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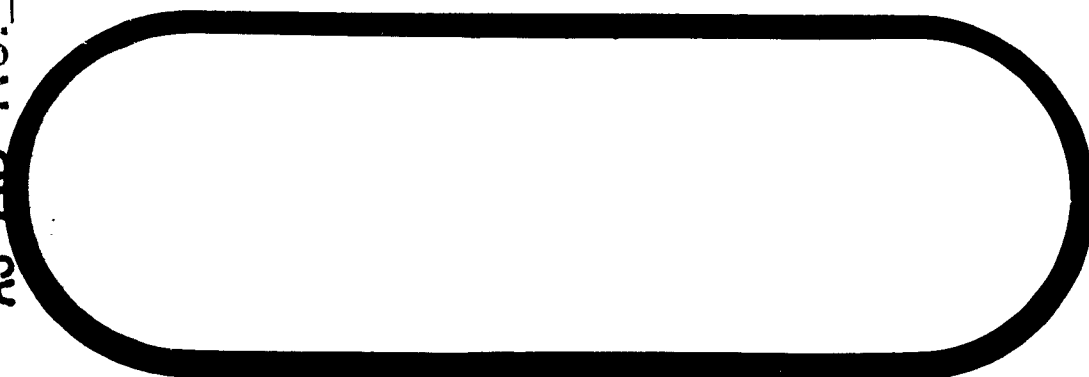
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THE **BOEING** COMPANY

CODE IDENT NO. 81205

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NUMBER D2-14934-5

TITLE WS-133A Maintainability Progress Report (U)

MODEL NO. SM-80A
WS-133A CONTRACT NO. AF04(648)-289

ISSUE NO. 15 ISSUED TO Astia

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FOREWORD

This document, D2-14934-5, entitled "WS-133A Maintainability Progress Report", is submitted to BSD/STL in accordance with the requirements of Technical Directive 62-4488, "Maintainability Requirement Program," dated 28 May 1962.



REFERENCES

- a. MIL-M-26512B, "Maintainability Requirements for Aerospace Systems and Equipment," dated 23 March 1962.
- b. 6120-7822-DU-RD1, "Maintainability Criteria, Preliminary," dated 16 March 1962.
- c. T. D. 62-4488, "Maintainability Requirements Program," dated 28 May 1962.
- d. CCN 448, dated 28 May 1962.
- e. CCP 803, dated 5 October 1962.
- f. D2-14475, "WS-133A Maintainability Program Plan."
- g. D2-4747-1, "Maintainability Design Criteria for Minuteman Electronic Equipment."
- h. D2-4747-2, "Maintainability Design Criteria for Minuteman Transportation and Handling Equipment."
- i. D2-4747-3, "Maintainability Design Criteria for Minuteman Facilities and Facilities Equipment."
- j. Boeing letter 2-5261-2-249, dated December 20, 1962, with enclosure, "List of WS-133A Equipment Selected for Maintainability Demonstrations."
- h. D2-14256 "Minuteman Maintainability Guide for Design Criteria."

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1.0 SCOPE

This document constitutes The Boeing Company's monthly status report to the Air Force on Maintainability Activities pertaining to the WS-133A Minuteman Weapon System. The Maintainability Program is a contractual obligation of The Boeing Company under CCN 448 of Contract Number AF 04(648)-289.

2.0 PURPOSE

The Air Force has requested that The Boeing Company develop Maintainability Criteria and conduct a Maintainability Program in accordance with this criteria. This is being accomplished in accordance with the WS-133A Maintainability Program Plan (D2-14475) based on the requirements set forth in MIL-M-26512B as amended by Technical Directive 62-4488.

The purpose of this document is to report to the appropriate Air Force agencies the progress achieved in execution of the Maintainability Plan and to detail the work accomplished during the reporting period.

3.0 INTRODUCTION

This document is the fifth of the monthly reports that outline the progress achieved by the contractor in the WS-133A Maintainability Program. The first report covered the period from 18 October 1962 thru 31 December 1962. Each succeeding report covers a monthly period from the first thru the last day of each month. This report covers the month of April 1963.

The Maintainability Program Plan for the Minuteman Weapon System is two-fold; it provides both a Design Review and Evaluation Plan and a Test and Demonstration Plan. The monthly reports contain status of progress and problem areas encountered in each of these plans.



4.0 MAINTAINABILITY REVIEW AND EVALUATION

4.1 MAINTAINABILITY REVIEWS

4.1.1 Program

As part of the Maintainability (M) effort under CCP-803 and the WS-133A Maintainability Program Plan (D2-14475), specific figure "A" items are being reviewed for M and soldering in accordance with criteria as specified in 6120-7822-DU-RD1. Major M problem areas revealed by these reviews are reported through initiation of a Maintainability Action Request (MAR). Minor M problems of the product improvement type are reported to the Design Project through a Maintainability Review Report (MRR).

4.1.2 Figure "A" Items To Be Reviewed

a) The following figure "A" items were selected by the customer for M review:

- 1) 1207 Drier, Air Compressor;
- 2) 1281 Fault Locator Set, AN/GSM-69;
- 3) 1288 Battery, Storage;
- 4) 1337 Distribution Box;
- 5) 1338 Console, Communications Control;
- 6) 1367 Motor/Generator, PU-521;
- 7) 1380 Distribution Box;
- 8) 1385 Distribution Box;
- 9) 1412 Signal Assembly, Voice Reporting;
- 10) 1423 Antenna Group, AN/GRA-72;
- 11) 1424 Antenna, AS-1213/GRC-113;
- 12) 1425 Antenna System, H.F., Receiving & Transmitting;
- 13) 1425 Antenna, H.F., Transmitting, Hardened;

4.1.2 (Continued)

- 14) 1607 Security and Alarm Set;
 - 15) 3007 Test-Set, Explosive Set Circuitry;
 - 16) 3092 Test-Set, Programmer Group;
 - 17) 4018 Adapter AN/GSM-61;
 - 18) 4043 Elevator, Work Cage;
 - 19) 4152 Test Equipment; Electrical Facility, Base Maintenance;
 - 20) 4220 Test-Set, Relay;
 - 21) 4252 CIV Set, AN/GSQ-65;
 - 22) 4344 Fault Locator, SCN Cable;
 - 23) 4451 Controller, Azimuth Drive;
 - 24) 4487 Command Signal Simulator;
 - 25) 4489 Simulator Set, Electrical Functions;
 - 27) 4491 Start-Up Unit;
 - 28) 4515 Static Frequency Changer;
 - 29) 4523 Common Power Supply;
 - 30) 4539 Test-Set, VRSA;
 - 31) 4601 Function Simulator; H.F./UHF Radio;
 - 32) 4632 Test-Set, Electric Power, LF;
 - 33) 4633 Test-Set, Electric Power, LCF.
- b) The Minutes of the Maintainability Review Meetings held at Boeing on 9 January 1962, and at RCA, on 16 January 1962 (file

4.1.2 (Continued)

No. 2-6331-0-366, dated 7 February 1962) listed certain figure "A" items which were not reviewed due to non-availability of hardware. These items are being reviewed on a schedule compatible with equipment availability.

- c) Other figure "A" items are being reviewed as problem areas are identified by review of Field Service Reports, System Test Action Requests, Unsatisfactory Reports, M Evaluation/Observation (E/O) Reports, and other field reports prepared by Boeing organizations.

4.2 MAINTAINABILITY ACTION REQUESTS (MAR)

During this reporting period, the following MAR was completed:

1-1283-A1 rev. 1, Motor-Generator Set, Launch Facility.

Status of all MAR's initiated to date is contained in the MAR Status Summary Chart (See Section 6.2).

4.3 MAINTAINABILITY REVIEW REPORTS (MRR)

During the reporting period, MRR's on the following equipments were completed:

- a) Test Equipment, Electronic Facility, Figure A 4152;
- b) Electrical Load Bank, Figure A 4167.

The MRR's have been forwarded to the cognizant design group for consideration as product improvement items. (See Maintainability Review Status Summary Chart Section 6.1).



4.4 FIELD LIAISON REPORTS

Surveillance of operational activities to obtain additional Maintainability data is being accomplished thru review of STAR's (System Test Action Requests), FSR's (Field Service Reports), UR's (Unsatisfactory Reports), and BIAR's (Base Installation Action Requests). During the reporting period, six (6) STAR's and five (5) FSR's have been reviewed for Maintainability implications.

4.4.1 MAINTAINABILITY SURVEILLANCE

In those cases where reviews indicate a maintainability problem **M** Engineers are assigned to work the problem with the design organization. If the proposed solutions to problems reported thru the above Field Liaison Reports do not satisfy maintainability requirements then a MAR or MRR will be initiated as appropriate.

5.0 MAINTAINABILITY TEST AND DEMONSTRATION

5.1 TEST AND DEMONSTRATION PLAN

Tests and performance demonstrations already scheduled for other purposes at the STP III installation, Vandenberg Air Force Base, and Minuteman Wing installations are being utilized to provide as many Maintainability demonstrations as possible. Maintainability Engineers are participating in those tests and demonstrations which have inherent Maintainability significance, and are documenting their observations.

Equipment items with Maintainability features having major impact upon the operation and maintenance of the Weapon System have been selected. Only demonstrations involving these items are being documented, pending both BSD approval of the equipment list and contractual coverage of any additional tests considered necessary by the Customer.

5.2 TEST AND DEMONSTRATION EQUIPMENT LIST

The "List of WS-133A Equipment Selected for Maintainability Demonstrations" was transmitted to BSD by letter 2-5261-2-249, dated December 20, 1962. This list identified applicable maintenance operations which may be observed during remaining scheduled test and demonstration activities, to provide Maintainability demonstrations of the selected Figure "A" equipment items. It also identified, for each selected equipment item, those maintenance operations which should be demonstrated but were not at that time known to be included within any scheduled test or demonstration.

The "Demonstration Requirements Status Summary" (Section 6.3 of this report) provides monthly amplification and updating of the "List of WS-133A Equipment Selected for Maintainability Demonstrations." It contains a tabulation of the maintenance operations which should be demonstrated for each selected "Figure A" equipment item, and identifies any scheduled events which are known to include these operations. It also contains a completion record, which provides completion dates and observer report numbers for all demonstrations which have been accomplished during current and previous reporting periods.

Maintainability Engineers will continue to participate in the scheduled demonstration events listed in the "Demonstration Requirements Status Summary," pending further direction from BSD.



5.3 MAINTAINABILITY EVALUATION/OBSERVATION (E/O) REPORTS

E/O Reports are prepared for both "dynamic" observations of maintenance and "static" evaluation of M design. The reports provide the basis for subsequent corrective action on any observed deficiencies, and are submitted monthly in this document series as a demonstration record.

- a) A "Static" evaluation is a complete visual inspection made on a non-interference basis whenever equipment becomes conveniently available. "Dynamic" observations are made during applicable maintenance operations using actual equipment. In either case an E/O Report documents the demonstration results.
- b) Each completed E/O Report is evaluated by the Maintainability Engineers who have Maintainability-review responsibility for the specific "Figure A" items of equipment identified in the report. When Maintainability deficiencies are identified in a report, MAR's and/or MRR's are initiated for appropriate action.
- c) Five E/O Reports were written during the period covered by this document: They were prepared by the Maintainability Engineers who participated in the M demonstrations. The reports are contained in Section 6.4.

6.0 REPORTS

This section contains status charts, copies of Maintainability Action Requests (MAR's), and Maintainability Evaluation/Observation (E/O) Reports.

6.1 MAINTAINABILITY REVIEW STATUS SUMMARY

The Maintainability Review Status Chart contains an up-to-date summary of all Figure A equipments reviewed in accordance with the discussion contained in Section 4. As additional Figure A items are reviewed they will be entered on this chart with notations as to action taken and date review is completed. This chart will be revised and reproduced for inclusion in each succeeding Progress Report.

MAINTAINABILITY REVIEW STATUS CHART

FIG. 'A' NO.	SUBJECT	ACTION REPORT		DATE REVIEW COMPLETED
		M AR NO.	M RR NO.	
1367	Motor-Generator, PU-521 (LCF)	3-1282-A1	1-1367	December 14, 1962
1282/1288	Battery Storage		2-1282	December 14, 1962
1243/1338	Consoles (telephone & transmitter control)		3-1243	December 14, 1962
1369	Antenna Set		4-1369	December 14, 1962
4488	Decoder Kit	1-1283-A1	5-4488	December 14, 1962
1283	Motor-Generator, PU-515		6-1283	December 21, 1962
4252	Code Insert-Verifier Set		7-4252	December 21, 1962
1370	Lighting Equipment Group		8-1370	December 21, 1962
1201	Programmer Group		9-1201	December 21, 1962
4523	Common Power Supply		10-4523	December 24, 1962
3109	Alarm Set Test Set		11-3109	January 8, 1963
Various	Electrical Equipment Cases, MGE		12-MGE	January 18, 1963
1337	Distribution Box J-1296		13-1337	January 23, 1963
1412	Voice Reporting Signal Assembly		14-1412	January 21, 1963
6950	HSM-80C Section 49 Skirt		15-6950	January 22, 1963
1380	Distribution Box, J-1312		16-1380	January 23, 1963
3007	Test Set, Explosive Set Circuitry	2-7724-A1	17-3007	January 29, 1963
7724	NCU Zero Alignment Test Set			January 22, 1963
4018	Test Adapter Group		18-4018	February 7, 1963
4491	Start-Up Unit, LF		19-4491	February 26, 1963
3092	Test Set, Programmer Group		20-3092	February 25, 1963
4490	Simulator Set Missile Launch		21-4490	February 26, 1963
1373/1374	Electric Surge Attensor		22-1373	March 6, 1963
3109	Test Set, Alarm Set, GSM-59		23-3109 revA	March 5, 1963
3013	Test Set, Consoles		24-3013	March 12, 1963
4388	Test Set, Telephone, GTM-3		25-4388	March 21, 1963
4152	Test Equipment, Electronic Facility		26-4152	April 16, 1963
4167	Electrical Load Bank		27-4167	April 17, 1963

6.2 MAR STATUS SUMMARY

The MAR Status Chart contains an up-to-date list of MAR's issued and the current status of each MAR. Copies of MAR's will be included in each monthly progress report, until such time as they are considered closed. MAR's requiring no further consideration by either the originating engineer or the organization responsible for corrective action will be closed. This status is assigned by the MAR originator only when one of the following has been achieved:

- a) An authorized hardware, procedure, specification or other corrective action has been found to satisfy the MAR problem;
- b) The organization responsible for action rejects the request for corrective action and the MAR originator concurs with reasons given for the rejection.
- c) The MAR originator considers that the MAR requires no further action because of related actions taken, events occurring, or status changing after initiation of the MAR.

6.2.1 MAR #1-1283-A1 Rev. 1 was issued and "closed" out, during this reporting period. The MAR was "closed" by the maintainability engineer because of the following status and actions, as reported by the equipment manager:

- a) PPR #11646 provides M-G Set start-up and shutdown procedure placards at all bases as A & CO items;
- b) A "capsulated" starting and stopping procedure is being provided on the M-G Sets, American Electronics Inc. part no. 302 405. The correct stopping procedure is part no. 102282 revision C and the correct starting procedure is part no. 101670 revision D;
- c) The 10-20945-2 M-G Set used in the launch control facility of Wing II and on has a disconnect device to prevent DC motor starting of the M-G Set.



MAR STATUS CHART

MAR NO,	SUBJECT	DATE ISSUED	STATUS
1-1283-A1 Rev.1 2-7724-A1 3-1282-A1	DC Drive Motor Disconnect, M-G Set NCU Zero Alignment Test Set Launch Facility Battery Shock Mounts	March 20, 1963 January 22, 1963 December 5, 1962	Closed* Closed Closed

*MAR copies follow this chart.



MAINTAINABILITY ACTION REQUEST

WS-133 WEAPON SYSTEM



The Boeing Company
Aero-Space Division
Seattle Washington
MAINTAINABILITY GROUP

Organization 2-5261-30
Mail Stop 50-66
Telephone JU6-6263

ROUTING

ACTION: E. L. Strum
ORGAN. 2-6522
M.S. 52-28

CC: K. Niebauer 52-26
J. E. Ercolini 52-26
D. A. Cole 43-86
J. M. Barker 50-66
E. S. Whitney 50-66

PAGE: 1

M A R No. 1-1283-A1 Rev.

DATE: March 20, 1963

DATE REPLY DUE:

April 25, 1963

FIGURE A NO. 1283 SYSTEM LF Electrical Power SUBSYSTEM Motor-Generator Set

Statement of Problem: The Launch Facility Motor-Generator Set, Figure A 1283, does not have a disconnect device for input power to the DC drive motor. DC power to the Motor-Generator Set is applied and removed by making or breaking the energized contacts of receptacle J2 and plug P2. Contact failures will result unless the application and removal of DC power is made in a specified sequence. Improper connection or removal of the DC input will result in failure of the plug and the Motor-Generator's DC receptacle. Ten failures at MAFB, seven at VAFB, two at CAFB, and three at STP III have resulted from improper application and removal of DC power to the Motor-Generator.

Emphasis on the correct procedure has reduced A & CO failures, however an instruction placard to ensure that SAC maintenance teams and Boeing A & CO personnel at upstream Minuteman bases use the correct procedure is needed on the Motor-Generator control panel.

Recommendation:

Provide a permanent "WARNING" placard on the control assembly of the Motor-Generator. Instructions on the placard would refer the maintenance technician to T.O. 21-SM80A-2-11 for the correct startup and shutdown procedures. The same placard can be placed on the LCC Motor-Generator Set. Advantages of the placard proposed are simplicity and no need to update due to equipment changes.

ATTACHMENTS:

Cost Effectiveness Summary
M Cost Study
References
Recommended Placard

Minuteman Finance
J. Niederkrome

Minuteman System Analysis
R. B. Grobe

M Engineer: A. Henschel
A. Henschel

Approved by: D. Heck
D. Heck

Approved by:

Recommended Placard

WARNING

Current dangerous to human life and equipment will exist if proper startup and shutdown procedures are not used for this Motor-Generator. Refer to T.O. 21-SM80A-2-11 for the correct procedures.

COST EFFECTIVENESS SUMMARY

WEAPON SYSTEM ELEMENTS

☐ Missile
☐ Launch Control Facility
☒ Launch Facility
☒ OGE
☐ MGE
☐ RPIE

CHANGE TASKS AND FUNCTIONS

☒ ECP Processing (or PRR)
☐ Research and development
☒ Retrofit and TCTO
☐ Special change-retrofit equipment
☐ Publications and drawings
☐ Figure A, forms B, C, C-1 changes
☒ Manufacturing changes
☐ Hardware changes
☐ Mandatory, "make-work" changes
☐ Customer directed
☒ Boeing initiated

LOGISTIC SUPPORT

☐ Maintenance loading & time lines
☐ Manhours and personnel requirements
☐ Crew-vehicle hours and trips
☐ "On-site" vs SMSB vs Depot repair
☐ Spares
☐ Test and maintenance equipment
☐ Training
☐ Transportation
☐ Supply functions

OPERATIONAL FACTORS

☒ Downtime or availability
☐ Reliability
☐ Standardization & interchangeability
☐ Compatibility (PAS, 465L, radio nets power, GFE, test equipment, etc.)
☐ Interfaces and secondary faults
☐ Schedule impact
☒ Safety and hazards
☒ Human factors (MIL-STD-803)

NOTE: This is a preliminary cost study to ascertain if the M proposal will result in a savings to the customer. Values used are gross figures and do not constitute official Boeing cost estimates. Their use is limited to planning purposes and trade studies for this M proposal.

Cost of Maintenance

\$56,196/year

\$561,960/ 10 years

Cost of Placards

\$40,000 initial cost

\$40,000 total cost

Savings

\$16,196/1st year

\$521,960 total savings

See accompanying M Cost Study for calculation of above figures.

M COST STUDY

Given Information and Assumptions

- 1.) Cost of crew-vehicle hour = \$68/hour
- 2.) Cost of missile downtime/hour = \$90/hour
- 3.) Cost of W715 connector = \$150
- 4.) 15 hours to correct a DC input connector failure.
- 5.) Motor-Generator Sets will be recycled for overhaul every three years.
- 6.) New SAC maintenance personnel will constantly cycle into the Weapon System due to Air Force personnel leaving the service.
- 7.) Failures can be reduced by 95% if the correct motor-generator start-up and shutdown procedures are used. (Assumption based on MAFB A&CO experience)
- 8.) Cost Study will be based on projected failures which are based upon the failure rate that has occurred.
- 9.) This study is based on an assumed 10-year period.

Cost Calculation

A. Cost of Maintenance to customer over a 10-year period.

- 1.) Failures due to procedure short cuts and correct procedure not being followed.

10 per AFB during A & CO (Assumed - MAFB & VAFB failures as a basis)
39 per AFB per 10 years (see attached graph) - Assumed failures

total failures (5 AF Bases)

A & CO 10 x 4 (Malmstrom won't be counted, failures have already occurred) = 40 A & CO failures.

Failure during
SAC Maintenance 39 x 5 = 195 SAC failures
Total = 235

95% can be prevented by the instruction placard .95 (235) = 223
preventable failures

- 2.) Cost of each failure:

15 hours/failure x \$68/crew-vehicle hr. = \$1020/failure (manhours)

2. (Continued)

15 hours/failure x \$90/missile hour = \$1350/failure (missile downtime)

1 connector/failure = \$150

Total \$2520/failure

3. Cost of failures (10 year period)

223 failures x \$2520/failure = \$561,960

8 Cost of placards for M-G sets

800 placards are needed

Assume a nominal cost of

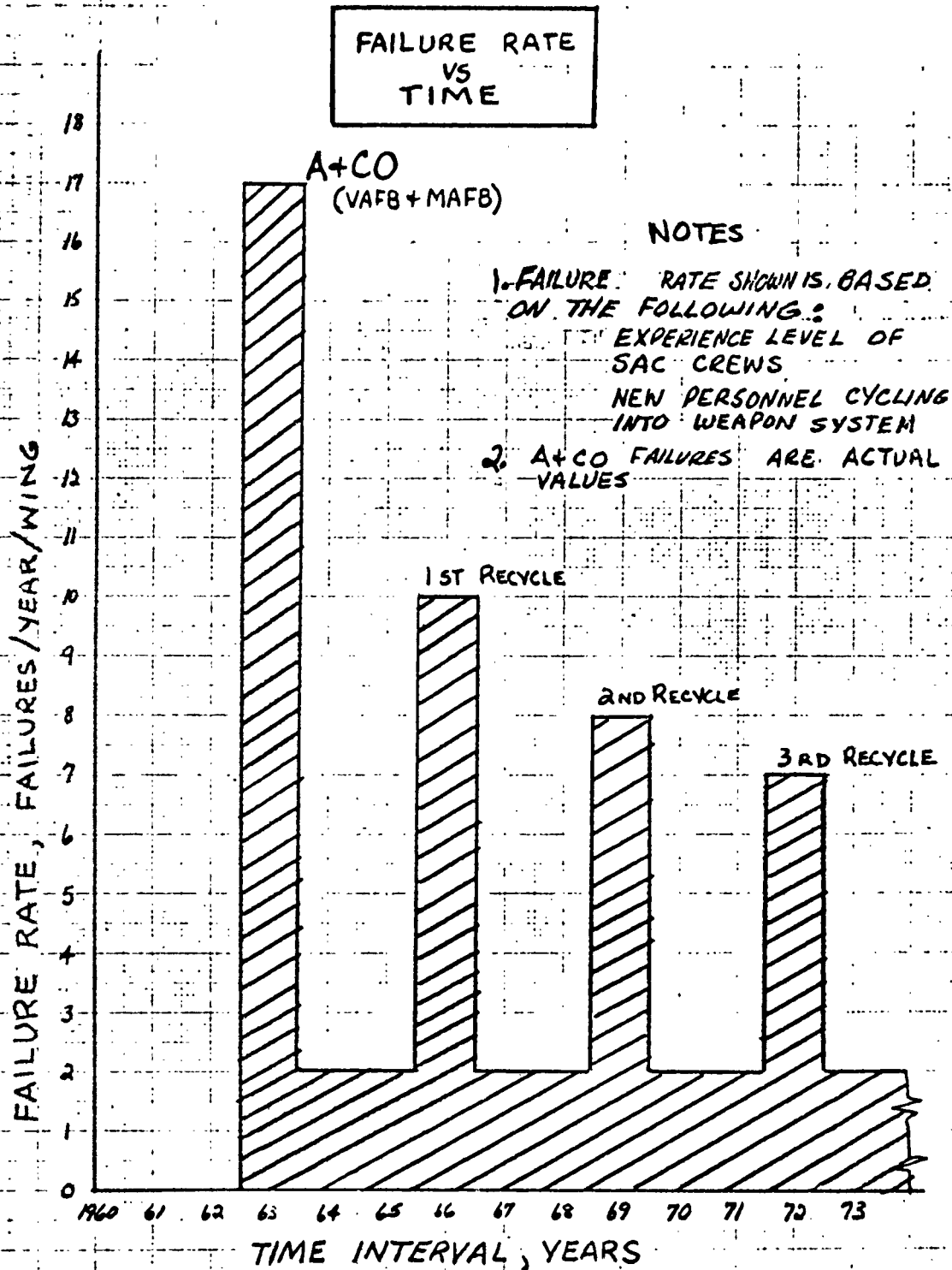
\$50/LF to properly placard

Cost = \$40,000

Weapons System savings - maintenance only

Cost of failures - cost of fix = savings

\$561,960 - \$40,000 = \$521,960



CALC			REVISED	DATE	PROJECTED FAILURE RATE LF MOTOR-GENERATOR D-C INPUT CABLE - MALMSTOM	
CHECK						
APR						
APR						
By:	Henschel	3-21-3			THE BOEING COMPANY	PAGE

- 21.) FR 038817, Plug P02 to Motor-Generator Set is burnt , CAFB T-11, October 17, 1962.
- 22.) FR 056897, DC Input recepticle pins are burnt, MAFB A-09, July 27, 1962.
- 23.) FR 056899, DC Input Plug of cable W715 is damaged, MAFB A-09, July 27, 1962.
- 24.) FR 065833, DC Input recepticle pins are burnt, VAFB LF-5, October 17, 1962
- 25.) FR 065818, DC Input recepticle on Motor-Generator are burnt, VAFB LF-2, October 17, 1962.
- 26.) FR 030436, DC Input connector pins are burnt, VAFB LF-4, Oct. 1, 1962.
- 27.) FR 030415, DC Input Connector pins burnt, VAFB LF-4, August 6, 1962.
- 28.) FR 052091, DC Input Connector pins melted, VAFB LF-2, August 3, 1962.
- 29.) FR 046213, DC Input recepticle of Motor-Generator damaged by arc, VAFB LF-4, June 13, 1962.
- 30.) FR 021800, DC Input recepticle burnt, STP III, January 4, 1962.
- 31.) STAR STP-174-T-M, Connection of cable W715 to LF Motor-Generator, April 23, 1962.
- 32.) STAR STP-198-T-M, Connection of cable W715 to LF Motor-Generator, May 10, 1962.
- 33.) BIAR MAFB-100-T Interim Reply, 21-51001 Cable Failures Figure A 1248, Summary and Problem Analysis, February 22, 1963.
- 34.) Excerpts from Synopsis of Electrical/Electronic Problems on Operational Ground Equipment Encountered at VAFB for Period August 1 through October 1, 1962.
- 35.) Memo 2-6545-03-810, Trip Report to Malmstrom AFB, October 2-5, 1962, J. L. Apperson from H. A. Bowman, October 8, 1962.
- 36.) Coordination Sheet ELU/S-1036, Malmstrom AFB LF Motor-Generator Problem, P. T. Wendel from H.A.Bowman, September 13, 1962.
- 37.) D2-7818 Volume 5, Acceptance Functional Test Procedure, Power Supply Group OA-3386/GSW-4, revised February 21, 1963.
- 38.) T.O. 21-SM80A-2-11, revised March 8, 1963.

6.3 DEMONSTRATION REQUIREMENTS STATUS SUMMARY

The following Demonstration Requirements Status Summary contains an up-to-date summary of scheduled maintainability demonstration events for each selected "Figure A" equipment item. Completion dates and E/O Report numbers are listed for those demonstrations which have occurred during the current and previous reporting periods. The Summary also lists those maintenance operations which should be demonstrated but are currently "unscheduled."

DEMONSTRATION REQUIREMENT STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
1201 Programmer Group	Organizational-Level Checkout	Technical Approval Demonstration 1-18, Malmstrom AFB	11-7-62	EO-1201-1	1-18-63			
		Technical Approval Demonstration 1-15, Vandenberg AFB						
	Organization-Level Fault Isolation	Technical Approval Demonstration 1-18, Malmstrom AFB	11-7-62	EO-1201-1	1-18-63			
		Technical Approval Demonstration 1-15 Vandenberg AFB						
	Field-Level Checkout	Verification; T.O. 31X3-12-8-2, par. 7-11, 7-12A, 7-13			3-28-63	EO-1201-2/ 4487-1	4-3-63	
	Drawer A1 (Part No. -55)	Verification; T.O. 31X3-12-8-2, par. 7-11, 7-12A, 7-13			3-28-63	EO-1201-2/ 4487-1	4-3-63	
	Drawer A2	Technical Approval Demonstration 1-14, Malmstrom AFB						
		Technical Approval Demonstration 1-11, Vandenberg AFB						
	(Part No. -44)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13			3-28-63	EO-1201-2/ 4487-1	4-3-63	
	(Part No. -50)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13			3-28-63	EO-1201-2/ 4487-1	4-3-63	
	(Part No. -53)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13			3-28-63	EO-1201-2/ 4487-1	4-3-63	
	(Part No. -54)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13			3-28-63	EO-1201-2/ 4487-1	4-3-63	

DEMONSTRATION, REQUIREMENTS STATEMENT SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(2201)	(Field -Level Checkout)	Drawer A3 (Part No. -49)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -50)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -50)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -59)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		Drawer A4 (Part No. -50)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -63)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -63)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		Drawer A6 (Part No. -40)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -50)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		(Part No. -59)			3-28-63	EO-1201-2/ 4487-1	4-3-63	
		Drawer A7			3-28-63	EO-1201-2/ 4487-1	4-3-63	

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REF. AT NO.	DATE COMPLETED	REPORT NO.	DATE REPORT	
(1201)	Field-Level Drawer A1 Fault Isolation	UNSCHEDULED						
	Drawer A2	Technical Approval Demonstration 1-14, Malmstrom AFB						
	Drawer A3	UNSCHEDULED						
	Drawer A4	UNSCHEDULED						
	Drawer A6	UNSCHEDULED						
	Drawer A7	UNSCHEDULED						
	Organizational-Level Checkout	UNSCHEDULED						
1211 Launcher Environmental Control System	Organizational-Level Fault Isolation	UNSCHEDULED						
	Organizational-Level Adjust- ment	UNSCHEDULED						
	Dampers D-1, D-2	UNSCHEDULED						
	Dampers D-3, D-3A, D-3B	UNSCHEDULED						
	Damper D-4	UNSCHEDULED						
	Damper D-5	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(420)	(Organizational- Level Adjustment) PE-4	Switch PE-2, PE-3, PE-4	UNSCHEDULED					
		Switch PE-5	UNSCHEDULED					
		Pressure Regulator PC-1	UNSCHEDULED					
		Flow Sensor FA-1	UNSCHEDULED					
		Flow Sensor FA-2	UNSCHEDULED					
		Thermostat TC-1	UNSCHEDULED					
		Thermostat TC-4	UNSCHEDULED					
		Thermostat TC-5	UNSCHEDULED					
		Thermostat HL-1	UNSCHEDULED					
		Thermostat TA-1, TA-6	UNSCHEDULED					
		Thermostat TA-2, TA-5	UNSCHEDULED					
		Thermostat TA-4	UNSCHEDULED					
		Low Temp. Cutout	UNSCHEDULED					
		Oil Pressure Cutout	UNSCHEDULED					
		Pressure Reg PRV-2	UNSCHEDULED					

DEMONSTRATION REQUIREMENTS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION ELEMENT	PREVIOUS				CURRENT			
			DATE COMPLETED		REPORT NO.		DATE COMPLETED		REPORT NO.	
			DATE	COMPLETED	NO.	DATE	DATE	COMPLETED	NO.	DATE
(1211)	(Organizational-Level Adjustment)	Restrictors								
		Brine Balancing								
		Air Flow Balancing								
		Emerg. Water Flow Balancing								
	Organizational-Level Calibration	Pressure Gage								
		Temperature Gage								
		Chiller Unit								
		Emerg. Cooling Unit								
	Field-Level Checkout	Misc. Components								
		Chiller Unit								
		Emerg. Cooling Unit								
		Misc. Components								

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(1211)	Field-Level Adjustment	High Pressure Cutout	UNSCHEDULED					
		Low Pressure Cutout	UNSCHEDULED					
		Oil Pressure Cutout	UNSCHEDULED					
		Low Temp. Cutout	UNSCHEDULED					
		Damper D-1	UNSCHEDULED					
		Damper D-2	UNSCHEDULED					
		Switches PE-2, PE-3	UNSCHEDULED					
		Pressure Reg. PC-1	UNSCHEDULED					
		Restrictor RS-1	UNSCHEDULED					
		Pressure Gage	UNSCHEDULED					
		Temp. Gages TG-4, TG-5	UNSCHEDULED					
		Restrictor RS-1A	UNSCHEDULED					
		Switch PR-5A	UNSCHEDULED					
		Switches PE-6A, PE-7A	UNSCHEDULED					
		Thermostat TA-3	UNSCHEDULED					
		Thermostat HL-2	UNSCHEDULED					

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
1213 Command-Status Message Processing Group (LCF)	Organizational-Level Checkout	Revalidat or. T. O. 21-SM8/A-2-3, par. 2-3b thru 2-3j						
	Complete	UNSCHEDULED						
	Organizational Level Fault Isolation	UNSCHEDULED						
	Field-Level Checkout	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7	3-6-63	EO-1213-1/ 1251-3	3-8-63			
	MX-3686 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7						
	MX-3687 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7	3-6-63	EO-1213-4/ 1251-3	3-8-63			
	CV-1243 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7	3-6-63	EO-1213-5/ 1251-3	3-8-63			
	CV-1237 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7						
	MX-3742 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7	3-6-63	EO-1213-1/ 1251-3	3-8-63			
	MU-446 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7	3-6-63	EO-1213-1/ 1251-3	3-8-63			
	CV-1249 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7						
	CV-1250 Drawer	Verification; T. O. 31X2-32-3-2, par. 8-5, 8-7						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
0213	Field-Level Fault Isolation	CV-1236 Drawer						
		MX-3686 Drawer						
		MX-3687 Drawer						
		CV-1243 Drawer						
		CV-1237 Drawer						
		MX-3742 Drawer						
		MU-446 Drawer						
		CV-1249 Drawer						
		CV-1250 Drawer						
	Field-Level Adjustment	CV-1237 Drawer						
	Inspection		3-6-63	EO-1213-4/ 1251-3		3-8-63		
		Verification: T. O. 31X2-32-3-2, par. 13-4						
		UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
1214 Ground Guidance and Control Liquid Cool- ing Equipment	Organizational- System Checkout Level Checkout	UNSCHEDULED Technical Approval Demonstration 1-15, Malmstrom AFB						
	Pump Pack, e Operation	Technical Approval Demonstration 1-12, Vandenberg, AFB						
	Electronic Con- trol Amplifier	UNSCHEDULED						
	Organizational -Level Fault Isolation	UNSCHEDULED Technical Approval Demonstration 1-15, Malmstrom AFB	3-13-63	EO-124-1	3-15-63			
	Remove and Replace Chiller Remove and Replace Pumping Assembly	Technical Approval Demonstration 1-12, Vandenberg, AFB						
	Field-Level Checkout	Technical Approval Demonstration 1-13, Malmstrom AFB						
	Water Chiller	Verification; T. O. 35E9-35-1, par. 3-4						
	Pumping Assem- bly	Verification; T. O. 35E9-35-1, par. 3-21						
	Electronic Con- trol Amplifier	Verification; T. O. 35E9-35-1, par. 3-30						
	Water Chiller	UNSCHEDULED						
Field-Level Fault Isolation	Water Chiller	UNSCHEDULED						
	Pumping Assem- bly	UNSCHEDULED						
	Electronic Con- trol Amplifier	UNSCHEDULED						
Inspection	Water Chiller	UNSCHEDULED						
	Pumping Assem- bly	UNSCHEDULED	3-8-63	EO-1214-1	3-8-63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
1228 Status-Command Message Processing Group (LF)	Organizational-Level Checkout	Technical Approval Demonstration 1-20, Malmstrom AFB Technical Approval Demonstration 1-17, Vandenberg AFB	11-7-62	EO-1228-1	11-24-52			
	Organizational-Level Fault Isolation	Technical Approval Demonstration 1-20, Malmstrom AFB Technical Approval Demonstration 1-17, Vandenberg AFB	11-7-62	EO-1228-1	11-29-52			
	Field-Level Checkout	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	MC-3775 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	MX-3776 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	CV-1254 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	KY-411 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	Field-Level Fault Isolation	UNSCHEDULED						
	MC-3775 Drawer	UNSCHEDULED						
	MX-3776 Drawer	UNSCHEDULED						
	CV-1254 Drawer	UNSCHEDULED						
	KY-411 Drawer	UNSCHEDULED						

1 DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
1243 Launch Control Console	Organizational-Level Checkout	Technical Approval Demonstration 1-22, Ellsworth AFB Technical Approval Demonstration 1-20, Vandenberg AFB	1-29-63	EO-1243-1	1-30-63			
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Field-Level Checkout	Verification; T.O. 31X3-3-9-2-1 p.r. 11-2						
	Telephone Xmr. Control	Verification; T.O. 31X3-3-9-2-1, p.r. 13-3, 13-4, fig. 13-1						
	Field-Level Fault Isolation	UNSCHEDULED						
	Telephone Xmr. Control	UNSCHEDULED						
	Removal, Replacement, and Checkout of Launch Control Panel	Technical Approval Demonstration 1-18, Vandenberg AFB	1-29-63	EO-1243-1	1-30-63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE	DATE COMPLETED	REPORT NO.	DATE
1251 Digital Data Group (LF)	Organizational-Level Checkout	Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-122-1/ 1251-1/4023-1	11-29-62			
	Organizational-Level Fault Isolation	Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-122-1/ 1251-1/4012-1	11-29-62			
	Field-Level Checkout	Verification: T. O. 31X2-32-3-2, par. 18-5, 18-7	3-4-63	EO-125-1/ 4014-4/ 1251-2	1-8-63			
		Verification: T. O. 31X2-32-3-2, par. 18-5, 18-7						
		Verification: T. O. 31X2-32-3-2, par. 18-5, 18-7	3-6-63	EO-1213-1/ 1251-3	3-8-63			
		Verification: T. O. 31X2-32-3-2, par. 8-5, 8-7						
		Verification: T. O. 31X2-32-3-2, par. 8-5, 8-7						
	Field-Level Fault Isolation	UNSCHEDULED						
		UNSCHEDULED						
		UNSCHEDULED						
	Field-Level Adjustment	Verification: T. O. 31X2-32-3-2, par. 29-8 thru Figure 29-4						
		Verification: T. O. 31X2-32-3-2, par. 19-10 thru Fig. 19-6						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
1265 Digital Data Group (L/F)	Organizational- Level Checkout	Revalidation; T. O. 21-SM80A-2-3, par. 2-36 thru 2-39						
	Complete	UNSCHEDULED						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Field-Level Checkout	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-8-63			
	R-1096 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	AM-3159 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-8-63			
	MX-3681 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-8-63			
	MX-3682 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	MX-3683 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	MX-3684 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7						
	MX-3685 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-8-63			
	ID-979 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7	3-25-63					
	R-1131 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-5, 18-7	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-8-63			
	Inspection	UNSCHEDULED	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-8-63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(1265)	Field-Level Fault Isolation	T-869 Drawer	UNSCHEDULED					
		R-1096 Drawer	UNSCHEDULED					
		AM-3159 Drawer	UNSCHEDULED					
		MX-3681 Drawer	UNSCHEDULED					
		MX-3682 Drawer	UNSCHEDULED					
		MX-3683 Drawer	UNSCHEDULED					
		MX-3684 Drawer	UNSCHEDULED					
		MX-3685 Drawer	UNSCHEDULED					
		ID-979 Drawer	UNSCHEDULED					
		R-1131 Drawer	UNSCHEDULED					
	Field-Level Adjustment	T-869 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-13					
		R-1096 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-13 thru fig. 19-7					
		AM-3159 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-13 thru fig. 20-7					
		ID-979 Drawer	Verification; T. O. 31X2-32-3-2, par. 22-8					
		R-1131 Drawer	Verification; T. O. 31X2-32-3-2, par. 18-13 thru fig. 23-3					

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT DATE
1283 Motor-Generator (LF)	Organizational-Level Checkout	Verification; T. O. 21-SM80A-2-II, par. 2-23						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Organizational-Level Brush Adjustment	UNSCHEDULED						
	Organizational-Level Shutdown	Verification; T. O. 21-SM80A-2-II, par. 2-19 thru 2-22	4-20-63	EO-1283-2	3-22-63			
1284 Power Supply Group (LF)	Removal and Replacement	UNSCHEDULED	3-16-63	EO-1283-1	3-19-63			
	Organizational- Voltage and Ckt. Level Checkout Breakers	Verification; T. O. 21-SM80A-2-II, par. 2-26						
	Relays	Verification; T. O. 21-SM80A-2-II, par. 2-27						
	Organizational- Voltage and Ckt. Level Fault Breakers Isolation	UNSCHEDULED						
	Relays	UNSCHEDULED						
	Organizational-Level Shutdown	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
(1284)	Field-Level Checkout (Fig. A 1284 and 1289)	PP-3026 Supply Verification: T.O. 35C2-2-63-1, par. 4-4 thru fig. 4-2	3-12-63	EO-1289-1/ 4152-2/ 1284-1	3-14-63			
		PP-3030 Supply Verification: T.O. 35C2-2-63-1, par. 4-4 thru fig. 4-2	3-12-63	EO-1289-1/ 4152-2/ 1284-1	3-14-63			
		PP-3027 Supply Verification: T.O. 35C2-2-63-1, par. 4-4 thru fig. 4-2	3-12-63	EO-1289-1/ 4152-2/ 1284-1	3-14-63			
	Field-Level Fault Isolation (Fig. A 1284 and 1289)	UNSCHEDULED						
		PP-3030 Supply UNSCHEDULED						
		PP-3027 Supply UNSCHEDULED						
	Inspection	UNSCHEDULED	3-12-63	EO-1289-1/ 4152-2/ 1284-1	3-15-63			
	Organizational-Level Checkout	Verification: T.O. 21-SM80A-2-11, fig. 1-10C						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Field-Level Checkout	(See Fig. A 1284)	3-12-63	EO-1289-1/ 4152-2/ 1284-1	3-14-63			
1289 Power Supply Group (LCF)	Field-Level Fault Isolation	(See Fig. A 1284)						
	Inspection	UNSCHEDULED	3-12-63	EO-1289-1/ 4152-2/ 1284-1	3-14-63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
1296 Restricted Area Anti-Intrusion Alarm Set Group	Organizational- Level Checkout	VRSA Input	Verification: T.O. 21-SM80A-2-4, par. 2-4A thru fig. 1-9					
		Inner Security	Verification: T.O. 21-SM80A-2-4, par. 2-4A thru fig. 1-9					
		Outer Security	Verification: T.O. 21-SM80A-2-4, par. 2-4A thru fig. 1-9					
	Organizational- Level Fault Isolation	VRSA Input	UNSCHEDULED					
		Inner Security	UNSCHEDULED					
		Outer Security	UNSCHEDULED					
	Organizational- Level Adjustment	Receiver- Transmitter	UNSCHEDULED					
		Converter- Monitor	UNSCHEDULED					
	Field-Level Checkout	Receiver Transmitter	Verification: T.O. J1X3-2-12-2, par. 7-19 thru fig. 10-2					
		Converter- Monitor	Verification: T.O. J1X3-2-12-2, par. 8-8 thru fig. 8-2					
		Power Supply	Verification: T.O. J1X3-2-12-2, par. 9-6 thru fig. 9-4					
	Field-Level Fault Isolation	Receiver- Transmitter	UNSCHEDULED					
		Converter- Monitor	UNSCHEDULED					
		Power Supply	UNSCHEDULED					
	Field-Level Adjustment	Receiver- Transmitter	UNSCHEDULED					
		Converter- Monitor	UNSCHEDULED					

DEMONSTRATION REQUIRED TO DATE SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	PREVIOUS		CURRENT	
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
1337 Distribution Box (LF)	Organizational-Level Checkout	Verification; T.O. 21-SM80A-2-II, Par. 2-30 thru 2-32				
	Organizational-Level Fault Isolation	UNSCHEDULED				
	Organizational-Level Shutdown Isolation	UNSCHEDULED				
	Organizational-Level Checkout	UNSCHEDULED	2-2-63	EO-1337-1	2-5-63	
	Organizational-Level Fault Isolation	UNSCHEDULED				
1338 Communication Control Console	Field-Level Checkout (Arm & Status Panel)	Verification; T.O. 3IX3-3-9-2-1, fig. 14-1				
	Field-Level Fault Isolation	UNSCHEDULED				
	Inspection	UNSCHEDULED	3-5-63	EO-1338-1	3-8-63	
1367 Motor-Generator (LCF)	Organizational-Level Checkout	Verification; T.O. 21-SM80A-2-II, fig. 1-10A	1-2-63	EO-1367-1	1-2-63	
	Organizational-Level Fault Isolation	UNSCHEDULED				
	Organizational-Level Servicing	UNSCHEDULED				
	Organizational-Level Alignment	Validation; T.O. 21-SM80A-2-II, par. 1-31				

DEMONSTRATION REQUIREMENTS STATE SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
1412 Voice Reporting Signal Assembly	Organizational-Level Checkout	UNSCHEDULED						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Field-Level End-to-End Checkout	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-2						
	Audio Reproducer A	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-3						
	Audio Reproducer B	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-4						
	Input Signal Converter No. 1	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-5						
	Input Signal Converter No. 2	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-6						
	Input Signal Converter No. 3	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-7						
	Input Signal Converter No. 4	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-8						
	Sequence Step-down Control	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-9						
	Interrogation Control	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-10						
	Audio Amplifier	Verification; T.O. 31SI-2GSW4-2, par. 7-4, 7-5, fig. 7-1, 7-11						
	Field-Level Fault Isolation	UNSCHEDULED						
	Field-Level Component Replacement	UNSCHEDULED	1-4-63	EO-1412-1		1-4-63		
	Inspection	UNSCHEDULED	1-14-63	EO-1412-2		1-22-63		

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
3013 Communication - Launch Control Consoles Test Set	Organizational-Level (1243) Utilization	Technical Approval Demonstration 1-20, Vandenberg AFB	1-20-63	EO-1243-1/ 3013-1	1-30-63			
		Technical Approval Demonstration 1-18, Vandenberg AFB	1-29-63	EO-1243-1/ 3013-1	1-30-63			
		Technical Approval Demonstration 1-22, Ellsworth AFB						
		UNSCHEDULED						
3092 Programmer Group Test Set		UNSCHEDULED						
	Field-Level Checkout	UNSCHEDULED						
	Field-Level Fault Isolation	UNSCHEDULED						
	Voltmeter Calibration	UNSCHEDULED						
	Organizational-Level (1201) Utilization	Technical Approval Demonstration 1-15, Vandenberg AFB	11-7-62	EO-1201-1/ 3092-1	1-18-63			
	Field-Level Checkout	Technical Approval Demonstration 1-18, Malmstrom AFB						
	Field-Level Fault Isolation	Verification: T. O. 33D9-III-3-1, par. 5-26	2-15-63	EO-3092-2	2-19-63			
		Unscheduled Functional Test						
		UNSCHEDULED						
							4-3-63	EO-3092-3 4-5-63

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(3092)	Field-Level Adjustment	Verification: T. O. 33D9-III-3-1, par. 8-6 thru fig. 8-3						
	Clock	Verification: T. O. 33D9-III-3-1, par. 8-6 thru fig. 8-3						
	Evaluator A	Verification: T. O. 33D9-III-3-1, par. 8-6 thru 8-13						
	Evaluator B	Verification: T. O. 33D9-III-3-1, par. 8-6 thru 8-14						
	Evaluator C Phase 1	Verification: T. O. 33D9-III-3-1, par. 8-6 thru 8-15						
	Evaluator C Phase 2	Verification: T. O. 33D9-III-3-1, par. 8-6 thru 8-16						
	Evaluator D	Verification: T. O. 33D9-III-3-1, par. 8-6 thru fig. 8-3						
	Evaluator E	Verification: T. O. 33D9-III-3-1, par. 8-6 thru fig. 8-3						
	Reset and Generator	Verification: T. O. 33D9-III-3-1, par. 8-6 thru 8-19						
	Pulse Generator Reset	Verification: T. O. 33D9-III-3-1, par. 8-6 thru fig. 8-3						
	Latching Relay Bias	Verification: T. O. 33D9-III-3-1, par. 11-5						
	Voltmeter Calibration	UNSCHEДУLED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
3109 Alarm Set Test Set	Organizational- Incomplete Level Utilization (1296)	Attempted Verification, T O 21-SM80A -2-4	10-15-62	EO-3109-1	10-15-62			
	VRSA Input	Verification, T O 21-SM80A-2-4, par. 2-4A thru fig 1-9						
	Inner Security	Verification, T O 21-SM80A-2-4, par. 2-4A thru fig 1-9						
	Outer Security	Verification, T O 21-SM80A-2-4, par. 2-4A thru fig 1-9						
	Field-Level Utilization (1296)	Verification, T O 31X3-2-12-2, par. 7-18 thru fig. 10-2						
	Field-Level Checkout	UNSCHEDULED						
	Antenna Simulator	Verification, T O. 33D9-137-2-1, par. 5-16 thru 5-22						
	Field-Level Adjustment	Verification, T O. 33D9-137-2-1, fig. 8-1						
	Antenna Test Set	Verification, T O. 33D9-137-2-1, fig. 8-3						
	Inspection	UNSCHEDULED	1-17-63 2-22-63	EO-3109-2 EO-3109-3	1-17-63 3-2-63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
4012 Data Analysis Central Test Set	Organizational-Level (1228, 1251) Utilization	Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-1228-1/ 1251-1/402-2				
	Field-Level Continuity Checkout	Verification: T. O. 33D9-133-3-1, par. 4-10 thru 4-12						
	Self-Verification	Verification: T. O. 33D9-133-3-1, fig. 4-1A, 4-2A						
	Meter Relay	Verification: T. O. 33D9-133-3-1, fig. 7-1, 7-2						
	Oscillator	Verification: T. O. 33D9-133-3-1, fig. 7-1, 7-2						
	Test Signal	Verification: T. O. 33D9-133-3-1, fig. 7-1, 7-2						
4018 Test Adapter Group	Field-Level Fault Isolation	UNSCHEDULED						
	Inspection	UNSCHEDULED	2-5-63	EO-4012-2	2-6-63			
	Field-Level Utilization (1201)	Technical Approval Demonstration 1-14, Malmstrom AFB						
	(1265, 1251)	Technical Approval Demonstration 1-1, Vandenberg AFB						
	(1201)	Verification: T. O. 31X2-32-3-2	3-4-63	EO-1265-1/ 4018-4/ 1251-2	3-5-63			
	(3092)	Verification: T. O. 31X3-12-8-2						
	(4252)	Verification: T. O. 33D9-111-3-1, par. 5-26						
		Verification: T. O. 31X2-62-4-1, par. 5-9						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(4018)	Field-Level Checkout	Self Test	2-25-63	EO-4018-3	2-27-63			
		Module A4						
		Module A5						
		Module A5 (Model A)						
		Generator A6						
		Converter A7						
		Simulator A8						
	Field-Level Adjustment	MX-3618 Stimuli Eval. Circuit						
		Voltage Reg. Circuit						
		Buffer Amp. Circuit						
		Eval. & Univib. Circuit						
		False Eval. Circuit						
		Self Test Circuit						
		Response Time Evaluator						
		Ref. Voltage						

1 DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
(4018)	(Field-Level Adjustment)	MX-4214 Self Test Circuit						
		Stimuli Gen. (25-33140)						
		Stimuli Gen. (25-33141)						
		PP-3377 Univibrator Circuit						
		Clock Pulse Simulator (25-33111)						
		Clock Pulse Simulator (25-33115)						
		Clock Pulse Supply (25-33112)						
		Clock Pulse Supply (25-33113)						
		Power Supply (25-33122)						
		Power Supply (25-33125)						
		Power Supply (25-33126)						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
(4014)	(Field-Level Power Supply Adjustment)	PP-3378 Power Supply (25-33132)						
		Power Supply (25-33135)						
		Power Supply (25-33136)						
	Inspection	PP-3376 Power Supply (25-33106)						
		Power Supply (25-33123)						
	Organization-Level Utilization Field-Level Checkout		2-5-63 2-11-63	EO-4018-1 EO-4018-2	2-8-63 2-14-63			
			12-18-62 3-26-63	EO-4043-1 EO-4043-3	12-18-62 3-29-63			
	Field-Level Fault Isolation Field-Level Servicing Field-Level Repair							
			1-25-63	EO-4043-2	1-25-63			
4043 Passenger and Equip- ment Elevator-Workage	Field-Level Fault Isolation Field-Level Servicing Field-Level Repair							

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
4152 Electronic Facility - Base Maintenance Test Equipment	Field-Level Utilization	Verification; T. O. 31X3-12-8-2, par. 11-17 thru 11-23	2-15-63	EO-4152-1	2-21-63			
	(1201 Drawer A6, Part No. -40)	Verification; T. O. 31X3-12-8-2, par. 11-17 thru 11-23						
	(1201 Drawer A6, Part No. -50)	Verification; T. O. 31X3-12-8-2, par. 11-17 thru 11-23						
	(1201 Drawer A7)	Verification; T. O. 31X3-12-8-2, par. 12-15 thru 12-19						
	(1243 Telephone Xmtr. Control)	Verification; T. O. 31X3-3-9-2-1, par. 13-3, 13-4, fig. 13-1						
	(1338 Arm & Status Panel)	Verification; T. O. 31X3-3-9-2-1, fig. 14-1						
	(3092 Self Test Gen.)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
	(3092 Clock)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
	(3092 Evaluator A)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-13						
	(3092 Evaluator B)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-14						
	(3092 Evaluator C#1)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-15						
	(3092 Evaluator C#2)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru 8-16						
	(3092 Evaluator D)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(4152)	(Field Level Diagnosis)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
	(3092 Reset & Gen)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-19						
	(3092 Pulse Gen. Reset)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-3)						
	(3109 Antenna Simulator)	Verification; T. O. 33D9-137-2-1, par. 5-16 thru 5-22						
	(3109 Fault Locator)	Verification; T. O. 33D9-137-2-1, fig. 8-1						
	(4252 Par. Supply Control)	Verification; T. O. 31X2-62-4-1						
	(4252 Reg. Power Supply)	Verification; T. O. 31X2-62-4-1						
	(4252 Verifier Indicator)	Verification; T. O. 31X2-62-4-1						
	(4252 CSD Verifier Unit)	Verification; T. O. 31X2-62-4-1						
	(4490 Simulator Set)	Verification; T. O. 33D9-14-26-1, par. 5-10, fig. 5-1						
(4152)	(1412)	Verification; T. O. 31S1-2CSW4-2						
	(4489)	Verification; T. O. 33D9-58-4-1	3-29-63					
	(1284, 1289)	Verification; T. O. 35C2-2-63-1	3-12-63	EO-4289-1/ 4152-2/ 1284-1			3-14-63	
(4152)	(1296 Receiver - Xmitr.)	Verification; T. O. 31X3-2-12-2, par. 7-19 thru fig. 10-2						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.
(4152)	(Field-Level Utilization)	(1296 Converter-Monitor)						
		(1296 Power Supply)						
	Field-Level Checkout	Maintenance Table						
		Elec. Dummy Loads DA-304, 305, 306						
		Test Set Power Supply TS-1795						
		Dummy Decoder Test Set TS-1796						
		Adapter-Connector MX-4283						
		Adapter-Connector MX-4284						
		Telephone Rptr. Test Set TS-1819, 1821, 1822						
		Test Adapter MX-4453						
		Revr-Xmtr Abnrm Set T.S. TS-1826						
		Converter-Monitor Test Set TS-1825						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(4152)	(Field-Level Checkout) Power Supply Test Set TS-1820 Test Set Voltage Regulator TS-1784 Comm. Test Set Tester TS-1789 VRSA Test Set Tester TS-1823 VRSA Test Set Adapters MK-685 Elec. Dummy Load DA-312 Connector-Adap- ters MX-4650, 4651, 4652 Azimuth Drive Controller Test Set TS-1849 Test Adapter MX-4451 Power Supply Test Set TS-1861 Power Supply Test Set TS-1860 Power Supply Test Set TS-1862 Elec. Dummy Load DA-321	Verification; T. O. 33D9-6-21-1, par 4-66, fig. 9-16 Verification; T. O. 33D9-6-21-1, par. 4-68, fig. 9-17 Verification; T. O. 33D9-6-21-1, par. 4-70, fig. 9-18 Verification; T. O. 33D9-6-21-1, par 4-72, fig. 9-19 Verification; T. O. 33D9-6-21-1, par. 4-74, fig. 9-20 Verification; T. O. 33D9-6-21-1, par. 4-78, fig. 9-22 Verification; T. O. 33D9-6-21-1, par. 4-80, fig. 9-23, 9-24, 9-25 Verification; T. O. 33D9-6-21-1, par. 4-82, fig. 9-26 Verification; T. O. 33D9-6-21-1, par. 4-84, fig. 9-27 Verification; T. O. 33D9-6-21-1, par. 4-86, fig. 9-28 Verification; T. O. 33D9-6-21-1, par 4-88, fig. 4-29, 9-29 Verification; T. O. 33D9-6-21-1, par. 4-90, fig. 4-30, 9-30 Verification; T. O. 33D9-6-21-1, par. 4-92, fig. 4-31, 9-31	3-26-53					

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(4152)	(Field-Level Checkout)	Verification: T. O. 33D9-6-21-1, par. 4-102, fig. 9-36						
	Logic Module T. S. TS-1848	Verification: T. O. 33D9-6-21-1, par. 4-104, fig. 9-37						
	Logic Module T. S. TS-1851	Verification: T. O. 33D9-6-21-1, par. 4-106, fig. 4-36, 9-38						
	Test Adapter MX-4691	Verification: T. O. 33D9-6-21-1, par. 4-108, fig. 9-39	3-26-63					
	Test Adapter MX-4703	Verification: T. O. 33D9-6-21-1, par. 4-110, fig. 9-40						
	Test Adapter MX-4704	Verification: T. O. 33D9-6-21-1, par. 4-112, fig. 9-41						
	Test Adapter MX-4702	Verification: T. O. 33D9-6-21-1, par. 4-114, fig. 9-42						
	Test Adapter MX-4700	Verification: T. O. 33D9-6-21-1, par. 4-114, fig. 9-43						
	Test Adapter MX-4701	Verification: T. O. 33D9-6-21-1, par. 4-114, fig. 9-44						
	Test Adapter MX-4696	Verification: T. O. 33D9-6-21-1, par. 4-116, fig. 4-37, 9-45						
	Test Adapter MX-4698	Verification: T. O. 33D9-6-21-1, par. 4-118, fig. 4-38, 9-46						
	Test Adapter MX-4693	Verification: T. O. 33D9-6-21-1, par. 4-120, fig. 4-39, 4-40, 9-47						
	Test Adapter MX-4692	Verification: T. O. 33D9-6-21-1, par. 4-122, fig. 4-41, 9-48						
	Test Adapter MX-4694	Verification: T. O. 33D9-6-21-1, par. 4-124, fig. 4-42, 9-49						
	Test Adapter MX-4695	Verification: T. O. 33D9-6-21-1, par. 4-126, fig. 4-43, 9-50	3-26-63					
	Test Adapter MX-4697							

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(4192)	(Field-Level Checkout)	Adapter Test Set TS-1841						
		Simulator Test Set TS-1879						
		Cooler Test Set TS-1880						
		Alarm Set T.S. Tester TS-1878						
	Field-Level Adjustment	Cooling Air Fixture Rotation Converter-Moni- tor Test Set Launch Simu- lator Test Set						
4252 Code Inserter-Verifier Set	Field-Level Utilization	Verification; T.O. 33D9-6-21-1, par. 4-94, fig. 9-32						
		Verification; T.O. 33D9-6-21-1, par. 4-96, fig. 9-33						
		Verification; T.O. 33D9-6-21-1, par. 4-98, fig. 9-34						
		Verification; T.O. 33D9-6-21-1, par. 4-100, fig. 4-32, 4-33, 4-34, 4-35, 9-38						
		Verification; T.O. 33D9-6-21-1, par. 4-5 UNSCHEDULED UNSCHEDULED						
		Technical Approval Demonstration 1-23, Ellsworth AFB						
	Field-Level Checkout	V.U. Readers & Function Sel. Assy Power Supply Control Code Indicator Coder Unit Code Pack						
		Verification; T.O. 31X2-62-4-1, par. 5-9						
		Verification; T.O. 31X2-62-4-1 Verification; T.O. 31X2-62-4-1 Verification; T.O. 31X2-62-4-1 Verification; T.O. 31X2-62-4-1						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE	DATE COMPLETED	REPORT NO.	DATE
(4252)	(Field-Level Checkout) {	Verification; T. O. 31X2-62-4-1						
	Launch Control Coder Unit	Verification; T. O. 31X2-62-4-1						
	Regulated Power Supply	Verification; T. O. 31X2-62-4-1						
	Unregulated Power Supply	Verification; T. O. 31X2-62-4-1						
	Verifier Unit Indicator Assy.	Verification; T. O. 31X2-62-4-1						
	Command Signals Decoder Ver. Unit	Verification; T. O. 31X2-62-4-1						
	Launch Control Panel Ver. Unit	Verification; T. O. 31X2-62-4-1						
	End-to-End	UNSCHEDULED						
	Field-Level Fault Isolation	UNSCHEDULED						
	V. U. Readers & Function Sel. Assy.	UNSCHEDULED						
	Power Supply Control	UNSCHEDULED						
	Code Indicator	UNSCHEDULED						
	Coder Unit Code Pack	UNSCHEDULED						
	Launch Control Coder Unit	UNSCHEDULED						
	Regulated Power Supply	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
(4252)	(Field-Level Fault Isolation) Power Supply	UNSCHEDULED						
	Verifier Unit Indicator Assy.	UNSCHEDULED						
	Command Signals Decoder Ver. Unit	UNSCHEDULED						
	Launch Control Panel Ver. Unit	UNSCHEDULED						
	Power Supply Control	Verification; T. O. 31X2-62-4-1						
	Code Indicator	Verification; T. O. 31X2-62-4-1						
	Reg. Power Supply	Verification; T. O. 31X2-62-4-1						
	Verifier Unit Indicator	Verification; T. O. 31X2-62-4-1						
	CSD Verifier Unit	Verification; T. O. 31X2-62-4-1						
	Coder Unit Brushes	UNSCHEDULED						
4487 Command Signals Decoder Simulator	Inspection	UNSCHEDULED	11-7-62	EO-4252-1	11-7-62			
	Organizational-Partial Level Utilization	Verification; T. O. 31-SM80A-2-3, par. 2-67C thru 2-67F						
	Complete	UNSCHEDULED						
					3-28-63	EO-1201-2/4487-1	4-3-63	

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DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
4489 Message Generator	Organizational- Partial Level Utilization Complete	Verification, T. O. 21-SM80A-2-3, par. 2-67C thru 2-67F UNSCHEDULED						
	Field-Level Checkout	Verification, T. O. 33D9-58-4-1	3-29-63					
	Field-Level Fault Isolation	UNSCHEDULED						
	Inspection	UNSCHEDULED	3-1-63	EO-4489-1	3-4-63			
4490 Missile and Launch Electrical Functions Simulator Set	Organizational- Partial Level Utilization Complete	Verification, T. O. 21-SM80A-2-3, par. 2-67C thru 2-67F UNSCHEDULED						
	Field-Level Checkout	Verification, T. O. 33D9-14-26-1, par. 5-10, fig. 5-1 Recorder						
	Field-Level Fault Isolation	UNSCHEDULED						
	Inspection	UNSCHEDULED	2-11-63 2-22-63	EO-4490-1 EO-4490-2	2-11-63 2-25-63			

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DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS		CURRENT			
			DATE COMPLETED	REPORT NO.	DATE COMPLETED	REPORT NO.	DATE	REPORT
4491 Launch Facility Start-Up Unit	Organizational- Partial Level Utilization	Verification: T. O. 21-SM80A-2-3, par. 2-67C thru 2-67F	1-25-63	EO-4491-1	2-6-63			
	Complete -	Verification: T. O. 21-SM80A-2-3, par. 2-66 thru fig. 2-37						
	Field-Level Checkout	UNSCHEDULED						
	Field - Level Fault Isolation	UNSCHEDULED						
	Field-Level Adjustment	Gyro Start Assy.						
	Power Supply Assy.	UNSCHEDULED						
Inspection		UNSCHEDULED	2-15-63 2-28-63	EO-4491-2 EO-4491-3	2-18-63 2-27-63			

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6.4 CURRENT EVALUATION/OBSERVATION (E/O) REPORTS

The following pages contain the five E/O Reports completed during the period covered by this document. The reports are arranged in numerical order, by report number.

Each E/O Report consists of a M Checklist and a supplementary rating analysis. The checklist contains numerical ratings for all major Maintainability features observed and evaluated during the indicated demonstration event. The supplementary rating analysis accompanying the checklist both substantiates the numerical ratings and provides constructive recommendations. The recommendations propose specific improvements to be made in order to attain "Good" Maintainability.



MAINTAINABILITY EXAMINATION/OBSERVATION REPORT

Report No. EO-1201-2/4487-1 Date April 3, 1963 Page 1 of 3
 Prepared by A. H. Smith M/S 6207-1 phone 866-3761
 Figure A No. 201/4487 Nomen Programmer Group/Command Signals Simulator
 Dwg. No. 25-22036-89/8324450-501 Serial No. 6 / 5
 Observed Event T.O. T&V Location VAFB Date 2.18.63 thru 3.28.63
 Title or Description Drawer Checkout
 T.O. Procedures 31X3-12-8-2 Sections VII through XII (31 January 1963 revision)

MAINTAINABILITY CHECKLIST

1	Fault Isolation	2	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	4
3	Interchangeability	4	16	Covers, Cases, Shields	4
4	Packaging, Mounting	4	17	Disposable Modules	4
5	Accessitility	2	18	Test Equipment	2
6	Work Space	4	19	Servicing, Handling, Equip.	N/A
7	Testing, Servicing	4	20	Tools	2
8	Displays	4	21	Platforms, Stands, Shelters	N/A
9	Handles	4	22	Technical Order	3
10	Labels, Marking	2	23	Figure A	3
11	Controls	4	24	Form B/C	N/E
12	Work Aids	4	25	Specifications	N/E
13	Connectors, Connections	4	26	Personnel Requirements	N/E

CHECKLIST RATINGS

4	Good Maintainability	N/A	Not Applicable
3	Satisfactory Maintainability	N/O	No Observation Possible
2	Unsatisfactory Maintainability	N/E	Not Evaluated
1	Poor Maintainability		

Rating analyses are provided on succeeding pages, for all checklist items rated 3 or lower.

- Item 1 Cable tray fault-isolation and repair considerations for the Minuteman Standard Rack configuration have been dealt with in items 1 and 5 of EO-1284-1.
- Item 5 The grouping of external electrical connectors at the top of the equipment rack has been dealt with in EO-1265-1 and EO-1201-1. The problem is quite pronounced in the case of the Programmer Group because of the large number of connections to be made in organizational level checkout. A hook-up technique favored by at least one Test Operator at VAFB is to make connections while lying on top of the air-conditioning trunking and overhead cable trays.

Recommendation.

Although it is recognized that a considerable effort would be involved, it is recommended that the rack should be redesigned to improve accessibility, and wiring-tray repairability.

- Item 10 a. All the drawers of the Programmer Group weigh more than 45 lbs, the Power Supply weight being more than 120 lbs, but the units are not marked.

Recommendation.

Weight labels should be affixed.

- b. The system of numbering of Printed Card Assembly locations (e.g. 403A1 A8) appears to have become confused. It is believed that the system was originally intended to define a card or component location, to facilitate rapid identification of an element among many similar elements; thus, the technician would know that the A3 card was the third one back, etc. Reference to figure 8-2 to T.O. 31X3-12-8-2 will quickly show the extent to which the system has been altered. Apparently the identification of a card by its part number has been abandoned and the card location system has been substituted in its place. This could result in confusion if a card becomes accidentally misplaced, and would at least result in the necessity to label a card with two identification numbers, the part number and the "A number".

Recommendation.

Specific card types should be identified by part number only, and locations should be identified by "A number" only. The part number should be visible when the card is in position, and the "A number" should be marked at both ends of the locations slot. Card locations should also be numbered serially from front to back.

Other components, particularly PCA connectors, should also be identified systematically in the same way; Figure 8-3 of T.O. 31X3-12-8-2 shows that PCA connectors are much less confused than the PCA's, and is a good example of the system as it was originally intended to function.

- Item 18 Difficulty has been encountered upon attempting to insert the Figure A 4487 Command Signals Simulator (SM-315/GYK-2) into the Decoder Vault of the Sequential Timer Drawer, due to the fact that the cover-retaining screws along the side of the unit are not countersunk, and will not enter the guide-slot. On the unit observed, all the retaining screws along the side-flanges had been removed in order to effect insertion.

Recommendation.

The screws used along the side-flanges should be countersunk.

- Item 20 The Tool Kit, Code Change, Command Signal Decoder TL-687/GYK-2 has been found at VAFB to suffer from the following mechanical deficiencies.

- a. The right-angle-drive wrench, (part no. 1790324-1) drive-spring is easily broken.
- b. The Code-Setting tool (part no. 1790323) pointed tip is too weak.
- c. Code post lock pins (part no. 1790325) have very fragile "heads" which break off easily.

Recommendation.

The tool kit items mentioned should be strengthened, either by increasing material thickness or by using stronger metals, so as to render the kit less liable to breakage in Field use.

- Item 22 The top left-hand PCA connector in Figure 10-4 of T.O. 31X3-12-8-2 is not identified. Study of the wiring diagram of the Launcher-Missile Status Monitor Drawer indicates that it may be J 10.

Recommendation.

The figure should be revised to show the identification of the jack.

- Item 23 The Figure A does not contain Maintainability Design Requirements.

Recommendation.

Maintainability Design Requirements should be incorporated at the next revision.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

Report No. EO-1251-4 Date April 24, 1963 Page 1 of 3
 Prepared by A. H. Smith M/S V1-07 phone 866-3761
 Figure A No. 1251 Nomen Digital Data Group OA-3593/4YK-2
 Dwg. No. 8323616-505 Serial No. 10
 Observed Event T.O. V&V Location VAFB Date April 8, 1963
 Title or Description Drawer Checkout and Static Evaluation
 T.O. Procedures T.O. 31X2-32-3-2 Section XXVIII through XXXIII

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	N/E	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	4
3	Interchangeability	4	16	Covers, Cases, Shields	2
4	Packaging, Mounting	3	17	Disposable Modules	4
5	Accessibility	2	18	Test Equipment	4
6	Work Space	4	19	Servicing, Handling, Equip.	4
7	Testing, Servicing	N/E	20	Tools	4
8	Displays	4	21	Platforms, Stands, Shelters	N/A
9	Handles	4	22	Technical Order	3
10	Labels, Marking	3	23	Figure A	3
11	Controls	4	24	Form B/C	N/E
12	Work Aids	N/E	25	Specifications	N/E
13	Connectors, Connections	4	26	Personnel Requirements	3

CHECKLIST RATINGS

4	Good Maintainability	N/A	Not Applicable
3	Satisfactory Maintainability	N/O	No Observation Possible
2	Unsatisfactory Maintainability	N/E	Not Evaluated
1	Poor Maintainability		

Rating analyses are provided on succeeding pages, for all checklist items rated 3 or lower.

- Item 4 a. The Figure A 1251 is mounted in a Standard Minuteman Rack, one characteristic of which is the grouping of external electrical connectors at the top-rear of the unit. This results in the necessity to utilize a stepladder to reach the connectors; accessibility is further impaired by the presence of overhead cable-trays and air ducting.

Recommendation.

A basic redesign of the rack configuration would be required in order to relocate the connectors at a more convenient level.

- b. The flexible air-ducting utilized to connect the Figure A 1251 rack to the Environmental Control System tends to collapse irregularly when subjected to an S-bend. It is possible that further cross-sectional changes may occur after calibration due to ageing or disturbance. Such a change in air-flow could conceivably result in an out-of-tolerance temperature condition and subsequent No-Go.

Recommendation.

Stiffened, constant cross-section flexible ducting should be used in place of the existing soft ducting.

- Item 5 a. Due to the fact that Drawer Connectors are mounted on the rear face of the Wire Tray connector panel, it is necessary to remove the entire rack to repair these connectors (See EO-1228-2 and others).

Recommendation.

Alternative a) The drawer connectors should be mounted on the front face of the connector panel.

Alternative b) The connectors should be mounted on hinged panels to allow access to the rear.

- b. It is necessary during test operations to remove the "site tailoring plug" in the Waveform Connector Drawer. At present this entails the removal and replacement of 44 screws to remove the top dust cover. (See EO-1251-1)

Recommendation.

A sliding panel should be provided in the dust cover to allow convenient access to this item.

Item 10

With the exception of the Waveform converter drawer, all drawers in the Figure A 1251 weigh more than 45 lbs., but are not so labeled.

Recommendation.

In accordance with section 10.4.3.1 of MIL-STD-803, weight labels should be affixed.

Item 16

As is common in all DAC equipment, top dust covers on the drawers are secured by 44 captive screws, while the bottom covers are secured by twenty quick-release fasteners.

Recommendation.

The number of screws securing the top dust cover should be reduced, and should preferably be of the quick-release variety.

Item 22

Paragraph 2-49 of the 4.6.63 version of T.O. 21-SM80A-2-3 covers twelve pages, due partly to inherent length of the paragraph, and partly to the revision process. The actual paragraph is only identified on the first page, which renders use of the T.O. unnecessarily time-consuming.

Recommendation.

The paragraph number should appear in the top right-hand corner of every page to facilitate use of the T.O.,

Item 23

The Figure A does not contain Maintainability design requirements.

Recommendation.

Maintainability design requirements should be incorporated at the next revision.

Item 26

Soldering capability is required extensively to effect repairs to components of the Figure A 1251.

Recommendation.

Either the Figure A 1251 should be reworked to eliminate soldered joints or a soldering capability should be provided at Field Level of maintenance. (See EO-1265-1)

MAINTAINABILITY ~~EXEMPTION~~/OBSERVATION REPORT

Report No. EO-1283-3 Date April 12, 1963 Page 1 of 3

Prepared by A. H. Smith M/S V1-07 phone 856-3761

Figure A No. 1283 Nomen Motor Generator PU-515/GSW-4 (Launcher)

Dwg. No. 43-2028-759-1 Serial No. 0001708

Observed Event T.O. Pre V&V Location VAFB Date April 10, 1963

Title or Description Brush Adjustment

T.O. Procedures T.O. 21-SM80A-2-11 Paragraph 2-84

MAINTAINABILITY CHECKLIST

1	Fault Isolation	4	14	Lines and Cables	N/E
2	Standardization	4	15	Fasteners	4
3	Interchangeability	4	16	Covers, Cases, Shields	3
4	Packaging, Mounting	N/E	17	Disposable Modules	N/E
5	Accessibility	2	18	Test Equipment	N/E
6	Work Space	4	19	Servicing, Handling, Equip.	N/E
7	Testing, Servicing	2	20	Tools	2
8	Displays	N/A	21	Platforms, Stands, Shelters	N/E
9	Handles	4	22	Technical Order	3
10	Labels, Marking	4	23	Figure A	N/E
11	Controls	4	24	Form B/C	N/E
12	Work Aids	4	25	Specifications	N/E
13	Connectors, Connections	4	26	Personnel Requirements	N/E

CHECKLIST RATINGS

4	Good Maintainability	N/A	Not Applicable
3	Satisfactory Maintainability	N/O	No Observation Possible
2	Unsatisfactory Maintainability	N/E	Not Evaluated
1	Poor Maintainability		

Rating analyses are provided on succeeding pages, for all checklist items rated 3 or lower.

Item 5 There are four brush assemblies on the D.C. motor of the Fig A 1283, spaced by ninety degrees, and located on diagonals. The bottom left-hand brush assembly is therefore placed in the corner between the motor bed-plate and the control-box. During the attempted preliminary V & V observed, it was discovered that work on this assembly is very difficult, if not actually impossible. No way could be found to operate the dial indicating scale. Similar difficulty was experienced with the bottom right-hand brush assembly, due to the closeness of the wall.

Recommendation.

The spring tension measurement does not appear to be possible in the way suggested by the T.O. - or with the existing test equipment. It seems probable that it would be economically unsound to remove the generator from the L.F. to perform these adjustments at the SMSB, so it is concluded that an item of special test equipment is justified. The provision of a suitably mounted pulley-wheel, (which could be manually held in position on the generator housing) together with a piece of nylon monofilament, would allow the tension measurement to be made axially instead of radially and would avoid the difficulties of access to both bottom brush-sets.

Item 7 Steps f and g of paragraph 2-84 require the operator to manually retract the solenoid plungers and check clearance between brushes and commutator using a feeler gage. It is very difficult to retract the solenoid armatures on the bottom brush assemblies, and even more difficult to insert the feeler gage. (See also item 20).

Recommendation.

The checking of brush clearances would be made very much easier if it could be arranged to have the solenoids actuated electrically; it might also, incidentally, be a more representative test.

This could best be accomplished by providing a suitable isolating jack on the Control Cabinet Assembly which would isolate the solenoids and connect them to an external 36 volt supply.

The solenoids could be lifted without modifying the existing cabinet by connecting a 36 volt supply across diode CR 1 by means of alligator leads, however this method has the obvious disadvantages that it is necessary to open the control cabinet first, and there is some risk of damaging CR 1 by application of the wrong polarity.

Item 16 It was observed that the wire-mesh portions of the D.C. Motor Screen had been damaged in places. In one spot a tear almost 3 inches long had occurred. This condition is undesirable, in that it leads to the possibility of R-F interference problems, as well as to the danger of allowing objects to enter the motor casing.

Recommendation.

The D.C. motor screen should be strengthened or protected from casual damage.

Item 20 Due to the geometry of the D-C motor housing and the brush assemblies, it is very difficult to insert a feeler gage between the brush and the commutator unless the gage has been suitably bent before-hand. It is also difficult to ensure that insertion of such an item will not damage either the brushes or the commutator.

Recommendation.

A special Go-No-Go gage should be provided for the checking of brush clearances. It should be an L - shaped tool, with the foot of the L being the gage. The gage should be "stepped" so that the first step represents the minimum clearance, while the second, or No-Go step represents the maximum clearance. The gage should be made of material with adequate dimensional stability and which would preferably be soft enough to preclude damaging the commutator or brushes in use; it should also be suitably shaped to measure a clearance between curved surfaces.

Item 22 Step e of paragraph 2-84 of T.O. 21-SM80A-2-11 states simply "Inspect brushes for proper seating." It is difficult to see the brushes, let alone determine whether they are seating properly, without actually removing them, however the T.O. does not mention this fact.

Recommendation.

Step e should be expanded somewhat to explain how the brushes should be inspected. It might also be considered worthwhile to mention that the sandpaper should be "rough-side-out", since it is not unknown for even experienced mechanics to make this simple error.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

Report No. EO-3092-3 Date April 5, 1963 Page 1 of 3

Prepared by A. H. Smith M/S 6207-1 phone 866-3726

Figure A No. 3092 Nomen Programmer Group Test Set AN/GSM-57

Dwg. No. 25-26725-2 Serial No. 5

Observed Event Maintenance Location VAFB Date April 3, 1963

Title or Description Incorporation of modification and use at LF

T.O. Procedures 21-SM80A-2-3 Paragraph 2-52

MAINTAINABILITY CHECKLIST

1	Fault Isolation	2	14	Lines and Cables	4
2	Standardization	2	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	4
4	Packaging, Mounting	3	17	Disposable Modules	4
5	Accessibility	4	18	Test Equipment	4
6	Work Space	3	19	Servicing, Handling, Equip.	N/E
7	Testing, Servicing	N/E	20	Tools	N/E
8	Displays	4	21	Platforms, Stands, Shelters	N/A
9	Handles	4	22	Technical Order	N/E
10	Labels, Marking	3	23	Figure A	N/E
11	Controls	4	24	Form B/C	N/E
12	Work Aids	N/E	25	Specifications	N/E
13	Connectors, Connections	4	26	Personnel Requirements	3

CHECKLIST RATINGS

4	Good Maintainability	N/A	Not Applicable
3	Satisfactory Maintainability	N/O	No Observation Possible
2	Unsatisfactory Maintainability	N/E	Not Evaluated
1	Poor Maintainability		

Rating analyses are provided on succeeding pages, for all checklist items rated 3 or lower.

Item 1

During a pre-demonstration checkout the Figure A 3092 Test Set indicated No-Go's on all phase voltage checks for the Regulator Assy. voltage MX-3629/GSW-4. The Regulator was changed, but the same No-Go's occurred. A second Test Set was substituted, but with the same results. It turned out that both Figure A 3092 Test Sets had been similarly damaged during checkout at the contractor support area, due to non-incorporation of a modification. The fault was finally discovered by the lengthy process of disabling evaluator outputs one at a time until it was found that one output of the A5 card was -30V instead of -10V, due to a broken-down transistor. The difficulty arose because, despite the failure, both sets repeatedly passed self-test. A total time of approximately five days elapsed before the fault was isolated, although some of this time was spent in moving equipment due to Vandenberg unique scheduling. It is estimated that this particular fault could have been isolated in less than two shifts under the most favorable circumstances.

Recommendation.

The specific incident described above is very unlikely ever to occur again, and it would probably be uneconomical to modify the self-check process to check the specific items concerned. It is considered worth while, however, to initiate an evaluation to see if there are other potentially difficult situations. Any results from such an analysis could be added to the trouble-shooting charts, to aid in a speedy resolution of similarly abstruse problems.

Item 2

The Power Supply PP-3267/GSM (Figure A 4523) that is used with the Figure A 3092 has suffered damage on two occasions at VAFB due, it is believed, to a lack of standardization of AC power cables. On one of the occasions, a wire bundle in the Power Supply was burned up due to the inadvertent use of an ACO AC power cable with a Figure A power supply. Apparently the connections for the Figure A equipment differ from those in the ACO equipment, although the plug keying was the same. The second incident, which occurred at the SMSA, was caused by the use of a non-standard cable to connect the VARIAC during bench checkout of the PP-3207.

Recommendation.

The AC input power cable, W-2 of PP-3267 (part no. 29-25048-1), should be carefully checked to ensure that the wiring is standard, and is compatible with the PP-3267 input power jack; also, any mechanically similar cables (such as that used with the ACO version of the Figure A 4523) should be checked to ensure electrical compatibility.

Item 4 Terminal Boards TB2, TB3, TB8, and TB9 in the Fault Locator are very difficult to work on because they are located close to an internal corner. It is necessary to remove the terminal board mounting plate first, which is rendered difficult by inaccessible fasteners.

Recommendation.

The terminal board mounting plate should be made more easily removable; this could be accomplished by securing it with screws which remove from the exterior surface of the Fault Locator top-chassis.

Item 6 The problem of making the many test connections to the top surface of the Programmer Group has been dealt with in EO-3092-1.

Item 10 The test programmer card-numbering system is confusing, since it is difficult to discover whether a deck is complete or not.
(see EO-3092-1)

Recommendation.

All cards in a deck should bear a deck identification number and a separate serial number. Gaps in the serial sequence should be filled with blank cards similarly numbered so that it may be quickly ascertained whether the deck is complete.

Item 15 The bolts used to secure the Fault Locator chassis to the case, at the card reader end, are rendered partially inaccessible due to the overhang of the card-pockets.

Recommendation.

Holes should be cut into the bottoms of the card-pockets to allow the use of a socket wrench. These holes would also, incidentally, tend to prevent the accumulation of dust and dirt in the card-pockets thereby possibly avoiding card-reader errors.

Item 26 Soldering is used extensively in the Fault Locator Unit, which precludes repair at Field-level.

Recommendation.

Soldered joints should be replaced by solderless joints wherever this is feasible and/or an authorized soldering capability should be provided at the SMSB.

Report No. D2-4043-4Date April 26, 1963Page 1 of 5Prepared by A. E. SmithM/S V1-07Phone 866-3761Figure A No. 4043Title Elevator Work Cage (New Model)Part No. 25-18099-2Serial No. 6Demonstration Event 595-6Location VAFBDate April 24, 1963T.O. Procedures T.O. 21-SM80A-2-10 Section III (1 May 1962 changed 16 April 1963)

MAINTAINABILITY CHECKLIST

1	Fault Isolation and Repair	1	14	Lines and Cables	P/A
2	Standardization	1	15	Fasteners	P/A
3	Interchangeability	1	16	Covers, Cases, and Shields	3
4	Packaging and Mounting	3	17	Disposable Modules	N/A
5	Accessibility	N/A	18	Test Equipment	N/A
6	Work Space	3	19	Servicing and Handling Equipment	P/E
7	Testing and Servicing	1	20	Tools	1
8	Displays	3	21	Platforms, Stands, and Shelters	N/A
9	Handles	3	22	Technical Order	3
10	Labels and Marking	P/E	23	Figure 'A'	P/E
11	Controls	3	24	Form B/C	N/R
12	Work Aids	N/A	25	Specifications	N/R
13	Connectors and Connections	P/E	26	Personnel Requirements	P/E

CHECKLIST RATINGS

1 Good Maintainability

3 Marginal Maintainability

N/A Not Applicable

2 Fair Maintainability

4 Poor Maintainability

N/R Not Rated

Rating analyses are provided on attached pages, for checklist items rated 3 or 4.

COMMENTS: Observation was made of usage of the Figure A 4043 during a Category I
Missile Emplacement at Vandenberg AFB.

The rating P/E is used to indicate that the item has been previously evaluated,
so as to avoid unnecessary repetition.

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- Item 4 a. During the test observed, the work cage extension screw "froze" with the cage in the extended position. It was necessary to operate the extension cut-out micro-switch by hand in order to traverse the cage back to the access door. Investigation revealed that a portion of the screw thread had chipped off, jamming the mechanism. The screw had clearly not been lubricated properly, and it is believed that this factor did contribute to the occurrence. It is also believed, however, that the primary cause of the thread fracture could be due to overstressing of the screw.

Recommendation.

The extension screw should be enlarged to distribute the stresses over a larger area of contact.

- b. It was observed that the traverse-wheel slipped quite frequently on the unit observed, especially when the hoist mechanism encountered obstacles. This situation could result in the production of recesses in the track, which would produce a self aggravating condition, and would lead to a necessity to re-grind the track.

Recommendation.

The knurling of the traverse drive-wheel should be cut deeper to provide a more positive bite on the track (See EO-4043-3).

- Item 6 The proper method of entering and leaving the work-cage is to position the cage on the access door and pass through the back of the cage. It was observed that this method was employed only twice out of an estimated fifty uses during the test. In all cases, the work-cage was positioned beside, and somewhat below, the access door, and personnel stepped over or through the safety barrier into the cage. (For comment on this operation see item 16 below) This method is adopted because of the difficulty and inconvenience of positioning the cage on the access door, due to the fact that it is not possible to raise the cage quite high enough to clear the door without a lot of jerking and manhandling. It is also frequently desirable to leave the access door unobstructed so as to allow its use as a work-platform from which to work on the missile.

Recommendation.

- a. The suspension of the work cage should be altered to allow the cage to rise approximately three inches higher than at present. This would facilitate traversing across the door as well as positioning on the door.

- b. The construction of the cage itself should be changed so as to allow direct entry from the sides, rather than having to climb over the sides or through the back. This could be accomplished if the cage sides were made into hinged doors, with suitable interlocks and safety devices to prevent motion with the doors open etc. This recommendation is independent of (a) above.

Item 8

The electrical trouble-indication lights on the distribution box (located in the upper equipment room on the launch tube wall) are supposed to glow "dimly and with equal brilliance", and according to a warning on the distribution box and in paragraph 3-6 of T.O. 21-SM80A-2-10, operation should not be continued if either or both lights are out or glowing with full brilliance. During the test observed some confusion existed for awhile due to a difference of opinion among the operators as to whether or not the lights were glowing with the proper brilliance.

Recommendation.

The trouble-indicating display should be altered so that interpretation is unambiguous. Paragraph 4.3.2 of MIL-STD-803 states that "coding techniques shall be selected from the following methods: a) color b) size c) location d) shape." The use of degrees of brightness is not recommended.

Item 9

It was observed that the elevator support structure was lowered down the access shaft and hoisted onto the launch tube assembly door by means of a rope tied around the cable-drum. Although the T.O. clearly states that the unit should not be suspended by the drum alone, the drum is such a natural choice that it is inevitable that it will be frequently used in this way. If proper and obvious handling-points were provided, this situation would not exist.

Recommendation.

The elevator should be provided with convenient, efficient, labeled handling points. (see EO-4043-1)

Item 11

On two occasions during the test observed, the elevator hoist was inadvertently operated; once by an operators elbow and once by an operators knee. On both occasions considerable consternation was shown by the occupants of the cage.

Recommendation.

The "Up" and "Down" buttons should be surrounded by a raised edge to prevent inadvertent operation.

Item 16

It was observed during the test that on one occasion a work-cage passenger reached the Launch-tube access door by climbing over the safety barrier; this is fairly common. As he stepped down, however, the top bar fell away from the wall. Inspection revealed that all four horizontal bars of the barrier were not pinned to the wall, but were merely resting on the pins. This was, of course an extremely hazardous situation, and it arose because of the great difficulty encountered in making the barrier fit. It appeared as though the verticals of the barrier were bent towards the wall, so that it required considerable force to push the horizontals back far enough to insert the pins. Inspection showed that the verticals were reasonably straight, however, and it could not be readily discovered why the barrier was so hard to install.

Recommendation.

Dimensions of the safety barrier should be examined for an additive-tolerance, or other condition that could cause this difficulty.

Item 22

- a. It was the opinion of the operators, after completing installation of the Elevators Support Structure that a more convenient method of installing the roller cable could be utilized, which would eliminate the use of a stepladder on the launch tube access door, as called for in step j. of paragraph 3-6 of T.O. 21-SM80A-2-10. The proposed method would be as follows:

- j. For units incorporating TCTO 35A4-2-31-501 perform the following:
 1. Remove cable and roller assembly from carrying fixture, and pass far end through elevator access door so that it hangs down onto launch tube access door.
 2. Plug one end of special purpose electric cable (figure 3-3A) into distribution box. Connect other end to roller cable connector on launch tube access door.
 3. Pull roller cable up and insert rollers into exposed support rail channel to the left of the open elevator access door.
 4. Plug roller cable into relay box and attach cable support to support structure frame.
 5. Close and secure elevator access door with support structure mounted on support rail.

Recommendation.

The method of installation suggested above should be evaluated, and if found to be acceptable, T.O. 21-SM80A-2-10 paragraph 3-6 j. should be appropriately changed.

- b. The method of passing the elevator power cable through the launch tube wall as shown in Figure 3-3A of T.O. 21-SM80A-2-10 does not agree with the method shown in Figure 3-5A. In Figure 3-3A the cable is shown passing through the launch tube access door, whereas in 3-5A it is shown passing through an unidentified hole, presumably the autocollimator window.

Recommendation.

Figure 3-5A should be corrected to agree with the instructions given for installation of the elevator support structure (paragraph 3-6).