

NATIONAL RADIO ASTRONOMY OBSERVATORY
GREEN BANK, WEST VIRGINIA

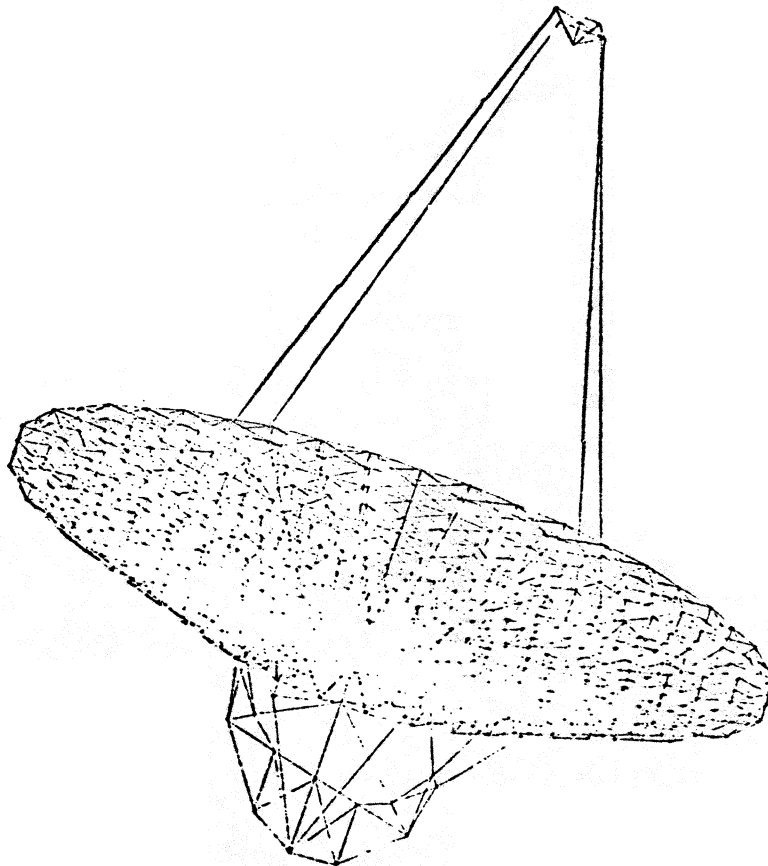
ENGINEERING DIVISION INTERNAL REPORT No. 104

ANALYSIS OF 36-FT. ELEVATION STRUCTURE

LEE KING

SEPTEMBER 1975

ANALYSIS OF 36 FT ELEVATION STRUCTURE



LJK September 1975

1.0 GENERAL

36 ft telescope elevation structure is divided into 3 main sections:

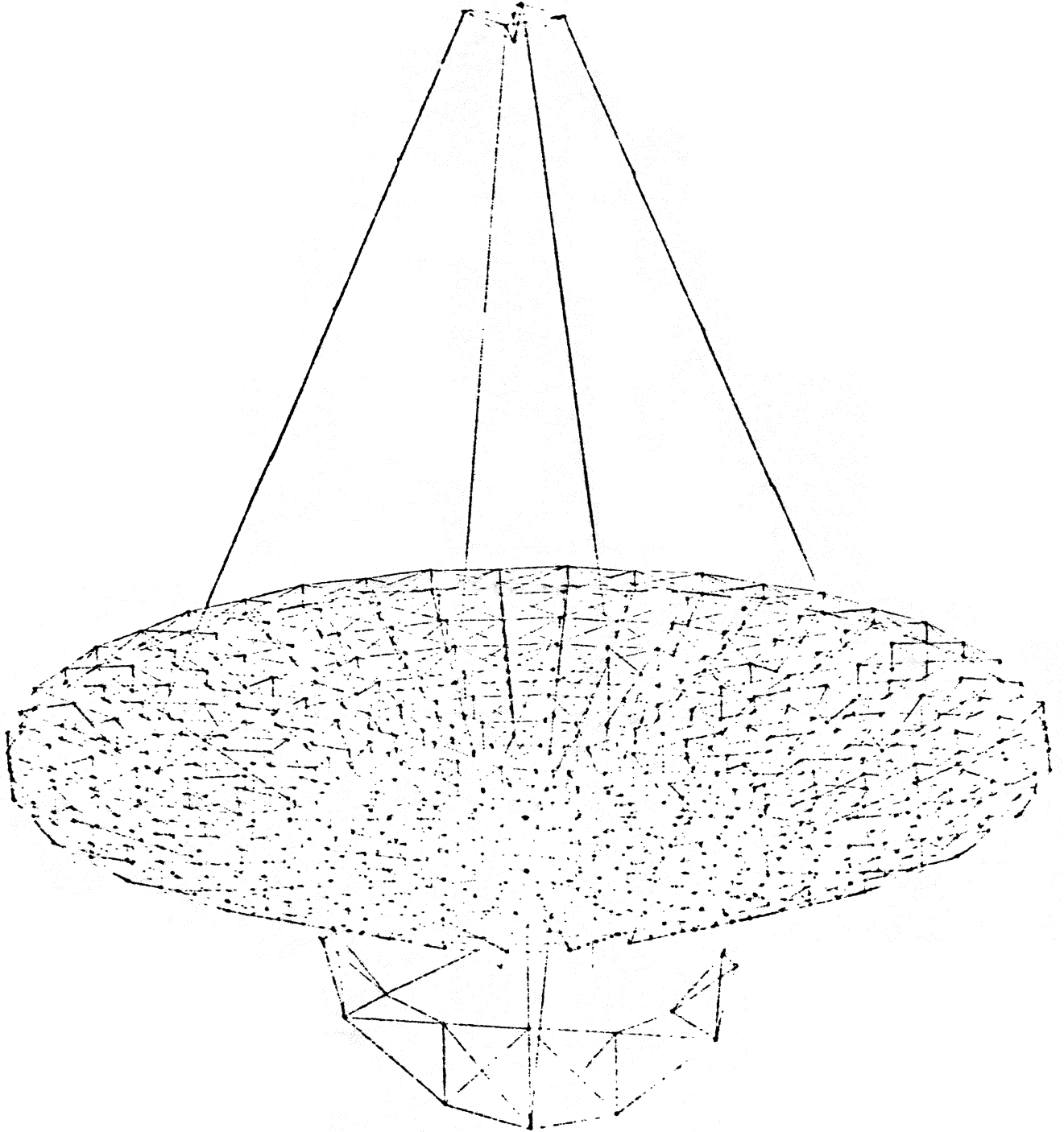
- (a) Aluminum feed structure: 2 main legs and 2 secondary supports.
- (b) Aluminum reflector structure: Shallow shell dish with reinforced ribs.
- (c) Steel balance structure: Elevation shaft and counterweight support structure.

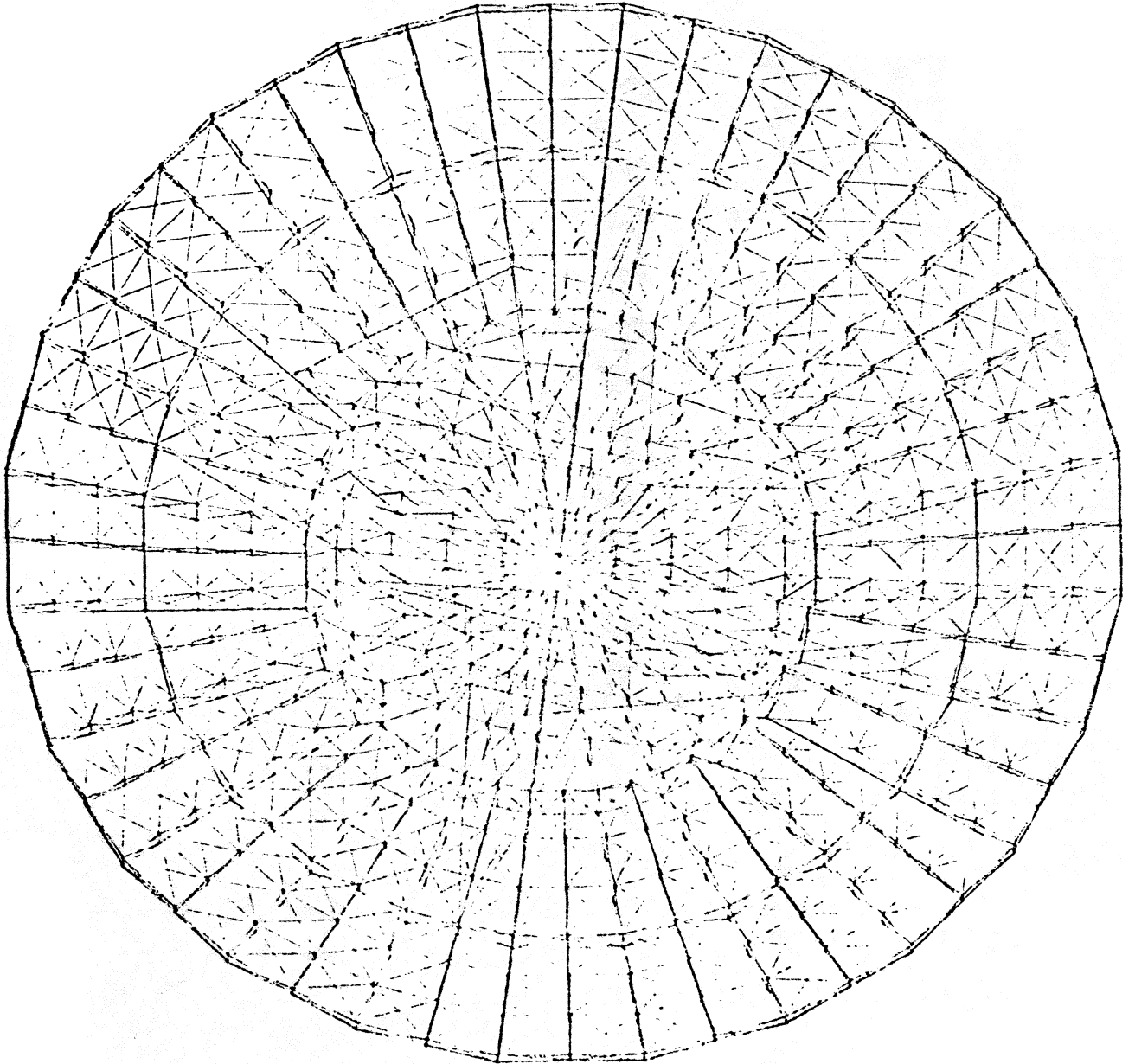
Computer model of this structure consisted of linear beam members and 2-dimensional plates of both in plane and bending stiffnesses is shown in two views on p.3 & p.4. With proper constraints, one quarter of the structure, ref. p.5, is sufficient for the computer analysis. A general purpose computer program, NASTRAN (NAsa STRuctural ANalysis), is used for the analysis.

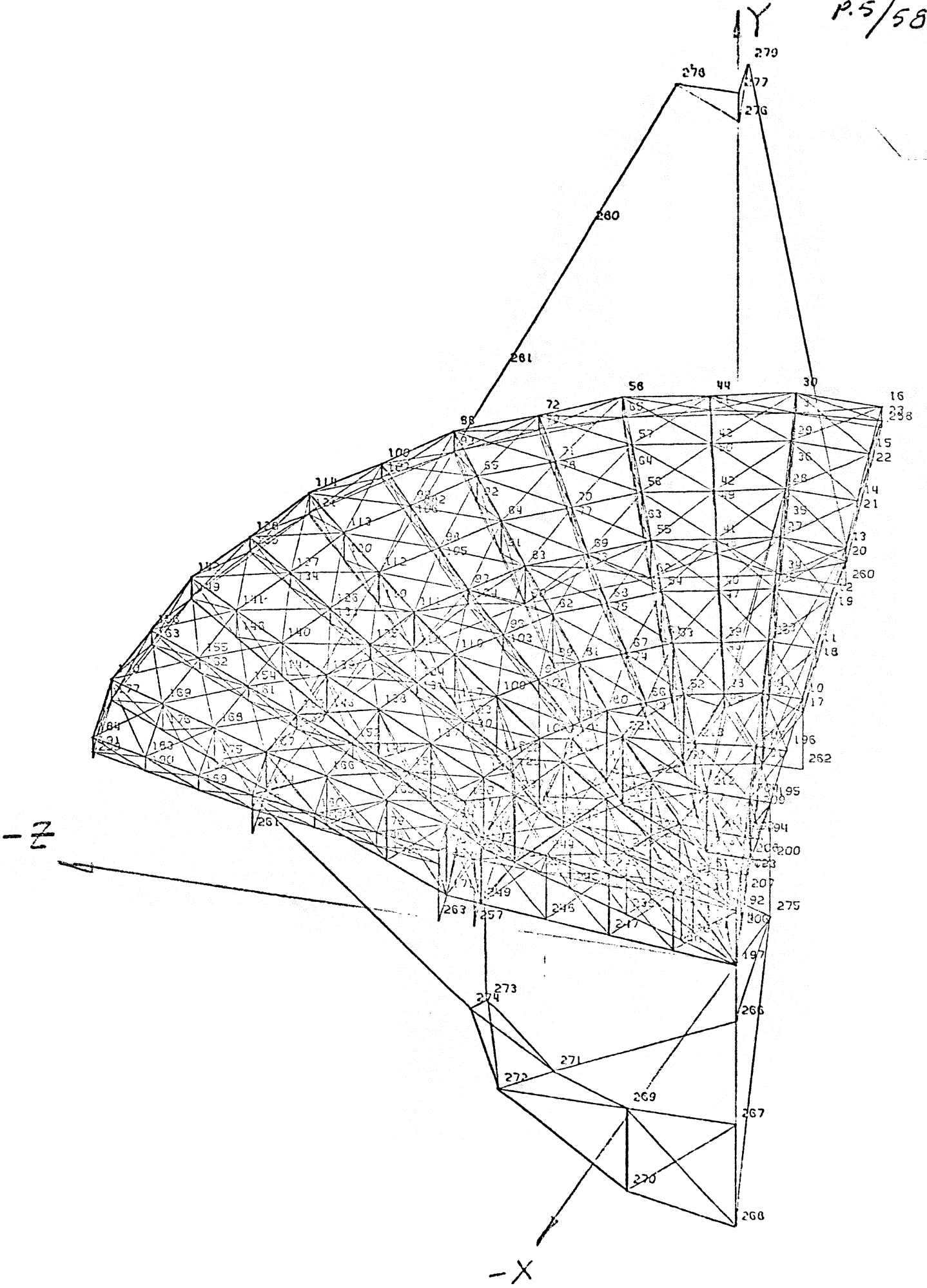
The purpose of this analysis is to investigate the surface deformations of the reflector due to gravity at various elevation angles and due to the temperature change of the structure.

2.0 TABLE OF CONTENTS

SECTION	DESCRIPTION	REF. PAGE
1.0	General	p.1
2.0	Table of Contents	p.2
3.0	Results and Conclusions	p.6
3.1	Surface RMS Error vs. Elevation Angle due to Gravity	p.7
3.2	Surface RMS Error due to Uniform Temperature Change	p.10
4.0	Structural Model	p.14
5.0	Loadings	p.14
6.0	NASTRAN Input (Bulk Data List)	p.18
7.0	Surface RMS Error Summary Sheets	p.40
7.1	Gravity Loading: Reflector Parameters Constrained	p.40
7.2	Gravity Loading: Reflector Parameters Freed	p.49
7.3	5°F Uniform Temperature Loading	p.58







3.0 RESULTS AND CONCLUSIONS

The behavior of the 36 ft telescope can now be investigated by means of the computer model discussed in Section 1.0. The results of two cases, the gravity load and the uniform temperature loading, are summarized as follows,

	①	②
Surface Error	Gravity load $\alpha=0^\circ$ wrt $\alpha=90^\circ$	Temp = 5°F
RMS	0.0120"	0.0020"
Best fitted RMS	0.0013"	0.0010"

To obtain the best fitted RMS, the following adjustments are required:

	①	②
Focus in Y-dir. (along reflector axis)	0.071"	0.041"
Focus in Z-dir. (\perp to reflector axis)	0.0035"	-----
Pointing direction (rot. about elev. axis)	6.3 sec	-----
Focal length (ref. $f=345.600''$)	345.536"	345.659"

The contour maps are given on p.11 thru p.13.

It is shown above that significant improvement of surface error can be obtained with relatively small adjustments of focus and pointing direction. The present surface RMS error is about 0.014" (0.35mm)

If the surface errors are successfully improved by the aluminum foil method^{*}, the gravity would have more effect on the overall performance.

We therefore should have the correction for gravity force in addition to the focal length correction for temperature change now used.

* Payne and Hollis memo. "Further measurements on 36 ft surface" May 14, 1975.

SURFACE RMS ERROR VS REFLECTOR ELEV. ANGLE DUE TO GRAVITY

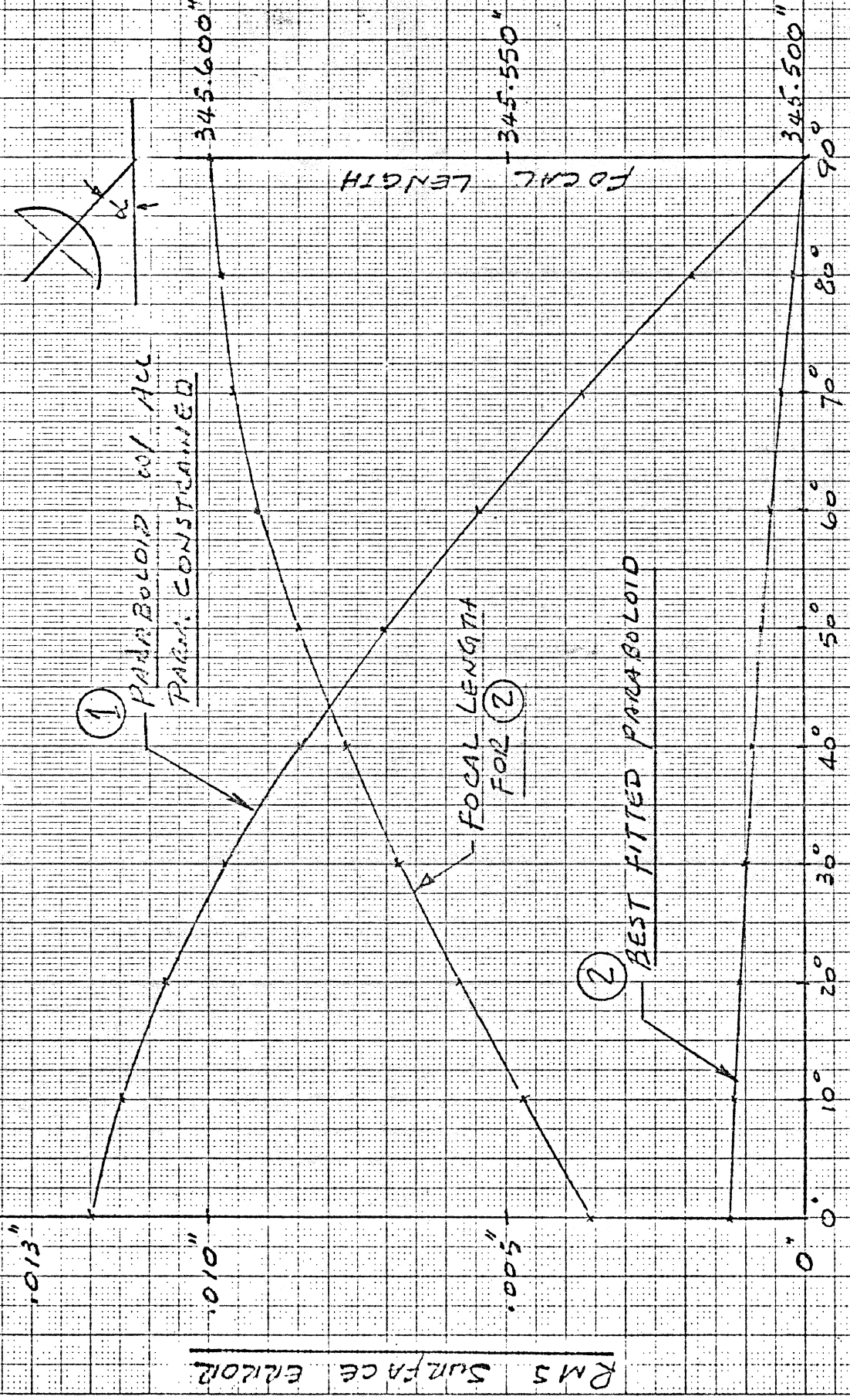
THE RELATION OF RMS VS ELEVATION ANGLE α ARE PLOTTED ON P. 8. THE RMS ERROR @ $\alpha = 90^\circ$ USED AS REFERENCE IS TAKEN TO BE ZERO. THE UPPER CURVE SHOWS THE INCREASE OF ERROR FROM 0 (@ $\alpha = 90^\circ$) UP TO .0120" (@ $\alpha = 0^\circ$), IF THE REFLECTOR PARAMETERS (VERTEX LOCATION, AXIS, AND FOCAL LENGTH) ARE ALL CONSTRAINED. THESE ERRORS CAN BE REDUCED AS GIVEN BY THE LOWER CURVE, IF THE PARAMETERS ARE ADJUSTED FOR BEST FITTED PARABOLOIDS.

THE RELATIVE LOCATIONS OF BEST FITTED PARABOLOID AND THE DEFLECTED FOCUS FOR $\alpha = 0^\circ$ IS SHOWN ON P. 9

SUMMARY SHEETS OF RMS CALCULATIONS FOR BOTH CONSTRAINED & FREED CONDITIONS OF VARIOUS ELEVATION ANGLES ARE GIVEN ON P. 40 THRU P. 57.

36' (9.12-75 UK)

SURFACE ERRORS DUE TO GRAVITY



RMS SURFACE ERROR

ELEVATION ANGLE, α

1

PARABOLOID OF ALL
PARAM. CONSTRAINED

FOCAL LENGTH
FOR 2

2

BEST FITTED PARABOLOID

FOCAL LENGTH

345.600"

345.550"

345.500"

.013"

.010"

.005"

0"

0°

10°

20°

30°

40°

50°

60°

70°

80°

90°

P. 9/58

REFLECTOR & FOCUS OF $\alpha = 0^\circ$ WRT $\alpha = 90^\circ$ DUE TO GRAVITY

F_{BF} = FOCUS LOCATION OF BEST FITTED PARABOLOID

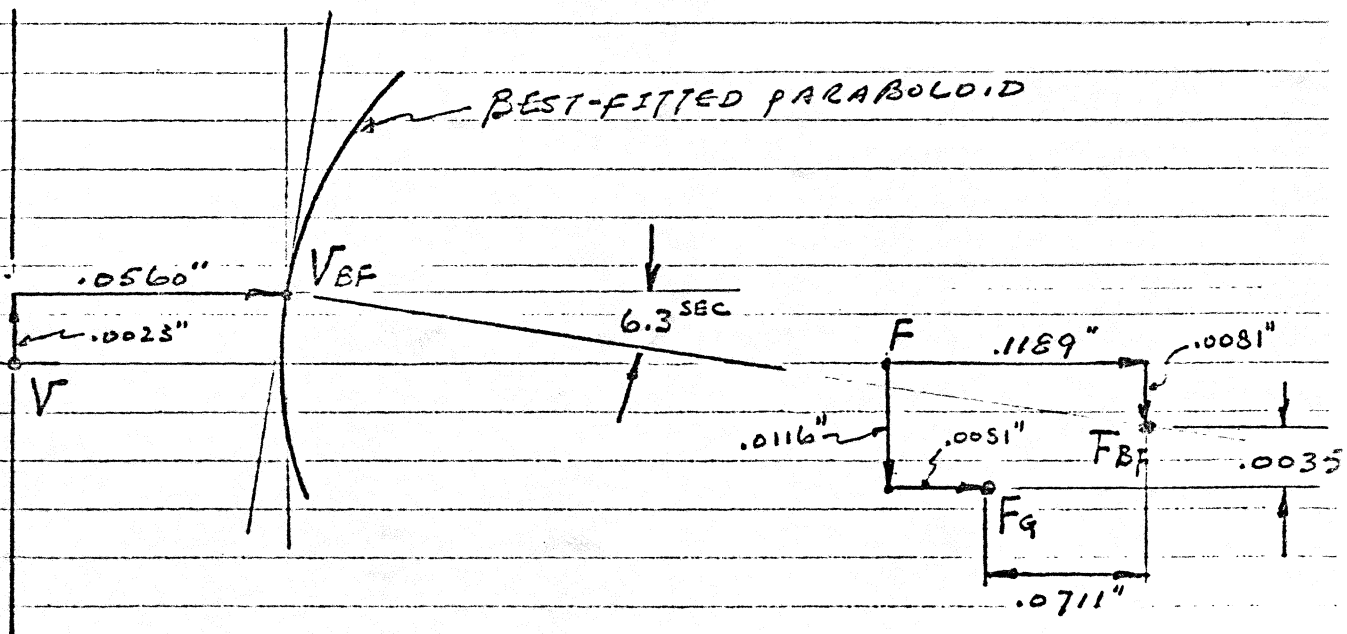
$$\left\{ \begin{array}{l} x = 0.0 \\ y = 345.663 \cos(6.3^\circ) + .05595 = 345.7189'' \\ z = -345.663 \sin(6.3^\circ) + .00233 = -.00814'' \end{array} \right.$$

F_G = DEFLECTED FOCUS LOCATION DUE TO GRAVITY

$$\left\{ \begin{array}{l} x = 0.0 \\ y = 345.6 + .00806 = 345.6081 \\ z = -.01156 \end{array} \right.$$

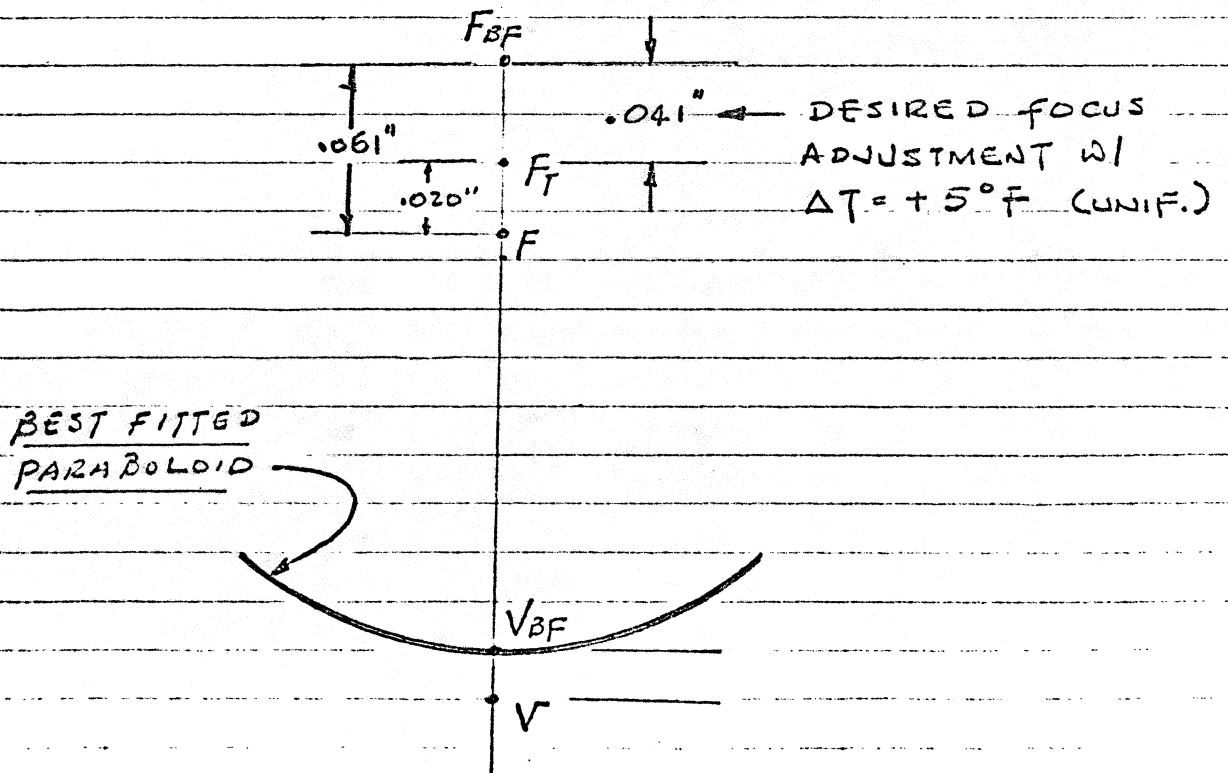
REQUIRED FOCUS ADJUSTMENT

$$\left\{ \begin{array}{l} x = 0.0 \\ y = .1189 - .0081 = .0711'' \\ z = -.0116 + .0081 = .0035'' \end{array} \right.$$



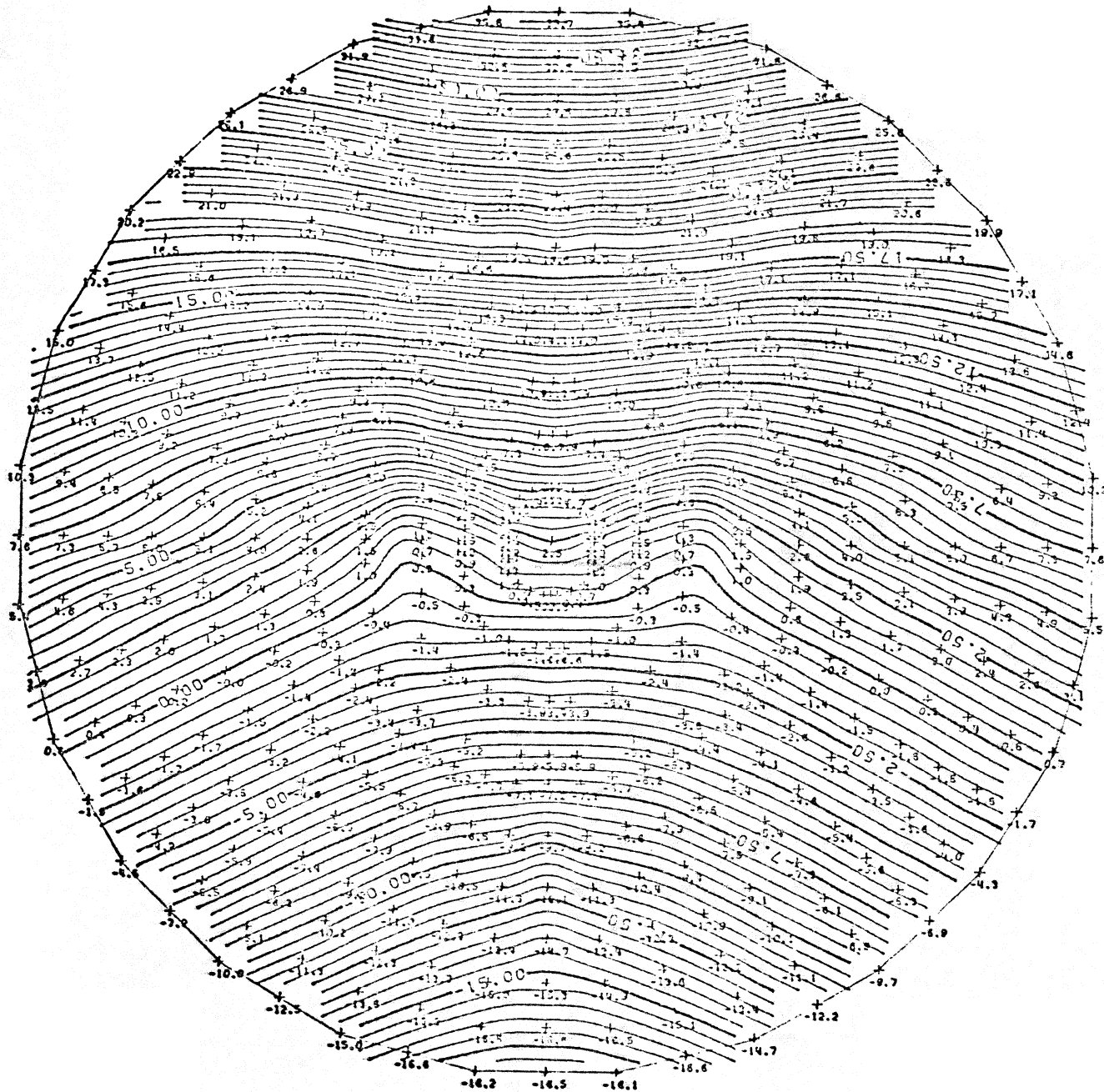
SURFACE RMS DUE TO UNIFORM TEMP. CHANGE

THE COEFFS. OF THERMAL EXPANSION FOR THE ALUMINUM (FEED & REFLECTOR) AND THE STEEL (COUNTERWEIGHT STRUCTURE) ARE APPROX. 2:1. WHILE THE TEMPERATURE OF THE ENTIRE STRUCTURE INCREASES UNIFORMLY, THE DISH TENDS TO BECOME FLATTENED AND HAS A LONGER FOCAL LENGTH. FOR $\Delta T = +5^\circ F$, THE GEOMETRY IS SHOWN AS FOLLOWS,



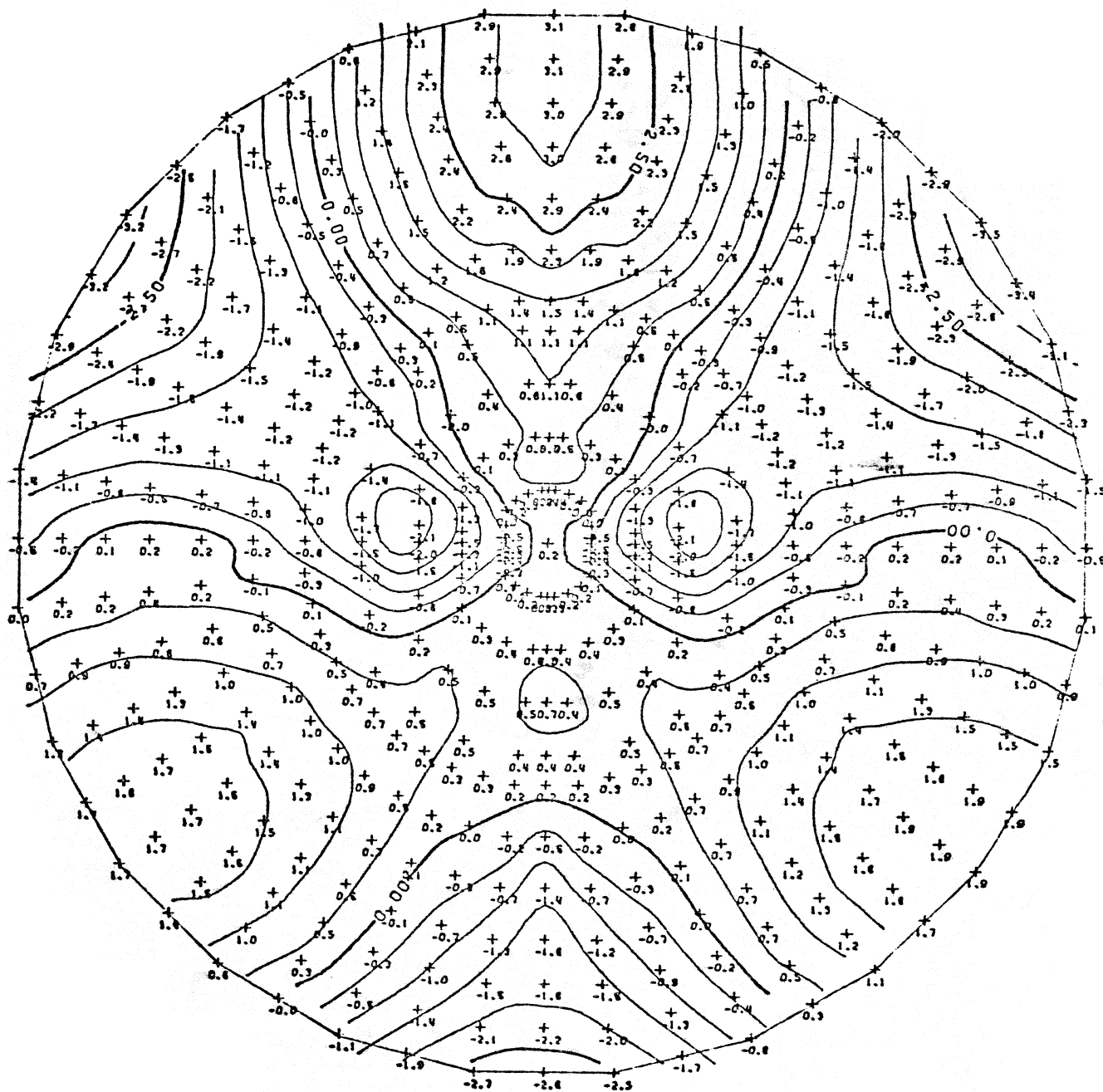
SURFACE CONTOUR IS PLOTTED ON P.13, RMS CALC. ON P.58.

36 ft Surface: Gravity with all reflector parameters constrained.
RMS=0.0120" Contour level @ 0.0005"



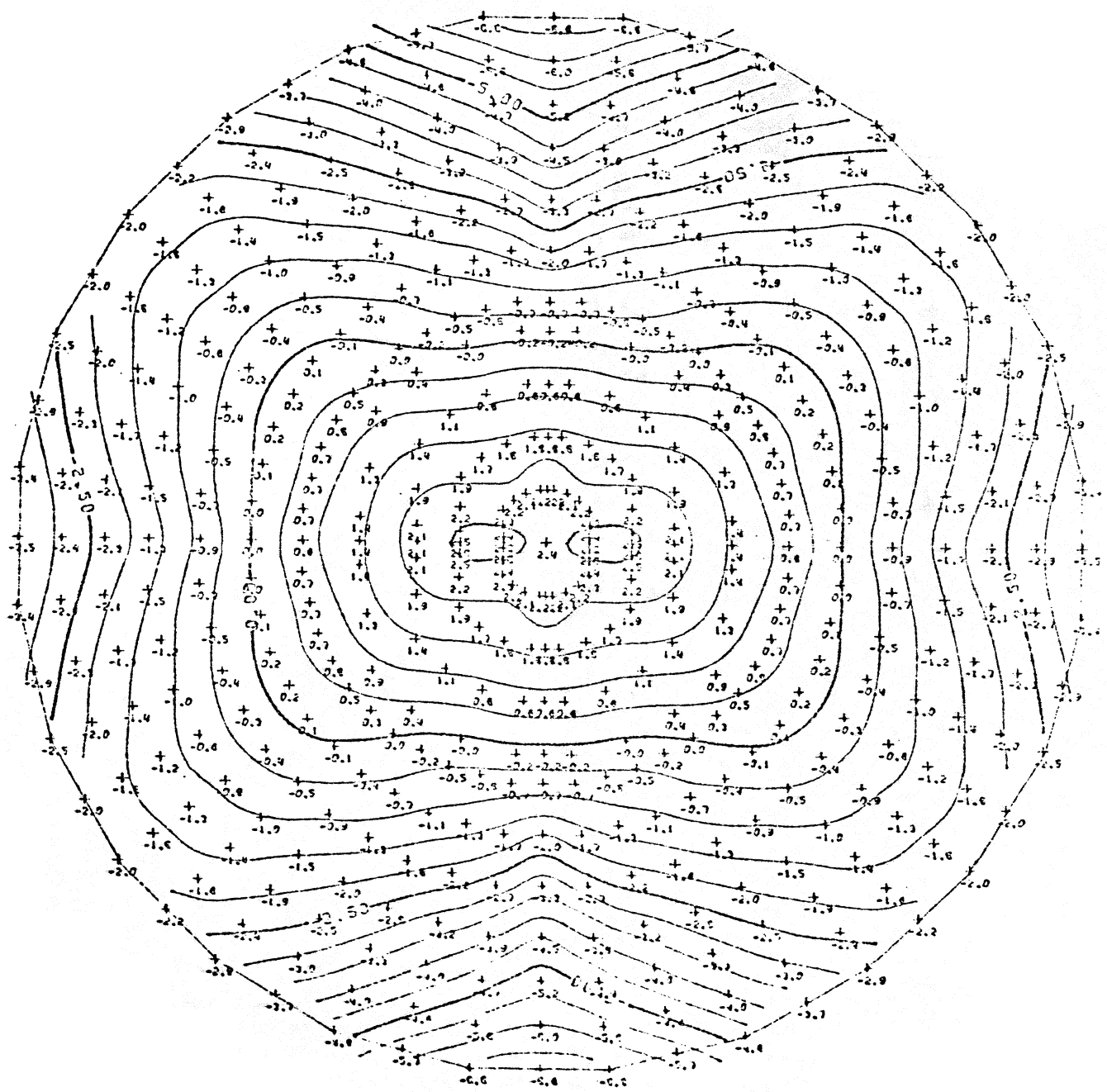
36 ft Surface: Gravity with all reflector parameters relieved.

RMS=0.0013" Contour level @ 0.0005"



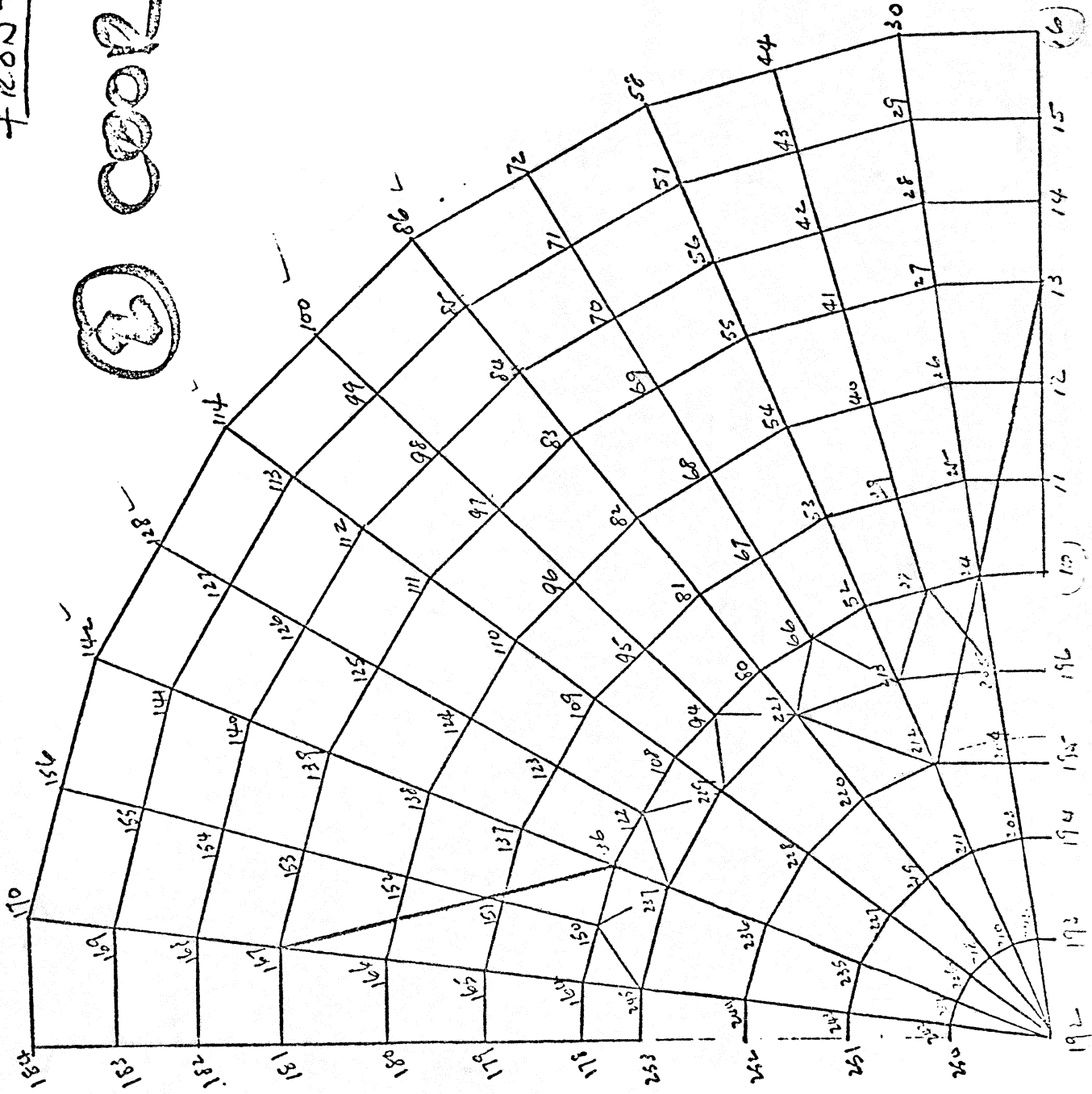
36 ft Surface: 5°F Uniform temperature load with all reflector parameters relieved.

RMS=0.0010" Contour level @ 0.0005"

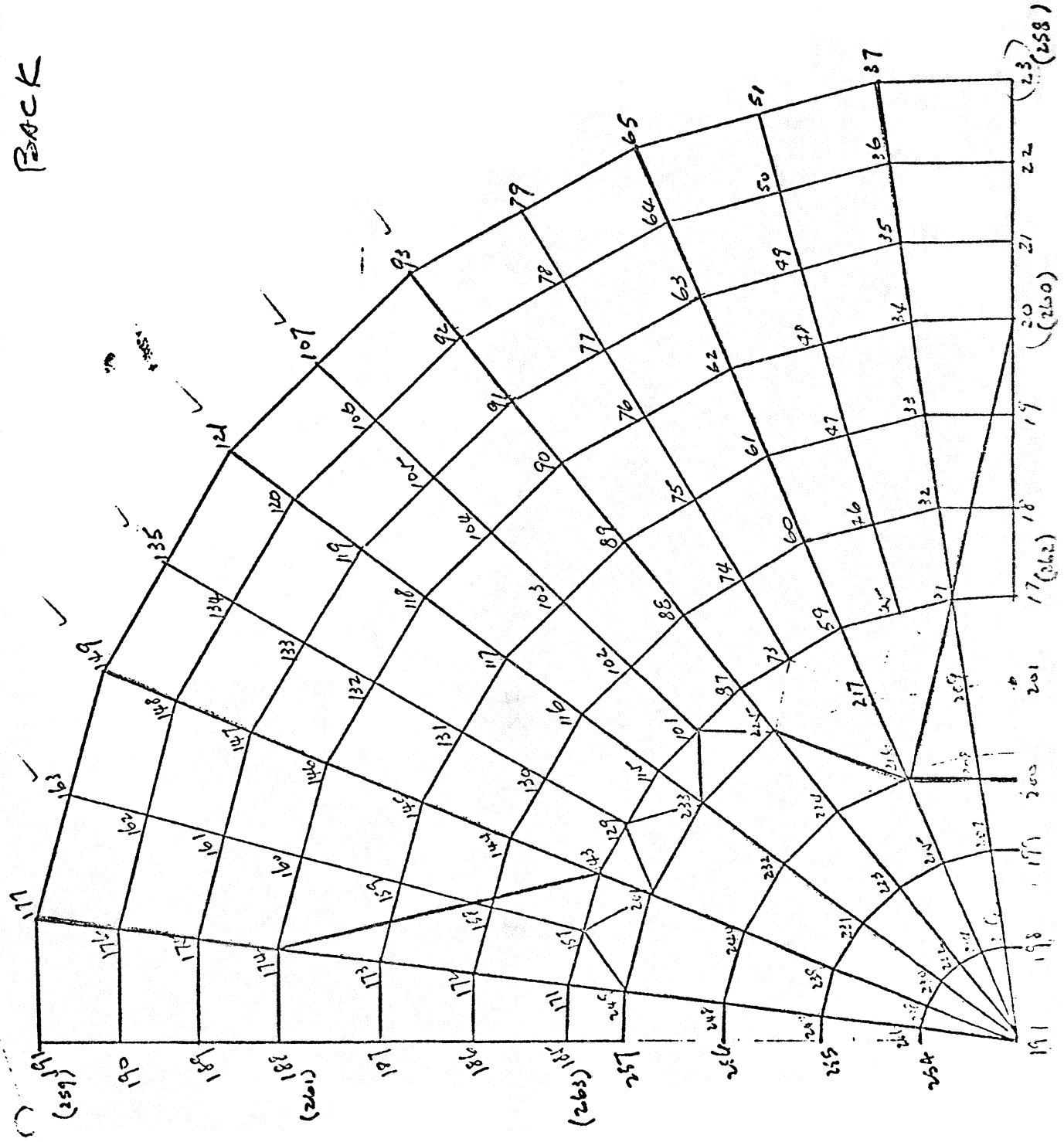


FRONT

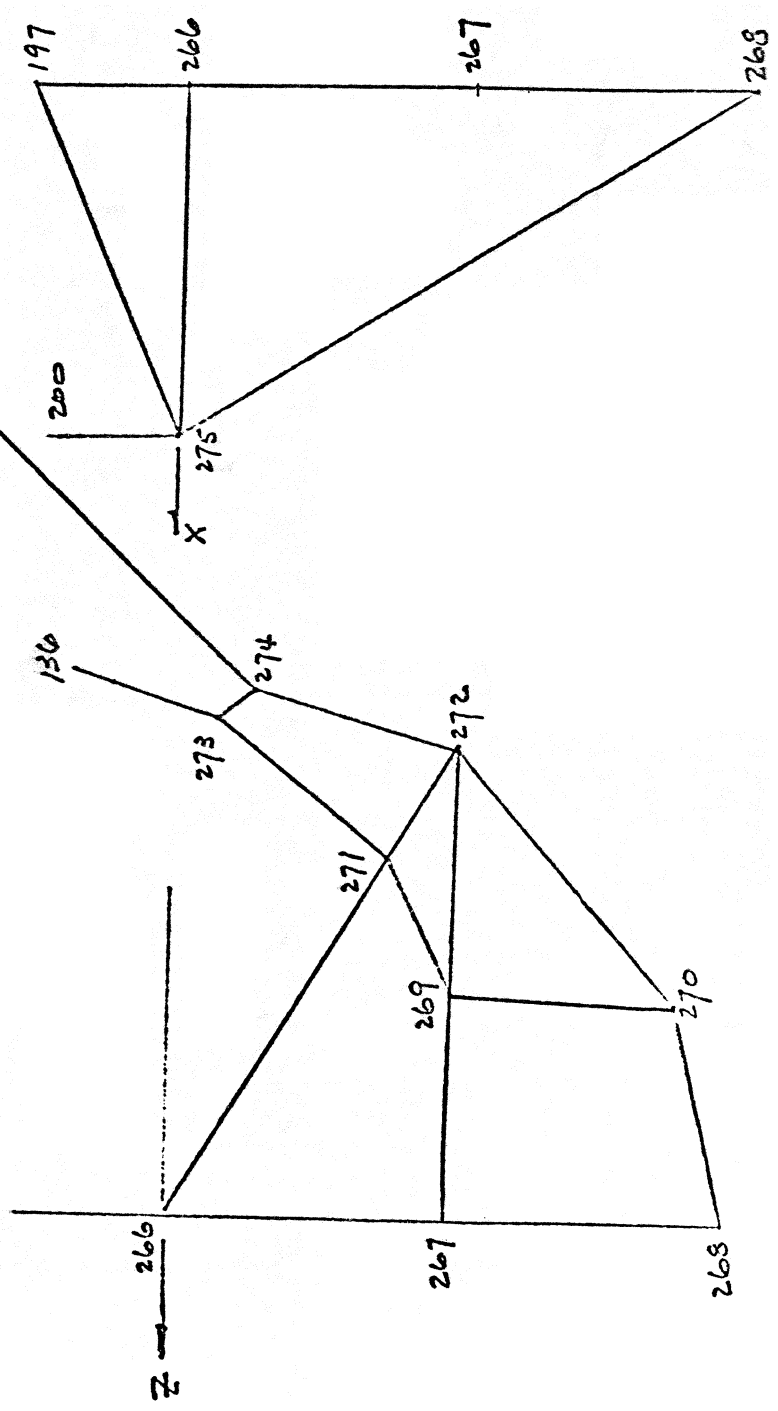
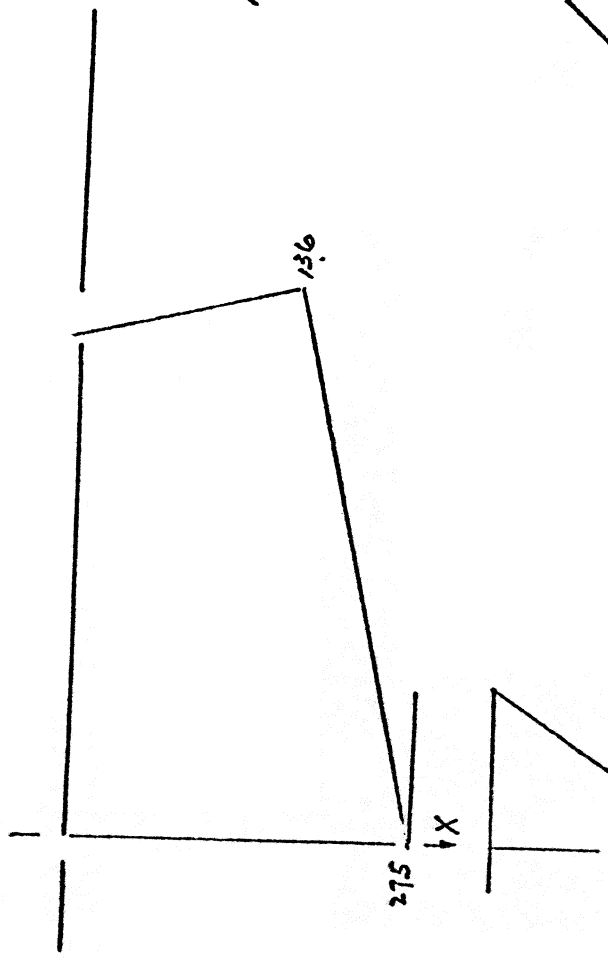
① cool



BACK



BALANCE STR



P.18/58

	1	2	3	4	5	6	7	8	9	10
CBAR	250	21	192	197	200.000	-24.000	0.0	0.0	1	1
CBAR	251	1	197	266	0.0	-24.313	200.000	0.0	1	1
CBAR	252	2	266	267	0.0	-45.200	200.000	0.0	1	1
CBAR	253	2	267	268	0.0	-44.800	200.000	0.0	1	1
CBAR	254	3	197	275	52.000	175.688	0.0	0.0	1	1
CBAR	255	4	266	275	52.000	200.000	0.0	0.0	1	1
CBAR	256	5	268	275	52.000	290.000	0.0	0.0	1	1
CBAR	257	6	200	275	0.0	-24.313	200.000	0.0	1	1
CBAR	259	7	136	275	14.114	144.597	91.464	9.864	1	1
CBAR	260	8	136	273	-37.886	137.597	9.864	9.864	1	1
CBAR	261	9	181	274	0.0	121.033	73.386	73.386	1	1
CBAR	262	10	273	274	0.0	195.000	-5.600	-5.600	1	1
CBAR	263	10	271	273	0.0	227.000	-21.600	-21.600	1	1
CBAR	264	10	272	274	0.0	233.200	-9.200	-9.200	1	1
CBAR	265	11	266	271	0.0	166.000	-60.000	-60.000	1	1
CBAR	266	11	271	272	0.0	188.800	-18.000	-18.000	1	1
CBAR	267	10	269	271	0.0	211.200	-24.000	-24.000	1	1
CBAR	268	12	267	269	0.0	200.000	-36.000	-36.000	1	1
CBAR	269	12	269	272	0.0	200.000	-42.000	-42.000	1	1
CBAR	270	12	269	270	0.0	-36.000	200.000	200.000	1	1
CBAR	271	12	268	270	0.0	208.800	-35.000	-35.000	1	1
CBAR	272	12	270	272	0.0	236.000	-42.000	-42.000	1	1
CBAR	280	13	13	279	-146.086	539.445	0.0	0.0	1	1
CBAR	281	14	181	283	0.0	267.889	26.786	26.786	1	1
CBAR	282	15	283	282	0.0	267.889	28.200	28.200	1	1
CBAR	283	16	281	282	0.0	132.111	-28.200	-28.200	1	1
CBAR	284	17	280	281	0.0	132.111	-28.200	-28.200	1	1
CBAR	285	18	278	280	0.0	132.111	-28.200	-28.200	1	1
CBAR	287	19	278	277	0.0	200.000	21.000	21.000	1	1
CBAR	288	20	277	276	0.0	-12.500	200.000	200.000	1	1
CBAR	290	19	277	279	14.500	200.000	0.0	0.0	1	1
CBAR	401	31	13	24	-62.450	188.435	-12.922	-12.922	1	1
CBAR	402	31	20	31	-62.450	163.509	-12.922	-12.922	1	1
CBAR	403	32	143	147	30.997	233.727	-74.835	-74.835	1	1
CBAR	404	30	31	216	-46.136	200.000	-8.617	-8.617	1	1
CBAR	405	33	200	208	0.0	200.000	-6.846	-6.846	1	1
CBAR	406	33	208	216	0.0	200.000	-14.693	-14.693	1	1
CBAR	407	30	216	225	17.022	200.000	-31.423	-31.423	1	1
CBAR	408	34	197	206	17.333	200.000	-2.282	-2.282	1	1
CBAR	409	34	206	207	17.334	200.000	-2.282	-2.282	1	1
CBAR	410	34	207	208	17.333	200.000	-2.282	-2.282	1	1
CBAR	411	34	208	209	23.068	200.000	-3.038	-3.038	1	1
CBAR	412	34	209	31	23.068	200.000	-3.038	-3.038	1	1
CBAR	413	37	31	32	20.817	208.738	-2.741	-2.741	1	1
CBAR	414	37	32	33	20.816	208.739	-2.741	-2.741	1	1
CBAR	415	37	33	34	20.817	208.739	-2.741	-2.741	1	1
CBAR	416	37	34	35	17.843	207.511	-2.350	-2.350	1	1
CBAR	417	37	35	36	17.843	207.511	-2.349	-2.349	1	1
CBAR	418	37	36	37	17.843	207.512	-2.350	-2.350	1	1
CBAR	419	35	197	214	17.333	200.000	-7.180	-7.180	1	1

12.19 / 58

1	2	3	4	5	6	7	8	9	10
CBAR	420	35	214	215	17.334	200.000	-7.179	1	
CBAR	421	35	215	216	17.333	200.000	-7.180	1	
CBAR	422	35	216	217	19.732	200.000	-8.173	1	
CBAR	423	35	217	59	19.732	200.000	-8.174	1	
CBAR	424	38	59	60	19.402	208.738	-8.036	1	
CBAR	425	38	60	61	19.401	208.739	-8.037	1	
CBAR	426	38	61	62	19.402	208.739	-8.037	1	
CBAR	427	38	62	63	16.630	207.511	-6.888	1	
CBAR	428	38	63	64	16.629	207.511	-6.868	1	
CBAR	429	38	64	65	16.630	207.512	-6.889	1	
CBAR	430	36	197	222	17.255	200.000	-13.241	1	
CBAR	431	36	222	223	17.256	200.000	-13.240	1	
CBAR	432	36	223	224	17.255	200.000	-13.241	1	
CBAR	433	36	224	225	17.256	200.000	-13.240	1	
CBAR	434	36	225	87	9.520	200.000	-7.305	1	
CBAR	435	39	87	88	16.660	208.738	-12.784	1	
CBAR	436	39	88	89	16.661	208.739	-12.784	1	
CBAR	437	39	89	90	16.660	208.739	-12.784	1	
CBAR	438	39	90	91	14.280	207.511	-10.958	1	
CBAR	439	39	91	92	14.281	207.511	-10.958	1	
CBAR	440	39	92	93	14.280	207.512	-10.958	1	
CBAR	441	36	197	230	13.241	200.000	-17.255	1	
CBAR	442	36	230	231	13.240	200.000	-17.256	1	
CBAR	443	36	231	232	13.241	200.000	-17.255	1	
CBAR	444	36	232	233	13.240	200.000	-17.256	1	
CBAR	445	36	233	115	7.305	200.000	-9.520	1	
CBAR	446	39	115	116	12.784	208.738	-16.660	1	
CBAR	447	39	116	117	12.783	208.739	-16.661	1	
CBAR	448	39	117	118	12.783	208.739	-16.660	1	
CBAR	449	39	118	119	10.959	207.511	-14.280	1	
CBAR	450	39	119	120	10.958	207.511	-14.281	1	
CBAR	451	39	120	121	10.959	207.512	-14.280	1	
CBAR	452	35	197	238	8.323	200.000	-20.094	1	
CBAR	453	35	238	239	8.324	200.000	-20.095	1	
CBAR	454	35	239	240	8.323	200.000	-20.094	1	
CBAR	455	35	240	241	8.323	200.000	-20.094	1	
CBAR	456	35	241	143	4.593	200.000	-11.087	1	
CBAR	457	38	143	144	8.036	208.738	-19.402	1	
CBAR	458	38	144	145	8.036	208.739	-19.401	1	
CBAR	459	38	145	146	8.037	208.739	-19.402	1	
CBAR	460	38	146	147	6.888	207.511	-16.630	1	
CBAR	461	38	147	148	6.888	207.511	-16.629	1	
CBAR	462	38	148	149	6.889	207.512	-16.630	1	
CBAR	463	34	197	246	2.839	200.000	-21.564	1	
CBAR	464	34	246	247	2.839	200.000	-21.564	1	
CBAR	465	34	247	248	2.839	200.000	-21.564	1	
CBAR	466	34	248	249	2.839	200.000	-21.564	1	
CBAR	467	34	249	171	1.566	200.000	-11.880	1	
CBAR	468	37	171	172	2.741	208.738	-20.811	1	
CBAR	469	37	172	173	2.741	208.739	-20.810	1	

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P. 20/58

I N P U T		B U L K		D A T A		D E C K		E C H O	
1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..
CBAR	470	37	173	174	2.741	208.739	-20.811	1	
CBAR	471	37	174	175	2.350	207.511	-17.849	1	
CBAR	472	37	175	176	2.349	207.511	-17.849	1	
CBAR	473	37	176	177	2.350	207.512	-17.849	1	
CBAR	474	40	23	258	200.000	-2.780	0.0	1	
CBAR	475	41	258	37	-0.141	200.587	-28.194	1	
CBAR	476	41	37	65	-14.557	200.000	-54.466	1	
CBAR	477	41	65	93	-28.194	200.000	-48.833	1	
CBAR	478	41	93	121	-39.871	200.000	-39.871	1	
CBAR	479	41	121	149	-48.833	200.000	-28.194	1	
CBAR	480	41	149	177	-54.466	200.000	-14.557	1	
CBAR	481	41	177	259	-28.194	199.413	0.0	1	
CBAR	482	40	259	191	0.0	2.780	200.000	1	
CBAR	483	40	20	260	200.000	-10.557	0.0	1	
CBAR	484	42	260	54	0.0	200.282	-21.145	1	
CBAR	485	42	34	62	-10.917	200.000	-40.850	1	
CBAR	486	42	62	90	-21.146	200.000	-36.624	1	
CBAR	487	42	90	118	-29.906	200.000	-29.904	1	
CBAR	488	42	118	146	-36.622	200.000	-21.146	1	
CBAR	489	42	146	174	-40.850	200.000	-10.899	1	
CBAR	490	42	174	261	-21.145	199.718	-0.018	1	
CBAR	491	40	261	188	0.0	10.557	200.000	1	
CBAR	492	40	17	262	200.000	-24.850	0.0	1	
CBAR	493	43	262	31	0.0	200.000	-12.922	1	
CBAR	494	43	31	59	-6.672	200.000	-24.964	1	
CBAR	495	43	59	87	-12.922	200.000	-22.381	1	
CBAR	496	43	87	115	-18.275	200.000	-18.275	1	
CBAR	497	43	115	143	-22.381	200.000	-12.922	1	
CBAR	498	43	143	171	-24.964	200.000	-6.672	1	
CBAR	499	43	171	263	-12.922	200.000	0.0	1	
CBAR	500	40	263	185	0.0	24.850	200.000	1	
CCUAD2	1	1	16	30	37	23			
CCUAD2	2	1	30	44	51	37			
CCUAD2	3	1	44	58	65	51			
CCUAD2	4	1	58	72	79	65			
CCUAD2	5	1	72	86	93	79			
CCUAD2	6	1	86	100	107	93			
CCUAD2	7	1	100	114	121	107			
CCUAD2	8	1	114	128	135	121			
CCUAD2	9	1	128	142	149	135			
CCUAD2	10	1	142	156	163	149			
CCUAD2	11	1	156	170	177	163			
CCUAD2	12	1	170	184	191	177			
CCUAD2	13	1	13	27	34	20			
CCUAD2	14	1	27	41	48	34			
CCUAD2	15	1	41	55	62	48			
CCUAD2	16	1	55	69	76	62			
CCUAD2	17	1	69	83	90	76			
CCUAD2	18	1	83	97	104	90			
CCUAD2	19	1	97	111	118	104			

P.21/58

36 FT ELEVATION STRUCTURE
STATIC ANALYSIS FORCE IN Y DIRECTION

1K D.L. 2K TEMP 5 F

I N P U T		B U L K		D A T A		D E C K		E C H O	
1	2	3	4	5	6	7	8	9	10
CQUAD2	20	1	111	125	132	118			
CQUAC2	21	1	125	139	146	132			
CQUAD2	22	1	139	153	160	146			
CQUAD2	23	1	153	167	174	160			
CQUAD2	24	1	167	181	188	174			
CQUAC2	25	1	10	24	31	17			
CQUAD2	26	1	24	38	45	31			
CQUAD2	27	1	38	52	59	45			
CQUAD2	28	1	52	66	73	59			
CCUAL2	29	1	66	80	87	73			
CQUAD2	30	1	80	94	101	87			
CCUAC2	31	1	94	108	115	101			
CQUAD2	32	1	108	122	129	115			
CQUAD2	33	1	122	136	143	129			
CQUAC2	34	1	136	150	157	143			
CQUAD2	35	1	150	164	171	157			
CQUAD2	36	1	164	178	185	171			
CQUAD2	37	2	195	204	208	200			
CQUAD2	38	2	204	212	216	208			
CQUAC2	39	2	212	221	225	216			
CQUAD2	40	1	221	229	233	225			
CQUAD2	41	1	229	237	241	233			
CQUAD2	42	1	237	245	249	241			
CQUAD2	43	1	245	253	257	249			
CQUAD2	44	1	10	11	18	17			
CQUAD2	45	1	11	12	19	18			
CQUAD2	46	1	12	13	20	19			
CCUAC2	47	1	13	14	21	20			
CQUAC2	48	1	14	15	22	21			
CQUAD2	49	1	15	16	23	22			
CQUAD2	50	1	192	202	206	197			
CQUAD2	51	1	202	203	207	206			
CQUAC2	52	1	203	204	208	207			
CQUAD2	53	1	204	205	209	208			
CQUAD2	54	1	205	24	31	209			
CQUAC2	55	1	24	25	32	31			
CQUAD2	56	1	25	26	33	32			
CQUAD2	57	1	26	27	34	33			
CQUAD2	58	1	27	28	35	34			
CQUAD2	59	1	28	29	36	35			
CQUAD2	60	1	29	30	37	36			
CCUAD2	61	1	38	39	46	45			
CQUAD2	62	1	39	40	47	46			
CQUAD2	63	1	40	41	48	47			
CQUAD2	64	1	41	42	49	48			
CQUAD2	65	1	42	43	50	49			
CQUAC2	66	1	43	44	51	50			
CQUAC2	67	1	192	210	214	197			
CQUAD2	68	1	210	211	215	214			
CCUAD2	69	1	211	212	216	215			

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P.22/58

I N P U T B U L K D A T A D E C K E C H O									
1	2	3	4	5	6	7	8	9	10
CQUAD2	70	1	212	213	217	216			
CQUAD2	71	1	213	52	59	217			
CQUAD2	72	1	52	53	60	59			
CQUAD2	73	1	53	54	61	60			
CQUAD2	74	1	54	55	62	61			
CQUAD2	75	1	55	56	63	62			
CQUAD2	76	1	56	57	64	63			
CQUAD2	77	1	57	58	65	64			
CQUAD2	78	1	66	67	74	73			
CQUAD2	79	1	67	68	75	74			
CQUAD2	80	1	68	69	76	75			
CQUAD2	81	1	69	70	77	76			
CQUAD2	82	1	70	71	78	77			
CQUAD2	83	1	71	72	79	78			
CQUAD2	84	1	192	218	222	197			
CQUAD2	85	1	218	219	223	222			
CQUAD2	86	1	219	220	224	223			
CQUAD2	87	1	220	221	225	224			
CQUAD2	88	1	221	80	87	225			
CQUAD2	89	1	80	81	88	87			
CQUAD2	90	1	81	82	89	88			
CQUAD2	91	1	82	83	90	89			
CQUAD2	92	1	83	84	91	90			
CQUAD2	93	1	84	85	92	91			
CQUAD2	94	1	85	86	93	92			
CQUAD2	95	1	94	95	102	101			
CQUAD2	96	1	95	96	103	102			
CQUAD2	97	1	96	97	104	103			
CQUAD2	98	1	97	98	105	104			
CQUAD2	99	1	98	99	106	105			
CQUAD2	100	1	99	100	107	106			
CQUAD2	101	1	192	226	230	197			
CQUAD2	102	1	226	227	231	230			
CQUAD2	103	1	227	228	232	231			
CQUAD2	104	1	228	229	233	232			
CQUAD2	105	1	229	108	115	233			
CQUAD2	106	1	108	109	116	115			
CQUAD2	107	1	109	110	117	116			
CQUAD2	108	1	110	111	118	117			
CQUAD2	109	1	111	112	119	118			
CQUAD2	110	1	112	113	120	119			
CQUAD2	111	1	113	114	121	120			
CQUAD2	112	1	122	123	130	129			
CQUAD2	113	1	123	124	131	130			
CQUAD2	114	1	124	125	132	131			
CQUAD2	115	1	125	126	133	132			
CQUAD2	116	1	126	127	134	133			
CQUAD2	117	1	127	128	135	134			
CQUAD2	118	1	128	129	136	135			
CQUAD2	119	1	129	130	137	136			
CQUAD2		1	234	235	239	238			

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

P.23/58

1< D.L. 2< TEMP 5 F

1	2	3	4	5	6	7	8	9	10
CQUAD2	120	1	235	236	240	239			
CQUAD2	121	1	236	237	241	240			
CQUAD2	122	1	237	238	242	241			
CQUAD2	123	1	238	239	243	242			
CQUAD2	124	1	239	240	244	243			
CQUAD2	125	1	240	241	245	244			
CQUAD2	126	1	241	242	246	245			
CQUAD2	127	1	242	243	247	246			
CQUAD2	128	1	243	244	248	247			
CQUAD2	129	1	244	245	249	248			
CQUAD2	130	1	245	246	250	249			
CQUAD2	131	1	246	247	251	250			
CQUAD2	132	1	247	248	252	251			
CQUAD2	133	1	248	249	253	252			
CQUAD2	134	1	249	250	254	253			
CQUAD2	135	1	250	251	255	254			
CQUAD2	136	1	251	252	256	255			
CQUAD2	137	1	252	253	257	256			
CQUAD2	138	1	253	254	258	257			
CQUAD2	139	1	254	255	259	258			
CQUAD2	140	1	255	256	260	259			
CQUAD2	141	1	256	257	261	260			
CQUAD2	142	1	257	258	262	261			
CQUAD2	143	1	258	259	263	262			
CQUAD2	144	1	259	260	264	263			
CQUAD2	145	1	260	261	265	264			
CQUAD2	146	1	261	262	266	265			
CQUAD2	147	1	262	263	267	266			
CQUAD2	148	1	263	264	268	267			
CQUAD2	149	1	264	265	269	268			
CQUAD2	150	1	265	266	270	269			
CQUAD2	151	1	266	267	271	270			
CQUAD2	152	1	267	268	272	271			
CQUAD2	153	1	268	269	273	272			
CQUAD2	154	1	269	270	274	273			
CQUAD2	155	1	270	271	275	274			
CQUAD2	156	1	271	272	276	275			
CQUAD2	157	1	272	273	277	276			
CQUAD2	158	1	273	274	278	277			
CQUAD2	159	1	274	275	279	278			
CQUAD2	160	1	275	276	280	279			
CQUAD2	161	1	276	277	281	280			
CQUAD2	162	1	277	278	282	281			
CQUAD2	163	1	278	279	283	282			
CQUAD2	164	1	279	280	284	283			
CQUAD2	165	1	280	281	285	284			
CQUAD2	166	1	281	282	286	285			
CQUAD2	167	1	282	283	287	286			
CQUAD2	168	1	283	284	288	287			
CQUAD2	169	1	284	285	289	288			

P.24/58

STATIC ANALYSIS FORCE IN Y DIRECTION
1< D.L. 2< TEMP 5 F

	1	2	3	4	5	6	7	8	9	10
CQUAD2	170	40	41	55	54	55	54			
CQUAD2	171	41	42	56	55	56	55			
CQUAD2	172	42	43	57	56	57	56			
CQUAD2	173	43	44	58	57	58	57			
CQUAD2	174	44	45	59	58	59	58			
CQUAD2	175	45	46	60	59	60	59			
CQUAD2	176	46	47	61	60	61	60			
CQUAD2	177	47	48	62	61	62	61			
CQUAD2	178	48	49	63	62	63	62			
CQUAD2	179	49	50	64	63	64	63			
CQUAD2	180	50	51	65	64	65	64			
CQUAD2	181	51	52	66	65	66	65			
CQUAD2	182	52	53	67	66	67	66			
CQUAD2	183	53	54	68	67	68	67			
CQUAD2	184	54	55	69	68	69	68			
CQUAD2	185	55	56	70	69	70	69			
CQUAD2	186	56	57	71	70	71	70			
CQUAD2	187	57	58	72	71	72	71			
CQUAD2	188	58	59	73	72	73	72			
CQUAD2	189	59	60	74	73	74	73			
CQUAD2	190	60	61	75	74	75	74			
CQUAD2	191	61	62	76	75	76	75			
CQUAD2	192	62	63	77	76	77	76			
CQUAD2	193	63	64	78	77	78	77			
CQUAD2	194	64	65	79	78	79	78			
CQUAD2	195	65	66	80	79	80	79			
CQUAD2	196	66	67	81	80	81	80			
CQUAD2	197	67	68	82	81	82	81			
CQUAD2	198	68	69	83	82	83	82			
CQUAD2	199	69	70	84	83	84	83			
CQUAD2	200	70	71	85	84	85	84			
CQUAD2	201	71	72	86	85	86	85			
CQUAD2	202	72	73	87	86	87	86			
CQUAD2	203	73	74	88	87	88	87			
CQUAD2	204	74	75	89	88	89	88			
CQUAD2	205	75	76	90	89	90	89			
CQUAD2	206	76	77	91	90	91	90			
CQUAD2	207	77	78	92	91	92	91			
CQUAD2	208	78	79	93	92	93	92			
CQUAD2	209	79	80	94	93	94	93			
CQUAD2	210	80	81	95	94	95	94			
CQUAD2	211	81	82	96	95	96	95			
CQUAD2	212	82	83	97	96	97	96			
CQUAD2	213	83	84	98	97	98	97			
CQUAD2	214	84	85	99	98	99	98			
CQUAD2	215	85	86	100	99	100	99			
CQUAD2	216	86	87	101	100	101	100			
CQUAD2	217	87	88	102	101	102	101			
CQUAD2	218	88	89	103	102	103	102			
CQUAD2	219	89	90	104	103	104	103			

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1K D.L. 2K TEMP 5 F

P.25/58

	1	2	3	4	5	6	7	8	9	10
1	1	220	1	154	155	169	168			
CCUAD2				155	156	170	169			
CCUAD2	1	221	1	242	243	251	250			
CCUAD2				243	244	252	251			
CCUAD2	1	223	1	244	245	253	252			
CCUAD2				245	164	178	178			
CCUAD2	1	224	1	164	165	179	179			
CCUAD2				165	166	180	180			
CCUAD2	1	225	1	166	167	181	180			
CCUAD2				167	168	182	181			
CCUAD2	1	226	1	168	169	183	182			
CCUAD2				169	170	184	183			
CCUAD2	1	227	1	202	203	211	210			
CCUAD2				203	204	212	211			
CCUAD2	1	228	1	204	205	213	212			
CCUAD2				210	211	219	218			
CCUAD2	1	229	1	211	212	220	219			
CCUAD2				212	213	221	220			
CCUAD2	1	230	1	218	219	227	226			
CCUAD2				219	220	228	227			
CCUAD2	1	231	1	220	221	229	228			
CCUAD2				226	227	235	234			
CCUAD2	1	232	1	227	228	236	235			
CCUAD2				228	229	237	236			
CCUAD2	1	233	1	234	235	243	242			
CCUAD2				235	236	244	243			
CCUAD2	1	234	1	236	237	245	244			
CCUAD2				24	212	45	28			
CCUAD2	1	245	2	271	272	274	273			
CCUAD2				269	267	268	270			
CCUAD2	1	246	3	225	87	101	101			
CCUAD2				225	101	233	233			
CCUAD2	1	247	2	233	101	115	115			
CCUAD2				233	115	129	129			
CCUAD2	1	248	3	233	129	241	241			
CCUAD2				241	129	143	143			
CCUAD2	1	249	3	241	143	157	157			
CCUAD2				241	157	249	249			
CCUAD2	1	304	3	249	157	171	171			
CCUAD2				271	272	269	269			
CCUAD2	1	305	3	192	193	202	202			
CCUAD2				192	202	210	210			
CCUAD2	1	306	3	192	210	218	218			
CCUAD2				192	218	226	226			
CCUAD2	1	307	3	192	226	234	234			
CCUAD2				192	234	242	242			
CCUAD2	1	308	3	192	242	250	250			
CCUAD2				205	24	38	38			
CCUAD2	1	309	3	205	33	213	213			
CCUAD2				205	33					
CCUAD2	1	310	3	205	33					
CCUAD2				205	33					
CCUAD2	1	311	3	205	33					
CCUAD2				205	33					
CCUAD2	1	312	3	205	33					
CCUAD2				205	33					
CCUAD2	1	313	3	205	33					
CCUAD2				205	33					
CCUAD2	1	314	3	205	33					
CCUAD2				205	33					
CCUAD2	1	320	3	205	33					
CCUAD2				205	33					
CCUAD2	1	321	3	205	33					
CCUAD2				205	33					
CCUAD2	1	322	3	205	33					
CCUAD2				205	33					
CCUAD2	1	323	3	205	33					
CCUAD2				205	33					
CCUAD2	1	324	3	205	33					
CCUAD2				205	33					
CCUAD2	1	325	3	205	33					
CCUAD2				205	33					
CCUAD2	1	326	3	205	33					
CCUAD2				205	33					
CCUAD2	1	327	3	205	33					
CCUAD2				205	33					
CCUAD2	1	328	3	205	33					
CCUAD2				205	33					

P.26/58

36 FT ELEVATION STRUCTURE
STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

I N P U T		B U L K		D A T A		D E C K		E C H O	
1	2	3	4	5	6	7	8	9	10
CTRIA2	329	10	213	38	52				
CTRIA2	330	10	213	52	66				
CTRIA2	331	10	213	66	221				
CTRIA2	332	10	221	66	80				
CTRIA2	333	10	221	80	94				
CTRIA2	334	10	221	94	229				
CTRIA2	335	10	229	94	108				
CTRIA2	336	10	229	108	122				
CTRIA2	337	10	229	122	237				
CTRIA2	338	10	237	122	136				
CTRIA2	339	10	237	136	150				
CTRIA2	340	10	237	150	245				
CTRIA2	341	10	245	150	164				
FORCE	1	10	0	8.5900.0		-1.0	0.0		
FORCE	1	11	0	8.4390.0		-1.0	0.0		
FORCE	1	12	0	9.5140.0		-1.0	0.0		
FORCE	1	13	0	82.5410.0		-1.0	0.0		
FORCE	1	14	0	10.0280.0		-1.0	0.0		
FORCE	1	15	0	10.8350.0		-1.0	0.0		
FORCE	1	16	0	7.5900.0		-1.0	0.0		
FORCE	1	17	0	3.3730.0		-1.0	0.0		
FORCE	1	18	0	2.3430.0		-1.0	0.0		
FORCE	1	19	0	2.3500.0		-1.0	0.0		
FORCE	1	20	0	9.6750.0		-1.0	0.0		
FORCE	1	21	0	2.0320.0		-1.0	0.0		
FORCE	1	22	0	2.0330.0		-1.0	0.0		
FORCE	1	23	0	2.9920.0		-1.0	0.0		
FORCE	1	24	0	47.0770.0		-1.0	0.0		
FORCE	1	25	0	22.3440.0		-1.0	0.0		
FORCE	1	26	0	22.6360.0		-1.0	0.0		
FORCE	1	27	0	25.9930.0		-1.0	0.0		
FORCE	1	28	0	36.9470.0		-1.0	0.0		
FORCE	1	29	0	21.4090.0		-1.0	0.0		
FORCE	1	30	0	14.8320.0		-1.0	0.0		
FORCE	1	31	0	57.1280.0		-1.0	0.0		
FORCE	1	32	0	16.8390.0		-1.0	0.0		
FORCE	1	33	0	14.9970.0		-1.0	0.0		
FORCE	1	34	0	23.1960.0		-1.0	0.0		
FORCE	1	35	0	10.4220.0		-1.0	0.0		
FORCE	1	36	0	9.5660.0		-1.0	0.0		
FORCE	1	37	0	10.8420.0		-1.0	0.0		
FORCE	1	38	0	17.3950.0		-1.0	0.0		
FORCE	1	39	0	14.5340.0		-1.0	0.0		
FORCE	1	40	0	16.6750.0		-1.0	0.0		
FORCE	1	41	0	21.9230.0		-1.0	0.0		
FORCE	1	42	0	17.9930.0		-1.0	0.0		
FORCE	1	43	0	19.5960.0		-1.0	0.0		
FORCE	1	44	0	14.1410.0		-1.0	0.0		
FORCE	1	45	0	21.8650.0		-1.0	0.0		
FORCE	1	46	0	2.3430.0		-1.0	0.0		

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P. 27/58

1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..
FORCE 1		47	0	2.3500.0		-1.0	0.0		
FORCE 1		48	0	6.6430.0		-1.0	0.0		
FORCE 1		49	0	2.0270.0		-1.0	0.0		
FORCE 1		50	0	2.0330.0		-1.0	0.0		
FORCE 1		51	0	4.9600.0		-1.0	0.0		
FORCE 1		52	0	24.7600.0		-1.0	0.0		
FORCE 1		53	0	22.3480.0		-1.0	0.0		
FORCE 1		54	0	22.6400.0		-1.0	0.0		
FORCE 1		55	0	25.9920.0		-1.0	0.0		
FORCE 1		56	0	20.6590.0		-1.0	0.0		
FORCE 1		57	0	21.3990.0		-1.0	0.0		
FORCE 1		58	0	14.8270.0		-1.0	0.0		
FORCE 1		59	0	35.3360.0		-1.0	0.0		
FORCE 1		60	0	19.0710.0		-1.0	0.0		
FORCE 1		61	0	17.2290.0		-1.0	0.0		
FORCE 1		62	0	27.3620.0		-1.0	0.0		
FORCE 1		63	0	12.3350.0		-1.0	0.0		
FORCE 1		64	0	11.4790.0		-1.0	0.0		
FORCE 1		65	0	12.5760.0		-1.0	0.0		
FORCE 1		66	0	16.0070.0		-1.0	0.0		
FORCE 1		67	0	14.5360.0		-1.0	0.0		
FORCE 1		68	0	16.6770.0		-1.0	0.0		
FORCE 1		69	0	21.9260.0		-1.0	0.0		
FORCE 1		70	0	17.9960.0		-1.0	0.0		
FORCE 1		71	0	19.5990.0		-1.0	0.0		
FORCE 1		72	0	14.1430.0		-1.0	0.0		
FORCE 1		73	0	5.5850.0		-1.0	0.0		
FORCE 1		74	0	2.3430.0		-1.0	0.0		
FORCE 1		75	0	2.3500.0		-1.0	0.0		
FORCE 1		76	0	6.6440.0		-1.0	0.0		
FORCE 1		77	0	2.0270.0		-1.0	0.0		
FORCE 1		78	0	2.0330.0		-1.0	0.0		
FORCE 1		79	0	4.9610.0		-1.0	0.0		
FORCE 1		80	0	20.7550.0		-1.0	0.0		
FORCE 1		81	0	22.3430.0		-1.0	0.0		
FORCE 1		82	0	22.6400.0		-1.0	0.0		
FORCE 1		83	0	25.9920.0		-1.0	0.0		
FORCE 1		84	0	20.6590.0		-1.0	0.0		
FORCE 1		85	0	21.4000.0		-1.0	0.0		
FORCE 1		86	0	14.8270.0		-1.0	0.0		
FORCE 1		87	0	38.6500.0		-1.0	0.0		
FORCE 1		88	0	23.5290.0		-1.0	0.0		
FORCE 1		89	0	21.6870.0		-1.0	0.0		
FORCE 1		90	0	31.5030.0		-1.0	0.0		
FORCE 1		91	0	16.1580.0		-1.0	0.0		
FORCE 1		92	0	15.3020.0		-1.0	0.0		
FORCE 1		93	0	14.4830.0		-1.0	0.0		
FORCE 1		94	0	14.7140.0		-1.0	0.0		
FORCE 1		95	0	14.5370.0		-1.0	0.0		
FORCE 1		96	0	16.6790.0		-1.0	0.0		

P. 28/58

36 FT ELEVATION STRUCTURE
STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

1	2	3	4	5	6	7	8	9	10
FORCE	1	97	0	21.9280.0	-1.0	0.0			
FORCE	1	98	0	17.9970.0	-1.0	0.0			
FORCE	1	99	0	19.6000.0	-1.0	0.0			
FORCE	1	100	0	14.1430.0	-1.0	0.0			
FORCE	1	101	0	21.4730.0	-1.0	0.0			
FORCE	1	102	0	2.3430.0	-1.0	0.0			
FORCE	1	103	0	2.3510.0	-1.0	0.0			
FORCE	1	104	0	6.6450.0	-1.0	0.0			
FORCE	1	105	0	2.0270.0	-1.0	0.0			
FORCE	1	106	0	2.0330.0	-1.0	0.0			
FORCE	1	107	0	4.9010.0	-1.0	0.0			
FORCE	1	108	0	20.7550.0	-1.0	0.0			
FORCE	1	109	0	22.3480.0	-1.0	0.0			
FORCE	1	110	0	22.6390.0	-1.0	0.0			
FORCE	1	111	0	25.9920.0	-1.0	0.0			
FORCE	1	112	0	20.6590.0	-1.0	0.0			
FORCE	1	113	0	21.4000.0	-1.0	0.0			
FORCE	1	114	0	14.8270.0	-1.0	0.0			
FORCE	1	115	0	42.7610.0	-1.0	0.0			
FORCE	1	116	0	23.5290.0	-1.0	0.0			
FORCE	1	117	0	21.6870.0	-1.0	0.0			
FORCE	1	118	0	31.5030.0	-1.0	0.0			
FORCE	1	119	0	16.1590.0	-1.0	0.0			
FORCE	1	120	0	15.3020.0	-1.0	0.0			
FORCE	1	121	0	14.4830.0	-1.0	0.0			
FORCE	1	122	0	14.7140.0	-1.0	0.0			
FORCE	1	123	0	14.5350.0	-1.0	0.0			
FORCE	1	124	0	16.6770.0	-1.0	0.0			
FORCE	1	125	0	21.9260.0	-1.0	0.0			
FORCE	1	126	0	17.9950.0	-1.0	0.0			
FORCE	1	127	0	19.5990.0	-1.0	0.0			
FORCE	1	128	0	14.1430.0	-1.0	0.0			
FORCE	1	129	0	21.4730.0	-1.0	0.0			
FORCE	1	130	0	2.3430.0	-1.0	0.0			
FORCE	1	131	0	2.3500.0	-1.0	0.0			
FORCE	1	132	0	6.6440.0	-1.0	0.0			
FORCE	1	133	0	2.0270.0	-1.0	0.0			
FORCE	1	134	0	2.0330.0	-1.0	0.0			
FORCE	1	135	0	4.9010.0	-1.0	0.0			
FORCE	1	136	0	234.3040.0	-1.0	0.0			
FORCE	1	137	0	22.3430.0	-1.0	0.0			
FORCE	1	138	0	22.6400.0	-1.0	0.0			
FORCE	1	139	0	25.9930.0	-1.0	0.0			
FORCE	1	140	0	20.6590.0	-1.0	0.0			
FORCE	1	141	0	21.3990.0	-1.0	0.0			
FORCE	1	142	0	14.8270.0	-1.0	0.0			
FORCE	1	143	0	78.3450.0	-1.0	0.0			
FORCE	1	144	0	19.0710.0	-1.0	0.0			
FORCE	1	145	0	17.2290.0	-1.0	0.0			
FORCE	1	146	0	27.3020.0	-1.0	0.0			

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P.29/58

1	2	3	4	5	6	7	8	9	10
FORCE	1	147	0	51.0290.0	-1.0	0.0	0.0		
FORCE	1	148	0	11.4790.0	-1.0	0.0	0.0		
FORCE	1	149	0	12.5760.0	-1.0	0.0	0.0		
FORCE	1	150	0	14.7110.0	-1.0	0.0	0.0		
FORCE	1	151	0	14.5330.0	-1.0	0.0	0.0		
FORCE	1	152	0	16.6740.0	-1.0	0.0	0.0		
FORCE	1	153	0	21.9230.0	-1.0	0.0	0.0		
FORCE	1	154	0	17.9940.0	-1.0	0.0	0.0		
FORCE	1	155	0	19.5970.0	-1.0	0.0	0.0		
FORCE	1	156	0	14.1410.0	-1.0	0.0	0.0		
FORCE	1	157	0	21.4670.0	-1.0	0.0	0.0		
FORCE	1	158	0	2.3430.0	-1.0	0.0	0.0		
FORCE	1	159	0	2.3510.0	-1.0	0.0	0.0		
FORCE	1	160	0	6.6440.0	-1.0	0.0	0.0		
FORCE	1	161	0	2.0280.0	-1.0	0.0	0.0		
FORCE	1	162	0	2.0330.0	-1.0	0.0	0.0		
FORCE	1	163	0	4.9600.0	-1.0	0.0	0.0		
FORCE	1	164	0	21.1310.0	-1.0	0.0	0.0		
FORCE	1	165	0	22.3370.0	-1.0	0.0	0.0		
FORCE	1	166	0	22.6310.0	-1.0	0.0	0.0		
FORCE	1	167	0	25.9870.0	-1.0	0.0	0.0		
FORCE	1	168	0	20.6590.0	-1.0	0.0	0.0		
FORCE	1	169	0	21.4030.0	-1.0	0.0	0.0		
FORCE	1	170	0	14.8270.0	-1.0	0.0	0.0		
FORCE	1	171	0	30.9870.0	-1.0	0.0	0.0		
FORCE	1	172	0	16.8340.0	-1.0	0.0	0.0		
FORCE	1	173	0	14.9930.0	-1.0	0.0	0.0		
FORCE	1	174	0	23.1950.0	-1.0	0.0	0.0		
FORCE	1	175	0	10.4260.0	-1.0	0.0	0.0		
FORCE	1	176	0	9.5670.0	-1.0	0.0	0.0		
FORCE	1	177	0	10.8430.0	-1.0	0.0	0.0		
FORCE	1	178	0	7.4960.0	-1.0	0.0	0.0		
FORCE	1	179	0	9.4390.0	-1.0	0.0	0.0		
FORCE	1	180	0	9.5130.0	-1.0	0.0	0.0		
FORCE	1	181	0	110.40+0.0	-1.0	0.0	0.0		
FORCE	1	182	0	10.0130.0	-1.0	0.0	0.0		
FORCE	1	183	0	10.8180.0	-1.0	0.0	0.0		
FORCE	1	184	0	7.5810.0	-1.0	0.0	0.0		
FORCE	1	185	0	3.3730.0	-1.0	0.0	0.0		
FORCE	1	186	0	2.3430.0	-1.0	0.0	0.0		
FORCE	1	187	0	2.3560.0	-1.0	0.0	0.0		
FORCE	1	188	0	4.4160.0	-1.0	0.0	0.0		
FORCE	1	189	0	2.0270.0	-1.0	0.0	0.0		
FORCE	1	190	0	2.0330.0	-1.0	0.0	0.0		
FORCE	1	191	0	2.9670.0	-1.0	0.0	0.0		
FORCE	1	192	0	81.2820.0	-1.0	0.0	0.0		
FORCE	1	193	0	0.7830.0	-1.0	0.0	0.0		
FORCE	1	194	0	1.4550.0	-1.0	0.0	0.0		
FORCE	1	195	0	5.9760.0	-1.0	0.0	0.0		
FORCE	1	196	0	4.4130.0	-1.0	0.0	0.0		

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P.30/58

1 ..	2 ..	3 ..	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..
FORCE	1	197	0	151.8940.0	-1.0	0.0			
FORCE	1	200	0	139.6770.0	-1.0	0.0			
FORCE	1	202	0	10.4150.0	-1.0	0.0			
FORCE	1	203	0	12.7390.0	-1.0	0.0			
FORCE	1	204	0	28.5010.0	-1.0	0.0			
FORCE	1	205	0	24.5030.0	-1.0	0.0			
FORCE	1	206	0	11.7910.0	-1.0	0.0			
FORCE	1	207	0	12.0160.0	-1.0	0.0			
FORCE	1	208	0	31.1820.0	-1.0	0.0			
FORCE	1	209	0	17.3570.0	-1.0	0.0			
FORCE	1	210	0	12.3560.0	-1.0	0.0			
FORCE	1	211	0	15.8520.0	-1.0	0.0			
FORCE	1	212	0	63.1970.0	-1.0	0.0			
FORCE	1	213	0	26.7910.0	-1.0	0.0			
FORCE	1	214	0	14.0680.0	-1.0	0.0			
FORCE	1	215	0	14.3470.0	-1.0	0.0			
FORCE	1	216	0	82.0190.0	-1.0	0.0			
FORCE	1	217	0	17.5650.0	-1.0	0.0			
FORCE	1	218	0	14.6920.0	-1.0	0.0			
FORCE	1	219	0	19.0920.0	-1.0	0.0			
FORCE	1	220	0	24.1160.0	-1.0	0.0			
FORCE	1	221	0	47.0140.0	-1.0	0.0			
FORCE	1	222	0	19.7300.0	-1.0	0.0			
FORCE	1	223	0	29.2770.0	-1.0	0.0			
FORCE	1	224	0	20.8240.0	-1.0	0.0			
FORCE	1	225	0	68.5750.0	-1.0	0.0			
FORCE	1	226	0	15.0230.0	-1.0	0.0			
FORCE	1	227	0	19.7030.0	-1.0	0.0			
FORCE	1	228	0	24.7590.0	-1.0	0.0			
FORCE	1	229	0	34.5140.0	-1.0	0.0			
FORCE	1	230	0	19.7300.0	-1.0	0.0			
FORCE	1	231	0	29.2770.0	-1.0	0.0			
FORCE	1	232	0	20.8240.0	-1.0	0.0			
FORCE	1	233	0	52.3880.0	-1.0	0.0			
FORCE	1	234	0	15.0230.0	-1.0	0.0			
FORCE	1	235	0	19.7030.0	-1.0	0.0			
FORCE	1	236	0	24.7590.0	-1.0	0.0			
FORCE	1	237	0	34.5140.0	-1.0	0.0			
FORCE	1	238	0	16.5330.0	-1.0	0.0			
FORCE	1	239	0	17.0800.0	-1.0	0.0			
FORCE	1	240	0	17.6270.0	-1.0	0.0			
FORCE	1	241	0	49.9070.0	-1.0	0.0			
FORCE	1	242	0	13.8020.0	-1.0	0.0			
FORCE	1	243	0	17.4430.0	-1.0	0.0			
FORCE	1	244	0	21.3770.0	-1.0	0.0			
FORCE	1	245	0	28.1610.0	-1.0	0.0			
FORCE	1	246	0	14.9340.0	-1.0	0.0			
FORCE	1	247	0	15.4820.0	-1.0	0.0			
FORCE	1	248	0	16.0290.0	-1.0	0.0			
FORCE	1	249	0	33.8020.0	-1.0	0.0			

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P.31/58

I N P U T		B U L K		D A T A		D E C K		E C H O	
1	2	3	4	5	6	7	8	9	10
FORCE	1	250	0	1.2210.0	-1.0	0.0	0.0		
FORCE	1	251	0	2.2540.0	-1.0	0.0	0.0		
FORCE	1	252	0	3.3810.0	-1.0	0.0	0.0		
FORCE	1	253	0	6.3840.0	-1.0	0.0	0.0		
FORCE	1	257	0	3.0750.0	-1.0	0.0	0.0		
FORCE	1	258	0	0.7770.0	-1.0	0.0	0.0		
FORCE	1	259	0	0.7770.0	-1.0	0.0	0.0		
FORCE	1	260	0	2.0930.0	-1.0	0.0	0.0		
FORCE	1	261	0	2.0930.0	-1.0	0.0	0.0		
FORCE	1	262	0	2.9730.0	-1.0	0.0	0.0		
FORCE	1	263	0	2.9730.0	-1.0	0.0	0.0		
FORCE	1	266	0	238.2710.0	-1.0	0.0	0.0		
FORCE	1	267	0	1309.7800.0	-1.0	0.0	0.0		
FORCE	1	268	0	1426.6940.0	-1.0	0.0	0.0		
FORCE	1	269	0	1212.7230.0	-1.0	0.0	0.0		
FORCE	1	270	0	1743.9130.0	-1.0	0.0	0.0		
FORCE	1	271	0	100.2500.0	-1.0	0.0	0.0		
FORCE	1	272	0	601.4440.0	-1.0	0.0	0.0		
FORCE	1	273	0	197.4300.0	-1.0	0.0	0.0		
FORCE	1	274	0	127.4900.0	-1.0	0.0	0.0		
FORCE	1	275	0	395.4650.0	-1.0	0.0	0.0		
FORCE	1	276	0	36.7530.0	-1.0	0.0	0.0		
FORCE	1	277	0	67.5930.0	-1.0	0.0	0.0		
FORCE	1	278	0	64.3930.0	-1.0	0.0	0.0		
FORCE	1	279	0	78.4330.0	-1.0	0.0	0.0		
FORCE	1	280	0	86.6820.0	-1.0	0.0	0.0		
FORCE	1	281	0	75.3570.0	-1.0	0.0	0.0		
FORCE	1	282	0	63.9630.0	-1.0	0.0	0.0		
FORCE	1	283	0	52.4150.0	-1.0	0.0	0.0		
GRID	10		98.136	55.279	0.0				
GRID	11		118.953	59.175	0.0				
GRID	12		139.769	63.071	0.0				
GRID	13		160.586	66.967	0.0				
GRID	14		178.476	71.803	0.0				
GRID	15		196.366	76.640	0.0				
GRID	16		214.256	81.476	0.0				
GRID	17		93.136	49.173	0.0				
GRID	18		118.953	53.050	0.0				
GRID	19		139.769	56.927	0.0				
GRID	20		160.586	60.804	0.0				
GRID	21		178.476	65.621	0.0				
GRID	22		196.366	70.439	0.0				
GRID	23		214.256	75.256	0.0				
GRID	24		98.136	55.402	-12.922				
GRID	25		118.953	59.367	-15.663				
GRID	26		139.769	63.332	-18.404				
GRID	27		160.586	67.293	-21.145				
GRID	28		178.429	72.219	-23.495				
GRID	29		196.272	77.141	-25.844				
GRID	30		214.115	82.003	-28.194				

P.32/58

INPUT BULK DATA DECK ECHO

GRID	1	2	3	4	5	6	7	8	9	10
GRID 31	98.136	24.313	-12.922							
GRID 32	118.953	33.051	-15.663							
GRID 33	139.769	41.790	-18.404							
GRID 34	160.586	50.529	-21.145							
GRID 35	178.429	58.040	-23.495							
GRID 36	196.272	65.551	-25.844							
GRID 37	214.115	73.063	-28.194							
GRID 38	94.792	55.279	-25.399							
GRID 39	114.899	59.175	-30.787							
GRID 40	135.007	63.071	-36.175							
GRID 41	155.114	66.967	-41.563							
GRID 42	172.349	71.803	-46.181							
GRID 43	189.584	76.640	-50.799							
GRID 44	206.819	81.476	-55.417							
GRID 45	94.792	49.173	-25.399							
GRID 46	114.899	53.050	-30.787							
GRID 47	135.007	56.927	-36.175							
GRID 48	155.114	60.804	-41.563							
GRID 49	172.349	65.621	-46.181							
GRID 50	189.584	70.439	-50.799							
GRID 51	206.819	75.256	-55.417							
GRID 52	91.464	55.402	-37.886							
GRID 53	110.866	59.367	-45.922							
GRID 54	130.267	63.332	-53.958							
GRID 55	149.569	67.298	-61.995							
GRID 56	166.299	72.219	-68.883							
GRID 57	182.928	77.141	-75.771							
GRID 58	199.558	82.063	-82.660							
GRID 59	91.464	24.313	-37.886							
GRID 60	110.866	33.051	-45.922							
GRID 61	130.267	41.790	-53.958							
GRID 62	149.669	50.529	-61.995							
GRID 63	166.299	58.040	-68.883							
GRID 64	182.928	65.551	-75.771							
GRID 65	199.558	73.063	-82.660							
GRID 66	84.983	55.279	-49.068							
GRID 67	103.016	59.175	-59.476							
GRID 68	121.044	63.071	-69.885							
GRID 69	139.072	66.967	-80.293							
GRID 70	154.524	71.803	-89.215							
GRID 71	169.977	76.640	-98.136							
GRID 72	185.429	81.476	-107.058							
GRID 73	84.988	49.173	-49.068							
GRID 74	103.016	53.050	-59.476							
GRID 75	121.044	56.927	-69.885							
GRID 76	139.072	60.804	-80.293							
GRID 77	154.524	65.621	-89.215							
GRID 78	169.977	70.439	-98.136							
GRID 79	185.429	75.256	-107.058							
GRID 80	78.542	55.402	-60.267							

1K D.L. 2K TEMP 5 F

INPUT BULK DATA DECK ECHO

1	2	3	4	5	6	7	8	9	10
GRID	81	95.202	59.367	-73.051					
GRID	82	111.863	63.332	-85.835					
GRID	83	128.523	67.298	-98.619					
GRID	84	142.803	72.219	-109.577					
GRID	85	157.084	77.141	-120.535					
GRID	86	171.364	82.063	-131.493					
GRID	87	78.542	24.313	-60.267					
GRID	88	95.202	33.051	-73.051					
GRID	89	111.863	41.790	-85.835					
GRID	90	128.523	50.529	-98.619					
GRID	91	142.803	58.040	-109.577					
GRID	92	157.084	65.551	-120.535					
GRID	93	171.364	73.063	-131.493					
GRID	94	69.393	55.279	-69.393					
GRID	95	84.112	59.175	-84.112					
GRID	96	98.832	63.071	-98.832					
GRID	97	113.552	66.967	-113.552					
GRID	98	126.169	71.803	-126.169					
GRID	99	138.785	76.640	-138.785					
GRID	100	151.402	81.476	-151.402					
GRID	101	69.393	49.173	-69.393					
GRID	102	84.112	53.049	-84.112					
GRID	103	98.832	56.925	-98.832					
GRID	104	113.552	60.801	-113.552					
GRID	105	126.169	65.619	-126.169					
GRID	106	138.785	70.433	-138.785					
GRID	107	151.402	75.256	-151.402					
GRID	108	60.267	55.402	-78.542					
GRID	109	73.051	59.367	-95.202					
GRID	110	85.834	63.332	-111.863					
GRID	111	98.617	67.298	-128.523					
GRID	112	109.576	72.219	-142.803					
GRID	113	120.534	77.141	-157.084					
GRID	114	131.493	82.063	-171.364					
GRID	115	60.267	24.313	-78.542					
GRID	116	73.051	33.051	-95.202					
GRID	117	85.834	41.790	-111.863					
GRID	118	98.617	50.529	-128.523					
GRID	119	109.576	58.040	-142.803					
GRID	120	120.534	65.551	-157.084					
GRID	121	131.493	73.063	-171.364					
GRID	122	49.068	55.279	-84.988					
GRID	123	59.476	59.175	-103.016					
GRID	124	69.885	63.071	-121.044					
GRID	125	80.293	66.967	-139.072					
GRID	126	89.215	71.803	-154.524					
GRID	127	98.136	76.640	-169.977					
GRID	128	107.058	81.476	-185.429					
GRID	129	49.068	49.173	-84.988					
GRID	130	59.476	53.050	-103.016					

P. 33/58

1K D.L. 2K TEMP 5 F

12.34/58

INPUT BULK DATA DECK ECHO

1	2	3	4	5	6	7	8	9	10
GRID	131		69.885	56.927	-121.044				
GRID	132		80.293	60.804	-139.072				
GRID	133		89.215	65.621	-154.524				
GRID	134		98.136	70.439	-169.977				
GRID	135		107.058	75.256	-185.429				
GRID	136		37.886	55.403	-91.464				
GRID	137		45.922	59.368	-110.866				
GRID	138		53.958	63.333	-130.267				
GRID	139		61.995	67.298	-149.669				
GRID	140		68.883	72.219	-166.299				
GRID	141		75.771	77.141	-182.928				
GRID	142		82.660	82.063	-199.558				
GRID	143		37.886	24.313	-91.464				
GRID	144		45.922	33.051	-110.866				
GRID	145		53.958	41.790	-130.267				
GRID	146		61.995	50.529	-149.669				
GRID	147		68.883	58.040	-166.299				
GRID	148		75.771	65.551	-182.928				
GRID	149		82.660	73.063	-199.558				
GRID	150		25.399	55.279	-94.792				
GRID	151		30.787	59.175	-114.899				
GRID	152		36.175	63.071	-135.007				
GRID	153		41.563	66.967	-155.114				
GRID	154		46.181	71.803	-172.349				
GRID	155		50.799	76.640	-189.584				
GRID	156		55.417	81.476	-206.819				
GRID	157		25.399	49.173	-94.792				
GRID	158		30.787	53.040	-114.899				
GRID	159		36.175	56.925	-135.007				
GRID	160		41.563	60.801	-155.114				
GRID	161		46.181	65.619	-172.349				
GRID	162		50.799	70.438	-189.584				
GRID	163		55.417	75.256	-206.819				
GRID	164		12.922	55.402	-98.136				
GRID	165		15.663	59.367	-118.947				
GRID	166		18.404	63.332	-139.757				
GRID	167		21.145	67.293	-160.568				
GRID	168		23.495	72.219	-178.417				
GRID	169		25.844	77.141	-196.266				
GRID	170		28.194	82.063	-214.115				
GRID	171		12.922	24.313	-98.136				
GRID	172		15.663	33.051	-118.947				
GRID	173		18.404	41.790	-139.757				
GRID	174		21.145	50.529	-160.568				
GRID	175		23.495	58.040	-178.417				
GRID	176		25.844	65.551	-196.266				
GRID	177		28.194	73.063	-214.115				
GRID	178		0.0	55.279	-94.792				
GRID	179		0.0	59.175	-114.899				
GRID	180		0.0	63.071	-135.007				

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1K D.L. 2K TEMP 5 F

P.35/58

	1	2	3	4	5	6	7	8	9	10
GRID 181	0.0	0.0	0.0	0.0	66.967	-160.586				
GRID 182	0.0	0.0	0.0	0.0	71.803	-178.429				
GRID 183	0.0	0.0	0.0	0.0	76.640	-196.272				
GRID 184	0.0	0.0	0.0	0.0	81.476	-214.115				
GRID 185	0.0	0.0	0.0	0.0	49.173	-98.136				
GRID 186	0.0	0.0	0.0	0.0	53.050	-118.953				
GRID 187	0.0	0.0	0.0	0.0	56.927	-139.769				
GRID 188	0.0	0.0	0.0	0.0	60.804	-160.586				
GRID 189	0.0	0.0	0.0	0.0	65.621	-178.429				
GRID 190	0.0	0.0	0.0	0.0	70.439	-196.272				
GRID 191	0.0	0.0	0.0	0.0	75.256	-214.115				
GRID 192	0.0	0.0	0.0	0.0	48.313	0.0				
GRID 193	17.333	49.003	0.0	0.0	49.003	0.0				
GRID 194	34.667	49.693	0.0	0.0	49.693	0.0				
GRID 195	52.000	50.383	0.0	0.0	50.383	0.0				
GRID 196	75.068	52.831	0.0	0.0	52.831	0.0				
GRID 197	0.0	24.313	0.0	0.0	24.313	0.0				
GRID 200	52.000	24.313	0.0	0.0	24.313	0.0				
GRID 202	17.333	49.015	-2.282	0.0	49.015	-2.282				
GRID 203	34.667	49.717	-4.564	0.0	49.717	-4.564				
GRID 204	52.000	50.419	-6.846	0.0	50.419	-6.846				
GRID 205	75.068	52.911	-9.884	0.0	52.911	-9.884				
GRID 206	17.333	24.313	-2.282	0.0	24.313	-2.282				
GRID 207	34.667	24.313	-4.564	0.0	24.313	-4.564				
GRID 208	52.000	24.313	-6.846	0.0	24.313	-6.846				
GRID 209	75.068	24.313	-9.884	0.0	24.313	-9.884				
GRID 210	17.333	49.121	-7.180	0.0	49.121	-7.180				
GRID 211	34.667	49.930	-14.359	0.0	49.930	-14.359				
GRID 212	52.000	50.738	-21.539	0.0	50.738	-21.539				
GRID 213	71.732	53.070	-29.712	0.0	53.070	-29.712				
GRID 214	17.333	24.313	-7.180	0.0	24.313	-7.180				
GRID 215	34.667	24.313	-14.359	0.0	24.313	-14.359				
GRID 216	52.000	24.313	-21.539	0.0	24.313	-21.539				
GRID 217	71.732	24.313	-29.712	0.0	24.313	-29.712				
GRID 218	17.255	49.681	-13.241	0.0	49.681	-13.241				
GRID 219	34.511	51.050	-26.431	0.0	51.050	-26.431				
GRID 220	51.766	52.419	-39.722	0.0	52.419	-39.722				
GRID 221	69.022	53.788	-52.962	0.0	53.788	-52.962				
GRID 222	17.255	24.313	-13.241	0.0	24.313	-13.241				
GRID 223	34.511	24.313	-26.481	0.0	24.313	-26.481				
GRID 224	51.766	24.313	-39.722	0.0	24.313	-39.722				
GRID 225	69.022	24.313	-52.962	0.0	24.313	-52.962				
GRID 226	13.241	49.681	-17.255	0.0	49.681	-17.255				
GRID 227	26.481	51.050	-34.511	0.0	51.050	-34.511				
GRID 228	39.722	52.419	-51.766	0.0	52.419	-51.766				
GRID 229	52.962	53.788	-69.022	0.0	53.788	-69.022				
GRID 230	13.241	24.313	-17.255	0.0	24.313	-17.255				
GRID 231	26.481	24.313	-34.511	0.0	24.313	-34.511				
GRID 232	39.722	24.313	-51.766	0.0	24.313	-51.766				
GRID 233	52.962	24.313	-69.022	0.0	24.313	-69.022				

1< D.L. 2< TEMP 5 F

P.36/58

	1	2	3	4	5	6	7	8	9	10
GRID	234	8.323	49.681	-20.094						
GRID	235	16.647	51.050	-40.189						
GRID	236	24.970	52.419	-60.283						
GRID	237	33.293	53.788	-80.377						
GRID	238	8.323	24.313	-20.094						
GRID	239	16.647	24.313	-40.189						
GRID	240	24.970	24.313	-60.283						
GRID	241	33.293	24.313	-80.377						
GRID	242	2.839	49.681	-21.564						
GRID	243	5.678	51.050	-43.128						
GRID	244	8.517	52.419	-64.692						
GRID	245	11.356	53.788	-86.256						
GRID	246	2.839	24.313	-21.564						
GRID	247	5.678	24.313	-43.128						
GRID	248	8.517	24.313	-64.692						
GRID	249	11.356	24.313	-86.256						
GRID	250	0.0	49.681	-21.560						
GRID	251	0.0	51.050	-43.120						
GRID	252	0.0	52.419	-64.681						
GRID	253	0.0	53.788	-86.241						
GRID	257	0.0	24.313	-86.241						
GRID	258	214.256	72.476	0.0						
GRID	259	0.0	72.476	-214.115						
GRID	260	160.586	50.2467	0.0						
GRID	261	0.0	50.2467	-160.586						
GRID	262	98.136	24.3125	0.0						
GRID	263	0.0	24.3125	-98.136						
GRID	266	0.0	0.0	0.0						
GRID	267	0.0	-45.2	0.0						
GRID	268	0.0	-90.0	0.0						
GRID	269	0.0	-45.2	-36.0						
GRID	270	0.0	-81.2	-36.0						
GRID	271	0.0	-34.0	-60.0						
GRID	272	0.0	-45.2	-78.0						
GRID	273	0.0	-7.0	-81.6						
GRID	274	0.0	-12.0	-87.20						
GRID	275	52.0	0.0	0.0						
GRID	276	0.0	393.9125	0.0						
GRID	277	0.0	406.4125	0.0						
GRID	278	0.0	406.4125	-21.0						
GRID	279	14.5	406.4125	0.0						
GRID	280	0.0	338.5234	-49.2						
GRID	281	0.0	270.6343	-77.4						
GRID	282	0.0	202.7452	-105.1						
GRID	283	0.0	134.8561	-133.8						
MAT1	1	10.0E66	3.75E6		2.73E-4	13.0-6	0.0			
MAT1	100	29.0E66	11.5E66		7.324-4	6.70-6	0.0			
PARAM	IKRES	1								
PBAR	1	100	7.069	311.1	311.1	622.2				
PBAR	2	100	12.75	476.93	105.25	2.396				

AC

36 FT ELEVATION STRUCTURE
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

P.37/58

		INPUT BULK DATA DECK ECHO									
1	2	3	4	5	6	7	8	9	10		
PBAR	1	100	3.75	5.86	9.45	.3125					
PBAR	4	100	13.02	237.5	237.5	475.					
PBAR	5	100	4.5	8.95	16.6	.375					
PBAR	6	100	22.	85.62	357.33	6.46					
PBAR	7	100	9.0	17.89	33.2	0.75					
PEAR	8	100	13.9	42.08	49.	2.672					
PEAR	9	100	4.92	11.97	12.1	.6141					
PBAR	10	100	10.	30.79	30.79	3.165					
PBAR	11	100	3.75	16.134	5.55	.3125					
PBAR	12	100	20.	200.	200.	50.					
PEAR	13	1	3.636	14.085	8.472	31.847					
PEAR	14	1	5.661	76.74	17.95	.625					
PUAR	15	1	7.237	162.92	35.31	.792					
PEAR	16	1	8.819	298.74	61.54	.960					
PBAR	17	1	10.401	495.23	98.43	1.129					
PBAR	18	1	11.983	763.7	147.80	1.296					
PUAR	19	1	20.	739.9	739.9	1479.9					
PBAR	20	1	5.04	235.0	235.0	370.					
PUAR	21	1	7.069	311.1	311.1	622.2					
PBAR	30	1	9.0	108.	42.2	2.53					
PBAR	31	1	1.46	0.849	0.849	0.048					
PHAR	32	1	9.0	11.05	8.50	2.25					
PBAR	33	1	6.0	32.0	11.02	1.69					
PBAR	34	1	2.25	6.75	1.21	0.158					
PBAR	35	1	3.0	9.0	1.65	0.303					
PHAR	36	1	4.5	13.5	4.22	0.896					
PBAR	37	1	3.0	16.0	11.71	0.211					
PBAR	38	1	4.0	21.33	7.61	0.404					
PHAR	39	1	6.0	32.0	9.05	1.195					
PRAR	40	1	15.0	236.	.236.	5.0					
PBAR	41	1	0.5625	0.035	0.844	0.140					
PBAR	42	1	2.02	.047	39.0	0.189					
PBAR	43	1	4.704	.0110	430.	0.441					
PQUAD2	1	1	0.375								
PQUAD2	2	1	0.750								
PQUAD2	3	100	0.50								
PTRIAZ	10	1	0.375								
PTRIAZ	20	1	0.75								
PTRIAZ	30	100	0.50								
SEGGP		101.3.1.2		521.3.1.3		1121.3.1.4		1131.3.1.5			
SEGGP		111.2.2.7		601.2.2.8		391.2.2.9		741.2.3.1			
SEGGP		201.2.4.9		1071.2.5.1		1001.2.5.2		1041.2.5.3			
SEGGP		211.1.8.7		411.1.8.8		151.1.9.6		141.1.9.7			
SEGGP		261.2.1.3		271.2.1.4		891.2.1.5		181.2.2.6			
SEGGP		341.1.9.8		681.1.9.9		191.2.1.1		821.2.1.2			
SEGGP		381.2.9.7		811.2.9.8		241.2.9.9		1111.3.1.1			
SEGGP		421.1.8.3		351.1.8.4		831.1.8.5		431.1.8.6			
SEGGP		481.1.4.5		371.1.4.6		551.1.4.7		231.1.4.8			
SEGGP		511.1.2.3		501.1.3.4		571.1.3.5		581.1.3.9			
SEGGP		531.2.4.5		121.2.4.6		671.2.4.7		321.2.4.8			

P. 38/58

1K D.L. 2< TEMP 5 F

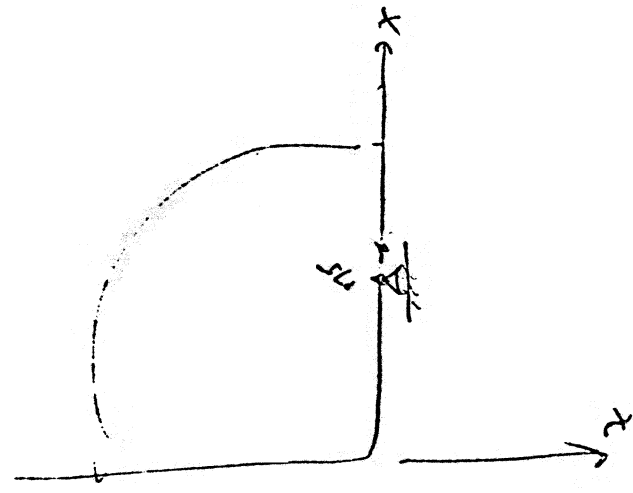
INPUT BULK DATA DECK ECHO

	1	2	3	4	5	6	7	8	9	10
SEGGP	541.1.6.3			721.1.6.4		921.1.6.9			861.1.7.1	
SEGGP	611.1.5.4			751.1.5.5		621.1.5.6			651.1.5.7	
SEGGP	631.1.1.1			641.1.1.2		711.1.1.3			771.1.1.4	
SEGGP	661.3.3.3			801.3.3.4		2621.3.3.5			1211.3.4.3	
SEGGP	701.1.4.1			221.1.4.2		301.1.4.3			161.1.4.4	
SEGGP	781.1.1.5			561.1.1.6		491.1.2.1			441.1.2.2	
SEGGP	791.1.5.8			761.1.5.9		401.1.6.1			331.1.6.2	
SEGGP	841.1.7.2			851.1.7.3		361.1.7.4			291.1.7.5	
SEJUP	901.2.3.2			461.2.3.3		251.2.3.4			931.2.4.4	
SEGGP	941.3.8.9			2051.3.9.1		2091.3.9.2			1301.3.9.3	
SEGGP	971.2.7.3			131.2.7.4		281.2.7.5			731.2.7.6	
SEGGP	981.2.5.4			991.2.5.5		881.2.5.6			171.2.5.7	
SEGGP	1021.3.4.4			1191.3.4.5		1161.3.4.6			1201.3.4.7	
SEGGP	1061.2.8.2			451.2.8.3		591.2.9.5			951.2.9.6	
SEGGP	1141.3.1.6			311.3.2.9		1171.3.3.1			1181.3.3.2	
SEGGP	1151.4.2.7			1451.4.2.8		1491.4.2.9			1471.4.3.1	
SEGGP	1221.4.6.9			2201.4.7.1		2111.4.7.2			2031.4.7.3	
SEGGP	1251.3.4.8			1261.3.6.4		871.3.5.1			1321.3.6.6	
SEGGP	1341.3.8.1			1351.3.8.2		2171.3.8.3			2131.3.8.4	
SEGGP	1391.3.9.4			1401.4.1.9		1411.4.2.1			1421.4.2.2	
SEGGP	1431.4.3.2			1381.4.3.3		1591.4.3.4			2081.4.3.5	
SEGGP	1501.8.6.9			1361.8.7.1		2221.8.7.2			2141.8.7.3	
SEGGP	1511.8.4.7			1741.8.4.8		1581.8.5.2			1941.8.5.3	
SEGGP	1521.9.8.5			1531.5.8.6		2281.8.4.1			1441.8.4.2	
SEGGP	1551.8.4.3			1631.8.4.4		2321.8.4.5			1431.8.4.6	
SEGGP	1642.1.1.1			1732.1.1.2		2352.1.1.3			1752.1.1.4	
SEGGP	1681.9.5.3			1651.9.5.4		1721.9.5.5			2311.9.5.6	
SEGGP	1701.8.6.5			1691.8.6.6		2001.8.6.7			2101.8.6.8	
SEGGP	1792.1.5.8			2632.1.5.9		2392.1.6.1			2432.1.6.2	
SEGGP	1852.1.6.3			1852.1.6.4		1872.1.6.9			1892.1.7.1	
SEGGP	1912.1.4.1			1832.1.4.2		2302.1.4.3			1822.1.4.4	
SEGGP	1922.1.4.5			2452.1.4.6		2752.1.4.7			1972.1.4.8	
SEGGP	1951.4.4.1			1611.4.4.2		2151.4.4.3			2771.4.4.8	
SEGGP	1961.3.8.5			1081.3.8.6		1011.3.8.7			1241.3.8.8	
SEGGP	2041.4.3.6			1231.4.3.7		1371.4.3.8			2241.4.3.9	
SEGGP	2061.8.8.9			2371.8.9.1		1931.8.9.2			2181.8.9.3	
SEGGP	2071.8.5.4			1771.8.5.5		2761.8.6.3			2231.8.6.4	
SEGGP	2191.4.7.4			1601.4.7.5		2331.4.7.6			1561.4.7.7	
SEGGP	2211.4.2.3			2251.4.2.4		2161.4.2.5			1461.4.2.6	
SEGGP	2261.9.4.8			2411.9.4.9		1661.9.5.1			2361.9.5.2	
SEGGP	2291.4.7.8			1291.4.7.9		1541.5.8.3			1621.5.8.4	
SEGGP	2492.1.5.4			2342.1.5.5		2402.1.5.6			1782.1.5.7	
SEGGP	2502.1.9.8			2512.1.9.9		2522.2.1.1				
SEGGP	2532.1.7.2			1902.1.7.3		2422.1.7.4				
SEGGP	2572.2.2.7			2662.2.2.8						
SEGGP	2581.1.4.9			471.1.5.1		691.1.5.2			911.1.5.3	
SEGGP	2592.1.2.3			1762.1.3.4		1882.1.3.5			1842.1.3.9	
SEGGP	2601.2.7.7			1031.2.7.6		961.2.7.9			1051.2.8.1	
SEGGP	2612.1.1.5			1812.1.1.6		1572.1.2.1			1712.1.2.2	

TUC
 STATIC ANALYSIS FORCE IN Y DIRECTION

1< D.L. 2< TEMP 5 F

	1	2	3	4	5	6	7	8	9	10
SEGGP	1	2	3	4	5	6	7	8	9	10
SEGGP		2662.2.1.3		2682.2.1.4		2702.2.3.4		2722.2.4.4		
SEGGP		2672.2.3.2		2692.2.3.3		2472.1.9.6		2482.1.9.7		
SEGGP		2712.1.8.7		2462.1.8.8		1802.1.5.2		2442.1.5.3		
SEGGP		2732.1.4.9		2802.1.5.1						
SEGGP		2742.1.8.3		2382.1.8.4						
SEGGP		2781.3.7.4		1671.8.8.6		2271.8.8.7		2021.8.8.8		
SEGGP		2791.3.6.7		1331.3.6.8		1091.3.6.9		2121.3.7.1		
SEGGP		2822.2.4.5		2832.2.4.6						
SPC1	1	4	130	131	133	134				
SPC1	1	4	158	159	161	162				
SPC1	1	6	46	47	49	50				
SPC1	1	6	74	75	77	78				
SPC1	1	6	102	103	105	106				
SPC1	1	156	178	THRU	185					
SPC1	1	156	188	191						
SPC1	1	156	250	251	252	253	257			
SPC1	1	156	269	THRU	274					
SPC1	1	156	278	THRU	283					
SPC1	1	345	10	THRU	17					
SPC1	1	345	20	23						
SPC1	1	345	193	THRU	196					
SPC1	1	345	200	279						
SPC1	1	1456	186	187	189	190				
SPC1	1	3456	18	19	21	22				
SPC1	1	13456	192	197	276	277				
SPC1	1	13456	266	267	268					
SPC1	1	123456	275							
TEMPD	11	5.0								
ENDDATA										



P.39/58

TOTAL CCOUNT# 1079

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 00 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.011977

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00483

SUM-UNIT AREA*1/2 LAMBDA = 4.3445

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.010904

NEW FOCAL LENGTH = 345.5000

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00076

SUM-UNIT AREA*1/2 LAMBDA = 0.6797

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE
36 FT ELEVATION STR --- 10 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.011466

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00399

SUM-UNIT AREA*1/2 LAMBDA = 3.5901

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.010710

NEW FOCAL LENGTH = 345.5173

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00062

SUM-UNIT AREA*1/2 LAMBDA = 0.5617

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 20 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NC. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.010709

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00318

SUM-UNIT AREA*1/2 LAMBDA = 2.8585

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.010201

NEW FOCAL LENGTH = 345.5342

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00050

SUM-UNIT AREA*1/2 LAMBDA = 0.4472

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 30 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.009709

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00241

SUM-UNIT AREA*1/2 LAMBDA = 2.1722

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.009388

NEW FOCAL LENGTH = 345.5500

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00038

SUM-UNIT AREA*1/2 LAMBDA = 0.3399

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 40 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.008482

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00172

SUM-UNIT AREA*1/2 LAMBDA = 1.5519

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.008296

NEW FOCAL LENGTH = 345.5642

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00027

SUM-UNIT AREA*1/2 LAMBDA = 0.2427

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

P.45/58

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 50 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.007051

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00113

SUM-UNIT AREA*1/2 LAMBDA = 1.0164

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.006956

NEW FOCAL LENGTH = 345.5767

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00018

SUM-UNIT AREA*1/2 LAMBDA = 0.1590

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 60 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.005448

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00065

SUM-UNIT AREA*1/2 LAMBDA = 0.5821

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.005408

NEW FOCAL LENGTH = 345.5867

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00010

SUM-UNIT AREA*1/2 LAMBDA = 0.0911

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 70 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.003710

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00029

SUM-UNIT AREA*1/2 LAMBDA = 0.2620

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.003698

NEW FOCAL LENGTH = 345.5938

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00005

SUM-UNIT AREA*1/2 LAMBDA = 0.0410

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 80 WRT 90 --- 11111

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Z COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001878

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00007

SUM-UNIT AREA*1/2 LAMBDA = 0.0660

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001877

NEW FOCAL LENGTH = 345.5984

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00001

SUM-UNIT AREA*1/2 LAMBDA = 0.0103

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.0

Z COORDINATE OF VERTEX = 0.0

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

P.49/58

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 00 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.002252

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00006

SUM-UNIT AREA*1/2 LAMBDA = 0.0496

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00498

Z COORDINATE OF VERTEX = 0.05595

ROTATION ABOUT X AXIS = -0.0000303

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001249

NEW FOCAL LENGTH = 345.5361

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00233

Z COORDINATE OF VERTEX = 0.05595

ROTATION ABOUT X AXIS = -0.0000303

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

P.50/58

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 10 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001954

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00005

SUM-UNIT AREA*1/2 LAMBDA = 0.0410

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00411

Z COORDINATE OF VERTEX = 0.05561

ROTATION ABOUT X AXIS = -0.0000291

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001192

NEW FOCAL LENGTH = 345.5474

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00192

Z COORDINATE OF VERTEX = 0.05561

ROTATION ABOUT X AXIS = -0.0000291

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

P.51/53

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 20 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001660

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00004

SUM-UNIT AREA*1/2 LAMBDA = 0.0327

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00327

Z COORDINATE OF VERTEX = 0.05259

ROTATION ABOUT X AXIS = -0.0000284

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001111

NEW FOCAL LENGTH = 345.5579

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00153

Z COORDINATE OF VERTEX = 0.05259

ROTATION ABOUT X AXIS = -0.0000284

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 30 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001374

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00003

SUM-UNIT AREA*1/2 LAMBDA = 0.0247

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00249

Z COORDINATE OF VERTEX = 0.04964

ROTATION ABOUT X AXIS = -0.0000245

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001006

NEW FOCAL LENGTH = 345.5681

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0001

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00116

Z COORDINATE OF VERTEX = 0.04964

ROTATION ABOUT X AXIS = -0.0000245

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 40 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.001103

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00002

SUM-UNIT AREA*1/2 LAMBDA = 0.0177

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00178

Z COORDINATE OF VERTEX = 0.04425

ROTATION ABOUT X AXIS = -0.0000212

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000877

NEW FOCAL LENGTH = 345.5774

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0001

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00083

Z COORDINATE OF VERTEX = 0.04425

ROTATION ABOUT X AXIS = -0.0000212

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 50 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000850

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00001

SUM-UNIT AREA*1/2 LAMBDA = 0.0116

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00116

Z COORDINATE OF VERTEX = 0.03674

ROTATION ABOUT X AXIS = -0.0000184

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000728

NEW FOCAL LENGTH = 345.5850

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00054

Z COORDINATE OF VERTEX = 0.03674

ROTATION ABOUT X AXIS = -0.0000184

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 60 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000616

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00001

SUM-UNIT AREA*1/2 LAMBDA = 0.0066

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00067

Z COORDINATE OF VERTEX = 0.02031

ROTATION ABOUT X AXIS = -0.0000259

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000562

NEW FOCAL LENGTH = 345.5916

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00031

Z COORDINATE OF VERTEX = 0.02031

ROTATION ABOUT X AXIS = -0.0000259

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 70 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000399

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00000

SUM-UNIT AREA*1/2 LAMBDA = 0.0030

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00030

Z COORDINATE OF VERTEX = 0.01348

ROTATION ABOUT X AXIS = -0.0000183

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA.WEIGHTED BY AREAS = 0.000383

NEW FOCAL LENGTH = 345.5962

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00014

Z COORDINATE OF VERTEX = 0.01348

ROTATION ABOUT X AXIS = -0.0000183

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

P.57/58

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 80 WRT 90 --- 01010

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS CF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000196

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00000

SUM-UNIT AREA*1/2 LAMBDA = 0.0008

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00008

Z COORDINATE OF VERTEX = 0.00655

ROTATION ABOUT X AXIS = -0.0000097

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS CF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000194

NEW FOCAL LENGTH = 345.5991

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00000

SUM-UNIT AREA*1/2 LAMBDA = -0.0000

SUM-UNIT AREAS = 450.0000

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00004

Z COORDINATE OF VERTEX = 0.00655

ROTATION ABOUT X AXIS = -0.0000097

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIANS

BEST FIT PARABOLOID WITH MINIMUM PATH LENGTH IN LEAST SQUARES SENSE

36 FT ELEVATION STR --- 5-DEG F TEMP INCREASE (ZENITH PTD)

ORIGINAL FOCAL LENGTH = 345.5999 NO. POINTS IN ANALYSIS = 450

INPUT DISTORTIONS OBTAINED ANALYTICALLY - OPTION 1

ASSIGNED OFF-SET OF VERTEX X COORDINATE = 0.0

ASSIGNED OFF-SET OF VERTEX Y COORDINATE = 0.0

ASSIGNED ROTATION ABOUT X-AXIS = 0.0

ASSIGNED ROTATION ABOUT Y-AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO RIGID BODY MOTION

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.002007

DEVIATION OF THE MEAN - 1/2 LAMBDA = -0.00005

SUM-UNIT AREA*1/2 LAMBDA = -0.0463

SUM-UNIT AREAS = 450.0000

Z COORDINATE OF VERTEX = 0.0

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = -0.00083

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

MINIMIZATION OF RMS WITH RESPECT TO FOCAL LENGTH CHANGE

RMS OF 1/2 LAMBDA WEIGHTED BY AREAS = 0.000984

NEW FOCAL LENGTH = 345.6592

DEVIATION OF THE MEAN - 1/2 LAMBDA = 0.00000

SUM-UNIT AREA*1/2 LAMBDA = 0.0000

SUM-UNIT AREAS = 450.0000

Z COORDINATE OF VERTEX = 0.0

X COORDINATE OF VERTEX = 0.0

Y COORDINATE OF VERTEX = 0.00165

ROTATION ABOUT X AXIS = 0.0

ROTATION ABOUT Y AXIS = 0.0

ALL LENGTH UNITS ARE CONSISTENT WITH INPUT

ROTATION UNITS ARE RADIAN

REFLECTIVITY