

**TECHNICAL MANUAL**

**GS AND DEPOT MAINTENANCE MANUAL  
TEST, CRYOGENIC  
REFRIGERATOR  
AN/AAM-40  
(NSN 4130-00-403-1007)  
SERVICE KIT, REFRIGERANT  
MK-1171/AAS-24  
(NSN 4940-00-403-1007)**

This copy is a reprint which includes  
current pages from Changes 1 and 2.  
The title was changed by Change 2.

---

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**FEBRUARY 1971**

TECHNICAL MANUAL  
No. 11-6625-2446-45

{

TM 11-6625-2446-45  
HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC, 5 February 1971

**GS and Depot Maintenance Manual**

**TEST SET, CRYOGENIC REFRIGERATOR AN/AAM-40 (NSN 4130-00-197-6347)  
AND  
SERVICE KIT, REFRIGERANT MK-1171/AAS-24 (NSN 4940-00-403-1007)**

		Paragraph	Page
CHAPTER	1. INTRODUCTION.....	1-1-1-4	1-1
CHAPTER	2. FUNCTIONING OF EQUIPMENT		
Section	I. Block Diagram discussion.....	2-1, 2-2	2-1
	II. Circuit discussion.....	2-3, 2-4	2-5
	II. Functioning of electronic subassemblies.....	2-5-2-10	2-11-2-14
CHAPTER	3. GENERAL SUPPORT MAINTENANCE		
Section	I. General .....	3-1-3-3	3-1
	II. Troubleshooting.....	3-4-3-6	3-2-3-13
	III. Removal and replacement.....	3-7, 3-8	3-14
	IV. Adjustment and alignment .....	3-9, 3-10	3-14
	V. Repair .....	3-11, 3-12	3-14
	VI. General support test procedures .....	3-13-3-15	3-15
CHAPTER	4. DEPOT MAINTENANCE		
Section	I. General .....	4-1-4-3	4-1
	II. Depot troubleshooting.....	4-4- 4-7	4-1, 4-2
	III. Depot removal and replacement procedures.....	4-8-4-12	4-4-4-10
	IV. Depot adjustment and alignment .....	4-13, 4-14	4-18, 4-19
	V. Repair .....	4-15, 4-16	4-19
	VI. Depot test procedures.....	4-17-4-19	4-20
	VII. Printed circuit board maintenance .....	4-20-4-22	4-20
CHAPTER	5. DEPOT OVERHAUL STANDARDS.....	5-1-5-3	5-1
APPENDIX	A. REFERENCES.....		A-1
INDEX	.....		I-1

Change 2 i

## LIST OF ILLUSTRATIONS

Figure No.	Title	Page
2-1	Cryo test set vacuum system, block diagram .....	2-3
2-2	Control group unit 2, block diagram.....	2-4
2-3	Detector tester 3A1, block diagram .....	2-5
2-4	Equipment interconnection.....	2-6
2-5	Unit 2 filter assembly, schematic diagram .....	2-9
2-6	Detector tester 3A1, schematic diagram.....	2-10
2-7	Cryogenic high vacuum unit 1A1A2, schematic diagram.....	2-12
2-8	High voltage power supply 1A3, schematic diagram.....	2-13
2-9	Filter assembly 1A2, schematic diagram .....	2-15
2-10	Integrated circuit type SN52709L, schematic diagram.....	2-16
2-11	Cryo test set vacuum system, schematic diagram.....	2-17
4-1(1)	Power supply 1A1, parts location (part 1 of 3) .....	4-5
4-1(2)	Power supply 1A1, parts location (part 2 of 3) .....	4-6
4-1(3)	Power supply 1A1, parts location (part 3 of 3) .....	4-7
4-2	Leak detector 1A1A1, parts location.....	4-8
4-3	High vacuum unit 1A1A2, parts location.....	4-9
4-4	High voltage power supply 1A1A3, parts .....	4-10
4-5(1)	Vacuum pump group unit 1, parts location (part 1 of 3) .....	4-11
4-5(2)	Vacuum pump group unit 1, parts location (part 2 of 3) .....	4-12
4-5(3)	Vacuum pump group unit 1, parts location (part 3 of 3) .....	4-13
4-6(1)	Control group unit 2, parts location (part 1 of 2) .....	4-14
4-6(2)	Control group unit 2, parts location (part 2 of 2) .....	4-15
4-7	Detector tester 3A1, parts location .....	4-16
4-8(1)	Compressor unit 5, parts location (part 1 of 2).....	4-17
4-8(2)	Compressor unit 5, parts location (part 2 of 2).....	4-18
4-9	Leak detector 1A1A1, initial test setup .....	4-22
4-10	High vacuum power supply 1A3, initial test setup.....	4-24
4-11	High voltage power supply 1A3, initial test setup.....	4-27
4-12	Manifold parts location diagram .....	4-30
FO-1	Color code for military standard resistors, inductors, and capacitors.....	FO-1
FO-2	Vacuum pump group unit 1, block diagram .....	FO-2
FO-3	Vacuum pump group unit 1, schematic diagram.....	FO-3
FO-4	Control group unit 2, schematic diagram .....	FO-4
FO-5	Leak detector 1A1A1, schematic diagram .....	FO-5
FO-6	Compressor unit 5, schematic diagram .....	FO-6
FO-7	Filter assembly 1A2, parts location.....	FO-7
FO-8(1)	Vacuum pump group unit 1, wiring diagram (part 1 of 2) .....	FO-8
FO-8(2)	Vacuum pump group unit 1, wiring diagram (part 2 of 2) .....	FO-9
FO-9	Control group unit 2, wiring diagram.....	FO-10
FO-10	Cables, wiring diagrams .....	FO-11

## LIST OF TABLES

Table No.	Title	Page
3-1	Test Equipment.....	3-1
3-2	Voltage Measurements .....	3-8
3-3	Resistance Measurements .....	3-9
3-4	Continuity Measurements.....	3-11
4-1	Test Equipment.....	4-1
4-2	Compressor Repair and Replacement Data .....	4-3
4-3	Transistor and Diode Voltage Measurements for 1A1A1 .....	4-23
4-4	Operational Amplifier Voltage and Waveforms for 1A1A1 .....	4-23
4-5	Transistor and Diode Voltage Measurements for 1A1A2 .....	4-26
4-6	Transistor and Diode Voltage Measurements for 1A3.....	4-29

**LIST OF CHARTS**

Chart No.	Title	Page
3-1	Oscilloscope AN/USM-281A Control Settings.....	3-1
3-2	Troubleshooting Procedure .....	3-3
3-3	General Support Test Procedures .....	3-18
4-1	Depot Troubleshooting.....	4-2
4-2	leak Detector 1A1A1, Test Procedure .....	4-21
4-3	Leak Detector 1A1A1, Troubleshooting .....	4-22
4-4	High Vacuum Unit 1A1A2, Test Procedures .....	4-25
4-5	High Vacuum Unit 1A1A2, Troubleshooting .....	4-26
4-6	High Voltage Power Supply 1A3, Test Procedures .....	4-28
4-7	High Voltage Power Supply .1A3, Troubleshooting.....	4-29

**Change 2 iii**

## CHAPTER 1 INTRODUCTION

### 1-1. Scope

a. This manual contains functioning of equipment, general support and depot maintenance for Test Set, Cryogenic Refrigerator AN/AAM-40 and Service Kit, Refrigerant MK-1171/AAS-24. General support and depot maintenance includes troubleshooting, removal and replacement, adjustment and alignment, repair and testing.

b. Operator and organizational maintenance procedures are contained in TM 11-6625-2446-12.

### 1-2. Indexes of Publications

a. Refer to the latest issue of DA Pam 310-4 to determine if there are new editions, changes, or additional publications pertaining to the equipment.

b. Refer to the latest issue of DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

#### NOTE

**Applicable forms and records are covered in TM 11-6625-2446-12.**

### 1-3. Reporting of Errors

You can help improve this manual by calling attention to

errors and by recommending improvements and stating your reasons for the recommendations. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

### 1-3.1. Reporting Equipment Improvement Recommendations

EIR's will be prepared using DA Form 2407, (Maintenance Request). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Electronics Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

### 1-4. Reference Designations

Reference designations for major components of Test Set, Cryogenic Refrigerator AN/AAM-40 and Service Kit, Refrigerant MK-1171/AAS-23 are listed in TM 11-6625-2446-12.

**Change 2 1-1**