TM 11-5810-389-13&P
Includes Change 1, 5 Jan 1998

TECHNICAL MANUAL

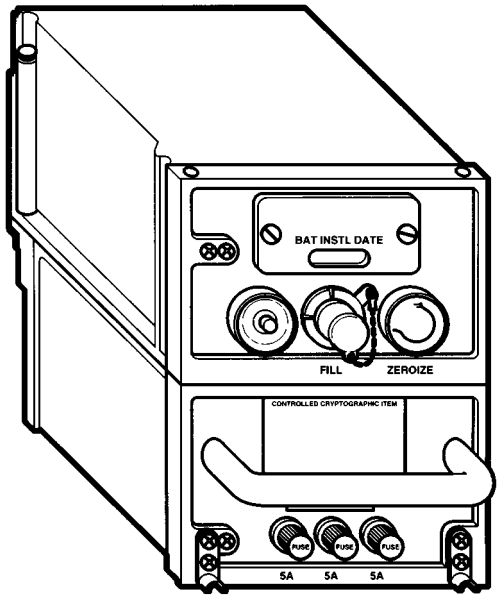
OPERATOR'S UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL

FOR

KI-1C CRYPTOGRAPHIC COMPUTER

KIT-1C (NSN 5810-01-273-7820)

KIR-1C (NSN 5810-01-273-7819)



Protective marking is in accordance with paragraph 3-200, exemption 3a, AR 25-35.

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This manual supersedes TM 11-5810-389-13&P, dated 28 September 1990.

Headquarters, Department of the Army Washington, D.C., 01 September 1995

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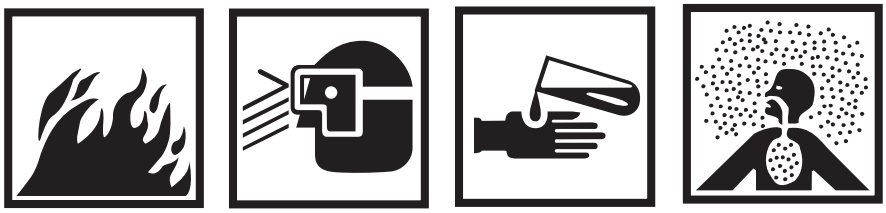
WARNING

HIGH VOLTAGE

is used in the operation of this equipment.

THIS POWER CAN KILL YOU

Death may result if personnel fail to observe safety precautions. Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas. Be careful not to contact high-voltage connections when installing or operating this equipment. Keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.



ELECTRON

Use this solvent in well ventilated areas only. Avoid prolonged breathing of vapors. Avoid bodily contact. The use of chemical gloves (solvent resistant) and chemical splash goggles are required when using this material. Do not use near heat, spark, or flame. This solvent is reactive with acids and oxidizers; do not mix or cross-apply with other cleaners or chemicals. Organic vapor respirator with dust and mist filter is recommended when solvent is spray applied. Keep containers closed between applications. Provide mechanical ventilation if used in confined spaces. Coordinate the use of this material with your supporting Industrial Hygiene and Safety Offices. Ensure you read and understand the Material Safety Data Sheet (MSDS) for this solvent prior to use.

Storage of Materials

Handle solvent as a combustible liquid. Store away from heat, sparks and flame. Keep container sealed when not in use. Solvent saturated waste rags must be placed in a metal sealable container after use to avoid the possibility of spontaneous combustion.

For artificial respiration or flushing of eyes, see FM 21-11.

Use of demolition materials can cause injury or death.
Get to know the rules of FM 5-25.

i

5 Safety Steps to Follow if Someone is the Victim of Electrical Shock

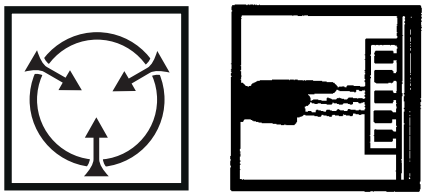
1. **Do not try to pull or grab the individual**

2. **If possible, turn OFF the electrical power**

3. **If you cannot turn off the electrical power, pull, push or lift the person to safety using a wooden pole or a rope or some other insulating material.**

4. **Send for help as soon as possible**

5. **After the injured person is free of contact with the source of electrical shock, move the person a short distance away and, if required, immediately start artificial respiration**



CAUTION

This equipment contains Electrostatic Sensitive Devices (ESD).

Either of these symbols may be found preceding an ESD Caution.

STATIC ELECTRICITY

Get To Know It -- because when it gets on semiconductor devices it'll ZAP'em for sure. It can certainly DEGRADE and even DESTROY your Printed Circuit Board (PCB). A discharge as low as 100 to 200 Volts will zap a PCB, and it can build up to a level of 39,000 Volts. It's created by the contact and separation of materials. It can be generated by work surfaces, floors, chairs clothing, paper, work order holders, packaging material and personnel. Your body can carry a charge up to 4,000 Volts and you'll never even know it. Here's what you can generate when you're:

- **Walking on a carpet -** 12,000 to 39,000 VOLTS
- **Walking across a floor -** 4,000 to 13,000 VOLTS
- **Working at a bench -** 500 to 3,000 VOLTS

Protect Your PCBs!!

Remember - people, plastics, styrofoam, dust, lint, all carry large charges of static electricity and must not be allowed to touch sensitive semiconductor devices. The static charge can even travel through test points. To protect PCBs from getting zapped, proper grounding and handling is required. Follow these instructions:

1. STORE and TRANSPORT PCBs in conductive materials - not plastic "snow" or plastic trays.

2. Do not wear CLOTHING material which can store static electricity; i.e., nylon.

3. GROUND yourself, using a WRIST STRAP, when unpacking, handling and replacing PCBs or removing equipment covers.

4. If a GROUNDED BENCH AREA is not available always place PCBs on an antistatic surface mat. The known good PCB must be removed from the protective packing and immediately installed or placed on the anti-static surface mat, or immediately placed in protective packaging.

TECHNICAL MANUAL*
No. 11-5810-389-13&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 01 September 1995

OPERATOR'S
UNIT AND DIRECT SUPPORT
MAINTENANCE MANUAL
FOR
KI-1C CRYPTOGRAPHIC COMPUTER
KIT-1C (NSN 5810-01-273-7820)
KIR-1C (NSN 5810-01-273-7819)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Director, U.S. Army Communications-Electronics Command, Communications Security Logistics Activity, ATTN: SELCL-EP-A, Fort Huachuca, AZ 85613-7090. You may also forward it via e-mail to selcl-dir@huachuca-emh1.army.mil or fax at DSN 879-8162. A reply will be furnished to you. For a quicker response, call us at DSN 879-0686.

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TABLE OF CONTENTS

HOW TO USE THIS MANUAL

A front cover index has been provided to guide you to the most-used sections of this TM. A black bar on each front cover index tab corresponds to another black tab on the page inside the manual. Line up these bars to find the indexed portion.

Alphabetical Index - This index (located at the back of this book) lists major headings or topics from the TM contents, together with the page number where that topic is located. Multiple entries, based on key words within the topic title or heading, are provided where possible.

Throughout this TM you will find **Warnings**, **Cautions**, and **Notes**:

WARNING **CAUTION** **NOTE**

Warnings note operational or maintenance conditions, practices or procedures which could result in long term health hazard, injury to, or death of personnel performing the task prescribed in the TM.

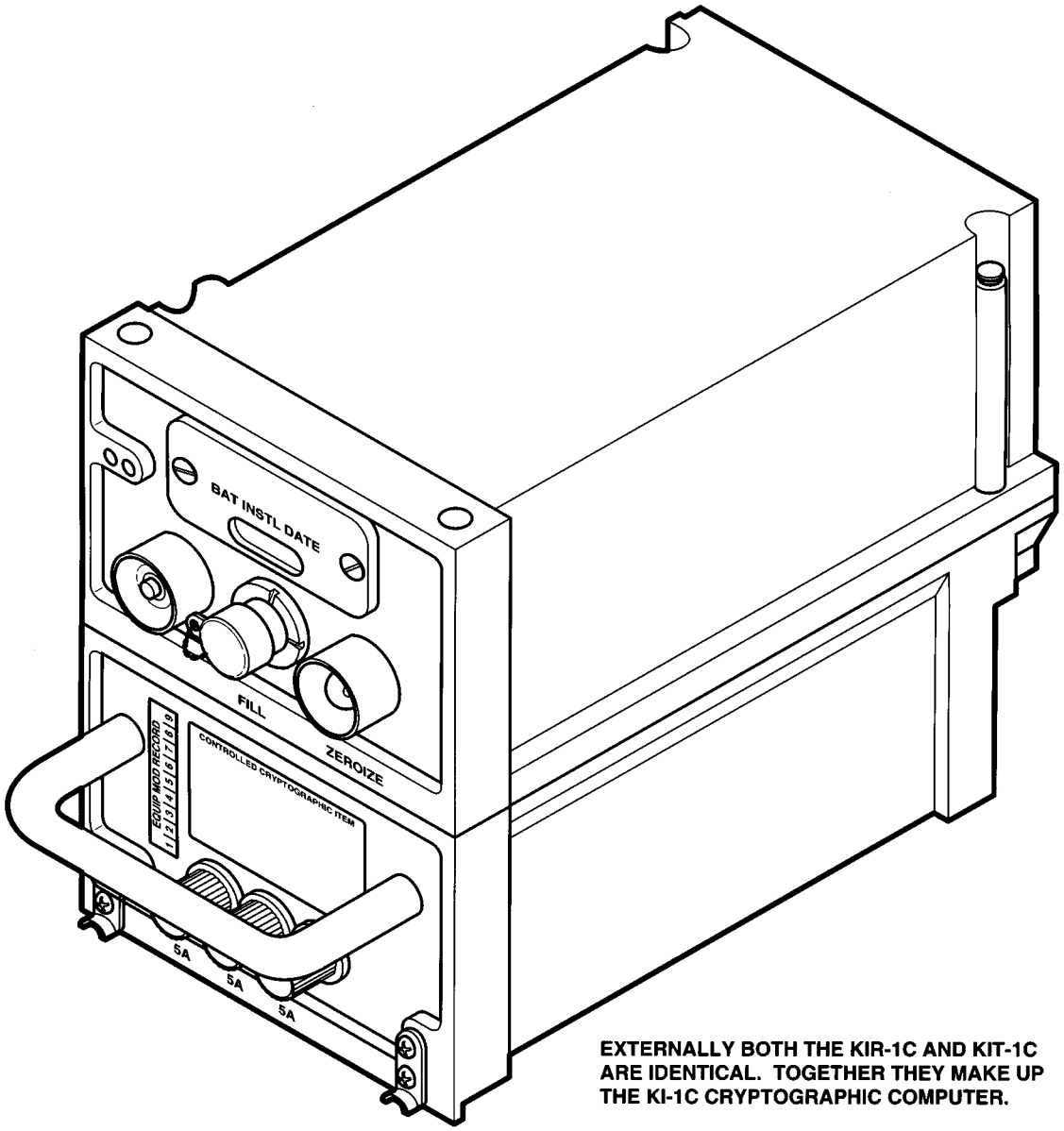
Cautions warn about operational or maintenance conditions, practices, or procedures which could result in damage to, or destruction of equipment or loss of mission effectiveness.

Notes are used to add, emphasize, or clarify essential information of special importance or interest.

The following selected chassis mounted components can be replaced at Direct Support Maintenance:

Boot, Push button
Cap, Assembly Dust
Handle, Special
Bracket, Angle (organizational level maintenance)

All other chassis mounted components are replaceable at Depot only.



EXTERNALLY BOTH THE KIR-1C AND KIT-1C ARE IDENTICAL. TOGETHER THEY MAKE UP THE KI-1C CRYPTOGRAPHIC COMPUTER.

KI-1C Cryptographic Computer

CHAPTER 1
INTRODUCTION
SECTION I. GENERAL INFORMATION

1.1 SCOPE.

1.1.1 **Type of Manual:** Operator's, Unit, and Direct Support Maintenance

1.1.2 **Model Number and Equipment Name:**

KIT-1 C - Transponder Computer

KlR- 1 C - Interrogator Computer

NOTE

Externally, both units are identical and are hereinafter referred to as the Kl-1 C.

1.1.3 **Purpose of Equipment:** Provides Mode 4 security for Mark Xll Identification Friend or Foe (IFF) System.

1.2 MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pamphlet 738-750 and DA Pamphlet 738-751, the Army Maintenance Management System (TAMMS).

1.3 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S).

If your equipment needs improvement, let us know. Send us an EIR. You, the user are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at Director, US Army CECOM Communications Security Logistics Activity, ATTN: SELCL-EP-B, Fort Huachuca, AZ 85613-7090. A reply will be furnished to you.

1.4 DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

The Kl-1C is a controlled cryptographic item (CCI). In a hostile action, primary efforts must be make toward the safe evacuation of the complete destruction of CCI to prevent enemy use. Procedures for CCI emergencies may be incorporated into existing Communications Security (COMSEC) equipment emergency plans (refer to TB 380-40- 22). Additional information is available in TM 750-244-22.

1.5 PHYSICAL CONTROL.

a. An unkeyed Kl-1C is CCI meaning that the unkeyed Kl-1C is unclassified but must be controlled. Certain physical security procedures must be followed to protect the Kl-1C from unnecessary loss or exposure to unauthorized individuals. For additional references, see DA Pamphlet 25-380-2.

b. When the Kl-1C is keyed and ready for use, it must be protected to the same extent as the highest classified key in the Kl-1C.

c. The Kl-1C may be operated in any location used for classified operations, as long as unauthorized persons are denied access to a keyed Kl-1C. An approved cryptofacility is not required to receive, operate, or store the Kl-1C.

1.6 PREPARATION FOR STORAGE OR SHIPMENT.

a. If the KI-1C contains classified keys, it must be either in the personal possession of an individual with the proper clearance, or it must be stored in a security container, in a vault, or in an alarmed or guarded area.

b. The KI-1C must be zeroized before transporting except when operational use requires it to be delivered to the user in a keyed condition. A KEYED KI-1C MUST BE TRANSPORTED AS A CLASSIFIED KEY. TB 380-40-22 provides more information on storage and shipment of your KI-1C.

SECTION II. EQUIPMENT DESCRIPTION AND DATA

1.7 EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

The KI-1C operates as part of the Mark XII IFF System. Section III of this chapter provides an overview of the Mark XII IFF System and how the KIT-1C and KIR-1C function within it. All KI-1C signal and power connections are made using the rear system connector (J2). Key loading is accomplished electronically using the front panel FILL connector (J1) with a successful key loading indication. Remote fill operations are possible using a remote fill cable assembly.

1.8 DIFFERENCES BETWEEN MODELS.

There is only one model of the KI-1C, which consists of a KIT-1C, Transponder Computer and a KIR-1C, Interrogator Computer. All owning activities should turn their KI-1A equipment into their Supply Support Activity (SSA); whereby, the SSA will process IAW AR 725-50, Chapter 7: "Materiel Returns Program". The appropriate customer will then submit a requisition for the KI-1C to us at B56, to include in the requisition, the Type Requirement Codes (cc55-56) of "29".

1.9 EQUIPMENT DATA

Physical characteristics of the KI-1C are as follows:

HEIGHT	6.75 inches
DEPTH	8.25 inches
WIDTH	5.0 inches
WEIGHT	KIR-1C: 8.3 pounds, KIT-1C: 8.2 pounds

Temperature:

Storage	-80° F to 203° F	-54° C to 95° C
Operating	-65° F to 203° F	-62° C to 95° C

Power Requirements

21 to 29 Vdc (28 Vdc nominal, 2.24 watts) or
115V ac $\pm$ 10%, 1.04 watts

1.10 SAFETY, CARE, AND HANDLING.

There are no special safety, care or handling requirements. However, to prevent possible damage to the connector pins, use a fill cable to connect your fill devices to your COMSEC equipment.

1.11 ACCESS AND PHYSICAL SECURITY.

The Kl-1C is a "Controlled Cryptographic Item" (CCI): by definition unclassified, but controlled. However, two different conditions apply; KEYED and UNKEYED. It is only in the UNKEYED condition that the equipment is unclassified.

1.11.1 **ACCESS.** A security clearance is not required for access to UNKEYED equipment. However, users are required to hold a security clearance equal to the highest classification level of the KEYED equipment. The person must have a need-to-know and be either a U.S. citizen, permanent resident employed by the U.S. Government, or a foreign citizen employed by their government, for which formal approval was granted.

1.11.2 **PHYSICAL CONTROL.** KEYED equipment must be protected to the level of the classification of the key being used. UNKEYED equipment is unclassified but controlled. Certain physical security procedures must be followed to protect the equipment from loss or access by unauthorized persons. DOUBLE BARRIER PROTECTION MUST BE PROVIDED.

1.11.3 **REPORTING INSECURITIES.** The following are just some of the types of insecurities that will be reported IAW TB 380-41:

Loss of key or control of equipment

Unauthorized access or suspected espionage

Unauthorized means of transportation

Unreconciled inventory.

SECTION III. TECHNICAL PRINCIPLES OF OPERATION

1.12 MARK XII IFF SYSTEM

a. The Mark XII IFF System provides the capability to transmit interrogations and replies, in a cyptosecure mode. These transmissions take the form of high-speed, pulsed, radio frequency (rf) signals which are exchanged for the purpose of identifying and locating friendly forces. To accomplish this mission, IFF uses transponders, interrogators, altitude computers, servoaltimeters, controls, and other associated equipment, When operating in the secure mode, Mode 4, IFF also uses Kl-1C cryptographic equipment (KIR-1C and KIT-1C).

NOTE

The KIT-1C can be interrogated by and will respond to other correctly keyed Mode 4 interrogators (i.e., HAWK ADA, STINGER,PATRIOT, etc.)

b. Operation of this system in the field involves the transmission of interrogation signals from ground facilities, weapons platforms, or aircraft. These signals, when received by IFF-equipped aircraft, trigger an automatic reply transmission. These transmissions are sent and received in five different modes: Mode 1, Mode 2, Mode 3/A, Mode C, and Mode 4.

(1) Mode 1 is known as the General Identification Signal. Switch settings permit the selection of any one of 32 reply codes.

(2) Mode 2 is an individual identification mode. The Mode 2 code is preset before flight and is usually not aircraft-selectable. There are 4,096 codes available for use as Mode 2 Identification numbers.

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(3) Mode 3/A combines military IFF Mode 3 with civilian Secondary Surveillance Radar (SSR) Mode A. There are 4,096 aircrew-selectable reply codes.

(4) Mode C is normally used with aircraft IFF installations. For this mode to function, several associated altimetry components must be installed in the aircraft. When interrogated, the IFF codes will provide the aircraft's altitude, as well as its identification code.

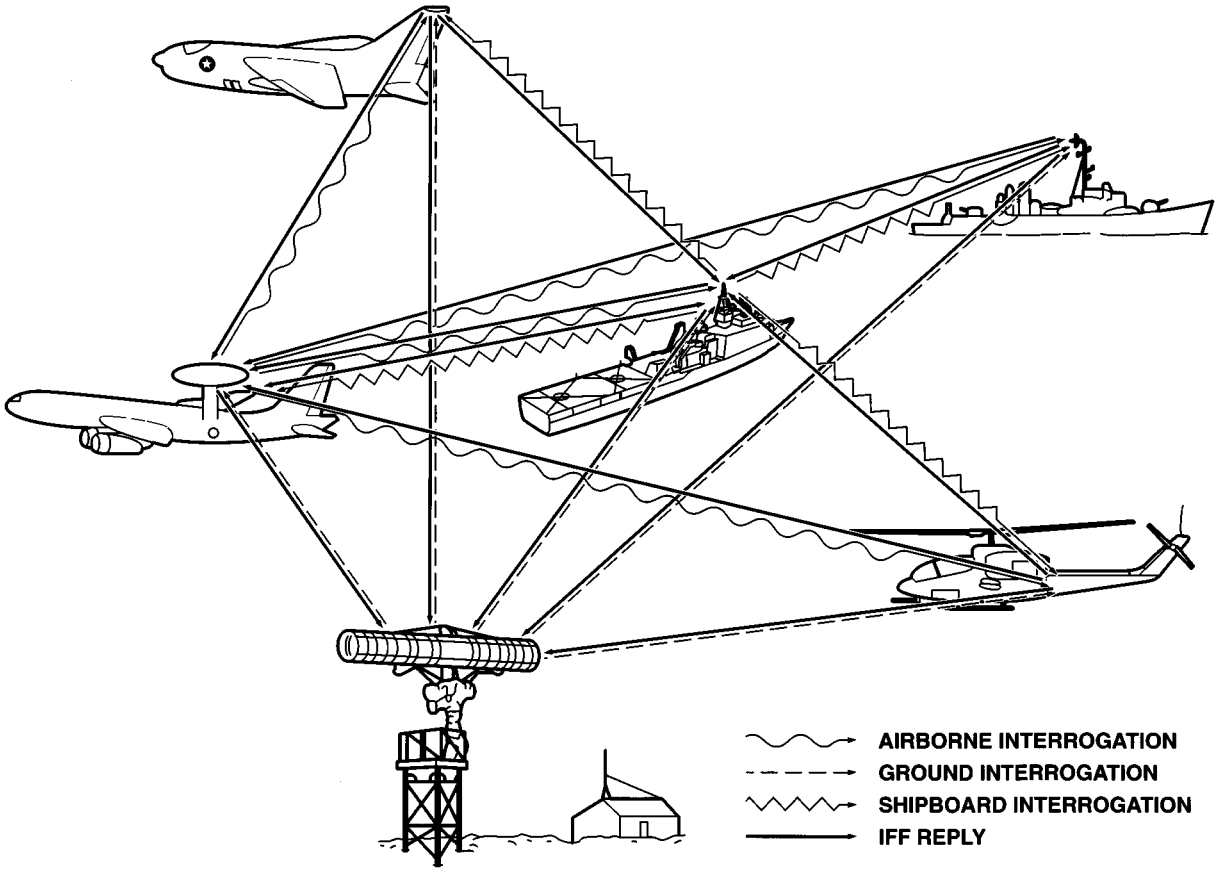
(5) Mode 4 is the secure mode. Operation in Mode 4 utilizes the KI-1C equipment. The cryptographic keys in effect for the anticipated flight time must be loaded into the computer by the ground crew. Mode 4 may be enabled or switched off by the aircrew in accordance with operational requirements.

c. In addition to these five basic modes of operation, the IFF can transmit a simultaneous identification of position signal and/or emergency signal. These signals are selected individually and are enabled by the operator.

d. A typical interrogator subsystem installed at a ground facility or other interrogator facility would be made up of a receiver-transmitter, a synchronizer, a data processor, displays, controls, antennas, and a KIR-1C interrogator computer.

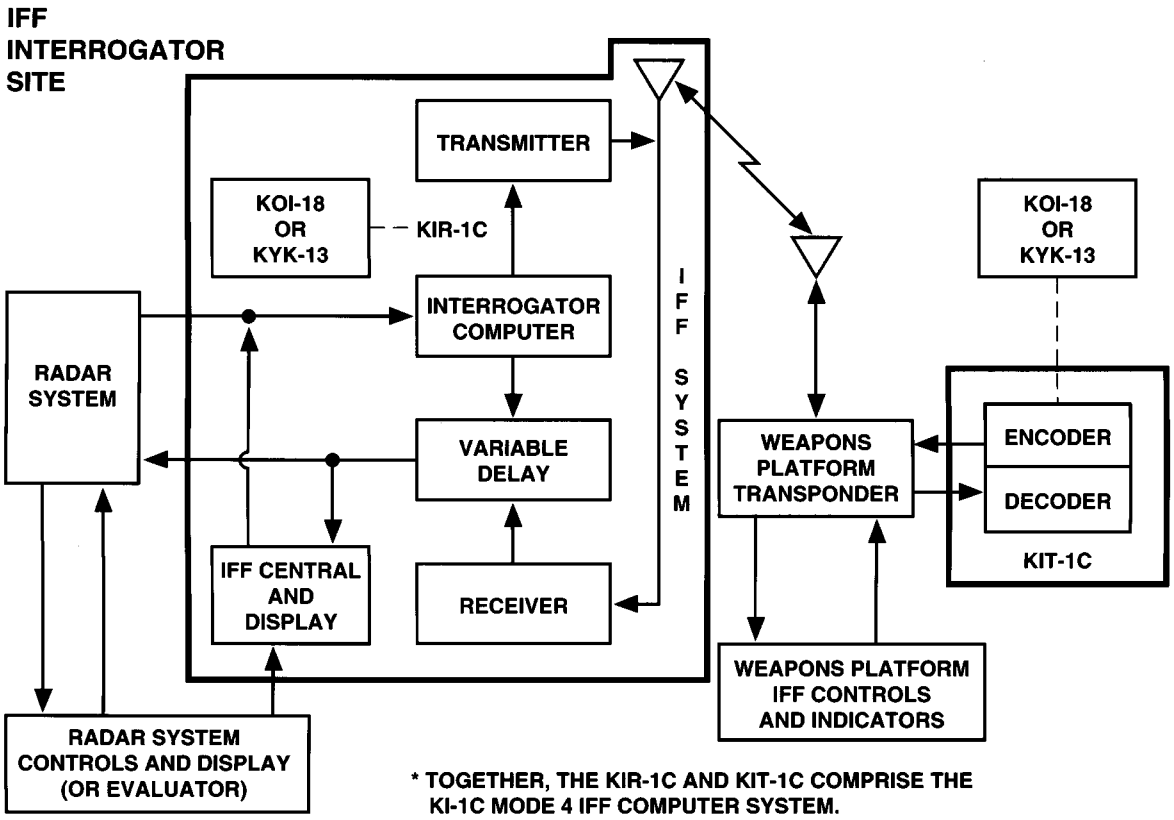
e. A typical transponder subsystem in an IFF-equipped aircraft or other weapons platform would be made up of a transponder, controls, associated mounts, an antenna system, and a KIT-1C transponder computer. Optionally, the system could also include a transponder tester and altimetry subsystem.

f. Interrogations (or challenges) are encoded by the interrogator facility IFF and transmitted at 1030 MHz. The transmitted pulse code format will vary depending upon the selected interrogation mode.



g. All IFF reply codes in every mode are transmitted at 1090 MHz. Aircraft equipped with space diversity transponders will transmit the reply from the antenna that received the strongest interrogation signal.

h. When operating in Modes 1,2,3/A, or C, the operator or evaluator-initiated challenge is developed and coded in IFF control and display circuitry. From here, the challenge is sent to the IFF transmitter and on to the IFF antenna system where it is broadcast.



NOTE

In Modes 1,2,3/A, or C, the KIR-1C provides no COMSEC processing. You can still operate in these modes, even if the KIR-1C fails or has been removed, but you must use additional care in identifying all targets.

i. The aircraft must respond in the same mode in which it is interrogated. Interrogation signals received in Modes 1,2,3/A, and C are decoded by the aircraft transponder. The appropriate replies are then generated within the transponder and transmitted.

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1.13 TYPICAL MODE 4 INTERROGATION AND REPLY CYCLE.

a. When an IFF operator selects Mode 4 for interrogation, KIR-1C interrogator computer encrypts an interrogation work (or challenge) for transmission by the interrogator set.

b. The target's transponder set recognizes the Mode 4 identification pulses and automatically sends the encrypted challenge to the KIT-1 C transponder computer for processing. If the interrogation is compatible with the loaded key in the KIT-1 C, the transponder computer generates a time-coded reply.

c. The reply is sent to the transponder set, which transmits the reply back to the interrogating system that sent the original interrogation. The KIR-1C decodes this reply. The time delayed reply is then presented to the interrogator operator or automatic evaluation equipment.

d. In systems with a video display only, the operator must evaluate the displayed Mode 4 video to determine if it originated from a friendly platform. In some systems, automatic evaluation equipment evaluates the reply and indicates to the operator the outcome of the evaluation. Remember that only a KIT-1C using the same key as the KIR-1C can correctly reply to the interrogations.

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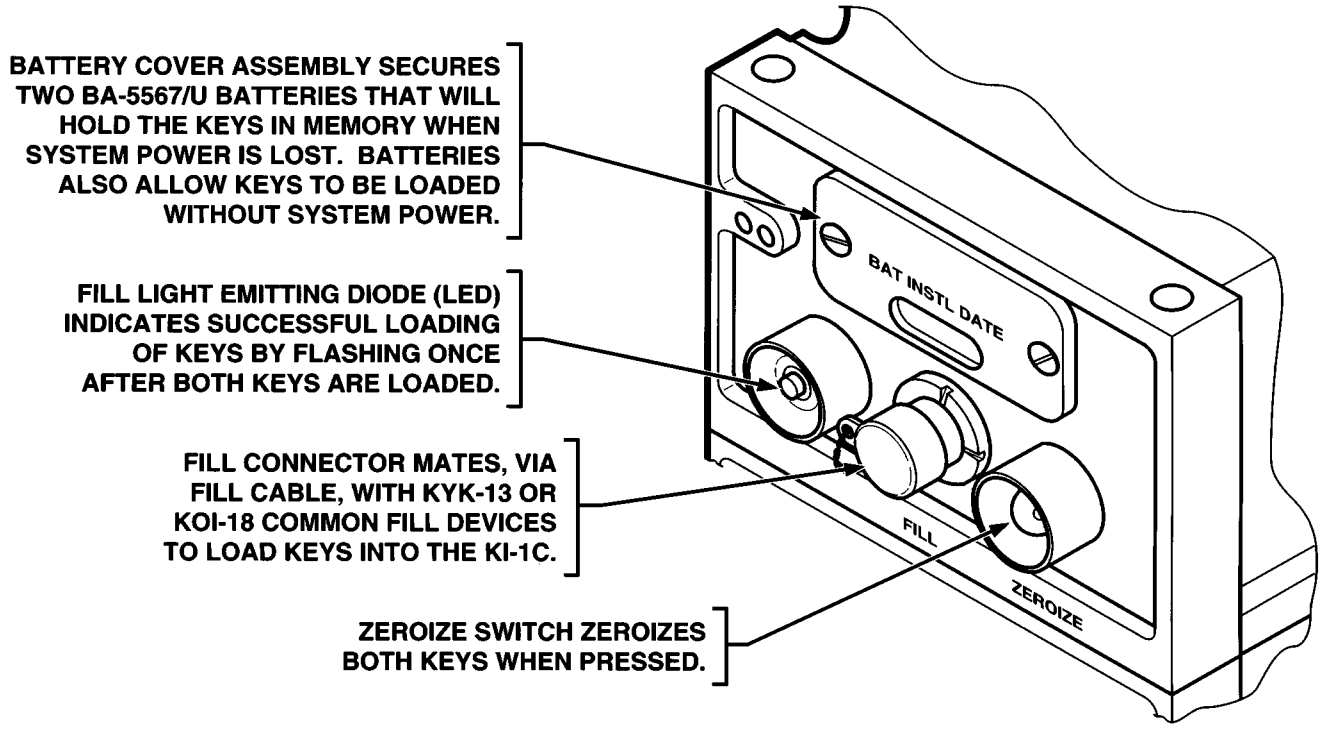
CHAPTER 2
OPERATING INSTRUCTIONS

SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2.1 OPERATOR'S CONTROLS AND INDICATORS.

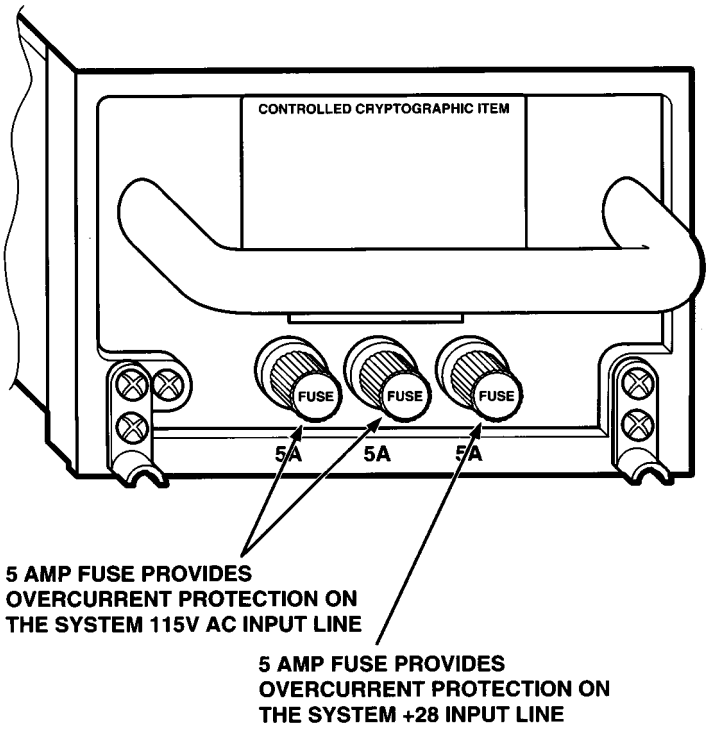
2.1.1 Upper Housing Front Panel



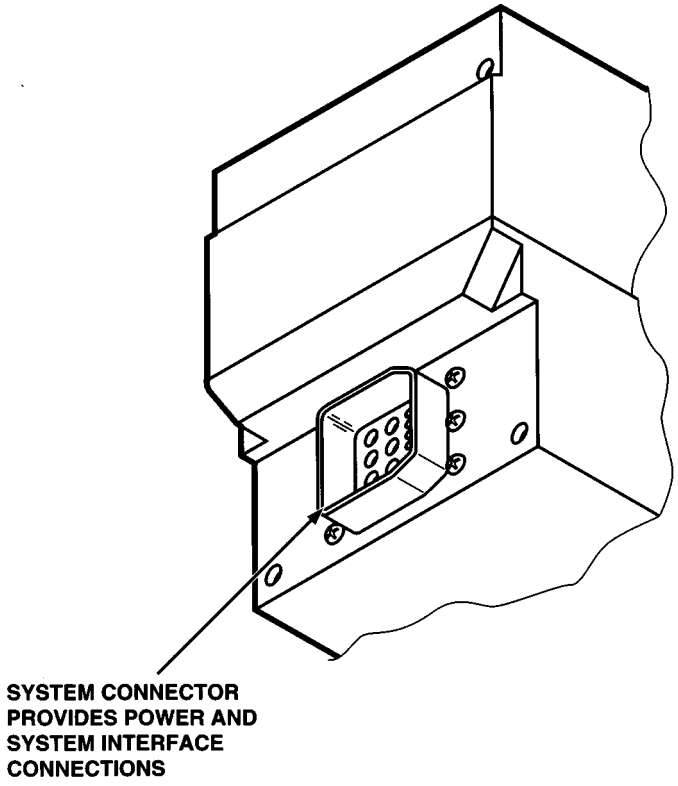
CAUTION

When ordering batteries, specify "ONLY FROM SAFT AMERICA INC., CONTRACT DAAB07-90-C-C023 OR BALLARD BATTERY SYSTEMS, CONTRACT DAAB07-90-C-C022."

2.1.2 Bottom Housing Front Panel



2.1.3 Bottom Housing Rear Panel



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SECTION II. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

We recommend you perform routine maintenance on your Kl-1C equipment whenever necessary. This includes cleaning, dusting, covering unused receptacles, and checking for loose/missing hardware and damaged or missing front panel controls and indicators.

SECTION III. OPERATION UNDER USUAL CONDITIONS

2.2 GENERAL.

a. Once the keys have been loaded into the Kl-1 C, the equipment is ready to operate as part of the Mark Xll IFF System. The Theory of Operation section of Chapter 1 describes how the KIT-IC and KIR-1C operate within the Mark Xll IFF System.

NOTE

The keys may be loaded from a K0I-18 or a KYK-13 Fill Device. KYX-15/ 15A is not authorized to load your Kl-1C.

b. Each Mark Xll interrogator system provides the operator with several controls and indicators used only for the Mode 4 function. In most cases, these controls are provided at a remote control station positioned near the operator. These remote control stations can take on many forms depending on the system you have. In some systems, the controls and indicators are divided up, with the more frequently used controls located at each operator's position and the rest at a central location.

c. The transponder system provides several controls and indicators for using and monitoring the Mode 4 function. Most of these controls and indicators are located on the transponder control panel. The remaining controls and indicators are located on special equipment enclosures or on various aircraft instrumentation panels. Refer to the operator's manual for your specific weapons platform for a description of the transponder system controls and indicators.

2.3 KEY LOADING FROM A K0I-18.

NOTE

Key loading from a KYK-13 is preferred; however, the K0I-18 may be used if your mission requires.

If the light-emiting diode (LED) doesn't flash after both keytape segments are loaded, the keys did not load properly. Make sure your K0I-18 is serviceable and you are using the correct keytape segments before you try again.

Make sure keytape segment is correctly inserted before you try to pull it through the K0I-18.

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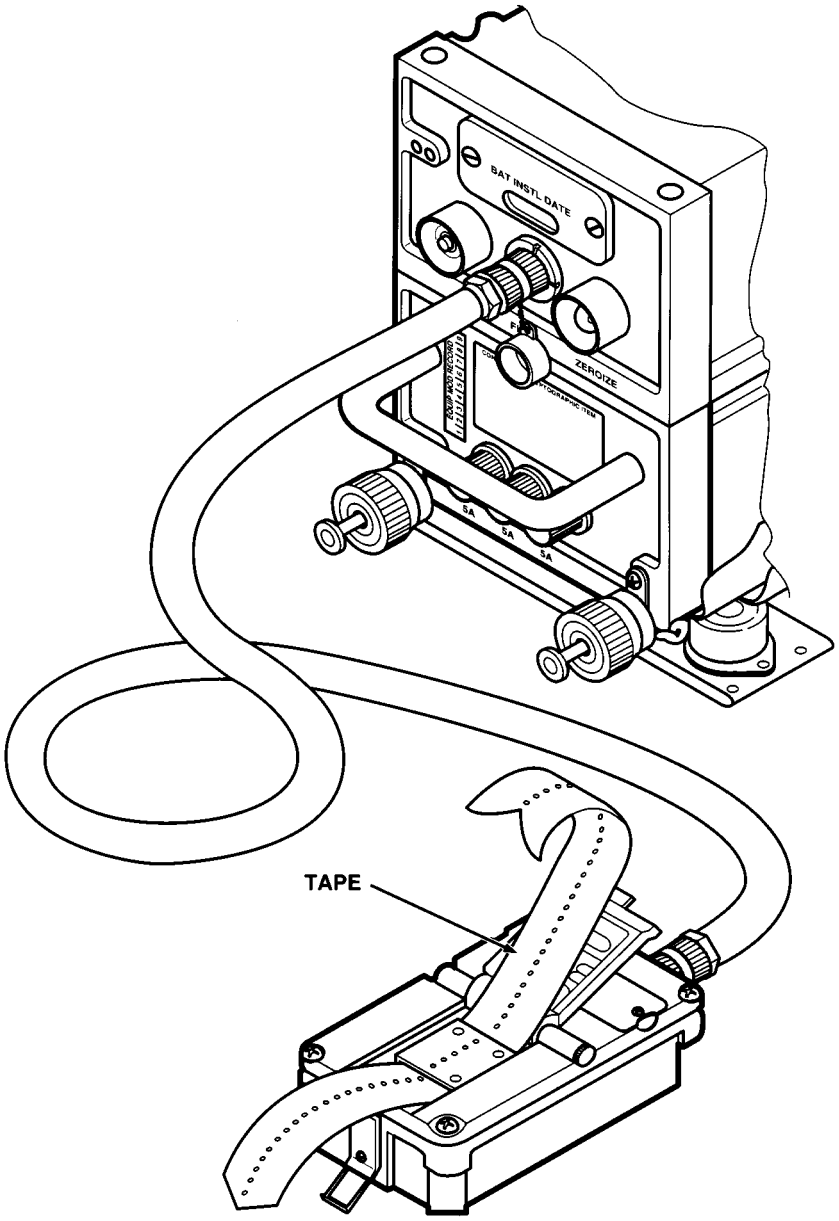

a. Using a fill cable, connect KOI-18 to Kl-1C FILL Connector. Insert first keytape segment and slowly pull it through KOI-18.

b. Disconnect and reconnect fill cable to Kl-1C FILL connector.

NOTE

You must disconnect and reconnect fill cable for a successful load of second keytape segment.

c. Insert second keytape segment and slowly pull it through KOI-18 while you observe the Kl-1C fill light-emitting diode flash once.

d. Secure key tape IAW TB 380-41.

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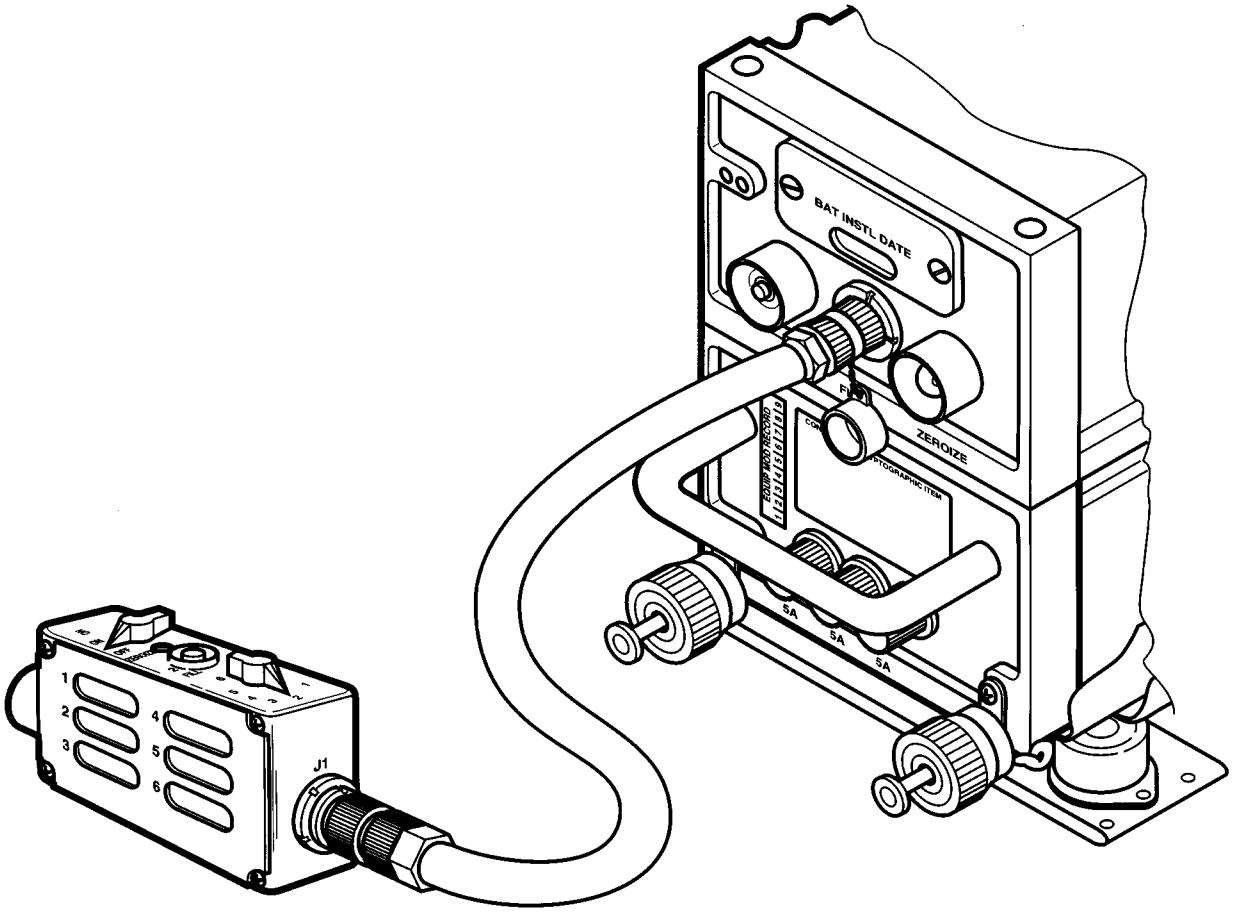
2.4 KEY LOADING FROM A KYK-13.

NOTE

The KYK-13 must have two key segments loaded into it from a K0I-18. Follow procedures given in TM 11-5810-292-13&P.

If the KI-1C FILL indicator LED does not flash after both key segments are loaded, the key segments did not load properly. Make sure that the KYK-13 is serviceable and that you are using the correct key segments before you try again.



a. Set the KYK-13 MODE SELECT switch to the OFF position. Using a FILL cable, connect KYK-13 to KI-1C FILL connector.

b. Set KYK-13 ADDRESS SELECT switch to the position where the first key segment is stored. Set KYK-13 MODE SELECT switch to ON.

c. Set KYK-13 MODE SELECT switch to OFF. Set KYK-13 ADDRESS SELECT switch to the position where the second key segmment is stored. Set KYK-13 MODE SELECT switch to ON while you observe that the KI-1C FILL indicator (LED) flashes once.

d. Set KYK-13 MOD SELECT switch to OFF. Disconnect fill cable from KI-1C FILL connector and replace FILL connector dust cover.

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SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2.5 OPERATION IN UNUSUAL WEATHER.

Your KI-1C is environmentally sealed; however, when operating in regions subject to dust storms or sandstorms, keep the unit free from dust buildup and, as always, make sure you reinstall the fill connector dust cover after use.

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CHAPTER 3
OPERATOR MAINTENANCE INSTRUCTIONS

NOTE

No operator level maintenance is authorized for the KI-1C.

CHAPTER 4
UNIT MAINTENANCE

NOTE

The Kl-1C requires \ lubrication.

SECTION I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

4.1 COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4.2 SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT.

The only special tools or equipment required for unit maintenance of your Kl-1C is AN/USM-486 or AN/PSM-45 digital multimeter.

4.3 REPAIR PARTS.

Repair parts are listed in Appendix F of this manual.

SECTION II. SERVICE UPON RECEIPT

4.4 SITE AND SHELTER REQUIREMENTS.

Any specialized site and shelter requirements may be found in the MARK Xll system manuals.

4.5 UNPACKING THE EQUIPMENT.

The Kl-1C Cryptographic Computer consisting of the KIR-1C and the KIT-1C are packed and shipped in separate containers. The following illustrations show how these units are packaged, and material requirements for REPACKING. No special unpacking instructions are required other than the packaging illustrations.

4.6 CHECKING UNPACKED EQUIPMENT.

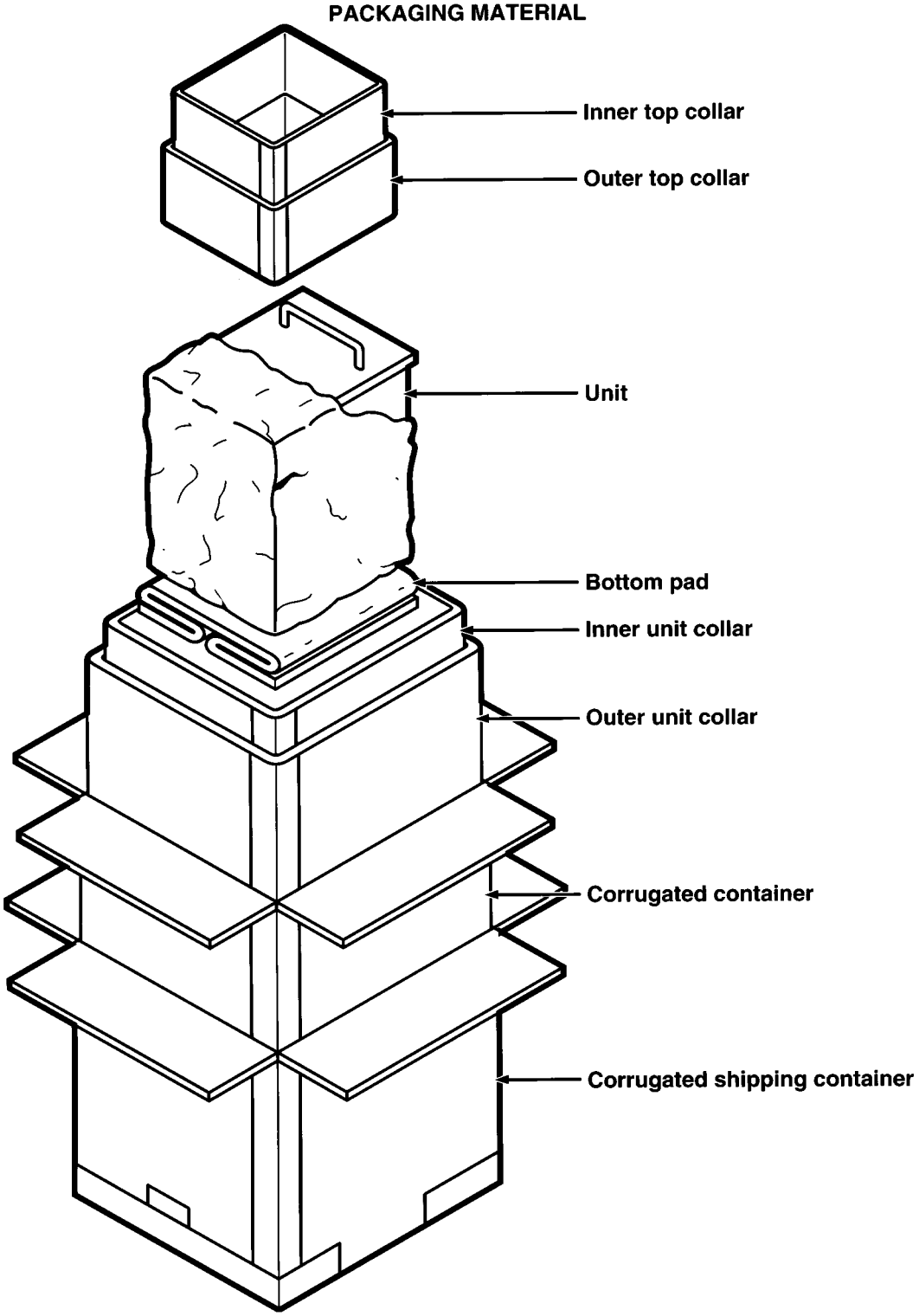
a. Inspect the equipment for damage caused during shipment. If damage is found, report the damage on SF 361, Transportation Discrepancy Report.

b. Check the equipment against the packing slip to see if the shipment is complete. Report item discrepancies attributable to shippers on SF 364, Report of Discrepancy and in shipment on SF 361.

CAUTION

Do not thrust pointed or sharp tools or instruments into the interior of the corrugated boxes or cartons.

PACKAGING MATERIAL



NOTE

Save cartons, innerblocking and fillers for future shipment or storage of your KI-1C.

4.7 INITIAL INSTALLATION PROCEDURES.

a. To install the Kl-1C equipment in its particular system configuration, turn off system power and carefully slide the equipment into the KIR or KIT mount and hand tighten the two knurled nuts.To deinstall, insure power is off, loosen the two knurled nuts and slide the equipment out of its mount.

b. Refer to Mark Xll system and/or aircraft system technical manuals for exact locations for the Kl-1C subsystem. There are no external cable connections involved when installing Kl-1C equipment. Unless otherwise directed, make sure the Kl-1C is zeroized immediately after removal.

SECTION III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4.8 GENERAL.

Unit Preventive Maintenance Checks and Services (PMCS) are the required inspection and care of your Kl-1C to keep it in good operating condition.

4.9 PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

NOTE

If your Kl-1C must be in use ALL THE TIME, check and service those items that can be checked and serviced without stopping operation. Make your complete PMCS when the Kl-1C is fully shut down.

4.9.1 Warnings and Cautions.

Always observe the WARNINGS and CAUTIONS appearing in your PMCS table before certain procedures. You must pay close attention to these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent your equipment from being damaged.

4.9.2 Explanation ofTable Entries.

a. **Item number.** Numbers in this column are for reference. When completing DA Form 2404, Equipment Inspection and Maintenance Worksheet, include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

b. **Interval.** This column tells you when you must do the procedure column. The "BEFORE" procedures must be done before you operate or use the equipment. The "DURING" procedures must be done during the time you are operating or using the equipment. The "AFTER" procedures must be done immediately after you have operated or used the equipment.

NOTE

All PMCS must be done as scheduled, before a mission, when equipment is first installed, and when reinstalled for any reason.

c. **Check/Service.** This column provides the location and the item to be checked or serviced.

d. **Procedure.** This column provides the procedure you must do to check or service the item listed in the Check/ Service Column to know if the equipment is ready and available for its intended mission or operation. You must do the procedure at the time stated in the interval column.

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e. **Not fully mission capable if.** Information in this column tells you what faults do not allow operation of the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

TABLE 4-1. KI-1C PREVENTIVE MAINTENANCE CHECKS AND SERVICES TABLE

ITEM NO	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Before		**PUBLICATIONS** Check DA PAM 25-35 for new applicable publications. Check TB 750-38 for any new applicable MWO. All URGENT MWOs must be applied.	Urgent MWOs have not been applied.
2	Before	Front	**FILL BATTERIES AND CONTACTS** Check for signs of corrosion. If corroded, replace batteries and clean contacts.	Batteries or contacts corroded.
3	Semi-annually	Front	**FILL BATTERIES** Check battery installation date and replace if outdated. Battery life is 180 days.	Batteries outdated.

SECTION IV. TROUBLESHOOTING

4.10 GENERAL.

a. This section lists malfunctions which you may find while testing, operating, or performing preventative maintenance checks and services on your KI-1C.

b. This section does not list all of the problems that could occur. If a problem is not listed, or if a problem is not corrected by the steps given, tell your superior or higher level maintenance personnel.

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NOTE

The first step should always be to check for power to the equipment.

c. Follow the steps as they are shown in the troubleshooting table. Perform the corrective actions in the order listed. If the listed actions do not correct the problem, return the failed KI-1C to your COMSEC direct support maintenance for further analysis.

4.11 TROUBLESHOOTING TABLE

TABLE 4-2. TROUBLESHOOTING TABLE

MALFUNCTION	POSSIBLE CAUSE	CORRECTIVE ACTION
KI-1C FILL indicator does not flash after both keys are loaded.	Key may not have been correctly loaded.	Make sure you are using the correct keys. Check that fill device is correctly connected to KI-1C FILL connector. If not, reconnect and reload keys. Refer to paragraph 2.3 or 2.4 for key loading procedures.
	If key loading was attempted with system power off (cold fill) or the fill batteries may have failed.	Check fill battery installation date. Replace batteries if outdated. Remove battery cover, inspect batteries and contacts for corrosion. Measure voltage across battery compartment terminals. If voltage is less than 5.5 volts, replace fill batteries.
	If replacing the fill batteries does not correct the problem, the FILL connector contacts may be dirty.	Clean FILL connector contacts (refer to paragraph 4.10).
	If cleaning the FILL connector does not solve the problem, you may have a defective fill device.	Try to load keys with a known good fill device.
	If problem persists, your KI-1C may have failed.	Replace KI-1C.
KI-1C locked in alarm state.	Your KI-1C may have failed.	Replace KI-1C.
No Mode 4 operation.	System power may have failed.	Check system connector connection to KI-1C. Make sure primary power source is working.
	If primary power source is operating and system connector is properly mated, the KI-1C fuses may have failed.	Remove and check continuity of fuses. Replace any failed fuses (refer to paragraph 4.15).
	If problem persists, your KI-1C may have failed.	Replace KI-1C.

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CAUTION

When ordering batteries, specify "ONLY FROM SAFT AMERICA INC., CONTRACT DAAB07-90-C-C023 OR BALLARD BATTERY SYSTEMS, CONTRACT DAAB07-90-C-C022."

SECTION V. MAINTENANCE PROCEDURES

4.12 MAINTENANCE PROCEDURES.

Unit maintenance personnel are authorized to inspect, clean and replace the KI-1C. They are also authorized to replace the battery cover assembly, the batteries, and the fuses.

4.13 INSPECTION.

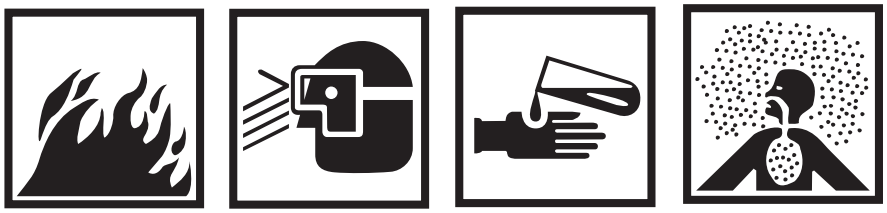
Perform the following steps each time you inspect your KI-1C.

Insure that exterior surface is free of dust, dirt, grease, and fungus. Make sure FILL connector dust cover is installed. Check that equipment mounting hardware is secure.

4.14 CLEANING.

Remove dust or loose dirt from the outside of your KI-1C with a clean, soft cloth (Item 2 appendix E).

WARNING



ELECTRON

Use this solvent in well ventilated areas only. Avoid prolonged breathing of vapors. Avoid bodily contact. The use of chemical gloves (solvent resistant) and chemical splash goggles are required when using this material. Do not use near heat, spark, or flame. This solvent is reactive with acids and oxidizers; do not mix or cross-apply with other cleaners or chemicals. Organic vapor respirator with dust and mist filter is recommended when solvent is spray applied. Keep containers closed between applications. Provide mechanical ventilation if used in confined spaces. Coordinate the use of this material with your supporting Industrial Hygiene and Safety Offices. Ensure you read and understand the Material Safety Data Sheet (MSDS) for this solvent prior to use.

a. Remove grease, oil, fungus, or ground-dirt from the outside of your KI-1C with a soft cloth dampened (not wet) with electron (Item 3, Appendix E).

b. Connector contacts may be cleaned with electron. Clean pin and socket contacts with a small, soft bristle brush (Item 1, Appendix E).

4.15 REPLACEMENT.

4.15.1 **KI-1C.**

NOTE

Removal/replacement procedures are essentially the same as the install/deinstall. Procedures vary from system to system. Refer to your appropriate systems manual or aircraft electronics configurations manual for KI-1C removal/replacement procedures. Unless otherwise directed, make sure the KI-1C is zeroized immediately after removal.

4.15.2 **BATTERY COVER ASSEMBLY.**

a. Loosen two captive screws securing battery cover to front panel and remove battery cover assembly.

CAUTION

Take care not to cross-thread or overtighten captive screws when installing battery cover.

b. Position battery cover assembly onto front panel and secure by evenly tightening two captive screws.

4.15.3 **BATTERIES.**

WARNING

TURN OFF the equipment immediately if you detect the battery compartment becoming unduly hot, hear battery cells venting (hissing sound), or smell irritating sulfur dioxide gas. Remove and dispose of batteries only after they are cool.

Lithium organic batteries (BA-5567/U) or cells are used in this equipment. They are potentially hazardous if misused or tampered with before, during, or after discharge. The following precautions must be strictly observed to prevent possible death or injury to personnel or equipment damage. When ordering batteries, specify "ONLY FROM SAFT AMERICA INC., CONTRACT DAAB07-90-C-C023 OR BALLARD BATTERY SYSTEMS, CONTRACT DAAB07-90-C-C022."

DO NOT attempt to recharge batteries.

DO NOT heat, incinerate, crush, puncture, disassemble, or otherwise mutilate batteries.

DO NOT store batteries in the equipment during long periods of nonuse, in excess of 30 days or when the equipment is to be shipped.

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4.15.3.1 **BATTERY REMOVAL PROCEDURE.**

a. Remove battery cover assembly (1).

CAUTION

Do not use a knife or screwdriver to pry batteries from front panel battery compartment.

b. Remove batteries (2) from front panel battery compartment. Use your fingernail to pry batteries from the compartment. Pry the batteries out from the negative side first.

c. Turn in the old batteries to the unit supply for disposal in accordance with local Standard Operating Procedure (SOP).

d. Inspect battery contacts (3) for dirt or corrosion and clean if necessary.

4.1 5.3.2 **BATTERY INSTALLATION PROCEDURE.**

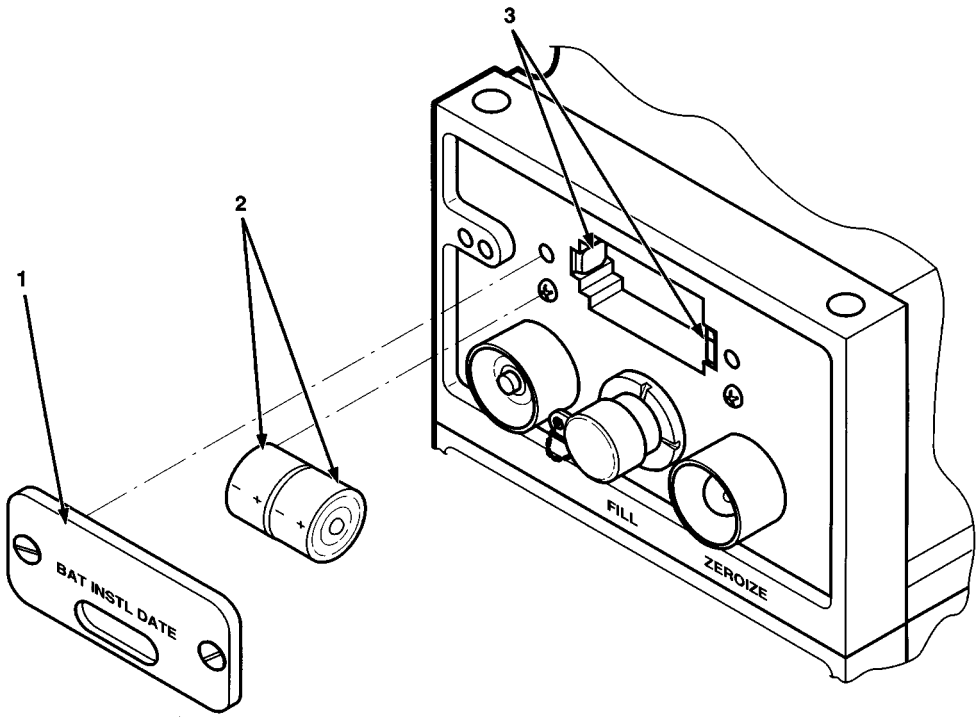
NOTE

Batteries must be installed mated together using only finger pressure. When ordering batteries, specify "ONLY FROM SAFT AMERICA INC., CONTRACT DAAB07-90- C-C023 OR BALLARD BATTERY SYSTEMS, CONTRACT DAAB07-90-C-C022."

a. Insert two BA-5567/U batteries (2) into the front panel battery compartment. Be careful to observe correct battery polarity.

b. Print installation date on the battery cover assembly (1).

c. Reinstall the battery cover assembly (1).



4.1 5.4 **FUSES.**

a. Grasp fuseholder cap (1) and turn counterclockwise to remove from fuseholder (3~.

NOTE

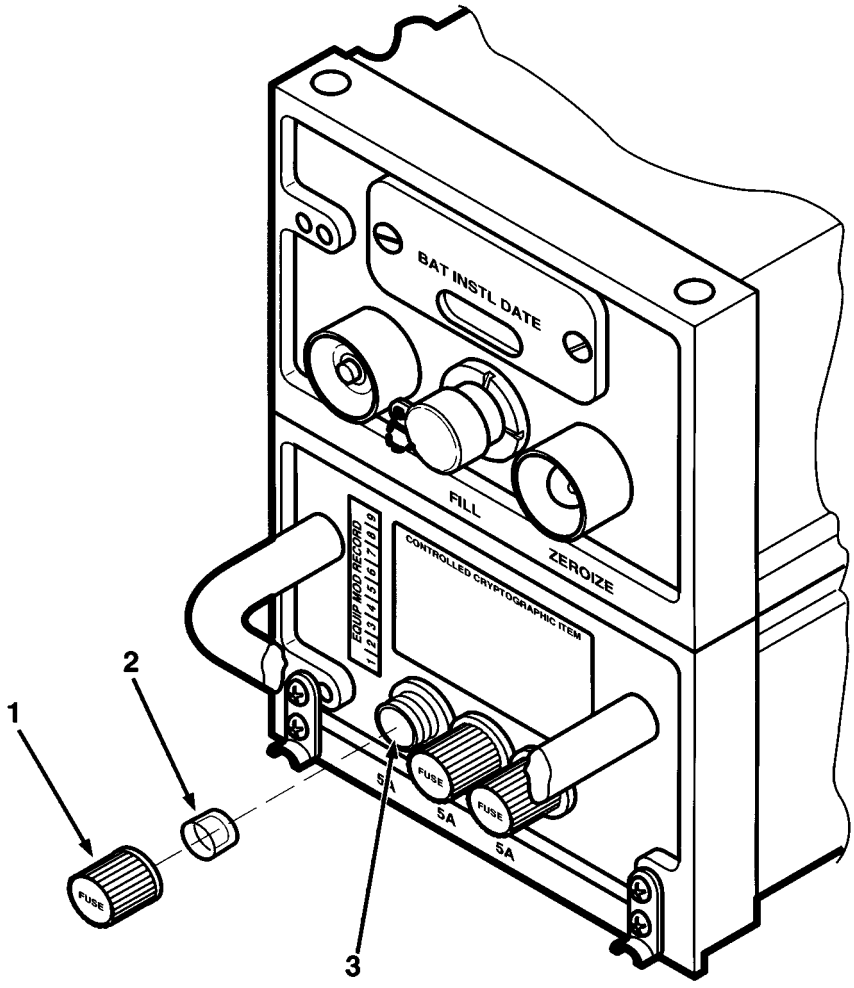
Do not attempt to turn fuse. Pull fuse straight out to remove from fuseholder.

WARNING

Replacement fuse must have the same voltage/amperage rating as the old fuse. Refer to Appendix F, Section II for fuse rating and part number. Replacement with an improperly rated fuse can cause damage to the KI-1C.

b. Remove old fuse (2) from fuseholder (3) and insert replacement fuse into the fuseholder.

c. Position fuseholder cap (1) onto fuseholder (3) and turn clockwise to tighten.



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SECTION IV. PREPARATION FOR STORAGE OR SHIPMENT

When you remove a KI-1C from an aircraft or other weapons platform for storage or shipment, make sure that you zeroize it by pressing the front panel ZEROIZE switch and removing the fill batteries. There is no other preparation at the unit level for storage or shipment of the KI-1C.

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CHAPTER 5
DIRECT SUPPORT MAINTENANCE

NOTE

The KI-1C requires no lubrication.

SECTION I. REPAIR PARTS, SPECIAL TOOLS, TEST MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE) AND SUPPORT EQUIPMENT.

5.1 TOOLS AND TEST EQUIPMENT.

Tools and test equipment required for direct support maintenance of the KI-1C are listed in the Maintenance Allocation Chart (MAC) in Appendix B of this manual.

5.2 SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT.

Special tools, TMDE and support equipment required for direct support maintenance of the KI-1C are listed in Section II, Appendix F of this manual.

5.3 REPAIR PARTS

Repair parts for the KI-1C are listed in Section II, Appendix F of this manual.

SECTION II. SERVICE UPON RECEIPT

5.4 GENERAL.

Refer to chapter 4 of this manual for the following Service Upon Receipt information:

a. Assembling and preparation for use

b. Unpacking the equipment

c. Checking unpacked equipment

5.5 SITE AND SHELTER REQUIREMENT.

The specialized requirements will be identified in the Mark XII System information or technical manual for the KI-1C application.

5.6 INSTALLATION INSTRUCTIONS.

Refer to Chapter 4 of this manual or the applicable systems manual for installation instructions.

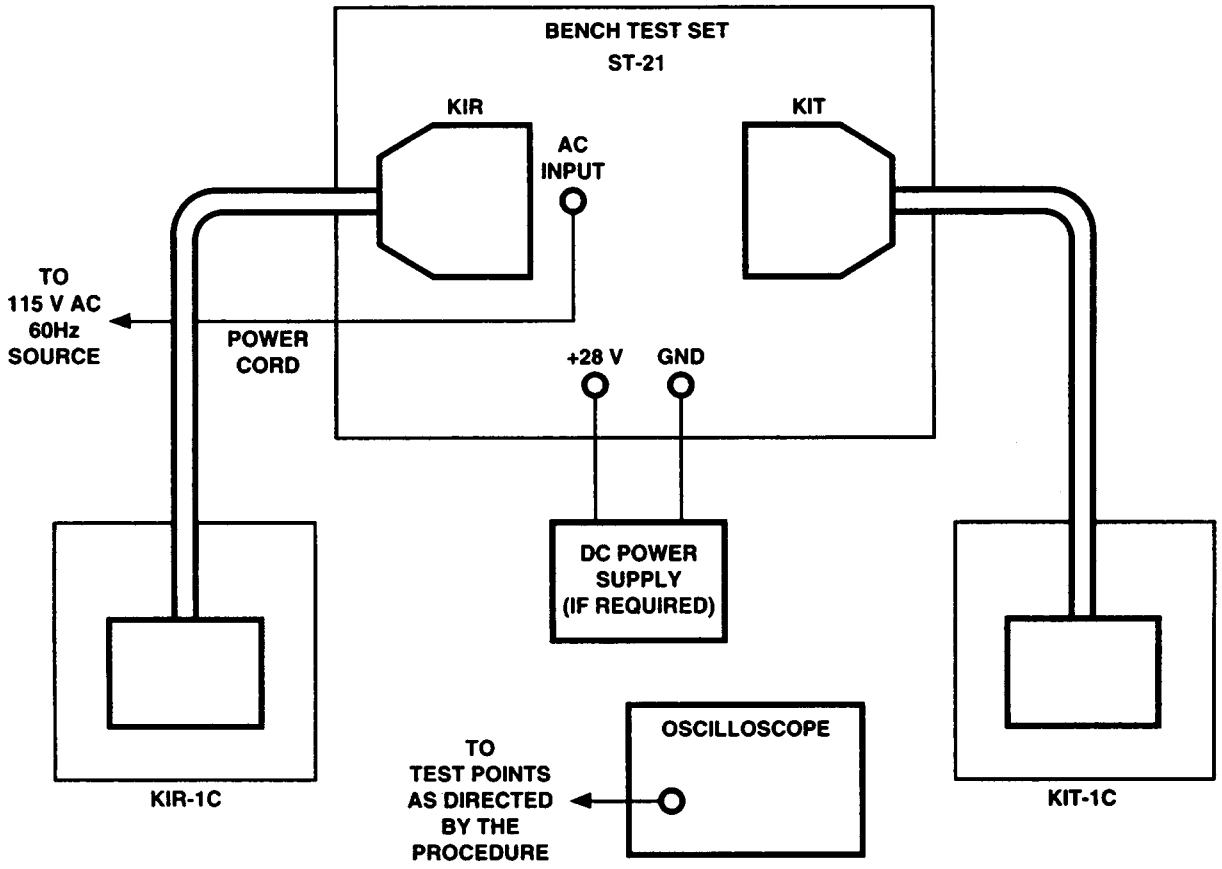

Figure 5-1. Operational Test Setup

SECTION III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

Refer to Chapter 4, Section III for PMCS.

SECTION IV. MAINTENANCE PROCEDURES

5.7 ST-21 SETUP.

Ensure you have a known good keyed KIR-1C and/or KIT-1C and ST-21. Known good units should be keyed with KMT-5177 maintenance key segments 1 and 2 using a KOI-18.

CAUTION

Turn off the ST-21 prime power before connecting or disconnecting system cables or unit subassemblies.

a. Ensure that unit under test (UUT) has a known good fill battery installed.

NOTE

DO NOT attempt to turn fuse during removal. Pull fuse straight out to remove from fuseholder.

b. Remove UUT fuses and check continuity using a multimeter. Reinstall fuses and fuseholder caps.

c. Zeroize the unit under test (UUT).

d. Set ST-21 POWER switch to OFF and all other switches to the normal or down position.

e. Connect the ST-21 AC INPUT cable connector to 115V power source. Set ST-21 POWER switch to ON.

NOTE

ST-21 serial numbers 1 through 19 operate from 57 to 440 Hz.

f. Set ST-21 LAMP TEST switch to TEST. Ensure that all indicator lamps are lit. Release LAMP TEST switch. Make sure that INTERROGATOR COMPUTER ALARM, NOISE ALARM, and TRANSPONDER COMPUTER ALARM lamps are off.

g. Connect KIT-1C, KIR-1C, and ST-21 as shown in Figure 5-1. Be sure that you have a known good unit and the UUT connected. No warm-up period is required for the ST-21.

h. Load key segments A and B into UUT using KMT-5177 maintenance key with a KYK-13 that has been loaded from a KOI-18.

NOTE

If alarm light on ST-21 does not go off, key was not successful.

i. Proceed to paragraph 5.8 or 5.9 to perform operational test once using ac power and again using do power. For a do powered platform, set power supply output to +28 V and connect toST-21 and GRD jacks.

5.8 KIR-1C OPERATIONAL TEST.

a. The following test procedures are performed with the ST-21. After set up procedures are preformed, fill KIR with KMT-5177 maintenance keys.

DESIRED RESULTS: KIR front panel fill LED flashes after second key is loaded.

b. Set ST-21 POWER switch to ON.

DESIRED RESULTS: Within 2 seconds, ST-21 INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps go off.

c. Set ST-21 INTERROGATOR COMPUTER CODE SELECT switch to B. Using oscilloscope, observe signal at ST-21 TDV test point.

DESIRED RESULT: No time decoded video (TDV) signal.

d. Set ST-21 INTERROGATOR COMPUTER CODE SELECT switch to A. Set ST-21 TRANSPONDER COMPUTER CODE SELECT switch to B. Using oscilloscope, observe signal at ST-21 TDV test point.

DESIRED RESULT: No time decoded video (TDV) signal.

e. Set ST-21 INTERROGATOR COMPUTER CODE SELECT switch to B. Using oscilloscope, observe signal at ST-21 SLS/ET, GTC, CV and TDV test points.

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DESIRED RESULT: Amplitude and pulse conform with characteristics listed:

SIGNAL	ST-21 TEST POINT	PULSE WIDTH IN Usec	PULSE AMPLITUDE IN VOLTS
Side Lobe Suppression	SLS/ET	0.3 to 1.5	3.0 to 5.0
Gain Time Control	GTC	0.3 to 1.5	3.0 to 5.0
Challenge Video	CV	0.3 to 0.7	3.0 to 5.0
Time-Decoded Video	TDV	0.3 to 0.7	1.5 to 3.0

f. Connect oscilloscope to ST-21 TDV test point. Set VERIFY NO. 1 switch to 1 and then back to 0 while observing oscilloscope.

DESIRED RESULT: Time-decoded video (TDV) signal is present with VERIFY NO. 1 switch in either position.

g. Set ST-21 VERIFY NO.2 switch to 1 and then back to 0 while observing oscilloscope.

DESIRED RESULTS: Time-decoded video (TDV) signal is present with VERIFY NO. 2 switch in either position.

NOTE

To successfully pass this test, ST-21 INTERROGATOR COMPUTER GEAR switch must have been in DOWN position when power was applied. If KIR does zeroize in the next step, refill maintenance keys and repeat step before going to troubleshooting procedures.

h. Set ST-21 POWER switch to OFF for 15 seconds, then ON.

DESIRED RESULT: Within 2 seconds, INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps go off.

i. Set ST-21 INTERROGATOR COMPUTER GEAR switch to UP for 15 seconds, then down. Set ST-21 INTERROGATOR COMPUTER REFUEL HOLD switch momentarily to HOLD. Set ST-21 POWER switch to OFF for 15 seconds, then ON.

DESIRED RESULTS: Within 2 seconds, ST-21 INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps go off.

j. Set ST-21 INTERROGATOR COMPUTER GEAR switch to UP. Set ST-21 POWER switch to OFF for 15 seconds, then ON.

DESIRED RESULT: ST-21 INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps light and remain lit.

k. Refill KIR with KMT-5177 maintenance key. Make sure ST-21 INTERROGATOR COMPUTER ALARM and NOISE lamps go off. Set ST-21 INTERROGATOR COMPUTER GEAR switch to DOWN. Momentarily set ST-21 INTERROGATOR COMPUTER CODE switch to ZEROIZE.

DESIRED RESULT: ST-21 INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps light.

l. Refill KMT-5177 maintenance key into KIR. Make sure ST-21 INTERROGATOR ALARM and NOISE ALARM lamps go off. Momentarily press KIR front panel ZEROIZE switch.

DESIRED RESULTS: ST-21 INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps light.

m. Refill KMT-5177 maintenance key into KIR. Make sure INTERROGATOR ALARM and NOISE ALARM lamps go off. Loosen four screws securing top housing and carefully open unit.

DESIRED RESULT: ST-21 INTERROGATOR COMPUTER ALARM and NOISE ALARM lamps light.

n. Set ST-21 POWER switch to OFF. If unit has successfully passed all tests, resecure top housing and place unit back in service.

5.9 KIT-1C OPERATIONAL TEST.

a. The following procedures are performed using the ST-21. After set up procedures are preformed, fill KIT-1C with KMT-5177 maintenance key.

DESIRED RESULT: The KIT-1C front panel LED flashes after the second key is loaded.

b. Set ST-21 POWER switch to ON.

DESIRED RESULT: Within 2 seconds, the TRANSPONDER COPMPUTER ALARM lamp goes off.

c. Set ST-21 INTERROGATOR COMPUTER CODE SELECT switch to B. Using oscilloscope, observe signals at ST-21 RV and DIS test points.

DESIRED RESULT: Reply video output is missing from ST-21 test point. Disparity pulse is present at ST-21 DIS test point and conforms with characteristics listed:

SIGNAL	ST-21 TEST POINT	PULSE WIDTH IN Usec	PULSE AMPLITUDE IN VOLTS
Disparity	DIS	0.3 to 1.0	3.0 to 5.0

d. Set ST-21 INTERROGATOR COMPUTER CODE SELECT switch to A. Set ST-21 TRANSPONDER COMPUTER CODE SELECT switch to B. Using oscilloscope, observe signals at ST-21 RV and DIS test points.

DESIRED RESULT: Reply video output is present at ST-21 point RV and conforms with characteristics listed:

SIGNAL	ST-21 TEST POINT	PULSE WIDTH IN Usec	PULSE AMPLITUDE IN VOLTS
Reply Video	RV	0.4 to 0.6	1.5 to 5.0
Disparity	DIS	0.3 to 1.0	3.0 to 5.0

Disparity pulse is missing at ST-21 DIS test point.

e. Connect oscilloscope to ST-21 TDV test point. Set ST-21 VERIFY NO. 1 switch to 1 and then back to 0 while observing oscilloscope.

DESIRED RESULT: Time-decoded video (TDV) output is present with VERIFY NO. 1 switch in either position.

f. Set ST-21 VERIFY NO. 2 switch to 1 and then back to 0 while observing oscilloscope.

DESIRED RESULTS: Time-decoded video (TDV) output is present with ST-21 VERIFY NO. 2 switch in either position.

NOTE

To successfully pass this test, TRANSPONDER COMPUTER GEAR switch must have been in DOWN position when power was applied. If KIT does zeroize in the next step, refill maintenance keys and repeat step before going to troubleshooting procedures.

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g. Set ST-21 POWER switch to OFF for 15 seconds, then ON.

DESIRED RESULT: Within 2 seconds, ST-21 TRANSPONDER COMPUTER ALARM lamp goes off.

h. Set ST-21 TRANSPONDER COMPUTER GEAR switch to UP for 15 seconds, then DOWN. Set ST-21 TRANSPONDER COMPUTER REFUEL HOLD switch momentarily to HOLD. Set ST-21 POWER switch to OFF for 15 seconds, then ON.

DESIRED RESULTS: Within 2 seconds, ST-21 TRANSPONDER COMPUTER ALARM lamp goes off.

i. Set ST-21 TRANSPONDER COMPUTER GEAR switch to UP. Set ST-21 POWER switch to OFF for 15 seconds, then ON.

DESIRED RESULT: ST-21 TRANSPONDER COMPUTER ALARM lamp lights and remains lit.

j. Refill KIT with KMT-5177 maintenance key. Make sure ST-21 TRANSPONDER COMPUTER ALARM lamp goes off. Set ST-21 TRANSPONDER COMPUTER GEAR switch to DOWN. Momentarily set ST-21 TRANSPONDER COMPUTER CODE switch to ZEROIZE.

DESIRED RESULT: ST-21 TRANSPONDER COMPUTER ALARM lamp lights.

k. Refill KMT-5177 maintenance key into KIT. Make sure ST-21 TRANSPONDER COMPUTER ALARM lamp goes off. Momentarily press KIT front panel ZEROIZE switch.

DESIRED RESULTS: ST-21 TRANSPONDER COMPUTER ALARM lamp lights.

l. Refill KMT-5177 maintenance key into KIT. Make sure the TRANSPONDER COMPUTER ALARM lamp goes off. Loosen four screws securing top housing and carefully open unit.

m. Set the ST-21 POWER switch to OFF. If unit has successfully passed all tests, resecure top housing and place the unit back in service.

SECTION V. TROUBLESHOOTING.

NOTE

Troubleshooting at the Direct Support level consists of visual checks and bench test with the ST-21.

a. Troubleshooting your KI-1C involves performing the operational test for the KIR-1C or KIT-1C. After successfully troubleshooting the failed step, always restart the test beginning with step 1 (do not continue from the point where the test was previously halted, as another fault may have been introduced during troubleshooting).

b. When the suspected faulty board is interchanged with a known-good replacement and this does not correct the fault, do not reinstall the original assembly immediately, as more than one fault may be present in the equipment.

CAUTION

Never remove or install any plug-in assemblies with power applied. To do so may result in damage to the equipment. Place unit on an ESD mat which is correctly grounded to bench ground and to all test equipment being used. Wear an ESD wriststrap which is connected to an ESD mat when removing, reinstalling or testing the Circuit Card Assembly (CCA).

Table 5-1. Troubleshooting of KIR-1C

FAILED TEST STEP	INDICATION	CORRECTIVE ACTION
5.8.a	KIR front panel fill LED does not flash after second key is loaded.	Top housing assembly or CCA E- GFO is suspect; refer to step 1 Table 5-3.
5.8.b	INTERROGATOR COMPUTER ALARM or NOISE ALARM lamps remain lit.	Replace CCA E-GFO.
5.8.c	Time-decoded video is present to ST- 21 TDV test point.	Replace CCA E-GFO.
5.8.d	Time-decoded video is present to ST- 21 TDV test point.	Replace CCA E-GFO.
5.8.e	Time-decoded video missing or does not meet requirements.	Replace CCA E-GFO.
5.8.f	Time-decoded video missing.	Replace CCA E-GFO.
5.8.g	Time-decoded video missing.	Replace CCA E-GFO.
5.8.h	KIR zeroizes.	Replace CCA E-GFO.
5.8.i	KIR does not zeroize.	Replace CCA E-GFO.
5.8.j	KIR does not zeroize.	Replace CCA E-GFO.
5.8.k	KIR does not zeroize.	Replace CCA E-GFO.
5.8.l	KIR does not zeroize.	Top housing assembly or CCA E- GFO is suspect.
5.8.m	KIR does not zeroize.	Replace CCA E-GFO.

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Table 5-2. Troubleshooting of KIT-1C

FAILED TEST STEP	INDICATION	CORRECTIVE ACTION
5.9.a	KIT front panel fill LED does not flash after second key is loaded.	Top housing assembly or CCA E- GFN is suspect.
5.9.b	TRANSPONDER COMPUTER ALARM lamp remains lit.	Replace CCA E-GFN.
5.9.c	Reply video is present to ST-21 RV test point or disparity pulse is missing from ST-21 DIS test point.	Replace CCA E-GFN.
5.9.d	Reply video missing or does not meet requirements listed in the table.	Replace CCA E-GFN.
5.9.e	Time-decoded video missing.	Replace CCA E-GFN
5.9.f	Time-decoded video missing.	Replace CCA E-GFN
5.9.g	KIT zeroizes.	Replace CCA E-GFN.
5.9.h	KIT zeroizes.	Replace CCA E-GFN.
5.9.i	KIT does not zeroize.	Replace CCA E-GFN.
5.9.j	KIT does not zeroize.	Replace CCA E-GFN.
5.9.k	KIT does not zeroize.	Top housing assembly or CCA E- GFN is suspect.

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Table 5-3. Troubleshooting of Top Housing Assembly

STEP	SIGNAL FUNCTION	PROCEDURE
1	FILL INDICATION	a. Set the ST-21 POWER switch to ON. Within 2 seconds, all ALARM and NOISE ALARM lamps go off. If lamps go off proceed to step b. If lamps do not go off proceed to step d. b. Set the ST-21 POWER switch to OFF and remove top housing assembly. Measure resistance between terminals of fill LED, reverse multimeter leads and measure resistance again. Fill LED internal resistance is low (approximately 100 ohms) in one direction and high (near infinity) the other direction. If you get these readings proceed to step c., if not, send the unit to Depot for fill LED replacement. c. Check continuity between positive terminal (green wire) of fill LED and W1P1-11, and between negative terminal (white wire with green stripe) of fill LED and W1P1-20. If continuity exists replace CCA (E- GFO on KIR, E-GFN on KIT). If continuity does not exist send the unit to Depot for upper cable assembly repair. d. Set the ST-21 POWER switch to OFF and remove top housing assembly. Check continuity between FILL connector and W1J1 and CCA connector W1P1. If continuity exists between all points replace CCA (E-GFO on KIR, E-GFN on KIT). If not, send the unit to Depot for upper cable assembly repair.
2	FRONT PANEL ZEROIZE	a. Set the ST-21 POWER switch to OFF and remove top housing assembly. Check continuity between ZEROIZE switch W1S1 terminals while switch is depressed. If continuity exits proceed to step b. If not, send to Depot for ZEROIZE switch replacement. b. Check continuity between W1S1 (white wire with black stripe) and CCA connector W1P1-4, and between W1S1-2 (black wire) and CCA connector W1P1-6. If continuity exists replace CCA (E-GFO on KIR, E- GFN on KIT). If not send to Depot for upper cable assembly repair.

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5.10 CCA REPLACEMENT.

CAUTION

Wear an ESD wriststrap which is connected to an ESD mat when working near the CCA.

Slowly lift top housing from unit to avoid damaging or straining upper cable assembly.

a. To remove the top housing assembly loosen four captive screws on top housing.

b. Carefully lift top housing from unit until upper cable assembly connector W1P1 may be accessed.

c. Disconnect connector W1P1 from CCA; remove top housing.

d. Disconnect the lower cable assembly connector W2P1 from CCA.

e. Remove the seven screws and flat washers securing CCA to bottom housing and remove CCA. Some units may have three short screws installed along rear of unit.

f. Replace CCA and reinstall the seven screws and flat washers securing CCA to bottom housing.

g. Connect the lower cable assembly connector W2P1 to CCA.

h. Connect connector W1P1 to CCA and replace top housing.

i. Carefully replace top housing on unit.

j. Secure top housing assembly by tightening the four captive screws on top housing.

5.11 DUST CAP REMOVAL.

a. Remove spanner nut and dust cap assembly from FILL connector.

b. Install retaining ring of replacement dust cap assembly onto FILL connector.

c. Apply thread-locking of compound to threads of FILL connector.

d. Install spanner nut onto FILL connector.

5.12 REMOVAL/REPLACEMENT OF HANDLES.

a. To remove the handles, you must first remove the top housing assembly and CCA. (Refer to paragraph 5.10 for procedures)

b. Carefully move plate shield to access handle screws.

c. Remove screws, washers and lock washers securing handles to bottom housing assembly.

d. Replace handles.

e. Reinstall plate shield, CCA and top housing assembly.

5.13 BATTERY COVER ASSEMBLY GASKET REPLACEMENT.

a. Loosen the two captive screws securing the battery cover to the front panel and remove battery cover assembly.

b. Remove unserviceable gasket from battery cover. Use a knife to remove all traces of gasket and RTV adhesive from battery cover.

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c. Apply primer to area where gasket will contact battery cover. Allow primer to cure in accordance with manufacturer's instructions.

d. After primer cures, apply RTV adhesive to gasket and position gasket onto battery cover.

e. After adhesive has cured, position battery cover assembly onto front panel and secure by evenly tightening two captive screws.

5.14 PAINTING.

The Kl-1C will be spot painted IAW local SOP as defined in AR 750-01.

SECTION Vl. PREPARATION FOR STORAGE OR SHIPMENT.

5.15 REPACKING.

The Kl-1 C equipment is shipped in cartons. See Chapter 4, paragraph 4.5 and perform the procedures in the reverse order.

NOTE

ZERIOZE unit before packing. Remove batteries. DO NOT SHIP equipment with batteries installed.

5.1 6 TYPES OF STORAGE.

a. Short term (administrative) = 1 to 45 days. All equipment in short term storage must be able to be made ready within 24 hours for use on a mission. Before placing any item in short term storage, perform next schedule PMCS and correct or repair any deficiencies you find. The storage site should provide required protection from extreme weather conditions and allow you to reach the equipment for visual inspections or exercises, when applicable.

b. Intermediate = 46 to 180 days

c. Long term or flyable = no time limit

APPENDIX A
REFERENCES

A-1 SCOPE.

The following is a list of forms, Army regulations, technical bulletins, technical manuals, and maintenance manuals referenced in this manual.

A-2 PUBLICATION INDEXES.

The following publication indexes should be consulted frequently for the latest changes or revisions of references given in this appendix and for new publications relating to material covered in this manual.

A-3 FORMS.

DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2028	Recommended Changes to Publications and Blank Forms
SF 361	Transportation Discrepancy Report
SF 364	Report of Discrepancy
SF 368	Product Quality Deficiency Report

A-4 ARMY REGULATIONS (AR).

AR 55-38	Report of Transportation Discrepancies in Shipments
AR 380-40	Policy for Safeguarding and Controlling Communications Security (COMSEC) Material
AR 735-11-2	Reporting of Item and Packaging Discrepancies
AR 570-1	Army Materiel Maintenance Policies

A-5 DA PAMPHLETS.

DA PAM 25-35	Index of Communications Security (COMSEC) Publications
DA PAM 750-10	US Army Equipment Index of Modification Work Orders
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 25-380-2	Security Procedures for Controlled Cryptrographic Item
DA PAM 738-750	Functional Users Manual for the Army Maintenance Management System (TAMMS)

A-6 TECHNICAL BULLETINS (TB).

TB 11-5810-389-40	Specialized Repair Activities (SRA) Maintenance Procedures for Kl-1 C Cryptographic Computer, NSN 5810-01-273-7820 (KIT-1C) and NSN 5810-01-273-7819 (KIR-1C)
TB 43-0001-06	Equipment Improvement Recommendation and Maintenance Digest Report for Communications Security Equipment
TB 380-41	Procedures for Safeguarding, Accounting and Supply Control of COMSEC Material
TB 750-10	Painting, Replating, and Preserving Instructions for Communications Security Equipment
TB 750-25	Maintenance of Supplies and Equipment: Army Test, Measurement and Diagnostic Equipment (TMDE) Calibration and Repair Support Program
TB 750-38 (C)	Alteration of Communications Security Equipment (U)
TB MED 502	Occupational and Environment Health Respiratory Protection Program

A-7 TECHNICAL MANUALS (TM).

TM 43-0001-38	Army Ammunition Data Sheets for Demolition Materials

A-8 MAINTENANCE MANUALS.

KAM-528()	Limited Maintenance Manual KIR-1C and KIT-1C

A-9 FIELD MANUALS.

FM 5-25	Explosives and Demolition
FM 21-11	First Aid for Soldiers

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APPENDIX B
MAINTENANCE ALLOCATION CHART (MAC)

SECTION I. INTRODUCTION

B-1 THE ARMY MAINTENANCE SYSTEM MAC.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in Column (4) as:

Unit - includes two subcolumns, C (operator/crew) and O (unit) maintenance.
Direct Support - includes an F subcolumn.
General Support - includes two subcolumns, H (general support) and L (specialized repair activity).
Depot - includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced in Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2 MAINTENANCE FUNCTIONS.

Maintenance functions are limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. **Test.** To verify serviceability by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, or to paint.

d. **Adjust.** To maintain, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to the specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

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h. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3rd position code of the SMR code.

i. **Repair.** The application of maintenance services[1] including fault location/troubleshooting,[2] removal/installation, disassembly/assembly[3] procedures, and maintenance actions[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. **Overhaul.** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/ operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. **Rebuild.** Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

B-3 EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. **Column 1, Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b. **Column 2, Component/Assembly.** Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. **Column 3, Maintenance Function.** Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see B-2.)

d. **Column 4, Maintenance Level.** Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed as manhours in whole numbers or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

---

[1]Services - Inspect, test service, adjust, align, calibrate, and/or replace.

[2]Fault Location/Troubleshooting - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

[3]Disassembly/Assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its maintenance under consideration (i.e., identified as maintenance significant).

[4]Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

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C..... Operator or crew maintenance
O ..... Unit maintenance
F ..... Direct support maintenance
H..... General support maintenance
L ..... Specialized repair activity (SRA)[5]
D..... Depot maintenance

e. **Column 5.** Tools and Equipment Reference Code. Column 5 specifies, by code, those common tool sets (not individual tools), common TMDE, and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to tools and test equipment in Section 111.

f. **Column 6,** Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

B-4 EXPLANATION OF COLUMNS IN TOOLS AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. **Column 1, Tool or Test Equipment Reference Code.** The tool or test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. **Column 2, Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3, Nomenclature.** Name or identification of the tool or test equipment

d. **Column 4, National/NATO Stock Number.** The National/NATO Stock Number of the tool or test equipment.

e. **Column 5, Tool Number.** The manufacturer's part number, model number or type number.

B-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. **Column 1, Remarks Code.** The code recorded in Column 6, Section II.

b. **Column 2, Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

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[5] SRAs are those support facilities which are properly staffed with personnel with the necessary skills, and equipped with special tools and test equipment necessary for repair of selected equipment and assemblies which are beyond the capability of a normal General Support facility. DA has approved the Theater COMSEC Management Office-Europe as the SRA for COMSEC equipment.

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SECTION II - MAINTENENCE ALLOCATION CHART FOR KI-1C CRYPTOGRAPHIC COMPUTERS

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL						(5) TOOLS AND EQUPT.	(6) REMARKS
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT		DEPOT		
			C	O	F	H	L	D		
00	KI-1C									
01	KIR-1C INTERROGATOR COMPUTER	INSPECT		0.1						A
		SERVICE		0.1						B
		REPLACE		0.3						C
		REPAIR		0.1					1	D
		INSPECT			0.1					E
		TEST			0.6				2-8, 10-17	F
		REPAIR			0.5				6-7	G
		TEST						***		H
		REPAIR						***		I
		OVERHAUL						***		L
0101	CCA, E-GFO	INSPECT			0.2				6-7	A
		REMOVE/INSTALL			0.2				6-7	J
		REPLACE			0.2				6-7	K
		REPAIR						***		I
0102	COVER, BATTERY	REMOVE/INSTALL		0.1					1	J
		REPLACE			0.1				6	K
		REPAIR			0.1				6	G
02	KIT-1C TRANSPONDER COMPUTER	INSPECT		0.1						A
		SERVICE		0.1						B
		REPLACE		0.3						C
		REPAIR		0.1					1	D
		INSPECT			0.1					E
		TEST			0.6				2-7, 9-17	F
		REPAIR			0.5				6-7	G
		TEST						***		H
		REPAIR						***		I
		OVERHAUL						***		L
0201	CCA, E-GFN	INSPECT			0.2				6-7	A
		REMOVE/INSTALL			0.2				6-7	J
		REPLACE			0.2				6-7	K
		REPAIR						***		I
0202	COVER, BATTERY	REMOVE/INSTALL		0.1					1	J
		REPLACE			0.1				6	K
		REPAIR			0.1				6	G

*** NOTE - THESE ACTIONS ARE CONDUCTED BY AIR FORCE DEPOT ONLY

SECTION III - TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
KI-1C CRYPTOGRAPHIC COMPUTERS

(1) TOOL OR TEST EQUIPMENT	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	O	TOOL KIT, ELECTRONIC	5180-00-064-5178	TK-101/G
2	F	BATTERY, NONRECHARGABLE (FILL BATTERY)	*6135-01-090-5365	BA-5567/U
3	F	ELECTRONIC, TRANSFER DEVICE KYK-13	5810-01-026-9618	0N190318
4	F	GENERAL PURPOSE TAPE READER KOI-18	5810-01-026-9620	0N190315
5	F	CABLE, FILL	5810-01-066-7587	0N512424
6	F	TOOL KIT, ELECTRONIC	5180-00-610-8177	TK-105/G
7	F	WORK STATION KIT, ELECTROSTATIC	4940-01-250-4236	M87893-02
8	F	CCA, E-GFO	5998-01-298-0804	0N389781-1
9	F	CCA, E-GFN	5998-01-298-0802	0N389779-1
10	F	MULTIMETER, DIGITAL	6625-01-145-2430	AN/USM-486
11	F	KMT-5177, MAINTENANCE KEY	5810-00-U11-6400	KMT-5177
12	F	OSCILLOSCOPE	6625-01-187-7847	AN/USM-488
13	F	KIR-1C	5810-01-273-7819	0N389699-1
14	F	KIT-1C	5810-01-273-7820	0N389698-1
15	F	ST-21 BENCH TEST SET	5810-00-127-2346	0N089176
16	F	POWER SUPPLY	6130-01-139-2514	PP-2309C/U
17	F	FUSE, CARTRIDGE	5920-00-782-6179	FM02A125V5A

* NOTE - When ordering the batteries, specify “ONLY FROM SAFT AMERICA INC. CONTRACT DAAB07-90-C-C023 OR BALLARD BATTERY SYSTEMS, CONTRACT DAAB07-90-C-C022”

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SECTION IV - REMARKS
FOR
KI-1C CRYPTOGRAPHIC COMPUTERS

(1) REFERENCE CODE	(2) REMARKS
A	VISUAL EXTERNAL INSPECTION FOR BROKEN, MISSING, CRACKED OR DEFECTIVE COMPONENTS.
B	PERFORM PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) AS SPECIFIED IN CHAPTER 4 OF THIS MANUAL.
C	REPLACE UNSERVICABLE UNIT.
D	REPAIR BY REPLACEMENT OF FILL BATTERIES AND OR FUSES.
E	VISUAL EXTERNAL/INTERNAL INSPECTION FOR BROKEN, MISSING, CRACKED OR DEFECTIVE COMPONENTS.
F	PERFORM TESTING IN ACCORDANCE WITH CHAPTER 5 OF THIS MANUAL.
G	REPAIR BY REPLACEMENT OF CCA/DS REPLACEABLE COMPONENTS IDENTIFIED DURING VISUAL INSPECTION/TESTING TO BE FAULTY, BROKEN, MISSING, CRACKED OR DEFECTIVE.
H	PERFORM TESTING IN ACCORDANCE WITH KAM-527A. (NOTE - APPLIES TO AIR FORCE DEPOT ONLY)
I	REPAIR IN ACCORDANCE WITH KAM-527A. (NOTE - APPLIES TO AIR FORCE DEPOT ONLY)
J	REMOVE/INSTALL TO PERFORM OTHER MAINTENANCE TASKS.
K	REPLACE DEFECTIVE COMPONENT IDENTIFIED DURING VISUAL INSPECTION/TEST PROCEDURES.
L	PERFORM OVERHAUL IN ACCORDANCE WITH KAM-527A. (NOTE - APPLIES TO AIR FORCE DEPOT ONLY)

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APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

SECTION I. INTRODUCTION

C- 1 SCOPE.

This appendix lists components of end item and basic issue items for the Kl-1C to help you inventory items for safe and efficient operation of the equipment.

C-2 GENERAL.

The Components of End Item (COEI) and Basic Issue Items (Bll) Lists are divided into the following sections:

a. **Section II - Components of End Item.** This listing is for information purposes only and is not authority to requisition replacements. These items are part of the Kl-1C. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary.

b. **Section III - Basic Issue Items.** These essential items are required to place the Kl-1C in operation, operate it, and to do emergency repairs. Although shipped separately package, Bll must be with the Kl-1C during operation and when it is transferred between property accounts. Listing these items is your authority to request/ requisition them for replacement based on authorization of the end item by the TOE/MTOE.

There are no COEI or Bll for the Kl-1C.

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APPENDIX D
ADDITIONAL AUTHORIZATION LIST

SECTION I. INTRODUCTION

D-1 SCOPE.

This appendix lists additional items you are authorized for the support of KI-1C.

D-2 GENERAL.

This list identifies items that do not have to accompany the equipment and do not have to be turned in with it. These items are authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

a. Column (1) - National/NATO Stock Number (NSN). Lists the National/NATO Stock Number assigned to the item.

b. Column (2), Description. Lists the Federal item name and, if required, a description to identify the item. The last line for each item lists the Commercial and Government Entity (CAGE) Code in parentheses followed by the part number. The usable on code is used to indicate the different models of the equipment.

c. Column (3) - Unit of Measure (U/M). Lists the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (for example, EA, IN, PR).

d. Column (4) - Quantity (QTY) Authorized. Lists the quantity on the item required to support.

SECTION II. ADDITIONAL AUTHORIZATION LIST

(1) National/NATO Stock Number	(2) Description CAGE AND PART NUMBER / USABLE ON CODE	(3) U/M	(4) QTY AUTH
5180-01-066-7587	Cable Assembly, Special Purpose, Electrical Fill (3ft) (98230) 0N512424	EA	1
5810-01-026-9618	Electronic Transfer Device, KYK-13 (98230) 0N190318	EA	1
5810-01-026-9620	General Purpose Tape Reader, KOI-18 (98230) 0N190315	EA	1

APPENDIX E
EXPENDABLE AND DURABLE ITEMS LIST

SECTION I. INTRODUCTION

E-1 SCOPE.

This appendix lists expendable and durable items that you will need to operate and maintain the KI-1C. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-790, Expendable/Durable Items.

E-2 EXPLANATION OF COLUMNS.

a. **Column (1) - Item Number.** This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item.

b. **Column (2) - Level.** This column identifies the lowest level of maintenance that requires the item. The maintenance levels are:

C - Crew or Operator

O - Unit

F - Direct Support

H - General Support

L - Specialized Repair Activity

c. **Column (3) - National/NATO Stock Number.** Lists the National/NATO Stock Number assigned to the item which you can use to requisition it.

d. **Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number.** This provides the other information you need to identify the item.

e. **Column (5) - Unit of Measure (UM).** This code shows the physical measurement or count of an item, such as gallon, dozen, each, etc. It is expressed by a two-character alphabetical abbreviation. If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

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SECTION II. EXPENDABLE AND DURABLE ITEMS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL/NATO STOCK NUMBER	(4) ITEM NAME, DESCRIPTION (CAGEC), PART NUMBER	(5) U/M
1	O	6135-01-090-5365	Battery, (80058) BA-5567/U	EA
2	O	7920-00-685-3980	Brush, Dusting, Painters (81348) H-B-212	EA
3	O	8305-00-267-3015	Cloth, Cotton, Cheesecloth, (81348) CCC-C440	YD
4	O	6850-01-371-8049	Electron, Non-aqueous	OZ
5	O	6850-00-177-5094	Silicon, Compound (81349) MIL-2-8660	
6	F	8040-00-938-1535	Primer, MIL-A-46146, Type I	
7	F		RTV Adhesive, 0N315906	

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APPENDIX F
REPAIR PARTS SPECIAL TOOLS LIST

SECTION I. INTRODUCTION

F-1 SCOPE.

This RPSTL lists and authorizes spare and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of Unit and Direct Support maintenance of the equipment. It authorizes the requisitioning, issue and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes. This manual also includes national stock number (NSN) cross-referenced to part number.

F-2 GENERAL.

In addition to Section I, Introduction, this repair parts and special tools list is divided into the following sections:

a. **Section II, Repair Parts List.** A list of spare and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts.

b. **Section III, Special Tools List.** A list of special tools, special TMDE, and special support equipment authorized by this RPSTL for the performance of maintenance. There are no special tools required.

c. **Section IV, National Stock Number Cross-Referenced to Part Number Index.** A list of all NSNs, in ascending numerical sequence, appearing in the listings cross-referenced to part number.

F-3 EXPLANATION OF COLUMNS (SECTIONS II AND III).

a. **ILLUSTRATION (Column 1).** This column is not used as all illustrations are located in KAM-528 ( ).

b. **SMR CODE (Column 2).** The source, maintenance, and recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instructions as shown in the following breakout:

Source Code	Maintenance Code		Recoverability Code
xx	xx		x
1st two positions How to get an item.	3rd position Who can install, replace, or use the item.	4th position Who can do complete repair* on the item.	5th position Who determines disposition action on unserviceable items.

*Complete repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Source Code	Application/ Explanation
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purposes because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment procured for initial issue or outfitting. Stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specified maintenance activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. Normally applied to an item peculiar to the equipment which, because of probable discontinuance, would prove uneconomical to reproduce at a later time.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
KD	An item of depot overhaul. Repair kit and not purchased separately. Depot kit is defined as a kit that provides the items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at either unit or level of maintenance.
MD	Item to be manufactured or fabricated at the depot maintenance level.
MF	Item to be manufactured or fabricated at the direct support maintenance level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
ML	Item to be manufactured or fabricated only at COMSEC specialized repair activity level.
MO	Item to be manufactured or fabricated at unit level.
AD	Item to be assembled at depot maintenance level.
AF	Item to be assembled at direct support maintenance level.
AH	Item to be assembled at general support maintenance level.
AL	Item to be assembled at the COMSEC specialized repair activity maintenance level.
AO	Item to be assembled at unit level.

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Source Code	Application/ Explanation
XA	Item not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.
XB	Item is not procured or stocked. If not available, obtain through salvage or requisition.
XC	Installation drawing, diagram, instruction sheet, field service drawing that is identified by manufacturer's part number(s).
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

(2) Maintenance Code. Maintenance codes are assigned to indicate the levels of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth position of the SMR code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Maintenance Code	Application/ Explanation
C	Crew or operator maintenance done within unit maintenance.
O	Unit level maintenance can remove, replace, and use the item.
F	Direct support maintenance can remove, replace, and use the item.
H	General support maintenance can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized functions):

Maintenance Code	Application/ Explanation
O	Unit (or on-site) is the lowest level that can do complete repair of the item.
F	Direct support is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.

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Maintenance Code	Application/ Explanation
L	Specialized repair activity (designate the specialized repair activity) is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR code as follows:

Recoverability Code	Application/ Explanation
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the 3rd position of the SMR code.
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at the unit level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
L	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA)/depot level.
D	Reparable item. When beyond lower-level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
A	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material).

c. **NSN (Column 3).** The National stock number (NSN) for the item is listed in this column. When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

d. **CAGEC (Column 4).** The commercial and Government entity code (CAGEC) is a five-digit code listed in SB 708-41/42/43/48 which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

e. **Part Number (Column 5).** Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

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f. **Description (Column 6).** Indicates the item name and, if required, a minimum description to identify the item. The preferred manufacturer's part number is also listed in this column when it differs from the part number i Column 5.

g. **Usable on Code (Column 7).** Not used.

h. **Unit of Measure (U/M) (Column 8).** Indicates the standard of the basic quantity of the listed item used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR, etc). When the U/M differs from the unit of issue, the lowest unit of issue, the lowest unit of issue that will satisfy the required U/M will be requisitioned.

i. **Quantity Incorporated in Unit (Column 9).** Indicates the quantity of the item used in the breakout shown on the illustration figure in the NAM/KAM, which is prepared for a functional group, subfunctional group, or an assembly A "V" appearing in this column instead of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

F-4 SPECIAL INFORMATION.

a. **References.**

(1) Following is a list of COMSEC publications which may be obtained either through normal distribution channels or special requisitioning procedures. These publications should be kept readily available to COMSEC equipment maintenance personnel.

(a) AR 380-40, Department of the Army Policy for Safeguarding COMSEC information.
(b) AR 710-2, Supply Policy Below the Wholesale Level.
(c) AR 725-50, Requisition, Receipt and Issue System.
(d) DA PAM 25-35, Index of Communication Security (COMSEC) Publications.
(e) TB 43-0001-06-( ), Equipment Improvement Report and Maintenance Digest for Communications Security Equipment (Initial distribution only).
(f) TB 380-41, Procedures for Safeguarding, Accounting, and Supply Control of COMSEC Material.
(g) TB 750-38 (C), Alteration of Communications Security Equipment (U). This publication identifies National Security Agency MODs that are authorized for Army application to COMSEC equipment.
(h) TM 11 -5810-389-40, Specialized Repair Activities (SRA) Maintenance Procedures for Kl-1C Cryptographic Computer, NSN 5810-01-273-7819 (KIR-1C) and NSN 5810-01-273-7820 (KIT-1C).

(2) The following publication(s), if authorized to the requester, can be obtained by submitting a requisition on DD Form 1348-6 (DA Single Line Item Requisition System Document (Mechanical) through COMSEC logistics channels as outlined in the TB 380-41.

b. **Requisitioning Publications.**

(1) The DA Pamphlet 25-33, (Military Publications: The Standard Army Publications System (STARPUBS) Revision of DA 12-Series Forms Usage and Procedures), prescribes the latest procedures for establishing pinpoint distribution (DA Form 12) and for completing DA Form 12-43-E and other DA Form(s) 12-( ) listing COMSEC publications.

(2) DA Pam 310-10 (The Standard Army Publications System (STARPUBS): Users Guide) outlines instructions for completing DA Form 4569 for request for resupply. Additional guidance for obtaining publications may be found in AR 25-30 (The Army Integrated Publishing and Printing Program).

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(3) TB 380-41 (Procedures for Safeguarding, Accounting, and Supply Control of COMSEC Material) provides procedures to obtain accountable publications which are available with justification through COMSEC logistics channels.

c. **Requisitioning Repair Parts, Subassembly, or Other Items.**

(1) All classified repair items designated as COMSEC and identified in the Army Master Data File with Source of Supply as B56-managed may be requisitioned by Army users through COMSEC logistics channels using a funded DD Form 1348/1348M/1348-6 or DA Form 2765/2765-1 in accordance with TB 380-41. Unclassified repair items including Controlled Cryptographic Items (CCI) are requisitioned through the standard Army logistics channels IAW AR 710-2.

(2) Common items (repair parts, subassembly, or other items) which are required in support of COMSEC equipment and are not identified as B56-managed are to be requisitioned in accordance with the provisions of AR 725-50.

d. **Items Source Coded A or M.** Requirements for drawings of items source coded A or M in the first position of the SMR code should be submitted to Director, U.S. Army Communications-Electronics Command, Communications Security Logistics Activity, ATTN: SELCL-EP-C, Fort Huachuca, Arizona 85613-7090.

e. **Modifications.**
Not applicable.

F-5 HOW TO LOCATE REPAIR PARTS.

a. Repair part numbers are listed in alpha-numeric sequence by part number in Column 4 of Section II. NSNs are listed in ascending numerical sequence in Section IV and cross-referenced to the part numbers listed in Column 5 of Section II.

b. Special Tools are listed in Section III. In the Special Tools List (Section III) the initial basis of issue appears as the last line in the entry for each special tool, TMDE, and support equipment.

F-6 ABBREVIATIONS.

Not applicable.

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SECTION II. REPAIR PARTS LIST FOR KIT-1C

(1) ILLUS		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) Fig No.	(b) Item No.	SMR Code	National Stock Number	CAGE	Part Number	Description	U/M	Qty Incl In Unit
		PAFZZ	9905-01-299-7742	98230	0N014681-16	PLATE, EQUIP MOD	EA	1
		PAFZZ	5340-01-392-1485	98230	0N096833-2	HANDLE, SPECIAL	EA	1
		PAOZZ	5340-00-985-0778	98230	0N096834	BRACKET, ANGLE	EA	2
		PAFZZ	5810-01-106-7313	98230	0N231752-2	INSERT MARKING	EA	1
		PA	5810-01-273-7820	98230	0N389698-1	KI-1C	EA	1
		PAFZZ	9905-01-298-0794	98230	0N389714-1	PLATE, IDENT KIT-1C	EA	1
		PAFZZ	5305-01-298-3600	98230	0N389720-1	SCREW, MACHINE	EA	4
		PAFZZ	5330-01-298-1990	98230	ON389746-1	GASKET	EA	1
		PAFZZ	5305-01-298-0780	98230	0N389747-1	SCREW, CAP, SOCKET HEAD	EA	2
		PAOZZ	6160-01-298-8377	98230	0N389748-1	COVER, BATTERY	EA	1
		PAFDD	5998-01-298-0802	98230	0N389779-1	CCA, E-GFN	EA	1
		PAFZZ	5340-01-103-6592	98230	0N511078-502	CAP, ASSEMBLY DUST	EA	1
		PAFZZ	5310-00-615-1556	28527	2616950G001	WASHER, FLAT	EA	4
		PAOZZ	6135-01-090-5365	80058	BA-5567/U	BATTERY, NONRECHARGEABLE***	EA	2
		PAOZZ	5920-00-782-6179	81349	FM02A125V5A	FUSE, CARTRIDGE	EA	3
		PAFZZ	5310-00-722-5998	96906	MS15795-805	WASHER, FLAT	EA	7
		PAFZZ	5305-00-068-5406	96906	MS16996-15	SCREW, CAP, SOCKET HEAD	EA	2
		PAFZZ	5310-00-933-8120	96906	MS35338-138	WASHER, LOCK	EA	6
		PAOZZ	5305-00-054-6650	96906	MS51957-26	SCREW, MACHINE	EA	3
		PAOZZ	5305-00-054-6653	96906	MS51957-29	SCREW, MACHINE	EA	4
		PAFZZ	5305-00-054-6657	96906	MS51957-33	SCREW, MACHINE	EA	7
		PAFZZ	5930-01-114-1843	81349	M5423-07-06	BOOT, PUSHBUTTON	EA	1
		PAFZZ	5330-00-947-4271	80205	NAS1598C3Y	WASHER, SEALING	EA	2
		PAFZZ	7690-01-292-3410	98230	0N385907-1	LABEL, WARNING	EA	1

*** NOTE - When ordering the batteries, specify “ONLY FROM SAFT AMERICA INC, CONTRACT DAAB07-90-C-C023 or BALLAD BATTERY SYSTEMS, CONTRACT DAAB07-90-C-C022”.

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SECTION II. REPAIR PARTS LIST FOR KIR-1C

(1) ILLUS		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) Fig No.	(b) Item No.	SMR Code	National Stock Number	CAGE	Part Number	Description	U/M	Qty Incl In Unit
		PAFZZ	9905-01-299-7742	98230	0N014681-16	PLATE, EQUIP MOD	EA	1
		PAFZZ	5340-01-392-1485	98230	0N096833-2	HANDLE, SPECIAL	EA	1
		PAOZZ	5340-00-985-0778	98230	0N096834	BRACKET, ANGLE	EA	2
		PAFZZ	5810-01-106-7313	98230	0N231752-2	INSERT MARKING	EA	1
		PA	5810-01-273-7819	98230	0N389699-1	KIR-1C	EA	1
		PAFZZ	9905-01-298-0795	98230	0N389714-2	PLATE, IDENT KIR-1C	EA	1
		PAFZZ	5305-01-298-3600	98230	0N389720-1	SCREW, MACHINE	EA	4
		PAFZZ	5330-01-298-1990	98230	ON389746-1	GASKET	EA	1
		PAFZZ	5305-01-298-0780	98230	0N389747-1	SCREW, CAP, SOCKET HEAD	EA	2
		PAOZZ	6160-01-298-8377	98230	0N389748-1	COVER, BATTERY	EA	1
		PAFDD	5998-01-298-0804	98230	0N389781-1	CCA, E-GFO	EA	1
		PAFZZ	5340-01-103-6592	98230	0N511078-502	CAP, ASSEMBLY DUST	EA	1
		PAFZZ	5310-00-615-1556	28527	2616950G001	WASHER, FLAT	EA	4
		PAOZZ	6135-01-090-5365	80058	BA-5567/U	BATTERY, NONRECHARGEABLE***	EA	2
		PAOZZ	5920-00-782-6179	81349	FM02A125V5A	FUSE, CARTRIDGE	EA	3
		PAFZZ	5310-00-722-5998	96906	MS15795-805	WASHER, FLAT	EA	7
		PAFZZ	5305-00-068-5406	96906	MS16996-15	SCREW, CAP, SOCKET HEAD	EA	2
		PAFZZ	5310-00-933-8120	96906	MS35338-138	WASHER, LOCK	EA	6
		PAOZZ	5305-00-054-6650	96906	MS51957-26	SCREW, MACHINE	EA	3
		PAOZZ	5305-00-054-6653	96906	MS51957-29	SCREW, MACHINE	EA	4
		PAFZZ	5305-00-054-6657	96906	MS51957-33	SCREW, MACHINE	EA	7
		PAFZZ	5930-01-114-1843	81349	M5423-07-06	BOOT, PUSHBUTTON	EA	1
		PAFZZ	5330-00-947-4271	80205	NAS1598C3Y	WASHER, SEALING	EA	2
		PAFZZ	7690-01-292-3410	98230	0N385907-1	LABEL, WARNING	EA	1

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GLOSSARY

CCI:	Controlled Cryptographic Item
COMSEC:	Communication Security
IFF:	Identification Friend or Foe
LED:	Light Emitting Diode
RF:	Radio Frequency

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BY ORDER OF THE SECRETARY OF THE ARMY:

DENNIS J. REIMER
General, United States Army
Chief of Staff

OFFICIAL:
JOEL B. HUDSON

Administrative Assistant to the
Secretary of the Army

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To be distributed in accordance with ID 43-0950, Operator, Unit, and Direct Support Maintenance requirements for TM 11-5810-389-13&P for the KI-1C.