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22-1

Tab 22

MISSILE	BOLD ORION (199B)
SPONSOR	Air Force
CONTRACTOR	Primer: Martin - Airframe Associate: Thiokol Chemical - Propulsion

First R&D launch	26 May 58
Final launch	13 Oct 59
Total launchings at AMR	12

(8 single and 4 two-stage vehicles.)

(Used B-47 carrier for air launch.)

Program completed

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MT 60-2511

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22-2

BOLD CRICK OF 199B LAUNCHINGS

TOTAL TO DATE	DURING PERIOD	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JANUARY - JUNE 1958</u>				
1	1	1	26 May 58	First launch at AMR. Success made 2nd Phase I flight un- necessary.
2	2	2	27 Jul 58	1st Phase II launch. High pitch altitude caused erratic flight.
<u>JULY - DECEMBER 1958</u>				
3	1	3	16 Jul 58	90° roll tumbled gyro causing erratic flight.
4	2		25 Sep 58	Range Safety destruct at 1-19 seconds.
5	3		10 Oct 58	Range Safety destruct at 1-26 seconds.
6	4	6	17 Nov 58	Met all test objectives.
7	5	7	8 Dec 58	First two stage version. Impacted as dud.
8	6	5	16 Dec 58	2nd two stage version. Met test objectives.
<u>JANUARY - JUNE 1959</u>				
9	1	3rd 2 Stage	3 Apr 59	2nd stage failed to operate.
10	2	7th Single Stage	8 Jul 59	Met test objectives.
11	3	8th Single Stage	19 Jul 59	Met test objectives.
<u>JULY - DECEMBER 1959</u>				
12	1	14th Two Stage	18 Oct 59	Launched for satellite inter- cept with EXPLORER VI. Miss distance not recorded. This launch completed the 199B test program.

MT 60-2544

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23-1

Tab 23

MISSILE	199-C B-58 ALBM
SPONSOR	Air Force
CONTRACTOR	Prime: Convair
	Subcontractor: Lockheed (Builder)

First R&D launch 5 Sep 58

Final launch 4 Jun 59

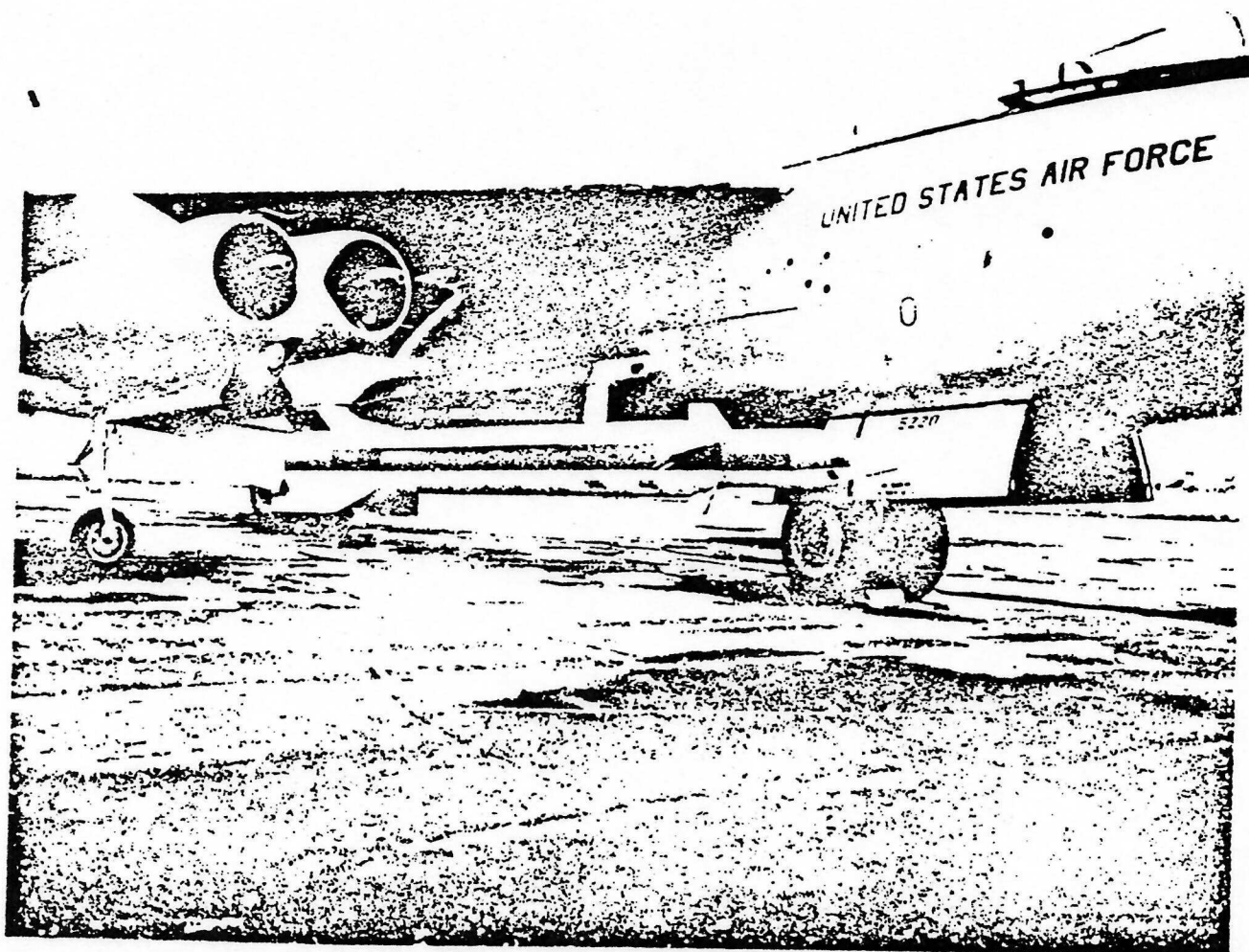
Total launchings at AMR 3

(Used B-58 carrier for air launch.)

Program transferred to Eglin AFB for final launch.

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[REDACTED]

MT 60-2544



THE AIR FORCE'S BOLD ORION (1958), AIR LAUNCHED BALLISTIC MISSILE ON THE
ATLANTIC MISSILE RANGE

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[REDACTED]

23-2

199-C LAUNCHINGS

TOTAL TO DATE	DURING PERIOD	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JULY - DECEMBER 1958</u>				
1	1	1	5 Sep 58	First launch. Flight erratic.
2	2	2	19 Dec 58	Met test objectives.
<u>JANUARY - JUNE 1959</u>				
3	1	3	4 Jun 59	Last launch at AMR. Program moved to Eglin AFB.

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MT 60-2544

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2L-1

Tab 2L

MISSILE	DRACO (199-D)
SPONSOR	Air Force
CONTRACTOR	McDonnell Aircraft

First R&D launch 16 Feb 59

Final Launch 27 Apr 59

Total launchings at AMR 3

Program completed

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MT 60-2544

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21-2

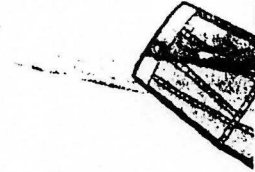
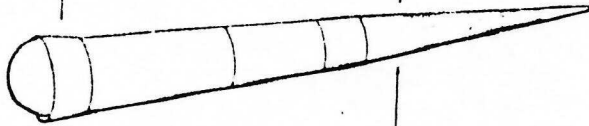
DRACO or 199-D LAUNCHINGS

TOTAL TO DATE	DURING PERIOD	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JANUARY - JUNE 1959</u>				
1	1	1	16 Feb 59	First launch at AMR. Met test objectives.
2	2	2	16 Mar 59	Met test objectives.
3	3	3	27 Apr 59	Final launch at AMR. Program completed.

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MT 60-2544

AEROBALLISTIC



MISSILE	DRACO (199-D)
SPONSOR	Air Force
CONTRACTOR	McDonnell Aircraft

First R&D launch	16 Feb 59
------------------	-----------

Final Launch	27 Apr 59
--------------	-----------

Total launchings at AFB	3
-------------------------	---

AEROBALLISTIC is a word coined to describe the lifting body concepts proven by flights of McDonnell hypersonic missiles from Cape Canaveral in early 1959. The test flights demonstrated precise atmospheric control, the aerodynamic efficiency of an Aeroballistic vehicle and were the first breakthroughs in the design of maneuverable re-entry spacecraft. Space missions utilizing an Aeroballistic type vehicle would terminate with a conventional runway landing.

25-1

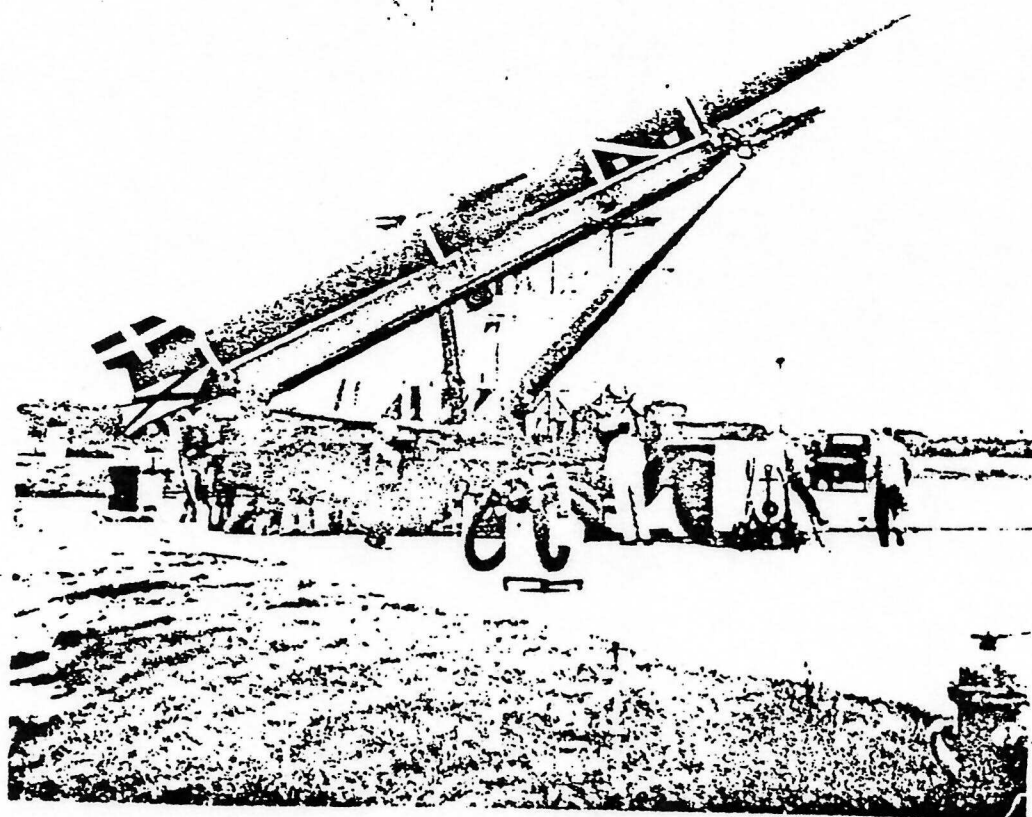
Tab 25

MISSILE	JASON
SPONSOR	Air Force
CONTRACTOR	Aerolab, Pasadena, California

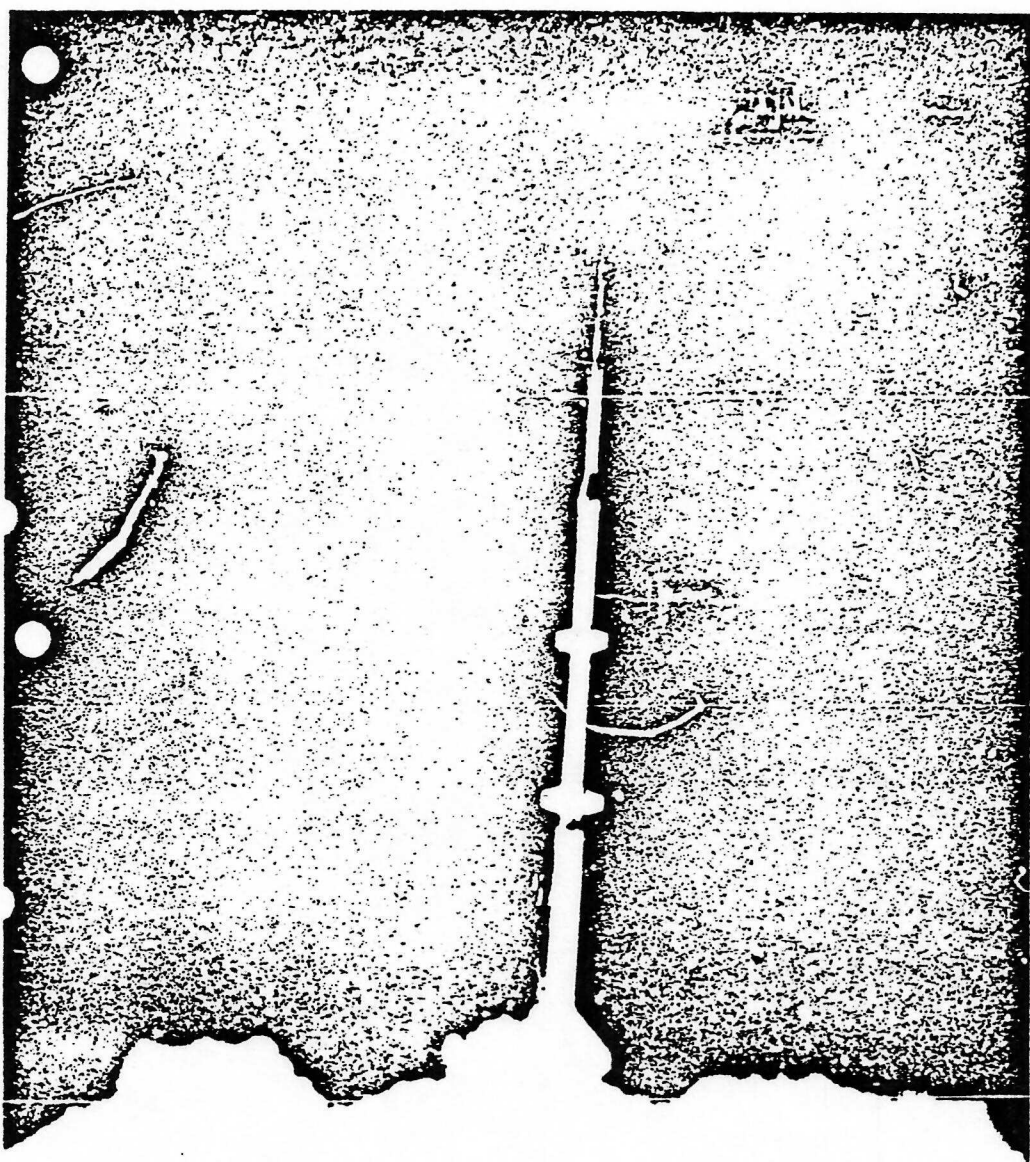
First Launch	14 Aug 58
Final Launch	2 Sep 58

Launchings from Cape Canaveral	6
Launchings from Ramey AFB	6
Total Launchings at AMR	12

Program cancelled 15 Sep 58



24 THE AIR FORCE'S OV-10A, READY FOR LAUNCH AT CAPE CANAVERAL, LAUNCHING SITE OF THE AIR FORCE MISSILE TEST CENTER



25

THE AIR FORCE'S JASON MISSILE LAUNCHED AT CAPE CANAVERAL, LAUNCHING
SITE OF THE AIR FORCE MISSILE TEST CENTER.

15-2

ASCM LAUNCHING

TOTAL TO DATE	DURING PERIOD	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JULY DECEMBER 1958</u>				
1	1	1	10 Aug 58	
2	2	2	27 Aug 58	
3	3	3	29 Aug 58	
4	4	4	30 Aug 58	
5	5	5	30 Aug 58	
6	6	6	2 Sep 58	

Project cancelled as of 15 Sep 58

6 launchings from Ramey AFB,
Puerto Rico. Also some from
Wallops Island, Va.

Fig. 11

MODEL

MODEL DGS (DAG-77)

SPONSOR

Air Force

DEVELOPER

Naval Aerospace Aviation

First test launch

25 Apr 58

(Used S-37 carrier for the launch)

Program currently underway

12-11-58

Tab 26

MISSILE	HOOND DCG (SAM-77)
SPONSOR	Air Force
CONTRACTOR	North American Aviation

First R&D launch 23 Apr 59
 (Used B-52 carrier for air launch.)

Program currently underway

BOUND LOG of (GAM-77) LAUNCHINGS

TOTAL TO DATE	DURING PERIOD	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JANUARY - JUNE 1959</u>				
1	1	001	23 Apr 59	First GAM-77 launch at AMR.
2	2	003	9 Jun 59	Met major test objectives.
<u>JULY - DECEMBER 1959</u>				
3	1	002	21 Aug 59	Defective autonavigator prevented climb to proper altitude.
4	2	005	30 Oct 59	Flew exactly as planned.
5	3	007	15 Dec 59	Met all test objectives.
6	4	008	23 Dec 59	Carried dummy warhead by Sandia.
<u>JANUARY - JUNE 1960</u>				
7	1	011	25 Feb 60	Met all test objectives.
8	2	2796	29 Feb 60	1st production missile in SAC category III program.
9	3	2792	29 Feb 60	First off-course launch. Production model. Met test objectives.
10	4	009	11 Mar 60	Met test objectives.
11	5	012	24 Mar 60	Met test objectives. Flew dog-leg course.
12	6		12 Apr 60	3rd category III launch. Met test objectives.
13	7	014	18 Apr 60	Longest GAM-77 flight to date. Traveled over 500 nautical miles.
14	8	015	17 May 60	Met test objectives.
15	9	017	24 May 60	Flight erratic, but met objectives.
16	10	018	9 Jun 60	Met test objectives.
17	11	023	23 Jun 60	Met test objectives.

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26-3

BOUND DOG or (GAM-77) LAUNCHINGS

TOTAL TO DATE	TEST NUMBER	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JULY - DECEMBER 1960</u>				
18	2520	NAA 024	1 Aug 60	NAA flight. Impact was 2.5 NM over the planned 425 NM range.
19	2515	NAA 026	11 Aug 60	NAA flight. Total flight distance was 620 NM, the longest to date.
20	2323	NAA 027	18 Oct 60	NAA flight. Malfunction of automatic control made manual command control necessary. Total flight distance was 690 NM, the longest to date.
21	4249	SAC 4	25 Oct 60	SAC flight. Low altitude, off-course launch followed by high cruise flight. Launched from B-52. Impact was near target.
22	4414	SAC 8	2 Nov 60	SAC flight. High level launch and cruise and straight-line flight. Range was 600 NM.
23	4520	SAC 9	15 Nov 60	SAC flight. RSO destruct 22 min after launch.
24	3516	NAA 031	21 Dec 60	NAA flight. All systems functioned normally. Radial error at impact was 0.5 NM.

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MT 60-2544-1

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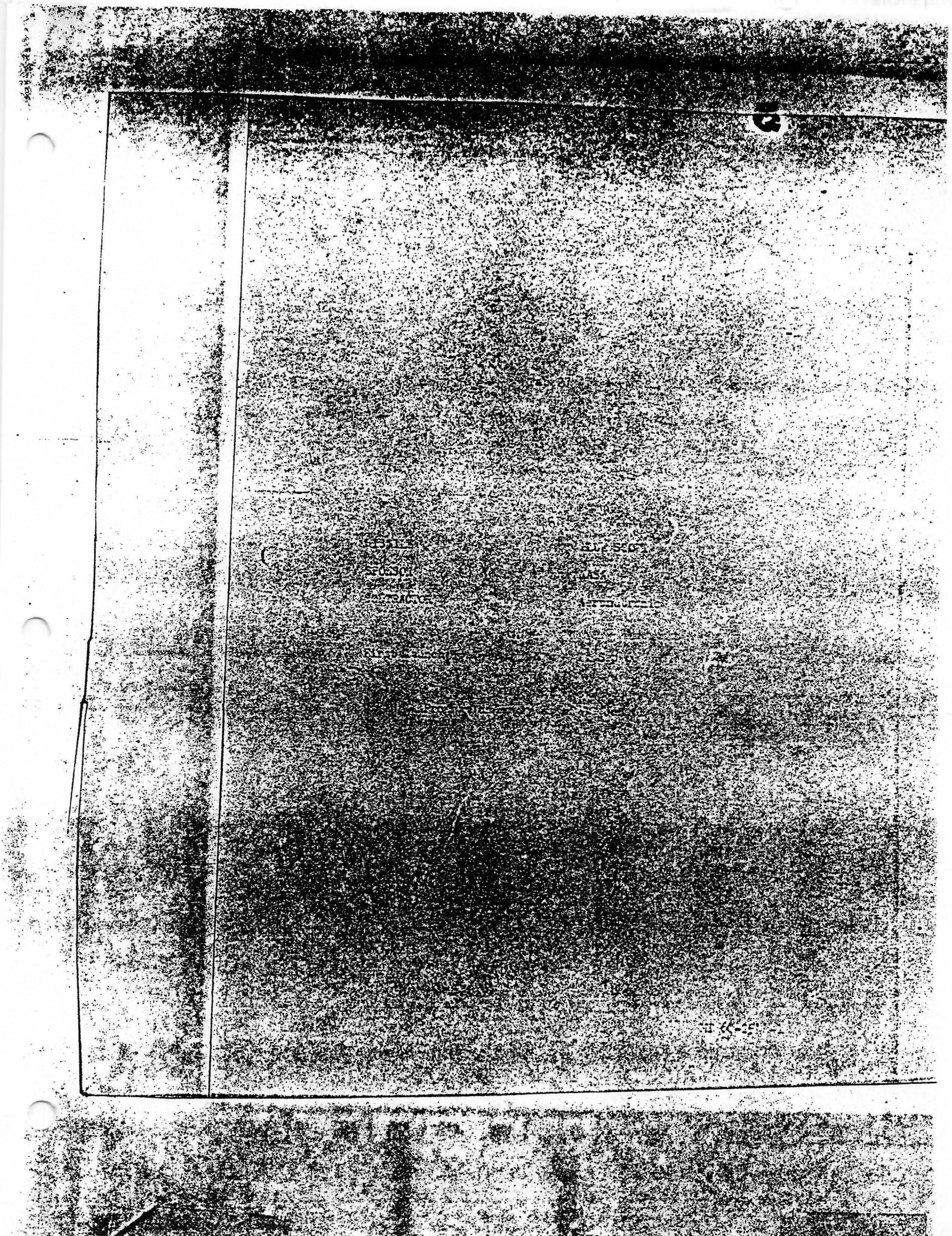
UNCLASSIFIED

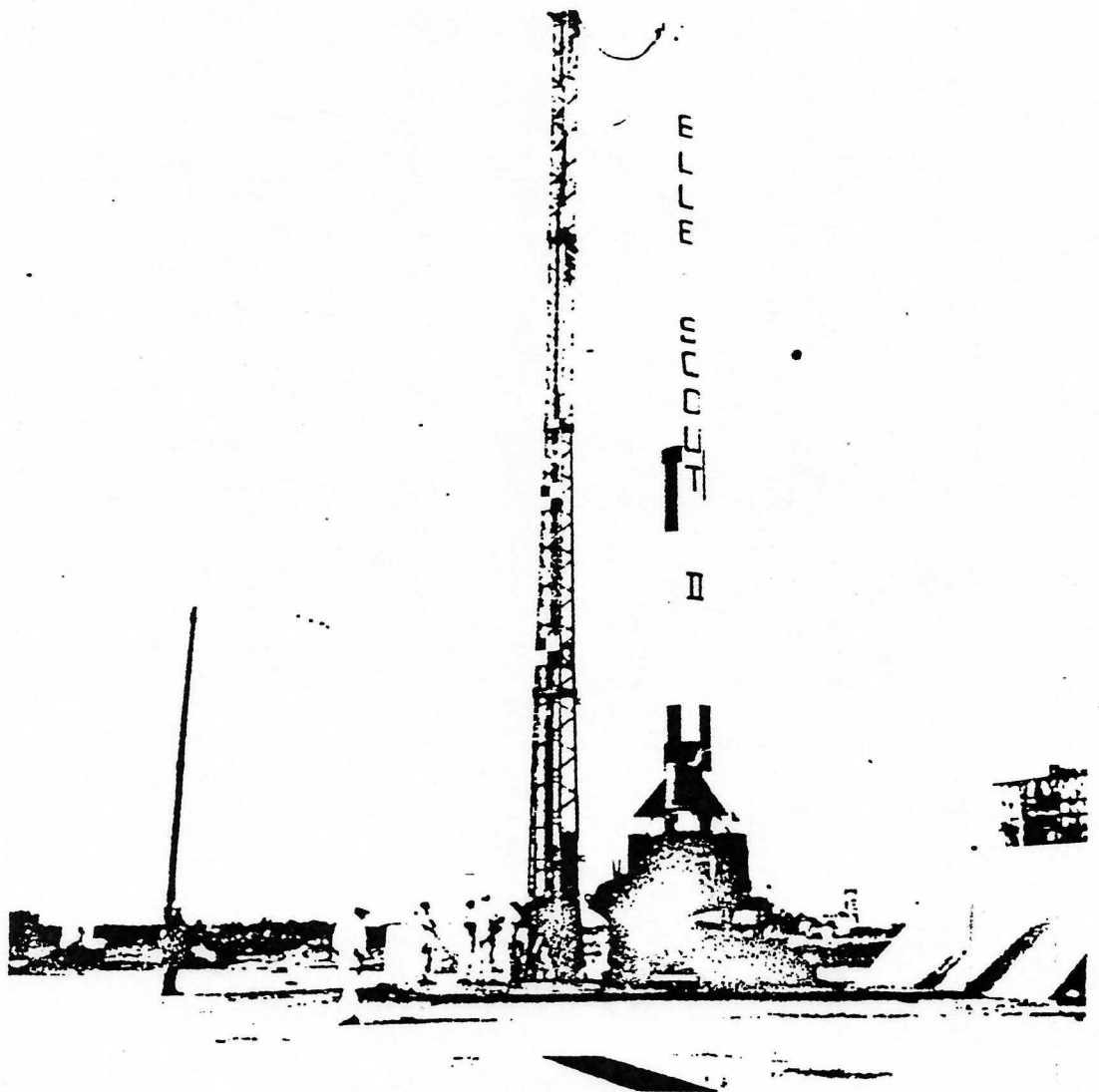
REPORT OF (DAW-77) LAUNCHES

TOTAL ID DATE	TEST NUMBER	MISSILE NUMBER	DATE LAUNCHED	REMARKS
JANUARY - JUNE 1961				
25	622	NAA 030	9 Feb 61	Flew 576 NM range. Radial error at impact 1.2 NM.
26	726	SAC #11	10 Feb 61	1-12 launched. Flew 603 NM. Radial error at impact 1.0 NM.
27	830	SAC #12	21 Feb 61	Propulsion malfunction prevented climb to cruise altitude. 350 destruct after 170 mi flight.
28	823	NAA 032	10 Mar 61	Flew 600 NM range. Radial error at impact 0.7 NM.
29	775	SAC #5	21 Mar 61	Flew programmed 90 degree dog-leg turn to target. Impact 9 NM long.
30	832	NAA 033	5 Apr 61	Flew 576 NM range. Radial error at impact 0.1 NM.
31	825	NAA 031	12 Apr 61	Did not climb to cruise altitude. Terminal dive occurred at 190 NM.
32	824	NAA 035	25 Apr 61	Flew 576 NM range. Radial error at impact 0.1 NM.
33	1357	SAC #13	27 Apr 61	All functions normal. Impact was in target area.
34	1358	SAC #14	27 Apr 61	Broke up shortly after launch. Impacted near launch point.
35	801	NAA 028	19 May 61	Became unstable during terminal dive. Range was 600 NM with radial error of 3.6 NM.
36	2050	NAA 036	22 May 61	Programmed 90 degree dog-leg turn executed. Impact 2.8 NM long for total range of 512 NM.

AF 60-2510-1

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BLUE SCOUT II THE AIR FORCE'S LAUNCHING VEHICLE FOR CONDUCTING RESEARCH
EXPERIMENTS AND TESTING RELATED TO ITS SPACE ACTIVITIES. IT USES DIFFERENT
COMBINATIONS OF SOLID PROPELLANT BOOSTERS. PRIME CONTRACTOR IS AERO-
NUTRONIC DIVISION OF FORD MOTOR COMPANY. MISSILE STANDS ON LAUNCH PAD
AT CAPE CANAVERAL, FLA. NOTED SITE OF THE AIR FORCE MISSILE TEST CENTER

BLUE SCOUT

TOTAL TO DATA	TEST NUMBER	MISSILE TYPE	DATE LAUNCHED	REMARKS
<u>JULY - DECEMBER 1960</u>				
1	1009	D-1	21 Sep 60	BLUE SCOUT Junior. First launch of the TS-609A vehicle initiated series of 9 programmed launches in Radiation Study Program. Primary test objectives were met. All military launch by 6555th Test Wg (Det). Purpose to boost a 32.6 lb payload to apogee altitude of approx 14,476.9 km.
2	1512	(ARM-91) D-2	8 Nov 60	BLUE SCOUT Junior. Launched by military personnel. Missile performance appeared normal thru 2nd stage ignition. Analysis indicates that missile may have broken up approx 24.7 sec after 2nd stage ignition. Telem track lost at 1+30 sec.

BLUE SCOUT

TOTAL TO DATE	EST NUMBER	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JANUARY - JUNE 1961</u>				
3	2510	A1-1 D-3	7 Jan 61	High altitude probe. Apogee of 700 NM. Impact 175 mi short of impact point. Carried 392 pound payload. Recovery vehicle not recovered. BLUE SCOUT I.
4	826	A1-1 D-1	3 Mar 61	Military launched space probe with 172 lb payload. Impact was 102 NM short and 71 NM to right of predicted point. BLUE SCOUT II altitude probe.
5	827	A1-2 D-5	12 Apr 61	Military launched BLUE SCOUT II carried 365 pound payload. Recovery vehicle not recovered.
6	105	A1-2 D-6	9 May 61	Erratic second stage action at T+82 sec resulted in BSO destruct. BLUE SCOUT I.

NY 61-2541-1

HETS (Hyper Environmental Test System)

HETS Radiation Study 21 Sep 60 Placed instrumented payload of
 Booster: ELVE SCOUT JR 32.8 lbs at altitude of 21,490.2
 NM to study radiation at altitude.

HETS Radiation Study 8 Nov 60 Attempt to boost instrumented
 Booster: ELVE SCOUT JR package to high altitude for radiation
 Sponsor: Air Force study. Telemetry lost at 7.60
 sec with indication that missile
 may have broken up approx 21.7 sec
 after second stage ignition.

HETS Radiation Study 7 Jan 61 Purpose to boost a 390 lb payload
 Booster: ELVE SCOUT I on a high altitude probe trajectory
 Vehicle: AL-1 No. D-3 with apogee of 875 NM and recover
 the payload. Apogee of payload
 was slightly over 700 NM and impact
 was 175 NM short of impact point.
 Heat shield did not separate
 properly. The recovery vehicle
 was located floating on the surface
 of the water by search aircraft but
 was lost before the recovery vessel
 arrived. Search was abandoned at
 nightfall.

HETS Radiation Study 3 Mar 61 Purpose to boost a 172 lb payload
 Booster: ELVE SCOUT II on an altitude probe trajectory
 Vehicle: AL-1 No. D-4 with an apogee of 15,000 NM. Impact
 was 102 NM short and 7. NM right
 of predicted impact point. All six
 experiments in the payload functioned
 properly and valuable data was
 recorded.

HETS Radiation Study 12 Apr 61 Purpose to boost a 165 lb payload
 Booster: ELVE SCOUT II on a high altitude probe trajectory
 Vehicle: AL-2 No. D-5 with an apogee of 1075 NM. Recovery
 aids were destroyed after re-entry.
 Re-entry vehicle was not recovered.

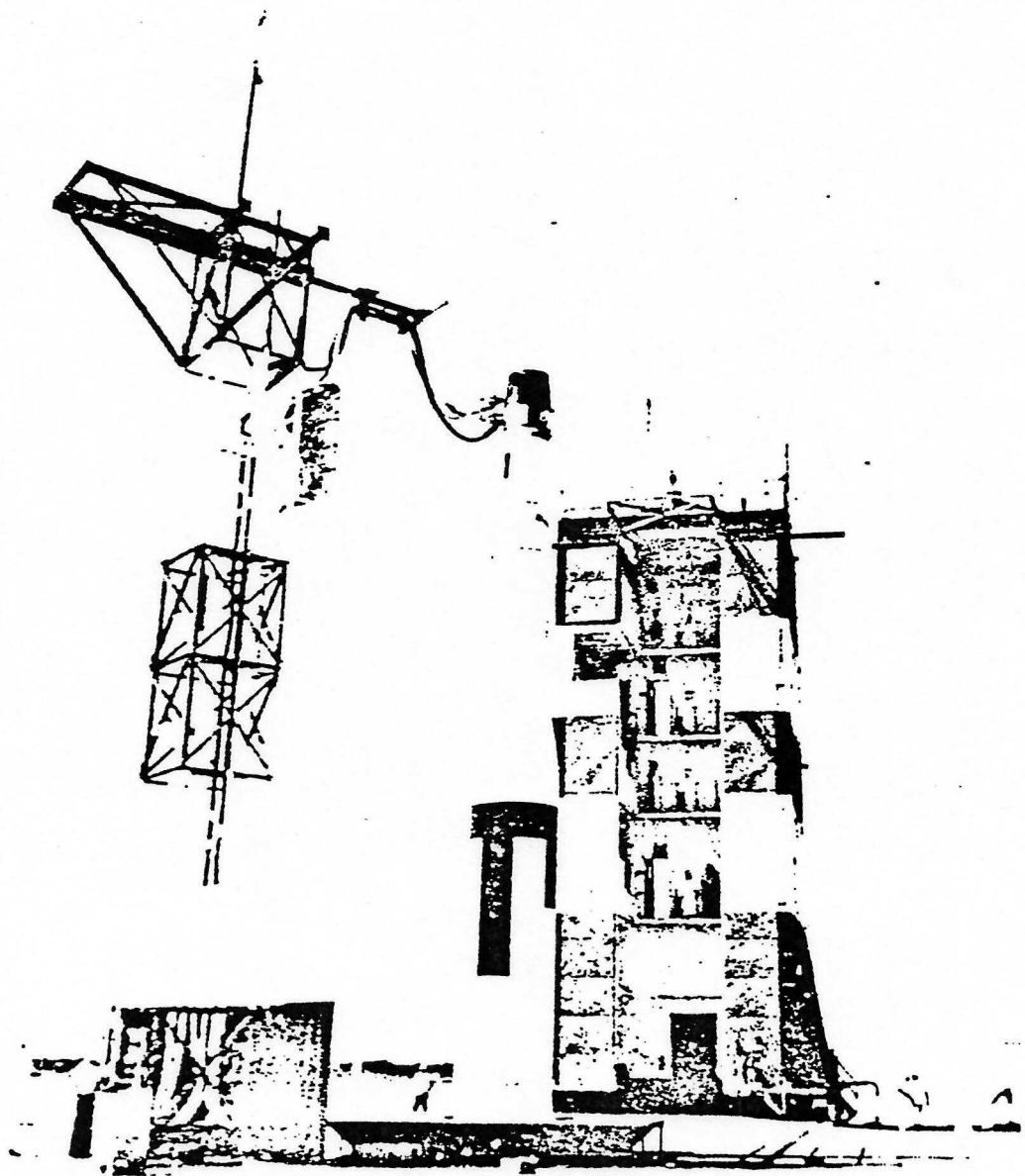
HETS Radiation Study 9 May 61 Purpose to boost a 144 lb payload
 Booster: ELVE SCOUT I on altitude probe trajectory with
 Vehicle: AL-2 No. D-6 an apogee of 875 NM. RSO destruct
 ordered at 7.62 sec when 2nd stage
 behavior became erratic.

LUNAR PROBES AND ORBITS

1st lunar probe 17 Aug 58 Escape earth's gravity field and
Booster: #127 THOR-AELE 1 place instrumented payload in
vicinity of the moon. 1st stage
malfunction terminated flight at
T+75 seconds.

For information on 2nd, 3rd, 4th, and 5th lunar probes see the PIONEER
program.

1st attempted moon 26 Nov 59 Purpose to overcome earth's gravi-
orbit tational field and place instru-
Booster: 20D ATLAS-AELE IV mented payload in orbit around the
Sponsor: NASA moon. 2nd stage fell from vehicle
at T+47.6 seconds. No orbit.



WHITEMAN, THE AIR FORCE'S FIRST SOLID PROPELLANT INTERCONTINENTAL
MISSILE, PRIME CONTRACTOR - GLENN L. MARTIN COMPANY. MISSILE
LAUNCH PAD AT CAPE CANAVERAL, LAUNCHING SITE OF THE
WHITEHOUSE MISSILE TEST CENTER.

28-1

Tab 28

MISSILE

MINUTEMAN

SPONSOR

Air Force

CONTRACTORS

Prime: Boeing Aircraft

Associate: Aerojet General
Thiokol
AYCO
Hercules
Autonetics

First Launch

1 Feb 61

Program underway as of 30 Jun 61

MT 60-7011-1

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28-2

MINUTEMAN LAUNCHINGS

TOTAL TO DATE	TEST NUMBER	MISSILE NUMBER	DATE LAUNCHED	REMARKS
<u>JANUARY - JUNE 1961</u>				
1	5103	401	1 Feb 61	First launch under MINUTEMAN program at AMR. First time all stages of multi-stage weapon system tested on first launch. Impact 1,600 NM down range.
2	406	402	19 May 61	Nozzle malfunction during second stage caused erratic behavior that required destruct action.

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MT 60-2514-1

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PERIOD: JULY 1950 - DECEMBER 1968

RECAP OF MINUTEMAN LAUNCHES BY WING PERSONNEL --
BY YEAR/PROGRAM SERIES/OVERALL TOTAL

YEAR/PROGRAM	YEAR OF FIRST/ LAST LAUNCH IN EACH SERIES	SERIES TOTAL: BY YEAR	TOTAL LAUNCHES: BY YEAR	TOTAL LAUNCHES: BY SERIES	AND ALL M-MAN LAUNCHED	GRAND TOTAL:
<u>1961</u> (ICBM) M-Man I	First	6	6			
<u>1962</u> M-Man I		19	19			
<u>1963</u> M-Man I		18	18			
<u>1964</u> M-Man I	Last	11				
M-Man II	First	<u>4</u>	15			
				<u>Total M-Man I : 54</u>		
<u>1965</u> M-Man II		7	7			
<u>1966</u> M-Man II		4	4			
<u>1967</u> M-Man II		4	4			
<u>1968</u> M-Man II	Last	1				
M-Man III	First/Contin- uing Program	<u>2</u>	<u>3</u>			
				<u>Total M-Man II : 20</u>		
				<u>Total M-Man III : 2</u>		
				GRAND TOTAL:		<u>76</u>

Compiled By: M. A. Kingsley (As of 31 Dec 1968)

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(CONTINUED)

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MINUTEMAN I

M-MAN I -CONTINUED

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MINUTEMAN LAUNCHES (CONTINUED)

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<u>Missile</u>	<u>Launch Date</u>	<u>Launched from</u>	<u>Summary</u>
<u>M-M-N I - FTM #</u>			
423A	7 Jan 63	Silo 31B	
419.	23 Jan 63	Silo 32B	
421B	20 Feb 63	Silo 32B	
425	18 Mar 63	Silo 31B	
419A	27 Mar 63	Silo 32B	
425A	10 Apr 63	Silo 31B	
425B	18 May 63	Silo 32B	
428	28 May 63	Silo 31B	
427	5 Jun 63	Silo 32B	
429	27 Jun 63	Silo 31B	
431	1 Jul 63	Silo 32B	
430	16 Jul 63	Silo 32B	
432	24 Jul 63	Silo 31B	
433	5 Aug 63	Silo 32B	
435	27 Aug 63	Silo 31B	
434	7 Nov 63	Silo 32B	
446	13 Nov 63	Silo 31B	
447	18 Dec 63	Silo 32B	
438	16 Jan 64	Silo 32B	
448	28 Jan 64	Silo 31B	
436	12 Feb 64	Silo 32B	
437	25 Feb 64	Silo 31B	
439	27 Feb 64	Silo 32B	
440	13 Mar 64	Silo 32B	
442	20 Mar 64	Silo 31B	
441	30 Mar 64	Silo 32B	
443	7 Apr 64	Silo 31B	

MINUTEMAN LAUNCHES (CONT.)

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MINUTEMAN LAUNCHES (CONTINUED) ~~FOR OFFICIAL USE ONLY~~

Missile	Launch Date	Launched From	Remarks
MIN-MAN I	24 Apr 64	Silo 31B	
MIN-MAN II #449	24 Sep 64	Silo 32B	FIRST MINUTEMAN II LAUNCH. (See Minuteman II Report - classified information.)
MIN-MAN I #445	29 Sep 64	Silo 31B	LAST MINUTEMAN I Flight Test.
MIN-MAN II #450	29 Oct 64	Silo 32B	
451	15 Dec 64	Silo 32B	
452	18 Dec 64	Silo 31B	
453	28 Jan 65	Silo 31	
455	7 May 65	Silo 32	
456	26 May 65	Silo 32	
457	4 Aug 65	Silo 32	
454	23 Aug 65	Silo 31	
458	25 Sep 65	Silo 32	
459	2 Oct 65	Silo 31	
461	6 Jan 66	Silo 32	
460	11 Feb 66	Silo 31	
462	1 Apr 66	Silo 31	
463	9 Jul 66	Silo 32	
464	18 Jan 67	Silo 32	
465	24 Feb 67	Silo 32	
466	17 Aug 67	Silo 32	
467	6 Nov 67	Silo 32	
468	6 Feb 68	Silo 32	LAST MINUTEMAN II Flight Test.

(MINUTEMAN Launches Cont'd)

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MINUTEMAN LAUNCHES (CONTINUED)

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<u>Missile</u>	<u>Launch Date</u>	<u>Launched From</u>	<u>Remarks</u>
<u>MINUTEMAN III - FTM //</u>			
201	16 Aug 68	Silo 32	<u>FIRST MINUTEMAN III LAUNCH.</u>
202	24 Oct 68	Silo 32	Classified AF Program -- see
203	26 Mar 69	Silo 31	Wing Histories.
204	22 Apr 69	Silo 31	
205	27 May 69	Silo 32	
206	25 Jun 69	Silo 32	
207	31 Jul 69	Silo 31	
208	23 Sep 69	Silo 31	Silo 31 deactivated. Total of 5 M-Man (includ. 4 M-Man III) Msl. launched from Complex(Silo) 31 since 1961.
209	6 Nov 69	Silo 32	
210	4 Dec 69	Cx 32 (Silo)	
212	13 Mar 70	Cx 32 (Silo)	
<u>MCD. MINUTEMAN II</u>			
Shelter Based Msl	14 Mar 70	Cx 31A	First Launch. Classified AF Program -- see Wing Histories.

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MINUTEMAN LAUNCHES -- RECAP (CONTINUED) ~~FOR OFFICIAL USE ONLY~~

PERIOD: JANUARY 1969 - _____

GRAND TOTAL BROF FORWARD: _____

YEAR/PROGRAM	YEAR OF FIRST/ LAST LAUNCH IN EACH SERIES	SERIES TOTAL: BY YEAR	TOTAL LAUNCHES: BY YEAR	TOTAL LAUNCHES: BY SERIES	GRAND TOTAL : ALL MINUTEMAN LAUNCHES
1969 (*ICBM)M-MAN III (Cont'd)		8	8		

1970

(ICBM) M-MAN III		/			
(ICBM) M-MAN II	First	/			
(SBM**) (MODIFIED)					

*ICBM - Intercontinental Ballistic Missile

**SBM - Shelter Based Missile

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AFSC - AAFB - WASH. DC

Tests

AFSC FORM 1956

GENERAL PURPOSE WORKSHEET (10 1/2" X 8")

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

ANNEX A
SATELLITE LAUNCHINGS
AND SPACE PROBES

	FY-58	FY-59	FY-60	FY-61	TOTAL
PASSENGER SATELLITE LAUNCHINGS					
SEACON		1	1		2
COURIER				2 (1)	2 (1)
ECHO			1	1 (1)	2 (1)
EXPLORER	3 (2)	2 (1)	3 (2)	1 (1)	4 (2)
MIDAS			2 (1)		2 (1)
SCORE		1 (1)			1 (1)
TIROS			1 (1)	1 (1)	2 (2)
TRANSIT			1	2 (2)	1
VANGUARD	1	5 (1)	1 (*)	3 (1)	1 (1)
					11 (3)
SPACE PROBES AND FLIGHTS **					
HERS				2	4
LUNAR PROBES		1	1	2	4
MERCURY			1	3	4
PIONEER		3	1 (1)	1 (1)	
TOTALS	1	9 (2)	9 (2)	1 (2)	9 (3)
			8 (5)	13 (4)	14 (4)
					65 (23)
FY-57	FY-58	FY-59	FY-60	FY-61	

Numbers in parentheses indicate successful orbit achieved.
 * Circled earth 3 or 4 times before re-entering earth's atmosphere.
 ** The space probe payloads were not satellites, and placing an object in orbit was not the purpose of the flights.
 # These two went into orbit around the sun.

Tab 27

ANNEX A

SPACE FLIGHTS
and
PASSENGER SATELLITES

ECHO PROGRAM

ECHO	13 May 60	Purpose to place 100 ft inflatable balloon in 900 NM orbit around the earth as a passive communications aid satellite. Orbit of payload was not achieved.
Booster: DELTA 1 - THOR #1111		
Sponsor: NASA		
 ECHO 1B	12 Aug 60	 Purpose to place 100 ft inflatable sphere in earth orbit for use in passive communications experiments. Near circular orbit with apogee of 1,050 NM, perigee of 950 NM, and period 118.3 min achieved. Message from Pres. Eisenhower transmitted from JPL, Goldstone, Calif to ETL, Holmdel, NJ via ECHO on first orbital pass over the US.
Booster: DELTA #2		
Sponsor: NASA		
	19 Aug 60	ECHO I was first used to transmit wireless code across the Atlantic from BTL to Issy-les-Moulineaux, France.
	22 Aug 60	The first transatlantic voice message via ECHO I was sent from BTL, New Jersey to Jodrell Bank, England.
	10 Nov 60	NASA and the US Post Office cooperated in transmitting a letter from Stump Neck, Md to Newark, NJ via ECHO I. This was the first letter to be processed through outer space.

EXPLORER PROGRAM

EXPLORER I	31 Jan 58	First U.S. earth satellite placed in orbit. Cylinder 50" long, 6" diameter, weight 30.8 lbs. Expected life, 3 to 5 years.
Booster: JUPITER-C #27		
EXPLORER II	5 Mar 58	Failed to achieve orbit. Size and weight same as EXPLORER I.
Booster: JUPITER-C #26		
EXPLORER III	26 Mar 58	Placed in earth orbit. Size and weight same as EXPLORER I. Re-entered earth's atmosphere 27-29 Jun 58.
Booster: JUPITER-C #21		
EXPLORER IV	26 Jul 58	38.64 lb. earth satellite to study cosmic ray intensity. Placed in earth orbit. Re-entered earth's atmosphere 23 Oct 59.
Booster: JUPITER-C #14		
EXPLORER V	24 Aug 58	Failed to achieve orbit. 2nd and 3rd stages fired at incorrect angle for orbital flight.
Booster: JUPITER-C #17		
EXPLORER VI	7 Aug 59	Paddlewheel satellite placed in earth orbit. Life expectancy over 1 year. Purpose to study environment encountered.
Booster: #134 THOR-AK3 3		
EXPLORER VII	13 Oct 59	Placed in orbit a 91.5 lb. earth satellite with a life expectancy of 20 years.
Booster: JUNO II #19A		

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EXPLORER PROGRAM

EXPLORER I	12 Jan 55	First U.S. earth satellite placed in orbit. Cylinder 40" long, 6" diameter, weight 20.6 lbs. Expected life, 3 to 5 years. Apogee 1,155 mi, perigee 217 mi.
EXPLORER II	5 Mar 55	Failed to achieve orbit. Size and weight same as EXPLORER I.
EXPLORER III	26 Mar 55	Placed in earth orbit. Size and weight same as EXPLORER I. Re-entered earth's atmosphere 27-29 Jun 58 after about 1,250 revolutions. Apogee 1,741 mi, perigee 157 mi.
EXPLORER IV	26 Jul 58	38th U.S. earth satellite to study cosmic ray intensity. Placed in earth orbit. Re-entered earth's atmosphere 23 Oct 59 after about 6,100 revolutions. Apogee 1,380 mi, perigee 157 mi.
EXPLORER V	24 Aug 58	Failed to achieve orbit. 2nd and 3rd stages failed at incorrect angle for orbital flight. Payload weight 38.4 lbs (25.8 lb satellite and 12.6 lb non-space).
EXPLORER (Unnumbered)	16 Jul 58	Purposed to place satellite in orbit to measure earth's rotation balance. Payload weighed 91.5 lbs, was 76" high and 17.5" in diameter. A30 destruct of booster at 7:05 sec prevented orbit.
EXPLORER VI	7 Aug 59	Paralleled satellite placed in earth orbit. Life expectancy over 1 year. Purpose to study environment encountered. Apogee 26,457 mi, perigee 186 mi, weight 20.6 lbs.

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EXPLORER PROGRAM

EXPLORER VII 13 Oct 59
Booster: JUNG II #19A

Placed in orbit a 91.5 lb earth satellite with a life expectancy of 20 years. Apogee 573 mi, perigee 344 mi. Purpose to study radiation.

EXPLORER (Unnumbered) 23 Mar 60
Booster: JUNG II #19C

Attempt to place a radiation measurement package in earth orbit to study Van Allen radiation belt. Payload weight 35.3 lbs (22.8 lb instrument pack and 12.5 lb lth stage). Lth stage of vehicle did not ignite. Mission probably not achieved.

EXPLORER VIII 3 Nov 60
Booster: JUNG II #19P
Sponsor: NASA

Placed 90 lb satellite in earth orbit to study radiation. Apogee 2422.6 statute mi, perigee 258.4 statute mi. Orbital period 112.75 min. Life expectancy 10 years. Payload weight 90.44 lbs.

EXPLORER IX

Was launched from Wallops Island, Va., consequently, it is not included in this series.

EXPLORER (Unnumbered) 24 Feb 61
Booster: JUNG II #19F
Sponsor: NASA

Attempted placement of 74 lb payload in earth orbit to study stage of ionosphere by analysis of transmitted signals. Payload was 30" diameter, 34" high formed by joining two aluminum truncated cones at their bases. Failure of third and fourth stage boosters to ignite prevented orbit of payload. Test accomplished later as EXPLORER XI.

EXPLORER X 25 Mar 61
Booster: DELTA-THOR #4
Sponsor: NASA

Satellite payload weighed 79 lbs and was 52" high. It consisted of a 13" sphere atop a supporting tube joined to the flat side of a 19" cylinder. Purpose to gather data on earth's magnetic fields. Achieved elliptical orbit with perigee of 100 mi and apogee of 445,000 mi. Estimated lifetime of a few weeks.

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A-1-3

EXPLORER PROGRAM

EXPLORER XI 27 Apr 61
Booster: JUNO II #19E
Sponsor: NASA

Earth satellite to study gamma rays from cosmic sources and map their distribution in the sky. Payload weighed 82 lbs. Configuration resembled old-time street lamp - 12" diameter, 23.5" long octagonal box mounted on 6" diameter column that was 20.5" long. The 44" long 4th stage booster remained attached to satellite. Elliptical orbit had apogee of 1113.2 mi and perigee of 304 mi. Estimated lifetime, 1 to 3 years.

EXPLORER (Unnumbered) 24 May 61
Booster: JUNO II #19G
Sponsor: NASA

Purpose was to place a 75 lb earth satellite in orbit known as "Ionospheric Beacon (S-45)." Electrical power failure in missile prevented orbit of payload. This was the last of the JUNO II boosters.

UNCLASSIFIED

MT 60-2544-1

PIONEER PROGRAM

PIONEER I	11 Oct 58	PIONEER I was not a satellite. It was the second lunar probe. Booster traveled 99,000 statute miles into space, farthest to date. Major test objectives were not achieved. Verified Van Allen radiation belt.
Booster:	THOR-AELE I #130	
Sponsor:	NASA	
 PIONEER II	 8 Nov 58	 Third lunar probe. Third stage of booster did not ignite and objectives were not achieved.
Booster:	THOR-AELE I #129	
Sponsor:	NASA	
 PIONEER III	 6 Dec 58	 Fourth lunar probe to obtain radiation data regarding Van Allen belt by placing 15 lb payload in the vicinity of the moon. Short burning time of 1st stage failed to produce required velocity and it traveled only 66,654 miles into space.
Booster:	JUNO II (AM-11)	
Sponsor:	NASA	
 PIONEER IV	 3 Mar 59	 Fifth lunar probe to obtain radiation data regarding Van Allen belt by placing 15 lb payload in the vicinity of the moon. By-passed moon by 38,000 miles and went into orbit around the sun. Became first U.S. satellite in solar orbit.
Booster:	JUNO II #14	
Sponsor:	NASA	
 PIONEER V	 11 Mar 60	 Deep space probe around the sun in orbital path of Venus. Placed satellite, known as paddlewheel planet, in orbit around sun. On 29 Apr 60 it was 6.5 million miles from earth, had a velocity of 6,500 mph, and its 5 watt transmitter was still operating. 2nd U.S. sun satellite.
Booster:	THOR-AELE #4	
Sponsor:	NASA	

PIONEER PROGRAM

PIONEER I 11 Oct 58
Booster: THOR-AELE I #110
Sponsor: NASA

PIONEER I was not a satellite. It was the second lunar probe. Booster traveled 90,000 statute miles into space, farthest to date. Major test objectives were not achieved. Verified Van Allen radiation belt.

PIONEER II 8 Nov 58
Booster: THOR-AELE I #129
Sponsor: NASA

Third lunar probe. Third stage of booster did not ignite and objectives were not achieved.

PIONEER III 6 Dec 58
Booster: JUNO II (AM-11)
Sponsor: NASA

Fourth lunar probe to obtain radiation data regarding Van Allen belt by placing 15 lb. payload in the vicinity of the moon. Short burning time of 1st stage failed to produce required velocity and it traveled only 66,651 miles into space.

PIONEER IV 3 Mar 59
Booster: JUNO II #11
Sponsor: NASA

Fifth lunar probe to obtain radiation data regarding Van Allen belt by placing 15 lb. payload in the vicinity of the moon. By-passed moon by 36,000 miles and went into orbit around the sun. Became first U.S. satellite in solar orbit.

PIONEER V 11 Mar 60
Booster: THOR-AELE #1
Sponsor: NASA

Deep space probe around the sun in orbital path of Venus. Placed satellite, known as paddlewheel planet, in orbit around sun. On 29 Apr 60 it was 6.5 million miles from earth, had a velocity of 0.500 mph, and its 5 watt transmitter was still operating. 2nd U.S. sun satellite.

LUNAR PROBES AND ORBITS

1st lunar probe 17 Aug 58 Escape earth's gravity field and
 Booster: #127 THOR-AE1 1 place instrumented payload in
 vicinity of the moon. 1st stage
 malfunction terminated flight
 at T+75 seconds.

For information on 2nd, 3rd, 4th, and 5th lunar probes see the
 PIONEER program.

1st attempted moon 26 Nov 59 Purpose to overcome earth's gravi-
 orbit tational field and place instru-
 Booster: 2CD ATLAS-AE1 IV mented payload in orbit around
 Sponsor: NASA the moon. 2nd stage fell from
 vehicle at T+7.5 seconds. No
 orbit.

Lunar probe 25 Sep 60 Purpose interplanetary space
 Booster: ATLAS-AE1 5 probe beyond earth's gravitational
 #800 field. Low thrust and premature
 shutdown of second stage pre-
 vented velocity gain. 3rd stage
 accelerated in opposite direc-
 tion from that desired. Required
 velocity for lunar exploration
 not achieved.

Lunar probe 60 Purpose same as above
 Booster: ATLAS-AE1 Vehicle lost structural integ-
 #913 rity at T+67 seconds after
 lift-off.

MERCURY PROGRAM

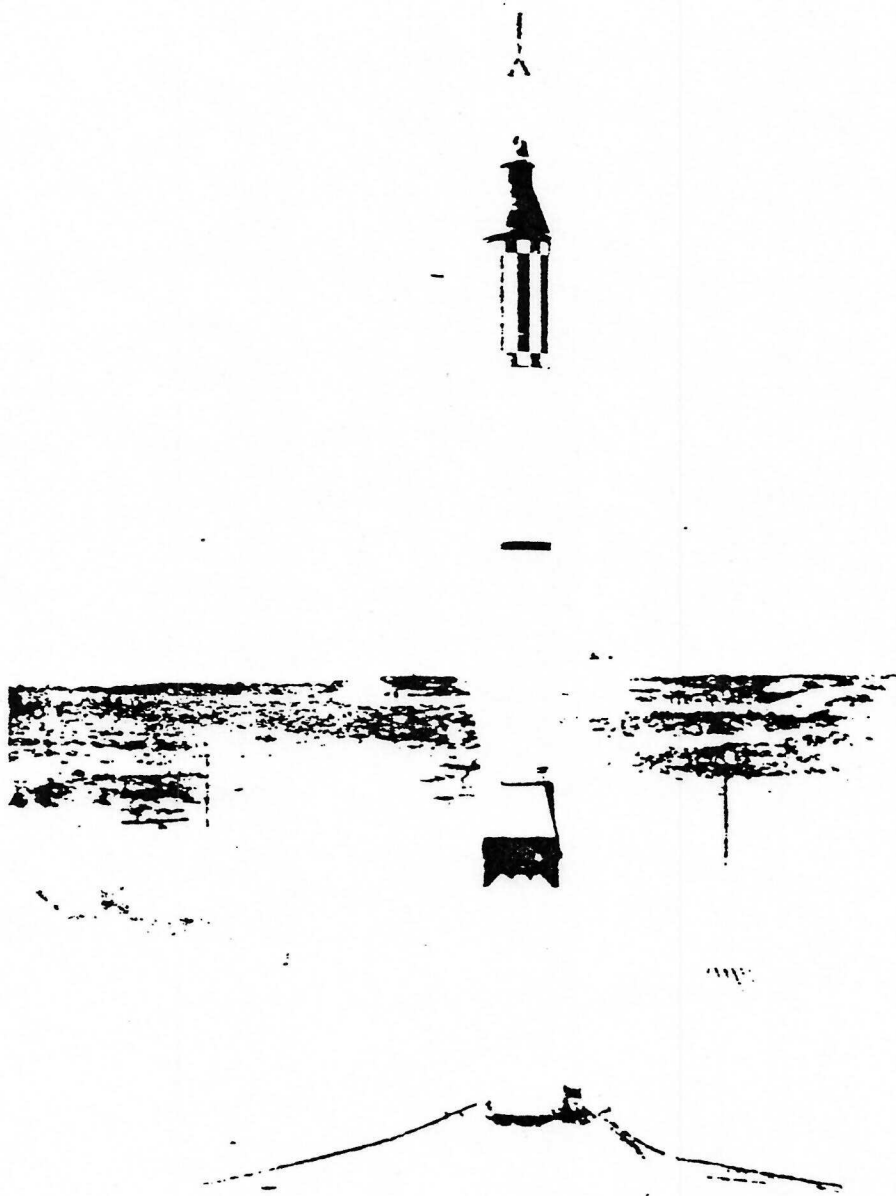
MERCURY MA Prototype Booster: ATLAS 100 Sponsor: NASA	13 Sep 60	1st MERCURY capsule launch at AER. Shipboard recovery accomplished. Mission heat shield was in excellent condition. There was a delayed separation between capsule and booster but test objectives were achieved.
MERCURY MA-1 Booster: ATLAS 50D	29 Jul 60	Second Mercury launch. First McDonnell A-7 Corp capsule test. Undisclosed difficulty encountered at T-60 seconds. Orbit not achieved. Capsule crashed 4.5 mi off shore from Cape Canaveral.
MERCURY MR-1 Booster: REDSTONE	21 Nov 60	Failed. Engine cutoff occurred one second after ignition and booster settled back on the pad. MR-1 capsule jettisoned and landed 1700 feet from launch pad.
MERCURY MR-1A Booster: REDSTONE	19 Dec 60	First successful MERCURY REDSTONE launch from AER. Capsule recovered 100 mi after launch by USS Valley Forge. First time capsule landed within 100 mi of target.
MERCURY MR-2 Booster: REDSTONE	31 Jan 61	MERCURY capsule contained a champagne bottle. Higher than normal thrust carried capsule 100 mi further down range than expected. Capsule was recovered in satisfactory condition. Bottle shattered on all efforts to open it.
MERCURY MA-2 Booster: ATLAS 679	21 Feb 61	Capsule launched on target of 81 NM and impacted 100 NM from range just 13 mi from calculated impact point. Impact occurred 30 mi after 1.5 hr of flight. Capsule lifted from water by ship and recovered 150 mi from launch site after impact.

M-10-1544-1

MIDAS PROGRAM

MIDAS I	26 Feb 60	1st of two MIDAS shots. Purpose
Booster: ATLAS 29B		to place MIDAS capsule in earth
Sponsor: Air Force from		orbit with infrared detection
ARPA		payload as Missile Defense Alarm
		System. Orbit not achieved.
MIDAS II	24 May 60	Placed MIDAS capsule containing
Booster: ATLAS 45D		infrared detection device in
Sponsor: Air Force from		earth orbit as Missile Defense
ARPA		Alarm System. Life expectancy
		3 or 4 months. Completed MIDAS
		program at AFMTC.

Program completed.



MERCURY REDSTONE - NASA'S MERCURY REDSTONE SPACECRAFT USED IN THE "MAN IN SPACE" PROGRAM. LAUNCHES FROM THE CAPE CANAVERAL LAUNCH SITE OF THE AIR FORCE MISSILE TEST CENTER.

MIDAS PROGRAM

MIDAS I	26 Feb 60	1st of two MIDAS shots. Purpose
Booster: ATLAS 27D		to place MIDAS capsule in earth
Sponsor: Air Force from		orbit with infrared detection pay-
ARPA		load as Missile Defense Alarm
		System. Orbit not achieved.
 MIDAS II	 24 May 60	 Placed MIDAS capsule containing
Booster: ATLAS 45D		infrared detection device in
Sponsor: Air Force from		earth orbit as Missile Defense
ARPA		Alarm System. Life expectancy
		3 or 4 months. Completed MIDAS
		program at AFMTC.

Program completed.

MERCURY PROGRAM

MERCURY MA-3
Booster: ATLAS

25 Apr 61

Planned one time orbit and recovery of uninhabited capsule. Booster failed to program properly and RSO destruct action was required at 140 sec. Capsule escape system functioned properly and propelled it away from explosion area prior to destruct. Capsule landed in ocean several hundred yards off shore and was recovered undamaged by helicopter.

MERCURY MR-3
Booster: REDSTONE

5 May 61

First manned space flight carried astronaut Alan B. Shepard, Jr 260 miles down range (4 mi farther than planned) during a 15 min flight. Capsule recovery was made without incident by helicopter that deposited it on deck of USS Lake Champlain 10 min after it landed in the ocean.

MERCURY PROGRAM

MERCURY
Booster: ATLAS 10D
Sponsor: NASA

9 Sep 59

1st MERCURY capsule launch at AMR.
Shipboard recovery accomplished.
Ablating heat shield was in excellent condition. There was a delayed separation between capsule and booster but test objectives were achieved.

A-5-1

PROJECT SCORE

ATLAS satellite 1st Dec 58 ATLAS missile 108 placed in earth
Booster: ATLAS 108 orbit. Used to relay President
Sponsor: ARPA Eisenhower's Christmas message
to the world. Satellite decayed
21 Jan 1959.

NY 60-2514-1

PROJECT SCORE

ATLAS satellite	11 Dec 58	ATLAS missile 108 placed in earth
Booster: ATLAS 108		orbit. Used to relay President
Sponsor: ARPA		Eisenhower's Christmas message
		to the world. Satellite decayed
		21 Jan 1959.

SEACON PROGRAM

SEACON 22 Oct 58
Booster: JUPITER-C #19
Sponsor: NASA

Purpose to place 12 ft diameter inflatable sphere in earth orbit to study atmospheric density at various levels. Failed to achieve orbit. Weight of payload 15.3 lbs. Weight of sphere 9.26 lbs.

SEACON 11 Aug 58
Booster: JUNK II #193

Attempt to orbit a 10 lb, 12 ft diameter inflatable sphere around the earth to study air density in space. Payload failed to achieve orbit.

TIROS PROGRAM

TIROS I	1 Apr 60	Purpose to place meteorological
Booster: THOR-AEOL		satellite in earth orbit to pho-
Sponsors: NASA, AF, Army,		tograph cloud coverage of the
Navy, and Weather		earth. Orbited 170 lb. package
Bureau		with life expectancy of 50 years.

TIROS PROGRAM

TIROS I 1 Apr 60
Booster: THOR-AELE
Sponsors: NASA, AF, Army,
Navy and Weather
Bureau

Purpose to place meteorological satellite in earth orbit to photograph cloud coverage of the earth. Orbited 270 lb. package with life expectancy of 50 years.

TIROS II 23 Nov 60
Booster: DELTA #3

Placed 280 lb sphere in orbit as meteorological cloud cover satellite. Apogee 453 NM, perigee 387 NM. (Rocket 3rd stage also went into orbit) Tiros II transmitted TV pictures of the earth's cloud cover to Ft Monmouth, NJ and Kalna Point, Hawaii. It also carried sensors to observe radiation from earth and atmosphere. Life expectancy 50 to 100 years.

TRANSIT PROGRAM

TRANSIT 1A	17 Sep 59	Purpose to place a navigational aid satellite in orbit around the earth. Booster third stage failure prevented satellite orbit.
Booster:	THOR-ABLE #136	
Sponsors:	ARPA, Navy	
TRANSIT 1B	13 Apr 60	Purpose to place navigational aid satellite in orbit around the earth. Orbit achieved with life expectancy of 16 months.
Booster:	THOR-ABLE-STAR #257	
Sponsors:	ARPA, Navy	
TRANSIT 2A	22 Jun 60	Navigational aid earth satellite 36" diameter ball weighing 223 lbs. placed in orbit around earth. It carried aloft a 42 lb. basketball size sphere, known as the "piggy-back" satellite, to measure radiation in the ionosphere which also achieved orbit.
Booster:	THOR-ABLE-STAR #281	
Sponsors:	ARPA, Navy	

TRANSIT PROGRAM

TRANSIT 1A	17 Sep 59	Purpose to place a navigational aid satellite in orbit around the earth. Booster third stage failure prevented satellite orbit.
Booster:	THOR-AELE #136	
Sponsors:	ARPA, Navy	
TRANSIT 1B	13 Apr 60	Purpose to place navigational aid satellite in orbit around the earth. Orbit achieved with life expectancy of 16 months.
Booster:	THOR-AELE-STAR #257	
Sponsors:	ARPA, Navy	
TRANSIT 2A	22 Jun 60	Navigational aid earth satellite 36" diameter ball weighing 223 lbs. placed in orbit around earth. It carried aloft a 12 lb basketball size sphere, known as the "piggy-back" satellite, to measure radiation in the ionosphere which also achieved orbit.
Booster:	THOR-AELE-STAR #281	
Sponsors:	ARPA, Navy	
TRANSIT 3A	30 Nov 60	Purpose to place TRANSIT 3A into earth orbit. 1st stage engine cutoff occurred 11 seconds early, failed to provide orbital velocity for payload.
Booster:	THOR-AELE-STAR #263	
TRANSIT 3B	21 Feb 61	Purpose to place navigational aid satellite in near circular orbit about the earth, and boost LOFTI satellite into orbit to measure attenuation of signals received by satellite from ground station. Orbit was achieved with apogee of 596 NM, perigee of 91 NM, and orbital period of 96 min. Separation of the two payloads (TRANSIT and LOFTI) and booster second stage did not occur. This fact will lower payload performance. TRANSIT 3B weighed 250 lbs and LOFTI weighed 54 lbs.
Booster:	THOR-AELE-STAR #313	

TRANSIT PROGRAM

TRANSIT LA	26 Jan 61	TRANSIT LA was a 175 lb drum shaped payload. It contained a small nuclear battery, which made it the first satellite to employ nuclear energy to operate its electronic equipment. TRANSIT LA was placed in a near circular orbit with an apogee of 582 NM and a perigee of 456 NM. A triple payload was boosted into orbit on this launch. Satellites "TIGER" and "TIGER" were lifted along with TRANSIT LA. They did not completely separate from one another; nevertheless, some data is being received from both.
Booster	THOR-AEAS-SLAR #315	

MISCELLANEOUS SATELLITE ATTEMPTS

IGY satellite Booster JUNG II #16	16 Jul 59	Attempt to place 94 lb. IGY earth satellite in orbit. Booster failure caused impact 250 ft. from launch pad.
Inflatable sphere Booster: JUNG II #19B	11 Aug 59	Attempt to orbit 12 ft. diam. inflatable sphere around earth. Payload failed to achieve orbit.
Van Allen measurement Booster: JUNG II #19C	23 Mar 60	Attempt to place radiation measurement package in earth orbit to study Van Allen belt radiation. 4th stage of vehicle did not ignite; orbital velocity not achieved.

COURIER PROGRAM

COURIER 1A 13 Aug 60 Purpose to place COURIER 1A, an
Booster: THOR-AELE-STAR #262 active communications satellite,
in earth orbit. Missile break-
up during first stage operation
prevented orbit.

COURIER 1B 4 Oct 60 Purpose to place 500 lb COURIER
Booster: THOR-AELE-STAR #293 1B in earth orbit. Orbit achieved
with apogee of 657 mi and perigee
of 503 mi. COURIER 1B carried its
own receiver, transmitter, and
power supply. It was an active
communications satellite that re-
ceived and stored signals from
the ground then later transmitted
them to the proper ground receiver.
This was supposed to be the last
of the COURIER satellites.

VANGUARD PROGRAM

VANGUARD I	17 Mar 58	1st VANGUARD satellite, a 6" diam., 3.2 lb. sphere, placed in earth orbit. Apogee 2,165 and perigee 406 statute miles. Life expectancy 200 to 1000 years.
VANGUARD II	17 Feb 59	2nd VANGUARD satellite, a 20" diam. 71.5 lb. sphere placed in earth orbit. Apogee 2,063 and perigee 346 statute miles. Life expectancy 200 years.
VANGUARD III	16 Sep 59	3rd VANGUARD satellite, a 20" diam. 94.6 lb. sphere placed in earth orbit. Apogee 2,326 and perigee 317 statute miles. Life expectancy 50 years.

Program completed.

See Tab 21 for complete VANGUARD program.

VANGUARD PROGRAM

VANGUARD I	17 Mar 58	1st VANGUARD satellite, a 6" diam., 3.2 lb sphere, placed in earth orbit. Apogee 2,445 and perigee 406 statute miles. Life expectancy 200 to 1000 years.
VANGUARD II	17 Feb 59	2nd VANGUARD satellite, a 20" diam., 71.5 lb sphere placed in earth orbit. Apogee 2,063 and perigee 346 statute miles. Life expectancy 200 years.
VANGUARD III	18 Sep 59	3rd VANGUARD satellite, a 20" diam., 94.6 lb sphere placed in earth orbit. Apogee 2,326 and perigee 317 statute miles. Life expectancy 50 years.

Program completed.

See Tab 21 for complete VANGUARD program.

ECHO PROGRAM

ECHO 13 May 1960
Booster: DELTA 1 - THOR #1114
Sponsor: NASA

Purpose to place 100 ft. inflatable balloon in 900 nm orbit around the earth as a passive communications aid satellite. Orbit of payload was not achieved.