NASA Contractor Report 178416, Part 2

SPACE SHUTTLE PHASE B WIND TUNNEL
MODEL AND TEST INFORMATION

VOLUME 3 - LAUNCH CONFIGURATION

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CHRYSLER CORPORATION
Military Public Electronic Systems
Michoud Engineering Office
New Orleans, Louisiana

Contract NAS1-18276
July 1988

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National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665

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*Pages i and 1-439 published under separate cover as NASA CR-178416, Part 1.

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 346

☐ PRETEST
☒ POSTTEST

TEST GDHST 304-0 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD. XW	SCHD. β	CONTROL DEFLECTION δLe	CONTROL DEFLECTION δRe	NO. of RUNS	Z DISPLACEMENT, FULL SCALE 4.38	13.38	29.38	54.38
BCA 003	B9J + 130G	A	0	0	0	4	3			
BCA 051							51			
BCA 053							53			
BCA 052							52			
BCA 008							8			
BCA 009							9			
BCA 010							10			
BCA 012							12			
BCA 013							13			
BCA 014							14			
BCA 015							15			
BCA 016							16			
BCA 017							17			
BCA 019							19			
BCA 020							20			
BCA 021							21			
BCA 022							22			
BCA 023							23			
BCA 024							24			
BCA 025							25			

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CLM	CAF	CA	CL	CDF	L/D	FW	ALPHA		Z	XN	9
COEFFICIENTS:										IDPVAR(1)	IDPVAR(2)	NDV

a or β SCHEDULES: XWA = -180 to +80 ft. FROM MATED POSITION

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TEST GDHST 304-0 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. XW	SCHD. β	CONTROL DEFLECTION δLe	CONTROL DEFLECTION δRe	NO. of RUNS	Z DISPLACEMENT, FULL SCALE 4.38	13.38	29.38	54.38
BCA026	B9J + 130G	A	0	0	0	4	26			
BCA027	+ 134G						27			
BCA028							28			
BCA029							29			
BCA031							31			
BCA032							32			
BCA033							33			
BCA034							34			
BCA035							35			
BCA036							36			
BCA037							37			
BCA038							38			
BCA039							39			
BCA040							40			
BCA041							41			
BCA042							42			

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CLM	CAF	CA	CL	CDF	L/D	ZW	ALPHA		Z	XWl	9
										IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS:

α or β SCHEDULES: XWA = -180 to +60 FT. FROM MATED POSITION

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 347

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 348

TEST GDHST 304-0 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. XW	SCHD. β	CONTROL DEFLECTION δe_L	CONTROL DEFLECTION δ_{Re}			NO. of RUNS	Z DISPLACEMENT, FULL SCALE 4.38	13.38	29.38	54.38
BCA043	B8X +134B	A	0	0	0			4	43			
BCA045									45			
BCA046									46			
BCA047									47			
BCA048									48			
BCA049	+130G								49			
BCA050									50			

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CLM	CAF	CA	CL	CDF	L/D	ZW	ALPHA		Z	XW	9

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES: XW_A = -180 to +E.O Ft. FROM MATED POSITION

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TEST GDHST 364-0 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_{Le}	CONTROL DEFLECTION δ_{Re}			NO. of RUNS	MACH NUMBERS 1.6
BCA055	B9J (B7W5)	B	0	0	0			1	55
BCA044	B8X(B1W3T6-90)	C	0	0	0			1	44

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CLM	CAF	CA	CL	CDF	L/D						7

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

$\alpha_B = -15 \text{ to } +5°$

$\alpha_C = -15 \text{ to } +15°$

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 349

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 350

TEST GDHST 364-0 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. XW	SCHD. β	CONTROL DEFLECTION δ_h				NO. of RUNS	Z DISPLACEMENT, FULL SCALE 4.38	13.38	29.38	54.38
ØCA003	130G + 89J	A	0	0				4	3			
ØCA051									51			
ØCA053									53			
ØCA052									52			
ØCA008									8			
ØCA009									9			
ØCA010									10			
ØCA012									12			
ØCA013									13			
ØCA014									14			
ØCA015									15			
ØCA016									16			
ØCA017									17			
ØCA019									19			
ØCA020									20			
ØCA021									21			
ØCA022									22			
ØCA023									23			
ØCA024									24			
ØCA025									25			

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CLM	CAF	CA	CL	CDF	L/D	ZW			Z	XW	8
										IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS:

α or β SCHEDULES: XW_A = -180 to +80 FT FROM MATED POSITION

TEST GDHST 304-0 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. XW	SCHD. β	CONTROL DEFLECTION δh	δe	δr		NO. of RUNS	Z DISPLACEMENT, FULL SCALE 4.38	13.38	29.38	54.38
ØCA026	130G + B9J	A	0	0	–	–		4	26			
ØCA027	134B				0	0			27			
ØCA028				–					28			
ØCA029				–					29			
ØCA031				–					31			
ØCA032				–					32			
ØCA033				–					33			
ØCA034				–					34			
ØCA035				–					35			
ØCA036				–					36			
ØCA037				–					37			
ØCA038				–					38			
ØCA039				–					39			
ØCA040				–					40			
ØCA041				–					41			
ØCA042				–					42			

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CLM	CAF	CA	CL	CDF	L/D	ZW			Z	XW	8
										IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS:

α or β SCHEDULES: XWA = -180 to 80 Ft From Mated Position

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 351

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 352

TEST 304-0 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δh	δe	δr		NO. of RUNS	MACH NUMBERS 1.1	1.6
ØCA122	130G (B6W10H12)	0	0	0	–	–		1	22	
ØCA126		5			–	–		1	26	
ØCA152		0			–	–		1		52
ØCA112		5			–	–		1		12
ØCA115		-5			–	–		1		15
ØCA117		-10			–	–		1		17
ØCA129	134B (B5W13E2V14R4)	0		–	0	0		1	29	
ØCA134		0		–				1		34
ØCA138		5		–				1		38
ØCA141		-5		–				1		41
ØCA142		-10		–				1		42

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN CLM CAF CA CL CDF L/D 7

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β
SCHEDULES

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TEST GDHST-304-0 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. XW	SCHD. β	CONTROL DEFLECTION δh	CONTROL DEFLECTION δe	CONTROL DEFLECTION δr	CONTROL DEFLECTION	NO. of RUNS	Z DISPLACEMENT, FULL SCALE 4.38	13.38	29.38	54.38
ΦCA043	134B + B8X	A	0	-	0	0		4	43			
ΦCA045				-					45			
ΦCA046				-					46			
ΦCA047				-					47			
ΦCA048				-					48			
ΦCA049	130G			0	-	-			49			
ΦCA050					-	-			50			

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CN	CLM	CAF	CH	CL	CDF	L/D	ZW			Z	XW		8
										IDPVAR(1)	IDPVAR(2)		NDV

COEFFICIENTS:

α or β SCHEDULES: XWA = -180 to +80ft. From mated Position

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 353

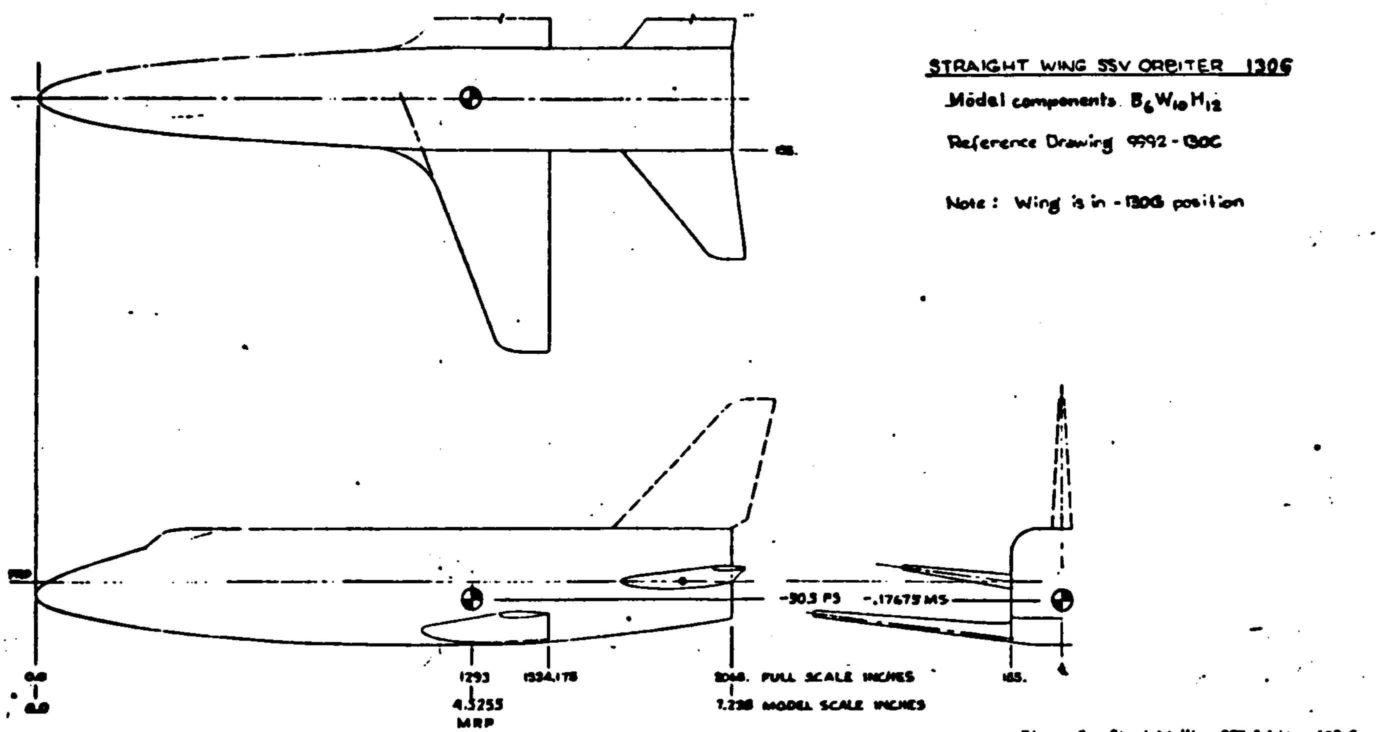

Figure 2. Straight Wing SSV Orbiter 130 G

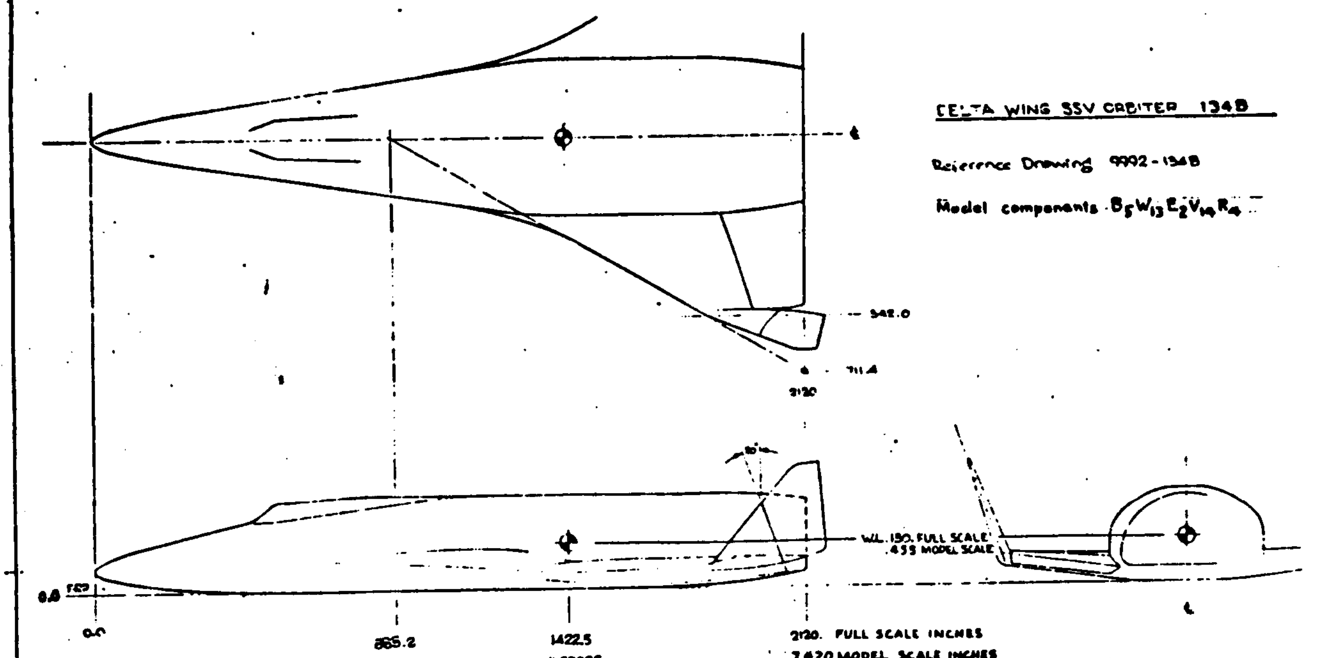

Figure 3. Delta Wing SSV Orbiter 134B.

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 355

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052 C-1- 356

STRAIGHT-WING BOOSTER BBX

Model components $B_1W_3^{15}T_6^{90}$

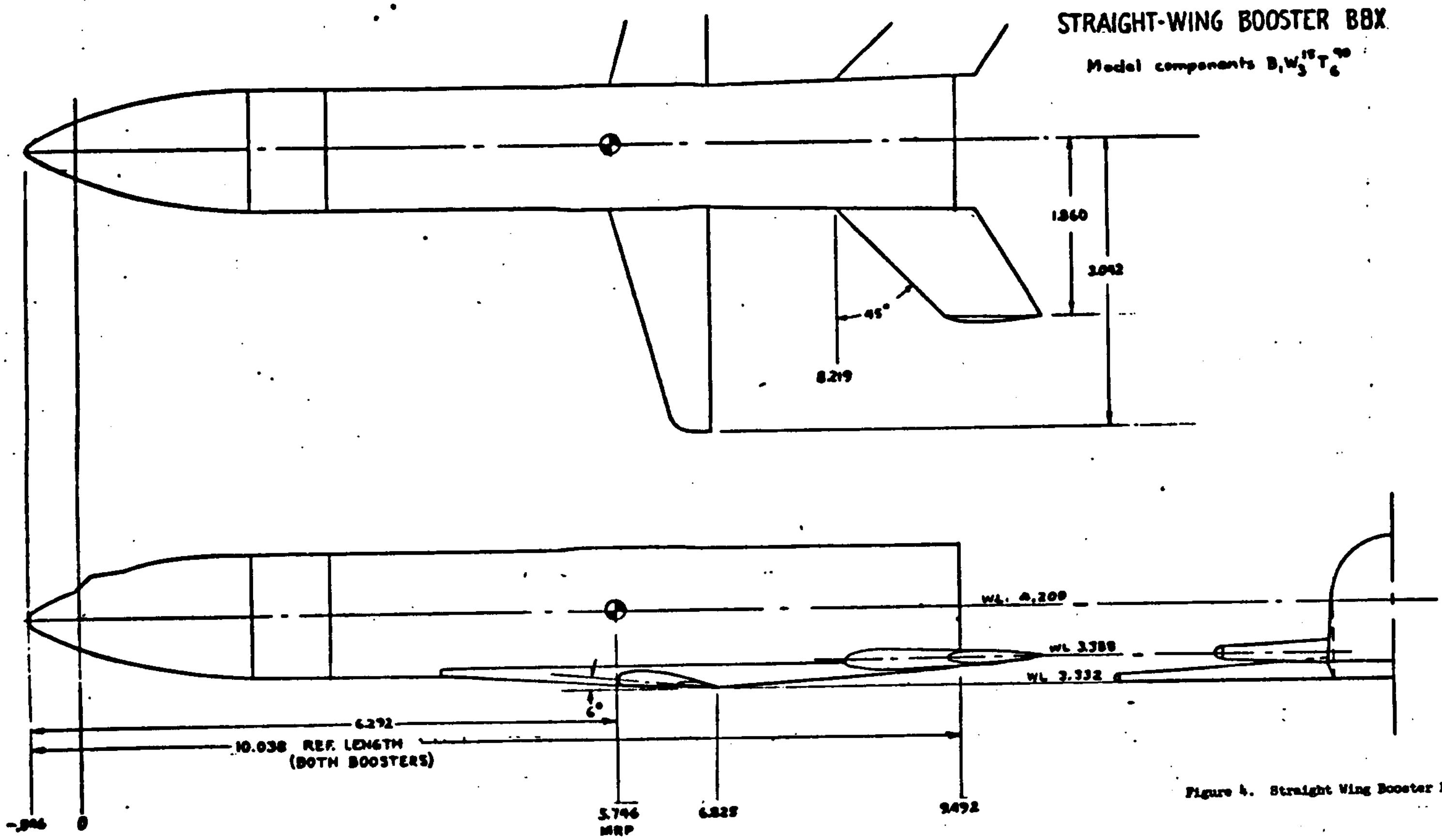

Figure 4. Straight Wing Booster BBX.

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DELTA-WING BOOSTER B9J

Model components B_7W_8

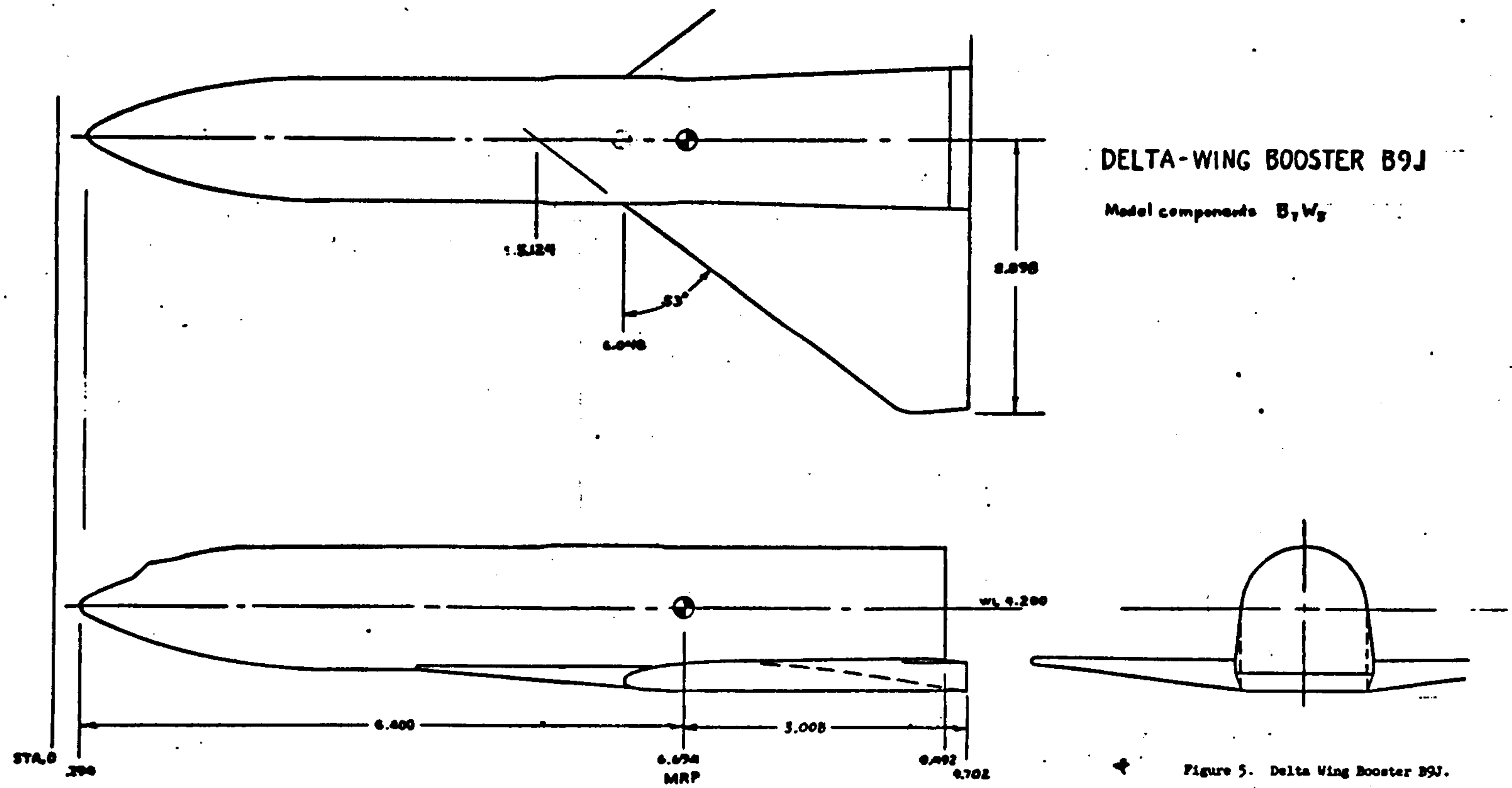
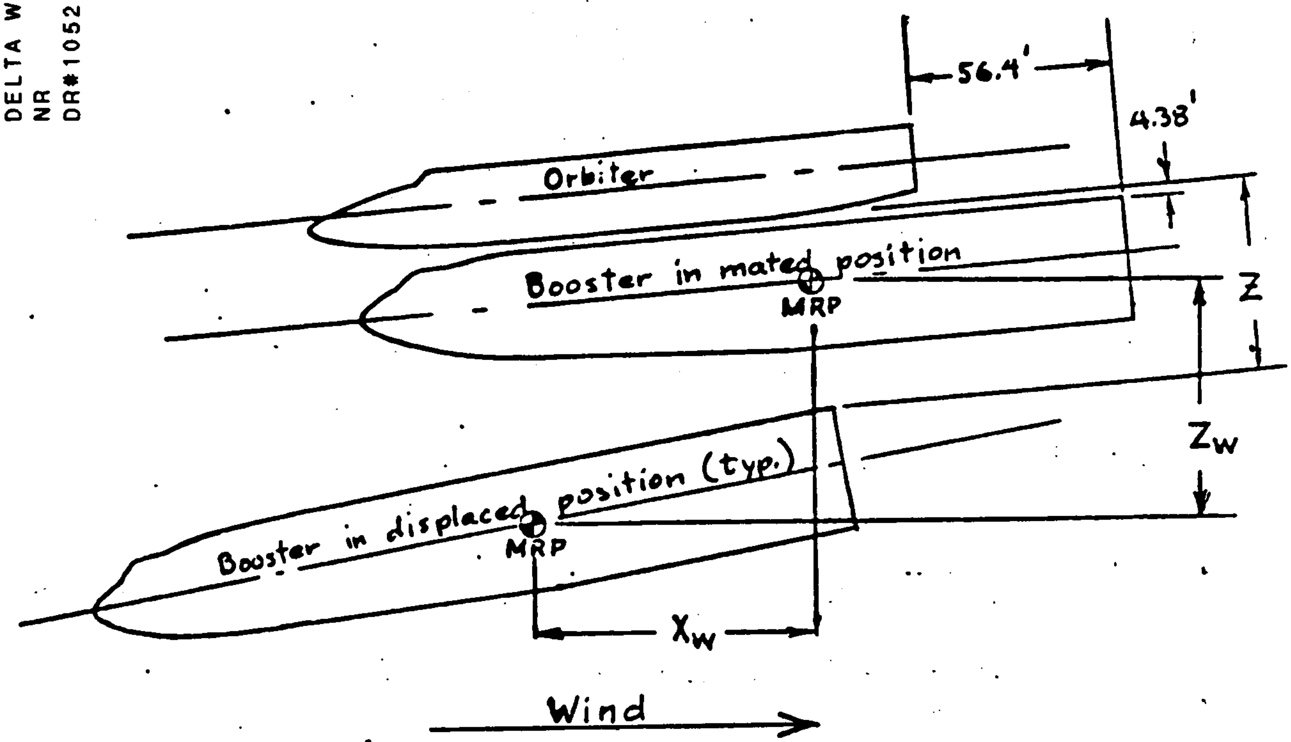


Figure 5. Delta Wing Booster B9J.

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1052   C-1- 357



In the mated position the fuselage reference planes were parallel, and the gaps between bodies and the base-to-base dimension were as noted. The same mated dimensions applied to all four combinations of the two boosters and the two orbiters. The dimensions are in feet, full scale.

With the booster in the displaced position that is shown, the displacement coordinates X_W and Z_W are positive. X_W and Z_W are the displacement coordinates of the moment reference point (MRP), for which see the general arrangement drawings.

Figure 6. Identification of the "mated" position and displacement Coordinates Z, X_W, and Z_W.

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TABLE I

TEST AMES 6x6-548 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δe_{BL}	δe_{BR}	NO. of RUNS	MACH 0.6	MACH 0.9	MACH 1.2	MACH 1.5	MACH 2.0
RAZ 201	$B_7ZW_{16}V_{24}$	B	0	---	---	5	5	4	3	2	1
202	$B_4ZW_{16}V_{26}$	A	0	---	---		11	10	9	8	7
203		0	F	---	---		16	15	14	13	12
204		-5		---	---		21	20	19	18	17
205		5		---	---		26	25	24	23	22
206				---	---	1	27				
107	$B_{22}C_8W_{19}V_{10}+B_4ZW_{16}V_{26}$	A	0	0	0	5	32	31	30	29	28
207											
108				-10	+10		37	36	35	34	33
208											
109				+15	-15		42	41	40	39	38
209											
110				+10	-10		47	46	45	44	43
210											
111		0	F				52	51	50	49	48
211											
112				+15	-15		57	56	55	54	53
212											
113				0	0		62	61	60	59	58
213											

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN CAF CLM CAB CY CBL CYN IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES

α(A) = -15, -12, -8, -4, -2, 0, 2, 4, 8, 11

α(B) = -5, -2, 0, 2, 4, 8, 10, 14, 18, 20

β(F) = -5, -2, -1, 0, 1, 2, 4, 6, 10

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1127 C-1- 359

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1127 C-1- 360
☐ PRETEST
☒ POSTTEST

TABLE I (Concluded)

TEST AMES 6x6-548 DATA SET/RUN NUMBER

COLLATION SUMMARY

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δe_{BL}	δe_{BR}			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.2	1.5	2.0
RAZ 114	$B_{22}C_8W_{19}+B_4ZW_{16}V_{26}$	0	F	0	0			5	67	66	65	64	63
214									72	71	70	69	68
115	$B_{22}W_{19}V_{10}+B_4ZW_{16}V_{26}$								77	76	75	74	73
215									82	81	80	79	78
116		A	0						87	86	85	84	83
216									92	91	90	89	88
117	$B_{22}C_8W_{19}V_{10}+B_4ZW_{16}V_{26}$	-5	F						97	96	95	94	93
217									102	101	100	99	98
118				+15	-15				107	106	105	104	103
218									112	111	110	109	108
119				+10	-10				117	116	115	114	113
219									122	121	120	119	118
120		5							127	126	125	124	123
220													
121				0	0								
221													
122	$B_{22}C_8W_{19}V_{10}$												
123		-5											
124		0											
125		A	0										
126		A	0										

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN CAF CLM CAB CY CBL CYN IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES

$\alpha(A)$ = -15, -12, -8, -4, -2, 0, 2, 4, 8, 11

$\alpha(B)$ = -5, -2, 0, 2, 4, 8, 10, 14, 18, 20

$\beta(F)$ = -5, -2, -1, 0, 1, 2, 4, 6, 10

NASA-MSFC-MAF

DESCRIPTION OF 134D/B9U SPACE SHUTTLE CONFIGURATION

Model dimensions in inches

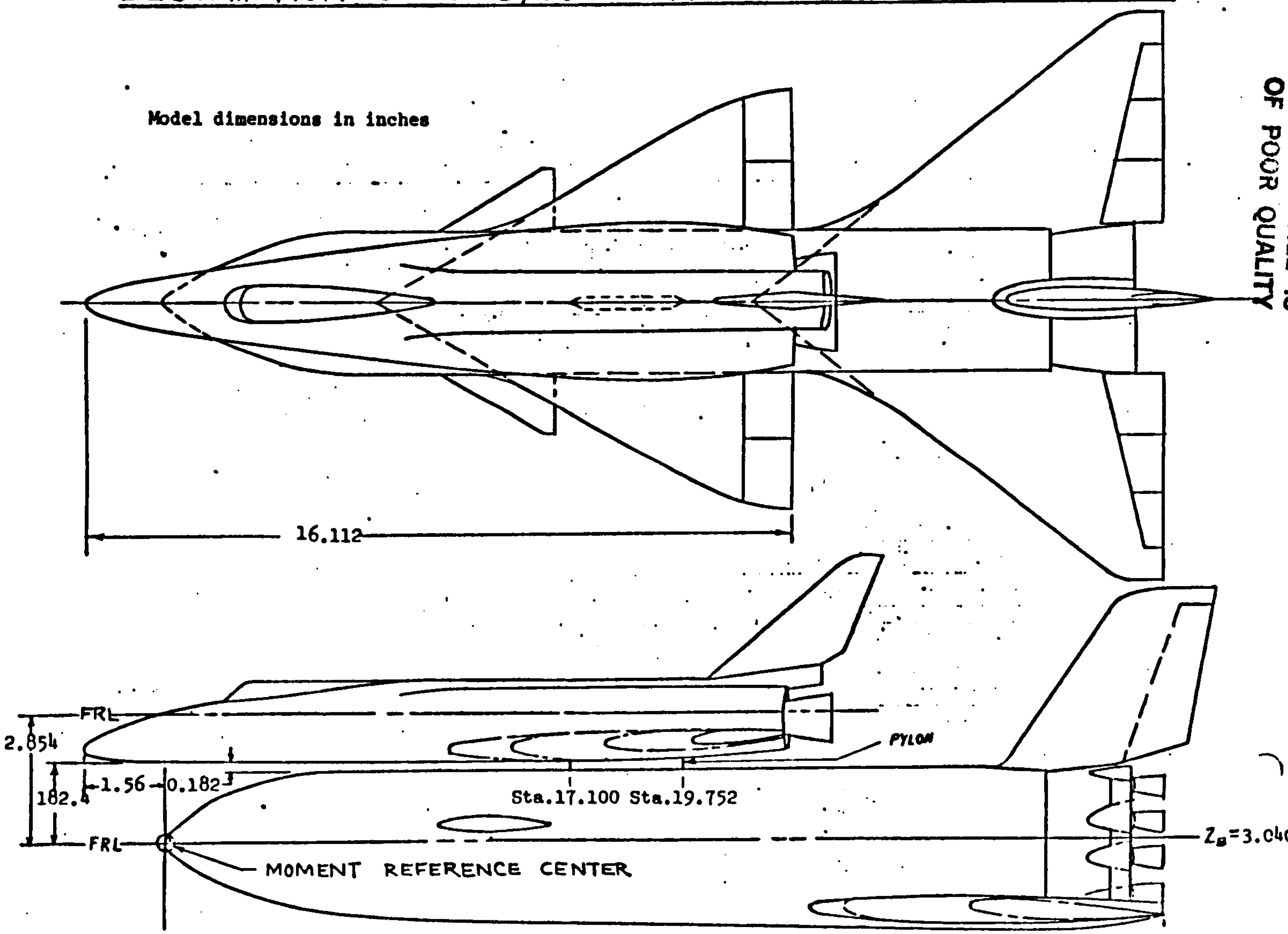


Figure B Launch Configuration

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1127 C-1- 361

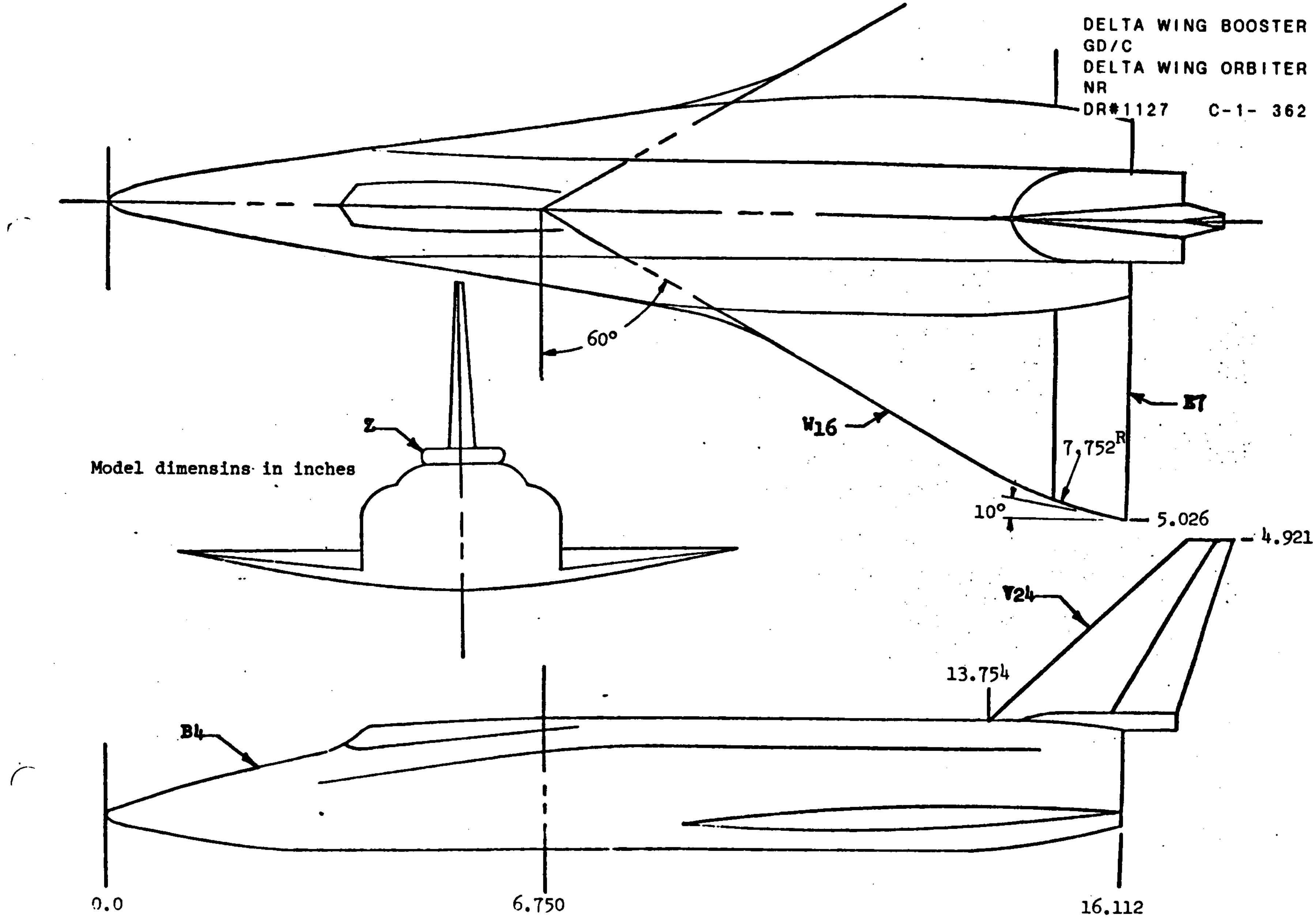
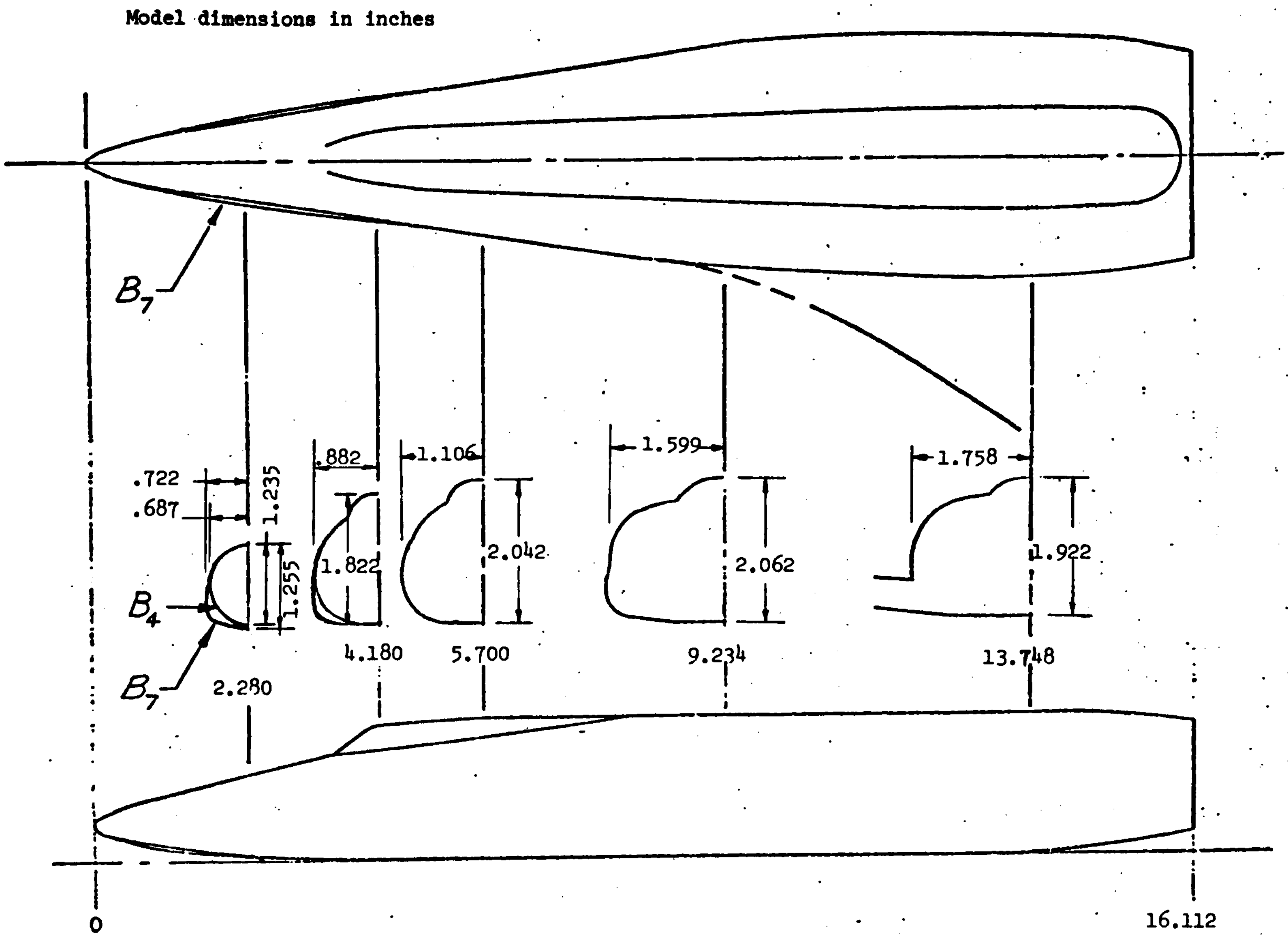


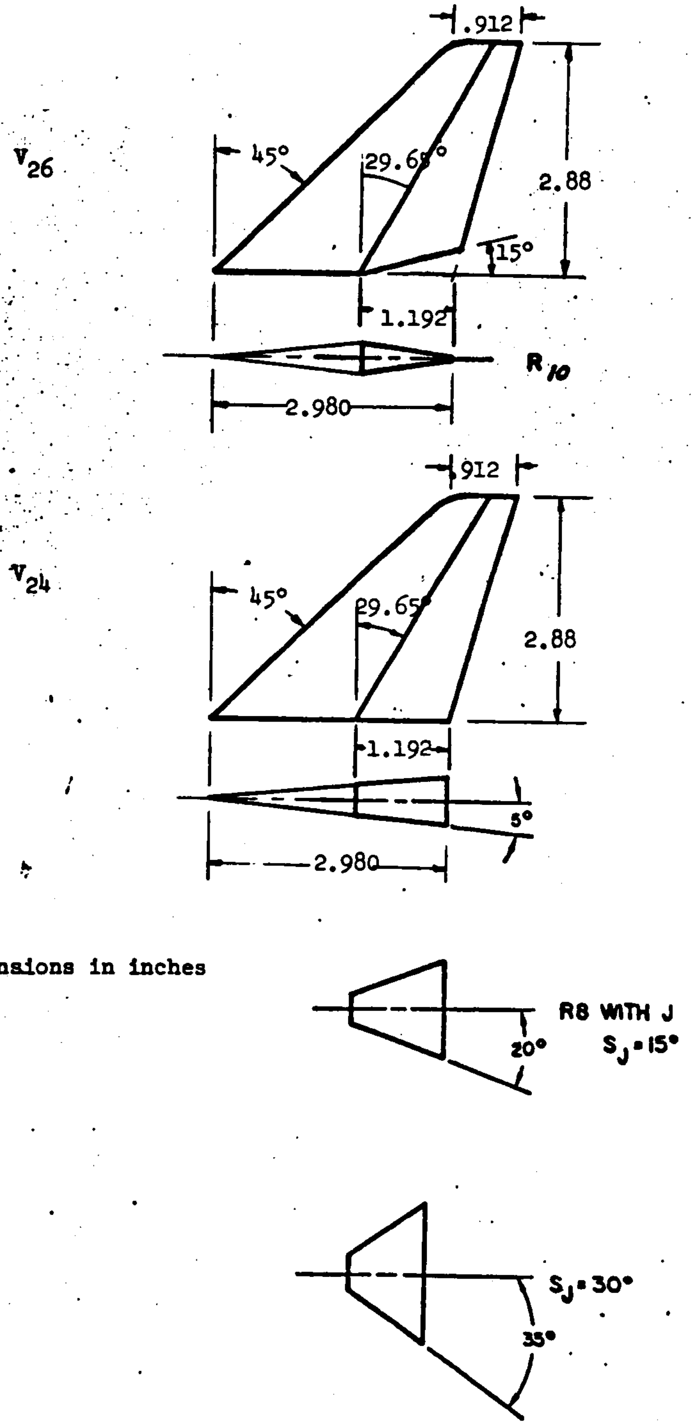
Figure C 3 View Delta Wing Orbiter



BODY B4 9992-129 CONFIGURATION
Body B7 9992-129 Configuration With 161 Nose Modification

Figure D Orbiter Body

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1127 C-1- 363



Model dimensions in inches

Figure E Flared Rudder, Delta Wing Orbiter

DELTA WING BOOSTER GD/C
DELTA WING ORBITER NR
DR#1127 C-1- 365

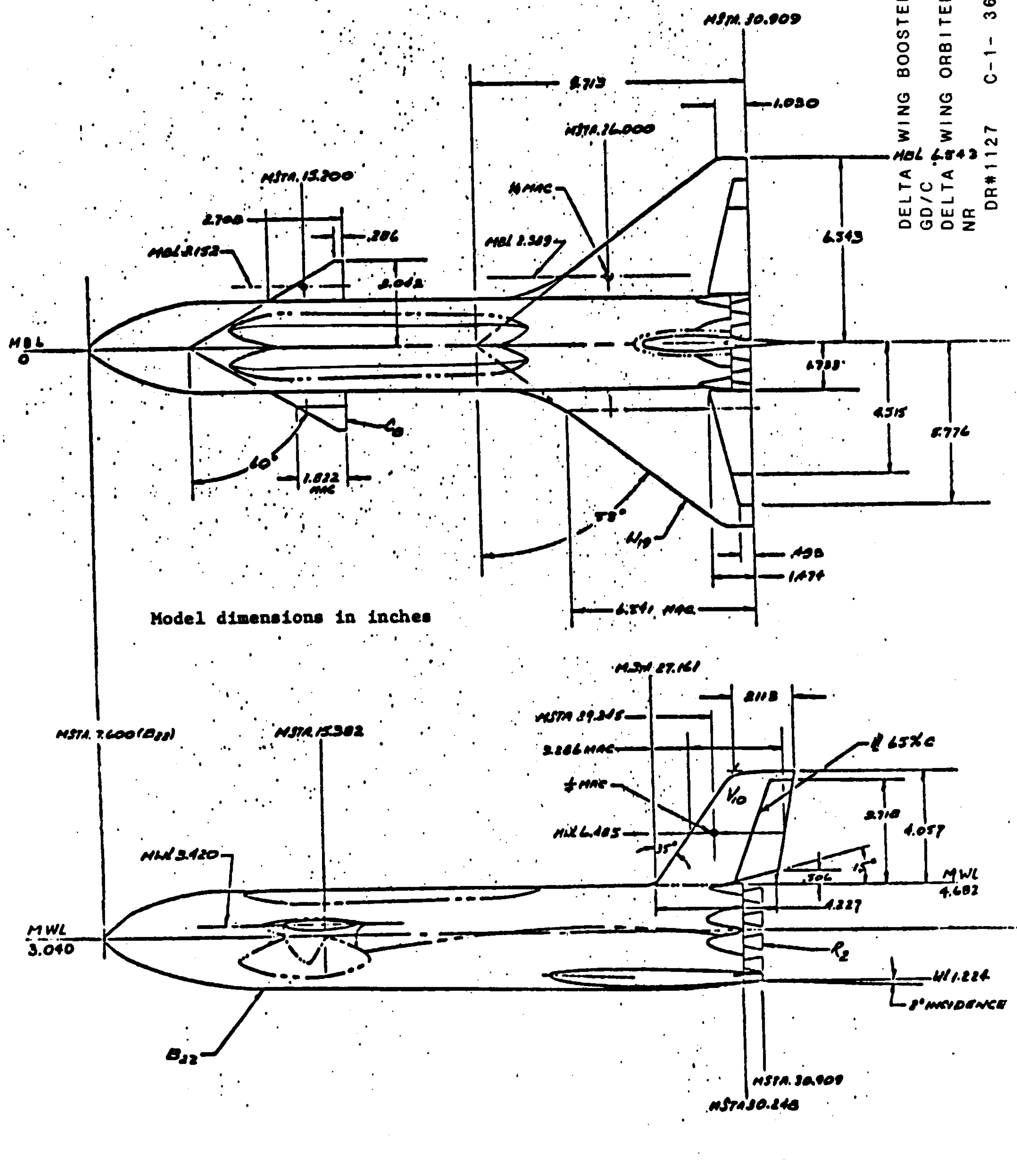
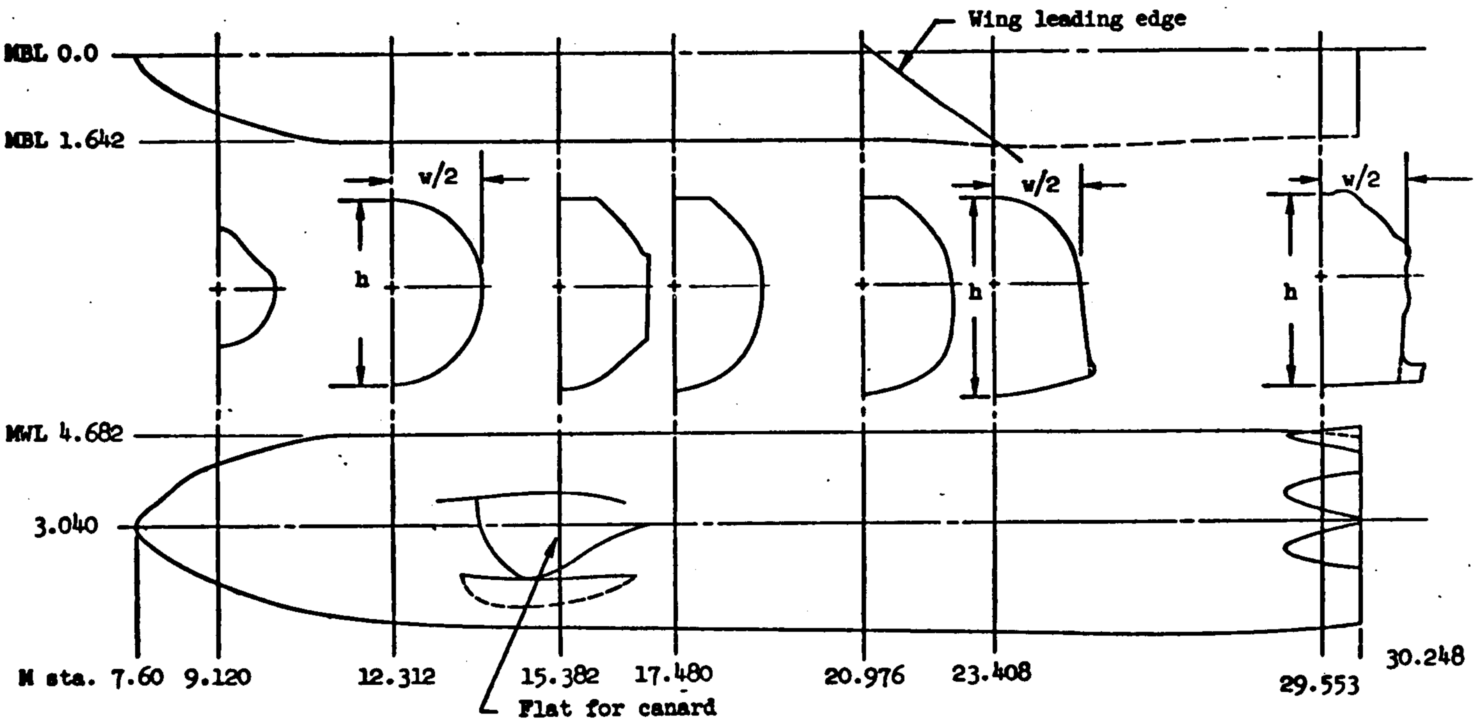


Figure F Delta Wing Booster



Model dimensions in inches

M sta.	9.120	12.312	15.382	17.480	20.976	23.408	29.553
h	2.182	3.427	3.535	3.566	3.622	3.665	3.687
w/2	1.052	1.638	1.638	1.638	1.638	1.638	1.638

Figure G Booster Body

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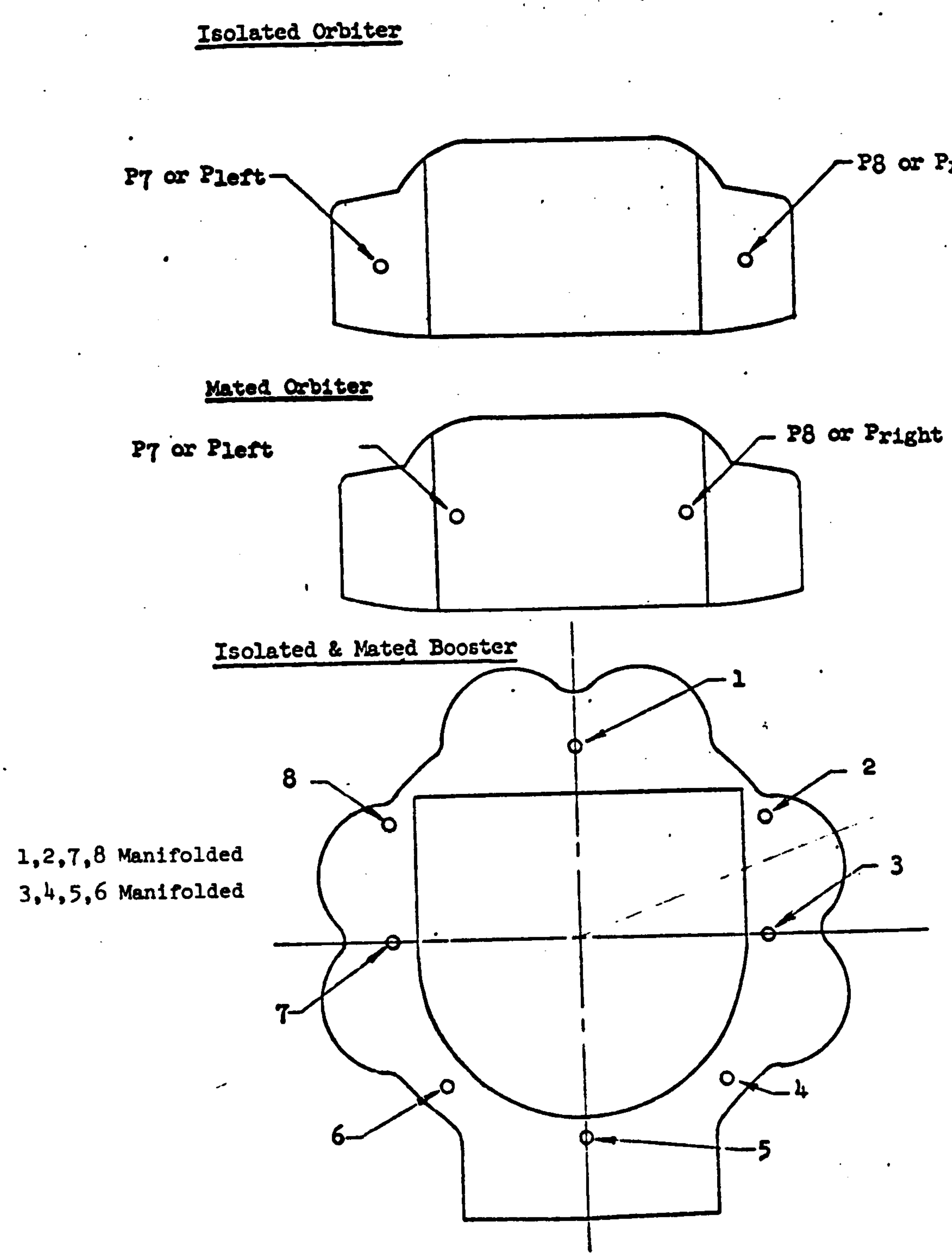

Figure H Base Pressure Taps

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 368

☐ PRETEST
☒ POSTTEST

TEST TWT-490 DATA SET COLLATION SHEET

Force- Booster, 0.0035-Scale, Stability and Control

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δE				NO. of RUNS	MACH NUMBERS 0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.99	4.96			
R32 01A	B20	A	0					5	158/0	159/0		160/0		213/0	208/1					
02A	B20C4B	↓	↓					5	140/0	141/0		142/0		212/0	206/0					
03A	B20C4BW14	↓	↓	0				7	110/0	111/0	903/0	112/0	904/0	220/0	164/0					
04A	B20W14	↓	↓	↓				5	115/0	114/0		113/0		218/0	165/0					
05A	B20C4BW14V8	↓	↓	↓				9	001/0	002/1	003/0	004/1	005/0	221/0	162/0	268/0	267/0			
06A	↓	↓	↓	+10L -10R				7	010/0	009/0	008/0	007/0	006/0	222/0	163/0					
05B	↓	B	↓	0				5					298/1	278/0	297/0	276/0	275/0			
58A	B20	A	6	↓				5	334/0	333/1		332/0		285/0	290/0					
07A	B20C4BW14V8	↓	↓	0				9	324/0	330/0	329/0	328/0	327/0	279/0	296/0	274/0	273/0			
05C	↓	O	C	↓				9	083/0	084/0	085/0	086/0	087/0	223/0	161/0	266/0	265/0			
57B	↓	B	0	10				1									277/0			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CY CBL CYN CAF CAB CPB1 CPC CL → IDPVAR(1) IDPVAR(2) NDV 1 0

COEFFICIENTS:

α or β SCHEDULES

αA = -10 -8 -6 -4 -2 0 2 4 6 8 10

αB = 6 8 10 12 14 16 18 20 22 24

βC = -10 -8 -6 -4 -2 0 2 4 6 8 10

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TEST TWT-490 **DATA SET COLLATION SHEET**

Force - Booster + Orbiter, 0.0035-Scale, Launch Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTIONS δE	δC	δe₀	δR₀	NO. of RUNS	ORB. ATT. POS	ORB. ATT. i	MACH NUMBERS 0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.99	4.96	
R32 08A	B20+BS	A	0					5	1	0	157/0	156/0		155/0		214/0	201/0			
09A	B20W14+BS			0				5			134/0	135/0		136/0		219/0	200/0			
10A	B20W14+BSW17					0		5			121/0	120/0		119/0		217/0	199/0			
11A	B20C4BW14+BSW17				0			5			122/0	123/0		124/0		231/0	197/0			
12A	B20C4B+BS							5			139/0	138/0		137/0		210/0	205/0			
13A	B20+BSW17					0		5			152/0	153/0		154/0		215/0	202/0			
14A	B20+BSW17V17						0	5			151/0	150/0		149/0		216/0	203/0			
15A	B20C4B+BSW17V17				0			5			146/0	147/0		148/0		209/0	204/0			
16A	B20C4BW14V8+BSV17			0				5			127/0	126/0		125/0		232/0	198/0			
17A	B20+BS		6					5			340/0	339/0		338/0		287/0	288/0			
18A	B20C4BW14V8+BSW17			0	0	0		5			323/0	322/0		321/0		284/0	291/0			
19A	B20C4BW14+BSW17V17						0	5			318/0	319/0		320/0		283/0	292/0			
20A	B20+BSW17V17							5			335/0	334/0		337/0		286/0	289/0			
21A	B20C4BW14V8+BSW17V17			0	0			9			317/0	316/0	315/0	314/0	313/0	281/0	294/0	272/0	271/0	
22A			0					9			025/0	026/0	027/0	028/0	029/0	235/0	177/0	260/0	259/0	
23A				-20				5			024/0	023/0		022/0		236/0	178/0			
24A				-10				5			019/0	020/0		021/0		237/0	179/0			
25A				10				5			018/0	017/0		016/0		238/0	180/0			
26A				+10L -10R				8			011/0	012/0	013/0	014/0	015/0	239/0		262/0	261/0	
27A				0		10		5			032/0	031/0		030/0		240/0	182/0			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM	CN	CY	CBL	CYN	CAF	CAB	CPB1	CPC	CL			10

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES: α A = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

POS 1 : P/B - BASE
2 : P/B - N/A
3 : P/B - AFT
POS 4 : B/B - BASE
5 : B/B - AFT

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 369

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 370

☐ PRETEST
☒ POSTTEST

TEST TWT-490 DATA SET COLLATION SHEET

Force - Booster + Orbiter, 0.0035-Scale, Launch Stability and Control

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δE	δC	δE_O	δR_O	NO. of RUNS	ORB. ATT. POS	i	MACH 0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.99	4.96
R32 23A	B2C4BW14V8+B5W17V17	A	0	0	0	-10	0	5	1	0	033/2	034/0		035/0		241/0	183/0		
29A						OFF		5			038/0	037/0		036/0		242/0	184/0		
22B		B				0		1			299/0								
23B				-20				1			300/0								
24B				-10				1			301/0								
25B				10				1			302/0								
26B				+10L -10R				1			303/0								
30B				0	-15			1			304/0								
31B					-30			1			305/0								
22C		0	C		0			9			046/0	045/0	044/0	043/0	042/0	243/0	186/0	264/0	263/0
32C		-6						9			308/0	309/0	310/0	311/0	312/0	282/0	293/0	270/0	269/0
33C		0		+10L -10R				5			047/0	048/0		049/0		246/0	187/0		
34C				0			-10	5			052/0	051/0		050/0		245/0	188/0		
35C							OFF	5			039/0	040/0		041/0		244/0	185/0		
36A		A	0				0	5		2	053/0	054/0		055/0		247/0	176/0		
37A								5		4	058/0	057/0		056/0		248/0	175/0		
38A								5	2	0	059/0	060/0		061/0		249/1	191/0		
38C		0	C					5			070/0	069/0		068/0		252/0	192/0		
39A		A	0					5		2	064/0	063/0		062/0		250/0	190/0		
40A								5		4	065/0	066/0		067/0		251/0	189/0		

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CY CBL CYN CAF CAB CPB1 CPC CL → IDPVAR(1) IDPVAR(2) NDV 10

COEFFICIENTS:
α or β SCHEDULES
αA = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10
αB = 6, 8, 10, 12, 14, 16, 18, 20, 22, 24
βC = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

POS 1: P/B-BASE
2: P/B-N/N
3: P/B-AFT
POS 4: B/B-BASE
5: B/B-AFT

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TEST TWT- 490 DATA SET COLLATION SHEET

Force - Booster + Orbiter, 0.0035 - Scale, Launch Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δE	δC	δEo	δRo	NO. of RUNS	ORB. ATT. POS	ORB. ATT. i	MACH NUMBERS 0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.99	4.96
232 41A	B2C4BW14V8+B5W17V17	A	0	0	0	0	0	5	3	0	076/0	075/0		074/0		254/0	194/0		
42C		o	C					5			071/0	072/0		073/0		253/0	193/0		
43A		A	0					5		2	077/0	078/1		079/0		255/0	195/0		
44A								5		4	082/0	081/0		080/0		256/0	196/0		
45A	B20W14+B5							5	4	0	133/0	132/0		131/0		229/0	167/0		
46A	B20W14+B5W17					0		5			116/0	117/0		118/0		230/0	166/0		
47A	B2C4BW14+B5				0			5			128/0	129/0		130/0		228/0	168/0		
48A	B2C4BW14+B5W17V17					0	0	5			109/0	108/0		107/0		227/0	169/0		
49A	B2C4B+B5							5			145/0	144/0		143/0		211/0	207/0		
50A	B2C4BW14V8+B5W17V17			0		0	0	9			097/0	096/0	095/0	094/0	093/0	225/0	170/0	258/0	257/0
51A				10				5			098/0	099/0		100/0		226/0	171/0		
51B		B						1			307/0								
50B				0				1			306/0								
50C		O	C					7			088/0	089/0	090/0	091/0	092/0	224/0	172/0		
52A		A	0					5		2	103/0	102/0		101/0		233/0	174/0		
53A				10				2				902/0		901/0					
54A				0				5	5	0	104/0	105/0		106/0		234/0	173/0		
55A			6					5			331/0	325/0		324/0		280/0	295/0		
56A			0	-10L +10R				1	1								181/0		

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CY	CBL	CYN	CAF	CAB	CPB1	CPC	CL			1 0

COEFFICIENTS: IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

αA = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

αB = 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26

βC = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

POS 1: P/B - BASE
2: P/B - N/N
3: P/B - AFT
POS 4: B/B - BASE
5: B/B - AFT

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 371

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 372

SSV LAUNCH CONFIGURATION

Piggy Back - Baseline
(Position 1)

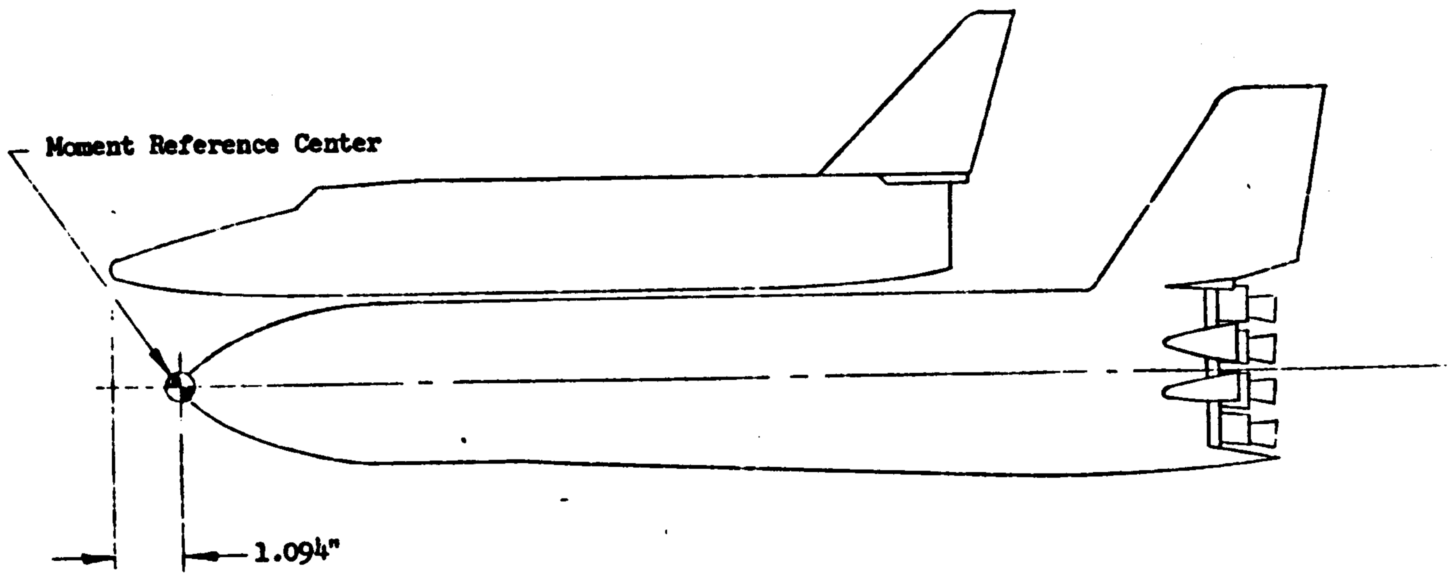


FIGURE 6. BOOSTER ORBITER MOUNTING RELATIONSHIPS

SSV LAUNCH CONFIGURATION

Piggy Back - Nose To Nose
(Position 2)

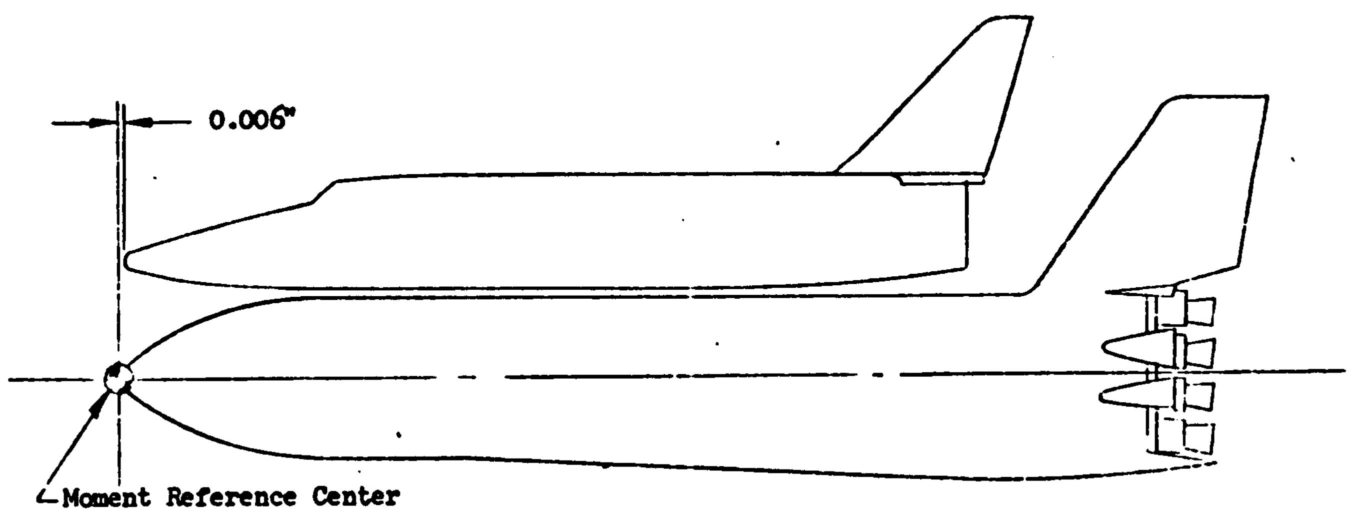


FIGURE 6. BOOSTER ORBITER MOUNTING RELATIONSHIPS (Continued)

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 373

SSV LAUNCH CONFIGURATION

Piggy Back - Orbiter Aft
(Position 3)

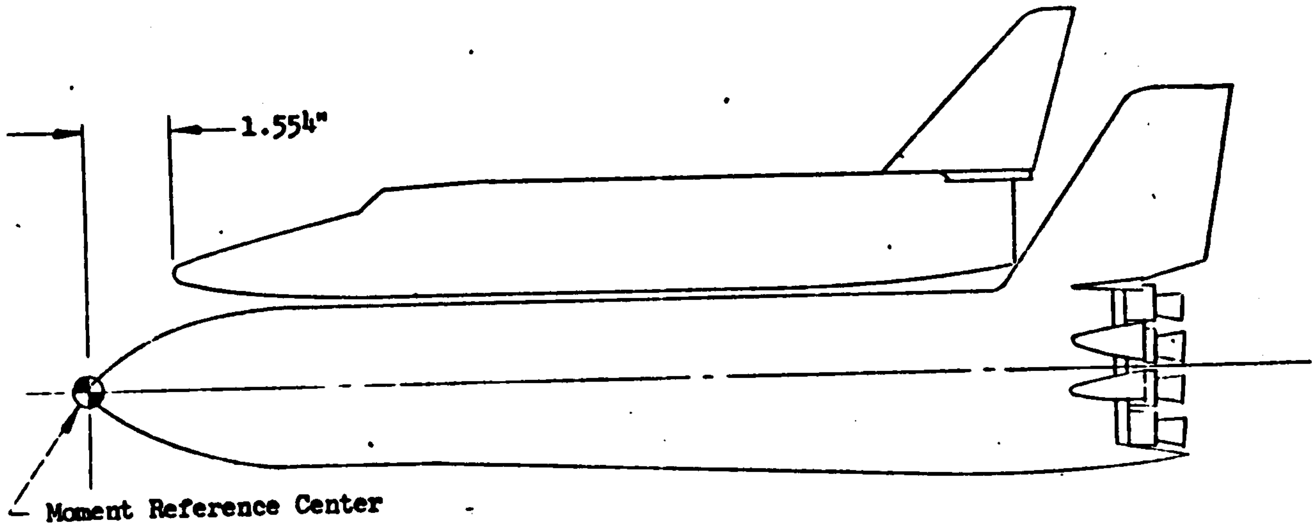


FIGURE 6. BOOSTER ORBITER MOUNTING RELATIONSHIPS (Continued)

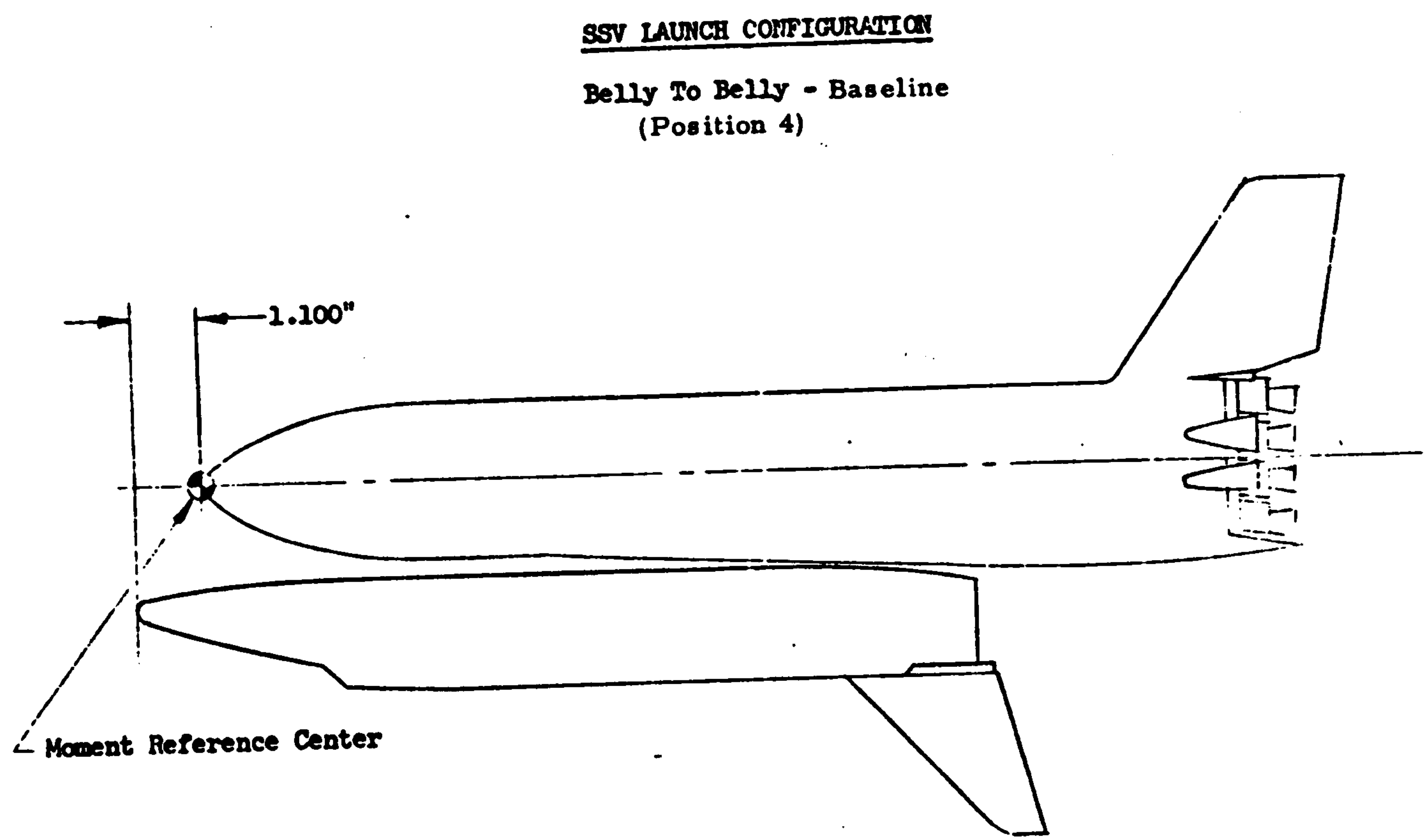


FIGURE 6. BOOSTER ORBITER MOUNTING RELATIONSHIPS (Continued)

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 375

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 376

SSV LAUNCH CONFIGURATION

Belly To Belly - Aft
(Position 5)

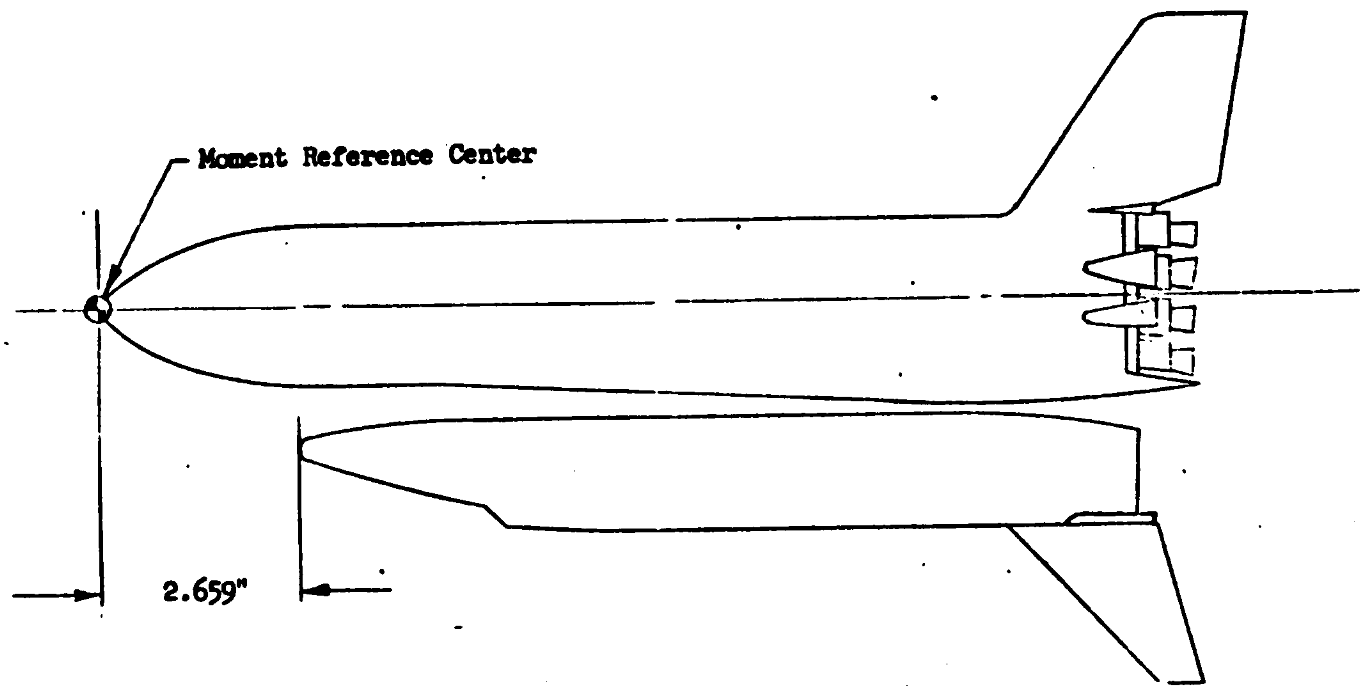


FIGURE 6. BOOSTER ORBITER MOUNTING RELATIONSHIPS (Continued)

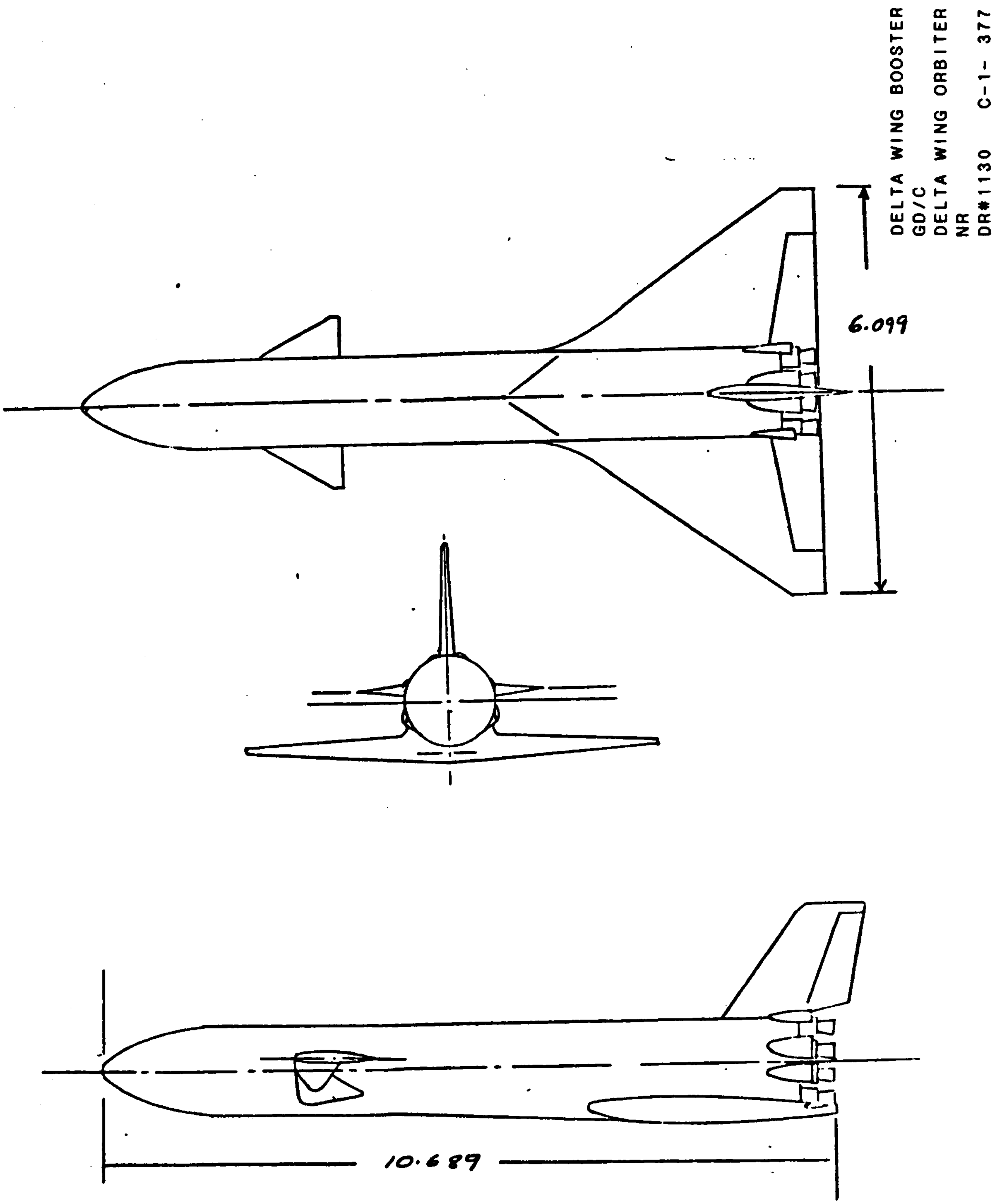


FIGURE 7. THREE-VIEW SKETCH OF BOOSTER $B_{20}W_{11}C_{48}V_{8}$

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 378

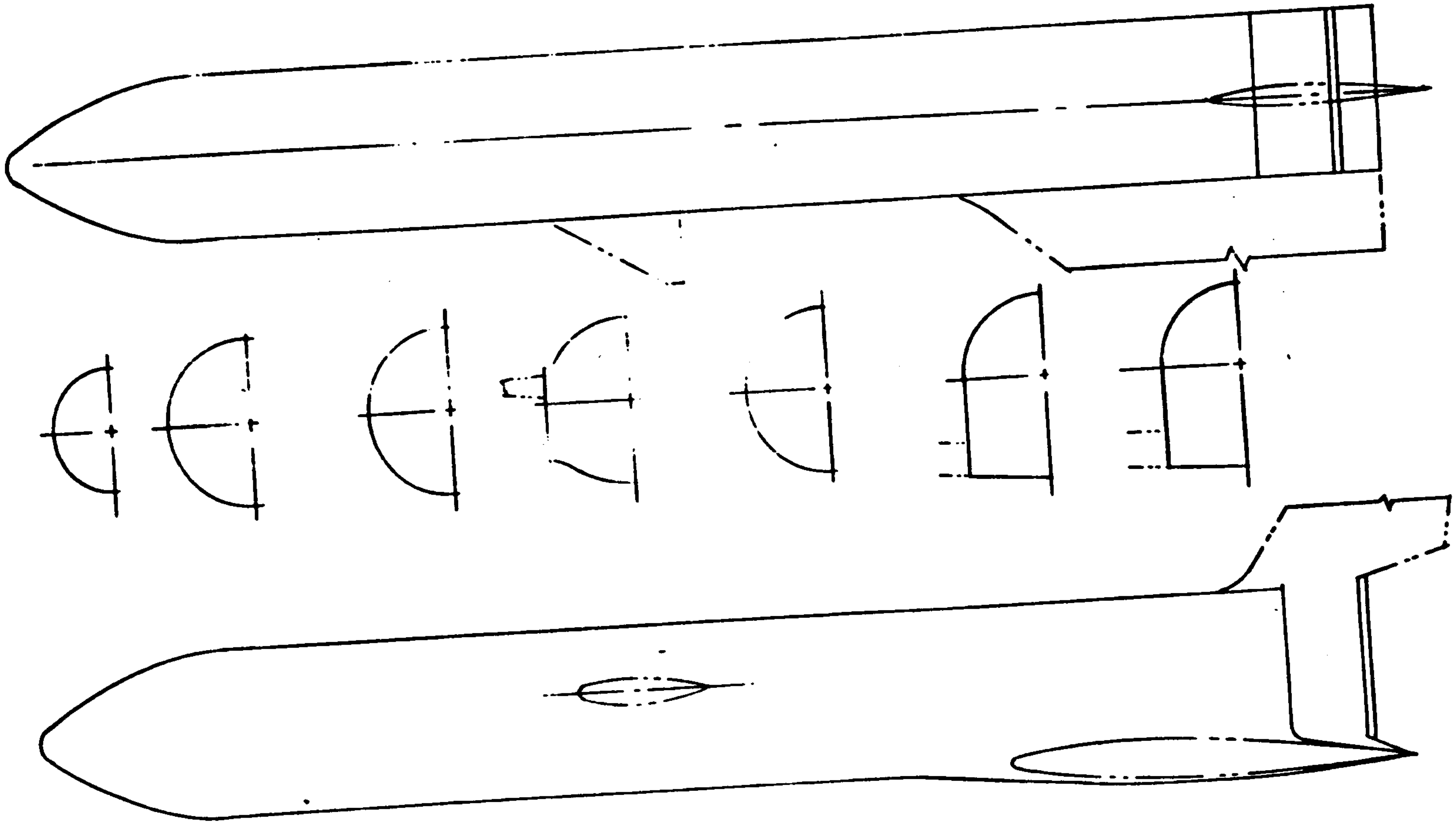


FIGURE 8.

BODY B20 - BOOSTER B-15 B-1 (LENGTHENED 10%) CONFIGURATION

MODEL DESCRIPTION

Delta Wing Booster - (Cont'd)

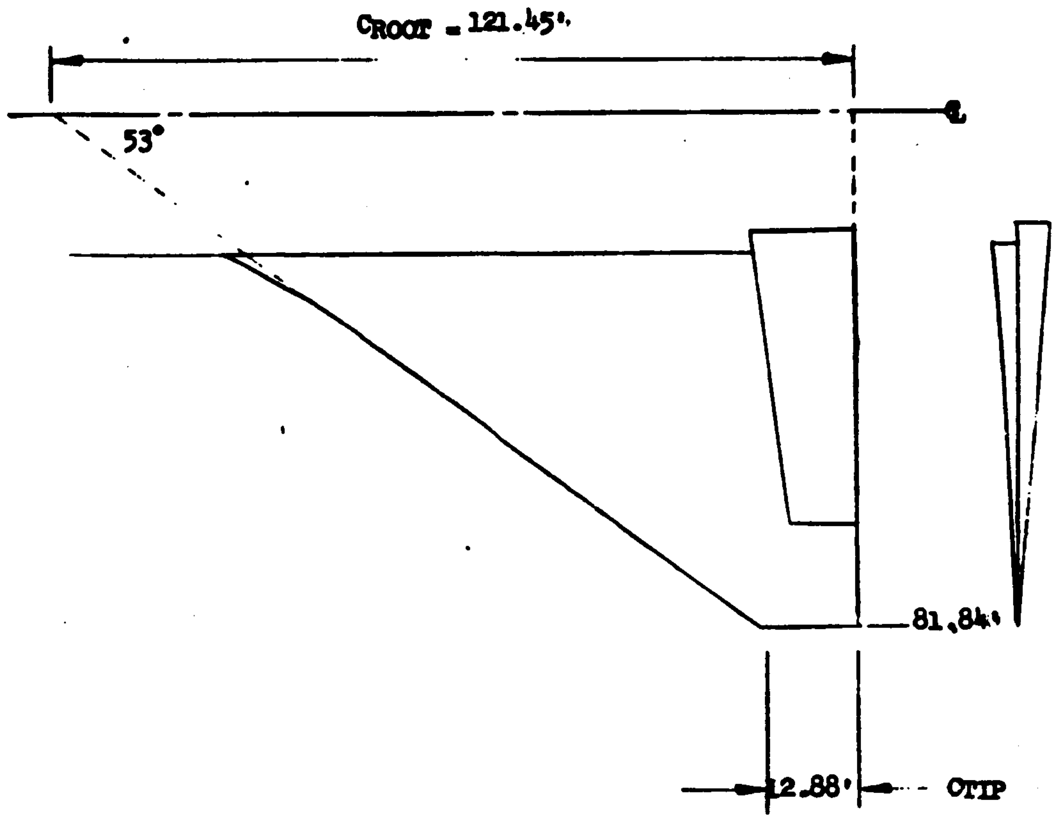


FIGURE 9. WING W_{14} - BOOSTER CONFIGURATION

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

MODEL DESCRIPTION

Delta Wing Booster - (Cont'd)

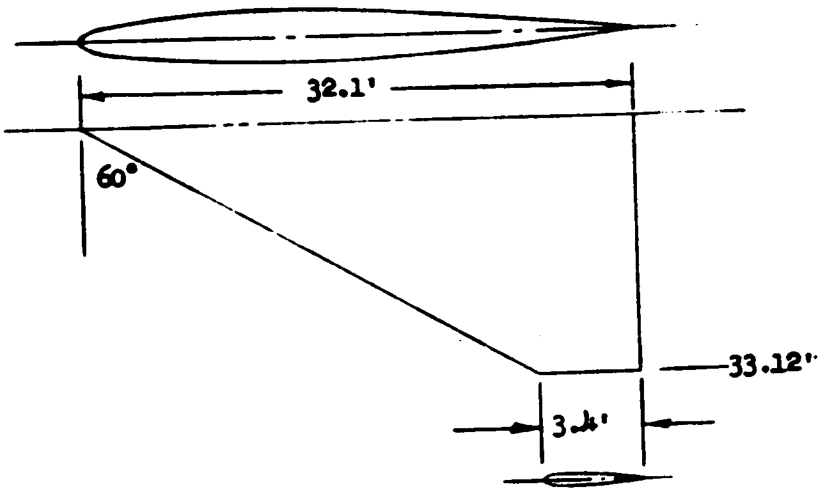


FIGURE 10. CANARD - C4

MODEL DESCRIPTION

Delta Wing Booster - (Cont'd)

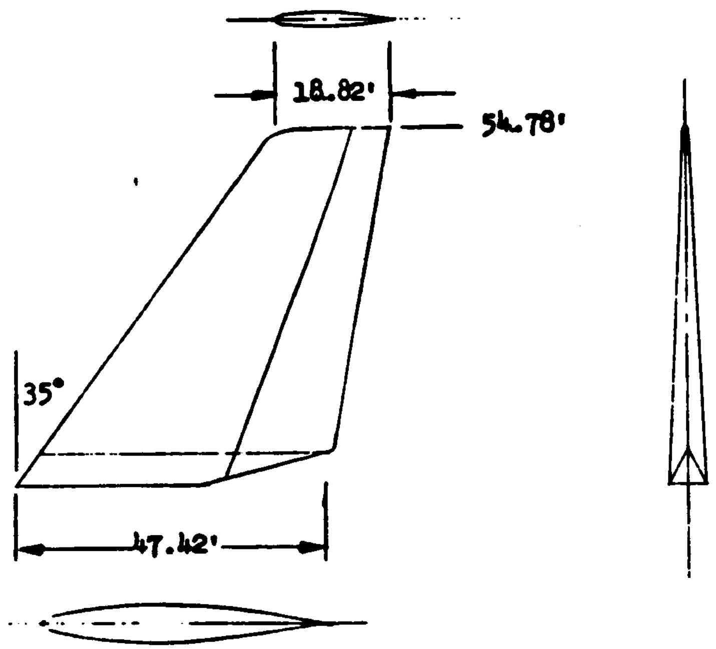


FIGURE 11. **VERTICAL TAIL - V8**

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1- 382

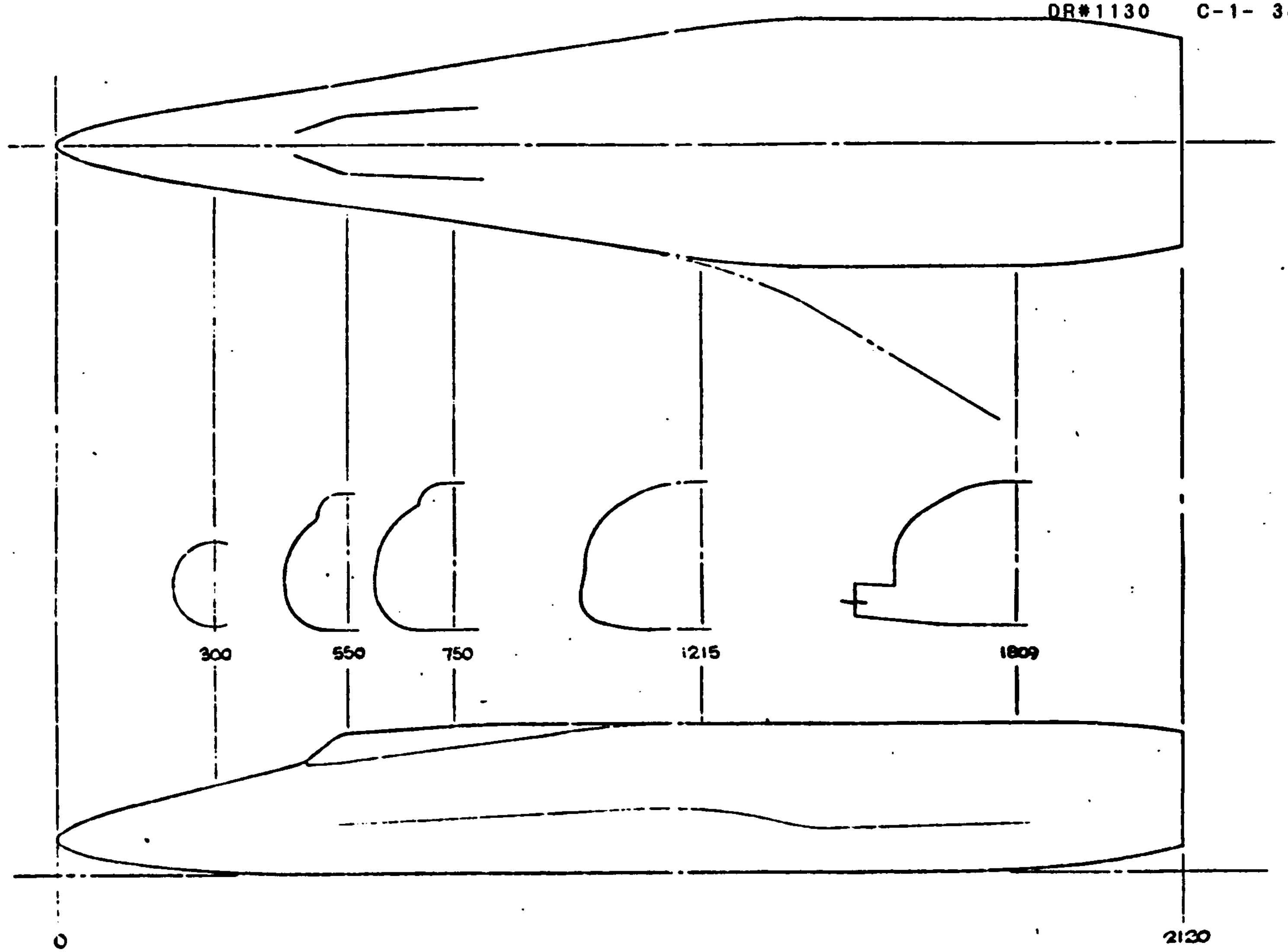


FIGURE 12. BODY B5 9902-134B CONFIGURATION

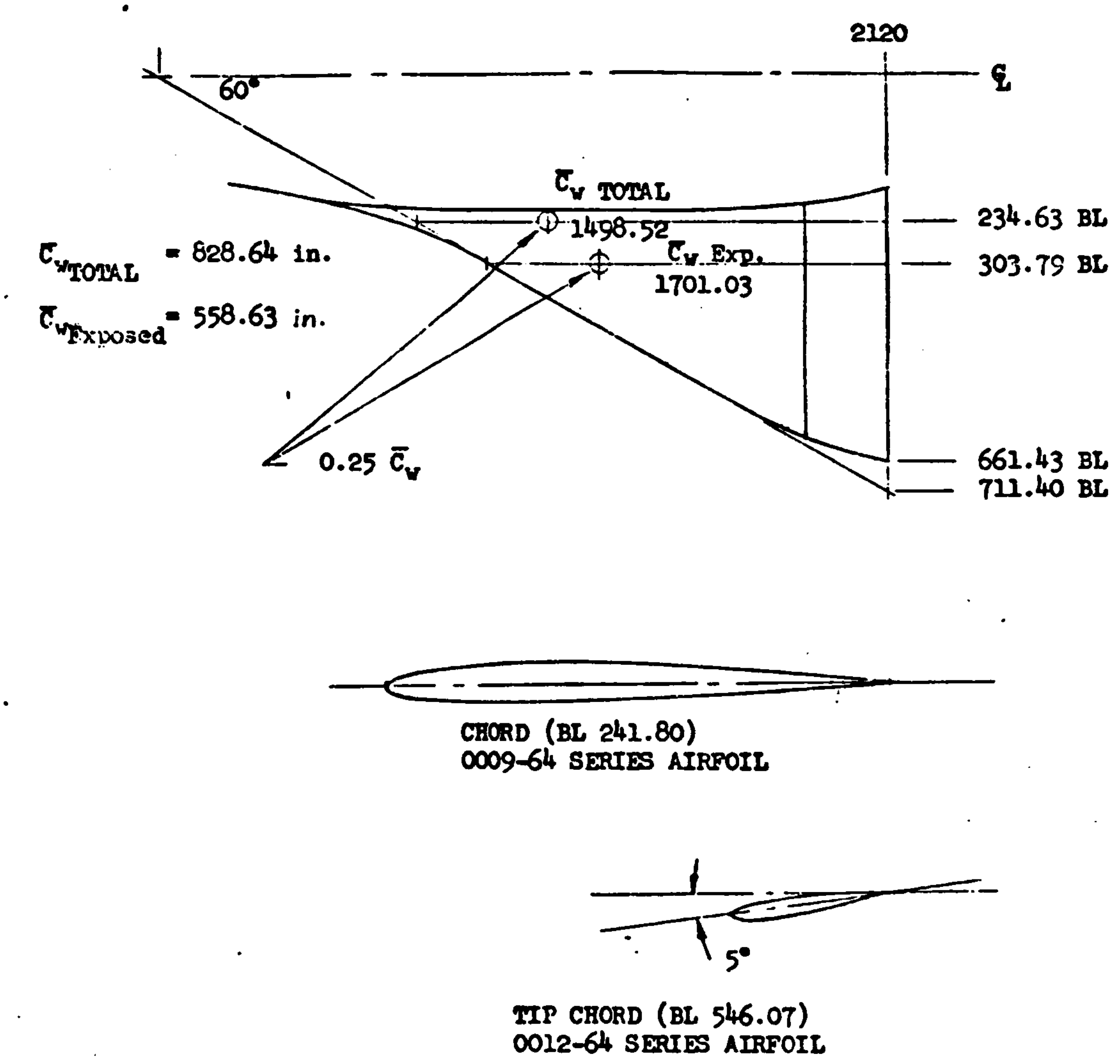


FIGURE 13. WING W_{17} 9992-134 D Configuration

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1130 C-1-384

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

MODEL DESCRIPTION - CONTINUED
<u>Dimensional Data</u> - Continued
Delta Wing Orbiter - Continued

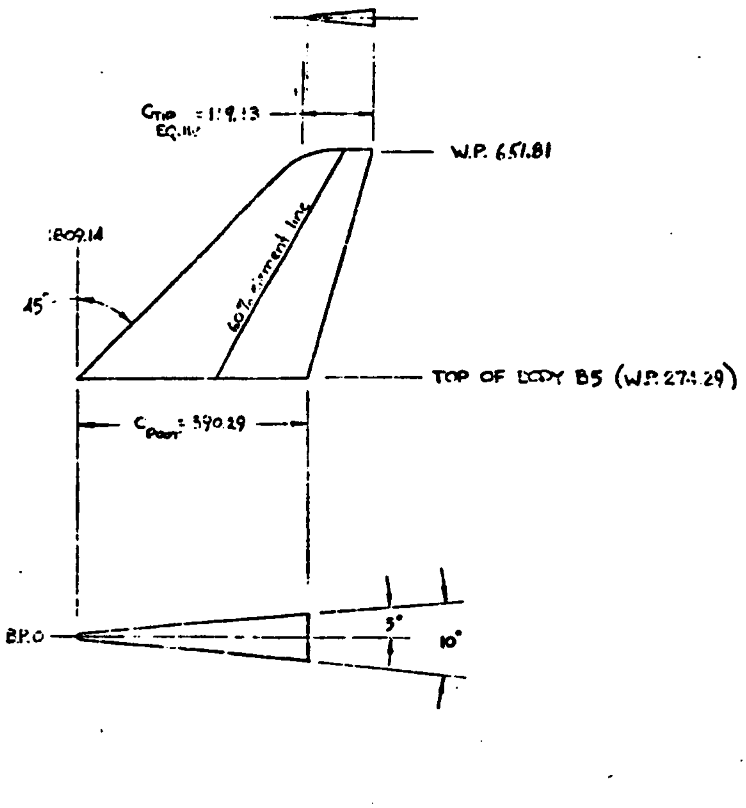
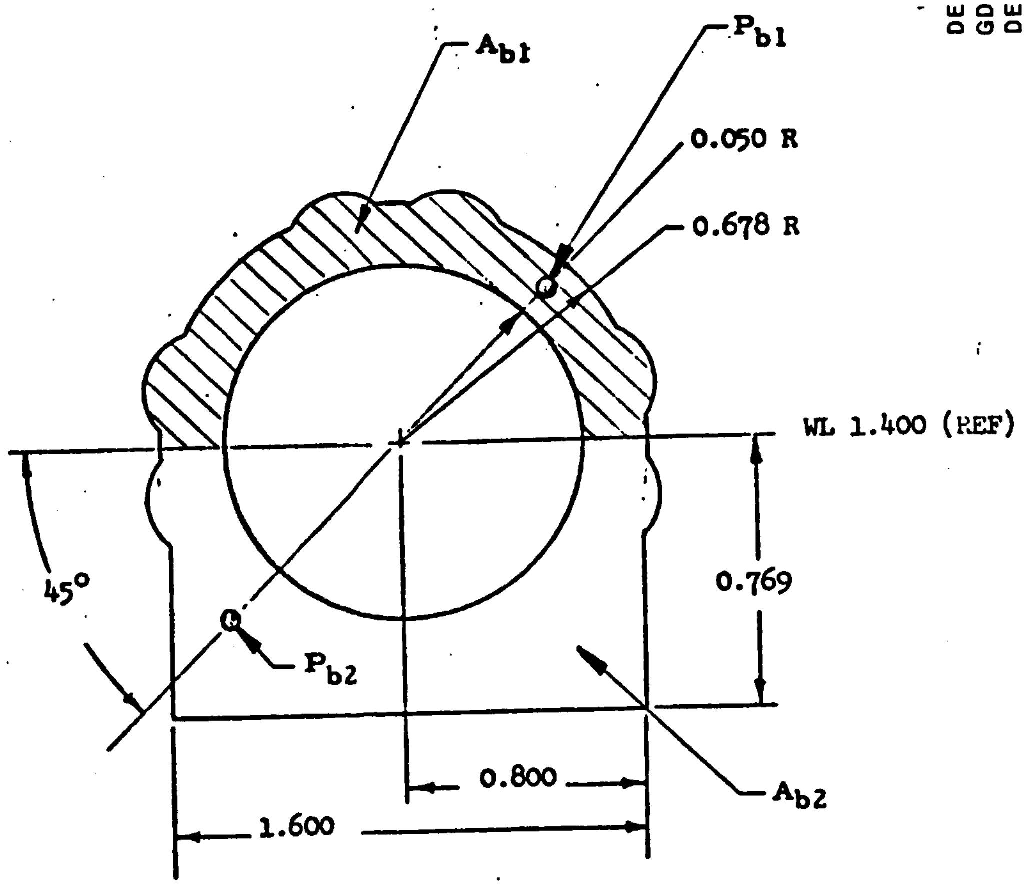


FIGURE 14.
VERTICAL STABILIZER V17



View Looking Forward

NOTE: Location of pressure taps may vary slightly as installation will be made during test setup.

FIGURE 15. BOOSTER BASE PRESSURE ORIFICE LOCATIONS

TABLE IV.

TEST UPWT 966 DATA SET/RUN NUMBER

COLLATION SUMMARY

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1237 C-1- 386
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 1.6	1.9	2.16
RØBL01	LAUNCH (TANDEM ORB)	A	0			1	6	12
02		A	5			2	7	13
09		0	B			3	8	14
10		7	B			4	9	15
03	(TANDEM INVERT ORB)	A	0			16	19	20
04		A	5			17	18	21
05	(PARALLEL ORB)	A	0			22	28	32
06		A	5			23	29	33
11		0	B			24	30	34
12		7	B			25	31	35
RØBB07	BOOSTER ALONE	A	0			38	42	48
08		A	5			39	43	49
13		0	B			40	44	50
14		7	B			41	45	51
RØBØ21	ORBITER ALONE	A	0			52	56	59
22		A	5			53	57	58

TEST RUN NUMBERS

1	7	13	19	25	31	37	43	49	55	61	67	75 76
BETA	CN	CA	CLM	CBL	CYN	CY	CL	CD	CAB	MACH	ALPHA	10
COEFFICIENTS:										IDPVAR(1)	IDPVAR(2)	NDV

α or β SCHEDULES
A) $-8° \rightarrow 12°$, $\Delta\alpha = 2°$
B) $-4° \rightarrow 6°$, $\Delta\beta = 2°$

NASA-MSFC-MAF

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TABLE IV (CONCLUDED)

TEST UPWT 966 DATA SET/RUN NUMBER

COLLATION SUMMARY

SHEET 2 of 2
☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 1.6	1.9	2.16
RØBØ15	MATED ORBITER (TANDEM)	A	0			1	6	12
16		A	5			2	7	13
23		0	B			3	8	14
24		7	B			4	9	15
17	(TANDEM INVERT)	A	0			16	19	20
18		A	5			17	18	21
19	(PARALLEL)	A	0			22	28	32
20		A	5			23	29	33
25		0	B			24	30	34
26		7	B			25	31	35

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

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NASA-MSFC-MAF

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1237 C-1- 387

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1237 C-1- 388

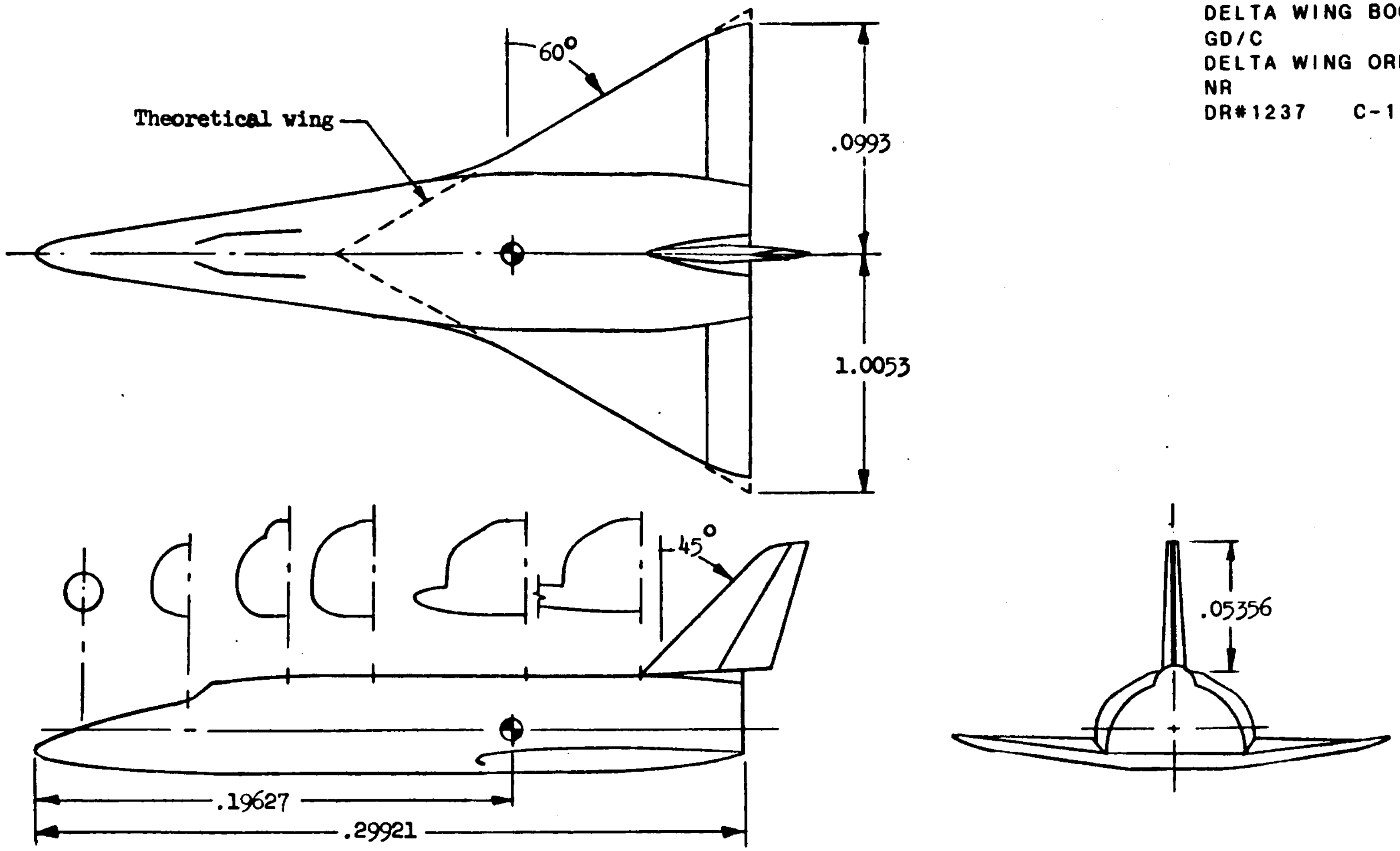

Figure 2. - North American Rockwell 134 D Orbiter
All dimensions are in meters.

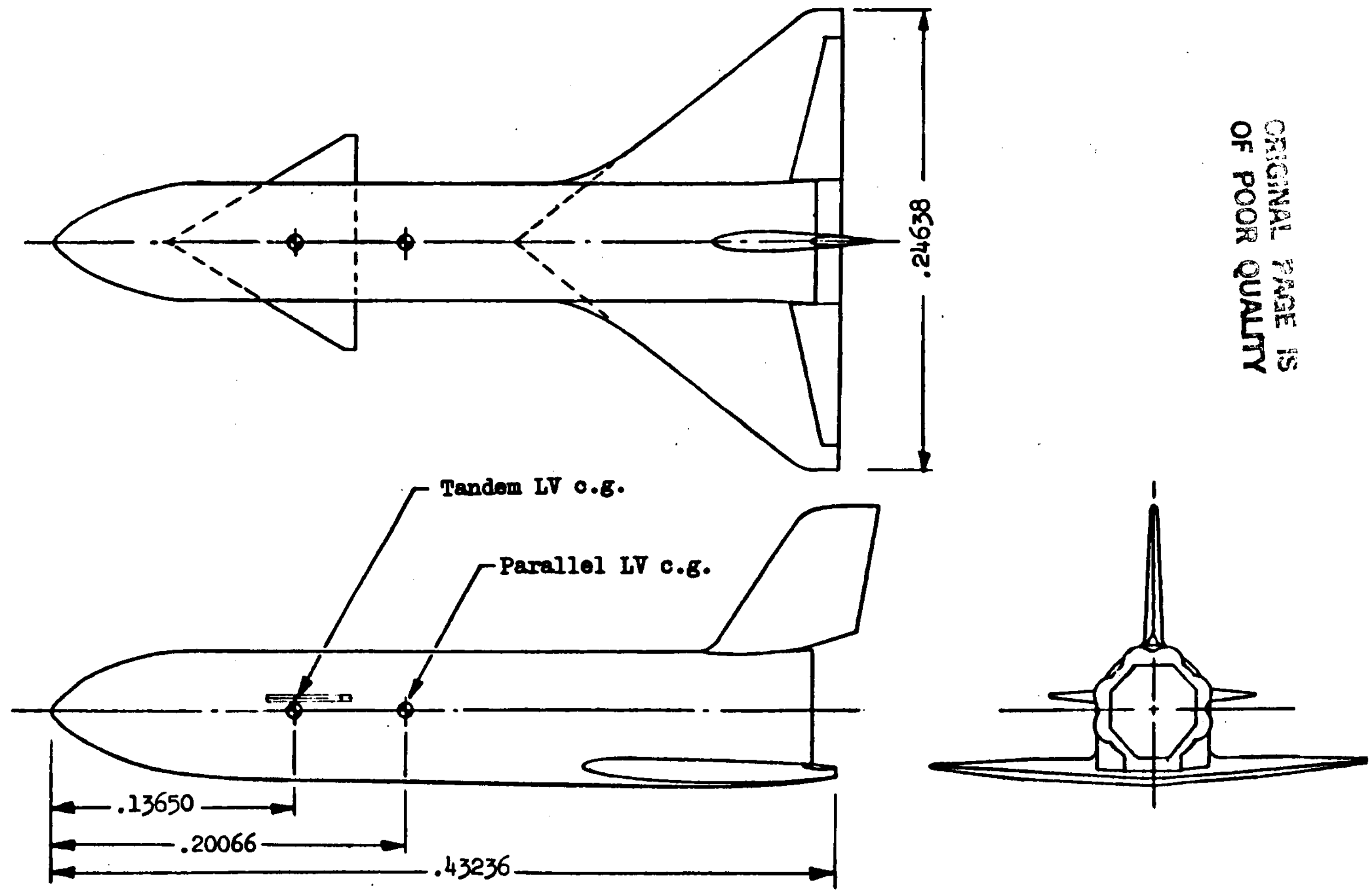

Figure 3.- General Dynamics B9U booster. All dimensions are given in meters.

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1237 C-1- 389

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1237 C-1- 390

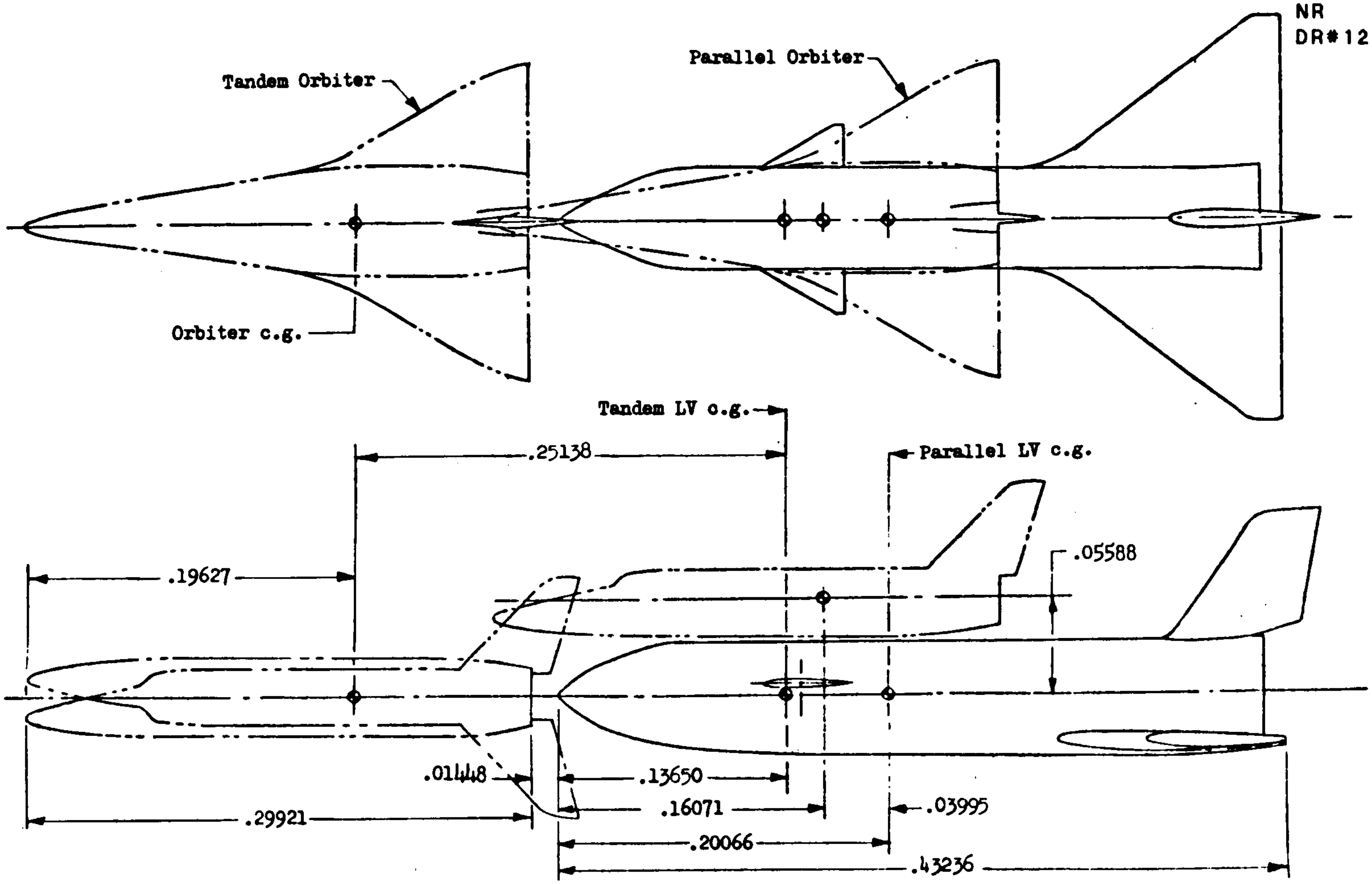

Figure 4.- Tandem and parallel launch configurations. All dimensions are given in meters.

TABLE II

TEST TWT 517 DATA SET/RUN NUMBER

COLLATION SUMMARY

S-0440

DMS-DR-1213

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δ_e	δ_{BL}	δ_{BF}	δ_c	NO. of RUNS	.6	.9	1.0	1.2	1.96	2.74	3.48	4.96				
RS6001	BI CI	A	0	–	–	–	0		043/0	042/0		041/0	063/0							
002		B											113/0	092/0						
003		C												091/0		090/0				
004	BI WI CI	A		0					038/0	039/0		040/0	062/0							
005		B											112/0	093/0						
006		C												094/0		095/0				
007	BI WI	A					–		037/0	036/0		035/0	061/0							
008		B											111/0	098/0						
009		C												097/0		096/0				
010		0	D						032/0	033/0		034/0								
011		15							031/0	030/0		029/0	060/0							
012		30											108/0	105/0						
013		50												106/0		107/0				
014	BI WI VI	A	0		0	0	0		020/0	021/0		022/0	058/0							
015		B											110/0	099/0						
016		C												100/0		101/0				
017		0	D						025/0	024/0		023/0								
018		15							026/0	027/0		028/0	059/0							
019		30											109/0	102/0						
020		50												103/0		104/0				

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: CLM CN CY CBL CYN CA CAB CAC CL CD → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES:

A: $\alpha = 0^\circ$ TO 20° D: $\beta = -10^\circ$ TO 10°

B: $\alpha = 20^\circ$ TO 40° $\Delta\alpha = \Delta\beta = 2^\circ$

C: $\alpha = 40^\circ$ TO 60°

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 391

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TABLE II (Continued)

TEST TWT-517 DATA SET/RUN NUMBER

COLLATION SUMMARY

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 392
POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δE	δRL	δRR	δC	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.9	1.0	1.2	1.96	2.74	3.48	4.96
R56021	B1W1C1V1	A	O	0	0	0	0		001/0	002/0		003/0	054/0			
022		B							120/0				114/0	084/0		
023		C												085/0	086/0	087/0
024		C	D						006/0	005/0		004/0				
025		15							007/0	008/0		009/0	055/0			
026		30											119/0	083/0		
027		50												082/0	081/0	080/0
028		A	O				10		019/0							
029		C					-50							089/0		088/0
030		C	D		-20	-20	0		013/0	014/0		015/0				
031		15							012/0	011/0		010/0	056/0			
032		30											118/0	077/0		
033		50												078/0		079/0
034		30			20								117/0	076/0		
035		50												075/0		074/0
036		30			0	-40							115/0	071/0		
037		50												072/0		073/0
038		A	O	-10		0			018/0	017/0		016/0	057/0			
039		B											115/0	070/0		
040		C		10										069/0		068/0

TEST RUN NUMBERS

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CY	CBL	CYN	CA	CAB	CAC	CL	CD	IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS:

α or β SCHEDULES

A: $\alpha = 0° \text{ TO } 20°$ D: $\beta = -10° \text{ TO } 10°$

B: $\alpha = 20° \text{ TO } 40°$ $\Delta\alpha = \Delta\beta = 2°$

C: $\alpha = 40° \text{ TO } 60°$

NASA-MSFC-MAF

TABLE II (Concluded)

TEST TWT 517 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δ_E	δ_{RL}	δ_{RR}	δ_C	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.9	1.0	1.2	1.96	2.74	3.48	4.96				
RSL041	L1 O1 D1	E	O	0	0	0	0		044/0	045/0	046/0	047/0	053/0	065/0		064/0				
042	↓	O	D	0	0	0	0		051/0	050/0	049/0	048/0	052/0	066/0		067/0				

TEST RUN NUMBERS

1 CLM 7 CN 13 CY 19 CBL 25 CYN 31 CA 37 CAB 43 CAC 49 CL 55 CD 61 IDPVAR(1) 67 IDPVAR(2) 75 76 NDV

COEFFICIENTS:

α or β SCHEDULES

E: $\alpha = -10^\circ$ TO 10°

D: $\beta = -10^\circ$ TO 10°

$\Delta\alpha = \Delta\beta = 2^\circ$

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DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 393

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 394

NOTE: 1. Dimensions are in inches.
2. Model values are shown in parenthesis.

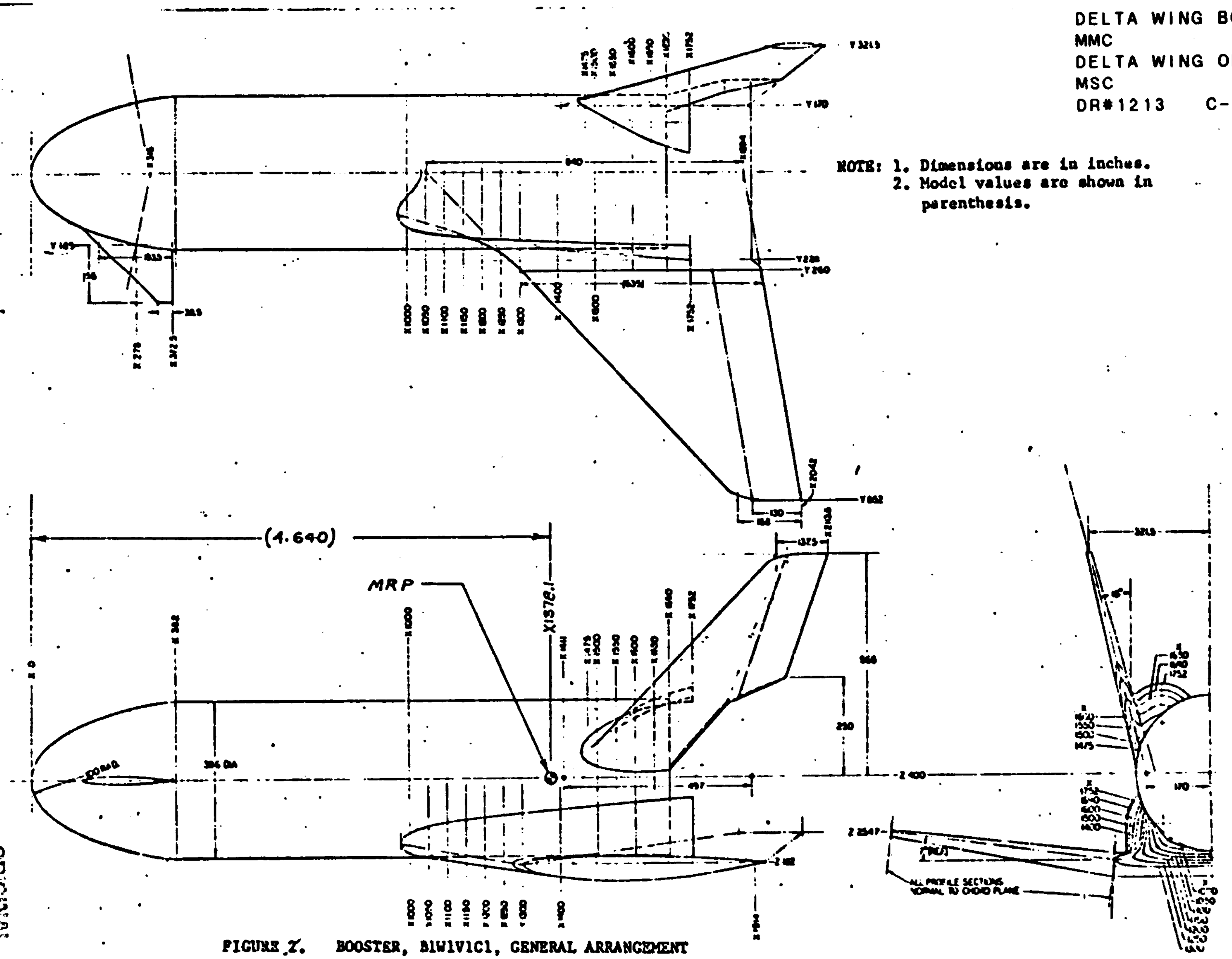
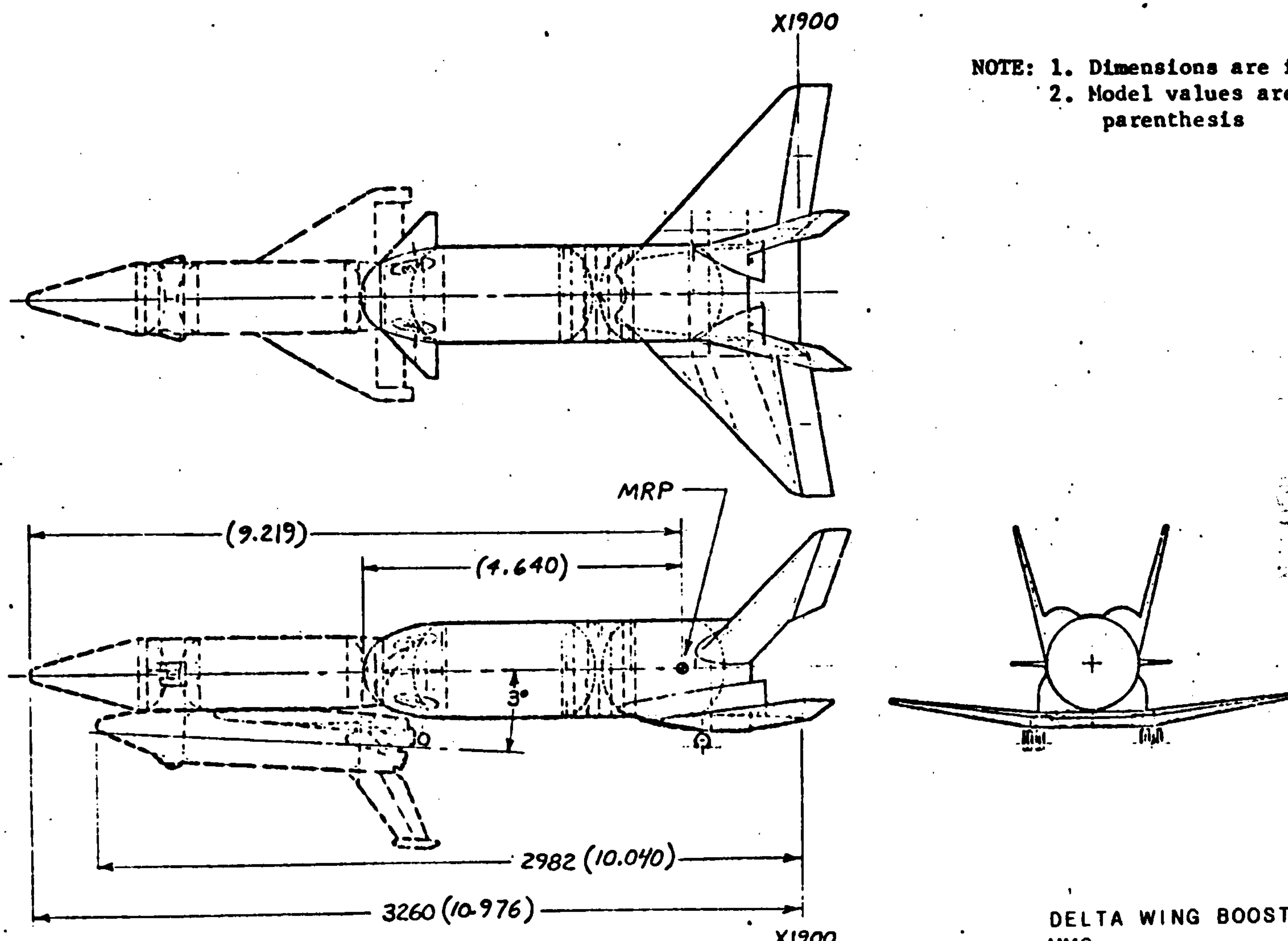


FIGURE 2. BOOSTER, B1W1V1C1, GENERAL ARRANGEMENT

NOTE: 1. Dimensions are in inches
2. Model values are shown ir parenthesis



DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 395

FIGURE 3. LAUNCH CONFIGURATION, L1 O1 D1, GENERAL ARRANGEMENT

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 396

NOTES: 1. All dimensions are full scale in inches unless otherwise indicated.
2. Model values are shown in inches in parenthesis.

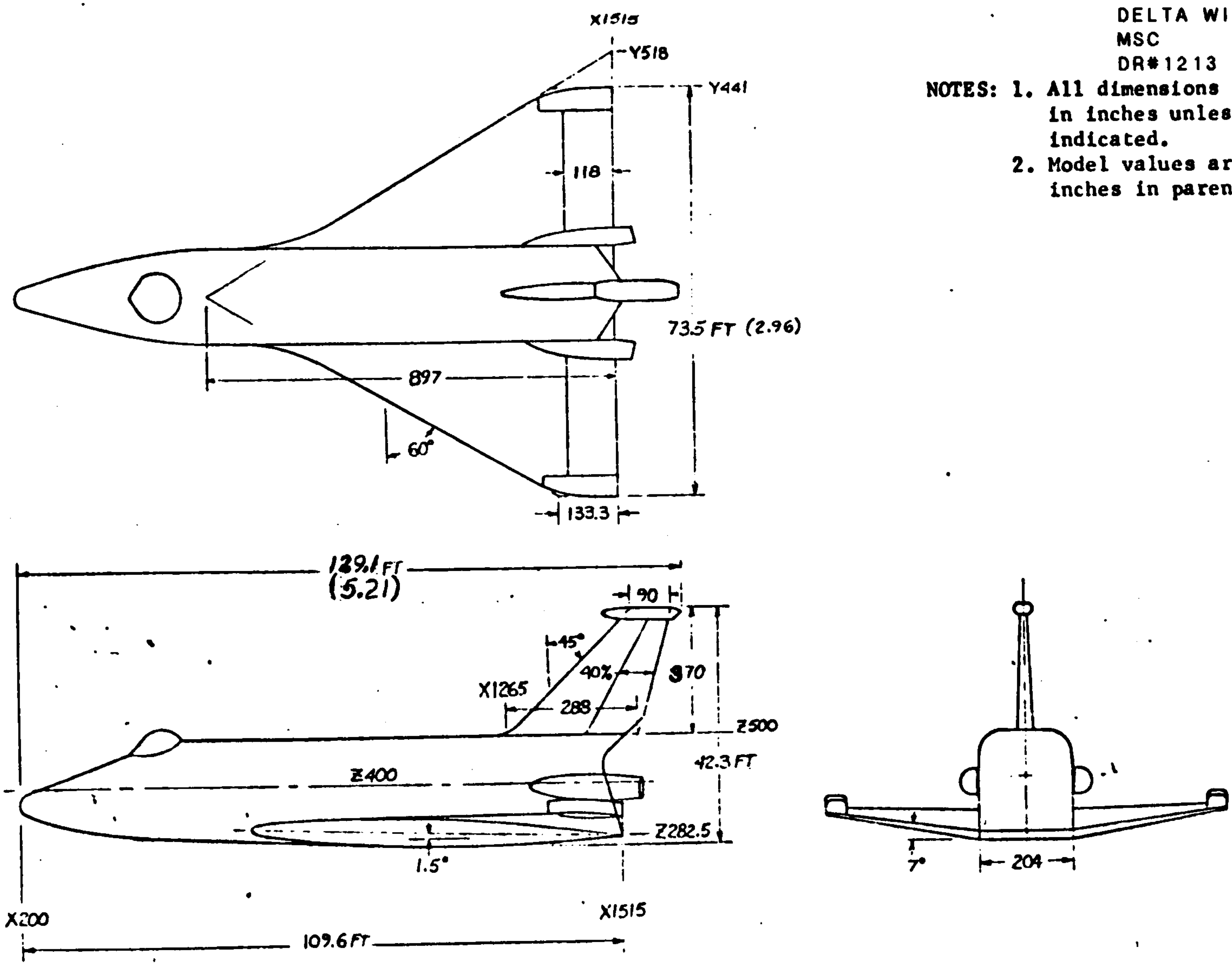


FIGURE 4. GENERAL ARRANGEMENT OF 040A ORBITER

NOTES:
1. All dimensions are in inches
2. Model values are shown in parenthesis

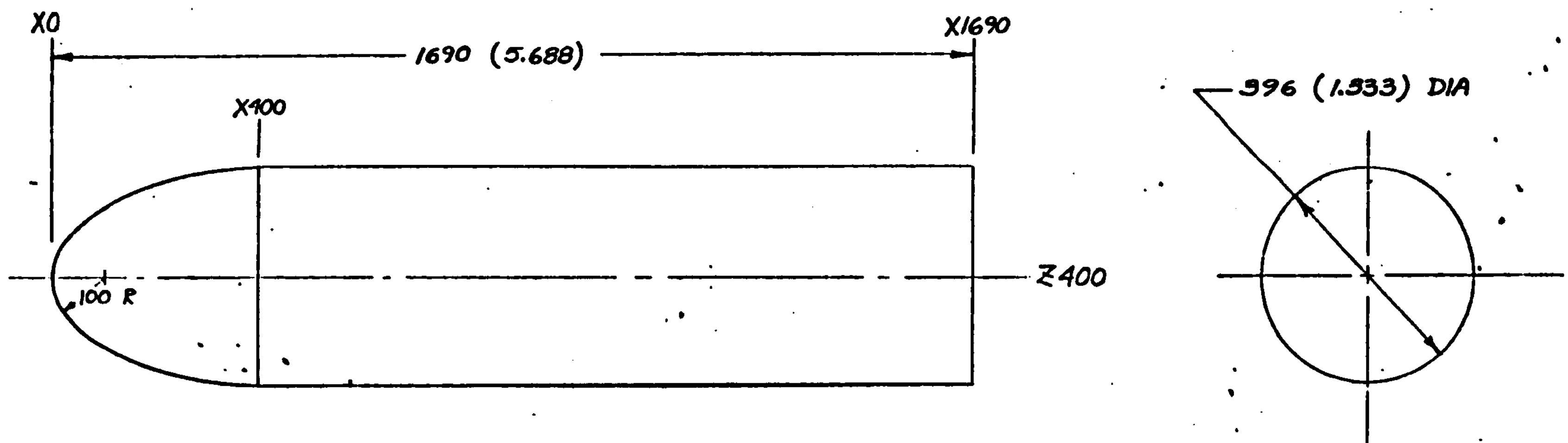


FIGURE 5. BOOSTER BODY, B1

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 397

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1- 398

NOTES:

1. All dimensions are in inches
2. Model values are shown in parehthesis

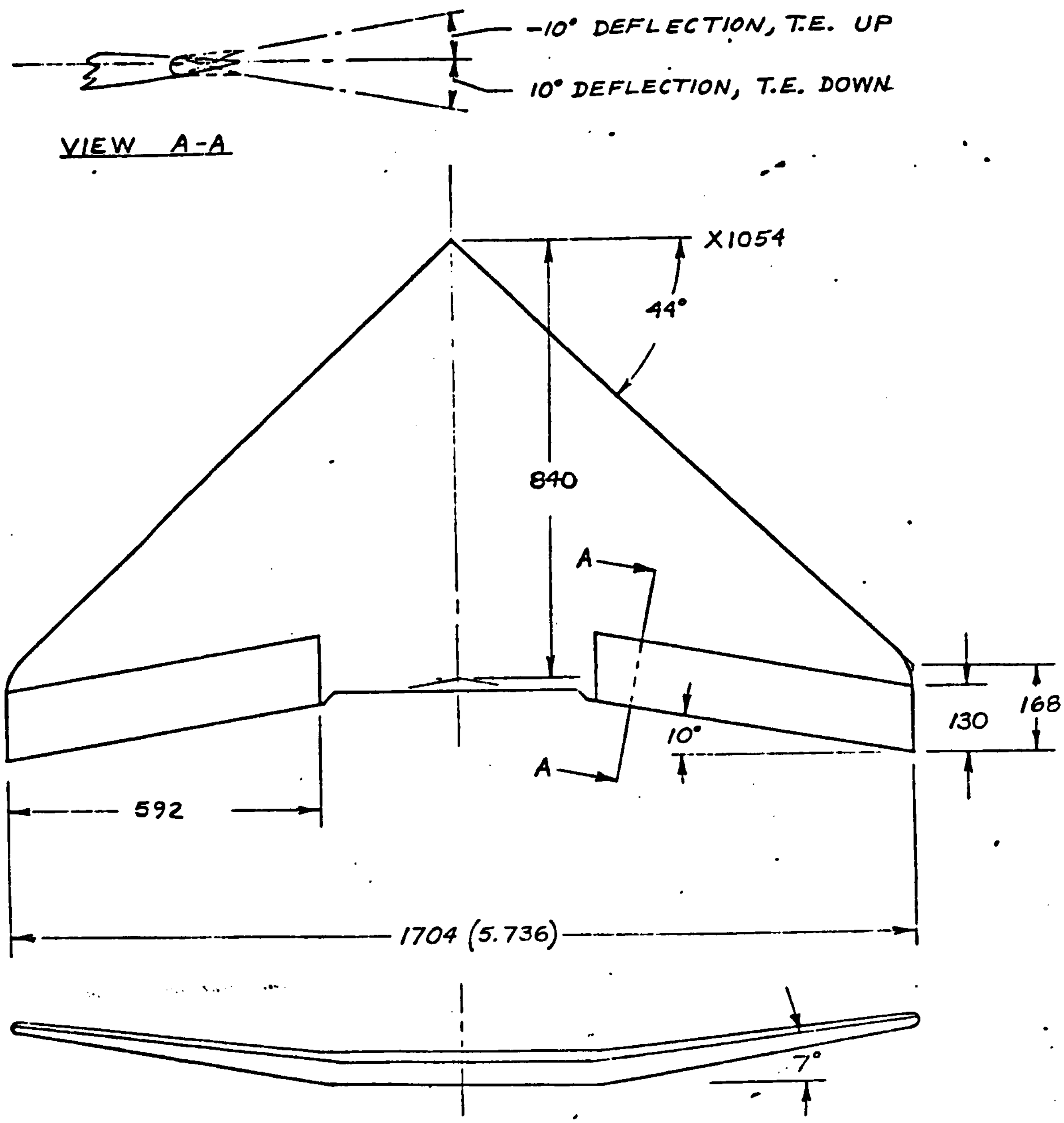


FIGURE 6. BOOSTER WING AND ELEVON, W1

DELTA WING BOOSTER
MMC
DELTA WING ORBITER
MSC
DR#1213 C-1-399

NOTES:

1. All dimensions are in inches
2. Model values are shown in parenthesis

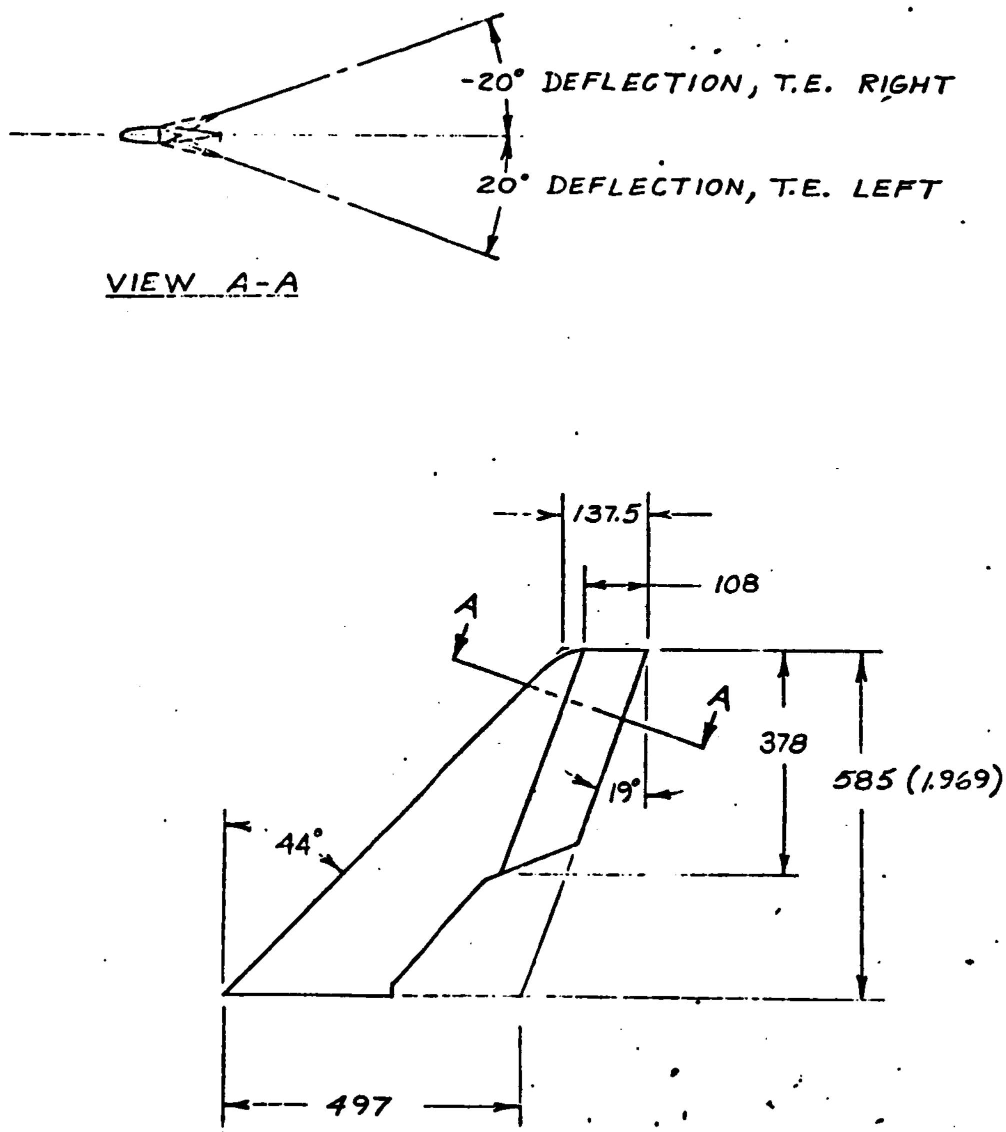


FIGURE 7. BOOSTER VERTICAL TAIL AND RUDDER, V1

NOTES:
1. All dimensions are in inches
2. Model values are shown in parenthesis

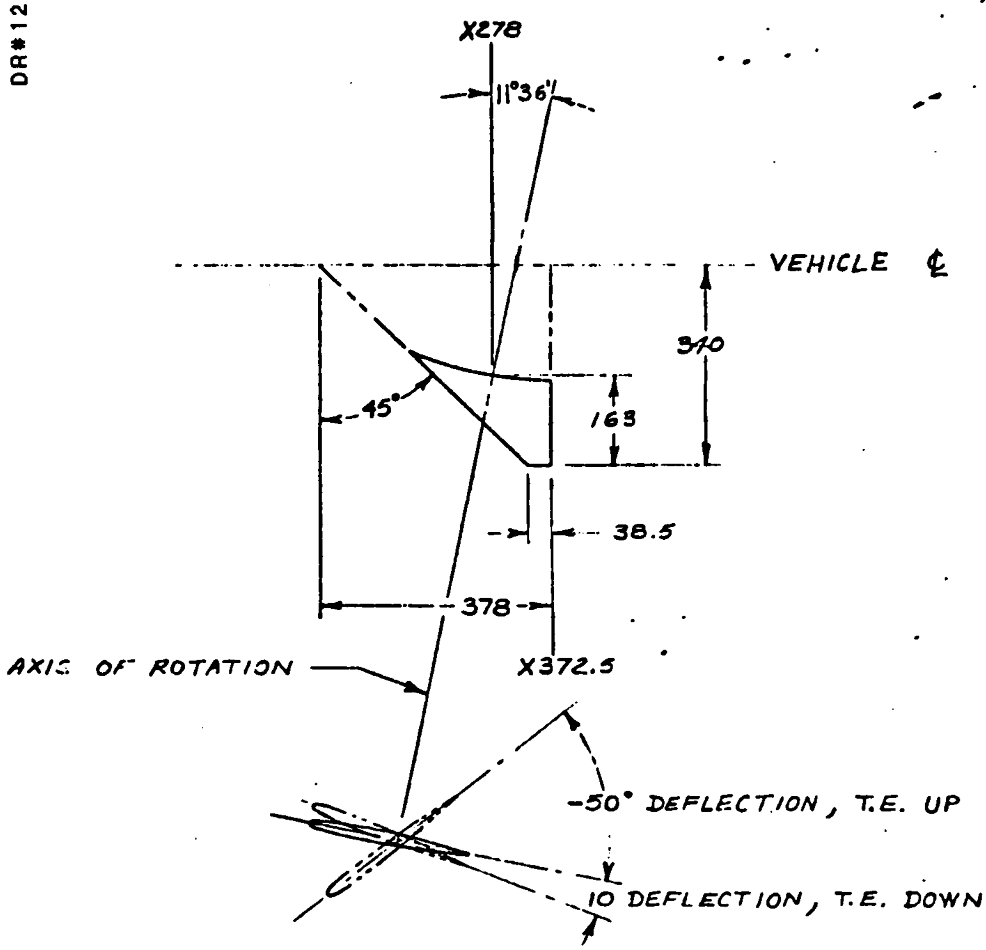


FIGURE 8. BOOSTER CANARD, C1 (LEFT SURFACE SHOWN)

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TEST S-XXX DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	α	β	δ	δ	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RCU 001	$B_{11}W_{11}V_5$		A	0°			0.9																3
RCU 002	↓		0°	B			0.9																4
RCU 003			A	0°			1.1																1
RCU 004			0°	B			1.1																2
RCU 005		$B_{83}W_{86}$	A	0°	0°	0°	1.1	14	15	16	11	12	13	5	6	7	8	9	10				
RCU 006		↓	↓	↓	↓	↓	0.9	17	18	19	20	21	22	23	24	25	26	27	28				
RCU 007		$B_{83}W_{86}V_{81}$	0°	B			0.9			29	30		31		32	33			34				
RCU 008		↓	↓	↓			1.1			38	39		40		35	36			37				
RCU 009						5°	1.1			41	42		43		44	45			46				
RCU 010					↓	↓	0.9			50	51		52		47	48			49				
RCU 011		$B_{83}W_{86}$	A	0°	4°	0°	0.9				53	54	55	56	57	58	59	60	61				
RCU 012		↓	↓	↓	↓	↓	1.1				68	69	70	65	66	67	62	63	64				
RCU 013					-5°		1.1				71	72	73	74	75	76	77	78	79				
RCU 014					↓		0.9				86	87	88	83	84	85	80	81	82				
RCU 015	↓						0.6				89	90	91	205	206	207	208	209	210				
RCU 016	$B_{11}W_{11}$		0°	B			0.9																92
RCU 017	↓		↓	↓			1.1																93
RCU 018	$B_{11}W_{11}V_5$	$B_{83}W_{86}$	0°	0°	0°	0°	1.1													106	107	108	
RCU 019	↓	↓	↓	↓	↓	↓	0.9													109	110	111	
RCU 020			-5°		-5°		0.9													100	101	102	

1	7	13	19	25	31	37	43	49	55	61	67	75
CA	CY	CN	CBL	CLM	CYN	CPC	CPB			SEPPDS		8

COEFFICIENTS:
IDIVAR(1) IDIVAR(2)

SCHEDULES
A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 401

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 402
☐ PRETEST
☑ POSTTEST

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TEST S-XXX DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	Orbiter α	Orbiter β	Booster α	Booster β	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RCU 021	$B_N W_N V_S$	$B_{B3} W_{BC}$	-5°	0°	-5°	0°	1.1													103	104	105	
RCU 022	↓	↓	4°		4°		1.1													94	95	96	
RCU 023			↓		↓		0.9													97	98	99	
RCU 024			0°		0°		1.38													112	113	114	
RCU 025			4°		4°															115	116	117	
RCU 026			-5°		-5°															118	119	120	
RCU 027		$B_{B3} W_{BC}$	A		↓						121	122	123	124	125	126	127	128	129				
RCU 028		↓	↓	↓	0°	↓		139	140	141	136	137	138	133	134	135	130	131	132				
RCU 029	↓																						142
RCU 030			0°	B																			143
RCU 031	$B_N W_N$																						144
RCU 032	$B_N W_N V_S$	$B_{B3} W_{BC} V_{B1}$			0°	0°				145	146		147		148	149			150				
RCU 033	↓	↓	↓	↓	↓	5°				154	155		156		151	152			153				
RCU 034		$B_{B3} W_{BC}$	A	0°	4°	0°	↓				157	158	159	160	161	162	163	164	165				
RCU 035		↓	-5°		-5°															166	167	168	
RCU 036			↓		↓		0.6													169	170	171	
RCU 037			4°		4°															172	173	174	
RCU 038			0°		0°															175	176	177	
RCU 039		↓	A		↓	↓		178	179	160	187	188	189	164	185	166	181	162	183				
RCU 040	↓		↓	↓			↓																190

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CA CY CN CBL CLM CYN CPC CPB SEPPOS B

COEFFICIENTS: → IDIVAR(1) IDIVAR(2) NDV

α or β

SCHEDULES: A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

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TEST S-XXX DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER α	ORBITER β	BOOSTER α	BOOSTER β	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RCU041	$B_{11}W_{11}V_5$		0°	B			0.6																191
RCU042	$B_{11}W_{11}$		↓	↓			↓																192
RCU043	$B_{11}W_{11}V_5$	$B_{83}W_{86}V_{81}$	↓	↓	0°	0°	↓			193	194		195		196	197			198				
RCU044	↓	↓	↓	↓	↓	5°	↓			202	203		204		199	200			201				
RCU045	↓	$B_{83}W_{86}$	A	0°	4°	0°	0.6				217	218	219	214	215	216	211	212	213				
RCU046	$B_{11}W_6H_9V_5$	$B_{83}W_{81}H_{81}$	A	0°	0°	0°	0.6							220	221	222							

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CA CY CN CBL CLM CYN CPC CPB SEPPOS B

COEFFICIENTS: → IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES
$A = \pm 10°$ (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
$B = \pm 6°$ (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 403

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 404

☐ PRETEST

☑ POSTTEST

ORIGINAL PAGE IS
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TEST S-XXX DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	Orbiter α	Orbiter β	Booster α	Booster β	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RCU 047	$B_{11}W_{11}V_5$	$B_{83}W_{BC}$	A	0°	0°	0°	1.1	514	515	516	511	512	513	505	506	507	508	509	510				
RCU 048							0.9	517	518	519	520	521	522	523	524	525	526	527	526				
RCU 049		$B_{83}W_{BC}V_{B1}$	0°	B			0.9			529	530		531		532	533			534				
RCU 050							1.1			538	539		540		535	536			537				
RCU 051						5°	1.1			541	542		543		544	545			546				
RCU 052							0.9			550	551		552		547	548			549				
RCU 053		$B_{83}W_{BC}$	A	0°	4°	0°	0.9				553	554	555	556	557	558	559	560	561				
RCU 054							1.1				568	569	570	565	566	567	562	563	564				
RCU 055					-5°		1.1				571	572	573	574	575	576	577	578	579				
RCU 056							0.9				586	587	588	583	584	585	580	581	582				
RCU 057							0.6				589	590	591	705	706	707	708	709	710				
RCU 058			0°		0°		1.1													606	607	608	
RCU 059							0.9													609	610	611	
RCU 060			-5°		-5°		0.9													600	601	602	
RCU 061							1.1													603	604	605	
RCU 062			4°		4°		1.1													594	595	596	
RCU 063							0.9													597	598	599	
RCU 064			0°		0°		1.38													612	613	614	
RCU 065			4°		4°															615	616	617	
RCU 066			-5°		-5°															618	619	620	

1 7 13 19 25 31 37 43 49 55 61 67 76

CA CY CN CBL CLM CYN CPC CPB SEPPOS B

COEFFICIENTS: IDVAR(1) IDVAR(2) NDV

α or β SCHEDULES

A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

TEST S-XXX DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER α	ORBITER β	BOOSTER α	BOOSTER β	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RCU 067	$B_{11}W_{11}V_5$	$B_{83}W_{86}$	A	0°	-5°	0°	1.38				621	622	623	624	625	626	627	628	629				
RCU 068					0°			639	640	641	636	637	638	633	634	635	630	631	632				
RCU 069		$B_{83}W_{86}V_{81}$	0°	B						645	646		647		648	649			650				
RCU 070						5°				654	655		656		651	652			653				
RCU 071		$B_{83}W_{86}$	A	0°	4°	0°					657	658	659	660	661	662	663	664	665				
RCU 072			5°		5°																		
RCU 073							0.6													666	667	668	
RCU 074			4°		4°															669	670	671	
RCU 075			0°		0°															672	673	674	
RCU 076			A					678	679	680	687	688	689	684	685	686	681	682	683	675	676	677	
RCU 077		$B_{83}W_{86}V_{81}$	0°	B						693	694		695		696	697			698				
RCU 078						5°				702	703		704		699	700			701				
RCU 079		$B_{83}W_{86}$	A	0°	4°	0°					717	716	719	714	715	716	711	712	713				
RCU 080	OFF				0°																		
RCU 081							0.9																723
RCU 082							1.1																724
RCU 083		$B_{83}W_{86}V_{81}$					1.1																725
RCU 084							0.9																726
RCU 085							0.6																727
RCU 086						5°																	728
																							729

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CA	CY	CN	CBL	CLM	CYN	CPC	CPB			SEPPOS			8

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV
α or β

SCHEDULES
A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 405

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 406
POSTTEST

TEST S-XXX DATA SET COLLATION SHEET

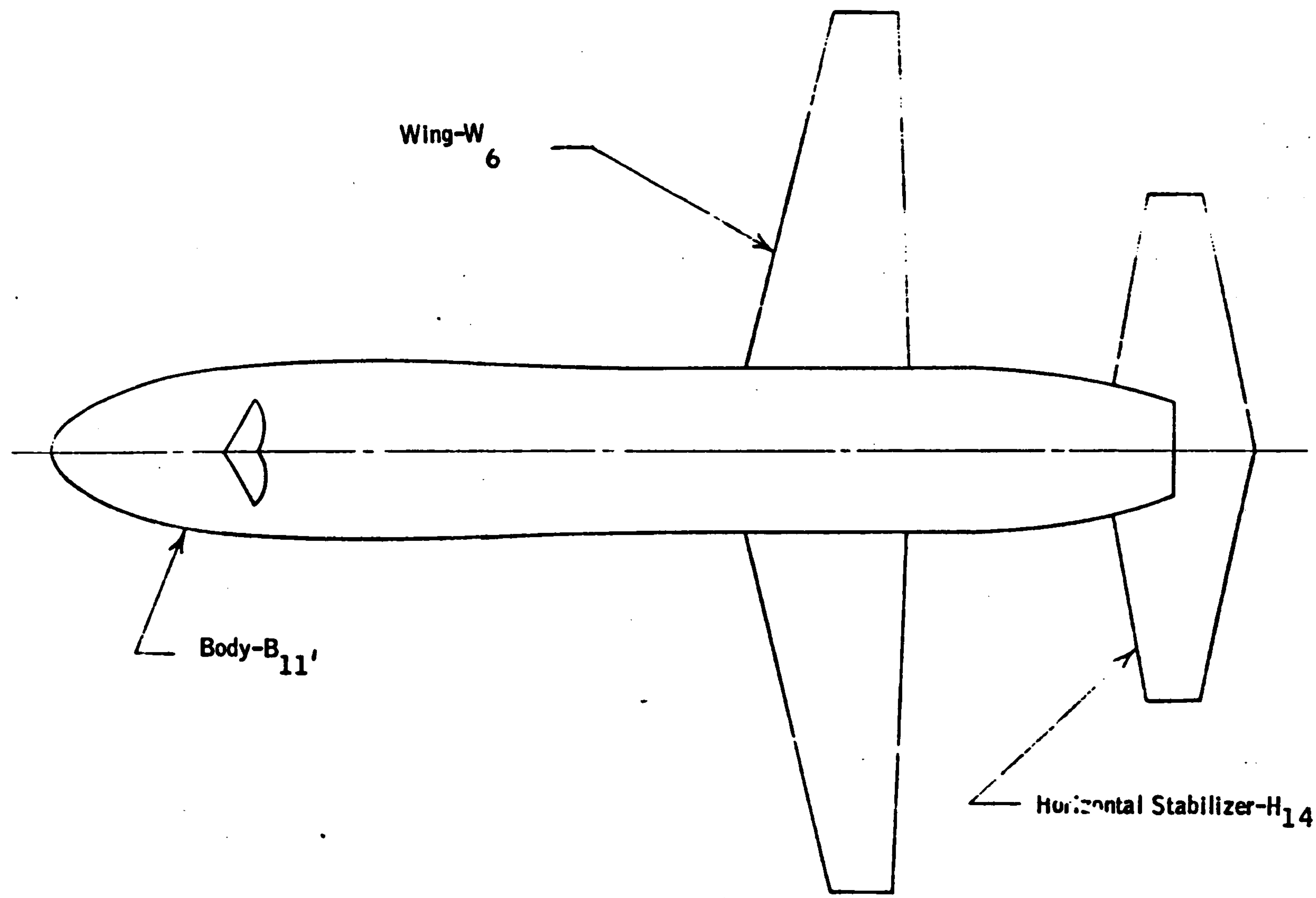
DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	[illegible]	[illegible]	[illegible]	[illegible]	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RCU 087	OFF	$B_{B3}W_{B6}V_{B1}$			0°	5°	0.9																730
RCU 088							1.1																731
RCU 089		$B_{B3}W_{B6}$					1.1																732
RCU 090							0.9																733
RCU 091							0.6																734
RCU 092					-5°	0°	0.6																735
RCU 093							0.9																736
RCU 094							1.1																737
RCU 095					4°		1.1																738
RCU 096							0.9																739
RCU 097							0.6																740
RCU 098							1.38																741
RCU 099					-5°																		742
RCU 100		$B_{B3}W_{B6}V_{BL}$			0°																		743
RCU 101		$B_{B3}W_{B6}$																					744
RCU 102						5°																	745
RCU 103		$B_{B3}W_{B6}V_{B1}$				5°																	746
RCU 104	$B_{11}W_6H_{10}V_5$	$B_{B3}W_{B1}H_{B1}$	A	0°	0°	0°	0.6							720	721	722							

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CA	CY	CN	CBL	CLM	CYN	CPC	CPB			SEPPOS		8

COEFFICIENTS: IDVAR(1) IDVAR(2) NDV

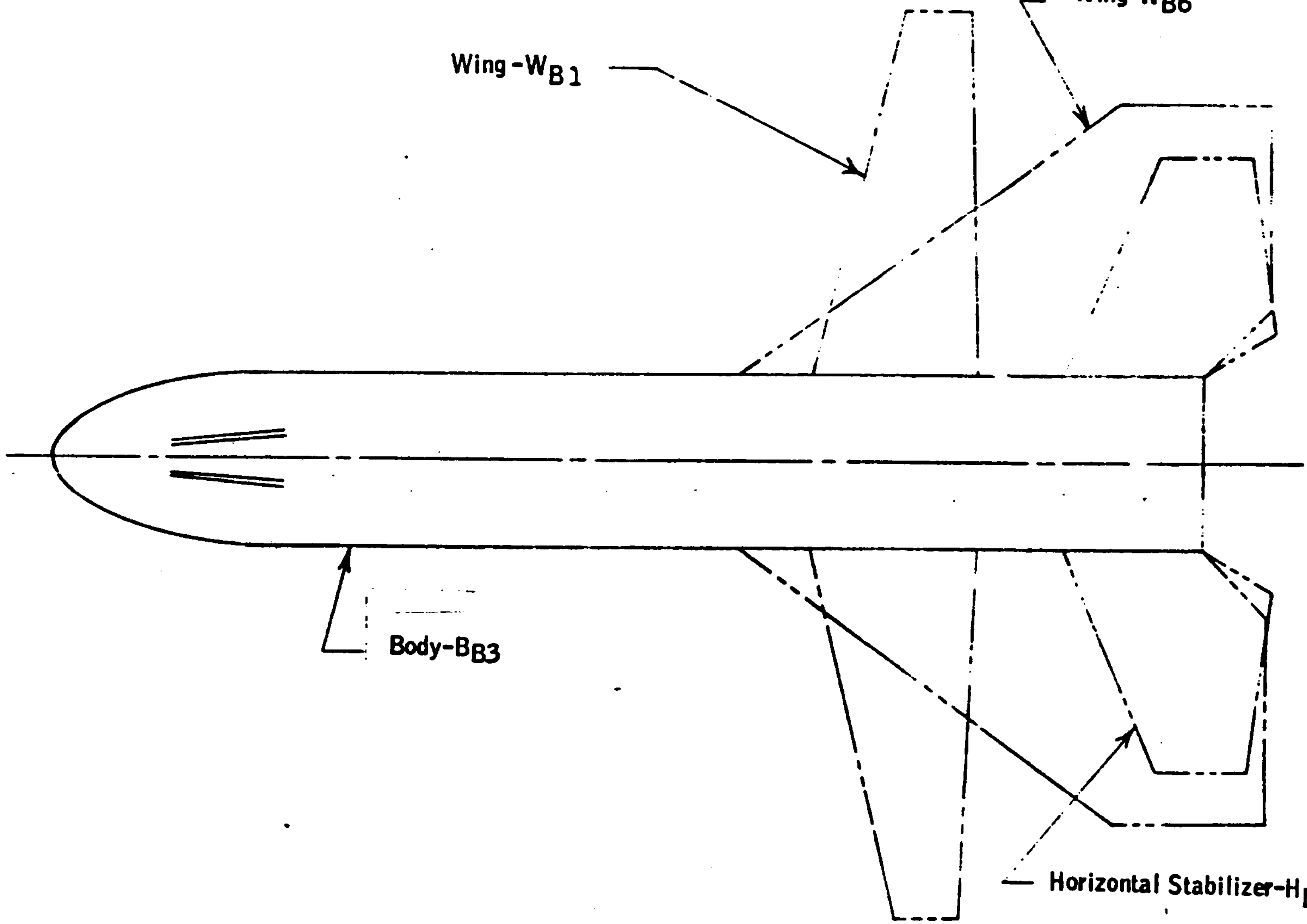
[illegible]

SCHEDULES:

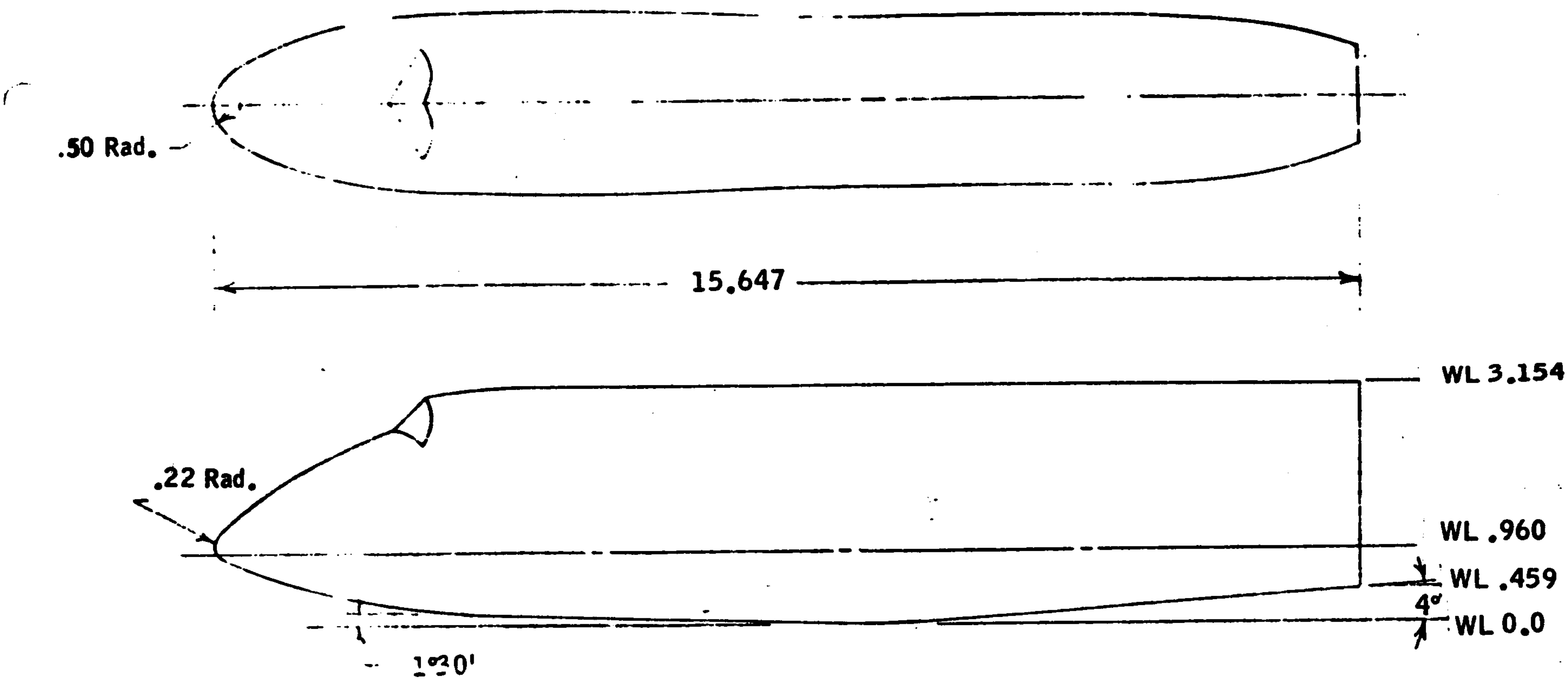


(a) Model Assembly
Figure 5. - 243 Orbiter Configuration. Model S-13A.
All Dimensions are in Inches.

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 407

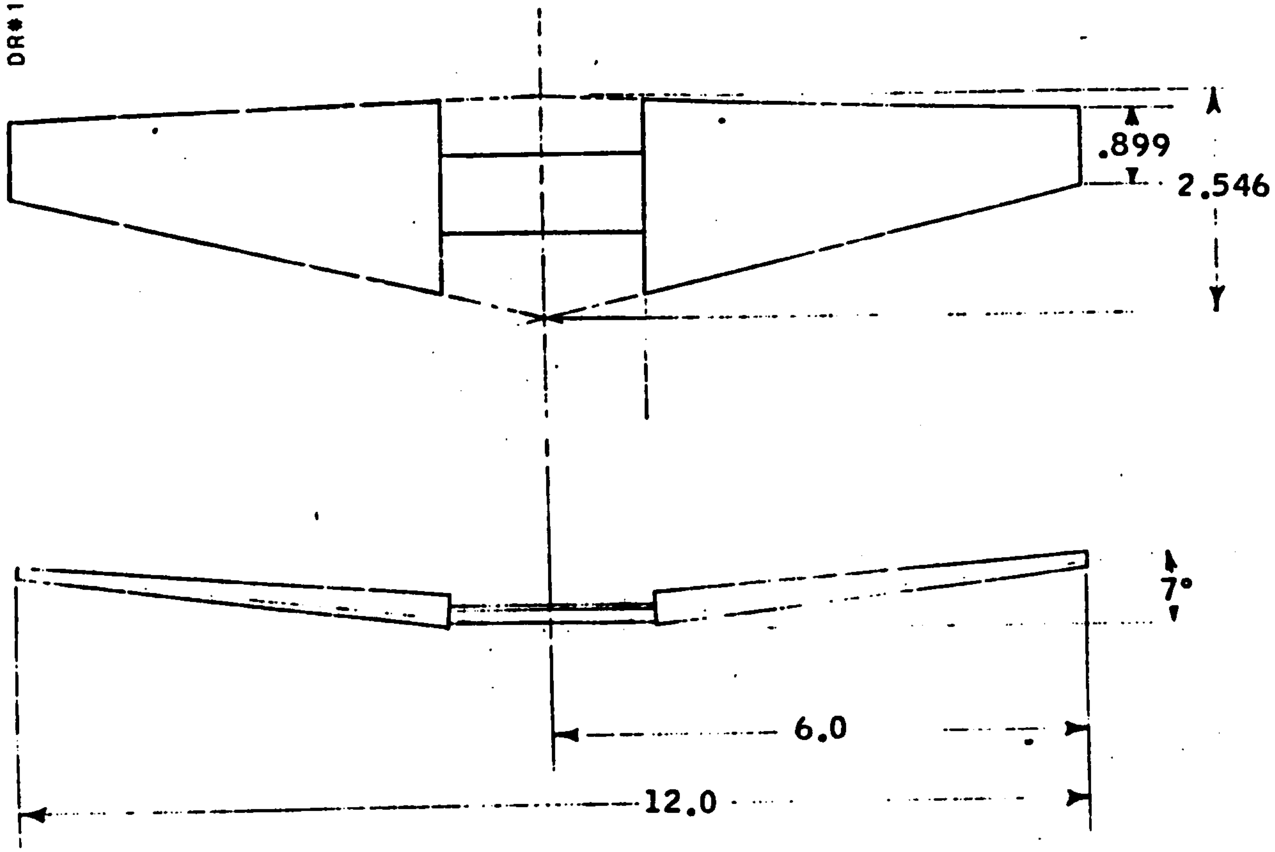


(a) Model Assembly
Figure 6 - 251 Booster Configuration. Model SB-13A. All Dimensions are in Inches.



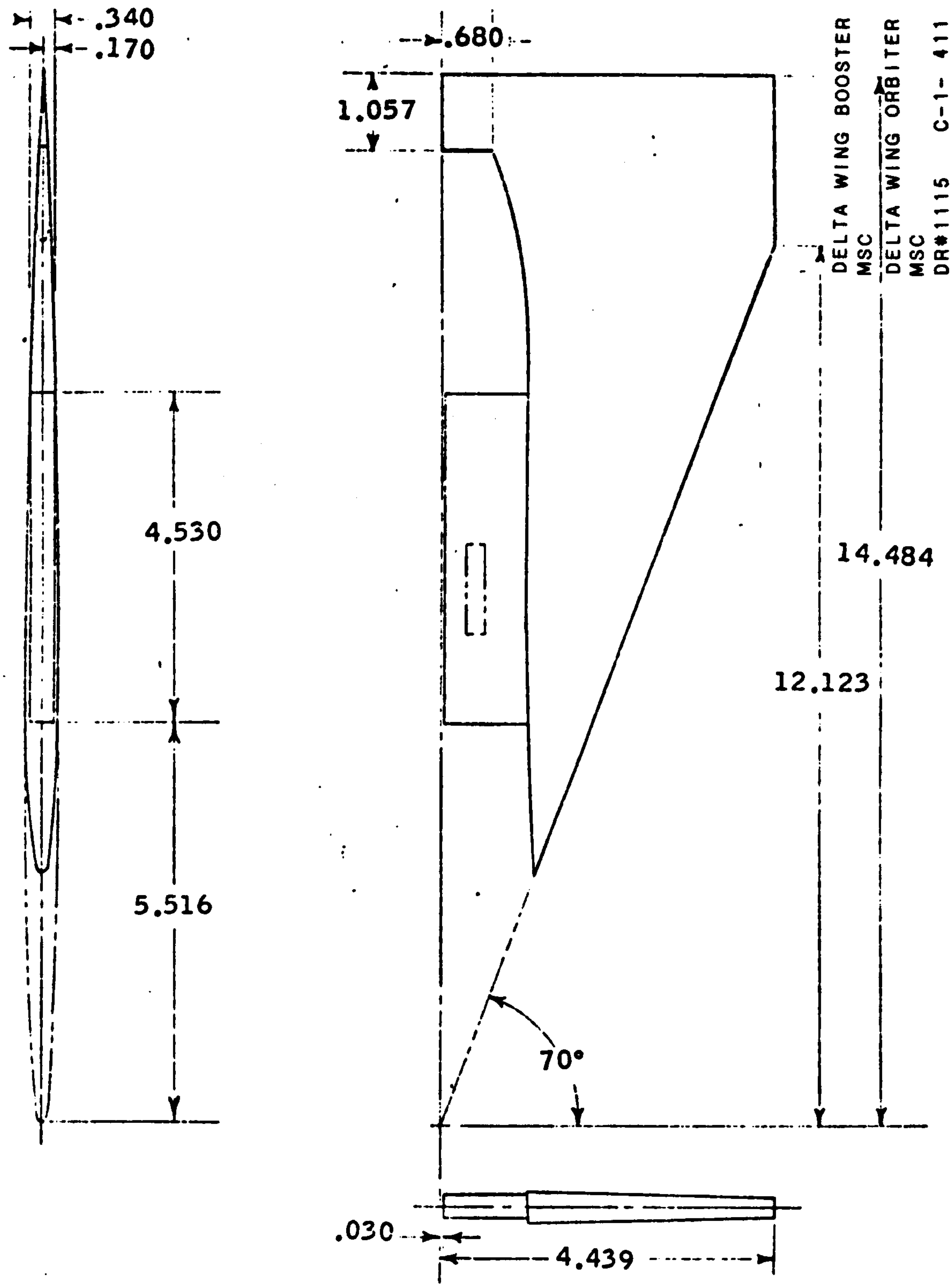
(b) Body - B_{11}
Figure 5. - Continued.

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 409



(c) Wing - W_6

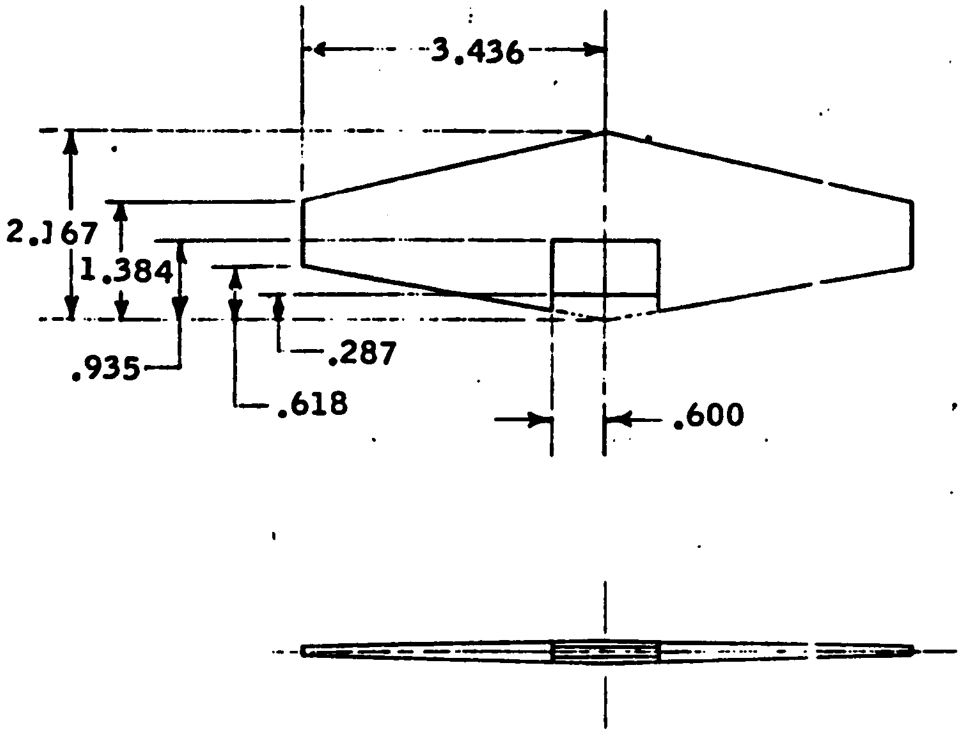
Figure 5 - Continued.



(l) Wing - W_{11}

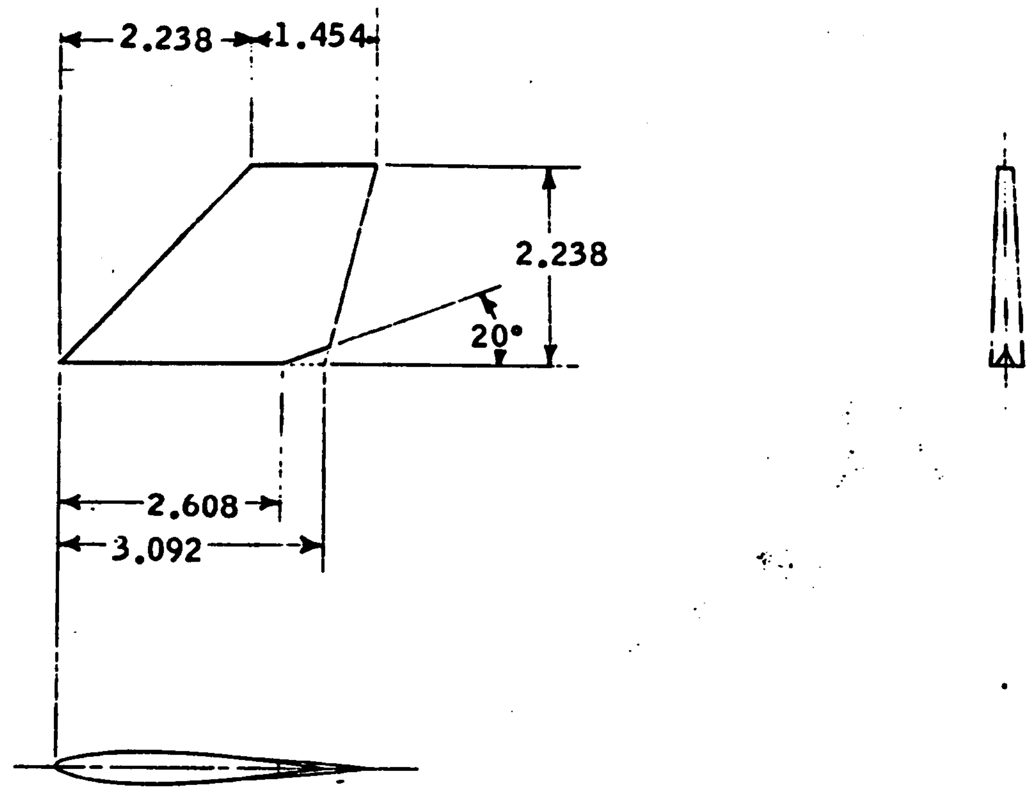
Figure 5 - Continued.

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 412



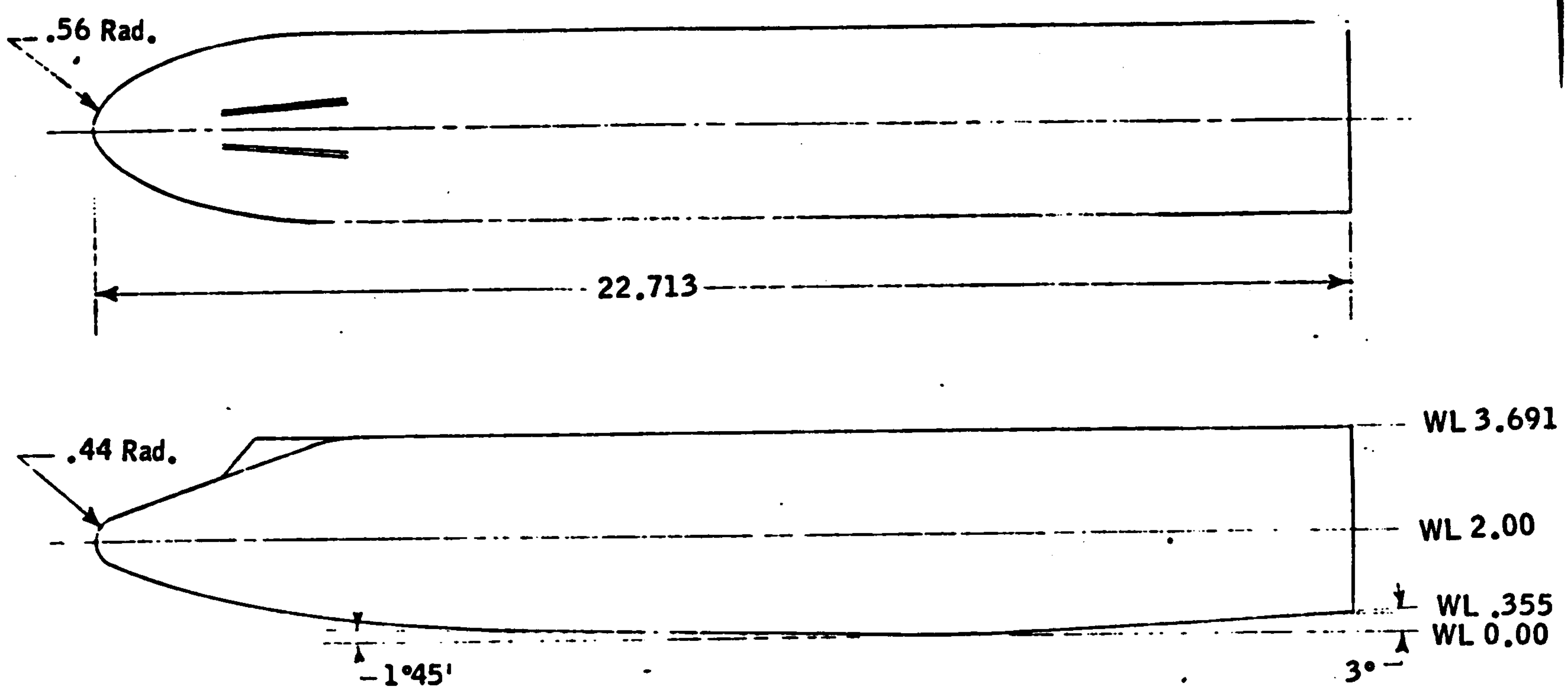
(e) Horizontal stabilizer - H_{14}

Figure 5 - Continued.



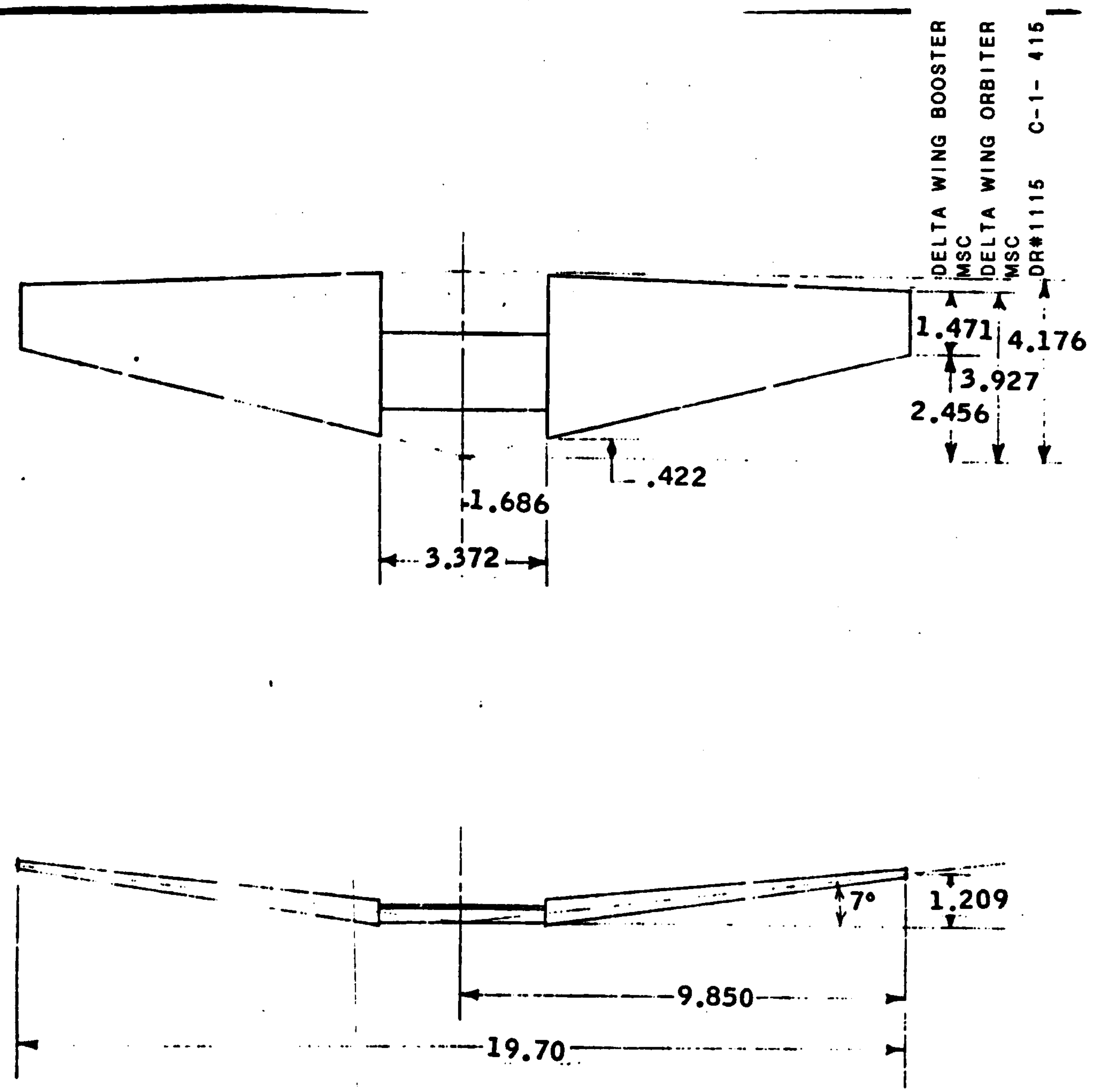
(f) Vertical tail - V_5

Figure 5 - Concluded.



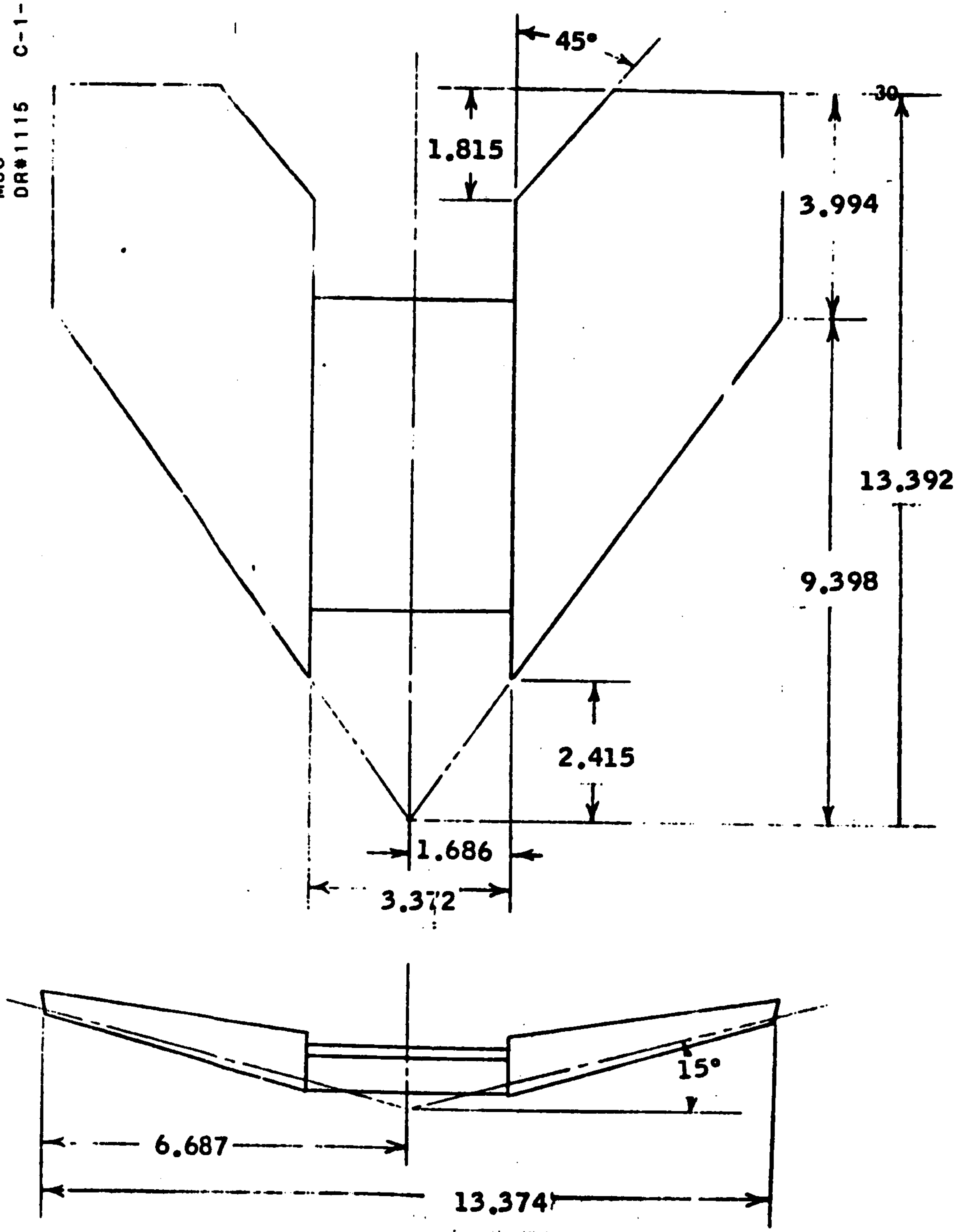
(b) Body - B_{B3}

Figure 6. - Continued.



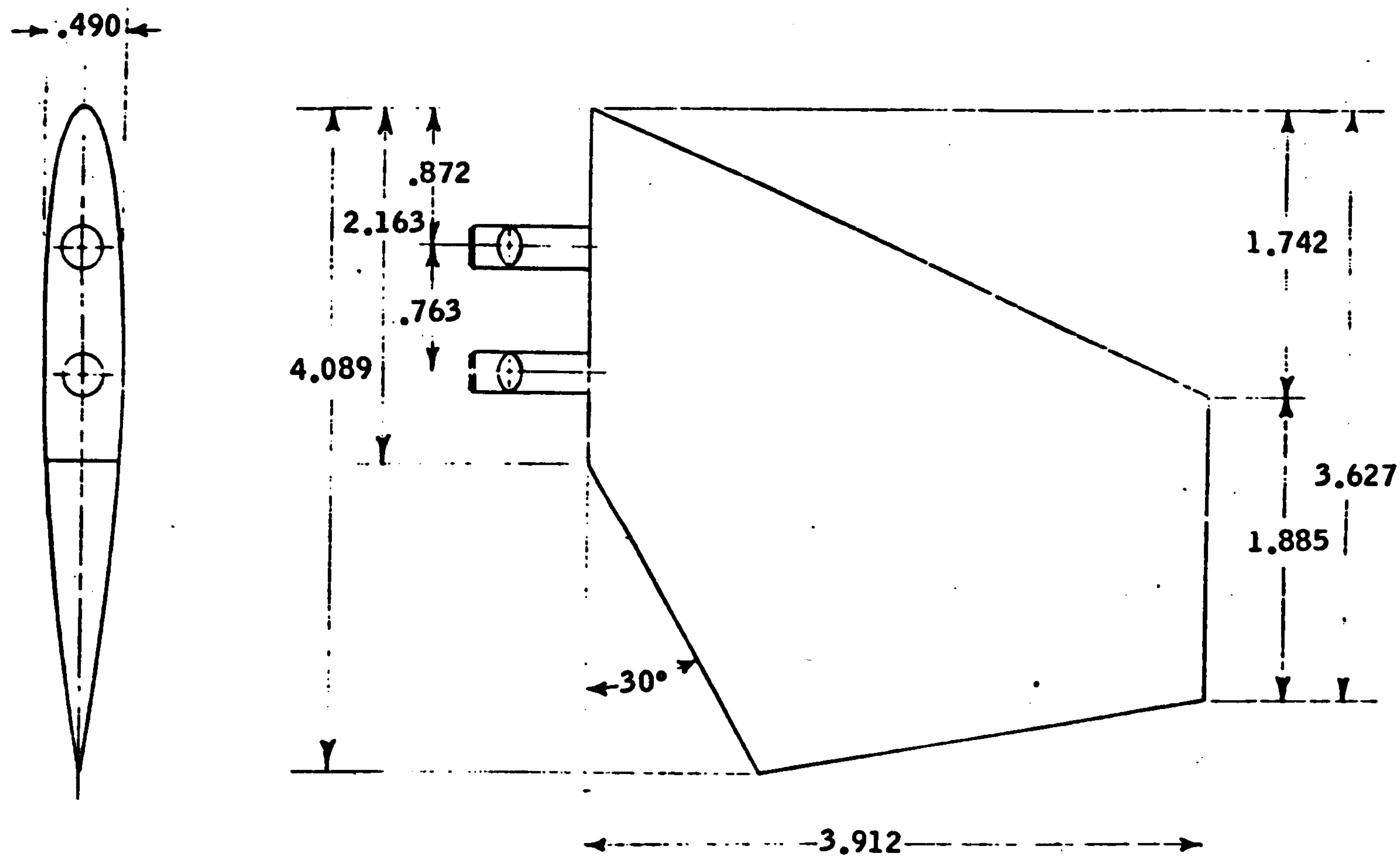
(c) Wing - W_{B1}

Figure 6 - Continued.



(d) Wing-W_{B6}

Figure 6 - Continued.

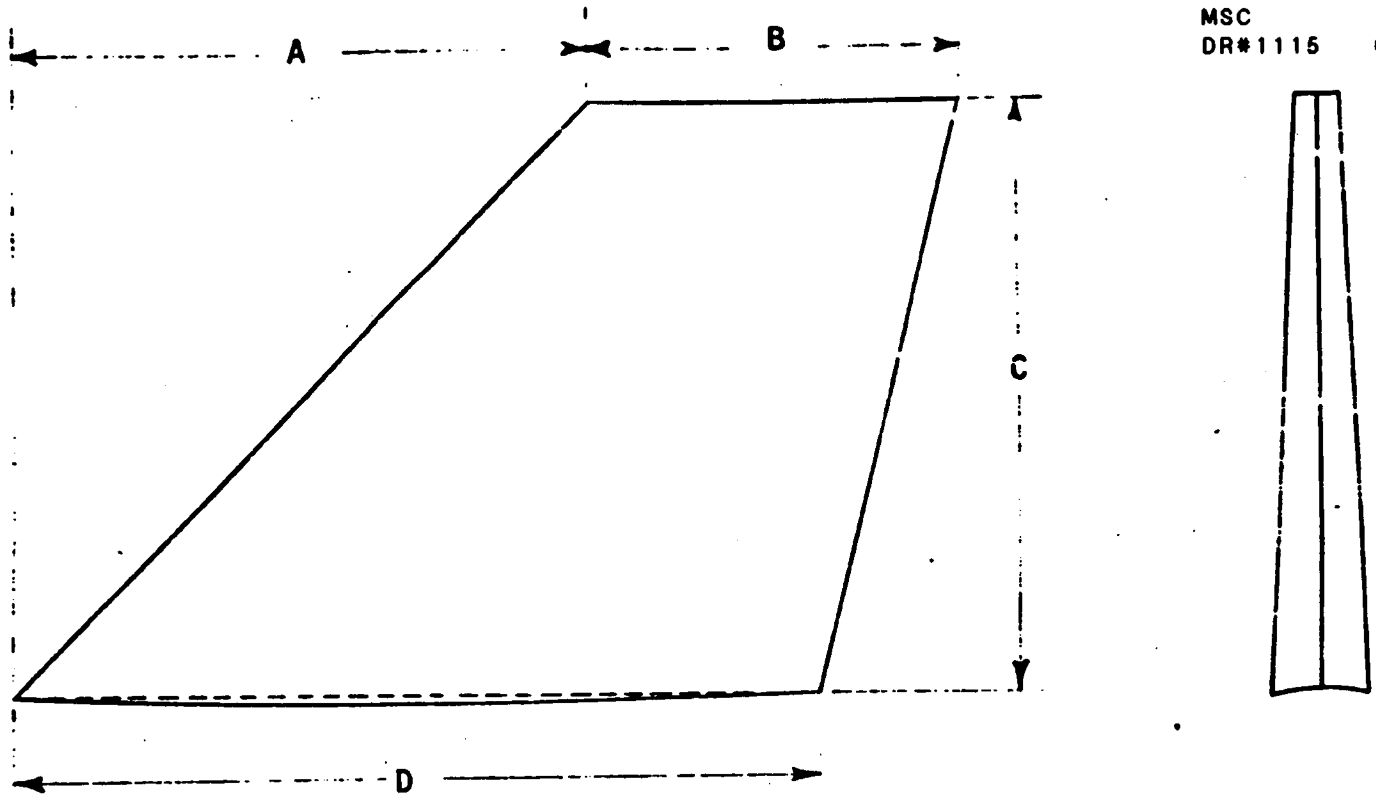


(e) Horizontal stabilizer - H_{B1}

Figure 6. - Continued.

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 417

DELTA WING BOOSTER
MSC
DELTA WING ORBITER
MSC
DR#1115 C-1- 418



Tail	A	B	C	D
V_{B1}	3.3310	2.1150	3.3310	4.6340
V_{B5}^{*}	6.9070	2.7490	6.9070	6.6520

- * NOT APPLICABLE TO THIS TEST

(f) Vertical tail - V_{B1}, V_{B5}

Figure 6. - Continued. -

BALANCE IN BOOSTER 1
BALANCE IN ORBITER 2
TEST MODE 1 PITCH 2 SIDESLIP
CONFIG. #
BOOSTER/
ORBITER/

TABLE I

TEST 6 x 6 -486 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

ORIGINAL PAGE IS OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS VALUES	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.60	0.80	0.90	1.20	1.50	2.00	TAPE
AA111	B/BW1HV+0/BW6HV	A	0		6	6	5	4	3	2	1	R1
121	B/BW3 +0/BW6HV	A	0		3				9	8	7	
131	B/BW3 +0/BW11	A	0		6	15	14	13	12	11	10	
141	B/BW1HV+0/BW11	A	0		5	20		19	18	17	16	
142	B/BW1HV+0/BW11	0	B		5	25		24	23	22	21	
132	B/BW3 +0/BW11	0	B		5	30		29	28	27	26	
122	B/BW3 +0/BW6HV	0	B		5	35		34	33	32	31	
112	B/BW1HV+0/BW6HV	0	B		5	40		39	38	37	36	
152	B/BW1HV	0	B		5	45		44	43	42	41	
151	B/BW1HV	A	0		5	50		49	48	47	46	
161	B/BW3	A	0		5	55		54	53	52	51	
RAA211	B/BW1HV+0/BW6HV	A	0		6	6	5	4	3	2	1	R2
221	B/BW3 +0/BW6HV	A	0		3				9	8	7	
231	B/BW3 +0/BW11	A	0		6	15	14	13	12	11	10	
241	B/BW1HV+0/BW11	A	0		5	20		19	18	17	16	
242	B/BW1HV+0/BW11	0	B		5	25		24	23	22	21	
232	B/BW3 +0/BW11	0	B		5	30		29	28	27	26	
222	B/BW3 +0/BW6HV	0	B		5	35		34	33	32	31	
212	B/BW1HV +0/BW6HV	0	B		5	40		39	38	37	36	

TEST RUN NUMBERS

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CA	~~CAB~~	CLM	CY	CYN	CBL				MACH	ALPHA	7,6

RAA 1-/2-

COEFFICIENTS: → IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES
A= -12°, -10°, -8°, -6°, -4°, -2°, 0°, 2°, 4°, 6°, 8°, 10°, 12°
B= -4°, -2°, -1°, 0°, 1°, 2°, 4°, 6°

DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 419

J.W. 7/15/70

DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 420

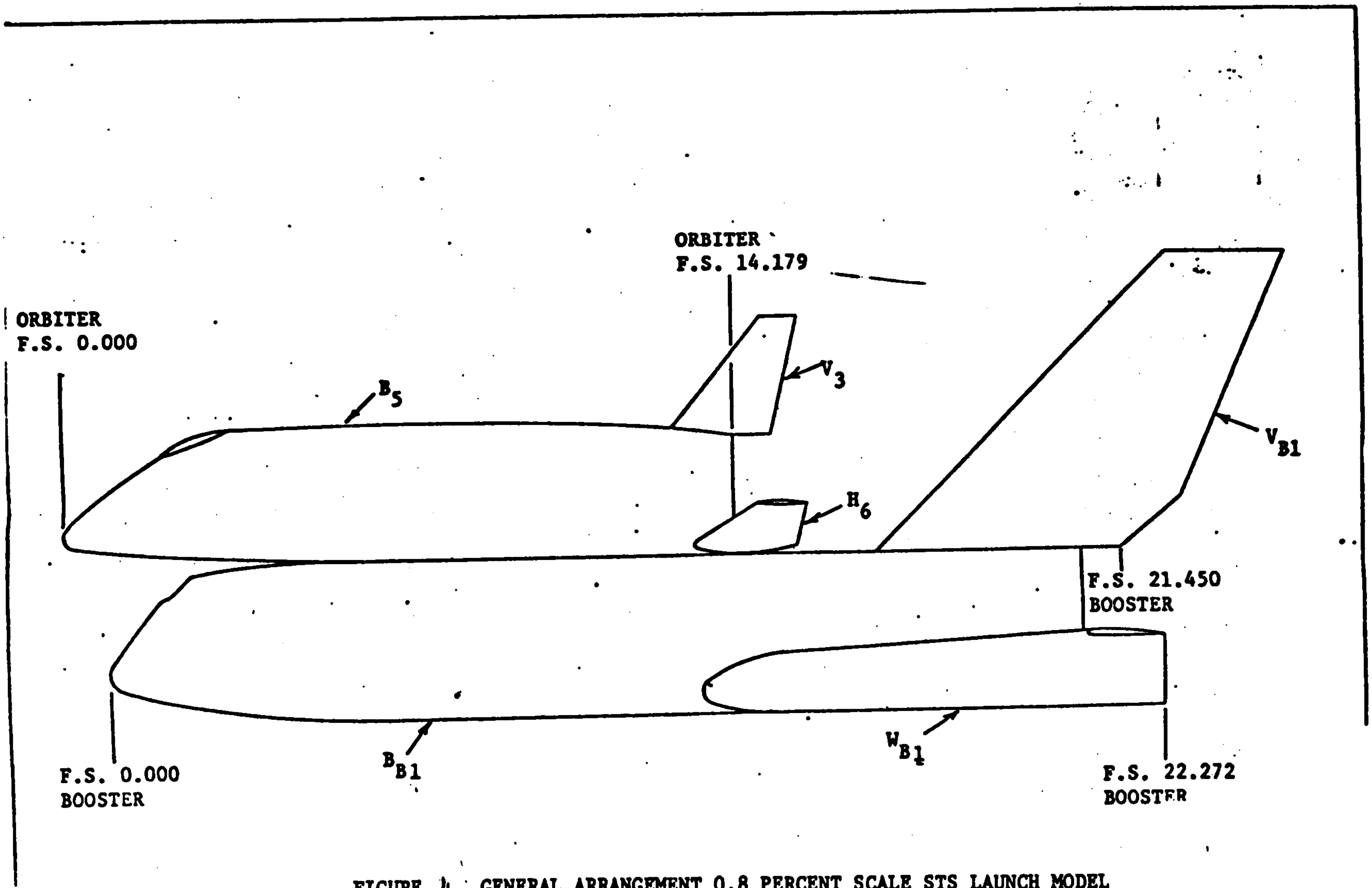
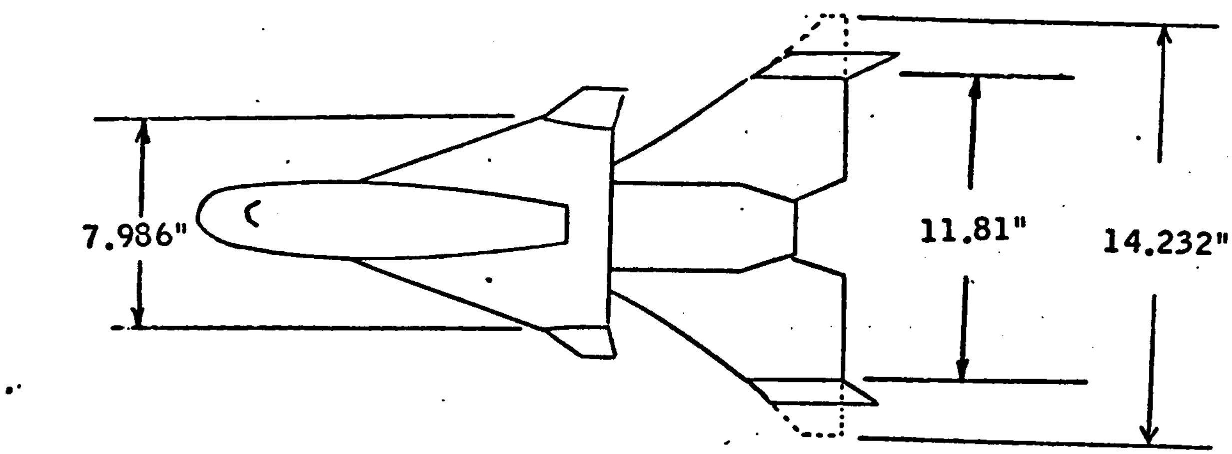
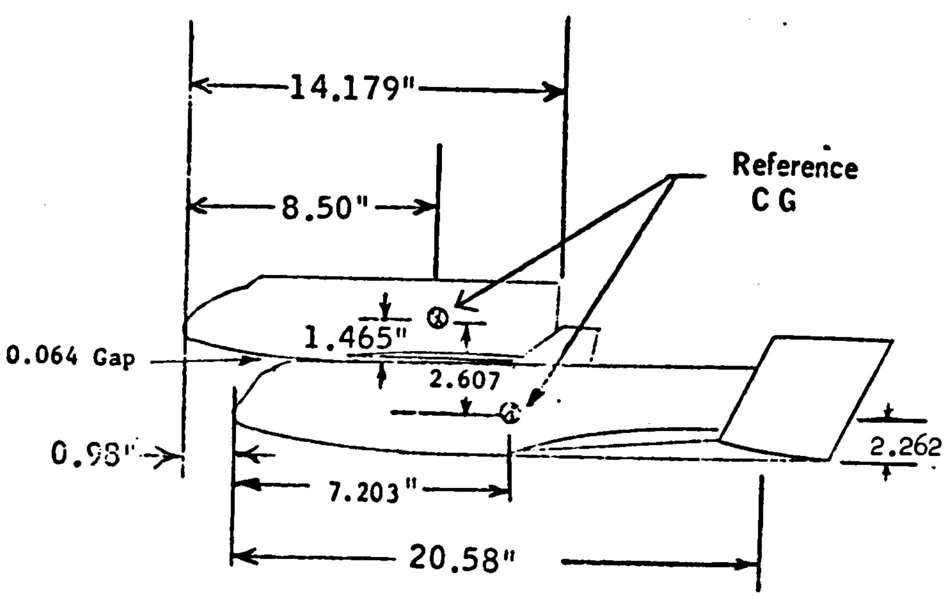


FIGURE 4. GENERAL ARRANGEMENT 0.8 PERCENT SCALE STS LAUNCH MODEL

a) Side View





REFERENCE LENGTHS AND AREA

	ORBITER	BOOSTER and LAUNCH CONFIGURATION
S	60.925 in^2	101.3 in^2
b	7.986 in	14.232 in
$\bar{c}$	8.964 in	8.248 in

CG LOCATIONS

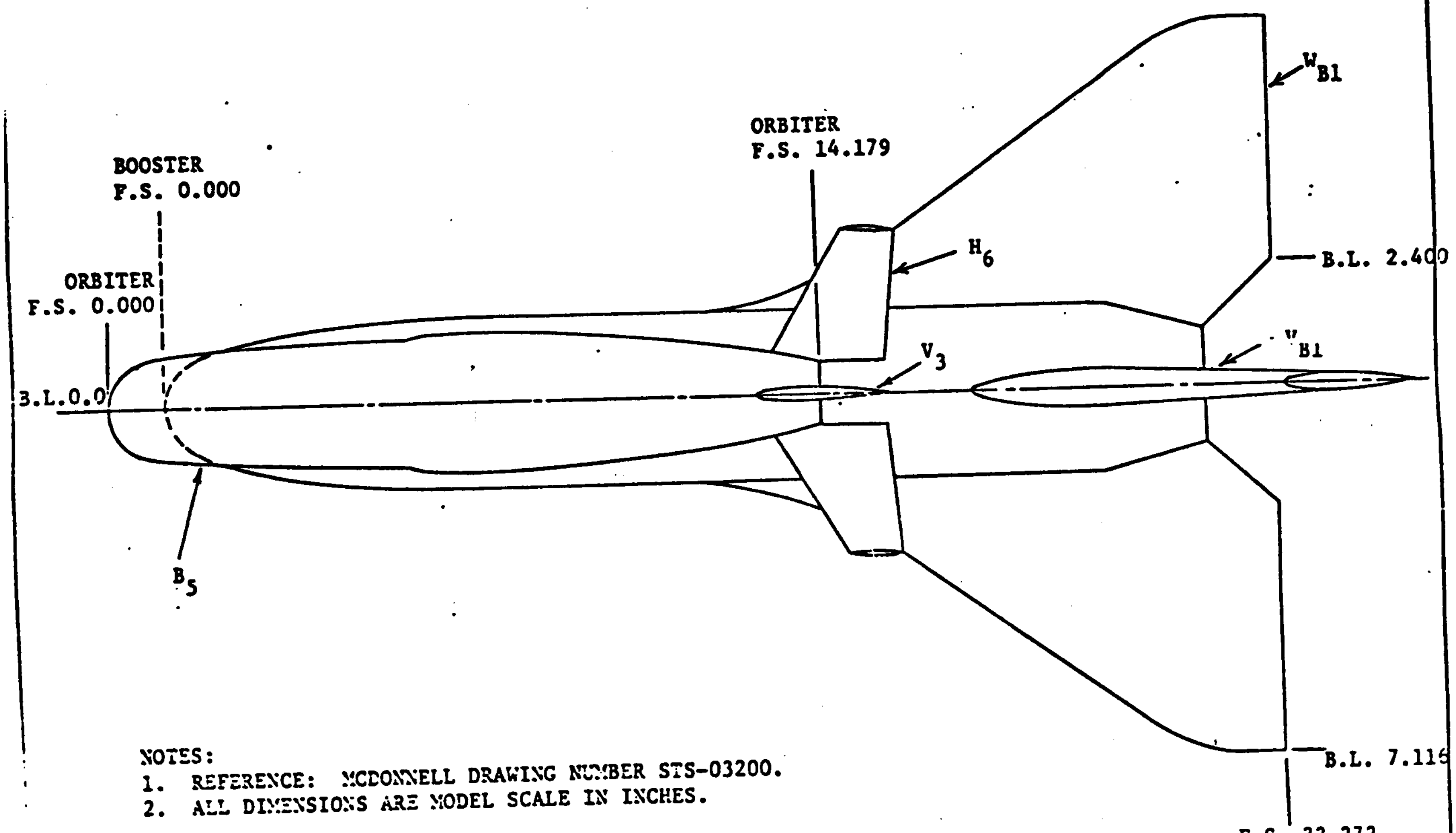
	XMRP	ZMRP
ORBITER	8.50 in.	1.465 in.
BOOSTER	12.34	1.675 in.
COMPOSITE	7.203 in.	2.262 in.

Aerodynamic data on the delta wing booster was reduced using a theoretical (non-clipped) delta wing.

DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 421

a) Delta Wing Orbiter Mated to the Delta Wing Booster

Figure 6. - Delta Wing Booster Launch Configuration



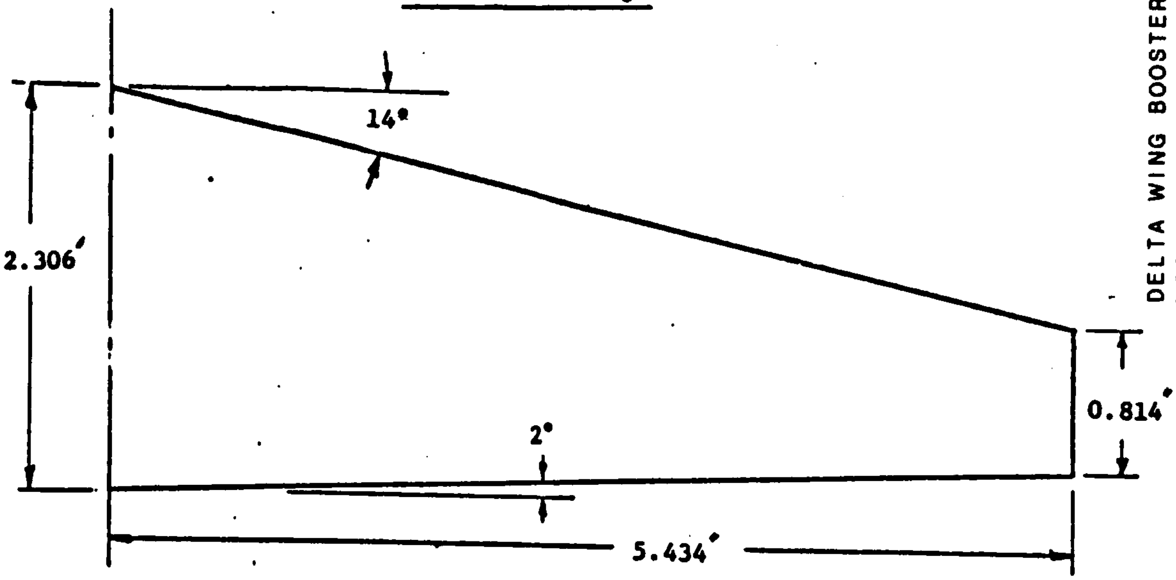
NOTES:
1. REFERENCE: MCDONNELL DRAWING NUMBER STS-03200.
2. ALL DIMENSIONS ARE MODEL SCALE IN INCHES.

FIGURE 4. GENERAL ARRANGEMENT 0.8 PERCENT SCALE STS LAUNCH MODEL

b) Top View

DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 423

ORBITER WING, W_6 (STRAIGHT)



ORBITER VERTICAL TAIL, V_3

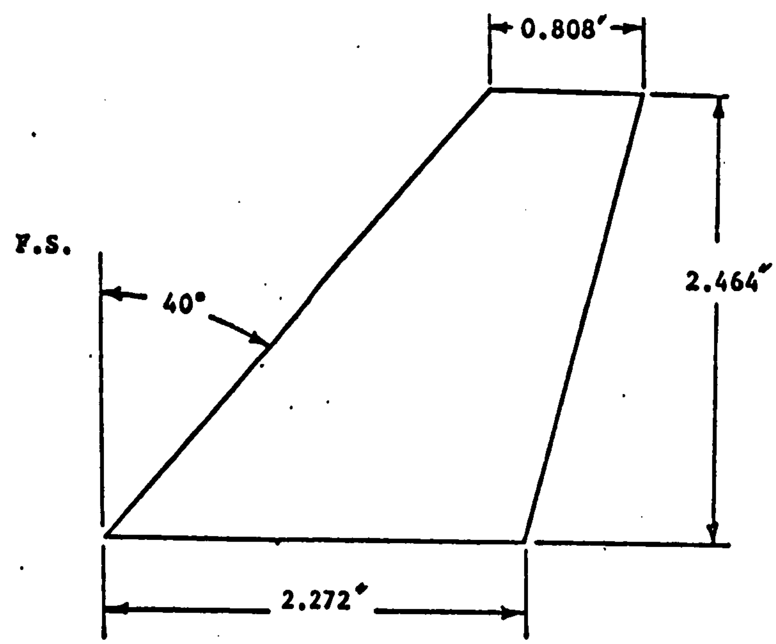


Figure 7.

DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 424

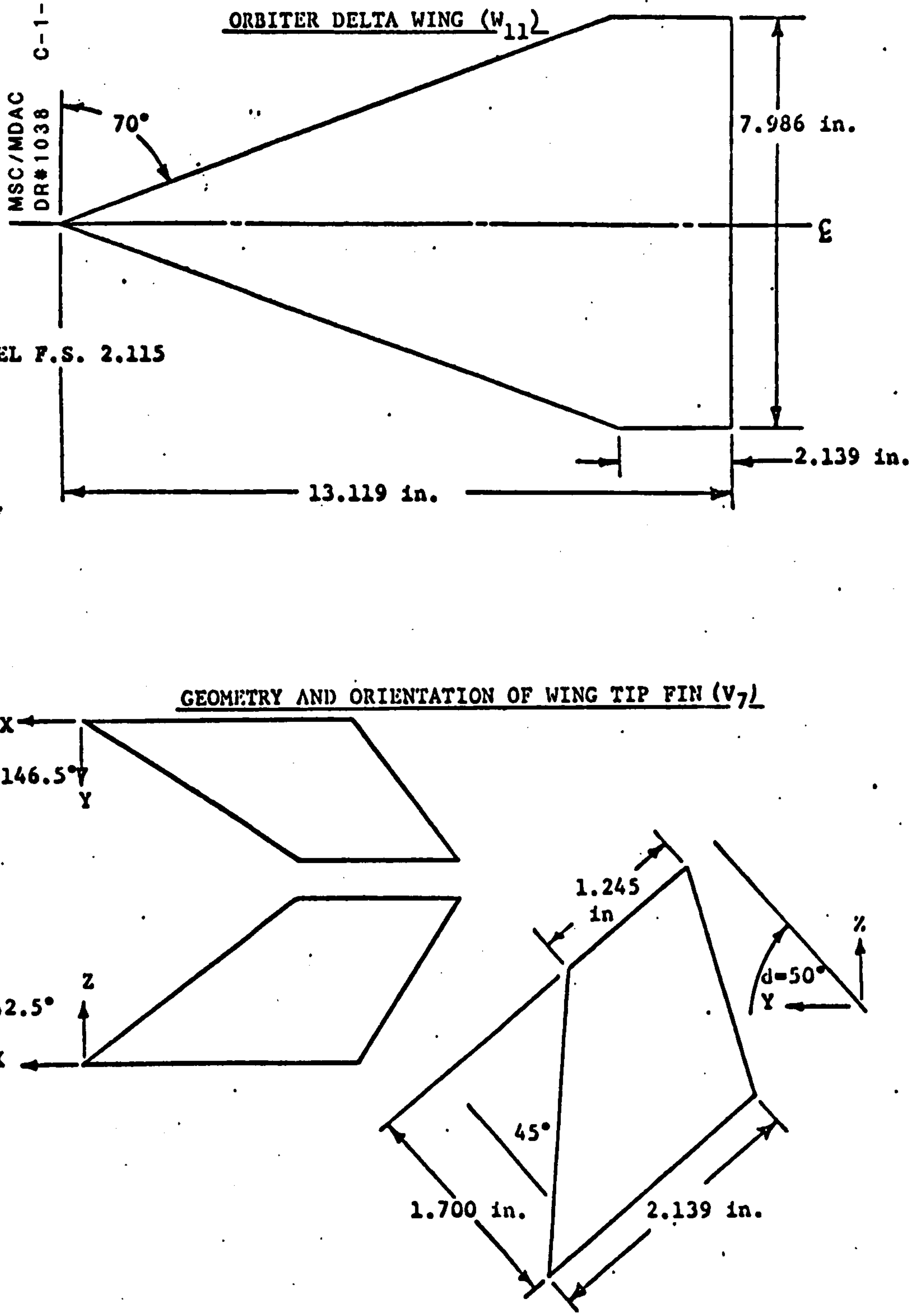


Figure 8.

ORBITER HORIZONTAL TAIL, H_{13}

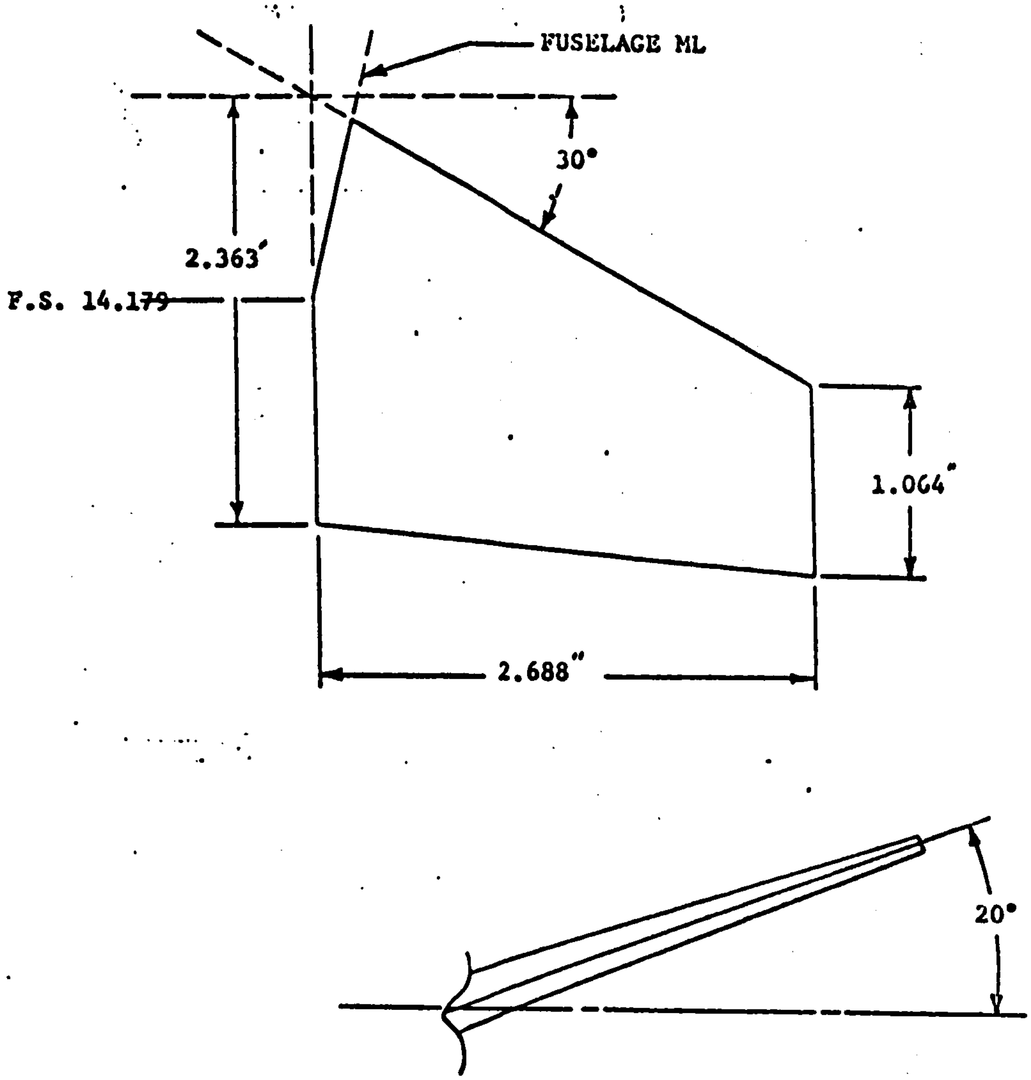
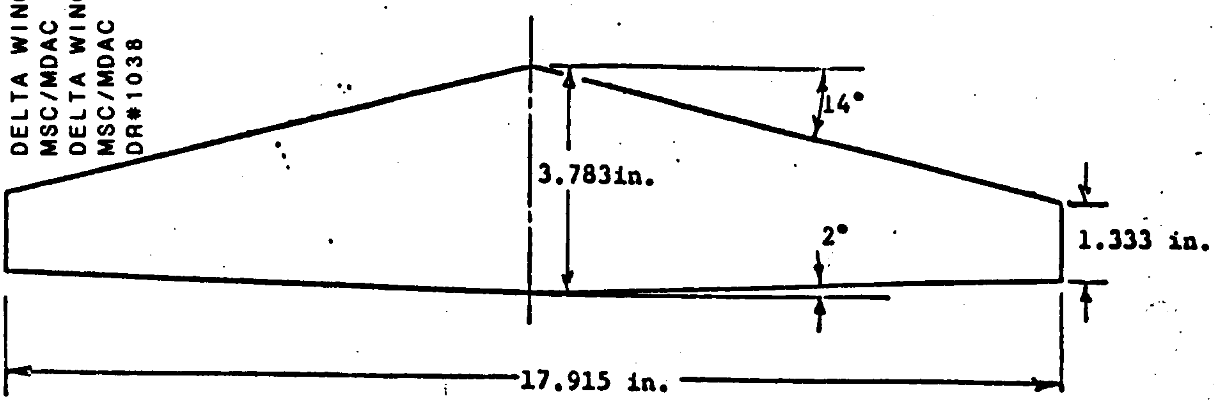


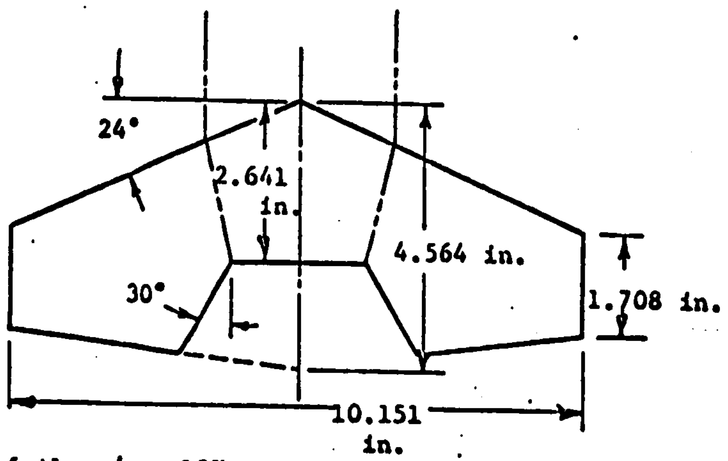
Figure 9

DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 426

BOOSTER TRAPEZOIDAL PLANFORM WING (W_{B1}) (STRAIGHT)



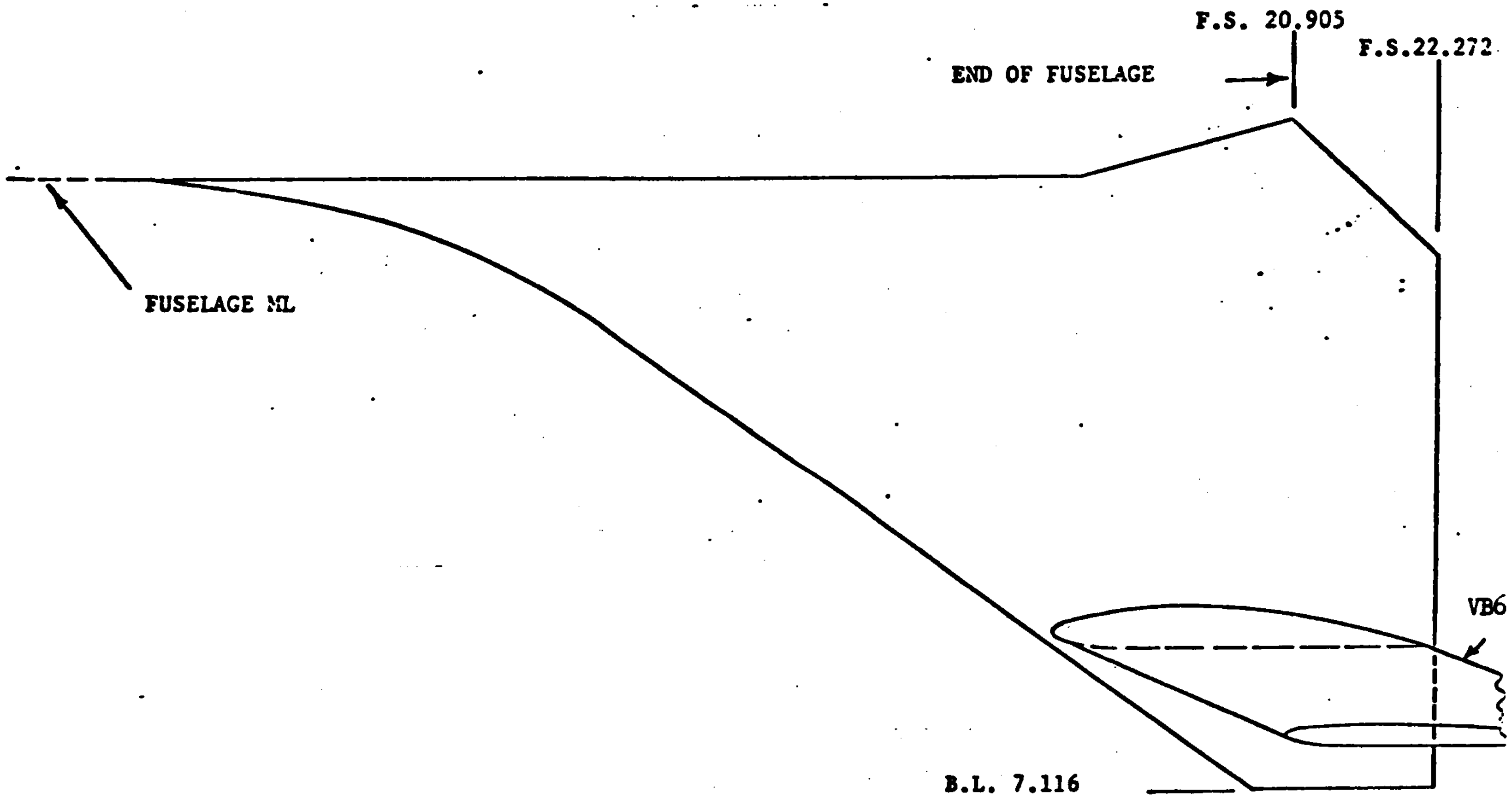
BOOSTER HORIZONTAL TAIL (H_{B1})



0064 Airfoil, t/c = 12%

Figure 10.

FIGURE 11. BOOSTER WING, W_{B2} & W_{B3} (DELTA)



DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 427

BOOSTER VERTICAL TAIL, V_{B5}

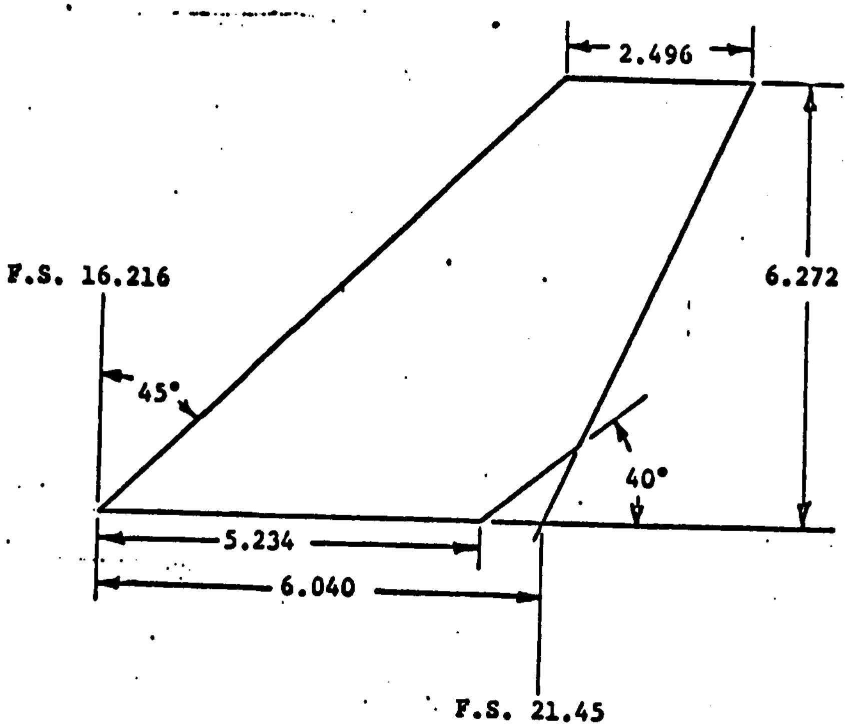
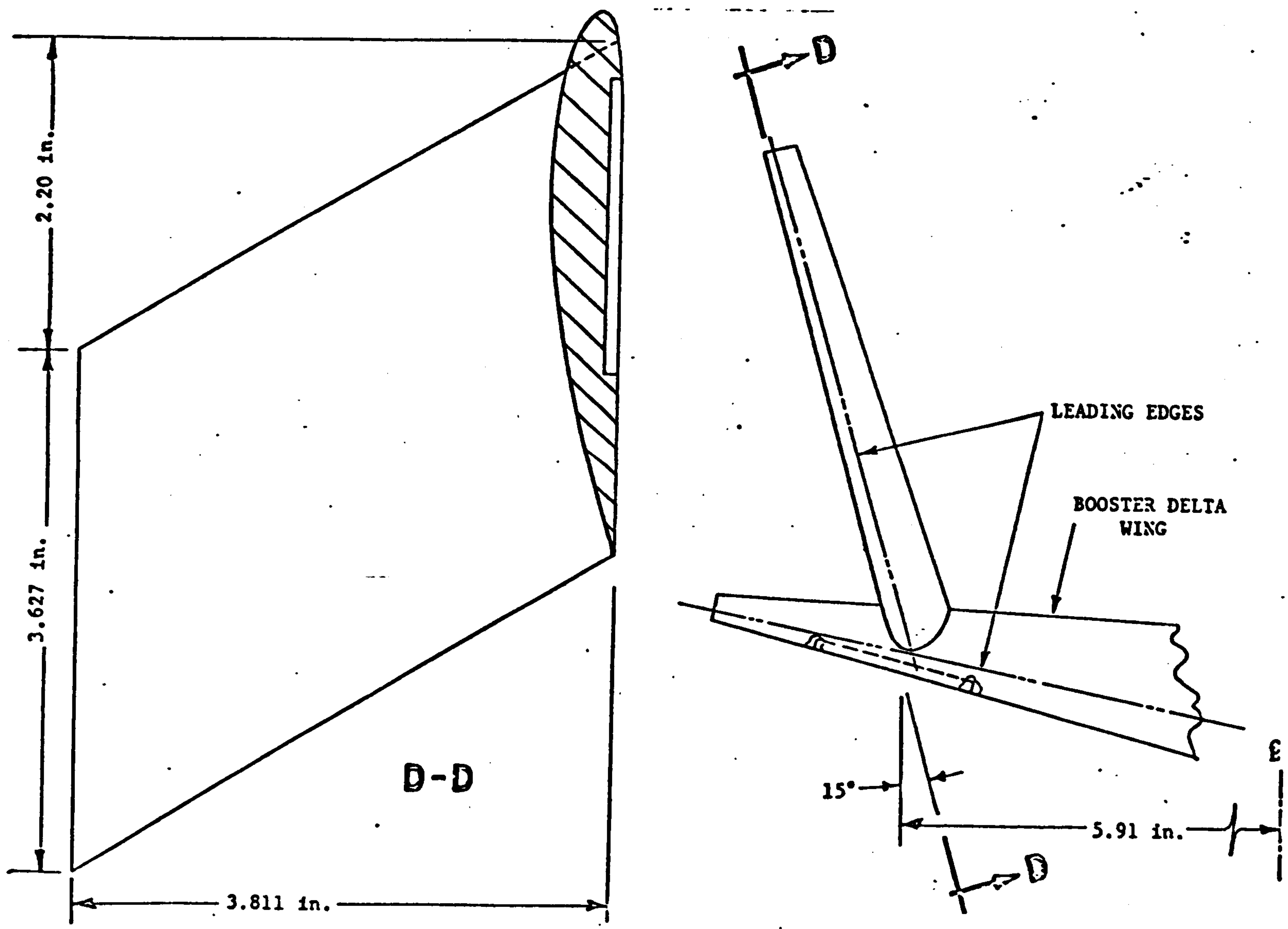


Figure 12.

FIGURE 13. BOOSTER TIP FIN, V_{B6}



DELTA WING BOOSTER
MSC/MDAC
DELTA WING ORBITER
MSC/MDAC
DR#1038 C-1- 429

TEST MSFC 506 DATA SET/RUN NUMBER

COLLATION SUMMARY

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 430
☒ POSTTEST

BOOSTER ALONE (WING W_{10})

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δ_{eL}	δ_{eR}	δ_R	δ_{EL}	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.5	0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.74	3.5	4.96	
R4801A	B_4	A	0	—	—	—	—			119	118			117		128	178	179	180	
01M	↓	M	0	—	—	—	—									282	280	281		
01N	↓	N	0	—	—	—	—											277	276	
01Q	↓	Q	0	—	—	—	—										279	278		
02B	$B_4 W_{10}$	0	B	0	0	—	0			64	61			60		158	221	222	223	
02H	↓	15	B	0	0	—	0			57	58			59		159	235			
02L	↓	30	B	0	0	—	0									286	259	260	261	
04X	$B_4 W_{10} V_4$	15	B	0	0	0	0			62				63						
04A	$B_4 W_{10} V_4$	A	0	0	0	0	0		302	28	27			26		132	184	185	186	
04B	↓	0	B	0	0	0	0			35	36			37		151	208	209	210	
04C	↓	C	0	0	0	0	0			23	24			25		131	189	188	187	
04H	↓	15	B	0	0	0	0			40	39			38		163	236			
04M	↓	M	0	0	0	0	0									283	241	240		
04N	↓	N	0	0	0	0	0											266/3	267/1	
04P	↓	40	B	0	0	0	0										251			
04Q	↓	Q	0	0	0	0	0										265	248		
04L	↓	30	B	0	0	0	0									288				
27A	$B_4 W_{10}$	A	0	0	0	0	0			300										
27B	↓	0	B	0	0	0	0			303										
27G	↓	10	B	0	0	0	0			301										

TEST RUN NUMBERS

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CY	CBL	CYN	CAF	CAB	CPC	CL	CDF			

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

α_A - 0° → 20°
α_C - -10° → 10° } $\Delta\alpha = 2°$ β_B = -6° → 6°, $\Delta\beta = 2°$
α_M - 20° → 40°
α_Q - 30° → 50
α_N - 50° → 70

SHEET 1 of 5

NASA-MSFC-MAF

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TEST MSFC 506 DATA SET/RUN NUMBER

COLLATION SUMMARY

Booster Alone (Wing W_{10})

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δ_{EL}	δ_{ER}	δ_R	δ_{FL}	NO. of RUNS		0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.74	3.5	4.96	
R4805A	$B_4 W_{10} V_4$	A	0	0	-20	0	0			29	30			31		133	183	182	181	
05B		0	B	0	-20	0	0			34	33			32		152	213	212	211	
05G		10	B	0	-20	0	0									153				
05H		15	B	0	-20	0	0									165				
05M		M	0	0	-20	0	0									284	242	243		
05N		N	0	0	-20	0	0											269	268	
05Q		Q	0	0	-20	0	0											247		
07A	$B_4 W_{10} V_4 C_1$	A	0	0	0	0	0			83				82		137				
07H		15	B	0	0	0	0			56				55		166				
08A	$B_4 W_{10} V_4 R_1$	A	0	0	0	30/30	0			77	78	79	80	81		136	190	191	192	
08B		0	B	0	0	30/30	0			51	50	49	48	47		155	220			
08H		15	B	0	0	30/30	0			52	53			54		161	237			
08M		M	0	0	0	30/30	0										238	239		
08P		40	B	0	0	30/30	0										250			
08Q		Q	0	0	0	30/30	0											249		
19A	$B_4 W_{10} V_4 R_0$	A	0	0	0	15	0			76	75			74		134				
20A		A	0	0	0	30	0			71	72			73		135				

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

SHEET 2 of 5

NASA-MSFC-MAF

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 431

ORIGINAL PAGE IS OF POOR QUALITY

TEST *MSFC 506* DATA SET/RUN NUMBER

COLLATION SUMMARY

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 432
☒ POSTTEST

Booster Alone (Wing W_{10})

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δ_{EL}	δ_{SB}	δ_R	δ_{FL}	NO. of RUNS		0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.74	3.5	4.96	
R48 18A	$B_4 W_{10} V_4$	A	0	0	-40	0	0			84	85			86						
18B		0	B	0	-40	0	0			89	88			87						
19G		10	B	0	-40	0	0									154				
18H		15	B	0	-40	0	0									164				
18M		M	0	0	-40	0	0									285	245	244		
18N		N	0	0	-40	0	0											273	272	
18Q		Q	0	0	-40	0	0											246		
10N		N	0	0	OFF	0	0											270	271	
21B	$B_4 W_{10} V_4 V_6$	0	B	0	0	0	0			46	45			44		156	227	228	229	
21H		15	B	0	0	0	0			41	42			43		162	230			
22B	$B_4 W_{10} V_5$	0	B	0	0	0	0			65	66			67		157	226	225	224	
22H		15	B	0	0	0	0			70	69			68		160	234			
22P		40	B	0	0	0	0										252			
22L		30	B	0	0	0	0									287	258	257	256	
24H	$B_4 W_{10} V_5 V_6$	15	B	0	0	0	0										231	232	233	
24L		30	B	0	0	0	0										264	263	262	
24S		60	B	0	0	0	0											274	275	

MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: → IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

SHEET 3 of 5

NASA-MSFC-MAF

ORIGINAL PAGE IS OF POOR QUALITY

TEST *MSFC 506* DATA SET/RUN NUMBER

COLLATION SUMMARY

Booster Alone (Wing W_{11})

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δ_L	δ_{ER}	δ_R	δ_{FL}	NO. of RUNS	0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.74	3.5	4.96	
R4823A	$B_4 W_{11} V_4$	A	0	0	0	0	0		120	121			122		127	219	218	217	
23C		C	0	0	0	0	0		125	124			123		126	214	215	216	
25A	$B_4^2 W_{11} V_5$	A	0	0	0	0	0		299	298			297				290		
25H		15	B	0	0	0	0		295				296				291		
26H	$B_4 W_{11} V_5$	15	B	0	0	0	0		294				293				292		

MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

Sheet 4 of 5

NASA-MSFC-MAF

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DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 433

TEST *NSFC 506* DATA SET/RUN NUMBER

COLLATION SUMMARY

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 434
~~PRE~~ POSTTEST

Booster + Orbiter

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δ_e	δ_{eR}	δ_R	δ_{FL}	NO. of RUNS		0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.74	3.5	4.96	
R4B17C	$B_4V_4T_1$	C	0	0	0	0	—			113	112		111		177	130				
15C	$B_4V_4W_{10}T_1$	C	0	0	0	0	15			96	97		98		171	142				
16C	$B_4V_4T_1 + O^1$	C	0	0	0	0	—			114	115				176	129				
06C	$B_4V_4W_{10}T_1 + O^1$	C	0	0	0	0	0			1	2	3	4	5		139	195	194	193	
09C		C	0	0	0	0	15			8	7			6	170	140	196	197	198	
09B		0	B	0	0	0	15			9	10	11	12	13	167	148	207	206	205	
09G		10	B	0	0	0	15			16	15			14		149				
12C	$B_4V_4W_{10}T_1 + O^2$	C	0	0	0	0	15			95	94		93		169	141				
12B		0	B	0	0	0	15			90	91		92		168	147				
11C	$B_4V_4W_{10}T_2 + O^1$	C	0	0	0	0	15			22	21			20		138	201	200	199	
11B		0	B	0	0	0	15			17	18			19		150	202	203	204	
13C	$B_4V_4W_{10}T_3 + O^3$	C	0	0	0	0	15			101	100		99		175	143				
13B		D	B	0	0	0	15			102	103		104		174	146				
14C	$B_4V_4W_{10}T_3 + O^4$	C	0	0	0	0	15			108	109		110		172	144				
14B		0	B	0	0	0	15			107	106		105		173	145				

PARAMETERS/VALUES — MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) — TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

Sheet 5 of 5

NASA-MSFC-MAF

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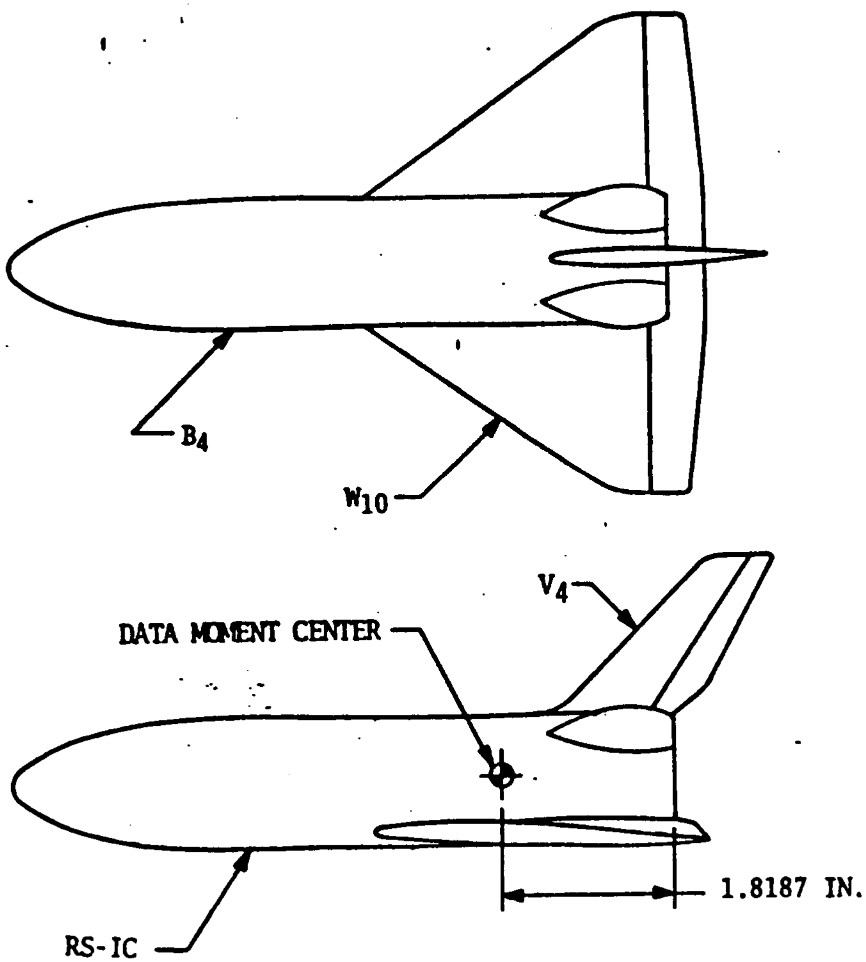


$S = 13.0528$ sq. in. (9000 sq. ft.)
$\ell_{LONG} = 4.515$ in. (112 ft)
$\ell_{LAT} = 4.908$ (121.5 ft)
$A_B = 1.5580$ (Nom.) (955 x

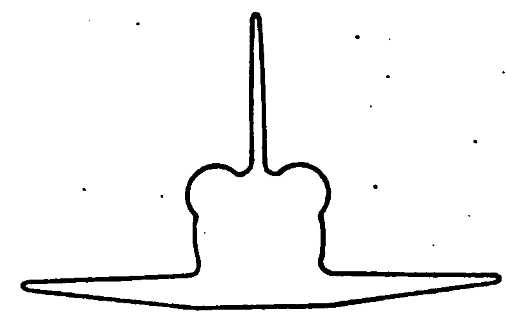


FIGURE 4. 0.003366 SCALE AR1216I-1 BOOSTER

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 435

$S = 13.0528$ sq. in. (8000 sq. ft.)
$\ell_{LONG} = 4.515$ in. (112 ft)
$\ell_{LAT} = 4.908$ in. (121.5 ft)
$A_B = 1.5580$ in. (955 sq.ft. Nom.)

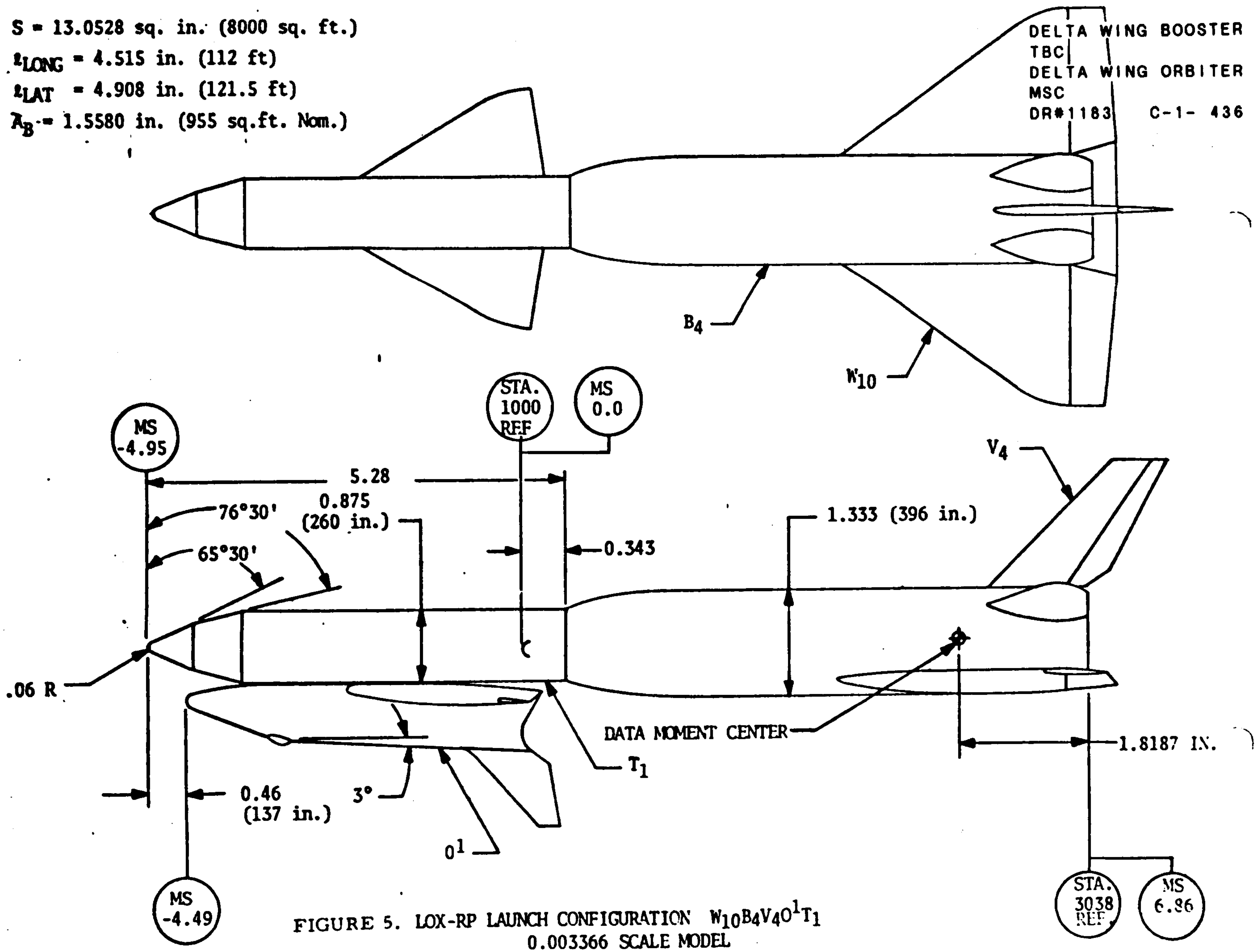


FIGURE 5. LOX-RP LAUNCH CONFIGURATION $W_{10}B_4V_4O^1T_1$
0.003366 SCALE MODEL

$S = 13.0528$ sq. in. (8000 sq. ft.)
$\ell_{LONG} = 4.515$ in. (112 ft)
$\ell_{LAT} = 4.908$ in. (121.5 ft)
$A_B = 1.5580$ in. (955 sq. ft. Nom.)

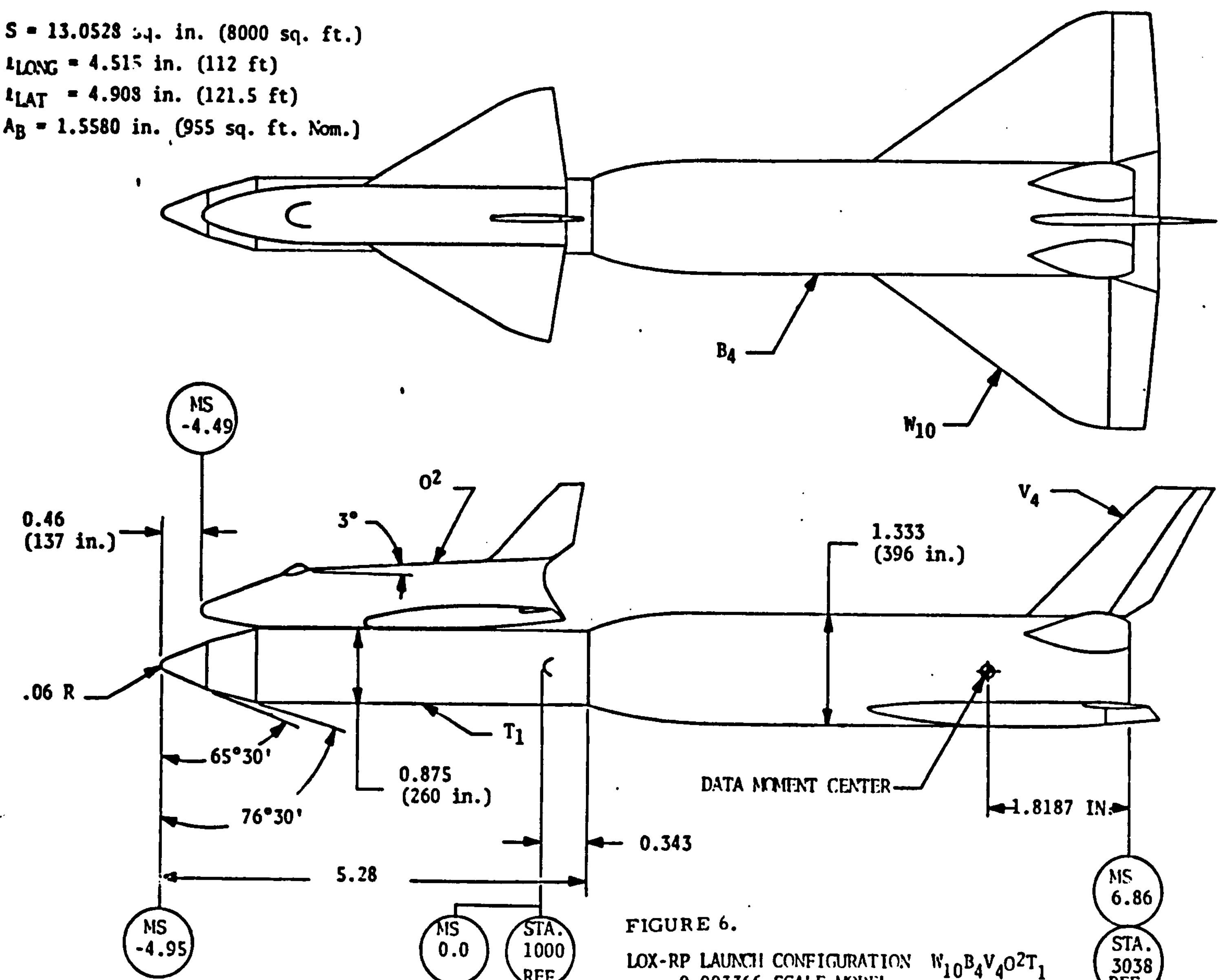


FIGURE 6.
LOX-RP LAUNCH CONFIGURATION $W_{10}B_4V_4O^2T_1$
0.003366 SCALE MODEL

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 437

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 438

S = 13.0528 sq. in. (8000 sq. ft.)

ℓ_{LONG} = 4.515 in. (112 ft)

ℓ_{LAT} = 4.908 in. (121.5 ft)

A_B = 1.5580 in. (955 sq. ft. Nom.)

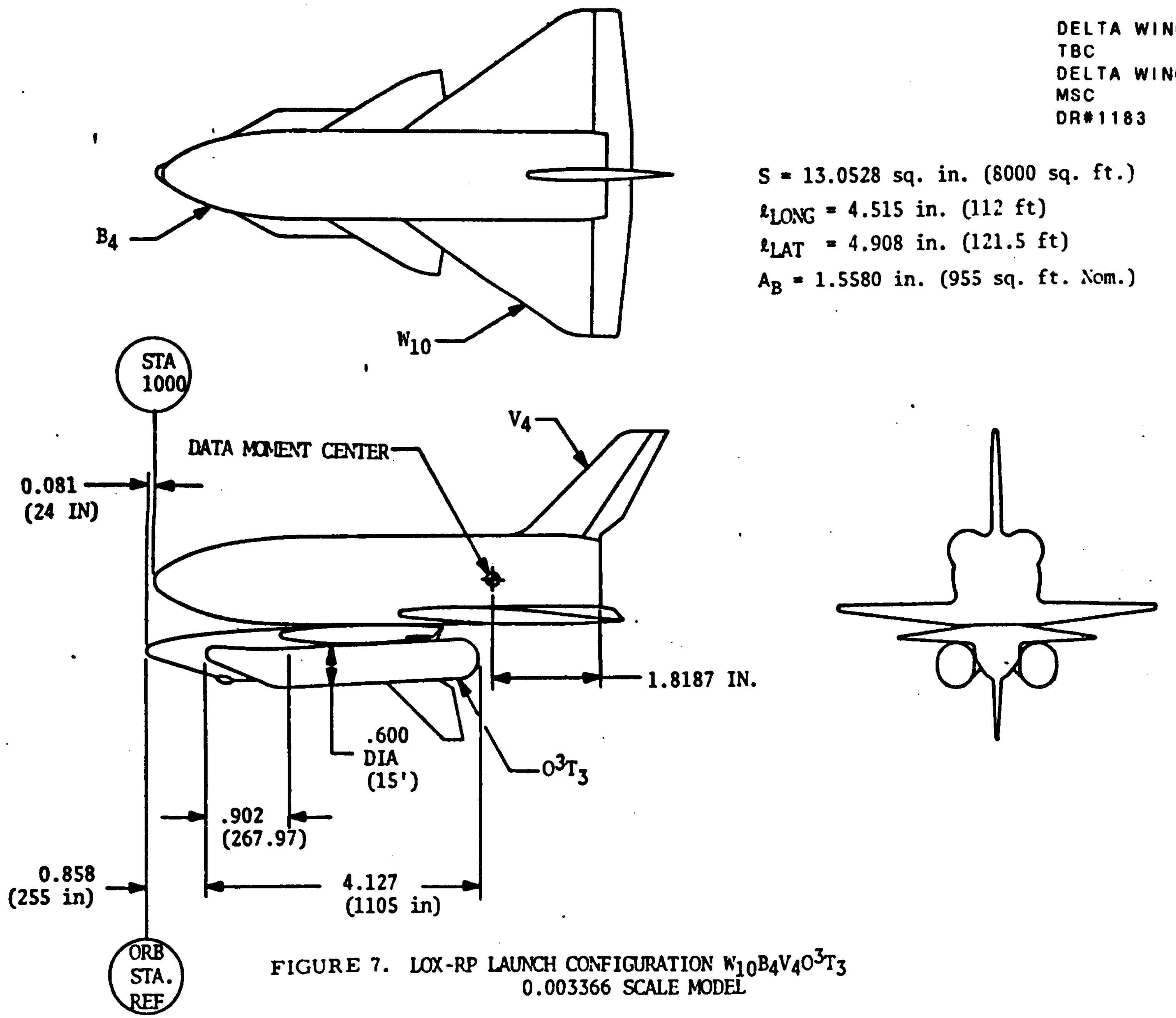


FIGURE 7. LOX-RP LAUNCH CONFIGURATION $W_{10}B_4V_4O^3T_3$
0.003366 SCALE MODEL

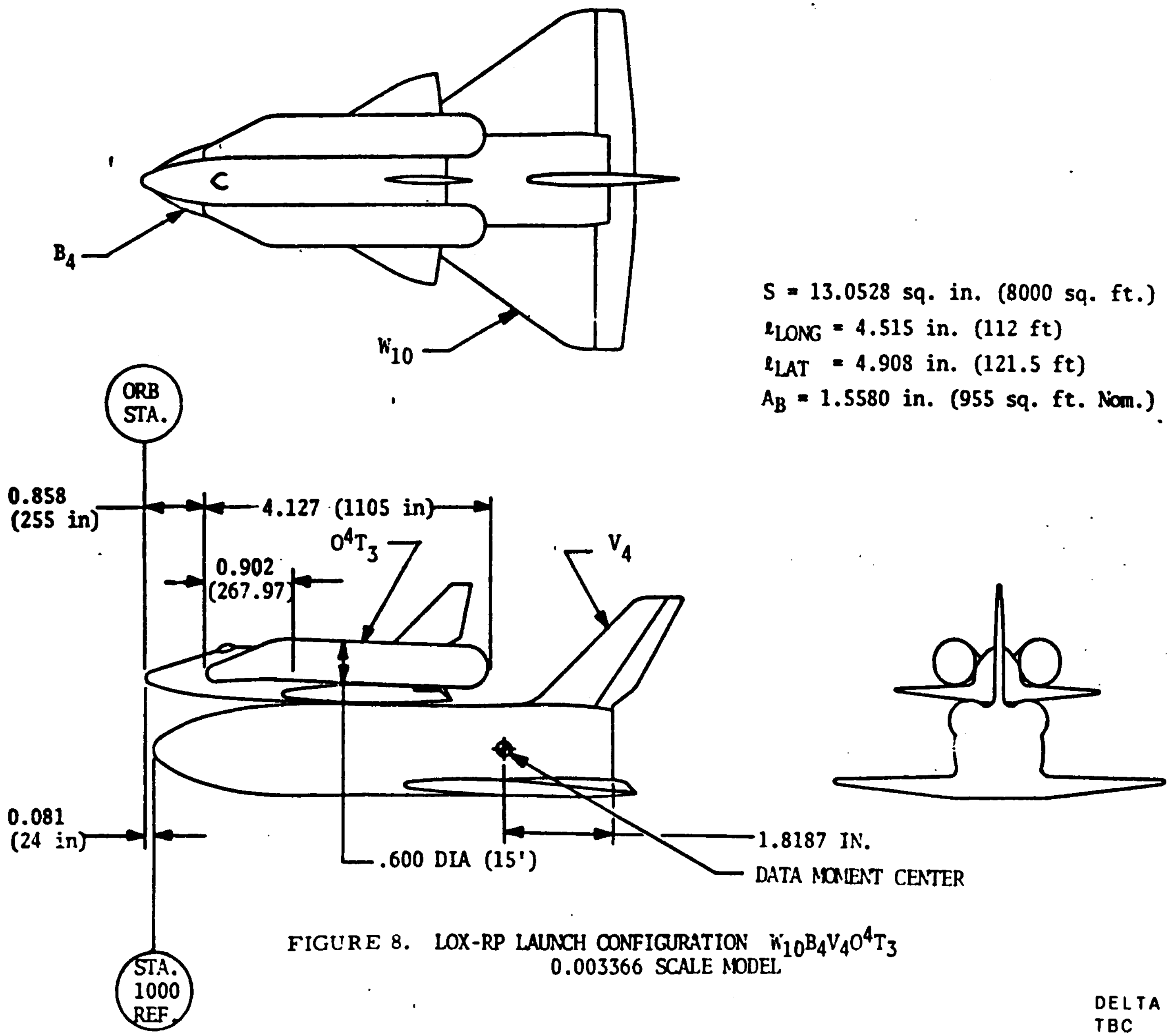


FIGURE 8. LOX-RP LAUNCH CONFIGURATION $W_{10}B_4V_4O^4T_3$
0.003366 SCALE MODEL

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 439

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 440

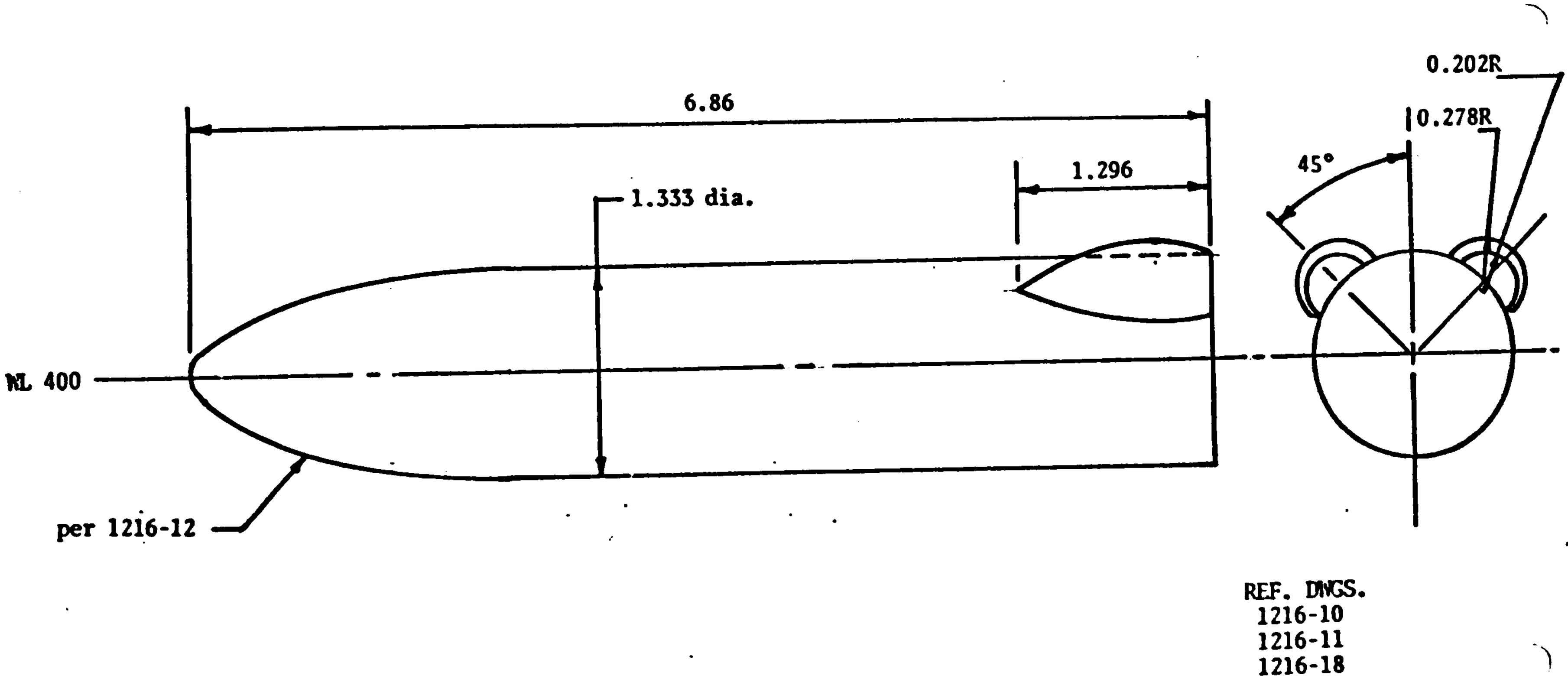


FIGURE 9. REUSABLE LOX-RP (-049) BOOSTER BODY - B4
0.003366 SCALE AR1216I-1 MODEL

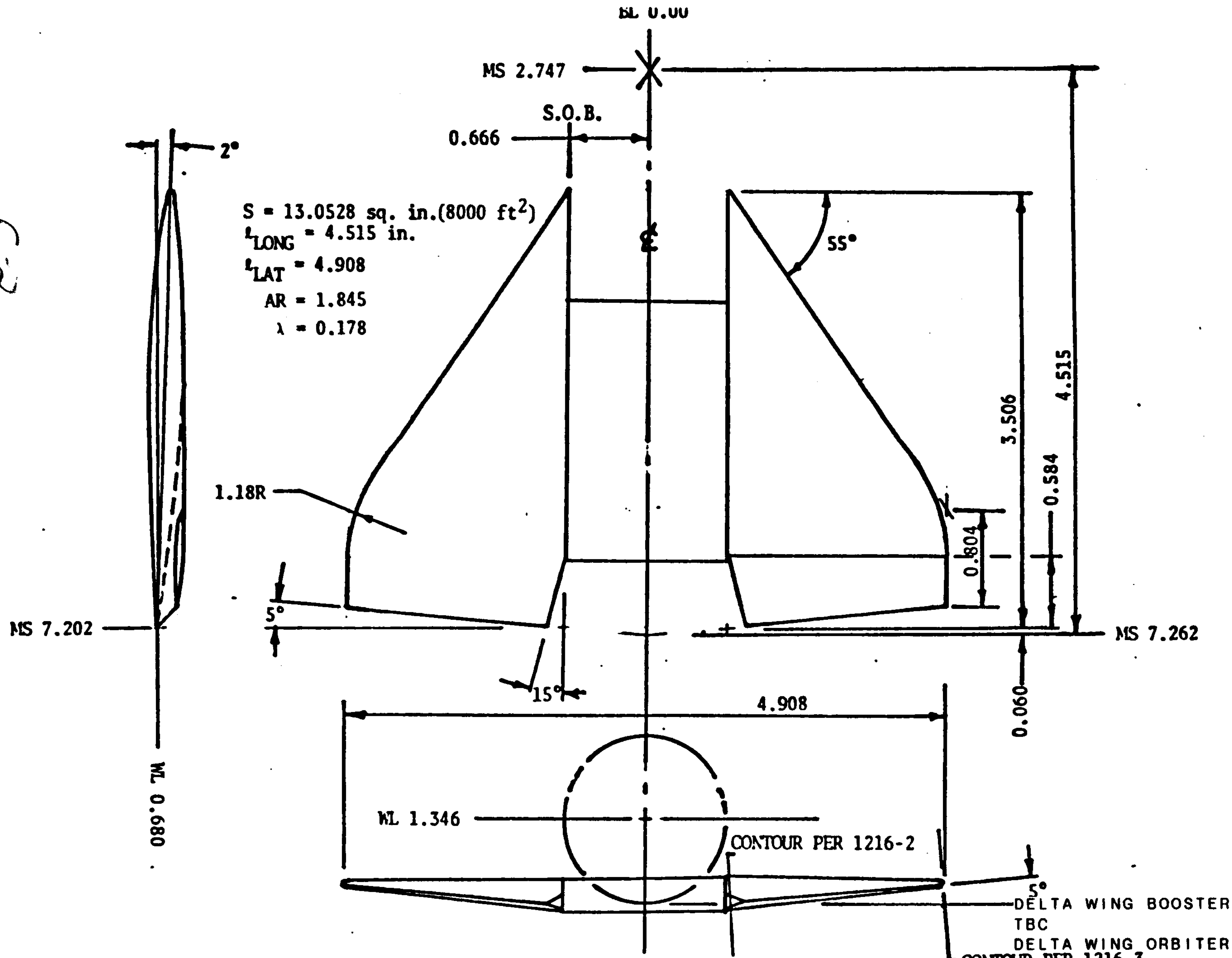
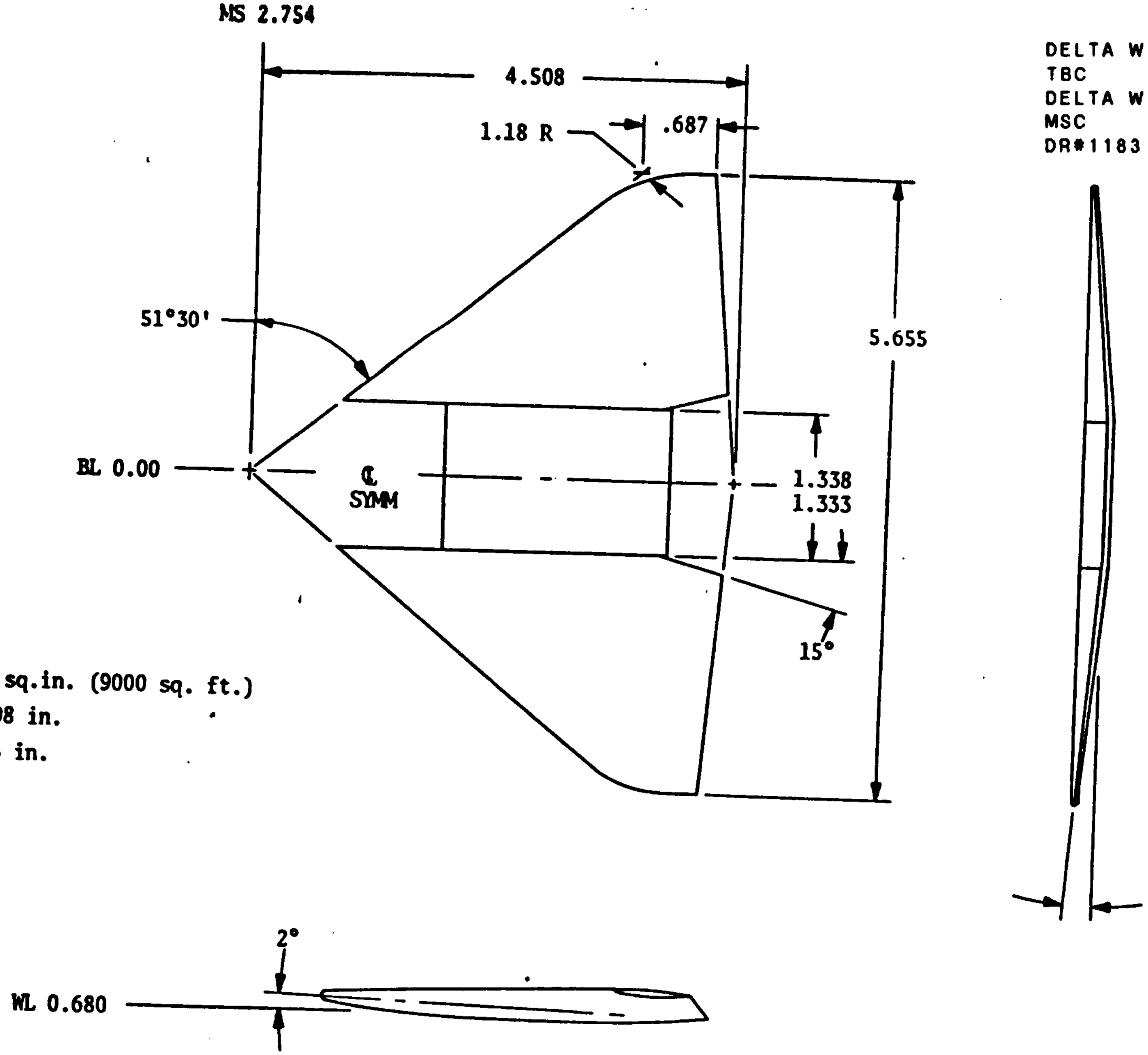


FIGURE 10. REUSABLE LOX-RP (-049) BOOSTER WING - W_{10}
0.003366 SCALE AR1216I-1 MODEL

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 442



S = 14.6836 sq.in. (9000 sq. ft.)
ℓ_{LONG} = 4.508 in.
ℓ_{LAT} = 5.655 in.
AR = 2.18
λ = 0.15

FIGURE 11. REUSABLE LOX-RP (-049) BOOSTER WING - W_{11}
0.003366 SCALE AR 1216I-1 MODEL

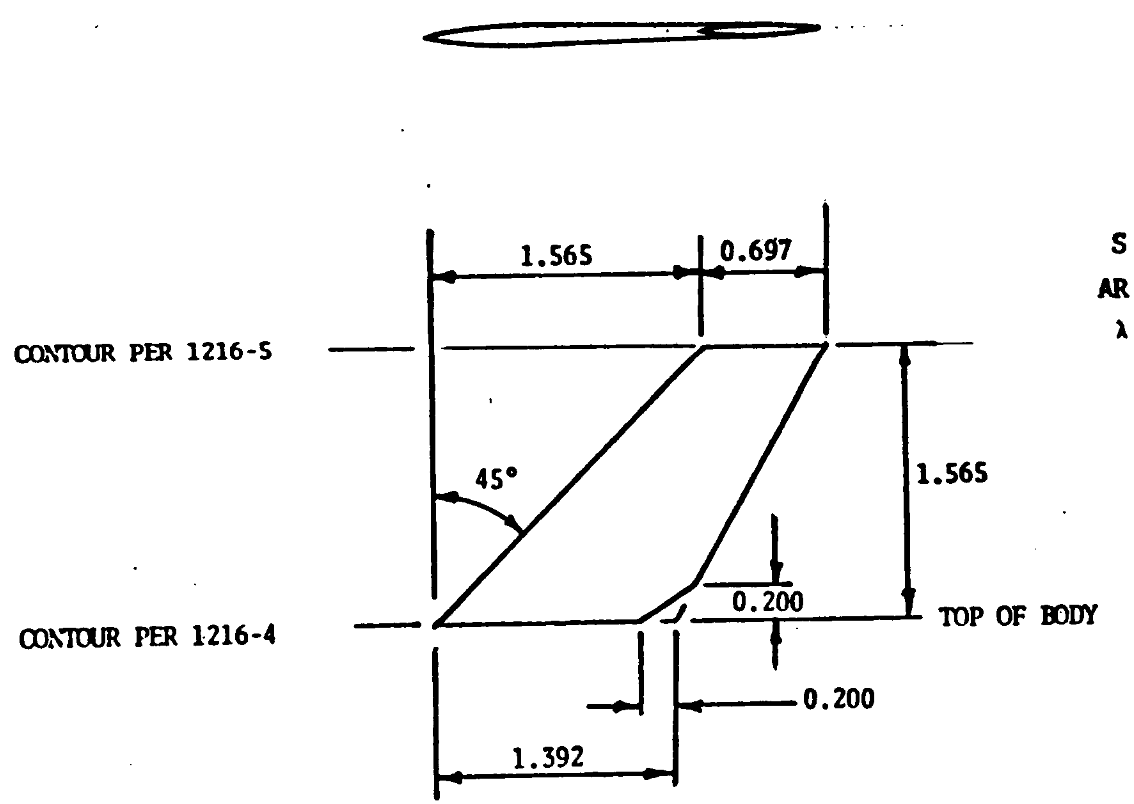


FIGURE 12. REUSABLE LOX-RP (-049) BOOSTER VERTICAL TAIL - V_4
0.003366 SCALE AR1216I-1 MODEL

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 443

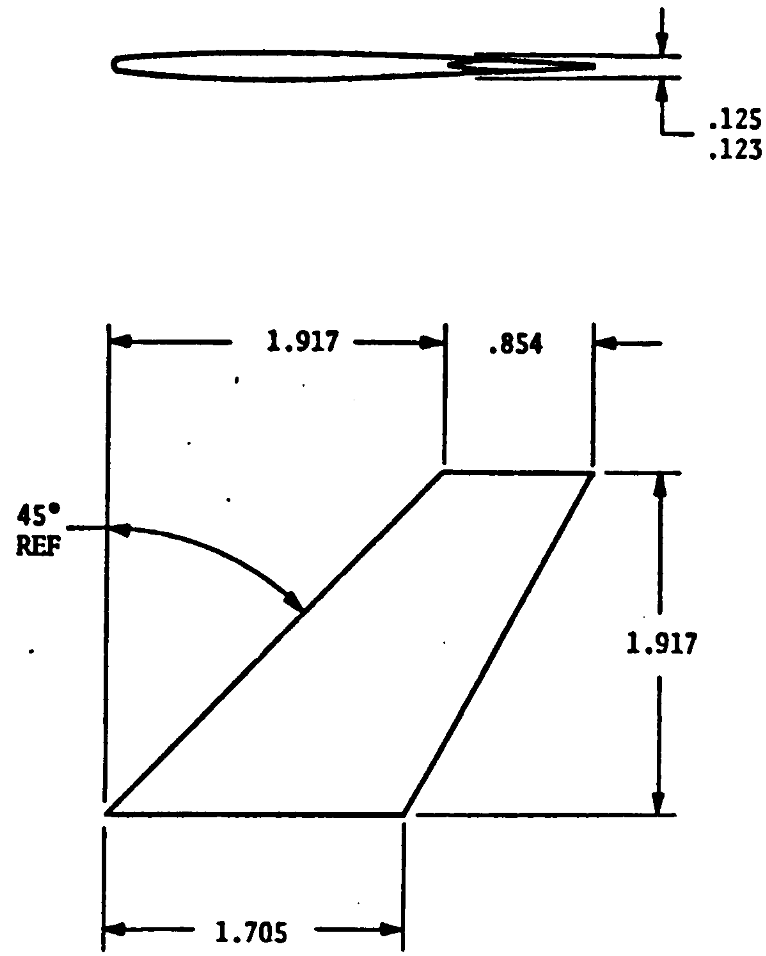


FIGURE 13. REUSABLE LOX-RP (-049) BOOSTER VERTICAL TAIL - V_5
0.003366 SCALE AR 1216I-1 MODEL

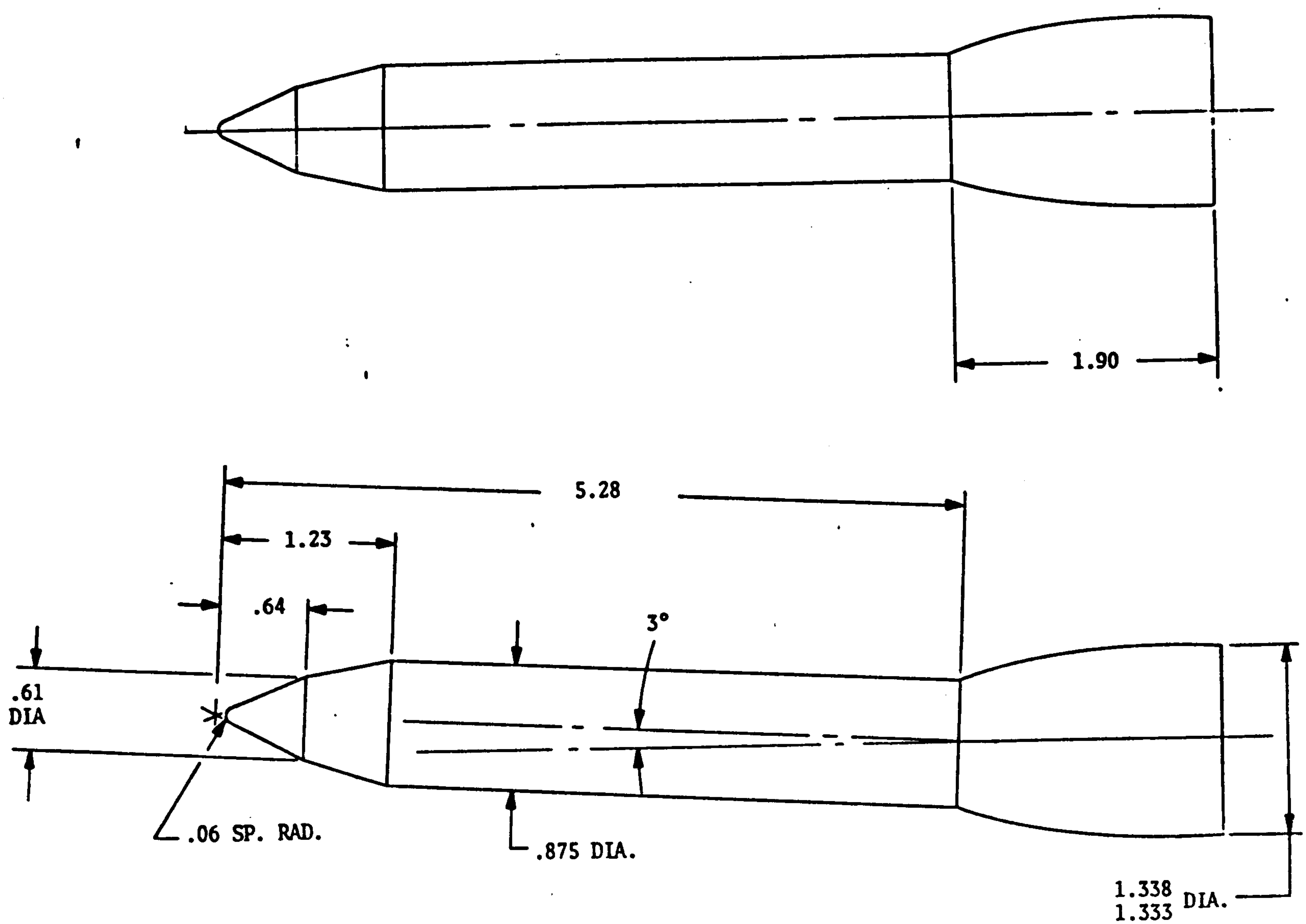


FIGURE 14. LOX-RP ORBITER TANK, DEFLECTED T_2
0.003366 SCALE MODEL

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 445

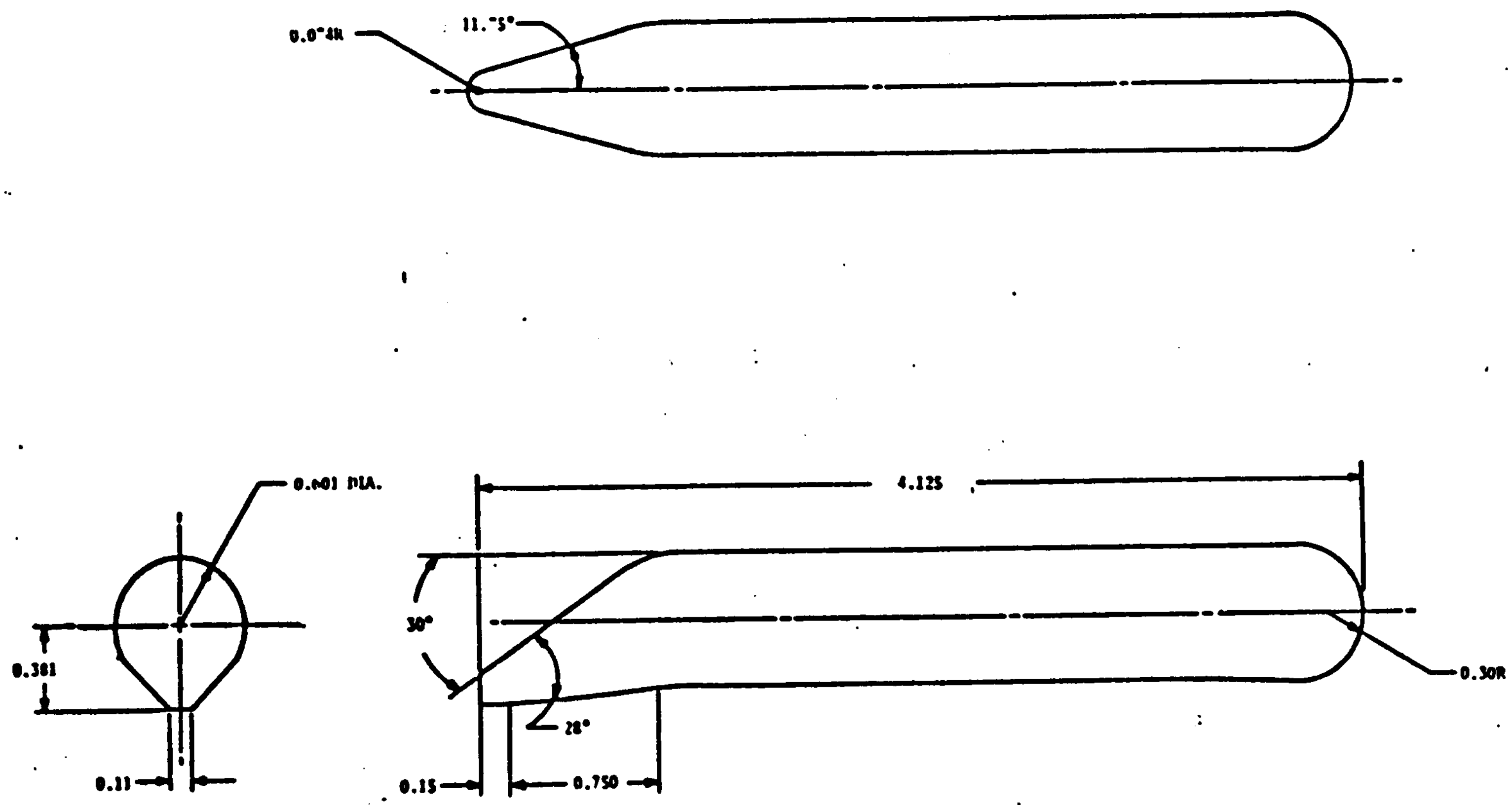


FIGURE 15. ORBITER DROP TANKS - T_3
0.003366 SCALE MODEL AR 1216I-1

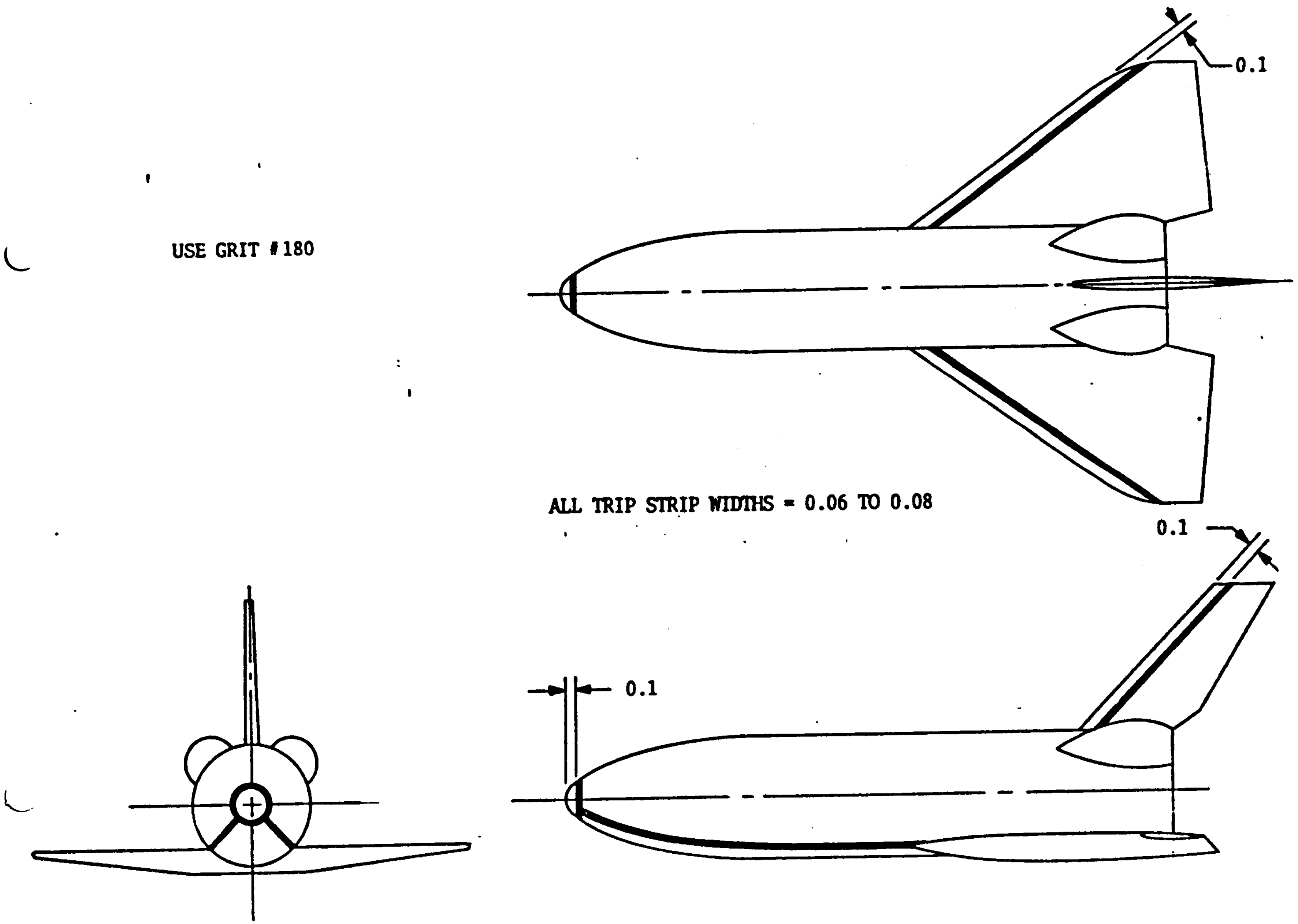


FIGURE 16A. TRIP STRIP CHART
AR1216I-1 MODEL

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 447

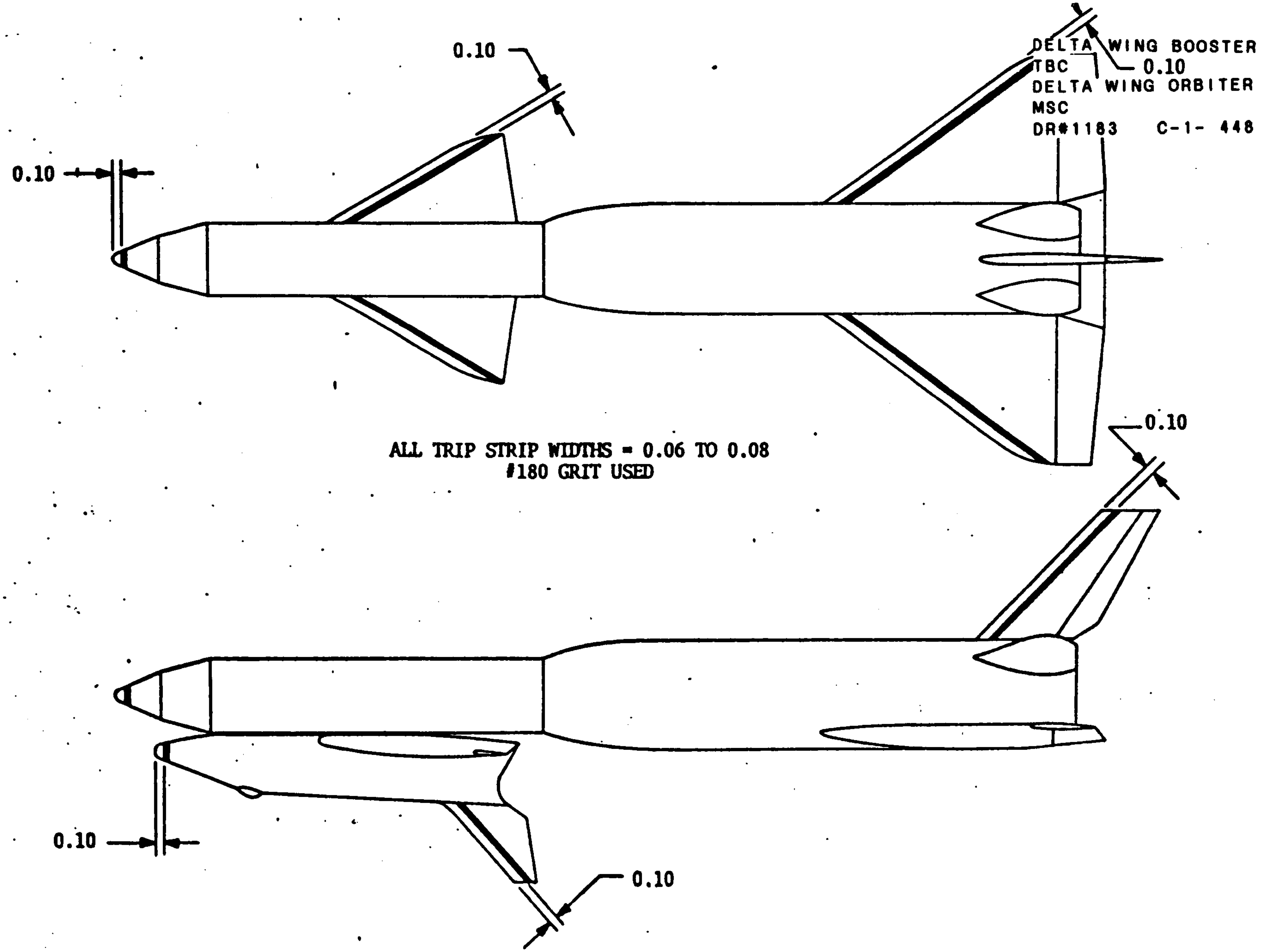


FIGURE 16B. TRIP STRIP CHART
AR1216I-1 MODEL

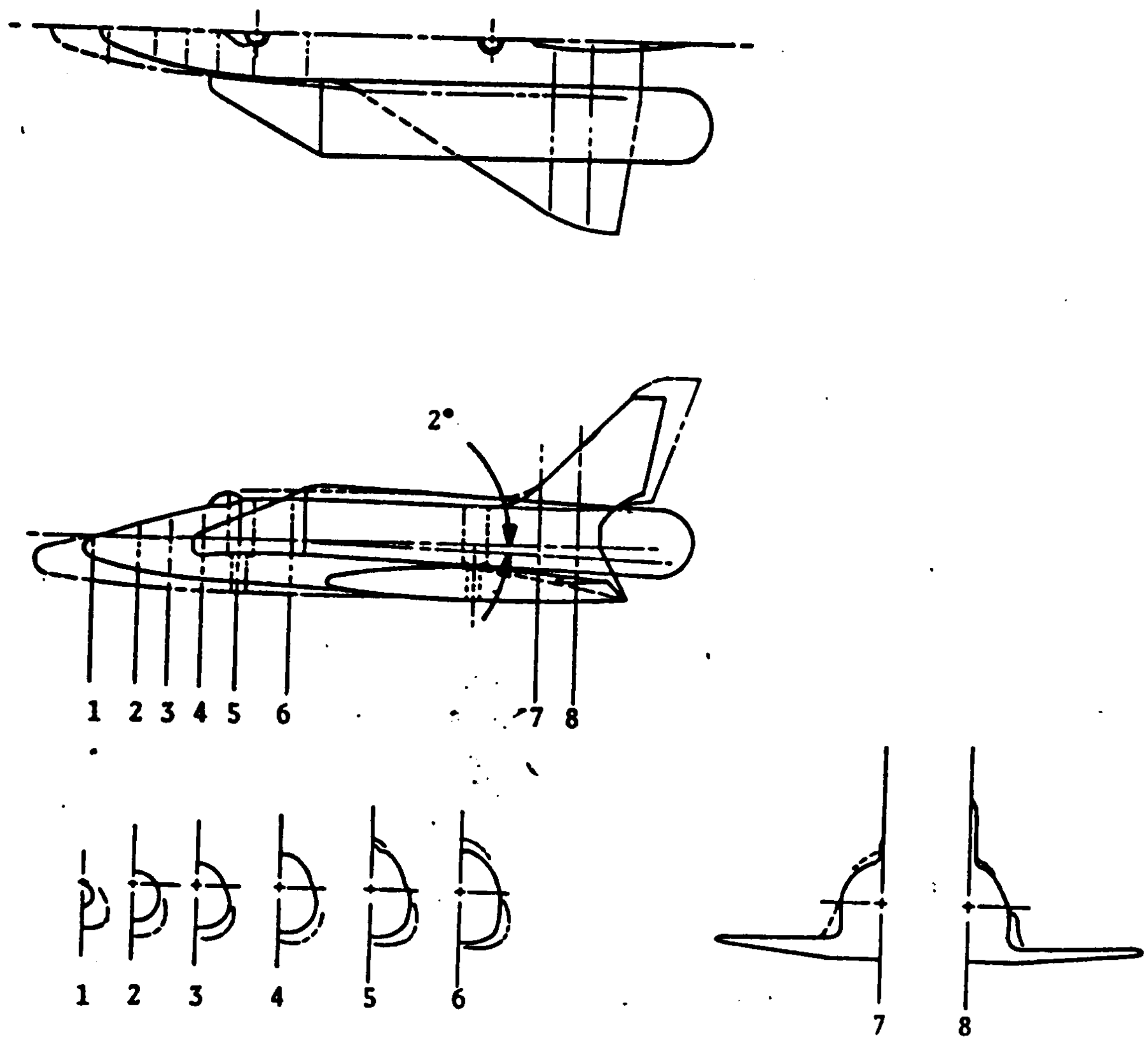


FIGURE 18. MSC-040A ORBITER
0.003366 Scale Model

DELTA WING BOOSTER
TBC
DELTA WING ORBITER
MSC
DR#1183 C-1- 449

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1047 C-1- 450

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TEST CFHT No. 54 **DATA SET · ORGANIZATION · SHEET**

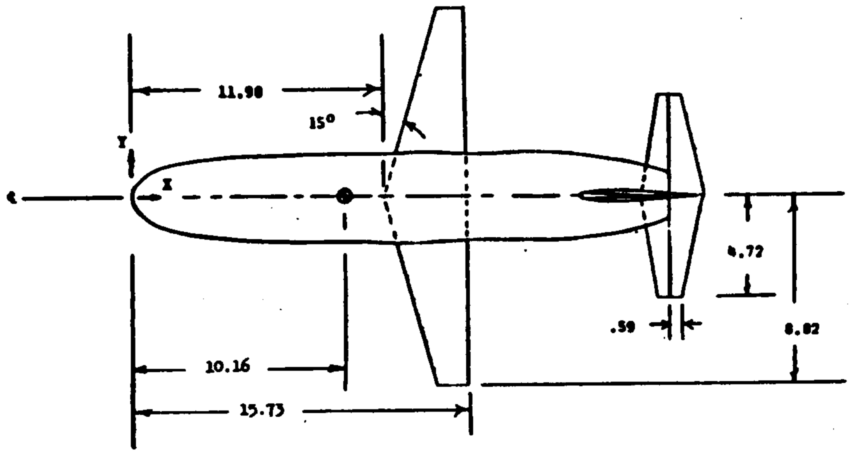
DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION	NO. of RUNS	MACH NUMBERS 10.4
RLB002	B1W2V3H6L0	A	0			2
RLB007	B1W2V3H6L1G1	│	0			7
RLB008	B1W2V3H6L2G1	│	0			8
RLB006	B1W2V3H6L3G1	│	0			6
RLB009	B1W2V3H6L2G2	V	0			9

ALPHA Schedule: A -10, -8, -6, -4, -2, 0, 2, 4, 6

COEFFICIENTS: CY Q(PSF) CN CA CLM MACH/ALPHA

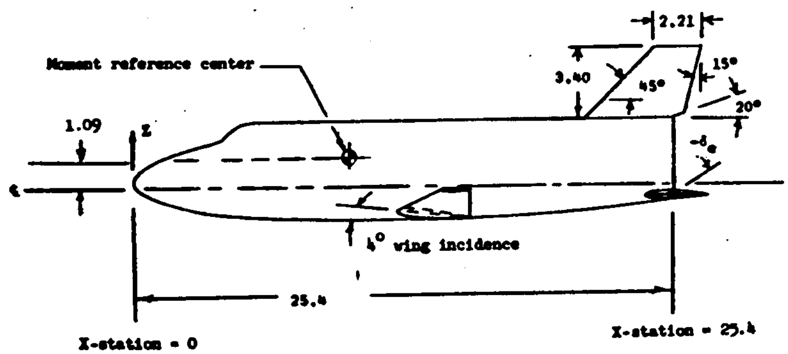
α or β SCHEDULES

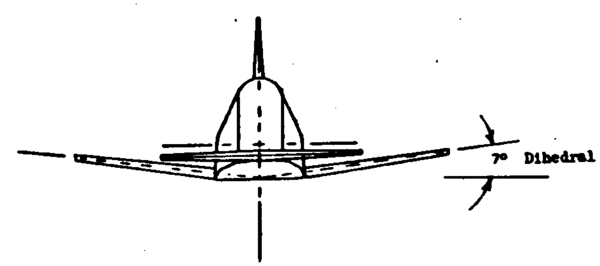
SSD-A



x/c	y/c
Horizontal tail (NACA 0012-64); center-line root chord, 2.98; tip chord, 1.05	
0.10	0.04
.40	.06
.80	.03
1.00	.001
Leading-edge radius, 0.06	Leading-edge radius, 0.02
Vertical tail (NACA 0012-64)	
z = 1.24; c = 6.12	z = 6.48; c = 2.21
0.10	0.04
.40	.06
.80	.03
1.00	.001
Leading-edge radius, 0.11	Leading-edge radius, 0.04

x/c	y/c
Wing root (NACA 0014-64); center-line root chord, 3.78	
0.15	0.06
.50	.07
.80	.02
1.00	.002
Leading-edge radius, 0.06	
Wing tip (NACA 0010-64); tip chord, 1.33	
0.15	0.05
.50	.05
.80	.01
1.00	.005
Leading-edge radius, 0.02	

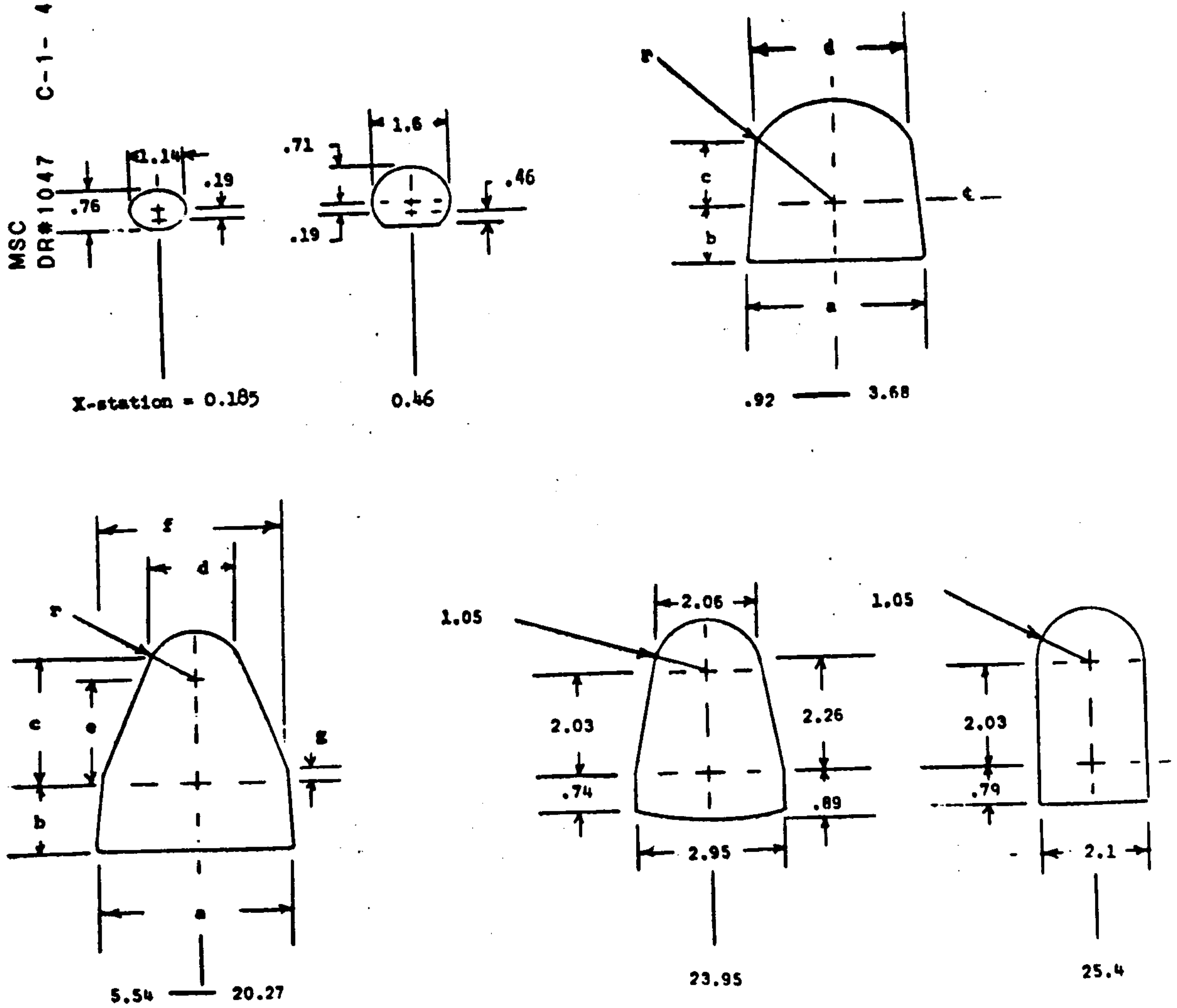




(a) General arrangement.

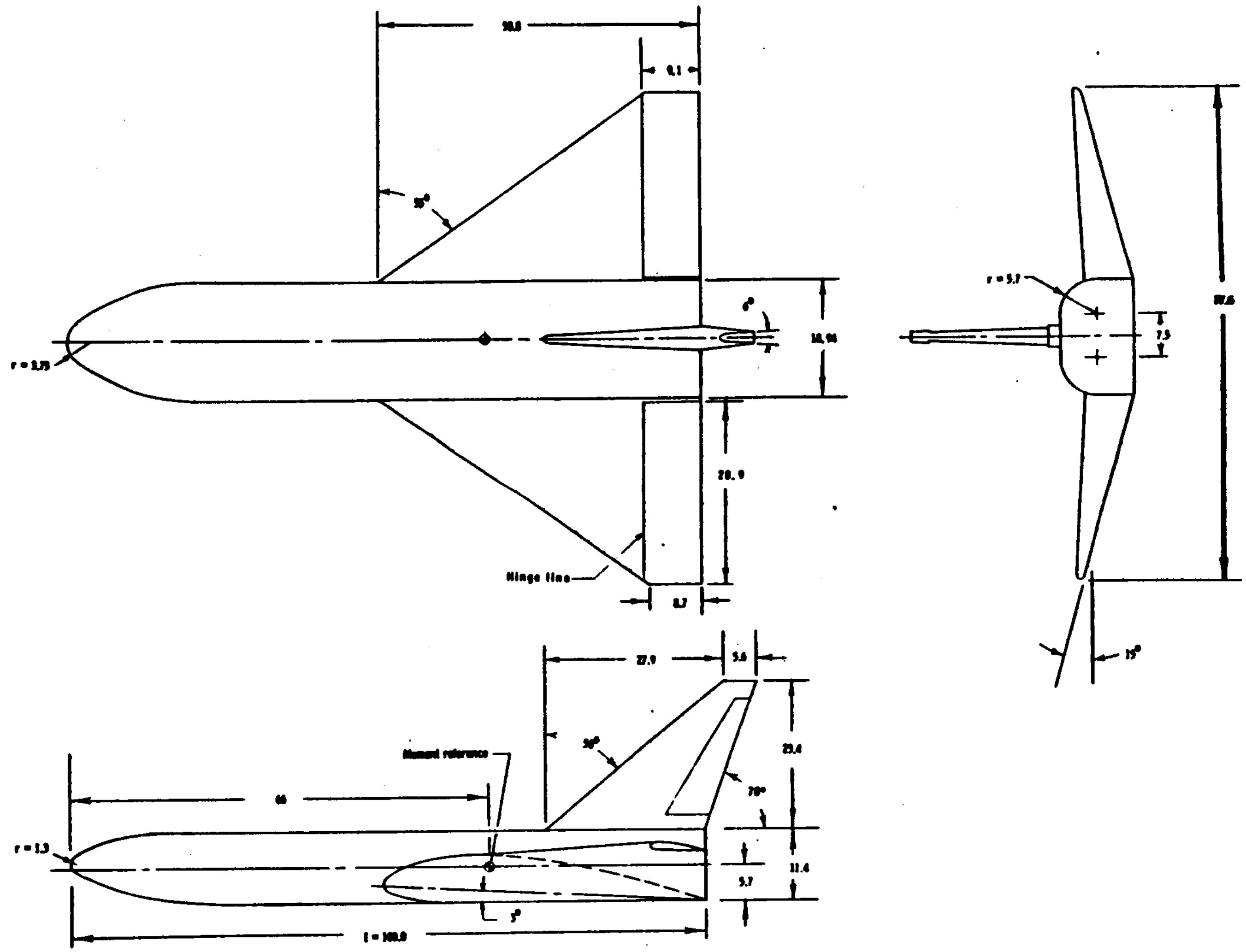
FIGURE 2 Orbiter model details. All dimensions are in centimeters.

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1047 C-1- 452



X-station	a	b	c	d	e	f	g	r
0.92	2.22	0.46	0.66	1.93				1.14
1.85	2.79	.73	1.02	2.11				1.47
2.76	3.25	.97	1.12	2.62				1.78
3.68	3.56	1.14	1.27	3.05				2.03
5.54	3.91	1.37	2.41	1.75	2.03	3.68	0.25	.99
7.37	4.06	1.42	2.49	1.91	2.03	3.81	.25	1.05
11.05	4.19	1.52	2.49	1.91	2.03	3.94	.29	1.05
13.82	4.14	1.63	2.49	1.91	2.03	3.94	.29	1.05
15.55	3.94	1.52	2.48	1.91	2.03	3.94	.29	1.05
20.27	3.94	1.21	2.48	1.91	2.03	3.94	.29	1.05

FIGURE 3 Orbiter model cross-sections



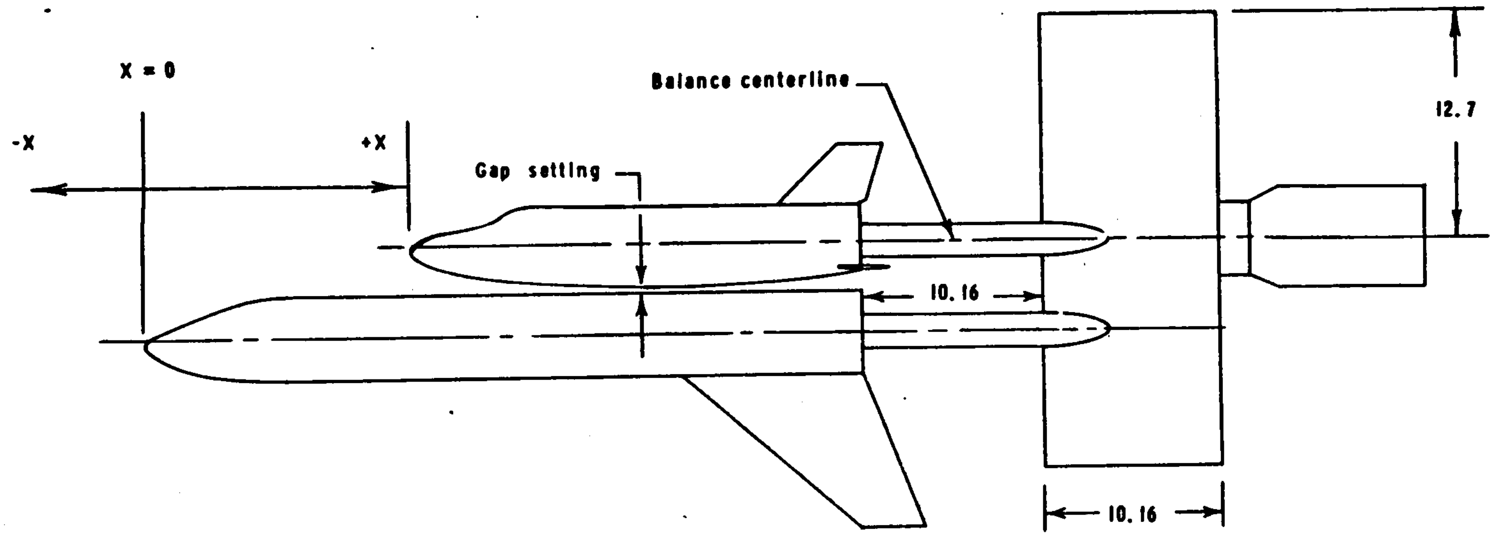
ℓ = 16 inch (40.6 cm.)

FIGURE 4 Booster model details. Linear dimensions are in percent of model length.

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1047 C-1- 453

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1047 C-1- 454

Axial location		Gap setting	
	X, cm.		cm.
L1	-5.08	G1	0.19
L2	8.89	G1	0.19
L3	15.24	G1	0.19
L2	8.89	G2	0.69
L0	Booster removed		



Wings omitted for clarity

Orbiter shown here in axial location L3

FIGURE 5 Drawing of orbiter - booster arrangement. All dimensions in centimeters.

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TEST CFHT No. 54 DATA SET - ORGANIZATION - SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS 10.4											
RLC012	BWTLO	A	0						12											
RLC007	BWTL1G1		0						7											
RLC008	BWTL2G1		0						8											
RLC006	BWTL3G1		0						6											
RLC009	BWTL2G2	V	0						9											

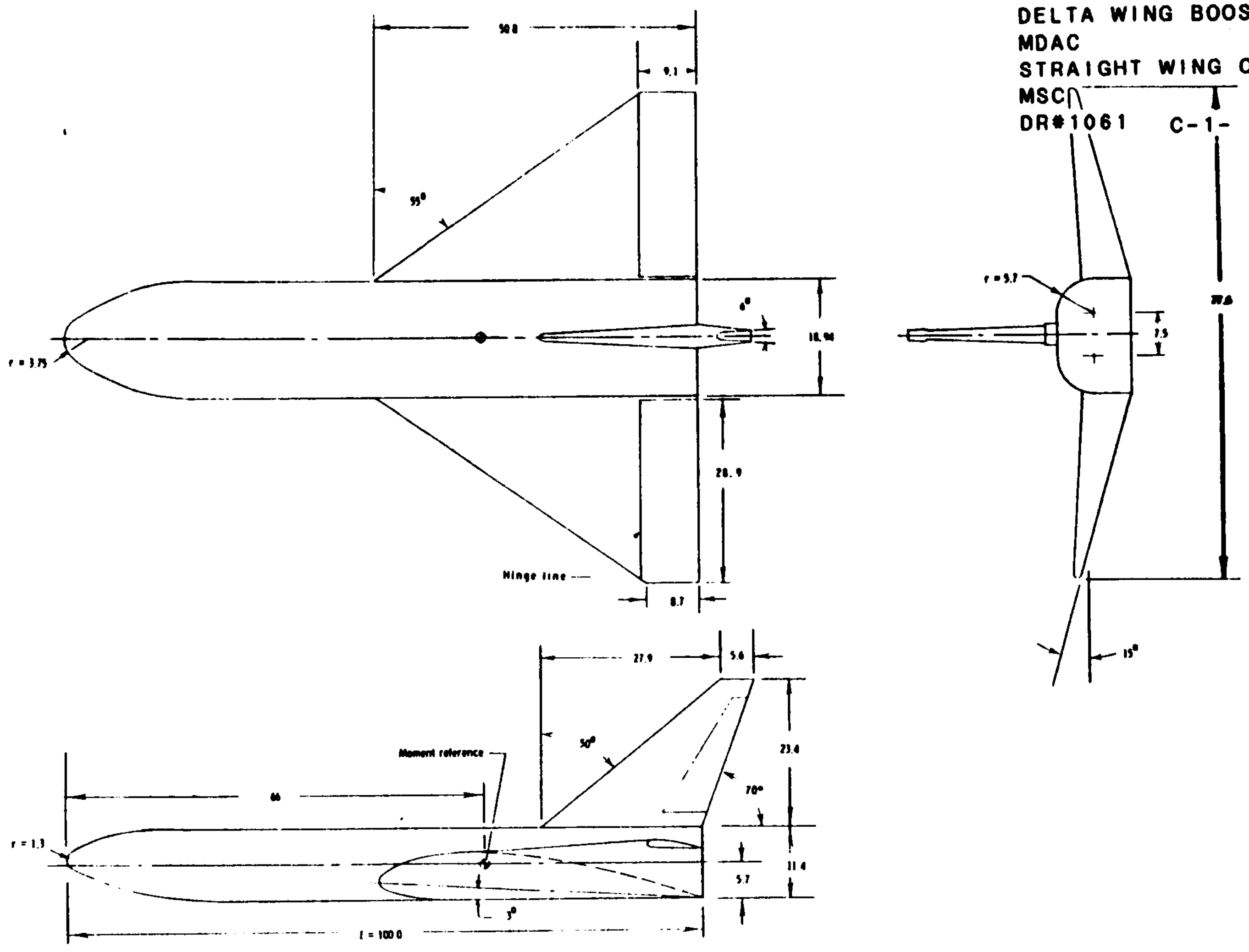
ALPHA Schedule: A 10, 8, 6, 4, 2, 0, -2, -4, -6

COEFFICIENTS: CY Q(PSF) CN CA CLM CAB MACH/ALPHA

α or β
SCHEDULES

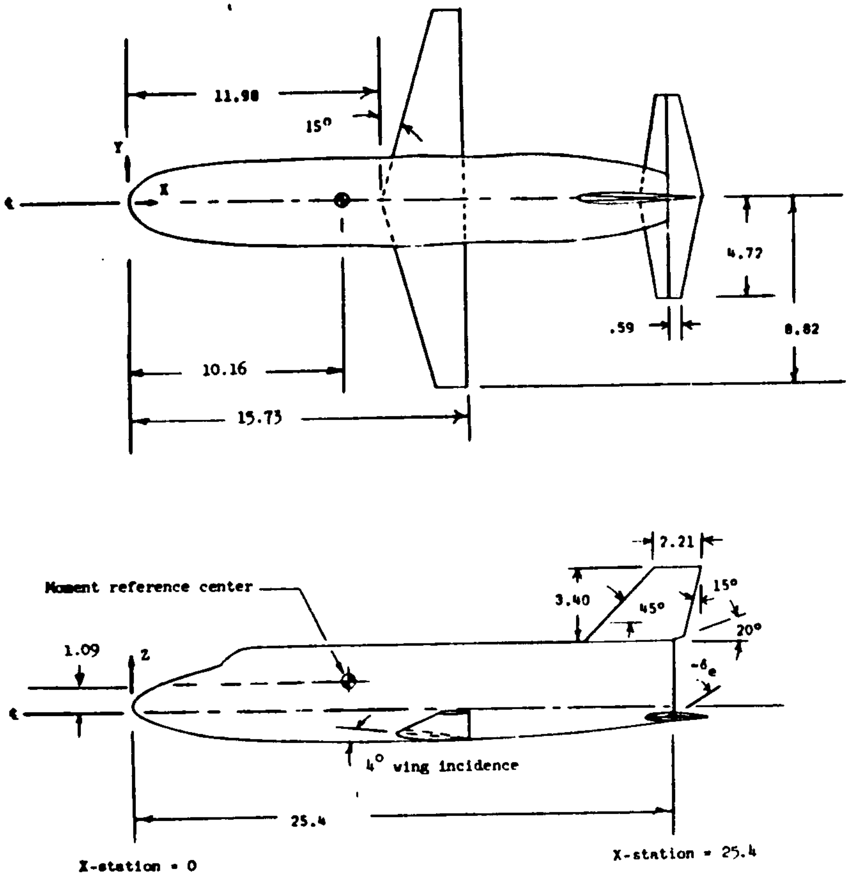
DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1061 C-1- 455

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1061 C-1- 456



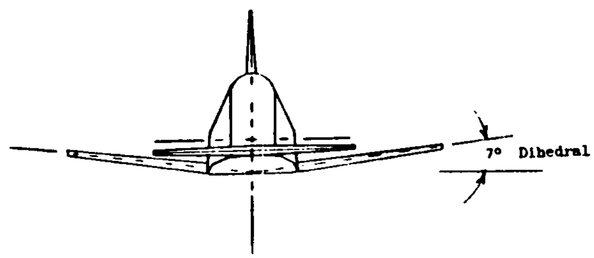
ℓ = 16 inch (40.6 cm.)

FIGURE 2. Booster model details. Linear dimensions are in percent of model length.



x/c	y/c
Horizontal tail (NACA 0012-64); center-line root chord, 2.98; tip chord, 1.05	
0.10	0.04
.40	.06
.80	.03
1.00	.001
Leading-edge radius, 0.06	Leading-edge radius, 0.02
Vertical tail (NACA 0012-64)	
z = 1.24; c = 6.12	z = 6.48; c = 2.21
0.10	0.04
.40	.06
.80	.03
1.00	.001
Leading-edge radius, 0.11	Leading-edge radius, 0.04

x/c	y/c
Wing root (NACA 0014-64); center-line root chord, 3.75	
0.15	0.06
.50	.07
.90	.02
1.00	.002
Leading-edge radius, 0.06	
Wing tip (NACA 0010-64); tip chord, 1.33	
0.15	0.05
.50	.05
.90	.01
1.00	.005
Leading-edge radius, 0.02	

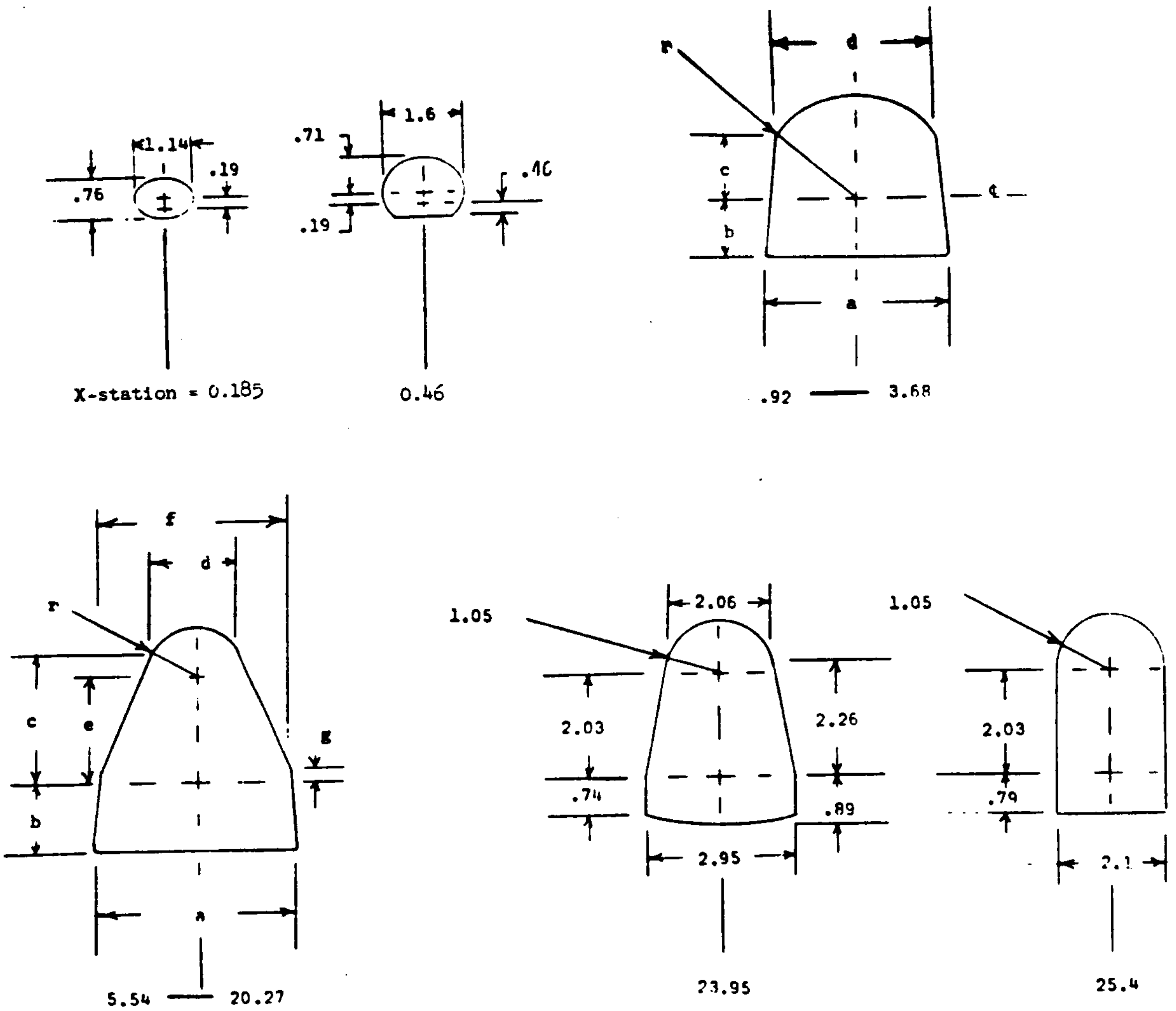


(a) General arrangement.

FIGURE 3. Orbiter model details. All dimensions are in centimeters.

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1061 C-1- 457

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1061 C-1- 458



X-station	a	b	c	d	e	f	g	r
0.92	2.22	0.46	0.66	1.93				1.14
1.85	2.79	.73	1.02	2.11				1.47
2.76	3.25	.97	1.12	2.62				1.78
3.68	3.56	1.14	1.27	3.05				2.03
5.54	3.91	1.37	2.41	1.75	2.03	3.68	0.25	.99
7.37	4.06	1.42	2.49	1.91	2.03	3.81	.25	1.05
11.05	4.19	1.52	2.49	1.91	2.03	3.94	.29	1.05
13.82	4.14	1.63	2.49	1.91	2.03	3.94	.29	1.05
15.55	3.94	1.52	2.48	1.91	2.03	3.94	.29	1.05
20.27	3.94	1.21	2.48	1.91	2.03	3.94	.29	1.05

FIGURE 4.

(b) Orbiter model cross-sections.

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Axial location	X, cm.	Gap setting	cm.
L1	-5.08	G1	0.19
L2	8.89	G1	0.19
L3	15.24	G1	0.19
L2	8.89	G2	0.69
L0	Orbiter removed		

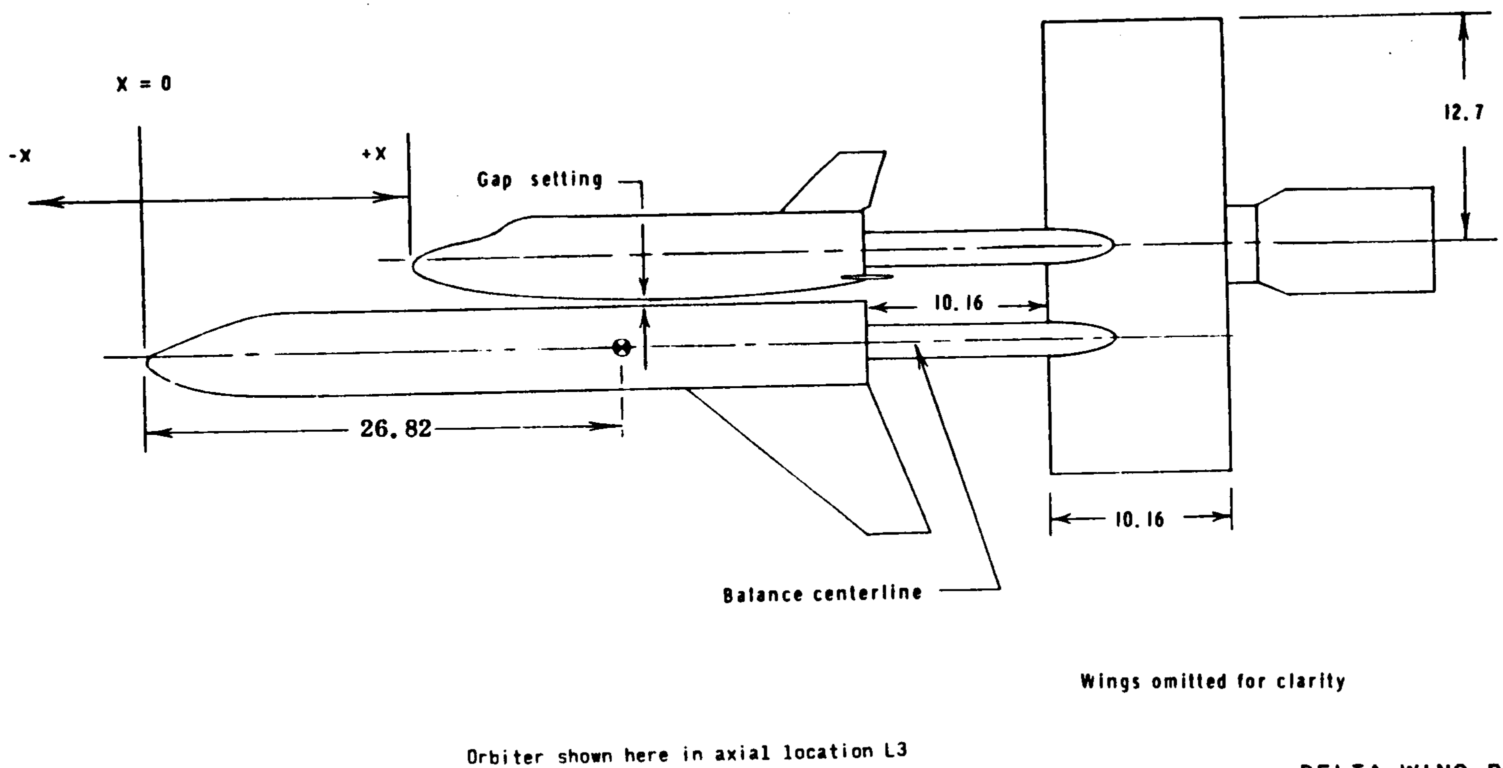


FIGURE 5. Sketch of booster - orbiter arrangement. All dimensions in centimeters.

DELTA WING BOOSTER
MDAC
STRAIGHT WING ORBITER
MSC
DR#1061 C-1- 459

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 460
18

TEST XXVIII, Phase 2 DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER i	ORBITER β	BOOSTER α	BOOSTER β	MACH NO.	SEPARATION POSITIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RCH CC1	$B_{11}W_{6}H_{10}V_{7}$	$B_{23}W_{81}H_{81}$	A	0°	0°	0°	1.81	[illegible]	[illegible]	11	6	7	8	3	4	5	[illegible]	10	11			
RCH CC2		$B_{23}:W_{81}H_{81}V_{81}$	0°	B	0°	0°				[illegible]	16		17		18	19			20			
RCH CC3		$B_{23}:W_{81}H_{81}$	A	0°	+5°	0°					21	22	23	24	25	26	27	28	29			
RCH CC4		$B_{23}W_{81}H_{81}V_{81}$	0°	B	0°	+5°				[illegible]	31		32		33	34			35			
RCH CC5		$B_{23}W_{81}H_{81}$	A	0°	-5°	0°					36	37	38	39	40	41	42	43	44			
RCH CC6			A	0°	-5°	[illegible]	1.99				51	[illegible]	[illegible]	48	49	50	[illegible]	46	47			
RCH CC7			A	0°	0°	0°		[illegible]	64	65	66	61	62	61	[illegible]	[illegible]	57	[illegible]	[illegible]			
RCH CC8		$B_{23}W_{81}H_{81}V_{81}$	0°	B	0°	0°				67	68		69		[illegible]	71			[illegible]			
RCH CC9			0°	B	0°	0°				73	74		75		76	77			78			
RCH C10		$B_{23}W_{81}H_{81}$	A	0°	+5°	0°					79	80	81	[illegible]	83	84	[illegible]	86	87			
RCH C11			A	0°	+5°	0°	4.39				97	98	99	94	95	96	91	92	93			
RCH C12			A	0°	0°	0°		111	112	113	108	[illegible]	[illegible]	[illegible]	104	106	[illegible]	[illegible]	[illegible]			
RCH C13		$B_{23}W_{81}H_{81}V_{81}$	0°	B	0°	0°				114	115		116		117	118			119			
RCH C14			0°	B	0°	+5°				120	121		122		[illegible]	124			125			
RCH C15		$B_{23}W_{81}H_{81}$	A	0°	-5°	0°					126	127	128	129	130	131	132	133	134			
RCH C16		$B_{23}:W_{81}V_{66}$	A	0°	-5°	0°	1.61				141	142	143	138	139	140	135	136	137			
RCH C17			A	0°	0°	0°		144	145	146	147	148	149	150	151	152	153	154	155			
RCH C18			0°	B	0°	0°				156	157		158		159	160			161			
RCH C19			0°	0°	0°	0°														162	163	
RCH C20		$B_{23}W_{81}H_{81}$	0°	0°	0°	0°														164	165	

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CA	CY	CN	CBL	CLM	CYN	CPB				SEPPOS		7

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES
A = ±10° (Data at small increments - not [illegible])
B = ±6° (Data at small increments [illegible])

TEST [illegible] DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER	ORBITER	BOOSTER α	BOOSTER β	MACH NO.	SEPARATION POSITIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RCH C21	B1W5H[illegible]	[illegible]	-	0	+5°	0	[illegible]													[illegible]	16[illegible]	
RCH C22			5	0°	-5°	0														168	169	
RCH C23			-[illegible]	[illegible]	-5°	0°	[illegible]													170	171	
RCH C24			[illegible]	[illegible]	+5°	0°														172	173	
RCH C25			0°	0°	0°	[illegible]														174	175	
RCH C26					0°	[illegible]	1.39													176	177	
RCH C27			+5°	0°	+5	[illegible]														[illegible]	179	
RCH C28			-5°	0°	-5°	0°														[illegible]	181	
RCH C29		OFF	A	0°			1.[illegible]1															2
RCH C30			A	0°			2.99															[illegible]
RCH C31			A	0°			[illegible].39															167

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CA CY CN CBL CLM CYN CPB SEPPOS 7

COEFFICIENTS : IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 461

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 462

TEST [illegible] DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER	ORBITER	BOOSTER α	BOOSTER β	MACH NO.	SEPARATION POSITIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RCH C32	[illegible] V	$B_{A3}W_{B1}H_{B1}$	A	0°	0°	0°	[illegible]	[illegible]	513	514	506	507	508	[illegible]	504	505	509	510	511			
RCH C33	↓	[illegible]	0°	B	0°	0°	↓			515	516		517		518	519			520			
RCH C34		$B_{B3}W_{B1}H_{B1}$	A	0°	+5°	0°					521	522	523	524	525	526	527	528	529			
RCH C35		$B_{B3}W_{B1}H_{B1}V_{B1}$	0°	B	0°	+5°				530	531		532		533	534			535			
RCH C36		F [illegible]	A	0°	-5°	0°	↓				536	537	538	539	540	541	542	543	544			
RCH C37		↓	A	0°	-5°	0°	0.99				545	546	547	548	549	550	551	552	547			
RCH C38			A	0°	0°	0°		563	564	565	566	561	562	554	555	556	557	558	559			
RCH C39		$B_{B3}W_{B1}H_{B1}V_{B1}$	0°	B	0°	0°				567	568		569		570	571			572			
RCH C40		↓	0°	B	0°	+5°				573	574		575		576	577			578			
RCH C41		$B_{B3}W_{B1}H_{B1}$	A	0°	-5°	0°	↓				579	580	581	582	583	584	585	586	587			
RCH C42		↓	A	0°	+5°	0°	4.39				597	598	599	594	595	596	591	592	593			
RCH C43			A	0°	0°	0°		611	612	613	608	609	610	603	604	606	600	601	602			
RCH C44		$F_{?}W_{?}H_{B1}V_{B1}$	0°	B	0°	0				614	615		616		617	618			619			
RCH C45		↓	0°	B	0°	+5°	↓			620	621		622		623	624			625			
RCH C46		$B_{B3}W_{B1}H_{B1}$	A	0°	-5°	0°					626	627	628	629	630	631	632	633	634			
RCH C47			0°	0°	0	0	1.81													664	665	
RCH C48			+5°	0°	+5°	0	↓													666	667	
RCH C49			-5°	0°	-5°	0														668	669	
RCH C50			-5°	0°	-5°	0	2.99													670	671	
RCH C51	↓	↓	+5°	0°	+5°	0	↓													672	673	

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CA	CY	CN	CBL	CLM	CYN	CPB				SEPPOS		7

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES
A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

TEST SAXVIII, Phase 1 DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER α	ORBITER β	BOOSTER α	BOOSTER β	MACH NO.	SEPARATION POSITIONS 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
KCH 052	$B_{..}W_cH_{..}V_5$	$B_3W_{B1}H_{B1}$	0°	0°	0°	0°	2.99													674	675	
KCH 053			0°	0°	0°	0°	4.39													676	677	
KCH 054			+5°	0°	+5°	0°														678	679	
KCH 055			-5°	0°	-5°	0°														680	681	
KCH 056	OFF				-5°	0°																682
KCH 057					+5°	0°																683
KCH 058					0°	0°																684
KCH 059					0°	+5°																685
KCH 060		$B_{B3}W_{B1}H_{B1}V_{B1}$			0°	+5°																686
KCH 061					0°	0°																687
KCH 062					0°	0°	2.99															689
KCH 063		$B_B W_{B1}H_{B1}$			0°	0°																690
RCH 064					0°	+5°																691
RCH 065		$B_{B3}W_{B1}H_{B1}V_{B1}$			0°	+5°																692
RCH 066		$B_{B3}W_{B1}H_{B1}$			+5°	0°																693
KCH 067					-5°	0°																694
RCH 068					-5°	0°	1.81															695
KCH 069					+5°	0°																696
RCH 070					0°	0°																697
RCH 071					0°	+5°																701

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CA	CY	CN	CBL	CLM	CYN	CPB				SEPPOS		7

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 463

ORIGINAL PAGE IS OF POOR QUALITY

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 464

TEST XXVIII, [illegible] 1 DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION ORBITER	CONFIGURATION BOOSTER	ORBITER	ORBITER	BOOSTER α	BOOSTER β	MACH NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	1.61															70
[illegible] 7	↓	↓					↓															199

1 7 13 19 25 31 37 43 49 55 61 67 73 76

CA	CY	CN	CBL	CLM	CYN	CPB				SEPFOS		7

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES
A = ±10° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)
B = ±6° (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

ORIGINAL PAGE IS
OF POOR QUALITY

TEST ________ DAT. SET COLLATION SHEET

☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION		ORBITER		BOOSTER		MACH	SEPARATION POSITIONS														
	ORBITER	BOOSTER	[illegible]	[illegible]	α	β	NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
KCH C71	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				61	61	61	[illegible]	[illegible]	61	6	[illegible]	[illegible]			
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6	[illegible]	[illegible]	[illegible]			
[illegible]			[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]		[illegible]		[illegible]	[illegible]			[illegible]			
KCH C77			[illegible]	[illegible]	[illegible]	[illegible]														[illegible]	[illegible]	
[illegible]	[illegible]				[illegible]	[illegible]																[illegible]
[illegible]					[illegible]	[illegible]																
KCH [illegible]					[illegible]	[illegible]																[illegible]

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CA	CY	CN	CBL	CLM	CYN	CPB	[illegible]	7

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

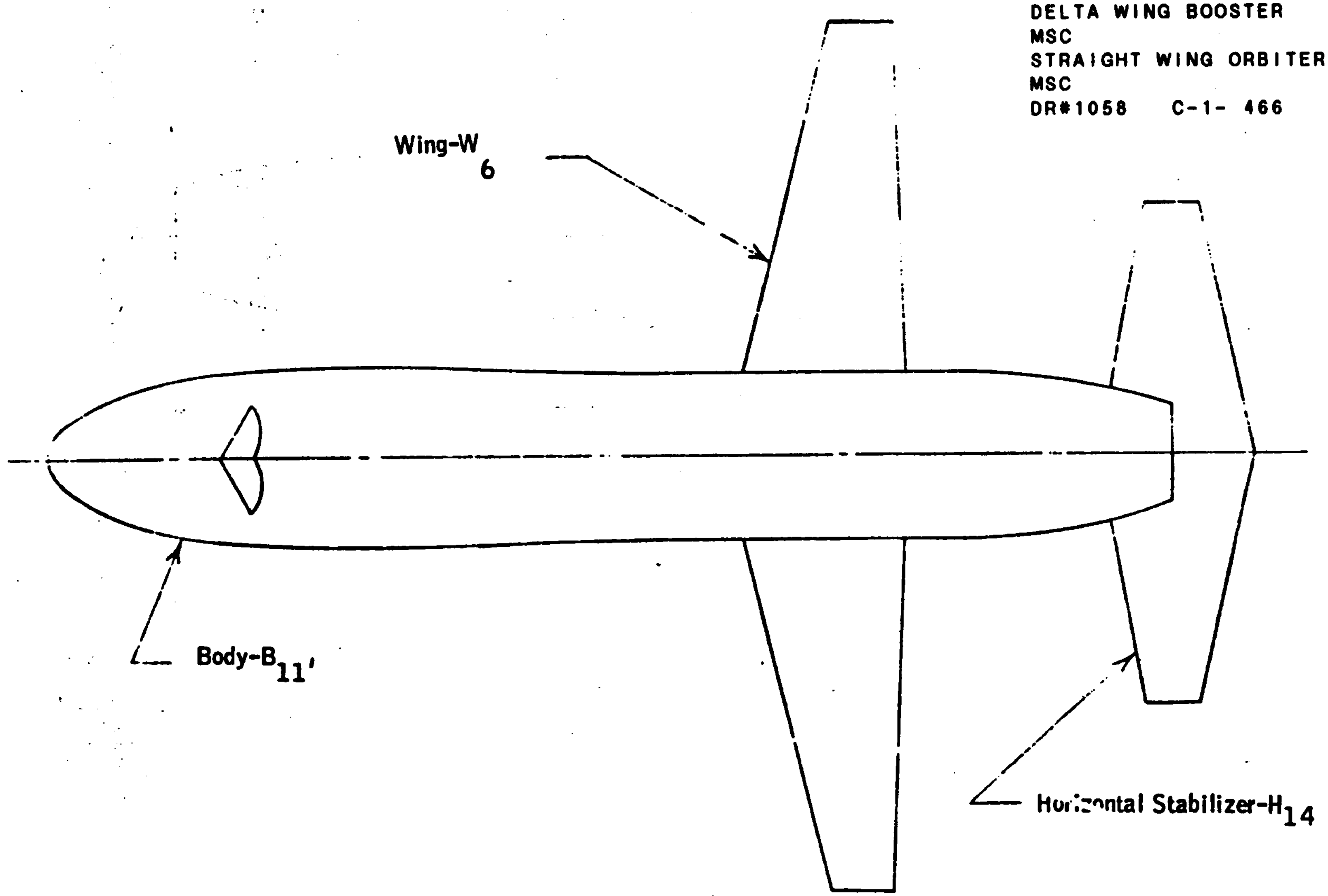
α or β SCHEDULES

A = ±1[illegible] (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

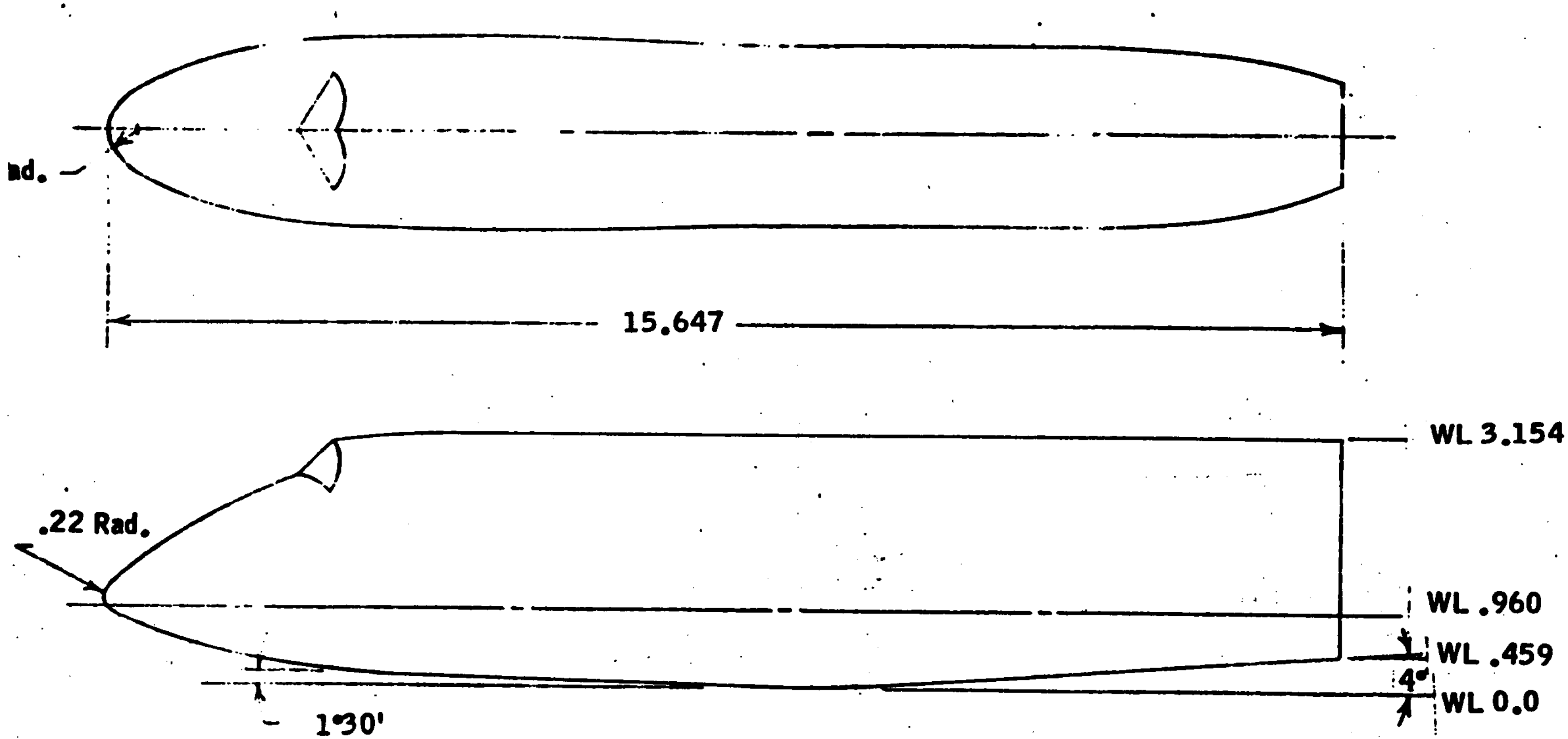
B = ±[illegible] (DATA AT SMALL INCREMENTS - NOT CONSTANT FOR EACH RUN)

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 465

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 466



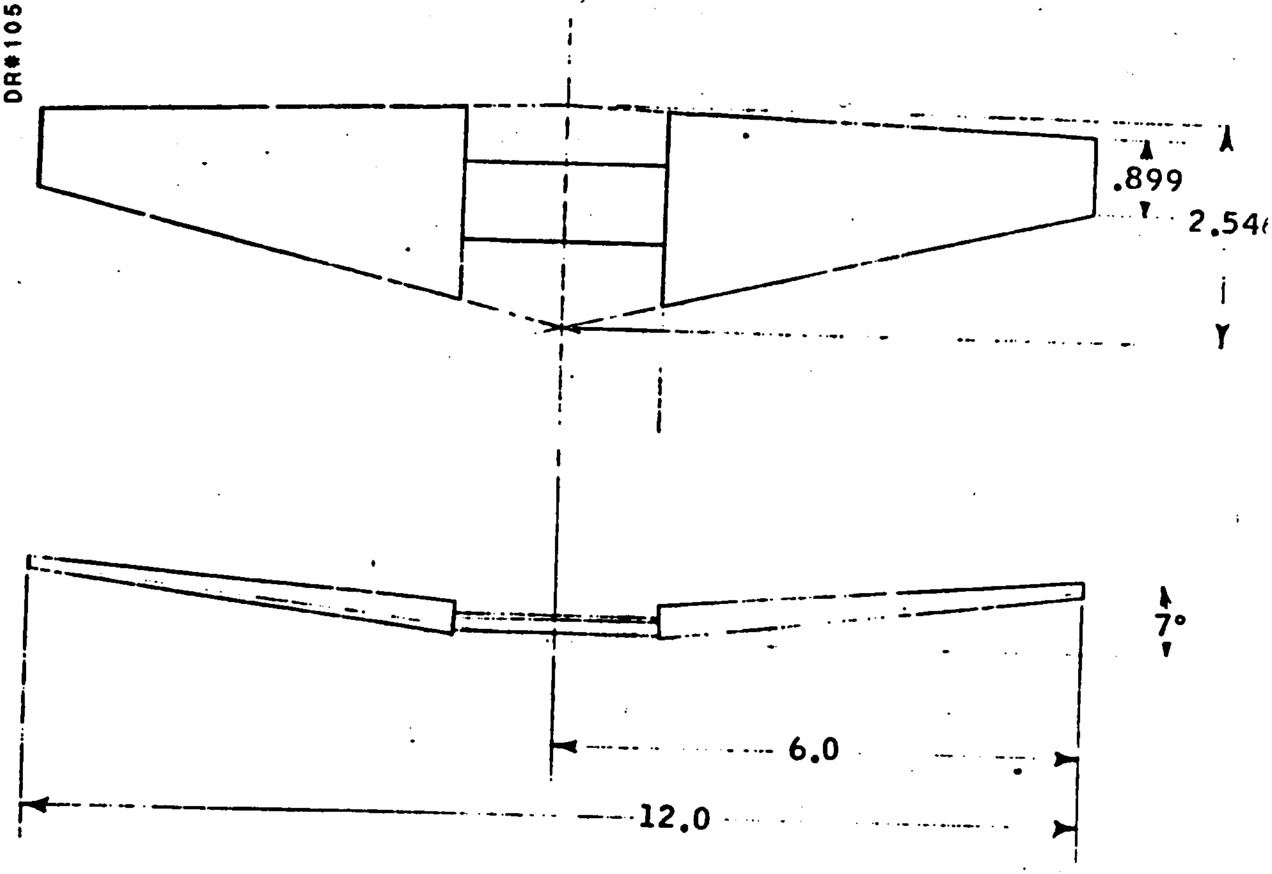
(a) Model Assembly
Figure 1. - 245 Orbiter Configuration. Model S-13A.
All Dimensions are in Inches.



(b) Body - B_{11}
Figure 1. - Continued.

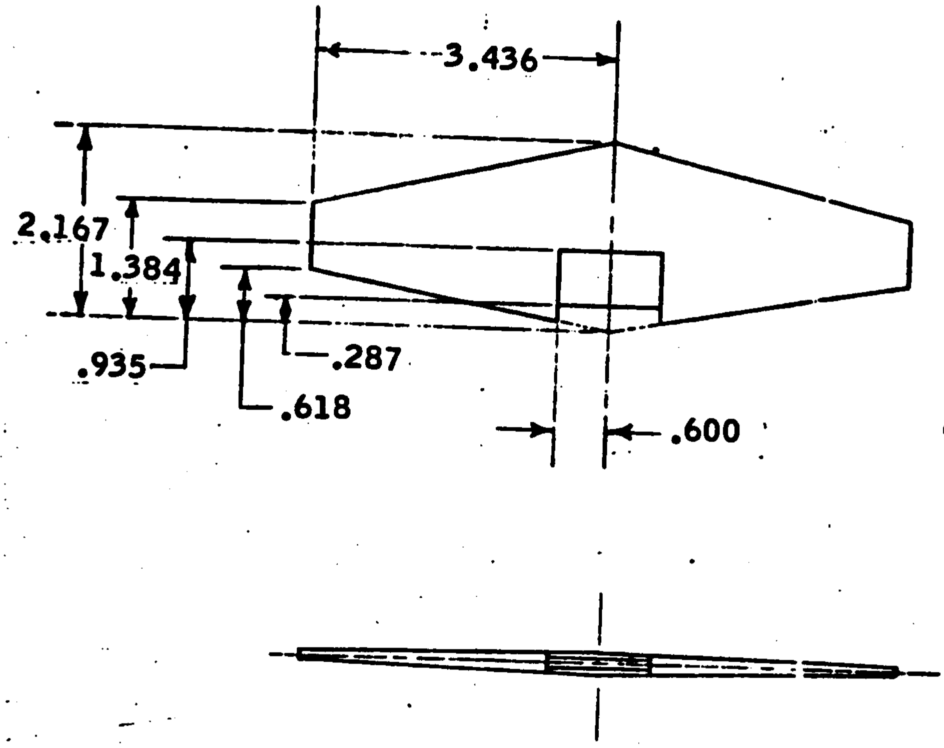
DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 467

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 468



(c) Wing - W_6

Figure 1. - Cont. .ued.

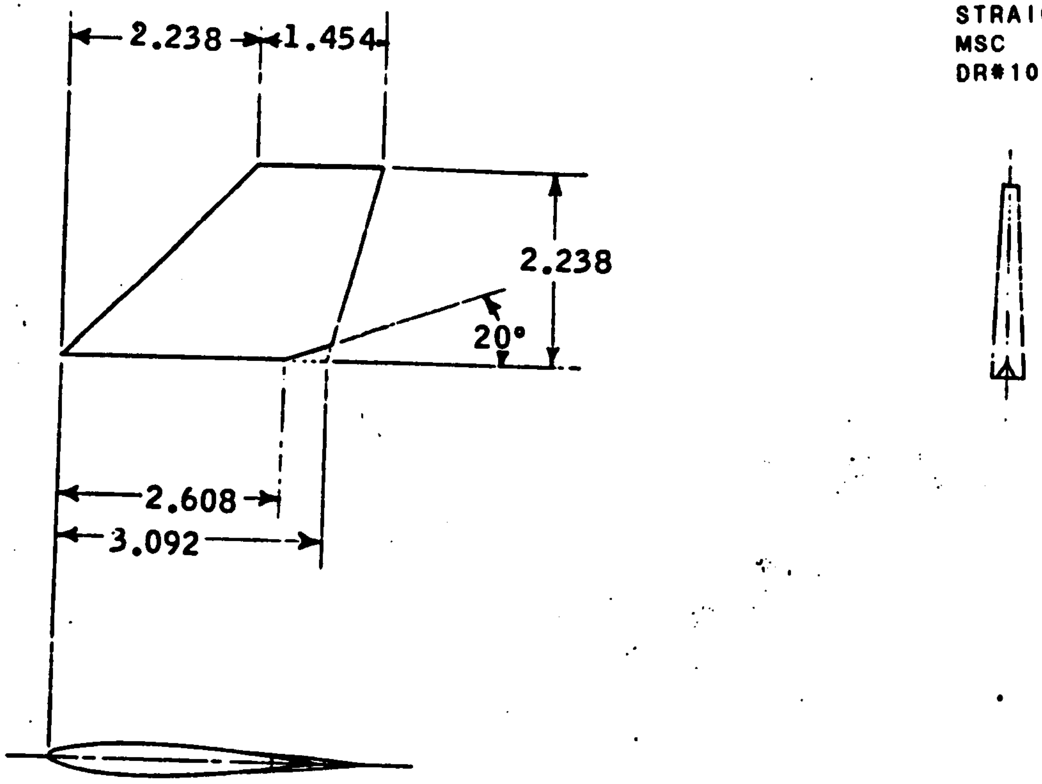


(d) Horizontal stabilizer - H_{14}

Figure 1. - Continued.

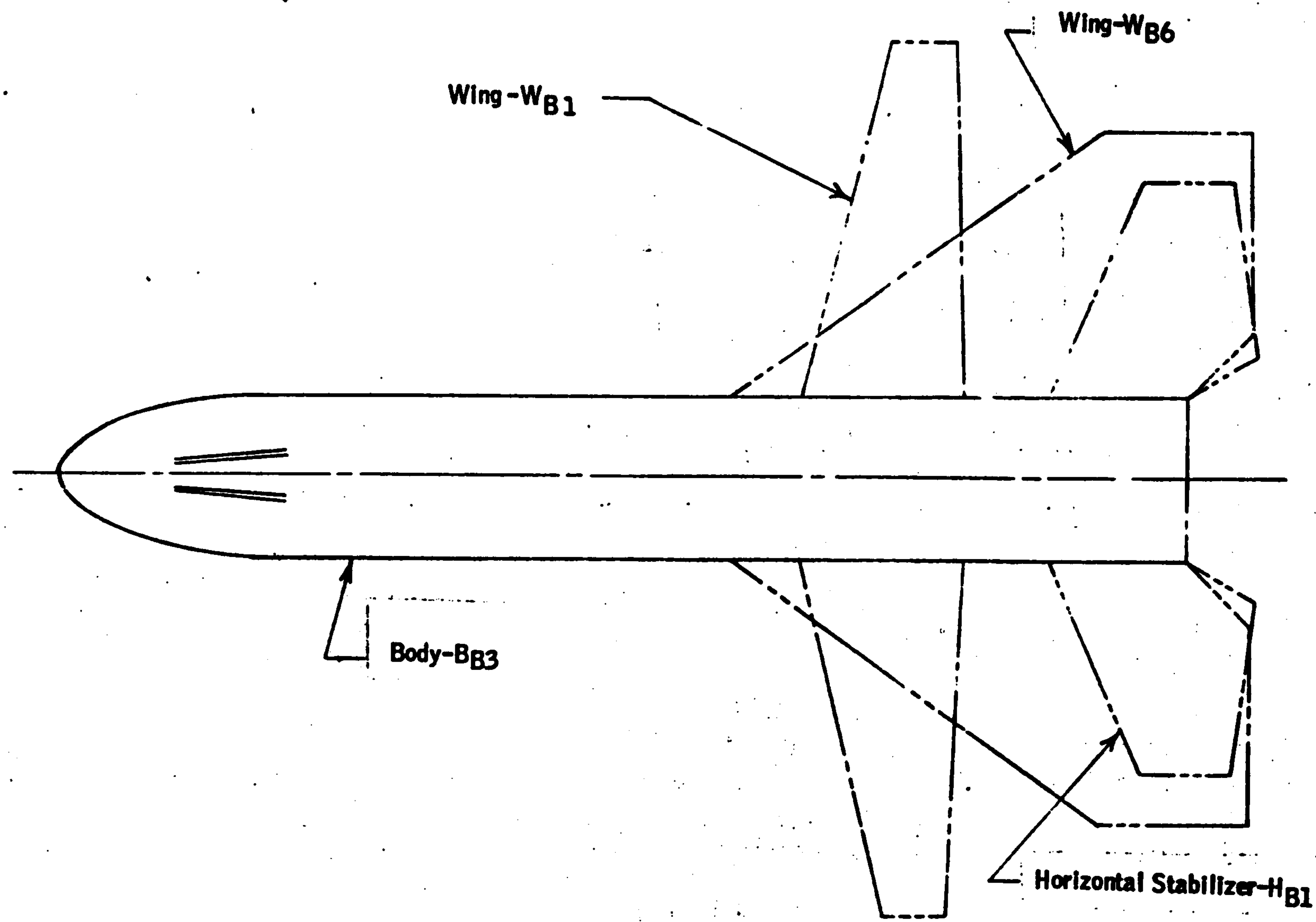
DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 469

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058   C-1- 470



(e) Vertical tail - V_5

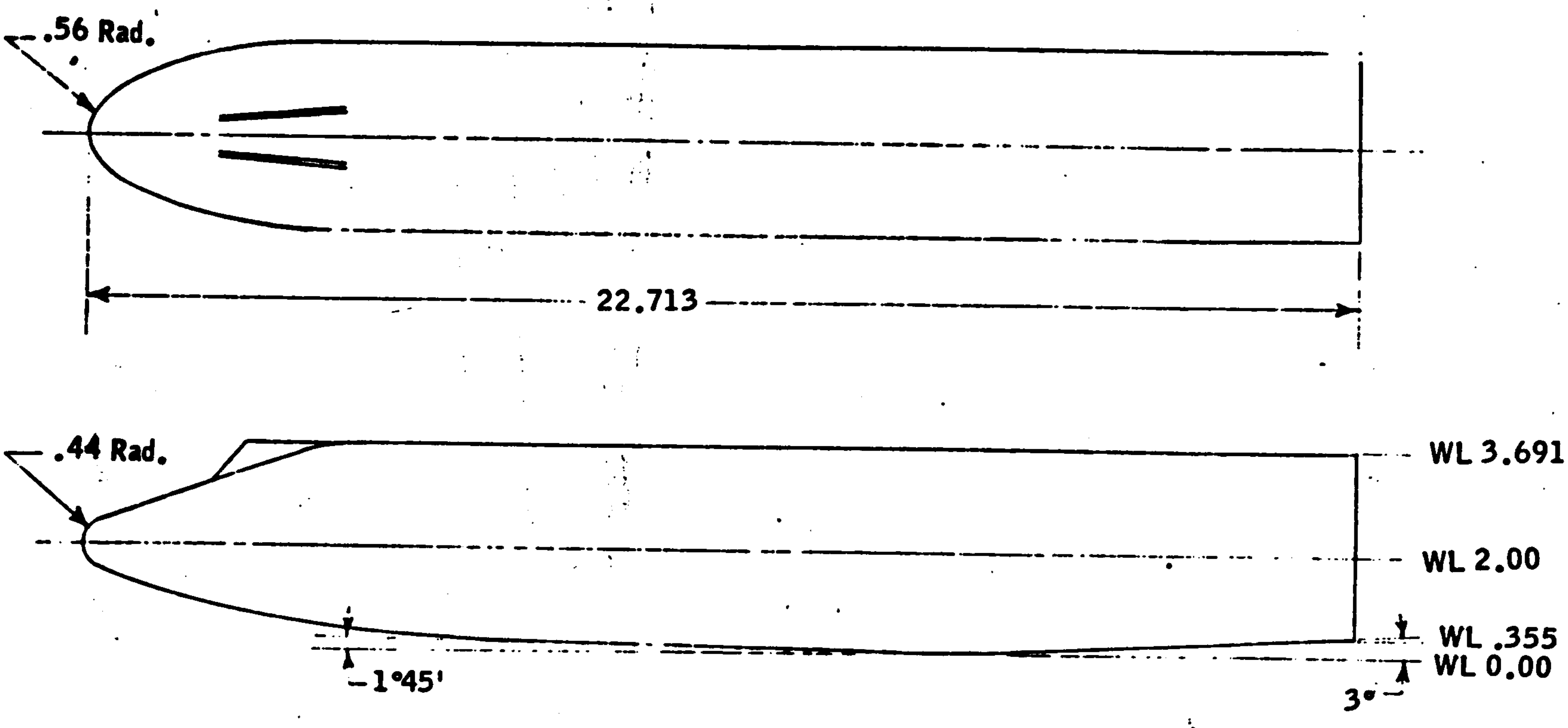
Figure 1. - Concluded.



(a) Model Assembly

Figure 2. - 251 Booster Configuration. Model SB-13A. All Dimensions are in Inches.

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 472



(b) Body - B_{B3}

Figure 2. - Continued.

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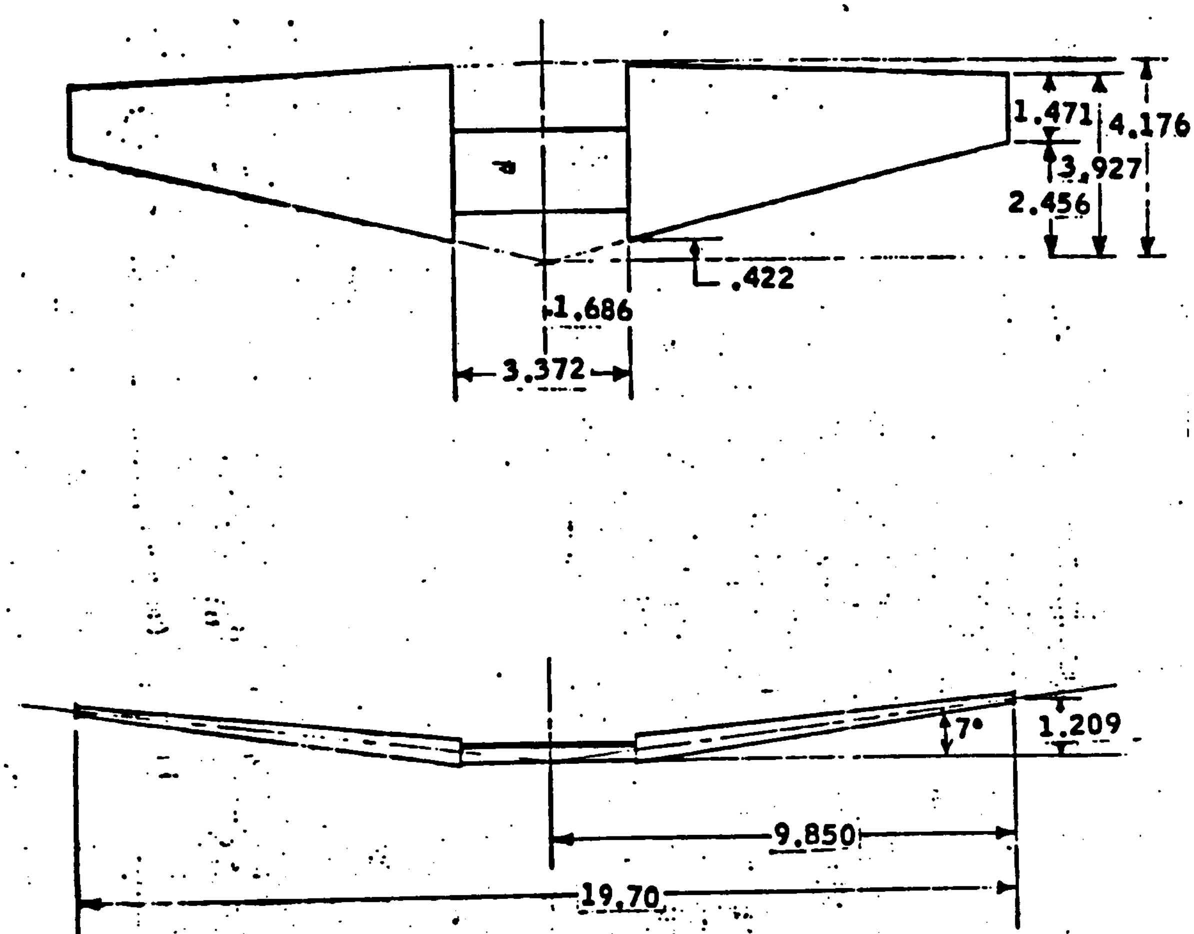
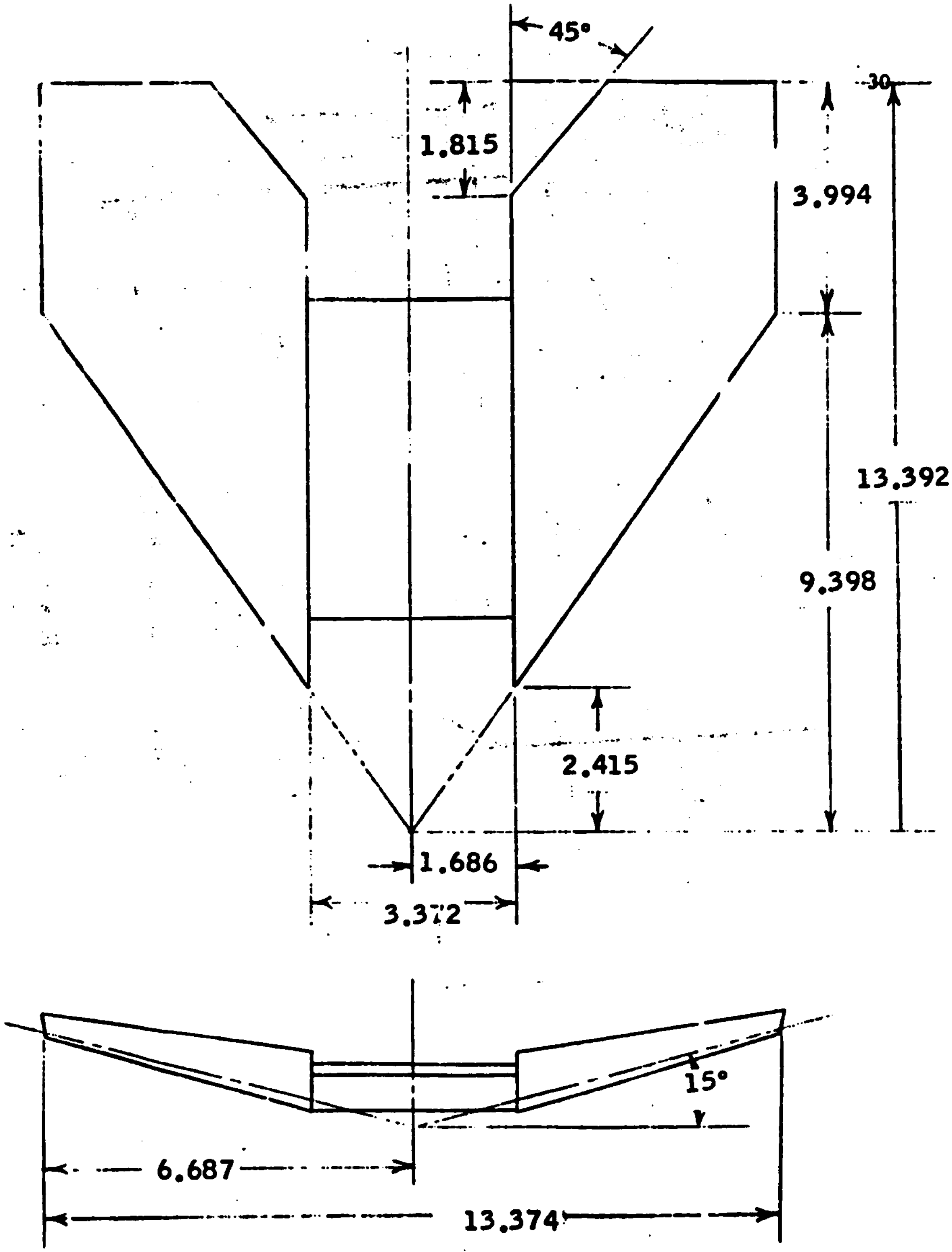
DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 473



(c) Wing - W_{B1}

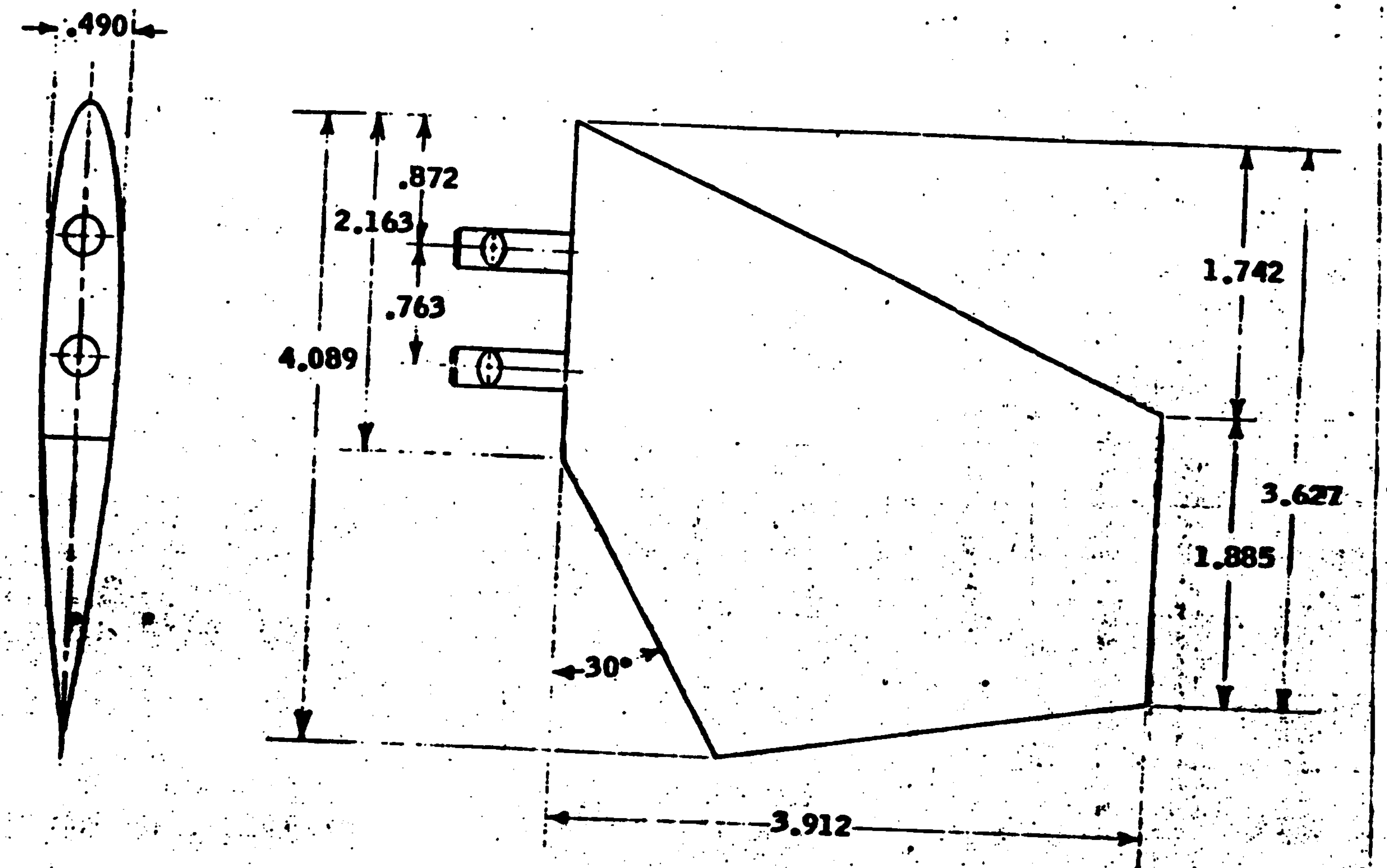
Figure 2. - Continued.

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 474



(d) Wing-W_{B6}

Figure 2. - Continued.

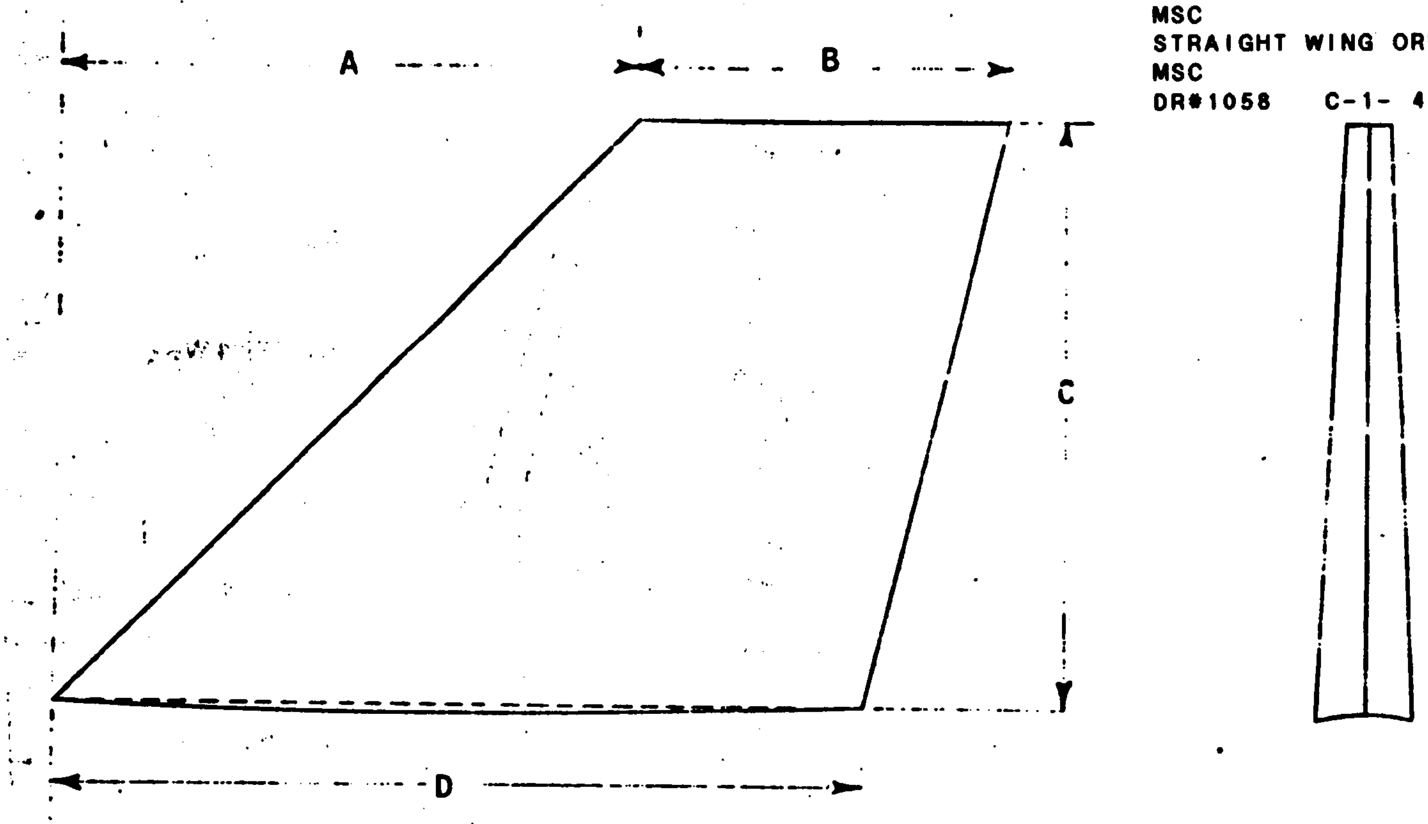


(e) Horizontal stabilizer - H_{B1}

Figure 2. - Continued.

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 475

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 476

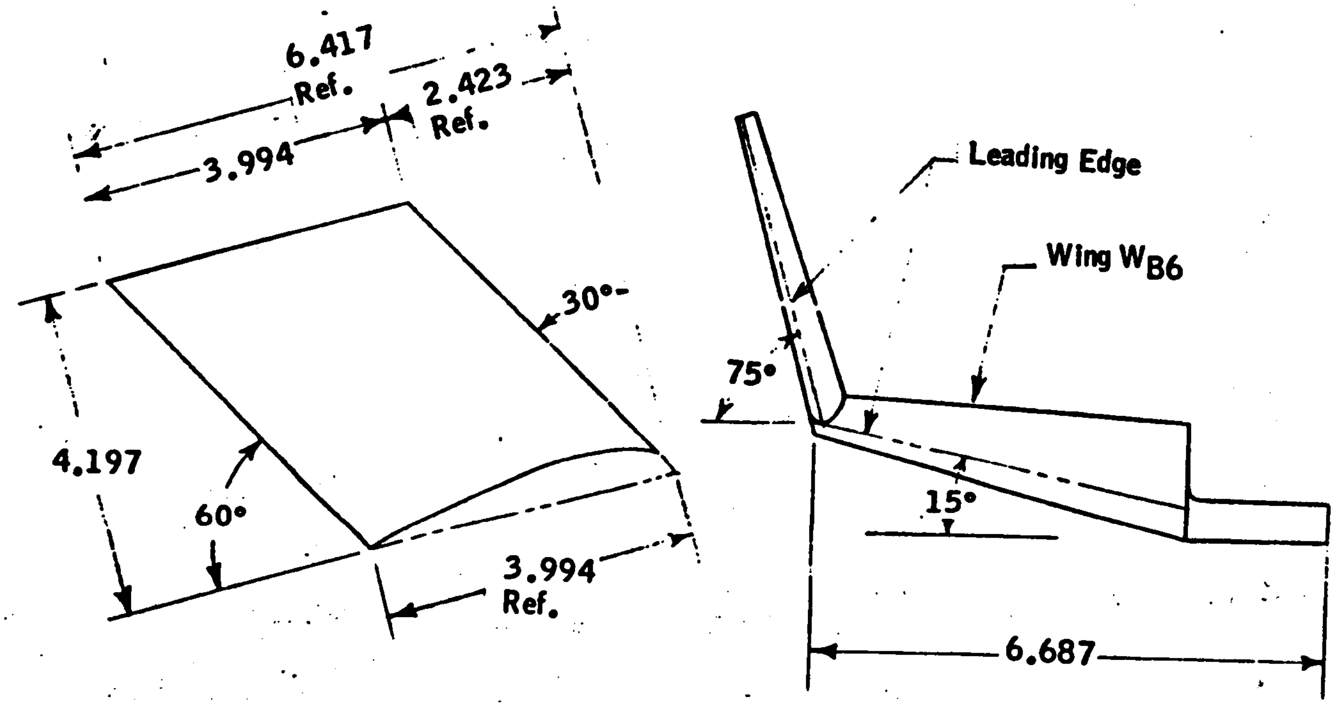


Tail	A	B	C	D
V_{B1}	3.3310	2.1150	3.3310	4.6340
V_{B5}^{*}	6.9070	2.7490	6.9070	6.6520

- * NOT APPLICABLE TO THIS TEST

(f) Vertical tail - V_{B1}, V_{B5}

Figure 2. - Continued.



(g) Vertical - V_{B6}

Figure 2. - Concluded.

DELTA WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1058 C-1- 477

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 478

TEST MSFC-TWT 489 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	ELEVON L/E	δ_e	δ_a	δ_R	NO. of RUNS	0.6	0.9	1.0	1.2	1.96	2.99	4.96
R3101A	U	A	0	–	–	–	–			585	584	583	562	577	576
01B	U	-6	B	–	–	–	–		592	593	594	595	567	569	568
02A	U2	A	0	–	–	–	–			580	581	582	563	579	578
02B	U2	-6	B	–	–	–	–			598	597	596	566	571	570
03A	U3	A	0	–	–	–	–			586	587	588	564	575	574
03B	U3	-6	B	–	–	–	–			591	590	589	565	573	572
04C	$B_{19}W_{14}C_4AV_7+U$	C	0	0	0	0	0		500	501	502	503	521	524	525
05C				10/-10	0	10	0		507	506	505	504	522	528	529
06C				10/-20	-5	15	0					508		530	
07C				10/-40	-15	25	0					509		531	
08C				0	0	0	10					510		526	
09C				10/-10	0	10	0					511		527	
04B		-6	B	0	0	0	0			554	553	552	551	542	543
05B				10/-10	0	10	0					557		546	
06B				10/-20	-5	15	0					558		547	
07B				10/-40	-15	25	0					559		548	
08B				0	0	0	10					555		544	
09B				10/-10	0	10	0					556		545	
10B		0		0	0	0	0			514	513	512	523	535	536
11B		0		10/-10	0	10	0					515		534	

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: CLM, CN, CY, CBL, CYN, CAF, CAB, CPBI, CPC, CL → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES
A) -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16
B) -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

δ_e = elevon deflection
δ_a = aileron deflection

TEST MSFC-TWT 489 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES ELEV L/R	δ_a	δ_e	δ_R	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)	0.6	0.9	1.0	1.2	1.96	2.99	4.96				
R3112B	$B_{19}W_{14}C_4AV_7+U$	0	B	10/-20	-5	15	0						516		533					
13B	+U			10/-40	-15	25	0						517		532					
14B	+U			0	0	0	10						518		537					
15B	$+U_2$	-6		0	0	0	0						560		550					
16B	$+U_2$	6		0	0	0	0						—		540					
17C	$+U_2$	C		0	0	0	0						519		538					
18C	$B_{19}W_{14}C_4AV_7+U_3$	C	0	0	0	0	0						520		539					
19B	$+U_3$	-6	B	0	0	0	0						561		549					
20B	$+U_3$	6	B	0	0	0	0						—		541					

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES
B) -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10
C) -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 479

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DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 480

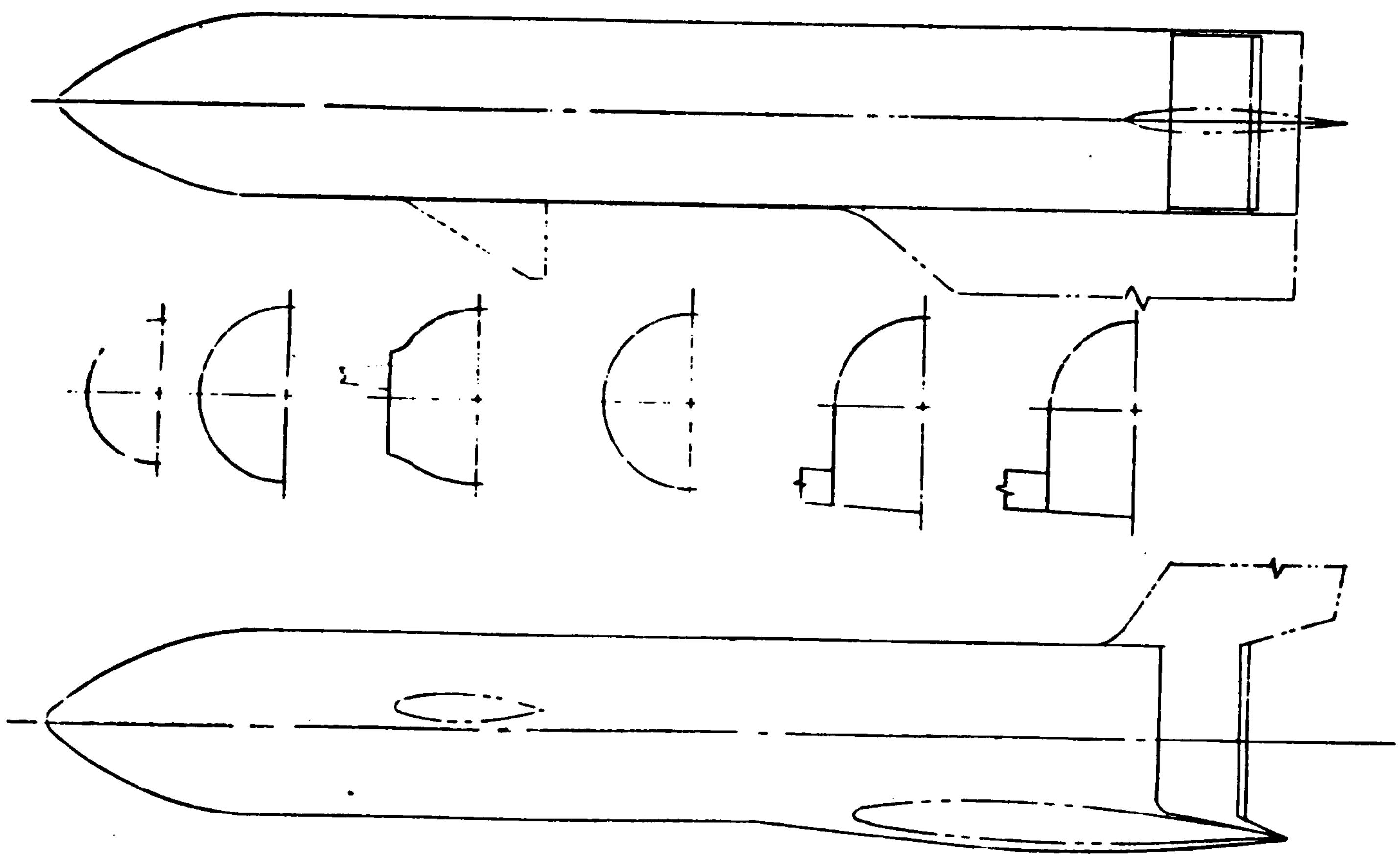


FIGURE 6. BODY B19 - BOOSTER B-15 B-1 CONFIGURATION

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 481

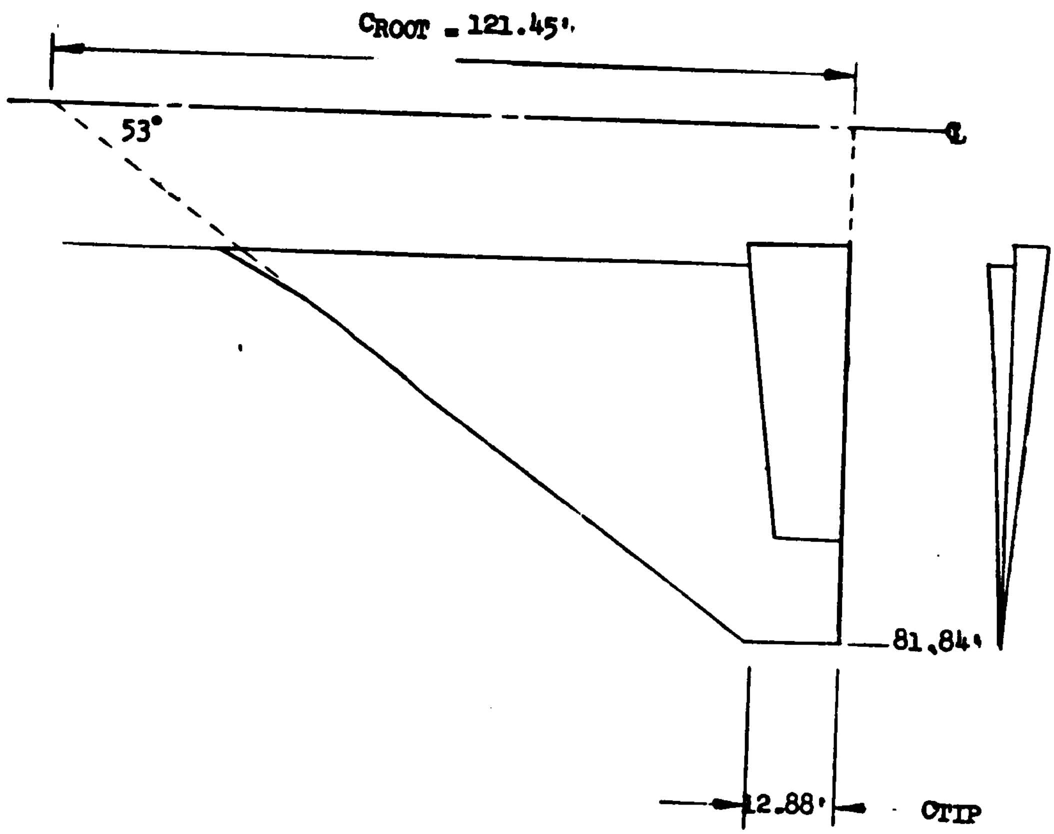


FIGURE 7. WING W14 - BOOSTER CONFIGURATION

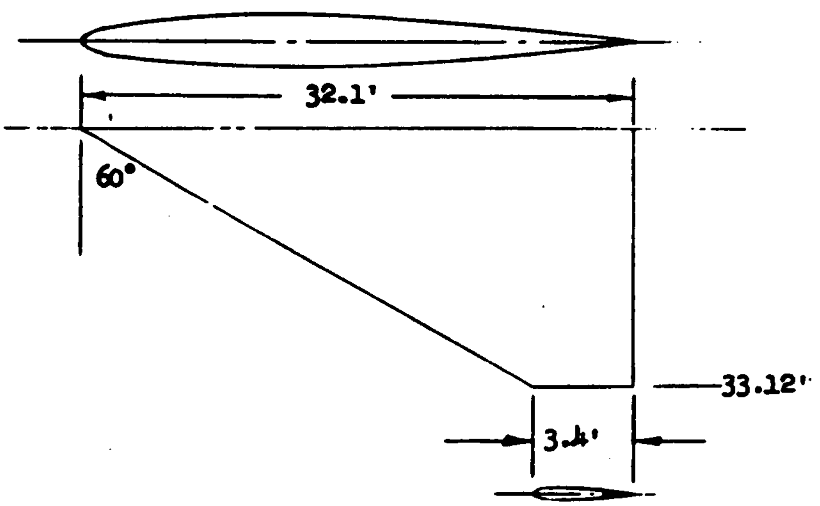


FIGURE 8. CANARD - C4

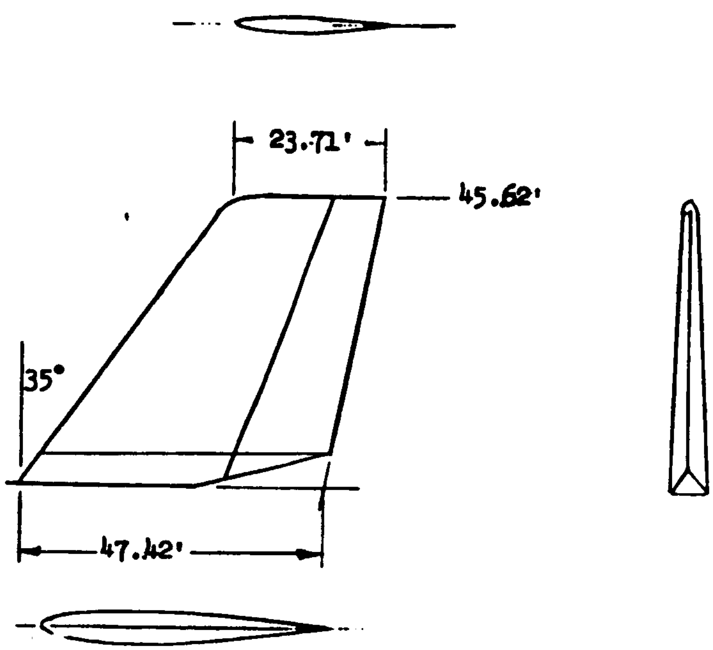


FIGURE 9. VERTICAL TAIL - V_7

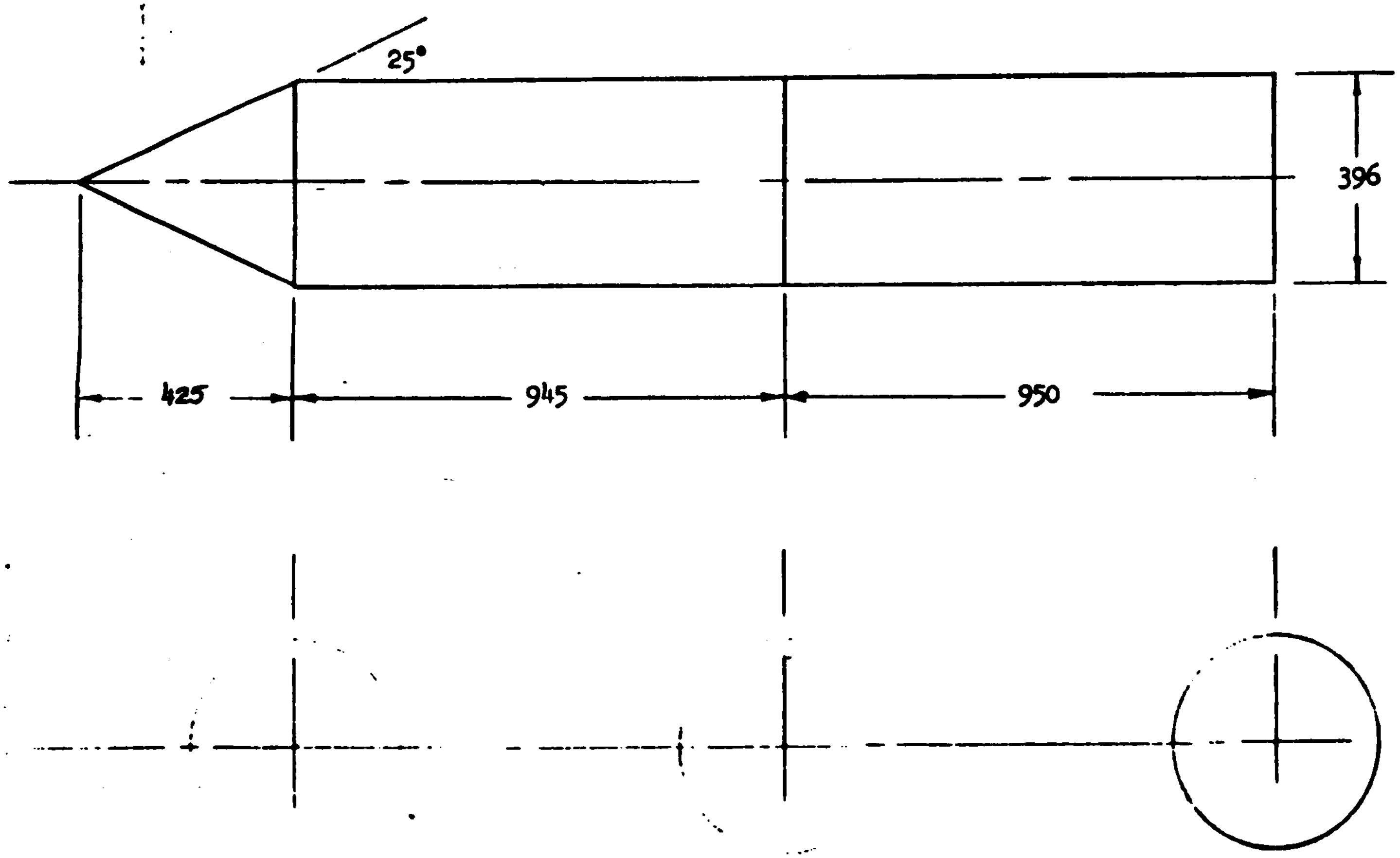


FIGURE 10.ESS VEHICLE - U

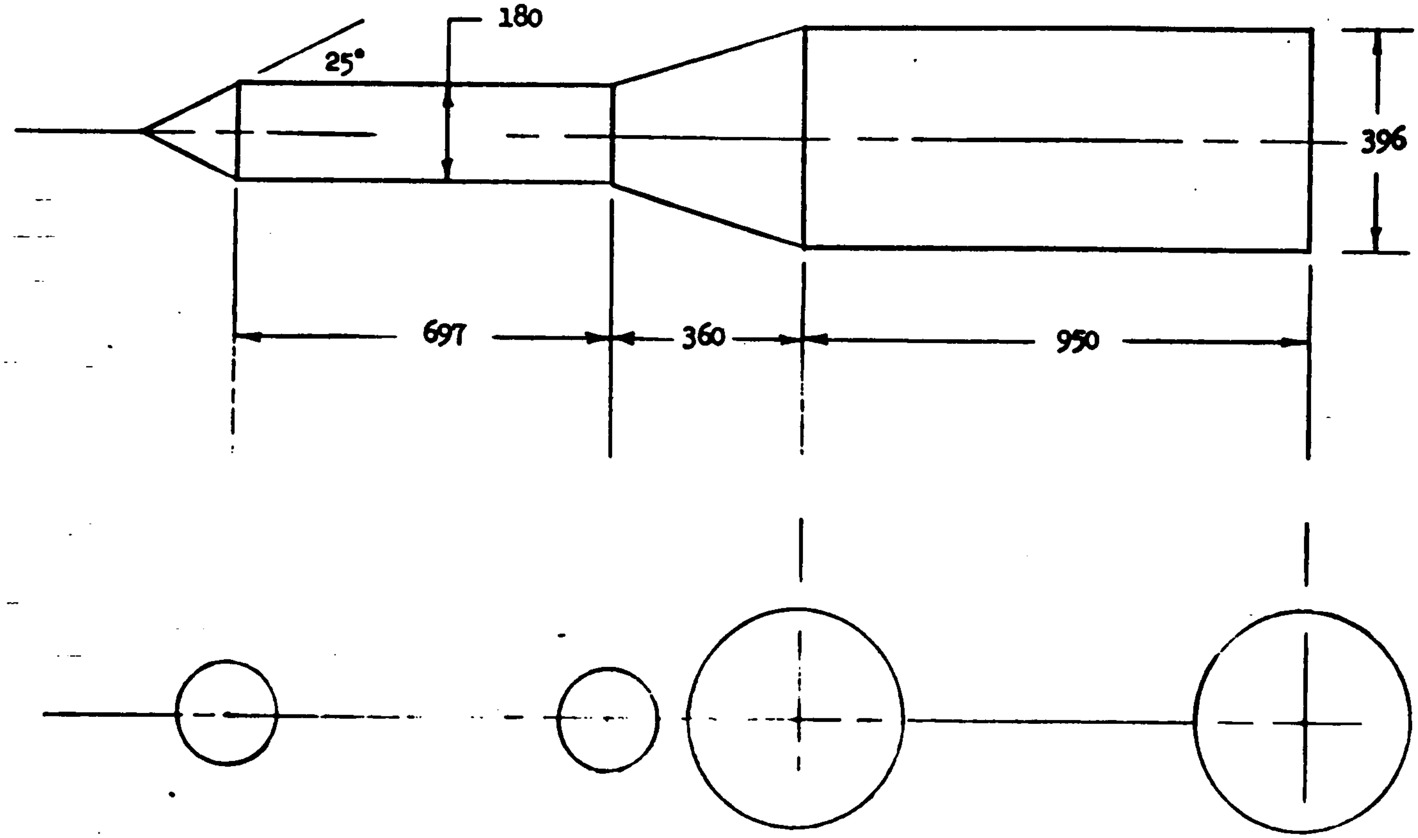


FIGURE 12. ESS VEHICLE - U_3

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 485

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 486

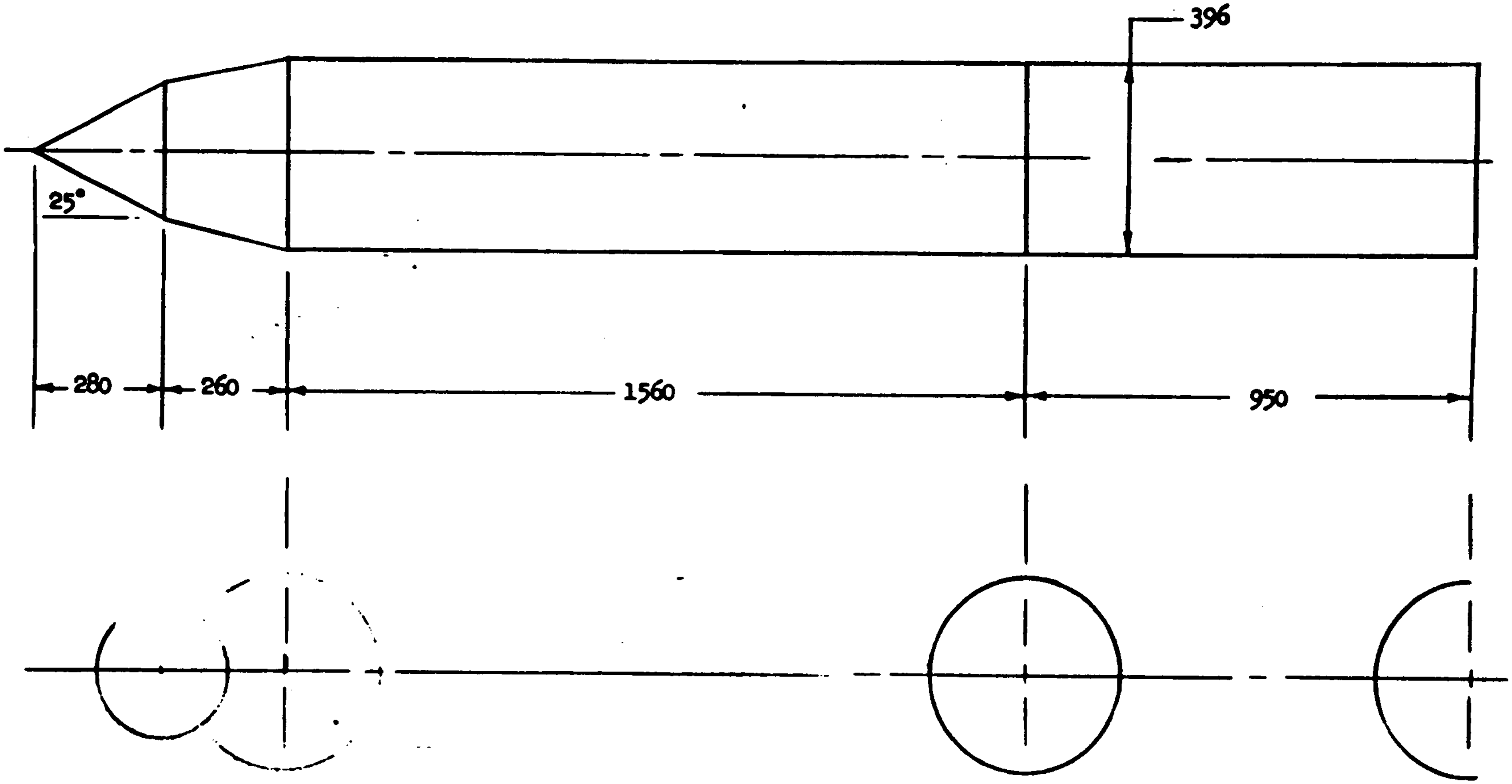
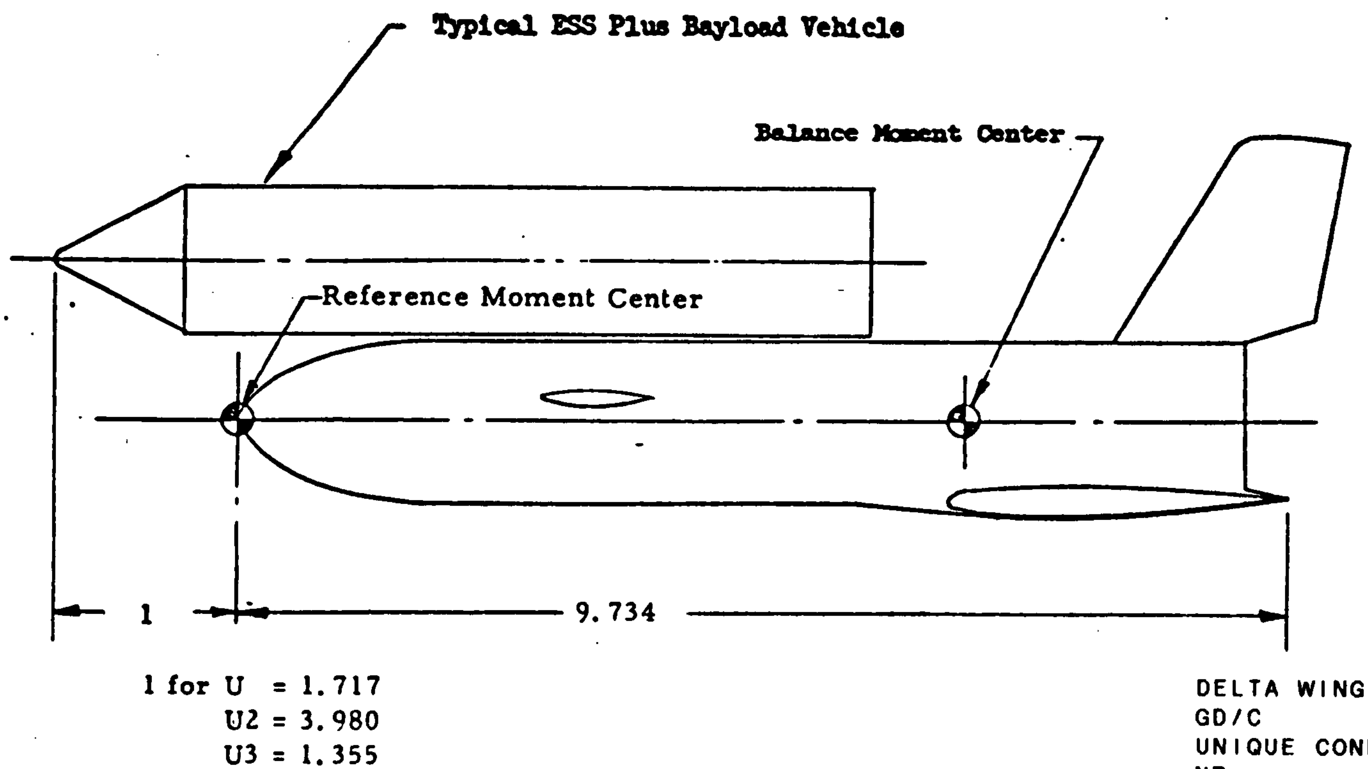
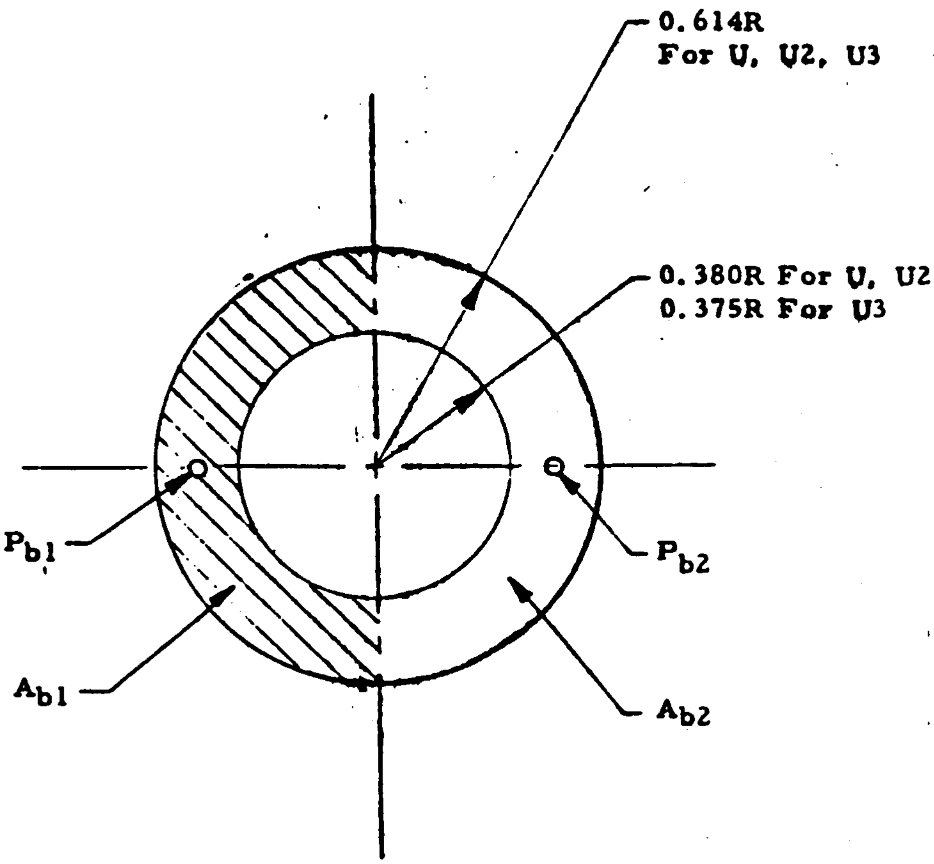


FIGURE 11. ESS VEHICLE - U2



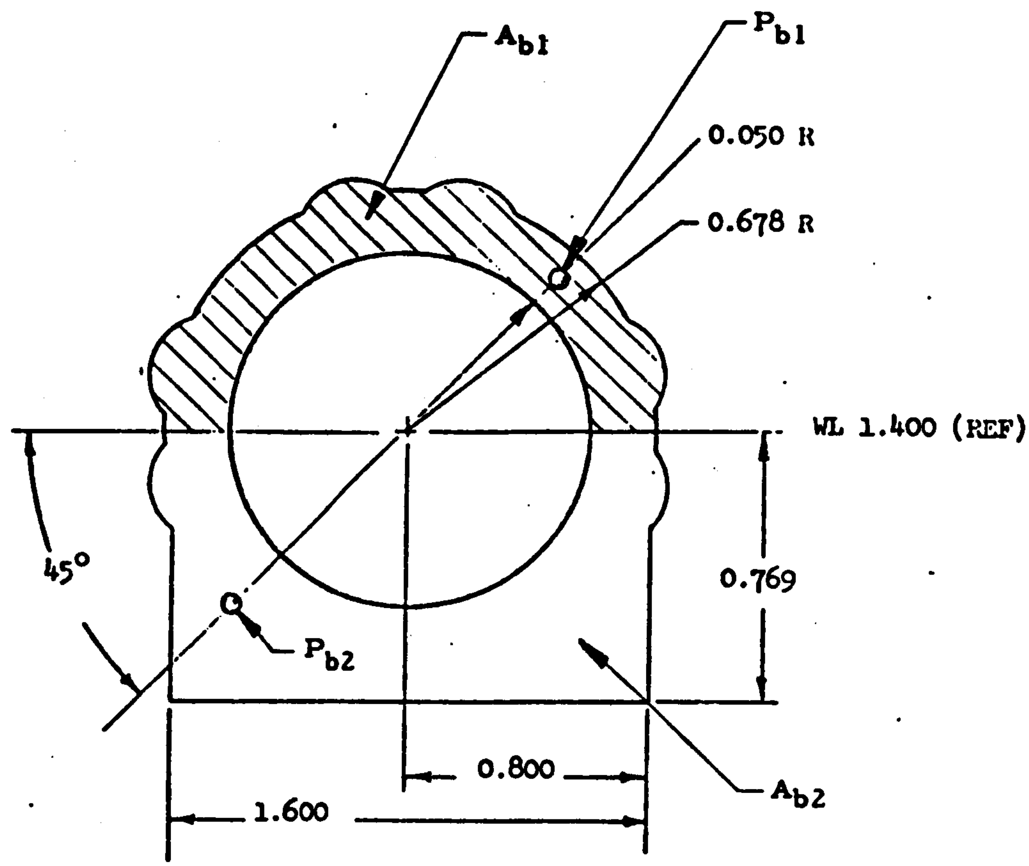
DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1119 C-1- 487

FIGURE 13. MOMENT REFERENCE CENTER LOCATION



Note: Location of pressure taps may vary slightly as installation will be made during test setup.

Figure 14 . Location of Base Pressure Taps for ESS Alone.



View Looking Forward

NOTE: Location of pressure taps may vary slightly as installation will be made during test setup.

Figure 15. Location of Base Pressure Taps for Launch Configurations.

TEST TWT-497 DATA SET COLLATION SHEET

Force - Reuseable Nuclear Stage + Booster and Booster Alone
0.0031-Scale - Stability and Control

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 490
POSTTEST

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DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δEL	δER	δR	GRIT	NO. of RUNS	MACH 0.6	0.95	1.0	1.2	2.99	4.96						
R39 01A	B19W14C4AV7	A	0	0	0	0	OFF	6	020/0	019/0	018/0	017/0	015/0	016/0						
02A							ON	6	001/1	002/0	003/0	004/0	012/0	011/0						
01B		-6	B				OFF	6	024/0	023/0	022/1	021/0	014/0	013/0						
02B							ON	6	008/0	007/0	006/0	005/0	010/1	009/0						
03A		A	0			10		1				043/0								
04A				10	-10			1				042/0								
05A						0		1				039/0								
06A					-20			1				038/0								
06B		-6	B					1				035/0								
05B					-10			1				034/0								
04B						10		1				031/0								
03B				0	0			1				030/0								
07B	+RNS					0		4	025/0	026/0	027/0	028/0								
07A		A	0					4	048/0	047/0	046/0	045/0								
08A				10	-10			1				040/0								
09A					-20			1				037/0								
10A					-10	10		1				041/0								
11A				0	0			1				044/0								
11B		-6	B					1				029/0								
10B				10	-10			1				032/0								

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CY	CBL	CYN	CAF	CAB	CPBL	CPC	CL			1 0

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES
$\alpha A = -16, -14, -12, -10, -8, -6, -4, -2, 0, 2, 4$
$\beta B = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10$

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TEST TWT-497 DATA SET COLLATION SHEET

Force - Reuseable Nuclear Stage + Booster, and RNS Alone, Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTIONS δEL	δER	δR	δRIT	NO. of RUNS	MACH NUMBERS 0.6	0.95	1.0	1.2	2.99	4.96
R39 08B	BMW16CAAV7+RNS	-6	B	10	-10	0	ON	1				033/0		
↓ 09B	↓	↓	↓	↓	-20	↓	↓	1				036/0		
12A	↓ Re MAX	A	0	0	0	↓	↓	1				049/0		
13A	RNS Alone	A	0	—	—	—	ON	4	53/0	52/0	51/0	50/0		
↓ 13B	↓	-6	B	—	—	—	↓	4	54/0	55/0	56/0	57/0		

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CY	CBL	CYN	CAF	CAB	CPB1	CPC	CL			1 0

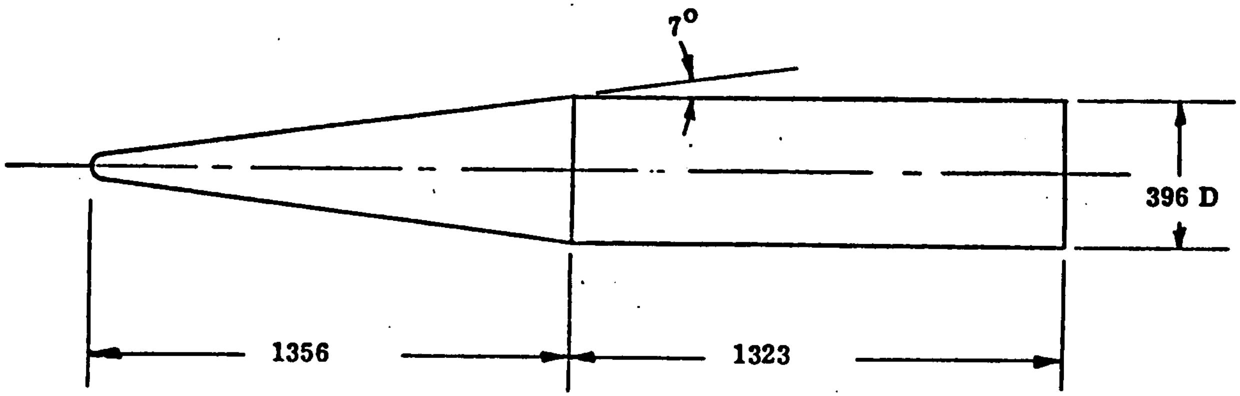
COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

αA = -16, -14, -12, -10, -8, -6, -4, -2, 0, 2, 4

βB = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 491



RNS

Figure 5. General Arrangement - Reuseable Nuclear Stage

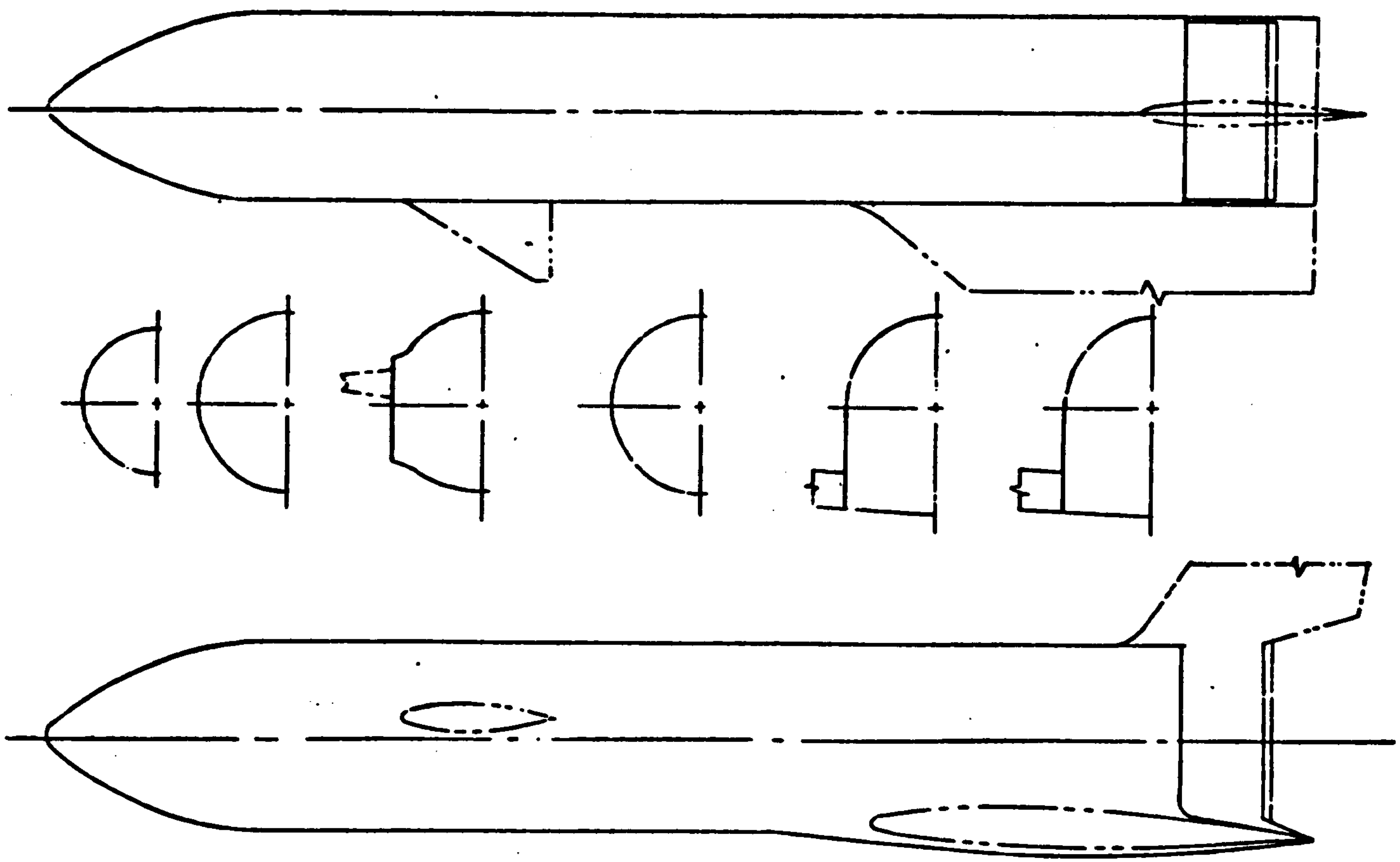


Figure 6. BODY B19 - BOOSTER B-15 B-1 CONFIGURATION

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 493

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 494

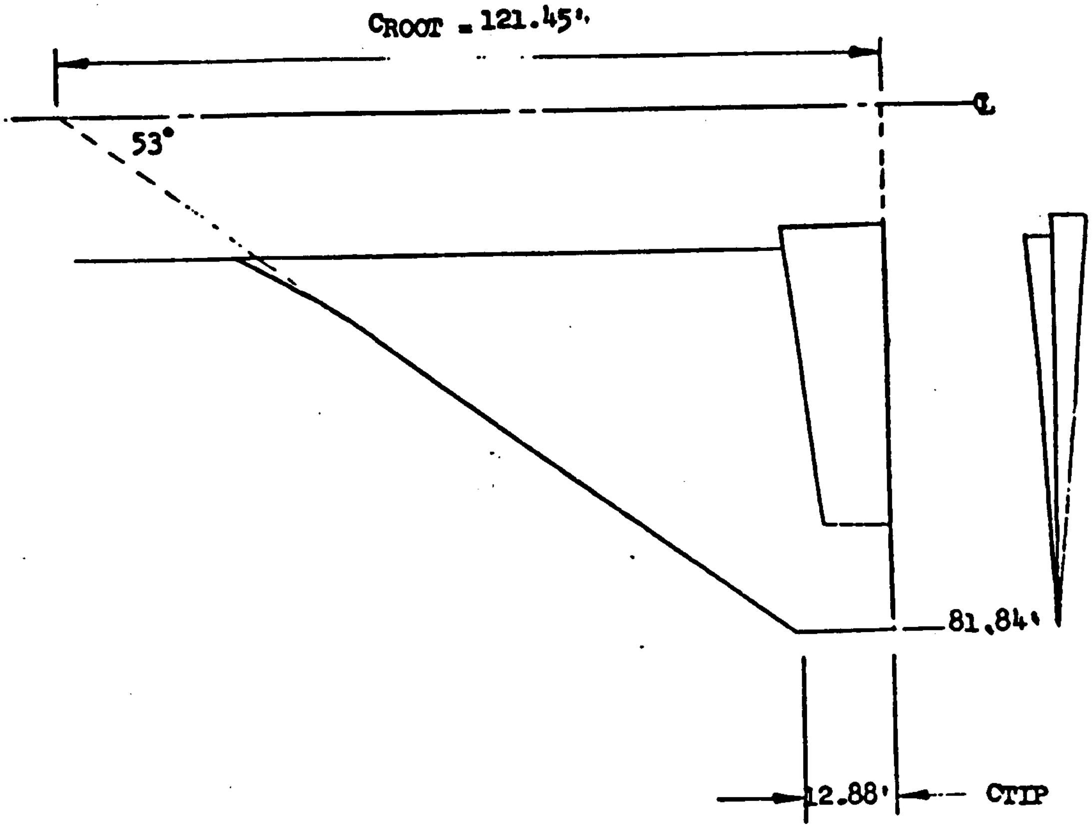


Figure 7. WING W_{14} - BOOSTER CONFIGURATION

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 495

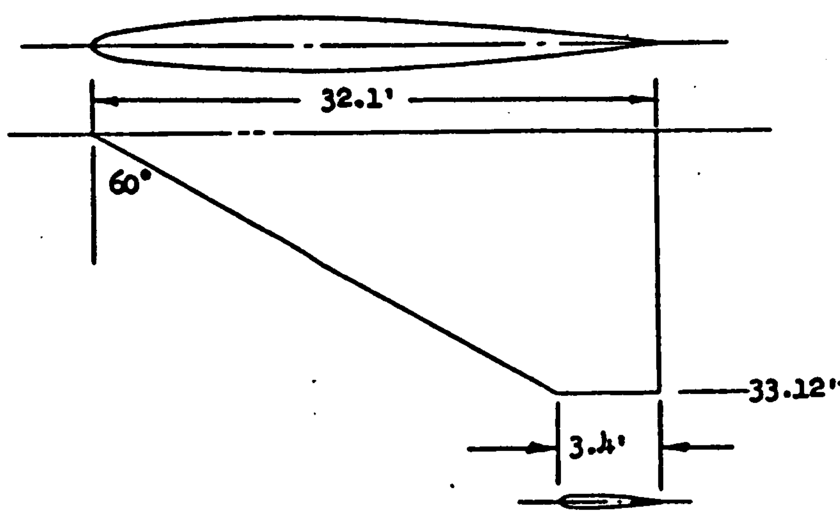


Figure 8. CANARD - C4

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 496

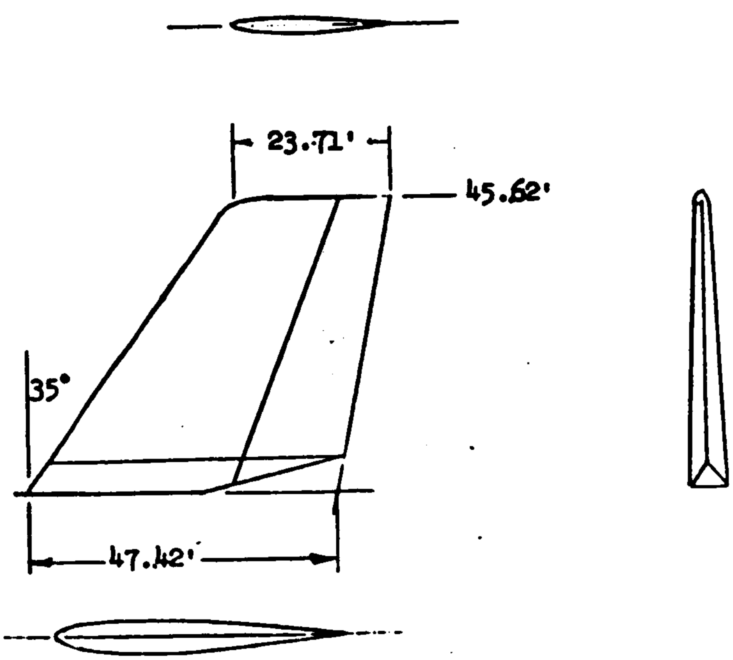


Figure 9. VERTICAL TAIL - V_7

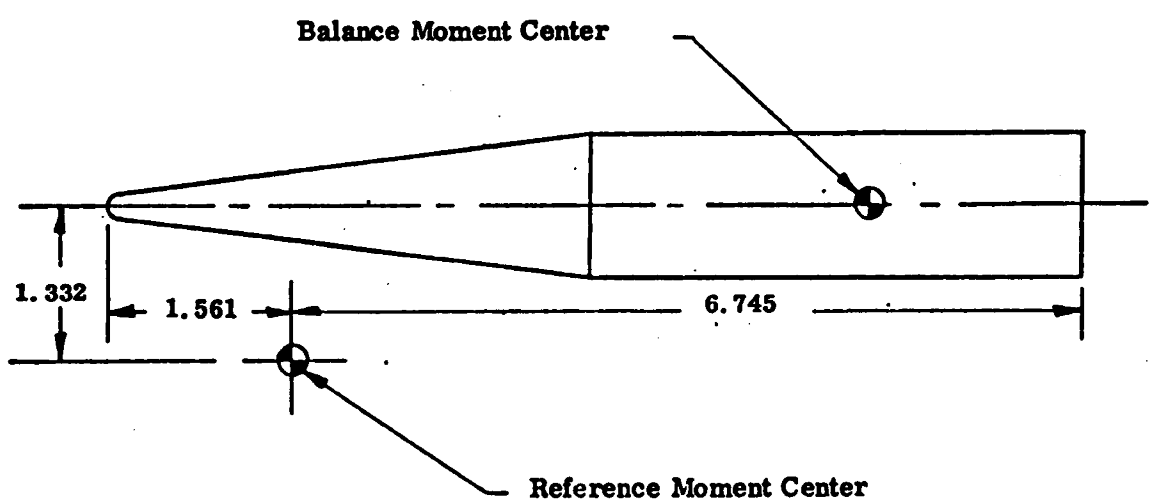


Figure 10. Reuseable Nuclear Stage Reference c.g. Location

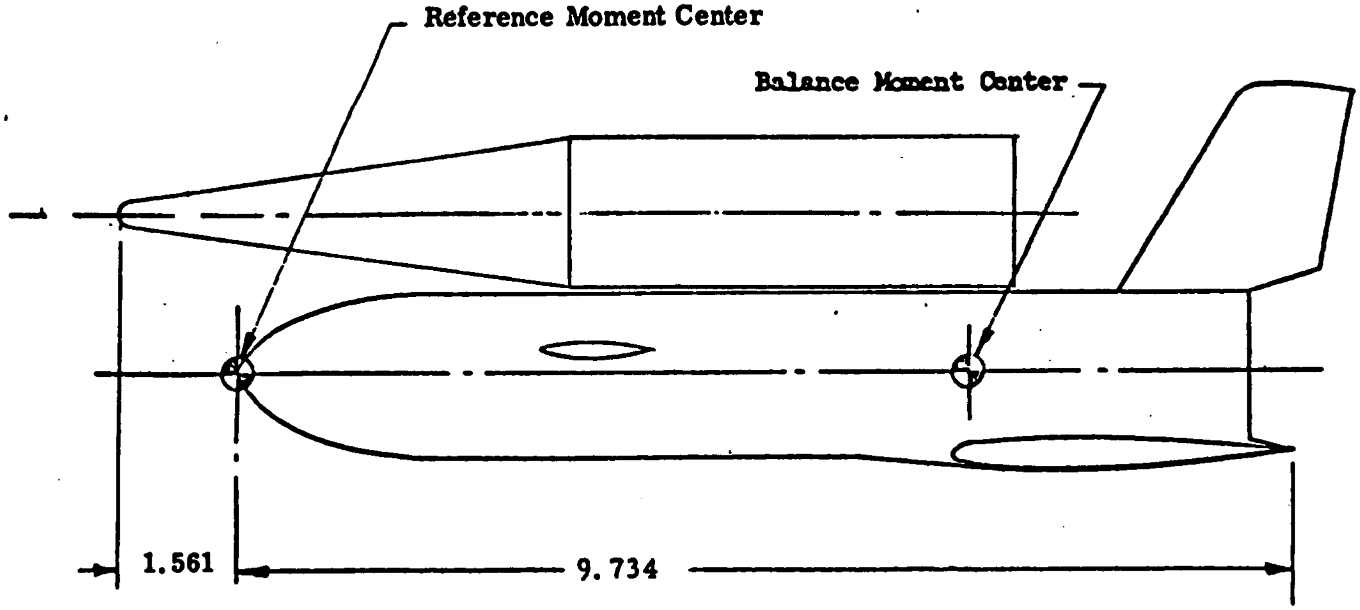
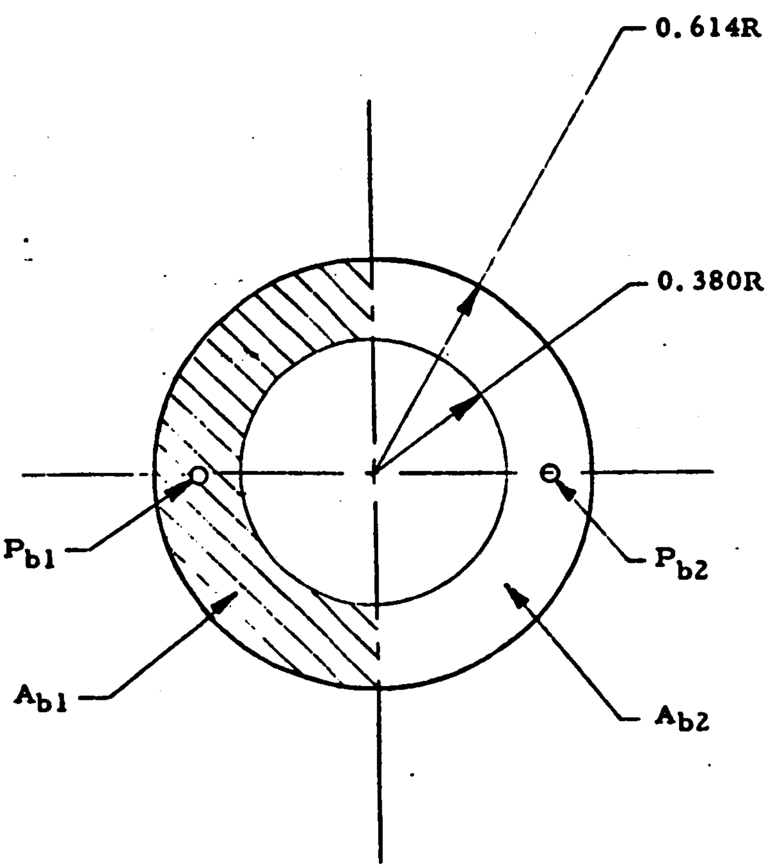


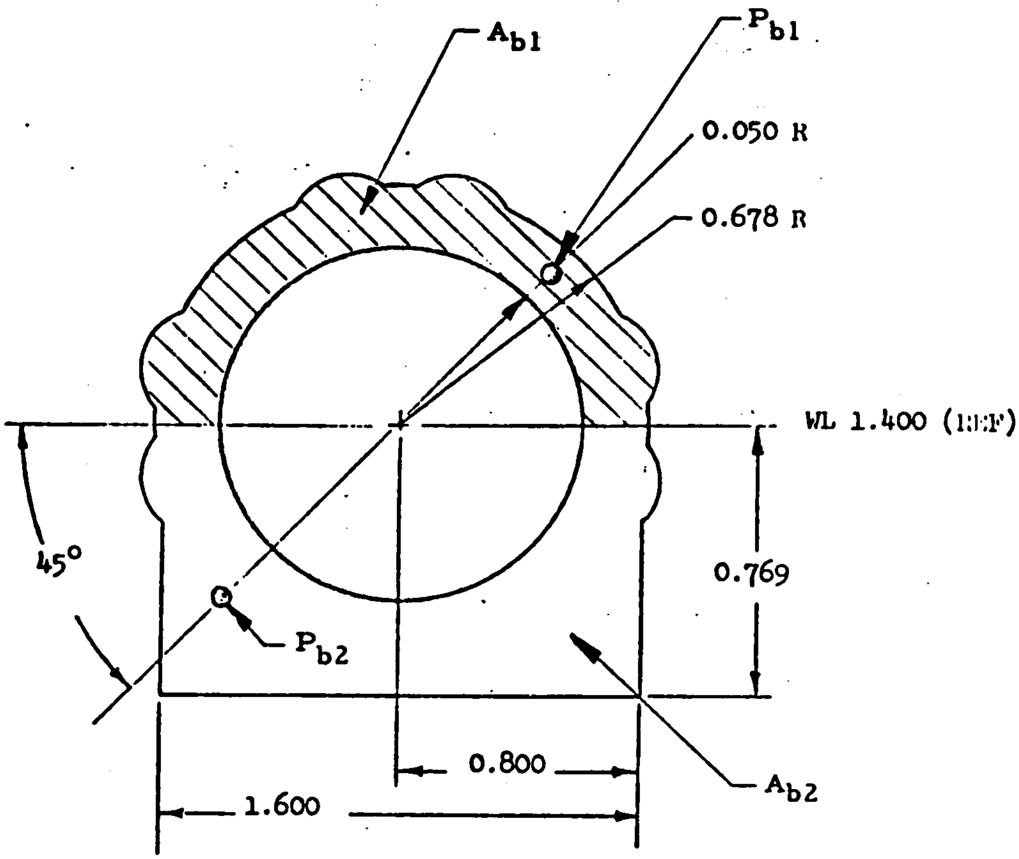
Figure 11. RNS Launch and Booster Alone Reference c.g. Location

DELTA WING BOOSTER
GD/C
UNIQUE CONFIGS. ORBITER
NR
DR#1162 C-1- 499



Note: Location of pressure taps may vary slightly as installation will be made during test setup.

Figure 12. Location of Base Pressure Taps for RNS Alone.



View Looking Forward

NOTE: Location of pressure taps may vary slightly as installation will be made during test setup.

Figure 13. Location of Base Pressure Taps for Booster Alone and RNS Launch Configurations

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MRC CONFIG. α/β

TEST ARC 6x6-505 DATA SET COLLATION SHEET PAGE 1 OF 2

9-16-70

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	VARIABLE P	VARIABLE A	VARIABLE RL	VARIABLE RR	NO. of RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0
BAG 1 1 1	B1 W3 T1	E	0°	-	-	0	0	5	6	5	4	3	2
BAG 1 1 2	B1 W3 T1	0°	X	-	-	0	0	5	68	67	66	65	64
BAG 2 2 1	B+O1	E	0	1	0	0	0	5	38	37	36	35	34
OAG 8 2 1		E	0	1	0	0	0		38	37	36	35	34
BAG 3 3 1	B+O1	E	0	2	0	0	0	5	11	10	9	8	7
OAG 8 3 1		E	0	2	0	0	0		11	10	9	8	7
BAG 3 4 1	B+O1	E	0	2	+5°	0	0	5	18	17	16	15	14
OAG 8 4 1		E	0	2	+5°	0	0		18	17	16	15	14
BAG 3 5 1	B+O1	E	0	2	0	30°	10°	2	–	13	12	–	–
OAG 8 5 1		E	0	2	0	30°	10°		–	13	12	–	–
BAG 4 6 1	B+O1	E	0	3	0	0	0	5	43	42	41	40	39
OAG 8 6 1		E	0	3	0	0	0		43	42	41	40	39
BAG 2 2 3	B+O1	-5	X	1	0	0	0	5	63	62	61	60	59
OAG 8 2 3		-5	X	1	0	0	0		63	62	61	60	59
BAG 3 3 3	B+O1	-5	X	2	0	0	0	5	48	47	46	45	44
OAG 8 3 3		-5	X	2	0	0	0		48	47	46	45	44

1 7 13 19 25 31 37 43 49 55 61 67 75 76

BETA CN CA CAB CLM CY CYN CRL 7

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

αE = -15, -12, -8, -4, -2, 0, +2, 4, 8, 12

βX = -5, -2, 0, +2, 4, 6, 10

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1050 C-1- 501

TEST ARC 6-6-505 DATA SET COLLATION SHEET

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1050 C-1- 502

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	VARIABLE P	VARIABLE A	VARIABLE RL	VARIABLE RR	NO. of RUNS	MACH NUMBERS .06	.09	1.2	1.5	2.0
BAG571	B+O2	E	0°	1	0	0	0	5	33	32	31	30	29
OAG971		E	0	1	0	0	0		33	32	31	30	29
BAG681	B+O2	E	0	2	0	0	0	5	28	27	26	25	24
OAG981		E	0	2	0	0	0		28	27	26	25	24
BAG691	B+O2	E	0	2	5	0	0	5	23	22	21	20	19
OAG991		E	0	2	5	0	0		23	22	21	20	19
BAG573	B+O2	-5	X	1	0	0	0	5	58	57	56	55	54
OAG973		-5	X	1	0	0	0		58	57	56	55	54
BAG683	B+O2	-5	X	2	0	0	0	5	53	52	51	50	49
OAG983		-5	X	2	0	0	0		53	52	51	50	49

1 7 13 19 25 31 37 43 49 55 61 67 75 76

BETA CN CA CAB CLM CY CYN CRL

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1050 C-1- 503

NAR Straight-wing orbiter model for Ames 6' x 6' wind tunnel tests

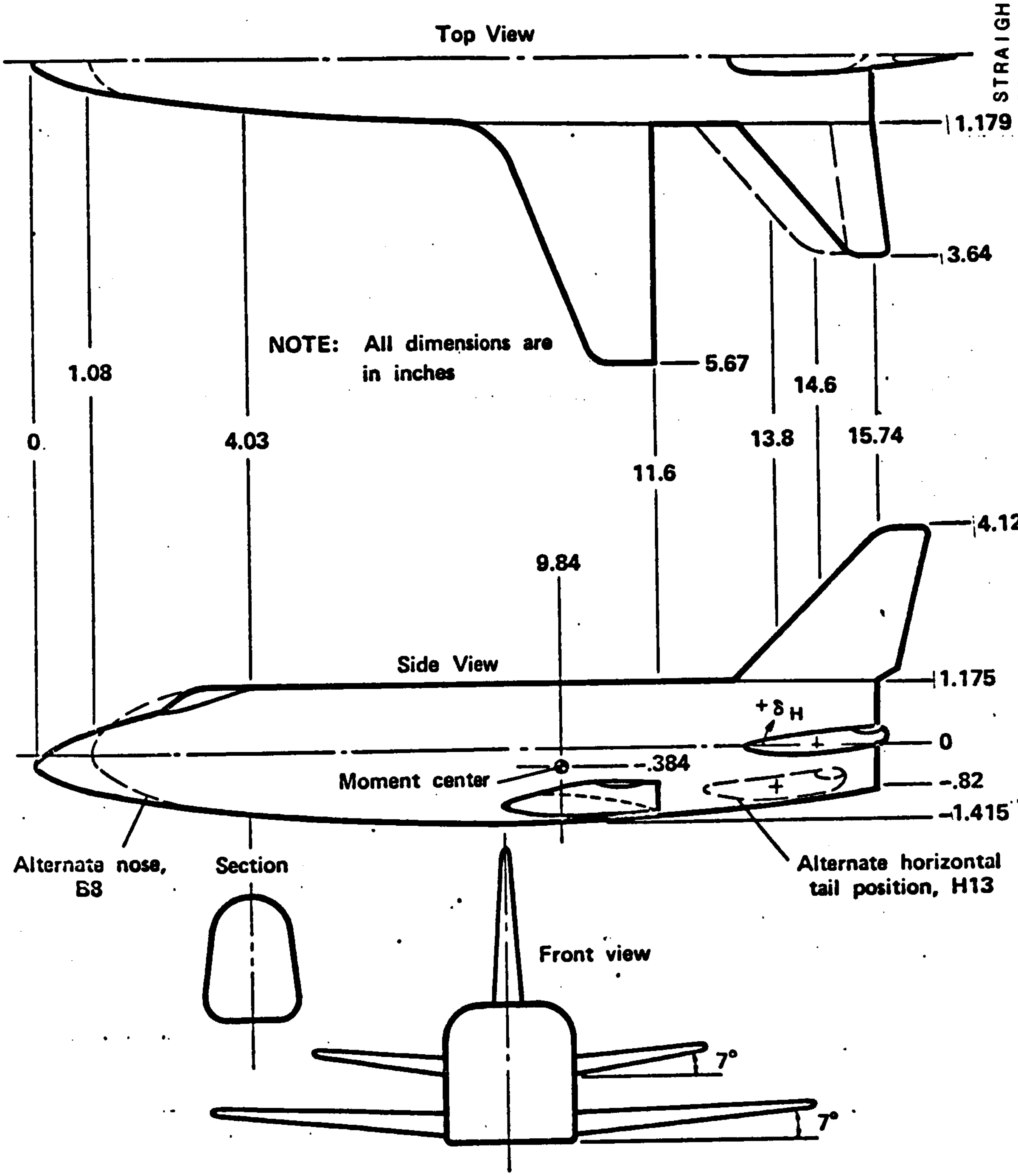

Figure 3 - NAR Straight Wing Orbiter, Three-View

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1050 C-1- 504

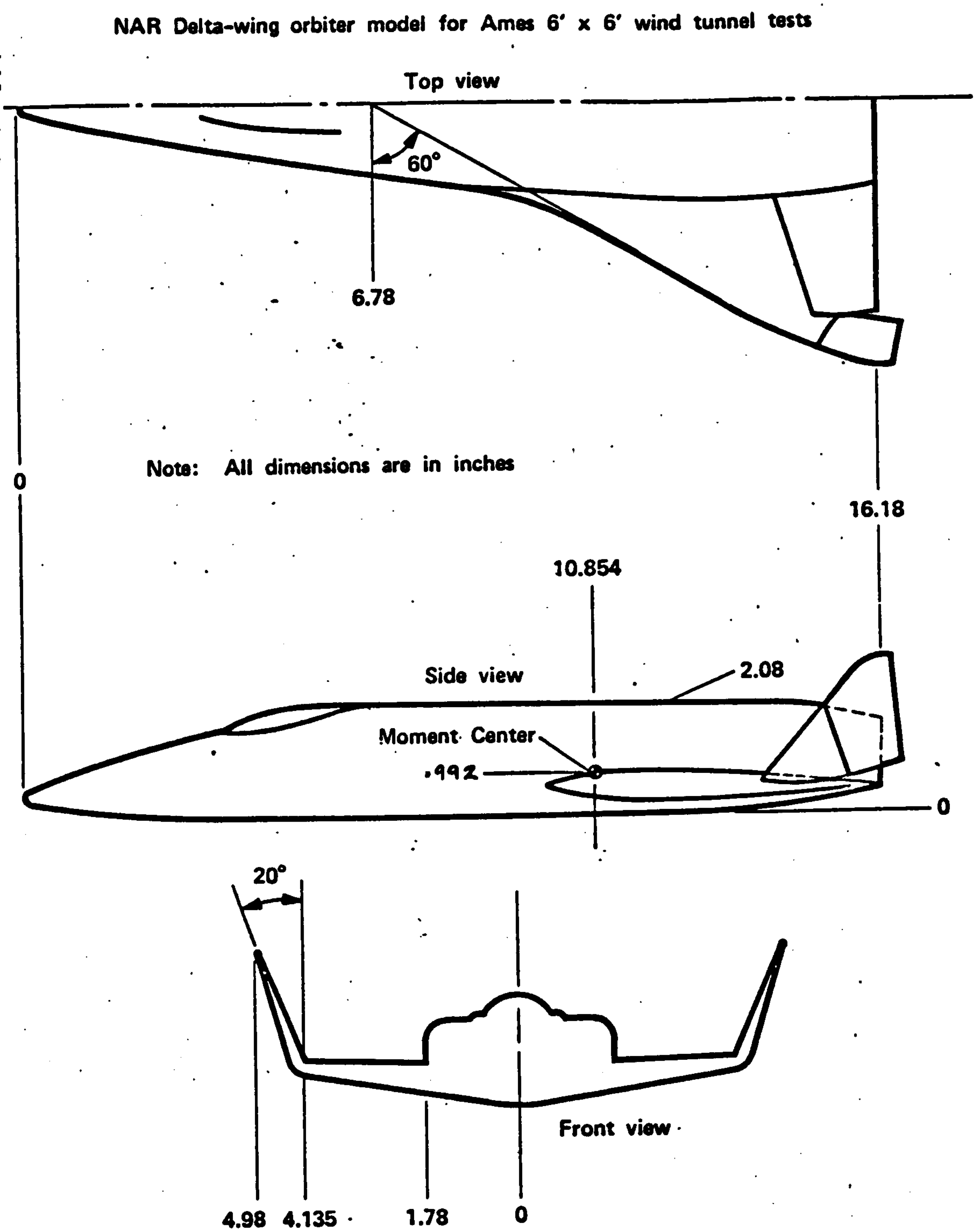

Figure 4.- NAR Delta Wing Orbiter, Three-View

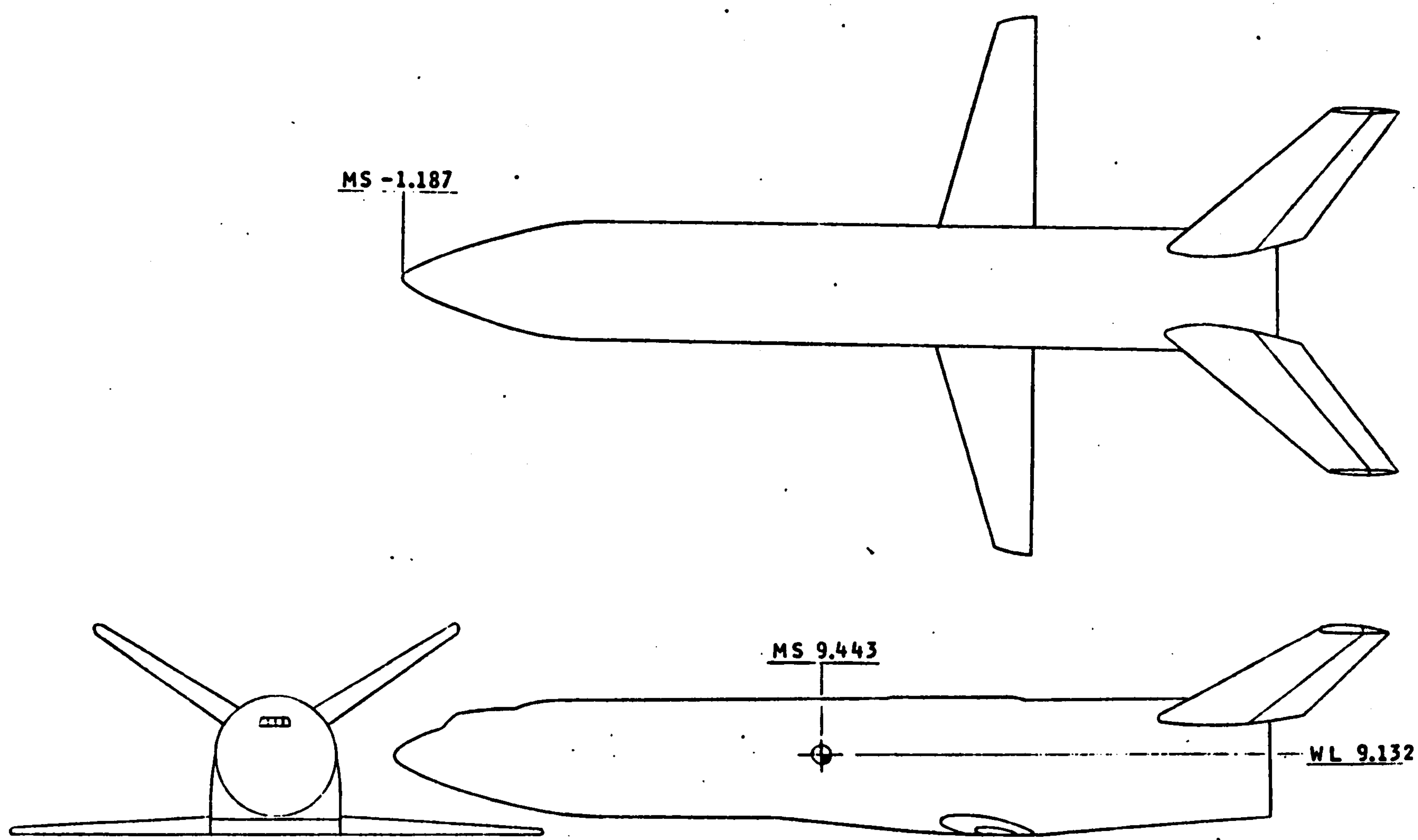

Figure 5. General Dynamics Straight Wing Booster, Three-View Sketch.

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1050 C-1- 505

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1050 C-1- 506

Position	Dimension A	Dimension B	ΔX	ΔZ	ΔX'	ΔZ'
1 (FWD)	4.715	5.836	5.742	.996	6.316	.940
2 (MID)	0.267	0.918	4.395	.904	5.052	.940
3 (AFT)	-3.860	-	3.269	.889	-	-

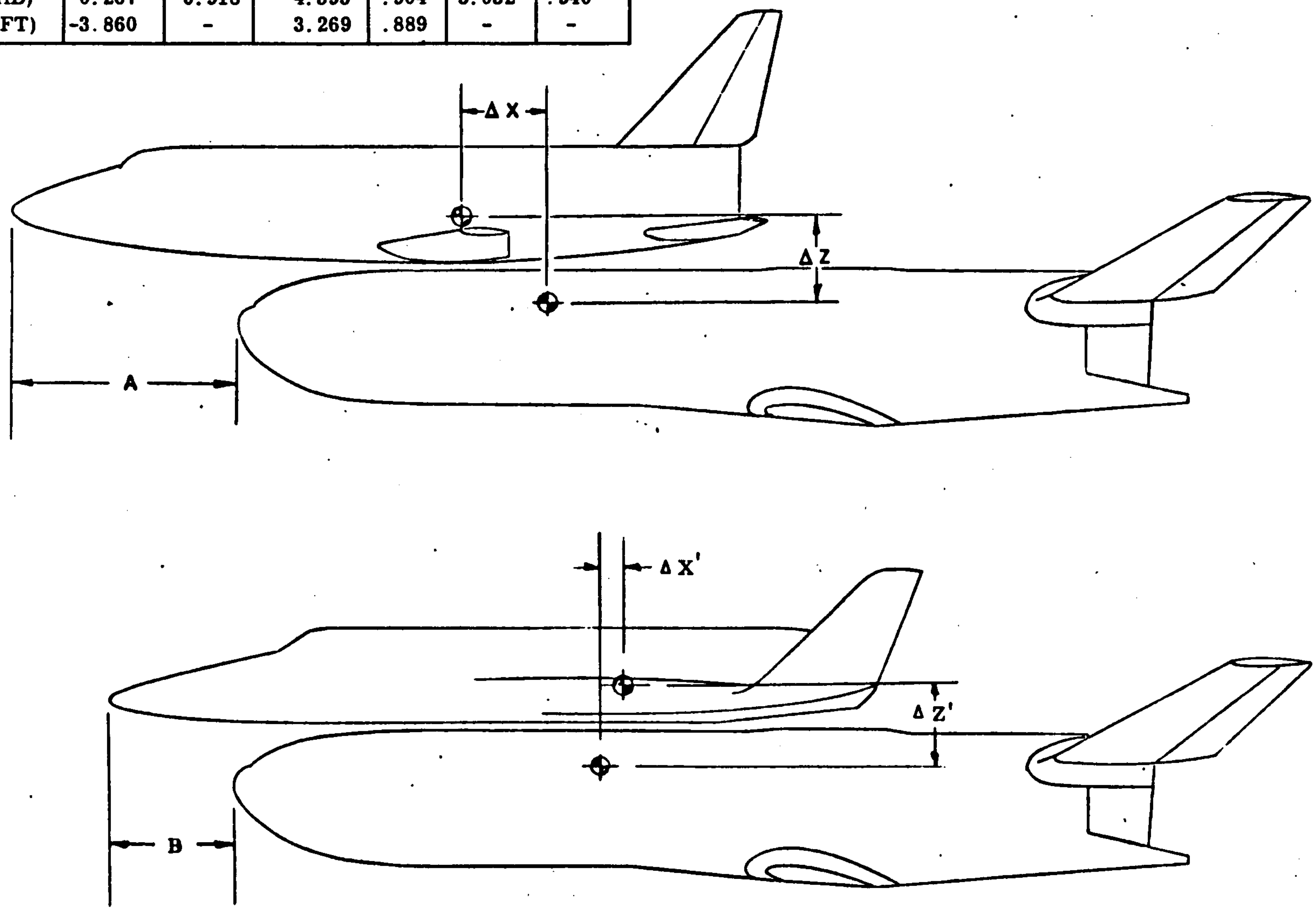

Figure 6. Relative Positions between Booster and Orbiters

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TEST TWT-466 DATA SET COLLATION SHEET

Force - Booster + Orbiter, 0.0025 - Scale Launch Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δH	δA	δR	GRIT	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	0.95	1.0	1.05	1.1	1.2	1.3	1.46	1.96	2.99	4.96
R2201A	B16W6T8V6+BSW13E2V14R4	A	0	0	0	0		12	074/6	075/6	076/6	077/6	078/6	079/6	080/6	081/6	193/6	171/6	002/6	001/6
21A							120	5	097/6	096/6		098/6		099/6		100/6				
22A							90	2											189/6	188/6
01E		0	B					11		045/6	044/6	043/6	042/6	041/6	040/6	039/6	190/6	182/6	010/6	009/6
01C		-6						7		228/6		227/6		226/6		225/6		217/6	224/6	223/6
01D		6						7		202/6		203/6		204/6		205/6		214/6	213/6	212/6
02A		A	0	-10				1								122/6				
03A				-20				1								127/6				
04A				0	-10L +10R			1								132/6				
04B		0	B					1								194/6				
24B					0	6.5		1								245/6				
R2217A	B16W6T8V6+BSW14E3V17	A	0	0	0	0		8		105/6		107/6		108/6		109/6		177/6	006/6	005/6
17C		-6	B					3										218/6	220/6	219/6
10A	+BS	A	0					5		114/6		115/6		116/6		117/6		178/6		
11A	+BSW13E2							5		113/6		112/6		111/6		110/6		179/6		
20B	B16W6T8 +BSW13E2V14R4	0	B					5		198/6		199/6		200/6		201/6		184/6		
19A	B16W6	A	0					5		136/6		135/6		134/6		133/6		167/6		
18A	B16							5		145/6		146/6		147/6		148/6		170/6		

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CL CLN CY CSL CAB CDF CN CCP 9

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES

αA = -10 -8 -6 -4 -2 0 2 4 6 8 10

βB = -4 -2 0 2 4 6 8 10

δH + = TE DOWN

δR + = TE LEFT

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 507

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 508

TEST TWT-466 DATA SET COLLATION SHEET

Force - Booster + Orbiter, 0.0035- Scale, Launch Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δH	δA	δR	GRIT	NO. of RUNS	MACH NUMBERS 0.6	0.9	0.95	1.0	1.05	1.1	1.2	1.3	1.46	1.96	2.99	4.96
R22 05A	B16W6T8V6+B6W10H12VS	A	0	0	0	0		11		088/0	087/0	086/0	085/0	084/0	083/0	082/0	192/0	172/0	004/0	003/0
↓ 22A	↓	↓	↓	↓	↓	↓	120	4		104/0		103/0		102/0		101/0				
05B		0	B					11		032/0	033/0	034/0	035/0	036/0	037/0	038/0	191/0	181/0	007/0	008/0
05C		-6						7		229/0		230/0		231/0		232/0		216/0	222/0	221/0
05D		6	↓	↓				7		209/0		208/0		207/0		206/0		215/0	211/0	210/0
06A		A	0	-10				5		121/0		120/0		119/0		118/0		174/0		
07A				-20	↓			5		126/0		125/0		124/0		123/0		175/0		
08A		↓	↓	0	-10L +10R			5		131/0		130/0		129/0		128/0		176/0		
08B		0	B		↓	↓		3		197/0				196/0		195/0				
↓ 26B	↓	↓	↓	↓	0	6.5		3		242/0				243/0		244/0				
R22 09B	B16W6T8V6+B6W10H12	0	B	0	0	0		5		047/0		048/0		049/0		050/0		180/0		
12A	B16 +B6W10H12VS	A	0					5		144/0		143/0		142/0		141/0		169/0		
12B	↓	0	B					5		073/0		072/0		071/0		070/0		187/0		
13A	B16W6	A	0					5		137/0		138/0		139/0		140/0		168/0		
13B	↓	0	B					5		066/0		067/0		068/0		069/0		186/0		
14B	B16T8			0	0			4		065/0		064/0		063/0		062/0				
↓ 15B	B16W6T8 ↓	↓	↓	↓	↓			5		058/0		059/0		060/0		061/0		185/0		

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM KL KLN KY KSL KAB KDF KN KCP 9

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:
α or β SCHEDULES
αA = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10
β B = -4, -2, 0, 2, 4, 6, 8, 10

$\delta_H + = \delta_A + =$ TE DOWN
$\delta_R + =$ TE LEFT

TEST TWT-466 DATA SET COLLATION SHEET

Force - Booster + Orbiter, 0.0035-Scale, Launch Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δH	δA	δR	GRIT	NO. of RUNS	MACH NUMBERS 0.6	0.8	0.9	0.95	1.0	1.05	1.1	1.2	1.3	1.96		
R22 16A	B16W6T8V6	A	0	0	0	0		7			090/0	150/0	091/0	149/0	092/0		093/0	173/0		
16B	↓	0	B	↓	↓	↓		8			057/0	056/0	055/0	054/0	053/0	052/0	051/0	183/0		
16C	↓	-6	↓	↓	↓	↓		5			237/0		238/0		239/0		240/0	241/0		

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CL	KLN	KY	CSL	CAB	CDF	CN	KCP		IDPVAR(1)	IDPVAR(2)	NDV 9

COEFFICIENTS:

α or β SCHEDULES

α A = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10

β B = -4, -2, 0, 2, 4, 6, 8, 10

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 509

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STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 510

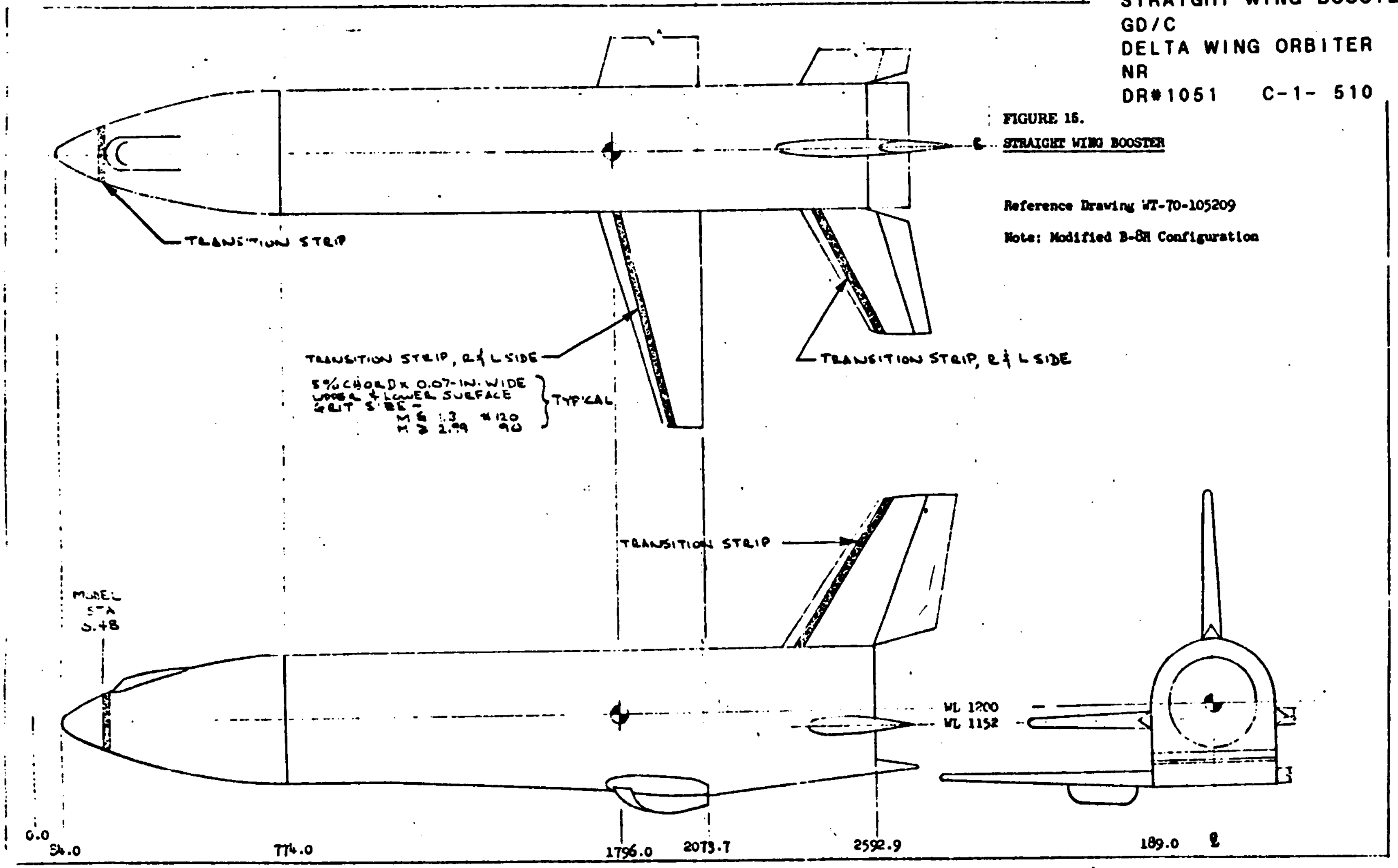


FIGURE 15.
STRAIGHT WING BOOSTER

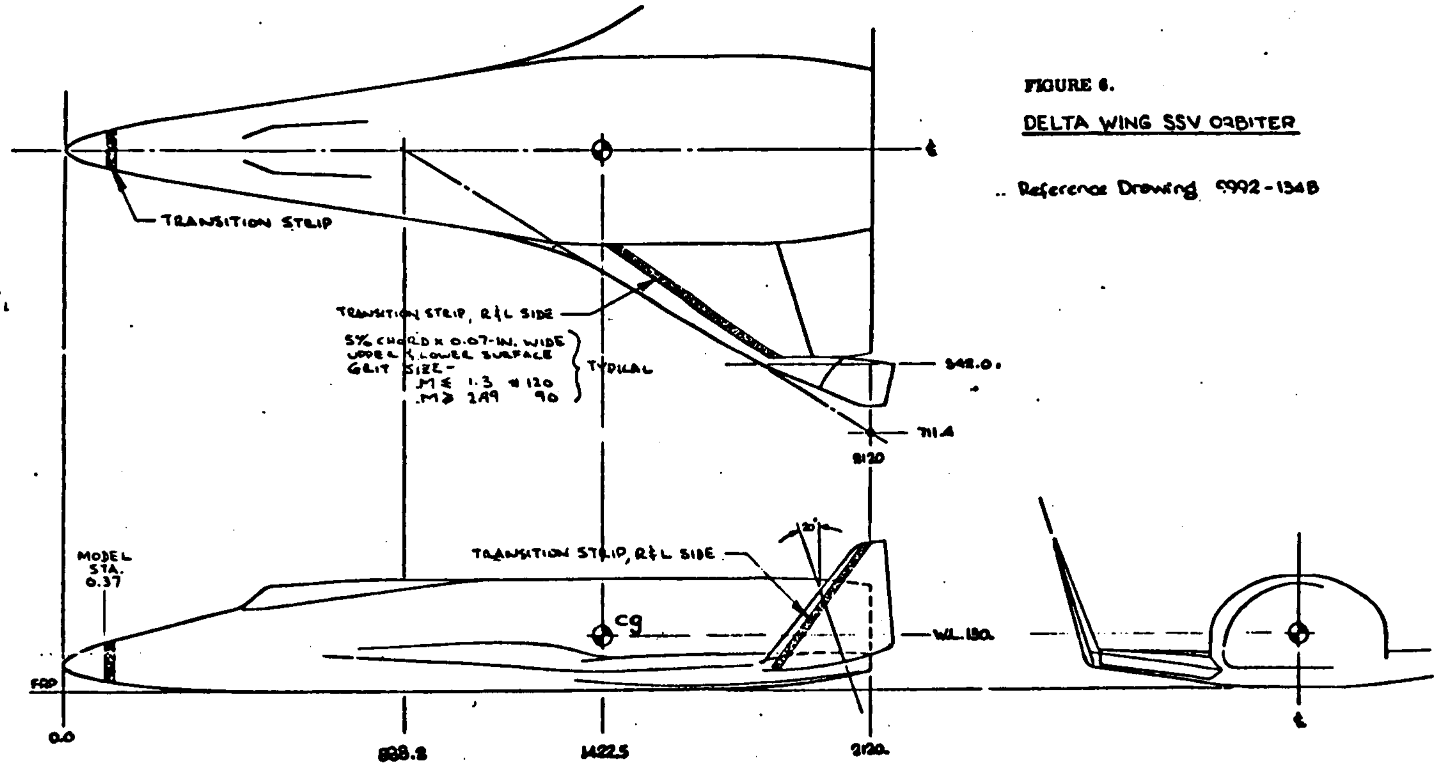
Reference Drawing WT-70-105209

Note: Modified B-8H Configuration

FIGURE 6.

DELTA WING SSV ORBITER

.. Reference Drawing 9992-134B



STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 511

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 512

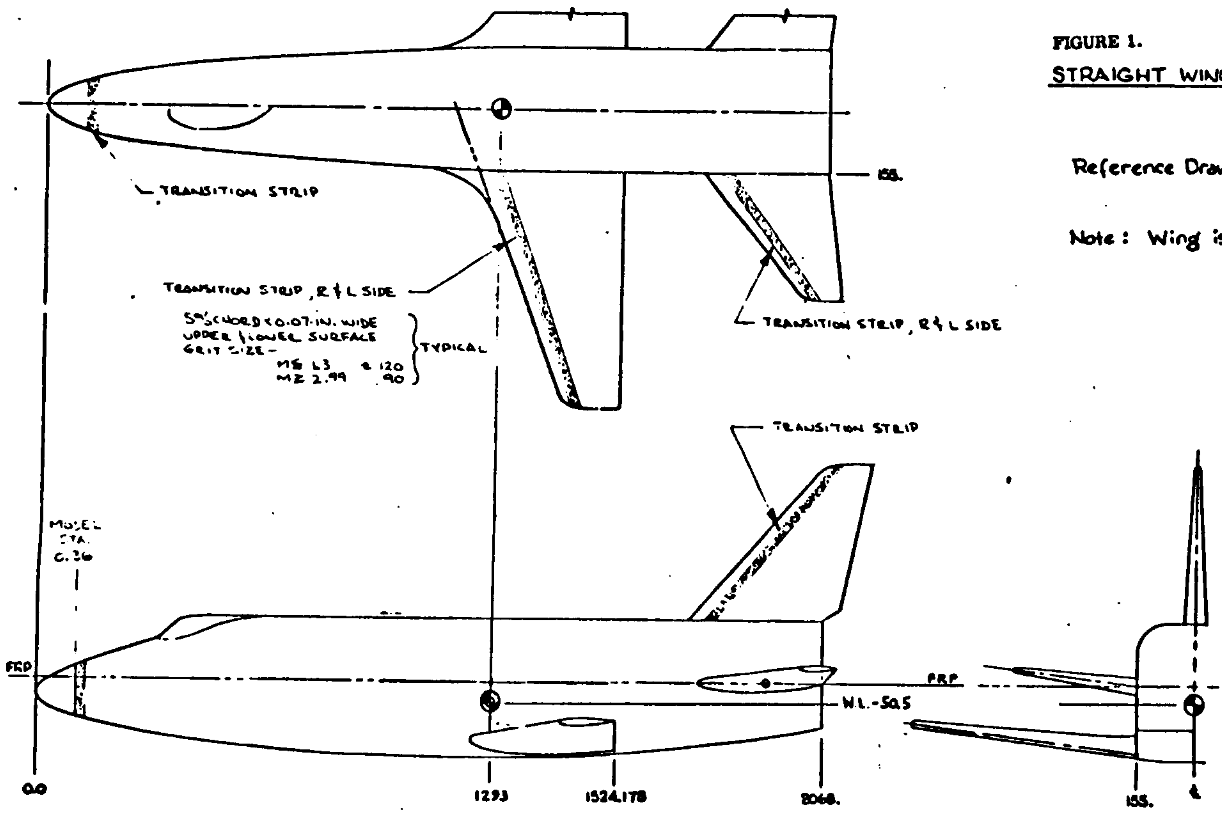


FIGURE 1.
STRAIGHT WING SSV ORBITER

Reference Drawing 9992-130C

Note: Wing is in -130G position

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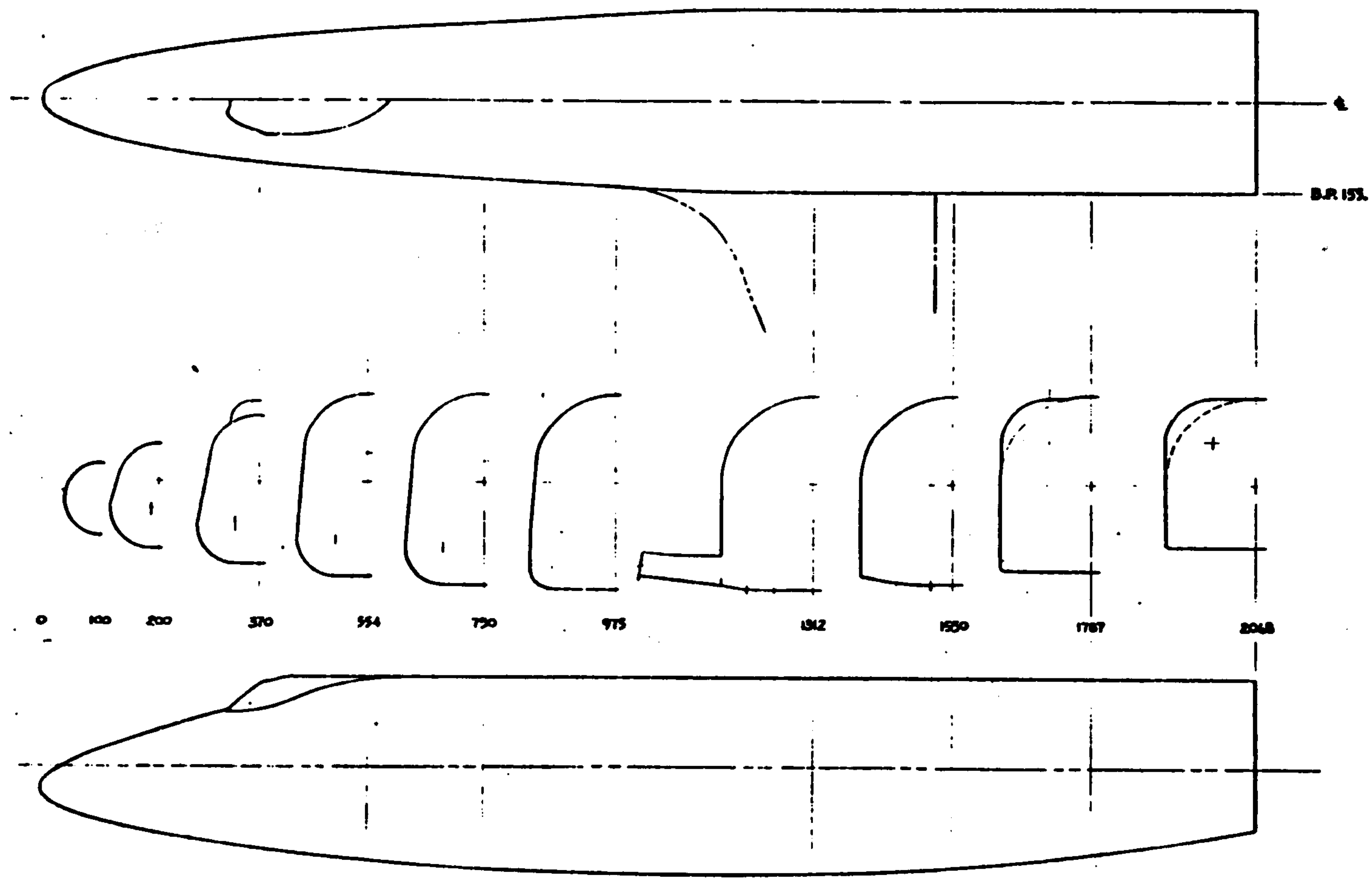


FIGURE 2 BODY B6 9992-130C CONFIGURATION

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 513

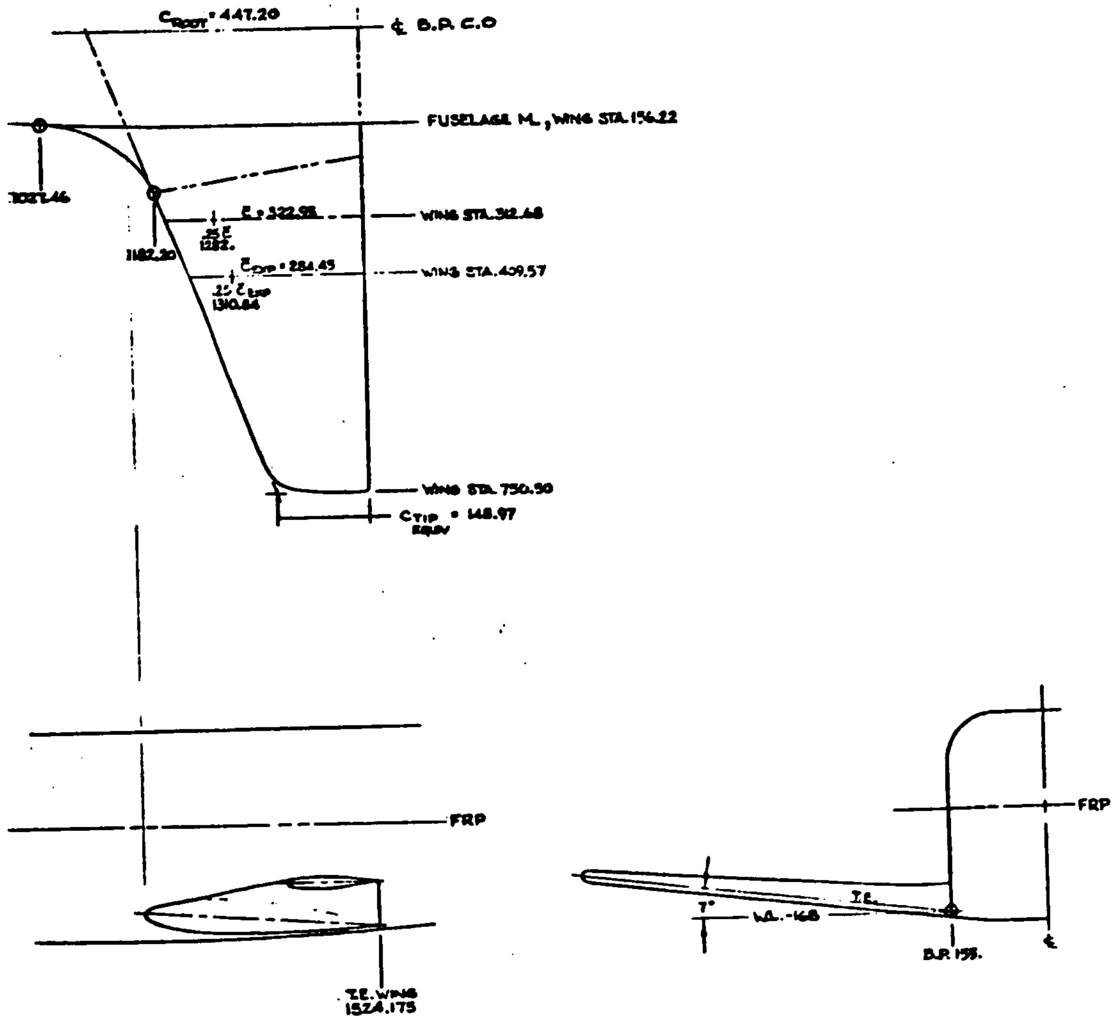
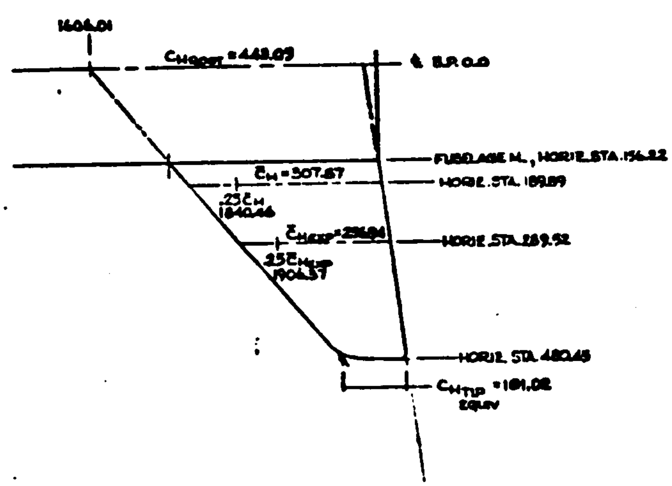


FIGURE 3 WING W10 9992-130 C CONFIGURATION
9992-130 G WING POSITION

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 515



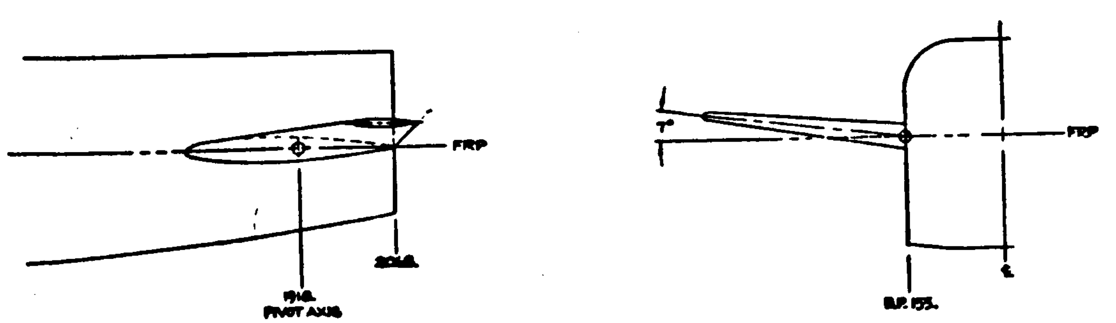


FIGURE 4
HORIZONTAL STABILIZER H12 9992-130C CONFIGURATION

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 516

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

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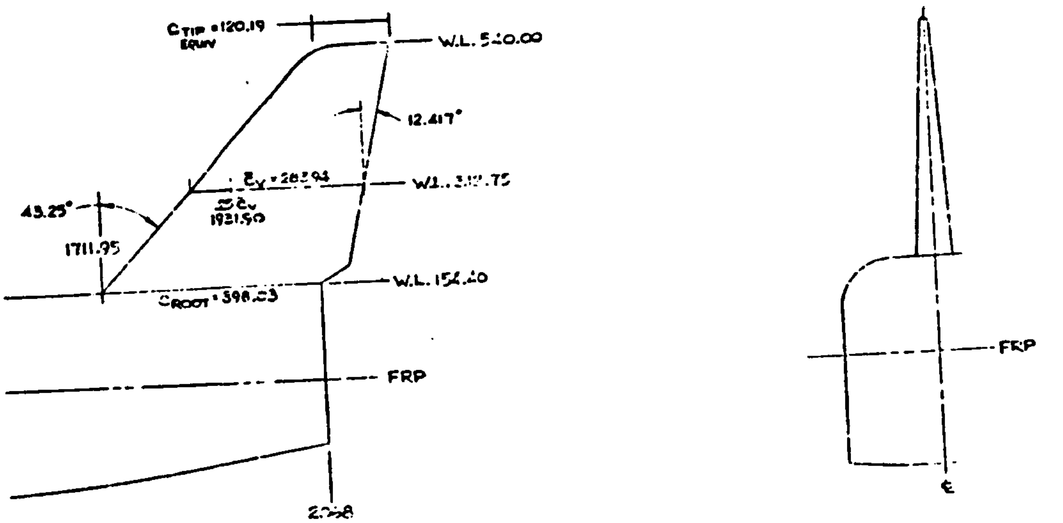


FIGURE 5

VERTICAL STABILIZER V5 9992-130C CONFIGURATION

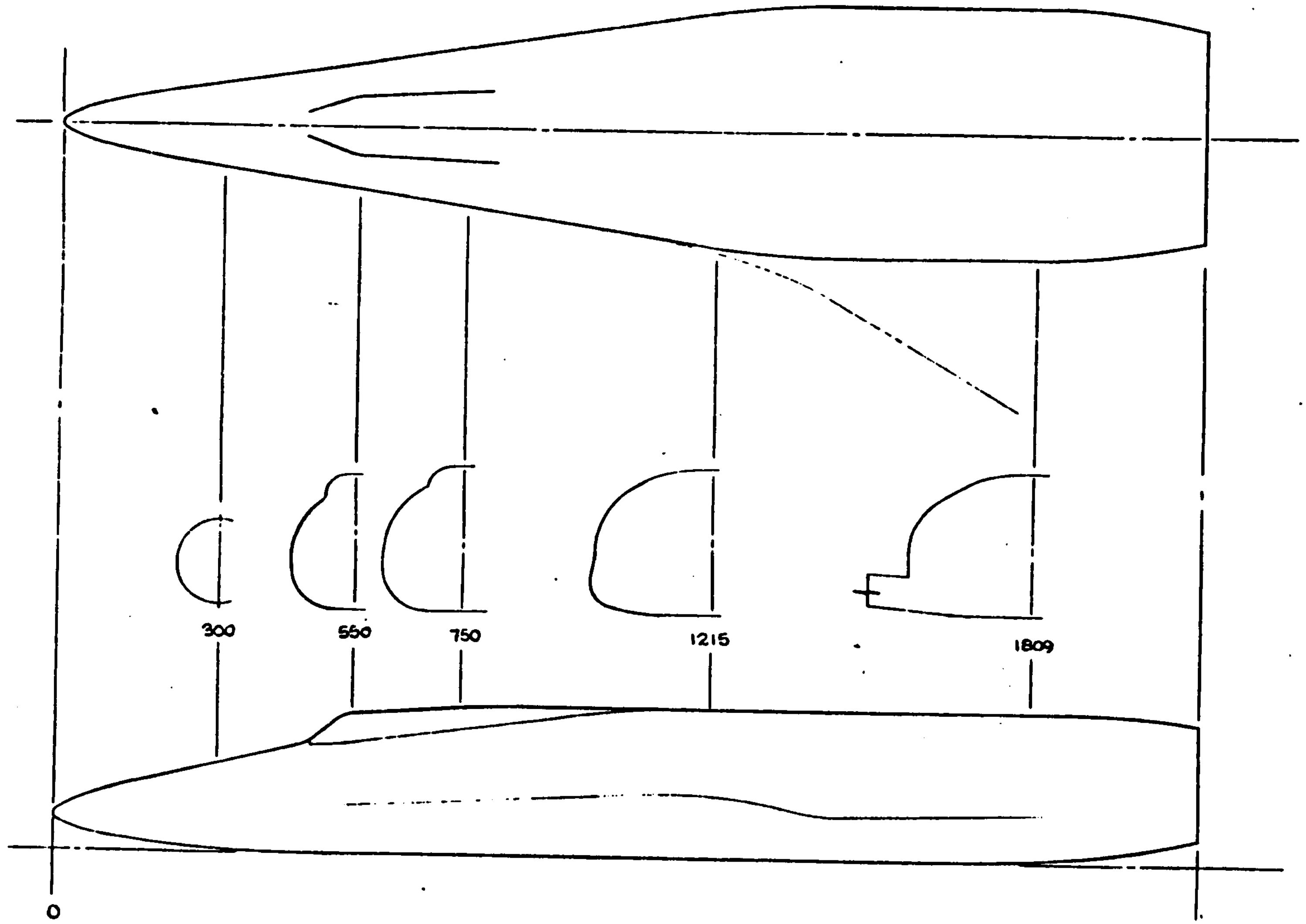


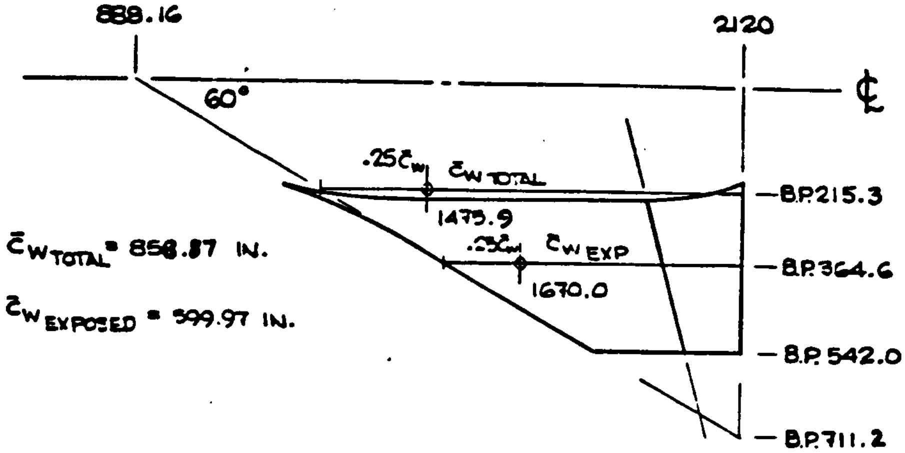
FIGURE 7 BODY B5 9992-134B CONFIGURATION

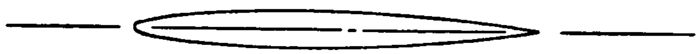
STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 517

3.0 MODEL DESCRIPTION - Continued

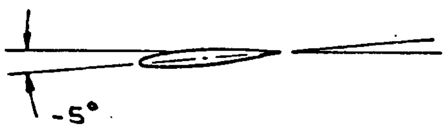
3.3 Dimensional Data - Continued

3.3.2 Delta Wing Orbiter - Continued





CHORD (B.P. 240.0)
0009 - 64 SERIES AIRFOIL



TIP CHORD (B.P. 542.0)
0012 - 64 SERIES AIRFOIL

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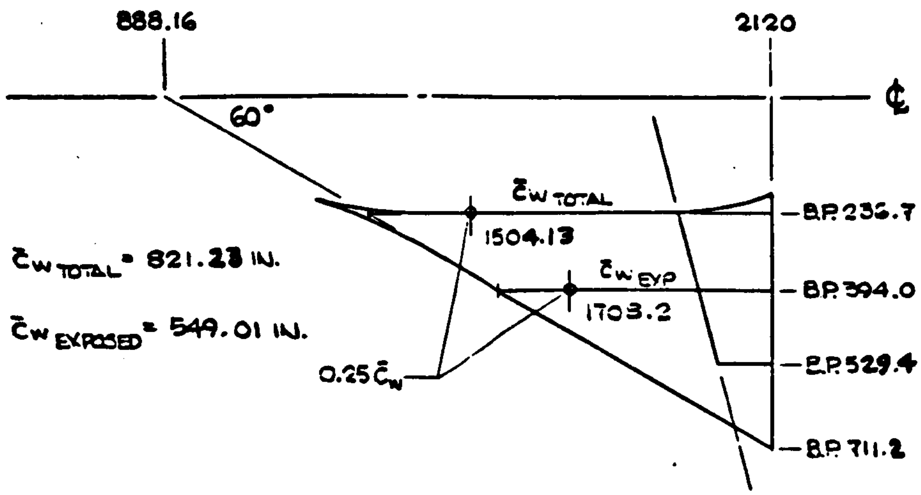
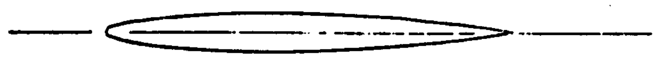
FIGURE 8.

WING W13 9992-134B CONFIGURATION

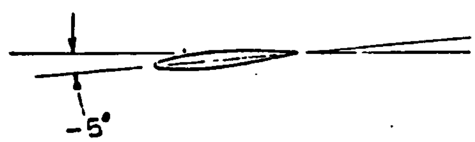


STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 519



CHORD (B.P. 240.0)

0009-64 SERIES AIRFOIL



TIP CHORD (B.P. 542.0)

0012-64 SERIES AIRFOIL

FIGURE 9. WING W14 [illegible]2-134B CONFIGURATION
COMPLETE DELTA - [illegible] TIP

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 520

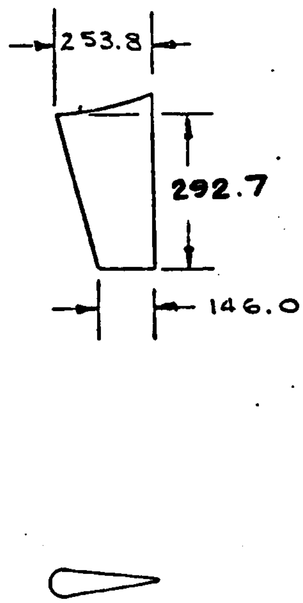


FIGURE 10.

ELEVON, E_2 - Elevon Used With Wing W_{13}
E_3 - Elevon Used with Wing W_{14}

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 521

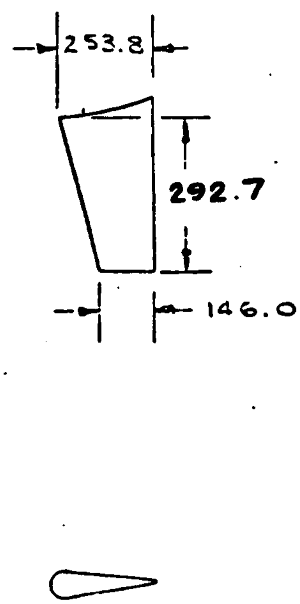


FIGURE 11.

ELEVON, E_2 - Elevon Used With Wing W_{13}
E_3 - Elevon Used with wing W_{14}

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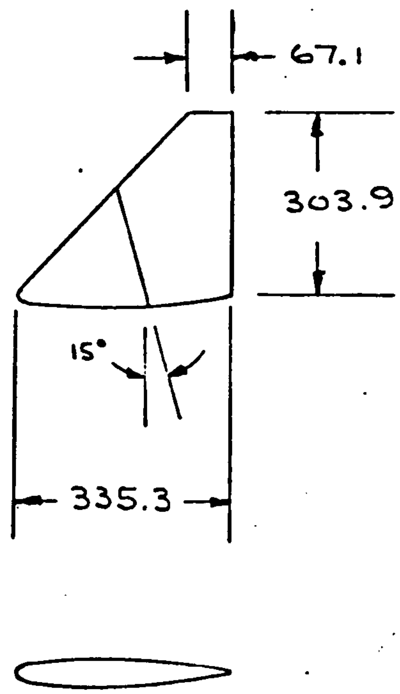

0012-64 SERIES AIRFOIL

FIGURE 12
VERTICAL STABILIZER V_{14} 9992-134B CONFIGURATION

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 523

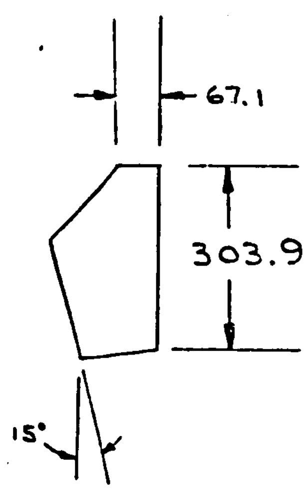

FIGURE 13
RUDDER - R4

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 524

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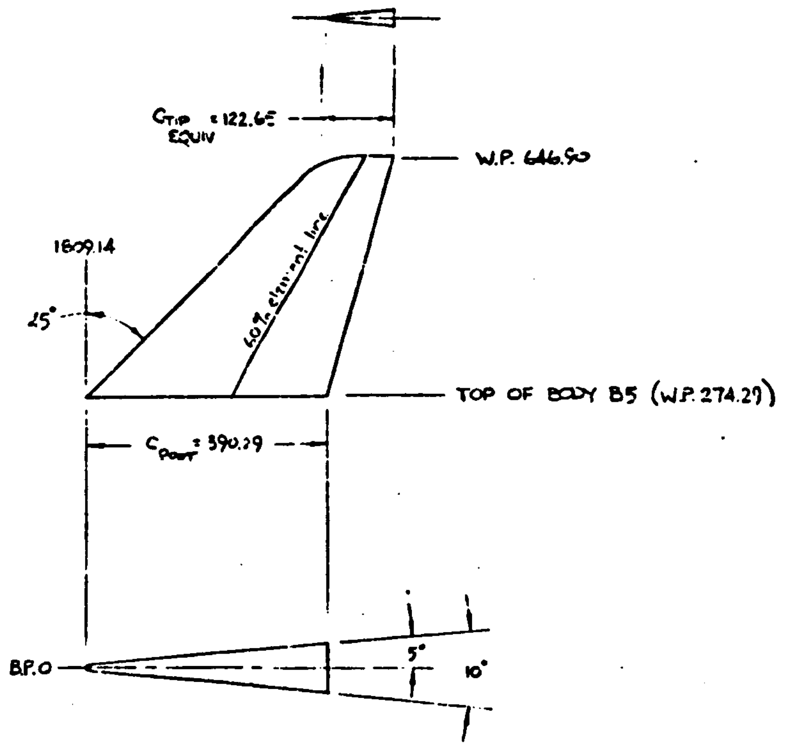
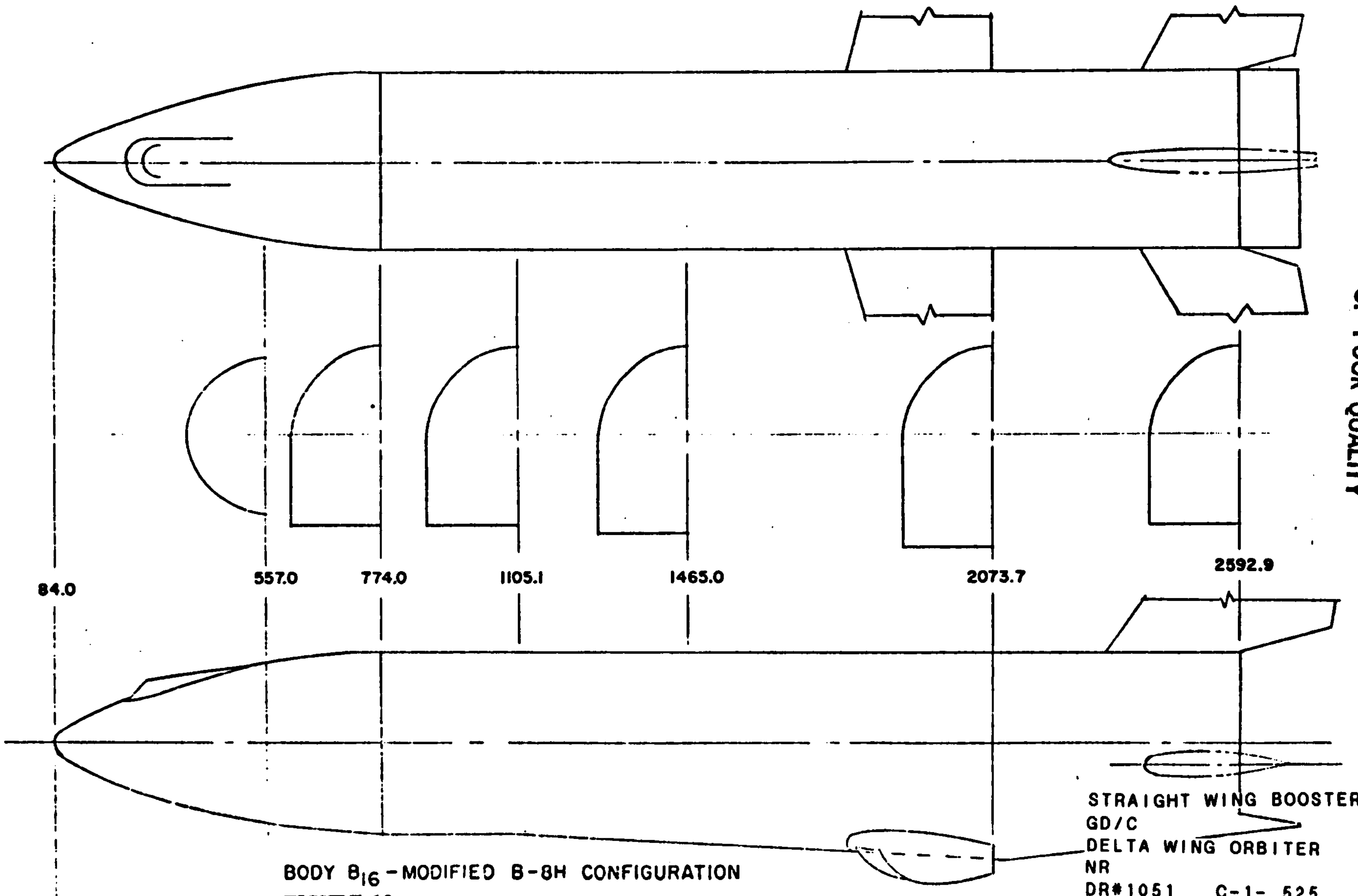


FIGURE 14.

VERTICAL STABILIZER V17

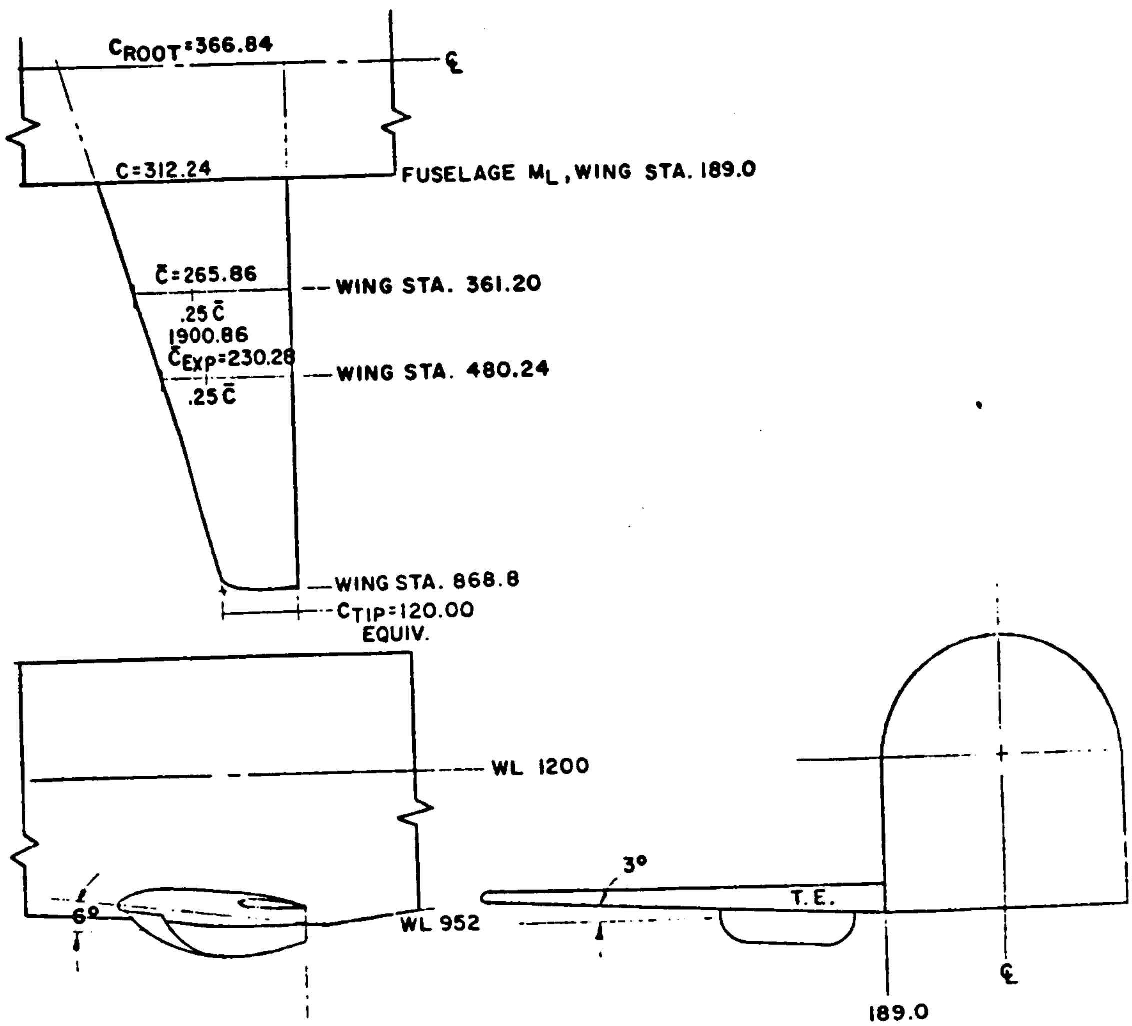


BODY B_{16} - MODIFIED B-8H CONFIGURATION
FIGURE 16.

MODEL DESCRIPTION - Continued

Dimensional Data - Continued

Straight Wing Booster - Continued

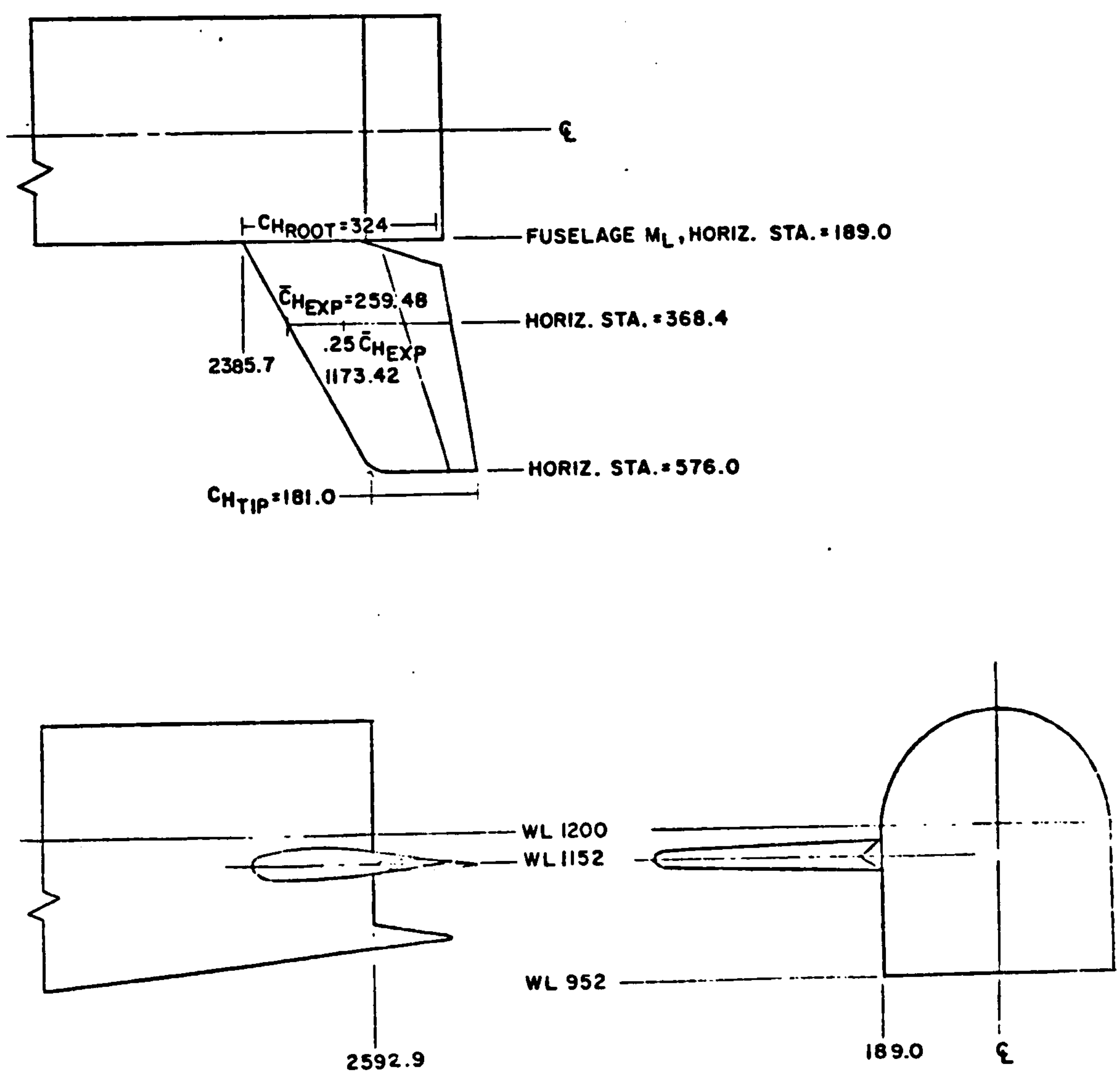


WING W_6 MODIFIED B-8H CONFIGURATION
FIGURE 17.

MODEL DESCRIPTION - Continued

Dimensional Data - Continued

Straight Wing Booster - Continued

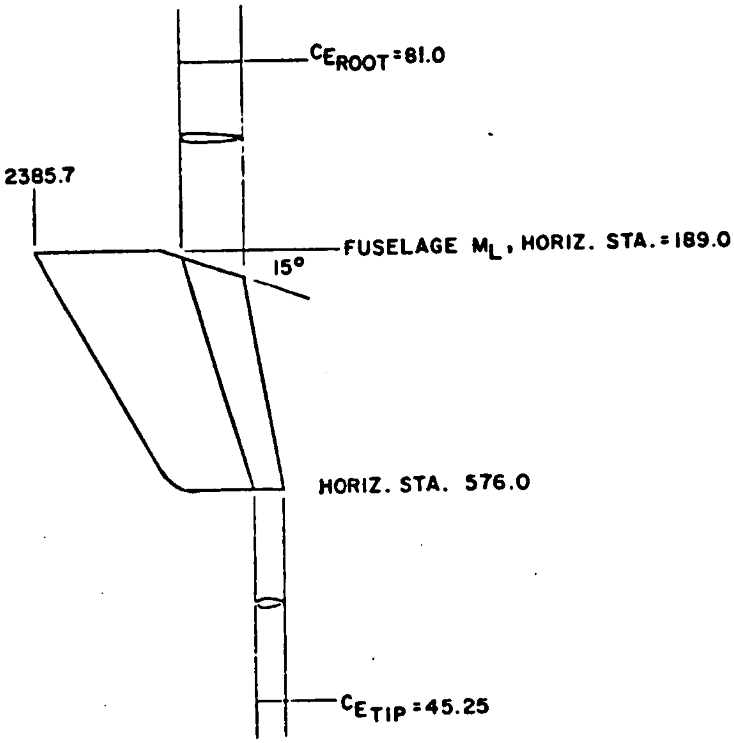


HORIZONTAL TAIL T_8
FIGURE 18.

MODEL DESCRIPTION - Continued

Dimensional Data - Continued

Straight Wing Booster - Continued



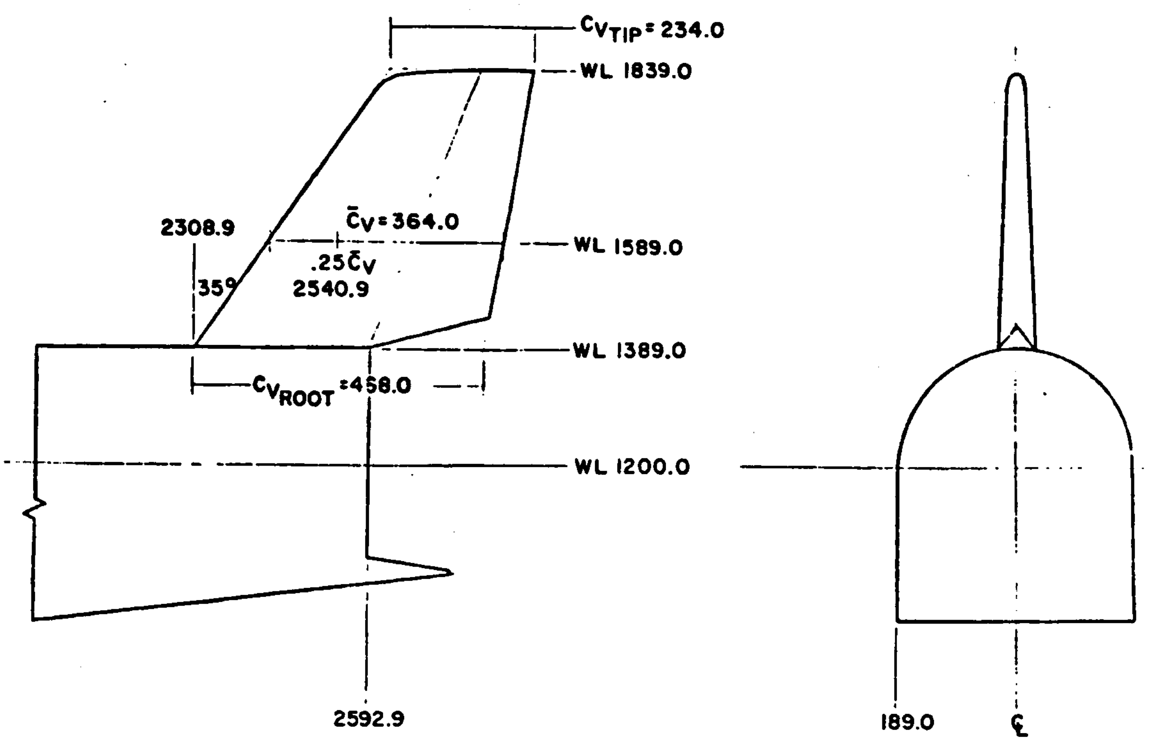
HORIZONTAL TAIL ELEVATOR (T_8)
FIGURE 18. (Cont.)

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1051 C-1- 529

MODEL DESCRIPTION - Continued

Dimensional Data - Continued

Straight Wing Booster - Continued

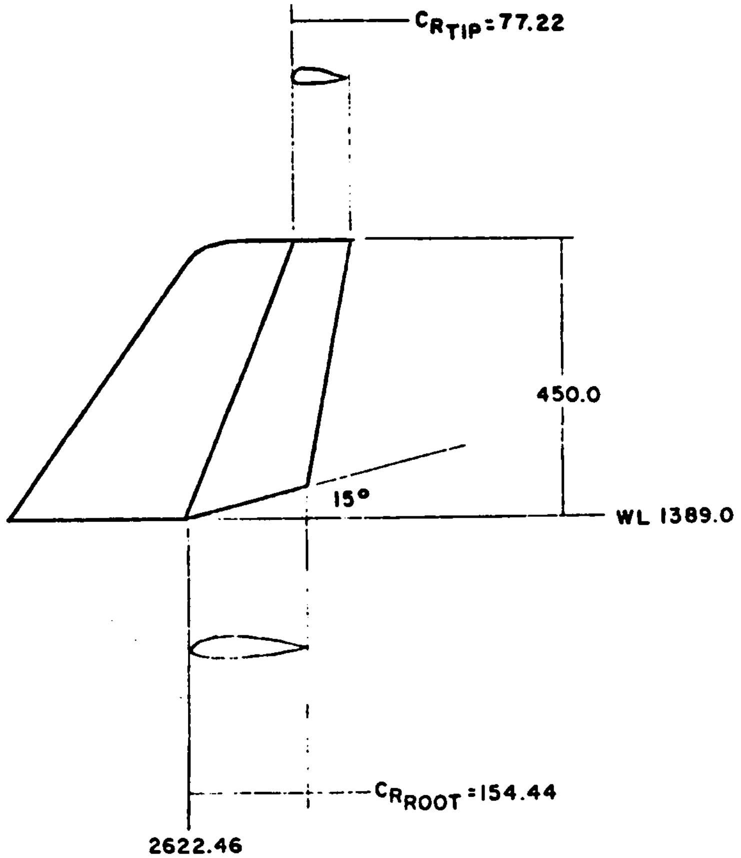


VERTICAL TAIL V_6
FIGURE 19.

MODEL DESCRIPTION - Continued

Dimensional Data - Continued

Straight Wing Booster - Continued



VERTICAL TAIL RUDDER (V_6)
FIGURE 19. (Cont.)

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TABLE I

TEST 66-511 DATA SET/RUN NUMBER

COLLATION SUMMARY

BOOSTER ALONE

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	I_{HL}	I_{HR}	δe	δa	NO. of RUNS	0.6	0.9	1.2	1.5	2.0
RAHBAA	B_{18}	A	0	-	-	-	-	5	5	4	3	2	1
BA		B	0	-	-	-	-	5	10	9	8	7	6
AB	B_{18} W_8	A	0	-	-	-	-	5	20	19	18	17	16
BB		B	0	-	-	-	-	5	15	14	13	12	11
AC	B_{18} W_8 H_8	A	0	0	0	0	0	5	25	24	23	22	21
BC		B	0	0	0	0	0	5	77	76	75	73	72
AD	B_{18} W_8 H_8 E_{29}	A	0	0	0	0	0	5	30	29	28	27	26
BD		B	0	0	0	0	0	5	56	55	54	53	52
AE		A	0	30	30	30	0	5	97	96	95	94	93
BE		B	0	30	30	30	0	5	61	60	59	58	57
AF		A	0	-50	-50	-50	0	5	35	34	33	32	31
BF		B	0	-50	-50	-50	0	5	71	70	69	68	67
AG		A	0	-30	-30	-30	0	5	43	42	41	40	39
BG		B	0	-30	-30	-30	0	5	66	65	64	63	62
AH	B_{18} W_8 H_9 E_{29}	A	0	0	0	0	0	3	-	46	45	-	44
BH		B	0	0	0	0	0	3	-	89	48	-	47
AI		A	0	30	30	30	0	3	-	92	91	-	90
BI		B	0	30	30	30	0	3	-	88	87	-	86
AJ	B_{18} W_8 H_8 E_{29}	A	0	-10	+10	0	10	3	-	38	37	-	36
BJ		B	0	-10	+10	0	10	3	-	51	50	-	49

PARAMETERS/VALUES; MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE); TEST RUN NUMBERS

1 CN, 7 CAF, 13 CLM, 19 CY, 25 CYN, 31 CBL, 37 CAB, 43 L/DF, 49 DCLM, 55 DCA, 61 IDPVAR(1), 67 IDPVAR(2), 75 76 NDV

COEFFICIENTS:

α or β SCHEDULES

A) +26 → 42

B) +44 → 68

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075 C-1- 531

TABLE I (Continued)

TEST 66-511 DATA SET/RUN NUMBER COLLATION SUMMARY

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075 C-1- 532
☐ PRETEST
☒ POSTTEST

BOOSTER ALONE

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	I_{HL}	I_{HR}	δ_e	δ_a	NO. of RUNS		0.6	0.9	1.2	1.5	2.0						
RAHBBK	B_{18} W_8 H_8 E_{29}	B	0	0	0	0	0	5		85	84	83	82	81						
DK		53	D	0	0	0	0	3		-	80	79	-	78						
CL	B_{18} W_8 H_8 E_{29} V_6	C	0	0	0	0	0	5		102	101	100	99	98						
CM		C	0	0	0	0	0	5		107	106	105	104	103						
EM		E	0	0	0	0	0	5		132	131	130	129	128						
EN		E	0	-20	20	0	20	5		138	137	136	134	133						
DO		5	D	0	0	0	0	5		122	121	120	119	118						
FP		0	F	0	0	0	0	5		127	126	125	124	123						
FQ		-5	F	0	0	0	0	5		117	116	115	114	113						
FR		-10	F	0	0	0	0	5		112	111	110	109	108						

Header groups: PARAMETERS/VALUES over I_{HL}, I_{HR}, δ_e, δ_a; MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) over the Mach columns; TEST RUN NUMBERS.

1 CN 7 CAF 13 CLM 19 CY 25 CYN 31 CBL 37 CAB 43 L/DF 49 DCLM 55 DCA 61 IDPVAR(1) 67 IDPVAR(2) 75 76 NDV

COEFFICIENTS:

α or β SCHEDULES

A) +26 → 42 D) -10 → +10
B) +44 → 68 E) -15 → +10
C) -2 → 24 F) -5 → +10

NASA-MSFC-MAF

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TABLE I (Concluded)

TEST ARC-66-511 DATA SET/RUN NUMBER

COLLATION SUMMARY

COMPOSITE - RAH 1 xx
and ORBITER - RAH 2 xx

B = STG. WNG. BOOSTER, B_{18} W_8 H_8 E_{29} V_6
O_1 = DLT. WNG. ORBITER, B_4 W_{16} V_{21}
O_2 = STG. WNG. ORBITER, B_6 W_{10} H_{12} V_5

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	δ_{HL}	δ_{HR}	δ_e	δ_a	NO. of RUNS		MACH 0.6	0.9	1.2	1.5	2.0						
RAH - 21	B + O_2	E	0	-20	20	0	20	5		143	142	141	140	139						
- 22		E	0	0	0	0	0	5		148	147	146	145	144						
- 23		0	F	0	0	0	0	5		153	152	151	150	149						
- 24		-10	F	0	0	0	0	5		158	157	156	155	154						
- 25		-5	F	0	0	0	0	5		163	162	161	160	159						
- 11	B + O_1	-5	F	0	0	0	0	5		168	167	166	165	164						
- 12		-5	F	0	0	0	0	5		173	172	171	170	169						
- 13		0	F	0	0	0	0	5		178	177	176	175	174						
- 14		E	0	-20	20	0	20	5		183	182	181	180	179						
- 15		E	0	0	0	0	0	5		188	187	186	185	184						
- 16		-10	F	0	0	0	0	5		193	192	191	190	189						

MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN | CAF | CLM | CY | CYN | CBL | CAB | L/DF | DCA | | | |

XCP (Orbiter Data) → IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:

α or β SCHEDULES

E) $-15^\circ \rightarrow 11^\circ$

F) $-5^\circ \rightarrow 10^\circ$

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075 C-1- 533

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075 C-1- 534

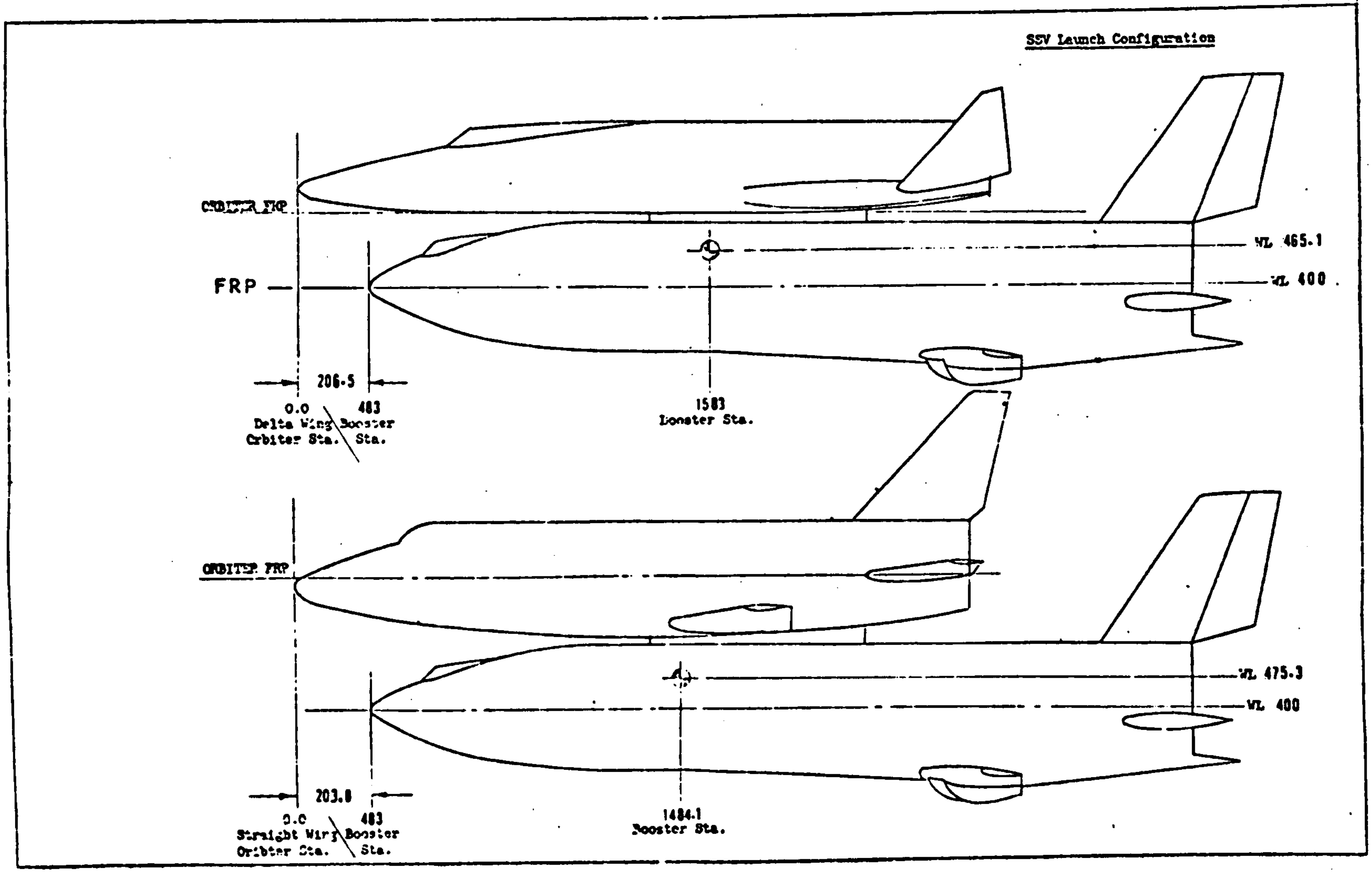


FIGURE B. LAUNCH CONFIGURATIONS, GENERAL ARRANGEMENT

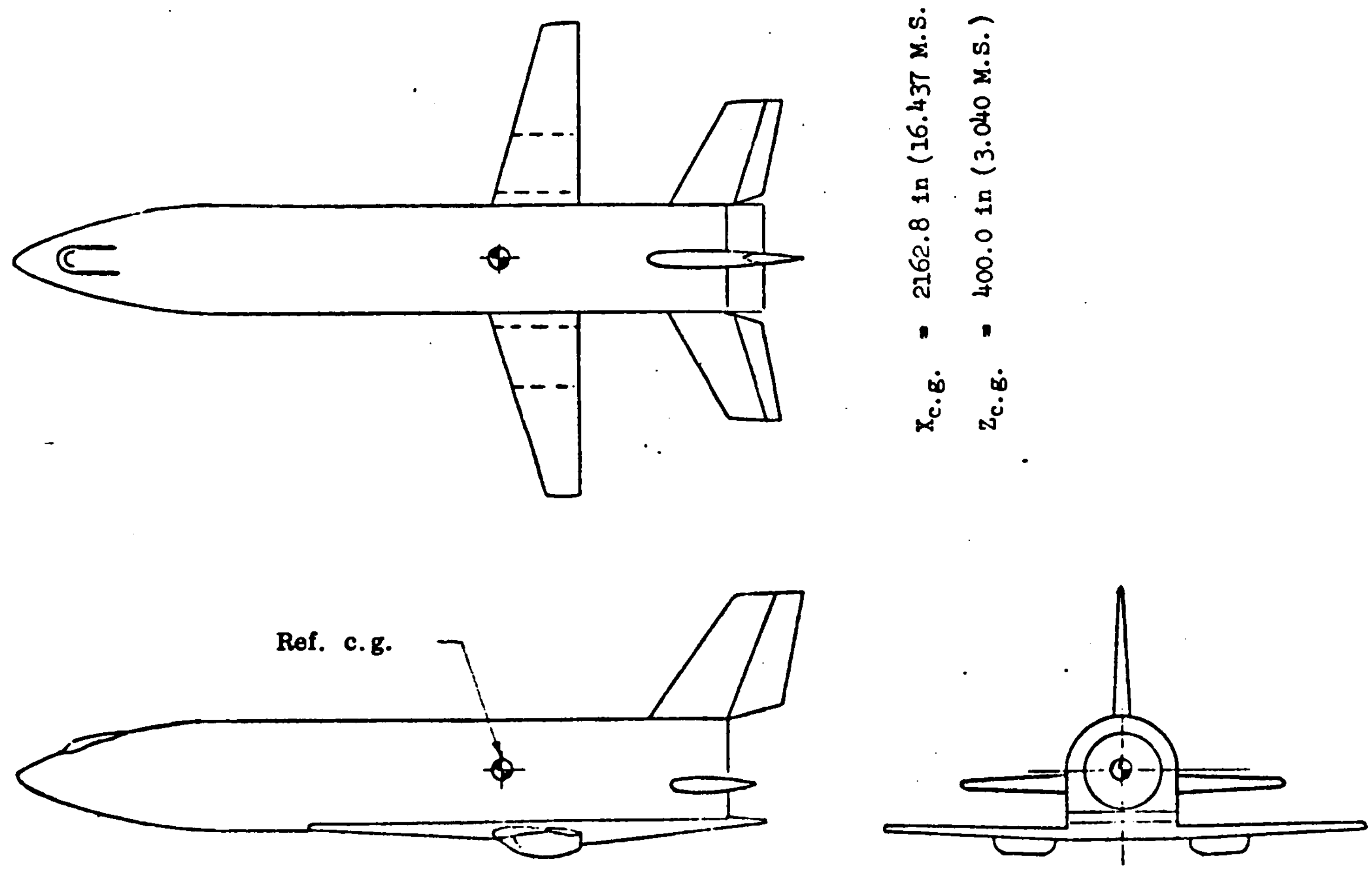


FIGURE C.- GENERAL ARRANGEMENT, BOOSTER

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075   C-1- 535

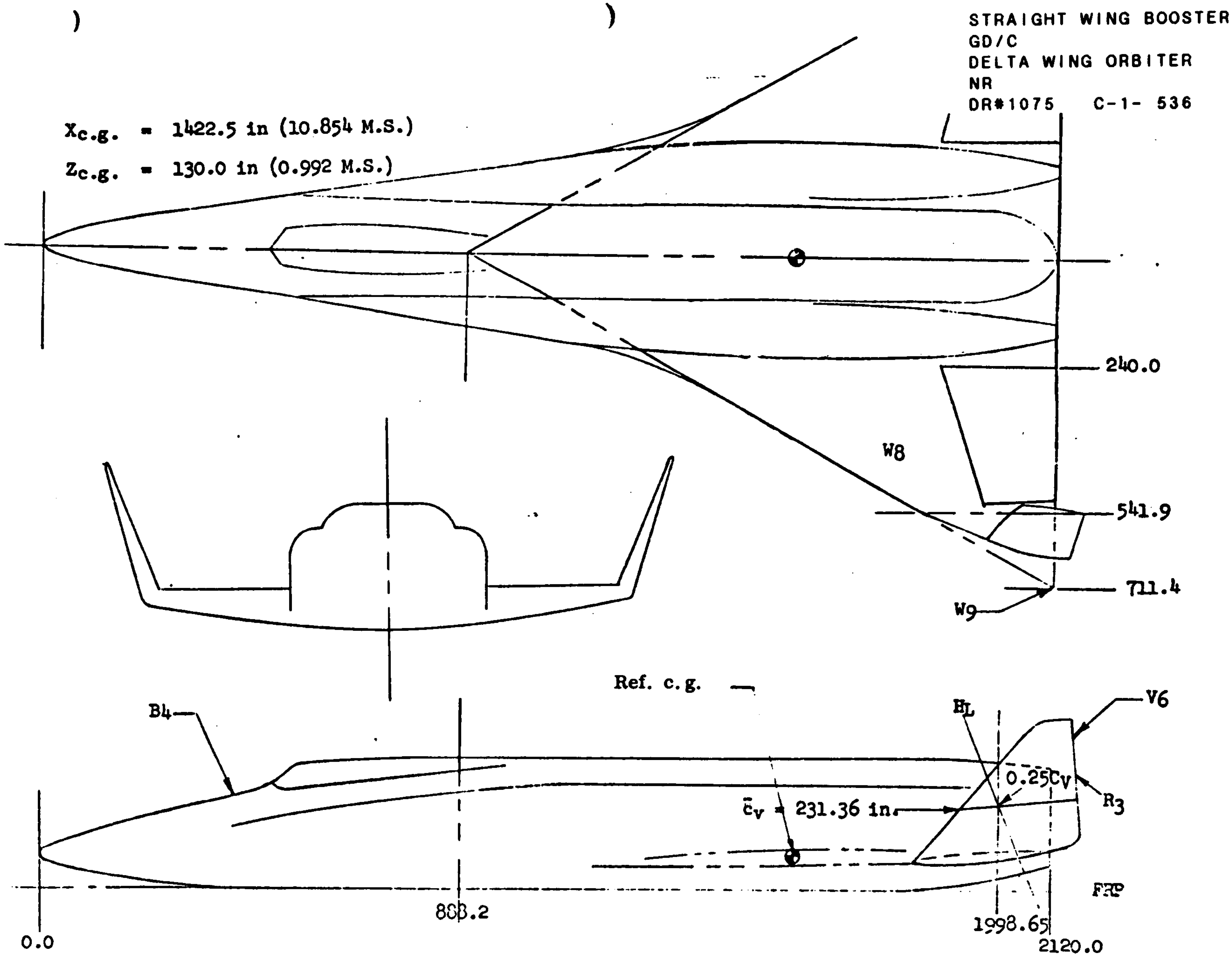
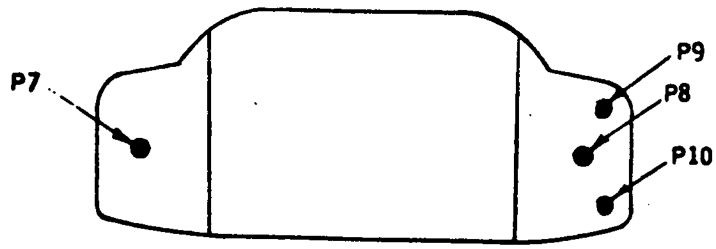
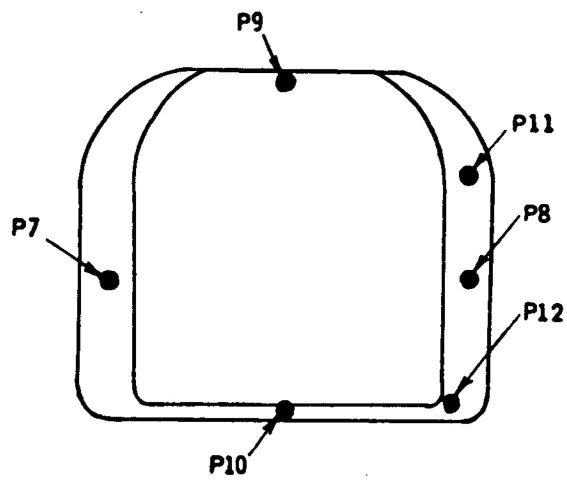


FIGURE D.- ORBITER (NO. 1) GENERAL ARRANGEMENT

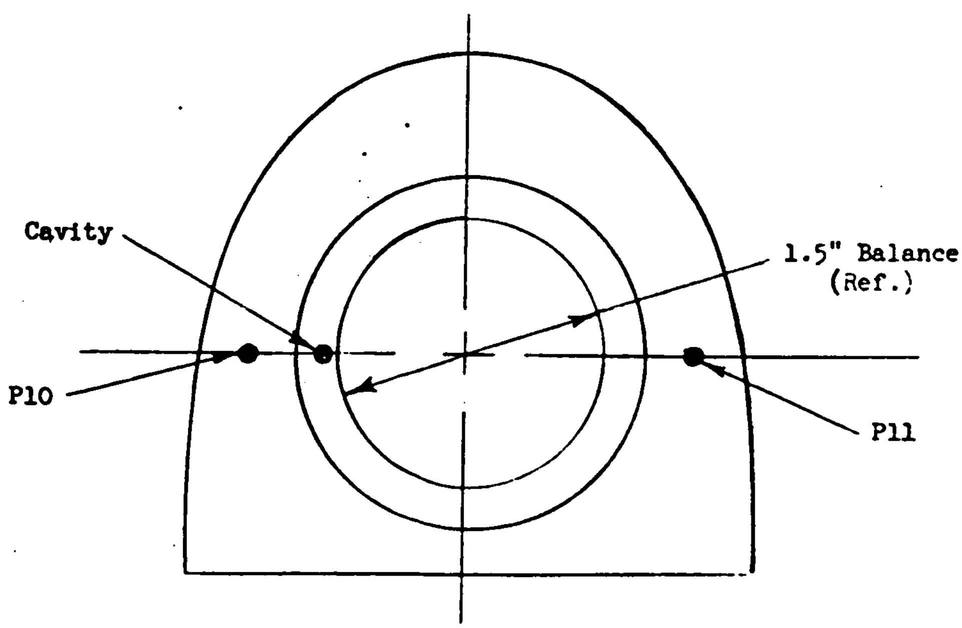
STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075 C-1- 537



Delta Wing Orbiter



Straight Wing Orbiter



Booster

FI(ŻE F. BASE PRESSURE ORIFICE LOCATIONS

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1075   C-1- 538

$X_{c.g.}$ = 1293 in. (9.840 M.S.)

$Y_{c.g.}$ = 50.5 in. (-0.384 M.S.)

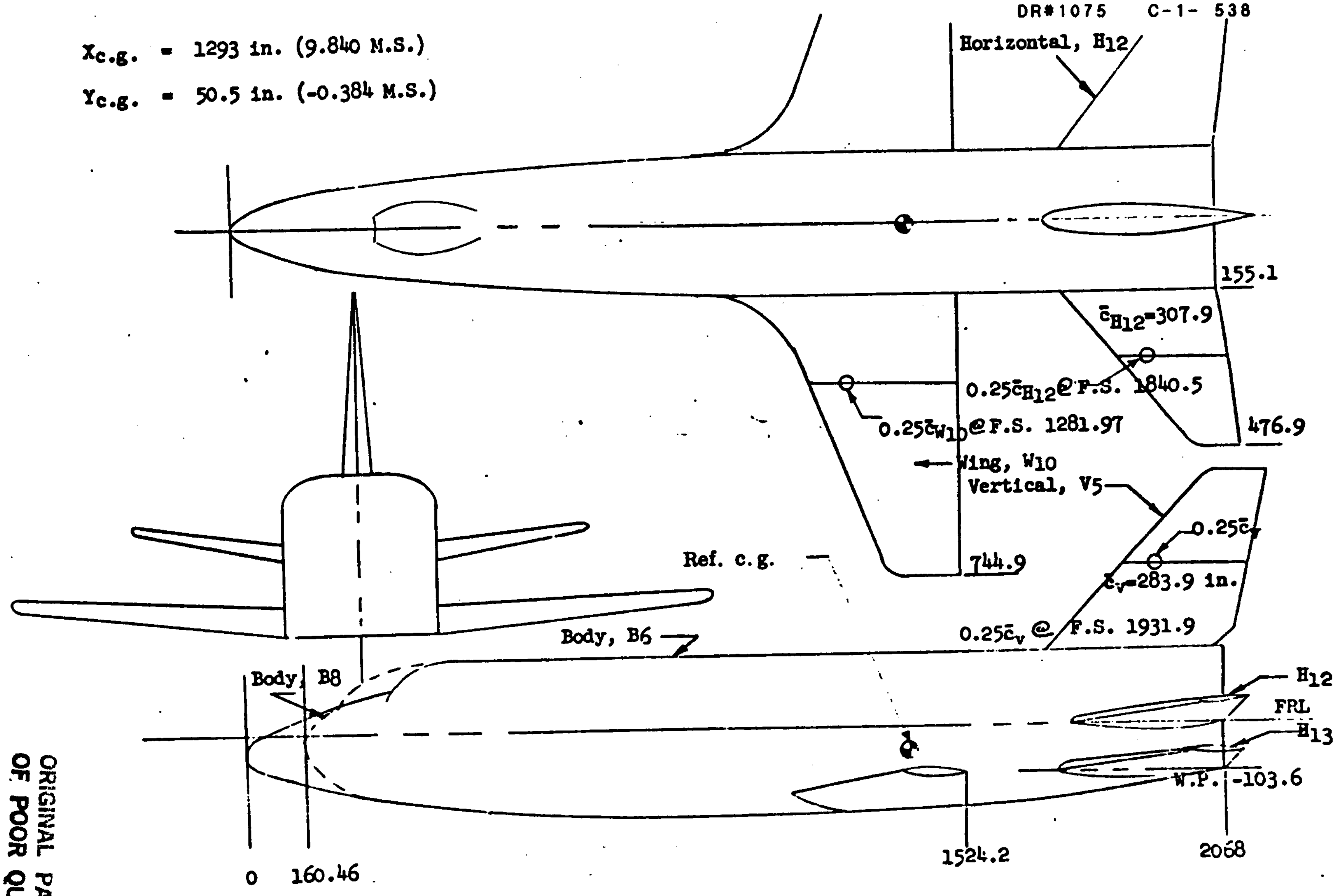


FIGURE E.- ORBITER (NO. 2) GENERAL ARRANGEMENT

C-3

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TEST AMES 66-488 DATA SET COLLATION SHEET

MSC LAUNCH CONFIGURATION

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)											
										.60	.70	.80	.85	.90	1.10	1.20	1.40			
RAN110	$B_{B1}W_{B1}H_{B1}V_{B1}$	A	0							3	4	5	6	7	8	9				
RAN210	$B_{B1}W_{B1}H_{B1}V_{B1}/B_{1}V_{5}$	A	0							17	16	15	14	13	12	11	10			
RAN310	$B_{1}W_{1}H_{1}V_{1}/B_{1}W_{5}H_{14}V_{5}$	A	0							25	24	23	22	21	20	19	18			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN CA CL CD CLM L/D IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES A) -8°, -6°, -4°, -2°, 0°, 2°, 4°, 6°, 8°

NASA-MSFC-MAF

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 539

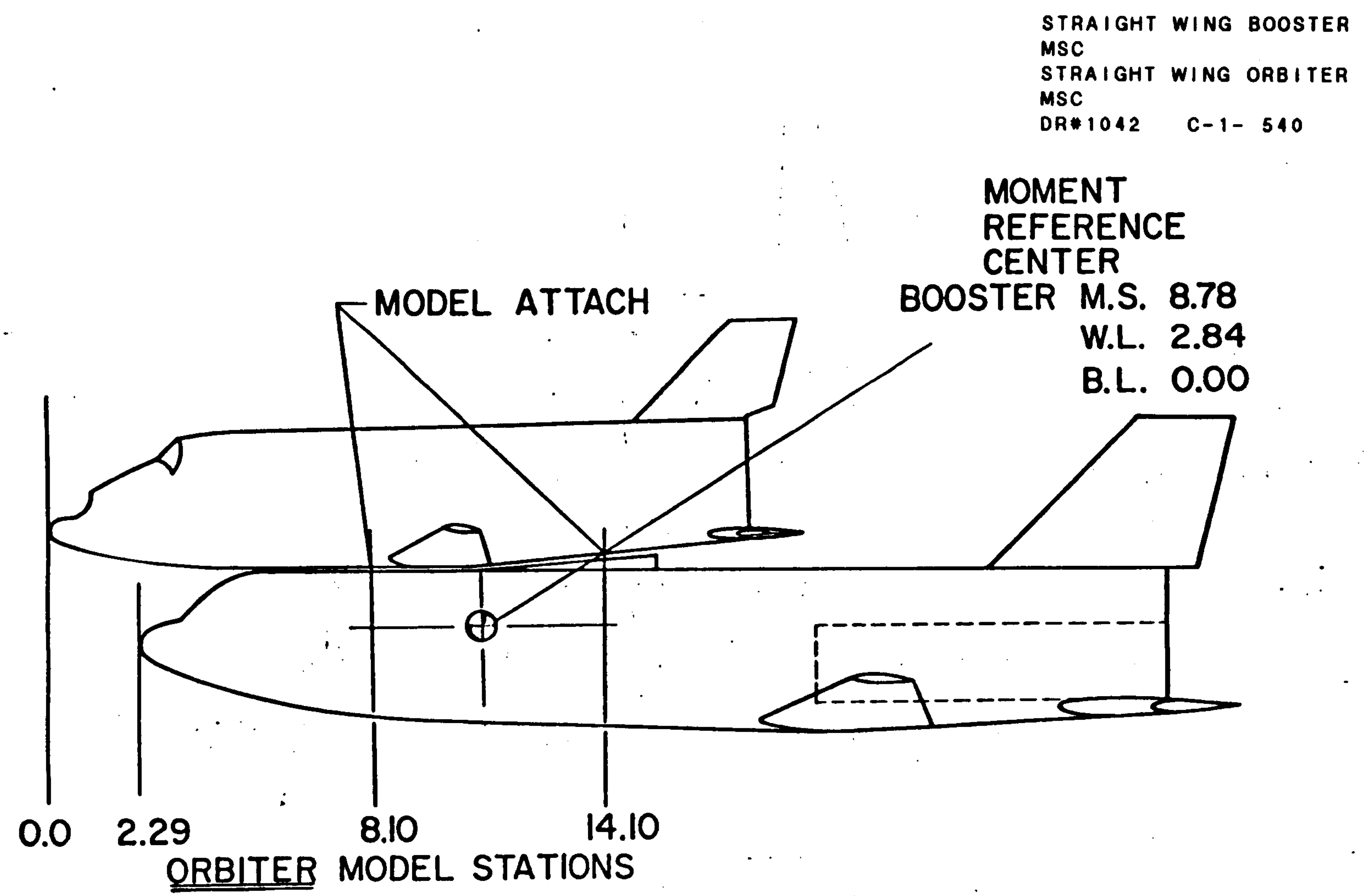


Figure 2. Sketch of MSC Launch Configuration Model

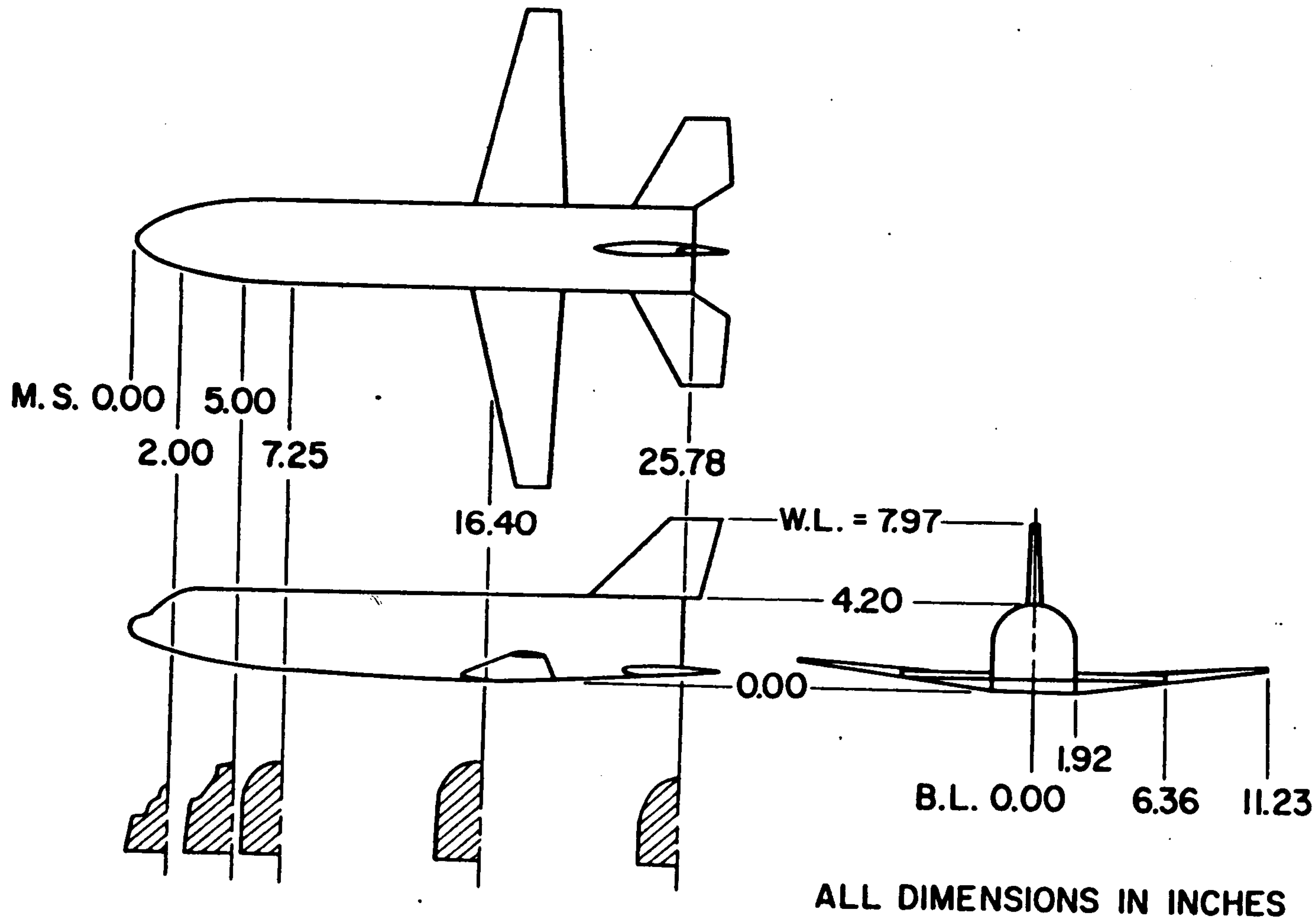


Figure 3. Plan, Elevation and End View of MSC Booster Model

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 541

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 542

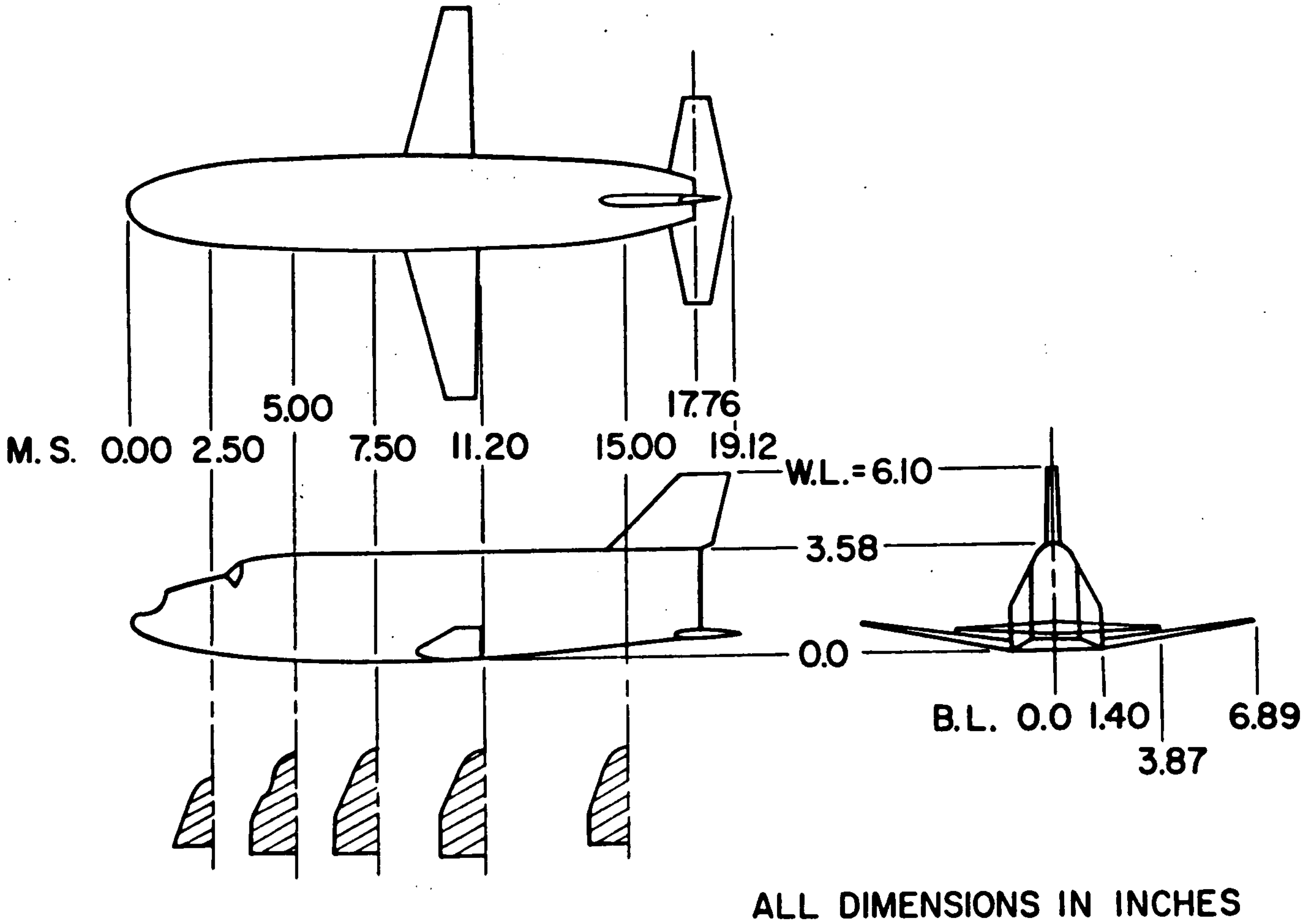
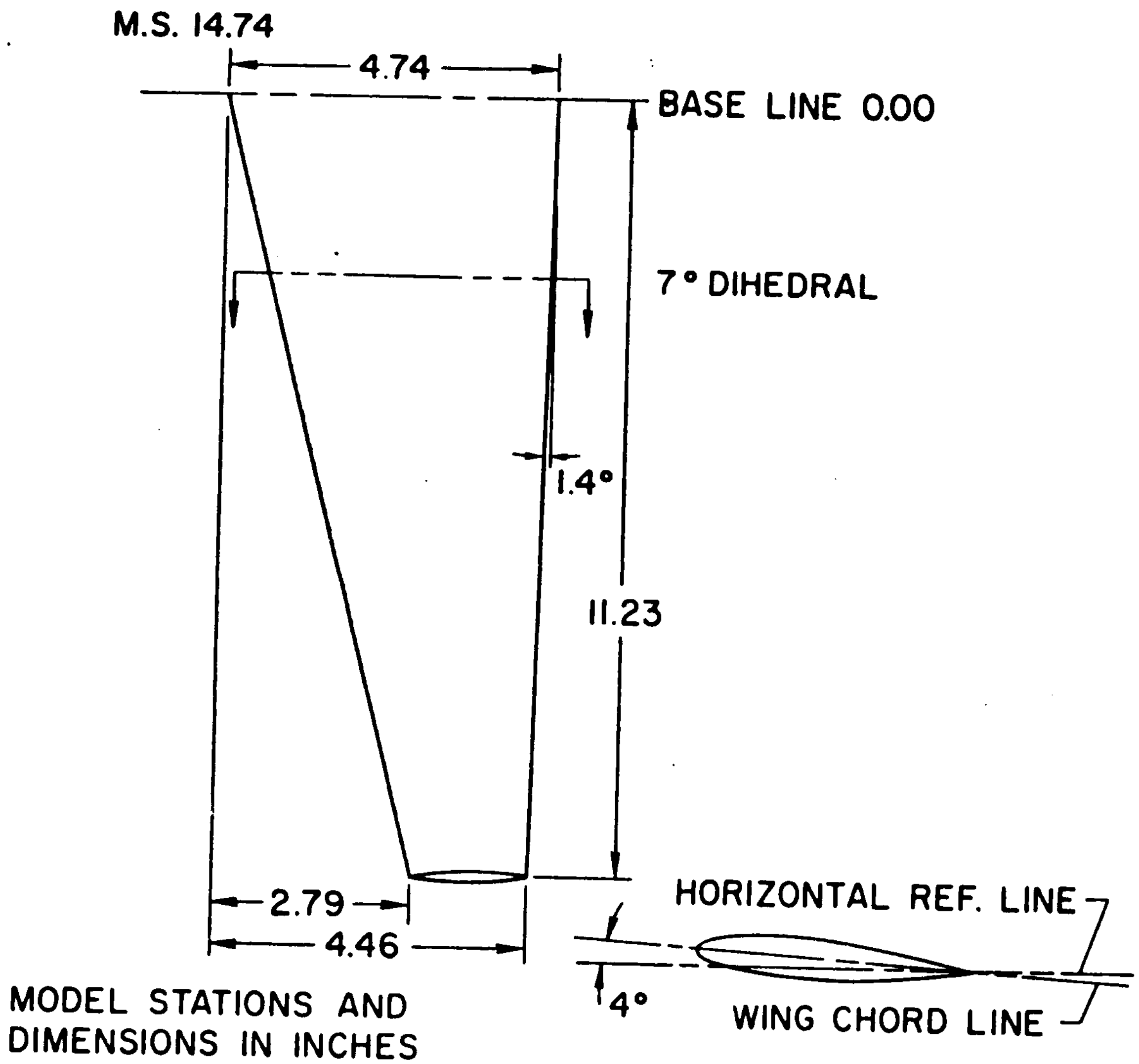


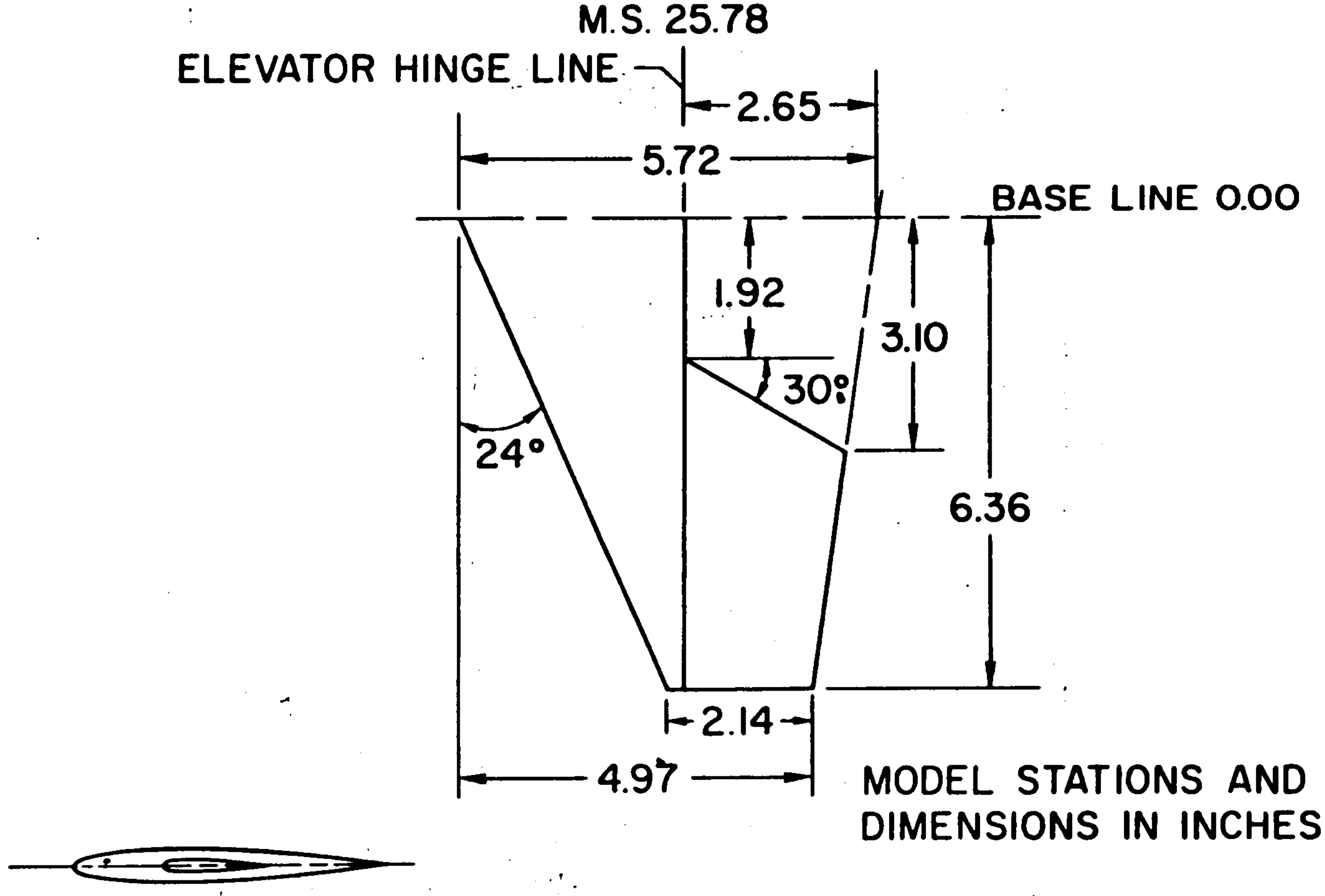
Figure 4. Plan, Elevation and End View of MSC Orbiter Model



(a) Wing, W_{B1}

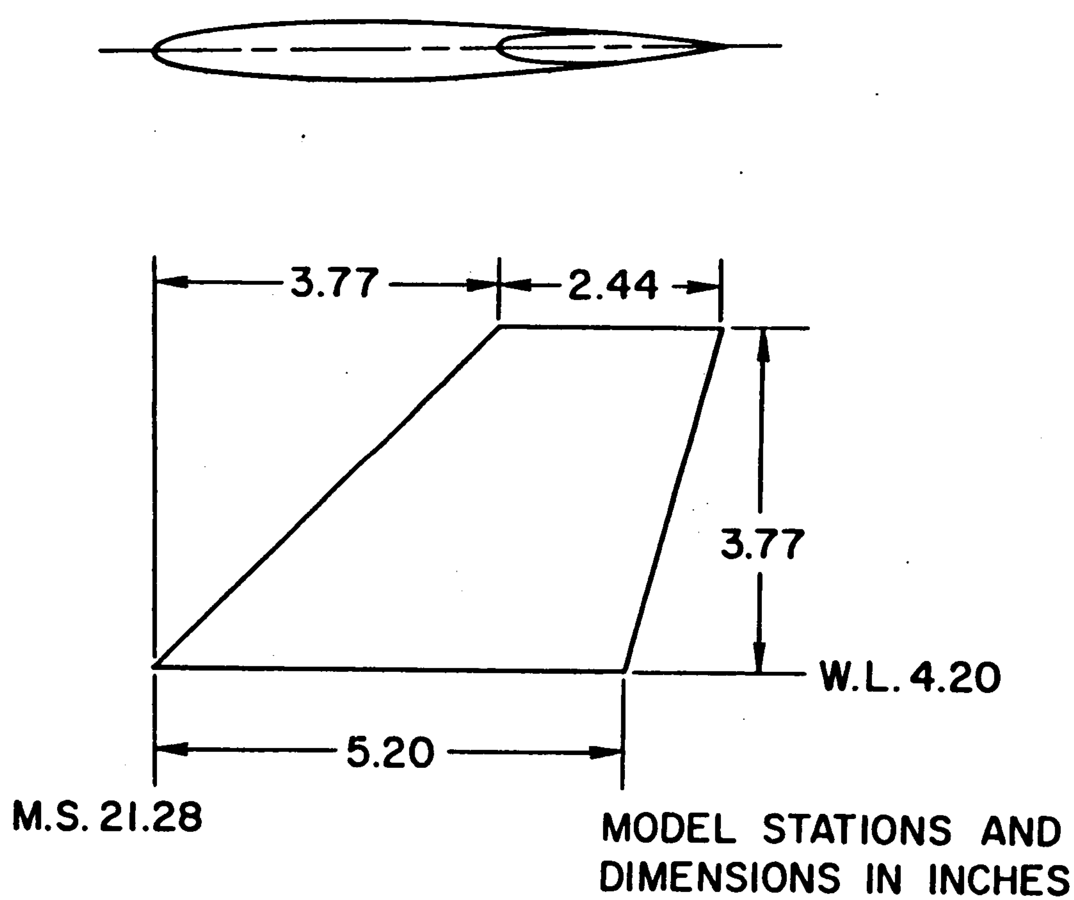
Figure 5. Sketches of Wing, Horizontal and Vertical Stabilizers for the Booster Model

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 543



(b) Horizontal stabilizer, H_{B1}

Figure 5.- Continued.

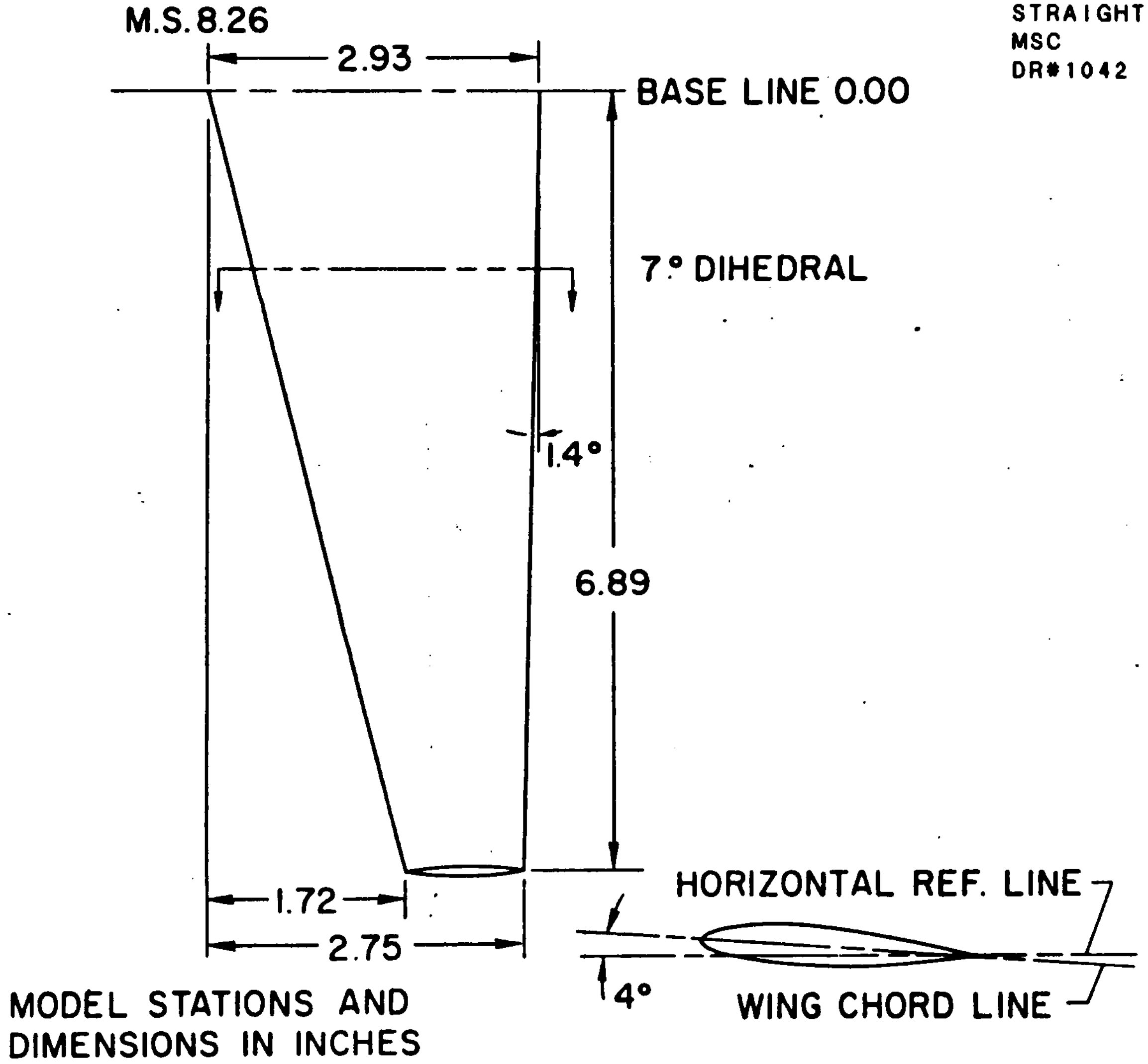


(c) Vertical stabilizer, V_{B1}

Figure 5.- Concluded.

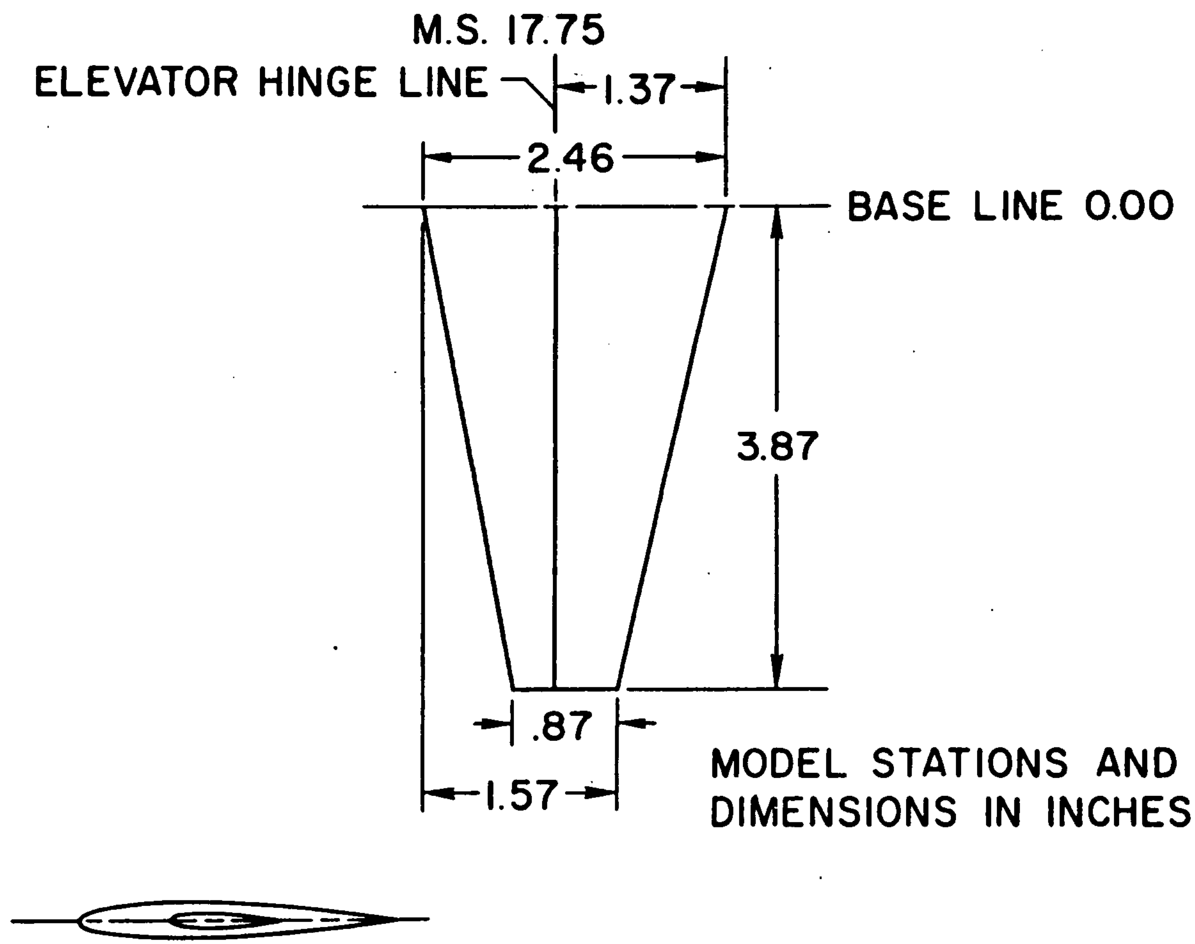
STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 545

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 546



(a) Wing, W_6

Figure 6. Sketches of Wing, Horizontal and Vertical Stabilizers for the Orbiter Model

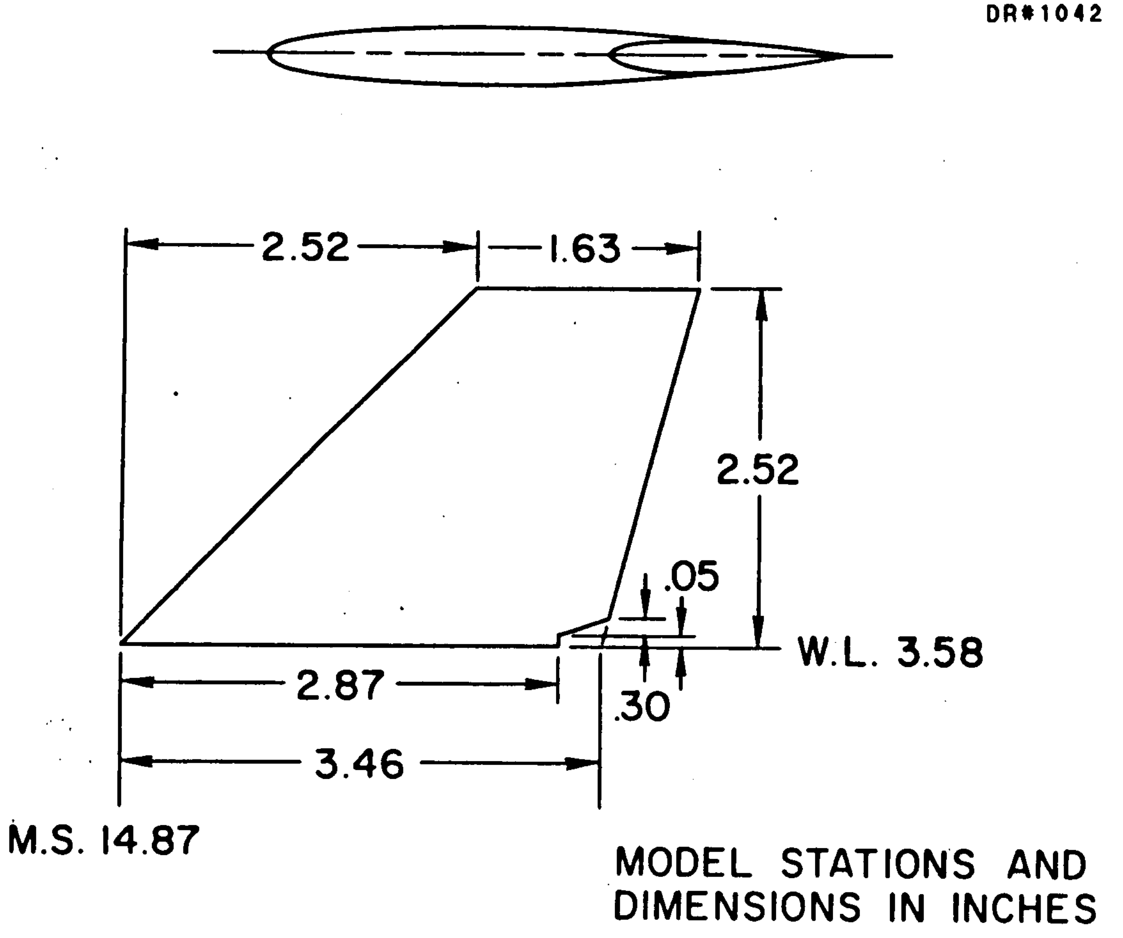


(b) Horizontal stabilizer, H_{14}

Figure 6.- Continued.

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 547

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1042 C-1- 548



(c) Vertical stabilizer, V_5

Figure 6.- Concluded.

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TEST 66-524 DATA SET COLLATION SHEET

4th digit code: 1- BOOSTER BALANCE DATA
2- ORBITER BALANCE DATA (CAB DATA NOT AVAILABLE)
3- ORBITER BALANCE DATA EXPRESSED IN BOOSTER REFERENCE DIMENSIONS

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δ_{aL}	δ_{aR}	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.2	1.5	2.0
RAΦ-11	BOOST. + ORB (FWD)	A	0	0	0		6	5	4	3	2
-12		A	0	15	-15		11	10	9	8	7
-13		A	0	30	-30		16	15	14	13	12
-19		0	B	0	0		45	44	43	42	41
-16		-5	B	0	0		30	29	28	27	26
-20	BOOST. + ORB. (AFT)	0	B	0	0		50	49	48	47	46
-14	BOOST. (-H_B) + ORB. (FWD)	A	0	0	0			20	19	18	17
-18	BOOST. (-V_{B_3}) + ORB. (FWD)	0	B	0	0		40	39	38	37	36
-17	(FWD)	-5	B	0	0		35	34	33	32	31
-21	(AFT)	0	B	0	0		55	54	53	52	51
-15	(B_{B_3}) + ORB. (FWD)	A	0	0	0		25	24	23	22	21
-22	BOOST. + ORB. (-V_3) (AFT)	0	B	0	0		60	59	58	57	56
-23	BOOSTER ALONE	0	B	0	0		65	64	63	62	61
-24	BOOST. ALONE (-V_{B_7})	0	B	0	0		70	69	68	67	66
-25	(B_{B_3}) ALONE	0	B	0	0		75	74	73	72	71

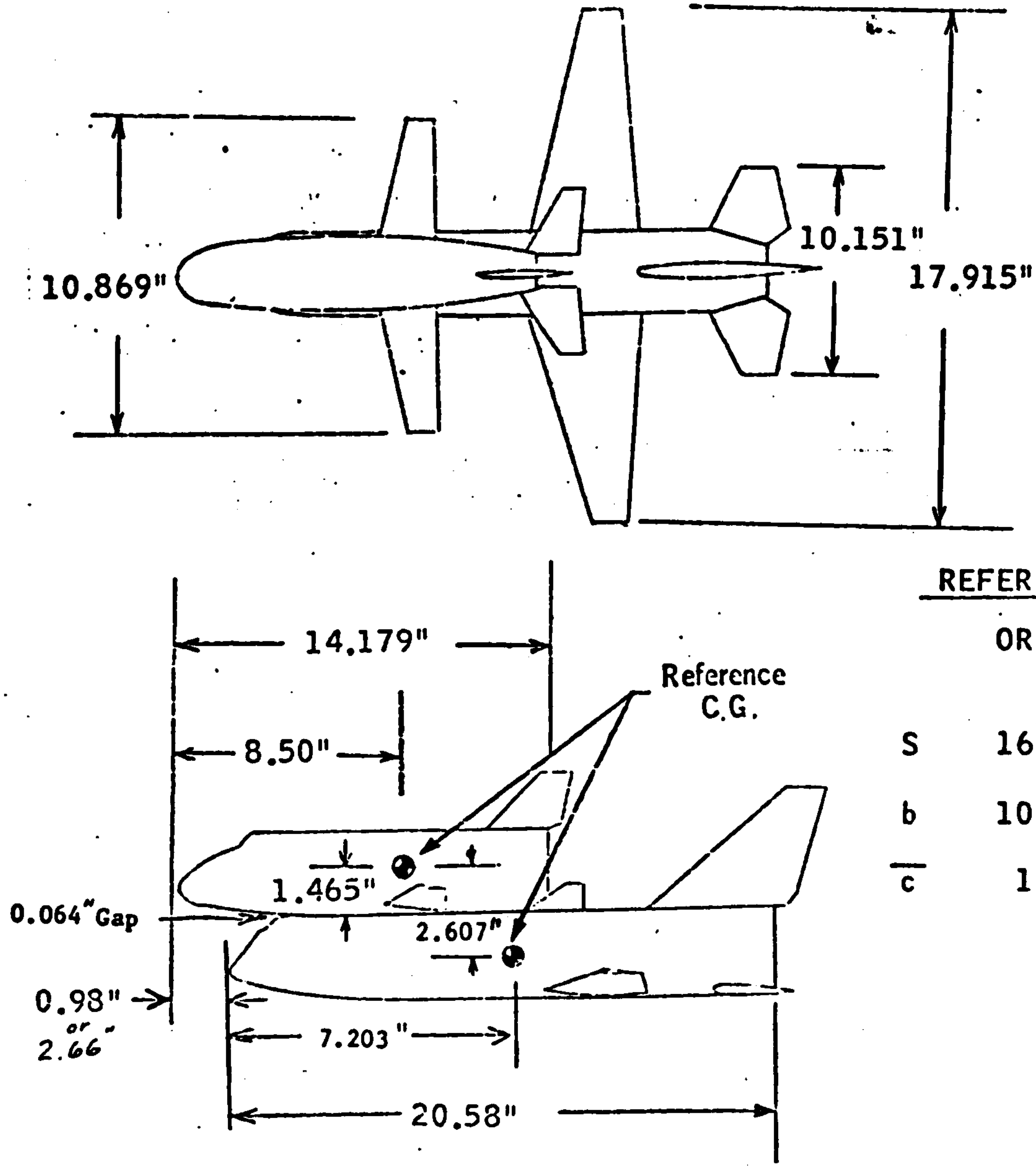
1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: CN CA CAB CLM CY CYN CBL → IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES
A) -12° → 12°, Δ2°
B) -4, -2, -1, 0, 1, 2, 4, 6 deg.

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1063 C-1- 549

STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1063 C-1- 550



REFERENCE LENGTHS AND AREA

	ORBITER	BOOSTER and LAUNCH CONFIGURA
S	16.956 in^2	45.827 in^2
b	10.869 in	17.915 in
$\bar{c}$	1.679 in	2.754 in

a) Straight Wing Orbiter Mated to the Straight Wing Booster

Figure 4. - Straight Wing Booster Launch Configuration

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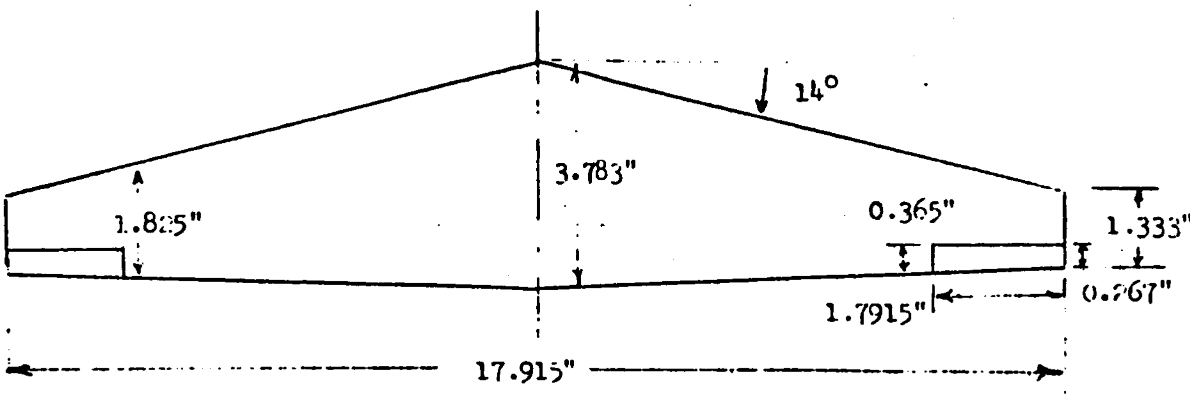
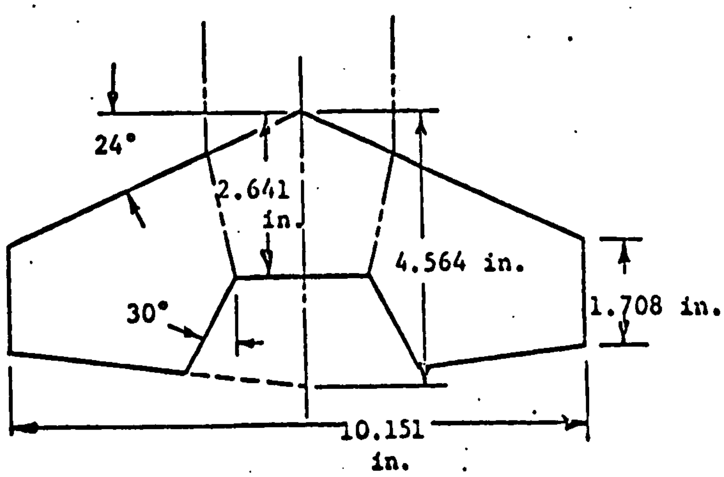
BOOSTER TRAPEZOIDAL PLANFORM WING (W_{B1})

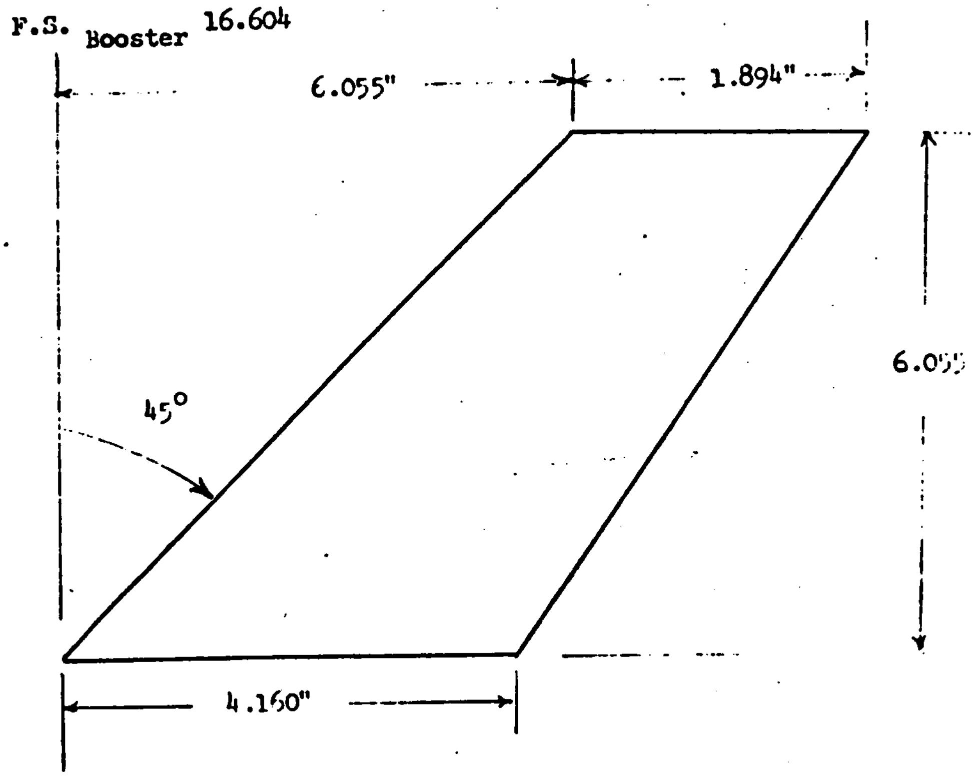


BOOSTER HORIZONTAL TAIL (H_{B1})



0064 Airfoil, t/c = 12%

FIGURE 5. BOOSTER TRAPEZOIDAL PLANFORM WING (W_{B1}) AND HORIZONTAL TAIL (H_{B1})



Tail Parameters:

Aspect Ratio = 2.0
Taper Ratio = 0.455
Airfoil - 0012-64

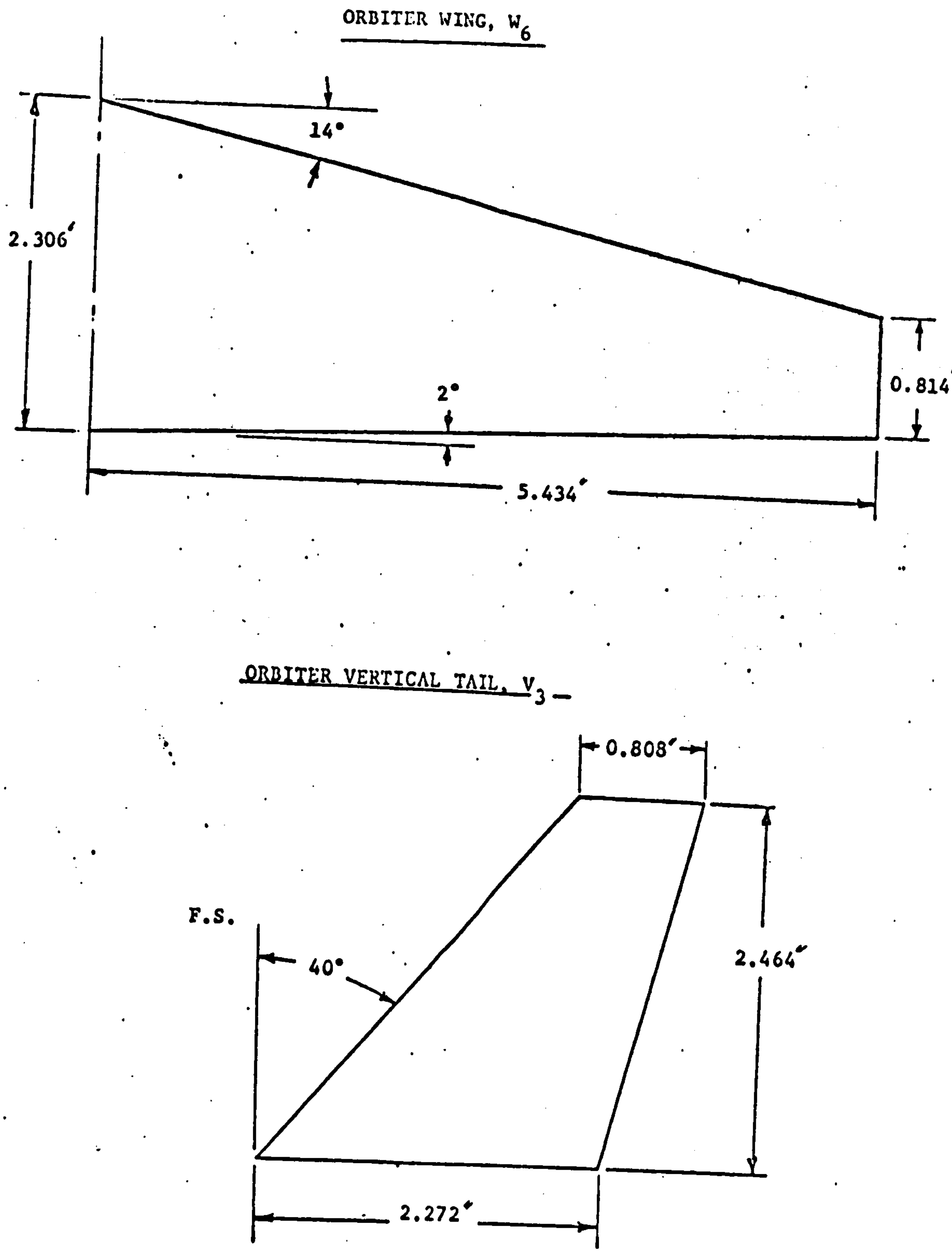
Full Scale:

Area = 1988.75 ft.^{2}
Span = 63.073 ft.

Model Scale:

Area = 18.3284 in.^{2}
Span = 6.055 ft.

Figure 6. - Booster vertical stabilizer, V_{B7}.



STRAIGHT WING BOOSTER
MSC
STRAIGHT WING ORBITER
MSC
DR#1063 C-1- 553

FIGURE 7. ORBITER TRAPEZOIDAL PLANFORM WING (W_6) AND VERTICAL TAIL (V_3)

ORBITER HORIZONTAL TAIL, H_{13}

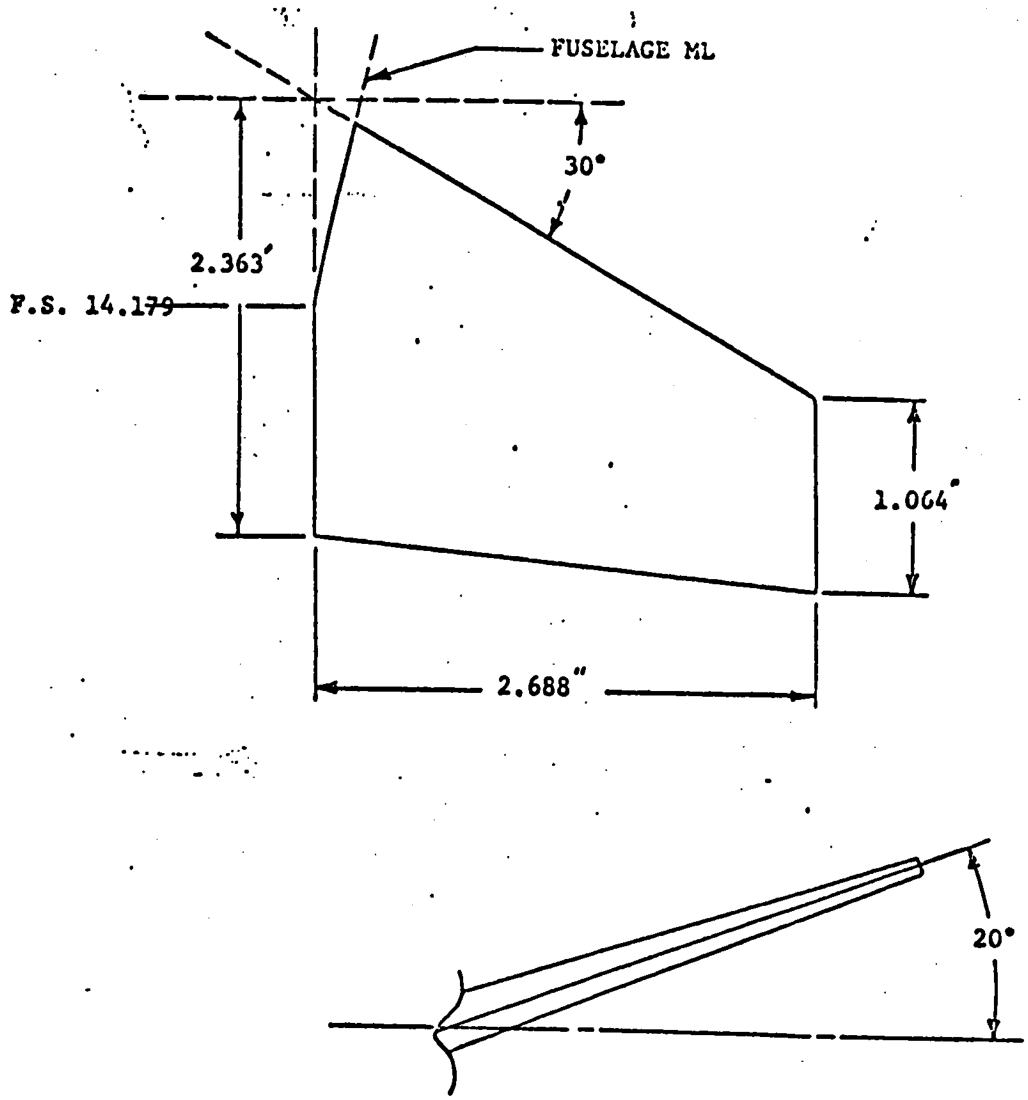


FIGURE 8. ORBITER HORIZONTAL TAIL

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TABLE IV

TEST AMES 66-546 DATA SET/RUN NUMBER

COLLATION SUMMARY

STUDY OF BASIC LAUNCH CONFIGURATION DATA IN THE AMES
6- by 6-Foot Supersonic Wind Tunnel

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.9	1.2	1.5	2.0	.25						
RAWB01	(B)1(O)1A5T1	A	0					5	6	5	3	2	1							
RAWB02	(B)1(O)1A1T1	A	0					5	12	11	9	8	7							
RAWB03	(B)1(O)1A1	A	0					4		17	15	14	13							
RAWB05	(B)1(O)1A3T1	A	0					5	30	29	27	25	24							
RAWB06	(B)1(O)1A3	A	0					5	35	34	33	32	31							
RAWB07	(B)1(O)1A4T1	B	0					4	39	38	37		36							
RAWB08	(B)1(O)1A3T1	0	C					5	44	43	42	41	40							
RAWB09	(B)1(O)1A1T1	0	C					5	49	48	47	46	45							
RAWB10	(B)1(O)1A1	0	C					5	54	53	52	51	50							
RAWB11	(B)1	0	C					5	59	58	57	56	55							
RAWB12	(B)1	D	0					6	64	63	62	61	60	65						

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

C L . . . IC D F . . IC L M . . IC Y . . . IC L N . . IC S L . . C D R . . IC A F . . IC N

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

αA = -12 to 15°, α = -12, -8, -4, -2, 0, 2, 4, 8, 12, 15

αB = -8 to 8, α = -8, -4, -2, 0, 2, 4, 8

βC = -5, 0, 5, 10

αD = -6, -4, -2, 0, 2, 4, 8, 12, 16, 20, 22

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1122 C-1- 555

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1122 C-1- 556

ORIGINAL PAGE IS
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TABLE IV.- CONTINUED

TEST AMES 66-546 DATA SET/RUN NUMBER

COLLATION SUMMARY

ORBITER BALANCE DATA OF VARIOUS LAUNCH CONFIGURATIONS IN THE AMES
6- by 6-Foot Supersonic Wind Tunnel

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.9	1.2	1.5	2.0
RAWφ01	(B)1(O)1A5T1	A	O					5	6	5	3	2	1
RAWφ02	(B)1(O)1A1T1	A	O					5	12	11	9	8	7
RAWφ03	(B)1(O)1A1	A	O					4		17	15	14	13
RAWφ05	(B)1(O)1A3T1	A	O					5	30	29	27	25	24
RAWφ06	(B)1(O)1A3	A	O					5	35	34	33	32	31
RAWφ07	(B)1(O)1A4T1	B	O					4	39	38	37		36
RAWφ08	(B)1(O)1A3T1	O	C					5	44	43	42	41	40
RAWφ09	(B)1(O)1A1T1	O	C					5	49	48	47	46	45
RAWφ10	(B)1(O)1A1	O	C					5	54	53	52	51	50

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

C.L. | C.D | C.L.M. | C.Y | C.L.N | C.SL | C.A | C.N

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

αA = -12, -8, -4, -2, 0, 2, 4, 8, 12, 15

αB = -8, -4, -2, 0, 2, 4, 8

βC = -5, 0, 5, 10

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TEST AMES 66-546 DATA SET/RUN NUMBER

COLLATION SUMMARY

BOOSTER ALONE DATA AT HIGH ANGLES OF ATTACK IN THE AMES 6- by 6-Foot Supersonic Wind Tunnel

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .25	.6	.9	1.2	1.5	2.0						
RAWB13	B2W3H3V2	E	O					6	71	70	69	68	67	66						
RAWB14	B2W3H3V2	E	O					3		74	73	72								
RAWB15	B2W3	E	O					6	75	80	79	78	77	76						
RAWB16	B2W3H3V2	64	F					6	86	85	84	83	82	81						
RAWB17	B2W3H3V2	O	C					5		59	58	57	56	55						
RAWB18	B2W3H3V2	D	O					6	65	64	63	62	61	60						

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

C L | C D F | C L M | C Y | C l N | C S L | C DB | C A F | C N | | IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:

α or β SCHEDULES

$\alpha E = 44, 48, 52, 56, 60, 64, 68, 72$

$\beta F = -6, -2, 0, 2, 4, 6, 8, 10$

$\beta C = -5, 0, 5, 10$

NASA-MSFC-MAF

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1122 C-1- 557

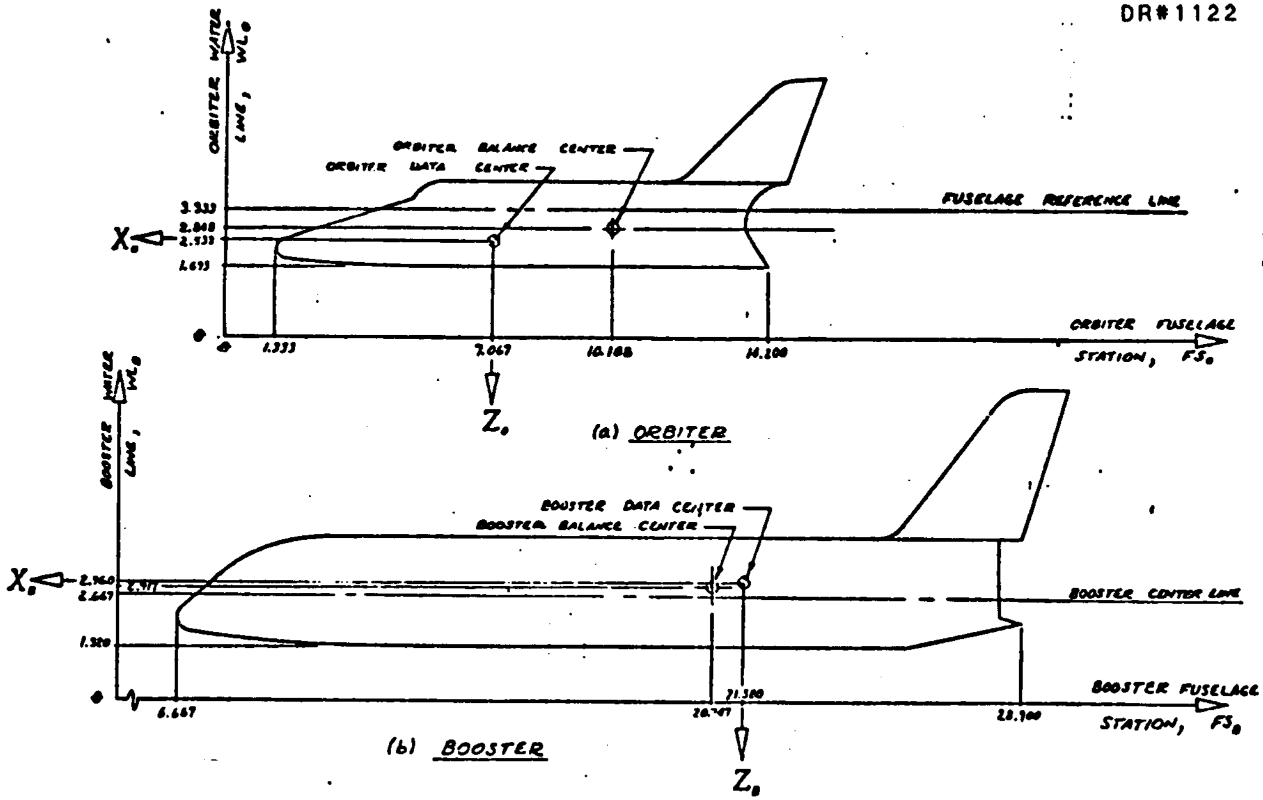

FIGURE A. ILLUSTRATION OF ORBITER AND BOOSTER $\frac{1}{150}$-SCALE WIND TUNNEL MODELS (ALL DIMENSIONS ARE MODEL SCALE)

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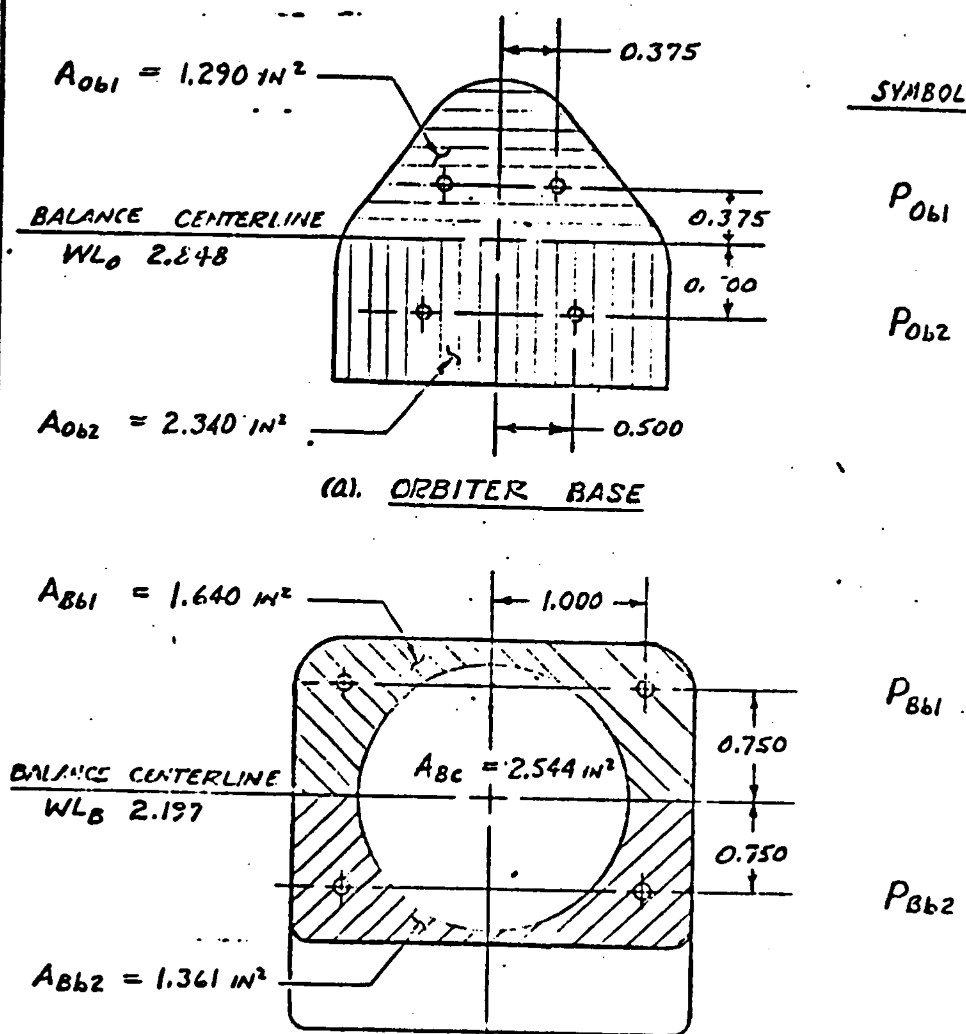
STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1122 C-1- 559



NOTE: BOOSTER BASE PRESSURE TAPS TO BE NONMETRIC PROBES NEAR BOOSTER BASE.

(b). BOOSTER BASE

FIGURE B.- PRESSURE TAP LOCATIONS ON THE BASES OF THE ORBITER AND THE BOOSTER $\frac{1}{150}$-SCALE WIND TUNNEL MODELS

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1122 C-1- 560

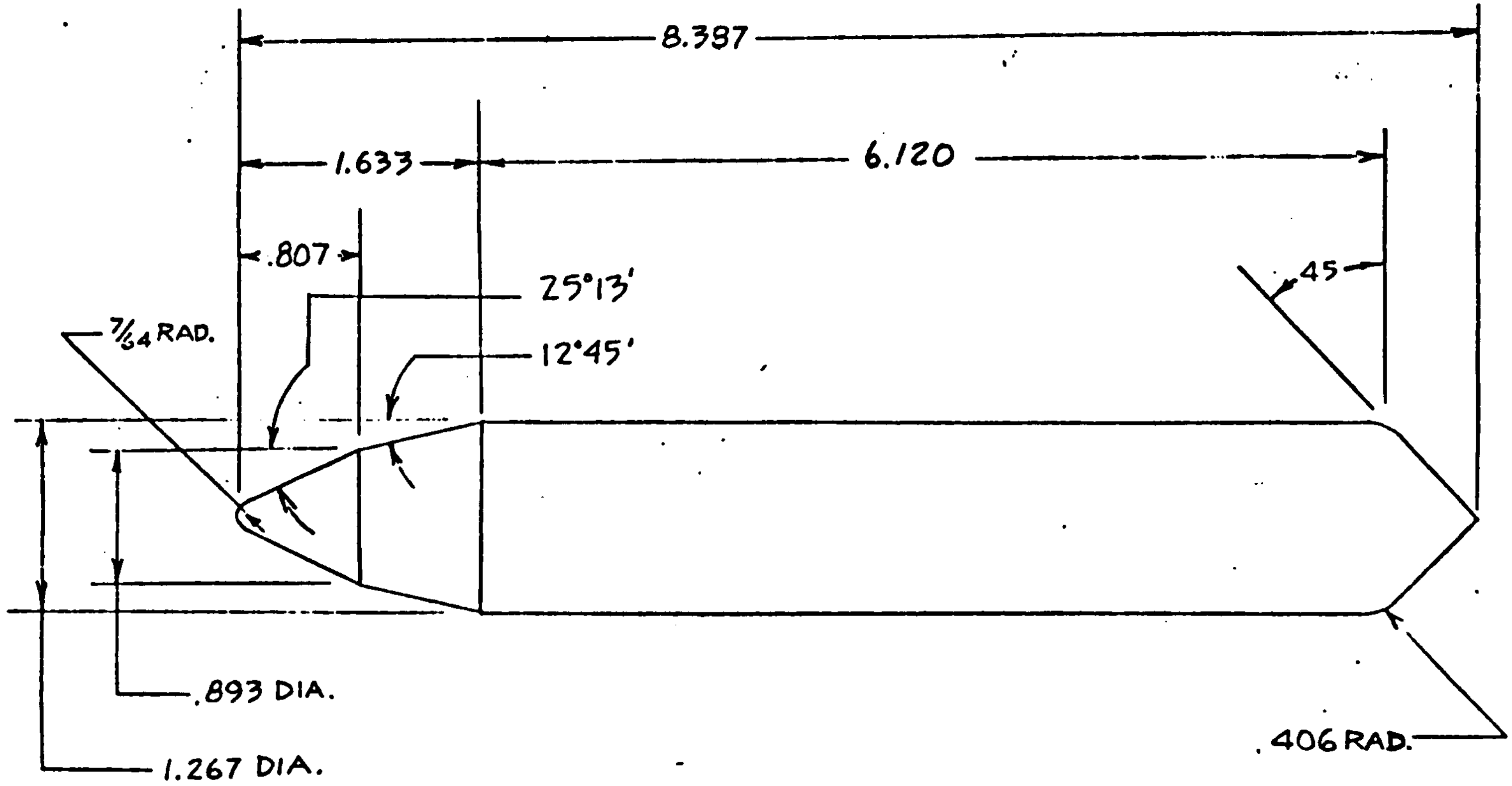


Figure C.- T_1 external tanks (1/150 scale).

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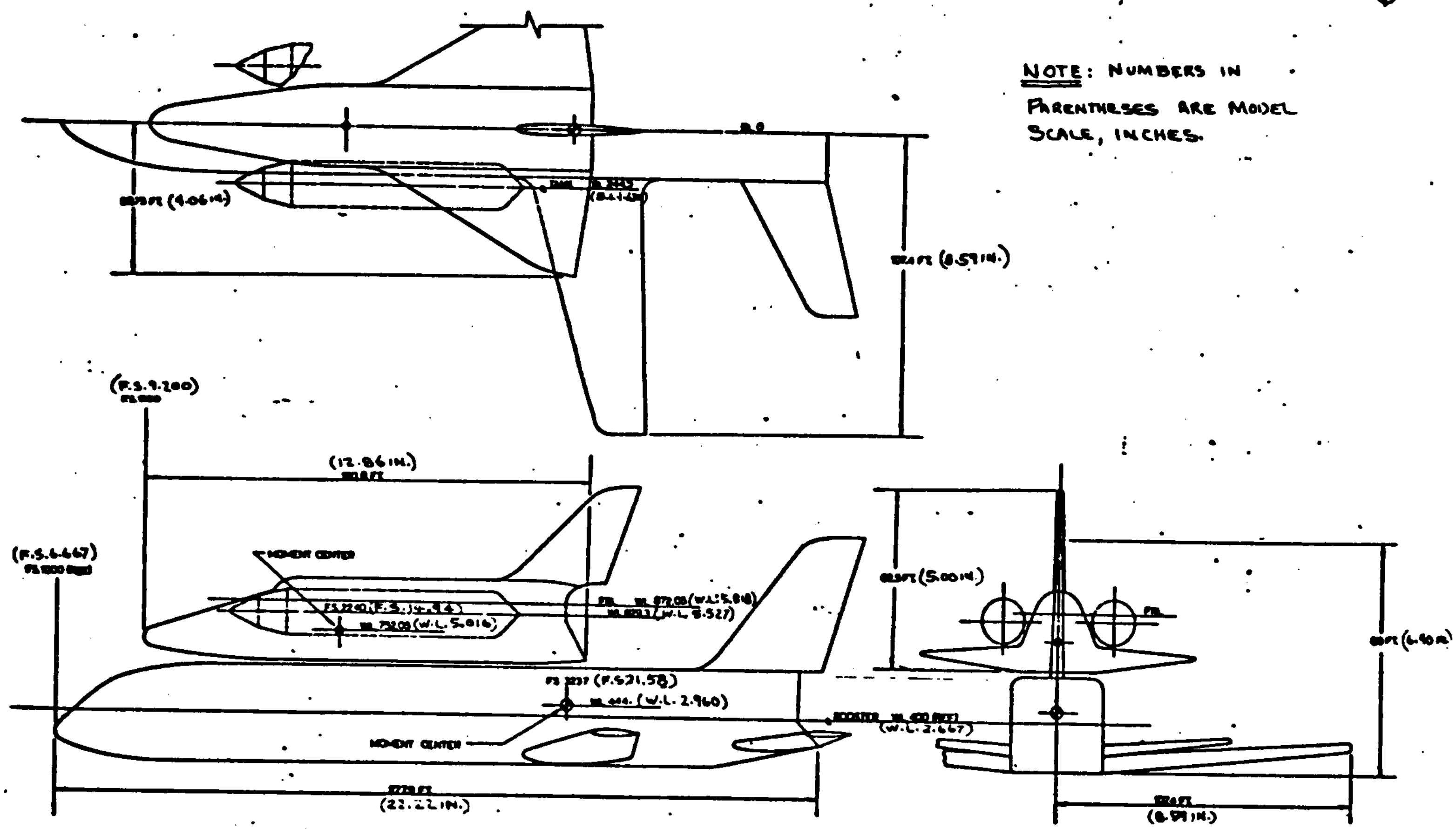


Figure D.- Launch configuration with orbiter mounted in the A_1 position, showing moment center locations.

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1122 C-1- 561

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 562

☐ PRETEST

☒ POSTTEST

TABLE I

TEST AMES 66-551 DATA SET COLLATION SHEET

1/150-SCALE BOOSTER PLUS ORBITER LAUNCH CONFIGURATION

TESTS IN THE AMES 6'X6' WINDTUNNEL

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δ_i	δ_e			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.8	.9	1.2	1.5	2.0	.96					
RBCB01	$(B)_2(O)_2^{\circ} A_6^{-5} T_2'$	A	0	-5	0			5	5		4	3	2	1						
RBCB02	$(B)_2(O)_2^{\circ} A_6^{+4} T_2'$	A	0	+4	0			5	10		9	8	7	6						
RBCB03	$(B)_2(O)_2^{\circ} A_6^{\circ} T_2'$	A	0	0	0			6	16	15	14	13	12	11						
RBCB04	$(B)_2(O)_2^{-5} A_6^{\circ} T_2'$	A	0	0	-5			5	21			19	18	17	20					
RBCB05	$(B)_2(O)_2^{+5} A_6^{\circ} T_2'$	A	0	0	+5			5	26		25	24	23	22			RUN NUMBERS			
RBCB06	$(B)_2(O)_2^{\circ} A_6^{\circ}$	A	0	0	0			5	31		30	29	28	27						
RBCB07	$(B)_2(O)_2^{\circ} A_6^{\circ} T_3'$	A	0	0	0			5	36		35	34	33	32						
RBCB08	$(B)_2(O)_2^{\circ} A_6^{\circ} T_3'$	0	B	0	0			5	41		40	39	38	37						
RBCB09	$(B)_2(O)_2^{\circ} A_6^{\circ} T_2'$	0	B	0	0			6	47	46	45	44	43	42						
RBCB10	$(B)_2(O)_2^{\circ} A_6^{\circ}$	0	B	0	0			5	52		51	50	49	48						

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CL CD CLM CY CLN CSL CAB

COEFFICIENTS: → IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

$\alpha A = -12, +8, -4, -2, 0, 2, 4, 8, 12, 15$

$\beta B = -4, -2, -1, 0, 1, 2, 4, 8, 12$

NASA-MSFC-MAF

TABLE 1 (CONCLUDED)

TEST Ames 66-551 **DATA SET COLLATION SHEET**

1/150-SCALE BOOSTER PLUS ORBITER LAUNCH CONFIGURATION TESTS IN THE AMES 6'X6' WINDTUNNEL

ORBITER DATASETS

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δ_i	δ_c			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.8	.9	1.2	1.5	2.0	.96					
RBC001	$(B)_2 (O)_2^0 A_6^{-5} T_2'$	A	O	-5	0			5	5		4	3	2	1						
RBC002	$(B)_2 (O)_2^0 A_6^{-4} T_2'$	A	O	+4	0			5	10		9	8	7	6						
RBC003	$(B)_2 (O)_2^0 A_6^0 T_2'$	A	O	0	0			6	16	15	14	13	12	11						
RBC004	$(B)_2 (O)_2^{-5} A_6^0 T_2'$	A	O	0	-5			5	21			19	18	17	20					
RBC005	$(B)_2 (O)_2^{-5} A_6^0 T_2'$	A	O	0	+5			5	26		25	24	23	22						
RBC006	$(B)_2 (O)_2^0 A_6^0$	A	O	0	0			5	31		30	29	28	27						
RBC007	$(B)_2 (O)_2^0 A_6^0 T_3'$	A	O	0	0			5	36		35	34	33	32						
RBC008	$(B)_2 (O)_2^0 A_6^0 T_2'$	O	B	0	0			5	41		40	39	38	37						
RBC009	$(B)_2 (O)_2^0 A_6^0 T_2'$	O	B	0	0			6	47	46	45	44	43	42						
RBC010	$(B)_2 (O)_2^0 A_6^0$	O	B	0	0			5	52		51	50	49	48						

RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CL CD CLM CY CLN CSL — IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES

αA = -12, -8, -4, -2, 0, 2, 4, 8, 12, 15

βB = -4, -2, -1, 0, 1, 2, 4, 8, 12

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 563

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 564

NOTE: THIS SKETCH NOT TO SCALE
MODEL DIMENSIONS IN INCHES

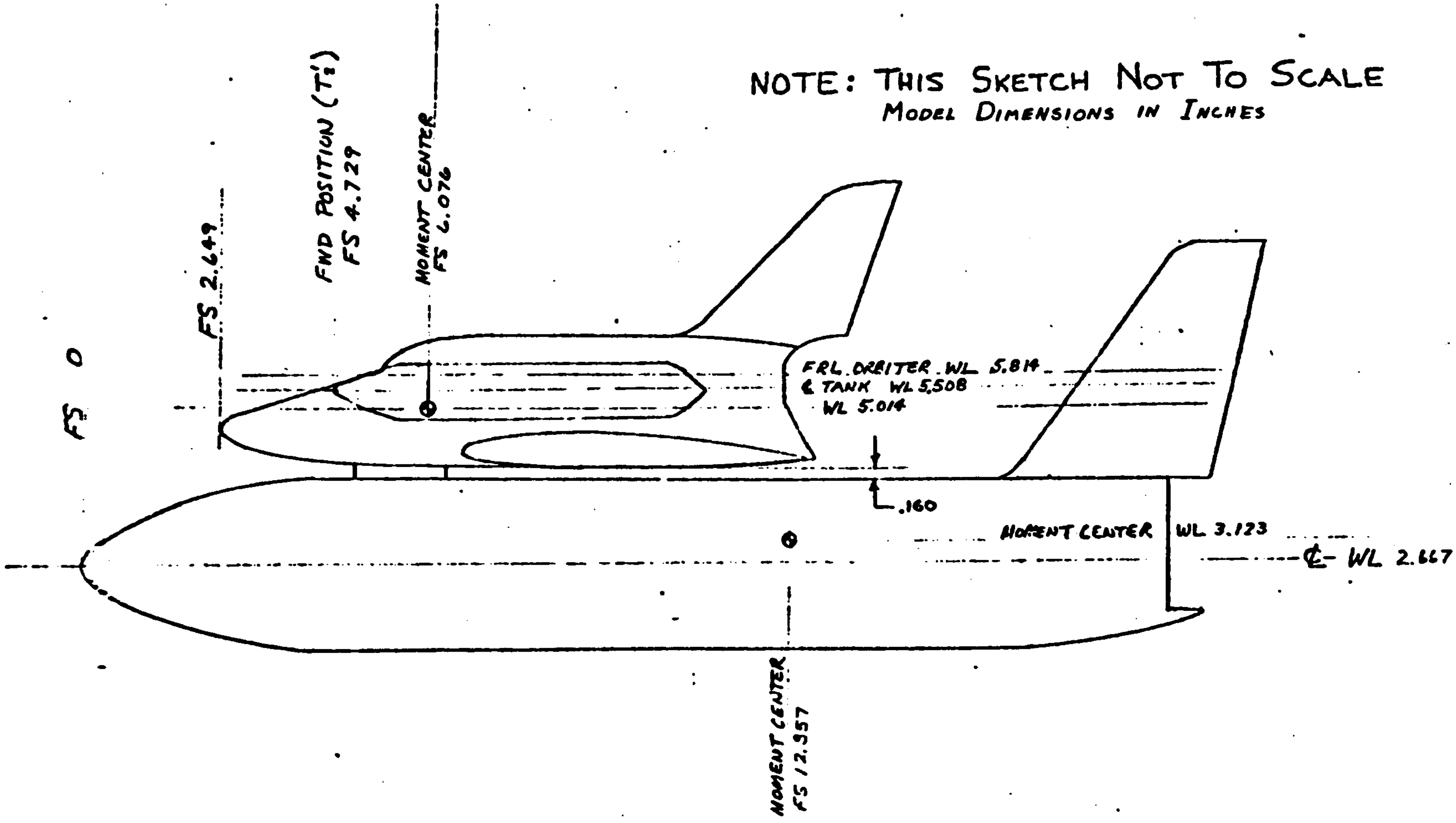


FIG. B LAUNCH CONFIGURATION USING BOOSTER REFERENCE SYSTEM

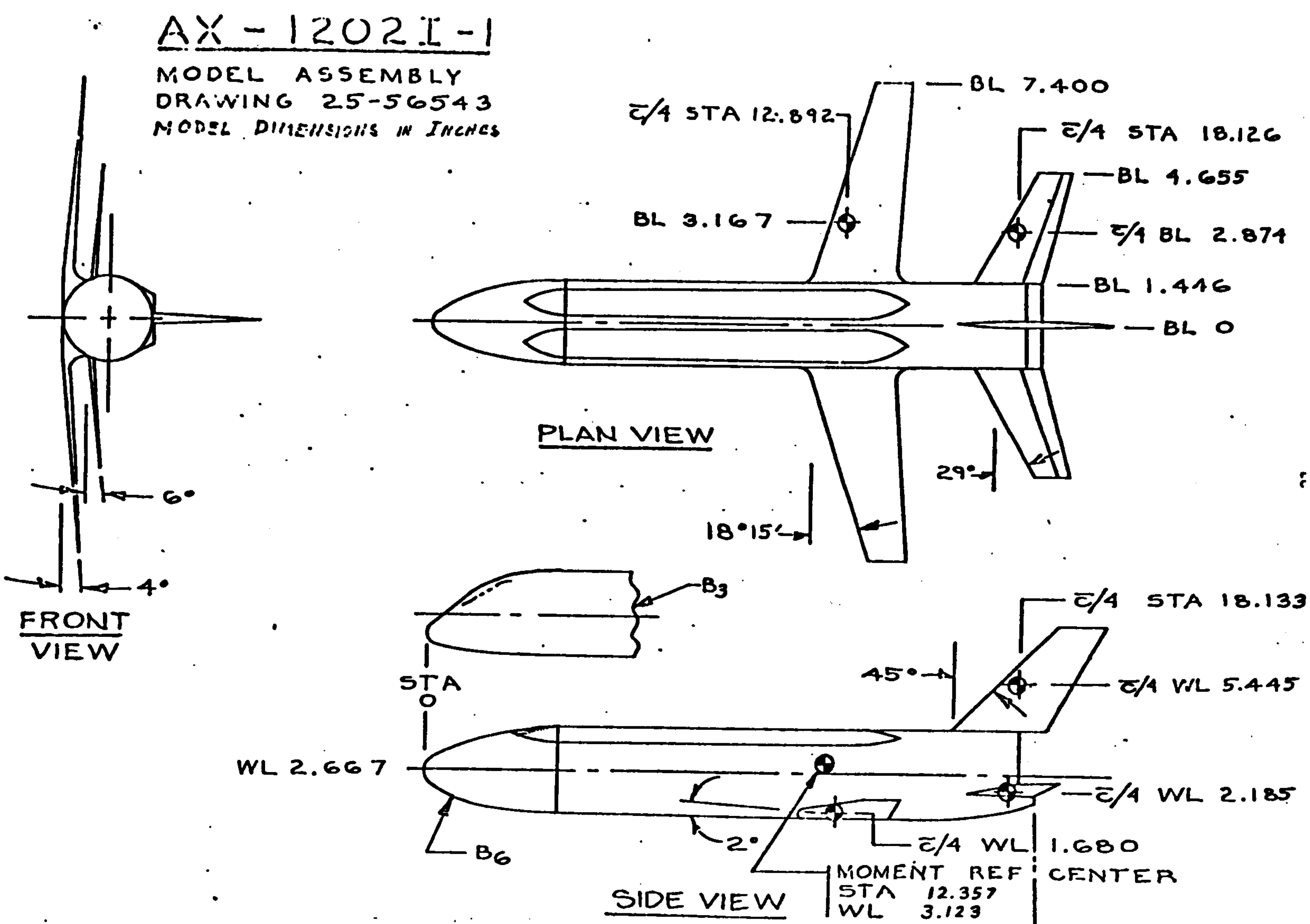


Figure C Illustration of 1/150-Scale Booster

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 565

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 566

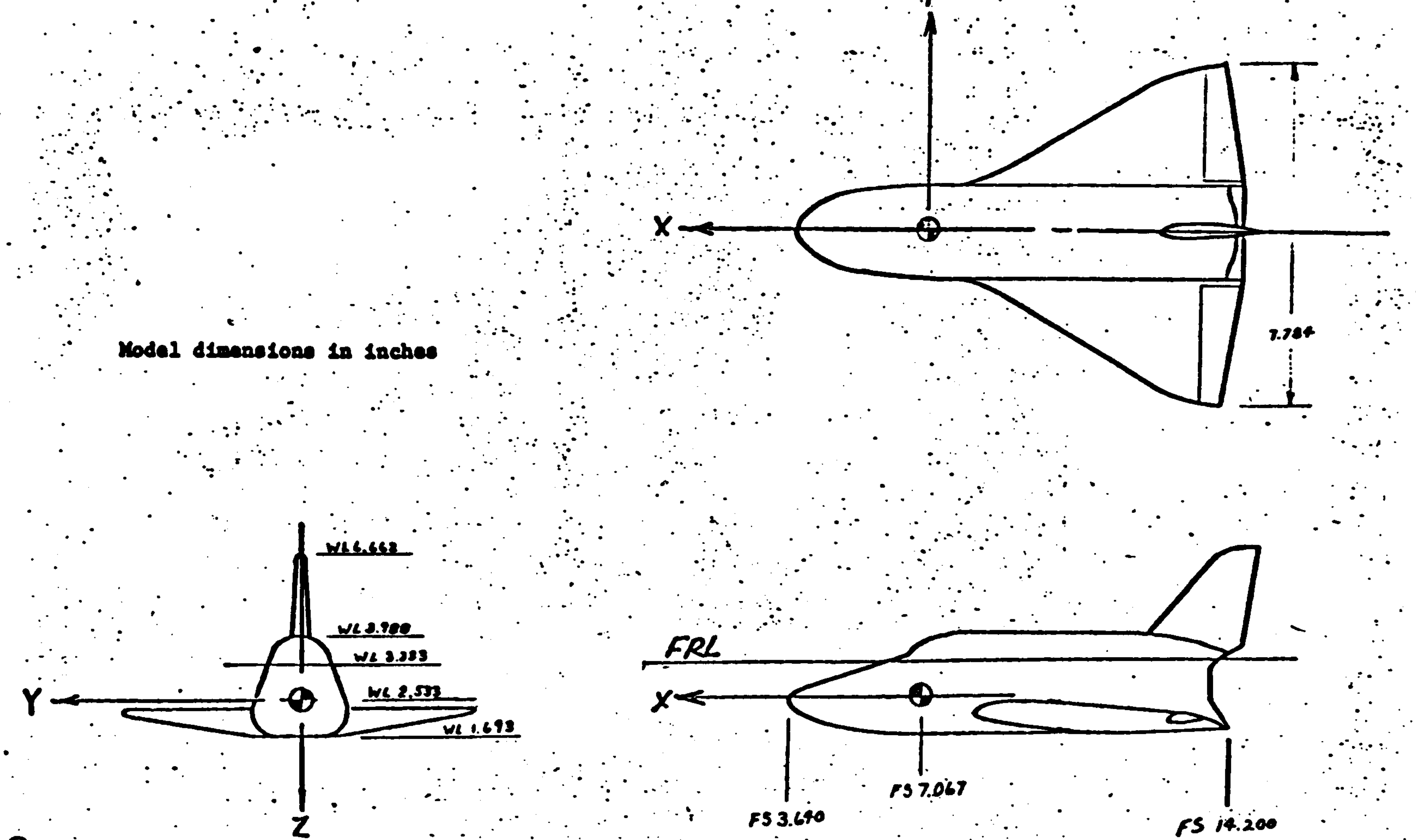


FIGURE D CONFIGURATION ROS-NB2

Model dimensions in inches

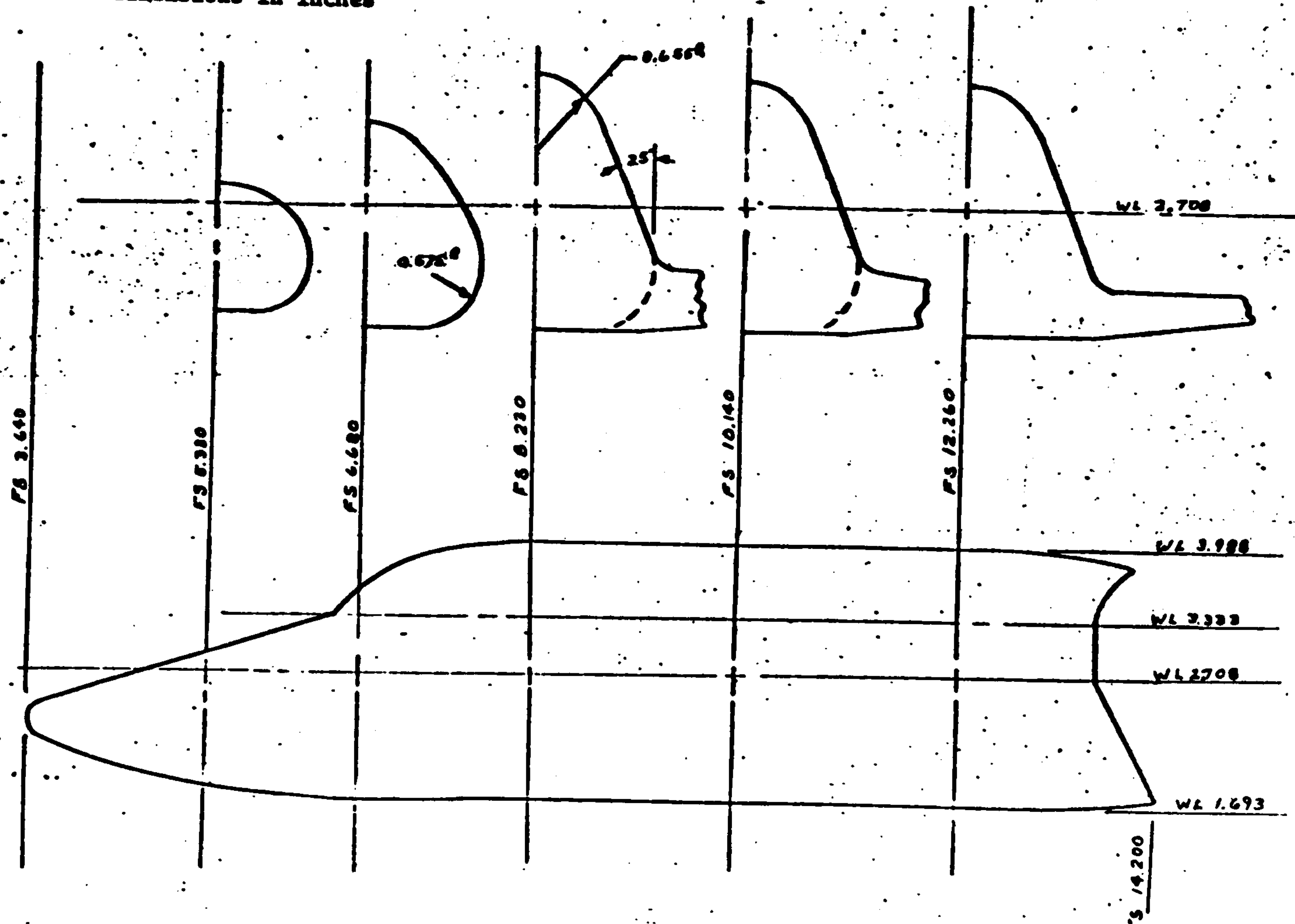


FIGURE E

ROS-NB2 BODY

661

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 567

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 568

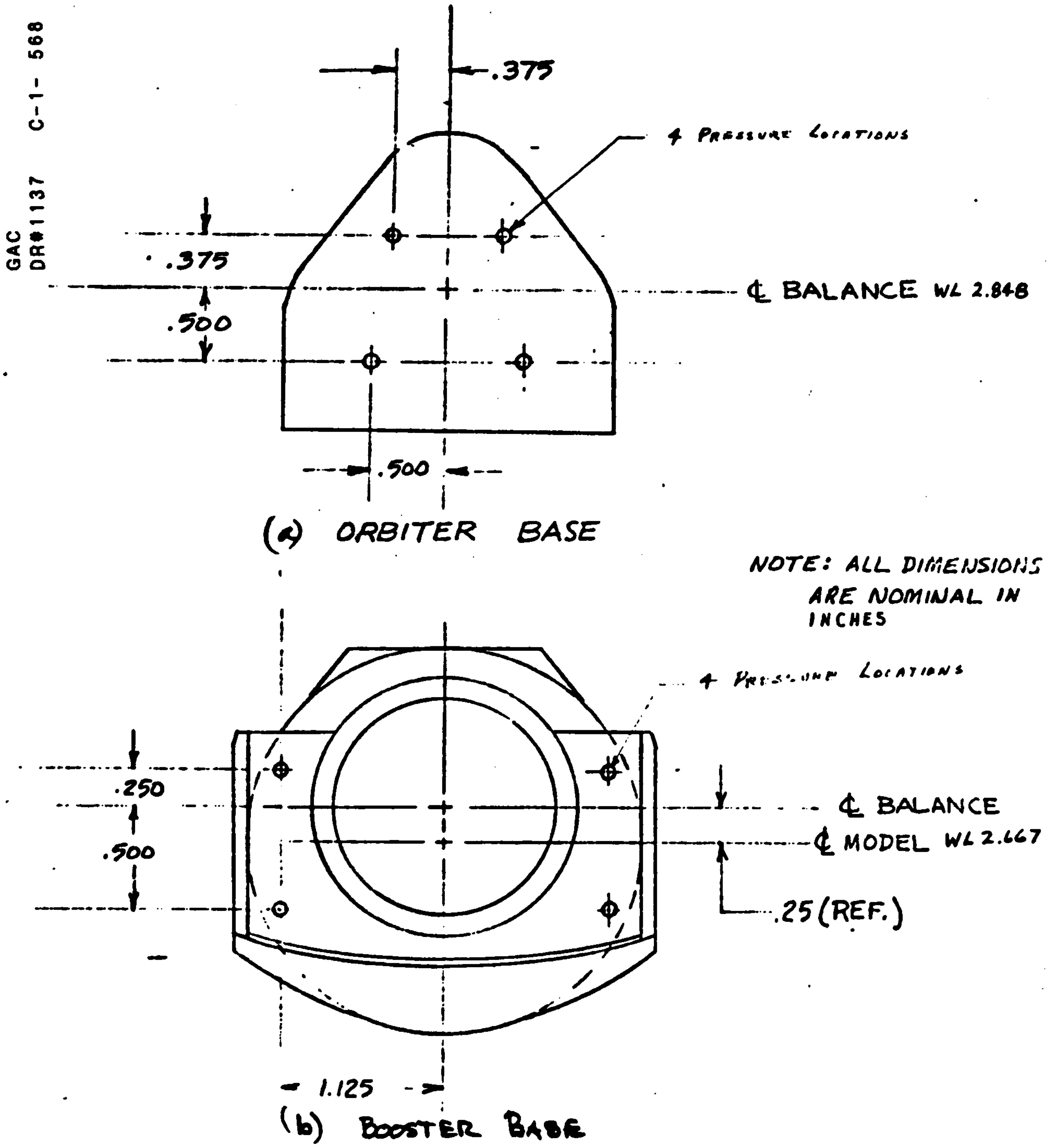
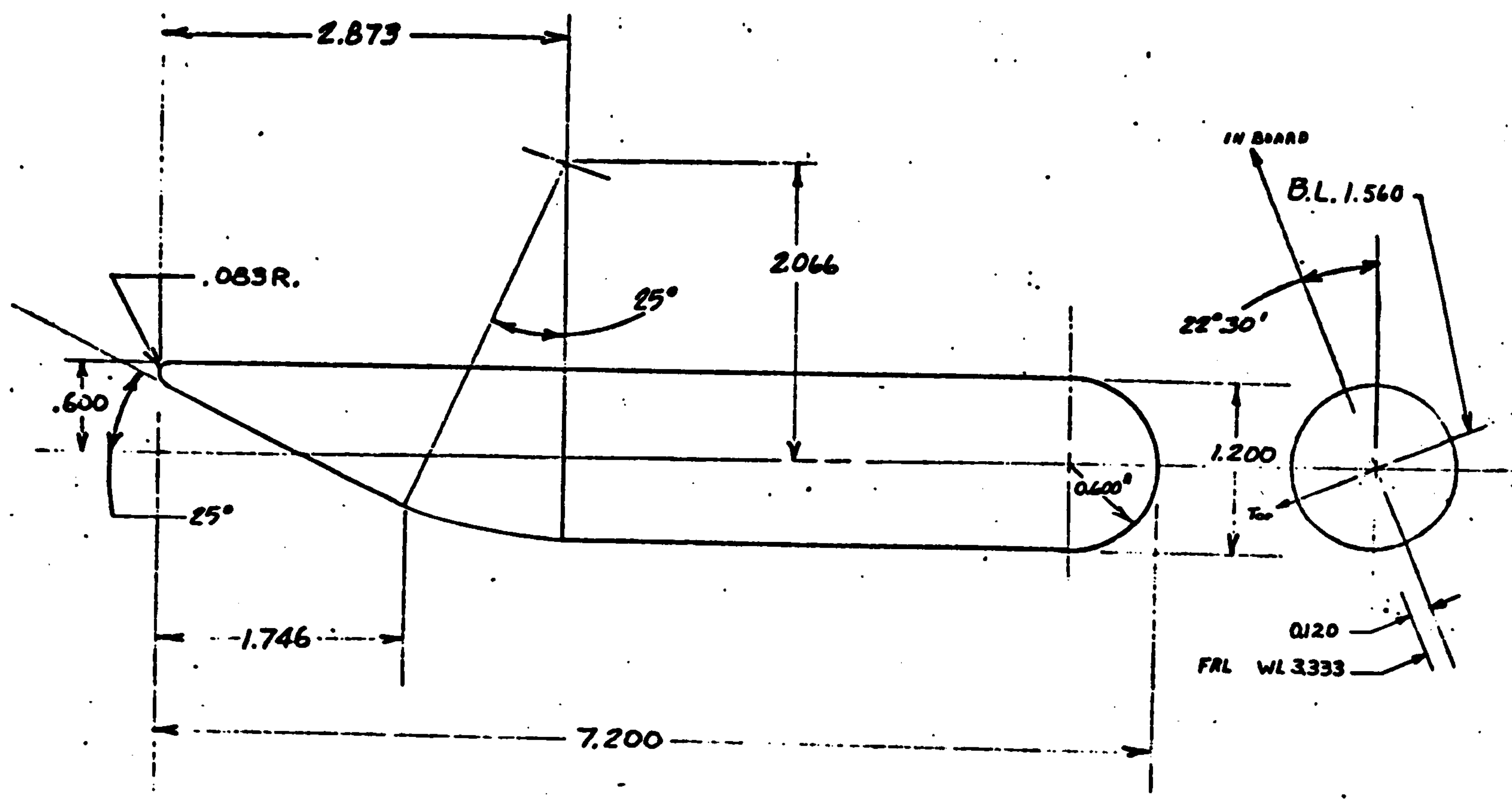


FIGURE F ORBITER AND BOOSTER BASE PRESSURE TAPS

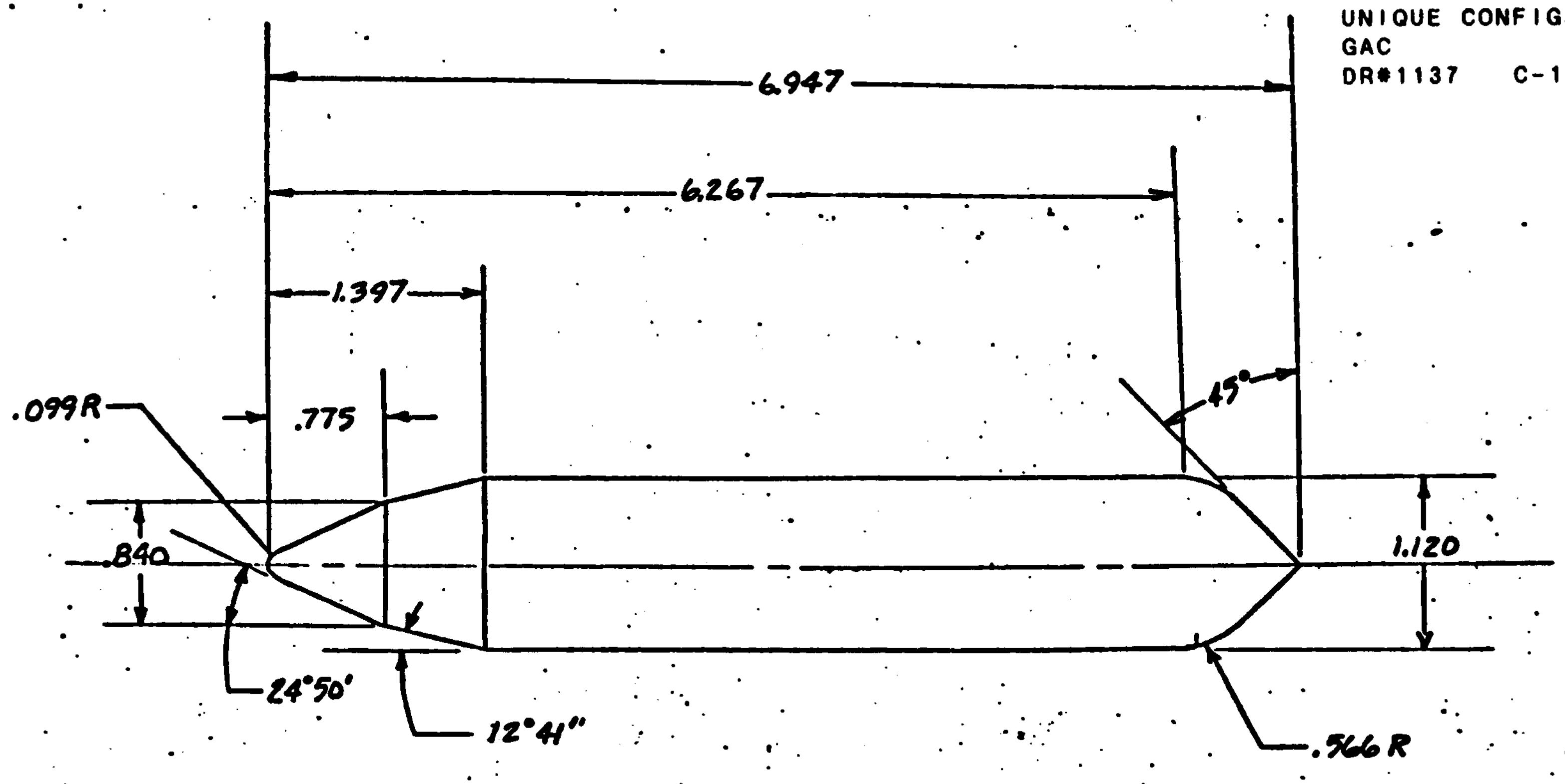


MODEL DIMENSIONS IN INCHES

FIGURE G CONTOURED NOSE TANK - T_3
(1/150 SCALE, LEFT TANK SHOWN)

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 569

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1137 C-1- 570



MODEL DIMENSIONS IN INCHES

FIGURE H CONICAL TANK - T_2 (1/150 SCALE)

TEST ARC-66-542 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_{SB}	δ_F	δ_{R}			NO. of RUNS	MACH NUMBERS 0.25	0.6	0.8	0.9	1.1	1.2	1.6	2.0
RAV001	T2B4F16	A	O	-	15	—	0/0	0/0	6		1	6	5		2	8	7
002		A	O						2				4		3		
003		7.5	B						7		15	14	13	12	11	10	9
004		-7.5	C						6		21	20	19		18	17	16
005		0	C						7		28	27	26	25	24	23	22
101	B4F16E2	D	O	30	0	0/0	-20/+20	-20/+20	5		33		32		31	30	29
102							-10/+10	-20/+20	5		38		37		36	35	34
103							0/0	0/0	5		43		42		41	40	39
104						+10/-10	0/0		4		47		46		45		44
~~10?~~						0/0	+10/-10		~~2~~						~~49~~		~~48~~
106							0/0		2	50	51						
107	B4F16E3			0	-2		-10/+10		3		60		59				58
108				0			-20/+20		5		61		65		64	63	62
109				10					5		70		69		68	67	66
110				15					5		75		74		73	72	71
111		7.5	B	0			-10/+10		5		80		79		78	77	76
112		7.5	C	0			-20/+20		5		85		84		83	82	81
113		15	B	0			-20/+20		5		90		89		88	87	86
114		15	B	0			-10/+10		5		95		94		93	92	91
115	B4F21E3	D	O	30	0		-20/+20		2		96		97				

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CN	CY	CA	CLM	CYN	CBL	CAB				MACH		

COEFFICIENTS: IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

A = -6, -4, -2, 0, 2, 4, 6, 8, 10 deg.

B = -4, -2, 0, 2, 4, 6, 10   C = -10, -6, -4, -2, 0, 2, 4 deg.

D = -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 deg.

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1085 C-1- 571

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1085 C-1- 572

TEST ARC-66-542 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_{SE}	δ_{BF}				NO. of RUNS	MACH NUMBERS 0.6										
1A6	B4F16E2	D	O	-20	0	0/0	0/0	0/0	1	52										

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN CY CA CLM CYN CBL CAB MACH

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES: D = -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22 deg

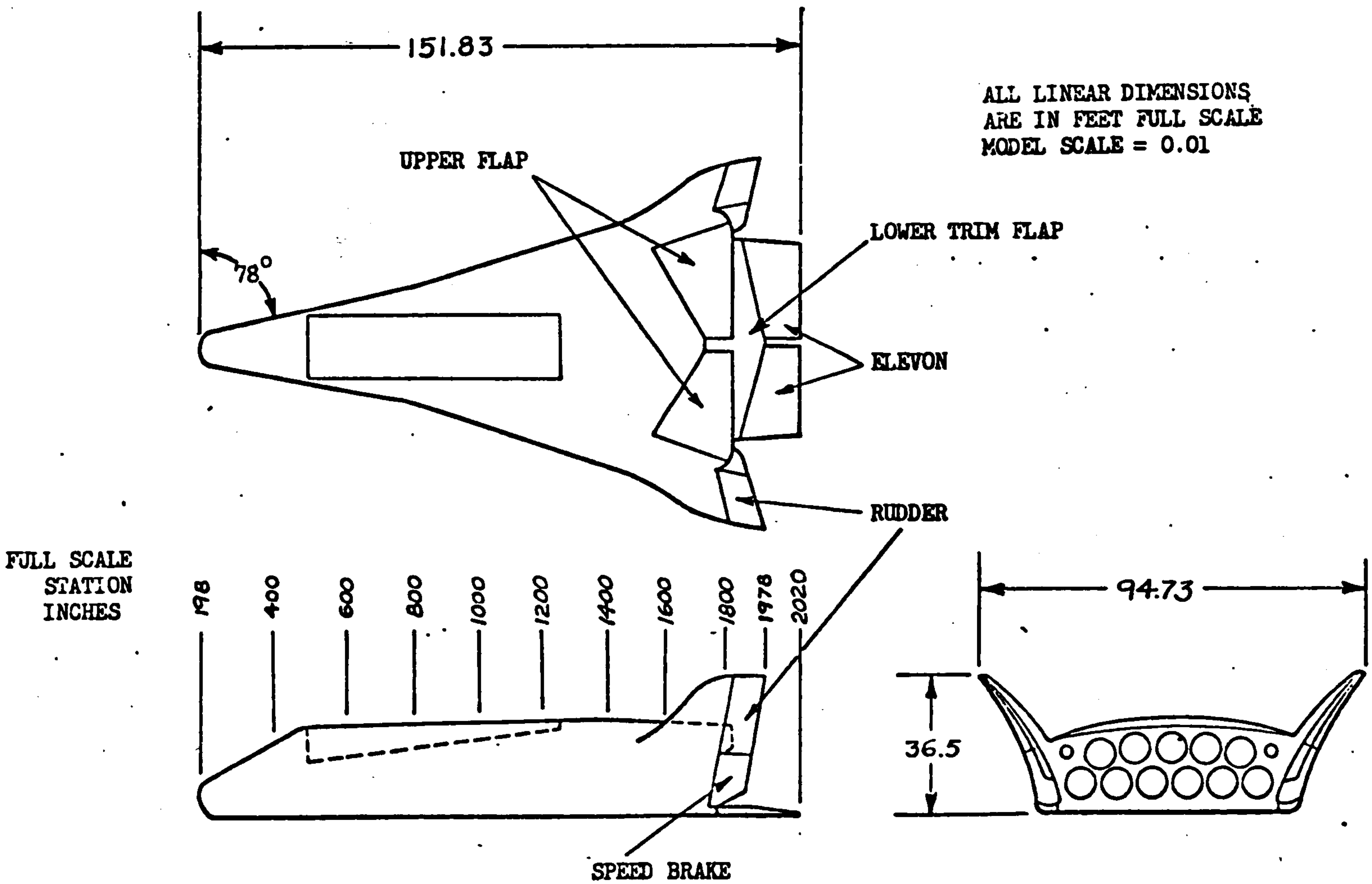


FIGURE 1. ORBITER CONFIGURATION $B_4F_{16}E_2$ THREE-VIEW

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1085 C-1- 573

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1085 C-1-574

epared by:	Date	LOCKHEED MISSILES & SPACE CC ANY A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION	Page Temp. Perm.
ecked by:	Date	Title	Model
proved by:	Date		Report No.

BODY STATIONS ARE IN INCHES
FULL SCALE
MODEL SCALE = 0.01

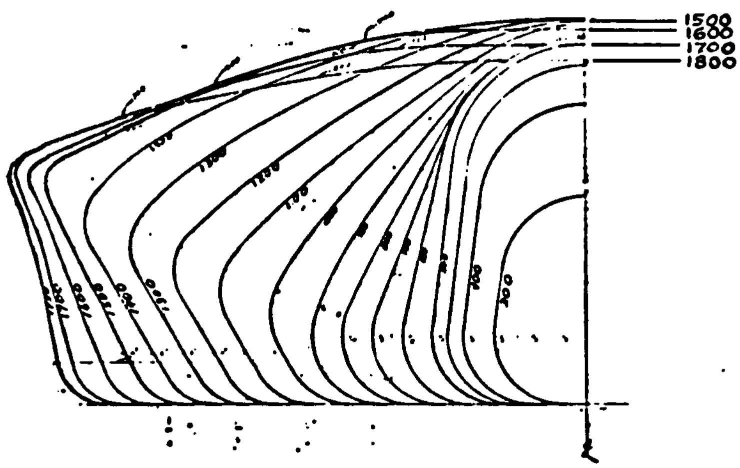


FIGURE 2. BODY CONTOURS - CONFIGURATION B_4

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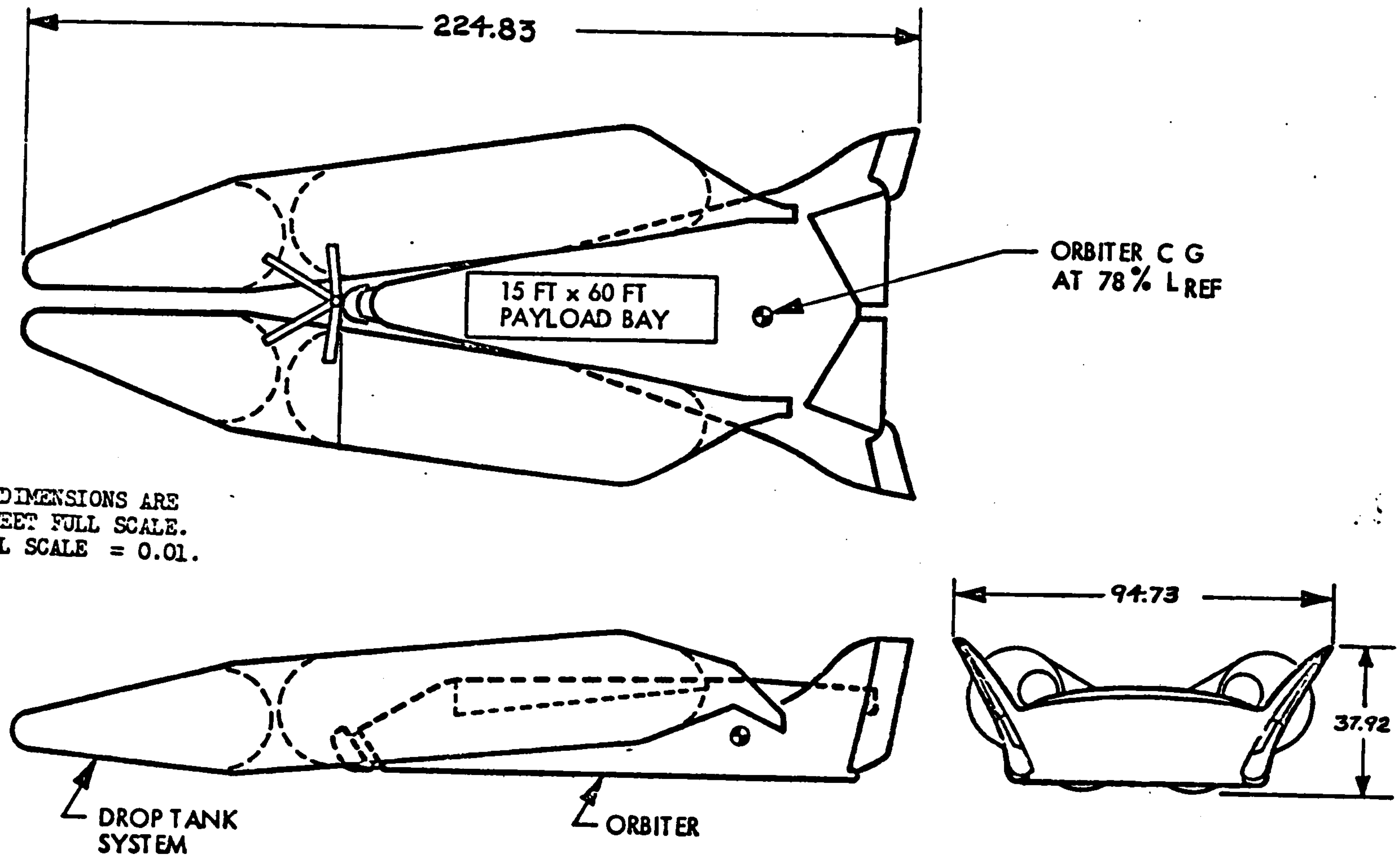
OF POOR QUALITY

FORM LMSC 362 B-2



ORIGINAL PAGE IS
OF POOR QUALITY

ALL DIMENSIONS ARE
IN FEET FULL SCALE.
MODEL SCALE = 0.01.

FIGURE 3. LAUNCH VEHICLE CONFIGURATION $T_2B_4F_{16}$ THREE-VIEW

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1085 C-1- 575

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1085 C-1- 576

ZONE	LTR	REVIS DESCRIP

4 3 2

LIMITED CALENDAR LIFE	LIMITED OPERATING LIFE

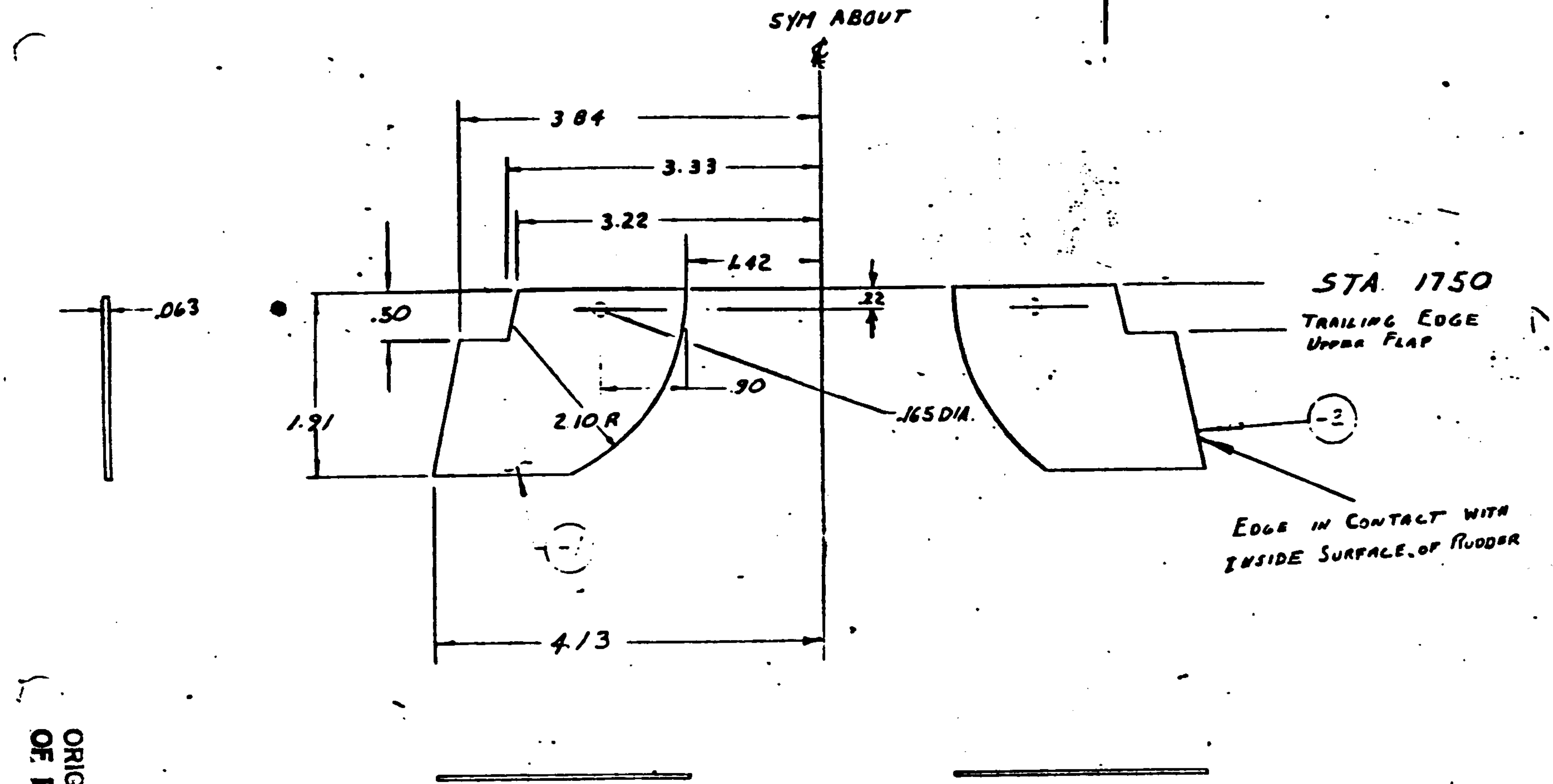


FIGURE 4. EXTENSION FLAP B8

TABLE II.

TEST UPWT 962 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	BSTR. CONTROL DEFL. δ_{eL}	δ_{eR}	i_c		NO. of RUNS	MACH NUMBERS 1.5	1.9	2.16									
RMWB 01	BWN_1V_1	B	0	0	0	-		3	37	42	47									
02		B	5	0	0	-			38	43	48									
03		0	C	0	0	-			39	44	49									
04		10	C	0	0	-			40	45	50									
05		20	C	0	0	-			41	46	51									
06		B	0	-10	-10	-			53	55	57									
07		B	5	-10	-10	-			54	56	58									
08		B	0	-20	-20	-			59	61	63									
09		B	5	-20	-20	-			60	62	64									
10		B	0	-30	-30	-			65	67	69									
11		B	5	-30	-30	-			66	68	70									
12		B	0	0	-10	-			71	73	75									
13		B	5	0	-10	-			72	74	76									
14	BWN_1V_1C	B	0	0	0	0			77	79	81									
15		B	5	0	0	0			78	80	82									
16		B	0	0	0	-10			83	85	87									
17		B	5	0	0	-10			84	86	88									
18		B	0	0	0	-20			89	91	93									
19		B	5	0	0	-20			90	92	94									
20		B	0	0	0	-30			95	97	99									

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: I

α or β SCHEDULES

ALPHA ~ B = -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26

BETA ~ C = -4, -2, -1, 0, 1, 2, 4, 6, 8

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 577

ORIGINAL PAGE IS OF POOR QUALITY

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 578

TABLE II. (CONTINUED)

TEST UPWT 962 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	BSTR. CONTROL DEFL. δ_{eL}	δ_{eR}	i_c		NO. of RUNS	MACH NUMBERS 1.5	1.9	2.16
RMWB 21	BWN_1V_1C	B	5	0	0	-30°		3	96	98	100
22		B	0	0	0	10			101	103	105
23		B	5	0	0	10			102	104	106
24		B	0	0	0	20			107	109	111
25		B	5	0	0	20			108	110	112
26	BWN_1C	B	0	0	0	0			119	115	117
27		B	5	0	0	0			114	116	118
28	BWN_1	B	0	0	0	--			120	122	124
29		B	5	0	0	--			121	123	125

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

NASA-MSFC-MAF

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TABLE II. (Continued)

TEST UPWT 962 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	BSTR. CONTROL DEFL. δ_{eL}	δ_{eR}	i_c		NO. of RUNS	MACH NUMBERS 1.5	1.9	2.16
RMWL 01	$BWN_1V_1C + B_4W_{16}V_{24}$	A	0	0	0	0		3	1	7	11
02		A	5	0	0	0			4	10	14
03		0	C	0	0	0			2	8	12
04		10	C	0	0	0			3	9	13
05	$BWN_1V_1 + B_4W_{16}V_{24}$	A	0	0	0	-			16	18	20
06		A	5	0	0	-			17	19	21
07		A	0	-10	-10	-			22	24	26
08		A	5	-10	-10	-			23	25	27
09		A	0	0	-10	-			28	30	32
10		A	5	0	-10	-			29	31	33

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDP

COEFFICIENTS:

α or β SCHEDULES

ALPHA ~ A = -8, -6, -4, -2, 0, 2, 4, 6, 8, 10, 12

BETA ~ C = -4, -2, -1, 0, 2, 4, 6, 8

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 579

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 580

TABLE II. (CONTINUED)

TEST UPWT 962 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	BSTR. CONTROL DEFL. δ_{eL}	δ_{eR}	i_c		NO. of RUNS	MACH NUMBERS 1.5	1.9	2.16
RMWO 01	$B_4W_{16}V_{24}$	A	0	0	0	0		3	1	7	11
02		A	5	0	0	0			4	10	14
03		0	C	0	0	0			2	8	12
04		10	C	0	0	0			3	9	13
05		A	0	0	0	-			16	18	20
06		A	5	0	0	-			17	19	21
07		A	0	-10	-10	-			22	24	26
08		A	5	-10	-10	-			23	25	27
09		A	0	0	-10	-			28	30	32
10		A	5	0	-10	-			29	31	33

TEST RUN NUMBERS

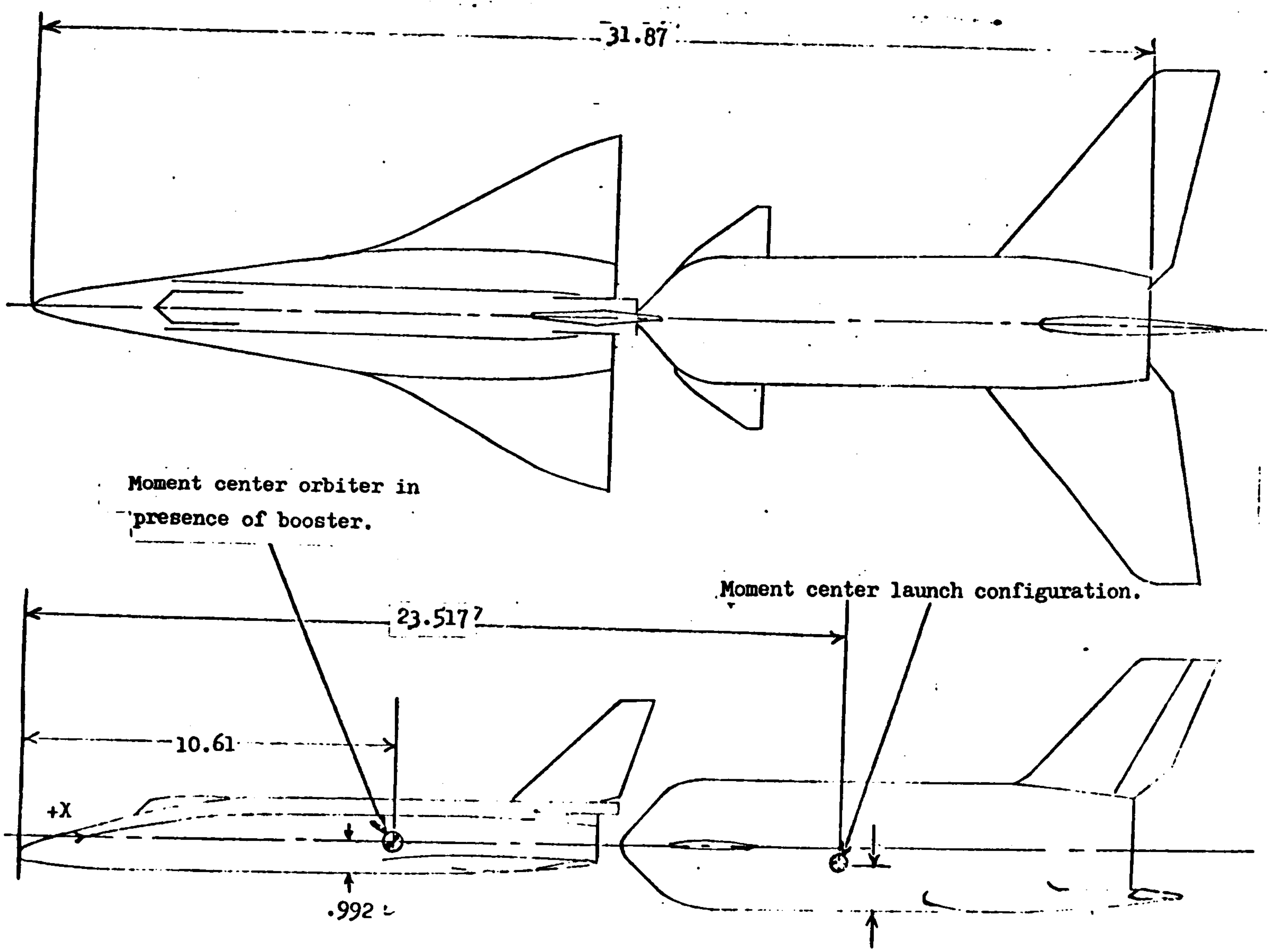
1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES
ALPHA ~ A = -8, -6, -4, -2, 0, 2, 4, 6, 8, 10, 12
BETA ~ C = -4, -2, -1, 0, 1, 2, 4, 6, 8

NASA-MSFC-MAF



All dimensions in inches.

FIGURE 2. MOMENT CENTER OF LAUNCH CONFIGURATION

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 581

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 582

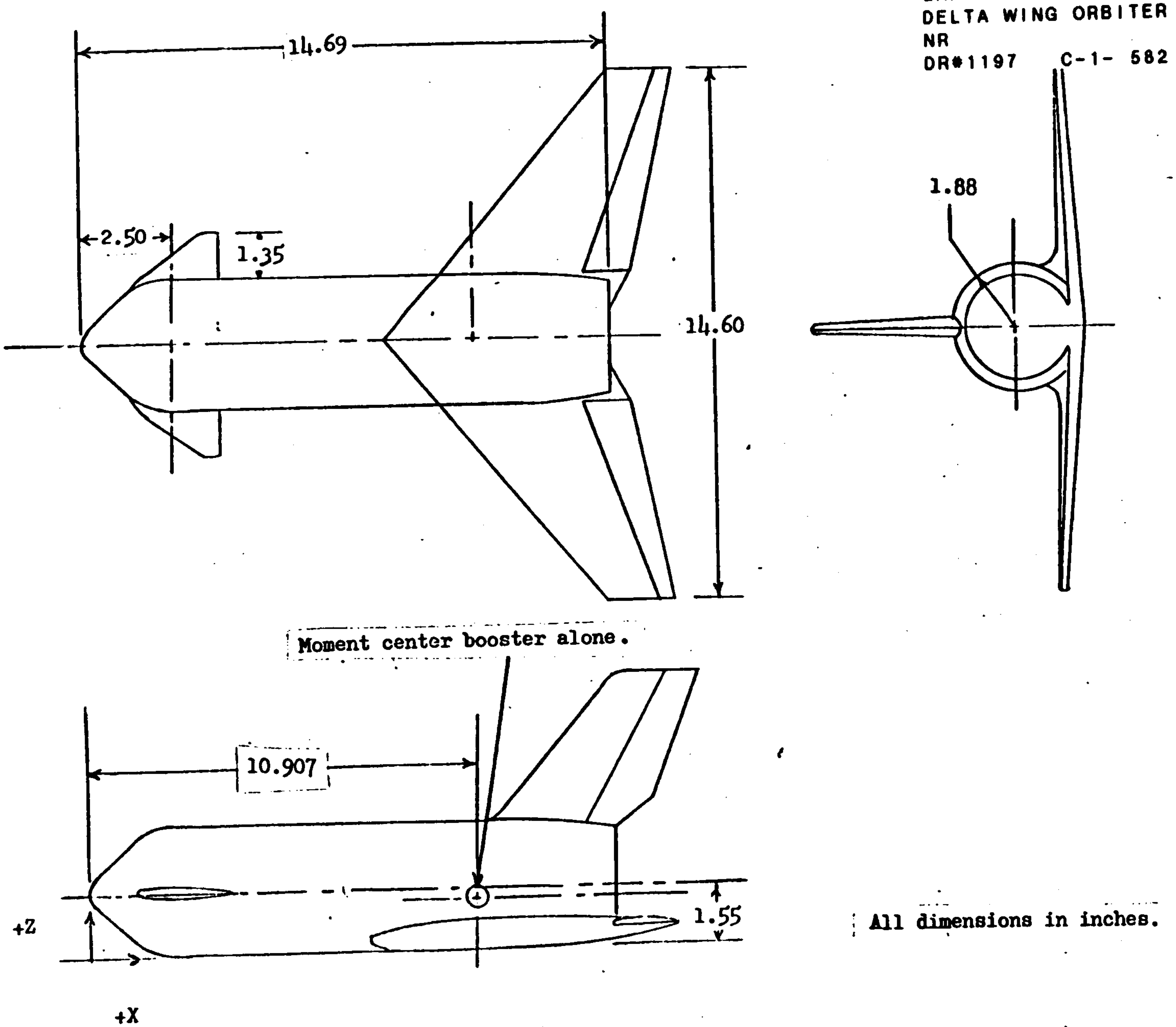


FIGURE 3. BOOSTER DIMENSIONS

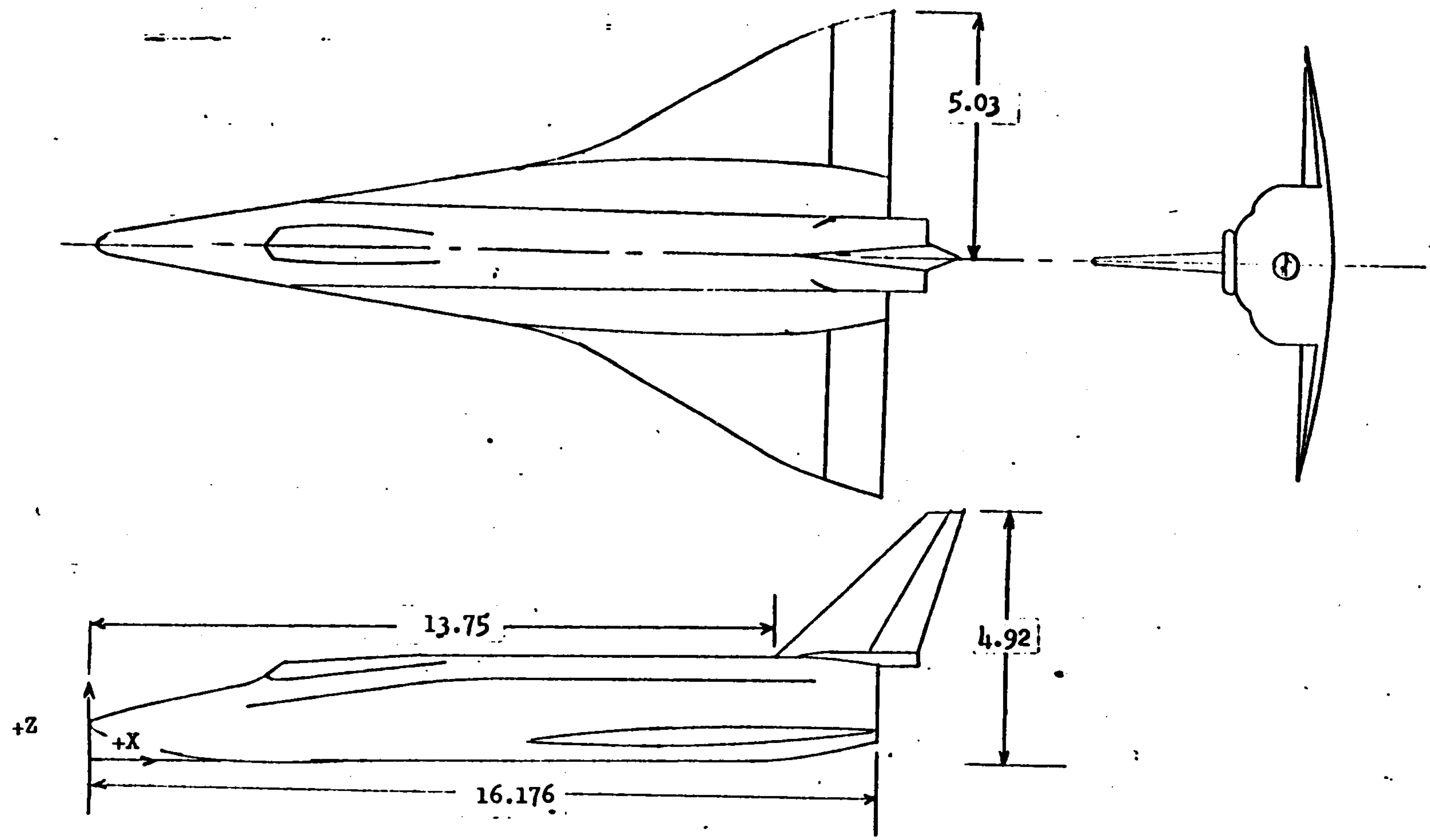


FIGURE 4. ORBITER DIMENSIONS

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1197 C-1- 583

All dimensions in inches.

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1198 C-1- 584

TEST CFHT - 74 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_e	δ_c	δ_R		NO. of RUNS	MACH NUMBERS 10.23 (TEST RUN NUMBERS)
RMYB 01	BCW	A	0	0	-60	-		1	3
02			-5	0					4
03			0	-15					13
04			-5	-15					14
05			0	-30					11
06			-5	-30					12
07			0	-45					15
08			-5	-45					16
09		B	0	0	-30				7
10			-5		-30				8
11			0		-75				9
12			-5		-75				10
13	BCWV (Rudder Off)		0		-60				17
14			-5		-60				18
15	BW		0		-				21
16			-5		-				22
17	B		0	-	-				23
18			-5	-	-				24
19	BCWV	C	0	0	0	0			34
20		C	4	0	0	0			35

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:

α or β SCHEDULES

A - ALPHA - 20, 25, 30, 35, 40, 45, 50, 55, 60
B - ALPHA - 25, 30, 35, 40, 45, 50, 55, 60
C - ALPHA - -11, -8, -4, -2, 0, 2, 5, 10, 15, 20, 25, 28

NASA-MSFC-MAF

TEST CFHT - 74 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_e	δ_c	δ_R		NO. of RUNS	MACH NUMBERS 10.23
RMYB 21	BCW	30	D	0	-60	-		1	5
↓ 22	↓	50	D	0	-60	-		1	6
RMYL 01	BCWV + NR 134D ORB.	E	0	0	0	0		1	31
02	↓	E	4	↓	↓	↓		↓	32
↓ 03	↓	0	F	↓	↓	↓		↓	30

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES

D - BETA - -5, -2, 0, 2, 4

E - ALPHA - -11, -9, -6, -4, -2, 0, 2, 4, 6, 9, 11

F - BETA - 0, 1, 2, 3, 4

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1198 C-1- 585

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1198   C-1- 586

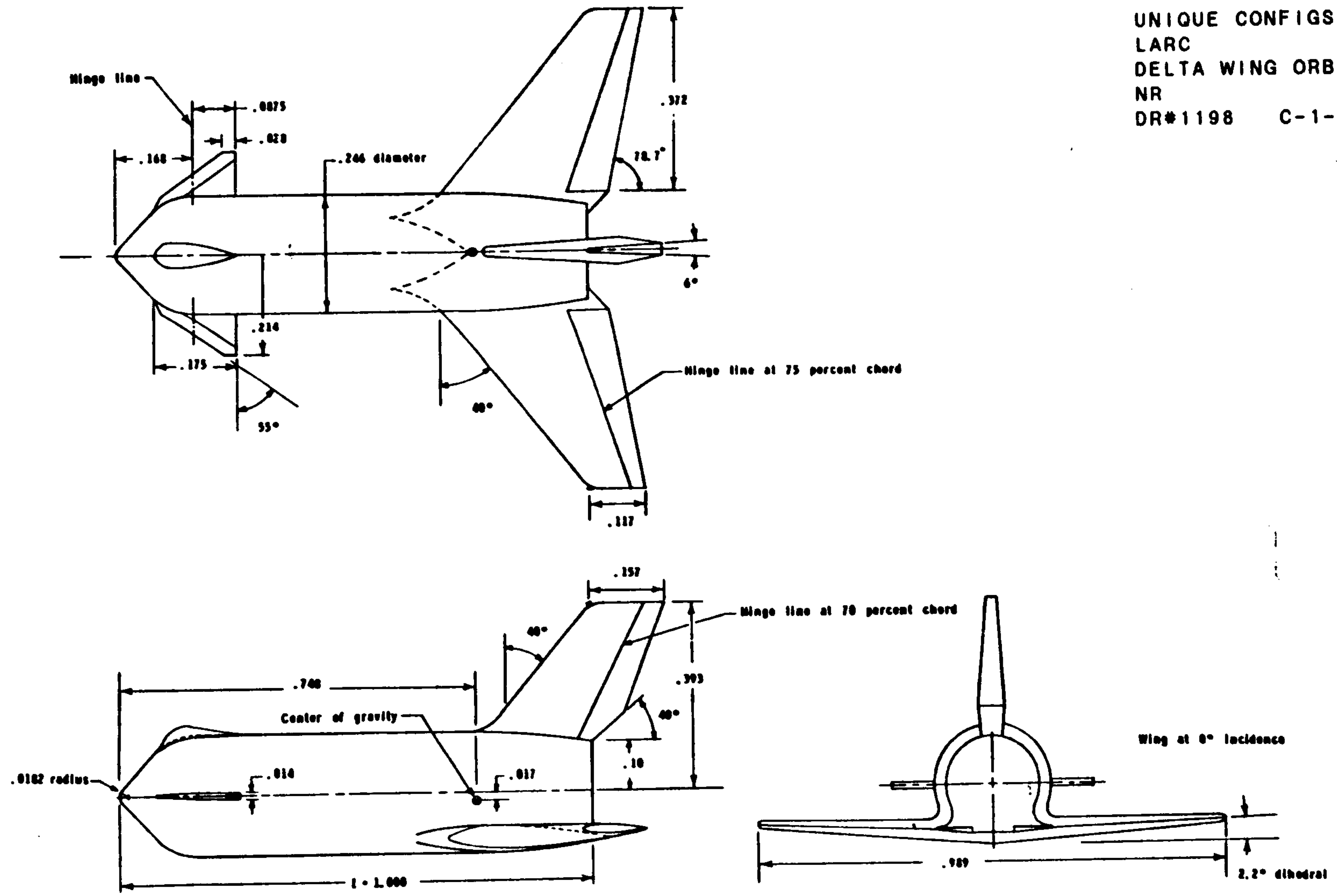


Figure 2. Booster model. All dimensions in percent of fuselage length (8.90-inch)

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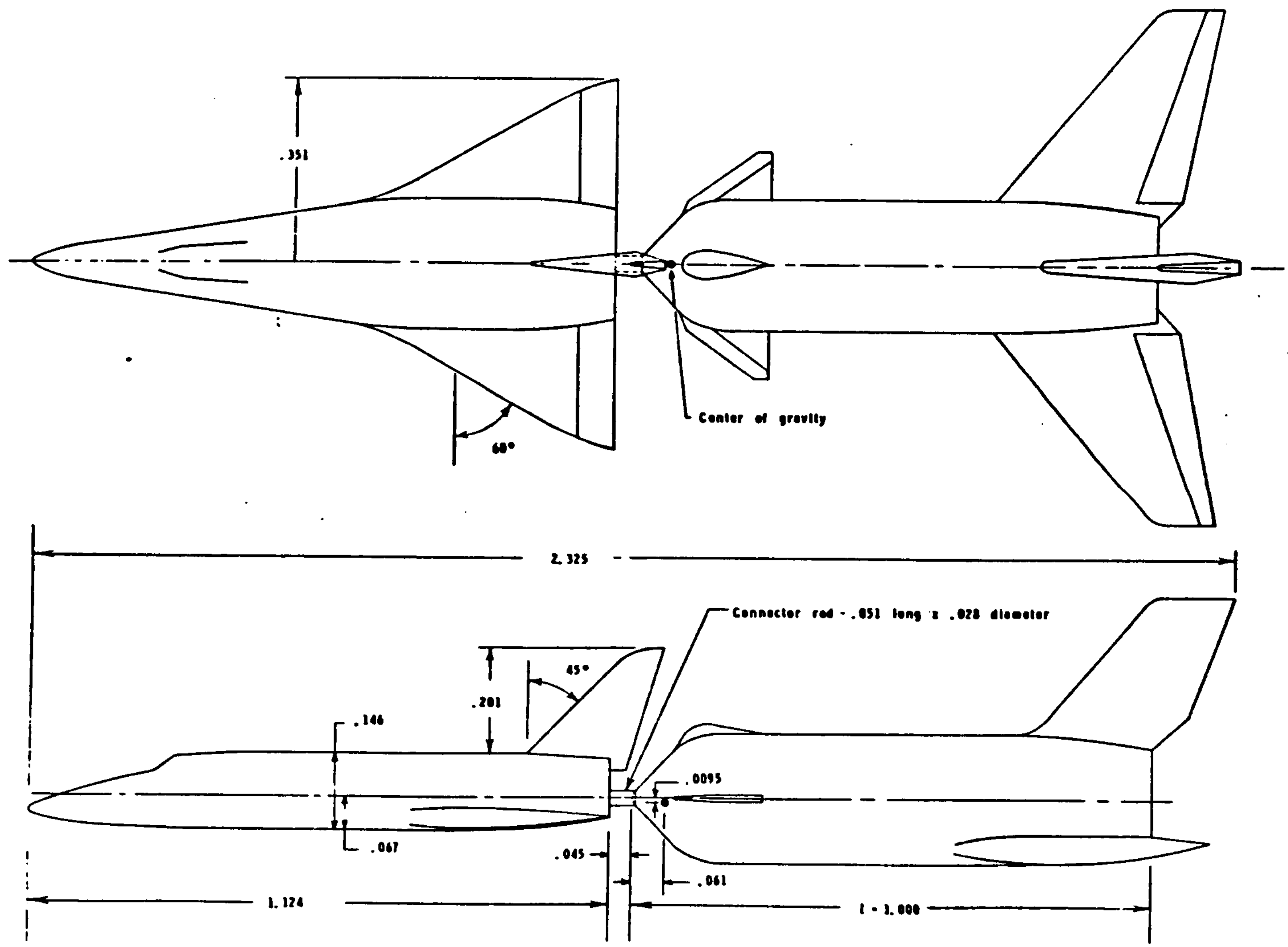


Figure 3. Ascent configuration. All dimensions in percent of booster fuselage length (8.90-inch) UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1198 C-1- 587

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1200 C-1- 588

☐ PRETEST
☐ POSTTEST

TABLE II.

TEST 8' TPT 605 DATA SET/RUN NUMBER

COLLATION SUMMARY

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	BSTR. CONTROL DEFL. δe	i_c			NO. of RUNS	MACH NUMBERS 0.4	0.6	0.9	1.0	1.2							
RMZB 01	BWN_1V_1	B	0	0	-			5	45	44	43	42	41							
02		B	0	-10	-				50	49	48	47	46							
03		B	0	-30	-				55	54	53	52	51							
04	BWN_1V_1C	B	0	0	0				60	59	58	57	56							
05		B	0	0	10				65	64	63	62	61							
06		B	5	0	0				35	34	33	32	31							
07	BWN_1V_1	B	5	0	-				40	39	38	37	36							
RMZL 01	$BWN_1V_1C+B_4W_{16}V_{24}$	A	0	0	0				1	2	3	4	5							
02	$BWN_1V_1 + B_4W_{16}V_{24}$	A	0	0	-				10	9	8	7	6							
03		A	0	-10	-				15	14	13	12	11							
04		A	5	0	-				25	24	23	22	21							
05	$BWN_1V_1C + B_4W_{16}V_{24}$	A	5	0	0				27	26	30	29	28							
RMZO 01	$B_4W_{16}V_{24}$(Pres. Booster)	A	0	0	0				1	2	3	4	5							
03		A	0	-10	-				15	14	13	12	11							
04		A	5	0	-				25	24	23	22	21							
05		A	5	0	0				27	26	30	29	28							
06	$B_4W_{16}V_{24}$(Orbiter Alone)	A	0	-	-				85	84	76	80	82							
07	$B_4W_{16}V_{24}$(Pres. Booster)	A	0	0	0				71	70	74	73	72							

TEST RUN NUMBERS

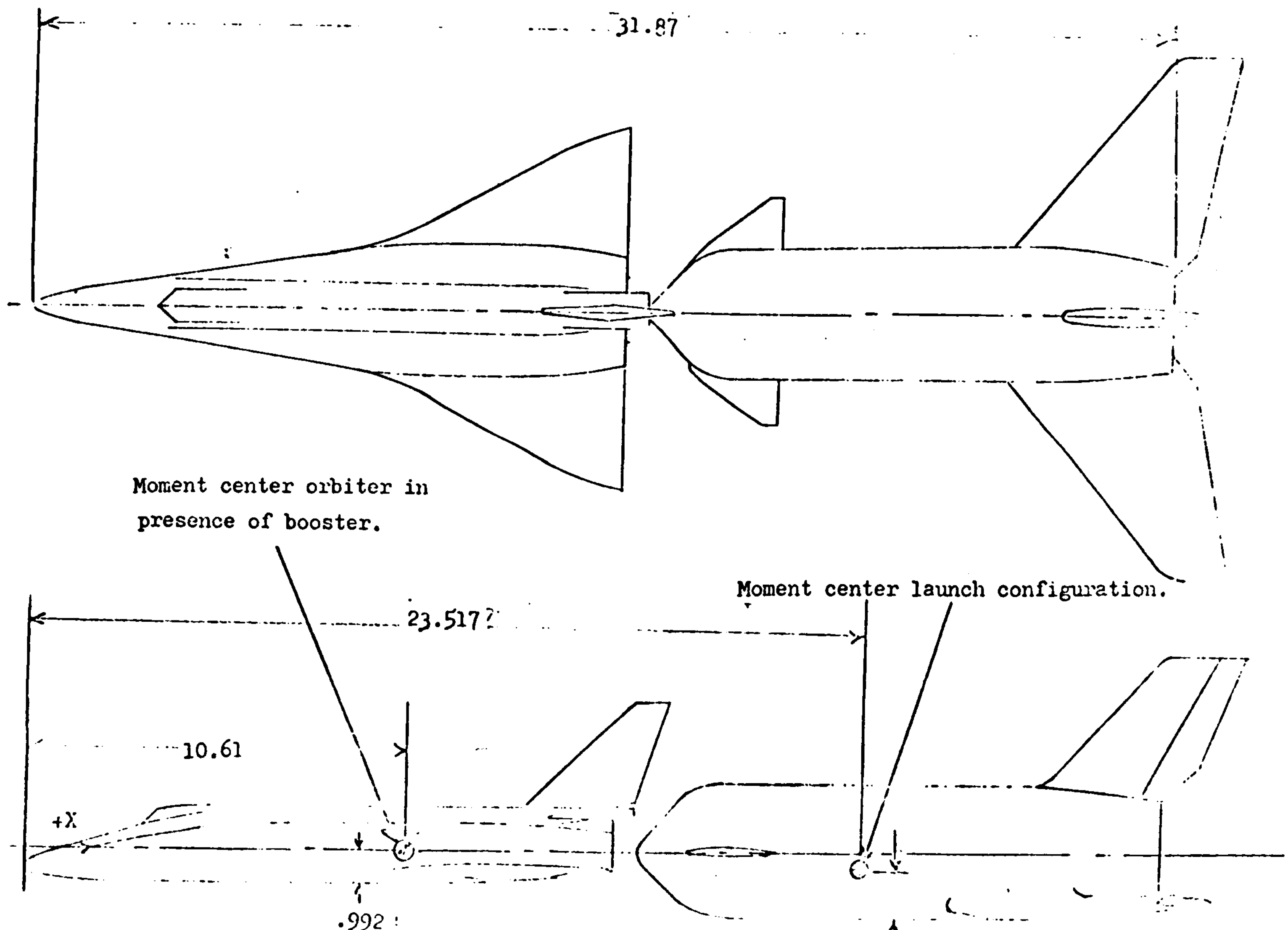
1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

Schedule	
α A	-8, -6, -4, -2, 0, 2, 4, 6, 8
α B	-1, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

NASA-MSFC-MAF



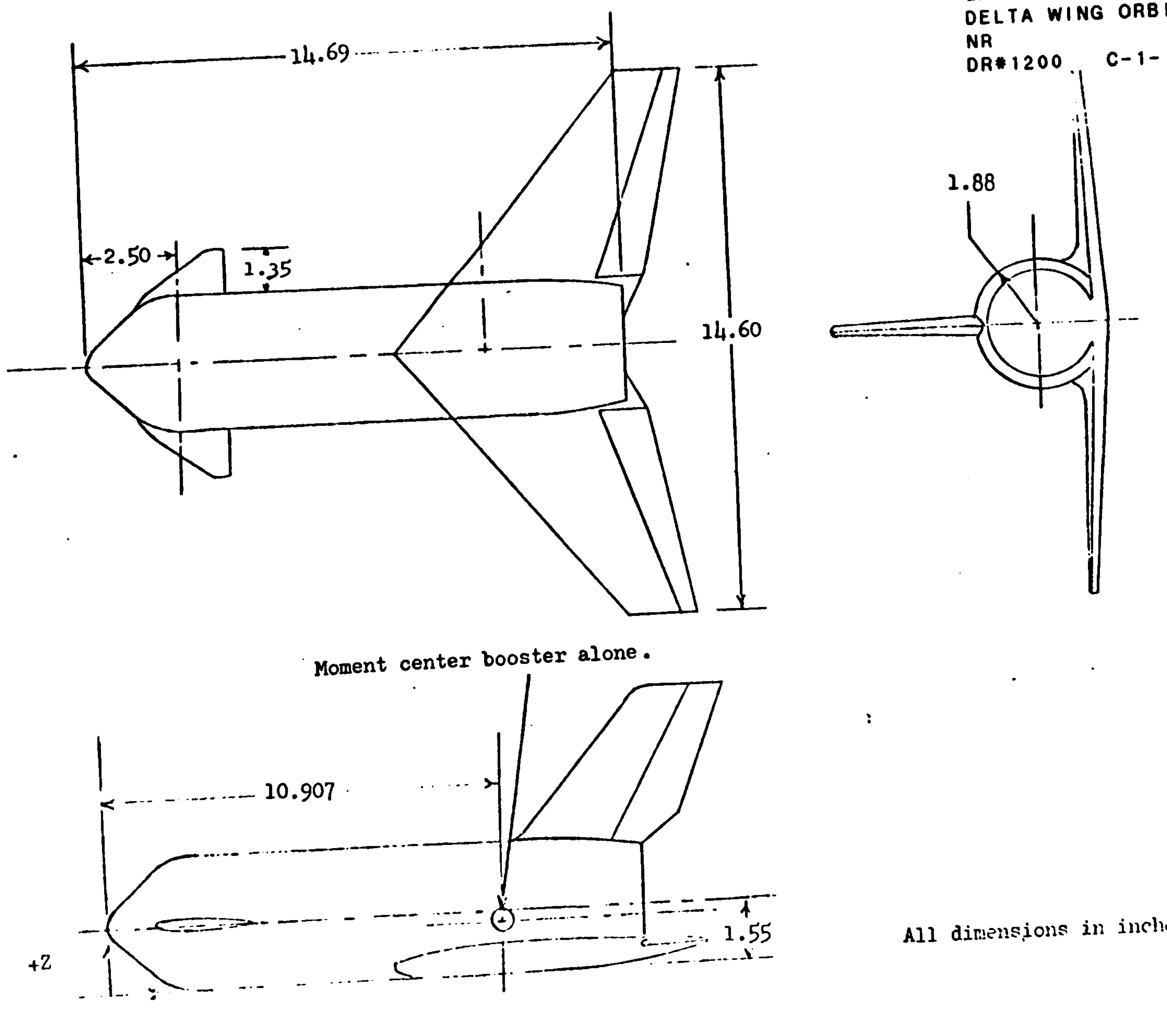
All dimensions in inch...

FIGURE 2. LAUNCH CONFIGURATION DIMENSIONS

683

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1200 C-1- 589

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1200 C-1- 590



All dimensions in inches.

FIGURE 3. BOOSTER DIMENSIONS

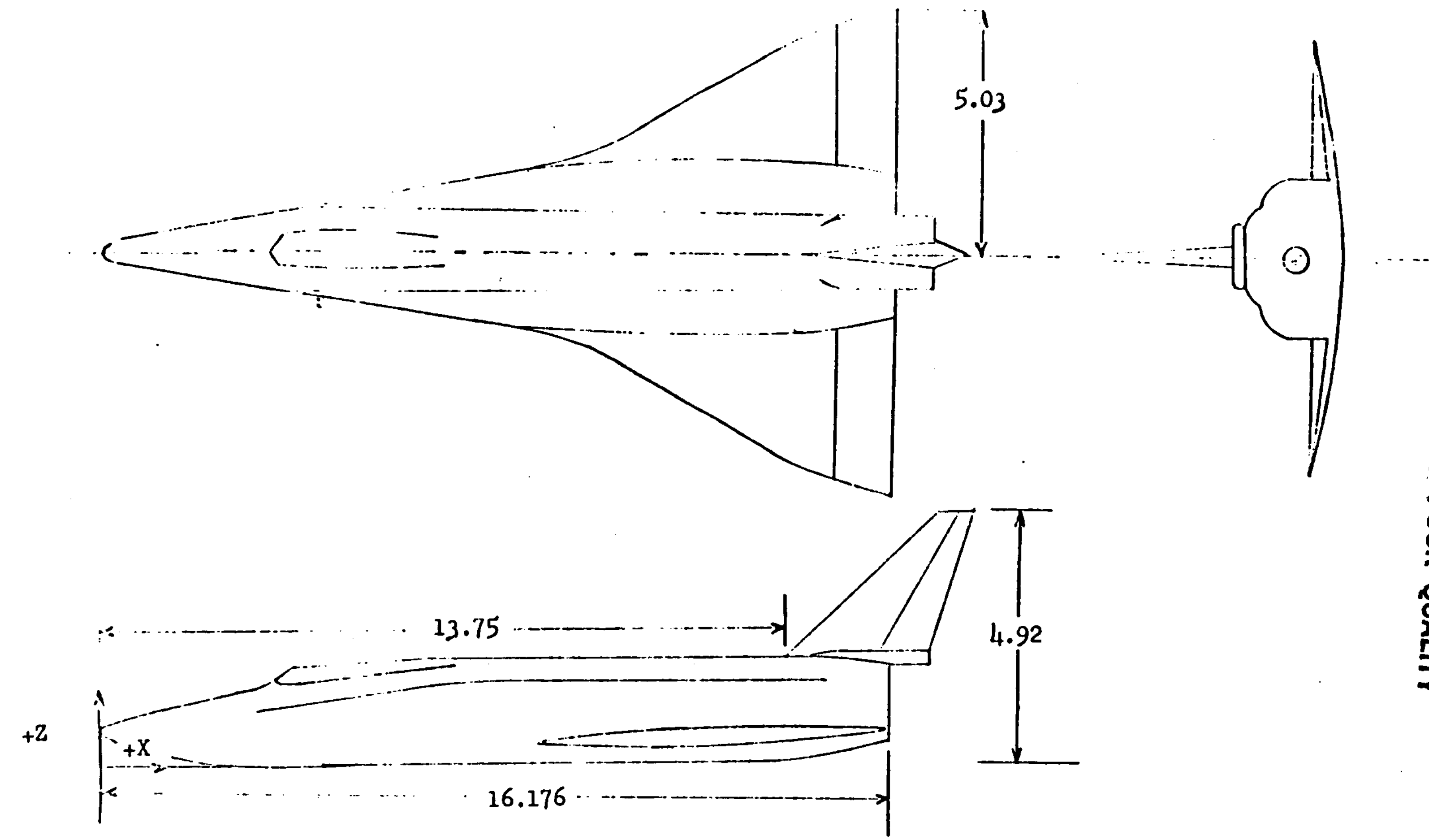


FIGURE 4. ORBITER DIMENSIONS

UNIQUE CONFIGS. BOOSTER
LARC
DELTA WING ORBITER
NR
DR#1200 C-1- 591

All dimensions in inches.

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1055 C-1- 592

TEST MSFC TWT476 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION i_o				NO. of RUNS	MACH NUMBERS 0.60	[illegible]	[illegible]	1.10	[illegible]	[illegible]	[illegible]					
R25021	BF₁S+B5W14E3V17	A	0	+1°				7	8	[illegible]	[illegible]	11	12	13	14					
R25031		A	0	+4°				7	15	16	17	18	19	20	21					
R25041		A	0	-2°				7	22	23	24	25	26	27	28					
R25061	BS+B5W14E3V17	A	0	+1°				7	29	30	31	32	33	34	35					
R25071		A	0	+4°				7	36	37	38	39	40	41	42					
R25081		A	0	-2°				7	43	44	45	46	47	48	49					
R25053	BF₁S+B5W14E3V17	0	B	+1°				7	57	59	[illegible]	60	61	62	63					
R25093	BF₂S+B5W14E3V17	0	B	+1°				7	64	65	66	67	68	69	70					
R25091		A	0	+1°				7	71	72	73	74	75	76	77					

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CYN	CY	CBL	CA	CAF	CPBL	[illegible]	CPCAV			10

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES
αA: -12, -10, -8, [illegible]
βB: -1.5, 1.0, [illegible]

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NOTE: ALL DIMENSIONS ARE MODEL SCALE (INCHES)

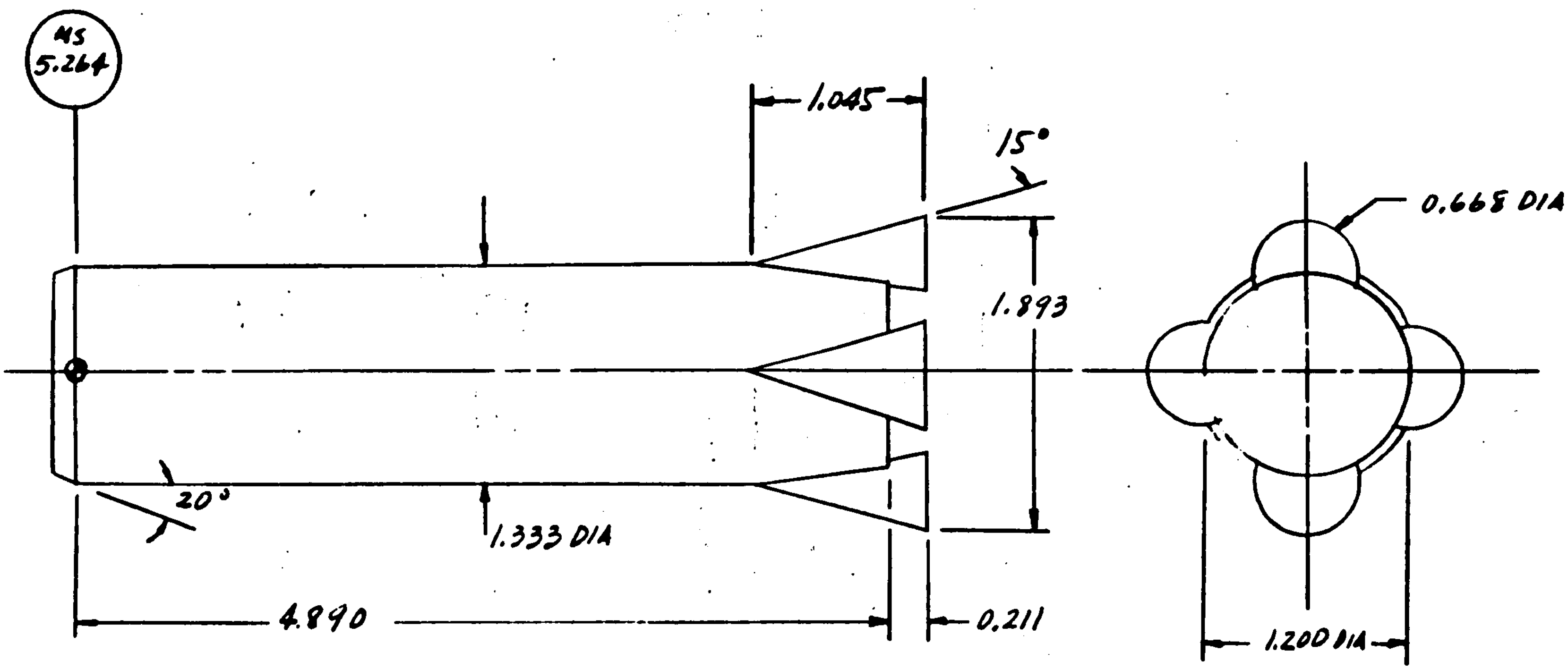


FIGURE 9. SATURN V/SIC BOOSTER

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1055 C-1- 593

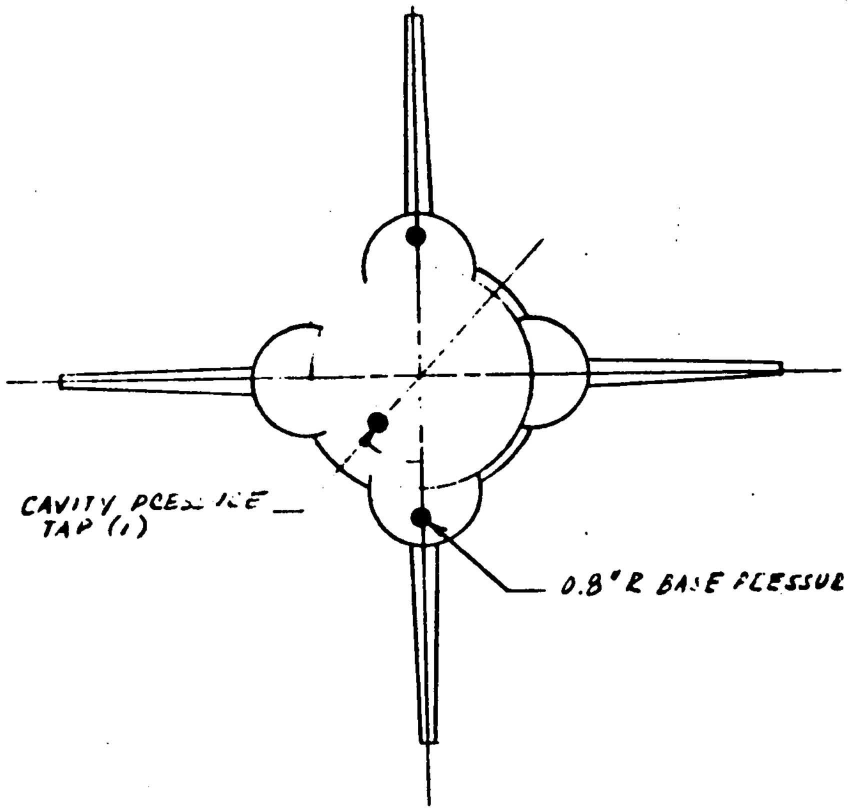


FIGURE 3. TYPICAL BASE PRESSURE LOCATIONS

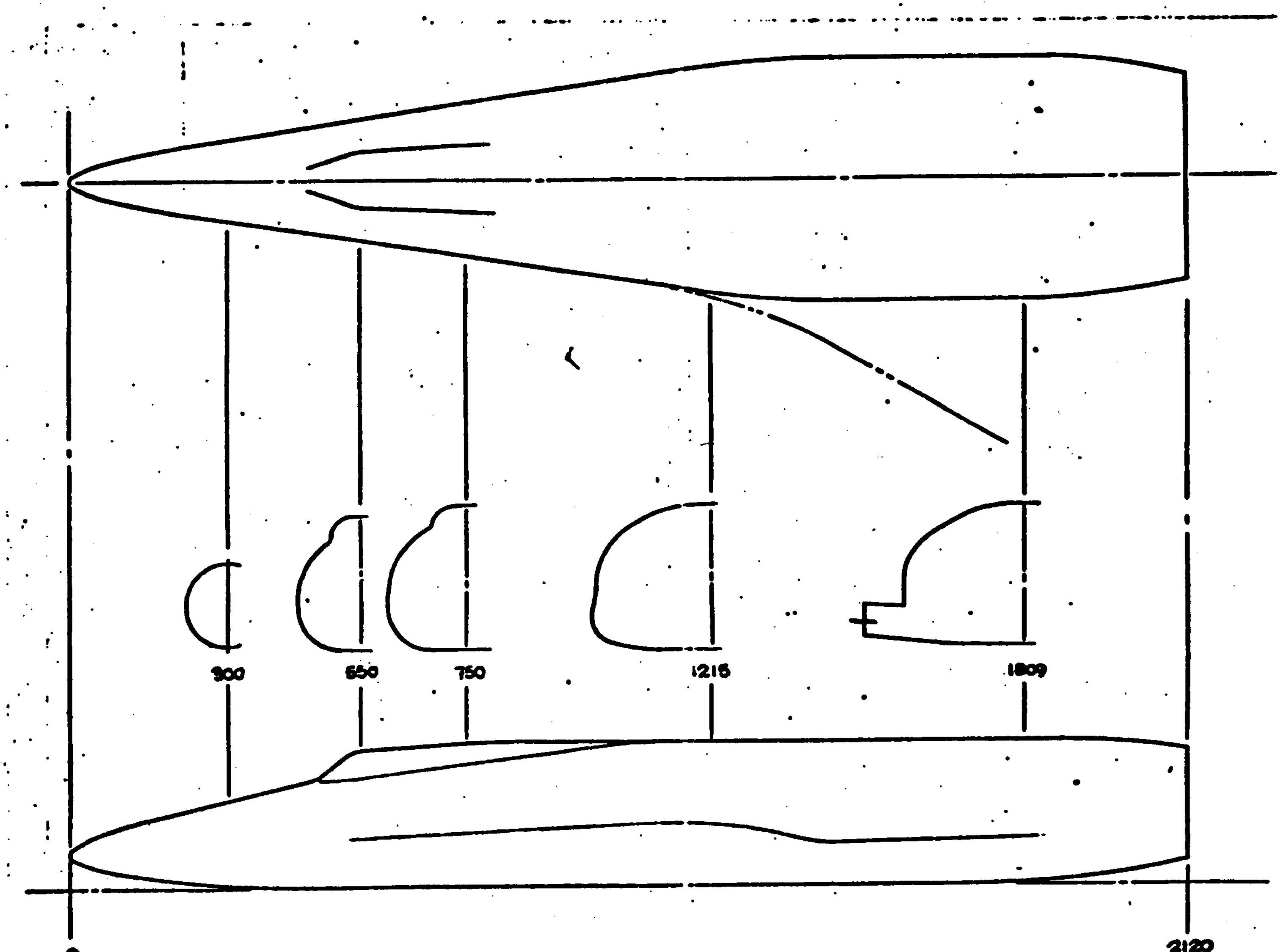
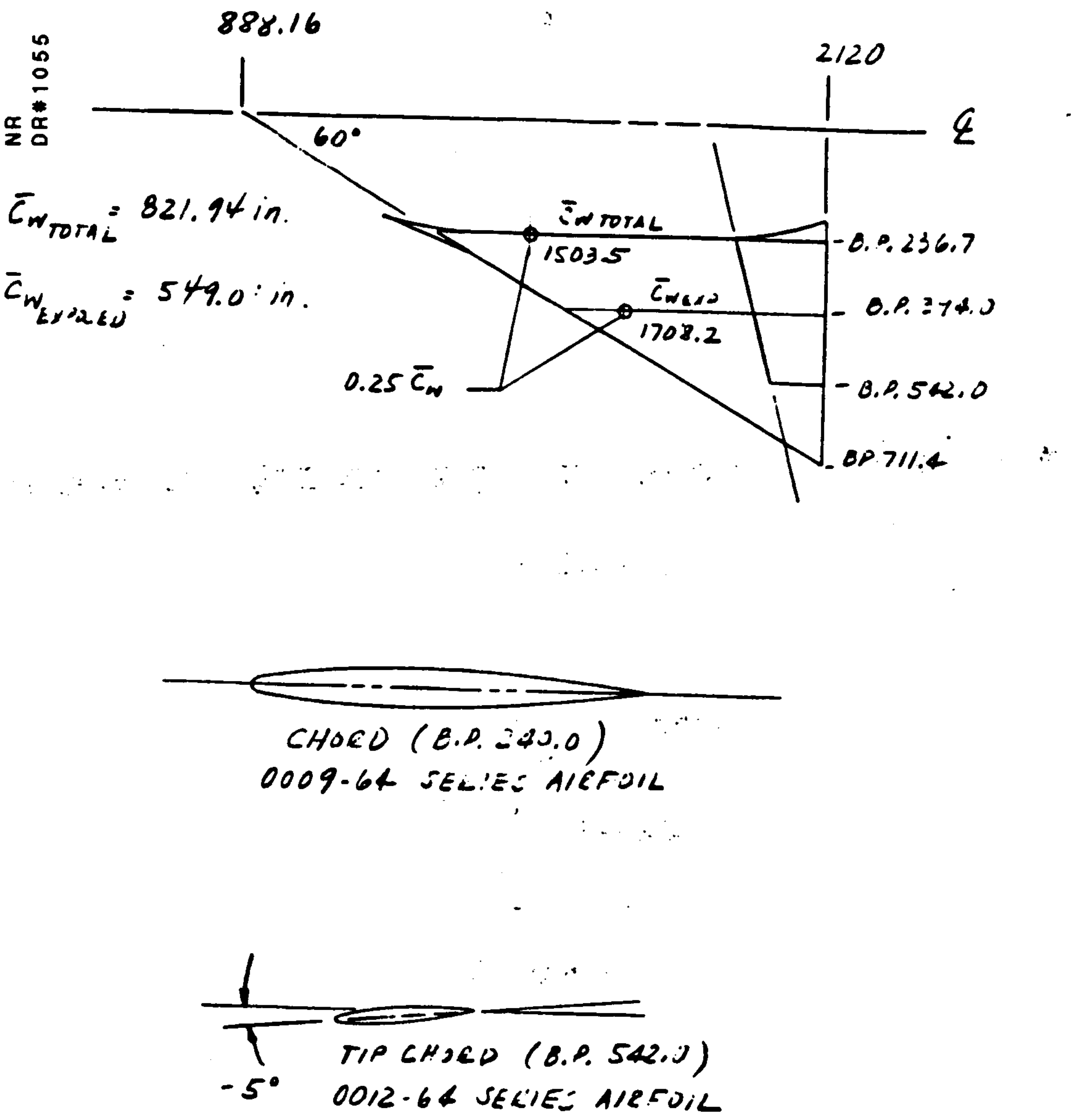


FIGURE 5. BODY B5 9992-134B CONFIGURATION

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1055 C-1- 595



NOTE: ALL DIMENSIONS ARE FULL SCALE (INCHES)

FIGURE 6. WING W14 9992-134B CONFIGURATION
COMPLETE DELTA - NO CLIPPED TIP

NOTE: ALL DIMENSIONS ARE FULL SCALE (INCHES)

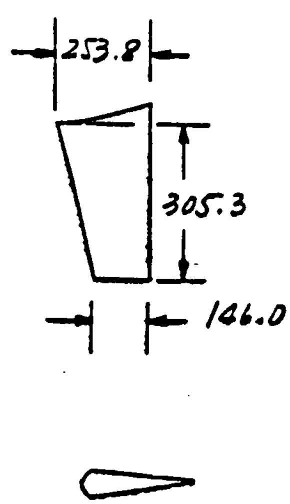


FIGURE 7. ELEVON E3 - ELEVON USED WITH WING W14

NOTE: ALL DIMENSIONS ARE FULL SCALE (INCHES)

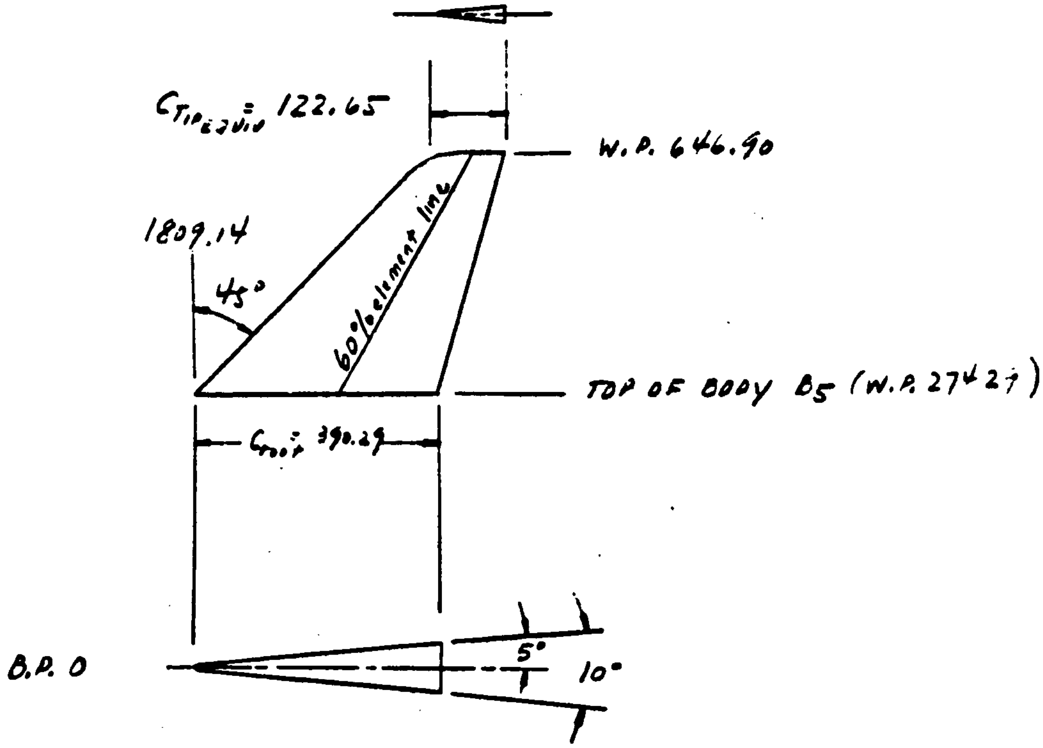


FIGURE 8. VERTICAL STABILIZER V17

NOTE: ALL DIMENSIONS ARE MODEL SCALE (INCHES)

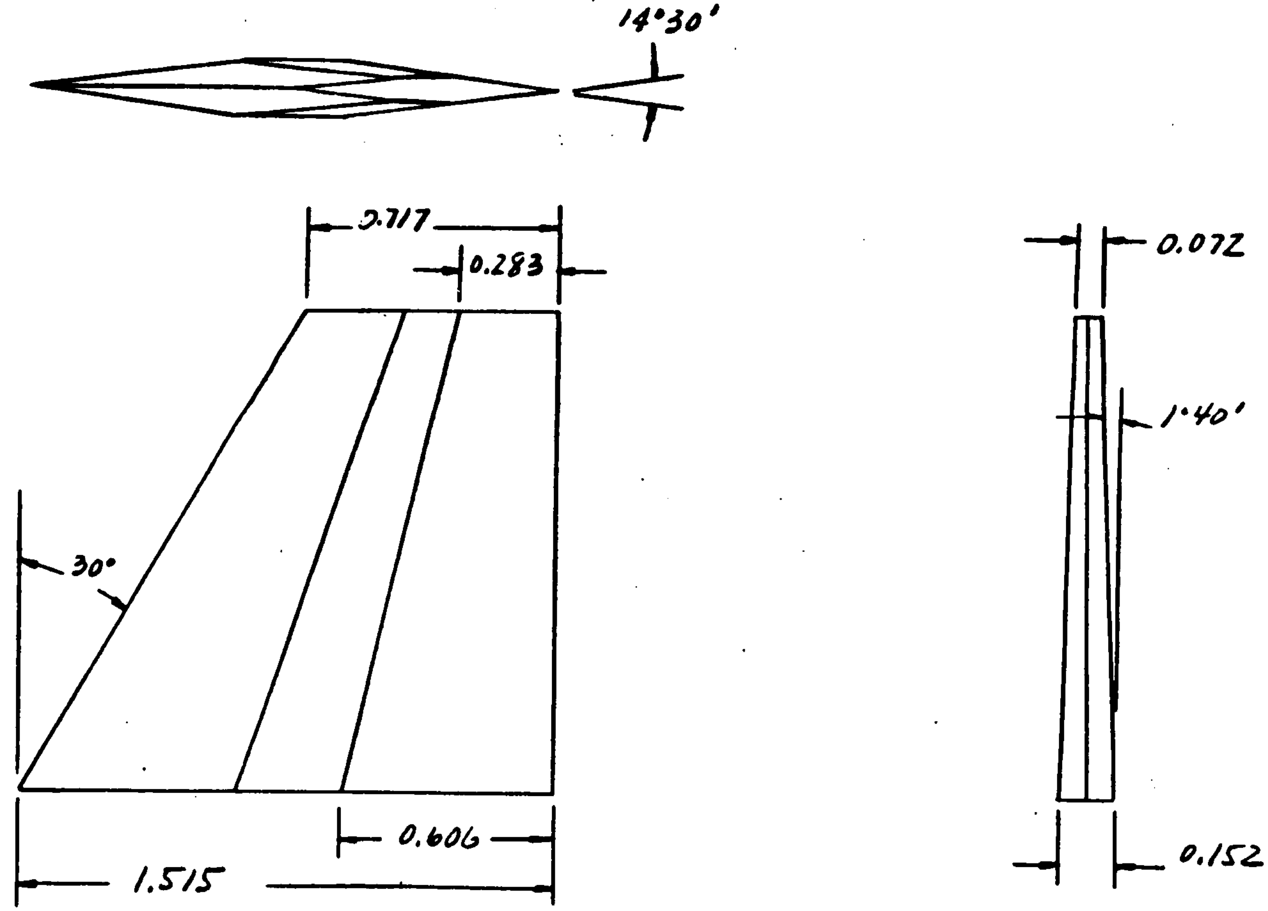
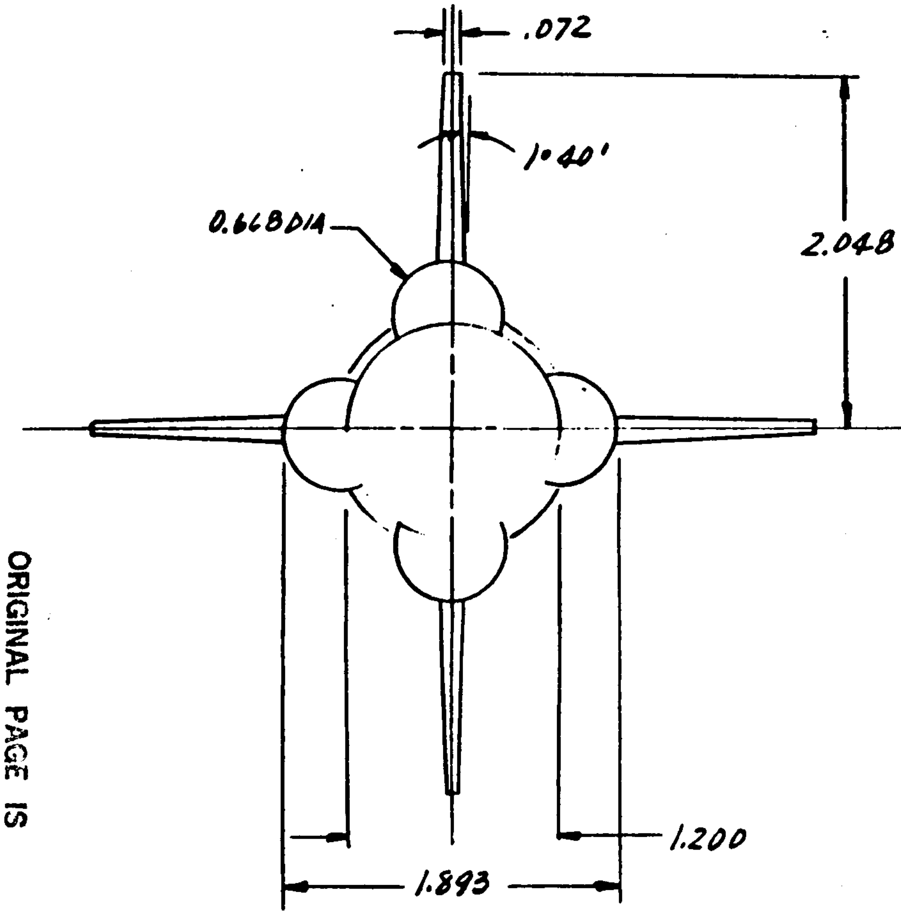


FIGURE 10. $900 FT^2$ S-IC FIN

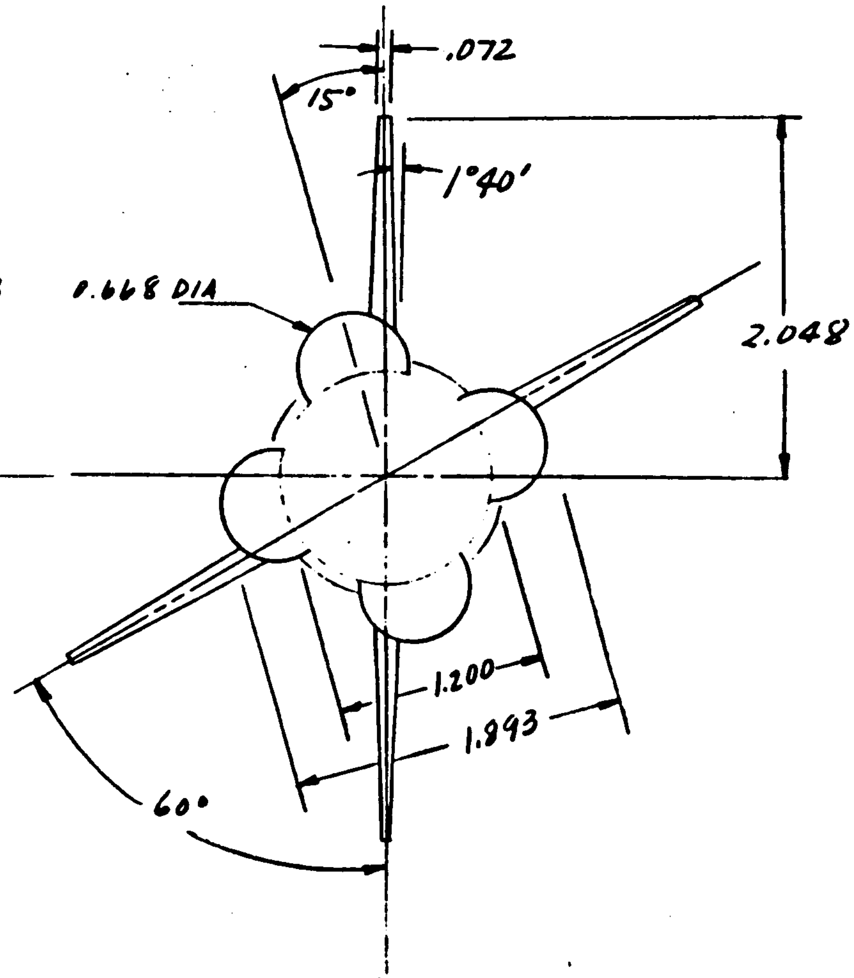
UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1055 C-1- 599

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1055 C-1- 600

NOTE: ALL DIMENSIONS ARE MODEL SCALE (INCHES)



S-IC 45° FIN CONFIGURATION
(F₂)



S-IC 30° FIN CONFIGURATION
(F₁)

FIGURE 10 (CONTINUED)

TEST IWT #485 DATA SET COLLATION SHEET

SHEET 1 of 2

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.60	0.90	1.00	1.10	1.20		1.96						
	OBF (SHADOWGRAPH)	E	0°					3		001/0	002/0		003/0								
	OBF "	0°	E					3		006/0	005/0		004/0								
R30021	OBF	A	O					6	007/0	008/0	009/0	010/0	011/0		083/0						
R30022	OBF	O	B					6	016/0	015/0	014/0	013/0	012/0		082/0						
R30041	OBFS1	A	O					3		019/0	018/0		017/0								
R30061	OBFS2							3		020/0	021/0		022/0								
R30081	OBFVD1							3		025/0	024/0		023/0								
R30101	OBFVD2							3		026/0	027/0		028/0								
R30091	OBVD2							3		031/0	030/0		029/0								
R30071	OBVD1							3		032/0	033/0		034/0								
R30051	OBS2							3		037/0	036/0		035/0								
R30031	OBS1							3		038/0	039/0		040/0								
R30011	OB							6	045/0	044/0	043/0	042/0	041/0		084/0						
R30012	OB	O	B					6	046/0	047/0	048/0	049/0	050/0		085/0						
R30111	GB	A	O					3		053/0	052/0		051/1								
R30122	GBF	O	B					3		059/0	058/0		057/0								
R30121	GBF	A	O					3		054/0	055/0		056/0								

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CYN	CY	CBL	CPC	CL	CD	CAB	CAF			10

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

$\alpha A = -1\ -8°, -6°, -4°, -2°, 0°, +2°, +4°, +6°, +8°$

$\beta B = -2°, 0°, +2°, +4°, +6°, +8°$

$\alpha = 0°, \beta = 0°\quad \alpha + \beta E = 0°, +10°$

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UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 601

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 602
☑ POSTTEST

TEST TWT #485 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.60	0.90	1.00	1.10	1.20		1.96					
R30131	$OBFS_3$	A	O					3		061/0	060/0		062/0							
R30132	$OBFS_3$	O	B					3		063/0	064/0		065/0							
R30202	$OBFVD_2$ (BEST DEV.)	O	B					6	071/0	072/0	073/0	074/0	075/0		081/0					
R30201	$OBFVD_2$ "	A	O					6	070/0	069/0	068/0	067/0	066/0		080/0					
	$OBFVD_2$ (SHADOWGRAPH)	A	O					1			077/0									
	$OBFVD_2$ "	O	B					1			076/0									
	$OBFS_3$ "	O	B					1			079/0									
	$OBFS_3$ "	A	O					1			078/0									
							E	-	O	-	T									

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CYN CY CBL CPC CL CD CAB CAF | 10

IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:

α or β SCHEDULES

$\alpha A = -8^\circ, -6^\circ, -4^\circ, -2^\circ, 0^\circ, +2, +4^\circ, +6^\circ, +8^\circ$

$\beta B = -2^\circ, 0^\circ, +2^\circ, +4^\circ, +6^\circ, +8^\circ$

$\alpha + \beta E = 0^\circ, +10^\circ$

NASA-MSFC-MAF

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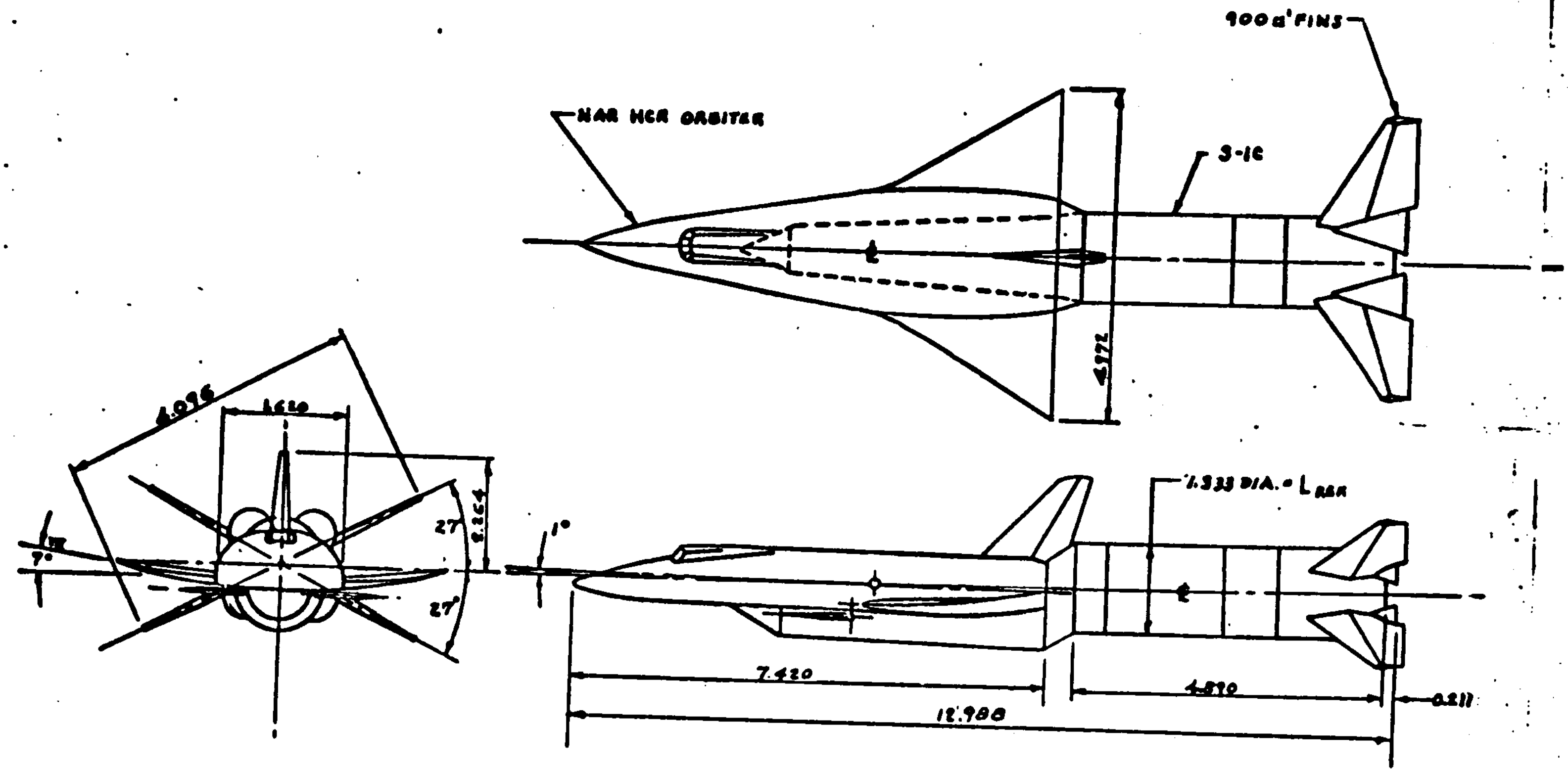

FIGURE 10. 0.003366 SCALE S-IC/NAR HCR ORBITER MODEL

DRAWING NOT TO SCALE

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 603

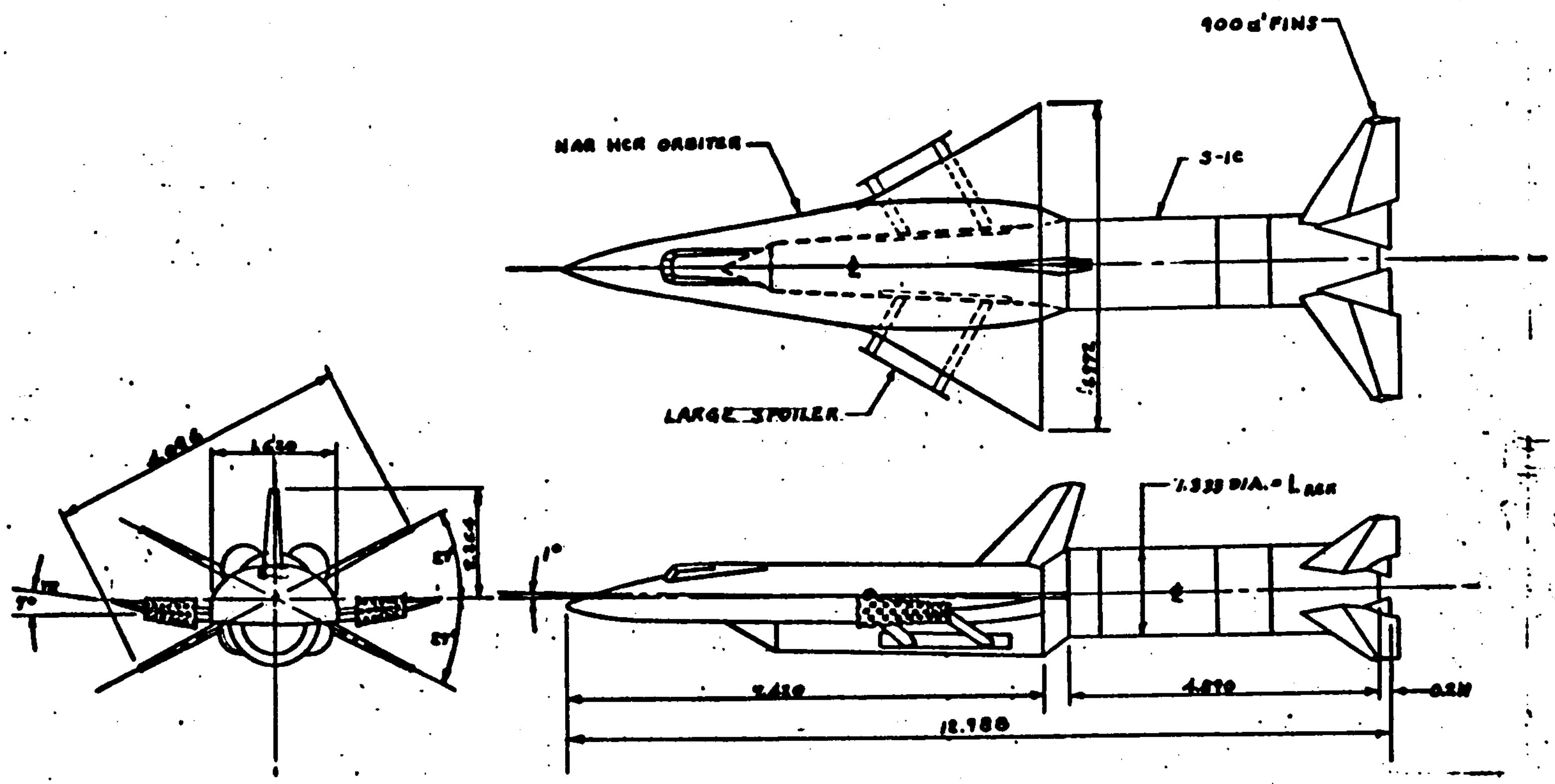

FIGURE 11. S-IC/NAR HCR ORBITER WITH SPOILERS, 0.003366 SCALE MODEL

DRAWING NOT TO SCALE

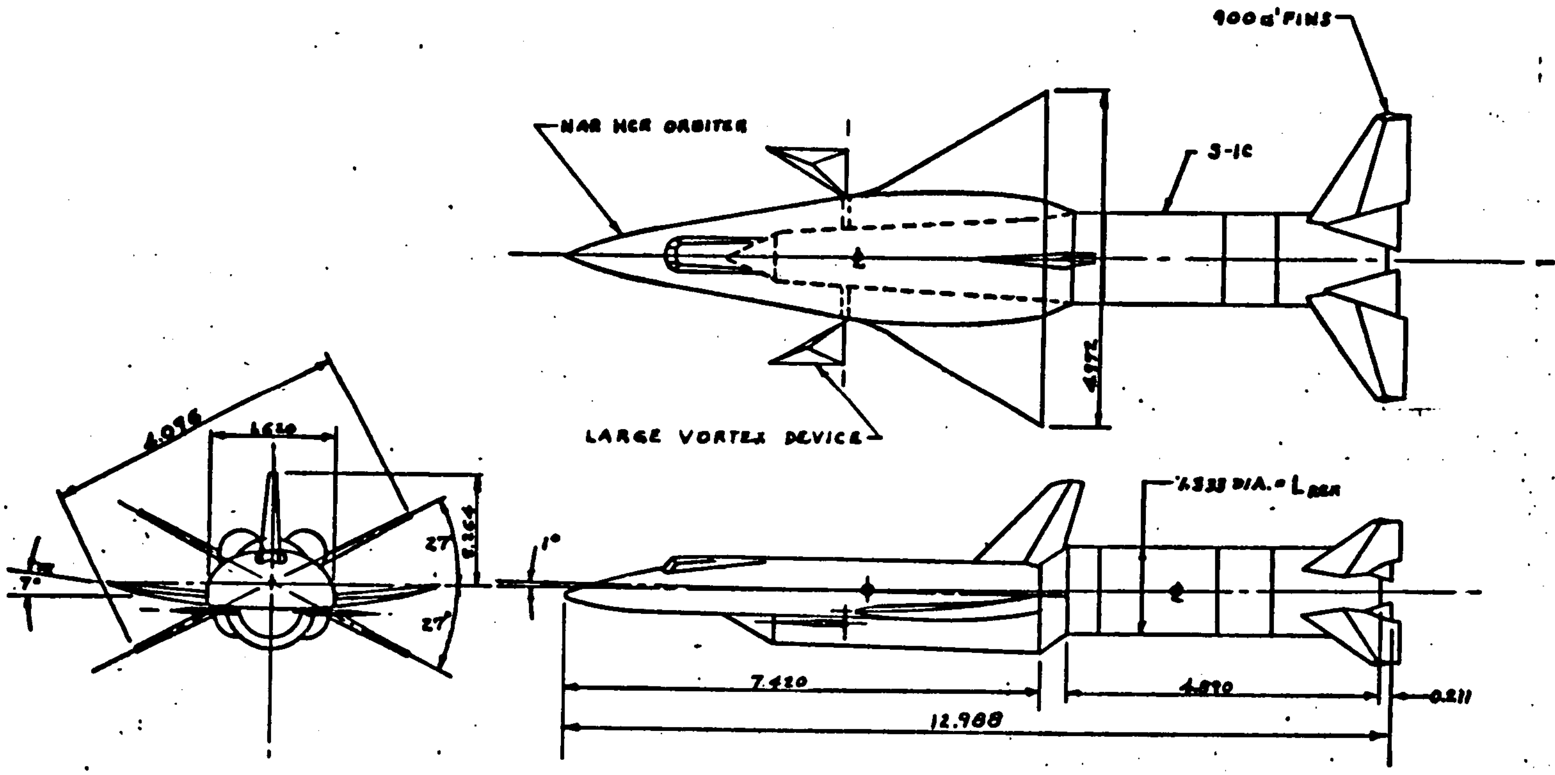

FIGURE 12. S-IC/NAR HCR ORBITER WITH VORTEX DEVICE, 0.003366 SCALE MODEL

DRAWING NOT TO SCALE

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UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 605

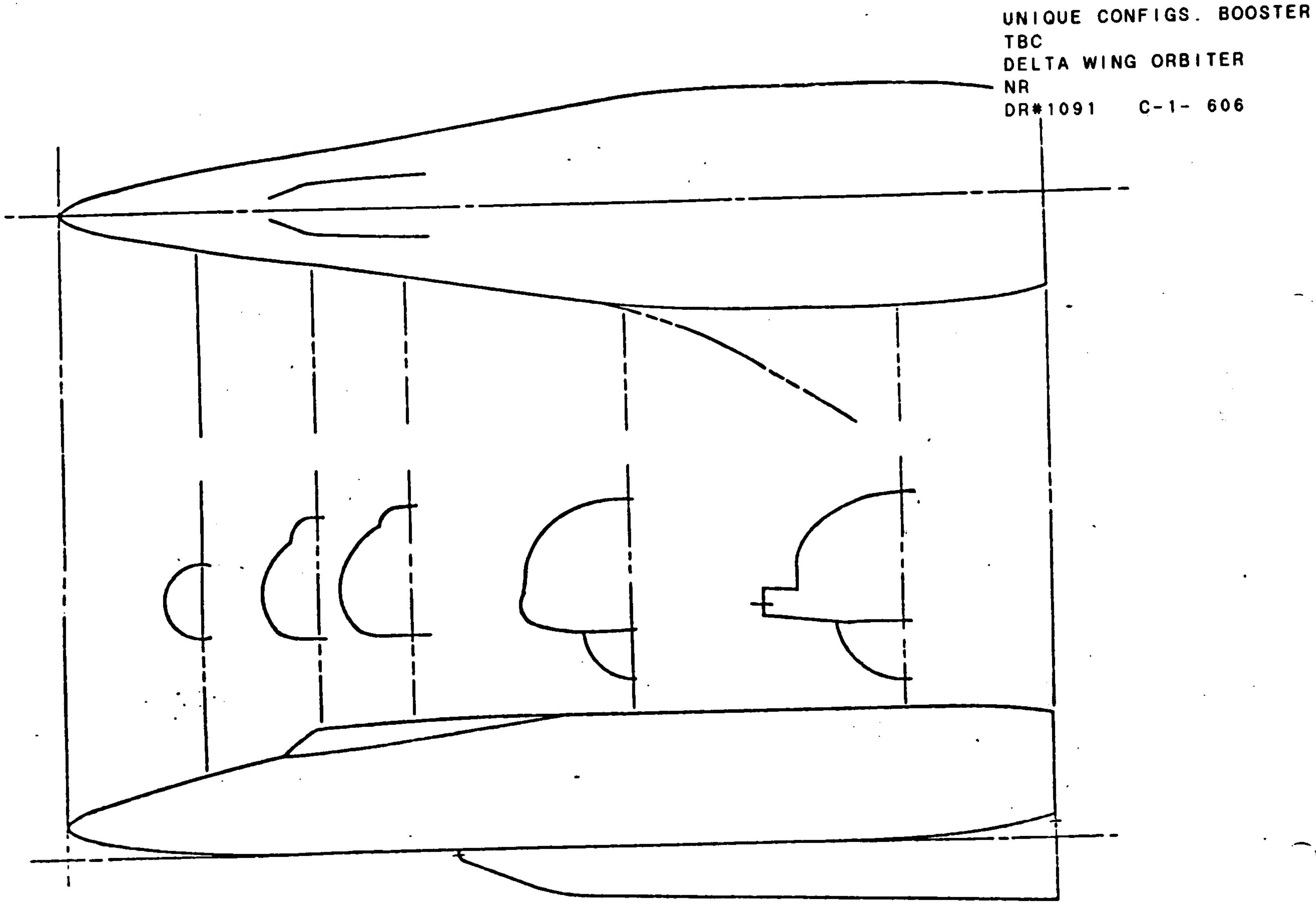

FIGURE 13. NAR HCR ORBITER BODY WITH CRADLE

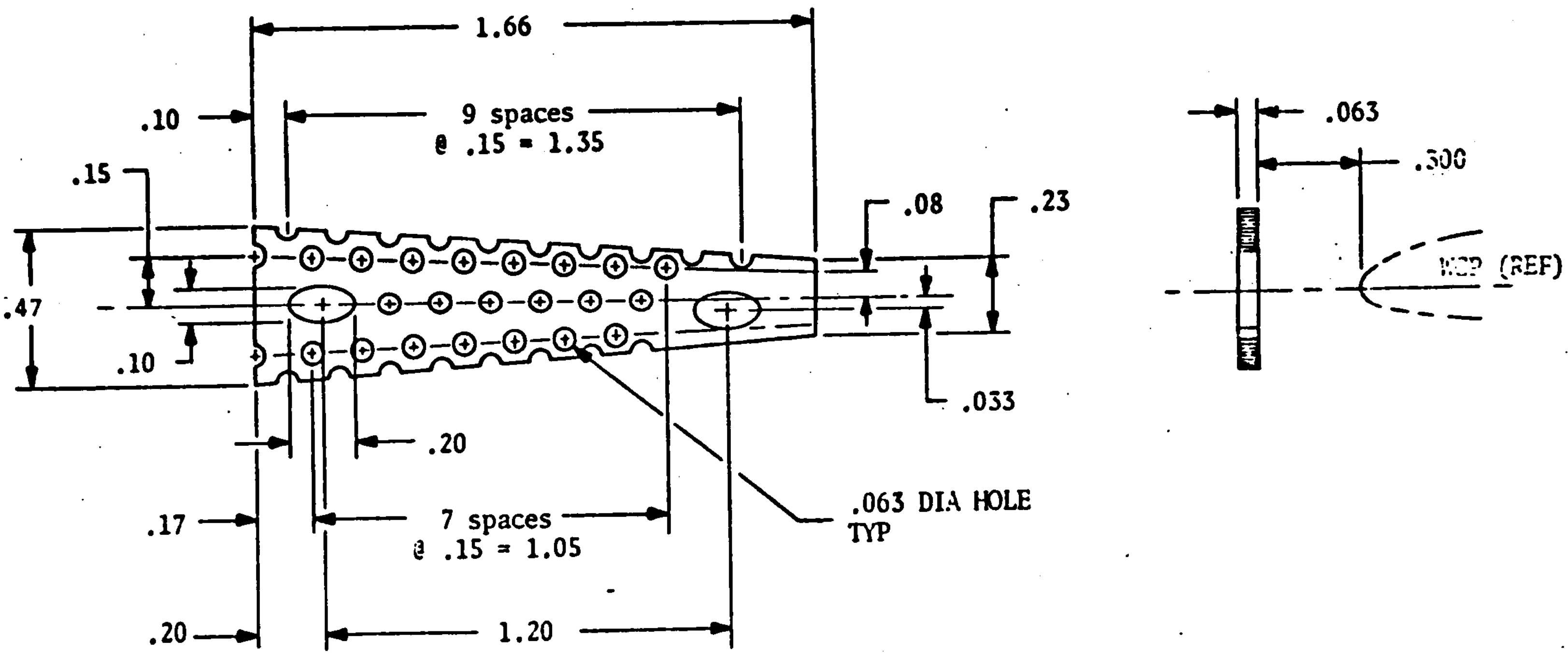

FIGURE 14. LARGE SPOILER - S_1

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 607

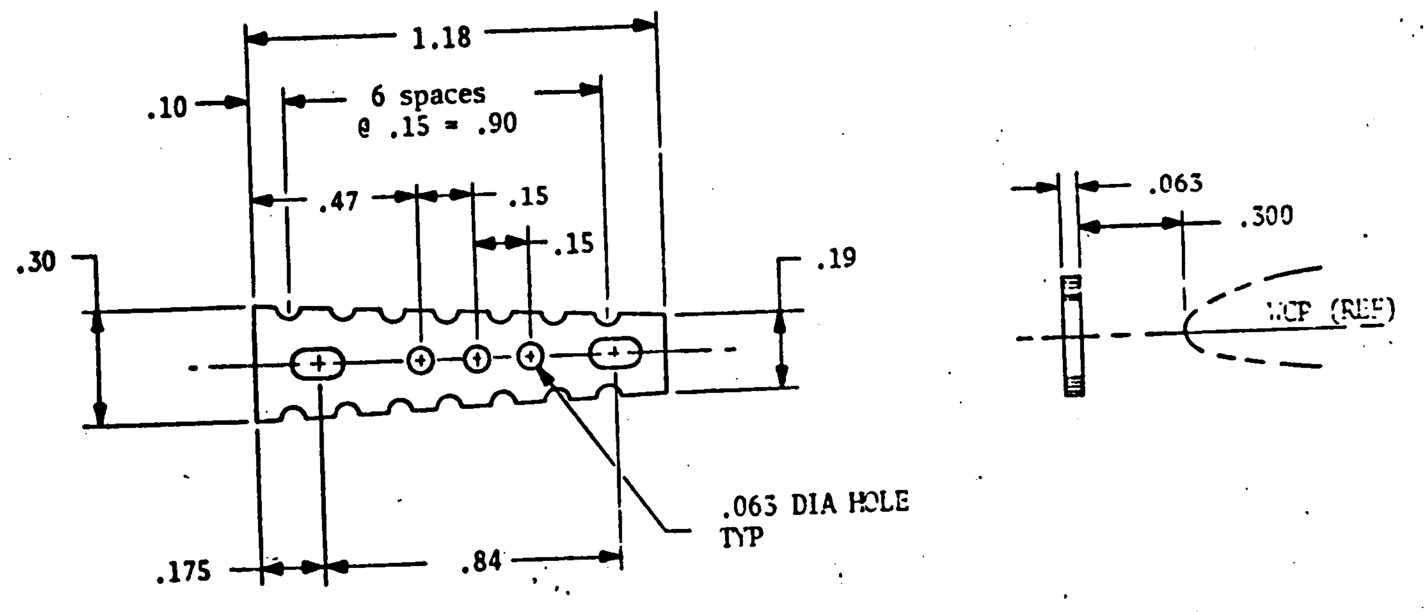

FIGURE 15. SMALL SPOILER - S2

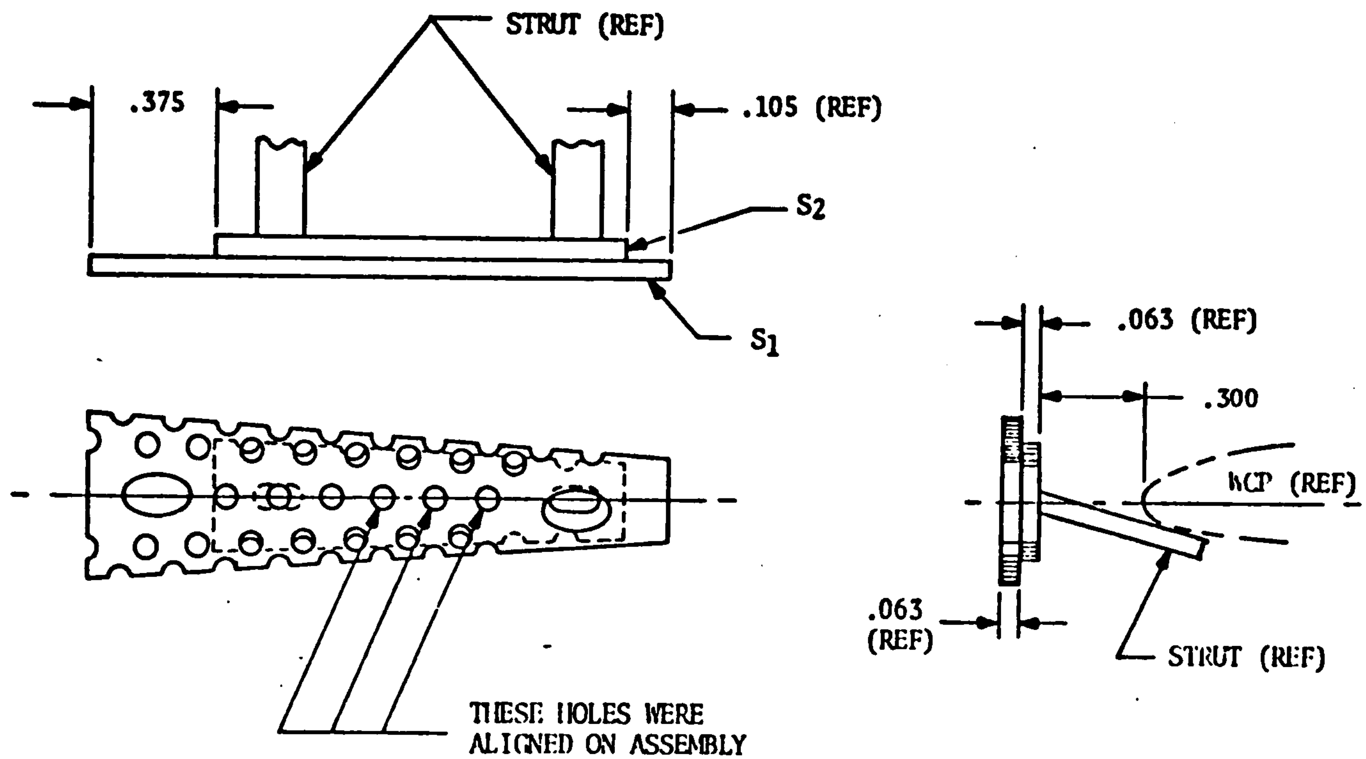

FIGURE 16. SPOILER S_3
(MODIFIED S_1/S_2)

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 609

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 610

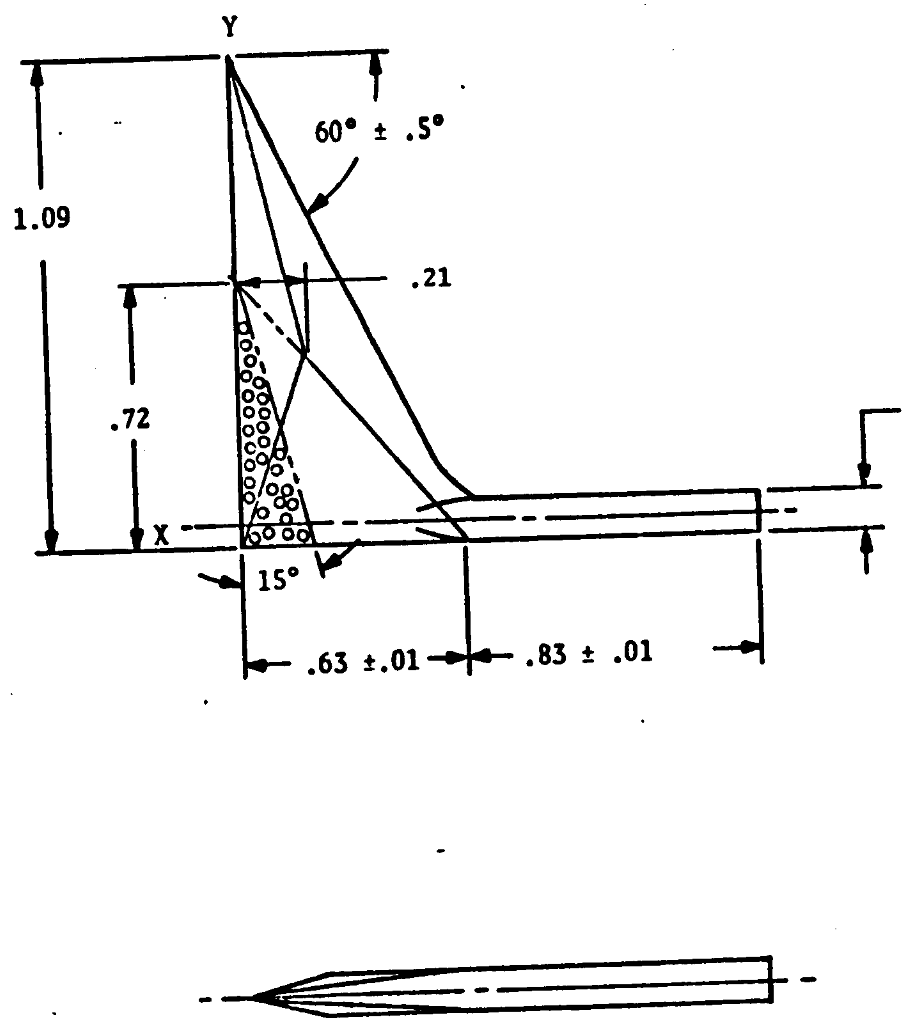

FIGURE 17. LARGE VORTEX DEVICE - VD_1

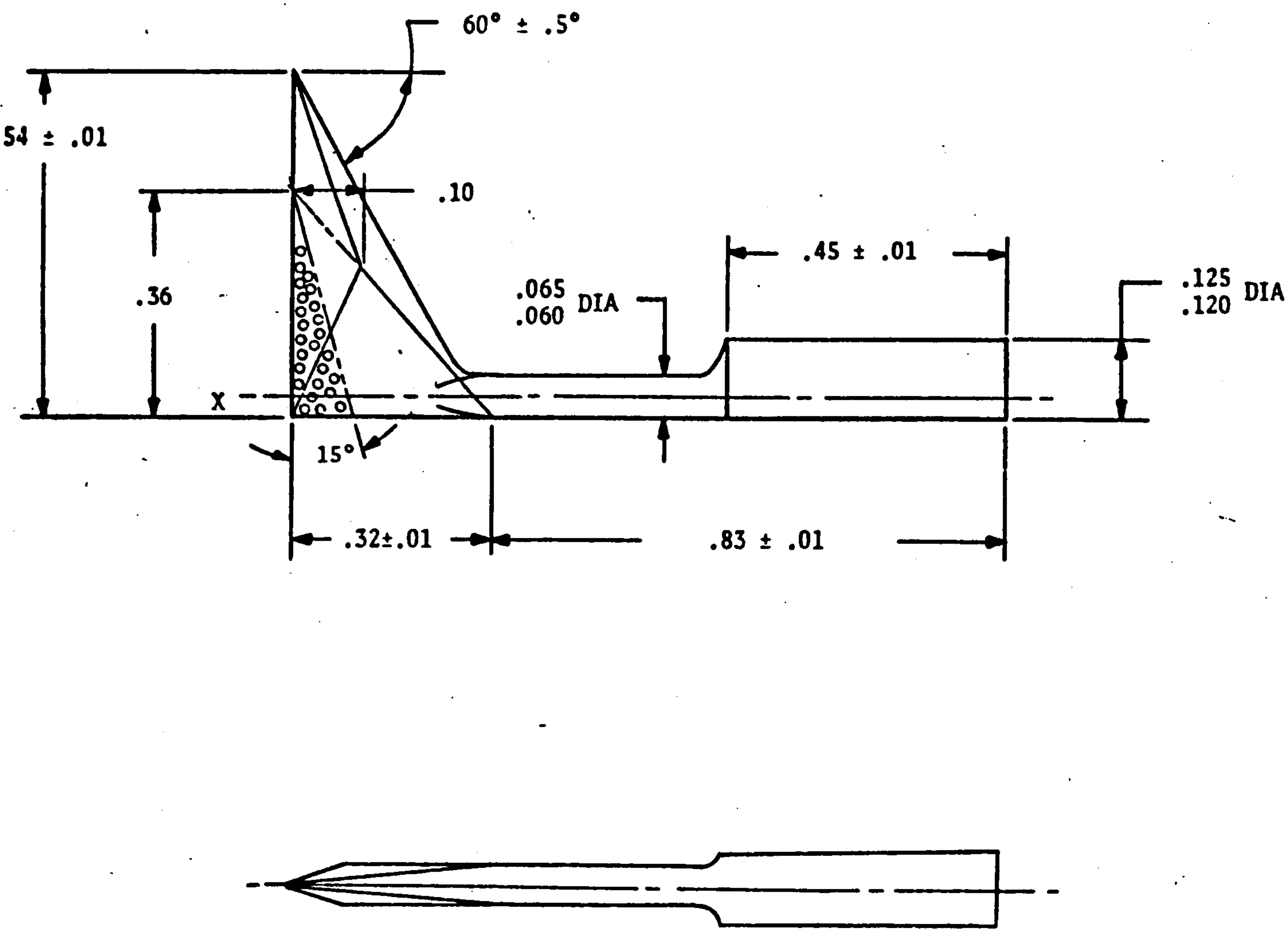

FIGURE 18. SMALL VORTEX DEVICE - VD_2

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 611

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 612

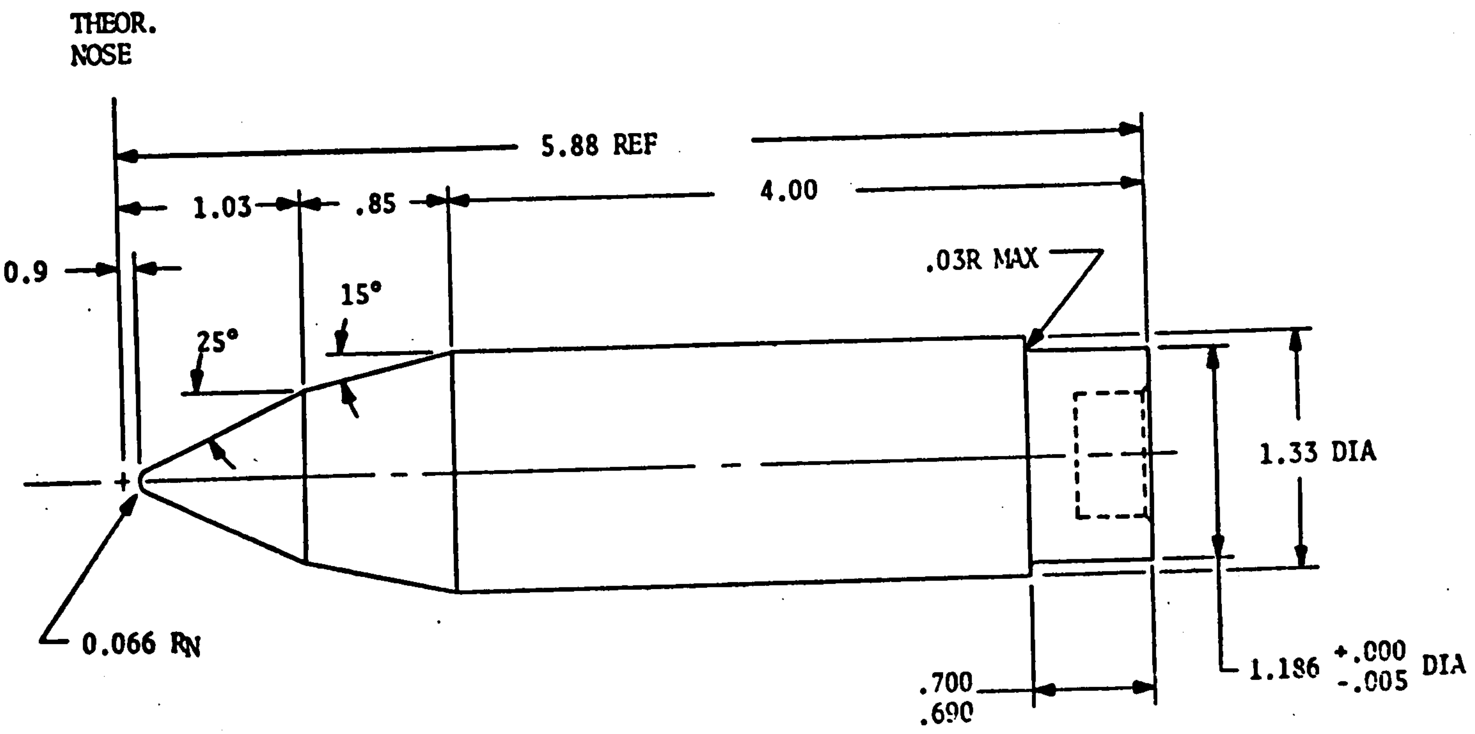

FIGURE 19. MLV CONE FRUSTUM CYLINDER FOREBODY - G

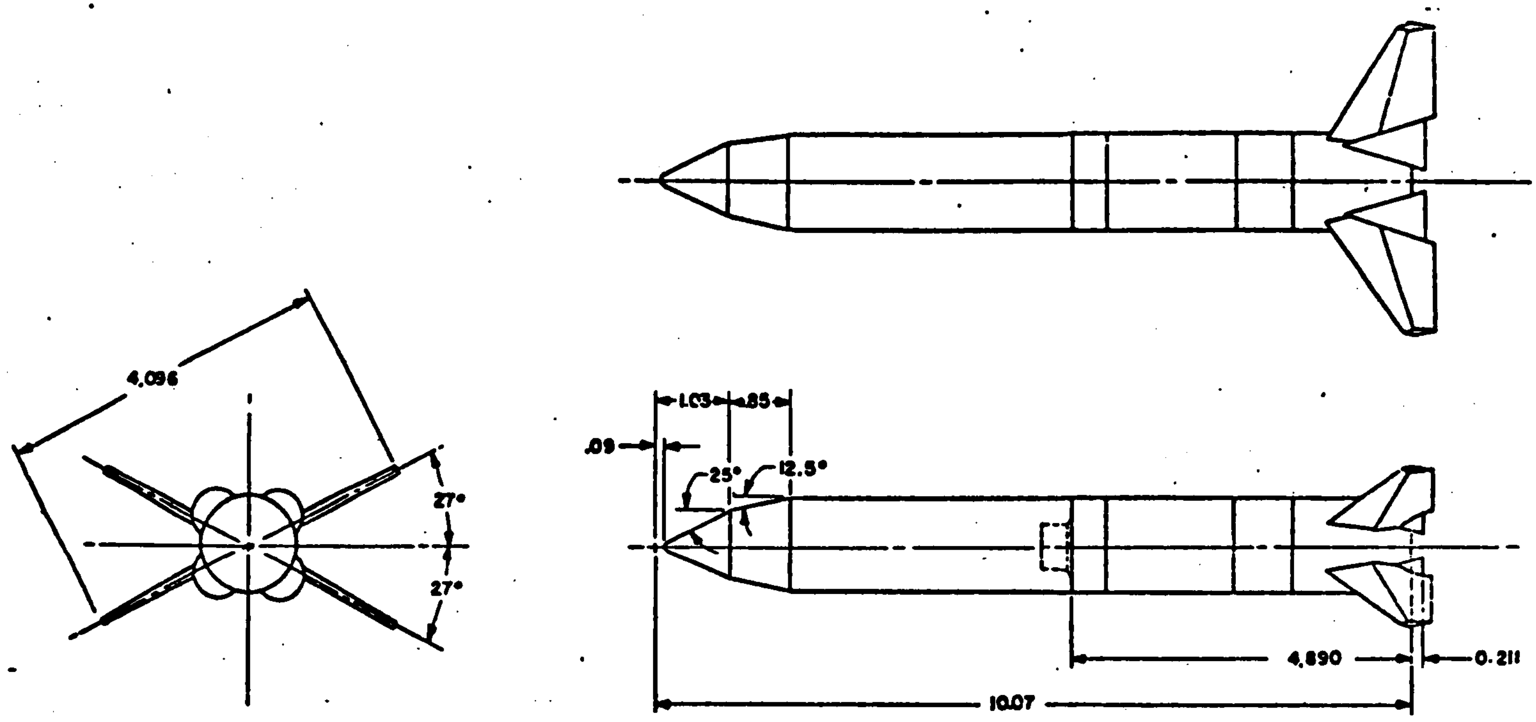

FIGURE 20.

0.003366 SCALE S-IC/MLV CONE FRUSTUM CYLINDER (G)

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 613

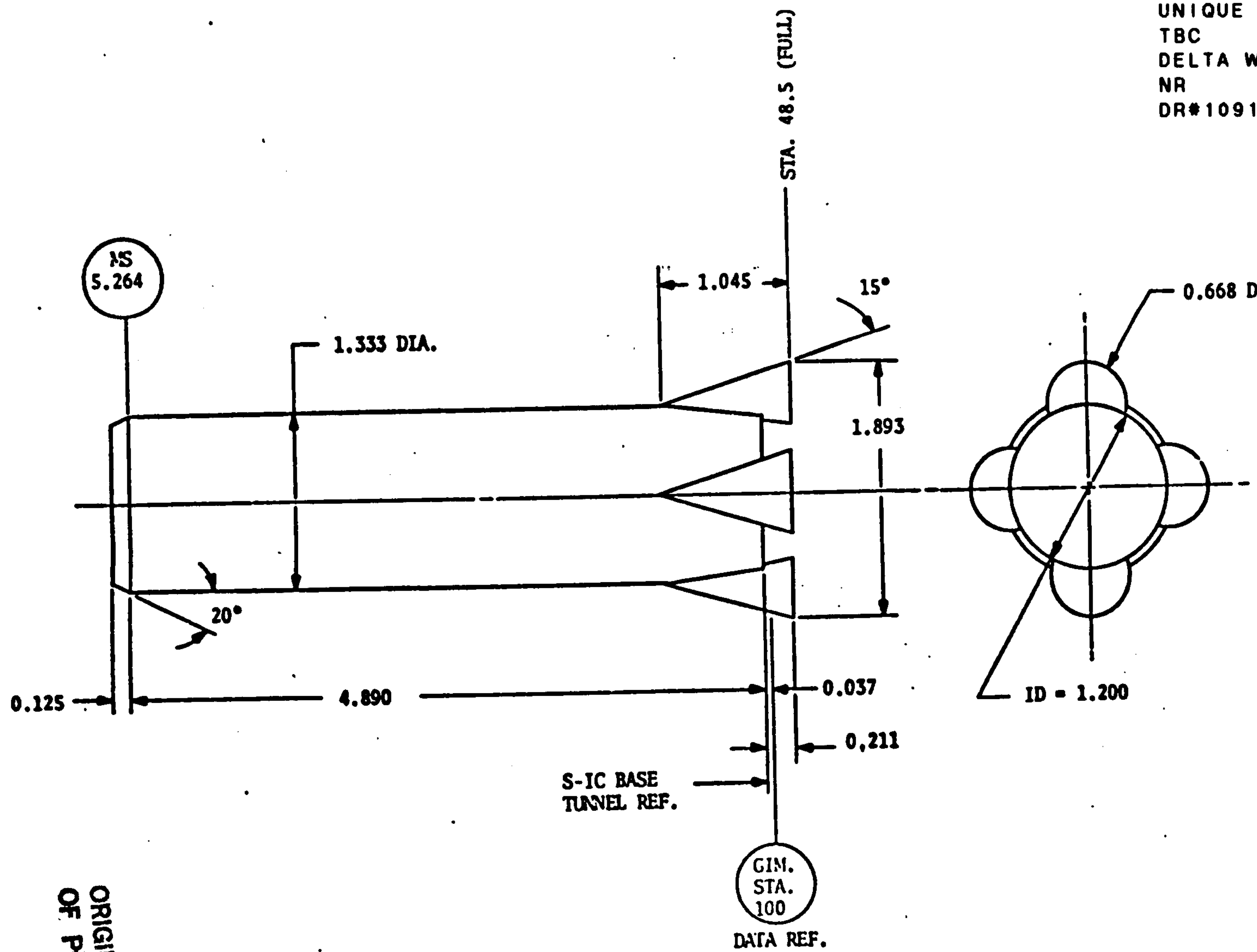

FIGURE 21. SATURN V/S-IC BOOSTER
0.003366 SCALE

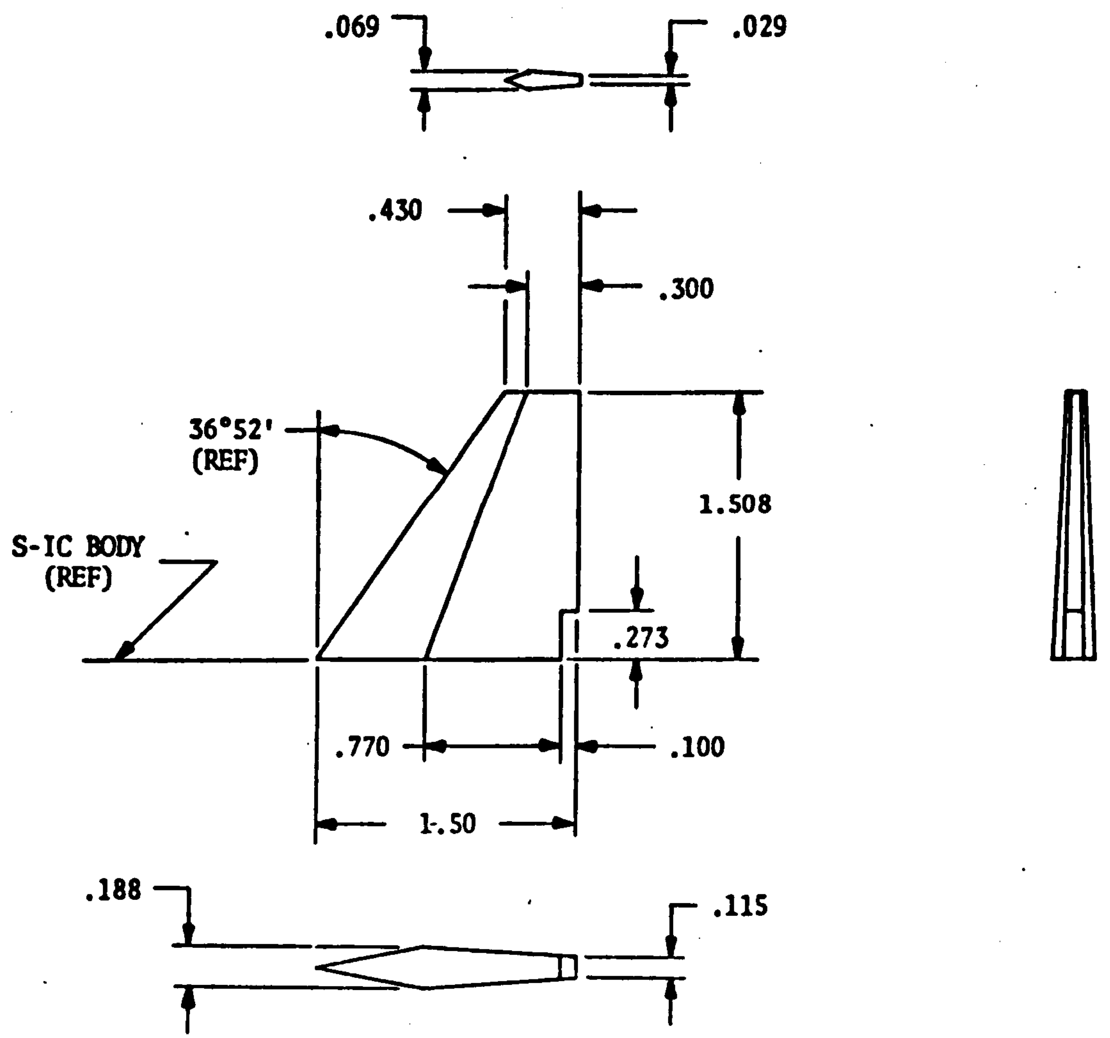

FIGURE 22. 884 SQ. FT. S-IC FIN

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 615

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 616

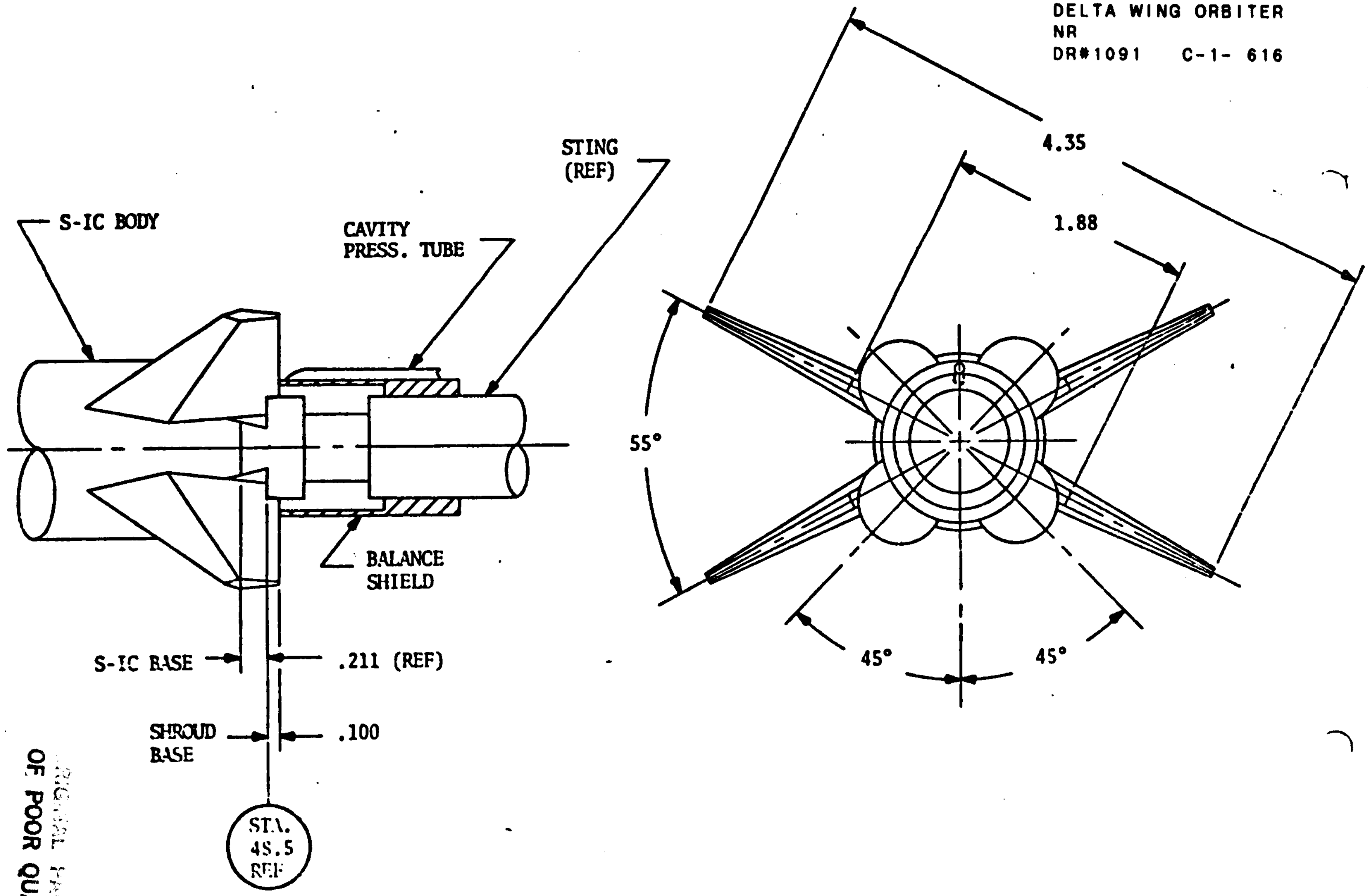

FIGURE 23. 884 SQ. FT. S-IC 27° FIN CONFIGURATION

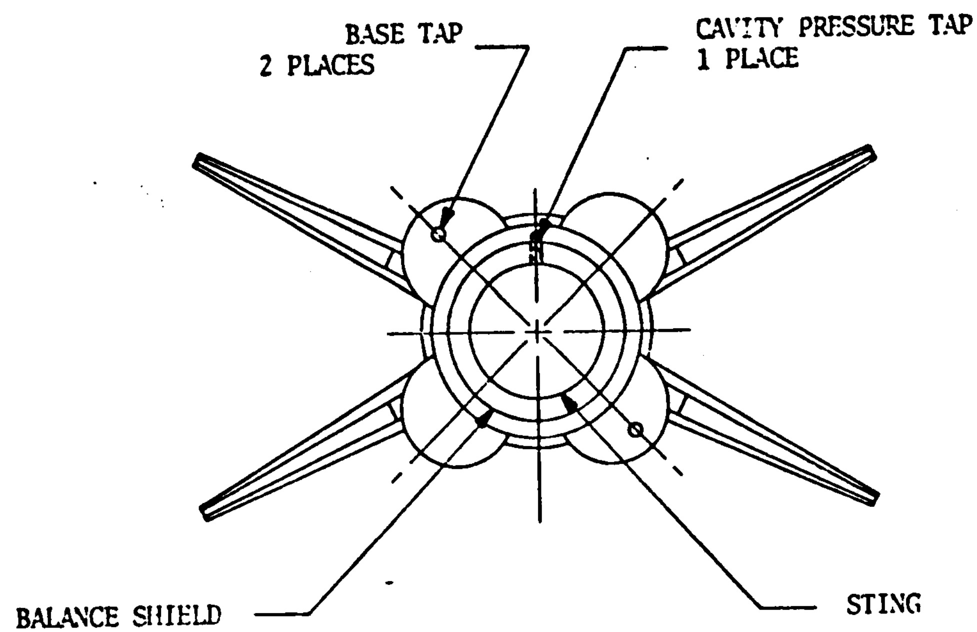

FIGURE 24. BASE PRESSURE TAP LOCATIONS

UNIQUE CONFIGS. BOOSTER
TBC
DELTA WING ORBITER
NR
DR#1091 C-1- 617

TEST MSFC TWT 470 DATA SET COLLATION SHEET

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 618
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)											
		α	β	i_o	i_{wo}	i_{ho}	ϕ_B		0.6	0.9	1.0	1.1	1.2	1.46	1.96	1.3				
R24011	BF₁OWHVS	A	0	0	+4	0	0	7	001/1	002/2	003/1	004/0	005/0	006/0	007/0					
R24021		A		0				7	028/0	027/0	026/0	025/0	024/0	023/0	022/0					
R24031		C		-2				7	029/0	030/0	031/0	032/0	033/0	034/0	035/0					
R24041				-4				7	036/0	037/0	[illegible]	039/0	040/0	041/0	042/0					
R24051	BOWHVS			0				7	043/0	044/0	045/0	046/0	047/0	048/0	049/0					
R24061				-2				7	050/2	051/0	052/0	053/0	054/0	055/0	056/0					
R24071				-4				7	057/0	058/0	059/0	060/0	061/0	062/0	063/0					
R24081	BF₁OWHVS			-1.05				8	064/0	065/0	066/0	067/0	068/2	069/1	070/0	170/0				
R24091						-5		7	071/0	072/0	073/0	074/0	075/0	076/0	077/0					
R24101	BOHVS				–	0		1			171/0									
R24111	BF₁OHVS				–			4			087/0	088/0	089/0	090/0						
R24121	BF₂OWHVS				+4		45	4			094/0		096/0	097/0		175/0				
R24131							0	4			101/0		103/0	104/0		174/0				
R24132		0	B					7	106/0	107/0	108/0		110/0	111/0	112/0	173/0				
R24022	BF₁OWHVS	0	B					8	113/0	114/0	115/2	116/0	117/0	118/0	119/0	172/0				
R24141		C	0		+2			4			143/0	144/0	145/0	146/0						
R24151	BF₁OWHV				+4			4			150/0	151/0	152/0	153/0						
R24161	BF₁OW₁HVS				+4			8	162/0	163/0	164/0	165/0	166/0	167/0	168/0	169/0				

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM	CN	CYN	CY	CBL	CA	CAF	CPB1	CPB2	CPCAV			10

COEFFICIENTS: → IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

αA = -10, -8, -6, -4, -3, -2, -1, 0, 1, 2, 3, 4, 6, 8, 10

αC = -8, -6, -4, -3, -2, -1, 0, 1, 2, 3, 4, 6, 8

βB = -1.5, -1.0, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16

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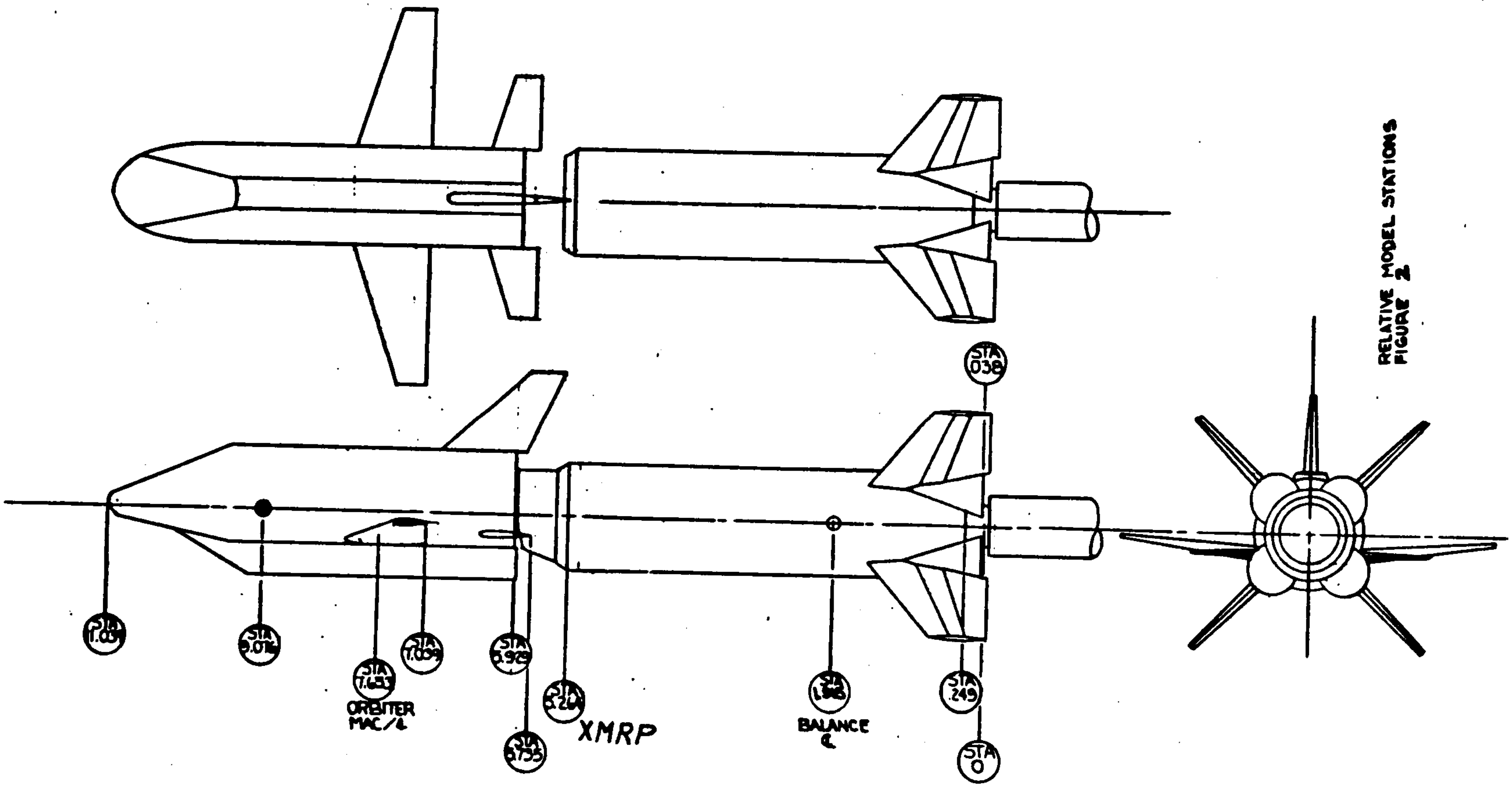
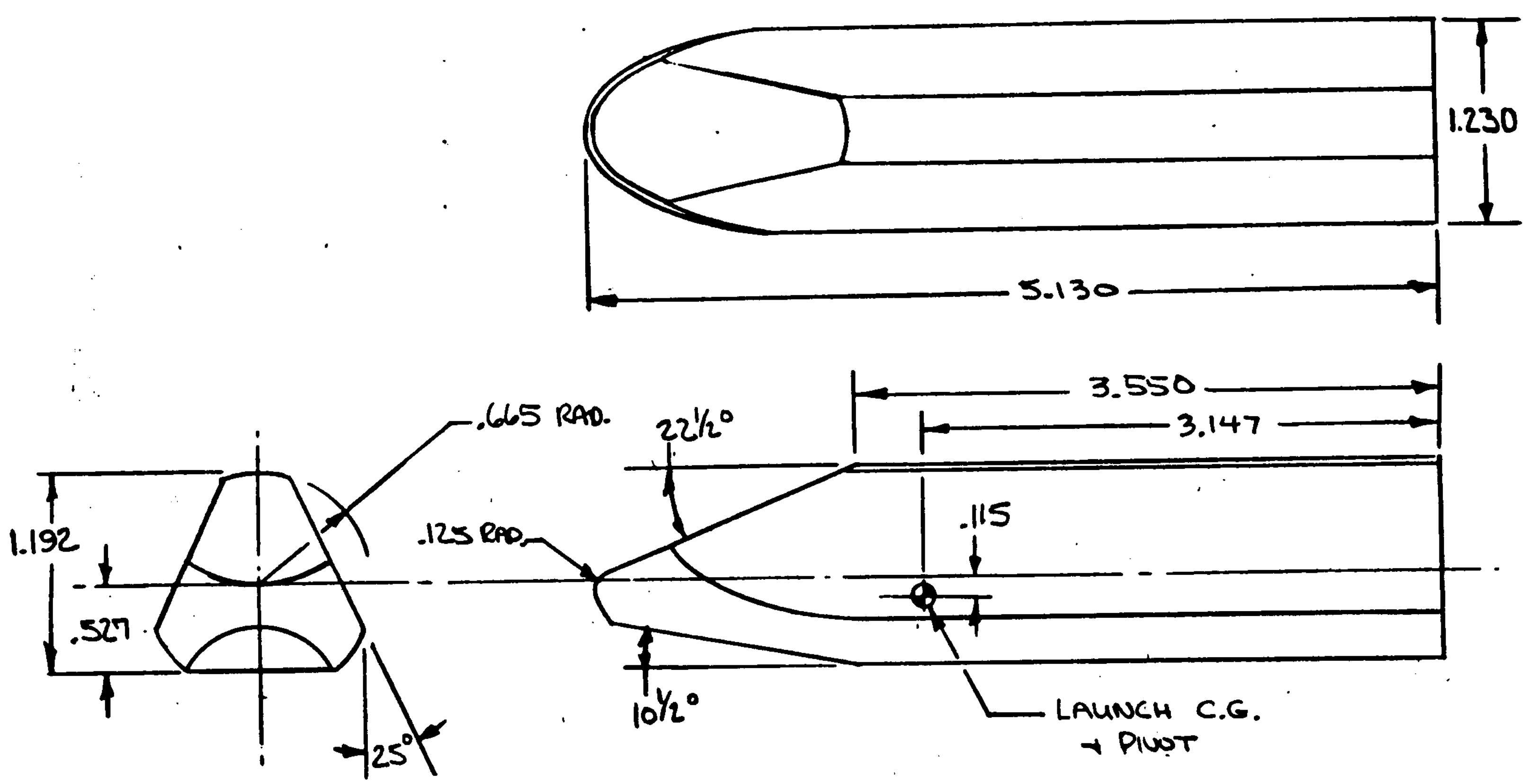


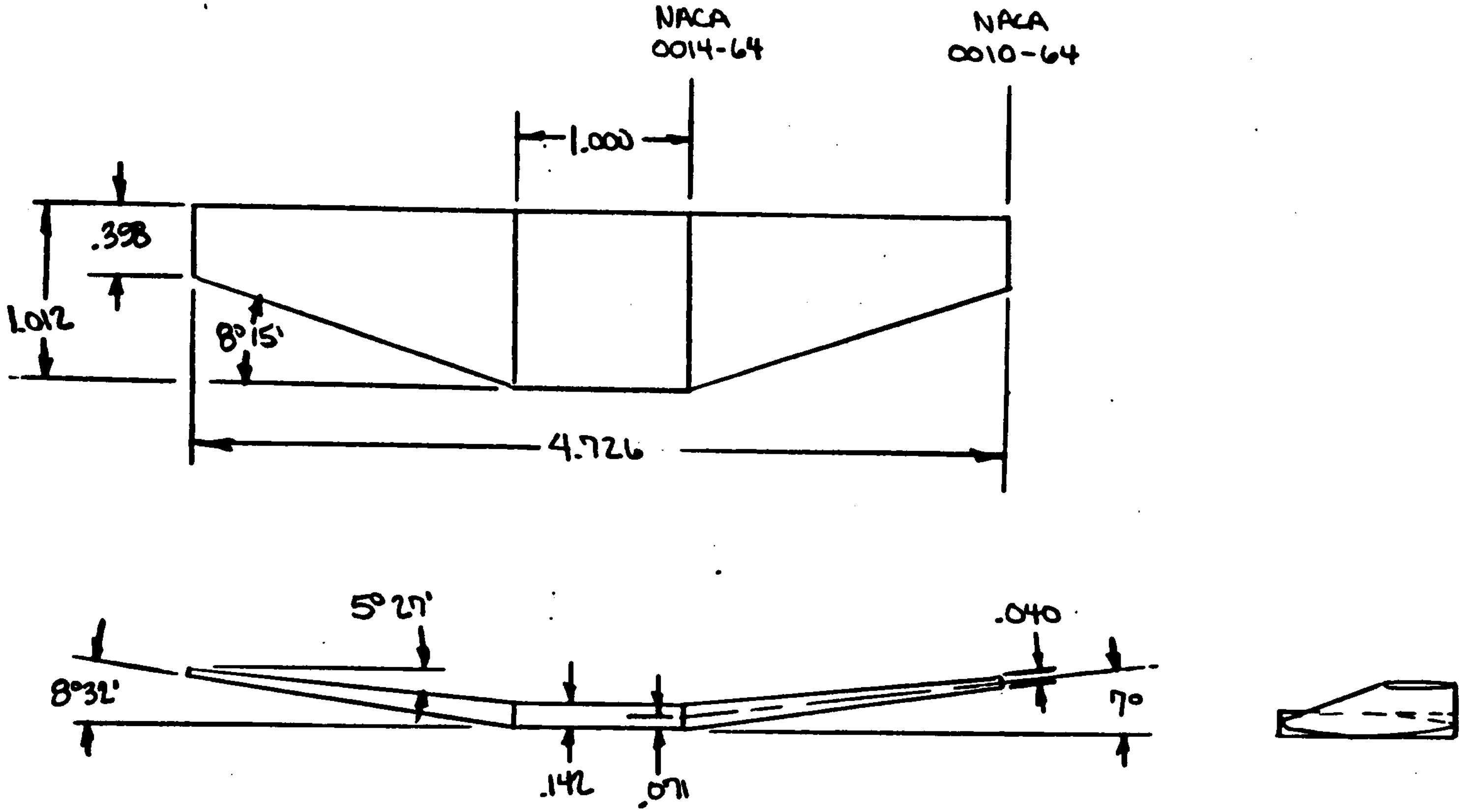
RELATIVE MODEL STATIONS
FIGURE 2

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 619

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 620



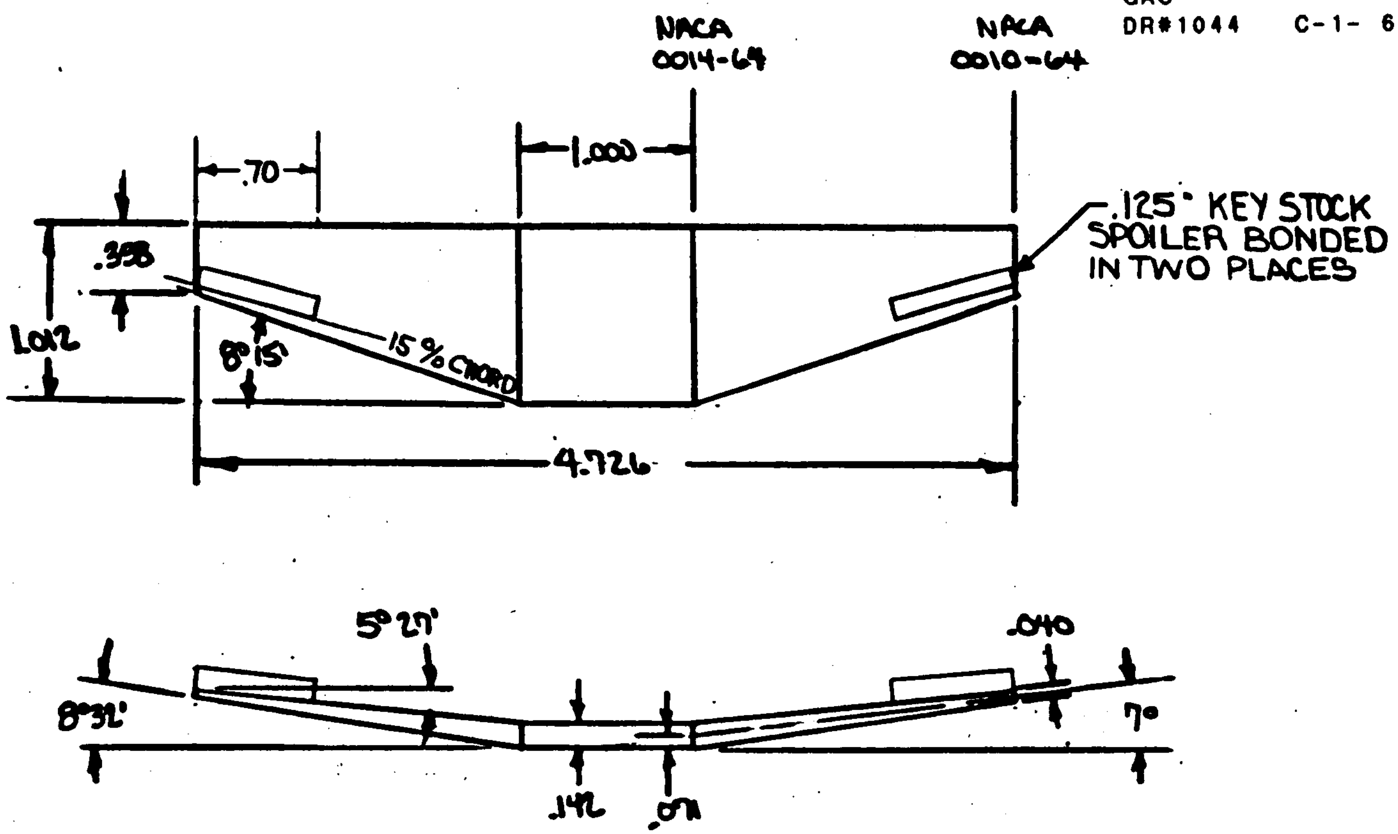
ORBITER BODY - 0
FIGURE 3



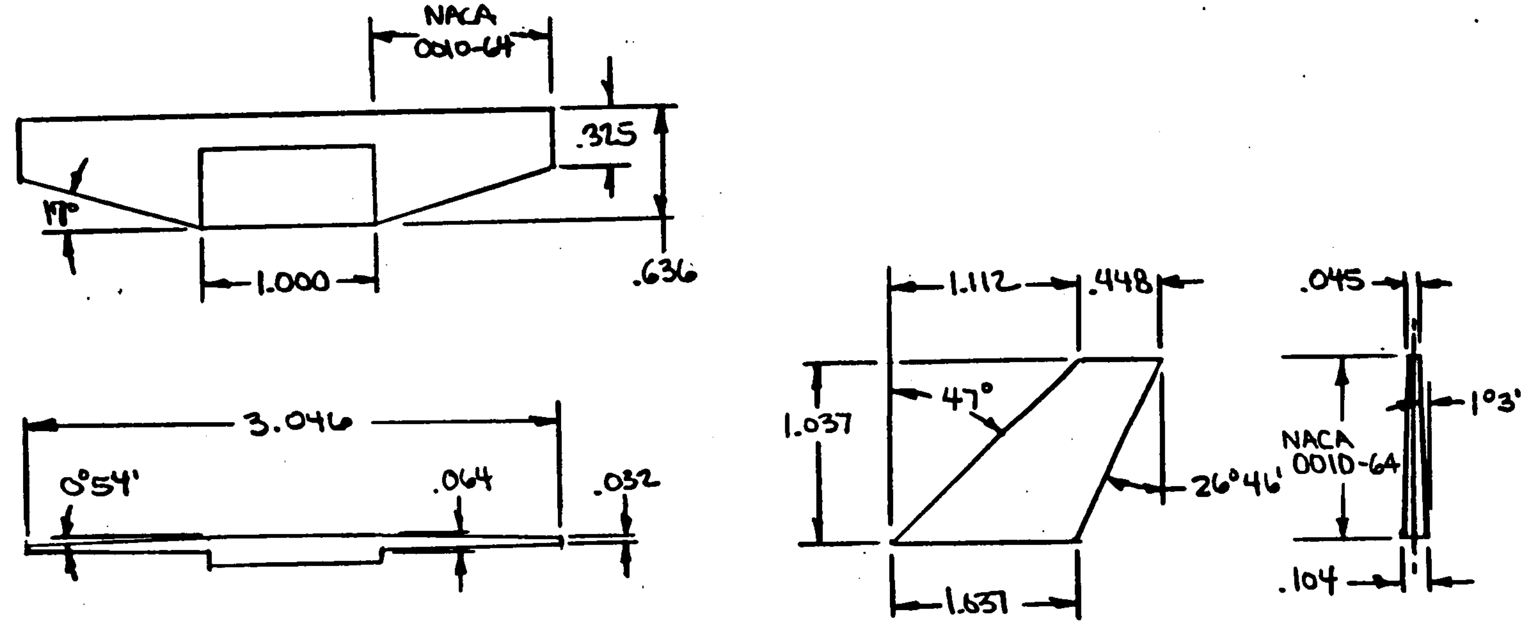
ORBITER WING - W
FIGURE 4

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 621

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 622



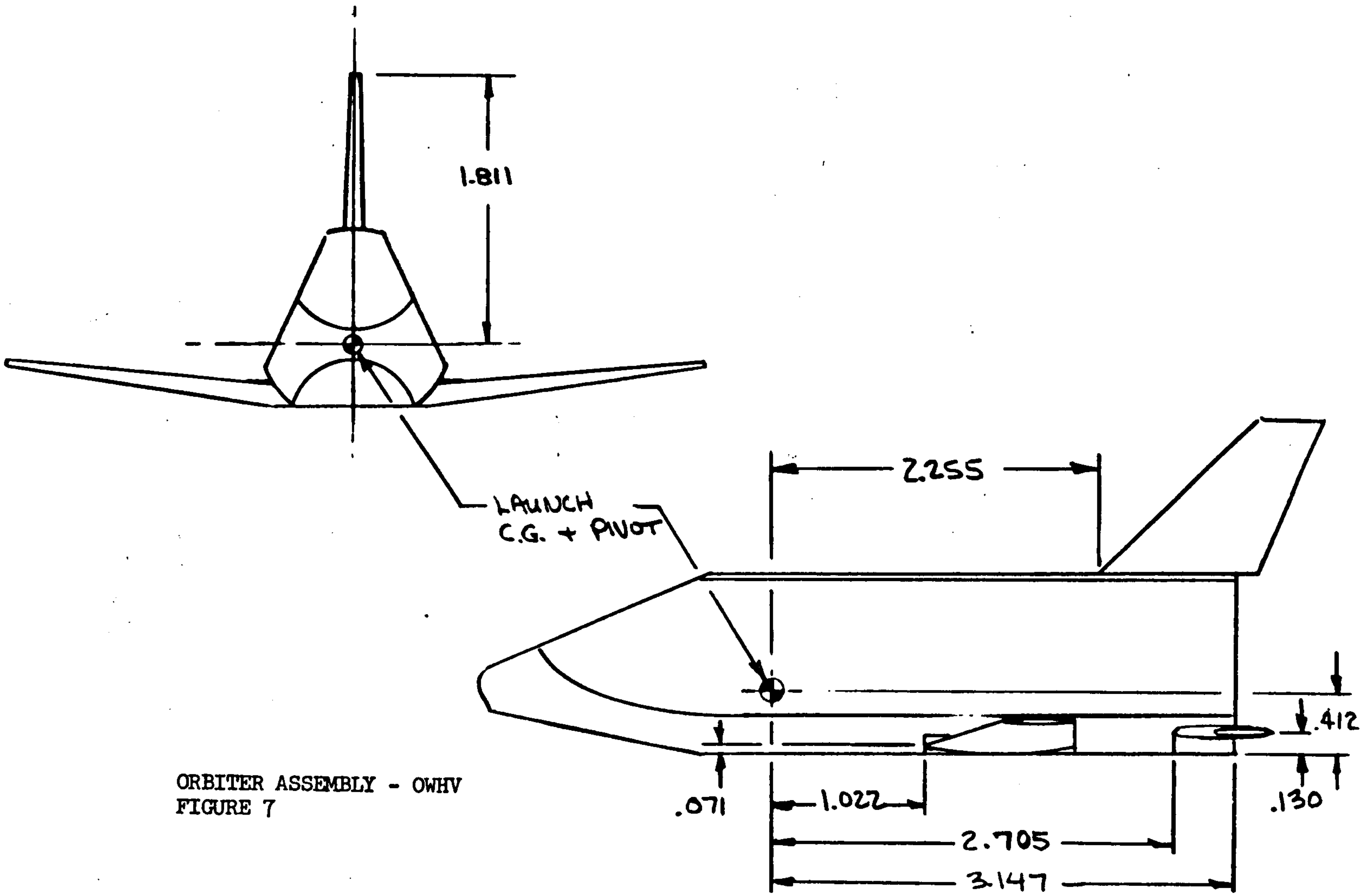
ORBITER WING WITH SPOILERS W_1
FIGURE 5



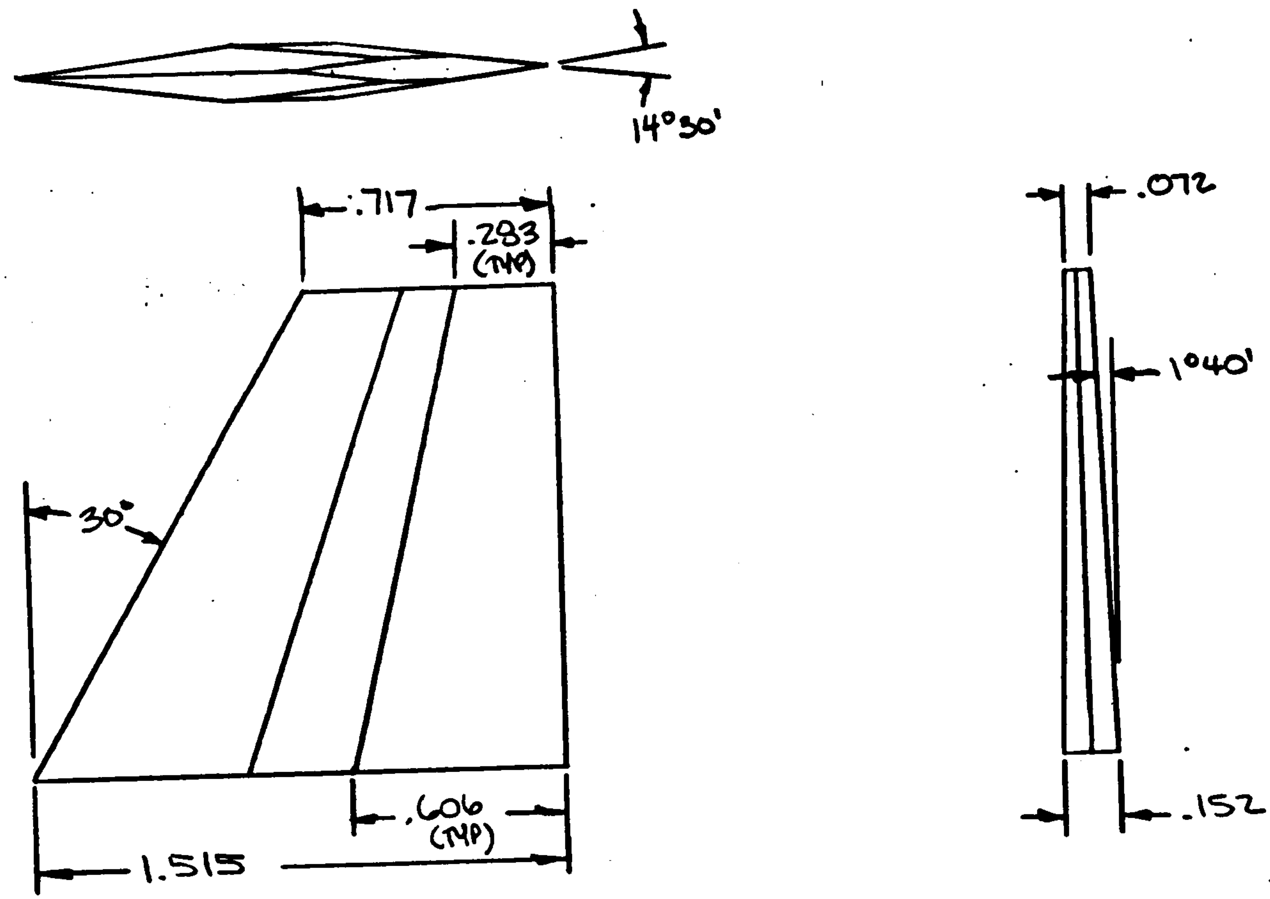
ORBITER HORIZONTAL TAIL H,
VERTICAL TAIL - V
FIGURE 6

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 623

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044   C-1- 624



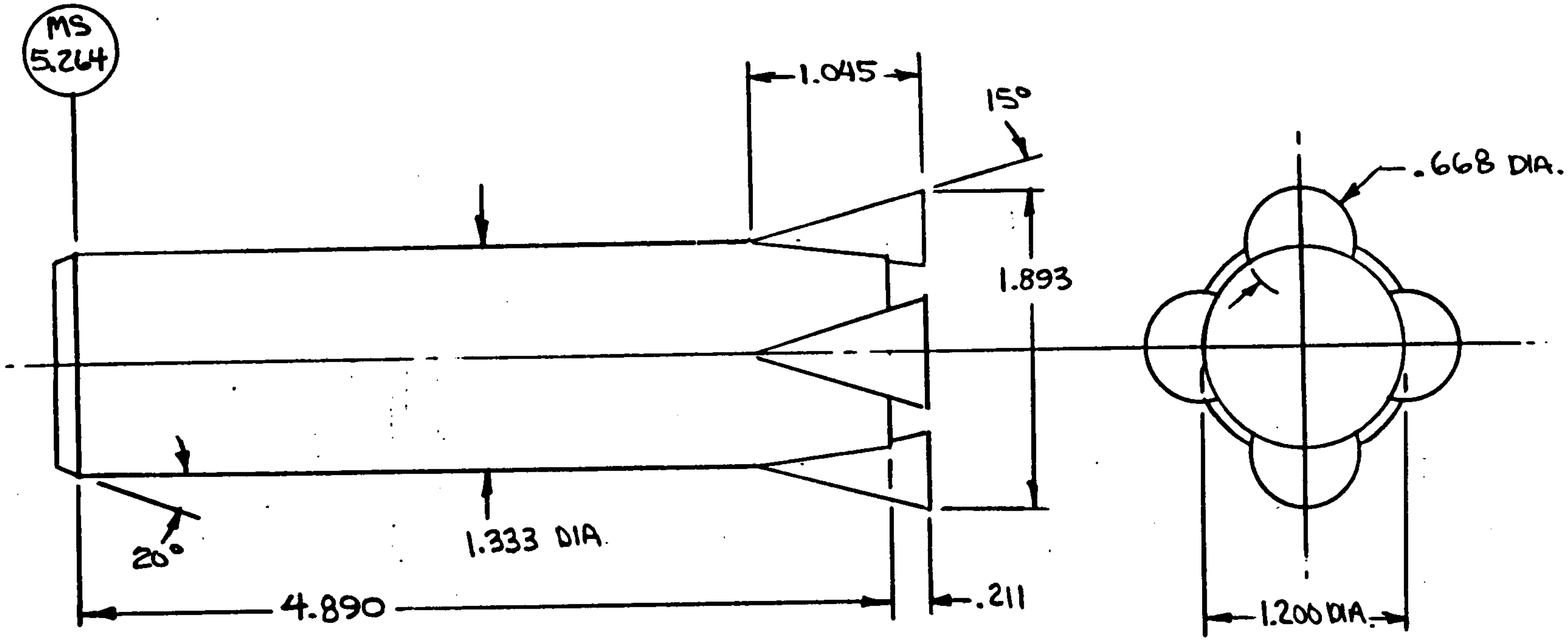
ORBITER ASSEMBLY - OWHV
FIGURE 7



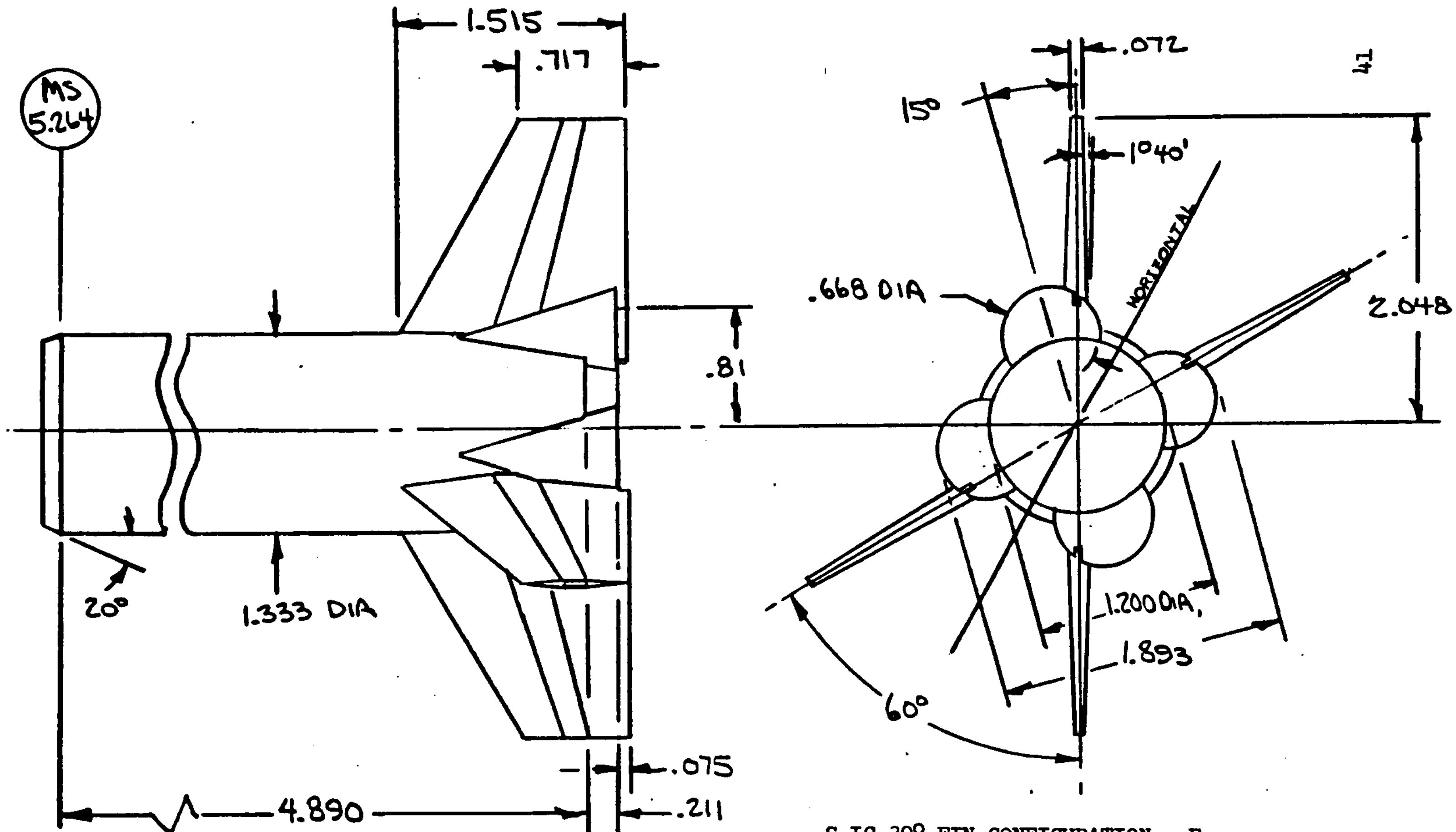
900 FT^2 S-IC FIN
FIGURE 8

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 625

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 626



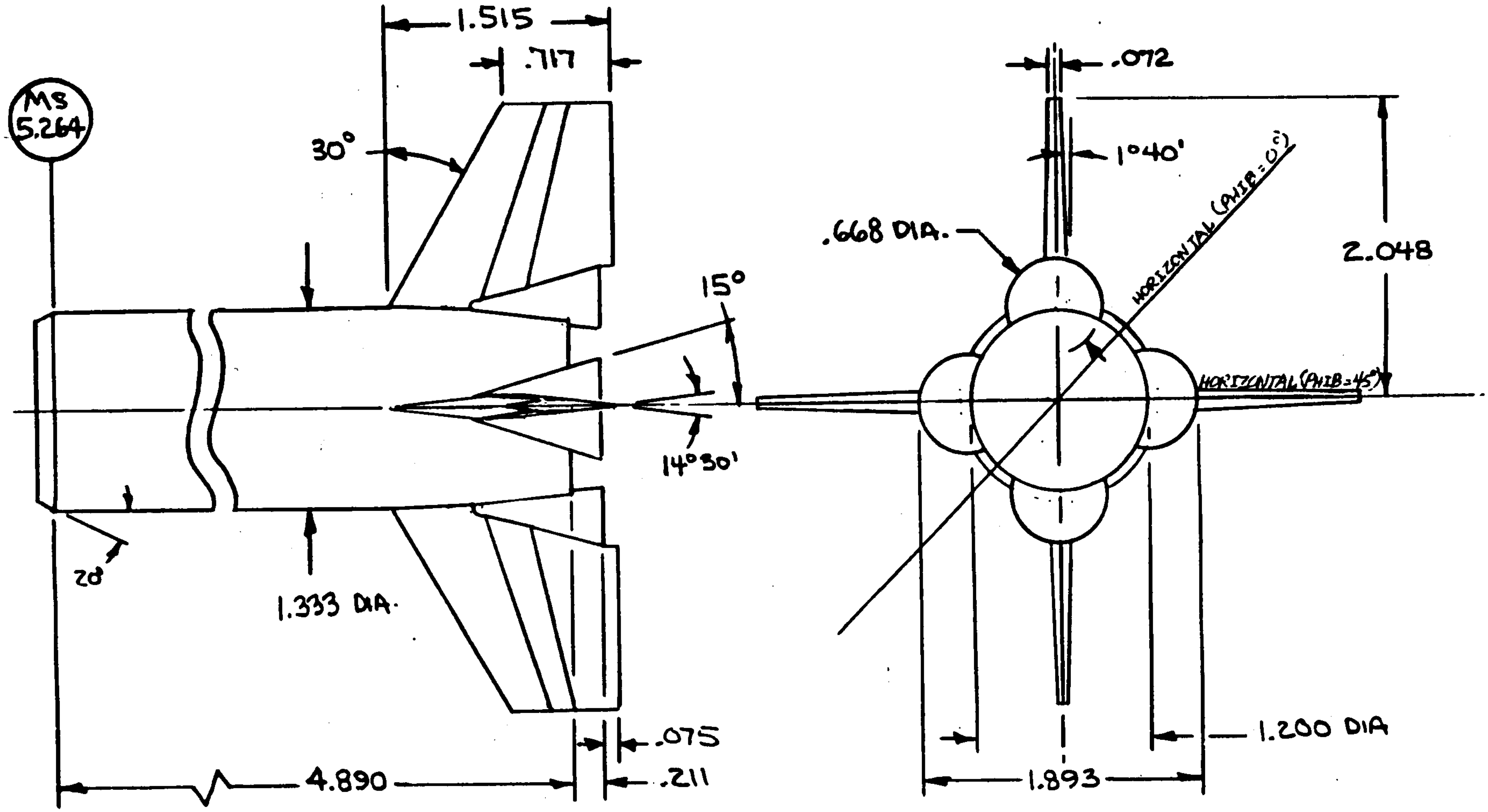
S-IC BODY - B
FIGURE 9



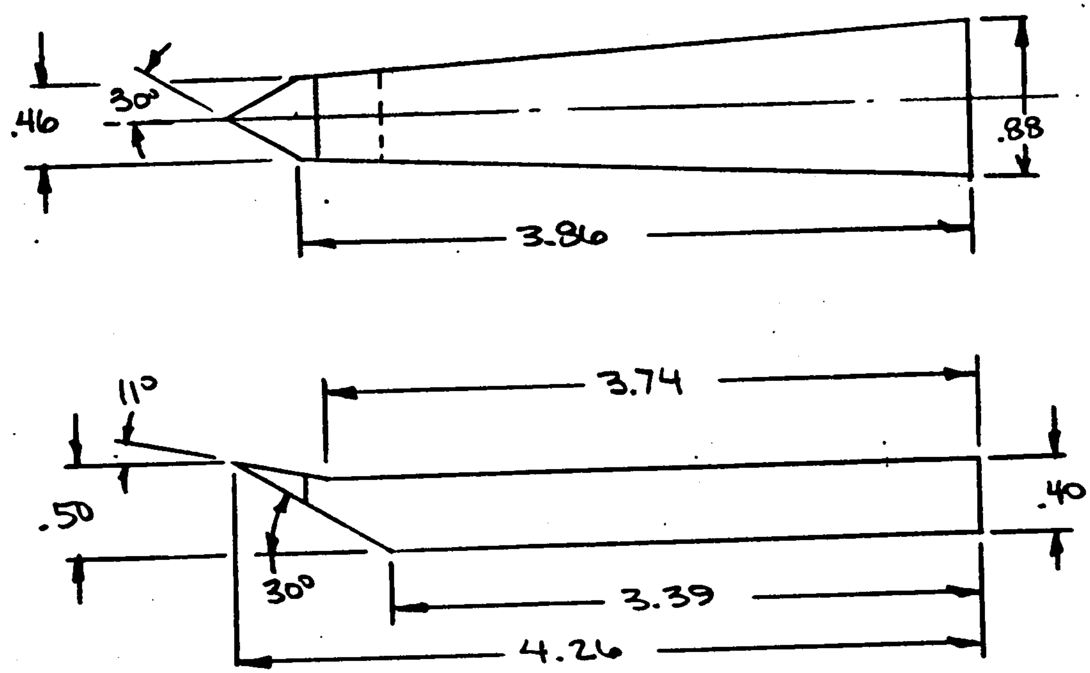
S-IC 30° FIN CONFIGURATION - F_1
FIGURE 10

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044   C-1- 627

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 628

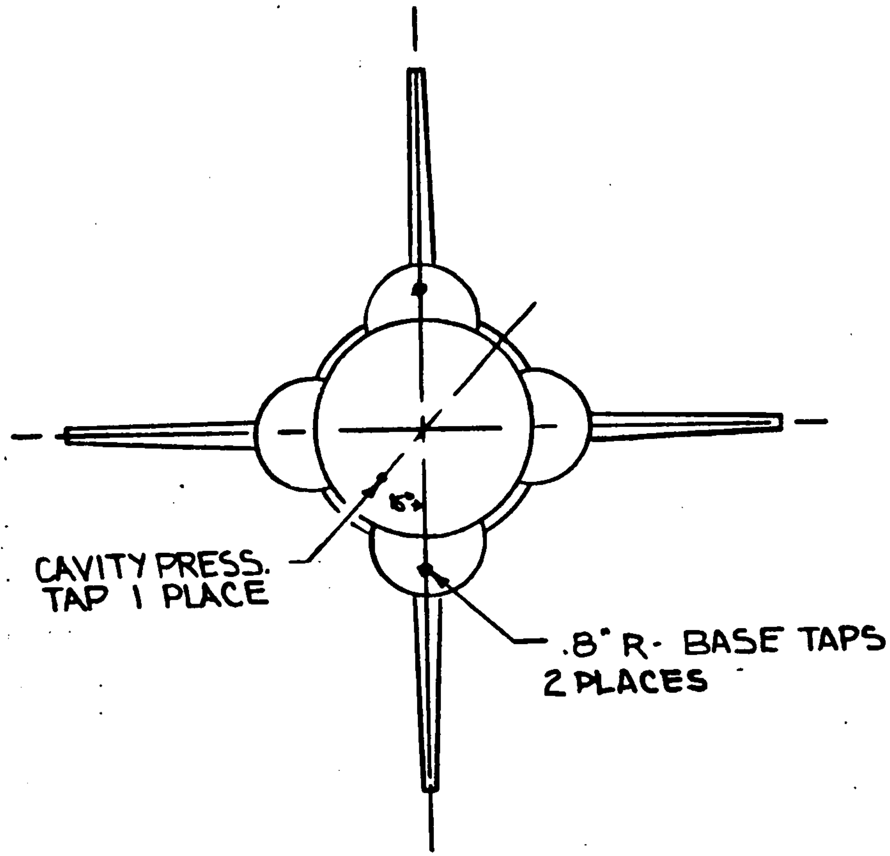


S-IC 45° FIN CONFIGURATION - F_2
FIGURE 11



STRONGBACK - S
FIGURE 12

UNIQUE CONFIGS. BOOSTER
TBC
STRAIGHT WING ORBITER
GAC
DR#1044 C-1- 629



BASE PRESSURE TAP LOCATIONS
FIGURE 13

TEST DELCTUT #503 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

T III L 4-33 PIGGYBACK

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.0	1.1	1.2	1.46	1.96	3.48	4.96			
345101	$L_1 + O_1$	A	0					7	001 0	002 C	003 C	004 0	005 0	016 C	017 0					
102	↓	B	6					9	011 C	010 C	012 C	013 0	014 0	015 C	019 C	029 C	025 C			
103	↓	0	C					7	026 0	025 0	024 C	023 0	022 C	021 0	020 C					
104	↓	-6	B					6		009 0	008 C	007 1	006 2	027 0	018 C					
105	$C_1 S_{12} + O_1$	A	0					1						068 C						
106	↓	B	6					1						069 0						
107	$C_1 + O_1$	A	0					9	075 0	074 0	076 C	077 0	078 C	067 0	063 0	080 C	079 C			
108	↓	B	6					6		073 0	072 0	071 0	070 0	066 C	062 0					
109	↓	0	0					3							064 0	081 0	052 0			
110	↓	-6	B					3							065 0	084 0	083 0			
111	$L_1 + O_1$	D	0					2								030 0	031 C			
301	$L_3 + O_1$	A	0					9	042 0	041 C	040 C	039 C	038 C	059 0	060 0	037 0	036 C			
302	↓	B	6					9	043 C	044 C	045 C	046 C	047 C	058 C	061 C	034 C	035 C			
303	↓	0	0					5		051 C	050 C	049 0	048 0	057 C						
304	↓	-6	B					5		052 0	053 0	054 0	055 0	056 C						
305	↓	D	0					2								033 C	032 0			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CY CBL CYN CAF CABB CABΦ CABS CMT

COEFFICIENTS:

α or β SCHEDULES

A = -16, -14, -12, -10, -8, -6 ±4, ±2, 0   C = 0, ±2, ±4, +6 +8 +10

B = ±10, ±8, ±6, ±4 ±2, 0   D: 0, ±2, ±4, +6 -8 +10 +12, +14, +16

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 631

ORIGINAL PAGE IS
OF POOR QUALITY

TEST MSFC TWT-5C3 DATA SET COLLATION SHEET

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 632

T III L/H-33 TANDEM

[ ] POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.0	1.1	1.2	1.46	1.96	[illegible]	[illegible]			
R45 201	L_2+O_1	B	O					8	092 0	093 0	094 0	095 0	096 0	106 0	105 0		085 0			
202	↓	O	B					8	091 0	090 1	089 0	088 0	087 0	107 0	104 0		086 0			
203	C_2+O_1	B	O					3							103 0	101 0	102 0			
204	↓	O	B					3							098 0	100 0	099 0			
205	L_2+O_1	B	O					1		108 0										
401	L_4+O_1	B	O					8	109 0	110 0	111 0	112 0	113 0	120 0	121 0		123 0			
402	↓	O	B					8	118 0	117 0	116 0	115 0	114 0	119 0	122 0		124 0			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM | CN | CY | CBL | CYN | CAF | CABB | CAB4 | CABS | CAT

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES $B = \pm 10, \pm 8, \pm 6, \pm 4, \pm 2, 0$

NASA-MSFC-MAF

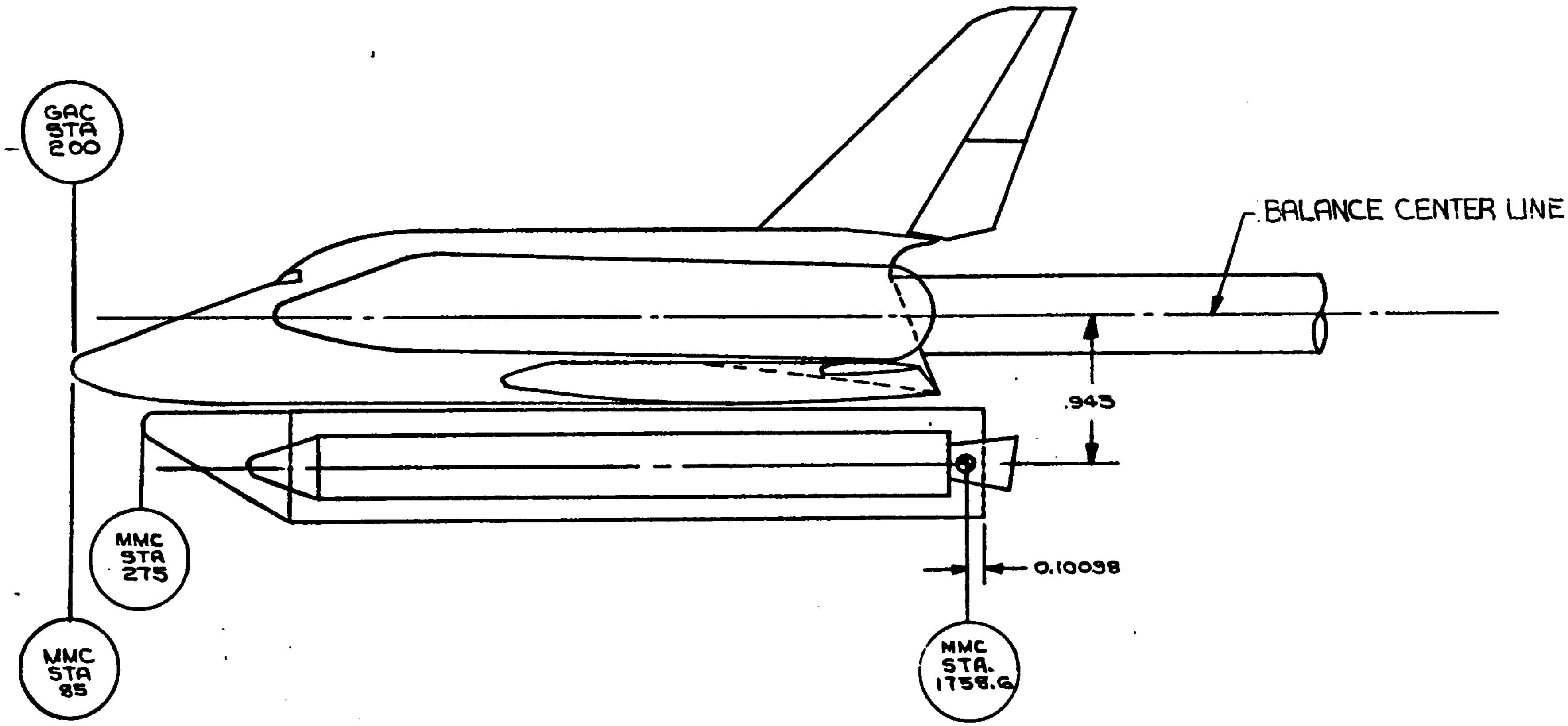
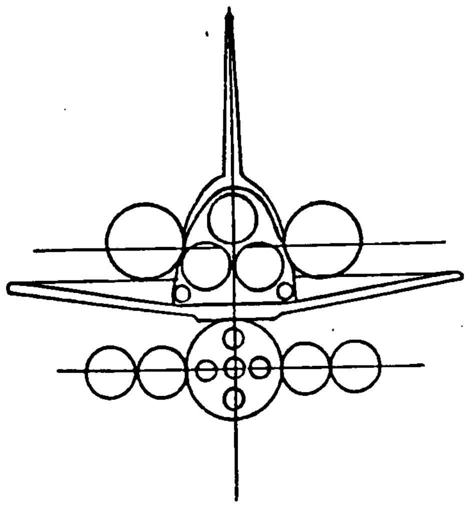


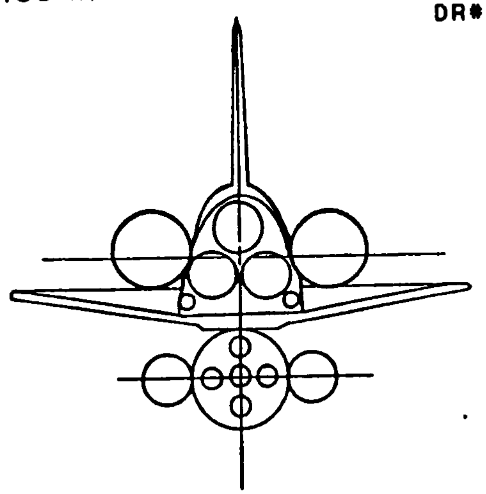
FIGURE 3. T III L (1207-4)/GAC H-33 PIGGYBACK SPREAD CONFIGURATION

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 633

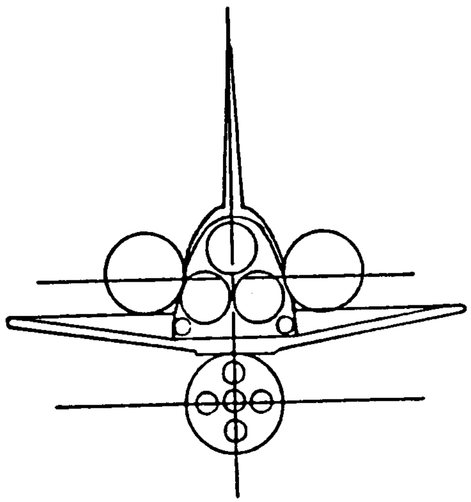
FIGURE 3. (CONTINUED)
TIIIL(1207-4)/GAC H-33 PIGGYBACK CONFIGURATIONS



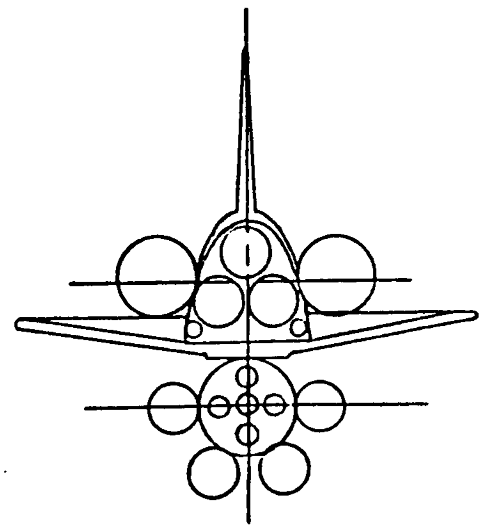
PIGGYBACK SPREAD
$L_1 + O_1$



PIGGYBACK SPREAD
$C_1S_{12} + O_1$



PIGGYBACK
$C_1 + O_1$



PIGGYBACK CLUSTER
$L_3 + O_1$

NOTE: OUTBOARD SRMS
CANTED ON 0.5^{0}
BASE OUT
ALL DIMENSIONS
IN INCHES (FULL SCALE)

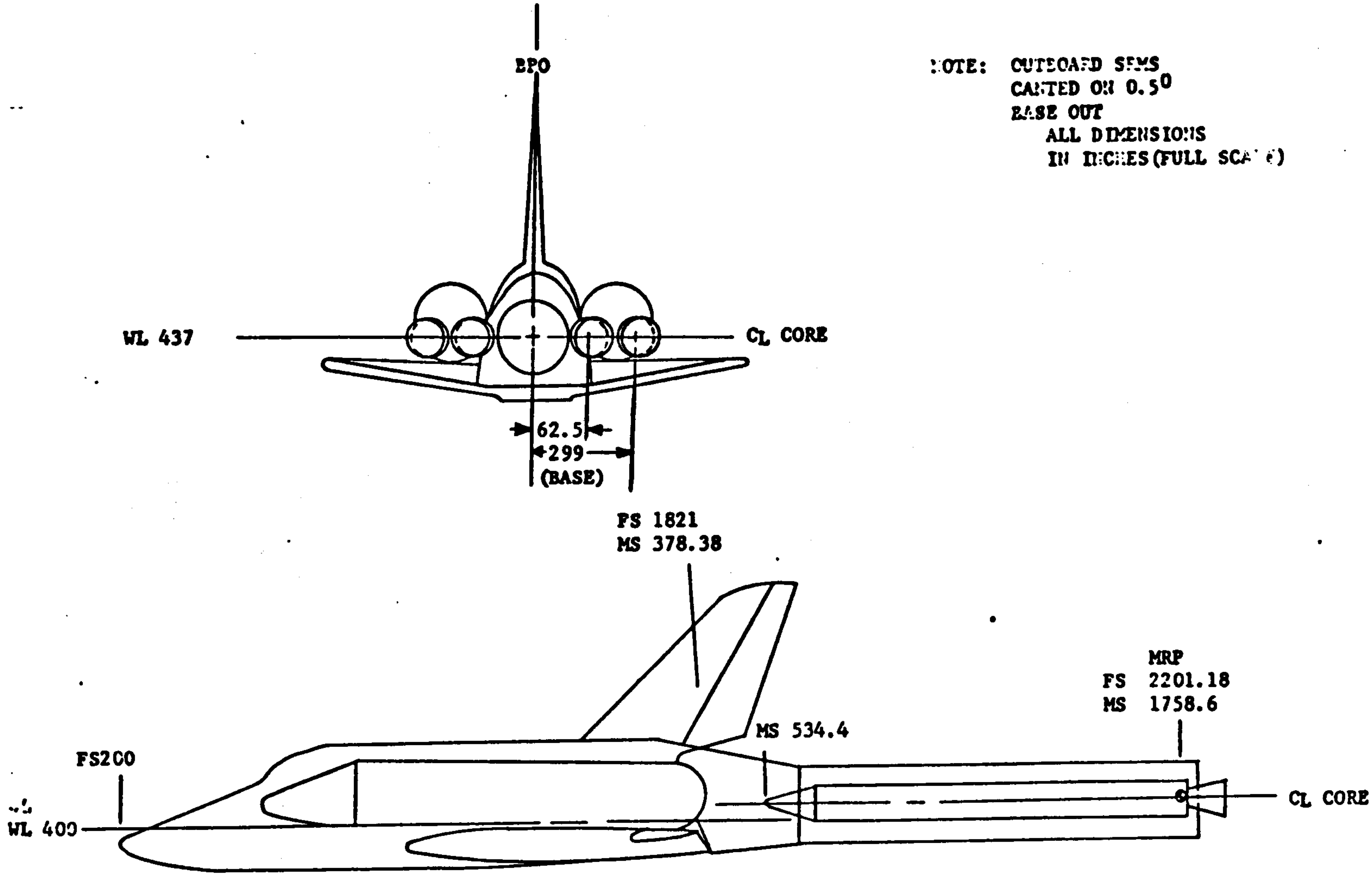


FIGURE 4. TIIIL (1207-4)/GAC H-33 (SPREAD) TANDEM CONFIGURATION

C-4

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 635

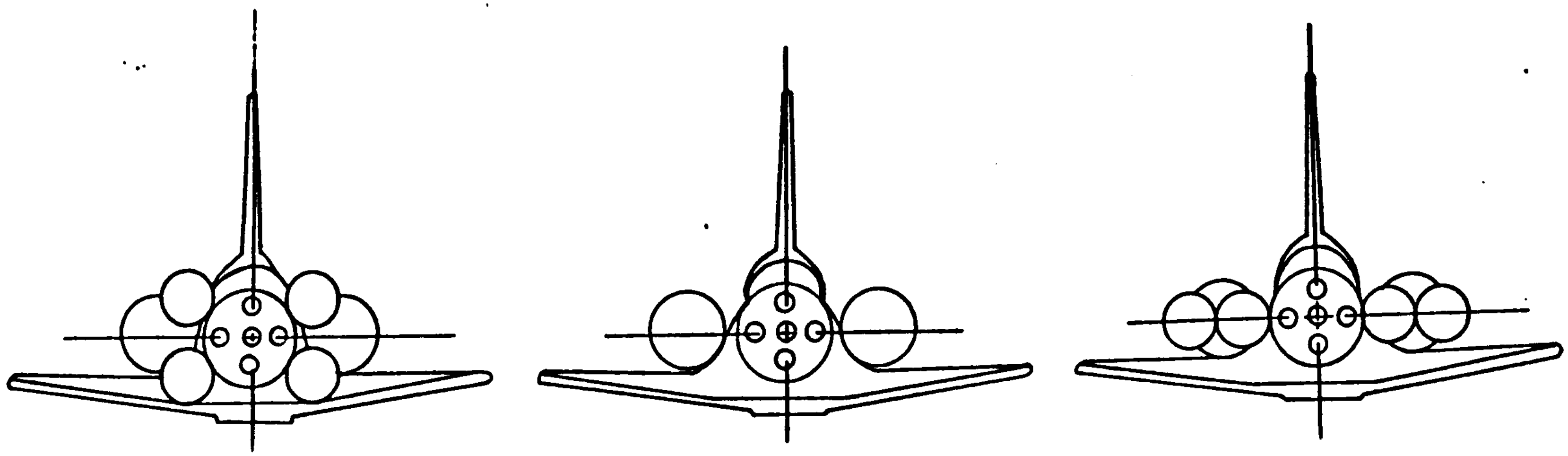


FIGURE 4. (CON'T) TIIIL(1207-4)/GAC H33 TANDEM CONFIGURATIONS

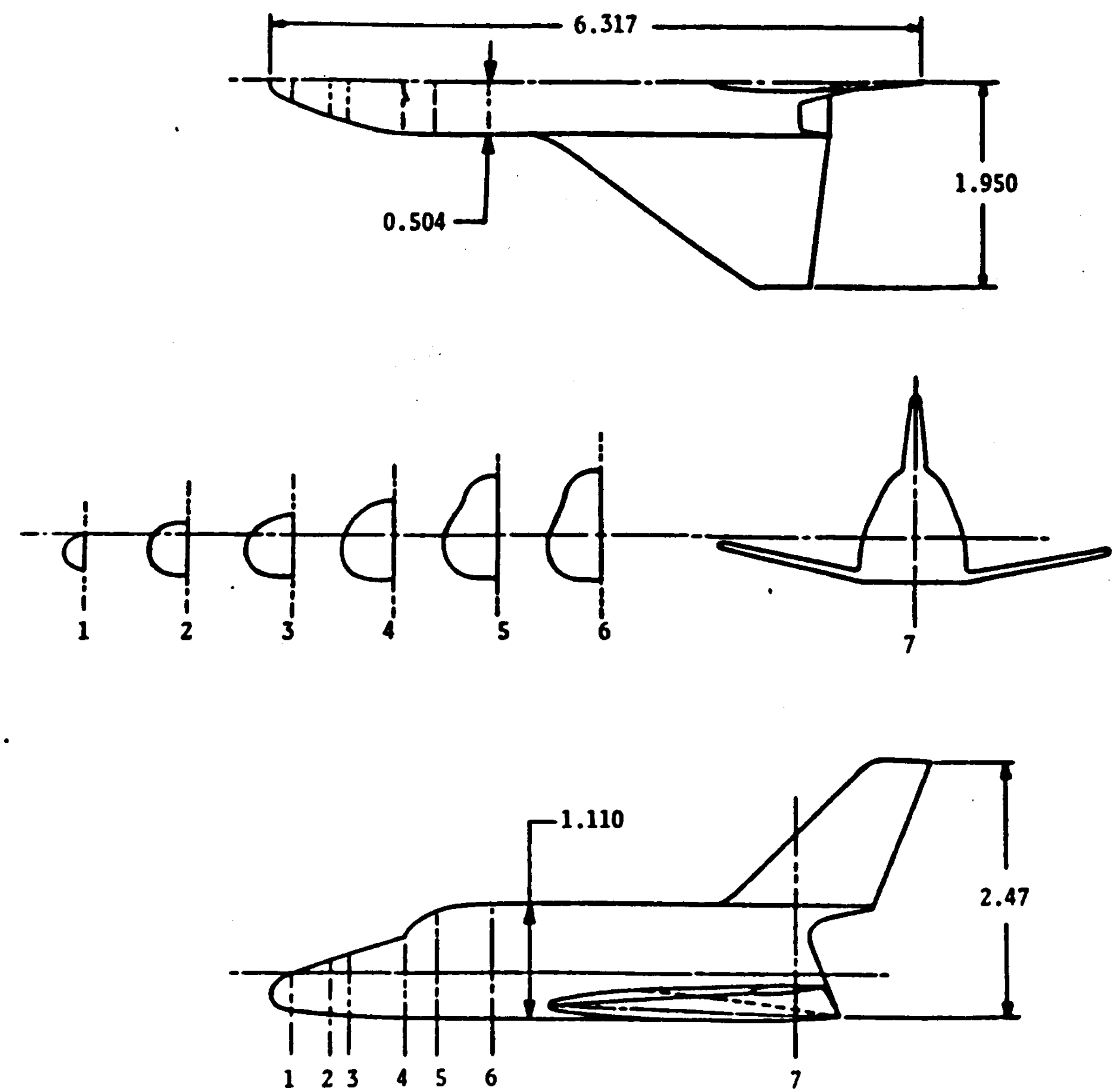


FIGURE 5. H-33 ORBITER (3-VIEW)

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 637

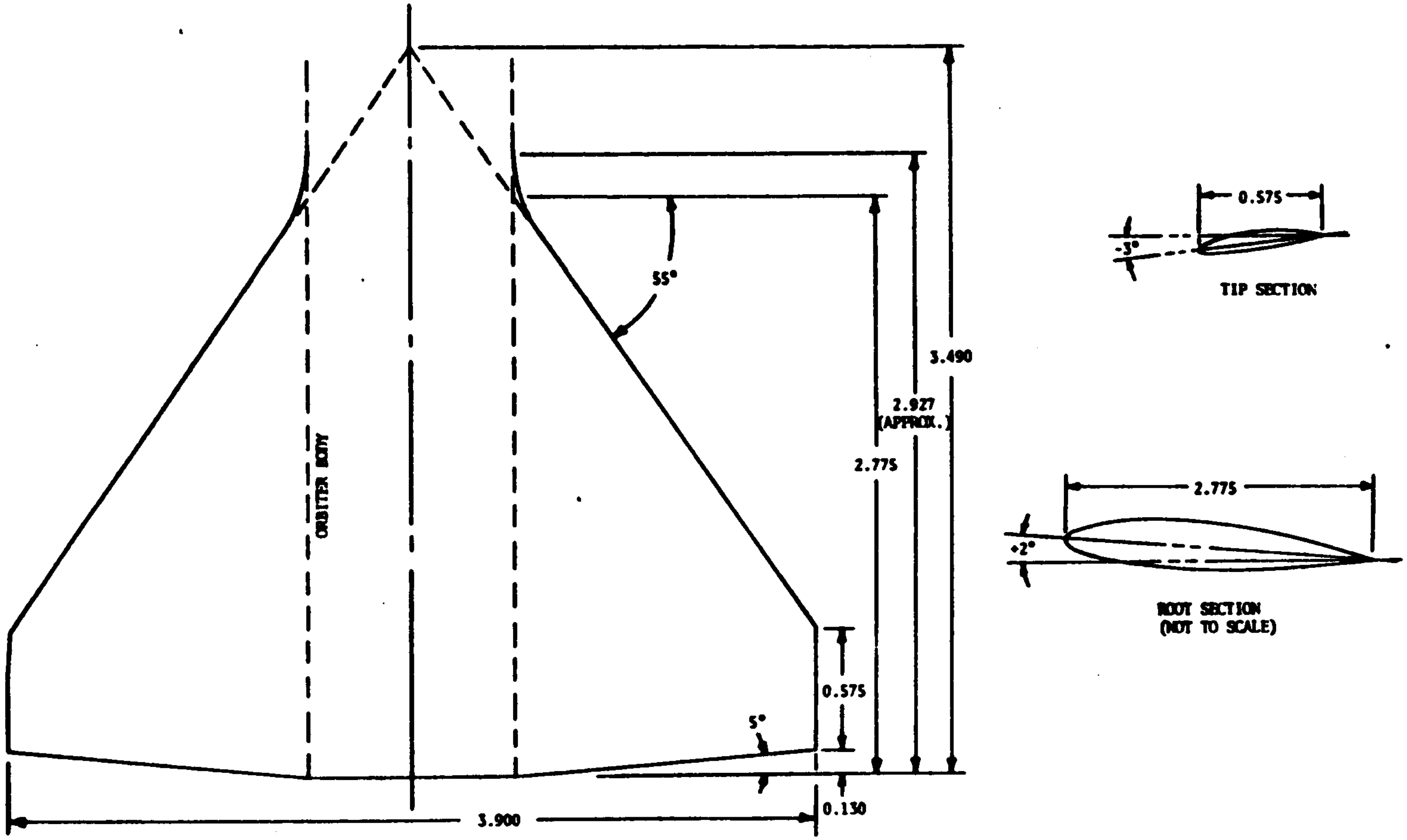


FIGURE 6. GRUMMAN H-33 ORBITER WING 0.003366 SCALE

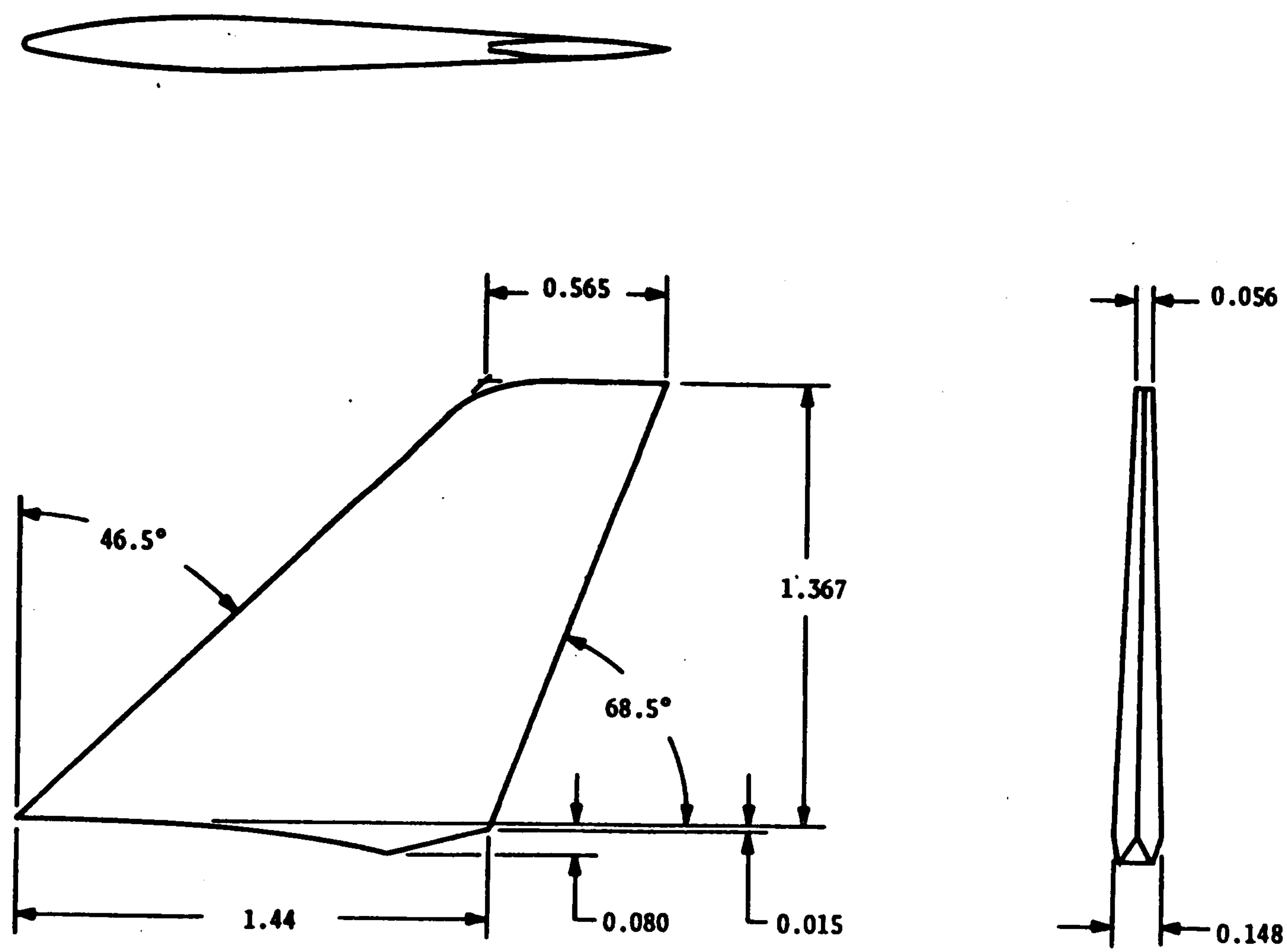


FIGURE 7. GRUMMAN H-33 ORBITER VERTICAL TAIL 0.003366 SCALE

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 639

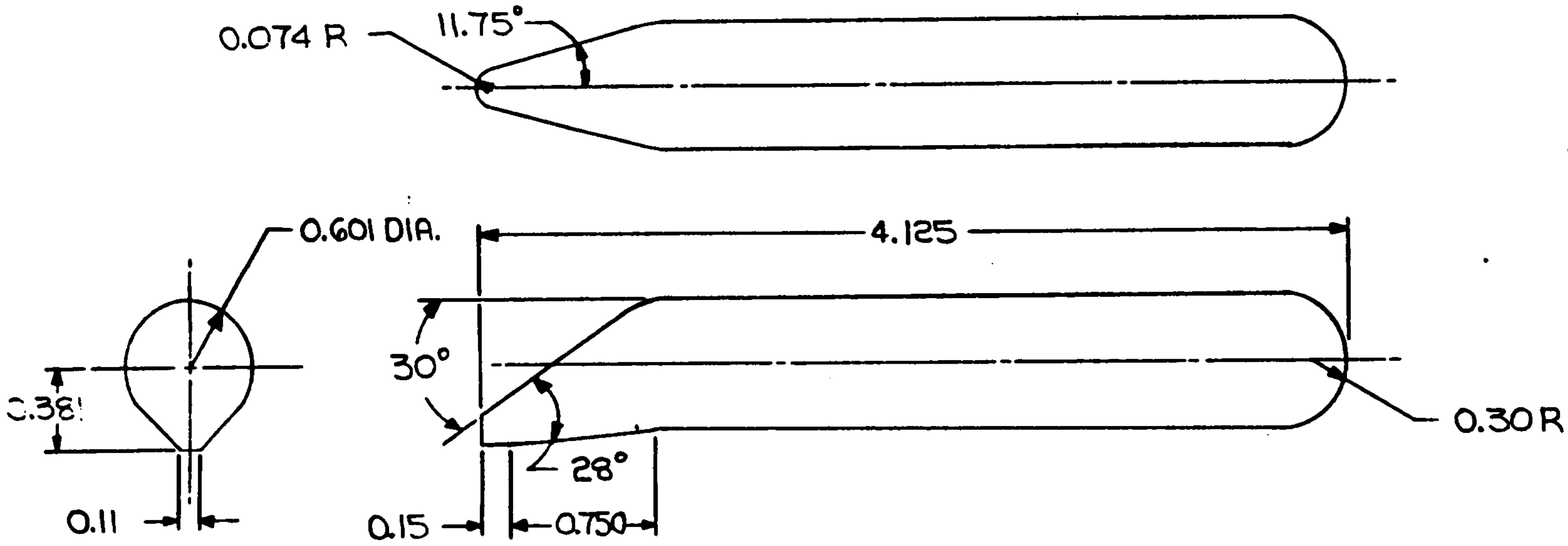


FIGURE 8. GRUMMAN H-33 ORBITER EXTERNALLY MOUNTED DROP TANK

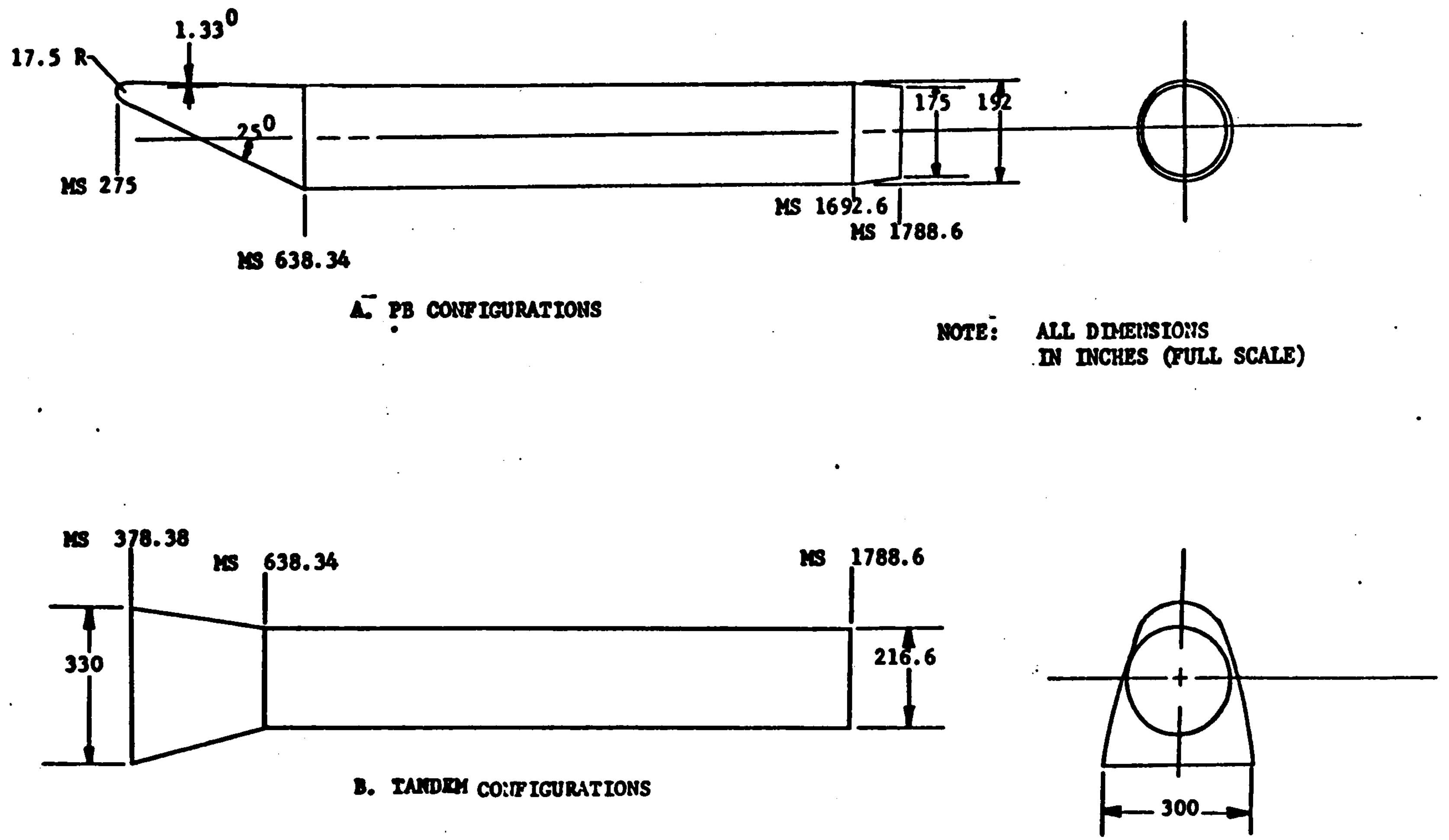
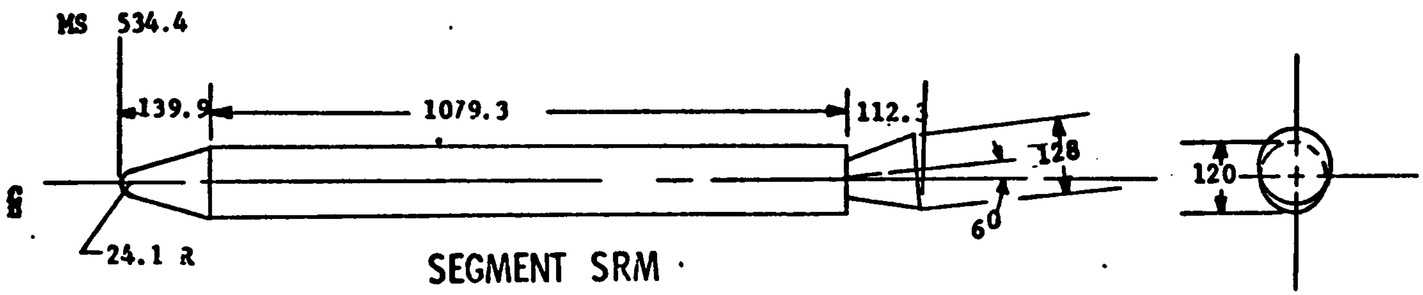


FIGURE 9. TIIIL CORE

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
GAC
DR#1188 C-1- 641



NOTE: ALL DIMENSIONS IN INCHES (FULL SCALE)

FIGURE 10. TIIIL SOLID ROCKET MOTOR (SRM)

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TEST MSFC TWT # 525 **DATA SET COLLATION SHEET**

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	.6	.9	1.0	1.1	1.2	1.46	1.96	2.74	3.48			
RA7001	O_1	A	0					8	046 0	045 0	044 0	043 0	042 0		047 0	001 0	002 0			
002	↓	A	-6					4	052 0		051 0		050 0		049 0					
003	↓	0	B					8	037 0	038 0	039 0	040 0	041 0		048 0	004 0	003 0			
004	$O_1 D_1$	A	0					7	027 0	028 0	029 0	030 0	031 0			008 0	007 0			
005	↓	0	B					7	036 0	035 0	034 0	033 0	032 0			005 0	006 0			
006	$O_1 D_1 L_2$	A	0					9	026 0	025 0	024 0	023 0	022 0	015 0	014 0	009 0	010 0			
007	↓	0	B					9	017 0	018 0	019 0	020 0	021 0	016 0	013 0	012 0	011 0			
008	$O_1 D_2 L_4$	[illegible]	0					9	053 0	054 0	055 0	056 0	057 0	076 0	077 0	082 0	081 0			
009	↓	A	-6					5	093 0		092 0		091 0		090 0		094 0			
010	↓	0	B					9	062 0	061 0	060 0	059 0	058 0	075 0	078 0	079 0	080 0			
011	O_1 [illegible]	A	0					8	072 0	071 0	070 0	069 0	068 0	073 0		086 0	085 0			
012	↓	[illegible]	E					8	063 0	064 0	065 0	066 0	067 0	074 0		087 0	088 0			
013	D_2 [illegible]	[illegible]	[illegible]					2								083 0	084 0			

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLN CD [illegible] CB CYN CAF CABO CABC CABS

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β SCHEDULES

α: -12, -?, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10, 12

β: -?, -?, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10, 12

UNIQUE CONFIGS. BOOSTER MMC
UNIQUE CONFIGS. ORBITER MMC
DR#1182 C-1- 643

FIGURE 4. DTO-7 ORBITER REENTRY CONFIGURATION, 01

THEORETICAL WING AREA	2970 FT^2
VERTICAL FIN AREA	443 FT^2
ELEVON AREA	515 FT^2
TOTAL WETTED AREA	10,600 FT^2
BASE AREA	443 FT^2

MODEL DIMENSIONS ARE SHOWN IN PARENTHEESIS

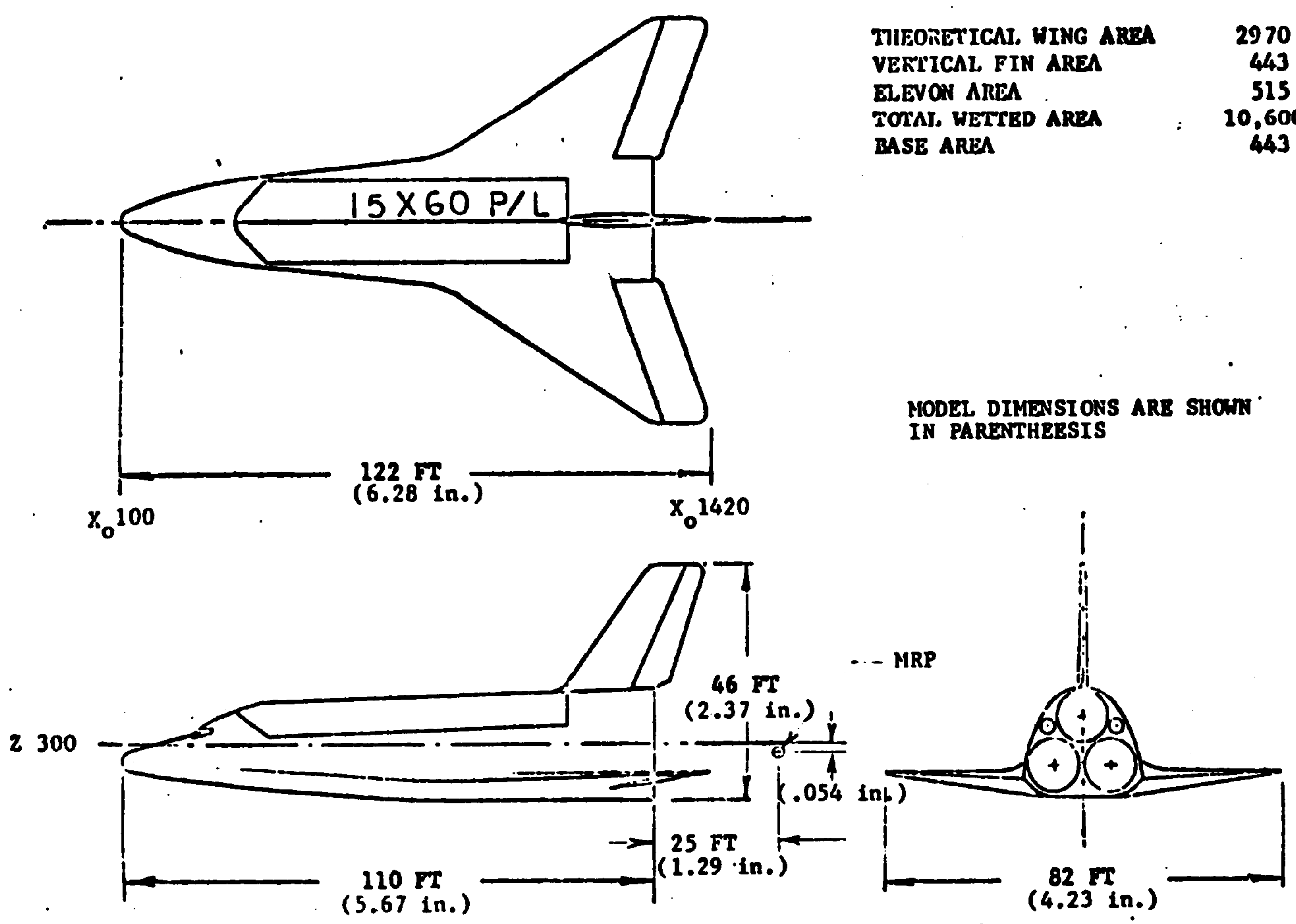
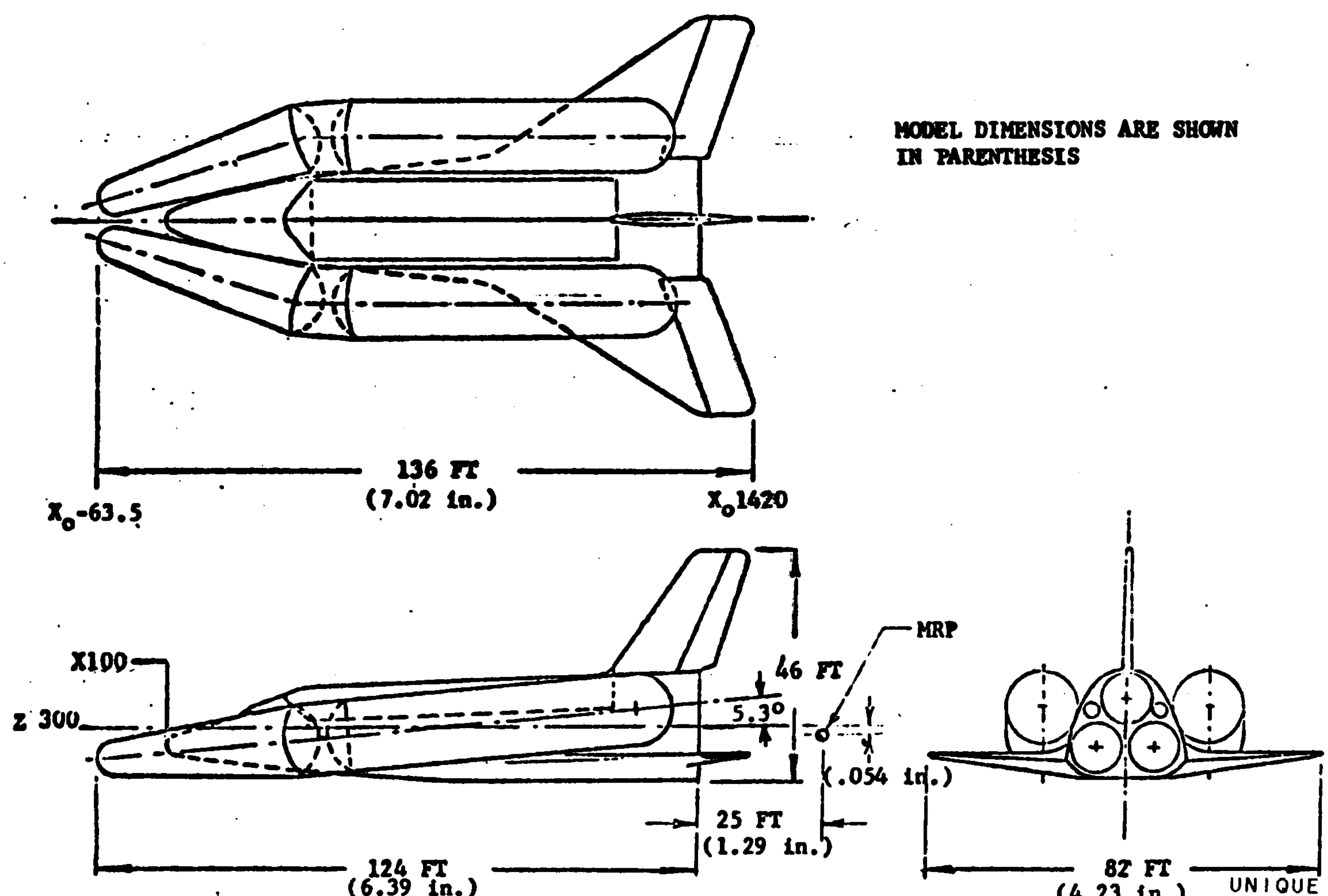


FIGURE 5. DTO-7 ORBITER ASCENT CONFIGURATION, 01 D1



UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 645

FIGURE 6. DTO-7/1205-4 OEL LAUNCH CONFIGURATION, 01 D1 L2

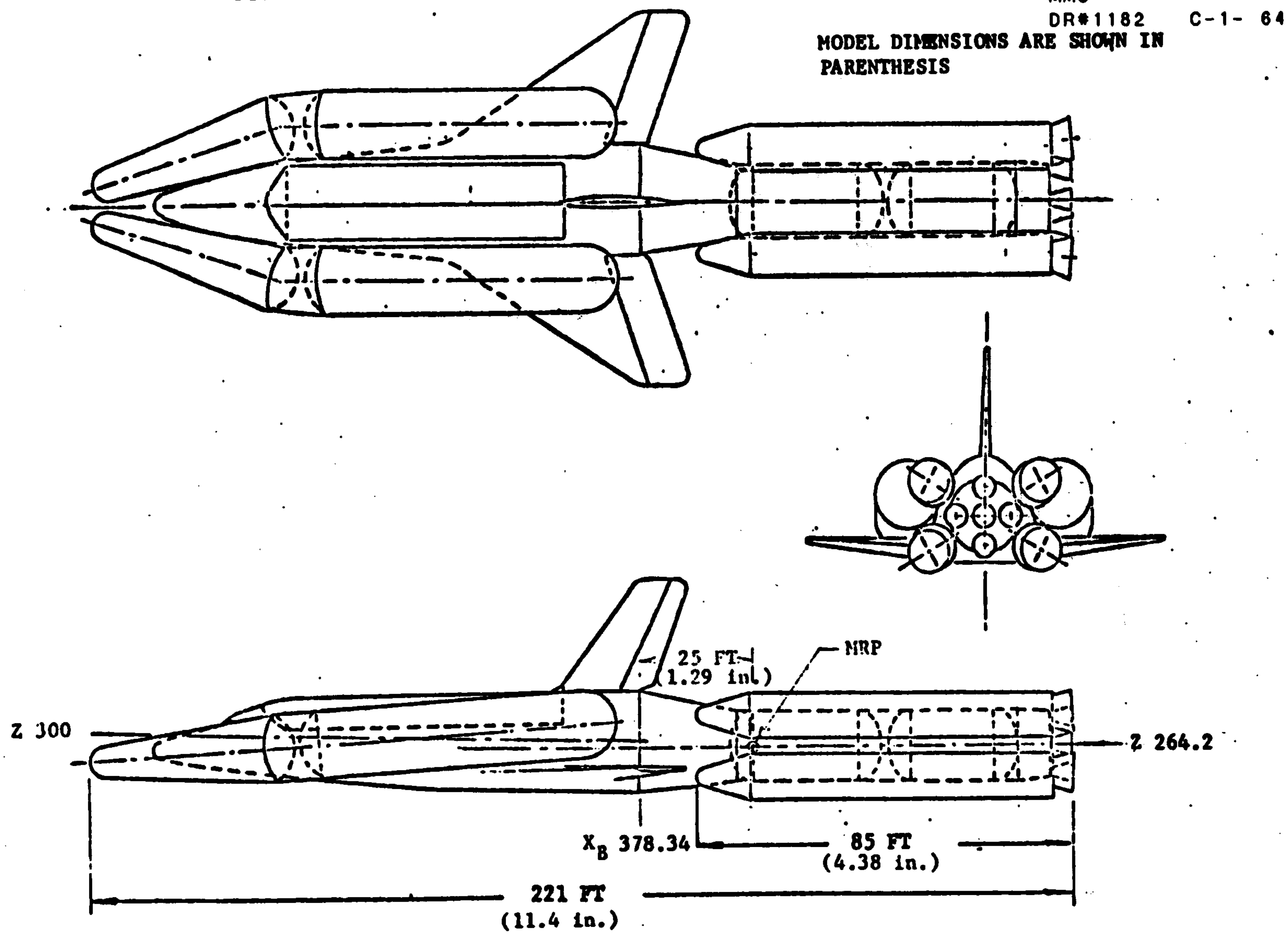
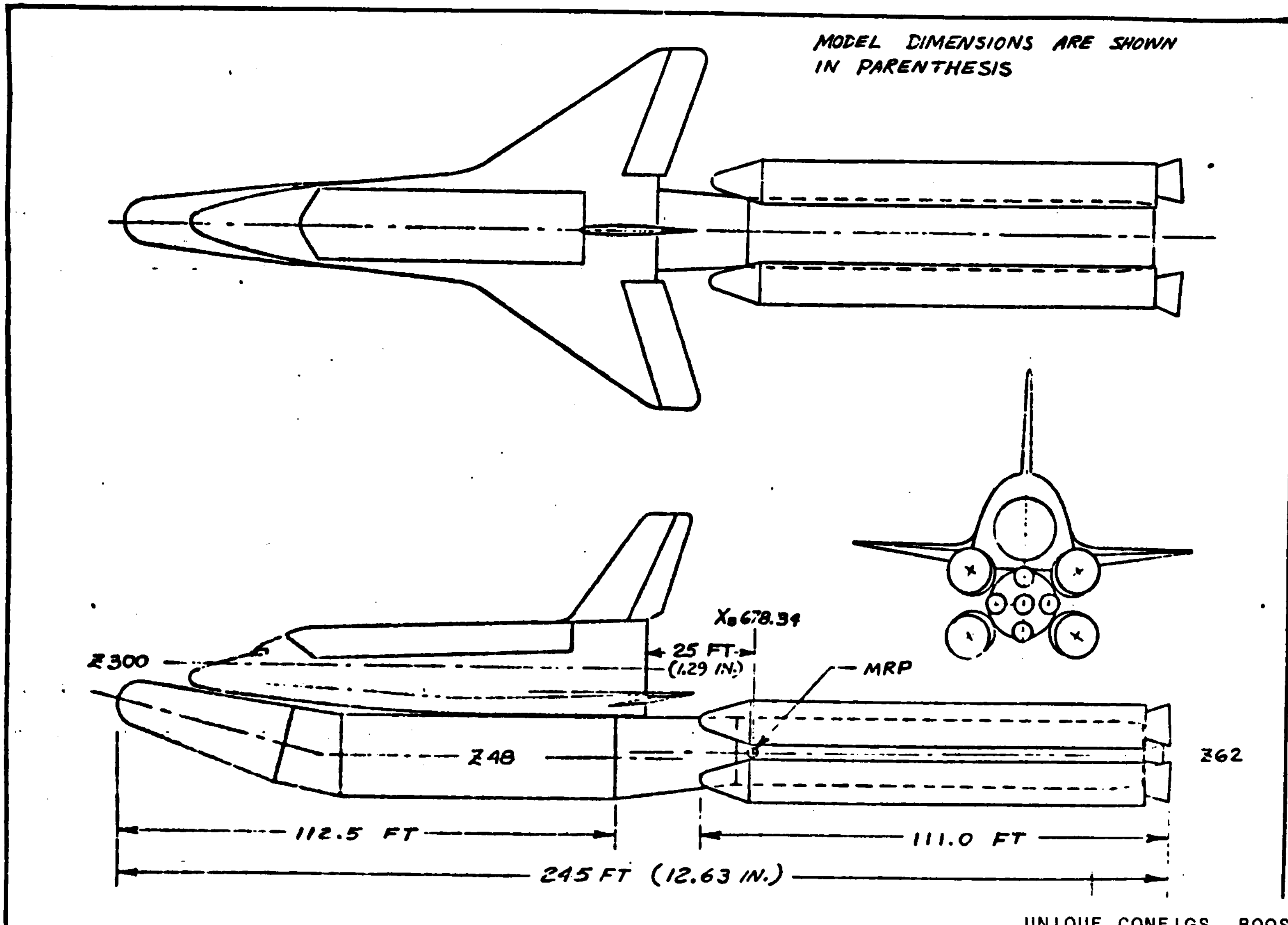


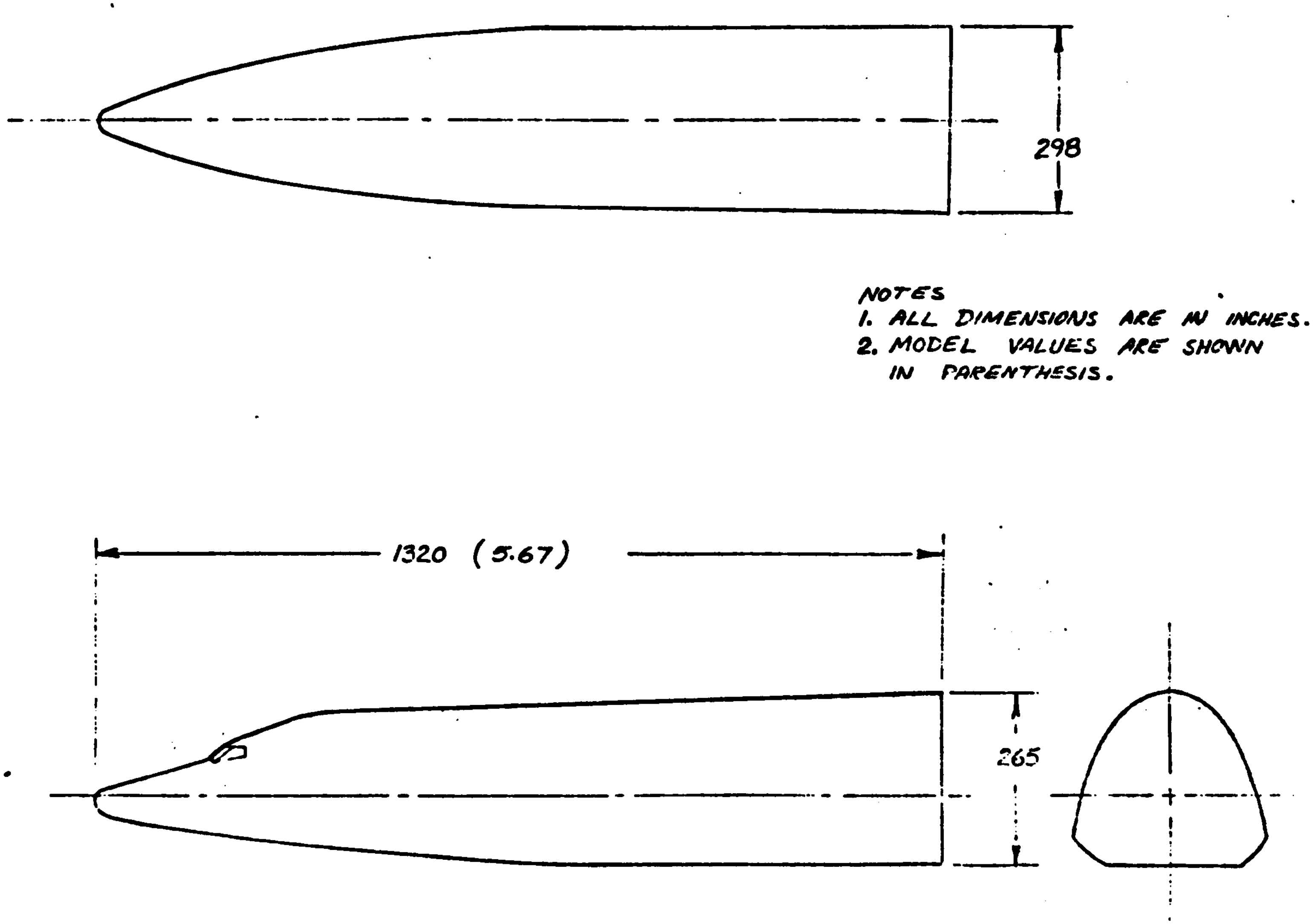
Figure 7. DTO-7/1207-4 TEL LAUNCH CONFIGURATION, OID2L4



UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 647

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 648

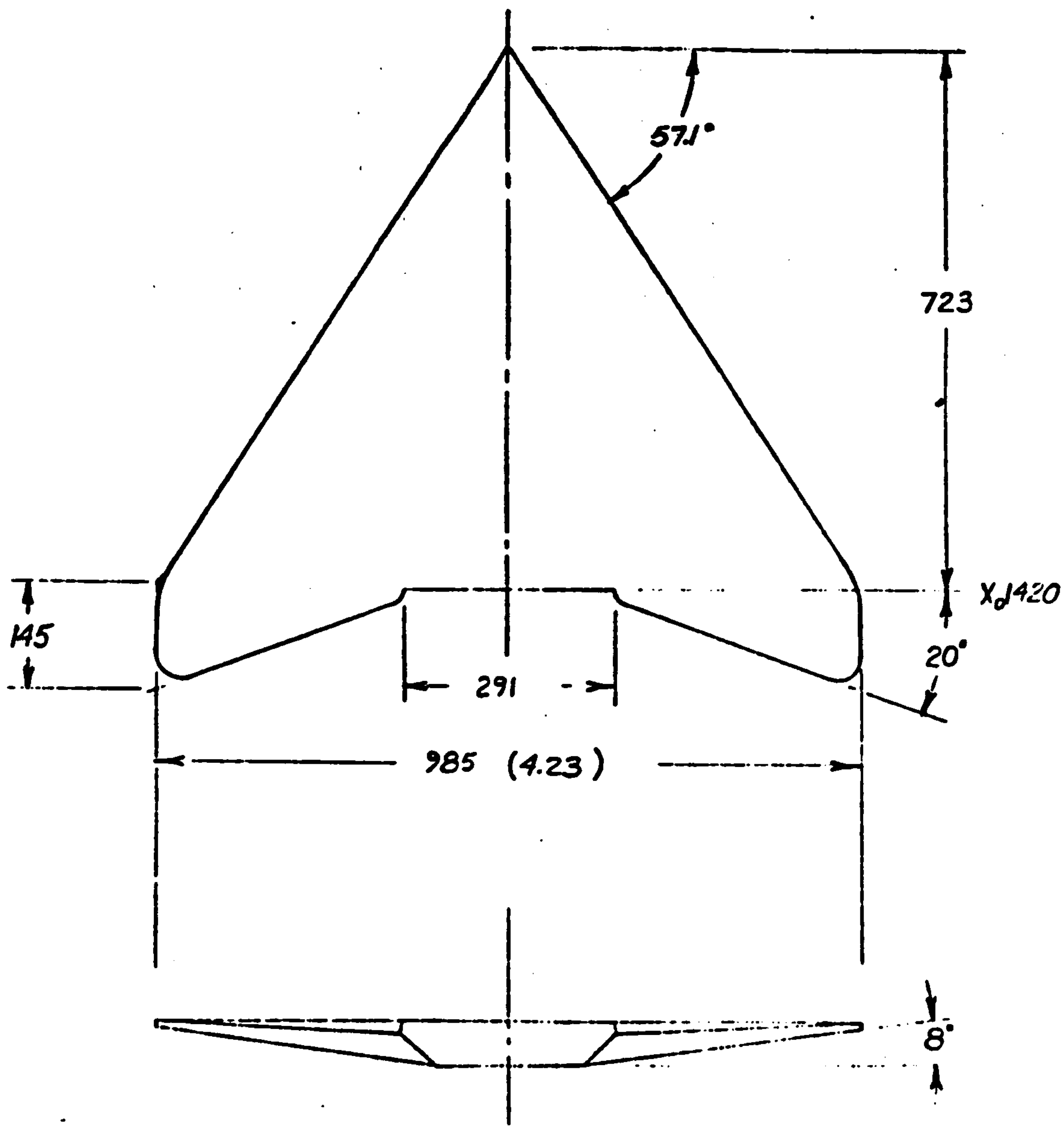
FIGURE 8. ORBITER BODY ~ B1



NOTES
1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN IN PARENTHESIS.

FIGURE 9. ORBITER WING ~ W1

1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN IN PARENTHESIS.



UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 650

FIGURE 10. ORBITER VERTICAL FIN ~ VI

1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN IN PARENTHESIS.

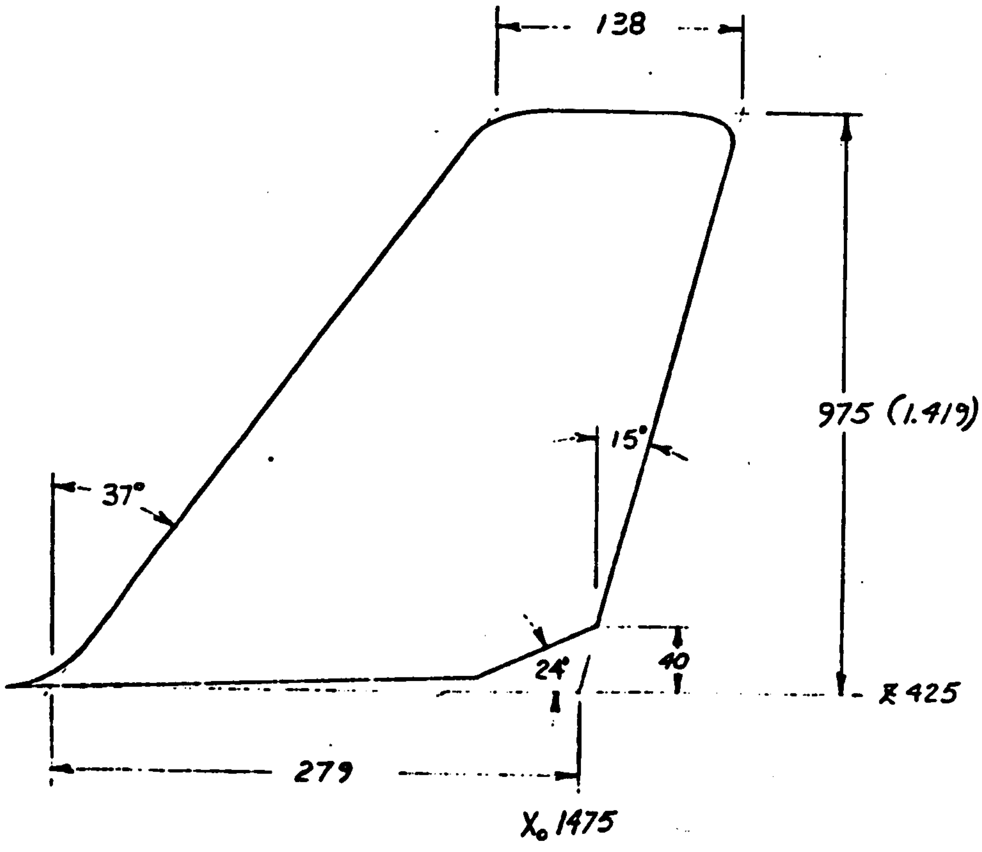
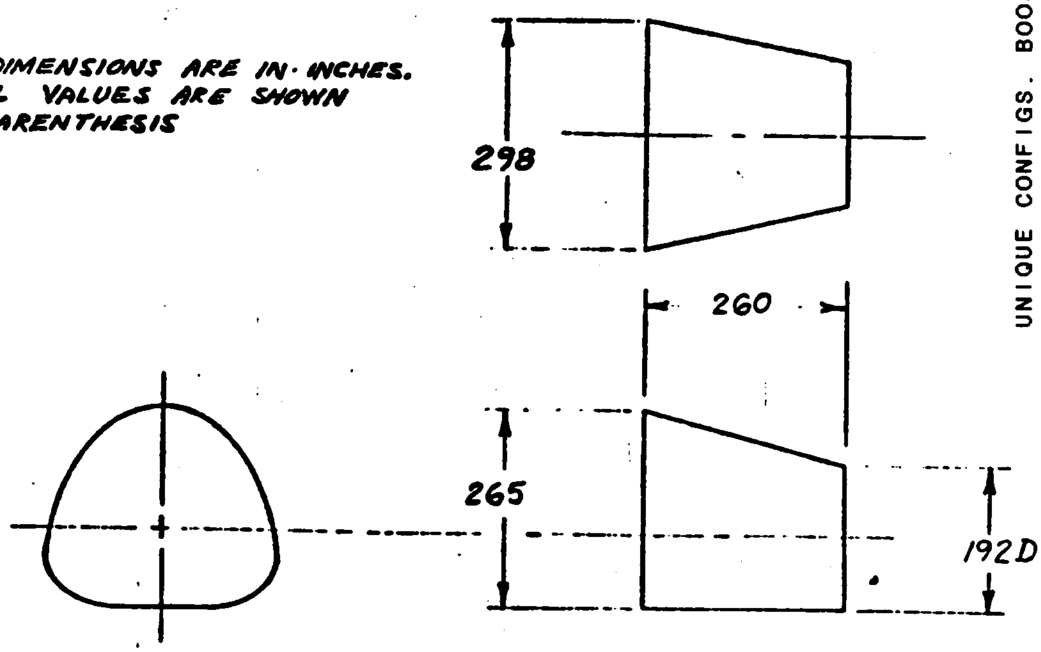


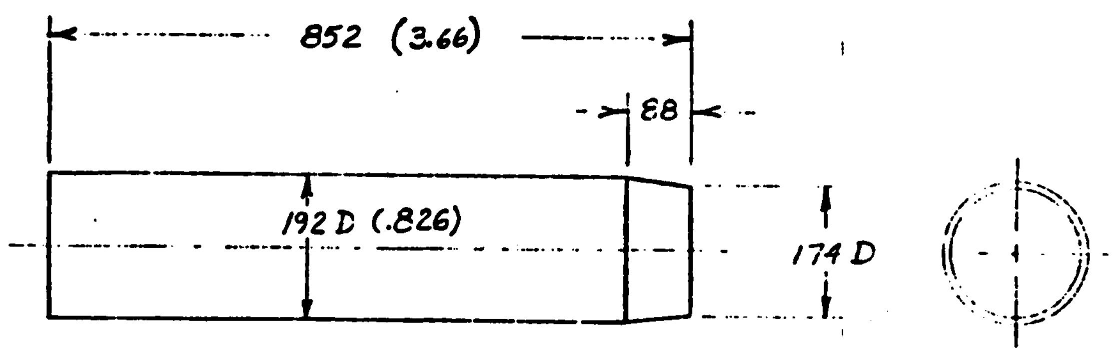
FIGURE 11. ADAPTER ~ A1

NOTES
1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN IN PARENTHESIS



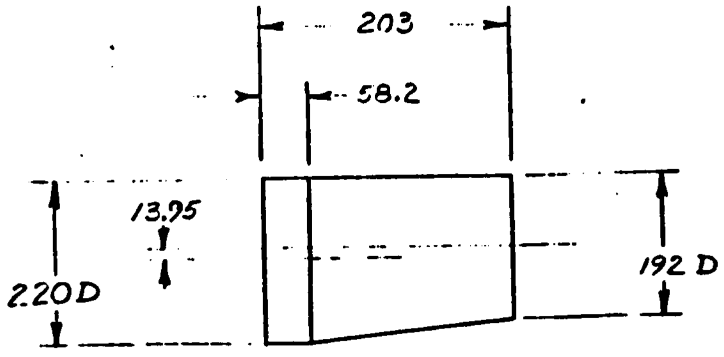
UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1-651

BOOSTER CORE ~ C1



UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 652

FIGURE 12. ADAPTOR ~ A2



ALL DIMENSION ARE FOR FULL SCALE IN INCHES

BOOSTER CORE ~ C2

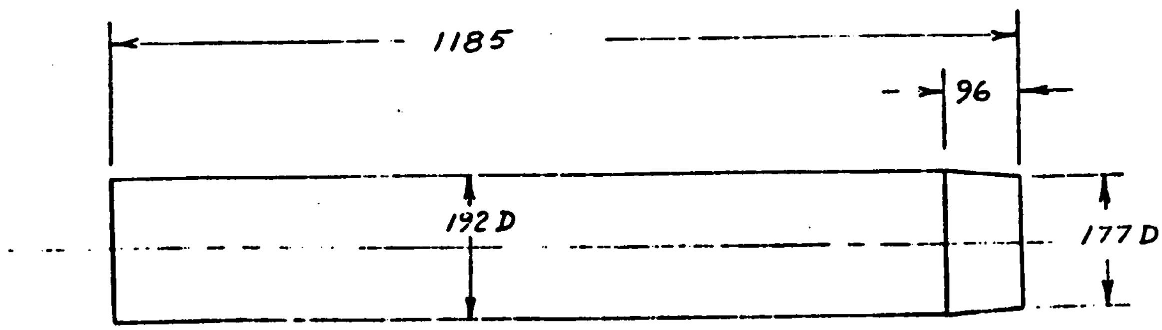


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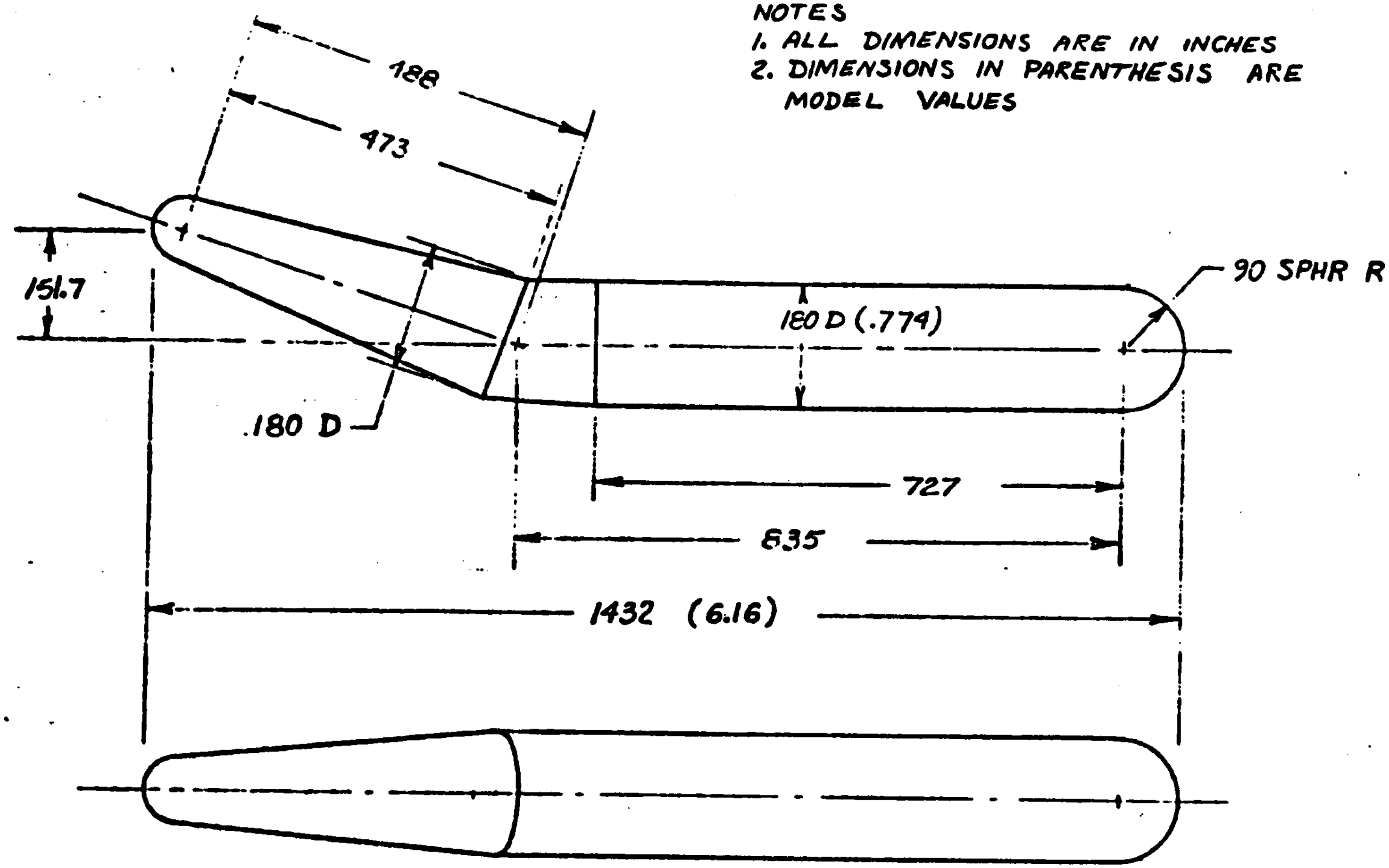
FIGURE

FIGURE 13. DROP TANK ~ D1

NOTES
1. ALL DIMENSIONS ARE IN INCHES
2. DIMENSIONS IN PARENTHESIS ARE
MODEL VALUES



UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 653

FIGURE 14. DROP TANK ~ D2

UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 654

NOTES
1. ALL DIMENSIONS ARE INCHES
2. DIMENSIONS IN PARENTHESIS ARE MODEL VALUES

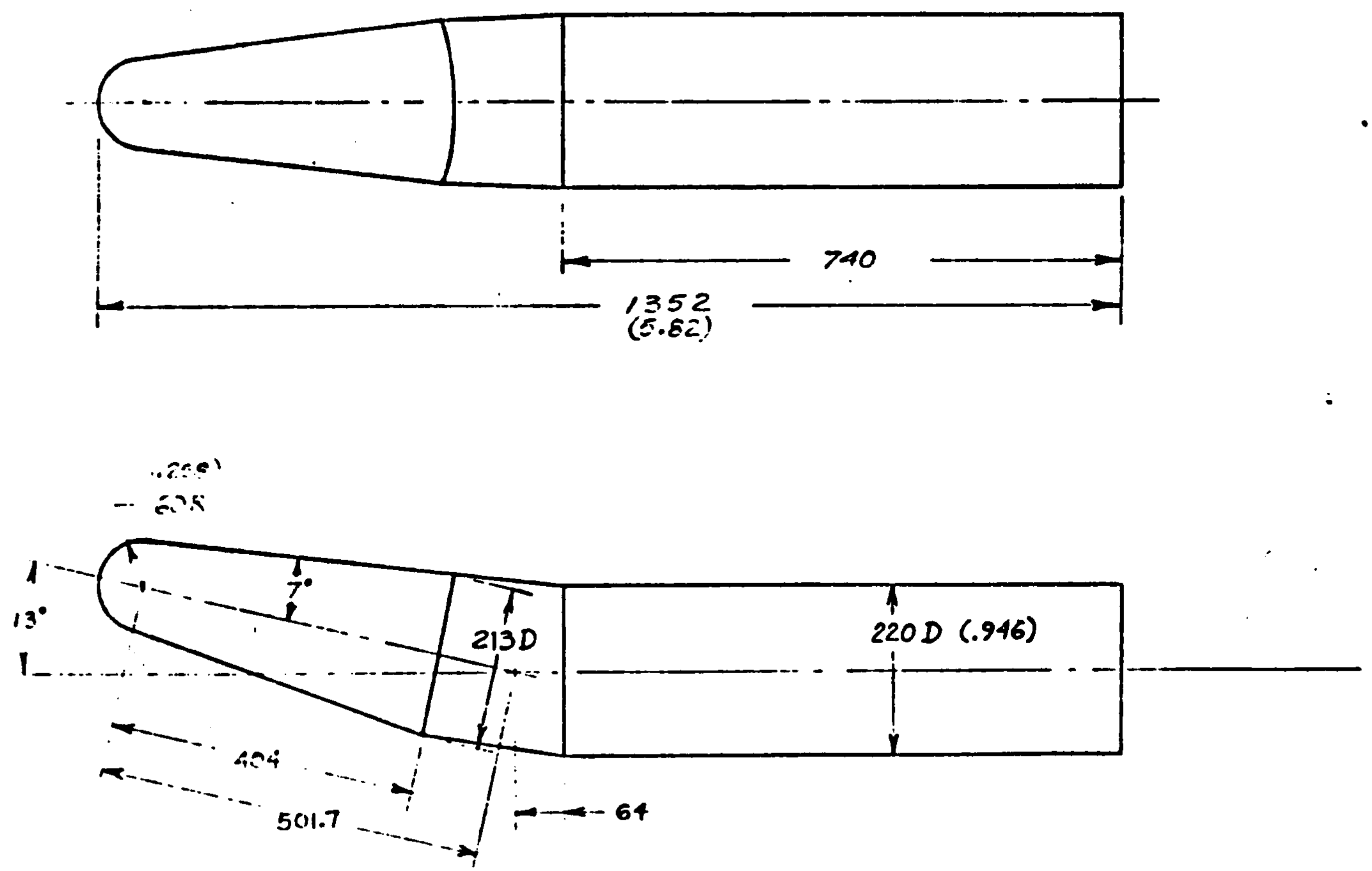
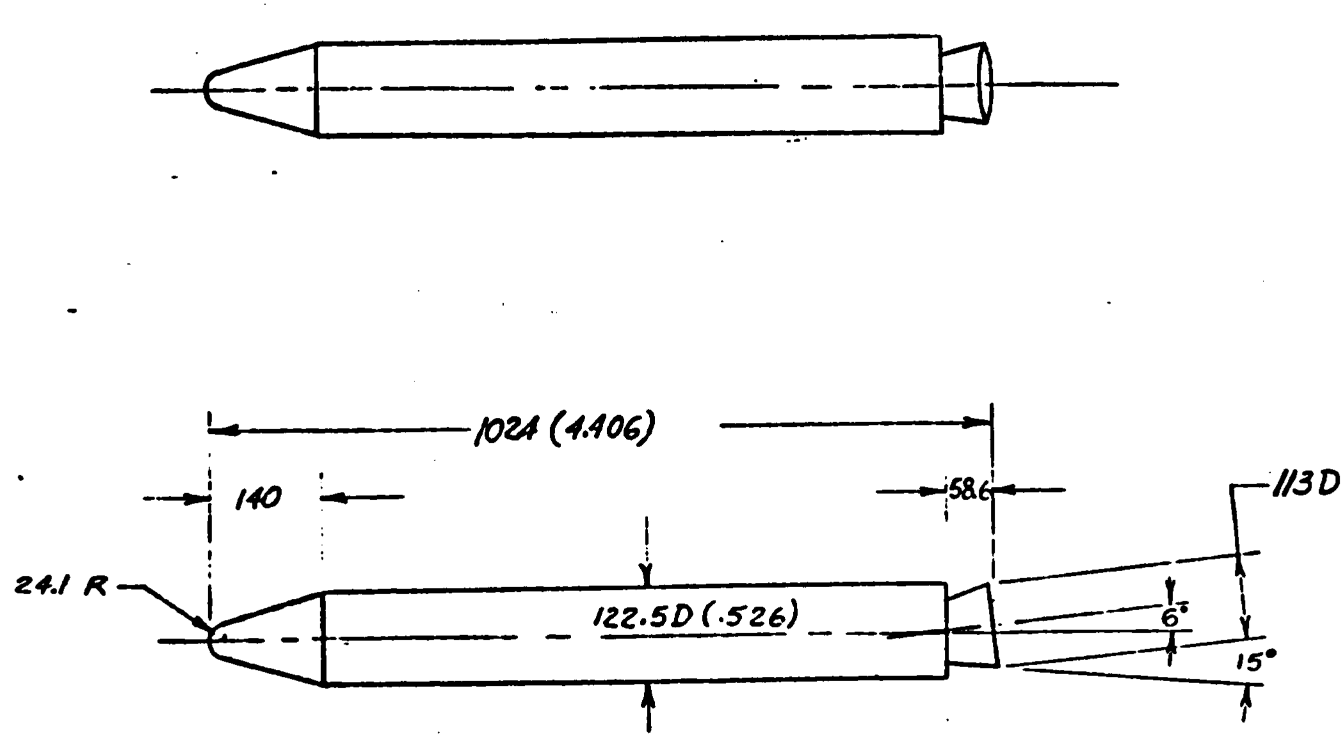


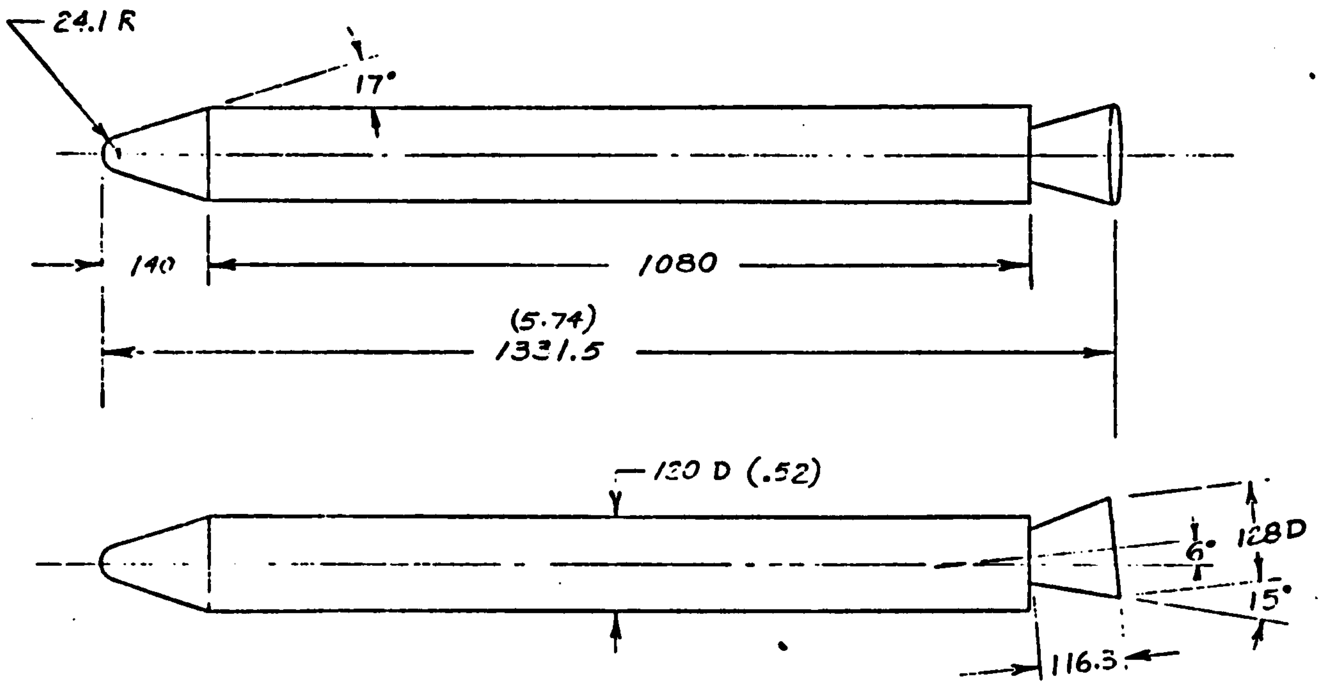
FIGURE 15. 5 SEGMENT SOLID ROCKET MOTOR (SRM) ~ S1



UNIQUE CONFIGS. BOOSTER
MMC
UNIQUE CONFIGS. ORBITER
MMC
DR#1182 C-1- 655

FIGURE 16 7 SEGMENT SOLID ROCKET MOTOR (SRM) ~ S2

NOTES
1. ALL DIMENSIONS ARE IN INCHES
2. DIMENSIONS IN PARENTHESIS ARE MODEL VALUES



TEST MSFC TWT 491 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES i	φ			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.99	4.0	4.96		
R33011	ΦVWCBT1F	A	O	+1°	0°					001/0	002/0	003/0	004/0							
R33051	ΦVWCBT2F	A		+1°						008/0	007/0	006/0	005/0							
R33151	ΦVWCBT2F	D		0°						009/1	010/1	011/1	012/1							
R33111	ΦVWCBT1F			0°						016/0	015/1	014/1	013/0							
R33211	ΦVWCBT1F			-2°						017/0	018/1	019/1	020/0							
R33251	ΦVWCBT2F			-2°						024/0	023/0	022/0	021/0							
R33351	ΦVWCBT2F			-4°						025/0	026/0	027/0	028/0							
R33311	ΦVWCBT1F			-4°						032/0	031/0	030/0	029/0							
R33411	ΦVWCBT1F			-3.1°					033/0	034/0	035/0	036/0	037/0	092/0	093/0	090/0	091/0	047/0		
R33412	ΦVWCBT1F	O	G		90°				052/0	051/0	050/0	049/0	048/0	087/0	096/0	046/0	045/0	044/0		
R33032	ΦVWCBF	O	G		90°				053/0	054/1	055/0	056/0	057/0	088/0	097/0	123/0	095/0	094/0		
R33031	ΦVWCBF	D	O		0°				062/0	061/0	060/0	059/0	058/0	089/0	098/0	124/0	125/0	126/0		
R33041	ΦVWCB	D	O		0°				063/0	064/0	065/0	066/0	067/0	086/0	099/0					
R33042	ΦVWCB	O	G		90°				072/0	071/1	070/1	069/1	068/0	085/0	100/0					
R33022	ΦVWCBT1	O	G		90°				073/0	074/0	075/1	076/1	077/1	084/0	101/0	043/0	042/0	041/0		
R33021	ΦVWCBT1	D	O		0°				082/0	081/0	080/0	079/0	078/0	083/0	102/0	040/0	039/0	038/0		
R33101	ΦVWCBT1F	D	O		180°					103/0	104/0	105/0	106/0							
R33071	ΦVWBT1F	D	O		0°					110/0	109/0	108/0	107/0							
R33072	ΦVWBT1F	O	G		90°					111/0	112/0	113/0	114/0							
R33081	ΦVWBT1	D	O		0°					118/0	117/0	116/0	115/0							

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CYN CY CBL CPC CAB CAF CPBL CAT IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES: αA = -8°, -6°, -4°, -2°, 0°, +2°, +4°, +6°, +8°

αD = -8°, -6°, -4°, -2°, -1°, 0°, +1°, +2°, +4°, +6°, +8°

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UNIQUE CONFIGS. BOOSTER TBC

UNIQUE CONFIGS. ORBITER GAC

DR#1140 C-1- 657

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 658
☒ POSTTEST

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TEST MSFC TWT 491 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES i_c	PARAMETERS/VALUES φ			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.0	1.1	1.2	1.4						
R33082	ΦVWBT₁	O	G	-3.1°	90°					119/0	120/0	121/0	122/0							
R33091	ΦVWCBT₁F₁	D	O	-3.1°	0°					127/0	128/0	129/0	130/0							

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CYN CY CBL CPC CAB CAE CPBL CAT → IDPVAR(1) | IDPVAR(2) | NDV 10

COEFFICIENTS:
α or β SCHEDULES
$\alpha D = -8°, -6°, -4°, -2°, -1°, 0°, +1°, +2°, +4°, +6°, +8°$
$\beta G = -8°, -6°, -4°, -2°, -1°, 0°, +1°, +2°, +4°, +6°, +8°$

NASA-MSFC-MAF

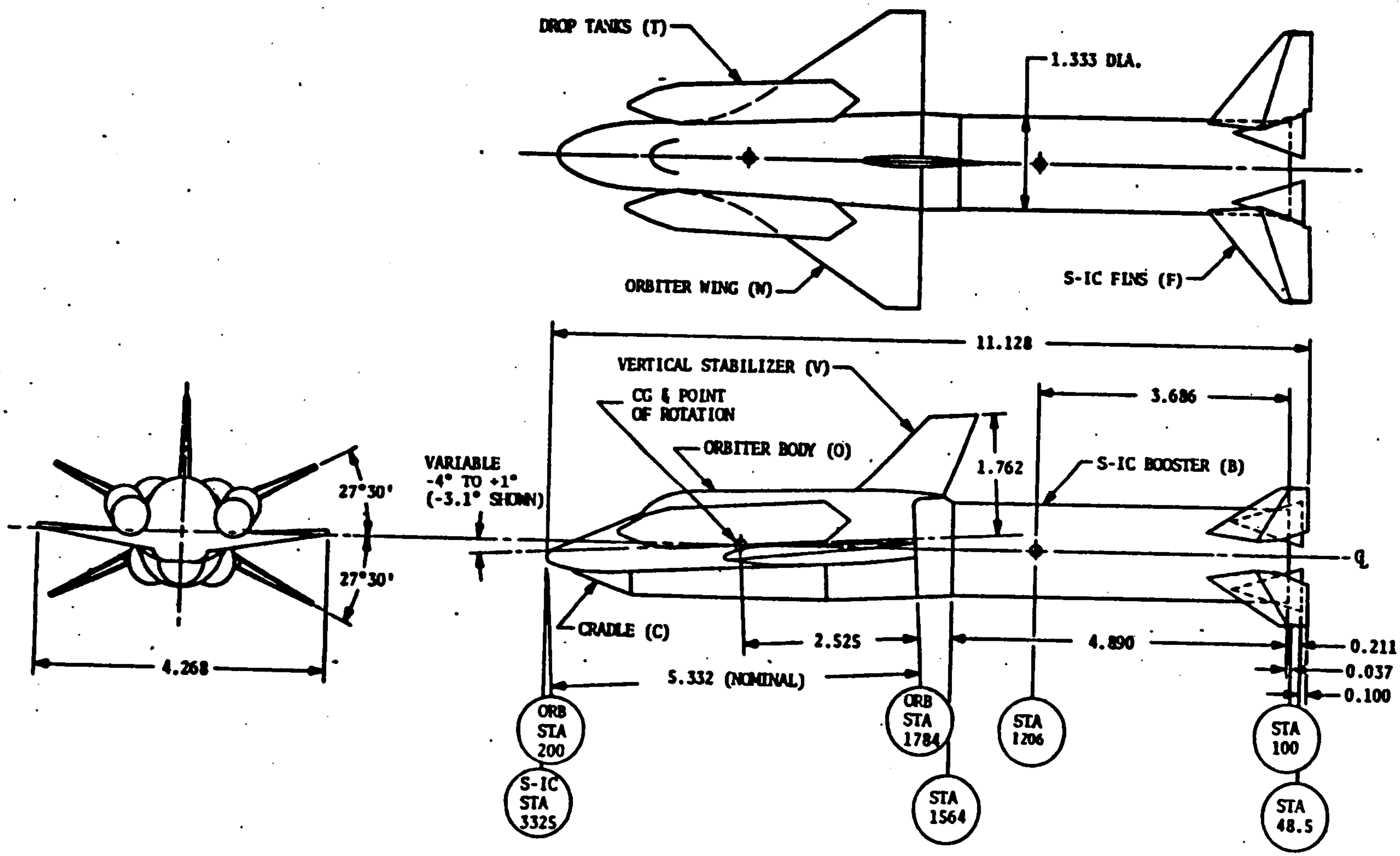

FIGURE 2. G-11 Orbiter/S-IC 0.003366 Scale Model

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OF POOR QUALITY

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 659

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 660

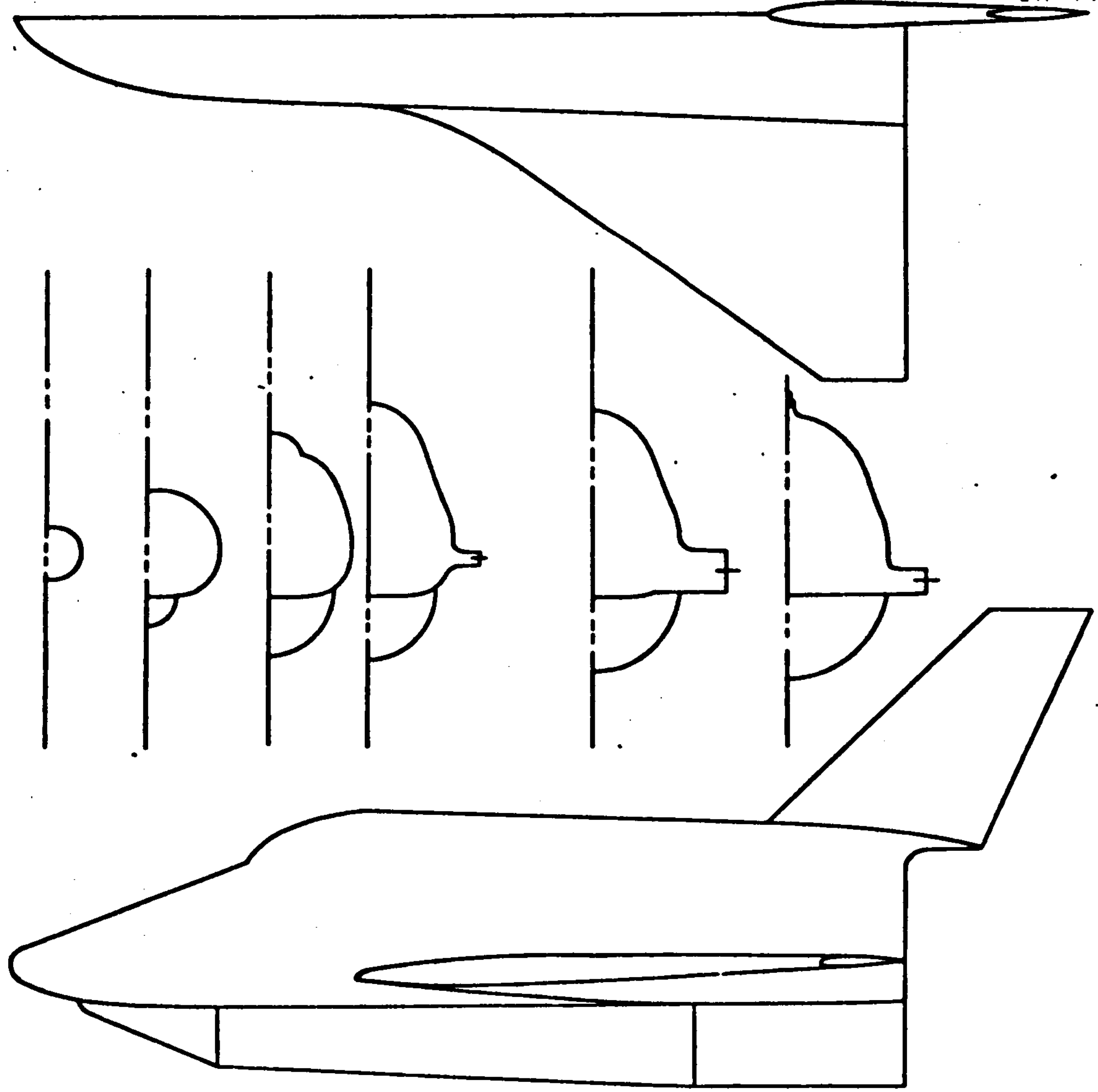

FIGURE 6. G-11 ORBITER WITH CRADLE

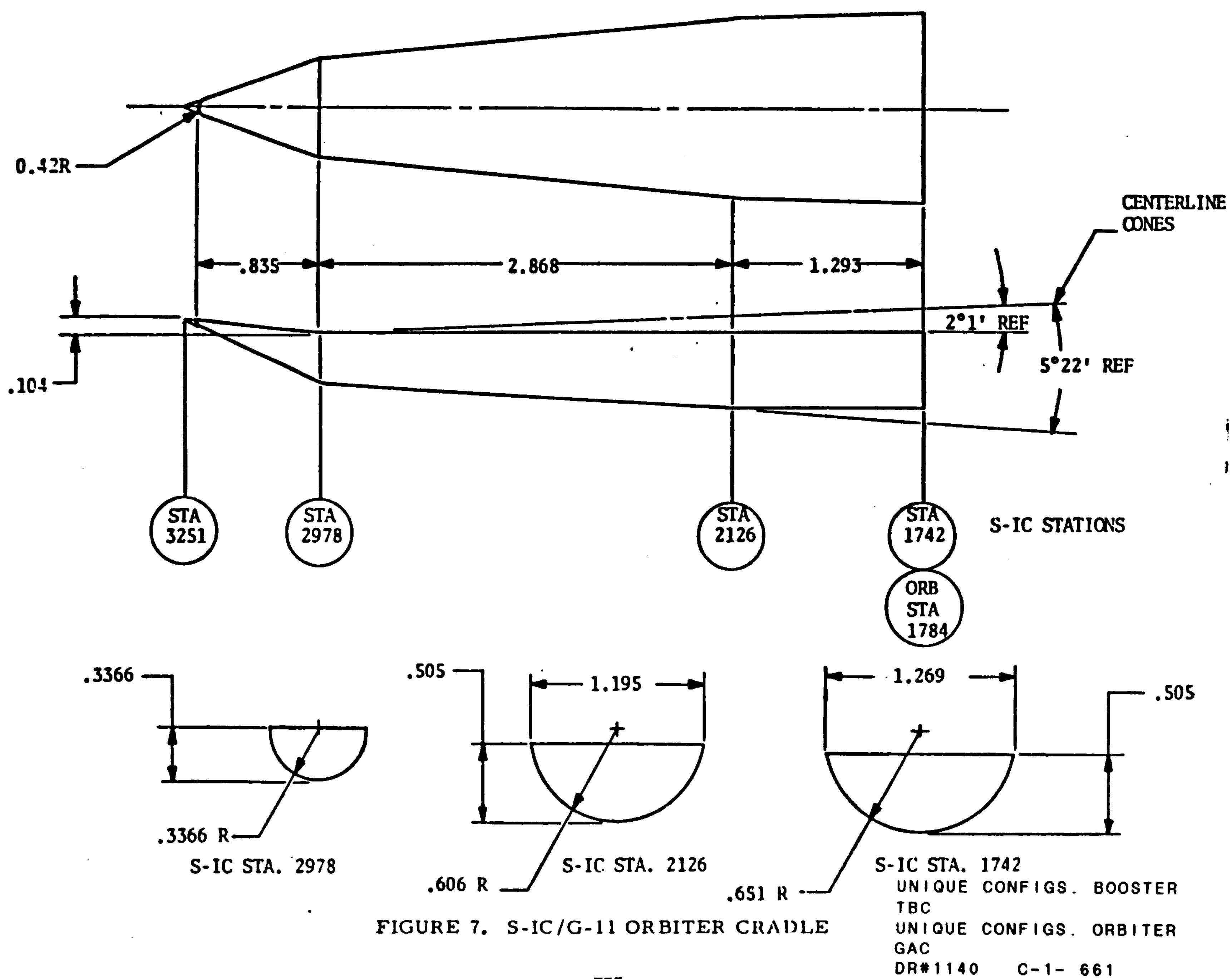

FIGURE 7. S-IC/G-11 ORBITER CRADLE

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 662

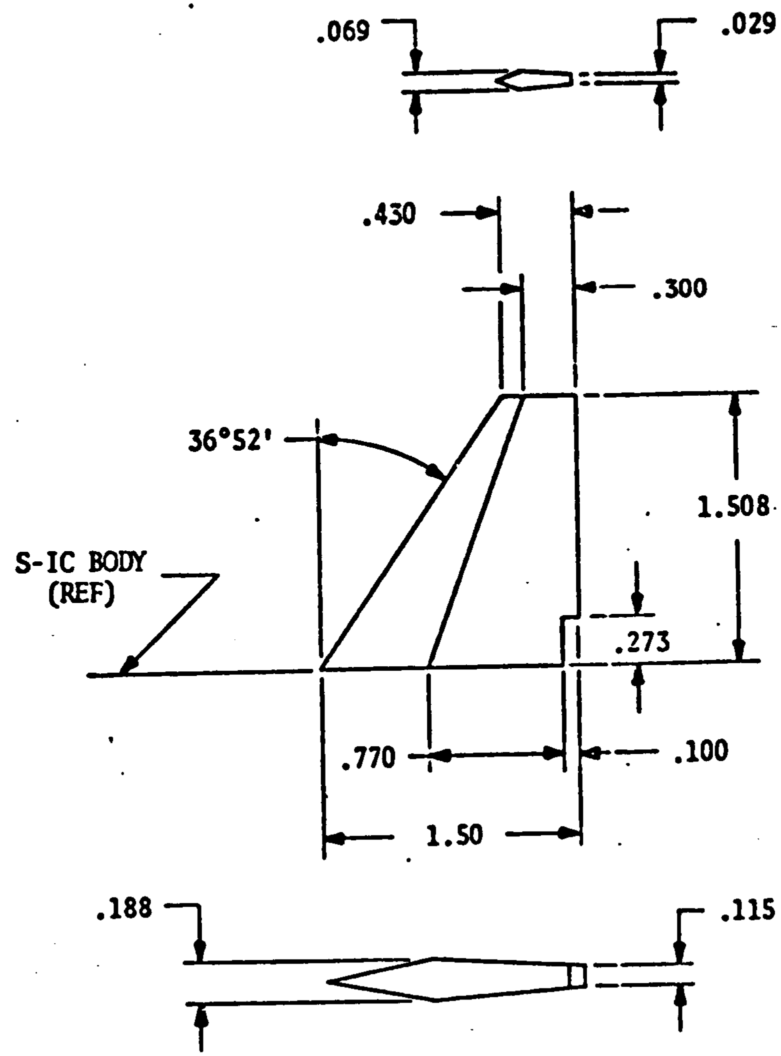

FIGURE 9. 884 SQ. FT. S-IC FIN - F

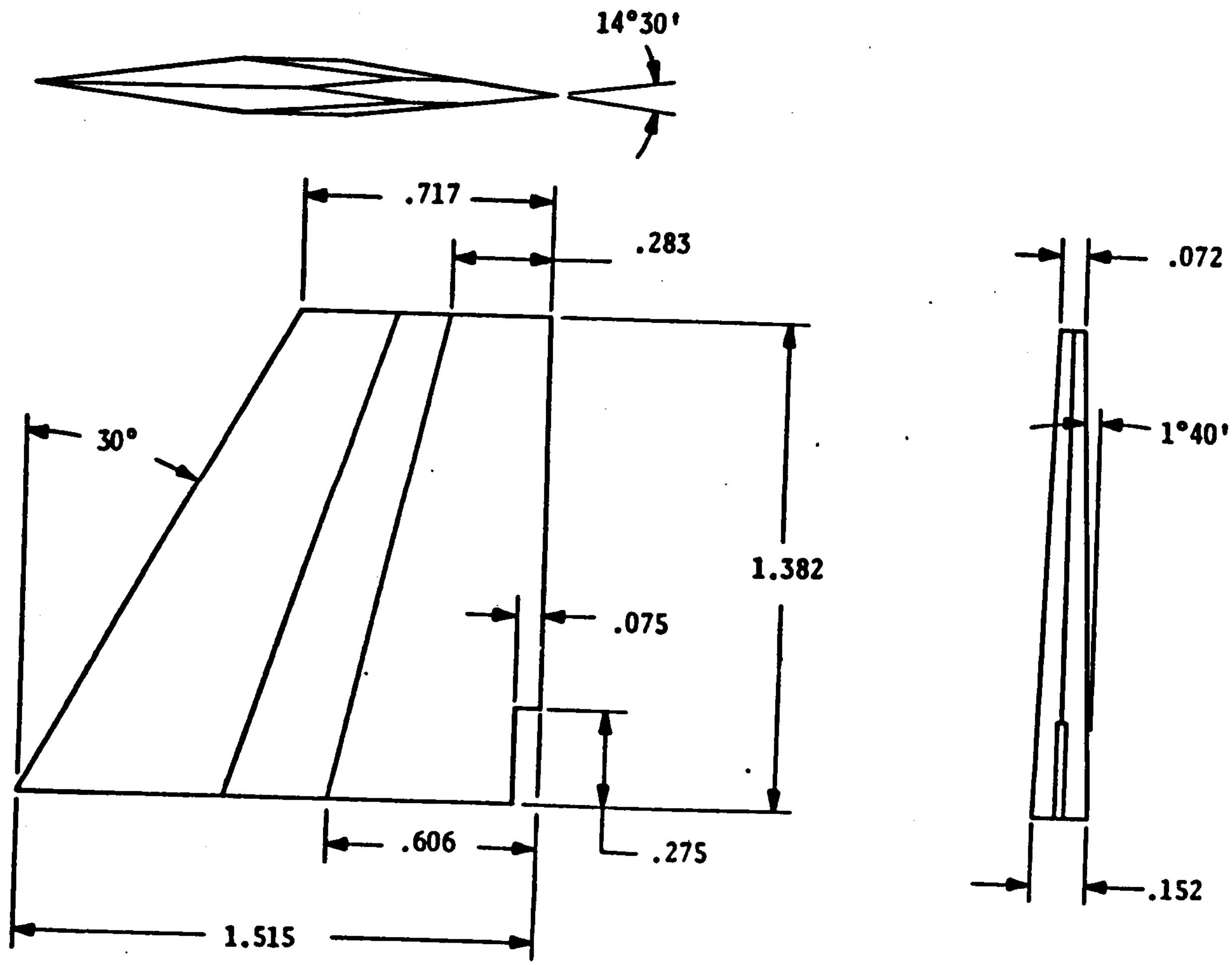

FIGURE 10. 900 FT^2 S-IC FIN - F_1

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 663

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 664

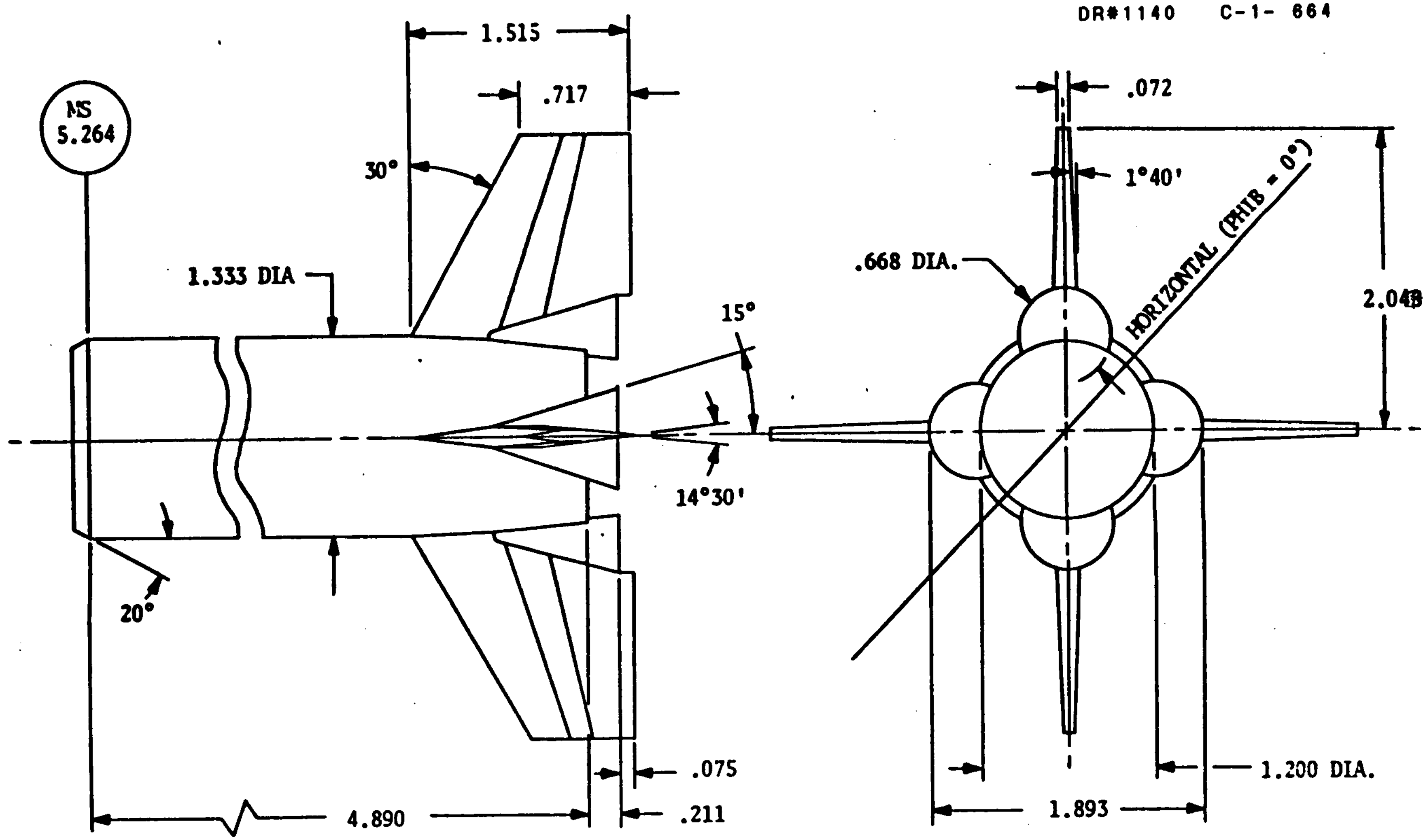

FIGURE 11. S-IC 45° FIN CONFIGURATION - F_1

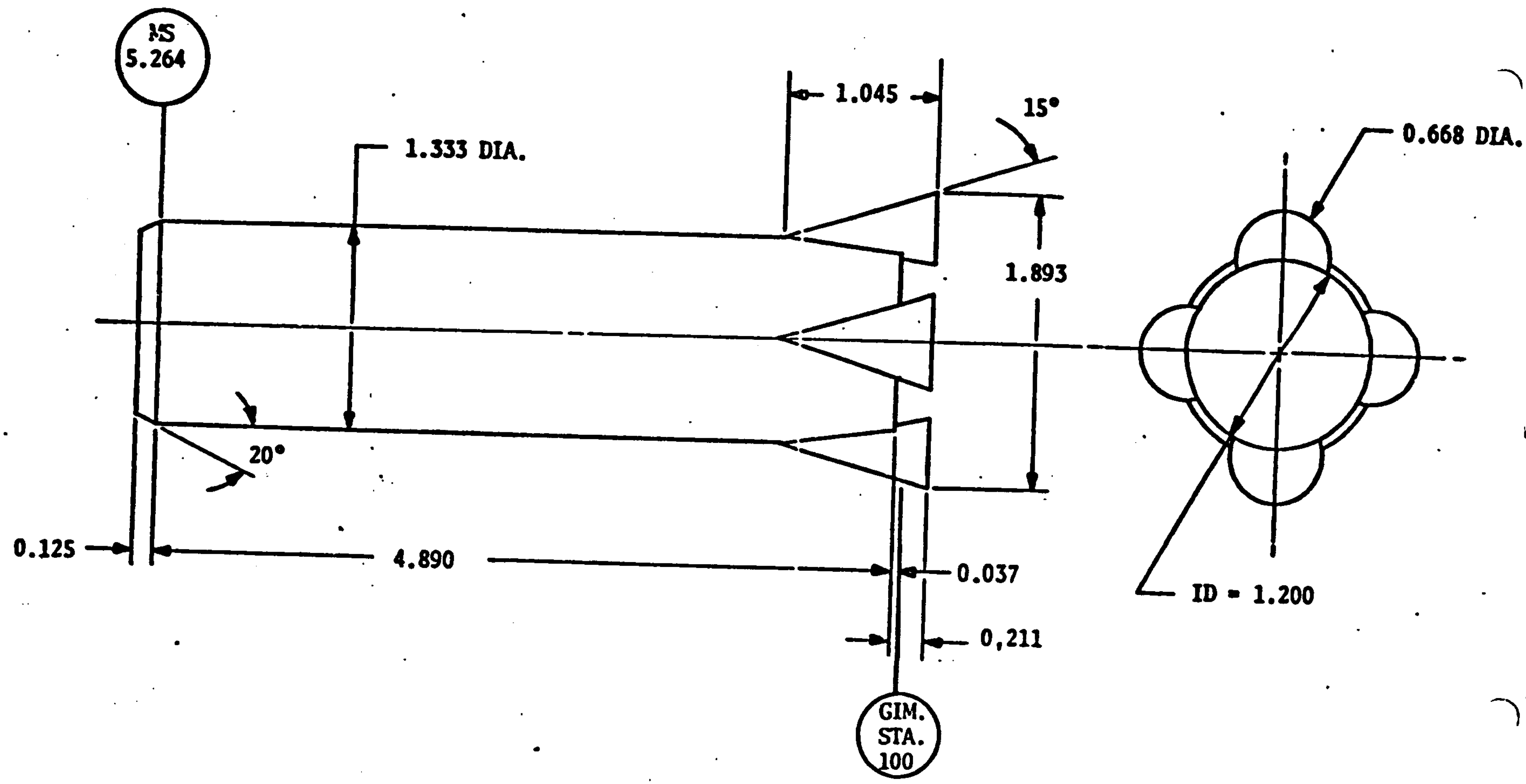

FIGURE 12. SATURN V/S-IC BOOSTER FINS OFF

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 665

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1140 C-1- 666

- USED FOR BOTH 120 AND 90 GRIT
- 10% BACK OF LEADING EDGES EXCEPT AS NOTED
- 0.10" WIDTH AT ROOT TAPERING TO 0.05" AT TIP ON WINGS AND FINS
- STRIP ON LOWER SURFACE OF WING SAME AS TOP

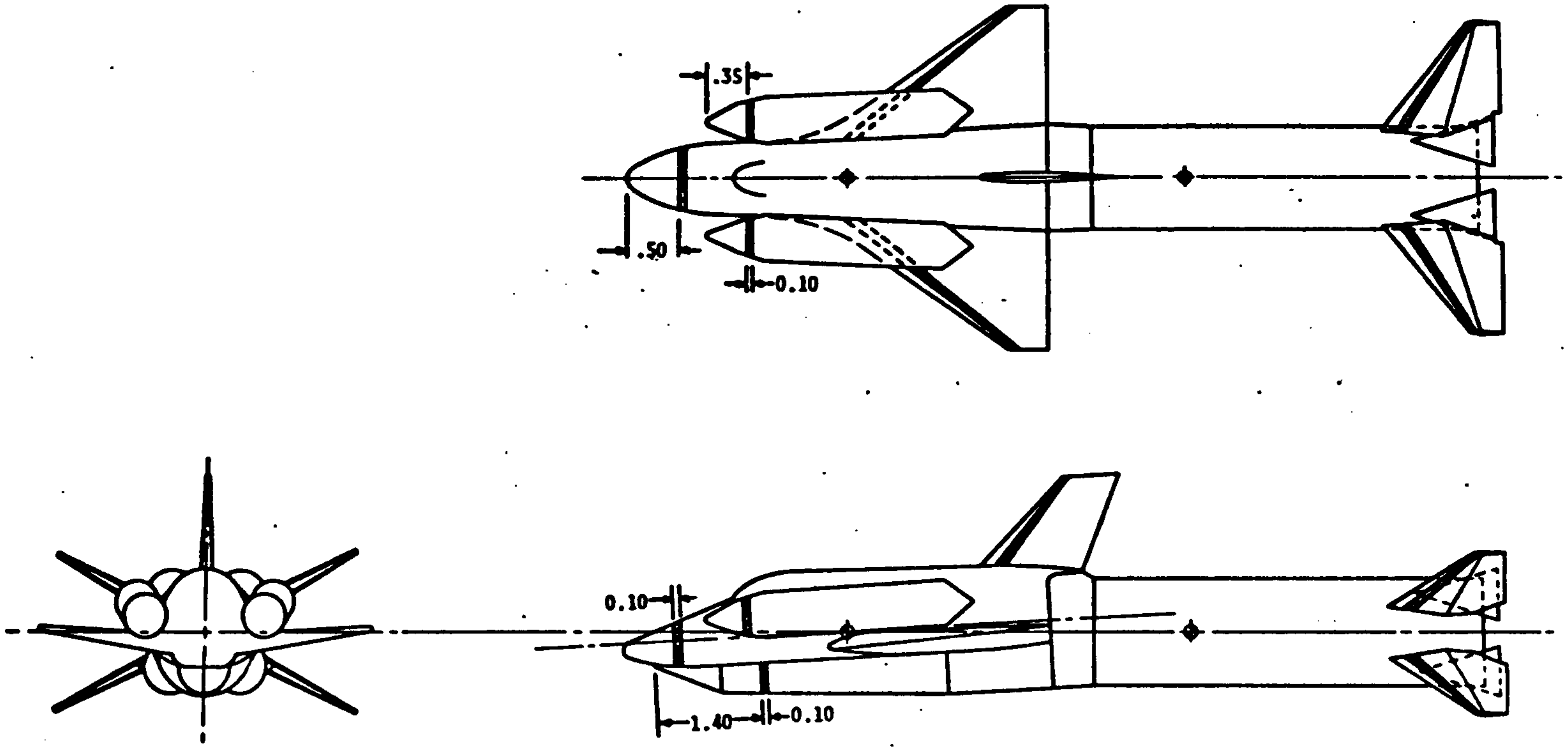

FIGURE 13. TRIP STRIP CHART S-IC/G-11 ORBITER

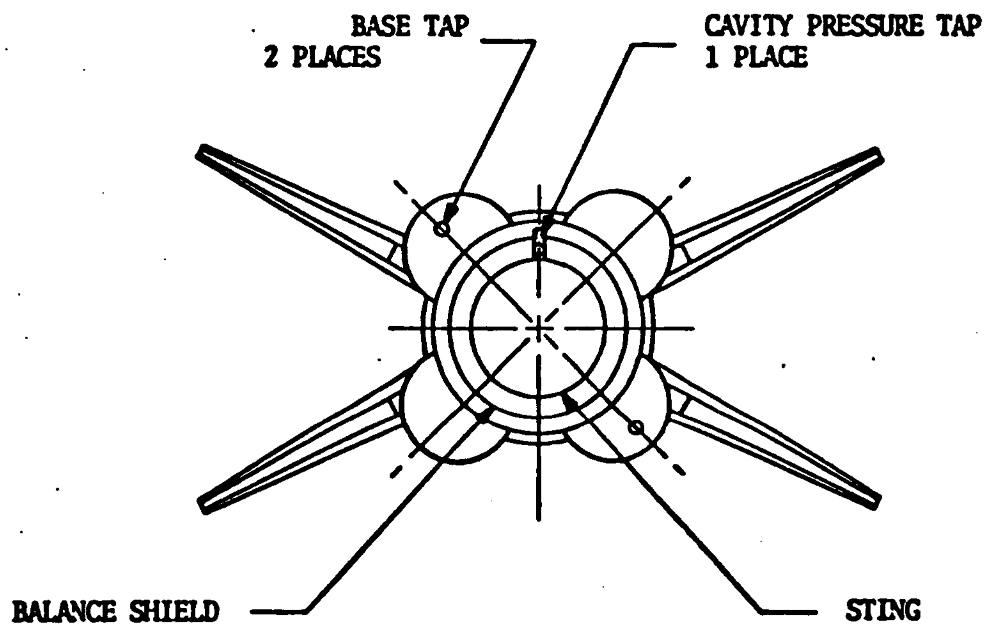

FIGURE 14. BASE PRESSURE TAP LOCATIONS

TABLE 1. DATASET COLLATION SHEETS

TEST IWT #502 DATA SET/RUN NUMBER

COLLATION SUMMARY

UNIQUE CONFIGS. BOOSTER TBC
UNIQUE CONFIGS. ORBITER GAC
DR#1187 C-1- 668

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES i_o	ϕ			NO. of RUNS	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.46	1.96	3.5	4.96
									MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										
RUU031	OWVTCBF	A	O	-2	0			4				11	12	13	14				
RUU011	OWVTCBF	I	I	1.24	I			4				7	8	9	10				
RUU021	OWVCBF	I	I	1.24	I			2				16	15						
RUU041	OWVTCBF	A	O	O	0			11	19	45	46	3	4	5	6	83	74	89	88
RUU045	I	O	B		90			9	36			35	34	33	32	84	73	86	87
RUU042	I	S	S		20			5	20			21	22		23		75		
RUU043	I	I	I		45			5	27			26	25		24		76		
RUU044	OWVTCBF	S	S		70			5	28			29	30		31		77		
RUU101	OWVTCBFI	A	O		0			7	105			47	48		49		80	101	100
RUU105	OWVTCBFI	O	B		90			7	104			52	51		50		79	102	103
RUU051	OWVCBF	A	O		0			7				1	2	17	18		71	90	91
RUU055	OWVCBF	O	B		90			7				37	38	39	40		72	93	92
RUU061	OWVTCB	A	O		0			5				60	59	58	57		82		
RUU065	OWVTCB	O	B		90			5				53	54	55	56		81		
RUU085	OWTCBF	O	B		90			7				41	42	43	44		78	94	95
RUU091	OVCBF	A	O		0			7				61	62	63	64		70	98	99
RUU095	OVCBF	O	B	O	90			7				68	67	66	65		69	97	96

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CY CBL CYN CA CAF CAB CPC CPBI → IDPVAR(1) IDPVAR(2) NDV 10

COEFFICIENTS: SN TUNNEL SECTOR FOLLOWS α A SCHEDULE. α & β VARY AS f(φ)

α or β SCHEDULES
αA = -10, -8, -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10
αB = -10, -8, -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10

NASA-MSFC-MAF

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TABLE 1. (CONTINUED)

TEST TWT #502 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δe	Ø			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6	0.9	1.0	1.1	1.2	1.96	3.5	4.96				
RUJ111	OWVTC	A	O	-	0			8	106	107	108	109	110	118	119	120				
RUJ115	OWVTC	O	B	-	90			8	115	114	113	112	111	117	122	121				
RUJ125	OWTC	O	B	-	90			1					116							

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM CN CY CBL CYN CA CAF CAB CPC CABS 10

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 669

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UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 670

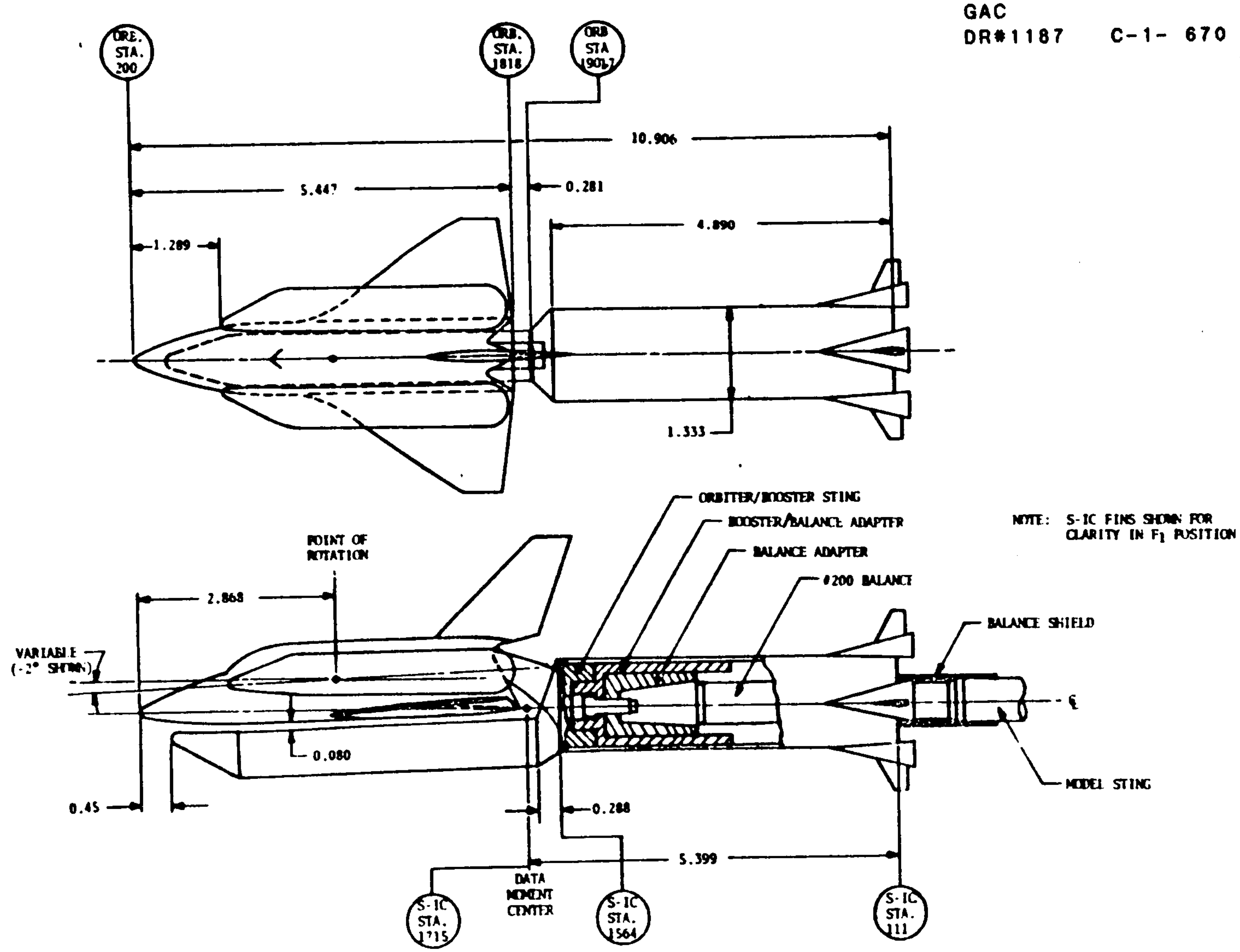

Figure 2. S-IC/H-33 Grumman Orbiter

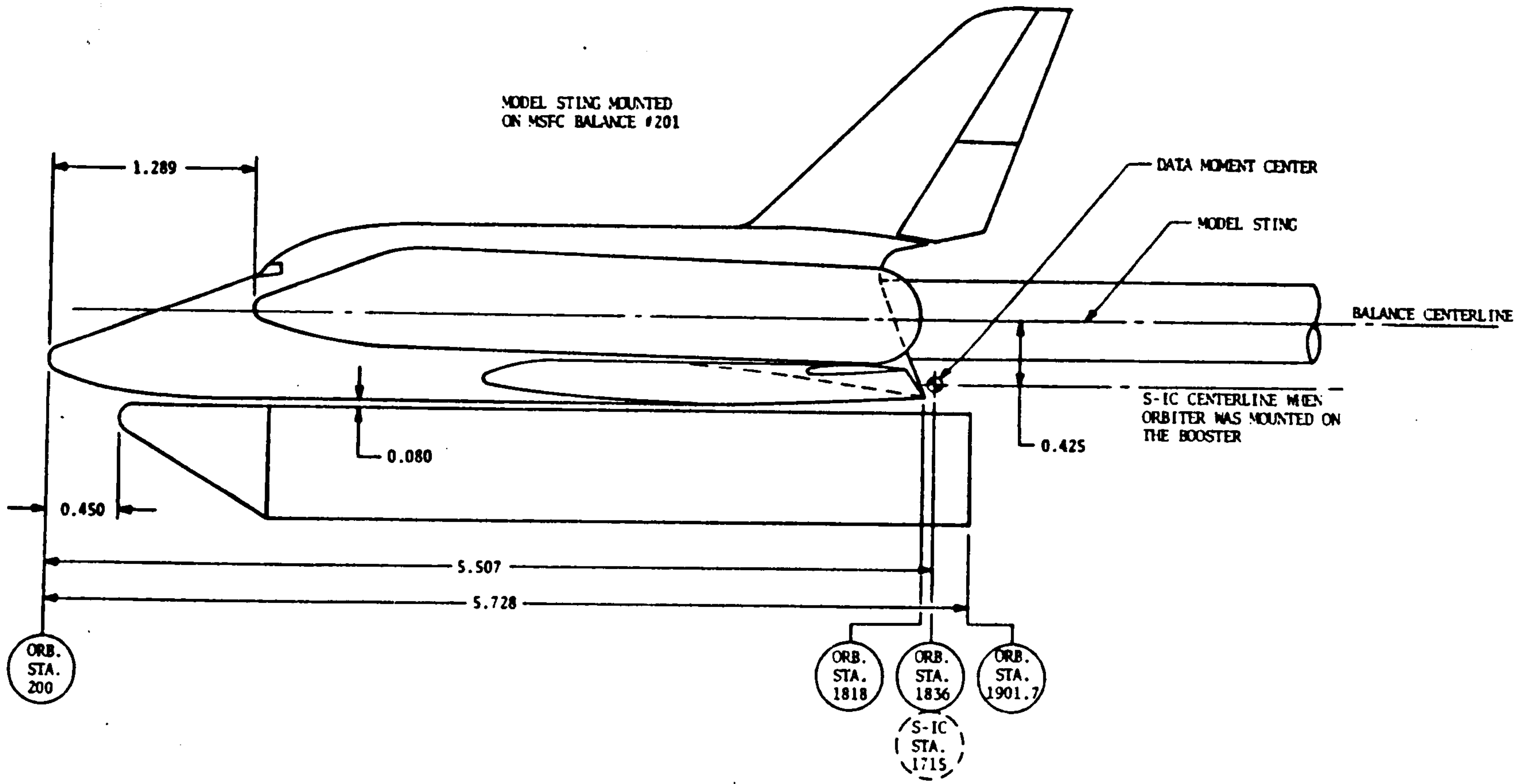

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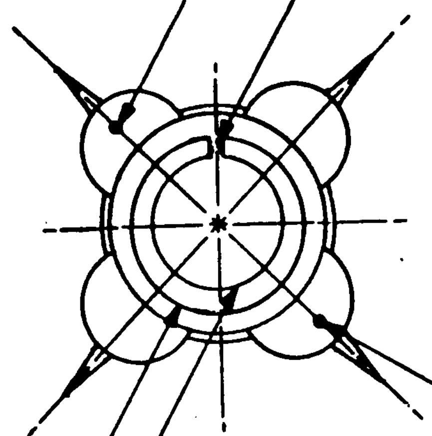
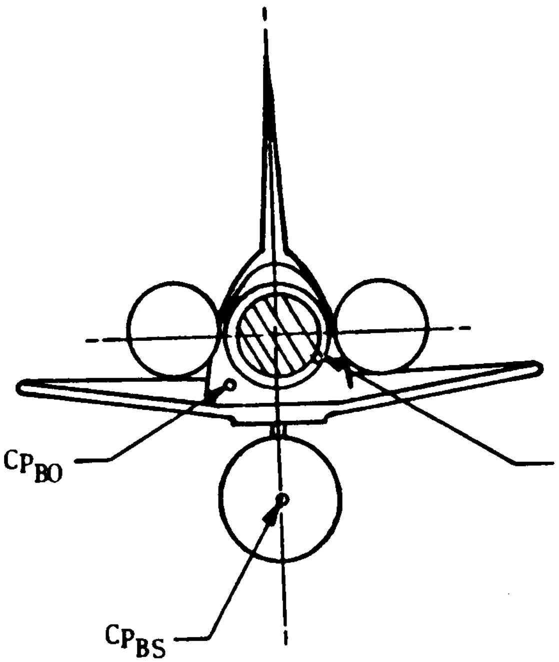
FIGURE 3. H-33 GRUMMAN ORBITER WITH S-IC CRADLE

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 671

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 672



BOOSTER BASE PRESSURE LOCATIONS



ORBITER + CRADLE BASE PRESSURE LOCATIONS

Figure 4. Booster and Orbiter Plus Cradle Base Pressure Locations

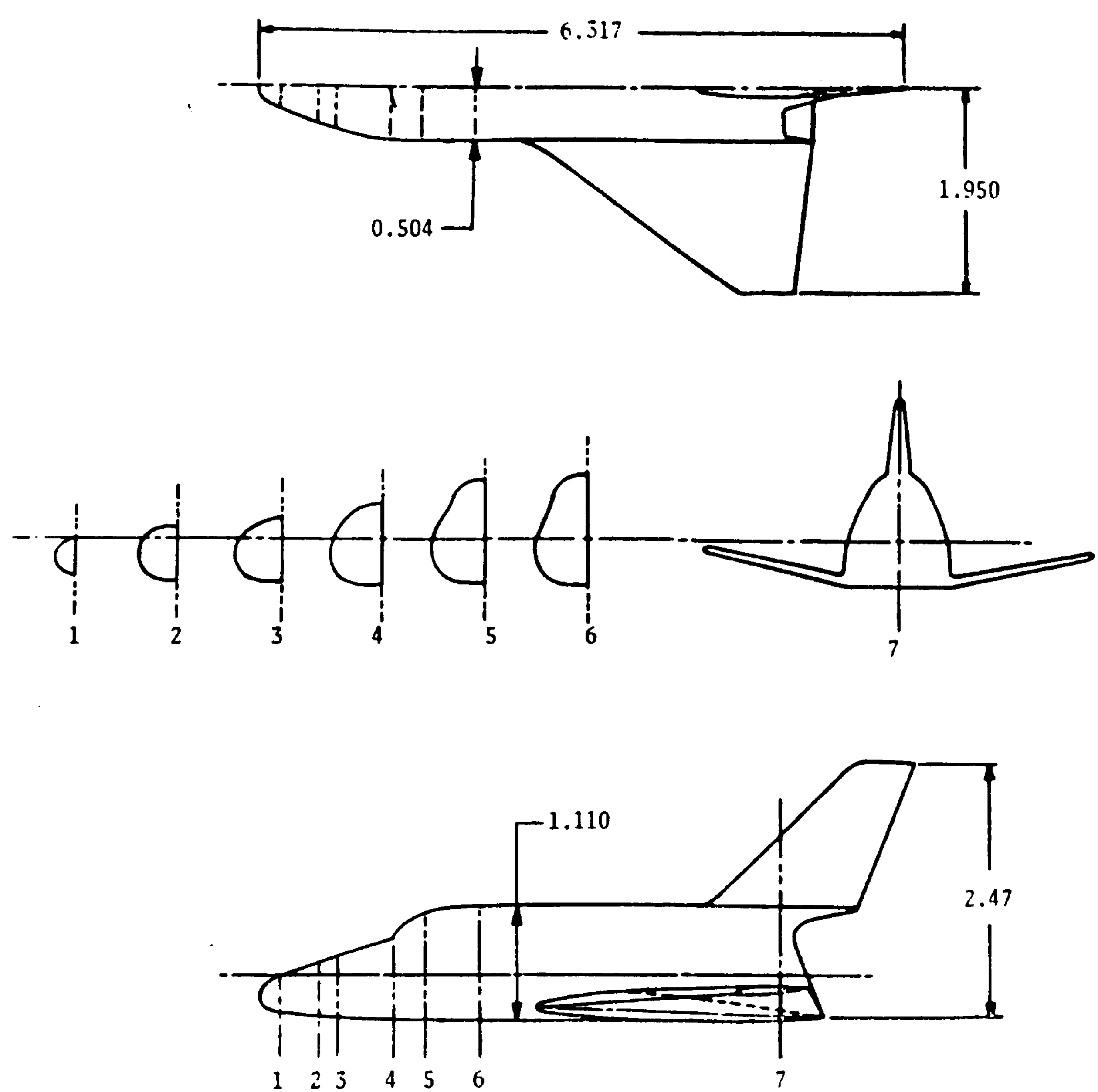


Figure 5. Orbiter Body Model Component (O)

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 673

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 674

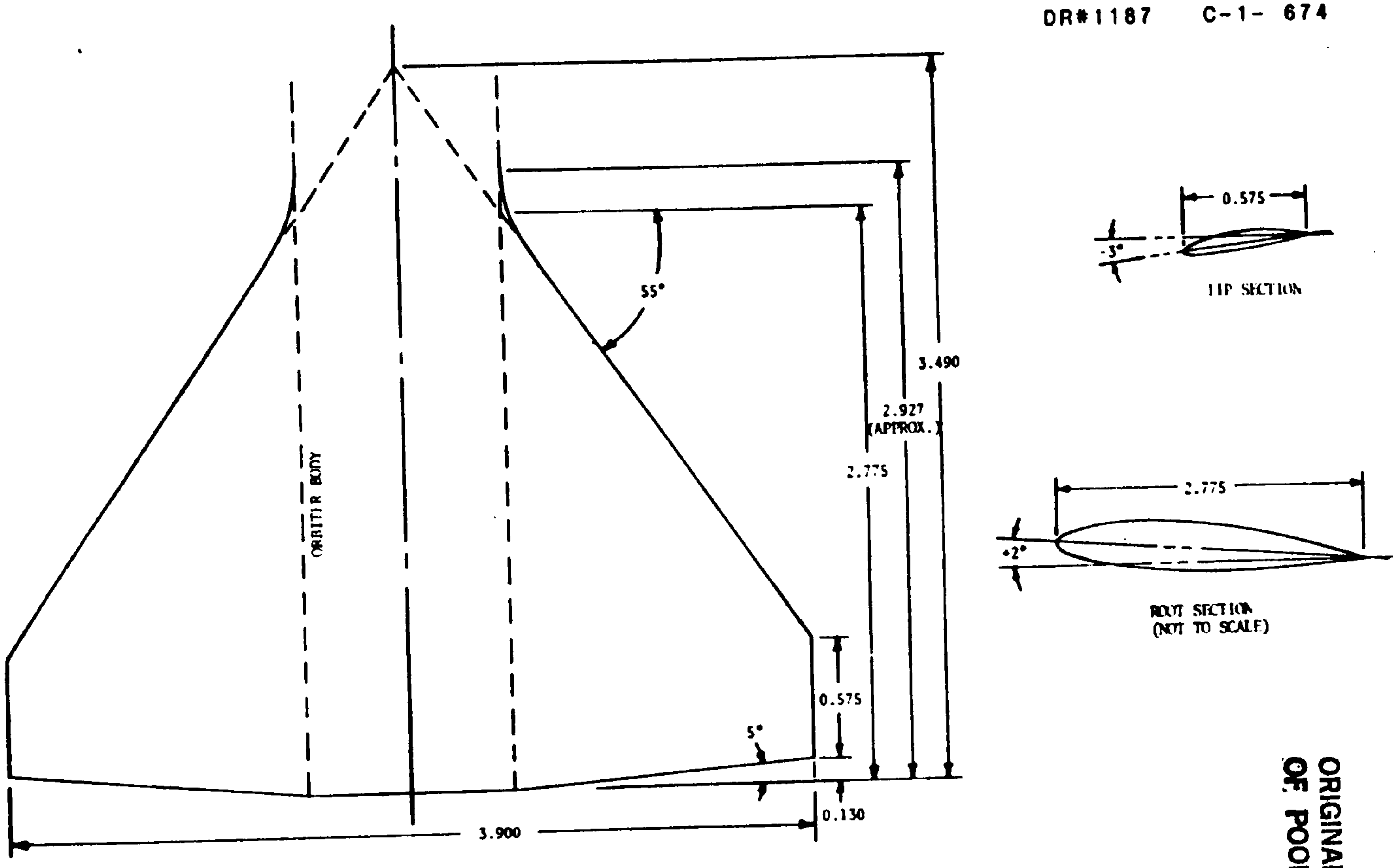


Figure 6. Grumman H-33 Orbiter Wing

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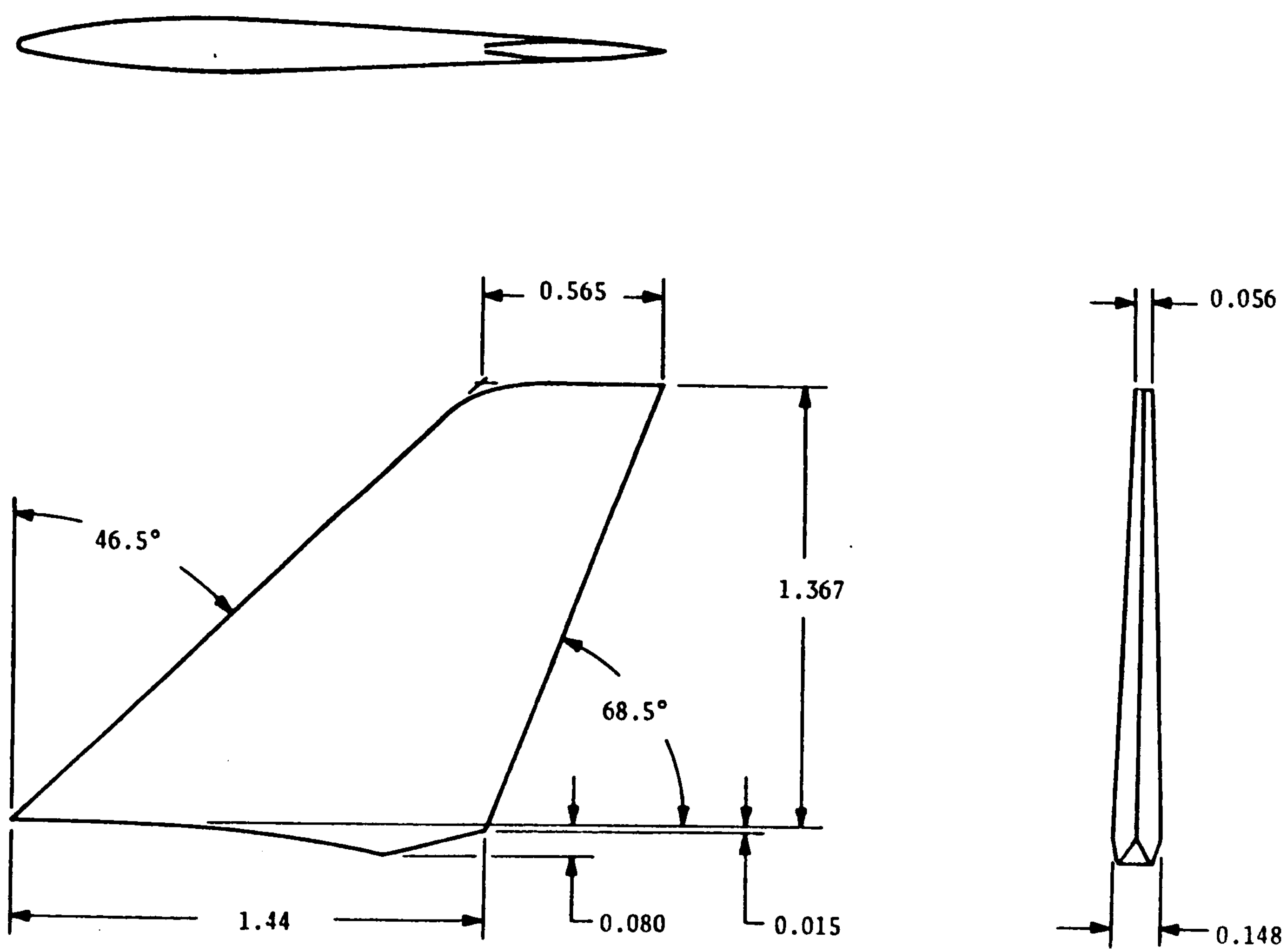

FIGURE 7. GRUMMAN H-33 ORBITER VERTICAL TAIL

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 675

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 676

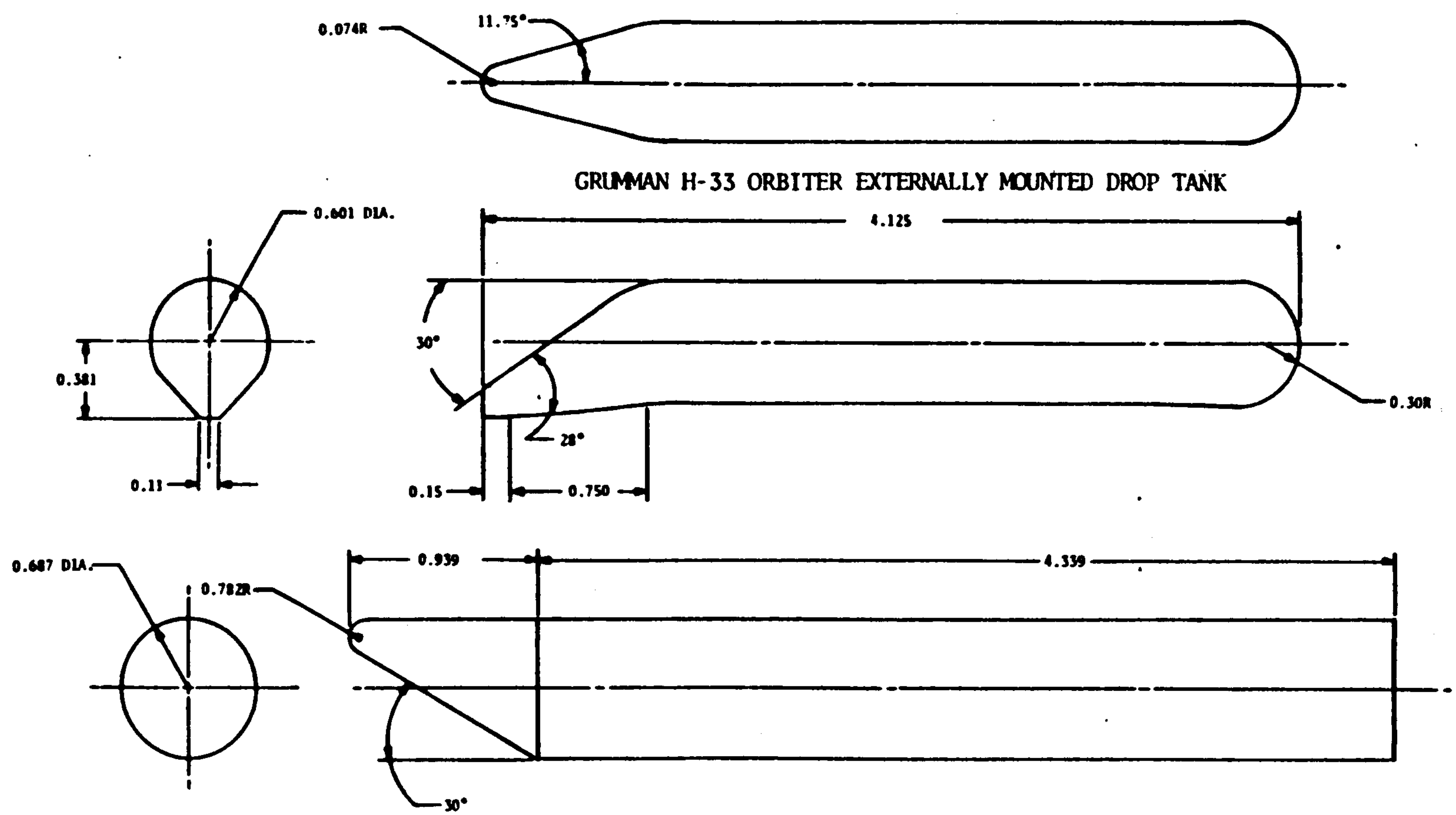

Figure 8. Grumman H-33 Orbiter/S-IC Cradle Assembly

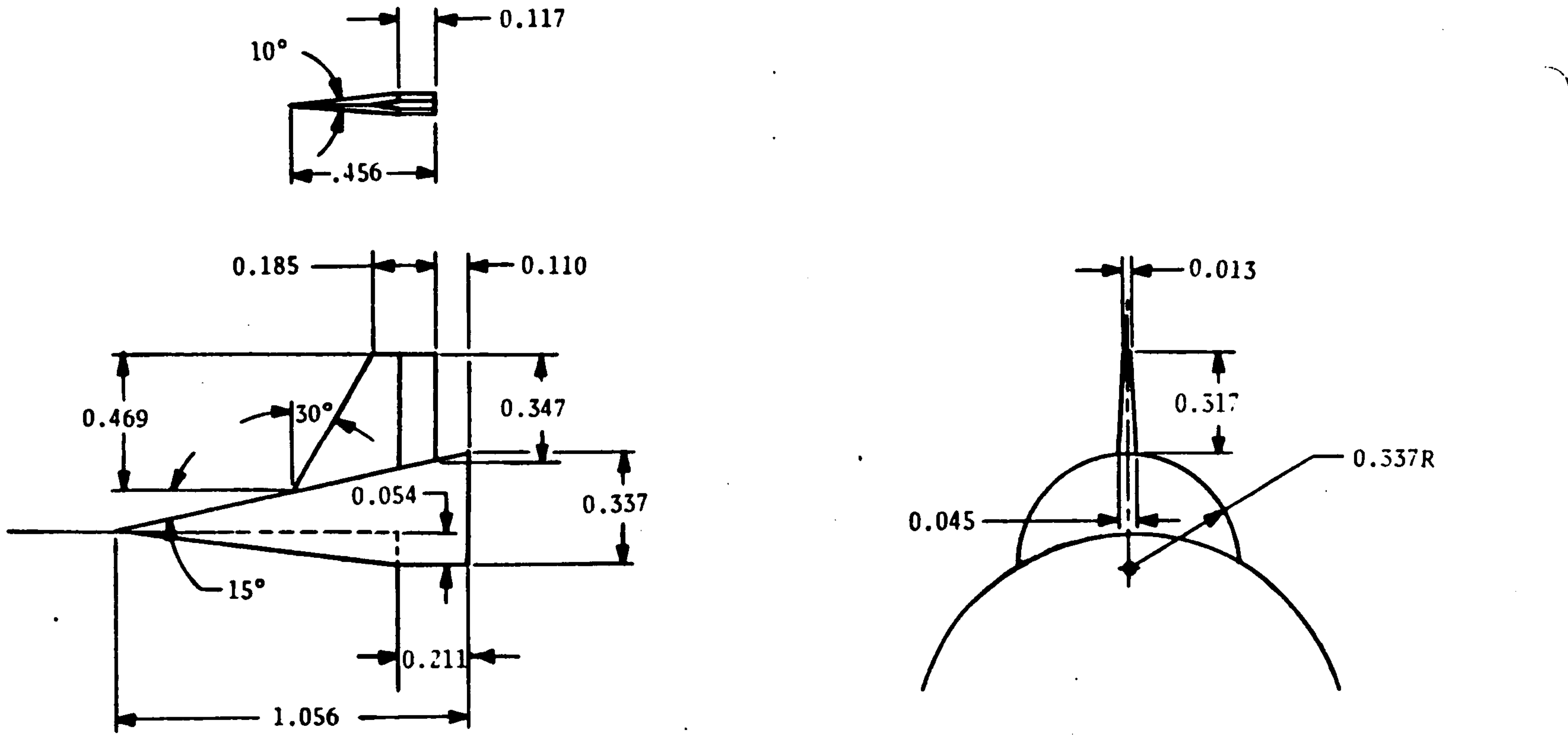

FIGURE 9. S-IC ENGINE SHROUD AND 75 SQ. FT. FIN

UNIQUE CONFIGS. BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1187 C-1- 677

APPENDIX C-2

MODEL FIGURES

LAUNCH AIRLOADS

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TABLE I

TEST AEDC 1163 PRESSURE DATASET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATASET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	P_o PSIA	T_o °F	M	α_i	PWR_B	PWR_C	NO. OF RUNS	DELTAZ .105	.112	.120	.151	.228	.908
(1)T851(2)	BOOSTER/ORBITER	A	0°	22	135	5.0	0°	0	0	116		A	B	B	B	C
T852	↓	A	↓	↓	↓	↓	0°	100	50	22		A				C
T853	↓	A	↓	↓	↓	↓	0°	50	100	114		A	B	B	B	C
T854	↓	A	↓	↓	↓	↓	5°	50	100	24				D	D	
T855	↓	B	↓	↓	↓	↓	5°	0	0	18				D	D	
T856	↓	B	↓	↓	↓	↓	0°	50	100	20			D	D		C
T857	↓	B	↓	↓	↓	↓	0°	0	0	21			D	D		C
T858	↓	0°	↓	150	180	↓	0°	0	0	20			D	D	D	C
T859	↓	A	↓	22	135	↓	0°	0	0	20	E					
T860	↓	A	↓	↓	↓	↓	0°	100	100	8	E					
T861	↓	A	↓	↓	↓	↓	0°	100	0	20	E					
T862	(CANARD OFF)	B	↓	↓	↓	↓	0°	0	0	9	F			F		C
T863	(CANARD AND TRIPS OFF)	B	↓	↓	↓	↓	0°	0	0	6	F			F		

Refer to page 14 for DELTAX schedules.

NOTES: (1)-Characters A through I refer to booster body, upper wing, lower wing, canard, & base, and orbiter body, upper wing, lower wing, & base, respectively.
(2)-Characters 1 through 5 refer to angles of attack of -10, -5, 0, +5, & +10 degrees, respectively.

α or β SCHEDULES
A(α)= -10, -5, 0, +5, +10
B(α)= -5, 0, +5

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CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1174 C-2- 2

☐ PRETEST
☒ POSTTEST

TABLE I (Continued)

TEST AEDC 1163 PRESSURE DATASET COLLATION SHEET

DATASET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	P_o PSIA	T_o °F	PARAMETER VALUES M	α_i	PWR_B	PWR_C	NO. OF RUNS	DELTAZ .105	.112	.120	.151	.228	.408	
(1) T831 (2)	BOOSTER/ORBITER	A	0°	11.5	120	3.0	0°	50	100	70			D	D	D	G	Refer to page 14 for DELTAX schedules.
T832		A					0°	0	0	55			D	D	D	G	
T833		A					0°	0	0	15	H						
(1) T821 (2)	BOOSTER/ORBITER	A	0°	7.5	120	2.0	0°	50	100	55			D	D	D	G	
T822		A					0°	0	0	55			D	D	D	G	
T823		A					0°	0	0	15	H						
T824		B					5°	50	100	18				D	D		
T825		B					5°	0	0	18				D	D		
T826		A					0°	100	0	15	H						
T827		A					0°	100	100	5	I						
(1) T8013	BOOSTER/ORBITER	0°	0°	-	-	0.0	5°	0	100	12				B	B		
T8023		0°	0°	-	-	0.0	5°	0	100	6				B			

NOTES: (1)-Characters A through I refer to booster body, upper wing, lower wing, canard, & base, and orbiter body, upper wing, lower wing, & base, respectively.
(2)-Characters 1 through 5 refer to angles of attack of -10, -5, 0, +5, & +10 degrees, respectively.

α or β SCHEDULES
A(α)= -10, -5, 0, +5, +10
B(α)= -5, 0, +5

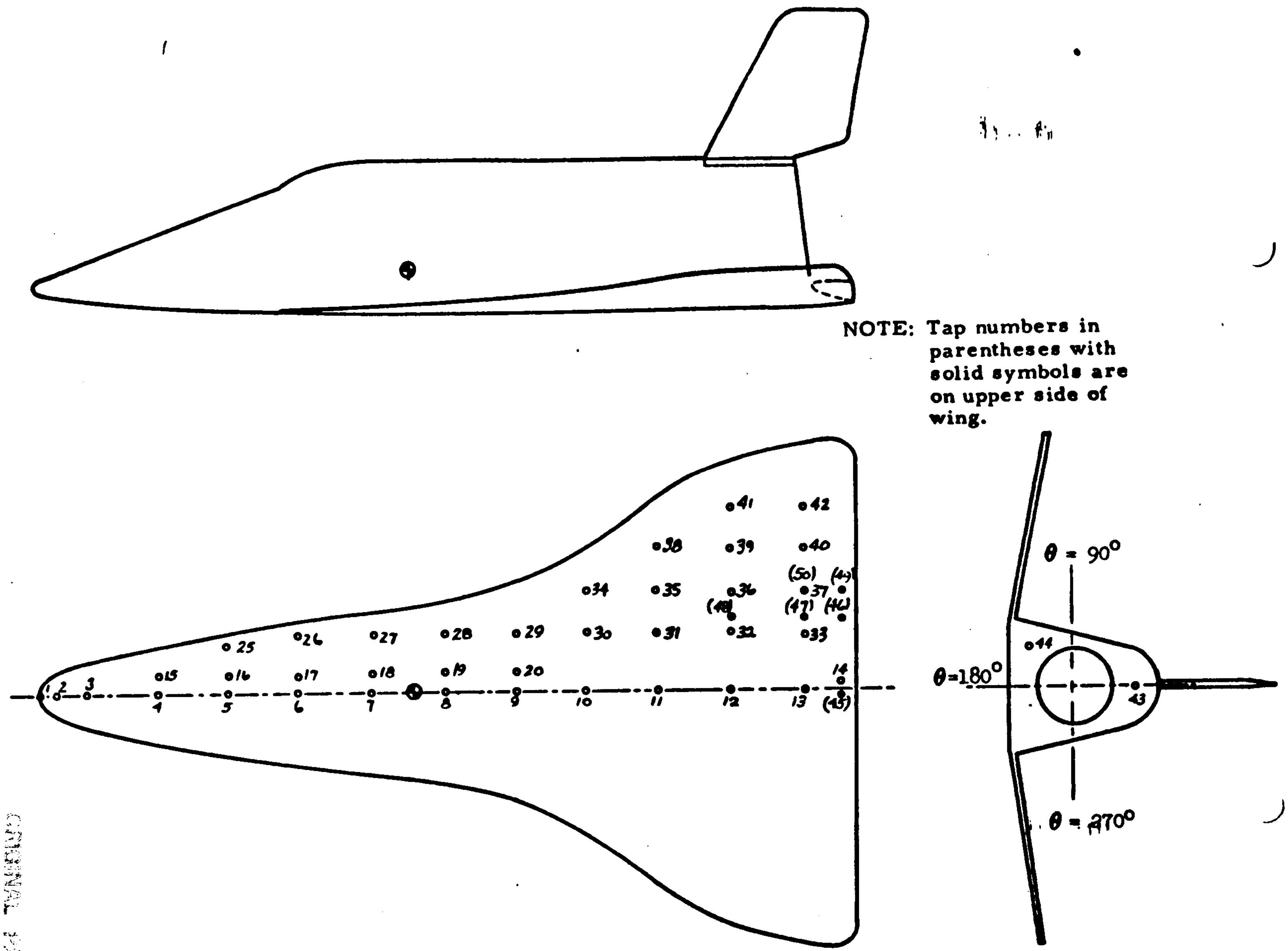


Fig. 1.- Pressure Tap Layout - Orbiter

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1174 C-2- 3

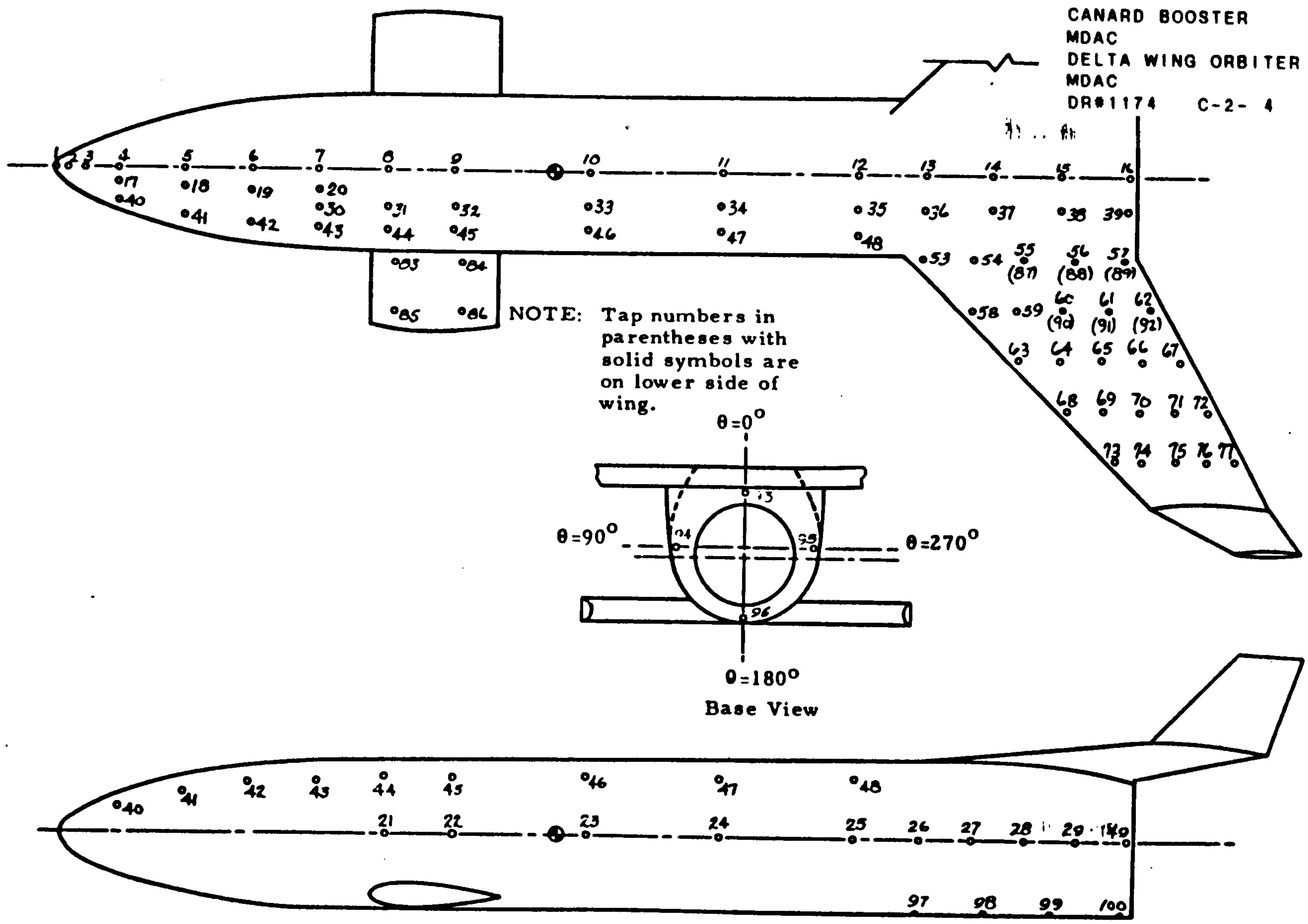


Fig. 2 - Pressure Tap Layout - Booster

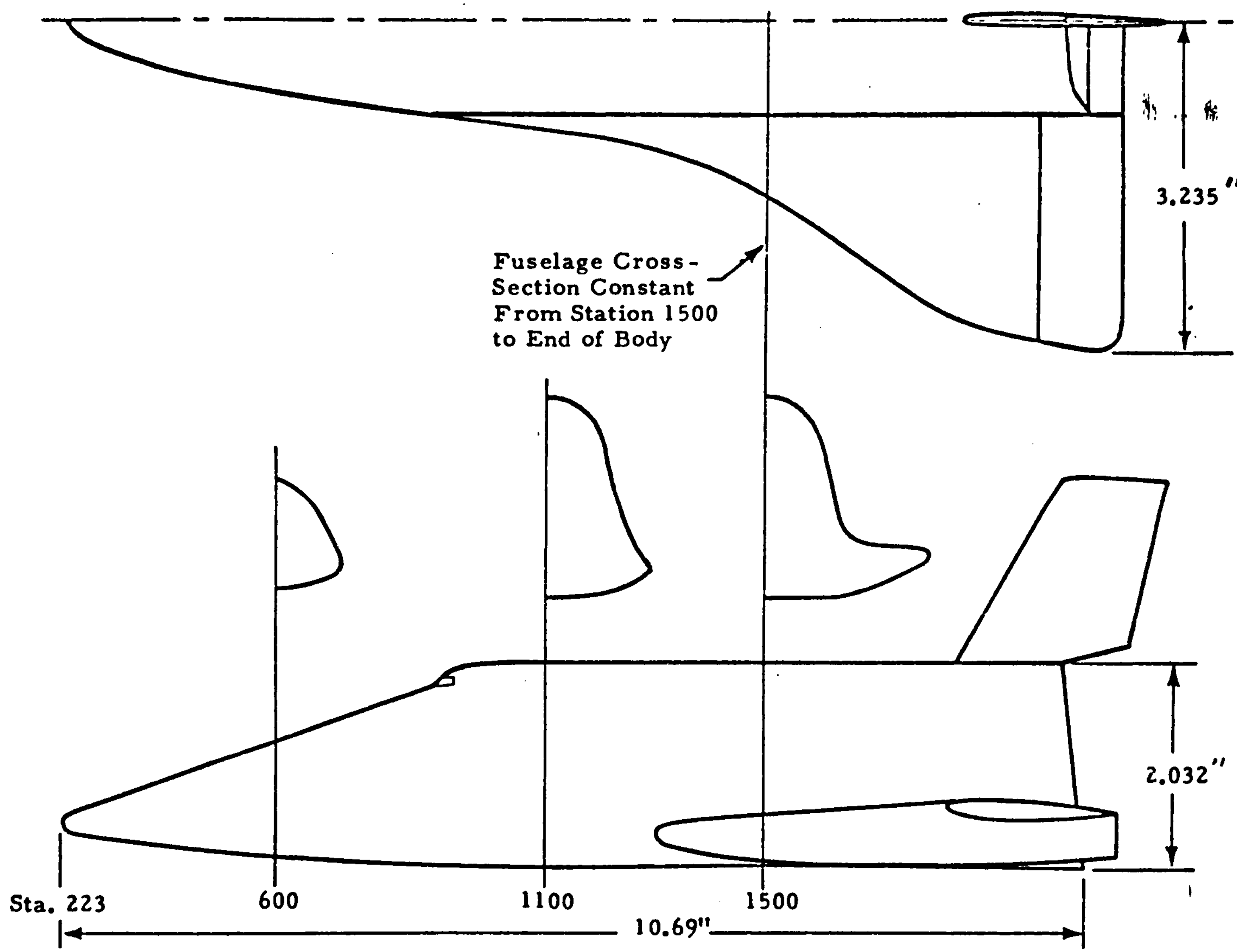


Fig. 3 - Modifications to Orbiter Model

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1174 C-2- 5

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1174 C-2- 6

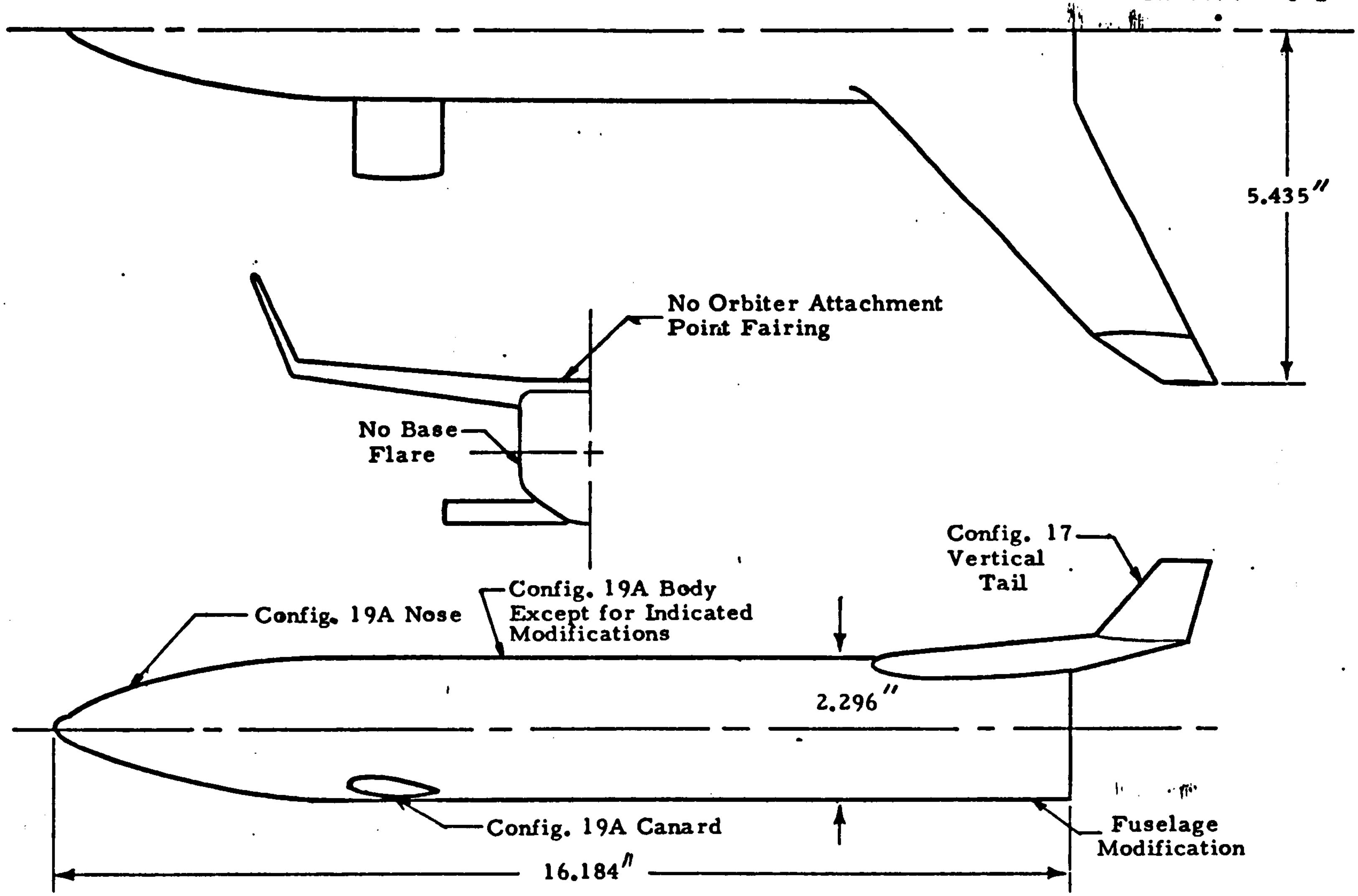
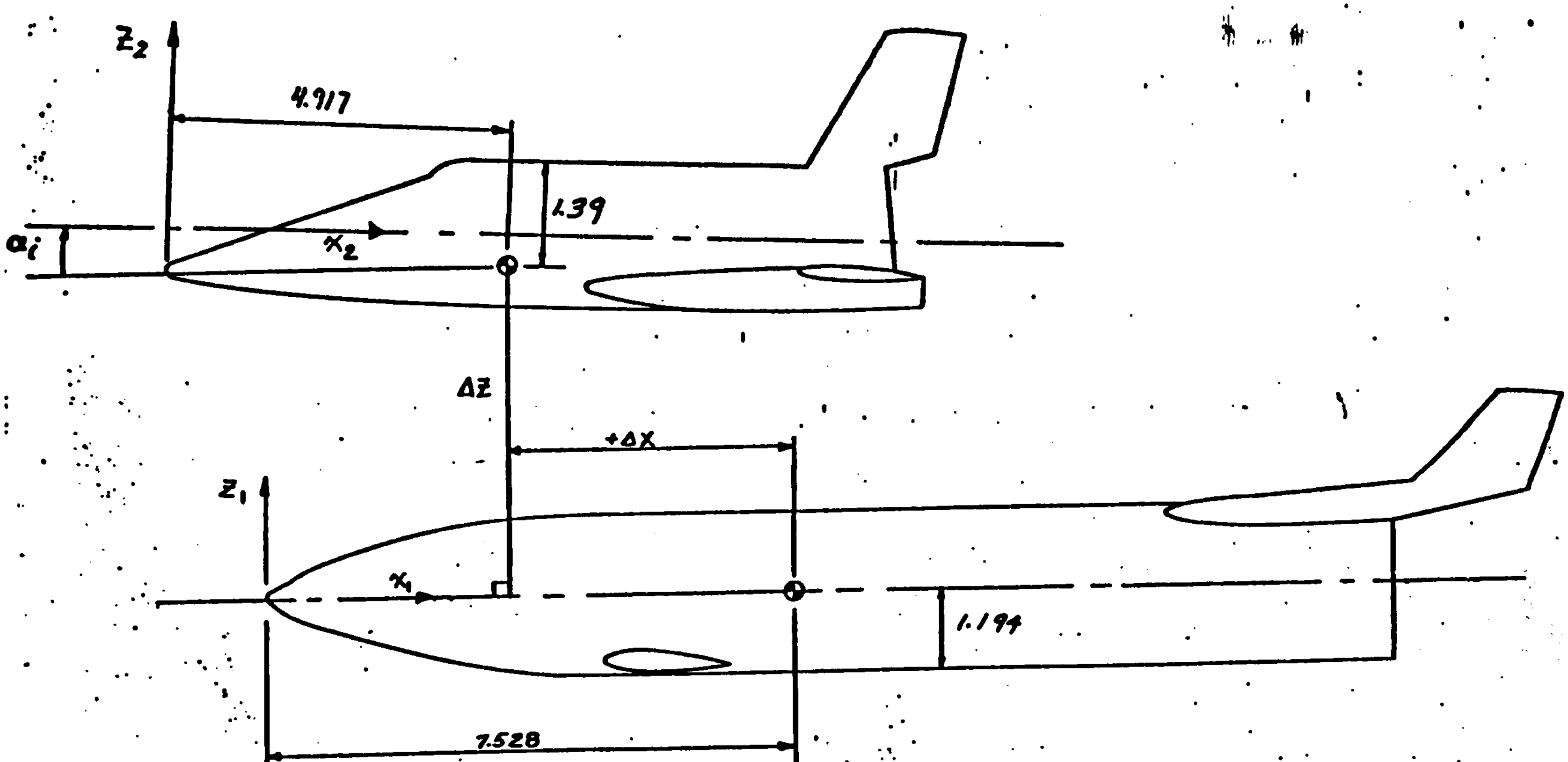


Fig. 4 - Modifications to Booster Model



All dimensions are model scale, in inches.

Figure 6. Separation Nomenclature and Center of Gravity Locations

☐ PRETEST
☒ POSTTEST

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TABLE II

TEST AEDC TC 174 PRESSURE DATASET COLLATION SHEET

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES i	PARAMETER/VALUES $\Delta X/\ell$	NO. OF RUNS	MACH .6	MACH .9	MACH 1.0	MACH 1.1	MACH 1.2	MACH 1.3
(1) TC001	BOOSTER/ORBITER	A through I		A	0°	0°	0		✓	✓	✓	✓	✓	✓
TC002				0°	B				✓	✓	✓	✓	✓	✓
TC003				-6°	C				✓	✓	✓	✓	D	D
TC004				+6	B		↓		✓	✓	✓	D	D	D
TC005				A	0°		.0367		✓	P	P	✓	✓	✓
TC006				0°	B				✓	✓	✓	✓	✓	✓
TC007				-6°	D				✓	✓	✓	✓	✓	✓
TC008				+6°	D	↓			✓	✓	✓	✓	✓	✓
TC009				A	0°	1.9°			✓	✓	✓	✓	✓	✓
TC010				A	0°	3.8°	↓		P	✓	✓	✓	✓	P
TC011	↓	↓		A	0°	0°	.1943		✓	✓	✓	✓	✓	✓
TC012	BOOSTER ALONE	A,B,C,D,E		A	0°	—	—		✓	✓	✓	✓	✓	✓
TC013	↓	↓		0°	B	—	—		✓	✓	✓	✓	✓	✓
TC014	BOOSTER ALONE/ CANARD OFF	A,B,C,E		A	0°	—	—			✓		✓		

NOTE (1): First character of each dataset identifier denotes model section: A through I refer to booster body, upper wing, lower wing, canard, base, and orbiter body, upper wing, lower wing, and base, respectively.

α OR β SCHEDULES

A(α)=-8,-6,-4,-2, 0,+2,+4,+6,+8,+10 degrees P(α)=partial schedule A

B(β)=-6,-4,-2, 0,+2,+4,+6 degrees C(β)=-4,-2, 0,+2,+4 degrees

D(β)=-4,+4 degrees (plotted data includes β=0 at α=-6 or +6 from corresponding α-variant dataset)

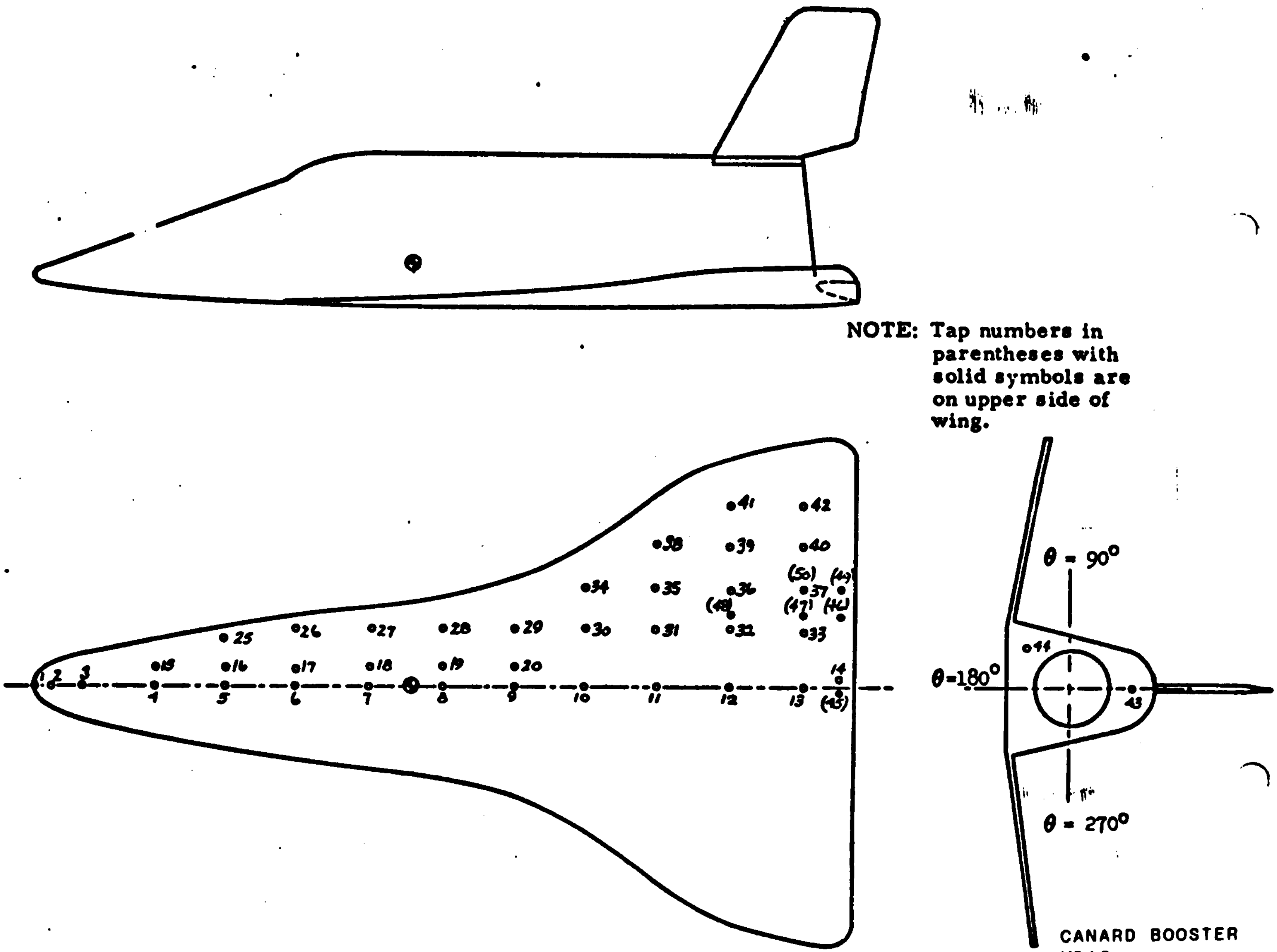

Fig. 1.- Pressure Tap Layout - Orbiter

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1222 C-2- 9

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1222 C-2- 10

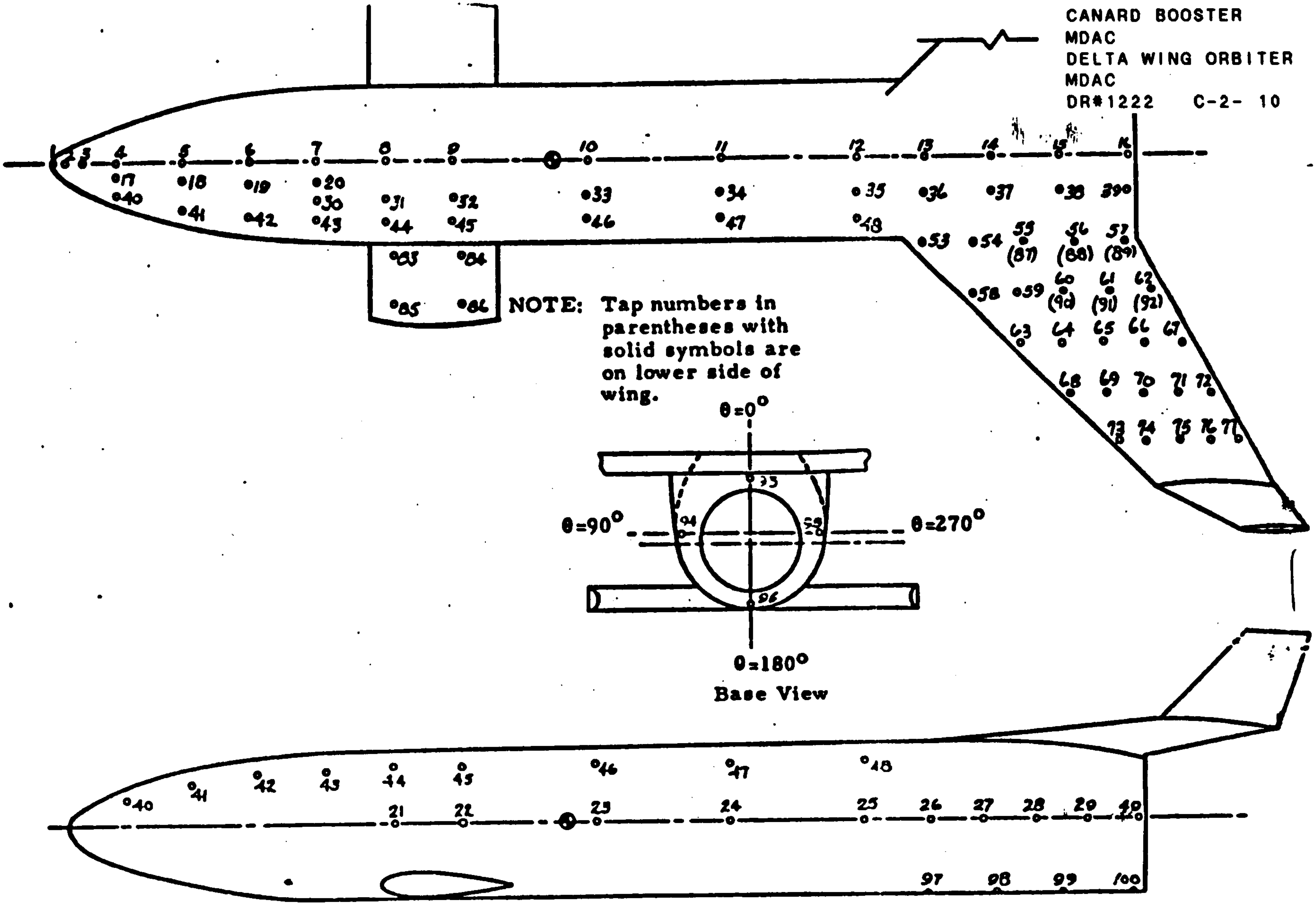

Fig. 2 - Pressure Tap Layout - Booster

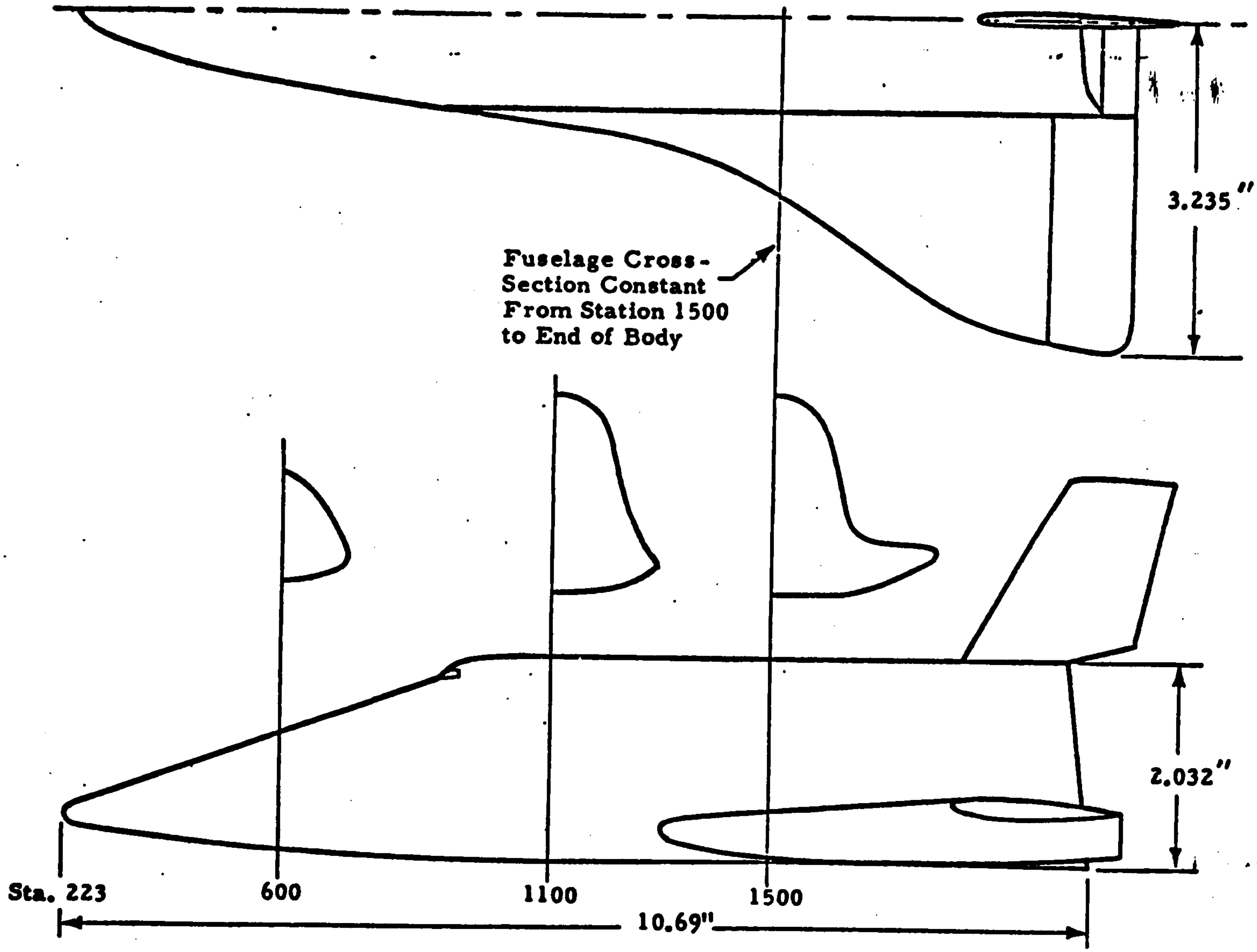

Fig. 3 - Modifications to Orbiter Model

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1222 C-2- 11

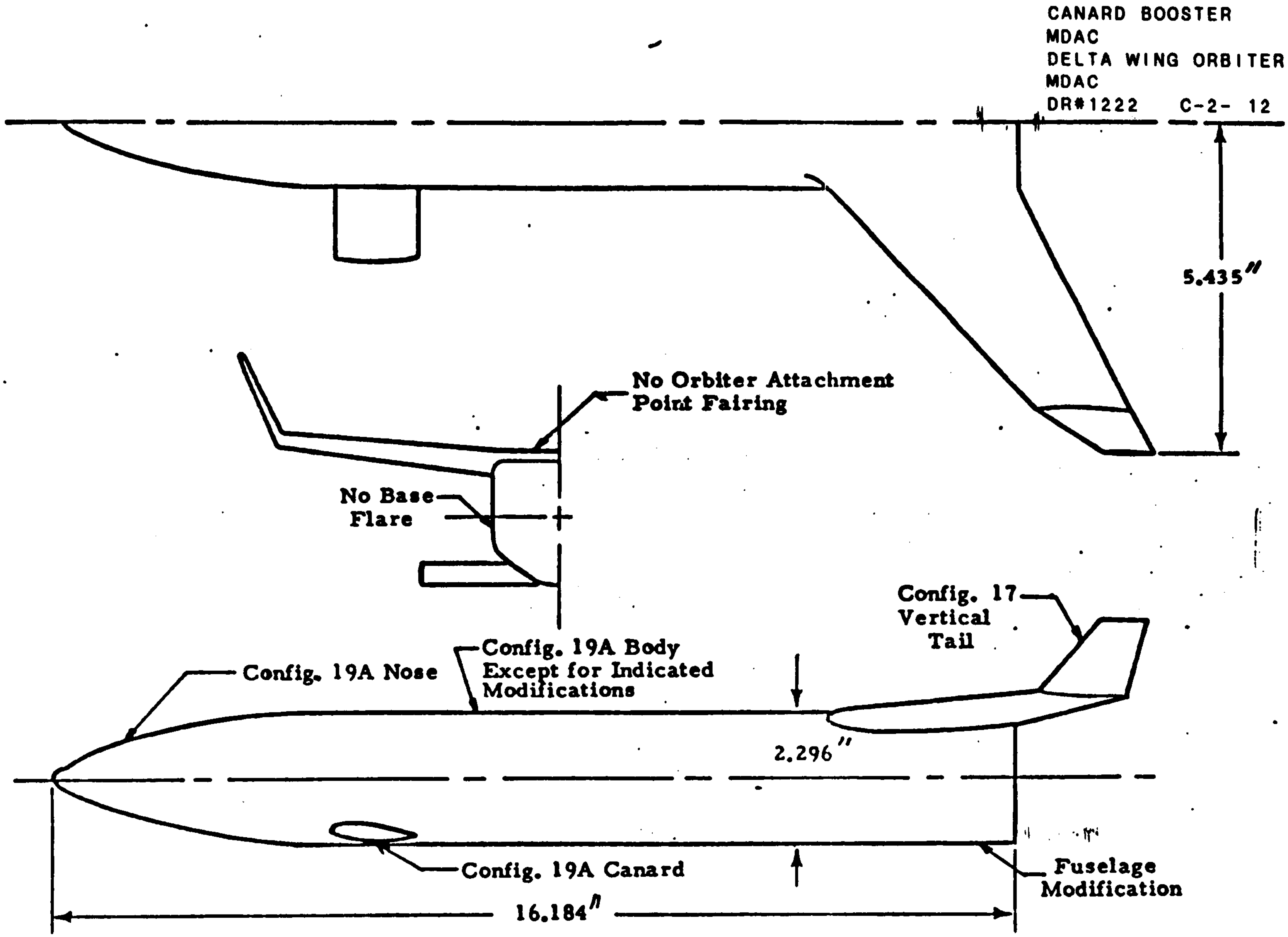

Fig. 4 - Modifications to Booster Model

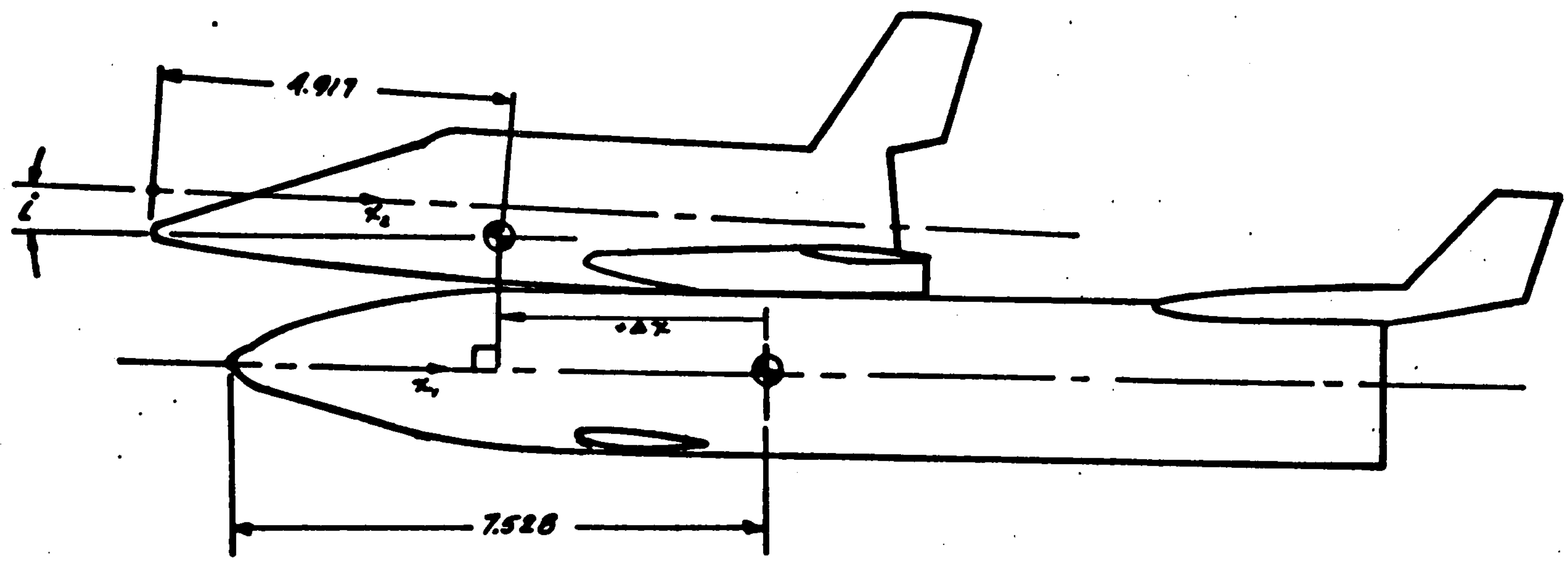

Figure 5: Model Separation Variables

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1222 C-2- 13

TABLE II.

TEST: MSFC 543

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE: PO

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION SRB POS.	CONTROL DEFLECTION α_i	CONTROL DEFLECTION Δg	NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.80	0.95	1.10	1.20	1.46	1.96
R70000	T_1	A	0	—	—	—		265-269			260-264	270-274	285-289
600	T_1O_1			—	-1.5°	—		250-254			255-259	275-279	280-284
500	T_1S_1			1	—	.025					175-179		
				3	—						170-174		
				5	—						56-60		
				6	—						61-65		
100	$T_1S_1O_1$ (WITHOUT ABORT SRB)			1	-1.5°			150-154	145-149		140-144	125-129	110-114
		A		3				155-159	160-164		165-169	120-124	115-119
		B		4					3-4		1-2		
		A		5				20-24	5-9		10-14	91-95	96-100
				6				35-39	25-29		30-34	86-90	101-105
200				1	0°						180-184	130-134	
				3							185-189	135-139	
				5							71-75	76-80	
				6							66-70	81-85	

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICENTS IDVAR (1) IDVAR (2) NDV

α OR β SCHEDULES
A) -10°, -4°, 0°, 4°, 10°
B) 10, -10

TABLE II. (Continued)

TEST: MSFC 543

DATA SET/RUN NUMBER COLLATION SUMMARY

DATE: POST TEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION SRB POS.	CONTROL DEFLECTION ∝L	CONTROL DEFLECTION Δφ	NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.80	0.95	1.10	1.20	1.46	1.96
R70300	T.S.O1 (WITHOUT ABORT SRB)	O	A	1	-1.5°	.025					195-199		
				3							190-194		
				5							240-244		
				6							245-249		
400		6		1					205-209		200-204		
				3					210-214		215-219		
				5					230-234		235-239		
				6					225-229		220-224		
700		B	O	5		.05			52-53		54-55		
				6					40-41		42-43		
800				5		.10			48-49		50-51		108-109
				6					46-47		44-45		106-107
905	T.S.O2 (WITH ABORT SRB)	A		5		.025		15-19					

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICENTS IDVAR (1) IDVAR (2) NDV

α OR β SCHEDULES

786

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
LMSC
DR#1255 C-2- 15

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CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
LMSC
DR#1255 C-2- 16

Note: All dimensions in inches (model scale)

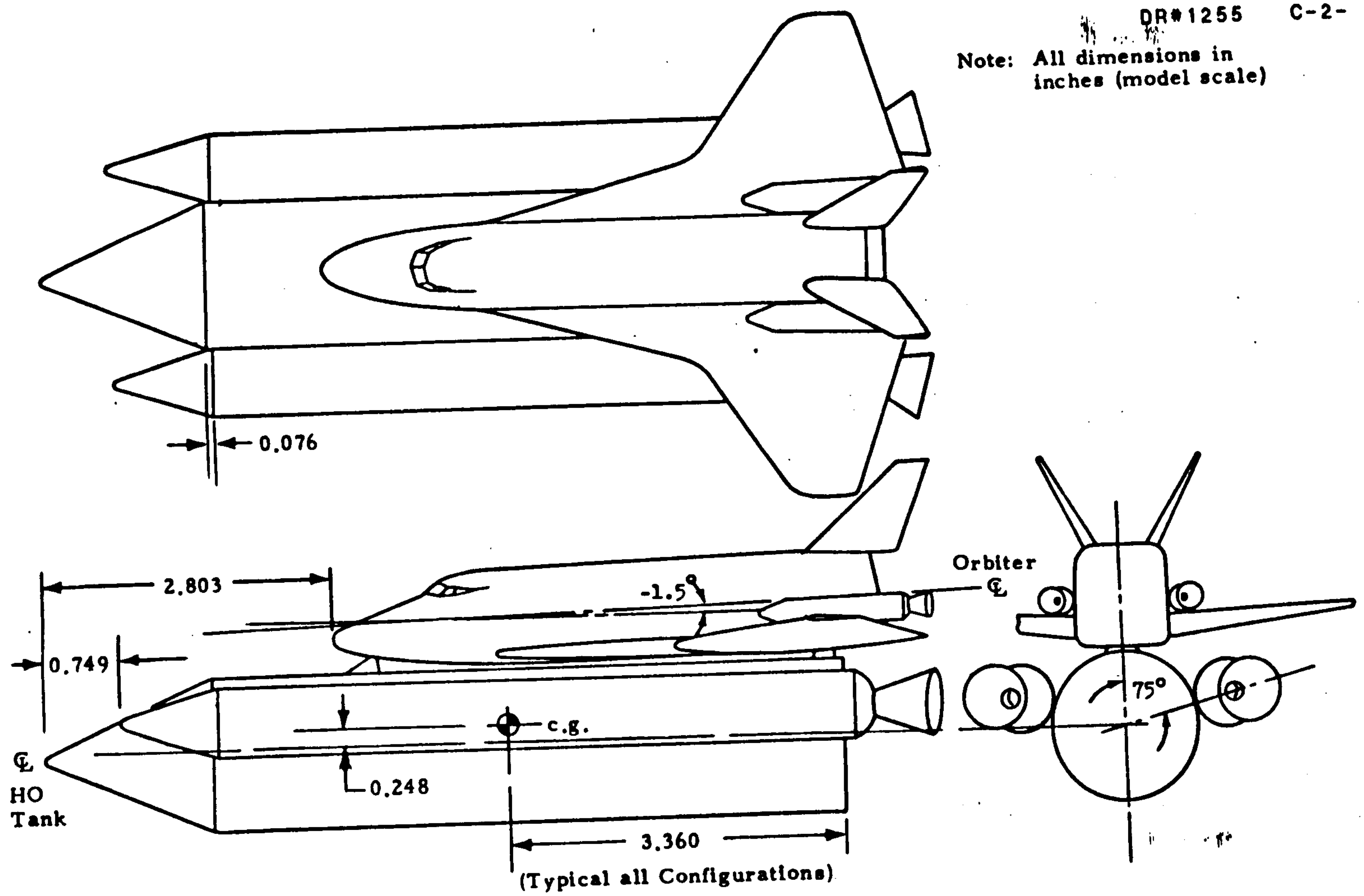

Fig. 2 - Baseline Launch Vehicle

NOTE:
All dimensions in inches
(model scale).

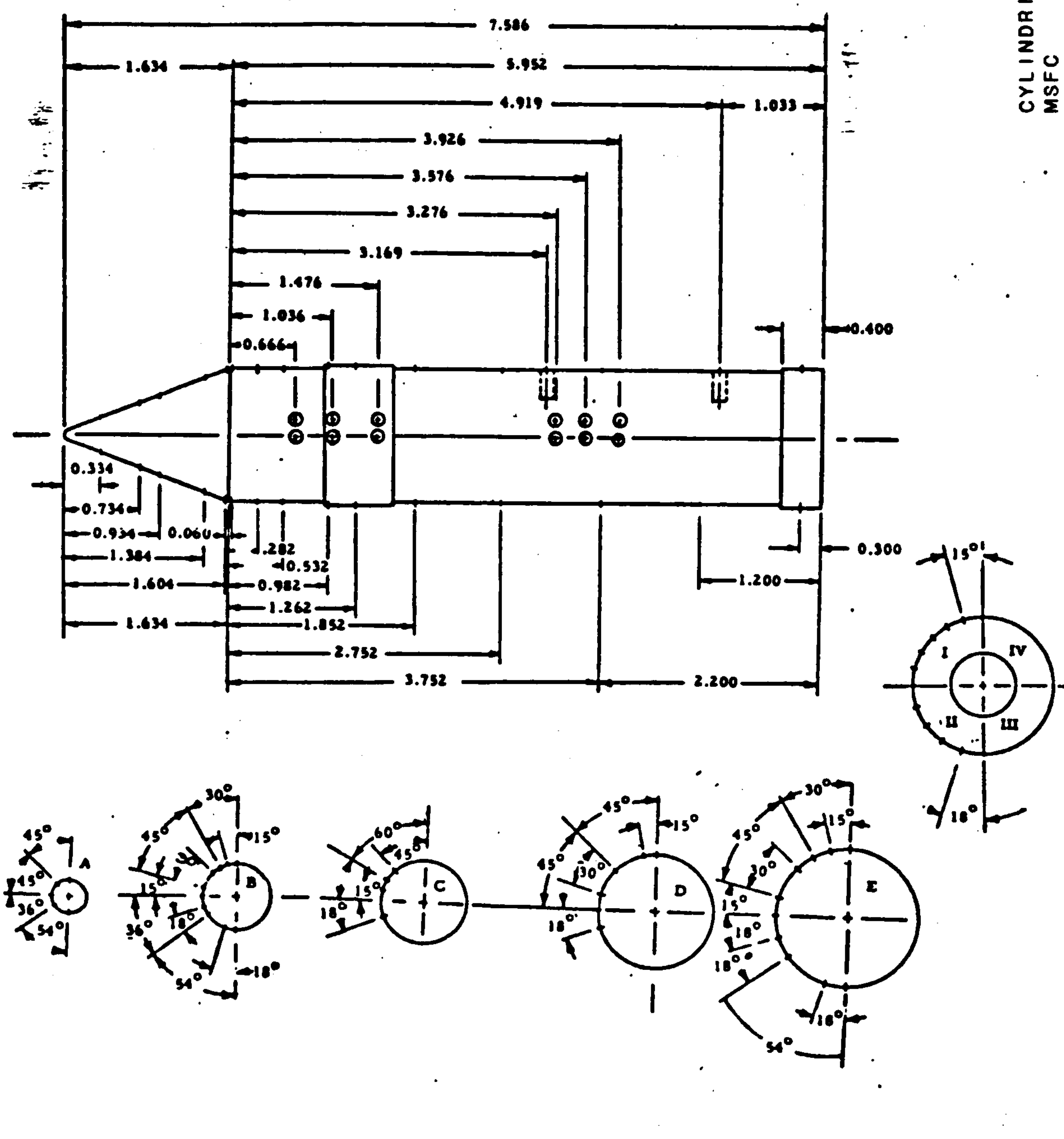

Fig. 4 - HO Tank Pressure Orifice Location

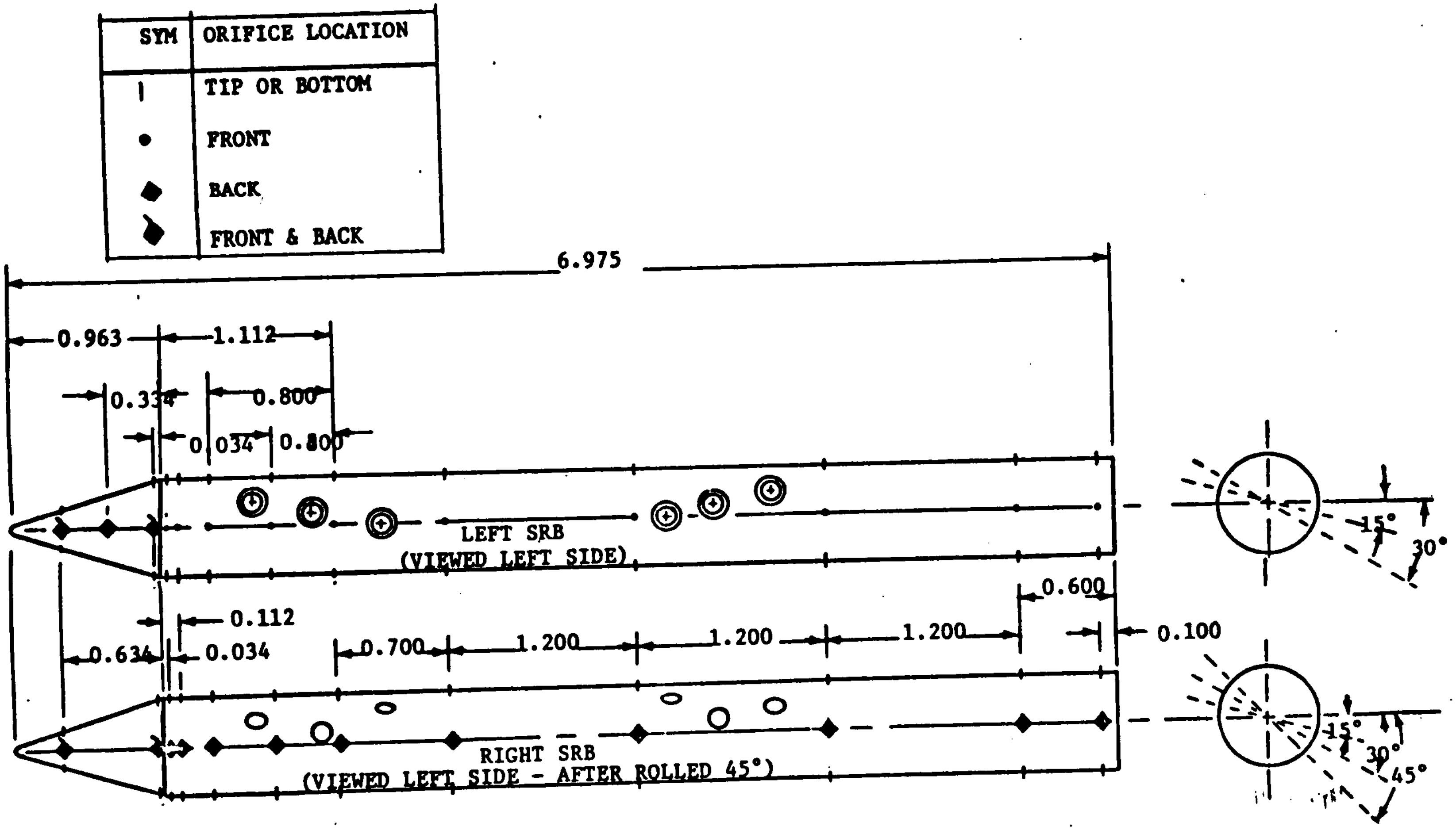

FIGURE 5. ORIFICE LOCATIONS ON SRB's

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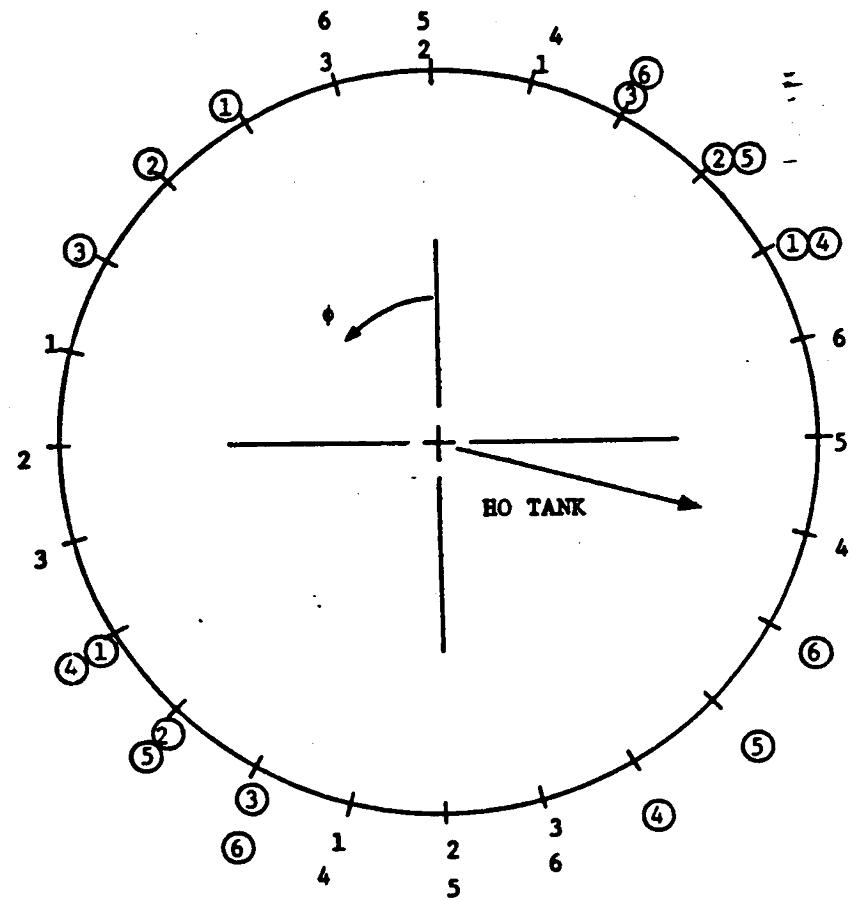
CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
LMSC
DR#1255 C-2- 19



AFT VIEW (REFERENCED TO LEFT SRB)

1 = SRB POSITION I (LEFT SRB)
2 = SRB POSITION II
3 = SRB POSITION III
4 = SRB POSITION I + 180
5 = SRB POSITION II + 180
6 = SRB POSITION III + 180

NOTE: CIRCLED NUMBER, 3 , REPRESENTS ORIFICE LOCATED ON RIGHT SRB REFERRED TO THE LEFT SRB

FIGURE 6. COMPOSITE OF RADIAL LOCATIONS OF ORIFICES ON SRB FOR VARIOUS BOLT PATTERNS

TABLE III

TEST MSFC IWT 540 DATA SET/RUN NUMBER

COLLATION SUMMARY

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1259 C-2- 20

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES C_0	PARAMETERS/VALUES θ_S			NO. of RUNS	0.6	0.8	0.9	1.1	1.2	1.96	2.74	1.46				
R67001	T101	A	0	-1.5	—			42	10 / 16	20 / 26	30 / 36	40 / 46	50 / 56	430 / 436						
002		B	0					6							600 / 602	590 / 592				
003		0	C					42	100 / 106	90 / 96	80 / 86	60 / 66	70 / 76	480 / 486						
004		0	D					6							490 / 492	500 / 502				
005	T101B1	B	0					24	300 / 302	290 / 292	280 / 282	270 / 272	260 / 262	440 / 442	570 / 572	580 / 582				
006		0	D					24	110 / 112	120 / 122	130 / 132	140 / 142	150 / 152	470 / 472	520 / 522	510 / 512				
007	T101R1S1	A	0		21°			42	210 / 216	220 / 226	230 / 236	240 / 246	250 / 256	450 / 456						
008		B	0					6							560 / 562	550 / 552				
009		0	C					42	200 / 206	190 / 196	180 / 186	170 / 176	160 / 166	460 / 466						
010		0	D					6							530 / 532	540 / 542				
011	C1	A	0	—	—			42	310 / 316	320 / 326	330 / 336	350 / 356	340 / 346	420 / 426						
012		B	0					6							610 / 612	620 / 622				
013		0	C					42	400 / 406	390 / 396	380 / 386	360 / 366	370 / 376	410 / 416						
014		0	D					6							640 / 642	630 / 632				
015		E	0					3							650 / 652					
[illegible]		F	0					3								660 / 662				

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

TAPN. X/L CP → IDPVAR(1) IDPVAR(2) NDV 3

COEFFICIENTS:

α or β SCHEDULES

αA = -6° TO 6° Δα = 2° βC = -6° TO 6° Δβ = 2° αE = 12°, 20°, 26°

αB = -6° TO 6° Δα = 6° βD = -6° TO 6° Δβ = 6° αF = 12°, 20°, 22°

NASA-MSFC-MAF

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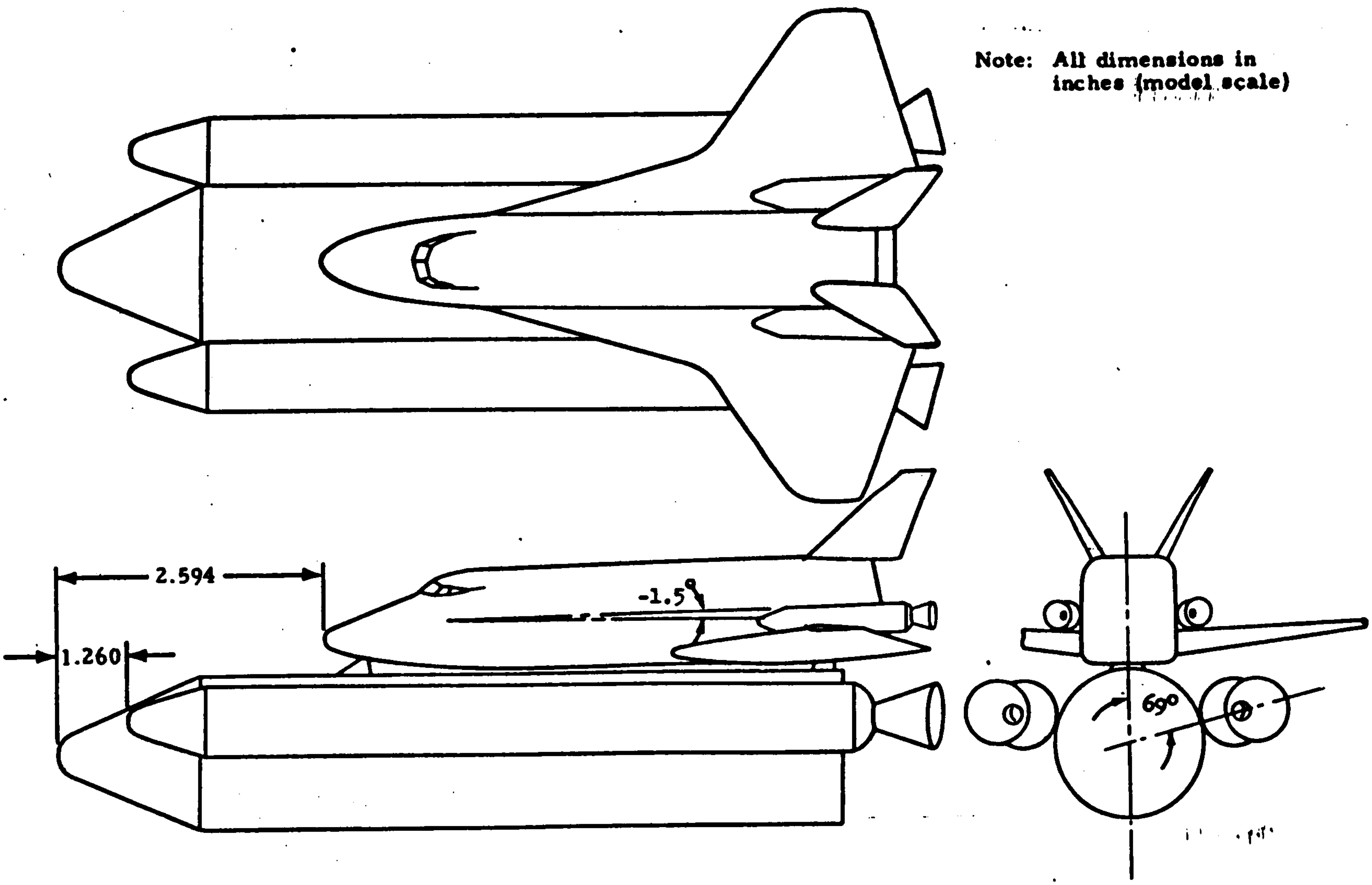

Fig. 1 - Baseline Launch Vehicle

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1259 C-2- 21

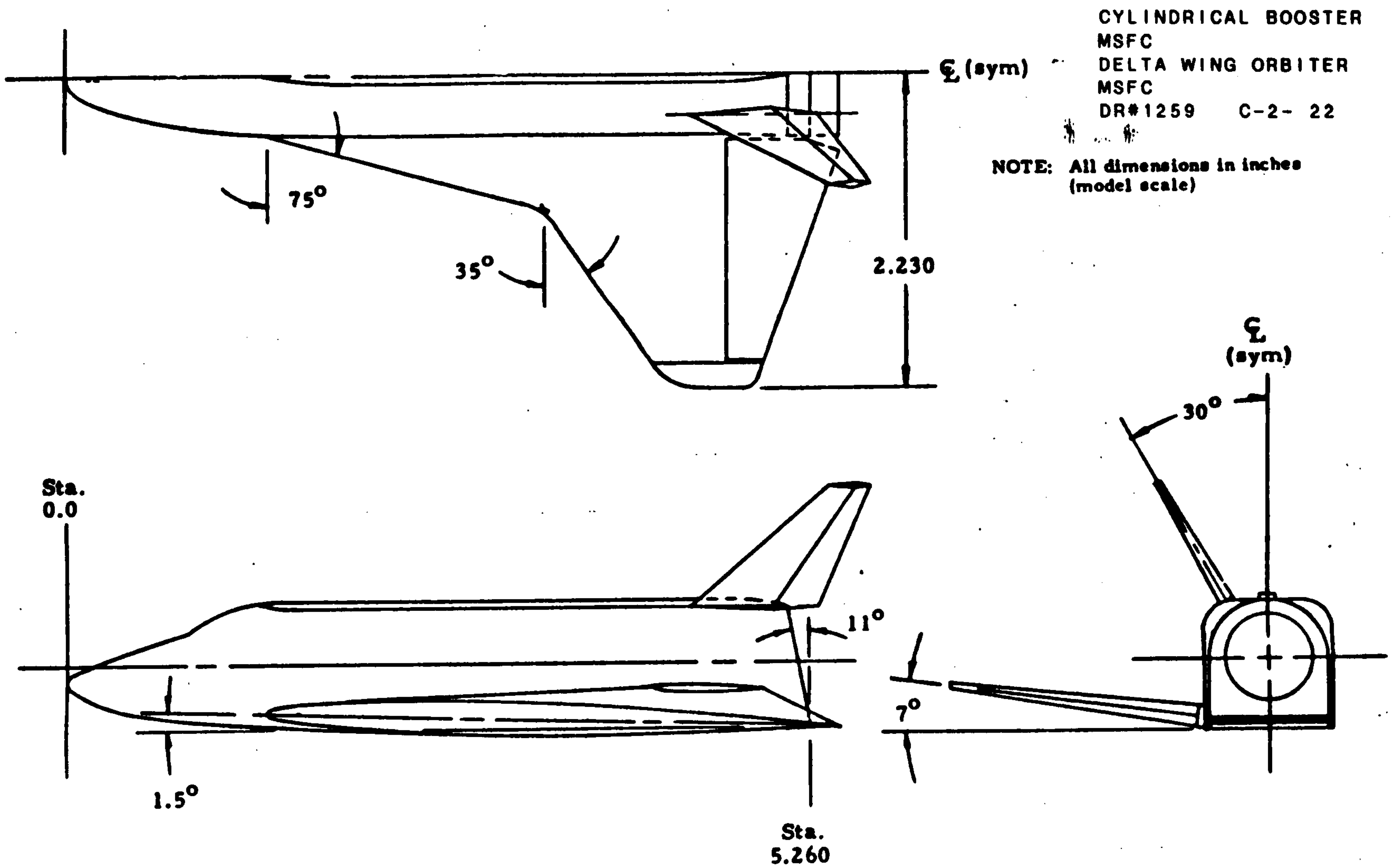

Fig. 2- General Arrangement, Space Shuttle 049 Orbiter

Note: All dimensions in inches (model scale)

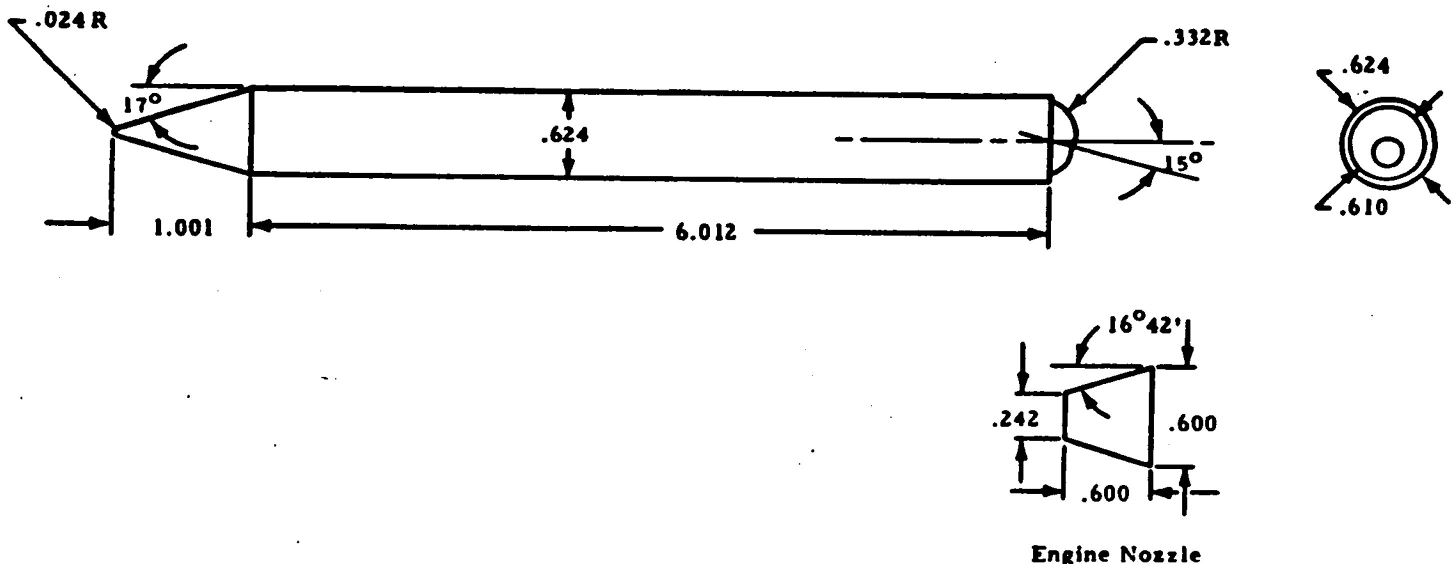

Fig. 3 - 156-Inch Solid Rocket Motor

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1259 C-2- 24

Numbers in parenthesis are on the lower surface

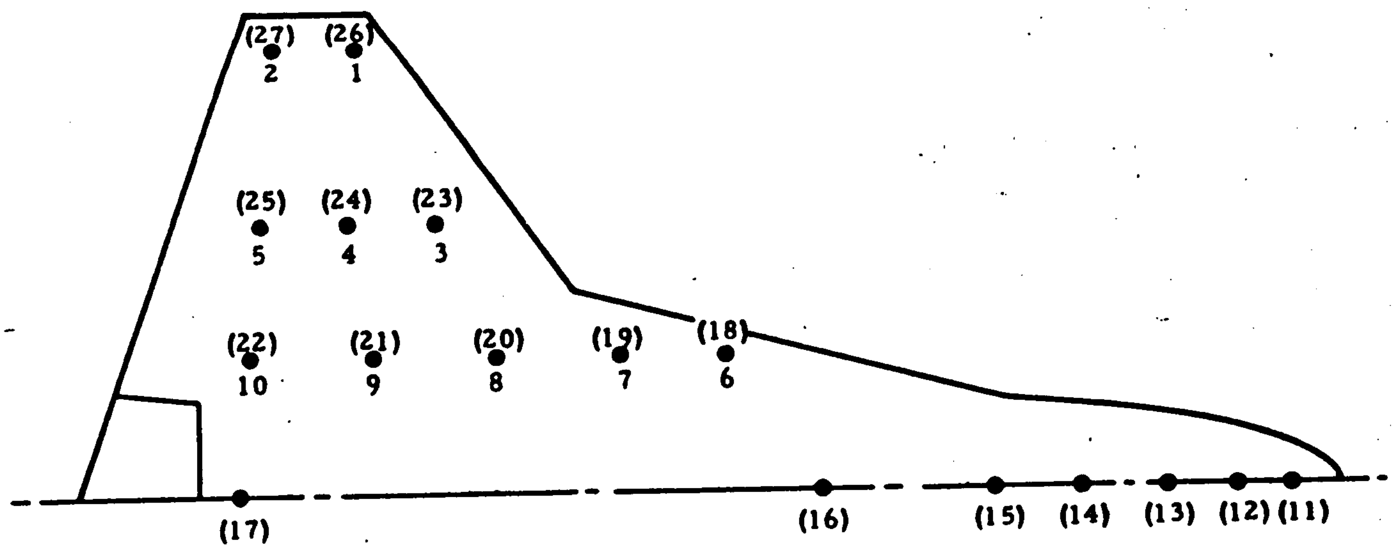

Fig. 4 - Static Pressure Tap Positions

TABLE III. TEST TWT 550 DATA SET COLLATION SHEET

☐ PRETEST
☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES i_o	PARAMETERS/VALUES ϕ_s	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.9	1.0	1.1	1.2	1.46	1.96	4.96
R73 001	T30151	A	O	-1.5	75	45	431/489	471/479	461/469	451/459	441/449			
002		O	A			35	491/497	501/507	511/517	521/527	531/539			
003	T30231	A	O			27					1/9	791/799	921/929	
004		O	A			21					11/17	781/787	931/937	
005		A	O	0.0		27					31/39	801/809	911/919	
006		O	A			21					21/27	811/817	901/907	
007		B	O	-1.5		4								1/1 / 4/1
008		O	B			4								11/1 / 14/1
009		C	O	0.0		8								31/1 / 38/1
010		O	C			6								21/1 / 26/1
011	T30151	A	O			45	371/379	361/369	321/329	331/339	341/349			
012		O	A			35	381/387	391/397	431/437	421/427	401/407			
013		A	O		90	45	271/279	291/287	311/319	301/309	291/299			
014		O	A			35	261/267	251/257	241/247	231/237	221/227			
015	T30251	A	O			27					41/49	831/839	881/889	
016		O	A			21					51/57	821/827	891/897	
017		A	O	-1.5		27					71/79	761/769	951/959	
018		O	A			21					61/67	771/779	941/947	
019		B	O			4								991/994
020		O	B			4								981/984

1 7 13 19 25 31 37 43 49 55 61 67 75 76

TAPN IX/L ICP → IDPVAR(1) IDPVAR(2) NDV 03

COEFFICIENTS:
α or β SCHEDULES

α: A = -8° to 8° by Δα = 2°; B = -6°, 0°, 2°, 6°; C = -8°, -6°, -4°, 0°, 2°, 4°, 6°, 8°
β: A = -6° to 6° by Δβ = 2°; B = -6°, 0°, 2°, 6°; C = -6°, -4°, 0°, 2°, 4°, 6°

MSFC - Form 363-2 (February 1972)

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1273 C-2- 25

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CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1273 C-2- 26

TABLE III. TEST TWT 550 DATA SET COLLATION SHEET (CONCL

☐ PRETEST

☑ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES i_o	ϕ_s			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) .6	.9	1.0	1.1	1.2	1.46	1.96	4.96				
R73021	T30251	C	O	0.0	90			8								611/618				
022	↓	O	C	↓	↓			6								511/561				
023	T30151	A	O	-1.5				45	591/599	601/609	631/639	621/629	611/619							
024		O	A		↓			35	581/587	571/577	561/567	551/557	541/547							
025		A	O		135			45	681/689	671/679	641/649	651/659	661/669							
026		O	A	↓				35	691/697	701/707	731/737	721/727	711/717							
027		A	O	0.0				45	161/169	151/159	141/149	181/189	121/129							
028	↓	O	A					35	171/177	181/187	191/197	201/207	211/217							
029	T30251	A	O					27					111/119	841/849	871/879					
030		O	A	↓				21					101/107	851/857	861/867					
031		A	O	-1.5				27					81/89	751/759	961/969					
032	↓	O	A		↓			21					90/97	741/747	931/937					
033	T10151	A	O		75			9					351/359							
↓ 034	↓	O	A	↓	↓			7					411/417							

1 7 13 19 25 31 37 43 49 55 61 67 75 76

TAPN X/L CP 03

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

α or β SCHEDULES

α: A = -8° to 8° by Δα = 2°; B = -6°, +0°, 2°, 6°; C = -8°, -6°, -4°, 10°, 2°, 4°, 6°, 8°

β: A = -6° to 6° by Δβ = 2°; B = -6°, 0°, 2°, 6°; C = -6°, -4°, 0°, 2°, 4°, 6°, 8°

MSFC - Form 263-2 (February 1972)

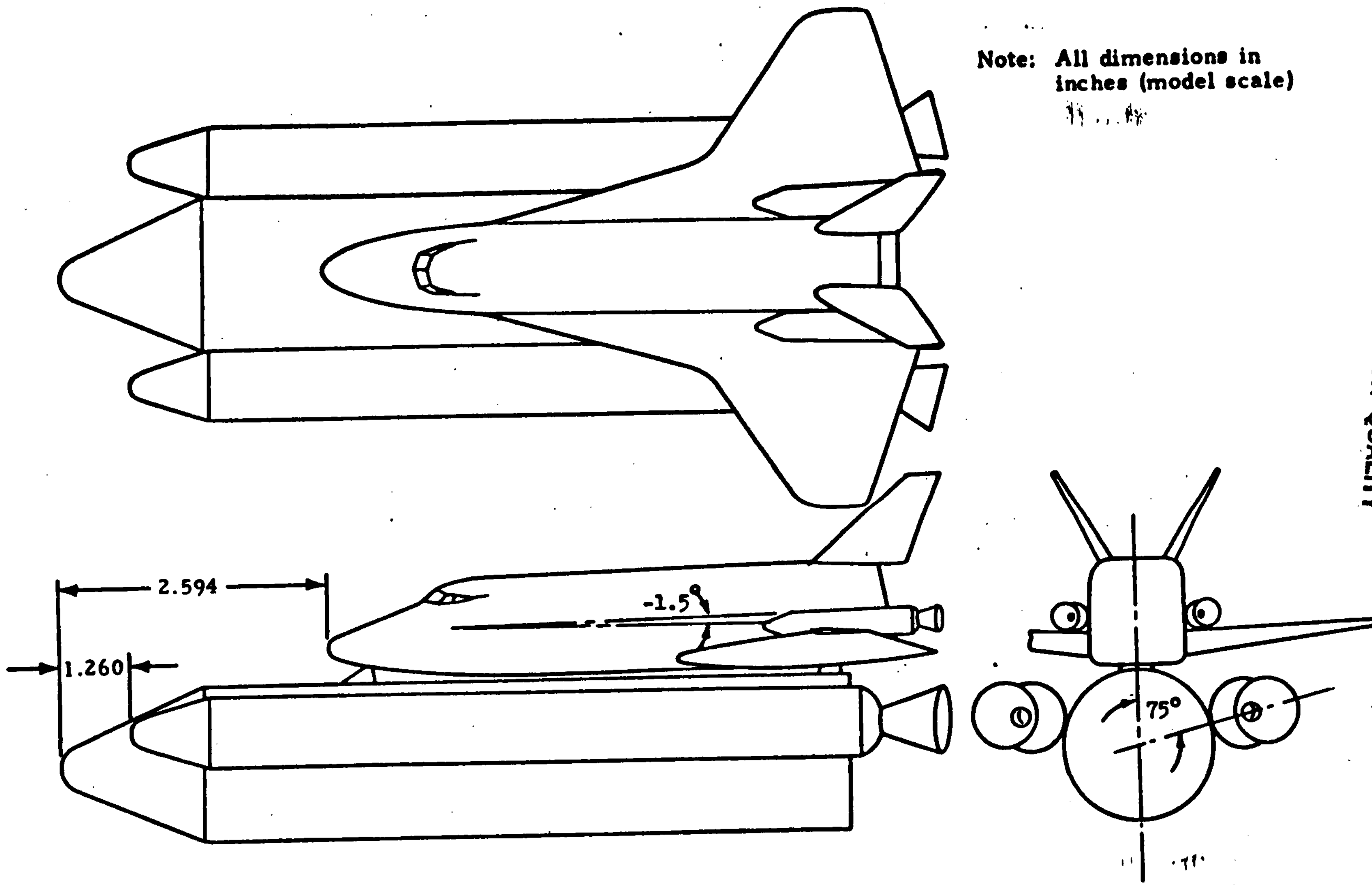

Fig. 1 - Baseline Launch Vehicle

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1273 C-2- 27

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1273 C-2- 28

NOTE: All dimensions in inches (model scale)

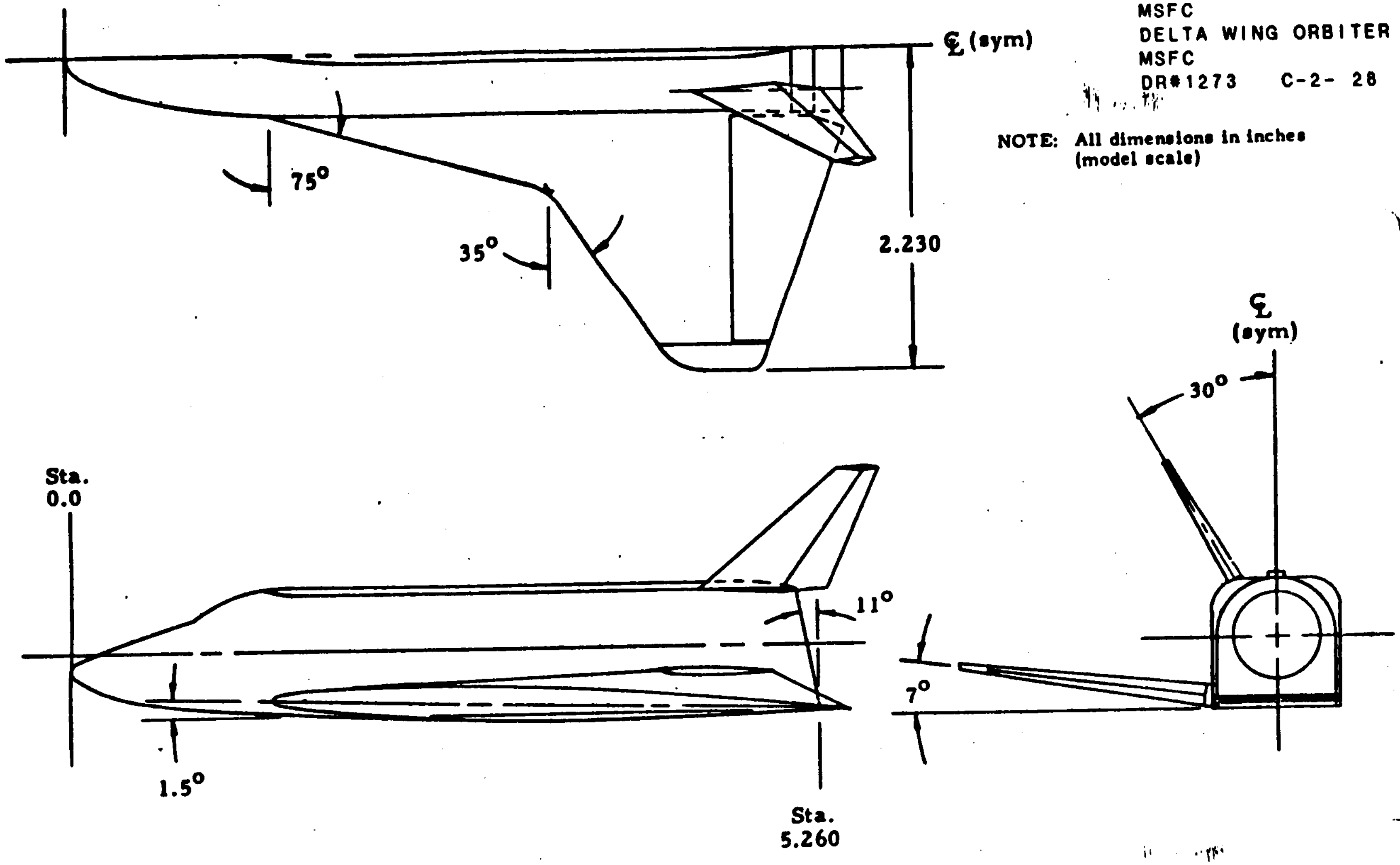

Fig. 2- General Arrangement, Space Shuttle 049 Orbiter

Note: All dimensions in inches (model scale)

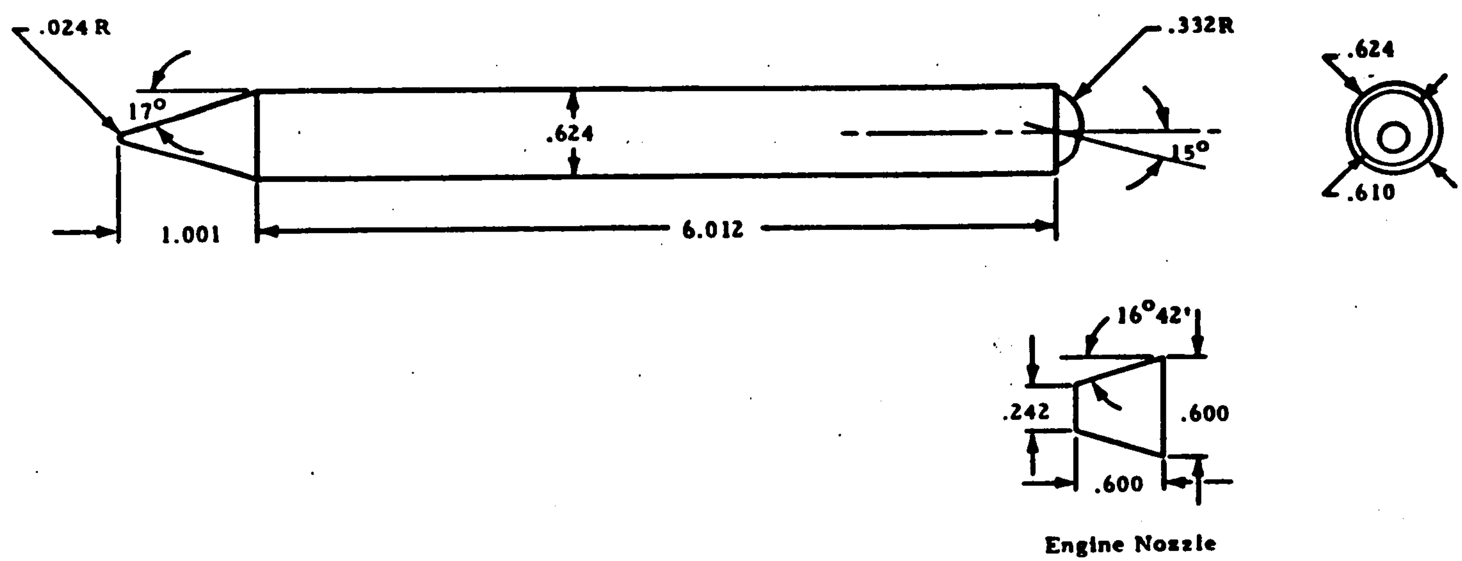

Fig. 3- 156-Inch Solid Rocket Motor

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSFC
DR#1273 C-2- 30

NOTE: All dimensions in inches
(model scale)

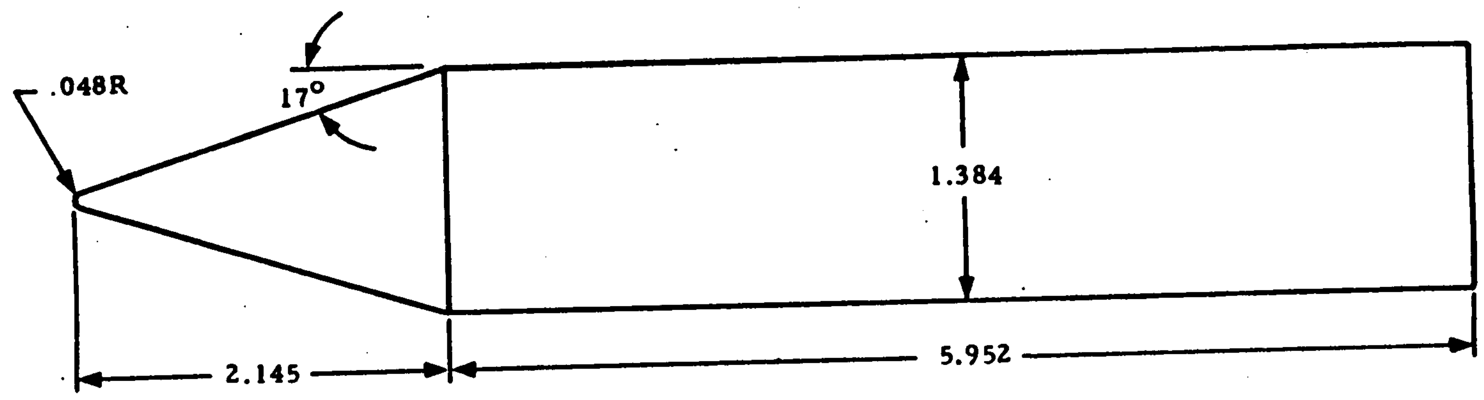

Fig. 4 - 346-Inch Diameter HO Tank with 17-Degree Nosecone

Numbers in parenthesis are on the lower surface

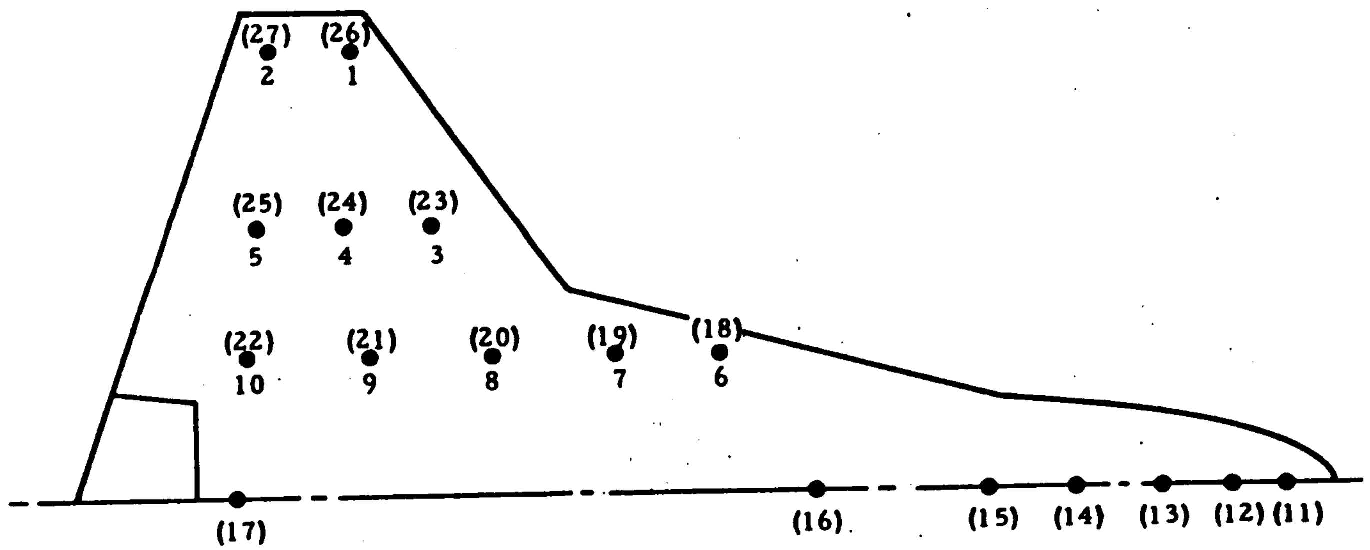

Fig. 5 - Static Pressure Tap Positions

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 32

TABLE V

TEST AMES 6x6 509 PRESSURE DATASET COLLATION SHEET

STRAIGHT WING BOOSTER ALONE DATA

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES	NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0
BAXB11	B1W3AV1T7	BODY	1	0	N		5	1	2	3	4	5
BAXW11		UPPER WING	2									
BAXW16		LOWER WING	2									
BAXH11		UPPER HORIZ. TAIL	2									
BAXH16		LOWER HORIZ. TAIL	2									
BAXV11		VERTICAL TAIL	2									
BAXB12		BODY	1	-5°	N			15	14	13	12	11
BAXW12		UPPER WING	2									
BAXW17		LOWER WING	2									
BAXH12		UPPER HORIZ. TAIL	2									
BAXH17		LOWER HORIZ. TAIL	2									
BAXV12		VERTICAL TAIL	2									
BAXB13		BODY	1	L	0°			10	9	8	7	6
BAXW13		UPPER WING	2									
BAXW18		LOWER WING	2									
BAXH13		UPPER HORIZ. TAIL	2									
BAXH18		LOWER HORIZ. TAIL	2									
BAXV13		VERTICAL TAIL	2									

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12°
P (α) 16°, 20°, 25°, 30°, 35°, 40°
T (α) 16°, 20°, 25°, 30°
N (β) -10°, -5°, 0°, 5°, 10°
R (α) 30°, 35°, 40°, 45°, 50°, 55°
Q (α) 40°, 45°, 50°, 55°, 60°, 65°
S (α) -12°, -5°, 0°, 4°, 12°

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TABLE V (CONTINUED)

TEST AMES 6x6 509 **PRESSURE DATASET COLLATION SHEET**

☐ PRETEST
☒ POSTTEST

STRAIGHT WING BOOSTER DATA - IN PRESENCE OF DELTA WING ORBITER

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES				NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0		
BAXB21	B1W3AV1T7/B5W1BV10	BODY	1	L	0					5	27	28	29	30	31		
BAXW21		UPPER WING	2														
BAXW26		LOWER WING	2														
BAXH21		UPPER HORIZ. TAIL	2														
BAXH26		LOWER HORIZ. TAIL	2														
BAXV21		VERTICAL TAIL	2														
BAXB22		BODY	1	-5°	N						36	35	34	33	32		
BAXW22		UPPER WING	2														
BAXW27		LOWER WING	2														
BAXH22		UPPER HORIZ. TAIL	2														
BAXH27		LOWER HORIZ. TAIL	2														
BAXV22		VERTICAL TAIL	2														
BAXB23		BODY	1	L	0°						41	40	39	38	37		
BAXW23		UPPER WING	2														
BAXW28		LOWER WING	2														
BAXH23		UPPER HORIZ. TAIL	2														
BAXH28		LOWER HORIZ. TAIL	2														
BAXV23		VERTICAL TAIL	2														

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12°
P (α) 16°, 20°, 25°, 30°, 35°, 40°
T (α) 16°, 20°, 25°, 30°
N (β) -10°, -5°, 0°, 5°, 10°
R (α) 30°, 35°, 40°, 45°, 50°, 55°
Q (α) 40°, 45°, 50°, 55°, 60°, 65°
S (α) -12°, -5°, 0°, 4°, 12°

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 33

TABLE V (CONTINUED)

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 34

TEST AMES 6 x 6 509 PRESSURE DATASET COLLATION SHEET

STRAIGHT WING BOOSTER DATA - IN PRESENCE OF STRAIGHT WING ORBITER

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES	NO. OF RUNS	MACH 0.6	MACH 0.9	MACH 1.2	MACH 1.5	MACH 2.0
BAXB31	B1W3AV1T7/B6W10H12V5	BODY	1	L	0°		5	25*	24	23	22	21
BAXW31		UPPER WING	2									
BAXW36		LOWER WING	2									
BAXH31		UPPER HORIZ. TAIL	2									
BAXH36		LOWER HORIZ. TAIL	2									
BAXV31		VERTICAL TAIL	2									
BAXB32		BODY	1	-5°	N			20	19	18	17	16
BAXW32		UPPER WING	2									
BAXW37		LOWER WING	2									
BAXH31		UPPER HORIZ. TAIL	2									
BAXH37		LOWER HORIZ. TAIL	2									
BAXV31		VERTICAL TAIL	2									

*RUN 25 USES α SCHEDULE S

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12°
P (α) 16°, 20°, 25°, 30°, 35°, 40°
T (α) 16°, 20°, 25°, 30°
N (β) -10°, -5°, 0°, 5°, 10°
R (α) 30°, 35°, 40°, 45°, 50°, 55°
Q (α) 40°, 45°, 50°, 55°, 60°, 65°
S (α) -12°, -5°, 0°, 4°, 12°

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TABLE V (CONTINUED)

TEST AMES 6 x 6 509 PRESSURE DATASET COLLATION SHEET

DELTA WING ORBITER ALONE DATA

☐ PRETEST
☒ POSTTEST

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES				NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0		
DAXB41	B5W13V10	BODY	1	-5°	N					5	46	45	44	43	42		
DAXW41		UPPER WING	2														
DAXW46		LOWER WING	2														
DAXV41		INBOARD VERT. STAB.	2														
DAXV46		OUTBOARD VERT. STAB.	2														
DAXB42		BODY	1	L	0°						51	50	49	48	47		
DAXW42		UPPER WING	2														
DAXW47		LOWER WING	2														
DAXV42		INBOARD VERT. STAB.	2														
DAXV47		OUTBOARD VERT. STAB	2														
DAXB43		BODY	1	R	0°						56	55	54	53	52		
DAXW43		UPPER WING	2														
DAXW48		LOWER WING	2														
DAXV43		INBOARD VERT. STAB.	2														
DAXV48		OUTBOARD VERT. STAB.	2														
DAXB44		BODY	1	0°	N						61	60	59	58	57		
DAXW44		UPPER WING	2														
DAXW49		LOWER WING	2														
DAXV44		INBOARD VERT. STAB.	2														
DAXV49		OUTBOARD VERT. STAB.	2														

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) $-16^{\circ}, -12^{\circ}, -8^{\circ}, -5^{\circ}, -2^{\circ}, 0^{\circ}, 2^{\circ}, 4^{\circ}, 6^{\circ}, 8^{\circ}, 12^{\circ}$
P (α) $16^{\circ}, 20^{\circ}, 25^{\circ}, 30^{\circ}, 35^{\circ}, 40^{\circ}$
T (α) $16^{\circ}, 20^{\circ}, 25^{\circ}, 30^{\circ}$
N (β) $-10^{\circ}, -5^{\circ}, 0^{\circ}, 5^{\circ}, 10^{\circ}$
R (α) $30^{\circ}, 35^{\circ}, 40^{\circ}, 45^{\circ}, 50^{\circ}, 55^{\circ}$
Q (α) $40^{\circ}, 45^{\circ}, 50^{\circ}, 55^{\circ}, 60^{\circ}, 65^{\circ}$
S (α) $-12^{\circ}, -5^{\circ}, 0^{\circ}, 4^{\circ}, 12^{\circ}$

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STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 35

TABLE V (CONTINUED)

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 36

TEST AMES 6 x 6 509 **PRESSURE DATASET COLLATION SHEET**

DELTA WING ORBITER ALONE DATA
(Continued)

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES				NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0		
DAXB45	B5W13V10	BODY	1	P	0^o					3			64	63	62		
DAXW45	↓	UPPER WING	2	↓	↓					↓			↓	↓	↓		
DAXW50	↓	LOWER WING	2	↓	↓					↓			↓	↓	↓		
DAXV45	↓	INBOARD VERT. STAB.	2	↓	↓					↓			↓	↓	↓		
DAXV50	↓	OUTBOARD VERT. STAB.	2	↓	↓					↓			↓	↓	↓		

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) -16^o, -12^o, -8^o, -5^o, -2^o, 0^o, 2^o, 4^o, 6^o, 8^o, 12^o
P (α) 16^o, 20^o, 25^o, 30^o, 35^o, 40^o
T (α) 16^o, 20^o, 25^o, 30^o
N (β) -10^o, -5^o, 0^o, 5^o, 10^o
R (α) 30^o, 35^o, 40^o, 45^o, 50^o, 55^o
Q (α) 40^o, 45^o, 50^o, 55^o, 60^o, 65^o
S (α) -12^o, -5^o, 0^o, 4^o, 12^o

TABLE V (CONTINUED)

TEST AMES 6 x 6 509 PRESSURE DATASET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DELTA WING ORBITER DATA - IN PRESENCE OF STRAIGHT WING BOOSTER

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES	NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0
DAXB21	B5W13V10/B1W3AV1T7	BODY	1	L	0°		5	27	28	29	30	31
DAXW21	↓	UPPER WING	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXW26	↓	LOWER WING	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXV21	↓	INBOARD VERT. STAB.	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXV26	↓	OUTBOARD VERT. STAB.	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXB22	↓	BODY	1	-5°	N		↓	36	35	34	33	32
DAXW22	↓	UPPER WING	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXW27	↓	LOWER WING	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXV22	↓	INBOARD VERT. STAB.	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXV27	↓	OUTBOARD VERT. STAB.	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXB23	↓	BODY	1	0°	N		↓	41	40	39	38	37
DAXW23	↓	UPPER WING	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXW28	↓	LOWER WING	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXV23	↓	INBOARD VERT. STAB.	2	↓	↓		↓	↓	↓	↓	↓	↓
DAXV28	↓	OUTBOARD VERT. STAB.	2	↓	↓		↓	↓	↓	↓	↓	↓

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2, X/C, Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12° R (α) 30°, 35°, 40°, 45°, 50°, 55°
P (α) 16°, 20°, 25°, 30°, 35°, 40° Q (α) 40°, 45°, 50°, 55°, 60°, 65°
T (α) 16°, 20°, 25°, 30° S (α) -12°, -5°, 0°, 4°, 12°
N (β) -10°, -5°, 0°, 5°, 10°

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 37

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STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 38

TABLE V (CONTINUED)

TEST AMES 6 x 6 509 PRESSURE DATASET COLLATION SHEET

STRAIGHT WING ORBITER ALONE DATA

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES				NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0		
SAXB51	B6W10H12V5	BODY	1	L	0°					5	69	68	67	66	65		
SAXW51		UPPER WING	2														
SAXW56		LOWER WING	2														
SAXH51		UPPER HORIZ. TAIL	2														
SAXH56		LOWER HORIZ. TAIL	2														
SAXV51		VERTICAL TAIL	2														
SAXB52		BODY	1	-5°	N						74	73	72	71	70		
SAXW52		UPPER WING	2														
SAXW57		LOWER WING	2														
SAXH52		UPPER HORIZ. TAIL	2														
SAXH57		LOWER HORIZ. TAIL	2														
SAXV52		VERTICAL TAIL	2														
SAXB53		BODY	1	0°	N						79	78	77	76	75		
SAXW53		UPPER WING	2														
SAXW58		LOWER WING	2														
SAXH53		UPPER HORIZ. TAIL	2														
SAXH58		LOWER HORIZ. TAIL	2														
SAXV53		VERTICAL TAIL	2														
SAXB54		BODY	1	Q̄	0°						84	83	82	81	80		
SAXW54		UPPER WING	2														

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12°
P (α) 16°, 20°, 25°, 30°, 35°, 40°
T (α) 16°, 20°, 25°, 30°
N (β) -10°, -5°, 0°, 5°, 10°
R (α) 30°, 35°, 40°, 45°, 50°, 55°
Q (α) 40°, 45°, 50°, 55°, 60°, 65°
S (α) -12°, -5°, 0°, 4°, 12°

TABLE V (CONTINUED)

TEST AMES 6x6 509 PRESSURE DATASET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

STRAIGHT WING ORBITER ALONE DATA
(Continued)

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES	NO. OF RUNS	MACH 0.6	MACH 0.9	MACH 1.2	MACH 1.5	MACH 2.0
SAXW59	B6W10H12V5	LOWER WING	2	Q	0°		5	84	83	82	81	80
SAXH54		UPPER HORIZ. TAIL	2									
SAXH59		LOWER HORIZ. TAIL	2									
SAXV54		VERTICAL TAIL	2									
SAXB55		BODY	1	T	0°			89	88	87	86	85
SAXW55		UPPER WING	2									
SAXW60		LOWER WING	2									
SAXH55		UPPER HORIZ. TAIL	2									
SAXH60		LOWER HORIZ. TAIL	2									
SAXV55		VERTICAL TAIL	2									

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C, Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12°
P (α) 16°, 20°, 25°, 30°, 35°, 40°
T (α) 16°, 20°, 25°, 30°
K (β) -10°, -5°, 0°, 5°, 10°
R (α) 30°, 35°, 40°, 45°, 50°, 55°
Q (α) 40°, 45°, 50°, 55°, 60°, 65°
S (α) -12°, -5°, 0°, 4°, 12°

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STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 39

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 40

TABLE V (CONTINUED)

TEST AMES 6 x 6 509 PRESSURE DATASET COLLATION SHEET

STRAIGHT WING ORBITER DATA - IN PRESENCE OF STRAIGHT WING BOOSTER

DATASET IDENTIFIER	CONFIGURATION	MODEL SECTION	GEO. CONFIG.	SCHD. α	SCHD. β	PARAMETER/VALUES	NO. OF RUNS	MACH NUMBERS 0.6	0.9	1.2	1.5	2.0		
SAXB31	B6W10H12V5/B1W3AV1T7	BODY	1	L	0°		5	25*	24	23	22	21		
SAXW31		UPPER WING	2											
SAXW36		LOWER WING	2											
SAXH31		UPPER HORIZ. TAIL	2											
SAXH36		LOWER HORIZ. TAIL	2											
SAXV31		VERTICAL TAIL	2											
SAXB32		BODY	1	-5°	N			20	19	18	17	16		
SAXW32		UPPER WING	2											
SAXW36		LOWER WING	2											
SAXH32		UPPER HORIZ. TAIL	2											
SAXH36		LOWER HORIZ. TAIL	2											
SAXV32		VERTICAL TAIL	2											

* RUN 25 USES α SCHEDULE S

GEOMETRY CONFIGURATION
1) X, THETA, R
2) Y/(B/2), X/C Z/C

α OR β SCHEDULES
L (α) -16°, -12°, -8°, -5°, -2°, 0°, 2°, 4°, 6°, 8°, 12°
P (α) 16°, 20°, 25°, 30°, 35°, 40°
T (α) 16°, 20°, 25°, 30°
N (β) -10°, -5°, 0°, 5°, 10°
R (α) 30°, 35°, 40°, 45°, 50°, 55°
Q (α) 40°, 45°, 50°, 55°, 60°, 65°
S (α) -12°, -5°, 0°, 4°, 12°

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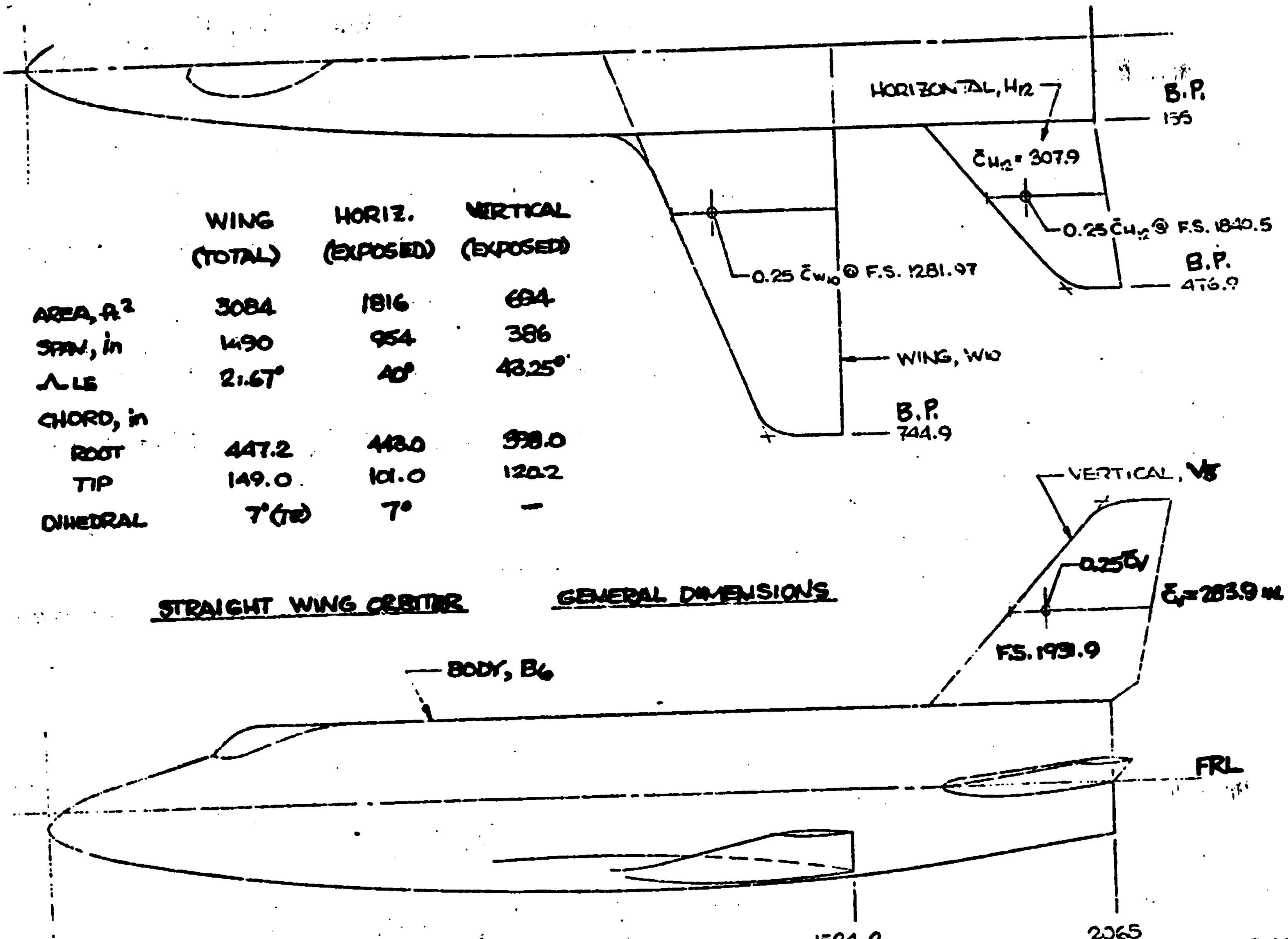


STRAIGHT WING ORBITER GENERAL DIMENSIONS

	WING (TOTAL)	HORIZ. (EXPOSED)	VERTICAL (EXPOSED)
AREA, ft^2	3084	1816	694
SPAN, in	1490	954	386
Λ_{LE}	21.67°	40°	43.25°
CHORD, in			
ROOT	447.2	448.0	398.0
TIP	149.0	101.0	120.2
DIHEDRAL	7°(TE)	7°	—

FIGURE 1. STRAIGHT-WING ORBITER

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 41

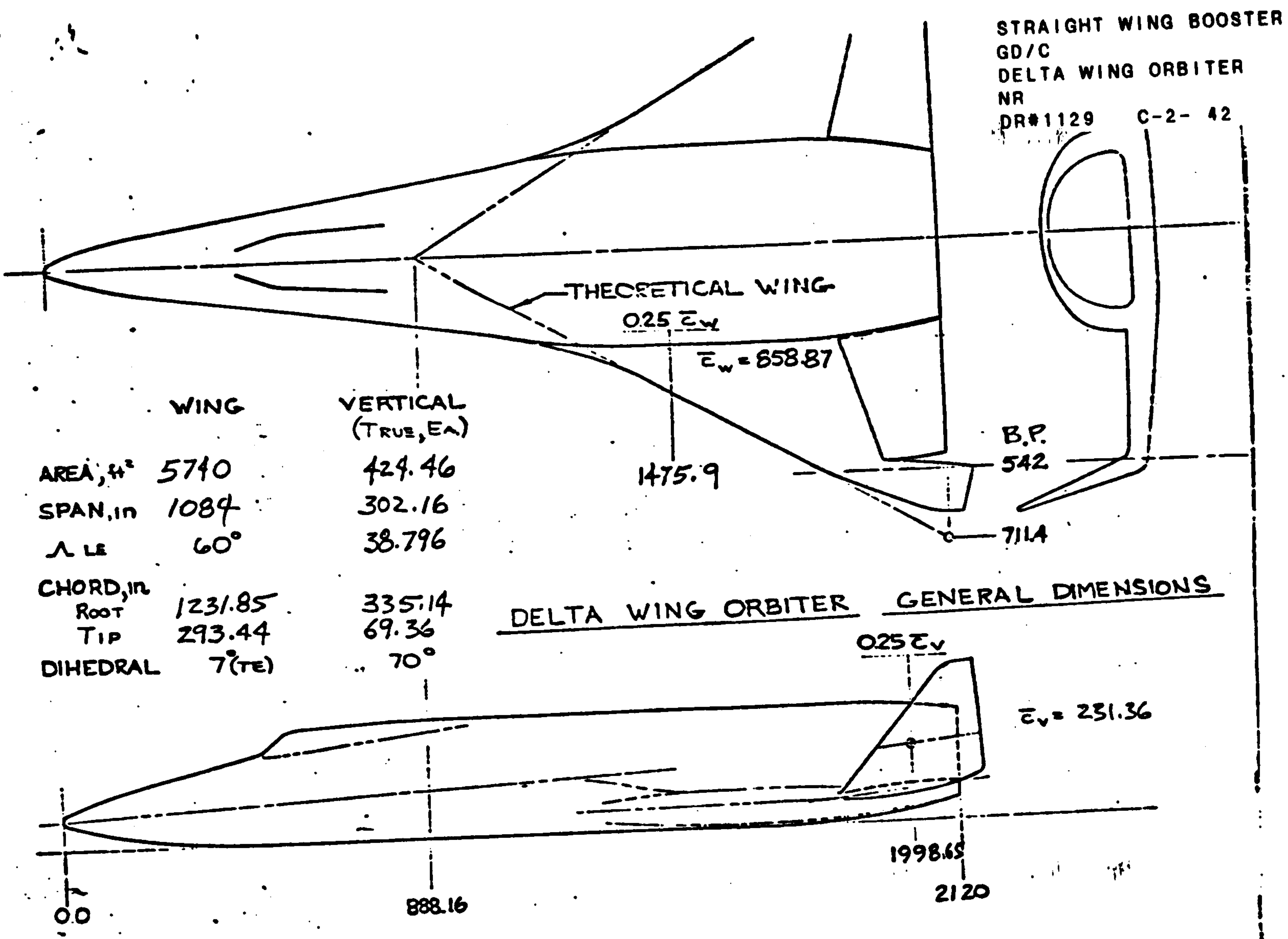
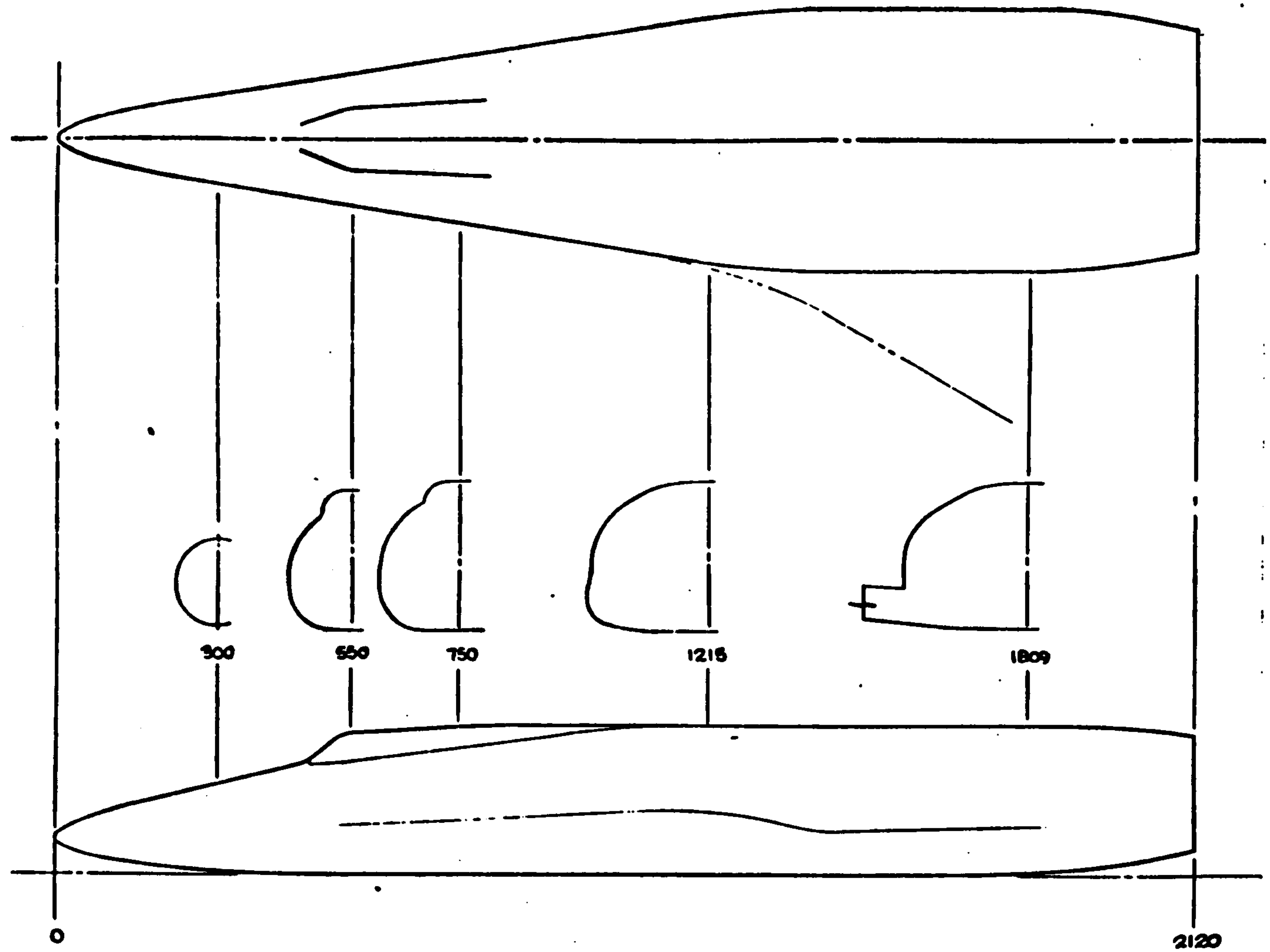


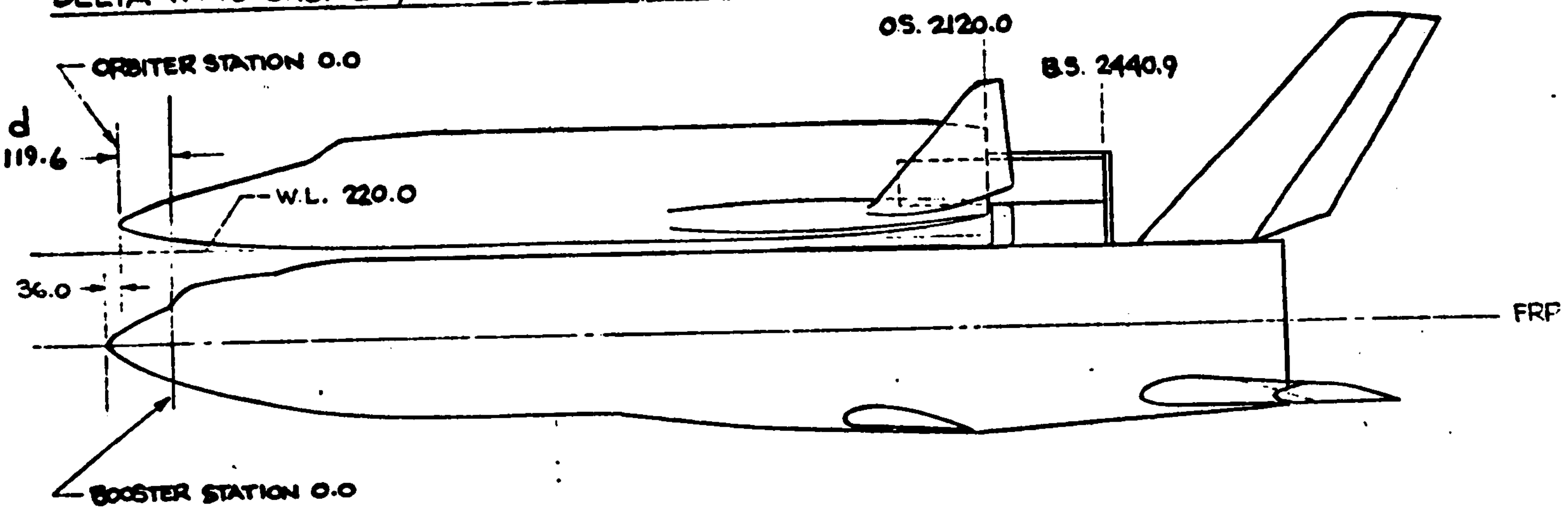
FIGURE 2 DELTA WING ORBITER



BCDY B5 9992-134B CONFIGURATION

FIGURE 3 DELTA WING ORBITER BODY

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 44



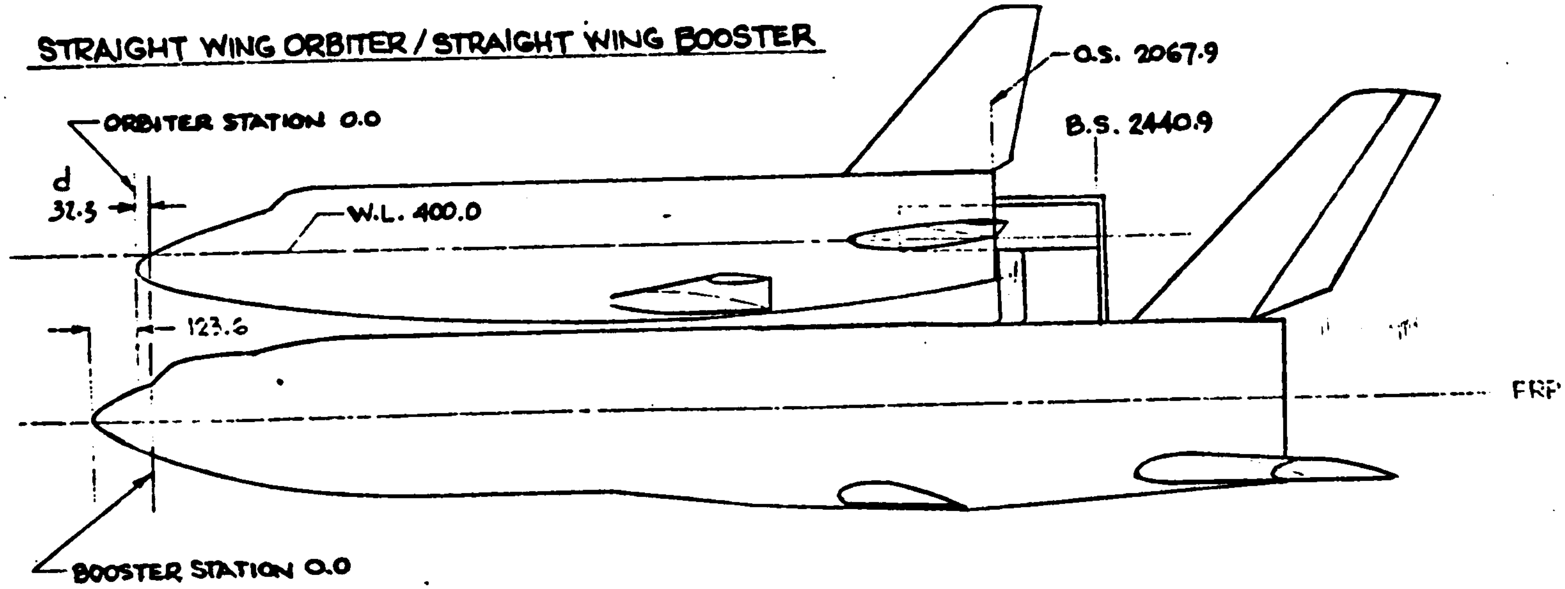


FIGURE 4 LAUNCH CONFIGURATIONS

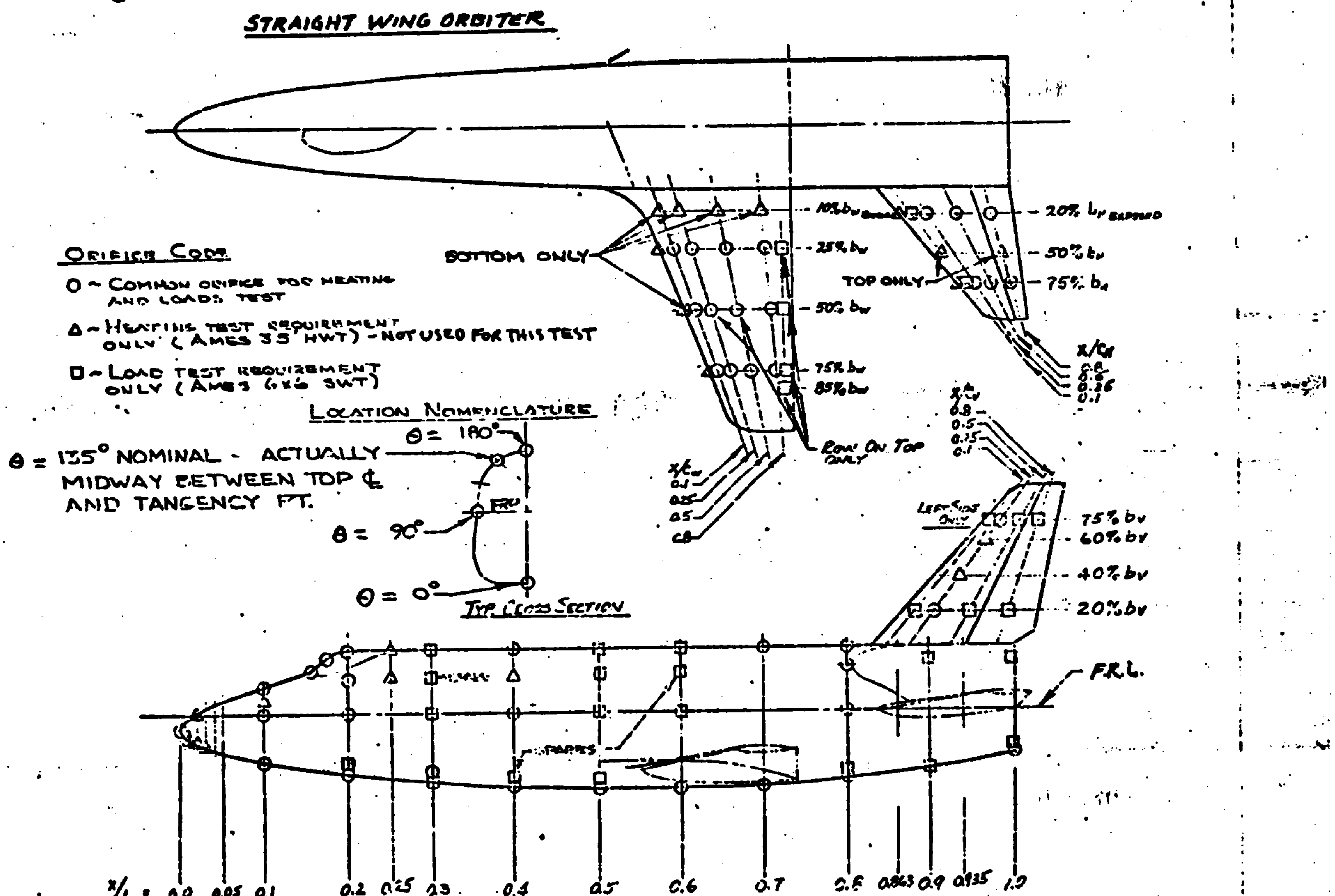


FIGURE 6 PRESSURE ORIFICE LOCATIONS, STRAIGHT WING ORBITER

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 45

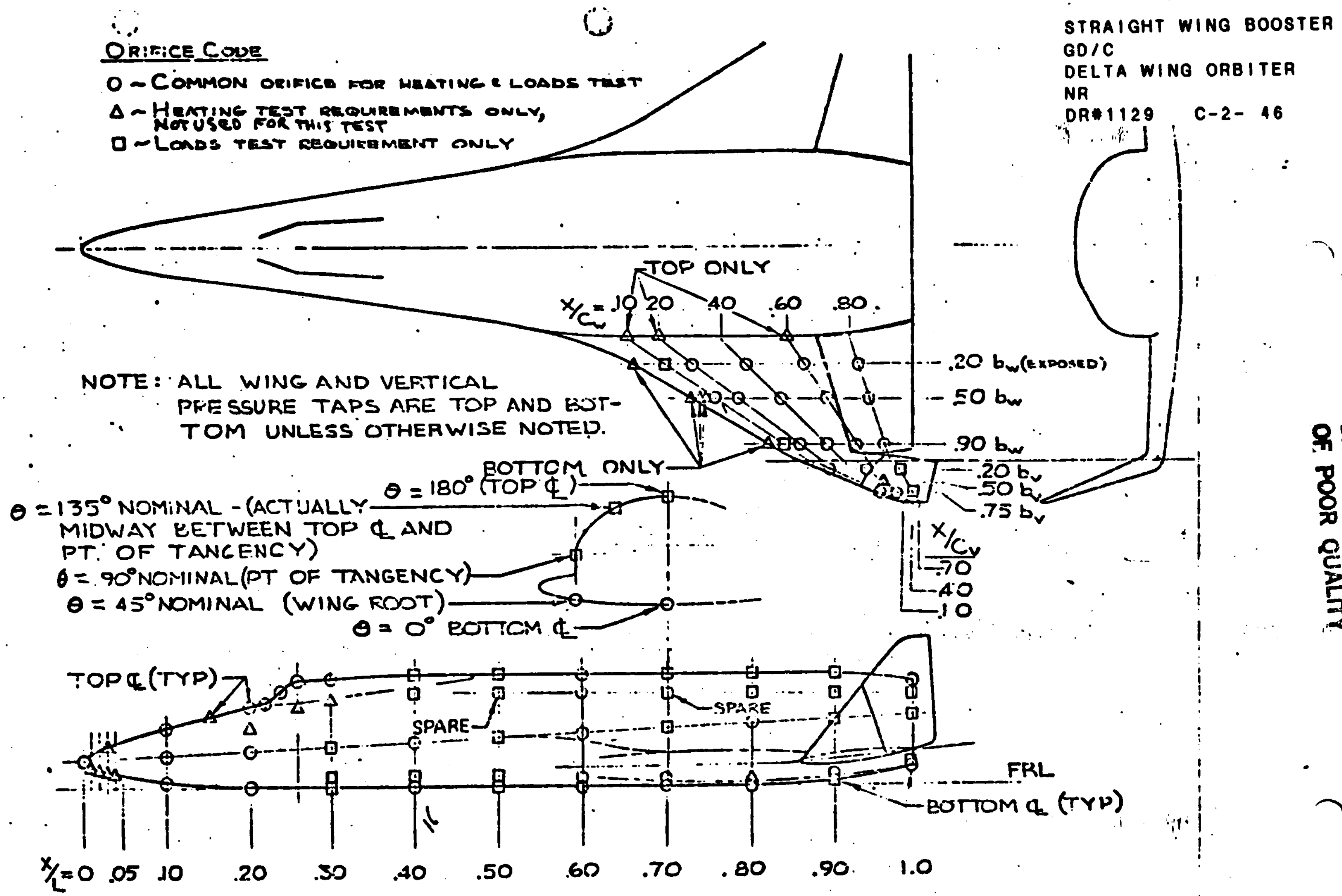


FIGURE 7 DELTA WING ORBITER PRESSURE ORIFICE LOCATIONS

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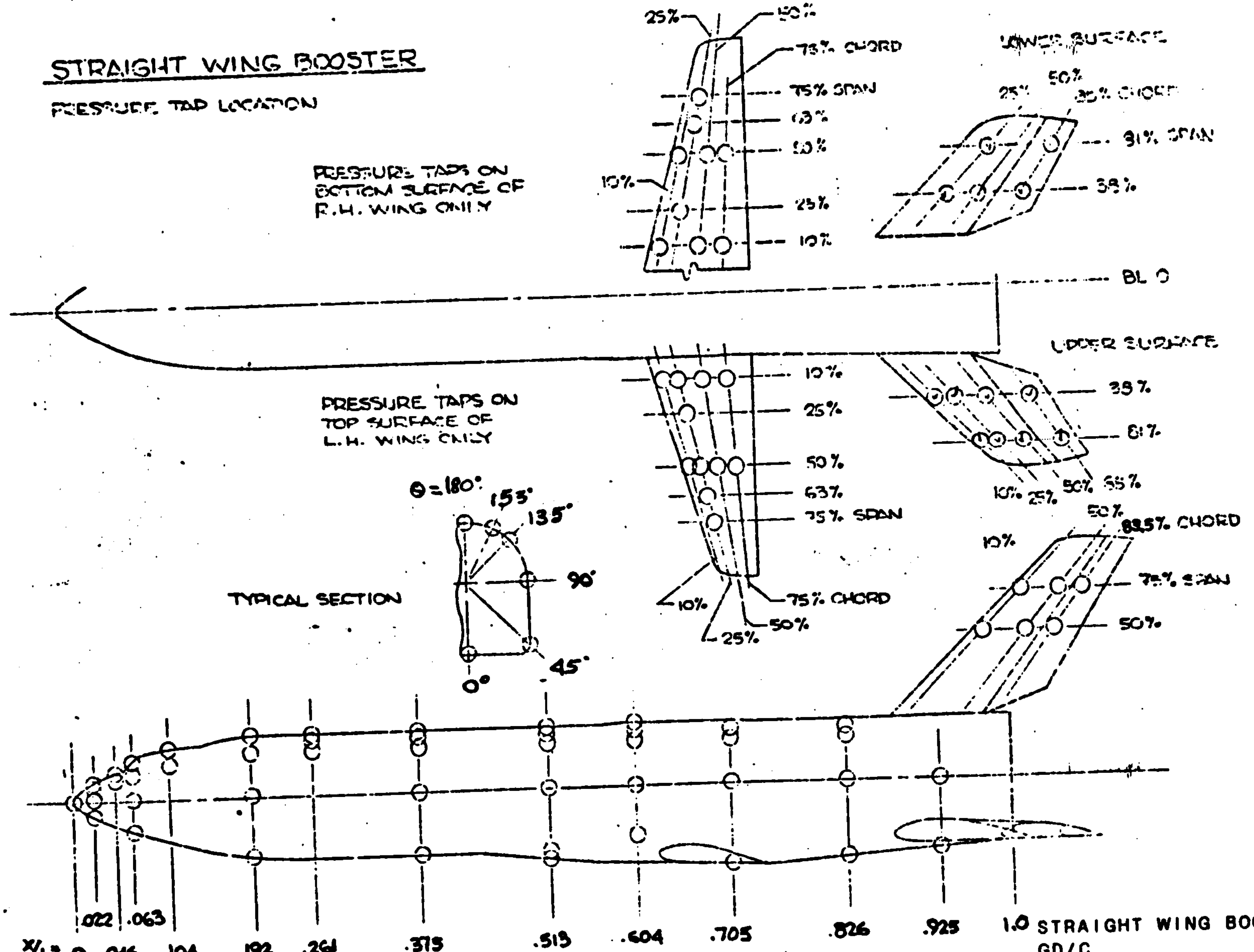

FIGURE 8 BOOSTER PRESSURE ORIFICE LOCATIONS

STRAIGHT WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1129 C-2- 47

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 48

☐ PRETEST
☐ POSTTEST

TABLE 1. TEST AMES 66-561 DATA SET/RUN NUMBER COLLATION SUMMARY

1/150-SCALE LAUNCH CONFIGURATION - METRIC AND PRESSURE TANK TEST IN THE AMES 6' x 6' WIND TUNNEL

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)											
RBCT 11	$(B)_2(O)_2A_6T_2^1$	C	O					4	5	4	3	2								
RBCT 12	$(B)_2(O)_2A_6T_2^2$	C	O					4	9	8	7	6								
RBCT 13	$(B)_2(O)_2A_6T_2^1$	O	D					4	13	12	11	10			RUN NUMBERS					
RBCT 14	$(B)_2(O)_2A_6T_3^1$	O	D					4	17	16	15	14								
RBCT 15	$(B)_2(O)_2A_6T_3^1$	C	O					3		20	19	18								

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN	CA	CLM	CY	CYN	CBL	CAC				IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS: α or β SCHEDULES

α C = -12, -8, -4, 0, 4, 8, 12

β D = -12, -8, -4, 0, 4, 8, 12

NASA-MSFC-MAF

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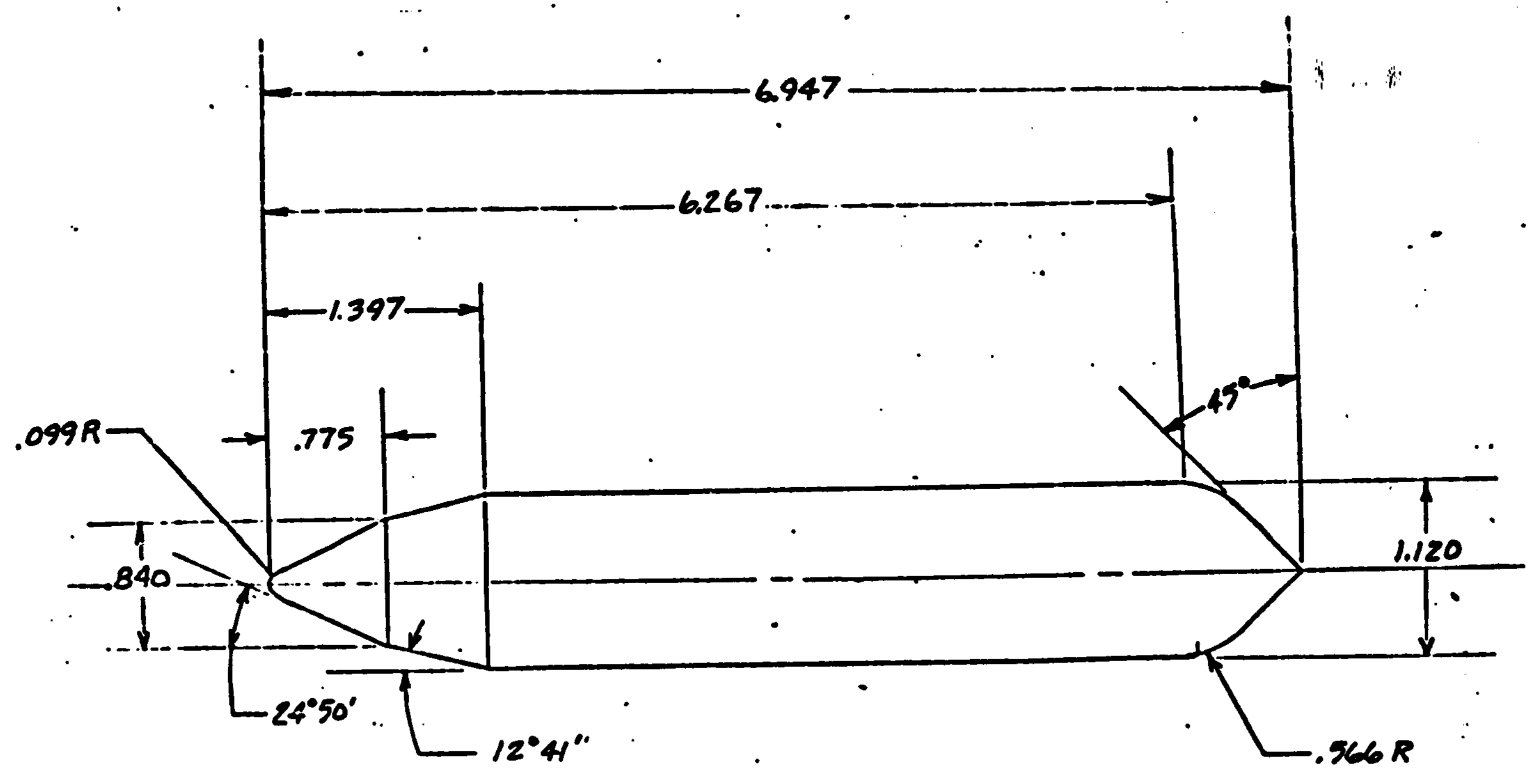


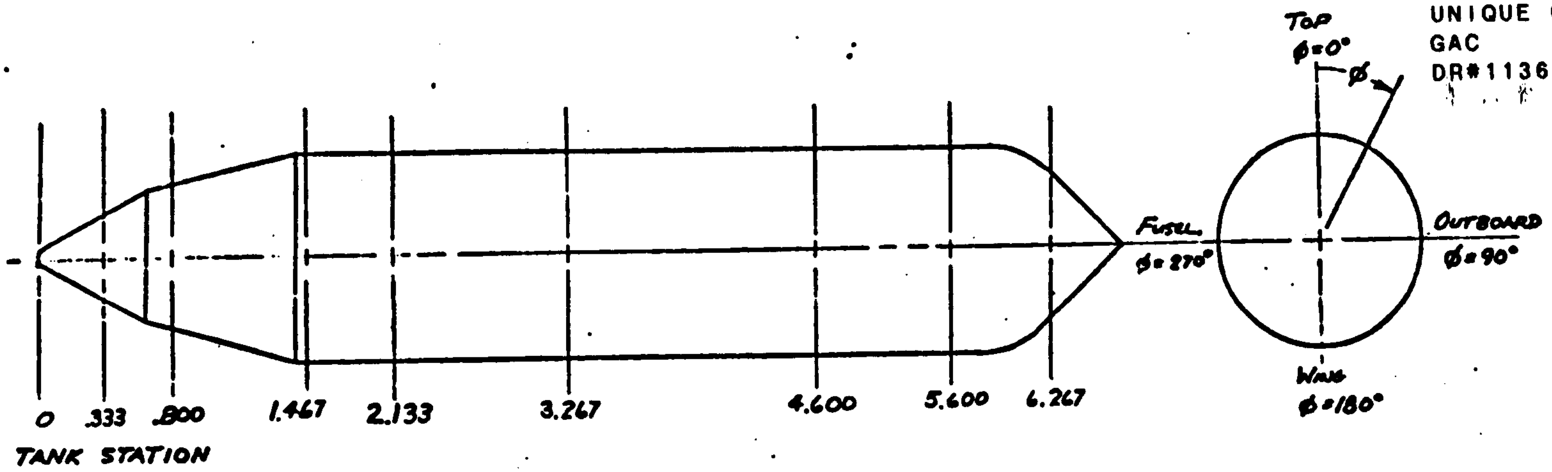
Model dimensions in inches

(a) Dimensions

Figure D.- Conical-Nose Tanks - T_2 (1/150 Scale)

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 49

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 50



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TANK STATION	NO. OF TAPS	TAP NOS.	PRESSURE TAP LOCATIONS (ϕ in DEG.)
0.333	4	2-5	0, 90, 180, 270
0.800	8	6-13	0, 45, 90, 135, 180, 225, 270, 315
1.467	8	14-21	0, 45, 90, 135, 180, 225, 270, 315
2.133	8	22-29	0, 45, 90, 135, 180, 225, 270, 315
3.267	4	30-33	0, 90, 180, 270
4.600	6	34-39	0, 45, 90, 135, 180, 270
5.600	4	40-43	0, 90, 180, 270
6.267	2	44-45	0, 180
TOTAL	44 TAPS		

(b) PRESSURE TAP LOCATIONS

FIGURE D. – concluded.

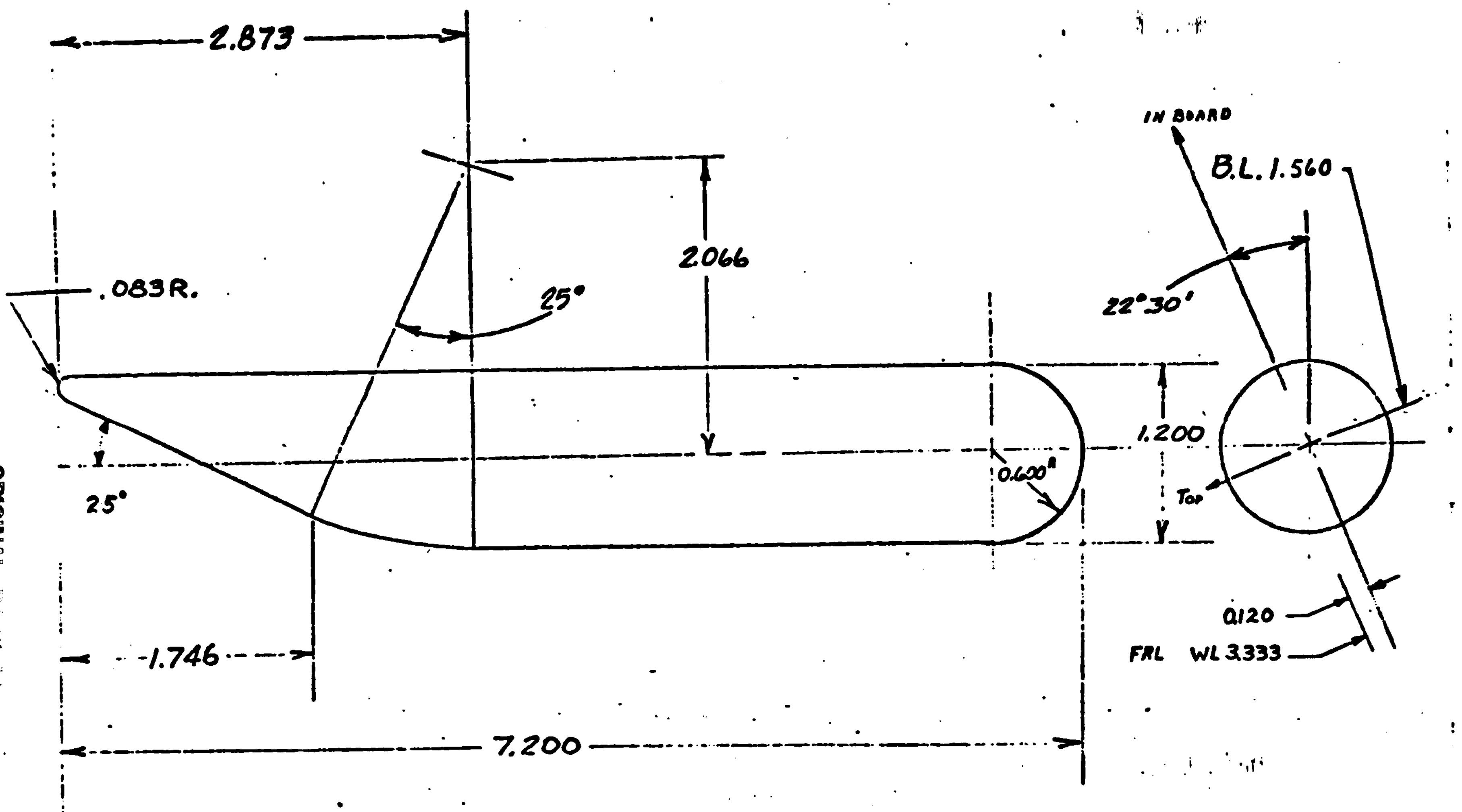
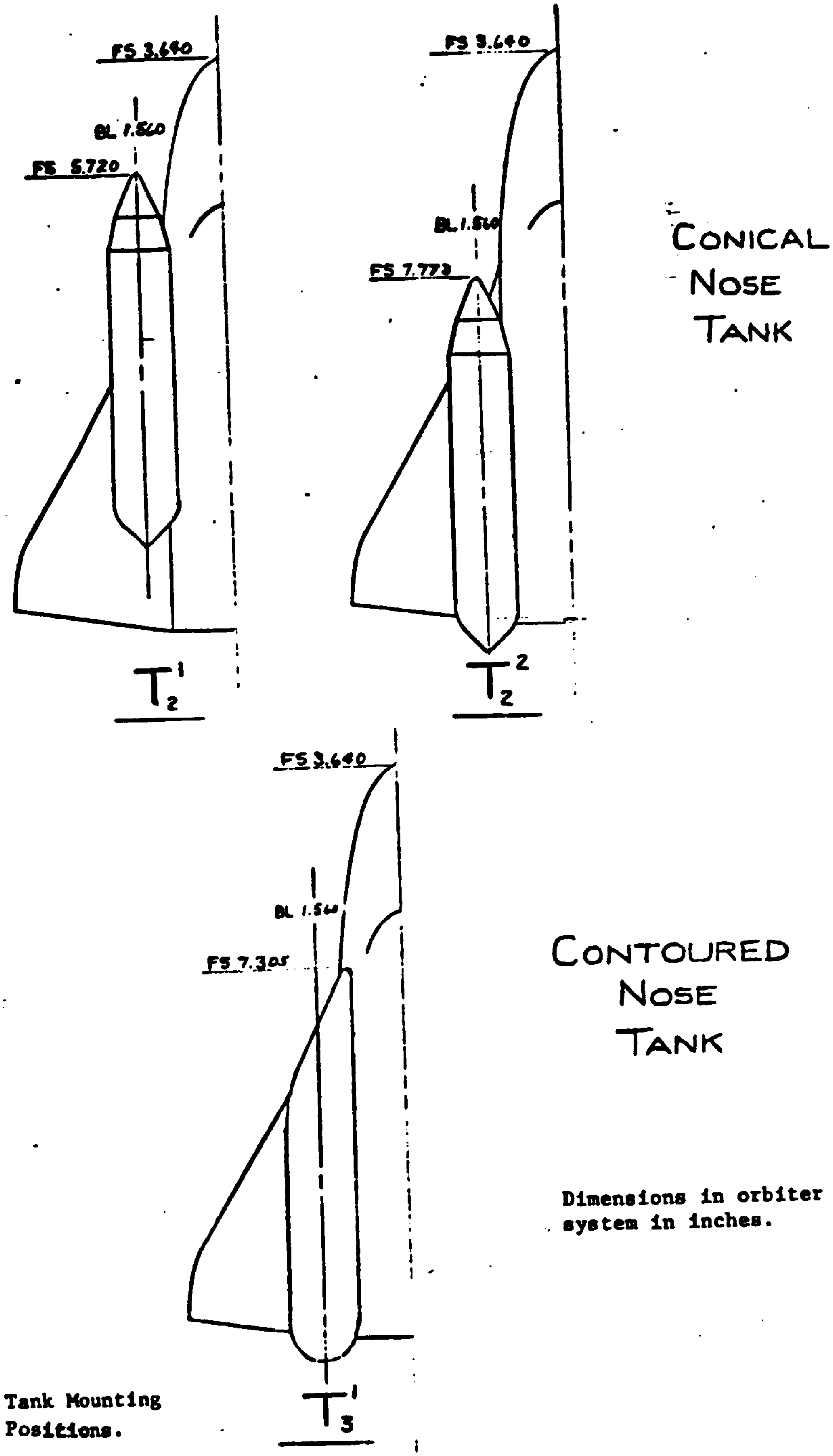


Figure E.- Contoured-Nose Tank - T_3
(1/150 scale, left tank shown)

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 51

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 52



Dimensions in orbiter reference system in inches.

Figure F.- Tank Mounting Positions.

Note: This sketch not to scale
All stations and waterlines referenced to the booster
Model dimensions in inches

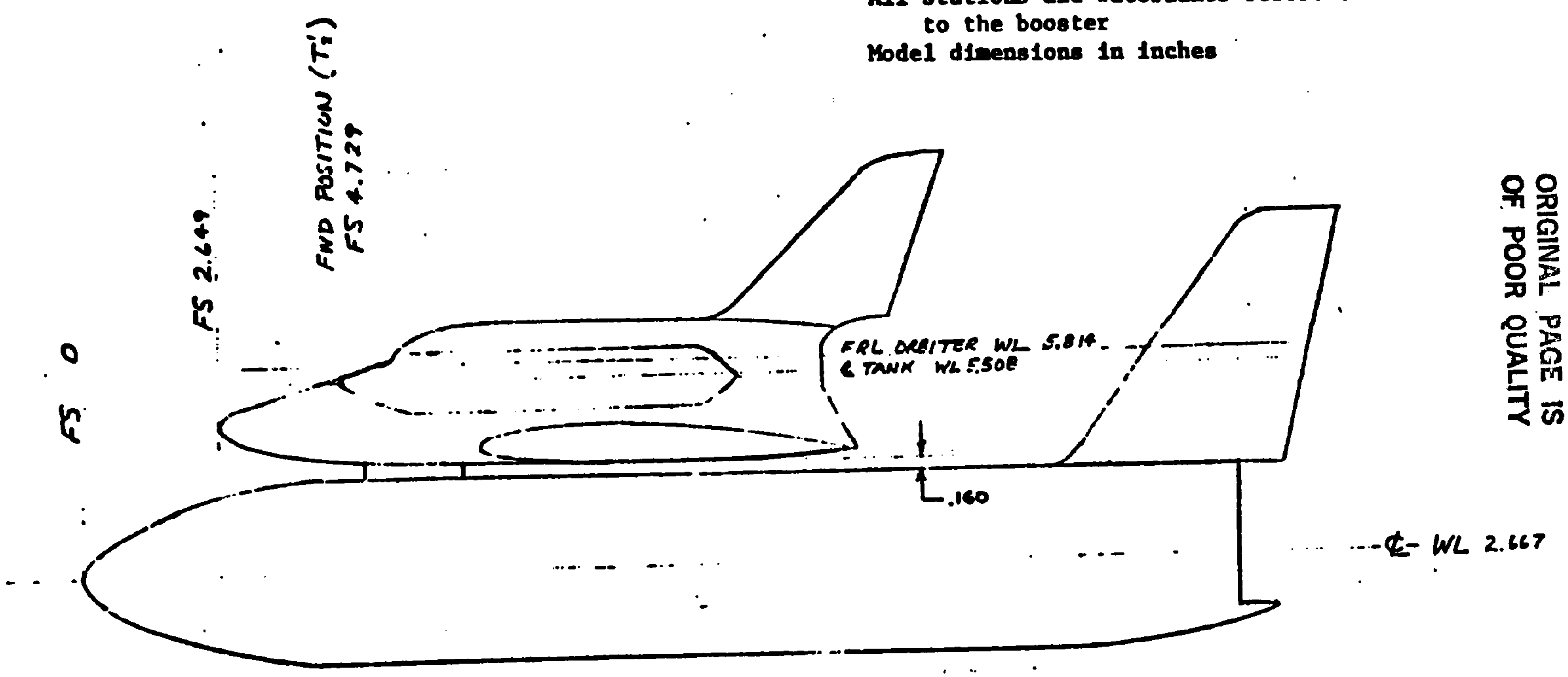


Figure G.- Launch Configuration

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 53

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITE
GAC
DR#1136 C-2- 54

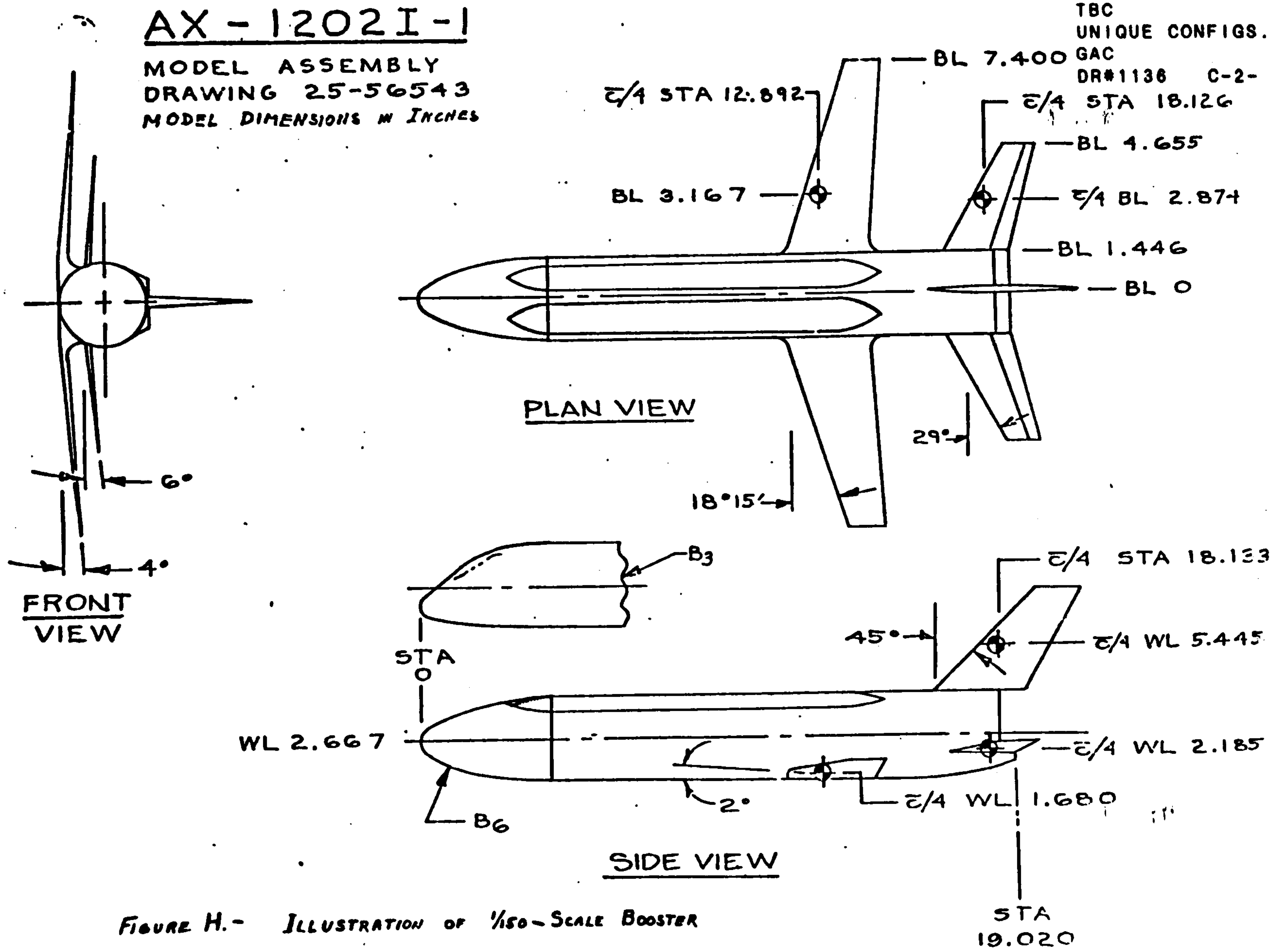
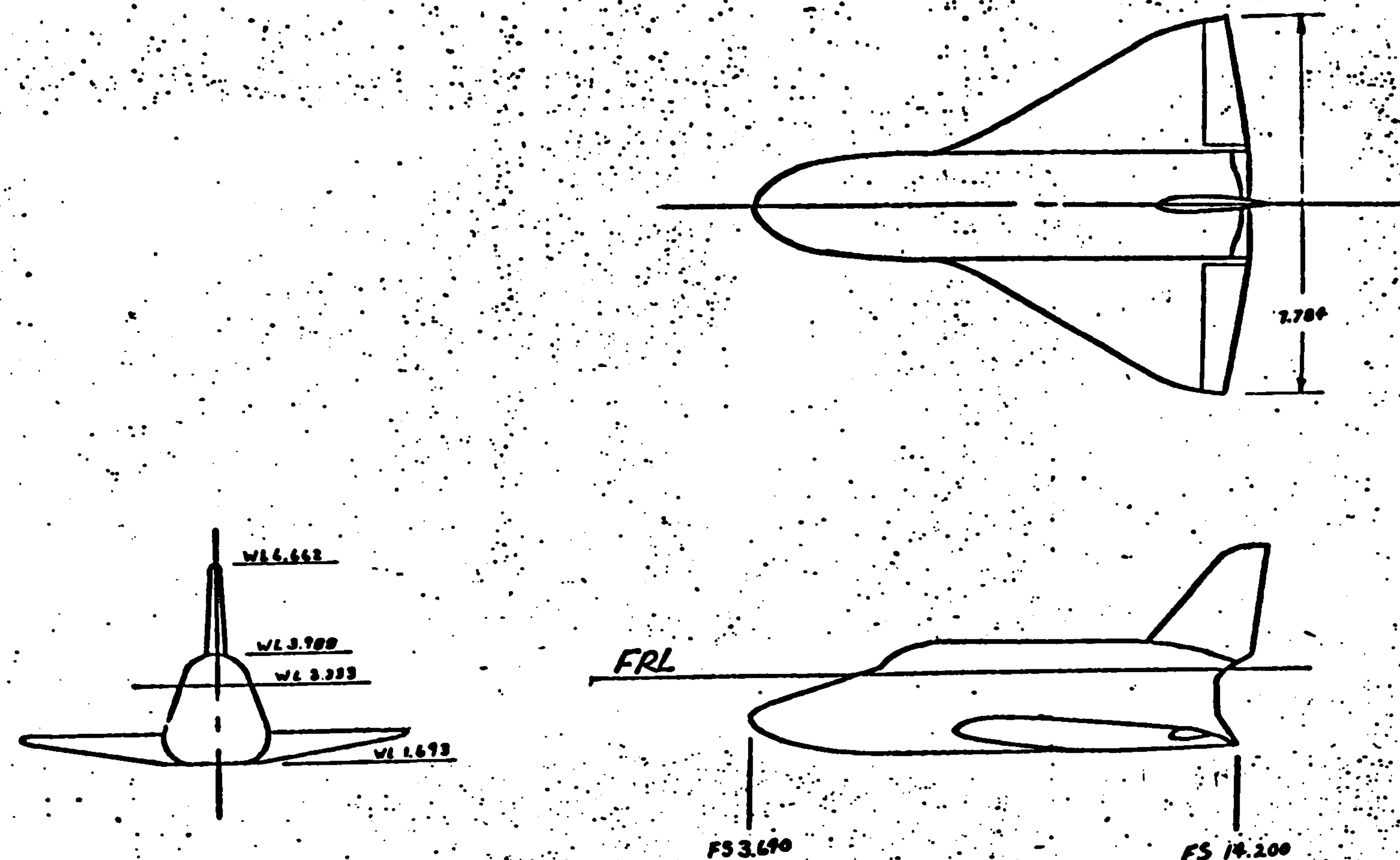


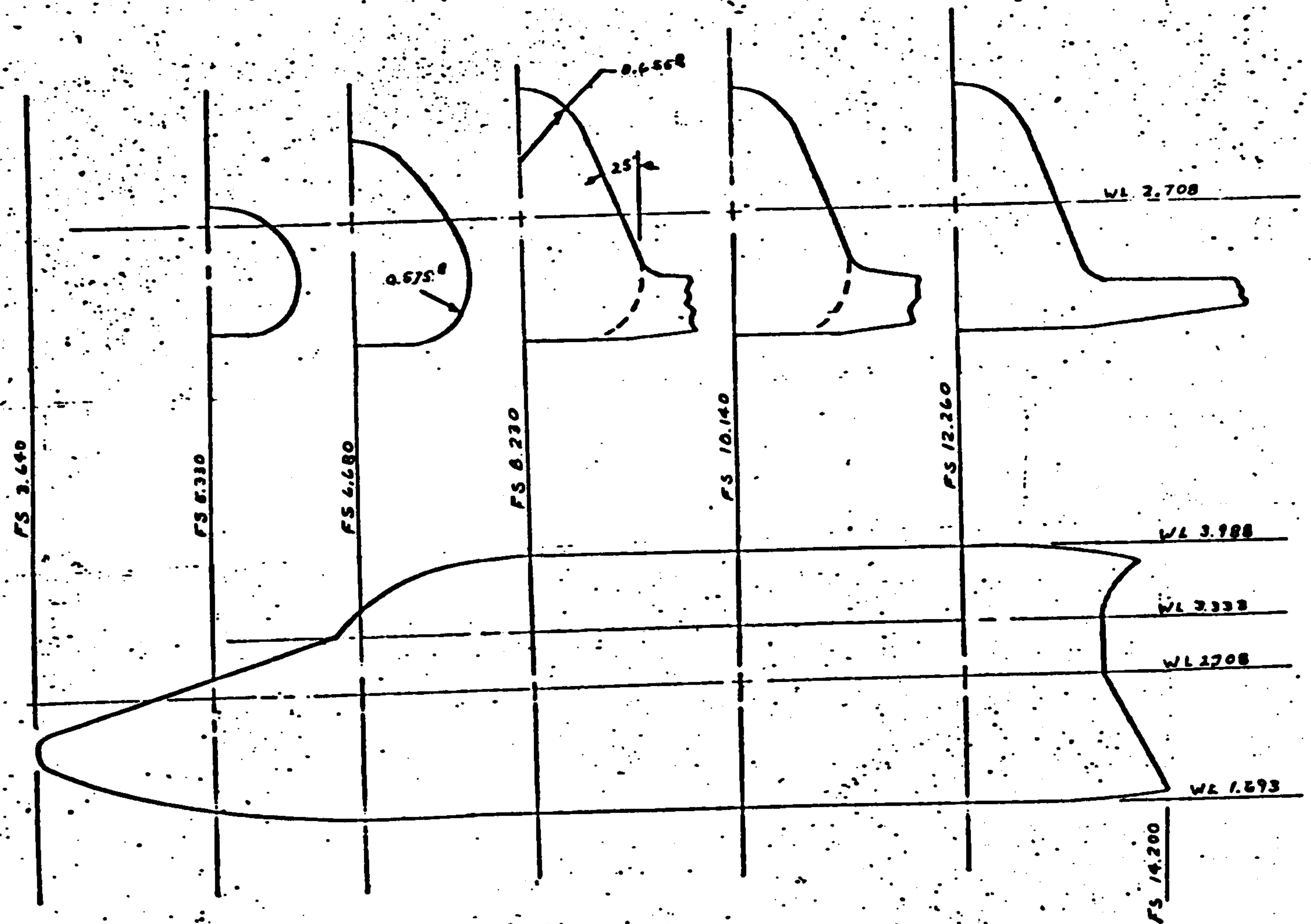
Figure H.- Illustration of 1/150-Scale Booster



(a) Three View

Figure I.- Illustration of Orbiter ROS-NB2

STRAIGHT WING BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1136 C-2- 55



(b) ROS-NB2 Body Dimensions

Figure I:- concluded.

APPENDIX C-3

MODEL FIGURES

LAUNCH HEAT TRANSFER

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CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1170 C-3- 1

TABLE 4

RUN SCHEDULE - MDAC SPACE SHUTTLE
CAL 96" HST

RUN NO.	CONFIGURATION	T_w/T_o	M_∞	$Re_\infty \times 10^{-6}$ ft.$^{-1}$	Angle of Attack deg.	Yaw deg.	CONTROL DEFLECTIONS ELEVON deg.	FLAP deg.
1	Orbiter	.155	11.7	.31	0	0	+10	+10
2	Orbiter	.156	11.7	.31	25	0	0	+10
3	Orbiter	.162	12.7	2.8	25	0	0	+10
4	Orbiter	.160	13	4.7	25	0	0	+10
5	Orbiter	.160	13	4.7	25	+5	0	+10
6	Orbiter	.157	13	4.5	25	-5	0	+10
7	Orbiter	.157	11.7	.32	45	0	-40	0
8	Orbiter	.162	13	4.8	45	0	-40	0
9	Orbiter	.160	13	4.6	45	+5	-40	0
10	Orbiter + Straight External Tanks	.160	11.8	.32	0	0	0	0
11	Orbiter + Straight External Tanks	.160	13	4.6	0	0	0	0
12	Orbiter + Straight External Tanks	.141	7.6	.31	0	0	0	0
13	Orbiter + Straight External Tanks	.334	7.7	2.2	0	0	0	0
14	Orbiter + Straight External Tanks	.312	7.5	9.4	0	0	0	0
15	Orbiter	.141	7.6	.31	0	0	+10	+10
16	Orbiter	.328	7.5	10.4	0	0	+10	+10
17	Orbiter	.137	7.6	.32	20	0	+10	+10
18	Orbiter	.345	7.6	10.3	20	0	+10	+10
19	Orbiter	.326	7.5	10.4	25	0	+10	0
20	Orbiter	.139	7.6	.31	25	0	0	+10
21	Orbiter	.332	7.7	2.2	25	0	0	+10
22	Orbiter	.325	7.5	10.4	25	0	0	+10
23	Orbiter	.345	7.6	10.3	25	+5	0	+10
24	Orbiter	.324	7.5	10.2	25	-5	0	+10
25	Orbiter	.339	7.6	27.8	25	0	0	+10
26	Orbiter	.137	7.6	.32	45	0	-40	0
27	Orbiter	.340	7.6	27.4	45	0	-40	0
28	Orbiter	.140	7.6	.32	60	0	-40	0
29	Orbiter	.329	7.5	10.5	60	0	-40	0
30	Orbiter	.327	7.5	10.4	45	0	0	0
31	Orbiter + Canted External Tanks	.136	7.6	.32	0	0	0	0
32	Orbiter + Canted External Tanks	.336	7.7	2.3	0	0	0	0
33	Orbiter + Canted External Tanks + Tip Fairing	.332	7.7	2.2	0	0	0	0
34	Orbiter	.130	7.8	11.4	45	0	-40	0
35	Orbiter	.116	7.2	10.6	25	0	0	+10
36	Orbiter	.340	7.6	10.4	60	0	0	+10
37	Mated, Position 2	.329	7.6	24.4	0	0	0	0
38	Mated, Position 2	.324	7.6	24.0	0	0	0	0
39	Mated, Position 3	.330	7.6	24.7	0	0	0	0
40	Mated, Position 3 + Canted External Tanks	.330	7.7	2.4	0	0	0	0
41	Mated, Position 1 + Canted External Tanks	.337	7.7	2.2	0	0	0	0
42	Mated, Position 1	.332	7.7	2.3	0	0	0	0
43	Mated, Position 1	.139	7.6	.31	0	0	0	0
44	Mated, Position 1	.324	7.6	24.4	0	0	0	0
45	Mated, Position 1	.322	7.6	24.1	-5	0	0	0
46	Booster	.134	7.6	.30	0	0	0	0
47	Booster	.327	7.7	2.4	0	0	0	0
48	Booster	.324	7.6	27.1	0	0	0	0
49	Booster	.322	7.6	24.6	0	0	0	0
50	Mated, Position 1	.166	10.3	.37	0	0	0	0
51	Mated, Position 1	.166	10.2	.35	0	0	0	0
52	Booster	.169	10.3	.37	0	0	0	0
53	Booster	.190	11.2	10.1	15	0	0	0
54	Booster	.166	10.3	.37	30	0	0	0
55	Booster	.186	11.2	9.9	30	0	0	0
56	Booster	.165	10.3	.35	45	0	0	0
57	Booster	.161	10.5	.87	45	0	0	0
58	Booster	.162	10.9	5.4	45	0	0	0
59	Booster	.185	11.2	9.7	45	0	0	0
60	Booster	.167	10.3	.36	60	0	0	0
61	Booster	.161	10.5	.87	60	0	0	0
62	Booster	.159	10.9	4.6	60	0	0	0
63	Booster	.186	11.2	9.9	60	0	0	0
64	Booster	.160	10.9	4.5	60	+5	0	0
65	Booster	.189	11.2	9.8	50	0	0	0
66	Booster	.184	11.2	10.2	55	0	0	0
67	Booster	.182	11.2	9.7	15	0	0	+25
68	Booster	.180	11.2	9.3	60	0	0	+25

FIGURE 7 ORBITER INSTRUMENTATION LOCATIONS

p indicates pressure orifice
In data listing the orbiter instrumentation numbers shown are prefixed with a 1

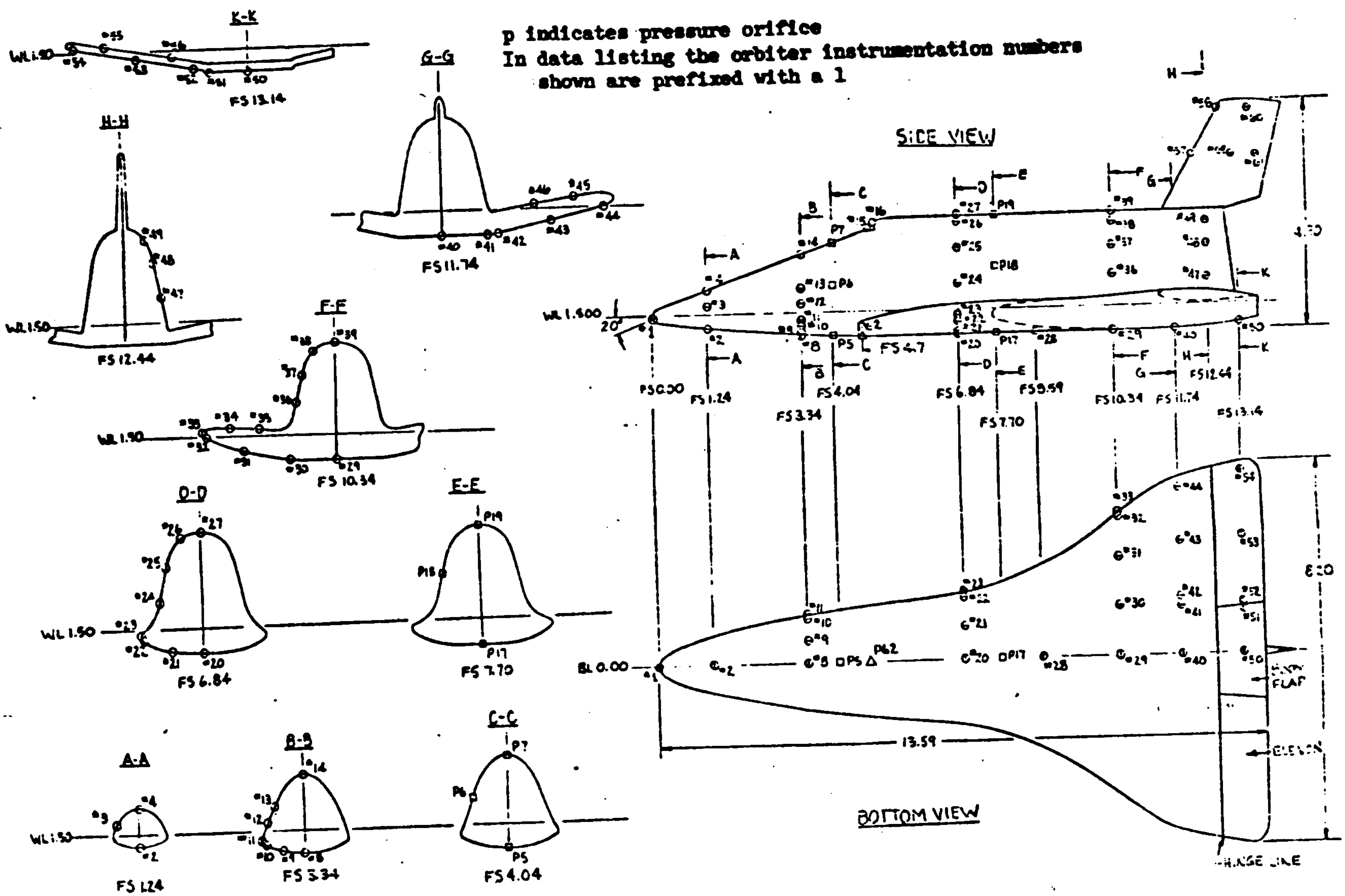
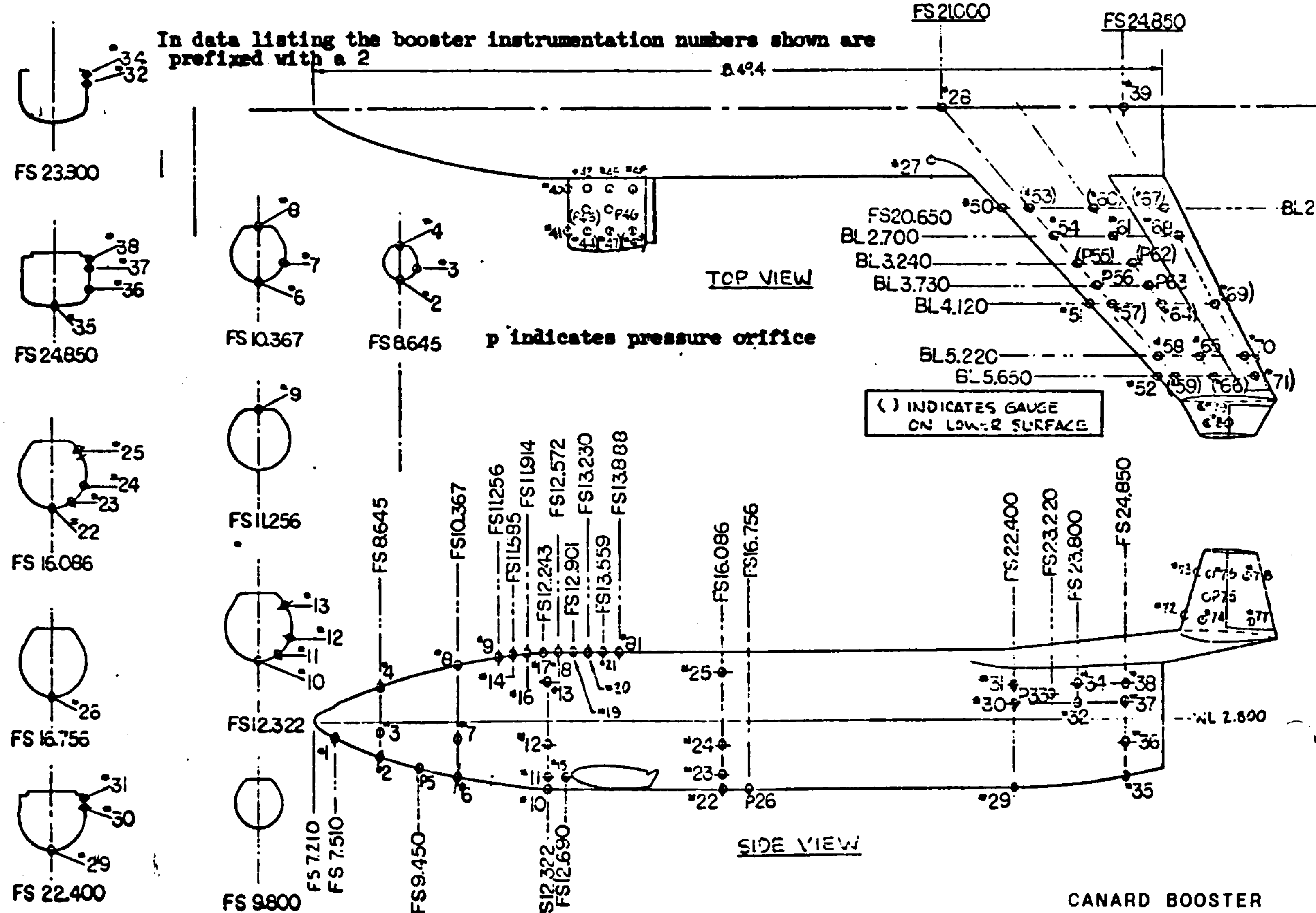


FIGURE 8 BOOSTER INSTRUMENTATION LOCATIONS

In data listing the booster instrumentation numbers shown are prefixed with a 2

p indicates pressure orifice

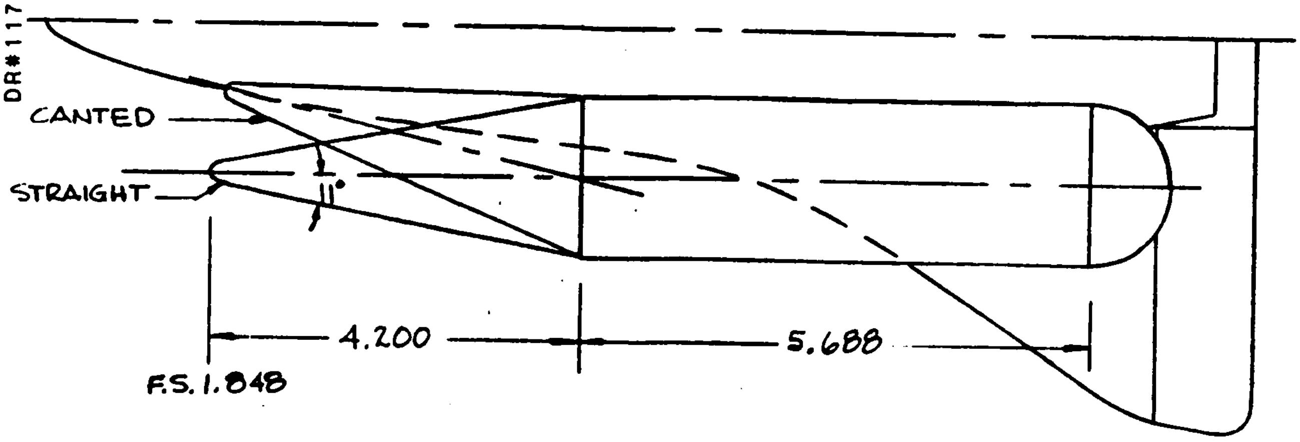


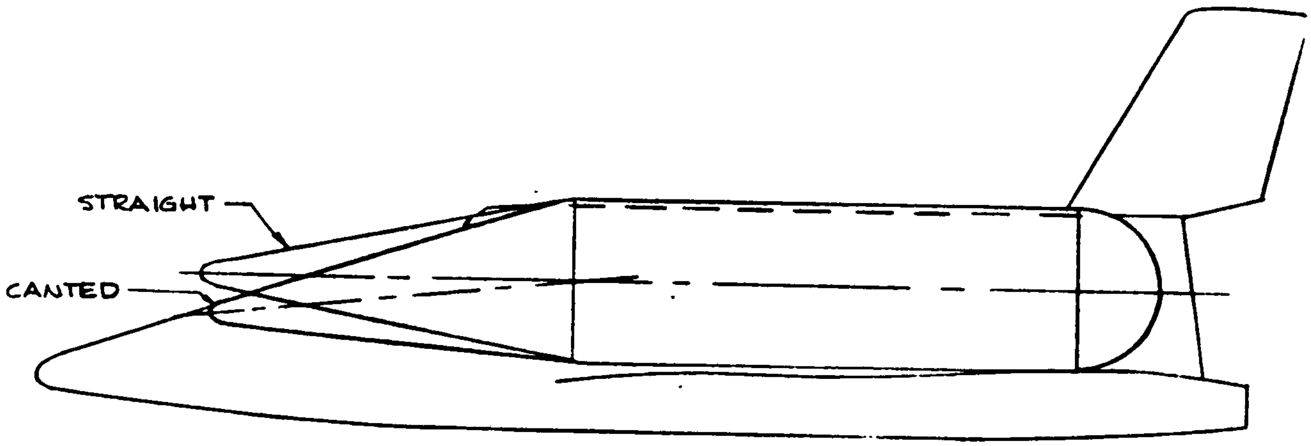
CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1170 C-3- 3

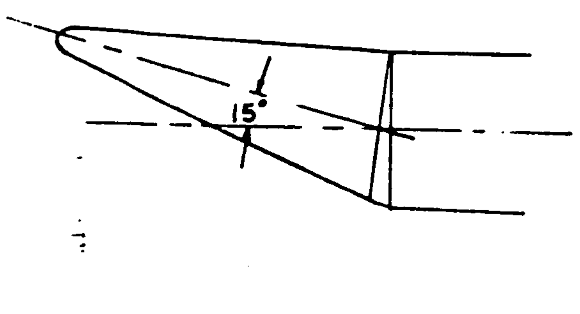
CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1170 C-3- 4

FIGURE 5.

EXTERNAL TANK CONFIGURATIONS

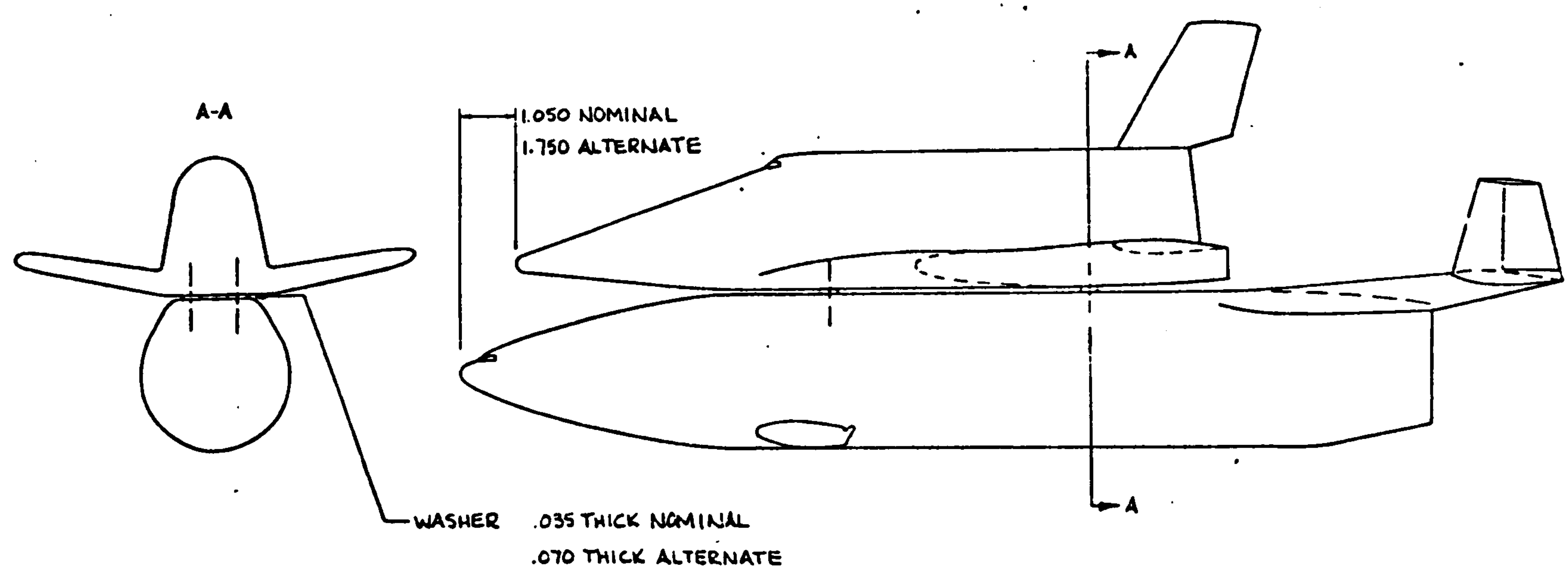






CANTED TANK DETAIL –
FORWARD CONE CANTED 15°
AND ROTATED 30° CLOCKWISE
LOOKING FORWARD

FIGURE 4 MATED CONFIGURATION



CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1170 . C-3- 5

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1238 C-3- 6
☐ POSTTEST

TABLE 16

TEST LaRC 6386/6387 DATA SET/RUN NUMBER

COLLATION SUMMARY

NOTE: Run numbers presented are LaRC Run No./MSFC Run No.

DATA SET IDENTIFIER	CONFIGURATION	TEST 63-		ANGLE OF ATTACK - DEGREES																			
		86	87	-5		-4		-3		-2		-1		0		5							
AHTB01	Booster Body	X		16	4-3									15	4-4	11	4-2						
2		X		9	1-3									3	1-2	8	1-4						
3			X	4	1-8									2	1-7	3	1-9						
4			X	23	4-8									21	4-7	22	4-9						
5			X	9	1-13									6	1-12	7	1-14						
6			X	30	4-13									28	4-12	29	4-14						
7		X		25	5-6									23	5-5	24	5-7						
8		X		21	5-9									19	5-8	22	5-10						
AHTC01	Canard Upper Surface		X	4	1-8									2	1-7	3	1-9						
2			X	23'	4-8									21	4-7	22	4-9						
3		X		25	5-6									23	5-5	24	5-7						
4		X		21	5-9									19	5-8	22	5-10						
5			X			15	-	14	-	13	-	12	-	11	-								
6	Canard Lower Surface		X	4	1-8									2	1-7	3	1-9						
7			X	23	4-8									21	4-7	22	4-9						
8		X		25	5-6									23	5-5	24	5-7						
9		X		21	5-9									19	5-8	22	5-10						
AHTC10			X			15	-	14	-	13	-	12	-	11	-								
AHTF01	Left Outboard Fin		X	9	1-13									6	1-12	7	1-14						
AHTF02			X	30	4-13									28	4-12	29	4-14						

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

* TEST
SCHEDULE

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TABLE 16 (Continued)

TEST LaRC 6386/6387 DATA SET/RUN NUMBER

COLLATION SUMMARY

NOTE: Run numbers presented are LaRC Run No./MSFC Run No.

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	TEST 63-86	TEST 63-87	-5		-4		-3		-2		-1		0		5	
AHTF03	Left Outboard Fin		X			15	-	14	-	13	-	12	-	11	-		
4	Right Inboard Fin		X	9	1-13									6	1-12	7	1-14
5			X	30	4-13									28	4-12	29	4-14
6			X			15	-	14	-	13	-	12	-	11	-		
AHTW01	L.Wing-Upper Surface		X	9	1-13									6	1-12	7	1-14
2			X	30	4-13									28	4-12	29	4-14
3			X			15	-	14	-	13	-	12	-	11	-		
4	L.Wing-Lower Surface		X	9	1-13									6	1-12	7	1-14
5			X	30	4-13									28	4-12	29	4-14
6			X			15	-	14	-	13	-	12	-	11	-		
7	R.Wing-Upper Surface		X	9	1-13									6	1-12	7	1-14
8			X	30	4-13									28	4-12	29	4-14
9			X			15	-	14	-	13	-	12	-	11	-		
AHTW10	R.Wing-Lower Surface		X	9	1-13									6	1-12	7	1-14
11			X	30	4-13									28	4-12	29	4-14
12			X			15	-	14	-	13	-	12	-	11	-		

TEST RUN NUMBERS

1 7 13 19 25 31 37 43 49 55 61 67 75 76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

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CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1238 C-3- 7

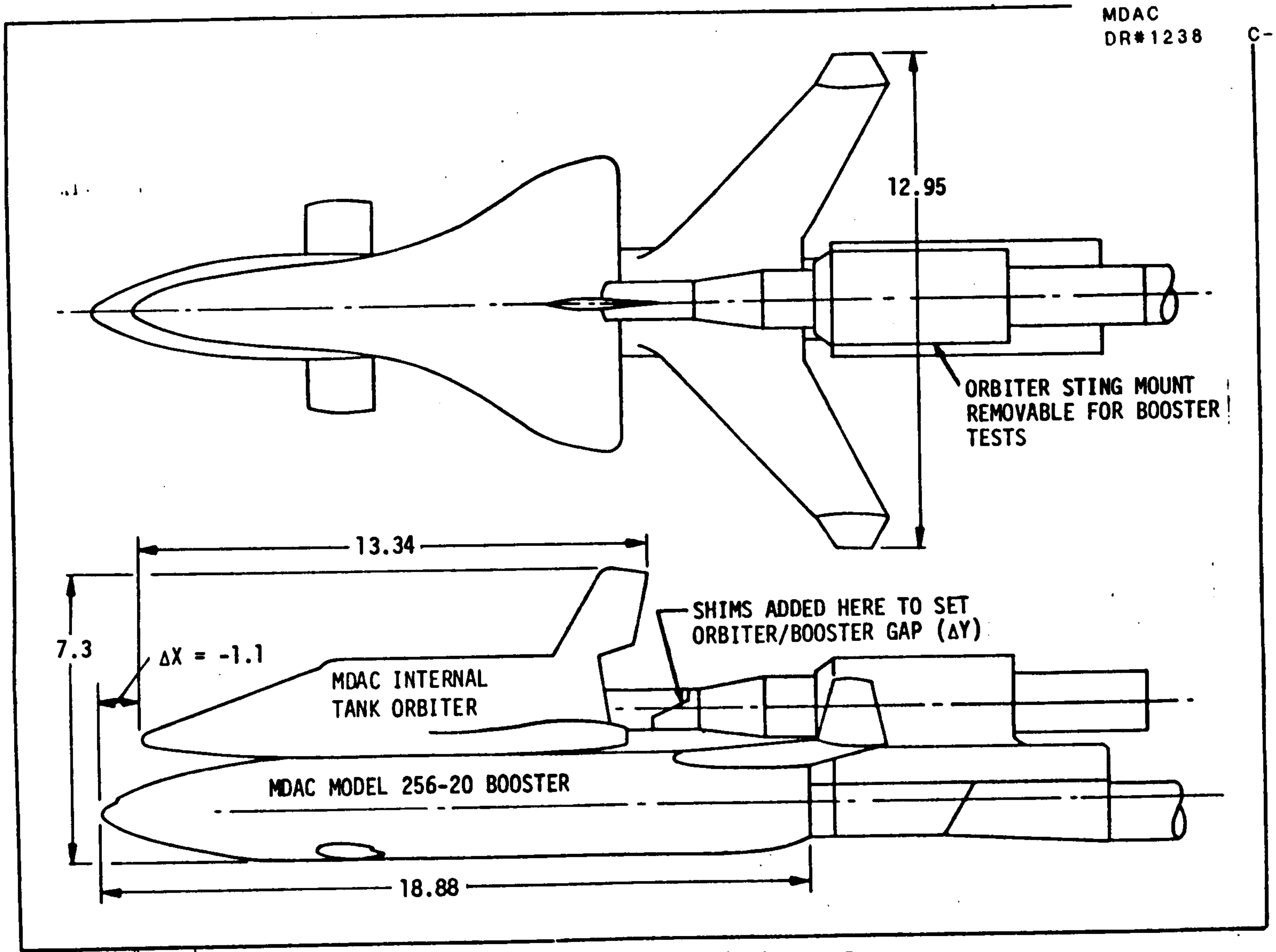

Figure 1. MATED MODEL ARRANGEMENT

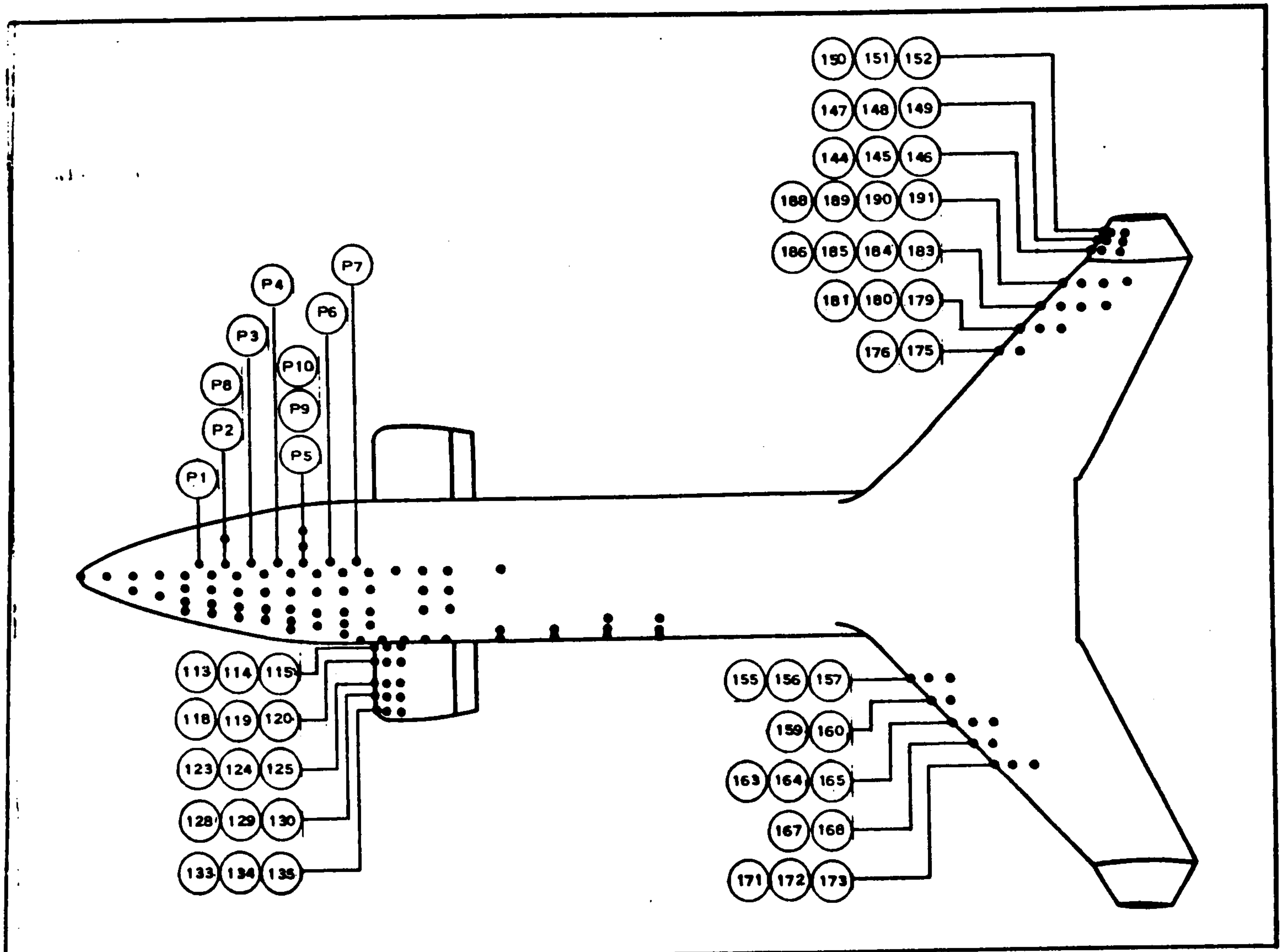

Figure 3. BOOSTER THEMOCOUPLE LOCATIONS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1238 C-3- 9

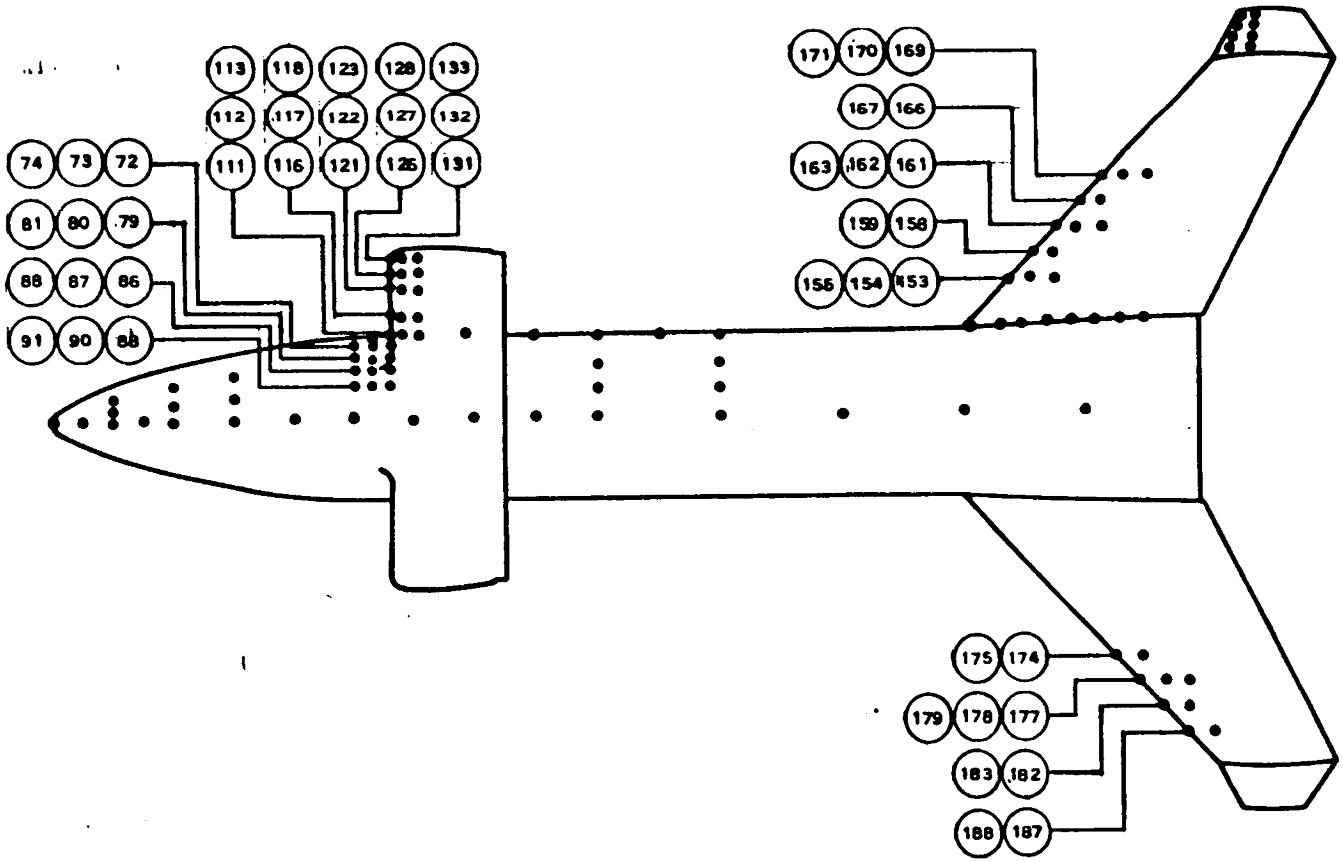

Figure 3 (Continued) BOOSTER THERMOCOUPLE LOCATIONS

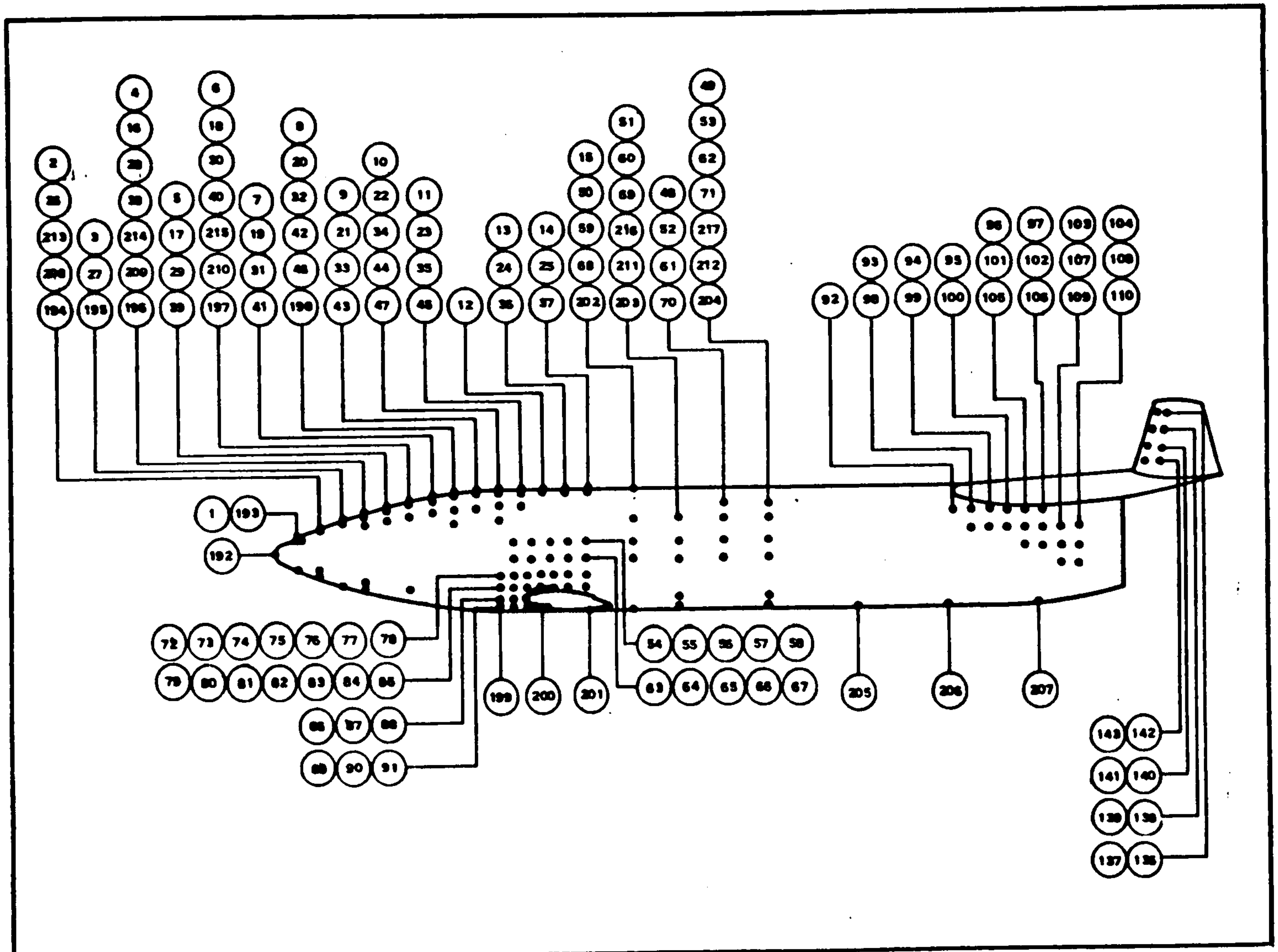

Figure 3 (Concluded) BOOSTER THERMOCOUPLE LOCATIONS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1238 C-3- 11

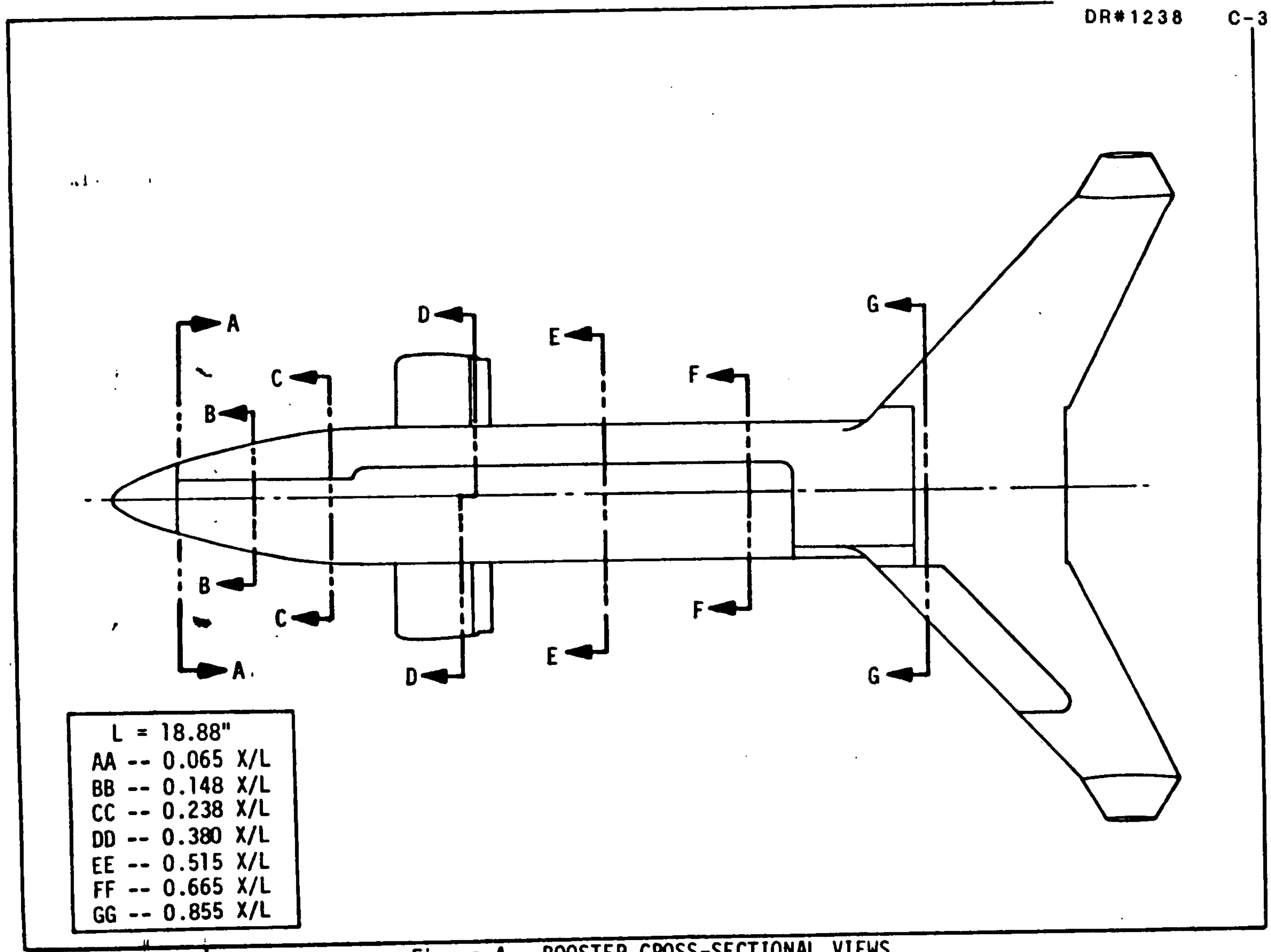

Figure 4. BOOSTER CROSS-SECTIONAL VIEWS

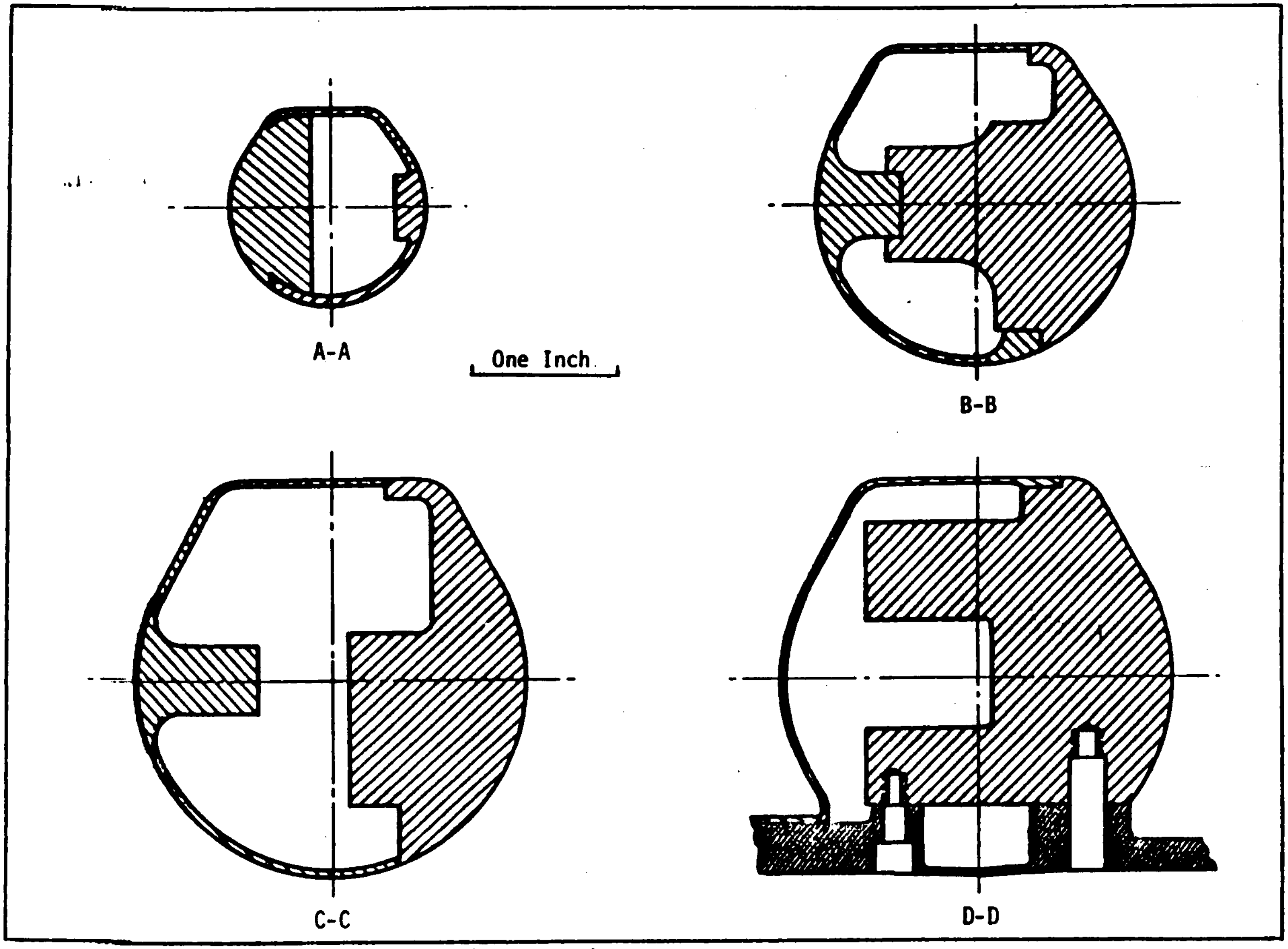

Figure 4 (Continued) BOOSTER CROSS-SECTIONAL VIEWS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1238 C-3- 13

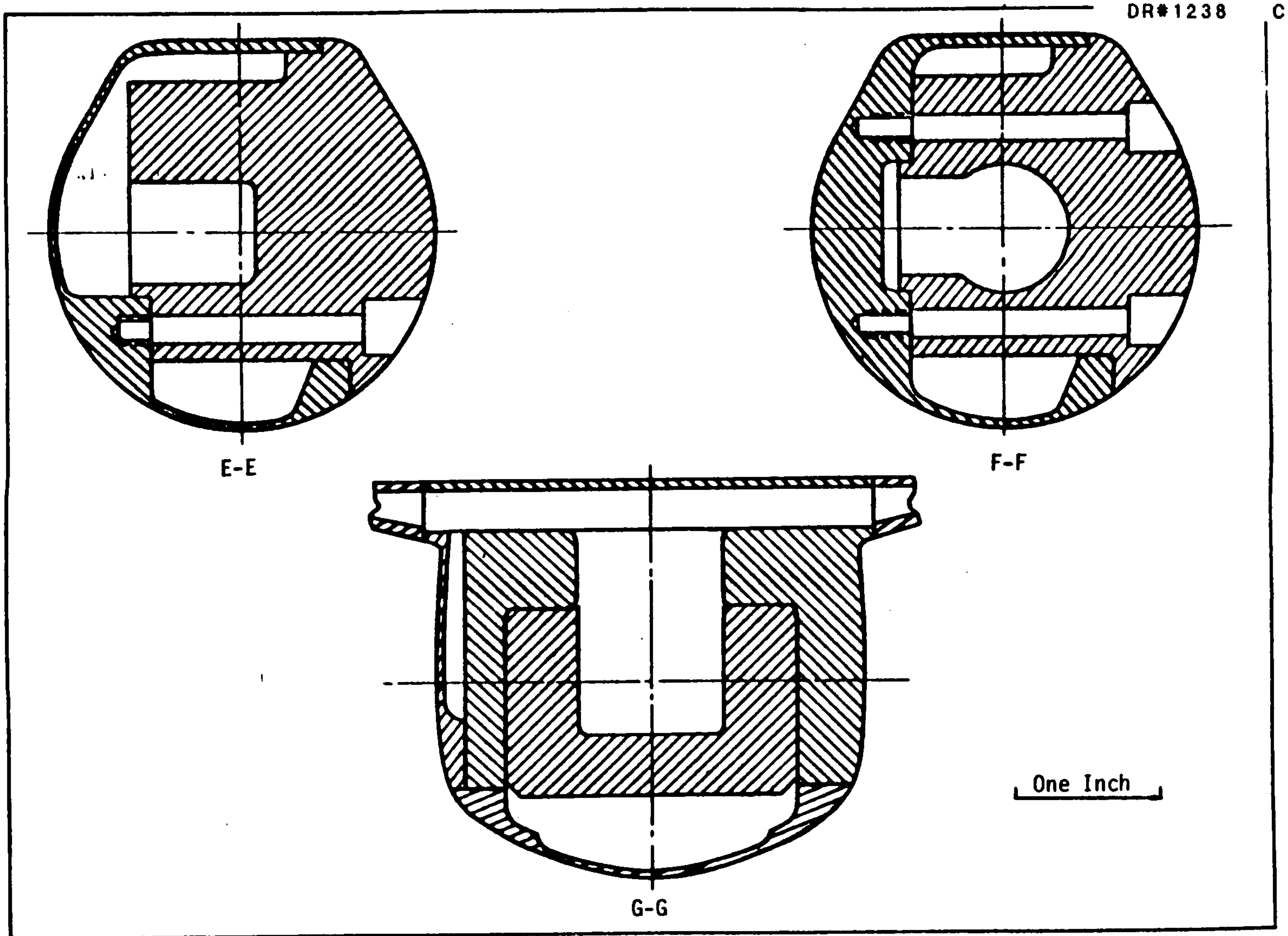

Figure 4 (Concluded) BOOSTER CROSS-SECTIONAL VIEWS

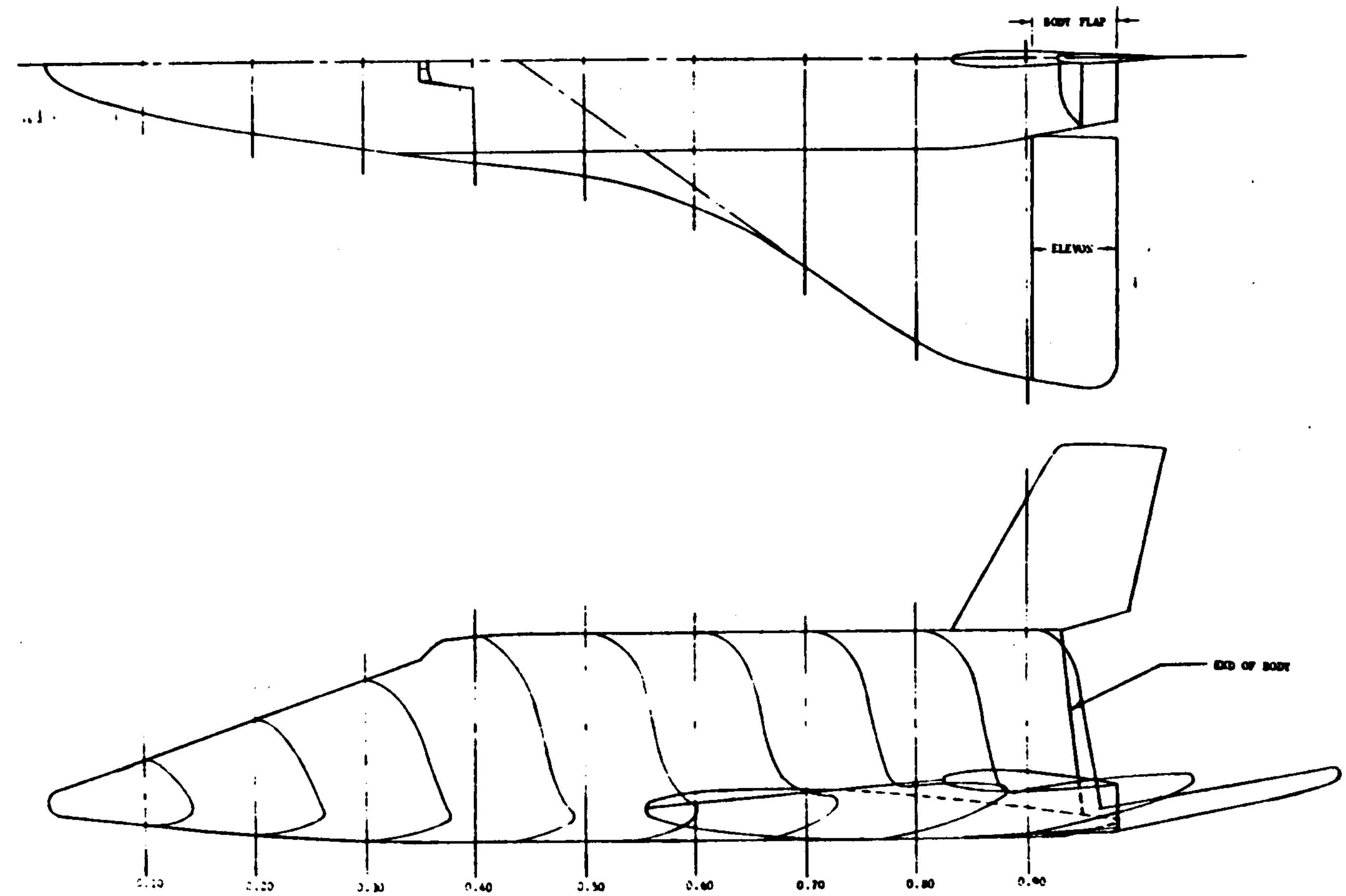

Figure 5. ORBITER CROSS-SECTIONAL VIEWS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1238 C-3- 15

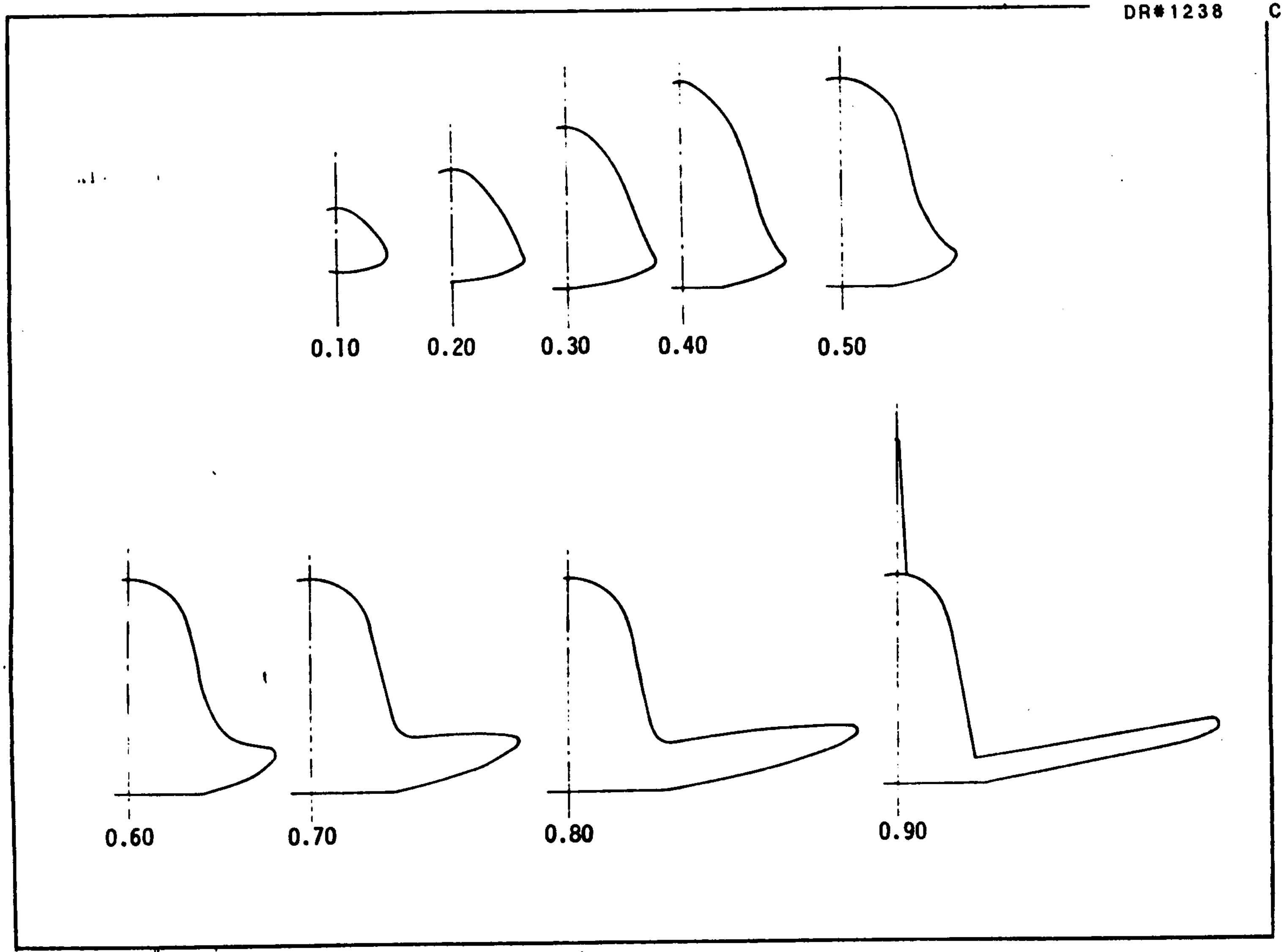

Figure 5 (Concluded) ORBITER CROSS-SECTIONAL VIEWS

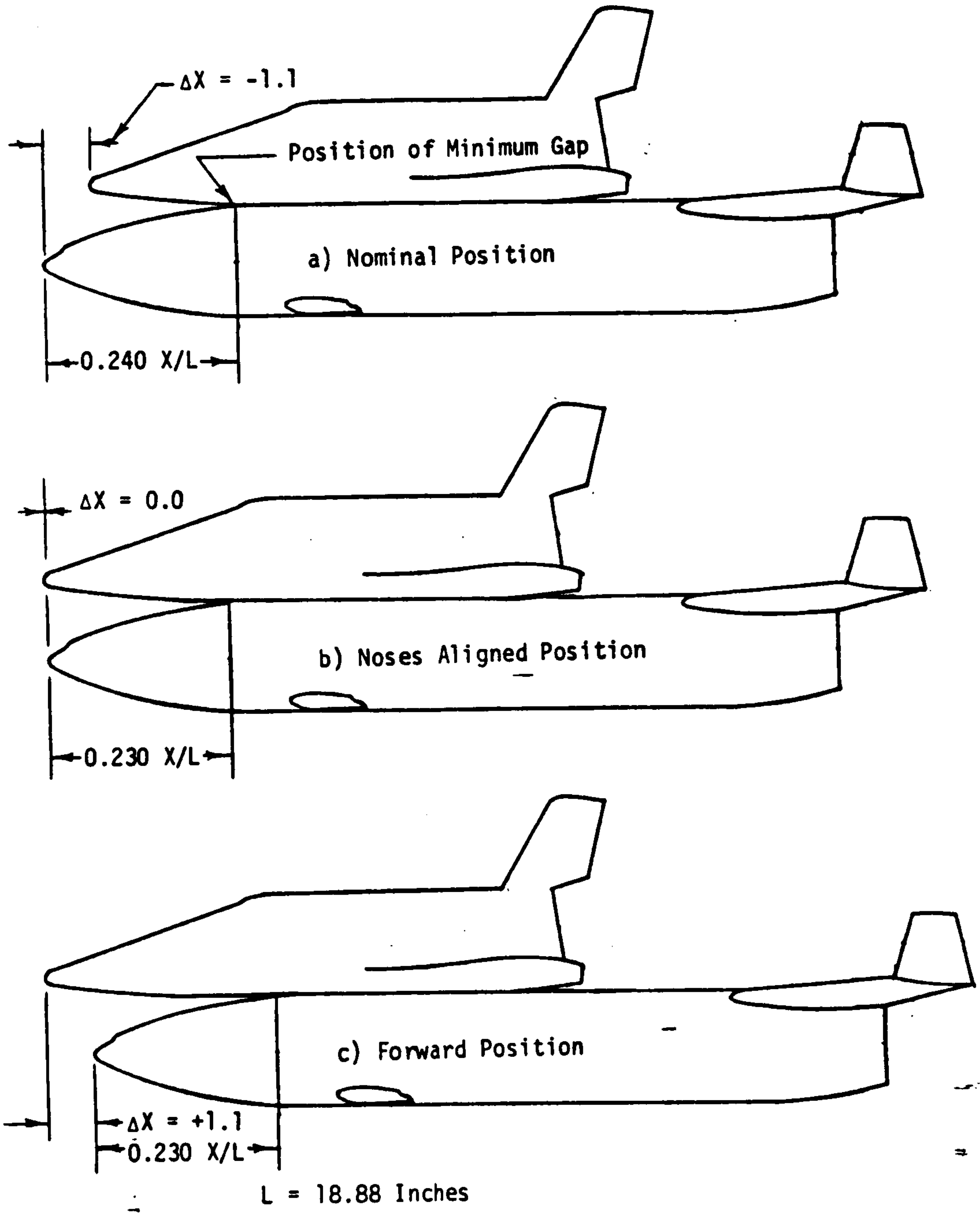

Figure 22. ORBITER POSITIONS USED IN MATED CONFIGURATION TESTS

TEST LaRC 10-78 DATA SET/RUN NUMBER

COLLATION SUMMARY

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260 C-3- 18

DATA SET IDENTIFIER	CONFIGURATION		ANGLE OF ATTACK - DEGREES -5	0	5
ROKB 01	BODY *	RUNS	2	1	3
02	BODY **		13	12	14
03	BODY *		5	4	6
04	BODY **		16	15	17
05	BODY *		10	9	11
06	BODY **		19	18	20
07	BODY **		26	25	27
ROKB 08	BODY **		31	30	32
ROKC 01	CANARD UPPER SURF. *		2	1	3
02	**		13	12	14
03	*		5	4	6
04	CANARD UPPER SURF. **		16	15	17
ROKC 06	CANARD LOWER SURF. **		19	18	20
07	**		26	25	27
ROKC 08	CANARD LOWER SURF. **		31	30	32
ROKF 01	LEFT OUTBRD FIN *		2	1	3
02	LEFT OUTBRD FIN **		13	12	14
04	RIGHT INBRD FIN **		16	15	17
ROKF 05	RIGHT INBRD FIN *	RUNS	10	9	11

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

* BOOSTER CONFIGURATION

** MATED CONFIGURATION

\#

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TABLE 15. (CONTINUED)

TEST LaRC 10-78 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION		ANGLE OF ATTACK - DEGREES -5	0	5						
ROKW 01	L. WING UPPER SURF *	RUNS	2	1	3						
02	L. WING UPPER SURF. * *		13	12	14						
04	L. WING LOWER SURF * *		16	15	17						
05	L. WING LOWER SURF. *		10	9	11						
07	R. WING UPPER SURF. * *		19	18	20						
ROKW 08	R. WING UPPER SURF. * *	RUNS	31	30	32						

1 7 13 19 25 31 37 43 49 55 61 67 75 76

IDPVAR

COEFFICIENTS:

* BOOSTER CONFIGURATION

* * MATED CONFIGURATION

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260 C-3- 19

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260   C-3- 20

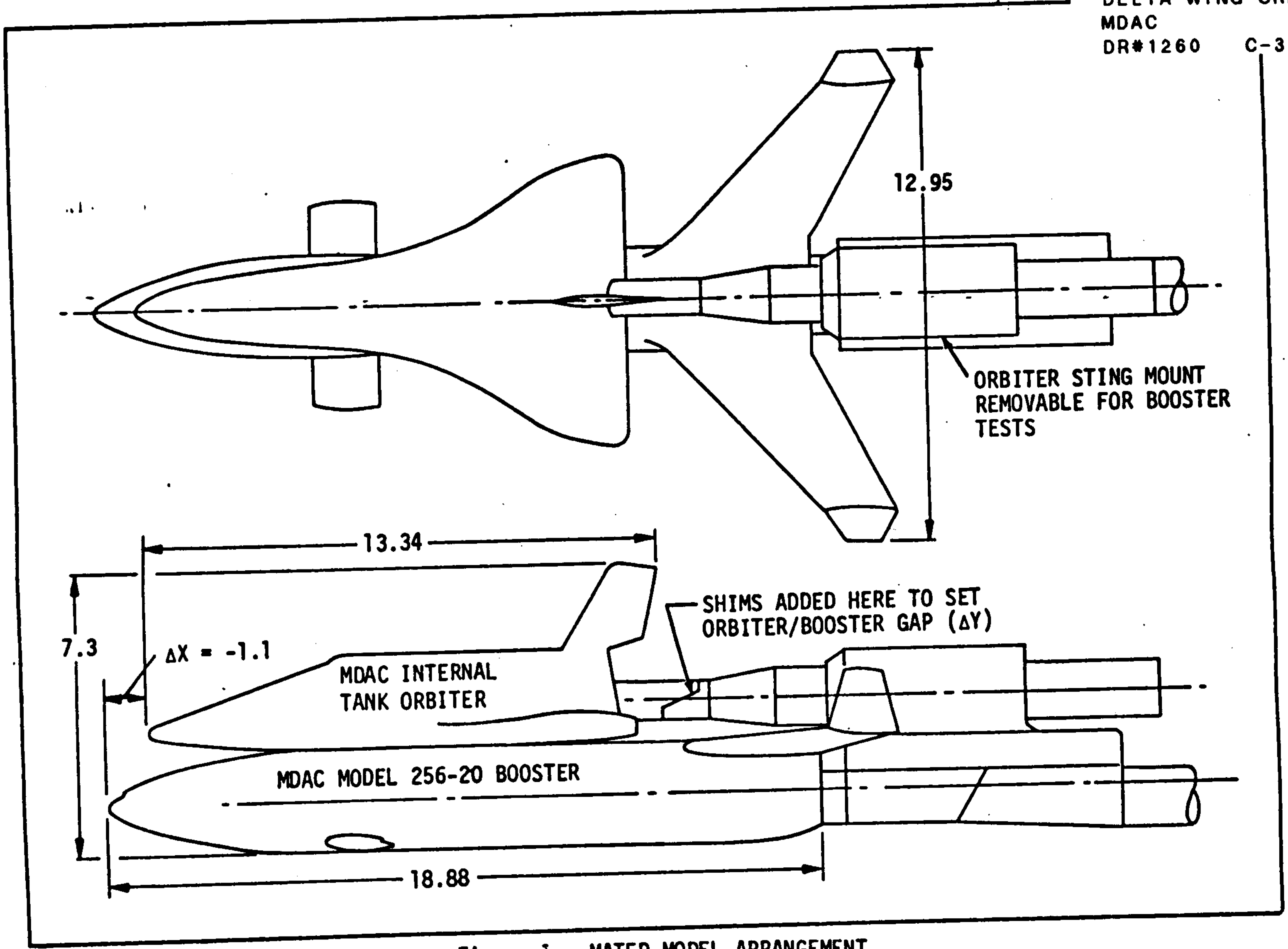


Figure 1. MATED MODEL ARRANGEMENT

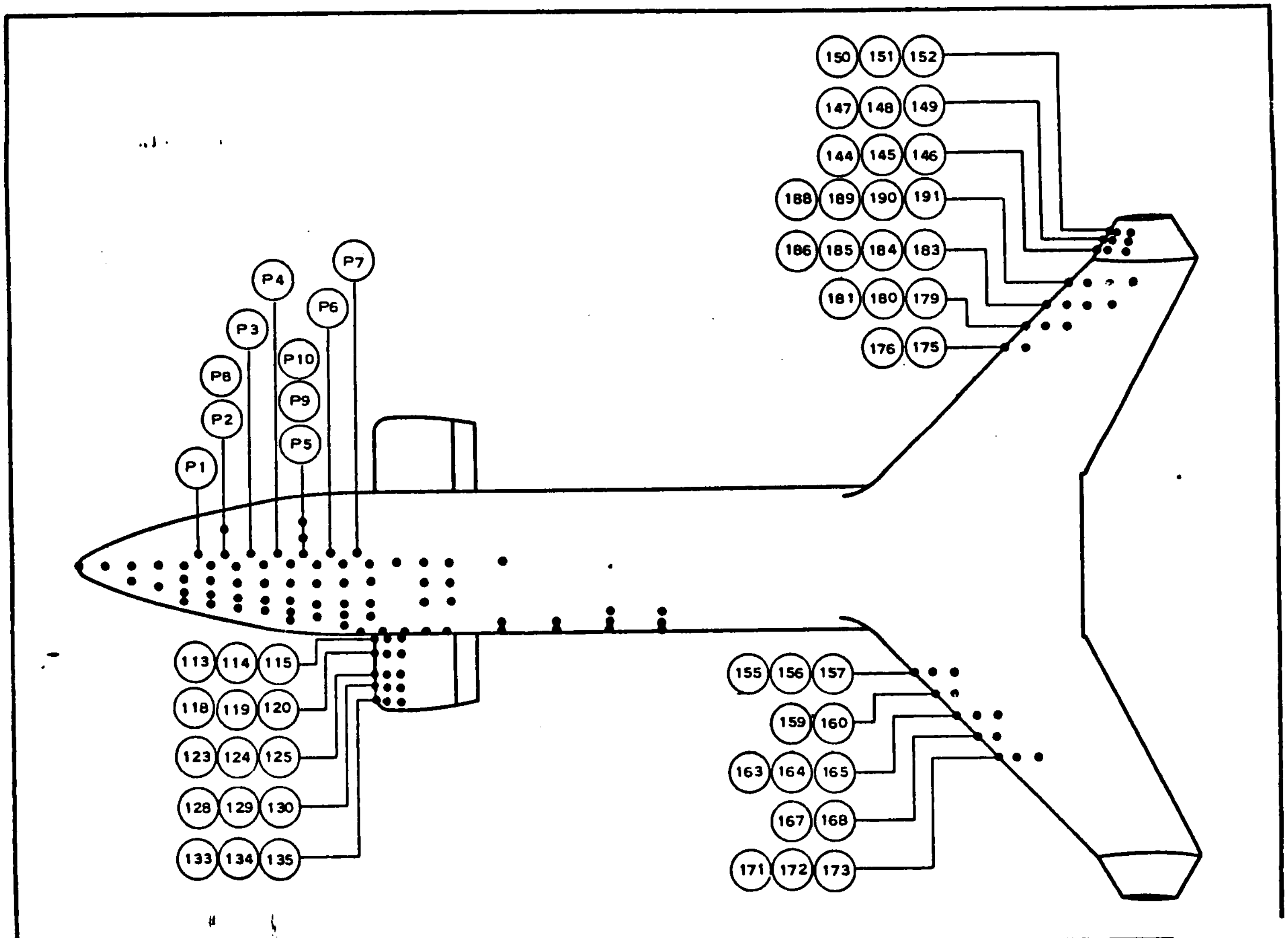


Figure 3. BOOSTER THEMOCOUPLE LOCATIONS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260 C-3- 21

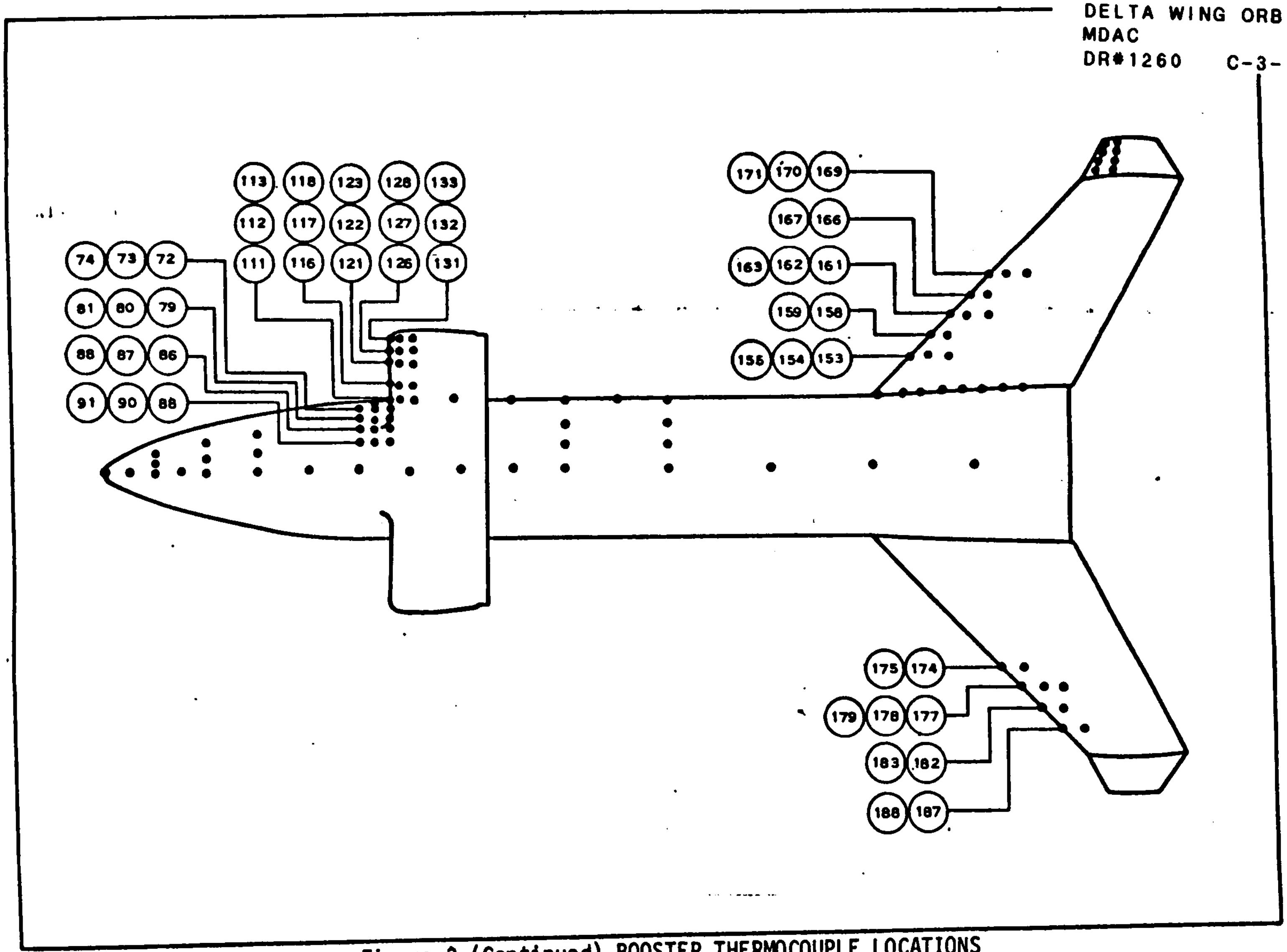


Figure 3 (Continued) BOOSTER THERMOCOUPLE LOCATIONS

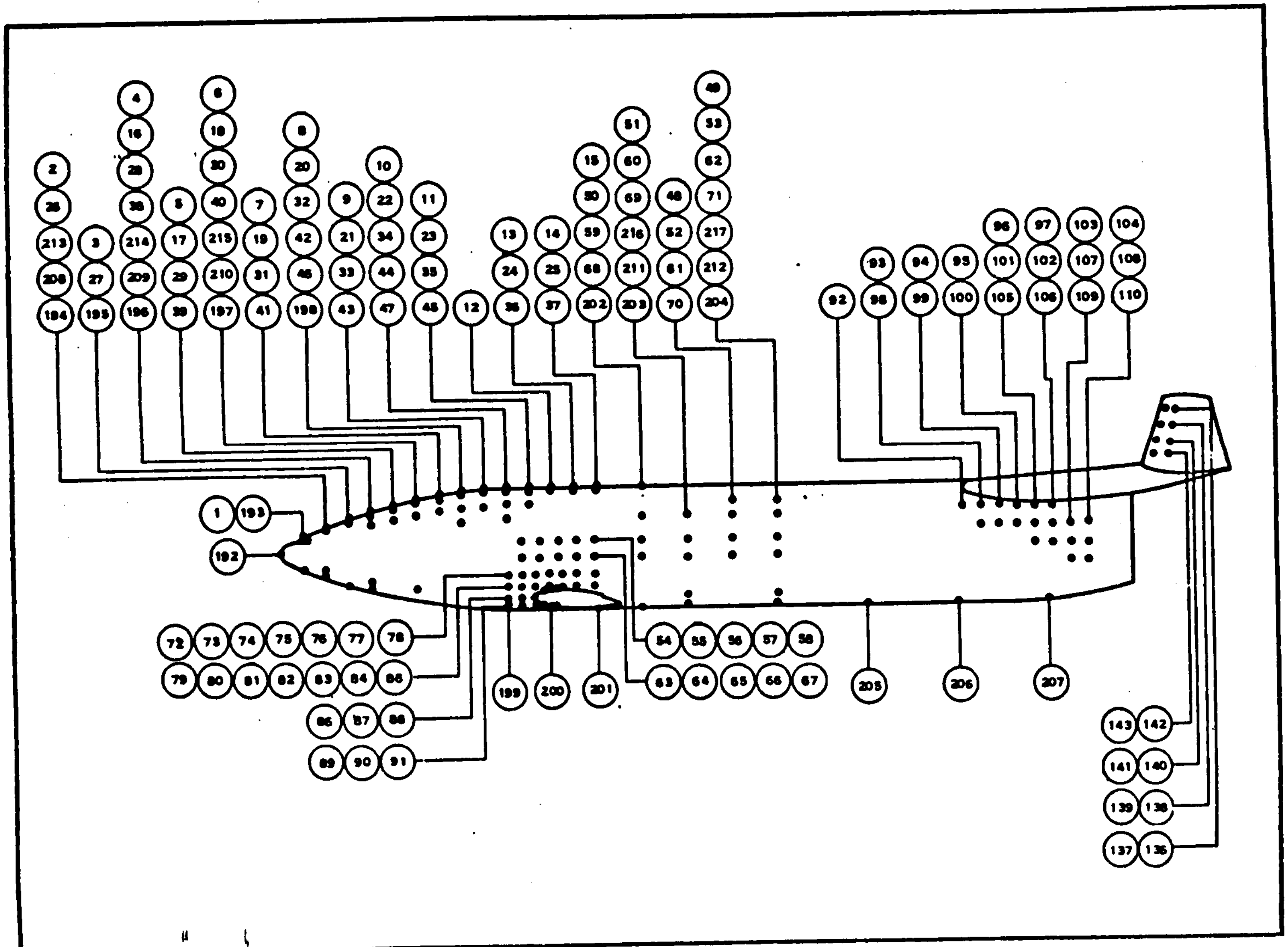
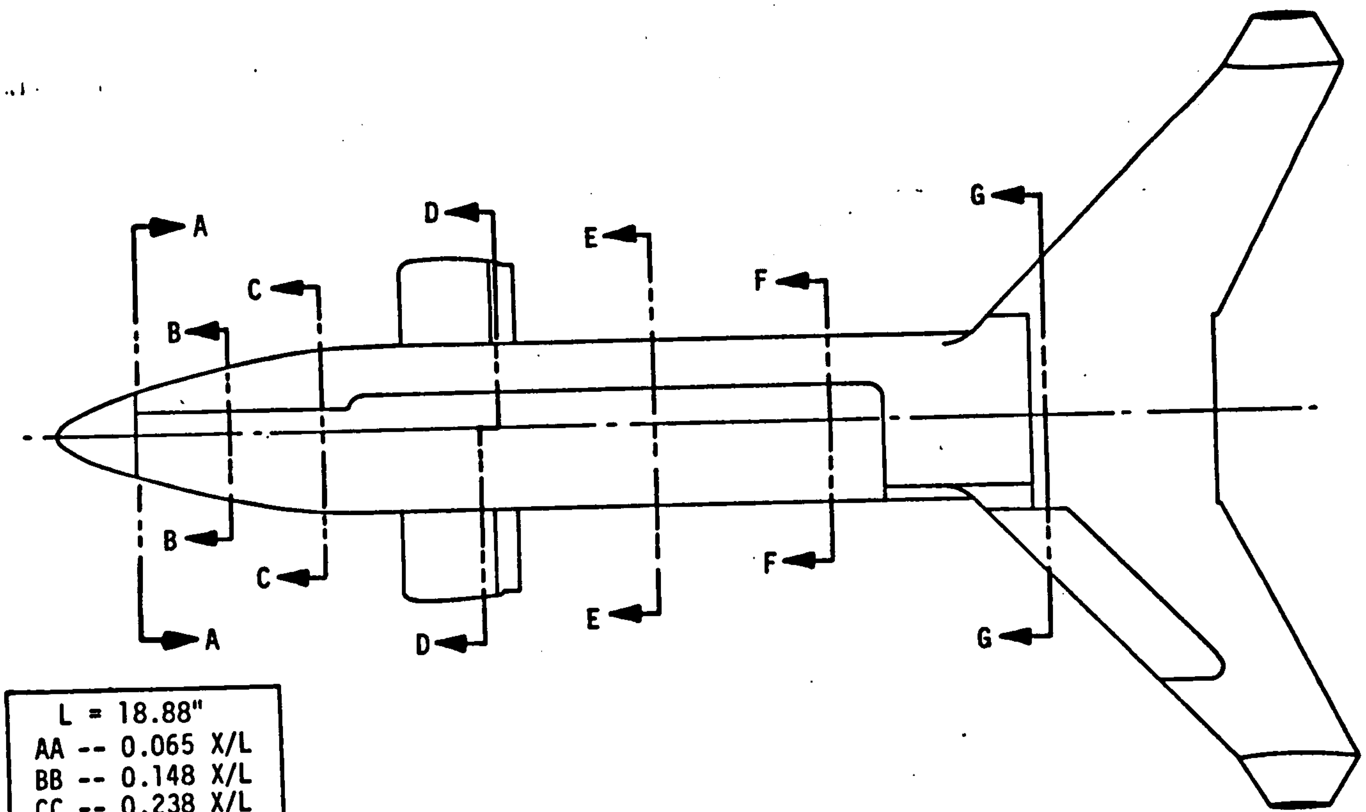


Figure 3 (Concluded) BOOSTER THERMOCOUPLE LOCATIONS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260   C-3- 23

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260 C-3- 24



L = 18.88"	
AA --	0.065 X/L
BB --	0.148 X/L
CC --	0.238 X/L
DD --	0.380 X/L
EE --	0.515 X/L
FF --	0.665 X/L
GG --	0.855 X/L

Figure 4. BOOSTER CROSS-SECTIONAL VIEWS

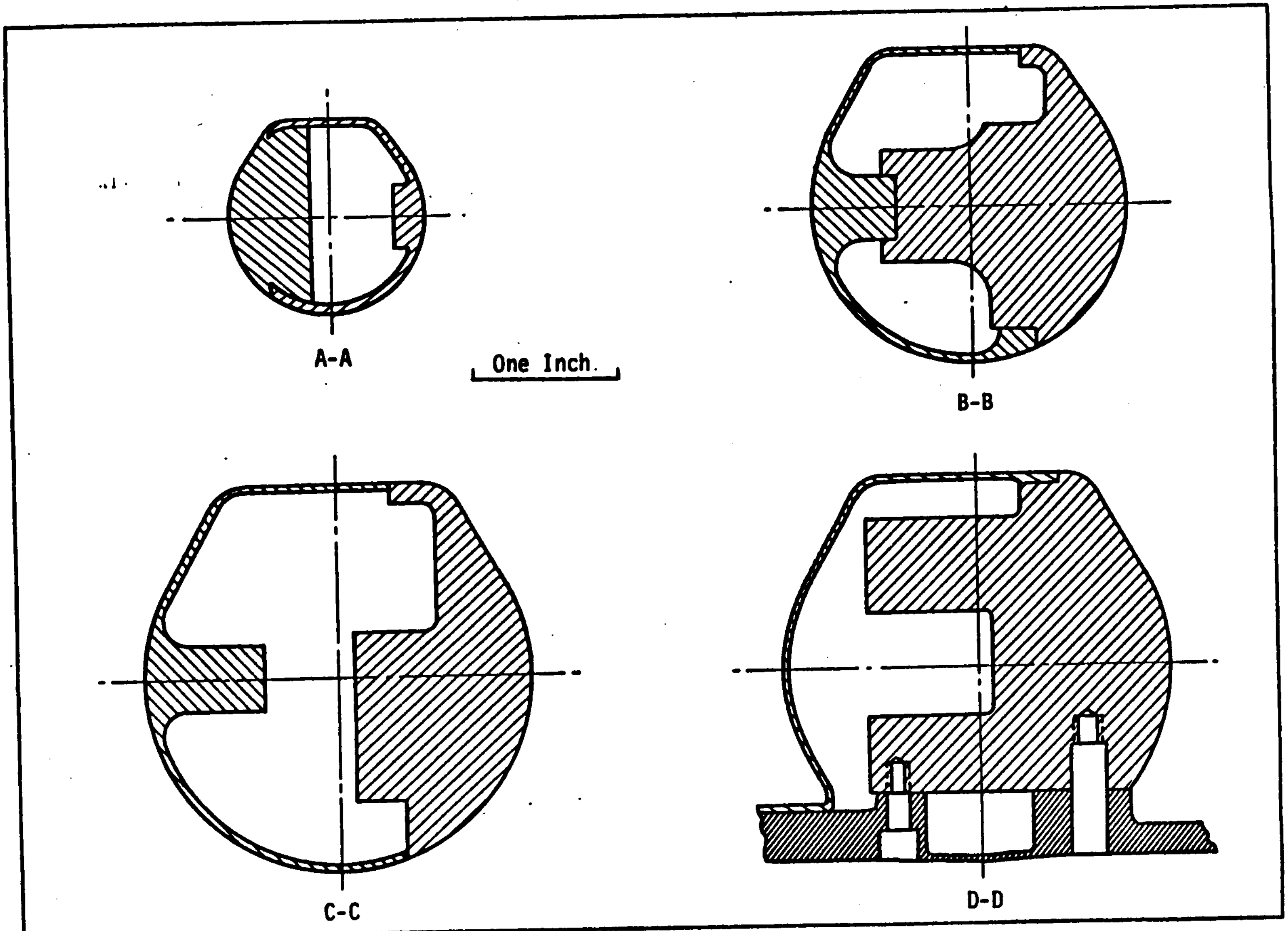


Figure 4 (Continued) BOOSTER CROSS-SECTIONAL VIEWS

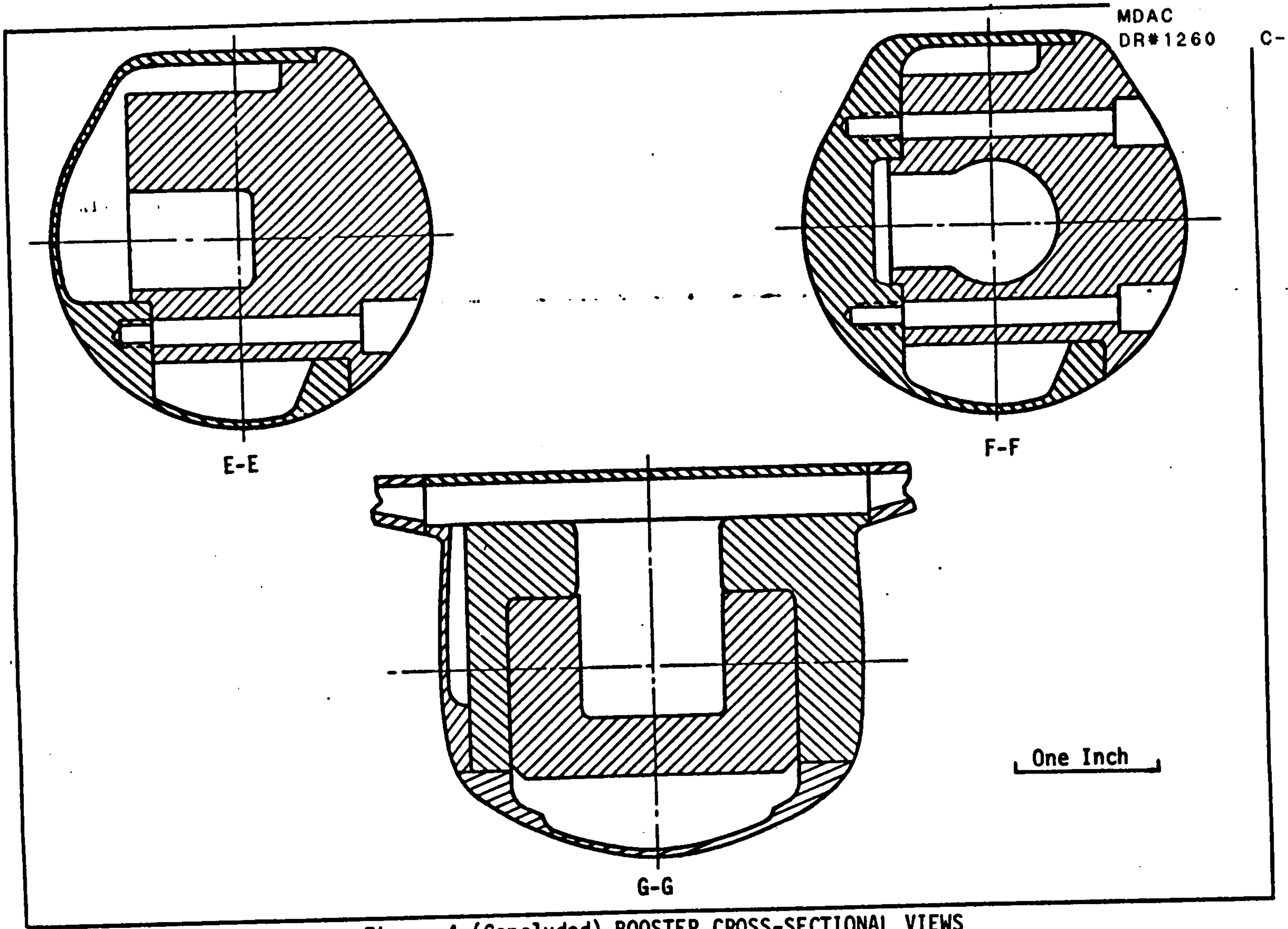


Figure 4 (Concluded) BOOSTER CROSS-SECTIONAL VIEWS

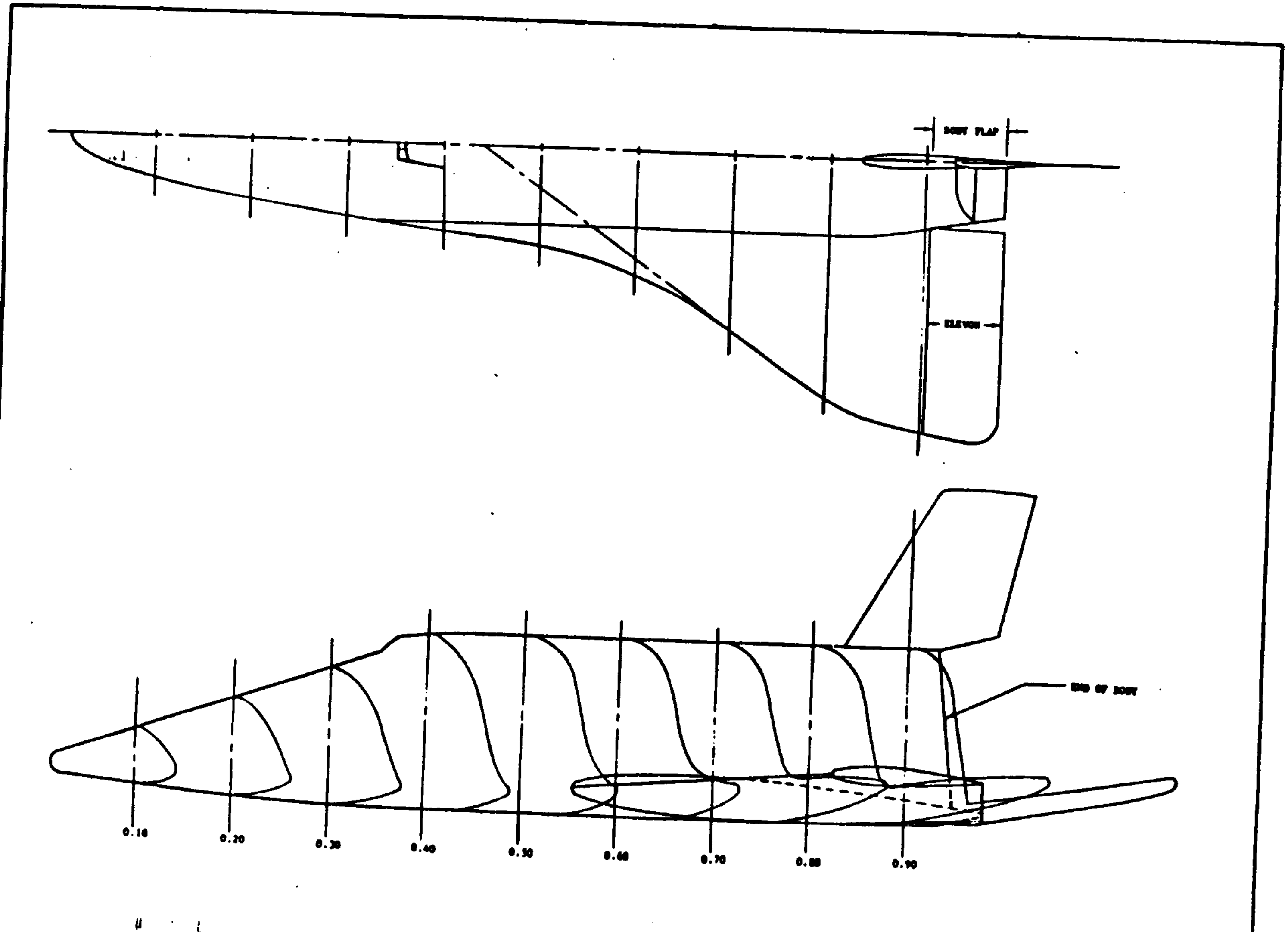


Figure 5. ORBITER CROSS-SECTIONAL VIEWS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260 C-3- 28

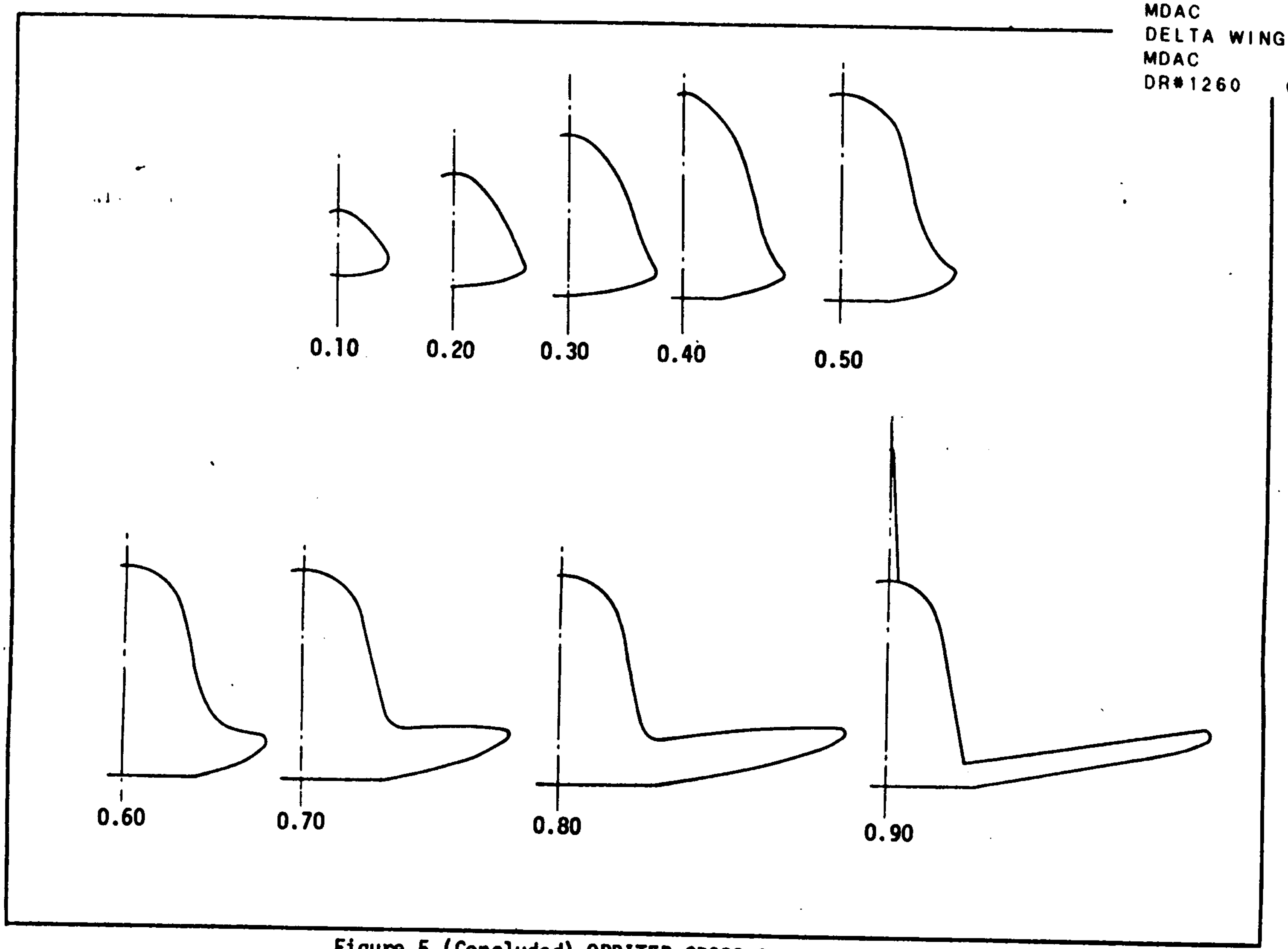


Figure 5 (Concluded) ORBITER CROSS-SECTIONAL VIEWS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1260 C-3- 29

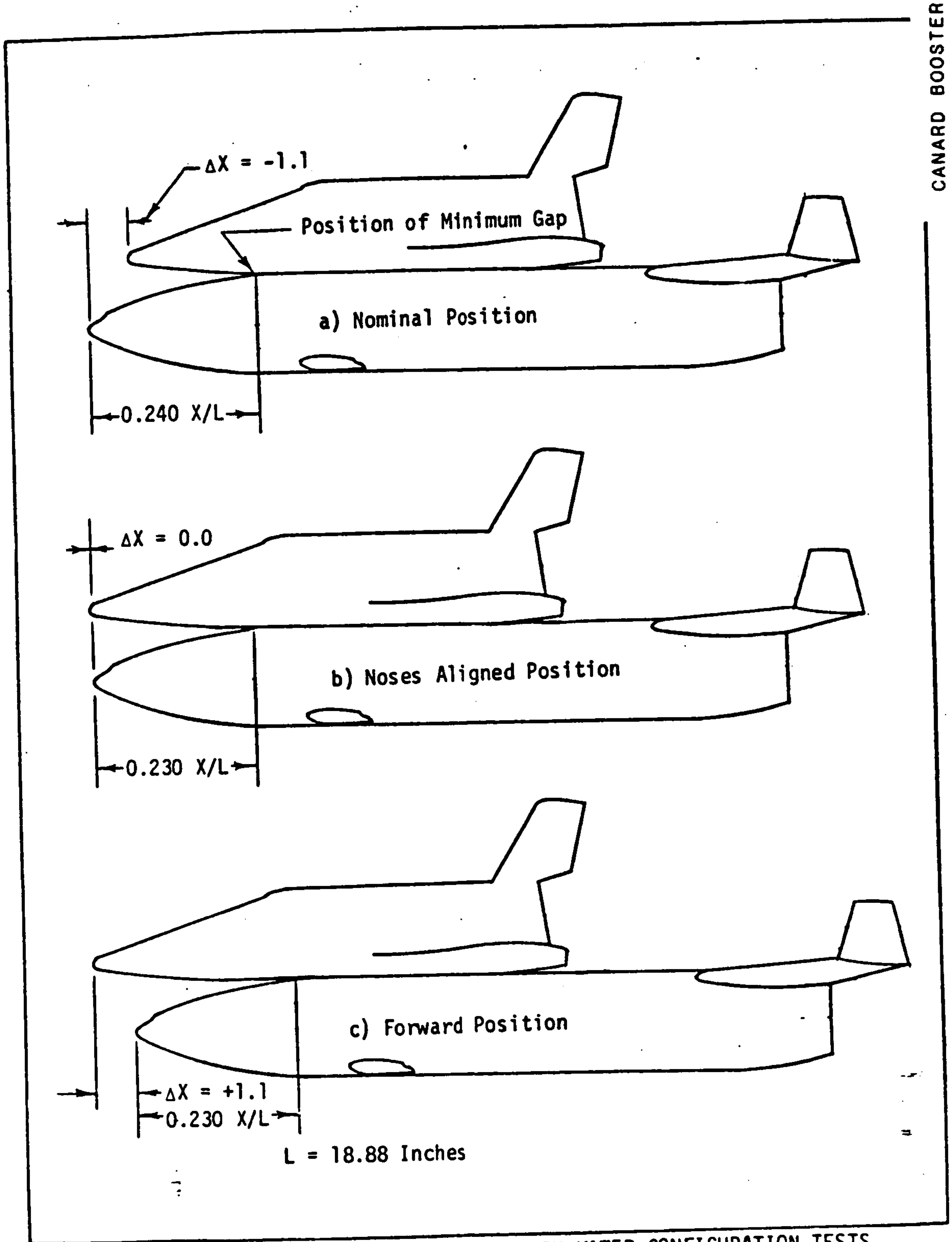


Figure 6. ORBITER POSITIONS USED IN MATED CONFIGURATION TESTS

Table 3

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of the MDAC Configurations

TEST NUMBER: VT1162-9 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
194	MDAC-B + DWO	0.011	8.0	150	1180	1.0	0.8	400	0	0	0	Side
195								250	0			
+ 196								150	0			
+ 201								113/400	0			
197								250	-5			
+ 198								113/500	-5			
199								250/400	5			
200								113	5			
+ 202		0.011	8.0	555	1310	1.0	2.5	300/500	0			
+ 203								125/500	0			
208								200	0			
204								250/500	5			
205								150	5			

* T_{aw} = adiabatic wall temperature

+Post-test photograph

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PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of the MDAC Configurations

TEST NUMBER: VT1162-9 TEST FACILITY: VKF Tunnel B

TEST DATE: June 1971 TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
+ 206	MDAC-B + DWO	0.011	8.0	555	1310	1.0	2.5	250/500	-5	0	0	Side
207		"	"	"	"	"	"	150	-5			
+ 209		0.011	8.0	860	1340	1.0	3.7	300/500	0			
210		"	"	"	"	"	"	200	0			
222		0.011	8.0	555	1310	N/A	2.5	Oil Flow	0			Top/Side
221									-5			
220									5			
224								Shado	0	0	0	N/A
227									0	0	90	
225									5		0	
226									-5			

* T_{aw} = adiabatic wall temperature

+ Post-test photograph

Table 3

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of MDAC Configurations (Not Mated)

TEST NUMBER: VT1162-9 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
213	MDAC-Booster	0.011	8	555	1310	1.0	2.5	125	0	0	0	Top/Side
214								200	0			
219								113	0			
215								150	5			
216								150	-5			
218								113	-5			
211		0.011	8	860	1340	1.0	3.7	300	0			
212								200	0			
265		0.011	8	555	1310	N/A	2.5	Shado	0		0	Side
262									0		90	Top
263									5		0	Side
264									-5		0	"

* T_{aw} = adiabatic wall temperature

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OF POOR QUALITY

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of MDAC Configurations (Not Mated)

TEST NUMBER: VT1162-9 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free - Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
291	MDAC-DWO	0.011	8.0	150	1220	1.0	0.8	100	0	0	180	Bottom
								113				Side
289								113	-5			Bottom
								113				Side
292								100	-5			Bottom
								100				Side
290								113	5			Bottom
								113				Side
293								100	5			Bottom
								100				Side
280		0.011	8.0	555	1310	1.0	2.5	100	0			Bottom
												Side

* T_{aw} = adiabatic wall temperature

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1262 C-3- 33

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

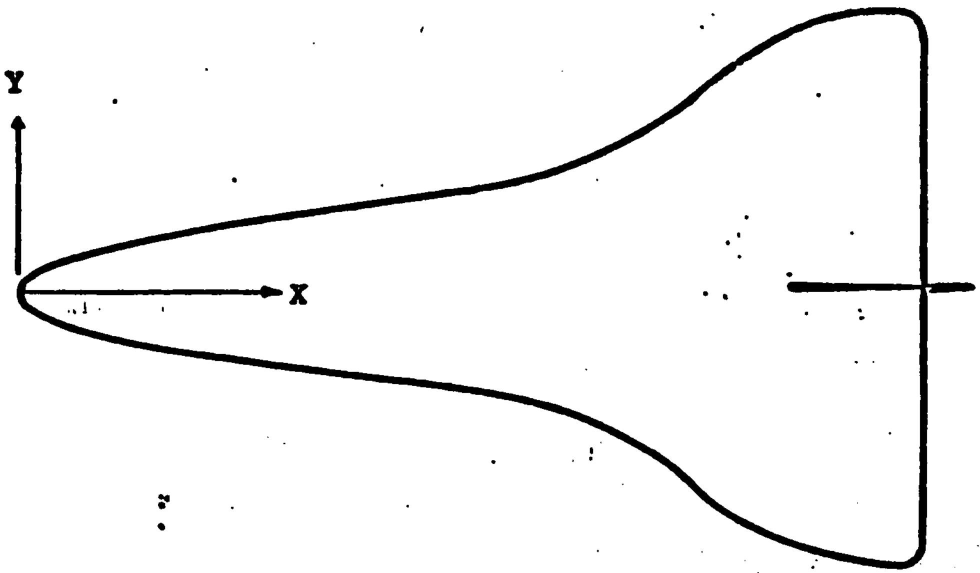
TEST TITLE: Ascent Heat Transfer Test of MDAC Configurations (Not Mated)

TEST NUMBER: VT1162-9 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

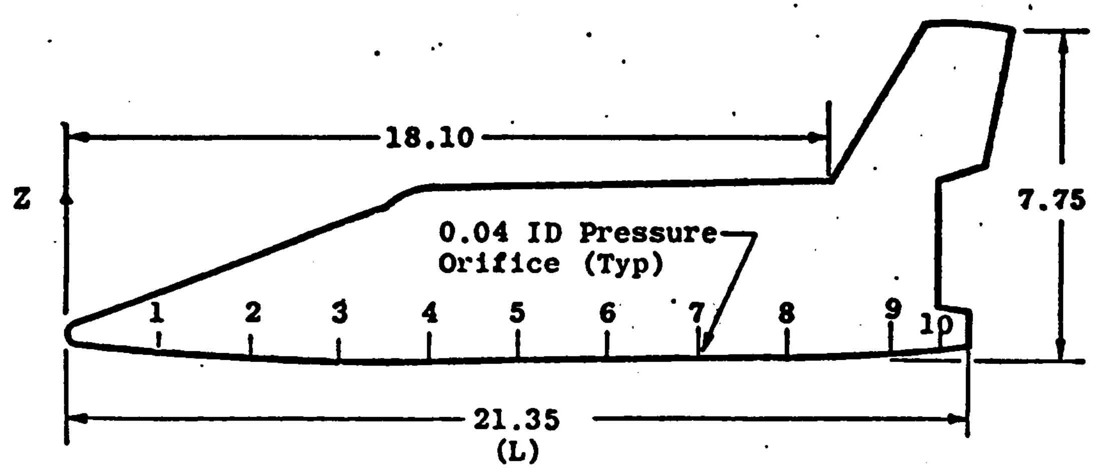
Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw}* / T_{total}	$RN \times 10^6$ / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Model Surface
279	MDAC-DWO	0.011	8.0	555	1310	1.0	2.5	100	-5	0	180	Bottom
								113				Side
278								113	5			Bottom
								113	"			Side
281		0.011	8.0	860	1340	1.0	3.7	113	0			Bottom
								150				Side
282								100				Bottom
								113				Side
285		0.011	8.0	555	1310	N/A	0.8	Oil Flow	0	0	180	Bottom/Side
283									-5			
284									5			

* T_{aw} = adiabatic wall temperature



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

All Dimensions in Inches



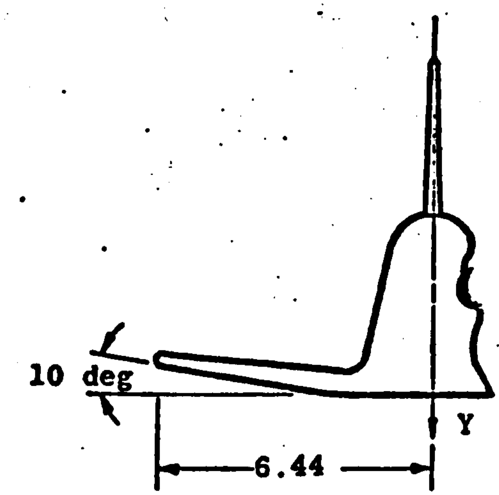
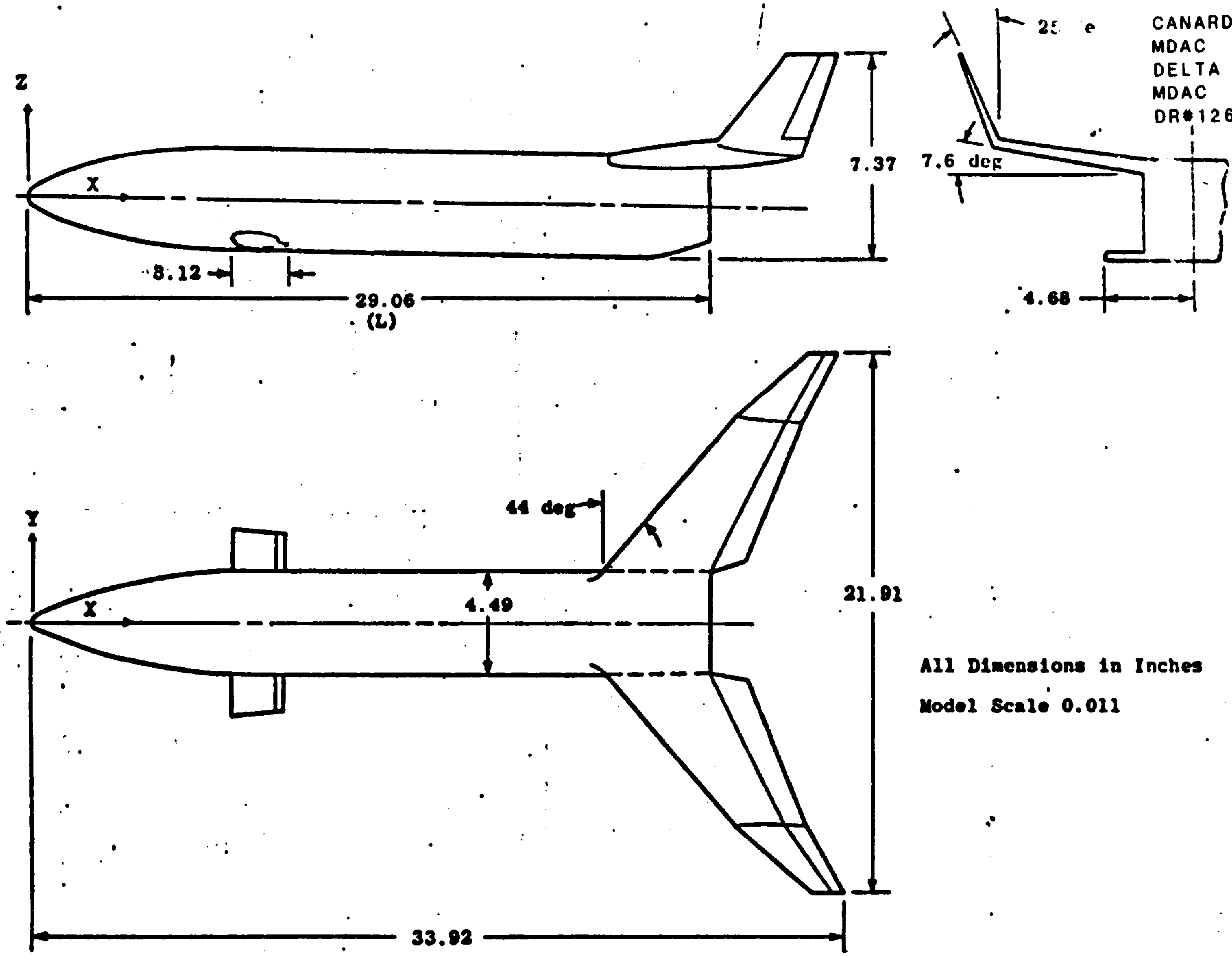


Fig. 1 McDonnell Douglas Delta Wing Orbiter Model Sketch (0.011 Scale)

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1262 C-3- 35

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1262 C-3- 36



All Dimensions in Inches

Model Scale 0.011

Fig. 2 McDonnell-Douglas Booster (MDAC-B)

TABLE 16

TEST UPWT - 967 DATA SET/RUN NUMBER

COLLATION SUMMARY

B- Body

☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES RN/L		ΔY	ΔX	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 2.3	3.7
AHVB01	Booster Alone	-5	0	3.98		-	-		1-2	1-7
1		0				-	-		1-1	1-5
1		5				-	-		1-3	1-8
2	Booster + orbiter	-5				0	-1.1		2-11	2-8
2		0							2-10	2-7
2		5							2-12	2-9
3		-5					0		3-11	3-8
3		0							3-10	3-7
3		5							3-12	3-9
4	Booster Alone	0		5.31		-	-			6-3
4				3.98		-	-			1-5
4				1.31		-	-			6-4
5	Booster + orbiter			5.51		0	-1.1			5-4
5				3.98						4-7
5				1.29						5-5

LRC TEST RUN NUMBERS

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1263 C-3- 37

"X" : C : CANARD
: W : wing

Datasets 1,2,3 on upper surface
4 5 6 on lower surface

TEST UPWT-967 DATA SET/RUN NUMBER
COLLATION SUMMARY

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1263 C-3- 38
☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)	
		α	β	RN/L		ΔY	ΔX		2.3	3.7
AHVX01	Booster Alone	-5	0	3.48		-	-		1-2	1-7
1		0				-	-		1-1	1-5
1		5				-	-		1-3	1-8
2	Booster + Orbiter	-5				0	-1.1		2-11	2-8
2		0							2-10	2-7
2		5							2-12	2-9
3		-5					0		3-11	3-8
3		0							3-10	3-7
3		5							3-12	3-9
4	Booster Alone	-5				-	-		1-2	1-7
4		0				-	-		1-1	1-5
4		5				-	-		1-3	1-8
5	Booster + Orbiter	-5				0	-1.1		2-11	2-8
5		0							2-10	2-7
5		5							2-12	2-9
6		-5					0		3-11	3-8
6		0							3-10	3-7
6		5							3-12	3-9

LRC TEST RUN NUMBERS

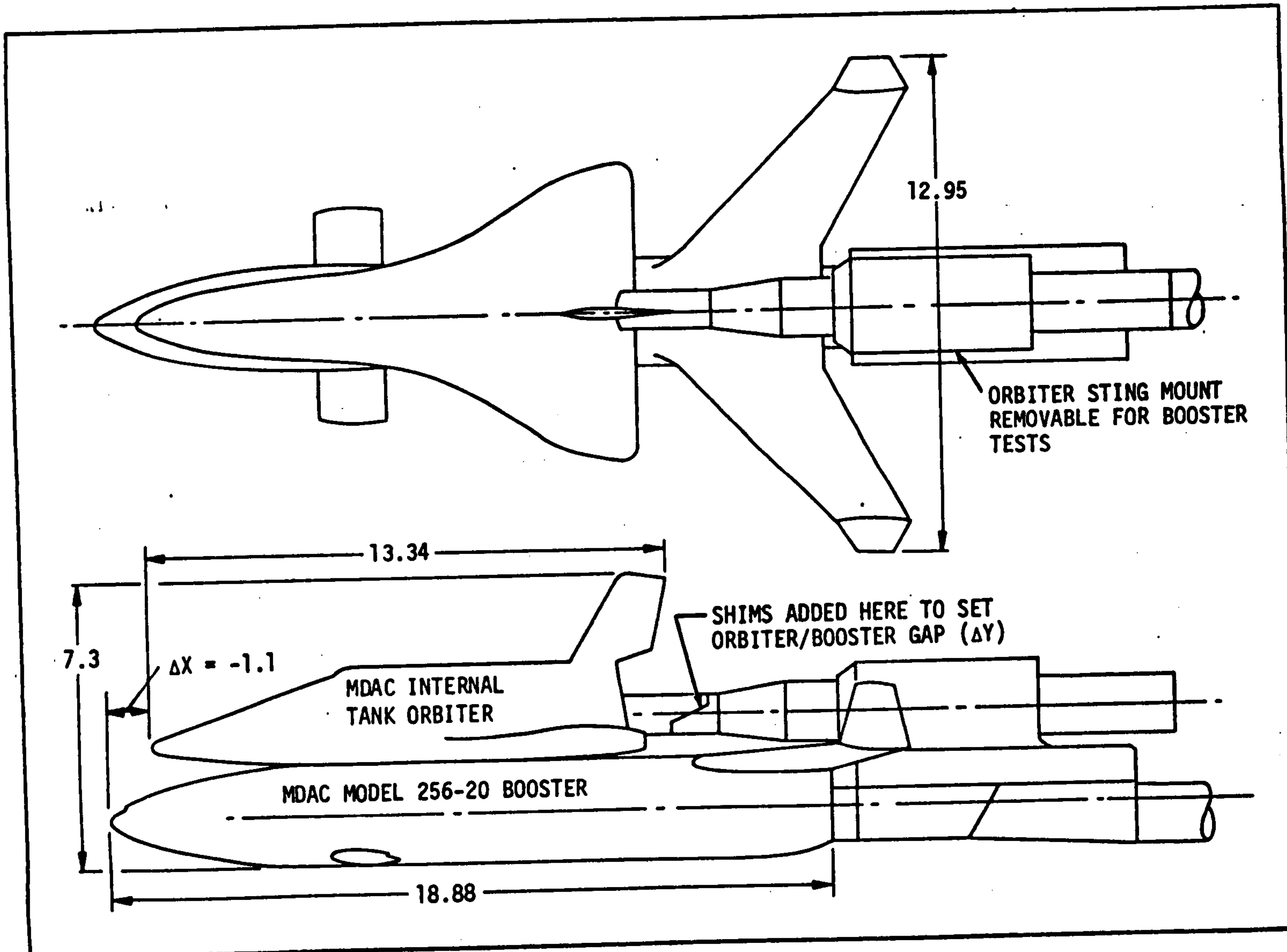


Figure 1. MATED MODEL ARRANGEMENT

CANARD BOOSTER
MDAC
DELTA WING ORBITER
MDAC
DR#1263 C-3- 39

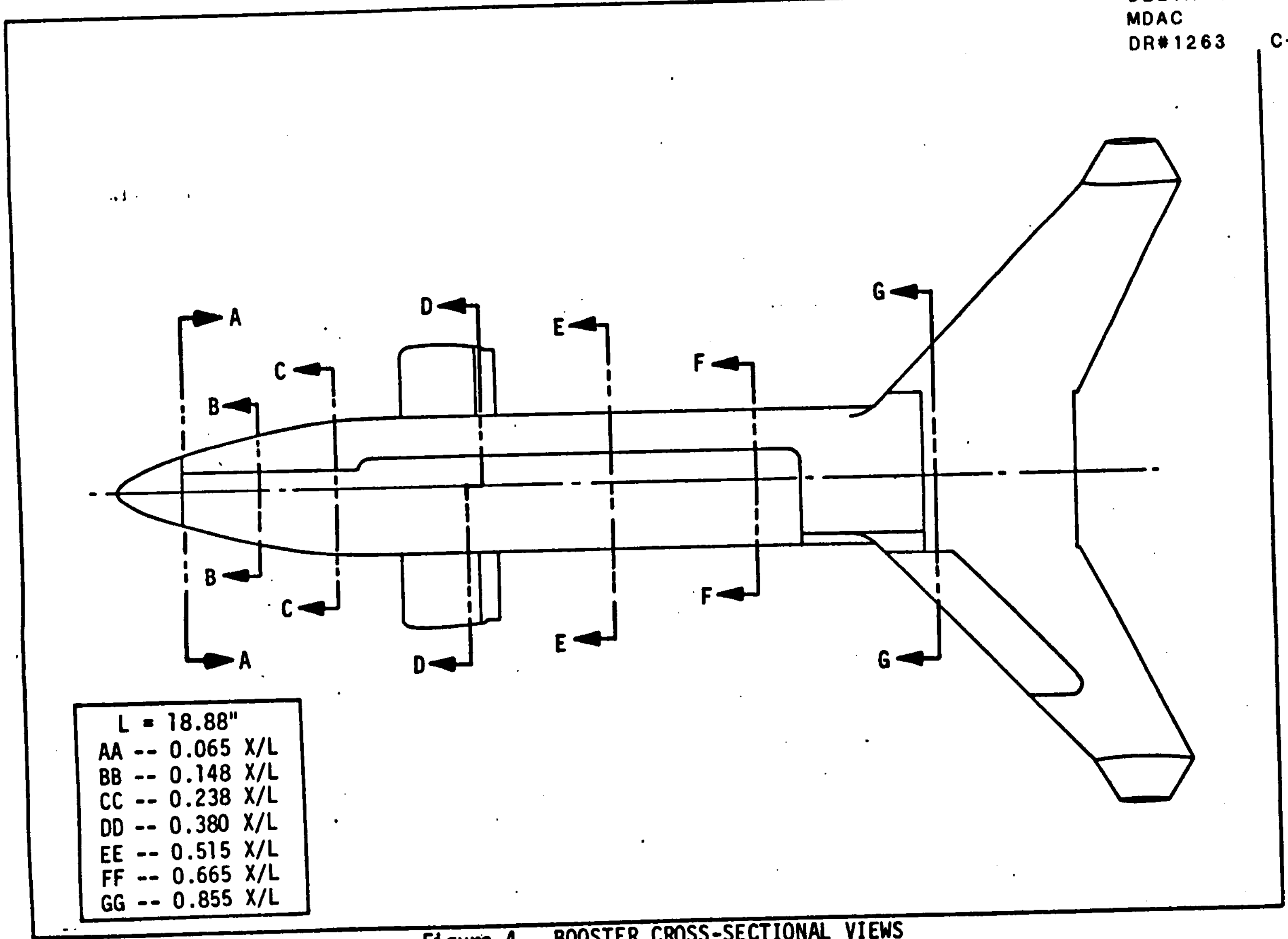


Figure 4. BOOSTER CROSS-SECTIONAL VIEWS

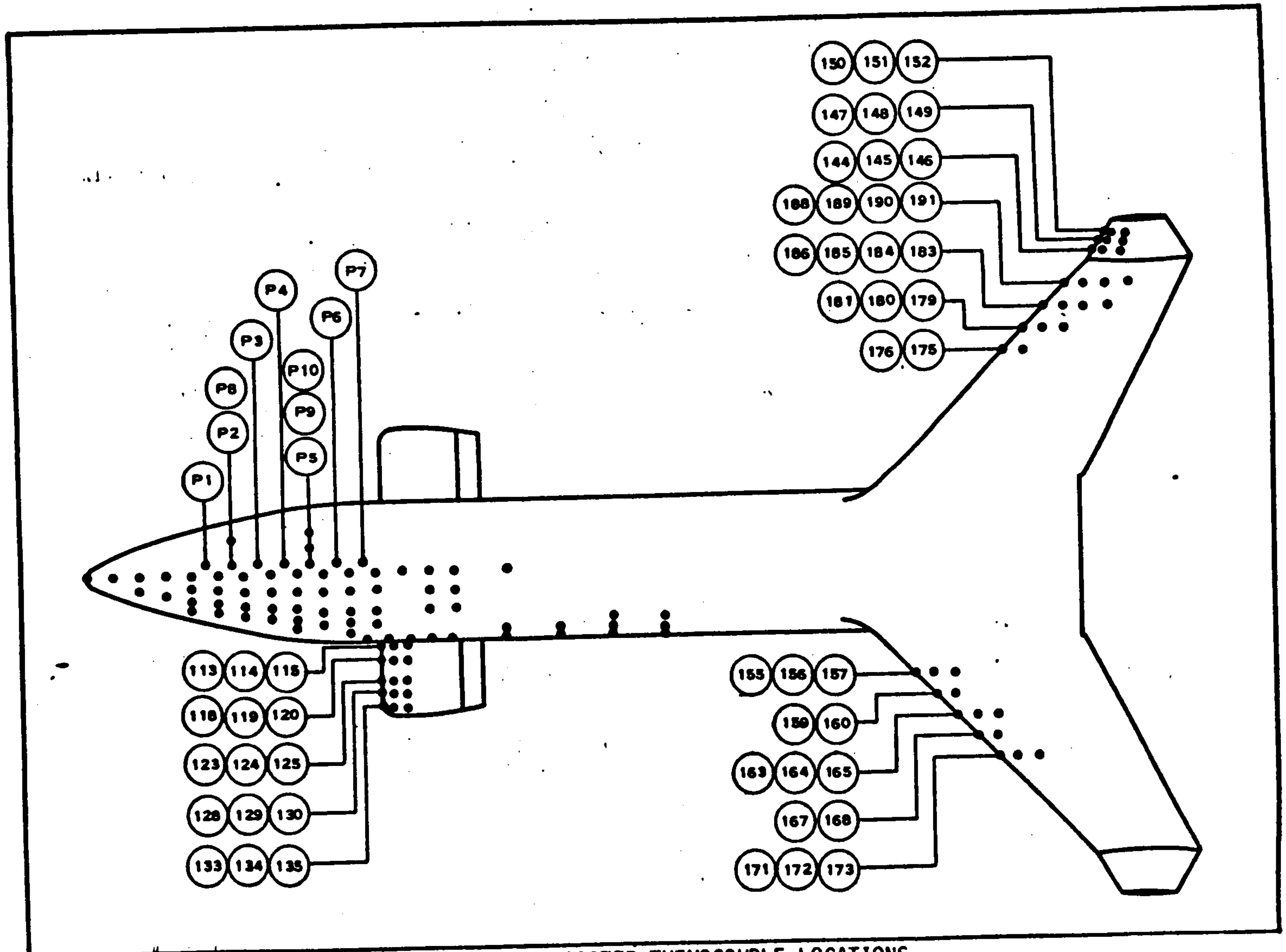


Figure 3. BOOSTER THEMOCOUPLE LOCATIONS

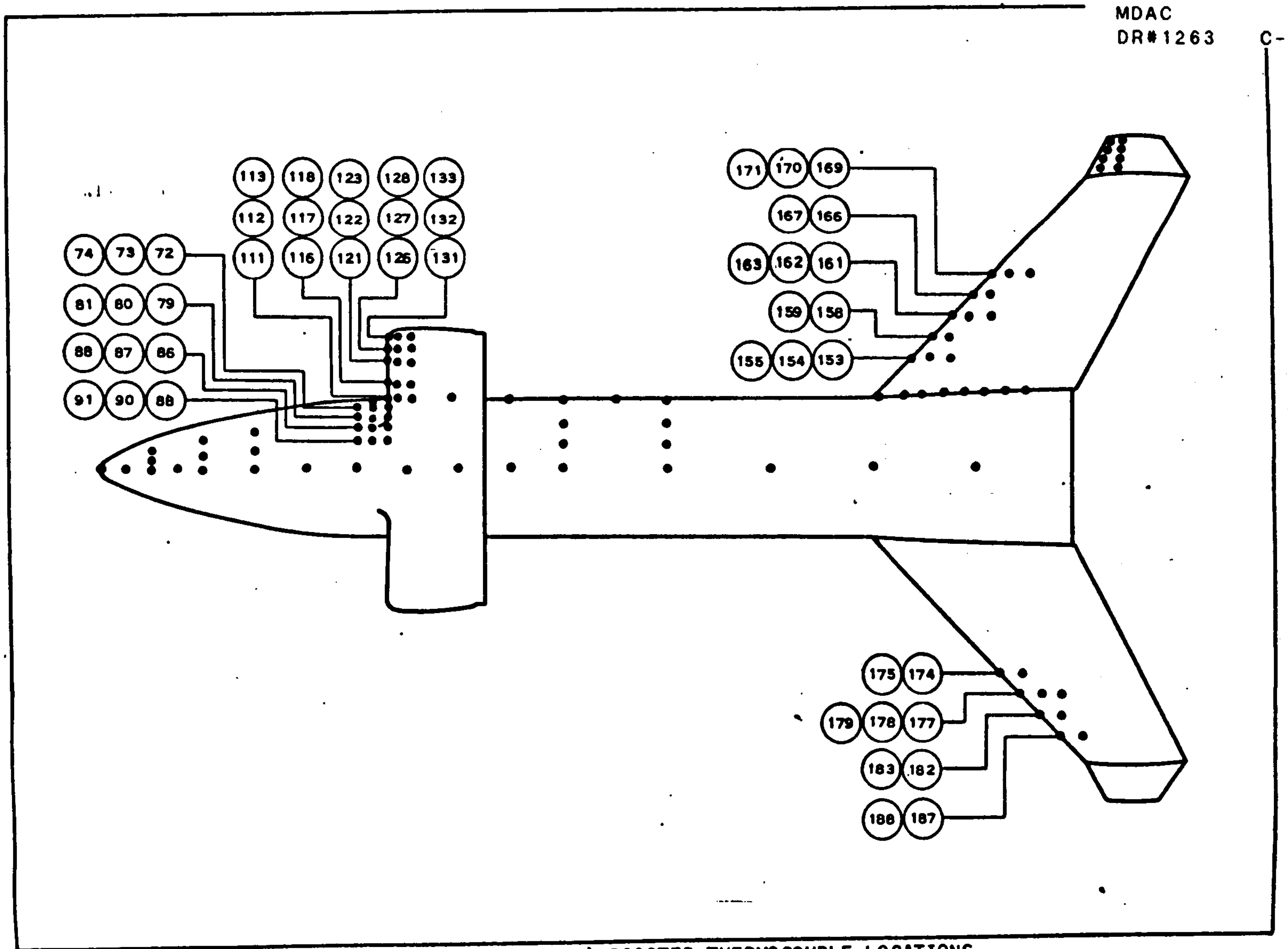


Figure 3 (Continued) BOOSTER THERMOCOUPLE LOCATIONS

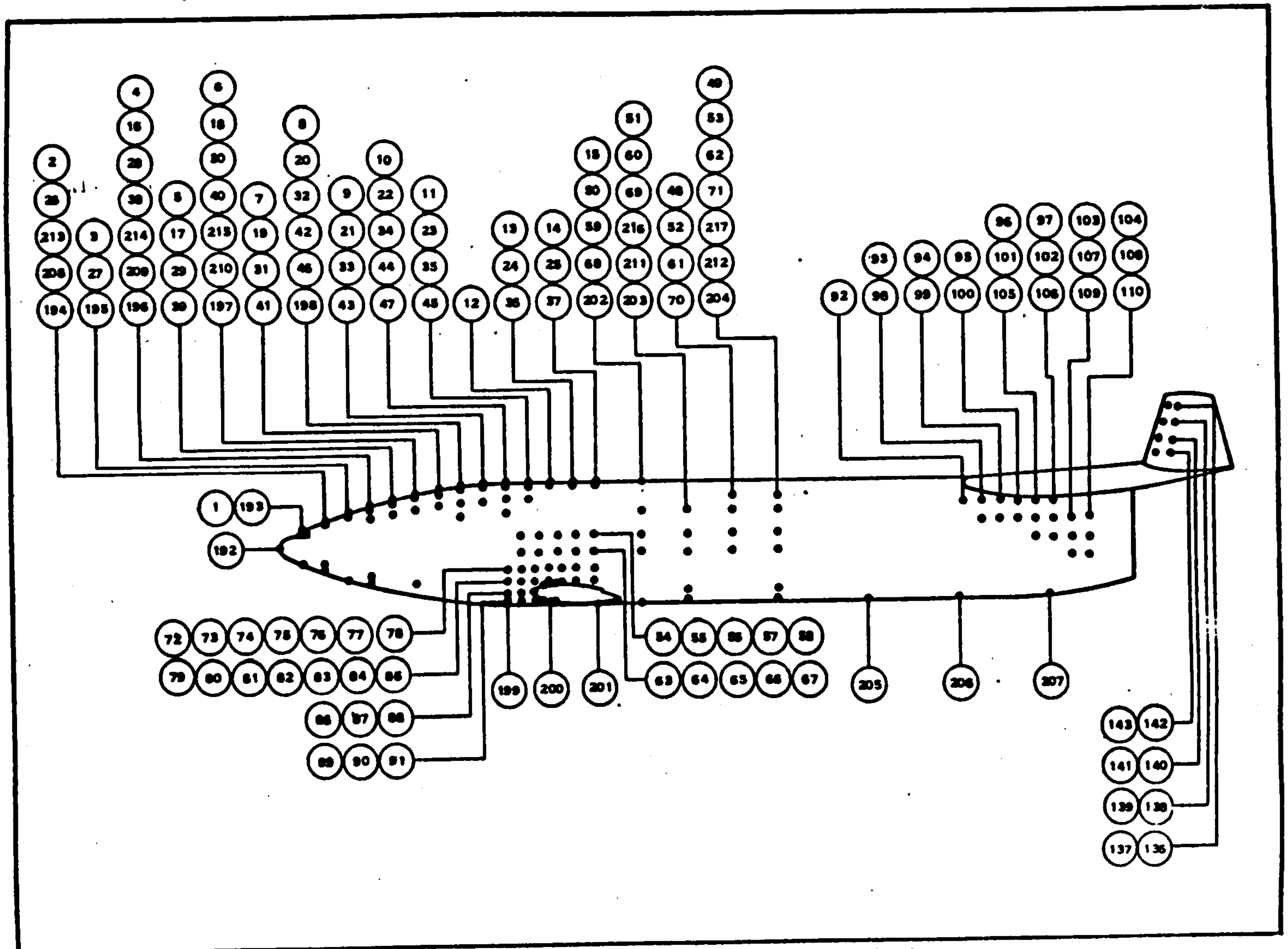


Figure 3 (Concluded) BOOSTER THERMOCOUPLE LOCATIONS

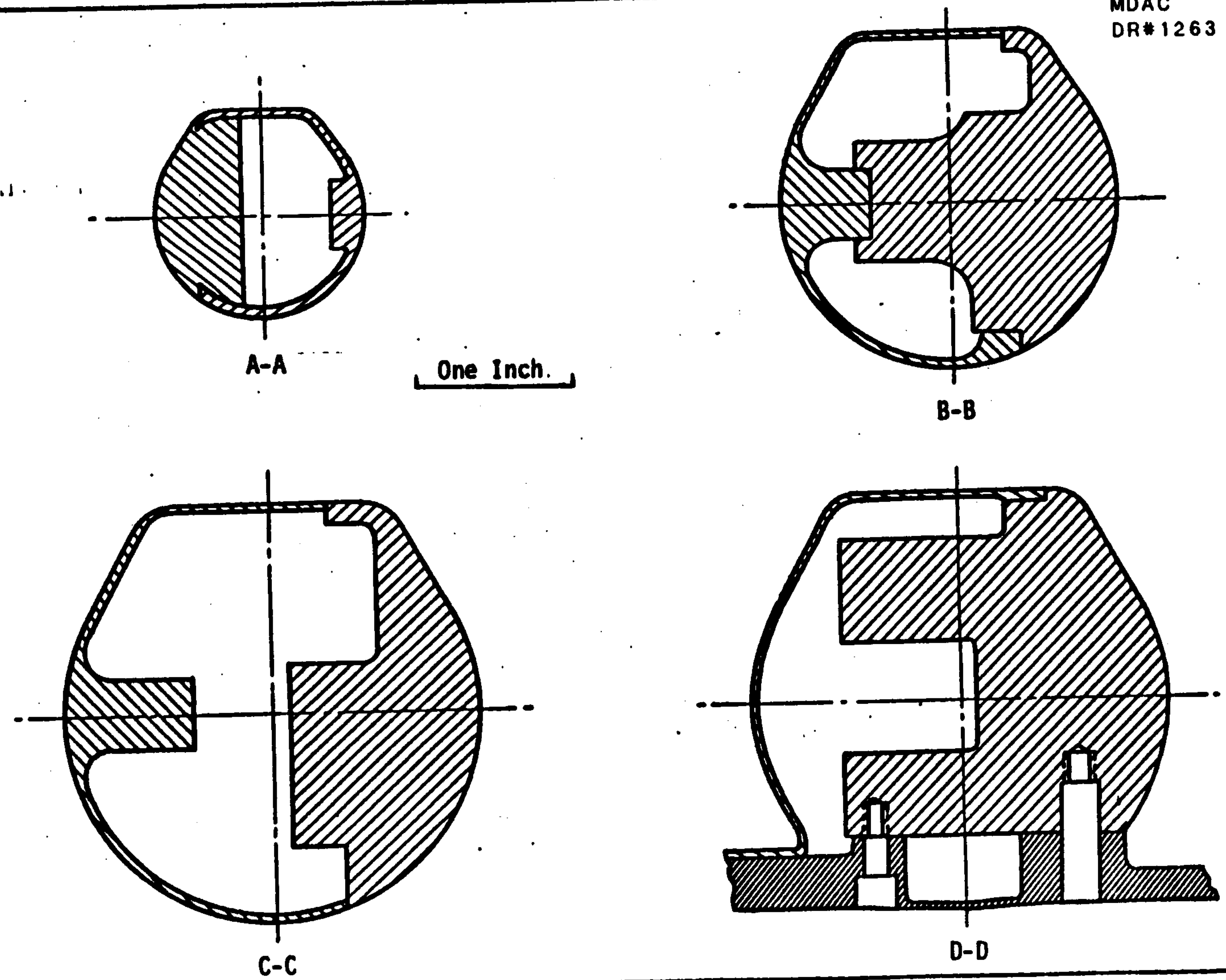


Figure 4 (Continued) BOOSTER CROSS-SECTIONAL VIEWS

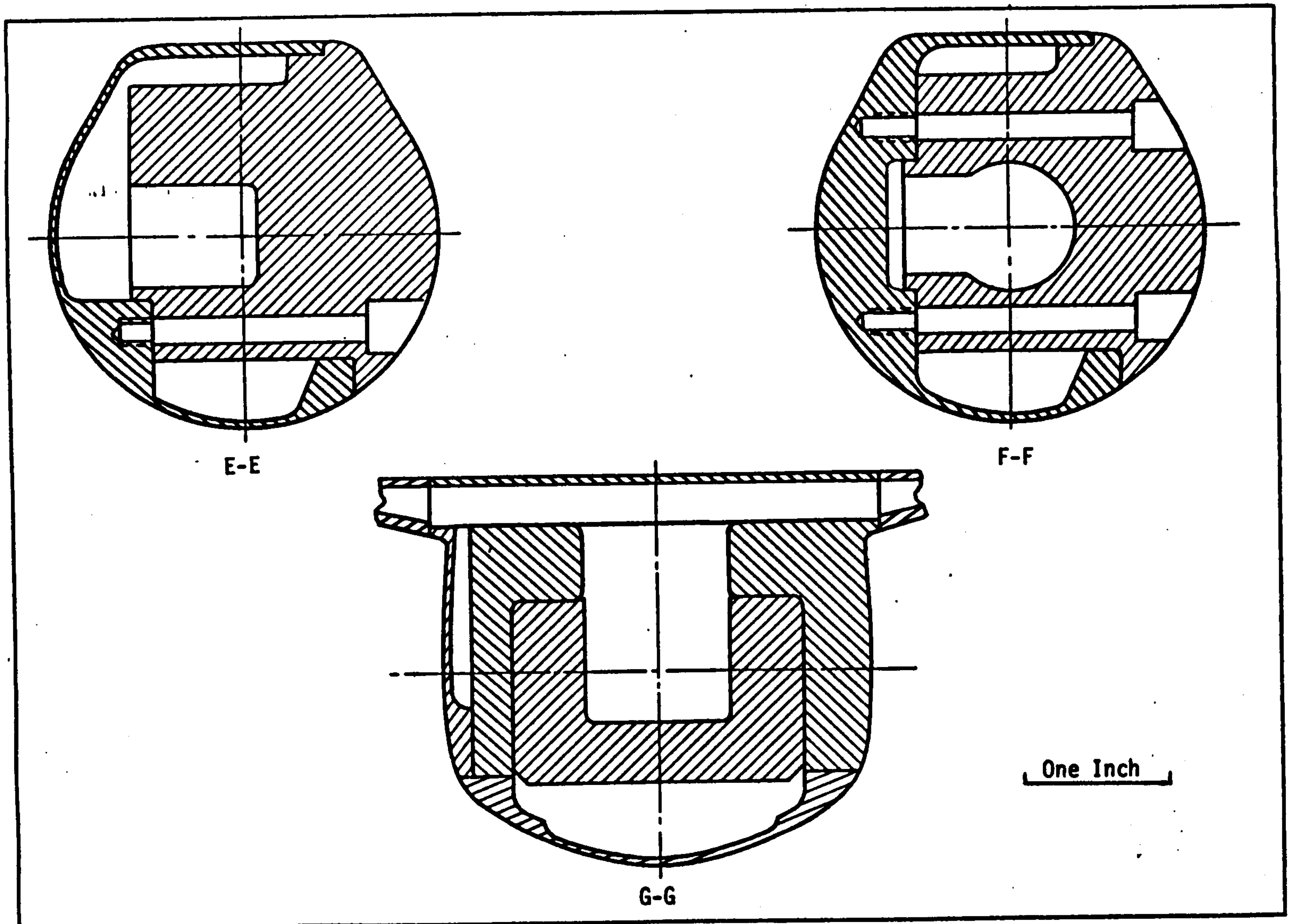


Figure 4 (Concluded) BOOSTER CROSS-SECTIONAL VIEWS

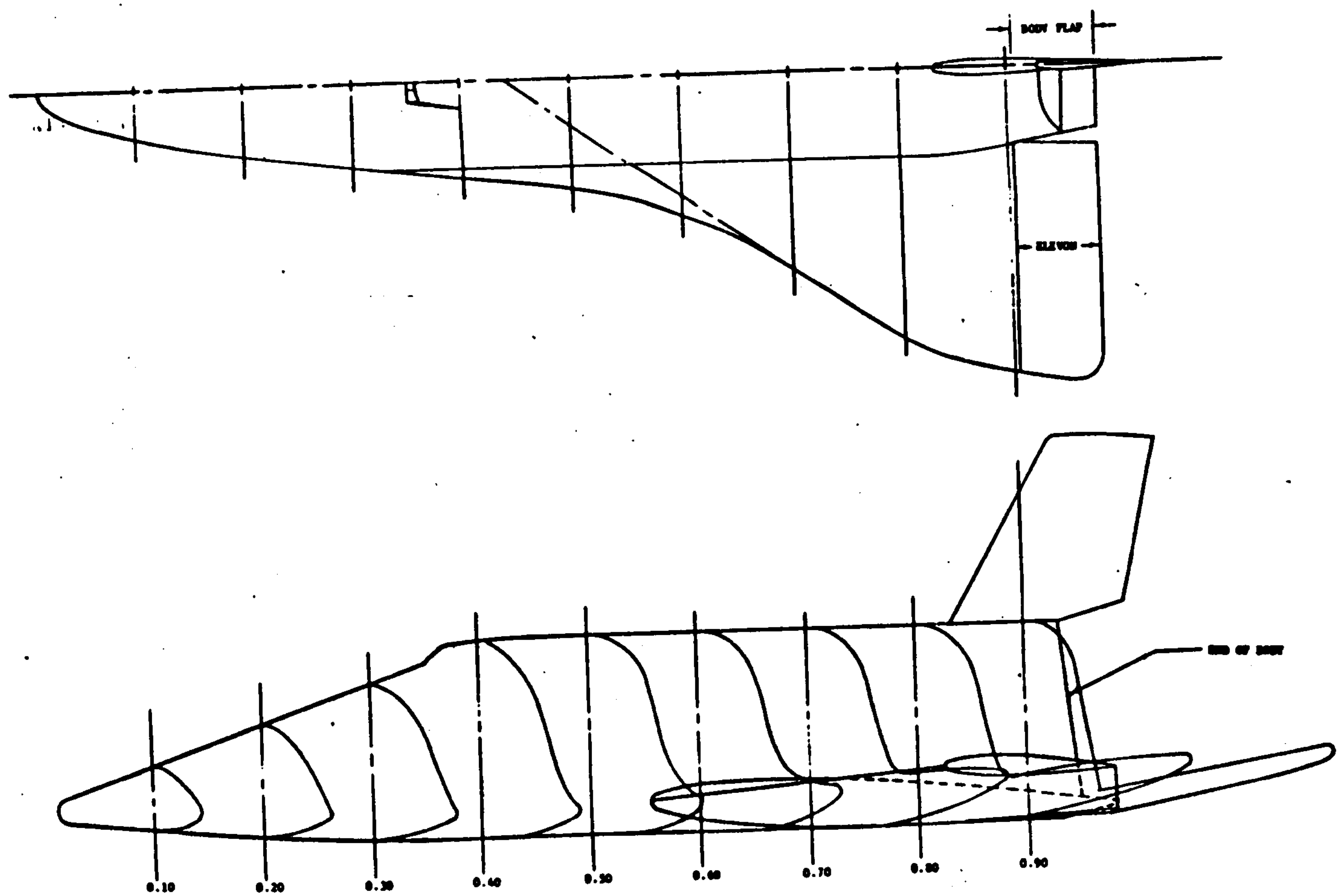


Figure 5. ORBITER CROSS-SECTIONAL VIEWS

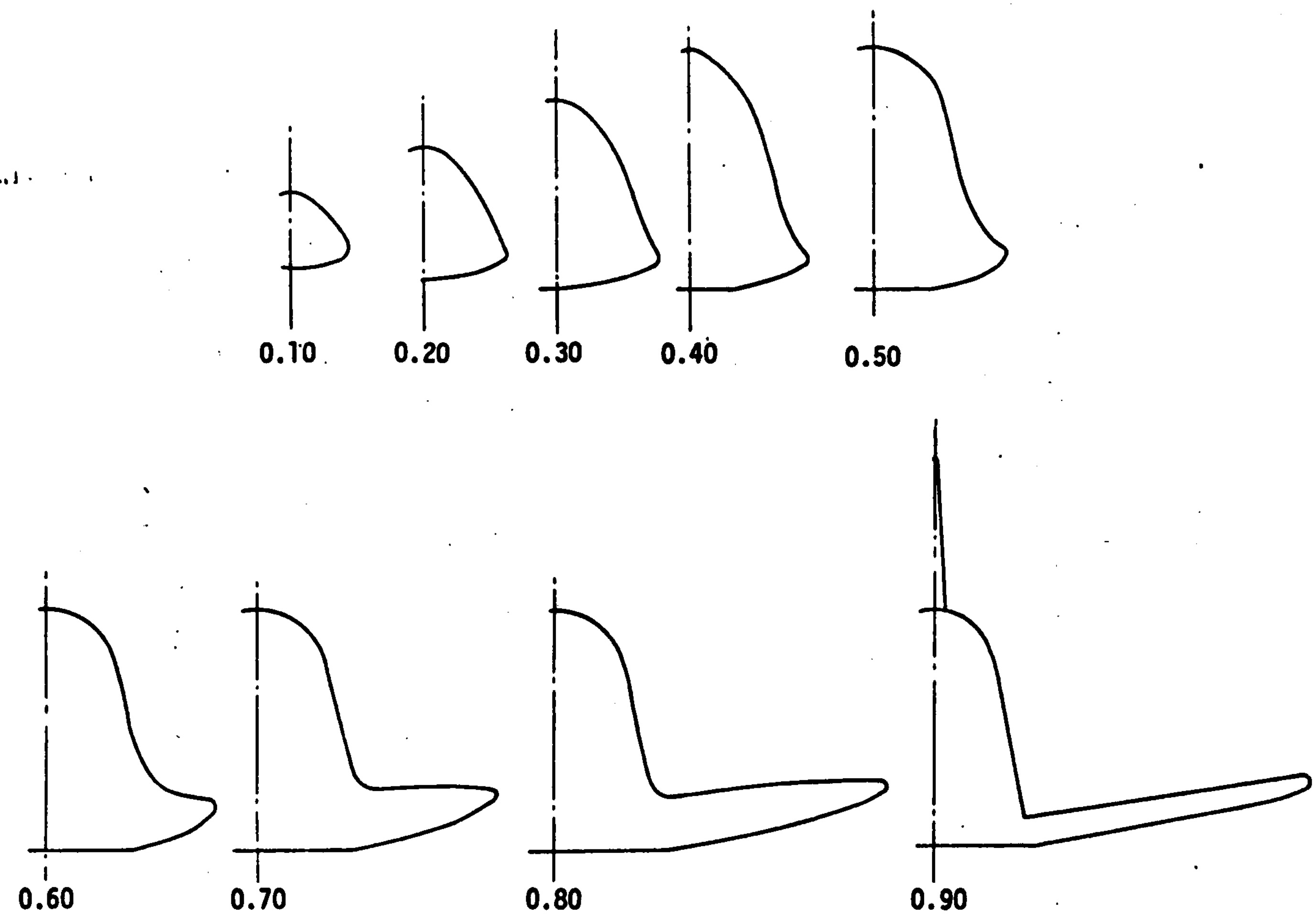


Figure 5 (Concluded) ORBITER CROSS-SECTIONAL VIEWS

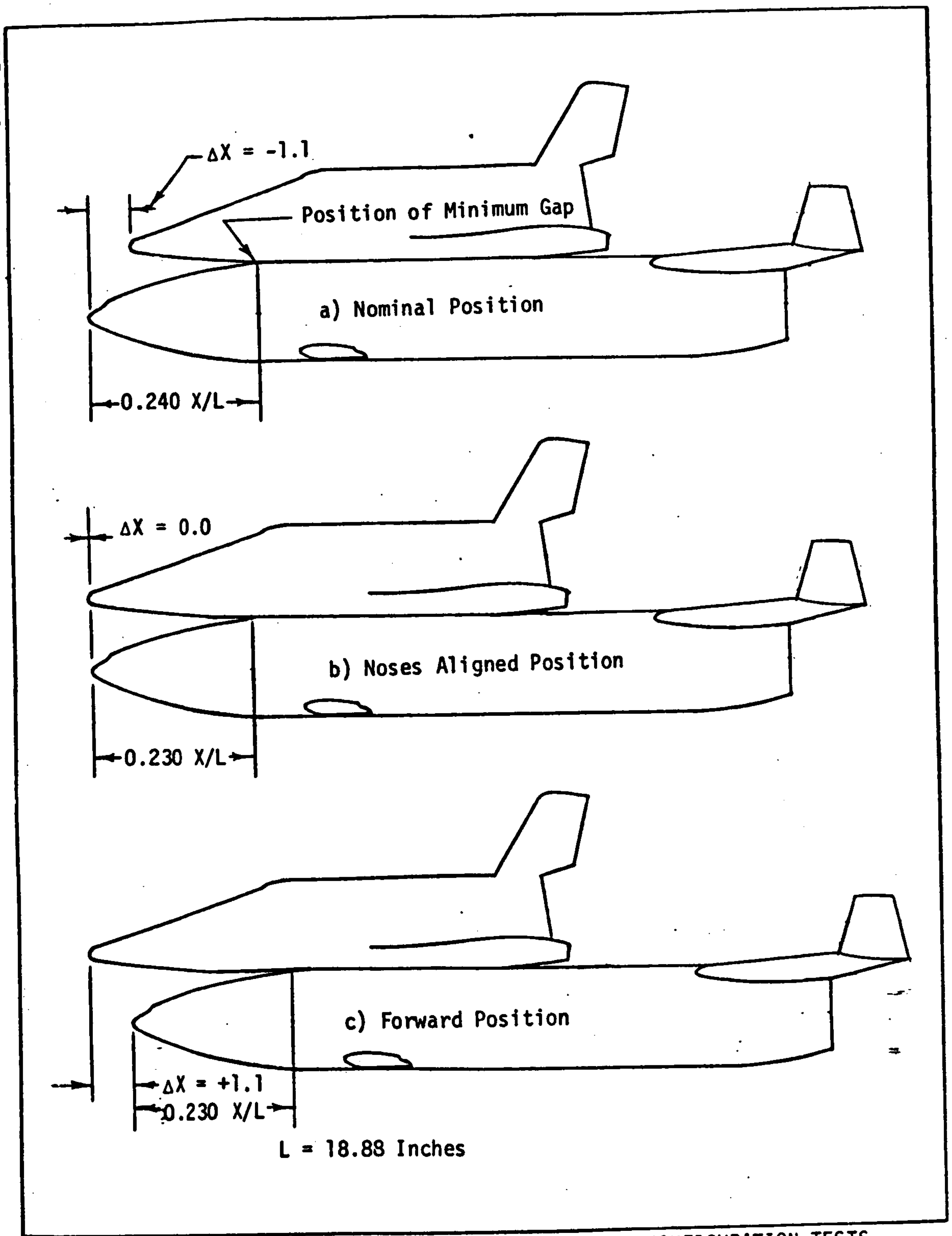


Figure 36. ORBITER POSITIONS USED IN MATED CONFIGURATION TESTS

TABLE III PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Grid Figure No. Camera Loc.	
									α	β	ϕ	Top	Side
147	O1	.00325	7.71	115	1310	0.95	0.605	250	20	0	180	G85	G86
148	O1	"	"	115	1260	"	0.645	150	"	"	"	"	"
149	O1	"	7.95	1415	1435	"	5.967	400	"	"	"	"	"
150	O1	"	"	1415	1420	"	6.069	250	"	"	"	"	"
151	O1	"	7.71	115	1265	"	0.641	109	"	"	"	"	"
152	O2	"	"	115	1270	"	0.636	250	"	"	"	G87	G88
153	O2	"	"	115	1310	"	0.605	150	"	"	"	"	"
154	O2	"	7.95	1415	1470	"	5.738	350	"	"	"	"	"
155	O2(s)	"	7.71	115	1285	"	0.624	150	"	"	"	"	"
156	O2(s)	"	7.95	535	1440	"	2.242	300	"	"	"	"	"
157	O1 (no side camera contour tracing)	"	7.71	125	1325	"	0.650	300	40	"	"	G89	--
158	O1 (no top or side camera contour tracing)	"	"	145	1335	"	--	150	"	"	"	--	--
159	O1 (no grid for side camera tracing)	"	7.95	1415	1405	"	6.174	300	"	"	"	G89	--

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

Sheet 1 of 12

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 49

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No. Camera Loc. Top	Side
160	O1 (no side camera contour tracing)	.00325	7.95	1415	1450	0.95	5.933	400	40	0	180	G89	--
161	O2	"	7.71	115	1370	"	0.563	250	"	"	"	G90	G91
162	O2 (no top camera contour tracing)	"	"	115	1310	"	0.605	109	"	"	"	--	"
163	O2	"	"	115	1310	"	"	125	"	"	"	G90	"
164	O2 (no grid for side camera tracing)	"	"	115	1360	"	0.569	300	60	"	"	G92	--
165	O2 (" ")	"	"	115	1335	"	0.587	200	"	"	"	"	--
166	O1 (no side camera contour tracing)	"	"	115	1315	"	0.601	250	"	"	"	G93	--
167	O1 (no top camera cont. trac. no top or side grids)	"	"	115	1320	"	0.598	125	"	"	"	--	--
168	O1 (no side camera contour tracing)	"	7.95	1415	1490	"	5.614	400	"	"	"	G93	--
169	O1 (" ")	"	"	1015	1485	"	4.049	400	"	"	"	"	--
170	O2 (no grid for side camera tracing)	"	"	1455	1415	"	6.276	400	"	"	"	G92	--
171	O2 (no top camera cont. trac. no side grid)	"	"	1415	1470	"	5.738	125	"	"	"	--	--
172	O2 (no grid for side camera tracing)	"	"	1045	1500	"	4.102	400	"	"	"	G92	--

* T_{aw} = adiabatic wall temperature
** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

Sheet 2 of 12

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Grid Figure No. Camera Loc.	
									α	β	ϕ	Top	Side
173	O2 (No grid for side camera tracing)	.00325	7.95	615	1460	0.95	2.521	300	60	0	180	G92	--
174	O2 " "	"	7.87	315	1390	"	1.433	300	"	"	"	"	--
175	O2	"	7.95	1415	1460	"	5.802	300	0	"	"	G94	G95
176	O2	"	"	1415	1475	"	6.578	125	"	"	"	"	"
177	O1 (No top camera contour tracing)	"	"	1415	1480	"	5.676	250	"	"	"	---	G97
178	O1	"	"	1435	1475	"	5.788	175	"	"	"	G96	"
179	O1	"	"	1435	1490	"	5.694	125	"	"	"	"	"
206	B1	"	7.71	120	1375	"	0.584	350	60	"	"	G98	G99
207	B1	"	7.81	220	1380	"	1.032	250	"	"	"	"	"
208	B1	"	"	220	1370	"	1.044	150	"	"	"	"	"
209	B1	"	7.95	1415	1475	"	5.707	350	"	"	"	"	"
210	B2 (No top camera contour tracing)	"	"	1415	1450	"	5.867	500	"	"	"	--	G100
211	B2 (" ")	"	7.81	215	1375	"	1.014	150	"	"	"	--	"

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70;
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

Sheet 3 of

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 51

TABLE III (cont'd) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No. / Camera Loc. Top	Side
212	B2 (No Top Camera Contour Tracing)	.00325	7.81	215	1385	0.95	1.002	250	60	0	180	--	G100
213	B2 (" ")	"	"	215	1360	"	1.033	400	"	"	"	--	"
214	O2 MA (No side cam. cont. trac. no top or side grids)	"	7.71	120	1310	"	0.632	300	"	"	"	--	--
215	O2 MA (" ")	"	"	115	1295	"	0.617	200	"	"	"	--	--
216	O2 MA (" ")	"	"	115	1310	"	0.586	350	"	"	"	--	--
217	B2	"	7.81	220	1350	"	1.069	150	45	"	"	G101	G102
218	B1	"	"	215	1365	"	1.026	150	"	"	"	G103	G104
219	B2	"	"	220	1390	"	1.020	350	"	"	"	G101	G102
220	B1	"	"	215	1390	"	0.997	350	"	"	"	G103	G104
221	B2	"	"	220	1395	"	1.014	275	"	"	"	G101	G102
222	B1	"	"	220	1390	"	1.020	275	"	"	"	G103	G104
223	B2	"	"	220	1350	"	1.069	300	30	"	"	G105	G106
224	B1 (no grid for side camera tracing)	"	"	225	1360	"	1.081	300	"	"	"	G107	--

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

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TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70 ----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Grid Figure No. Camera Loc. Top	Side
225	B2	.00325	7.81	225	1390	0.95	1.043	225	30	0	180	G105	G106
226	B1 (No grid for side camera tracing)	"	"	225	1375	"	1.062	225	"	"	"	G107	--
227	B2	"	"	215	1400	"	0.985	150	"	"	"	G105	G106
228	B1 (No grid for side camera tracing)	"	"	215	1400	"	"	150	"	"	"	G107	--
229	B2	"	"	215	1360	"	1.033	250	15	"	"	G108	G109
230	B1	"	"	215	1380	"	1.008	250	"	"	"	G110	G111
231	B2	"	"	215	1395	"	0.991	150	"	"	"	G108	G109
232	B1	"	"	225	1420	"	1.008	150	"	"	"	G110	G111
233	O1 + B1	"	7.71	120	1370	"	0.587	175	0	0	237	G112	G113
234	O1 + B2	"	"	125	1335	"	0.638	175	"	"	"	G114	G115
235	O1 + B1	"	"	115	1330	"	0.590	113	"	"	"	G112	G113
236	O1 + B2	"	"	112	1320	"	0.582	113	"	"	"	G114	G115
237	O1 + B1	"	7.95	1415	1445	"	5.834	175	"	"	"	G112	G113

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

Sheet 5 of 12

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 53

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE. MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Grid Figure No. Camera Loc. Top	Side
238	O1 + B2	00325	7.95	1415	1475	0.95	5.707	175	0	0	237	G114	G115
239	O1 + B1	"	"	1415	1490	"	5.614	275	"	"	"	G112	G113
240	O1 + B2	"	"	1415	1520	"	5.437	275	"	"	"	G114	G115
241	O3 + B1	"	"	1415	1485	"	5.645	175	"	"	"	G116	G117
242	O3 + B2	"	"	1415	1490	"	5.614	175	"	"	"	G118	G119
243	O3 + B1	"	"	1435	1495	"	5.663	275	"	"	"	G116	G117
244	O3 + B2	"	"	1415	1510	"	5.495	275	"	"	"	G118	G119
245	O2 + B1	"	7.71	135	1360	"	0.669	175	"	"	"	G120	G121
246	O2 + B1	"	"	125	1335	"	0.638	113	"	"	"	"	"
247	O2 + B2	"	"	120	1395	"	0.570	113	"	"	"	G122	G123
248	O2 + B2	"	"	120	1350	"	0.601	175	"	"	"	"	"
249	O2 + B1	"	7.95	1440	1510	"	5.592	175	"	"	"	G120	G121
250	O2 + B2	"	"	1415	1505	"	5.524	175	"	"	"	G122	G123

* T_{aw} = adiabatic wall temperature
** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70 ----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp (°F)	Model Position (degrees)			Grid Figure No. Camera Loc.	
									α	β	ϕ	Top	Side
251	O1 + B1	.00325	7.71	115	1385	0.95	0.553	150	0	0	270	G124	G125
252	O1 + B2	"	7.81	215	1435	"	0.947	150	"	"	"	G126	G127
253	O2 + B1	"	"	220	1395	"	1.104	150	"	"	"	G128	G129
254	O2 + B2	"	"	215	1410	"	0.974	150	"	"	"	G130	G131
255	O1 + B1	"	"	220	1400	"	1.008	150	"	"	"	G124	G125
256	B1	"	"	220	1400	"	"	125	"	"	"	G132	G133
257	B2	"	"	220	1410	"	0.997	"	"	"	"	G134	G135
258	B1	"	7.71	115	1360	"	0.569	113	"	"	90	G136	G137
259	B2	"	"	115	1365	"	0.553	113	"	"	"	G138	G139
260	B1	"	7.95	1415	1520	"	5.437	175	"	"	270	G132	G133
261	B2	"	"	1415	1495	"	5.584	175	"	"	"	G134	G135
[illegible]	B1	"	7.81	215	1375	"	1.014	150	"	"	180	G140	G141
263	B2 (No grid for side camera tracing)	"	"	215	1435	"	0.947	150	"	"	"	G142	--

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

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CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 55

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw}* / T_{total}	$RNX10^6$ / Ft	Phase Change Temp. (^oF)	Model Position (degrees)			Grid Figure No. / Camera Loc.	
									α	β	ϕ	Top	Side
264	B1	.00325	7.95	1415	1470	0.95	5.738	150	0	0	180	G140	G141
265	B2 (No grid for side camera tracing)	"	"	1415	1475	"	5.707	"	"	"	"	G142	--
266	O1 + B1	"	7.81	220	1445	"	0.958	150	+5	0	0	G143	G144
267	O1 + B2	"	"	220	1410	"	0.997	150	"	"	"	G145	G146
268	O2 + B1	"	"	225	1400	"	1.031	150	"	"	"	G147	G148
269	O2 + B2	"	"	225	1410	"	1.019	150	"	"	"	G149	G150
270	O1 + B1	"	7.95	1415	1480	"	5.676	175	"	"	"	G143	G144
271	O1 + B2	"	"	1415	1470	"	5.739	175	"	"	"	G145	G146
272	O1 + B1	"	"	1415	1480	"	5.676	175	-5	"	"	G151	G152
273	O1 + B2	"	"	1415	1485	"	5.645	175	"	"	"	G153	G154
274	O1 + B1	"	7.81	220	1345	"	1.076	150	"	"	"	G151	G152
275	O1 + B2	"	"	220	1390	"	1.020	150	"	"	"	G153	G154
276	O2 + B1	"	"	220	1420	"	0.985	150	"	"	"	G155	G156

* T_{aw} = adiabatic wall temperature
** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70 ----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No. Camera Loc. Top	Side
277	O2 + B2	.00325	7.81	220	1410	0.95	0.997	150	-5	0	0	G157	G158
278	O2 + B1	"	7.95	1415	1520	"	5.437	175	"	"	"	G155	G156
279	O2 + B2	"	"	1415	1500	"	5.554	175	"	"	"	G157	G158
280	O3 + B1	"	7.71	115	1405	"	0.540	175	0	"	237	G159	G160
281	O3 + B2	"	"	115	1370	"	0.563	175	"	"	"	G161	G162
282	O3 + B1	"	"	115	1365	"	0.566	113	"	"	"	G159	G160
283	O3 + B2	"	"	115	1355	"	0.573	113	"	"	"	G161	G162
284	O1 (No side camera contour tracing)	"		115	1320	"	0.598	250	60	"	180	G163	--
285	O3 (No top camera contour tracing)	"	7.95	1415	1510	"	5.495	350	"	"	"	--	G164
286	O1 (No side camera contour tracing)	"		1015	1560	"	3.740	400	"	"	"	G163	--
287	O3 (No top camera contour tracing)	"	"	1415	1535	"	5.351	125	"	"	"	--	G164
[illegible]	O1 (No side camera contour tracing)	"	"	1415	1515	"	5.466	400	"	"	"	G163	--
289	O2 (No top camera contour tracing)	"	"	615	1485	"	2.453	125	"	"	"	--	G165

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

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CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
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TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Grid Figure No. Camera Loc.	
									α	β	ϕ	Top	Side
290	O2R (No top camera contour tracing)	.00325	7.71	115	1320	0.95	0.598	113	60	0	180	--	G165
291	O2	"	"	120	1335	"	0.612	175	"	"	"	G166	"
292	O2R (No side camera contour tracing)	"	"	120	1350	"	0.601	200	"	"	"	"	--
293	O2 (No top camera contour tracing)	"	"	120	1360	"	0.594	113	"	"	"	--	G165
294	O2R (" ")	"	7.95	1415	1515	"	5.466	125	"	"	"	--	"
295	O2R (" ")	"	"	1490	1520	"	5.725	175	"	"	"	--	"
296	O2 (" ")	"	"	1045	1465	"	4.261	125	"	"	"	--	"
297	O2 (" ")	"	"	1415	1515	"	5.466	175	"	"	"	--	"
298	O3 (" ")	"	"	1415	1520	"	5.437	113	0	"	"	--	G167
299	O3	"	"	1435	1520	"	5.503	150	"	"	"	G168	"
300	O3 (No top camera contour tracing)	"	"	1435	1505	"	5.603	150	20	"	"	--	G169
301	O3	"	"	1435	1515	"	5.543	300	"	"	"	G170	"
302	O1 (No side camera contour tracing)	"	7.81	265	1425	"	1.180	250	60	"	"	G163	--

* T_{aw} = adiabatic wall temperature
** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

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TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification		Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw}* / T_{total}	$RN \times 10^6$ / Ft	Phase Change Temp. (^oF)	Model Position (degrees)			Grid Figure No. Camera Loc.	
										α	β	ϕ	Top	Side
303	O1	No side camera contour tracing	.00325	7.95	515	1475	0.95	2.077	350	60	0	180	G163	--
304	O2F	No top camera contour tracing	"	7.71	120	1345	"	0.605	113	"	"	"	--	G165
305	O2F	" "	"	7.81	315	1400	"	1.444	125	"	"	"	--	"
306	O2F	" "	"	"	615	1465	"	2.621	175	"	"	"	--	"
307	O2F	" "	"	7.95	1415	1500	"	5.554	175	"	"	"	--	"
308	B2	" "	"	"	1415	1465	"	5.770	350	"	"	"	G171	G172
309	B1		"	"	1415	1485	"	5.645	500	"	"	"	G173	G174
310	B2		"	"	1415	1505	"	5.524	500	"	"	"	G171	G172
311	B2		"	"	1415	1500	"	5.554	400	45	"	"	G175	G176
312	B1		"	"	1415	1540	"	5.323	400	"	"	"	G177	G178
[illegible]	B1		"	"	1315	1560	"	4.845	300	30	"	"	G179	G180
314	B2		"	"	1325	1500	"	5.201	300	"	"	"	G181	G182
315	B1		"	"	1415	1510	"	5.495	250	15	"	"	G183	G184

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

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CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 59

TABLE III (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: None TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 8/20/70 ----9/28/70 TEST ENGINEER: Click & Schmitt

Run No.**	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Grid Figure No. Camera Loc.	
									α	β	ϕ	Top	Side
316	B2	.00325	7.95	1415	1510	0.95	5.495	250	15	0	180	G185	G186
317	(O2 + B1)G	"	7.71	115	1320	"	0.598	113	0	"	237	G187	G188
318	(O2 + B1)G	"	7.95	1415	1485	"	5.645	175	"	"	"	"	"
319	(O2 + B1)A	"	7.71	115	1280	"	0.628	113	"	"	"	G189	G190
320	(O2 + B1)A	"	7.95	1415	1480	"	5.676	175	"	"	"	"	"
321	O1 (No top or side camera contour tracings)	"	7.71	115	1290	"	0.620	350	60	"	180	--	--
322	O1 (No side camera contour tracing)	"	"	115	1335	"	0.587	250	"	"	"	G163	--

* T_{aw} = adiabatic wall temperature

** Tunnel Log Run No.
(Run 147 thru 179, 1st entry, 8/20/70 thru 8/21/70)
(Run 206 thru 322, 2nd entry, 9/16/70 thru 9/28/70)

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TABLE IV PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Click & Schmitt

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No.
1	01	.00325	10.28	400	1770	0.9	0.525	131	20	0	90	G-1
2	01	"	"	"	1780	"	"	200	"	"	"	"
3	02	"	"	"	"	"	0.520	131	"	"	"	G-2
4	02	"	"	"	1790	"	"	200	"	"	"	"
5	01	"	"	"	1800	"	0.513	113	"	"	180	G-3
6	01	"	"	"	1810	"	0.508	"	"	+5	"	G-4
7	01	"	"	"	1740	"	0.510	131	"	"	90	G-5
8	01	"	"	"	1790	"	"	200	"	"	"	"
9	02(No good, flow breakdown)	"	"	"	-	-	-	"	60	0	"	-
10	02	"	"	"	1800	"	0.513	300	"	"	"	G-6
[illegible]	02	"	"	"	1820	"	"	350	"	"	"	"
12	02	"	"	"	1830	"	0.500	"	"	+5	"	G-7
13	02	"	"	"	1790	"	"	275	"	"	"	"

* T_{aw} = adiabatic wall temperature

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MDAC/MMC
DR#1036 C-3- 61

TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Click & Schmitt

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No.
14	02	.00325	10.28	400	1800	0.9	0.513	113	60	0	180	G-8
15	02	"	"	"	1780	"	0.523	125	"	+5	"	G-9
16	02	"	"	"	"	"	"	113	"	0	0	G-10
17	02	"	"	"	1820	"	0.503	125	"	-5	"	G-11
18	01	"	"	"	1800	"	0.523	131	10	0	90	G-12
19	01	"	"	"	1760	"	"	200	"	"	"	"
20	01	"	"	"	1750	"	0.525	150	30	"	"	G-13
21	01	"	"	"	1800	"	"	200	"	"	"	"
22	01 (Use grid G-14 & adjust/scale)	"	"	"	1790	"	0.518	"	40	"	"	G-14
23	01	"	"	"	1780	"	"	250	"	"	"	"
24	01	"	"	"	"	"	0.523	113	10	"	180	G-15
25	01	"	"	"	1820	"	0.503	"	30	"	"	G-16
26	B1	"	"	"	1760	"	0.534	275	60	"	90	G-17

* T_{aw} = adiabatic wall temperature

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TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Click & Schmitt

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * / Ttotal	RNX10⁶ / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Grid Figure No.
									α	β	Φ	
27	B1	.00325	10.28	400	1790	0.9	0.518	350	60	0	90	G-17
28	B2	"	"	"	1780	"	0.523	275	"	"	"	G-18
29	B2	"	"	"	"	"	"	350	"	"	"	"
30	B2	"	"	"	1820	"	0.503	"	"	"	0	G-19
31	B2	"	"	"	1790	"	0.518	113	"	"	"	"
32	B2	"	"	"	"	"	"	200	"	"	"	"
33	B1	"	"	"	1820	"	0.503	"	"	"	"	G-20
34	B1	"	"	"	1800	"	0.513	113	"	"	"	"
35	B1	"	"	"	"	"	"	350	"	"	"	"
36	B1	"	"	"	1820	"	0.503	131	"	-5	"	G-21
37	B1 (Bad film, no contour tracing)	"	"	"	1730	"	-	350	"	"	"	-
38	B1 (Bad film, no contour tracing)	"	"	"	1760	"	-	200	"	"	"	-
39	B2 (No grid taken)	"	"	"	1800	"	0.513	131	"	"	"	G-22

* T_{aw} = adiabatic wall temperature

TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Click & Schmitt
Hanner & Sarver

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	$RNX10^6$ / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Grid Figure No.
40	B2	.00325	10.28	400	1750	0.9	0.539	350	60	-5	0	G-22
41	B2	"	"	"	1800	"	0.513	200	"	"	"	"
42	01 (Bad film, no contour / (Repeat Run #1) tracing)	"	"	"	1830	"	-	131	20	0	90	-
43	02	"	"	"	1790	"	0.518	400	70	"	"	G-23
44	02	"	"	"	1840	"	0.493	275	"	"	"	"
45	02	"	"	"	1810	"	0.508	113	"	"	180	G-24
46	02	"	"	"	1740	"	0.544	325	50	"	90	G-25
47	02	"	"	"	1780	"	0.523	200	"	"	"	"
48	02	"	"	"	1820	"	0.503	113	"	"	180	G-26
49	02	"	"	"	"	"	"	200	40	"	90	G-27
50	02	"	"	"	"	"	"	275	"	"	"	"
51	02	"	"	"	1800	"	0.513	113	"	"	180	G-28
52	02	"	"	"	"	"	"	175	30	"	90	G-29

* T_{aw} = adiabatic wall temperature

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TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Schmitt, Hanner, Sarver

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Grid Figure No.
53	02	.00325	10.28	400	1830	0.9	0.498	225	30	0	90	G-29
54	02	"	"	"	1810	"	0.508	113	"	"	180	G-30
55	02	"	"	"	"	"	"	"	20	"	"	G-31
56	02	"	"	"	1720	"	0.556	"	"	"	0	G-32
57	01	"	"	"	1810	"	0.508	150	0	"	90	G-33
58	01	"	"	"	"	"	"	113	"	"	"	"
59	01	"	"	"	1800	"	0.513	"	"	"	180	G-34
60	01	"	"	"	1790	"	0.518	200	"	"	"	"
61	B1	"	"	"	"	"	"	113	"	"	90	G-35
62	B1	"	"	"	1780	"	0.523	175	"	"	"	"
	B1	"	"	"	1790	"	0.518	113	"	"	180	G-36
64	B1	"	"	"	1810	"	0.508	175	"	"	"	"
65	B1	"	"	"	1720	"	0.556	113	"	"	270	G-37

* T_{aw} = adiabatic wall temperature

CANARD BOOSTER
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MDAC/MMC
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TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Hanner, Sarver

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	$RNX10^6$ / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No.
66	B1	.00325	10.28	400	1810	0.9	0.508	175	0	0	270	G-37
67	01	"	"	"	1760	"	0.536	131	20	0	90	G-44
68	B1	"	"	"	"	"	0.534	350	60	-5	0	G-38
69	B1	"	"	"	1710	"	0.561	200	"	"	"	"
70	02	"	"	430	1835	"	0.532	113	40	0	"	G-39
71	02	"	"	400	1790	"	0.534	"	30	"	"	G-40
72	01 + B1	"	"	"	1805	"	0.510	"	0	"	35	G-41
73	01 + B1	"	"	"	1800	"	0.513	275	"	"	"	"
74	01 + B1	"	"	"	"	"	"	113	"	"	-25	G-42
75	01 + B1	"	"	"	1830	"	0.498	175	"	"	"	"
76	01 + B1	"	"	"	1820	"	0.503	"	"	"	35	G-41
77	02	"	"	"	1800	"	0.513	"	"	"	0	G-43
78	01	"	"	"	1710	"	0.561	131	20	0	90	G-44

* T_{aw} = adiabatic wall temperature

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TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Hanner, Sarver

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Grid Figure No.
79	03	.00325	10.28	400	1820	0.9	0.503	250	60	0	90	G-45
80	03	"	"	"	"	"	"	400	"	"	"	"
81	03	"	"	"	1790	"	0.518	250	40	"	"	G-46
82	03	"	"	"	1810	"	0.477	325	"	"	"	"
83	02	"	"	"	1780	"	0.523	113	0	"	"	G-47
84	03	"	"	"	1795	"	0.515	225	30	"	"	G-48
85	03	"	"	"	1770	"	0.528	175	"	"	"	"
86	03	"	"	"	1730	"	0.550	"	20	"	"	G-49
87	03	"	"	"	1810	"	0.508	131	"	"	"	"
[illegible]	03	"	"	"	1825	"	0.500	200	"	+5	"	G-50
89	03 (No film, no contour tracing)	"	"	"	1820	"	0.503	150	"	"	"	"
90	03	"	"	"	1810	"	0.508	175	10	0	"	G-51
91	03	"	"	410	1830	"	0.510	113	"	"	"	"

* T_{aw} = adiabatic wall temperature

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 67

TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Hanner, Sarver & Click

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	Φ	Grid Figure No.
92	03	00325	10.28	400	1810	0.9	0.508	175	0	0	90	G-52
93	03	"	"	"	1790	"	0.518	113	"	"	"	"
94	03 + B1	"	"	410	1820	"	0.515	175	"	"	-20	G-53
95	03 + B1	"	"	400	1810	"	0.508	113	"	"	+20	G-54
96	03 + B1	"	"	415	1835	"	0.514	325	"	"	-20	G-53
97	03 + B1	"	"	400	1785	"	0.520	"	"	"	+20	G-54
98	03	"	"	"	1820	"	0.503	113	"	"	180	G-55
99	03 (No good) (Faulty Injection)	"	"	"	-	"	-	175	"	"	"	-
100	03	"	"	"	1810	"	0.508	"	"	"	"	G-55
101	03	"	"	"	1840	"	0.493	113	10	"	"	G-56
102	03	"	"	"	1810	"	0.508	"	20	"	"	G-57
103	03	"	"	"	1800	"	0.513	"	"	-5	"	"
104	03	"	"	"	1820	"	0.503	"	30	0	"	G-58

* T_{aw} = adiabatic wall temperature

TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/ /70 TEST ENGINEER: Click & Hanner

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Grid Figure No.
105	03	.00325	10.28	400	1840	0.9	0.493	113	40	0	180	G-58
106	02 (Repeat of Run #46 w/re-furbished Model)	"	"	"	1830	"	0.498	325	50	"	90	G-59
107	03	"	"	"	1760	"	0.533	113	60	"	180	G-60
108	03 + B1	"	"	"	1790	"	0.518	175	0	"	+20	G-61
109	03 + B1	"	"	"	1820	"	0.503	113	"	"	-20	G-62
110	02	"	"	"	"	"	"	"	"	"	180	G-63
111	02	"	"	"	1810	"	0.508	175	"	"	"	"
112	02	"	"	"	1800	"	0.513	113	"	"	0	G-64
113	02 (Use Grid G-65, adjust/scale)	"	"	"	1840	"	0.493	"	20	-5	"	G-65
114	02	"	"	"	"	"	"	"	"	+5	180	G-66
115	01 + B1 (Repeat of Run #75 w/ Revised Alignment)	"	"	"	"	"	"	175	0	0	-25	G-67
116	01 + B1 (Repeat of Run #76 w/ Revised Alignment)	"	"	"	1740	"	0.544	"	"	"	+35	G-68
117	02	"	"	"	1780	"	0.520	400	55	0	90	G-69

* T_{aw} = adiabatic wall temperature

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 69

TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Click & Hanner

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	$RNX10^6$ / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	ϕ	Grid Figure No.
118	02	.00325	10.28	400	1860	0.9	0.484	275	55	0	90	G-69
119	02	"	"	"	1840	"	0.493	400	45	"	"	G-70
120	02	"	"	"	1850	"	0.488	275	"	"	"	"
121	02	"	"	"	1810	"	0.508	400	50	"	"	G-71
122	02	"	"	"	"	"	"	"	40	"	"	G-72
123	02	"	"	"	"	"	"	"	20	+5	"	G-73
124	02	"	"	"	1860	"	0.484	225	"	"	"	"
125	02	"	"	"	1820	"	0.503	175	0	0	"	G-74
126	02	"	"	"	1840	"	0.493	131	"	"	"	"
127	01 + B2	"	"	"	1750	"	0.539	175	"	"	-25	G-75
128	01 + B2	"	"	"	1820	"	0.503	"	"	"	+35	G-76
129	B2	"	"	"	1810	"	0.508	"	"	"	0	G-77
130	03 + B2	"	"	"	1850	"	0.488	"	"	"	+20	G-78

* T_{aw} = adiabatic wall temperature

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TABLE IV (cont'd.) PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: MDC/MMC THERMAL MAPPING TEST

TEST NUMBER: 53 TEST FACILITY: LRC 31" CFHT

TEST DATE: 8/24/70 thru 9/11/70 TEST ENGINEER: Click & Hanner

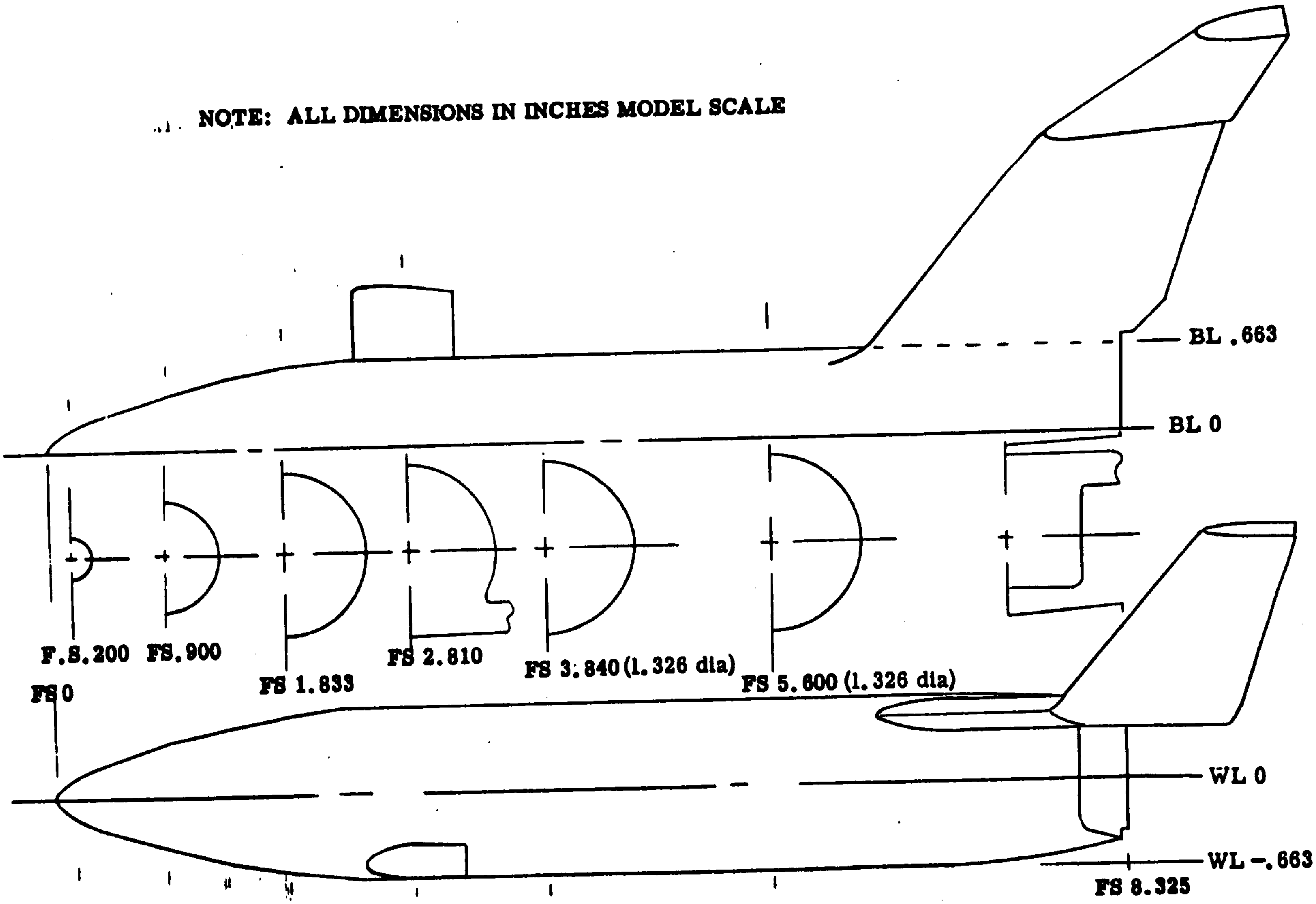
a	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	$\frac{T_{aw}*}{T_{total}}$	$\frac{RNX10^6}{Ft}$	Phase Change Temp. (^oF)	Model Position (degrees)			Grid Figure No.
									α	β	ϕ	
31	B2	.00325	10.28	400	1850	0.9	0.488	175	0	0	90	G-79
32	03 + B2	"	"	"	1810	"	0.508	"	"	"	-20	G-80
33	B2	"	"	"	1840	"	0.493	"	"	"	270	G-81
134	02	"	"	"	1820	"	0.503	131	"	"	225	G-82
135	03 + B2	"	"	"	1855	"	0.486	325	"	"	+20	G-78
136	03 + B2	"	"	"	1850	"	0.488	"	"	"	-20	G-80
137	02	"	"	"	1835	"	0.495	400	60	"	90	G-83
138	02	"	"	"	1810	"	0.508	131	20	"	270	G-84

* T_{aw} = adiabatic wall temperature

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 71

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 72

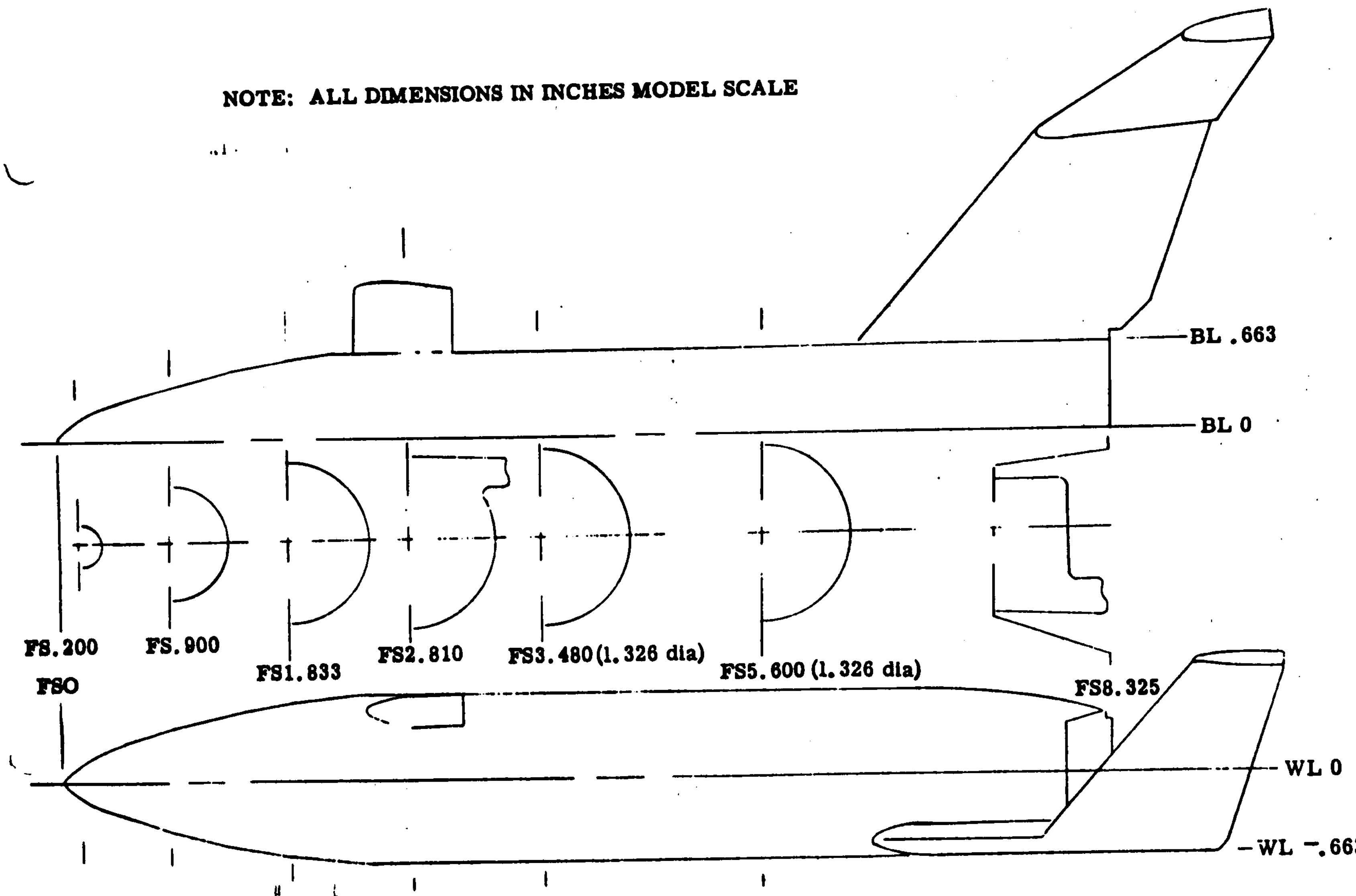
NOTE: ALL DIMENSIONS IN INCHES MODEL SCALE



BASELINE BOOSTER CONFIGURATION (B1)

FIGURE 1

NOTE: ALL DIMENSIONS IN INCHES MODEL SCALE



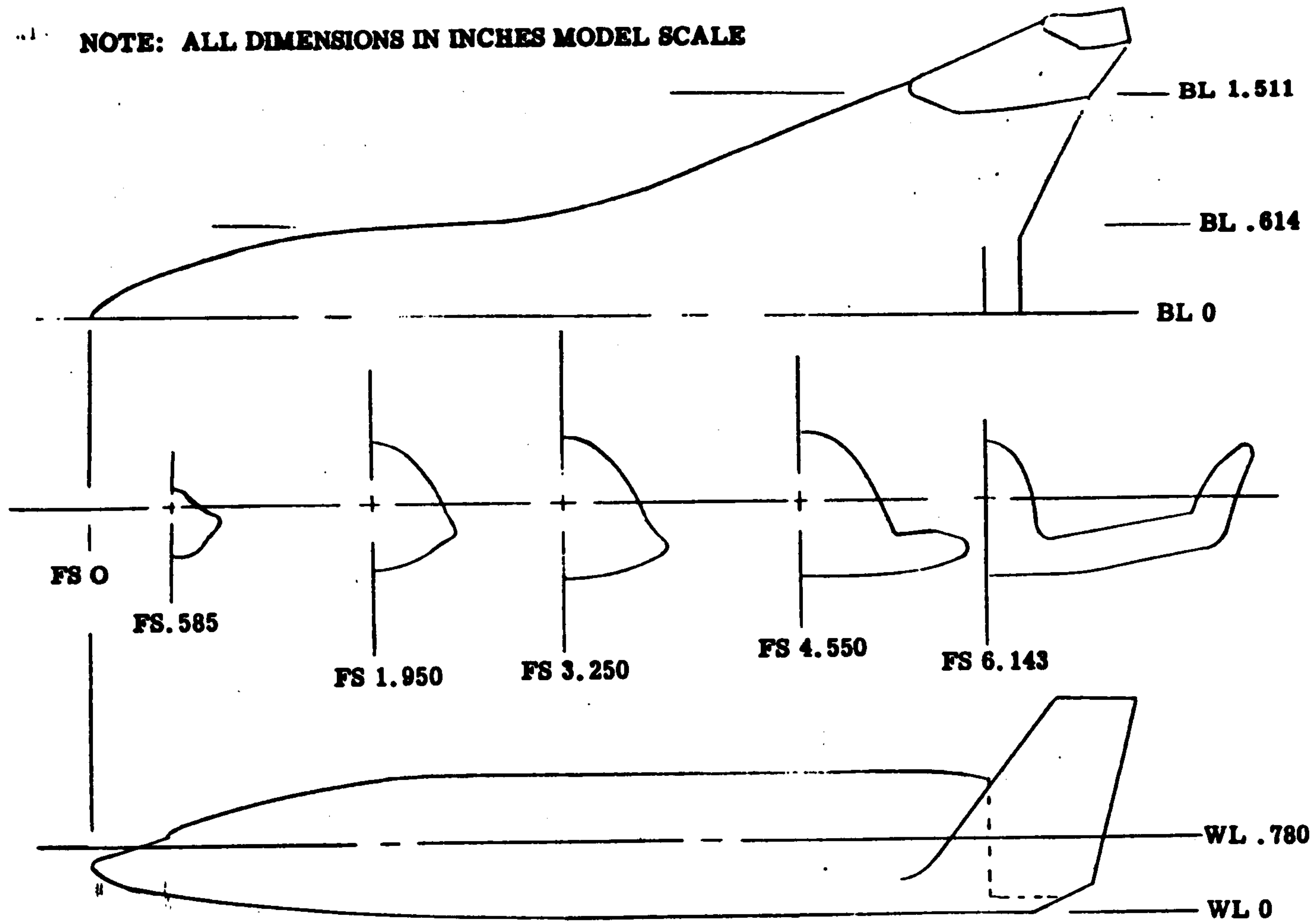
ALTERNATE BOOSTER CONFIGURATION (B2)

FIGURE 2

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 73

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 74

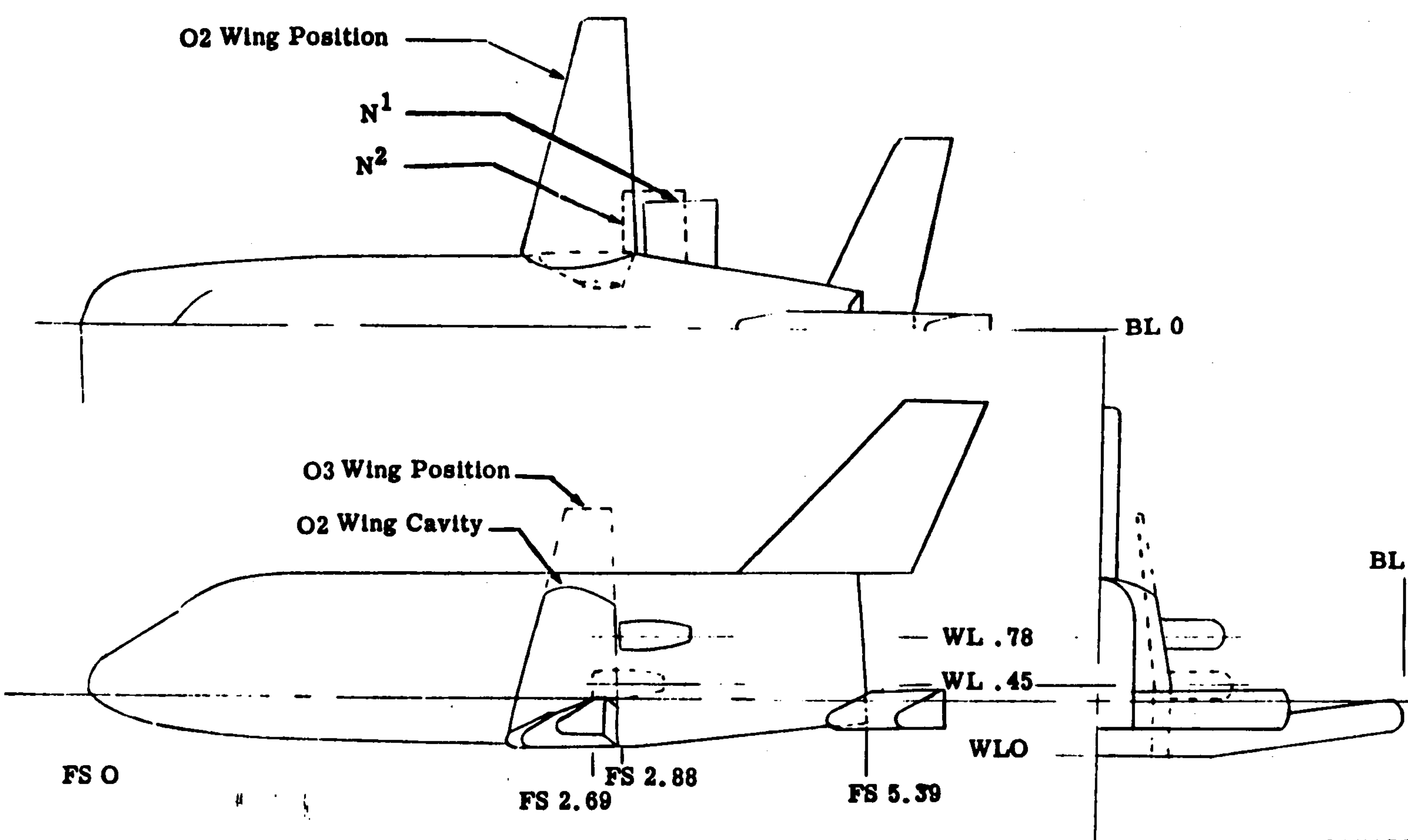
NOTE: ALL DIMENSIONS IN INCHES MODEL SCALE



HIGH CROSS RANGE ORBITER (O1)

FIGURE 3

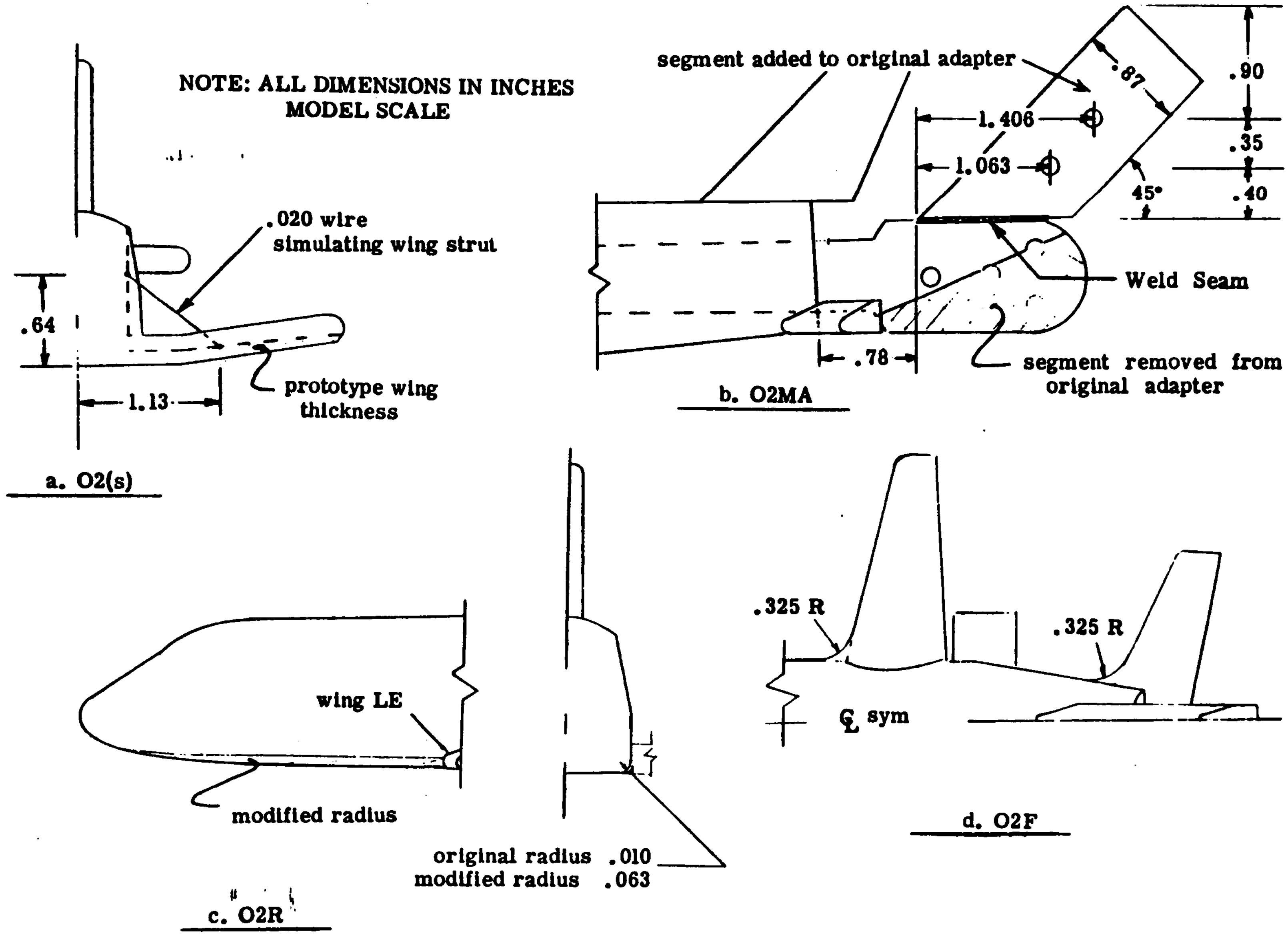
NOTE: ALL DIMENSIONS IN INCHES
MODEL SCALE



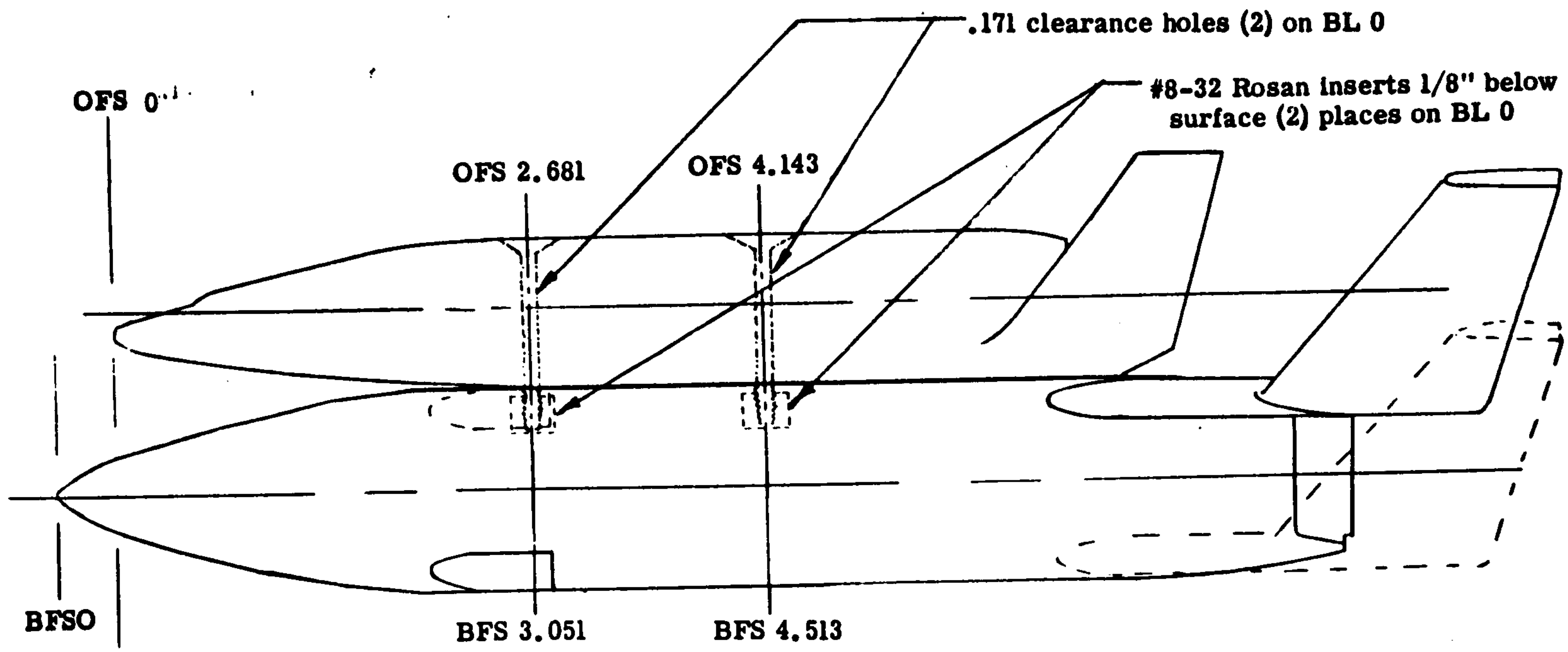
LOW CROSS RANGE ORBITER (O2 and O3)

FIGURE 4

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 75



MODIFICATIONS TO (O2) CONFIGURATION
FIGURE 5

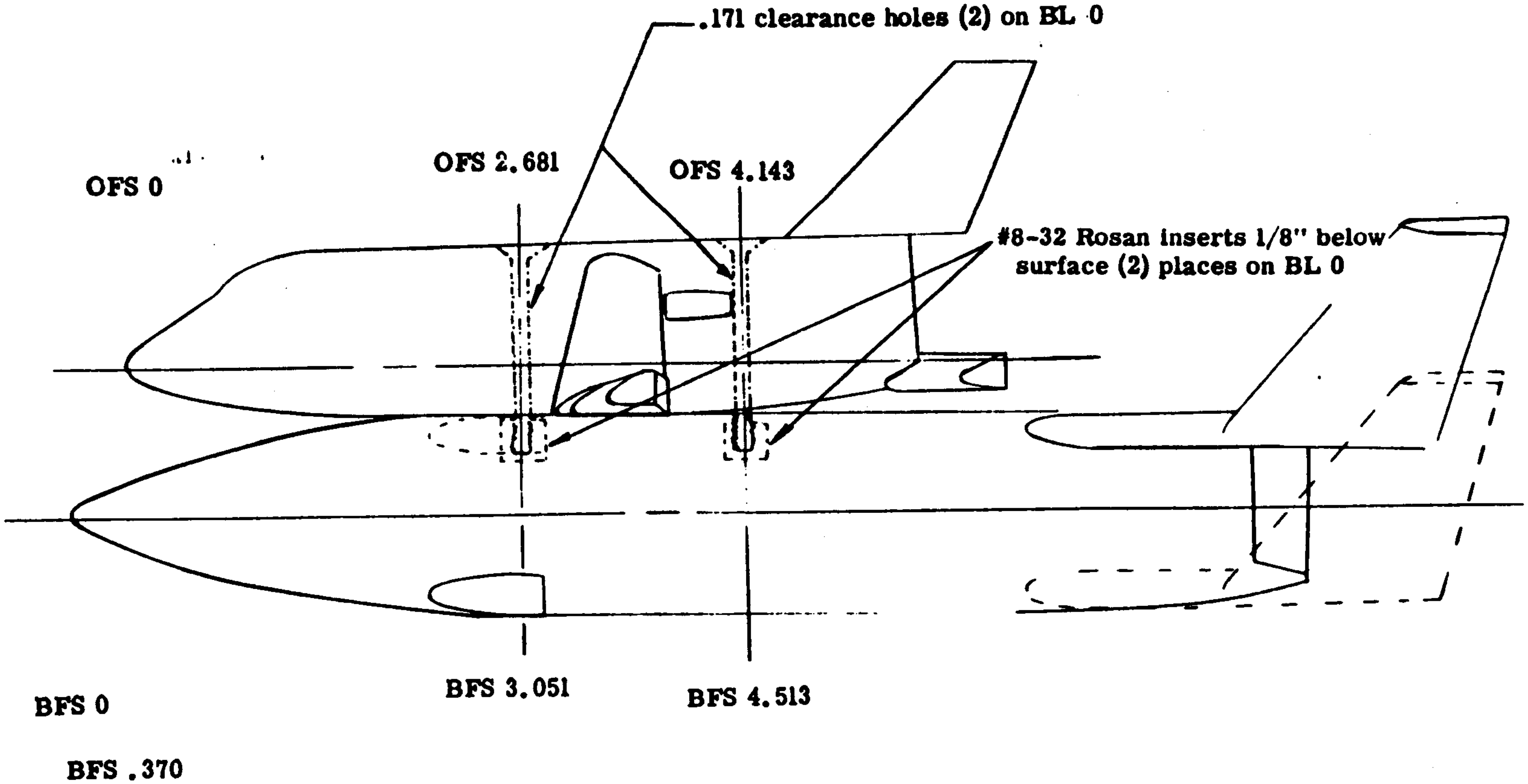


NOTE:
- BFS = booster fuselage station, inches model scale
- OFS = orbiter fuselage station, inches model scale
- orbiter lower surface rests on booster upper surface with orbiter and booster WL's parallel and ℄'s concentric in planview
- solid line (——) designates B1, dashed line (-----) designates B2

LAUNCH VEHICLE(High Cross Range Orbiter + Booster), C1 + B1 & O1 + B2
FIGURE 6

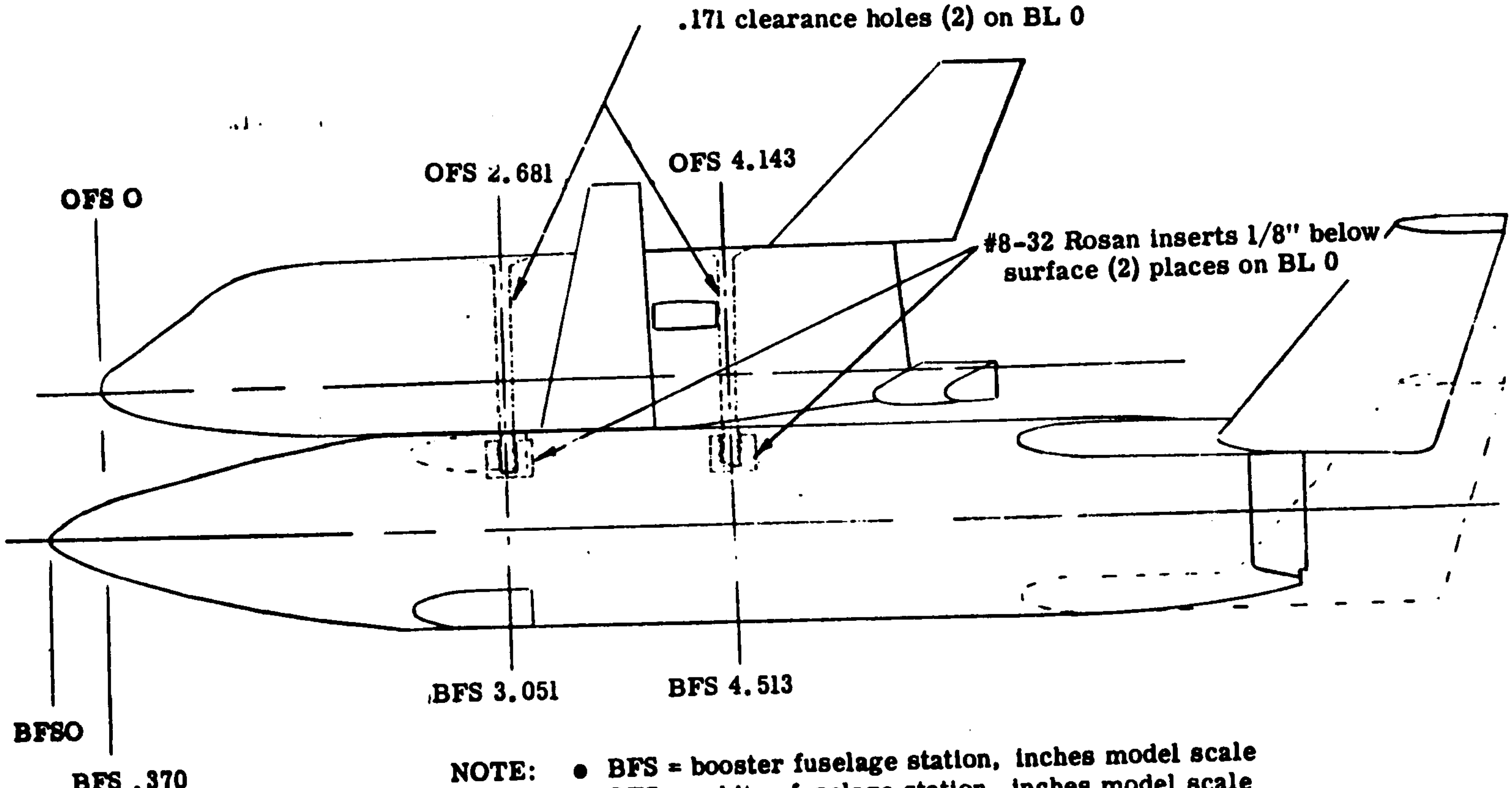
CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 77

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 78



NOTE:
- BFS= booster fuselage station, inches model scale
- OFS= orbiter fuselage station, inches model scale
- Orbiter lower surface rests on booster upper surface with orbiter and booster WL's parallel and ℄'s concentric in planview
- Solid line (——) designates B1, dashed line (----) designates B2

LAUNCH VEHICLE(Low Cross Range, wings unfolded Orbiter + Booster), O2 + B1 & O2 + B2
FIGURE 7



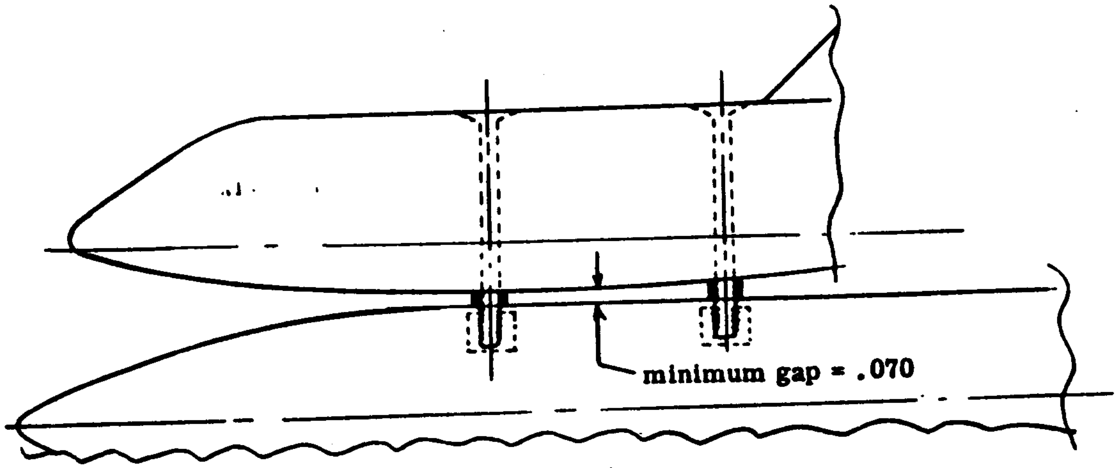
NOTE:
- BFS = booster fuselage station, inches model scale
- OFS = orbiter fuselage station, inches model scale
- Orbiter lower surface rests on booster upper surface with orbiter and booster WL's parallel and ℄'s concentric in plan view
- Solid lines (———) designate B1, dashed lines (------) designates B2

LAUNCH VEHICLE(Low Cross Range, wings folded Orbiter + Booster), O3 + B1 & O3 + B2

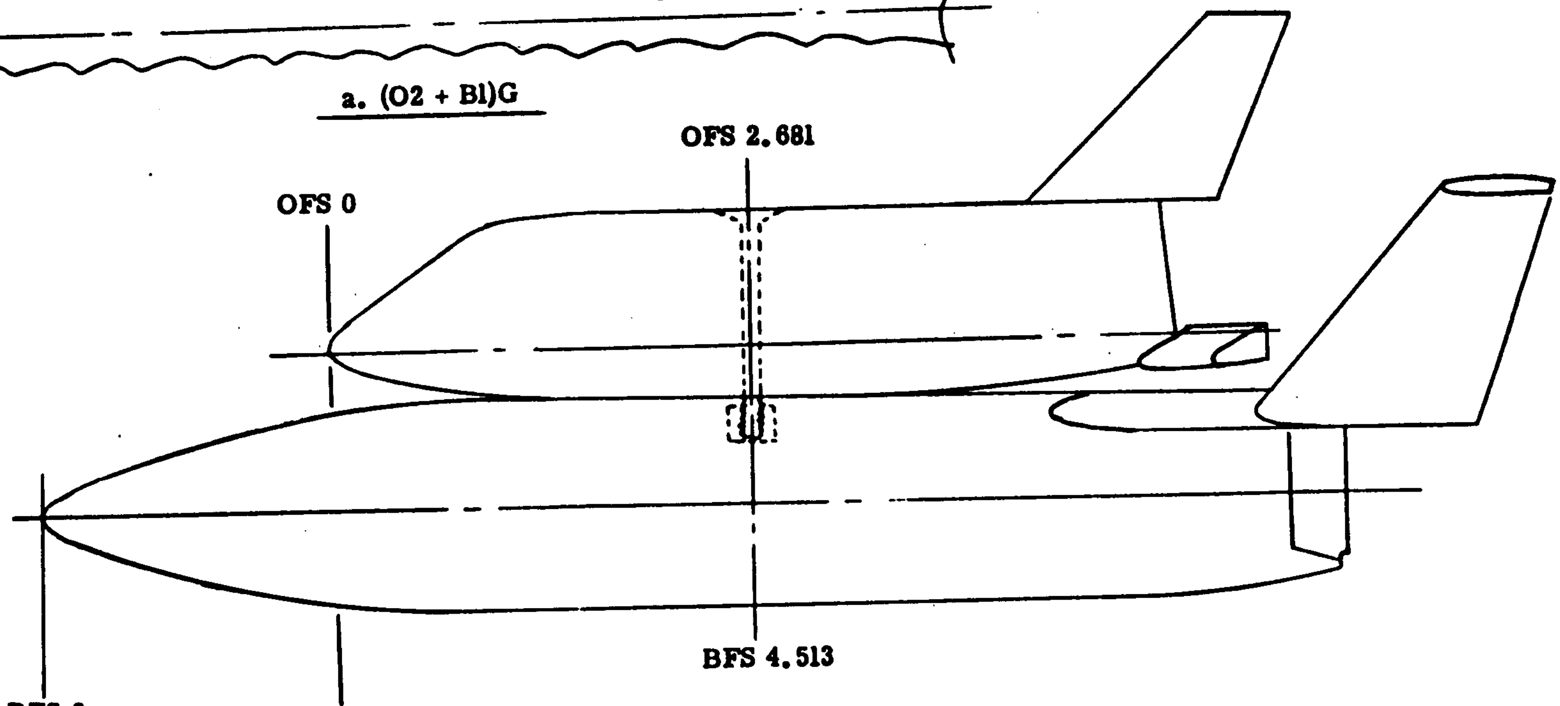
FIGURE 8

CANARD BOOSTER
MDAC/MMC
DELTA WING ORBITER
MDAC/MMC
DR#1036 C-3- 79

NOTE: ALL DIMENSIONS IN INCHES
MODEL SCALE



a. (O2 + B1)G



b. (O2 + B1)A

MODIFICATIONS TO (O2 + B1) CONFIGURATIONS
FIGURE 9

TABLE 4

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET

TEST TITLE: HEAT TRANSFER STUDY OF THE GRUMMAN H-33/HO ORBITER

TEST NUMBER: 546 TEST FACILITY: NASA/LRC-VDT

TEST DATE: OCTOBER 14-21, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
1948	P, W_4, V_5, Q_1	.005	7.9	304	1312	1.0	1.6	N/A	0	0	0			
1949				306	1271		1.7		5					
1950				292	1276		1.6		15					
1951				295	1279		1.6		-5					
1952	P, W_4, V_5			300	1263		1.6		-5					
1953				295	1278		1.6		0					
1954				300	1265		1.7		5					
1955				299	1270		1.6		5					
1956				292	1275		1.6		15					
1957				297	1270		1.6		27					
1958				296	1279		1.6							
1959				102	1199		0.6							
1960				1085	1393		5.0							

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} - adiabatic wall temperature

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CYLINDRICAL BOOSTER
GAC
DELTA WING ORBITER
GAC
DR#1234 C-3-81

CYLINDRICAL BOOSTER
GAC
DELTA WING ORBITER
GAC
DR#1234 C-3- 82

TABLE 4 (Continued)

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET

TEST TITLE: HEAT TRANSFER STUDY OF THE GRUMMAN H-33/HO ORBITER

TEST NUMBER: 546 TEST FACILITY: NASA/LRC-VDT

TEST DATE: OCTOBER 14-21, 1971 TEST ENGINEER: A. D'ERRICO

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw* / Ttotal	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	Φ	Camera** Location (in) X	Y	Z
1961	B_5 W_4 V_5	.005	7.9	1847	1348	1.0	8.5	N/A	27	0	0			
1962				1856	1332		8.5							
1963				2519	1326		12.0							
1964				101	1172		0.6		20					
1965				1107	1382		5.1							
1966				1866	1341		8.6							
1967				2501	1274		12.8							
1968				293	1236		1.7							
1969	[illegible]			283	1250		1.6		0					
1970				292	1270		1.6							

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

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TABLE 5

OIL FLOW TEST DATA SUMMARY SHEET

TEST TITLE: HEAT TRANSFER STUDY OF THE GRUMMAN H-33/HO ORBITER

TEST NUMBER: 546 TEST FACILITY: NASA/LRC-VDT

TEST DATE: OCTOBER 14-21, 1971 TEST ENGINEER: A. D'ERRICO

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^{6} / Ft.	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Camera** Location (in) X	Y	Z
1992	B_5 W_{11} V_5	.005	7.9	290	1290	N/A	1.5	N/A	37	0	0			
1994	B_5 W_{III} V_5	↓	↓	1100	1400	↓	5.0	↓	↓	↓	↓			

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

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CYLINDRICAL BOOSTE
GAC
DELTA WING ORBITER
GAC
DR#1234 C-3- 83

TABLE 6

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: HEAT TRANSFER STUDY OF THE GRUMMAN H-33/HO ORBITER

TEST NUMBER: 546 TEST FACILITY: NASA/LRC-VDT

TEST DATE: OCTOBER 14-21, 1971 TEST ENGINEER: A. D'ERRICO

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^{6} Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	Φ	Camera** Location (in) X	Y	Z
1971	$B_5 W_{4II} V_5$	.005	7.9	305	1250	1.0	1.7	119	27	0	0			
1972				305	1260		1.7	150						
1973				305	1238		1.7	300						
1976				305	1285		1.6	119						
1977				1135	1390		5.2	150						
1978				1115	1400		5.0	250						
1979				1165	1400		5.2	200						
1980				1865	1415		7.9	200						
1981				1865	1415		7.9	300						
1982				2515	1395		10.8	300						
1983				2515	1385		10.8	450						
1984	$D_5 W_{4II} V_5 P_1$			1115	1375		5.1	250						
1985				305	1270		1.7	250						

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} adiabatic wall temperature

TABLE 6 (Continued)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: HEAT TRANSFER STUDY OF THE GRUMMAN H-33/HO ORBITER

TEST NUMBER: 546 TEST FACILITY: NASA/LRC-VDT

TEST DATE: OCTOBER 14-21, 1971 TEST ENGINEER: A. D'ERRICO

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	Φ	Camera** Location (in) X	Y	Z
986	B_5 W_{4H} V_5 P_1	.005	7.9	1115	1365	1.0	5.3	125	27	0	0			
1987	B_5 W_{4H} V_5			1115	1400		5.0	200						
988	B_5 W_{4H} V_5 P_1			1115	1405		5.0	200						
989				305	1275		1.7	125						
990				2515	1360		11.3	125						
991				2515	1370		11.3	200						
992				1865	1405		7.9	125						
995	B_5 W_{4H} V_5 T_5			1115	1375		5.1	300	0		45			
996				1115	1385		5.1	150						
997	B_5 W_{4H} V_5 Q_1			305	1250		1.7	150						
998	B_5 W_{4H} V_5 T_5 Q_1			305	1260		1.7	150			0			
999	B_5 W_{4H} V_5 Q_1			1145	1260		6.2	150	15					
000				305	1270		1.7	200						

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

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CYLINDRICAL BOOSTER
GAC
DELTA WING ORBITER
GAC
DR#1234   C-3- 86

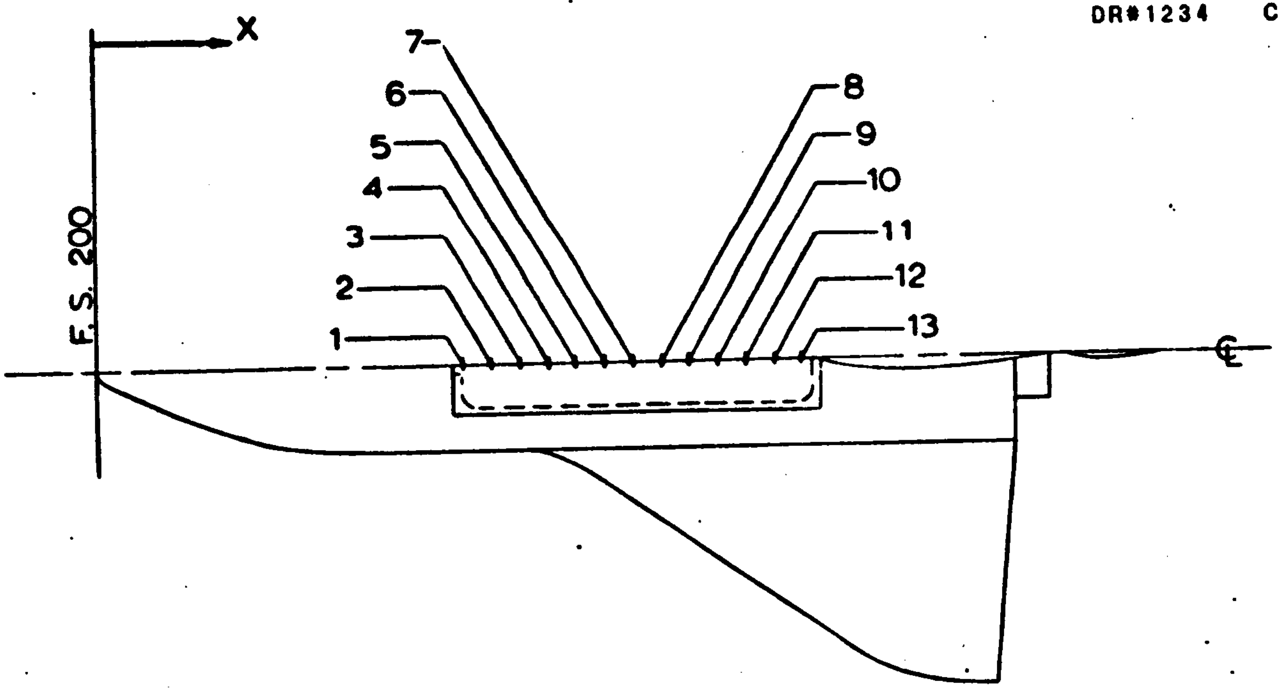


FIGURE 1. ORBITER THERMOCOUPLE LOCATIONS (UPPER SURFACE)

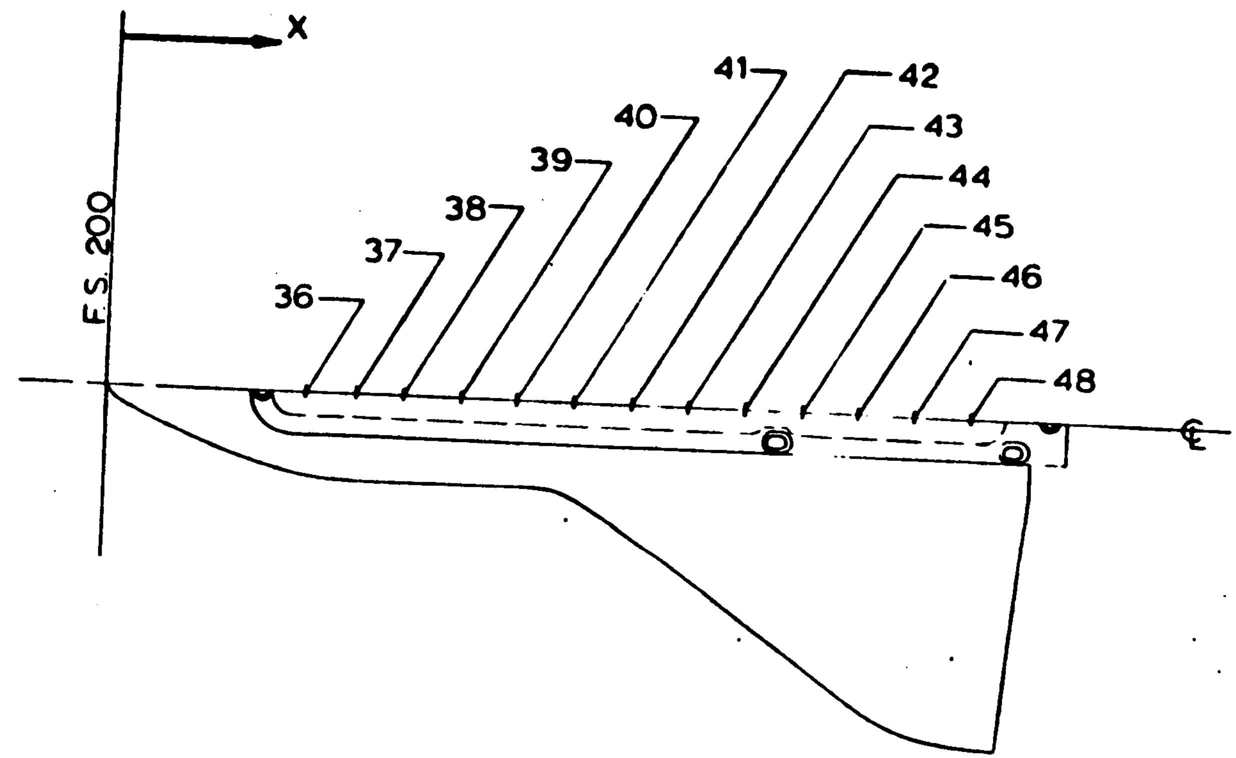
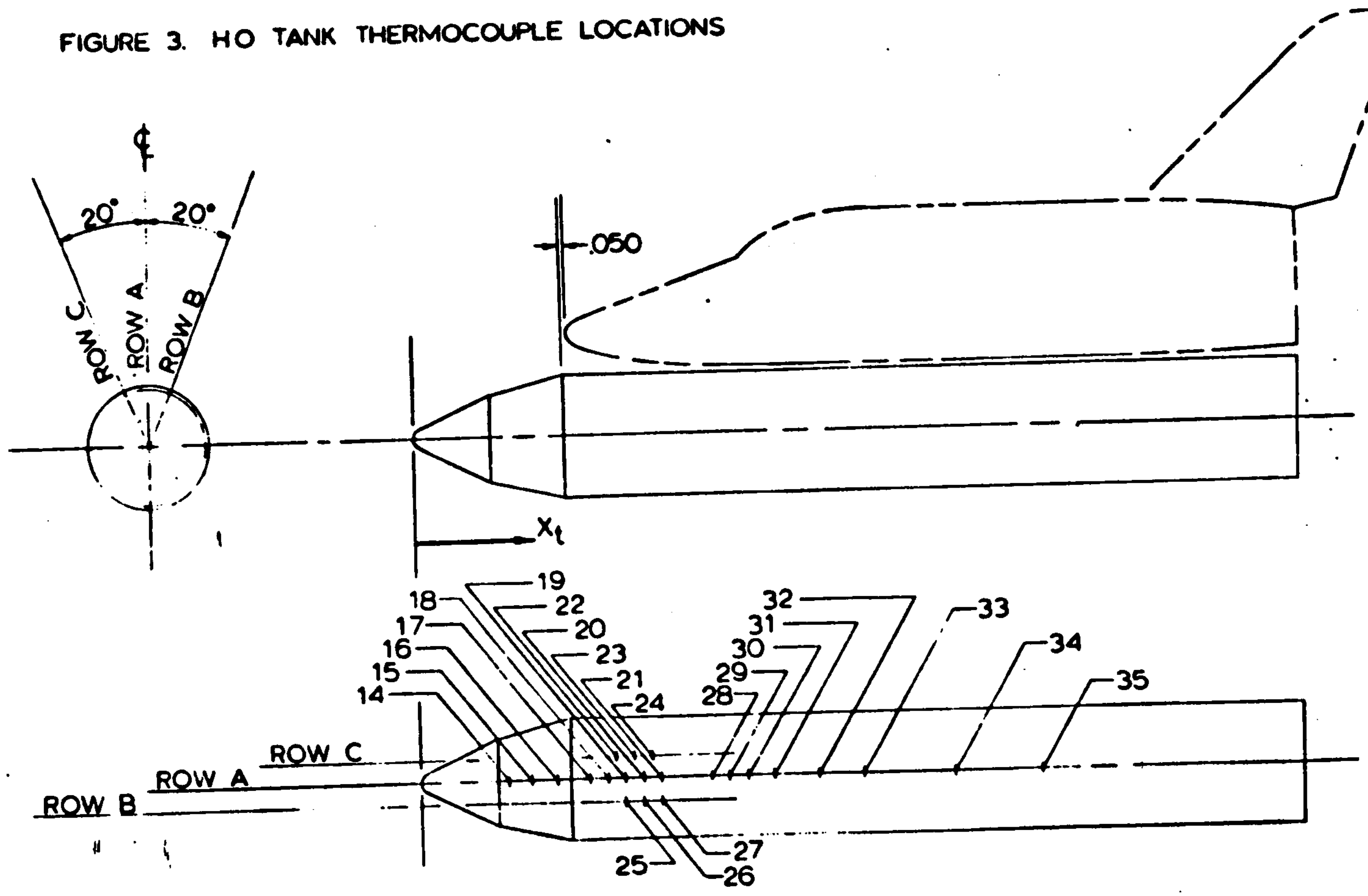


FIGURE 2. ORBITER THERMOCOUPLE LOCATIONS (LOWER SURFACE)

FIGURE 3. HO TANK THERMOCOUPLE LOCATIONS



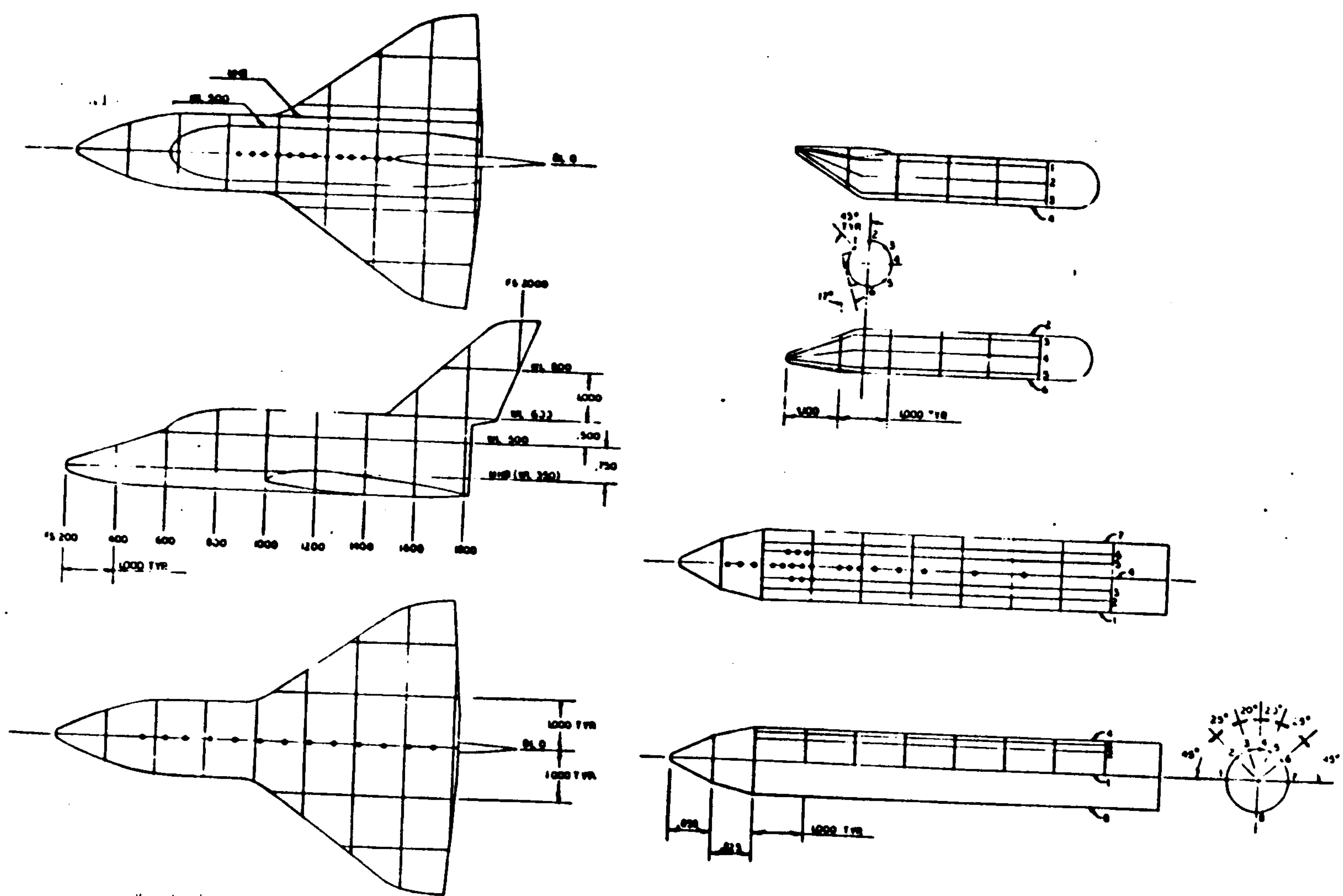


FIGURE 4. REFERENCE GRID SYSTEMS - PHASE CHANGE PAINT MODELS

CYLINDRICAL BOOSTER
GAC
DELTA WING ORBITER
GAC
DR#1234 C-3- 89

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CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSC
DR#1278 C-3- 90

Table 1. TEST CONDITIONS

MSFC RUN NO.	LaRC RUN NO.	P_t PSIG	Re/FT x 10^{-6}	T_t °F	INSERT. TIME	INITIAL TEMP. °F	PHASE CHG. TEMP. °F	MACH NO.	ANGLE OF ATTACK	DATE	TIME EDT	ΔX_o	ΔZ	ΔX_B	ΔY	MODEL*	CONF.
1	2886	26.5	.29	780	29.6	82	119/150	7.53	0	5/15	2:00					H/W1	
2	2887	185	1.00	835	30.4	86	119/150	7.78	0	5/15	2:15					H/W1	
3	2888	1185	5.00	930	15.4	87	150/200	8.01	0	5/15	2:35					H/W3	
4	2889	1175	4.90	930	15.1	91	150/200	8.00	0	5/15	3:00					H/W1	
5	2890	1190	5.05	930	15.5	87	150/200	8.00	0	5/15	3:25					H/W2	
6	2891	2590	10.0	1025	8.3	82	300/150	8.00	0	5/16	8:40					H/W1	
7	2892	25	0.29	650	30.4	88	119/100	7.5	0	5/16	10:00					TNR/W2	
8	2893	26	0.29	795	30.5	91	119/100	7.5	0	5/16	10:45					T/W3	
9	2894	185	1.00	850	32.2	88	150/100	7.78	0	5/16	11:20					TNR/W2	
10	2895	1193	5.00	925	15.7	91	200/103	8.0	0	5/16	12:46					TNR/W2	
11	2896	186	1.00	835	23.9	89	150/103	7.78	0	5/16	1:14					T/W1	
12	2897	1195	5.00	930	19.0	89	200/103	8.0	0	5/16	1:48					T/W3	
13	2898	2600	10.0	990	10.4	89	250/119	8.0	0	5/16	2:20					T/W1	
14	2899	2590	10.0	975	11.4	89	250/119	8.0	0	5/16	2:50					TNR/W2	
15	2900	2590	10.0	985	10.6	89	300/150	8.0	0	5/16	3:18					B/1	
16	2901	30	0.29	750	10.3	86	300/103	7.5	0	5/17	10:00	3.68	0.0715			T01	A
17	2902	26	0.29	765	32	87	250/103	7.5	0	5/17	10:45	3.68	0.0715			T01	A
18	2903	30	0.29	725	27	89	200/103	7.5	0	5/17	11:12	3.68	0.0715			T01	A
19	2904	25	0.29	775	33.4	90	150	7.5	0	5/17	1:10	3.68	0.0715			T01	A
20	2905	30	0.29	725	30.4	90	150	7.5	0	5/17	1:40	2.68	0.0715			T01	B
21	2906	30	0.29	700	30.2	91	250	7.5	0	5/17	2:20	2.68	0.0715			T01	B
22	2907	22.5	0.29	810	33.4	92	150	7.5	0	5/17	3:00	3.68	0.084			T01	A
23	2908	25	0.29	740	30.2	91	150	7.5	0	5/17	3:27	3.68	0.084			T03	A
24	2909	27	0.29	815	30.1	83	250	7.5	0	5/18	8:30	3.68	0.084			T03	A
25	2910	25	0.29	700	32.9	87	150	7.5	0	5/18	9:25	3.68	0.084			T01	A
26	2911	1195	5.0	950	11.7	92	300	8.0	0	5/18	10:00	3.68	0.084	0.97	0.048	L1	C
27	2912	1185	5.0	930	10.3	92	350	8.0	0	5/18	10:40	3.68	0.084	0.97	0.048	L1	C
28	2913	2595	10.0	930	8.8	85	450	8.0	0	5/18	12:25	3.68	0.084	0.97	0.048	L1	C
29	2914	2600	10.0	960	5.4	84	350/125	8.0	0	5/18	1:04	3.68	0.084	0.97	0.048	L1	C
30	2915	2590	10.0	965	5.7	86	500	8.0	0	5/18	1:55	3.68	0.084	0.97	0.048	L2	C
31	2916	2590	10.0	985	15.2	85	138	8.0	0	5/18	2:30					TNR/W2	
32	2917	2605	10.0	925	22.0	87	138	8.0	0	5/18	2:53					T/W1	
33	2918	1185	5.0	950	12.8	88	500	8.0	0	5/18	3:30	3.68	0.084	2.00	0.048	L2	D
34	2919	1180	5.0	975	8.5	81	400	8.0	0	5/19	8:33	3.68	0.084	2.00	0.048	L2	D
35	2920	1185	5.0	955	10.3	89	400	8.0	0	5/19	9:00	2.68	0.084	0.97	0.048	L2	E
36	2921	1205	5.0	955	10.4	88	500	8.0	0	5/19	9:35	2.68	0.084	0.97	0.048	L2	E
37	2922	1180	5.0	940	8.2	88	500	8.0	0	5/19	10:10	3.68	0.042	0.97	0.048	L2	C
38	2923	1195	5.0	950	8.4	88	400	8.0	0	5/19	10:35	3.68	0.042	0.97	0.048	L2	C
39	2924	1200	5.0	950	8.6	87	500	8.0	0	5/19	11:15	3.68	0.084	0.97	0.096	L2	C
40	2925	1195	5.0	945	8.1	86	400	8.0	0	5/19	12:25	3.68	0.084	0.97	0.096	L2	C
41	2926	1205	5.0	940	10.8	85	138	8.0	0	5/19	1:00	3.68	0.084	0.97	0.048	L2	C
42	2727	25	0.29	780	32.3	87	138/200	7.5	+10	5/19	2:10	3.68	0.084			T02	
43	2928	24	0.29	710	25.4	86	138/103	7.5	+10	5/19	2:38	3.68	0.084			T02	
44	2929	27	0.29	695	20.0	84	103	7.5	+10	5/19	3:05					T/W3	

*See Table 2.

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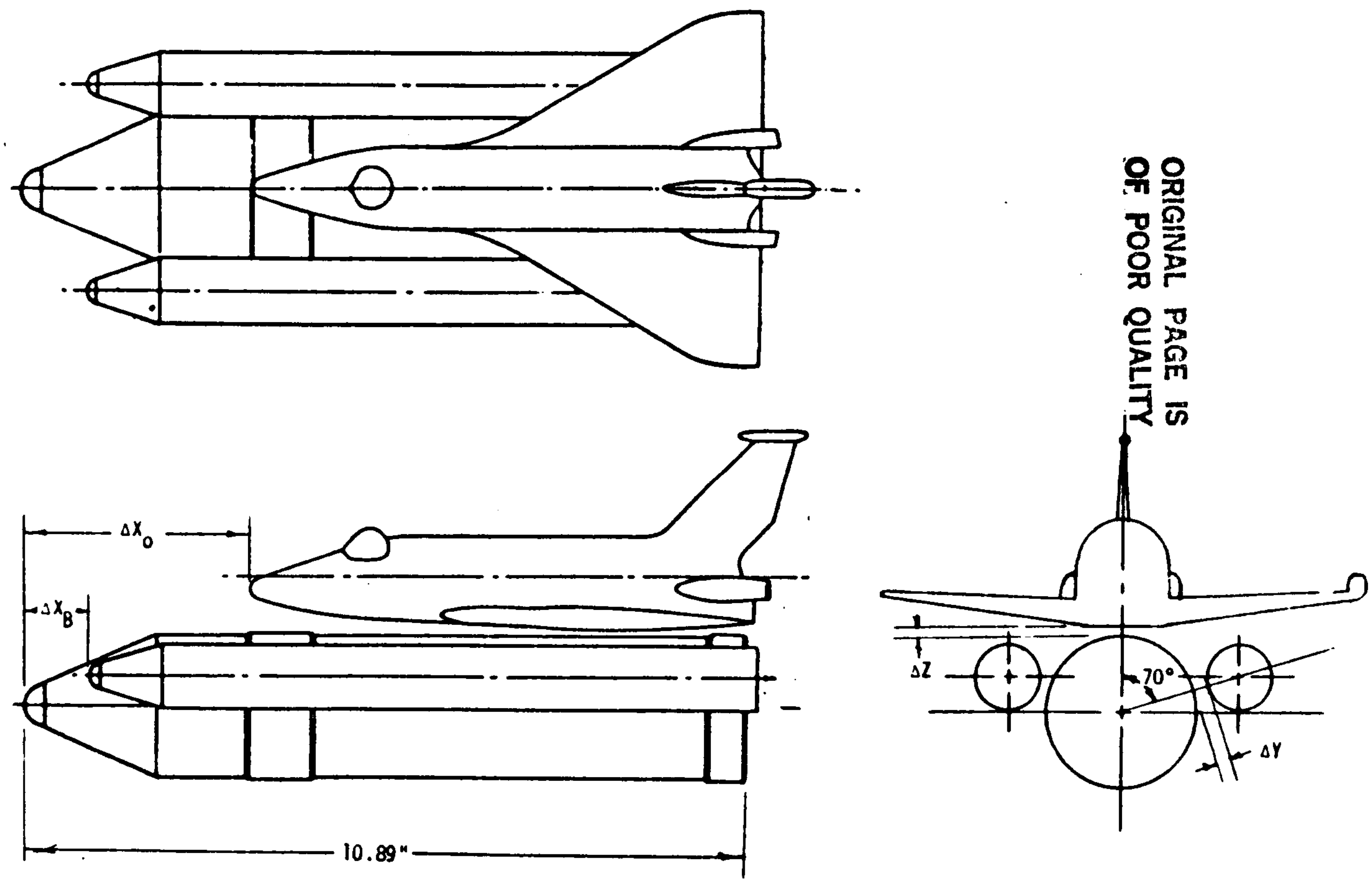


(0.006 SCALE)

Figure 2. MSC SRM SPACE SHUTTLE CONFIGURATION

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSC
DR#1278 C-3- 91

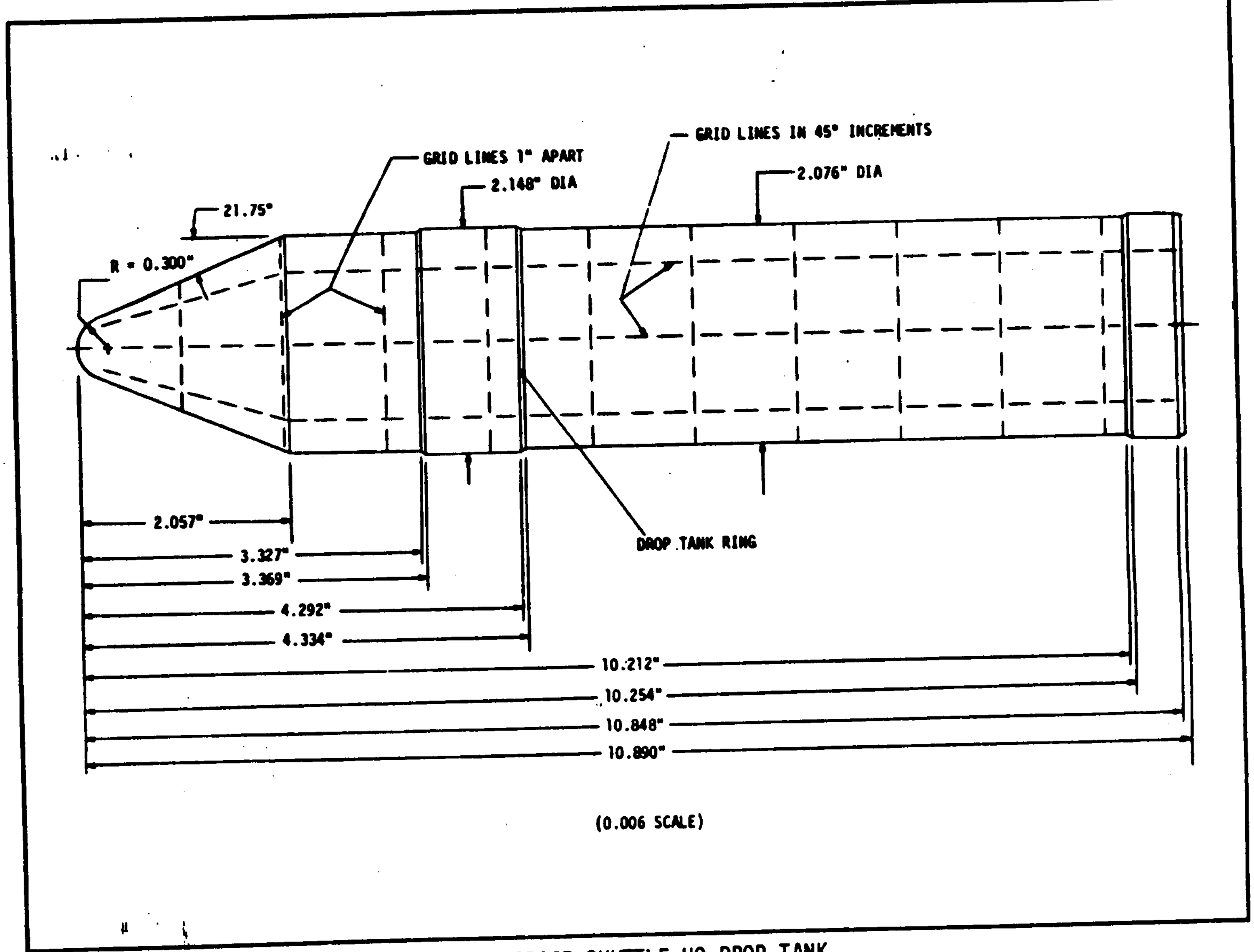
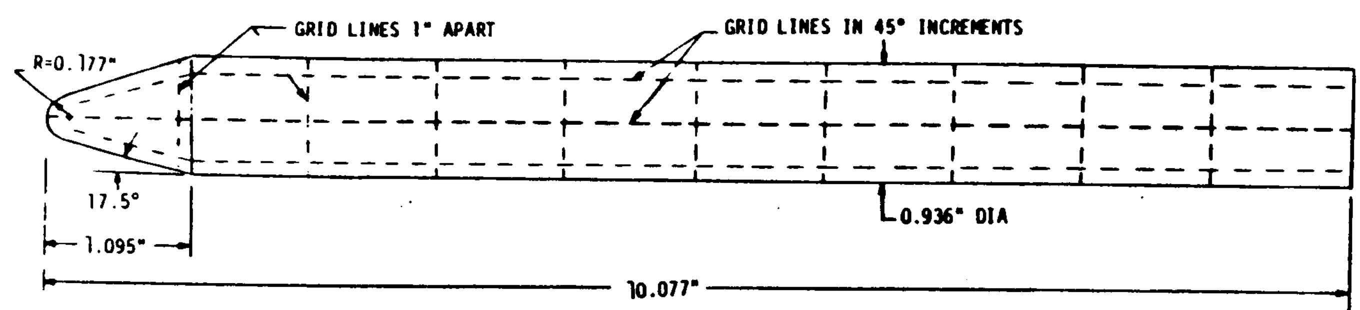


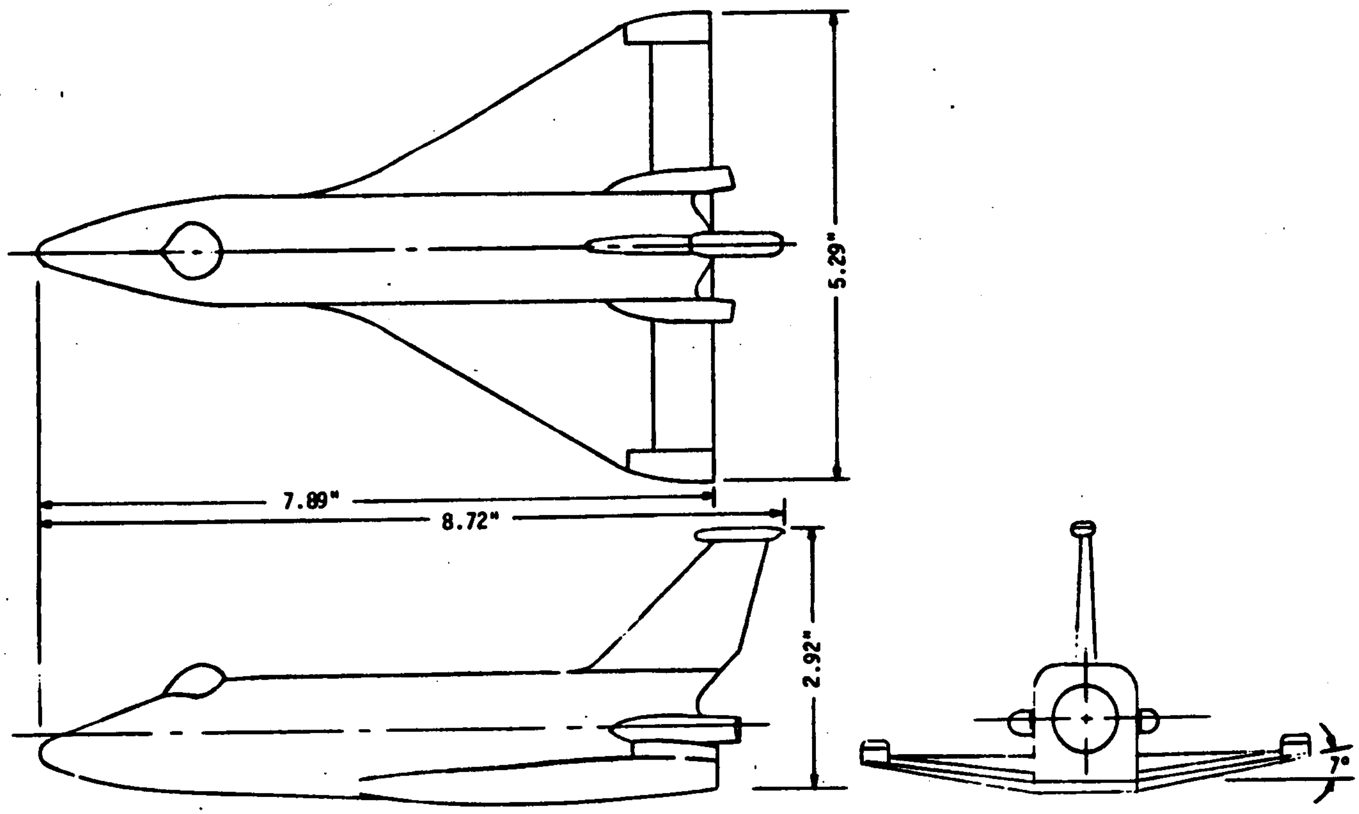
Figure 3. SPACE SHUTTLE HO DROP TANK



(0.006 Scale)

Figure 4. SPACE SHUTTLE SRM

CYLINDRICAL BOOSTER
MSFC
DELTA WING ORBITER
MSC
DR#1278 C-3- 94



(0.006 SCALE)

Figure 1. SPACE SHUTTLE 040A ORBITER

TABLE I.

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Investigation of Heating Rates on ILV and Reentry Configurations

TEST NUMBER: RO8 TEST FACILITY: LaRC M=8 VDT

TEST DATE: Mar 3-10, 1972 TEST ENGINEER: J. Houser

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft (Nom.)	Phase Change Temp. (^oF)	Model Position (degrees) *** α	β	Φ	Camera** Location (in) X	Y	Z
2503	O,B,S,V,T,	.0033	7.85	315	1255	1.0	1.65	125	0	0	0	Top		
05	✓	✓	✓	320	1315	✓	✓	200	✓	✓	180		✓	
06	✓	✓	✓	325	✓	✓	✓	✓	✓	✓	✓		✓	
07	✓	✓	✓	325	1320	✓	✓	125	✓	✓	0	Top & Side		
08	✓	✓	8.1	2525	1415	✓	10.0	250	✓	✓	✓		✓	
09	✓	✓	✓	✓	✓	✓	✓	400	✓	✓	90		✓	
10	✓	✓	✓	2585	✓	✓	✓	150	✓	✓	0		✓	
11	B,S,V,T,	✓	✓	✓	1410	✓	✓	✓	✓	✓	180		✓	
12	O,B,S,V,T,	✓	✓	2555	1420	✓	✓	✓	✓	✓	90		✓	
13	✓	✓	7.85	345	1310	✓	1.65	200	✓	✓	0		✓	
14	✓	✓	✓	320	✓	✓	✓	125	✓	✓	180		✓	
15	✓	✓	✓	✓	✓	✓	✓	200	✓	✓	0		✓	
2516	✓	✓	✓	325	✓	✓	✓	125	✓	✓	✓		✓	

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} : adiabatic wall temperature

*** ILV model mounted upright gives $\Phi = 0°$; nose up with respect to g gives $\alpha > 0$
Booster alone with fins up gives $\Phi = 0°$

CYLINDRICAL BOOSTER
TBC
DELTA WING ORBITER
GAC
DR#1261 C-3- 95

TABLE I. (Continued)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Investigation of Heating Rates on ILV and Reentry Configurations

TEST NUMBER: RD8   TEST FACILITY: LaRC M-8 VDT

TEST DATE: Mar 3-10, 1972   TEST ENGINEER: J. Houser

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10⁶ / Ft (Nom.)	Phase Change Temp. (°F)	Model Position (degrees) *** α	β	Φ	Camera** Location (in) X	Y	Z
2517	O,B,S,V,T,	.0033	8.1	2575	1445	1.0	10	350	5	0	0	7.[illegible]	[illegible]	7.[illegible]
15	✓	✓	7.85	315	1340	✓	1.65	125	✓	✓	1[illegible]		✓	
19	✓	✓	8.1	2545	1440	✓	10	150	✓	✓	0		✓	
20	✓	✓	✓	2525	1465	✓	✓	✓	✓	✓	180		✓	
22	✓	✓	7.85	320	1335	✓	1.65	200	-5	✓	0		✓	
25	✓	✓	8.1	2555	1465	✓	10	350	✓	✓	✓		✓	
24	✓	✓	✓	2525	1425	✓	✓	150	✓	✓	✓		✓	
25	✓	✓	7.85	320	1305	✓	1.65	125	✓	✓	✓		✓	
26	✓	✓	8.1	2530	1375	✓	10	150	✓	✓	180		✓	
27	✓	✓	7.85	325	1305	✓	1.65	175	✓	✓	✓		✓	
28	✓	✓	✓	✓	1320	✓	✓	✓	0	✓	✓		✓	
30	Reference hemisphere	✓	✓	✓	1325	✓	✓	400	✓	✓	0		✓	
2531	✓ ✓	✓	✓	320	1330	✓	✓	150	✓	✓	✓		✓	

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

*** ILV model mounted upright gives φ=0°, nose up with respect to g gives α>0
Booster alone with fins up gives φ=0°.

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7.

TABLE I. (Continued)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Investigation of Heating Rates on 1LV and Reentry Configurations

TEST NUMBER: RO8 TEST FACILITY: LaRC M=8 VDT

TEST DATE: Mar 3-10, 1972 TEST ENGINEER: J. Hausser

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft (Nom)	Phase Change Temp. (°F)	Model Position (degrees) ***			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
7532	Reference hemisphere	[illegible]	8.0	1020	1255	1.0	4.8	100	0	0	0	Top	[illegible]	Side
34	✓ ✓	✓	7.85	320	1315	✓	1.65	250	✓	✓	✓		✓	
35	✓ ✓	✓	8.0	1025	1245	✓	4.8	250	✓	✓	✓		✓	
† 36	B.S.V.	✓	7.85	320	1230	✓	1.65	150	✓	✓	✓		✓	
37	✓	✓	✓	✓	1305	✓	✓	200	✓	✓	✓		✓	
38	✓	✓	✓	325	1315	✓	✓	150	✓	✓	30		✓	
39	✓	✓	8.1	2520	1440	✓	10.0	✓	✓	✓	0		✓	
40	✓	✓	7.85	320	1255	✓	1.65	200	✓	✓	90		✓	
41	✓	✓	✓	✓	1315	✓	✓	125	✓	✓	0		✓	
42	✓	✓	8.1	2525	1415	✓	10.0	250	✓	✓	✓		✓	
43	✓	✓	✓	2515	1425	✓	✓	150	✓	✓	90		✓	
44	✓	✓	✓	2535	1395	✓	✓	250	✓	✓	✓		✓	
7545	✓	✓	7.85	320	1310	✓	1.65	150	5	✓	0		✓	

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

*** 1LV model mounted upright gives ϕ=0; nose up with respect to y gives α=0
Booster alone with fins up gives ϕ=0°

† Runs 36-55 were made with low-α reentry configuration on sting at 0°

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CYLINDRICAL BOOSTER
TBC
DELTA WING ORBITER
GAC
DR#1261 C-3-97

TABLE I. (Continued)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Investigation of Heating Rates on ILV and Reentry Configurations

TEST NUMBER: E88 TEST FACILITY: LaRC M=8 VDT

TEST DATE: Mar 3-10, 1972 TEST ENGINEER: J. Houser

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10[6] / Ft (/cm)	Phase Change Temp. (°F)	Model Position (degrees) *** α	β	Φ	Camera** Location (in) X	Y	Z
2546	B_5V_1	.0033	7.85	320	1325	1.0	1.65	150	5	0	180	[illegible]	[illegible]	[illegible]
47	–	–	8.1	2515	1430	–	10.0	–	–	–	0		–	
48	–	–	–	2550	1473	–	–	300	–	–	–		–	
49	–	–	7.85	325	1300	–	1.65	150	-5	–	–		–	
50	–	–	–	325	1340	–	–	200	–	–	–		–	
51	–	–	–	320	1310	–	–	150	–	–	180		–	
52	–	–	8.1	2530	1420	–	10.0	–	–	–	–		–	
53	–	–	–	2520	[illegible]	–	–	300	–	–	0		–	
54	–	–	–	–	1445	–	–	150	–	–	180		–	
55	–	–	–	2510	1440	–	–	300	–	–	–		–	
56	–	–	7.85	320	1255	–	1.65	200	0	–	180		–	
57	–	–	–	–	1325	–	–	400	–	–	–		–	
2558	–	–	8.1	2525	1430	–	10.0	–	–	–	–		–	

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

*** ILV model mounted upright gives $\phi = 0°$. Nose up with respect to y gives $+\alpha$.
Booster alone with fins up gives $\phi = 0°$

† Runs 56 on were made with high-α reentry configuration on sting at 75°

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TABLE I. (Continued)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Investigation of Heating Rates on IAV and Reentry Configurations

TEST NUMBER: ZB8 TEST FACILITY: LaRC M=8 VDT

TEST DATE: Mar 3-10, 1972 TEST ENGINEER: J. Houser

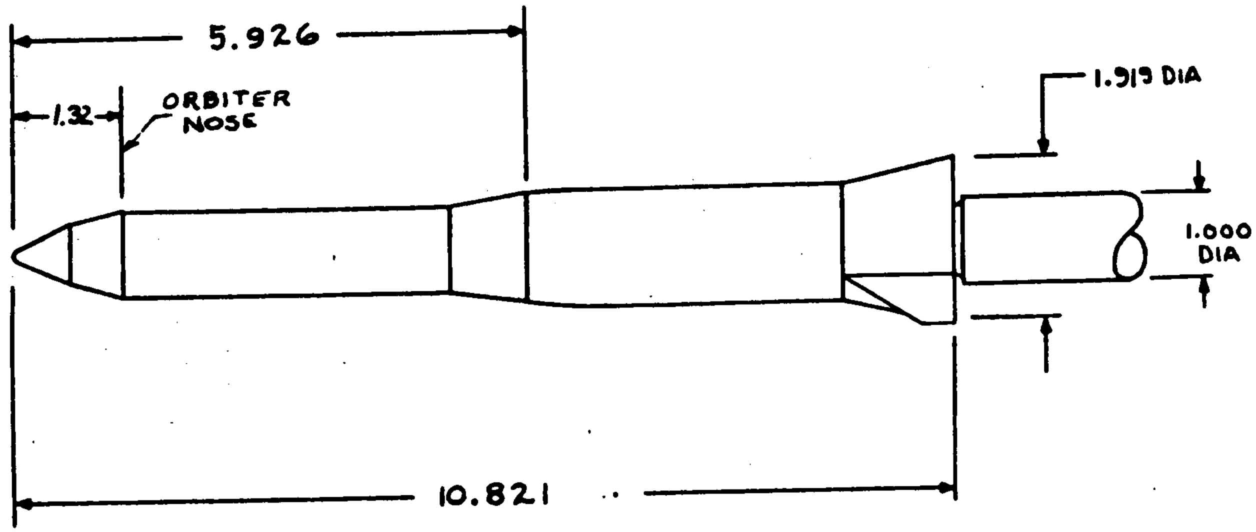
Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft (Linear)	Phase Change Temp. (°F)	Model Position (degrees) *** α	β	Φ	Camera** Location (in) X	Y	Z
2559	B S V	.1833	6.1	2030	1435	1.0	10.0	550	0	0	180	Top	✓	Side
60	–	–	7.55	320	1315	–	1.15	-110	-10	–	–		–	
61	–	–	–	315	1315	–	–	200	–	–	–		–	
62	–	–	–	320	–	–	–	–	10	–	–		–	
63	–	–	–	–	–	–	–	400	–	–	–		–	
64	–	–	6.1	2035	1425	–	10.0	–	–	–	–		–	
2565	–	–	–	2025	1350	–	–	500	–	–	–		–	

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

*** IAV model mounted upright gives φ=0°. Nose up with respect to φ gives α<0
Booster alone with fins up gives φ=0°

CYLINDRICAL BOOSTER
TBC
DELTA WING ORBITER
GAC
DR#1261 C-3-99



AX - 1234 M-1

BOOSTER - TANK ASSEMBLY ; B, S, V, T,

FIGURE 4. BOOSTER-TANK ASSEMBLY DRAWING

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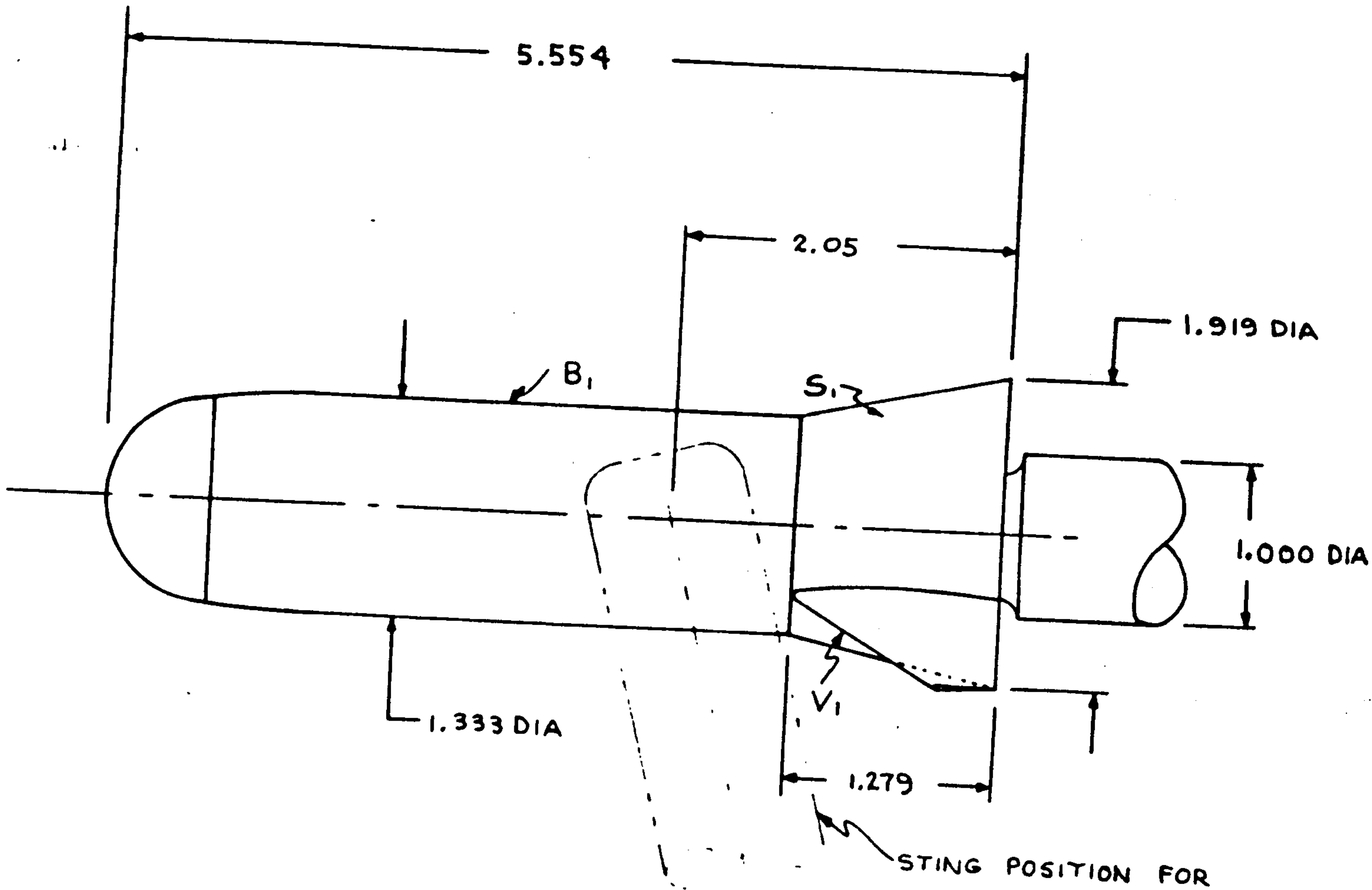


AX - 1234 M - 1

BOOSTER ASSEMBLY ; B_1 S_1 V_1

FIGURE 5. BOOSTER ASSEMBLY DRAWING

CYLINDRICAL BOOSTER
TBC
DELTA WING ORBITER
GAC
DR#1261 C-3- 101

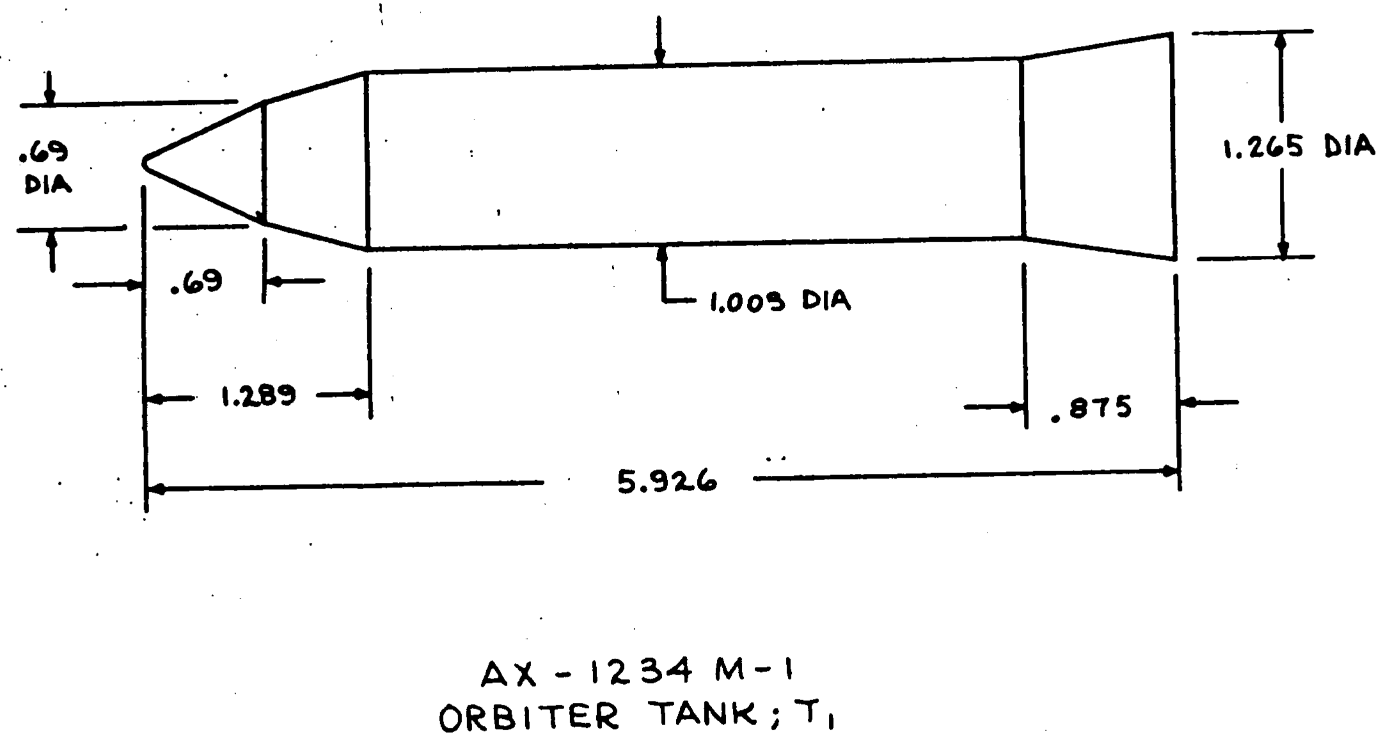
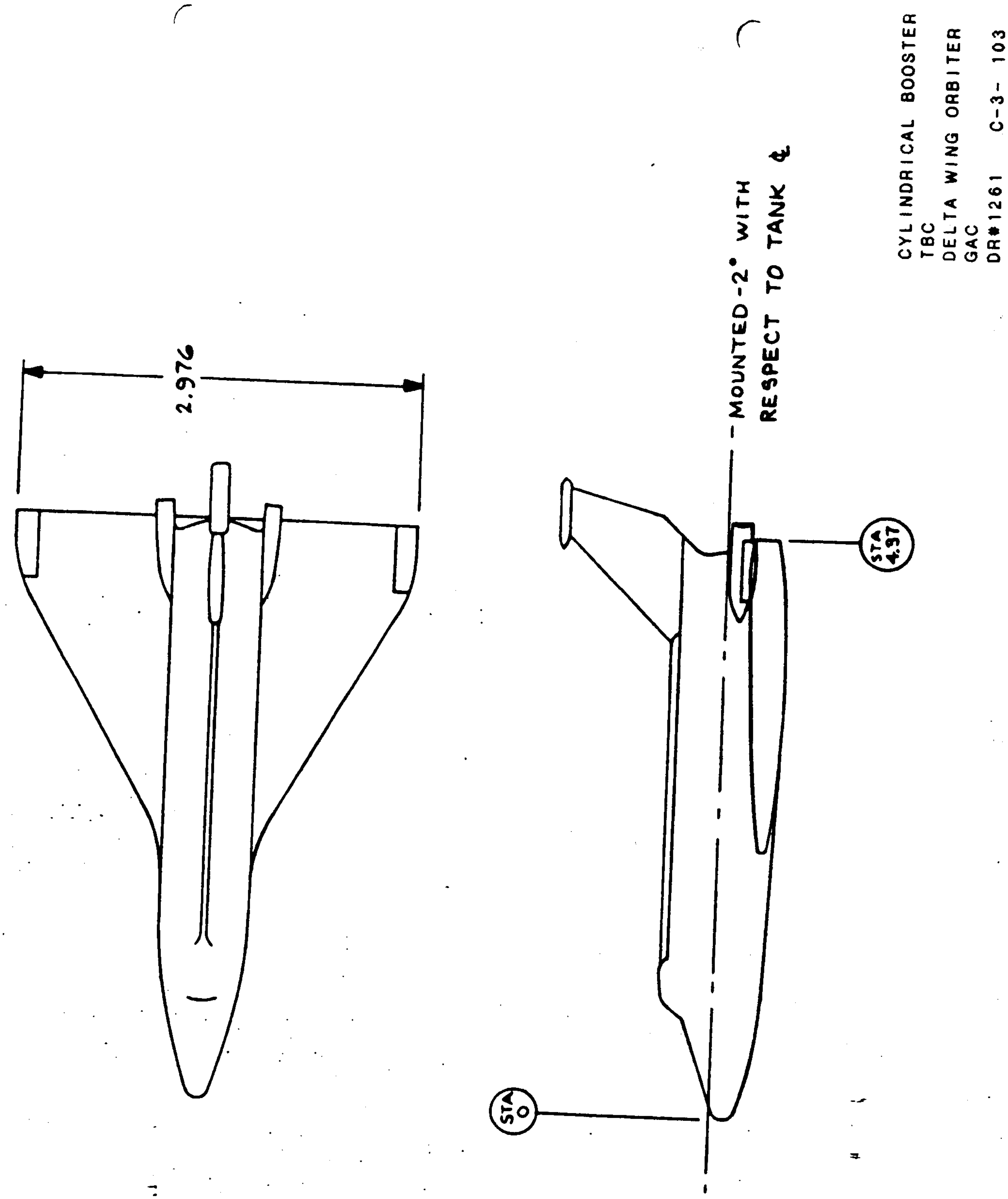


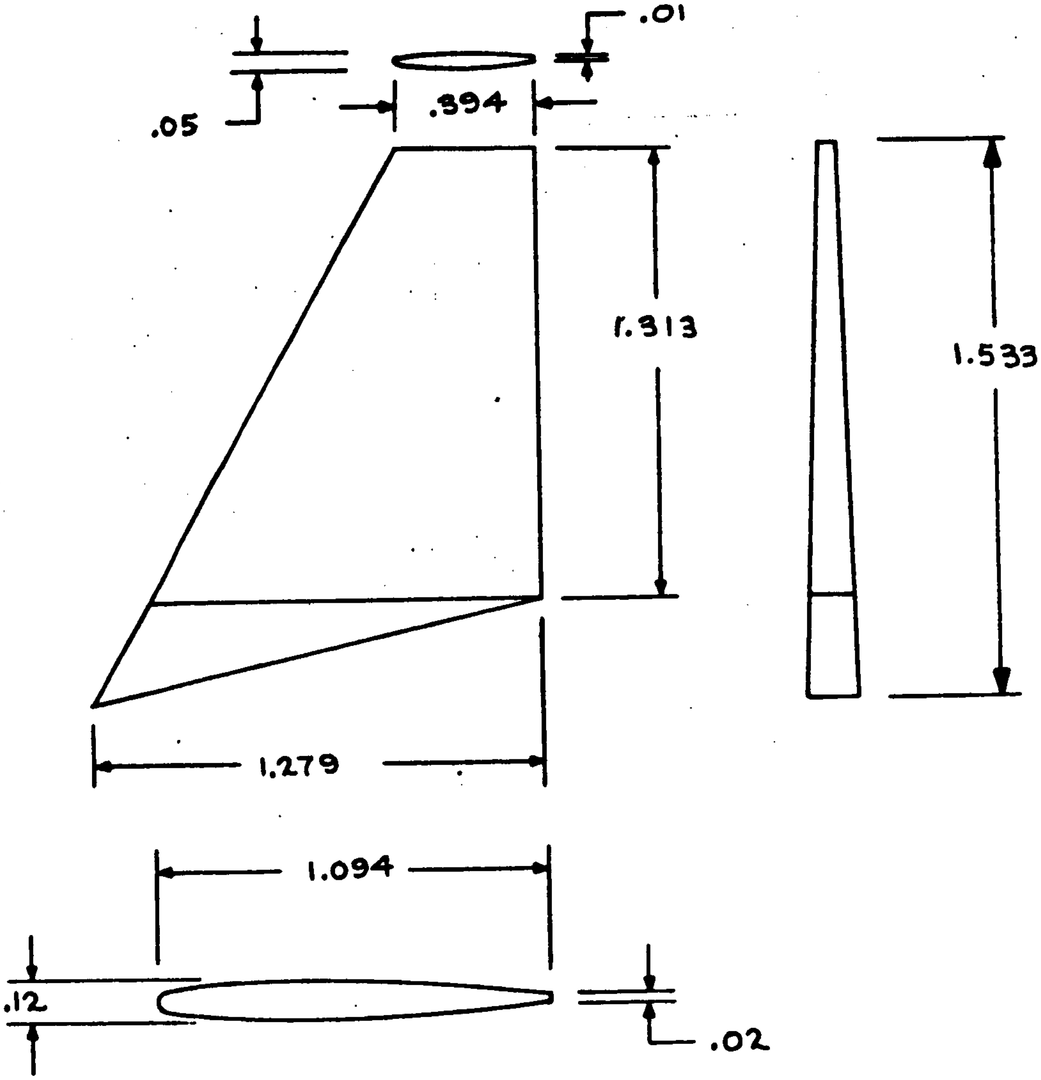
FIGURE 6. ORBITER TANK DRAWING



AX-1234 M-1

040 A ORBITER ; O_1

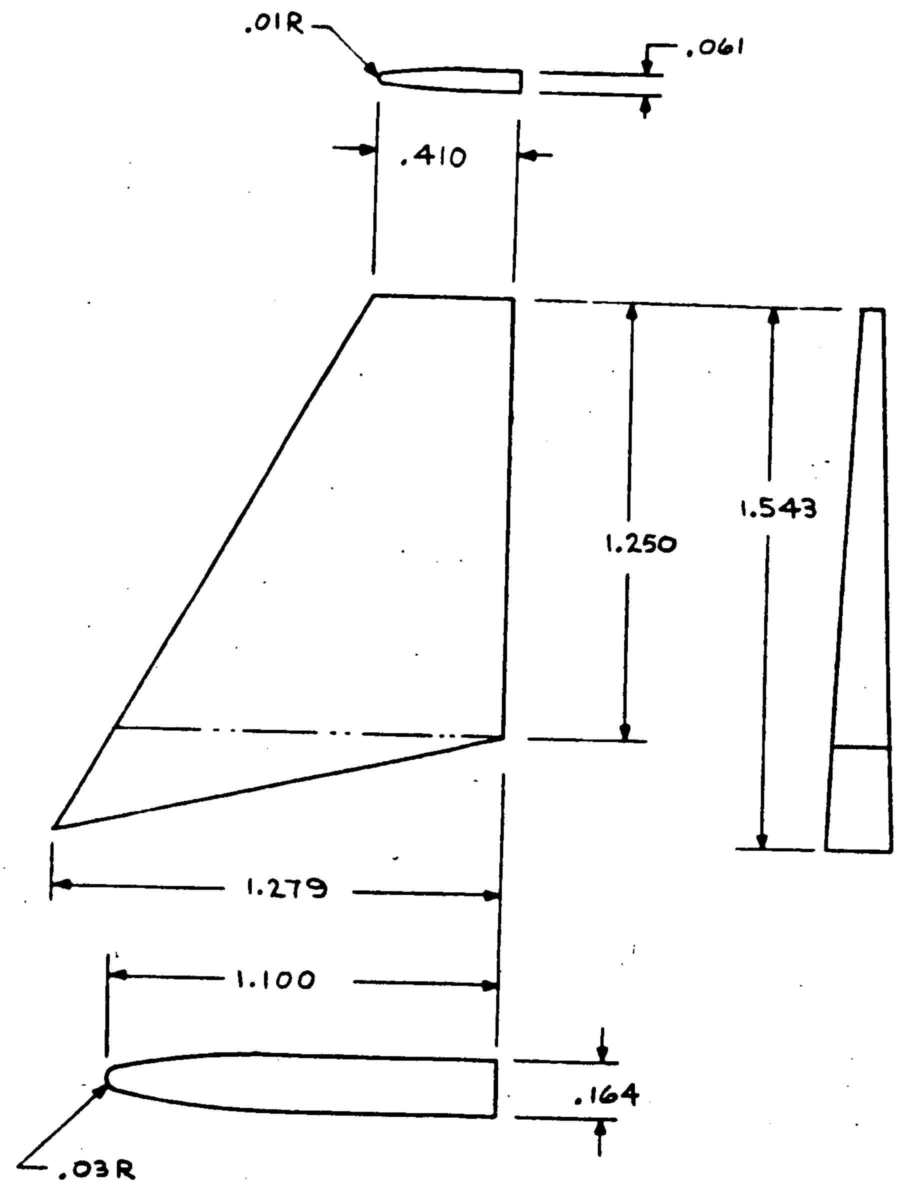
FIGURE 7. 040-A ORBITER DRAWING



AX-1234 M-1
SCALE FIN; V_1

FIGURE 8. SCALE FIN DRAWING

CYLINDRICAL BOOSTER
TBC
DELTA WING ORBITER
GAC
DR#1261 C-3- 105



AX-1234 M-1

FIN; V_1

FIGURE 9. TEST FIN DRAWING

TABLE 4

CYLINDRICAL BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1178 C-3- 106

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET

TEST TITLE: RE-ENTRY HEAT TRANSFER TO ORBITER SURFACES AND INTERFERENCE HEATING DURING LAUNCH, BOOST AND HIGH ALTITUDE ABORT RE-ENTRY

TEST NUMBER: 69 TEST FACILITY: NASA/LRC 31 INCH-CFHT

TEST DATE: June 2-11, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw* / Ttotal	RNX10⁶ / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	Φ	X	Y	Z
8	$(0)_3 T_5$	.0067	10.35	750.0	1818	1.0	.97	N/A	0	0	0			
9				750.5	1834		.95		-5					
10				749.4	1837		.95		0	-5				
11				748.1	1838		.94			0				
12				745.2	1854		.92			+5				
13				754.7	1842		.95		-5	0				
14				753.4	1844		.94		+5					
15				753.3	1846		.94		+10					
16				753.6	1846		.94		+20					
17	$(B)_{2H}\ (b)_3\ A_7\ T_5$			753.9	1821		.97		0					
18				753.5	1840		.95		-5					
19				753.1	1800		.99		0					
20	$(B)_{2H}\ (0)_3\ A_8\ T_5$			755.0	1813		.98							

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

TABLE 4 (CONTINUED)

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET

RE-ENTRY HEAT TRANSFER TO ORBITER SURFACES AND INTERFERENCE

TEST TITLE: HEATING DURING LAUNCH, BOOST AND HIGH ALTITUDE ABORT RE-ENTRY

TEST NUMBER: 69 TEST FACILITY: NASA/LRC 31 INCH-CFHT

TEST DATE: JUNE2-11, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (^oF)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
21	(B)2H $(O)_3A_8\ T_5$	.0067	10.35	754.2	1813	1.0	.98	N/A	-5	0	0			
22	(B)2H $(O)_3A_9\ T_5$			754.7	1807		.98		0					
[illegible]				754.0	[illegible]		[illegible]		-5					
24				753.1	1803		.99		+5					
25	(B)2H $(O)_3A_{10}\ T_5$			753.6	1818		.97		-5					
26				751.6	1817		.97		0					
27				750.5	1824		.96		+5					
28	(B)2H $(O)_3\ A_{11}\ T_5$			749.0	1828		.95		0					
29				753.1	1819		.97		-5					
30	(B)2H $(O)_3\ A_{12}\ T_5$			750.2	1823		.96		0					
31				750.3	1821		.96		-5					
32				749.4	1829		.95		+5					
33	$(O)_3$			749.2	1798		.99		-5					

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} adiabatic wall temperature

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CYLINDRICAL BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1178 C-3- 107

TABLE 4 (CONTINUED)

CYLINDRICAL BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1178 C-3- 108

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET
RE-ENTRY HEAT TRANSFER TO ORBITER SURFACES AND INTERFERENCE

TEST TITLE: HEATING DURING LAUNCH, BOOST AND HIGH ALTITUDE ABORT RE-ENTRY

TEST NUMBER: 69 TEST FACILITY: NASA/LRC 31 INCH-CFHT

TEST DATE: June 2-11, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw* / Ttotal	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
34	(O)3	.0067	10.35	749.2	1798	1.0	.99	N/A	0	0	0			
35				749.3	1799		.98			-5				
36				757.8	1829		.96			+5				
37				754.4	1823		.97		10	0				
38				751.8	1807		.98		20					
39				751.3	1802		.98		27	-5				
40				749.3	1803		.98			0				
41				750.8	1814		.97			+5				
42				751.2	1812		.97		-5	0				
43				754.2	1813		.98		0	-5				
44				751.4	1837		.95			0				
45				751.4	1821		.96			+5				
46				750.2	1816		.97							

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} adiabatic wall temperature

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TABLE 4 (CONTINUED)

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET
RE-ENTRY HEAT TRANSFER TO ORBITER SURFACES AND INTERFERENCE

TEST TITLE: HEATING DURING LAUNCH, BOOST AND HIGH ALTITUDE ABORT RE-ENTRY

TEST NUMBER: 69 TEST FACILITY: NASA/LRC 31 INCH-CFHT

TEST DATE: June 2-11, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	Φ	Camera** Location (in) X	Y	Z
47	$(O)_3$	.0067	10.35	748.3	1828	1.0	.95	N/A	+5	0	0			
48				768.5	1749		1.07		10					
49				751.3	1811		.97		20					
50				753.8	1833		.95		27	-5				
51				750.6	1842		.94			0				
52				751.8	1849		.94			+5				
54				761.9	1777		1.03		40	0				
55				771.2	1756		1.06		45					
57				777.1	1737		1.10							
58				768.0	1728		1.09		40					

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

CYLINDRICAL BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1178 C-3- 109

CYLINDRICAL BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1178 C-3- 110

TABLE 5

OIL FLOW TEST DATA SUMMARY SHEET

TEST TITLE: RE-ENTRY HEAT TRANSFER TO ORBITER SURFACES AND INTERFERENCE HEATING DURING LAUNCH, BOOST AND HIGH ALTITUDE ABORT RE-ENTRY

TEST NUMBER: 69 TEST FACILITY: NASA/LRC 31 INCH-CFHT

TEST DATE: June 2-11, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	$\frac{T_{aw}}{T_{total}}$ *	$RN X 10^6$ / Ft	Phase Change Temp. (^oF)	Model Position (degrees) α	β	Φ	Camera** Location (in) X	Y	Z
59	$(0)_3 T_5$	.0067	10.35	750	1820	N/A	1.0	N/A	0	0	0			
60														
61									10					

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

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TABLE 6

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: RE-ENTRY HEAT TRANSFER TO ORBITER SURFACES AND INTERFERENCE HEATING DURING LAUNCH, BOOST AND HIGH ALTITUDE ABORT RE-ENTRY

TEST NUMBER: 69 TEST FACILITY: NASA/LRC 31 INCH-CFHT

TEST DATE: June 2-11, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (^oR)	$\frac{T_{aw}}{T_{total}}$ *	RNX10^6 Ft	Phase Change Temp. (^oF)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
64	$(0)_3\ T_5$	.0067	10.35			1.0		250	0	0	RWD			
65								150 450 LT			LWD			
66								325			RWD			
68								150						
69								250 150 RT			LWD			
70								150	10		0			
71								250 125 LT	0					
72								150 325 LT	20					
73	$(B)_{2H}\ (0)_3\ A_7\ T_5$							250	0					
74								150						
75	$(0)_3$							125						
76	$(B)_{2H}\ (0)_3\ A_8\ T_5$							150						
77	$(B)_{2H}\ (0)_3\ A_{10}\ T_5$							150						

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

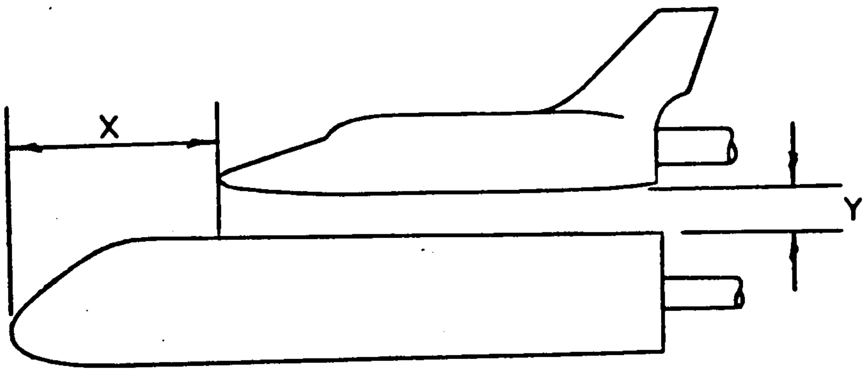
* T_{aw} adiabatic wall temperature

RWD = Right wing down
LWD = Left wing down
LT = Left tank
RT = Right tank

CYLINDRICAL BOOSTER
TBC
UNIQUE CONFIGS. ORBITER
GAC
DR#1178 C-3- 111

CONFIGURATION DESCRIPTION (CONTINUED)

The attachment points designated by A_x were as follows:



	X(IN)	Y(IN)	ORBITER-BOOSTER ORIENTATION
A_7	4.286	.160	belly to back
A_8	3.006	.160	belly to back
A_9	4.286	.080	belly to belly
A_{10}	4.286	.160	belly to belly
A_{11}	3.006	.160	belly to belly
A_{12}	4.286	0	belly to belly

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PHASE-CHANGE-COA TING TEST DATA SUMMARY SHEET
Table 1

TEST TITLE: Space Shuttle Booster/Orbiter Mated-Model Heat Transfer Wind Tunnel Runs

TEST NUMBER: 137-146, 189-192 **TEST FACILITY:** Mach 8 Variable Density Hypersonic Wind Tunnel

TEST DATE: 19, 25 August 1970 **TEST ENGINEER:** W. R. Ginsky/R. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									α	β	ϕ	X	Y	Z
1	B11/01 (Baseline Orbiter Position)	.0035	7.84	265	1302	0.9	1.353	250	0°	0°	0°			
2	B11/01 (Baseline Orbiter Position)		7.84	265	1357		1.265	150						
3	B11/01 (Aft Orbiter Position)		7.84	265	1395		1.210	200						
4	B11/01 (Fwd Orbiter Position)		7.84	265	1390		1.217	200						
5	B11/01 (Fwd Orbiter Position)		7.95	990	1430		4.198	300						
6	B11/01 (Aft Orbiter Position)		7.95	965	1495		3.808	300						
7	B11/01 (Baseline Orbiter Position)		7.95	955	1470		3.873	300						
8	B11/01 (Baseline Orbiter Position)		7.95	965	1460		3.957	300	-5°					
9	B11/01 (Baseline Orbiter Position)		7.84	266	1380		1.231	200	-5°					
10	B11/02 (Baseline Orbiter Position)		7.84	265	1385		1.224	150	0°					
11	B11/02 (Baseline Orbiter Position)		7.95	955	1535		3.612	250	0°					
12	B11/02 (Baseline Orbiter Position)		7.84	265	1335		1.299	150	-5°					
13	B11/02 (Baseline Orbiter Position)		7.95	945	1515		3.650	250	-5°					

** X axis parallel to stream (+ downstream, - upstream)
Y axis (+ right, - left, as viewed from the rear)
Z axis (+ up, - down)

* T_{aw} = adiabatic wall temperature

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1032 C-3- 113

PHASE-CHANGE-CO..ING TEST DATA SUMMARY SHEET
Table 2

TEST TITLE: Space Shuttle Booster/Orbiter Mated-Model Heat Transfer Wind Tunnel Runs

TEST NUMBER: 193-205 **TEST FACILITY:** Mach 8 Variable Density Hypersonic Wind Tunnel

TEST DATE: 26, 27 August 1970 **TEST ENGINEER:** W. R. Ginsky/R. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	$RNX10^6$ / Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in.)		
									α	β	φ	X	Y	Z
14	B2/02 (Baseline Orbiter Position)	.0035	7.95	965	1490	0.9	3.829	250	0°	0°	0°			
15	B2/01 (Baseline Orbiter Position)		7.95	965	1520		3.708	250						
16	01		7.84	265	1365		1.253	125						
17	01		7.95	965	1490		3.829	175						
18	02		7.84	265	1335		1.299	125						
19	02		7.95	965	1470		3.914	175						
20	02		7.84	265	1380		1.231	125	-5°					
21	02		7.95	965	1485		3.850	175						
22	01		7.84	265	1405		1.196	125						
23	01		7.95	965	1495		3.808	175						
24	B11		7.84	265	1400		1.203	125						
25	B11		7.95	965	1500		3.788	175						
26	B11		7.84	265	1385		1.224	109	0°					

** X axis parallel to stream (+ downstream, - upstream)
Y axis (+ right, - left, as viewed from the rear)
Z axis (+ up, - down)

* T_{aw} = adiabatic wall temperature

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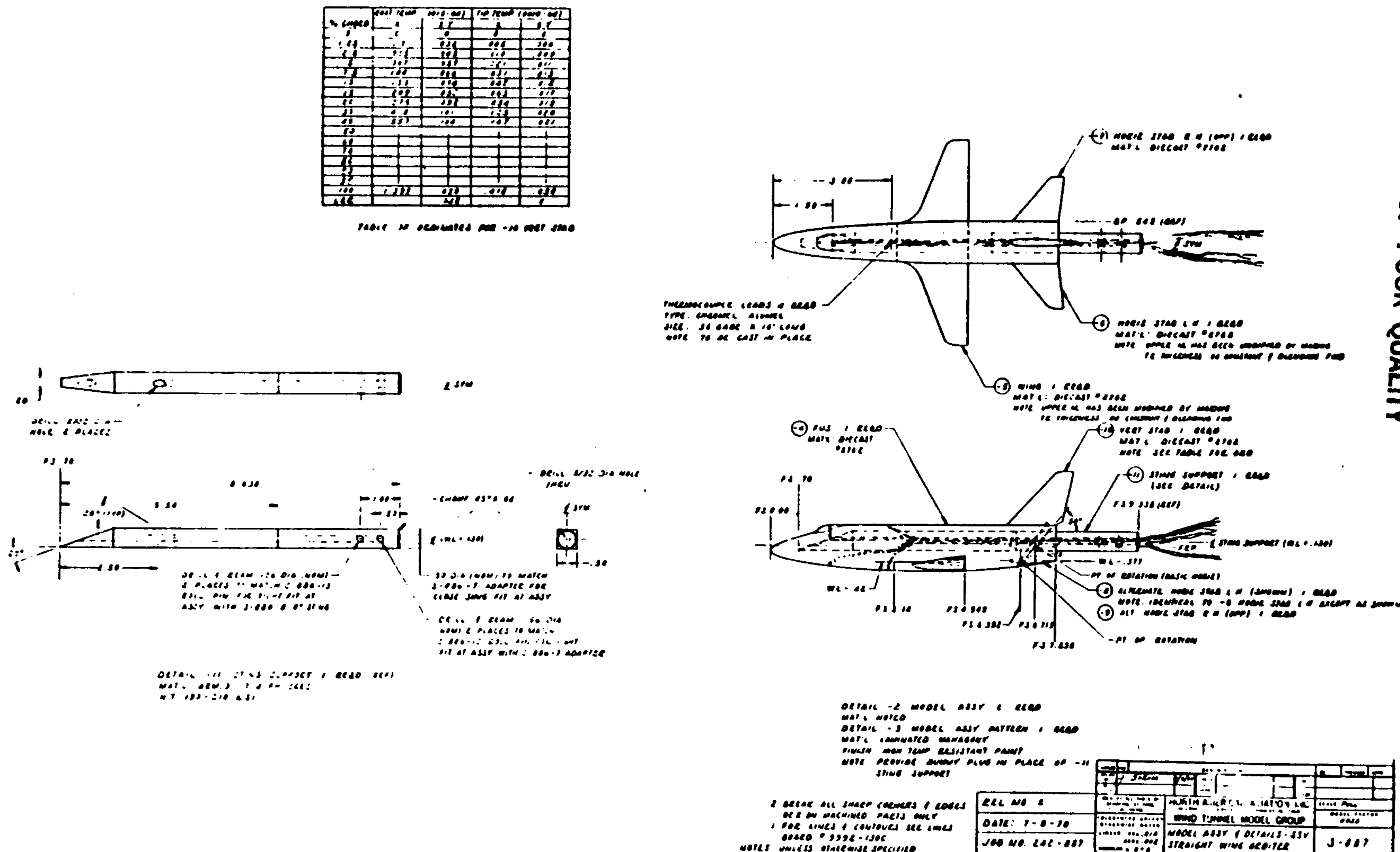

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Figure 3

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1032 C-3- 115

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1032   C-3- 116

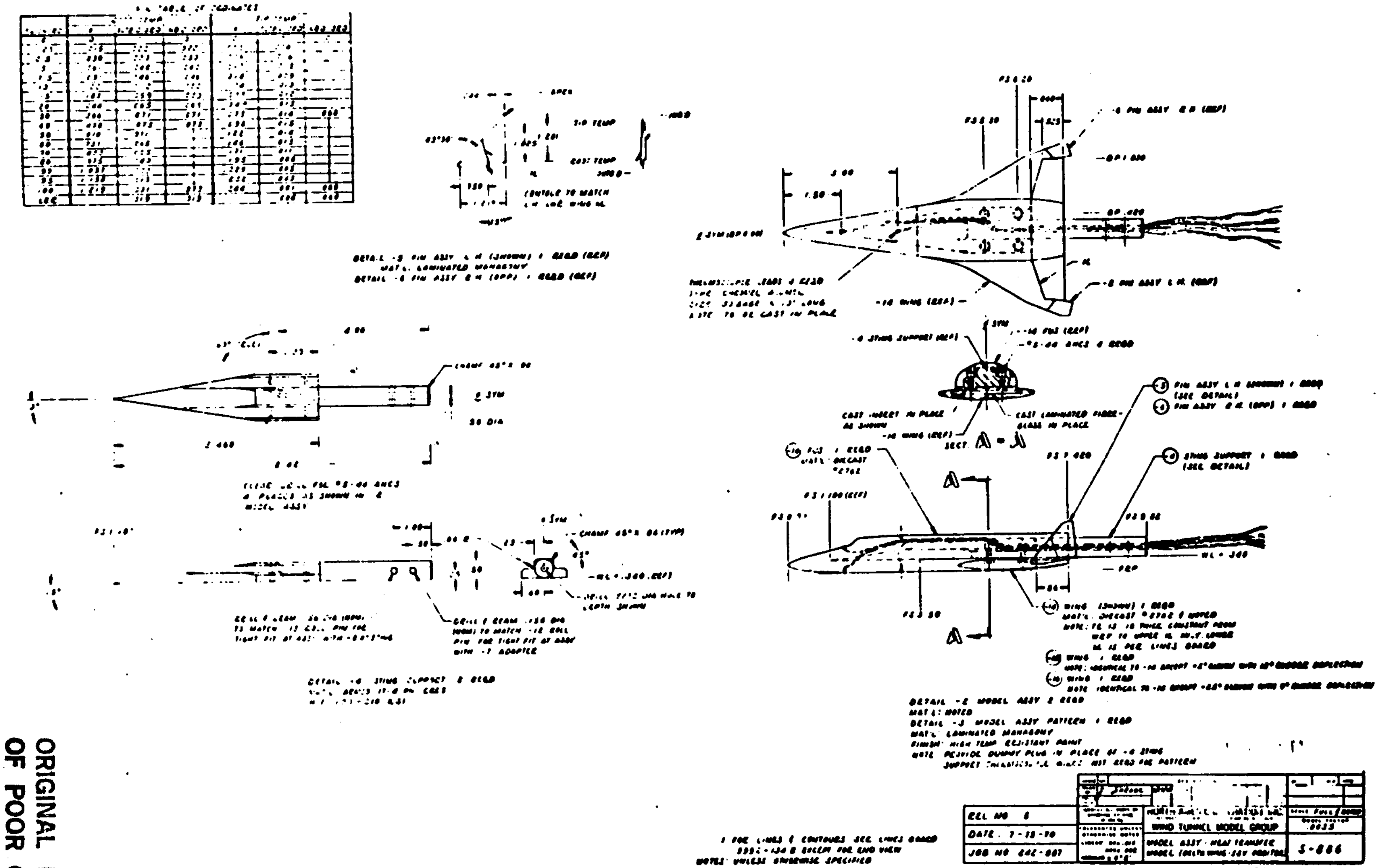

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Figure 4

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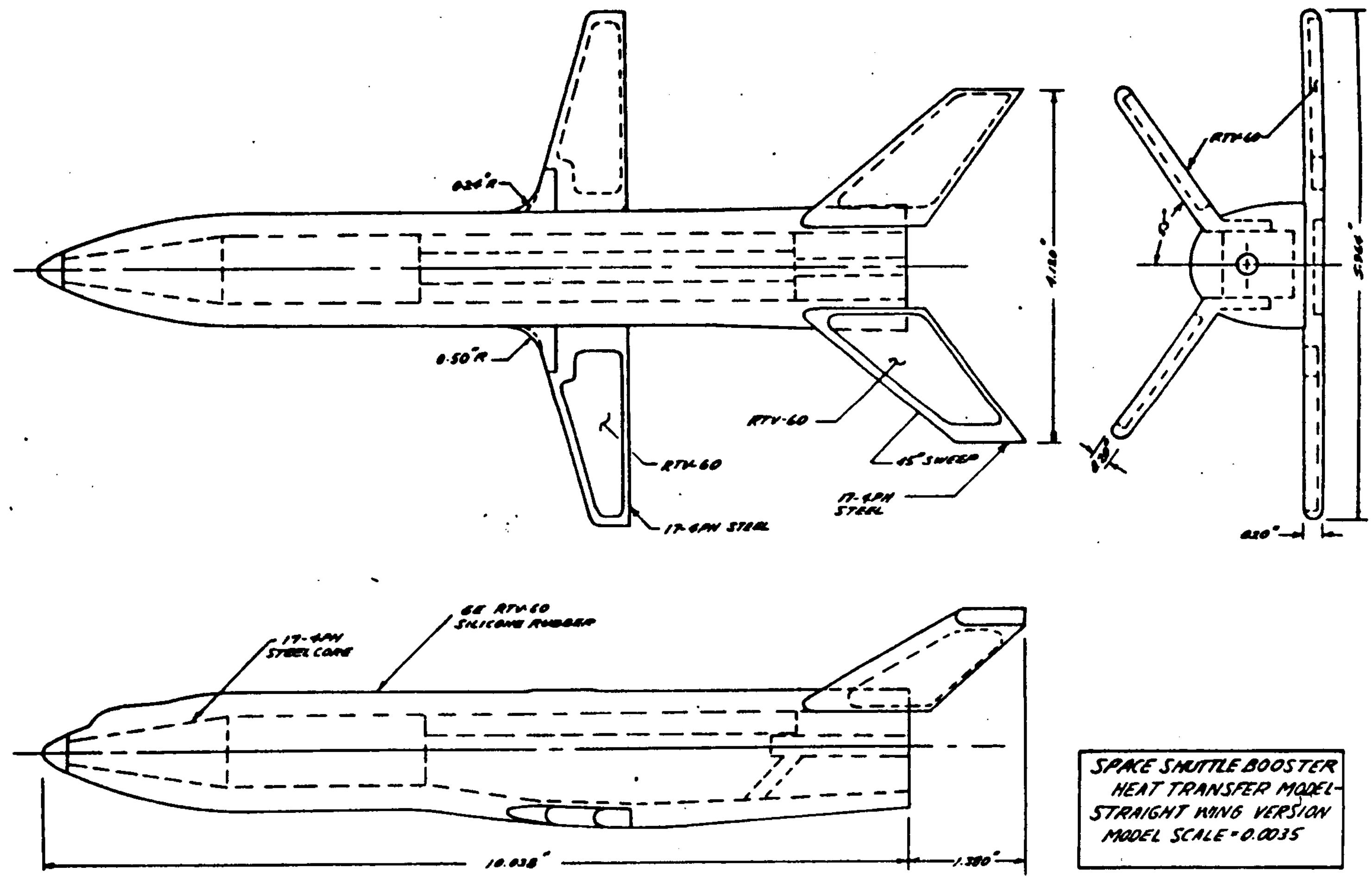

SPACE SHUTTLE BOOSTER
HEAT TRANSFER MODEL-
STRAIGHT WING VERSION
MODEL SCALE = 0.0035

Figure 1.

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1032 C-3- 117

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1032 C-3- 118

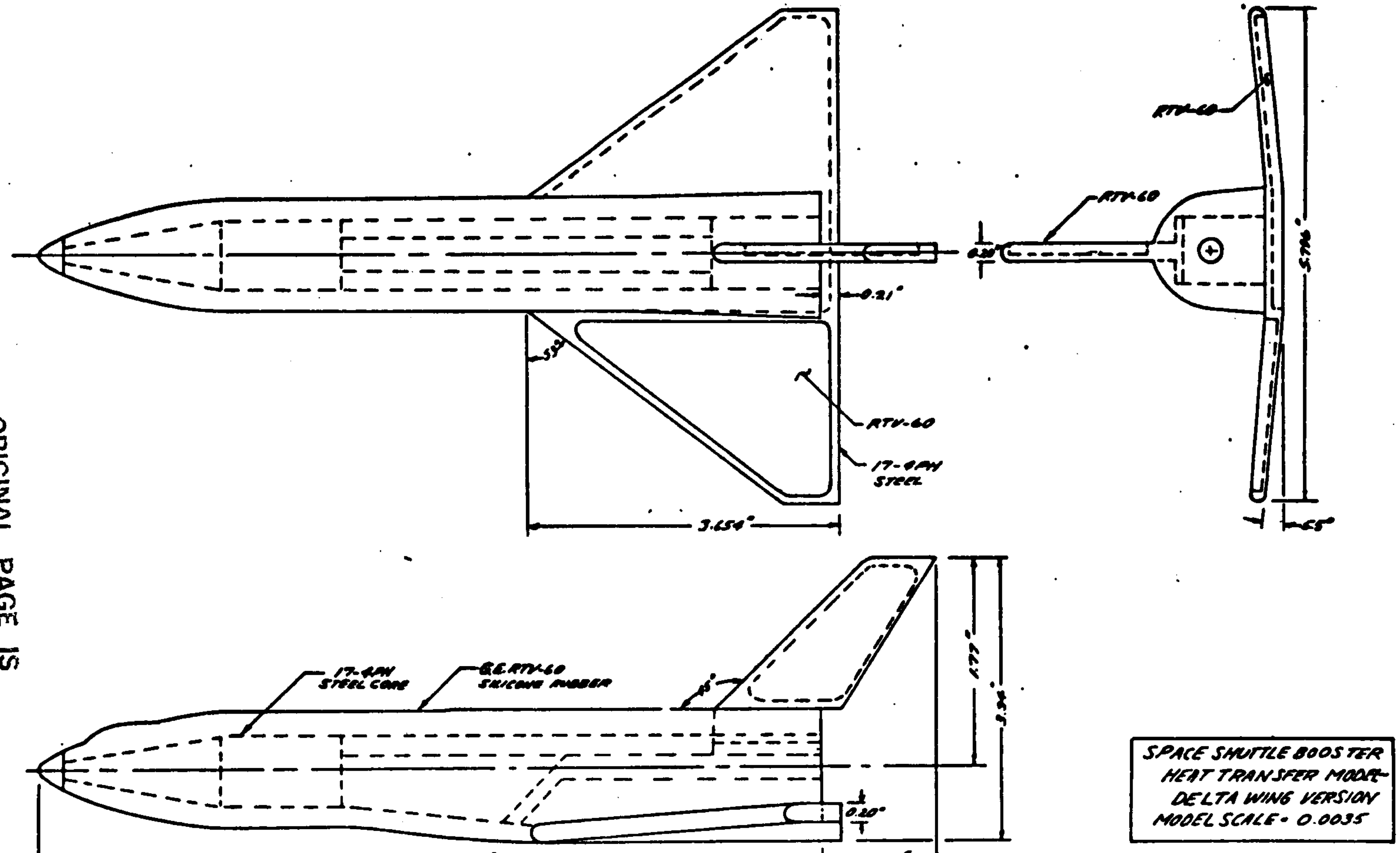

Figure 2

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1098 C-3- 119

Table 16. Test Data Summary - Heat Transfer Runs

Run/ Point	Configu-ration	M_∞	P_o (psfa)	T_o (°R)	Re_∞ $\times 10^{-6}$/ft	α (deg)	β (deg)	Orbiter Position (In)	Orbiter-Booster Gap (In.)	Remarks
9/2	B2+O2	2.5	4918	722	4.59	0	0	1.34	0.02	
9/3		2.5	4899	727	4.53	-5				
9/4		2.5	2709	721	2.54	0				
9/5		2.5	2715	715	2.56	-5				
9/6		3.7	9889	721	4.81	0				
9/7		3.7	9918	715	4.90	-5				
9/8		3.7	5041	714	2.49	0				
9/9		3.7	5013	709	2.50	0				Repeat of 9/8
9/10		3.7	4994	705	2.51	-5			0.02	
10/2		2.5	4903	724	4.56	0			0.14	
10/3		2.5	2690	716	2.54	-5				
10/4		3.7	9912	717	4.86	0				
10/5		3.7	5007	714	2.48	-5		1.34	0.14	
11/2		2.5	4897	722	2.57	0		0.0	0.02	
11/3		2.5	2672	715	2.53	-5				
11/4		3.7	9960	714	4.93	0				
11/5		3.7	5017	714	2.48	-5		0.0		
12/2		2.5	4910	724	4.56	0		2.5		
12/3		2.5	2686	725	2.49	-5				
12/4		3.7	9929	719	4.86	0				
12/5	B2+O2	3.7	5005	713	2.48	-5		2.5	0.02	
13/2	B2	2.5	4922	724	4.57	0		-	-	
13/3			4893	724	4.55	-5		-	-	
13/4			2684	724	2.49	0		-	-	
13/5		2.5	2685	717	2.53	-5		-	-	
13/6		3.7	9808	715	4.85	0		-	-	
13/7			9874	710	4.92	-5		-	-	
13/8			5064	706	2.54	0		-	-	
13/9	B2	3.7	5035	707	2.53	-5		-	-	
14/2	O2	2.5	4914	723	4.58	0		-	-	
14/3			4905	726	4.54	-5		-	-	
14/4			2680	723	2.50	0		-	-	
14/5		2.5	2682	721	2.51	-5		-	-	
14/6		3.7	9906	709	4.94	0		-	-	
14/7			9905	709	4.93	-5		-	-	
14/8			4980	708	2.50	0		-	-	
14/9	O2	3.7	4980	702	2.52	-5		-	-	
15/2	O1	2.5	4905	722	4.58	0		-	-	
15/3			4905	720	4.60	-5		-	-	
15/4			2665	718	2.51	0		-	-	
15/5		2.5	2686	718	2.53	-5		-	-	
15/6		3.7	9905	717	4.85	0		-	-	
15/7			9905	718	4.85	-5		-	-	
15/8			4990	713	2.47	0		-	-	
15/9	O1		5000	709	2.49	-5		-	-	
16/2	B2+O1		5008	710	2.49	0		1.43	0.02	
16/3		3.7	5017	713	2.48	-5				
16/4	B2+O1	2.5	2696	713	2.56	0				
16/5	B2+O1	2.5	2698	714	2.56	-5	0	1.43	0.02	

B2 = Delta Wing Booster, O1 = Straight Wing Orbiter, O2 = Delta Wing Orbiter

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1098 C-3-120

Table 17. Test Data Summary - Schlieren and Shadowgraph Runs

Run/Point	Configuration	M_∞	P_o (psia)	T_o (°R)	$Re_\infty \times 10^{-6}$/ft	α (deg)	β (deg)	Orbiter Position (in.)	Orbiter-Booster Gap (in)	Remarks: Schlieren	Remarks: Shadowgraph
1/630 & 631	B2	2.5	2550	610	3.0	0	0	-	-	Side View	No. 2
1/628 & 629	B2	3.7	4790					-	-	Side View	No. 1
2/635 & 636	B2	3.7	4790					-	-	Top View	
3/643 & 644	O2	2.5	2550					-	-	Side View	
3/645 & 646	O2	2.5	2550					-	-	Top View	
3/639 & 640	O2	3.7	4790					-	-	Side View	No. 4
3/641 & 642	O2	3.7	4790					-	-	Top View	
4/648 & 649	O1	2.5	2550					-	-	Side View	
4/650 & 651	O1	2.5	2550					-	-	Top View	No.3 & 5
4/652 & 653	O1	3.7	4790					-	-	Side View	
4/654 & 655	O1	3.7	4790					-	-	Top View	No.6 & 7
5/671 & 678	B2+O1	2.5	2550			0		1.43	0.02	Side View	No. 11
5/672 & 677		2.5				-5				Side View	No. 12
5/673 & 676		2.5				-5				Top View	
5/674 & 675		2.5	2550			0				Top View	
5/658 & 665		3.7	4790			0				Side View	No.8&9
5/659 & 664		3.7	4790			-5				Side View	No. 10
5/660 & 663		3.7	4790			-5				Top View	
5/661 & 662		3.7	4790			0		1.43		Top View	
6/680 & 683		2.5	2550			0		2.50		Side View	No. 13
6/681 & 682		2.5	2550			0		2.50		Top View	
6/684 & 687		3.7	4790			0		2.50		Side View	No.14&15
6/685 & 686		3.7	4790			0		2.50		Top View	
7/692 & 693		2.5	2550			0		0.0		Side View	No. 16
7/694 & 695		2.5	2550			0		0.0		Top View	
7/696 & 697		3.7	4790			0		0.0		Side View	No. 17
7/698 & 699	B2+O1	3.7	4790			0		0.0		Top View	No.18&19
8/713 & 720	B2+O2	2.5	2550			0		1.34		Side View	No. 23
8/714 & 719		2.5	2550			-5				Side View	No. 22
8/716 & 717		2.5	2550			0				Top View	
8/715 & 718		2.5	2550			-5				Top View	
8/705 & 712		3.7	4790			0				Side View	No. 20
8/706 & 711		3.7	4790			-5				Side View	No. 21
8/708 & 709		3.7	4790			0				Top View	
8/707 & 710		3.7	4790			-5		1.34		Top View	
17/2 & 3		2.5	2550			0		0.0		Side View	No. 24
17/4 & 5		2.5	2550							Top View	
17/8 & 9		3.7	4790							Side View	No. 25
17/6 & 7		3.7	4790					0.0		Top View	
18/1 & 2		2.5	2550					2.5		Side View	No.26&27
18/3 & 4		2.5	2550							Top View	
18/5 & 6		3.7	4790							Side View	No.28&29
18/7 & 8	B2+O2	3.7	4790	610	3.0	0	0	2.5	0.02	Top View	No. 30

B2 = Delta Wing Booster, O1 = Straight Wing Orbiter, O2 = Delta Wing Orbiter

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1098 C-3- 121

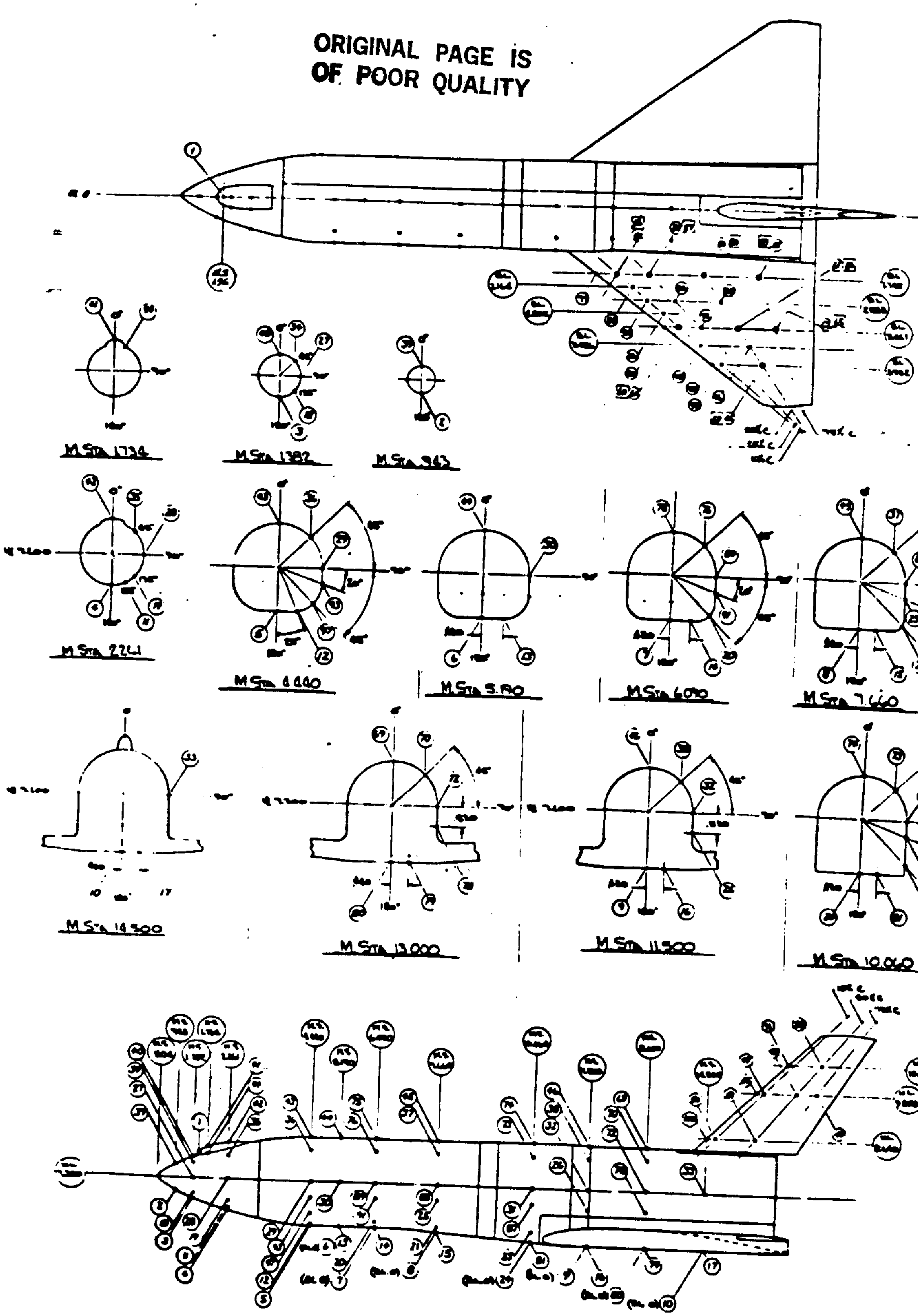

Figure 5. Thermocouples Location - Delta Wing Booster Model

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1098 C-3- 122

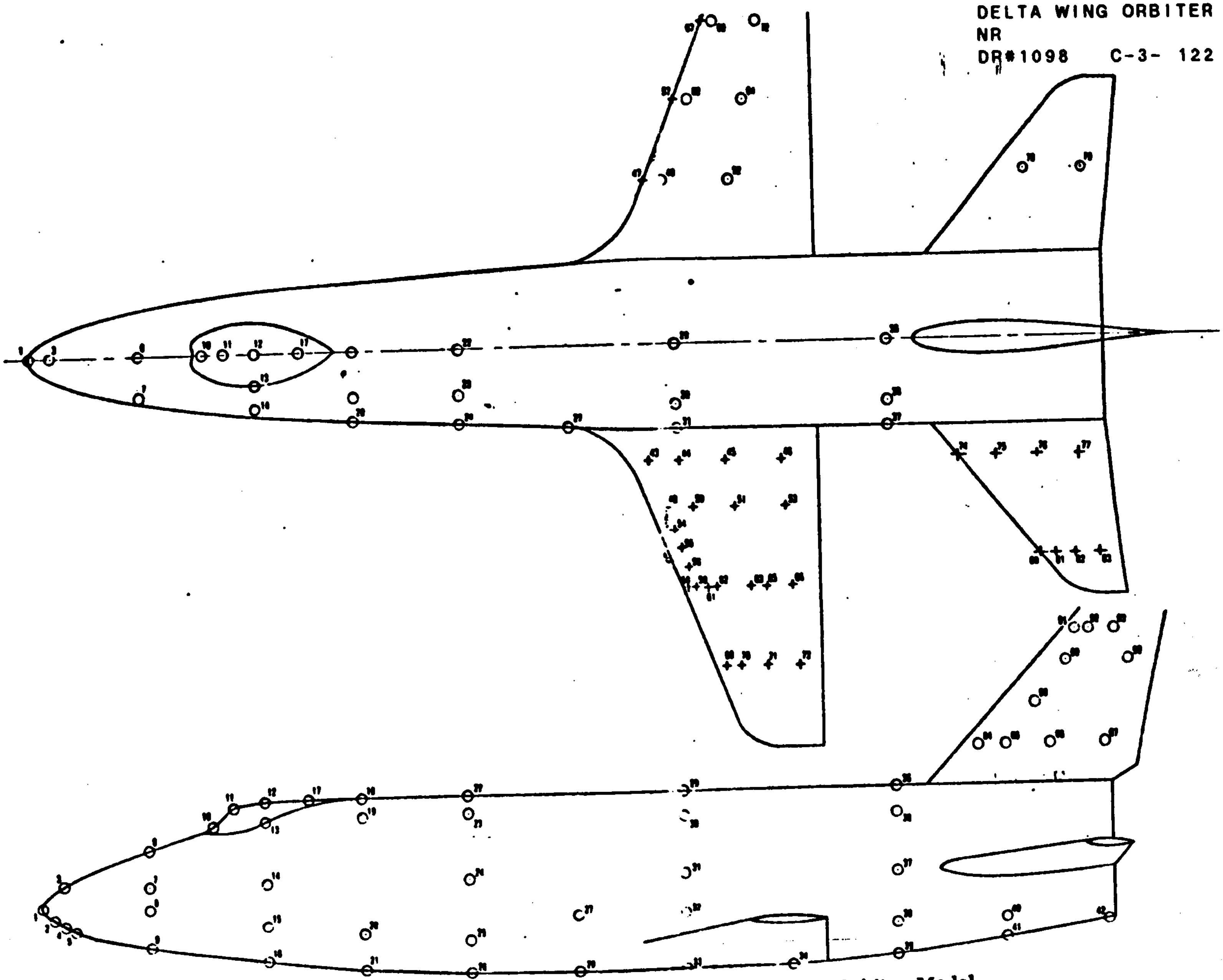

Figure 6. Thermocouples Location - Straight Wing Orbiter Model

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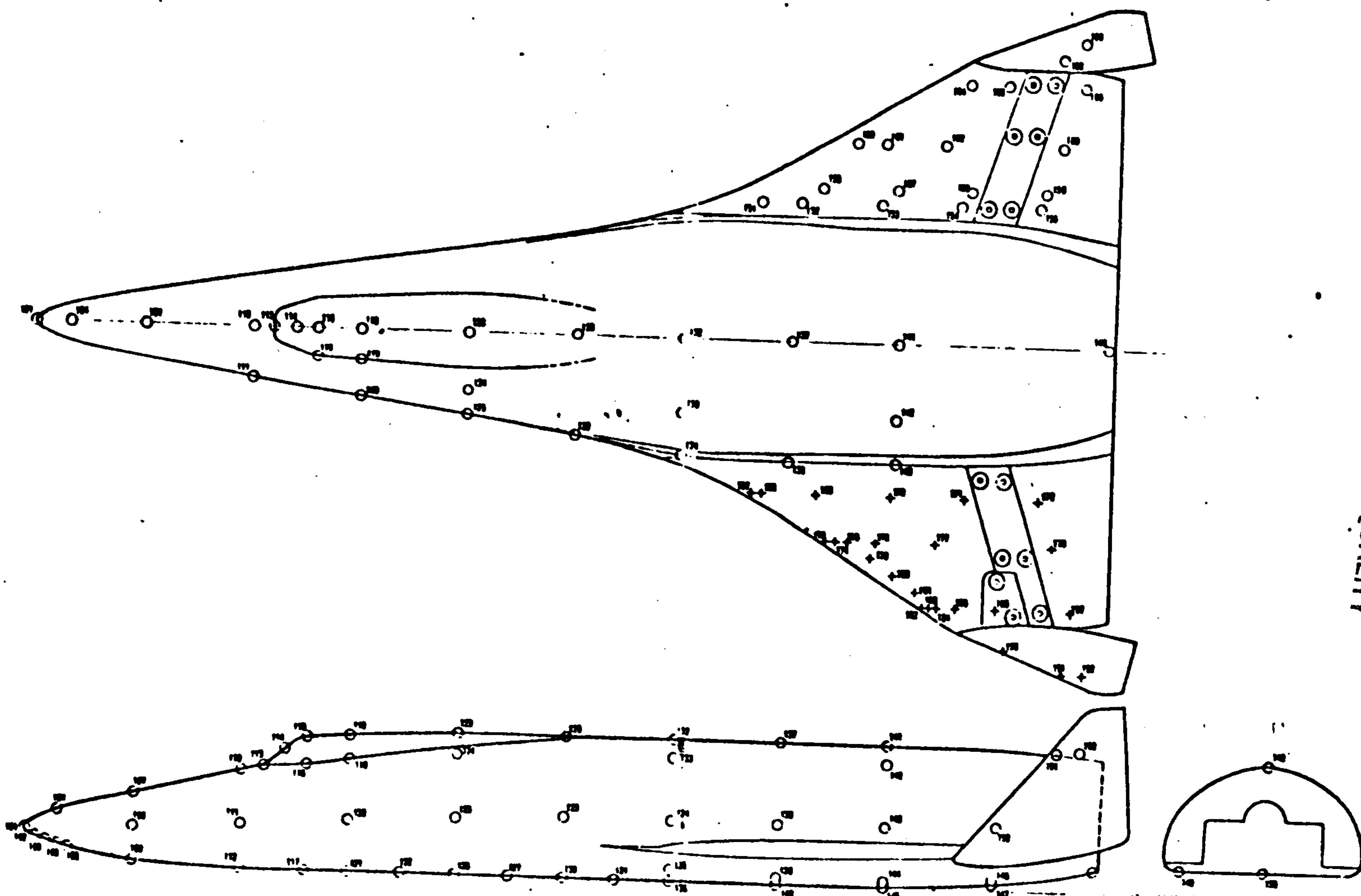

Figure 7. Thermocouples Location - Delta Wing Orbiter Model

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1098 C-3- 123

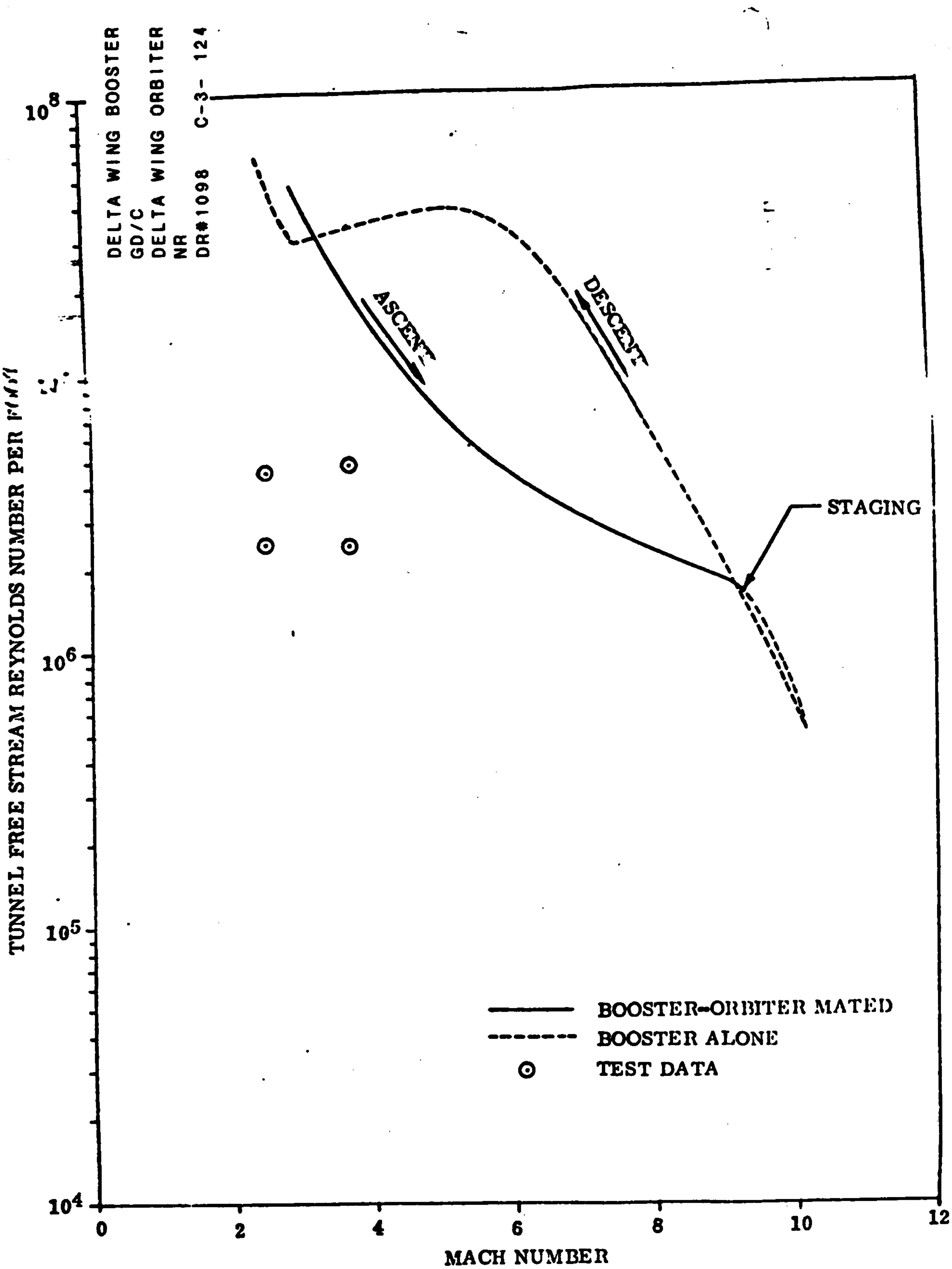

Figure 13. Space Shuttle Booster-Orbiter and Booster Mach Number and Reynolds Number Simulation (0.006 Scale Model)

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Table 7.
PHASE CHANGE COATING TEST DATA SUMMARY

Tunnel Run Number	Configuration *	RN/ft x 10^6	Free Stream Mach No.	Angle of Attack, deg.	Body Flap	Canard Position deg**	Phase Change Temp, °F	Total Temperature, °F	Total Pressure PSIA	Camera Designation Side	Camera Designation Top	Camera Designation Bottom	T_{aw}/T_{total}	Test Duration sec.	$h_{r=1}$, BTU/ft^2 sec °R
1237	B	6.3	7.95	50	-	0	450	985	1490	1		2	0.939	6.5	0.1570
1238	C	6.5		50	-	0	450	975	1530	1		2	0.939	7.0	0.1516
1239	B	6.5		50	-	0	700	950	1480	1		2	0.939	6.5	0.1560
1240	C	6.5		50	-	0	700	960	1505	1		2	0.939	6.5	0.1501
1241	B	6.4		50	On	-10	550	960	1475	1		2	0.939	6.7	0.1557
1242	B	6.9		60	-	0	450	930	1530	1		2	0.964	6.7	0.1588
1243	C	6.5		60	-	0	450	950	1485	1		2	0.964	6.7	0.1491
1244	B	6.3		60	-	0	700	970	1485	1		2	0.964	6.6	0.1565
1245	C	6.6	7.95	60	-	0	700/138	965	1535	1		2	0.964	6.7	0.1516
1246	AO	2.2	7.92	0	-	0	138	890	465	1		2	0.853	12.5	0.0766
1247	C	6.5	7.95	20	-	0	200	950	1490	1		2	0.870	6.5	0.1492
1248	AO	3.8	7.95	0	-	0	200	910	830	1		2	0.853	6.6	0.1016
1249	E	6.5		20	-	-	200	945	1475	1		2	0.870	6.3	0.1348
1250	C	6.6		20	-	0	350	950	1500	1		2	0.870	6.5	0.1501
1251	AO	6.7		0	-	0	300	940	1505	1		2	0.853	6.8	0.1364
1252	AO	2.3	7.92	0	-	0	300	870	465	1		2	0.853	12.4	0.0770
1253	E	6.7	7.95	20	-	-	350	950	1530	1		2	0.870	6.7	0.1377
1254	AO	4.5		0	-	0	450	785	830	1		2	0.853	10.3	0.1014
1255	C	6.5		20	-	0	550	950	1490	1		2	0.870	7.2	0.1491
1256	AO	3.8		0	-	0	200	910	825	1		2	0.853	10.9	0.1015
1257	E	6.5		20	-	-	550	960	1490	1		2	0.870	8.6	0.1355
1258	AO	6.5		0	-	0	550	965	1510	1		2	0.853	9.3	0.1365
1259	A	6.4		0	-	0	138	970	1500	1		2	0.853	8.5	0.1356
1260	A	6.5		0	-	0	300	955	1500	1		2	0.853	8.5	0.1363
1261	A	6.8		20	-	-	300	920	1490	1		2	0.870	7.4	0.1361
1262	C	6.7		40	-	0	450	940	1505	1		2	0.914	7.8	0.1500
1263	E	7.1		40	-	-	350	915	1545	1		2	0.914	7.5	0.1386
1264	B	6.5		40	On	-10	550	955	1490	1		2	0.914	4.1	0.1565
1265	E	6.7		40	-	-	550	960	1540	1		1	0.914	7.6	0.1378
1266	C	6.5		40	-	0	700	970	1515	1		2	0.914	6.6	0.1507
1267	B	6.3		40	On	-20	700	985	1500	1		2	0.914	4.5	0.1574
1268	A	6.5		20	-	0	550	975	1510	1		2	0.870	7.3	0.1368
1269	A	6.7		30	-	0	300	940	1505	1		2	0.890	6.3	0.1364

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1145 C-3- 125

Table 7 (Cont'd)
PHASE CHANGE COATING TEST DATA SUMMARY

Tunnel Run Number	Configuration *	RN/ft x 10^6	Free Stream Mach No.	Angle of Attack, deg.	Body Flap	Canard Position deg **	Phase Change Temp, °F †	Total Temperature, °F	Total Pressure PSIA	Camera Designation Side	Camera Designation Top	Camera Designation Bottom	T_{aw}/T_{total}	Test Duration, sec.	$h_{r=1}$, BTU/ft² sec °R
1270	E	6.7	7.95	50	-	-	450	935	1510	1		2	0.939	6.5	0.1366
1271	A	6.5	7.95	30	-	0	700	970	1510	1		2	0.890	6.4	0.1366
1272	E	6.4	7.95	50	-	-	700	965	1490	1		2	0.939	6.3	0.1357
1273	B	1.2	7.83	50	On	-20	550	810	215	1		2	0.939	9.1	0.0632
1274	A	6.6	7.95	40	-	0	450	935	1485	1		2	0.914	7.2	0.1354
1275	B	1.1	7.80	60	On	-10	450	810	198	1		2	0.964	9.1	0.0614
1276	E	6.4	7.95	60	-	-	550	970	1500	1		2	0.964	6.7	0.1361
1277	A	6.5	7.95	40	-	0	700	950	1490	1		2	0.914	6.7	0.1355
1278	B	6.7	7.95	60	On	-20	700	925	1490	1		2	0.964	4.8	0.1567
1279	E	1.2	7.82	60	-	-	350	810	210	1		2	0.964	12.6	0.0544
1280	E	1.1	7.80	60	-	-	200	815	198	1		2	0.964	9.5	0.0531
1281	A	6.5	7.95	40	-	-20	138/350	960	1500	1	2		0.853	0	-
1282	B	6.6	7.95	60	-	-30	150	940	1490	1	2		0.853	9.1	0.1559
1283	C	6.5	7.95	60	-	-30	138/350	955	1500	1	2		0.853	6.3	0.1492
1284	C	6.9	7.95	60	-	-10	175/350	925	1525	1	2		0.853	6.8	0.1509
1285	B	6.6	7.95	50	-	-20	150	935	1490	1	2		0.853	8.3	0.1560
1286	E	6.7	7.95	50	-	-	103	930	1500	1	2		0.853	8.0	0.1352
1287	C	6.6	7.95	50	-	-10	175/450	940	1500	1	2		0.853	6.0	0.1567
1288	E	3.9	7.95	50	-	-	103	890	825	1	2		0.853	7.1	0.1011
1289	C	6.5	7.95	50	-	-20	138/550	960	1505	1	2		0.853	6.5	0.1495
1290	C	6.5	7.95	40	-	-10	250	960	1500	1	2		0.853	8.7	0.1500
1291	E	3.8	7.95	40	-	-	103	900	815	1	2		0.853	8.4	0.1004
1292	B	6.5	7.95	40	-	-20	150	950	1485	1	2		0.853	8.6	0.1557
1293	C	6.6	7.95	40	-	-20	138/350	940	1500	1	2		0.853	10.7	0.1491
1294	B	6.6	7.95	40	-	-10	250	945	1495	1	2		0.853	8.7	0.1569
1295	D	3.9	7.95	0	-	-	103	890	815	1	2		0.853	10.1	0.1124
1296	D	3.8	7.95	0	-	-	125	915	825	1	2		0.853	13.1	0.1130
1297	D	6.5	7.95	0	-	-	138	960	1500	1	2		0.853	12.9	0.1516

*Model Configurations:
- A - 0.004-scale B-9U booster with slab canard (20° sting angle)
- AO - Mated booster/orbiter (0.004-scale B-9U with 161C orbiter: 20° sting angles)
- B - 0.003-scale B-9U booster with contoured canard (40° sting angle)
- C - 0.0033-scale B-15B-2 booster (40° sting angle)
- D - 0.0032-scale B-15B booster (fuselage only; no fairings, wings, or canard: 55° sting angle)
- E - 0.004-scale B-9U delta wing (no fuselage or body flap: 40° sting angle)

**Canard angle of attack measured from freestream

†Numbers following / indicate canard paint temperatures on all runs except 1245, where 138°F paint was used on sting. Phase-Change-Temperature is the temperature used for T_{wall} in the calculation of $h_{r=1}$.

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1145 C-3- 127

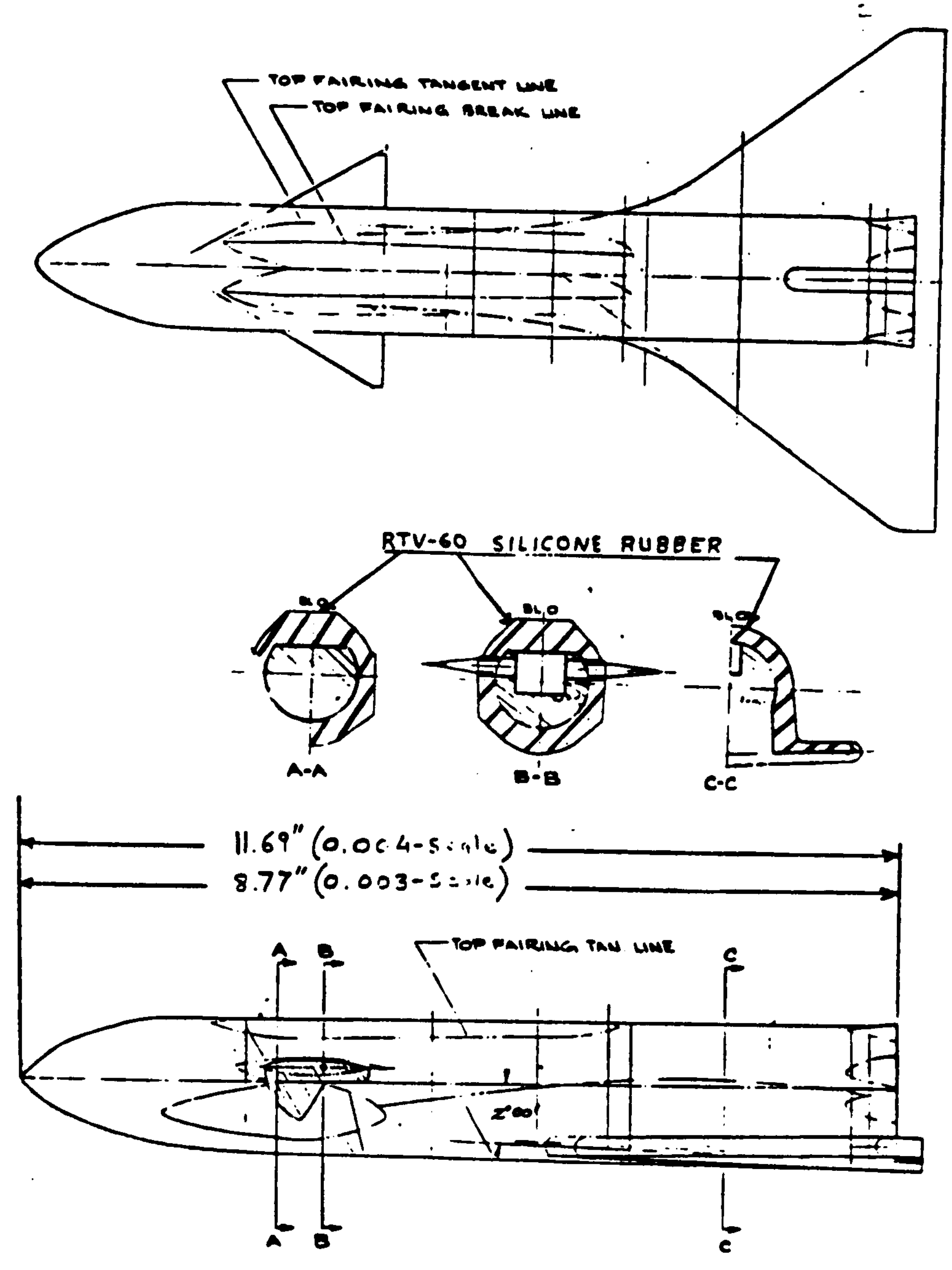

Figure 3 Space Shuttle Booster
B9U Heat Transfer Model

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1145 C-3- 128

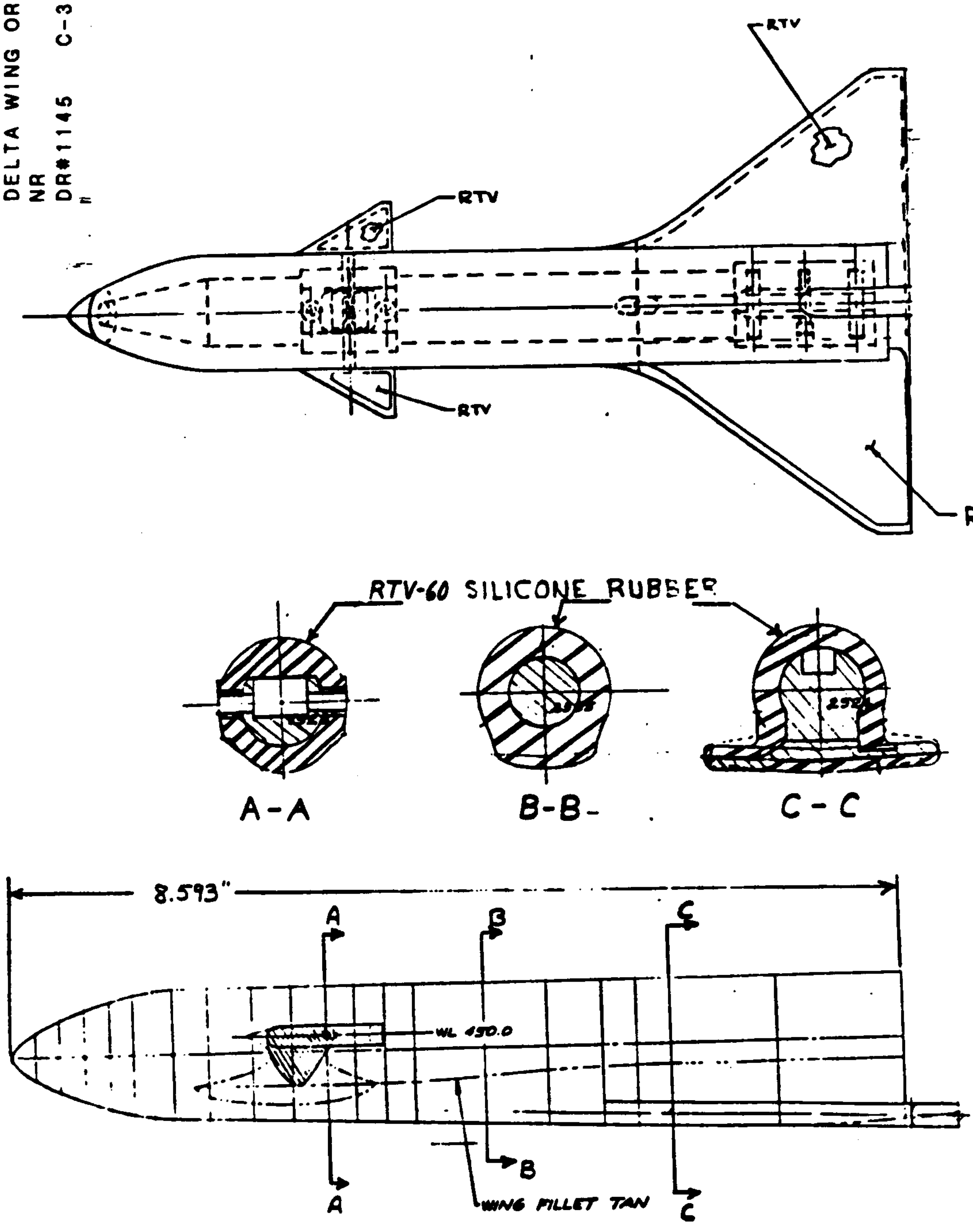

Figure 4 Space Shuttle Booster B-15B-2 Heat Transfer Model

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1145 C-3- 129

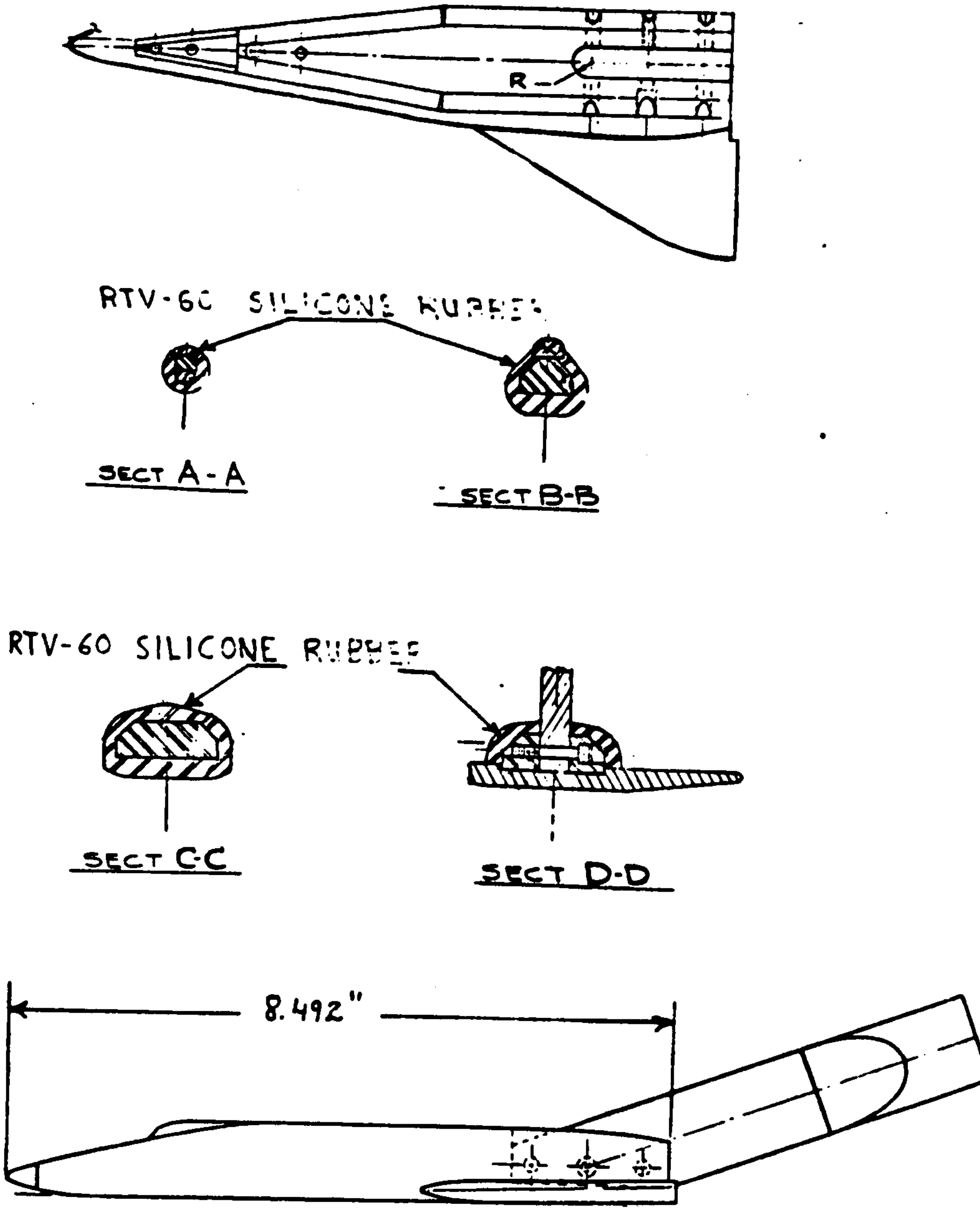

Figure 5 **Space Shuttle Orbiter 161C for Mated Ascent Tests**

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1145 C-3- 130

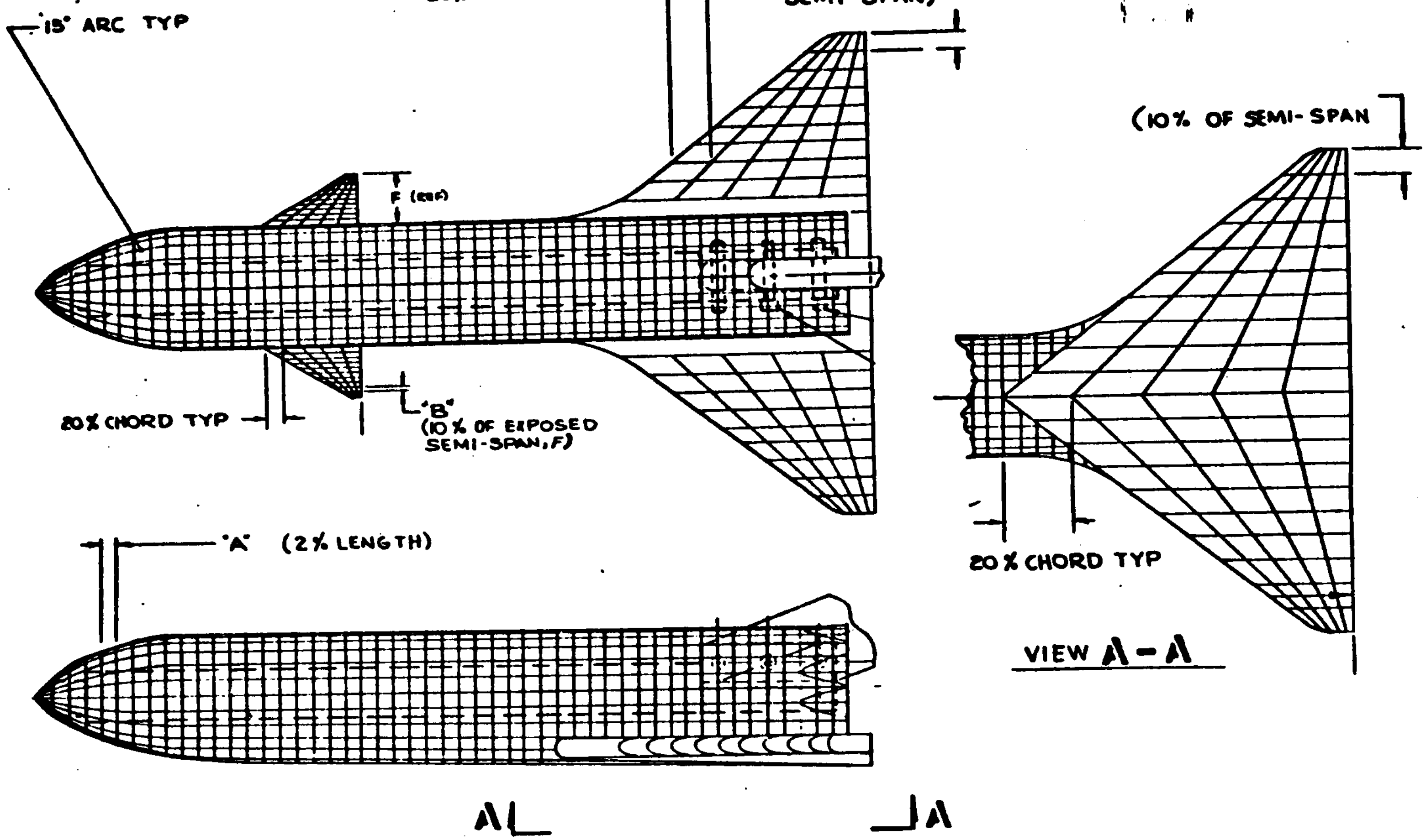

Figure 7 Typical Heat Transfer Grid Model

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TABLE 2

TEST CONDITIONS

TEST TITLE: AEDC-MSFC Phase B Heating Study - Thin-Skin Thermocouple Phase

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

TEST DATE: May 26-29, 1971 **TEST ENGINEER:** W. R. Martindale & R. K. Matthews

Run No.	Model Configuration Identification	δ_c	δ_e	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10⁶/Ft	Phase Change Temp. (°F)	Booster-Orbiter Spacing (in.) XD	ZD	GRIT	Model Position (degrees) β	ϕ_{11}	α
1	Booster + Orbiter	0	0	0.009	8.00	857	1339	1.00	3.75	NA	2.22	.234	Off	0	0	0
2						858	1347		3.72							-5
3						856	1346		3.72							5
4						858	1341		3.75		1.72					0
5						859	1347		3.73		2.72					
6						858	1338		3.76		2.22	.118				
7						859	1346		3.73			.318				
8					7.93	149	1249		0.74			.234				
9						148	1234		0.75							-5
10						151	1233		0.77							5
11					8.00	857	1342		3.74					-5		0
12	Booster					861	1342		3.76		-	-		0		
13						860	1341		3.75		-	-				-5

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1177 C-3- 131

TABLE 2 - Continued

TEST CONDITIONS

TEST TITLE: AEDC-MSFC Phase B Heating Study - Thin-Skin Thermocouple Phase

TEST NUMBER: VT1162 TEST FACILITY: AEDC Tunnel B

TEST DATE: May 26-29, 1971 TEST ENGINEER: W. R. Martindale & R. K. Matthews

Run No.	Model Configuration Identification			Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	$RNX10^6$ / Ft	Phase Change Temp. (°F)	Booster-Orbiter Spacing (in.)			Model Position (degrees)		
		δ_c	δ_e								XD	ZD	GRIT	β	ϕ_M	α
14	Booster	0	0	0.009	8.00	856	1347	1.00	3.72	NA	-	-	Off	0	0	5
15					7.93	149	1225		0.76							0
16						150	1223		0.77							-5
17						149	1219		0.77							5
18		60			8.00	857	1353		3.69							60
19		50				855	1340		3.74							50
20		40				857	1338		3.76							40
21		40				856	1342		3.73				On			40
22		60				860	1343		3.75				On			60
23		10				856	1344		3.73				Off			10
24		20				856	1342		3.73							20
25		30				857	1346		3.72							30
26		30	-15			857	1342		3.74							

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

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TABLE 2 - Continued

TEST CONDITIONS

TEST TITLE: AEDC-MSFC Phase B Heating Study - Thin-Skin Thermocouple Phase

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

TEST DATE: May 26-29, 1971 **TEST ENGINEER:** H. R. Martindale & R. K. Matthews

Run No.	Model Configuration Identification	δ_c	δ_c	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10[6] / Ft	Phase Change Temp. (°F)	Booster-Orbiter Spacing (in.) XD	ZD	GRIT	Model Position (degrees) β	ϕ_1	α
27	Booster	30	15	0.009	8.00	859	1342	1.00	3.74	NA	-	-	Off	0	0	30
28	Booster	0	0			858	1342		3.74							0
29	Orbiter	-				859	1339		3.76				On			50
30						857	1337		3.76				On			40
31						857	1343		3.74				On			30
32						856	1340		3.74				Off			30
33						856	1343		3.73							40
34						858	1347		3.72							50
35						555	1305		2.52							50
36						553	1311		2.50							40
37						554	1311		2.50							30
38						554	1308		2.51							20
39						553	1307		2.51							10

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

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TABLE 2 - Concluded

TEST CONDITIONS

TEST TITLE: AEDC-MSFC Phase B Heating Study - Thin-Skin Thermocouple Phase

TEST NUMBER: VT1162 TEST FACILITY: AEDC Tunnel B

TEST DATE: May 26-29, 1971 TEST ENGINEER: W. R. Martindale & R. K. Matthews

Run No.	Model Configuration Identification			Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10[6] / Ft	Phase Change Temp. (°F)	Booster-Orbiter Spacing (in.)			Model Position (degrees)		
		δ_c	δ_e								XD	ZD	GRIT	β	ϕ_H	α
40	Orbiter	-	0	0.009	7.94	165	1254	1.00	0.82	NA	-	-	Off	0	0	10
41						165	1237		0.83							20
42						166	1228		0.84							30
43						167	1232		0.85							5
44						167	1237		0.84							0
45						165	1241		0.83							-5
46					8.00	856	1324		3.81							-5
47						863	1335		3.79							0
48						861	1344		3.75							20
49						856	1342		3.74							10
50						856	1344		3.74				*** On			10
51			-10			858	1346		3.73				Off			30

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* T_{aw} = adiabatic wall temperature

***Nose only

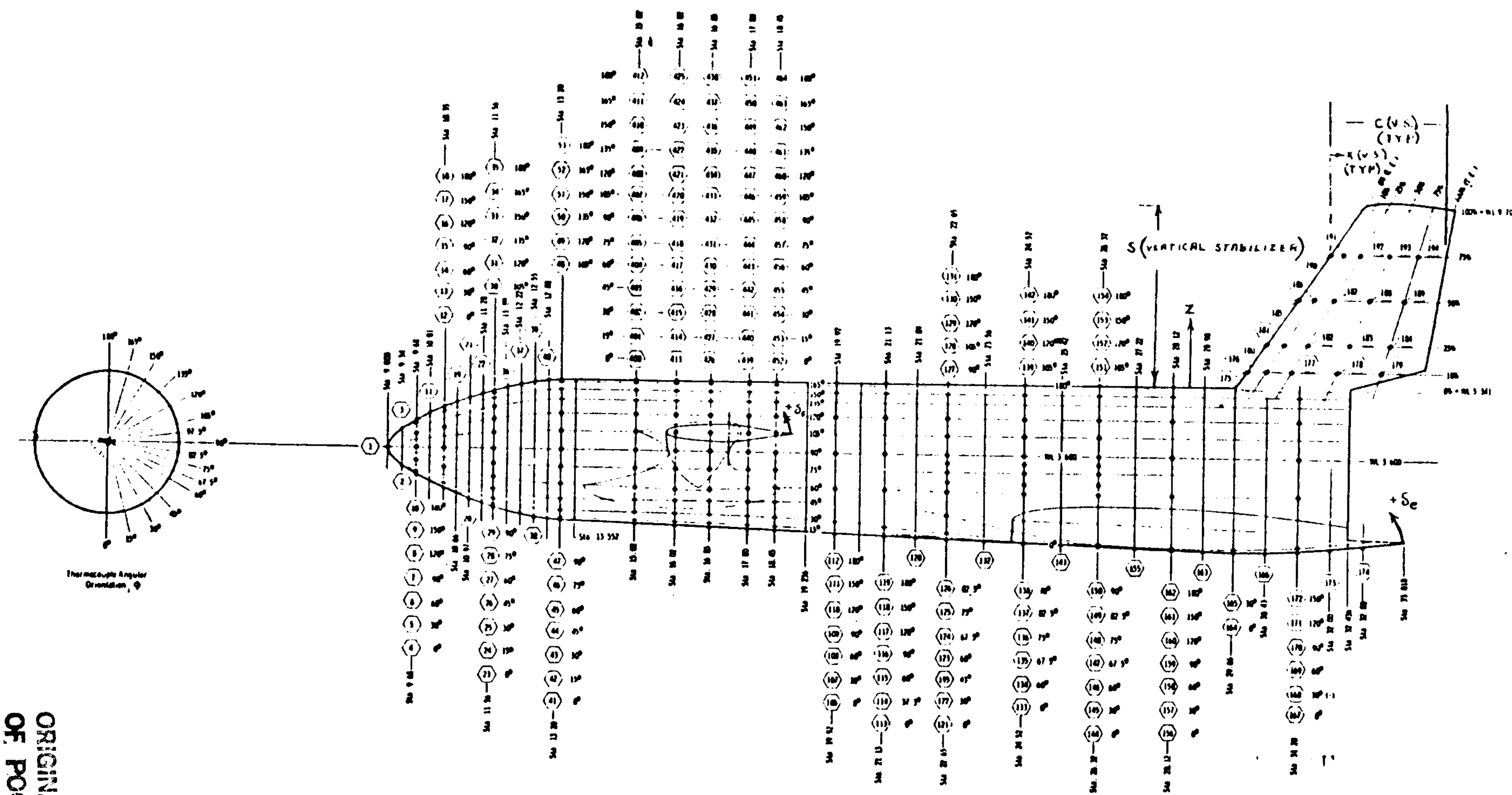

Figure 2. Booster Thermocouple Locations

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DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1177 C-3- 135

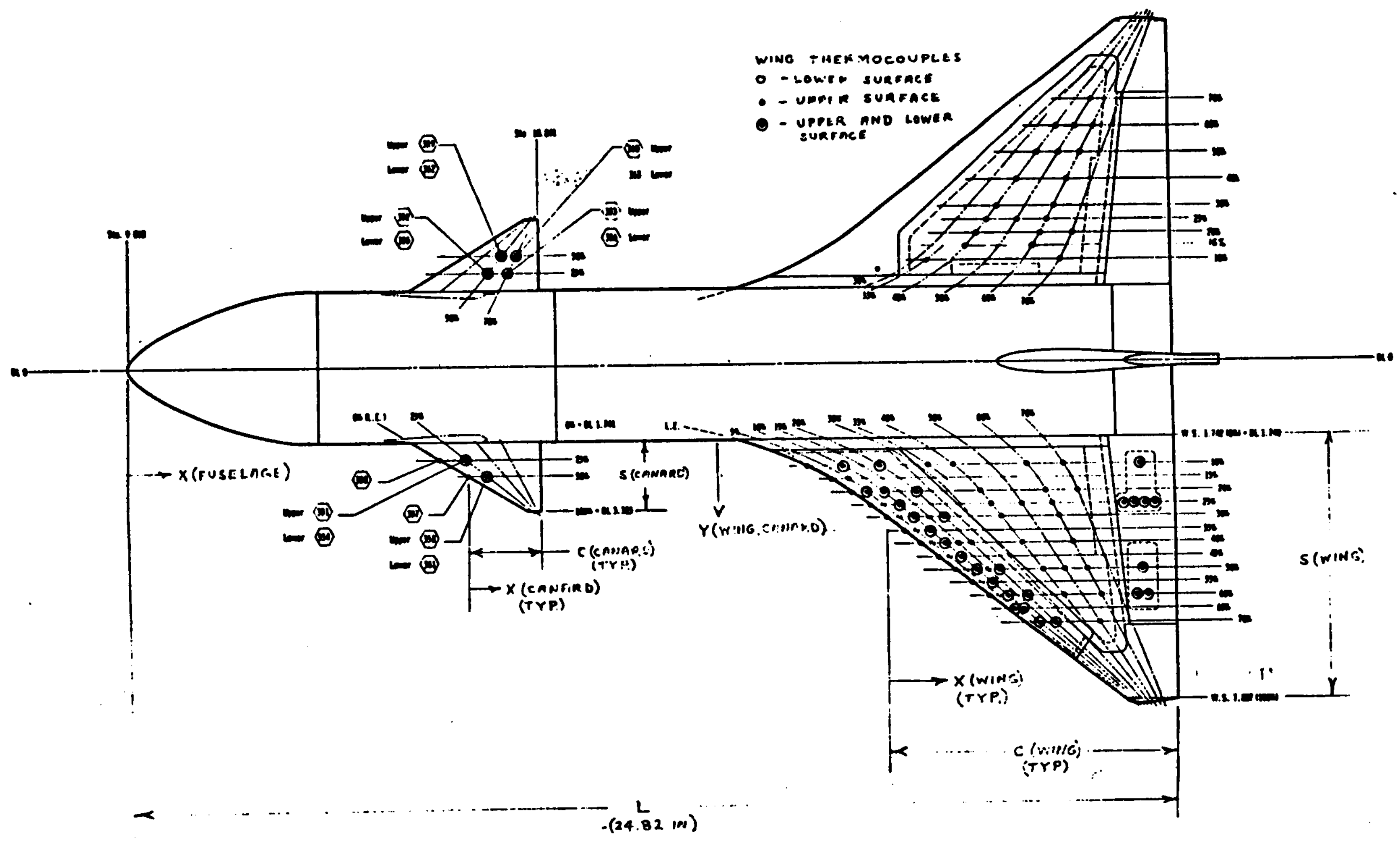


Figure 2. Continued

WING THERMOCOUPLE IDENTIFICATION NUMBERS
o = Lower Surface
• = Upper Surface

% Span	% Chord													
	0% (L.E.)	5%	10%	15%	20%	33%	40%	50%	60%	70%	81%			
10% Upper	200		201		202	203	204		205	206	207			
10% Lower			208		209	210				213	214			
15% Upper	215													
15% Lower		216					211		212					
20% Upper	217	218	219		220		221		222	223				
20% Lower		224	225		226		227		228	229	83.3%	86.7%	90.1%	93.5%
25% Upper	230		231				232	233	234		235	236	237	238
25% Lower		239	240				241	242	243		244	245	246	247
30% Upper	248		249		250		251		252					
30% Lower		253	254	255	256		257		258					
35% Upper	259		260											
35% Lower		261	262											
40% Upper	263		264				265		266					
40% Lower		267	268	269	270		271		272					
45% Upper	273		274											
45% Lower		275	276								87.7%			
50% Upper	277		278		279		280	281	282		283			
50% Lower		284	285	286	287		288	289	290		291			
55% Upper	292		293											
55% Lower		294	295								82%	88.1%		
60% Upper	296		297		298		299		300		301	302		
60% Lower		303	304		305		306	307	308		309	310		
65% Upper		311	312											
65% Lower		313	314											
70% Upper			315		316			317						
70% Lower			318		319			320						

Figure 4. Concluded

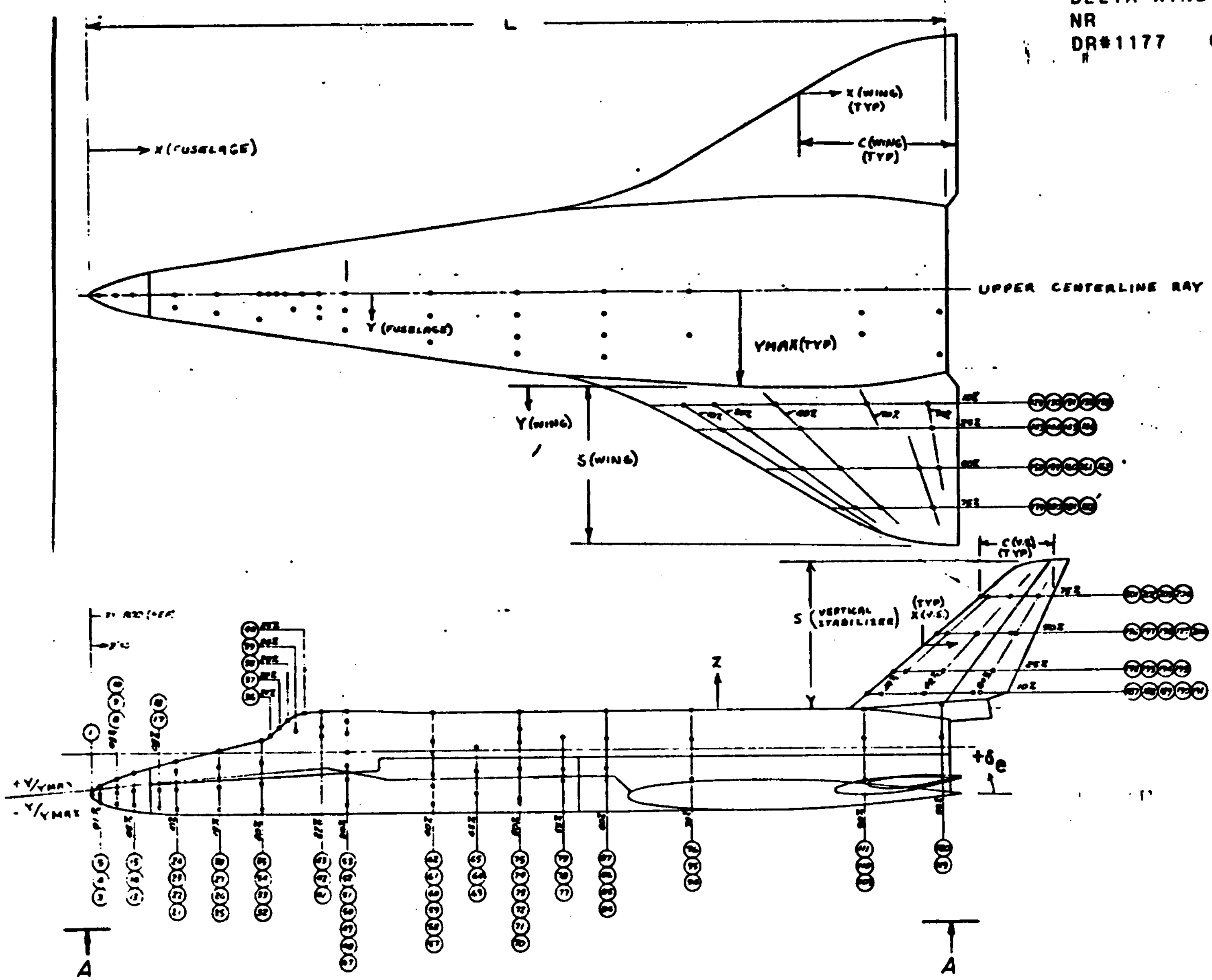


Figure 5. Orbiter Thermocouple Locations

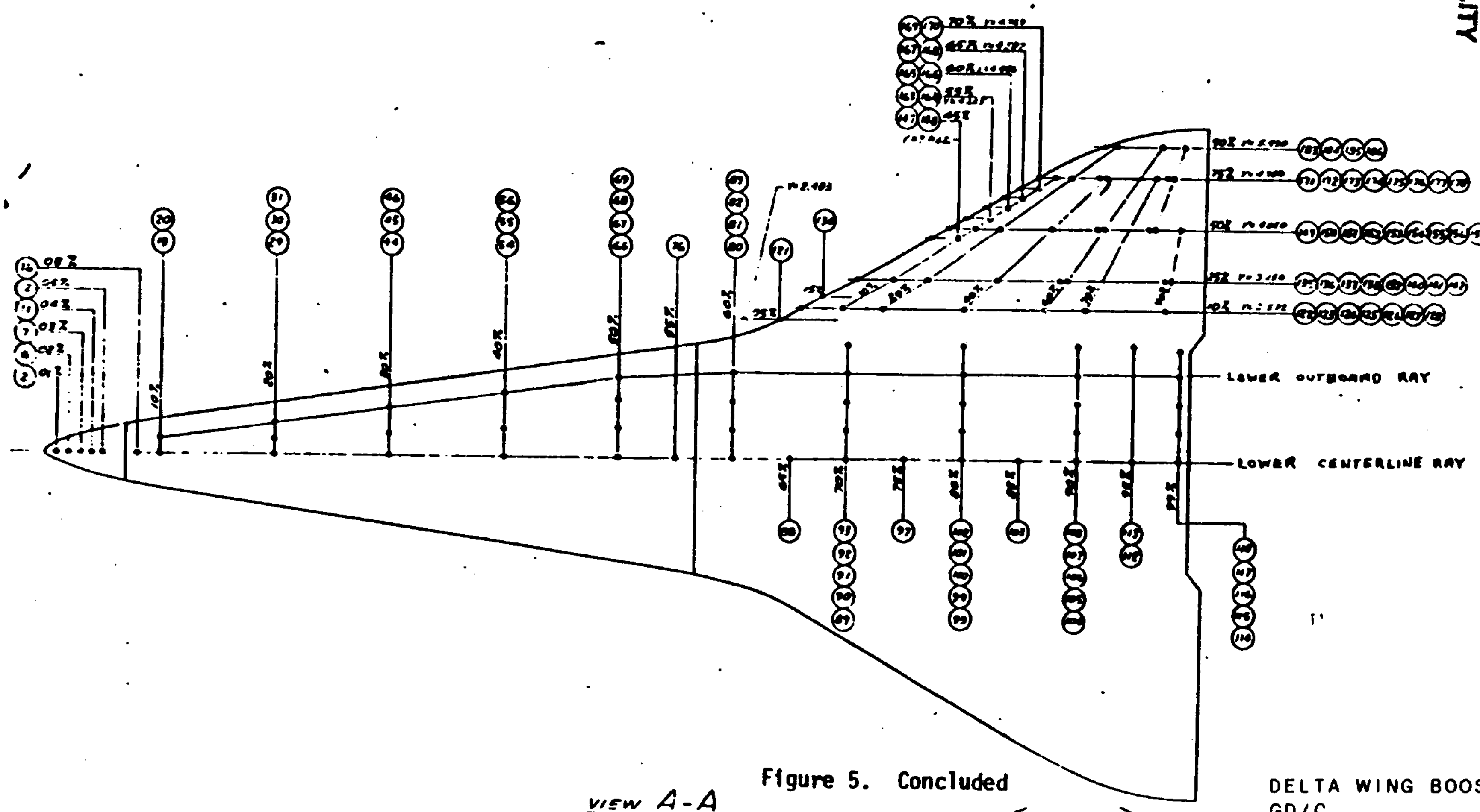


Figure 5. Concluded

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1177 C-3- 139

Table 3

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of GDC-B+NAR-DWO

TEST NUMBER: VT1162-11 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
232	GDC-B + NAR-DWO	0.013	8.0	265	1270	1.0	1.25	250	0	0	0	Side
233								125	0			
230								250	-5			
231								125	-5			
228								250	5			
229								125	5			
238				567	1310		2.55	275	0			
239								150	0			
236								275	-5			
237								150	-5			
234								300	5			
235								150	5			
242						N/A		0.F**	0			

* T_{aw} = adiabatic wall temperature

**0.F. = Oil Flow

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of GDC-B+NAR-DWO

TEST NUMBER: VT1162-11 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews and W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	$RN \times 10^6$ / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
241	GDC-B + NAR-DWO	0.013	8.0	567	1310	N/A	2.55	O.F.**	-5	0	0	Side
240								O.F.	5		0	
260								Sha***	0		0	
261								Sha	0		90	
258								Sha	-5		0	
259								Sha	5		0	

* T_{aw} = adiabatic wall temperature
**O.F. = Oil Flow
***Sha = Shadowgraphs

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1264 C-3- 141

Table 3
PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of GDC-B + NAR-DWO

TEST NUMBER: VT1162-11 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw}* / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	ϕ	Model Surface
250	GDC-B	0.013	8.0	265	1270	1.0	1.26	113	0	0	0	Side
251								113	-5			
249								113	5			
•								100	•			Top
247				565	1315	1.0	2.54	125	0			Side
248								150	0			
•								113	•			Top
244								200	-5			Side
•								113	•			Top
245								125	-5			Side
243								200	5			
•								113	•			Top
246								125	5			Side

* T_{aw} = adiabatic wall temperature

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of GDC-B + NAR-DWO

TEST NUMBER: VT1162-11 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	β	Φ	Model Surface
270	NAR-DWO	0.013	8.0	265	1250	1.0	1.30	113	0	0	180	Bottom
•								113	•			Side
266								113	-5			Bottom
•								113	•			Side
267								100	-5			Bottom
•								150	•			Side
268								125	5			Bottom
•								125	•			Side
269								100	5			Bottom
276		0.013	8.0	566	1315	1.0	2.54	113	0			Bottom
274								113	-5		180	Bottom
275								100	-5			•
•								150	•			Side

* T_{aw} = adiabatic wall temperature

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1264 C-3- 143

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Ascent Heat Transfer Test of GDC-B + NAR-DWO

TEST NUMBER: VT1162-11 **TEST FACILITY:** VKF Tunnel B

TEST DATE: June 1971 **TEST ENGINEER:** R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} * / T_{total}	RNX10^6 / Ft	Phase Change Temp. (°F)	Model Position (degrees) α	ψ	ϕ	Model Surface
273	NAR-DWO	0.013	8.0	566	1315	1.0	2.54	113	5	0	180	Bottom
272								113	5			Side
288								O.F.**	0			Bottom/Side
286								"	-5			Bottom/Side
287								"	5			Bottom/Side

* T_{aw} = adiabatic wall temperature
** Oil Flow

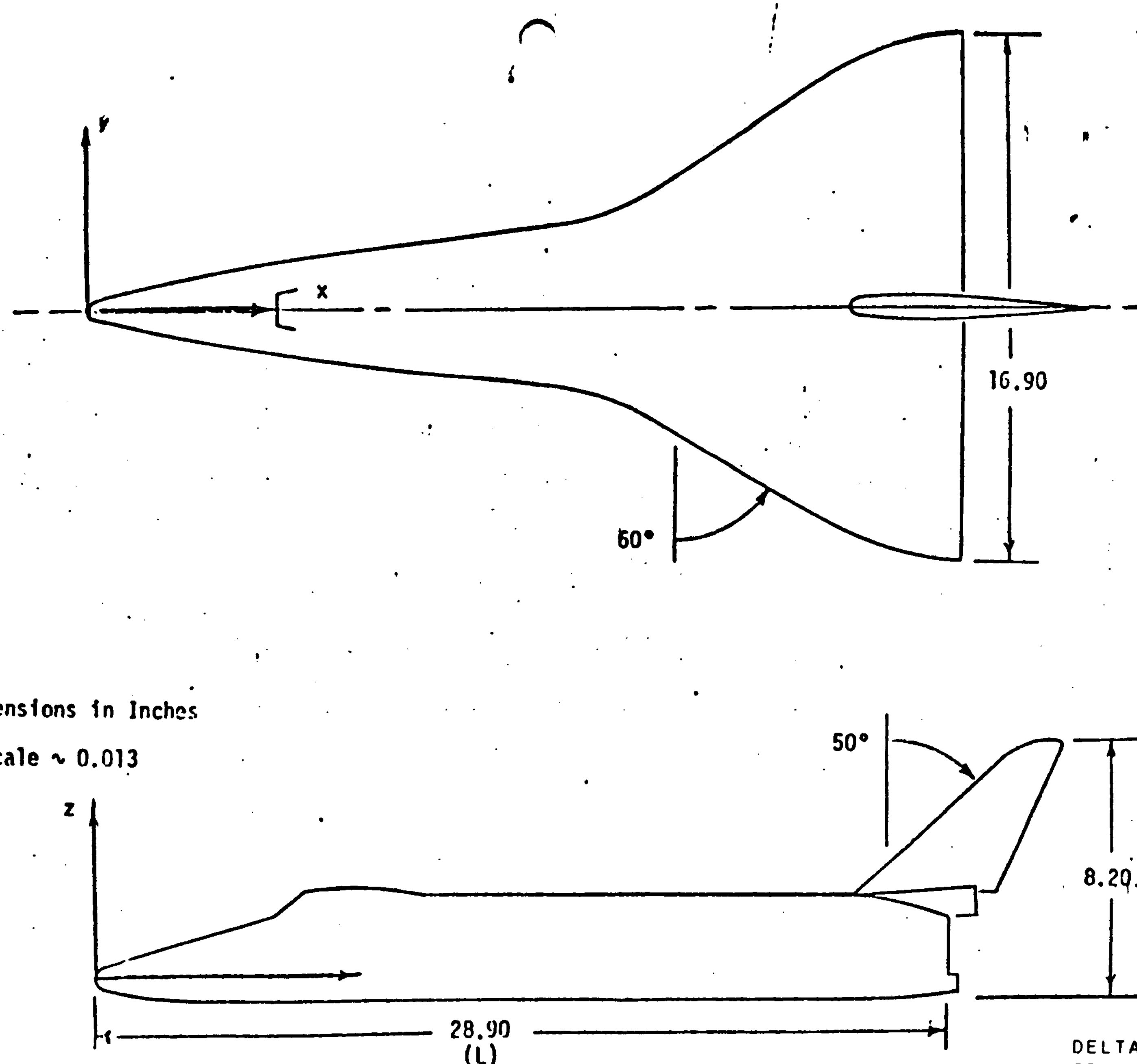


Fig. 1 North American Rockwell Delta Wing Orbiter Model Sketch

DELTA WING BOOSTER
GD/C
DELTA WING ORBITER
NR
DR#1264 C-3- 145

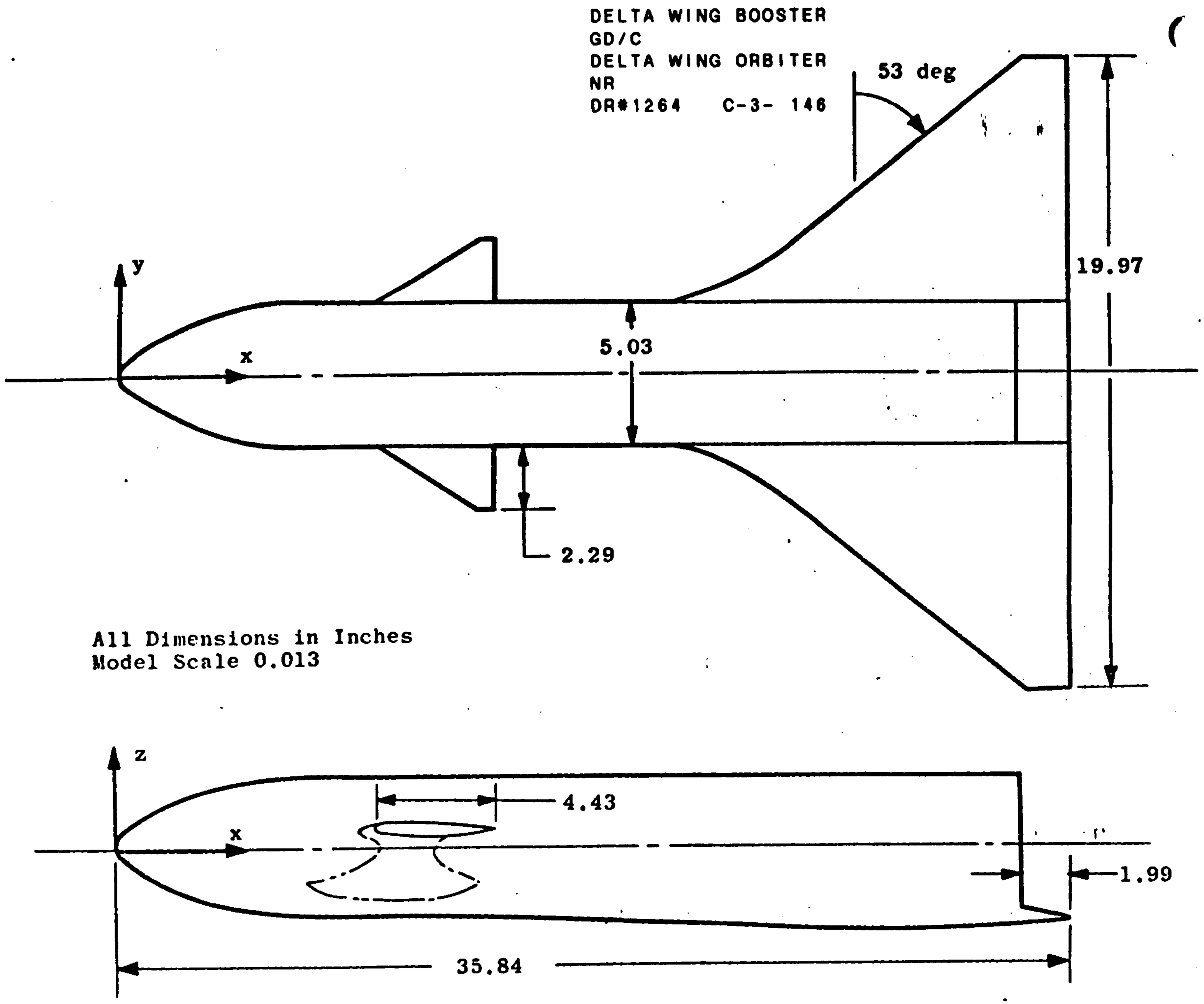


Fig. 2 General Dynamics - Convair Booster (GDC-B)

TABLE I TEST CONDITIONS

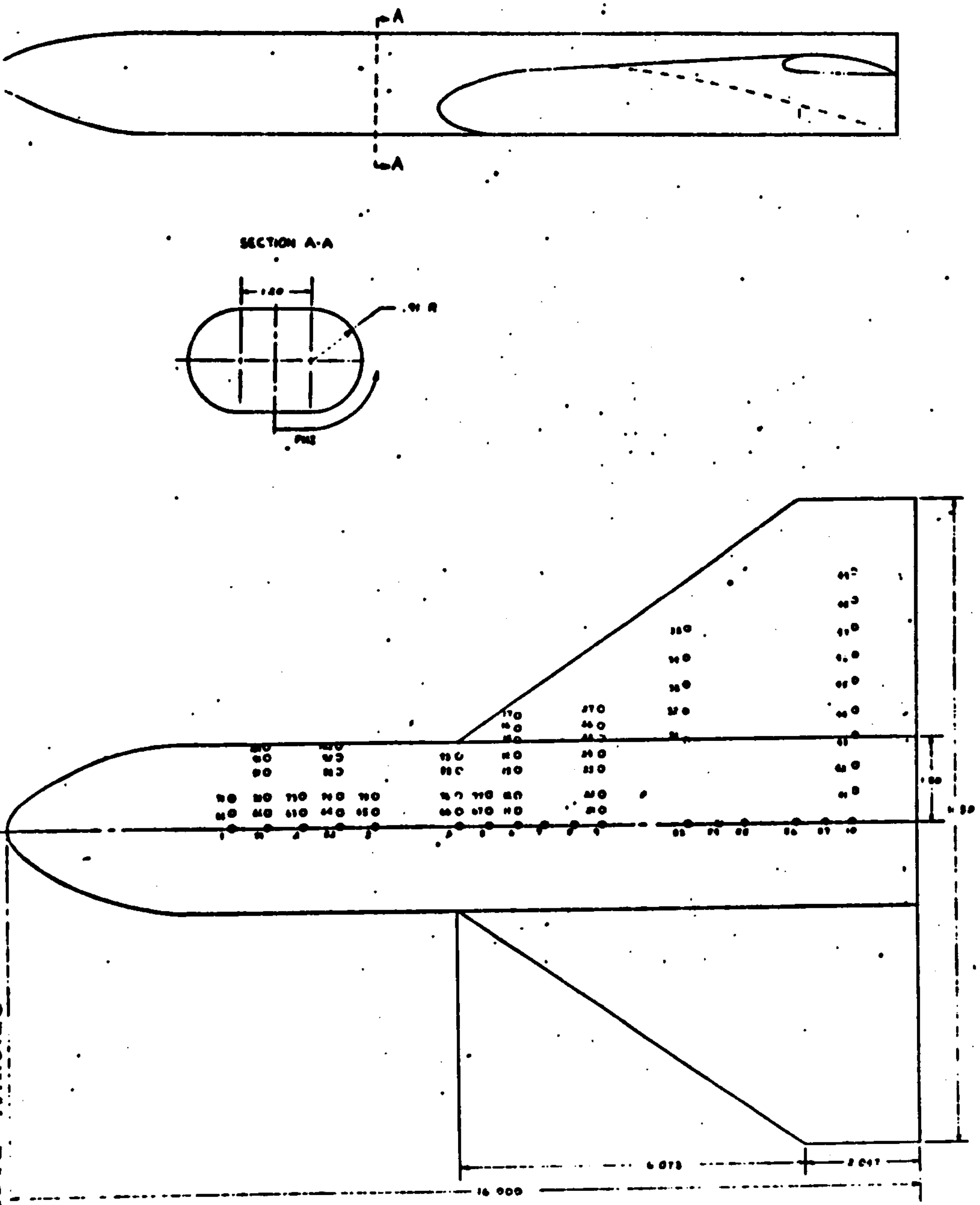
TEST TITLE: INTERFERENCE HEATING TESTS OF A CLIPPED DELTA WING BOOSTER AND AN MSC ORBITER
TEST NUMBER: 50 TEST FACILITY: LANGLEY 31" CONTINUOUS FLOW HYPERSONIC TUNNEL
TEST DATA: THERMOCOUPLE CALORIMETRIC HEAT TRANSFER - TEST ENGINEER: D. H. CRAWFORD
TEST DATE: August 1970

(3) RUN NUMBER	(4) FREE STREAM MACH NUMBER	(5) TOTAL PRESSURE (psia)	(6) TOTAL TEMPERATURE (°R)	(7) $\frac{RN \times 10^6}{ft.}$	(8) $\frac{T_{aw}}{T_{total}}$	(9) α	(10) β	(11) ROLL	(12) X *	(13) Gap *
1	10.36	750.12	1783.05	1.00	1.00	0°	0	0	No orbiter	
2	10.36	779.06	1782.19	1.04		5°			No orbiter	
4	10.36	775.75	1747.03	1.08		0°			2.5"	0.0"
5	10.35	753.97	1762.47	1.03		5°			2.5"	0.0"
6	10.36	767.48	1751.74	1.06		10°			2.5"	0.0"
7	10.35	749.29	1816.93	.966		10°			No orbiter	
8	10.36	780.71	1754.96	1.08		5°			2.5"	0.240"
9	10.35	750.67	1781.33	1.01		5°			-1.5"	0.0"
10	10.35	744.05	1783.26	.995		5°			-1.5"	0.240"
11	10.35	749.29	1780.05	1.01		10°			-1.5"	0.240"

* See FIGURE 4 for definition

DELTA WING BOOSTER
LARC
STRAIGHT WING ORBITER
MSC
DR#1016 C-3- 147

DELTA WING BOOSTER
LARC
STRAIGHT WING ORBITER
MSC
DR#1016 C-3- 148



NOTE: REFER TO TABLE II FOR LOCATION DIMENSIONAL DATA.

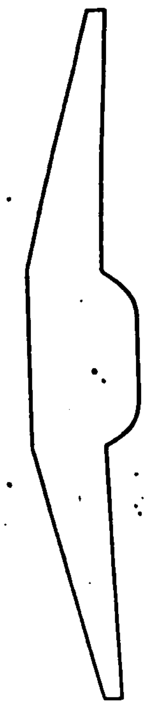


FIGURE 2. CLIPPED WING BOOSTER AND THERMOCOUPLE LOCATION

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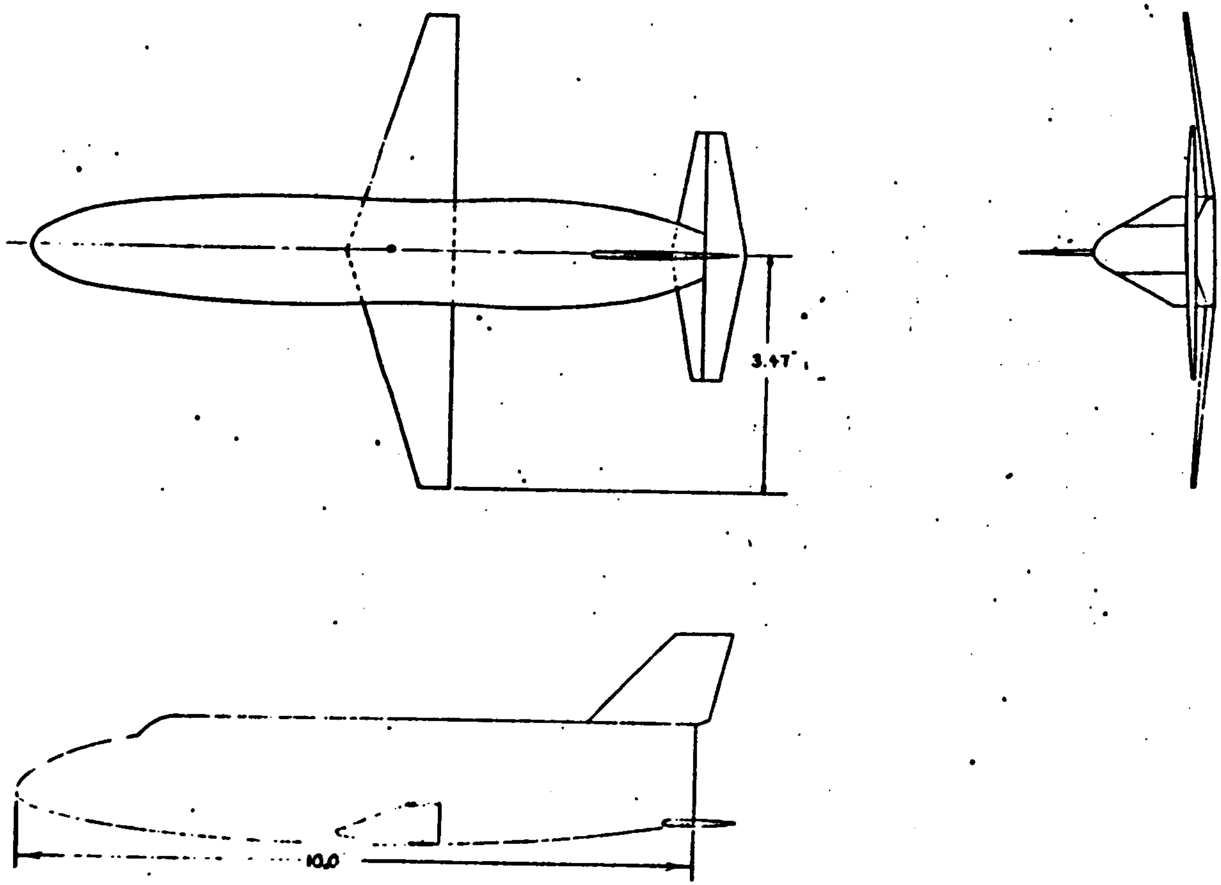

FIGURE 3. MSC ORBITER, 3-VIEW

DELTA WING BOOSTER
LARC
STRAIGHT WING ORBITER
MSC
DR#1016 C-3- 149

DELTA WING BOOSTER
LARC
STRAIGHT WING ORBITER
MSC
DR#1016 C-3- 150

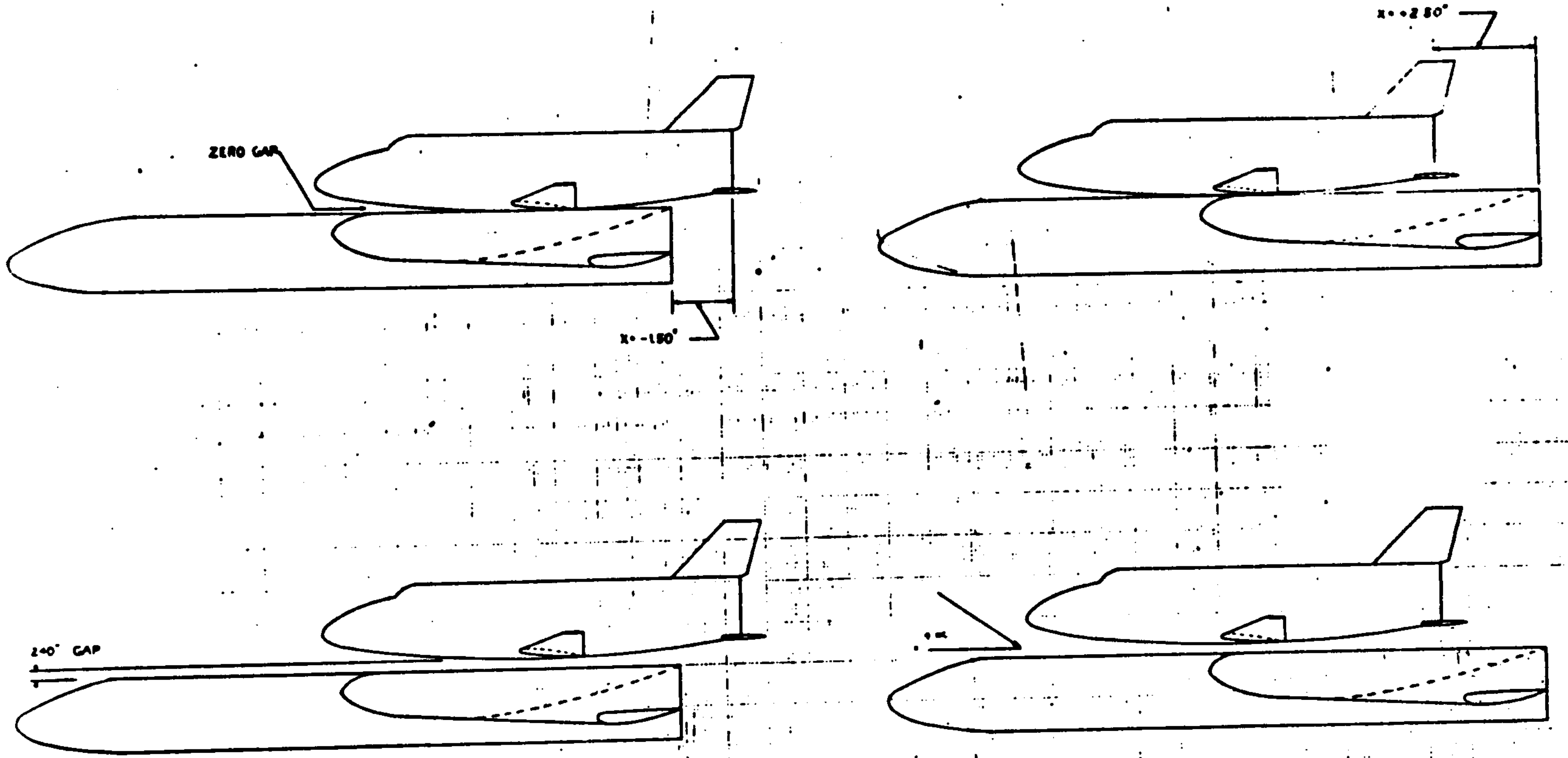

FIGURE 4. RELATIVE POSITIONS OF BOOSTER AND ORBITER

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LMSC-A99

Table 1

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: LMSC DELTA-BODY ORBITER

TEST NUMBER: RMA075-RMA106 TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 4/5/71 - 4/9/71 TEST ENGINEER: Schultz and McGee

RUN NO.	MODEL CONFIGURATION IDENTIFICATION	MODEL SCALE	FREE STREAM MACH NUMBER	TOTAL PRESSURE (PSIA)	TOTAL TEMP. (°R)	T_{AW}/T_{TOTAL}	$RN \times 10^6$/FT	PHASE CHNG TEMP. (°F)#	MODEL POSITION (DEGREES) α	β	φ	$h_{r=1}$ BTU/sec-ft^2-°R
075	12 in. Orbiter	.00770	7.80	215	1310	0.861*	1.04	138	0	0	180	.0396
076	1-1/2 Stage Ascent	.00558	7.98	815	1365	1.000	3.46	225	0	0	180	.0864
077	1-1/2 Stage Ascent	.00558	7.98	815	1360	1.000	3.49	225	0	0	0	.0863
078	12 in. Orbiter	.00770	7.80	215	1260	0.884*	1.10	225	20	0	180	.0394
079	12 in. Orbiter	.00770	7.80	215	1325	0.884*	1.01	175	20	0	180	.0395
080	12 in. Orbiter	.00770	7.91	465	1270	0.884*	2.26	175	20	0	180	.0562
081	12 in. Orbiter	.00770	7.98	815	1310	0.884*	3.68	225	20	0	180	.0732
082	12 in. Orbiter	.00770	8.03	1215	1405	0.884*	4.88	225	20	0	180	.0890
083	9 in. Orbiter	.00558	7.80	215	1270	0.915*	1.09	225	32	0	180	.0482
084	9 in. Orbiter	.00558	7.86	325	1285	0.915*	1.58	225	32	0	180	.0562
085	9 in. Orbiter	.00558	7.85	315	1270	0.915*	1.57	400	32	0	180	.0562
086	9 in. Orbiter	.00558	7.85	315	1320	0.900	1.48	100	32	0	0	.0554
087	9 in. Orbiter	.00558	7.91	470	1290	0.900	2.22	100	32	0	0	.0662

*Value of 0.900 was used for reduction of sideview data.

Also value used in $h_{r=1}$ calculation.

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1143 C-3- 151

Table 1 (Cont'd)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: LMSC DELTA-BODY ORBITER TEST

TEST NUMBER: RMA075-RMA106 TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 4/5/71 - 4/9/71 TEST ENGINEER: Schultz and McGee

RUN NO.	MODEL CONFIGURATION IDENTIFICATION	MODEL SCALE	FREE STREAM MACH NUMBER	TOTAL PRESSURE (PSIA)	TOTAL TEMP. (°R)	T_{AW}/T_{TOTAL}	$RN \times 10^6$/FT	PHASE CHNG TEMP. (°F)#	MODEL POSITION (DEGREES) α	β	φ	$h_{r=1}$ BTU/sec-ft²-°R
088	9 in. Orbiter	.00558	7.98	815	1360	0.900	3.51	100	32	0	0	.0859
089	9 in. Orbiter	.00558	7.85	315	1340	0.910*	1.44	400	32	0	30	.0564
090	9 in. Orbiter	.00558	7.85	315	1310	0.900	1.50	400	32	0	0	.0564
091	9 in. Orbiter	.00558	7.85	315	1330	0.900	1.47	100	20	0	0	.0555
092	9 in. Orbiter	.00558	7.85	315	1300	0.900	1.51	400	20	0	0	.0564
093	9 in. Orbiter	.00558	7.85	315	1285	0.900	1.54	100	25	0	0	.0552
094	9 in. Orbiter	.00558	7.85	315	1310	0.900	1.50	156	25	0	0	.0554
095	9 in. Orbiter	.00558	7.85	315	1280	0.900	1.55	100	35	0	0	.0551
096	9 in. Orbiter	.00558	7.85	315	1275	0.900	1.56	100	40	0	0	.0551
097	9 in. Orbiter	.00558	7.85	315	1310	0.900	1.50	400	40	0	0	.0564
098	9 in. Orbiter	.00558	7.85	315	1325	0.960*	1.48	225	45	0	180	.0557
099	9 in. Orbiter	.00558	7.80	215	1290	0.947*	1.06	225	40	0	180	.0463
100	9 in. Orbiter	.00558	7.80	215	1275	0.926*	1.09	225	35	0	180	.0462

*Value of 0.900 was used for reduction of sideview data.

Also value used in $h_{r=1}$ calculation.

Table 1 (Cont'd)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: LMSC DELTA-BODY ORBITER

TEST NUMBER: RMA075-RMA106 TEST FACILITY: LRC Mach 8 VDT

TEST DATE: 4/5/71 - 4/9/71 TEST ENGINEER: Schultz and McGee

RUN NO.	MODEL CONFIGURATION IDENTIFICATION	MODEL SCALE	FREE STREAM MACH NUMBER	TOTAL PRESSURE (PSIA)	TOTAL TEMP. (°R)	T_{AW}/T_{TOTAL}	RNX10^6 / FT	PHASE CHNG TEMP. (°F)#	MODEL POSITION (DEGREES) α	β	φ	$h_{r=1}$ BTU / sec-ft²-°R
101	9 in. Orbiter	.00558	7.80	215	1285	0.910*	1.08	225	30	0	180	.0462
102	9 in. Orbiter	.00558	7.80	215	1280	0.894*	1.09	225	25	0	180	.0462
103	9 in. Orbiter	.00558	7.85	315	1270	0.884*	1.57	225	20	0	180	.0552
104	12 in. Orbiter	.00770	7.70	115	1175	0.900	0.68	400	0	0	0	.0300
105	12 in. Orbiter	.00770	7.85	315	1270	0.900	1.57	156	0	0	0	.0470
106	1-1/2 Stage Ascent	.00558	7.91	465	1300	1.000	2.19	400	10	0	180	.0673
107	1-1/2 Stage Ascent	.00558	7.91	465	1310	1.000	2.16	225	10	0	180	.0664

*Value of 0.900 was used for reduction of sideview data.

Also value used in $h_{r=1}$ calculation.

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UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1143 C-3- 153

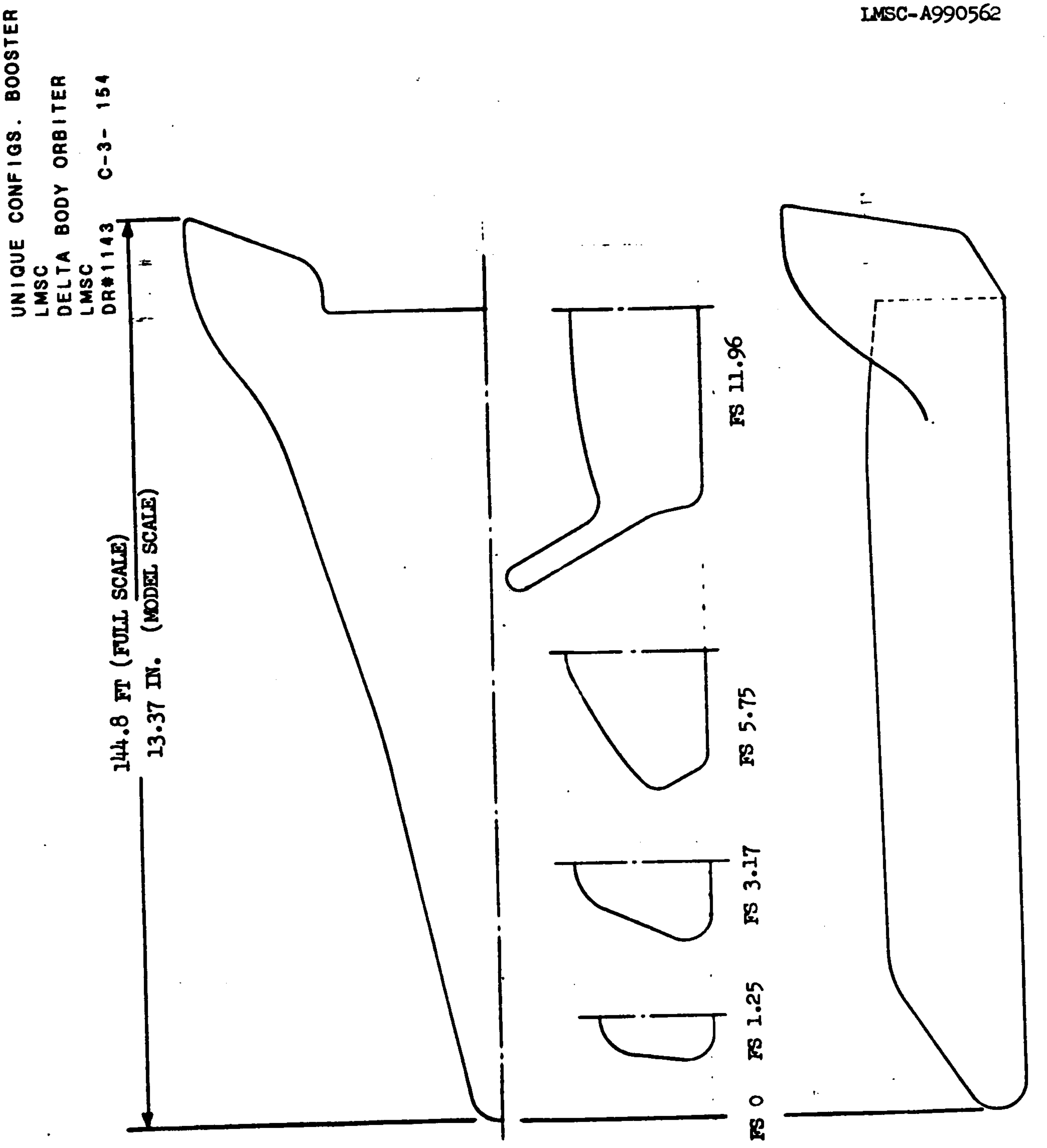

Fig. 1 Delta-Body Orbiter 0.00770 Scale Model

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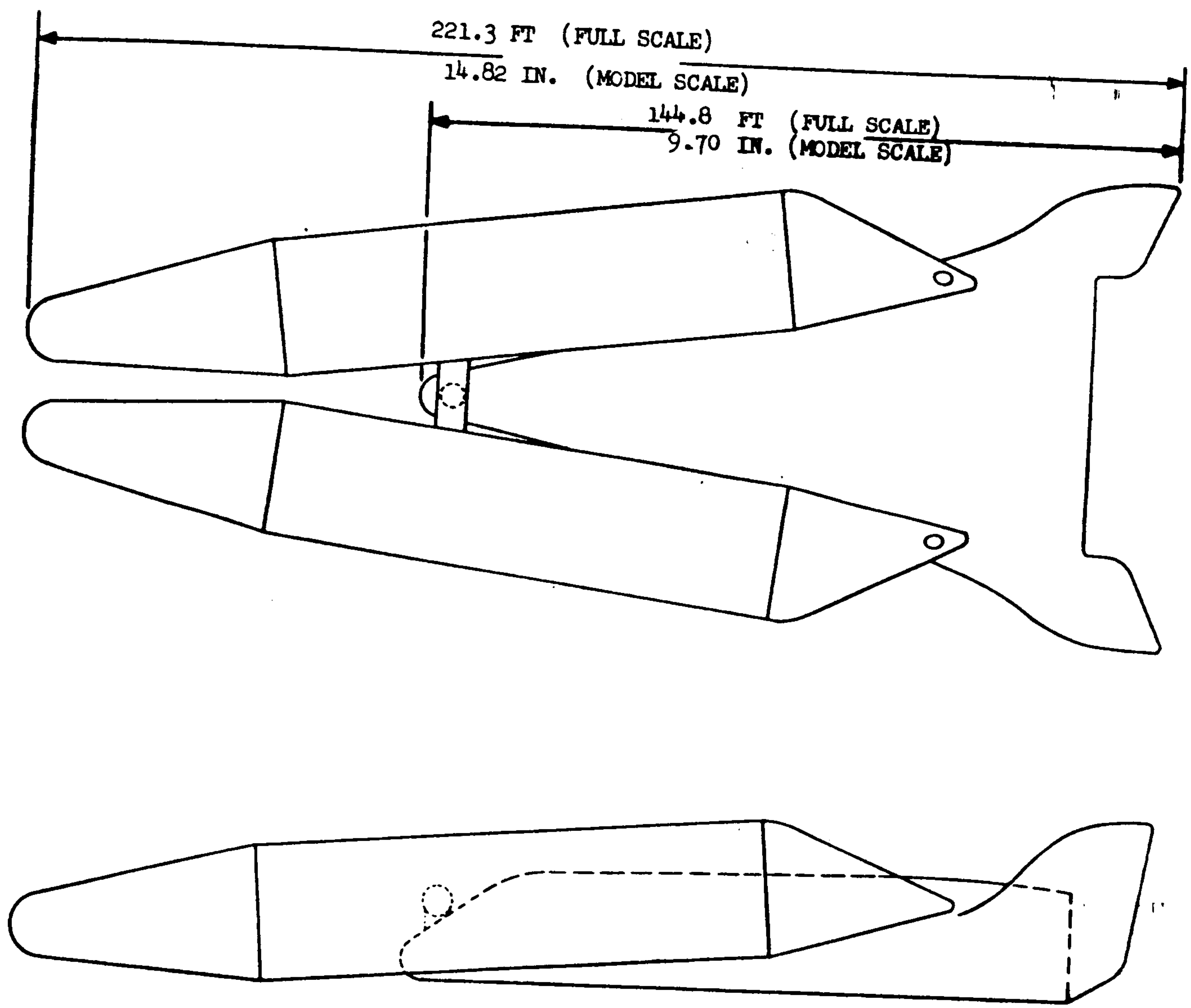

Fig. 2 Stage-and-One-Half C.00558 Scale Model

UNIQUE CONFIGS. BOOSTER
LMSC
DELTA BODY ORBITER
LMSC
DR#1143 C-3- 155

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16. Abstract
Archived wind tunnel test data are available for flyback booster or other alternate recoverable configurations as well as reusable orbiters studied during initial development (Phase B) of the Space Shuttle. Considerable wind tunnel data was acquired by the competing contractors and the NASA centers for an extensive variety of configurations with an array of wing and body planforms.

All contractor and NASA wind tunnel test data acquired in the Phase B development have been compiled into a database and are available for applying to current winged flyback or recoverable booster aerodynamic studies.

The Space Shuttle Phase B Wind Tunnel Database is structured by vehicle component and configuration type. Basic components include the booster, the orbiter and the launch vehicle.

Booster configuration types include straight and delta wings, canard, cylindrical, retro-glide and twin body.

Orbiter configuration types include straight and delta wings, lifting body, drop tanks and double delta wings.

Launch configuration types include booster and orbiter components in various stacked and tandum combinations.

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