

USAF ACCIDENT/INCIDENT REPORT							
(b) (6)							
1. DATE OF OCCURRENCE (Year, month and day)		2. VEHICLE/MATERIAL INVOLVED (THIS & Serial No., if applicable)		3. FOR GROUND ACCIDENTS ONLY (Base Code and Report Serial No.)			
1964 December 5, Saturday		LGM-30B 64-006		64-12-5-401 N/A (b) (6)			
4. PLACE OF OCCURRENCE: STATE, COUNTY, DISTANCE AND DIRECTION FROM NEAREST TOWN. IF ON BASE, IDENTIFY. IF OFF BASE GIVE DISTANCE FROM NEAREST BASE.				5. HOUR AND TIME ZONE LOCAL			
South Dakota, Butte County, Launch Facility Lima Two				1500 MST			
28 NW NW Ellsworth AFB 79 019 GM31-N				<input checked="" type="checkbox"/> DAY <input type="checkbox"/> NIGHT <input type="checkbox"/> DAWN <input type="checkbox"/> DUSK			
7. ORGANIZATION POSSESSING OWNING VEHICLE OR MATERIAL AT TIME OF MISHAP							
Major Command	Subcommand or AF	Air Division	Wing	Group	Separation or Unit	Name and Base Code	
SAC SAC	15AF 15	821 SAD	44 SMW	---	69 SMS	Ellsworth AFB - GM31	
8. (List organizations of second vehicle, if they differ from item 7 above)							
SR1							
9. BASE AND COMMAND SUBMITTING REPORT (Do not Abbreviate)							
Ellsworth AFB, Strategic Air Command							
10. LIST OF PERSONNEL DIRECTLY INVOLVED (For aircraft include operator and all other persons whether in plane or not. If more space is required to list all personnel, use additional sheet(s).)							
Last Name	First Name	ML	Grade	Service No.	Assigned Duty	Auto Rating	Injury to Individual
(b) (6)	(b) (6)	(b) (6)	A2C	(b) (6)	Comm. Repairman	N/A	None
(b) (6)	(b) (6)	(b) (6)	A2C	(b) (6)	Comm. Repairman	N/A	None
(b) (6)	(b) (6)	(b) (6)	CAPT	(b) (6)	MCCC	N/A	None
(b) (6)	(b) (6)	(b) (6)	1STLT	(b) (6)	DMCCC	N/A	None
11. NARRATIVE DESCRIPTION OF ACCIDENT: Give a detailed history of flight, or chronological order of facts and circumstances leading to the mishap as applicable, the results of investigation and analysis to include discussion of all cause factors listed, findings, and recommendations, and any corrective action taken. (Continue on reverse, if more space needed.)							
SEE LAC A-1							
<div style="text-align: right;">TAB A</div> <div style="text-align: right;">Page 1 of 1 page</div>							
<div style="text-align: center;"> Removed by direction of HQ AFSEC/JA, October 2015. FOR OFFICIAL USE ONLY (CROSSING HANDLING REQUIRED, SEE AFR 127-4) </div>							
12. AUTHENTICATION							
CERTIFICATION BY (Title)		TYPED NAME AND GRADE					
President, Investigation Board		COL JAMES V. FARLEY					
		(b) (6)					
		(b) (6)					
		18 Dec 64					

NARRATIVE SEQUENCE OF EVENTS

On 4 December 1964 the missile combat crew at LCF Lima One, 68SMS, reported a fault in the Inner Zone security system at LF Lima Two to 44MIMS Job Control. On 5 December 1964 at 1200 hours MST a team of two 44MIMS Communications Repairmen was dispatched to Lima Two to troubleshoot the system and to rectify the discrepancy.

The team, comprised of A2C (b) (6) and A2C (b) (6) both of 44MIMS, arrived at Lima Two at 1415 hours MST. The missile combat crew on duty at Lima One was comprised of Capt (b) (6) (MCCC) and 1st Lt (b) (6) (DMCCC). The team established communications with the MCC. Permission was then requested to break outer zone security. It was granted and the airmen proceeded to open the "A" circuit security pit. (Plug Five was discovered laying disconnected at the bottom of the pit, but was determined to have had no bearing on the events to follow.) The personnel access hatch was then opened to check the magnetic switch and to continue the troubleshooting. Subsequent checks eliminated the magnetic switch and the inner zone security drawer as defective, so this isolated the fault to the Inner Zone Loop. The first item to be checked for proper operation in the loop was relay "K-1" located in the security alarm control box.

NOTE: The Airmen were using the aural method of checking the relay. That is, fuse "F-1", also located in this control box, was removed from the circuit momentarily; then reinstalled. A "good" relay "clicks" audibly when the fuse makes contact in its holder.

Airman (b) (6) lacking a fuse puller, utilized a screwdriver to pry one end of the fuse from its clip. When the fuse was pushed back against the clip, the Airman did not hear the "click", so he repeated the procedure. Still not certain he heard the "click", he again pulled the one end of the fuse away from the clip and then pushed it back to make the contact. At 1500 hours MST, simultaneously with the making of this contact, a loud explosion occurred in the launch tube. At the same time the Missile Status Indicator Launcher Panel in the Launch Control Center indicated a fault and a warhead alarm for Lima Two.

The Airmen expeditiously evacuated to the soft support building where they immediately established contact with the missile combat crew at the LCF. The information was passed to the 44SMW Command Post. SACF 340 was executed and SACR 355-3 actions were initiated. At 1529 hours MST, the Airmen were authorized by the 44SMW Potential Hazard Team to re-enter the launcher to reconnoiter. A rapid visual inspection was made and heavy gray smoke was reported in the launch tube. They were instructed not to re-enter the launcher. At 1543 hours MST, a Potential Broken Arrow was declared and a 2000 foot cordon was established around Lima Two by the Mobile Strike Team dispatched from Lima One.

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Two non-commissioned officers from the Technical Analysis Division and one from the Missile Safety Office were dispatched to the scene via helicopter. They were granted permission by the SAC Potential Hazard Team to enter the launcher once more to reconnoiter. They entered at 1705 hours MST and discovered that the re-entry vehicle was no longer atop the missile. An immediate evacuation was effected and the information was relayed to the Potential Hazard Team at the Wing Command Post.

It was subsequently discovered that the explosion, a re-entry vehicle retro rocket firing, had caused the re-entry vehicle to separate at the ball lock interface of the spacer assembly and topple approximately seventy-five feet to the floor of the launch tube.

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FINDINGS AND RECOMMENDATIONS

PRIMARY CAUSE: Personnel Error, in that a maintenance technician inadvertently shorted a plus battery potential to ground. This application of plus battery voltage coupled with the fault in the retro cable connector provided a path for sufficient current to flow and ignite the retro rocket. The technician did not use the authorized, available tool to remove the fuse.

(b) (5)

(b) (5)

ADDITIONAL FINDINGS:

A/F Nr. 1: Launch facility re-entry by the two maintenance technicians was ordered without adequate protective and monitoring equipment.

(b) (6)

(b) (5)

(b) (5)

A/F Nr. 2: The electrical surge arrestor access panels were open at the time of the accident. While this did not contribute to the accident, open access panels compromise radio frequency interference specifications for the Minuteman missile.

(b) (5)

(b) (5) (b) (6)

TAB A

A/F Nr. 3: During the course of the investigation a locally designed checklist was found which was used to check the inner zone security systems on a one time basis at all launch facilities. (Performed at Lima-Two 8 November 1964) This checklist was designed, primarily, to find jumper wires which had been placed in the system presumably by the contractor during the assembly and check-out phase. The checklist was found to be technically and typographically incorrect. The use of the checklist was not a cause factor in this accident.

(b) (5)

A/F Nr. 4: The existing retro rocket circuitry does not provide enough protection against short circuits.

(b) (5)

A/F Nr. 5: Present method of testing the K-1 relay by removing the F-1 fuse is unsafe.

(b) (5)

(b) (5)

TAB A

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L-2 SEQUENCE OF EVENTS ON 5 DEC 64

2:00 p.m. 2100Z - Amn (b) (6) and (b) (6) arrived at L-2 (Site Condition-Strategic alert, VRS 2, 40T) Site penetration began. Plug "5" found disconnected from "A" circuit.

2138Z - Team chief reported missile safe (SCS installed) IZ Security System checkout started. OZ and IZ drawers checked OK on portable fault locator. Pulled F-1 fuse to check K-1 relay (21LGH30A-2-19, Fig 4-4, Pg 4-10) three times.

2200Z - Explosion occurred. (After fuse replaced third time) LCC received indication of NO-GO fault at L-2 (SA out, warhead alarm and fault light illuminated).

2201Z - A2C (b) (6) reported explosion and smoke in the launcher from the SSB.

2202Z - WCP noticed. SAC Form 340 completed.

2203Z - Strike team dispatched from L-1 to L-2.

2208Z - Strike team arrived at L-2.

2225Z - SACR 355-3 action initiated.

2229Z - Amn (b) (6) and (b) (6) were asked to re-enter launcher. No damage was found.

2243Z - LCU noticed potential Broken Arrow had been declared.

2250Z - SMSgt (b) (6) and MSGt (b) (6) reported to CP.

2300Z - Maj (b) (6) briefed 355-3 to higher headquarters on his analysis of the situation. "Appears that critical leads disconnect squib inside G&C can has fired. Loss of warhead monitoring. Believes we do not have a hazardous situation. Recommends shutdown of DC to DC converter in security system. No need to shutdown site power."

2330Z - Chopper enroute to L-2 with Sgts (b) (6), (b) (6) and (b) (6).

2346Z - Col Fall queried for permission to let TAD and Safety enter LF upon arrival and remove fuse to disable DC to DC converter.

2354Z - Maj (b) (6) briefed OAMA (S me as 2325).

2355Z - Sgts (b) (6), (b) (6) and (b) (6) arrived at L-2.

0000Z - Permission granted by SAC for personnel to enter launcher.

0005Z - Sgt (b) (6) and crew cleared to enter site and make a visual inspection (Team briefed by Maj (b) (6)).

0007Z - Sgt (b) (6) reported via VHF radio that all personnel were evacuating the launcher.

0026Z - Sgt (b) (6) reported the following observation at L-2 to WCP from L-1 via telephone:

- (1) OGE power lamp on programmer group - OFF.
- (2) Suction pressure gauge on G&C chiller - 30 psi.
- (3) G&C umbilical - normal configuration.
- (4) RV - missing.

MISSILE/SPACE VEHICLE ACCIDENT/INCIDENT REPORT															
(Fill in all spaces applicable. If additional space is needed, use additional sheet(s))															
GENERAL INFORMATION															
1. a. Y.M.S. and Serial No. of Air Vehicle(s) Involved		b. Assignment/Status Code (AFM 65-110)		c. Time of Launch (Local)		d. DURATION OF FLIGHT									
LGM30B 64-006		CC		-----		<table border="1"> <tr> <td>No.</td> <td>Min.</td> <td>Sec.</td> </tr> <tr> <td>--</td> <td>--</td> <td>--</td> </tr> </table>				No.	Min.	Sec.	--	--	--
No.	Min.	Sec.													
--	--	--													
2. a. Activity or Maneuver Prior to Accident/Incident				f. Alt. of Accid. in relation to Surface (Actual or estimated)		g. Violations									
Strategic Alert				Surface		Yes ___ No <u>X</u>									
3. PHASE OF OPERATION (Check one)															
Transportation ___ Handling ___ Countdown ___ Initial Climb ___ Re-entry ___ Recovery ___ Other (Specify) ___ Storage ___ Precountdown ___ Launch ___ Inflight ___ Termination/Dump ___ Servicing or Maintenance ___ <u>Security Maintenance</u>															
4. ACCIDENT TYPE					5. MISSION										
(e.g. Fire or explosion on launch/in air, intentional descent or flight term., power failure in flight, loss of command guidance, flight control system, primary guidance system.)					(e.g. Launch, training, under handling, operations alert, I&C Test)										
Ignition of R/V Rocket					Maint/I&C test of security systems										
6. WEATHER (At time and place of launch)															
Sky Condition		Visibility		Wind Direction/Velocity—Gusts and Altimeter on Trajectory											
Scattered Clouds		15 mi		Calm											
Temperature		Humidity		Dew Point		Other Weather Conditions (If weather was a factor in accident indicate and attach a statement of weather officer)									
23°F.		68%		14°F.		Not a factor.									
7. MISSILE/CGE DAMAGE INFORMATION															
a. Damage (Check one)			b. Was Missile Damage Verified		c. Est. No. Direct Hit(s) for Repair, if Applicable										
Destroyed ___ Repaired <u>X</u> Missing ___			Yes ___ No <u>X</u>		72										
8. COST OF DAMAGE		d. To Mission		e. To Operational Ground Equipment (Excludes normal residual damage)											
		Superficial		234,349.12											
f. Did the error? Yes ___ No <u>X</u>			g. Did Explosion Occur? Yes ___ No <u>X</u>			h. I.C. not Complied with at time of accident (List Y.M.S. No. and Title on Separate Sheet if Modified on sub E.)									
If Yes, Pre-launch ___ Launch ___ Inflight ___ On Impact ___			If Yes, Pre-launch ___ Launch ___ Inflight ___ On Impact ___			See Tab K									
i. US Submittal?		j. Previous US's Submitted on any other launch?			k. Failure and Correction Report Submitted		l. Will Reported								
2 ___ No ___		Yes ___ No <u>X</u> If Yes, how many ___			Yes ___ No <u>X</u>		Yes <u>X</u> No ___								
9. a. Mission Report Number and Factors, as applicable and attach Report															
Retro-Rocket Assembly Report No. 28BW EUR 64-187. Secret - Restricted Data.															
Security Alarm Control Box Report No. 44SNW-64-130. Secret.															
See Classified Annex.															
10. LAUNCH FACILITIES															
a. Type of Facility				b. If Facility was a Factor in the Accident, Give Details											
Launch Facility, LGM-30B				See EUR 44SNW-64-130, Classified Annex											
c. Summarize Launch Elements with Military or Civil Agencies, (If applicable)															
N/A															
11. AIRCRAFT INFORMATION															
a. Launch Airt. T.M. & E.		b. Airt. Serial No.		c. Was Aircraft Damaged?		d. Launch Airt. Estimated Growth to Airt. if Reported									
N/A		N/A		Yes ___ No ___ Destroyed ___ Sub ___ Missing ___ Other ___ Missing ___		N/A									
12. OTHER USAF PROPERTY DAMAGE															
a. Type of Property Damaged (Refr. Miss. Structures and other Governmental Significance)						b. Repair/Replacement Cost									
Launch Facility 02-L-02						200.00									
13. NON-USAF PROPERTY DAMAGE															
c. Property Damaged (Type and extent)						d. Repair/Replacement Cost									
None						N/A									

EXPERIENCE OF KEY PERSONNEL									
a. LAUNCH EXPERIENCE		Launches Supervised		LAUNCH EXPERIENCE		Launches Supervised		LAUNCH EXPERIENCE	
Duty, as Applicable		Total Prev.	This Missile	Duty, as Applicable		Total Prev.	This Missile	Duty, as Applicable	
Commander of Unit Possessing Missile				Range Safety Off. (MSO)				Launch Pilot	
Flight/Site Commander				Ground Control Officer				Chase Pilot	
Operations Officer				Guidance Officer				Other Aft. Crew	
Launch Control (b) (6)				Other Ground Pers. (Specify)					
b. Other Experts etc. A2G (b) (6)									

These technicians were performing ground communications equipment repairs, AFSC 30454. These technicians were performing security system checks when the accident occurred. Amn (b) (6) was last evaluated on outer zone security system on 7 July 1964 by QC&E evaluator and given a highly qualified rating. Amn (b) (6) also received a highly qualified rating on 25 June 1964. QC&E evaluator was SSgt (b) (6). These two technicians have been dispatched for similar work on the security system approximately twice weekly for the past six months. Inner zone security system checkout was in progress when the explosion was heard.

CAUSE FACTORS (Check one primary and all applicable contributing and probable factors)				Primary	Contributing	Probable
Factors						
Aircraft Crew (Specify)						
Launch Crew (Specify)						
Launch Officer (Specify)						
Supervisory Personnel						
Maint. Supporting Pers. (Specify)						
A2G (b) (6)				X		
Other Supporting Pers. (Specify)						
Material Failure						
Airframe						
Booster Unit						
Propulsion Unit						
Guidance and Control System						
Recovery System						
Other (Specify)						
Retro-rocket cable short					X	
Ground Facilities (Specify)						
Weather						
Miscellaneous (Specify)						
Undetermined						

ENGINE(S) (If caused or contributed to mishap)			
a. Engine Involved:		b. Manufacturer and Date of Mfr.	
Booster	N/A		
c. Powered Flight Time on Accident Involved Engine (Hrs., Min., Sec.)		d. Engine Overhaul Depot or Facility Accomplishing TDR	
b. Name, Engine Model, Serial No.			
d. Engine Time (Hours, Minutes) Static Test, Flight Test, Ground Run Up			
f. Engine Time since Overhaul (Hours, Minutes)			

GUIDANCE OR OTHER SYSTEM(S) INVOLVEMENT			
(If caused or contr. to mishap, including ground or other components not an integral part of the missile)			
a. Name, Model, Serial No.		b. Manufacturer, Date of Mfr. of Malfunctioning Component	
N/A			
c. Time in Service		d. Overhaul Depot or Facility Accomplishing TDR if Applicable	
e. Name, Model, Serial No.		b. Manufacturer, Date of Mfr. of Malfunctioning Component	
f. Time in Service		d. Overhaul Depot or Facility Accomplishing TDR if Applicable	

DESCRIPTION AND HISTORY OF MALFUNCTIONING COMPONENT(S)	
Describe previous discrepancies or difficulties encountered including services, maintenance and operational difficulties. Summarize information that relates to specific failure(s) or malfunction(s)	
N/A	

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MISSILE/SPACE VEHICLE ACCIDENT/INCIDENT REPORT (Fill in all spaces applicable. If additional space is needed, use additional sheet(s).)									
GENERAL INFORMATION									
1. T.A.S. and Serial No. of Air Vehicle(s) Involved LCM30B 64-006			b. Assignment/Status Code (AFM 65-116) CC		c. Time of Launch (Local) -----		d. DEBARK OF FLIGHT No. --- Min. --- Sec. ---		
e. Activity or Maneuver Prior to Accident/Incident Strategic Alert					f. Alt. of Acc. in relation to Terrain (Actual or estimated) Surface		g. Violation Yes --- No X		
PHASE OF OPERATION (Check one)									
2. Transportation --- Handling --- Countdown --- Initial Climb --- Re-entry --- Recovery --- Other (Specify) ---									
Storage --- Precountdown --- Launch --- Inflight --- Terminal/Down --- Servicing or Maintenance --- Security Maintenance									
3. ACCIDENT TYPE (e.g. Fire or explosion on launch/in air, intentional distress or flight termination failure in flight, loss of command guidance, flight control system, proximity guidance system.) Ignition of R/V Rocket					4. ASSIGNMENT (e.g. Launch, training, maintenance, handling, operations alert, I&C Test) Maint/I&C test of security systems				
WEATHER (At time and place of launch)									
5. Sky Condition Scattered Clouds		Visibility 15 mi		Wind Direction/Velocity—Surface and Altitude on Trajectory Calm		Other Weather Conditions (If weather was a factor in accident indicate and attach a statement of weather officer) Not a factor.			
Temperature 23°F.		Humidity 68%		Barometer 14.0°F.					
MISSILE/VEHICLE DAMAGE INFORMATION									
6. a. Damage (Check one) Destroyed --- Repairable X Missing ---				b. Was Missile Damage Beyond Reasonable Repair? Yes --- No X		c. Est. No. Direct Damages for Repair, if Applicable 72			
7. COST OF DAMAGE		d. To Missile Superficial		e. To Operational Ground Equipment (Exclude normal routine damage) 234,349.12		f. T.O. not Compliant with at time of accident (List T.O. No. and Title on Separate Sheet if Needed as per R.) See Tab K			
i. Did fire occur? Yes --- No X If Yes, Pre-launch --- Launch --- Inflight --- On Impact ---		j. Did Explosion Occur? Yes --- No X If Yes, Pre-launch --- Launch --- Inflight --- On Impact ---		k. Failure and Corruption Report Submitted Yes --- No X		l. Will Report be Yes X No ---			
8. Will Submitter 2 No		i. Previous U.S. Submitted on any other launch? Yes --- No X If Yes, how many ---		m. Identify Report Number and Subject, or applicable and attach report Retro-Rocket Assembly Report No. 28BW EUR 64-187. Secret - Restricted Data. Security Alarm Control Box Report No. 44SRM-64-130. Secret. See Classified Annex.					
LAUNCH FACILITIES									
7. a. Type of Facility Launch Facility, LCM-30B					b. If Facility was a Factor in this accident, Give Details See EUR 44SRM-64-130, Classified Annex				
c. Describe Launch Operations with Military or Civil Agencies, (If applicable) N/A									
AIRCRAFT INFORMATION									
8. a. Launch Alt. (T.A.S.) N/A		b. Alt. Serial No. N/A		c. Was Aircraft Damaged? Yes --- No X If Yes, how many ---		d. Specify Alt. Damaged Component, to which it belongs N/A			
9. OTHER VEHICLE PROPERTY DAMAGE									
a. Type of Property Damaged (List: Ship, Structure and other structures, equipment) Launch Facility 02-L-02					b. Estimated Damage Cost 200.00				
c. Was Property Damaged? Yes					d. Was it Damaged? N/A				

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OTWAP919VV CMAA32TMC887
PP RUCMEL
DE RUWHHL 3D 06/2044Z
ZNR
P 062000Z
FM OAMA HILL AFB UTAH
TO AIG 682
INFO AIG 667
RUCSC/SAC
RUWHNF/BSO NORTON AFB CALIF
RUWHSS/OAMA TEST SITE DET 42 VANDENBERG AFB CALIF
RUWHSS/6595 ATW VANDENBERG AFB CALIF

BT
UNCLAS OONCT - 83875
FOR DCM/QC&E AT ALL WINGS AND NUMBERED AF'S. INFO DCM4C, DM4C3
AT SAC; BSQR and OOG-DE AT BSD: OOG-DB; VWTMT. THIS MESSAGE MUST
BE DELIVERED IMMEDIATELY UPON RECEIPT WITHOUT REGARD TO DUTY HOURS
FOR DCM/QC&E AT ALL WINGS AND VANDENBERG AFB. THE FOLLOWING
REVISION TO T.O. 21M-LCM30A-2-19, CHANGED 15 NOV 64, HAS BEEN
APPROVED BY THE CHAIRMAN OF THE CTOCU AT VANDENBERG AFB. IN ORDER
TO PREVENT THE POSSIBILITY OF RECURRENCE OF THE RECENT INCIDENT
AT ELLSWORTH AFB, THE FOLLOWING CHANGES TO T.O. 21M-LCM30A-2-19
WILL BE ADHERED TO IMMEDIATELY. REFERENCE SECTION 2, FIGURE 2-7,

PAGE 2 RUWHHL 3D UNCLAS
PAGE 2-12, STEP 5 CONTINUED, REMEDY C-2. DISCONTINUE USE OF
PARAGRAPH C-2 OF STEP 5 IN FIGURE 2-7 OF T.O. 21M-LCM30A-2-19
IMMEDIATELY. FUSE P-1 FIGURE 4-4 ON PAGE 4-10 WILL NOT BE USED TO
CHECK OPERATION OF INNER SECURITY. DISCONNECTING PLUG P-1 ON
FIGURE 4-4, PAGE 4-10 COULD ALSO POSSIBLY RESULT IN A DANGEROUS
CONDITION AND SHOULD NOT BE ATTEMPTED. HAZARDOUS CURRENT CONDITIONS
MAY RESULT IF THESE CAUTIONS ARE IGNORED. THIS IS A COORDINATED
OAMA, SAC, BSD/VWTMT/ MESSAGE. THE FORMAL ITOPCN WILL BE ISSUED
AS OF 7 DEC 64.

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TAB 1-1

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TEAR DOWN REPORTS

1. All representatives of AMA's and engineering agencies agreed to take follow-on action with their home offices to formulate test plans/ instructions and furnish shipping instructions to the 44th Strategic Missile Wing for the following items:

- a. Missile
- b. G&C Section
- c. Autocollimator
- d. R/V Residue
- e. Retrorockets

2. Teardown reports will be furnished activities, in accordance with paragraph 5, Attachment 2, AFR 127-4.

(b) (6)

LtCol, USAF
Chief, Missile and
Launch Complex Group

(b) (6)

OOAMA Engineering

(b) (6)

Member of Technical Staff
STL

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TAB J
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OUTSTANDING TCTO'S (Not Complied With)

Launcher Facility L-2 and LGM30B, Number 64-006

<u>TCTO</u>	<u>TITLE</u>
1. 21M-LGM30-612	Control, Exhaust Nozzle
2. 21M-SM80-519	Removal Vortex Damper Seals on Brine Chiller
3. 11G2-10-5-509	Missile Guidance Set, Mod Computer
4. 21M-LGM30-598	Mod of Security and Alarm Set Delete Sensor and Lock Indicator CKTs.
5. 21M-LGM30B-524	Install Bolts and Washers on G&C and 3d Stage Motor.
6. 31X4-1-515	Launcher Cable Assy Set
7. 31X2-32-3-510	Reduce LF DAC Noise
8. 35M1-1-504	Mod Launcher Closure Actuating and Locking Mechanism.
9. 35E9-35-506	Guidance Section Liquid Cooler
10. 49A11-7-506	Guidance Section Liquid Cooler Addition of Neutral Wire
11. 2K-SRM57-503	Retrofit Stage III Rocket Motor
12. 2K-SRM57-507	Replace Frangible Sector Retaining Clip
13. 2K-SRM57-508	Revise Thrust Termination Shield
14. 2K-SRM57-524	Color Code A/D Switch
15. 6K10-3-506	Replacement of Attaching Screws on Exhaust Nozzle Control
16. 6K10-3-505	Modification of Flame Deflector Support Ring
17. 6K10-3-509	Addition of Wafer to J-2 Connector
18. 6K10-3-510	Addition of Wafer to J-2 Connector

TAB E-1

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Warhead (RV)

TCTO

1. 11N-RV11-506
2. 11N-RV11-505
3. 11N-RV11-511
4. 11N-RV11-514
5. 11N-RV11-517

TITLE

Arming and Fusing Assy
Special Purpose Electrical Branch Cable Assy
Special Purpose Electrical Branch Cable Assy
Spacer Assy
Cover Rear and Body Section, Pairing

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ICBM MAINTENANCE EVALUATION REPORT

1. ORGANIZATION 444TMS		2. TEAM NR n/a	3. TYPE EVALUATION Initial	4. WEAPON SYS LGM-30B	5. DATE EVALUATED 7 July 1964
6. LAST NAME - FIRST NAME - MIDDLE INITIAL (b) (6)		7. GRADE A2C	8. DAFSC 30454	9. TEAM POSITION n/a	10. INDIV RATING HQ

11. CHECKLIST USED

- DD Form 1350, 1 Dec 61, No Chg
- 21M-LGM30A-2-1, 30 Jan 63, Chg 1 Jun 64
- 21M-LGM30A-2-10CL-1, 22 Apr 64, Chg 30 Apr 64
- 21M-LGM30B-2-4-1, 1 Feb 64, No Chg
- 3DA1-12-2-1, 1 Aug 62, No Chg
- 44SEV OPS PLAN 419-64, 1 Jun 63, No Chg

13. TASKS		a. SAFETY			b. RELIABILITY			14. ERROR COLUMN											15. GRADES
		I	II	III	I	II	III	c. TECH ORDER	d. JOB ORIENTATION	e. EQUIPMENT	f. SUPERVISION	g. PREPARATION	h. SEQUENCE	i. TIME	j. OTHER	k. CORRECTION			
12.	Troubleshoot & repair OZ security system AN/GSQ-74																		
A.	Checks out vehicle prior to dispatch																		
B.	Configures vehicle for job to be done																4		
C.	Penetrates & departs LF			2													4		
D.	Operates portable fault locator AN/GSM-105																3		
E.	Operates multimeter AN/PSM-6																4		
F.	Troubleshoots, removes & replaces OZ receiver																4		
G.																	4		
H.																			
I.																			
J.																			
K.																			
L.																			
16. TOTALS				2													23		
17. SIGNATURE (Signature)		(b) (6)			18. SCORE 3.83			19. RATING HQ											
20. SIGNATURE (Maintenance Supervisor)		(b) (6)			21. Lt Col			22. PAGE 1 OF 2 PAGES											

SAC FORM 4 SEP 63

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TAB N-1
Page 1 of 2 Pages

Ref:

1. 44SW OPS PLAN 419-64
2. 21M-LCN30A-2-10CL-1

C a (III) Did not use hard hat chin strap ascending SSB ladder. Ref: #1

C a (III) Did not use safety belt when installing PAH safety stops. Ref: #2

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Page 2 of 2 Pages

ICBM MAINTENANCE EVALUATION REPORT									
1. ORGANIZATION 44MMS	2. TEAM NR n/a	3. TYPE EVALUATION Initial	4. WEAPON SYS LGM-30B	5. DATE EVALUATED 25 June 1964					
6. LAST NAME - FIRST NAME - MIDDLE INITIAL (b) (6)	7. GRADE A2C	8. DAFSC 30454	9. TEAM POSITION n/a	10. INDIV RATING Q					
11. CHECKLIST USED									
1. DD Form 1350, 1 Dec 61, No Change 2. 21M-LGM30A-2-10CL-1, 22 Apr 64, Chg 30 Apr 64 3. 33A1-12-2-1, 1 Aug 62, No Change 4. 21M-LGM30B-2-4-1, 1 Feb 64, No Change									
12. TASKS	13. SAFETY		14. RELIABILITY						
Troubleshoot & repair OZ security system AN/GSQ-74									
A. Checks out vehicle prior to dispatch									
B. Penetrates & departs LF									
C. Operates multimeter AN/PSM-6									
D. Operates portable fault locator AN/GSM-105									
E. Troubleshoots, removes & replaces OZ security receiver									
F.									
G.									
H.									
I.									
J.									
K.									
L.									
16. TOTALS	(b) (6)		18. SCORE 3.60						
17. EVALUATOR (b) (6)	SSgt, 44SM		19. RATING Q						
20. SIGNATURE (Maintenance Supervisor) (b) (6)	Lt Col		PAGE 1 OF 2						

SAC FORM 4 SEP 63

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TAB M-2
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Ref: 1. 21M-LGH30A-2-10CL-1
2. 21M-LGH30B-2-4-1

- B c Did not know location of gauge PG 30 in SSB (step 37 of opening access hatch)
- B c Did not know location of ballistic gas generator (step 3 of securing equipment room) Ref 1
- D c During steps 11 & 12 of checkout procedures, airman switched to OZ instead of portion of PFL selector switch. Ref # 2

HEADQUARTERS
FIFTEENTH AIR FORCE (SAC)
UNITED STATES AIR FORCE
MARCH AIR FORCE BASE, CALIFORNIA

11 December 1964

SPECIAL ORDER

M-90

The verbal orders of the Comdr, 5 Dec 64, appointing a board of officers, organizations indicated, to investigate the nuclear incident which occurred at site L2, Ellsworth AFB, South Dakota, on 5 Dec 64, is confirmed. This board will determine the cause of the accident/incident, make recommendations to prevent recurrence, and prepare the accident/incident report as prescribed in AFR 127-4, AFM 127-2, and AFM 122-1. Authority: AFR 11-1. In the absence of the designated president and/or recorder, the senior member present at the meeting will act as president and the junior member present will perform the duties of the recorder. Asterisk (*) indicates voting members.

- * COL JAMES V FARLEY (b) (6) 341 Strat Msl Wg, President
- LTCOL (b) (6) (b) (6) 44 Strat Msl Wg, Recorder
- * LTCOL (b) (6) (b) (6) 341 Strat Msl Wg, Chief, Msl and Launch Complex Gp/Maintenance Insp and Records Gp/Investigating Officer
- * LTCOL (b) (6) (b) (6) 819 Strat Aerospace Div, Advisor/Chief, Coordinating Gp
- MAJ (b) (6) (b) (6) 44 Strat Msl Wg, Maintenance Insp and Records Gp
- * MAJ (b) (6) (b) (6) 821 Med Gp, Launch Ops and Witness Gp
- * MAJ (b) (6) (b) (6) 341 Strat Msl Wg, Chief, Nuclear Weapons Investigation Gp
- CAPT (b) (6) (b) (6) Det 1, 2701 EOD Sq (AFLC), Explosion Ordnance Disposal Representative
- * CAPT (b) (6) (b) (6) 341 Strat Msl Wg, Chief, Launch Ops and Witness Gp
- * CAPT (b) (6) (b) (6) 44 Strat Msl Wg, Advisor/Nuclear Safety

FOR THE COMMANDER



(b) (6)

Major, USAF
Directorate of Administrative Services

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M and M (4)

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M-90

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TAB F

CHRONOLOGICAL SEQUENCE OF EVENTS FOR L-2, STARTING ON 5 DECEMBER 64

- 2100 A2C (b) (6) and A2C (b) (6) arrived at L-2 to check security system. (Site condition - missile on strategic alert, VRSA channels 2,40 and safe tone) Site Penetration began.
- 2138 Team chief (Amn (b) (6)) reported missile safe (Safety Control Switch installed.)
- 2138 Checkout of IZ security system started. OZ and IZ drawers checked O.K. on portable fault locator. Pulled F-1 fuse to check K-1 relay in alarm control box. (21LGM30A-2-19, Figure 4-4, Page 4-10) three times. (explosion occurred simultaneously with-or very shortly after replacing the fuse the third time.)
- 2200 Explosion occurred. LCC received indications of a No-Go fault at L-2. (Strategic alert light out, warhead alarm and fault warning light illuminated.)
- 2201 A2C (b) (6) reported explosion and smoke in the launcher. This report was made to the LCC from the SSB via the SIN line.
- 2202 WCP notified. SAC Form 340 completed.
- 2203 Strike team dispatched from L-1 to L-2.
- 2208 Strike team arrived at L-2.
- 2225 355-3 started, Commanders and Safety at Wing Command Post P-4-11 Inter Zone Security 21M-LGM30A-2-19
Installing DAW
Checking Out Pins 1 & 5
PP-1
- 2229 Amn (b) (6) and (b) (6) were asked to re-enter the launcher and make a visual inspection. (Nothing found) 355-3 established with higher headquarters K-1 Relay-Fuze F-1
- 2300 Arrangements set up for Sgt (b) (6) and Sgt (b) (6) and Sgt (b) (6) to go to LF by helicopter - Safety equipment: Six Scott Packs, lantern, oxygen analyzer, CO indicator.
- 2315 EMT from K-5 enroute to L-2 with work cage and necessary equipment. EMT team dispatched from base.
- 2316 Two men in LFSB monitoring sin line - CDF road block established 2000' radius.
- 2325 Maj (b) (6) briefs 355-3 higher headquarters - on his analysis of situation. Appears that critical leads disconnect squib inside G&C can has fired. Loss of warhead monitoring. Believes we do not have a hazardous condition. Recommends shutdown of DC to DC converter in security system - no need to shut down site power.

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2330 Report from CP that chopper is enroute and will arrive in 30 minutes.

2345 VRSA reports channels 5, 6, 7, 25, 34, 40.

2346 Col Fall queried for permission to let TAD and safety enter LF upon arrival and remove fuse to disable DC to DC converter.

2354 Maj (b) (6) briefs OOAMA same as above. (2325)

2400 Personnel at LF awaiting permission to enter LF. Chopper arrived at LF L-2.

2403 Permission granted by SAC for our personnel to enter launcher with safety gear.

2410 Maj (b) (6) briefs Sgt (b) (6) at LF to check these items: Cocked G&C umbilical disconnect, tight retraction cable, and stage separation.

2412 Medics arrive at LF area and standing by.

2415 Sgt (b) (6) reports by VHF that personnel should fall back beyond 2000' radius - launcher situation looks bad - RV off of G&C section

2420 EOD personnel on way - all traffic in area has been blocked - all personnel have withdrawn from the area beyond 2000' Bent Spear and 55-30 initiated.

2430 Sgt (b) (6) reports by phone from LCF that entire first level opposite collimator slot is covered with grey dust. RV separated approximately four inches above RV skirt which is still attached to G&C section.

2435 Disaster control for base activated. Radioactive monitor to be dispatched immediately. Doctor is at LCF. All exposed personnel were instructed to take showers. Will be given a medical check by Doctor.

0015 Radiation monitoring team dispatched.

0034 Apex Beeline report (Conference call to USAF, SAC, and 15AF Command Posts) was transmitted.

0050 SAC requested OOAMA to send R/V specialist. SAC requested EOD people from OOAMA.

0110 EMT and MMT teams arrived at the LF and are standing by.

0120 15AF and SAC recommend we hold off until daylight hours before taking any further action, such as dispatching the EOD personnel. 15AF and SAC reconsidered and concur in our recommendation to dispatch EOD immediately to check for contamination

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0125 Mark II team to experts, Col Taylor and Maj (b) (6) from SAAMA will depart for EAFB within the hour. Also personnel from OOAMA will depart for EAFB within the hour.

0152 Disaster control personnel team put on 15 minute alert. Equipment in place and ready for departure from base.

0155 Request from 15AF as to availability of 21000 series tech orders. We have all Unclass 21000 series, but not all Classified. Recommended that they bring along the Classified 21000 series.

0200 Col Robinson requested permission to send in a Radiation Monitor team to check for contamination in the launch tube, and if none detected, would like to send in maintenance personnel to look only. Standing by. Major (b) (6) described his proposal.

0211 Col Seigel, SAC granted permission.

0242 CBR team entering LF this time.

0251 EMT on site with CBR team (on comm net).

0300 Above ground clean of radioactive condition.

0347 CBR team entering below ground with T-290 and 27C test equipment. Negative reading with 27C. Negative reading level 1 and 2 (All possible radioactive checked). Smell of burnt rocket motors - possible retd. R/V not visible - R/V found at bottom of silo on its side.

0431 CBR with drawing returning to LCF pending.

0500 Following personnel arrived in conference room from OOAMA. Mr (b) (6) Hill AFR (SSM); Mr (b) (6) Hill AFR (SSM); Capt (b) (6) Hill AFB (EOD); Mr (b) (6) OOAMA.

6 Dec 64
1830 Re-opened 355-3 net: SAC, 15AF & OOAMA were given our proposals to safe the missile and reconnaissance the launcher area. All agencies approved. (Col Robinson) net closed out.

7 Dec 64
0300Z the net was reopened. The SAC, 15AF and OOAMA personnel were notified of the results of the reconnoiter. Everything appears safe. Col Robinson then closed the net.

1846 The net was reopened. Col Farley briefed the SAC, 15AF and OOAMA personnel on our next proposed course of action. Over all responsibility for the recovery operation is given to AFMC; that is, EOD personnel. Overall responsibility for the launch facility is still retained by SAC. All participants concurred in Col Farley's recommended course of action. The missile will not be removed. The EOD people will proceed to the

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bottom of the tube and separate the R/V from the warhead and bring them separately to the surface. We were directed to open the 355-3 net again during the R/V removal operation.

1908 Col Cole recommended closing the net. All concurred.

8 Dec 64

2040 Contact with L-2 established for monitoring of descent into LF for inspection. Capt (b) (6) and Mr (b) (6) will make initial descent.

2048 Descent began at this time.

2055 Capt (b) (6) and Mr (b) (6) leaving work cage to make their inspection of the R/V. Inspection of the scratches on Stage II and interstage area was made on descent. Work cage was raised to allow more room to work in.

2100 T-290 check being made at this time and determined negative (Alpha Rad)

2107 Reported by L-2 to be in a safe configuration.

2108 Gamma background is negative.

2111 Structural damage apparent. Further inspection to determine final status.

2114 Inspection revealed structural damage to the extent that separation of the two items is not feasible or practical at this time.

2120 Additional internal damage noted during inspection which precludes possibility of separation. Item will probably be raised with cargo net sling.

2122 Upon removal of R/V, final, Rsp will have to be accomplished. This will be done at the MMS area.

2126 Recommended at this time to remove R/V in one piece and perform RSP after return to base.

2153 Recommendation was made to obtain a container for an earlier type R/V which has the same basic diameter and will probably be the best device for returning item to the base.

2159 Dimensions of Titan R/V cradle requested and being obtained.

2202 Mr (b) (6) (SANDIA Corp) and the photographer descending into hole at this time.

2226 Col Fall called Col Cloyd on 355-3 for status report, and recommendations so far. Col Fall brought up to date and advised that prior to proceeding past the planning stage he will be contacted and advised by Col Cloyd. Col Fall also

advised that a 11A shipping can has been requested from F E Warren AFB and T-29 from Lowry will pick up at approximately 1730. CNX at 22322.

- 2234 Verification that only one retro rocket has fired.
- 2245 LtCol (b) (6) and Mr (b) (6) are descending into the hole at this time.
- 2309 LtCol (b) (6) and Mr (b) (6) coming up out of the hole. Mr (b) (6) and photographer are out of the hole at this time also.
- 2315 Mr (b) (6) recommends that a cargo net be used to hoist the R/V out of the hole and place the R/V net and all, into shipping container in order to transport back to the base.
- 2317 Maj (b) (6) and Sgt (b) (6) descending into the hole.
- 2355 Communication between L-2 and Command Post terminated.

9 Dec 64
1600

Discussion was started on sequence of events which have occurred up to this time. Proposed checklist was read which contained the planned steps and methods to be used. This was read which contained the planned steps and methods to be used. This was read by Col Farley. Mr (b) (6) (NE OOAMA) further elaborated on some phases of the planned procedures. Col Cloyd directed that the 355-3 net be opened and the planned procedures as outlined be explained, requesting verification and approval prior to proceeding. These are listed below:

1. Condition of weapon
 - a. Electrical and Nuclear Safe
 - b. Structurally unsound so normal handling equipment not satisfactory.
2. Operations Proposed
 - a. Lift R/V in nose down vertical position, encased in doubled (two) nylon nets.
 - (1) Identical nets have been test w/approx 1500# wt. (present weight R/V 750# + or-).
 - (2) Additional support for R/V will be provided by web straps around and lengthwise.
 - b. Lift will be provided by MC-1 crane (AIC Kittrel-operator)
 - (1) Crane has been QC&E capacity tested @ 7500#.
 - (2) Crane operator best available.
 - (3) Secondary support will be provided in case crane, cable or net failure by 1" hemp rope secured to dead man.
3. It is planned to remove weapon from silo as is.
 - a. Further RSP will be accomplished after removal from silo in empty magazine.

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- b. Weapon will be radio graphed prior to determining final RSP required and to determine safe shipping configuration.
- c. To prevent chance of static electricity or circulatory ground currents during hoisting procedures. The warhead case will be grounded through a 1,000 ohm externally attached resistance and ground cable. Grounding apparatus will be connected between crane cable and warhead case.

1630 The 355-3 net was opened with Col Fall (SAC), Col Cole (15AF) Col Taylor (OOAMA) and Col Kadaira (BSD). Col Cloyd opened by explaining the status as it stands regarding the changes which have taken place. The net was turned over to Col Farley who read the proposed procedures. The existing conditions were read prior to the procedures outlined by checklist outline. Mr (b) (6) then read the procedures he proposes. Also stating the STL position. Col Farley re-read his outlined procedures for (BSD) and Col Taylor (OOAMA (17052)). Mr (b) (6) followed and re-read his proposal. Capt (b) (6) read the BSD position. Col Cloyd re-iterated the position of the OOAMA representative. Mr (b) (6) and 44th TAD Maj (b) (6) to Col Fall, Col Kadaira (b) (6) and Mr (b) (6) prior to committing final BSD position. Col Cloyd queried Col Taylor (OOAMA) as to feasibility for obtaining additional gear case motors. Col Kadaira stated that they did not want power to hole. Mr (b) (6) replied adding the fact that there are no means available to provide isolated lighting and ventilation as well as communication. Maj (b) (6) explained the available lights in the hole for work procedures. Col Dawd (15AF) stated it was felt that using means other than what is in site provided would induce more interference. Col Kadaira (BSD) queried as to feasibility of safing retros prior to proceeding. Col Cloyd stated that EOD personnel available did not want to touch these at this time since they were not sure of their condition. (1745)

- 1750 Proposal was reread by Col Farley to 355-3 net. Mr (b) (6) followed.
- 1756 SAC has given approval to proceed with recovery as outlined. Net will be re-opened at that time.
- 1821 Recovery team has arrived at site.
- 1855 Maj (b) (6) Mr (b) (6) and SMSgt (b) (6) arrived at site by chopper.
- 1902 Maj (b) (6) and Mr (b) (6) requested permission to proceed with safing operations. They were advised that they were cleared to proceed.
- 1905 Capsule reported that fault light for L-2 was out for 1 minute.

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1935 Second chopper enroute to L-2 with equipment.

1941 A&F package and rear cover being brought topside and placed in padded container.

1949 Closure is completely open and safety barriers are being installed.

2005 355-3 net being re-opened at this time.

2007 Capt (b) (6) and Capt (b) (6) descending into tube by way of work cage.

2017 Capt (b) (6) and Capt (b) (6) on bottom of silo. Gamma check was made showed negative. Maj (b) (6) proceeding to silo bottom to install nozzle covers. Capt (b) (6) reports that alpha monitoring showed negative also.

2029 Nozzle covers have been re-installed.

2034 Large net being lowered by MC-1 crane.

2044 Capt (b) (6) requested that all unnecessary personnel be cleared out of the silo.

2052 Nets for R/V raising are on bottom of silo. Crane hook being removed.

2102 Capt (b) (6) reported that he had removed all impact crystals.

2109 Capt (b) (6) states that they are preparing to move the R/V away from the wall, forward and try to lift it so that they can place the net under it.

2112 R/V has been moved forward 6" and 4" away from silo wall.

2115 Work cage being brought up. Topping and padding being performed on R/V. This involves all jagged edges.

2117 Mr (b) (6) (LRL) is at bottom of silo at this time.

2122 Col Kilpatrick relayed progress to 355-3 net, monitor Col Fall.

2128 Periodic radiation check at this time with T-290 at base of R/V - negative.

2131 Reported personnel at bottom of silo are Capt (b) (6), Capt (b) (6), Mr (b) (6), Sgt (b) (6), (b) (6) and (b) (6). Mc-1 hook being prepared for lowering into hole.

2136 Jagged piece of R/V flare removed from R/V.

2137 Col Taylor (Hill) requested confirmation that the 1000 ohm resistor and grounding strap are installed prior to movement.

2138 Tape recorder tuned on, site communication monitor.

2146 Preparing to place web-strap under CG of R/V.

2152 Hook being raised very slowly checking for exact CG. Lowered for adjustment.

2152 Hook being raised and lowered slowly to locate CG.

2156 R/V is approx 8" off of silo floor net being involved to slip under the R/V.

2200 Tape changed.

2205 R/V being raised approx 4" more to accommodate mattress pad under R/V.

2207 R/V being lowered onto mattress pad into lifting net.

2222 Raise very slow to position R/V into vert position. This relayed to Col Fall, SAC.

2238 R/V beginning to raise up so that securing strap can be installed around cargo net to secure net and R/V. Resistor and ground strap to be installed as soon as R/V is vert.

2246 R/V is hanging vertical.

2255 Tape chg

2300 Direct chopper at L-2 on stdby to return to base.

2303 Col Fall advised that the last portion of raise operation may go into darkness. Advised that on site lighting is available and can be used. Col Fall and Col Taylor concur on continuing operation. Current status relayed to Col Fall.

2313 Preparing to install resistor and ground strap to R/V.

2319 Silo has been evacuated of all non-essential personnel. Flood lights are verified oper.

2321 T/S (b) (6) being sent to ring for guidance purposes. Mr (b) (6) going topside. Resistor and grounding strap are verified connected at this time. Grounding connect on crane are being checked also.

2325 Three people are manning the dead man rope.

2328 Start to raise R/V from silo.

2329+152 Completely suspended clear of silo floor.

2330 R/V is not true vertical slight angle.

2331 1½ feet off of silo floor and rising.
 2332-5Z Approximately 3" and rising.
 2332+58Z Approximately 5' and rising.
 2333+40Z Approximately 6' and rising nicely.
 2334+5Z Approximately 10' from bottom and rising.
 2335+30Z Stop operations.
 2336+5Z Up very slow. Dead slow.
 2336+45Z Stop.
 2337 Up very slow.
 2337+45Z Stop.
 2338+30Z Up slow.
 2338+50Z Stop.
 2340+3Z Up slow.
 2340+45Z Stop.
 2341+3Z Up slow.
 2341+45Z Stop.
 2342+40Z Up slow.
 2343Z Approximately 16" from floor.
 2343+30Z Stop.
 2343+50Z Up Slow.
 2344+10Z Stop.
 2345+15Z Up slow.
 2346Z Stop.
 2346+5Z Up slow.
 2346+40Z Stop.
 2346+50Z Up slow.
 2347 Clear of ring.

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~~TOP SECRET - COMINT (Special Handling Required, See AFB 1-7.4)~~

2347+45Z Past the ring approximately 30' off the deck. Up fast.

2348+50Z Half way up the tube.

2349 Approximately at platform.

2349+50Z Slow - clear - up fast.

2350 Over level #1 and rising.

2351+50Z Release guide lines at bottom, transfer to top.

2352+15Z R/V is now out of the tube.

2352+45Z Swing and lowered to hold position on mattress. 355-3 net closed.

2354+30Z R/V is touching mattress padding at top of pad.

2359 Transferring the R/V into the R/V G&C van at this time.

2360Z Sgt (b) (6) directed to keep monitor of environmental control. 9 K-W heater will be in operation.

0009 Change of hoisting so that R/V G&C van hoist can pull it into van.

0020 R/V has been transferred completely to crane hoist, MC-1 has been disconnected and removed.

0024 SIN line net closed.

10 Dec 64

0830L Formulation of convoy plans was begun. Convoy was stated to be a normal type of convoy w/an EOD vehicle at the rear of the convoy trailed by a second Air Police vehicle. A man will ride inside the van with monitoring equipment and communications to the cab. The second AP vehicle was dispatched for the L-2 convoy.

Discussion followed for missile safing procedures. Capt (b) (6) is to study a mockup prior to beginning any operation on the Ordnance items. This is to determine the steps and procedures he will use for his operations involving safing of the ordnance.

0900 Col Kilpatrick was directed by Col Cloyd to contact Col Fall and Col Cole advising them of the intent and methods proposed.

0930 It was stated that the normal convoy route would be used to transport this R/V back.

It was also determined that the 355-3 net would be opened at 1500 hours this date. This conference was closed at this time.

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1930 Contact w/SAC, 15AF and OOAMA advising them of proposed route, elements and departure time. Departed from L-2 at 1947+30Z. Estimated time in route 3 hrs and 20 min.

1940 SAC OK.

2145 Convoy approximately midway between site and main base

2153 355-3 net re-initiated at this time.

2212 Convoy approximately 7 miles from base.

2218+15 355-3 net open all concerned are on the net.

2219 Col Farley read the list of personnel and equipment required for the safing operation. The sequence of events are also read as outlined. Also the step by step procedures were available but not read.

2229 Col Fall asked for BSD feelings on recommendations.

2231 Col Fall verified that all concerned agreed upon the intended procedures. Proposed time for beginning of operations was 1500 Friday, 11 Dec 64.

2236 Col Fall and all others agreed to keep the net open until the R/V is in the igloo.

2237 Col Fall asked Col Farley to re-read the proposals as outlined emphasizing the portion where complete agreement was not emphasized.

2240 Verification of reasons for leaving power on in the site was asked for by (Hill) Col Taylor.

2245 Col Fall asked for clarification of power switching during shorting operations. This was verified.

2246 SAC concurrence given at this time w/request to re-open the net prior to initiation of activities in the morning.

2249 355-3 net closed except for Col Taylor (Hill) w/message for Col Kilpatrick.

2250 355-3 net closed.

11 Dec 64
1545 Col Cloyd called by Col Cole and determined that 355-3 net would not be opened for the operations this a.m., but the net would be informed and cancelled after the operation is completed by telephone.

1553 SIN lin to L-2 was opened at this time.

1555 Mr (b) (6) entering the LF and preparing to proceed w/outlined steps. Maj (b) (6) accompanied.

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1608 Maj (b) (6) reported that the G&C section is split open.

1611 Mr (b) (6) verified condition of G&C and recommended removal of missile and G&C as it is presently. He also requested that BSD be contacted for recommendations and/or verification. He suggested that Mr (b) (6) be contacted. He also requested that all civilian technical personnel available locally be contacted for any proposals that they may have.

1724 Maj (b) (6) and Mr (b) (6) preparing to descend to bottom of silo to install insulation in Stage I nozzles.

1727 Col Farley called Col Kilpatrick and stated that civilian techs agreed that there was no reason to re-install the space on the missile and also said that there were some passive tests (power off) that they wanted to perform.

1728 EOD team arrived at L-2.

1739 Grounding straps being installed on skirt.

1745 Maj (b) (6) and Mr (b) (6) coming out of the hole. Insulation and covers are installed.

1749 Launcher closure to be opened approx 18" - 24".

1756 Closure opened.

1823 Col Cole asked for status report via 355-3 net. This was relayed by Col Kilpatrick as well as G&C info. Col Fall copied conversation.

1826 Mr (b) (6) verified that bottles would not be removed at L-2, instead they would be removed after it has returned to the base.

1830 Col Dallas advised for Col Cole of this change, which was not in the original plan.

1837 At this time step 2f, of the proposed plan is being performed.

1919 All ordnance has been safed at this time.

1937 Closure is closed. SIN line to be re-opened at approx 2030.

2030 L-2 comm net re-established.

2043 Maj (b) (6) 15AF, called for info for Col Fall, Col Kilpatrick relayed current status as of this time.

2047 G&C van in position and the lid has been opened.

2049 Impedance checks being made at this time.

2104 Step 2g has been completed.

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- 2106 Step 2h completed, step 2i in progress.
- 2116 Spacer removed, completed. Spacer is in the van at this time.
- 2117 Lid being closed at this time.
- 2118 355-3 net cancelled by Col Cloyd through Col Cole.
- 2123 Visual inspection did not reveal any damage to the missile. Further checks, if necessary, will be determined by the Accident Investigation Board.
- 2126 SIN net was terminated.

NOTE: See recovery and safing plans in Annex _____

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TAB V
Page 13 of 13 pages

~~FOR OFFICIAL USE ONLY (Special Handling Required: GDS 424 127-47)~~

FORM NO. 10-1		FORM NO. 10-2		FORM NO. 10-3		FORM NO. 10-4		FORM NO. 10-5		FORM NO. 10-6		FORM NO. 10-7		FORM NO. 10-8		FORM NO. 10-9		FORM NO. 10-10	
TITLE		SUBJECT		AUTHORITY		DATE		PAGE		REVISION		APPROVAL		REMARKS		ACTION		STATUS	
000		EFFECT		A-02		THRU 0-11		AUG 11 1961		(b) (6)									
010		ENGR. DATA		REQ'D: SH. ADEN		REV.		AUG 11 1961		(b) (6)									
020		GENERAL NOTES: (1) THIS MATTER PROVIDES						AUG 11 1961		(b) (6)									
030		FOR SECURING THE LF AS DEFINED						AUG 11 1961		(b) (6)									
040		IN 21-53832, SEE IV						AUG 11 1961		(b) (6)									
050		PERFORM LAUNCH ENABLE SYSTEM CHECK						AUG 11 1961		(b) (6)									
060		OUT AS FOLLOWS:						AUG 11 1961		(b) (6)									
070		1. PERFORM STEPS 2-83A & THRU & PER						AUG 11 1961		(b) (6)									
080		2. SECURE LAUNCH						AUG 11 1961		(b) (6)									
090		FACILITY - CCP 1776						AUG 11 1961		(b) (6)									
100		MOD						AUG 11 1961		(b) (6)									

FORM NUMBER		FORM NUMBER		FORM NUMBER		FORM NUMBER	
CCP17764		21-53832		WS-123		6-19-4	
UNIT NUMBER		JOB EFFECTIVITY		UNIT DATE		MANUFACTURING & INSPECTION RECORD	
EAFB		(b) (6)		(b) (6)		BASE INSTALLATION	
OPERATION		02-1-02		6-19-4			
GROUP	SEQUENCE	OPERATION	FLIGHT	DATE	FLIGHT RECORD	Q.C. ACCEPTANCE	DATE
030	CONT.	T.O. ZIM-LGM30A-2-3 SEC II	(b) (6)	AUG 11 1964	(b) (6)	(b) (6)	AUG 11 1964
040		INSPECT OPER. 030 PER T.O. ZIM-LGM30A-2-3	(b) (6)	AUG 11 1964	(b) (6)	(b) (6)	AUG 11 1964
050		PERFORM LAUNCH ENABLE SYSTEM TROUBLE SHOOTING PER STEP 2-BAD OF T.O. ZIM-LGM30A-2-3	(b) (6)	AUG 11 1964	(b) (6)	(b) (6)	AUG 11 1964
060		CONDUCT SAFE TONE PROCDURE PER STEP 2.85A & THEN 2 PER T.O. ZIM-LGM30A-2-3	(b) (6)	AUG 11 1964	(b) (6)	(b) (6)	AUG 11 1964
070		INSPECT OPER'S. 050 THEN 060 PER T.O. ZIM-LGM30A-2-3.	(b) (6)	AUG 11 1964	(b) (6)	(b) (6)	AUG 11 1964
080		PERFORM ARMING FAILURE PROCEDURE PER STEPS 2.86 & THEN 2 OF T.O. ZIM-LGM30A-2-3.	(b) (6)	AUG 11 1964	(b) (6)	(b) (6)	AUG 11 1964
JOB TITLE		JOB NUMBER		JOB NUMBER		JOB NUMBER	
MOD		SECURE LAUNCH		21-53832		CCP17764	
FORM 2-100		FORM 2-100		FORM 2-100		FORM 2-100	

M612

Appendix 1
Attachment 3
Tab W-4
5 of 7 Pages

JOINT MESSAGEFORM				SECURITY CLASSIFICATION UNCLASSIFIED EFTO	
SPACE BELOW RESERVED FOR COMMUNICATION CENTER					
PRECEDENCE		TYPE MSG (Check)		ACCOUNTING SYMBOL	ORIG. OR REFERS TO
ACTION	ROUTINE	BOOK	MULTI	SINGLE	AF
INFO	ROUTINE	X			
FROM: 821STRATAEROSPDIV ELLSWORTH AFB SDAK					SPECIAL INSTRUCTIONS
TO: OOAMA HILL AFB UTAH					ENCRYPT FOR TRANSMISSION ONLY
INFO: SAC					
BSD NORTON AFB CALIF					
AFIG					
DEP TIG USAF NORTON AFB CALIF					
APPRO THE BOEING CO SEATTLE WASH					
AIG 667					
AIG 682					
821STRATAEROSPDIV ELLSWORTH AFB SDAK (MESSENGER)					
UNCLASS EFTO 44DCMQ-M					
FOR OONPM-1/OOAMA. INFOR DM4G, COL GIDDINGS/SAC; DM4C; DM4C/2AF/15AF;					
DM2/8AF; MSQC(MM)/BSD: MCNT/AFLC; AFIAS-R2/DEP TIG; DM/DCM/MM					
QCSE/AIG 667/AIG 682; 821SAD(DM). A. MISSION FAILURE (QE DEFICIENCY)					
B. LGM30B, MINUTEMAN SECURITY AND ALARM SET. C. 44 SMW - 64 -65.					
D. DC-DC CONVERTER, PART #10PE107, WUC # BB280. E. MPN 10PE107,					
SN PA 00639. F. 07397. G. 00759. H. 1EA, CODE 242; FAILED TO					
					DATE
					TIME
					MONTH
					YEAR
					MAY 1964
SYMBOL 44DCMQ-M		SIGNATURE			
TYPED NAME AND TITLE (Signature, if required) (b) (6) AIC		TYPED (or stamped) NAME AND TITLE WILLIAM J KILPATRICK, Colonel, USAF			
PHONE (b) (6)		Deputy Commander for Maintenance			
SECURITY CLASSIFICATION UNCLASSIFIED EFTO		44 Strat Mal Wg			
PAGE 1		NR. OF PAGES 2			

DD FORM 1 MAY 55 173

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

Attachment 4

TAB W-4

Page 1 of 5 pages

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JOINT MESSAGEFORM — CONTINUATION SHEET

SECURITY CLASSIFICATION

FROM:

821STRATAKROSPDIV ELLSWORTH AFB SDAK

OPERATE. I. 1EA, CODE P; FUNCTIONAL/OPERATIONAL CHECK. J. 1EA CODE P, REMOVED. K. 1EA, TOTAL. L. 15 MANHOURS. M. A COMM. TEAM WAS DISPATCHED TO TROUBLE SHOOT A INTER ZONE ALARM THAT WOULD NOT RESET. THE DC TO DC CONVERTER WAS REPLACED AND THE TEAM WITHDREW WITHOUT BEING ABLE TO RESET THE INTER ZONE ALARM. ON THE SECOND DISPATCH IT WAS FOUND THAT THE REPLACED DC TO DC CONVERTER HAD 35V DC ON THE INPUT PINS ONE & TWO, AND ZERO VOLTS ON THE OUTPUT THREE AND FOUR. THE CONVERTER WAS REMOVED AND RETURNED TO THE SMSB FOR NRTS ACTION. DUE TO THE NUMBER OF FAULTY DC TO DC CONVERTERS EXPERIENCED AT THIS WING THE TECHNICAL ANALYSIS DIVISION INVESTIGATED THE FAULTY UNIT AND FOUND TWO MAJOR DEFECTS. THE TRANSFORMER, MPN 13-20004, WAS NOT PROPERLY SOLDERED ON THE PRINTED BOARD. THIS TRANSFORMER COULD NOT HAVE MADE AN ELECTRICAL CONTACT DUE TO THE COLD SOLDER JOINTS ON ALL 8 PINS. THE FILTER, F310 60-MICROFARAD, 50V ATTACHED TO THE INPUT TERMINAL PIN TWO APPEARS TO HAVE BEEN INSTALLED BACKWARDS.

(b) (5)

(b) (5)

(b) (5)

TRICAL SECURITY MONITORING CAPABILITY AT LAUNCH FACILITY. O. THE DC TO DC CONVERTER COULD BE REPLACED WITH VOLTAGE DROPPING RESISTOR. THIS WOULD PROVIDE THE SAME FUNCTION AS THE DC TO DC CONVERTER AND AT A MUCH REDUCED COST. P. THE FAULTY UNIT IS BEING HELD FOR DR EXHIBIT PENDING SHIPPING INSTRUCTIONS. Q. 1LT (b) (6) 44DCMDA, DUTY PH (b) (6) HOME PH (b) (6). R. YES.

SYMBOL

44DCMQ-M

DD FORM 1 MAY 55 173-1

PAGE
NR
2NR OF
PAGES
2

SECURITY CLASSIFICATION

~~UNCLASSIFIED~~

INITIALS

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Attachment 4

TAB W-4

Page 2 of 5 pages

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JOINT MESSAGEFORM				SECURITY CLASSIFICATION	
				UNCLASSIFIED EPFO	
SPACE BELOW RESERVED FOR COMMUNICATION CENTER					
PRECEDENCE		TYPE MSG (Check)		ACCOUNTING SYMBOL	ORIG. OR REFERS TO
ACTION ROUTINE	BOOK	MULTI	SINGLE	AF	CLASSIFICATION OF REFERENCE
INFO ROUTINE		X			
FROM: 821STRATAEROSPDIV ELLSWORTH AFB SDAK					SPECIAL INSTRUCTIONS ENCRYPT FOR TRANSMISSION ONLY
TO: OQAMA HILL AFB UTAH					
INFO: SAC					
BSD NORTON AFB CALIF					
AFLC					
DEF TIG USAF NORTON AFB CALIF					
APPRO THE BOEING CO SEATTLE WASH					
AIG 667					
AIG 682					
821STRATAEROSPDIV ELLSWORTH AFB SDAK (MESSENGER)					
UNCLAS EPFO 44DCMQ-M					
FOR CONPM-1/OONSI/OQAMA. INFO DM4C, COL GIDDINGS/SAC; DM4C; DM4C/2AF/					
15AF; DM2/8AF; MSQC(MM) BSD: MCNT/AFLC; AFIAS-R2/DEF TIG; DM/DCM/PM					
QC&E/AIG 667/AIG 682; 821SAD (IM). A. MISSION FAILURE. B. LGM30B					
MINUTEMAN, R1222/GSQ-74 (RECEIVER). C. 44SMW-64-103. D. SEMI-					
CONDUCTOR DIODE 1M21WE, WUC N/A. E. MPN 1N21WE, FSN 5960-615-5550.					
F. 07397. G. 07397. H. TOTAL FIELD 98 INCIDENTS - 72EA 029					DATE
(CURRENT INCORRECT), 25EA 242 (FAILED TO OPERATE), 1EA 070					TIME
					MONTH
					YEAR
					AUG 1964
SYMBOL		SIGNATURE			
44DCMQ-M		WILLIAM J KILPATRICK			
TYPED NAME AND TITLE (Signature, if required)		TYPED (or stamped) NAME AND TITLE			
(b) (6) AIC		Col, USAF			
PHONE (b) (6)		Deputy Commander for Maintenance			
SECURITY CLASSIFICATION		44 Strat Msl Wg			
UNCLASSIFIED EPFO					

DD FORM 173 MAY 55

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

Attachment 4

TAB W-4

Page 3 of 5 pages

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JOINT MESSAGEFORM — CONTINUATION SHEET		SECURITY CLASSIFICATION UNCLASSIFIED EFTO	
FROM: 821STRATAEROSPDIV ELLSWORTH AFB SDAK			
<p>(BROKEN) 1-30 JUNE 64, TOTAL SHOP 100 INCIDENTS - 84 EA 029 (CURRENT INCORRECT) 9EA 242 (FAILED TO OPERATE), 7EA 127 (ADJUSTMENT IMPROPER), 1 - 30 JUN 64. I. 90EA CODE P (FUNCTIONAL OPERATIONAL CHECK), (BENCH CHECKED, REPAIRED) 6EA CODE F (REPAIR), 9EA, CODE C, REPAIR-DEFERRED), 1 - 30 JUN 64. K. 98 TOTAL. L. A TOTAL OF 1252 MANHOURS BROKEN DOWN AS FOLLOWS: 784 MH FOR CODE 11, 18.- (TRAVEL DRIVING), 196 MH FOR 01 (PENETRATE AND DEPART LF), 171 MH FOR 01 (FIELD REMOVAL-REPLACE, 101 MH FOR 01 (SHOP REPAIR). M. DUE TO THE HIGH FAILURE RATE OF THE DIODE 1M21WE WHICH IS UTILIZED IN THE R-1222 GSO/74 RECEIVER, EXCESSIVE MANHOURS ARE BEING LOST AND THE MISSION CAPABILITY HAS BEEN REDUCED. N. EXCESSIVE SECURITY SYSTEM MALFUNCTIONS ACCREDITED TO THE FAILURE OF THE 1M21WE DIODE. ITEM L DOES NOT REFLECT THE TOTAL MANHOURS EXPENDED TO GUARD LF'S WHEN THE SECURITY SYSTEM IS NOT FUNCTIONING. O. (b) (5)</p> <p>(b) (5)</p> <p>(b) (5)</p> <p>F. N/A.</p> <p>Q. (b) (6), SSGT, 44MDMS, DUTY PH (b) (6) HOME PH (b) (6)</p> <p>R. YES.</p>			<p>ENCRYPT FOR TRANSMISSION ONLY</p>
SYMBOL 44DCMQ-M	PAGE NR 2	NR OF PAGES 2	SECURITY CLASSIFICATION UNCLASSIFIED EFTO

DD FORM 1 MAY 58 173-1

Attachment 4

TAB W-4

Page 4 of 5 pages

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STATUS OF MAY 64 MESSAGE: 44SMW-64-65, DC to DC Converter, MIP 0064-3045 has been established.

STATUS OF AUG 64 MESSAGE: 44SMW-64-103, Diode, (Receiver Sec Sys) MIP 0064-4166R has been established. Date MIP established: 5 Aug 64. Estimated Closing Date: 15 Nov 64. Responsible Activity: NCTA-C (Mr. (b) (6)).

Current Status: 31 Aug 64, Letter forwarded.
2 Oct 64, OQAMA/SAC MIP Review Action - No update.
13 Oct 64, No change.
31 Oct 64, No change.

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Attachment 4

TAB W-4

Page 5 of 5 pages

AFTO FORM 22

TO: OQAMA (COMSTA)
Hill AFB, Utah

FROM: 44MIMS 44 SWW DCMQ
Ellsworth AFB, SDak

T.O. 21M-LCM30A-2-19

Page 2-8 and 2-26

Para No. 2-35

Figure No. Fig 6

DEFICIENCY: Fig 6 Page 2-8 Troubleshooting Steps 1, 2 and 5, and
Page 2-26 Para 2-33 are no longer required because
of TCTO 21M-LCM30-598.

RECOMMENDATION: Delete Troubleshooting Steps 1, 2, and 5, Fig 6,
Para 2-8. Delete Para 2-33, Page 2-26.

REASON FOR CHANGE: Incorporation of TCTO 21M-LCM30-598. Technical
Data is not current with present configuration.

NOTE: TCTO 21M-LCM30-598 modifies the security and alarm set P/N
3037-1665 by deleting of sensor circuit and lock indicator
light circuit.

STATUS: Action still pending.

Attachment 3

Tab B-4

Page 1 of 1 page

STATEMENT

TO: WHOM IT MAY CONCERN

I, MSgt (b) (6) (b) (6), am supervisor of SSgt (b) (6) (b) (6). SSgt (b) (6) has completed and is signed off on all four phases of JOTS except his written examinations, which are not required. As SSgt (b) (6) supervisor, I certify that he is fully qualified in all tasks on his JOTS package.

(b) (6)
(b) (6)

MSgt, (b) (6)

12 December 1964

Attachment 6

TAB W-4

Page 1 of 1 Page

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9th Weather Squadron - Det 12
3d Weather Wing (MATS)
UNITED STATES AIR FORCE
Ellsworth Air Force Base, South Dakota, 57706

REPLY TO
ATTN OF: WEA

6 December 1964

SUBJECT: Official Weather at Ellsworth AFB, 5 Dec 64

TO: Whom it May Concern

1. Following is the official weather at Ellsworth AFB, for
5 Dec 64, as extracted from our records:

2155Z 8,000 SCATTERED, visibility 15 miles, Temperature
23 Deg., Dew Point 14 Deg., Wind Calm.

2255Z 8,000 SCATTERED, visibility 15 miles, Temperature
19 Deg., Dew Point 13 Deg., Wind Calm.

2. Weather reported for 2200Z by the site manager, for Missile
Site LIMA 1, was SCATTERED clouds, visibility 10 miles, wind
calm, temperature 24 Deg.

3. Due to the synoptic situation in existence on 5 Dec 64, for
the area, the weather reported at Ellsworth AFB and Missile Site
LIMA 1 is considered to be representative of the actual conditions
for the whole 68th Missile Sq. Complex.

(b) (6)

(b) (6)

GAPT

LT Colonel, USAF
Commander

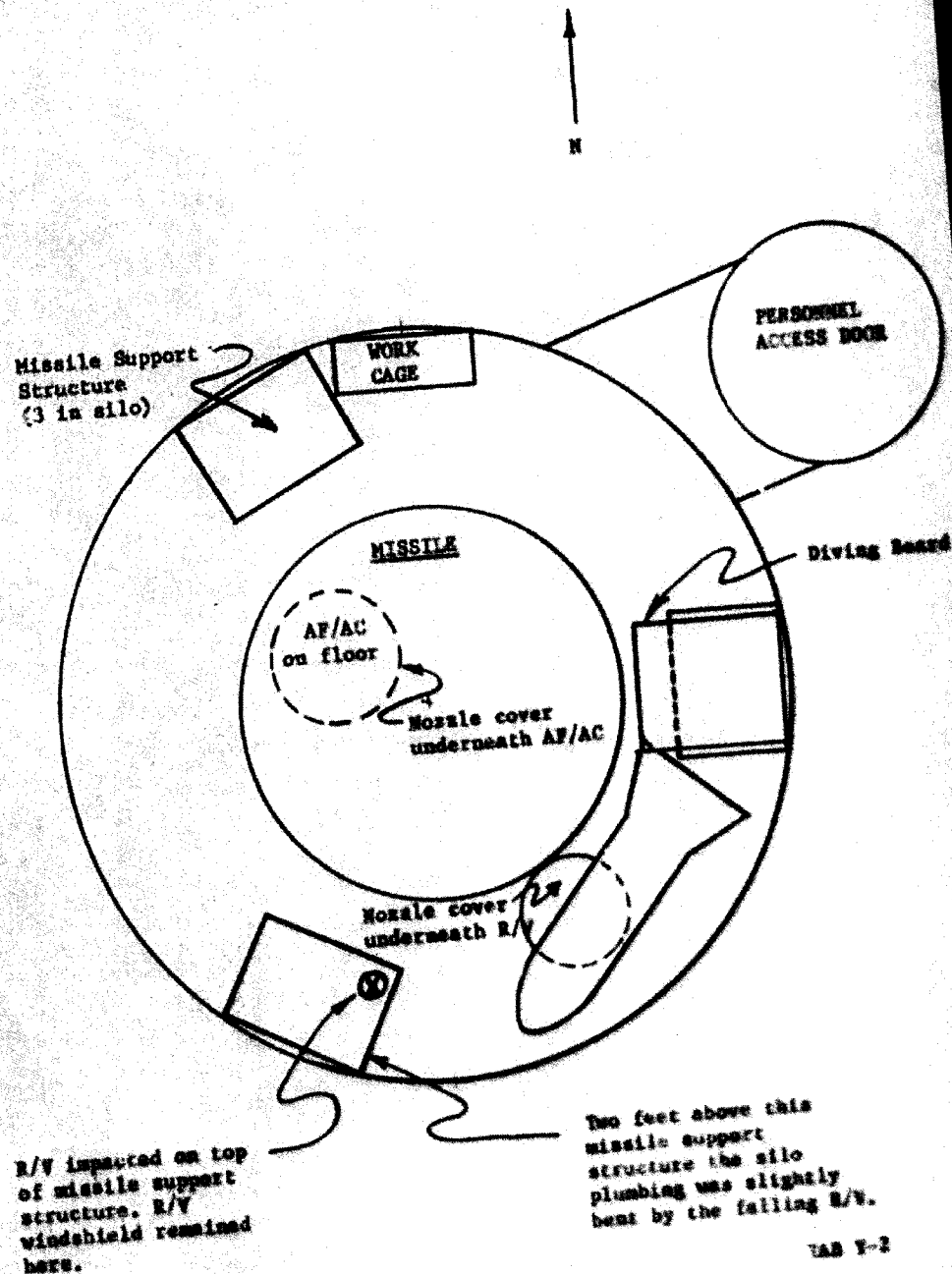
TAB W-5

Page 1 of 1 page

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SILO FLOOR LOCATION OF R/V DEBRIS



TAB Y-2

Page 1 of 1 page

TRAJECTORY OF R/V

1. R/V lifted by firing of retro-rocket
2. R/V hinges at approx 160° pt on R/V and noses over.
3. R/V grazes wall of silo

4. R/V grazes side of 2nd stage mtr. (very slight)

5. R/V grazes base of 2nd stage mtr and interstage junctions

6. R/V impacts with one of three vertical support members (16' high) which hold the the missile support ring.

7. R/V rebounds and flare section hits 2nd of three vertical support members and slams to the floor flare first.

8. R/V rests in horizontal position against the wall with the aft end of the R/V butted against the vertical support member.

FALLING PATH OF RV

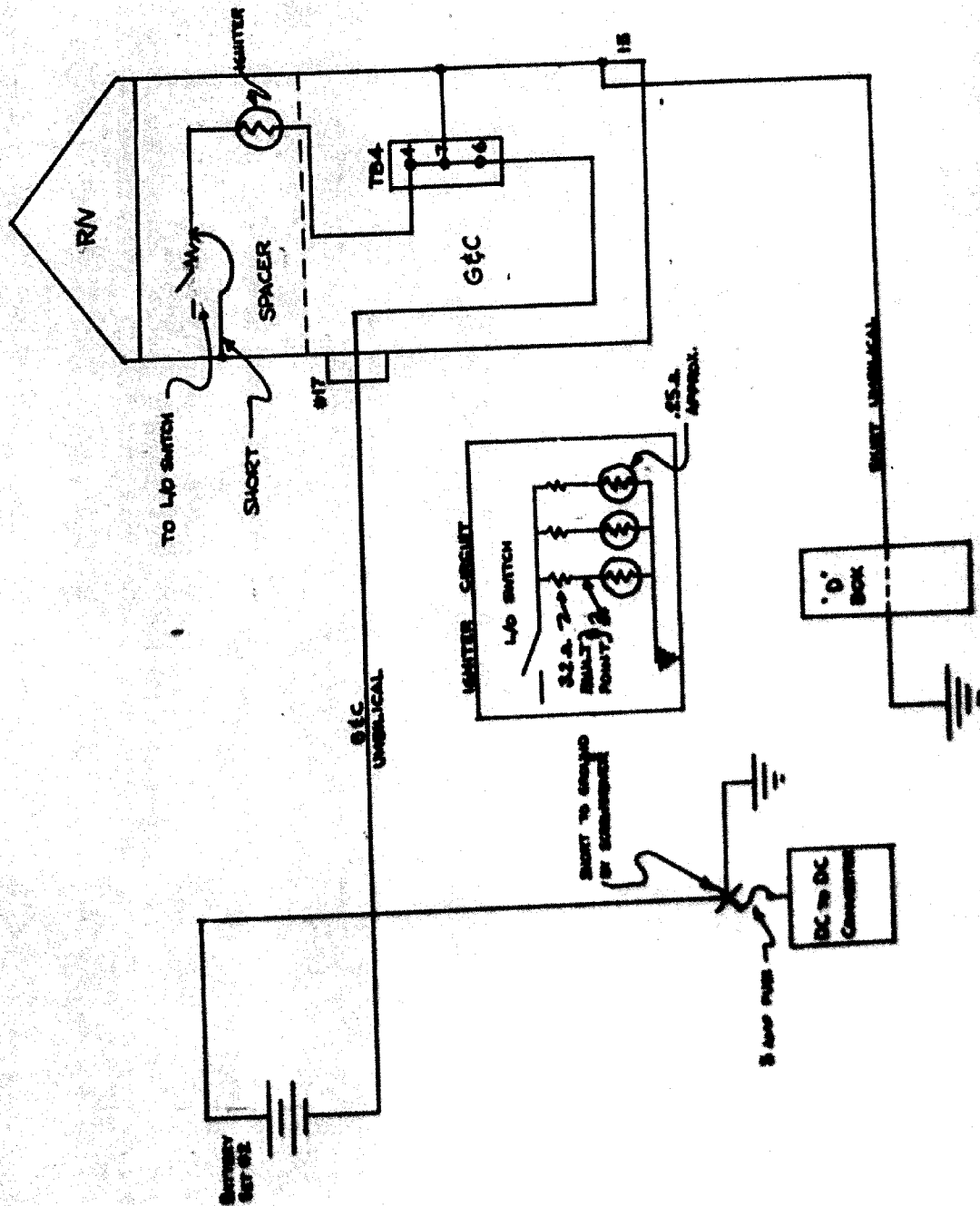
TAB Y-3

Page 1 of 1 page

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DIAGRAM OF FAULT CIRCUIT



D/S 1-4

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Page 1 of . Page

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44 Missile Maintenance Squadron
44 Strategic Missile Wing (SAC)
UNITED STATES AIR FORCE
Ellsworth Air Force Base, South Dakota

REPLY TO
ATTN OF: 44MIMSM-MA

18 December 1964

SUBJECT: Multimeter

TO: Chairman
15AF Accident Investigation Board

1. This is to certify that multimeter ME-70A/PSM-6, AF04(694)107, serial number 5 was given a functional check by Base FMEL as directed on 17 December 1964.
2. The multimeter was found to be free from defect and recertified.

(b) (6)

(b) (6)

Major, USAF
OIC, E & E Supervision

CERTIFIED TRUE COPY:

(b) (6)

Lt Col, USAF
Recorder

Appendix 7

Attachment 3

TAB W-11

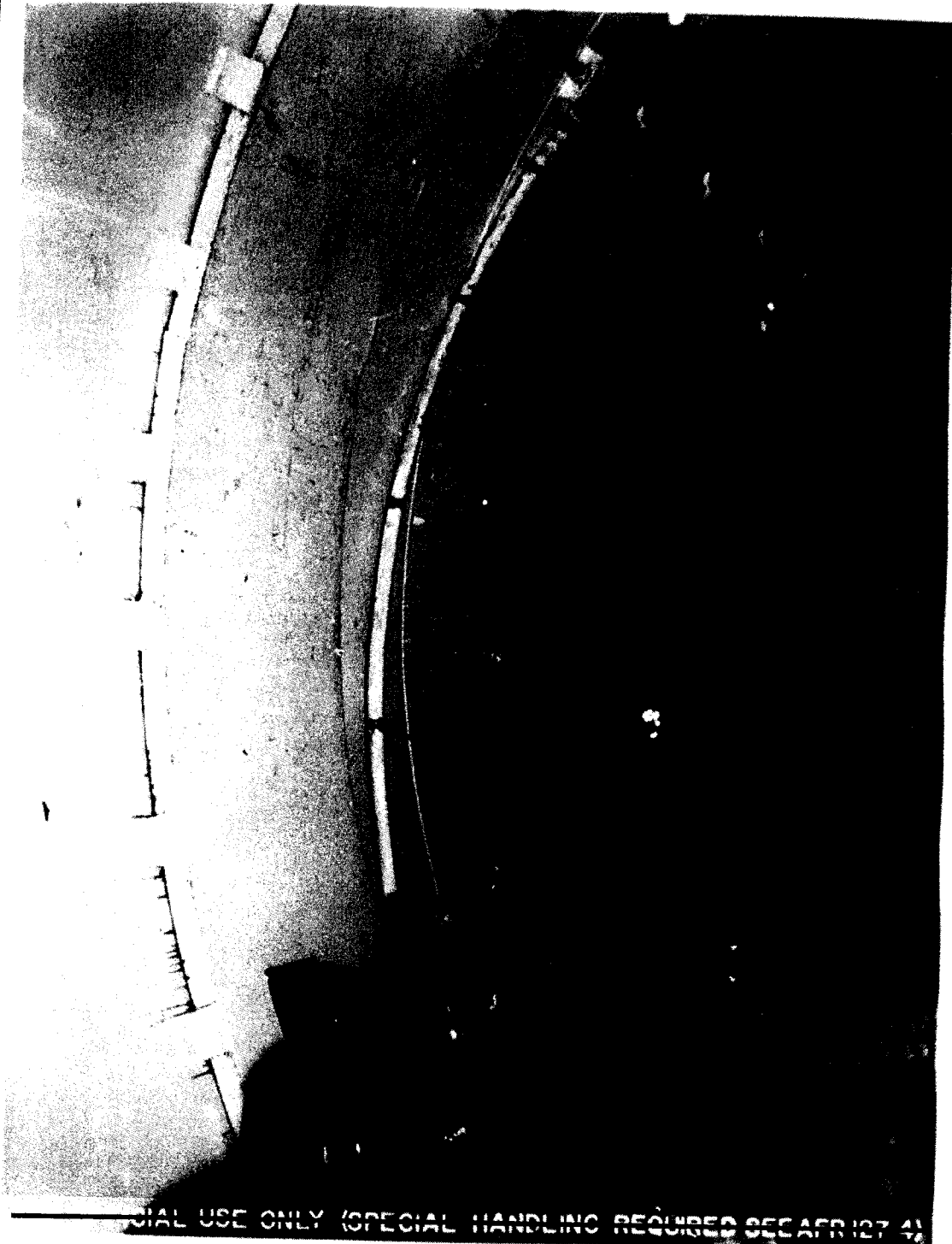
Page 1 of 1 page

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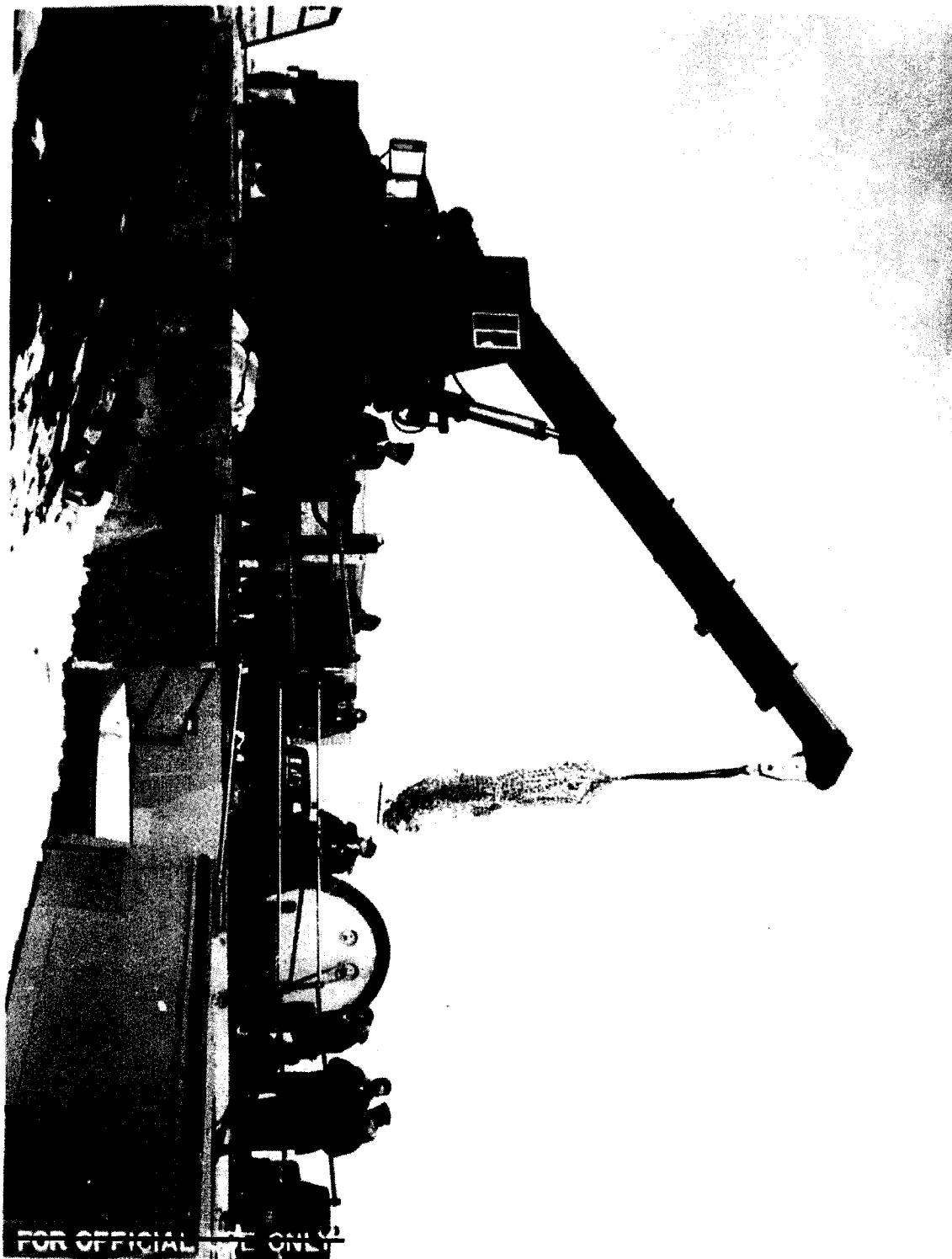


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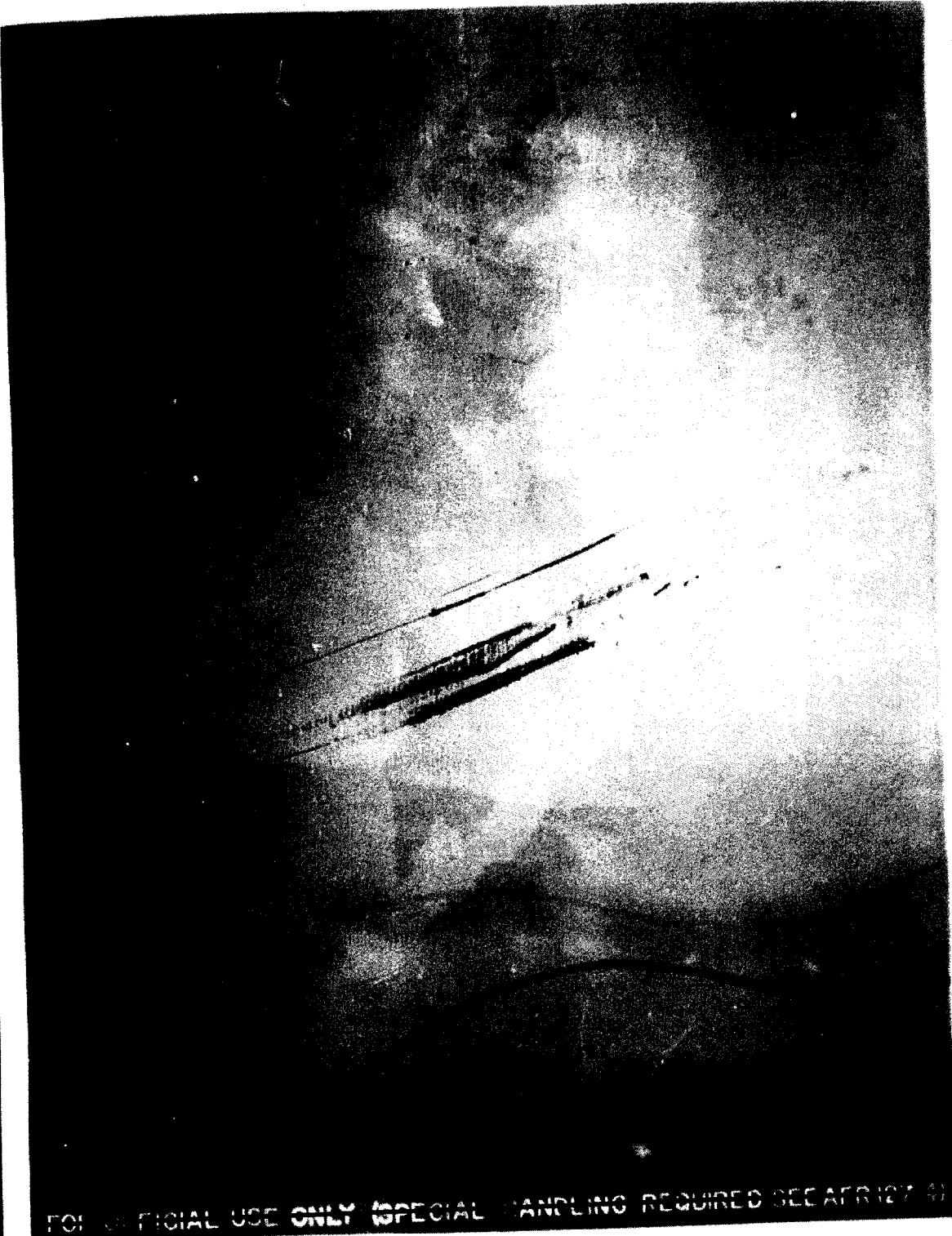


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TAB 2-24



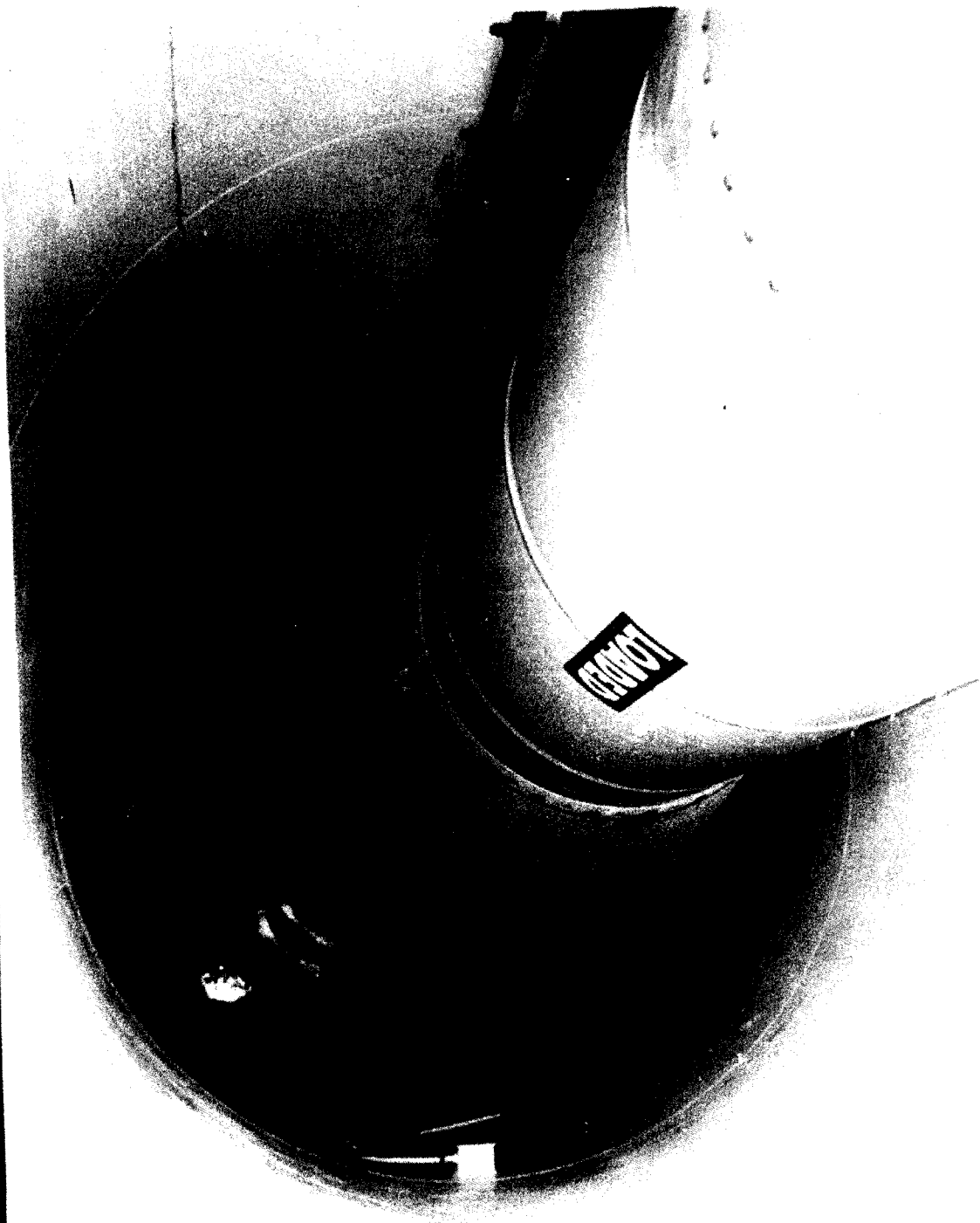
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TAB Z-13



TAB Z-46

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TAB 2-10

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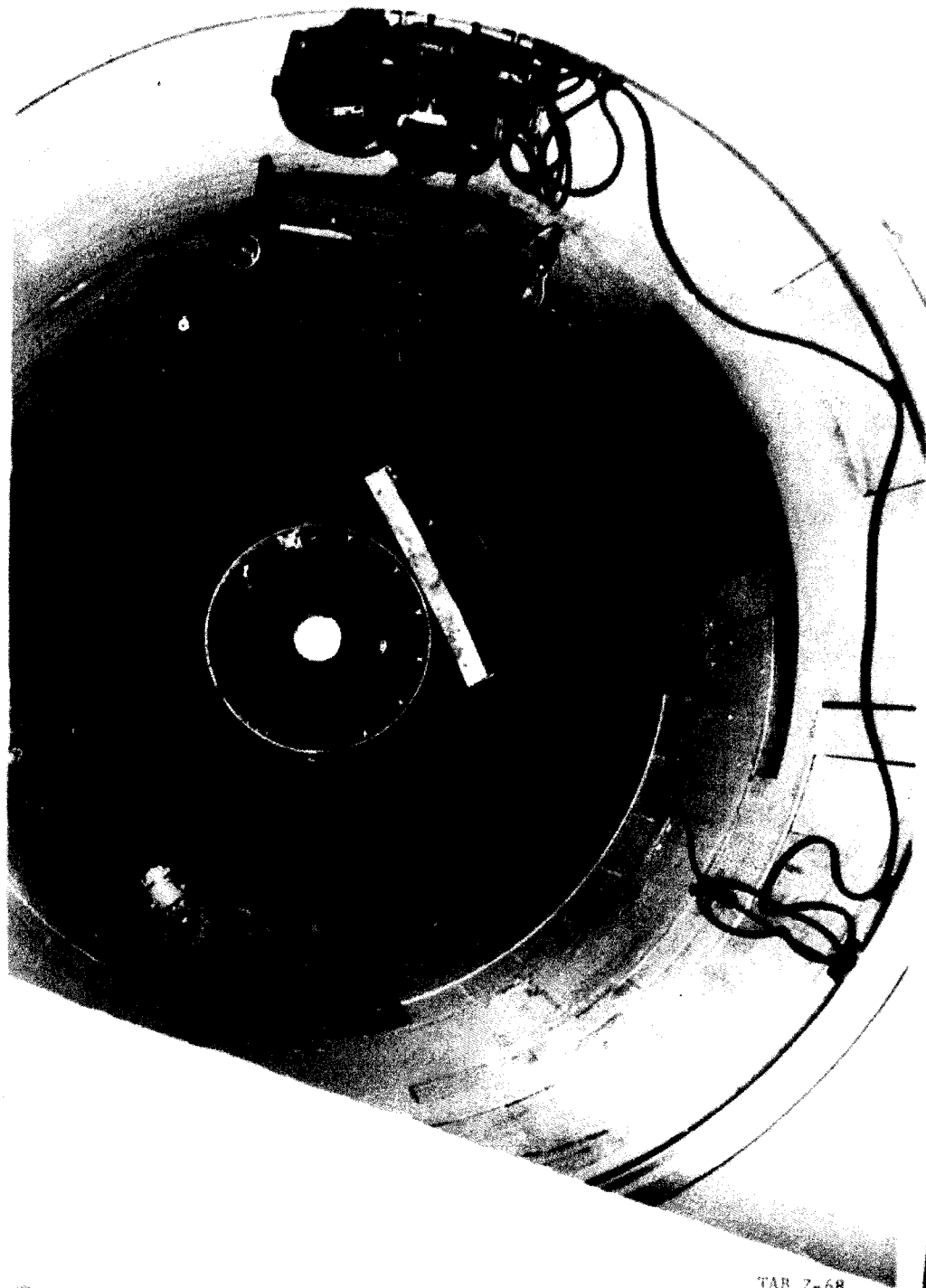
TAB 2 47

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Removed by direction of
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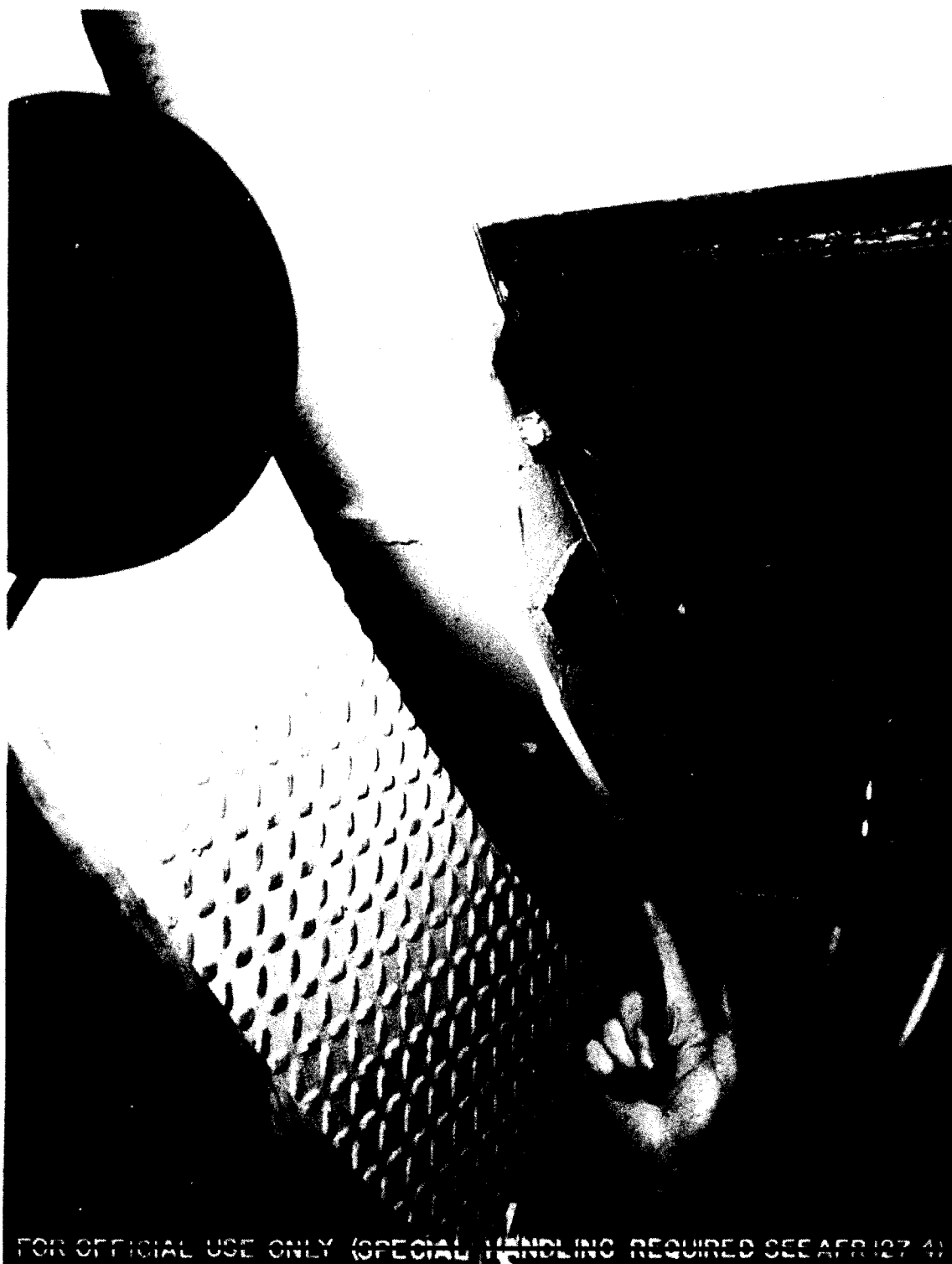
DAB 7-48



TAB Z-68

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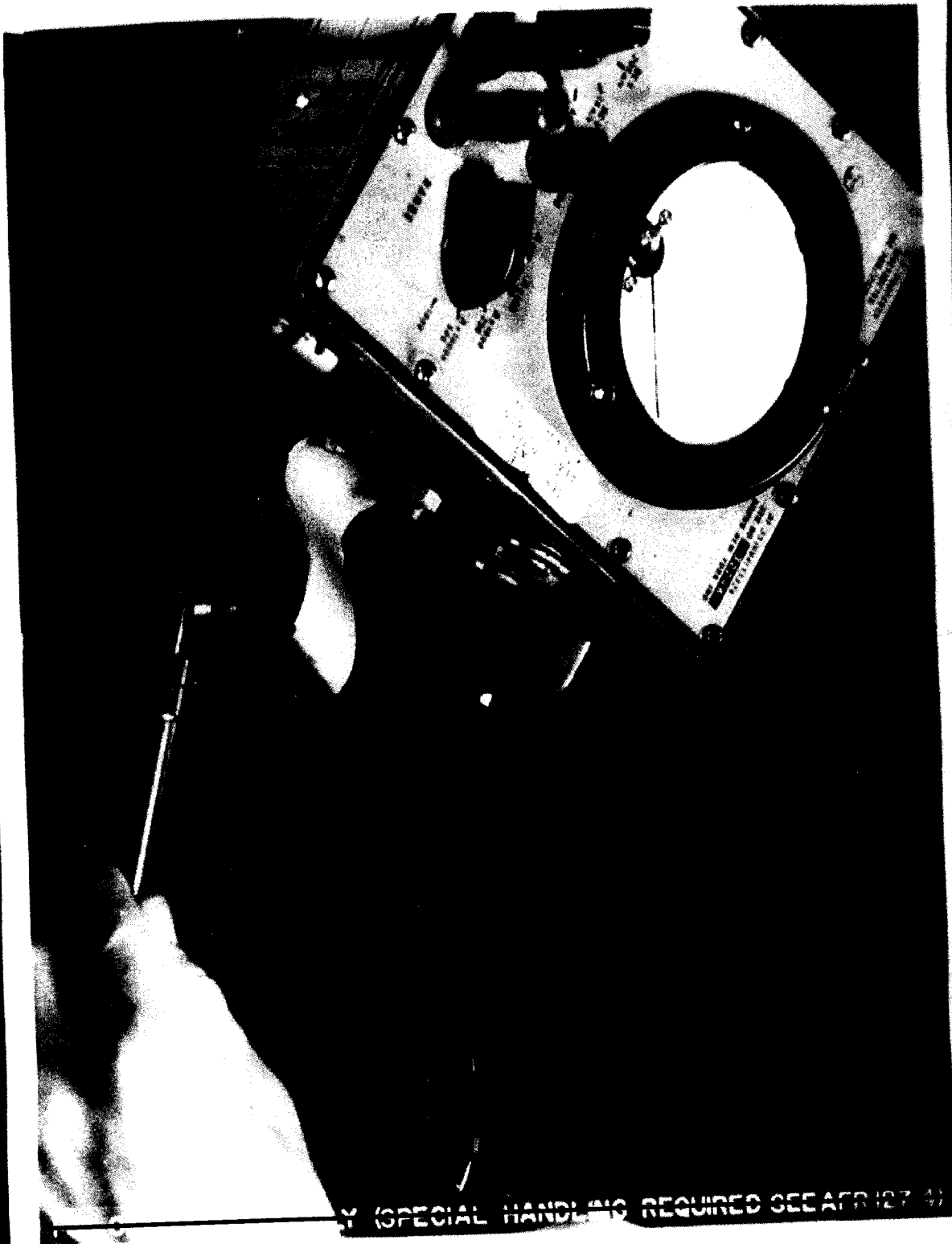
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TAB 2-72



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TAB 2-74



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TAB Z-75



SOLDER TOUCHING CONNECTOR CASE

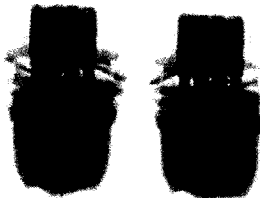
IN RED RETRO CABLE CONNECTOR

FOR RETRO CABLE CONNECTOR

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TAB Z-79

NO RED RETRO CABLE CONNECTOR



SOLDER TOUCHING CONNECTOR CASE

NO RED RETRO CABLE CONNECTOR

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~~REQUIRED SF~~

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TAB 7-81

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~~NO REQUIRED SE - APR 1974~~