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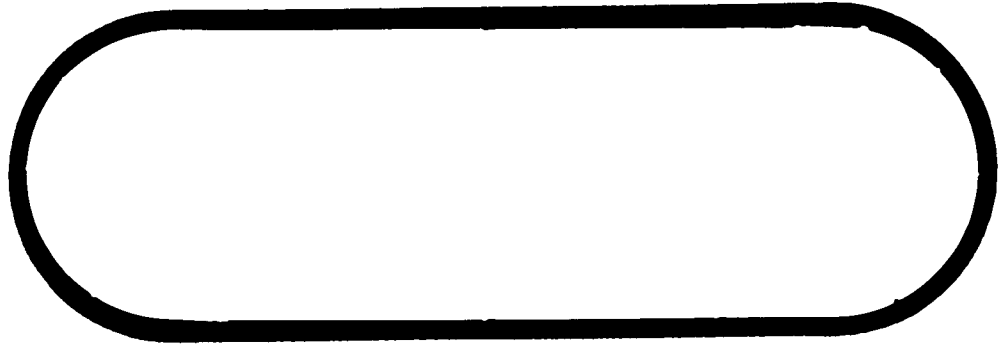
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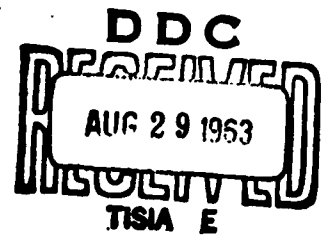
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414501

BOEING



414501



SEATTLE, WASHINGTON

THE **BOEING** COMPANY

CODE IDENT NO. 81205

NUMBER D2-14787-2

TITLE Flight Test Missile Estimated Mass Data (F-180) -
Boeing Components

MODEL NO. XSM-80 CONTRACT NO. AFO4(647)-289

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SECT. _____ PAGE 1

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SECT.

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INTRODUCTION

Subsequent to the release of D2-14787-1, STL verbally directed the discontinuance of future Estimated (F-180) reports. Official BSD contractual change notification has not followed, although STL still confirms this direction. (Telecon: D. S. Askins - STL/C. O. Bailey - Boeing, 24 July 1963.) In compliance with the still existing AF O4(647)-289 contractual requirement this report has been prepared and submitted.

This document has been prepared to serve as a mass data summary of the Boeing Responsibility Hardware in the Minuteman Flight Test Program. It provides the pertinent Estimated (F-180) weight, balance and inertia data, as released officially by the Boeing Minuteman Weight Group.

Volume I presented mass data for Flight Test Missiles 437 thru 442. This document (Volume II) presents mass data for Flight Test Missiles 443 thru 445 and Flight Test Missiles 446 thru 448.

FTM 448 represents the final flight test missile in the -289 contract. Therefore this document will be the final release of the Estimated (F-180) reports.

1. FIM 443 THRU FIM 445

A review of the projected FIM 443-445 Estimated (P-180) weight data determined that only minor changes will occur over the released FIM 437-442 data (Ref: D2-14787-1). Therefore all data pertinent to FIM 443-445 are referenced to D2-14787-1.

• S Explosive Chamber.
 •• To be determined.
 N.A.- Not Applicable.

2.2 SECTIONAL DATA SUMMARY BOEING RESPONSIBILITY

3.2 SECTIONAL DATA SUMMARY BOEING RESPONSIBILITY												
LN	SC	DESCRIPTION	DATA	EXPENDED WEIGHT LB	TOTAL WEIGHT LB	LONG	CENTER OF GRAVITY LAT	VERY	Inertia SLUG FT ² IN ²			
									ROLL	PITCH		
01	41	RV SPACER	SIL0									
02			AERO									
03	42	C+C SECTION	SIL0		2.52	238.96	100.00	100.00	0	0		
04			AERO									
07	43	R+O SECTION	SIL0	1.40	393.05	248.24	99.84	100.06	.015	.010		
08			AERO	1.06		249.35	99.09	100.25	0	0		
09			AERO		81.13	291.00	89.40	116.80	0	0		
10	44	3RD STAGE ENGINE	SIL0	.70		307.86	97.46	112.89	.002	.010		
11			AERO	2.27		290.00	102.26	118.58	0	0		
12			BASE	3.72		293.19	108.11	119.14	0	0		
13			BASE			326.10	95.16	109.30	0	0		
14	45	INTERSTAGE 2-3 FWD	SIL0	2.25	182.63	330.82	99.31	103.04	.017	.010		
15			AERO	5.72		331.51	99.62	95.89	0	0		
16			BASE	5.27		331.44	99.49	97.92	0	0		
17			SIL0			331.75		99.86	0	0		
18			AERO									
19	JETTISONED PORTION		BASE									
20			JETT									
21	45	INTERSTAGE 2-3 AFT	SIL0	1.86	116.81	350.31	99.39	104.57	.015	.008		
22			AERO	4.75		351.19	99.81	94.02	0	0		
23			AERO		80.12	351.24	99.91	92.27	.001	0		
24	46	2ND STAGE ENGINE	SIL0	1.60		425.71	98.77	119.34	.003	.028		
25			AERO	1.92		410.17	102.80	124.03	0	0		
26			BASE	1.98		427.87	105.51	123.99	0	0		
27			BASE			480.51	91.47	105.92	0	0		
28	47	INTERSTAGE 1-2 FWD	SIL0	4.45	377.50	489.29	100.53	103.73	.067	.045		
29			AERO	6.41		488.21	99.43	101.88	.001	0		
30			BASE	4.78		488.86	101.11	102.83	.001	.001		
31			SIL0			494.88	101.95	106.13	.001	0		
32			AERO									
33	JETTISONED PORTION		BASE									
34			JETT									
35			JETT									
36	47	INTERSTAGE 1-2 AFT	SIL0	1.65	116.92	517.53	99.15	100.23	.026	.013		
37			AERO	1.43		518.31	99.95	101.57	0	0		
38			AERO		129.56	519.65	98.88	115.34	0	0		
39	48	1ST STAGE ENGINE	SIL0	6.36		666.94	98.59	122.83	.010	.162		
40			AERO	2.73		670.23	100.75	125.02	0	.008		
41			BASE	5.33		628.42	100.53	129.71	0	.003		
42			BASE			788.06	100.60	101.07	0	0		
43			BASE		306.92	766.95	100.45	102.45	.071	.043		
44	49	SKIRT	SIL0	17.11		767.00	100.00	100.15	.004	.002		
45			AERO	2.99		767.10	100.00	99.30	.001	0		
46			BASE	39.33		767.95	100.39	100.58	.009	.005		
47			BASE		1787.16	461.97	99.72	104.95	.243	13.1		
48	MISSILE		SIL0	37.38		615.87	100.15	105.46	.006	.257		
49			AERO	29.28		450.93	100.63	106.07	.003	.141		
50			BASE	60.41		673.43	99.84	101.71	.010	.375		
51			JETT									
52			JETT									

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3 BORING HEIGHT RESPONSIBILITY
MISSILE BW 44G-448
DATE 7-24-63

2.3.1 Section 42
C
UNEXPENDED

D
EXPENDED
C + D
TOTAL

LM FUNCTIONAL LISTING

01 RACEMAYS R
02 COVERS + CAPS R
03 HEAT PROTECTION R
04 SILO R
05 AERO R
06 COVERS + CAPS O
07 HEAT PROTECTION O
08 SILO O
09 AERO O
10 O

11 INSTRUMENTATION
12 EQUIPMENT + WIRE
13 BASE HEAT PROTECTION
14 EQUIP + WIRE - JETT.
15 BASE HEAT PRO.-JETT.
16 SILO HEAT PROTECTION
17 DESTROY PROVISION

18
19 G+C INSTALLATION
20 CABLE PROV + INSTL PRO
21 BASE HEAT PROTECTION
22 SILO HEAT PROTECTION

23 STRUCTURE
24 UNJETTISONED
25 SEPARATION MECH.
26 HEAT PROTECTION
27 SILO EXTERNAL
28 AERO
29 BASE
30 SILO INTERNAL

31 JETTISONED
32 SEPAR. MECH.- STAGE
33 SEPAR. MECH.- PEEL
34 HEAT PROTECTION
35 SILO
36 AERO
37 BASE

38 ACCELEROMETER SUPPORT
39
40
41 HEAT DEFLECTOR INSTL.
42 DEFLECTOR + STNUC.
43 BASE HEAT PROTECTION
44 SILO HEAT PROTECTION
45 MISCELLANEOUS

46
47 CONTINGENCY
48
49 UNACCOMMODATED

90
91 COLUMN TOTAL SECT 42
92
93 SECTION TOTAL

WT M CG L CG V CG WT M CG L CG V CG

1.02 238.90 100.00 100.00 1.02 238.90 100.00 100.00

1.50 239.00 100.00 100.00 1.50 239.00 100.00 100.00

2.52 238.96 100.00 100.00 2.52 238.96 100.00 100.00

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.2 Section 43
MISSILE BY ALC-448
DATE 7-24-63

LN	FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				E + F TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS												
02	COVERS + CAPS												
03	HEAT PROTECTION	1.92	250.53	89.61	116.58					1.92	250.53	89.61	116.58
04	SILLO												
05	AERO												
06	COVERS + CAPS												
07	HEAT PROTECTION	2.10	250.76	89.47	116.64	.12	251.00	89.40	116.80	.12	251.00	89.40	116.80
08	SILLO					1.06	251.00	89.40	116.80	3.16	250.84	89.44	116.69
09	AERO												
10													
11	INSTRUMENTATION												
12	EQUIPMENT + WIRE												
13	BASE HEAT PROTECTION	303.33	247.93	99.12	100.04					303.33	247.93	99.12	100.04
14	EQUIP + WIRE - JETT.												
15	BASE HEAT PRO.-JETT.												
16	SILLO HEAT PROTECTION												
17	DESTRUCT PROVISION												
18		28.48	250.72	108.96	98.36					28.48	250.72	108.96	98.36
19	G-C INSTALLATION												
20	CABLE PROV + INSTL PRO												
21	BASE HEAT PROTECTION	.61	247.50	108.00	111.40					.61	247.50	108.00	111.40
22	SILLO HEAT PROTECTION												
23	STRUCTURE												
24	UNJETTISONED	38.03	248.05	99.86	99.82					38.03	248.05	99.86	99.82
25	SEPARATION MECH.												
26	HEAT PROTECTION												
27	SILLO EXTERNAL												
28	AERO												
29	BASE												
30	SILLO INTERNAL												
31	JETTISONED												
32	SEPAR. MECH.- STAGE												
33	SEPAR. MECH.- PEEL												
34	HEAT PROTECTION												
35	SILLO												
36	AERO												
37	BASE												
38													
39	ACCELEROMETER SUPPORT												
40													
41	HEAT DEFLECTOR INSTL.												
42	DEFLECTOR + STRUC.												
43	BASE HEAT PROTECTION												
44	SILLO HEAT PROTECTION												
45	MISCELLANEOUS												
46													
47	CONTINGENCY												
48													
49	UNACCOUNTED												
50													
51	COLUMN TOTAL SECT 43	390.59	248.22	99.87	100.02	2.46	250.06	94.92	107.38	393.05	248.24	94.84	100.06
52													
53	SECTION TOTAL												

**6 • H
TOTAL**

[illegible]

2.3 BOEING WEIGHT RESPONSIBILITY		2.3.4 Section 45 Fwd		J		K		J + K	
MISSILE BW 446-448		UNEXPENDED		EXPENDED		TOTAL			
DATE 7-24-63									
LN	FUNCTIONAL LISTING	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS	0.21	332.24	88.14	119.99	0.21	332.24	88.14	119.99
02	COVERS + CAPS								
03	HEAT PROTECTION								
04	SILLO	2.40	331.39	88.48	119.91	.20	330.55	88.07	120.61
05	AERO	3.32	331.07	110.95	118.89	.74	330.55	88.08	120.59
06	COVERS + CAPS								
07	HEAT PROTECTION								
08	SILLO	1.35	331.67	111.13	119.28	.13	331.00	111.30	119.60
09	AERO					.51	331.00	111.30	119.60
10	INSTRUMENTATION								
11	EQUIPMENT + WIRE	12.08	334.83	86.04	117.04	.04	337.60	85.70	114.10
12	BASE HEAT PROTECTION	.37	337.60	85.70	114.10				
13	EQUIP + WIRE - JETT.								
14	BASE HEAT PRO.-JETT.								
15	SILLO HEAT PROTECTION								
16	DESTRUCT PROVISION								
17									
18	G+C INSTALLATION								
19	CABLE PROV + INSTL PRO	4.17	340.40	112.00	112.10	.05	340.40	112.00	112.10
20	BASE HEAT PROTECTION	.52	340.40	112.00	112.10				
21	SILLO HEAT PROTECTION								
22	STRUCTURE	84.82	328.54	100.88	100.83	84.82	328.54	100.88	100.83
23	UNJETTISONED	9.47	341.03	99.04	100.06	9.47	341.03	99.04	100.06
24	SEPARATION MECH.								
25	HEAT PROTECTION								
26	SILLO EXTERNAL	7.74	331.63	100.03	92.23	1.92	331.64	100.03	91.70
27	AERO	34.94	329.94	100.16	99.91	4.47	331.64	100.03	91.70
28	BASE					5.18	331.62	99.48	99.63
29	SILLO INTERNAL								
30	JETTISONED								
31	SEPAR. MECH.- STAGE								
32	SEPAR. MECH.- PEEL								
33	HEAT PROTECTION								
34	SILLO								
35	AERO								
36	BASE								
37	ACCELEROMETER SUPPORT								
38	HEAT DEFLECTOR INSTL.								
39	DEFLECTOR + STRUC.								
40	BASE HEAT PROTECTION								
41	SILLO HEAT PROTECTION								
42	MISCELLANEOUS								
43	CONTINGENCY								
44	UNACCOUNTED								
45	COLUMN TOTAL SECT 45 FWD	169.39	330.76	99.29	103.40	13.24	331.58	99.51	98.35
46	SECTION TOTAL					182.63	330.82	99.31	103.04

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.5 Section 45 Aft
MISSILE BW 446448
DATE 7-25-63

LM	FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				L + M TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS												
02	COVERS + CAPS	4.53	349.01	86.66	120.82	4.53	349.01	86.66	120.82				
03	HEAT PROTECTION												
04	SILO					.13	350.14	86.62	123.23	.13	350.14	86.62	123.23
05	AERO	.98	350.46	87.11	122.37	.19	350.14	86.62	123.22	1.17	350.41	87.03	122.51
06	COVERS + CAPS	3.02	350.88	113.17	122.73	3.02	350.88	113.17	122.73				
07	HEAT PROTECTION												
08	SILO					.10	350.80	113.37	123.17	.10	350.80	113.37	123.17
09	AERO	1.49	350.80	113.11	122.72	.15	350.80	113.33	123.09	1.64	350.80	113.13	122.75
10	INSTRUMENTATION												
11	EQUIPMENT + WIRE												
12	BASE HEAT PROTECTION	12.46	344.59	91.72	118.76	12.46	344.59	91.72	118.76				
13	EQUIP + WIRE - JETT.												
14	BASE HEAT PRO.-JETT.												
15	SILO HEAT PROTECTION												
16	DESTRUCT PROVISION												
17	G+C INSTALLATION												
18	CABLE PROV + INSTL PRO	.02	347.40	109.60	121.50	.02	347.40	109.60	121.50				
19	BASE HEAT PROTECTION												
20	SILO HEAT PROTECTION												
21	STRUCTURE												
22	UNJETTISONED	52.74	352.87	101.98	102.12	52.74	352.87	101.98	102.12				
23	SEPARATION MECH.	12.56	344.73	96.57	93.62	12.56	344.73	96.57	93.62				
24	HEAT PROTECTION												
25	SILO EXTERNAL					1.63	351.30	100.03	89.90	1.63	351.30	100.03	89.90
26	AERO	8.15	351.34	100.03	90.36	4.41	351.30	100.03	89.89	12.56	351.32	100.03	90.20
27	BASE												
28	SILO INTERNAL												
29	JETTISONED												
30	SEPAR. MECH.- STAGE												
31	SEPAR. MECH.- PEEL												
32	HEAT PROTECTION												
33	SILO												
34	AERO												
35	BASE												
36	ACCELEROMETER SUPPORT												
37	HEAT DEFLECTOR INSTL.	14.25	350.00	98.90	112.27	14.25	350.00	98.90	112.27				
38	DEFLECTOR + STRUC.												
39	BASE HEAT PROTECTION												
40	SILO HEAT PROTECTION												
41	MISCELLANEOUS												
42	CONTINGENCY												
43	UNACCOUNTED												
44	COLUMN TOTAL SECT 45 AFT	110.20	350.26	99.36	105.27	6.61	351.22	99.88	92.76	116.81	350.31	99.39	104.57
45	SECTION TOTAL SECT 45	279.59	338.44	99.32	104.14	19.85	338.12	99.64	96.49	299.44	338.42	99.34	103.63

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.6 Section 46
MISSILE BW 446-448
DATE 7-24-63

LN	FUNCTIONAL LISTING	M				P				M + P			
		UNEXPENDED				EXPENDED				TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS												
02	COVERS + CAPS	10.33	410.47	86.77	122.85					10.33	410.47	86.77	122.85
03	HEAT PROTECTION												
04	SIL0												
05	AERO	4.22	408.72	86.42	123.48	.60	408.71	85.60	124.90		408.71	85.60	124.90
06	COVERS + CAPS	15.48	413.10	112.79	122.17	.50	409.21	85.60	124.90		408.77	86.33	123.63
07	HEAT PROTECTION									15.48	413.10	112.79	122.17
08	SIL0												
09	AERO	5.12	401.35	113.11	123.14	1.00	411.04	113.12	123.51	1.00	411.04	113.12	123.51
10	INSTRUMENTATION					1.42	434.44	112.53	123.67	6.54	408.54	112.98	123.26
11	EQUIPMENT + WIRE												
12	BASE HEAT PROTECTION	22.77	437.31	90.24	118.22					22.77	437.31	90.24	118.22
13	EQUIP + WIRE - JETT.	6.77	479.17	90.94	107.77	1.86	480.33	90.10	105.22	8.63	479.42	90.76	107.22
14	BASE HEAT PRO.-JETT.												
15	SIL0 HEAT PROTECTION												
16	DESTRUCT PROVISION	7.02	384.74	112.21	120.43					7.02	384.74	112.21	120.43
17													
18	G+C INSTALLATION												
19	CABLE PROV + INSTL PRO	1.34	473.66	110.64	117.21					1.34	473.66	110.64	117.21
20	BASE HEAT PROTECTION	1.34	480.79	111.65	117.00					1.46	480.99	111.73	116.98
21	SIL0 HEAT PROTECTION												
22	STRUCTURE												
23	UNJETTISONED												
24	SEPARATION MECH.												
25	HEAT PROTECTION												
26	SIL0 EXTERNAL												
27	AERO												
28	BASE												
29	SIL0 INTERNAL												
30	JETTISONED												
31	SEPAR. MECH.- STAGE												
32	SEPAR. MECH.- PEEL												
33	HEAT PROTECTION												
34	SIL0												
35	AERO												
36	BASE												
37	ACCELEROMETER SUPPORT												
38	HEAT DEFLECTOR INSTL.												
39	DEFLECTOR + STRUC.												
40	BASE HEAT PROTECTION												
41	SIL0 HEAT PROTECTION												
42	MISCELLANEOUS												
43	CONTINGENCY												
44	UNACCOUNTED												
45	COLUMN TOTAL SECT 46	74.62	424.53	98.70	119.48	5.50	441.67	99.67	117.50	80.12	425.71	98.77	119.34
46	SECTION TOTAL												
47													
48													
49													
50													
51													
52													
53													

2.3.7 ROEING WEIGHT RESPONSIBILITY
MISSILE BW 446-148
DATE 7-24-65

2.3.7 Section 47 Fwd

FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				Q + R TOTAL			
	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01 RACEWAYS												
02 COVERS + CAPS	1.46	466.34	85.97	124.31					1.46	466.34	85.97	124.31
03 MEAT PROTECTION												
04 SILO												
05 AERO	.82	467.47	86.10	124.15	.29	467.50	85.80	124.70	.29	467.50	85.80	124.70
06 COVERS + CAPS	6.00	487.43	114.99	126.00	.16	467.50	85.80	124.70	.98	467.47	86.06	124.24
07 MEAT PROTECTION									6.00	487.43	114.99	126.00
08 SILO												
09 AERO	2.04	487.94	115.16	126.26	.28	486.30	115.30	126.50	.28	486.30	115.30	126.50
10 INSTRUMENTATION					.86	486.30	115.30	126.50	2.90	487.45	115.20	126.33
11 EQUIPMENT + WIRE												
12 BASE MEAT PROTECTION	16.52	491.28	95.43	121.05					16.52	491.28	95.43	121.05
13 EQUIP + WIRE - JETT.	10.98	487.73	96.68	117.75	.76	499.31	90.66	120.59	11.74	488.48	96.29	117.93
14 BASE MEAT PROTECTION												
15 SILO MEAT PROTECTION												
16 DESTRUCT PROVISION												
17												
18												
19 G+C INSTALLATION												
20 CABLE PROV + INSTL PRO	4.29	505.65	123.55	117.27					4.29	505.65	123.55	117.27
21 BASE MEAT PROTECTION	2.46	506.20	123.70	117.20	.64	506.20	123.70	117.20	3.10	506.20	123.70	117.20
22 SILO MEAT PROTECTION												
23 STRUCTURE												
24 UNJETTISONED	237.98	488.09	99.93	100.67					237.98	488.09	99.93	100.67
25 SEPARATION MECH.	14.58	509.91	103.85	112.59					14.58	509.91	103.85	112.59
26 MEAT PROTECTION												
27 SILO EXTERNAL												
28 AERO	14.50	489.12	99.33	98.46	3.88	489.90	99.30	98.40	3.88	489.90	99.30	98.40
29 BASE	50.23	487.40	100.37	102.16	5.39	489.90	99.30	98.40	19.89	489.33	99.32	98.44
30 SILO INTERNAL					3.38	491.74	100.37	100.78	53.61	487.67	100.37	102.07
31 JETTISONED												
32 SEPAR. MECH.- STAGE												
33 SEPAR. MECH.- PEEL												
34 MEAT PROTECTION												
35 SILO												
36 AERO												
37 BASE												
38 ACCELEROMETER SUPPORT												
39												
40												
41 MEAT DEFLECTOR INSTL.												
42 DEFLECTOR + STRUC.												
43 BASE MEAT PROTECTION												
44 SILO MEAT PROTECTION												
45 MISCELLANEOUS												
46												
47 CONTINGENCY												
48												
49 UNACCOUNTED												
50												
51 COLUMN TOTAL SECT 47 FWD	361.86	489.23	100.51	103.74	15.64	490.51	100.89	103.57	377.50	489.29	100.53	103.73
52												
53 SECTION TOTAL												

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.8 Section 47 Aft
MISSILE BN 446-448
DATE 7-24-63

LN	FUNCTIONAL LISTING	EXPENDED				UNEXPENDED				S + T TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS												
02	COVERS + CAPS												
03	HEAT PROTECTION												
04	SILO												
05	AERO												
06	COVERS + CAPS												
07	HEAT PROTECTION												
08	SILO												
09	AERO												
10													
11	INSTRUMENTATION												
12	EQUIPMENT + WIRE												
13	BASE HEAT PROTECTION												
14	EQUIP + WIRE - JETT.												
15	BASE HEAT PRO.-JETT.												
16	SILO HEAT PROTECTION												
17	DESTRUCT PROVISION												
18													
19	G+C INSTALLATION												
20	CABLE PROV + INSTL PRO												
21	BASE HEAT PROTECTION												
22	SILO HEAT PROTECTION												
23	STRUCTURE												
24	UNJETTISONED												
25	SEPARATION MECH.												
26	HEAT PROTECTION												
27	SILO EXTERNAL												
28	AERO												
29	BASE												
30	SILO INTERNAL												
31	JETTISONED												
32	SEPAR. MECH.- STAGE												
33	SEPAR. MECH.- PEEL												
34	HEAT PROTECTION												
35	SILO												
36	AERO												
37	BASE												
38													
39	ACCELEROMETER SUPPORT												
40													
41	HEAT DEFLECTOR INSTL.												
42	DEFLECTOR + STRUC.												
43	BASE HEAT PROTECTION												
44	SILO HEAT PROTECTION												
45	MISCELLANEOUS												
46													
47	CONTINGENCY												
48													
49	UNACCOUNTED												
50													
51	COLUMN TOTAL SECT 47 AFT	113.84	517.49	99.17	100.02	3.08	518.93	98.52	107.96	116.92	517.53	99.15	100.23
52													
53	SECTION TOTAL SECT 47	475.70	496.00	100.19	102.85	18.72	495.19	100.50	104.29	494.42	495.97	100.20	102.90

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.9 Section 48

MISSILE BW 446-448
DATE 7-24-63

LN	FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				U + V TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS	23.35	637.12	83.00	129.32					23.35	637.12	83.00	129.32
02	COVERS + CAPS												
03	HEAT PROTECTION					2.55	650.35	82.91	129.54	2.55	650.35	82.91	129.54
04	SILLO					1.33	629.92	82.91	129.55	7.02	631.68	82.94	129.44
05	AERO	5.49	632.09	82.95	129.42					27.50	633.52	117.17	129.64
06	COVERS + CAPS	27.50	633.52	117.17	129.64								
07	HEAT PROTECTION					2.78	644.75	117.21	129.77	2.78	644.75	117.21	129.77
08	SILLO					1.40	627.01	117.26	129.87	6.94	631.99	117.16	129.69
09	AERO	5.54	633.25	117.14	129.65								
10													
11	INSTRUMENTATION												
12	EQUIPMENT + WIRE	23.43	638.33	83.54	128.66					23.43	638.33	83.54	128.66
13	BASE HEAT PROTECTION	2.23	771.42	106.86	112.54	.47	771.54	106.82	112.12	2.70	771.44	106.85	112.47
14	EQUIP + WIRE - JETT.												
15	BASE HEAT PRO. - JETT.												
16	SILLO HEAT PROTECTION					.08	770.86	106.13	112.74	.08	770.86	106.13	112.74
17	DESTRUCT PROVISION	6.39	540.24	116.39	128.43					6.39	540.24	116.39	128.43
18													
19	G+C INSTALLATION												
20	CABLE PROV + INSTL PRO												
21	BASE HEAT PROTECTION												
22	SILLO HEAT PROTECTION												
23	STRUCTURE												
24	UNJETTISONED												
25	SEPARATION MECH.												
26	HEAT PROTECTION												
27	SILLO EXTERNAL												
28	AERO												
29	BASE												
30	SILLO INTERNAL												
31	JETTISONED												
32	SEPAR. MECH. - STAGE												
33	SEPAR. MECH. - PEEL												
34	HEAT PROTECTION												
35	SILLO												
36	AERO												
37	BASE												
38													
39	ACCELEROMETER SUPPORT												
40													
41	HEAT DEFLECTOR INSTL.	16.31	796.42	100.00	100.00					16.31	796.42	100.00	100.00
42	DEFLECTOR + STRUC.	4.70	789.13	100.00	100.00	4.86	789.64	100.00	100.00	9.56	789.40	100.00	100.00
43	BASE HEAT PROTECTION					.95	789.72	100.00	100.00	.95	789.72	100.00	100.00
44	SILLO HEAT PROTECTION												
45	MISCELLANEOUS												
46													
47	CONTINGENCY												
48													
49	UNACCOUNTED												
50													
51	COLUMN TOTAL SECT 48	115.14	662.07	98.33	123.56	14.42	705.87	100.65	117.05	129.56	666.94	98.59	122.83
52													
53	SECTION TOTAL												

3 BOEING WEIGHT RESPONSIBILITY
MISSILE BW 446-448
DATE 7-24-63

2.3.10 Section 49

UNEXPENDED

EXPENDED

M + M
TOTAL

LN	FUNCTIONAL LISTING	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEMAYS												
02	COVERS + CAPS	1.00	751.52	83.49	128.51					1.00	751.52	83.49	128.51
03	HEAT PROTECTION												
04	SILO												
05	AERO												
06	COVERS + CAPS	1.00	751.52	83.49	128.51					1.00	751.52	83.49	128.51
07	HEAT PROTECTION												
08	SILO												
09	AERO												
10	INSTRUMENTATION												
11	EQUIPMENT + WIRE	7.36	770.15	85.28	127.56					7.36	770.15	85.28	127.56
12	BASE HEAT PROTECTION	6.61	761.74	92.84	126.03					6.61	761.74	92.84	126.03
13	EQUIP + WIRE - JETT.												
14	BASE HEAT PROTECTION												
15	SILO HEAT PROTECTION												
16	DESTRUCT PROVISION												
17	STRUCTURE												
18	UNJETTISONED												
19	SEPARATION MECH.												
20	HEAT PROTECTION												
21	SILO EXTERNAL												
22	AERO												
23	BASE												
24	SILO INTERNAL												
25	JETTISONED												
26	SEPAR. MECH.- STAGE												
27	SEPAR. MECH.- PEEL												
28	HEAT PROTECTION												
29	SILO												
30	AERO												
31	BASE												
32	ACCELEROMETER SUPPORT												
33	HEAT DEFLECTOR INSUL.												
34	DEFLECTOR + STRUC.												
35	BASE HEAT PROTECTION												
36	SILO HEAT PROTECTION												
37	MISCELLANEOUS												
38	CONTINGENCY												
39	UNACCOUNTED												
40	COLUMN TOTAL SECT 49	247.49	766.78	100.50	102.95	59.43	767.63	100.26	100.39	306.92	766.95	100.45	102.45
41	SECTION TOTAL	1660.09	451.00	99.68	105.04	127.07	605.23	100.12	103.82	1787.16	461.97	99.72	104.95
42	MISSILE TOTAL												