MEMO ROUTING SLIP	NEVER USE FOR APPROVALS, DISAPPROVALS, CONCURRENCES, OR SIMILAR ACTIONS		
1 NAME OR TITLE SSJ	INITIALS		CIRCULATE
ORGANIZATION AND LOCATION	DATE		COORDINATION
2			FILE
			INFORMATION
3			NECESSARY ACTION
			NOTE AND RETURN
4			SEE ME
			SIGNATURE

REMARKS

1. For your information and for members of your staff per direction of General Greer.

2. Since this report was made in connection with a DOD directed study relating to incentive contracts based on reliability, it may help by pointing out present pitfalls which lead to a pratfall as far as legal liability on the part of Contractors go.

FROM NAME OR TITLE	DATE
JOHN R. DONNELLY, MAJOR, USAF	7 Feb 62
ORGANIZATION AND LOCATION	TELEPHONE
SSJ - Staff Judge Advocate	3682

DD FORM 1 FEB 50 95 Replaces DA AGO Form 895, 1 Apr 48, and AFHQ Form 12, 20 Nov 47, which may be used.

R & D 5-1
Tech 1110

DRAFT

Capt Diener/jm

DISCOVERER XXVII (322/1110) Incident

1. Following is a chronological sequence of events concerning the CEA, leading up th the subject incident:

a.	13 Apr 61	Missile 322 arrived at VAFB.
b.	17 Apr 61	CEA removed to DAC LAB for c/o.
c.	1 May 61	C/o on CEA in LAB in progress.
d.	10 May 61	Pitch network removed for rework.
e.	29-30 May 61	Pin 17 on P601 found broken. Therefore, an advanced EO was written changing the pitch rate function to the ME to Pin 38 on P601 and its receptacle J601 Hole 38 (EO 2796676 AC). This plug connects the programmer board to the rest of the CEA chassis.
f.	30 May 61	LAB checkout of CEA complete (per DAC Procedure 7797779).
g.	2 Jun 61	CEA removed from can in RIM for control checks.
h.	7 Jun 61	CEA re-installed in missile and sealed.
i.	5 Jul 61	CEA removed from missile on pad ans sent to LAB for flight trajectory installation and spin motor monitor mods.
j.	10-11 Jul 61	Programmer board SN F60030 was replaced by SN F60012 due to an intermittant relay, a loose roll control pot, and some chafed wires. Complete checkout of the CEA was completed per 7797779.
k.	13 Jul 61	CEA reinstalled in Missile 322 on pad.
l.	14 Jul 61	Rate gyro sensing tests with main engine disconnected and A/S check completed.
m.	20 Jul 61	R-1, all systems check completed. Rate gyro sensing check was included with the missile disconnected.

2. The CEA (Flight Controller) has contained within it the timer (tape) and programmer board. The attitude gyros are also contained within the CEA plug the rest of the circuitry. External to the CEA are the rate gyros. The plug and receptacle

601 are located within the CEA. The 8mfd condenser which is also suspected is internal to the CEA, but extended to the programmer board. It is connected across the Plug 601.

3. The checkout of the CEA following the programmer change on 10 Jul was covered by DAC inspection and the technician performing the checkout. Both indicated that the pitch circuit to the ME was satisfactory. During this check, an external simulated rate voltage is placed on the rate circuitry. The output from the CEA is connected to meters on the checkout console. This voltage is steady and continues to be registered on the meters until removed.

There is no paper which would indicate that the P60 plug on the new programmer was changed to be compatible with the J601 and in the CEA chassis nor vice-versa. Since the programmer board was a standard item it would appear that Pin 17 on P601 went into an empty receptacle on J601 since this wire had been removed to hold 38 on J601 previously.

4. Conclusion: It is impossible to state whether the configuration was on Plug 601 at liftoff, since tests state that it was and paperwork indicates that it was not. It is believed by the writer that a technician probably made a modification to Plug 601 during checkout and was not covered by paperwork. Since it would have been an unauthorized modification, there is very little chance that it will ever be admitted.

WILLIAM E. BIBNER
Captain, USAF

MISSILE MISHAP INVESTIGATION COMMITTEE REPORT

Discoverer X

[redacted]

HEADQUARTERS
AIR FORCE BALLISTIC MISSILE DIVISION
FIELD OFFICE
Post Office Box 1567
Vandenberg Air Force Base, California

Vehicle 105 Material File

UNCLASSIFIED

REPORT OF MISSILE MISHAP

DISCOVERER X

BY

MISSILE MISHAP INVESTIGATING COMMITTEE

19 FEBRUARY 1960

1695

UNCLASSIFIED

The following signatures indicate concurrence with the contents contained herein.

E. M. THOMPSON, MAJOR, USAF
Hq AFBMD Fld Ofc, VAFB, Calif
Chairman

R. R. MOORE, MAJOR, USAF
Hq AFBMD, Los Angeles 45, Calif
Member

VAUDEAN WATSON, MAJOR, USAF
Hq 1st Missile Div, VAFB, Calif
Member

R. B. LEIKSTAD, CAPTAIN, USAF
Hq AFBMD Fld Ofc, VAFB, Calif
Member

R. W. PURDY
VAFB Project Engineer
Douglas Aircraft Company, Inc
Member

J. F. WILLIAMS
Supervisor, Vehicle Systems Section
Lockheed Missile Space Division
Member

W. E. DIENER, CAPTAIN, USAF
Hq AFBMD Fld Ofc, VAFB, Calif
Recorder

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

CLASSIFICATION CHANGED TO [redacted]

By Authority of 205-2

APR 1966

WDGEV-60-3-54

UNCLASSIFIED

[redacted]

DD FORM 127

[redacted]

HEADQUARTERS AFBMD FIELD OFFICE
Vandenberg Air Force Base, California
29 February 1960

MISSILE MISHAP INVESTIGATION COMMITTEE REPORT

Discoverer X

AUTHORITY:

In accordance with the intent of AFBMDIR 11-7, dated 16 December 1958, an investigating committee was appointed by the Chief, AFBMD Field Office, Vandenberg Air Force Base (VAFB), California, to investigate the missile mishap which occurred on 19 February 1960 and resulted in the destruction of Discoverer X (Vehicle Numbers 1054/223). (See Attachment A).

SCOPE:

This investigation was conducted within the limitations of the information, capabilities, and facilities directly available to this committee at Vandenberg Air Force Base.

FLIGHT HISTORY:

Discoverer X was launched from Launch Emplacement 75-3-5 at VAFB at approximately 1215 P.S.T., 19 February 1960. Immediately after lift-off oscillations developed in the pitch plane. The oscillations became more pronounced and the missile began to exceed the prescribed range safety limits. The Missile Flight Safety Officer commanded missile destruction which resulted in missile destruct at approximately 21,000 feet altitude, 56 seconds after lift off. (See Attachment B). Major pieces were tracked by radar and cameras and impacted in the immediate area of the launch operation and up to 1½ miles south. A detailed description and plotting of pieces is provided in Attachment C.

[redacted]

[redacted]

INVESTIGATION AND ANALYSIS:

1. Examination of the post-launch films revealed clearly that the observed oscillations were about the pitch axis. Telemetry records indicated pitch program commands were being generated properly. The pitch rate of the vehicle was determined from telemetry records of both the Thor booster and the Agena second-stage. Thor records showed definite evidence of low gain in the pitch rate circuitry. The values recorded on telemetry were approximately one-tenth of the value which was calculated for the pitch rate from independent data sources in either stage of the vehicle. The low gain in the pitch rate circuitry reduced the damping in this axis to a level which resulted in instability after introduction of the normal disturbances associated with launching. As a result of the above evidence, the investigation was narrowed to the Control Electronics Assembly of the Thor booster and to any elements external to it that may have caused this assembly to perform abnormally.

2. A review of the pitch rate circuitry (See Attachment D) and the telemetry pick-off point resulted in isolation of the abnormality to one or more of the following:

a. The pitch rate gyro and associated circuitry.

b. The pitch rate AC amplifier-demodulator.

c. The shaping network (or summing network).

d. A condition introduced into the control circuits by telemetry.

3. The above components of the pitch rate circuit were recovered from the wreckage and examined within the capabilities at this station. The pitch rate gyro was checked for continuity when it appeared to have no fluorolube leaks. However the rotor would not spin upon application of power; the gyro

[redacted]

[redacted]

was then released to Douglas Aircraft for further examination at other locations. The AC amplifier demodulator had impact damage to several circuit elements and was also released for further examination after physical inspection. (See Attachment E). The shaping network components and the resistors between the gyro and the amplifier-demodulator were checked and found to be within tolerance. The recovered telemetry package was checked as functional by the 704th Instrumentation Squadron. This committee then shipped it to the Test and Activation Office, Headquarters AFBMD, for test and evaluation.

4. The possibility of the malfunction having been caused by conditions or events prior to launch, nonadherence to published procedures and documents, or personnel error were thoroughly investigated by the committee. No evidence of any of these factors affecting the cause of the incident was found.

a. The following Douglas Aircraft Company records were checked and cross-checked.

(1) Removal cards on Missile 223 and C.E.A. 5214 and all engineering orders associated with either.

(2) RIM Building and launch emplacement checkout procedures (DAC Drawings 7733825, F Change, dated 13 August 1959 and 7733816, K Change, dated 8 February 1960) and Preparation of Missile 223, DAC Drawing 7796330, D Change, dated 26 February 1960. (See Attachment F).

(3) Inspection records of tests required and accomplished by the above procedures and the qualifications of the personnel accomplishing same.

b. Examination of the above records indicates that Missile 223 experienced an unusually long time period at VAFB prior to launch:

(1) Arrival at VAFB - 30 July 1959.

[redacted]

[redacted]

(2) Missile checkout began 26 August 1959.

(3) Final CEA gain check - 2 October 1959.

(4) RIM checkout complete - 14 October 1959.

(5) Missile on Stand - 30 November 1959.

(6) MOS of Agena 1054 - 9 February 1960.

(7) Launch - 19 February 1960.

c. The records show a CEA operating time of approximately 29 hours. However, with additional running time in the electrical laboratory it is estimated that the unit had approximately 40 hours of operating time at this location. The CEA had been removed and reinstalled four times for incorporation of changes and checks.

d. There was no evidence of any unusual performance of Ground Support Equipment which could have caused this malfunction.

5. A review of all failure reports at VAFB concerning the suspect elements in the pitch rate circuitry was conducted using Douglas records for Discoverer and Air Force Records for the WS115A. In addition AMCTSO obtained pure statistical information from SBAMA on WS115A failures in the United Kingdom. Verbal information indicates a total of 16 failures associated with the rate gyros and the rate gyro assembly in the United Kingdom. Only two failures of rate gyros have been recorded at VAFB. In addition, the CEAs in Discoverer IX and X have been forerunners in a program which requires more modifications to be made at the vendor (RCA) rather than on site by Douglas personnel. No significant trends in changes or failures were established.

6. Since the only electrical interference between the two vehicles is through the command destruct system, photography was the primary means of determining whether any interference from the upper stage could have influenced the course of events.

[redacted]

[redacted]

a. Attachment G lists the significant events noted on the 70mm launch film. Sequentially these were as follows:

(1) Immediately after lift-off, at orbital stage umbilical ejection, a small amount of acid fumes was noted issuing from the ground half of the acid fill point. This was a normal occurrence.

(2) Although not noted on Attachment G, a smoky projectile was next noted in the vicinity of the missile. The exact source of this projectile is unknown; however, it is believed to be a ricocheting vernier engine ignitor. There is no known reason to believe that this item contributed to the failure.

(3) The next item observed, again not noted on Attachment G, was what appeared to be the gaseous nitrogen flex line to the payload falling to the ground. This is a normal disengagement of this item.

(4) At about 9.7 seconds after lift off a small object appeared to fall from the missile as it rose. However, no specific part can be identified. Since this event occurred after the oscillations began it was concluded that it did not contribute to the incident.

(5) At about 9.7 seconds after lift-off a series of vapor clouds appeared to emit from the orbital stage. This may be explained by the fact that due to the unusual pitching of the vehicle, the fluid level in the UDMH (Unsymmetrical Dimethyl Hydrazine) tank covered the vent valve connector in the tank allowing fuel to enter the feed line and vent valve. Liquid in the pilot section of the vent valve was thus ejected overboard causing the large volumes of vapor noted.

(6) Although not noted on Attachment G, at approximately 36 seconds after lift off it appears that a door from the booster guidance

[redacted]

[redacted]

section was ripped off. This could be due to a combination of the excessive oscillations of the missile and aerodynamic forces. This again was determined to have no bearing on the cause of the incident.

b. The possibility of an orbiting stage ullage rocket igniting at lift off and damaging the CEA and associated wiring was investigated. Visual inspection of the wreckage in the area around the ullage rocket exhaust nozzle eliminated this possibility.

c. The Lockheed records concerning Agena Vehicle No. 1054 were also thoroughly checked. No open paperwork was found. Spot checks of significant items removed or installed during the period immediately preceding launch were made; no discrepancies were found.

7. Because of the mid-air destruction of these vehicles several items involving safety were investigated by this committee.

a. All traces of Unsymmetrical Dimethyl Hydrazine (UDMH) and Inhibited Red Fuming Nitric Acid (IRFNA) found during the recovery and salvage operation were negligible and presented no safety hazard. Laboratory tests revealed that in 10 minutes time all trace of UDMH was dissipated from mild exposure metal surfaces and that four hours was the maximum for traces of IRFNA. Six personnel at Point Arguello, who picked up pieces, were treated with a neutralizing agent as a precautionary measure.

b. During recovery, pieces of magnesium-thorium alloy stamped "radioactive" were picked up for disposal. These alloys are used in the Agena vehicle and the LMSD adapter section. Magnesium-thorium alloy has radioactive thorium in its content. This alloy does not pose an external radiation hazard; however, it is an alpha radiation emitting element and thus

[redacted]

[redacted]

is potentially hazardous. Recovery and salvage of fragments of Discoverer X did not take into account this alpha radiation until a stamped piece was discovered. Subsequent collection and disposal of these pieces were handled by the Lockheed organization in accordance with industrial practice.

c. The area immediately adjacent to the Control Center 75-3, on which the four diesel generators and the diesel fuel storage tank are located drains toward the main access door of the control center. Should the 6,000 gallon diesel storage tank be ruptured, a quantity of the diesel fuel could contaminate the interior of the control center.

FINDINGS:

1. The malfunction which caused Discoverer X to exceed missile safety limits and to be destroyed by command destruct was isolated to the pitch rate circuitry of the Control Electronic Assembly of the Thor booster. This committee found no evidence that the malfunction was caused by personnel error, non-adherence to procedures, improper procedures, design deficiency, nor an inadequate inspection system. Checks and investigations of various components at this location have failed to reveal a specific cause for the malfunction.

2. The time between final CEA gain checks and launch of the missile amounted to 140 days. The missile on stand time amounted to 81 days. There are no formal requirements for calendar time nor operating time periodic inspections on the Thor booster in this program.

3. There is no evidence that the second stage Agena vehicle contributed in any way to this incident.

4. Doubt has been raised as to the effectiveness with which pertinent failure histories from the [redacted] have been made known to

[redacted]

[redacted]

Headquarters AFBMD for application to Thor boosters.

5. Routine and special procedures connected with an investigation of an incident of this type had not been established.

6. The fuels and oxidizers presented no safety hazard during this operation.

7. There was an original general unawareness of magnesium-thorium alloy in Discoverer X and at present there is a lack of specific hazard potential, if any, associated with this alloy.

8. A potential hazard exists in Control Center 75-3 in event of the rupture of its diesel fuel storage tank.

RECOMMENDATIONS:

1. That the investigations now underway at various locations continue on an expedited basis to determine whether a component failure existed in the pitch rate gyro or its associated amplifier demodulator. These investigations should be conducted under the supervision provided by the established project channels.

2. That the Discoverer program be reviewed to determine what checks are required, at what frequency, in the event extensive delays are encountered in the receipt-of-missile to launch sequence.

3. That Headquarters AFBMD insure that a positive system is in operation whereby failure reports from the WS115A program are reviewed for applicability to the Thor booster.

4. That general standard procedures be established for the conduct of proceedings of incident/accident boards to include membership, conduct of investigation, recovery and parts disposition, security control, and documentation. These procedures will involve actions by the AFBMD Field

[redacted]

[redacted]

Office, 1st Missile Division, and contractors.

5. That physical handling of salvaged and recovered parts be denied for a period of four hours (except specified recovery items handled by team members) to insure that no safety hazard exists. This does not include identification and location of parts.

6. That the AFBMD Field Office establish the hazards associated with magnesium-thorium alloy and that procedures be established through the project office for the safe handling and disposition of this alloy.

7. That a dike be constructed around the diesel fuel storage tank to isolate spillage of diesel fuel at Control Center 75-3.

7 Atchs:
1. Atch A: Ltr Order, Subj: Missile Mishap Investigation Committee w/ Amend, dtd 1 Mar 60 (U)
2. Atch B: 704th IS MFSO (DASMC-60-956) (V-2-60-555) (S)
3. Atch C: DAC ltr, Subj: Dispersal & Impact Areas of Mal 223/1054, A31-260-DM18-M-061 (V-3-60-601) (C)
4. Atch D: Discoverer Mal 200 & Subs; Pitch & Yaw Attitude & Rate (DAC) (V-3-60-600) (C)
5. Atch E: AC Amplifier Photo (U)
6. Atch F: DAC Drawing 7796330 (U)
7. Atch G: Data Engr Report on Mal 223, pgs 11 & 12, DAC (V-3-60-599) (S)

[redacted]

HEADQUARTERS
AIR FORCE BALLISTIC MISSILE DIVISION
FIELD OFFICE
Post Office Box 1567
Vandenberg Air Force Base, California

Reply to
Attn of: WDGEV

23 February 1960

SUBJECT: Missile Mishap Investigating Committee

TO: See distribution

1. This letter confirms verbal orders of 19 February 1960 appointing a committee to investigate the missile mishap which occurred on that date with Discoverer vehicle 1054/223. The committee will investigate the cause of the test mishap and render a report of findings and recommendations to the Chief, AFBMD Field Office.

2. The committee shall consist of the following personnel:

Major Earl M. Thompson, 16860A, AFBMD/FO, Chairman
Major Richard R. Moore, 19795A, AFBMD, Member
*Major Waldeam Watson, AO 743877, 1st MD, DS, Member
Captain William E. Diener, 44522A, AFBMD/FO, Recorder
Captain Roy B. Lefstad, 40573A, AFBMD/FO, Member
**Mr. W. E. Carrier, Mgr VAFB Engr, Lockheed, Member
**Mr. R. W. Purdy, Project Engr Thor Systems, Douglas, Member

*Indicates with concurrence of commander concerned.
**Indicates with concurrence of contractor concerned.

FOR THE COMMANDER:

JOSEPH J. GODY, JR.
Colonel, USAF
Chief, AFBMD Field Office

DISTRIBUTION:
1 - as individual
1 - Comdr AFBMD, AF Unit PO, Los Angeles 45, Calif
1 - Comdr, 1st Missile Division, VAFB, Calif
1 - Lockheed Missiles and Space Div, PO Box 1506, VAFB, Calif
1 - Douglas Aircraft, PO Box 1596, VAFB, Calif

Atch 4

HEADQUARTERS
AIR FORCE BALLISTIC MISSILE DIVISION
FIELD OFFICE
Post Office Box 1567
Vandenberg Air Force Base, California

REPLY TO
ATTN OF: WDGRV

1 March 1960

SUBJECT: Missile Mishap Investigating Committee

TO: See distribution

Reference is made to letter, subject as above, dated 23 February 1960 appointing Committee to investigate missile mishap. Paragraph 2 of subject letter is amended to include the name of Mr J. F. Williams, Vehicle Systems Section Supervisor, Lockheed, Member vice Mr W. E. Currier, Mgr VAFB Engr, Lockheed, Member.

FOR THE COMMANDER:

JOHNNY J. [illegible], JR.
Colonel, USAF
Chief, AFBMD Field Office

DISTRIBUTION:
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1 - Comdr, 1st Missile Division, VAFB, Calif
1 - Lockheed Missiles and Space Div, PO Box 1506, VAFB, Calif
1 - Douglas Aircraft, PO Box 1596, VAFB, Calif

[redacted]

704TH INSTRUMENTATION SQUADRON
UNITED STATES AIR FORCE
Vandenberg Air Force Base, California

REPLY TO
ATTN OF: 7041SC

25 FEB 1960

SUBJECT: Transmittal of MFSO Report, Discoverer Vehicle "DERBY DAY"

TO: 1 Missile Div (DS) 1 Missile Div (DO, Attn: Maj Skaggs)

AFBMD Field Office (Attn: Lt Col Bones)

1. Attached is the MFSO Report on Discoverer Vehicle "DERBY DAY".

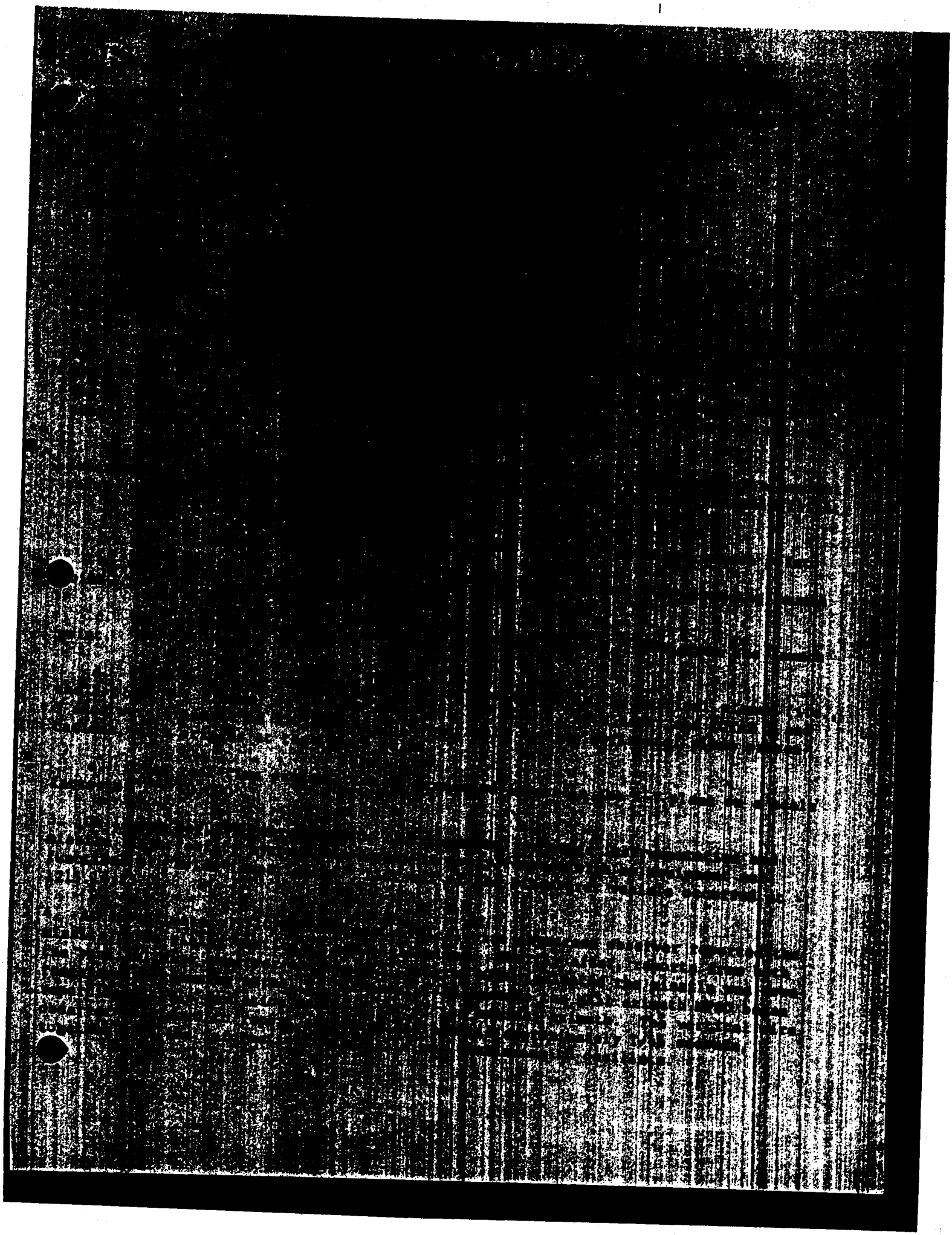
2. This letter is unclassified when the attachment is withdrawn.

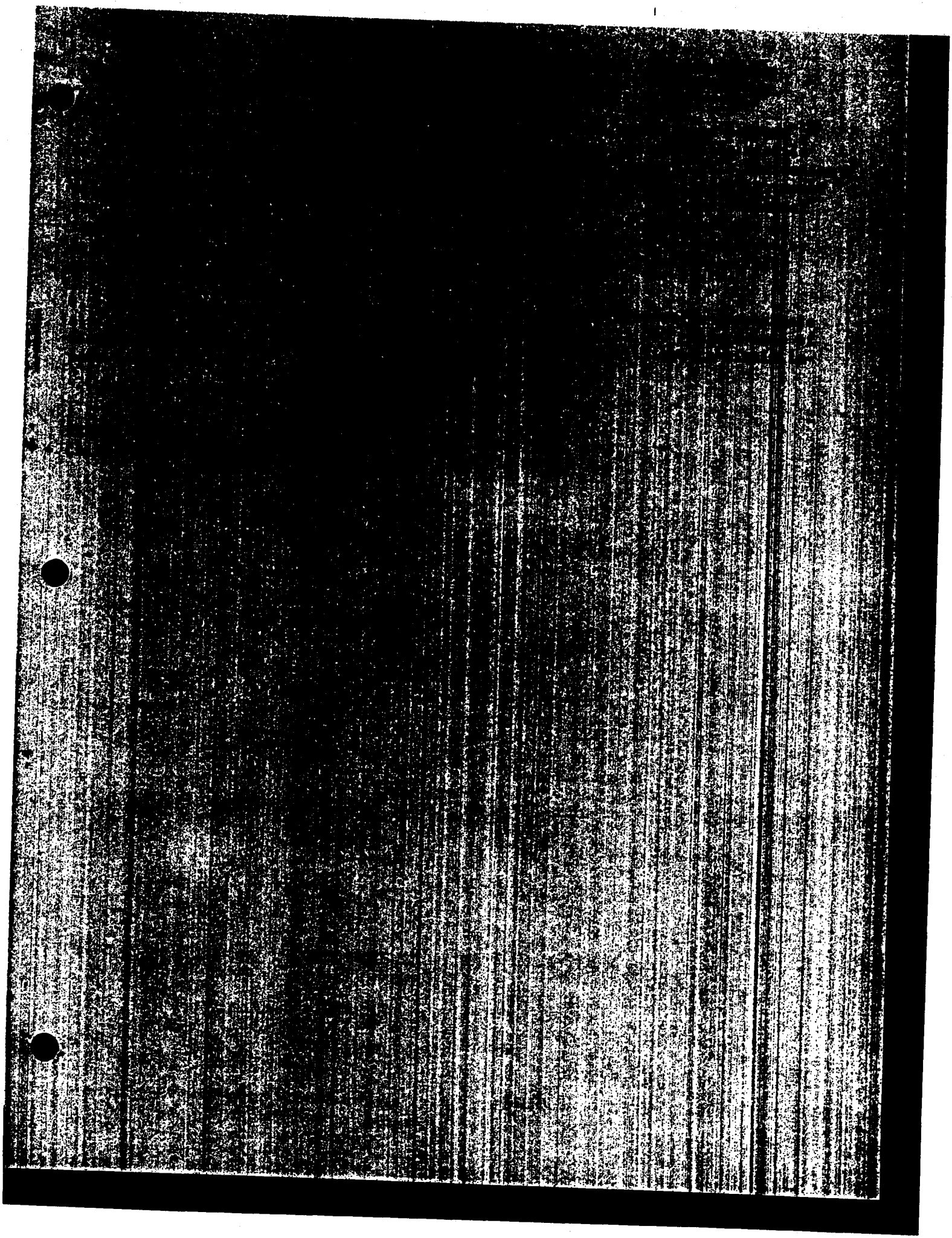
LUCIUS A. PERRY JR.
Colonel, USAF
Commander

1 Atch
as stated

[redacted]

DASMC-SC





[redacted]

MEMORANDUM

DATE: 26 February 1960
A31-260-DM18-M-061

TO: Chairman, Missile 223 Incident Review Board

FROM: R. W. Purdy, A31-260

SUBJECT: DISPERSAL & IMPACT AREA OF MISSILE 223/1054

COPIES TO:

Missile 223/1054 was launched from 75-3-5 on 19 February 1960 at approximately 12:15 PM. A command destruct signal was transmitted after approximately 56 seconds of flight. Missile 223/1054 had attained approximately 21,000 feet in altitude and was proceeding in a northerly direction.

At time of liftoff, surface winds were 12 to 19 knots from 330°. Wind at 20,000 feet was 46 knots from 340° and at 30,000 feet was from 330° at 62 knots.

Attached chart indicates areas of search and recovery also distance from 75-3-5. Attached detailed lists indicate, in Area "A", major items found and respective weights, in areas "B" thru "F" smaller items and weights. At completion of search, 4657 pounds of Missile 223/1054 had been recovered, which is approximately 67% of total weight.

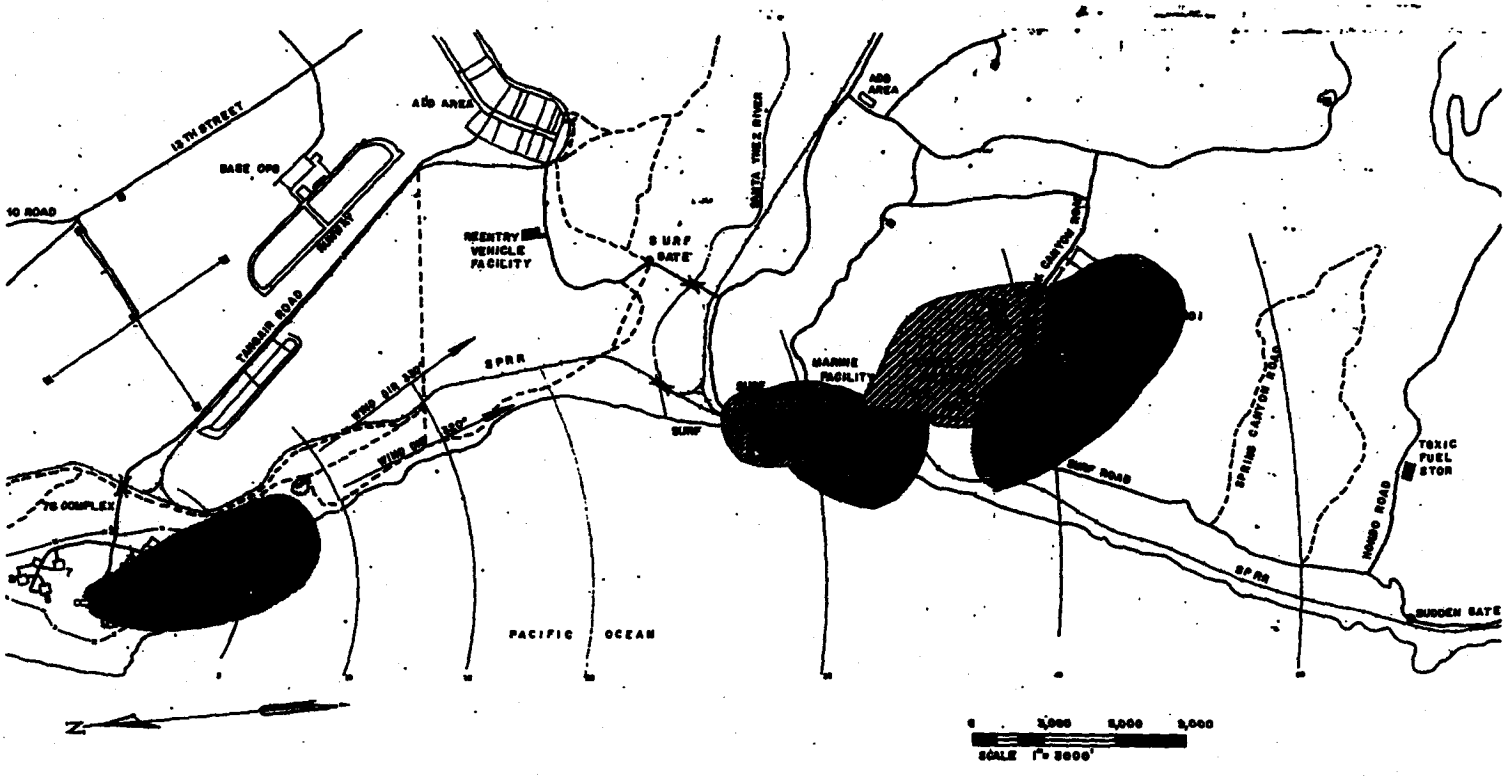
R. W. Purdy, A31-260
Project Engineer
THOR Systems

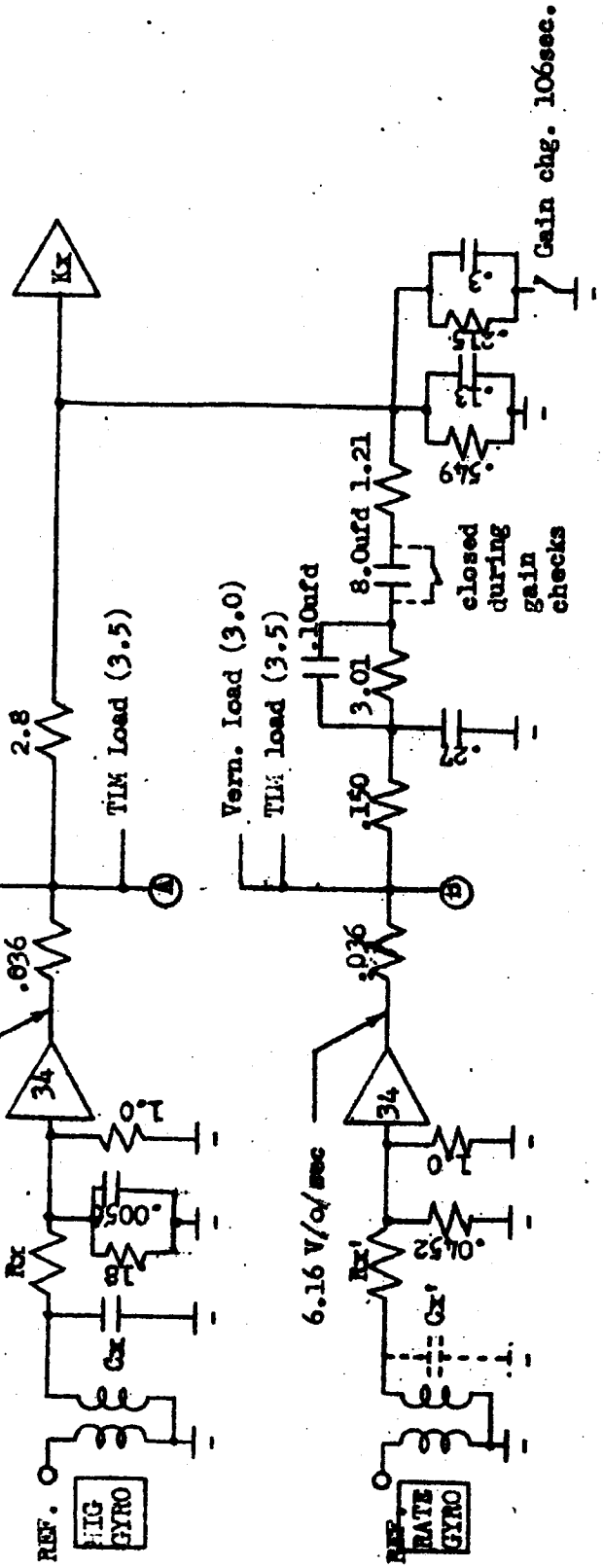
RWP/cw
Attachments - 4

PART	WEIGHT		I.D. NUMBERS
AREA "A"	Actual	Average	(On Area "A" Only)
Main Engine	1402.0		19
LO_2 Line	6.7		24
CEA	102.0		1
Guid Section	988.0		21
Nitrogen Line	8.3		25
Right Hand Vernier Engine	95.5		26
Access Door	.5		27
LMSD	Not available		28
Turbo Pump & G.G.	505.0		2
High Press Bottle (1)	45.0		3
High Press Bottle (1)	46.0		5
Fuel Duct Pipe	36.2		4
Fuel Duct Pipe	180.6	(filled with sand)	7
LO_2 Start Tank	38.4		22
Fuel Screen	32.6		23
Fuel Start Tank	27.6		6
LO_2 Vent Valve	20.1		29
Hydraulic Pump Assem	20.6		30
Missile Center Section	545.0		20
AREA "B"			
4 pcs LO_2 Tank Skin		22.0	
7 pcs Fuel Tank Skin		7.0	
2 pcs Engine Section		5.0	

PART	WEIGHT		I.D. NUMBERS
AREA "C"	Actual	Average	(On Area "A" Only)
3 pcs LMSD Prop Tank		3.5	
13 pcs LO_2 & Fuel Tank Skin		1.0	
1 pc LMSD Retro Fairing	0.9		
1 pc Engine Access Door	5.1		
2 pcs LO_2 Tank Skins		24.0	
8 pcs LO_2 & Fuel Tank Skins		5.7	
1 pc Fiber Glass Tunnel Cover	0.7		
1 pc LO_2 Tank Skin	19.7		
1 pc LMSD Skin	0.3		
1 pc LO_2 Tank Skin	6.8		
1 pc LO_2 Tank Skin	14.6		
1 pc Fuel Tank Skin	18.2		
AREA "D"			
7 pcs Engine Section		1.9	
14 pcs LO_2 & Fuel Tank Skin		9.3	
1 pc LMSD Skin	0.8		
AREA "E"			
1 pc LMSD Adapter	10.7		
1 pc LMSD Retro Cover	1.6		
1 pc Drip Shield	0.1		
1 pc Tank Skin	4.3		
1 pc Tank Skin	17.7		

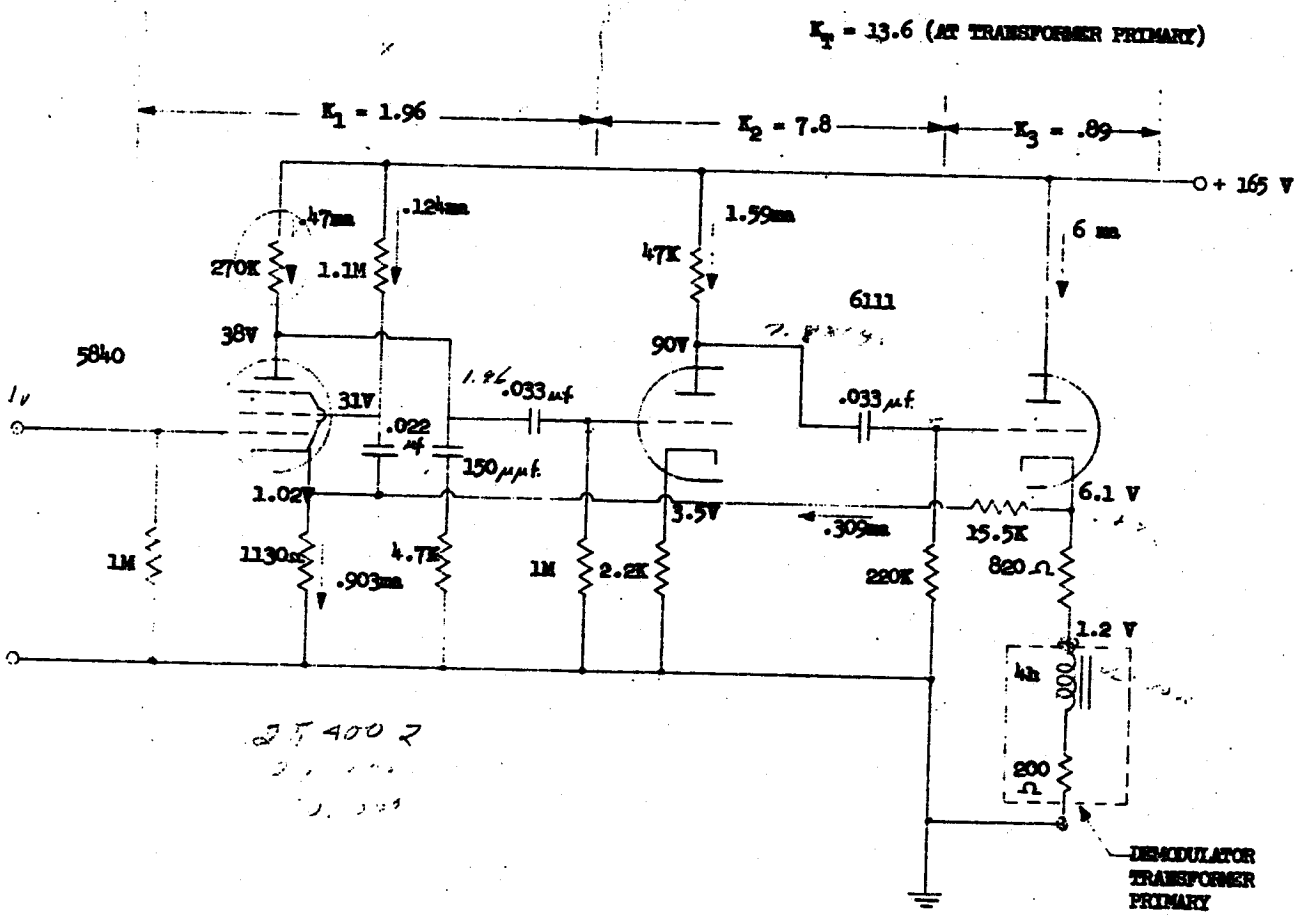
PART	WEIGHT		I.D. NUMBERS
AREA "F"	Actual	Average	(On Area "A" Only)
1 pc LO_2 Tank Skin	13.8		
1 pc Fuel Tank Skin	30.4		
1 pc LO_2 Tank Skin	14.0		
1 pc Engine Section Skin	0.3		
1 pc Engine Section Skin	1.7		
1 pc Engine Section Skin	0.5		


13TH STREET
BASE OPS
10 ROAD
RUNWAY
TARMAC ROAD
AGE AREA
REENTRY VEHICLE FACILITY
SURF GATE
SANTA YNEZ RIVER
SPRR
MARINE FACILITY
SURF
AGE AREA
CANYON ZONE
SPRING CANYON ZONE
HWY 101
TOXIC FUEL STOR
HOBBS ROAD
SPRR
HUDDEN GATE
76 COMPLEX
PACIFIC OCEAN
N
0
2,000
4,000
8,000
SCALE 1" = 2000'

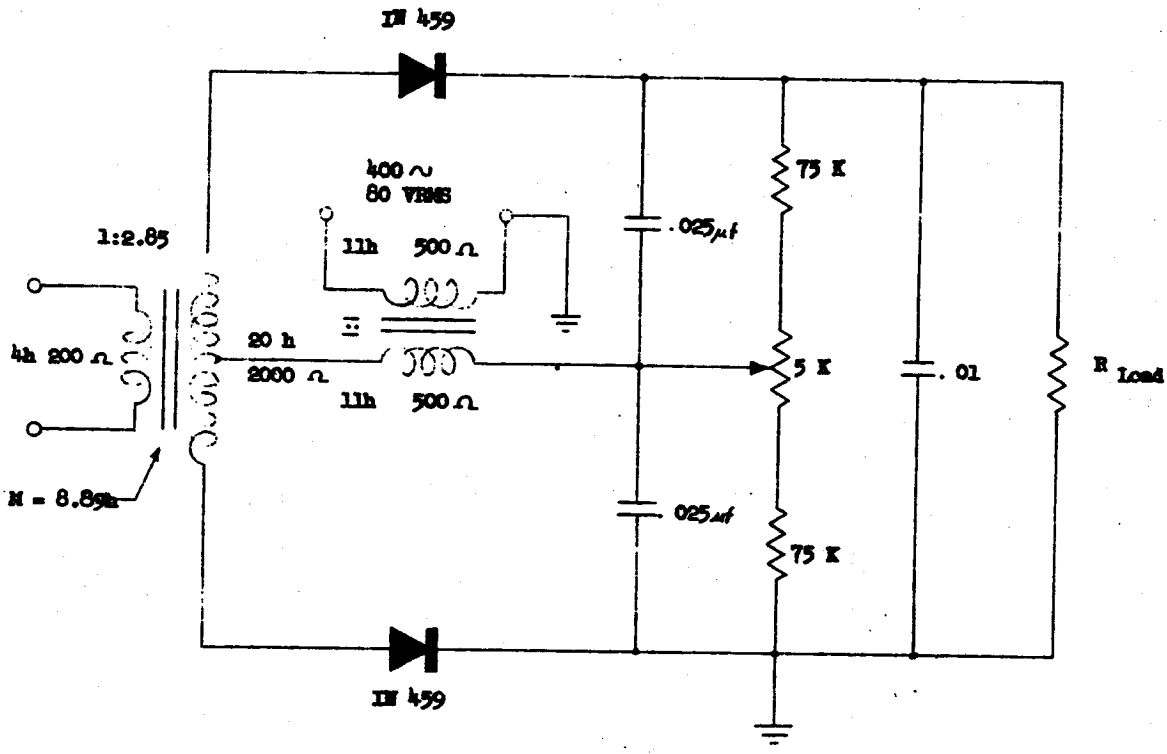


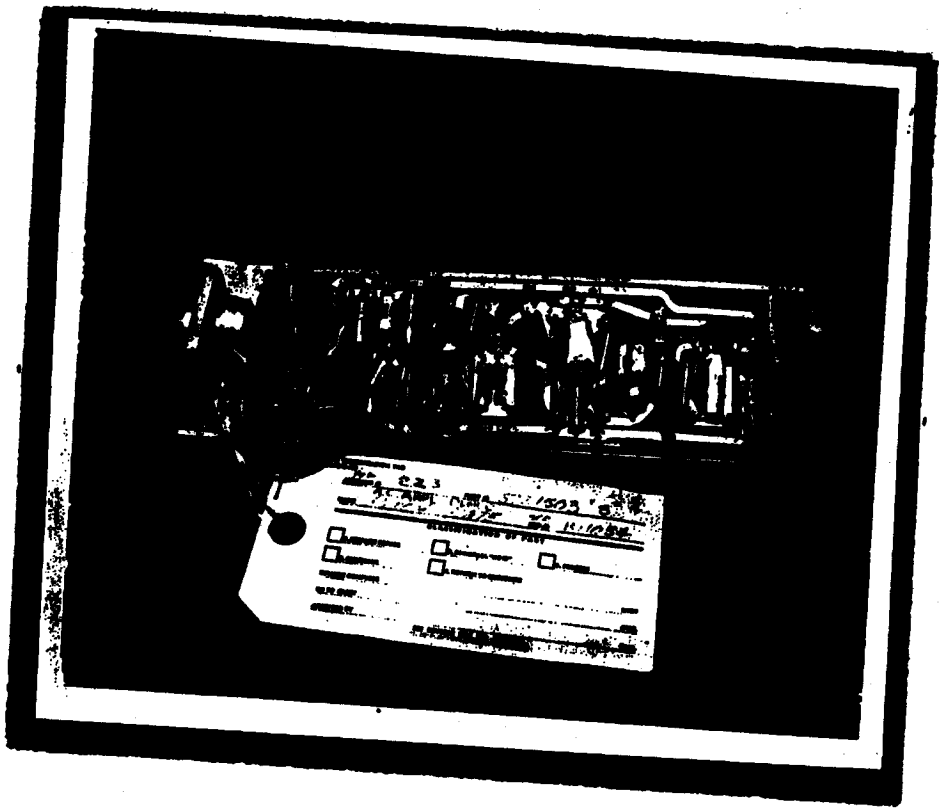
1. Add Cx to eliminate positive restraint of HIG gyro (usually .01 or .009 ufd).
2. Adjust Rx to give 10.15 V/deg at test point (A).
3. Cx' - (Line capacitance when gyros are in Guidance Section)
4. Adjust Rx' to give 6.04 Volts/Degree/Second at test point (B)

IOC CSA AC AMPLIFIER WITH FEEDBACK



IOC CBA DEMODULATOR





PITCH RATE A.C. AMPLIFIER DEMODULATOR

A | 7796330

FINISH SPECIFICATION	APPLICATION		QTY REQD		REVISIONS				
	NEXT ASSEMBLY	USED ON	NEXT ASSY	FINAL ASSY	SYM	DESCRIPTION	DFTSM	DATE	APPROVAL
	~	DM-18			A	SEE E.O.	THURBER	10/1/59	
					B	SEE E.O.	MALLEY	12-14-59	
					C	SEE E.O.	BARRY	2-23-60	

D SEE E.O. PG 1.1

ISSUED FOR USE AT VAFB ONLY

Model DM 1812-3

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
BREAK SHARP EDGES

FIRST RELEASE OF PRINTS: OCT 1 59
ORIGINAL DATE OF DRAWING:
ORIG SECT

CUST		
MATL	Dalton	9
WT CHK	Dalton	9
STR CHK		
CHECK	Dalton	9
PR ENGR	Dalton	9
DES ENGR		
GR ENGR	Dalton	9
DFTSM		

Preparation of Missile #823

SCALE | WT ACT CALC | LB

DOUGLAS AIRCRAFT COMPANY, INC.
SANTA MONICA DIVISION
SANTA MONICA, CALIFORNIA

DWG SIZE A | 7796330

PAGE 1.0

REVISIONS (CONTINUED FROM TITLE PAGE)

SYM	DESCRIPTION	DFTSM	DATE	APPROVAL
D	SEE E.O.	MELATTI	2-26-0	REB

SYM	DESCRIPTION	DFTSM	DATE	APPROVAL

25-1234 (7-56).

DOUGLAS

DRAWING NO. 176130

PAGE NO. 1-1

CHANGE LETTER D

2 345 (7-56)

DOUGLAS AIRCRAFT CO., INC. SANTA MONICA DIVISION

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CHANGE LETTER D

PAGE & CHANGE LETTER INDEX

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1.0	D						
1.1	D						
2.0	D						
3.0	C						
3.1	D						
4.0	C						
5.0	C						
5.1	C						
6.0	C						
7.0	C						
8.0	C						
9.0	C						
10.0	C						
11.0	C						
12.0	C						

DRAWING NO. 7796330
PAGE NO. 3.0
CHANGE LETTER C

DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
1-9-9	2795437	A	GUID DC J-BOX RWK	AE		*
2-3-9	2795196	A	RWK INTER PLUG P1	AE	8-20-9	
2-4-9	2795754	New	INERTIA SWITCH REMOVAL	AE	10-8-9	
3-9-9	2733628	B	TURBINE OVERSPEED TRIP SWITCH MOD	AE	8-25-9	
3-11-9	2795192	A	ECHO MSL CONTINUITY CHECK	AE	9-23-9	
3-11-9	2795192	Memo	ECHO MSL CONTINUITY CHECK	AE	9-23-9	
3-12-9	2795437	Memo	GUID DC J-BOX RWK	AE		*
3-18-9	2795192	B	ECHO MSL CONTINUITY CHECK	AE	9-23-9	
3-24-9	2733619	M	ECHO MSL PREP AT RIM PRIOR TO C/O	AE	9-21-9	
4-1-9	2733619	N	ECHO MSL PREP AT RIM PRIOR TO C/O	AE	9-21-9	
4-2-9	2796147	New	GUID & CONT LOCK WIRING RWK FOR 117L MSL	AE	8-19-9	
4-29-9	2796342	New	DISABLE FUEL DUCT BLANKET HEATERS	AE	9-1-9	
5-5-9	2795437	Memo	GUID DC J-BOX RWK	AE		*
5-6-9	2733619	P	ECHO MSL PREP AT RIM PRIOR TO C/O	AE	9-22-9	
5-13-9	2795734	G	WIRING RWK MECO CIRCUIT	AE		*
6-4-9	2795196	Memo	RWK INTER PLUG P1	AE	8-20-9	
6-4-9	2795734	Memo	WIRING RWK MECO CIRCUIT	AE		*
6-4-9	2796473	New	117L GUID SECT MOD	AE	9-11-9	
6-15-9	2796516	New	WIRING RWK ENG CIRCUIT	AE	8-20-9	
6-16-9	7795955	C	117L INVERTER C/O PROC	AE	8-4-9	#
6-26-9	2733993	AA	AO CANC	AE	7-30-9	
6-29-9	2795734	Memo	WIRING RWK MECO CIRCUIT	AE		*
7-14-9	7733825	D	C/O PROC FOR 117L MSL	AE	10-24-9	#
7-20-9	2795041	K	CUT PROG TAPE FOR 117L MSL	AE	9-22-9	
7-25-9	2795660	New	WIRING RWK ECHO MSL	AE	9-2-9	
7-25-9	2733993	Memo	AO CANC	AE	7-30-9	
7-30-9	2796625	C	RATE GYRO RELOCATION 117L	AE	8-18-9	
7-30-9	2796626	A	RATE GYRO WIRING RWK 117L	AE	9-11-9	
8-7-9	7795164	A	CERT PROC, SCHOTOMK BATT	AE	12-3-9	#
8-12-9	7733816	F	C/O PROC DM 1812-3 L/E	AE	2-11-9	#
8-13-9	2796473	Memo	117L GUID SECT MOD	AE	8-19-9	
8-14-9	2795660	A	WIRING RWK ECHO MSL	AE	8-17-9	
8-14-9	2796625	D	RATE GYRO RELOCATION 117L	AE	8-18-9	
8-17-9	7733825	E	C/O PROC FOR 117L MSL	AE	10-24-9	#
8-20-9	7733825	F	C/O PROC FOR 117L MSL	AE	10-24-9	#
8-25-9	2796675	New	ECHO GYRO NETWORK CALIB	AE	9-22-9	
8-28-9	2796473	Memo	117L GUID SECT MOD	AE	9-11-9	
8-31-9	2795041	Memo	CUT PROG TAPE FOR 117L MSL	AE	9-22-9	
9-3-9	2795437	B	GUID DC J-BOX RWK	AE	9-4-9	
9-8-9	2796676	C	RWK 5793467 FLIGHT CONT	AE	9-22-9	
9-10-9	2796676	D	RWK 5793467 FLIGHT CONT	AE	9-22-9	
9-14-9	2796676	F	RWK 5793467 FLIGHT CONT	AE	9-22-9	
9-14-9	7796701	New	PITCH PROG RESISTOR ADJ	AE	9-22-9	
9-15-9	2796725	New	RWK 100% FLOAT SWITCH	AE	9-29-9	
9-15-9	7796708	KB	FUNCT TEST PROC FOR 5793467 FLIGHT CONT	AE	9-22-9	
9-15-9	7733816	G	C/O PROC DM 1812-3 L/E	AE	2-11-9	#
9-17-9	2733619	R	ECHO MSL PREP AT RIM PRIOR TO C/O	AE	9-23-9	
9-29-9	2795041	LM	CUT PROG TAPE FOR 117L MSL	AE	10-23-9	
10-6-9	2795754	Memo	INERTIA SWITCH REMOVAL	AE	10-8-9	
10-6-9	7795712	G	C/O PROC MSL ENG MB-3 BLK 1	AE	10-8-9	
10-16-9	2733993	AB	AO CANC	AE	10-8-9	*
10-17-9	2796793	New	RWK CABLE TO PLUG P1	AE	2-10-9	
10-19-9	2795196	B	RWK INTER PLUG P2	AE	10-21-9	
10-19-9	2796807	New	RWK MSL FLIGHT CONT	AE	10-26-9	

* NOT APPLICABLE - # ACCOMPLISHED BY FIELD STATION A.O.

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DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
10-20-9	2796814	New	RWK MSL	AE	11-5-9	
10-20-9	2796676	J	RWK 5793467 FLIGHT CONT	AE	10-20-9	
10-20-9	7796701	C	PITCH PROG RESISTOR ADJ	AE	10-22-9	
10-20-9	7733825	Vari	C/O PROC FOR 117L MSL	AE	10-24-9	#
10-21-9	2795041	Memo	CUT PROG TAPE FOR 117L MSL	AE	10-23-9	
10-23-9	2796804	New	INTER BONDING - ECHO	AE	2-10-0	
10-23-9	2795041	M	CUT PROG TAPE FOR 117L MSL	AE	10-26-9	
10-26-9	2796473	A	117L GUID SECT MOD	AE	10-30-9	
11-10-9	2795041	Memo	CUT PROG TAPE FOR 117L MSL	AE		*
11-25-9	7733816	H	C/O PROC DM 1812-3 L/E	AE	2-11-0	#
12-31-9	2796625	E	RATE GYRO RELOCATION - 117L	AE		*
12-31-9	2795754	Rwk	INERTIA SWITCH - REMOVAL	AE		*
1-19-0	7733816	J	C/O PROC DM 1812-3 L/E	AE	2-11-0	#
1-26-0	2796997	Memo	RWK MSL AC AMPLIFIER DEMOD	AE	1-27-0	
2-1-0	2733831	P	MSL C/O AT LAUNCH EMPL	AE	2-12-0	
2-10-0	7733816	K	C/O PROC DM 1812-3 L/E	AE	2-11-0	#
2-10-0	2733993	AK	AO CANC	AE		*
2-11-0	2733831	Memo	MSL C/O AT LAUNCH EMPL	AE	2-12-0	

* NOT APPLICABLE

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DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
1-3-9	2733242	C	C/O PROC MSL INSTR	INSTR	8-27-9	
1-13-9	2733242	D	C/O PROC MSL INSTR	INSTR	8-27-9	
1-27-9	2733631	U	INSTR ECHO MSL	INSTR	8-27-9	
1-30-9	2733631	V	INSTR ECHO MSL	INSTR	8-26-9	
2-17-9	2733242	Memo	C/O PROC MSL INSTR	INSTR	8-27-9	
2-19-9	2733631	W	INSTR ECHO MSL	INSTR	8-25-9	
2-26-9	2733631	Memo	INSTR ECHO MSL	INSTR	8-27-9	
3-12-9	2733242	F	C/O PROC MSL INSTR	INSTR	8-29-9	
3-20-9	2733242	G	C/O PROC MSL INSTR	INSTR	10-3-9	
3-31-9	2795459	Nev	METER CALIB I & F CONSOLE	INSTR	12-10-9	
3-31-9	2795459	A	METER CALIB I & F CONSOLE	INSTR	12-10-9	
3-31-9	2795459	Memo	METER CALIB I & F CONSOLE	INSTR	12-10-9	
4-16-9	2733631	Y	INSTRUMENTATION ECHO MISSILE	INSTR	8-22-9	
4-24-9	2733631	Z	INSTRUMENTATION ECHO MISSILE	INSTR	8-22-9	
4-28-9	2733631	Memo	INSTRUMENTATION ECHO MISSILE	INSTR	8-25-9	
4-28-9	2733631	H	INSTRUMENTATION ECHO MISSILE	INSTR	8-25-9	
4-28-9	2733631	J	INSTRUMENTATION ECHO MISSILE	INSTR	8-25-9	
4-28-9	2733995	S	A.O. CANCELLATION INST SEC	INSTR	4-30-9	
5-4-9	2733631	AC	INSTRUMENTATION ECHO MISSILE	INSTR	8-7-9	
5-4-9	2733631	AD	INSTRUMENTATION ECHO MISSILE	INSTR	8-21-9	
5-5-9	2796336	Nev	CONNECTION IDENTIFICATION CABLE	INSTR	8-31-9	
5-9-9	2733631	AF	INSTRUMENTATION ECHO MISSILE	INSTR	8-22-9	
5-28-9	2733631	Memo	INSTRUMENTATION ECHO MISSILE	INSTR	8-25-9	
6-23-9	2795459	Memo	METER CALIBRATION I & F CONSOLE	INSTR		*
6-30-9	2733631	Memo	INSTRUMENTATION ECHO MISSILE	INSTR	8-19-9	
7-1-9	2733242	J	CHECKOUT PROCEDURE MISSILE INST.	INSTR	9-2-9	
7-1-9	2733631	AJ	INSTRUMENTATION ECHO MISSILE	INSTR	8-19-9	
7-28-9	2733631	AK	INSTRUMENTATION ECHO MISSILE	INSTR	8-26-9	
8-5-9	2733631	AL	INSTRUMENTATION ECHO MISSILE	INSTR	8-26-9	
8-8-9	2733631	AM	INSTRUMENTATION ECHO MISSILE	INSTR	8-26-9	
8-20-9	2733631	AO	INSTRUMENTATION ECHO MISSILE	INSTR	8-27-9	
8-21-9	2733631	Memo	INSTRUMENTATION ECHO MISSILE	INSTR	8-26-9	
8-21-9	7733595	J	INSTR C/O PROC ECHO MSL	INSTR	10-29-9	#
8-26-9	7733595	K	INSTR C/O PROC ECHO MSL	INSTR	10-29-9	#
8-27-9	7796659	Nev	CALIB PROC FOR A.C. AMPL DEMOD	INSTR	8-31-9	#
9-24-9	7733595	Rwk	INSTL C/O PROC ECHO MSL	INSTR	10-29-9	#
10-3-9	7733595	Memo	INSTL C/O PROC ECHO MSL	INSTR	10-29-9	#
10-3-9	2733242	Memo	C/O PROC MSL INSTR	INSTR	8-27-9	
10-3-9	2733242	K	C/O PROC MSL INSTR	INSTR	10-3-9	
10-8-9	2733631	AP	INSTR ECHO MSL	INSTR	10-12-9	
10-26-9	2796841	Nev	COMMAND RECEIVER RELOCATION	INSTR	11-10-9	
10-26-9	2733631	AS	INSTR ECHO MSL	INSTR	10-31-9	
11-7-9	2796841	B	COMMAND RECEIVER RELOCATION	INSTR	11-10-9	
11-24-9	7795458	C	CALIB PROC I & F CONSOLE METER PANEL	INSTR	12-10-9	
11-24-9	7795458	Memo	CALIB PROC I & F CONSOLE METER PANEL	INSTR	12-10-9	
1-5-0	2733995	AD	AO CANC	INSTR		*
2-15-0	2796873	E	INSTR INFLIGHT TRANS MOD	INSTR	2-17-0	

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2-23-9	2795888	New	FUEL INJECTOR PRESS SWITCH ADJ	PP	9-11-9	
3-27-9	2796121	New	RWK OF GO_2 INFLIGHT PRESS SYS	PP	8-25-9	
4-8-9	2796121	A	RWK OF GO_2 INFLIGHT PRESS SYS	PP	9-16-9	
4-8-9	2796197	New	RWK TURBINE EXHAUST EXT DUCT	PP	9-15-9	
4-18-9	2796235	New	SAFETY WIRING SUP BKT BOLTS	PP	9-4-9	
4-20-9	2796268	New	REMOVAL GH_2 MSL BOTTLES	PP	8-17-9	
4-24-9	2796268	A	REMOVAL GH_2 MSL BOTTLES	PP	8-16-9	
5-8-9	7795712	E	C/O PROC MSL PWR PLANT MB-3 BLK 1 ENG	PP	10-13-9	#
5-9-9	7795362	B	117L TEST PROP FLOW PROC	PP	2-13-0	#
6-5-9	2796467	New	REPLACE Q/D CAP ASSY	PP	9-10-9	
6-10-9	2733996	BU	AO CANC	PP	10-12-9	
6-15-9	7795884	A	117L BLK I C/O PROC MSL AT PAD	PP	12-22-9	#
6-17-9	2796532	New	RWK LUBE OIL TANK VENT LINE	PP	8-17-9	
6-22-9	7795712	Memo	C/O PROC MSL PWR PLANT MB-3 BLK I ENG	PP	1-13-9	#
6-24-9	2796580	New	INSP OXIDIZER START TANK VENT VALVE	PP	8-12-9	
6-26-9	7795884	Memo	117L BLK I C/O PROC MSL AT PAD	PP	12-22-9	#
6-30-9	7795362	Memo	117L TEST PROP FLOW PROC	PP	2-13-0	#
7-11-9	2796532	A	RWK LUBE OIL TANK VENT LINE	PP	8-17-9	
7-24-9	2796645	New	FUEL START TANK PRESS SWITCH INSP	PP	8-12-9	
7-25-9	7795362	C	117L TEST PROP FLOW PROC	PP	2-13-0	#
7-25-9	7795362	D	117L TEST PROP FLOW PROC	PP	2-13-0	#
8-5-9	2796467	Memo	REPL Q/D CAP ASSY	PP	9-10-9	
8-5-9	2796121	Memo	RWK GO_2 INFLIGHT PRESS SYS	PP	8-25-9	
8-5-9	2796645	Memo	FUEL START TANK PRESS SWITCH INSP	PP	9-23-9	
8-5-9	7795362	Memo	117L TEST PROP FLOW PROC	PP	2-13-0	#
8-5-9	2795675	New	REINFORCING RING DRAIN HOLE PLUG	PP	9-4-9	
8-5-9	2796580	Memo	INSP OXIDIZER START TANK VENT VALVE	PP	8-12-9	
8-8-9	2796532	Memo	RWK LUBE OIL TANK VENT LINE	PP	8-17-9	
8-8-9	2796197	Memo	RWK TURBINE EXHAUST EXT DUCT	PP	9-15-9	
8-10-9	7795362	Memo	117L TEST PROP FLOW PROC	PP	2-13-0	#
8-10-9	2795888	Memo	FUEL INJECTOR PRESS SWITCH ADJ	PP	9-11-9	
8-10-9	2796268	Memo	REMOVAL GH_2 MSL BOTTLE	PP	8-17-9	
8-12-9	2796121	Rwk	RWK GO_2 INFLIGHT PRESS SYS	PP	8-16-9	
8-12-9	2796235	Memo	SAFETY WIRING SUP BKT BOLTS	PP	9-4-9	
8-20-9	7795712	F	C/O PROC MSL PWR PLANT MB-3 BLK I ENG	PP	10-13-9	#
8-24-9	7795362	E	117L TEST PROP FLOW PROC	PP	2-13-0	#
8-26-9	2733996	CM	AO CANC	PP		*
9-15-9	2795888	A	FUEL INJECTOR, PRESS SWITCH ADJ	PP	9-23-9	
9-24-9	2796645	Memo	FUEL START TANK PRESS SWITCH INSP	PP	9-23-9	
10-6-9	2796645	Rwk	FUEL START TANK PRESS SWITCH INSP	PP	10-7-9	
10-9-9	2733996	Memo	AO CANC	PP	10-12-9	
10-12-9	2733996	CS	AO CANC	PP		*
10-19-9	2796802	New	CLEARENCE INSP	PP	10-23-9	
10-30-9	2795464	A	LUBE OF GIMBAL BEARINGS	PP	11-24-9	
11-7-9	2796854	New	MOD, 4-WAY SOLENOID VALVE	PP	11-12-9	
11-10-9	7795362	F	117L TEST PROP FLOW PROC	PP	2-13-0	#
11-24-9	7795884	D	117L BLK I C/O PREC MSL AT PAD	PP	12-22-9	#
11-27-9	2796802	A	CLEARENCE INSP	PP	12-18-9	
12-1-9	7795362	Vari	117L TEST PROP FLOW PROC	PP	2-13-0	#
12-1-9	7795884	E	117L BLK I C/O PREC MSL AT PAD	PP	12-22-9	#
12-11-9	2796700	C	GG LIQ OXY REG SETTING	PP	12-11-9	
12-12-9	2796943	New	REPL MAIN PNEU 4 WAY SOLENOID VALVE	PP	12-16-9	
12-15-9	2796854	A	MOD, 4 WAY SOLENOID VALVE	PP	12-16-9	
1-7-0	7795362	Vari	117L TEST PROP FLOW PROC	PP	2-13-0	#

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DOUGLAS

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L-260-256 (1-59)

DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
1-14-0	7795362	G	117L TEST PROP FLOW PROC	PP	2-13-0	#
1-19-0	2796992	New	MAIN ENG PROP VALVE INSP	PP	1-20-0	
1-26-0	7733816	Var1	C/O PROC IM 1812-3 L/E	PP	2-11-0	#
1-26-0	2796700	E	GG LIQ OXY REG SETTING	PP	2-17-0	
2-9-0	2797017	New	C/O PROC FUEL INJECT PRESS SWITCH	PP	2-11-0	
2-10-0	7795362	H	117L TEST PROP FLOW PROC	PP	2-13-0	#

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* [illegible]

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L-260-256 (1-59)

DATE	DRAWING OR E.O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
3-19-9	2796058	New	MISSILE MATING	GE	12-15-9	
3-19-9	2796059	New	MISSILE TRANSPORTING	GE	8-6	
8-5-9	2796059	A	MISSILE TRANSPORTING	GE	8-6	
8-19-9	2796059	Memo	MISSILE TRANSPORTING	GE		*

* NOT APPLICABLE

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DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
2-20-9	T795997	A	HYD C/O MSL	HM	9-21-9	#
3-11-9	2795323	J	HYD C/O MSL	HM	9-21-9	#
3-19-9	2795323	K	HYD C/O MSL	HM	9-21-9	#
3-20-9	2795323	L	HYD C/O MSL	HM	9-21-9	#
3-30-9	2795323	M	HYD C/O MSL	HM	9-21-9	#
3-30-9	2795323	Memo	HYD C/O MSL	HM	9-21-9	#
3-30-9	T795997	B	HYD C/O MSL	HM	10-7-9	#
3-30-9	T795188	C	C/O PROC MSL HYD	HM	12-10-9	#
5-15-9	2795323	Memo	HYD C/O MSL	HM	9-21-9	#
5-15-9	2795323	Memo	HYD C/O MSL	HM	9-21-9	#
5-15-9	T795188	Memo	C/O PROC MSL HYD	HM	12-10-9	#
5-16-9	T795997	Memo	HYD C/O MSL	HM	9-21-9	#
6-10-9	T795188	D	C/O PROC MSL HYD	HM	12-10-9	#
8-22-9	T795997	C	HYD C/O MSL	HM	9-21-9	#
9-10-9	T795188	E	C/O PROC MSL HYD	HM	12-10-9	#
9-24-9	T795188	Memo	C/O PROC MSL HYD	HM	12-10-9	#
2-16-0	2797031	New	PRE-LAUNCH C/O UMBIL MAST LINK	HM	2-17-0	

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L-260-286 (1-59)

DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
2-12-9	2733894	A	INSTL & ALIGN - LOCKHEED ADAPTER	STRUT		*
2-18-9	2733894	B	INSTL & ALIGN - LOCKHEED ADAPTER	STRUT		*
5-5-9	2796361	New	INSTL OF LOCKHEED ADAPTER RING	STRUT	2-10-9	
5-13-9	2733999	K	AO CANC	STRUT		*
6-1-9	2733999	N	AO CANC	STRUT		*
6-15-9	2796513	New	REMOVAL ENG WORK PLATFORM	STRUT	12-22-9	
6-23-9	2733894	Memo	INSTL & ALIGN - LOCKHEED ADAPTER	STRUT		*
6-25-9	7795858	A	ALIGN CHECK LMSD ADAPTER	STRUT		*
7-1-9	2796513	A	REMOVAL ENG WORK PLATFORM	STRUT	12-22-9	
7-10-9	7795858	Memo	ALIGN CHECK LMSD ADAPTER	STRUT		*
10-20-9	2733999	T	AO CANC	STRUT	10-21-9	
10-23-9	2796804	New	INTER STAGE BONDING ECHO PROJ	STRUT	2-10-9	
10-26-9	2796826	New	RWK STRUCT ASSY GUID SECT	STRUT	10-2-9	
11-2-9	2796826	A	RWK STRUCT ASSY GUID SECT	STRUT	11-3-9	
11-10-9	2733999	Memo	AO CANC	STRUT		*

* NOT APPLICABLE

DRAWING NO. 7796330
PAGE NO. 9.0
CHANGE LETTER C

DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
3-12-9	2733847	New	MSL WEIGHING & C.G. DETERMINATION	WTS	10-14-9	
11-12-9	2733847	Memo	MSL WEIGHING & C.G. DETERMINATION	WTS	10-14-9	

DOUGLAS

DRAWING NO. 7796330
PAGE NO. 10.0
CHANGE LETTER C

DATE	DRAWING OR E. O. NUMBER	CHG LTR	TITLE	GROUP	COMP DATE	
5-15-9	2795503	G	PREFLIGHT AUTHORIZATION	OPER		*
7-21-9	7795500	G	117L PREFLIGHT & TEST PROC	OPER	2-19-0	#
7-21-9	7795500	H	117L PREFLIGHT & TEST PROC	OPER	2-19-0	#
8-31-9	7795500	J	117L PREFLIGHT & TEST PROC	OPER	2-19-0	#
12-8-9	7795500	K	117L PREFLIGHT & TEST PROC	OPER	2-19-0	#
1-19-0	7795500	L	117L PREFLIGHT & TEST PROC	OPER	2-19-0	#
2-12-0	7795500	M	117L PREFLIGHT & TEST PROC	OPER	2-19-0	#

ACCOMPLISHED BY FIELD STATION A.O.

* NOT APPLICABLE

DATE	AO NUMBER	CHG LTR	SVC CHG	ED	PAGE	TITLE	GR	COMP DATE
7-30-9	5791978	B	784	2	1	VENT RELIEF VALVE INSTL RIM	PP	8-8-9
7-30-9	3832350	B		1	1	SWITCH INSTL FUEL INJECTOR	GSE	9-11-9
7-30-9	2842318	New		1	1	RWK V/ENG	PP	9-9-9
7-30-9	2842424	New		1	1	RWK ROCKET ENG	PP	11-13-9
7-30-9	2839881	New		2	1	RWK ROCKET ENG	PP	9-16-9
7-30-9	3696695	F		1	1	GSE 1st STAGE MOD ECHO MSL	STRUC	9-2-9
7-30-9	5689886	T	793	1	1	UMBIL INSTL	GE	9-2-9
7-30-9	5681970	AO	752	1	1	DOOR ASSY & INSTL EQUIP ACCESS	GE	9-22-9
7-30-9	5602332	AP	752	1	1	GUID SECT STRUCT ASSY	STRUC	9-10-9
7-30-9	2842168	New		2	1	RWK ROCKET ENG	PP	9-16-9
7-30-9	5832403	New		2	1	MOD GUID SECT CONT	STRUC	9-23-9
7-30-9	5681975	R	775	2	1	UMBIL INSTL GROUND HOSE CONN	GSE	9-2-9
8-7-9	2838709	New		8	1	RWK ROCKET ENG	PP	11-24-9
8-13-9	2839853	New		3	1	RWK ROCKET ENG	PP	11-7-9
8-28-9	2842319	New		1	1	RWK ROCKET ENG	PP	10-10-9
9-28-9	2848058	New		1	1	RWK FUEL START TANK	PP	10-7-9
10-19-9	5725028	AM	852	1	1	EQUIP INSTL ENG SECT	GSE	10-19-9
12-2-9	2842320	New		1	1	ROCKET ENG RWK	PP	12-4-9
12-10-9	5832403	New		3	1	MOD GUID SECT CONT	GSE	12-11-9
12-13-9	3697073	C		1	1	REMOVAL GUID CTR SECT COMP	GSE	2-13-0
12-22-9	2848537			1	1	ROCKET ENG SECT CONT	GSE	12-22-9
1-6-0	3697055			1	1	PANEL ISOLATION	GSE	2-13-0
2-16-0	3848395			1	1	MOD KIT PRESS SWITCH	GSE	2-16-0

(FORM 1-40-6)

DOUGLAS

DRAWING NO 7796339
PAGE NO 11.0
CHANGE LETTER C

25-1388 (5-56)

The following A.O.'s have been cancelled and the work accomplished by VAFB E.O.'s as noted:

A.O. NUMBER	CHG LTR	SVC CHG	CANC BY EO	CHG LTR	ACCOM BY EO	CHG LTR
2725028	AM		2733993	AB	2796342	New
3697073	C		2733993	AK	2796625	C,D
5844175	A		2733993	AA	2795734	H
5696837	K		2733995	S	2733631	
WRO DMIB-2262			2733996	CM	2795888	New & A
2848211	New		2733996	CS	2796467	New

DOUGLAS AIRCRAFT CO., INC. **MISSILES**

ENGINEERING ORDER SANTA MONICA DIVISION

FORM 40-315 (3-58)

SHEET 1 OF 1		E.O. 7796330	
DATE OF ISSUE MAR 1 1960		DRAWING CHANGED ON CHANGE LETTER	D
DATE OF ISSUE		RESERVED CHANGE LETTER	

DESCRIBE IN DETAIL AND GIVE REASON:

ISSUED FOR USE AT VAFB ONLY

1. AFFECTED PAGES: 1.0, 1.1, 2.0, 3.1

2. CHANGED PAGES: 1.0, 1.1, 2.0,

3. PAGE 3.1 REVISED & RETYPED

REASON: TO PROVIDE ADDITIONAL E.O. LISTINGS AND COMPLETION DATES & TO ESTABLISH A.O. LISTING SHEETS.

TITLE: PREP OF MISSILE 223

DISPOSITION

MODEL	REL. S.O.	EFFECTIVITY
SM1712-3	168319	RECORD

RELEASE THE FOLLOWING FOR EFFECTIVITY LISTED ABOVE

DRAWING NUMBER	REQUIREMENTS PER ARTICLE	FORMER REQ. PER ARTICLE	NEXT ASSEMBLY	

NO ARTICLE

DESIGN GROUP: PREP	E.O. PREPARED BY: MELATTI 2-26-0
ENGINEERING SECT.: —	DWG. MADE OR CHANGED BY: MELATTI 2-26-0
TIME CHARGE S.O.: 168319	DESIGN APPROVAL
SERIAL OR EWO: 71634	PROJECT ENGINEER
WRO: —	CUSTOMER
PATTERN / DIE / MOLD AFFECTED: YES / NO	WEIGHTS: W. / Wo
	CHECK RLEO APPROVAL
	DRAWING CHECKED BY
	STRENGTH 2-25-6
	MATERIAL 3-1-60
	RELEASE
	EXPERIMENTAL
	PRODUCTION
	TOOLS

_____ EXTRA PRINTS OF DWG TO _____ EXTRA PRINTS OF E.O. TO

[redacted]

DER 223

Prepared By D. Perlev
Date 2-23-60

Missile No. 223
Item No. 11.15
Page No. 11

TIMES OF VARIOUS EVENTS

(Data taken from 35mm film photographed at 2550 ft., 110 degrees, and 48 fps)

Event	*Time of Day	* L/O +
Lift-off	1215:14.238	
Vernier engine starts roll (to left)	1215:16.26	2.02
Vernier (max deflection)	1215:16.30	2.06
Vernier (centers)	1215:16.51	2.27
Main engine gimbal starts	20.83	6.59
Main engine hard over (left)	21.20	6.96
Main engine center	21.75	7.51
Main engine hard over (right)	22.58	8.34
Main engine center	23.00	8.76
Main engine hard over (left)	23.32	9.08
Main engine center	24.30	10.06
Main engine hard over (right)	Not readable(angle)	
Vernier engine hard over (right)	24.68	10.44
Roll program start	23.85	9.61
Roll approximately 15° to right	25.35	11.11
Main engine center	25.86	11.62
Main engine hard over (left)	26.45	12.21
Main engine Center	27.24	13.00
Rolls to left	27.24	13.00
Main engine hard over (right)	27.62	13.38
Vernier center (following main engine)	28.65	14.41
Main engine and Vernier engine hard left	29.23	14.99
Main engine and Vernier engine center	30.16	15.92
Gimbaling continued through entire flight		

* Corrections have been made for a 14 frame lag on time due to position of strobe (0.26 seconds).

[redacted]

DOUGLAS

COPY NO. 66

Prepared by R. Rice & R. Perdew [redacted] Missile No. 223
Date 2-23-60 [redacted] Item No. 11.16
Page No. 12

TIMES OF VARIOUS EVENTS

(Data taken from 70mm film photographed at 2,550 ft., 110 degrees, and 10 fps.)

Event	* Time L/O +
Vapor appears approximately 2' above first stage	T + 0.4
Vapor disappears (remains relative to shroud)	T + 2.9
Object (one foot diameter or smaller) is approximately 3 feet from missile and 18 feet below top of first stage)	T + 9.7
Vapor** appears (initially) from 2nd stage (LMSD Vehicle)	T + 9.7
Vapor intensity increases (approximately 1 foot above first stage)	T + 9.8
Vapor intensity increases (approximately 1 foot above first stage)	T + 9.9
Vapor intensity increases (approximately 1 foot above first stage)	T + 10.0
Vapor intensity increases (approximately 1 foot above first stage)	T + 10.1
Vapor intensity increases (approximately 1 foot above first stage)	T + 10.2
Vapor trail disappears from view (hidden by missile pitch)	T + 11.2
Vapor trail appears again (missile pitches back)	T + 12.5
Vapor trail increases in intensity	T + 13.0
Vapor trail extends well beyond missile (down stream)	T + 13.1
Vapor trail disappears (missile pitch)	T + 13.7
White streak on second stage appears (approximately 2' in length). Appears to be liquid.	T + 13.6
White streak extends down complete length of first stage	T + 13.9
White streak disappears (after intensifying and receeding)	T + 14.8
Vapor appears (as at T + 9.7)	T + 15.3
White streak (liquid) appears on second stage	T + 16.3
White streak extends along first stage	T + 16.4
White streak extends to seam above LOX tank area and reappears out of LOX tank section-boattail section seam.	T + 17.0
End of film	T + 18.2

* Times were obtained by counting frames and are approximate.
** Color of vapor cannot be determined.

[redacted] [redacted]

DOUGLAS

JOINT MESSAGEFORM

[redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CENTER

PRECEDENCE	TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
	BOOK	MULTI	SINGLE			
ACTION PRIORITY			XX		NA	NA
INFO						

FROM: AIR FORCE BALLISTIC MISSILE DIVISION FIELD OFFICE
VANDENBERG AFB, CALIFORNIA

TO: COMMANDER, AIR FORCE BALLISTIC MISSILE DIVISION, INGLEWOOD, CALIFORNIA

INFO: DAC FIELD OFFICE, VAFB, LMSD FIELD OFFICE, VAFB, 1ST MD, VAFB

SECRET FROM WDGEV NSB-10 . SUBJ: FLASH REPT OF FIRST DISCOVERER SATELLITE LAUNCH FROM VANDENBERG AFB.

1. VEHICLE CONFIGURATION

1.1 DISCOVERER SATELLITE VEHICLE, XA MODEL 3205 SERIAL 1022

1.2 BOOSTER, MODIFIED IOC THOR SERIAL 163

2. DATE AND TIME OF LAUNCH: FEB 28, 1959, 13:49:16 PST.

3. TEST OBJECTIVES

3.1 PRIMARY OBJECTIVES

3.1.1 DEMONSTRATE THE ORBITAL CAPABILITY OF THE THOR BOOSTED DISCOVERER CONFIGURATION.

3.1.2 ACHIEVE REQUIRED THOR SYSTEM PERFORMANCE TO LAUNCH, CONTROL, SEPARATE AND PLACE DISCOVERER AT THE SEPARATION POINT WITHIN ± 4 DEGREES OF DESIRED FLIGHT PATH ANGLE.

3.1.3 GROUND SUPPORT EQUIPMENT MUST PROVIDE ADEQUATE

SPECIAL INSTRUCTIONS

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

[redacted] CHANGED TO

By Authority of AFR 205-1
4 APR 1960

DAY	TIME
28	1830
MONTH	YEAR
2	59

SYMBOL AFBMD Field Office, VAFB

SIGNATURE

TYPED NAME AND TITLE (Signature, if required)
PATRICK B. MULCAIRE, Major, USAF

TYPED (or stamped) NAME AND TITLE

DOWNGRADED AT 3 YEAR INTERVALS,
DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

8-5133

PAGE NO. 1

NR. OF PAGES

CLASSIFICATION [redacted]

DD FORM 173, 1 OCT 48, WHICH WILL BE USED UNTIL EXHAUSTED

GROUND SUPPORT AND CHECKOUT REQUIRED BY THE DISCOVERER SYSTEM UP TO AND INCLUDING FIRING FROM THE LAUNCH PAD.

3.1.4 DISCOVERER

3.1.4.1 AIRFRAME. DEMONSTRATE AIRFRAME COMPATIBILITY TO BOOSTER VEHICLE, AND MEET ENVIRONMENTAL AND OPERATING REQUIREMENTS.

3.1.4.2 PROPULSION SYSTEM. ~~HER~~ DEMONSTRATE REQUIRED PERFORMANCE OF ULLAGE ROCKETS, LR-81-3 ENGINE AND PROPELLANT UTILIZATION TO PLACE DISCOVERER VEHICLE IN ORBIT.

3.1.4.3 AUXILIARY POWER SYSTEM. DEMONSTRATE UTILITY OF BATTERIES AND INVERTERS AND FUNCTIONAL ADEQUACY OF THERMAL DESIGN CRITERIA.

3.1.4.4 GUIDANCE AND CONTROL. DEMONSTRATE ABILITY TO PERFORM PROPER SEPARATION, TIMER ACTUATION, THE INITIATION OF ENGINE SEQUENCE, AND VEHICLE ORIENTATION DURING ALL PHASES FOLLOWING SEPARATION. ORIENTATION PERFORMANCE INCLUDES SS/D COMPUTER, IRP, HORIZON ~~XX~~ SCANNER, PNEUMATIC AND HYDRAULIC CONTROL SYSTEMS.

3.1.4.5 SUBSYSTEM H-TRACKING, TELEMETRY AND VEHICLE COMMAND. SS/H EQUIPMENTS MUST PROVIDE FOR GROUND RECORDS OF PRIMARY VEHICLE INSTRUMENTATION PARAMETERS, ALL GROUND-SPACE COMMANDS, AND THE TAKING AND PROCESSING OF DATA NECESSARY FOR DETERMINATION OF EPHEMERIS, ACQUISITION INFORMATION, AND VEHICLE TIMER RESET INFORMATION.

3.2 SECONDARY TEST OBJECTIVES

3.2.1 SAMPLE AND EVALUATE THE THERMAL ENVIRONMENT.

3.2.2 TO OBTAIN AND MAINTAIN A LOCAL VERTICAL, AFTER ORIENTATION, WITH REQUIRED ACCURACY.

3.2.3 EVALUATE FUNCTIONAL PERFORMANCE OF COMMUNICATIONS X SYSTEM.

3.2.4 ACQUISITION DURING ORBITAL PHASE BY ALTERNATE METHODS.

3.2.5 EVALUATION OF VEHICLE COMBINATION PERFORMANCE THROUGH OPTICAL METHODS.

3.3 TERTIARY TEST OBJECTIVE

3.3.1 EVALUATE RECOVERER OPERATION BY SIMULATION.

3.3.2 EVALUATE PERSONNEL AND GROUND EQUIPMENT DESIGN FROM HUMAN ENGINEERING APPROACH.

4. DESCRIPTION OF ACCOMPLISHMENT OF TEST OBJECTIVE

4.1 PRIMARY OBJECTIVE 3.1.1 WAS MET INSOFAR AS IN THE INJECTION PHASE INSTRUMENTATION AND TRACKING DATA WAS ABLE TO DETERMINE AT THIS TIME. TRACKING INFORMATION WAS RECEIVED FROM VAFB UNTIL 536 SECONDS AFTER LIFTOFF FROM THE TELEMETRY TRANSMITTER. VAFB AND MUOU RADAR MAINTAINED RADAR TRACK UNTIL 506 SECONDS AND 521 SECONDS RESPECTIVELY. A CONFIRMING FIRST ORBITAL PASS ACQUISITION HAS NOT YET BEEN RECEIVED.

4.2 PRIMARY OBJECTIVE 3.1.2 WAS ACHIEVED IN THAT THE SYSTEM DEMONSTRATED THE CAPABILITY OF THE THOR TO PLACE THE DISCOVERER AT THE SEPARATION POINT WITH DESIRED THOR BURNOUT VELOCITY ATTAINED BY A THOR BURNING TIME OF 2 MINUTES 40.75 SECONDS. THOR VERNIER ENGINES SHUT DOWN 9.05 SECONDS LATER. THE FLIGHT PATH PITCH ANGLE AT SEPARATION WAS APPARENTLY NORMAL. SUBSTANTIATED BY

TRACK TO AN INJECTION ALTITUDE AS REPORTED X BY PALO ALTO COMPUTER OF 165 NAUTICAL MILES AND INJECTION VELOCITY OF 25,670 FT/SEC. THOR LIFT OFF WAS ATTAINED AT 13:49 AND 16 SECONDS AFTER AN ABREVIATED COUNTDOWN WHICH STARTED AT 0800. THE THOR AUTOPILOT PERFORMED ITS PROGRAMMED ROLL/STARTING AT 2 SECS AND ENDING AT 9 SEC TO THE LAUNCH AZIMUTH OF 183° AS VERIFIED BY TRACKING DATA. THE PITCH PROGRAM WAS SMOOTH AND IN ACCORDANCE WITH SPECIFIED TIMES. SEPARATION OCCURRED AT 175 SECONDS, DEMONSTRATING SUCCESSFUL OPERATION OF SEPARATION SEQUENCE.

4.3 PRIMARY OBJECTIVE 3.1.3 WAS NET IN THAT THE GROUND SUPPORT EQUIPMENT PERFORMED WITHIN DESIGN SPECIFICATIONS WITH THE EXCEPTION OF THE PROPELLANT SENSING CIRCUITRY WHICH NECESSITATED A DELAY IN THE COUNTDOWN OF APPROXIMATELY THIRTY MINUTES. PROTECTIVE MODIFICATIONS TO THE LAUNCH EQUIPMENT TO REDUCE FLAME AND BLAST DAMAGE RESULTED IN LESS THAN EXPECTED DAMAGE.

4.4 PRIMARY OBJECTIVE 3.1.4.1 WAS APPARENTLY COMPLETELY ACHIEVED AS DEMONSTRATED BY DISCOVERER AIRFRAME STRUCTURAL INTEGRITY THRU LAUNCH SEPARATION, SECOND STAGE IGNITION AND SECOND STAGE BURNOUT.

4.5 PRIMARY OBJECTIVE 3.1.4.2 WAS COMPLETELY ACHIEVED AS RECORDED BY TELEMETRY THRU THE SEPARATION SEQUENCE, ENGINE IGNITION AND ENGINE BURNOUT. SEPARATION OCCURRED AT 175 SECONDS AND ENGINE IGNITION OCCURRED AT 340 SECONDS WITH A RECORDED BURNING TIME OF 96 SECONDS. THIS DEMONSTRATED SUCCESSFUL OPERATION OF THE X ULLAGE ROCKETS, IGNITION OF THE LR-81-3 ENGINE IN A SPACE ENVIORNMENT

MORE EFFICIENT PROPELLANT UTILIZATION DURING 96 SECOND BURNING TIME AGAINST NOMINAL BURNING TIME OF 97 SECONDS.

4.6 PRIMARY OBJECTIVE 3.1.4.3 WAS FULFILLED INSOFAR AS DEMONSTRATED BY PERFECT RECEPTION OF ALL TRACKING AIDS FOR 100 SECONDS AFTER SECOND STAGE ENGINE BURNOUT. THE ADEQUACY OF THE THERMAL DESIGN CRITERIA IS UNKNOWN AT THIS TIME.

4.7 PRIMARY OBJECTIVE 3.1.4.4 WAS COMPLETELY ACHIEVED IN THE SEPARATION SEQUENCE, AND "D" TIMER ACTUATION THRU THE ENGINE SEQUENCE. VEHICLE ORIENTATION, SS/D COMPUTER, IRF, HORIZON SCANNER, AND PNEUMATIC/HYDRAULIC CONTROLS SYSTEMS HAVE GIVEN NO DEFINITE INDICATION OF ANY MALFUNCTION. DETAILED INFORMATION WILL BE FURNISHED UPON COMPLETION OF TELEMETRY DATA REDUCTION.

4.8 PRIMARY OBJECTIVE # 3.1.4.5 WAS ACHIEVED THRU TRACKING BY VAFB TLM-18 FOR 536 SECONDS, VAFB TRI-HELIX FOR 516 SECONDS. MUGU RADAR TRACKED FOR 521 SECONDS. LOSS OF TRACK AT VAFB AND MUGU RADARS WERE [illegible] 183° 182.5° AZIMUTHS RESPECTIVELY AND MUGU RADAR RANGE WAS IN EXCESS OF TWO MILLION YARDS. ENGINE IGNITION TIMER DELAY COMMAND WAS INITIATED AT 280 SECONDS FOR A PERIOD OF 32.4 SECONDS. ENGINE IGNITION AS INDICATED BY SECOND STAGE CHAMBER PRESSURE OCCURRED AT 340 SECONDS. THE TAKING AND PROCESSING OF DATA FOR EPHEMERIS, ACQUISITION AND TIMER RESET WAS COMPLETELY SATISFACTORY EXCEPT FOR DATA TO BE FURNISHED BY THE TELEMETRY SHIP, THE DETAILS OF WHICH ARE UNKNOWN AT THIS TIME. VEHICLE TRANSMISSIONS NECESSARY FOR FIRST PASS TRACKING WERE NOT RECEIVED.

JOINT MESSAGEFORM - CONTINUATION SHEET [redacted]

FROM: ATRMD FIELD OFFICE
VANDENBERG AFB, CALIF

5. SECONDARY OBJECTIVE

5.1 SECONDARY OBJECTIVE 3.2.1 AND 3.2.2 ARE IMPOSSIBLE TO EVAULATE FROM INFORMATION AVAILABLE AT THIS TIME.

5.2 SECONDARY OBJECTIVE 3.2.3 WAS NORMAL AND SATISFACTORY.

5.3 SECONDARY OBJECTIVE 3.2.4 WAS NOT ACCOMPLISHED

5.4 SECONDARY OBJECTIVE 3.2.5 WAS REPORTED TO BE ONE HUNDRED PERCENT ACCOMPLISHED BY COMPLETE COVERAGE OF ALL CAMERAS. THE FILM RESULTS WILL BE PROVIDED WHEN AVAILABLE.

6. TERTIARY OBJECTIVES

6.1 OBJECTIVE 3.3.1 CANNOT BE EVALUATED AT THIS STATION.

6.2 OBJECTIVE 3.3.2 WAS COMPLETELY AND EXCELLENTY ACCOMPLISHED IN THE SUPERB PERFORMANCE OF THE LAUNCH CREW, THE CONTROL CENTERS AND ALL TRACKING STATION PERSONNEL, FROM A PERSONNEL PERFORMANCE STANDPOINT. HUMAN ENGINEERING DESIGN RECOMMENDATION REGARDING EQUIPMENT WILL BE MADE SEPARATELY.

7. CONCLUSION

ALTHOUGH INJECTION INTO ORBIT HAS NOT YET BEEN CONFIRMED, RESULTS AVAILABLE DEMONSTRATE A HIGH DEGREE OF SUCCESS WAS ACHIEVED IN THE LAUNCH OF DISCOVERER 1.

MESG.	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
WDGEVR	6		[redacted]	reb

JOINT MESSAGEFORM

SECURITY CLASSIFICATION [redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CEN[redacted]

PRECEDENCE	TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
	BOOK	MULTI	SINGLE			
ACTION PRIORITY IMMEDIATE			X	X	X	
INFO						

FROM:
CHIEF AFBMD FLD OFC VANDENBERG AFB, CALIF

TO:
COMDR AFBMD/HEDARDC/LOS ANGELES 45, CALIF

LOCKHEED MISSILES AND SPACE DIV PALO ALTO, CALIF

AFBMD FLD OFC PALO ALTO CALIF

DOUGLAS ACFT COMPANY SANTA MONICA, CALIF

SECRET/FROM WDGEV-4-18-C, LOSA FOR WDZW. LOCKHEED FOR DEPT 61-44 & 61-70.

SUBJECT CLN FOLLOW ON REPORT TO FLASH REPORT WDGEV-4-13-C, LAUNCH OF DISCOVERER NUMBER 2.

THIS MESSAGE IN TWO PARTS.

PART I.

PART I CONTAINS AN EVALUATION OF PAD DAMAGES THAT RESULTED FROM THE SUCCESSFUL LAUNCH OF DISCOVERER 2 (1018) ON 13 APRIL 1959 FROM PAD 4 OF COMPLEX 75-3 PLUS A HISTORY OF THE COUNTDOWN.

THE TERMINAL COUNTDOWN WAS INITIATED AT 1302 GLN 30 HOURS. NO UNSCHEDULED HOLDS OCCURRED AND LIFTOFF WAS AT 1318 GLN 42. TOTAL TERMINAL COUNTDOWN TIME WAS 16 MINUTES 12 SECONDS. MAIN ENGINE CUT-OFF OCCURRED AT 1321 GLN 20 AFTER 158.4 SECONDS OF MAINSTAGE.

SPECIAL INSTRUCTIONS

CLASSIFIED CHANGED TO [redacted] BY Authority of 205-2 4 APR 1966 DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

DATE	TIME
15 MONTH APRIL	1302Z 1959

RELEASER

TYPED NAME AND TITLE (Signature, if required)
WDGEV AFBMD Project Officer
Patrick M. Malecire, Major, USAF

PHONE 8-3122 | PAGE NR. 1 | OF PAGES 5

SECURITY CLASSIFICATION [redacted]

TYPED (or stamped) NAME AND TITLE

DD FORM 1 MAY 55 173 REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION [redacted]

FROM: CHIEF, AFSWC FLD OFC, VANDENBERG AFB, CALIFORNIA [redacted]

VERNIER ENGINE CUTOFF OCCURRED 9.2 SECONDS LATER. DOUGLAS DATA ANALYSIS INDICATES SEPARATION AT 170 SECONDS. LMSD DATA SHOWS 172 SECONDS. RETRO ROCKET IGNITION WAS AT 171 SECONDS. THIS ITEM IS TO BE RESOLVED FOR THE LAUNCH REPORT.

ALL ITEMS OF GROUND EQUIPMENT FUNCTIONED PROPERLY. THE SIX LAUNCH LEGS RETRACTED ON SCHEDULES AS DID THE FUEL AND LIQUID OXYGEN MASTS AND THE UMBILICAL MAST. THE LAUNCH MOUNT AND TRANSPORTER/ERECTOR APPARENTLY SUFFERED NO STRUCTURAL DAMAGE AND COULD BE USED FOR ANOTHER LAUNCHING AFTER REPLACEMENT OF DAMAGED HOSES, CABLES AND AIR CONDITIONING DUCTS.

A GROUND FIRE DEVELOPED ABOUT 50 PERCENT OF THE UMBILICARS SHOWN A SECONDARY FIRE IN THE RP-1 COMPLEX DAMAGED SOME ADDITIONAL CABLES.

THE DEFLECTOR CONE OF THE LAUNCH MOUNT SHOWS THE USUAL SURFACE FLOW, BUT SUFFERED NO SIGNIFICANT DAMAGE AND COULD BE REUSED WITHOUT REPAIR. THE REDESIGNED DEFLECTOR EXTENSIONS PROVIDED GOOD BLAST PROTECTION TO THE PROPELLANT LINES AND TERMINALS AND STOOD UP VERY WELL.

THE MISSILE SHELTER IS UNDAMAGED AND, ACCORDING TO THE BLAST GAGE, RECEIVED ONLY A MINIMUM OF BLAST PRESSURE.

THE FREE STANDING WALL OF THE SHELTER HAD BEEN REMOVED FROM THE PAD PRIOR TO THE LAUNCHING.

THE POWER PACK TRAILER WAS LOCATED IN A PROTECTED AREA AND SUFFERED NO DAMAGE.

COUNTDOWN HISTORY

DOWNGRADED AT 3-YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

AUTHENTICATING OFFICER AND/OR COMMUNICATIONS OFFICER RELEASING	NR	PAGES	INITIALS
AFSWC Field Office	2	5	[redacted]

DD FORM 1 MAY 65 173-1

U. S. GOVERNMENT PRINTING OFFICE: 1965—

AUTOMATIC MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION [redacted]

FROM: CHIEF, AFETR FLD OFC VANDENBERG AFB, CALIFORNIA

13 CLM 02.30 MSD/LC	"START"
13 CLM 02.35 TKR	PHASE I START NOMNAL
13 CLM 03.08 TKR	PHASE II START
13 CLM 03.12 TKR	PHASE III START
13 CLM 04.42 TKR	PHASE III COMPLETE*
13 CLM 04.42 TKR	PHASE IV START
13 CLM 13 TKR	PHASE IV COMPLETE
13 CLM 13.30 TKR	TECH HOLD IMPOSED
13 CLM 16.05 TKR	TECH HOLD RELEASED
13 CLM 16.06 MSD/LC	PHASE V
13 CLM 18.42	LIFT OFF
13 CLM 23	CSO TO PAD
13 CLM 38	POST LAUNCH EVALUATION TEAM TO PAD

PART 2

ORBITAL STAGE ADDITIONAL INFORMATION AVAILABLE AT THIS TIME IS AS FOLLOWS CLM.

/A/ AZIMUTH AT ORBITAL STAGE BURNOUT 183.5 DEGREES FROM MOON RADAR PLOT.

/B/ POSITION AT OSV BURNOUT FROM MOON RADAR PLOT. R WAS 663 NM H WAS 144 NM.

R WAS 144 NM.

/C/ ORBIT INCLINATION 99.9 DEGREES FROM MOON TRACKING DATA.

/D/ INJECTION ANGL. FLES .04 DEGREES UNCORRECTED FOR REFRACTION

/E/ INJECTION VELOCITY, AVERAGE OF MOON AND VAFB PLOTS, 25,561 FT/SEC.

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
AFETR Field Office WDCKY	4	5	[redacted]	

DD, FORM MAY 65 173-1

AT T-1h0.

TASK 1 /PRE-COUNTDOWN OPERATIONS AND COUNTDOWN INITIATION WAS COMPLETED AT T-430.

TASK 2 /RSO RATING/ WAS COMPLETED AT T-351.

TASK 3 /SHELTER REMOVAL AND VEHICLE EGRESS/ WAS COMPLETED AT T-330.

TASK 4 /LAZARD CONNECTION AND FUEL TRUCK DISPLACEMENT/ WAS COMPLETED AT T-223.

TASK 5/ DESTRUCT TESTS/ WERE COMPLETED AT T-222.

TASK 6 /SECOND STAGE ARM/ WAS COMPLETED AT T-174.

TASK 7 /CORRECT FIRST STAGE DESTRUCT SYSTEM/ WAS COMPLETED AT T-183.

TASK 8 /PROPELLANT LINE FILL/ WAS COMPLETED AT T-160.

TASK 9 /COUNTDOWN EVALUATION/ WAS COMPLETED AT T-160.

TASK 10 /PROPELLANT TANKING/ WAS COMPLETED AT T-132.

20 MIN HOLD CALLED TO CHECK SUSPECTED ACID LEAK LINES FOUND O.K.

TASK 11 /ELECTRONICS WAKE-UP/ WAS COMPLETED AT 11 GLN 05.

TASK 12 /REMOVE PROPELLANT TRUCKS/ WAS COMPLETED AT T-103.

TASK 13 /GUIDANCE & FLIGHT CONTROL CHECKOUT/ WAS COMPLETED AT 11 GLN 25.

TASK 14 /FR CHECKOUT/ WAS COMPLETED AT 11 GLN 42.

TASK 15 /PRESURIZATION/ WAS COMPLETED AT 11 GLN 38.

TASK 16 /COUNTDOWN EVALUATION/ WAS COMPLETED AT 12 GLN 49.

TASK 17 /TERMINAL COUNTDOWN/ BEGAN AT 1302 GLN 50. AFTER A 60 MIN HOLD FOR WEATHER AT T-20.

TERMINAL COUNTDOWN SEQUENCE SECLM

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM: [redacted]

CHIEF, AFBMD FLD OFC VANDENBERG AFB, CALIFORNIA

ALL OTHER INFORMATION PREVIOUSLY TRANSMITTED IN FLASH REPORT REMAINS VALID. NEXT FOLLOW-ON REPORT.

BT /

/SECRET/

16/0328Z APR

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIRECTIV. 5200.10

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
AFBMD Field Office (BDGEV)	5	5	[redacted]	

DD FORM 1 MAY 68 173-1

☆ U.S. GOVERNMENT PRINTING OFFICE: 1968—[illegible]

JOINT MESSAGEFORM

SECURITY CLASSIFICATION [redacted]

[redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CENTER

PRECEDENCE		TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
		BOOK	MULTI	SINGLE			
ACTION	PRIORITY [illegible]		X				
INFO	PRIORITY [illegible]						

FROM: CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF

TO: COMDR AFBMD/ARDC/LOS ANGELES 45, CALIF

LOCKHEED MISSILES AND SPACE DIVISION, PALO ALTO, CALIF

AFBMD FIELD OFFICE, PALO ALTO, CALIF

DOUGLAS AIRCRAFT COMPANY, SANTA MONICA, CALIF

INFO: 1ST MISSILE DIVISION, VANDENBERG AFB, CALIF (COURIER)

~~SECRET~~/FROM [illegible] 6-10-C . LOS ANGELES FOR [illegible]. LOCKHEED FOR DEPARTMENT [illegible] AND 61-70. SUBJECT; FLASH REPORT OF LAUNCHING OF DISCOVERER NO. 3 FROM VANDENBERG AFB.

1. VEHICLE CONFIGURATION

1.1. SATELLITE VEHICLE, LOCKHEED, XI MODEL [illegible], SERIAL [illegible]. SEPARATION WEIGHT, 8329 POUNDS, CONTAINING A MARK I BIOMEDICAL RESEARCH CAPSULE.

1.2. FIRST STAGE, THOR DM-18, SERIAL NO. 174, MODIFIED TO UTILIZE STRUCTURAL ADAPTER.

1.3. COMBINATION LAUNCH WEIGHT, 11[illegible],388 POUNDS.

2. DATE AND TIME OF LAUNCH, JUNE 3, 1959 AT 1309:21

SPECIAL INSTRUCTIONS

CLASSIFICATION CHANGED TO [redacted]

By Authority of 205-2 [illegible]

4 APR 1968

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

DATE	TIME
4	1800
MONTH	YEAR
JUN	1959

SYMBOL [illegible]

TYPED NAME AND TITLE (Signature, if required) [illegible], Lt. Col., USAF

PHONE [illegible] NO. 1 OF PAGES 7

SECURITY CLASSIFICATION [redacted]

SIGNATURE

TYPED (or stamped) NAME AND TITLE [redacted]

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM:

CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF [redacted]

3. PRIMARY OBJECTIVES

3.1. THE VEHICLE COMBINATION MUST PLACE IN ORBIT A DISCOVERER EARTH SATELLITE WHICH CONTAINS A RECOVERABLE CAPSULE CAPABLE OF RECORDING TEST DATA WHILE IN ORBIT AND OF RE-ENTRY, ON COMMAND, TO BE RECOVERED FOR DIRECT EXAMINATION.

3.2. THE LAUNCH MONITOR AND CONTROL EQUIPMENT, CHECKOUT EQUIPMENT, AND GROUND TRACKING AND RECEIVING EQUIPMENT MUST PROVIDE ADEQUATE SUPPORT AND CHECKOUT FACILITIES FOR LAUNCH OF THE DISCOVERER. IN ADDITION, ADEQUATE LAUNCH SUPPORT MUST BE PROVIDED AS REQUIRED BY THE BIOMEDICAL RECOVERY CAPSULE PRIOR TO AND INCLUDING LAUNCH OF THE DISCOVERER.

3.3. THE THOR FIRST STAGE SYSTEM MUST LAUNCH, CONTROL AND SEPARATE FROM THE DISCOVERER VEHICLE WITH AT LEAST THE MINIMUM PERFORMANCE SPECIFIED IN DESIGN DOCUMENTS. THE THOR AUTOPILOT MUST DEMONSTRATE ITS ABILITY TO CONTROL THE VEHICLE COMBINATION TO THE SEPARATION POINT WITHIN AN ACCEPTANCE BRACKET OF ACCURACY PLUS OR MINUS 4 DEGREES IN FLIGHT PATH ANGLE.

3.4. THE DISCOVERER AIRFRAME AND ADAPTER MUST DEMONSTRATE ITS ABILITY TO WITHSTAND CONTROL SYSTEM PERTURBATIONS AND FLIGHT ENVIRONMENT.

3.5. THE DISCOVERER PROPULSION SYSTEM MUST DEMONSTRATE THE FOLLOWING:

a. IGNITION OF THE ENGINE (BELL MODEL NO. 8048) IN A VACUUM.

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
			[redacted]	

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION: [redacted]

FROM: [redacted]

[redacted]

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

[redacted]

	NR	PAGES	INITIALS
	3	3	[redacted]

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION: [redacted]

FROM: CHIEF, AIRBORNE VIDEO OFFICE, VANDENBERG AFB, CALIF [redacted]

C. SEND THE COMMAND TO ADJUST THE SENSITIVITY TIMER TO INITIATE AND TERMINATE CENTRAL DOOR AND TO INITIATE CAPSULE EJECTION AT THE PROPER TIME.

B. DETERMINE AN INDICATION OF SHOT SUFFICIENTLY ACCURATE TO ASSURE ACQUISITION OF EACH SUCCEEDING INTERCEPT AND TO ALLOW THE VEHICLE TIMER TO BE ADJUSTED WITH SUFFICIENT ACCURACY TO PERFORM THE REQUIRED VEHICLE FUNCTIONS.

4. SECONDARY OBJECTIVES ARE TO TEST AND EVALUATE THE FOLLOWING:

A. SATELLITE SENSOR AND SUBSYSTEM AND THEIR EFFECTIVE FUNCTIONAL INTERRELATIONSHIPS.

B. DETERMINATION AT SUFFICIENT LOCATIONS ON THE VEHICLE SO THAT THE HIGH-FLUX RATIONS DESCRIBED IN TECHNICAL DESIGN CAN BE VERIFIED AND THE CORRECTIVE MEASUREMENT FOR LATER FLIGHTS ESTABLISHED.

C. INTEGRATION COMMUNICATIONS NETWORK.

D. ACQUISITION OF THE SATELLITE AT ANY ONE STATION BY MEANS OTHER THAN RADAR, AND SHOT INDICATION WITH CHEK RECORD AND REDUCTION INFORMATION FOR ANY GIVEN INTERCEPT.

D. ASCERTAINING EFFECTS OF THE ENVIRONMENT/THEIR CONSIDERATION WITHIN THE LIMIT OF OPTICAL TRACKING CAPABILITY.

5. TERTIARY FLIGHT TEST OBJECTIVES. TERTIARY FLIGHT TEST OBJECTIVES ARE TO TEST AND EVALUATE THE CHEK PERFORMANCE AND RECORD EQUIPMENT DESIGN FROM THE HUMAN ENGINEERING POINT OF VIEW.

6. DESCRIPTION OF THE ACCOMPLISHMENT OF THE TEST OBJECTIVES.

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SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
[redacted]	4	7	[redacted]	[redacted]

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION [redacted]

FROM: AIRBORNE FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

6.1. PRIMARY OBJECTIVE 3.1 PROVIDES AT THIS TIME NO VERIFICATION OF SHOT HAS BEEN RECEIVED.

6.2. PRIMARY OBJECTIVE 3.2 PROVIDES ALL GROUND SUPPORT EQUIPMENT OPERATED SATISFACTORILY TO PROVIDE ORDINANCE AND LAUNCH OF THE DISCOVERER.

6.3. PRIMARY OBJECTIVE 3.3 PROVIDES: DURING PERFORMANCE OF THE THOR FIRST STAGE WILL REQUIRE RECEIVING AND RECORDING OF THE PRELIMINARY TELEMETRY DATA AND IS VERIFIED AT THIS TIME. THE AUTOPILOT PERFORMANCE WILL REQUIRE REQUIRE TELEMETRY ANALYSIS.

6.4. PRIMARY OBJECTIVE 3.4 PROVIDES: THE DISCOVERER AIRFRAME AND ADAPTER SUCCESSFULLY DEMONSTRATED ITS ABILITY TO WITHSTAND ORDINAL ACOUSTIC VIBRATIONS AND FLIGHT ENVIRONMENT.

6.5. PRIMARY OBJECTIVE 3.5 PROVIDES:

A. DISCOVERER CAPSULE SUCCESSFULLY ORIENTED AT T + 213 SECONDS FOLLOWING LIFT OFF.

B. DISCOVERER CAPSULE TELEMETRY IS VERIFIED AND WILL REQUIRE DATA EVALUATION.

C. DISCOVERER RECOVERABLE VEHICLATION APPEARS NORMAL WITH AN EXPECTED RECOVERY TIME OF APPROXIMATELY 115 HOURS.

6.6. PRIMARY OBJECTIVE 3.6 PROVIDES: DISCOVERER NECESSARY POWER UNIT, BATTERIES, AND INVERTER PERFORMED NORMALLY FOR THE LAUNCH PHASE. ORBITAL PERFORMANCE IS UNKNOWN AT THIS TIME.

6.7. PRIMARY OBJECTIVE 3.7 PROVIDES:

A. THE RADIO GUIDANCE EQUIPMENT APPEARED TO

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

SYMBOL | PAGE NR 5 | NR OF PAGES 7 | SECURITY CLASSIFICATION [redacted] | INITIALS

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM: AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF [redacted]

CORRECT COMMANDS TO THE DISCOVERER. AT THIS TIME AIRBORNE VERIFICATION OF COMMAND RECEIPT AND EXECUTION IS UNKNOWN.

B. INITIATION AND TERMINATION OF ORBITAL BOOST AS INDICATED BY THE ENGINE BURNING TIME ARE APPARENTLY NORMAL. HOWEVER, QUICK LOOK DATA INDICATES THAT INJECTION VELOCITY WAS APPROXIMATELY 1300 FEET PER SECOND LESS THAN NOMINAL.

C. DISCOVERER VEHICLE ORIENTATION DURING COAST, ORBITAL BOOST, AND ORBIT PHASES WILL NOT BE KNOWN UNTIL PRELIMINARY ANALYSIS OF THE TELEMETRY DATA HAS BEEN ACCOMPLISHED.

6.2. PRIMARY OBJECTIVE 3.5 RESULTS:

A. GOOD TELEMETRY RECORDS WERE RECEIVED BY ALL TRACKING STATIONS DURING LAUNCH PHASE.

B. QUICK LOOK DATA INDICATES RECEIPT OF ALL GROUND COMMANDS. VEHICLE REACTION TO THESE COMMANDS IS UNKNOWN PENDING TELEMETRY DATA ANALYSIS.

C. DISCOVERER RESPONSE TO THE ORBITAL BOOST INITIATION AND TERMINATION COMMANDS TO ATTAIN SUBSYSTEM D TIMER IS UNKNOWN PENDING TELEMETRY ANALYSIS. CAPSULE RECOVERY INFORMATION IS NOT AVAILABLE AT THIS TIME.

D. SEQUENCE OF ORBIT PROGRAMMING IS UNKNOWN DUE TO NO ORBIT VERIFICATION.

7. SECONDARY OBJECTIVE RESULTS:

A. RADIATION SENSORS AND STRUCTURES ARE UNKNOWN DUE TO NO ORBIT VERIFICATION.

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
	6	7	[redacted]	

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION [redacted]

FROM:

AFSMD FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

B. TEMPERATURE DATA WILL REQUIRE DETAILED TELEMETRY ANALYSIS.

C. SATELLITE ACQUISITION HAS NOT BEEN CONFIRMED AT THIS TIME.

D. AERODYNAMIC INTEGRITY OF THE HUSOOVERER/TEER CONFIGURATION WAS SUCCESSFULLY DEMONSTRATED DURING THE LAUNCH PHASE.

8. TERTIARY OBJECTIVE RESULTS WERE ACCOMPLISHED SATISFACTORILY.

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
WDOEVK	7	7	[redacted]	

JOINT MESSAGEFORM

SECURITY CLASSIFICATION [redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CENTER [redacted]

IV 1

IV

WL 1023

PRECEDENCE	TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
	BOOK	MULTI	SINGLE			
ACTION PRIORITY IMMEDIATE						
INFO PRIORITY IMMEDIATE			XX			

FROM:
CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF

TO:
COMDR AFBMD, HEDARDC, LOS ANGELES 45, CALIF
LOCKHEED MISSILES AND SPACE DIVISION, ~~PALO ALTO~~ VAFB, CALIF
Hq. 6594th Inst Wg. AFBMD FIELD OFFICE, PALO ALTO, CALIF
DOUGLAS AIRCRAFT COMPANY, ~~SANTA MONICA~~ VAFB, CALIF

INFO: 1ST MISSILE DIVISION, VANDENBERG AFB, CALIF (COURIER)

~~SECRET~~/FROM WDGEV-NSJ-59. LOS ANGELES FOR WDZW. LOCKHEED FOR DEPARTMENT 61-44 AND 61-70. SUBJECT: FLASH REPORT OF LAUNCHING OF DISCOVERER NO. 4 (1023/179) FROM VANDENBERG AFB.

1. DISCOVERER NO. 4 (1023/179) WAS LAUNCHED FROM PAD #5 OF THE 75-3 COMPLEX 25 JUNE 1959 AT 15:47:46 PDT.

2. AT THIS TIME NO VERIFICATION OF ORBIT HAS BEEN OBTAINED.

3. ALL GROUND SUPPORT EQUIPMENT OPERATED SATISFACTORILY TO PROVIDE CHECKOUT AND LAUNCH OF THIS DISCOVERER. HOWEVER, AT THE START OF FUEL LOADING OF THE ORBITING VEHICLE A SLIDING INTERFLOW VALVE IN THE FUEL LINE AT THE QUICK DISCONNECT FAILED TO FUNCTION PROPERLY. IT WAS NECESSARY TO SEND TWO MEN UP TO THIS VALVE IN A HIGH-LIFT TO TAP THE VALVE HOUSING WITH A MALLET. THIS PROCEDURE UNSEATED THE

SPECIAL INSTRUCTIONS

By Authority of 205-2 [redacted] 4 APR '66

CLASSIFICATION CHANGED TO [redacted]

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

DATE	TIME
25	2100
MONTH	YEAR
6	59

SYMBOL: WDGEVR

WILLIAM F. HEISLER, LT COL, USAF

TYPED NAME AND TITLE (Signature, if required)

William F Heisler

PHONE 8-3122 | PAGE NR. 1 | NR. OF PAGES

SIGNATURE

TYPED (or stamped) NAME AND TITLE

3 JUN 1966

[redacted]

SECURITY CLASSIFICATION [redacted]

FROM: CHIEF, AFSWP FIELD OFFICE, VANDENBERG AFB, CALIF [redacted]

VALVE AND THE FUEL LOADING PROCEEDED WITH NO FURTHER DIFFICULTIES.

4. A QUICK LOOK ANALYSIS OF TIER PERFORMANCE AT BURNOUT INDICATES ATTITUDE WAS APPROXIMATELY TWO DEGREES WEST AND ALTITUDE WAS 40,000 FEET LOW. HYDRAULICS AND CONTROL SYSTEM PERFORMED SATISFACTORILY. PROGRAMMED TIMES APPEAR NORMAL BUT FURTHER ANALYSIS MUST BE PERFORMED TO ACCURATELY DETERMINE TRAJECTORY. THE OSCILLATION NOTED ON PREVIOUS LAUNCHES WAS AGAIN PRESENT. THRUST DEVELOPED 151,000 POUNDS. PROPELLANT LOADING WAS THREE GALLONS SHORT WHICH IS WELL WITHIN TOLERANCE. THE UMBILICAL MAST DID NOT FIRE. HOWEVER, NO APPARENT DAMAGE TO THE MISSILE OR GSE RESULTED FROM THIS MALFUNCTION.

5. THE DISCOVERER AIRFRAME AND ADAPTER SUCCESSFULLY DEMONSTRATED ITS ABILITY TO WITHSTAND CONTROL SYSTEM PERTURBATIONS AND FLIGHT ENVIRONMENT.

6. THE DISCOVERER ENGINE SUCCESSFULLY IGNITED AT T+241 SECONDS FOLLOWING LIFT OFF. ENGINE IMPULSE IS UNKNOWN AT THIS TIME. PROPELLANT UTILIZATION APPEARS NORMAL WITH AN ENGINE BURNING TIME OF 135.7 SECONDS. HOWEVER, A QUICK LOOK ANALYSIS INDICATES THAT THE ENGINE SHUT DOWN AS A RESULT OF FUEL DEPLETION RATHER THAN AS A RESULT OF A COMMAND FROM GUIDANCE. INTEGRATOR OPERATION APPEARS ABNORMAL.

7. DISCOVERER AUXILIARY POWER UNIT, BATTERIES, AND INVERTER PERFORMED NORMALLY IN FOR THE LAUNCH PHASE. ORBITAL PERFORMANCE IS UNKNOWN AT THIS TIME.

8. THE PEAVEY CONSTITUTIONAL EXCITEMENT APPARENTLY HAS [redacted]

DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

CORRECT COMMANDS TO THE DISCOVERER. AT THIS TIME AIRBORNE VERIFICATION OF COMMAND RECEIPT AND EXECUTION IS UNKNOWN. INITIATION AND TERMINATION OF ORBITAL BOOST AS INDICATED BY ENGINE BURNING TIME ARE APPARENTLY NORMAL. VEHICLE ORIENTATION DURING COAST, ORBITAL BOOST, AND ORBIT WILL NOT BE KNOWN UNTIL PRELIMINARY ANALYSES OF THE TELEMETRY DATA HAS BEEN ACCOMPLISHED. PRELIMINARY ANALYSIS INDICATES ALTITUDE AT BURNOUT WAS 112 STATUTE MILES, THE VELOCITY WAS 25,200 FT/SEC, AND THE INJECTION ANGLE APPROXIMATELY ZERO DEGREES.

9. COMMAND COMPONENTS FUNCTIONED AS FOLLOWS:

A. GOOD TELEMETRY RECORDS WERE RECEIVED BY VANDENBERG TRACKING STATION DURING LAUNCH PHASE.

B. QUICK LOOK DATA INDICATES RECEIPT OF ALL GROUND COMMANDS. MISSILE RESPONSE AND VERIFICATION REQUIRE FURTHER ANALYSIS.

C. ADJUSTMENT OF SUBSYSTEM "D" TIMER IS UNKNOWN AS APPARENTLY NO ORBIT WAS ACHIEVED. HOWEVER, BASIC "D" TIMER FUNCTIONS DURING EXIT PHASE APPEAR NORMAL.

D. EPHEMERIS OF ORBIT INFORMATION IS UNKNOWN AS NO ORBIT VERIFICATION HAS BEEN OBTAINED.

10. NO RECOVERY OBJECTIVES HAVE BEEN ASCERTAINED AS ORBIT IS NOT VERIFIED.

11. THE FOLLOWING INFORMATION IS AVAILABLE ON ACHIEVEMENT OF SECONDARY OBJECTIVES:

A. SATELLITE SYSTEMS AND STRUCTURES ARE UNKNOWN DUE TO NO ORBIT VERIFICATION.

B. TEMPERATURE DATA WILL REQUIRE DETAILED TELEMETRY ANALYSIS.

C. INTEGRATED COMMUNICATION NETWORK PERFORMED SATISFACTORILY.

D. ACCURATE ACQUISITIONS NOT OBTAINED AT THIS TIME.

E. APPROXIMATE INTEGRITY OF THE DESTRUCT/SAFE SEPARATION WAS SUCCESSFULLY DEMONSTRATED DURING THE LAUNCH PHASE.

12. TERTIARY OBJECTIVES WERE ACCOMPLISHED SATISFACTORILY.

13. TOTAL HOLD TIME DURING COUNTDOWN WAS FOUR HOURS FORTY-SEVEN MINUTES FOR THE FOLLOWING REASONS:

A. LEAK IN THE GASEOUS LIQUID OXYGEN MISSILE FILLLINE OF THE FIRST STAGE.

B. FAILURE OF THE ORBITING VEHICLE RADAR TO SUCCESSFULLY COMPLETE CHECKOUT.

C. SEEKING RETENTION VALVE IN THE Fuel LINE TO THE ORBITING VEHICLE.

14. THE FOLLOWING EVENTS OCCURRED AT THE TIMES NOTED:

LIFT OFF	15:47:46 EST
MECO	158.7"
VECO	168.0"
SEPARATION	172.4"
ORBITAL STAGE IGNITION	24.1"
ORBITAL STAGE BURNOUT	356.7"

15. DURING THE EXIT PHASE, A TWO SECOND COMMAND FIVE AND A 14.4 SECOND COMMAND SIX WERE SENT.

16. PAD DAMAGE FOR SAC APPEARS TO BE SIMILAR TO PAST LAUNCHES WITH THE EXCEPTION THAT EXTENSIVE AIR CONDITIONING DAMAGE RESULTED.

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION [redacted]

FROM: CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF

THREE TV CABLES WERE BURNED OUT AS A RESULT OF A POST-LAUNCH FIRE. LMSD ELECTRICAL CABLES SUFFERED EXTENSIVE DAMAGE RESULTING FROM FIRE RUNNING DOWN THE AIR CONDITIONER DUCTING.

SYMBOL	PAGE NR.	NR. OF PAGES	SECURITY CLASSIFICATION	INITIALS
WDGEVR	5		[redacted]	rab

173-1

JOINT MESSAGEFORM

SECURITY CLASSIFICATION [redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CENTER

PRECEDENCE	TYPE MSG (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
	BOOK	MULTI	SINGLE			
ACTION PRIORITY IMMEDIATE						
INFO PRIORITY IMMEDIATE						

FROM: CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF

TO: COMDR AFBMD, HEDAEDC, LOS ANGELES 45, CALIF, ATTN:WDZW

HQ 6594TH TEST WING, USAF, PALO ALTO, CALIF

LOCKHEED MISSILES AND SPACE DIVISION, VAFB, CALIF(COURIER)

DOUGLAS AIRCRAFT COMPANY, VAFB, CALIF(COURIER)

INFO 1ST MISSILE DIVISION, VANDENBERG AFB, CALIF(COURIER)

SECRET FROM WDGEV 8-74-C. LOSA FOR WDZW. LOCKHEED FOR DEPT 61-44 & 61-70. SUBJECT: FLASH REPORT OF LAUNCHING OF DISCOVERER NO. 5 FROM VANDENBERG AFB.

1. VEHICLE CONFIGURATION

1.1. SATELLITE VEHICLE, LOCKHEED, XA MODEL 2205, SERIAL NO. 1020, SEPARATION WEIGHT 3475 POUNDS.

1.2. FIRST STAGE, THOR DM-18, SERIAL NO. 127, MODIFIED TO UTILIZE STRUCTURAL ADAPTER.

2. DATE AND TIME OF LAUNCH, AUGUST 19, 1959 AT 15:00:00 PST, INTO A POLAR ORBIT ON AN ORBIT INJECTION AZIMUTH OF 186°.

SPECIAL INSTRUCTIONS

By Authority of [redacted]
By [redacted] 20 Apr 62
APR 1956

CLASSIFICATION CHANGED TO [redacted]

DOWNGRADED AT 3 YEAR INTERVALS
D CLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

DATE 19 TIME
YEAR AUGUST 1959

WRITER
SYMBOL WDGEVR
TYPED NAME AND TITLE (Signature, if required) WILLIAM F. MEISLER, Lt Col, USAF
PHONE 8-5147 PAGE NO. 1 NO. OF PAGES
SECURITY CLASSIFICATION [redacted]

RELEASER
SIGNATURE
TYPED (or stamped) NAME AND TITLE

DD FORM 1 MAY 55 173 REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED

Cy #5 of 6 cys

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM:

CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

3. PRIMARY OBJECTIVES. SEE DTO #/ FOR ALL OBJECTIVES.

3.1. THE VEHICLE COMBINATION MUST PLACE IN ORBIT A DISCOVERER EARTH SATELLITE WHICH CONTAINS A BIOMEDICAL CAPSULE CAPABLE OF RETURNING TEST DATA WHILE ON ORBIT AND OF RE-ENTRY, ON COMMAND, TO BE RECOVERED FOR DIRECT EXAMINATION.

all correction in msg WDGEV 60-3710 attached was recoverable capsule not biomedical

3.2. THE LAUNCH MONITOR AND CONTROL EQUIPMENT, CHECKOUT EQUIPMENT, AND GROUND HANDLING AND SERVICING EQUIPMENT MUST PROVIDE ADEQUATE SUPPORT AND CHECKOUT REQUIRED FOR LAUNCH OF THE DISCOVERER. IN ADDITION, ADEQUATE LAUNCH SUPPORT MUST BE PROVIDED AS REQUIRED BY THE BIOMEDICAL RECOVERY CAPSULE PRIOR TO AND INCLUDING LAUNCH OF THE DISCOVERER.

3.3. THE THOR FIRST STAGE SYSTEM MUST LAUNCH, CONTROL AND SEPARATE FROM THE DISCOVERER VEHICLE WITH AT LEAST THE MINIMUM PERFORMANCE SPECIFIED IN DESIGN DOCUMENTS. THE THOR AUTOPILOT MUST DEMONSTRATE ITS ABILITY TO CONTROL THE VEHICLE COMBINATION TO THE SEPARATION POINT WITHIN AN ACCEPTABLE DEGREE OF ACCURACY (PLUS OR MINUS 4 DEGREES IN FLIGHT PATH ANGLE).

3.4. THE DISCOVERER AIRFRAME AND ADAPTER MUST DEMONSTRATE ITS ABILITY TO WITHSTAND CONTROL SYSTEM PERTURBATIONS AND FLIGHT ENVIRONMENT.

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
	3		[redacted]	

DD FORM 1 MAY 55 173-1

Cy #5 of 6 Cys

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION: [redacted]

FROM:

CHIEF, AFMTC FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

3.5. THE DISCOVERER PROPULSION SYSTEM MUST DEMONSTRATE THE FOLLOWING:

A. IGNITION OF THE ENGINE BELL MODEL NO. 8048 M IN A VACUUM.

B. ABILITY OF THE ROCKET ENGINE TO PROVIDE THE TOTAL IMPULSE REQUIRED TO ATTAIN ORBITAL VELOCITY.

C. PROPER PROPELLANT UTILIZATION.

3.6. THE DISCOVERER AUXILIARY POWER UNIT MUST DEMONSTRATE ACCEPTABLE PERFORMANCE OF ITS COMPONENTS, ESPECIALLY BATTERIES AND INVERTERS.

3.7. THE DISCOVERER GUIDANCE AND CONTROL SYSTEM MUST DEMONSTRATE THE ABILITY OF ITS COMPONENTS TO:

A. DERIVE THE TIME TO INITIATE ORBITAL BOOST AND THE VELOCITY TO BE GAINED DURING ORBITAL BOOST USING THE REEVES COMPUTATION EQUIPMENT.

B. INITIATE AND TERMINATE ORBITAL BOOST AT THE PROPER TIME.

C. MAINTAIN PROPER VEHICLE ORIENTATION DURING THE COAST, ORBITAL BOOST AND ORIENTING PHASES UNTIL THE EJECTION OF THE REC. (INCLUDING PROPER FUNCTION OF THE SUBSYSTEM D COMPUTER, INERTIAL REFERENCE PACKAGE, HORIZON SCANNER, PNEUMATIC CONTROL SYSTEM, AND HYDRAULIC

DOWNGRADED AT 3 YEAR INTERVALS
D CLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
WDGSVR	3		[redacted]	

DD FORM 1 MAY 55 173-1

U. S. GOVERNMENT PRINTING OFFICE 1956-486884

Cy #5 of 6 cys

JOINT MESSAGEFORM - CONTINUATION SHEET | SECURITY CLASSIFICATION: [redacted]

FROM: CHIEF, AFMTC FIELD OFFICE, VANDENBERG AFB, CALIF [redacted]

CONTROL SYSTEM.

3. B. AIRBORNE AND GROUND TELEMETRY, TRACKING AND COMMAND SYSTEMS MUST DEMONSTRATE THE ABILITY OF THESE COMPONENTS TO:

A. SATISFACTORILY MONITOR ALL PRIMARY VEHICLE FUNCTIONS (THOR AND DISCOVERER) AND PRODUCE ADEQUATE GROUND TELEMETRY RECORDS OF THESE FUNCTIONS.

B. PROPERLY RECEIVE, ACT UPON, AND VERIFY ALL GROUND SPACE COMMANDS, AND ENSURE THAT NO FALSE COMMANDS ARE ACTED UPON.

C. SEND THE COMMAND TO ADJUST THE SUBSYSTEM D TIMER AND INITIATE AND TERMINATE ORBITAL BOOST AND TO INITIATE CAPSULE RECOVERY AT THE PROPER TIME.

D. DETERMINE AN ELEMENTS OF ORBIT SUFFICIENTLY ACCURATE TO ASSURE ACQUISITION ON EACH SUCCEEDING INTERCEPT AND TO ALLOW THE VEHICLE TIMER TO BE ADJUSTED WITH SUFFICIENT ACCURACY TO PROGRAM THE REQUIRED VEHICLE FUNCTIONS.

4. PRIMARY OBJECTIVE TO ATTAIN AN ORBIT WAS SATISFACTORILY ACHIEVED AS RECORDED BY ACQUISITION ON ALL TRACKING AIDS AT KODIAK, ANNETTE AND VAFB ON THE FIRST PASS.

4.1. PRIMARY OBJECTIVE OF ATTAINMENT OF ORBIT COMPATI-

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DECLASSIFIED AFTER 12 YEARS
DOD DIRECTIVE 5200.10

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
WDGNVR	4		[redacted]	JW

DD FORM MAY 55 173-1

☆ U. S. GOVERNMENT PRINTING OFFICE

Cy #5 of 6 Cys

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION: [redacted]

FROM: CDRAFMSC, AFMSC/SC, VANDENBERG AFB, CALIFORNIA [redacted]

4.1. PRIMARY OBJECTIVE OF EVALUATION OF SRM COMPATIBILITY TO THE SATELLITE WAS DEMONSTRATED [redacted] SATISFACTORILY [redacted] BY SUCCESSFUL LAUNCH. SOME CASE PROBLEMS WERE EXPERIENCED BUT ALL WERE CORRECTED.

4.2. PRIMARY OBJECTIVE OF [redacted] VEHICLE TO PROVIDE SATELLITE INPUT SO AS TO ACHIEVE AN ORBIT WAS SATISFACTORILY DEMONSTRATED, ALTHOUGH TIMING TIME WAS 38 SECONDS [illegible] STRUCTURES LATER.

4.3. PRIMARY OBJECTIVE OF SATELLITE AIRFRAME TO MEET ENVIRONMENTAL CONDITIONS WAS SATISFACTORILY DEMONSTRATED BY SUCCESSFUL OPERATION OF TRACKING AIDS ON FIRST PASS INDICATING STRUCTURAL INTEGRITY. SEPARATION OCCURRED 8 SECONDS AFTER VERNIER CUTOFF.

4.4. PRIMARY OBJECTIVE OF SATELLITE PROPULSION SYSTEM TO PROVIDE VACUUM IGNITION, TOTAL IMPULSE AND PROPELLANT UTILIZATION WAS SATISFACTORILY DEMONSTRATED BY SECOND STAGE IGNITION AFTER A COAST PERIOD OF 355 SECONDS AFTER SEPARATION. THE BURNING TIME IS SECONDS AS PROGRAMMED, INDICATING PROPER PROPELLANT UTILIZATION. TOTAL IMPULSE DESIRED WAS OBTAINED AS INDICATED BY FIRST ORBIT PASS ON PREDICTED TIME. THE ESTIMATED [illegible] VELOCITY IMPARTED [illegible] AT BURNOUT WAS [redacted]

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SYMBOL [illegible] SUBJECT [illegible] DATE [illegible] CLASSIFICATION [illegible] INITIALS [illegible]

DD FORM 1 MAY 58 173-1

[illegible] #5 [illegible] 6 [illegible]

FROM: CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

[illegible] FT/SECOND.

4.6. PRIMARY OBJECTIVE OF GUIDANCE SYSTEM TO INITIATE AND TERMINATE BOOST AND CONTROL VEHICLE ORIENTATION WAS SATISFACTORILY DEMONSTRATED BY ACHIEVEMENT OF ORBIT IN AN EPHEMERIS WHICH IS NOT YET ACCURATELY DETERMINED. GUIDANCE VALUES ARE YET TO BE OBTAINED FROM TELEMETRY.

4.7. PRIMARY OBJECTIVE OF THE GROUND SPACE COMMUNICATIONS SYSTEM TO FUNCTION PROPERLY AND COMMAND AS REQUIRED WAS DEMONSTRATED SATISFACTORILY. ACQUISITION WAS ACHIEVED WHEN PREDICTED.

5.0. ALL SECONDARY OBJECTIVES WERE ACHIEVED. DETAILS ARE DEPENDENT UPON TELEMETRY REDUCTION.

6.0. ALL TERTIARY OBJECTIVES WERE ACHIEVED.

7.0. THE FOLLOWING ADDITIONAL INFORMATION IS SUBMITTED:

A. TLM-18 TRACKED FOR [illegible] SEC.

B. VAFB RADAR TRACKED FOR [illegible] SEC.

JOINT MESSAGE FORM

SECURITY CLASSIFICATION [redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CENTER [redacted]

Volume #29

PRECEDENCE	TYPE MSG. (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
ACTION PRIORITY IMMEDIATE	BOOK	MULTI	SINGLE			
INFO PRIORITY IMMEDIATE						

FROM:

CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF

TO:

CGMSD, AFBMD, HEDAEDC, ATTN: WDZW

HQ 6594TH TEST WING, PALO ALTO, CALIF

LOCKHEED MISSILES AND SPACE DIVISION, VAFB (COURIER)

DOUGLAS AIRCRAFT COMPANY, VAFB (COURIER)

BIPOLET MISSILE DIVISION, VAFB (COURIER)

SECRET FROM WDZW 60-3710. LOSA FOR WDZW. LOCKHEED FOR DEPT 61-44 AND 61-70. SUBJECT: CORRECTION OF FLASH REPORT OF LAUNCHING OF DISCOVERER NO. 29 (1029) FROM VANDENBERG AFB.

AN ERROR WAS MADE IN THE FLASH REPORT ON DISCOVERER NO. 29, MESSAGE NUMBER WDZW 9-74-C. THE CAPSULE WAS A "RECOVERABLE" CAPSULE, NOT A "BIOMEDICAL CAPSULE" AS STATED. THEREFORE, DELETE THE WORD "BIOMEDICAL" WHEREVER IT OCCURS AND SUBSTITUTE "RECOVERABLE".

SPECIAL INSTRUCTIONS:

CLASSIFICATION CHANGED TO [redacted]

Authority for change DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

APR 1968

DATE	TIME
31	
MONTH	YEAR
AUG	1959

WRITER — SYMBOL

TYPED NAME AND TITLE [redacted]

[redacted] Col, USAF

SECURITY CLASSIFICATION [redacted]

RELEASER — SIGNATURE

TYPED (or stamped) NAME AND TITLE

60 3710

DD FORM 1 MAY 55 173 REPLACES DD FORM 173, 1 OCT 48, WHICH WILL BE USED UNTIL EXHAUSTED

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File

JOINT MESSAGEFORM

SECURITY CLASSIFICATION [redacted]

SPACE BELOW RESERVED FOR COMMUNICATION CENTER

PRECEDENCE	TYPE MSG. (Check)			ACCOUNTING SYMBOL	ORIG. OR REFERS TO	CLASSIFICATION OF REFERENCE
ACTION	BOOK	MULTI	SINGLE			
INFO PRIORITY IMMEDIATE						

FROM: PRIORITY IMMEDIATE

CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIF

TO:

COMDR AFBMD, [illegible], LOS ANGELES [illegible], CALIF. ATTN: [illegible]

[illegible] TEST WING, USAF, PALO ALTO, CALIF

LOCKHEED MISSILE AND SPACE DIVISION, VAFB, CALIF(COURIER)

DOUGLAS AIRCRAFT COMPANY, VAFB, CALIF(COURIER)

[illegible] MISSILE DIVISION, VANDENBERG AFB, CALIF(COURIER)

SECRET FROM [illegible] 8-101-C [illegible] FOR [illegible]. LOCKHEED FOR [illegible] [illegible]-70. SUBJECT: FLASH REPORT OF LAUNCHING OF [illegible] FROM VANDENBERG AFB.

1. VEHICLE CONFIGURATION

1.1. SATELLITE VEHICLE, LOCKHEED, XA MODEL [illegible], SERIAL NO. [illegible], [illegible] WEIGHT [illegible] POUNDS.

1.2. FIRST STAGE, THOR DM-18, SERIAL NO. [illegible], MODIFIED TO UTILIZE STRUCTURAL ADAPTER.

2. DATE AND TIME OF LAUNCH, AUGUST 1[illegible], 1959 AT 12:24:44 PST, [illegible] POLAR ORBIT ON AN [illegible] AZIMUTH OF [illegible]

SPECIAL INSTRUCTIONS

CLASSIFICATION CHANGED TO [redacted]

By Authority of [illegible]

[illegible] APR 1966

GROUP 4 DOWNGRADED AT 3 YEAR INTERVALS; DECLASSIFIED AFTER 12 YEARS DOD DIRECTIVE 5200.10

DATE	TIME
MONTH	YEAR
AUG	1959

SYMBOL	
TYPED NAME AND TITLE (Signature, if required) WILLIAM F. [illegible], Lt.Col. USAF	TYPED (or stamped) NAME AND TITLE
PHONE [illegible]	PAGE NR. 1 OF 6 PAGES
SECURITY CLASSIFICATION [redacted]	

UDGAV-59-8-265-106

DD FORM 173, 1 MAY 55 — REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED

Copy 4 of 10 cys

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION: [redacted]

FROM: CMDR, AFSCF FIELD OFFICE, VANDENBERG AFB, CALIFORNIA

2. PRIMARY OBJECTIVES. SEE DTO #2 & #3 FOR ALL OBJECTIVES.

2.1. DISCOVERER SATELLITE AIRFRAME AND ADAPTER. THE DISCOVERER AIRFRAME MUST DEMONSTRATE ITS COMPATABILITY WITH A GENERAL-MOUNTED, SWIVELING, GIMBING ROCKET MOTOR AND WITH FLIGHT ENVIRONMENT.

2.2. DISCOVERER SATELLITE PROPULSION SYSTEM. THE DISCOVERER PROPULSION SYSTEM MUST DEMONSTRATE THE FOLLOWING:

A. [illegible] OF THE TLR-81-BA-3 ROCKET ENGINE IN A VACUUM.

B. ABILITY OF THE ROCKET ENGINE TO PROVIDE THE TOTAL IMPULSE REQUIRED TO ATTAIN ORBITAL VELOCITY.

C. PROPER PROPELLANT UTILIZATION.

2.3. DISCOVERER SATELLITE APU SYSTEM. THE DISCOVERER AUXILIARY POWER UNIT MUST DEMONSTRATE ACCEPTABLE PERFORMANCE OF ITS COMPONENTS, ESPECIALLY BATTERIES AND INVERTERS.

2.4. DISCOVERER GUIDANCE AND CONTROL SYSTEM. THE DISCOVERER GUIDANCE AND CONTROL SYSTEM MUST DEMONSTRATE THE ABILITY OF ITS COMPONENTS TO:

A. DERIVE THE TIME TO INITIATE ORBITAL BOOST AND THE VELOCITY-TO-BE-GAINED DURING ORBITAL BOOST, USING THE

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SYMBOL	PAGE NO.	NO. PAGES	SECURITY CLASSIFICATION	INITIALS
VECTR	2	6	[redacted]	

DD FORM 1 MAY 65 173-1

* U. S. GOVERNMENT PRINTING OFFICE: [illegible]

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM:

CHIEF, ARMED FIELD OFFICE, VANDENBERG AFB, CALIFORNIA

REVIS COMPUTATION REQUIREMENT

B. INITIATE AND TERMINATE CRITICAL BOOST AT THE PROPER TIME

C. MAINTAIN PROPER VEHICLE ORIENTATION DURING THE COAST, CRITICAL BOOST AND CRITICAL BURNS UNTIL THE EJECTION OF THE RECOVERABLE CAPSULE (INCLUDING PROPER FUNCTION OF THE SUBSYSTEM'S COMPUTER, SPECIAL REFERENCE PACKAGE, REVISION SCANNER, TERMINATE CONTROL SYSTEM, AND HYDRAULIC CONTROL SYSTEM).

2.5. DISCOVERER SATELLITE TELEMETRY, TRACKING AND COMMAND EQUIPMENT

AIRBORNE AND GROUND TELEMETRY TRACKING AND COMMAND SYSTEMS MUST DEMONSTRATE THE ABILITY OF THEIR COMMAND CONSOLETTES TO:

A. SATISFACTORILY MONITOR ALL PRIMARY VEHICLE FUNCTIONS (TIMER AND RECOVERER) AND PRODUCE ADEQUATE GROUND TELEMETRY RECORDS OF THESE FUNCTIONS

B. PROPERLY RECEIVE, ACT UPON, AND VERIFY ALL GROUND-SPACE COMMANDS, AND INSURE THAT NO FALSE COMMANDS ARE ACTED UPON

C. SEND THE COMMAND TO ARM THE SUBSYSTEM D TIMER TO INITIATE AND TERMINATE CRITICAL BOOST AT THE

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DOD DIRECTIVE 5200.10

SYMBOL	PAGE NR	NR OF PAGES	SECURITY CLASSIFICATION	TIME FILED
WDOIVR	3	6	[redacted]	

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* U.S. GOVERNMENT PRINTING OFFICE: 1965—

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JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM:

CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIFORNIA

[illegible]

3. DETERMINE AN EPHEMERIS OF ORBIT SUFFICIENTLY ACCURATE TO ASSURE ACQUISITION ON EACH SUCCESSIVE INTERCEPT AND TO ALLOW THE VEHICLE TIMER TO BE ADJUSTED WITH SUFFICIENT ACCURACY TO PROGRAM THE REQUIRED VEHICLE FUNCTIONS.

4. PRIMARY OBJECTIVE TO ATTAIN AN ORBIT WAS SATISFACTORILY ACHIEVED AS EVIDENCED BY ACQUISITION OF ALL TRACKING AIDS AT KODIAK, ANNETTE AND VAFB ON THE FIRST PASS.

4.1. PRIMARY OBJECTIVE OF EVALUATION OF GSE COMPATIBILITY TO THE SATELLITE WAS DEMONSTRATED SATISFACTORILY BY THE SUCCESSFUL LAUNCH. SOME GSE PROBLEMS WERE EXPERIENCED, BUT ALL WERE CORRECTED.

4.2. PRIMARY OBJECTIVE OF THE FIRST STAGE VEHICLE TO PROVIDE SATELLITE BOOST SO AS TO ACHIEVE AN ORBIT WAS SATISFACTORILY DEMONSTRATED. MAIN ENGINE BURNING TIME WAS [illegible] SECONDS WITH VERNIER CUT OFF 9 SECONDS LATER.

4.3. PRIMARY OBJECTIVE OF SATELLITE AIRFRAME TO MEET ENVIRONMENTAL CONDITIONS WAS SATISFACTORILY DEMONSTRATED BY SUCCESSFUL OPERATION OF TRACKING AIDS ON FIRST PASS INDICATING STRUCTURAL INTEGRITY. SEPARATION OCCURRED 2 SECONDS AFTER VERNIER CUTOFF.

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SYMBOL	NR	NR OF PAGES	SECURITY CLASSIFICATION	INITIALS
REEVE	4	6	[redacted]	[illegible]

DD FORM 1 MAY 55 173-1

Cy # 4 of 6 cys

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM:

CHIEF, AFBMD FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

4.5. PRIMARY OBJECTIVE OF SATELLITE PROPULSION SYSTEM TO PROVIDE VACUUM IGNITION, TOTAL IMPULSE AND PROPELLANT UTILIZATION WAS SATISFACTORILY DEMONSTRATED BY SECOND STAGE IGNITION AFTER A COAST PERIOD OF [illegible] (approx 36) SECONDS AFTER SEPARATION. THE (first) BURNING TIME OF [illegible] (122) SECONDS, AS PROGRAMMED, INDICATED PROPER PROPELLANT UTILIZATION. TOTAL IMPULSE DESIRED WAS OBTAINED AS INDICATED BY FIRST ORBIT PASS ON PREDICTED TIME. THE ESTIMATED BURNOUT VELOCITY BASED ON BURNOUT RADAR DATA WAS [struck through] (25 600 ± 40) FT/SECOND.

4.6. PRIMARY OBJECTIVE OF GUIDANCE SYSTEM TO INITIATE AND TERMINATE BOOST AND CONTROL VEHICLE ORIENTATION WAS SATISFACTORILY DEMONSTRATED BY ACHIEVEMENT OF ORBIT IN AN EPHEMERIS WHICH IS NOT YET ACCURATELY DETERMINED. GUIDANCE VALUES ARE YET TO BE OBTAINED FROM TELEMETRY.

4.7. PRIMARY OBJECTIVE OF THE GROUND SPACE COMMUNICATIONS SYSTEM TO FUNCTION PROPERLY AND COMMAND AS REQUIRED WAS DEMONSTRATED SATISFACTORILY. ACQUISITION WAS ACHIEVED WHEN PREDICTED WITH ALL PARAMETERS READING OUT.

5.0. ALL SECONDARY OBJECTIVES WERE ACHIEVED. DETAILS ARE DEPENDENT UPON TELEMETRY REDUCTION.

6.0. ALL [illegible]

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WDGKVK	5	6	[redacted]	

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JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM:

CHIEF, AFMED FIELD OFFICE, VANDENBERG AFB, CALIFORNIA [redacted]

7.B. THE FOLLOWING ADDITIONAL INFORMATION IS SUBMITTED:

A. TLM-IS TRACKED FOR [illegible] SEC. 4047

B. VAFB RADAR TRACKED FOR [illegible] SEC. was tracking 180 when it went passive.

All timing is approx. and unconfirmed until tapes are read

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SYMBOL | PAGE NR | NR OF PAGES | SECURITY CLASSIFICATION [redacted] | INITIALS

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