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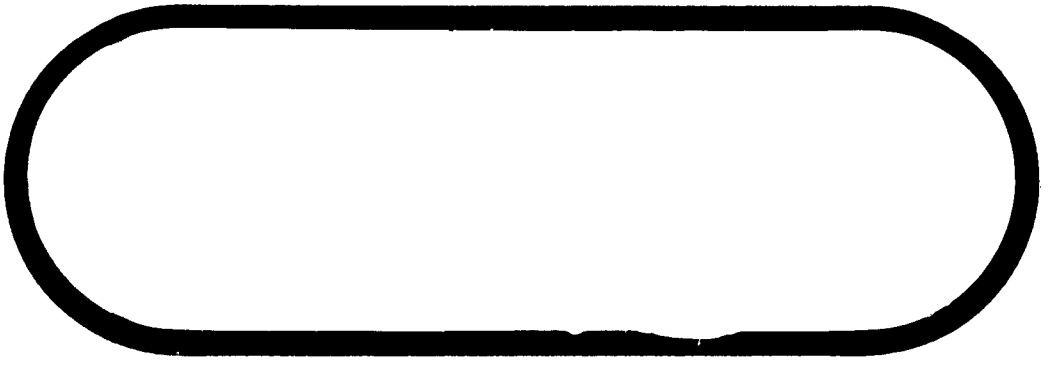

SEATTLE, WASHINGTON

THE BOEING COMPANY

CODE IDENT NO. 81205

4-1-3

NUMBER D2-14934-3

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

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FOREWORD

This document, D2-14934-3, 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."

TABLE OF CONTENTS

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 third 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 February, 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) 1426 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	Message Generator;
26)	4490	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)

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 Adapter Group, Figure A 4018;

b) L.F. Start-up Unit, Figure A 4491;

c) Programmer Group Test Set, Figure A 3092;

d) Simulator Set, Missile Launch, Figure A 4490;

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 (Systems Test Action Requests), FSR's (Field Service Reports), UR's (Unsatisfactory Reports), and BIAR's (Base Installation Action Requests)., During the reporting period, four (4) STAR's, four (4) FSR's, and three (3) BIAR'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 solutions with design. 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

a. Tests and performance already scheduled for other purposes at the STP III installation, Vandenberg Air Force Base, and Minuteman Wing installation 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.

b. Items of equipment whose Maintainability features have a 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 for any additional tests considered necessary by the Customer.

5.2 TEST AND DEMONSTRATION EQUIPMENT LIST

a. 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.

b. 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.

c. 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" evaluations of M design. The Maintainability E/O's provide the basis for subsequent corrective action on the noted problems, and are submitted in this Progress Report as a demonstration record.

a) "Static" evaluations are complete visual inspections 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 the E/O Reports document 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 the E/O, MAR's and/or MRR's are initiated for appropriate action.

c) Twelve E/O Reports were written during the report 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 in each succeeding monthly status report.

MAINTAINABILITY REVIEW STATUS CHART

Figure "A" NO.	SUBJECT	ACTION REPORT		DATE REVIEW COMPLETED
		MAR NO.	MRR NO.	
1367	Motor-Generator, PU-521 (LCF)		1-1367	December 14, 1962
1282/1288	Battery Storage	3-1282-A1	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		5-4488	December 14, 1962
1283	Motor-Generator, PU-515	1-1283-A1	6-1283	December 21, 1962
4252	Code Inserter-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		17-3007	January 29, 1963
7724	NCU Zero Alignment Test Set	2-7724-A1		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

6.2 MAR STATUS SUMMARY

The MAR Status Chart contains 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 status report until such time as they are considered closed. MAR's requiring no further consideration by either the originating engineeer 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 #2-7724-A1 is "closed" out for the following reasons:

1) The MAR reply from the equipment manager indicates that the M problem has been solved. PRR #11602 has been approved by the Change Board.

2) The PRR eliminates the cable between the NCU and the NCU Test Set. A shorting plug, which attaches to the NCU connector, replaces the cable which was giving all the trouble.

6.2.2 MAR # 3-1282-A1 is "closed" out for the following reasons:

1) The "fix" for the battery shock mounts as recommended in this MAR is identical to a fix previously recommended in ECP-391 and FCR187, which were subsequently cancelled.

2) In view of the above, Boeing considers this MAR closed unless further direction is received from RSD to resubmit the ECP.

MAR STATUS CHART

MAR NO.	SUBJECT	Date Issued	STATUS
1-1283-A1	DC Drive Motor Disconnect	To Be Issued	- - - - - -
2-7724-A1	NCU Zero Alignment Test Set	January 22, 1963	Closed*
3-1282-A1	Launch Facility Battery Shock Mounts	December 5, 1962	Closed*

*MAR copies immediately 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: Kazuo Kobauaski
ORGAN. 2-6433
M.S. 42-93

CC: Dan Ranney 14-01
D. A. Cole 43-86
Dan Supplee 34-03

MAR No. 2-7724-A1

DATE: 22 January 1963

DATE REPLY DUE: 5 February 1963

FIGURE A NO. 7724 SYSTEM Nozzle Control Unit SUBSYSTEM BGS-116 Test Set

Statement of Problem:

Failure of the connector/cable on the NCU Zero Alignment Test Set, which is returned to Boeing Seattle for repair, is affecting Plant 77 capability for maintenance of the NCU.

Factors of Problem:

1. The connector which mates with the NCU is "molded" to the cable which connects the NCU to the test set and proper facilities to do this molding are not available at Plant 77.

2. Spares Provisioning, organization 2-5274, can not authorize an entire figure A as a spare.

3. The cable is not provided as a spare; Drawing # 25-26801 calls out separate components to make up this cable.

4. Six of these figure A items have been sent from Plant 77 to Boeing for repair. One unit has been returned to Plant 77 after 75 days turn-around time and the others are still at Boeing after 25 days.

5. The test sets have a high usage factor. BIAR-Plant 77-130T, December 12, 1962, states "connectors become damaged thru constant normal usage."

Discussion:

The connector mates with a connector on the NCU and, if a damaged test set connector is used, resultant damage to the NCU connector requires that the NCU be returned to Autonetics for repair. Plant 77 has been unable to mold

Minuteman Finance J. Niederkrome	Minuteman System Analysis R. B. Grobe
M Engineer: E. Hardy	Approved by: J. S. McEacheran
	Approved by:

Discussion(Continued)

or pot the connector to the cable. This molding is required because test set is used in a hazardous area.

The current high failure rate for this test set plus the lengthy turn-around time requires that a change be made in the present repair concept or that the quantity authorized at Plant 77 be increased for this figure A.

NOTE: Since the cost of this figure A is only $790, increased authorization for this item at Plant 77 can be provided at a relative low cost; therefore a cost study will not be made. The problem here is not costs but that a maintenance bottleneck is to be prevented.

Recommendation:

Redesign of the connector/cable to make it replaceable at Plant 77.

Note:

This is a preliminary cost study to assertain 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.

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: F. L. Strum ORGAN. H&D Power Unit M.S. 52-26 CC: K. Niebauer 52-26 P. Koenig 52-91 J. M. Barker 50-66 D. A. Cole 43-86	PAGE: 1 of 2 MAR No. 3-1282-A1, Revision 1 DATE: February 14, 1963 (December 5, 1962) DATE REPLY DUE:

FIGURE A NO. 1282 SYSTEM Electrical SUBSYSTEM Storage Battery

Statement of Problem:

Difficulty is being experienced in installing Launch Facility battery shock mounts at operational sites.

References:

(a) Parson Drawing SK-161

(b) FSR No MAFB 341 SMW-53F

(c) BSD Drawing SK-162

Field Service Report received from Malmstrom Air Force Base (reference b) reports considerable difficulty in installing Launcher battery shock mounts. This same difficulty can be expected whenever batteries must be moved or replaced during the life of the weapon system.

Investigation and review of an alternate mount such as that represented by BSD drawing SK-162 (reference c) indicates elimination of the installation and maintenance problem. Cost studies show that due to simplicity of design, an overall savings of approximately $655,220 can be realized. This savings is based upon effectivity at Wing III. As the savings is approximately $625 per Launch Facility, it is recommended that this change be effected as soon as possible.

Recommend ECP be processed to change shock mounts to ones similar to BSD drawing SK-162 (reference c).

Minuteman Finance J. Niederkrome	Minuteman System Analysis R. B. Grobe	
M Engineer R. L. Stearns	Approved by: J. S. McEacheran	Approved by:

WEAPON SYSTEM ELEMENTS
- ___ Missile
- ___ Launch Control Facility
- ___ Launch Facility
- ___ GSE
- ___ MGE
- ___ RPIE
- ___

CHANGE TASKS AND FUNCTIONS
- X ECP Processing (or PRR)
- X Research and development
- ___ Retrofit and TCTO
- ___ Special change-retrofit equipment
- X Publications and drawings
- X 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
- X 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)

COST SUMMARY

	Cost	Savings
R&D	$50,000	
Publications & Drawings	5,000	
Form C	2,000	
Cost of modifying batteries $17.00/unit 12 units/LF, 150 LF/wing & 7 wings (Wings III through IX)		
Total cost of battery change $17X12X150X7	214,200	
Old shock mount $1800 for material/unit 240 manhours for manufacture. New shock mount $1800 for material/unit 184 manhours (56 less manhours) $10.00/hr. 150 LF/wing & 7 wings		
56X $10X13X150X7 = Manufacturing savings		$588,000
Savings of 2 manhours per unit on installation at $12.40/hr.		
$12,40X2X13X150X7 =		338,420
Totals	$-271,200	$926,420
Net Savings		$655,220

Note:
This is a preliminary cost study to assertain 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.

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, including completion dates and E/O Report numbers 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."

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, including completion dates and E/O Report numbers 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 REQUIREMENTS STATUS SUMMARY

FIGURE A *EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
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 Drawer A1 (Part No. -55)	Verification T.O. 31X3-12-8-2, par. 7-11, 7-12A, 7-13						
	(Part No. -68)	Verification; T.O. 31X3-12-8-2, par. 7-11, 7-12A, 7-13						
	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						
	(Part No. -50)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
	(Part No. -51)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
	(Part No. -54)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(1291)	(Field -Level Checkout)	Drawer A3 (Part No. -49)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		(Part No. -54)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		(Part No. -58)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		(Part No. -59)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		Drawer A4 (Part No. -58)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		(Part No. -62)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		(Part No. -63)	Verification; T.O. 31X3-12-8-2, par. 7-12A, 7-13						
		Drawer A6 (Part No. -40)	Verification; T.O. 31X3-12-8-2, par. 11-17 thru 11-23						
		(Part No. -50)	Verification; T.O. 31X3-12-8-2, par. 11-17 thru 11-23						
		(Part No. -51)	Verification; T.O. 31X3-12-8-2, par. 11-17 thru 11-23						
		Drawer A7	Verification; T.O. 31X3-12-8-2, par. 12-15 thru 12-19						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(12C1)	Field-Level Fault Isolation	Drawer A1	UNSCHEDULED						
		Drawer A2	Technical Approval Demonstration 1-14, Malmstrom AFB						
		Drawer A3	UNSCHEDULED						
		Drawer A4	UNSCHEDULED						
		Drawer A6	UNSCHEDULED						
		Drawer A7	UNSCHEDULED						
1211 Launcher Environmental Control System	Organizational-Level Checkout		UNSCHEDULED						
	Organizational-Level Fault Isolation		UNSCHEDULED						
	Organizational-Level Adjustment	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(A22)	(Organizational-Level Adjustment)	Switches 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 STATUS SUMMARY

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

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1213 Command-Status Message Processing Group (LCF)	Organizational-Level Checkout	Partial	Revalidation; T.O. 21-SM80A-2-3, par. 2-36 thru 2-39						
		Complete	UNSCHEDULED						
	Organizational Level Fault Isolation		UNSCHEDULED						
	Field-Level Checkout	CV-1236 Drawer	Verification; T.O. 31X2-32-3-2, par. 8-5, 8-7						
		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						
		CV-1243 Drawer	Verification; T.O. 31X2-32-3-2, par. 8-5, 8-7						
		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						
		MU-446 Drawer	Verification; T.O. 31X2-32-3-2, par. 8-5, 8-7						
		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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
8213	Field-Level Fault Isolation	CV-1236 Drawer	UNSCHEDULED						
		MX-3686 Drawer	UNSCHEDULED						
		MX-3687 Drawer	UNSCHEDULED						
		CV-1243 Drawer.	UNSCHEDULED						
		CV-1237 Drawer	UNSCHEDULED						
		MX-3742 Drawer	UNSCHEDULED						
		MU-446 Drawer	UNSCHEDULED						
		CV-1249 Drawer	UNSCHEDULED						
		CV-1250 Drawer	UNSCHEDULED						
	Field-Level Adjustment	CV-1237 Drawer	Verification; T O. 31X2-32-3-2, par. 13-4						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

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

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1228 Status-Command Message Processing Group (LF)	Organizational-Level Checkout		Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-1228-1	11-29-62			
			Technical Approval Demonstration 1-17, Vandenberg AFB						
	Organizational-Level Fault Isolation		Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-1228-1	11-29-62			
			Technical Approval Demonstration 1-17, Vandenberg AFB						
	Field-Level Checkout	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. 8-5, 8-7						
	Field-Level Fault Isolation	MC-3775 Drawer	UNSCHEDULED						
		MX-3776 Drawer	UNSCHEDULED						
		CV-1254 Drawer	UNSCHEDULED						
		KY-411 Drawer	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
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	DC Power Filter Assembly	Verification: T.O. 31X3-39-2-1, par. 11-3						
		Telephone Xmtr. Control	Verification; T.O. 31X3-3-9-2-1						
	Field-Level Fault Isolation	DC Power Filter Assembly	UNSCHEDULED						
		Telephone Xmtr. Control	UNSCHEDULED						
	Removal, Replacement, and Checkout of Launch Control Panel		Technical Approval Demonstration 1-18, Vandenberg AFB	1-29-63	EO-1243-1	1-3 -63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1251 Digital Data Group (LF)	Organizational-Level Checkout		Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-1251-1	11-29-62			
	Organizational-Level Fault Isolation		Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-1251-1	11-29-62			
	Field-Level Checkout	RT-646 Drawer	Verification; T.O. 31X2-32-3-2, par. 18-5, 18-7						
		DT-252 Drawer	Verification; T.O. 31X2-32-3-2, par. 18-5, 18-7						
		MX-3772 Drawer	Verification; T.O. 31X2-32-3-2, par. 18-5, 18-7						
		MX-3773 Drawer	Verification; T.O. 31X2 32-3-2, par. 8-5, 8-7						
		CV-1253 Drawer	Verification; T.O. 31X2-32-3-2, par. 8-5, 8-7						
	Field-Level Fault Isolation	RT-646 Drawer	UNSCHEDULED						
		DT-252 Drawer	UNSCHEDULED						
		MX-3772 Drawer	UNSCHEDULED						
		MX-3773 Drawer	UNSCHEDULED						
		CV-1253 Drawer	UNSCHEDULED						
	Field-Level Adjustment	RT-646 Drawer	Verification; T.O. 31X2-32-3-2, par. 29-8 thru Figure 29-4						
		DT-252 Drawer	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1265 Digital Data Group (LF)	Organizational-Level Checkout	Partial	Revalidation; T.O. 21-SM80A-2-3, par. 2-36 thru 2-39						
		Complete	UNSCHEDULED						
	Organizational-Level Fault Isolation		UNSCHEDULED						
	Field-Level Checkout	T-869 Drawer	Verification; T.O. 31X2-32-3-2, par. 18-5, 18-7						
		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						
		MX-3681 Drawer	Verification; T.O. 31X2-32-3-2, par. 18-5, 18-7						
		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						
		ID-979 Drawer	Verification; T.O. 31X7-32-3-2, par. 18-5, 18-7						
		R-1131 Drawer	Verification; T.O. 31X2-32-3-2, par. 18-5, 18-7						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1283 Motor-Generator (LF)	Organizational-Level Checkout	Verification; T. O. 21-SM80A-2-11, par. 2-23						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Organizational-Level Brush Adjustment	UNSCHEDULED						
	Organizational-Level Shutdown	UNSCHEDULED						
1284 Power Supply Group (LF)	Organizational-Level Checkout Voltage and Ckt. Breakers	Verification; T. O. 21-SM80A-2-11, par. 2-26						
	Relays	Verification; T. O. 21-SM80A-2-11, par. 2-27						
	Organizational-Level Fault Isolation Voltage and Ckt. Breakers	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(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						
		PP-3030 Supply	Verification; T.O. 35C2-2-63-1, par. 4-4 thru fig. 4-2						
		PP-3027 Supply	Verification; T.O. 35C2-2-63-1, par. 4-4 thru fig. 4-2						
	Field-Level Fault Isolation (Fig. A 1284 and 1289)	PP-3026 Supply	UNSCHEDULED						
		PP-3030 Supply	UNSCHEDULED						
		PP-3027 Supply	UNSCHEDULED						
1289 Power Supply Group (LCF)	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)						
	Field-Level Fault Isolation		(See Fig. A 1284)						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
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. 31X3-2-12-2, par. 7-19 thru fig. 10-2						
		Converter-Monitor	Verification; T.O. 31X3-2-12-2, par. 8-8 thru fig. 8-2						
		Power Suppl.	Verification; T.O. 31X3-2-12-2, 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 REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1337 Distribution Box (LF)	Organizational-Level Checkout	Verification; T.O. 21-SM80A-2-11, Par. 2-30 thru 2-32						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Organizational-Level Shutdown	UNSCHEDULED						
	Inspection	UNSCHEDULED				2-22-63	EO-1337-1	2-25-63
1338 Communication Control Console	Organizational-Level Checkout	UNSCHEDULED						
	Organizational-Level Fault Isolation	UNSCHEDULED						
	Field-Level Checkout (Arm & Status Panel)	Verification; T.O. 31X3-3-9-2-1						
	Field-Level Fault Isolation	UNSCHEDULED						
1367 Motor-Generator (LCF)	Organizational-Level Checkout	Verification; T.O. 21-SM80A-2-11, 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-2-11, par. 1-31						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
1412 Voice Reporting Signal Assembly	Organizational-Level Checkout		UNSCHEDULED						
	Organizational-Level Fault Isolation		UNSCHEDULED						
	Field-Level Checkout	End-to-End	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5A						
		Audio Reproducer A	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5B						
		Audio Reproducer B	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5C						
		Input Signal Converter No. 1	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5D						
		Input Signal Converter No. 2	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5E						
		Input Signal Converter No. 3	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5F						
		Input Signal Converter No. 4	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5G						
		Sequence Stepdown Control	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5H						
		Interrogation Control	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5J						
		Audio Amplifier	Verification; T.O. 31S1-2GSW4-1, par. 2-25A, 2-25B, fig. 2-6, 2-5K						
	Field-Level Fault Isolation		UNSCHEDULED						
	Field-Level Component Replacement		UNSCHEDULED	1-4-63	EO-1412-1	1-4-63			
	Inspection		UNSCHEDULED	1-18-63	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
3013 Communication - Launch Control Consoles Test Set	Organizational-Level (1243) Utilization	Technical Approval Demonstration 1-20, Vandenberg AFB	1-29-63	EO-3013-1	1-30-63			
		Technical Approval Demonstration 1-18, Vandenberg AFB	1-29-63	EO-3013-1	1-30-63			
		Technical Approval Demonstration 1-22, Ellsworth AFB						
	(1338)	UNSCHEDULED						
	Field-Level Checkout	Verification; T. O. 33D9-17-26-1						
	Field-Level Fault Isolation	UNSCHEDULED						
	Voltmeter Calibration	UNSCHEDULED						
3092 Programmer Group Test Set	Organizational-Level Utilization (1201) Partial	Verification; T. O. 21-SM80A-2-3, par. 2-28 thru fig. 2-34						
	Complete	Technical Approval Demonstration 1-18, Malmstrom AFB	11-7-62	EO-3092-1	1-18-63			
		Technical Approval Demonstration 1-15, Vandenberg AFB						
	Field-Level Checkout	Verification; T. O. 33D9-111-3-1, par. 5-26						
		Unscheduled Functional Test				2-15-63	EO-3092-2	2-19-63
	Field-Level Fault Isolation	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(3092)	Field-Level Adjustment	Self Test Generator	Verification; T.O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
		Clock	Verification; T.O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
		Evaluator A	Verification; T.O. 33D9-111-3-1, par. 8-6 thru 8-13						
		Evaluator B	Verification; T.O. 33D9-111-3-1, par. 8-6 thru 8-14						
		Evaluator C Phase 1	Verification; T.O. 33D9-111-3-1, par. 8-6 thru 8-15						
		Evaluator C Phase 2	Verification; T.O. 33D9-111-3-1, par. 8-6 thru 8-16						
		Evaluator D	Verification; T.O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
		Evaluator E	Verification; T.O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
		Reset and Generator	Verification; T.O. 33D9-111-3-1, par. 8-6 thru 8-19						
		Pulse Generator Reset	Verification; T.O. 33D9-111-3-1, par. 8-6 thru fig. 8-3						
		Latching Relay Bias	Verification; T.O. 33D9-111-3-1, par. 11-5						
	Voltmeter Calibration		UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
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	Fault Locator	Verification; T. O. 33D9-137-2-1, par. 5-9 thru fig. 5-8A						
		Antenna Simulator	Verification; T. O. 33D9-137-2-1, par. 5-16 thru 5-22						
	Field-Level Adjustment	Fault Locator	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	EO-3109-2	1-17-63	2-22-63	To Be Written	

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
4012 Data Analysis Central Test Set	Organizational-Level (1228, 1251) Utilization		Technical Approval Demonstration 1-20, Malmstrom AFB	11-7-62	EO-4012-1	11-29-62			
			Technical Approval Demonstration 1-17, Vandenberg AFB						
	Field-Level Checkout	Continuity	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						
	Field-Level Fault Isolation		UNSCHEDULED						
	Inspection		UNSCHEDULED				2-5-63	EO-4012-2	2-6-63
4018 Test Adapter Group	Field-Level Utilization	(1201)	Technical Approval Demonstration 1-14, Malmstrom AFB						
			Technical Approval Demonstration 1-11, Vandenberg AFB						
		(1228, 1251)	Verification; T. O. 31X2-32-3-2						
		(1201)	Verification; T. O. 31X3-12-8-2						
		(3092)	Verification; T. O. 33D9-111-3-1, par. 5-26						
		(4252)	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4018)	Field-Level Checkout	Self Test	Verification; T. O. 33D7-50-3-1, par. 5-7 thru fig. 5-4				2-25-63	EO-4018-3	2-27-63
		Module A4	Verification; T. O. 33D7-50-3-1, par. 5-7 thru fig. 5-4						
		Module A5	Verification; T. O. 33D7-50-3-1, par. 5-7, thru fig. 5-4						
		Module A5 (Model A)	Verification; T. O. 33D7-50-3-1, par. 5-7 thru fig. 5-4						
		Generator A6	Verification; T. O. 33D7-50-3-1, par. 5-7 thru fig. 5-4						
		Converter A7	Verification; T. O. 33D7-50-3-1, par. 5-7 thru fig. 5-4						
		Simulator A8	Verification; T. O. 33D7-50-3-1, par. 5-7 thru fig. 5-4						
	Field-Level Adjustment	MX-3618 Stimuli Eval. Circuit	UNSCHEDULED						
		Voltage Reg. Circuit	UNSCHEDULED						
		Buffer Amp. Circuit	UNSCHEDULED						
		Eval. & Univib. Circuit	UNSCHEDULED						
		False Eval. Circuit	UNSCHEDULED						
		Self Test Circuit	UNSCHEDULED						
		Response Time Evaluator	UNSCHEDULED						
		Ref. Voltage	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

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

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4018)	(Field-Level Adjustment)	PP-3378 Power Supply (25-33132)	UNSCHEDULED						
		Power Supply (25-33135)	UNSCHEDULED						
		Power Supply (25-33136)	UNSCHEDULED						
		PP-3376 Power Supply (25-33106)	UNSCHEDULED						
		Power Supply (25-33123)	UNSCHEDULED						
	Inspection		UNSCHEDULED				2-5-63 2-11-63	EO-4018-1 EO-4018-2	2-8-63 2-14-63
4043 Passenger and Equipment Elevator-Workcage	Organization-Level Utilization		UNSCHEDULED	12-18-62	EO-4043-1	12-18-62			
	Field-Level Checkout		Verification; T. O. 35A4-2-31-1						
	Field-Level Fault Isolation		UNSCHEDULED						
	Field-Level Servicing		UNSCHEDULED						
	Field-Level Repair		UNSCHEDULED	1-25-63	EO-4043-2	1-25-63			

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
4152 Electronic Facility-Base Maintenance Test Equipment	Field-Level Utilization	(1201 Drawer A6, Part No. -40)	Verification; T. O. 31X3-12-8-2, par. 11-17 thru 11-23				2-18-63	EO-4152-1	2-21-63
		(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 DC Power Filter)	Verification, T. O. 31X3-3-9-2-1, par. 11-3						
		(1243 Telephone Xmtr. Control)	Verification ; T. O. 31X3-3-9-2-1						
		(1338 Arm & Status Panel)	Verification; T. O. 31X3-3-9-2-1						
		(3013)	Verification ; T. O. 33D9-17-26-1						
		(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						
		(3092Evaluator 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 C01)	Verification; T. O. 33D9-111-3-1, par. 8-6 thru fig. 8-15						
		(3092 Evaluator C02)	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4152)	(Field Level Utilization)	(3092 Evaluator E)	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, par. 5-9 thru fig. 5-8A						
			Verification; T.O. 33D9-137-2-1, fig. 8-1						
		(4252 Pwr. 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						
		(1612)	Verification; T.O. 31S1-2GSW4-1						
		(4491)	Verification; D2-10825-44						
		(1284, 1289)	Verification; T.O. 35C2-2-63-1						
		(1296 Receiver - Xmtr.)	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4152)	(Field-Level Utilization)	(1296 Converter-Monitor)	Verification; T. O. 31X3-2-12-2, par. 8-8 thru fig. 8-2						
		(1296 Power Supply)	Verification; T. O. 31X3-2-12-2, par. 9-6 thru fig. 9-4						
	Field-Level Checkout	Maintenance Table	Verification; T. O. 33D9-6-21-1, par. 4-46, fig. 4-25						
		Elec. Dummy Loads DA-304, 305, 306	Verification, T. O. 33D9-6-21-1, par. 4-48, Fig. 9-3, 9-4, 9-5						
		Test Set Power Supply TS-1795	Verification; T. O. 33D9-6-21-1, par. 4-50, fig. 4-26, 9-6						
		Dummy Decoder Test Set TS-1796	Verification; T. O. 33D9-6-21-1, par. 4-52, Fig. 9-7						
		Adapter-Connector MX-4283	Verification; T. O. 33D9-6-21-1, par. 4-54, Fig. 9-8						
		Adapter-Connector MX-4284	Verification; T. O. 33D9-6-21-1, par. 4-56, Fig. 9-9						
		Telephone Rptr. Test Sets TS-1819, 1821, 1822	Verification; T. O. 33D9-6-21-1, par 4-58, Fig. 9-10, 9-11, 9-12						
		Test Adapter MX-4453	Verification; T. O 33D9-6-21-1, par. 4-60, fig 9-13						
		Revr-Xmtr Ahrm Set T.S. TS-1826	Verification; T. O. 33D9-6-21-1, par. 4-62, fig. 9-14						
		Converter-Monitor Test Set TS-1825	Verification; T. O. 33D9-6-21-1, par. 4-64, fig. 4-27, 4-28, 9-15						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4152)	(Field-Level Checkout)	Power Supply Test Set TS-1820	Verification; T.O. 33D9-6-21-1, par. 4-66, fig. 9-16						
		Test Set Voltage Regulator TS-1791	Verification; T.O. 33D9-6-21-1, par. 4-68, fig. 9-17						
		Comm. Test Set Tester TS-1789	Verification; T.O. 33D9-6-21-1, par. 4-70, fig. 9-18						
		VRSA Test Set Tester TS-1823	Verification; T.O. 33D9-6-21-1, par. 4-72, fig. 9-19						
		VRSA Test Set Adapters MK-685	Verification; T.O. 33D9-6-21-1, par. 4-74, fig. 9-20						
		Elec. Dummy Load DA-312	Verification; T.O. 33D9-6-21-1, par. 4-78, fig. 9-22						
		Connector-Adapters MX-4650, 4651, 4652	Verification; T.O. 33D9-6-21-1, par. 4-80, fig. 9-23, 9-24, 9-25						
		Azimuth Drive Controller Test Set TS-1849	Verification; T.O. 33D9-6-21-1, par. 4-82, fig. 9-26						
		Test Adapter MX-4451	Verification; T.O. 33D9-6-21-1, par. 4-84, fig. 9-27						
		Power Supply Test Set TS-1861	Verification; T.O. 33D9-6-21-1, par. 4-86, fig. 9-28						
		Power Supply Test Set TS-1860	Verification; T.O. 33D9-6-21-1, par 4-88, fig. 4-29, 9-29						
		Power Supply Test Set TS-1862	Verification; T.O. 33D9-6-21-1, par. 4-90, fig. 4-30, 9-30						
		Elec. Dummy Load DA-321	Verification; T.O. 33D9-6-21-1, par. 4-92, fig. 4-31, 9-31						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4152)	(Field-Level Checkout)	Adapter Test Set TS-1841	Verification; T. O. 33D9-6-21-1, par. 4-94, fig. 9-32						
		Simulator Test Set TS-1879	Verification; T. O. 33D9-6-21-1, par. 4-96, fig. 9-33						
		Cooler Test Set TS-1880	Verification; T. O. 33D9-6-21-1, par. 4-98, fig. 9-34						
		Alarm Set T. S. Tester TS-1878	Verification; T. O. 33D9-6-21-1, par. 4-100, fig. 4-32, 4-33, 4-34, 4-35, 9-35						
	Field-Level Adjustment	Cooling Air Fixture Rotation	Verification; T. O. 33D9-6-21-1, par. 4-5						
		Converter-Monitor Test Set	UNSCHEDULED						
		Launch Simulator Test Set	UNSCHEDULED						
4252 Code Inserter-Verifier Set	Field-Level Utilization		Technical Approval Demonstration 1-23, Ellsworth AFB						
	Field-Level Checkout	V. U. Readers & Function Sel. Assy	Verification; T. O. 31X2-62-4-1, par. 5-9						
		Power Supply Control	Verification; T. O. 31X2-62-4-1						
		Code Indicator	Verification; T. O. 31X2-62-4-1						
		Coder Unit Code Pack	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.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4252)	(Field-Level Checkout)	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	V. U. Readers & Function Sel. Assy.	UNSCHEDULED						
		Power Supply Control	UNSCHEDULED						
		Code Indicator	UNSCHEDULED						
		Coder Unit Code Pack	UNSCHEDULED						
		Launch Control Coder Unit	UNSCHDULED						
		Regulated Power Supply	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION		DEMONSTRATION EVENT	COMPLETION RECORD					
				PREVIOUS			CURRENT		
				DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
(4252)	(Field-Level Fault Isolation)	Unregulated Power Supply	UNSCHEDULED						
		Verifier Unit Indicator Assy.	UNSCHEDULED						
		Command Signals Decoder Ver. Unit	UNSCHEDULED						
		Launch Control Panel Ver. Unit	UNSCHEDULED						
	Field-Level Adjustment	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						
	Inspection		UNSCHEDULED	11-7-62	EO-4252-1	11-7-62			
4487 Command Signals Decoder Simulator	Organizational-Level Utilization	Partial	Verification; T.O. 21-SM80A-2-3, par. 2-67C thru 2-67F						
		Complete	UNSCHEDULED						

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
4489 Message Generator	Organizational- Partial Level Utilization	Verification; T. O. 21-SM80A-2-3, par. 2-67C thru 2-67F						
	Complete	UNSCHEDULED						
	Field-Level Checkout	Verification; D2-10825-43						
	Field-Level Fault Isolation	UNSCHEDULED						
4490 Missile and Launch Electrical Functions Simulator Set	Organizational- Partial Level Utilization	Verification; T. O 21-SM80A-2-3, par. 2-67C thru 2-67F						
	Complete	UNSCHEDULED						
	Field-Level Checkout Simulator Set	Verification; T. O. 33D9-14-26-1, par. 5-10, fig. 5-1						
	Recorder	Verification; T. O. 33D9-14-26-1, par. 5-12						
	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

DEMONSTRATION REQUIREMENTS STATUS SUMMARY

FIGURE A EQUIPMENT ITEM	MAINTENANCE OPERATION	DEMONSTRATION EVENT	COMPLETION RECORD					
			PREVIOUS			CURRENT		
			DATE COMPLETED	REPORT NO.	REPORT DATE	DATE COMPLETED	REPORT NO.	REPORT DATE
4491 Launch Facility Start-Up Unit	Organizational-Partial Level Utilization	Verification; T.O. 21-SM80A-2-3, par. 2-67C thru 2-67F						
	Complete	Verification; T.O. 21-SM80A-2-3, par. 2-66 thru fig. 2-37	1-25-63				EO-4491-1	2-6-63
	Field-Level Checkout	Verification; D2-10825-44						
	Field-Level Fault Isolation	UNSCHEDULED						
	Field-Level Adjustment — Gyro Start Assy.	UNSCHEDULED						
	Power Supply Assy.	UNSCHEDULED						
	Inspection	UNSCHEDULED				2-15-63	EO-4491-2	2-18-63
						2-27-63	EO-4491-3	2-27-63

6.4 CURRENT EVALUATION/OBSERVATION (E/O) REPORTS

The following pages contain the twelve 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 EVALUATION/OBSERVATION REPORT

Report No. EO-4491-3 Date 2-27-63 Page 1 of 2

Prepared by A. H. Smith M/S 6207-1 phone 866-3761

Figure A No. 4491 Nomen Start Up Unit, Launch Facility OA-3966/GSM-62

Dwg. No. 25-33549-1 Serial No. 3

Observed Event Evaluation Location Vafb Date 2-27-63

Title or Description Static Evaluation

T.O. Procedures

MAINTAINABILITY CHECKLIST

1	Fault Isolation	N/O	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	3
4	Packaging, Mounting	3	17	Disposable Modules	N/O
5	Accessibility	4	18	Test Equipment	N/A
6	Work Space	N/A	19	Servicing, Handling, Equip.	N/A
7	Testing, Servicing	N/E	20	Tools	4
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	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 4. a. The cable stowage cable-retaining lid is flimsy and bows outwards; this causes the three fasteners to disengage, making it impossible to fasten the lid down.

Recommendation.

The lid should be ribbed or flanged to stiffen it, and the fasteners should be mounted one sixteenth of an inch closer to the edge of the lid.

b. The cable retaining lid does not hold itself open but must be held up with one hand while working amongst the cables.

Recommendation.

A small section of the lid should be removed from each corner on the hinged side. This would prevent the lid from stopping against the curved corner of the case and would allow the lid to fall back far enough to remain open.

Item 10. Three spare fuses mounted in the cable storage box are not labelled. It is necessary to remove and inspect each one to find the correct rating.

Recommendation.

A label identifying fuse ratings should be affixed adjacent to each spare fuse holder.

Item 15. The over-center fasteners holding the bottom of the start-up unit case fall shut if an attempt is made to remove the unit in the upright position.

Recommendation.

The bottom lid fasteners should be turned around so that they fall open when disengaged, or alternatively they should be of a sprung variety that would hold itself open.

Item 16. One connector has a loose plastic dust cap, while all others have captive caps.

Recommendation.

A captive dust cap should be provided for J 4 of the start-up assembly.

MAINTAINABILITY EVALUATION/DEMONSTRATION REPORT

Report No. EO-3192-2 Date February 19, 1963 Page 1 of 8

Prepared by Alexander Henschel M/S 50-66 phone JU 6-6263

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

Dwg. No. 25-26825, 25-29147, 25-31488, 25-29127 Serial No. 0004

Observed Event Qualification Testing Location EDL Date February 15, 1963

Title or Description Functional Test

T.O. Procedures N/A

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	3	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	4
3	Interchangeability	4	16	Covers, Cases, Shields	4
4	Packaging, Mounting	3	17	Disposable Modules	4
5	Accessibility	3	18	Test Equipment	3
6	Work Space	4	19	Servicing, Handling, Equip.	4
7	Testing, Servicing	3	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 Form C only	3
12	Work Aids	3	25	Specifications	3
13	Connectors, Connections	3	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.

Rating Analyses for Test Set, Programmer Group, AN/GSM-57

Item I - Fault Isolation

Fault isolation to a replaceable component is an unduly complicated task. The self-test provision of AN/GSM-57 provides a GO-NO-GO indication. If a NO-GO is indicated the Test Set must be checked by use of the AN/GJM-15 Test Center and AN/GSM-61 Test Adapter Group. This does not insure the fault will be located since it may be in the power circuitry necessitating use of the AN/GSM-82(V) Test Equipment. After the fault has been corrected, a self-test will be run to determine whether or not a GO condition now exists. Therefore it is conceivable that four or more tests will run before the Test Set is returned to an operational status.

Recommendation:

Investigate the possibility of using a break-out box in conjunction with Standard Test Equipment, self-test provision of the AN/GSM-57, and the AN/GSM-82(V) Test Equipment. This type of test setup would shorten trouble-shooting and checkout by eliminating the need for converting from one test situation to another.

Item 4 - Packaging, Mounting

A. The suitcases and their feet will not withstand normal organizational usage.

Recommendation:

Zero Modular Packaging per catalog E59 or equivalent would provide the rugged test equipment suitcase needed for organizational usage.

B. The upper chassis of the Fault Locator, 25-29127-5, is mounted on the lower chassis. Mounting alignment is such that the corner hex head screws are too close to the case (four places).

Recommendation:

Initiate an ADCN to correct the out of tolerance condition.

Item 6 - Accessibility

Accessibility is limited for the connection of the AN/GSM-57 to the Programmer Group at the Launch Facility. Nine cables have to be connected at the top rear of the Programmer Group which necessitates use of a step-ladder.

Recommendation:

Investigate packaging the Programmer Group in the type of equipment rack which is used at the Launch Control Facility. This type of rack would allow more work space and would facilitate faster test setup.

Item 7 - Testing, Servicing

The test program for the AN/GSM-57 consists of punched program cards. There is no instruction on or near the card reader stating which way the Programmer card should be inserted. Instructions are in T.O. 21-SM80A-2-3.

Recommendation:

Provide an instruction placard or the outline of a program card on the card reader to eliminate any doubt as to which way the card should be placed.

Item 10 - Labels, Marking

A. The cable carrying case weighs 128 pounds with all cables. The eighteen cable compartments are unmarked as to which cable it is for, allowing the technician to place each cable where he wants to.

Recommendation:

Mark the weight of the carrying case, ref. MIL-STD-803 section 10.4.3.1 Mark each cable compartment for a particular cable. This will insure all cables are accounted for when the maintenance crew leaves the LF and will maintain the weight distribution of the cables in the proper manner. See Attachment A.

B. Test setups could be made quicker if a placard were provided in the top cover of the Fault Locator (cable hook-up placard for Programmer Group checkout) and the Distribution Box (cable hook-up placard for self-test).

Recommendation:

Provide a cable hook-up placard in the Fault Locator and the Distribution Box suitcases. See attachment B.

Item 12 - Work Aids

See discussion presented in items 7 and 10.

Item 13 - Connectors, Connections

The multitude of connections for self-test and fault isolation is discussed in item 1. Item 5 covers the accessibility aspect of making the test connections.

Item 18 - Test Equipment

The AN/GJM-15 Test Center and AN/GSM-61 Test Adapter Group are used to troubleshoot the AN/GSM-57 Test Set.

Recommendation:

Investigate the possibility of using Standard Test Equipment and the AN/GSM-82(V) Test Equipment only. Use Standard Test Equipment for troubleshooting and maintenance whenever possible. See MIL-M-26512B (USAF).

Item 22 - Technical Order

See Attachment C.

Item 23 - Figure A

Figure A Technical Requirements section should have a maintainability and operability paragraph.

Recommendation:

Conform with instructions in AFBSD Exhibit 61-56.

Item 24 - Form B/C

Form C analysis needs revision as to personnel requirements particularly in the callout of clock hours to complete certain tasks.

Recommendation:

Revise Form C's as more accurate time lines become available. Areas to be improved are test setup, test accomplishment, and return to prior configuration times.

Item 25 - Specifications

Model Specification, Test Set, Programmer Group (S-133-121-3-1-10), Boeing Document D2-9140, has no reference to maintainability.

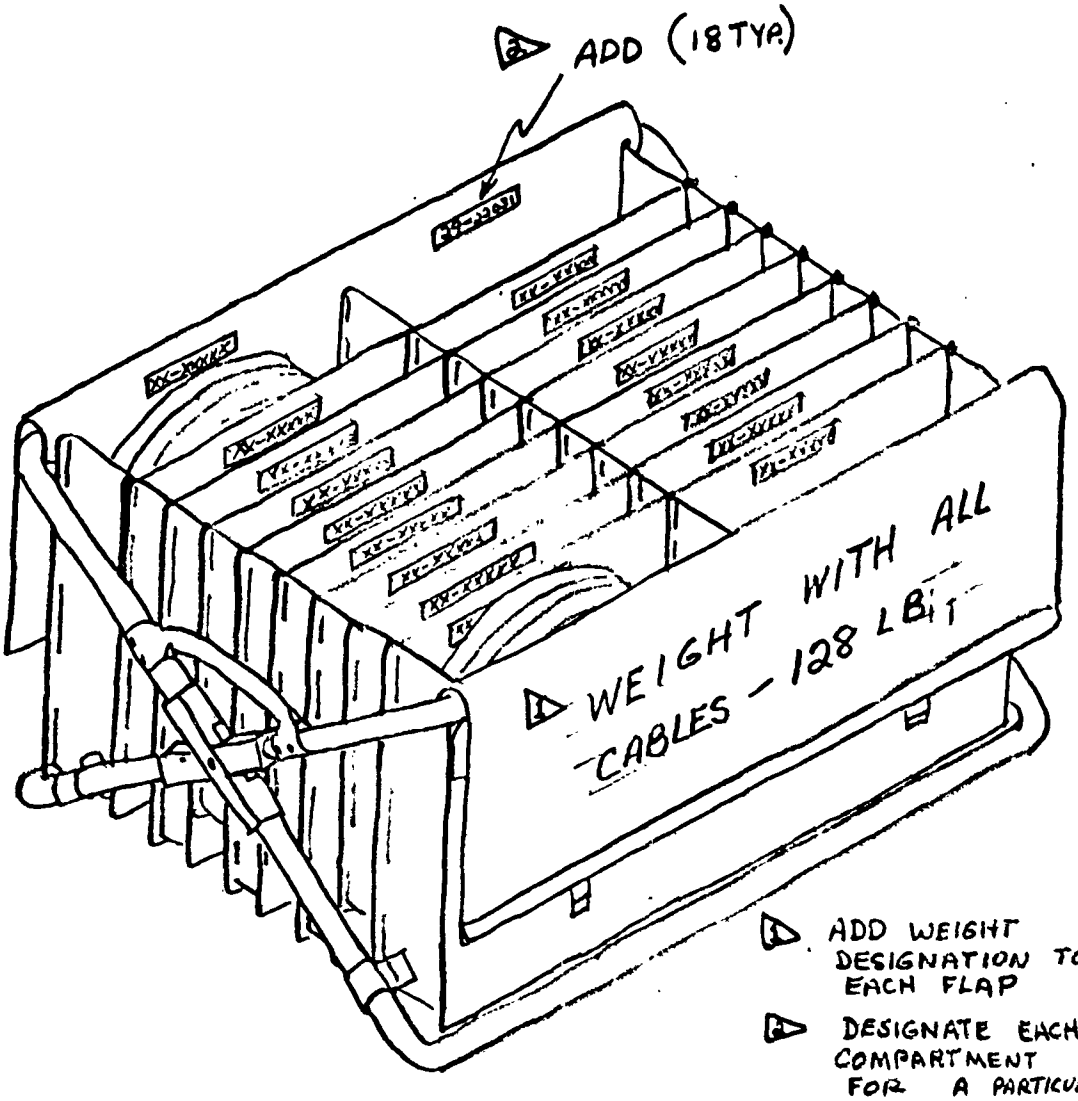
Item 25 - (Continued)

Recommendation:

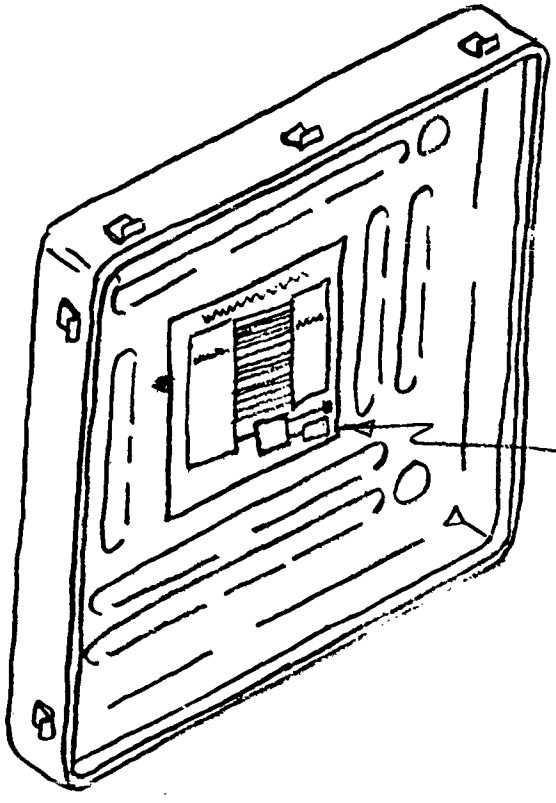
Conform to MIL-M-26512B (USAF) section 3.2.6.

Item 26 - Personnel Requirements

See Item 24.



ELECTRICAL CABLE CASE
25-29147



ADD PLACARD SHOWING CABLE HOOK-UP FOR PROGRAMMER GROUP TEST SET SELF-TEST (REF. T.O. 21-SM80A-23 FIG. 2-25)

COVER, DISTRIBUTION BOX
25-31488 (REF.)

COORDINATION SHEET

TO J. E. Fitzharris 2-5252 39-90
B. R. Johnson 2-5252 39-90

NO. MEG-3-34

File 410.04

GROUP INDEX Minuteman Maintainability Engineering Group

DATE FEB 14 1963

SUBJECT T.O.'s: 21-SM80A-2-3, 21-SM80A-8-1, and 33D9-111-3-1

MODEL WS-133A

Reference: Coordination Sheet No. MEG-3-11, dated 1/22/63.

A Maintainability study is presently in progress on Figure A number 3092, Programmer Group Test Set, AN/GSM-57, 57A. The subject T.O.'s are being used in conjunction with this study. Maintenance information on the Programmer Group Test Set can be improved by incorporation of the following recommendations:

1. At present T.O. 33D9-111-3-1 has no detailed instructions for performance of Self-Test. Section 5-25 is listed as not available.

   Recommendation:

   Insure that section 5-25 of T.O. 33D9-111-3-1 is consistent with sections 2-54 thru 2-56 of T.O. 21-SM80A-2-3. The only difference should be the fact that T.O. 33D9-111-3-1 will be for the SMSA and T.O. 21-SM80A-2-3 will be for the LF. Incorporate the suggestions contained in Coordination Sheet MEG-3-11 in the Self-Test procedure.

2. The Index of Punched Program Cards contained in each of the subject T.O.'s is not consistent. Figure 2-2, page 2-7, of T.O. 21-SM80A-8-1 differs from Figure 2-34A, page 2-74A, of T.O. 21-SM80A-2-3 which differs from section 1-12, page 1-4, of T.O. 33D9-111-3-1. Each of these figures should list the same items and information.

   Recommendation:

   Use the same Index of Punch Program Cards for the AN/GSM-57, 57A in all three T.O.'s. Insure that the punched card information is accurate.

Prepared by: A. Henschel

A. Henschel

Approved by: J. S. McEacheran

J. S. McEacheran
Minuteman M Engineering Group

AH:clj
2/13/63

MAINTAINABILITY EVALUATION/[illegible] REPORT

Report No. [illegible] Date 2-6-63 Page 1 of 3

Prepared by A. H. Smith M/S 6207-1 phone 866-3261

Figure A No. 4012 Nomen. DAC Test-Set (AGO equipment)

Dwg. No. Serial No. 000002

Observed Event None Location VAFB Date 2-5-63

Title or Description Static Evaluation

T.O. Procedures 21-SM80A-2-3 Para. 2-33

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	1	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	3
4	Packaging, Mounting	2	17	Disposable Modules	4
5	Accessibility	4	18	Test Equipment	N/E
6	Work Space	4	19	Servicing, Handling, Equip.	N/A
7	Testing, Servicing	4	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	N/E
11	Controls	4	24	Form B/C	N/E
12	Work Aids	N/A	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. In general, this test-set is of somewhat superior detailed design from a Maintainability viewpoint, however, according to the using group at VAFB, it has never been made to function. Whether this is due to generally poor reliability or to some undiscovered incompatibility is not clear as yet. It is quite certain that, in its present form, it represents a serious Maintainability problem since it would obviously lead to difficulties due to its inability to perform its test function.

More specific information will be available when an opportunity occurs to witness dynamic use of the item.

Item 4. Cases 3 and 4 of the test-set are similar to each other, containing a program-board compartment in the bottom of the case, with a cable-stowage space above.

It was observed that an effort has been made to provide adequate cable-stowage capabilities, but the result is not quite successful. The usual suit-case tester problem exists, namely getting the cables into their allotted space and getting the lid closed on them in a reasonable time.

One cable in case 3 showed a number of small but deep cuts in its insulation, and inspection of the lid revealed a possible explanation; the pressure-venting device protrudes inwards and may have caused the damage during lid-closure.

The cables are stored in a special tray which is secured to the top of the program-board compartment by 15 slotted quick-release fasteners. The ends of some of the cables are placed in a recess at one end of the case, down beside the program board compartment. If it is required to gain access to the program-boards, it is necessary to unwind and remove all the cables, undo the 15 fasteners, and remove the cable-tray.

The connector arrestors in the center of the tray are so designed that each cable must be stored in its proper location and in a complicated sequence which is printed on a label on one of the arrestor lids. The arrestor lids are hinged flaps with a quick-release fastener at the open end; the hinges are flimsy and it seems likely that they will fail in use.

Recommendation:

a. The cable tray should be redesigned so that it may be removed without disturbing the cables.
b. The 15 fasteners should be replaced by a small number of fasteners which are accessible without the need to remove the cables.
c. The connector-arrestor flaps should be provided with more robust hinges.

Item 10. a. No weight labels were found on the cases of the test-set. The cases are all too heavy for one man lift, but the two handles on the ends of the case might invite an attempt to lift the case resulting in probable damage to the individual or the equipment.

Recommendation:

Weight labels specifying two-man lift should be affixed to the cases.

b. The equipment identification label for case 3 was mounted inside the wall of the cable-tray.

Recommendation:
The label should be moved to the outside of the cable-tray where it is not obscured by the cables.

c. The test cables are identified only by drawing number.

Recommendation:
The cables should bear identification labels of the type which are common in other test-sets. These labels show the cable designation, the receptacles with which the connectors mate, as well as the drawing number.

Item 15. On case number 1, the quick-release fasteners holding the equipment chassis into the case were difficult to release. The difficulty was due to an outward bowing of the case along the longer sides; this bow caused the studs to bear against the outside of the chassis holes, thereby causing the chassis to catch against the shoulders of the studs.

In order to release the chassis two men were required; one to compress the sides of the case, the other to lift the chassis clear.

Recommendation:
The shoulders of the stud should be narrower than the diameter of the stud shaft.

Item 16. The program-board holding fixture on the Signal Monitor, (Case 2)is provided with a plywood protective cover which is installed when no board is being used. When removed from the test set this board could easily be mistaken for a piece of scrap wood, and could be lost or destroyed.

Recommendation:
The cover should be painted and identified.

Item 22. T.O. 21-SM80A-2-3 paragraph 2-34a contains a note describing how to change the keying of the adjustable plug on cable 714.

This note does not describe the process fully enough, and should be expanded to indicate the need for disengaging the castellations on the keying shell.

Recommendation:
The note should be expanded as indicated in item 22a of EO 1243-1/3013-1.

Item 26. All units of the test-set employ soldered connections internally. This precludes repair at Field-level due to the restriction on soldering at Field-level.

MAINTAINABILITY EVALUATION/[redacted] REPORT

Report No. EO-4018-1 Date February 8, 1963 Page 1 of 4

Prepared by Alexander Henschel M/S 50-66 phone 6-6263

Figure A No. 4018 Nomen Adapter Group, Test, AN/GSM-61

Dwg. No. 25-33559 Serial No. 0001

Observed Event N/A Location EDL Date February 4 & 5, 1963

Title or Description Maintainability Evaluation of Figure A 4018

T.O. Procedures

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	4	14	Lines and Cables	4
2	Standardization	N/E	15	Fasteners	3
3	Interchangeability	N/E	16	Covers, Cases, Shields	N/A
4	Packaging, Mounting	3	17	Disposable Modules	2
5	Accessibility	3	18	Test Equipment	N/A
6	Work Space	4	19	Servicing, Handling, Equip.	N/A
7	Testing, Servicing	3	20	Tools	N/A
8	Displays	3	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 Form C only	3
12	Work Aids	N/E	25	Specifications	N/E
13	Connectors, Connections	2	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.

Rating Analysis, Figure A Number 4018

4.

A.) A total of eight fuses are mounted within assemblies 25-31604-1, and 25-31603-1. Four are mounted on th heat sink assembly which is part of the 25-31605-1 a. are mounted on the 25-33020-1 heat sink assembly w the 25-31603-1 assembly. The remaining two are loc 31604-1 assembly, one is a spare. Six fuses, three a spare, are mounted on the front panel of 25-31604-1.

Recommendation:

Place all fuses and spares (one spare per active fus panel of their respective chassis. Provide indicatin and positive recognition of equipment malfunction. S Section 3.1.1.

B.) Three sub-contractor manufactured assemblies have assemblies (PCA's) which are electrically terminate connections. The wire route is wire harness to terr terminal board to PCA. Examination of the Referen Chassis 1193071-502, Waveform Converter Chassis 1 Electrical Impedance Simulator Chassis 1193073-502 following observations:

a.) The wire between the terminal board and PCA sufficient slack for at least three reterminatio This condition is not met.

b.) Form C maintenance analysis calls for unwra each PCA pin, replace the faulty PCA, and wra the PCA. This method decreases the reliabili connection because of the wire having had an e

c.) Maintenance technicians may forget the PCA's and pull without first removing the wiring. Th require replacement of PCA, terminal board,

d.) When the AN/GSM-61 and AN/GJM-15 are being used to check assemblies for faults, unnecessary downtime will result if the fault is traced to a wire wrapped PCA. This will be the repair and checkout time difference between a fault traced to an assembly containing wire wrapped PCA's and one to an assembly containing modules which are plug-in.

Recommendation:

Alternative I.

Investigate feasibility of re-design to eliminate the use of wire wrap terminations. Provide etched circuit boards and modules with the plug connector in accordance with Boeing Standard C45BN-3A or equivalent , and the receptacle in accordance with Boeing Standard C45BN-1 or equivalent. See STL Document 6120-6382-DU-RDI.

Alternative II.

a.) Revise Form C analysis to call out the following remove and replace techniques for wire wrapped PCA's:

Remove: 1.) Cut each wire as close as possible to the PCA pin. Tag as necessary for identification.

2.) Remove PCA mounting hardware.

3.) Remove PCA.

4.) Strip each wire in preparation for wrapping to new PCA. If sufficient length is not available replace wire between terminal board and PCA.

Install: 1.) Install new PCA.

2.) Install PCA mounting hardware.

3.) Use a wire wrapping tool to connect wiring to PCA.

4.) Route repaired assembly through test center.

b.) Provide a warning placard within assemblies containing wire wrapped PCA's stating the PCA's are not plug-in type.

5. Access panels at the rear of the cabinet are fasten

Recommendation:

Provide hinged access panels. See MIL-STD-803 Sub Item 1.A also.

7. See items 4 and 5.

8. See item 4.

10. Certain removable assemblies weighing over 45 po with their unit weight. An example is the Program 28170-1.

Recommendation:

Identify unit weight for assemblies weighing over STD-803 section 10.4.3.1

13. Solder connections are used through out the unit.

Recommendation:

Use plug-in assemblies, crimp-on connectors, or on "pig-tail" lead wires to a plug-in or mechanica Document 6120-7822-DU-RDI, Maintainability Crit Sub Item 4.B also.

15. See item 5.

17. See item 4.B

24. See item 4.B

MAINTAINABILITY EVALUATION/[illegible] REPORT

Report No. EO-4018-2 Date 2-14-63 Page 1 of 3

Prepared by A. M. Smith M/S 6207-1 phone 876-3761

Figure A No. 4018 Women Test Adapter Group (Programmer)

Dwg. No. 25-28170-1 Serial No. 0000002

Observed Event Evaluation Location VAFB Date 2-11-63

Title or Description Engineering evaluation of stepping switches.

T.O. Procedures

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	N/O	14	Lines and Cables	N/E
2	Standardization	4	15	Fasteners	N/E
3	Interchangeability	4	16	Covers, Cases, Shields	4
4	Packaging, Mounting	2	17	Disposable Modules	4
5	Accessibility	3	18	Test Equipment	N/O
6	Work Space	N/A	19	Servicing, Handling, Equip.	3
7	Testing, Servicing	N/O	20	Tools	N/O
8	Displays	N/A	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	3	26	Personnel Requirements	2

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. The evaluation observed was concerned primarily with the stepping switches in the Programmer drawer. Other areas were not accessible for evaluation; this report will therefore be more concerned with the programmer than any other component of the Fig A 4018.

a. In general, the Programmer is a very solidly constructed item and gives a strong impression of over-engineering. Its weight (in excess of 200 pounds) appears to derive very largely from a chassis constructed of ¼ inch alloy, and from thick bundles of wires which are broken frequently by terminal boards.

Recommendation

A review of the packaging of the programmer is highly desirable, to determine the feasibility of reducing the weight of the unit and the complexity of the wiring. Special attention should be given to the possibility of dividing this unit into two or more units of more conventional size.

b. A row of three stepping-switches is mounted across the middle of the upper chassis. The switches are sealed units, approximately 6 inches by 4 inches on the base, and they are mounted by means of hex-headed studs over holes in the chassis so that the connectors protrude through. There are seven quick-release Bendix connectors on the base of each switch. One of the studs is used to mount a diode-board, the components being placed on the "inside", that is, over the head of the bolt. This arrangement causes great difficulty in removing the stepping switch, since space is very cramped underneath the chassis. The problem is aggravated by the presence of two stacks of terminal strips on the side of the unit which impede free access to the stepping-switch bases. The basically simple task of removing two components took two hours to accomplish.

Recommendation

1. The mounting studs of the stepping-switches should be accessible from above the chassis, i.e., the switches should be screwed down onto the plate instead of being secured from below.

2. An alternative mounting point should be provided for the diode-boards, and again this should be removable from above.

3. The leads to the stepping-switch should be more readily removed than at present (see item 13). This might include providing longer leads to allow the switch to be partly withdrawn allowing access to the connectors on the underside.

Item 5. In order to remove the middle one of the three topmost stepping-switches, it would apparently be necessary to remove all the connectors from the base of one of the outer switches. The task bristles with difficulties due to the extremely poor accessibility of the seven Bendix plugs on the base of each switch. These plugs are so closely packed that it is only possible to grip them with the fingers and "nudge" them around, a process which is painful, tiring, and time-consuming.

This difficulty would remain even if the recommendations of item 4 were adopted to improve the ease of removal.

Recommendation

The method of making electrical connections to the stepping-switches should be changed. Ideally these components should be plug-in units.

Item 10 The Programmer weighs in excess of 200 pounds which requires the use of a fork-lift for handling. The unit is not labeled to this effect.

Recommendation

A weight label calling for the use of a mechanical hoist should be affixed.

Item 13 The problem of crowding of connectors on the stepping-switches would be disposed of by the recommendation of item 5.

It was noted that there is an enthusiastic employment of terminal strips throughout the unit. These strips impede access and increase cost and complexity, without apparently serving any other function. A bundle of wires will be broken by a terminal strip, with the great majority of the wires going straight on through to be regrouped into a bundle again.

Recommendation

The existing system of wiring should be replaced by a "harness" system to avoid redundant break-points. This process would undoubtedly be eased by repackaging the unit into two drawers.

Item 19 It was necessary to employ a hydraulic "LO-LIFT" to handle the programmer in the Vandenberg SMSB, and the process entailed the use of six men. If the weight of the unit cannot be reduced, or if the unit cannot be divided into two chassis, then a suitable handling fixture will be required.

Recommendation

It must be verified that a suitable mechanical hoist will be available for handling this item.

Item 26 The apparently simple task of removing two stepping-switches from the Programmer required the expenditure of 12 man hours. Part of the effort required the presence of six men to aid in handling.

With proper redesign of this unit it is estimated that the time could be reduced to one man hour or less.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

eport No. EO-4018-3 Date 2-27-63 Page 1 of 3

Prepared by A. N. Smith M/S 6207-1 phone 866-3761

Figure A No. 4018 Nomen Test Adapter Group

Dwg. No. 25-26876-1 Serial No. 5

Observed Event T.O. V&V Location VAFB Date 2-25-63

Title or Description Operational Checkout

T.O. Procedures 33D7-50-3-1 Para. 5-5 thru 5-11

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	4	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	3
4	Packaging, Mounting	3	17	Disposable Modules	N/E
5	Accessibility	4	18	Test Equipment	N/O
6	Work Space	4	19	Servicing, Handling, Equip.	N/E
7	Testing, Servicing	4	20	Tools	N/E
8	Displays	4	21	Platforms, Stands, Shelters	N/E
9	Handles	4	22	Technical Order	3
10	Labels, Marking	2	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	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 4. Circuit Control Boards have a pair of hooked projections on the mating surface which engage a retaining device when the Release Handle is raised.

It has been observed at VAFB that it is very easy for an inexperienced operator to damage the unit during board-insertion; if the bottom of the board is not firmly pressed inwards until it clicks, the retaining pin fouls the ends of the hooks and the great mechanical advantage of the release handles enables the operator to snap the hooks off without feeling any resistance.

Recommendation.

a. The retaining hooks should be bevelled to reduce the flat end-area, and to allow the retaining pin less chance of fouling.

b. The hooks should be strengthened.

c. A cautionary note should be included in all T.O.'s dealing with Circuit Control Board removal and replacement, especially 33D7-50-3-1. See item 22.

d. A cautionary label should be affixed to the cover of each board stressing the need to press the board home firmly before raising the handles.

Item 10. The Fig. A 4018 nameplate is mounted on the left hand end of the unit, and is invisible when the unit is used adjacent to other equipment.

Recommendation.

The nameplate should be mounted on a forward-facing surface.

Item 15. No protective cover is provided for the front of the Programmer Drawer when a Circuit Control Board is not installed. At VAFB it is the practice to tape a piece of cardboard in place.

Recommendation.

A simple plastic dust-cover should be provided for the front of the Programmer Drawer.

Item 22. a. Paragraph 5-7i is somewhat confusing. During Operational Check-out four test sequences are run, each one with a separate circuit control board. This paragraph implies that it is not necessary to turn power off before changing control boards.

During the V&V observed the Test Operator directed the Air Force technician to put the A624 into MODE 1 at the end of step i; this procedure removes power from the 4018 and makes it safe to change boards.

Recommendation.

T.O. 33D7-50-3-1 paragraph 5-7 step i should be revised to show

Rating Analysis, Figure A Number 4018

4.

A.) A total of eight fuses are mounted within assemblies 25-31605-1, 25-31604-1, and 25-31603-1. Four are mounted on the 25-32950-4 heat sink assembly which is part of the 25-31605-1 assembly. Two are mounted on the 25-33020-1 heat sink assembly which is part of the 25-31603-1 assembly. The remaining two are located in the 25-31604-1 assembly, one is a spare. Six fuses, three active and three spare, are mounted on the front panel of 25-31604-1.

Recommendation:

Place all fuses and spares (one spare per active fuse) on the front panel of their respective chassis. Provide indicating fuses for rapid and positive recognition of equipment malfunction. See MIL-M-26512B Section 3.1.1.

B.) Three sub-contractor manufactured assemblies have printed circuit assemblies (PCA's) which are electrically terminated by wire wrapped connections. The wire route is wire harness to terminal board, then terminal board to PCA. Examination of the Reference Signal Generator Chassis 1193071-502, Waveform Converter Chassis 1193072-502, and Electrical Impedance Simulator Chassis 1193073-502 results in the following observations:

a.) The wire between the terminal board and PCA should have sufficient slack for at least three reterminations at the PCA end. This condition is not met.

b.) Form C maintenance analysis calls for unwrapping the wire at each PCA pin, replace the faulty PCA, and wrap each wire to the PCA. This method decreases the reliability of the electrical connection because of the wire having had an extra wrap cycle.

c.) Maintenance technicians may forget the PCA's are wire wrapped, and pull without first removing the wiring. The results will require replacement of PCA, terminal board, and wiring.

d.) When the AN/GSM-61 and AN/GJM-15 are being used to check assemblies for faults, unnecessary downtime will result if the fault is traced to a wire wrapped PCA. This will be the repair and checkout time difference between a fault traced to an assembly containing wire wrapped PCA's and one to an assembly containing modules which are plug-in.

Recommendation:

Alternative I.

Investigate feasibility of re-design to eliminate the use of wire wrap terminations. Provide etched circuit boards and modules with the plug connector in accordance with Boeing Standard C45BN-3A or equivalent, and the receptacle in accordance with Boeing Standard C45BN-1 or equivalent. See STL Document 6120-6382-DU-RDL

Alternative II.

a.) Revise Form C analysis to call out the following remove and replace techniques for wire wrapped PCA's:

Remove: 1.) Cut each wire as close as possible to the PCA pin. Tag as necessary for identification.

2.) Remove PCA mounting hardware.

3.) Remove PCA.

4.) Strip each wire in preparation for wrapping to new PCA. If sufficient length is not available replace wire between terminal board and PCA.

Install: 1.) Install new PCA.

2.) Install PCA mounting hardware.

3.) Use a wire wrapping tool to connect wiring to PCA.

4.) Route repaired assembly through test center.

b.) Provide a warning placard within assemblies containing wire wrapped PCA's stating the PCA's are not plug-in type.

5. Access panels at the rear of the cabinet are fastened by Phillips screws.

Recommendation:

Provide hinged access panels. See MIL-STD-803 section 10.4.3.5.5. See Item 4.A also.

7. See items 4 and 5.

8. See item 4.

10. Certain removable assemblies weighing over 45 pounds are not marked with their unit weight. An example is the Programmer Assembly 25-28170-1.

Recommendation:

Identify unit weight for assemblies weighing over 45 pounds. See MIL-STD-803 section 10.4.3.1

13. Solder connections are used through out the unit.

Recommendation:

Use plug-in assemblies, crimp-on connectors, or components with soldered-on "pig-tail" lead wires to a plug-in or mechanical connectors. See STL Document 6120-7822-DU-RDI, Maintainability Criteria, dated 16 March 1962. See Item 4.B also.

15. See item 5.

17. See item 4.B

24. See item 4.B

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

Report No. EO-4018-2 Date 2-14-63 Page 1 of 3

Prepared by A. M. Smith M/S 6207-1 phone 876-3761

Figure A No. 4018 Women Test Adapter Group (Programmer)

Dwg. No. 25-28170-1 Serial No. 0000002

Observed Event Evaluation Location VAFB Date 2-11-63

Title or Description Engineering evaluation of stepping switches.

T.O. Procedures

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	N/O	14	Lines and Cables	N/E
2	Standardization	4	15	Fasteners	N/E
3	Interchangeability	4	16	Covers, Cases, Shields	4
4	Packaging, Mounting	2	17	Disposable Modules	4
5	Accessibility	3	18	Test Equipment	N/O
6	Work Space	N/A	19	Servicing, Handling, Equip.	3
7	Testing, Servicing	N/O	20	Tools	N/O
8	Displays	N/A	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	3	26	Personnel Requirements	2

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. The evaluation observed was concerned primarily with the stepping switches in the Programmer drawer. Other areas were not accessible for evaluation; this report will therefore be more concerned with the programmer than any other component of the Fig A 4018.

a. In general, the Programmer is a very solidly constructed item and gives a strong impression of over-engineering. Its weight (in excess of 200 pounds) appears to derive very largely from a chassis constructed of ¼ inch alloy, and from thick bundles of wires which are broken frequently by terminal boards.

Recommendation

A review of the packaging of the programmer is highly desirable, to determine the feasibility of reducing the weight of the unit and the complexity of the wiring. Special attention should be given to the possibility of dividing this unit into two or more units of more conventional size.

b. A row of three stepping-switches is mounted across the middle of the upper chassis. The switches are sealed units, approximately 6 inches by 4 inches on the base, and they are mounted by means of hex-headed studs over holes in the chassis so that the connectors protrude through. There are seven quick-release Bendix connectors on the base of each switch. One of the studs is used to mount a diode-board, the components being placed on the "inside", that is, over the head of the bolt. This arrangement causes great difficulty in removing the stepping switch, since space is very cramped underneath the chassis. The problem is aggravated by the presence of two stacks of terminal strips on the side of the unit which impede free access to the stepping-switch bases. The basically simple task of removing two components took two hours to accomplish.

Recommendation

1. The mounting studs of the stepping-switches should be accessible from above the chassis, i.e., the switches should be screwed down onto the plate instead of being secured from below.

2. An alternative mounting point should be provided for the diode-boards, and again this should be removable from above.

3. The leads to the stepping-switch should be more readily removed than at present (see item 13). This might include providing longer leads to allow the switch to be partly withdrawn allowing access to the connectors on the underside.

Item 5. In order to remove the middle one of the three topmost stepping-switches, it would apparently be necessary to remove all the connectors from the base of one of the outer switches. The task bristles with difficulties due to the extremely poor accessibility of the seven Bendix plugs on the base of each switch. These plugs are so closely packed that it is only possible to grip them with the fingers and "nudge" them around, a process which is painful, tiring, and time-consuming.

This difficulty would remain even if the recommendations of item 4 were adopted to improve the ease of removal.

Recommendation

The method of making electrical connections to the stepping-switches should be changed. Ideally these components should be plug-in units.

Item 10 The Programmer weighs in excess of 200 pounds which requires the use of a fork-lift for handling. The unit is not labeled to this effect.

Recommendation

A weight label calling for the use of a mechanical hoist should be affixed.

Item 13 The problem of crowding of connectors on the stepping-switches would be disposed of by the recommendation of item 5.

It was noted that there is an enthusiastic employment of terminal strips throughout the unit. These strips impede access and increase cost and complexity, without apparently serving any other function. A bundle of wires will be broken by a terminal strip, with the great majority of the wires going straight on through to be regrouped into a bundle again.

Recommendation

The existing system of wiring should be replaced by a "harness" system to avoid redundant break-points. This process would undoubtedly be eased by repackaging the unit into two drawers.

Item 19 It was necessary to employ a hydraulic "LO-LIFT" to handle the programmer in the Vandenberg SMSB, and the process entailed the use of six men. If the weight of the unit cannot be reduced, or if the unit cannot be divided into two chassis, then a suitable handling fixture will be required.

Recommendation

It must be verified that a suitable mechanical hoist will be available for handling this item.

Item 26 The apparently simple task of removing two stepping-switches from the Programmer required the expenditure of 12 man hours. Part of the effort required the presence of six men to aid in handling.

With proper redesign of this unit it is estimated that the time could be reduced to one man hour or less.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

eport No. EO-4018-3 Date 2-27-63 Page 1 of 3

Prepared by A. N. Smith M/S 6207-1 phone 866-3761

Figure A No. 4018 Nomen Test Adapter Group

Dwg. No. 25-26876-1 Serial No. 5

Observed Event T.O. V&V Location VAFB Date 2-25-63

Title or Description Operational Checkout

T.O. Procedures 33D7-50-3-1 Para. 5-5 thru 5-11

MAINTAINABILITY CHECKLIST					
1	Fault Isolation	4	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	3
4	Packaging, Mounting	3	17	Disposable Modules	N/E
5	Accessibility	4	18	Test Equipment	N/O
6	Work Space	4	19	Servicing, Handling, Equip.	N/E
7	Testing, Servicing	4	20	Tools	N/E
8	Displays	4	21	Platforms, Stands, Shelters	N/E
9	Handles	4	22	Technical Order	3
10	Labels, Marking	2	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	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 4. Circuit Control Boards have a pair of hooked projections on the mating surface which engage a retaining device when the Release Handle is raised.

It has been observed at VAFB that it is very easy for an inexperienced operator to damage the unit during board-insertion; if the bottom of the board is not firmly pressed inwards until it clicks, the retaining pin fouls the ends of the hooks and the great mechanical advantage of the release handles enables the operator to snap the hooks off without feeling any resistance.

Recommendation.

a. The retaining hooks should be bevelled to reduce the flat end-area, and to allow the retaining pin less chance of fouling.

b. The hooks should be strengthened.

c. A cautionary note should be included in all T.O.'s dealing with Circuit Control Board removal and replacement, especially 33D7-50-3-1. See item 22.

d. A cautionary label should be affixed to the cover of each board stressing the need to press the board home firmly before raising the handles.

Item 10. The Fig. A 4018 nameplate is mounted on the left hand end of the unit, and is invisible when the unit is used adjacent to other equipment.

Recommendation.

The nameplate should be mounted on a forward-facing surface.

Item 15. No protective cover is provided for the front of the Programmer Drawer when a Circuit Control Board is not installed. At VAFB it is the practice to tape a piece of cardboard in place.

Recommendation.

A simple plastic dust-cover should be provided for the front of the Programmer Drawer.

Item 22. a. Paragraph 5-7i is somewhat confusing. During Operational Check-out four test sequences are run, each one with a separate circuit control board. This paragraph implies that it is not necessary to turn power off before changing control boards.

During the V&V observed the Test Operator directed the Air Force technician to put the A624 into MODE 1 at the end of step i; this procedure removes power from the 4018 and makes it safe to change boards.

Recommendation.

T.O. 33D7-50-3-1 paragraph 5-7 step i should be revised to show

the necessity for removing power from the Fig. A 4018 before changing Circuit Control Boards.

b. T.O. 33D7-50-3-1 paragraph 5-4 describes the process of installing and removing Circuit Control Boards. The procedure does not stress the importance of snapping the bottom of the board firmly home before raising the handles. See item 4.

Recommendation.

A cautionary note should be added to paragraph 5-4, or step d should be rewritten to stress the importance of proper location of the board.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

port No. EO-4152-1 Date 2-21-63 Page 1 of 4

Prepared by A. H. Smith M/S 6207-1 phone 866-3761

Figure A No. 4152 Nomen Electrical Test and Maintenance Table FN-136/GSM-82 (v)

Dwg. No. 25-34145-1 Serial No. 0000001

Observed Event V&V Location VAFB Date 2-18-63

Title or Description T.O. V&V

T.O. Procedures 31X3-12-8-2 Paragraph 11.

MAINTAINABILITY CHECKLIST

1	Fault Isolation	N/O	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	4
4	Packaging, Mounting	1	17	Disposable Modules	N/O
5	Accessibility	4	18	Test Equipment	4
6	Work Space	4	19	Servicing, Handling, Equip.	3
7	Testing, Servicing	3	20	Tools	4
8	Displays	3	21	Platforms, Stands, Shelters	N/A
9	Handles	4	22	Technical Order	3
10	Labels, Marking	3	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	3	26	Personnel Requirements	4

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. To date one Adapter Connector and 3 Dummy Loads have been found to have connectors transposed. They are: MX-4284 Adapter Connector Dummy Decoder; Dummy Loads, Electrical DA-304, DA-305, DA-306. This is not strictly a maintainability problem, but the situation must obviously be rectified if these items are to be used.

b. The Fixture, Cooling Air, Part No. 25-35685-1 is designed to permit rotation of the drawer under test to gain access to the underside. The cooling air is supplied through a rotating joint, no doubt quite a costly feature, presumably to allow rotation while power is applied. The design of the trolley however is such as to prevent rotation of the drawer when it has an adapter and cables attached. It is necessary to remove all cables, and the adapter in order to rotate the drawer.

Recommendation.

The "table-top" structure of the trolley should be eliminated, since it is quite useless in its present form. It is too narrow to serve as a work surface. The rotating joint of the drawer fixture should be supported by simple vertical posts rising directly from the base structure. This would permit free access to the fixture and would permit rotation without dismantling of the test set-up. The cost of the fixture would also be considerably reduced by elimination of the decorative plastic and wood elements of the present fixture, together with elimination of the remarkably complex and expensive swivelled stainless steel handle.

Item 5. When a drawer is mounted in the Fixture, Cooling Air, it is not possible to remove the dust covers from the drawers without distorting them, because the openings top and bottom are a fraction of an inch too small.

Recommendation.

The size of the access holes should be increased to allow installation and removal of dust covers while a drawer is in the fixture.

Item 7. AVTRON T242B LOAD-BANK ELECTRICAL is adjusted by using a Multimeter and test leads (see paragraph 11-19d of T.O. 31X3-12-8-2) but the terminals of the load bank have no provision for inserting test leads. This requires the operator to press the leads against the terminals manually while adjusting the load bank with his third hand. This procedure could also result in error due to poor electrical contact.

Recommendation.

a. Holes should be drilled in ends of the terminals to accomodate banana jacks.

b. Provision should be made for measuring the resistance at a proper jack on the panel of the Test-Set, Voltage Regulators, Programmer Group TS-1794/GSM(v).

Item 8. Paragraph 11-21g calls for the use of the OHMS X1 scale to measure 30 ohm resistance of the load bank.

Recommendation.

The OHMS X10 scale will give a more accurate reading in this case. The T.O. should be changed to this effect.

Item 10. a. During Voltage Regulator checkout, W-18 is connected to the Load Bank Electrical. The terminating lugs of W-18 are indistinctly marked as E1 and E2 by means of a molded impression. T.O. 31X3-12-8-2, Figure 11-1, refers to these terminations as P2 and P3.

Recommendation.

A yellow adhesive label identifying the terminals as E1 and E2 should be affixed, and the T.O. Figure 11-1 should be changed to agree with the hardware.

b. The AVTRON T-242B Load Bank has no weight label although it weighs around 70 pounds.

Recommendation.

A weight label should be affixed.

Item 13. a. W-16 is connected to the Airflow Interlock connector on the Fixture, Cooling Air during drawer testing.

The cable terminates in a connector which is approximately 7 inches in length while being only ½" in diameter at the point of entry into the socket. Almost any accidental blow will break this connector or the socket.

This problem is fairly common throughout much of the equipment employing Pyle National connectors, but is especially hazardous in the thinner ones. It seems amazing that a seven inch "lay-back" is required to connect three conductors.

Recommendation.

An attempt should be made to provide a more practical connector in this application. Preferably an investigation of wider scope should be initiated to determine whether Pyle National connectors should be used at all on test equipment, on account of their excessive bulk and use of multiple-turn connections.

In some applications, the use of strap wrenches and torque-wrench kits is being advocated for these connectors, which seems absurd when it is recalled that these applications are for static ground-based test equipment.

It seems almost certain that a better connector should be available at or below the price of these items, which would incorporate the desirable features of quick connect/disconnect, and ruggedness.

Item 13. b. W-18 of the test set-up is terminated by flat circular terminal lugs. In order to connect these terminals it is necessary to remove the retaining knobs on the T242B Load Bank; it is then discovered that it is not possible to screw the terminals down tightly because the lugs are not long enough to clear the shoulders of the knobs.

Recommendation.

The terminal lugs on W-18 should be longer and more robust and should be of the open-sided variety.

Item 15. The fasteners used to lock an Adapter on the back of a drawer tend to swing out when the drawer (minus adapter) is rotated and catch on the "table-top" surface of the Cooling Air Fixture. In one case the fastener broke off.

Recommendation.

If the recommendation of item 4b is not accepted, these fasteners should be replaced by a spring variety that will remain close to the side of the drawer fixture when disengaged.

Item 19. Deficiencies in the Fixture, Cooling Air have been dealt with under item 4.

Item 22. a. T.O. 31X3-12-8-2, Figure 11-1, refers to the terminals of W-18 as P2 and P3. (See item 10.)

Recommendation.

The T.O. should be revised, identifying the terminals as E1 and E2 to agree with the hardware. Flagnote 1 should be similarly revised.

b. See item 8.

MAINTAINABILITY EVALUATION/~~OBSERVATION~~ REPORT

Report No. BO-4490-1 Date 2-11-63 Page 1 of 3

Prepared by A. H. Smith M/S 6207-1 phone 866-3761

Figure A No. 4490 Nomen Simulator Set, Electrical Functions, Missile-Launch AN/GSM-62

Dwg. No. 25-33940-1 Serial No. Set #2

Observed Event None Location VAFB Date 2-11-63

Title or Description Static evaluation

T.O. Procedures 3309-14-26-1 (Operation and Maintenance)

MAINTAINABILITY CHECKLIST

1	Fault Isolation	N/O	14	Lines and Cables	4
2	Standardization	4	15	Fasteners	3
3	Interchangeability	4	16	Covers, Cases, Shields	3
4	Packaging, Mounting	3	17	Disposable Modules	N/O
5	Accessibility	4	18	Test Equipment	N/O
6	Work Space	4	19	Servicing, Handling, Equip.	N/A
7	Testing, Servicing	N/O	20	Tools	N/O
8	Displays	3	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/O	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 4 The two small junction-boxes stored in the Distribution Box are held in place by a plate which is secured by eight slotted quick-release fasteners. It is necessary to remove the dust-caps from two of the sockets in order to remove the retaining plate, because the hole in the plate is too small to pass the skirt umbilical dust cover, and the dust cap on the small connector is attached to the plate by a chain.

Recommendation.

1. The retaining cover should be hinged along one side and fastened down with no more than two butterfly type quick-release fasteners.

2. The holes should be enlarged to allow the retaining plate to be removed without removing dust caps.

Item 8 The Signal Data Recorder has an indicator lamp adjacent to the ON-OFF switch. The word POWER is printed beside this indicator, implying that it will be illuminated when the recorder is switched on. During the evaluation the recorder was hooked up but not switched on, but it was observed that the lamp was glowing dimly. This situation was somewhat confusing because if the lamp is supposed to indicate that power is available, then it should be identified accordingly as POWER AVAILABLE, and the lamp should be bright enough to be easily discernible. If the lamp indicates that the recorder is switched on, then it should not glow at all when the unit is switched off. There is no circuit diagram in the Operation and Maintenance T.O., nor is there any descriptive material that indicates the proper mode of operation of this indicator.

Recommendation.

The function of the indicator should be clarified by an unambiguous label, and the T.O. should describe the Signal Data Recorder more fully.

Item 10 a. It was observed that temporary adhesive labels had been affixed to each box of the test-set showing "Fig A 4490" and "CASE 1 of 6" etc.

This practice of identifying items by temporary Fig A number labels has been adopted extensively at Vandenberg due to the confusion arising out of the use of several different identification systems. For example one item may be known by ACO number, drawing number, Federal Stock Number, BGS number or Figure A number.

Recommendation.

All Figure A items should be prominently labeled to aid in recognition.

b. The individual cases of the Fig A 4490 observed were all identified as being serial number 2, but the over-all Test-Set number as shown on the label of the Simulator was serial number 4.

It is quite possible that this situation is the result of an error, but it does indicate the desirability of listing component parts and serial numbers on a master label.

Recommendation.

A label should be added to the test-set listing serial numbers and drawing dash numbers to aid in determination that a complete and proper set has been acquired.

c. Some of the cables bear as many as eight assorted labels of the adhesive rubber and wrap-around yellow plastic types. It therefore becomes more difficult to identify a cable when it is tangled with others.

Recommendation.

One label at either end of a cable should be sufficient, and the label should bear the identification that is used in T.O. procedures.

If it is considered necessary to label cables with jack number, "mating with" plug number, drawing number, serial number, function, wire number etc., then one of the labels should be of an outstandingly different color to simplify the task of identification.

Item 15 a. The simulator chassis is secured to the case by 32 screws, and the small access panel is secured by 22 screws. The top and bottom lids are secured by 12 over-center latches each. All the other cases are secured by 12 latches each.

Recommendation.

Each case in the test-set should be re-evaluated to see if it is not possible to reduce the number of screws securing panels, and catches securing lids.

Item 16 All quick-release connector dust caps have a keyed center-piece. It becomes an irritating task to locate the dust cap because there is nothing with which to rotate the center-piece.

Recommendation.

The dust cap center-piece should not be keyed.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

Report No. EO-4490-2 Date February 25, 1963 Page 1 of 7

Prepared by Alexander Henschel M/S 50-66 phone JU6-6263

Figure A No. 4490 Nomen Simulator Set, Electrical Functions, Missile-Launch, AN/GSM-62

Dwg. No. 25-33940, 25-33733 Serial No. 0002*

Observed Event Static Evaluation Location EDL Date February 22, 1963

Title or Description Maintainability Evaluation of AN/GSM-62

T.O. Procedures 33D9-14-26-1 (Operation and Maintenance)
(Reference) *SM-245 Ser #000002 CY-3680 Ser #000002
RO-186 Ser #000001 CY-3681 Ser #000002
CY-3634 Ser #000002 J-1291 Ser #000001

MAINTAINABILITY CHECKLIST

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

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.

Rating Analyses for AN/GSM-62

Item 2, Standardization

Simulator Set Cable Assembly Cases CY-3680 and CY-3681 and Simulator Set Case - Test Adapter CY-3634 have feet which are strong and well designed. The suitcases for Simulator SM-245, Recorder RO-186, and Distribution Box J-1291 have riveted feet, Zero P/N 7-701, which are easily broken.

Recommendation:

Use the more rugged feet of CY-3634, CY-3680, and CY-3681 for all MGE and ACO equipment suitcases.

Item 3, Interchangeability

The top covers for suitcases CY-3634, CY-3680, and CY-3681 are interchangeable; they should not be. Each cover can be placed on its suitcase in four different positions; only one will allow fastening the latches. The top cover for Distribution Box J-1291 can fit two ways; only one is correct. Simulator SM-245 has a top and bottom cover for its suitcase; each cover can be placed two ways; only one will allow fastening.

Recommendation:

Provide an alignment marker on the suitcase and cover to make the proper position of the cover obvious. This alignment marker could be a different color for each of the like cases in question. See MIL-STD-803 sec. 10.4.3.5.1.

Item 4, Packaging, Mounting

a) The Simulator Assembly 25-33733-1, Recorder 25-35862-1, and Distribution Box 25-33734-1 can be placed in their carrying cases 180° from the proper position. When the Recorder is returned to its case the maintenance technician must align the RFI gasket with a dowel pin or other means before fastening the Recorder to the case.

Recommendation:

Provide alignment pins on the case so the Simulator Assembly, Recorder, and Distribution Box fit into their carrying case properly. Alignment pins will improve maintenance time and eliminate many

Item 4, (Continued)

of the stripped fasteners which result from improper chassis and case alignment. See MIL-STD-803 section 10.4.3.7.5.

b) Components on assembly 301294-901 (TB-3) of Recorder Assembly 301292-901 are high failure rate items (diodes). Work on or removal of TB-3 requires other assemblies to be removed first.

Recommendation:

Provide greater accessibility per MIL-STD-803 section 10.4.3.10.1.

c) The Recorder suitcase top cover, part of 10-21340-1, is hinged at one side. When the case is opened the cover can be removed from or left on the case during organizational use. If the cover is left on, the weight of the cover is sufficient to cause the hinges to tear away from the suitcase. Removing the cover will alleviate the above problem, however when it is replaced the hinge pins will be knocked out if perfect alignment of the cover hinge is not made with the case hinge pin.

Recommendation:

Provide a removable arm which will prevent the top cover from placing undue loading on the hinges when the Recorder suitcase is open.

d) Dust covers for the Skirt Umbilical Junction Box and G&C Umbilical Junction Box receptacles have to be removed before panel 29-26830-1 of Distribution Box 25-33734-1 can be raised. This panel has to be raised in order to remove the junction boxes for use. During the removal of these dust covers the maintenance technician's fingers rub against the rough nylon material lining the circumference of the holes in the panel where the junction box connectors protrude. Enough skin is removed from the technicians's fingers during this operation to sufficiently decrease his electrical resistance thereby making him more susceptible to electrical shock.

Recommendation:

Provide a hinged panel with larger holes so that the dust covers need not be removed. Fasten the panel to the Distribution Box with a minimum of captive quick-release fasteners and have the dust covers captive to their respective junction box rather than to the panel. Use MIL-STD-803 sections 10.4.3.5.5, 10.4.3.5.8, and 10.4.3.8.1.1 as a design guide.

Item 5, Accessibility

a) Spare fuses and a spare lamp for the Recorder are located behind the hinged partition of the top cover. Enough room is available on the front panel of the Recorder so the spares could be mounted adjacent to their active counterpart.

Recommendation:

Mount spare fuses and lamps as close as possible to their active counterpart.

b) Cable harness is mounted directly over the twist lamp and switch wiring terminations in Simulator 25-33733-1.

Recommendation:

Route wire harness so that access to switches is improved. See MIL-STD-803 section 10.4.2.3.3.

Item 8, Displays

Non-indicating fuses are used on the Simulator and Recorder.

Recommendation:

Use indicating type fuses per section 6.1.2.3.1, item 25.1.1.1.3, Boeing Document D2-4747-1, Maintainability Design Criteria for Minuteman Electronics Equipment.

Item 9, Handles

One handle on Simulator 25-33733-1 is mounted directly over four of the Phillips screws holding down panel 25-34464-1. The handles on the Recorder are much smaller than the standard handle used on the other chassis of AN/GSM-62.

Recommendation:

Use the standard handle BACH10G5 on the Recorder. Ensure that handle mounting does not interfere with removal of other items.

Item 10, Labels, Marking

a) Cases CY-3634, CY-3680, and CY-3681 all have the same weight marking of 100LB, however each case with cables does not weigh the same.

Item 10, (Continued)

Recommendation:

Mark the proper weight on each carrying case per MIL-STD-803 section 10.4.3.1.

b) The following items and blueprints have the incorrect marking for pounds.

1) Recorder RO-186

2) Blueprints 25-33735 and 25-35862

Recommendation:

MIL-STD-12B and Boeing Document 13228, Manual of Writing Style, Section II-2 give the abbreviation LB as correct for pounds. Use the above reference as guides for abbreviations.

Item 13, Connectors, Connections

a) Recepticles J6 and J6A of Recorder 25-35862 have plastic dust covers which are easily lost.

Recommendation:

Provide captive dust covers as are provided for the remaining receptacles of AN/GSM-62.

b) The routing of the wiring harness to the printed circuit cards in the Recorder allows the wiring to become damaged when the Recorder is lifted in and out of its carrying case.

Recommendation:

Reroute the wiring harness or use a larger case for the Recorder. See MIL-STD-803 section 10.4.3.5.3.

Item 15, Fasteners

The Simulator is fastened to its carrying case by 32 Phillips screws and self-locking nuts. Recorder RO-186 is fastened to its case by 16 Phillips screws. Panel 25-34464-1 is fastened to the Simulator by 22 Phillips screws. The Distribution Box 25-33734 has 22 Phillips screws to fasten it to the case. Washers are used under each of the Phillips screws.

Recommendation:

Recorder RO-186 has an RFI gasket and therefore needs the number of fasteners used. The remaining applications however need only one half the number of screws used. See MIL-STD-803 section 10.4.3.8.12. The washers need not be used because the maintenance technician in the field will either lose or throw them away. Use captive nut plates instead of lock nuts as a means of fastening the chassis to its case. Slotted hex-head screws are recommended in lieu of Phillips screws because of their better adaptability to field maintenance situations.

Item 16, Covers, Cases, Shields

See items 2,3, and 15

Item 22, Technical Order - T.O. 33D9-14-26-1.

a) Section VI, Maintenance Instructions, Section VII, Troubleshooting, Section VIII, Calibration, and Section IX, Repair Instructions are listed as information to be supplied at a later date.

Recommendation:

Apply these instructions as they become available to a working situation before including them in the T.O. This will ensure that the techniques and operations called out are valid.

b) Section I figure 1-2, Leading Particulars is in error with regard to equipment part numbers.

Recommendation:

Correct the Technical Order for the part numbers for these equipments:

(1) SM-245/GSM-62	Should be 25-33733-1
(2) J-1291/GSM-62	Should be 25-33734-1
(3) CY-3634/GSM-62	Should be 25-34046-1

c) Section 5-12. Recorder operational checkout procedure does not have a step for turning on power.

Recommendation:

Add a step between a. and b. stating "Place power ON/OFF switch to the ON position; white pilot lamp shall illuminate."

Item 23, Figure A

The Technical Requirements section does not contain a paragraph on Operability and Maintainability.

Recommendation:

Conform with AFBSD Exhibit 61-56 by supplying a paragraph on Operability and Maintainability in the Technical Requirements section of the Figure A.

MAINTAINABILITY ~~EVALUATION~~/OBSERVATION REPORT

Report No. EO.4491-1 Date February 6, 1963 Page 1 of 3

Prepared by Ralph L. Stearns M/S 50-66 phone 6-6263

Figure A No. 4491 Nomen Start-Up Unit, Launch Facility, OA/GSM-62

Dwg. No. 25-33549 Serial No. 7

Observed Event T.O Verification Location Malmstrom AFB-F6 Date 1-25-63

Title or Description T.O. Verification

T.O Procedures T.O. 21-SM80A-2-3 Paragraph 2-67

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

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 2. The power cable from the power pack, used with the Start-Up Unit, has a connector with a fine thread nut and plug.

Recommendation:

The connector and plug should be of the coarse thread, quick release type used on other Minuteman cabinets.

Item 10. The cable storage suitcase does not have a cable inventory and cable location placard.

Recommendation:

To minimize the loss and damage of cables a cable inventory and cable location placard should be fastened to the cover of the cable storage suitcase.

Item 11. The "ON-OFF" control for the start-up power to the G&C gyrosopes consists of connecting and disconnecting the power pack cable.

Recommendation:

An "ON-OFF" power control switch should be installed on the power pack.

Item 12. A head set must be used and VRSA must be interrogated three times during start-up.

Recommendation:

With a fault code placard attached to VRSA the same results could be accomplished by use of the selector switches and indicator lights. This would eliminate the need for a head set and the interrogation of VRSA.

Item 13. See Item 2.

Item 16. The cover to the test set suitcase can be installed only one way but due to symmetry, has no readily identifiable method of indicating the correct way.

Recommendation:

The cover and the case should be marked so maintenance personnel can readily discern the correct installation position.

Item 22. A. The Technical Order does not note that for a certain period of time the missile alignment light beam must not be broken.

Recommendation:

A caution note should be included in the T.O.

B. An interim solution to Item 12 could be attained by a minor T.O. revision.

Recommendation:

The T.O. could be changed so maintenance personnel were instructed to use the VRSA selector switches and the VRSA code table included in the T.O. This would eliminate the need for a head set and the interrogation of VRSA, thus increasing the useful life of VRSA.

MAINTAINABILITY EVALUATION/OBSERVATION REPORT

Report No. EO-4491-2 Date February 18, 1963 Page 1 of 5

Prepared by Ralph L. Stearns M/S 50-66 phone 6-6263

Figure A No. 4491 Nomen Start-Up Unit, Launch Facility, OA/GSM-62

Dwg. No. 25-33549 Serial No. 1

Observed Event Evaluation Location EDL Laboratory Date February 15, 1963

Title or Description

T.O. Procedures

MAINTAINABILITY CHECKLIST

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

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, Packaging, Mounting:

A. The two suitcases, used to house the figure A equipment, are fragile and may not be capable of withstanding the rough field handling.

Recommendation:

The suitcases should be changed to the Zero Modular Packaging System type per catalog E59 or similar.

B. When the top chassis is removed for service it is fastened to the lower module by a wire bundle. This makes the units very hard to handle and no doubt will result in damage to both the chassis and the wire bundle.

Recommendation:

The top chassis could be fastened to the lower unit by a hinge. If this is not practical the wire bundle should be made in two sections which would plug together when assembled.

C. To remove the lower chassis from the suitcase the top unit must be held by one man, a second man must hold the suitcase in place, and a third man must lift the lower chassis out of the suitcase.

Recommendation:

Per MIL-STD-803 paragraph 10.4.3.5.2 "Where possible, cases shall be designed to lift off units rather than units lifted out of cases."

D. To assemble the two chassis and the suitcase, drift pins must be used to align the three units.

Recommendation:

Per MIL-STD-803 paragraph 10.4.3.7.5 "Guide pins or their equivalent shall be provided on units for alignment during mounting."

E. There is no easy way to discern the orientation of the two chassis and the suitcase.

Recommendation:

Per MIL-STD-803 paragraph 10.4.3.5.1 "The proper orientation of a unit within its case shall be made obvious, either through design of the case or by means of appropriate labels.

F. The spare fuses for the modules in the test set suitcase are mounted in the cable storage suitcase.

Recommendation:

The spare fuses should be mounted in the same suitcase, readily accessible, and adjacent to the working fuses.

G. To use either the self-test set or the break-out-box the maintenance man must remove them from the suitcase.

Recommendation:

By mounting the connector receptacle on the tops of these modules this requirement would be eliminated.

Item 5, Accessibility:

Wire bundles located directly over terminal boards TB1, TB3, TB4, TB5, TB6, TB7, and TB8 make the terminals inaccessible.

Recommendation:

Relocate the wire bundles so the terminals are accessible.

Item 9, Handles:

During removal the lower chassis tends to twist because the handles are not located over the center of gravity.

Recommendation:

Per MIL-STD-803 paragraph 10.4.3.2.2 "Whenever possible, handles or grasp areas shall be located over the center of gravity of the unit so that when the unit is lifted it does not swing or tilt.

Item 10, Labels, Marking:

A. The label for transformer "T 1" is obscured by mounting board "A 1".

Recommendation:

Change the location of the transformer label.

B. It is difficult to locate the right positioning guide for the plug-in circuit boards.

Recommendation:

Label the correct positioning guides.

C. It is difficult to determine which plug-in circuit board goes into which receptacle.

Recommendation:

Label the circuit boards and the receptacles with reference designations.

D. The abbreviation of "pounds" on the suitcases is "lbs."

Recommendation:

The abbreviation "lb" should be used per MIL-STD-12B, paragraph I.3.4.

E. The name plates, on the test adapter and break-out-box chassis, are not visible when the modules are in their correct mountings.

Recommendation:

Locate the name plates so they are visible.

Item 15, Fasteners:

A. The circuit card retaining cover is held in place by phillips screws with flat washers under the heads.

Recommendation:

As the washers are not required and will be discarded by field personnel money can be saved by not using them.

B. Phillips head screws and bolts are used through out the test set. This type of head is susceptible to ruin while being removed.

Recommendation:

Use hex-head screws and bolts in place of phillips head.

C. The mountings for capacitors C2 and C3 are held in place by bolts and nuts. This requires the use of a holding tool and a turning tool to remove a part.

Recommendation:

When a nut is required use a captive type nut.

Item 16, Covers, Cases, Shields:

The cover to the test set suitcase can be installed only one way but due to symmetry has no readily identifiable method of indicating the correct way.

Recommendation:

The cover and the case should be marked so maintenance personnel can readily discern the correct installation position.

Item 23, Figure A:

The Figure A does not contain any Maintainability Design Requirements. In accordance with AFBSD exhibit 61-56 Maintainability Design Requirements must be included in the Figure A's for all OGE and MGE Minuteman equipment for which Boeing is responsible.

Recommendation:

When the Figure A is revised Maintainability Design Requirements should be added.

Item 24, Form B/C:

A. Line 4C of the Form C reads "blowers." There is only one blower.

Recommendation:

On the next revision of the Form C change line 4C to read "blower."

B. Line 4a of the Form C instructs the maintenance personnel to remove the test set case. The Form C does not instruct the maintenance personnel to put the test set back in the case.

Recommendation:

On the next revision of the Form C correct this condition.

MAINTAINABILITY EVALUATION/~~OBSERVATION~~ REPORT

Report No. EO-1337-1 Date February 25, 1963 Page 1 of 3

Prepared by Ralph L. Stearns M/S 50-66 phone 6-6262

Figure A No. 1337 Nomen Distribution Box J-1269/GSW-4

Dwg. No. 25-23468 Serial No. 7

Observed Event Evaluation Location EDL Laboratory Date 2-22-63

Title or Description

T.O. Procedures

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

A. The two large access panels must be supported and aligned by the technician while he is trying to install the retaining bolts.

Recommendation:

Per MIL-STD-803 paragraph 10.4.3.7.5 "Guide pins or their equivalent shall be provided on units for alignment during mounting."

B. To remove relay K3 the wiring to relay K2 must be removed.

Recommendation:

Per MIL-STD-803 paragraph 10.4.2.3.3 "All throwaway assemblies or parts are accessible without removal of other components."

C. Due to the location of cable connector receptacles J30, J32, J33 and J34 it is almost impossible to remove the cables without first removing other cables.

Recommendation:

Per MIL-STD-803 paragraph 10.5.2.1.2 "Connectors shall be located far enough apart that they can be grasped firmly for connections and disconnections. Space required will depend upon the size and shape of the plug."

Item 5, Accessibility

See Item 4 paragraph "B" and "C".

Item 10, Labels, Marking

Part of the label for circuit breaker No. 6, VRSA Emergency Power, is hidden by a mounting screw.

Recommendation:

Per MIL-STD-803 paragraph 5.2.4. "Labels should not be hidden by units and parts. For example, labels on the chassis should not be placed under the parts which they identify. Also see MIL-STD-130B. Paragraph 4.2."

Item 13, Connectors, Connections:

See Item 4 paragraph "C."

Item 15, Fasteners

There are eighty-six hex-head bolts holding the two access panels to the distribution box.

Recommendation:

Per MIL-STD-803 paragraph 10.4.3.7.1 "A minimum number of screws or bolts shall be used for unit installation."

Item 23, Figure A:

The Figure A does not contain any Maintainability Design Requirements. In accordance with AFBSD Exhibit 61-56 Maintainability Design Requirements must be included in the Figure A's for all OGE and MGE Minuteman equipment for which Boeing is responsible.

Recommendation:

When the Figure A is revised Maintainability Design Requirements should be added.

Item 24, Specifications

Model Specification, Distribution Box, (S-133-111-1-28), Boeing Document D2-6600, has no reference to maintainability.

Recommendation:

Conform to MIL-M-26512B (USAF) section 3.2.6.