS) MODEL 2  
 BEING HALF OFF-LAND. FOR 1 ETV. TRANS. AT WING (2-2/2077.)  
 FREE MEMS PILES AT INTERFACE  
 MODAL WYON. SUBCASE 10 1000 10 FREQ. 429.0400

65 10/10/74 MAX DEF. = 1.00000000

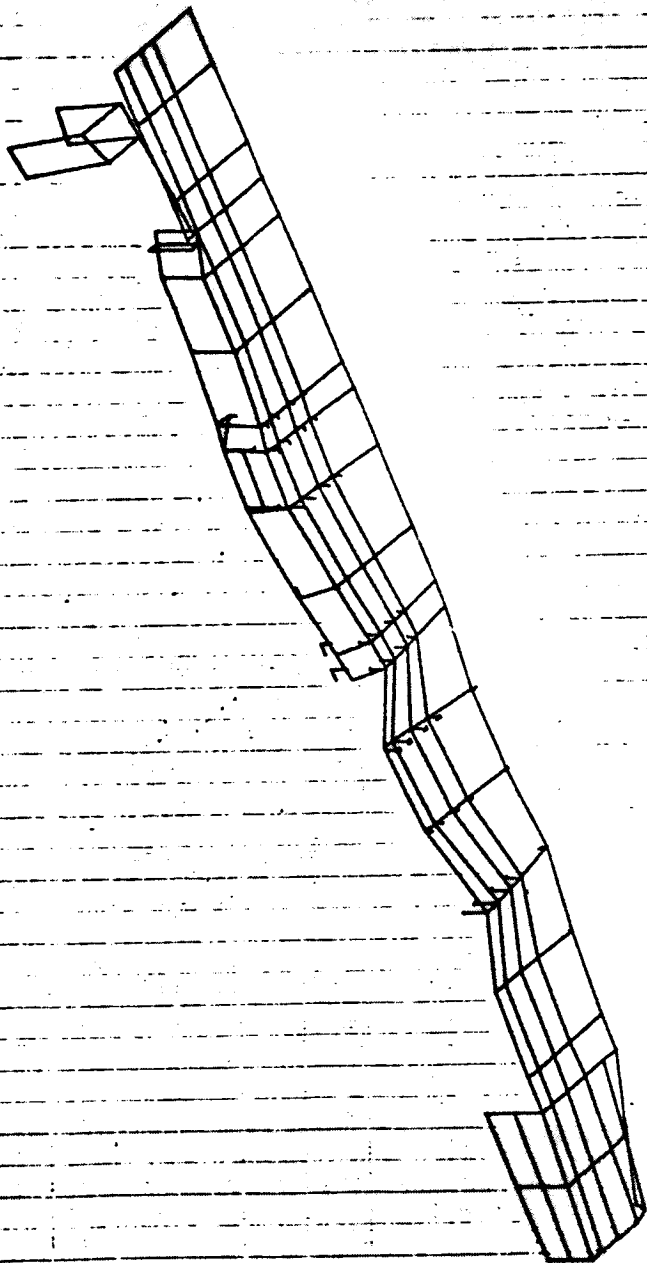


PHASE 1 COMBINED FUSelage-SYMA CASE) MODEL 2  
 SKINS HALF EFF. LONG. .89 ( EFF. TRANS. AT WING 00-02/08FF. )  
 FREE MODES FIXED AT INTERFACE  
 MODAL DEFOR. SURFACE 11 MODE 11 FREQ. 448.5991

11

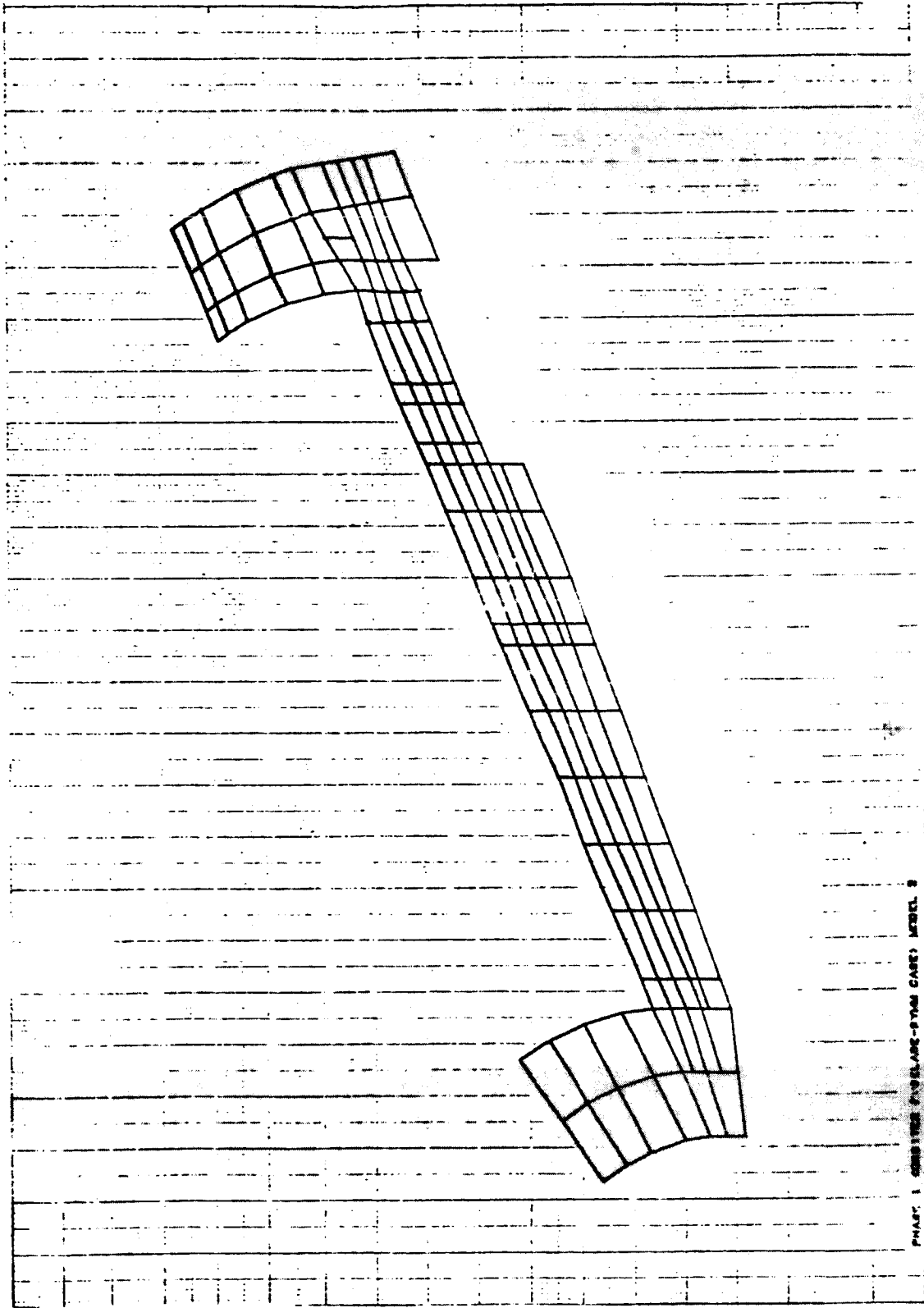
10/18/74 1000-007. = 1.00000000

11



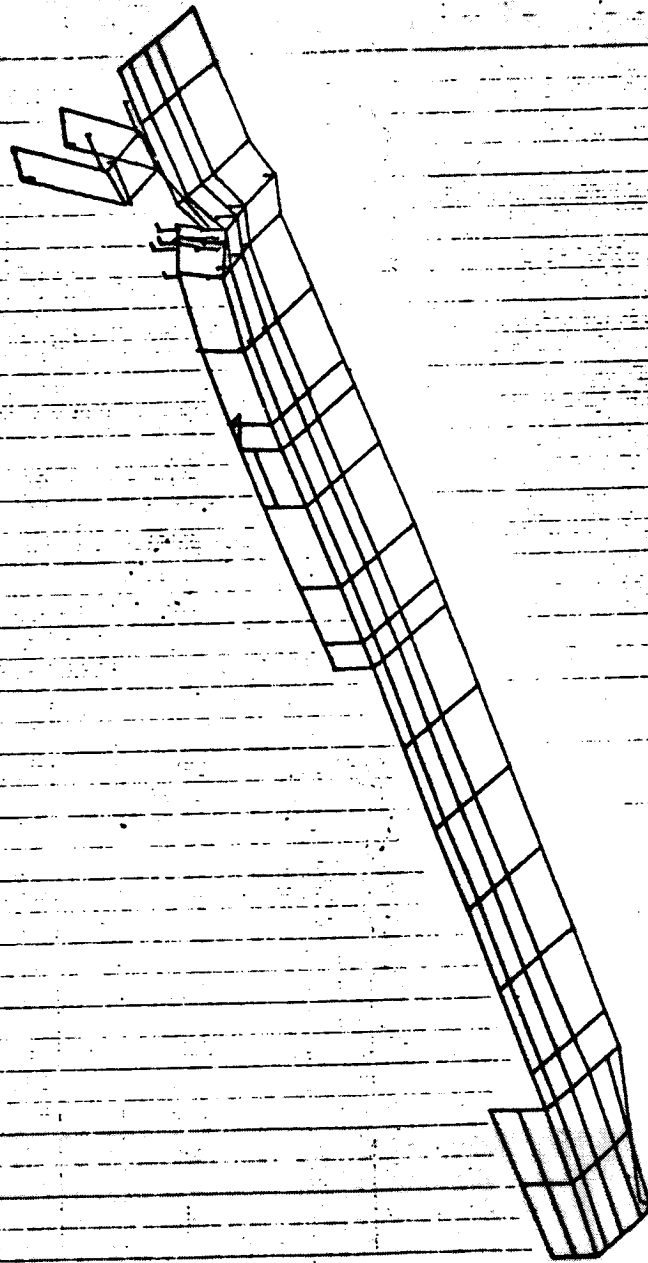
PHASE 1 GRIDDED FUSelage-SYMA CASEY MODEL 2  
 SKINS HALF EFF. LONG. 001 EFF. TRANS. AT WING 00-2/3EFF. 1  
 FREE MEMB FINES AT INTERFACE  
 MODAL BEFOR. SURFACE 11 MODE 11 FREQ. 448.8331

09 10/15/74 888-007, & 1-1-004100



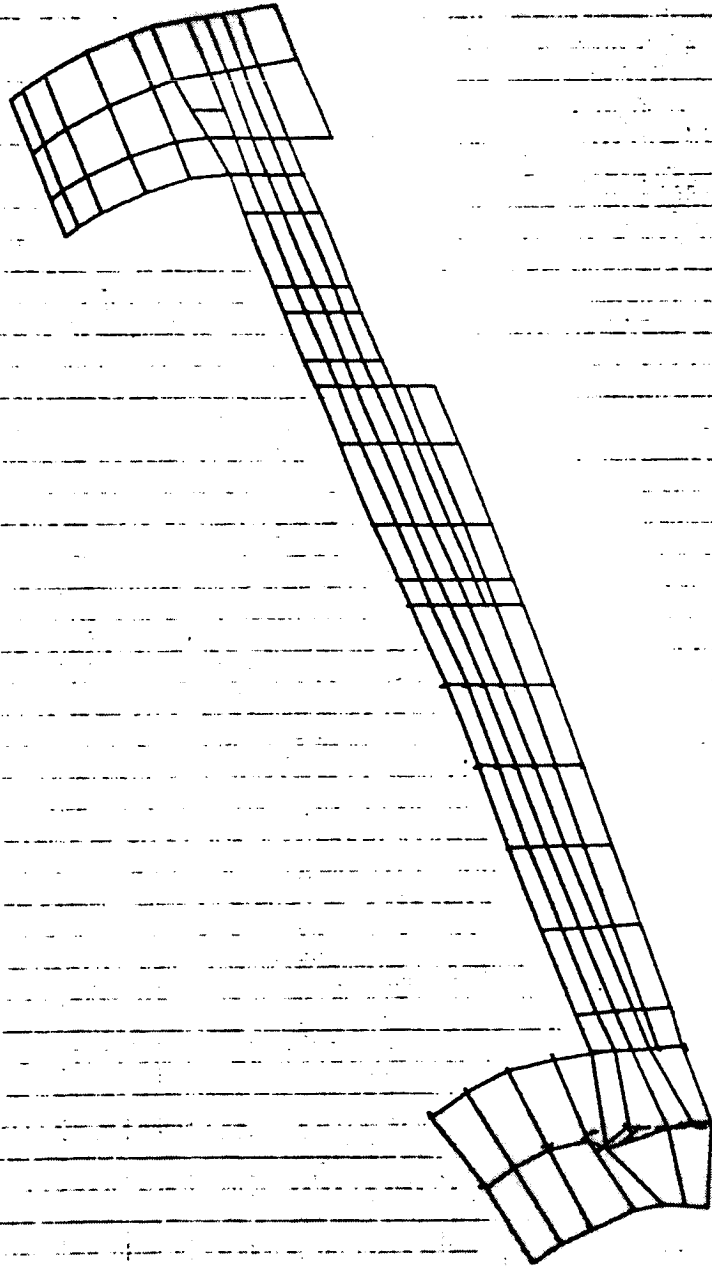
PHASE 1 CONTINUES TO DELAY STAGE CASE; METEL 8  
 DEL 1 HALF EFF. LONG. PER EFF. TRANS. AT WINDS 10/3 17.3  
 THE PROB FINED A 30" CRACK  
 W/ JCTOR. SUBCASE 17 MADE IS PRED. 496.017

18 08/10/74 000-007. - 1.1000110



PHASE 1 COMPLETE ENCLAVE-DYON CASES MODEL 2  
 BEING MADE BY LINDSAY & CO. LTD. AT WINDYBANK, PERTH.  
 FREE MEMBER FINED AT INTERFAC  
 MODAL SECTION, SURFACE 12 MODE 12 FREQ. 490.0174

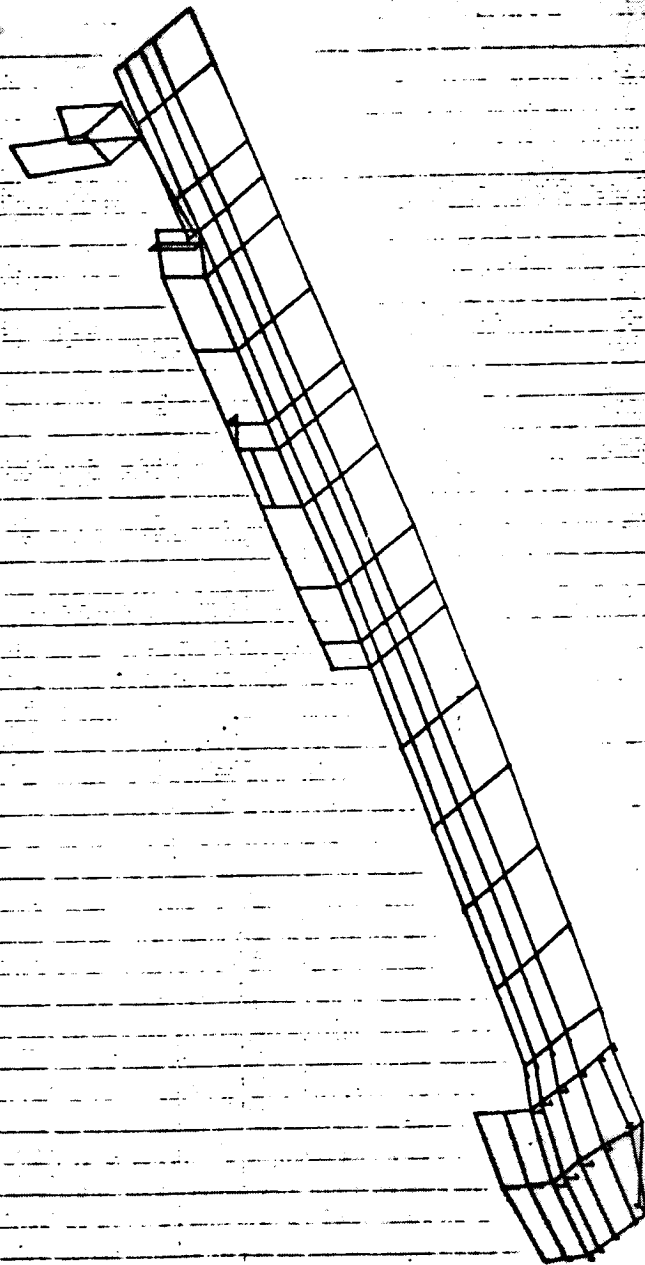
TO 10/10/74 1440-007. = 2.0721000



PHASE 1 CONSTITUTED FURBERG-SPIN GARD MODEL 2  
BEING HALF EFF. LONG. 801 EFF. TRANS. AT WING 00-02/0077.1  
FREE WORKS FINISH AT INTERFACE  
MODAL DEFOR. SURFACE 10 MODE 13 FREQ. 5071.0708

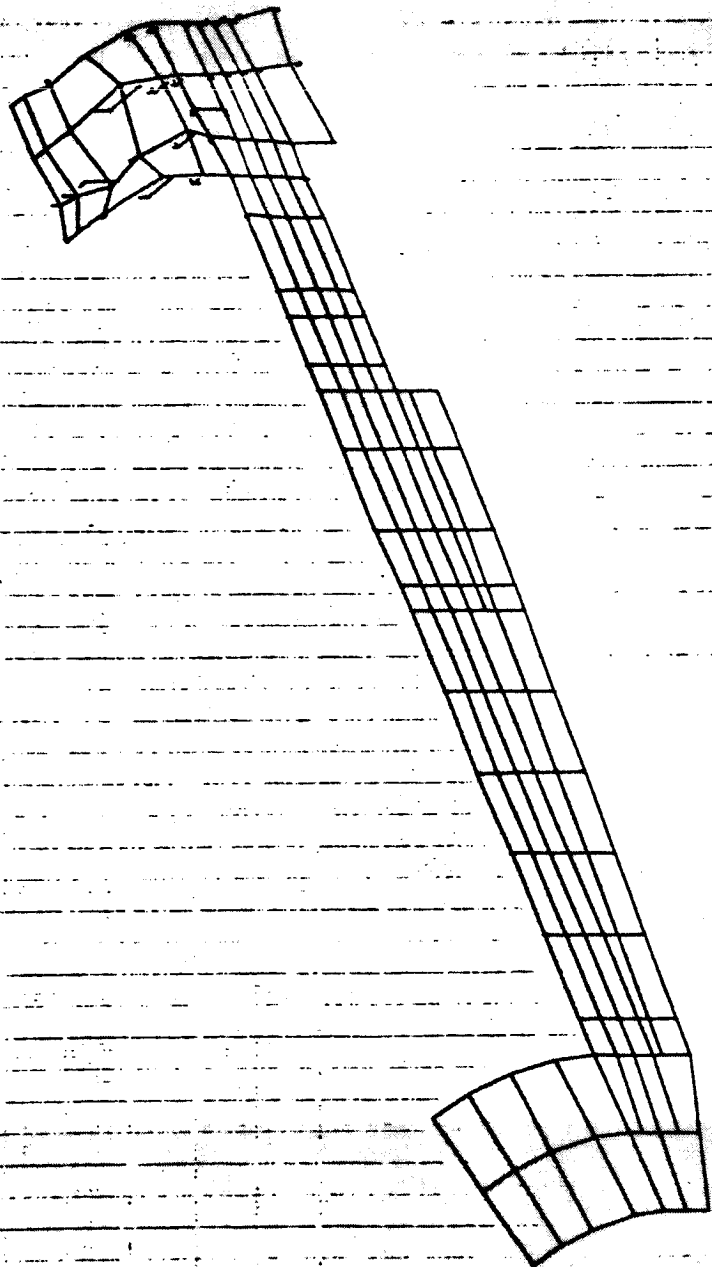


10 10/10/74 000-007. = 2. 8701000



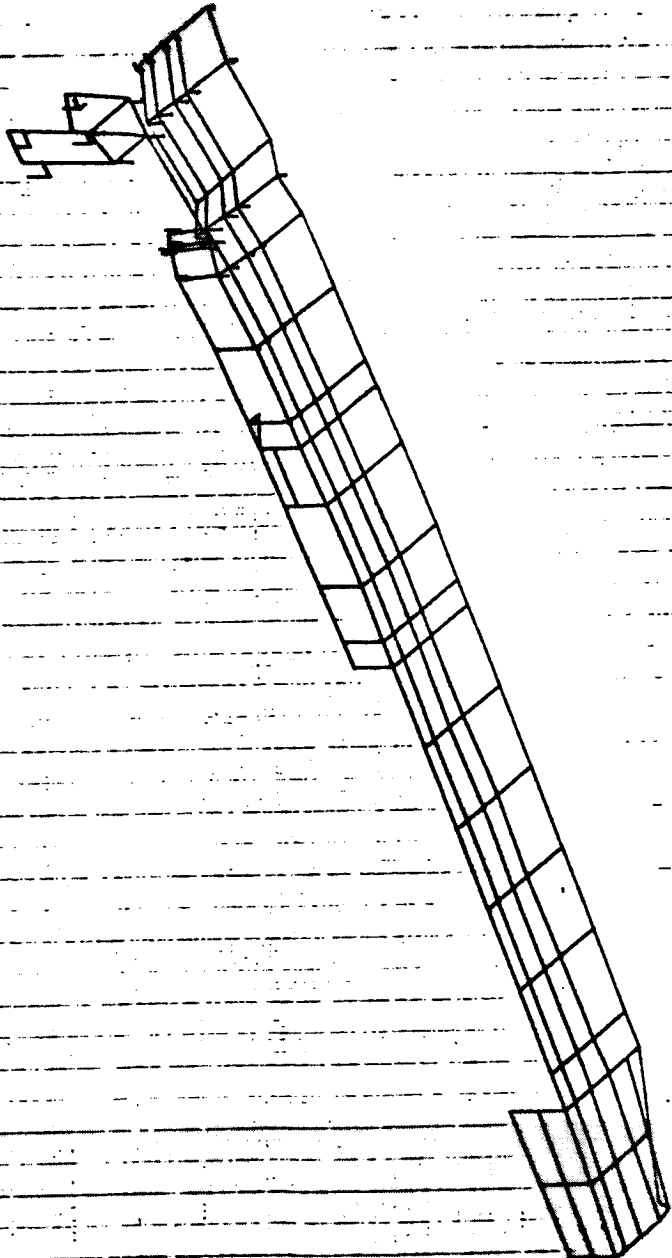
PHASE 1 ORBITER FUELAGE-OTM CASE MODEL 2  
 BEING HALF EFF. LAMB. BEC EFF. TRANS. AT WIND 9-2/2077.  
 FREE MODES FIXED AT INTERFACE  
 MODAL DEFOR. SURFACE 13 MODE 13 FREQ. 507.0700

11 10/10/70 0000-0007, 0 1.001.0000



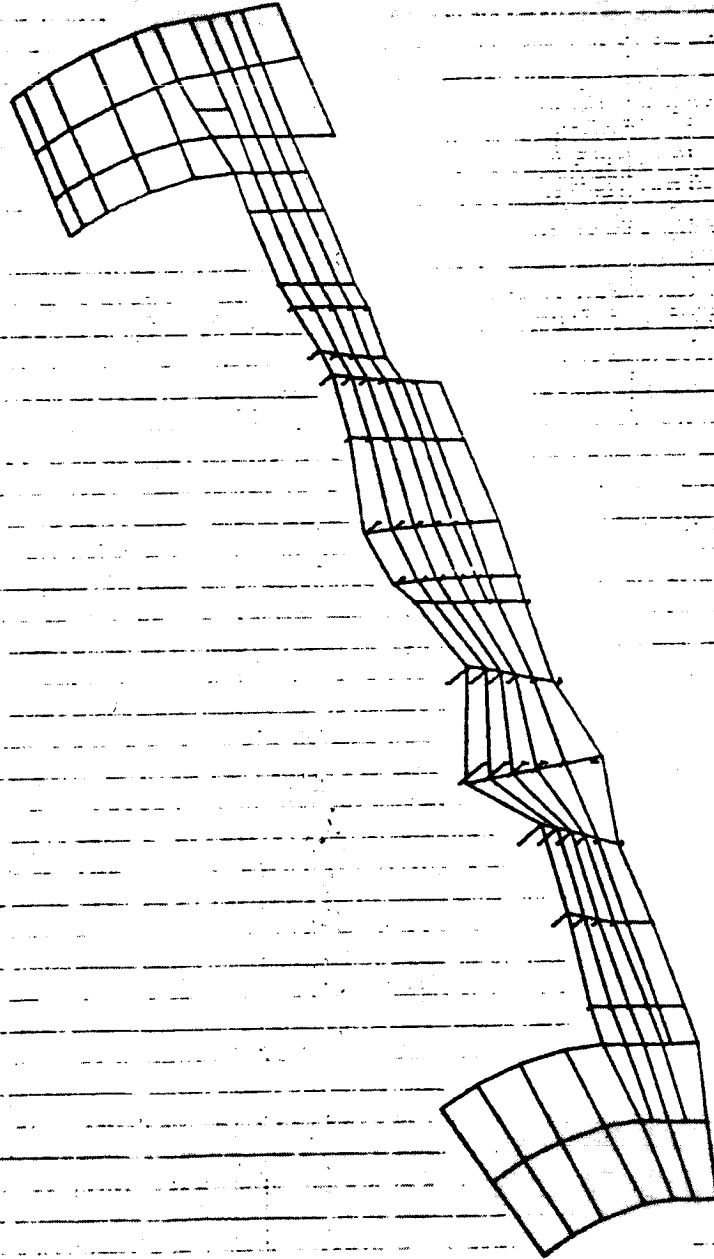
PHASE 1 - GEOMETRIC FINISHING-BYMAN CASE3 MODEL 8  
 BEING MADE BY LINDSAY I EFF. TRANS. AT WING (0-2/0077.)  
 FREE MEMBER FINISH AT INTERFACE  
 ADDL. DUPER. SUBCASE 14 MODEL 14 FREE. 000.0110

14 0010070 0000-0007. 0 00000000



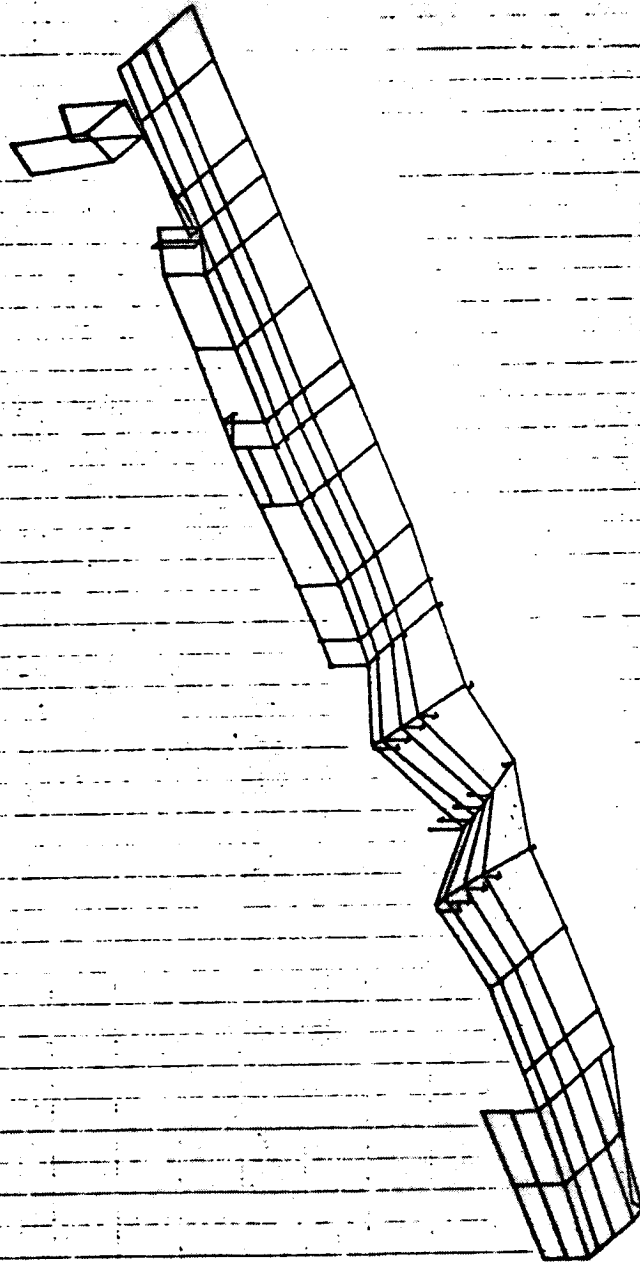
PHASE 1 MISSILE PURCHASE-SPIN CASES MODEL 2  
 SKILL HALF PROGRAM-80 C EYF. TRAM. AT WING 00-2/0077.3  
 FREE MODEL NUMBER OF INTERFACE  
 MODAL DEFER. MODEL 14 MODE 14 PREQ. 000.0470

18/10/74 MAN-REF. 1.00000000



PHASE 1 (GIBBITER FUSELAGE-SYMM CASE) MODEL 2  
 SKING HALF EFF. LONG. BCC EFF. TRANS. AT WING (B-2/REFF.)  
 FREE NODES FIXED AT INTERFACE  
 MEDIAL DEFOR. SUBCASE IS MODE 15 FREQ. 840.1018

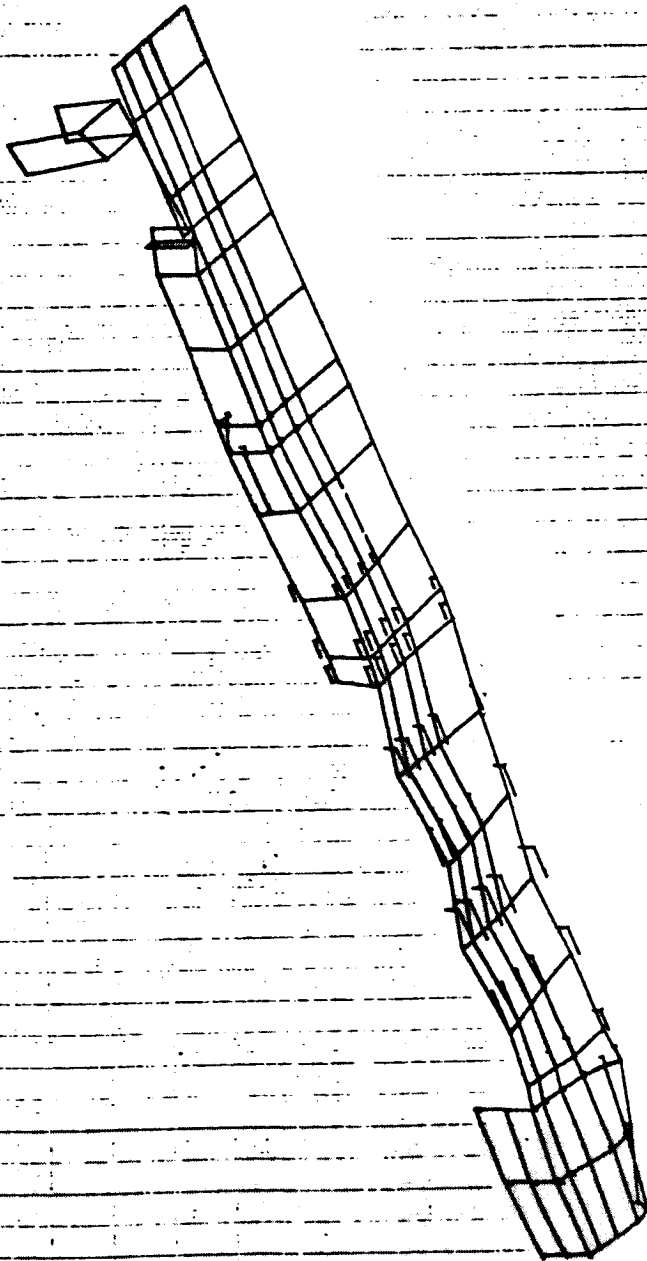
10 10/18/74 1000-007, 0 1, 00000000



PHASE 1 ORBITER FUELAGE-0704 GARC MODEL 2  
BEING HALF EFF. LONG. (83 ( EFF. TRANS. AT WING (8-2/0077.)  
FREE MOVED PITCH AT SWITCHFACE  
MODAL ORFOR. SURFACE IS MODC IS FREE. 040.1012



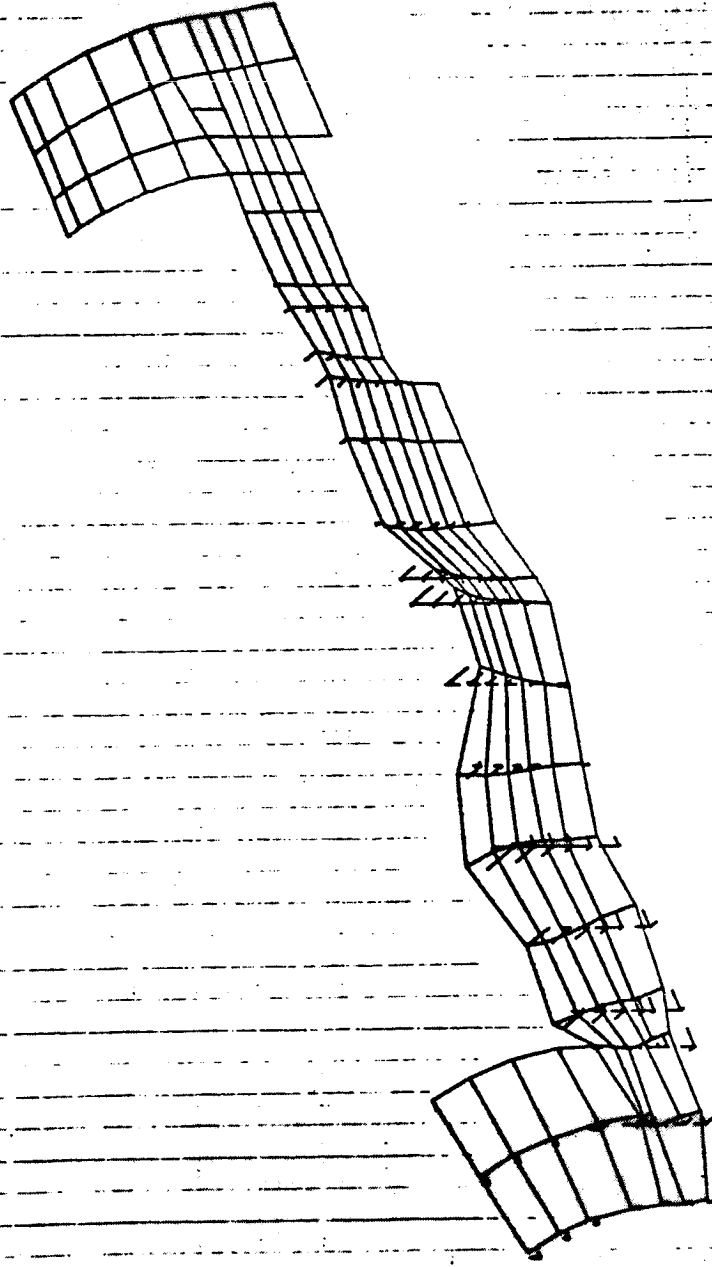
10 10-15/74 200-207, 0 1.00000000



PHASE 1 COMBINED FUSELAGE-WING CASE) MODEL 2  
SEEING HALF EFF. LENGTH. SEE EFF. TRANS. AT NUM 00-2/2077.  
FREE MEMES FINISH AT INTERFACE  
MODAL SCFOR. SURFACE 10 MODE 10 FREQ. 901.2587

18/10/74 10:00:00, 0 1.00000000

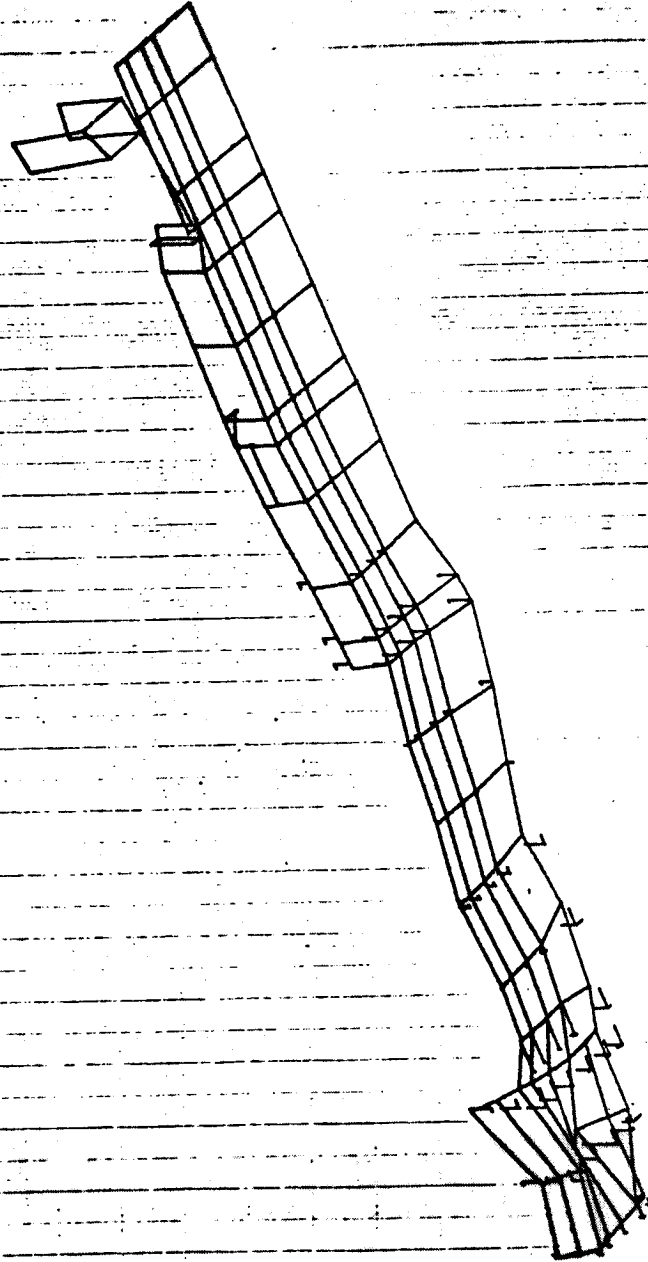
74



PHASE 1 CORBITER PURCHASE-BYEM CASE) MODEL 2  
 SKING HALF EFF. LONG. 88 C EFF. TRANS. AT WING (8-2/9007, 1)  
 FREE MODEL FINED AT INTERFACE  
 MODAL DEFORM. SURFACE 17 MODE 17 FREQ. 639.8001



10/10/74 800-007. 0 1.0000100



PHASE 1 CONTINUED FINSLAR-SYAM CASE) MODEL 2  
 SKING HALF EFF. LONG. 881 EFF. TRANS. AT WING 00-2/2077.1  
 FREE MODES FINED AT INTERFACE  
 MODAL DETON. SUBCASE 17 MODE 17 FREQ. 633.8001

10-10-74 000-007. 1.0010010

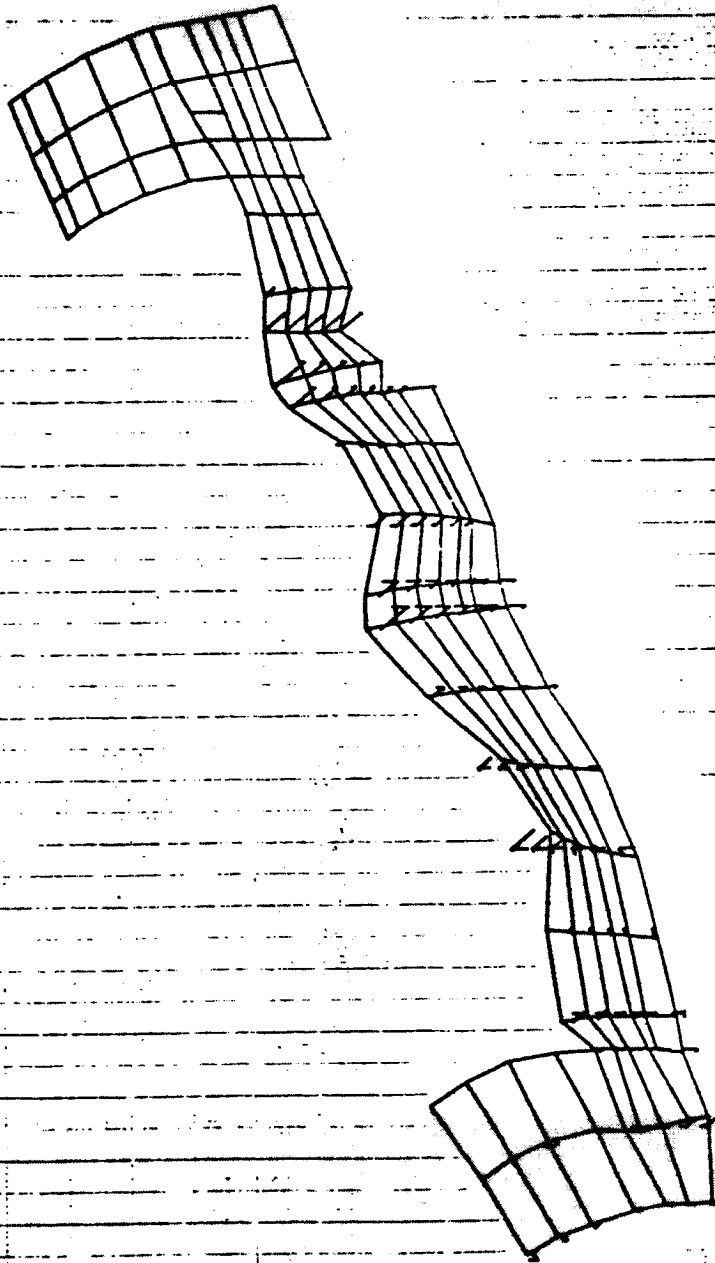


PLATE 1 CONSIDER PIPELAGE-STYAS CASE) MODEL 2  
BEING HALF EFF. LOW. .85 ( EFF. TRANS. AT WIND 10-1/2 EFF. )  
PRE: WOODS PILES / / INTERFAC  
MODA DEFORM. SHCASE 19 MODE 10 FREQ. 076.5816

18 10-10-74 1000-007. - 1.00100010

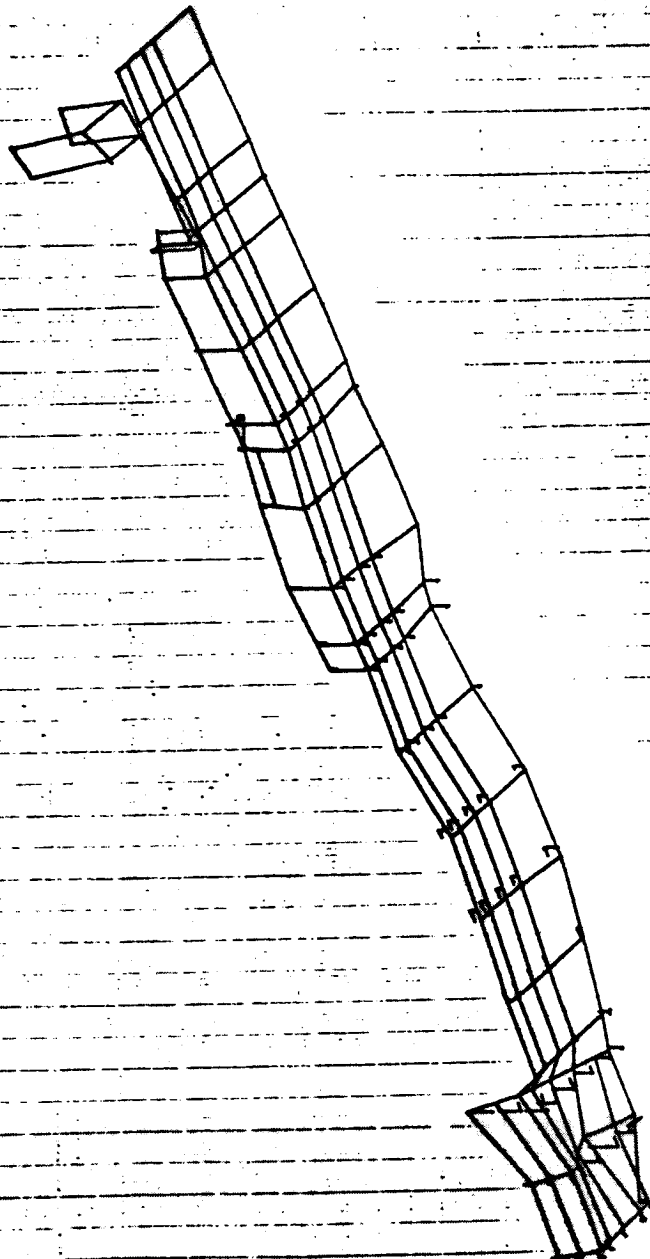
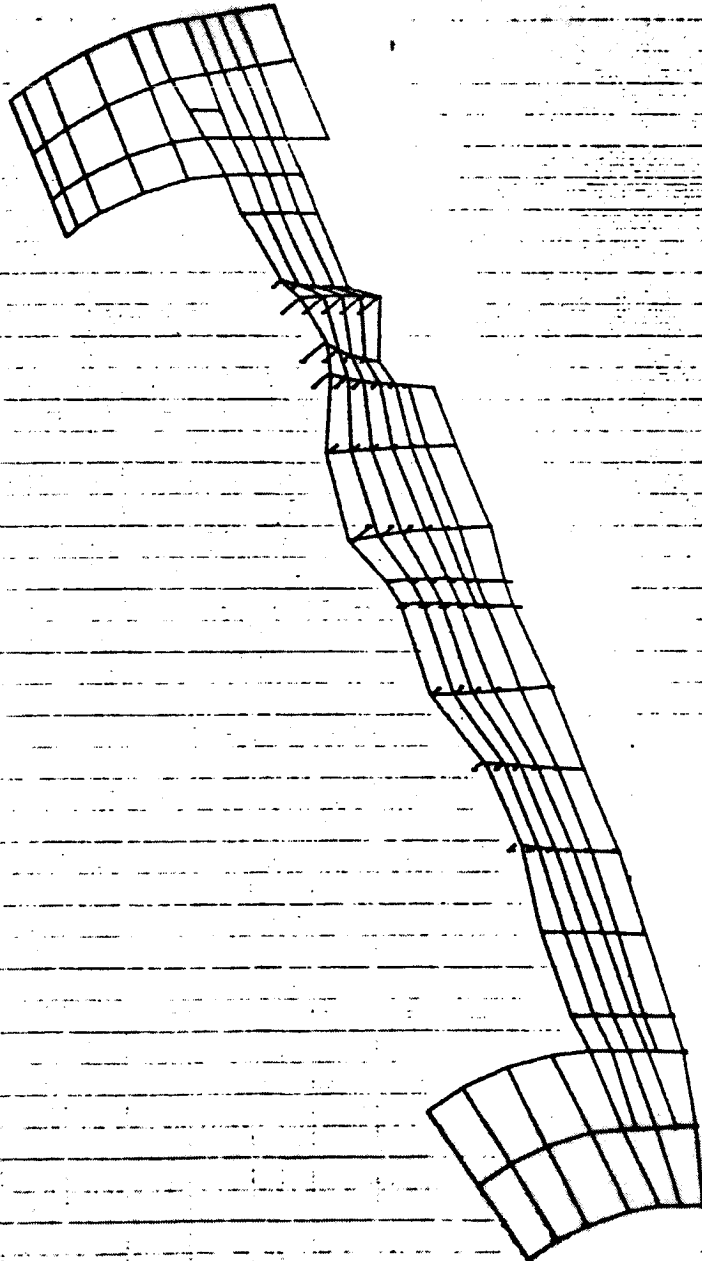


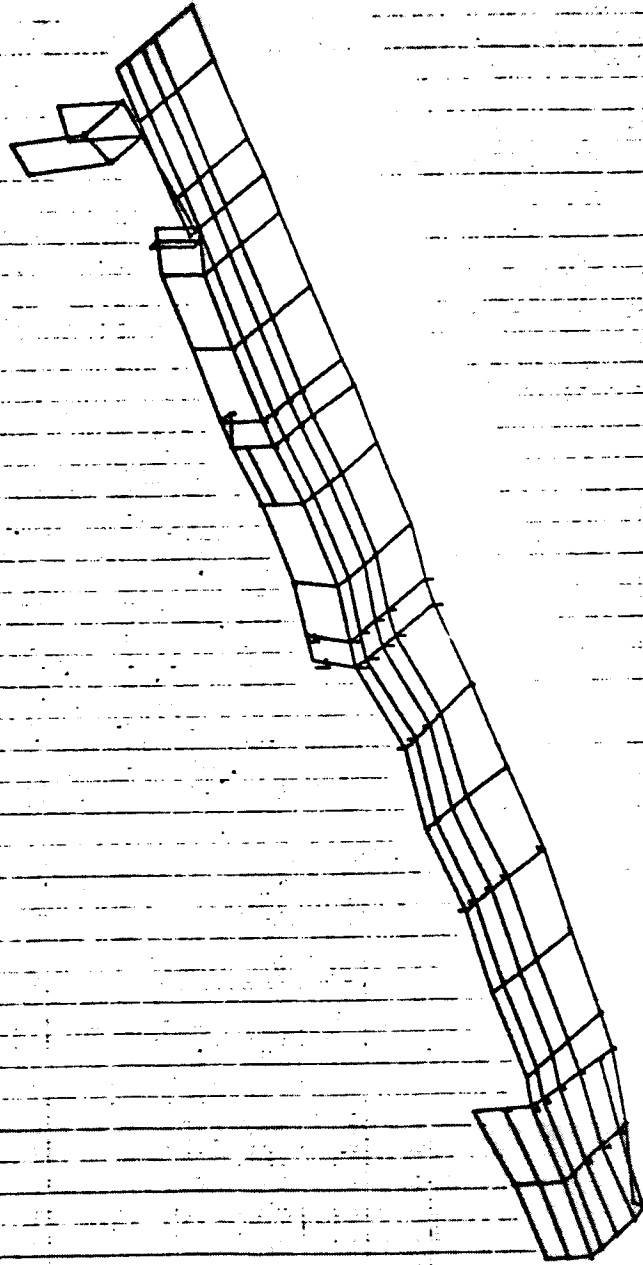
FIGURE 1. COMPLETE FRAMEWORK-STEEL GARDER MODEL. 2  
BEING MADE BY LINDS, 1001 EFT. TRUSS. AT WIND-00-2/0077.1  
FACE WORK FINISH AT INTERFACE  
LOCAL SECTOR. SURFACE IS MADE IS FIG. 070.0000

10/10/74 1441-007, s 1.0001500



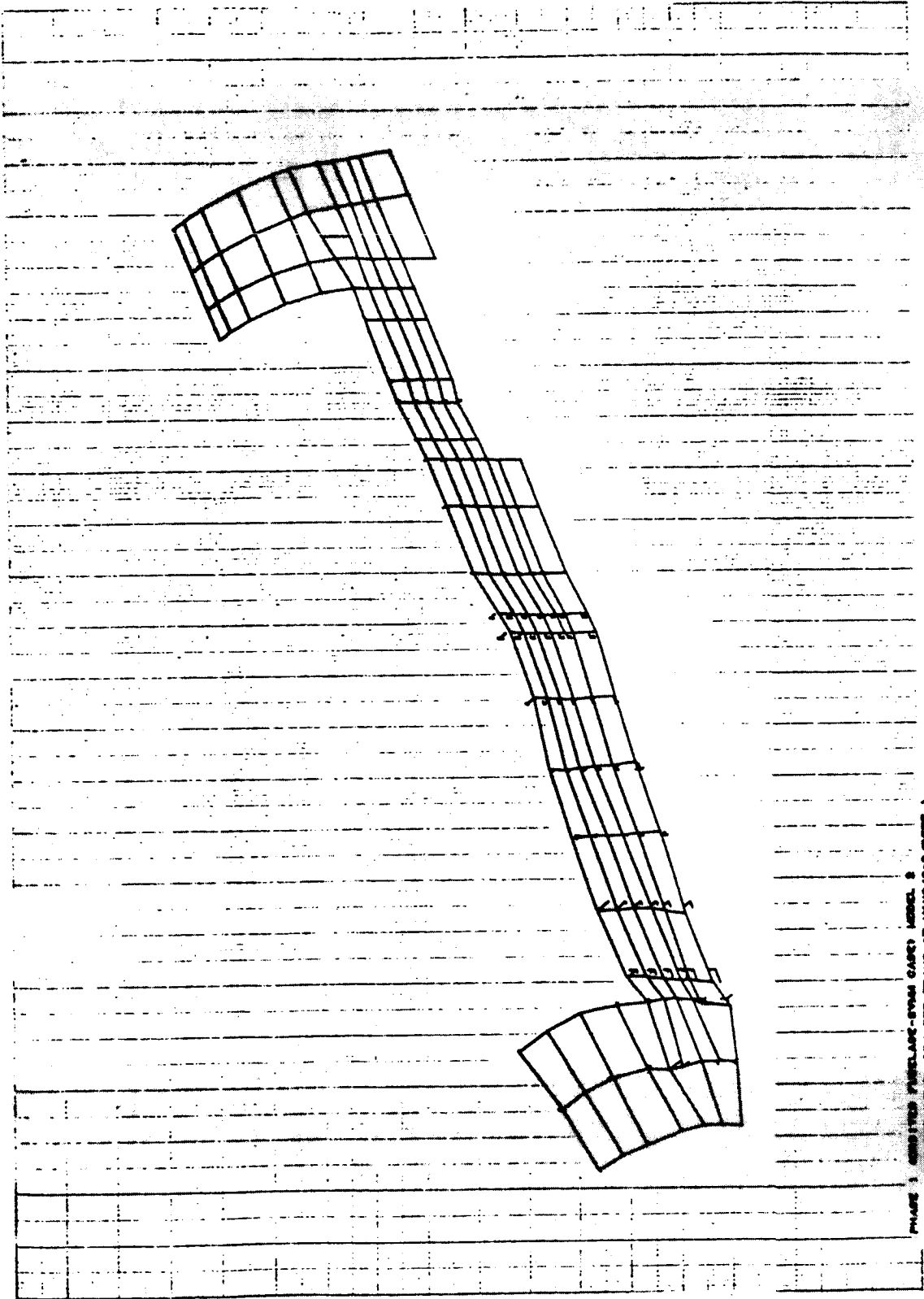
PHASE 1 CONSIDER PUNCLARE-SYMM CASE) MODEL 2  
 FIXING HALF EFF. LOAD. ON C EFF. TRANS. AT WING (0-2/DEPT.)  
 FREE MODES FIXED AT INTERFACE  
 MODAL DEFOR. SUBCASE 14 MODE 15 FREQ. 889.8300

14 10/10/70 100-207, 0 1,0001700



PHASE 1 CRIBSTER FUSELAGE-STYAN CASED MODEL 2  
SICING HALF EFF. LONG. 881 EFF. TRANS. AT WING (9-2/3EFF.)  
FREE MODES FINED AT INTERFACE  
MODAL DETOR. BURSCASE 14 MODE 14 FREQ. 688.8900

F



77 0010740 000-007. \* 1.0000000

PHASE 1. GENERATED FROM CASE MODEL 2  
 BEING HALF OF CASE. BEC EFF. TRANS. AT WING (0-0.0000000)  
 FREE SURFACE PILES AT INTERFACE  
 MODAL DEFOS. SURFACE 20 MODE 20 FREQ. 198.8133

20 10/10/74 1001-027.0 1.0000000

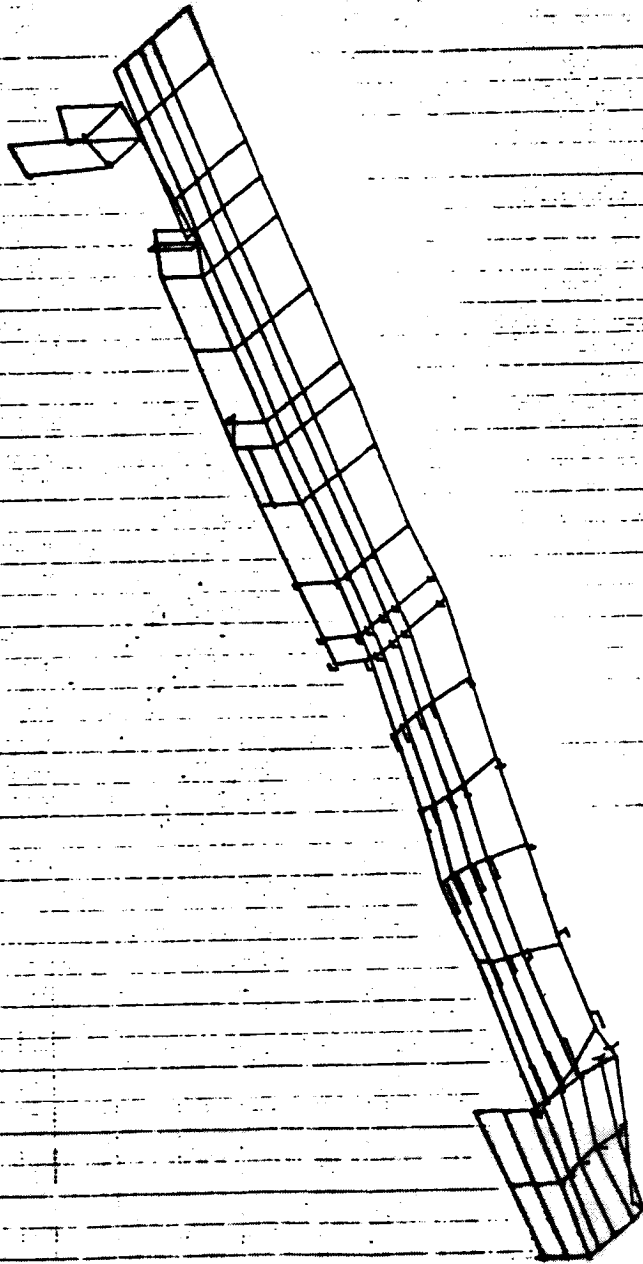
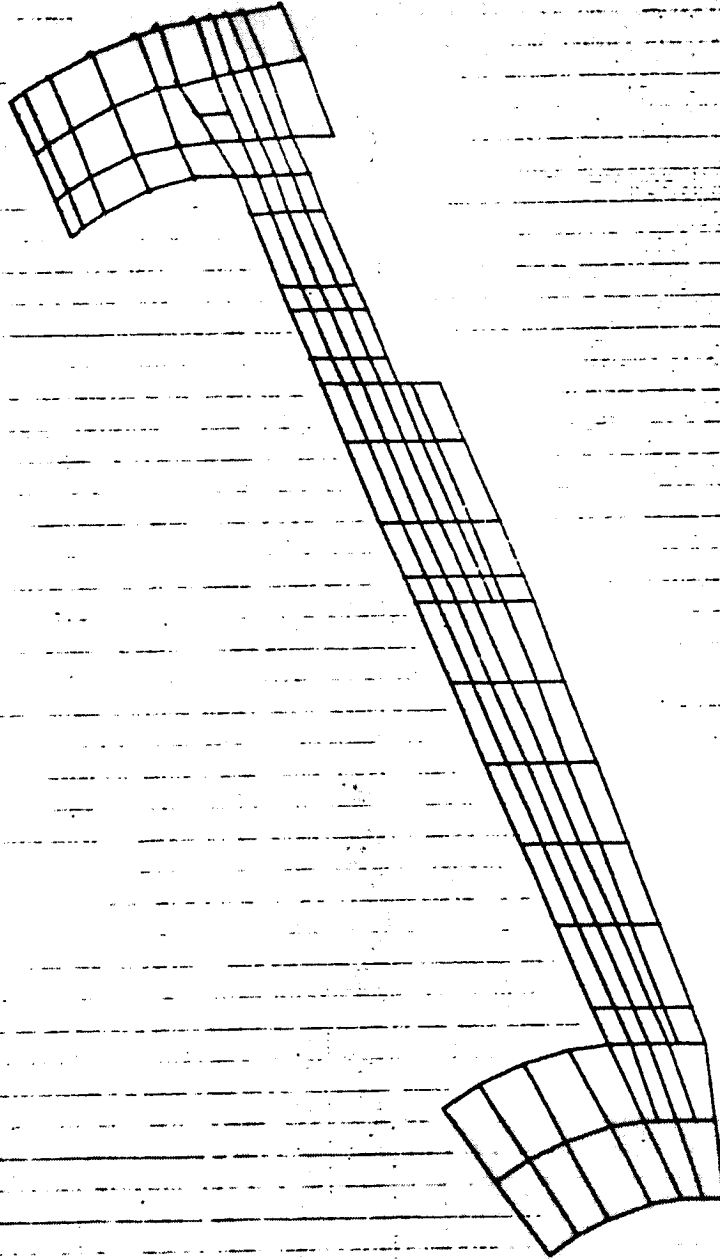


FIGURE 1. ANTENNA ELEMENTS FROM CASE NO. 1  
 SCALE: 1/2" = 1'-0". SEE EY. TRANS. AT MINS 00-2/0077.  
 FREE HOLE FROM SP. INTERFAC  
 MODAL DEFEN. DRAWING NO. 1001-027.0 1001-027.0

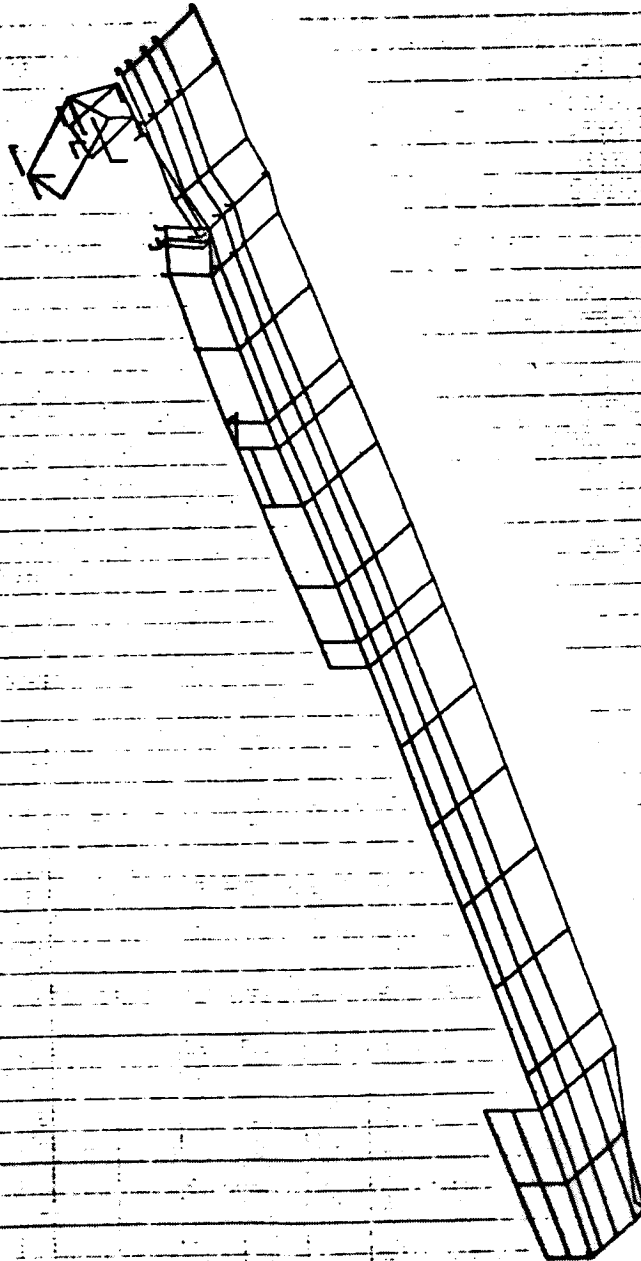
70 10/10/74 MON-OCT. 0 1.17148570



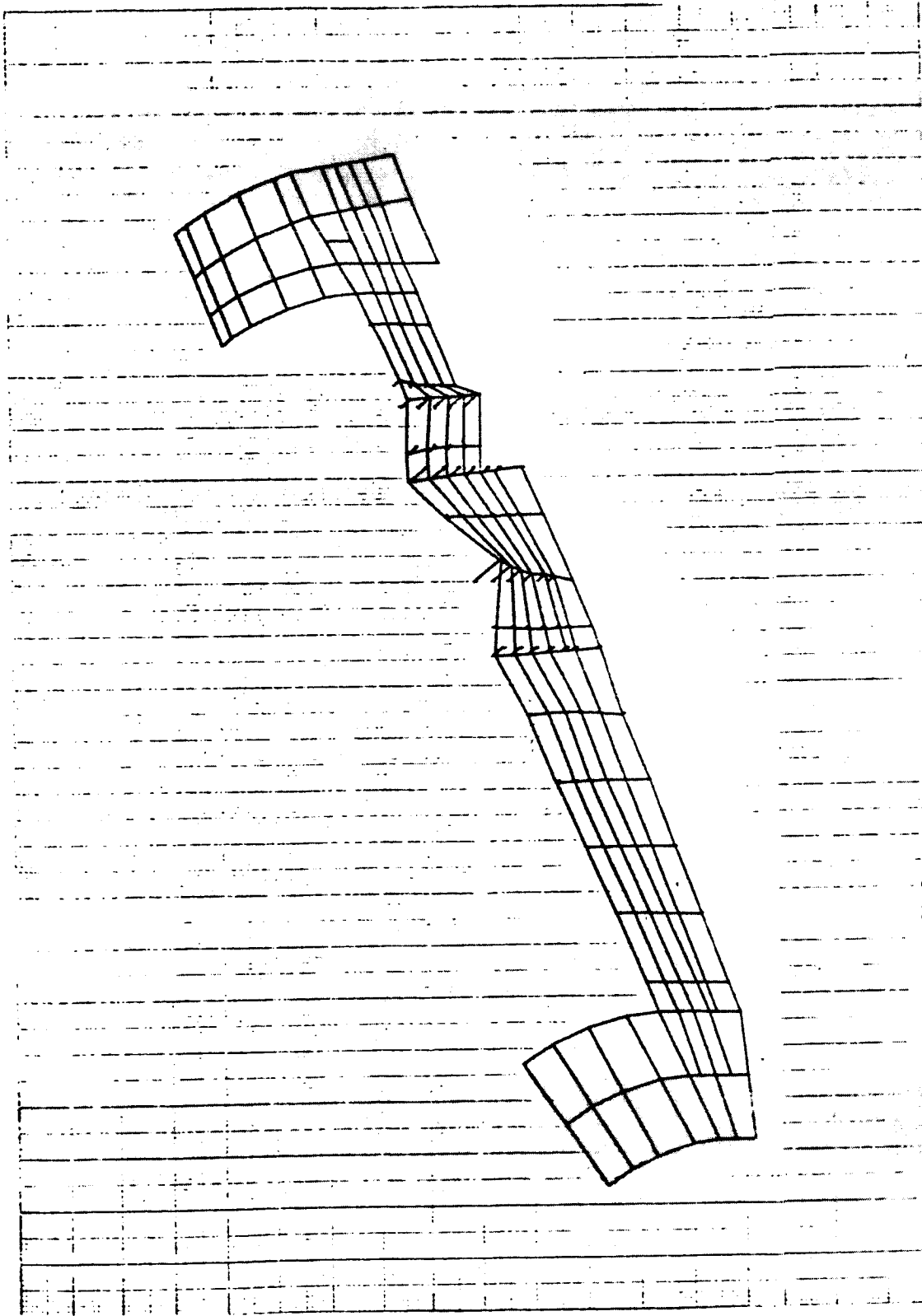
PHASE 1 CONTINUED (SUBCASE-5704 CASE) MODEL 2  
BEING HALF OFF LINE - P81 (PT. TRANS. AT MIN 03-2/2077.)  
FREE MORSE FINISH AT INTERFACE  
MODAL SECTION, SUBCASE 21 MODEL 21 (PREF. 78-1, 8008



21 10/10/74 344-007, 0 1, 17540000

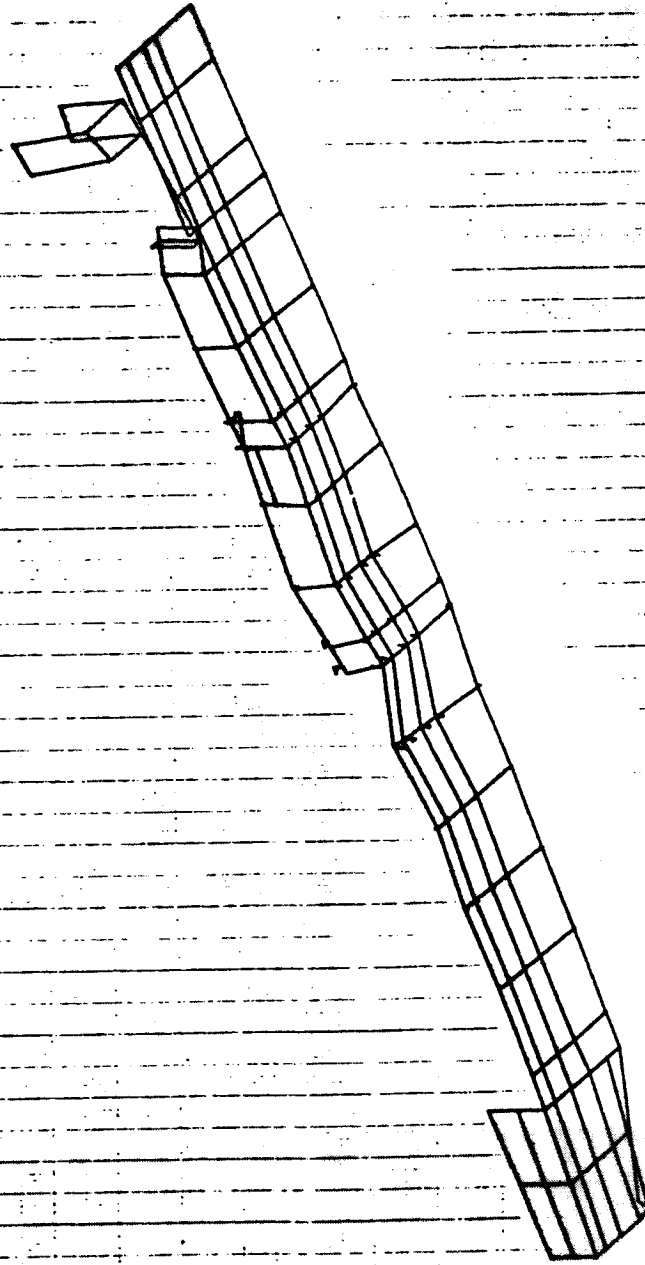


PHASE 1 CORBITER FUSELAGE-SYMM CASE) MODEL 2  
 BEING HALF EFF. LONG. BE ( EFF. TRANS. AT WIND 00=2, 00=277.)  
 FREE MEMES FINED AT INTERFACE  
 MODAL DEFOS. SURFACE 21 MODE 21 FREQ. 104.2308



PAGE 3 CONTAINS ENCLAVE-SPIN CASE) MODEL B  
 ON 48 HALF SPIN CASE) CASE OFF TRANS AT WING (0.8 LEFT)  
 PA 1 MODEL PUSED 1 INTER FACE  
 W 1 JETON. SUB CASE 22 WPC 22 PA 10. 778.5280

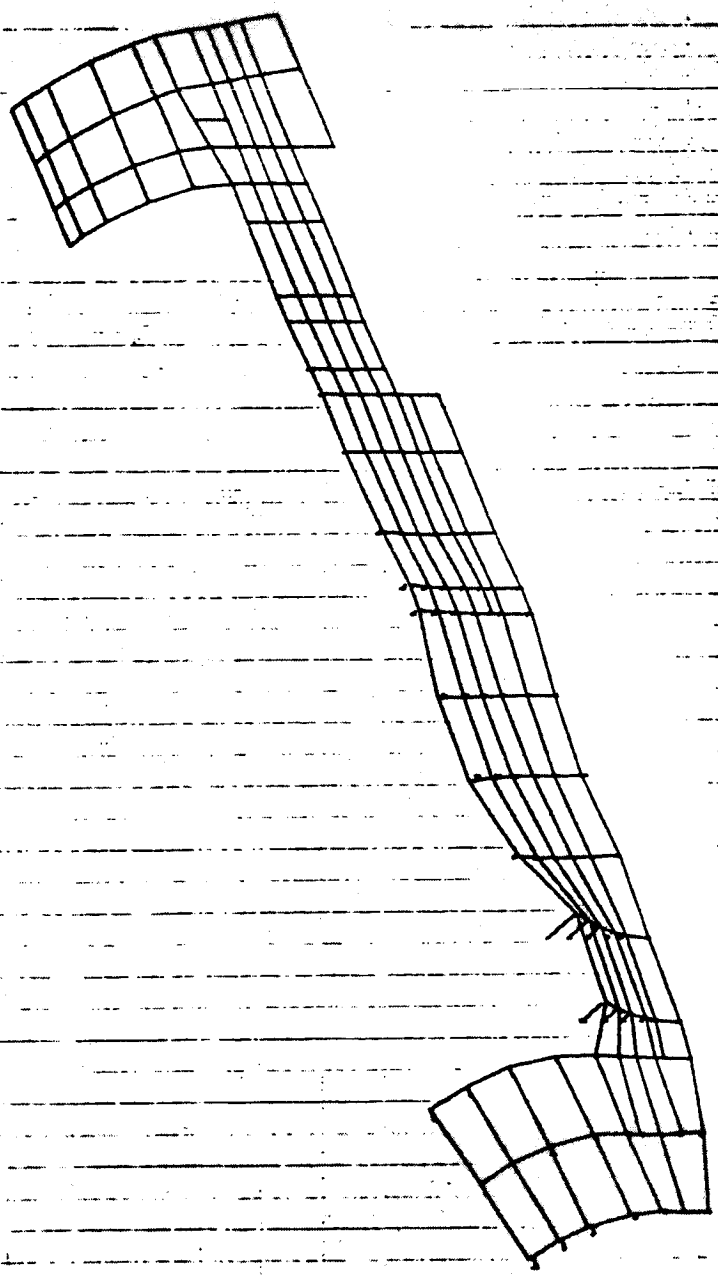
22 10/10/74 0000-007. 0 1. 00000000



PHASE 1 CONTINUED PURCHASE-STUDY CASE) MODEL 2  
BEING HALF EFF. LONG. SEE EFF. TRANS. AT WING-08-2/0877.1  
FREE MODEL FINES AT INTERFACE  
LOCAL SECTOR. SUBCASE 22 MODE 22 FREQ. 176.3380

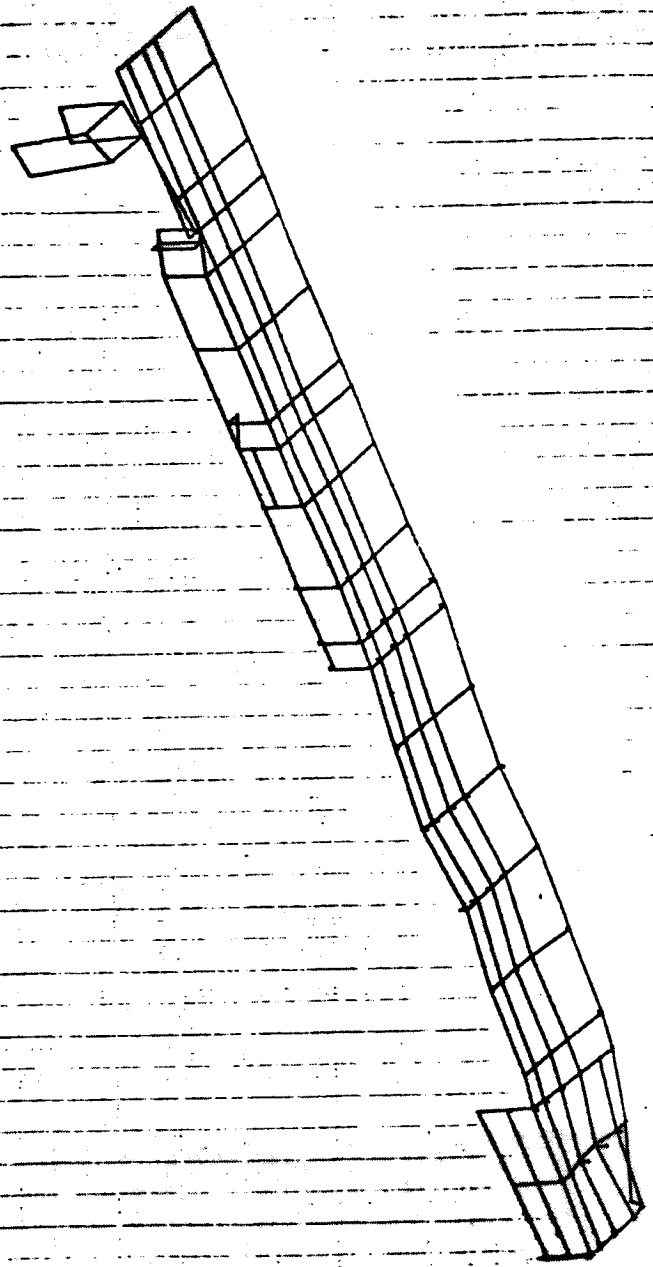
80

80 10/18/74 140 31 1.00000000



PHASE 1 CONTINUES FURNISHING-STEAM CASES MODEL 2  
 BEING MADE OFF-LINE. SEE CTF. TRANS. AT WING 00-0/0007.1  
 FREE MODEL FINISH AT INTERFACE  
 LOCAL DEPT. SURFACE 20 MODEL 20 PRCO. 011.0000

20 10/18/74 000-007. 1.000000



PHASE 1 ORBITER FUSelage-SYAM CASED MODEL 2  
 BEING HALF EFF LONG. 881 EFF. TRANS. AT WING 02-2/2077.1  
 FREE MODES FINES AT INTERFACE  
 MODAL DETOR. SURFACE 23 MODE 23 FREQ. 811.0886

01

10/18/74 1000-007, s. 1.0000000

01

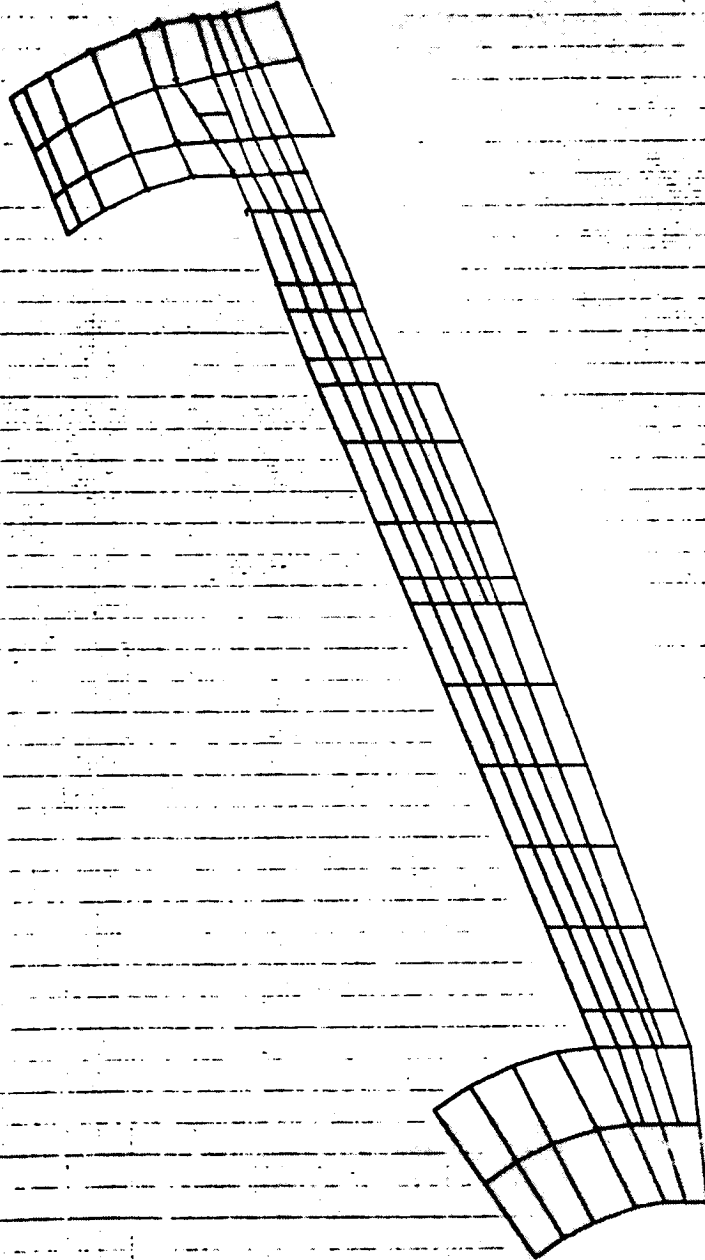
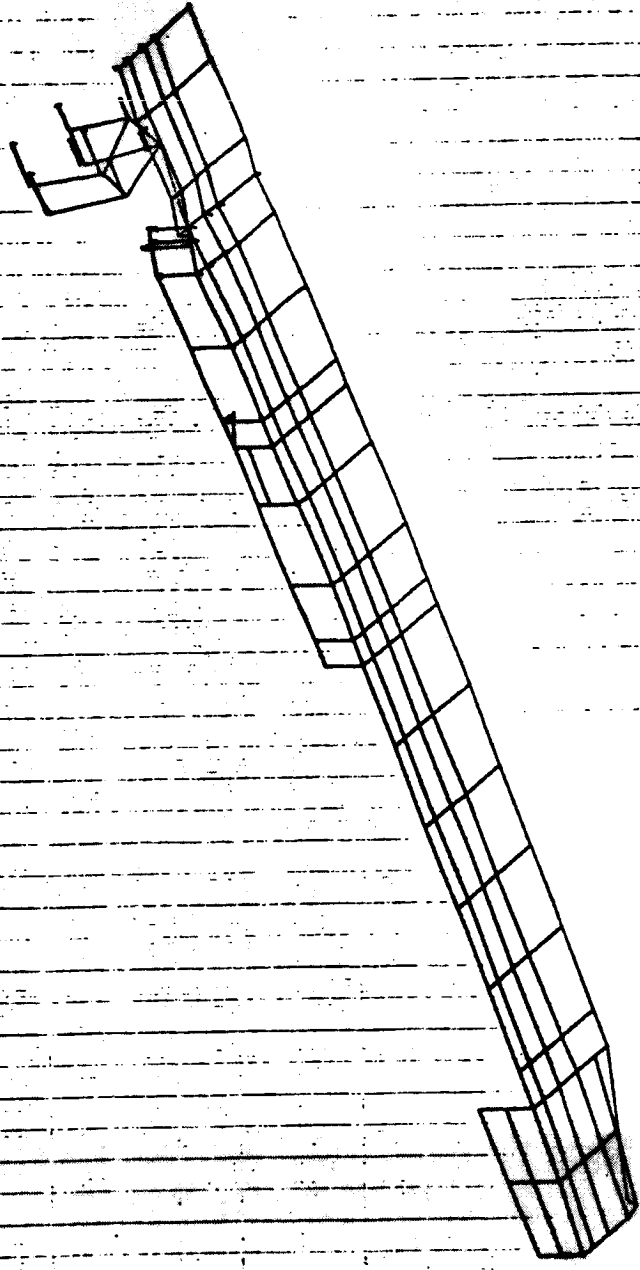
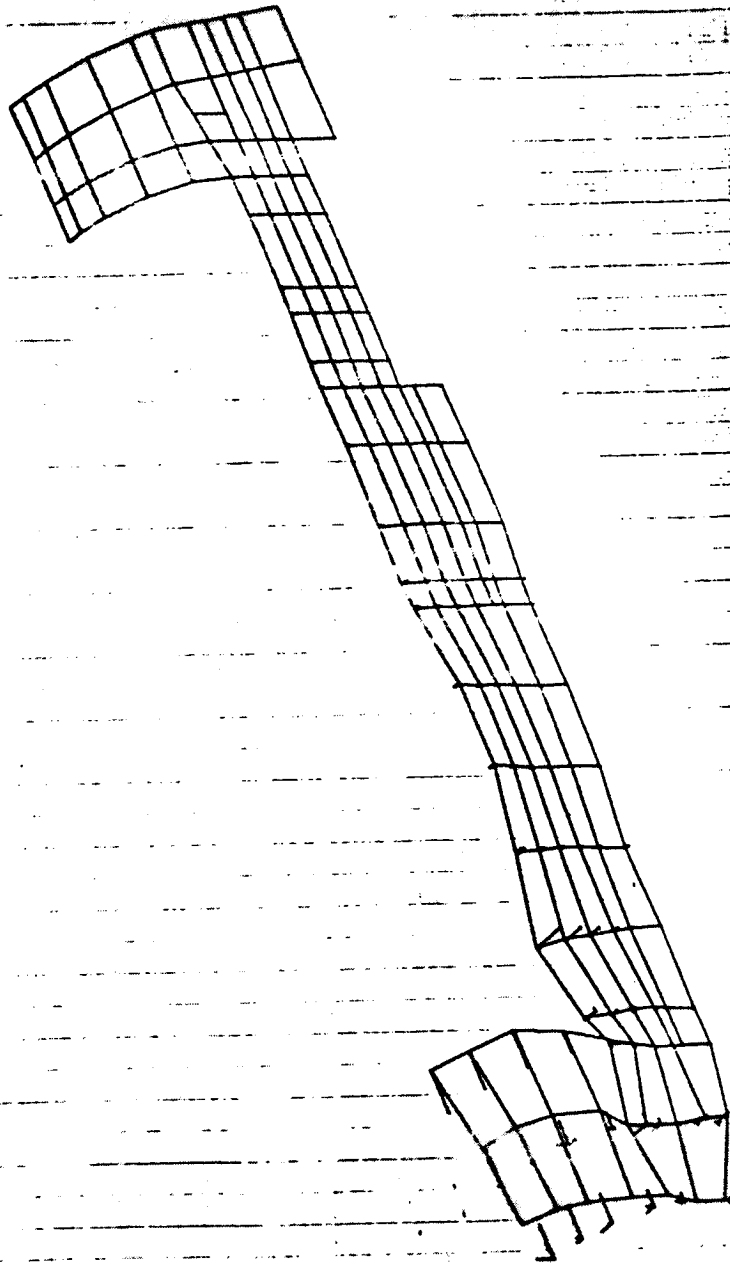


FIG. 1 (CONTINUED) PANELS FROM CASE 1 (SEE FIG. 1)  
 OF HALF SPAN, 1/2 BAY, PANELS AT X=0 TO X=1/2  
 OF CASE 1 (SEE FIG. 1) - TYPICAL  
 IN UPPER SURFACE OF WING

24 00000000 00000000 00000000



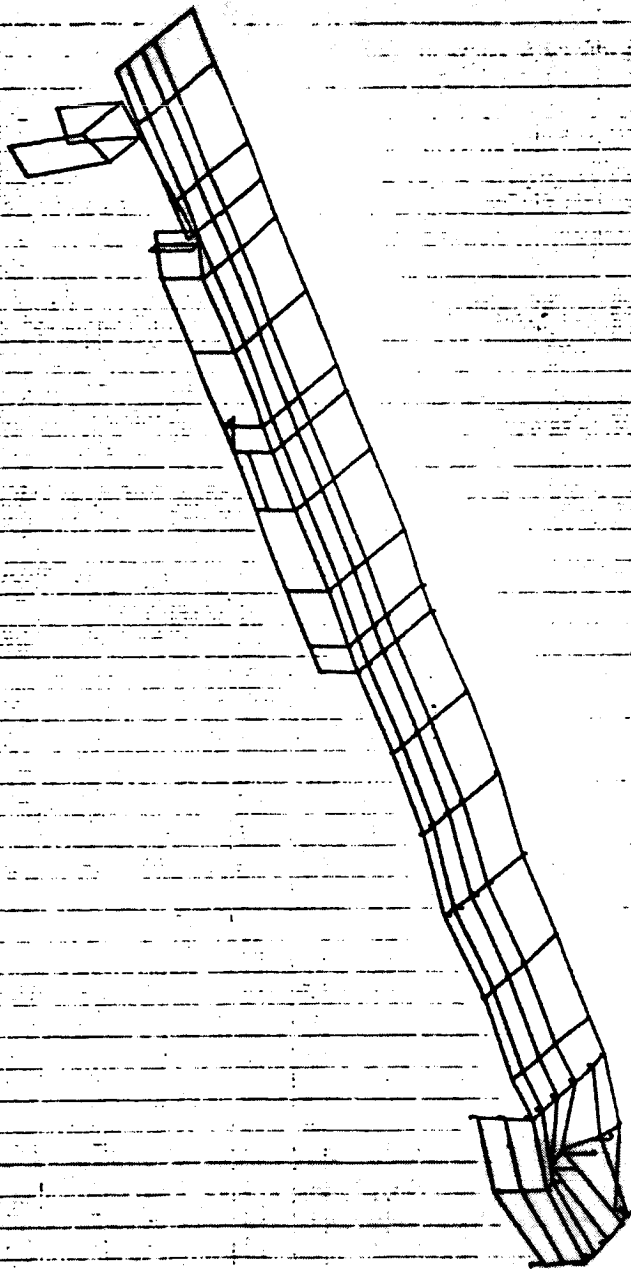
PHASE 1 SENSITIVE PERIPHERAL-COMM CASES LABEL 2  
 DRING MAP OFF LIMS, 00 ( 577, TRANS, AT WING 00-03/2077 )  
 FREE CASES PILED AT INTERFADE  
 LOCAL SEVEN, BARRAGE 24 JCODE 24 FREQ. 001.0000



PHASE 1 CRUISER FUELAGE-PYRA CASE) MODEL 2  
SKIN HALF 577.LONG, 88 ( ETT. TRANS. AT MID 09-25/2577.)  
FREE NODES FIXED AT INTERFACE  
LOCAL DEFOR. SURFACE 25 MODE 25 FREQ. 648.7732

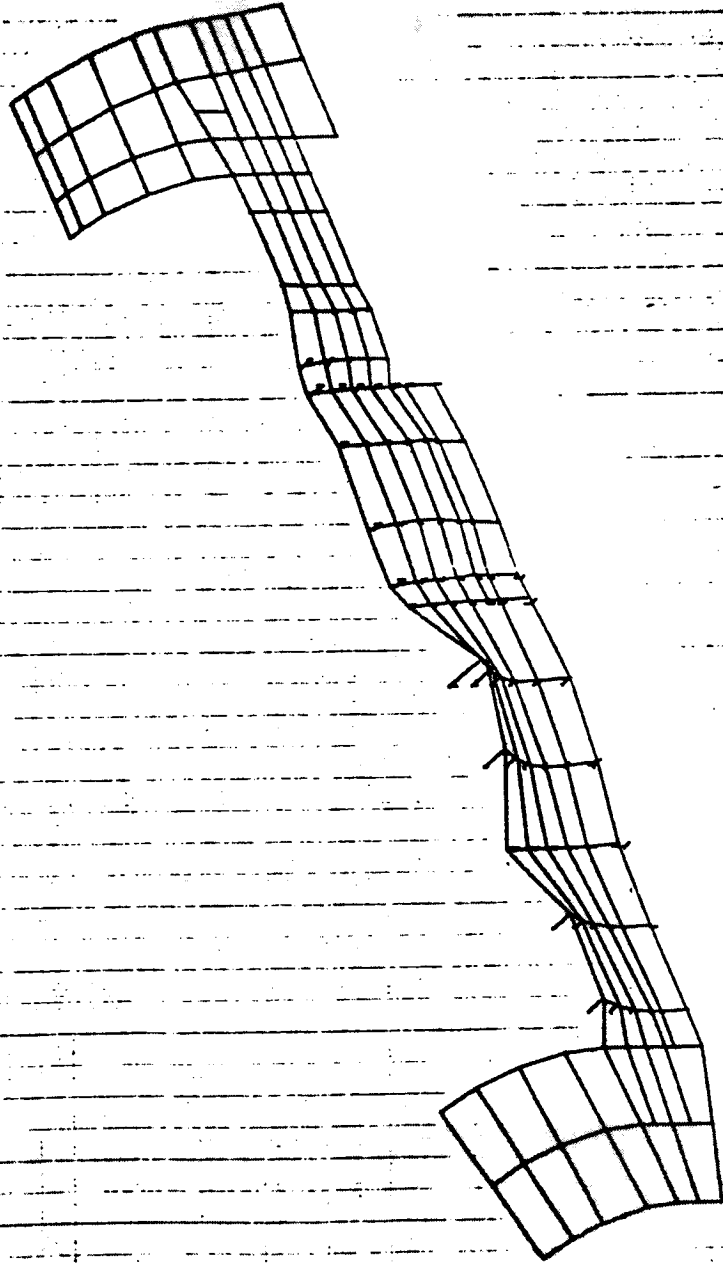


10 10/10/74 100-207, 4 1, 1000000



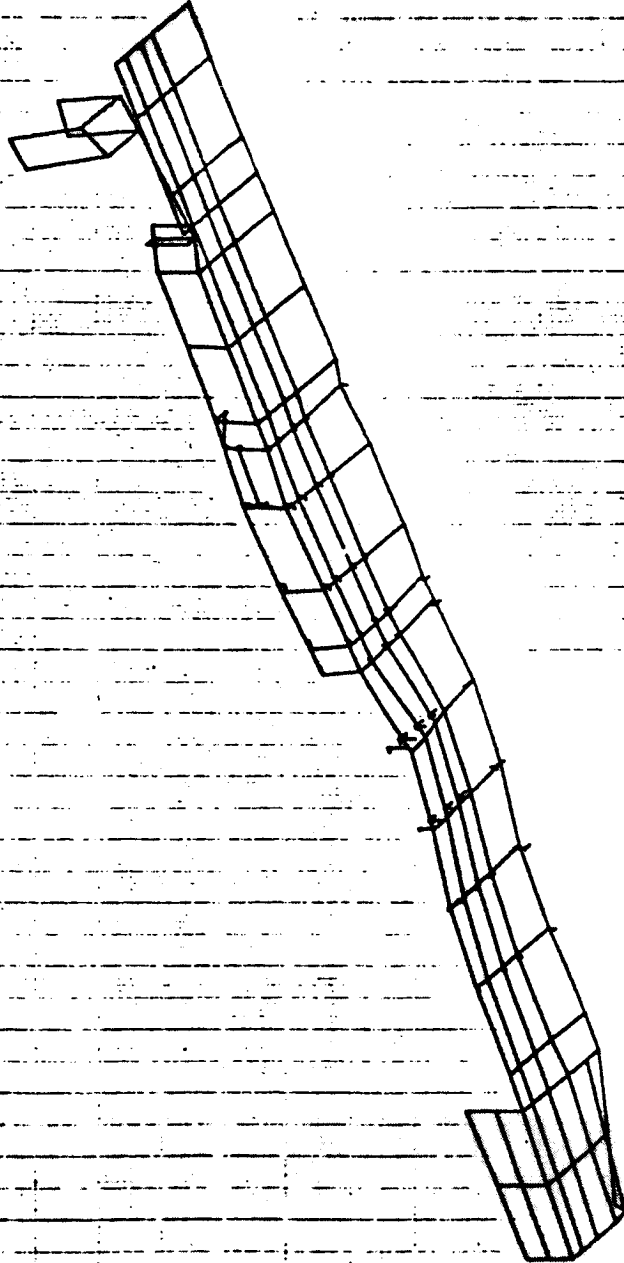
PHASE 1 ORBITER PAKELAGE-CYMS CASES MODEL 2  
BEING MADE BY LAMAR. 05 ( EYE TRANS. AT WIND 0-2/3/CTT. )  
FREE MODEL FILES AT INTERFACE  
LOCAL OFFICE. SUNDAY 20 1950 20 FREE. 040.7132

NO 181874 UNK-DEF. - 1.04711840



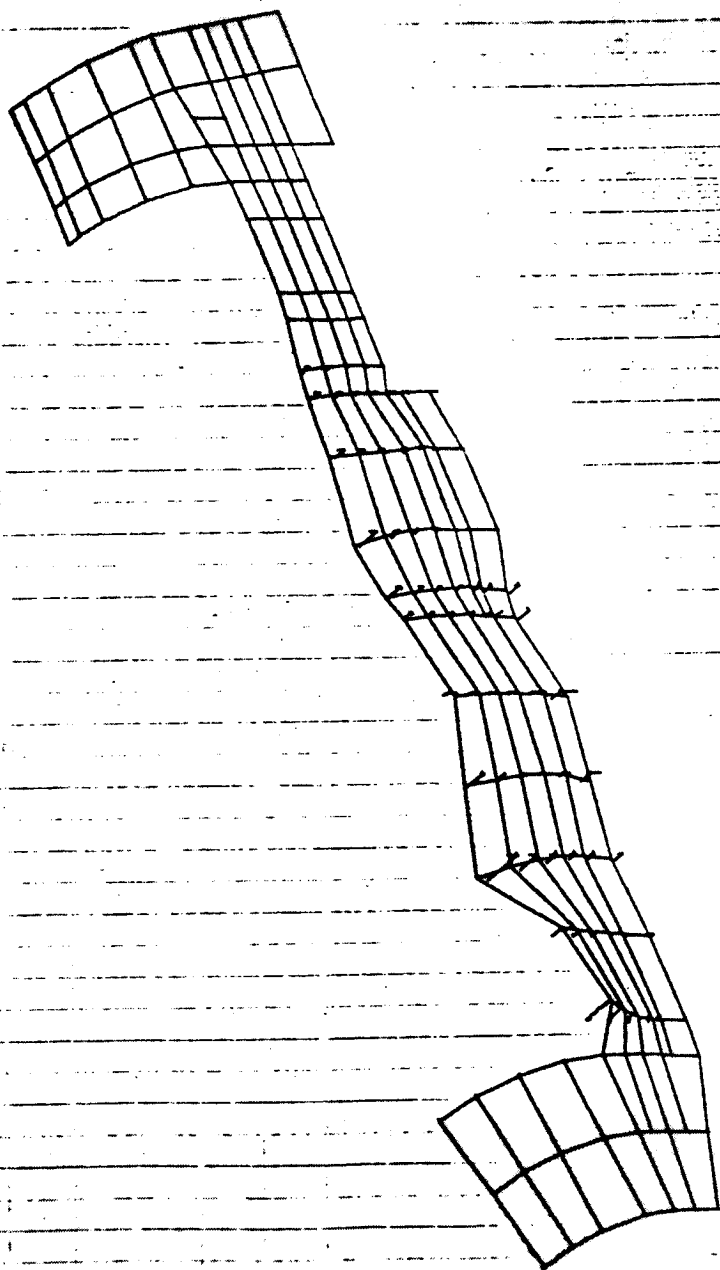
1 CENTER PANELAGE FROM CASE: MODEL 9  
2 HALF CUT LONG: 88% EFF. TRANS. (0.98) 100% EFF. 1.3  
3 JOINTS FINED AT INTERFACE  
4 DETON. 819 100% TO MOVE TO 100% 811180

20 10/18/74 MM-827. • 1.0711340



PHASE 1 COMPLETE PURCHASE FROM CARD MODEL 2  
BEING MADE EFF. 10/18/74 (EFF. TRANS. AT 11/18/74/1977.)  
FREE MODEL FROM BY INTERV. AGE  
MODEL 20/20. 10/18/74 NO 10/18/74 20 10/18/74

18/12/74 MAN-007. = 1.00000000

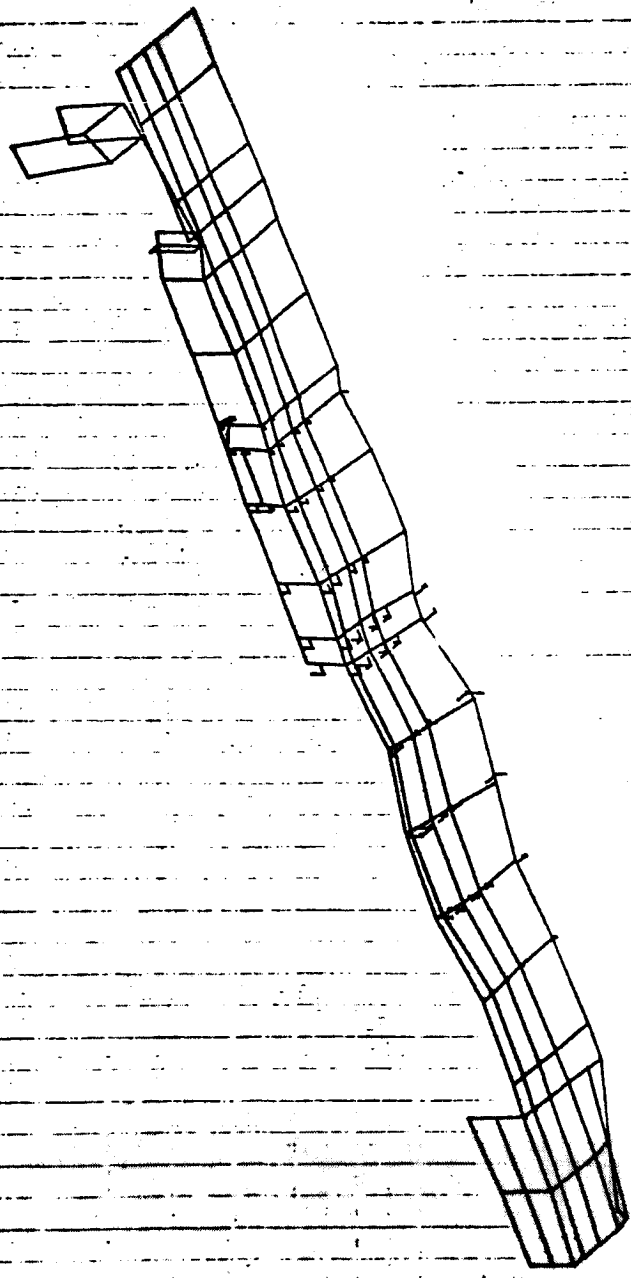


PHASE 1. ORBITER FURCARE-SYMA CASE) MODEL 2  
 BEING HALF OFF-LOAD. 88 ( EFF. TRANS. AT WING (0-2/3077.)  
 FREE MODES FIXED AT INTERFACE  
 MODAL ORDER, SUBCASE 27 MODE 27 FREQ. 125.8884

27

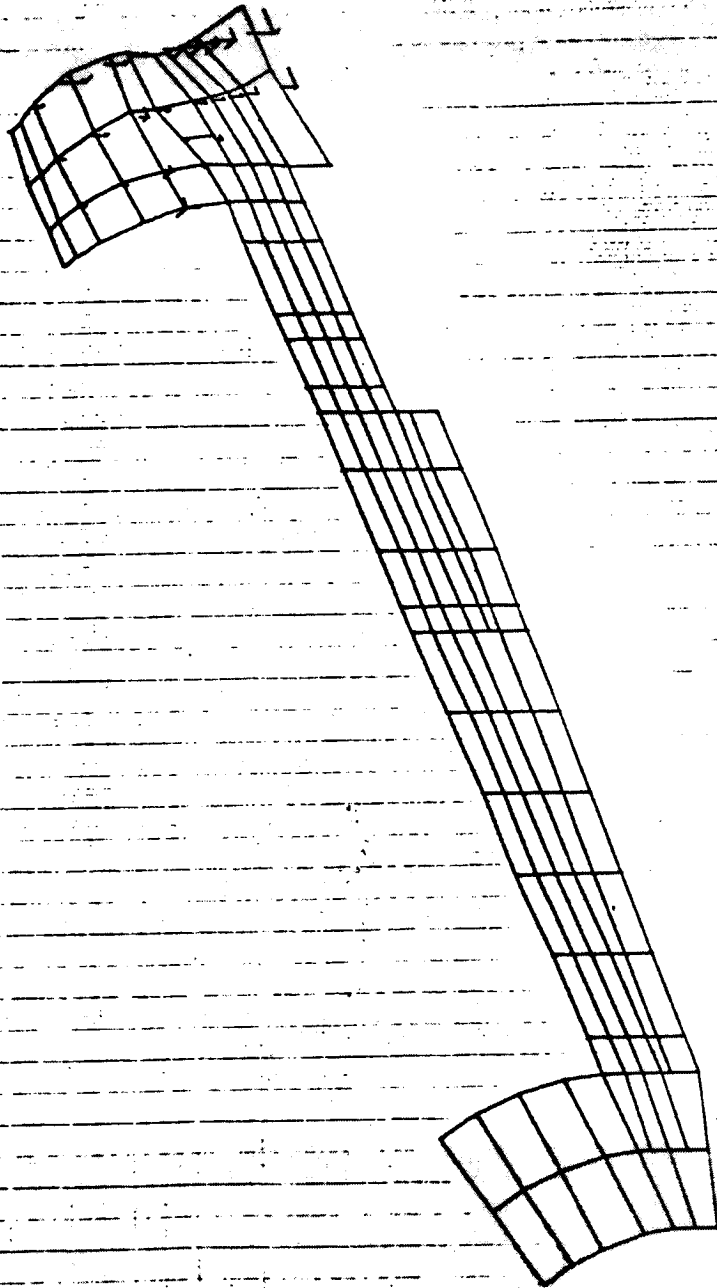
10/10/74 1000-007. \* 1.00000000

27



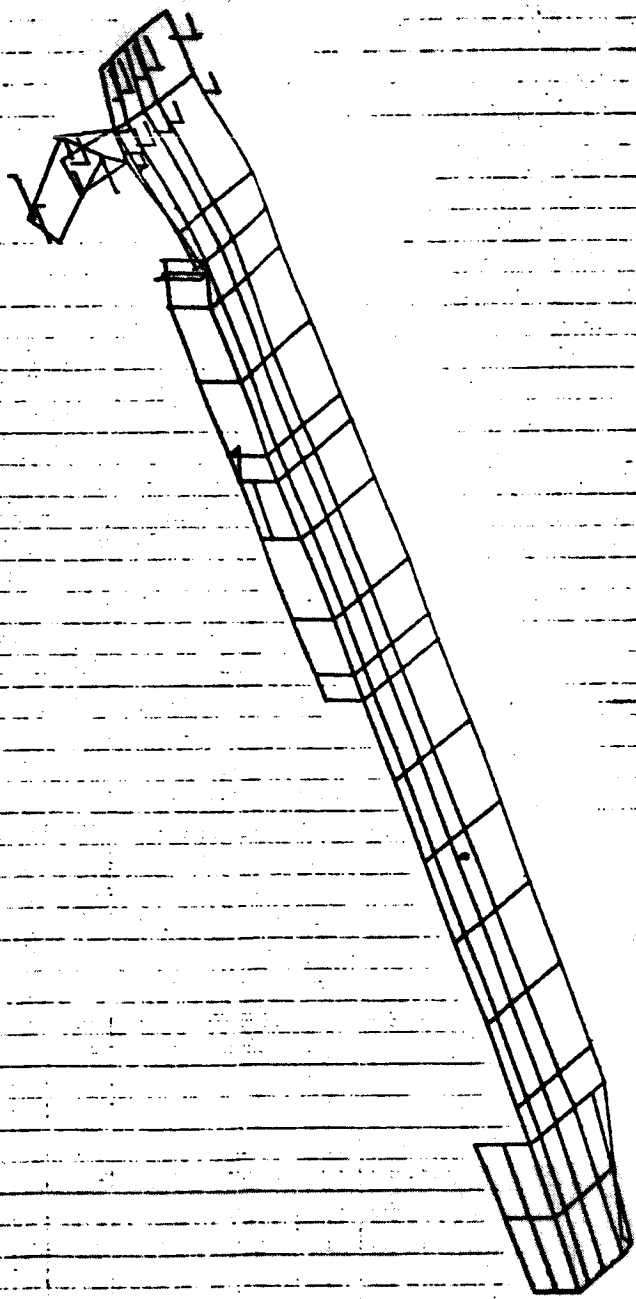
PHASE 1 CONTINUED FINISH-LINE CASE) MODEL 2  
 SKIN HALF EFF. LONG. 081 077. TRANS. AT WING 09-2/2077.  
 FREE MOVS PIVOT AT INTERFACE  
 MODAL DETOR. SURFACE 27 MODE 27 FREQ. 928.8884

00 10/10/74 1000-007, 0 1, 00000000



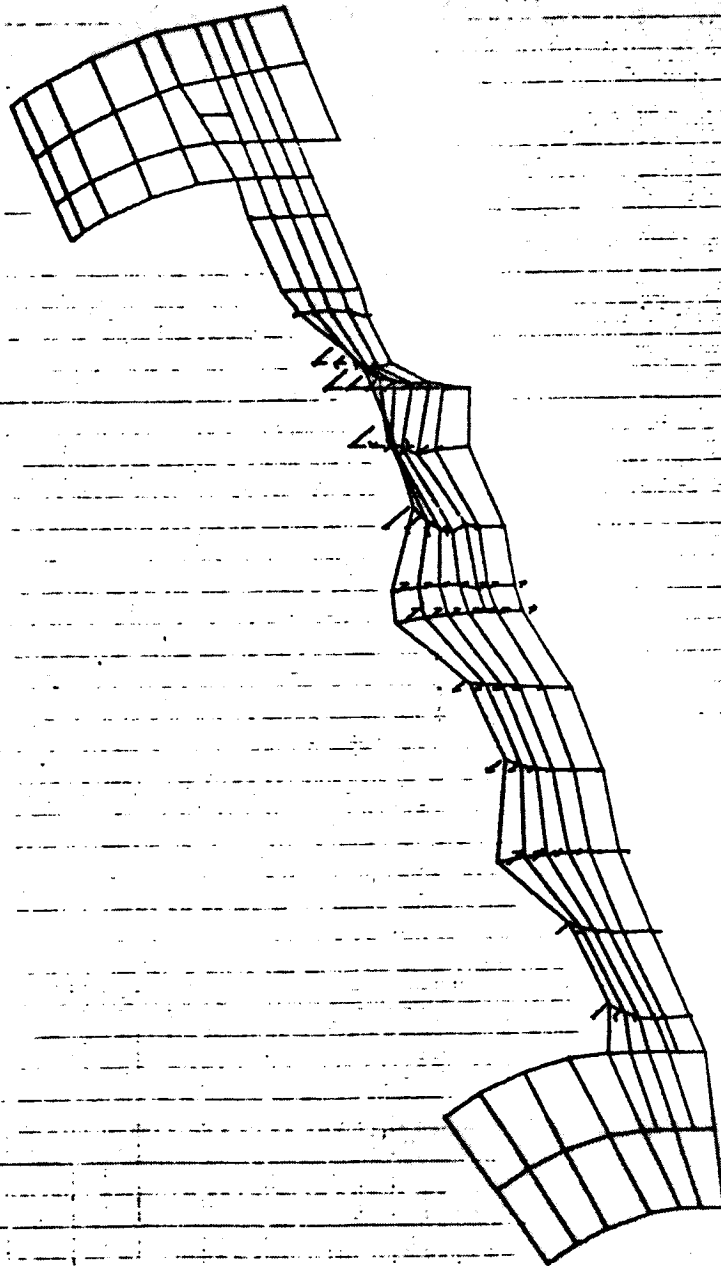
PHASE 1 CORBITER FURKEL-ARC-SYMM CASE) MODEL 2  
BEING HALF OFF-LOAD, 0.01 OFF. TRANS. AT WING (0.0-0.0/0.0/0.0)  
FREE NODES FIXED AT INTERFACE  
MOT. DETCH. SUBCASE 24 MODEL 20 FIG. 947-0031

10/10/74 000-007, 0 1, 00000000



PHASE 1 CONSIDER FURGLASC-07000 CASE; MODEL 2  
 BEING HALP EFF. LON. 08 ( EFF. TRANS. AT WIND 08-02/2077 )  
 FREE MOSES FINES AT INTERFACE  
 MODAL BEYON. SURFACE 28 MODE 26 FREQ. 117.6081

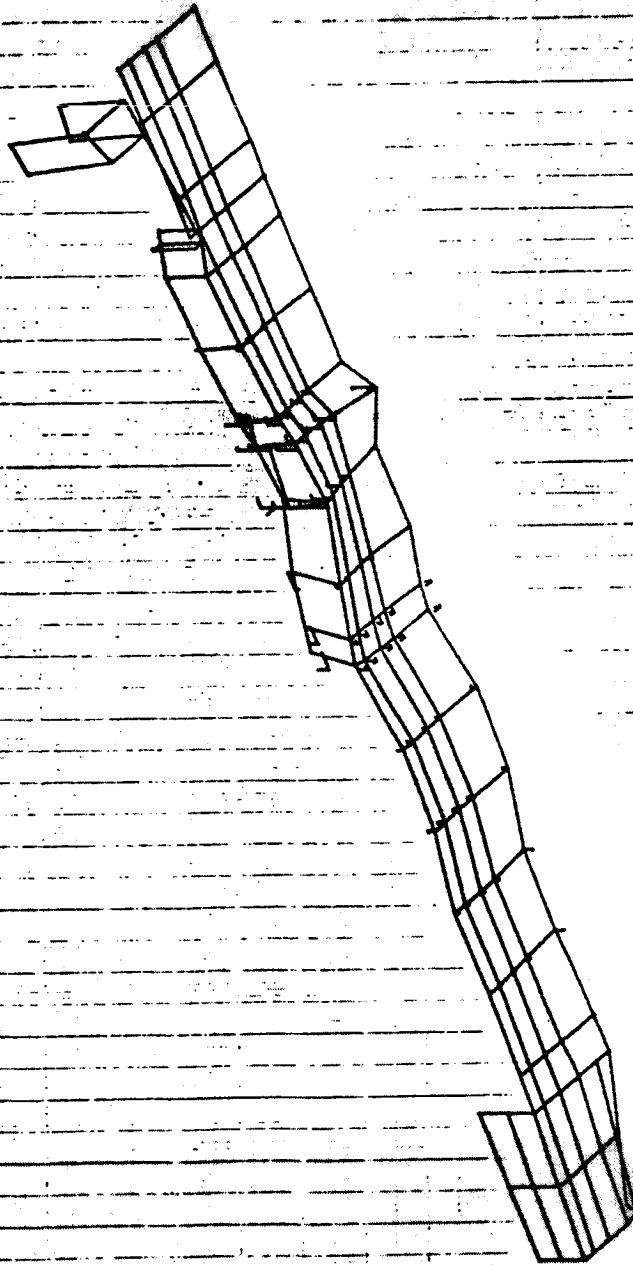
00 10/10/74 1000-007. 0 1. 00000000



PHASE 1 GENESIS FINELINE-SYMA CASED MODEL 8  
BEING HALF EPT.LONG. 686 EPT. TRANS. AT NING 08-2/2077.1  
FREE NODES FIXED AT INTERFACE  
LOCAL DCTOR. SURFACE 24 MODE 24 FREQ. 488.8284

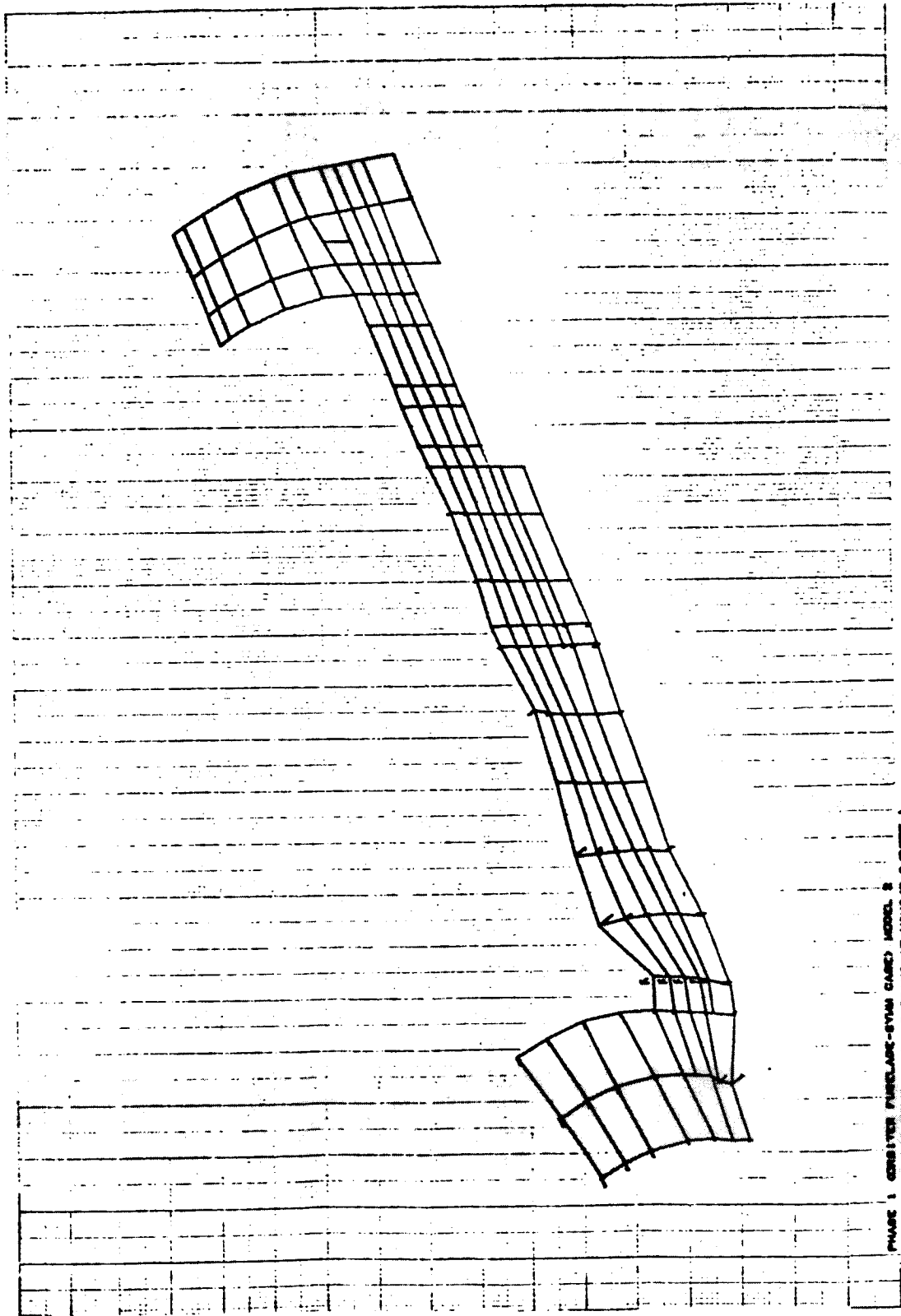


10-10-74 1000-007, 0 1.0000000



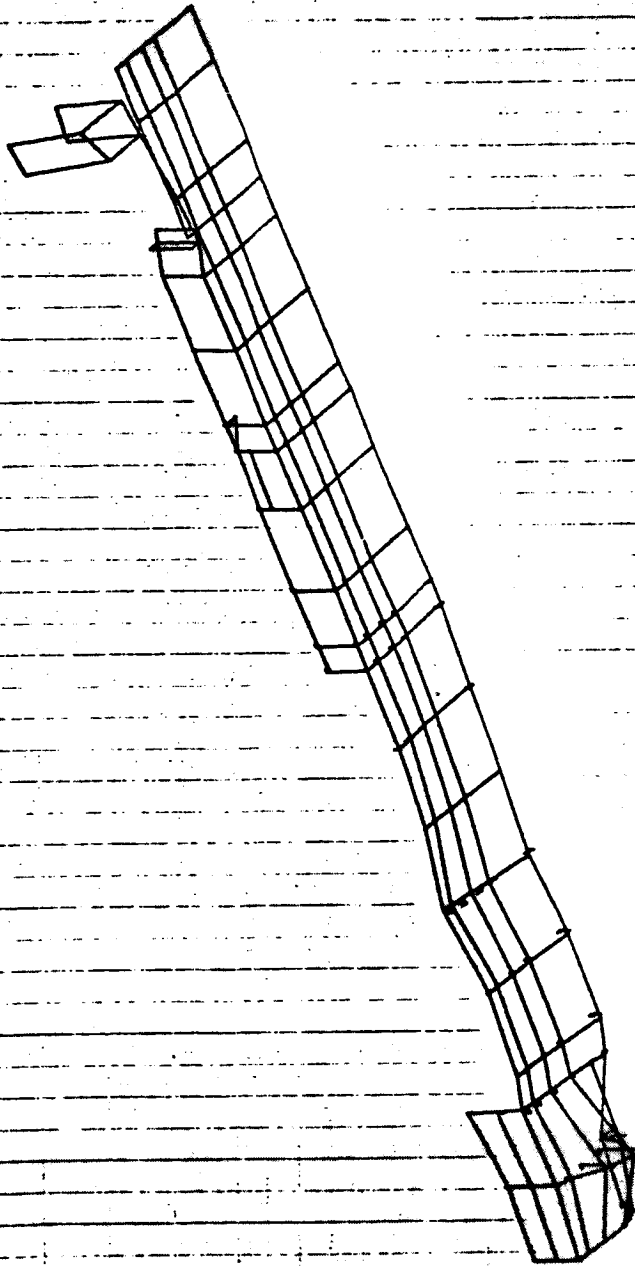
PHASE 1. CONSIDER PURLIN-TO-RIGID JOINT. 2  
 SKIN HALF EFF. LENS. 80% EFF. TRANS. AT VIBR. 0.2/DEFT. 1  
 FREE MEMB. FINES AT INTERFACE  
 MODAL DETERM. BARRAGE 24 MODE 24 FREQ. 989.0289

07 10710714 1111-007. 0 1.0 000000



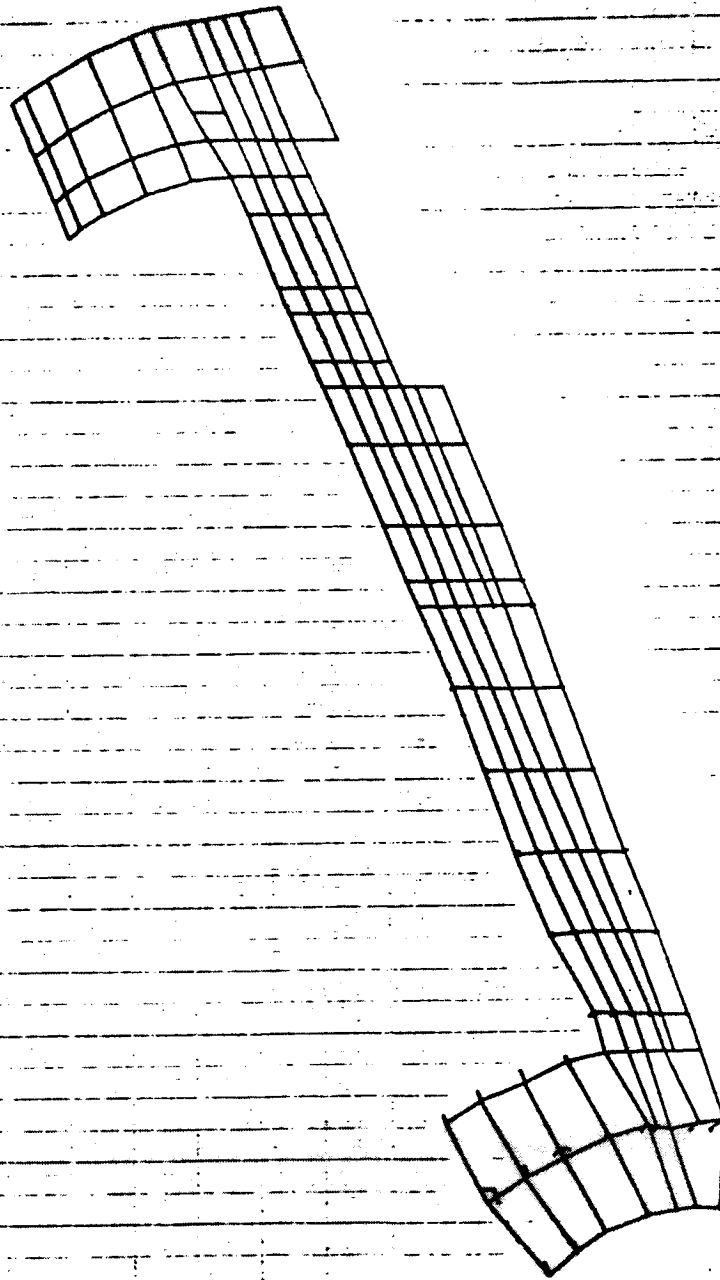
PHASE 1 CONCRETE FINISHING-SYMM CASE) MODEL 2  
SKIN HALF EFF. LONG. BEC EFF. TRANS. AT MIDSPAN (R=0.2/0.077.)  
FREE NODES Pinned AT INTERFACE  
MODAL ORDER. SUBCASE 30 MODE 30 FREQ. 149.8348

20 0070070 000-007, 0 1, 0-000000



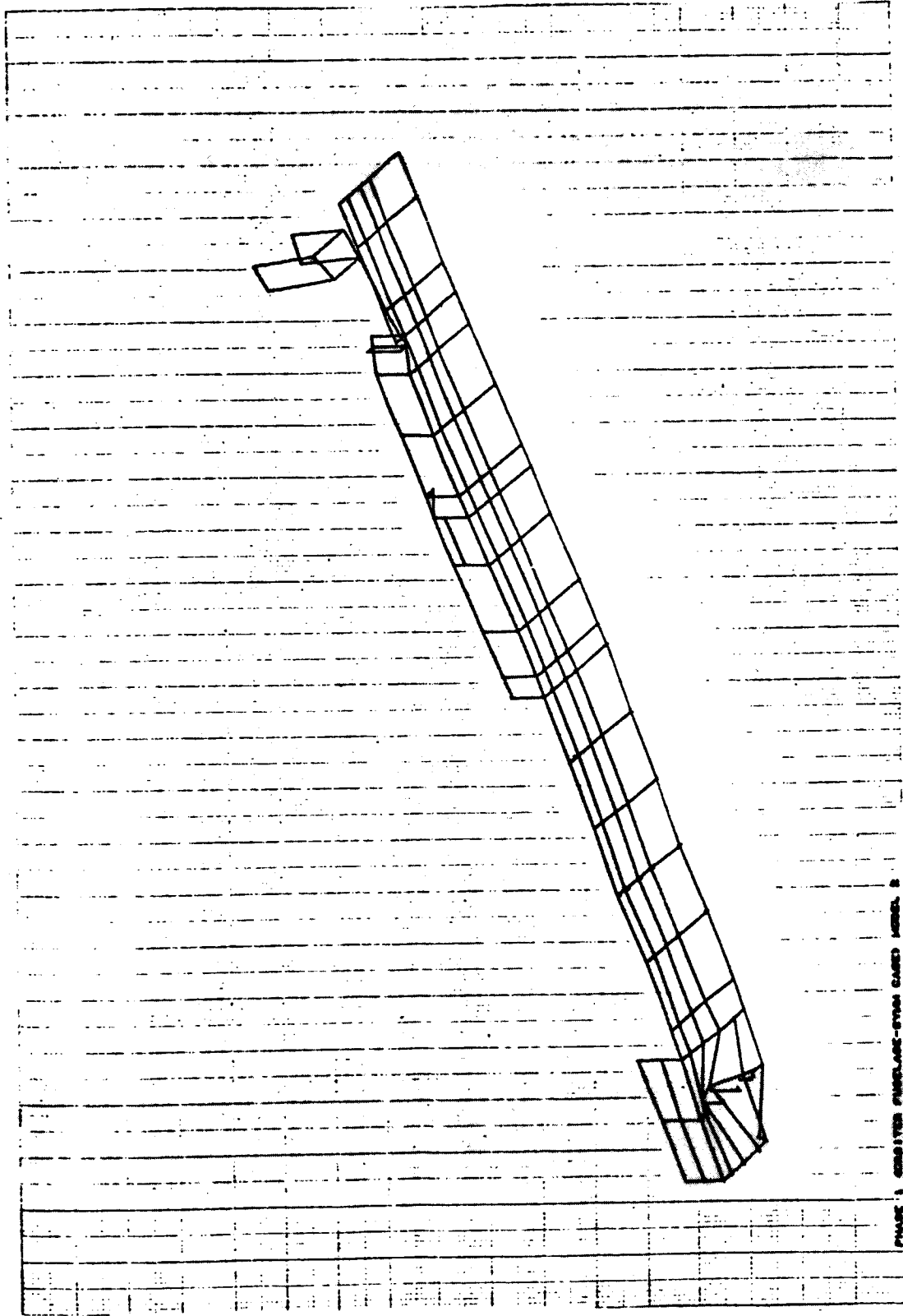
PHASE 3 ORBITER FUELAGE-SYMA CASE MODEL 8  
PRISM HALF OFF-LOW, 001 ETT, TRANS. AT WIND 00-02/0077, 3  
FREE BOUND FUELAGE AT INTERFACE  
LOCAL REFER. SURFACE 30 MODE 30 FREQ. 140.5000

02 181874 181874 02 181874



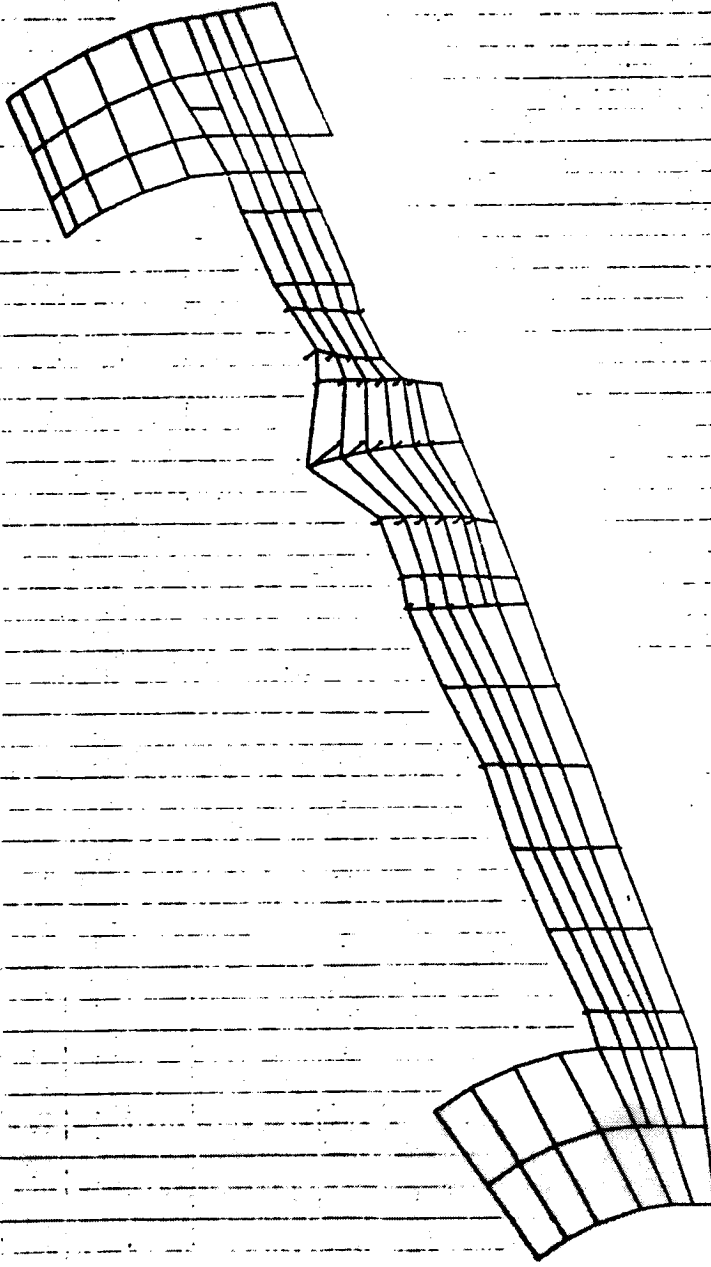
PHASE 1 CONSIDER FINISHING-0001 CASE1 MODEL 2  
BEING HALF OFF-LOADING (OFF TRANS AT WING 0-2/007.)  
FREE MODES FINED AT INTERFACE  
MODAL DEFOR. SUBCASE 31 MODE 31 FREQ. 1018.917

31 10/10/74 1000-007. = 2.100-1000



PHASE 1. CRITICAL FAILURE-STUDY CASES MODEL 2  
 BEING HALF EFF./AMB. FOR EFF. TRANS. AT WIND 10-2/3007.  
 FREE MODES FILLED AT INTERFACE  
 MODAL DECOR. SURFACE 31 MODE 31 FREQ. 1010.117

64 10/10/70 10/10/70 10/10/70



PHASE 1. CORBITER FUSELAGE-SYMM CASE) MODEL 2  
SKIN HALF EFF. LONG. 881 EFF. TRANS. AT WING (8-2/2077.)  
FREE MODES FINES AT INTERFACE  
MODAL DETER. SUBCASE 32 MODE 32 FREQ. 1042.683

32 1000000 1000000 1000000

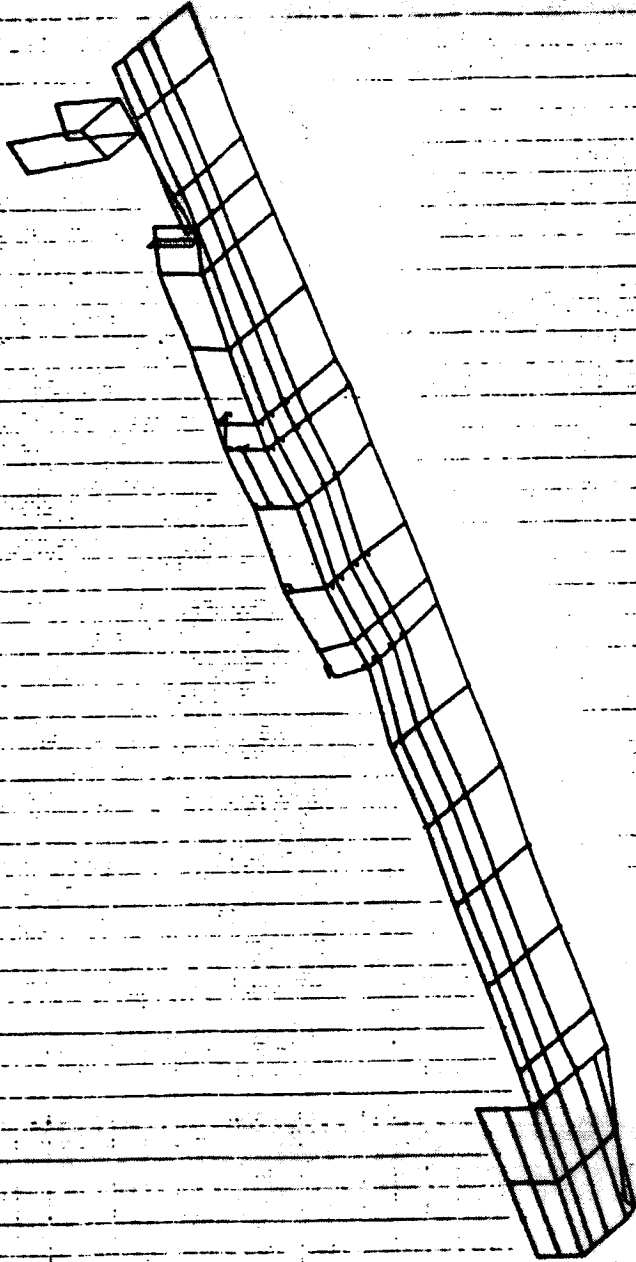
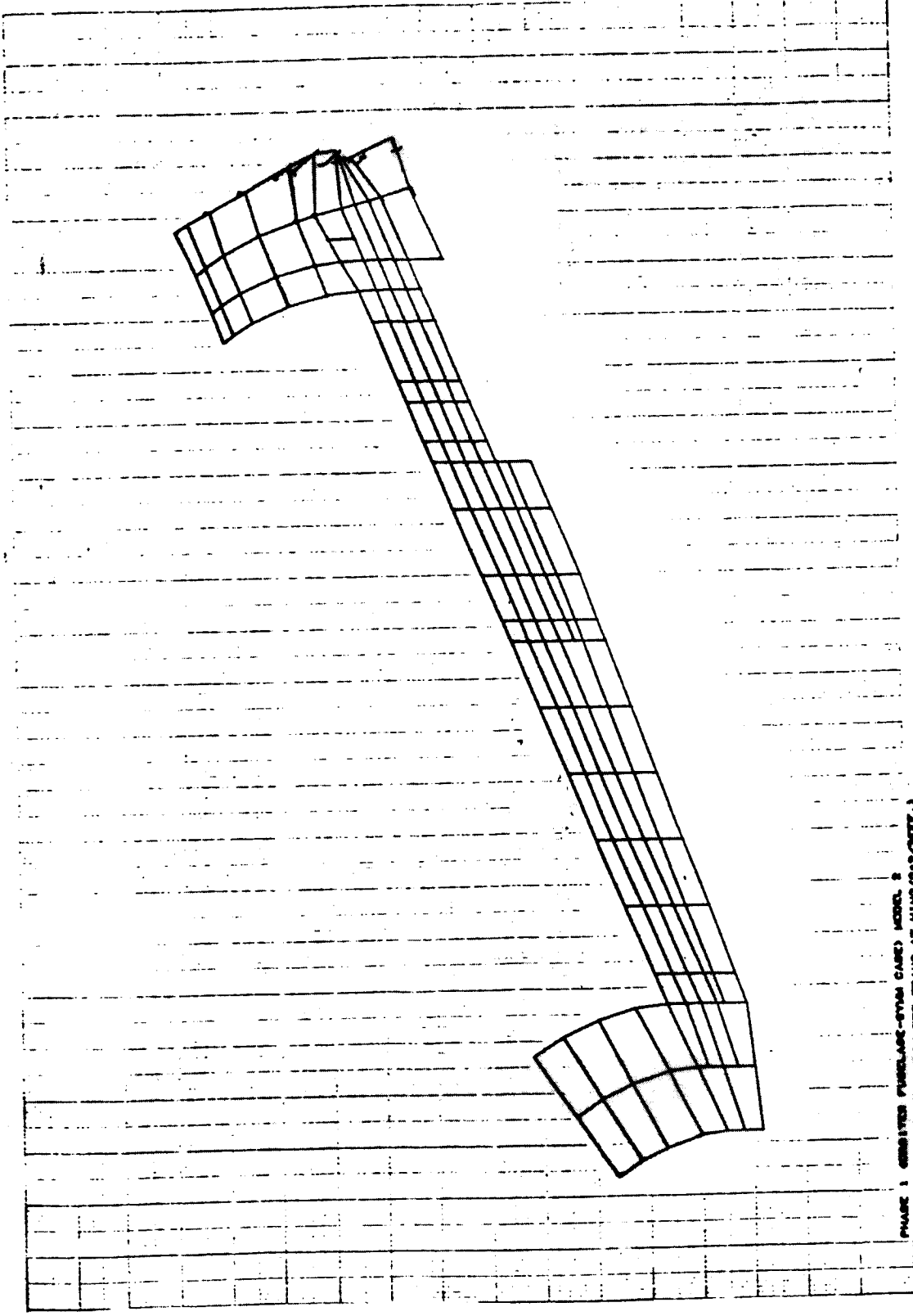


FIGURE 1. ORBITER FUELAGE-CYCLE BASED MODEL. 2  
BEING HALF OFF-LEAKAGE OF CYCLE TRANS. AT WING (0.5/0.5/0.5)  
FREE MODES FIXED AT INTERFACE  
LOCAL OCFOR. SURFACE 22 MODE 22 FREQ. 1042.000

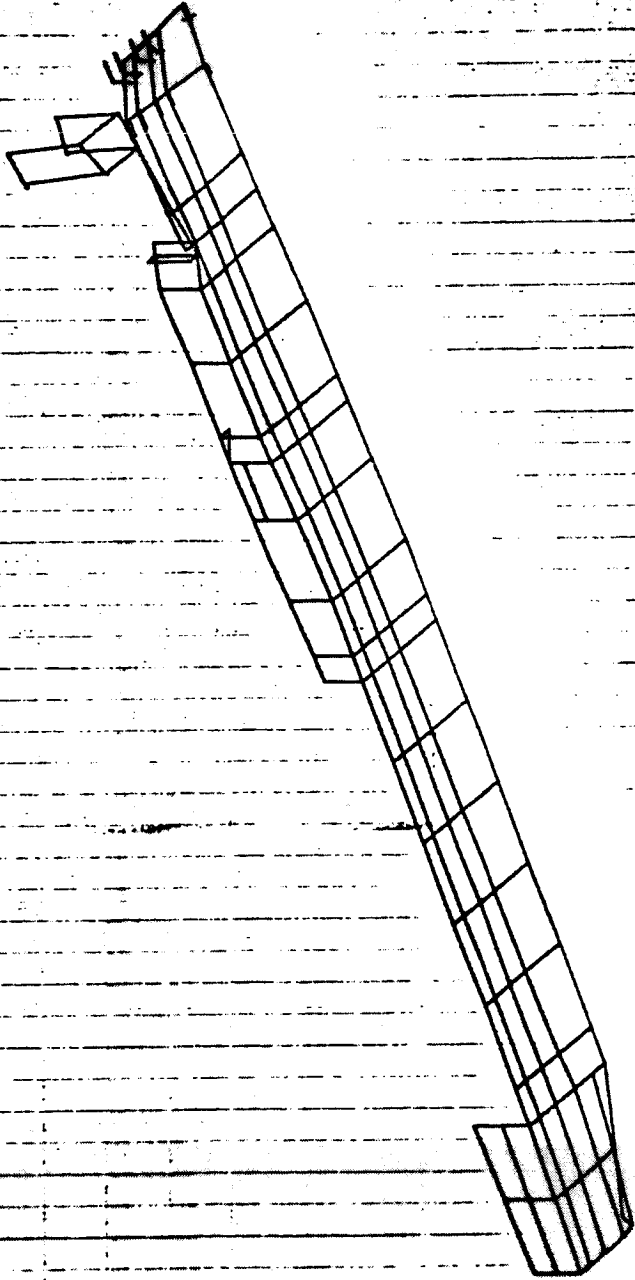
10/10/74 0000-0007.0 1.00000000



PHASE 1 ORBITER PURCHASE-670M CASE) MODEL 2  
PRIME HALP EFF. LOW. 85 ( EFF. TRANS. AT MIN 0.82/0077.)  
FREE MODES FINED AT INTERFACE  
MODAL ORDER. BURSCARE 33 MODE 33 FREQ. 1000.401

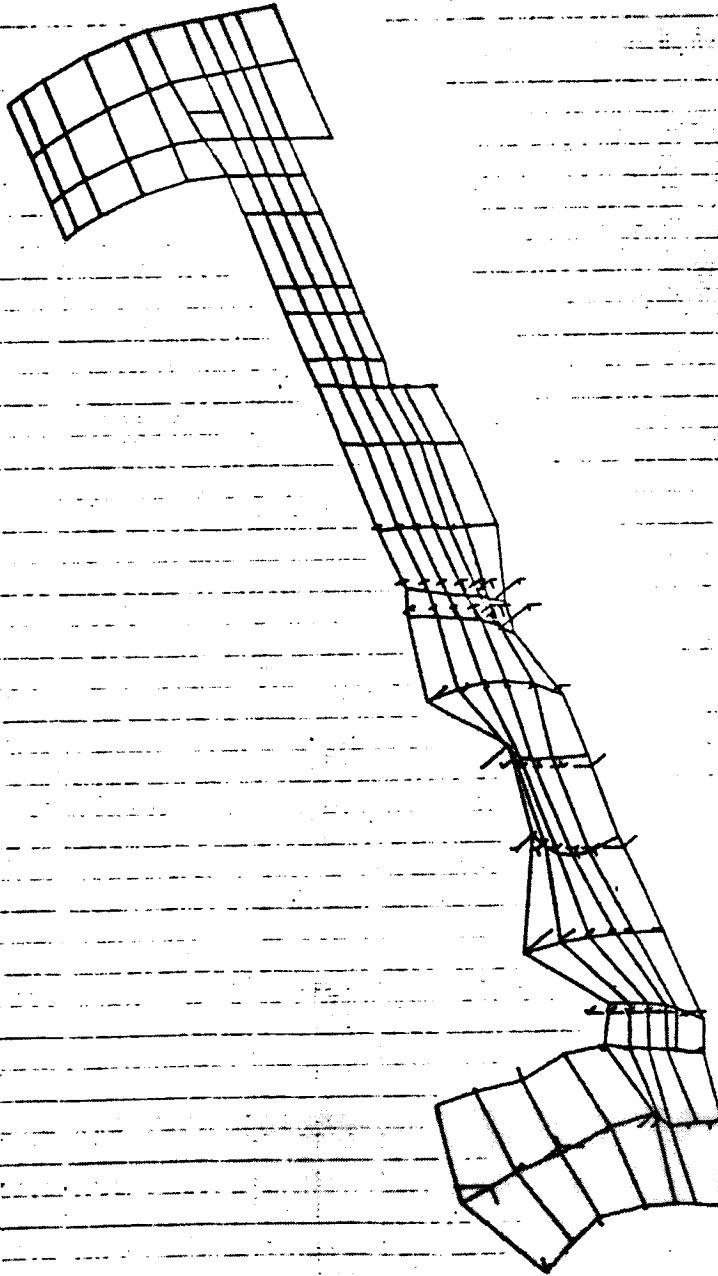


80 10/10/74 1000-007, 0 1, 00000000



PHASE 1. GOSVITER FUSELAGE-SYMS CASE) MODEL 2  
SKINING HALF EFF. LOW. .851 EFF. TRANS. AT WING (0.8/REFF. )  
FREE MOSES FINISH AT INTERFACE  
MOAL DETON. SURFACE 93 MODE 93 FREQ. 1080.401

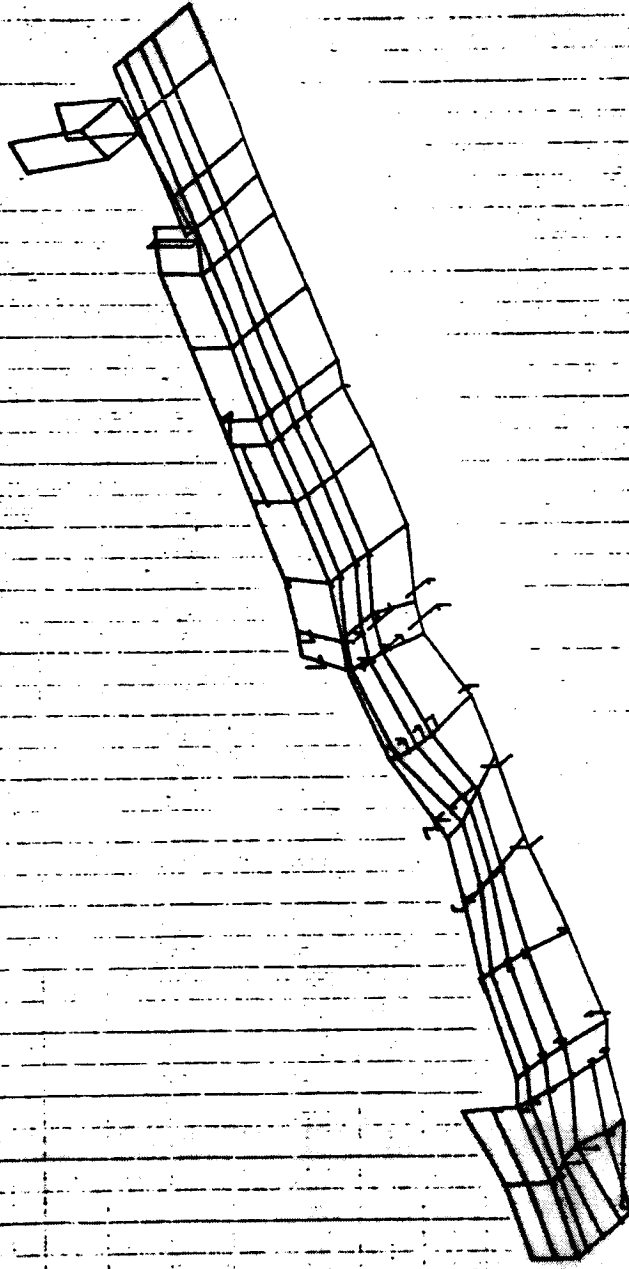
10/15/74 440-027. = 1.0001070



PHASE 1 COBOLITER FURCLARE-874M CASE) MODEL 2  
SKIN HALF EPT. LONG. 84 ( EPT. TRANS. AT WING (8-2/2PT. )  
PREC MODES FIXED AT INTERFACE  
MODAL DETOR. SUBCASE 34 MODE 34 FREQ. 1074.848

84

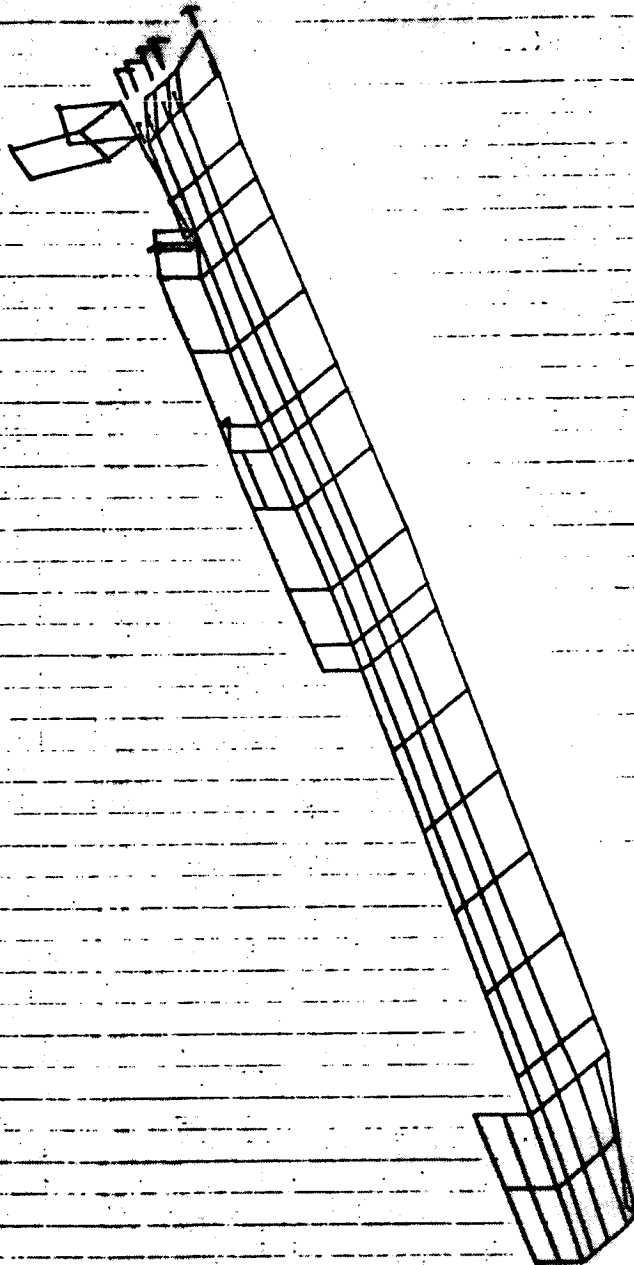
84 10/12/74 1000-007, 0 1, 0000079



PHASE 1 RESULTS FROM ARE-8000 CASE MODEL 2  
 SEEING W/ P. 077, 084, 085, 086, 087, 088, 089, 090, 091, 092, 093, 094, 095, 096, 097, 098, 099, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



30 00715074 000-007. 0 1.00000000



PHASE 1 ORBITER FUELAGE-STIM CASE) MODEL 2  
BULK HALF EFF-LENS, 75% EFF. TRANS. AT 1110 0-0/0077.1  
FREE MODES FINED AT INTERFACE  
MODAL ORDER, SURFACE 30 MODE 38 FREQ. 1088.008

10/18/74 100-007. 0 1.000000

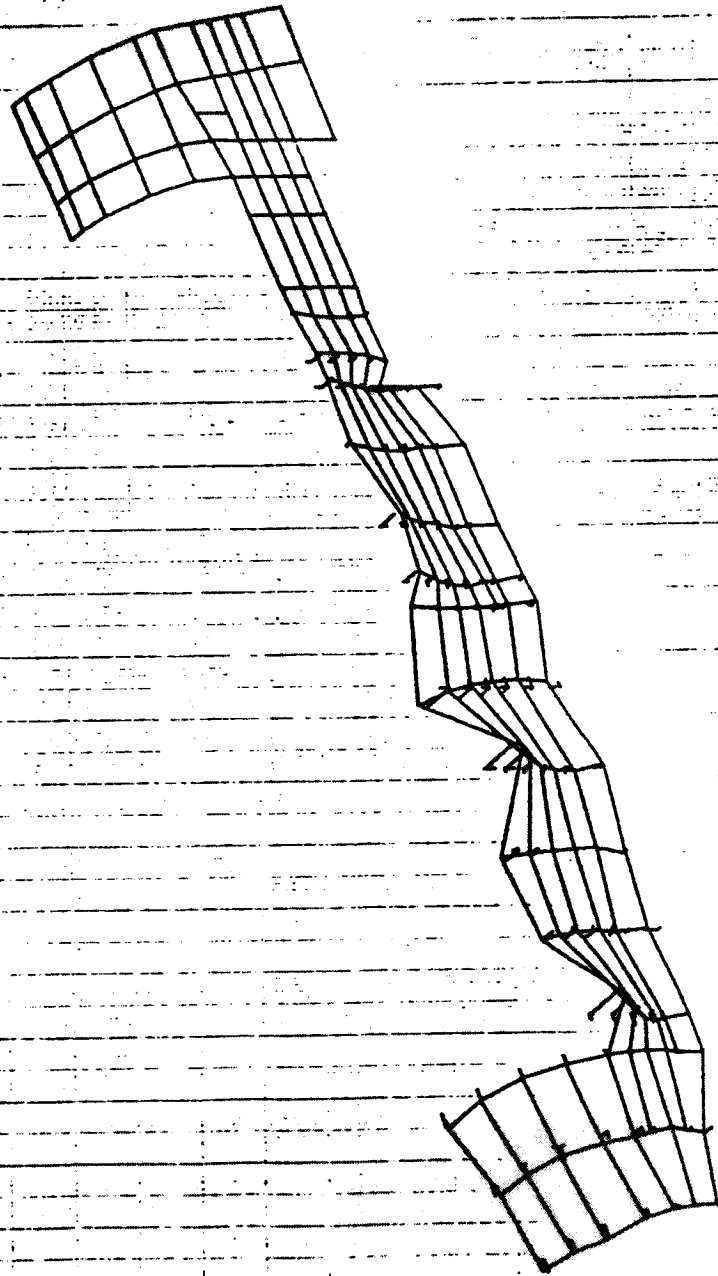


FIGURE 1. COMPOSITE FURLENS-SPIN CASE) MODEL 2  
BEING HALF EFF. LONG. 88 ( EFF. TRANS. AT WING (8+2/2EFF.)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFOR. SURFACE 36 MODE 36 FREQ. 1137.187

NO 107074 100-107. - 1.000000

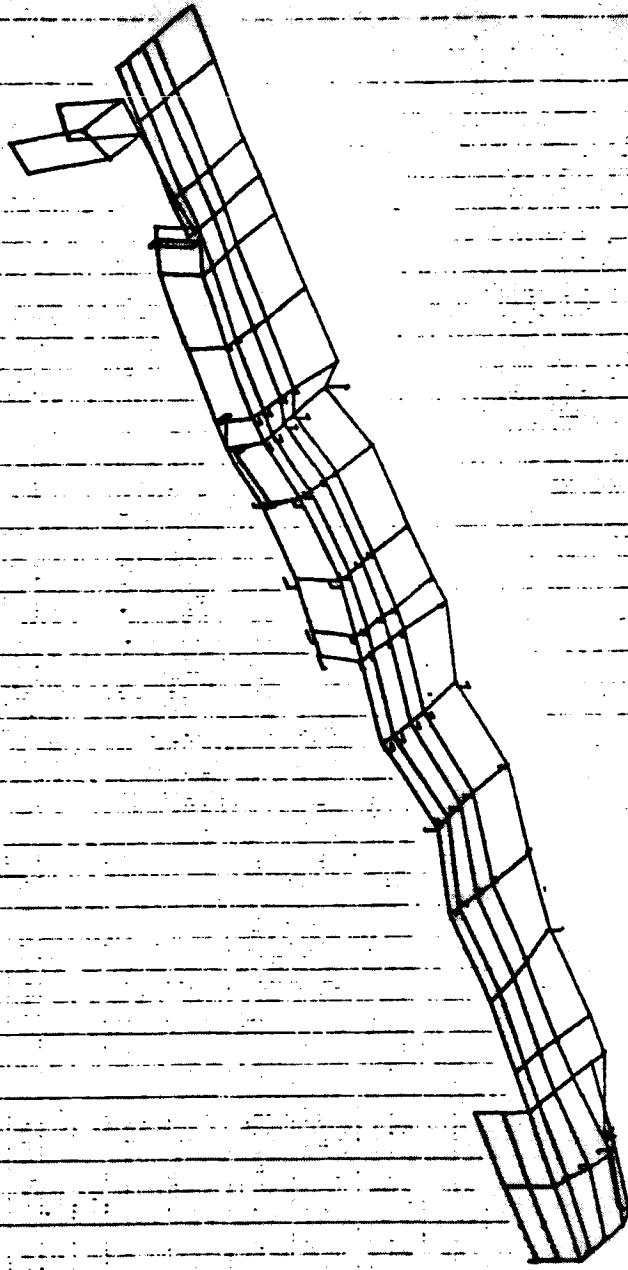
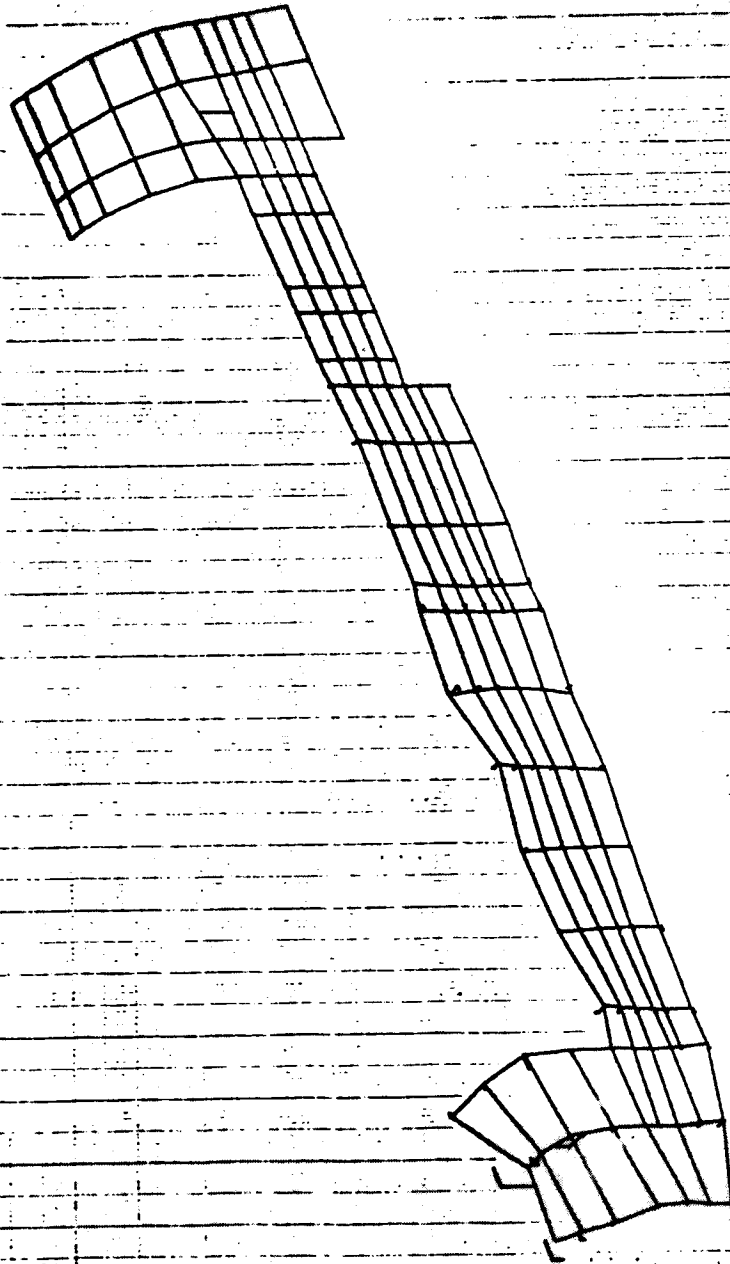


FIGURE 1. COASTAL FURCLARK-STROM GARD MODEL 2  
BEING HALF EFF. LONG. 0.81 EFF. TRAMP. AT 1100 0-0/0077.  
FACE WORKS FINES AT SPYFACE  
MODN. DEFOR. SURFACE 30 MODC 30 PREG. 1137.187

4 10/19/74 1000-007. - 2. 20710100



PHASE 1 CONTINUED FURSLAGE-SYMA CASE) MODEL 2  
BEING HALF CRY. LONG. 256 C CRY. TRANS. AT WING (0-2/3/277.)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFORM. SUBCASE 27 MODE 27 FREQ. 1140.840



57 1071574 100-227, • 2, 20110100

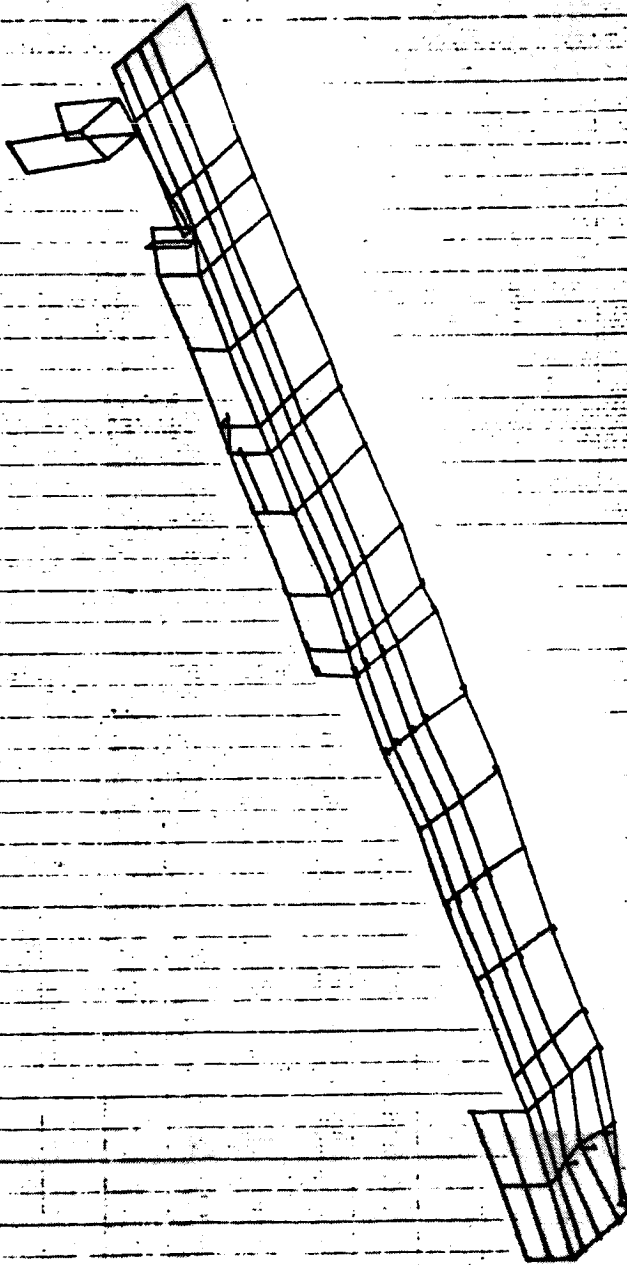
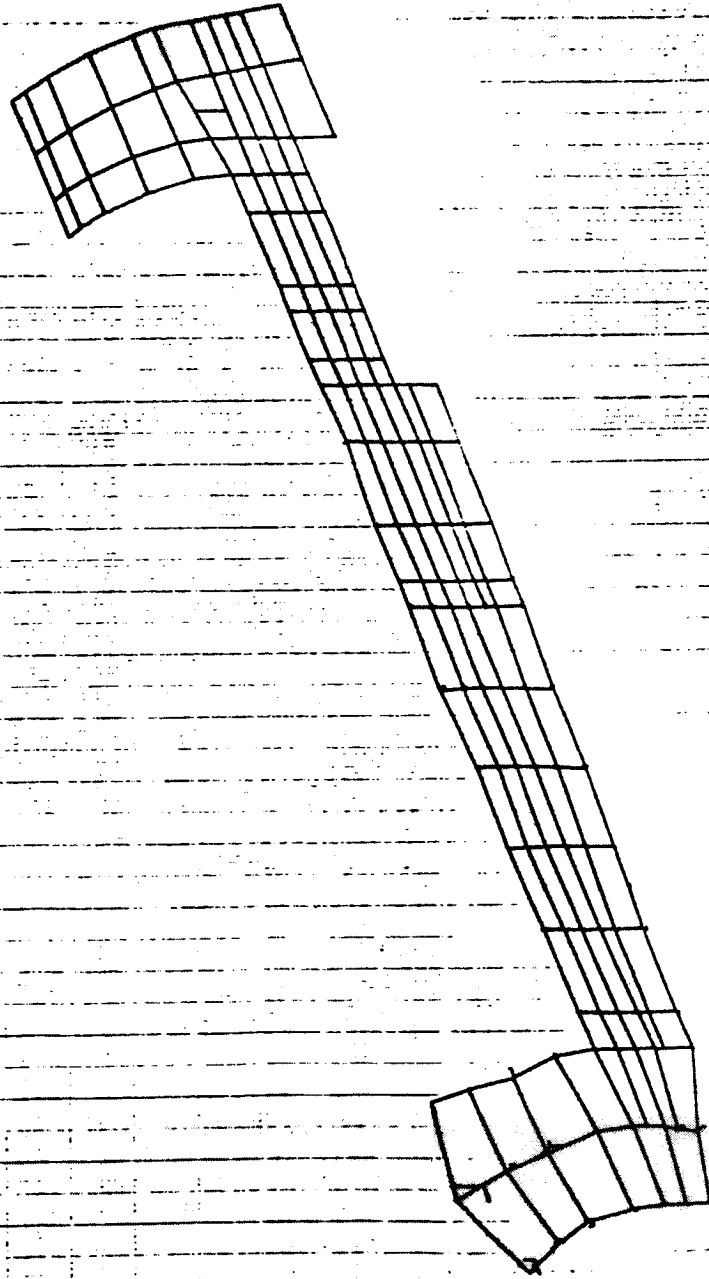


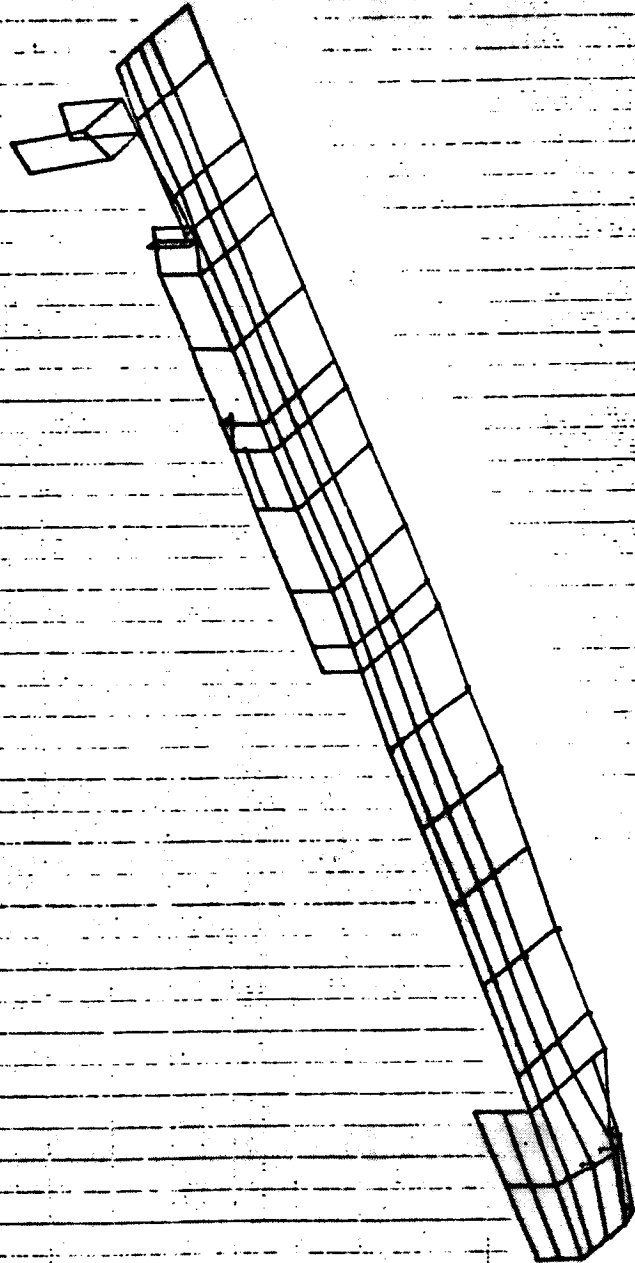
FIGURE 1 CORBITER WINDTUNNEL CASE MODEL B  
SKIN HALF EFF. LONG. 0.88 (EFF. TRANS. AT WIND 90-9/2077.)  
FREE MEMES FILLED AT INTERFACE  
MODEL REFER. SURFACE 37 MODE 37 FREQ. 1140.840

10/10/70 1440-DEF. 5 D. 10100000



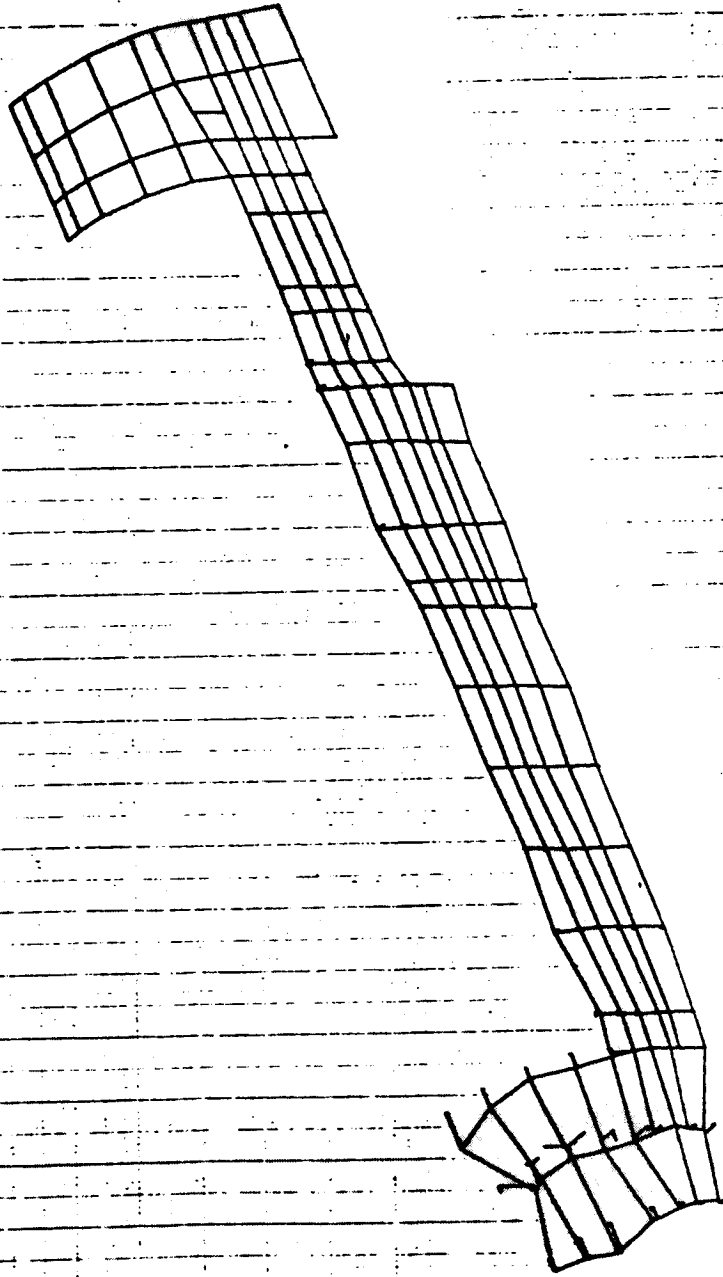
PHASE 1. REGISTER FUSELAGE-SYAM CASE) MODEL 2  
SKINS HALY EFF. LONG. 780 ( EFF. TRANS. AT NING (0-2-2/0EFF.)  
FREE MOSES FINED AT INTERFACE  
MOVAL DEFOR. SURFACE 38 MOCE 38 FREQ. 1104.002

30 10/10/74 100-007, d. 0. 1010000



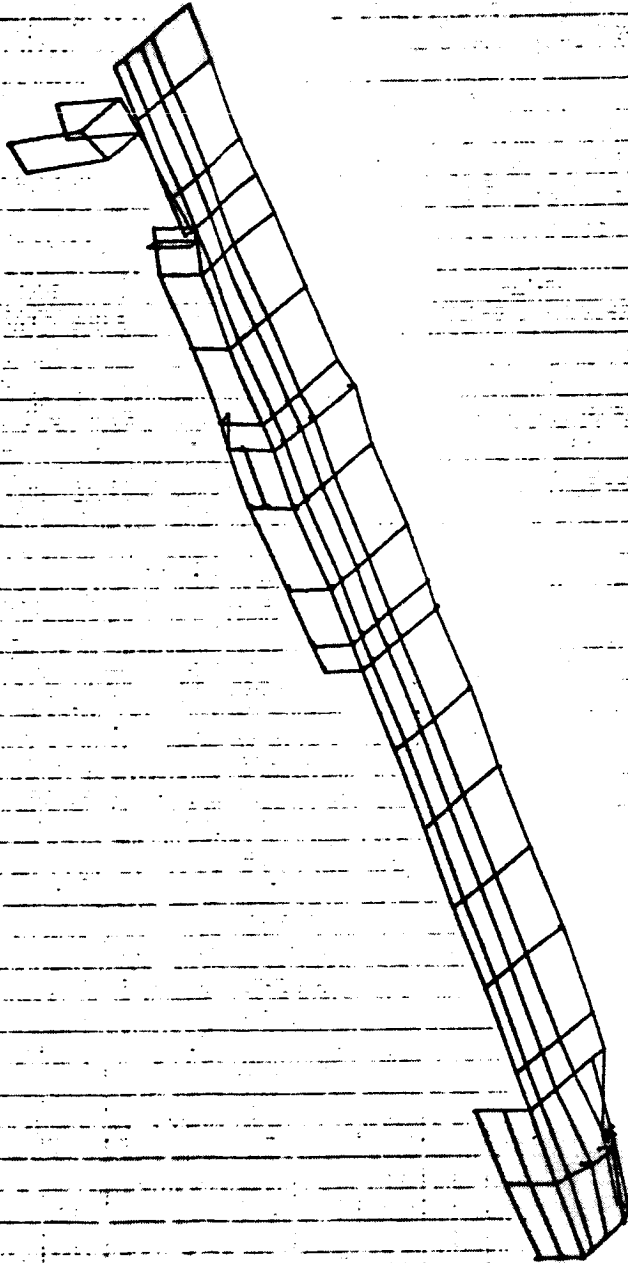
PHASE 1 COMPLETE FIBERGLASS-EPDM CASE; MODELS 2  
BEING HALF OFF-LOAD; 100% OFF TRANS AT 1000 RPM/REV.  
FREE MODES FIXED AT INTERFACE  
MODAL ORDER. SURFACE 38 MODE 36 FREQ. 1164.002

10/12/70 1100-207. • 1100170100



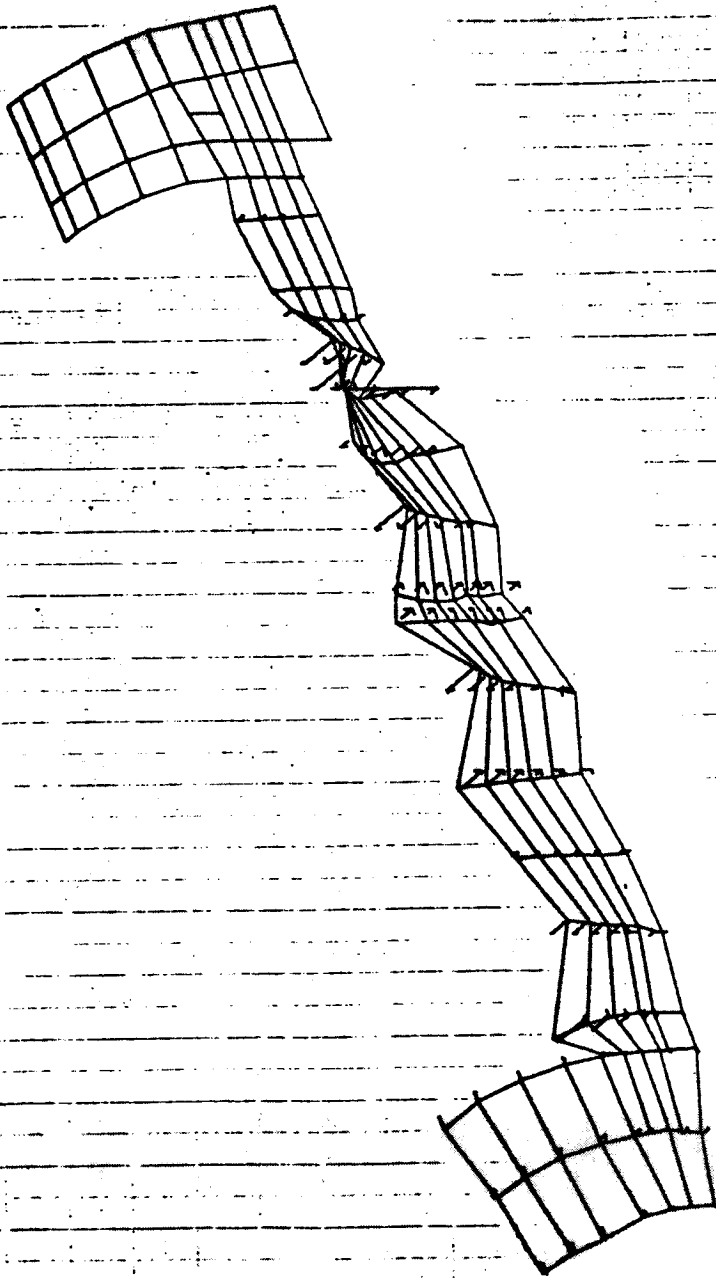
PHASE 1 (CORBITER FURBLANE-STVA CASE) MODEL 2  
BEING HALF EFF.LONG. (88 ( EFF. TRANS. AT WING (8-2/8EFF.))  
FREE MODES FIXED AT INTERFACE  
MODAL VECTOR. SURFACE 34 MODE 39 FREQ. 1190.379

34 08/10/74 0800-0827. 0 1.00170120



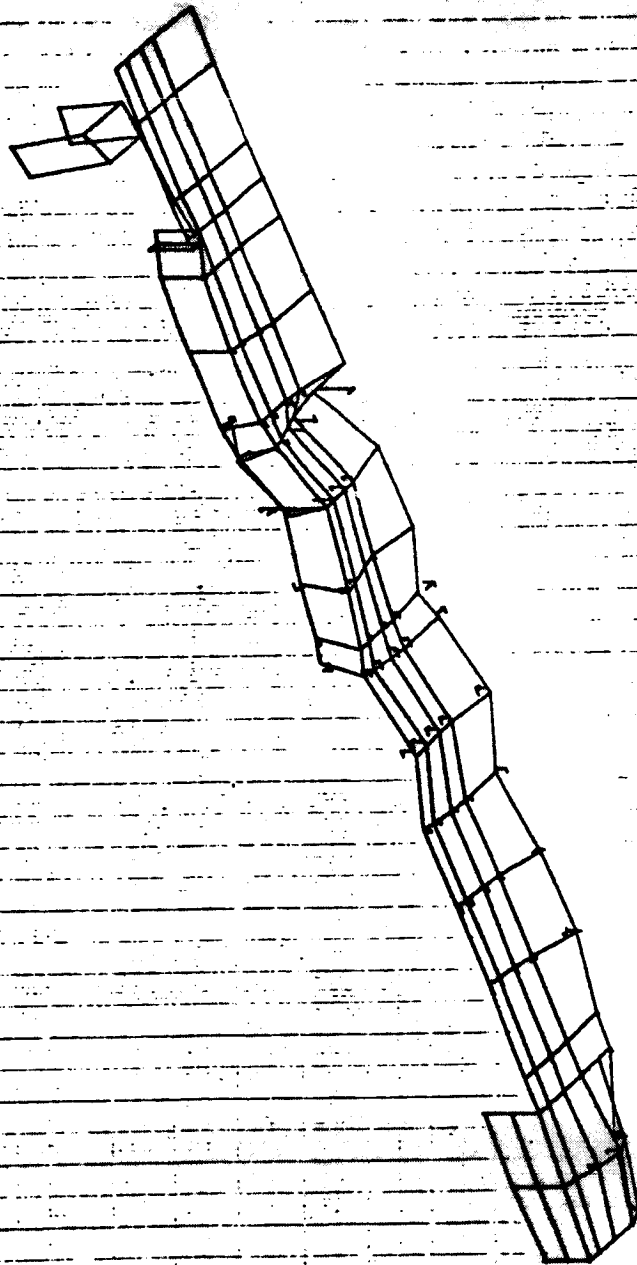
PHASE 1. COBBLETS FUSelage-SYMA CASED MODEL 2  
SLIMS HALF EYE, LONG, .851 EFF. TRANS. AT WING (0.8/0.877.)  
FREE MEMES FINED AT INTERFACE  
MODAL DEFON. SUBCASE 31 MODE 31 FREQ. 1100.371

10/18/74 10:00 AM 0.1.0000000



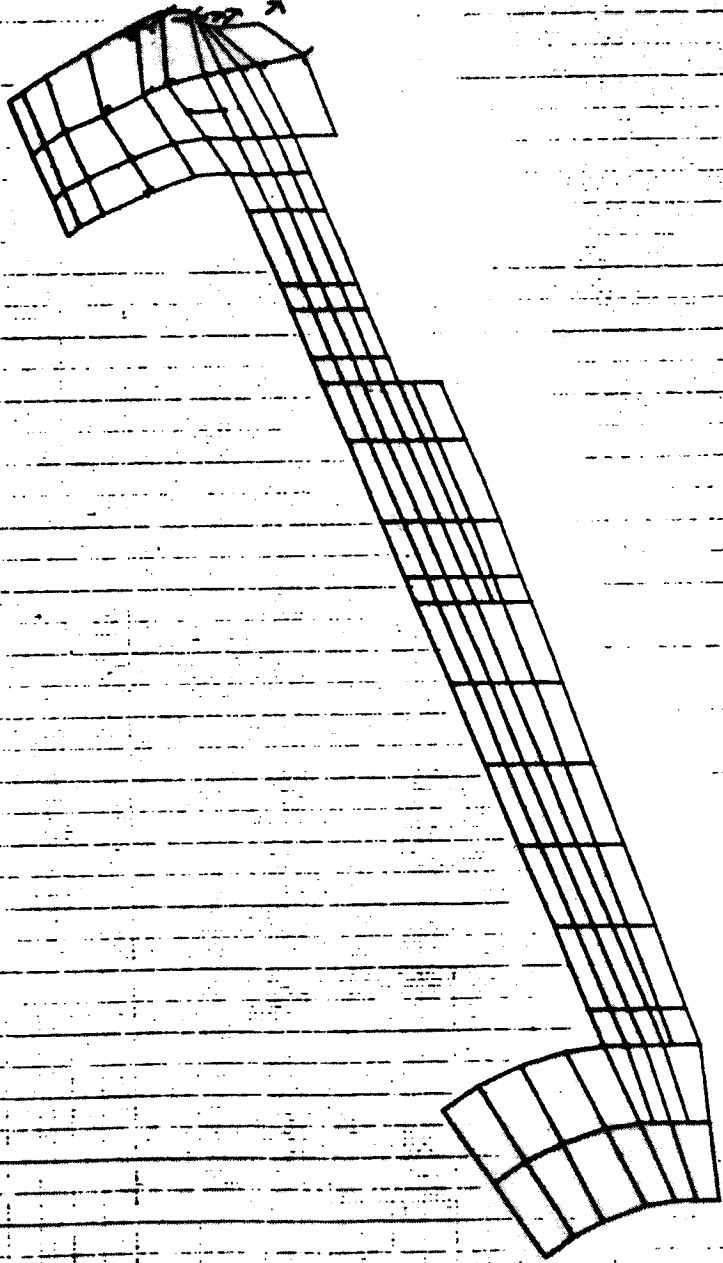
PHASE 1 ORBITER FUELAGE-STYAS CASE) MODEL 2  
ORING HALF OFF-LOAD, 48 ( 577. TRANS. AT WING (8-5/2677.)  
FREE MOES FIRES AT INTERFACE  
MODAL DEFOR. SURFACE 40 MODE 40 FREQ. 1174.880

49 10/10/74 000-007. 0 1.0000000



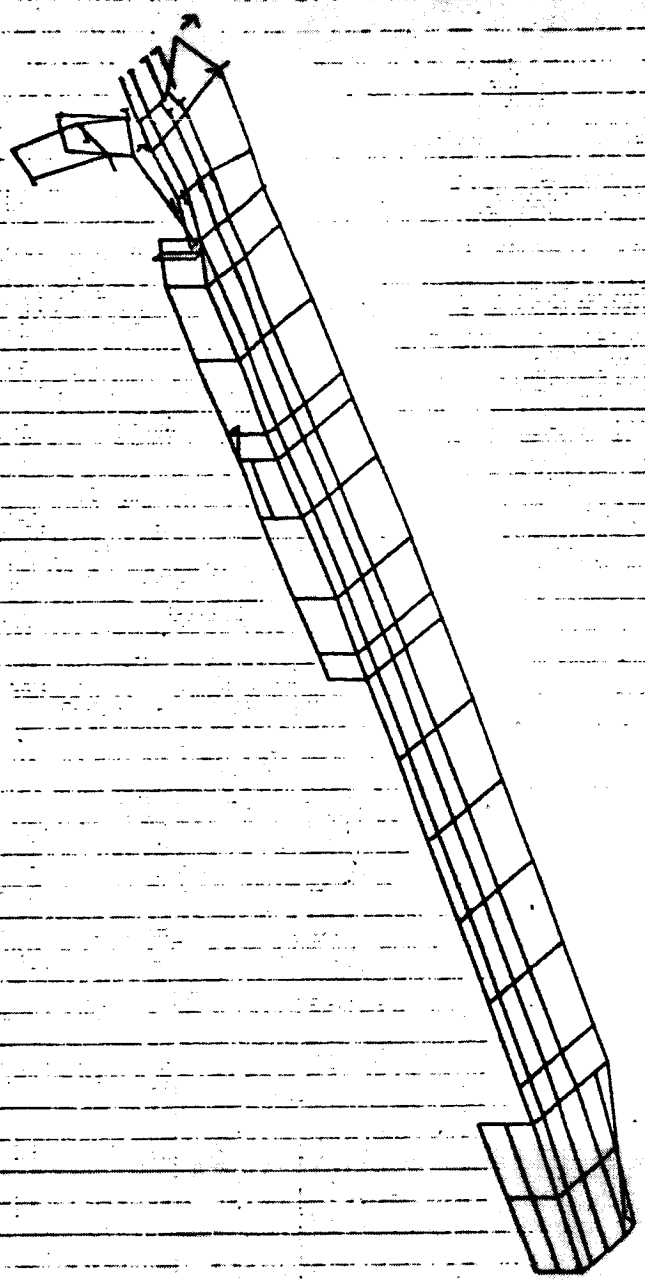
PHASE 1. COMPUTER FINISHING - (STAIN CASE) MODEL 2  
SKINS HALF EFF. LONG. / 98 ( EFF. TRANS. AT NING 0.5 / 2007. )  
FREE MEMES FINISH AT INTERFACE  
MODAL DEFOR. SURFACE 40 MODE 40 FREQ. 1174.880

0 00000000 00000000 00000000 00000000



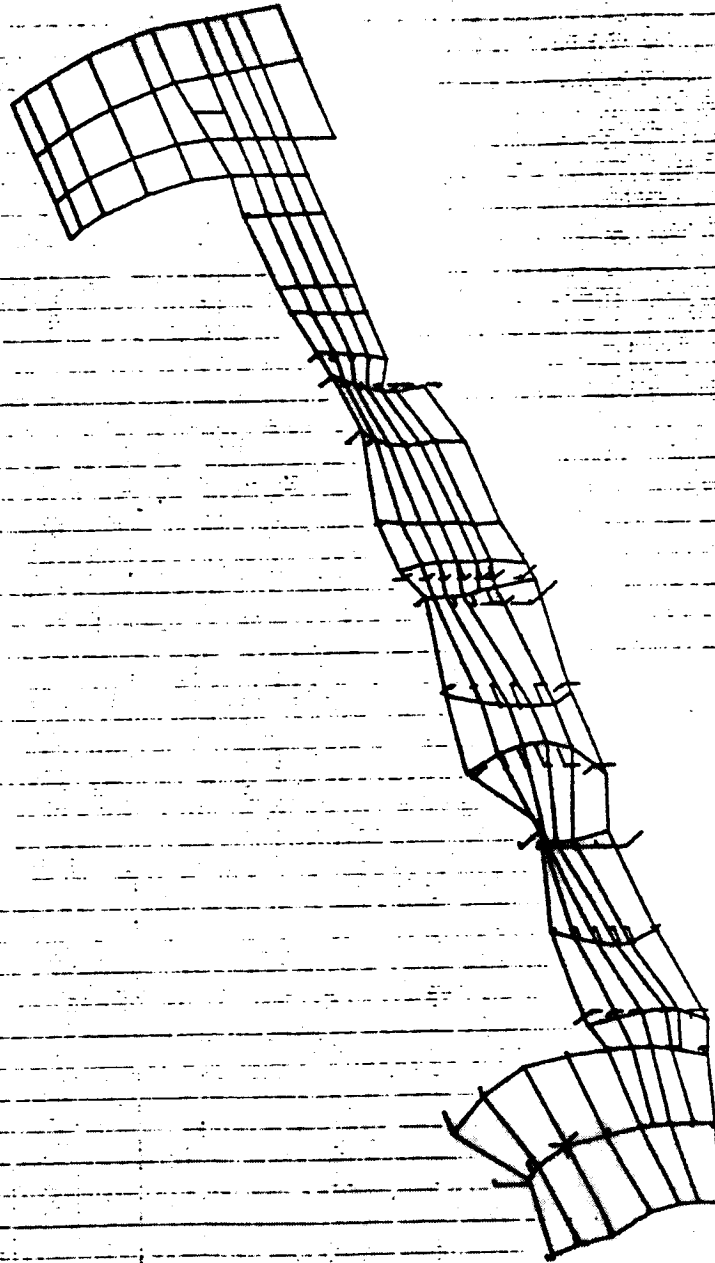
PHASE 1 RESISTOR SUBCIRCUIT-RTM CARD MODEL 2  
BEING HALF EFF./LAMB., 88 ( EFF. TRANS. AT WING 40-2/3577.)  
FREE MOVES FIXED AT INTERFACE  
MEDAL BEYON. SURFACE 41 MODEL 41 FREQ. 1197.362





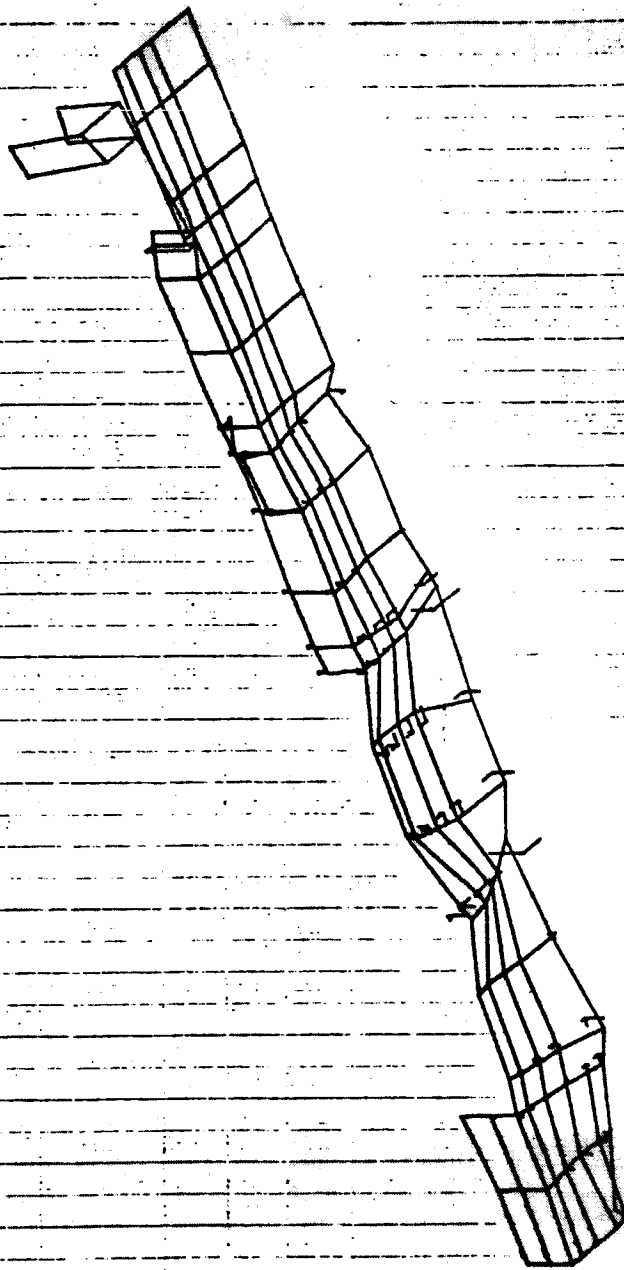
PHASE 1 CONSUMER FURCLARE-8704 CASE) MODEL 2  
 SKINS HALF EFF, LONG, .88( EFF. TRANS. AT WING (0-2/30FF.)  
 FREE MODES FIXED AT INTERFACE  
 MODAL DEFOR. SUBCASE 41 MODE 41 FREQ. 1187.362

18/10/76 222-227. • 1.000-0010



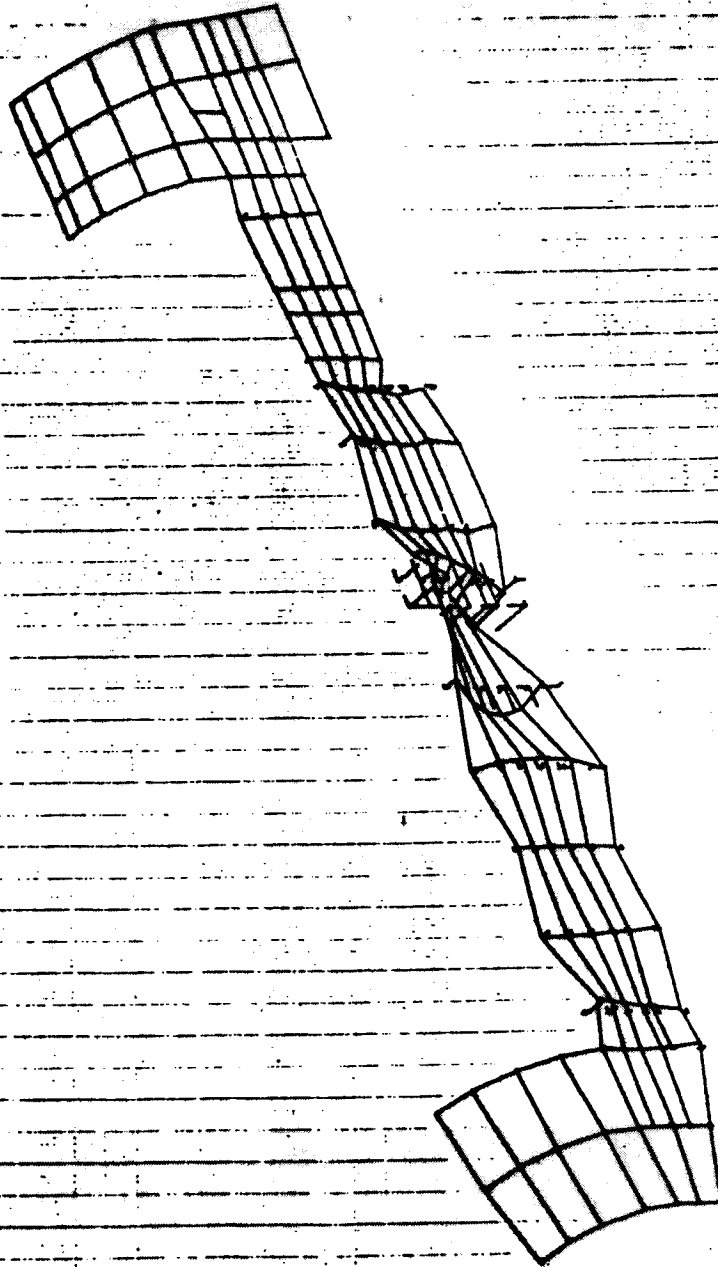
PHASE 1. COBOLTED FUNDLARK-SYAM CASE) MODEL. B  
BEING HALF EFF. LONG. 85% EFF. TRANS. AT WING (9-2/3/77.)  
FREE MOVES FINES AT INTERFACE  
MODAL OCTOR. SUBCASE 42 MODE 42 FREQ. 1309.867

42 10/10/74 200-007. = 1.000-010

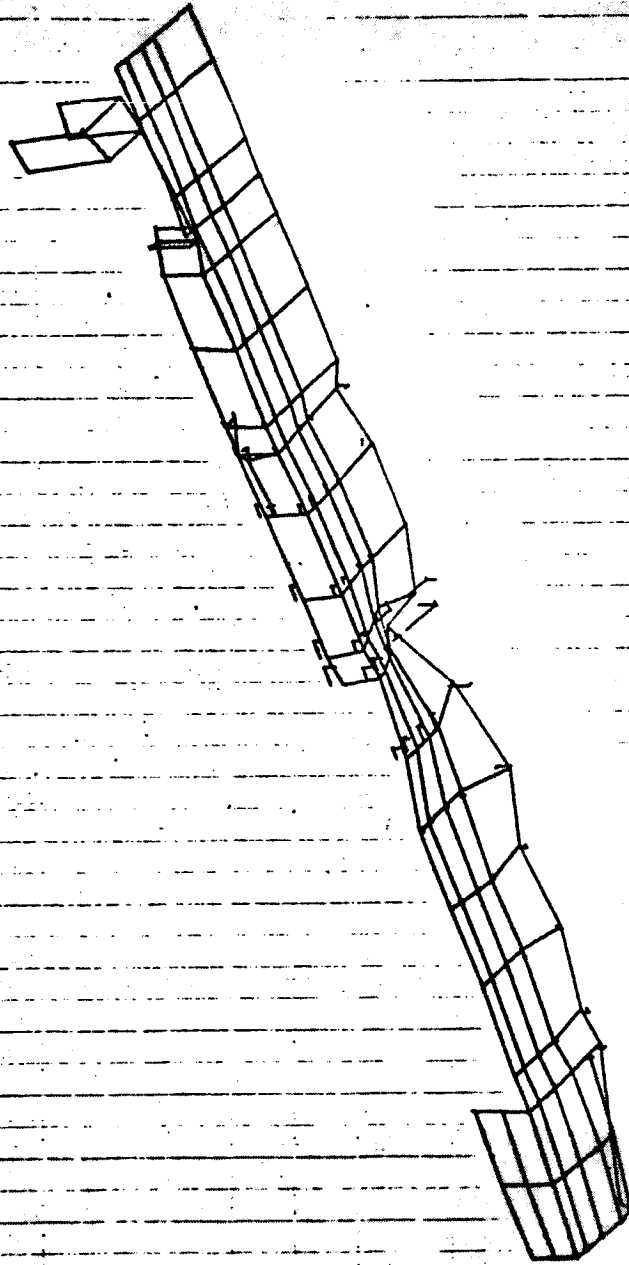


PHASE 1 CONSTITUT FUSelage-SPIN CASE; MODEL 2  
SKIN HALF OFF, LONG, SEC OFF, TRANS AT NING 00-3/2077.  
FREE BONES FIBED AT INTERFACE  
ACIAL BETA, SUB-CASE 42 MODC 42 FREQ. 1300.007

10 100000 100000 100000

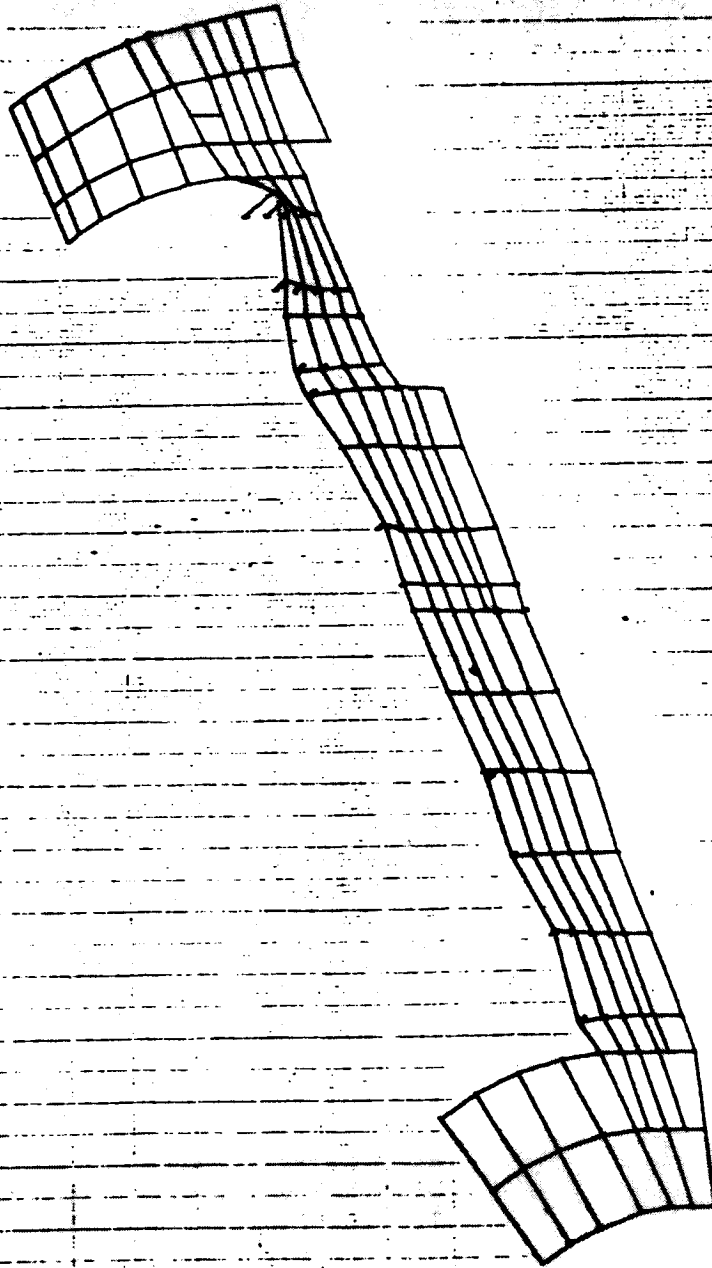


PHASE 1, GEOMETRIC FINELINE-SPIN CASE, MODEL 2  
CELLS HALF EFF. LENGTH, 80% EFF. TRANS. AT WIND 0-2/2000.  
FREE MODES FIXED AT INTERFACES  
MODAL ORDER, SUBCASE 43 MODE 49 FREQ. 1284.131



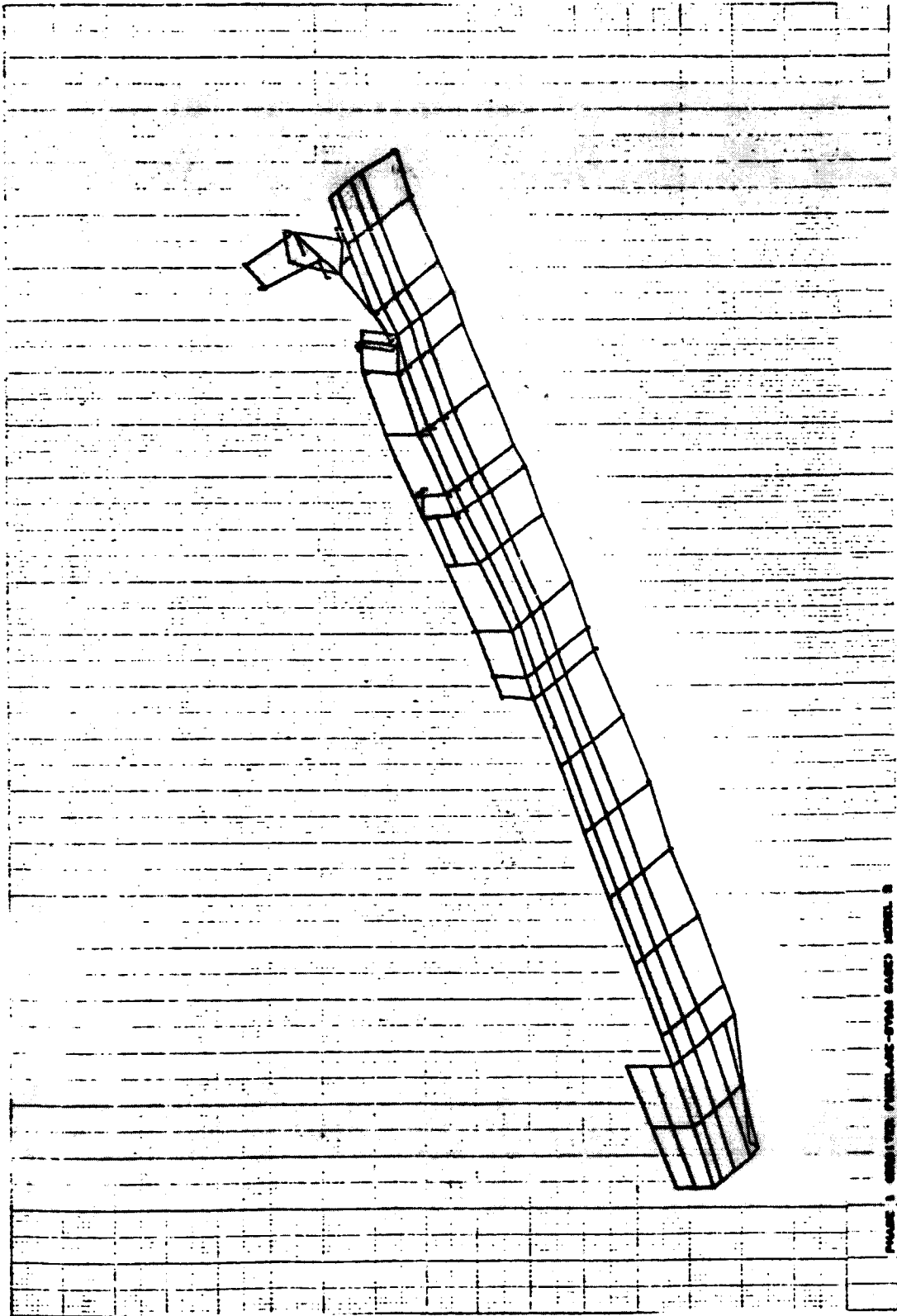
PHASE 1. CENTER SURFACE-OVAL CASE) MODEL 2  
 SKINS ONLY EPT. LAMP. 06 ( EPT. TRANS. AT WIND 00-02/0077.1)  
 FREE MODES FINED AT INTERFACE  
 MODAL ORDER. SURFACE 43 MODE 49 FREQ. 1254.131

11 10/13/78 MEMPHIS, O. I. 10/13/78

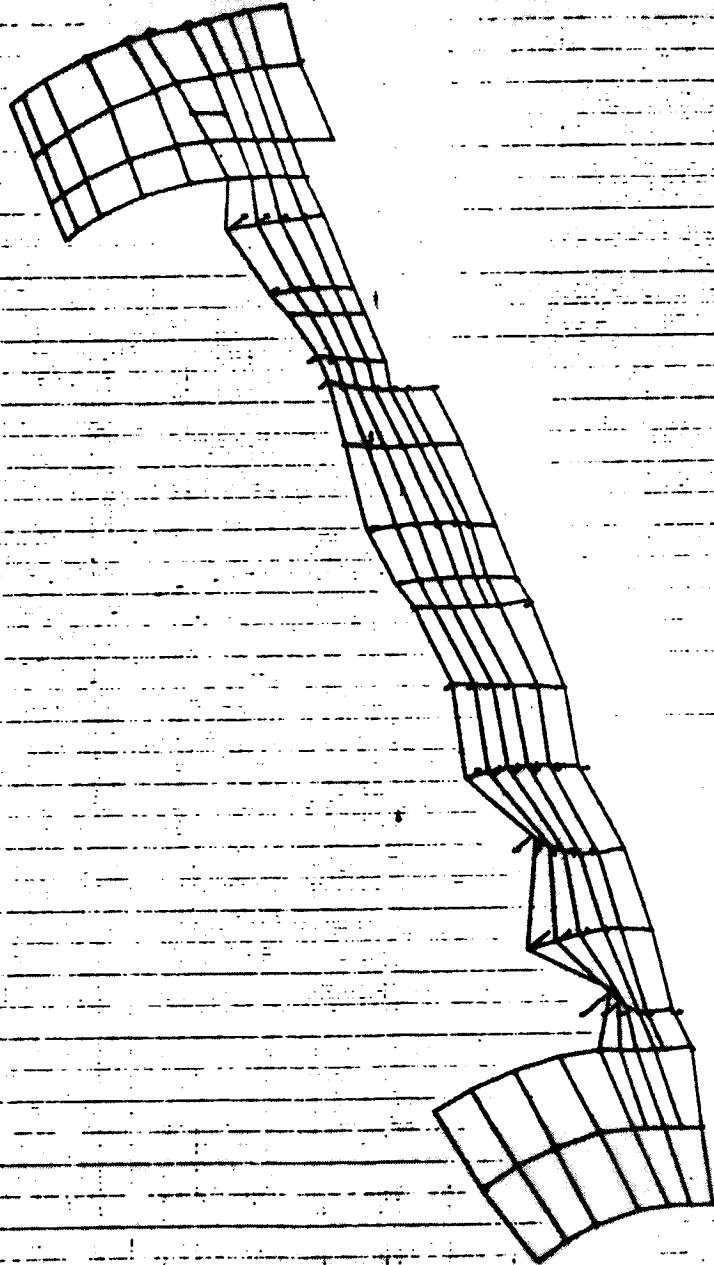


PHASE 1, QUANTITIES FURNISHED BY THE BUREAU OF RECONSTRUCTION  
BEING HALF OF THE QUANTITIES LISTED IN THE CONTRACT DOCUMENTS.  
FREE BIDDING FEE AT INTERFERENCE  
LOCAL OFFICE, SUBSCALE 44 CODE 44 PREQ. 1871.000

44 0071874 001-007. s 1.00000000



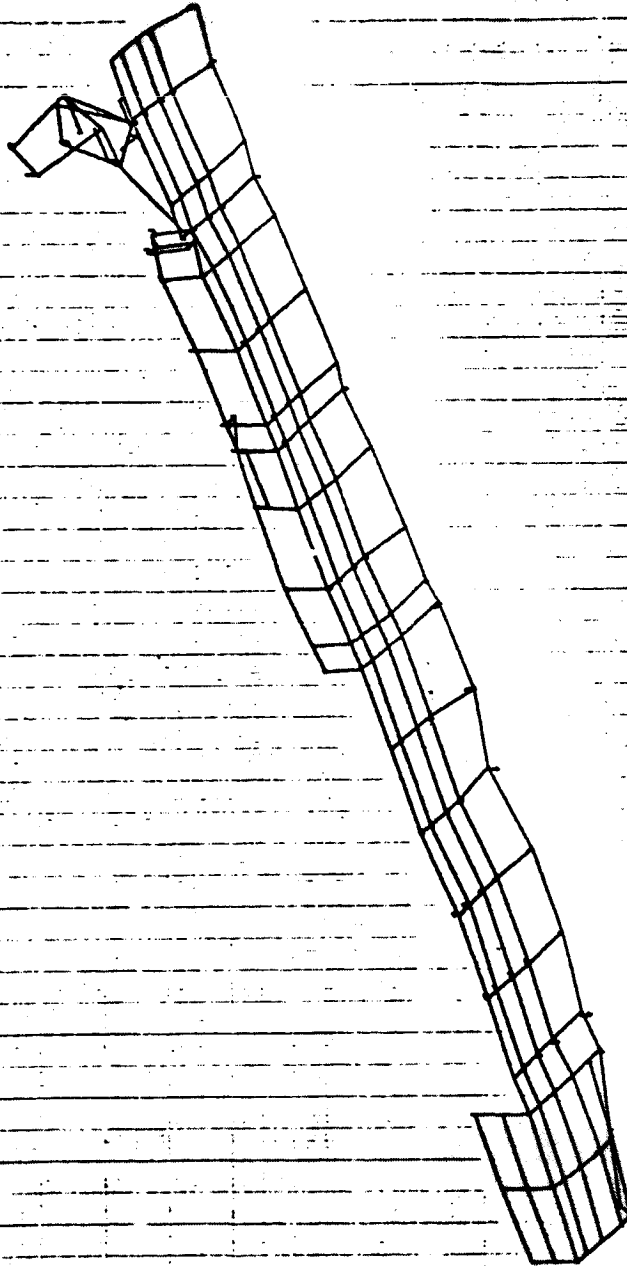
PHASE 1 COMPLETE - 001-007. s 1.00000000  
 SEE THE HELP OF THE... 001-007. s 1.00000000  
 FREE INFO FROM AT INTERFACE  
 001-007. s 1.00000000



PHASE 1. ANALYSIS SUBCASE-DYNA CASE) MODEL 2  
 SKINS HALF OFF-LONG. .09 ( EYF. TRANS. AT WING (0-0-0/0077. )  
 FREE MODES FINED AT INTERFACE  
 MODAL DEFOR. SUBCASE 48 MODE 48 FREQ. 1292.917

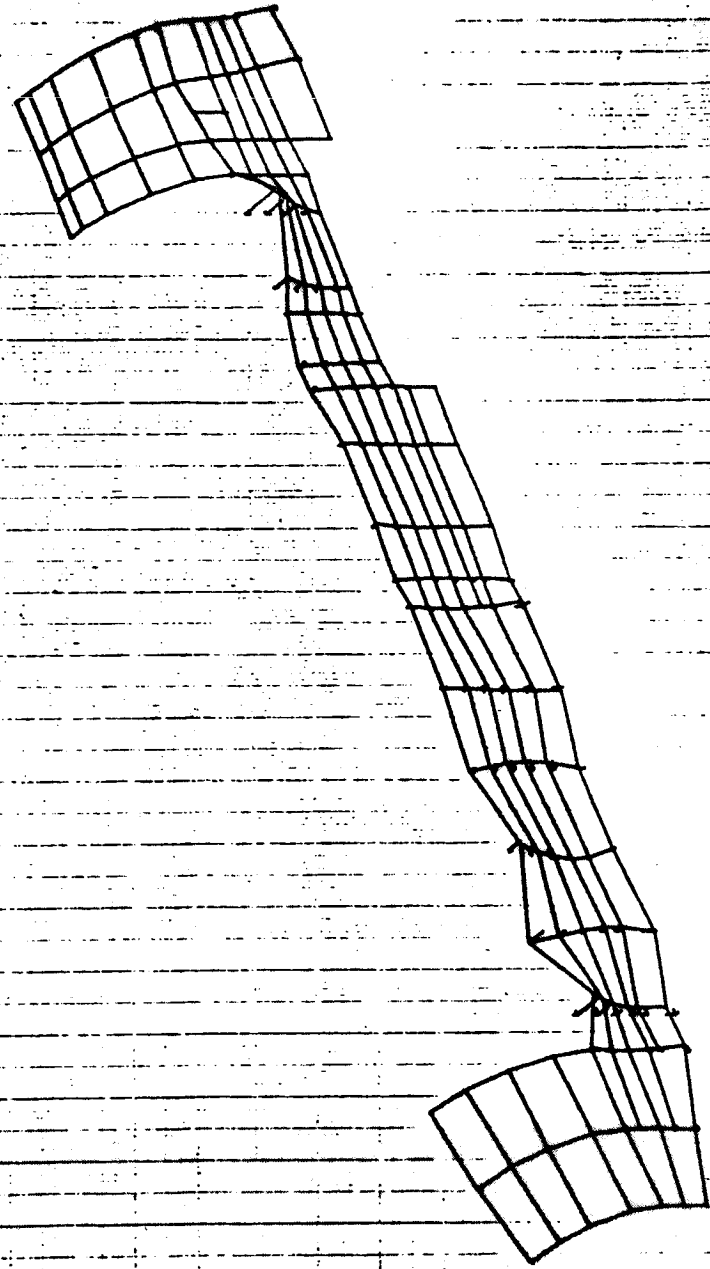


48 10/10/74 000-007. = 1.0000000



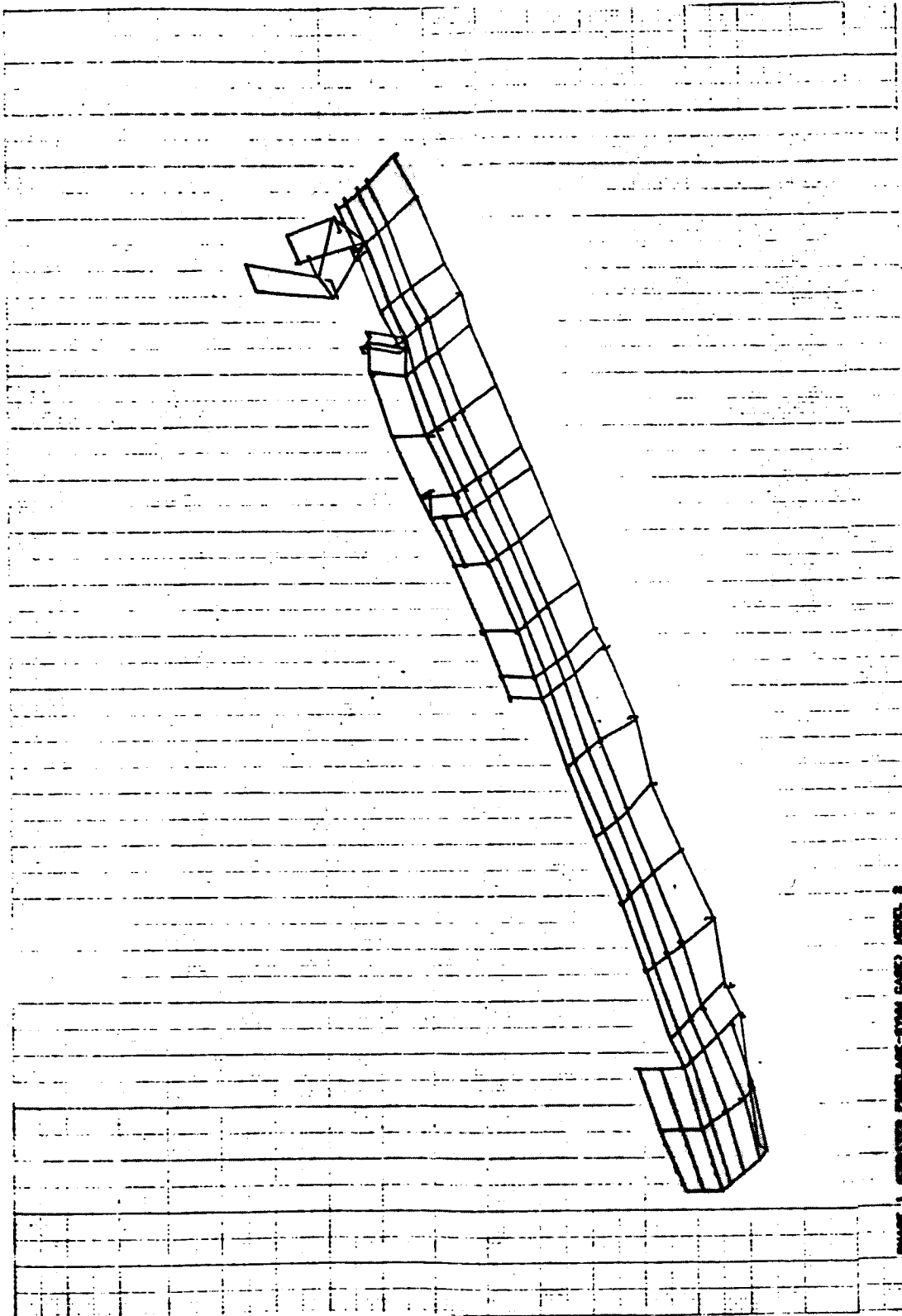
PHASE 1 ORBITER PURCHASE-SPIN CASE) MODEL 2  
BEING HALF EFF.LONG..85 ( EFF. TRANS. AT WING 0-2/REFF. )  
FREE BONES PINED AT INTERFACE  
MODAL MOTOR. SUBCASE 45 MODE 48 FREQ. 1883.977

10 10/12/70 1001-007, p. 1. 00000000



PHASE 1. CONSIDER FUSELAGE-SYMM CASE) MODEL 8  
 BEING HALF EFF. LONG. 78% EFF. TRUSS. AT WING (8-3-0EFF.)  
 FREE MODES FINED AT INTERFACE  
 MODAL DEFOR. SURFACE 48 MODE 48 FREQ. 1287.879

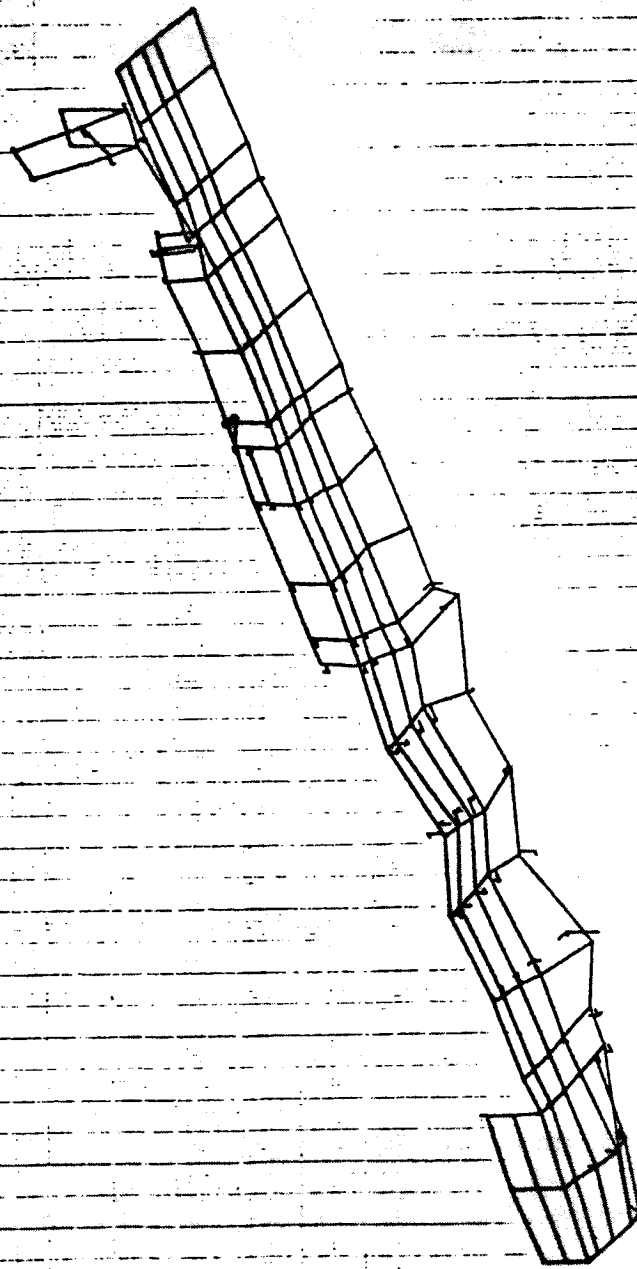
12/10/74 1000-207. = 1.00000000



PHASE 1 CONVERTER PARALLEL-SPIN CASE) MODEL 2  
 BEING HALF OFF-LOAD. 001 CTT. TRANS. AT WING 00-15/0077.)  
 FREE MODES FINER AT INTERFACE  
 MODAL DEFOR. SUBCASE 48 - MODE 48 FREQ. 1287.879



10/10/74 001-007. 1.000000



PHASE 1 CONTINUED FINISHLINE-6700 CASE) MODEL 2  
SKINS HALF ETT.LONG..88 ( ETT. TRANS. AT WING 08-2/2077.)  
FREE NODES FIXED AT INTERFACE  
LOCAL DEFORM. SURFACE 48 MODE 47 FREQ. 1230.116

18 10/10/74 100-107. - 1.000000

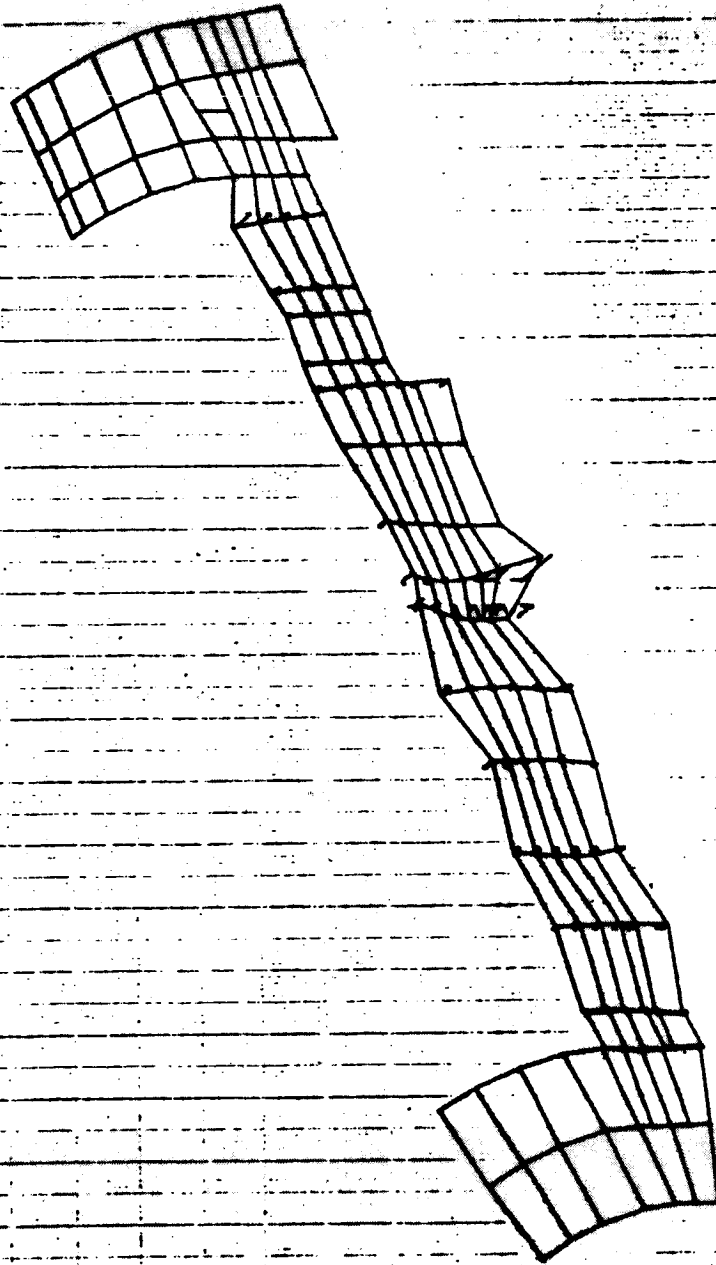
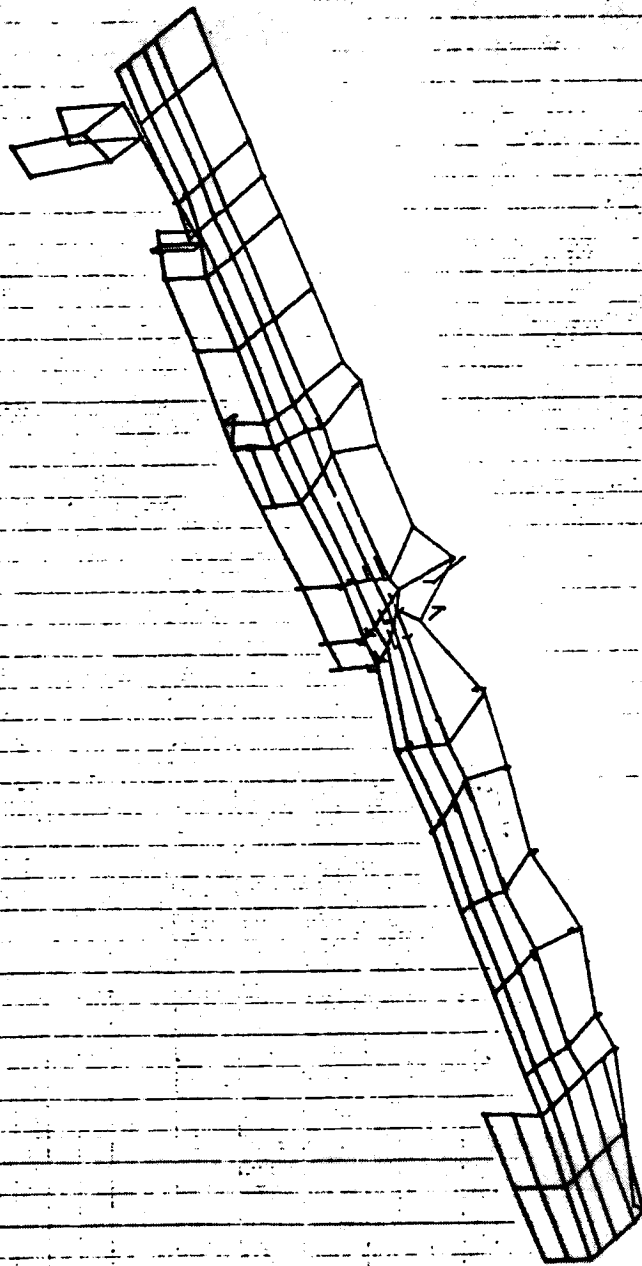


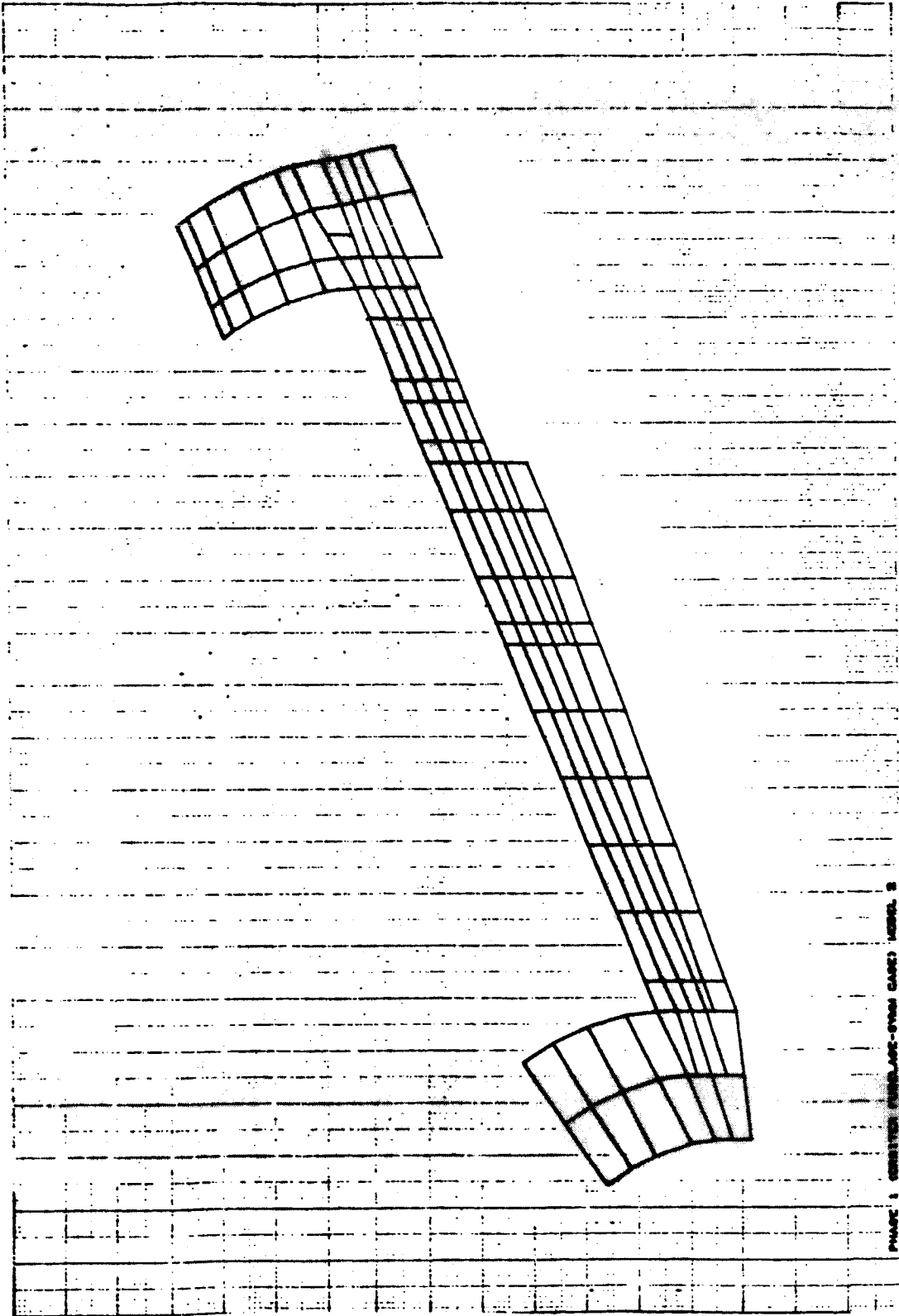
FIGURE 1. CURVED SEGMENTED WING OR TAIL SECTION. 8  
CELLS ONLY. SEE FIGURE 1. OFF. TRANS. AT WING OR TAIL.  
FREE HINGE POINT AT INTERFACE  
LOCAL COORDINATE SYSTEM AS SHOWN. 1000.000

48 08/18/74 1000-007. = 1.0000000



PHASE 1 CENTER FINELINE-SPIN CASE) MODEL 2  
 BEING MADE BY LAMB. 001 EFF. TRANS. AT WING 00-0/00077.)  
 FREE MODEL FINES AT INTERFACE  
 MODAL DETOR. SUBCASE 48 MODE 18 FREQ. 1330.480

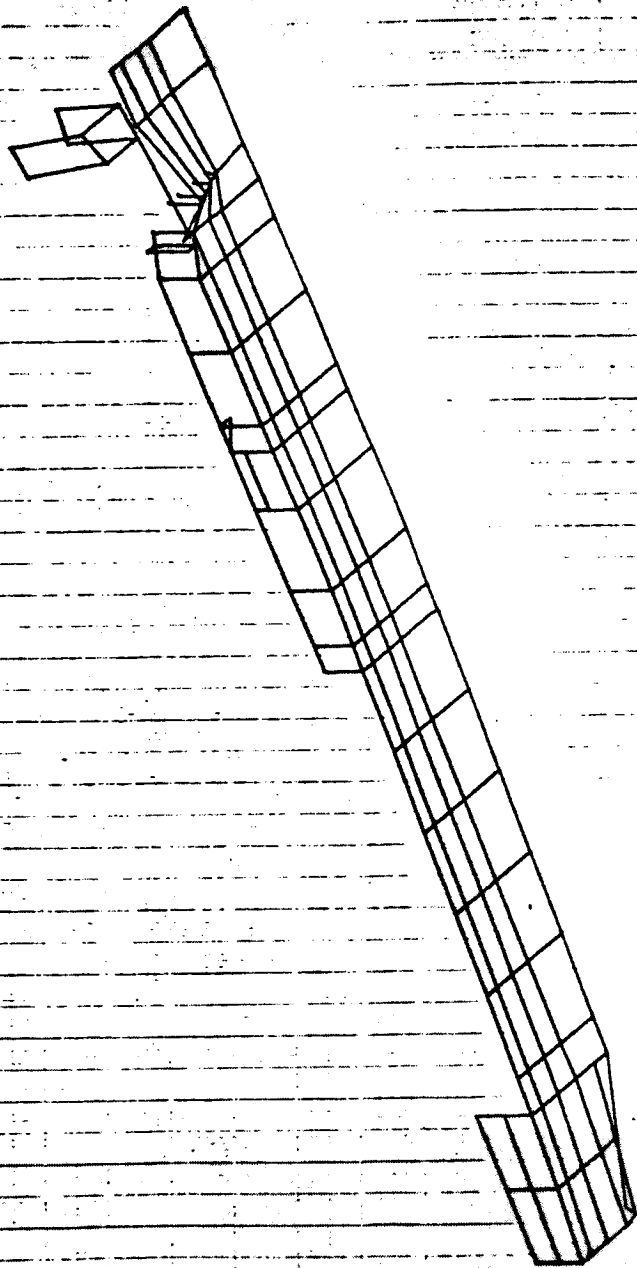
00000000 00000000 = 1.00000000



PHASE 1 CURVED OVERLAP-OVER CASE) MODEL 2  
 BEING HALF EFF. LONG. (SEE EFF. TRANS. AT WIND-UP-2/DEFF.)  
 FREE MEMES FIXED AT INTERFACE  
 MODAL SECTOR. SUBCASE 01 MODC 01 PRCB. 1994.711



49 10/10/74 0001-007. = 1.00000000



PHASE 1 SUBMITTER FUNDAMENTAL-SPIN CASE: MODEL 2  
 BEING HALF EFF. LONG. .08 ( EFF. TRANS. AT WIND CO-2/0EFF.)  
 FREE MODES FIXED AT INTERFACE  
 MODAL BEFOR. SUBCASE 48 MODE 47 FREQ. 1384.711

00/15/74 000-007, 1, 000000

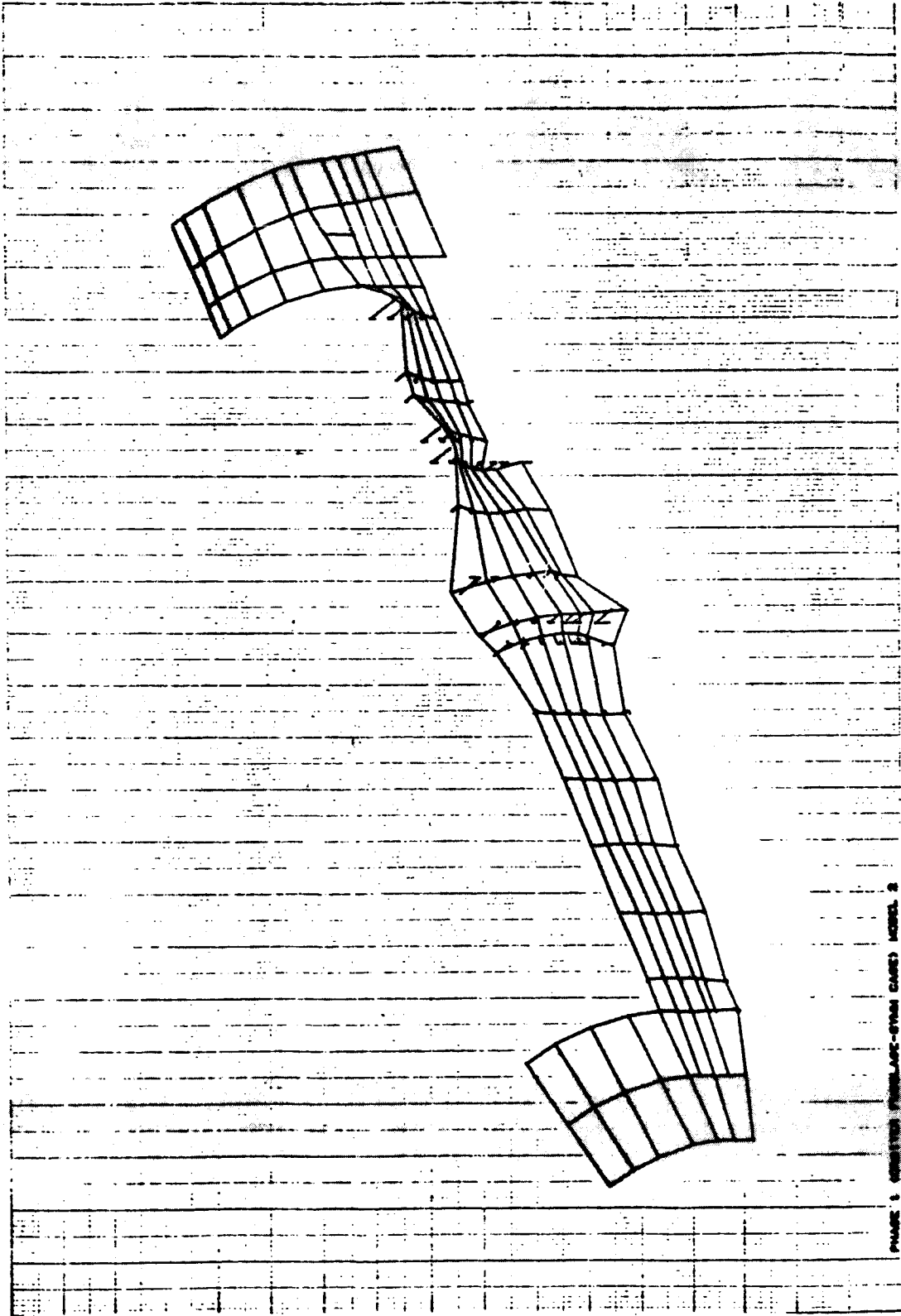
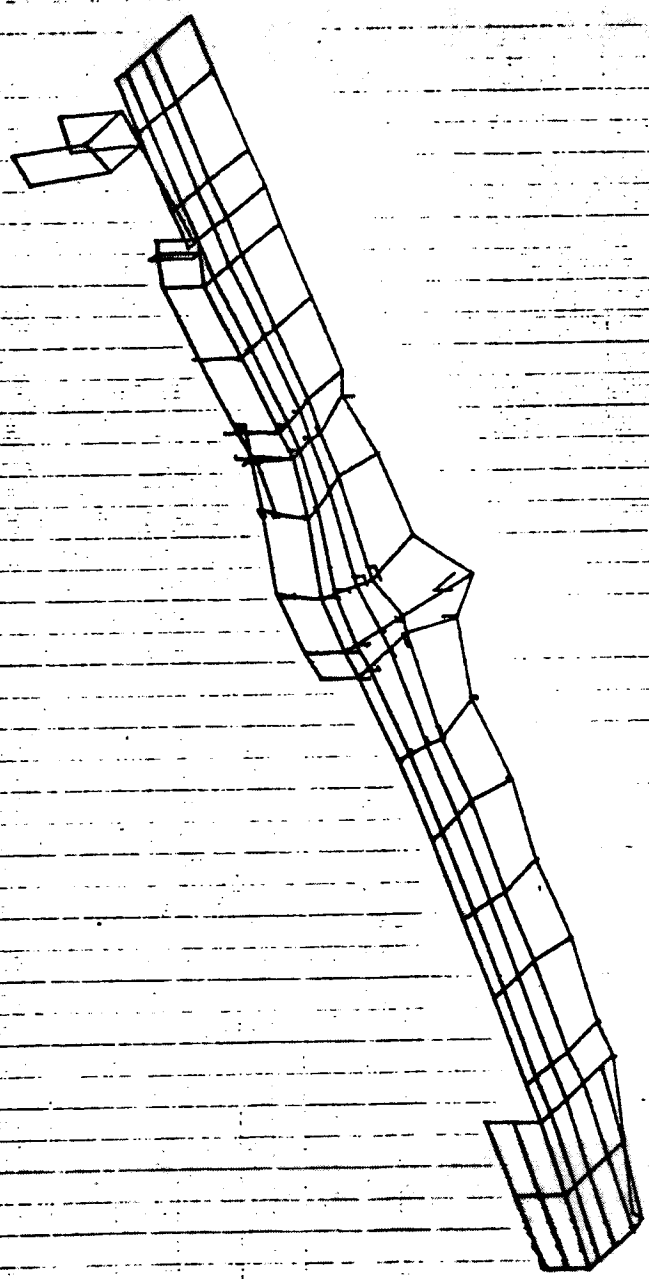


FIGURE 1. ORTHOTIC PROSTHESIS-ORAL CARE MODEL 2  
 BEING WORN BY LINDA, 48 YRS. TRANS AT WIND 08-5-75/77.1  
 FREE MESH FILLED AT INTERFACE  
 MODAL BEHAV. SHOWN IN FIGS. 1002, 010

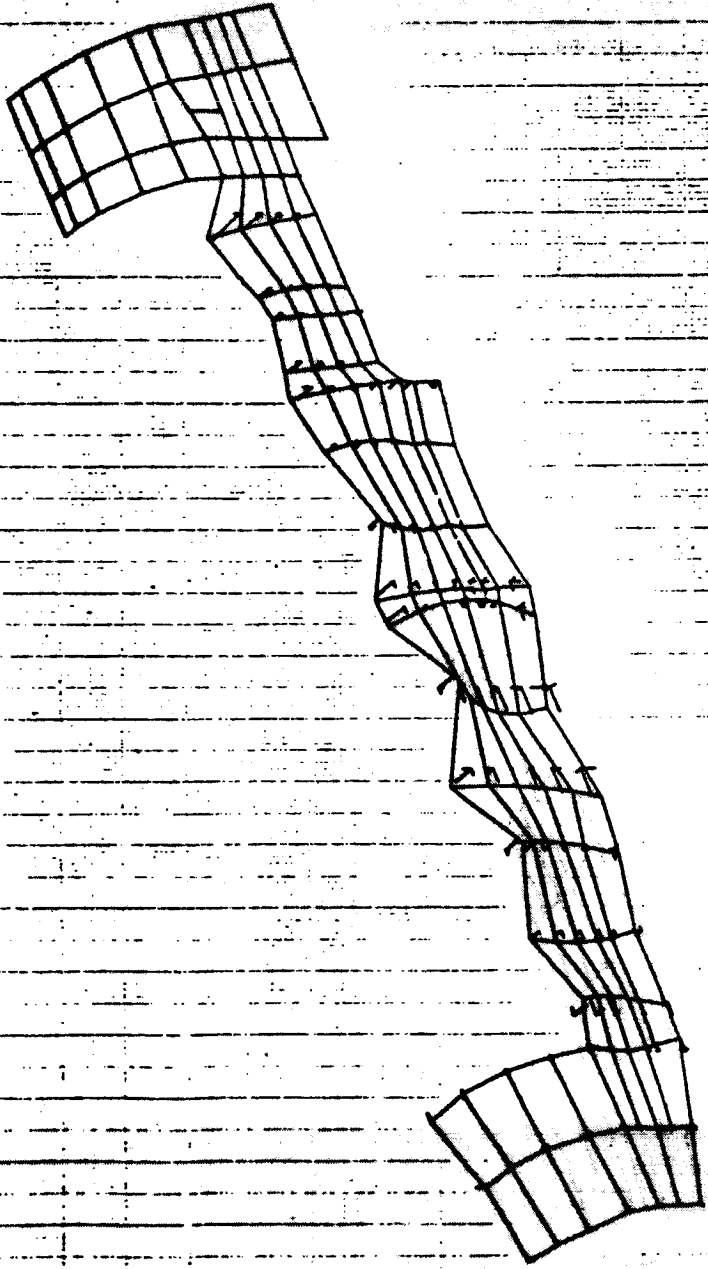
80

18/12/74 1000-007. 0 1.00000000



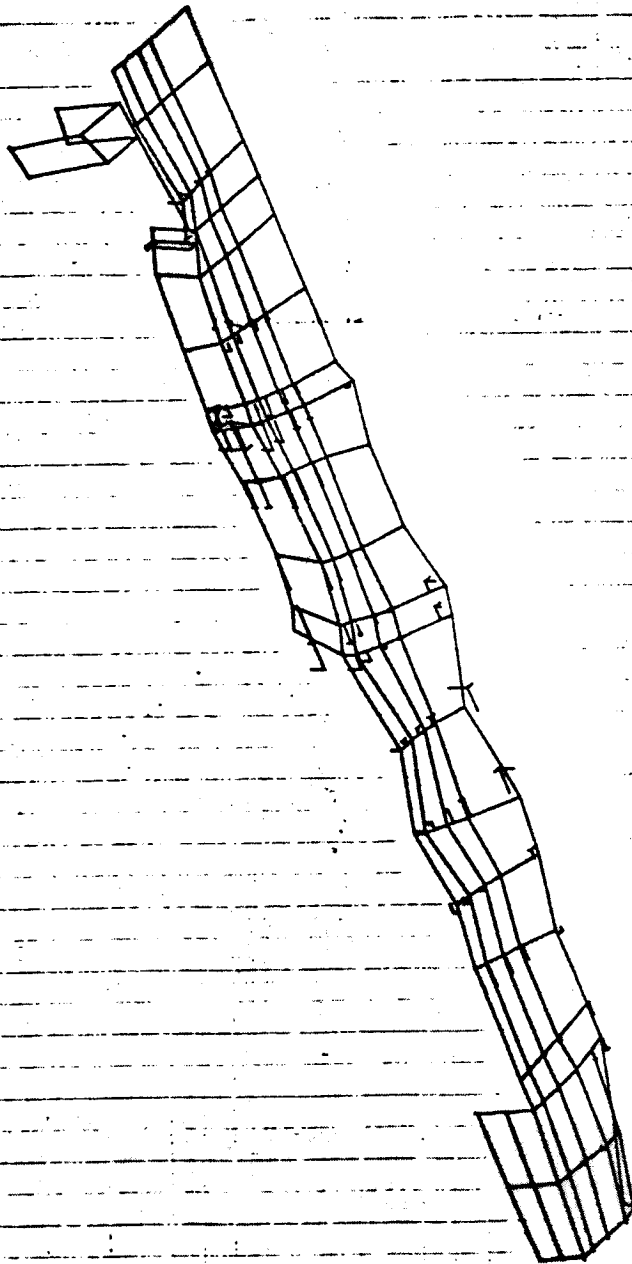
PHASE 1. GEOMETRIC FINISHING-SPIN CASE; MODEL 2  
 BEING MADE BY LOW. 001 (77. TRANS. AT WING 00-2/0077.)  
 PRET. MODES FINED AT INTERFACE  
 ADD'L. DATA. SURFACE 48. MODE 80. FREQ. 1983.078

10 000000 000000 0 1.000000



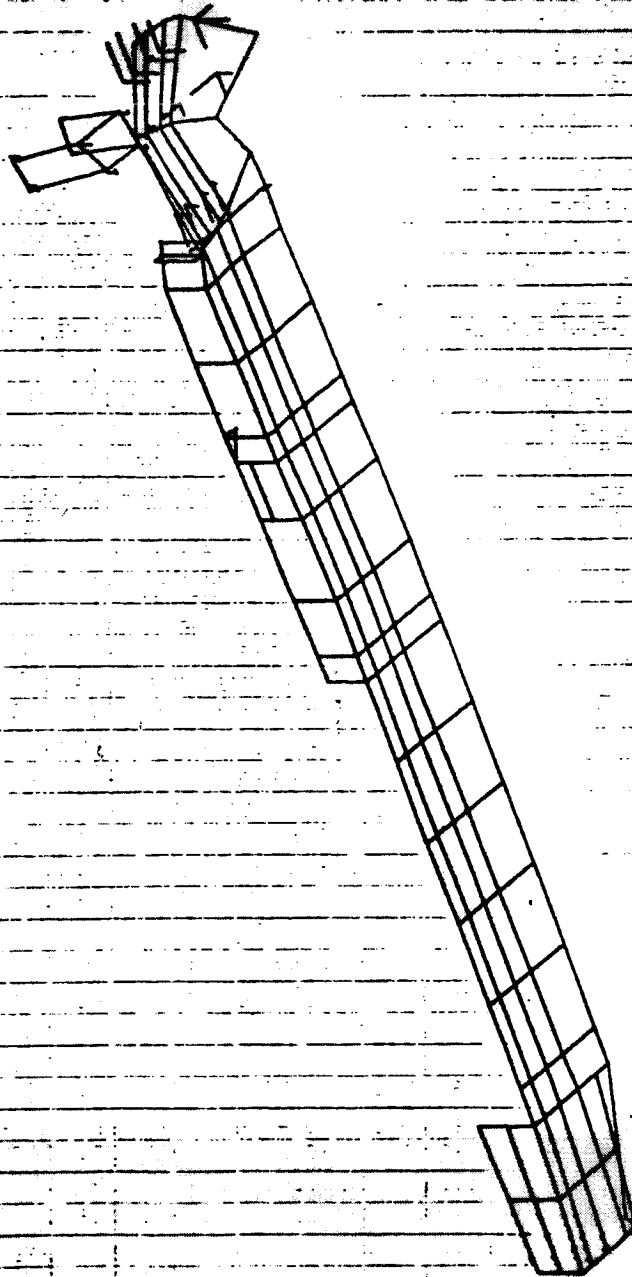
PHASE 1. CONTROL SURFACE STRESS ANALYSIS. 2.  
BEING ONLY BY THE USE OF ST. THOMAS AT WIND TUNNELS.  
FREE SURFACE FLOW AT INTERFACE  
MODAL SECTION. WIND TUNNEL 01. PAGE 01. 1989. 007

01 10/10/74 100-887, 0 1.0000000



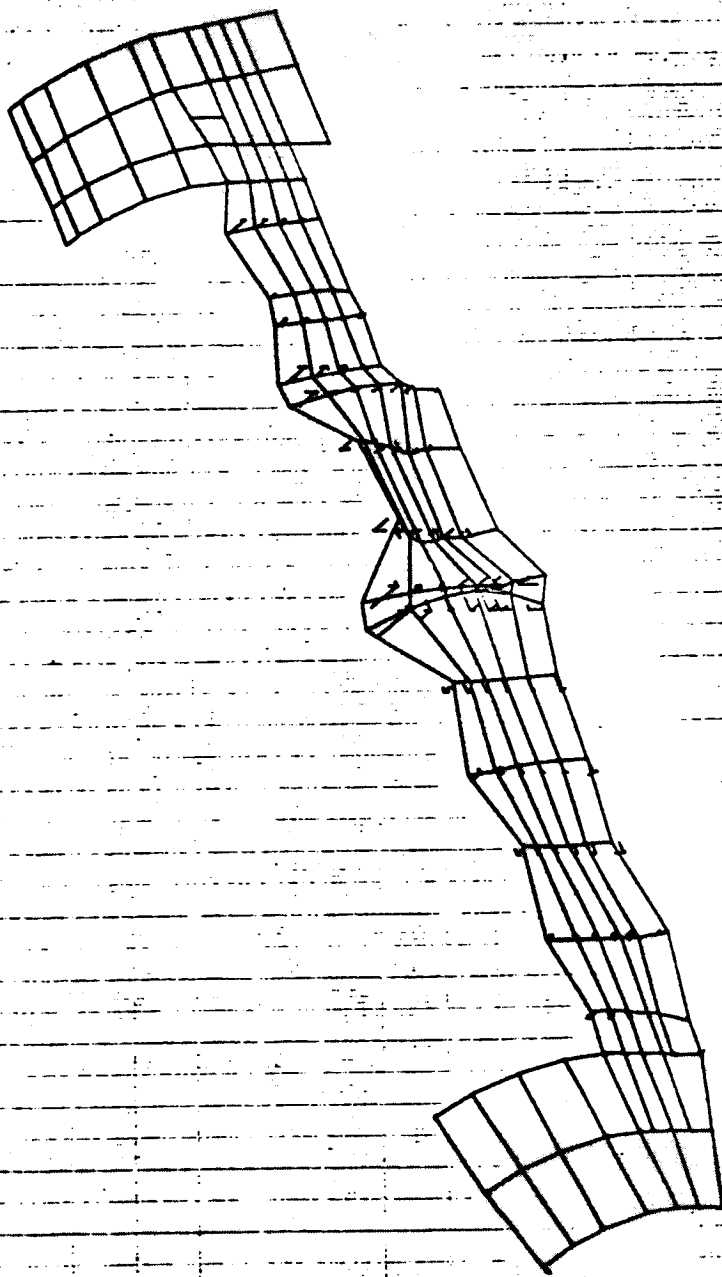
PHASE 1 CONJUNCTION FUSELAGE-SYMM CASE) MODEL 2  
BEING HALF EFF LONG. 06 ( EFF TRANS AT WING (0-2) SECT.)  
FREE MODES FINED AT INTERFACE  
MODAL SECTOR. SUBCASE 48 MODE 01 FREQ. 1993.907

00 10/18/74 1010-007. 0 1.00000000



PHASE 1. CENTER FRAME-SPIN CASED MODEL 8  
SKIN HALF 077.100.100 ( 077.1000.AT WING 00-2/0077. )  
FACE MODEL PITCH AT SURFACE  
ACIAL DEFIB. MESSAGE 06 MODE 03 FREQ. 1428.704

20 10/18/74 1001-007. - 1-0000000



PHASE 1 COMBATED FURCLARE-SYDAM CASE) MODEL 2  
BEING HALF EFF. LONG. 881 EFF. TRANS. AT WIND 0-5/2577.3  
FREE MODES FINED AT INTERFACE  
MODAL DETOR. SURFACE 03 MODE 03 FREQ. 1482.181

80 10-20-70 10-20-70, 0 1. 00000000

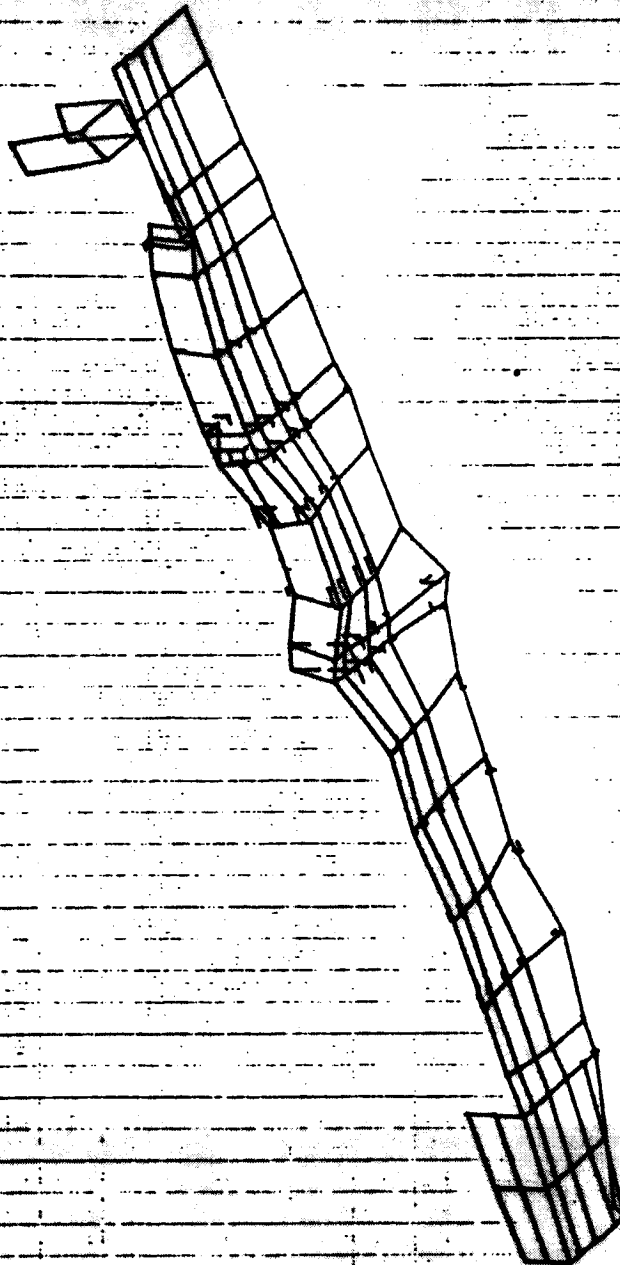
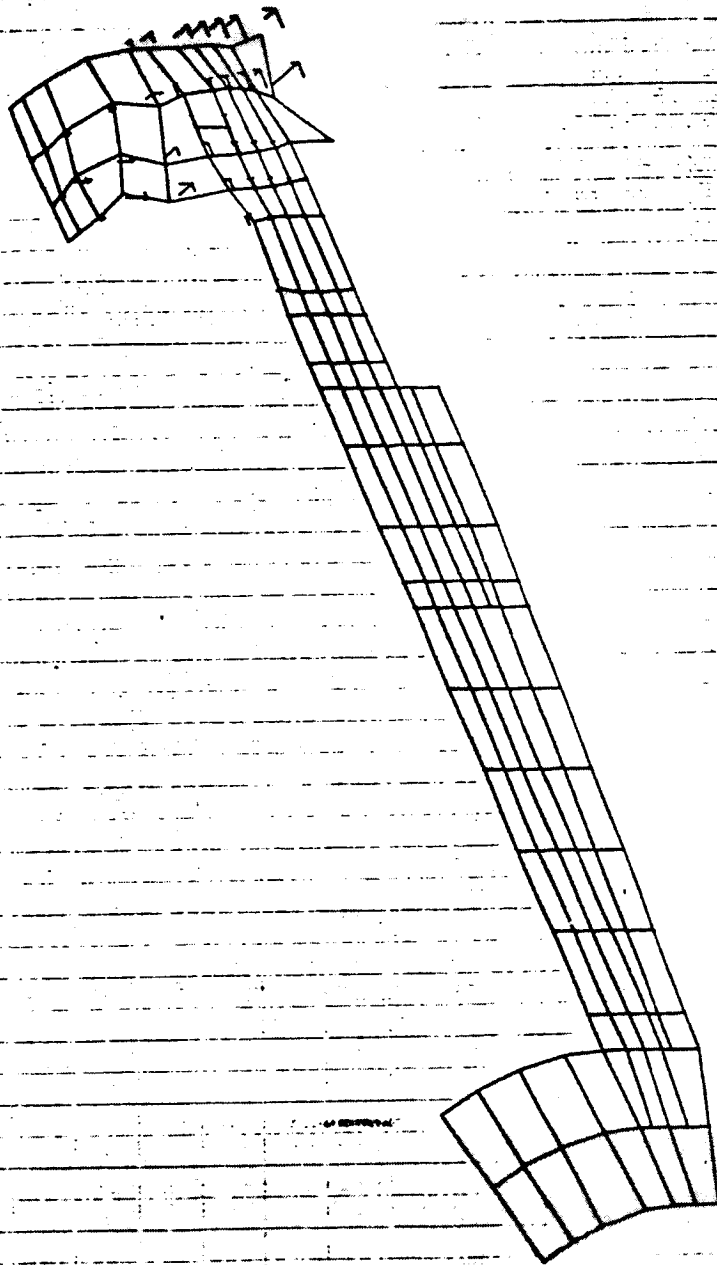


FIGURE 1. CONSTRUCTION OF THE PROSTHESIS FROM THE MODEL. THE  
MODEL WAS MADE OF 1/8" ALUMINUM RODS (1/8" DIA. TRANS. AT WELD JOINTS).  
FREE MOVEMENT AT INTERFACE  
MEDAL SURFACE. SURFACE 48 MODEL 83 FIG. 1-48. 181



81 10/12/74 444-027. = 1.00000000



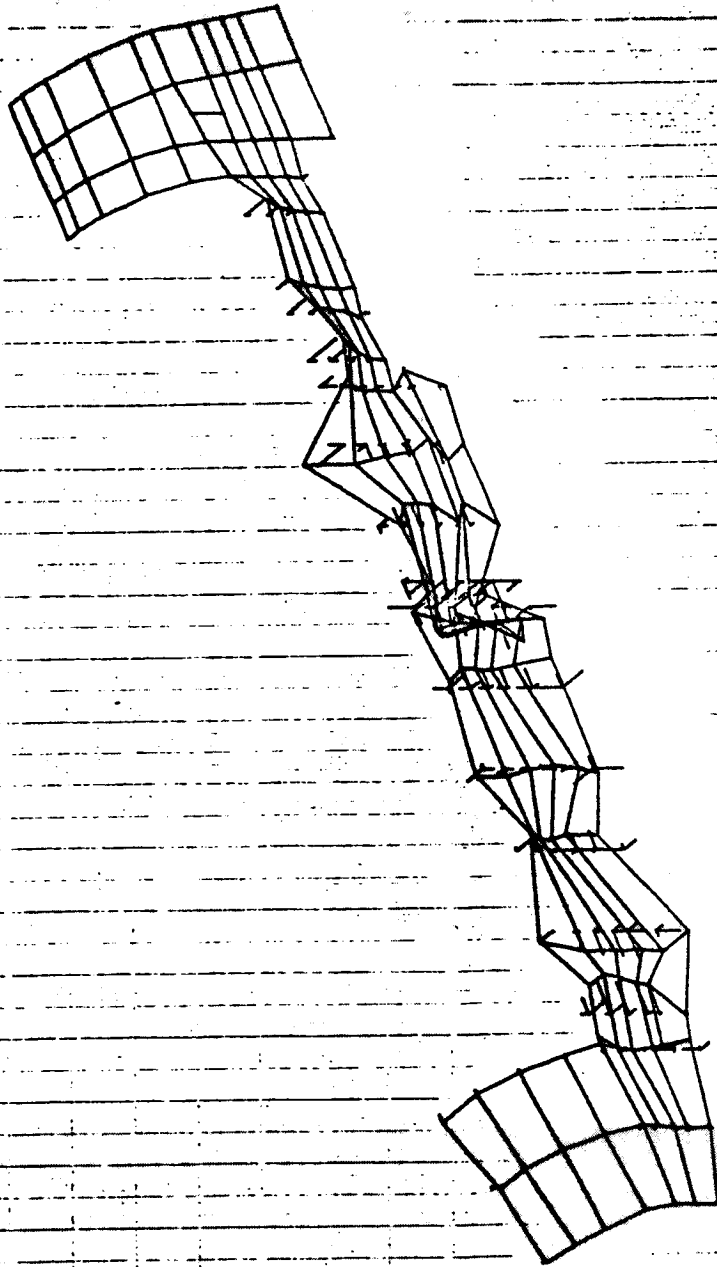
PHASE 1. COBITES FINCLARE-6744 CASE) MODEL 2  
SKINW HALF EFF. LONG. 88 (EFF. TRANS. AT NING 0-2/3EFF.)  
FREE MODES FIXED AT INTERFACE  
MODAL SECTOR. SURFACE 84 MODE 84 FREQ. 1478.259

04 10/10/74 10:00-10:15 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100



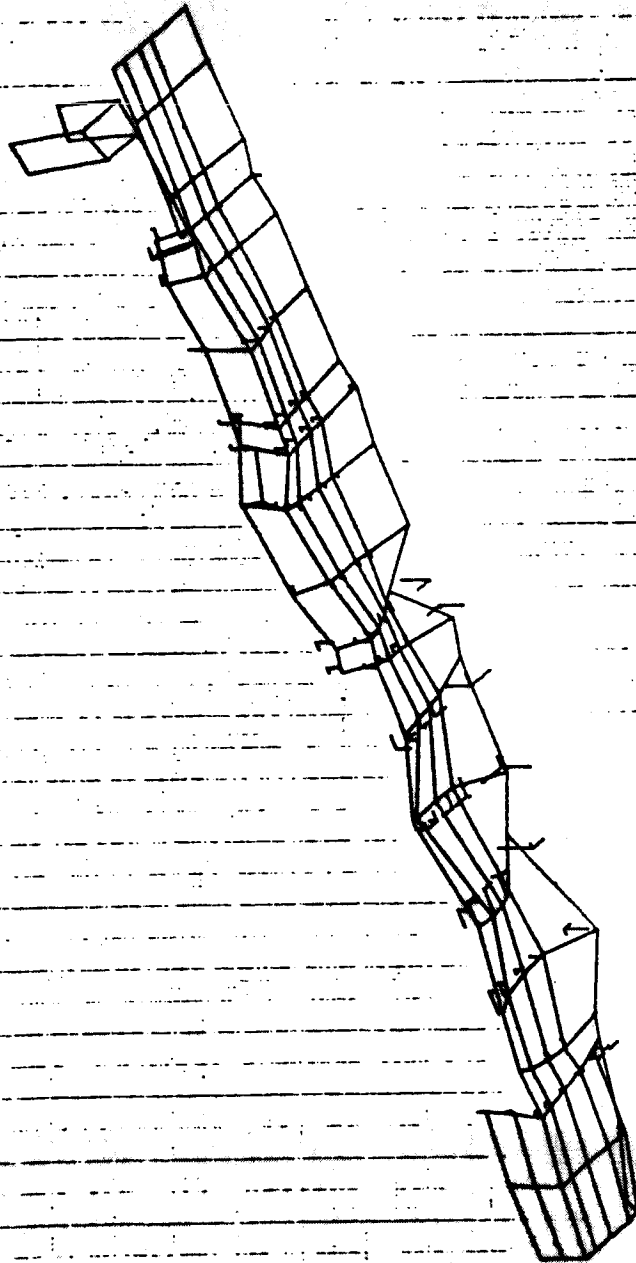
FIGURE 1. WINDTUNNEL MODEL OF THE AIRCRAFT. THE MODEL IS A 1/10 SCALE REPRESENTATION OF THE AIRCRAFT. THE MODEL IS MADE OF ALUMINUM AND IS PAINTED BLACK. THE MODEL IS USED TO STUDY THE AERODYNAMIC CHARACTERISTICS OF THE AIRCRAFT. THE MODEL IS USED TO STUDY THE AERODYNAMIC CHARACTERISTICS OF THE AIRCRAFT. THE MODEL IS USED TO STUDY THE AERODYNAMIC CHARACTERISTICS OF THE AIRCRAFT.

28 18710/74 001-007. 0 1.0000000



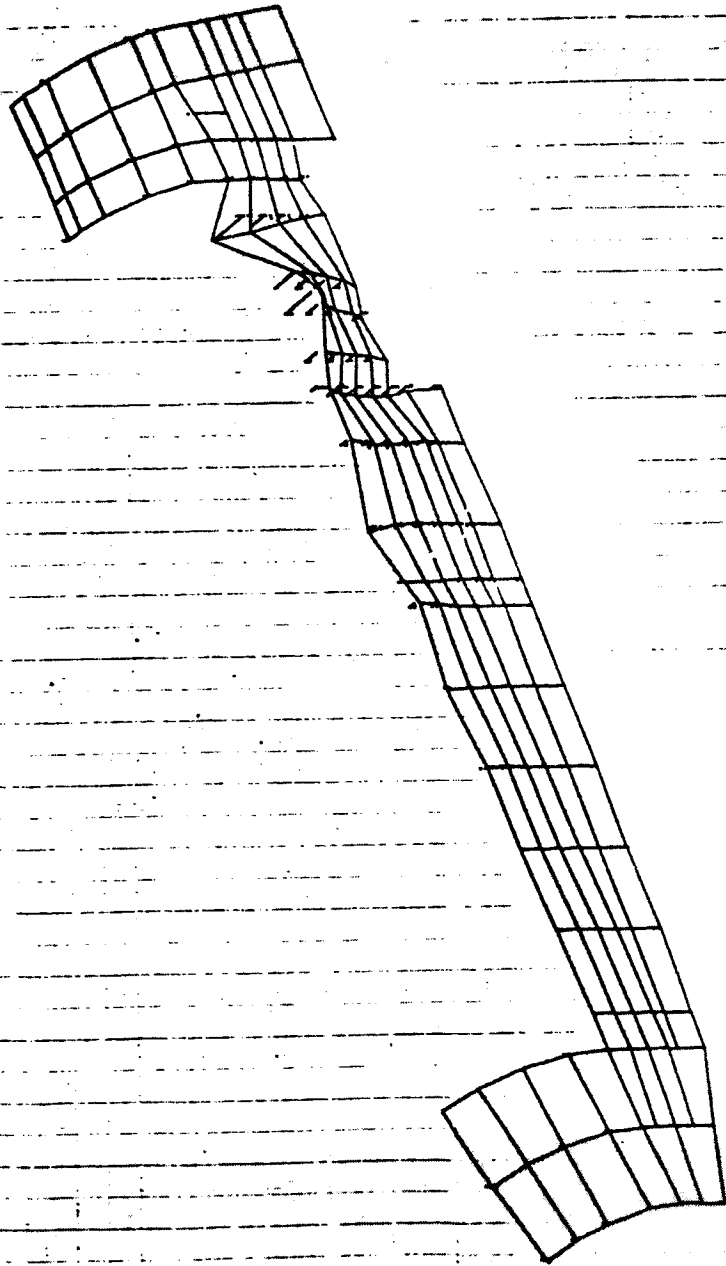
PHASE 1 COMPUTER FINISHING-SYMA CASE3 MODEL 2  
BEING HALF CTF.LONG.-881 CTF.TRANS.AT NIM00-3/8077.1  
FREE BONES FINISH AT INTERFACE  
MORAL SECTOR. SUBCASE 85 MODE 85 F800. 1483.441

80 1810274 . 1811-027 . 0 1.0000000



PHASE 1 GEOMETRY FUSELAGE-STYAN CASE) MODEL 5  
BEING ONLY EFF. LONG. SET EFF. TRANS. AT WING END (2/2077.)  
FREE MEMBER FINISH AT INTERFACE  
MODAL SECTOR. SUBSPACE 48 MODS 68 FREQ. 1489.441

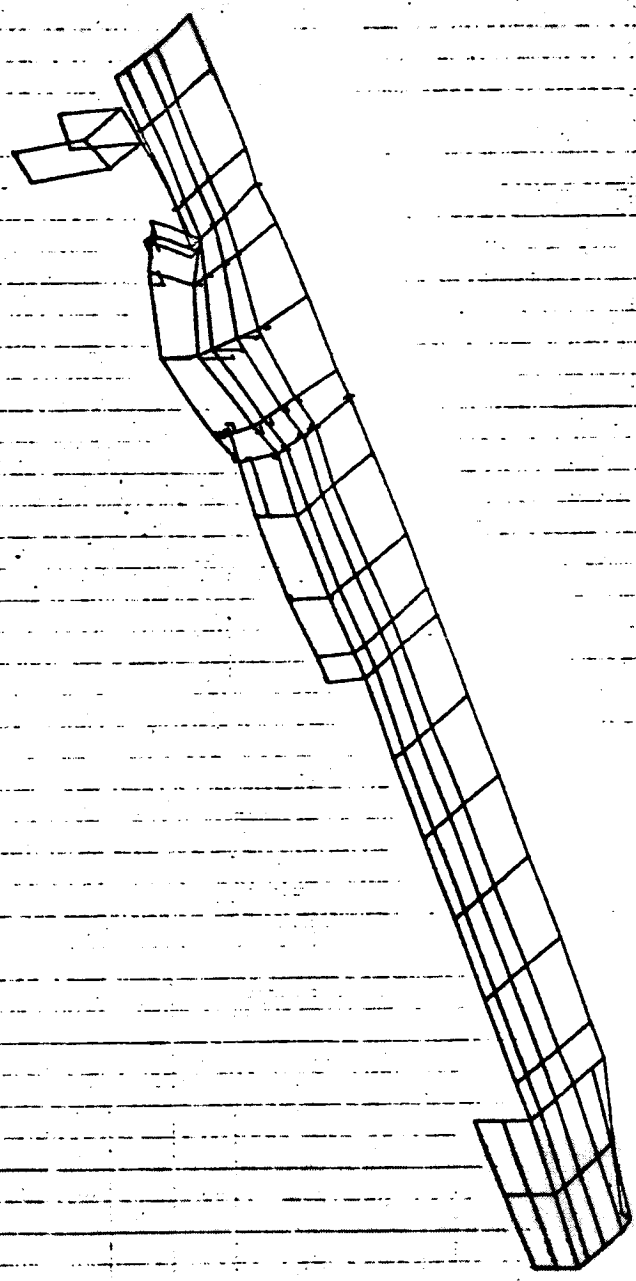
20 10/18/74 0001-007. = 1.0000000



PHASE 1 CONTINUED SUBCAGE-SYMA CASE1 MODEL 2  
 SKINS HALF EFF. LONG. .88 ( EFF. TRANS. AT WING (9-2/3EFF. )  
 FREE NODES FIXED AT INTERFACE  
 LOCAL DEFOR. SUBCAGE 80 MODC 88 FREQ. 1004.078

88

88 10/18/74 1000-007, 0 1, 00000000



PHASE 1 CONSTITUTED PURCHASE (STRA) CASE) MODEL 2  
 SKIN HALF EXP. LAMB. ABS (CTY. TRANS. AT WIND 60-0/3007.)  
 FREE MODES FIXED AT INTERFACE  
 MODAL ORDER, SUBMODE 48 MODE 98 FREQ. 1884.098

24 10/10/74 101-107. = 1.000000

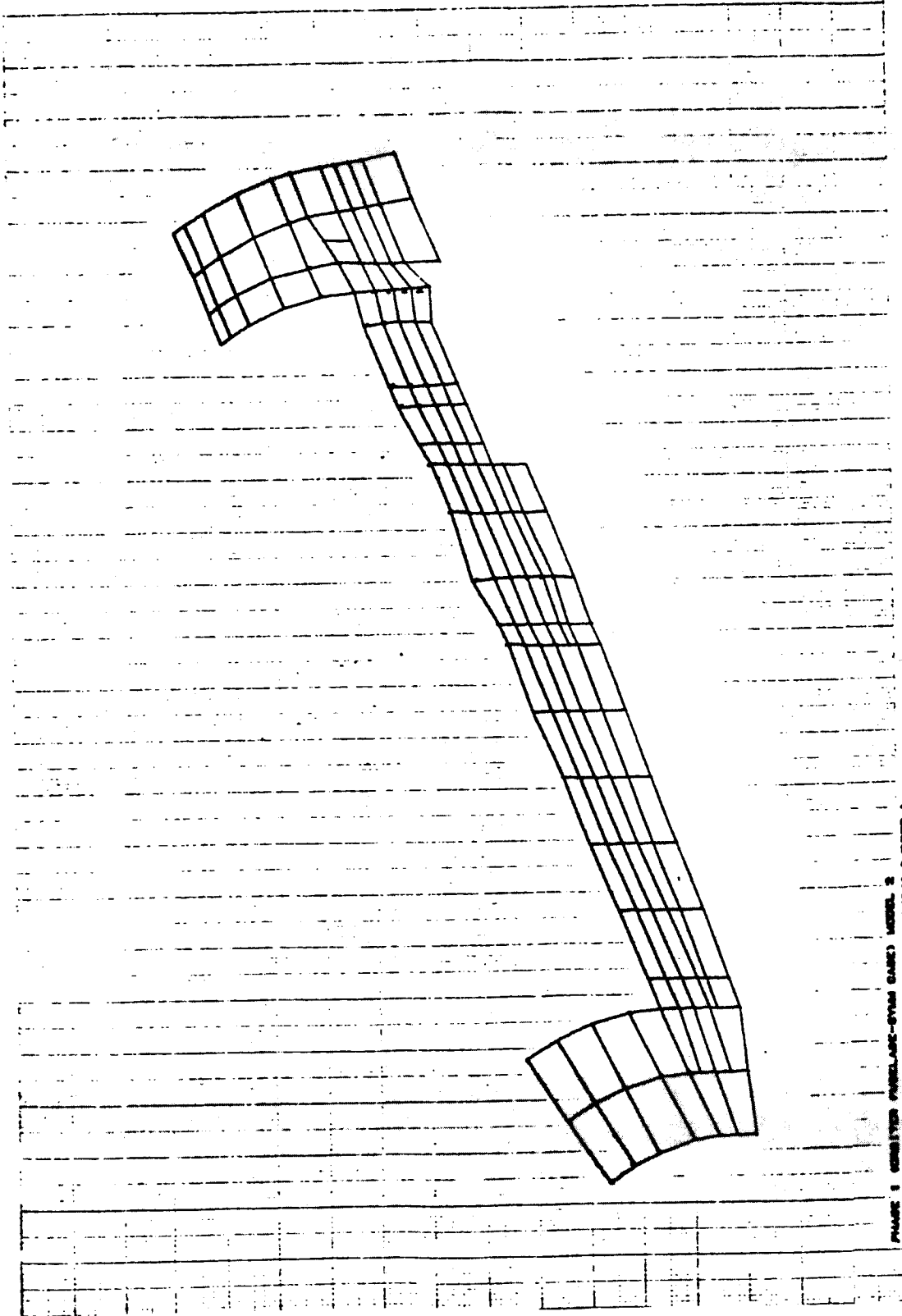
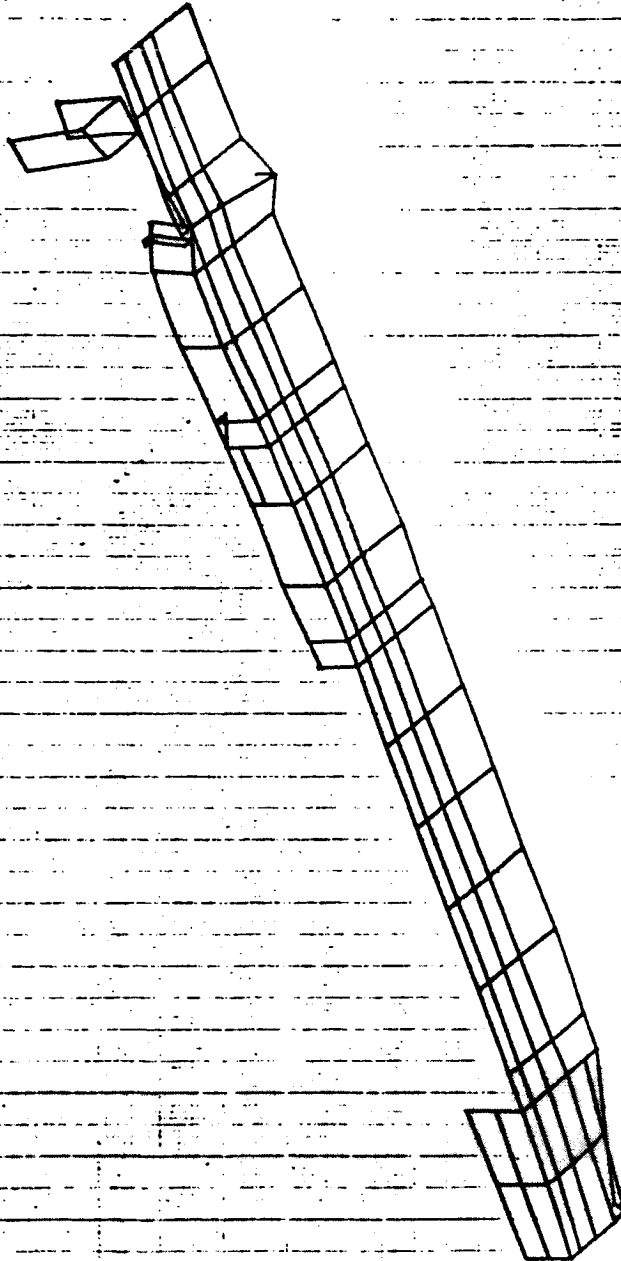


FIGURE 1. GEOMETRY PANELS (BYM CASE) MODE 2  
 BEING ONLY EFF. LONG. BE (EFF. TRING. AT WING 0-2/DEPT.)  
 FREE MODES PLOTTED AT INTERFACE  
 MODAL DEFOR. SURFACE 07 MODE 07 FREQ. 1871.148

BT 18/18/74: 1111-1111. 1.00000000



PHASE 1 COMPUTER FURFLAKE-OTIM CASE) MODEL B  
SKING HALF CY. LONG. 484. CFT. TRANS. AT WIND (0.2/2077.)  
FREE MODES FIXED AT SURFACE  
MODAL DEFORM. MESSAGE 48 MODE 57 FREQ. 1871.148



**Appendix B5**  
**INPUT BULK DATA/PHASE I ANALYSIS: MODEL II**  
**WING**

0 9/10/74 RECOVERS 85 PERCENT EFF.0

CASE CONTROL OFCK FCHD

CARD  
COUNT

1 TITLE # PHASE 1 XUPOLITER WING

2 SIMULT # 9/10/74 RECOVERS 85 PERCENT EFF.0

3 MAX LINES # 30000

4 METHOD # 2

5 MIC # 3000

6 SURFACE 1

7 MODE # 20

8 LABEL # FREE WINGS FIXED AT INTERFACE

9 OUTPUT # ALL

10 VECTOR # ALL

11 OUTPUT PLOT

12 SET 1 # INCLUDE 3101 THRU 3125

13 SET 2 # INCLUDE 3201 THRU 3227

14 SET 3 # INCLUDE 3301 THRU 3352

15 SET 4 # INCLUDE 3401 THRU 3478,3501 THRU 3536,3582

16 SET 5 # INCLUDE 3601 THRU 3694

17 SET 6 # INCLUDE 3701 THRU 3760

18 SET 7 # CLEAN

19 PLOTTER CALCOMP 765,105

20 AXES #MY,X,Y

21 VIEW # 30,0,0,0,0,0

22 MAXIMUM DEFORMATION 10.0

23 FREQ SCALE ORIGIN 2.5FT 7

24 PLOT WING DEFORMATION 1 THRU 20.5FT 7.0ORIGIN 2.5HAPF VECTOR XYZ

25 DECIM 300K

SEE USER INFORMATION MESSAGE 207. WING DATA NOT SORTED, XSDRI WILL RE-ORDER DECK.

0/10/74 XCOVERS AS PERCENT FFF.0

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1	CONRAD	3582	3474	3624	3100	315				
2	CONRAD	3629	3601	3651	3600	35.5085	-80.227A.0			47.84 EC3000
3	CONRAD	3630	3605	3655	3600	35.5085	-80.227A.0			57.5136 EC3001
4	CONRAD	3631	3609	3659	3631	35.5085	-80.227A.0			24.0518 EC3002
5	CONRAD	3632	3613	3663	3632	35.5085	-80.227A.0			
6	CONRAD	3633	3617	3667	3633	35.5085	-80.227A.0			
7	CONRAD	3634	3621	3671	3634	35.5085	-80.227A.0			
8	CONRAD	3635	3622	3672	3635	35.5085	-80.227A.0			
9	CONRAD	3636	3623	3673	3636	35.5085	-80.227A.0			
10	CONRAD	3637	3624	3674	3637	35.5085	-80.227A.0			
11	CONRAD	3638	3625	3675	3638	35.5085	-80.227A.0			
12	CONRAD	3639	3626	3676	3639	35.5085	-80.227A.0			
13	CONRAD	3640	3627	3677	3640	35.5085	-80.227A.0			
14	CONRAD	3641	3628	3678	3641	35.5085	-80.227A.0			
15	CONRAD	3642	3629	3679	3642	35.5085	-80.227A.0			
16	CONRAD	3643	3630	3680	3643	35.5085	-80.227A.0			
17	CONRAD	3644	3631	3681	3644	35.5085	-80.227A.0			
18	CONRAD	3645	3632	3682	3645	35.5085	-80.227A.0			
19	CONRAD	3646	3633	3683	3646	35.5085	-80.227A.0			
20	CONRAD	3647	3634	3684	3647	35.5085	-80.227A.0			
21	CONRAD	3648	3635	3685	3648	35.5085	-80.227A.0			
22	CONRAD	3649	3636	3686	3649	35.5085	-80.227A.0			
23	CONRAD	3650	3637	3687	3650	35.5085	-80.227A.0			
24	CONRAD	3651	3638	3688	3651	35.5085	-80.227A.0			
25	CONRAD	3652	3639	3689	3652	35.5085	-80.227A.0			
26	CONRAD	3653	3640	3690	3653	35.5085	-80.227A.0			
27	CONRAD	3654	3641	3691	3654	35.5085	-80.227A.0			
28	CONRAD	3655	3642	3692	3655	35.5085	-80.227A.0			
29	CONRAD	3656	3643	3693	3656	35.5085	-80.227A.0			
30	CONRAD	3657	3644	3694	3657	35.5085	-80.227A.0			
31	CONRAD	3658	3645	3695	3658	35.5085	-80.227A.0			
32	CONRAD	3659	3646	3696	3659	35.5085	-80.227A.0			
33	CONRAD	3660	3647	3697	3660	35.5085	-80.227A.0			
34	CONRAD	3661	3648	3698	3661	35.5085	-80.227A.0			
35	CONRAD	3662	3649	3699	3662	35.5085	-80.227A.0			
36	CONRAD	3663	3650	3700	3663	35.5085	-80.227A.0			
37	CONRAD	3664	3651	3701	3664	35.5085	-80.227A.0			
38	CONRAD	3665	3652	3702	3665	35.5085	-80.227A.0			
39	CONRAD	3666	3653	3703	3666	35.5085	-80.227A.0			
40	CONRAD	3667	3654	3704	3667	35.5085	-80.227A.0			
41	CONRAD	3668	3655	3705	3668	35.5085	-80.227A.0			
42	CONRAD	3669	3656	3706	3669	35.5085	-80.227A.0			
43	CONRAD	3670	3657	3707	3670	35.5085	-80.227A.0			
44	CONRAD	3671	3658	3708	3671	35.5085	-80.227A.0			
45	CONRAD	3672	3659	3709	3672	35.5085	-80.227A.0			
46	CONRAD	3673	3660	3710	3673	35.5085	-80.227A.0			
47	CONRAD	3674	3661	3711	3674	35.5085	-80.227A.0			
48	CONRAD	3675	3662	3712	3675	35.5085	-80.227A.0			
49	CONRAD	3676	3663	3713	3676	35.5085	-80.227A.0			
50	CONRAD	3677	3664	3714	3677	35.5085	-80.227A.0			

9/10/74 SCOVERS AS PERCENT EFF.N

CARD COUNT	1	2	3	4	5	6	7	8	9	10
51-	3463	3463	3463	3463	3463	3463	3463	3463	3463	3463
52-	3464	3464	3464	3464	3464	3464	3464	3464	3464	3464
53-	3465	3465	3465	3465	3465	3465	3465	3465	3465	3465
54-	3466	3466	3466	3466	3466	3466	3466	3466	3466	3466
55-	3467	3467	3467	3467	3467	3467	3467	3467	3467	3467
56-	3468	3468	3468	3468	3468	3468	3468	3468	3468	3468
57-	3469	3469	3469	3469	3469	3469	3469	3469	3469	3469
58-	3470	3470	3470	3470	3470	3470	3470	3470	3470	3470
59-	3471	3471	3471	3471	3471	3471	3471	3471	3471	3471
60-	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
61-	3473	3473	3473	3473	3473	3473	3473	3473	3473	3473
62-	3474	3474	3474	3474	3474	3474	3474	3474	3474	3474
63-	3475	3475	3475	3475	3475	3475	3475	3475	3475	3475
64-	3476	3476	3476	3476	3476	3476	3476	3476	3476	3476
65-	3477	3477	3477	3477	3477	3477	3477	3477	3477	3477
66-	3478	3478	3478	3478	3478	3478	3478	3478	3478	3478
67-	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479
68-	3480	3480	3480	3480	3480	3480	3480	3480	3480	3480
69-	3481	3481	3481	3481	3481	3481	3481	3481	3481	3481
70-	3482	3482	3482	3482	3482	3482	3482	3482	3482	3482
71-	3483	3483	3483	3483	3483	3483	3483	3483	3483	3483
72-	3484	3484	3484	3484	3484	3484	3484	3484	3484	3484
73-	3485	3485	3485	3485	3485	3485	3485	3485	3485	3485
74-	3486	3486	3486	3486	3486	3486	3486	3486	3486	3486
75-	3487	3487	3487	3487	3487	3487	3487	3487	3487	3487
76-	3488	3488	3488	3488	3488	3488	3488	3488	3488	3488
77-	3489	3489	3489	3489	3489	3489	3489	3489	3489	3489
78-	3490	3490	3490	3490	3490	3490	3490	3490	3490	3490
79-	3491	3491	3491	3491	3491	3491	3491	3491	3491	3491
80-	3492	3492	3492	3492	3492	3492	3492	3492	3492	3492
81-	3493	3493	3493	3493	3493	3493	3493	3493	3493	3493
82-	3494	3494	3494	3494	3494	3494	3494	3494	3494	3494
83-	3495	3495	3495	3495	3495	3495	3495	3495	3495	3495
84-	3496	3496	3496	3496	3496	3496	3496	3496	3496	3496
85-	3497	3497	3497	3497	3497	3497	3497	3497	3497	3497
86-	3498	3498	3498	3498	3498	3498	3498	3498	3498	3498
87-	3499	3499	3499	3499	3499	3499	3499	3499	3499	3499
88-	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500
89-	3501	3501	3501	3501	3501	3501	3501	3501	3501	3501
90-	3502	3502	3502	3502	3502	3502	3502	3502	3502	3502
91-	3503	3503	3503	3503	3503	3503	3503	3503	3503	3503
92-	3504	3504	3504	3504	3504	3504	3504	3504	3504	3504
93-	3505	3505	3505	3505	3505	3505	3505	3505	3505	3505
94-	3506	3506	3506	3506	3506	3506	3506	3506	3506	3506
95-	3507	3507	3507	3507	3507	3507	3507	3507	3507	3507
96-	3508	3508	3508	3508	3508	3508	3508	3508	3508	3508
97-	3509	3509	3509	3509	3509	3509	3509	3509	3509	3509
98-	3510	3510	3510	3510	3510	3510	3510	3510	3510	3510
99-	3511	3511	3511	3511	3511	3511	3511	3511	3511	3511
100-	3512	3512	3512	3512	3512	3512	3512	3512	3512	3512

9/10/74 SCIVERS 85 PERCENT EFF.4

SHORTFLY HULK DATA ECHO

CARD	COUNT	1	2	3	4	5	6	7	8	9	10
101	CRUD	3652	3650	3305	3300	3305	3653	3650	3304	3401	
102	CRUD	3654	3600	3321	3117	3321	3655	3600	3113	3417	
103	CRUD	3656	3600	3313	3117	3321	3657	3600	3113	3417	
104	CRUD	3658	3600	3313	3100	3313	3659	3600	3106	3417	
105	CRUD	3660	3600	3313	3057	3313	3661	3600	3106	3417	
106	CRUD	3662	3600	3301	3001	3305	3663	3600	3106	3417	
107	CRUD	3664	3601	3001	3001	3505	3702	3601	3102	3422	
108	CRUD	3701	3601	3322	3322	3322	3704	3601	3102	3422	
109	CRUD	3705	3601	3322	3322	3322	3706	3601	3102	3422	
110	CRUD	3707	3601	3322	3322	3322	3709	3608	3118	3418	
111	CRUD	3708	3606	3318	3318	3318	3711	3608	3118	3418	
112	CRUD	3710	3604	3318	3318	3318	3713	3608	3318	3418	
113	CRUD	3712	3600	3318	3318	3318	3715	3608	3318	3418	
114	CRUD	3714	3600	3318	3318	3318	3716	3608	3318	3418	
115	CRUD	3715	3603	3318	3318	3318	3718	3608	3318	3418	
116	CRUD	3717	3609	3318	3318	3318	3720	3620	3310	3410	
117	CRUD	3719	3609	3318	3318	3318	3722	3620	3310	3410	
118	CRUD	3721	3620	3310	3310	3310	3724	3624	3306	3406	
119	CRUD	3723	3620	3310	3310	3310	3726	3624	3306	3406	
120	CRUD	3725	3624	3306	3306	3306	3728	3627	3302	3402	
121	CRUD	3727	3627	3302	3302	3302	3730	3636	3314	3414	
122	CRUD	3729	3636	3314	3314	3314	3732	3636	3314	3414	
123	CRUD	3731	3636	3314	3314	3314	3734	3636	3314	3414	
124	CRUD	3733	3636	3314	3314	3314	3736	3636	3314	3414	
125	CRUD	3735	3636	3314	3314	3314	3738	3635	3314	3414	
126	CRUD	3737	3636	3314	3314	3314	3740	3635	3314	3414	
127	CRUD	3739	3636	3314	3314	3314	3742	3635	3314	3414	
128	CRUD	3741	3636	3314	3314	3314	3744	3635	3314	3414	
129	CRUD	3743	3636	3314	3314	3314	3746	3635	3314	3414	
130	CRUD	3745	3636	3314	3314	3314	3748	3635	3314	3414	
131	CRUD	3747	3636	3314	3314	3314	3750	3635	3314	3414	
132	CRUD	3749	3636	3314	3314	3314	3752	3635	3314	3414	
133	CRUD	3751	3636	3314	3314	3314	3754	3635	3314	3414	
134	CRUD	3753	3636	3314	3314	3314	3756	3635	3314	3414	
135	CRUD	3755	3636	3314	3314	3314	3758	3635	3314	3414	
136	CRUD	3757	3636	3314	3314	3314	3760	3635	3314	3414	
137	CRUD	3759	3636	3314	3314	3314	3762	3635	3314	3414	
138	CRUD	3761	3636	3314	3314	3314	3764	3635	3314	3414	
139	CRUD	3763	3636	3314	3314	3314	3766	3635	3314	3414	
140	CRUD	3765	3636	3314	3314	3314	3768	3635	3314	3414	
141	CSH AR	3101	3101	3117	3117	3117	3121	3121	3121	3121	
142	CSH AR	3102	3101	3117	3117	3117	3121	3121	3121	3121	
143	CSH AR	3103	3101	3117	3117	3117	3121	3121	3121	3121	
144	CSH AR	3104	3101	3117	3117	3117	3121	3121	3121	3121	
145	CSH AR	3105	3101	3117	3117	3117	3121	3121	3121	3121	
146	CSH AR	3106	3101	3117	3117	3117	3121	3121	3121	3121	
147	CSH AR	3107	3101	3117	3117	3117	3121	3121	3121	3121	
148	CSH AR	3108	3101	3117	3117	3117	3121	3121	3121	3121	
149	CSH AR	3109	3101	3117	3117	3117	3121	3121	3121	3121	
150	CSH AR	3110	3101	3117	3117	3117	3121	3121	3121	3121	



9/10/74 SCWERS 85 PERCENT EFF. R

CARD COUNT	1	2	3	4	5	6	7	8	9	10
CSMEAR	3310	3310	3301	3217	3317	3314	3218			
CSMEAR	3311	3311	3301	3213	3313	3314	3214			
CSMEAR	3312	3312	3301	3209	3300	3310	3210			
CSMEAR	3313	3313	3301	3209	3305	3306	3210			
CSMEAR	3314	3314	3301	3217	3321	3322	3222			
CSMEAR	3315	3315	3301	3317	3318	3318	3214			
CSMEAR	3316	3316	3301	3315	3313	3314	3314			
CSMEAR	3317	3317	3301	3309	3309	3310	3310			
CSMEAR	3318	3318	3301	3300	3305	3306	3306			
CSMEAR	3319	3319	3301	3301	3301	3302	3302			
CSMEAR	3320	3320	3301	3301	3301	3302	3302			
CSMEAR	3321	3321	3301	3301	3301	3302	3302			
CSMEAR	3322	3322	3301	3301	3301	3302	3302			
CSMEAR	3323	3323	3301	3301	3301	3302	3302			
CSMEAR	3324	3324	3301	3301	3301	3302	3302			
CSMEAR	3325	3325	3301	3301	3301	3302	3302			
CSMEAR	3326	3326	3301	3301	3301	3302	3302			
CSMEAR	3327	3327	3301	3301	3301	3302	3302			
CSMEAR	3328	3328	3301	3301	3301	3302	3302			
CSMEAR	3329	3329	3301	3301	3301	3302	3302			
CSMEAR	3330	3330	3301	3301	3301	3302	3302			
CSMEAR	3331	3331	3301	3301	3301	3302	3302			
CSMEAR	3332	3332	3301	3301	3301	3302	3302			
CSMEAR	3333	3333	3301	3301	3301	3302	3302			
CSMEAR	3334	3334	3301	3301	3301	3302	3302			
CSMEAR	3335	3335	3301	3301	3301	3302	3302			
CSMEAR	3336	3336	3301	3301	3301	3302	3302			
CSMEAR	3337	3337	3301	3301	3301	3302	3302			
CSMEAR	3338	3338	3301	3301	3301	3302	3302			
CSMEAR	3339	3339	3301	3301	3301	3302	3302			
CSMEAR	3340	3340	3301	3301	3301	3302	3302			
CSMEAR	3341	3341	3301	3301	3301	3302	3302			
CSMEAR	3342	3342	3301	3301	3301	3302	3302			
CSMEAR	3343	3343	3301	3301	3301	3302	3302			
CSMEAR	3344	3344	3301	3301	3301	3302	3302			
CSMEAR	3345	3345	3301	3301	3301	3302	3302			
CSMEAR	3346	3346	3301	3301	3301	3302	3302			
CSMEAR	3347	3347	3301	3301	3301	3302	3302			
CSMEAR	3348	3348	3301	3301	3301	3302	3302			
CSMEAR	3349	3349	3301	3301	3301	3302	3302			
CSMEAR	3350	3350	3301	3301	3301	3302	3302			
CSMEAR	3351	3351	3301	3301	3301	3302	3302			
CSMEAR	3352	3352	3301	3301	3301	3302	3302			
FIGR	2	2	INV	10.0	1200.	30	3568			
FIGR	MAX	MAX	0	0	0	0	0			
FIGR	3017	3017	0	145.0	-61.5A	51.5	456			
FIGR	3018	3018	0	165.0	-61.5A	49.0	0			
FIGR	3021	3021	0	170.75	-61.5A	51.5	0			
FIGR	3022	3022	0	170.75	-61.5A	49.0	0			

1.-3 6E1G2

9/10/74 SCOVERS 86 PERCENT EFF.0

CARD	1	2	3	4	5	6	7	8	9	10
261-	GR10	3113	153.375	54.067815						
262-	GR10	3114	153.375	54.067815	4487					
263-	GR10	3117	162.0	54.067815						
264-	GR10	3118	162.0	54.067815	4487					
265-	GR10	3121	170.75	54.067815						
266-	GR10	3122	170.75	54.067815	4487					
267-	GR10	3120	166.75	46.514815						
268-	GR10	3110	166.75	46.514815	4075					
269-	GR10	3113	153.375	46.514815						
270-	GR10	3114	153.375	46.514815	4075					
271-	GR10	3217	162.0	46.514815						
272-	GR10	3218	162.0	46.514815	4075					
273-	GR10	3110	166.75	46.514815						
274-	GR10	3110	166.75	46.514815	4075					
275-	GR10	3110	166.75	46.514815	4075					
276-	GR10	3110	166.75	46.514815	4075					
277-	GR10	3113	153.375	46.514815						
278-	GR10	3114	153.375	46.514815	2743					
279-	GR10	3117	162.0	46.514815						
280-	GR10	3118	162.0	46.514815	2743					
281-	GR10	3121	170.75	46.514815						
282-	GR10	3122	170.75	46.514815	2743					
283-	GR10	3110	166.75	46.514815						
284-	GR10	3110	166.75	46.514815	4075					
285-	GR10	3113	153.375	46.514815						
286-	GR10	3114	153.375	46.514815	4075					
287-	GR10	3117	162.0	46.514815						
288-	GR10	3118	162.0	46.514815	4075					
289-	GR10	3121	170.75	46.514815						
290-	GR10	3122	170.75	46.514815	4075					
291-	GR10	3110	166.75	46.514815						
292-	GR10	3110	166.75	46.514815	4075					
293-	GR10	3113	153.375	46.514815						
294-	GR10	3114	153.375	46.514815	4075					
295-	GR10	3117	162.0	46.514815						
296-	GR10	3118	162.0	46.514815	4075					
297-	GR10	3121	170.75	46.514815						
298-	GR10	3122	170.75	46.514815	4075					
299-	GR10	3110	166.75	46.514815						
300-	GR10	3110	166.75	46.514815	4075					



9/10/74 SCOWERS 85 PERCENT FFF.H

CARD COUNT	1	2	3	4	5	6	7	8	9	10
301-	GR1D	3571	170.75	-17.425	51.5					
302-	GR1D	3572	170.75	-17.425	45.7689					
303-	GR1D	3574	165.25	-17.425	45.7689	3000	456			
304-	GR1D	3601	125.5	-13.75	51.5					
305-	GR1D	3602	125.5	-13.75	45.5					
306-	GR1D	3605	130.0	-13.75	51.5					
307-	GR1D	3606	130.0	-13.75	45.5					
308-	GR1D	3600	166.75	-13.75	51.5					
309-	GR1D	3610	166.75	-13.75	45.5					
310-	GR1D	3613	153.275	-13.75	51.5					
311-	GR1D	3614	153.275	-13.75	45.5					
312-	GR1D	3617	162.0	-13.75	51.5					
313-	GR1D	3616	162.0	-13.75	45.5					
314-	GR1D	3610	153.275	-13.75	51.5					
315-	GR1D	3611	170.75	-13.75	45.5					
316-	GR1D	3622	170.75	-13.75	51.5					
317-	GR1D	3626	125.5	-12.5	51.5					
318-	GR1D	3613	145.0	-12.5	45.5					
319-	GR1D	3652	125.5	-12.5	51.5					
320-	GR1D	3655	145.0	-12.5	45.5					
321-	GR1D	3616	162.0	-12.5	51.5					
322-	GR1D	3619	162.0	-12.5	45.5					
323-	GR1D	3609	166.75	-12.5	51.5					
324-	GR1D	3600	144.75	-12.5	45.5					
325-	GR1D	3603	153.275	-12.5	51.5					
326-	GR1D	3604	153.275	-12.5	45.5					
327-	GR1D	3627	162.0	-12.5	51.5					
328-	GR1D	3628	162.0	-12.5	45.5					
329-	GR1D	3671	170.75	-12.5	51.5					
330-	GR1D	3672	170.75	-12.5	45.5					
331-	MATI	3100	10.566	.1	.1					
332-	MATI	3101	6.9276	.1	.1					
333-	MATI	3600	10.5766	.1	.1					
334-	MATI	3601	17.8766	.1	.1					
335-	MATI	3632	20.4266	.1	.1					
336-	MATI	3634	21.0766	.1	.1					
337-	MATI	3729	22.0566	.1	.1					
338-	MATI	3731	12.6166	.1	.1					
339-	MATI	3731	21.0766	.1	.1					
340-	MOC 3567X	3000	3567	1.0	7517	1	-5			EMC3567X
341-	MOC	3671	3617	1.0	3621	1	-5			EMC3571X
342-	EMC 3571X	3000	3621	-5	3568	2	-0.40139			EMC3574A
343-	MOC	3574	3574	3	3572	3	-0.23719			EMC3574R
344-	EMC 3574A	3000	3566	-5	3572	3	-5.5			EMC3574R
345-	EMC 3574R	3000	3572	3	3617	2	-5.5			EMC3574R
346-	MOC	3619	3619	2	3625	2	-5.5			EMC3574R
347-	EMC 3619Y	3000	3621	2	3118	3121	3122			
348-	MATI	3113	3117	3114	3110	3118	3122			
349-	MATI	3305	3306	3306	3310	3318	3322			
350-	MATI	3311	3313	3314	3317	3318	3322			

B5-8

9/10/74 XCOVERS AS PERCENT EFF.0

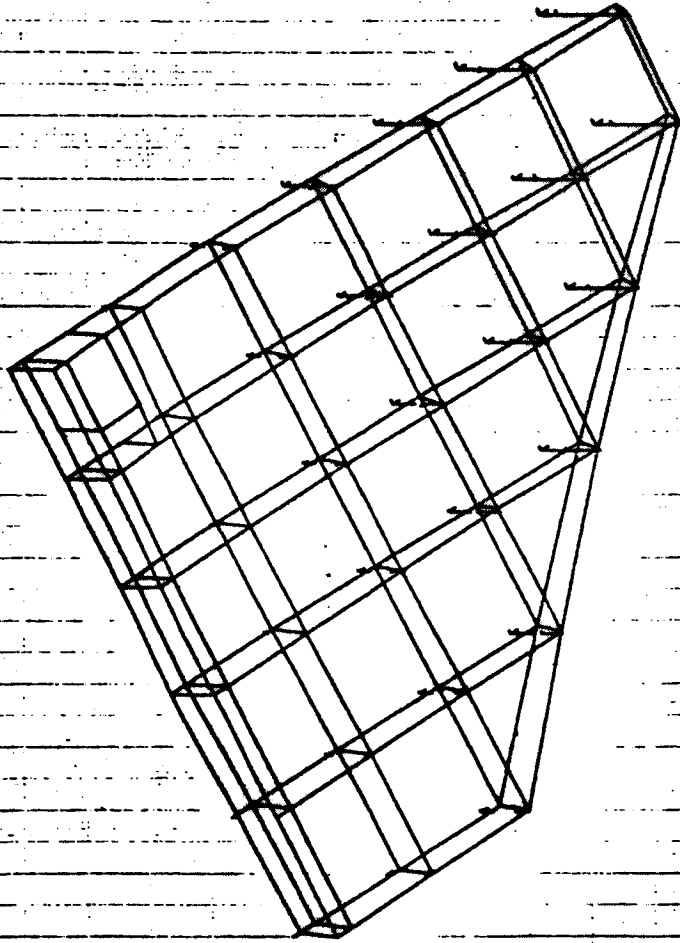
SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
351-	0M1T1		3505	3500	3509	3510	3501	3502		
352-	0M1V1		3513	3514	3517	3518	3521	3522		
353-	0M1V1		356A	357A	3572					
354-	PARAM	GRDENT								
355-	PARAM	TEMPER								
356-	PARAM	ATMOSP	002168							
357-	0M1T1		3600	3600	3600	3600	3601	3602		
358-	0M1V1		3603	3604	3609	3600	3601	3602		
359-	0M1V1		3609	3609	3600	3600	3601	3602		
360-	0M1T1		3617	3600	3600	3600	3601	3602		
361-	0M1T1		3617	3600	3600	3600	3601	3602		
362-	0M1T1		3649	3600	3600	3600	3601	3602		
363-	0M1T1		3651	3600	3600	3600	3601	3602		
364-	0M1T1		3664	3600	3600	3600	3601	3602		
365-	0M1T1		3677	3600	3600	3600	3601	3602		
366-	0M1T1		3677	3600	3600	3600	3601	3602		
367-	0M1T1		3677	3600	3600	3600	3601	3602		
368-	0M1T1		3677	3600	3600	3600	3601	3602		
369-	0M1T1		3677	3600	3600	3600	3601	3602		
370-	0M1T1		3677	3600	3600	3600	3601	3602		
371-	0M1T1		3677	3600	3600	3600	3601	3602		
372-	0M1T1		3677	3600	3600	3600	3601	3602		
373-	0M1T1		3677	3600	3600	3600	3601	3602		
374-	0M1T1		3677	3600	3600	3600	3601	3602		
375-	0M1T1		3677	3600	3600	3600	3601	3602		
376-	0M1T1		3677	3600	3600	3600	3601	3602		
377-	0M1T1		3677	3600	3600	3600	3601	3602		
378-	0M1T1		3677	3600	3600	3600	3601	3602		
379-	0M1T1		3677	3600	3600	3600	3601	3602		
380-	0M1T1		3677	3600	3600	3600	3601	3602		
381-	0M1T1		3677	3600	3600	3600	3601	3602		
382-	0M1T1		3677	3600	3600	3600	3601	3602		
383-	0M1T1		3677	3600	3600	3600	3601	3602		
384-	0M1T1		3677	3600	3600	3600	3601	3602		
385-	0M1T1		3677	3600	3600	3600	3601	3602		
386-	0M1T1		3677	3600	3600	3600	3601	3602		

**Appendix B6**  
**PLOTS OF COMPONENT MODES/PHASE I ANALYSIS**  
**MODEL II WING**

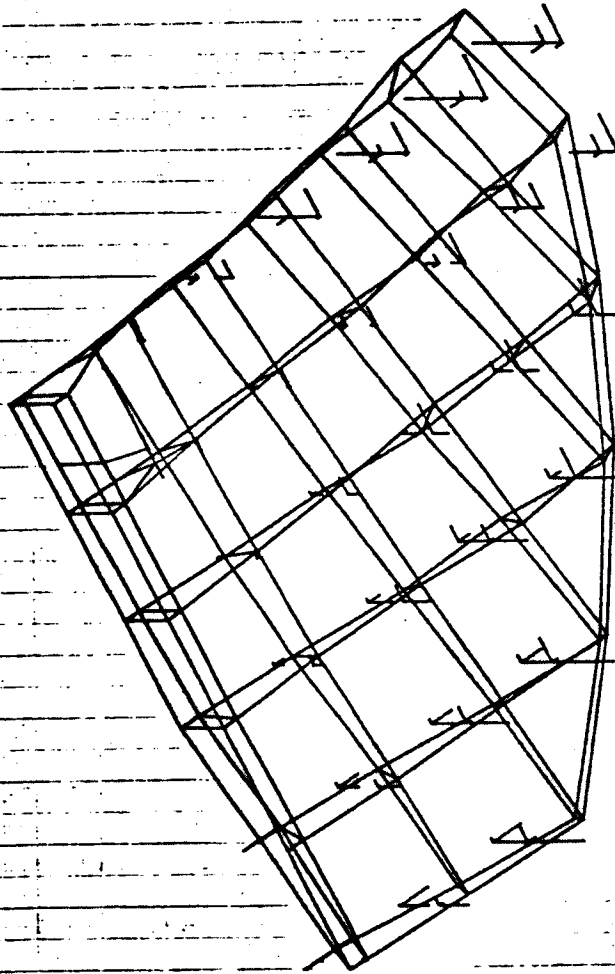
1. 20074 100-207-1-1-000000

96



PHASE 1, COMPLETE ISSUED  
4/10/75 0800H @ PERCHEN BPT-1  
FREE PRESS PAPER AT INTERPAGE  
MOAL BOSTON, BUREAU 1, MOSE 1, PMSB, 74-40000

3 - 4/10/74, 4448-027, 0 1.00000000



PHASE 1 (CORNER MEMB)  
4/10/74 CORNER 00 PERCENT EFF.)  
PRT MEMB PLMS AT INTERFACE  
MEDAL CTR. SURFACE 2 MODE 2 FREQ. 149.8111

2 5/16/74 141-887, e 1, 22222222

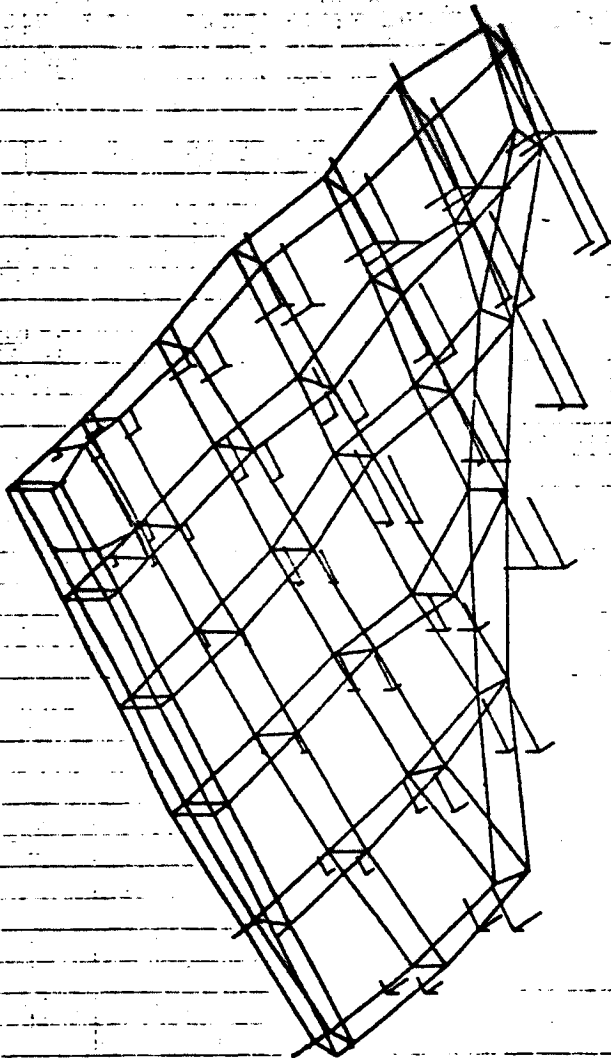
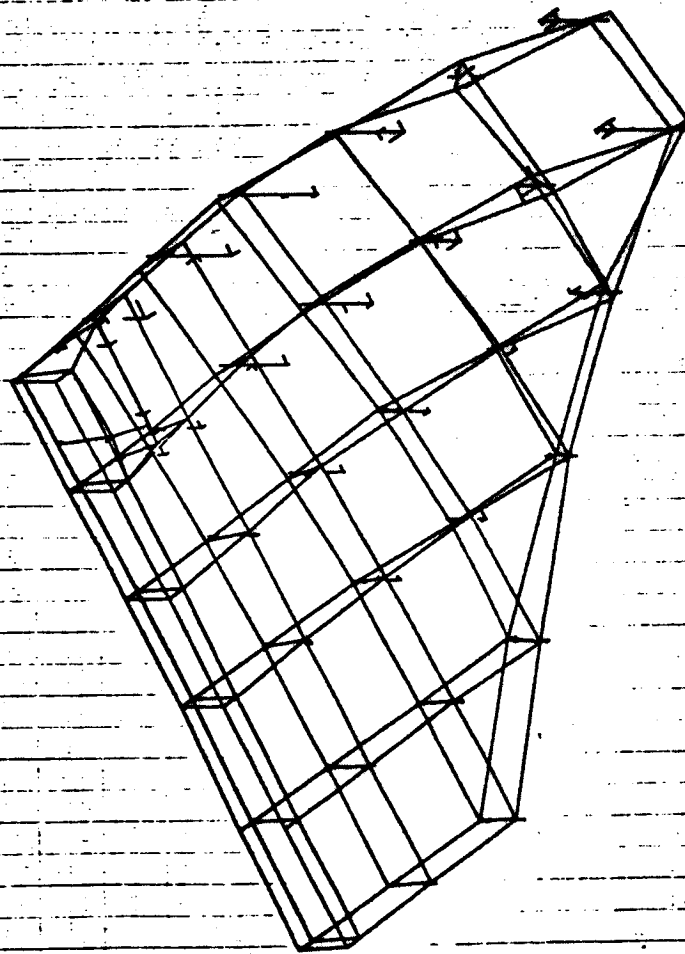


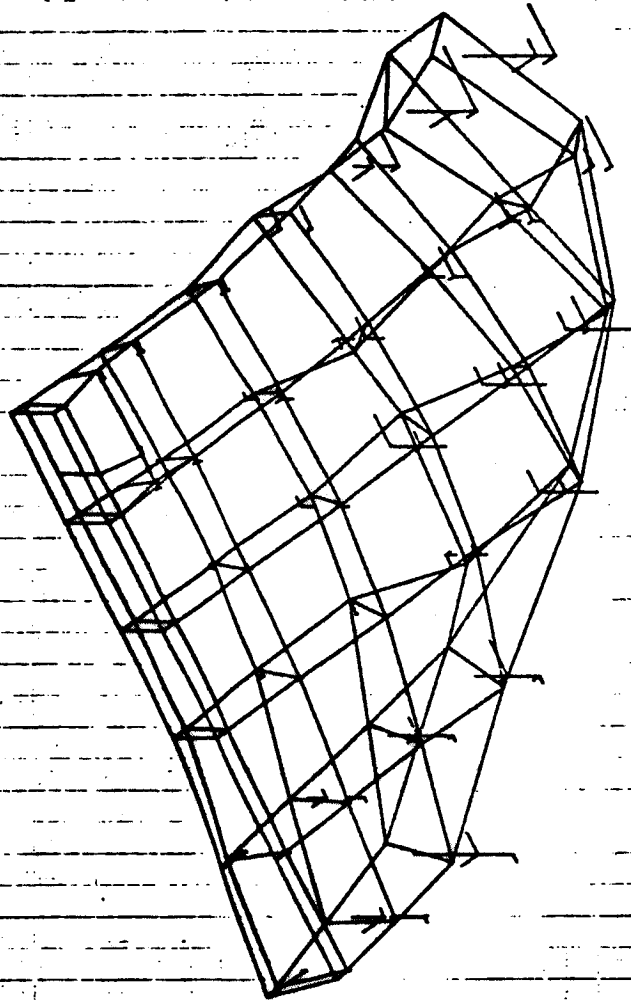
FIGURE 1 (SEE OTHER SHEET)  
5/16/74 REVISED AS PERCENT EFF.  
FREE MOOD FINES AT INTERFACE  
MOUL. BEYOND. SURFACE 3 LINC 3  
PROD. 884.00%

0/10/74 1000-007, o 1.0000000



PHASE 1 COMPLETE VIEW  
0/10/74 1000-007 (01 FEBRUARY 1974)  
FREE BODY PILES AT INTERFACE  
LOCAL SYSTEM. SURFACE 4. 1000. 240.0040

UNCLASSIFIED

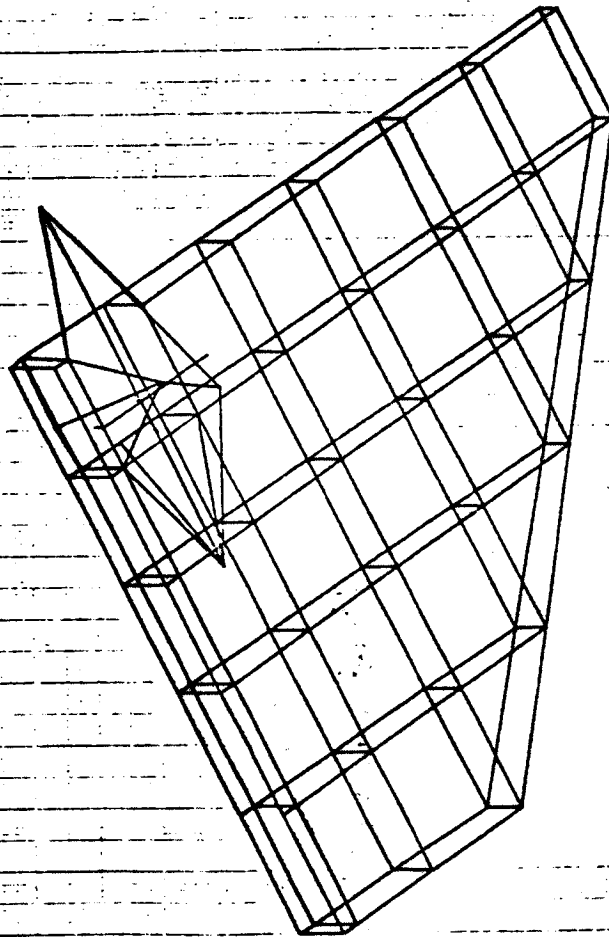


PHASE 3 COMPLETE WHEN  
5/10/74 WORKING ON PRESENT SPT.  
FREE MESH FUSED AT INTERFACE  
LOCAL COPY. SUBCASE 5 MODS 5

PREC. 890.0888

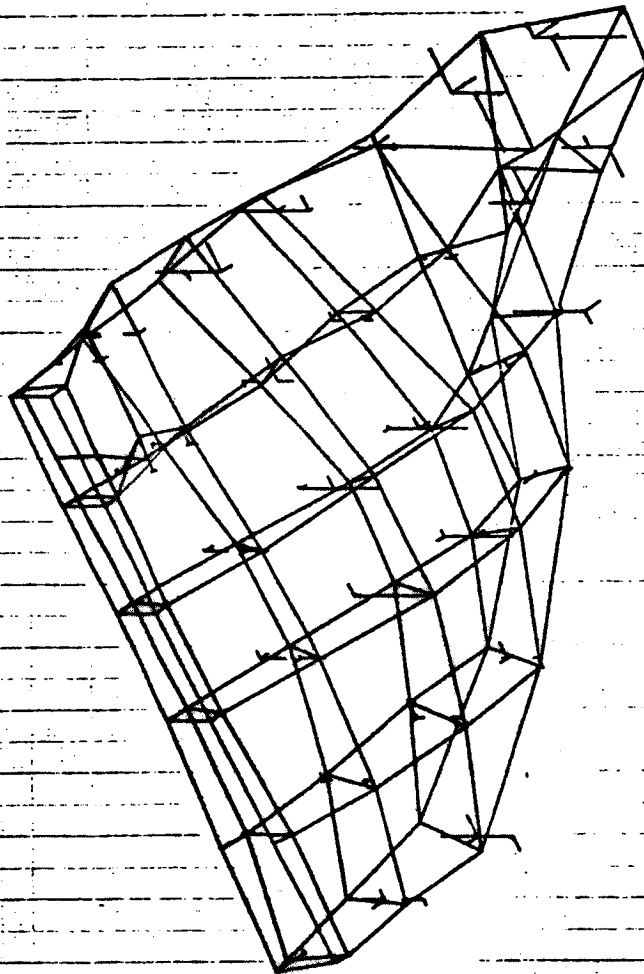


0 0/00/74 000-007. 0 1.0070170



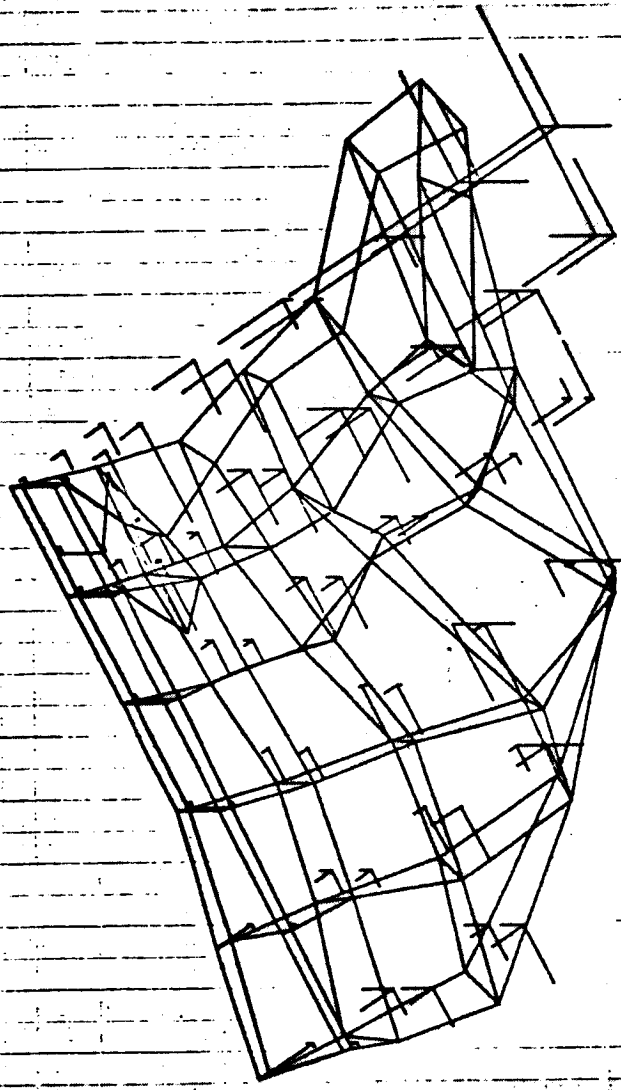
PHASE 1 COMPUTER MODEL  
0/10/74 000000 00 PERCENT EFF.  
FREE MESH FINES AT INTERFACE  
MEDAL DEFCON. SUBCASE 0 MDC0 0 PRED. 400.4813

1 7 4/10/74 10:00 AM 0 1 000000



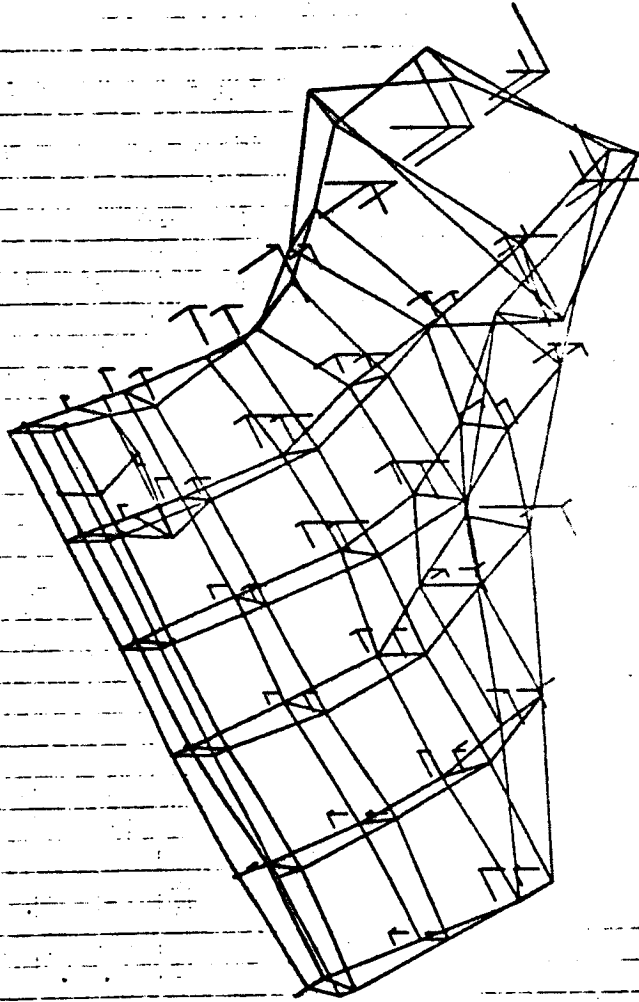
PHASE 1 ANALYSIS USING  
4/10/74 08:00:00 88 PERCENT STY. 1  
FREE MODES FIXED AT INTERFACE  
MODAL ORDER SURFACE 1 MODE 7 FREQ. 817.0078

00000000 00000000 00000000



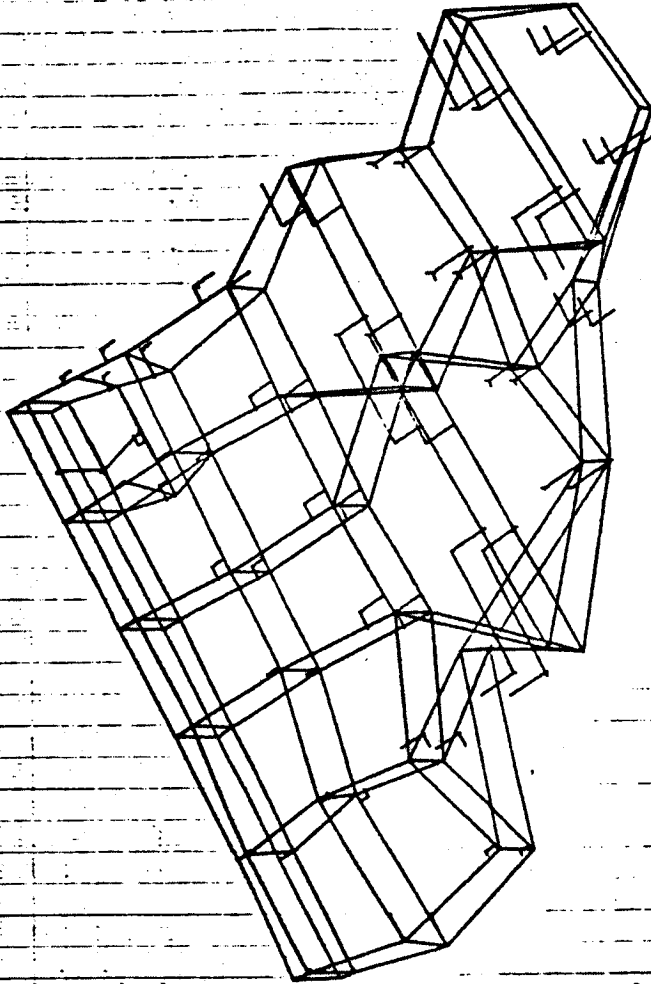
PHASE 1 CONSTRUCTION  
SCHEDULED TO BE COMPLETED BY 1/10/74  
FREE MARKET PRICES AT INTERSTATE  
MORAL DEBTOR. SUBSIDIARY 6 1000 6 1000 6 1000

0 4/28/74 1444-007. = 1.00000000



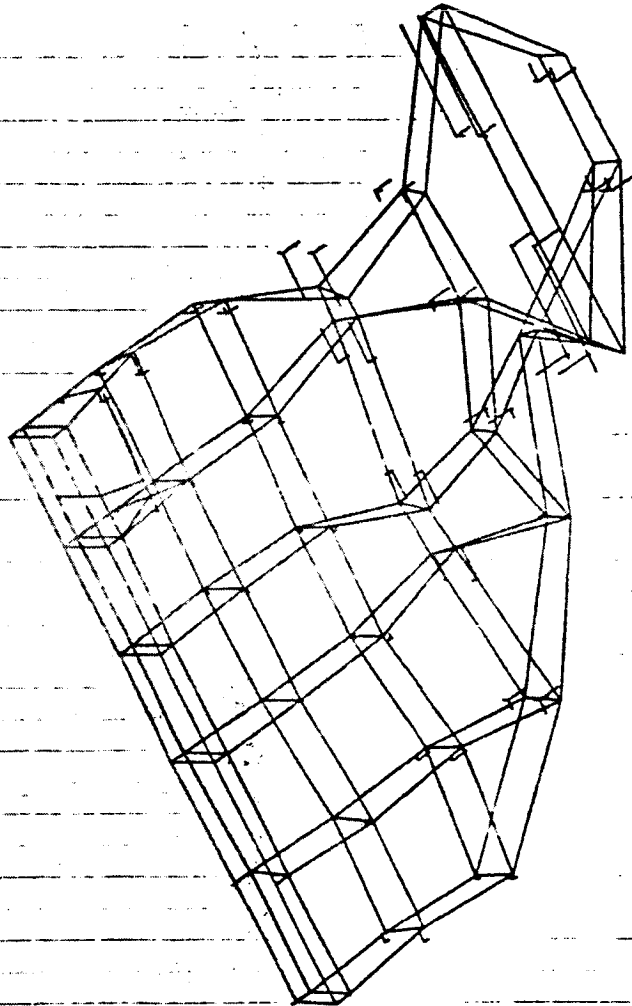
PHASE 1 (CORBITER WIND)  
1/10/74 (COVERS 88 PERCENT OF)  
FREE MODES FIXED AT INTERFACE  
LOCAL DEFOR. SUBCASE 1 MODE 1 FREQ. 800.0000

9/28/74 1000-007, 2 2.24671200



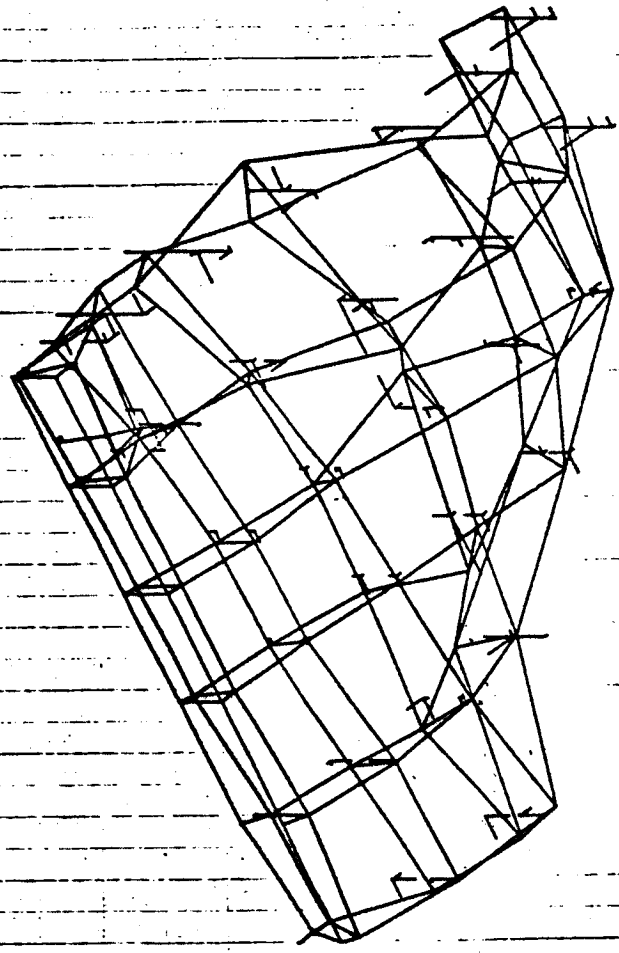
PHASE 1 COMPUTER MODEL  
 9/18/74 1000-007 88 PERCENT DVT. 1  
 PRICE MODEL FILED AT INTERFACE  
 LOCAL DESKTOP, SUBCASE 10 MODE 10 PRICED. 849.8782

11. 1 1/2 1/4 MAX-027, = 0.04000100



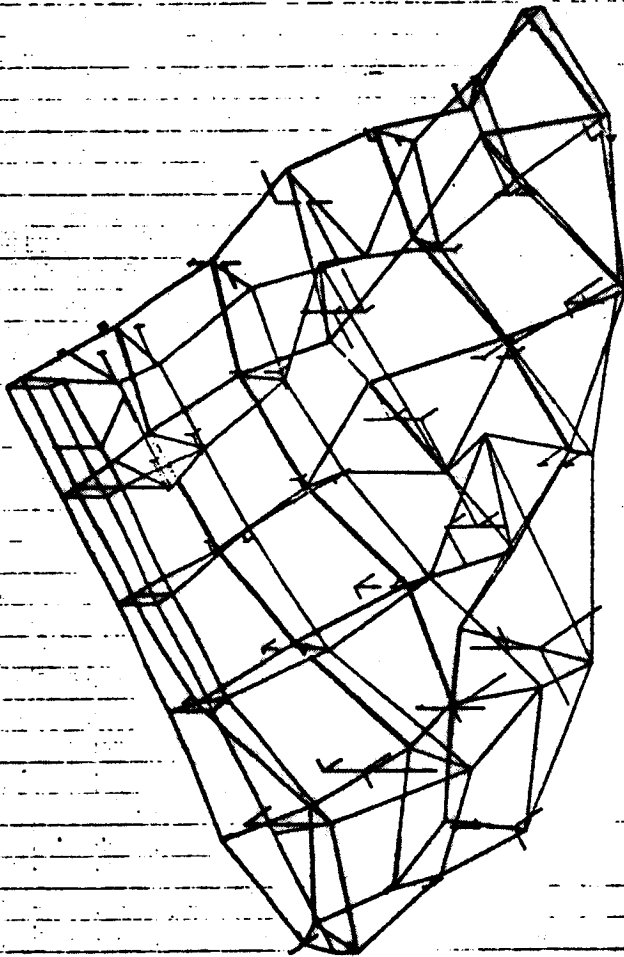
PHASE 1 CORBITER WING)  
1/10/71 (COVERS 85 PERCENT EFF.)  
FREE MODES FIXED AT INTERFACE  
MODAL DETER. SUBCASE 11 MODE 11 FREQ. 019.9228

18 1/10/74 444-807. 0 1.00000000



PHASE 1 (CONSTANT WIND)  
1/10/74 (COVERS 86 PERCENT EFF.)  
FACE MEMES FIXED AT INTERFACE  
MODAL DETON. BUSCASE 12 MODE 12 FREQ. 848.1408

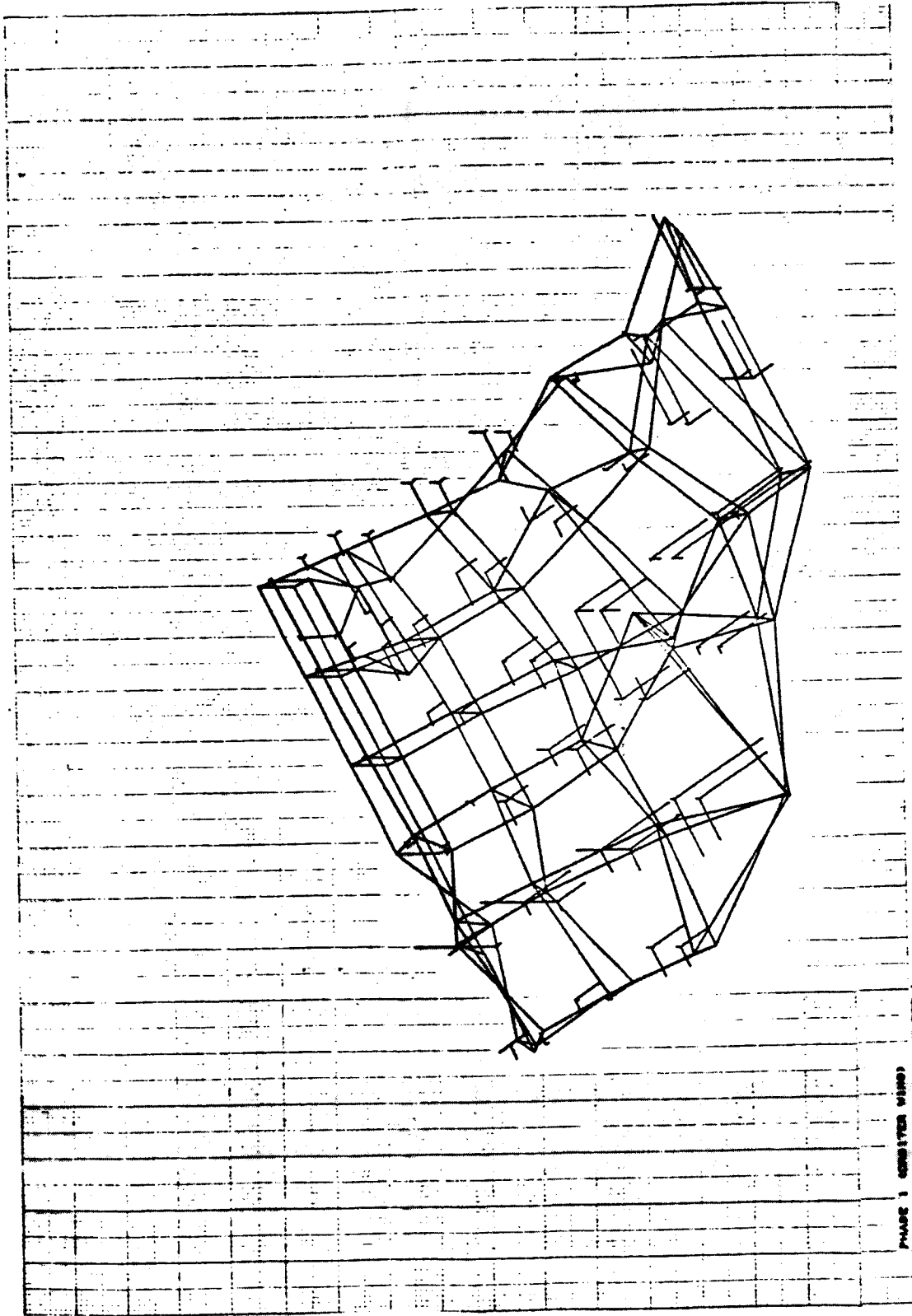
10 0400/74 1111-007, 0 1, 00000000



PHASE 1, ANALYSIS MODE  
1/10/74 02:00:00 00 PERCENT 077.1  
FREE NODES Pinned at INTERFACE  
MODAL DEFOR. SUBCASE 10 MODE 10 FREQ. 688.4784



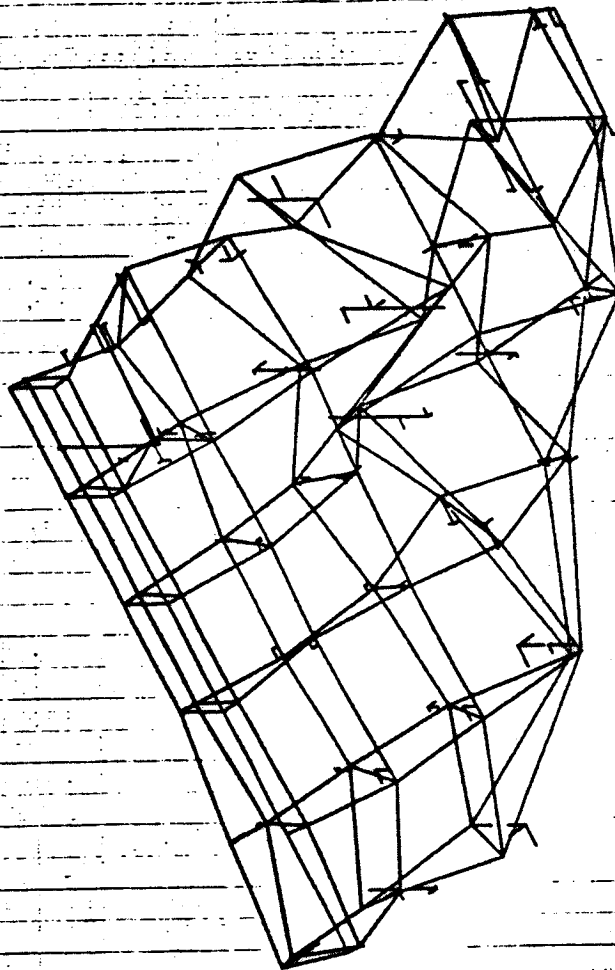
14 0/10/74 001-007. 0 1. 000000



PHASE 1 (CONTINUED FROM P. 13)  
 0/10/74 001-007. 0 1. 000000  
 FREE MOVES FINES AT INTERFACE  
 MODAL DEFOR. SURFACE 14 MODE 14 FREQ. 040.3248

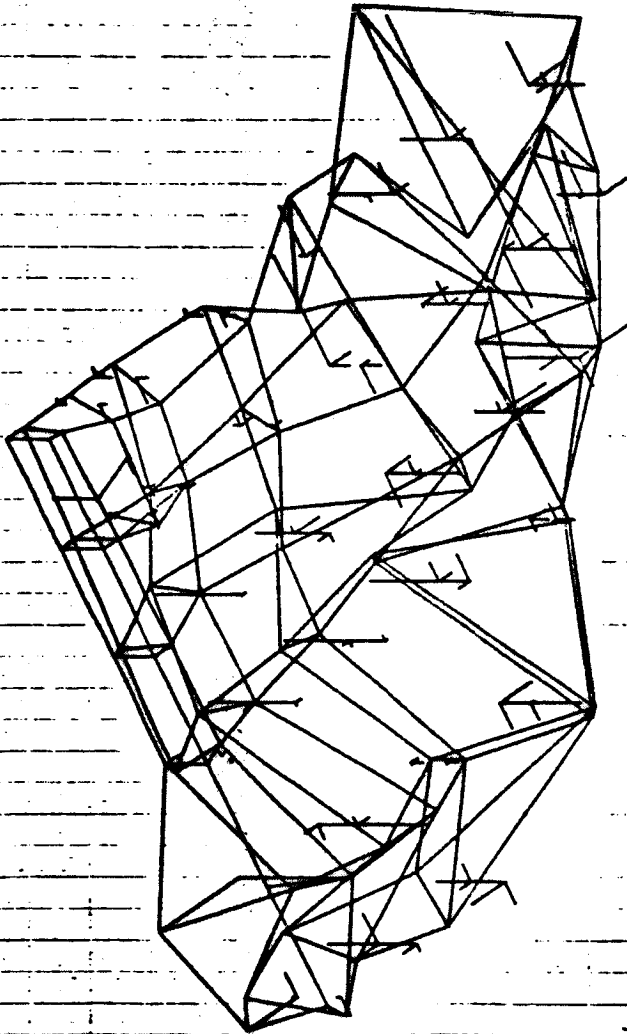


10 1/10/74 200-007, 1.000000



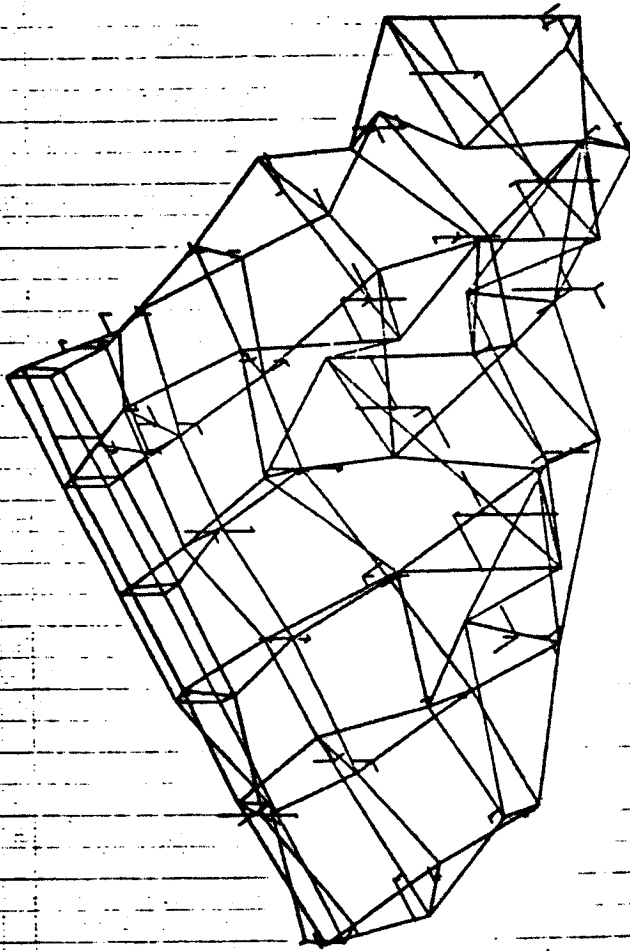
PHASE 1 (CONTINUED VIEW)  
1/10/74 CROSSING ON PERCENT 077.  
PREF. MARKS PLOTTED AT INTERFACET  
LOCAL SECTOR. SURFACE 10 MADE 10 FROM. 001. 0001

17 0/00/74 000-007. 0 1. 00000000



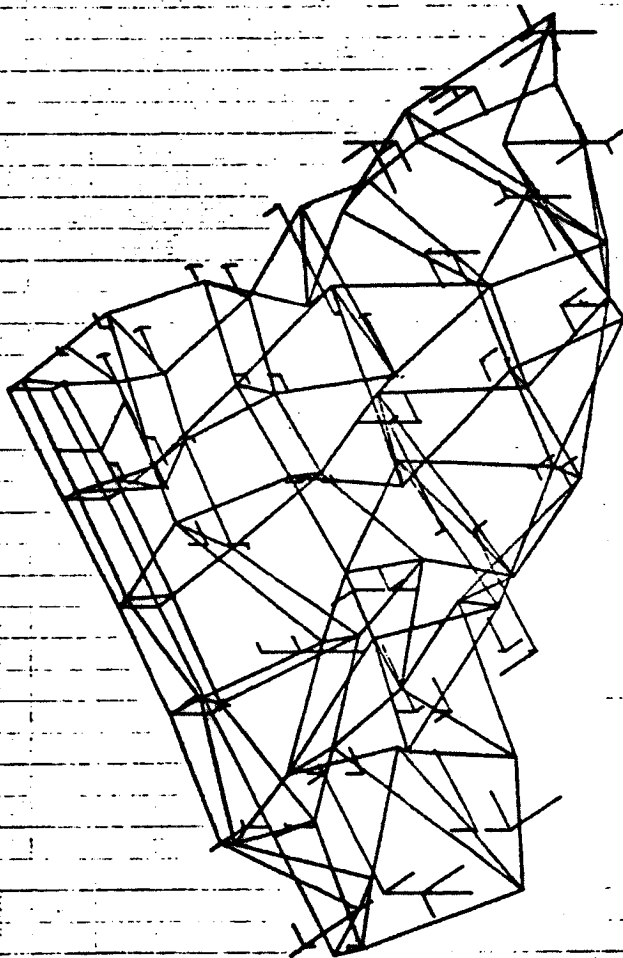
PHASE 1 (SHORTER WIND)  
1/10/74 (COVERS 88 PERCENT EFF.)  
FREE MODES FINES AT INTERFACE  
MODAL DEFOR. SUBCASE 17 MODE 17 FREQ. 032.0144

10 000074 000007.0 1.00000000



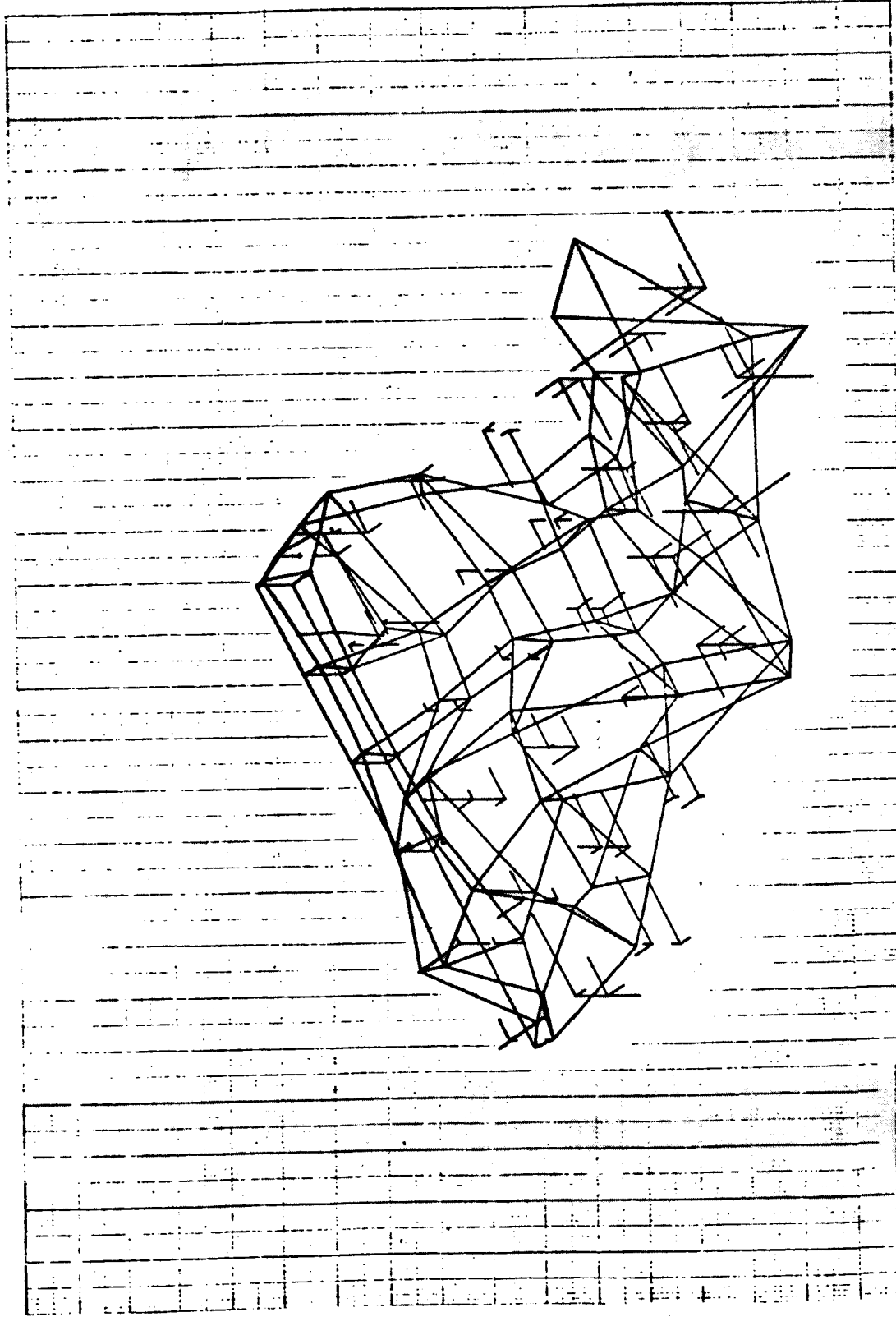
PHASE 1 CONSIDER WIND  
1/10TH GROUND OR PRESENT STY.  
FREE MOVES FIXED AT INTERFACE  
MODAL DEFEN. SUBCASE 10 MODE 10 FREQ. 042.8571

0/00/74 MM-007. • 111700000



PHASE 1 ORBITER WIND  
 1/10/74 COVERED 98 PERCENT ETT. 1  
 FREE WINDS FILED AT INTERFACE  
 MODAL DEPTH. MESSAGE 19 MODE 19 FREE. 770.0140

0/20/74 100-007. • 1.0000000



PHASE 1 CONTAINS WIRE  
 1/10/74 100-007. • 1.0000000  
 FREE WIRE FILES AT INTERFACE  
 LOCAL SYSTEM. SUBJECT TO MORE 20 PAGE. 000.0700

**Appendix B7**  
**INPUT BULK DATA/PHASE I ANALYSIS: MODEL II**  
**CARGO DOORS**



C A S E C O N T R O L D E C K E C H O

CARD	TITLE = PHASE 1
COUNT	SUBTITLE = ORBITER DOORS.SYM CASE(WITH STRAPS)
1	SPC = 400
2	SPC = 401
3	METHOD = 2
4	MAXLINES = 30000
5	OUTPUT
6	VECTOR = ALL
7	SURFACE 1
8	LAJL = FREE MODES FIXED AT INTERFACE
9	NODES = 20
10	OUTPUT(PLOT)
11	SFT 1 = GDMEM2.PAR
12	SFT 2 = INCLUDE 4201 THRU 4232
13	SFT 3 = INCLUDE 4241 THRU 4272
14	SFT 4 = INCLUDE 4301 THRU 4332
15	SFT 5 = INCLUDE 4301 THRU 4340
16	SFT 6 = INCLUDE 4341 THRU 4374
17	SFT 7 = INCLUDE 4341 THRU 4374
18	AXES = MY,X,Z
19	VIEW = 3C,0,45,0,0,0
20	PLOTTER CALCOMP 765,105
21	MAXIMUM DEFORMATION 5.0
22	FIND SCALE ORIGIN 1,SET 1
23	PLOT MODAL DEFORMATION 1 THRU 20,SET 1,SHAPE,VECTOR XYZ
24	PLGIN,BULK
25	
26	

\*\*\* USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED.XSORT WILL RE-ORDER DECK.

S O R T E D B U L K D A T A E C M O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1-	RAPOR		4381							
2-	CBAR	4381		4019	4029					
3-	CBAR	4382		4029	4049					
4-	CBAR	4383		4049	4069					
5-	CBAR	4384		4069	4079					
6-	CBAR	4385		4079	4099					
7-	CBAR	4386		4099	4119					
8-	CBAR	4387		4119	4129					
9-	CBAR	4388		4129	4149					
10-	CBAR	4389		4149	4169					
11-	CBAR	4391	4391	4391	4391					
12-	CBAR	4392	4391	4391	4391					
13-	CBAR	4393	4391	4391	4391					
14-	CBAR	4394	4391	4391	4391					
15-	CBAR	4395	4391	4391	4391					
16-	CBAR	4396	4391	4391	4391					
17-	CBAR	4397	4391	4391	4391					
18-	CBAR	4398	4391	4391	4391					
19-	CBAR	4399	4391	4391	4391					
20-	CBAR	4400	4391	4391	4391					
21-	CBAR	4401	4391	4391	4391					
22-	CBAR	4402	4391	4391	4391					
23-	CBAR	4403	4391	4391	4391					
24-	CBAR	4404	4391	4391	4391					
25-	CBAR	4405	4391	4391	4391					
26-	CBAR	4406	4391	4391	4391					
27-	CBAR	4407	4391	4391	4391					
28-	CBAR	4408	4391	4391	4391					
29-	CBAR	4409	4391	4391	4391					
30-	CBAR	4410	4391	4391	4391					
31-	CBAR	4411	4391	4391	4391					
32-	CBAR	4412	4391	4391	4391					
33-	CBAR	4413	4391	4391	4391					
34-	CBAR	4414	4391	4391	4391					
35-	CBAR	4415	4391	4391	4391					
36-	CBAR	4416	4391	4391	4391					
37-	CBAR	4417	4391	4391	4391					
38-	CBAR	4418	4391	4391	4391					
39-	CBAR	4419	4391	4391	4391					
40-	CBAR	4420	4391	4391	4391					
41-	CBAR	4421	4391	4391	4391					
42-	CBAR	4422	4391	4391	4391					
43-	CBAR	4423	4391	4391	4391					
44-	CBAR	4424	4391	4391	4391					
45-	CBAR	4425	4391	4391	4391					
46-	CBAR	4426	4391	4391	4391					
47-	CBAR	4427	4391	4391	4391					
48-	CBAR	4428	4391	4391	4391					
49-	CBAR	4429	4391	4391	4391					
50-	CBAR	4430	4391	4391	4391					

S O R T E D B U L K D A T A E C H O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
31-	CRDD	A007	A001	A027	A029	A047	A001	A035	A037	A037
32-	CRDD	A008	A001	A028	A043	A049	A001	A036	A038	A039
33-	CRDD	A009	A001	A041	A045	A050	A001	A051	A053	A053
34-	CRDD	A010	A001	A042	A046	A051	A001	A052	A054	A057
35-	CRDD	A011	A001	A043	A047	A052	A001	A055	A057	A059
36-	CRDD	A012	A001	A044	A048	A053	A001	A056	A058	A063
37-	CRDD	A013	A001	A045	A049	A054	A001	A057	A059	A065
38-	CRDD	A014	A001	A046	A050	A055	A001	A058	A060	A067
39-	CRDD	A015	A001	A047	A051	A056	A001	A059	A061	A073
40-	CRDD	A016	A001	A048	A052	A057	A001	A060	A062	A083
41-	CRDD	A017	A001	A049	A053	A058	A001	A061	A063	A085
42-	CRDD	A018	A001	A050	A054	A059	A001	A062	A064	A087
43-	CRDD	A019	A001	A051	A055	A060	A001	A063	A065	A093
44-	CRDD	A020	A001	A052	A056	A061	A001	A064	A066	A103
45-	CRDD	A021	A001	A053	A057	A062	A001	A065	A067	A105
46-	CRDD	A022	A001	A054	A058	A063	A001	A066	A068	A107
47-	CRDD	A023	A001	A055	A059	A064	A001	A067	A069	A108
48-	CRDD	A024	A001	A056	A060	A065	A001	A068	A070	A109
49-	CRDD	A025	A001	A057	A061	A066	A001	A069	A071	A110
50-	CRDD	A026	A001	A058	A062	A067	A001	A070	A072	A111
51-	CRDD	A027	A001	A059	A063	A068	A001	A071	A073	A112
52-	CRDD	A028	A001	A060	A064	A069	A001	A072	A074	A113
53-	CRDD	A029	A001	A061	A065	A070	A001	A073	A075	A114
54-	CRDD	A030	A001	A062	A066	A071	A001	A074	A076	A115
55-	CRDD	A031	A001	A063	A067	A072	A001	A075	A077	A116
56-	CRDD	A032	A001	A064	A068	A073	A001	A076	A078	A117
57-	CRDD	A033	A001	A065	A069	A074	A001	A077	A079	A118
58-	CRDD	A034	A001	A066	A070	A075	A001	A078	A080	A119
59-	CRDD	A035	A001	A067	A071	A076	A001	A079	A081	A120
60-	CRDD	A036	A001	A068	A072	A077	A001	A080	A082	A121
61-	CRDD	A037	A001	A069	A073	A078	A001	A081	A083	A122
62-	CRDD	A038	A001	A070	A074	A079	A001	A082	A084	A123
63-	CRDD	A039	A001	A071	A075	A080	A001	A083	A085	A124
64-	CRDD	A040	A001	A072	A076	A081	A001	A084	A086	A125
65-	CRDD	A041	A001	A073	A077	A082	A001	A085	A087	A126
66-	CRDD	A042	A001	A074	A078	A083	A001	A086	A088	A127
67-	CRDD	A043	A001	A075	A079	A084	A001	A087	A089	A128
68-	CRDD	A044	A001	A076	A080	A085	A001	A088	A090	A129
69-	CRDD	A045	A001	A077	A081	A086	A001	A089	A091	A130
70-	CRDD	A046	A001	A078	A082	A087	A001	A090	A092	A131
71-	CRDD	A047	A001	A079	A083	A088	A001	A091	A093	A132
72-	CRDD	A048	A001	A080	A084	A089	A001	A092	A094	A133
73-	CRDD	A049	A001	A081	A085	A090	A001	A093	A095	A134
74-	CRDD	A050	A001	A082	A086	A091	A001	A094	A096	A135
75-	CRDD	A051	A001	A083	A087	A092	A001	A095	A097	A136
76-	CRDD	A052	A001	A084	A088	A093	A001	A096	A098	A137
77-	CRDD	A053	A001	A085	A089	A094	A001	A097	A099	A138
78-	CRDD	A054	A001	A086	A090	A095	A001	A098	A100	A139
79-	CRDD	A055	A001	A087	A091	A096	A001	A099	A101	A140
80-	CRDD	A056	A001	A088	A092	A097	A001	A100	A102	A141
81-	CRDD	A057	A001	A089	A093	A098	A001	A101	A103	A142
82-	CRDD	A058	A001	A090	A094	A099	A001	A102	A104	A143
83-	CRDD	A059	A001	A091	A095	A100	A001	A103	A105	A144
84-	CRDD	A060	A001	A092	A096	A101	A001	A104	A106	A145
85-	CRDD	A061	A001	A093	A097	A102	A001	A105	A107	A146
86-	CRDD	A062	A001	A094	A098	A103	A001	A106	A108	A147
87-	CRDD	A063	A001	A095	A099	A104	A001	A107	A109	A148
88-	CRDD	A064	A001	A096	A100	A105	A001	A108	A110	A149
89-	CRDD	A065	A001	A097	A101	A106	A001	A109	A111	A150
90-	CRDD	A066	A001	A098	A102	A107	A001	A110	A112	A151
91-	CRDD	A067	A001	A099	A103	A108	A001	A111	A113	A152
92-	CRDD	A068	A001	A100	A104	A109	A001	A112	A114	A153
93-	CRDD	A069	A001	A101	A105	A110	A001	A113	A115	A154
94-	CRDD	A070	A001	A102	A106	A111	A001	A114	A116	A155
95-	CRDD	A071	A001	A103	A107	A112	A001	A115	A117	A156
96-	CRDD	A072	A001	A104	A108	A113	A001	A116	A118	A157
97-	CRDD	A073	A001	A105	A109	A114	A001	A117	A119	A158
98-	CRDD	A074	A001	A106	A110	A115	A001	A118	A120	A159
99-	CRDD	A075	A001	A107	A111	A116	A001	A119	A121	A160
100-	CRDD	A076	A001	A108	A112	A117	A001	A120	A122	A161
101-	CRDD	A077	A001	A109	A113	A118	A001	A121	A123	A162
102-	CRDD	A078	A001	A110	A114	A119	A001	A122	A124	A163
103-	CRDD	A079	A001	A111	A115	A120	A001	A123	A125	A164
104-	CRDD	A080	A001	A112	A116	A121	A001	A124	A126	A165
105-	CRDD	A081	A001	A113	A117	A122	A001	A125	A127	A166
106-	CRDD	A082	A001	A114	A118	A123	A001	A126	A128	A167
107-	CRDD	A083	A001	A115	A119	A124	A001	A127	A129	A168
108-	CRDD	A084	A001	A116	A120	A125	A001	A128	A130	A169
109-	CRDD	A085	A001	A117	A121	A126	A001	A129	A131	A170
110-	CRDD	A086	A001	A118	A122	A127	A001	A130	A132	A171
111-	CRDD	A087	A001	A119	A123	A128	A001	A131	A133	A172
112-	CRDD	A088	A001	A120	A124	A129	A001	A132	A134	A173
113-	CRDD	A089	A001	A121	A125	A130	A001	A133	A135	A174
114-	CRDD	A090	A001	A122	A126	A131	A001	A134	A136	A175
115-	CRDD	A091	A001	A123	A127	A132	A001	A135	A137	A176
116-	CRDD	A092	A001	A124	A128	A133	A001	A136	A138	A177
117-	CRDD	A093	A001	A125	A129	A134	A001	A137	A139	A178
118-	CRDD	A094	A001	A126	A130	A135	A001	A138	A140	A179
119-	CRDD	A095	A001	A127	A131	A136	A001	A139	A141	A180
120-	CRDD	A096	A001	A128	A132	A137	A001	A140	A142	A181
121-	CRDD	A097	A001	A129	A133	A138	A001	A141	A143	A182
122-	CRDD	A098	A001	A130	A134	A139	A001	A142	A144	A183
123-	CRDD	A099	A001	A131	A135	A140	A001	A143	A145	A184
124-	CRDD	A100	A001	A132	A136	A141	A001	A144	A146	A185
125-	CRDD	A101	A001	A133	A137	A142	A001	A145	A147	A186
126-	CRDD	A102	A001	A134	A138	A143	A001	A146	A148	A187
127-	CRDD	A103	A001	A135	A139	A144	A001	A147	A149	A188
128-	CRDD	A104	A001	A136	A140	A145	A001	A148	A150	A189
129-	CRDD	A105	A001	A137	A141	A146	A001	A149	A151	A190
130-	CRDD	A106	A001	A138	A142	A147	A001	A150	A152	A191
131-	CRDD	A107	A001	A139	A143	A148	A001	A151	A153	A192
132-	CRDD	A108	A001	A140	A144	A149	A001	A152	A154	A193
133-	CRDD	A109	A001	A141	A145	A150	A001	A153	A155	A194
134-	CRDD	A110	A001	A142	A146	A151	A001	A154	A156	A195
135-	CRDD	A111	A001	A143	A147	A152	A001	A155	A157	A196
136-	CRDD	A112	A001	A144	A148	A153	A001	A156	A158	A197
137-	CRDD	A113	A001	A145	A149	A154	A001	A157	A159	A198
138-	CRDD	A114	A001	A146	A150	A155	A001	A158	A160	A199
139-	CRDD	A115	A001	A147	A151	A156	A001	A159	A161	A200
140-	CRDD	A116	A001	A148	A152	A157	A001	A160	A162	A201
141-	CRDD	A117	A001	A149	A153	A158	A001	A161	A163	A202
142-	CRDD	A118	A001	A150	A154	A159	A001	A162	A164	A203
143-	CRDD	A119	A001	A151	A155	A160	A001	A163	A165	A204
144-	CRDD	A120	A001	A152	A156	A161	A001	A164	A166	A205
145-	CRDD	A121	A001	A153	A157	A162	A001	A165	A167	A206
146-	CRDD	A122	A001	A154	A158	A163	A001	A166	A168	A207
147-	CRDD	A123	A001	A155	A159	A164	A001	A167	A169	A208
148-	CRDD	A124	A001	A156	A160	A165	A001	A168	A170	A209
149-	CRDD	A125	A001	A157	A161	A166	A001	A169	A171	A210
150-	CRDD	A126	A001	A158	A162	A167	A001	A170	A172	A211
151-	CRDD	A127	A001	A159	A163	A168	A001	A171	A173	A212
152-	CRDD	A128	A001	A160	A164	A169	A001	A172	A174	A213
153-	CRDD	A129	A001	A161	A165	A170	A001	A173	A175	A214
154-	CRDD	A130	A001	A162	A166	A171	A001	A174	A176	A215
155-	CRDD	A131	A001	A163	A167	A172	A001	A175	A177	A216
156-	CRDD	A132	A001	A164	A168	A173	A001	A176	A178	A217
157-	CRDD	A133	A001	A165	A169	A174	A001	A177	A179	A218
158-	CRDD	A134	A001	A166	A170	A175	A001	A178	A180	A219
159-	CRDD	A135	A001	A167	A171	A176	A001	A179	A181	A220
160-	CRDD	A136	A001	A168	A172	A177	A001	A180	A182	A221
161-	CRDD	A137	A001	A169	A173	A178	A001	A181	A183	A222
162-	CRDD	A138	A001	A170	A174	A179	A001	A182	A184	A223
163-	CRDD	A139	A001	A171	A175	A180	A00			

CARD COUNT	1	2	3	4	5	6	7	8	9	10
101-	CRDD	4305	4301	4009	4010	4345	4301	4019	4020	
102-	CRDD	4304	4301	4021	4022	4346	4301	4031	4022	
103-	CRDD	4307	4302	4023	4024	4347	4302	4033	4024	
104-	CRDD	4308	4302	4025	4026	4348	4302	4035	4026	
105-	CRDD	4306	4302	4027	4028	4349	4302	4037	4028	
106-	CRDD	4310	4303	4029	4030					
107-	CRDD	4311	4301	4041	4042	4350	4301	4051	4042	
108-	CRDD	4312	4302	4043	4044	4351	4302	4053	4044	
109-	CRDD	4313	4302	4045	4046	4352	4302	4055	4046	
110-	CRDD	4314	4302	4047	4048	4353	4302	4057	4048	
111-	CRDD	4315	4302	4049	4050					
112-	CRDD	4316	4301	4071	4072	4354	4301	4081	4072	
113-	CRDD	4317	4302	4073	4074	4355	4302	4083	4074	
114-	CRDD	4318	4302	4075	4076	4356	4302	4085	4076	
115-	CRDD	4319	4302	4077	4078	4357	4302	4087	4078	
116-	CRDD	4320	4302	4079	4080					
117-	CRDD	4321	4301	4091	4092	4358	4301	4101	4092	
118-	CRDD	4322	4302	4093	4094	4359	4302	4103	4094	
119-	CRDD	4323	4302	4095	4096	4360	4302	4105	4096	
120-	CRDD	4324	4302	4097	4098	4361	4302	4107	4098	
121-	CRDD	4325	4302	4099	4100					
122-	CRDD	4326	4301	4121	4122	4362	4301	4131	4122	
123-	CRDD	4327	4302	4123	4124	4363	4302	4133	4124	
124-	CRDD	4328	4302	4125	4126	4364	4302	4135	4126	
125-	CRDD	4329	4302	4127	4128	4365	4302	4137	4128	
126-	CRDD	4330	4302	4129	4130					
127-	CRDD	4331	4301	4141	4142	4366	4301	4151	4142	
128-	CRDD	4332	4302	4143	4144	4367	4302	4153	4144	
129-	CRDD	4333	4302	4145	4146	4368	4302	4155	4146	
130-	CRDD	4334	4302	4147	4148	4369	4302	4157	4148	
131-	CRDD	4335	4302	4149	4150					
132-	CRDD	4336	4301	4161	4162	4370	4301	4171	4162	
133-	CRDD	4337	4302	4163	4164	4371	4302	4173	4164	
134-	CRDD	4338	4302	4165	4166	4372	4302	4175	4166	
135-	CRDD	4339	4302	4167	4168	4373	4302	4177	4168	
136-	CRDD	4340	4301	4169	4170	4374	4301	4179	4170	
137-	CSHEAR	4201	4201	4001	4003	4004	4002			
138-	CSHEAR	4202	4201	4005	4005	4006	4004			
139-	CSHEAR	4203	4201	4006	4007	4008	4006			
140-	CSHEAR	4204	4201	4007	4009	4009	4006			
141-	CSHEAR	4205	4201	4021	4023	4024	4022			
142-	CSHEAR	4206	4201	4023	4025	4026	4024			
143-	CSHEAR	4207	4201	4025	4027	4028	4026			
144-	CSHEAR	4208	4201	4027	4029	4030	4028			
145-	CSHEAR	4209	4201	4041	4043	4044	4042			
146-	CSHEAR	4210	4201	4043	4045	4046	4044			
147-	CSHEAR	4211	4201	4045	4047	4048	4046			
148-	CSHEAR	4212	4201	4047	4049	4050	4048			
149-	CSHEAR	4213	4201	4071	4073	4074	4072			
150-	CSHEAR	4214	4201	4073	4075	4076	4074			

PHASE 1 ORBITER 30.188.5VM CASE (WITH STRAPS)

S O R T E D B U L K D A T A F C H D

CARD COUNT	1	2	3	4	5	6	7	8	9	10
121-	CSHEAR	4215	4201	4075	4077	4078	4078			
122-	CSHEAR	4216	4201	4077	4079	4080	4080			
123-	CSHEAR	4217	4201	4091	4093	4094	4094			
124-	CSHEAR	4218	4201	4093	4095	4096	4096			
125-	CSHEAR	4219	4201	4095	4097	4098	4098			
126-	CSHEAR	4220	4201	4097	4099	4100	4100			
127-	CSHEAR	4221	4201	4121	4123	4124	4124			
128-	CSHEAR	4222	4201	4123	4125	4126	4126			
129-	CSHEAR	4223	4201	4125	4127	4128	4128			
130-	CSHEAR	4224	4201	4127	4129	4130	4130			
131-	CSHEAR	4225	4201	4129	4131	4132	4132			
132-	CSHEAR	4226	4201	4131	4133	4134	4134			
133-	CSHEAR	4227	4201	4133	4135	4136	4136			
134-	CSHEAR	4228	4201	4135	4137	4138	4138			
135-	CSHEAR	4229	4201	4137	4139	4140	4140			
136-	CSHEAR	4230	4201	4139	4141	4142	4142			
137-	CSHEAR	4231	4201	4141	4143	4144	4144			
138-	CSHEAR	4232	4201	4143	4145	4146	4146			
139-	CSHEAR	4233	4201	4145	4147	4148	4148			
140-	CSHEAR	4234	4201	4147	4149	4150	4150			
141-	CSHEAR	4235	4201	4149	4151	4152	4152			
142-	CSHEAR	4236	4201	4151	4153	4154	4154			
143-	CSHEAR	4237	4201	4153	4155	4156	4156			
144-	CSHEAR	4238	4201	4155	4157	4158	4158			
145-	CSHEAR	4239	4201	4157	4159	4160	4160			
146-	CSHEAR	4240	4201	4159	4161	4162	4162			
147-	CSHEAR	4241	4201	4161	4163	4164	4164			
148-	CSHEAR	4242	4201	4163	4165	4166	4166			
149-	CSHEAR	4243	4201	4165	4167	4168	4168			
150-	CSHEAR	4244	4201	4167	4169	4170	4170			
151-	CSHEAR	4245	4201	4169	4171	4172	4172			
152-	CSHEAR	4246	4201	4171	4173	4174	4174			
153-	CSHEAR	4247	4201	4173	4175	4176	4176			
154-	CSHEAR	4248	4201	4175	4177	4178	4178			
155-	CSHEAR	4249	4201	4177	4179	4180	4180			
156-	CSHEAR	4250	4201	4179	4181	4182	4182			
157-	CSHEAR	4251	4201	4181	4183	4184	4184			
158-	CSHEAR	4252	4201	4183	4185	4186	4186			
159-	CSHEAR	4253	4201	4185	4187	4188	4188			
160-	CSHEAR	4254	4201	4187	4189	4190	4190			
161-	CSHEAR	4255	4201	4189	4191	4192	4192			
162-	CSHEAR	4256	4201	4191	4193	4194	4194			
163-	CSHEAR	4257	4201	4193	4195	4196	4196			
164-	CSHEAR	4258	4201	4195	4197	4198	4198			
165-	CSHEAR	4259	4201	4197	4199	4200	4200			
166-	CSHEAR	4260	4201	4199	4201	4202	4202			
167-	CSHEAR	4261	4201	4201	4203	4204	4204			
168-	CSHEAR	4262	4201	4203	4205	4206	4206			
169-	CSHEAR	4263	4201	4205	4207	4208	4208			
170-	CSHEAR	4264	4201	4207	4209	4210	4210			
171-	CSHEAR	4265	4201	4209	4211	4212	4212			
172-	CSHEAR	4266	4201	4211	4213	4214	4214			
173-	CSHEAR	4267	4201	4213	4215	4216	4216			
174-	CSHEAR	4268	4201	4215	4217	4218	4218			
175-	CSHEAR	4269	4201	4217	4219	4220	4220			
176-	CSHEAR	4270	4201	4219	4221	4222	4222			
177-	CSHEAR	4271	4201	4221	4223	4224	4224			
178-	CSHEAR	4272	4201	4223	4225	4226	4226			

CARD COUNT	1 EIGR	2 MAX	3 INV	4 1.0	5 2000.	6 30	7 0	8 1.-3	9 0	10 EIG2
201-	GRID	4001	0	64.0	.0	75.0	U			456
202-	GRID	4002	0	64.0	.0	73.0	U			1456
203-	GRID	4003	0	64.0	-4.7835	74.0485	U			456
204-	GRID	4004	0	64.0	-4.0181	72.2007	U			1456
205-	GRID	4005	0	64.0	-8.8389	71.3389	U			456
206-	GRID	4006	0	64.0	-7.4247	69.9247	U			1456
207-	GRID	4007	0	64.0	-11.5485	67.2835	U			456
208-	GRID	4008	0	64.0	-9.7007	66.5181	U			1456
209-	GRID	4009	0	64.0	-12.5	62.5	U			456
210-	GRID	4010	0	64.0	.0	75.0	U			1456
211-	GRID	4011	0	64.0	.0	73.0	U			456
212-	GRID	4012	0	64.0	-4.7835	74.0485	U			1456
213-	GRID	4013	0	64.0	-4.0181	72.2007	U			456
214-	GRID	4014	0	64.0	-8.8389	71.3389	U			1456
215-	GRID	4015	0	64.0	-7.4247	69.9247	U			456
216-	GRID	4016	0	64.0	-11.5485	67.2835	U			1456
217-	GRID	4017	0	64.0	-9.7007	66.5181	U			456
218-	GRID	4018	0	64.0	-12.5	62.5	U			1456
219-	GRID	4019	0	64.0	.0	75.0	U			456
220-	GRID	4020	0	78.0	.0	73.0	U			1456
221-	GRID	4021	0	78.0	-4.7835	74.0485	U			456
222-	GRID	4022	0	78.0	-4.0181	72.2007	U			1456
223-	GRID	4023	0	78.0	-8.8389	71.3389	U			456
224-	GRID	4024	0	78.0	-7.4247	69.9247	U			1456
225-	GRID	4025	0	78.0	-11.5485	67.2835	U			456
226-	GRID	4026	0	78.0	-9.7007	66.5181	U			1456
227-	GRID	4027	0	78.0	-12.5	62.5	U			456
228-	GRID	4028	0	78.0	.0	75.0	U			1456
229-	GRID	4029	0	78.0	.0	73.0	U			456
230-	GRID	4030	0	78.0	-4.7835	74.0485	U			1456
231-	GRID	4031	0	78.0	-4.0181	72.2007	U			456
232-	GRID	4032	0	78.0	-8.8389	71.3389	U			1456
233-	GRID	4033	0	78.0	-7.4247	69.9247	U			456
234-	GRID	4034	0	78.0	-11.5485	67.2835	U			1456
235-	GRID	4035	0	78.0	-9.7007	66.5181	U			456
236-	GRID	4036	0	78.0	-12.5	62.5	U			1456
237-	GRID	4037	0	78.0	.0	75.0	U			456
238-	GRID	4038	0	93.28	.0	73.0	U			1456
239-	GRID	4039	0	93.28	-4.7835	74.0485	U			456
240-	GRID	4040	0	93.28	-4.0181	72.2007	U			1456
241-	GRID	4041	0	93.28	-8.8389	71.3389	U			456
242-	GRID	4042	0	93.28	-7.4247	69.9247	U			1456
243-	GRID	4043	0	93.28	-11.5485	67.2835	U			456
244-	GRID	4044	0	93.28	-9.7007	66.5181	U			1456
245-	GRID	4045	0	93.28	-12.5	62.5	U			456
246-	GRID	4046	0	93.28	.0	75.0	U			1456
247-	GRID	4047	0	93.28	-4.7835	74.0485	U			456
248-	GRID	4048	0	93.28	-4.0181	72.2007	U			1456
249-	GRID	4049	0	93.28	-8.8389	71.3389	U			456
250-	GRID	4050	0	93.28	-7.4247	69.9247	U			1456
251-	GRID	4051	0	93.28	-11.5485	67.2835	U			456
252-	GRID	4052	0	93.28	-9.7007	66.5181	U			1456
253-	GRID	4053	0	93.28	-12.5	62.5	U			456
254-	GRID	4054	0	93.28	.0	75.0	U			1456
255-	GRID	4055	0	93.28	-4.7835	74.0485	U			456

CARD COUNT	1	2	3	4	5	6	7	8	9	10
251-	GRID	4055	93.28	0.0	0.0	71.3389	0.0	0.0	0.0	456
252-	GRID	4057	91.28	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
253-	GRID	4062	102.12	0.0	-12.5	63.10	0.0	0.0	0.0	246
254-	GRID	4064	102.12	0.0	-12.5	62.61	0.0	0.0	0.0	456
255-	GRID	4069	107.92	0.0	0.0	75.0	0.0	0.0	0.0	456
257-	GRID	4071	107.92	0.0	-4.7835	74.0485	0.0	0.0	0.0	1456
258-	GRID	4072	107.92	0.0	-4.0181	72.2007	0.0	0.0	0.0	1456
259-	GRID	4073	107.92	0.0	-8.8389	71.3389	0.0	0.0	0.0	456
250-	GRID	4074	107.92	0.0	-7.4247	69.8247	0.0	0.0	0.0	1456
261-	GRID	4075	107.92	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
262-	GRID	4077	107.92	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	1456
263-	GRID	4078	107.92	0.0	-12.5	66.5181	0.0	0.0	0.0	456
264-	GRID	4079	107.92	0.0	-10.5	62.5	0.0	0.0	0.0	1456
265-	GRID	4080	107.92	0.0	0.0	75.0	0.0	0.0	0.0	456
266-	GRID	4081	107.92	0.0	-4.7835	74.0485	0.0	0.0	0.0	456
267-	GRID	4083	107.92	0.0	-4.0181	72.2007	0.0	0.0	0.0	456
268-	GRID	4085	107.92	0.0	-8.8389	71.3389	0.0	0.0	0.0	456
269-	GRID	4087	107.92	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
270-	GRID	4091	122.56	0.0	0.0	75.0	0.0	0.0	0.0	1456
271-	GRID	4092	122.56	0.0	-4.7835	74.0485	0.0	0.0	0.0	456
272-	GRID	4093	122.56	0.0	-4.0181	72.2007	0.0	0.0	0.0	456
273-	GRID	4094	122.56	0.0	-8.8389	71.3389	0.0	0.0	0.0	456
274-	GRID	4095	122.56	0.0	-7.4247	69.8247	0.0	0.0	0.0	1456
275-	GRID	4096	122.56	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
276-	GRID	4097	122.56	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	1456
277-	GRID	4098	122.56	0.0	-12.5	66.5181	0.0	0.0	0.0	456
278-	GRID	4099	122.56	0.0	-10.5	62.5	0.0	0.0	0.0	1456
279-	GRID	4100	122.56	0.0	0.0	75.0	0.0	0.0	0.0	456
280-	GRID	4101	122.56	0.0	-4.7835	74.0485	0.0	0.0	0.0	456
281-	GRID	4103	122.56	0.0	-4.0181	72.2007	0.0	0.0	0.0	456
282-	GRID	4105	122.56	0.0	-8.8389	71.3389	0.0	0.0	0.0	456
283-	GRID	4107	122.56	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
284-	GRID	4112	129.0	0.0	-12.5	63.10	0.0	0.0	0.0	246
285-	GRID	4114	129.0	0.0	-12.5	62.61	0.0	0.0	0.0	456
286-	GRID	4119	129.0	0.0	0.0	75.0	0.0	0.0	0.0	456
287-	GRID	4121	137.2	0.0	0.0	73.0	0.0	0.0	0.0	1456
288-	GRID	4122	137.2	0.0	-4.7835	74.0485	0.0	0.0	0.0	456
289-	GRID	4123	137.2	0.0	-4.0181	72.2007	0.0	0.0	0.0	456
290-	GRID	4124	137.2	0.0	-8.8389	71.3389	0.0	0.0	0.0	456
291-	GRID	4125	137.2	0.0	-7.4247	69.8247	0.0	0.0	0.0	1456
292-	GRID	4126	137.2	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
293-	GRID	4127	137.2	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	1456
294-	GRID	4129	137.2	0.0	-12.5	66.5181	0.0	0.0	0.0	456
295-	GRID	4130	137.2	0.0	-10.5	62.5	0.0	0.0	0.0	1456
296-	GRID	4131	137.2	0.0	0.0	75.0	0.0	0.0	0.0	456
297-	GRID	4133	137.2	0.0	-4.7835	74.0485	0.0	0.0	0.0	456
298-	GRID	4135	137.2	0.0	-8.8389	71.3389	0.0	0.0	0.0	456
299-	GRID	4137	137.2	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456
300-	GRID	4137	137.2	0.0	-11.548567.2835	0.0	0.0	0.0	0.0	456

S O R T E D B U L K D A T A E C M O

CARD COUNT	1	2	3	4	5	6	7	8	9	10
301-	GRID	4141	153.375	0	75.0	0	0	0	0	1456
302-	GRID	4142	153.375	0	73.0	0	0	0	0	1456
303-	GRID	4143	153.375	0	4.7835	74.0485	0	0	0	1456
304-	GRID	4144	153.375	0	-4.0191	72.2007	0	0	0	1456
305-	GRID	4145	153.375	0	-4.8389	71.3389	0	0	0	1456
306-	GRID	4146	153.375	0	-7.4247	69.9247	0	0	0	1456
307-	GRID	4147	153.375	0	-11.5485	67.2835	0	0	0	1456
308-	GRID	4148	153.375	0	-9.7007	66.5181	0	0	0	1456
309-	GRID	4149	153.375	0	-12.5	62.5	0	0	0	1456
310-	GRID	4150	153.375	0	0	75.0	0	0	0	1456
311-	GRID	4151	153.375	0	-12.5	63.10	0	0	0	1456
312-	GRID	4152	153.375	0	-4.7835	74.0485	0	0	0	1456
313-	GRID	4153	153.375	0	-4.7835	74.0485	0	0	0	1456
314-	GRID	4154	153.375	0	-12.5	62.00	0	0	0	1456
315-	GRID	4155	153.375	0	-8.8389	71.3389	0	0	0	1456
316-	GRID	4156	153.375	0	-11.5485	67.2835	0	0	0	1456
317-	GRID	4157	166.5	0	0	75.0	0	0	0	1456
318-	GRID	4158	166.5	0	-4.7835	74.0485	0	0	0	1456
319-	GRID	4159	166.5	0	-4.0191	72.2007	0	0	0	1456
320-	GRID	4160	166.5	0	-8.8389	71.3389	0	0	0	1456
321-	GRID	4161	166.5	0	-7.4247	69.9247	0	0	0	1456
322-	GRID	4162	166.5	0	-11.5485	67.2835	0	0	0	1456
323-	GRID	4163	166.5	0	-9.7007	66.5181	0	0	0	1456
324-	GRID	4164	166.5	0	-12.5	62.5	0	0	0	1456
325-	GRID	4165	166.5	0	0	75.0	0	0	0	1456
326-	GRID	4166	166.5	0	-4.7835	74.0485	0	0	0	1456
327-	GRID	4167	166.5	0	-4.0191	72.2007	0	0	0	1456
328-	GRID	4168	166.5	0	-8.8389	71.3389	0	0	0	1456
329-	GRID	4169	166.5	0	-7.4247	69.9247	0	0	0	1456
330-	GRID	4170	166.5	0	-11.5485	67.2835	0	0	0	1456
331-	GRID	4171	166.5	0	-9.7007	66.5181	0	0	0	1456
332-	GRID	4172	166.5	0	-12.5	62.5	0	0	0	1456
333-	GRID	4173	166.5	0	0	75.0	0	0	0	1456
334-	GRID	4174	166.5	0	-4.7835	74.0485	0	0	0	1456
335-	GRID	4175	166.5	0	-4.0191	72.2007	0	0	0	1456
336-	GRID	4176	166.5	0	-8.8389	71.3389	0	0	0	1456
337-	GRID	4177	166.5	0	-7.4247	69.9247	0	0	0	1456
338-	GRID	4178	166.5	0	-11.5485	67.2835	0	0	0	1456
339-	GRID	4179	166.5	0	-9.7007	66.5181	0	0	0	1456
340-	GRID	4180	166.5	0	-12.5	62.5	0	0	0	1456
341-	MATI	10.566	10.566	0	0	0	0	0	0	1456
342-	MPC	4000	4011	1	0	0	0	0	0	1456
343-	MPC	4000	4011	1	0	0	0	0	0	1456
344-	MPC	4000	4013	1	0	0	0	0	0	1456
345-	MPC	4000	4015	1	0	0	0	0	0	1456
346-	MPC	4000	4017	1	0	0	0	0	0	1456
347-	MPC	4000	4019	1	0	0	0	0	0	1456
348-	MPC	4000	4021	1	0	0	0	0	0	1456
349-	MPC	4000	4022	1	0	0	0	0	0	1456
350-	MPC	4000	4029	1	0	0	0	0	0	1456
351-	MPC	4000	4032	1	0	0	0	0	0	1456
352-	MPC	4000	4032	1	0	0	0	0	0	1456
353-	MPC	4000	4032	1	0	0	0	0	0	1456

64932X





SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
401-	SPC	4001	4022	2	5	4042	2			
402-	SPC	4001	4041	2	5	4051	2			
403-	SPC	4001	4071	2	5	4081	2			
404-	SPC	4001	4072	2	5	4092	2			
405-	SPC	4001	4091	2	5	4101	2			
406-	SPC	4001	4121	2	5	4131	2			
407-	SPC	4001	4122	2	5	4142	2			
408-	SPC	4001	4141	2	5	4151	2			
409-	SPC	4001	4171	2	5	4162	2			
410-	SPC	4002	4001	1	5	4001	3			
411-	SPC	4002	4002	3	5	4172	3			
412-	SPC	4002	4011	3	5	4122	3			
413-	SPC	4002	4021	3	5	4021	3			
414-	SPC	4002	4031	3	5	4031	3			
415-	SPC	4002	4041	1	5	4041	3			
416-	SPC	4002	4051	1	5	4051	3			
417-	SPC	4002	4071	1	5	4071	3			
418-	SPC	4002	4072	3	5	4092	3			
419-	SPC	4002	4081	1	5	4081	3			
420-	SPC	4002	4091	1	5	4091	3			
421-	SPC	4002	4101	1	5	4101	3			
422-	SPC	4002	4121	1	5	4121	3			
423-	SPC	4002	4122	3	5	4142	3			
424-	SPC	4002	4131	1	5	4131	3			
425-	SPC	4002	4141	1	5	4141	3			
426-	SPC	4002	4151	1	5	4151	3			
427-	SPC	4002	4161	3	5	4162	3			
428-	SPC	4002	4171	3	5	4171	3			
429-	SPC	4002	3	3	5	4172	3			
430-	SUPPORT	4004	23	4172	23	4008	23	4010	23	
431-	SUPPORT	4034	13	4084	13	4114	13	4154	13	
432-	SUPPORT	4174	23	4176	23	4178	23	4190	23	
433-	ENDDATA									

**Appendix B8**  
**PLOTS OF SYMMETRIC COMPONENT MODES/PHASE I**  
**ANALYSIS MODEL II CARGO DOORS**

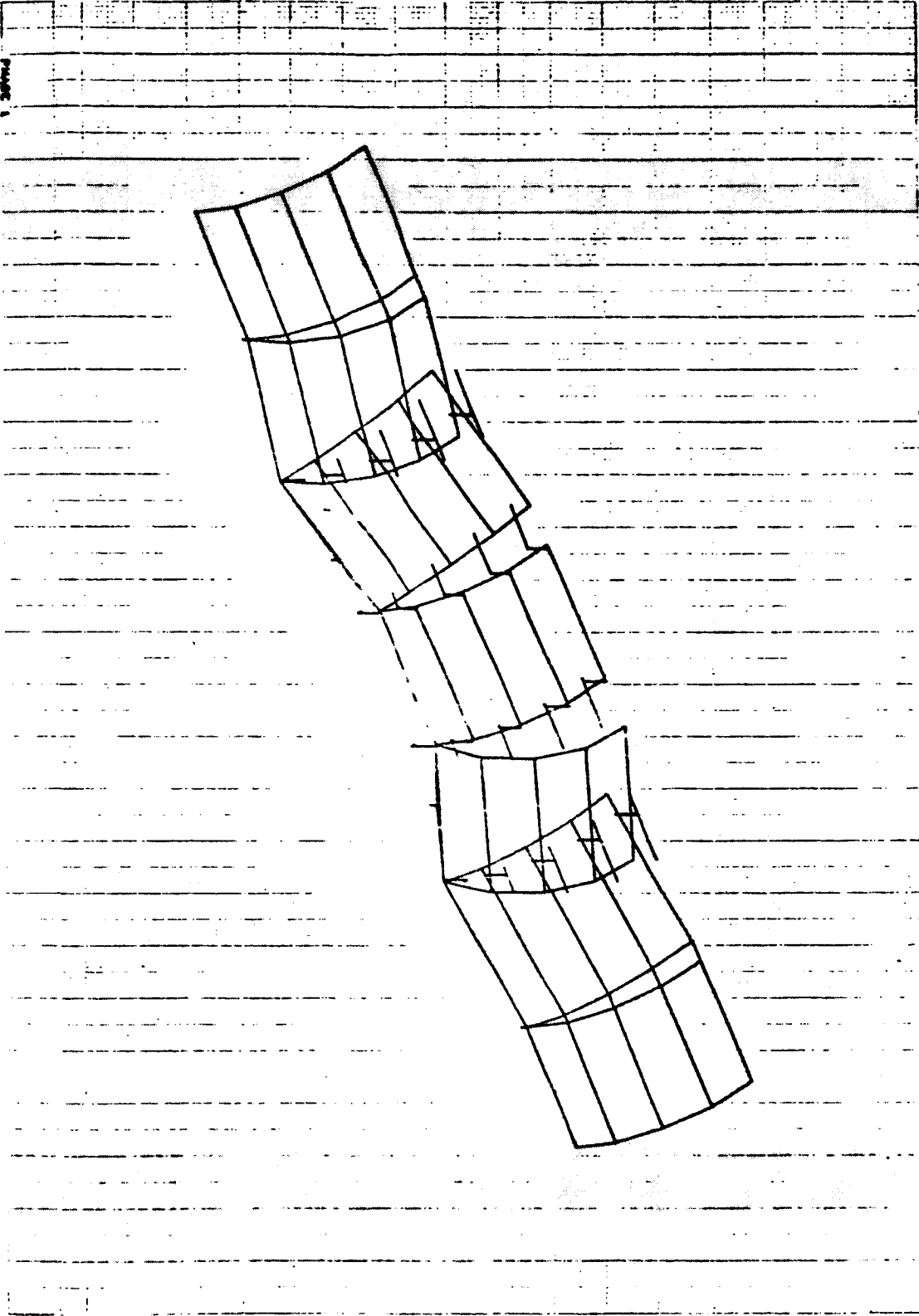


FIGURE 1  
ORBITAL SCANNING SATELLITE STRAPS  
FREE HOOKS PIVOT AT INTERFACES  
LOCAL ORIGIN, SURFACE 1, MODE 1, PERIOD, 47.88908

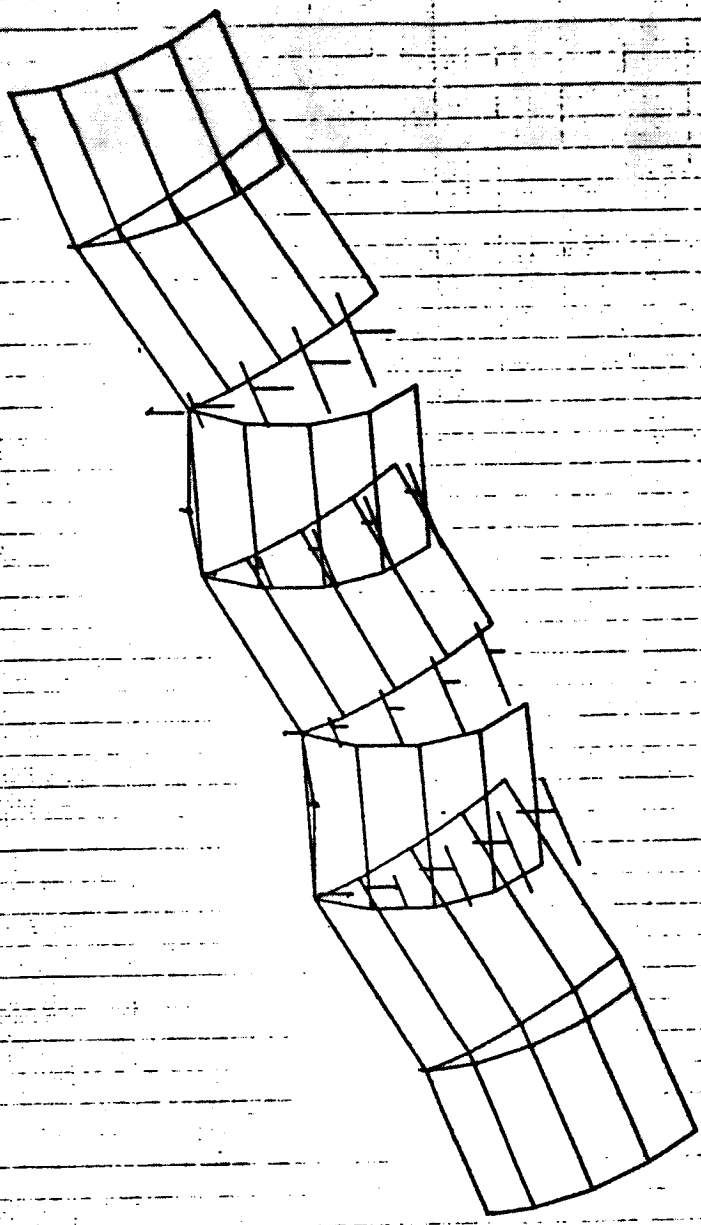
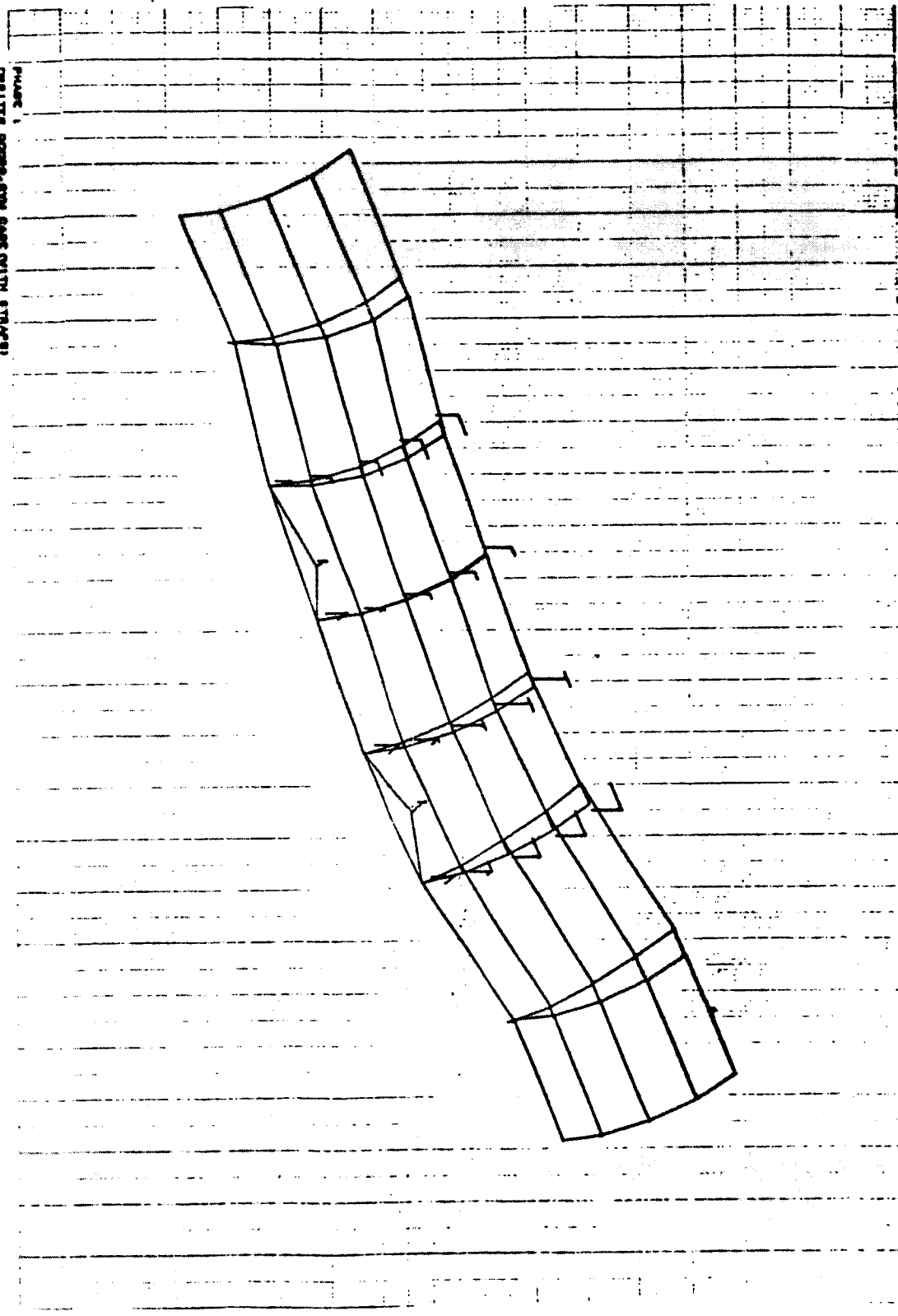
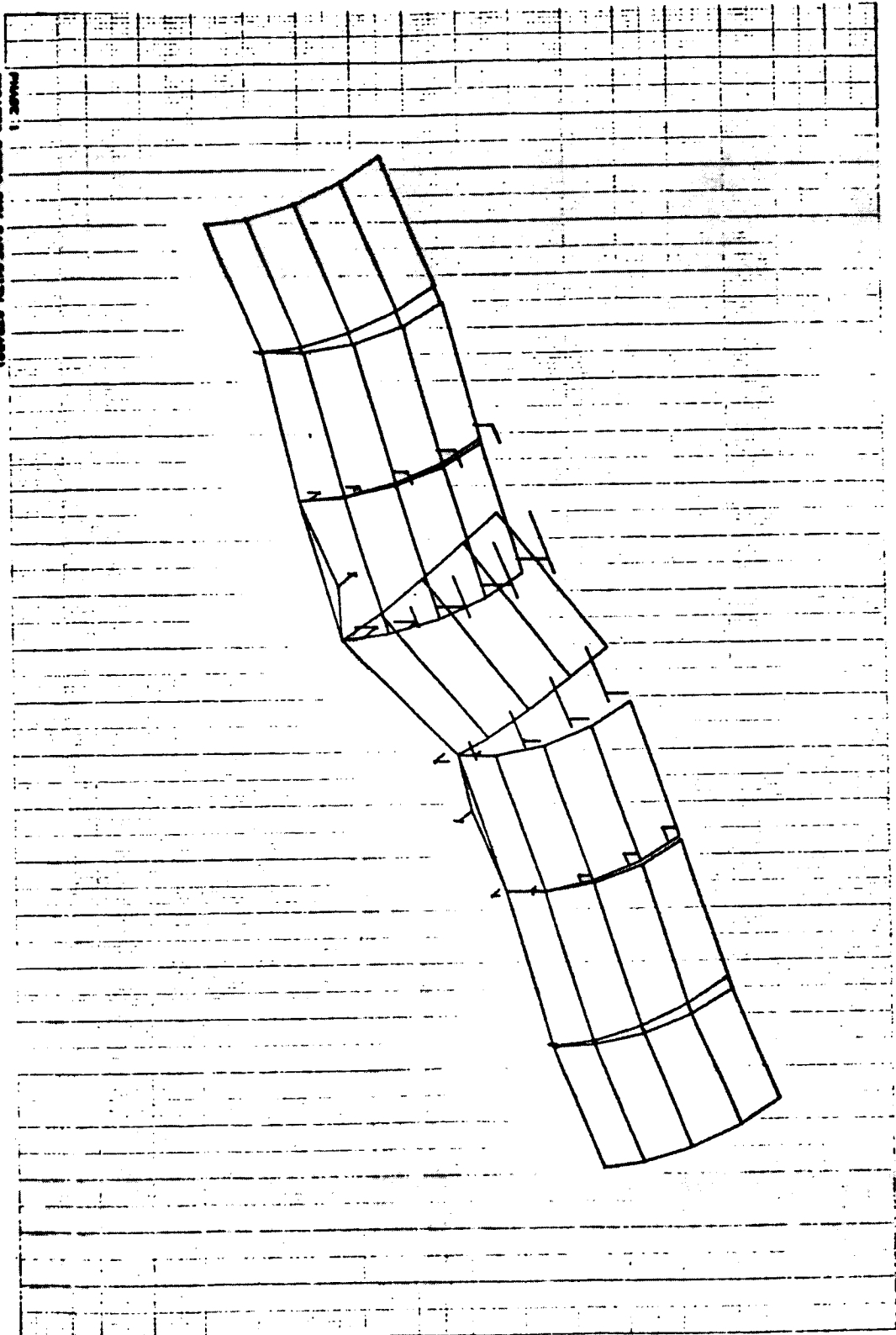


PLATE 1  
QUALITY ASSURANCE SECTION STRAP  
FRONT VIEW FROM AT INTERMEDIATE  
LOAD, SECTION, SUBSECTION 2, WORK 2, FIG. 20, 20000

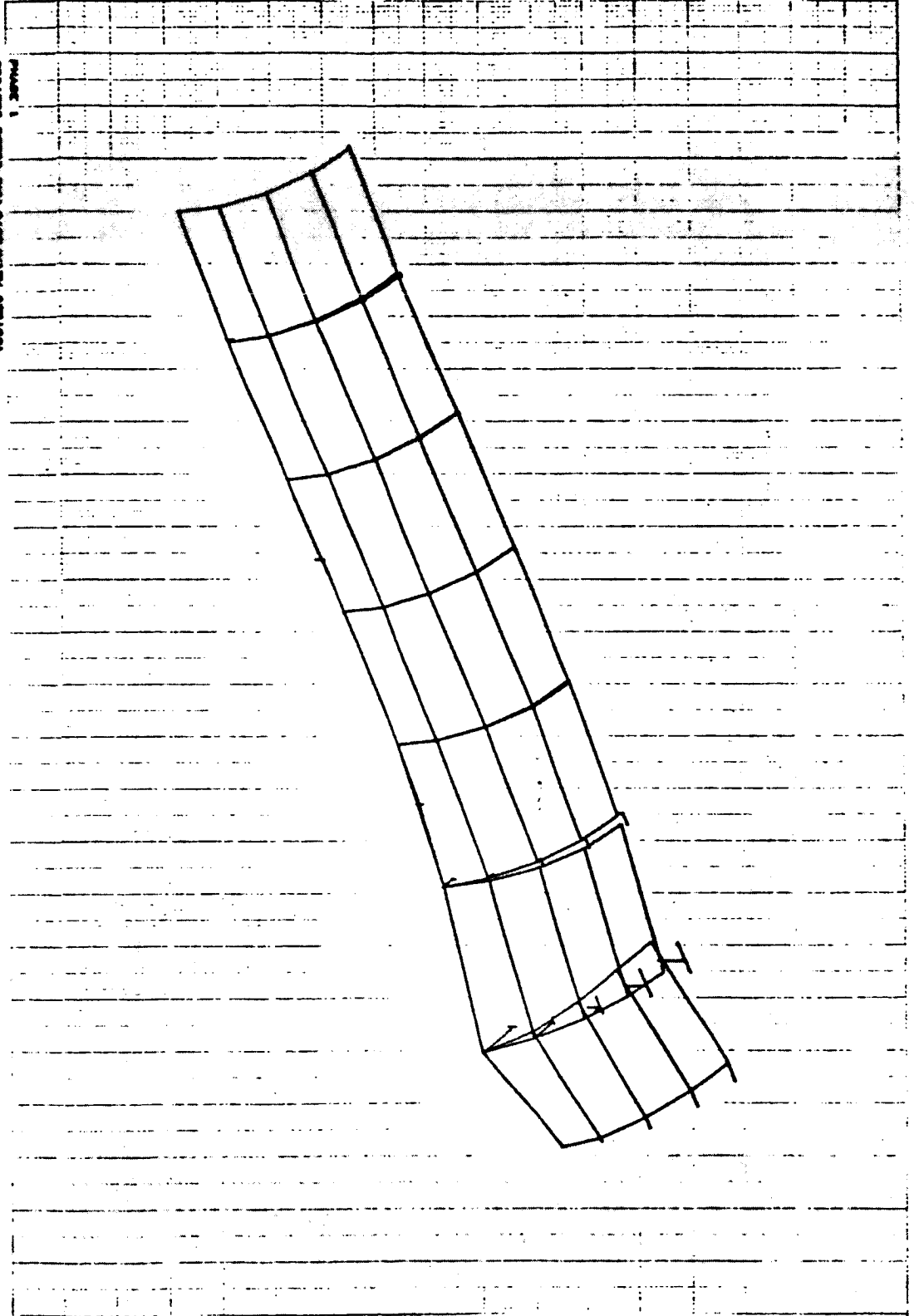


PHASE 1  
DRILLING OPERATIONS (SEE DRAWING STRAPS)  
PITTSBURGH, PA. (SEE DRAWING STRAPS)  
MORNING, SURFACE 2 MORNING, SURFACE 2  
MORNING, SURFACE 2 MORNING, SURFACE 2



PHASE 1  
UNITED STATES DEPARTMENT OF THE ARMY  
PRICE BOOKS PUBLISHED AT INTERFAC  
MONT. DEPT. OF THE ARMY 4 PRICE 89,11000

PHASE 1  
ORBITER SCIENCE EVA GEAR (STVA STRAP)  
PRICE MODEL FINDER AT INTERFACE  
MOM. OCFM. SURFACE 8 MON. 8 PRICE. 150.0000





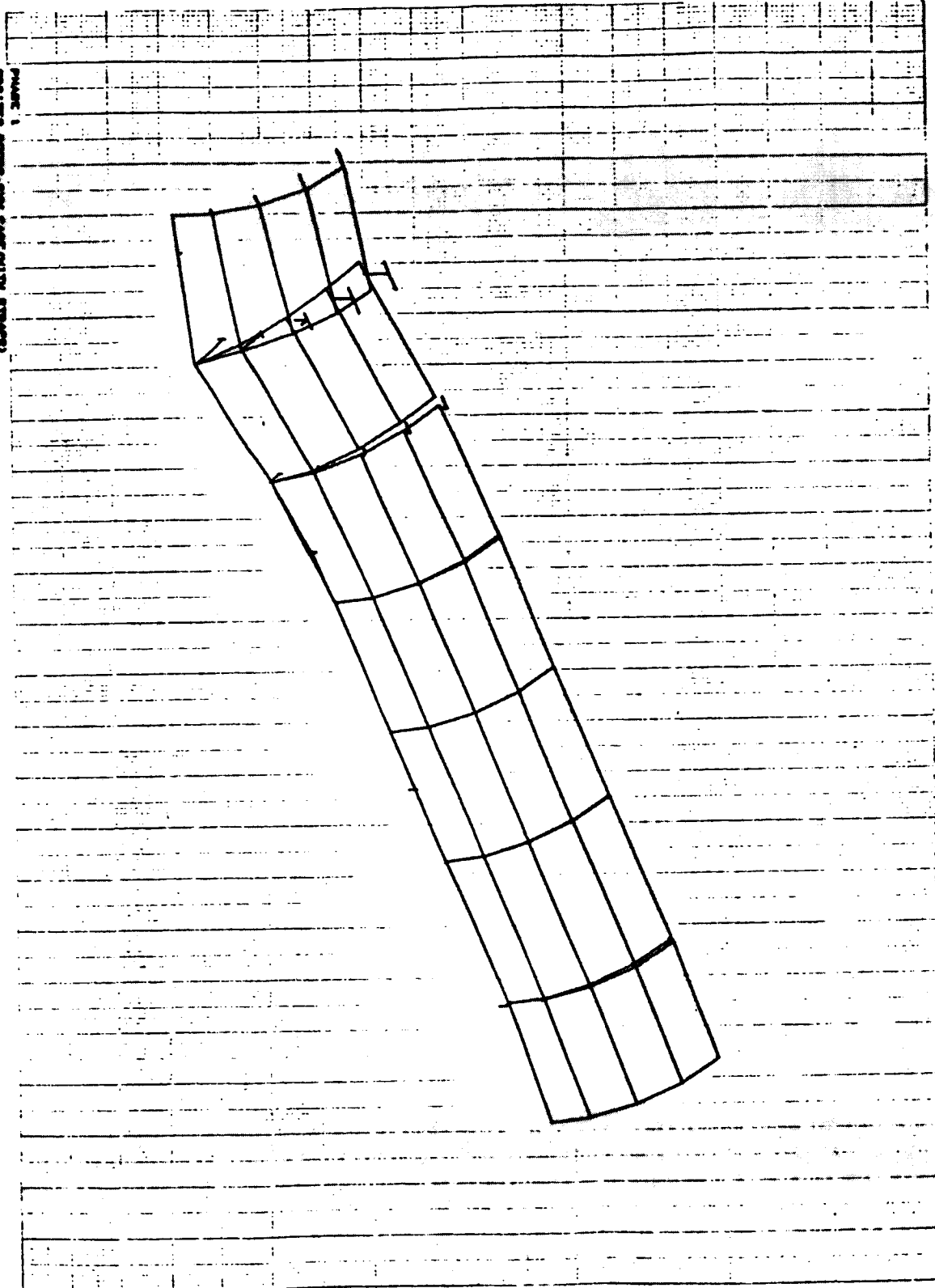
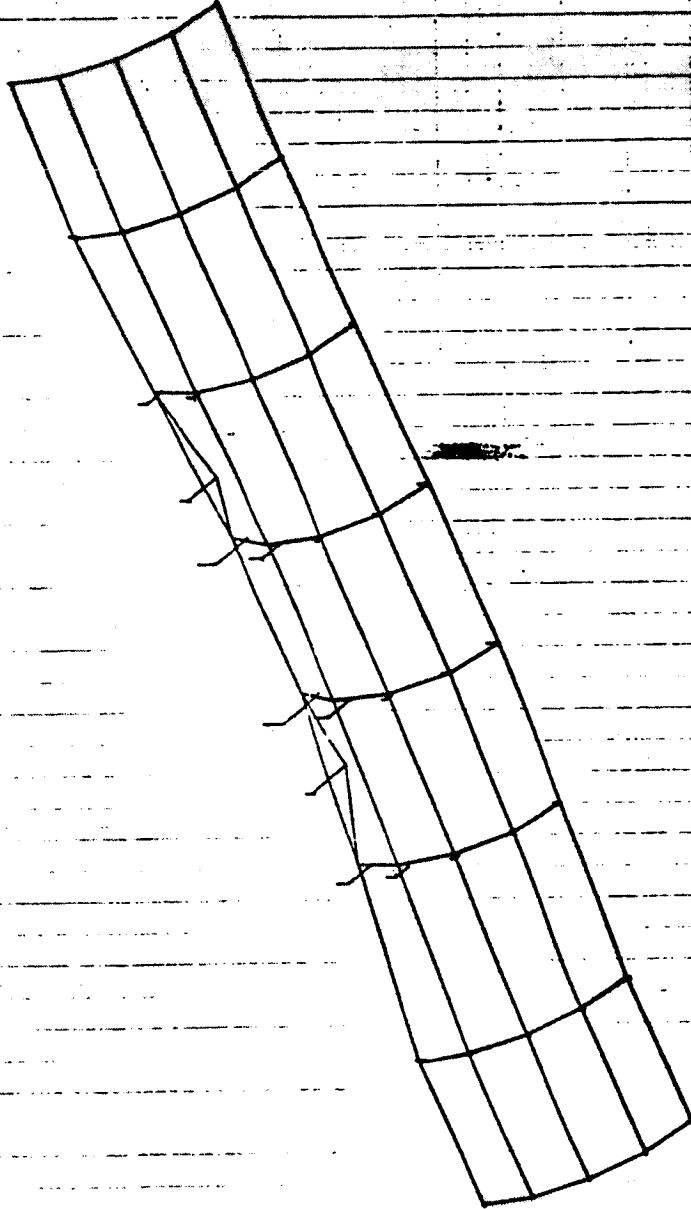
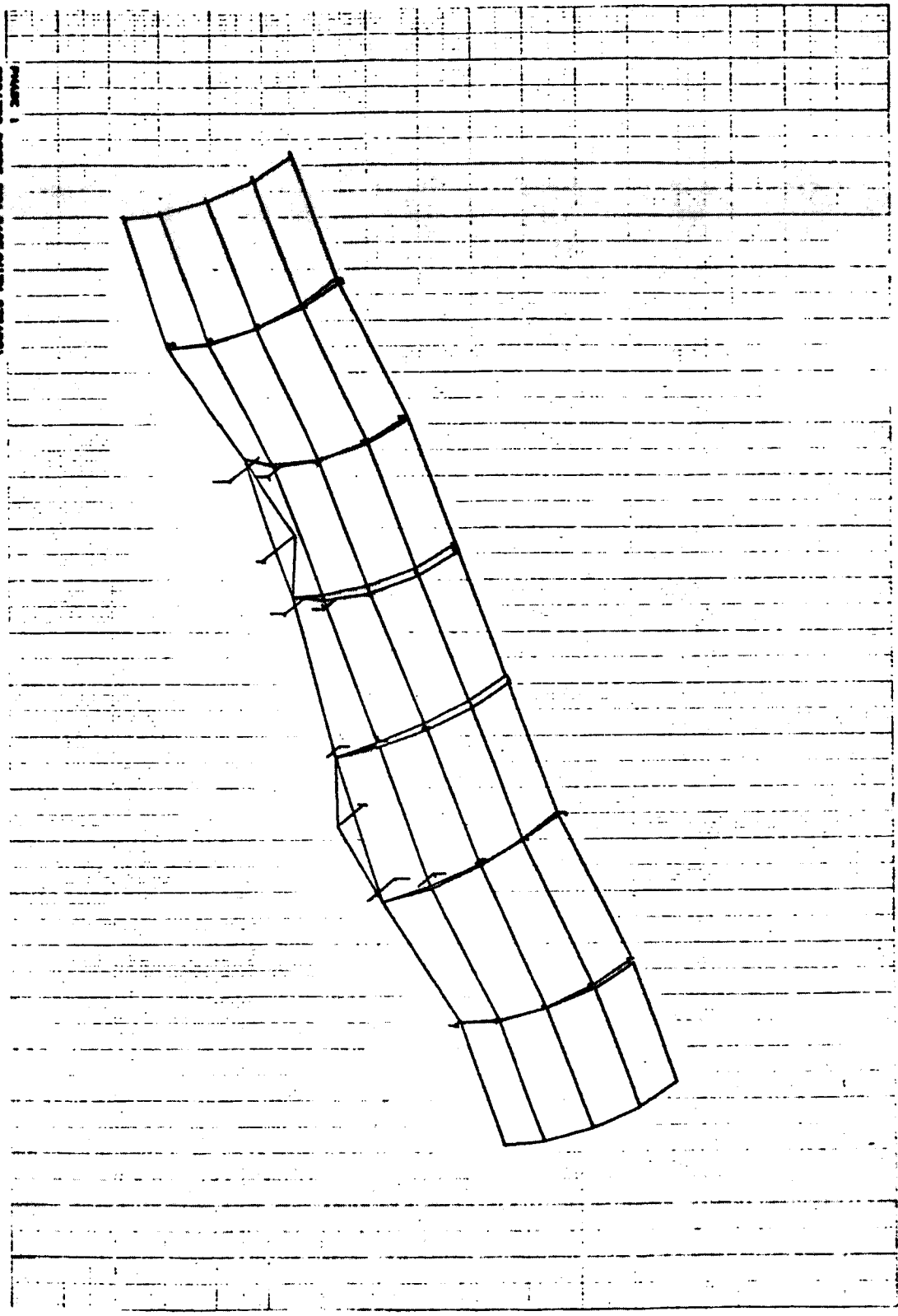


FIGURE 1  
Cylindrical object with grid pattern  
The object is oriented at 45 degrees  
to the horizontal. The object is  
made of metal. The object is  
100 mm in diameter and 100 mm  
in length.

PHASE 2  
CRISLER SOURCE/STYRE CASE (WITH STRAPS)  
PRICE INDEXES FIRST AT INTERFAC  
KODOL DETON, SUBCASE 1 MADE 1 PRICE 183.8000





PHASE 1  
ORBITER BOOMS (SEE SCHEDULED ATTACH)  
FREE BOARD FINISH AT INTERFAC  
MEDAL DETON. SURFACE 8 HORIZ. 174.1988

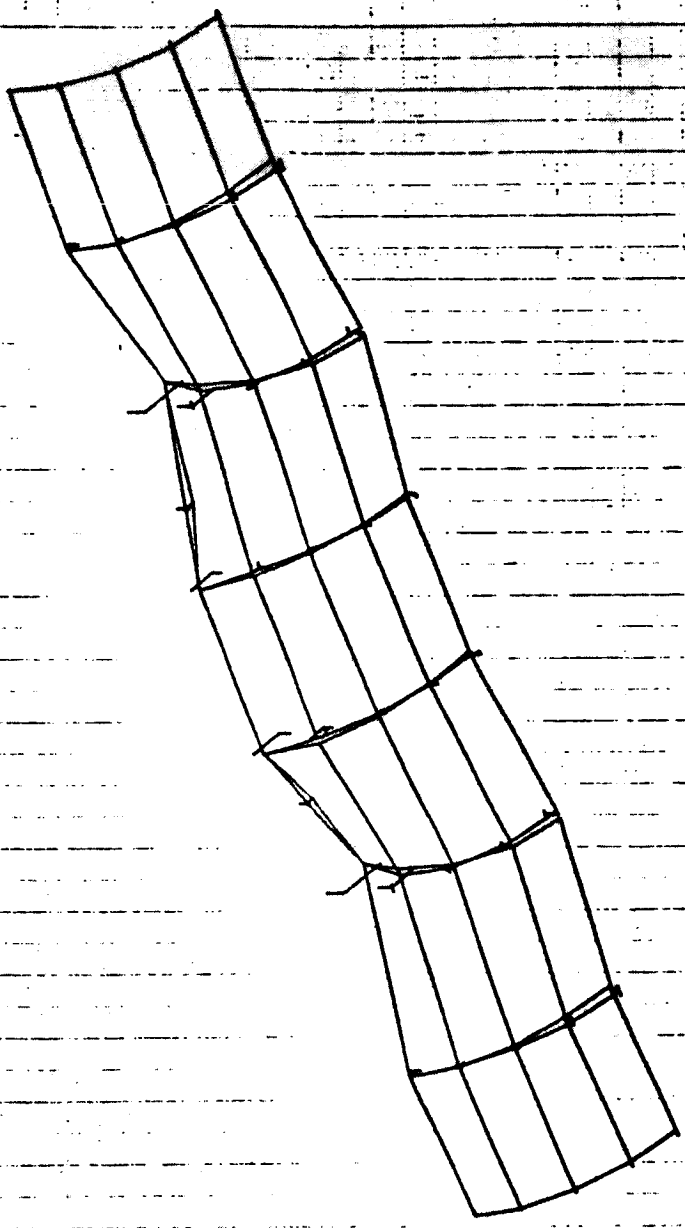


FIGURE 1  
MATERIALS SECTION (FROM SECTION STAFF)  
PLOT LOCUS OF THE AT INTERFACED  
MATERIAL SECTION, SURFACE 1, MODE 1, PWR, 140,000

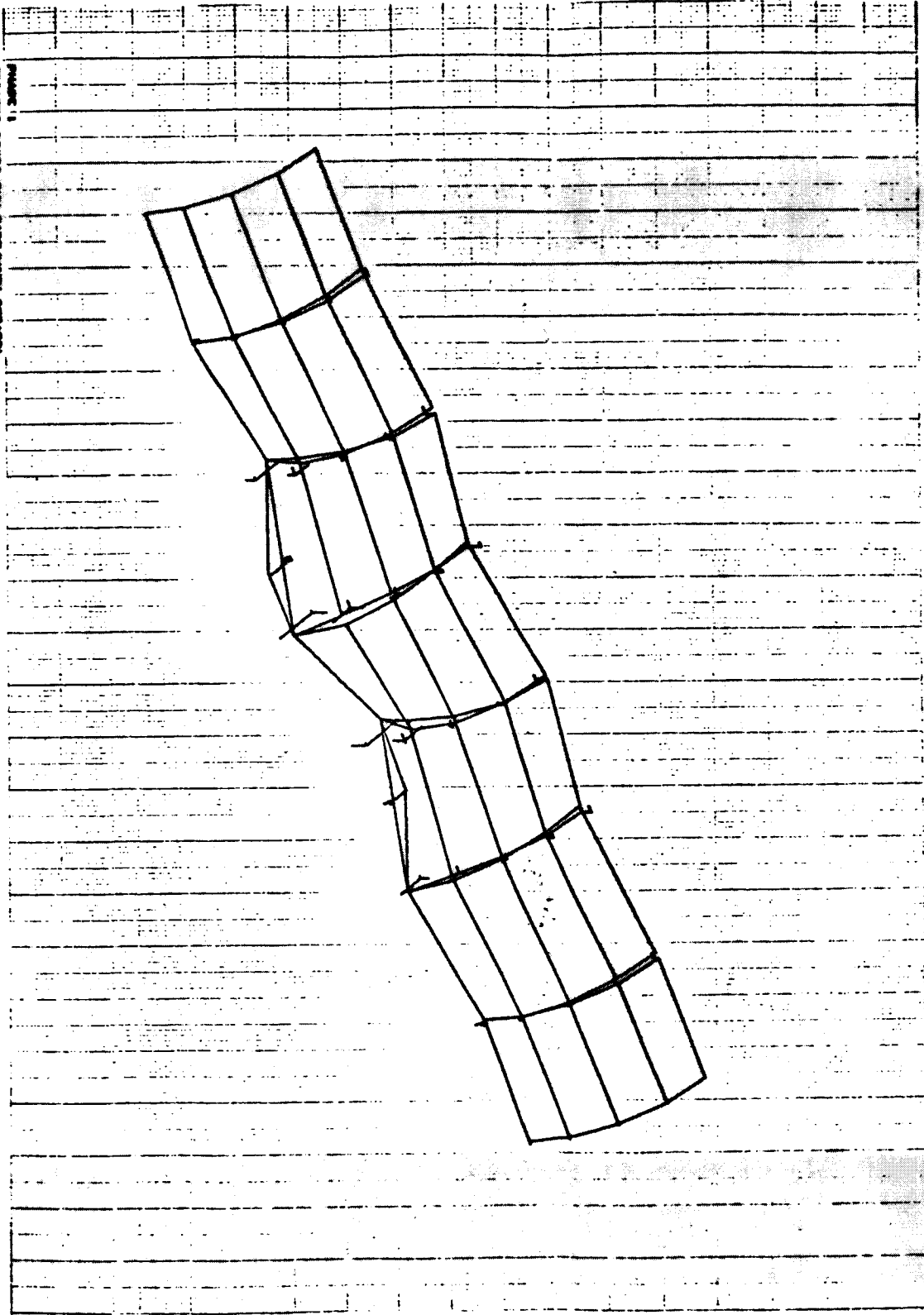
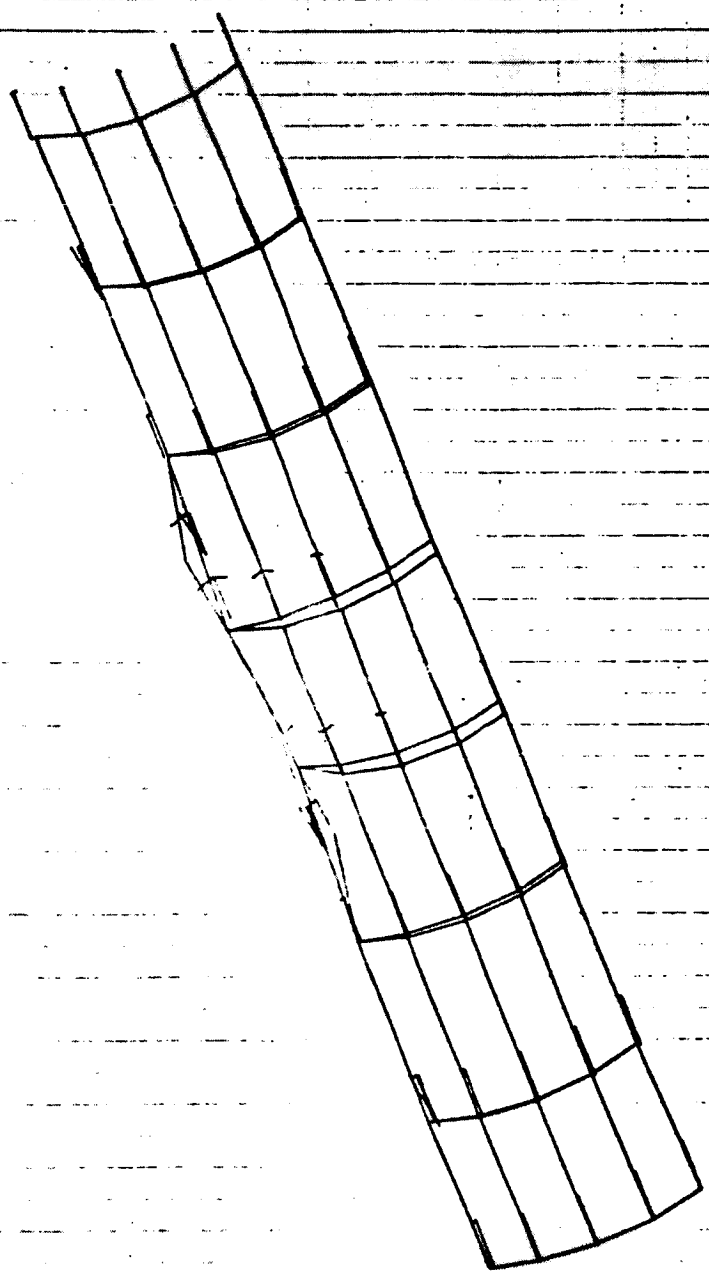
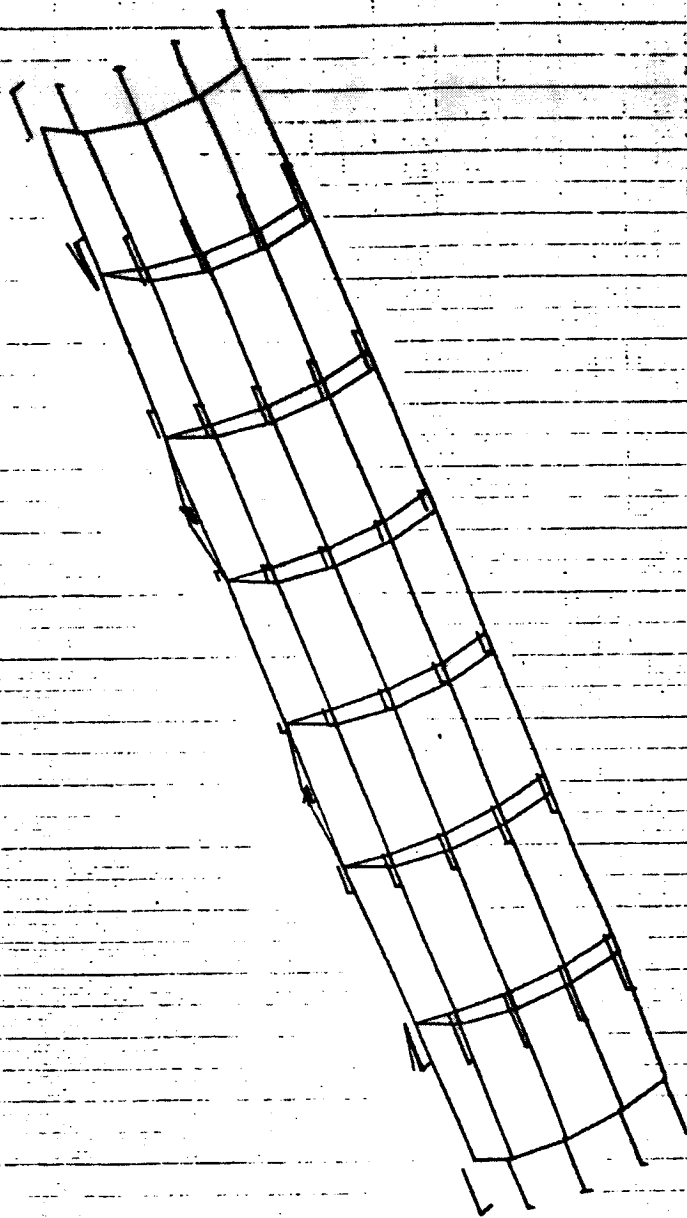


FIGURE 1  
CROSS SECTION OF A BUNDLE OF STRIPS  
WITH BUNDLES OF STRIPS AT INTERMEDIATE  
RADIAL DISTANCES, QUANTITIES 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

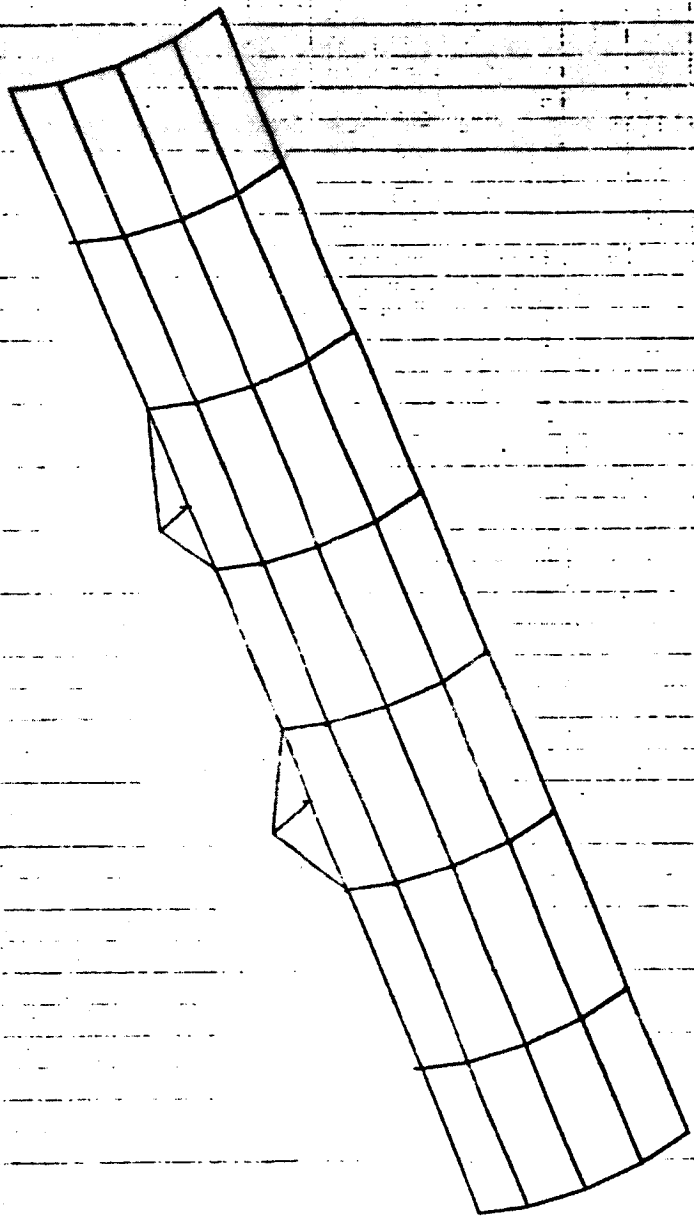
PHASE 1  
ORBITAL SCENE, SWM GAGE (WITH STRAPS)  
FIRE HOLES FIXED AT INTERFACE  
MOUL DEFORM, SUSPENSE EI MOUL II REC: 314.8916



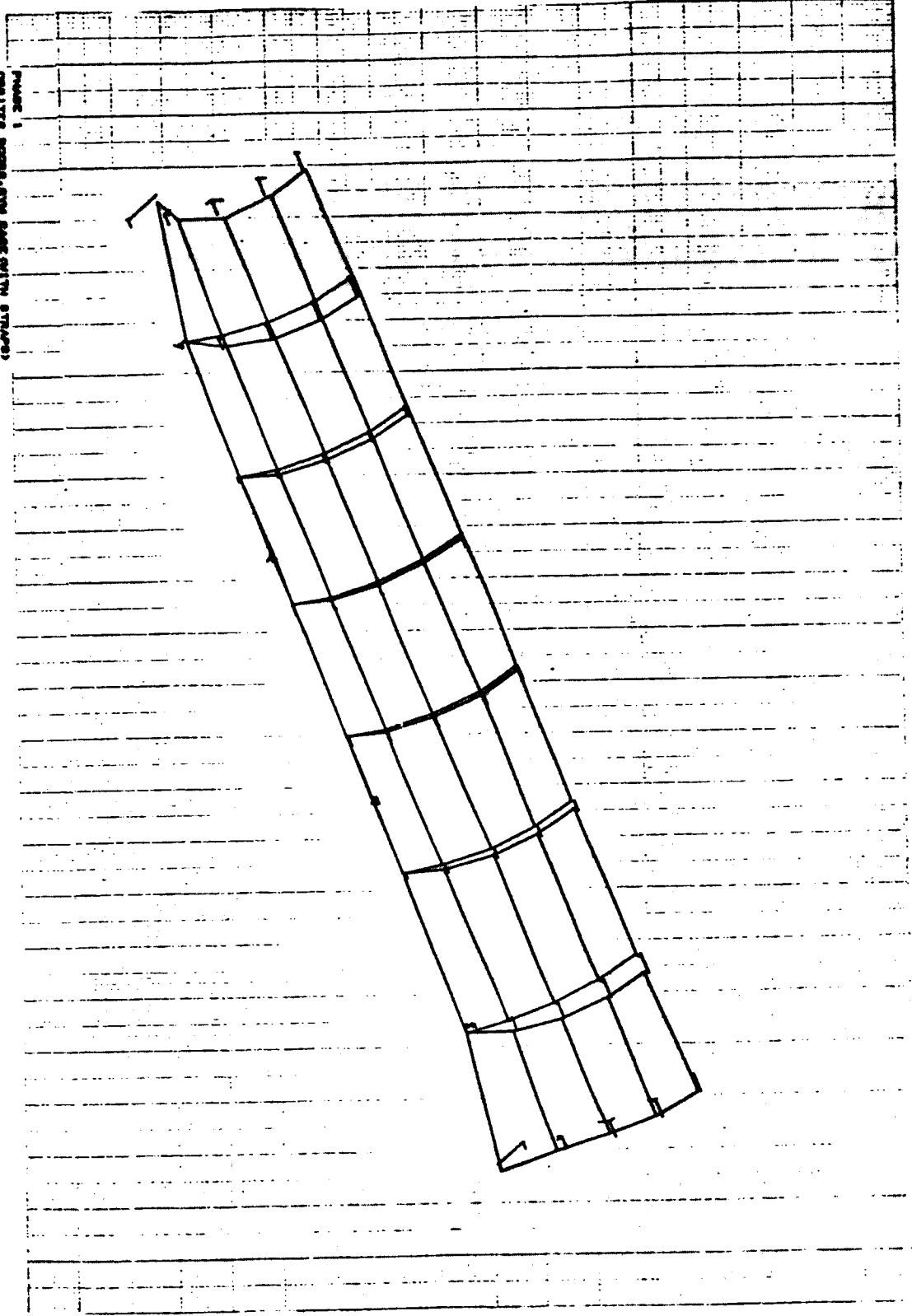
PHASE 1  
ORBITER BOOMS, STEEL BANDS WITH STRAPPS  
FRONT VIEW, PERSPECTIVE OF INTERIOR  
MOAL. REF. NO. 50000000 18 4/26/74 1000-1000, 1.00000000



PHASE 1  
ON-LINE OPERATIONS (CONNECTION STRAPS)  
FREE HOURS TYPED AT INTERFAC  
MOAL DECOM. SUBSIST 13 MOYE 13 FREB. 000.001

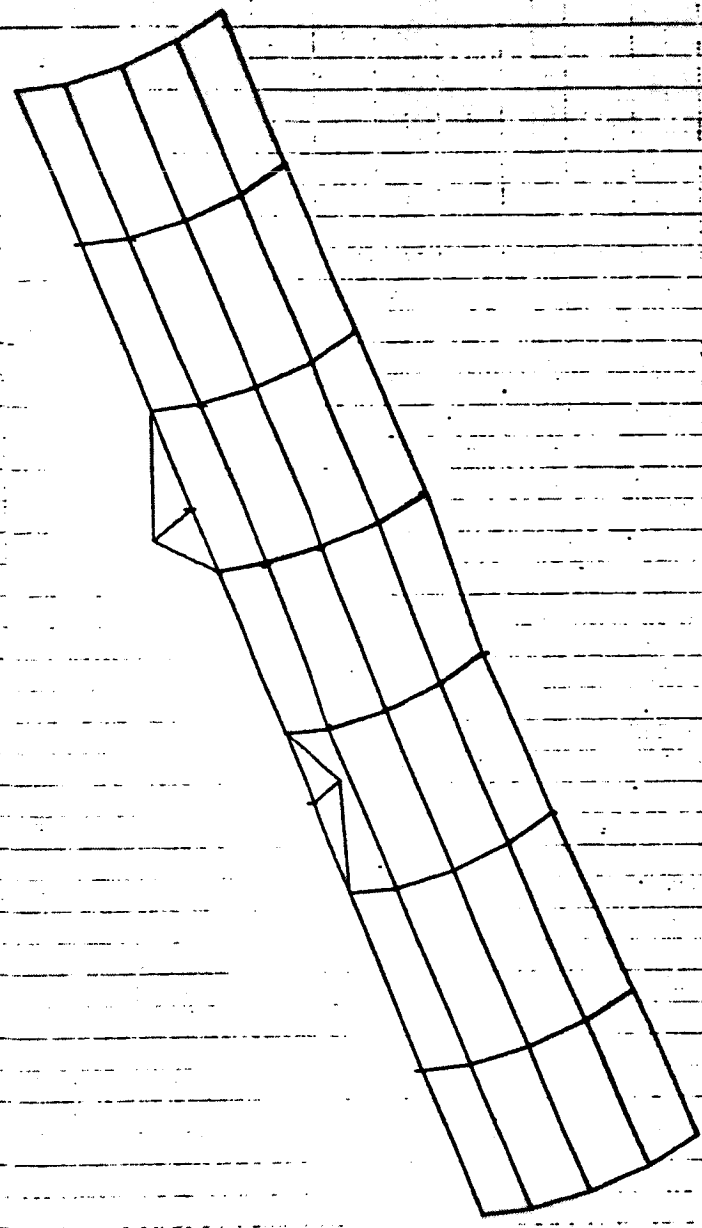






PHASE 1  
ORBITER SCORING/STW BASE WITH STRAPS  
PREC HOLES FILLED AT INTERFACE  
NOVA/ STW. SURFACE 14 HOLES 14 FROM 781.9108

PHASE 1  
UNLATCHED STRAPS - ONE SIDE ONLY WITH STRAPS  
FIXED LOCKER STRAPS AT INTERFACED  
ADJ. LOCKER STRAPS IN LOCKER IS FIXED, 790, 8048



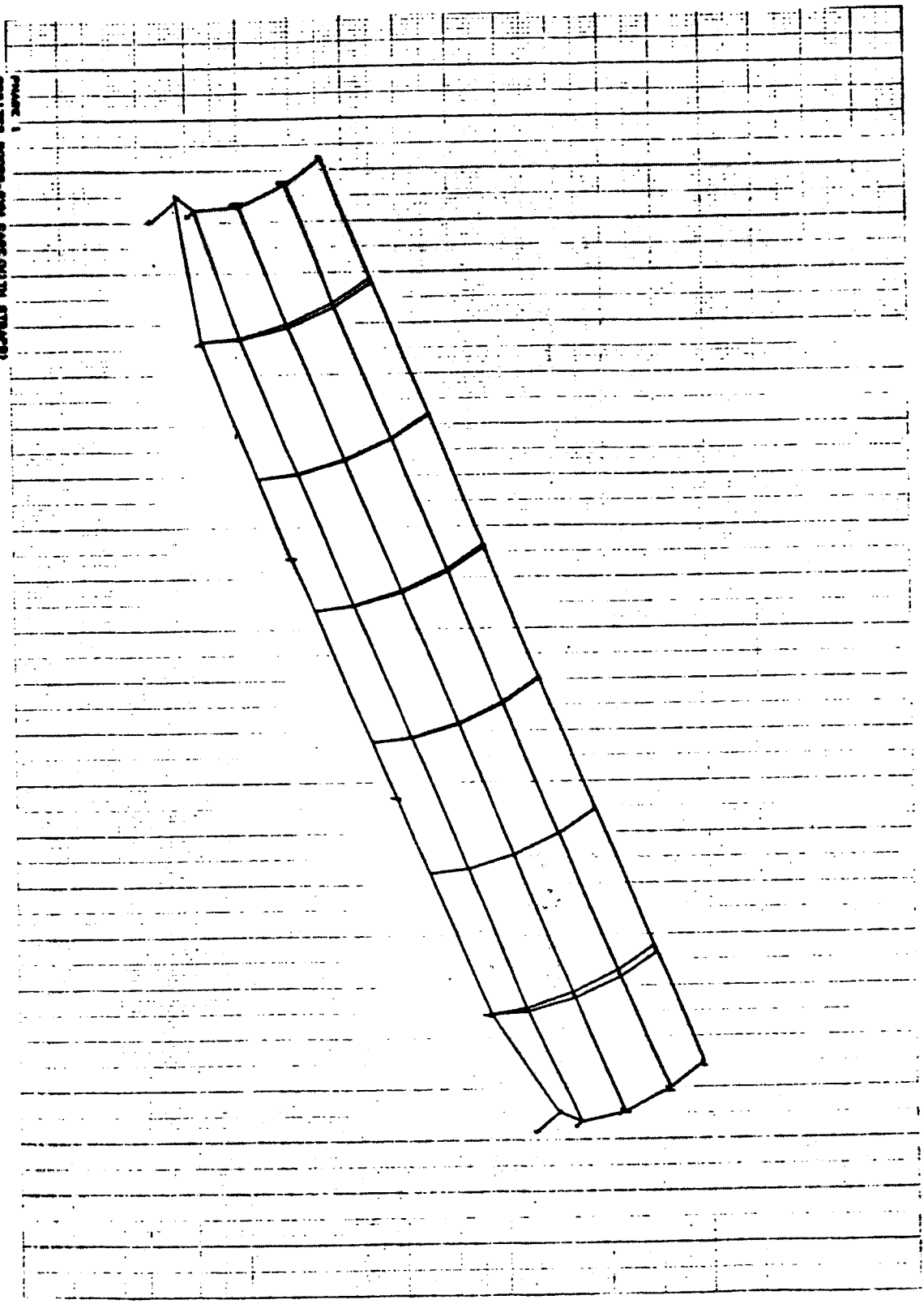
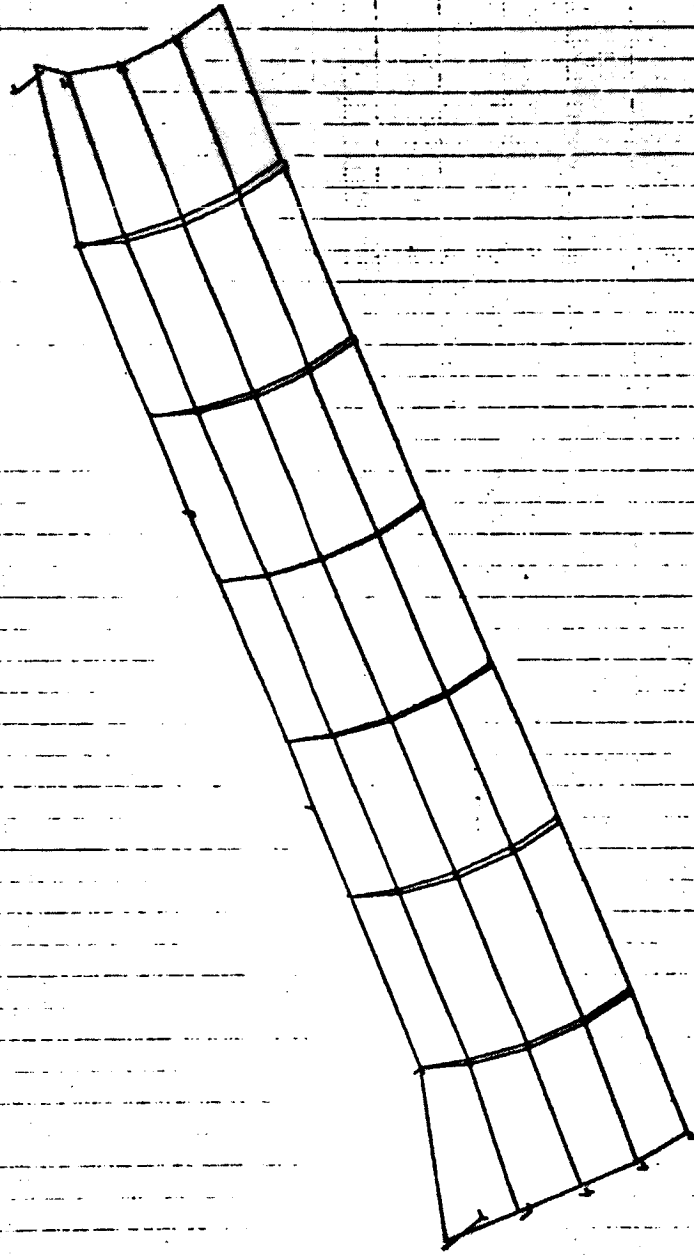


FIGURE 1  
ORIENTATION SCHEMATIC OF THE STRAP  
FREE HOOKS FIXED AT INTERFAC  
LOCAL SECTION. SURFACE IS MARK 10 FREE. 100.0001

PHASE 1  
ORBITAL SCENE, 0700 GARE (WITH STRAPS)  
FREE HOLES FILLED AT INTERFAC  
MOUL DEVON, SURFACE 17 MOOR 17 PREO, 02/9, 4971



UNITED STATES GOVERNMENT  
OFFICE OF THE SECRETARY OF DEFENSE

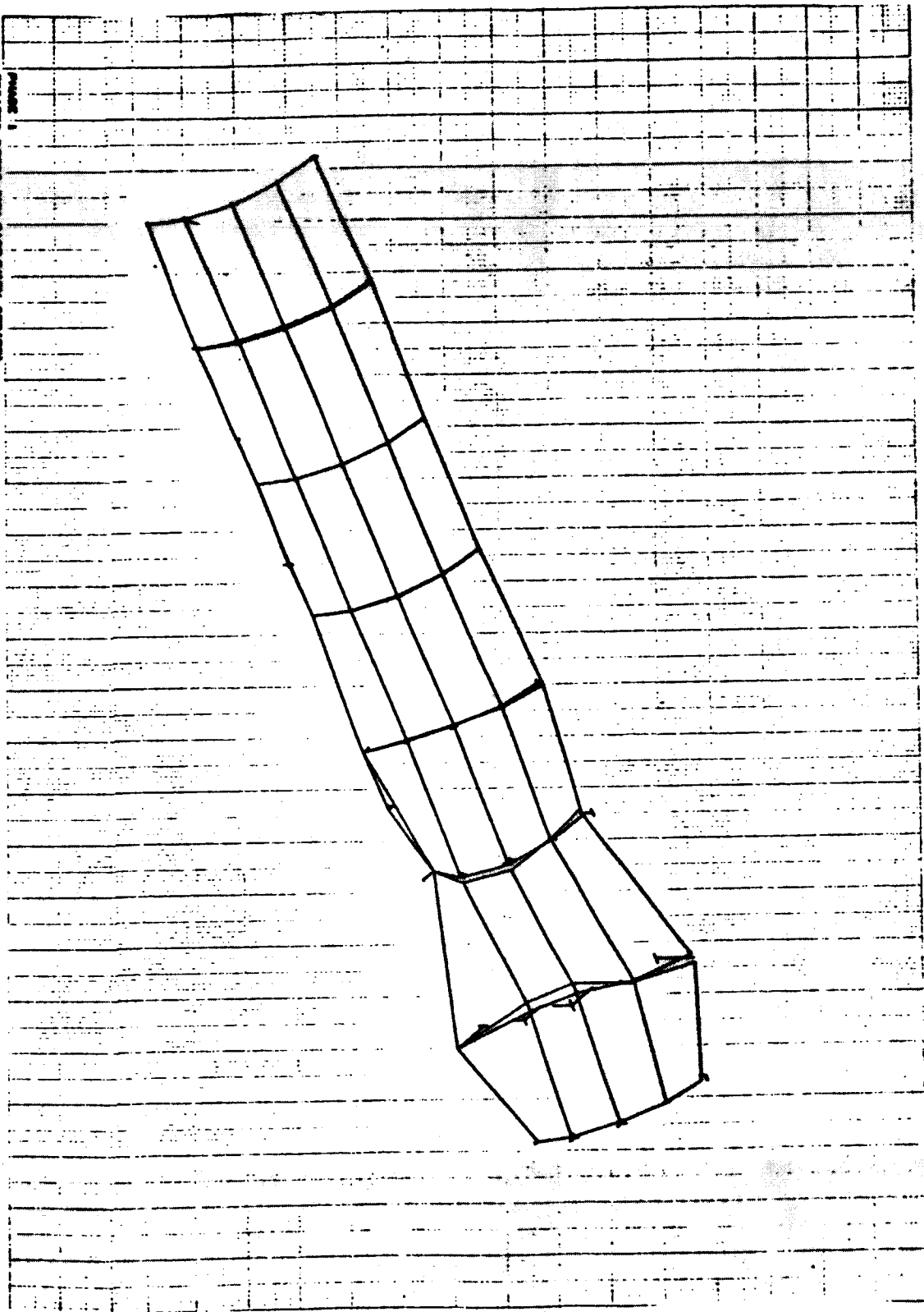
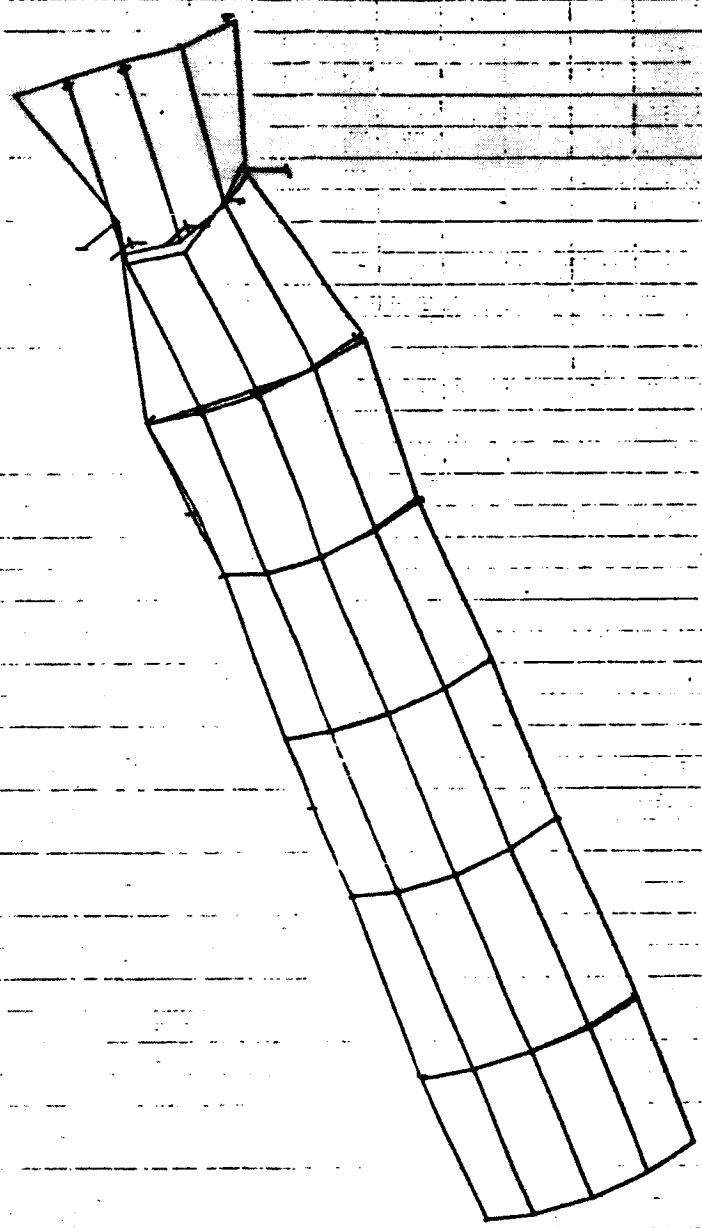
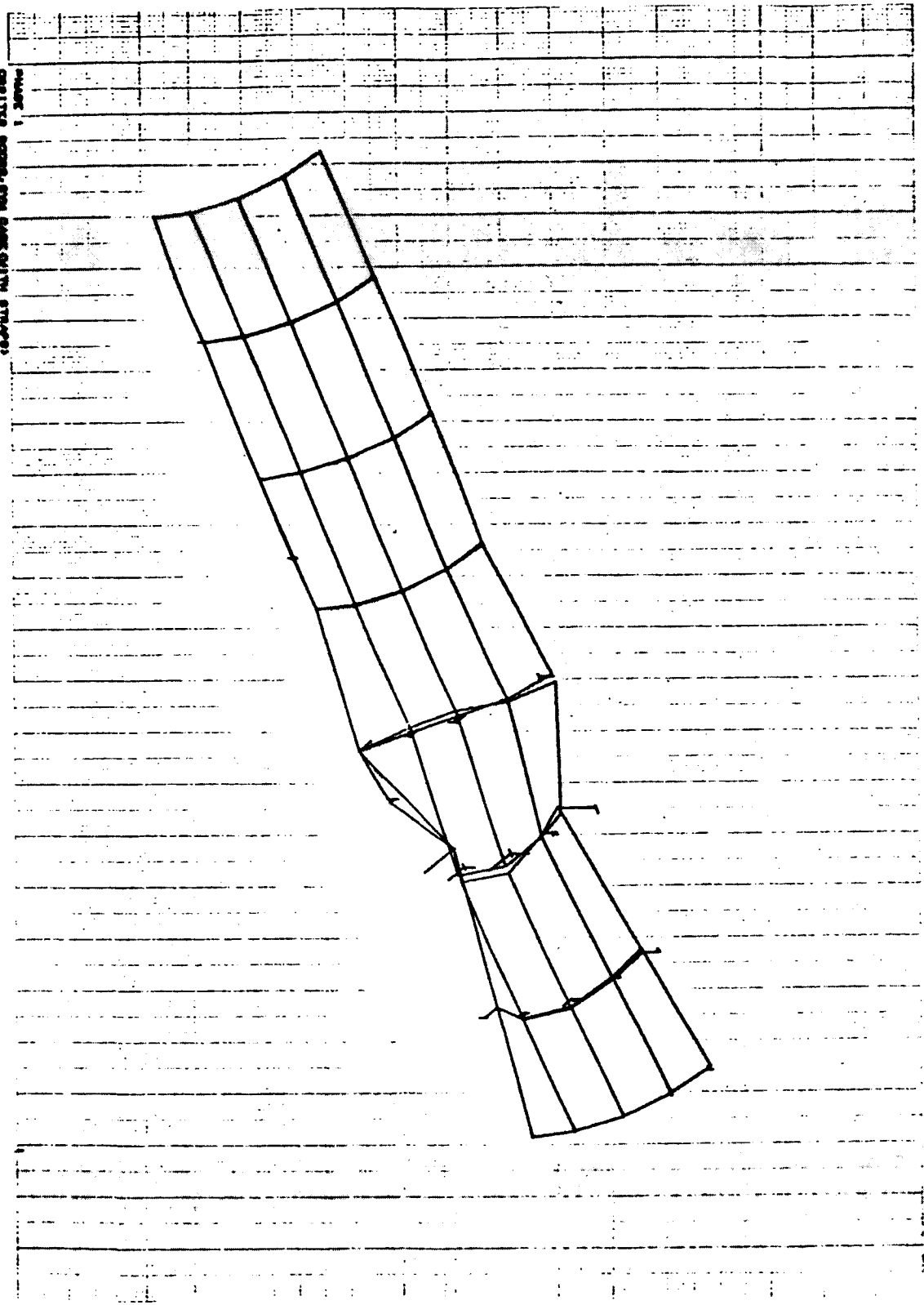


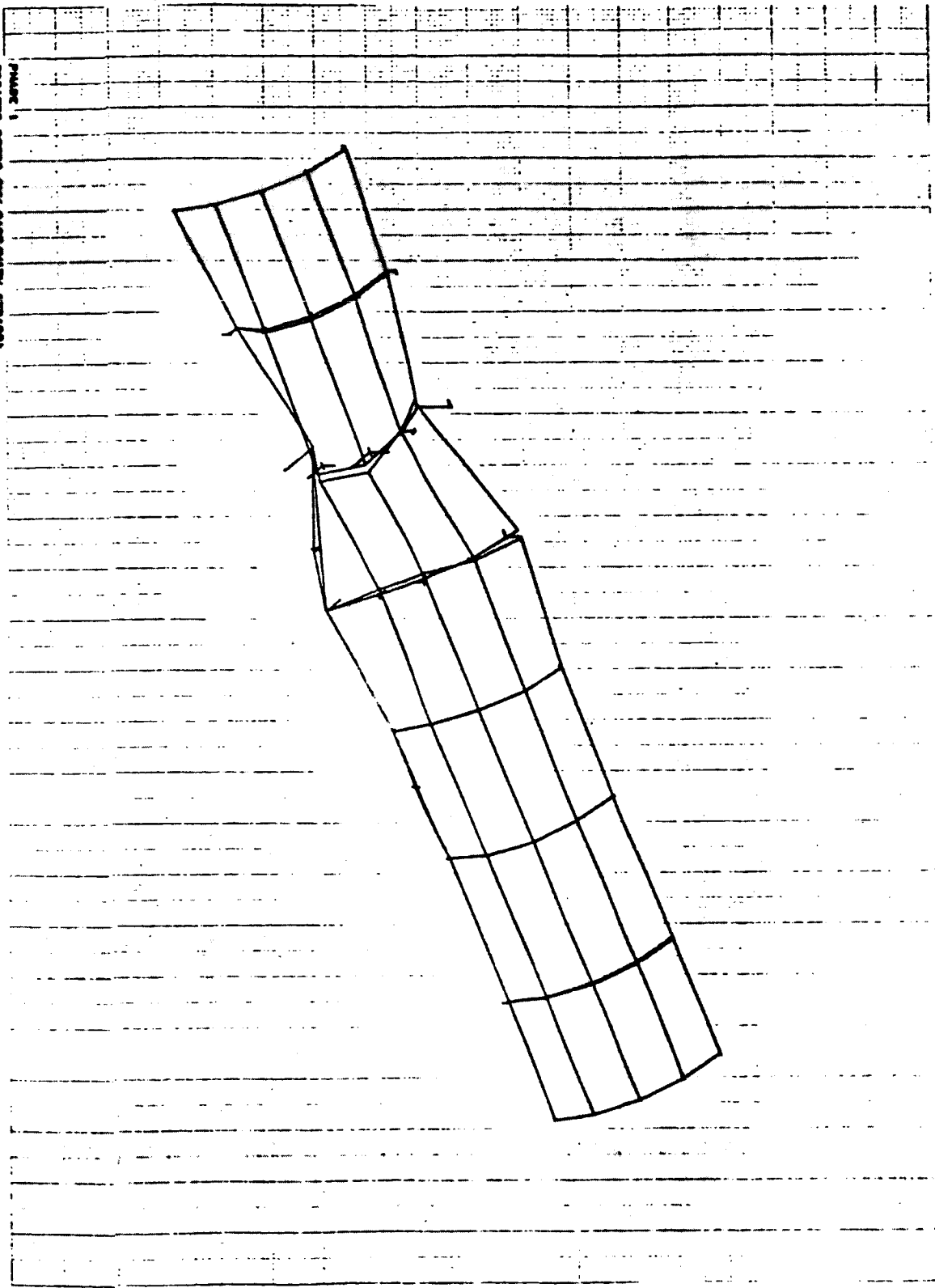
FIGURE 1  
QUALITY INSPECTION SPECIFICATION STRIP  
PNEUMATIC PRESSURE AT INTERFACIAL  
MOULDED SECTION, SPECIFIC TO MODEL 10 PRESS, 948-2048

PHASE 1  
CRITTER SCORING SYSTEM (SEE SECTION 17)  
PREC. MOSES PAGES AT INTERPAGE  
MOVAL. OTCOM. SUBPAGE 14 MOON. 14 PRECA. 441.0830





DRAWING NO. 100-100-100-100  
 THIS DRAWING IS THE PROPERTY OF THE  
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
 AND IS LOANED TO YOU BY THE NATIONAL AERONAUTICS  
 AND SPACE ADMINISTRATION. IT IS TO BE RETURNED TO THE  
 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
 AT THE END OF THE LOAN PERIOD.



PHASE 1  
 ORIGIN 0000,000 000 0000 (STRAP)  
 FINE LINES AT INTERFAC  
 LOCAL ORIGIN. SUBCASE 20 LODE 21 PICO. NO. 0000



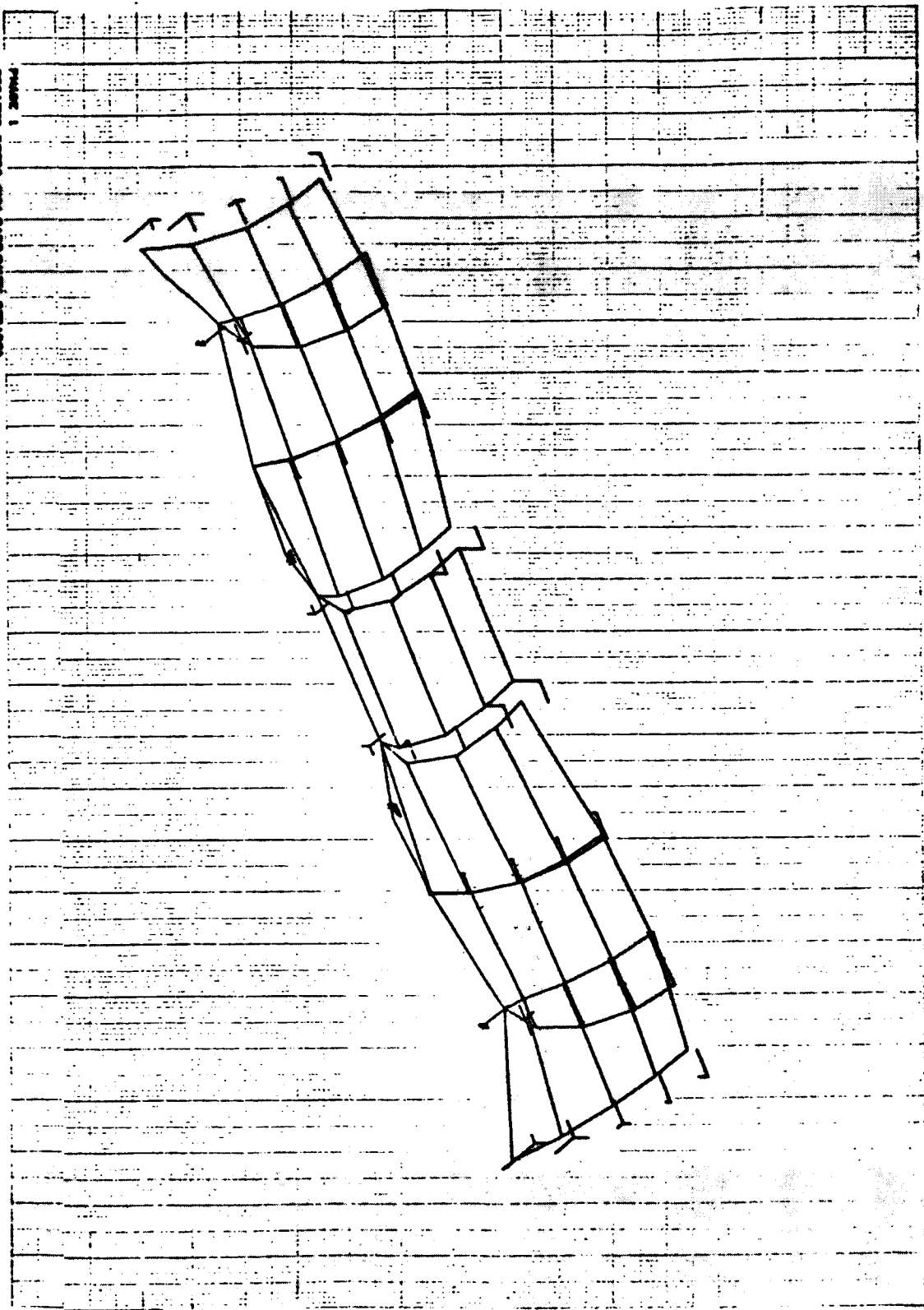
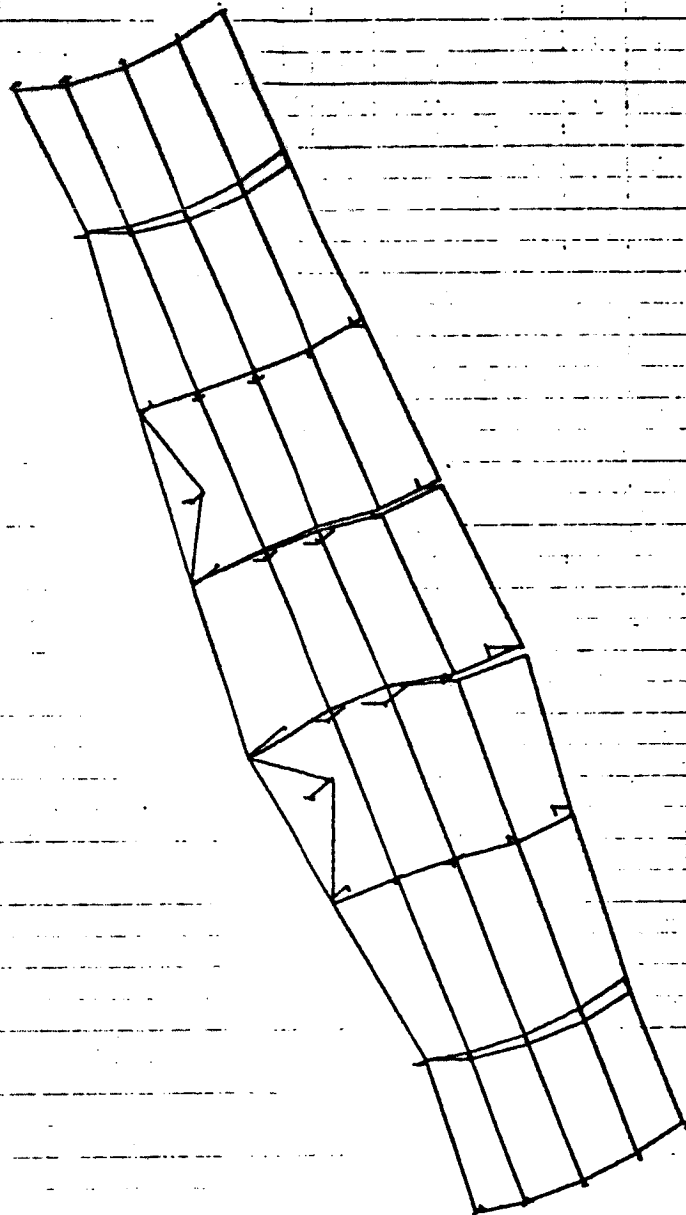
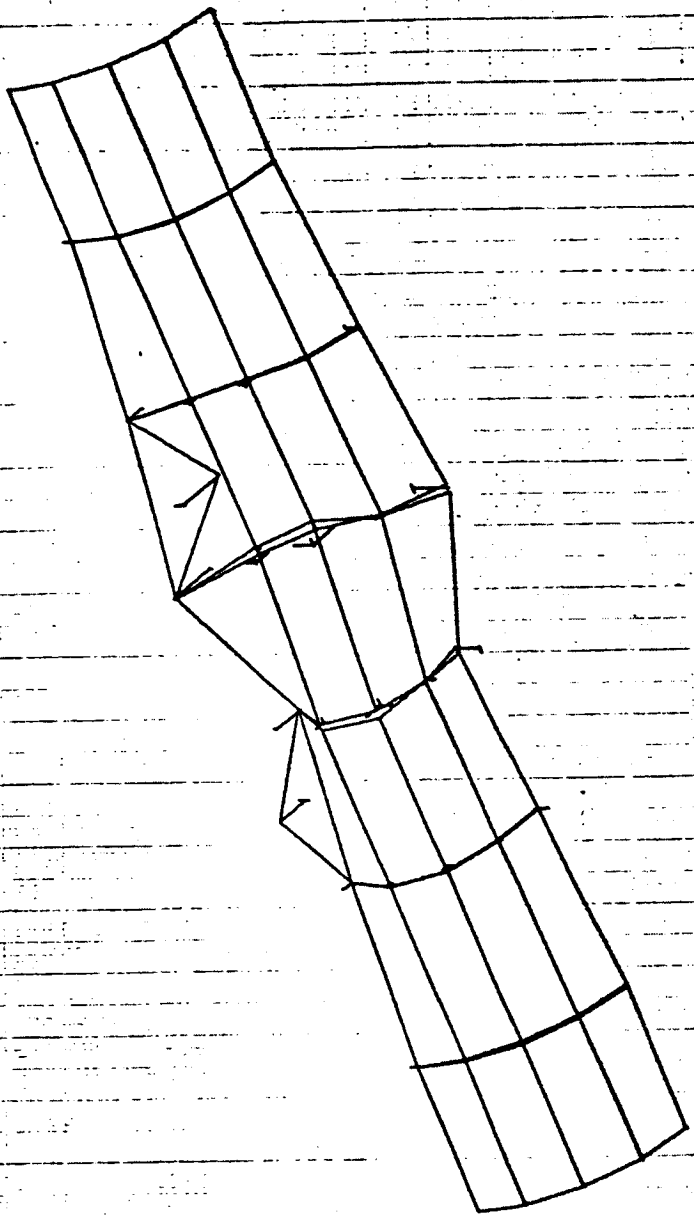


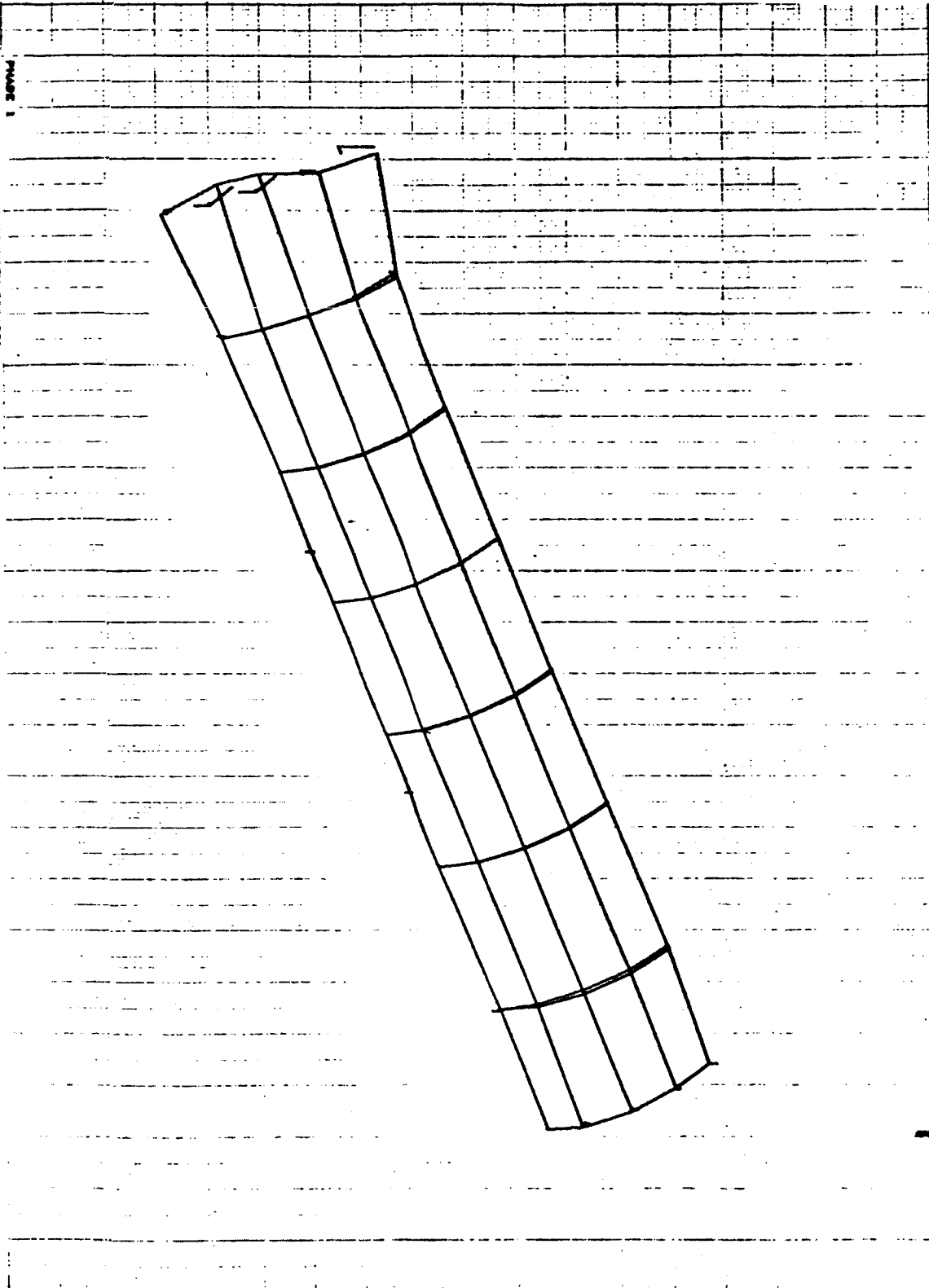
FIGURE 1  
 DRAWING NUMBER: 1-000000  
 DATE: 01/01/00  
 DRAWN BY: J. S. [unreadable]  
 CHECKED BY: [unreadable]

PHASE 1  
DIGITAL SCORING STRIPS (WITH STAPLES)  
FREE LINES PILED AT INTERFAC  
MOUL DETON. SUBCASE 20 MODK 29 PREG. 489.7078

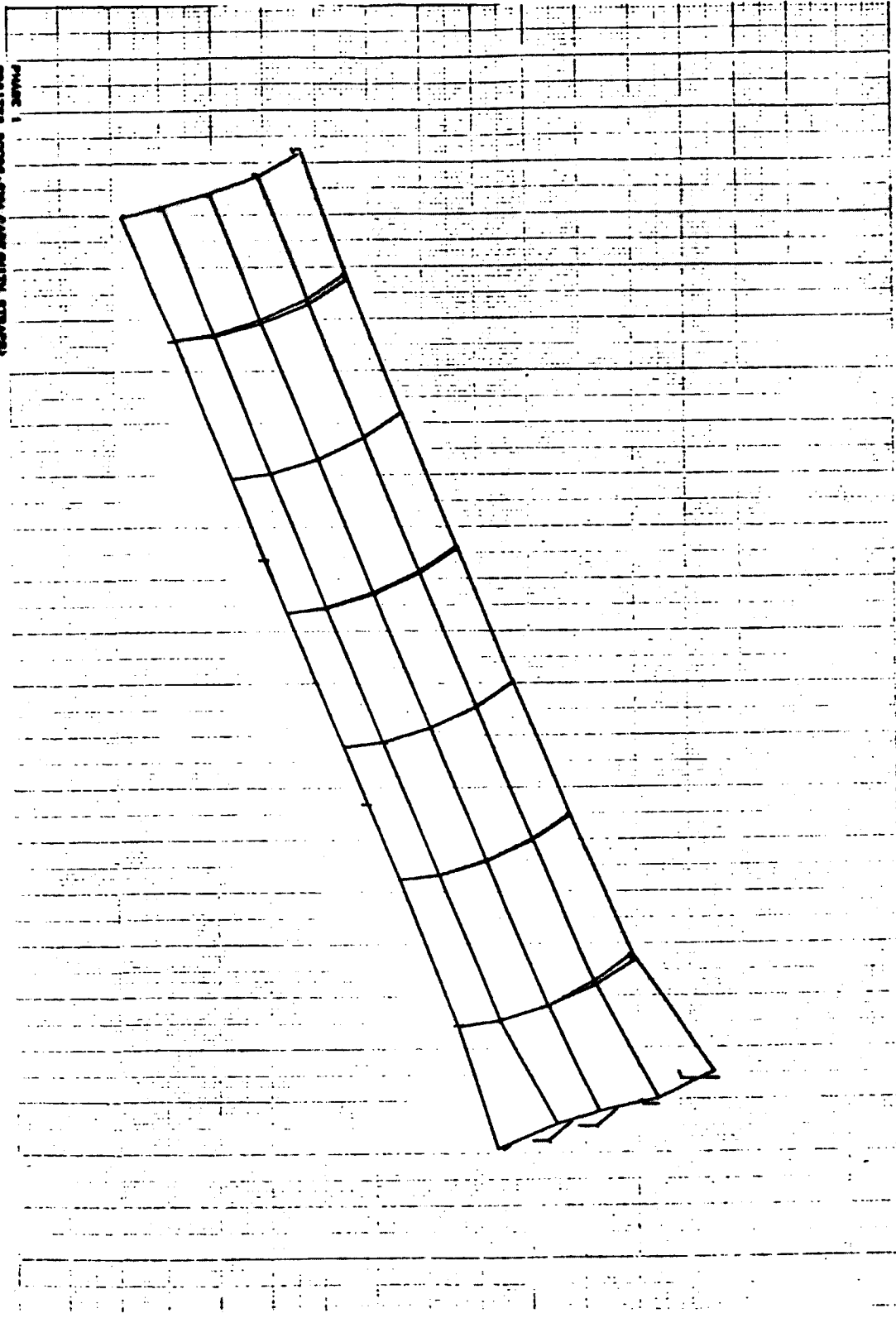


PHASE 1  
ON LITER SCENE, SWM CASE (WITH STRAPS)  
FACE MARKS PLOTTED AT INTERFAC  
LOCAL DEFORM. SURFACE SO MARK 24 FROM 1018.229



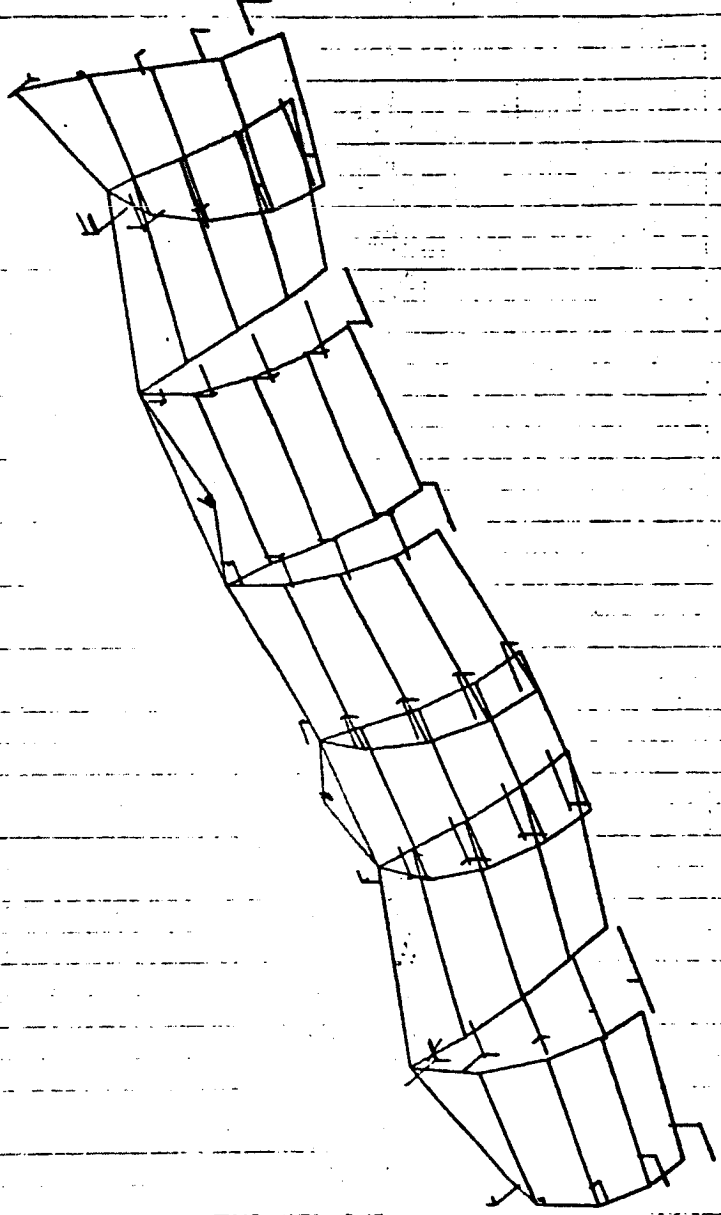


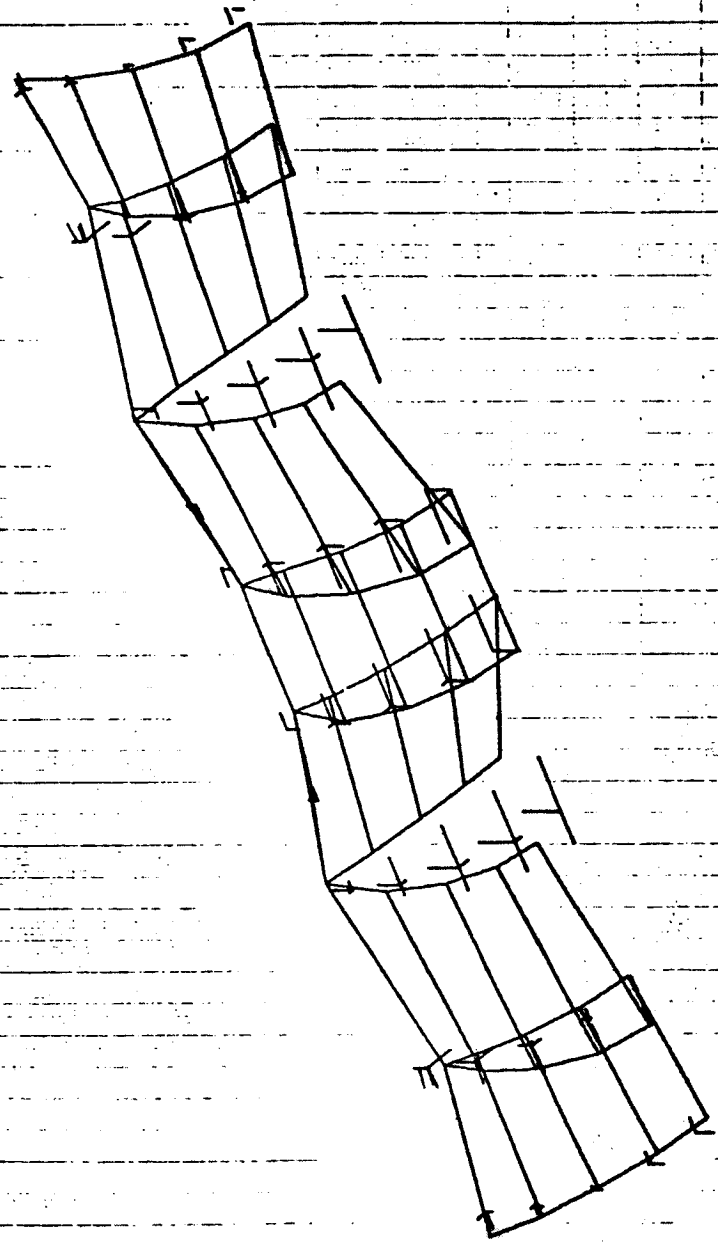
PHASE 1  
ONLITER DOORS, STM CASE (WITH STAYS)  
FREE MODES PIVED AT INTERFACE  
MODL DEFORM, SUBCASE 20 MODC 28 FREQ. 1084.818



PHASE 1  
QUALITY ASSURANCE DATA SHEET  
FREE HOLE PINS AT INTERFACES  
LOCAL SECT. SUBSECT 20 HOLE NO. PHOS. 10071.0071

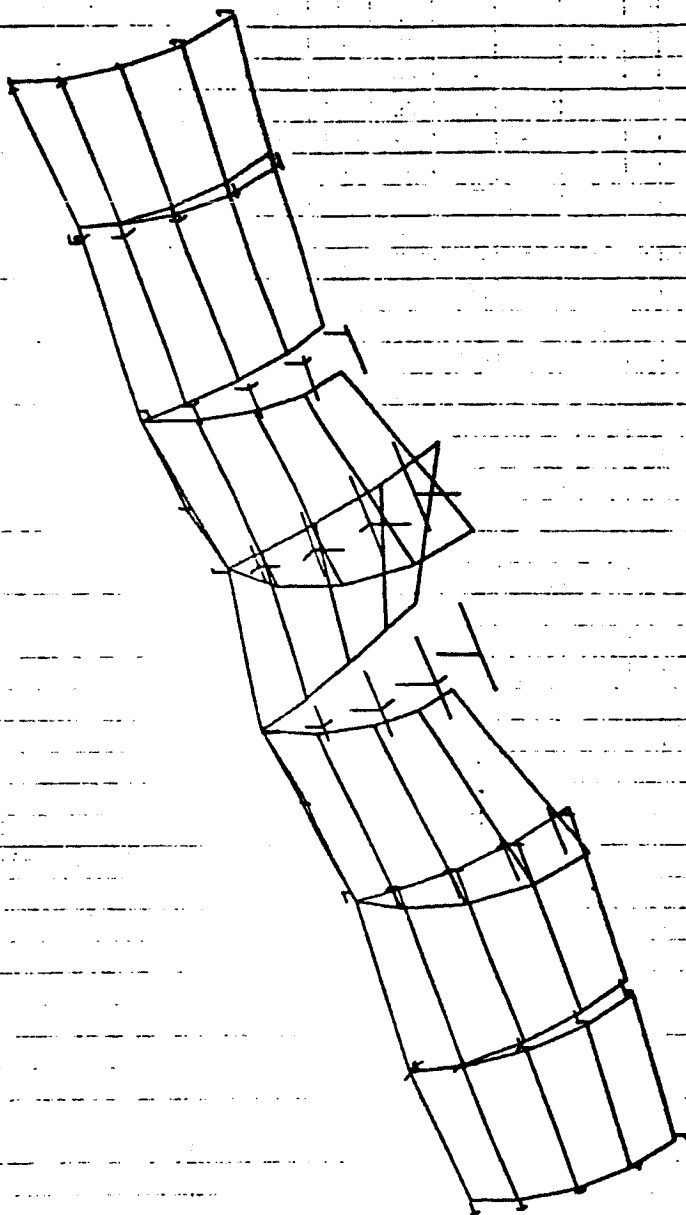
PHASE 1  
ORBITER COVER, STRIP CASE WITH STRIPES  
FREE MODES PILED AT INTERFACE  
LOCAL DEFOM. SURFACE SO MODE 31 FREQ. 1109.499





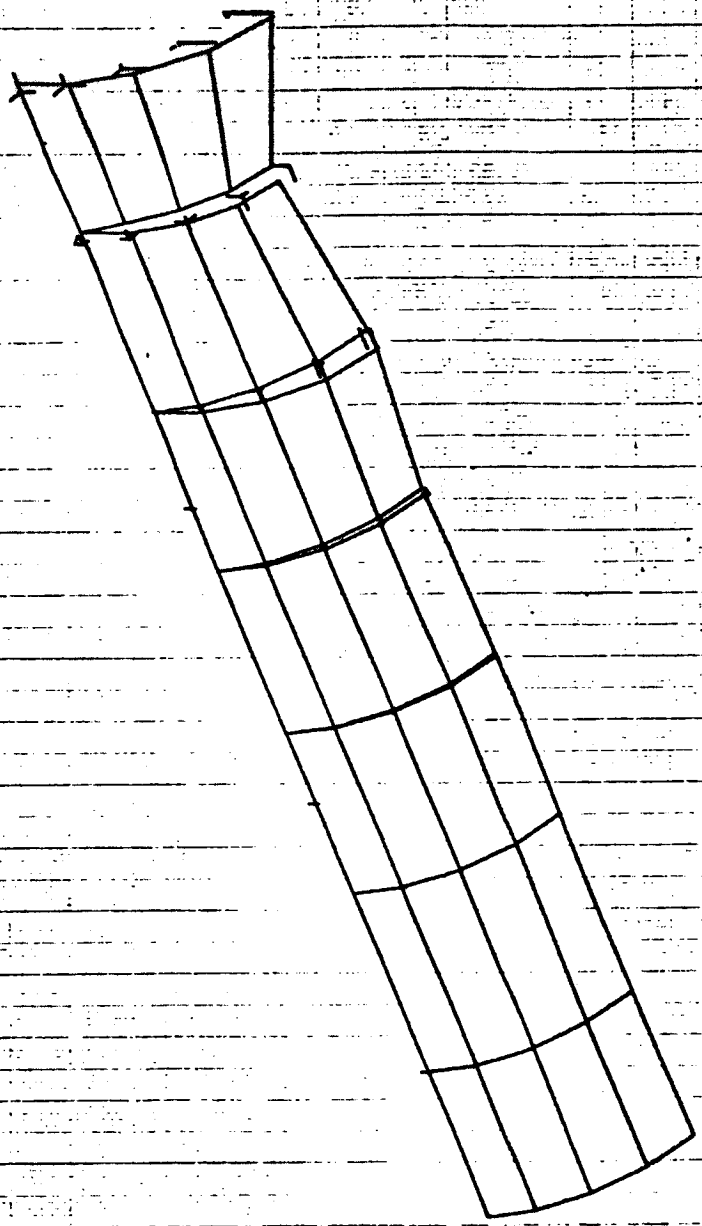
PHASE 1  
ORBITER DECKING, EVA GASE CUTTING STRAPS  
FACE LOCKS FIXED AT INTERFACE  
MOVAL DETON. BURSTAGE NO MOVE IN FREQ. 1979, 004

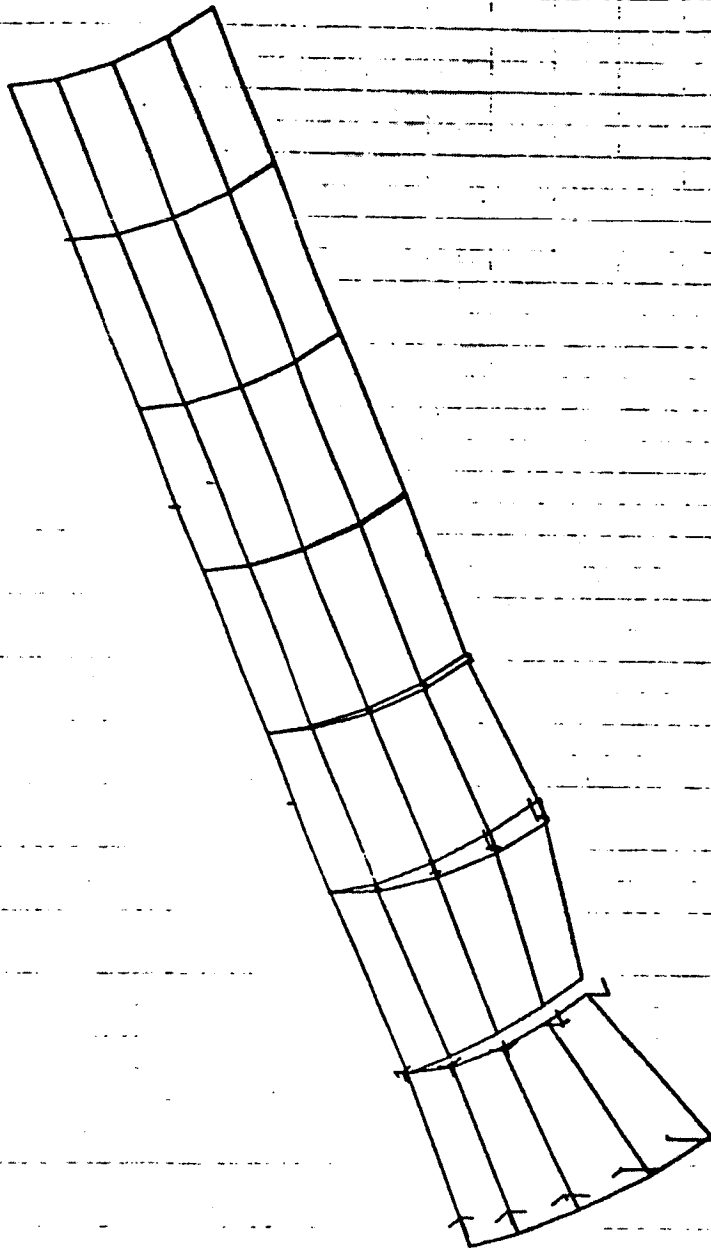
PHASE 1  
ORBITAL OCCURS BYM GARE (WITH STRAPS)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFORM. SUBCASE 20 MONO 29 FREQ. 1818.448



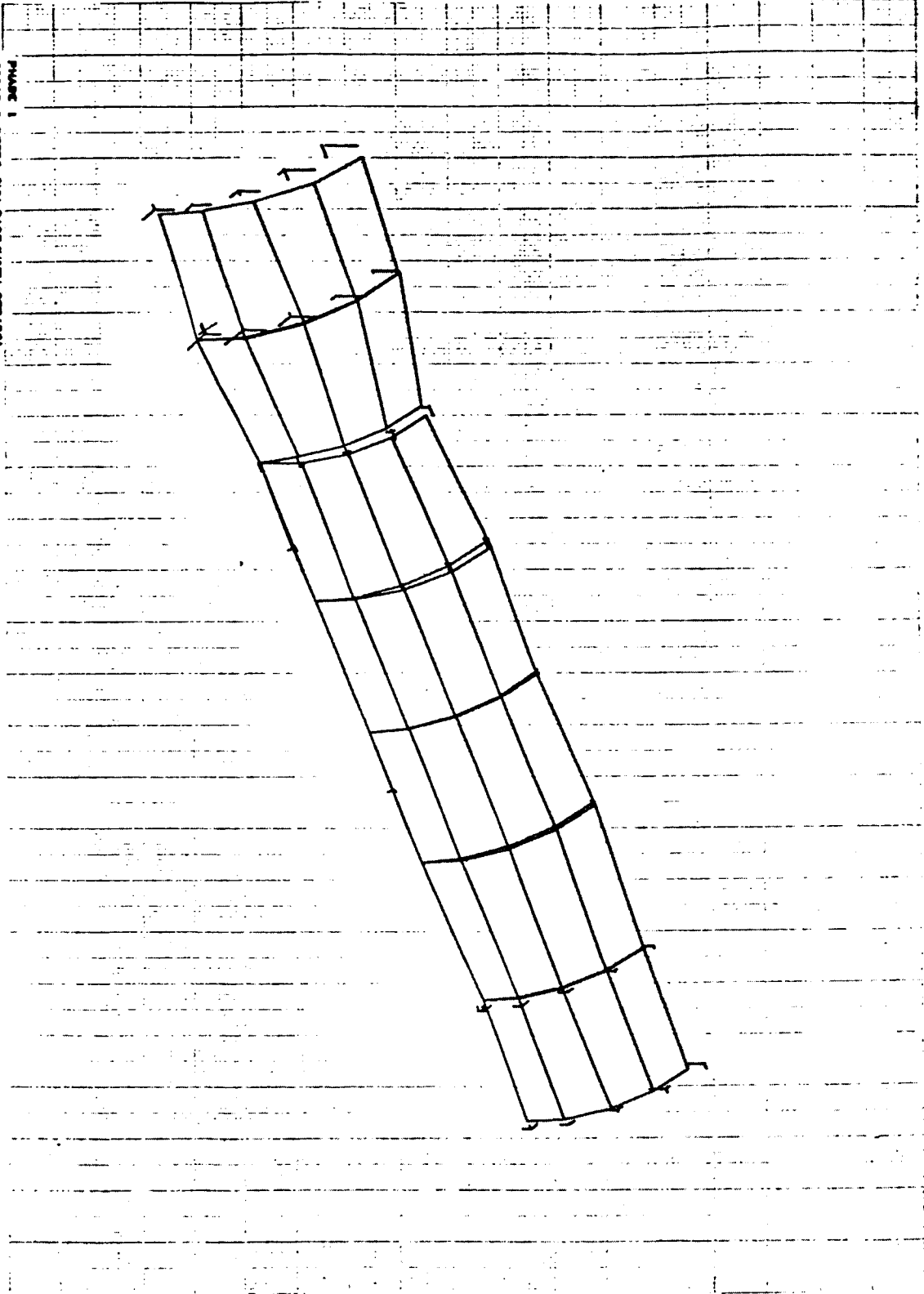


PHASE 1  
DRIVER OPERATOR (SEE DRAWING STRAP)  
FREE MOORE (FIRM AT INTERMEDIATE  
KODAL DETON. SURFACE SO MOORE SO FREE. 1941-000

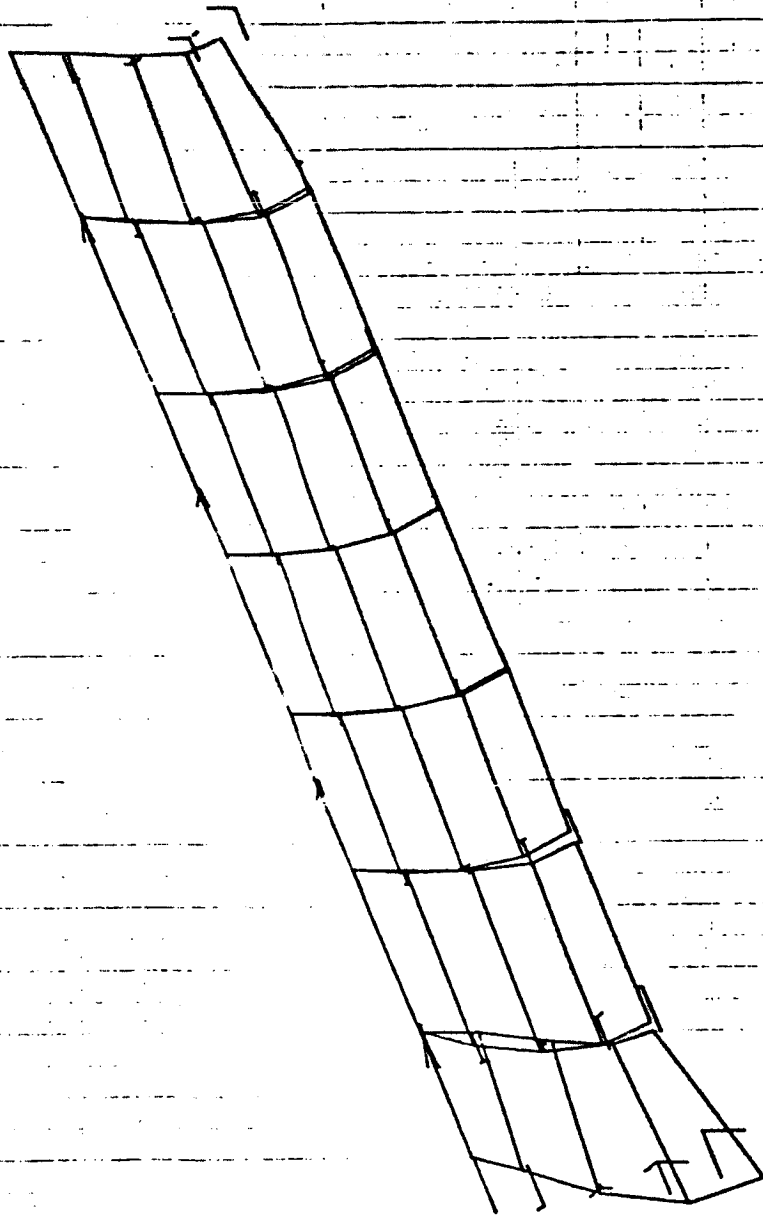




PHASE 1  
QUALITY CONTROL/STW CARE WITH STRAPS  
FREE MOVES FIXED AT INTERFACE  
MODAL ORDER. SURFACE 20 MEDIC 31 (HEU. 1804. 181

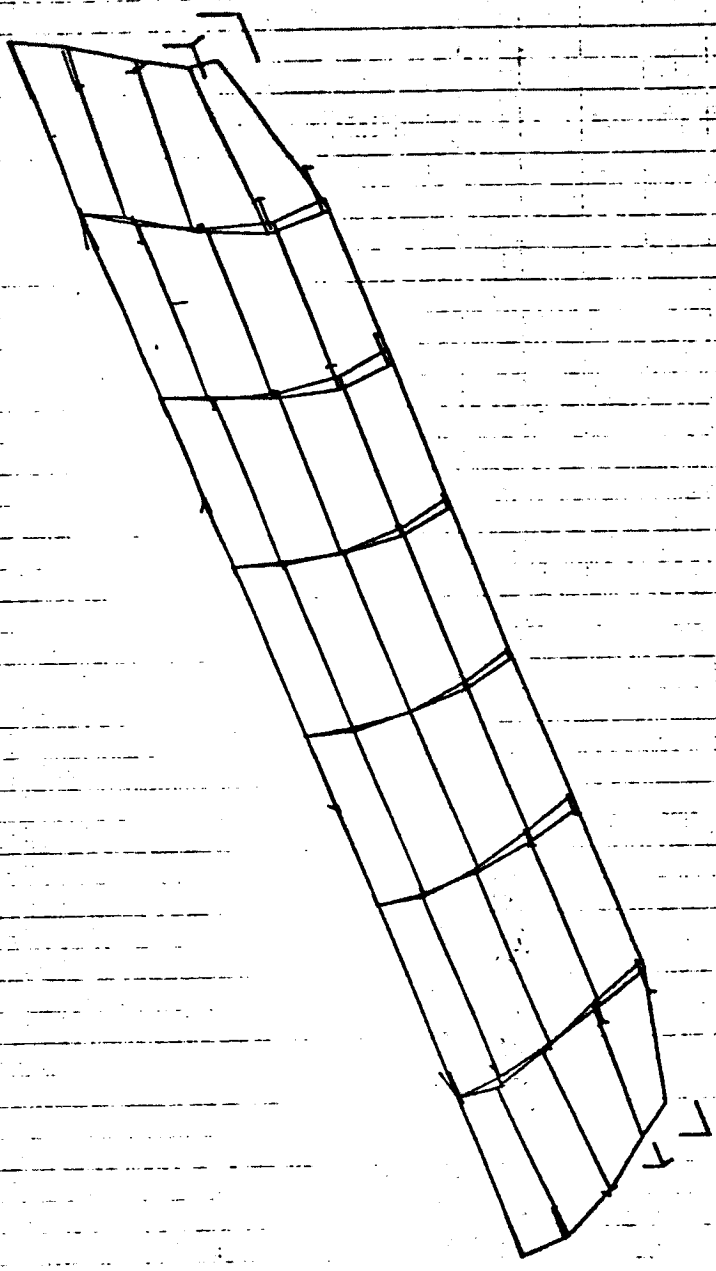


PHASE 1  
ORBITAL SCORING (W/ CASE WITH STRAPS)  
FIRE WORKS FIRED AT INTERFACE  
MOUL. OCTON. SURFACE 20 LOC 32 PRES. 1800.000

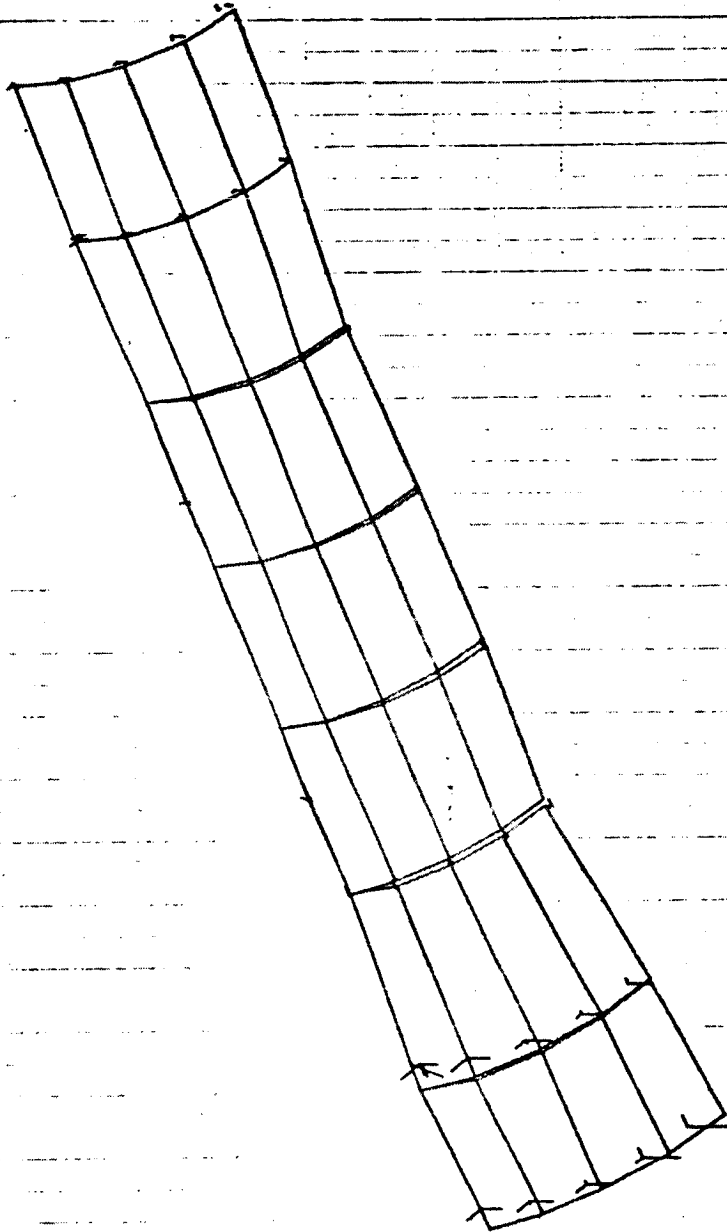


PHASE 1  
DRILLER OPER. SWM SCHEDULE (STRAPS)  
FREE MOVER FIXED AT INTERMEDIATE  
MOUNT. OPER. SUGGESTED TO MOUNT 24 PREG. 2037.848

PHASE 1  
ORBITER SCORING BY SAAC (SIVM STRAPERS)  
FACE MODES FILLED AT INTERFACE  
MEDAL DETON. SUBSCALE 20 MODC 26 FREQ. 2046.414



PHASE 1  
ONLITER DOORS, 67M CASE WITH STRAPS  
FREE MOORS FIXED AT INTERFACE  
MOOL DEFORM. SURFACE 20 MOOL 22 PREQ. 1982.771



**Appendix B9**  
**INPUT BULK DATA/PHASE I ANALYSIS: MODEL II FIN**

C A S E   C O N T R O L   D E C K   E C H O

CARD COUNT	TITLE # PHASE 1
1	SUBTITLE # FIN-SYMM WITH SPRINGS
2	MPC # 4451
3	SPC # 4401
4	METHOD # 1
5	MAXIMUMS # 30000
6	VECTOR # ALL
7	SURFACE # FREE
8	MODS # 20
9	OUTPUT PLOT
10	SET 61 # INCLUDE 4401 THRU 4424
11	SET 62 # INCLUDE 4431 THRU 4452
12	SET 63 # INCLUDE 4461 THRU 4529
13	PLUTER CALCOMP 765*105
14	AXES # MY,X,Z
15	VIEW # 45,20,30,0,0,0
16	MAXIMUM DEFORMATION 2.0
17	FIND SCALING ORIGIN 62,5LT 61
18	PLOT MIDAL DEFORMATION 1 THRU 20,SET 61,ORIGIN 62,SHAPE,VECTOR XYZ
19	REGIN BULK
20	
21	

\*\*\* USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED. XSORT WILL BE ORDER DECK.



CARD COUNT	1	2	3	4	5	6	7	8	9	10
1-	CELAS2 11	3550.	4400	0	0.0	0.0	0.0	0.0	0.0	0.0
2-	CELAS2 12	4400	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-	CELAS2 13	65500.	4465	0	0.0	0.0	0.0	0.0	0.0	0.0
4-	CONM1 4400	35000	4400	0	0.0	0.0	0.0	0.0	0.0	0.0
5-	ECM2 35000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6-	CONRUD 4401	13.725	4411	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7-	CONRUD 4491	4402	4412	4401	0.36	0.19	0.016	0.016	0.016	0.016
8-	CONRUD 4492	4405	4415	4401	0.26	0.19	0.016	0.016	0.016	0.016
9-	CONRUD 4493	4406	4416	4401	0.26	0.19	0.016	0.016	0.016	0.016
10-	CONRUD 4494	4409	4419	4401	0.36	0.19	0.016	0.016	0.016	0.016
11-	CONRUD 4495	4410	4420	4401	0.19	0.37	0.026	0.026	0.026	0.026
12-	CONRUD 4496	4411	4421	4401	0.37	0.23	0.016	0.016	0.016	0.016
13-	CONRUD 4497	4412	4422	4401	0.23	0.27	0.026	0.026	0.026	0.026
14-	CONRUD 4498	4415	4425	4401	0.27	0.27	0.016	0.016	0.016	0.016
15-	CONRUD 4499	4416	4426	4401	0.27	0.27	0.026	0.026	0.026	0.026
16-	CONRUD 4500	4419	4429	4401	0.37	0.23	0.026	0.026	0.026	0.026
17-	CONRUD 4501	4420	4430	4401	0.23	0.40	0.026	0.026	0.026	0.026
18-	CONRUD 4502	4421	4431	4401	0.40	0.27	0.016	0.016	0.016	0.016
19-	CONRUD 4503	4422	4432	4401	0.27	0.32	0.026	0.026	0.026	0.026
20-	CONRUD 4504	4425	4435	4401	0.32	0.32	0.016	0.016	0.016	0.016
21-	CONRUD 4505	4426	4436	4401	0.32	0.32	0.026	0.026	0.026	0.026
22-	CONRUD 4506	4429	4439	4401	0.40	0.27	0.026	0.026	0.026	0.026
23-	CONRUD 4507	4430	4440	4401	0.27	0.42	0.026	0.026	0.026	0.026
24-	CONRUD 4508	4431	4441	4401	0.42	0.32	0.016	0.016	0.016	0.016
25-	CONRUD 4509	4432	4442	4401	0.32	0.32	0.026	0.026	0.026	0.026
26-	CONRUD 4510	4435	4445	4401	0.32	0.32	0.016	0.016	0.016	0.016
27-	CONRUD 4511	4436	4446	4401	0.32	0.32	0.026	0.026	0.026	0.026
28-	CONRUD 4512	4439	4449	4401	0.42	0.32	0.026	0.026	0.026	0.026
29-	CONRUD 4513	4440	4450	4401	0.32	0.44	0.026	0.026	0.026	0.026
30-	CONRUD 4514	4441	4451	4401	0.44	0.37	0.026	0.026	0.026	0.026
31-	CONRUD 4515	4442	4452	4401	0.37	0.40	0.072	0.072	0.072	0.072
32-	CONRUD 4516	4445	4455	4401	0.40	0.37	0.026	0.026	0.026	0.026
33-	CONRUD 4517	4446	4456	4401	0.37	0.44	0.026	0.026	0.026	0.026
34-	CONRUD 4518	4449	4459	4401	0.44	0.37	0.026	0.026	0.026	0.026
35-	CONRUD 4519	4450	4460	4401	0.37	0.44	0.026	0.026	0.026	0.026
36-	CONRUD 4520	4451	4461	4401	0.44	0.37	0.026	0.026	0.026	0.026
37-	CONRUD 4521	4452	4462	4401	0.37	0.44	0.100	0.100	0.100	0.100
38-	CONRUD 4522	4455	4465	4401	0.44	0.40	0.026	0.026	0.026	0.026
39-	CONRUD 4523	4456	4466	4401	0.40	0.40	0.026	0.026	0.026	0.026
40-	CONRUD 4524	4459	4469	4401	0.40	0.40	0.026	0.026	0.026	0.026
41-	CONRUD 4525	4460	4470	4401	0.40	0.40	0.026	0.026	0.026	0.026
42-	CONRUD 4526	4461	4463	4400	0.72	0.72	0.026	0.026	0.026	0.026
43-	CONRUD 4527	4463	4465	4400	0.72	0.72	0.026	0.026	0.026	0.026
44-	CONRUD 4528	4465	4467	4400	0.72	0.72	0.026	0.026	0.026	0.026
45-	CONRUD 4529	4467	4469	4400	0.72	0.72	0.026	0.026	0.026	0.026
46-	CONRUD 4412	0	166.5	0	75.0	181.0	0.0	87.5	87.5	87.5
47-	CONRUD 200.0	0	0.0	0	0.0	166.5	0.0	166.5	166.5	166.5
48-	CONRUD 4413	200.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49-	CONRUD 200.0	0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
50-	CONRUD 4413	200.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CARD	COUNTY	1	2	3	4	5	6	7	8	9	10
51-	CORD2R	4416	0	0	176.1253	0	75.0	183.3422	0	87.5	0
52-	CC4416	200.0	0	0	75.0	0	75.0	186.R	0	87.5	0
53-	CORD2R	4420	0	0	182.3663	0	75.0	186.R	0	87.5	0
54-	CC4420	200.0	0	0	75.0	0	75.0	186.R	0	87.5	0
55-	CORD2R	4401	4401	4403	4401	4403	4413	4411	0.0	0.0	0.0
56-	CORD2R	4402	4402	4405	4401	4405	4415	4413	0.0	0.0	0.0
57-	CORD2R	4403	4403	4407	4401	4407	4417	4415	0.0	0.0	0.0
58-	CORD2R	4404	4404	4411	4401	4411	4421	4419	0.0	0.0	0.0
59-	CORD2R	4405	4405	4413	4401	4413	4423	4421	0.0	0.0	0.0
60-	CORD2R	4406	4406	4415	4401	4415	4425	4423	0.0	0.0	0.0
61-	CORD2R	4407	4407	4417	4401	4417	4427	4425	0.0	0.0	0.0
62-	CORD2R	4408	4408	4419	4401	4419	4429	4427	0.0	0.0	0.0
63-	CORD2R	4409	4409	4421	4401	4421	4431	4429	0.0	0.0	0.0
64-	CORD2R	4410	4410	4423	4401	4423	4433	4431	0.0	0.0	0.0
65-	CORD2R	4411	4411	4425	4401	4425	4435	4433	0.0	0.0	0.0
66-	CORD2R	4412	4412	4427	4401	4427	4437	4435	0.0	0.0	0.0
67-	CORD2R	4413	4413	4429	4401	4429	4439	4437	0.0	0.0	0.0
68-	CORD2R	4414	4414	4431	4401	4431	4441	4439	0.0	0.0	0.0
69-	CORD2R	4415	4415	4433	4401	4433	4443	4441	0.0	0.0	0.0
70-	CORD2R	4416	4416	4435	4401	4435	4445	4443	0.0	0.0	0.0
71-	CORD2R	4417	4417	4437	4401	4437	4447	4445	0.0	0.0	0.0
72-	CORD2R	4418	4418	4439	4401	4439	4449	4447	0.0	0.0	0.0
73-	CORD2R	4419	4419	4441	4401	4441	4451	4449	0.0	0.0	0.0
74-	CORD2R	4420	4420	4443	4401	4443	4453	4451	0.0	0.0	0.0
75-	CORD2R	4421	4421	4445	4401	4445	4455	4453	0.0	0.0	0.0
76-	CORD2R	4422	4422	4447	4401	4447	4457	4455	0.0	0.0	0.0
77-	CORD2R	4423	4423	4449	4401	4449	4459	4457	0.0	0.0	0.0
78-	CORD2R	4424	4424	4451	4401	4451	4461	4459	0.0	0.0	0.0
79-	CORD2R	4425	4425	4453	4401	4453	4463	4461	0.0	0.0	0.0
80-	CORD2R	4426	4426	4455	4401	4455	4465	4463	0.0	0.0	0.0
81-	CORD2R	4427	4427	4457	4401	4457	4467	4465	0.0	0.0	0.0
82-	CORD2R	4428	4428	4459	4401	4459	4469	4467	0.0	0.0	0.0
83-	CORD2R	4429	4429	4461	4401	4461	4471	4469	0.0	0.0	0.0
84-	CORD2R	4430	4430	4463	4401	4463	4473	4471	0.0	0.0	0.0
85-	CORD2R	4431	4431	4465	4401	4465	4475	4473	0.0	0.0	0.0
86-	CORD2R	4432	4432	4467	4401	4467	4477	4475	0.0	0.0	0.0
87-	CORD2R	4433	4433	4469	4401	4469	4479	4477	0.0	0.0	0.0
88-	CORD2R	4434	4434	4471	4401	4471	4481	4479	0.0	0.0	0.0
89-	CORD2R	4435	4435	4473	4401	4473	4483	4481	0.0	0.0	0.0
90-	CORD2R	4436	4436	4475	4401	4475	4485	4483	0.0	0.0	0.0
91-	CORD2R	4437	4437	4477	4401	4477	4487	4485	0.0	0.0	0.0
92-	CORD2R	4438	4438	4479	4401	4479	4489	4487	0.0	0.0	0.0
93-	CORD2R	4439	4439	4481	4401	4481	4491	4489	0.0	0.0	0.0
94-	CORD2R	4440	4440	4483	4401	4483	4493	4491	0.0	0.0	0.0
95-	CORD2R	4441	4441	4485	4401	4485	4495	4493	0.0	0.0	0.0
96-	CORD2R	4442	4442	4487	4401	4487	4497	4495	0.0	0.0	0.0
97-	CORD2R	4443	4443	4489	4401	4489	4499	4497	0.0	0.0	0.0
98-	CORD2R	4444	4444	4491	4401	4491	4501	4499	0.0	0.0	0.0
99-	CORD2R	4445	4445	4493	4401	4493	4503	4501	0.0	0.0	0.0
100-	CORD2R	4446	4446	4495	4401	4495	4505	4503	0.0	0.0	0.0

CARD COUNT	1	2	3	4	5	6	7	8	9	10
101	CRDD	4487	4487	4461	4462					
102	CRDD	4488	4487	4465	4466					
103	CRDD	4489	4487	4469	4470					
104	CSHAR	4431	4431	4401	4401	4404	4403			
105	CSHAR	4432	4431	4403	4404	4406	4405			
106	CSHAR	4433	4431	4405	4406	4408	4407			
107	CSHAR	4434	4431	4407	4408	4410	4409			
108	CSHAR	4435	4435	4401	4402	4412	4411			
109	CSHAR	4436	4435	4411	4412	4422	4421			
110	CSHAR	4437	4435	4421	4422	4432	4431			
111	CSHAR	4438	4435	4431	4432	4442	4441			
112	CSHAR	4439	4435	4441	4442	4452	4451			
113	CSHAR	4440	4435	4451	4452	4462	4461			
114	CSHAR	4441	4435	4461	4462	4472	4471			
115	CSHAR	4442	4435	4471	4472	4482	4481			
116	CSHAR	4443	4435	4481	4482	4492	4491			
117	CSHAR	4444	4435	4491	4492	4502	4501			
118	CSHAR	4445	4435	4499	4500	4510	4509			
119	CSHAR	4446	4435	4509	4510	4520	4519			
120	CSHAR	4447	4435	4519	4520	4530	4529			
121	CSHAR	4448	4435	4529	4530	4540	4539			
122	CSHAR	4449	4435	4539	4540	4550	4549			
123	CSHAR	4450	4435	4549	4550	4560	4559			
124	CSHAR	4451	4435	4559	4560	4570	4569			
125	CSHAR	4452	4435	4569	4570	4580	4579			
126	FLGR	1	INV	1.0	4000.	30				
127	FLGR	MAX								
128	GRID	4400	0	174.1	0	88.5	0			456
129	GRID	4401	0	181.0	-0.84	87.5	0			456
130	GRID	4402	0	181.0	0	87.5	0			456
131	GRID	4403	0	182.1711	-0.64	87.5	0			456
132	GRID	4404	0	182.1711	0	87.5	0			456
133	GRID	4405	0	183.3422	-0.84	87.5	0			456
134	GRID	4406	0	183.3422	0	87.5	0			456
135	GRID	4407	0	185.0711	-0.84	87.5	0			456
136	GRID	4408	0	185.0711	0	87.5	0			456
137	GRID	4409	0	186.8	-0.84	87.5	0			456
138	GRID	4410	0	186.8	0	87.5	0			456
139	GRID	4411	0	179.26	-0.9792	86.0	0			456
140	GRID	4412	0	179.26	0	86.0	0			456
141	GRID	4413	0	180.8001	-0.9792	86.0	0			456
142	GRID	4415	0	182.4762	-0.9792	86.0	0			456
143	GRID	4416	0	182.4762	0	86.0	0			456
144	GRID	4417	0	184.3721	-0.9792	86.0	0			456
145	GRID	4419	0	186.268	-0.9792	86.0	0			456
146	GRID	4420	0	186.268	0	86.0	0			456
147	GRID	4421	0	176.94	-1.1648	84.0	0			456
148	GRID	4422	0	176.94	0	84.0	0			456
149	GRID	4423	0	178.9732	-1.1648	84.0	0			456
150	GRID	4425	0	181.3215	-1.1648	84.0	0			456

CARD COUNT	1	2	3	4	5	6	7	8	9	10
151-	GRID	4426	0	IR1.3215.0	84.0	0	AA16	456		
152-	GRID	4427	0	IR3.4400-1.1644	84.0	0	AA13	456		
153-	GRID	4429	0	IR5.5586-1.1644	84.0	0	AA20	456		
154-	GRID	4430	0	IR5.5586.0	84.0	0	AA20	456		
155-	GRID	4431	0	IR4.04	81.5	0	AA12	456		
156-	GRID	4432	0	IR6.669	81.5	0	AA13	456		
157-	GRID	4433	0	IR9.6761-1.3968	81.5	0	AA16	456		
158-	GRID	4435	0	IR9.6761.0	81.5	0	AA13	456		
159-	GRID	4436	0	IR2.275	81.5	0	AA16	456		
160-	GRID	4437	0	IR4.0714-1.3968	81.5	0	AA13	456		
161-	GRID	4439	0	IR4.0714.0	81.5	0	AA20	456		
162-	GRID	4440	0	IR1.14	79.0	0	AA12	456		
163-	GRID	4441	0	IR1.14	79.0	0	AA12	456		
164-	GRID	4442	0	IR4.4044-1.6268	79.0	0	AA13	456		
165-	GRID	4443	0	IR4.4044.0	79.0	0	AA16	456		
166-	GRID	4445	0	IR6.4347-1.6268	79.0	0	AA16	456		
167-	GRID	4446	0	IR6.4347.0	79.0	0	AA13	456		
168-	GRID	4447	0	IR1.1049-1.6268	79.0	0	AA20	456		
169-	GRID	4449	0	IR3.7851-1.6268	79.0	0	AA20	456		
170-	GRID	4450	0	IR3.7851.0	79.0	0	AA20	456		
171-	GRID	4451	0	IR6.62	77.0	0	AA12	456		
172-	GRID	4452	0	IR2.5774-1.8144	77.0	0	AA13	456		
173-	GRID	4453	0	IR2.5774.0	77.0	0	AA16	456		
174-	GRID	4455	0	IR7.24	77.0	0	AA13	456		
175-	GRID	4456	0	IR7.24	77.0	0	AA16	456		
176-	GRID	4457	0	IR0.1774-1.8144	77.0	0	AA13	456		
177-	GRID	4459	0	IR3.0757-1.8144	77.0	0	AA20	456		
178-	GRID	4460	0	IR3.0757.0	77.0	0	AA20	456		
179-	GRID	4461	0	IR6.5	75.0	0	AA12	456		
180-	GRID	4462	0	IR6.5	75.0	0	AA13	456		
181-	GRID	4463	0	IR0.75	75.0	0	AA16	456		
182-	GRID	4465	0	IR6.1253-2.0	75.0	0	AA13	456		
183-	GRID	4466	0	IR6.1253.0	75.0	0	AA13	456		
184-	GRID	4467	0	IR9.2458-2.0	75.0	0	AA16	456		
185-	GRID	4469	0	IR2.3663-2.0	75.0	0	AA20	456		
186-	GRID	4470	0	IR2.3663.0	75.0	0	AA20	456		
187-	GRID	4471	0	IR6.5	75.0	0	AA20	456		
188-	GRID	4472	0	IR6.5	75.0	0	AA20	12456		
189-	GRID	4473	0	IR6.1253-2.0	75.0	0	AA20	12456		
190-	GRID	4400	10.566	IR2.3663-2.0	75.0	0	AA20	12456		
191-	MAT1	4401	10.566	IR2.3663-2.0	75.0	0	AA20	12456		
192-	MAT1	4401	10.566	IR2.3663-2.0	75.0	0	AA20	12456		
193-	MPC	4449	4412	3	1.0	4411	1	-652940	EMCA412A	
194-	MPC	4449	4416	3	1.0	4415	1	-666025	EMCA416A	
195-	MPC	4449	4415	3	1.0	4415	1	-666025	EMCA416A	
196-	MPC	4449	4420	3	1.0	4419	1	-642470	EMCA420A	
197-	MPC	4449	4419	3	1.0	4419	1	-642470	EMCA420A	
198-	MPC	4449	4422	3	1.0	4421	1	-652940	EMCA422A	
199-	MPC	4449	4421	3	1.0	4421	1	-652940	EMCA422A	
200-	MPC	4449	4426	3	1.0	4425	1	-666025	EMCA426A	

CARD COUNT	1	2	3	4	5	6	7	8	9	10
201-	EMCA426A	4425	4425	3	.50	4429	1	-.942470		EMCA430A
202-	MPC	4430	4420	1	1.0	4429	1	-.942470		EMCA432A
203-	EMCA430A	4449	4432	3	.33424	4431	1	-.652040		EMCA436A
204-	MPC	4449	4431	3	1.0	4435	1	-.666025		EMCA440A
205-	EMCA432A	4449	4436	1	1.0	4435	1	-.666025		EMCA442A
206-	MPC	4449	4435	3	.50	4439	1	-.942470		EMCA446A
207-	EMCA436A	4449	4440	1	1.0	4439	1	-.942470		EMCA450A
208-	MPC	4449	4434	3	.33424	4441	1	-.652040		EMCA452A
209-	EMCA440A	4449	4442	1	1.0	4441	1	-.652040		EMCA456A
210-	MPC	4449	4441	3	1.0	4445	1	-.866025		EMCA460A
211-	EMCA442A	4449	4446	1	1.0	4445	1	-.866025		EMCA462A
212-	MPC	4449	4446	3	.50	4449	1	-.942470		EMCA466A
213-	EMCA446A	4449	4447	1	1.0	4449	1	-.942470		EMCA470A
214-	MPC	4449	4440	3	.33424	4451	1	-.652040		EMCA401X
215-	EMCA450A	4449	4449	1	1.0	4451	1	-.652040		EMCA401Y
216-	MPC	4449	4452	3	1.0	4451	1	-.652040		EMCA401Z
217-	EMCA452A	4449	4451	1	1.0	4455	1	-.866025		EMCA402X
218-	MPC	4449	4446	3	.50	4455	1	-.866025		EMCA402Y
219-	EMCA456A	4449	4455	1	1.0	4459	1	-.866025		EMCA402Z
220-	MPC	4449	4460	3	.33424	4461	1	-.866025		EMCA403X
221-	EMCA460A	4449	4459	1	1.0	4461	1	-.866025		EMCA403Y
222-	MPC	4449	4462	3	1.0	4461	1	-.866025		EMCA403Z
223-	EMCA462A	4449	4461	1	1.0	4465	1	-.866025		EMCA404X
224-	MPC	4449	4466	3	.50	4465	1	-.866025		EMCA404Y
225-	EMCA466A	4449	4465	1	1.0	4465	1	-.866025		EMCA404Z
226-	MPC	4449	4470	3	1.0	4469	1	-.866025		
227-	EMCA470A	4449	4469	1	1.0	4469	1	-.866025		
228-	MPC	4450	4461	1	1.0	4400	1	-1.0		
229-	EMCA401X	4450	4400	1	1.0	4400	1	-0.84		
230-	MPC	4450	4401	5	1.0	4400	2	-1.0		
231-	EMCA401Y	4450	4401	2	1.0	4400	2	-1.0		
232-	MPC	4450	4400	4	1.0	4400	3	-1.0		
233-	EMCA401Z	4450	4401	3	1.0	4400	3	-1.0		
234-	MPC	4450	4402	4	.84	4400	5	-3.1		
235-	EMCA402X	4450	4400	1	1.0	4400	1	-1.0		
236-	MPC	4450	4400	5	1.0	4400	6	0.0		
237-	EMCA402Y	4450	4402	2	1.0	4400	2	-1.0		
238-	MPC	4450	4400	4	1.0	4400	6	-1.0		
239-	EMCA402Z	4450	4402	3	1.0	4400	3	-1.0		
240-	MPC	4450	4400	4	1.0	4400	5	-3.1		
241-	EMCA403X	4450	4403	1	1.0	4400	1	-1.0		
242-	MPC	4450	4403	5	1.0	4400	6	-0.84		
243-	EMCA403Y	4450	4403	2	1.0	4400	2	-1.0		
244-	MPC	4450	4403	4	1.0	4400	6	1.9289		
245-	EMCA403Z	4450	4403	3	1.0	4400	3	-1.0		
246-	MPC	4450	4400	4	.84	4400	5	-1.0		
247-	EMCA404X	4450	4400	1	1.0	4400	1	-1.0		
248-	MPC	4450	4400	5	1.0	4400	6	0.0		
249-	EMCA404Y	4450	4403	2	1.0	4400	2	-1.0		
250-	MPC	4450	4400	4	1.0	4400	6	1.9289		
251-	EMCA404Z	4450	4403	3	1.0	4400	3	-1.0		

CARD COUNT	1	2	3	4	5	6	7	8	9	10
251-	EMCA4047	4400	4400	1.0	.00	4400	5	-1.0289		EMCA405X
252-	MPC	4405	4405	5	1.0	4400	6	-0.8FA		EMCA405Y
253-	EMCA405X	4450	4405	2	1.0	4400	6	0.7478		EMCA405Z
254-	MPC	4450	4405	4	-1.0	4400	3	-1.0		EMCA406X
255-	EMCA405Y	4450	4405	3	1.0	4400	5	-0.7578		EMCA406Y
256-	MPC	4450	4405	4	.84	4400	6	0.0		EMCA406Z
257-	EMCA405Z	4450	4406	1	1.0	4400	2	-1.0		EMCA407X
258-	MPC	4450	4406	5	1.0	4400	6	-0.7478		EMCA407Y
259-	EMCA406X	4450	4406	2	1.0	4400	3	-1.0		EMCA407Z
260-	MPC	4450	4406	4	-1.0	4400	5	0.4711		EMCA408X
261-	EMCA406Y	4450	4406	3	1.0	4400	6	0.0		EMCA408Y
262-	MPC	4450	4406	4	1.0	4400	2	-0.7578		EMCA408Z
263-	EMCA406Z	4450	4407	1	1.0	4400	6	-0.8FA		EMCA409X
264-	MPC	4450	4407	5	1.0	4400	3	-1.0		EMCA409Y
265-	EMCA407X	4450	4407	2	1.0	4400	5	0.4711		EMCA409Z
266-	MPC	4450	4407	4	-1.0	4400	6	-1.0		EMCA410X
267-	EMCA407Y	4450	4407	3	1.0	4400	2	2.7		EMCA410Y
268-	MPC	4450	4407	4	1.0	4400	6	0.0		EMCA410Z
269-	EMCA407Z	4450	4407	1	1.0	4400	5	-1.0		EMCA413A
270-	MPC	4450	4407	5	.84	4400	6	-0.84		EMCA413B
271-	EMCA408X	4450	4408	2	1.0	4400	2	-2.7000		EMCA417A
272-	MPC	4450	4408	4	1.0	4400	6	-1.0		EMCA417B
273-	EMCA408Y	4450	4408	3	1.0	4400	5	2.7		EMCA423A
274-	MPC	4450	4408	4	1.0	4400	6	-1.0		EMCA423B
275-	EMCA408Z	4450	4408	1	1.0	4400	2	-2.7000		EMCA427A
276-	MPC	4450	4409	2	1.0	4400	6	-1.0		EMCA427B
277-	EMCA409X	4450	4409	4	1.0	4400	5	2.7		EMCA427C
278-	MPC	4450	4409	5	.84	4400	6	-1.0		EMCA427D
279-	EMCA409Y	4450	4410	1	1.0	4400	2	-3.17546		EMCA427E
280-	MPC	4450	4410	3	1.0	4400	6	0.0		EMCA427F
281-	EMCA409Z	4450	4410	4	1.0	4400	5	2.7		EMCA427G
282-	MPC	4450	4410	5	1.0	4400	6	-1.0		EMCA427H
283-	EMCA410X	4450	4411	2	1.0	4400	2	-4.07861		EMCA427I
284-	MPC	4450	4411	3	1.0	4400	6	-2.7000		EMCA427J
285-	EMCA410Y	4450	4411	4	1.0	4400	5	2.7		EMCA427K
286-	MPC	4450	4411	5	.84	4400	6	-1.0		EMCA427L
287-	EMCA410Z	4450	4412	2	1.0	4400	2	-4.07861		EMCA427M
288-	MPC	4450	4412	3	1.0	4400	6	-2.7000		EMCA427N
289-	EMCA413A	4450	4413	4	1.0	4400	5	2.7		EMCA427O
290-	MPC	4450	4413	5	.84	4400	6	-1.0		EMCA427P
291-	EMCA413B	4450	4415	2	1.0	4400	2	-4.07861		EMCA427Q
292-	MPC	4450	4415	3	1.0	4400	6	-2.7000		EMCA427R
293-	EMCA417A	4450	4415	4	1.0	4400	5	2.7		EMCA427S
294-	MPC	4450	4415	5	.84	4400	6	-1.0		EMCA427T
295-	EMCA417B	4450	4417	2	1.0	4400	2	-4.07861		EMCA427U
296-	MPC	4450	4417	3	1.0	4400	6	-2.7000		EMCA427V
297-	EMCA423A	4450	4421	4	1.0	4400	5	2.7		EMCA427W
298-	MPC	4450	4421	5	.84	4400	6	-1.0		EMCA427X
299-	EMCA423B	4450	4425	2	1.0	4400	2	-4.07861		EMCA427Y
300-	MPC	4450	4425	3	1.0	4400	6	-2.7000		EMCA427Z
301-	EMCA427A	4450	4425	4	1.0	4400	5	2.7		EMCA427AA
302-	MPC	4450	4425	5	.84	4400	6	-1.0		EMCA427AB
303-	EMCA427B	4450	4426	2	1.0	4400	2	-4.07861		EMCA427AC
304-	MPC	4450	4426	3	1.0	4400	6	-2.7000		EMCA427AD
305-	EMCA427C	4450	4426	4	1.0	4400	5	2.7		EMCA427AE
306-	MPC	4450	4426	5	.84	4400	6	-1.0		EMCA427AF
307-	EMCA427D	4450	4433	2	1.0	4400	2	-4.07861		EMCA427AG
308-	MPC	4450	4433	3	1.0	4400	6	-2.7000		EMCA427AH
309-	EMCA427E	4450	4433	4	1.0	4400	5	2.7		EMCA427AI
310-	MPC	4450	4433	5	.84	4400	6	-1.0		EMCA427AJ

PHASE 1  
FIN-SYMM WITH SPRINGS

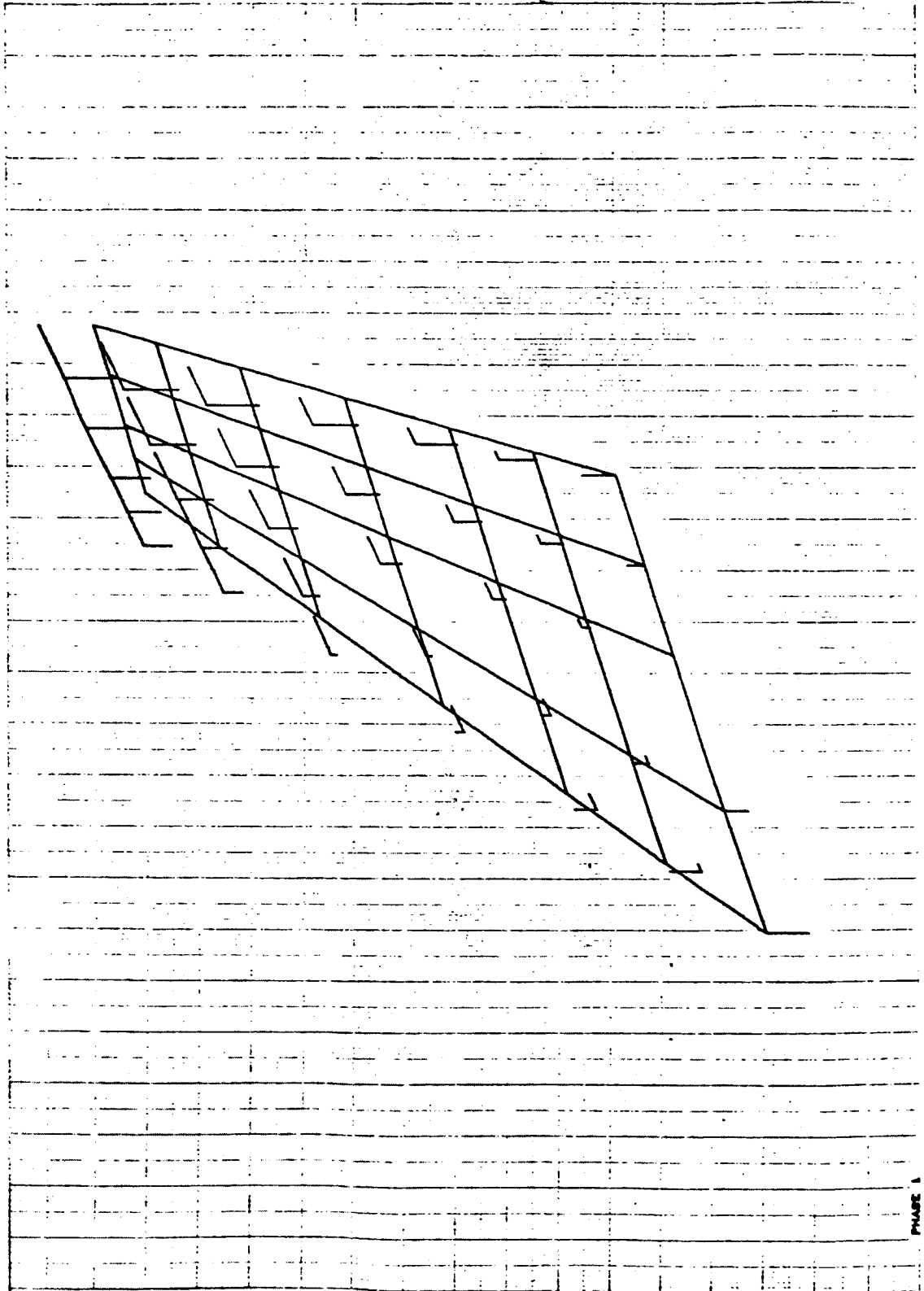
SORTED BULK DATA ECHO

CARD COUNT	1	2	3	4	5	6	7	8	9	10
301-	EMCA433A	4431	4431	294682	4435	2	-2.63767		EMCA433B	
302-	EMCA433H	4435	4435	244775	4435	2			EMCA437A	
303-	MPC	4437	4437	1.0	4435	2			EMCA437B	
304-	EMCA437A	4450	4439	046201	4439	2			EMCA443A	
305-	EMCA437H	4450	4443	7.2947	4441	2			EMCA443B	
306-	MPC	4450	4441	372375	4445	2			EMCA447A	
307-	EMCA443A	4450	4441	301677	4445	2			EMCA447B	
308-	EMCA443H	4450	4445	1.0	4449	2			EMCA447C	
309-	MPC	4450	4447	046201	4449	2			EMCA447D	
310-	EMCA447A	4450	4445	046201	4451	2			EMCA447E	
311-	EMCA447B	4450	4453	8.46	4451	2			EMCA447F	
312-	MPC	4450	4451	44534	4455	2			EMCA447G	
313-	EMCA447C	4450	4455	347195	4455	2			EMCA447H	
314-	EMCA447D	4450	4457	1.0	4459	2			EMCA447I	
315-	MPC	4450	4455	046201	4459	2			EMCA447J	
316-	EMCA447E	4450	4459	046201	4461	2			EMCA447K	
317-	EMCA447F	4450	4463	9.6753	4461	2			EMCA447L	
318-	MPC	4450	4461	392713	4465	2			EMCA447M	
319-	EMCA447G	4450	4465	1.0	4469	2			EMCA447N	
320-	EMCA447H	4450	4465	046201	4469	2			EMCA447O	
321-	MPC	4450	4465	046201	4469	2			EMCA447P	
322-	EMCA447I	4450	4469	4420	4472	4426	4430	4432	EMCA447Q	
323-	EMCA447J	4450	4469	4420	4472	4426	4430	4432	EMCA447R	
324-	MPCAD0	4451	4449	4420	4472	4426	4430	4432	EMCA447S	
325-	IM111	3	4412	4420	4472	4426	4430	4432	EMCA447T	
326-	IM111	3	4436	4420	4472	4426	4430	4432	EMCA447U	
327-	IM111	3	4460	4466	4470	4450	4452	4456	EMCA447V	
328-	PARAM	GRDPNT	0						EMCA447W	
329-	PARAM	TPNAME	0						EMCA447X	
330-	PARAM	WTMASS	002588						EMCA447Y	
331-	PARAM M2	4401	4400	02	0	0	0	0	EMCA447Z	
332-	PARAM	4461	4400	034	0	0	0	0	EMCA448A	
333-	PARAM	4472	4401	034	0	0	0	0	EMCA448B	
334-	PARAM	4487	4400	064	0	0	0	0	EMCA448C	
335-	PSHELL AR	4431	4400	04	0	0	0	0	EMCA448D	
336-	PSHELL AR	4435	4400	037	0	0	0	0	EMCA448E	
337-	SPEC	4401	4400	246	0	0	0	0	EMCA448F	
338-	SPEC	4402	4400	135	0	0	0	0	EMCA448G	
339-	SPEC	4401	4400	4412	4416	4422	4426	4430	EMCA448H	
340-	EMPSI	4432	4436	4440	4442	4446	4450	4456	EMPSI	
341-	EMPSI	4460	4462	4470	4470	4474	4478	4484	EMPSI	
342-	EMPSI	4402	4412	4416	4416	4420	4424	4428	EMPSI	
343-	EMPA1	4432	4436	4440	4442	4446	4450	4456	EMPA1	
344-	EMPA2	4460	4462	4470	4470	4474	4478	4484	EMPA2	
345-	SUPPORT	4461	4462	4466	4466	4470	4474	4478	EMPA2	
346-	SUPPORT	4469	4471	4473	4473	4477	4481	4485	EMPA2	
	EMDDATA									

**Appendix B10**  
**PLOTS OF SYMMETRIC COMPONENT MODES/PHASE I ANALYSIS**  
**MODEL II FIN**

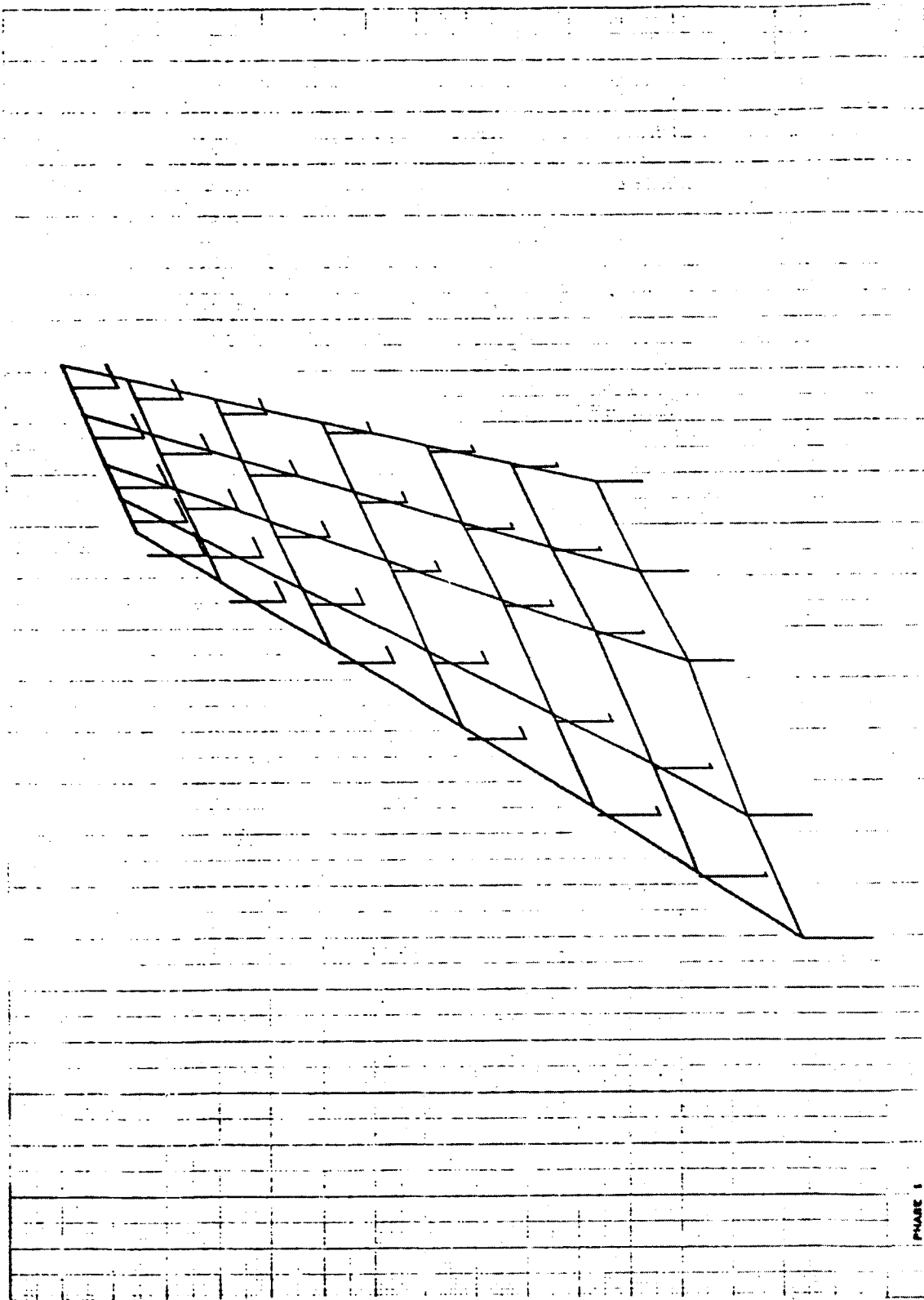


10/10/79 0001-007. \* 1.00000000



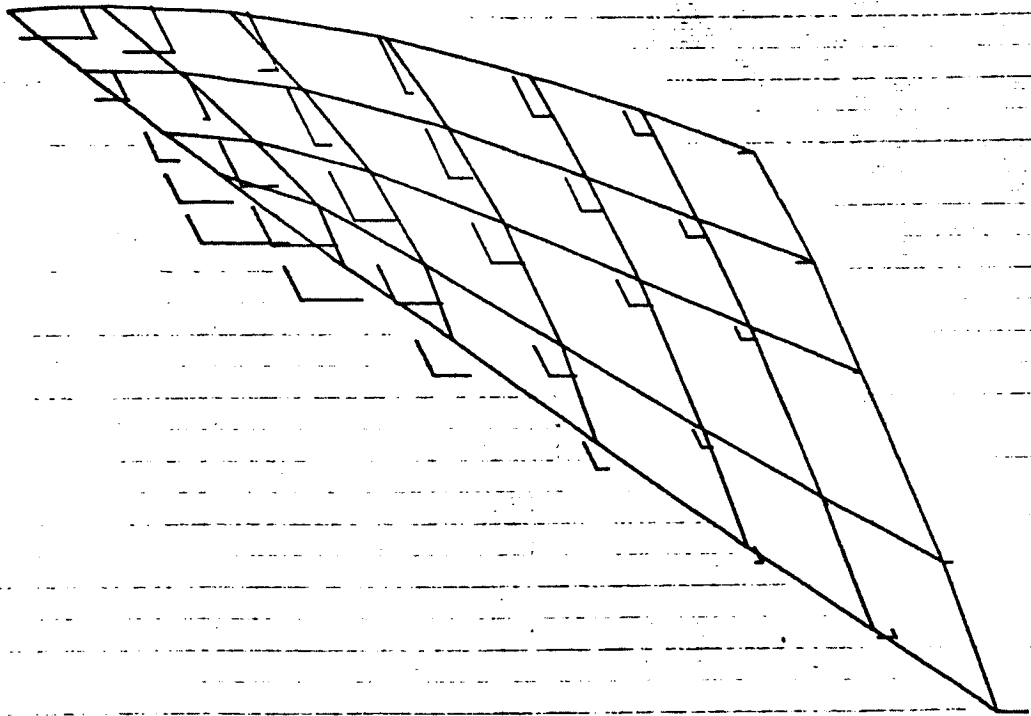
PHASE 1  
FIN-SYM (WITH SPRINGS)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFOR, SUBCASE 1 MODE 1 FREQ. 71.89192

10/10/74 MW-207. • 1.0110000



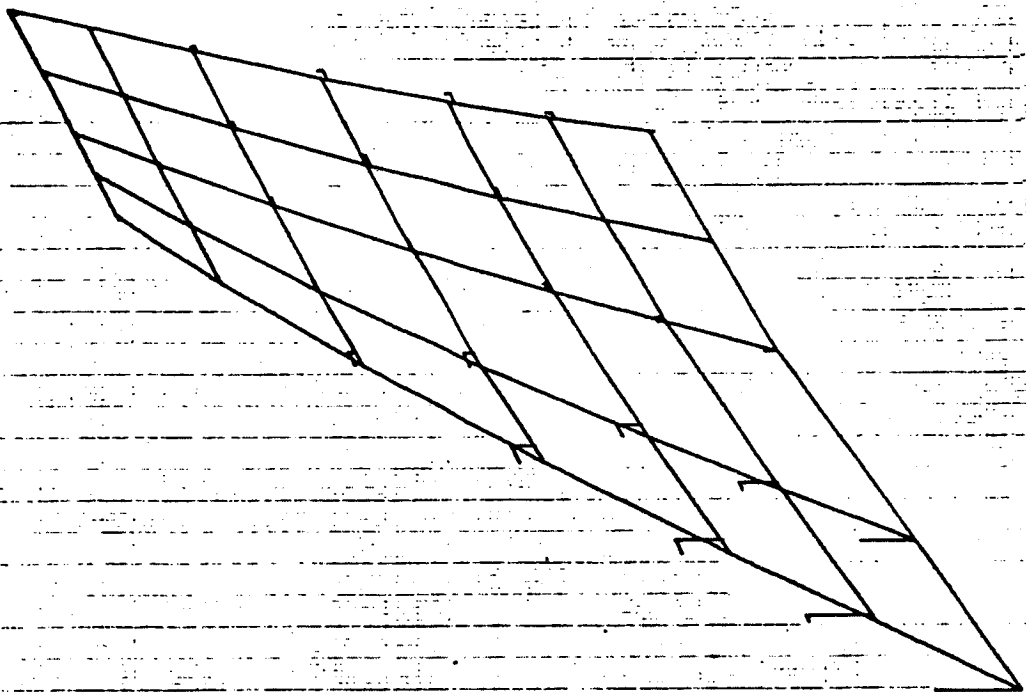
PHASE 1  
FIN-8Y46 (WITH SPRINGS)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFOR. SUBCASE 2 MODE 2 FREQ. 420.9484

18/10/74 MAX-DEF. = 1.2182780



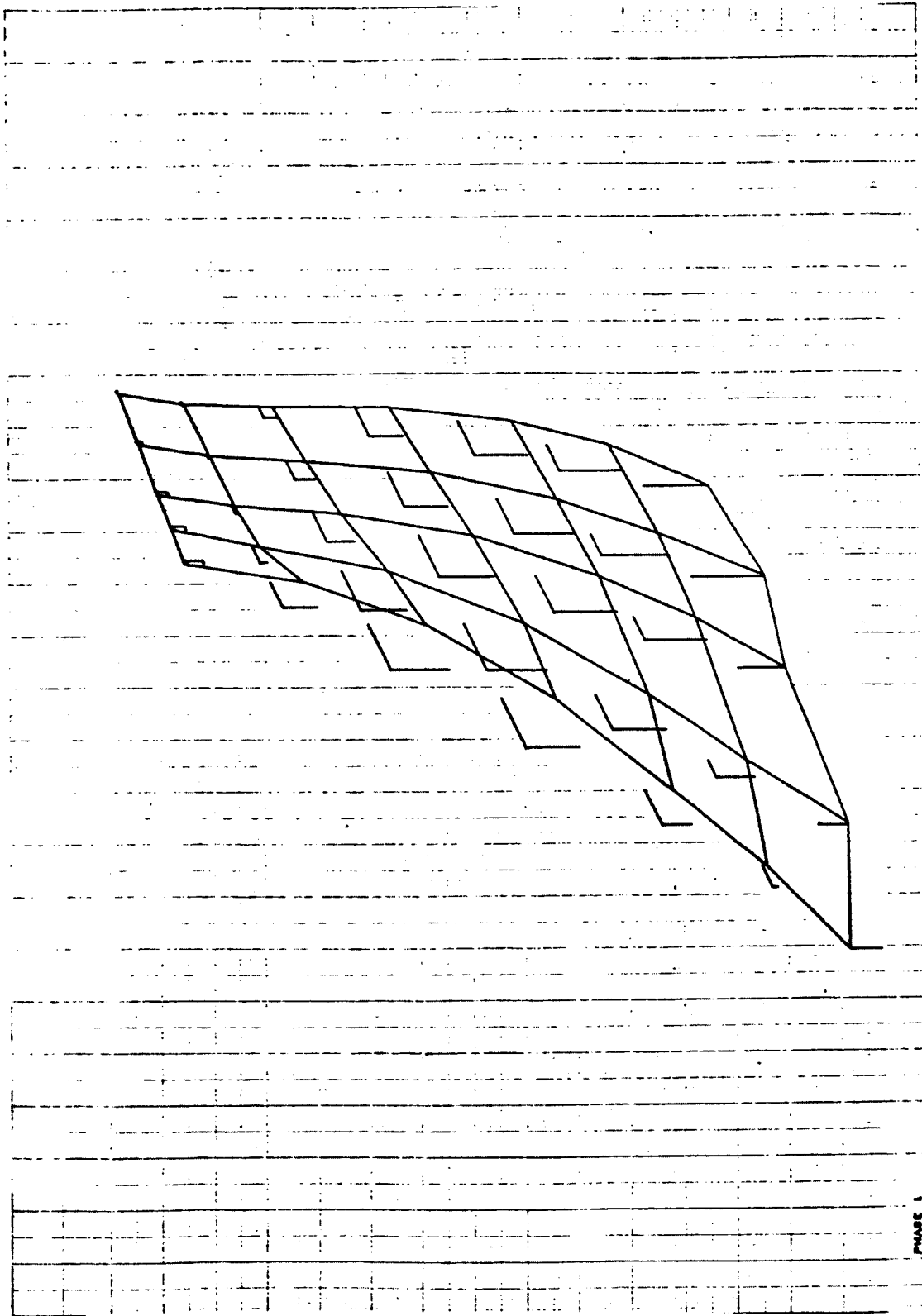
PHASE 1  
FIN-SYM (WITH SPRINGS)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFOR. SUBCASE 3 MODE 3 FREQ. 1281.477

4 18/10/74 MAX-DEF. = 1.0000000



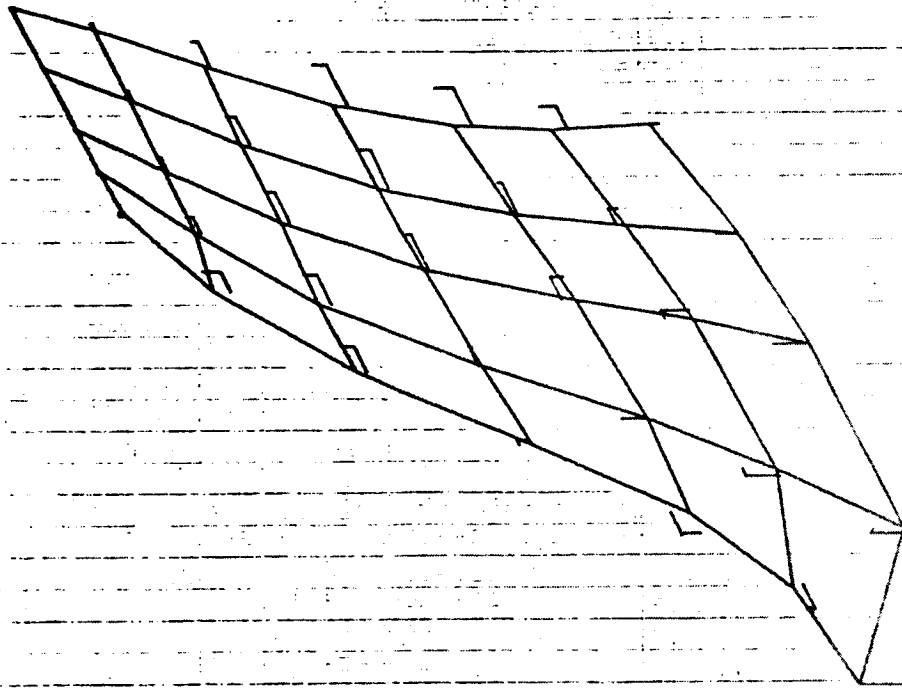
PHASE 1  
FIN-SPRING WITH SPRINGS  
FREE MODES FINES AT INTERFACE  
MEDAL DEFOR. SURFACE 4 MODE 4 FREQ. 1808.982

10/10/74 MAN-DET. • 1.00288420



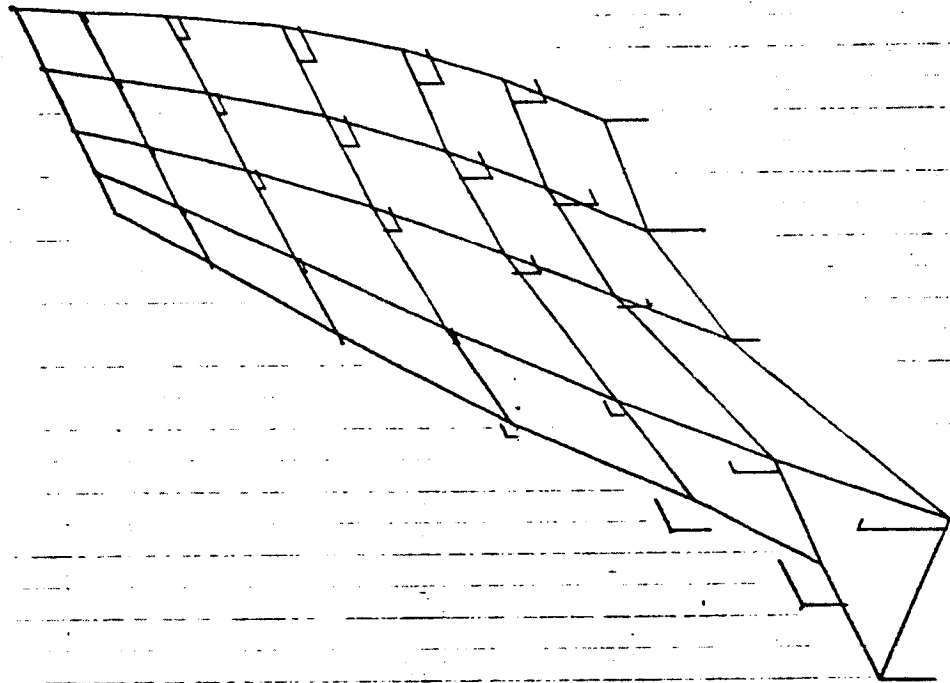
PHASE 1  
FIN-8700 (WITH SPRINGS)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFORM. SUBCASE 8 MODE 8 FREQ. 2487.648

10/10/74 1044-027, 0 1. 00000000



PHASE 1  
PIN-SYMS WITH SPRINGS  
FREE MODES FIXED AT INTERFACE  
LOCAL DEFOR. SURFACE 6 MODE 6 PAGE 10/10/74

18/10/74 MAX-DEF. = 0.93148828



PHASE 1  
FIN-SYMS (WITH SPRINGS)  
FREE MODES FIXED AT INTERFACE  
MODAL DEFON. SUBCASE 7 MODE 7 FREQ. 4389.934

**Appendix B11**  
**INPUT BULK DATA/PHASE I ANALYSIS: MODEL II**  
**PAYLOAD**



C A S F C O N T R O L D E C K E C H O

CARD COUNT	TITLE # PHASE 1
1	SUBTITLE # ORBITER PAYLOAD.SYMM CASE WITH SUPPORT SPRINGS
2	MPC # 4R91
3	SPC # 4R1
4	METHOD # 1
5	VECTOR # ALL
6	SUBCASE 1 # FREE MODES FIXED AT INTERFACE
7	LANFL # 20
8	MODES # 20
9	OUTPUT
10	OUTPUT%PLOT#
11	SET 1 # ALL
12	PLOTTER CALCOMP_765.105
13	AXES #MY.X.7
14	VIEW # 40.0.20.0.0.0
15	MAXIMUM DEFORMATION 5.0
16	FIND SCAL#ORIGIN 2.SET 1
17	PLOT MODAL DEFORMATION 1 THRU 20.SET 1.ORIGIN 2.SHAPE.VECTOR XYZ
18	RECIN HULK
19	

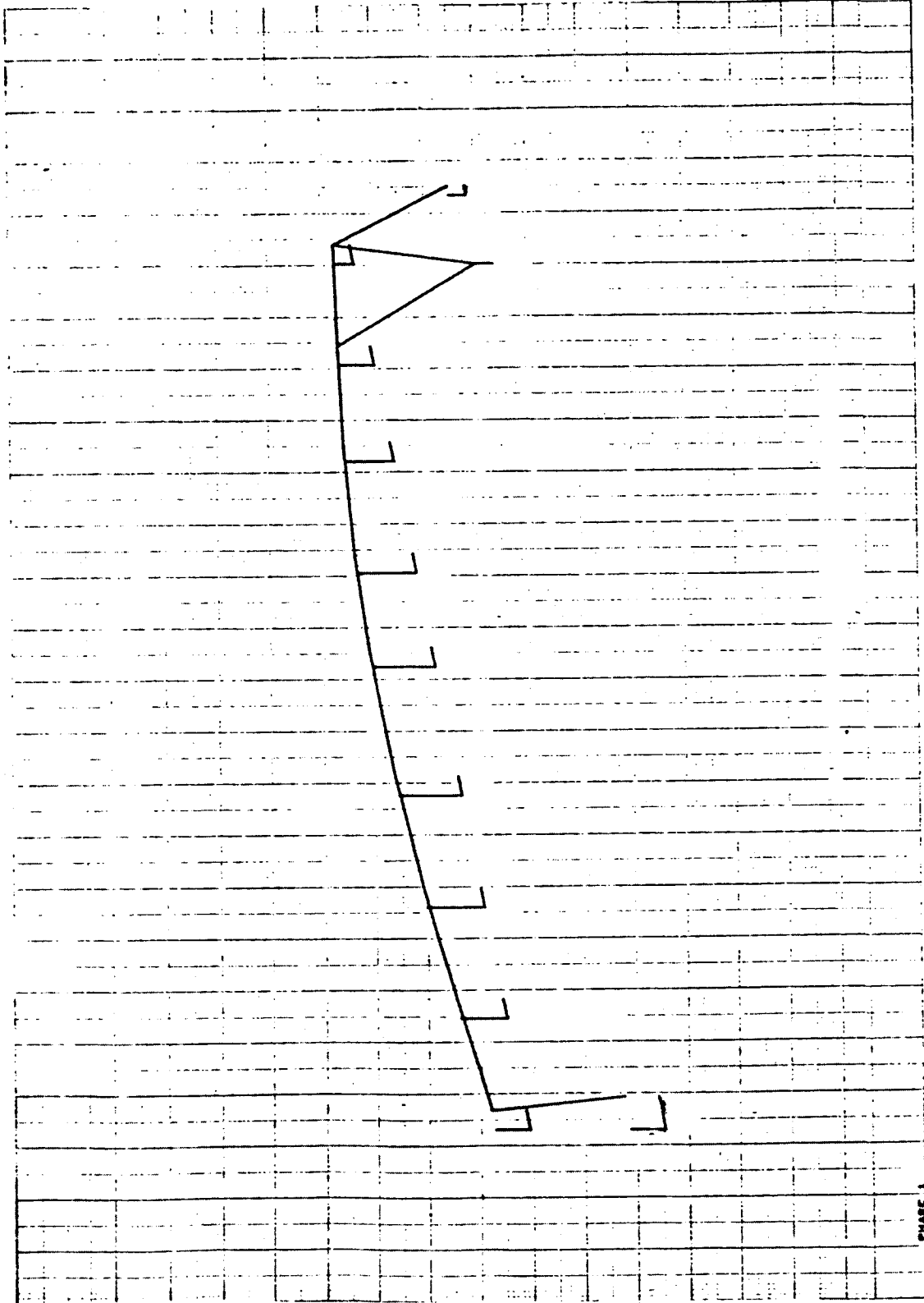
\*\*\* USER INFORMATION MESSAGE 207. HULK DATA NOT SORTED.XSORT WILL RE-ORDER DECK.

CARD COUNT	1	2	3	4	5	6	7	8	9	10
10	CBAR	4862	4862	4862	4862	4862	4862	4862	4862	4862
11	CBAR	4863	4863	4863	4863	4863	4863	4863	4863	4863
12	CBAR	4864	4864	4864	4864	4864	4864	4864	4864	4864
13	CBAR	4865	4865	4865	4865	4865	4865	4865	4865	4865
14	CBAR	4866	4866	4866	4866	4866	4866	4866	4866	4866
15	CBAR	4867	4867	4867	4867	4867	4867	4867	4867	4867
16	CBAR	4868	4868	4868	4868	4868	4868	4868	4868	4868
17	CBAR	4869	4869	4869	4869	4869	4869	4869	4869	4869
18	CELA52	14	23150.	4861	3	4860	3	4860	3	4860
19	CELA52	15	32250.	4861	3	4860	3	4860	3	4860
20	CONM2	14861	4861	0	.24					EMARR2
21	CONM2	14862	4862	0	.74					EMARR3
22	EMARR2	25.13	4863	0	.0					EMARR4
23	CONM2	14863	4863	0	.0					EMARR5
24	CONM2	14864	4864	0	.0					EMARR6
25	CONM2	14865	4865	0	.0					EMARR7
26	CONM2	14866	4866	0	.0					EMARR8
27	CONM2	14867	4867	0	.0					EMARR9
28	CONM2	14868	4868	0	.0					EMARR0
29	CONM2	14869	4869	0	.0					EMARR1
30	CONM2	14870	4870	0	1.47					EMARR2
31	CONM2	14871	4871	0	.17					EMARR3
32	FIGR	1	INV	10.0	4000.	20			1.0-4	FIG1
33	FIGR	1	MAX	10.0	4000.	20				FIG1
34	GRID	4860	0	78.0	.0	51.933	0	12456		
35	GRID	4861	0	78.0	.0	51.933	0	456		
36	GRID	4862	0	78.0	.0	62.5	0			
37	GRID	4863	0	78.0	.0	62.5	0			
38	GRID	4864	0	97.0	.0	62.5	0			
39	GRID	4865	0	106.5	.0	62.5	0			
40	GRID	4866	0	117.5	.0	62.5	0			
41	GRID	4867	0	125.5	.0	62.5	0			
42	GRID	4868	0	135.0	.0	62.5	0			
43	GRID	4869	0	143.25	.0	62.5	0			
44	GRID	4870	0	151.875	.0	62.5	0			
45	GRID	4871	0	151.875	-10.125	56.7	0	456		
46	GRID	4872	0	151.875	-10.125	56.7	0	456		
47	GRID	4873	0	151.875	-10.125	56.7	0	12456		
48	MAT1	4862	0	10.566	.3	.1				EMARR1FX
49	MPC	4861	4861	1.0	1.0	4862	1	-1.0		
50	EMARR1FX	4862	4862	1.0	10.567					

CARD COUNT	1	2	3	4	5	6	7	8	9	10
51-	MPC	4891	4892	3	1.0	4891	3	1.0		
52-	MPC	4891	4892	1	1.0	4890	1	-1.0		
53-	MPC	4891	4892	3	1.0	4890	1	-1.0		EM4899FZ
54-	EM4899FZ	4891	4891	3	-1.0	4892	1	.78400		
55-	MPC	4891	4892	5	1.0	4890	1	-1.0		EM4899MY
56-	EM4899MY	4891	4892	1	1.0	4891	3	-1.0		
57-	MPC	4891	4890	3	1.0	4890	1	-1.0		EM4899MY
58-	MPC	4891	4890	5	1.0	4890	1	-1.0		
59-	EM4899MY	4891	4892	1	1.0	4891	3	-1.0		
60-	MPC	4891	4891	1	1.0	4890	1	-1.0		EM4899FX
61-	EM4899FX	4891	4892	1	1.0	4890	1	-1.0		
62-	MPC	4891	4891	2	1.0	4892	2	-1.0		EM4899FY
63-	EM4899FY	4891	4890	3	1.0	4891	3	-1.0		
64-	MPC	4891	4892	3	1.0	4891	3	-1.0		
65-	PARAM	COUPMASS1								
66-	PARAM	CRDPNT 0								
67-	PARAM	TRNAME - PAYSP1								
68-	PARAM	WTMASS - .002448								
69-	PARAM	WPK2								
70-	PLTITL	4891	4892	5.775	21.87	23.23	71.00	.245		
71-	PLTITL	4891	4892	4892						
72-	PLTITL	4893	4890	4892						
73-	PLTITL	4894	4890	4891						
74-	SPC1	4891	4891	2						
75-	SPC1	4891	246	4892						
76-	SPC1	4891	3	4893						
	ENDDATA									

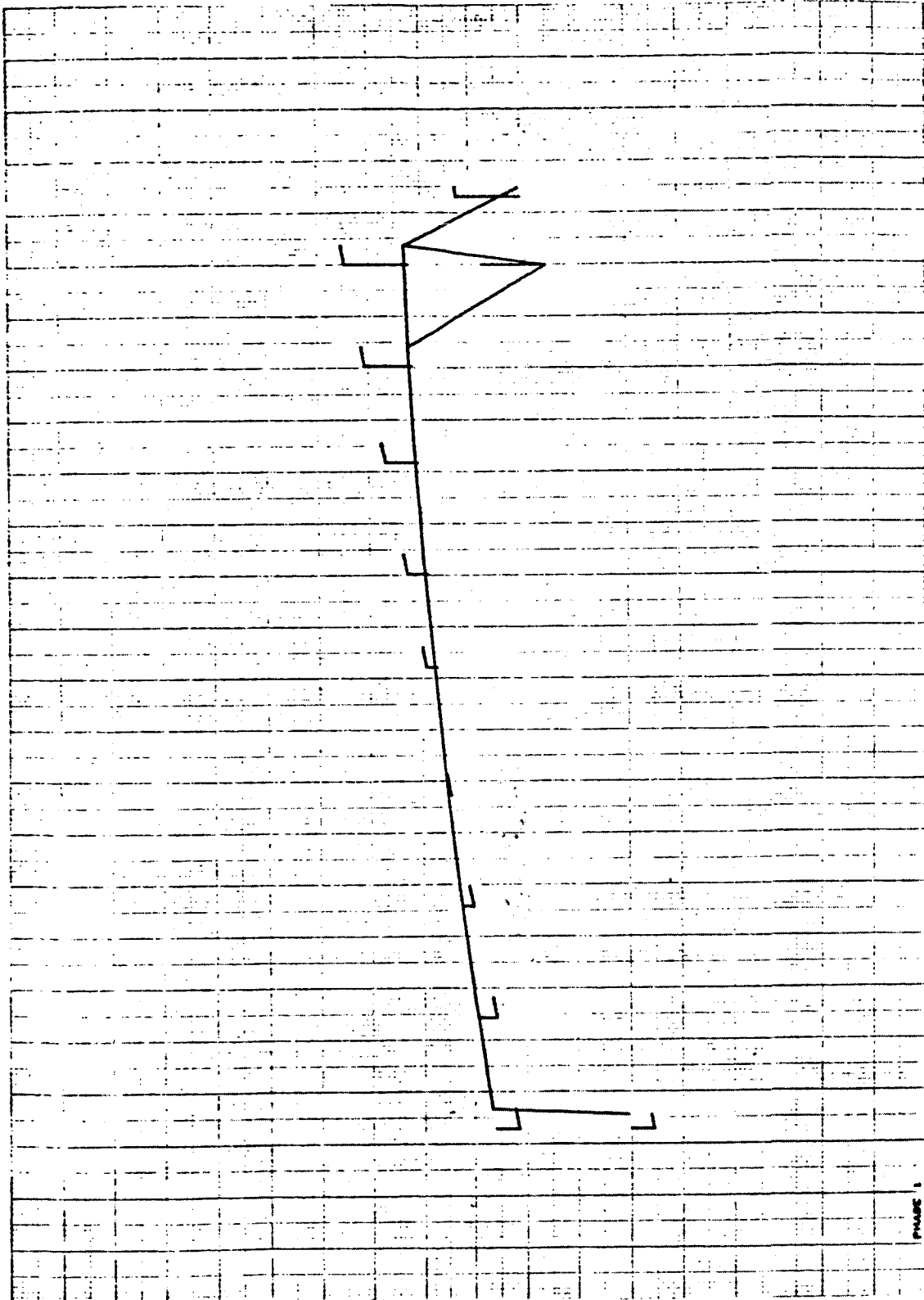
**Appendix B12**  
**PLOTS OF SYMMETRIC COMPONENT MODES/PHASE I ANALYSIS**  
**MODEL II PAYLOAD**

5/24/74 442-227. = 1.0000000



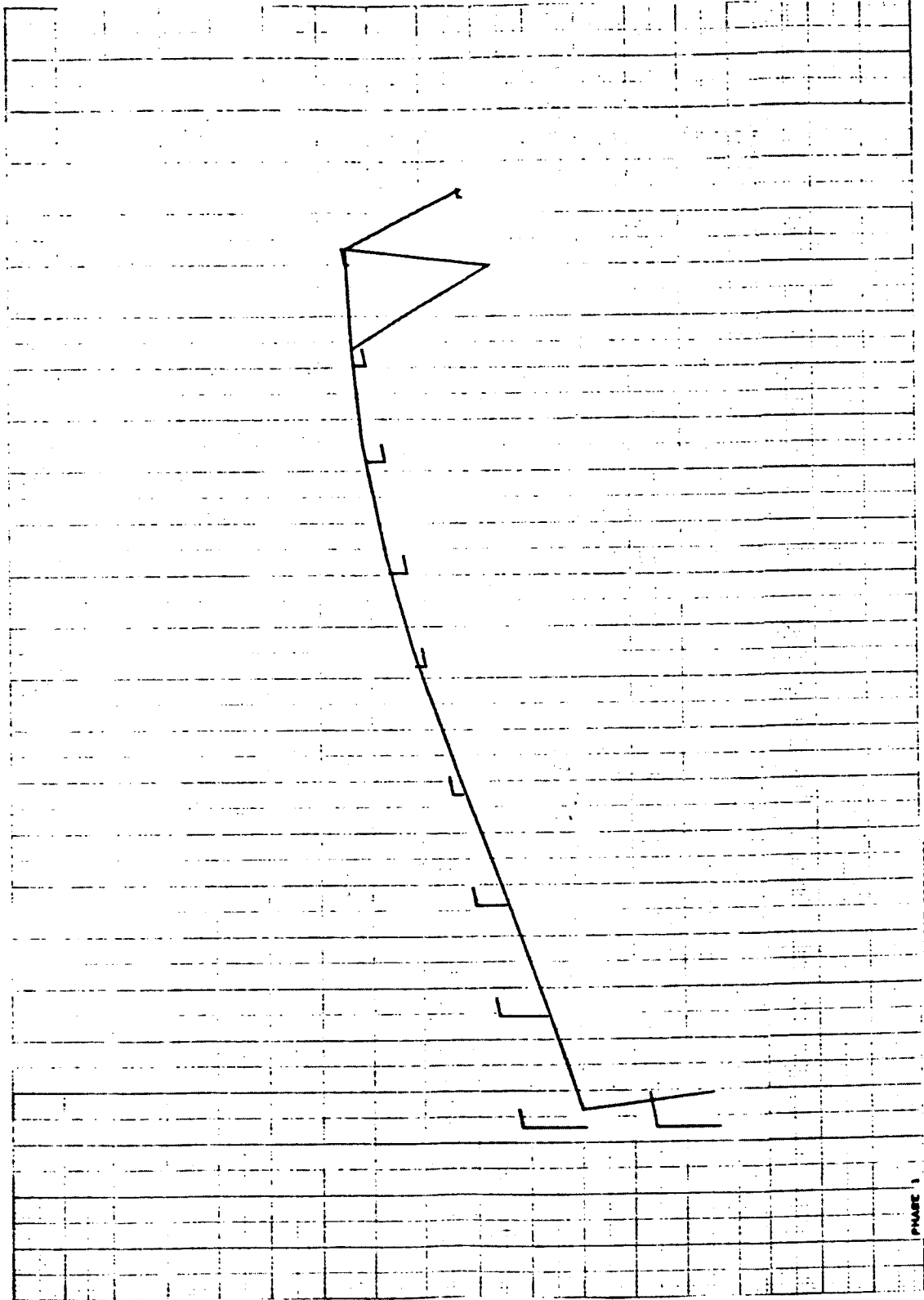
PHASE 1  
ON LATER PAYLOADS, SYMM CASE WITH SUPPORT SPRINGS  
FREE MODES FIXED AT INTERFACE  
LOCAL DCTOR. SUBCASE 1 MODE 1 FREQ. 64.32912

9/24/74 1000-007. 0 1.00000000



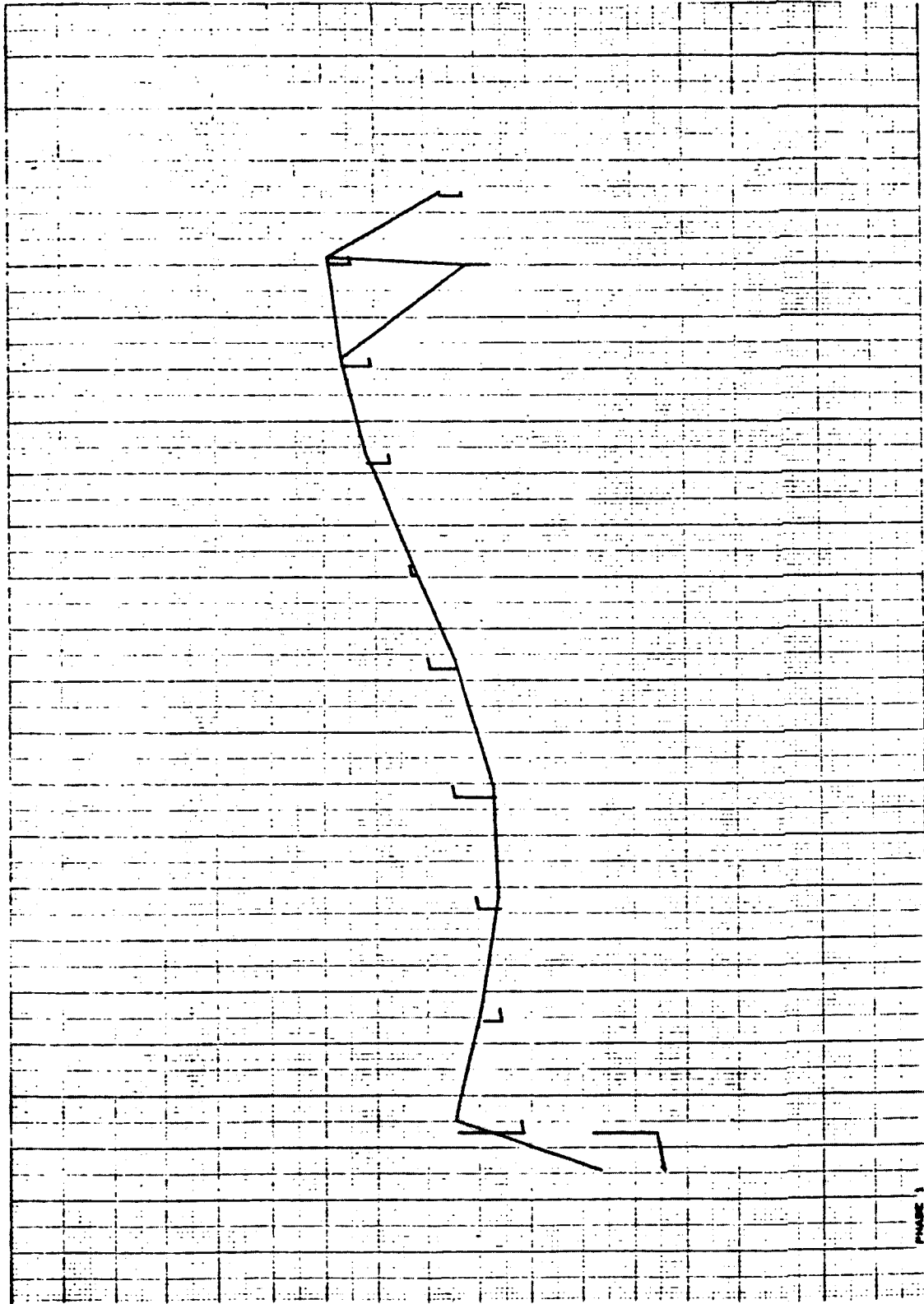
PHASE 1  
ORBITER PAYLOAD SYMB BASE WITH SUPPORT SPR (MSB)  
FREE MODES FIRED AT INTERFACE  
MANUAL DELTOM, SUBCARE 2 MODE 2 FREQ, 121.2311

9/24/74 100-007. 1.0000000



PHASE 1  
ORBITER PAYLOAD, STIM BASE WITH SUPPORT SPRINGS  
FREE MODES FIXED AT INTERFACE  
MODAL ORDER, SUBCASE 3 MODE 3 FREQ. 189.3482

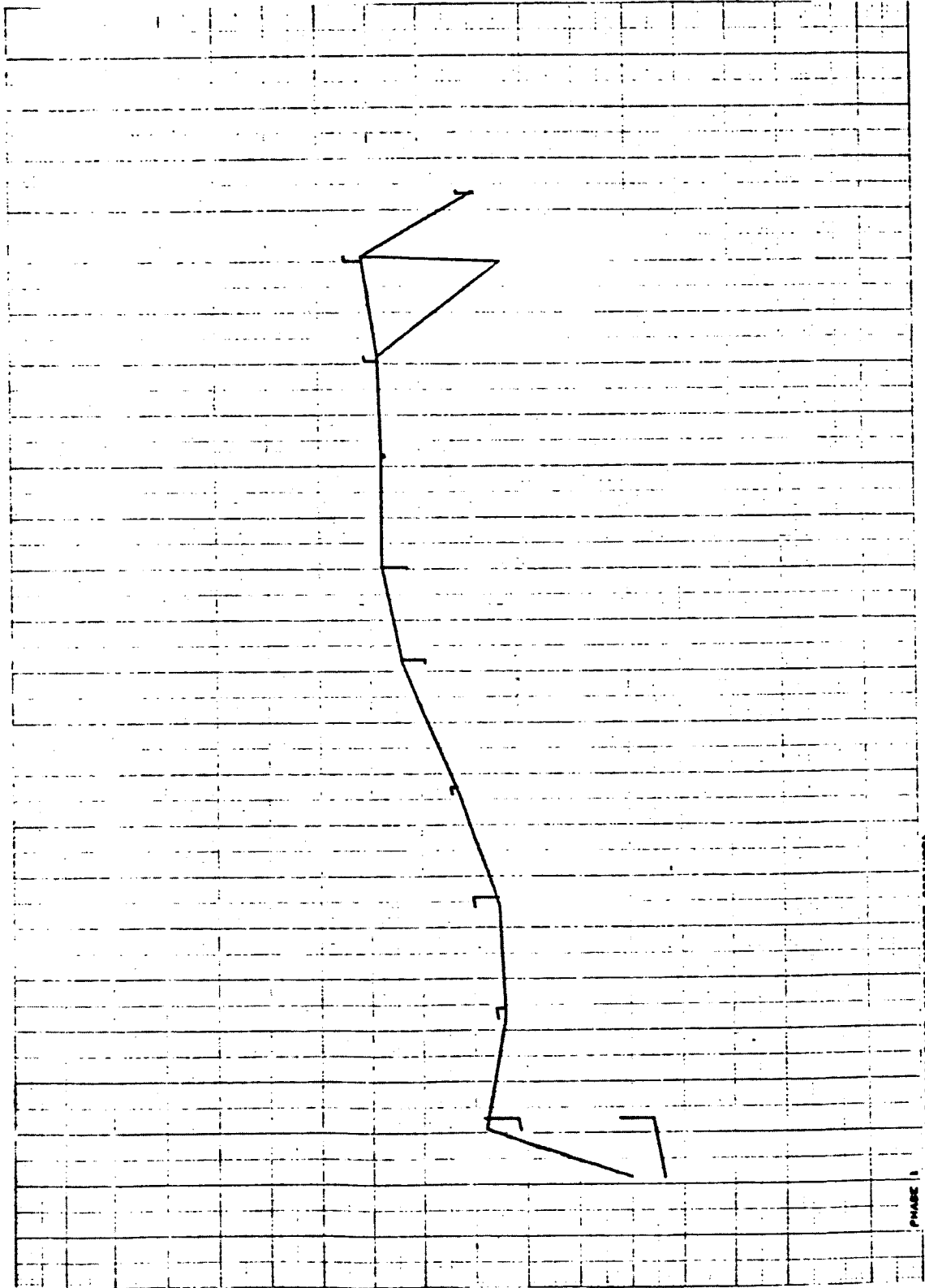
9/24/74 1000-007. 1.0000000



PHASE 1  
ORBITER PAYLOAD-EPWS SAGE (WITH SUPPORT OFRIM00)  
FREE MODES PLOTTED AT INTERFACE  
MODAL ORDER. SUBCARE 4 MODE 4 FREQ. 372.9850



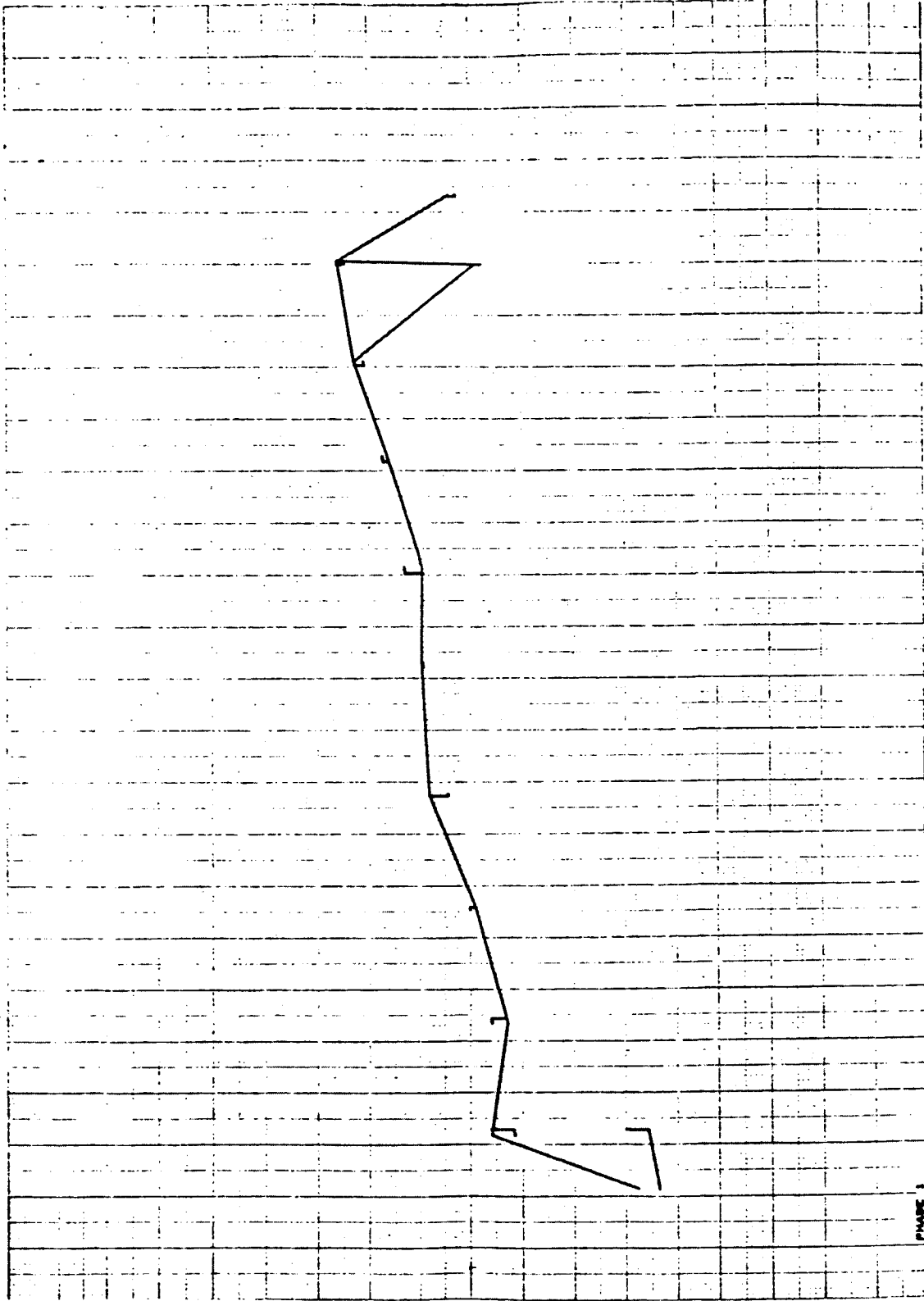
0 0.001/74 MAX-DEF. = 1.00076100



PHASE 1  
ORBITER PAYLOAD SYMM BASE WITH SUPPORT SPRINGS  
FREE MODES FIXED AT INTERFACE  
MODAL DETOR. SURFACE 8 MODC 8 FREQ. 603.0360

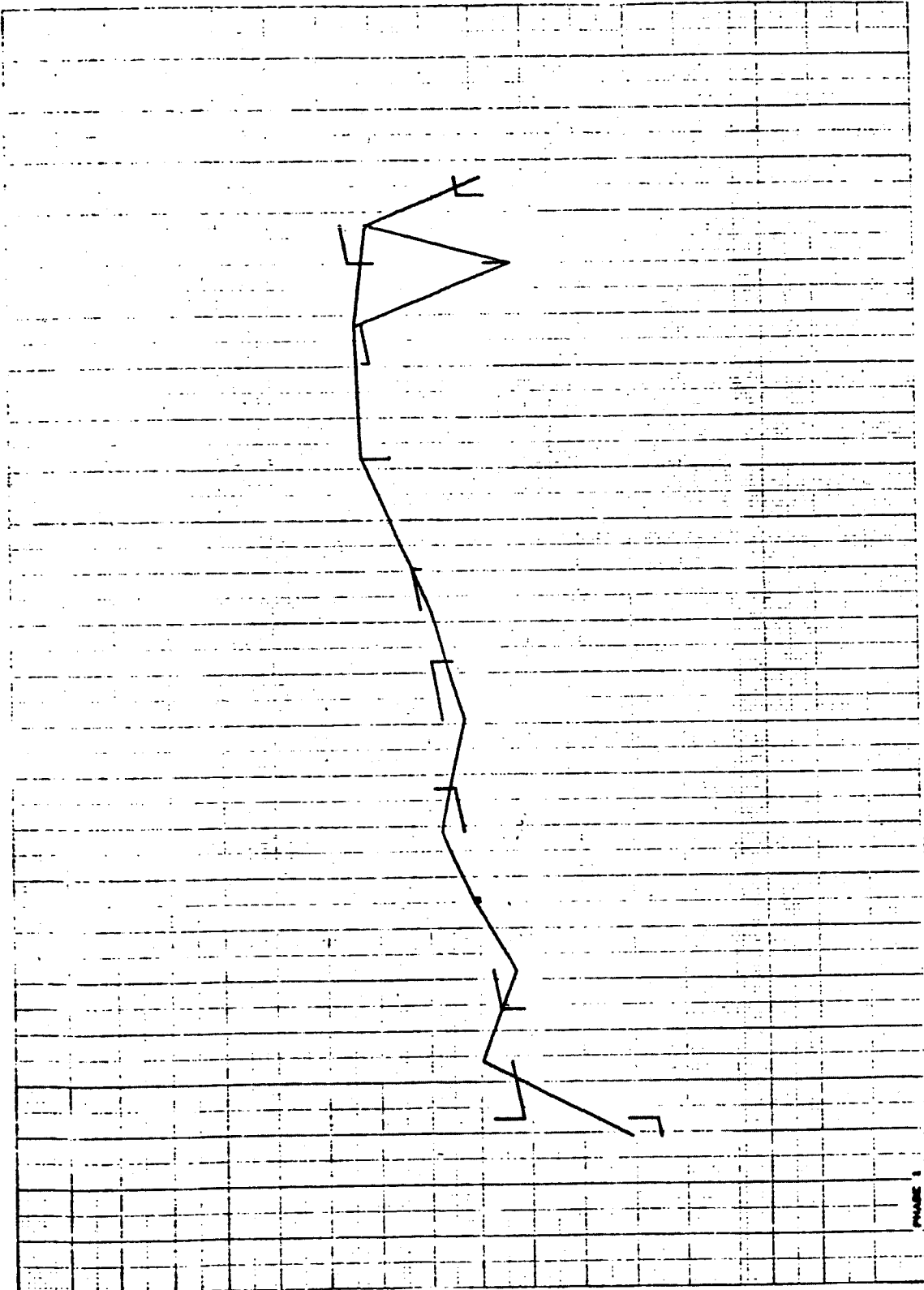


9/28/74 MAR-SEP. 8 2.8778400



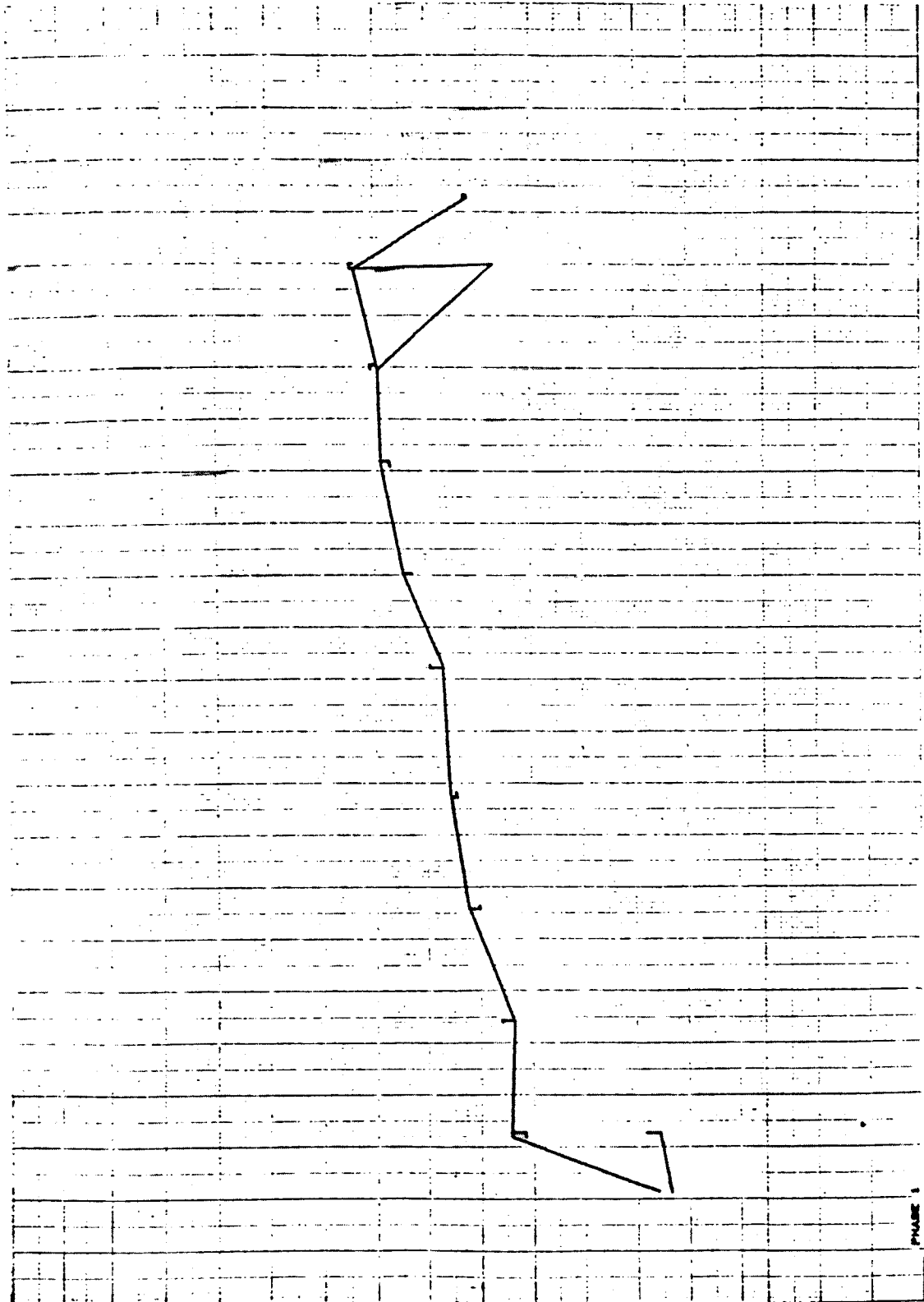
PHASE 1  
DRIBBLER PAYLOAD, 8V/1M GAIN WITH SUPPORT SPRINGS  
FREE MODES FIXED AT INTERFACE  
ACQAL DETEC. SURGARE 7 MODE 7 FREQ. 1890.378

8 9/23/74 1000-207. 0 1.00000000

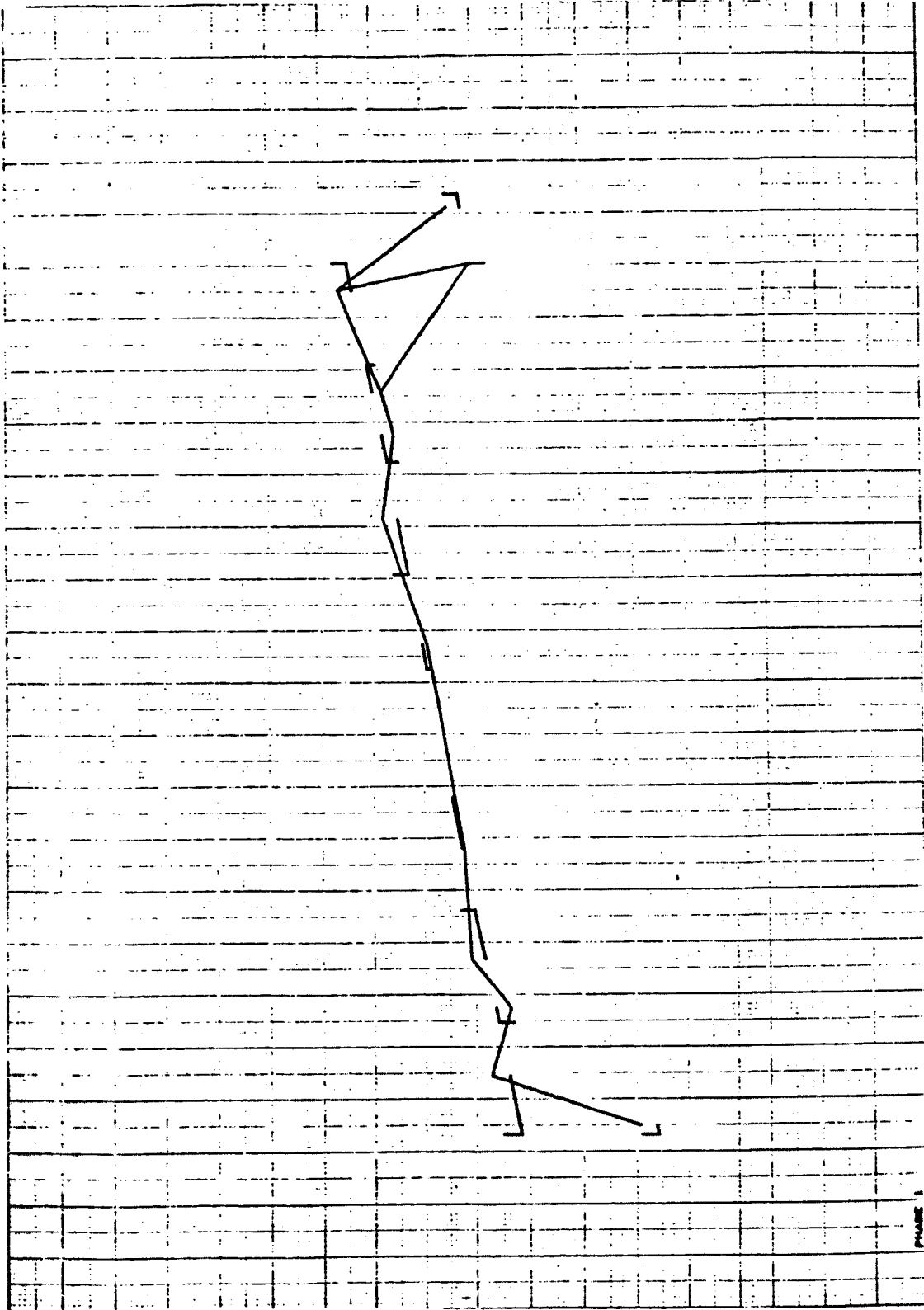


PHASE 1  
CRITER PAYLOAD, FROM CASE WITH SUPPORT SPRINGS  
FREE MODES FINED AT INTERFACE  
MODAL VECTOR, SUBCASE 8 MODC 8 FREQ. 208.888

9/24/74 MW-027 - 4.8820180

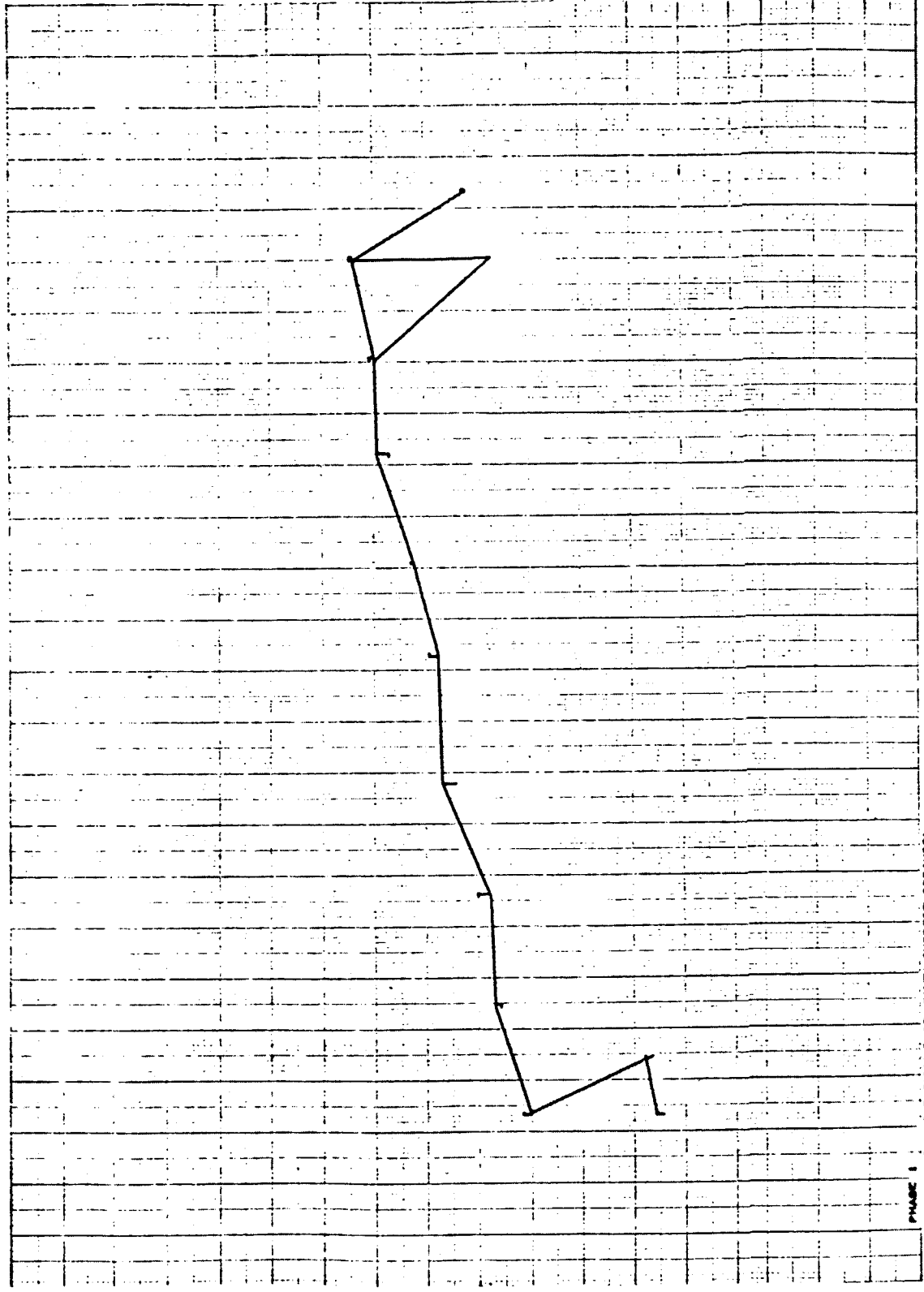


PHASE 1  
CRITER PAYLOAD, SYM CASE WITH SUPPORT SPRINGS  
FREE MODES FIXED AT INTERFACE  
MODAL DETOR. SUBCASE 1 MODE 1 FREQ. 2432.022



PHASE 1  
 DRIVER PAYLOAD-SYMM CASE (WITH SUPPORT SPRINGS)  
 FREE MODES PLOTTED AT INTERFACE  
 MODAL SECTOR, SUBCASE 10 MODE 10 FREQ. 3281.813

11 9/24/74 MAX-DEF. = 0.00142150



PHASE 1  
CRIBTER PAYLOAD, 8746 CASE (WITH SUPPORT SPRINGS)  
FREE MODES P103 AT INTERFACE  
MODAL DEFOR. SUBCASE 11 MODE 11 FREQ. 2094.789

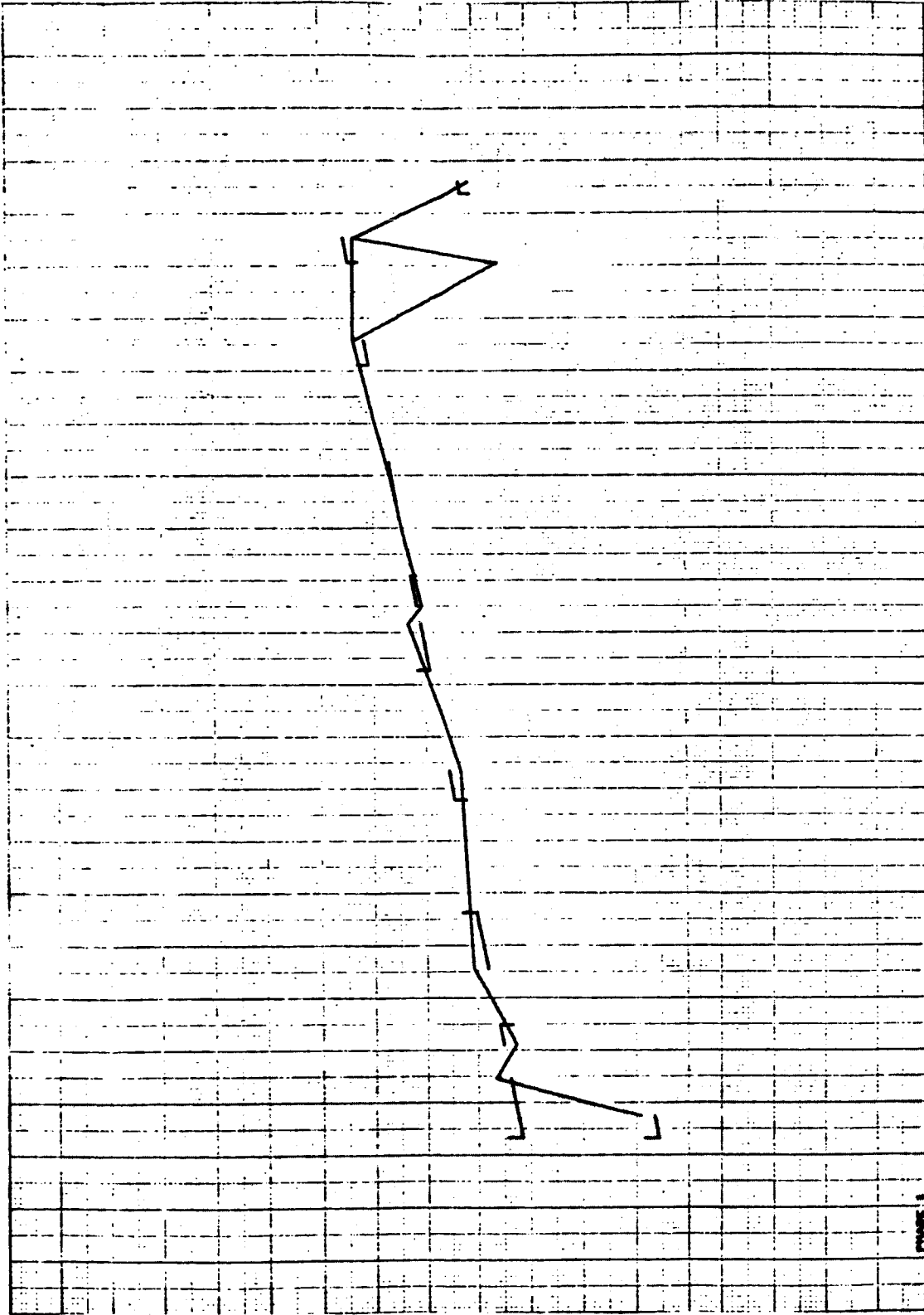


FIGURE 1  
 CABLE PAYLOAD, FROM CASE WITH SUPPORT SPINNING  
 FREE MODES FIXED AT INTERFACE  
 MODAL ORDER, SURFACE IS MODE 12 FREQ. 4822.578



**Appendix B13**  
**INPUT BULK DATA/PRE-PHASE 2 COPY RUN AND PHASE 2**  
**ANALYSIS: MODEL II ORBITER**

N A S T R A N   E X E C U T I V E   C O N T R O L   D E C K   E C H O

IC TAPE COPIES  
APP OMAP  
TIME 5  
DIAG 14  
DECIN 8 CONSOLIDATE SYMM, PHASE 1 TAPES CNTD 1 TAPE FOR PHASE 2  
(SEE NASTRAN SOURCE PROGRAM COMPILATION FOR LISTING OF OMAP SEQUENCE)  
END  
CEND

SYM TAPE COPY RUN  
CONSOLIDATE PHASE 1 TAPES ONTO 1 TAPE FOR PHASE 2

CASE CONTROL DECK ECHO

CARD  
COUNT

1  
2  
3  
TITLE =SYM TAPE COPY RUN  
SUBTITLE =CONSOLIDATE PHASE 1 TAPES ONTO 1 TAPE FOR PHASE 2  
BEGIN BULK

\*\*\* USER INFORMATION MESSAGE 207. BULK DATA NOT SORTED.XSORT WILL RE-ORDER DECK.

SYN TAPE COPY RUN  
CONSOLIDATE PHASE 1 TAPES ONTO 1 TAPE FOR PHASE 2

OCTOBER 17, 1974 NASTRAN 2/ 1/73

PAGE

3

CARD COUNT	1	2	3	4	5	6	7	8	9	10
1-	DMI	CPG100	0	1.0	1.0	1.0	1.0	1.0	1.0	EDOR11
2-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR12
3-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR13
4-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
5-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
6-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
7-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
8-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
9-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
10-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
11-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
12-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
13-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
14-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
15-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
16-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
17-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
18-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
19-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
20-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
21-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
22-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
23-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
24-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
25-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
26-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
27-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
28-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
29-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
30-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
31-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
32-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
33-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
34-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
35-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
36-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
37-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
38-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
39-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
40-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
41-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
42-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
43-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
44-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
45-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
46-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
47-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
48-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
49-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14
50-	DMI	CPG100	1	1.0	1.0	1.0	1.0	1.0	1.0	EDOR14

CARD COUNT	1	2	3	4	5	6	7	8	9	10
CFUSR9	79	1.0	1.0	0.0	1.0	85	1.0	1.0	1.0	CFUSR9
CFUSR10	91	1.0	1.0	1.0	1.0	97	1.0	0.0	1.0	CFUSR10
CFUSR11	103	1.0	1.0	1.0	1.0	109	1.0	0.0	1.0	CFUSR11
CFUSR12	115	1.0	1.0	1.0	1.0	121	1.0	0.0	1.0	CFUSR12
CFUSR13	127	1.0	1.0	1.0	1.0	133	1.0	0.0	1.0	CFUSR13
CFUSR14	139	1.0	1.0	1.0	1.0	145	1.0	0.0	1.0	CFUSR14
CFUSR15	148	1.0	1.0	1.0	1.0	151	1.0	1.0	1.0	CFUSR15
CFUSR16	157	1.0	1.0	1.0	1.0	163	1.0	1.0	1.0	CFUSR16
CFUSR17	169	1.0	1.0	1.0	1.0	175	1.0	1.0	1.0	CFUSR17
CFUSR18	181	1.0	1.0	1.0	1.0	187	1.0	1.0	1.0	CFUSR18
CFUSR19	193	1.0	1.0	1.0	1.0	199	1.0	1.0	1.0	CFUSR19
CFUSR20	205	1.0	1.0	1.0	1.0	211	1.0	1.0	1.0	CFUSR20
CFUSR21	217	1.0	1.0	1.0	1.0	223	1.0	1.0	1.0	CFUSR21
DM1	229	1.0	1.0	1.0	1.0	2	1.0	607	1.0	CPAYR1
CPGRPA	CPGRPA	0	2	445	0.0	0	1.0	0.0	0.0	CPAYR2
DM1	451	0.0	0.0	0.0	0.0	0	1.0	0.0	0.0	
CPGRMI	463	0.0	0.0	0.0	1.0	457	1.0	0.0	0.0	
DM1	CPGRMI	0	235	0.0	1.0	2	1.0	607	1.0	
DM1	241	1.0	0.0	0.0	1.0	0	1.0	0.0	1.0	EWING1
EWING2	253	1.0	1.0	1.0	1.0	247	1.0	1.0	1.0	EWING2
EWING3	265	1.0	1.0	1.0	1.0	259	1.0	1.0	1.0	EWING3
EWING4	277	1.0	1.0	1.0	1.0	271	1.0	1.0	1.0	EWING4
EWING5	289	1.0	1.0	1.0	1.0	283	1.0	1.0	1.0	EWING5
EWING6	301	1.0	1.0	1.0	1.0	295	1.0	1.0	1.0	EWING6
ENDDATA						307	1.0	1.0	1.0	

SYN DATA COPY DATA  
CONCATENATE TAPES TO TAPE FOR PHASE 2

- 1 INPUT 1 CONSOLIDATE SUMM MAKE 1 TAPES ON TAPE 2 PHASE 2
- 2 1 INCLUDE PARTITION VECTORS FOR VECTOR
- 3 INPUT1 /KRFU,KIIFU,MRRFU,MIRFU,MIIFU//C,N,1/C,N,FUSSPI
- 4 INPUT1 /DIFU,DRFU,.,./C,N,0/C,N,1 \$
- 5 OUTPUT1 /KRFU,KIIFU,MRRFU,MIRFU,MIIFU//C,N,1/C,N,0/C,N,ORBTSP2
- 6 OUTPUT1 /DIFU,DRFU,CPGRFU,CPGIFU,./C,N,0 \$
- 7 INPUT1 /KRWI,KIWI,MRRWI,MIRWI,MIWI//C,N,-3/C,N,2/C,N,WINGP1
- 8 INPUT1 /DIWI,DRWI,.,./C,N,0/C,N,2 \$
- 9 OUTPUT1 /KRWI,KIWI,MRRWI,MIRWI,MIWI//C,N,0 \$
- 10 OUTPUT1 /DIWI,DRWI,CPGRWI,CPGIWI,./C,N,0 \$
- 11 INPUT1 /KRRDO,KIIDO,MRRDC,MIRDO,MIIDO//C,N,-3/C,N,3/C,N,DCRSP1
- 12 INPUT1 /DIDO,DRDO,.,./C,N,0/C,N,3 \$
- 13 OUTPUT1 /KRRDO,KIIDO,MRRDO,MIRDO,MIIDO//C,N,0 \$
- 14 OUTPUT1 /DIDO,DRDO,CPGRDO,CPGIDO,./C,N,0 \$
- 15 INPUT1 /KRFI,KIIFI,MRRFI,MIRFI,MIIFI//C,N,-3/C,N,4/C,N,FINSPI
- 16 INPUT1 /DIFI,DRFI,.,./C,N,0/C,N,4 \$
- 17 OUTPUT1 /KRFI,KIIFI,MRRFI,MIRFI,MIIFI//C,N,0 \$
- 18 OUTPUT1 /DIFI,DRFI,CPGRFI,CPGIFI,./C,N,0 \$
- 19 INPUT1 /KRRPA,KIIPA,MRRPA,MIRPA,MIIPA//C,N,-3/C,N,5/C,N,PAYSPI
- 20 INPUT1 /DIPA,DRPA,.,./C,N,0/C,N,5 \$
- 21 OUTPUT1 /KRRPA,KIIPA,MRRPA,MIRPA,MIIPA//C,N,0 \$
- 22 OUTPUT1 /DIPA,DRPA,CPGRPA,CPGIPA,./C,N,0 \$
- 23 END

\*\*NO ERRORS FOUND - EXECUTE NASTRAN PROGRAM\*\*

PHASE 2  
ORBITER SYMM CASE

CASE CONTROL DECK ECHO

CARD  
PRINT

1 TITLE # PHASE 2  
 2 SUATITLE # ORBITER SYMM CASE  
 3 MDC # 21  
 4 SPC # 11  
 5 METHOD # 1  
 6 VECTOR # ALL  
 7 SURCASE 1  
 8 LABEL # FREE-FREE-MADES  
 9 MODES # 30  
 10 BEGIN BULK

\*\*\* USER INFORMATION MESSAGE 207, BULK DATA NOT SORTED, XSORT WILL RE-ORDER DECK.





CARD PRINT	1	2	3	4	5	6	7	8	9	10
51-	CR10	3651	0	25.5	-12.5	51.5	0	2155		
51-	CR10	3652	0	25.5	-12.5	45.5	0	455		
51-	CR10	3653	0	35.0	-12.5	51.5	0	2454		
54-	CR10	3654	0	66.75	-12.5	45.5	0	455		
56-	CR10	3659	0	66.75	-12.5	45.5	0	455		
57-	CR10	3660	0	53.375	-12.5	51.5	0	455		
58-	CR10	3663	0	53.375	-12.5	45.5	0	454		
50-	CR10	3664	0	53.375	-12.5	51.5	0	454		
60-	CR10	3668	0	170.75	-12.5	45.5	0	455		
61-	CR10	3671	0	170.75	-12.5	51.5	0	455		
62-	CR10	3672	0	66.0	0	73.0	0	454		
63-	CR10	4002	0	66.0	-4.0181	72.0007	0	1654		
64-	CR10	4004	0	66.0	-7.4247	69.9247	0	1655		
65-	CR10	4006	0	66.0	-9.7007	64.5181	0	1654		
66-	CR10	4008	0	66.0	-12.5	52.5	0	1654		
67-	CR10	4010	0	66.0	-12.5	52.5	0	2454		
68-	CR10	4034	0	102.12	-12.5	52.5	0	2454		
70-	CR10	4054	0	129.375	-12.5	52.5	0	2454		
71-	CR10	4114	0	153.375	-12.5	52.5	0	2454		
72-	CR10	4156	0	156.5	0	73.0007	0	1456		
73-	CR10	4172	0	156.5	-4.0181	72.0007	0	1456		
74-	CR10	4174	0	166.5	-7.4247	69.9247	0	1455		
75-	CR10	4178	0	166.5	-9.7007	64.5181	0	1455		
76-	CR10	4180	0	166.5	-12.5	52.5	0	1456		
77-	CR10	4180	0	166.5	-12.5	52.5	0	1456		
78-	CR10	4461	0	170.75	0	75.0	0	2454		
79-	CR10	4463	0	170.75	0	75.0	0	2454		
80-	CR10	4465	0	179.3663	-2.0	75.0	0	2454		
81-	CR10	4465	0	182.3663	-2.0	75.0	0	2454		
81-	CR10	4469	0	166.5	-2.0	75.0	0	12454		
81-	CR10	4471	0	166.5	-2.0	75.0	0	12454		
81-	CR10	4472	0	166.5	-2.0	75.0	0	12454		
81-	CR10	4473	0	166.5	-2.0	75.0	0	12454		
84-	CR10	4481	0	170.75	0	51.033	0	12454		
85-	CR10	4481	0	170.75	0	51.033	0	12454		
87-	CR10	4492	0	151.975	0	51.5	0	12454		
88-	CR10	4492	0	151.975	0	51.5	0	12454		
89-	CR10	4492	0	151.975	0	51.5	0	12454		
90-	MPC	3010	3651	1.0	10.125	11.5	1	1.0		
91-	MPC	3010	3652	1.0	1.0	11.5	1	1.0		
92-	MPC	3010	3652	1.0	1.0	11.5	1	1.0		
92-	MPC	3010	3652	1.0	1.0	11.5	1	1.0		
94-	MPC	3010	3655	1.0	1.0	12.12	1	1.0		
95-	MPC	3010	3655	1.0	1.0	12.12	1	1.0		
95-	MPC	3010	3655	1.0	1.0	12.05	1	1.0		
97-	MPC	3010	3656	1.0	1.0	12.05	1	1.0		
98-	MPC	3010	3656	1.0	1.0	12.05	1	1.0		
99-	MPC	3010	3659	1.0	1.0	14.0	1	1.0		
100-	MPC	3010	3659	1.0	1.0	14.0	1	1.0		

CARD ELEMENT	1	2	3	4	5	6	7	8	9	10
101-	MPC	3010	3659	3	0.0	410	3	0.0		
102-	MPC	3010	3660	1	0.0	405	1	0.0		
103-	MPC	3010	3660	2	0.0	405	2	0.0		
104-	MPC	3010	3663	3	0.0	410	3	0.0		
105-	MPC	3010	3663	2	0.0	410	2	0.0		
106-	MPC	3010	3664	3	0.0	405	3	0.0		
107-	MPC	3010	3664	2	0.0	405	2	0.0		
108-	MPC	3010	3664	1	0.0	405	1	0.0		
109-	MPC	3010	3664	3	0.0	405	3	0.0		
110-	MPC	3010	3667	2	0.0	410	2	0.0		
111-	MPC	3010	3667	3	0.0	410	3	0.0		
112-	MPC	3010	3667	1	0.0	410	1	0.0		
113-	MPC	3010	3669	3	0.0	405	3	0.0		
114-	MPC	3010	3669	2	0.0	405	2	0.0		
115-	MPC	3010	3669	1	0.0	405	1	0.0		
116-	MPC	3010	3671	3	0.0	405	3	0.0		
117-	MPC	3010	3671	2	0.0	405	2	0.0		
118-	MPC	3010	3671	1	0.0	405	1	0.0		
119-	MPC	3010	3672	3	0.0	405	3	0.0		
120-	MPC	3010	3672	2	0.0	405	2	0.0		
121-	MPC	3010	3672	1	0.0	405	1	0.0		
122-	MPC	3010	4004	3	0.0	232	3	0.0		
123-	MPC	3010	4004	2	0.0	232	2	0.0		
124-	MPC	3010	4004	1	0.0	232	1	0.0		
125-	MPC	3010	4006	3	0.0	235	3	0.0		
126-	MPC	3010	4006	2	0.0	235	2	0.0		
127-	MPC	3010	4008	3	0.0	232	3	0.0		
128-	MPC	3010	4008	2	0.0	232	2	0.0		
129-	MPC	3010	4010	3	0.0	229	3	0.0		
130-	MPC	3010	4010	2	0.0	229	2	0.0		
131-	MPC	3010	4034	1	0.0	519	1	0.0		CM4034X
132-	MPC	3010	4034	5	0.5	519	5	0.5		CM4034X
133-	MPC	3010	4034	3	0.0	519	3	0.0		CM4034X
134-	MPC	3010	4064	1	0.0	760	1	0.0		CM4064X
135-	MPC	3010	4064	5	0.5	760	5	0.5		CM4064X
136-	MPC	3010	4064	3	0.0	760	3	0.0		CM4064X
137-	MPC	3010	4114	1	0.0	1161	1	0.0		CM4114X
138-	MPC	3010	4114	5	0.5	1161	5	0.5		CM4114X
139-	MPC	3010	4114	3	0.0	1161	3	0.0		CM4114X
140-	MPC	3010	4154	1	0.0	1618	1	0.0		CM4154X
141-	MPC	3010	4154	5	0.5	1618	5	0.5		CM4154X
142-	MPC	3010	4154	3	0.0	1618	3	0.0		CM4154X
143-	MPC	3010	4174	2	0.0	1836	2	0.0		CM4174X
144-	MPC	3010	4174	3	0.0	1836	3	0.0		CM4174X
145-	MPC	3010	4176	2	0.0	1931	2	0.0		CM4176X
146-	MPC	3010	4176	3	0.0	1931	3	0.0		CM4176X
147-	MPC	3010	4178	2	0.0	1927	2	0.0		CM4178X
148-	MPC	3010	4178	3	0.0	1927	3	0.0		CM4178X
149-	MPC	3010	4180	2	0.0	1923	2	0.0		CM4180X
150-	MPC	3010	4180	3	0.0	1923	3	0.0		CM4180X

SORTED BULK DATA ECHO

CARD	1	2	3	4	5	6	7	8	9	10
151-	MPD	6011	4002	3	1.0	241	3	-1.0		
152-	MPD	4011	4172	3	1.0	183	3	-1.0		
153-	MPD	4012	4002	2	1.0	241	3	-1.0		
154-	MPD	4410	4172	2	1.0	183	2	-1.0		
155-	MPD	4410	4461	2	1.0	183	2	-1.0		
156-	MPD	4410	4461	2	1.0	183	2	-1.0		
157-	MPD	4410	4465	1	1.0	1926	1	-1.0		
158-	MPD	4410	4465	1	1.0	2041	1	-1.0		
159-	MPD	4410	4465	2	1.0	2041	2	-1.0		EM4457X
160-	MPD	4410	4457	1	1.0	2041	1	-0.5		
161-	EM4457X	4410	2114	1	-0.5	2114	1	-1.0		
162-	MPD	4410	4460	2	1.0	2114	2	-1.0		
163-	MPD	4410	4460	3	1.0	183	3	-1.0		
164-	MPD	4410	4471	3	1.0	2041	3	-1.0		
165-	MPD	4410	4471	3	1.0	2114	3	-1.0		
166-	MPD	4410	4473	3	1.0	2114	3	-1.0		
167-	MPD	4410	4493	3	1.0	1505	3	-1.0		EM4457A
168-	EM4457A	4410	1575	3	-1.0	13484	3	-1.0		EM4457B
169-	EM4457B	4410	1514	3	-1.0	13484	3	-1.0		
170-	MPD	4811	4880	2	1.0	504	2	-1.0		EM4457X
171-	MPD	4811	4892	1	1.0	1516	1	-0.5		
172-	EM4457X	4812	1606	2	-0.5	504	2	-1.0		
173-	MPD	4812	4881	2	1.0	1516	2	-0.5		EM4457Y
174-	MPD	4812	4882	2	1.0	1516	2	-0.5		
175-	EM4457Y	21	1506	2	-0.5	4910	2	-1.0		
176-	MPD	21	3010	4010	4910	4910	4011	4911		
177-	MPD	22	3010	4010	4910	4910	4012	4912		
178-	PARAM	TPVMEF	6							
179-	PARAM	TPVMEF	6							
180-	SPCI	11	241	241	301	504	1516	1506		
181-	SPCI	11	1400	1400	1833	4002	4172			
182-	SPCI	11	4881	4881	4892					
183-	SPCI	12	1516	1516	1606	1900	4892			
184-	SPCI	12	241	241	301	506	1833	4002		
185-	SPCI	12	4172	4172	4880					
186-	SPINT	1001	THRU	11057						
187-	SPINT	12001	THRU	13028						
188-	SPINT	13001	THRU	14735						
189-	SPINT	14001	THRU	16007						
190-	SPINT	15001	THRU	16012						
191-	SUPDRT	301	1900	1900	1	3624	3			
191-	ENDDATA									

**Appendix B14**  
**INPUT & PLOTS/PHASE 3 ANALYSIS: MODEL II FUSELAGE**  
**SYMMETRIC FREE-FREE ORBITER MODES**

C A S E   C O N T R O L   D E C K   E C H O

CARD	
COUNT	
1	TITLE # PHASE 3 XORBITER FUSFLAGE-SYMM CASEH MODEL 2
2	SUBTITLE # SKINS HALF EFF. LONG. .RSX EFF. TRANS. AT WINGXG#2/3EFF. R
3	MAXLINES # 50000
4	VECTOR # ALL
5	SUBCASE 1 * ORBITER FREE MODES
6	LABEL # 23
7	GROUPS # 23
8	OUTPUT#PLOT#
9	SET 40 # INCLUDE 2200 THRU 2293, 2630 THRU 2647, 2656 THRU 2659, 2706 THRU 2708, 2717, 2699
10	SET 41 # INCLUDE 2600 THRU 2629, 2646 THRU 2655, 2700 THRU 2705
11	SET 42 # INCLUDE 2300 THRU 2432
12	PLOT# CALCOMP 765, 105
13	AXIS #MY, X, Z
14	VIEW # 30, 0, 45, 0, 0, 0
15	MAXIMUM DEFORMATION 5, 0
16	FIND SCALE ORIGIN 40, SET 40
17	PLOT MODAL DEFORMATION 1 THRU 23, SET 40, SHAPE, VECTOR XYZ
18	PLOT MODAL DEFORMATION 1 THRU 23, SET 40, SHAPE, VECTOR XYZ
19	PLOT MODAL DEFORMATION 1 THRU 23, SET 40, SHAPE, VECTOR XYZ
20	BEGIN BULK

23      42

PARAM    TPNAME2    ORBTSP2

ENDDATA

1 4875274 487-227. 0 1.0000000

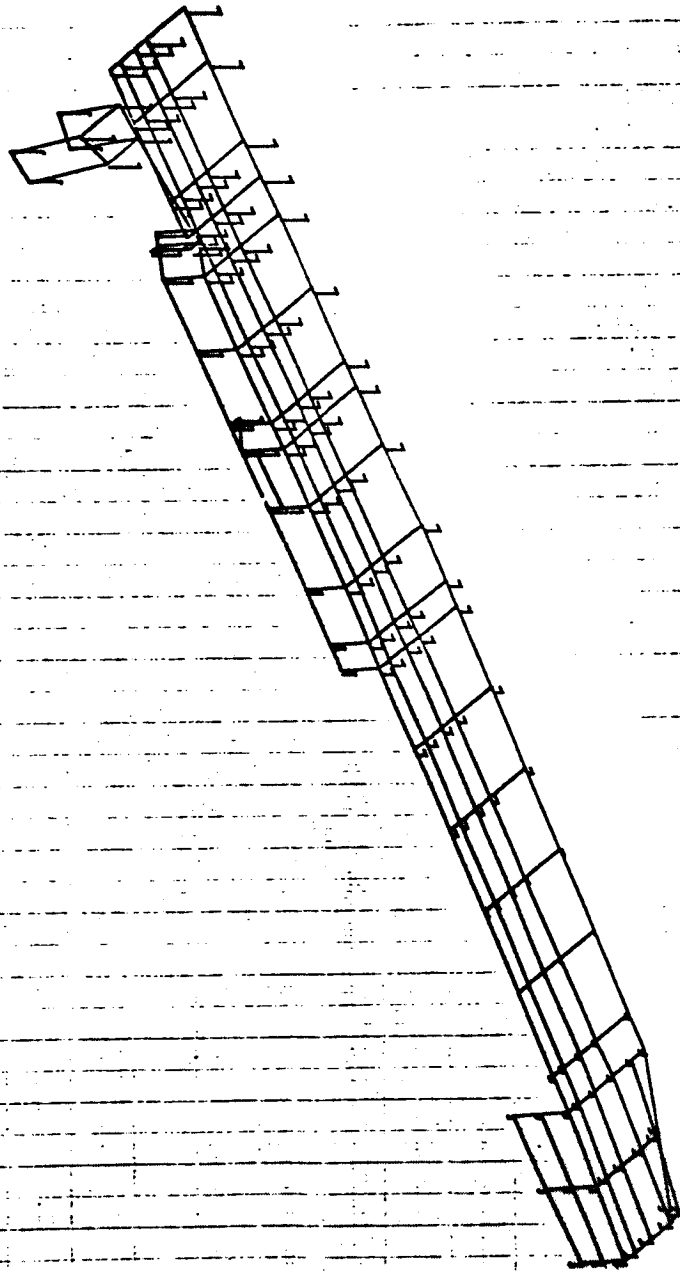
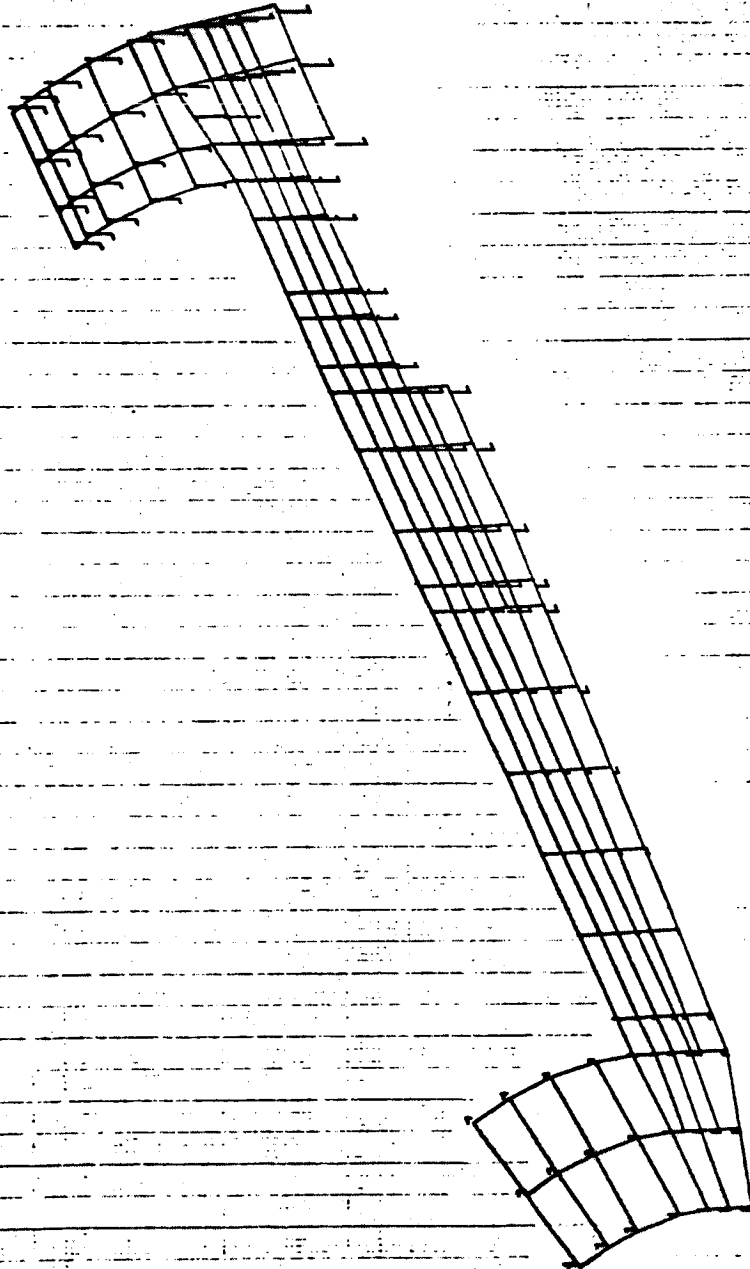


FIGURE 3 ORBITER FUSelage-STIM CASE) MODEL 2  
ORBITER HALF STY. LONG. .85 ( STY. TRANS. AT WING CO-2/30077.)  
ORBITER FUSEE FUSEE CASES  
MEDAL BEFOR. SUBCASE 1 MODEL 1 FREQ. 0.

10/19/74 001-027, 9 J. PROCTING

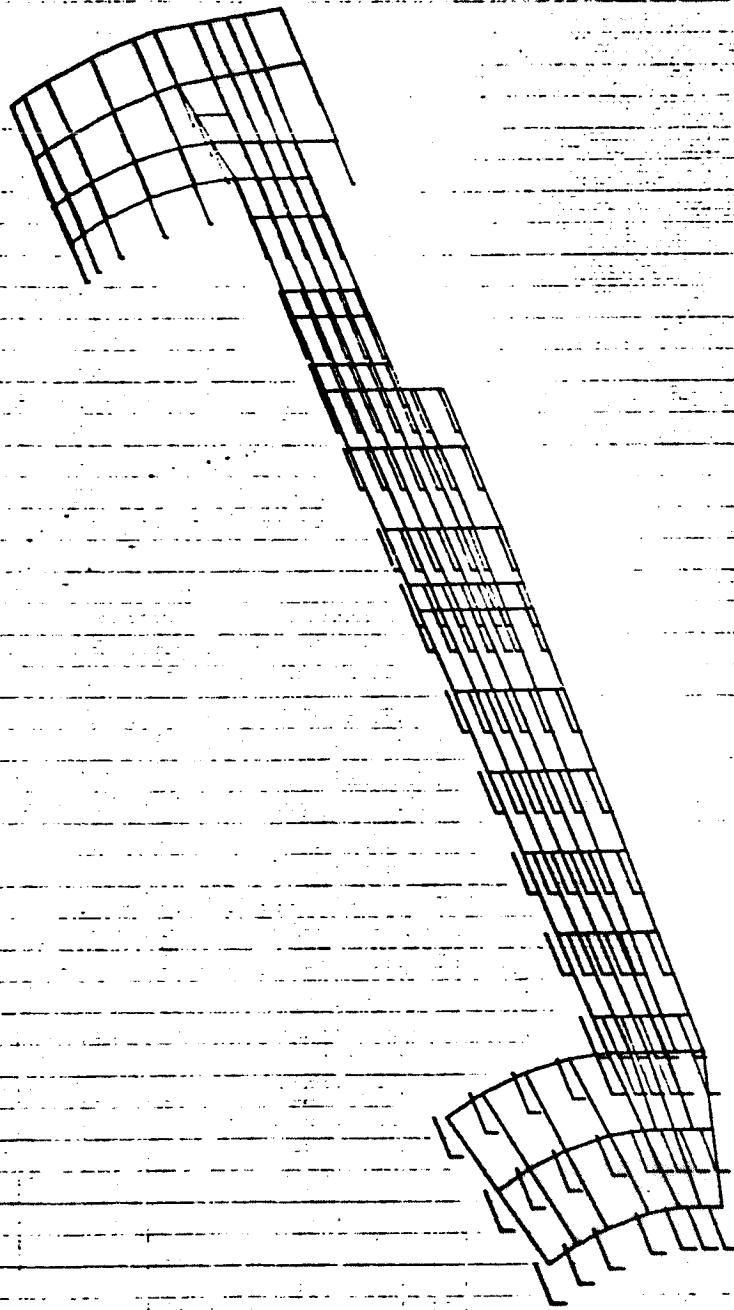


PHASE 3 ORBITER FURGLAGE-SPIN CASE) MODEL 2  
SKINS HALF EFF.LONG..881 EFF.TRANS.AT WING (8-2/8277.)  
ORBITER FREE FREE MOSES  
MODAL DEFOR. SURFACE 1 MODE 1 FREQ. 0.



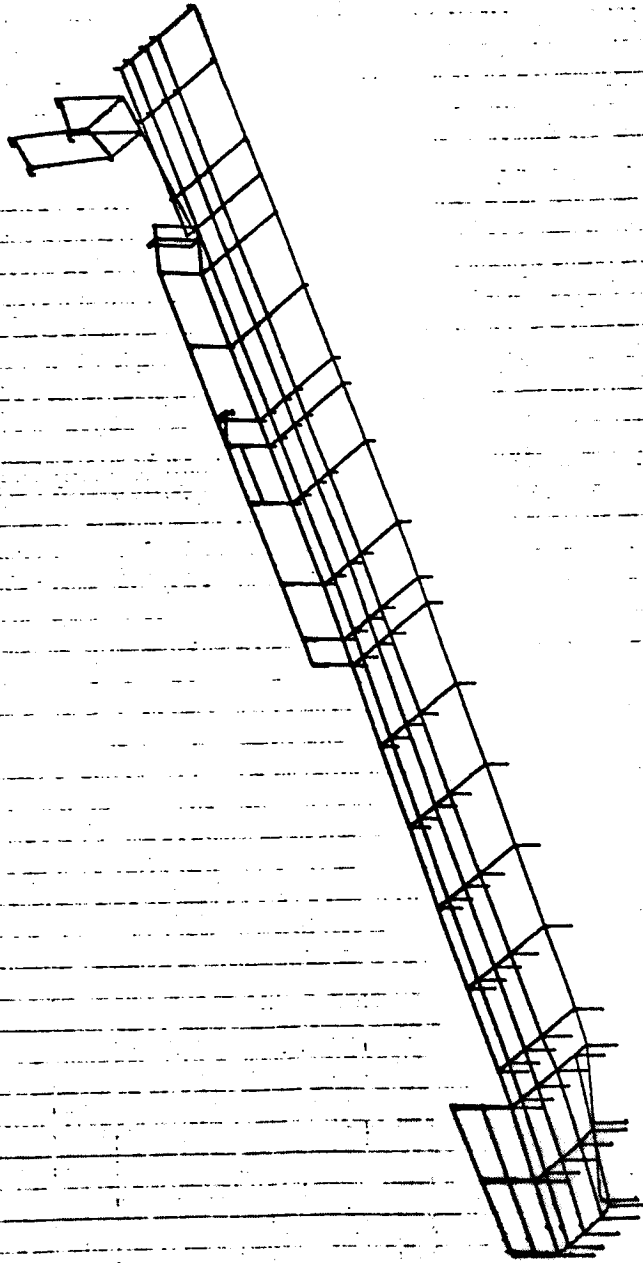


10/19/74 1400-007, 0. 00010000



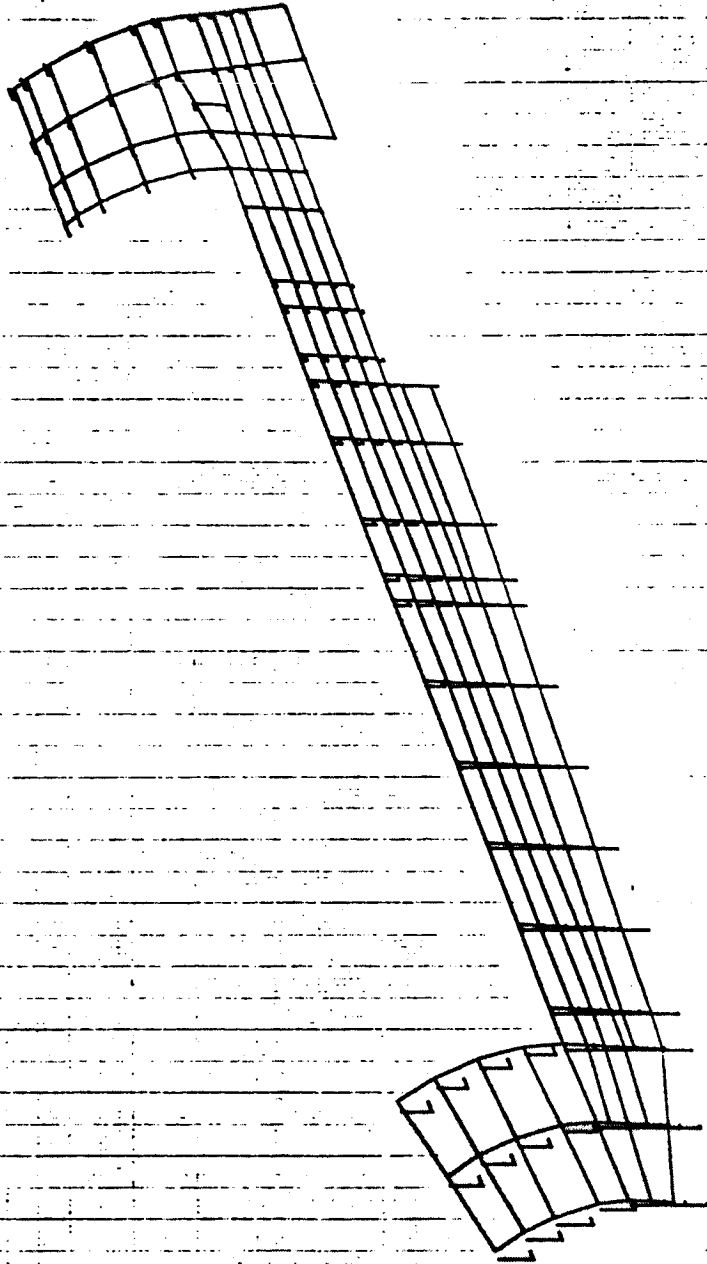
PHASE 2 ORBITER FUELAGG-BYOM GARD MODEL 2  
SKINE HALF EFF LONG 180 EFF TRANS AT WING (0-2/2EFF.)  
CYLINDER FREE FREE W/200  
M. A. DEPT. SUP-AS: 2 MODE 2 PREF. 0

9 10/10/70 . 100-027 . 1.1707010



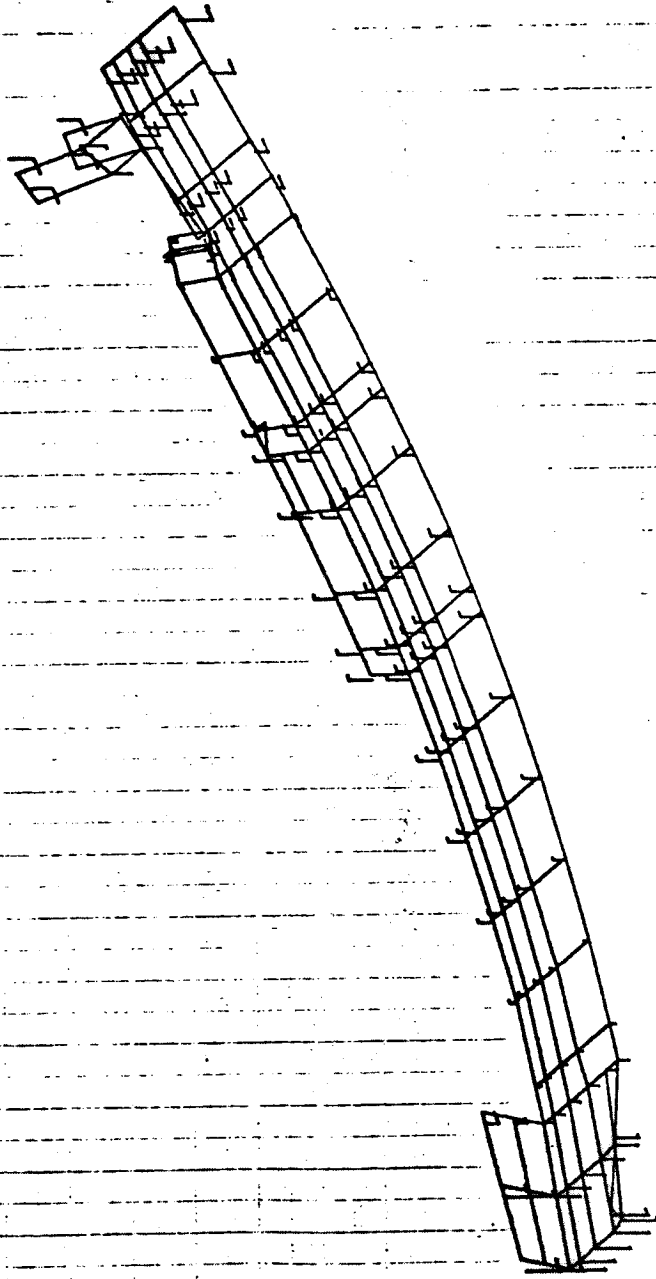
PHASE 3 ORBITER FUSELAGE-SYMM CASE) MODEL 2  
SKIN) HALF EFT. LONG. 0.88 ( EFT. TRANS. AT WING (0.2/0.077.)  
ORBITER FREE FREE MODES  
MODAL DEFOR. SUBCASE 3 MODE 3 FREQ. 0.

0 08/10/74 1000-007, 0 1.17007010



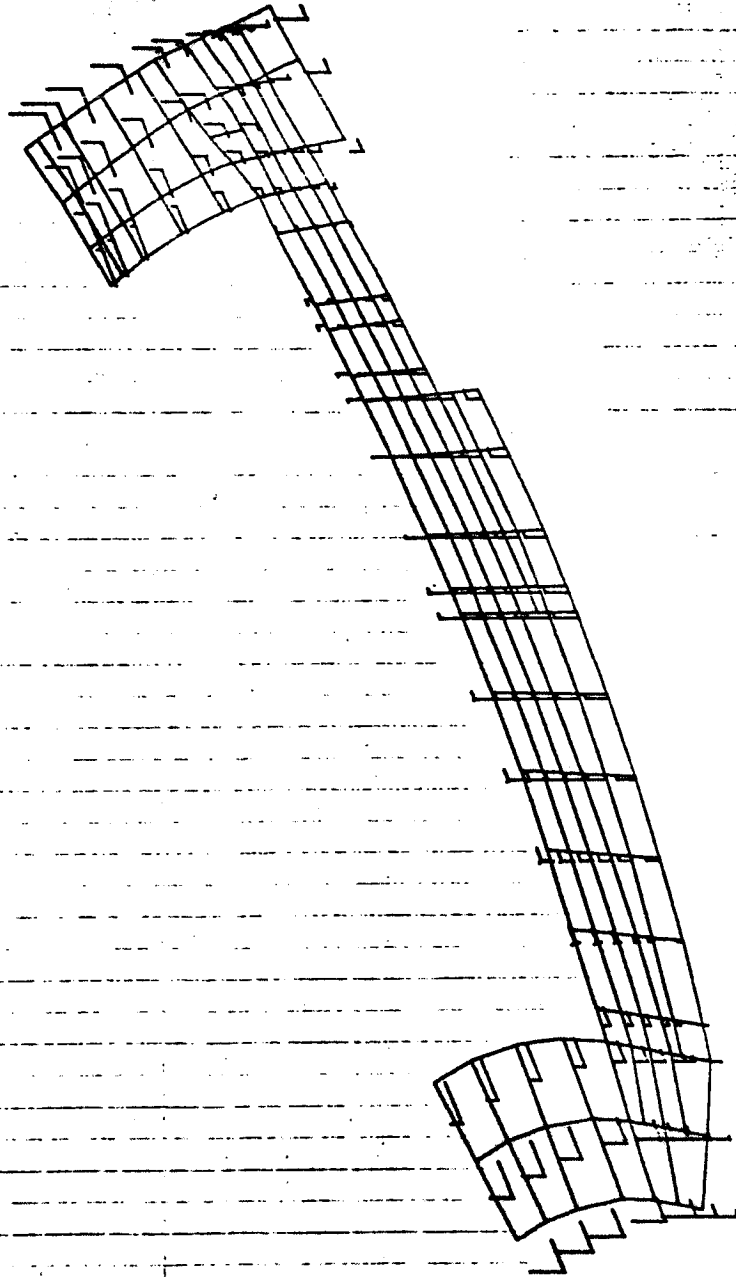
PHASE 3 ORBITER FORELAME--BYM GARE) MODEL 2  
BLIND HALF STP.LONG., 88 ( EFF. TRANS. AT WING (0-0/0EFF.)  
ORBITER FREE FREE MODES  
MODAL ORDER, SUBCASE 3 MODE 3 FREQ. 0.

10/19/74 MAN-DEF. 0 1.01901470



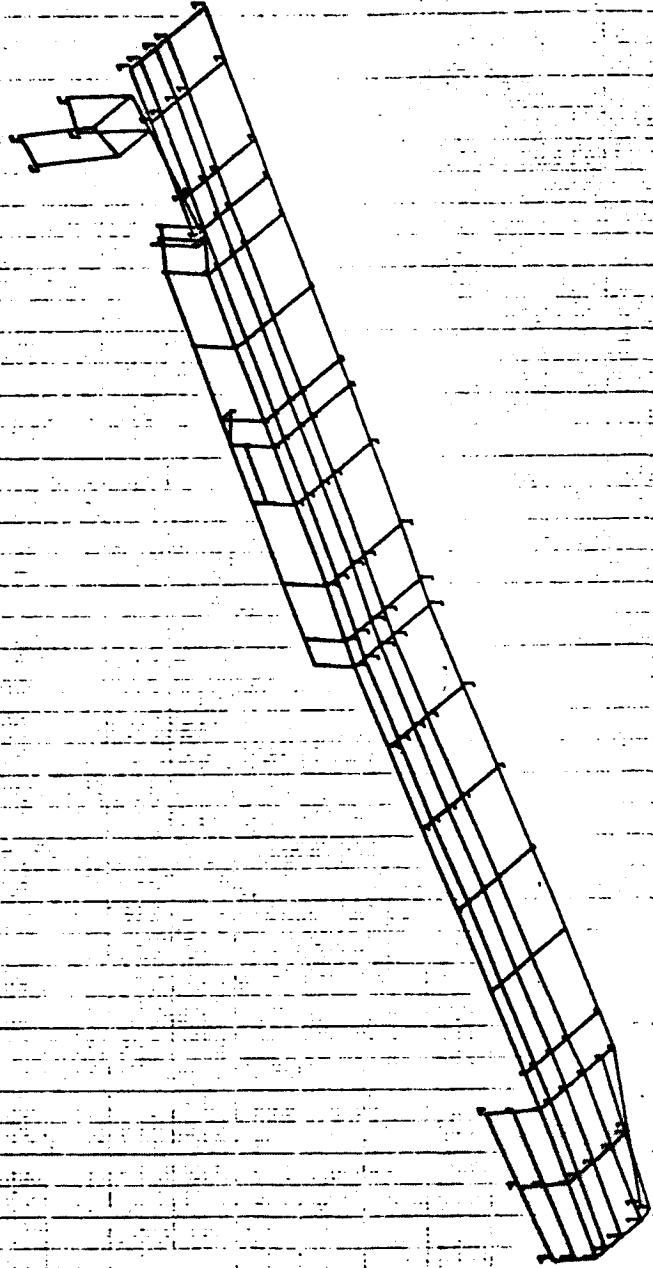
PHASE 3 (ORBITER FUELAGE-SYRM CASE) MODE 2  
SKING HALF EFF.LONG.05 (EFF.TRANS.AT WING 08-2/90FF.)  
ORBITER FREE FREE MODES  
MODAL DEFOR. BURSCASE 4 MODE 4 FREQ. 44.11371

4 10/10/74 MAN-REF. # 1.01891470



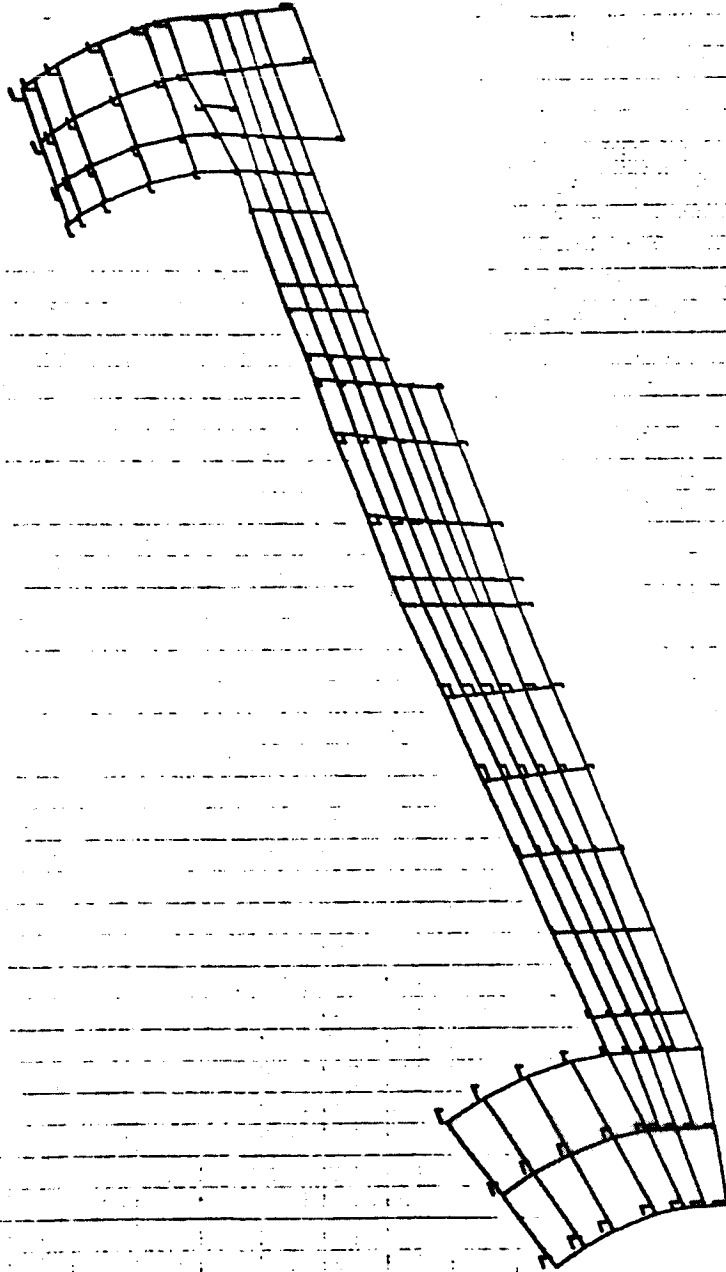
PHASE 3 COMPUTER PLOT/ARG-ONAM CASE) MODEL B  
SKINE -ALP EFF. LHM. .08 : EFF. TRANS. AT WING (0-0.2/REF.1)  
ORBIT'S FREE FREE FOR \*8  
MEDIA DEPOS. SUBCAR. MONO 4 FREE 14 11731

10/10/74 444-007. 8.0171041



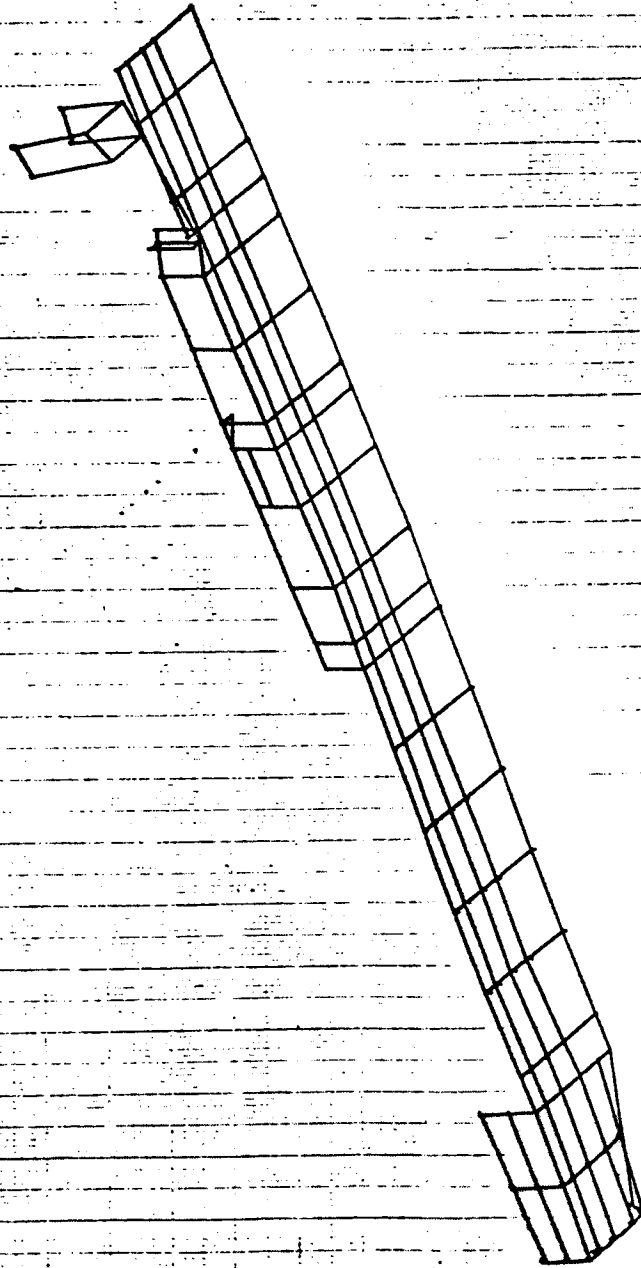
PHASE 3 ORBITER PURCHASE-574M CASE) MODEL 2  
BEING HALF E77.LONG.98 ( E77.TRANS.AT WING 10-8/1077.)  
ORBITER FREE FREE WINGS  
LOCAL DC/CR. SUBCASE 8 MODEL 8 FREQ. 46.33890

18/15/74 MM-227. 0.0110421



PHASE 3 CRIBITER FUSELAGE-SYMM CASE) MODEL 2  
BKING HALF EFF. LONG. .88 ( EFF. TRANS. AT WING (0.8/3577. )  
CRIBITER FREE FREE MODES  
MODAL ORDER. SURFACE 8 MODE 8 FREQ. 46.33890

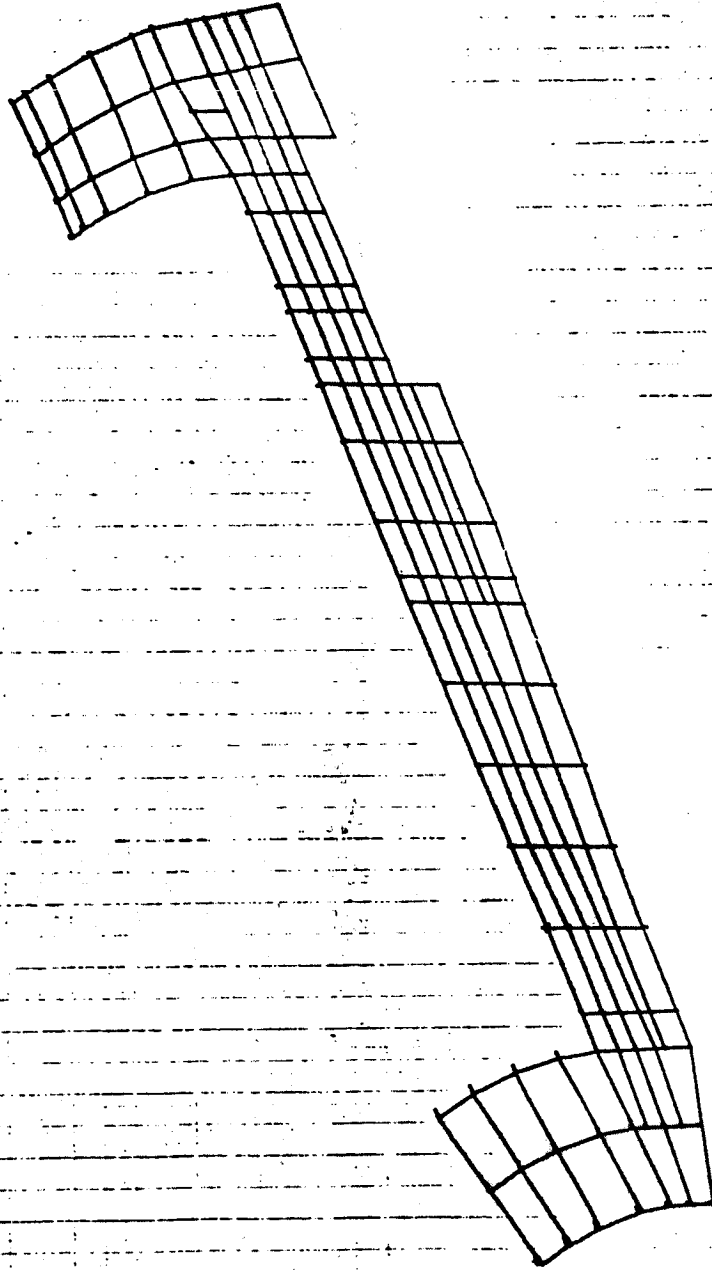
10/18/74 MAX-007. \* 0.0000000



PHASE 3 ORBITER FUEL/ASC-SYMM CASE) MODEL 2  
SKINS HALF EFF. LOW. .85 ( EFF. TRANS. AT WING (8-2/3EFF.)  
ORBITER FREE FREE MODES  
MODAL DEFOR. SUBCASE 6 MODE 6 FREQ. 51.28222

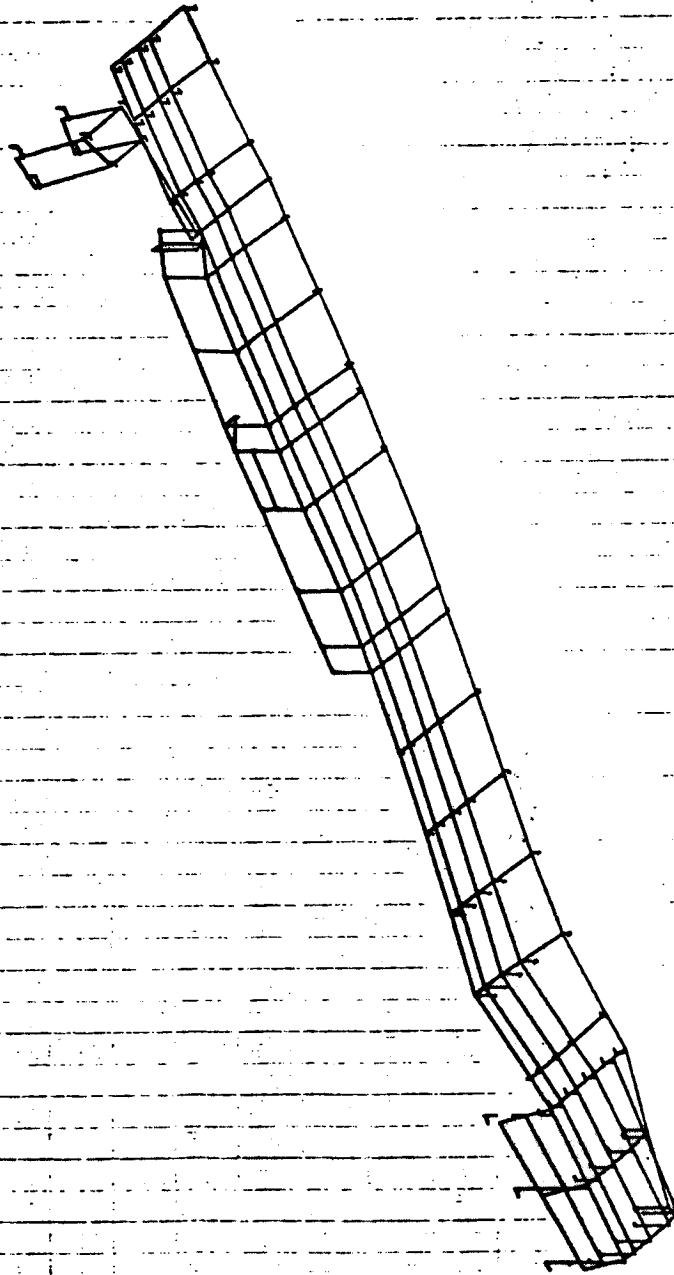


18/11/74 1001-007. 0. 00000000



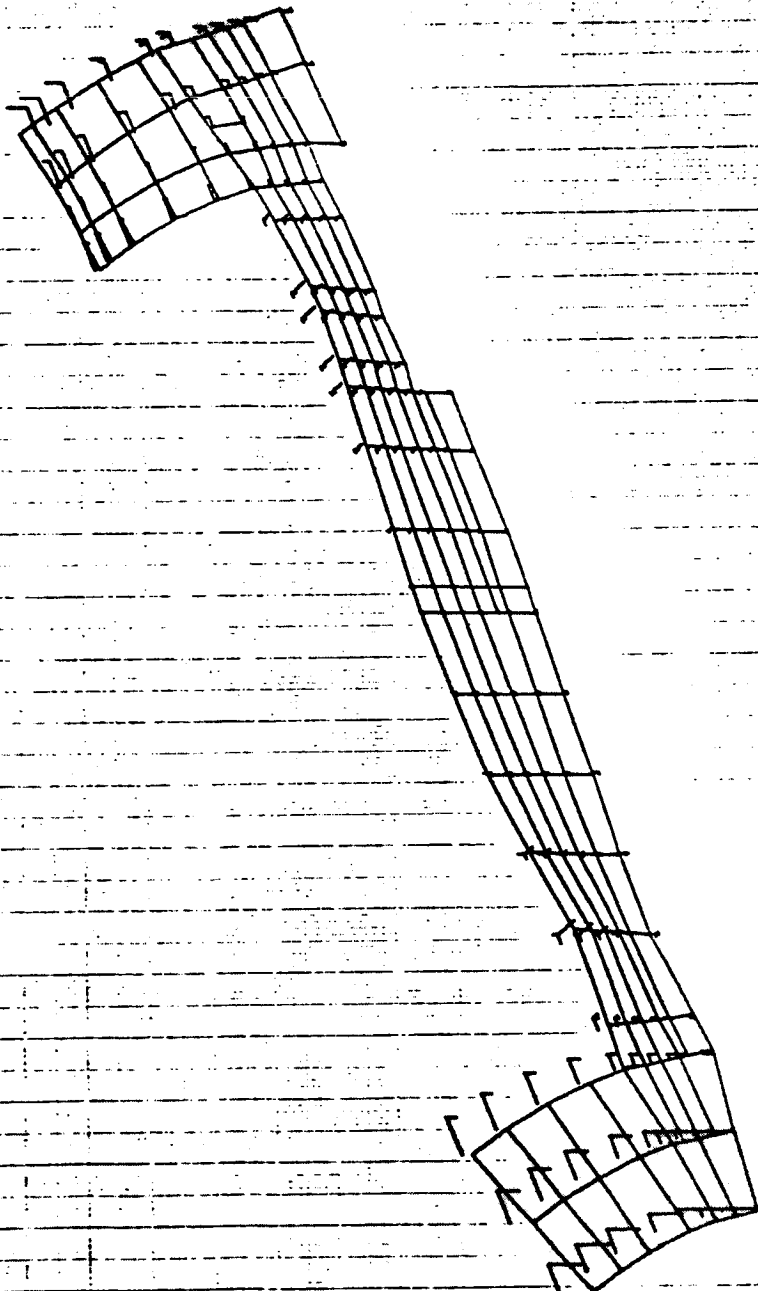
PHASE 0 ORBITER FUEL/AIR-0Y00 CASE) MODEL 0  
SKINS HALF EFF.LONG..88 ( EFF.TRIANG.AT WING 0-01/0077.)  
ORBITER FREE FREE MORSE  
MODAL DCTOR. SUBCASE 0 MODE 0 FREQ. 01.20222

10/18/76 1000-007. 0.0070-000



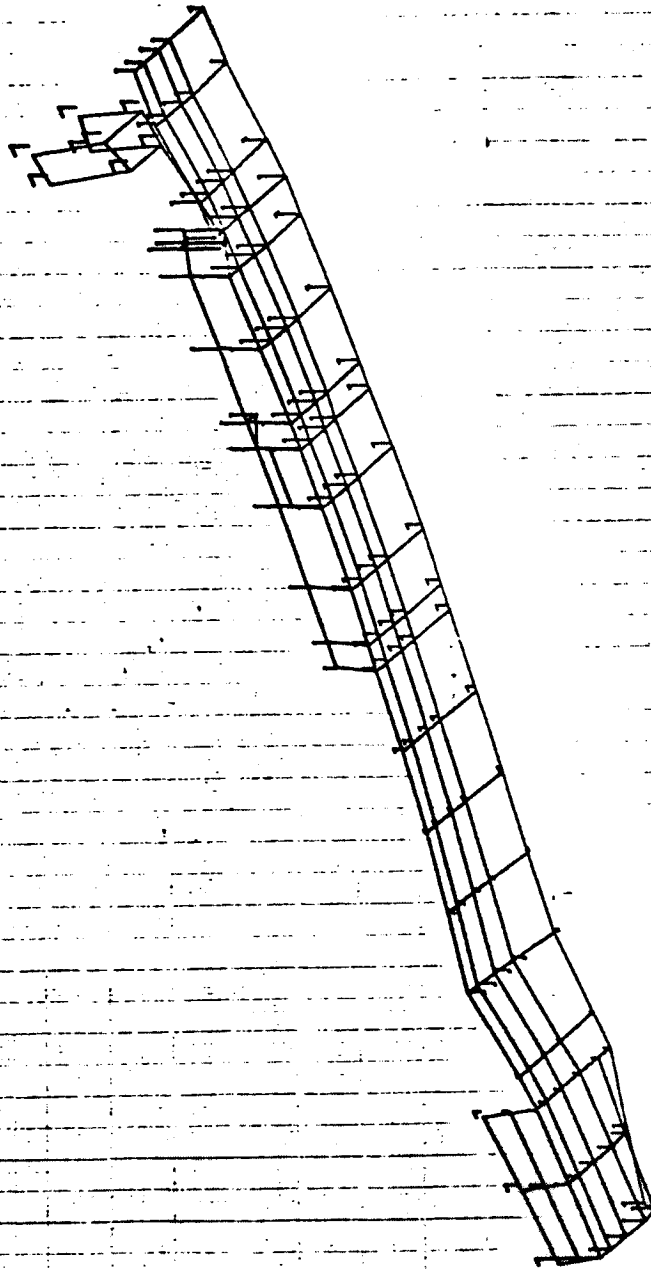
PHASE 9 ORBITER PURCHASE-SYMA CASE MODEL 2  
ORBITER HALF 877-1000.00 ( 877-TRANS.AT WING 68-2/9007. )  
ORBITER FREE PRICE MODEL 9  
MODEL DEFER. PURCHASE 7 MODEL 7 FREQ. 84.42372

1871974 -- 100-007, 0.0070-000



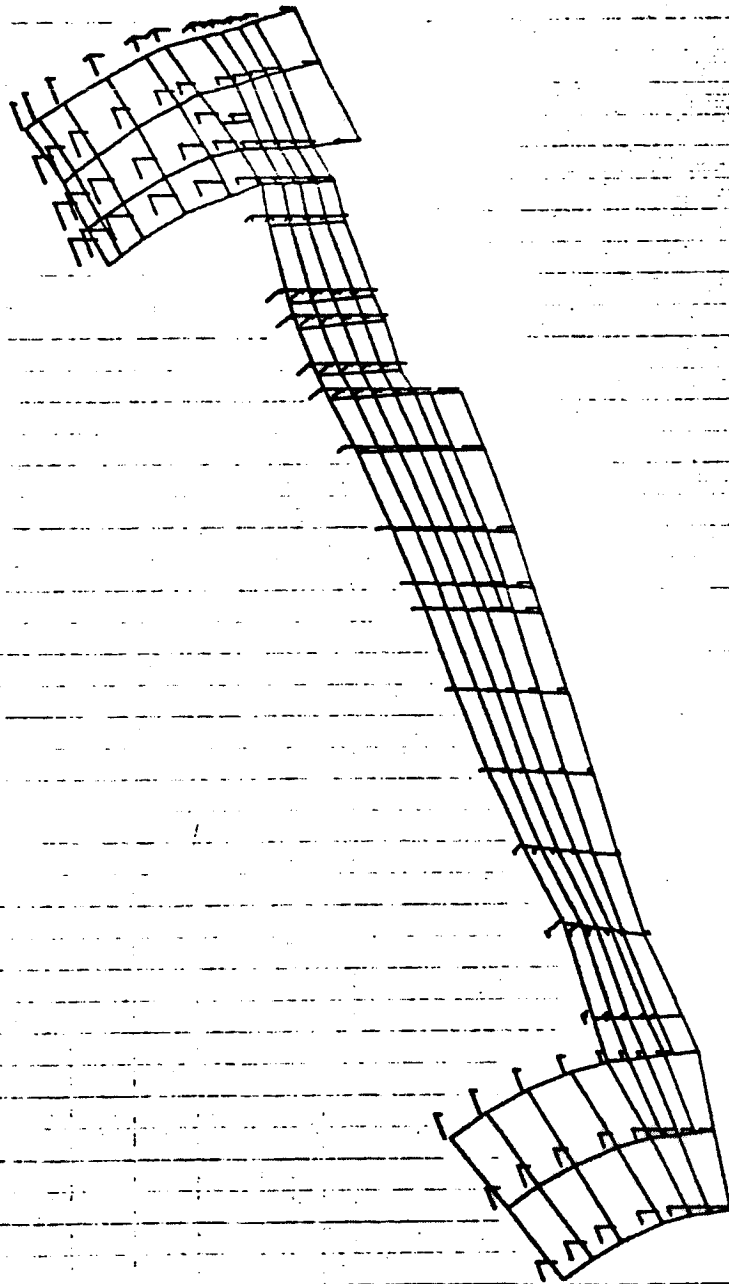
PHASE 3 ORBITER FUEL/ARE-PYRA CASE) MODEL 2  
ORBITER FREE FREE MODES  
MODAL SEFOR. SUBCASE 7 MODE 7 FREQ. 84.42372

78 18/13/74 100-827. 0. 0000180



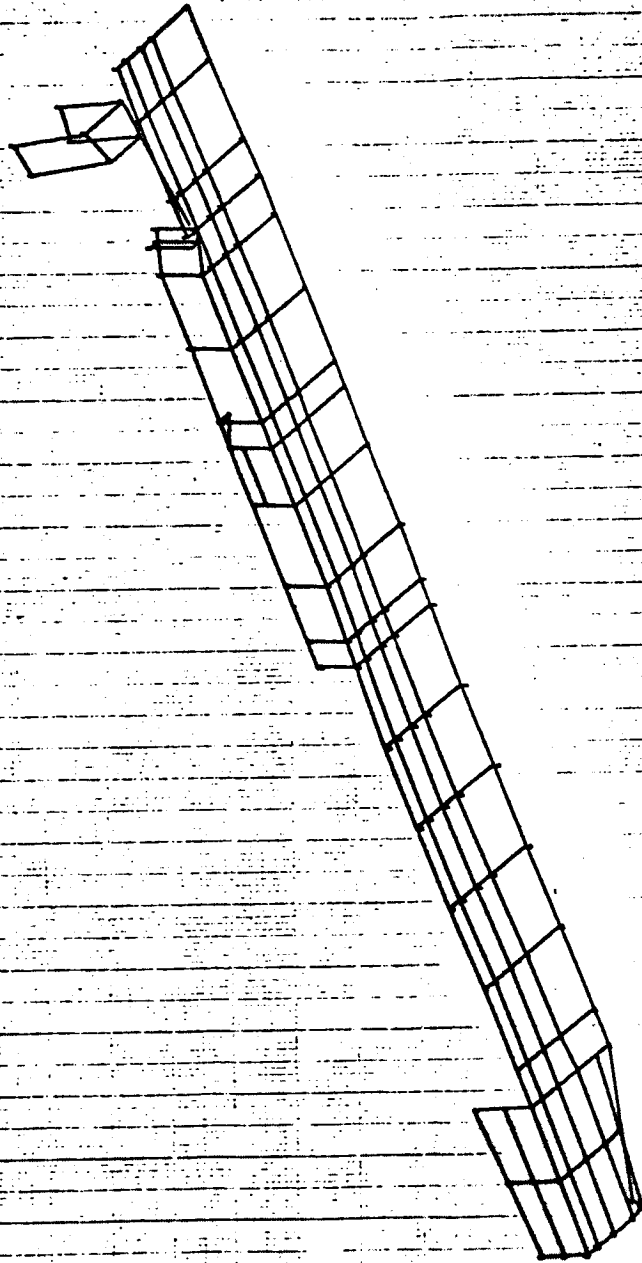
PHASE 2 CRIBITER FUSLAGE-87M CASE) MODEL 2  
SKIN HALF EFF. LONG. 88 ( EFF. TRANS. AT WING (0-2/2EFF.)  
CRIBITER FREE FREE MODES  
MODAL ORDER. SUBCASE 8 MODE 6 FREQ. 82.71864

8 10/15/74 100-807, 0 0, 0000180

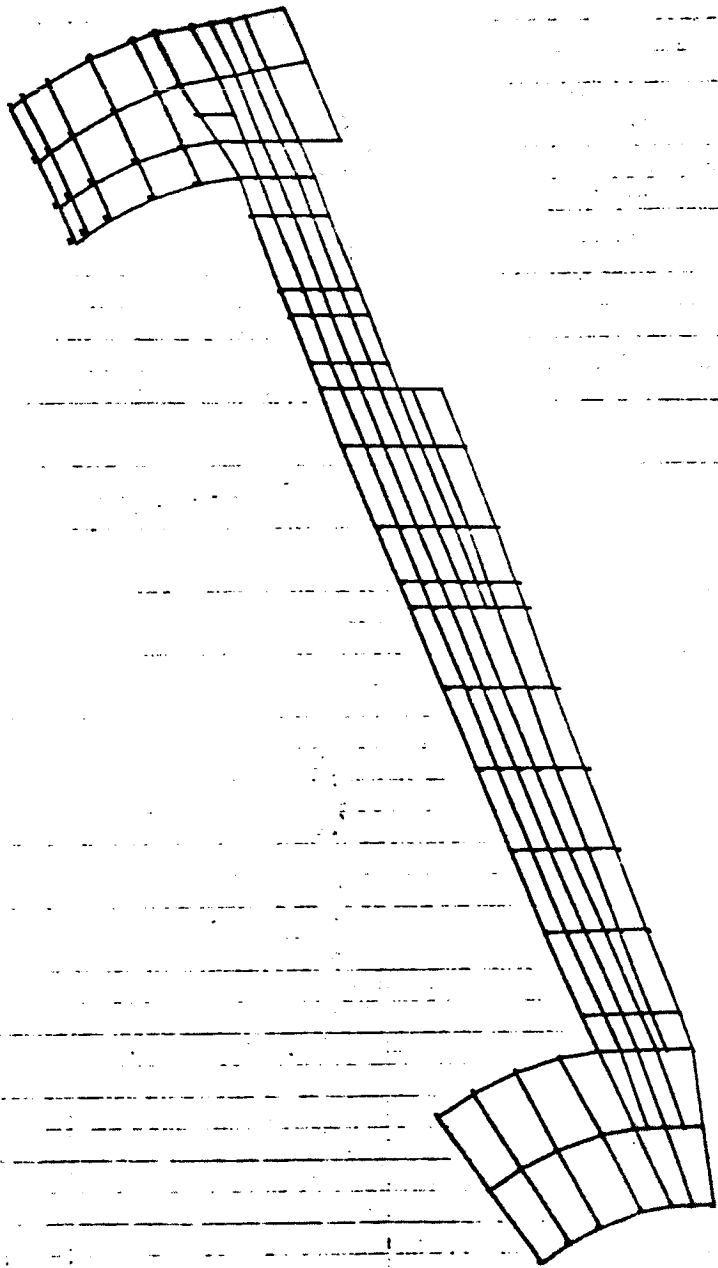


PHASE 0 ORBITER FUSELAGE-87001 CASE0 MODEL 0  
SKINS HALF EFF. LONG. 00 ( EFF. TRANS. AT WING (0=0/90TY.)  
ORBITER PRCE PRCE HORSE  
MODAL DEFOR. BUSCASE 0 MODEL 0 FREQ. 02.71004

10/10/74 1000-027, P. 0.44100002

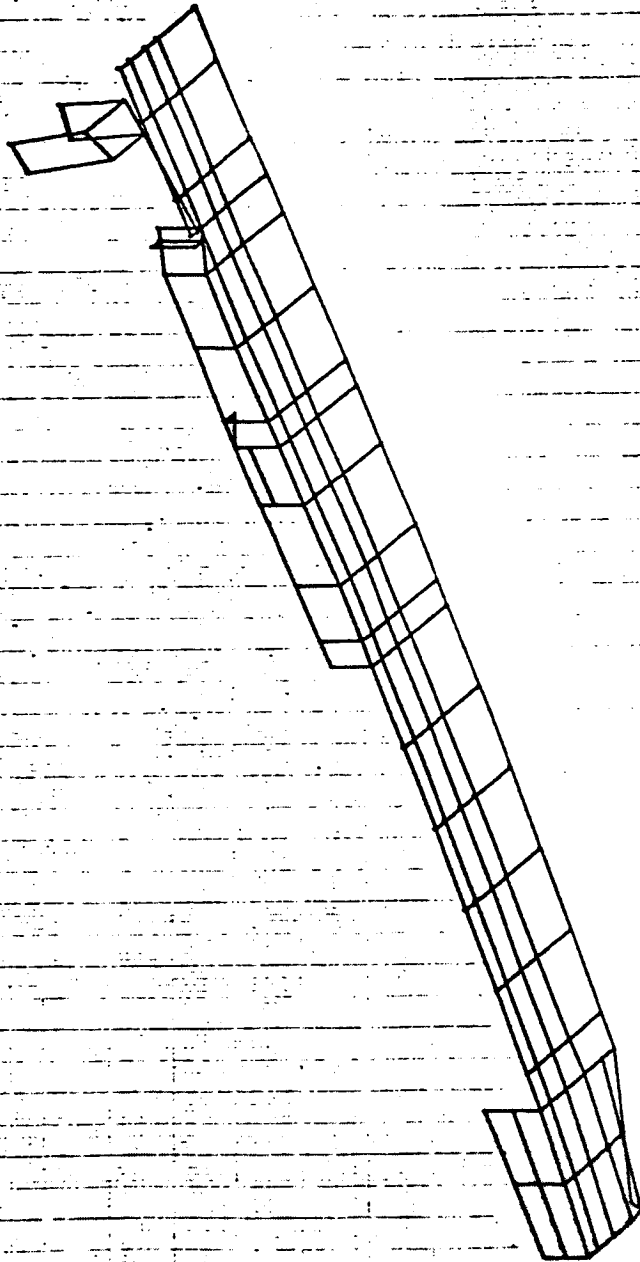


PHASE 9 ORBITER FUNDAMENTAL CASE) MODE 9  
SKIN HALF EXT. LONG. 00 ( EXT. TRANS. AT WIND 0-2/DEFT.)  
ORBITER FREE FREE MODES  
MODAL DEFOR. SUBCASE 9 MODE 9 FREQ. 00.00001



PHASE 9 CARRIER FUSelage-8700M CASE) MODEL 2  
BEING HALF EFF.LONG..881 EFF. TRANS. AT WING(8-82/PETT.)  
CARRIER PRICE FREE MODES  
MODAL DETOR. SUBCASE 9 MODC 9 FREQ. 88.88881

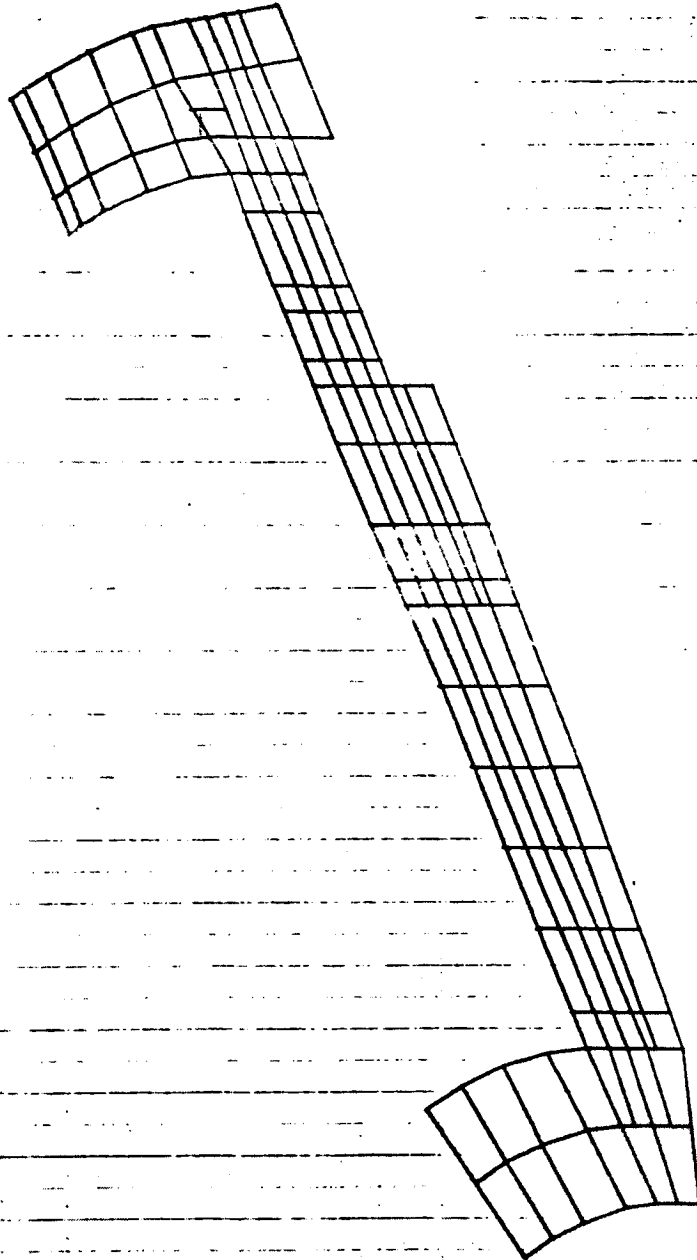
10 10/10/74 MMW-007. = 0.00010000



PHASE 0 CRIBITER PURCHASE-RTM0 CASE1 MODEL 2  
CRIBING HALF EFF.LONG.081 EFF.TRANS.AT WING (0-5/2027.)  
CRIBITER FREE PRICE MODES  
MODAL ORDER. PURCHASE 10 MODE 10 FREQ. 79.71948



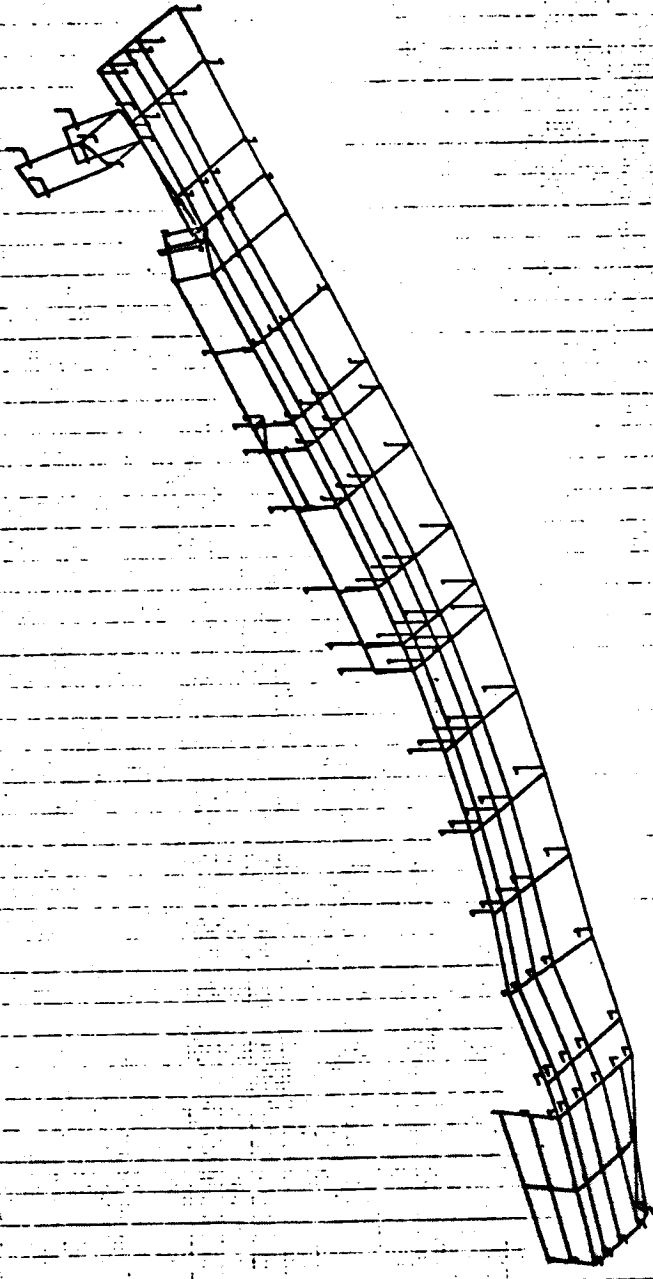
18 10/1 0/74 443-007 - 0.000 10000



PHASE 3 CONCRETE FURGLARE-STAM CASES W/DC. 2  
SKIMM HALF EFF. L.O.B. 1.881 EFF. TRANS. AT WIND-0.2/0.877  
CONCRETE FREE FREE 2.000  
W/01 ORDER PURCHASE 10 W/01 10 FROM 76.71048

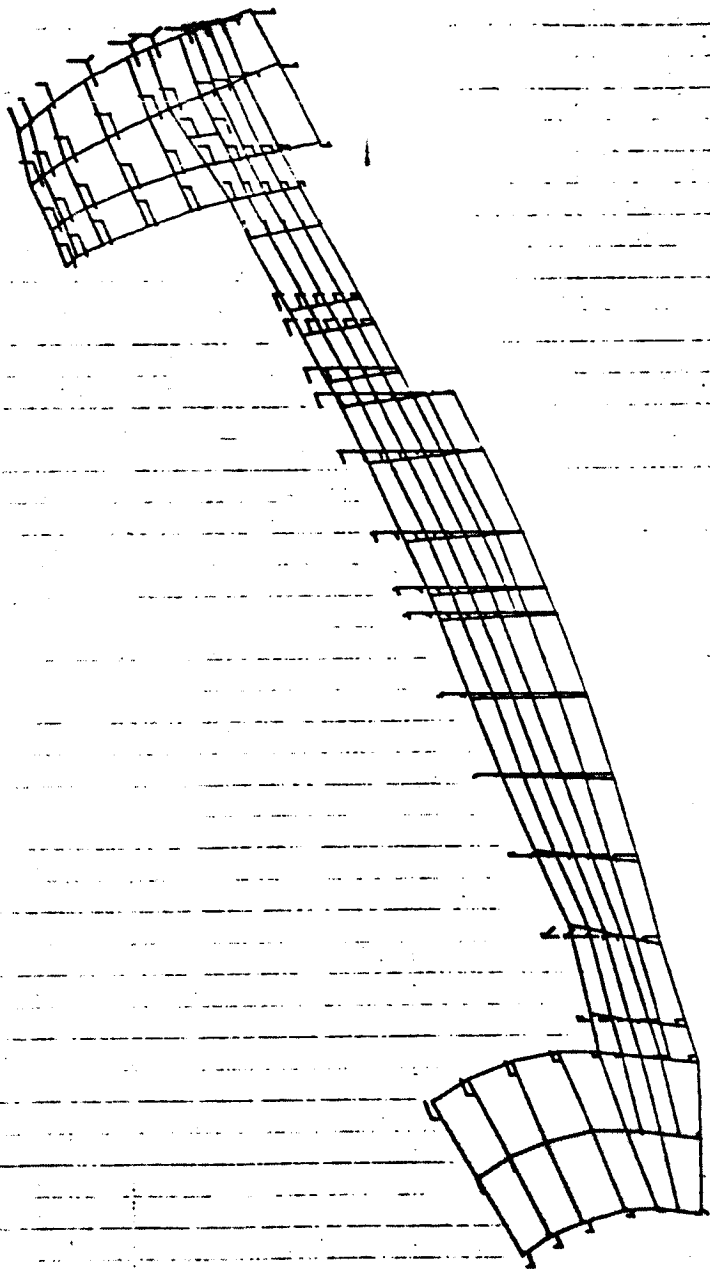
11

11 10/10/74 440-007, 0 S. STATION



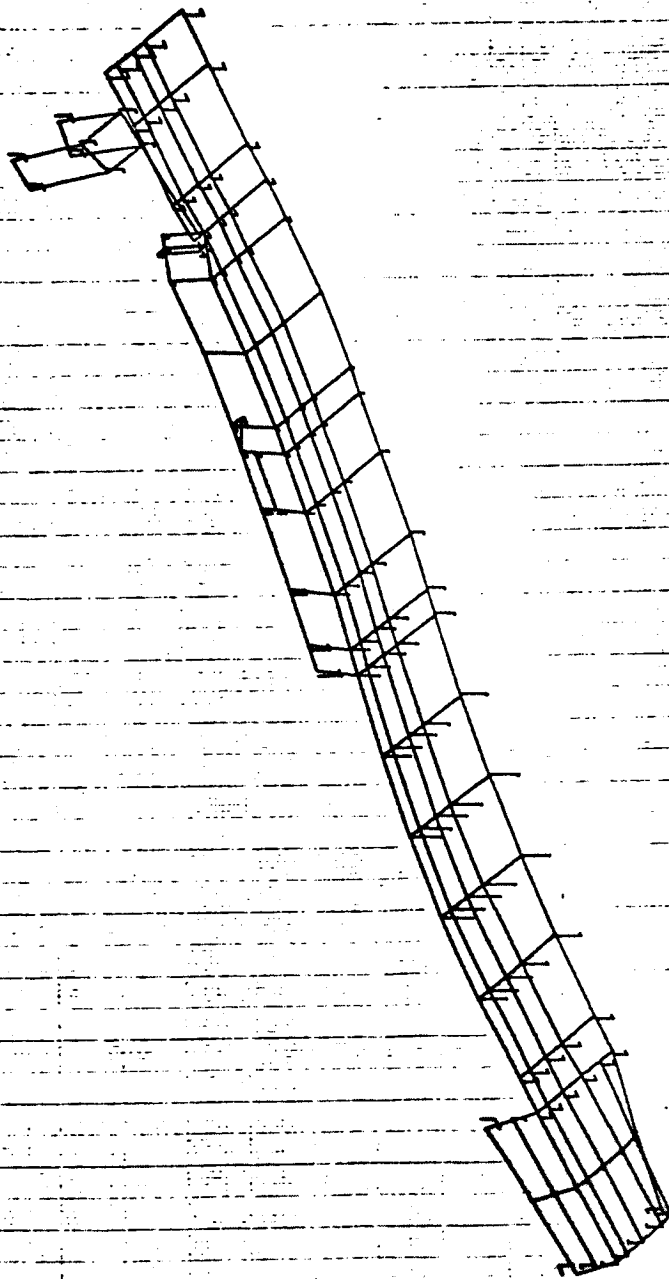
PHASE 2 CRIBITER PURCHASE (YAM CASE) MODEL 8  
 BEING HALF EFF. LONG. 88 ( EFF. TRANS. AT WING 10-2/80FF.)  
 CRIBITER FREE FREE MODES  
 MODAL OCTOR. SURFACE 11 MODE 11 FREQ. 03.11106

10/10/74 MAN-REF. "O. BTONIERS"



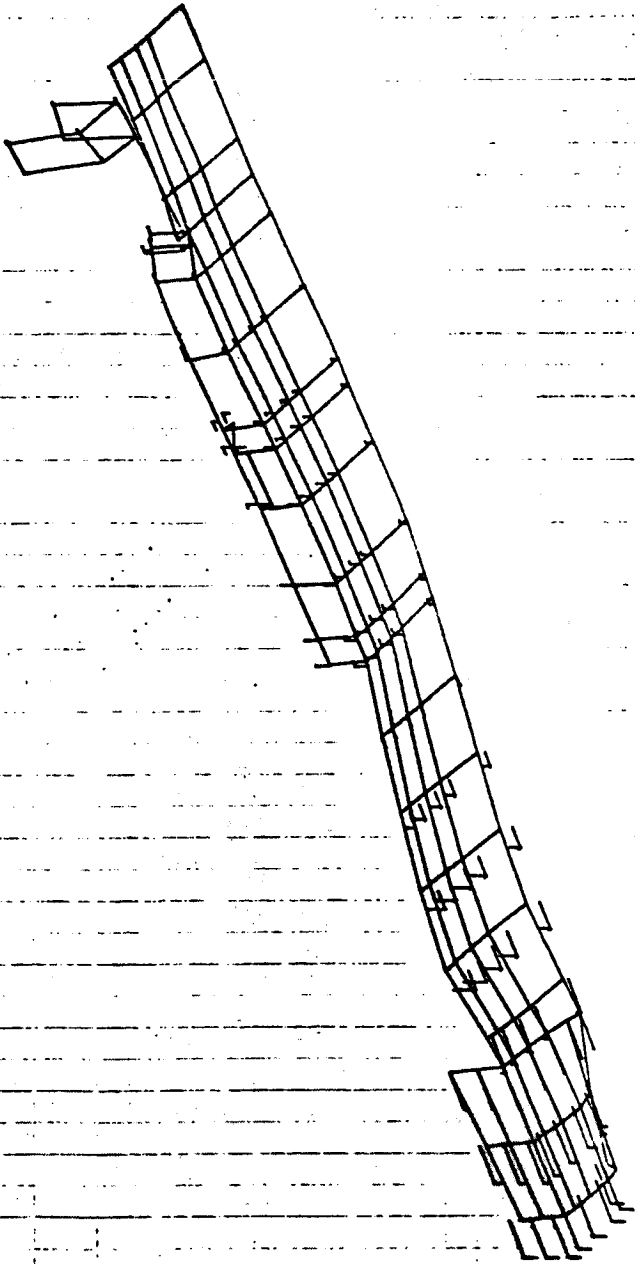
PHASE 9 COBITER PURCHASE-DYING CASE MODEL 2  
SKING HALF EFF.LONG./88 ( EFF. TRANS. AT WING (8-8/8877.)  
COBITER FREE FREE MOKE  
MEDAL DEFOR. SURFACE 11 MODE 11 PRED. 83.11188

18/18/74 WAX-007. • B. 94110700



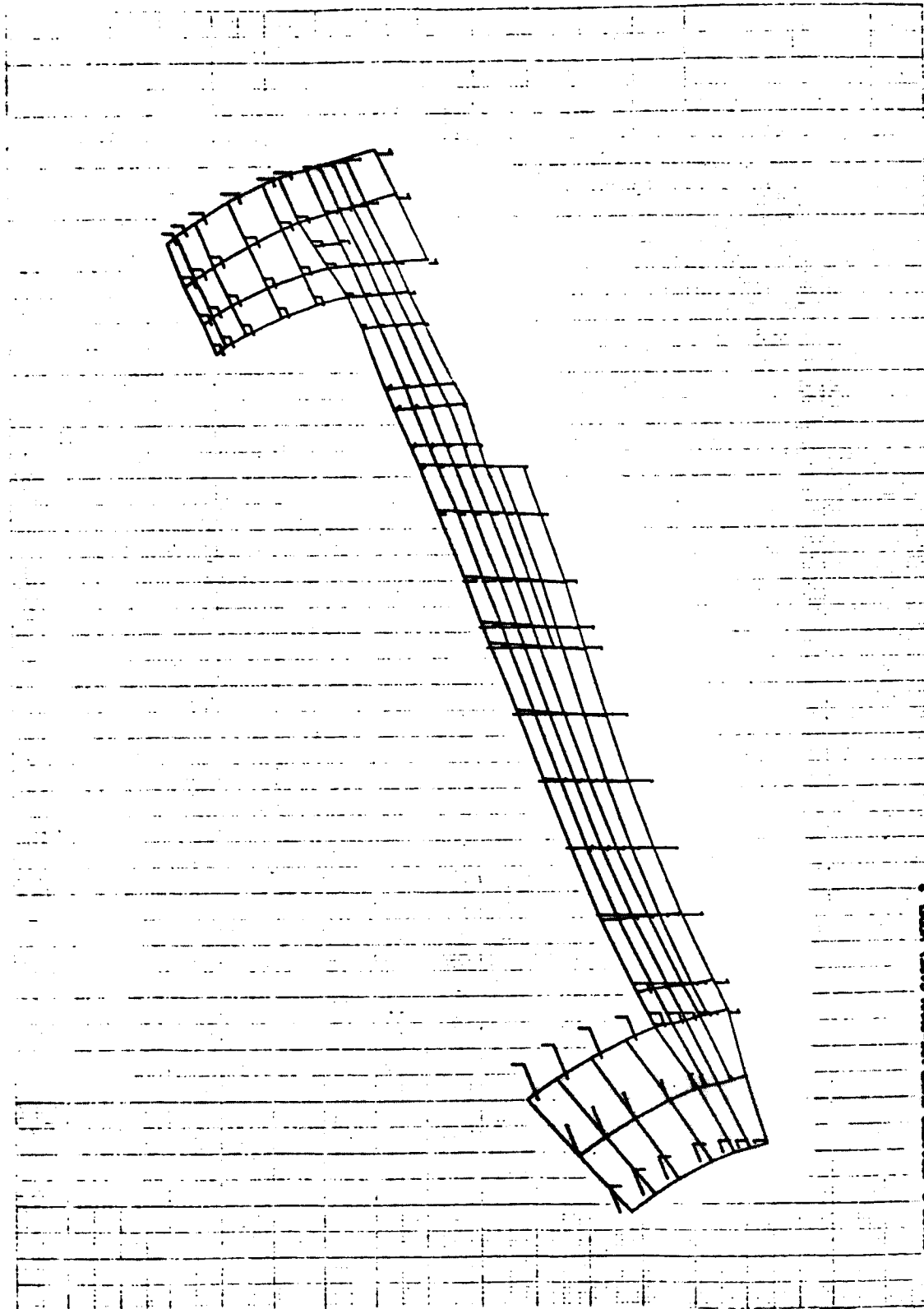
PHASE 3 CRIBITER FUSELAGE-0704 CASE) MODEL 2  
 BKING HALF EFF.LONG.785 ( EFF. TRANS.AT WING (0-2/SEFF.)  
 CRIBITER FREE FREE MODES  
 MODAL OCFOR. SURFACE 12 MODE 12 FREQ. 104.7841

18 10/18/74 1001-007, 0 1, 0000700



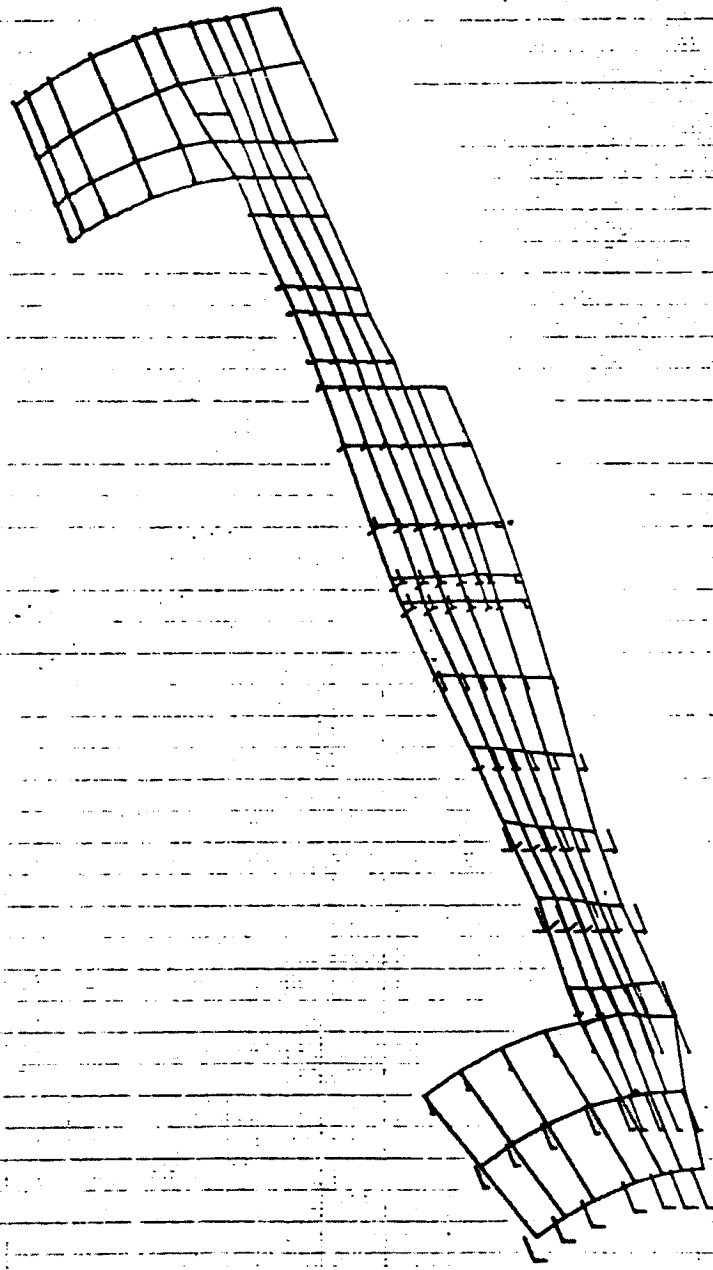
PHASE 3 ORBITER FUSELAGE-0YAM CASE) MODEL 2  
BEING HALF EFF. LONG. .88 ( EFF. TRANS. AT WING (0.8/0.877.1)  
ORBITER FREE FREE MODES  
MODAL DETER. SURFACE 13 MODE 13 FREQ. 116.6378

12 10/15/74 1000-007.0 0.4110700



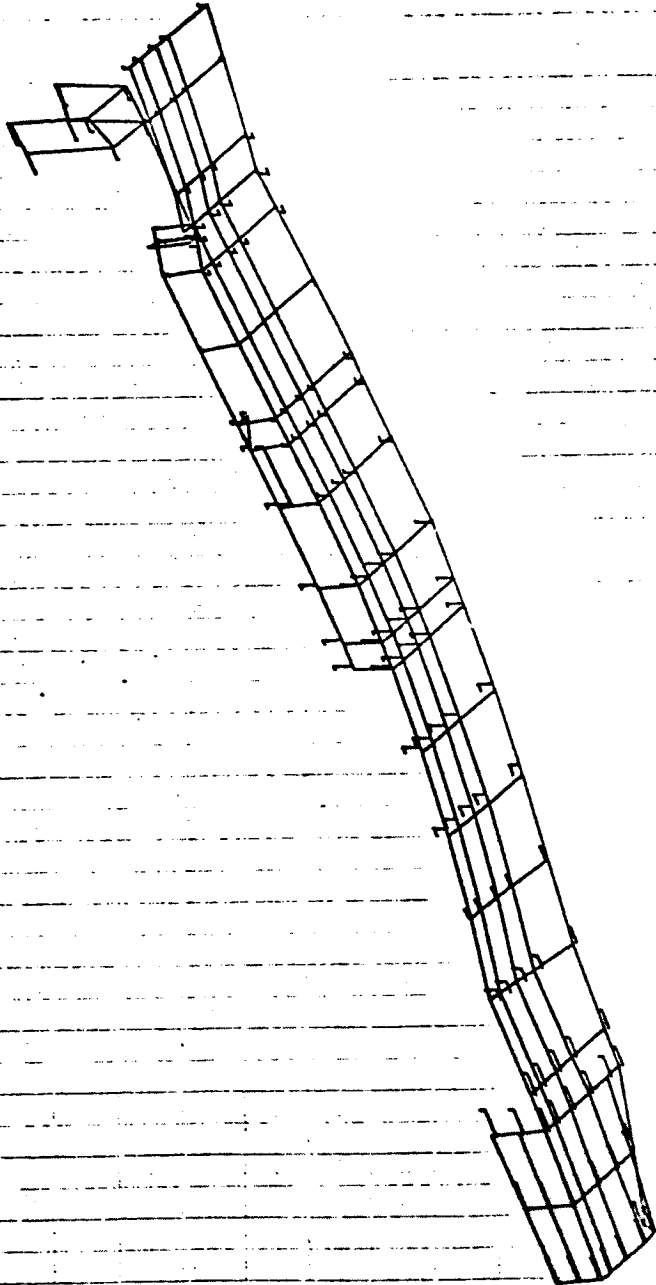
PHASE 3 CRIBITER FURGLARE-0700 CASE? MODEL 2  
 SKING HALF EFF. LAMB. .001 EFF. TRANS. AT WING 00-02/0077.  
 CRIBITER FREE FREE MOSES  
 MODAL DEFORM. SURFACE 12 MODE 12 FREQ. 104.7841

10/19/74 MMS-827. = 1.0882760



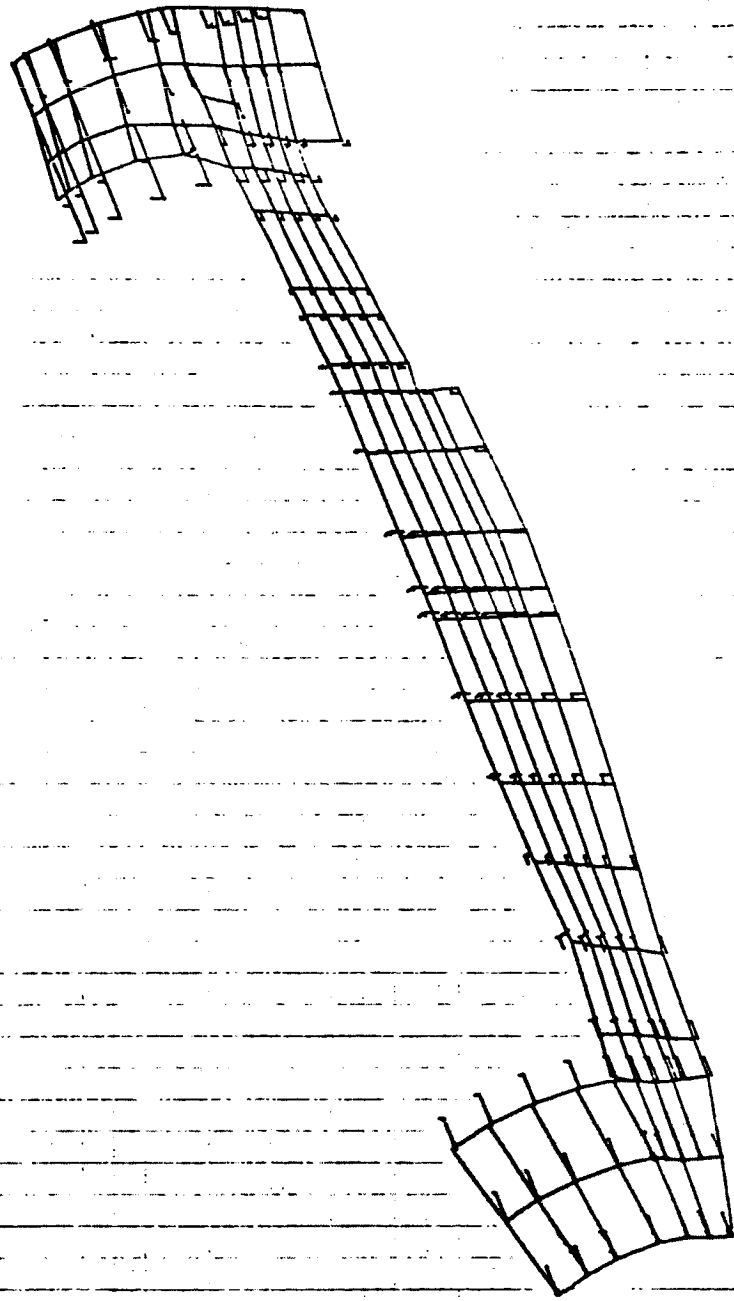
PHASE 3 ORBITER FUSelage-SYM CASE) MODEL 2  
 SKINS HALF EFF. LONG. 88% EFF. TRANS. AT WING (0-2/3877.)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 13 MODE 13 FREQ. 116.8276

10/18/74 MSX-007. - D. 00410-002



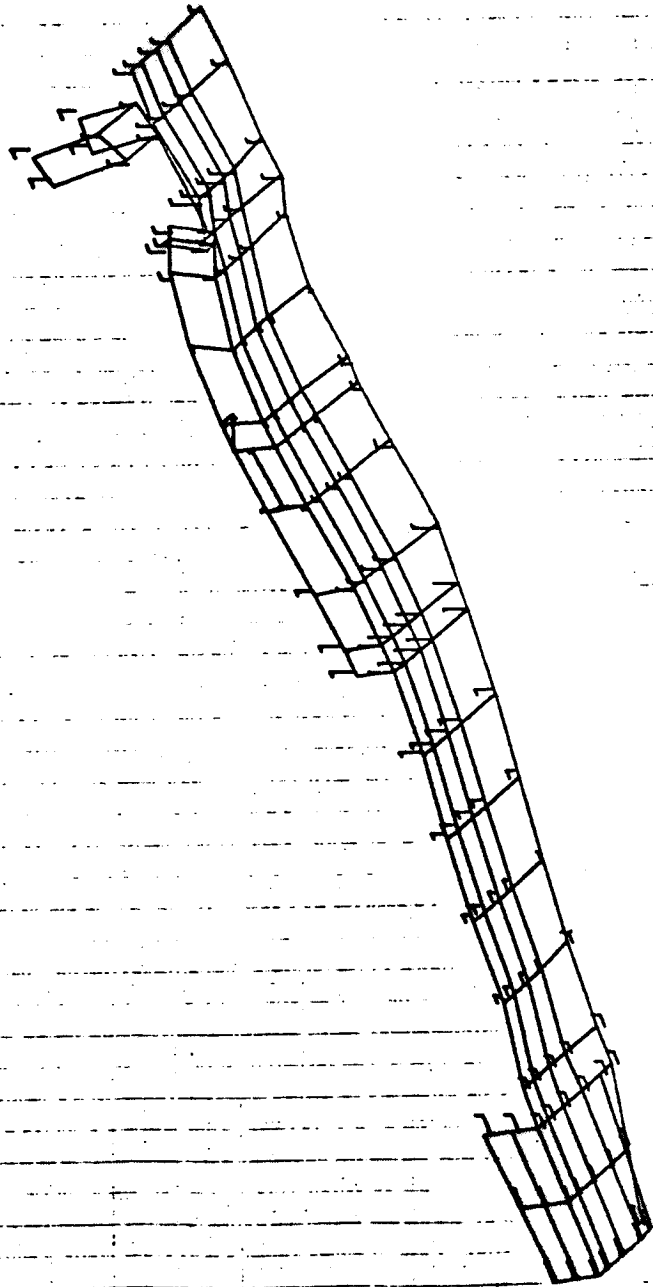
PHASE B (ORBITER PUBLIAC-SYMI CASE) MODEL 2  
 BEING HALF EFF. LONG. 88 (EFF. TRANS. AT WING (8-2/3077.))  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 14 MODE 14 FREQ. 122.2084





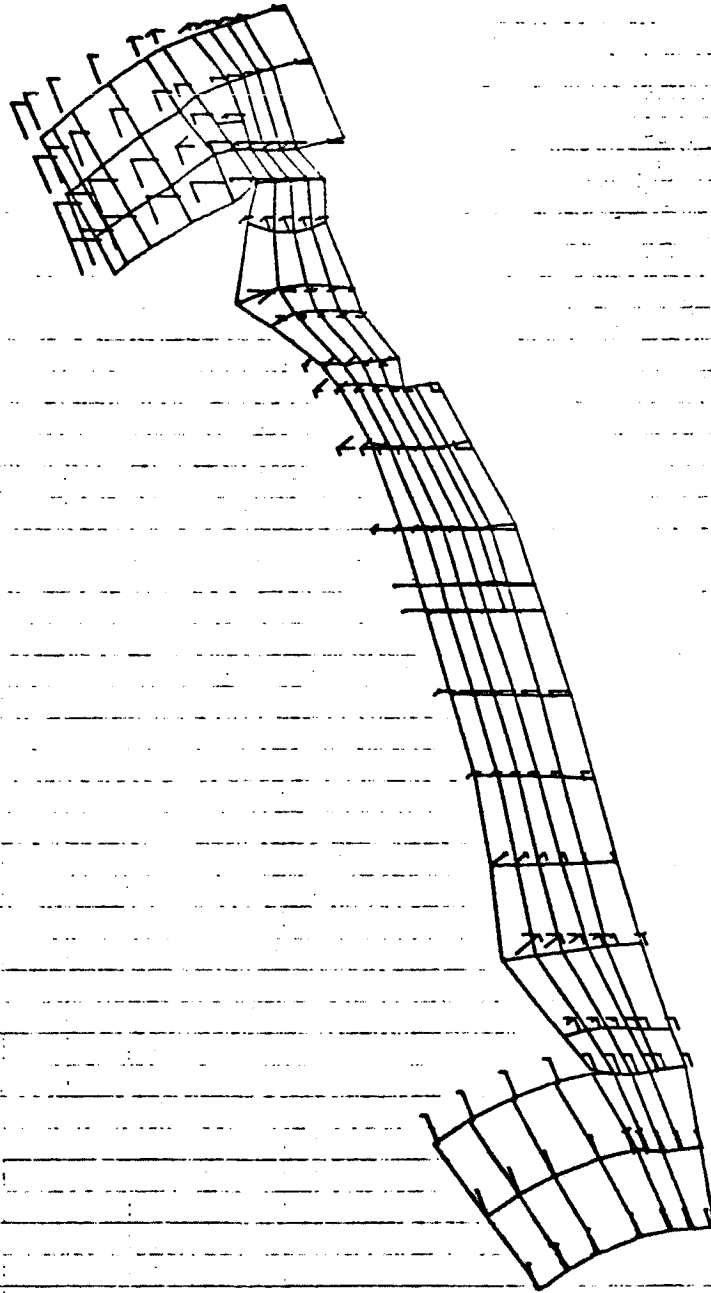
PHASE 3 CRIBITER FUSelage-SYMA CASE) MODEL 2  
 BEING HALF EFF. LONG., 88% EFF. TRANS. AT WING (0.2/3EFF.)  
 CRIBITER FREE MODES  
 MODAL DEFOR. SURFACE 14 MODE 14 FREQ 123.2084

15 10/16/74 1001-027. - G. G. G. G. G.



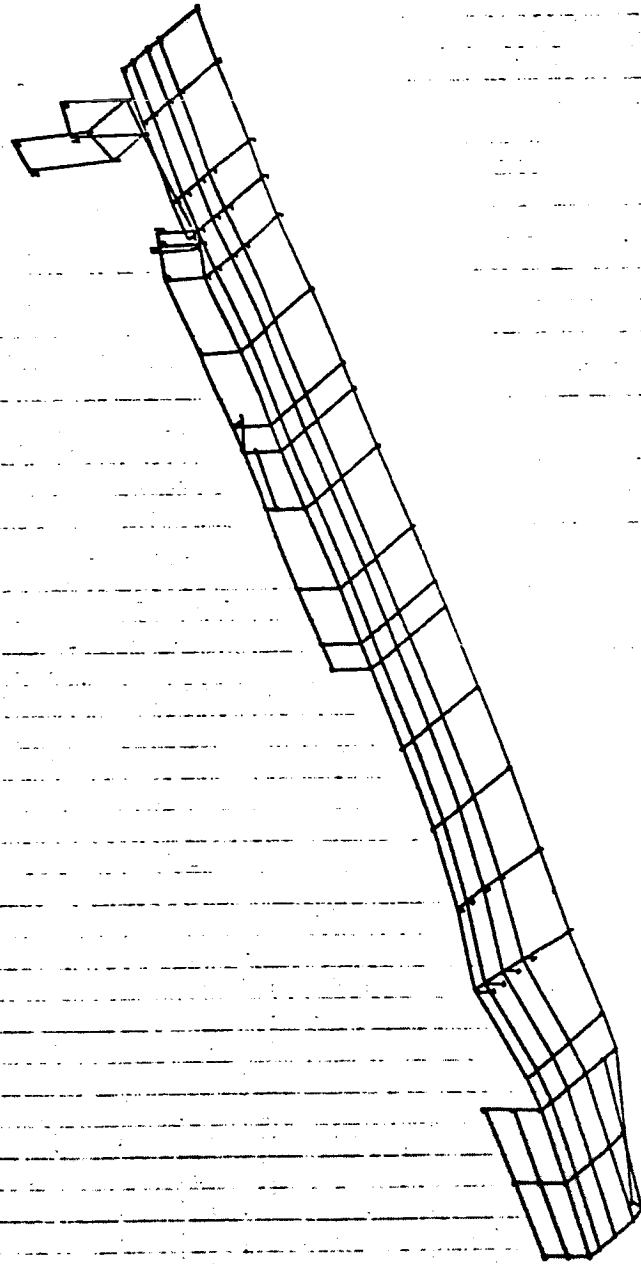
PHASE 3 CRIBITER FURD.ARC-0YAAI CASE) MODEL 2  
 BEING HALF EFF. LONG. .88 ( EFF. TRANS. AT WING Q=2.0/2077.)  
 CRIBITER FREE FREE MODES  
 MODAL ORDER. SURFACE IS MODE 15 FREQ. 124.4431

18 1871374 1000-007, 0 00710000



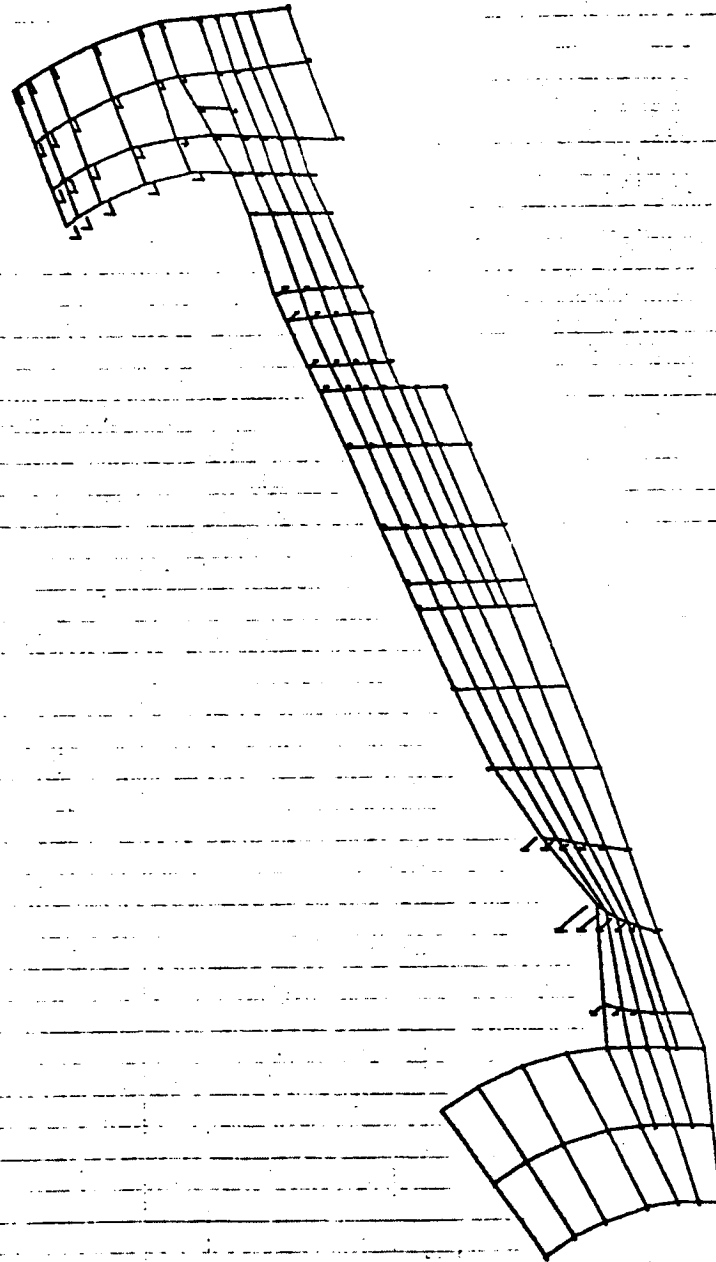
PHASE 3 ORBITER FUSelage-SYM CASE; MODEL 2  
SKINS HALF EFF. LONG. SB ( EFF. TRANS. AT WING (0-2/2577.))  
ORBITER FREE FREE MODES  
MODAL DEFORM. SUBCASE 15 MODE 15 FREQ. 124.9431

16 10/18/74 WAC-207, • C. 08701004

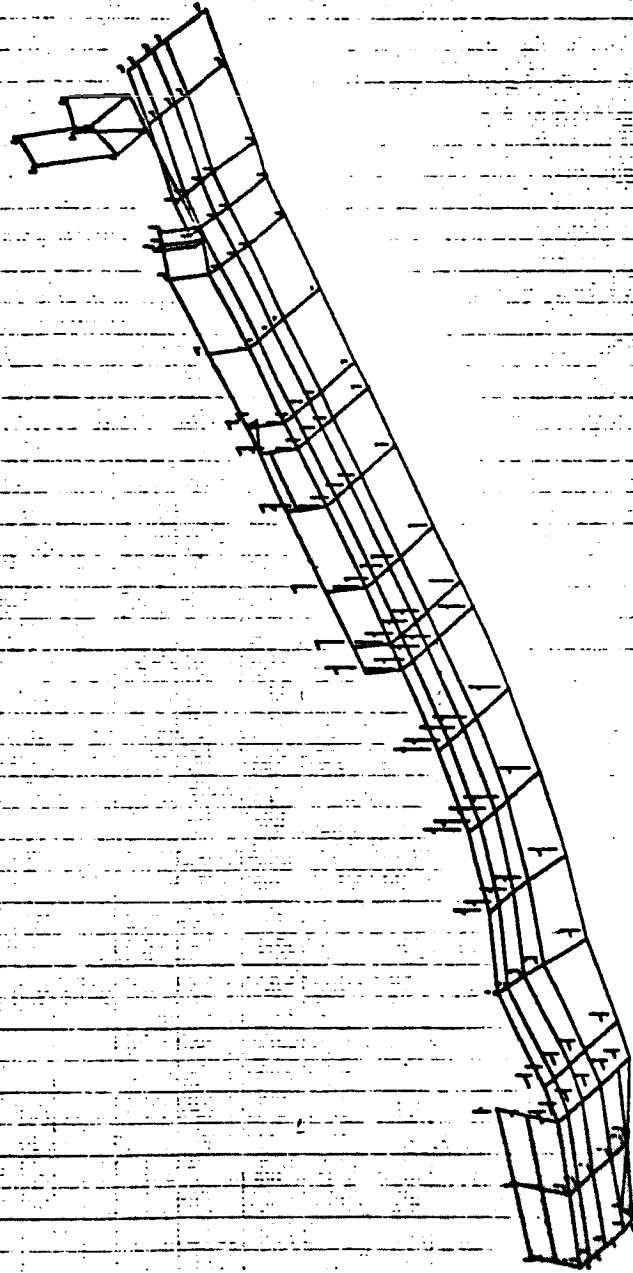


PHASE 3 ORBITER FUELAGE-STRIK CASE) MODEL 2  
SKINS HALF EFF. LONG. 88 ( EFF. TRANS. AT WING 0-2/2EFF. )  
ORBITER FREE FREE MODES  
MODAL DEFORM. SUBCASE 10 MODE 16 FREQ. 130.2033

10/10/74 1004-207, = G. 00721004

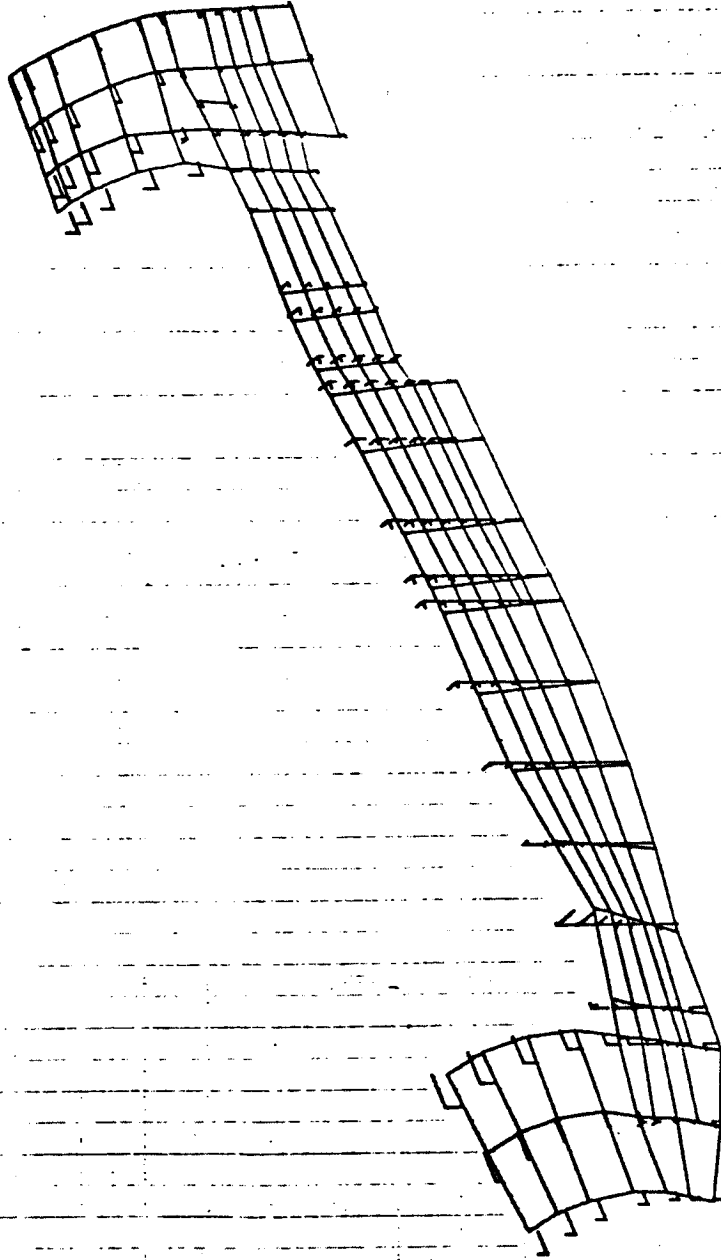


PHASE 3 ORBITER FUSelage-SYMM CASE) MODEL 2  
 SKIN HALF ETT.LONG.,SEC ETT. TRANS.AT WING(8-2/2ETT.)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 16 MODE 16 FREQ. 130.2633



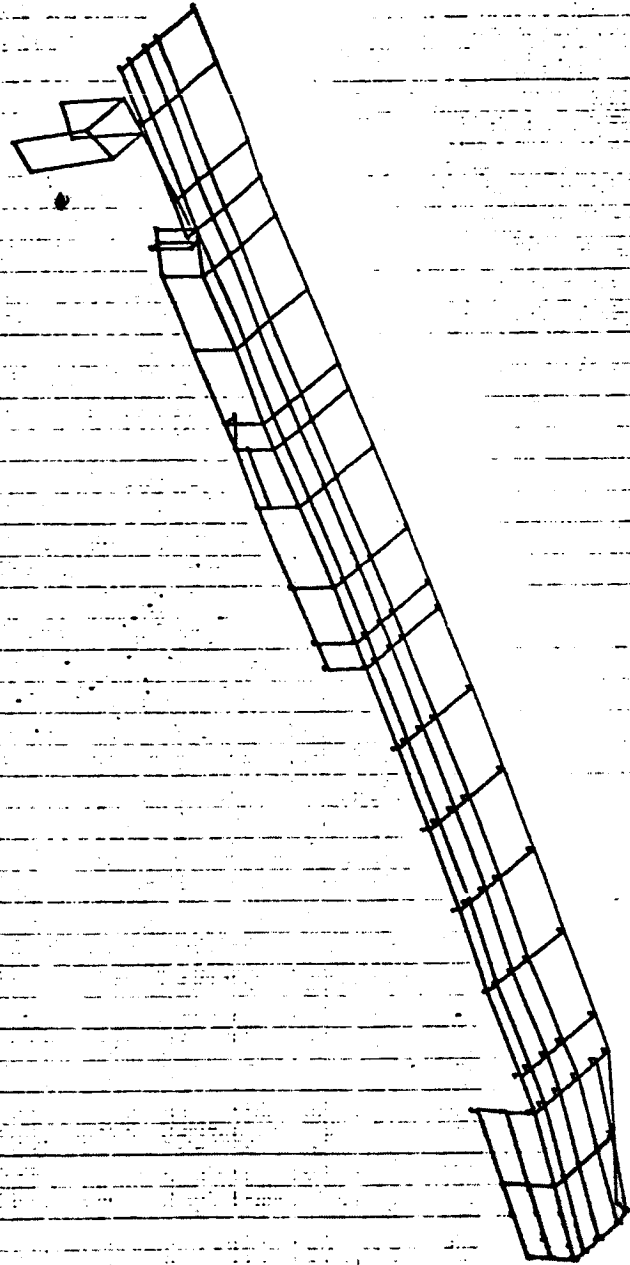
PHASE 9 ORBITER FUEL/LAR-6YMI CASE) MODEL 2  
 SKING HALF CRT. LONG. 88 ( CRT. TRANS. AT WING 08-2/2077.)  
 ORBITER FREE FREE MEDCS  
 MODAL, D/COR. SUBCASE 17 MODE 17 FREQ. 142.1368

10/11/74 144-227. - 0. 3100048



PHASE 3 ORBITER PURCHASE-SYMA CASE) MODEL 2  
 SKINS HALF EFF. LONG. 1881 EFF. TRANS. AT WING (0.2/0.277.)  
 ORBITER FREE PRICE MODEL 2  
 MEDAL DETOR. PURCHASE 17 MODE 17 PRCO. 142.1388

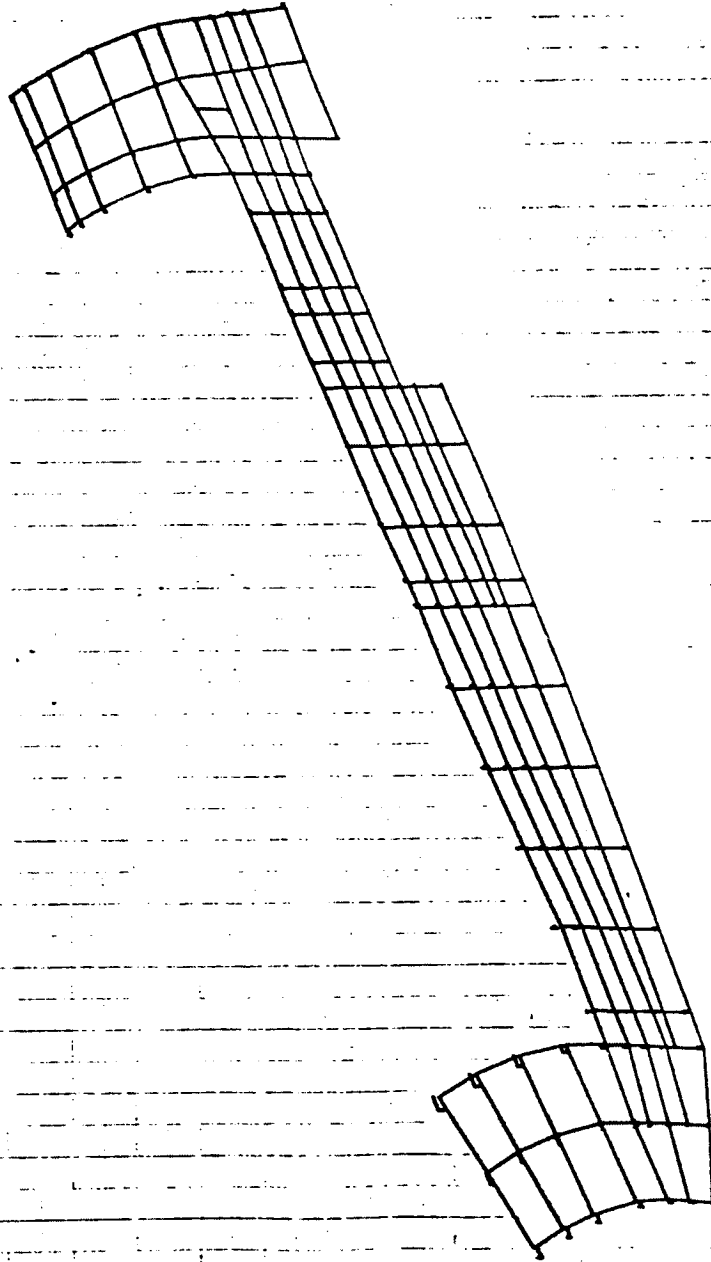
10 10/15/74 000-007. 0 01100000



PHASE 3 CORBITER FURCHASE-RTM CASE) MODC 2  
 SKING HALF OFF LOW. 00 ( EXT. TRANS. AT WING (0-5/3007.))  
 CORBITER FREE FREE MEMO  
 MODAL DETOR. SUBCASE 10 MODC 10 FREQ. 159.0000

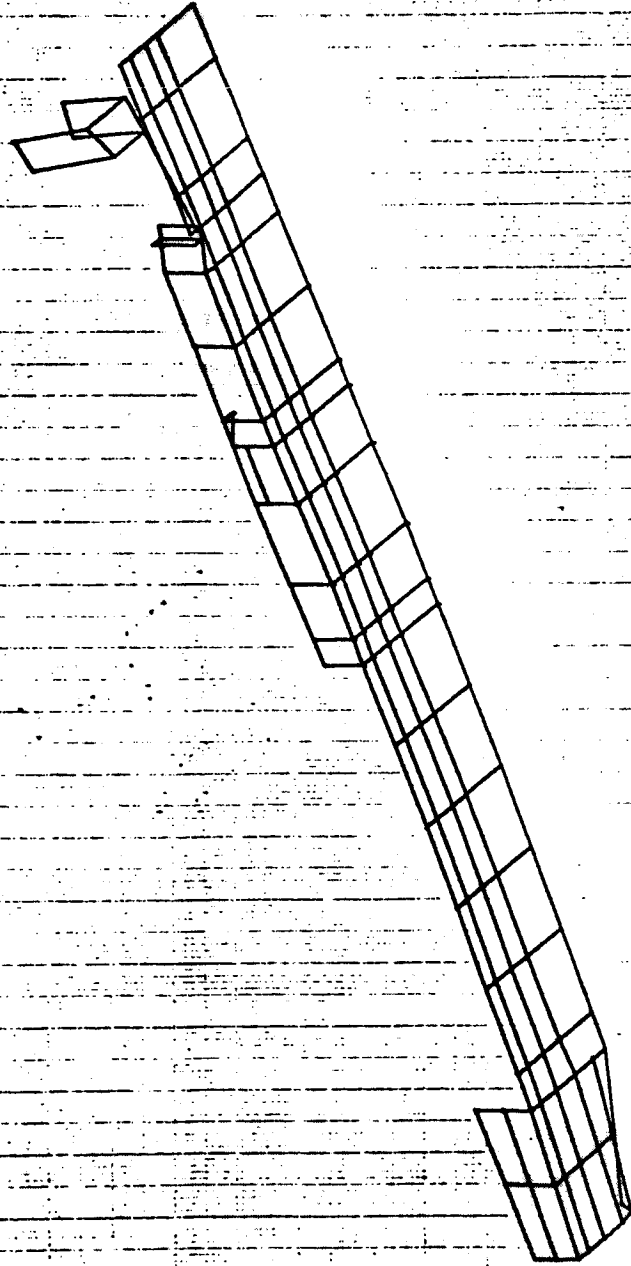


10 10/15/74 MISS-DEF. # D.1180984



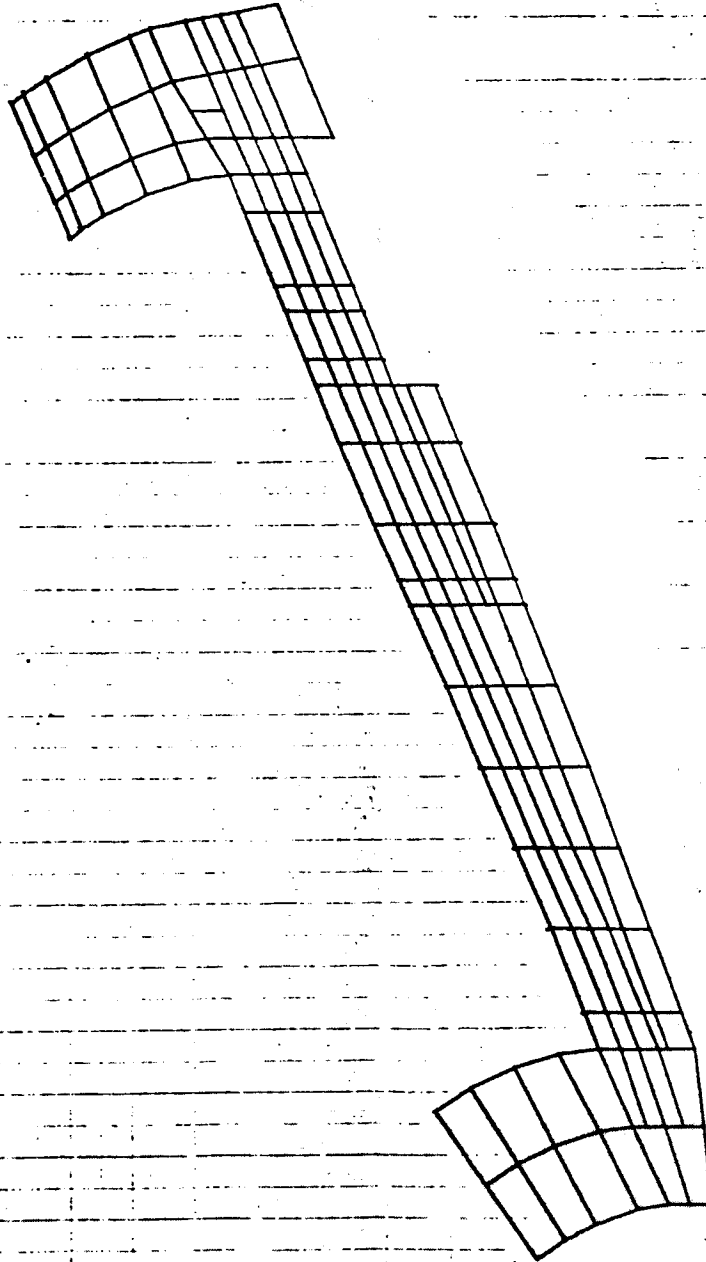
PHASE 3 CRIBITER PURCHASE-SYMM CASE) MODEL 2  
 BEING HALF EFF. LONG. 98 ( EFF. TRANS. AT WING (0-15/2077.)  
 CRIBITER FREE FREE MODES  
 MODAL DEFOR. SURFACE IS    MODE 10    FREQ. 187.6381

19 .10210/74 100-207. - 0.10010000

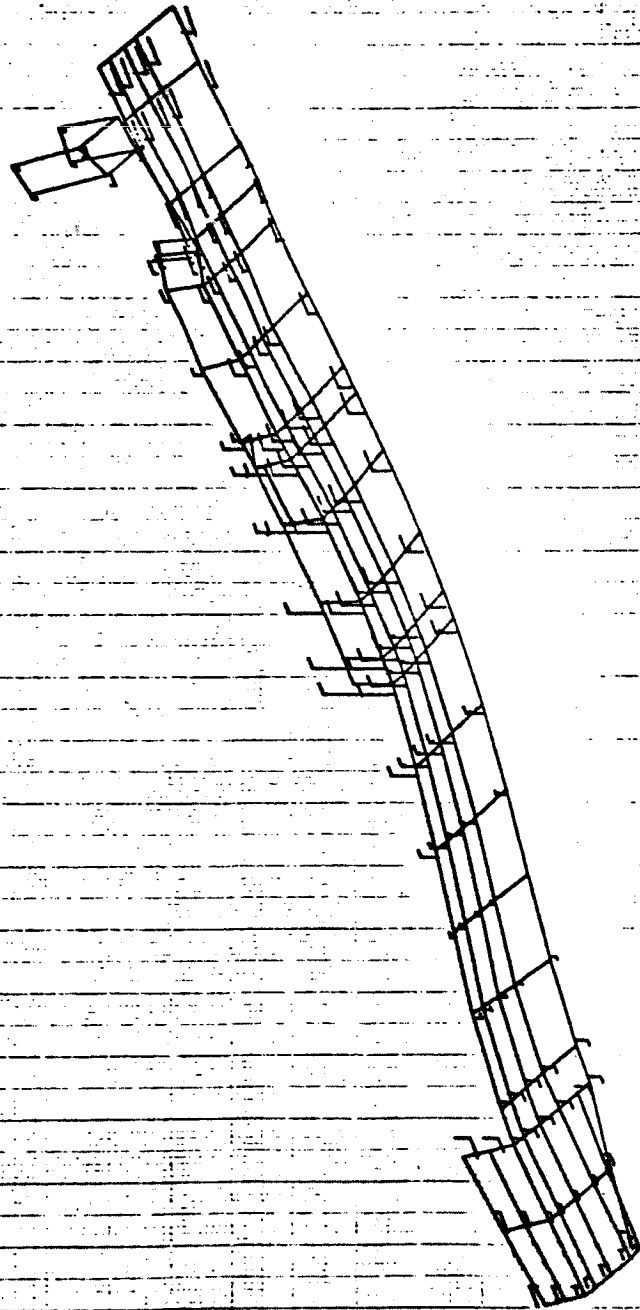


PHASE 3 CRUISER PUSHLAGE-PTM CASE) MODEL 2  
 SKINS HALF DT. LOW. .00 ( DT. TRANS. AT WING 00-2/2077. )  
 CRUISER PRIC PRIC MARKS  
 MEDAL DEFOR. SURFACE 19 MODE 19 PRIC. 100.3002

14 10/15/74 444-007, 0.1010000

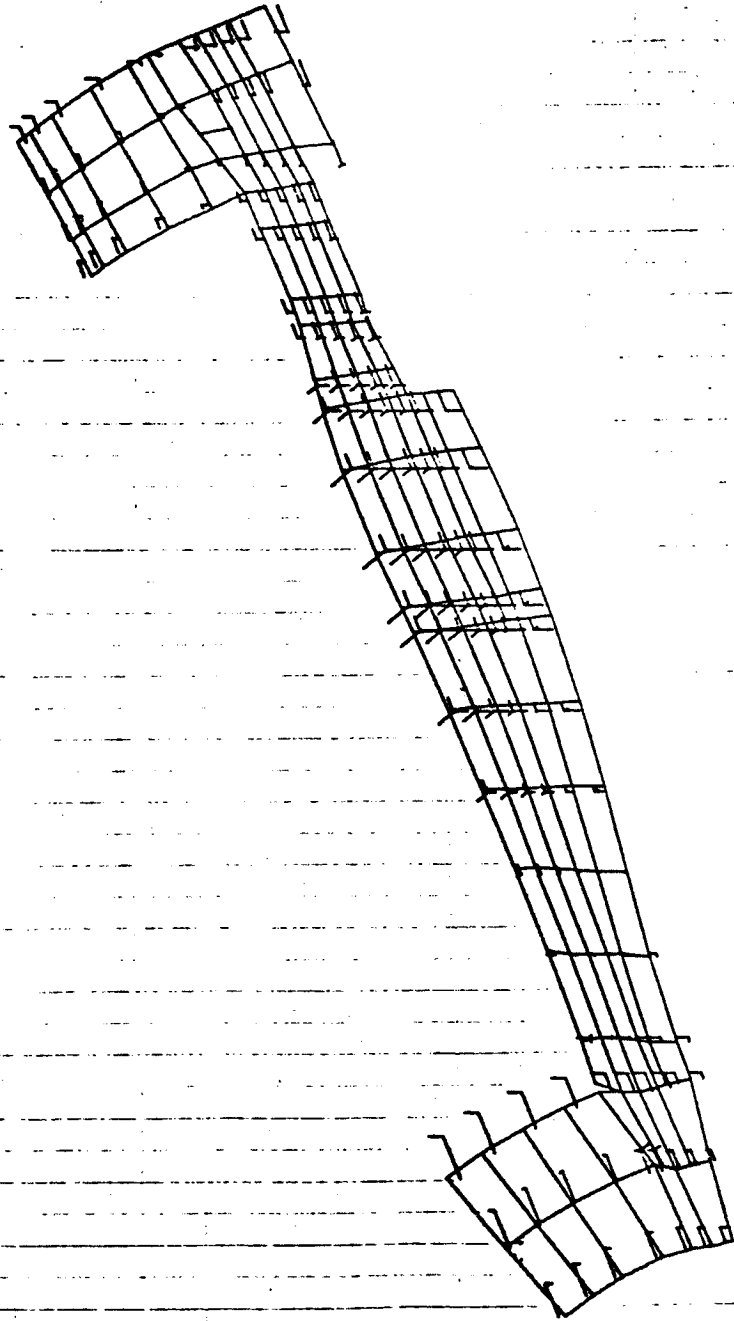


PHASE 8 ORBITER FUELAGE-8700 CASE) MODL 2  
SKINS HALF EFF.LONG.798 ( EFF. TRANS. AT WING (0-2/9EFF.)  
ORBITER FARE FREE MOSES  
MODAL OPTON, SUBCASE 14 MODL 14 FREQ. 100.3002

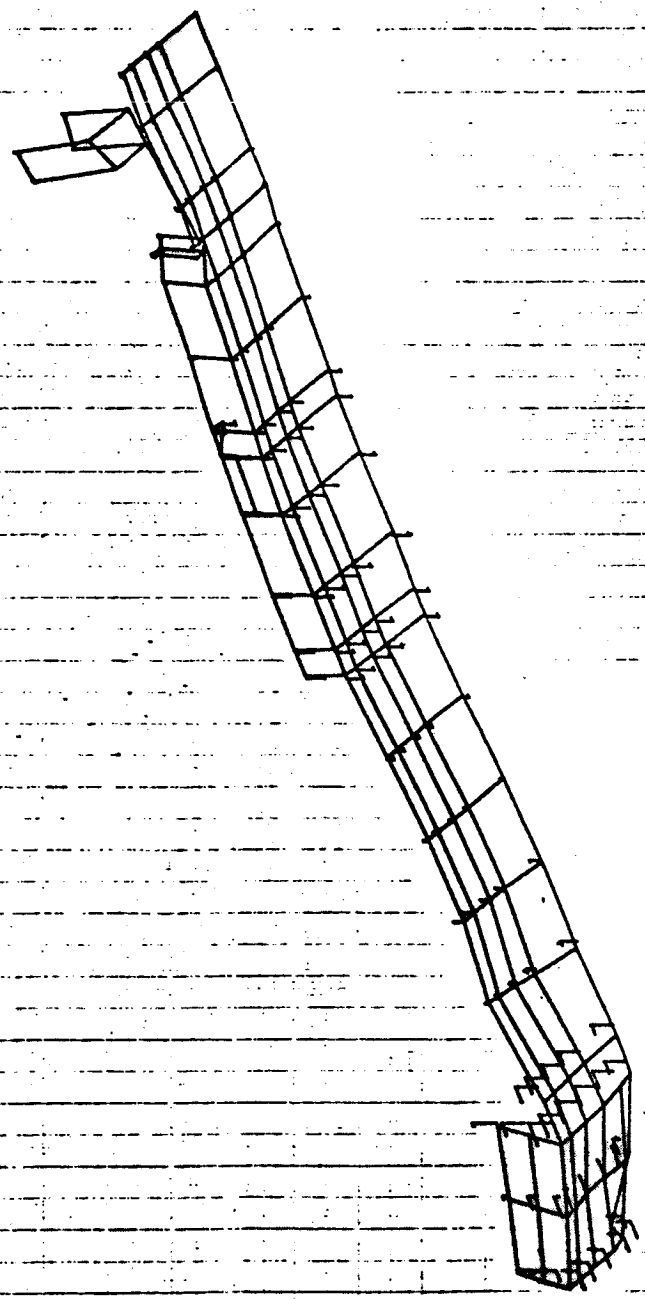


PHASE 3 CRIBITER FURCLAGE-STYAI CASEI MODEL 2  
 BKING HALF EFF.LONG..SIC EFF.TRANS.AT WING 09-2/2677.7  
 CRIBITER FREE FREE MORCS  
 MODAL DEFOR. SURCAGE 20 MODE 20 FREQ. 171.7384

10/15/74 MAX-DET. • 0.6180000



PHASE 3 CRIBITER FUELAGE-SYMS CAPS) MOD. 2  
 BRING HALF EFF. LONG. 85 ( EFF. TRANS. AT WING (8-2/3 EFF. )  
 CRIBITER FREE FREE MODS  
 MOD. DETOR. SURCASE 20 MOD 20 FREQ. 171.7384

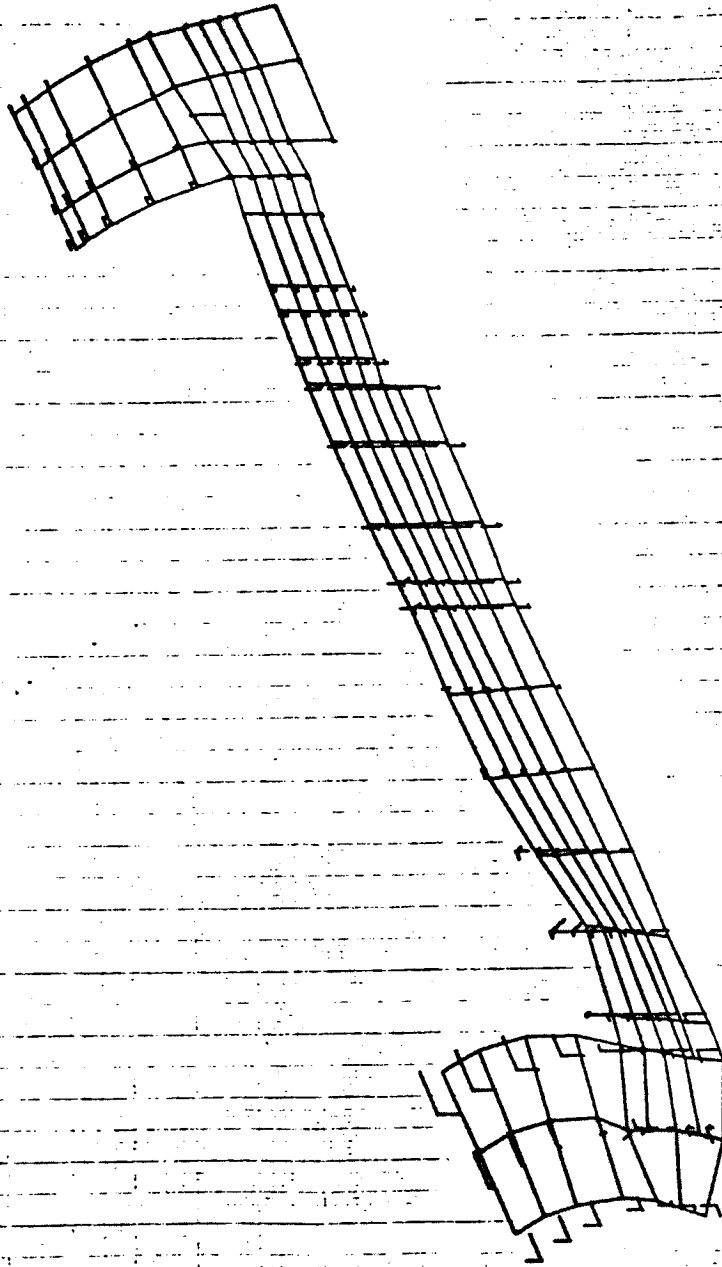


PHASE 2. GROWTH FUSelage-0700 CASE) MODEL 2  
 BEING HALF 177. LONG. 001 ETT. THIN. AT WING 0-2-0077. 4  
 GROWTH FREE FREE MODEL  
 MODAL COST. SURFACE 21. MODC 21. FREQ. 100.4070

21

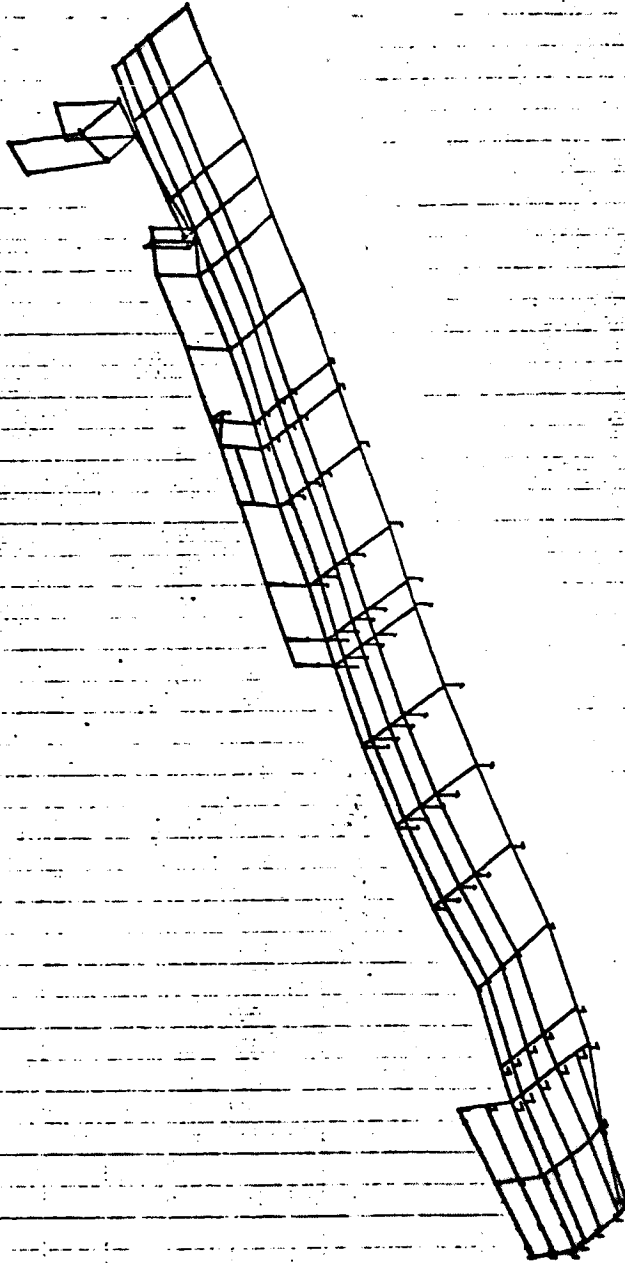
10/15/74 1600-007. = 0.70001024

21



PHASE 2 ORBITER FLARE-SPIN CASE) MODEL 2  
 SKINE HALF CTT, LONG, 1.88 CTT, TRANS. AT WING (0-2/3077.1)  
 ORBITER FREE FREE MODES  
 MODAL VECTOR. SUBCASE 21 MODE 21 FREQ. 189.4890

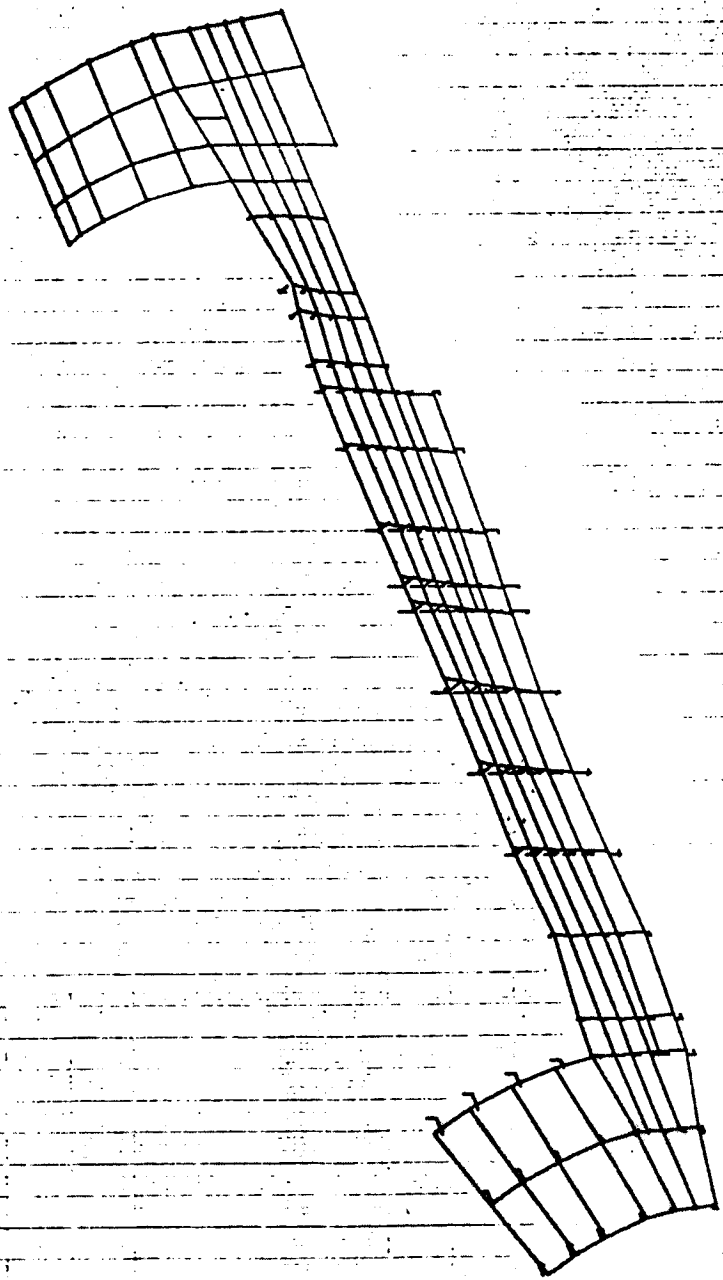
22 10/10/74 100-007, 0 0.0218081



PHASE 0 CRIBBITER FUSELAGE-STRUT CASE) MODEL 2  
 SKINING HALF EFF. LONG. .86 ( EFF. TRANS. AT WING 0.3/2EFF. )  
 CRIBBITER FUSELAGE FUSELAGE MODEL 2  
 MODAL DEFOR. SUBCASE 22 MODE 22 FREQ. 140.2283

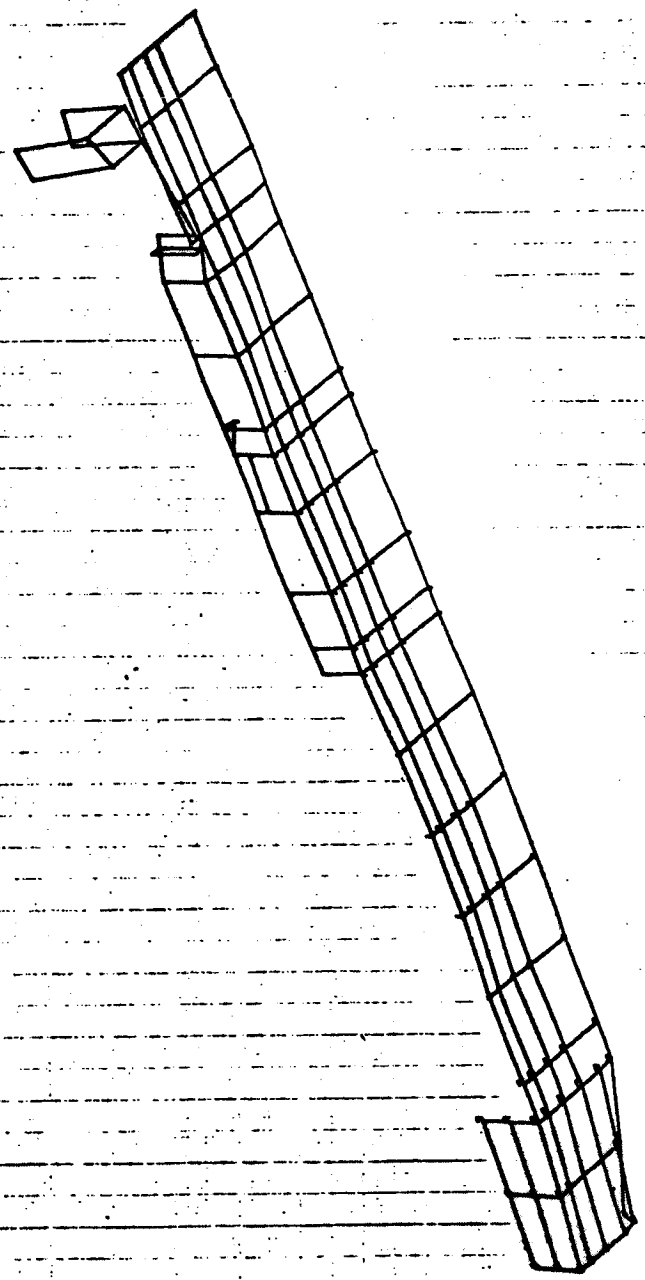


18/1/74 1000-007. = G. 02112021

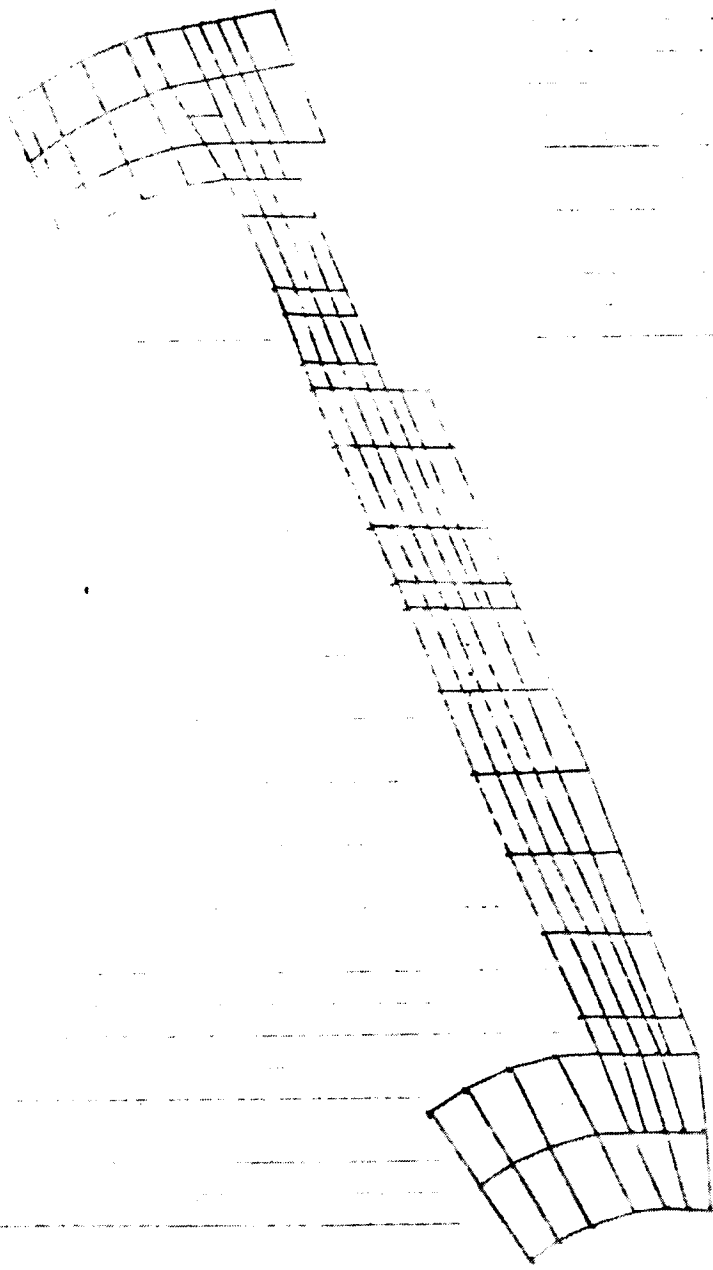


PHASE 9 ORBITER PURCHASE-PYRAM CASE) MODEL 2  
 BKING HALP EFT.LONG..86 ( EFT. TRANS. AT WING (0-2/2EFT.)  
 ORBITER FREE FREE MODES  
 MODAL DCTOR. BURCASE 22 MODE 22 FREQ. 190.2363

20 10/10/74 100-207, 0-00000000



PHASE 3 GEMETER FUSBLAKE-OTM CASE) MODEL 2  
 SKINS W/ALY EFF-LOW, .001 EFF, THIN, AT 1110 00-2/2077.  
 GEMETER FREE FREE MODES  
 MODAL OCFOR. SUBCASE 23 MODE 23 FREQ. 284.0214



PHASE 3 ORBITER SUBCARE-BYAM GABC) 1600L 8  
 BK 108 HALF OFF, LONG .85 ( EFF. TRANS. AT NING 02/2/2077.1)  
 ORBITER FREE FREE MODES  
 MOD.4 OFFOR. SUBCARE 23 1600L 23 7REQ. 221.0814

**Appendix B15**  
**INPUT & PLOTS/PHASE 3 ANALYSIS: MODEL II WING**  
**SYMMETRIC FREE-FREE ORBITER MODES**

PHASE 3 SCATTER WING  
9/10/74 SCOVERS 85 PERCENT FFF.B

C A S E C O N T R O L D E C K E C H O

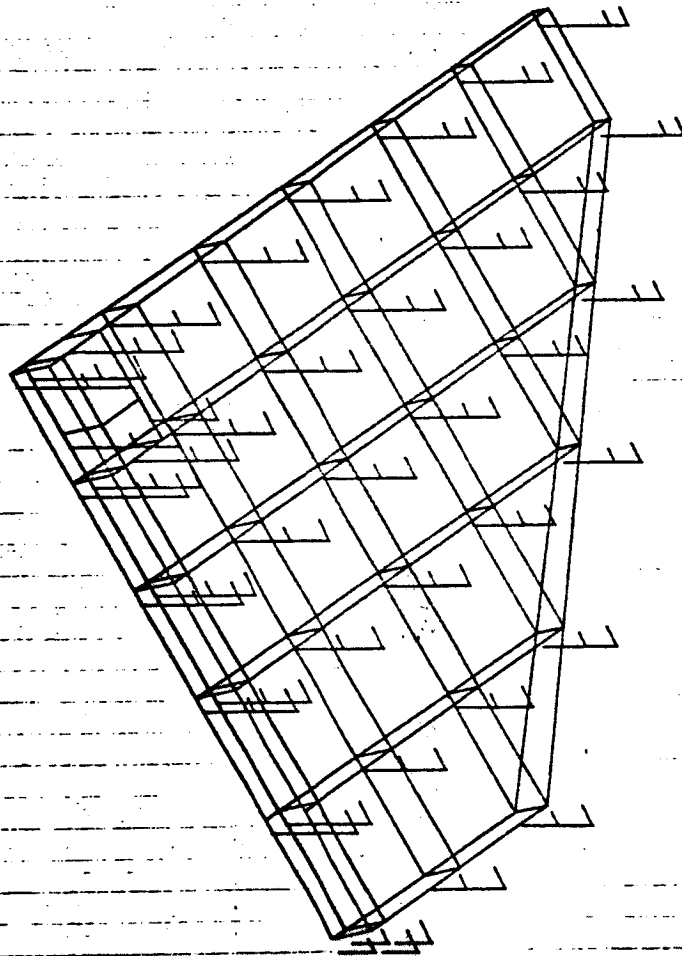
CARD  
COUNT

1 TITLE # PHASE 3 SCATTER WING  
 2 SUBTITLE # 9/10/74 SCOVERS 85 PERCENT FFF.B  
 3 MAXITER # 20000  
 4 SUBCASE # 1  
 5 LABEL # SCATTER FREE FFF MODES  
 6 MODES # 23  
 7 DDDDDI  
 8 VECTOR # ALL  
 9 INDEPENDENT  
 10 SET 1 # INCLUDE 3101 THRU 3125  
 11 SET 2 # INCLUDE 3201 THRU 3227  
 12 SET 3 # INCLUDE 3301 THRU 3352  
 13 SET 4 # INCLUDE 3401 THRU 3478 3501 THRU 3536 3582  
 14 SET 5 # INCLUDE 3601 THRU 3664  
 15 SET 6 # INCLUDE 3701 THRU 3766  
 16 SET 7 # SHAP  
 17 PHASE CONTROL 765.105  
 18 AXIS # XYZ  
 19 VIB # 30.0000.0.000  
 20 MAXIMUM DEFORMATION 10.0  
 21 FFFD SCAL ORIGIN 2.501 7  
 22 FFFD SCAL DEFORMATION 1 THRU 23.511 7.0KIGIN 2.5SHAP.VECTOR XY7  
 23 FFFD SCAL DEFORMATION 1 THRU 23.511 7.0KIGIN 2.5SHAP.VECTOR XY7

TPNAM TPNAME2 CRTSP2

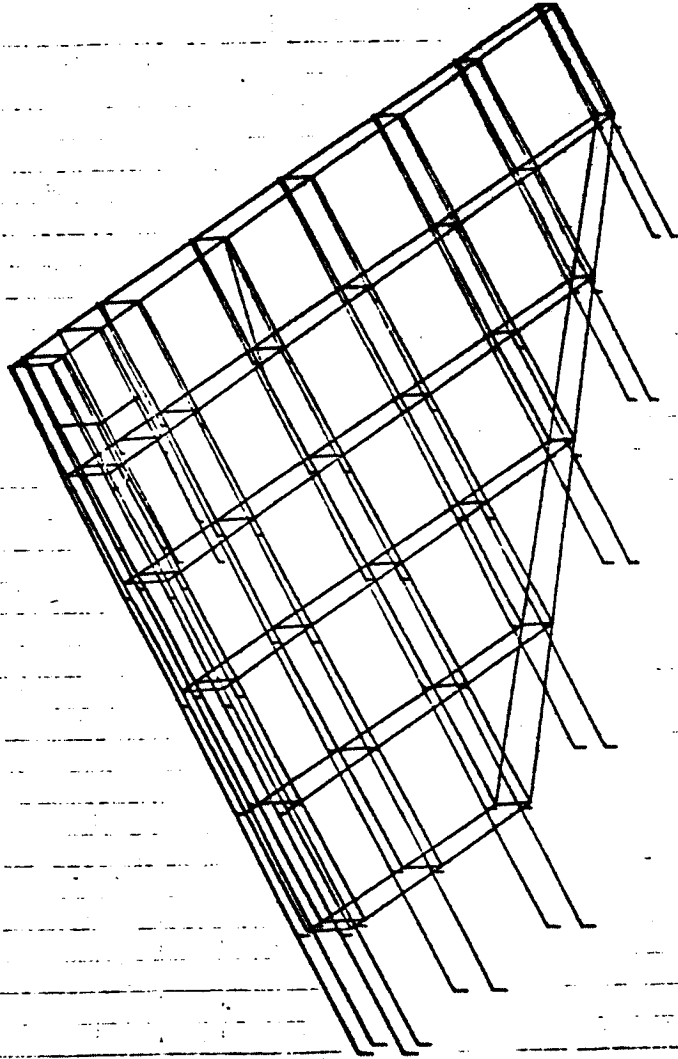
ENDDATA

10/10/74 100-007, 0.0001700



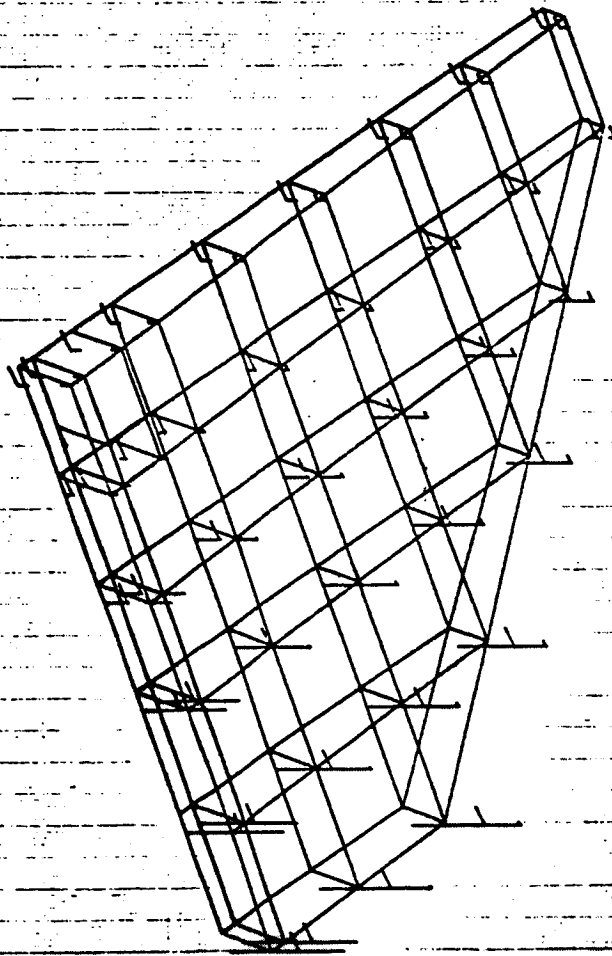
PHASE 3 CRIBSTER WINDS  
4/10/74 (COVERS BY PERCENTY ETT.)  
CRIBSTER FREE FREE MODES  
MODAL DEFOR. SUBCASE 1 MODE 1 FREQ. 0.

1.2 10/18/74 MAX-DEF. = 0.9419204



PHASE 3 CONSIDER WINDS  
4/10/74 COVER 89 PERCENT (77.1)  
CRIBTER FREE FREE MOVES  
MODAL DEFOR. SUBCASE 2 MODE 3 FREQ. 0.

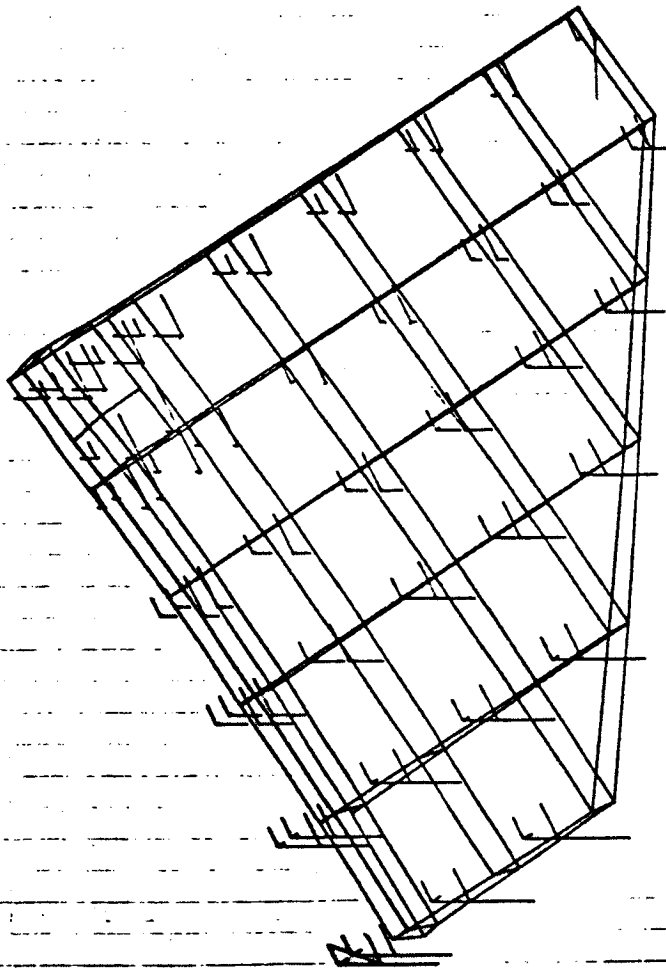
10/10/74 1000-007, S. 0.0000004



PHASE 9 CONTAINER W/MS  
9/10/74 1000-007 S. 0.0000004  
CONTAINER FREE FEE MOBS  
MEDICAL DEPT. SURGICAL 9 MEDIC 9 FREE. 0.

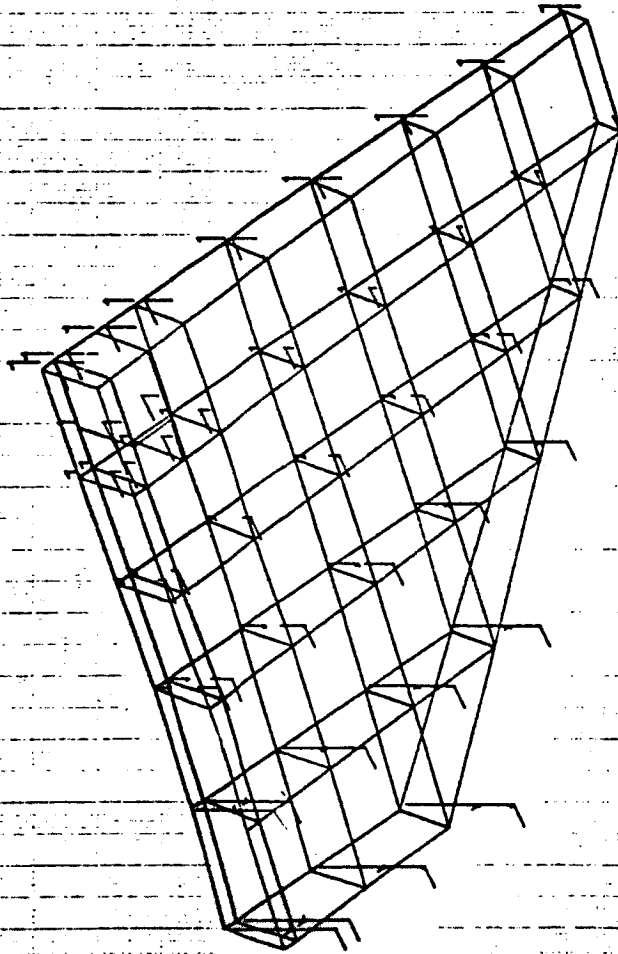


10/18/74 WMS-007, 0 0.01770118



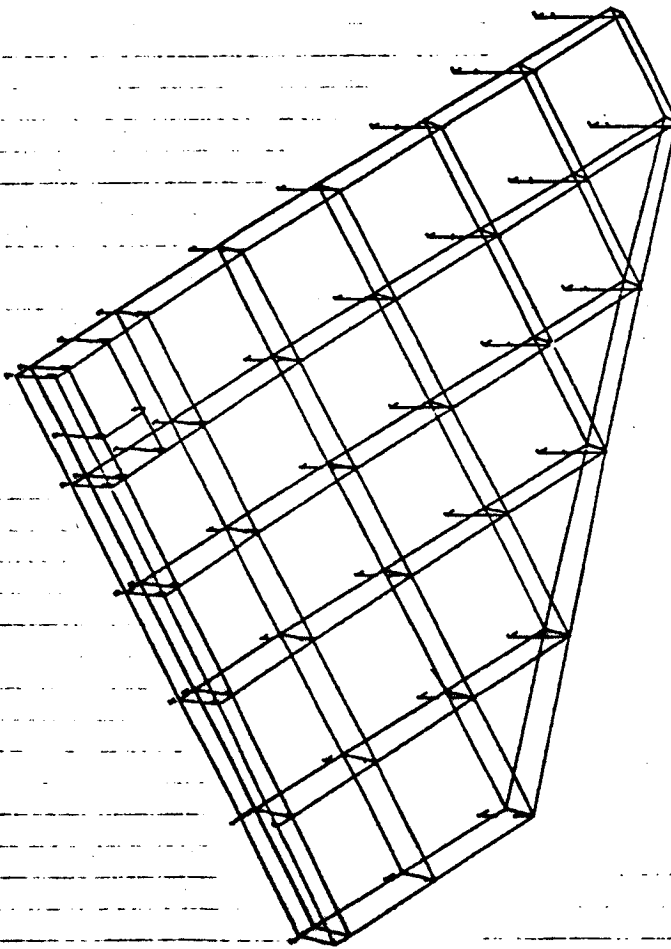
PHASE 3 (COVER WIND)  
4/10/74 (COVER 88 PERCENT EFF.)  
DRITER FREE FREE MOODS  
MODAL DEFOR. SUBCASE 4 MODE 4 FREQ. 44.11971

10/15/74 MUX-007, o. s. 0284200



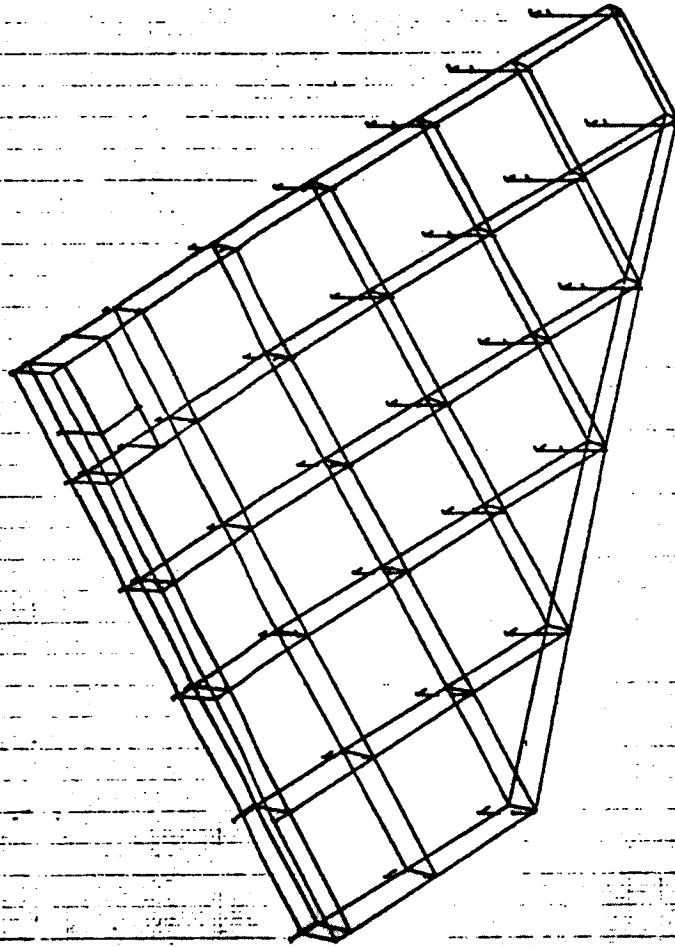
PHASE 3 (ORBITER NINE)  
4/10/74 (COVERS 80 PERCENT EFF.)  
ORBITER FREE FREE MODES  
MODAL DETOR. SUBCASE 8 MODE 8 FREQ. 48.33890

10/10/74 1001-027, S. D. 00000000



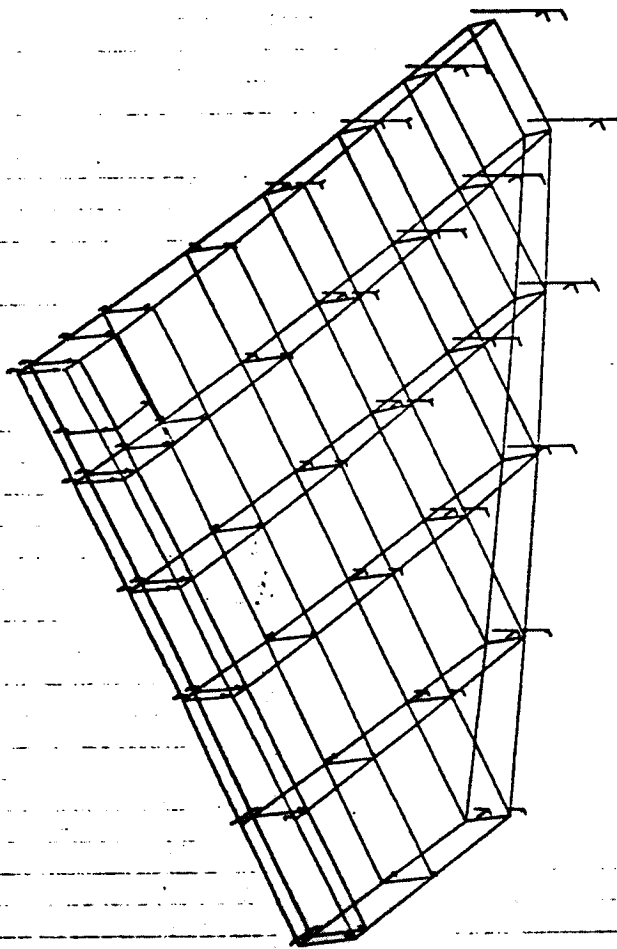
PHASE 9 (ORBITER WING)  
1/10/74 (COVERS 88 PERCENT EFF.)  
ORBITER FACE FREE MODES  
MODAL DEFORM. SURFACE 9 MODE 9 FREQ. 01.00000

10/10/74 444-007. = 1.00147000



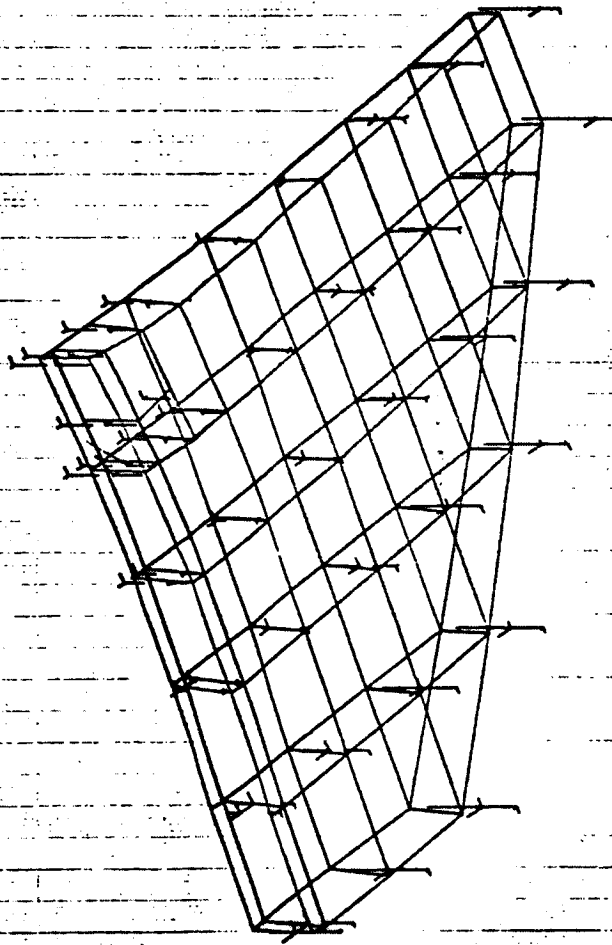
PHASE 9 COVER WITH  
7/10/74 COVER BY PERCENT 877.1  
COVER FACE FREE MODES  
MODAL DECOR. SUBCASE 7 MODE 7 FREQ. 84.48978

6 10/18/74 MAX-DEF. = 1.9749180



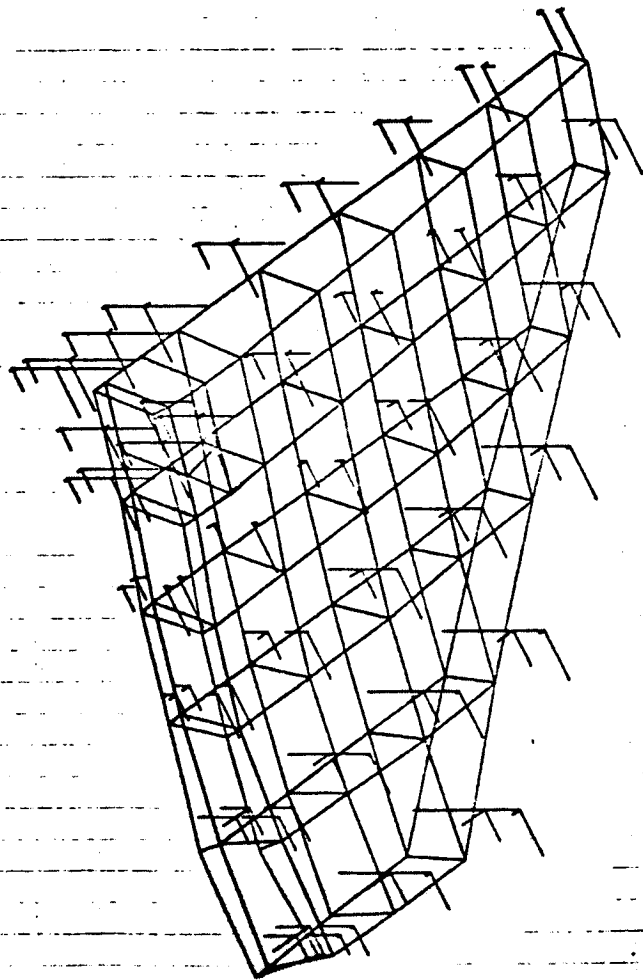
PHASE 3 (ORBITER WINGS)  
4/10/74 (COVERS 88 PERCENT EFT.)  
ORBITER FREE FREE MODES  
MODAL ORDER, BUSCASE 8 MODE 8 FREQ. 62.71884

10/19/74 1400-007, o 0.1055444



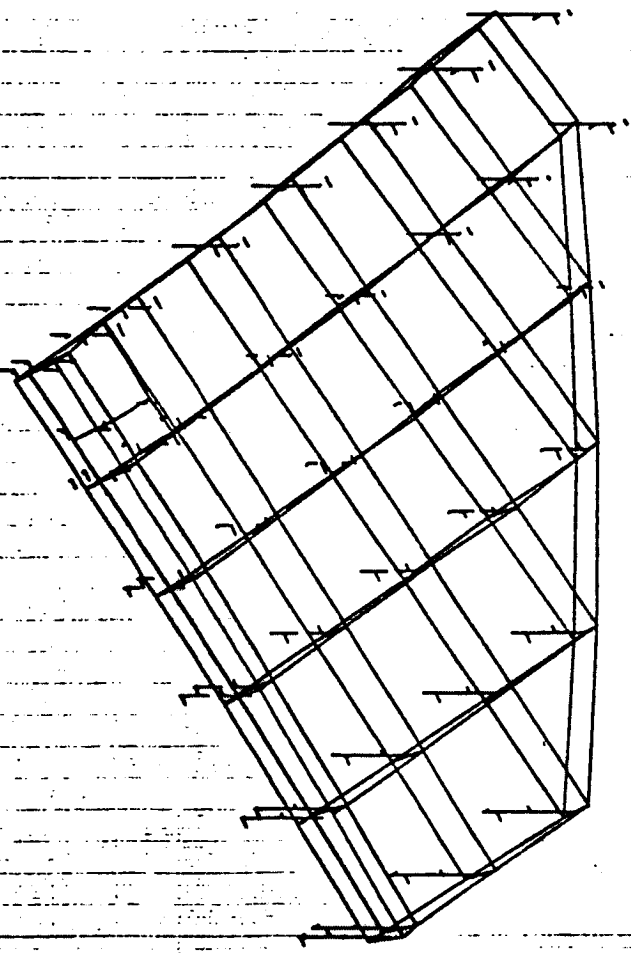
PHASE 3 CORRITER WING  
1/10/74 (COVERS 88 PERCENT 877.)  
CORRITER FREE FREE MODES  
MODAL DEFORM. SURFACE 1 MODE 1 FREQ. 89.88881

10 10/10/74 MAX-007. = 0.0144000



PHASE 3 (CRIBTER NIMS)  
 1/10/74 (COVERS 88 PERCENT STY.)  
 CRIBTER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 10 MODE 10 FREQ. 76.71848

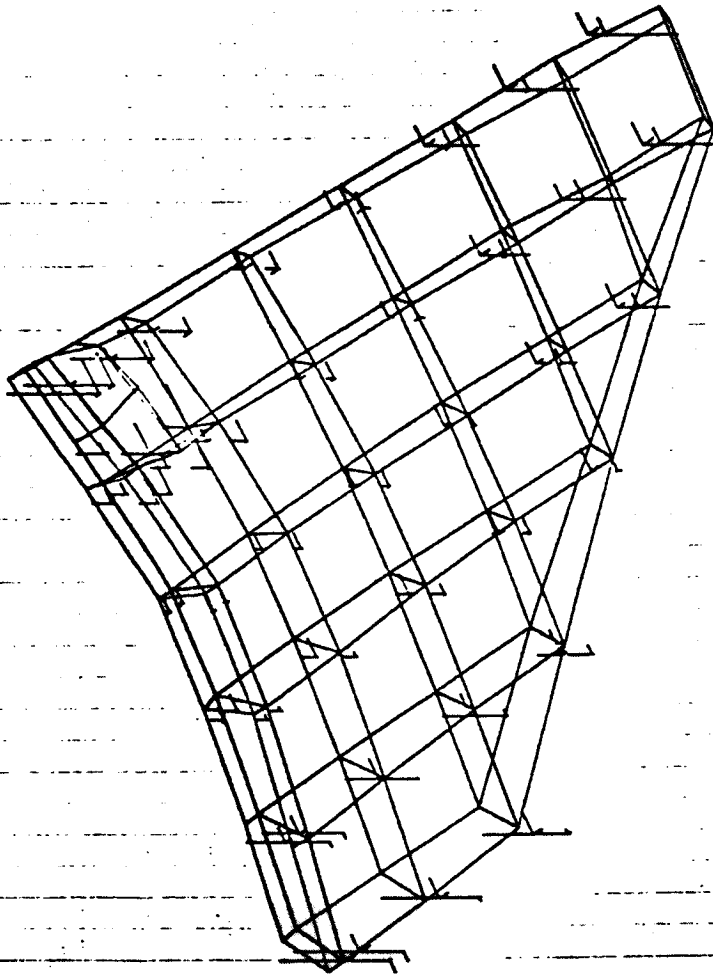
11 10/18/74 1043-007. = 8.1.101003



PHASE 3 CORBITER MIMO)  
3/10/74 (COVERS 88 PERCENTY 877.)  
CORBITER FREE FREE MODES  
MODAL DEFON. SUBCASE 11 MODE 11 FREQ. 99.11100

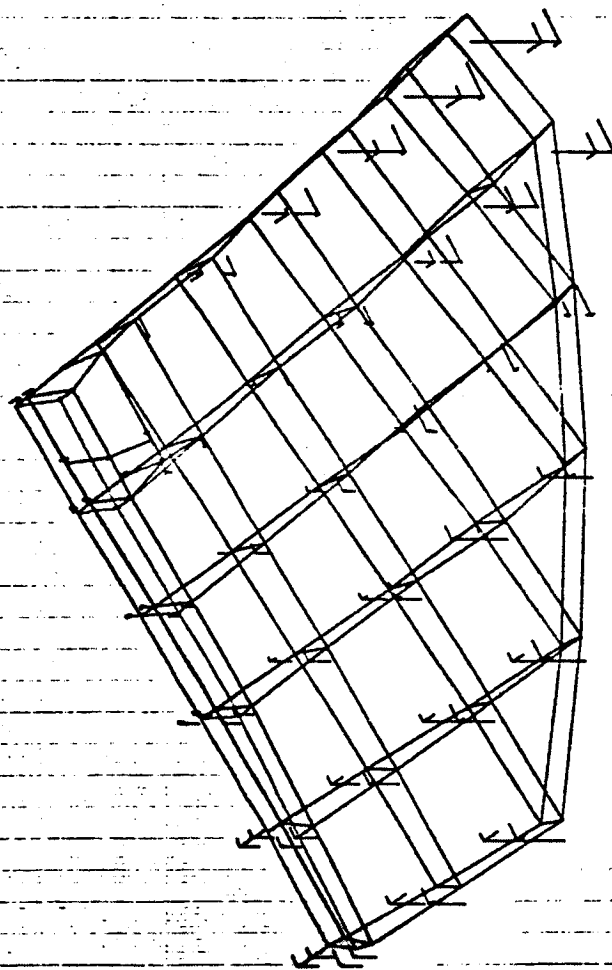


12 10/16/74 MAX-007. • 0.0418044



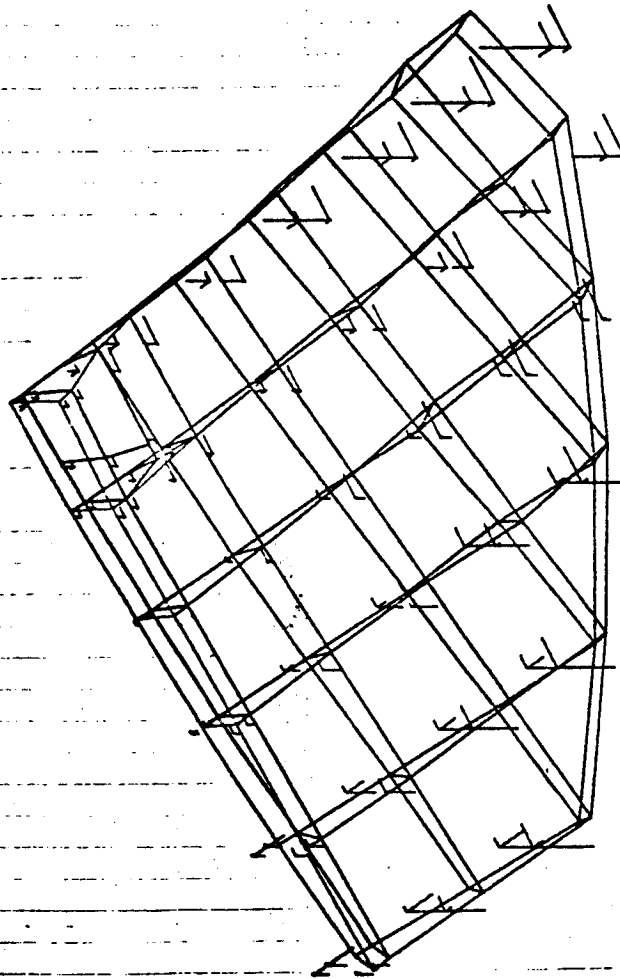
PHASE 3 CRIBTER WINDS  
 1/10/74 COVER 88 PERCENT 877.3  
 CRIBTER FREE FREE WINDS  
 MODAL DEFOR. SUBCASE 12 MODE 13 FREQ. 104.7841

19 10/10/74 MAX-DEF. = 0.14761180



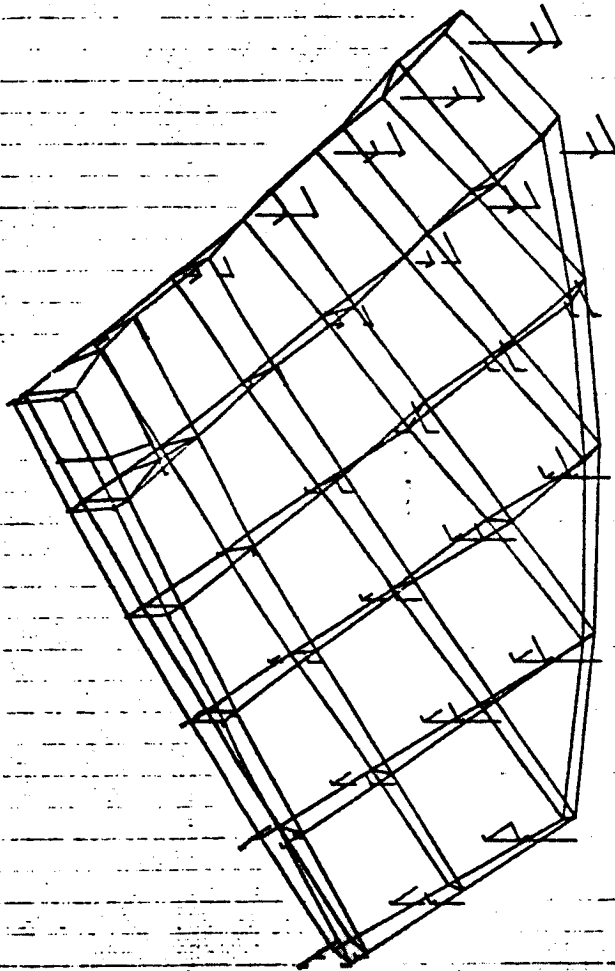
PHASE 3 ORBITER #1000  
 1/10/74 (COVERS 88 PERCENT EPT.)  
 ORBITER FREE FREQ. MODES  
 MODAL DEFOR. SUBCASE 13 MODE 13 FREQ. 118.9276

14 10/18/74 MAX-DEF. = 1.17671760



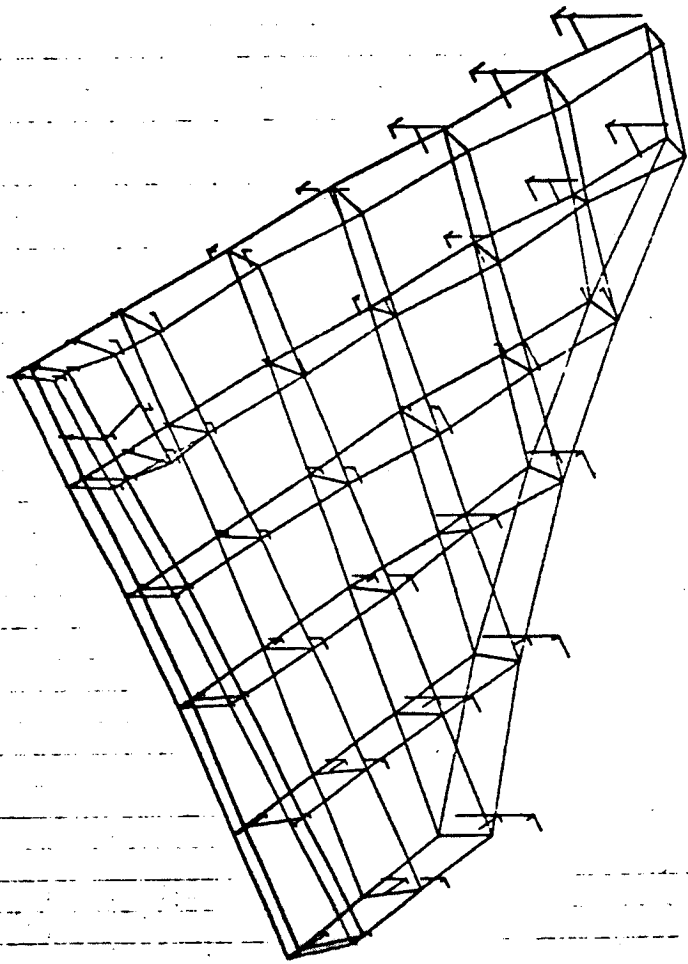
PHASE 9 (ORBITER WING)  
 9/10/74 (COVERS 88 PERCENT STY.)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 14 MODE 14 FREQ. 122.8084

18 1871874 1871874, 1871874

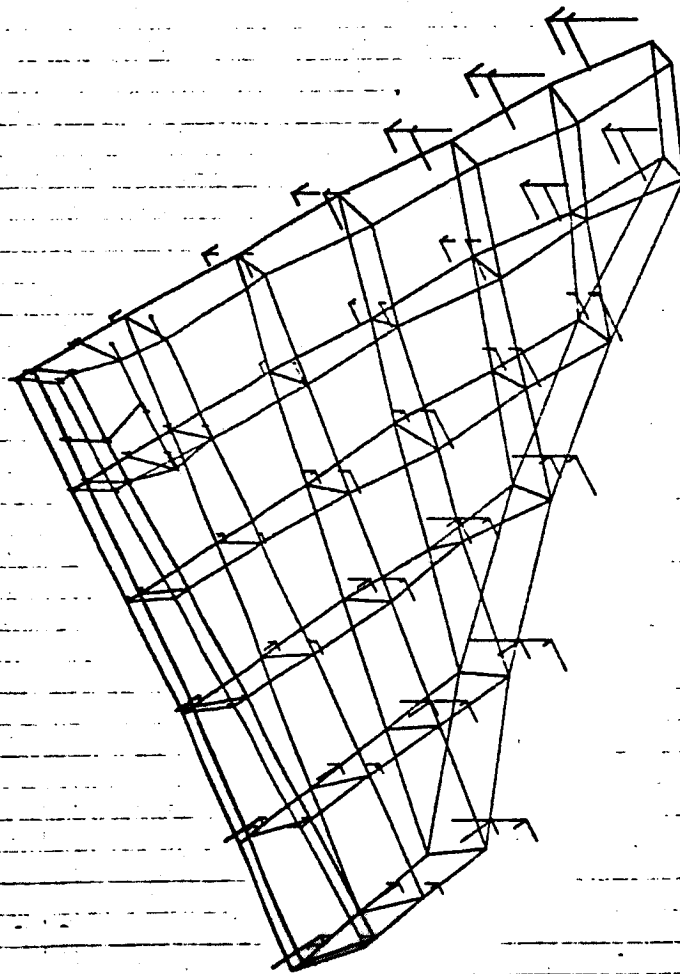


PHASE 3 CRIBTER WING  
1/10/74 COVER 88 PERCENT EFF.  
CRIBTER FREE FREE MODES  
MODAL ORDER, SUBCASE 18 MODE 18 FREQ. 129.9431

10 10/18/74 MUM-007. • 0.04100748

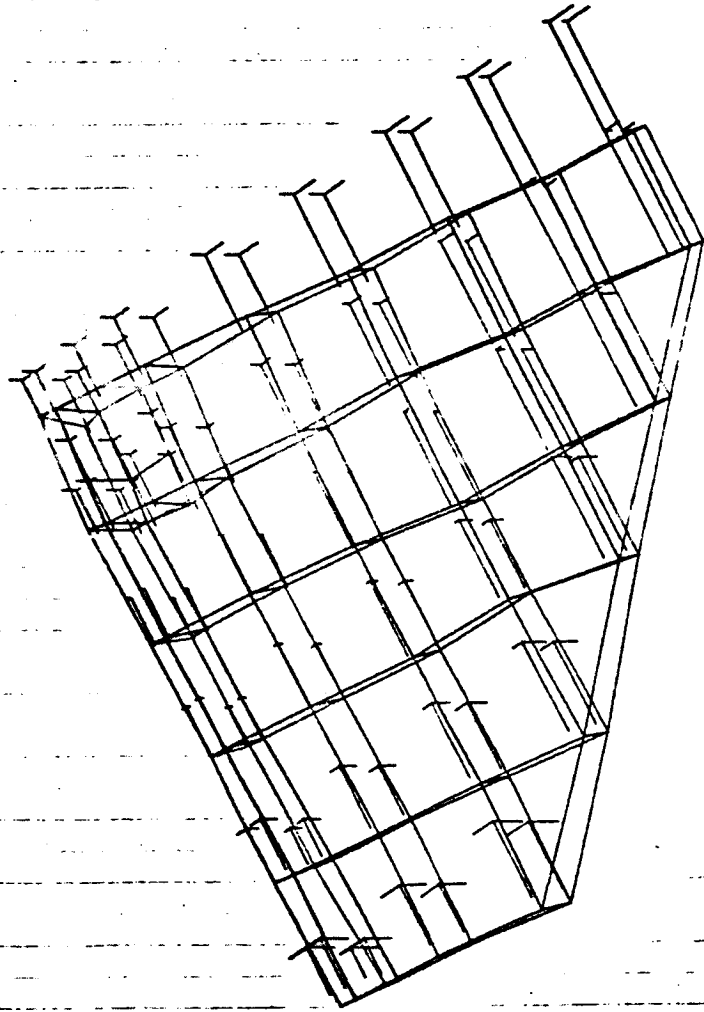


PHASE 2 (ORBITER WING)  
 4/10/74 (COVERS 80 PERCENT EFF.)  
 ORBITER FREE FREE MODES  
 MODAL ORDER. SUBCASE 18 MODE 18 FREQ. 130.2033

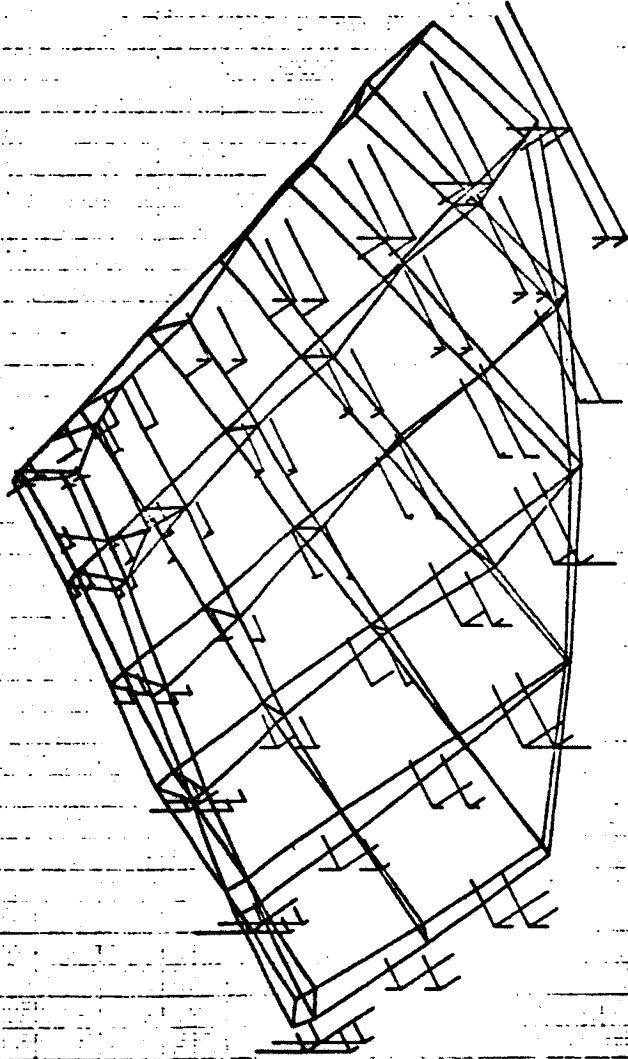


PHASE 9 ORBITER WING  
 1/10/74 (COVERS 88 PERCENT OFT.)  
 ORBITER FREE FREE MODES  
 MODAL DETOR. SUBCASE 17 MODE 17 FREQ. 142.1388

18 18/18/74 MAX-DEF. = 0.01876760



PHASE 9 (ORBITER WING)  
 7/10/74 (COVERS 85 PERCENT EFF.)  
 ORBITER FARE PAKE WDCR  
 MODAL DECOR. SURFACE 18 WDCR 18 FREQ. 187.8374

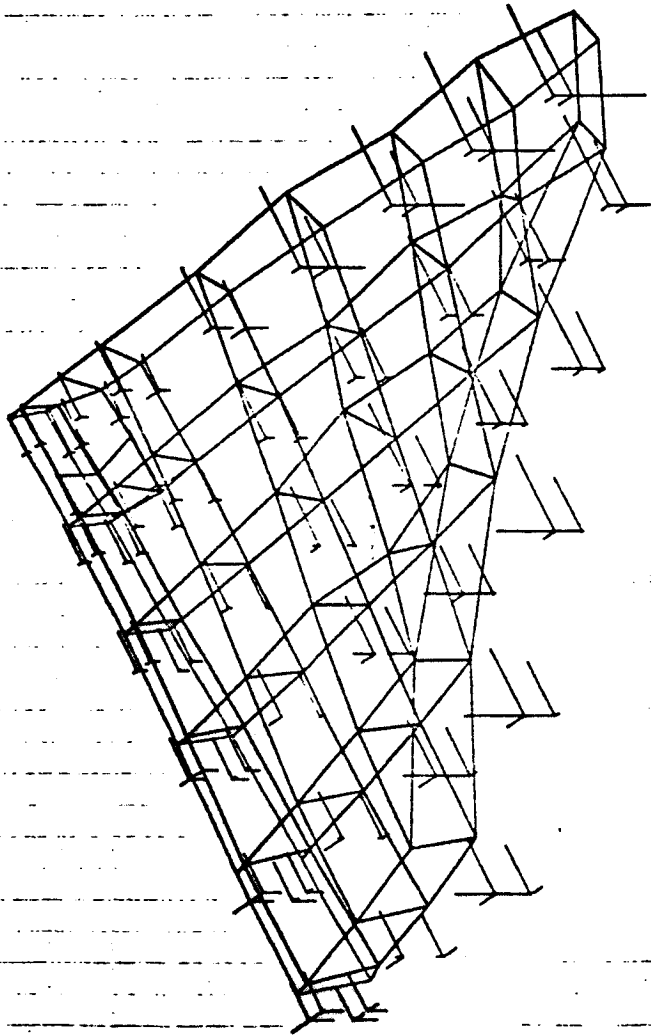


PHASE 3 CRIBTER WINGS  
 4/10/74 COVERED BY PERIODIC EPT.  
 CRIBTER FILE 7 PRICE SOURCE  
 MOVAL DETOR, SUSCANE 14 100C 14 PREG. 100.0002



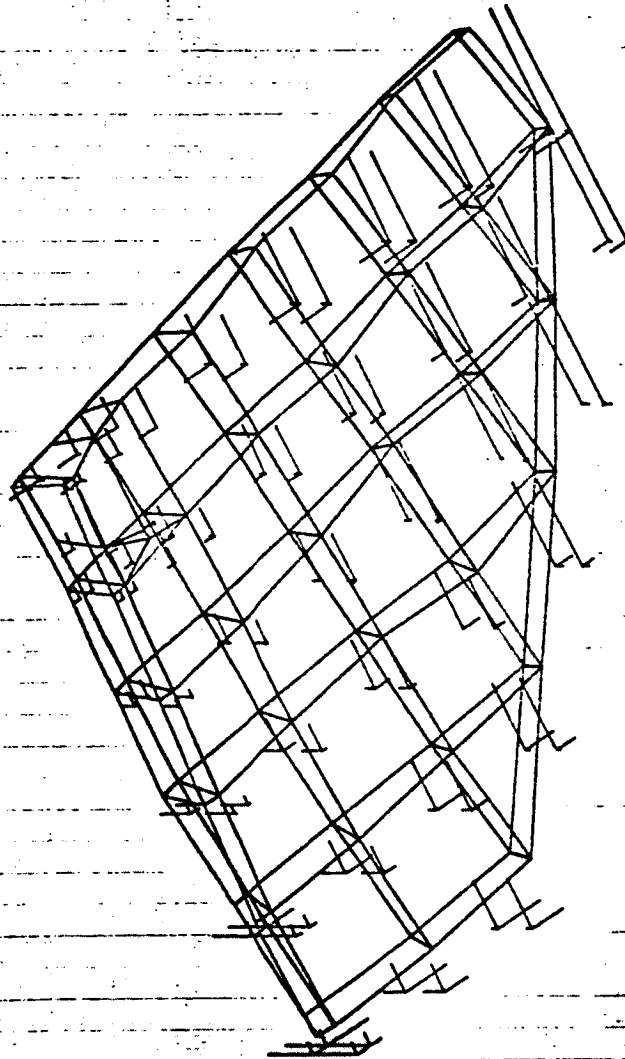
20

10/10/74 444-027. • 1.2109250



PHASE 3 ORBITER WING)  
 5/10/74 (COVERS 88 PERCENT EFF.)  
 ORBITER FREE FREE WORKS  
 MODAL OCTOR. SUBCASE 20 MODE 20 FREQ. 171.7584

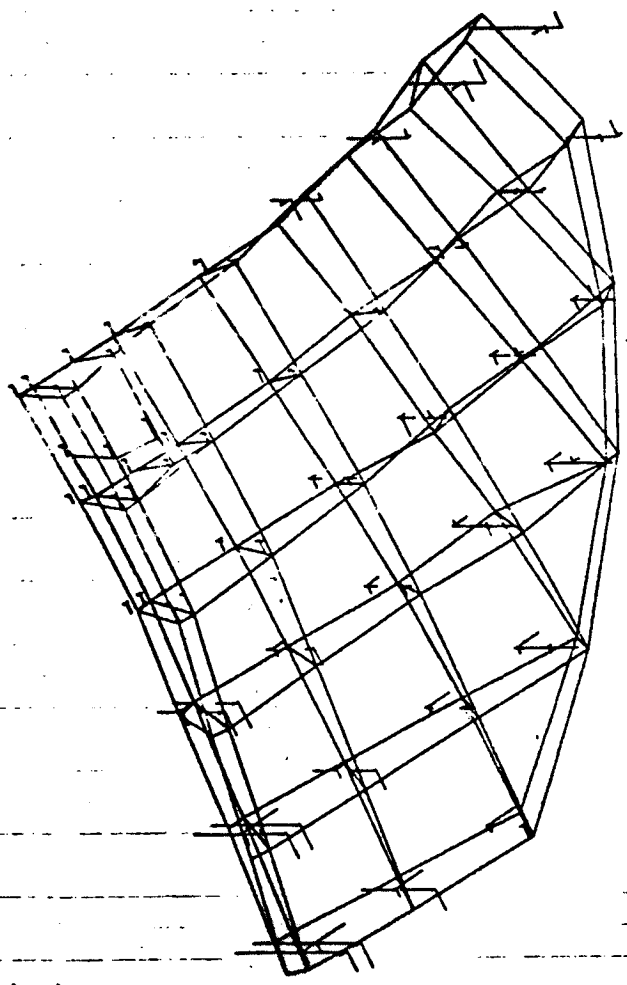
21 10/10/74 1000-007, - 0.0119020



PHASE 9 (ORBITER WING)  
1/10/74 (COVERS 88 PERCENT EFF.)  
ORBITER FREE FREE MODES  
MODAL ORDER. SUBCASE 21 MODE 21 FREQ. 186.4870

22

22 10/10/74 MAX-SEP. = 0.00817118

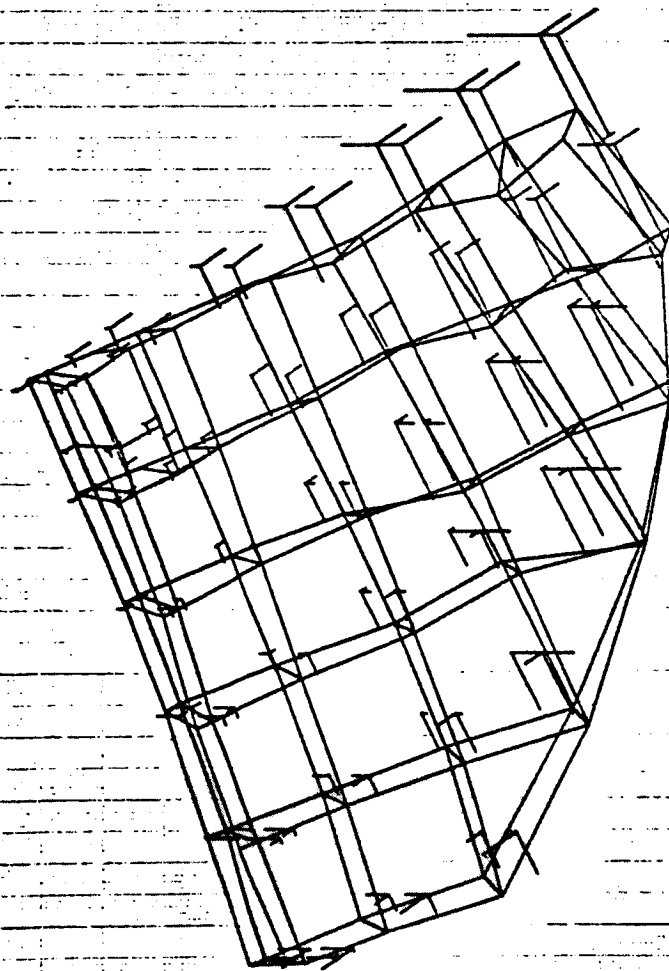


PHASE 9 (ORBITER WING)  
 1/10/74 (COVERS 85 PERCENT EFF.)  
 ORBITER FUEL FREE LO IS  
 MODAL DEFC. SURFACE 22 WAVE 22 FREQ. 140.3303

20

12/16/74

20



PHASE 3 CONTINUED WITH  
 4/10/74 (CONTRACT REVISIONS) 20 PAGES. 224.0514  
 COST FOR THIS PRICE BOOK  
 107

**Appendix B16**  
**INPUT & PLOTS/PHASE 3 ANALYSIS: MODEL II CARGO**  
**DOORS SYMMETRIC FREE-FREE ORBITER MODES**

PHASE 3  
PROTIFR DDIRS.SYM CASEXWITH STRAPSR

C A S F C O N T R O L D E C K E C H O

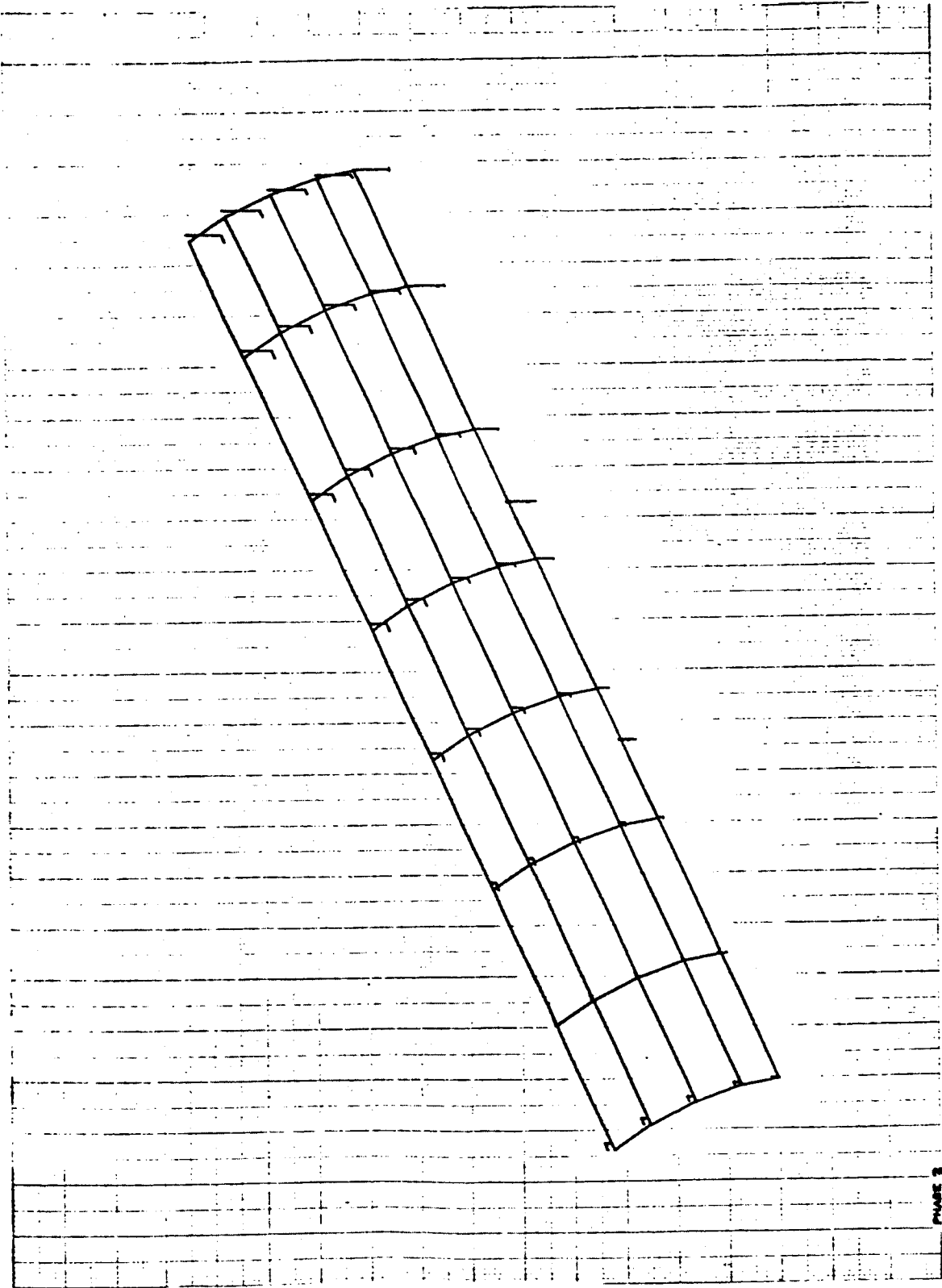
CARD  
COUNT

1 TITLE # PHASE 3  
 2 SUBTITLE # PROTIFR DDIRS.SYM CASEXWITH STRAPSR  
 3 MAXLINE# # 40000  
 4 VECTORS # ALL  
 5 SUBCASE # 1  
 6 LABEL # 1  
 7 MESSAGES # 24  
 8 INPUT/OUTPUT  
 9 SET 1 # GRUMM 4201 THRU 4232  
 10 SET 2 # INCLUDE 4241 THRU 4272  
 11 SET 3 # INCLUDE 4281 THRU 4312  
 12 SET 4 # INCLUDE 4321 THRU 4352  
 13 SET 5 # INCLUDE 4361 THRU 4392  
 14 SET 6 # INCLUDE 4401 THRU 4432  
 15 SET 7 # INCLUDE 4441 THRU 4472  
 16 PROBLEM CALCOMP 76%10%  
 17 AXES # XYZ, XZ  
 18 VIEW # 20, 45, 90, 0, 0  
 19 MARKERS DET OR MATIEN 2, 0  
 20 FIND SCALE SURFACES 1, 2, 1  
 21 PLOT MODAL INFORMATION 1 THRU 23, SET 1, SHAPE, VECTOR XYZ  
 22 BEGIN WORK

PARAM TPJAME2 OF 1, PZ

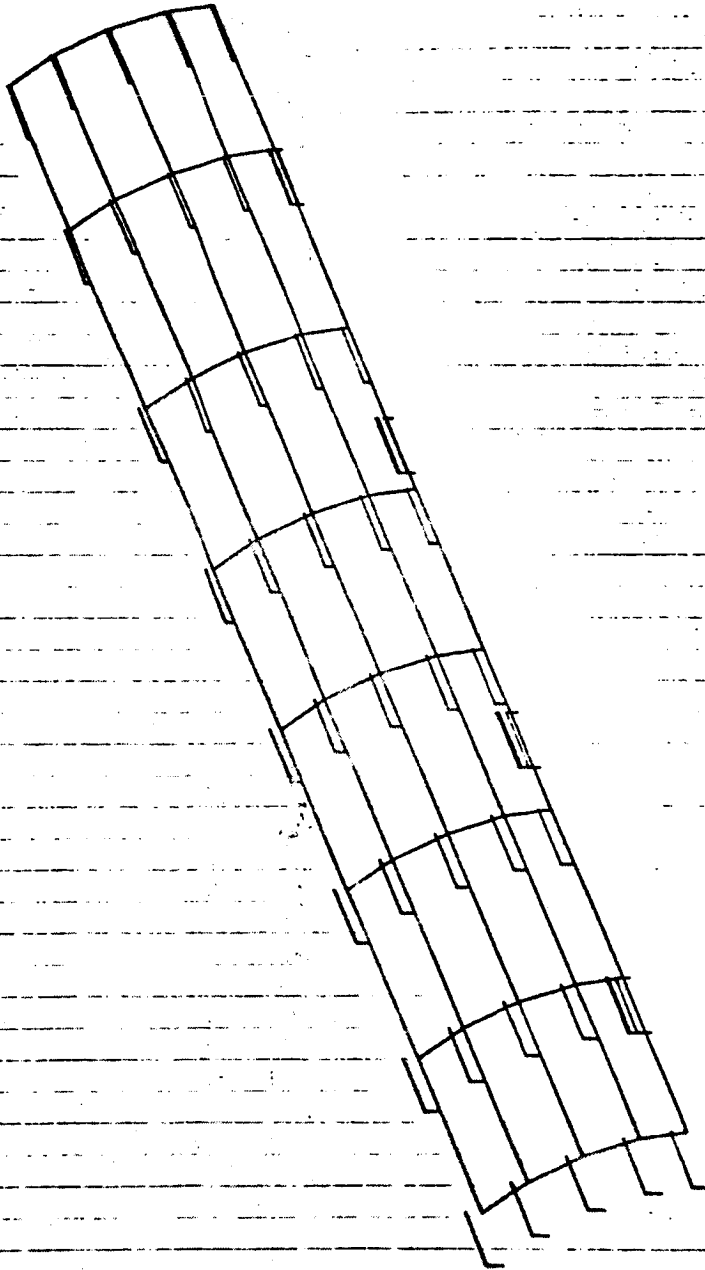
EMUDATA

10/10/74 1400-007, 0 010445100



PHASE 3  
ORBITER OCCURS, SYN CASE (WITH STRAPS)  
ORBITER FREE FREE MODES  
MODAL DEFOR. BURSCASE 1 MODE 1 FREQ. 0.

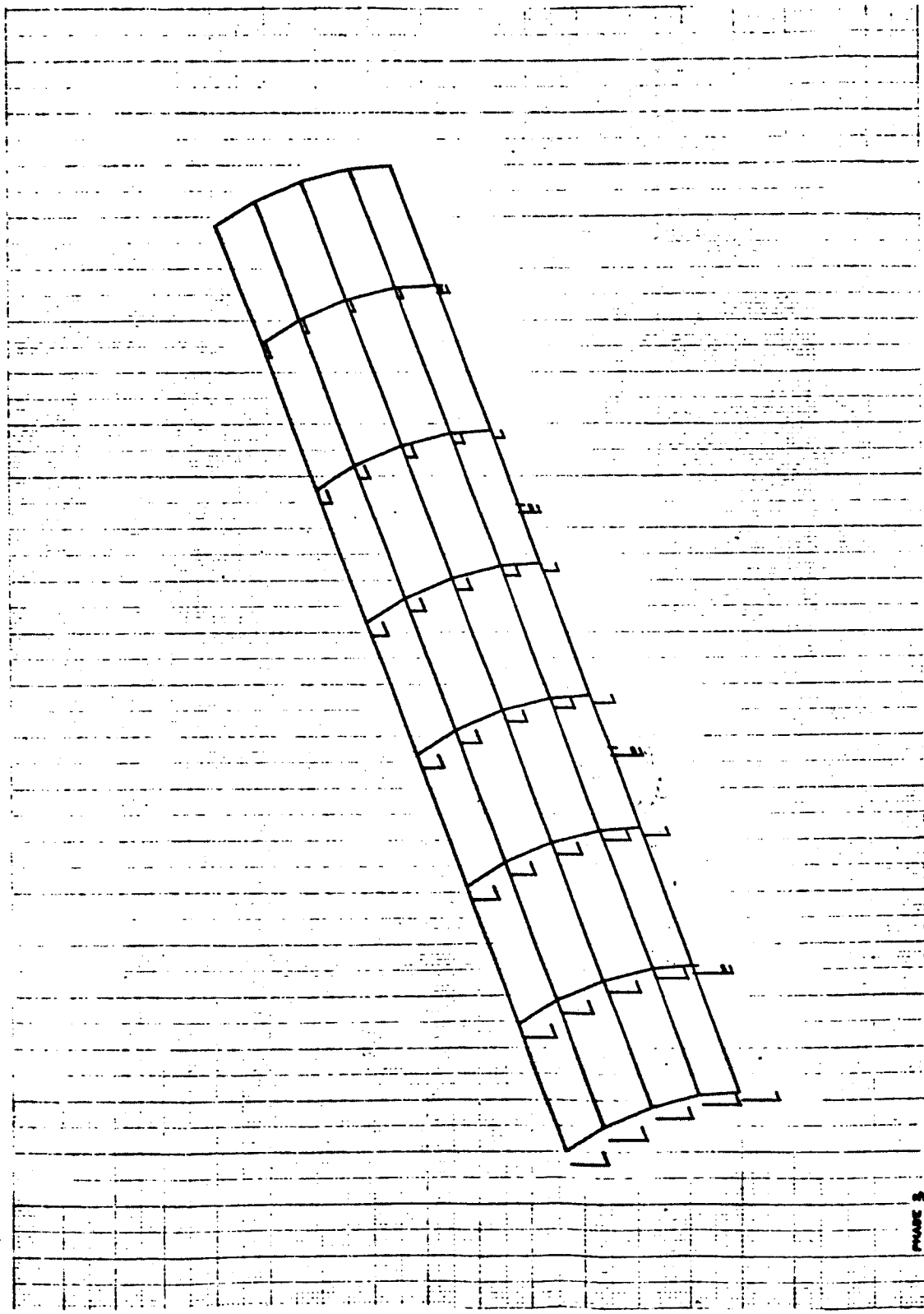
10/19/74 444-007, 0.410012



PHASE 3  
CRITER 0000, BYU CASE (WITH STRAP)  
CRITER FREE MODES  
MODAL DEFOR. SUBCASE 2 MODE 2 FREQ. 0.

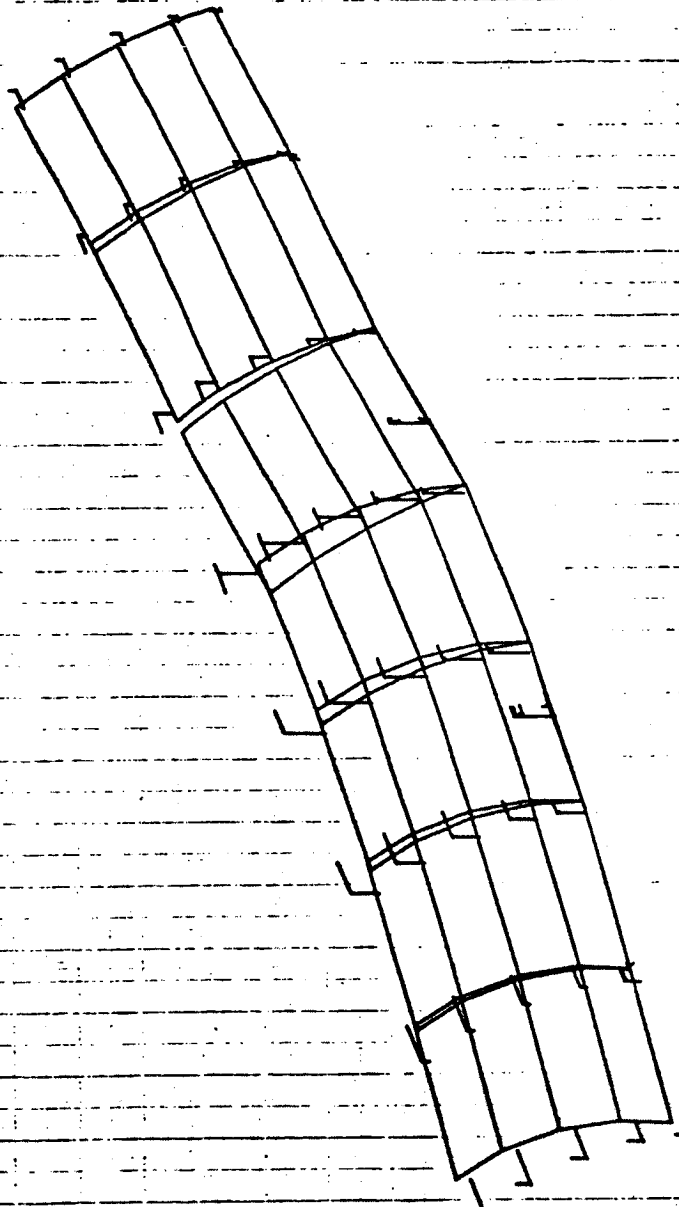


18/18/74 448-227. • 1.000000



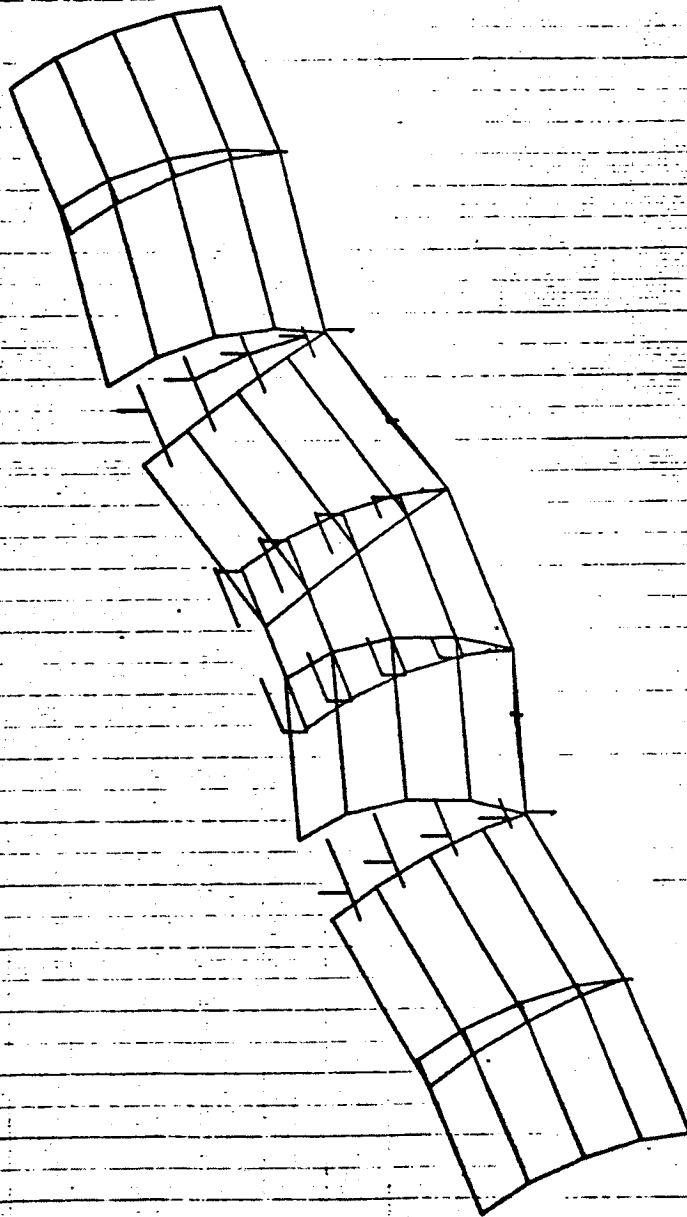
PHASE 3  
CRITER DOORS, SWM GABE (WITH STRAPS)  
CRITER FREE FREE MODES  
MODAL DETER. SUBCASE 3 MODE 3 FREQ. 0.

10/16/74 444-027. - G. 9770000



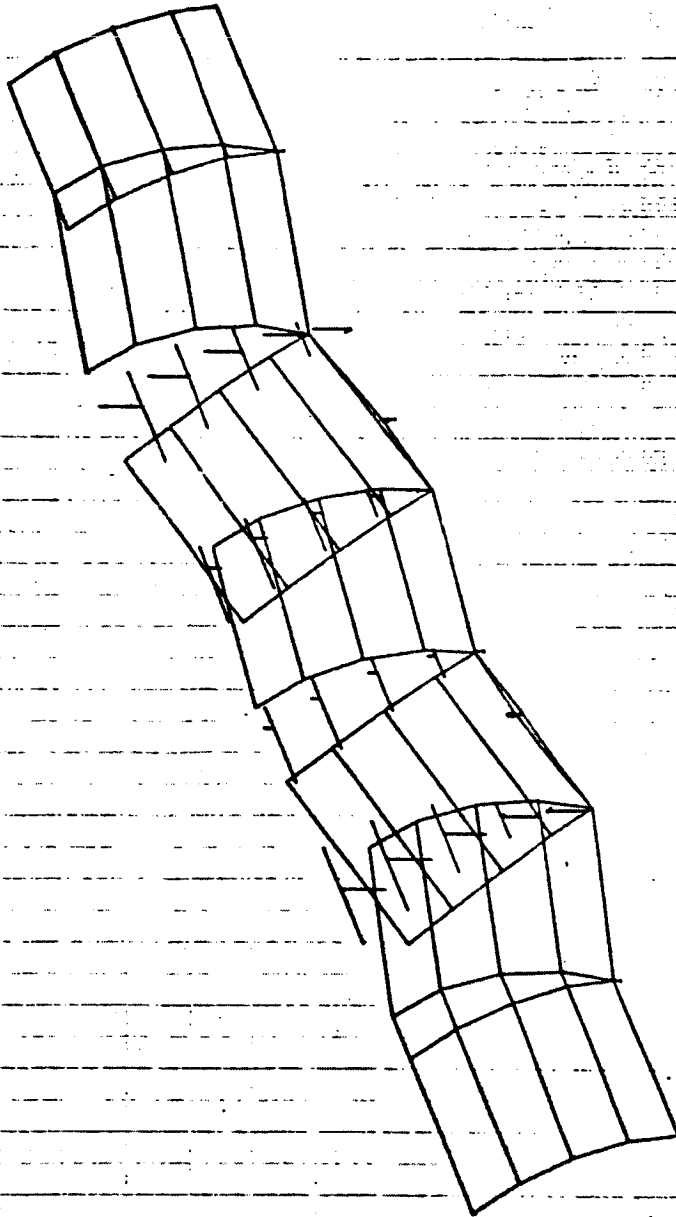
PHASE 3  
CRIBLTER OCCURS BYM CASE (WITH STRAPS)  
CRIBLTER FREE FREE MODES  
MODAL DETON. SUBSCAPE 4 MODE 4 FREQ. 44.11871

0 10/18/74 1000007.0 1.0011110



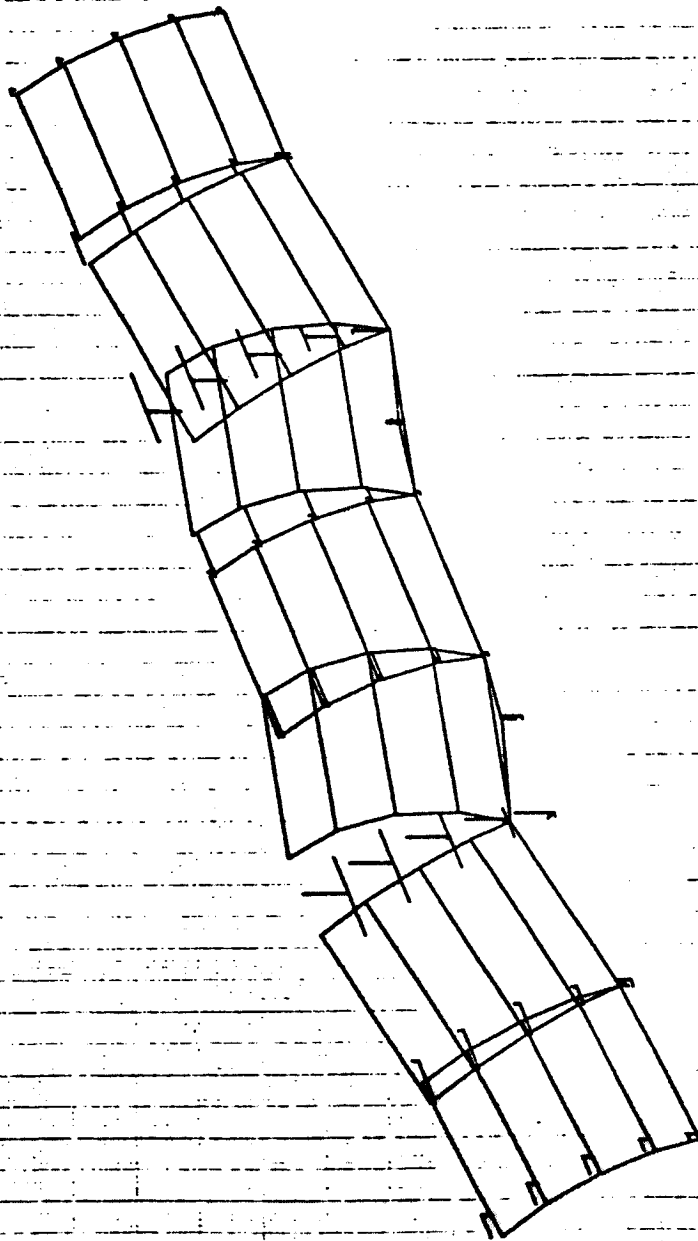
PHASE 5  
CRITER 00000.000 CASE WITH STRAPS)  
CRITER FREE FREE MONO  
MODAL DETER. SURFACE 8 MODC 8 PRIC. 45.38640

10/10/74 100-1007. 1. 10/10/74



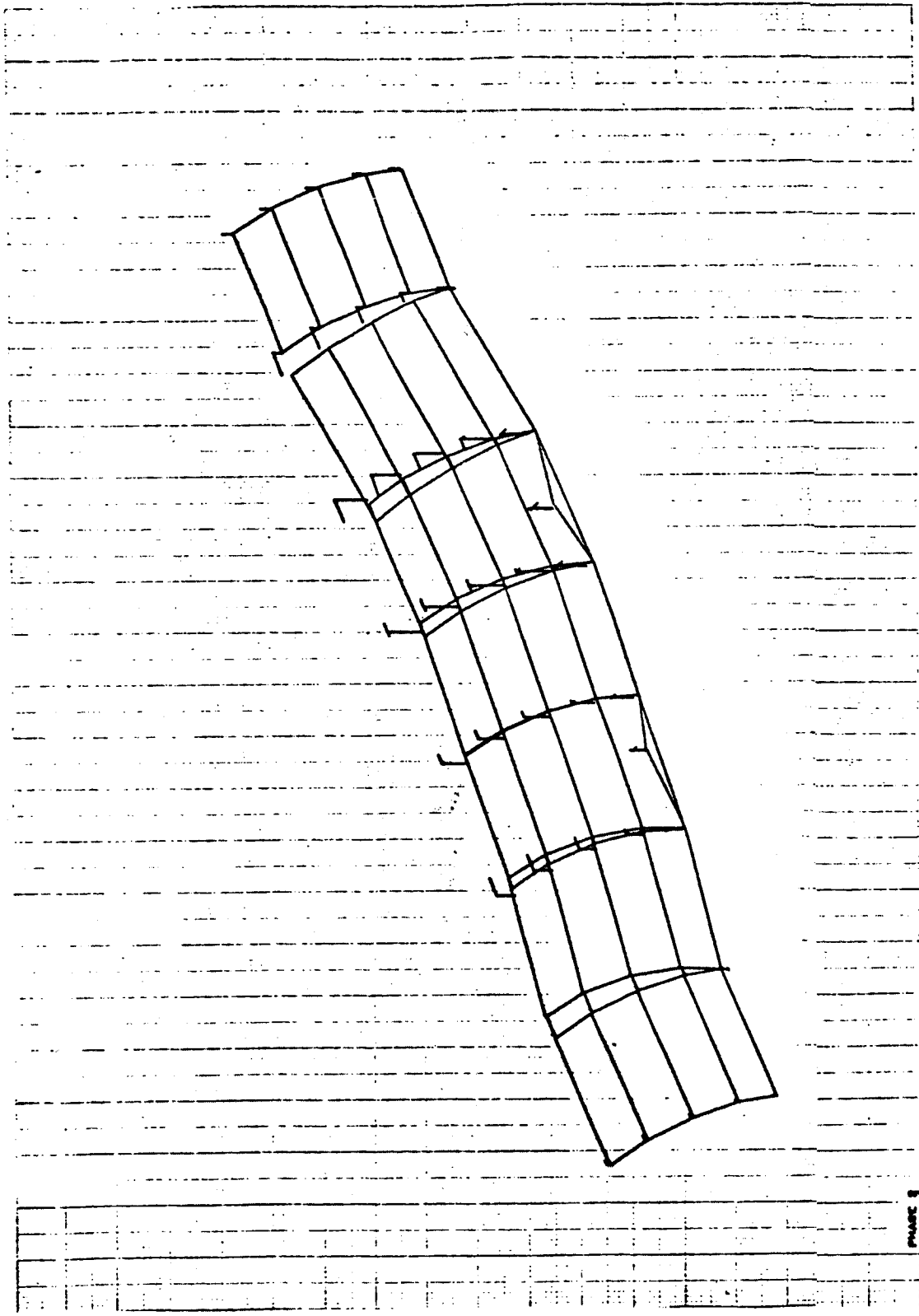
PHASE 3  
CREDIT BOOKS, 874 CASE WITH STRAPS  
CREDIT FREE FREE BOOKS  
MODAL DETON. SURFACE 6 MODE 6 PREG. 01.00000

7 10/10/74 MIL-DEF. - G.0031104



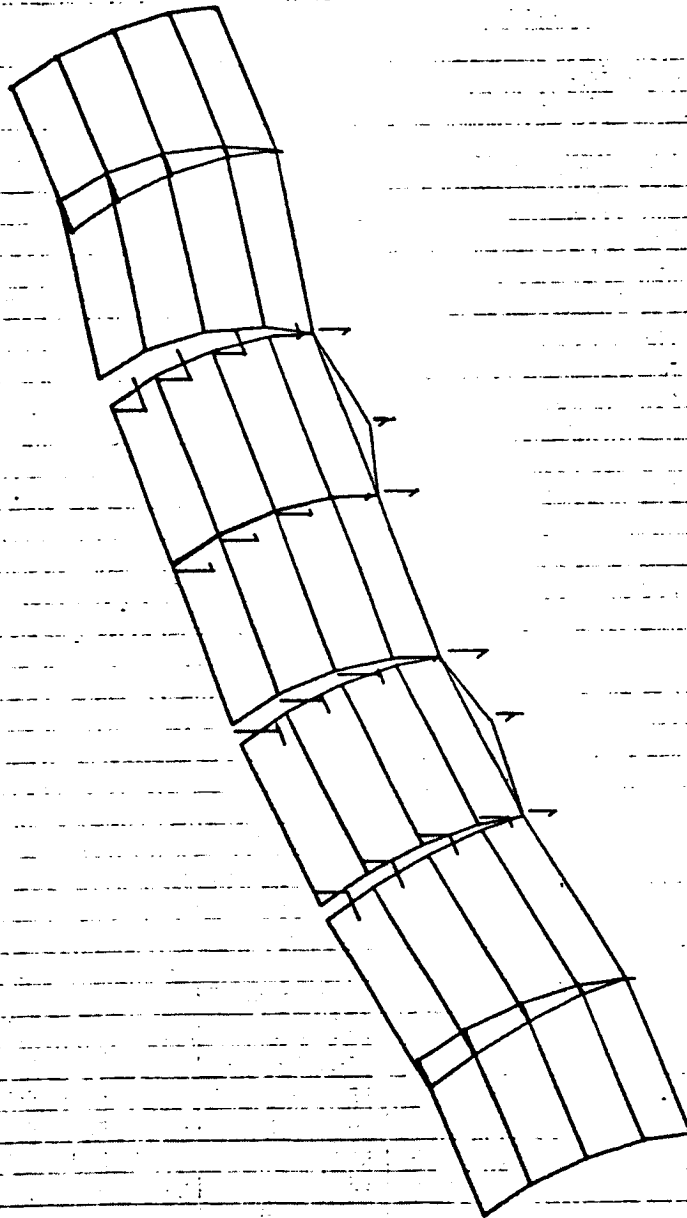
PHASE 3  
ORBITER DOORS, BYM CASE WITH STRAPS  
ORBITER FREE FREE MODES  
MEDAL DOOR, SURGARE 7 MODE 7 FREO. 84.42372

10/18/74 1400-007. • G. 7400000



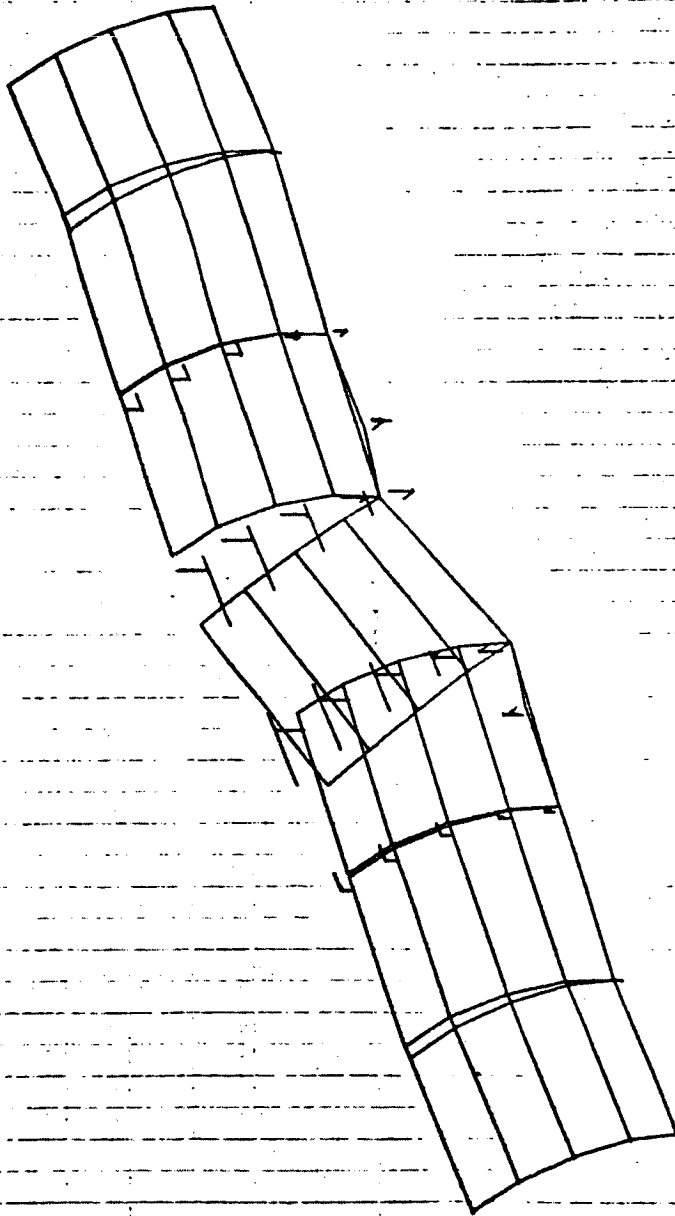
PHASE 3  
CRITER SCORES, SWS CASE (WITH STRAPS)  
CRITER FREE FREE MOSES  
MEDAL DETON. SURGARE 8 MOSE 8 FREQ. 95.71604

18/15/74 MM-827. 1.57222100



PHASE 3  
CREDIT BOOKS, 674 GARE WITH STRAPS  
CREDIT FREE FREE MOSES  
MODAL DEFON. SURSAGE 1 MOSE 1 FREE. 96.00001

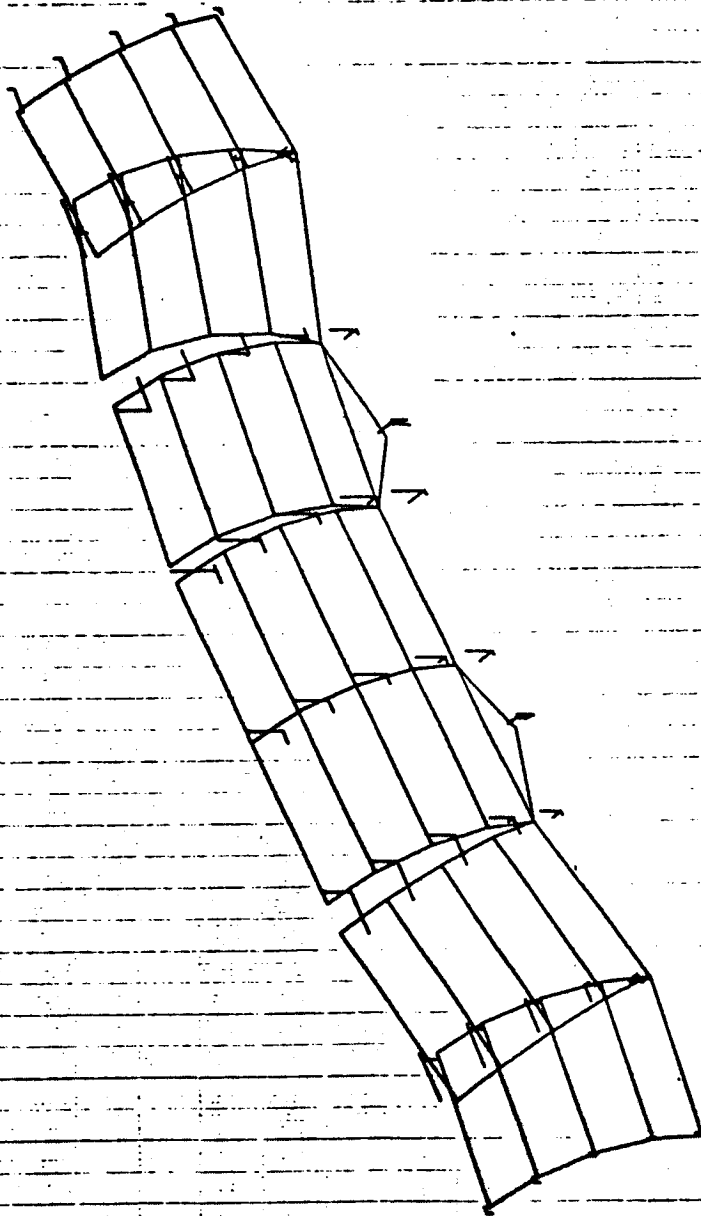
10 10/18/74 MM-027. - 1.4M14770



PHASE 3  
ORBITER DOORS, BYM CASE (WITH STRAPS)  
ORBITER FREE FREE MODES  
MODAL DEFORM. SUBCASE 10 MODE 10 FREQ. 78.71848

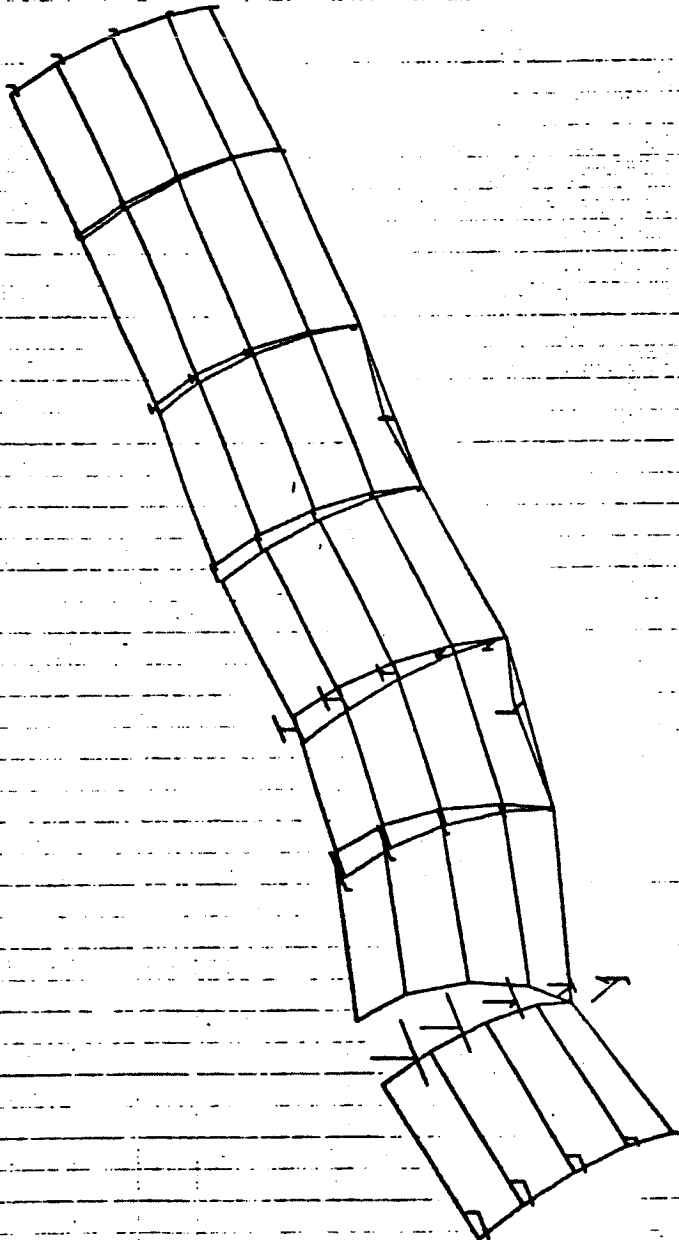


11 10/18/74 148-227. = 0.0000000



PHASE 2  
ORBITER BEARING OVER CASE WITH STRAPS  
ORBITER FREE FREE MOMES  
MODAL DEFOR. SUBCASE 11 MODE 11 FREQ. 83.11100

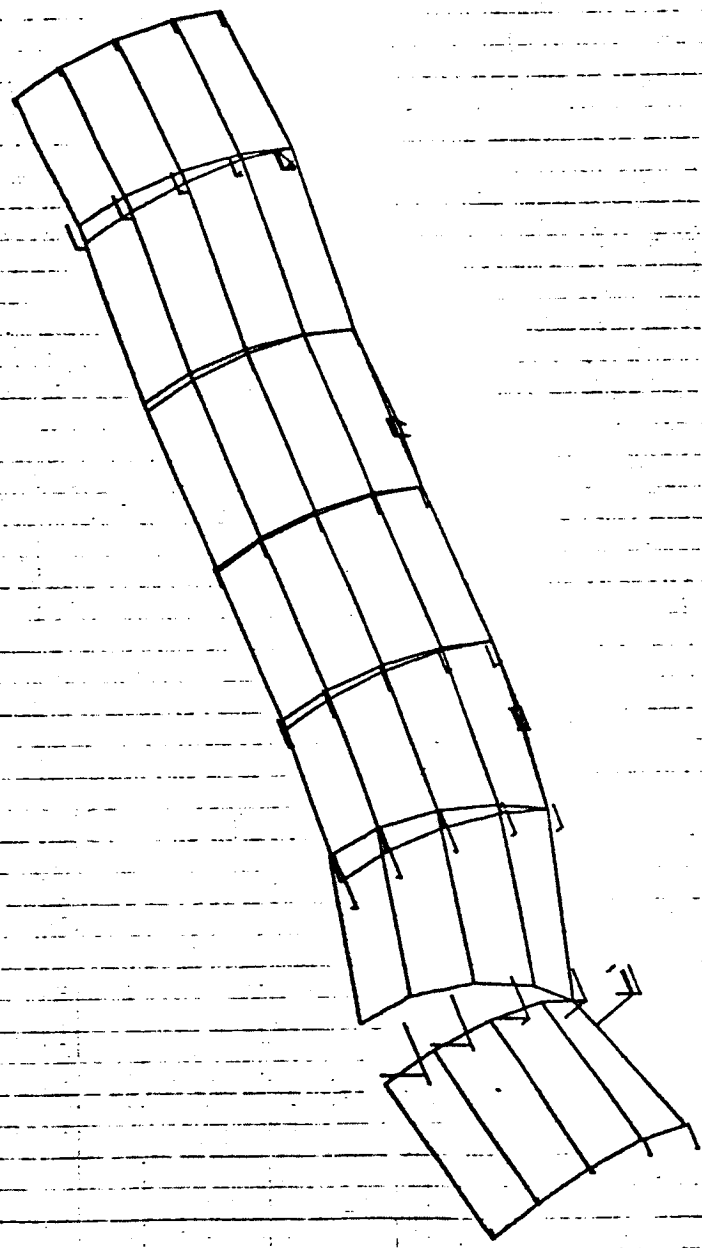
18 10/18/74 MM-227 • 1.4850000



PHASE 3  
CRITER DOORS, 6TH CASE (WITH STRAPS)  
CRITER FREE FREE MODES  
MODAL DEFOR. SURFACE 12 MODE 12 FREQ. 104.7641

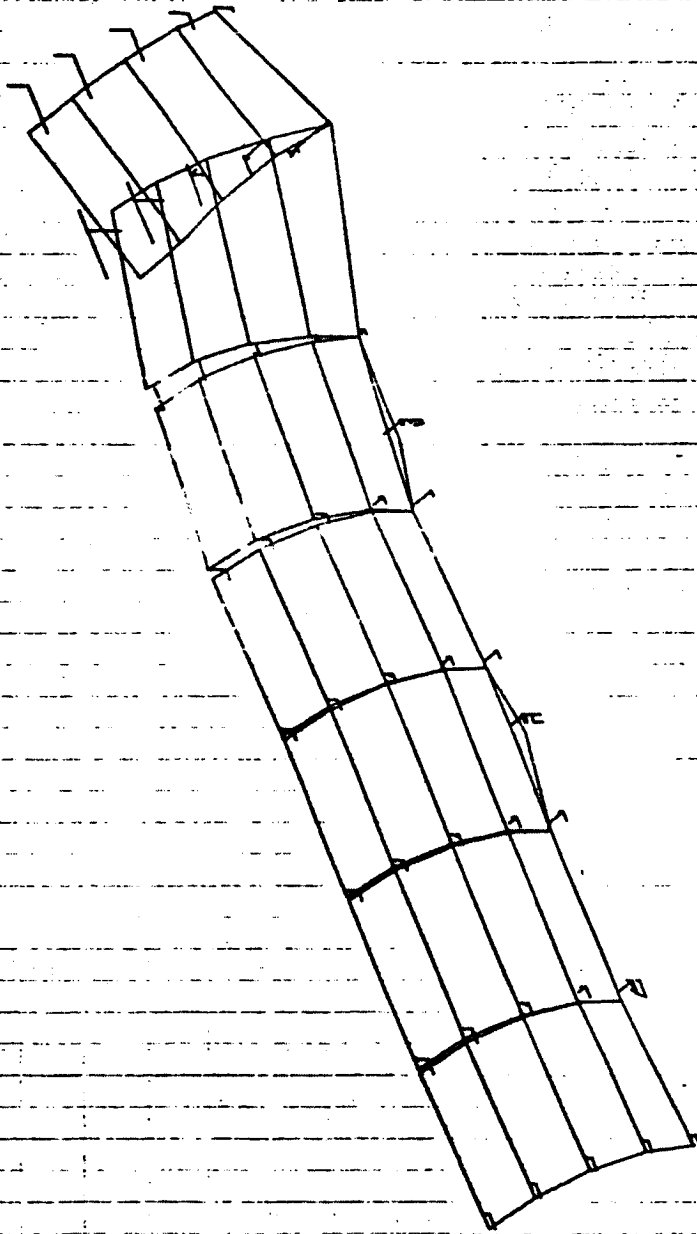
18

18 10/19/74 MW-007, = 1.0003140



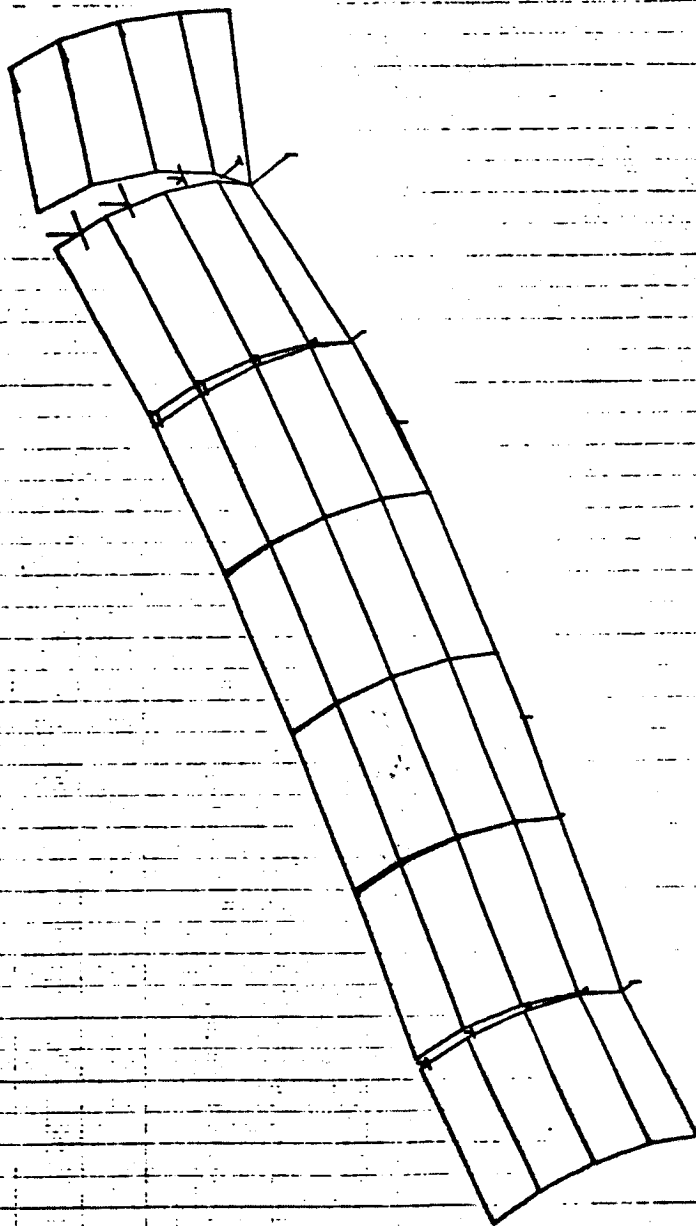
PHASE 2  
 ORBITER DOORS, BYM CASE (WITH STRAPS)  
 ORBITER FIRE FREE MODES  
 MOAL DEFOR. SUBCASE 13 MODE 13 PRCD. 118.8278

14 10/18/74 MAX-DEF. = 0.4150004



PHASE 5  
CRITER 0008, 074 GARE (WITH STRAPS)  
CRITER FREE FREE MODES  
MEDAL DEFER. SUBCAT 14 MODE 14 FREQ. 124.5004

10/18/74 1001-027. 1.000000

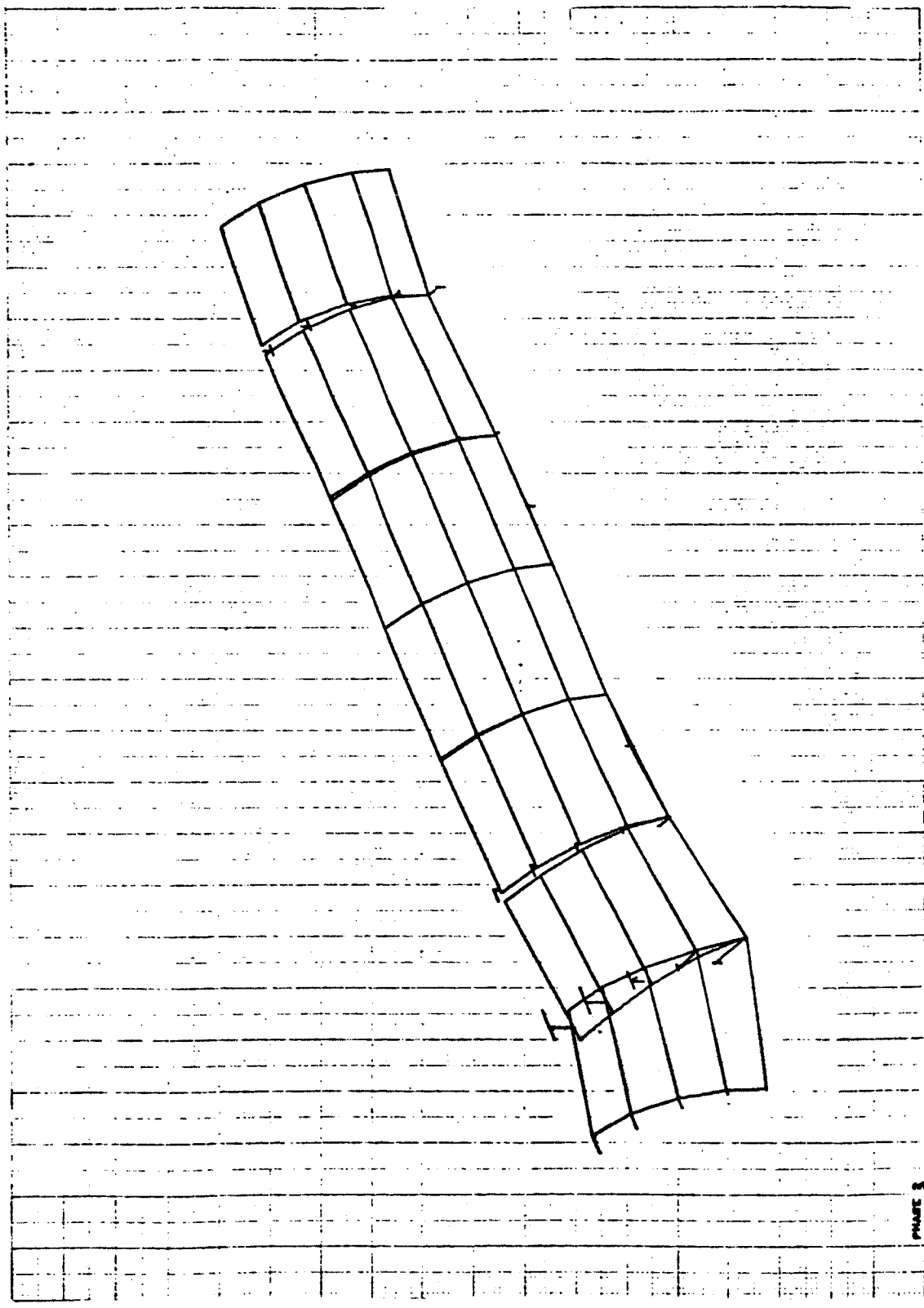


PHASE 3  
DRIVER SEAT, FROM CAR WITH STRAPS  
DRIVER SEAT FREE MODE  
MODAL DEFOR. SURFACE IS MODE 16 FREQ. 129.9481

16

10/18/74 MAX-DET. • 1.0014990

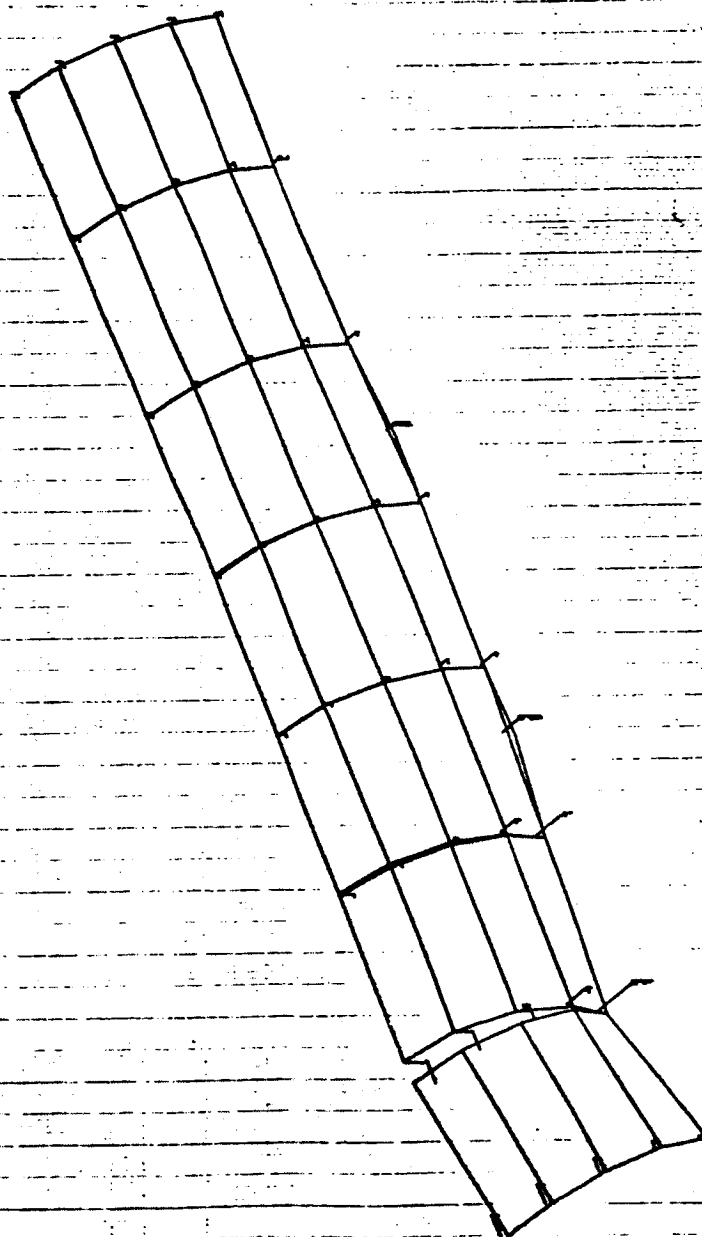
16



PHASE 2  
 CREDIT DEPOS. SYS CASE (WITH STRAPS)  
 CREDIT FREE FREE MODES  
 MODAL DETOR. PURCHASE 16 MODE 18 FREE. 190.8933

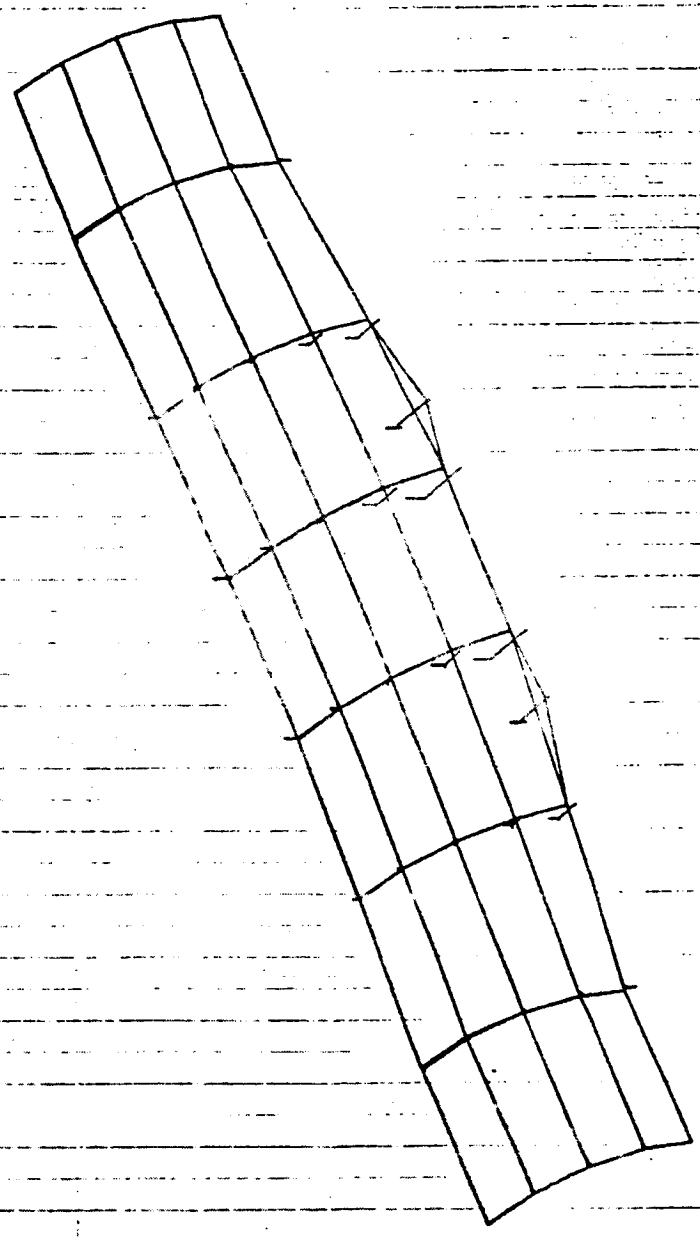
14 10/18/74 MAX-DEF. = 1.01817040

17



PHASE 3  
 ORBITER DOORS, EVA CASE (WITH STRAPS)  
 ORBITER FREE FREE MODES  
 MODAL DEFER. SUBCASE 17 MODE 17 FREQ. 142.1388

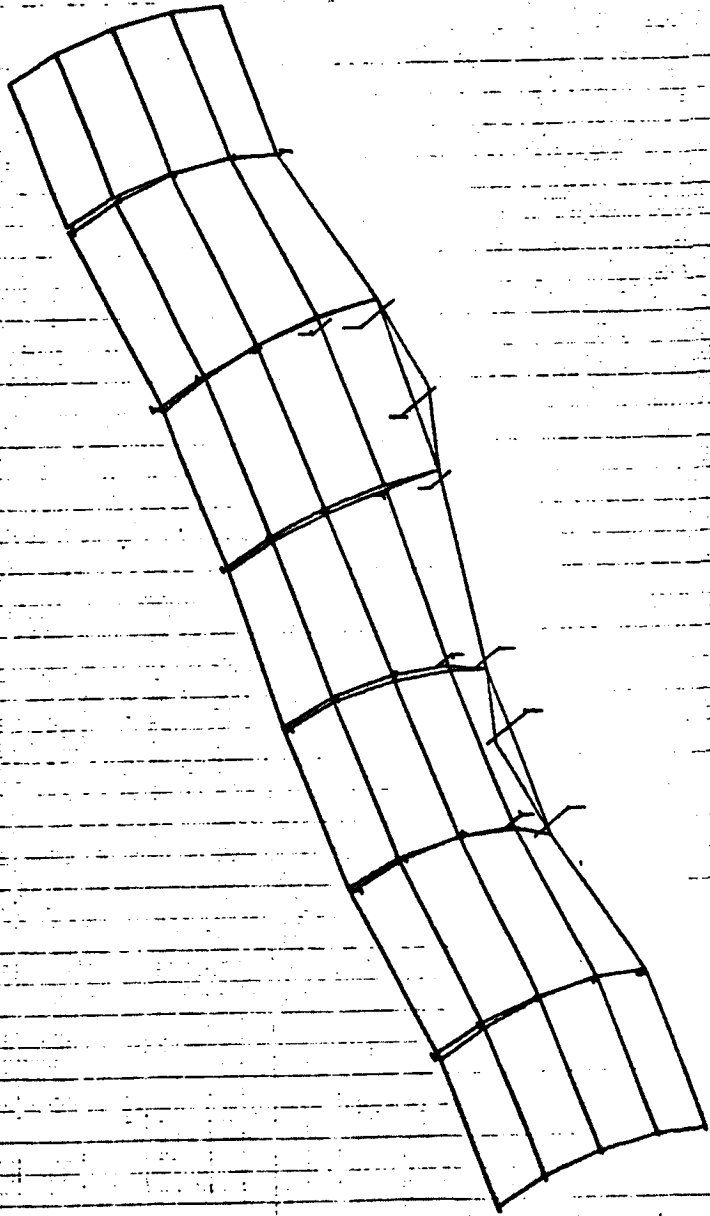
10/18/74 1041-007. = 1.00000000



PHASE 3  
 CRITTER DOORS, SYN CASE WITH STRAPS  
 CRITTER FREE FREE MODES  
 COAL DEPOT. SUBCASE 10 MODE 10 FREQ. 109.0309



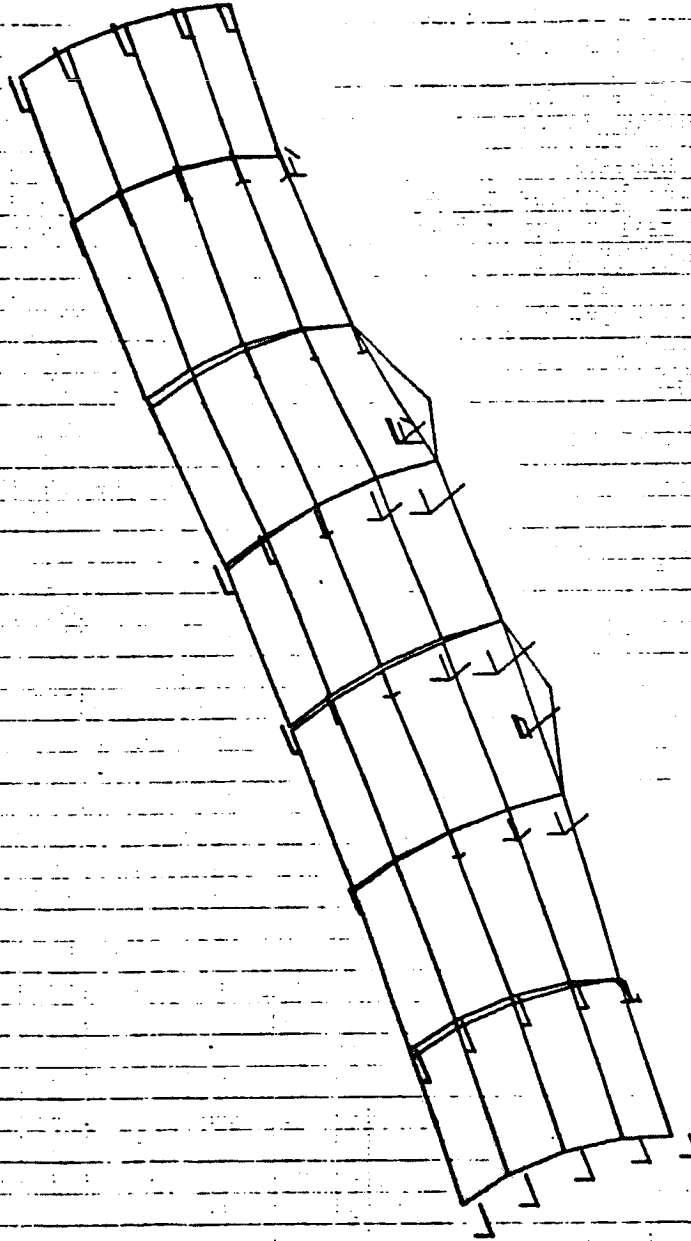
19 10/18/74 100-807.0 1.1700000



PAGE 3  
 ORDER 8008, 814 GAK WITH STRAPS)  
 ORDER PRICE FREE MOKE  
 LOCAL DEFOR. SUBCASE 19 MOKE 19 PRICE 100.0003

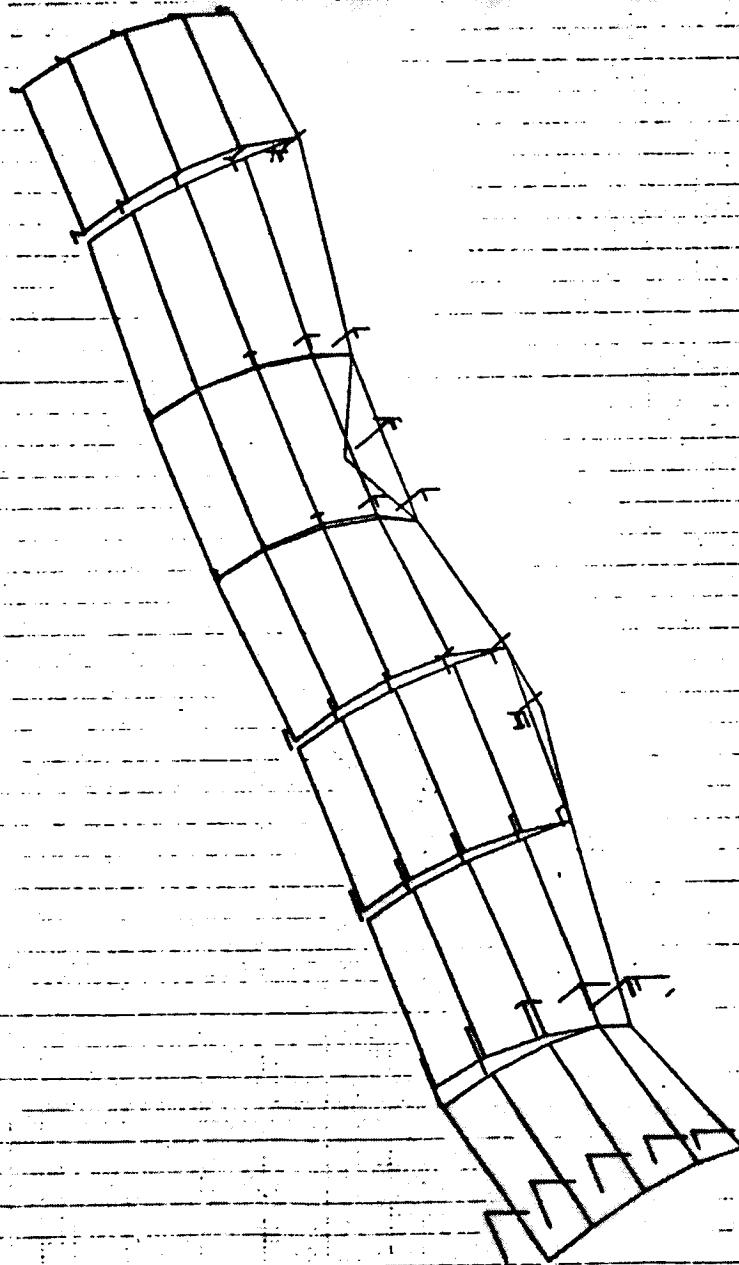
80

80 10/19/74 WSP-227, S. 2222422



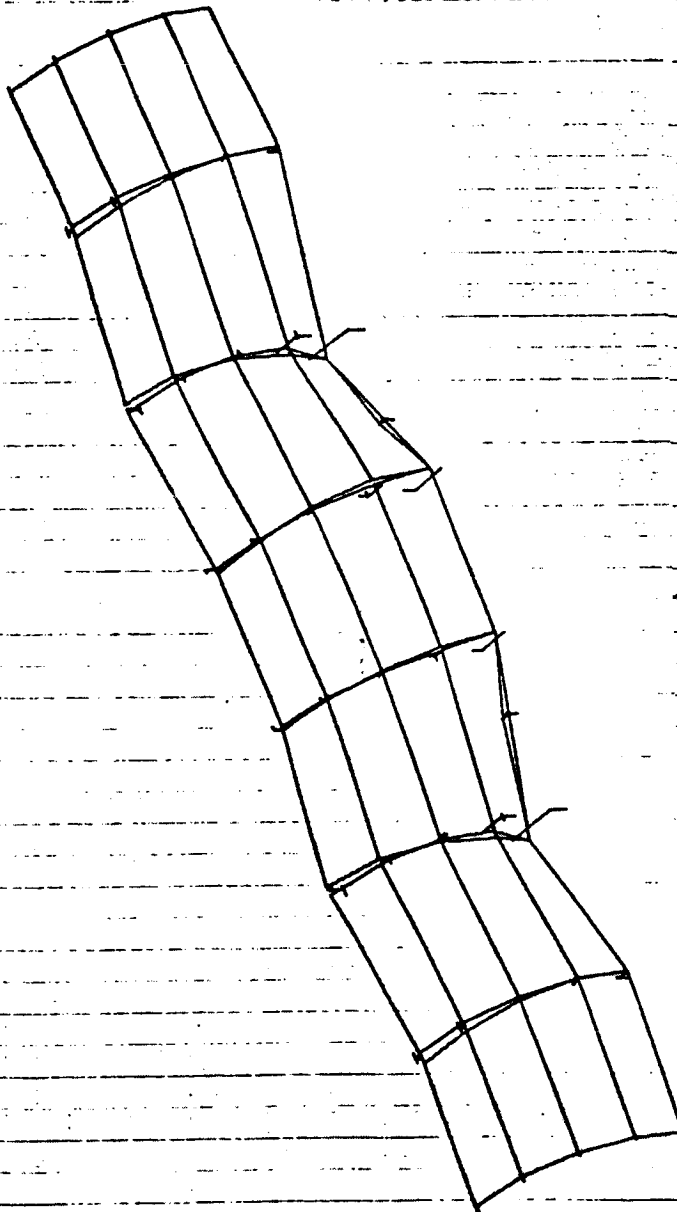
PHASE 2  
 CRITER BOORS, BYM CASE WITH STRAPS  
 CRITER FREE FREE MOSES  
 LOCAL OFFIC. SURFACE 20 MODE 20 FREQ. 171.7384

21 10/16/74 100-207, o. 2, 2070004



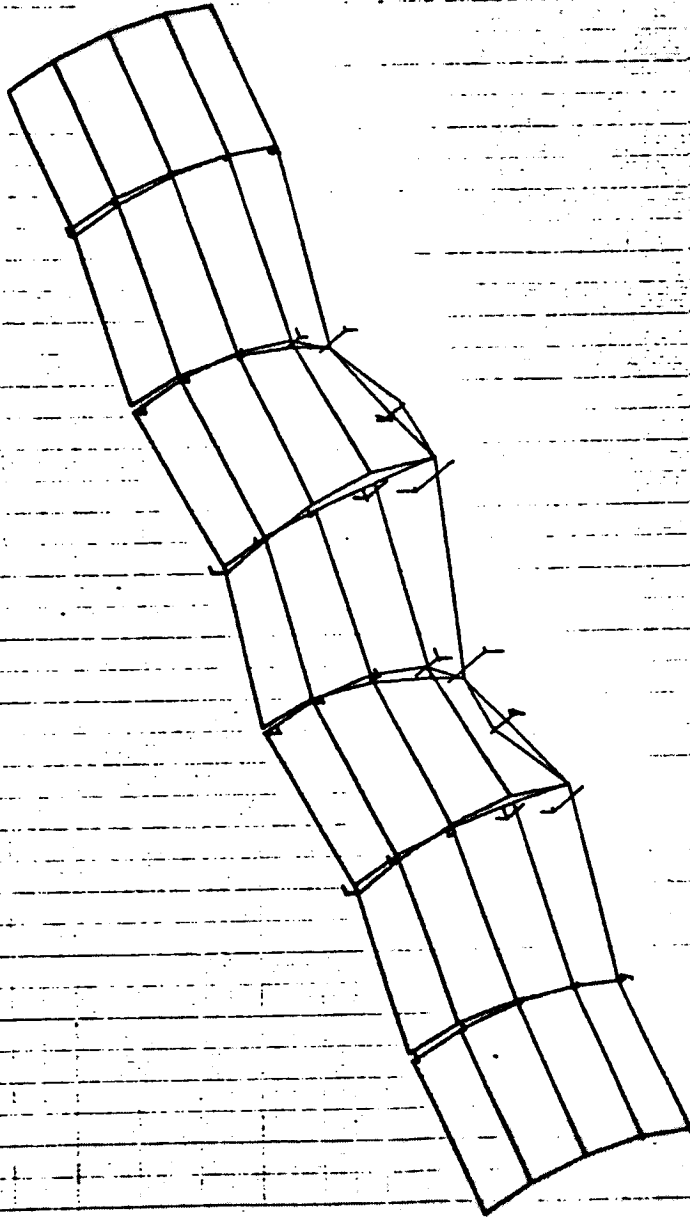
PHASE 2  
 CRITERIA SCHEMATIC DRAWING (WITH STRAPS)  
 CRITERIA FREE FREE MODEL  
 LOCAL DETAIL. SUBSCALE 2:1 MODEL 100-4090

10/18/74 MMN-007, 1, 0879000



PHASE 3  
 CRITTER SCORING SYS CARE WITH STRAPS  
 CRITTER FREE FREE INDEX  
 MEDAL DEFER. SUSPENSE 22 ICODE 22 FREQ. 140.2263

29 10/10/74 444-227. = 1.0000010



PHASE 3  
 CRITTER ENGINEERING BASE WITH STRAPS  
 CRITTER FREE FREE HOOPS  
 MODAL DETCH. SUBCASE 23 WOPC 20 FREQ. 224.0E+4

**Appendix B17**  
**INPUT & PLOTS/PHASE 3 ANALYSIS: MODEL II FIN**  
**SYMMETRIC FREE-FREE ORBITER MODES**

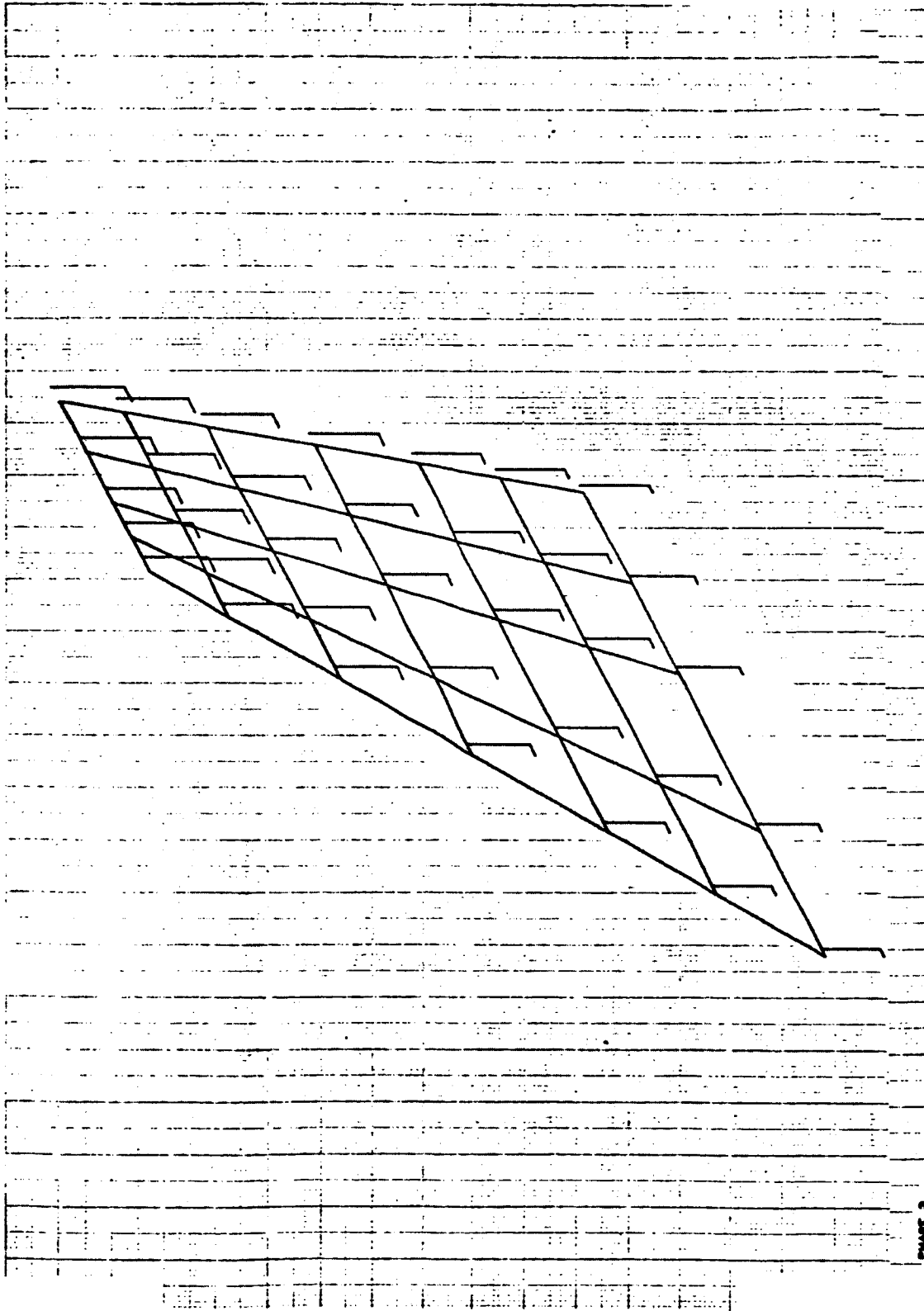
CASE CONTROL DECK ECHD

CARD	
1	TITLE # PHASE 3
2	SUBTITLE # FIN-SYMM XWITH SPRINGSII
3	MAXITER# # 50000
4	VECTOR # ALL
5	CORCASE 1
6	LEVE # ORBITER FREE MODES
7	MORAS # 23
8	ORBITERPLDTH
9	SET OF # INCLUDE 4401 THRU 4424
10	SET OF # EXCLUDE 4431 THRU 4452
11	SET OF # INCLUDE 4461 THRU 4529
12	EXITER 010000 765.105
13	AXIS # 452.2
14	VLEN # 66.650.0.0.0
15	MAXITER# INFORMATION 2.0
16	LEVE SCALAR INFORMATION 67.50 T 61
17	PLATE ORBITAL INFORMATION 1 THRU 2.3.51 T 61.0A.IGIN 62. SHAPE. VECTOR XYZ
18	LEVEN DLEN

PANAM TITANIE 2 ORBITSP2

ENDDATA

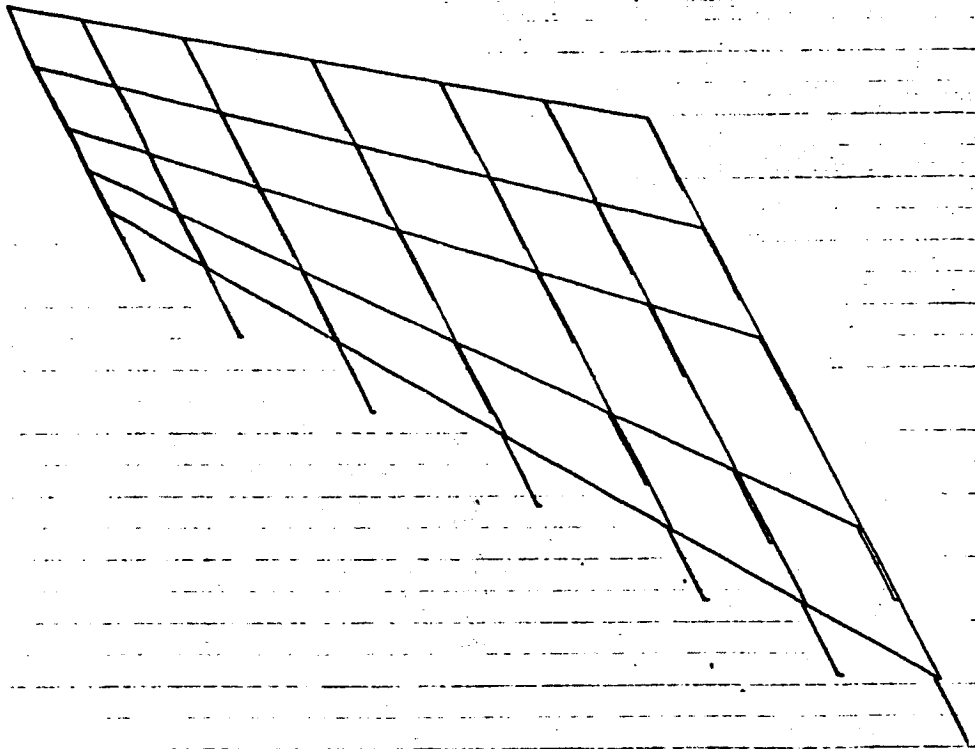
1 10/19/74 100-207, • 1.015-0010



PHASE 3  
P14-0744 (WITH 0711000)  
ORBITER FREE FREE NUMBER  
LOCAL DEFOR. SUBCASE 1 MODE 1 PRCB. 0.

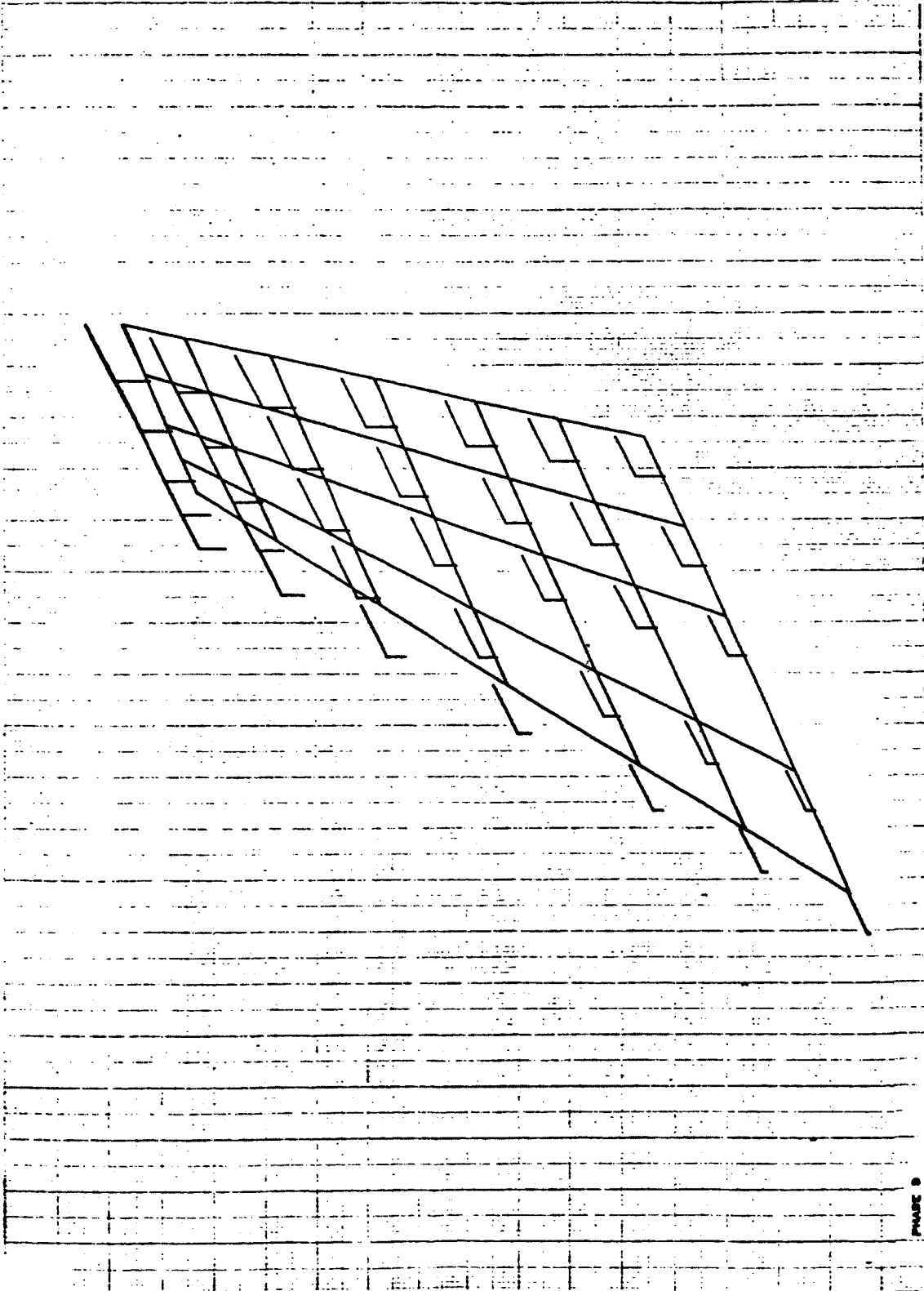


2 10/18/74 MAX-DEF. = 0.91401000



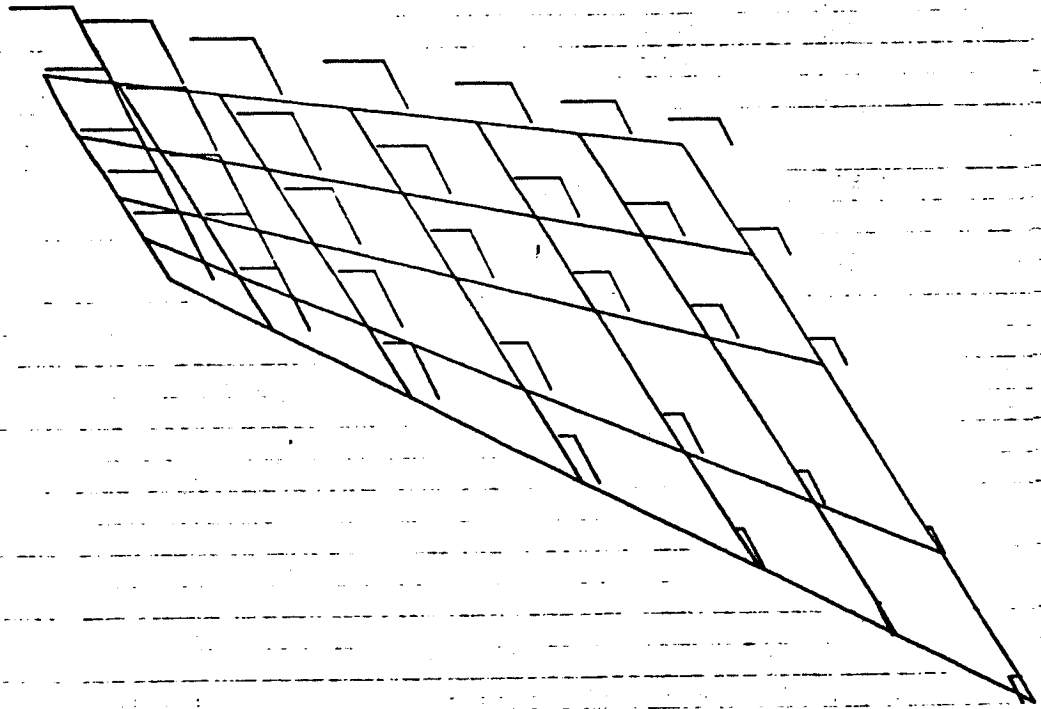
PHASE 2  
FIN-STAG (WITH SPRINGS)  
ORBITER FREE FREE MODES  
MODAL DEFOR. SUBCASE 2 MODE 2 FREQ. 0.

10/18/74 100-207, 0.45-100004



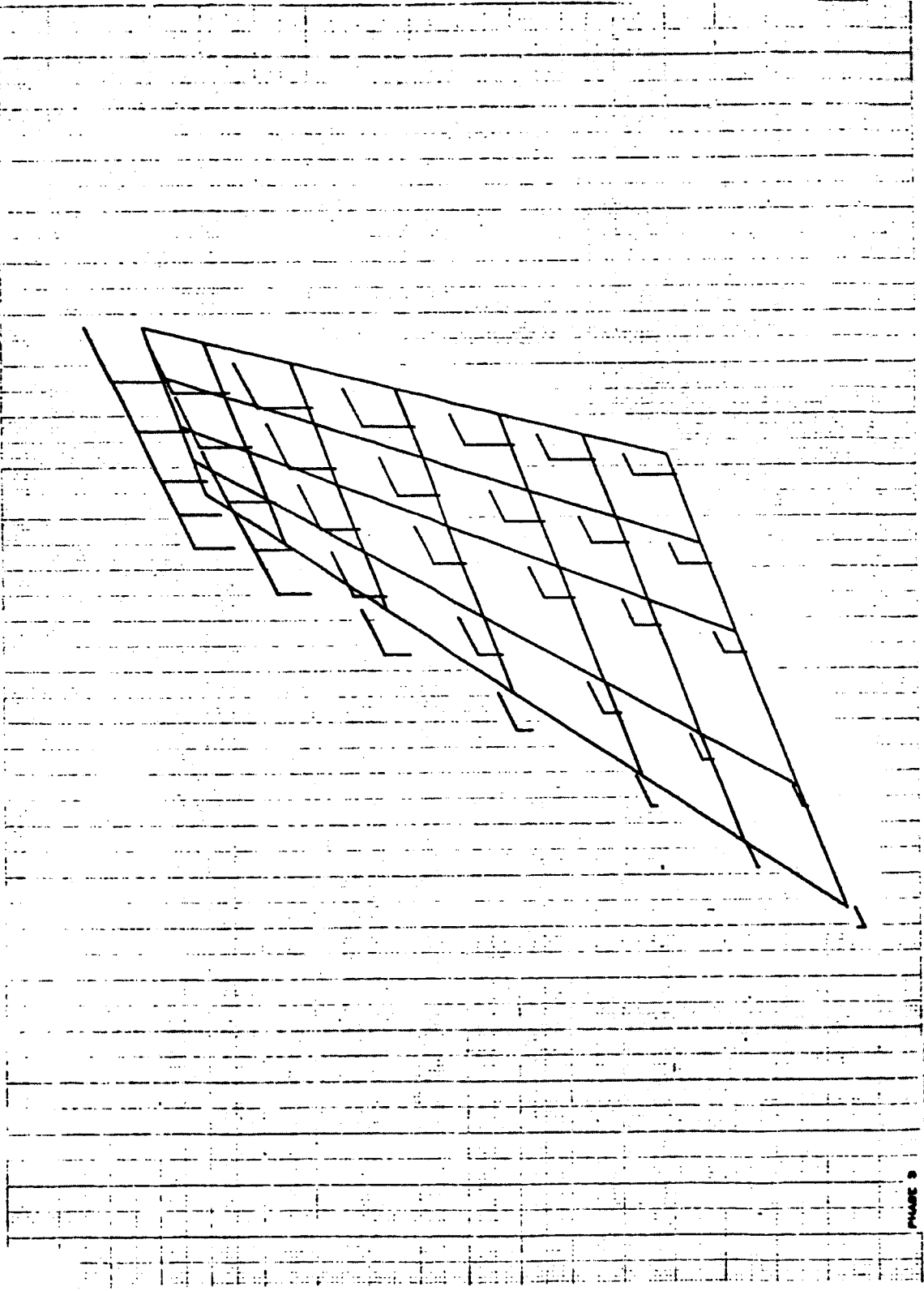
PHASE 9  
FIN-SYLM (WITH 8PP11000)  
ORBITER FREE FREQ 14003  
MODAL DETOR. SUBCARE 9 WESC 9 FREQ. 0.

10/19/74 100-007, 2, 203-1000



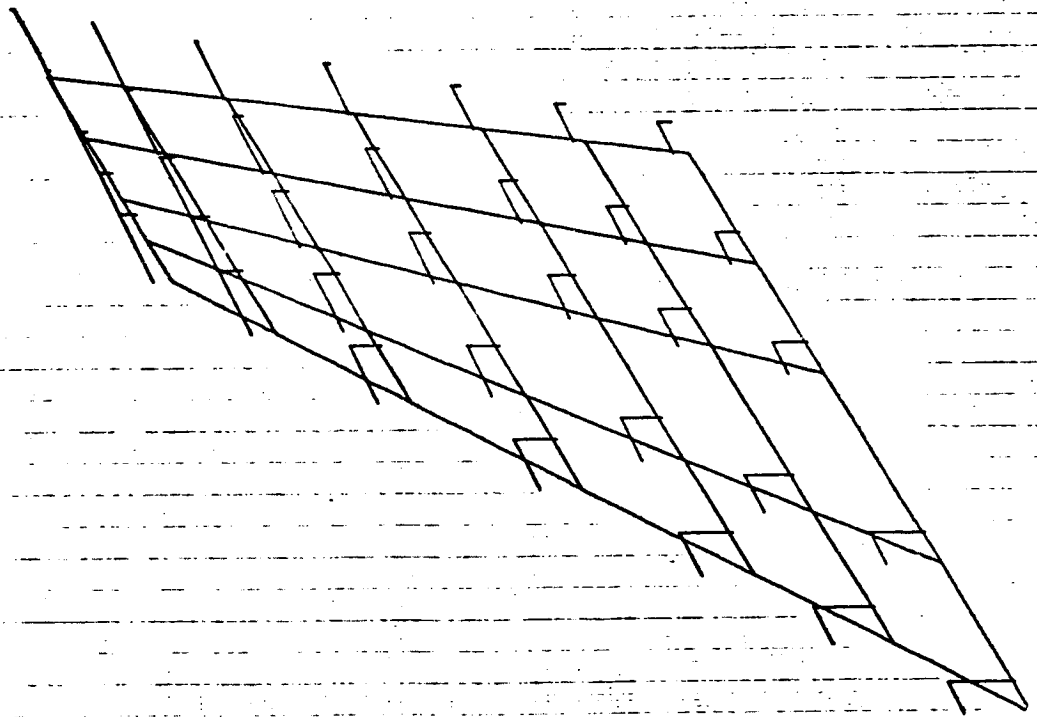
PHASE 3  
FIN-SYM (WITH SPRINGS)  
CRITER FREE MODES  
MODAL DETOR. SUBCASE 4 MODE 4 FREQ. 44.11871

10/18/74 000000Z . O. 012400Z



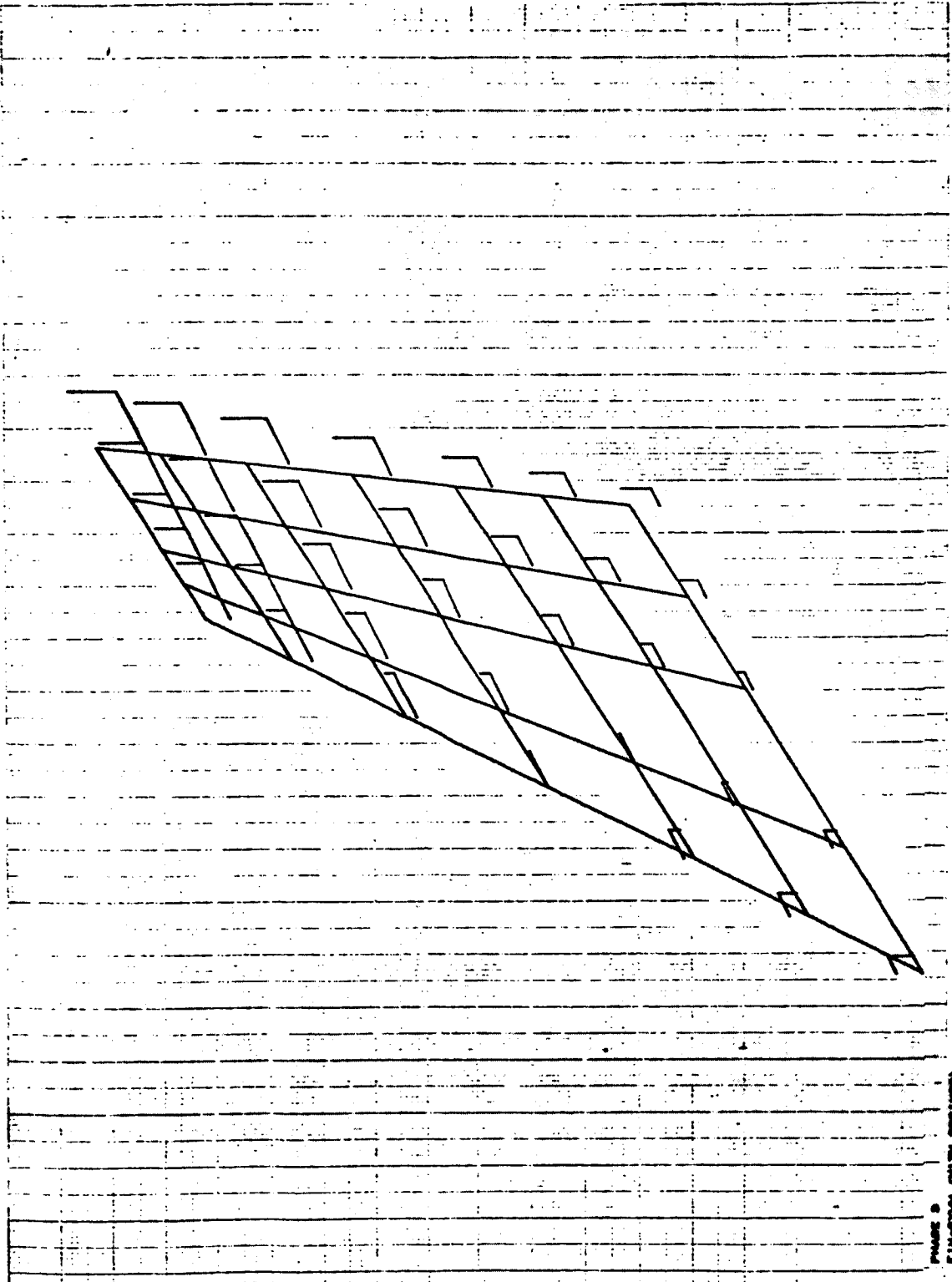
PHASE 3  
FIN-5744 (WITH SPINNING)  
ORBITER FREE FREE MESSAGE  
MODAL DETON. MESSAGE 3 0000 0000 48.0000

0 10/18/74 144-207, 0 0.0120070



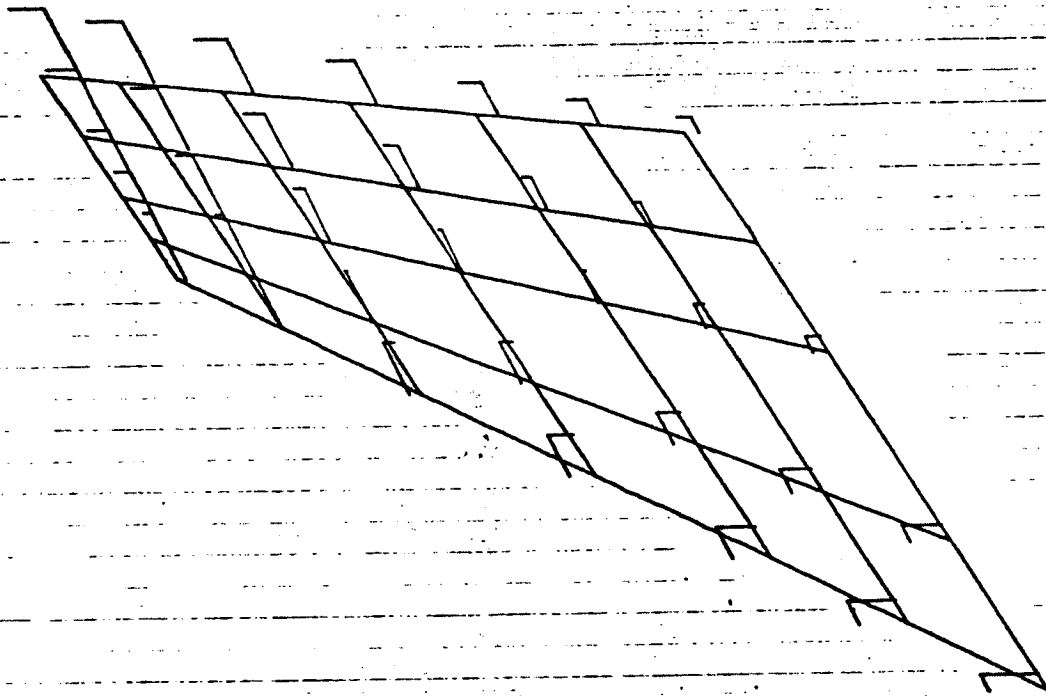
PHASE 3  
FIN-SYDAS WITH SPRING3  
ORBITER FREE FREE MODES  
MODAL DEFOR. SUBCASE 6 MODE 6 FREQ. 01.20832

10/18/74 100-207, c. 2, 10210002



PHASE 5  
FINISH WITH SPINDLES  
CRATER FREE FREE UNITS  
MEDAL DCTOR. SURFACE 7  
PAGE 7 PECO. 94-48878

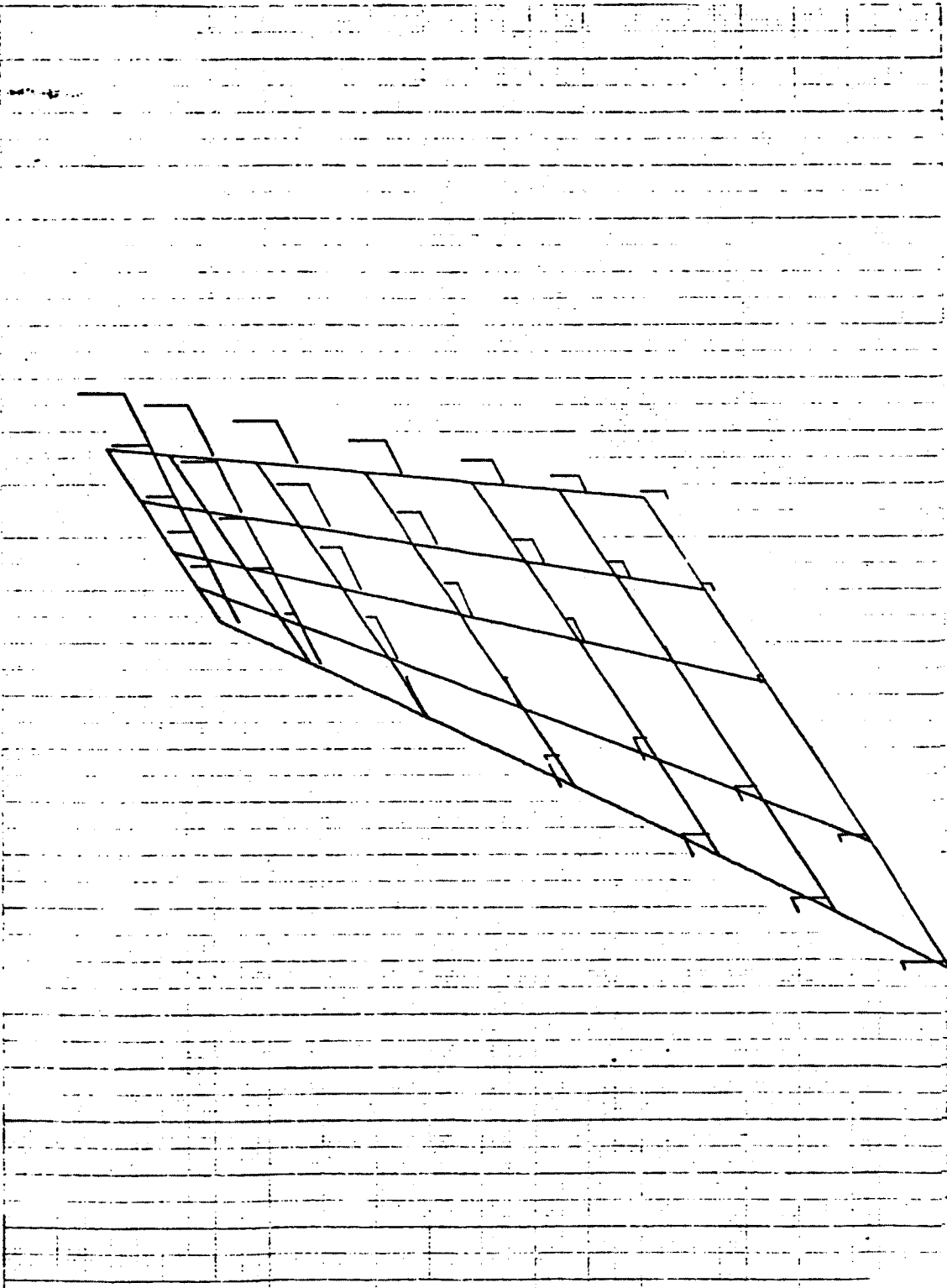
10/18/74 1000-007.0 0.01248172



PHASE 3  
TIM-0004 WITH SPRINGS  
DIBITER FREE MODES  
LOCAL DEFOR. SURFACE 8

FREQ. 68.71664

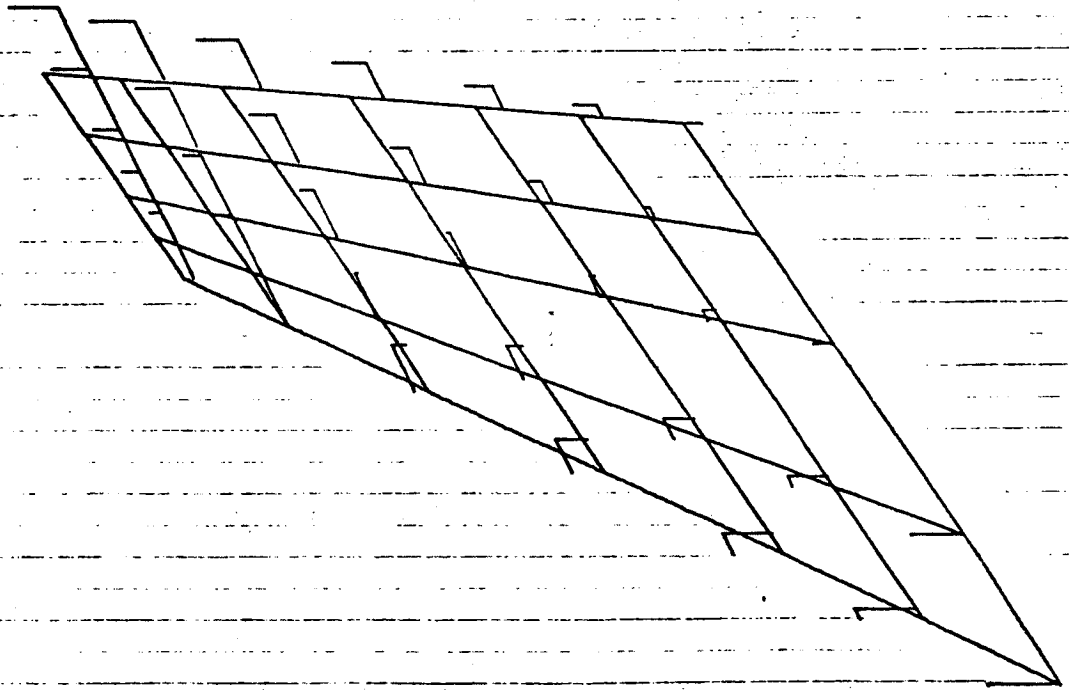
10/10/74 1001-007. = 0.00100010



PHASE 3  
PIN-SPIN WITH SPRINGS  
CRITER FREE FREE MODES  
MODAL DEFORM. SUBCASE 4 MODE 4 FREQ. 60.80081

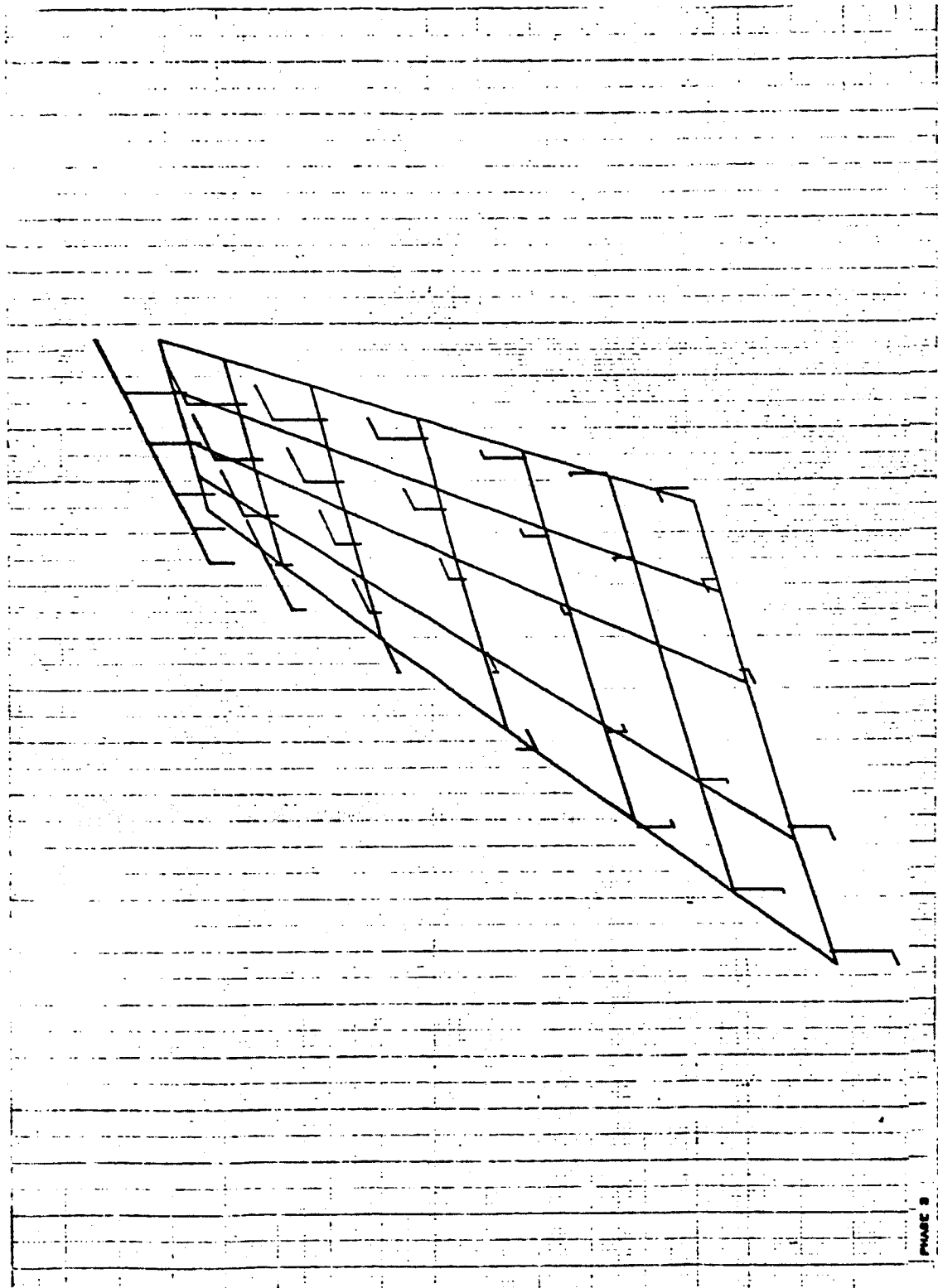


10 10/18/74 MAX-DEF. = 0.0000171



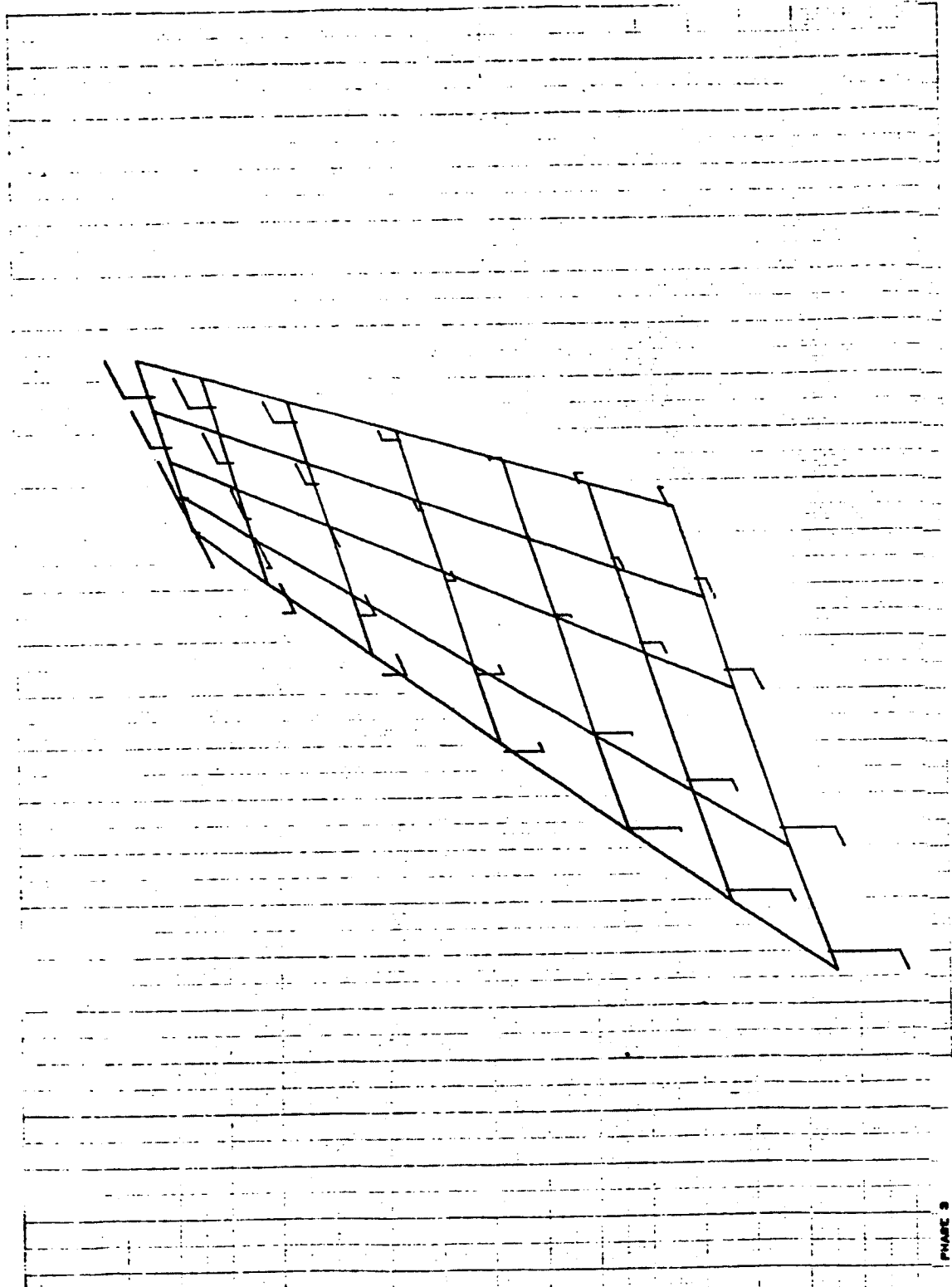
PHASE 2  
PIN-SYM (WITH SPRINGS)  
ORBITER FREE FREE MODES  
MODAL DETOP. SUBCASE 10 MODE 10 FREQ. 76.71049

11 10/10/74 100-007, 0.00-00000

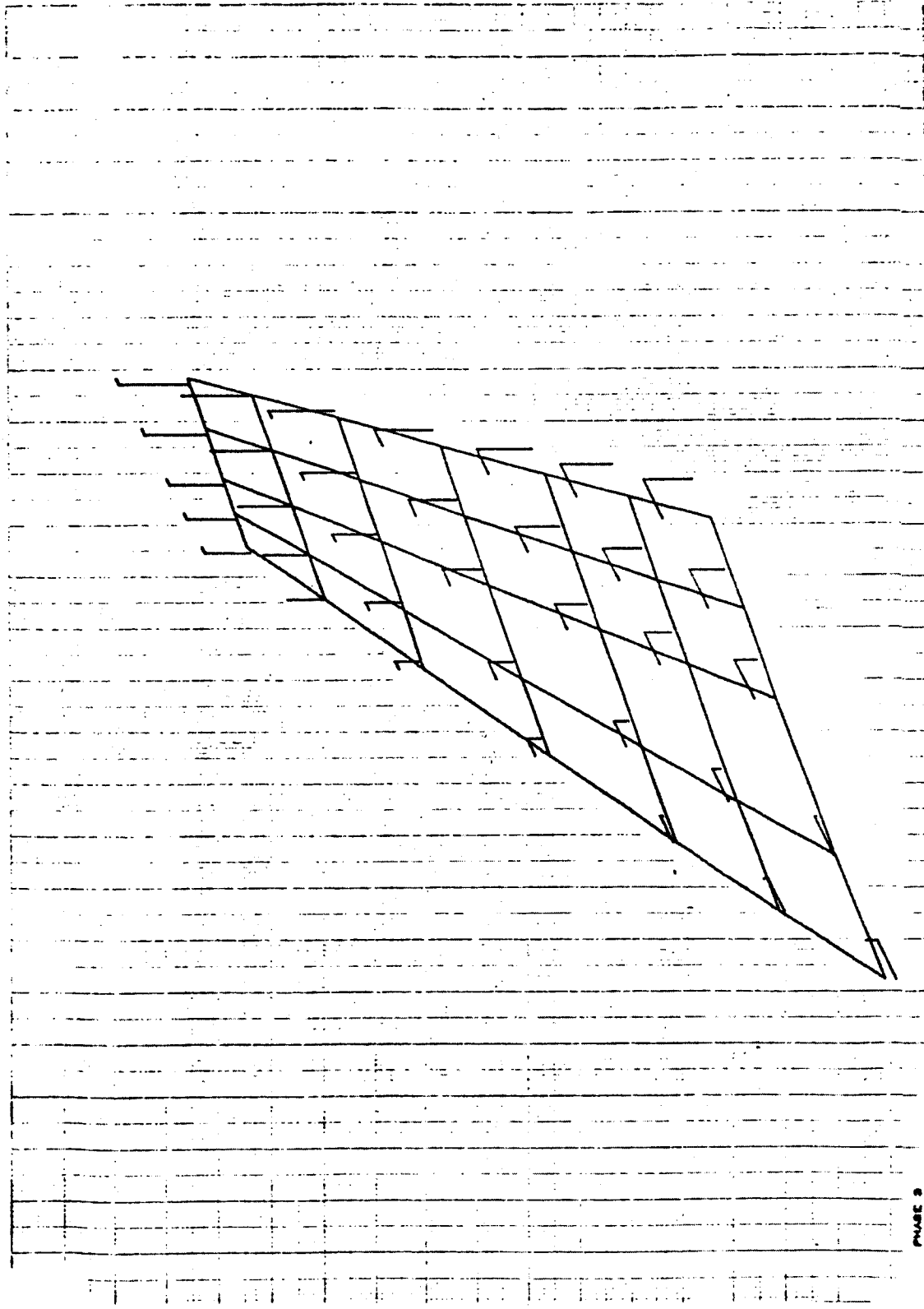


PHASE 2  
FIN-SYLM WITH SPRINGS  
CRITER FREE FREE MODES  
MODAL DEFOR. SURFACE 11 MODE 11 FREQ. 60.1100

12. 10/15/74 1001-027, 0.00000004

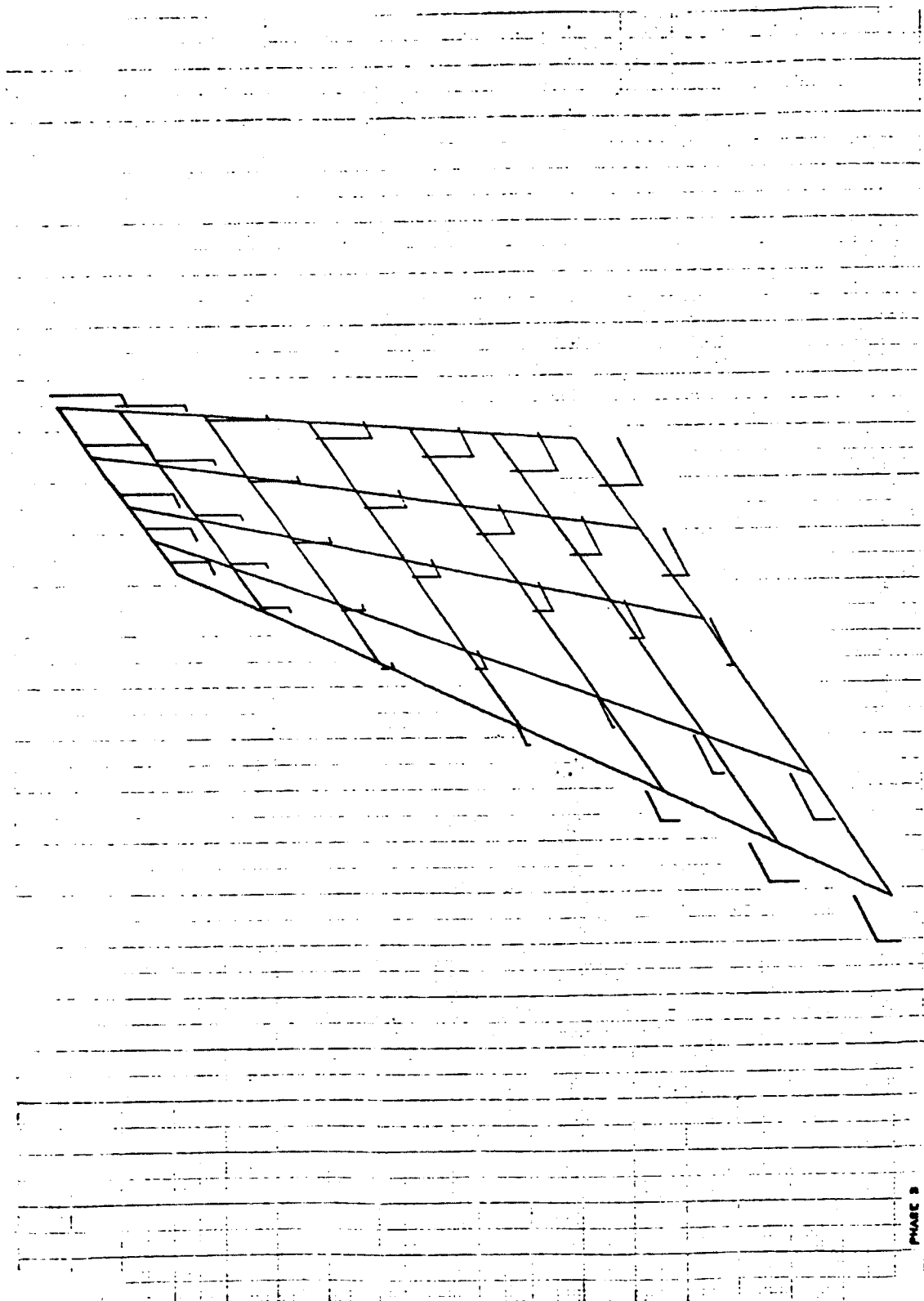


PHASE 3  
 FIN-SYAM (WITH SPRINGS)  
 ORBITER FREE FREE MODES  
 MODAL DETON. SUBCASE 12 MODE 12 FREQ. 104.7841



PHASE 2  
 FIN-PTM (WITH SPRING)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 13 MODE 13 FREQ. 115.9278

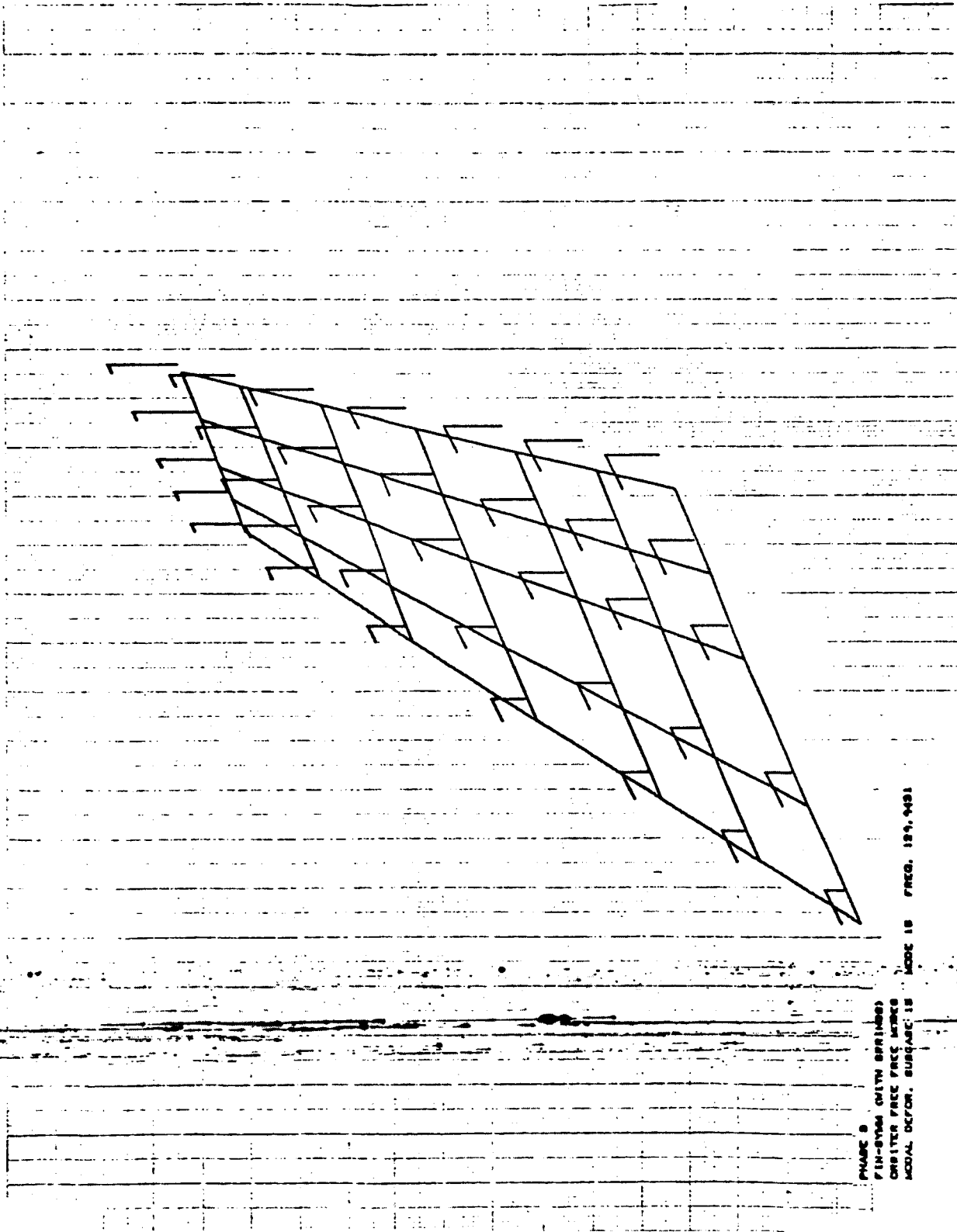
14 10/18/74 MAN-REP. 0.78170388



PHASE 3  
 FIM-SYAM (WITH SPRINGS)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 14

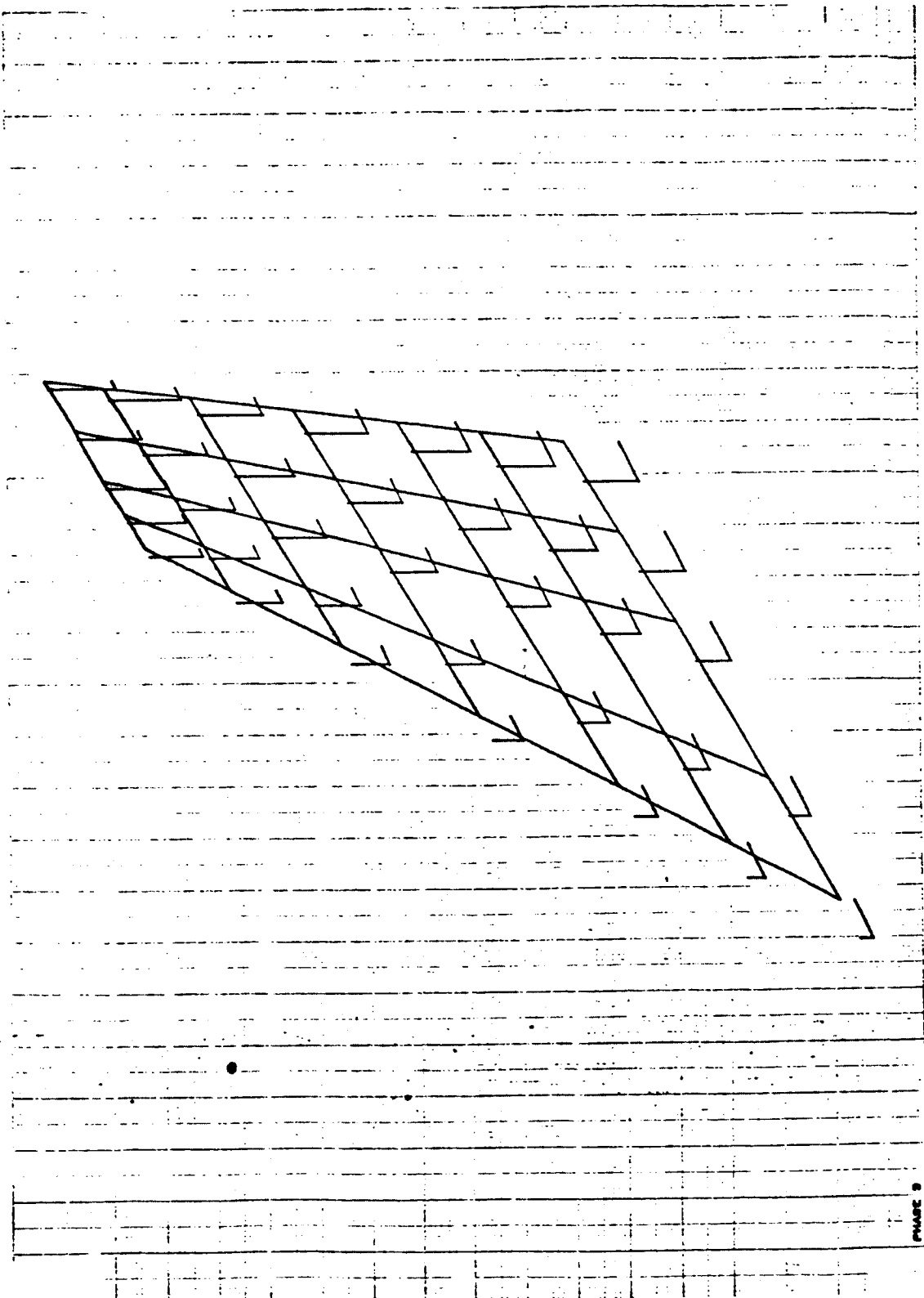
MODE 14 FREQ. 122.2084

10/18/74



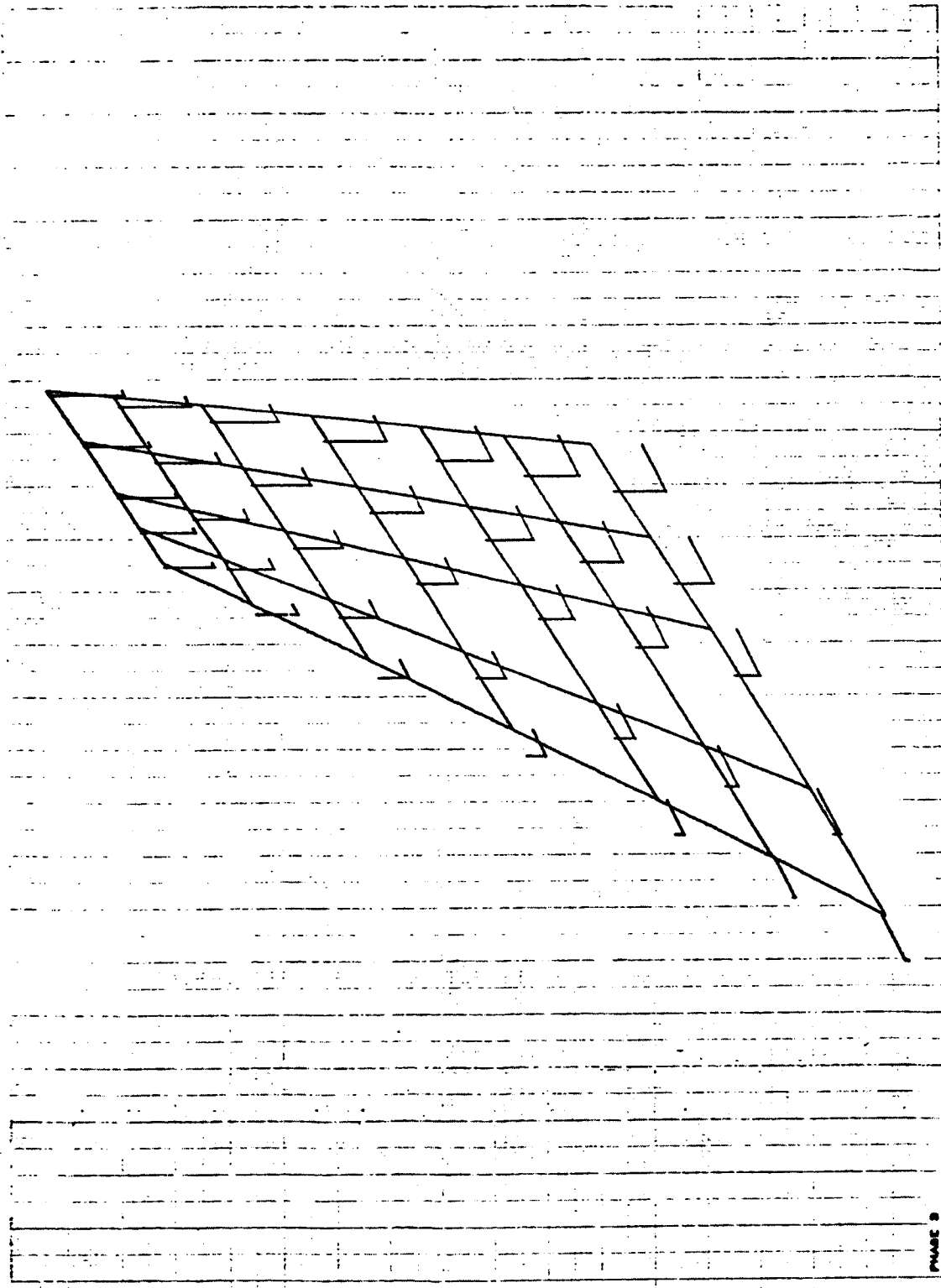
PHASE 8  
 PEN-8704 WITH SPRINGS  
 ORBITER FREE FREE MODES  
 MODAL ORDER. SUBCASE 18 MODE 18 FREQ. 197.4491

10 10/18/74 MMS-007. = 0.0111049



PHASE 9  
 FIN-STRIP WITH SPRINGS  
 CENTER FREE MODES  
 MODAL DEFOR. SURFACE IS MODE 16 FREQ. 130.2033

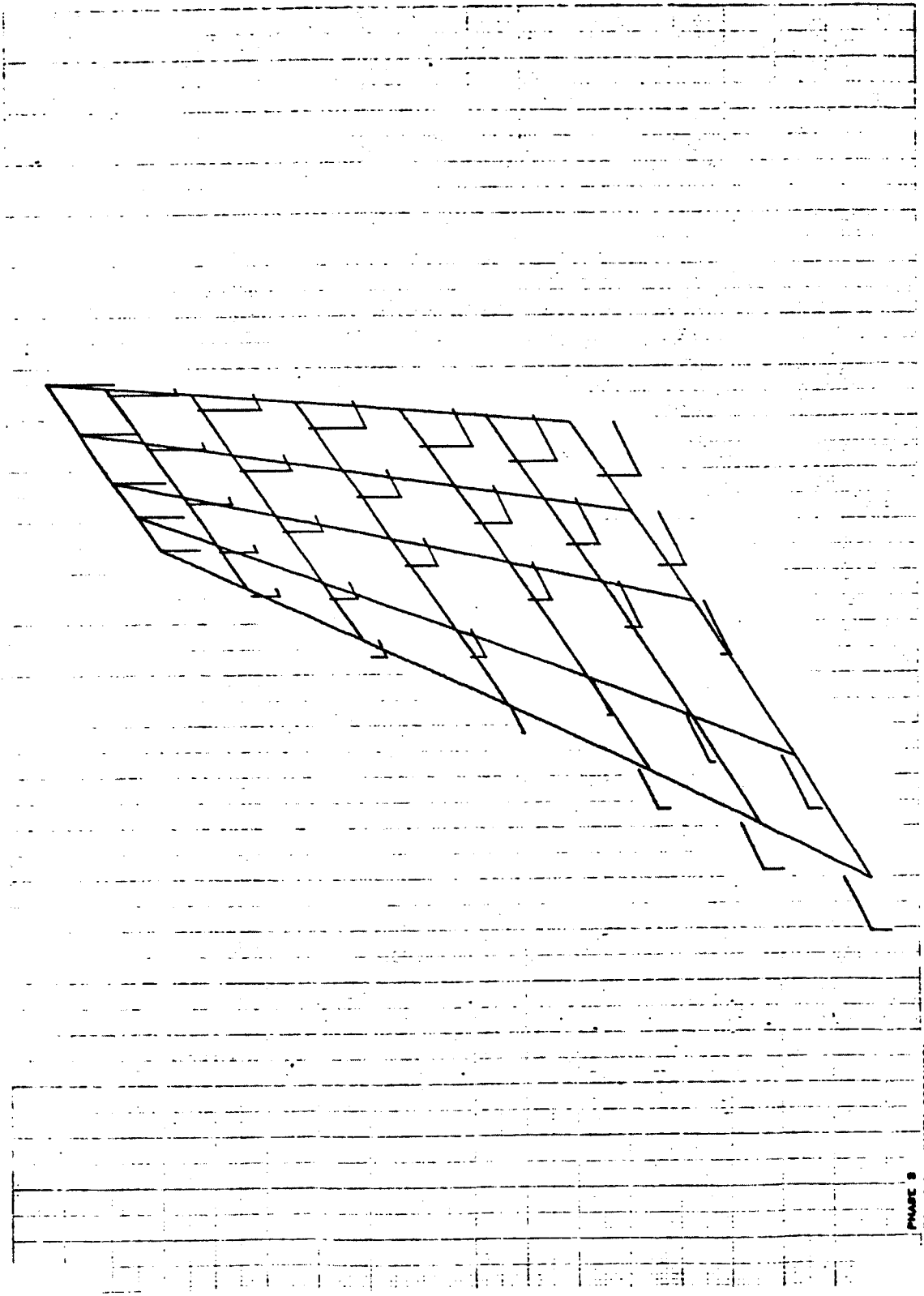
10/18/74 142-1388-17 0.00000000



PHASE 8  
 FIN-SYAM WITH SPRING  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 17 MODE 17 FREQ. 142.1388

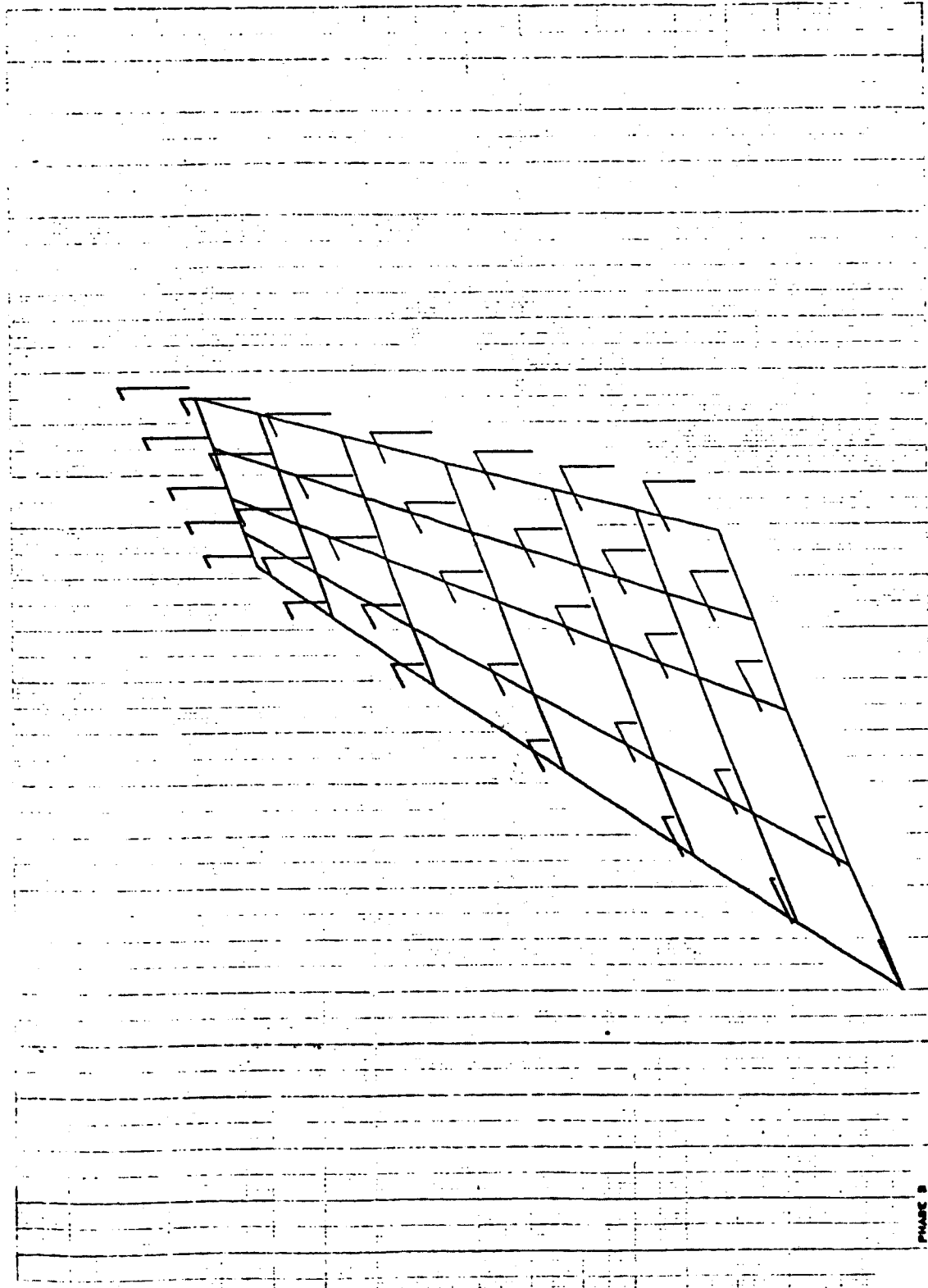


18 10/19/74 MAT-DEPT. # 0.0180481



PHASE 3  
 FIN-STRM (WITH SPRINGS)  
 ORBITER FREE FREE MODES  
 MODAL DETER. SURFACE 16 MODE 16 FREQ. 189.8309

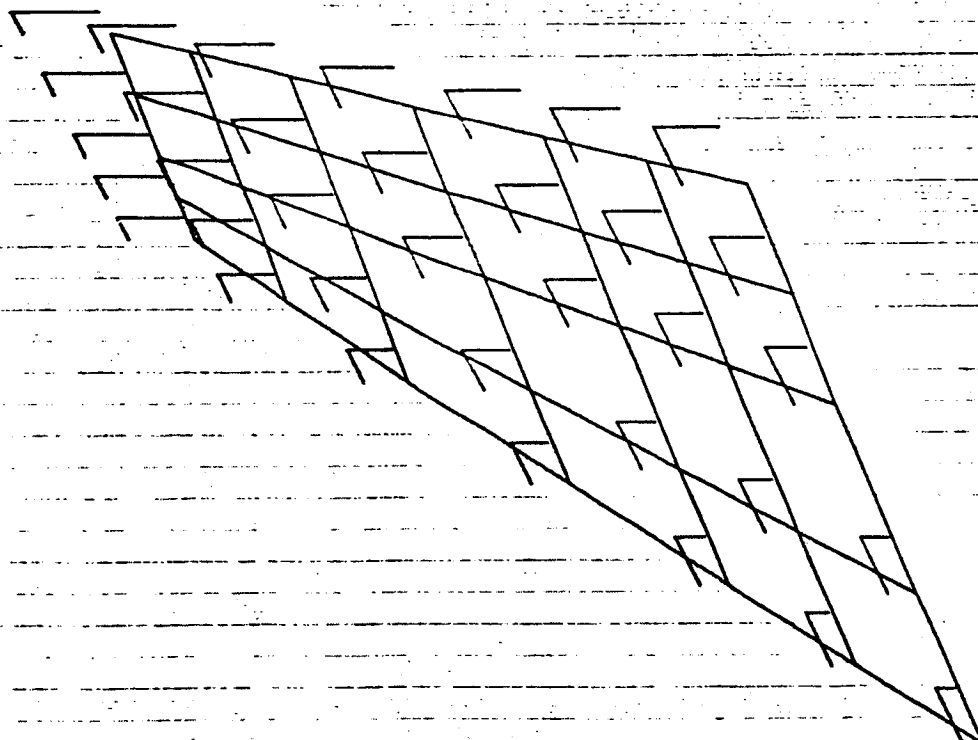
10/18/74 MMS-207.0 0.0119000



PHASE 2  
 FIN-2004 (WITH SPRINGS)  
 ORBITER FREE FREE MODES  
 MODAL ORDER SURFACE 19 FREQ. 166.3038



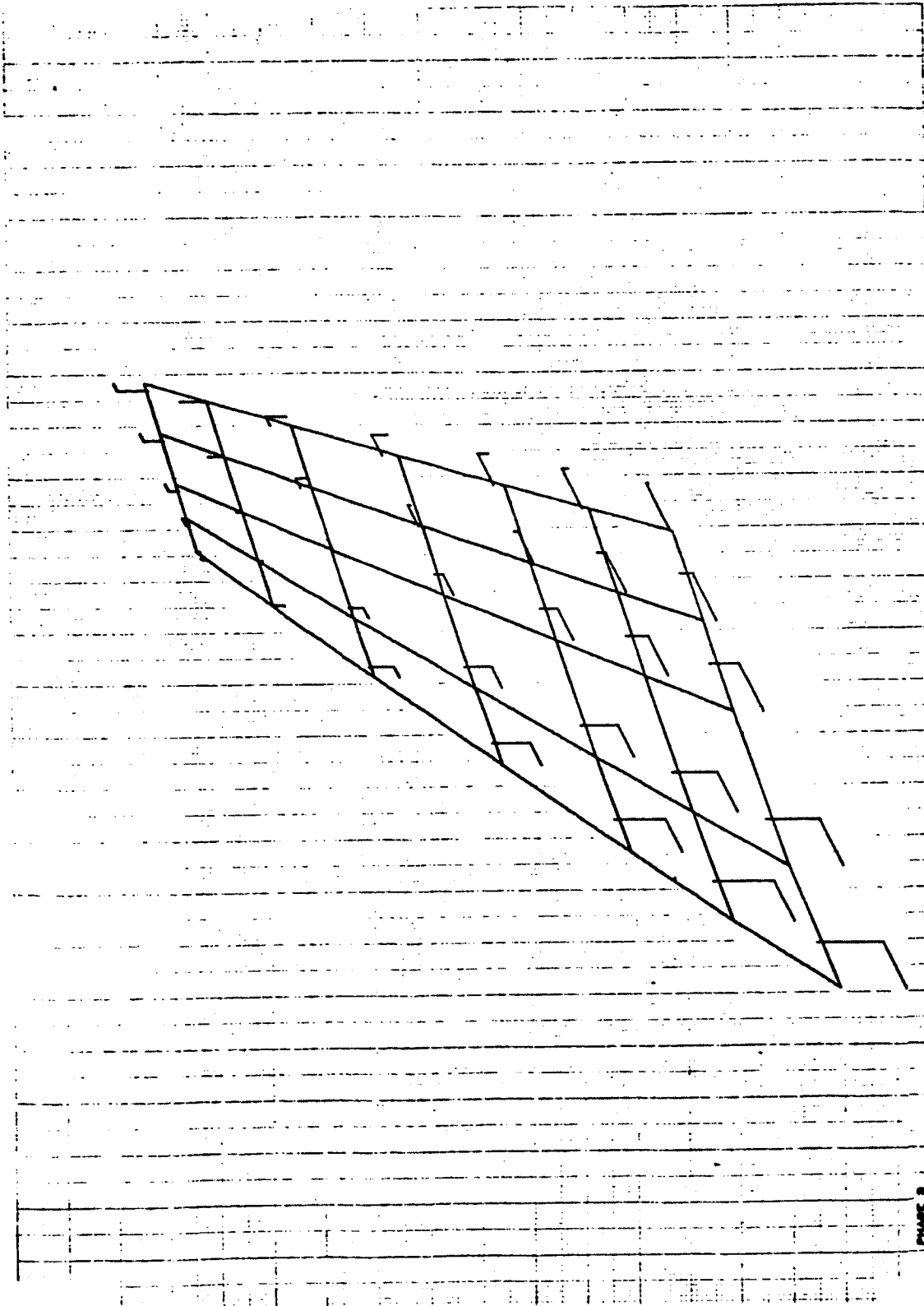
21 10/18/74 MUS-007. - G. 1004900



PHASE 8  
 FIN-8YAM (WITH SPRING)  
 ORBITER FREE FREE MOORE  
 MOVAL DEFOR, SUBCASE 21 MODE 21 FREQ. 100.4840



10/18/74 MMW-027, a O. 0000102



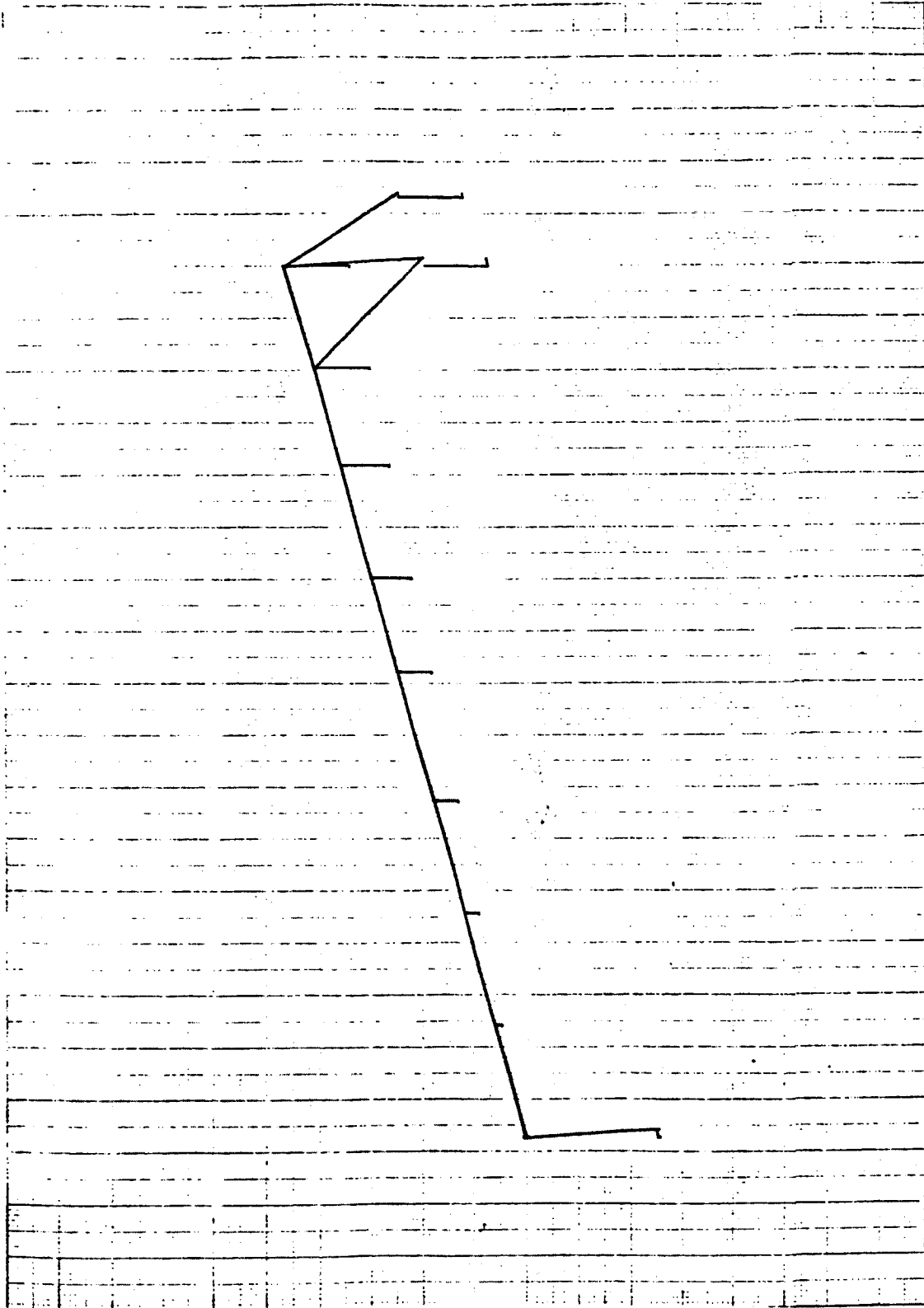
PWA 8  
 FIN-5744 (WITH SP/1000)  
 ORBITER PREC PREC 40000  
 MODAL DEFOR, SURFACE 23 MODC 23 FREQ. 224.02-4

**Appendix B18**  
**INPUT & PLOTS/PHASE 3 ANALYSIS: MODEL II PAYLOAD**  
**SYMMETRIC FREE-FREE ORBITER MODES**





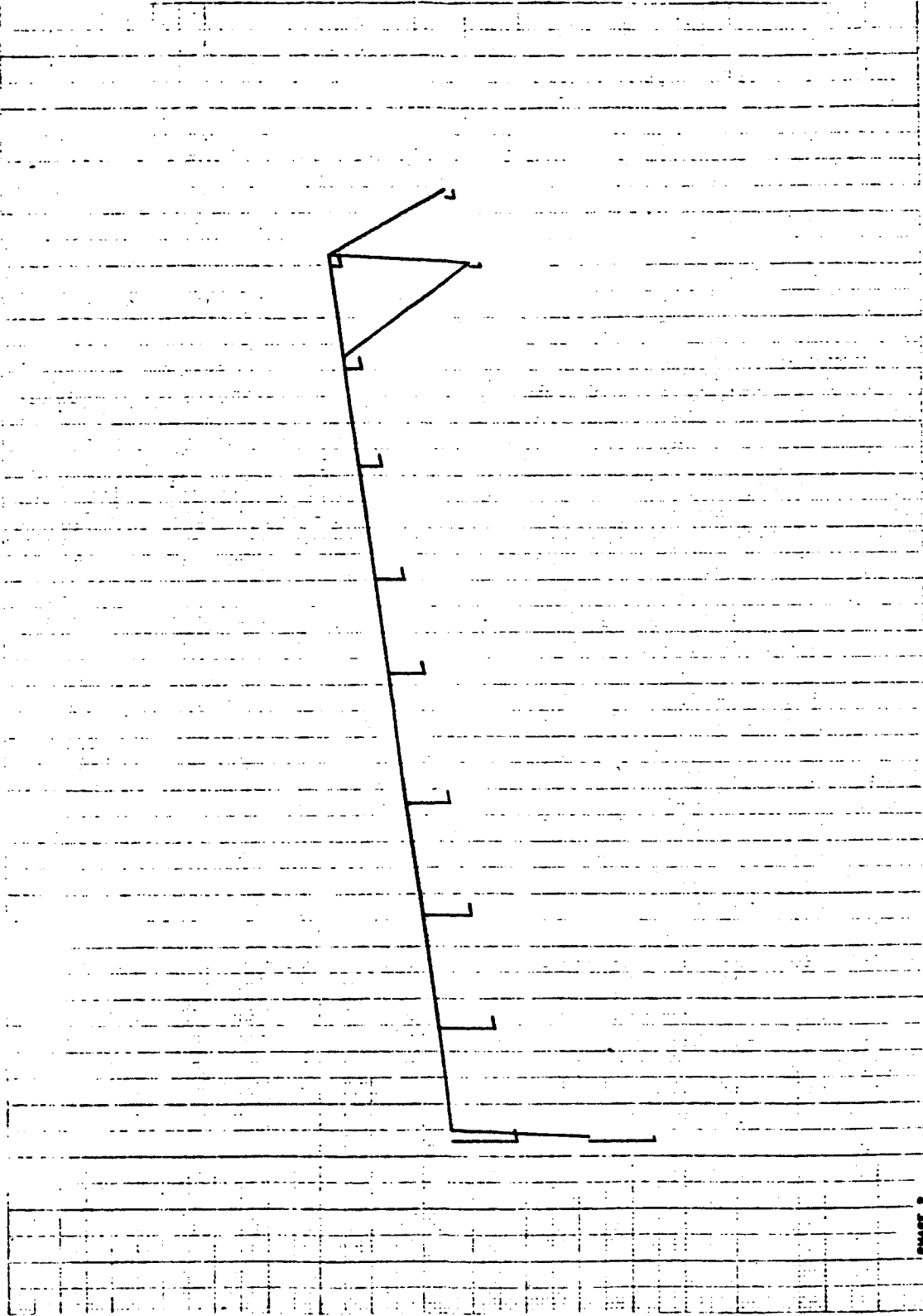
18718/74 444-007. 0. 7011078



PHASE 3  
ORBITER PAYLOAD, STAG CASE WITH SUPPORT SPRINGS  
ORBITER FREE FREE MODES  
MODAL DEFOR. SUBCASE 1 MODE 1 PRCD. 0.

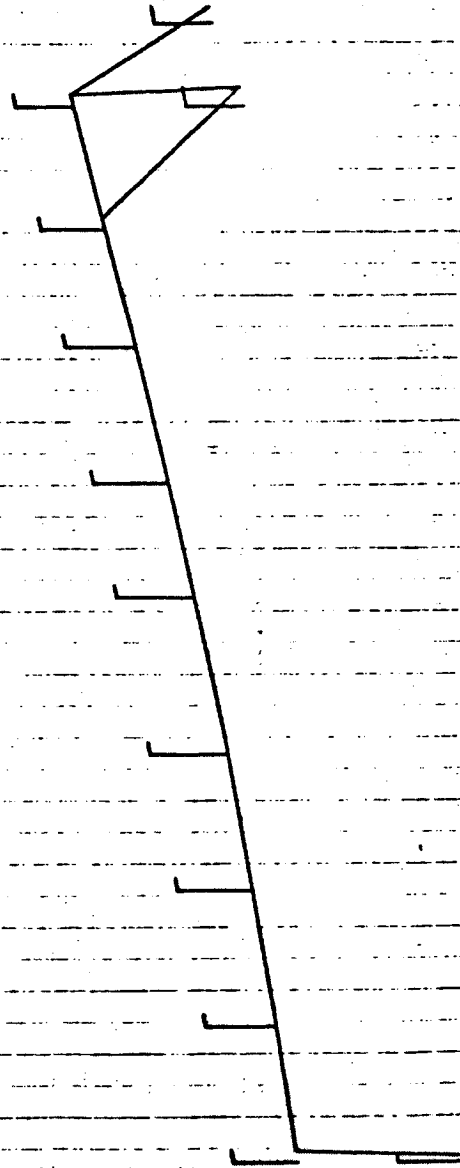


10/10/74 1001-207. a 0.001700-0



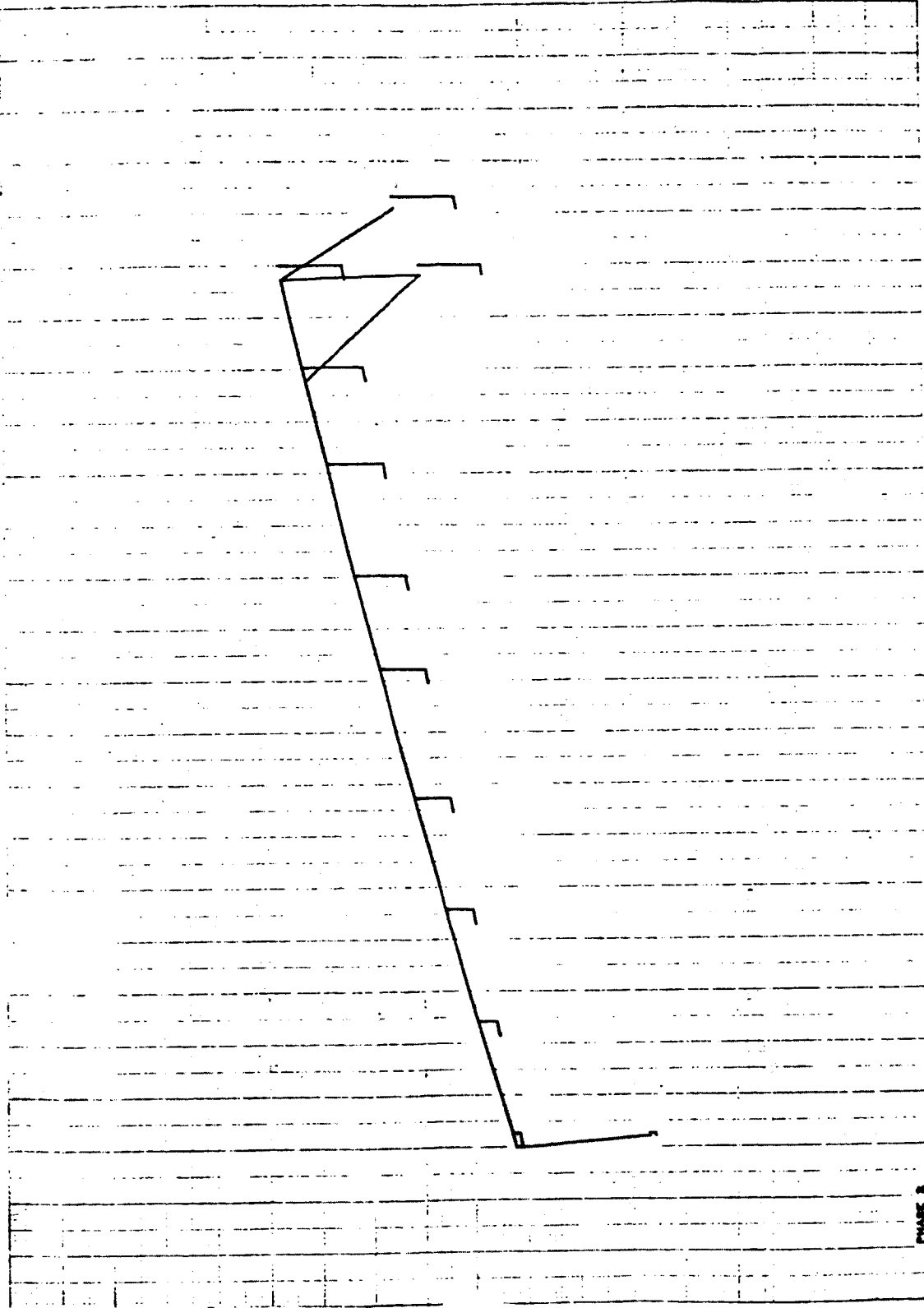
PHASE 3  
CRIBTER PAYLOAD, BYAM CASE (WITH SUPPORT SPRINGS)  
CRIBTER FREE FACE MORSE  
MODAL DEFOR. SURFACE 3 MODE 3 FREQ. 0.

10/19/74 MAX-DET. • 0.50768100



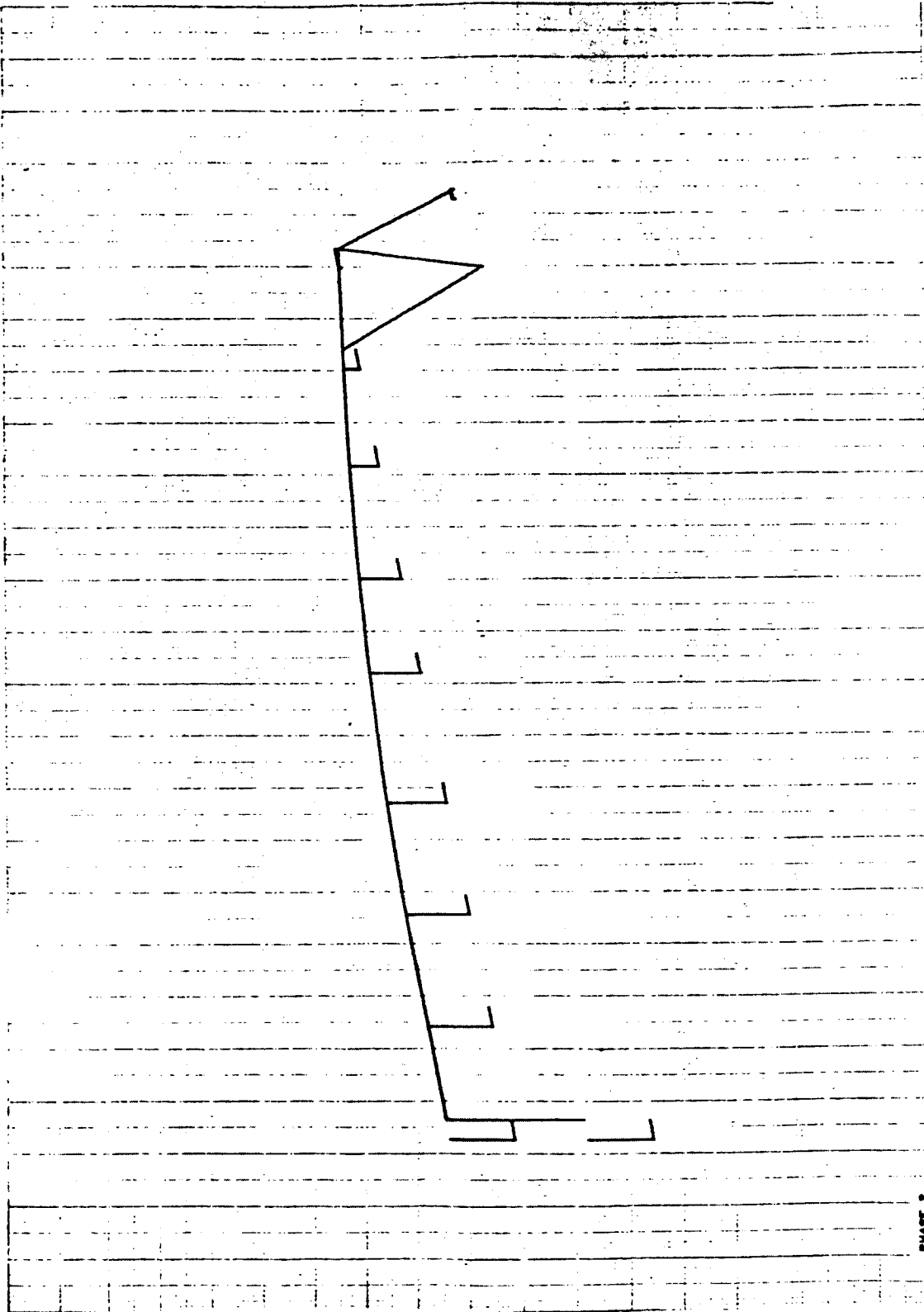
PHASE 3  
CREDIT PAYLOAD, SYSTEM GAME WITH SUPPORT SPRING  
CREDIT FREE FACE NUMBER  
MODAL DETOR. SURFACE 4 MODE 4 FREQ. 44.11571

10/18/74 WAP-007, S. S. 0010172



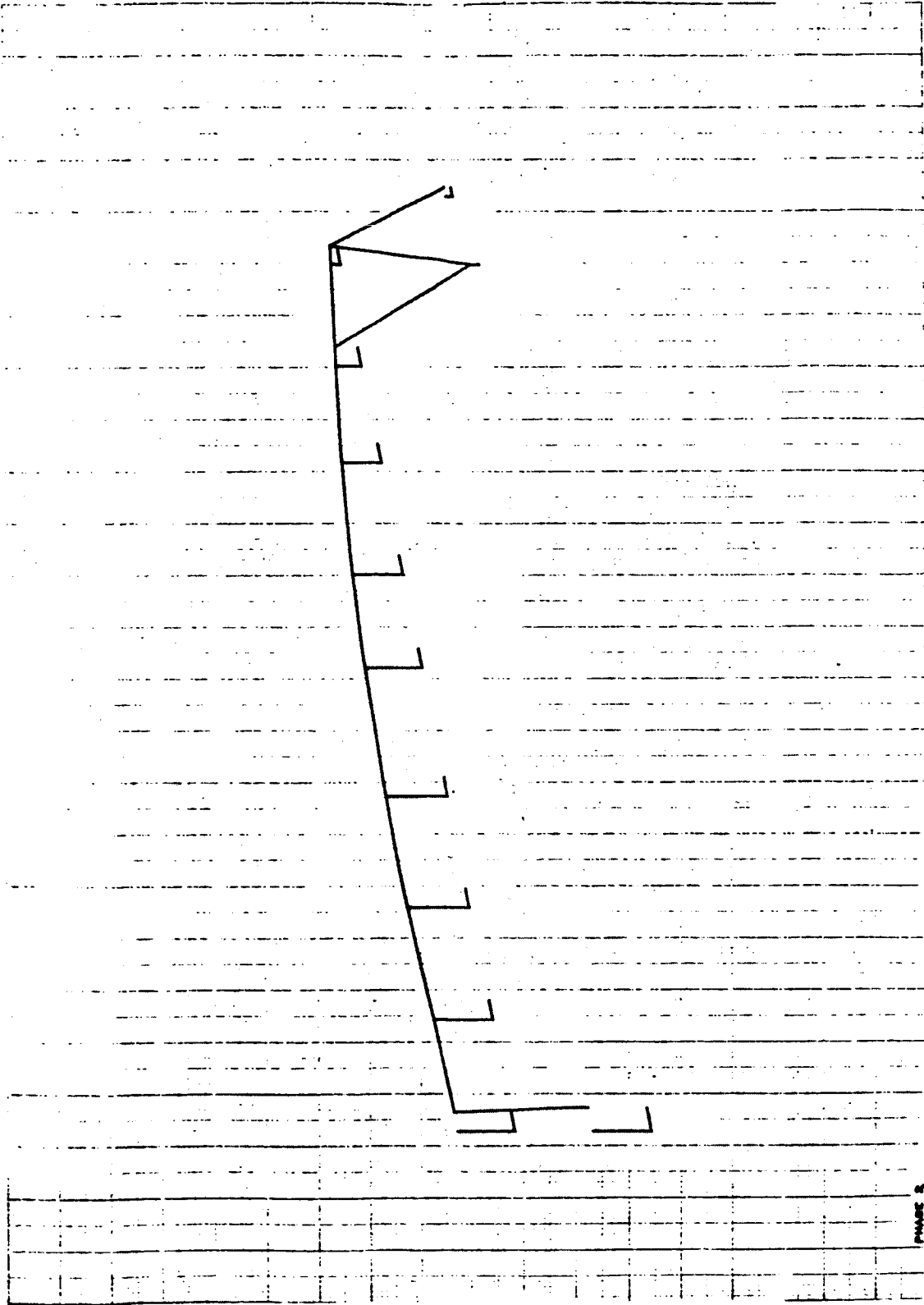
PHASE 3  
CRITTER PAYLOAD, STIM CASE WITH SUPPORT SPRINGS)  
CRITTER FREE FREE BONES  
MODAL DEFORM. SUBCASE 8 MODE 8 FREQ. 45.33590

10/18/74 MAX-007. • 0. 08-4185-40



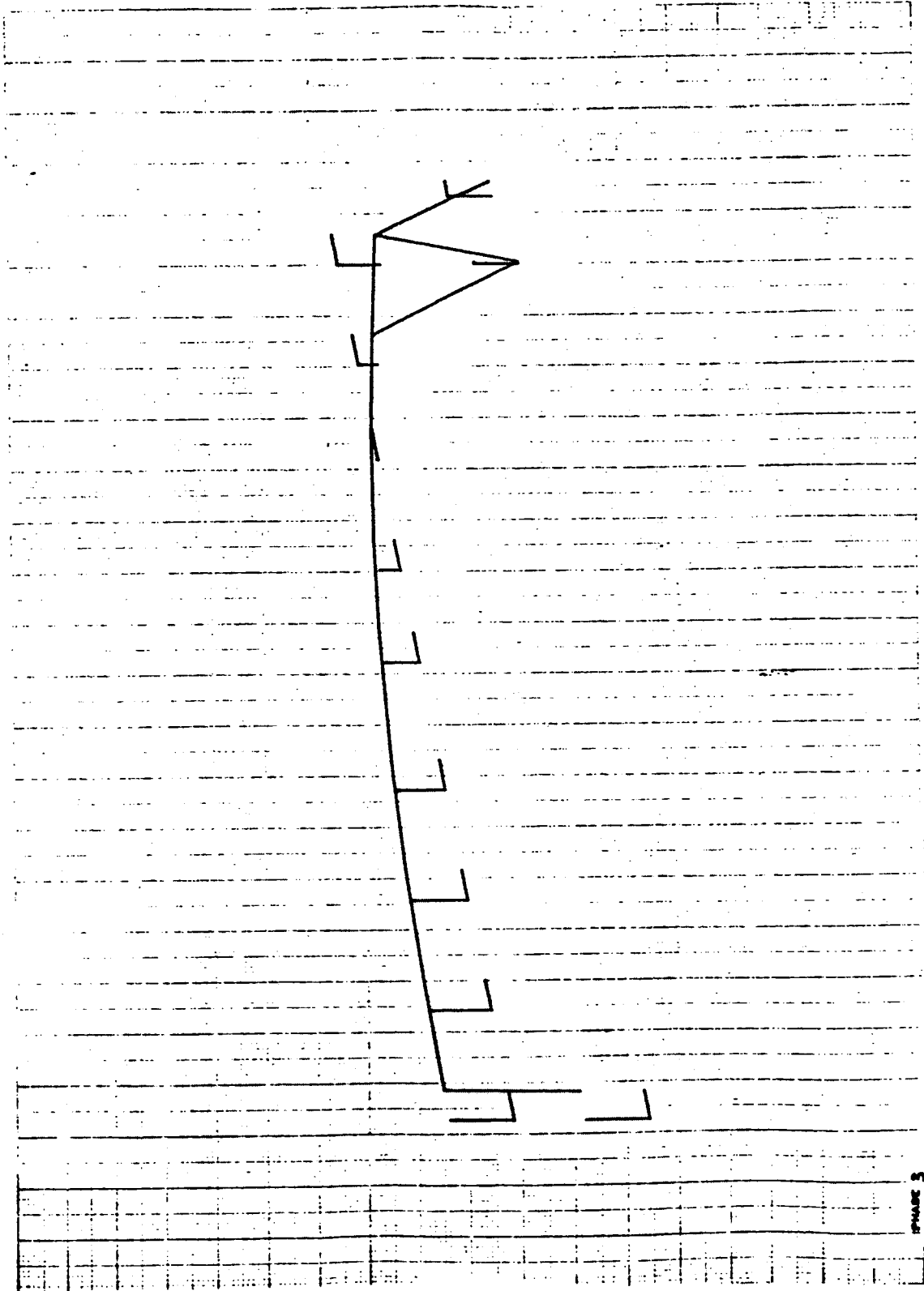
PHASE 3  
DRIBTER PAYLOAD SYSTEM CASE (WIT: SUPPORT SPRING)  
DRIBTER FREE FREE NOTES  
MODAL DEFOR. SUBCASE 0 MODE 0 FREQ. 81.20322

1 10/18/74 100-207, & 10-4870424



PHASE 3  
ORBITER PAYLOAD SYSTEM CASE (WITH SUPPORT SPRINGS)  
ORBITER FREE FREE MODES  
MODAL ORDER, SURFACE 7 MODE 7 FREQ. 54.43372

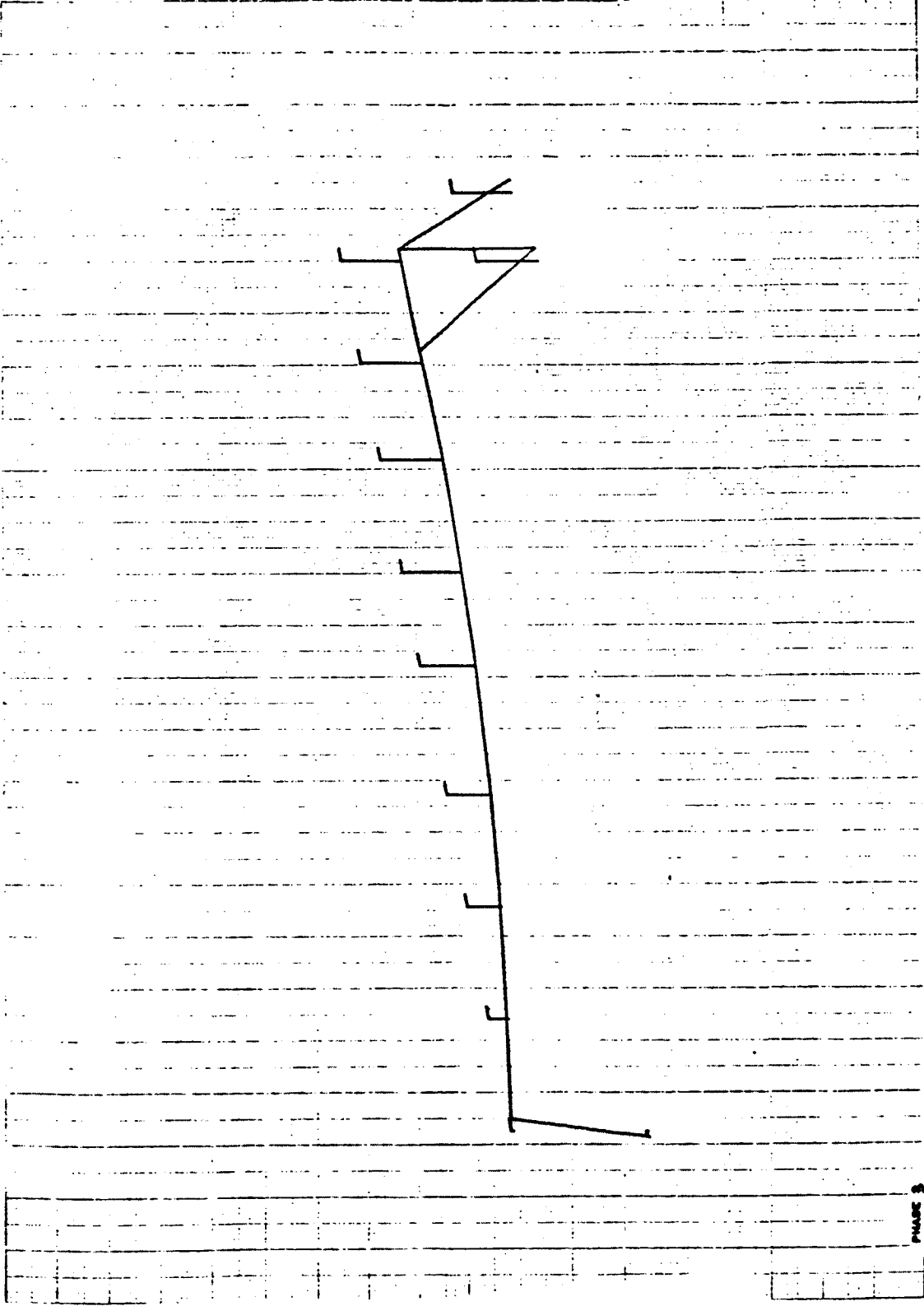
10/18/74 1000-007. 0 0.00000000



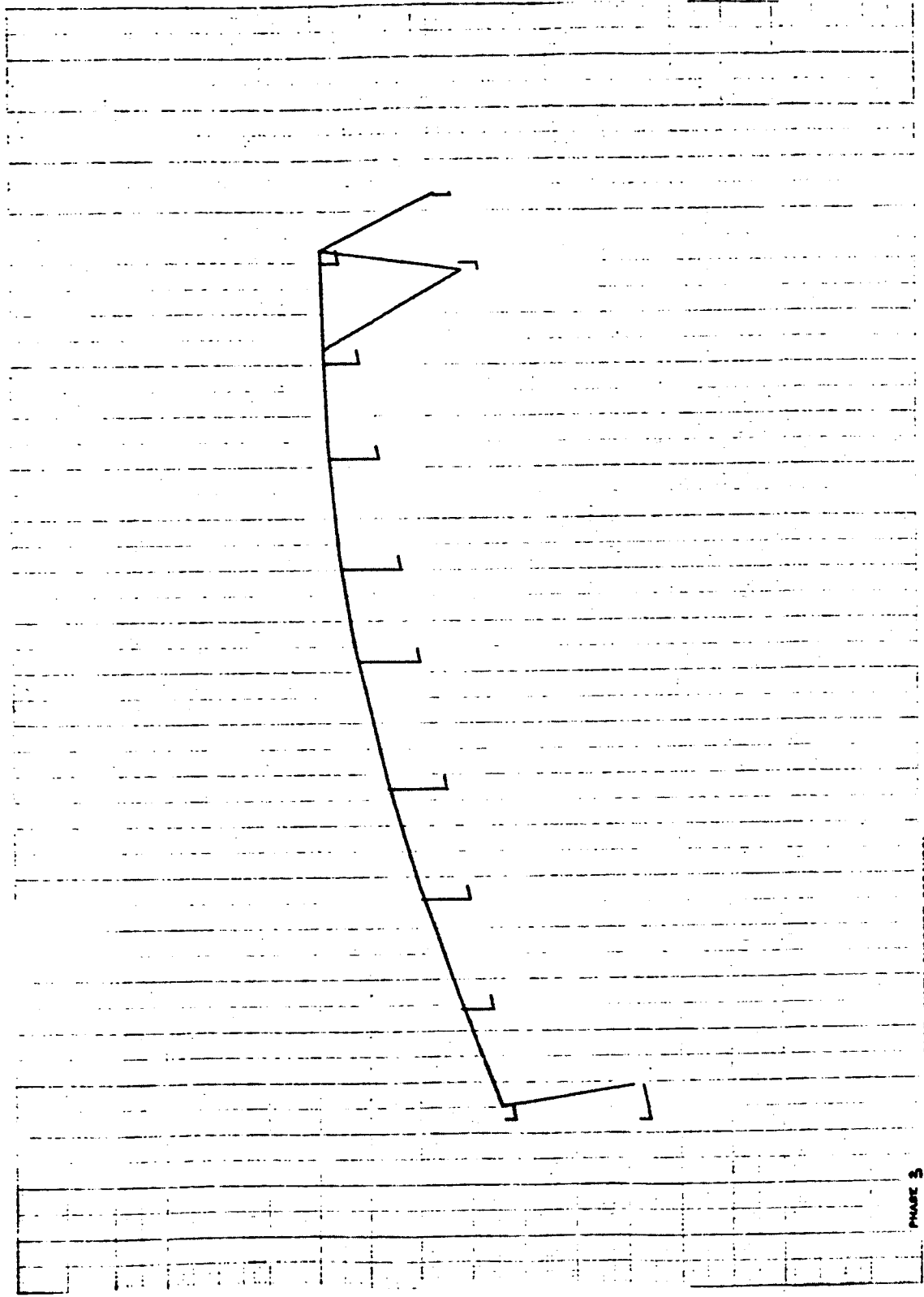
PHASE 3  
CRITTER PAYLOAD, 0.000 G (WITH SUPPORT SPRING)  
CRITTER FREE FREE MODES  
MODAL DETOR. SUBCASE 8 MODE 8 FREQ. 92.71864



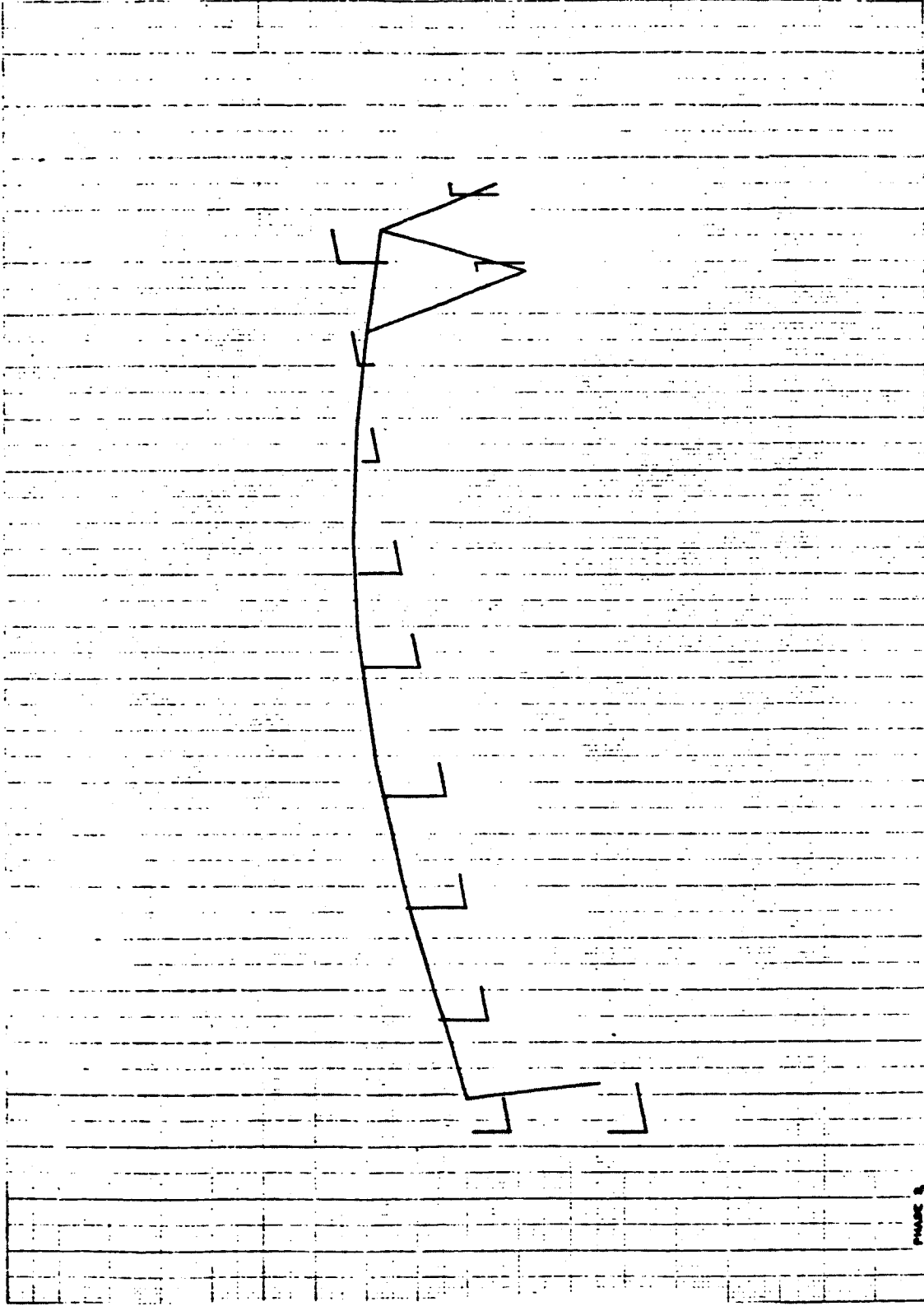
12/15/74 MW-DET. - 0.0246117



PHASE 3  
CRITER PAYLOAD, 87MM CASE WITH SUPPORT SPRINGS)  
CRITER FACE FREE MOVES  
MODAL DEFOR. SUBCASE 4 MODC 4 FREQ. 66.86681

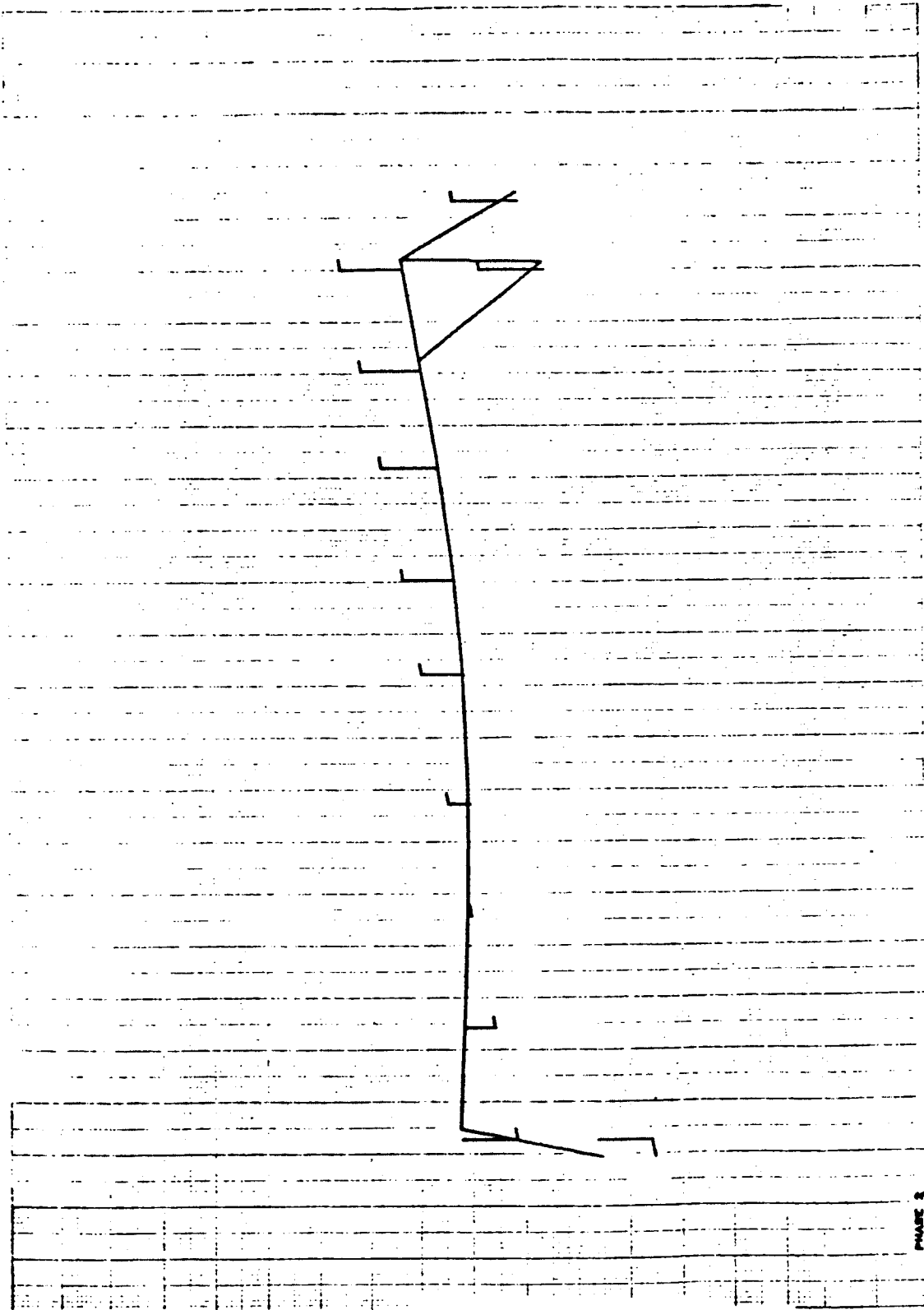


PHASE 3  
 CRITER PAYLOAD, 87000 LBS (WITH SUPPORT SPRINGS)  
 CRITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 10 MODE 10 FREQ. 76.71848



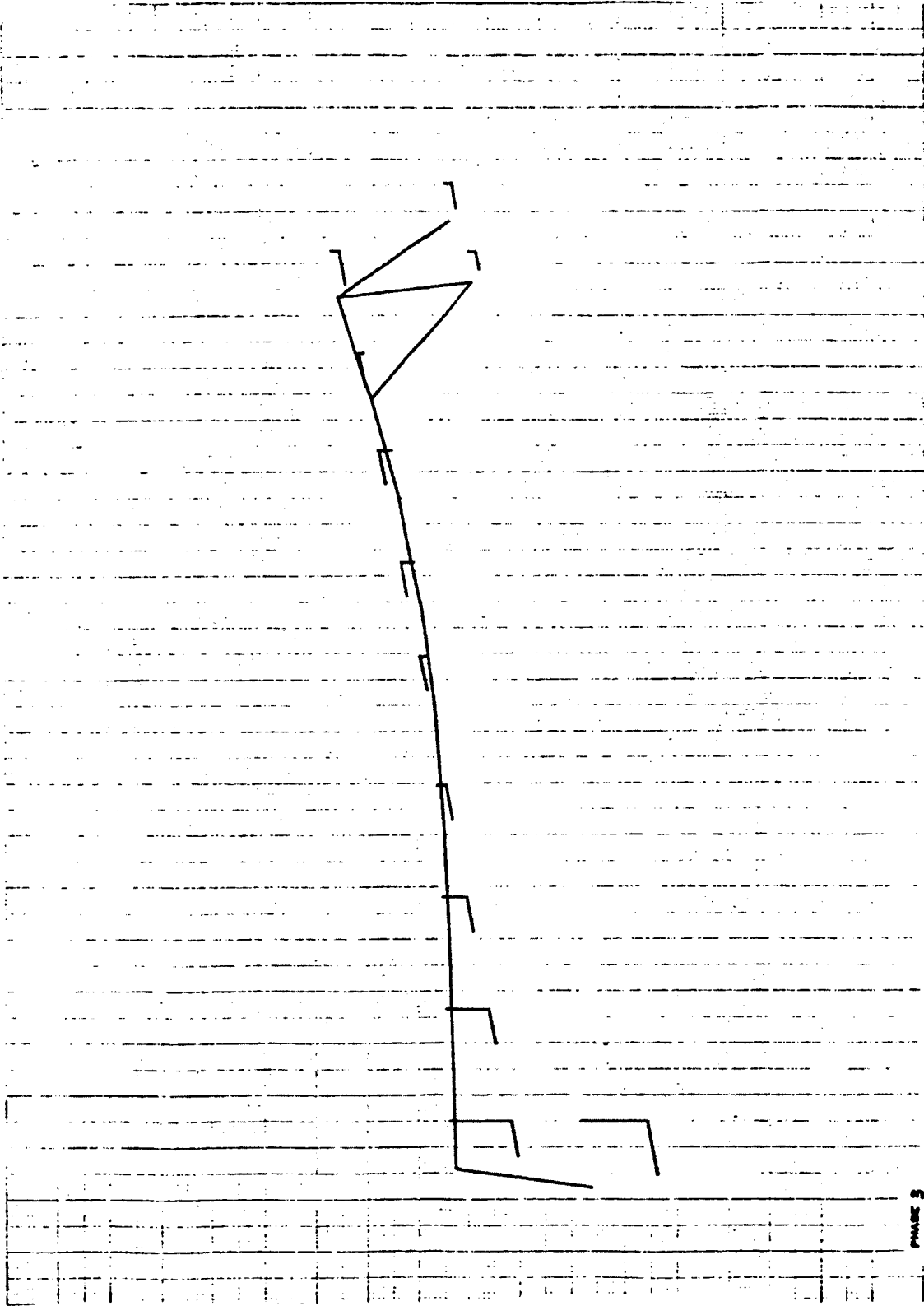
PHASE 3  
 CRITER PAYLOAD, SWAN CASE WITH SUPPORT SPRINGS  
 CRITER FREE FREE MODES  
 MODAL COVER, BURCASE 11 MODE 11 FREQ. 89.1180

16 1010174 100-007. 0 0.010000



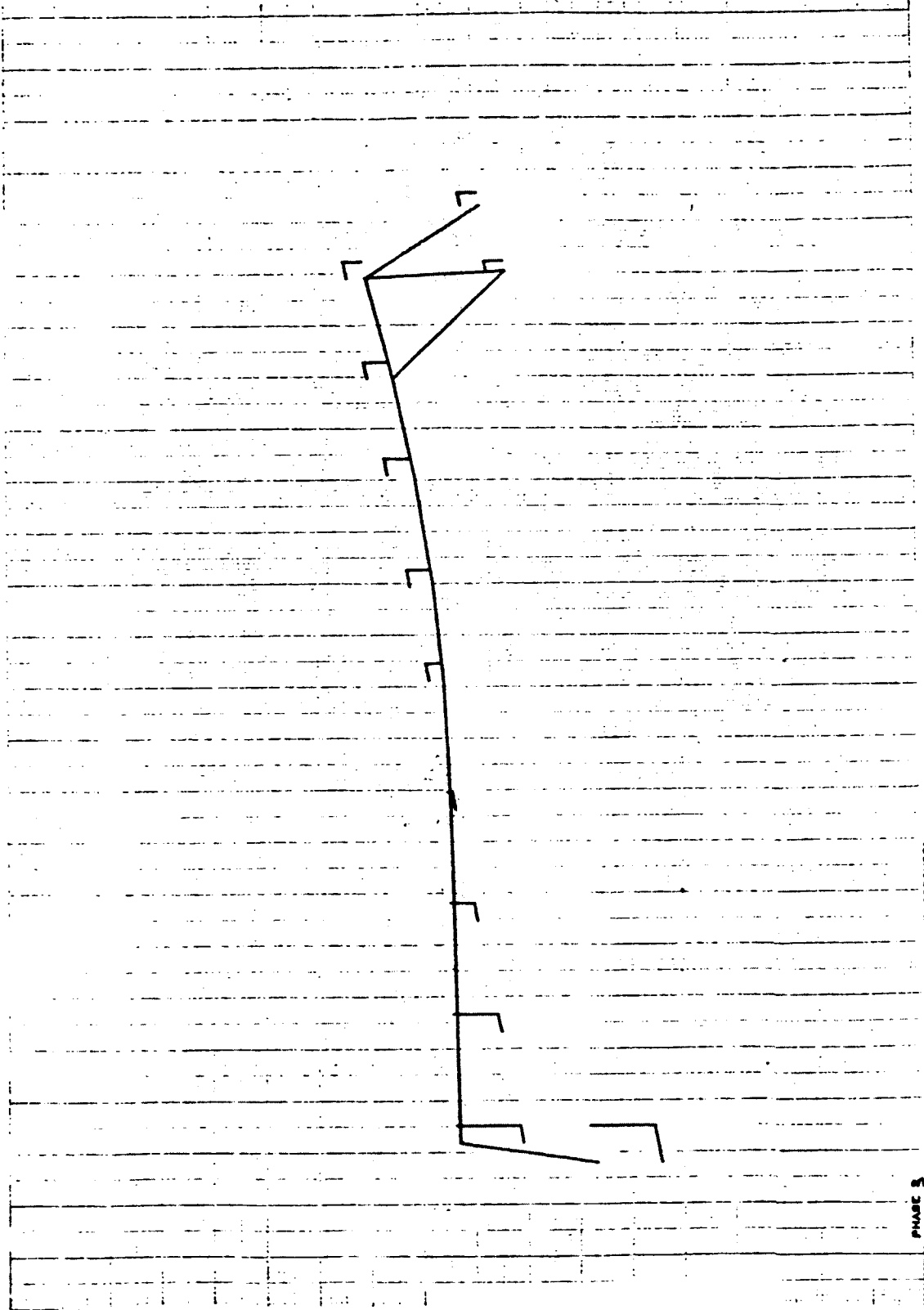
PHASE 2  
 CRITTER PAYLOAD SYSTEM CASE (WITH SUPPORT SPRINGS)  
 CRITTER FREE FREE MODES  
 MODAL ORDER. SUBCASE 12 MODE 12 FREQ. 104.7641

19 10/18/74 MAX-DEF. = 1.0762150



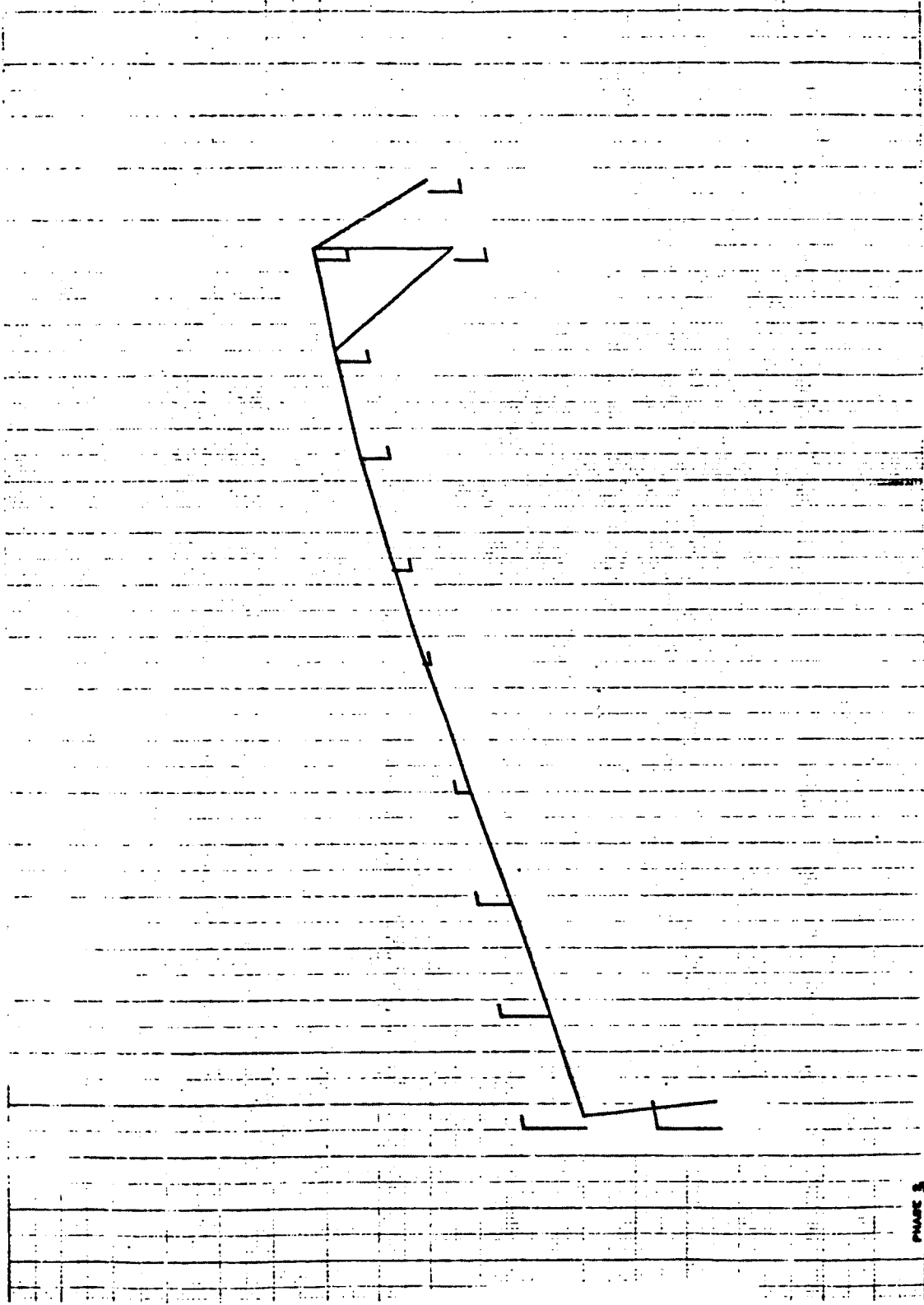
PHASE 3  
 CRITTER PAYLOADS-DYNAI CASE (WITH SUPPORT SPRINGS)  
 CRITTER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 13 MODE 19 FREQ. 116.8276

14 10/18/74 MAX-DEF. = 0.02497942



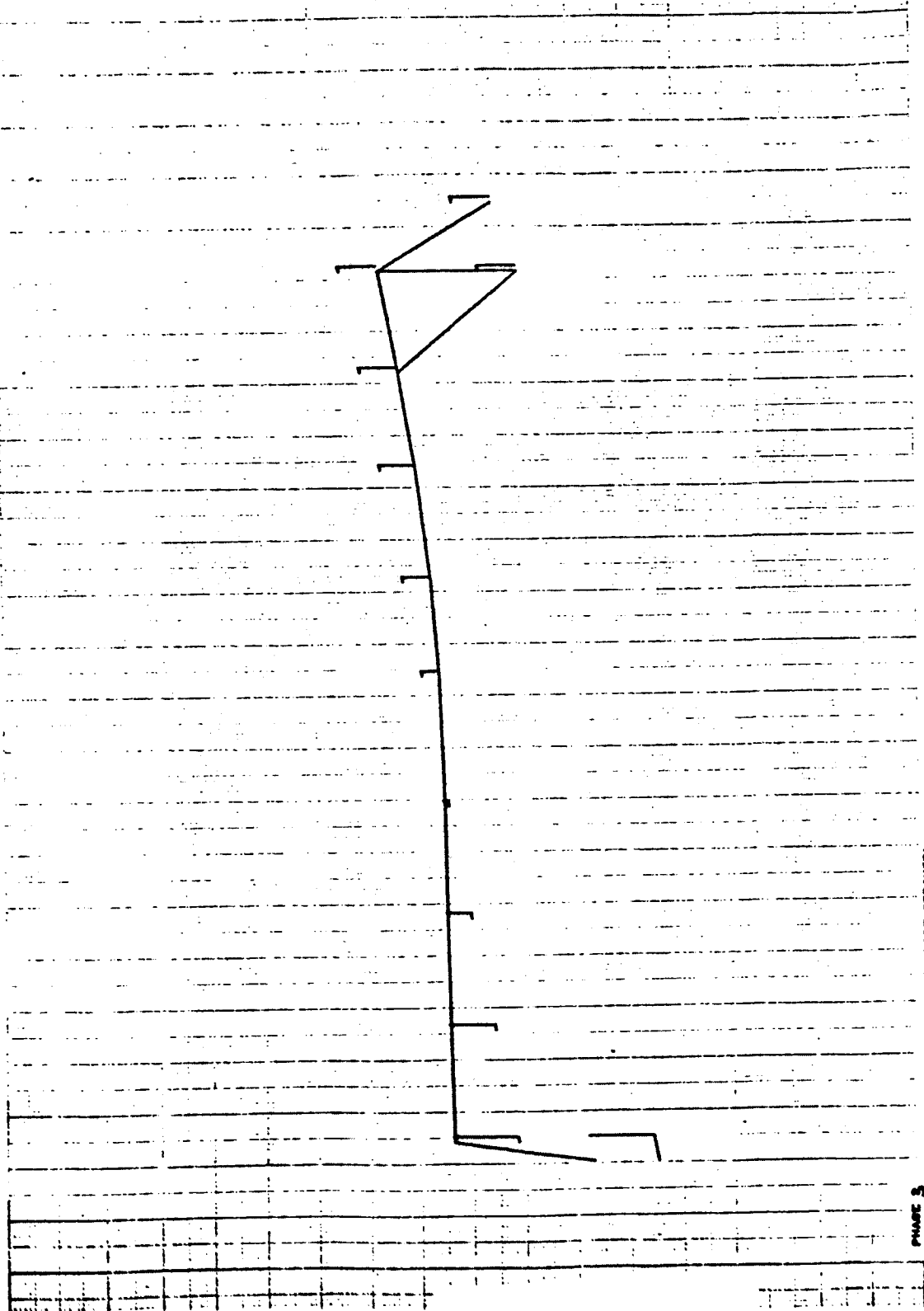
PHASE 3  
 ORBITER PAYLOAD, SYMA CASE (WITH SUPPORT SPRINGS)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SUBCASE 14 MODE 14 FREQ. 122.2084

10 10P/10P/10 1000-007, 0, 000000000



PHASE 3  
CREDIT PAYLOAD FROM BASE WITH SUPPORT (P/1000)  
CREDIT FREE FROM MEMO  
MODAL DEFER. SUBBASE IS MODE IS FREQ. 129, 1431

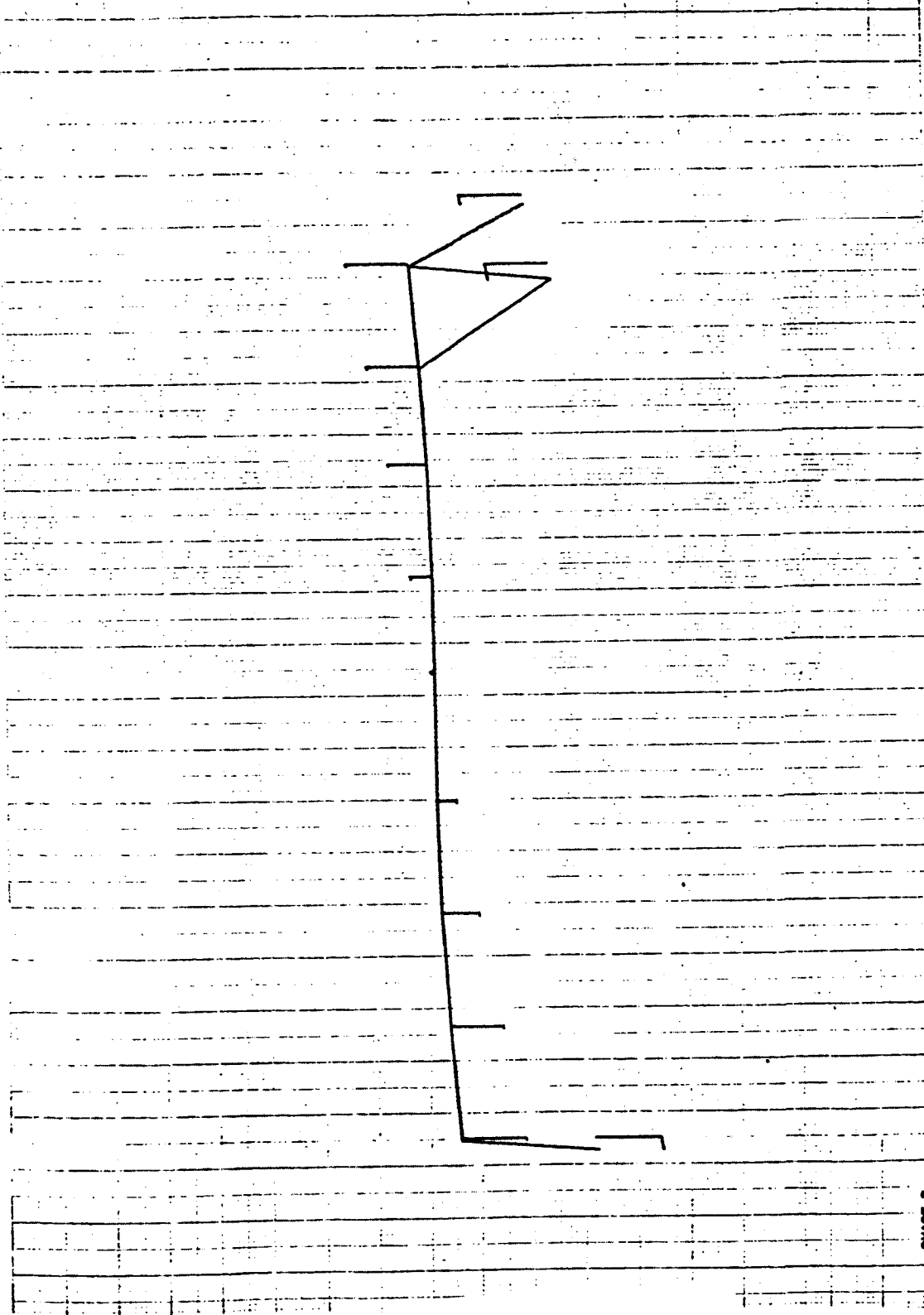
10/18/74 1000-007. - S. 04700074



PHASE 3  
 ON/ITER PAYLOAD, SYMA CASE (WITH SUPPORT SPRINGS)  
 ON/ITER FREE FREE MODES  
 MODAL DEFOR. SURFACE 10 MODE 10 FREQ. 130.2853

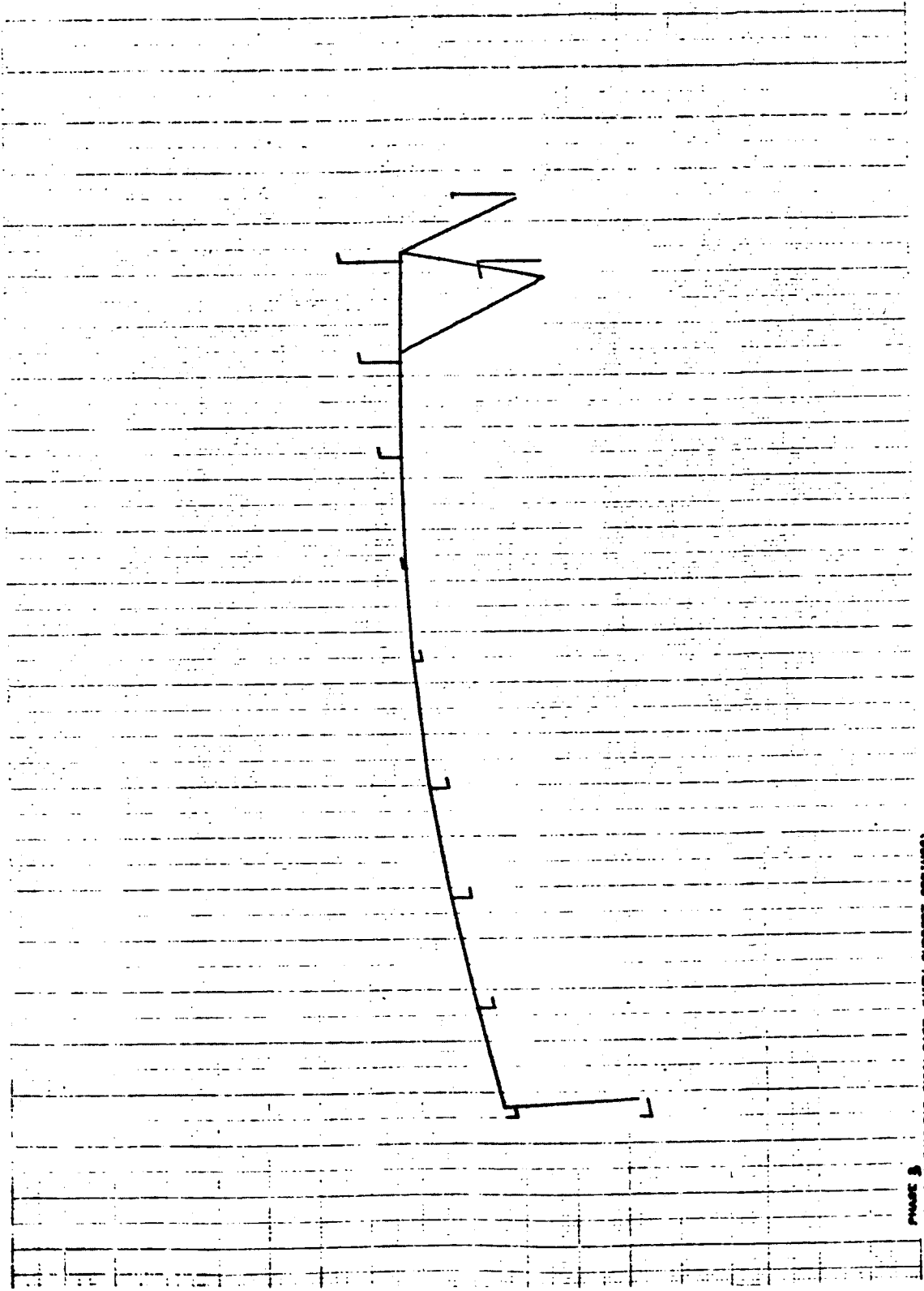


10/19/74 - 1001-007. - 0.1000000

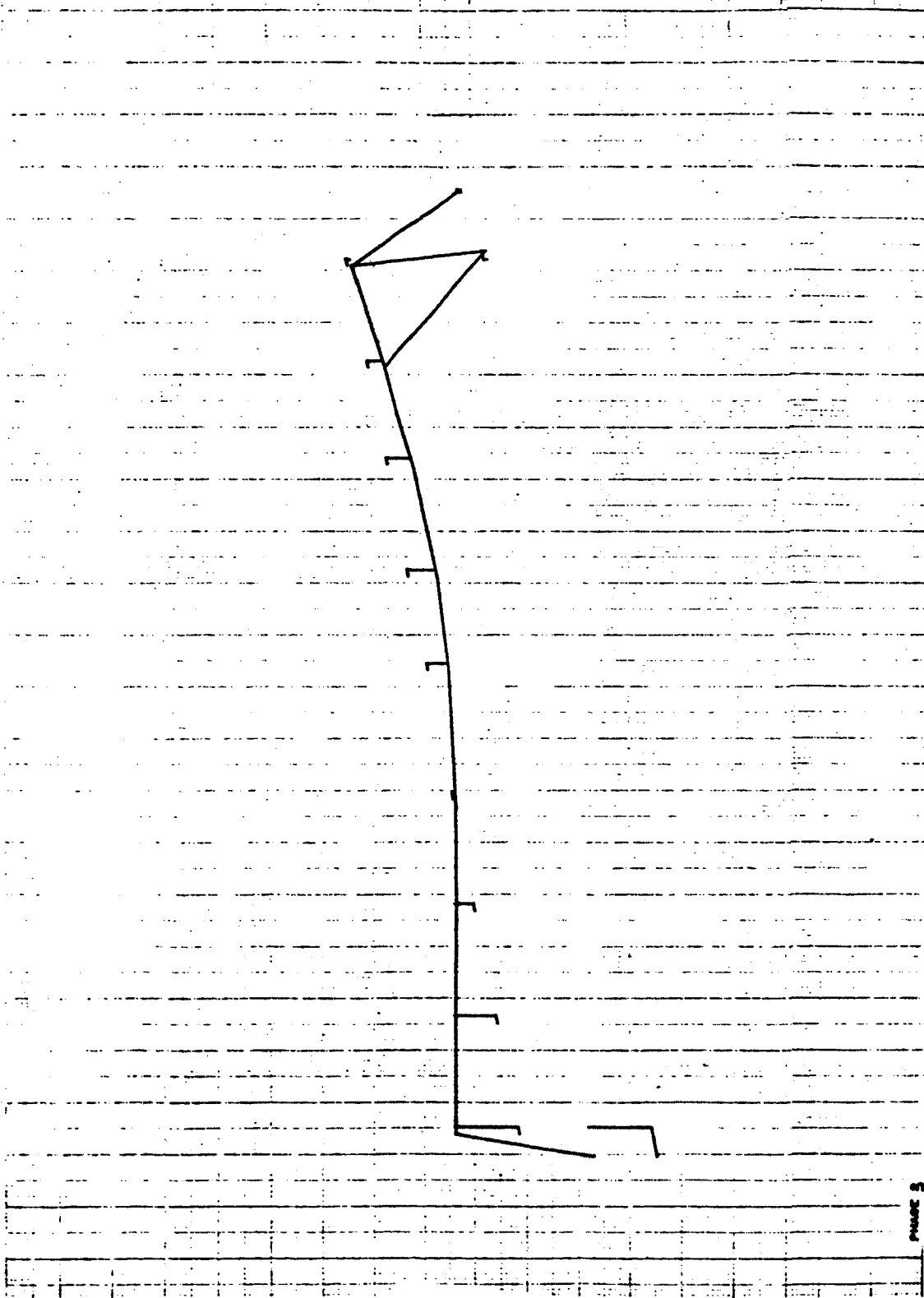


PHASE 2  
 ORBITER PAYLOADS-ORION CASE (WITH SUPPORT SPRINGS)  
 ORBITER FREE FREE MODES  
 MODAL DEFOR. SURFACE 17 MODE 17 FREQ. 142.1300

18 10/18/74 100-227, • 0.0101248

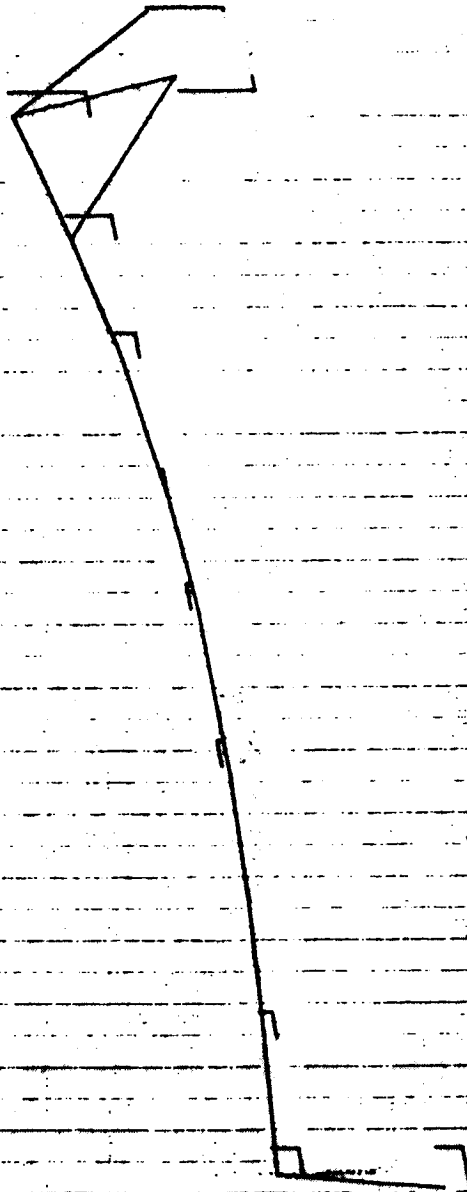


PHASE 3  
CRITTER PAYLOAD, 8MM CASE (WITH SUPPORT SPRINGS)  
CRITTER FREE FREE MODES  
MODAL DETOR. SUSCASE 18 MODE 18 FREQ. 157.8389



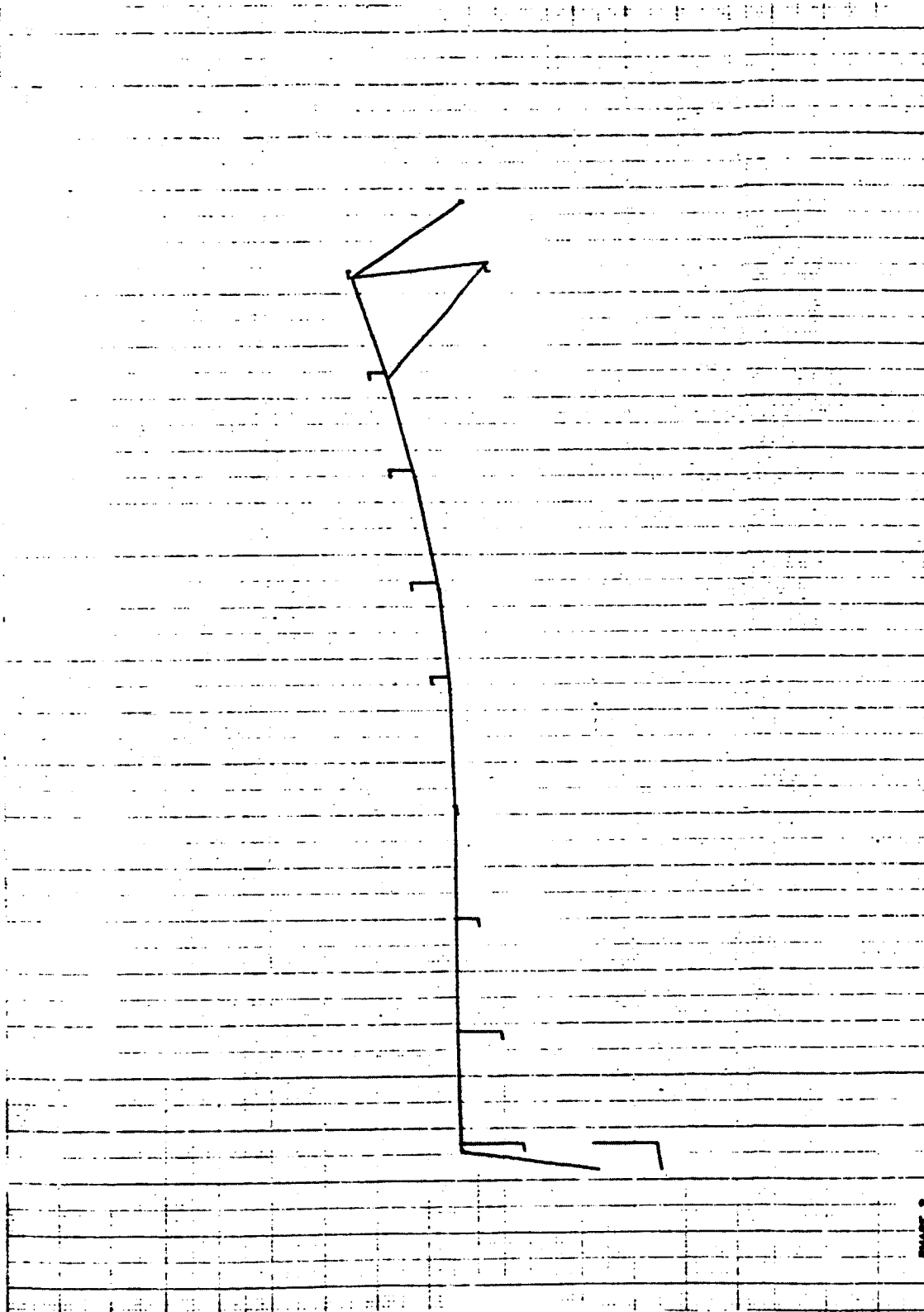
PHASE 5  
 ORBITER PAYLOAD. SWAS CASE (WITH SUPPORT SPRINGS)  
 ORBITER FREE FREQ MODES  
 MODAL DEFORM. SURFACE 14 MODE 14 FREQ. 166.5082

NO 181670 100-107. - 8. 0100000



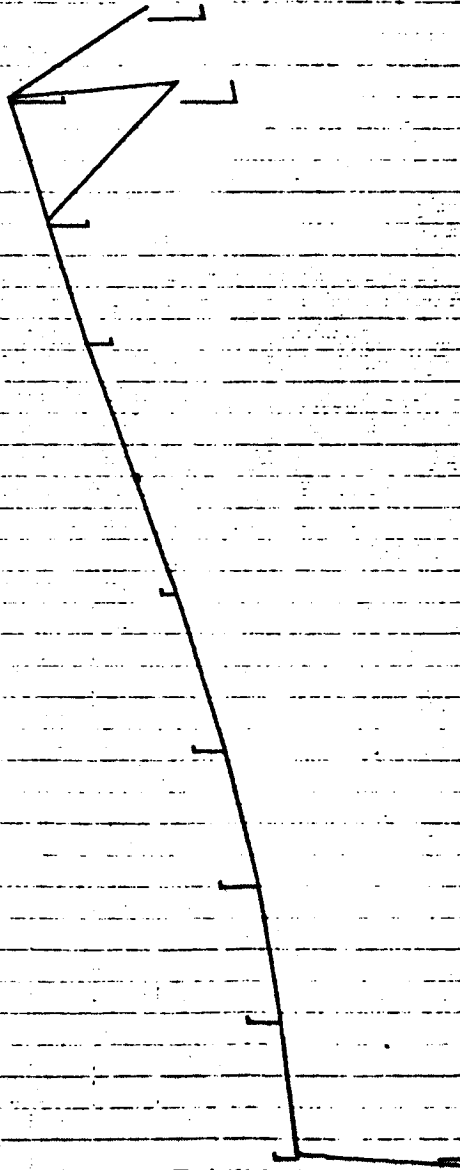
PHASE 5  
ORBITER PAYLOAD, STWIA CASE WITH SUPPORT SPRINGS  
ORBITER FACE FREE MODES  
MODAL DETOR. SUBCASE 20 FREQ. 171.7584

41 (insert number, e.g. 100000)



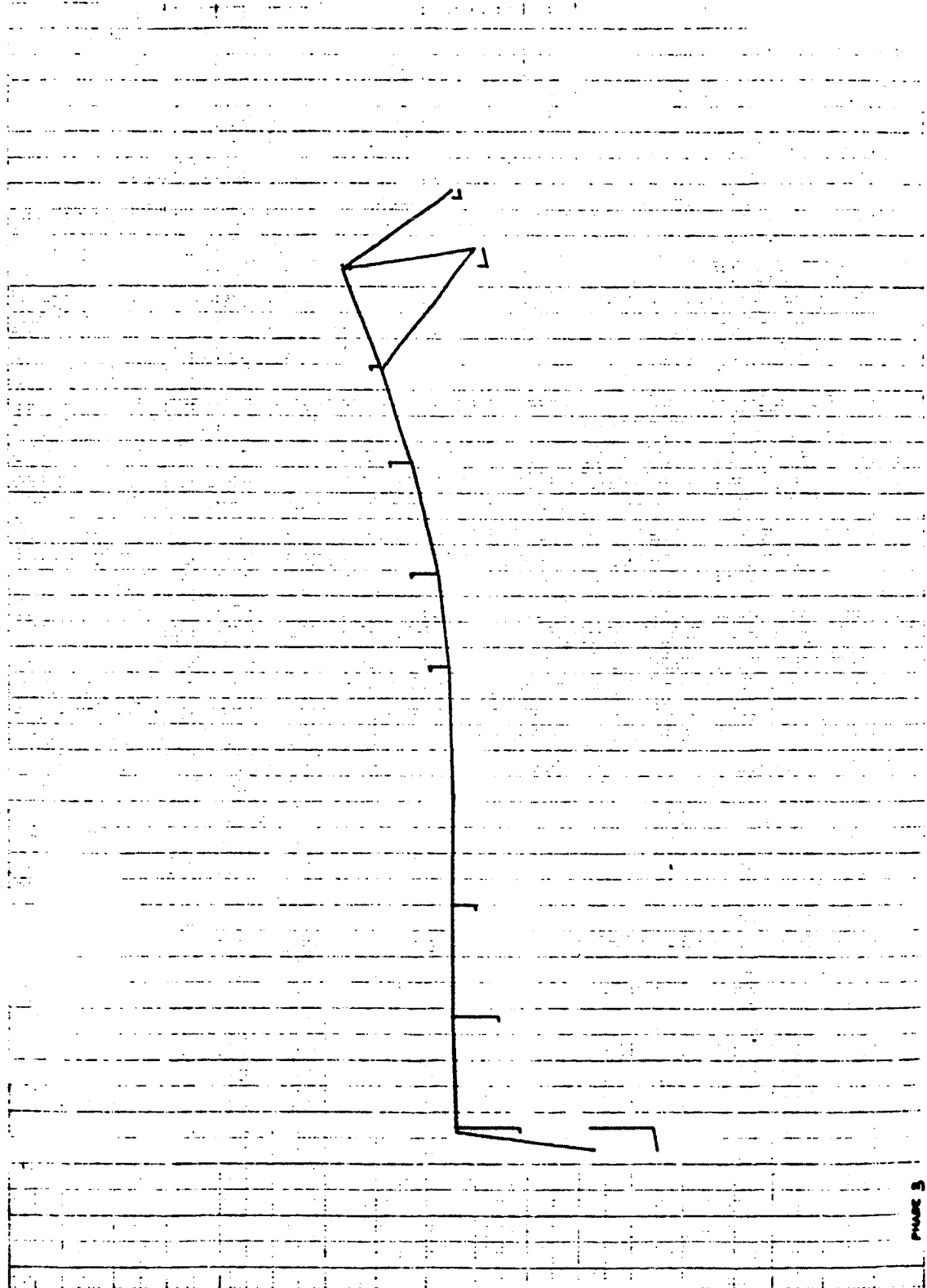
PHASE 3  
ORBITER PAYLOAD-ORBIT BASE WITH SUPPORT STRUCTURE  
ORBITER FREE FREE MODES  
MODAL ORDER, SUBCASE 21 MODE 21 FREQ. 100.4890

10/18/74 100-007, o. o. 00130281



PHASE 3  
CRIBTER PAYLOAD, SYM CASE (WITH SUPPORT SPRINGS)  
CRIBTER FREE FREE MODES  
MODAL ORDER, SUBCASE 22 MODE 22 FREQ. 140.3289

28 10/18/74 MW-007. • 0.000000



PHASE 3  
CREDIT PAYLOAD SVCS CASE (WITH SUPPORT SPRINGS)  
CREDIT FREE FREE HOURS  
SOCAL OCTOP. SURCHARGE 33 1000 23 FREQ. 254.0294