

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL

**CONTROL,
INTERCOMMUNICATION
SET C-1611D/AIC
AND
DISCRIMINATOR, DISCRETE
SIGNAL MD-736/A**

This copy is a reprint which includes current
pages from Changes 1 and 2.

HEADQUARTERS, DEPARTMENT OF THE ARMY
JANUARY 1970

WARNING

OBSERVE ALL SAFETY PRECAUTIONS

Do not make contact with exposed wires or connectors. Turn all power switches off before making any connections or disconnections.

CHANGE }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 9 January 1984

ORGANIZATIONAL MAINTENANCE MANUAL CONTROL, INTERCOMMUNICATION SET C-1611D/AIC (NSN 5831-00-933-9822) AND DISCRIMINATOR, DISCRETE SIGNAL MD-736/A

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1-1 and 1-2
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5-1
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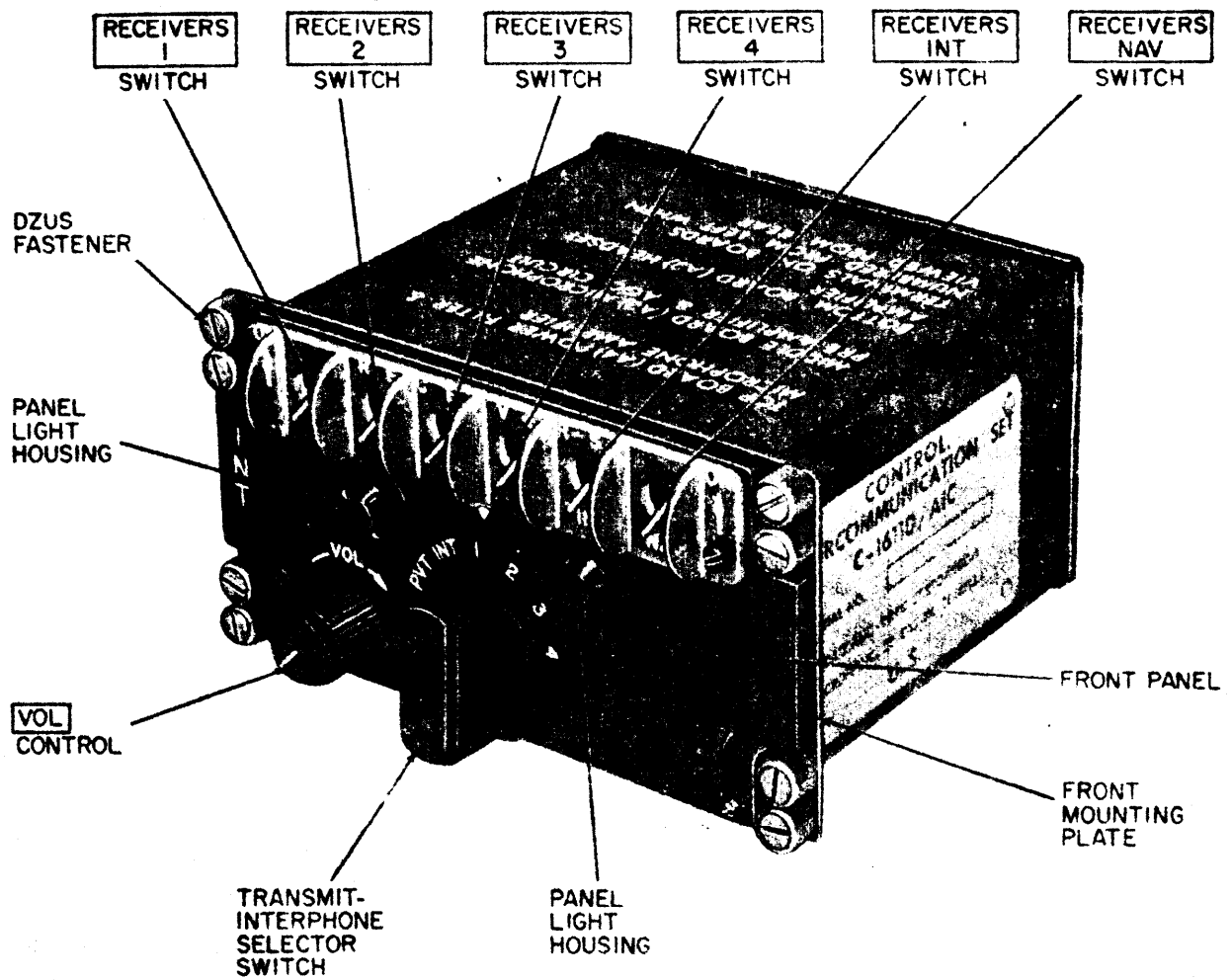
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 12 January 1970

**ORGANIZATIONAL MAINTENANCE MANUAL
CONTROL, INTERCOMMUNICATION SET C-1611D/AIC
(NSN 5831-00-933-9822) AND DISCRIMINATOR.
DISCRETE SIGNAL MD-736/A**

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*This manual supersedes so much of TM 11-5631-201-15, 2 March 1966, as pertains to operation and organizational maintenance, and appendixes II and III.

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Figure 1-1. Control, Intercommunication Set C-1611D/A1C.

CHAPTER 1 INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Control, Intercommunications Set C-1611D/AIC (Fig. 1-1), and provides instructions for operation and organizational maintenance. It includes instructions for cleaning and inspection of the equipment, preventive maintenance checks and services, and replacement of parts available to the organizational maintenance repairman.

b. This manual also describes Discriminator, Discrete Signal MD-736/A used as auxiliary equipment with the C-1611D/AIC. Description and maintenance instructions for the Discriminator, Discrete Signal MD-736/A are found in chapter 4.

c. Several models of Control, Intercommunication Set C-1611D/AIC have been manufactured. The C-1611D/AIC is referred to throughout this manual as the control set.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

a. *Reports of Maintenance and Unsatisfactory Equipment.* Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

b. *Report of Packaging and Handling Deficiencies.* Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-3.1. 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) direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. In either case, a reply will be furnished direct to you.

1-3.2. Reporting Equipment Improvement Recommendations (EIR)

If your intercommunication control or discrete signal discriminator 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. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. We'll send you a reply.

1-3.3. Administrative Storage

Administrative Storage of Equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in chapter 5 and TM 740-90-1.

1-3.4. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 740-244-2.

Section II. DESCRIPTION AND DATA

1-4. Use of Term Hertz

The National Bureau of Standards has officially adopted the term hertz (Hz) to replace cycles per

second (cps). The chart below provides the common equivalents of the unit/quantity terms and the list of approved abbreviations used throughout the manual.

Unit/Quantity	Old term	Oldabbrer	New term	New abbrer
Frequency	Cycles per second	cps	hertz	Hz
10 ³ cycles per second	Kilocycles per second	Kc	kilohertz	kHz
10 ⁶ cycles per second	Megacycles per second	Mc	megahertz	MHz
10 ⁹ cycles per second	Gigacycles per second	Gc	gigahertz	GHz

1-5. Purpose. and Use

a. Control, Intercommunication Set C-1611D/AIC (control set) is used as part of a multistation intercommunication and radio control system in Army aircraft. The system may include maximum of six control sets, eight radio receivers, and four radio transmitters.

b. The control sets are used by aircraft crewmen to—

(1) Control intercommunication through the aircraft's interphone system.

(2) Control voice radio communication (air-to-air or air-to-ground) through a maximum of four radio transmitter-receiver combinations.

(3) Monitor the output of a maximum of three navigational type radio receivers.

(4) Route the output of an emergency radio receiver directly to the earphones independent of the control set.

c. A typical system using the control set is shown in figure 1-2. The actual number and types of radio transmitters and receivers, and the numbers of control sets used in an aircraft are determined by the type of aircraft in which they are installed. All control sets are normally connected to the same radio receivers. Usually, only two control sets (such as chose used by the pilot and copilot) are connected to the radio transmitters. All control sets in the aircraft are connected to the interphone line. The navigational-type equipment (marker beacon, low frequency navigation, very high frequency (vhf), and navigation receivers) are monitored as a group. The emergency receiver output is always connected to the earphones and cannot be turned off at the control set. A crewmember may select and use any one of four radio transmitters connected to a particular control set.

d. The private interphone line (fig. 1-2) is an option that provides intercommunication between any two stations in an aircraft that is specifically wired to use this option. The private interphone line cannot be monitored by other stations connected in the intercommunication system.

1-6. Technical Characteristics

Input impedance:

Receiver 150 ohms.

Microphone 8 ohms.

Output impedance

Transmitter 150 ohms"

Headset 8 ohms.

Radio facilities

Transmitters 4 max

Receivers	8 max.
Weight . .	2 pounds
Input voltage	27.5±.5vdc.
Power requirements	5.6 watts.
Power output	
Transmitter	60 mw.
Headset	200 mw.

1-6.1. Item Comprising an Operable Equipment

Control, intercommunications Set C-1611D/AIC (NSN 583 1-00-933-9822) comprises an operable equipment.

1-7. Description

The C-1611D/AIC consists of a wraparound type metal housing with removable front and rear mounting plates (covers). Multiconnector pin receptacle J 1 and relay K1 are mounted on the rear cover. Connector J 1 mates with aircraft cable assembly plug connector providing connections to and from the other associated equipment in the system. The controls; RECEIVERS switches, VOL, Transmit-interphone selector switch, and two panel lights are mounted on the front mounting plate and extend through cutouts in the front panel. All control markings are engraved on the translucent front panel which is edge-lighted by the two panel lights. The front panel is secured to the front mounting plate by four screws. A plastic switch guard is mounted over RECEIVERS switches. There are eight Dzus fasteners on the front mounting plate which secure the control set to the airframe. The interior of the control set housing contains three printed circuit boards designated as follows:

A2, Headset Amplifier

A3, Microphone Preamplifier

A4, Microphone Amplifier

Switch board A1, is mounted on the front mounting plate. Printed circuit boards A2, A3, A4, are removed by sliding out toward the front, after removing front panel and mounting plate, and U-shaped aluminum bracket.

1-8. Additional Equipment Required

Control Set, C-1611D/AIC requires a power source of 27.5 vdc for normal operation. A typical aircraft installation consists of the following

a. Radio Transmitters. A maximum of four radio transmitters may be used with the control set. Radio transmitters, such as the transmitter portion of Receiver-Transmitter, Radio RT-348/ARC-54 (part Of Radio Set AN/ARC-54), may be used to transmit voice signals to other aircraft or ground stations.

b. Radio Receivers. A maximum of eight radio receivers may be used with the control set. Four of the radio receivers, such as the receiver portion

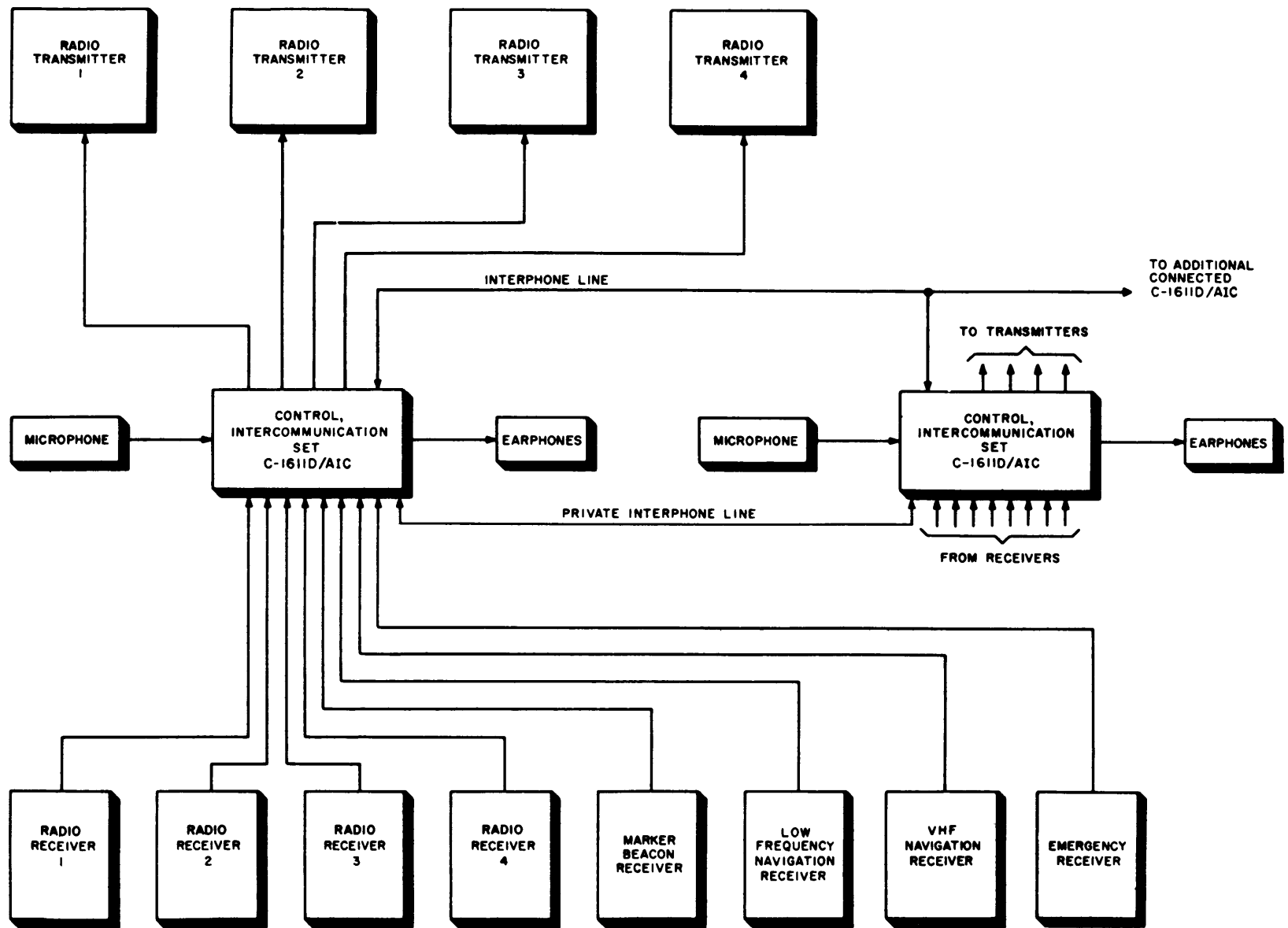


Figure 1-2. Control, Intercommunication Set C-1611D/AIC, typical system block diagram

TM5831-201-20-2

of Receiver-Transmitter, Radio RT-348/ARC-54 (part of Radio Set AN/ARC-54), are used to receive voice transmission from other aircraft or ground stations. Up to four special purpose receivers (such as marker beacon, vhf navigation, low frequency navigation, or emergency receivers)

may be connected to the control unit.

c. *Headset-Microphone.* At least one headset-microphone (such as Headset-Microphone H-101/U) (fig. 1-3) is required for each control set for transmitting and receiving voice signals over radio and interphone equipment

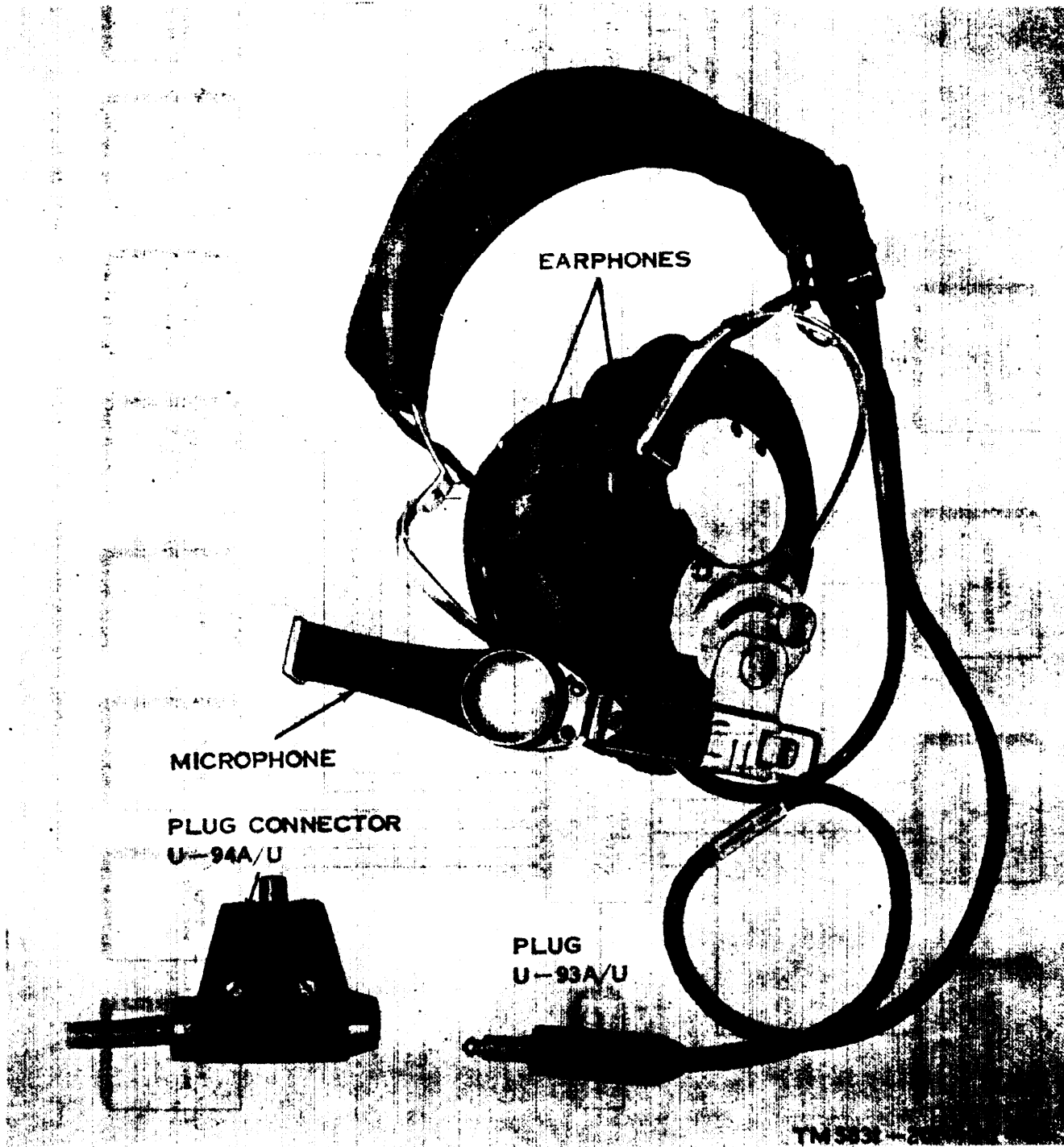


Figure 1-3. Headset-Microphone H-101/U with Plug, Connector U-94 A-U

d. External Switches (Remote). One or more of the switches described below are required for use with the control set to permit a user to talk over the interphone line or transmit over radio. The quantity and type of switches used will differ between types of aircraft in which they are installed and may differ between models of the same type of aircraft. Mechanical operation of these switches, as well as physical appearance and panel control markings, will often differ. The switches are mounted near a user's station.

(1) *Transmit-interphone talk switch.* This switch is usually a double-pole, double-throw, push-to-talk type switch. It is used to select either

the radio transmitter or interphone line for transmission purposes.

(2) *Crew station switch.* A crew station talk switch, such as Plug, Connector U-94A/U (fig. 1-3), is used for connection and control of Headset-Microphone H-101/U. This is a push-to-talk type of switch normally used by crewmembers who have access to interphone facilities only.

(3) *Hot mike switch.* This switch is usually a double-pole, single-throw, locking-type switch. It is used to connect the user's microphone output to the interphone line without holding a non-locking crew station talk switch or transmit-interphone talk switch in a closed position.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS AND SWITCHES

2-1. Controls

a. General. The functions of the C-1611D/AIC controls and switches are given in *b* below. The functions of the controls (external controls) in the associated equipments which comprise the system in the aircraft, connected to, but not mounted on, the Control Set C-1611D/AIC, are given in *c* below. The complete explanation of the

functions of the external controls found on the transmitting and receiving equipments associated with the C-1611D/AIC are described in the technical manuals covering these equipments. Refer to appendix A and to the applicable aircraft configuration manuals.

b. Control Set, Controls and Switches (fig. 1-1).

Control	Sw pos	Function
RECEIVERS 1, 2, 3 and 4 switches (two-position, locking toggle switches),	ON (or up)_____	Applies output of connected radio receiver to earphones of headset-microphone.
	Down _____	Disconnects headset-microphone from radio receiver,
RECEIVERS NAV switch (two-position, locking, toggle switch).	ON (or up)_____	Applies output of vhf navigation, low frequency navigation, and marker beacon receivers to earphones of headset-microphone.
	Down _____	Disconnects headset-microphone from vhf navigation, low frequency navigation, and marker beacon receivers.
RECEIVERS INT switch (two-position, locking, toggle switch).	ON (or up)_____	Connects earphones of headset-microphone to interphone system,
	Down -----	Disconnects headset-microphone from interphone system.
VOL control (rotary knob control).	- - - - -	Adjusts earphone volume from interphone system and all radio receivers except the low frequency navigation and emergency receivers.
Transmit-interphone selector switch. (Six Position rotary).	1, 2, 3, or 4 _____	Connects radio receiver-transmitter 1, 2, 3, or 4 to the headset-microphone for air-to-air and air-to-ground voice communication.
	INT _____	Connects headset-microphone to the intercommunication system (interphone line).
	PVT -----	Connects headset-microphone to the private interphone line.

c. External Controls (Remote) Associated Equipment.

control	Sw pos	Function
Transmit-interphone talk switch (three-position push-to-talk switch).	Transmit -----	Connects microphone output to radio transmitter input through control set.
	Interphone -----	Connects microphone output to interphone line through control set.
	off -----	Disconnects microphone from control set.
Crew station talk switch (two-position, push-to-talk switch	Depressed _____	Connects microphone output to control set.
	Released -----	Disconnects microphone from control set.
Hot mike switch, (two-position, , locking type, switch).	On ___ . . .	Connects microphone output to control set without holding crew station talk switch operated.
	Off -- - --- --	Disconnects microphone output from control set.

NOTE, This switch is normally used with . . .ner the transmit -interphone talk switch or crew station talk switch to connect the microphone to the interphone line without holding a push-to-talk type switch operated.

Section II. OPERATION

2-2. Modes of Operation

a. Three modes of operation (receiver monitoring, two-way voice radio, and intercommunication over the common interphone line) may be used between all C-1611D/AIC control sets. In addition, a fourth mode of operation (private interphone) may be used between any two equipments specifically wired for this type of operation.

b. Any mode may be selected by a crewmember having access to all these facilities. In some instances, only the receiver monitoring and interphone communication modes are available at a particular control set. It is important to determine which modes of operation are available before attempting to operate the control unit. This should be done during preflight checks before the aircraft leaves the ground (para 2-3).

c. To operate the equipment or any particular mode of operation, perform the following procedures:

- (1) Preflight checks (para 2-3).
- (2) Starting procedure (para 2-4a).
- (3) Procedure for the desired mode of operation (para 2-4).
- (4) Stopping procedure (para 2-4.f).

2-3. Preflight Checks

a. Start the system (para 2-4a). Check each associated radio transmitter, one at a time, by depressing the transmit-interphone talk switch (external control) to the transmit position and operating the transmit-interphone selector switch on the control set sequentially to positions 1, 2, 3, and 4 and listening for sidetone. (Some user's stations, other than the pilot's or copilot's station, may not have access to transmitter.)

b. Operate RECEIVERS NAV switch to ON and listen for receiver noise to check vhf navigation, low frequency navigation, and marker beacon radio receivers.

c. Call each user's interphone station one at a time and ask for a reply (para 2-4c) to check the intercommunication system. Listen for sidetone while talking.

d. When the equipments wired for the private interphone feature are used, operate the transmit-interphone selector switch to PVT and call the other connected station wired for PVT mode (para 2-4e). Sidetone should be heard while

talking. Talk in both directions to check the private interphone line,

NOTE

If the MD-736/A is installed in the aircraft, observe the preflight check procedures in chapter 4.

2-4. Operating Procedures

a. *Starting.* Turn on the power system for the aircraft navigation, communications, and interphone systems and check to see that the headset-microphone plug (fig. 1-3) is inserted in the headset-microphone output jack. No other starting procedures are required.

b. *Two-Way Radio Communication.* Two-way radio communication through a C-1611/AIC system is available to the pilot, copilot, and, in some installations, to a third crewmember. To use the C-1611D/AIC in conjunction with the two-way radio, proceed as follows:

- (1) Operate the transmit-interphone selector switch to the desired transmitter position (1, 2, 3, or 4).
- (2) Operate the transmit-interphone talk switch to the transmit position and speak into the microphone.
- (3) Adjust the volume of received signal to a comfortable level with the VOL control.

NOTE

When the transmit-interphone selector switch is operated to position 1, 2, 3, or 4, it connects the associated radio receiver to the headset-microphone as well as the transmitter. Therefore, it is necessary to operate a RECEIVERS 1, 2, 3, or 4 switch, except when monitoring more than one radio receiver.

c. *Intercommunication (Interphone Line).* Three methods of operation are possible. The method selected by each crewmember depends on the switches available at the interphone station.

(1) *Transmitter-interphone talk switch (external control).* Select one of the two following methods:

(a.) Operate the transmit-interphone talk switch to the interphone position and speak into the microphone.

(b) Operate the transmit-interphone selector switch on the control set to the INT posi-

tion. Operate the transmit-interphone talk switch to the transmit position and speak into the microphone.

(2) *Crew station talk switch.*

(a) Operate the transmit-interphone selector switch on the control set to INT.

(b) Depress the crew station talk switch and speak into the microphone. Hold the switch closed while speaking.

(3) *Hot mike switch (external control).*

(a) Operate the RECEIVERS INT switch on the control unit to ON.

(b) Operate the hot mike switch to ON and speak into the microphone. Turn off the hot mikes switch before attempting to use a radio transmitter. No transmission over the radio transmitters is possible when the hot mike switch is turned on.

NOTE

When an interphone station contains both a crew station talk switch and a hot mike switch, either switch may be used to communicate over the interphone system.

d. Receiver and Interphone Monitoring.

(1) The low frequency navigation, the marker beacon, and the vhf navigation receivers

may each be monitored by operating the RECEIVERS NAV switch to ON. These receivers cannot be monitored separately through the RECEIVERS 1, 2, 3, 4, switches of the control set.

(2) Monitor communications radio receiver 1, 2, 3, or 4 individually or simultaneously by operating the RECEIVERS 1, 2, 3, or 4 switches to ON.

(3) Monitor the interphone line only, by operating the RECEIVERS INT switch to the ON position. The interphone may be monitored simultaneously with any or all of the radio receivers if desired.

(4) The emergency receiver input is monitored independently of all control switches in the control set.

e. Private Interphone. Operate the transmit-interphone selector switch to PVT and speak into the microphone to communicate with the other station connected to the interphone line.

NOTE

In some aircraft, it may be necessary to operate a push-to-talk switch before speaking into the microphone.

f. Stopping. The equipment may be turned off by shutting down the power system of the aircraft, interphone, navigation, and communication systems.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

Section I. GENERAL

3-1. Scope of Organizational Maintenance

NOTE

The pilot or copilot will not perform preventive or corrective maintenance.

Organizational maintenance for the C-1611D/AIC consists of preventive maintenance, operational checks, troubleshooting, and minor repair and replacement of equipment. The corrective maintenance required is generally limited to replacement of lamps, fuses, and substitution of equipment to keep the system in operation. The maintenance duties assigned to the organizational repairman of the C-1611D/AIC, together with a reference to the paragraph covering the specific maintenance function, are listed below. The tools and test equipment required for organizational maintenance are indicated in paragraph 3-2.

- a. Organizational preventive maintenance (para 3-3).
- b. Organizational preventive maintenance checks and services chart (para 3-5).
- c. Cleaning (para 3-6).
- d. Presemination (para 3-7).
- e. Deleted.
- f. Repainting and refinishing (para 3-10).
- g. Troubleshooting (para 3-1 1).
- h. Cable continuity checks (para 3-12).
- i. Replacement procedure (para 3-13).

3-2. Tools, Test Equipment, and Materials Required

- a. Toolkit, Electronic Equipment TK-101/G.
- b. Multimeter AN/URM-105.
- c. Brush, MIL-G-7241.
- d. Sandpaper, fine No. 000.
- e. Trichlorotrifluoroethane (NSN 6850-00-105-3084).
- f. Lint free cloth.

3-3. Preventive Maintenance

a. Organizational preventive maintenance procedures are designed to help maintain equipment in serviceable condition. They include items to be checked and how to check them. These checks and services, described in paragraph 3-5, outline inspections that are to be made at specific intermediate (I) intervals.

b. Routine checks like CLEANING, DUSTING, WASHING, CHECKING FOR FRAYED CABLES, STOWING ITEMS NOT IN USE, COVERING UNUSED RECEPTACLES, CHECKING FOR LOOSE NUTS AND BOLTS, AND CHECKING FOR COMPLETENESS are not listed as PMCS checks. They are things that you should do any time you see they must be done. If you find a routine check like one of those listed in your PMCS, it is because other operators reported problems with this item.

NOTE

When you are doing any PMCS or routine checks, keep in mind the warnings and cautions.

WARNINGS

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Goggles must be worn at all times while cleaning with compressed air. Compressed air shall not be used for cleaning purposes except where reduced to less than 29 pounds per square inch gage (psig) and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when trichlorotrifluoroethane has been used.

NOTES

The PROCEDURES column in your PMCS charts instruct how to perform the required checks and services. Carefully follow these instructions and, if tools are needed or the chart so instructs, get higher maintenance to do the necessary work.

If your equipment must be in operation all the time, check those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

c. Deficiencies that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of preventive maintenance must be made in accordance with procedures given in TM 38-750.

3-4. Organizational Intermediate Preventive Maintenance Checks and Services

Intermediate inspection provides verification of

I – Intermediate

Item No.	Interval	Item to be inspected	Procedures
	I		
1	●	Mission Essential Equipment	Check for completeness and satisfactory condition of the equipment. Report missing items.
2	●	Intercommunication Control Set C-1611D/AIC	a. Perform operational checks as described in paragraph 2-3. b. Check panel light illumination.
3	●	Discrete Signal Discriminator MD-736/A	If the MD-736/A is installed in the aircraft, perform preflight check procedures as described in paragraph 4-6.1.

3-6. Cleaning

Inspect the exterior of the C-1611/AIC and the MD-736/A. Exterior surfaces should be free of moisture, dirt, grease, and fungus.

a. Remove moisture and loose dirt with a clean soft cloth.

b. Remove dust and dirt from the front panel, controls, and panel light housing with a soft, clean cloth. To remove fingerprints or dirt difficult to remove, use a cloth dampened with water; of necessary, mild soap may be used to make the cleaning more effective.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUORO-

satisfactory operation at intervals between daily (preflight checks, para 2-3) and periodic inspections. Intermediate inspection will be accomplished at intervals of 25-flying hours and will be performed concurrently with the intermediate inspection performed on the aircraft in which the equipment is installed. The maintenance interval must be adjusted to compensate for any unusual operating conditions. Intermediate maintenance must be performed on equipment maintained in a standby (ready for operation) condition concurrently with the intermediate inspection performed on the carrying aircraft that is in a standby condition. Equipment that has a deficiency that cannot be remedied at the organizational level should be referred to higher category of maintenance and recorded in accordance with instructions in TM 38-750. Perform all of the checks and services given in the chart in paragraph 3-5 in the sequence listed.

3-5. Organizational Preventive Maintenance Checks and Services Chart

ETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUORO-ETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

c. Remove grease, fungus, and ground-in dirt with a soft cloth dampened (not wet) with cleaning compound.

d. Remove dirt from the connector with a brush; remove moisture with a dry cloth.

3-7. Preservation

Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint (para 3-10) on the bare

Paragraph 3-8 deleted.

Paragraph 3-9 deleted.

metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TB 43-0118.

3-10. Repainting and Refinishing Instructions

Repaint clean, bare metal surfaces with black enamel. Apply enamel with a small, soft brush.

Allow the first coat to dry thoroughly before applying the second coat. Keep enamel thin to provide a smooth, even finish.

Section II. TROUBLESHOOTING**3-11. Troubleshooting Chart**

The following troubleshooting chart for the C-1611D/AIC is based on operational symptoms and is used to determine whether the C-1611D/AIC is operating in a normal condition. The symptoms listed in the *Symptom* column may not be observed during normal operation or during a preflight check. If replacement of a C-1611D/AIC restores the system to normal operation, note the symptom on the repair tag and return the defective C-1611D/AIC to higher maintenance level for repair. If replacement of the C-1611D/AIC does not restore the system to normal operation, troubleshooting of the other associated components of the system; transmitters, receivers, headset-microphones, control switches, and system cabling is required and should be referred to higher category of maintenance.

NOTE

Before using the chart below, be sure that power is applied to the C-1611D/AIC and that the other components of the system are properly energized.

3-12. Aircraft Cable Continuity Checks

a. *Procedure.* If the trouble symptom (para 3-11) indicates that a trouble may be located in

the aircraft cable, checks the cable for continuity as follows:

(1) Turn off all power to the control set and all externally connected equipment which comprises the system.

(2) Remove the control set from its mounting and disconnect the plug connector from J1 receptacle at the rear (para 3-13b).

(3) Operate Multimeter AN/URM-105 as an ohmmeter and refer to the plug connector pin termination chart (b below).

(4) Check continuity of cable pairs (items 1 through 8, 11 through 13, and 19 through 22) by shorting the opposite ends of the corresponding cable pairs at the external equipment and connecting the AN/URM-105 to the two pin numbers listed for cable pair in the *Pin* column of the chart (b below).

(5) Check the continuity of single leads (items 9, 10, and 14 through 18) by selecting a second conductor to provide a return path for the meter circuit. Use a *lead in the cable* that is known to be in good condition or the *airframe* for the second conductor. Short the opposite end of the second conductor to the single lead under test. Connect the AN/URM-105 between the second conductor and the pin connector to the single

Item No.	Symptom	Probable trouble	Remedy
1	Panel lamps do not light .	Defective panel light - Defective control set - _ _ ---- _____ Defective system cabling - ---- _____	Replace panel light (para 3-13d). Replace control set (para 3-13b). Check cabling (para 3-12).
2	With transmit-interphone selector switch set at position 1, 2, 3, or 4, no sidetone is heard in headset when speaking into microphone.	Defective control set ----- - _ . . . Defective system cabling Defective system component	Replace control set (3-13 b). Check system cabling (para 3 -12). Refer to publication covering type of radio set installed in aircraft.
3	With one RECEIVERS switch in ON position, no receiver noise is heard in headset.	Defective control set Defective system cabling Defective system component	Replace control set (para 3-13 b). Check system cabling (para 3-12). Refer to publication covering type of radio set installed in aircraft.
4	When talking over interphone system, no audio is heard in headset.	Defective control set	Replace control set (para 3-13b).
5	No sidetone when talking on private interphone line,	Defective control set	Replace control set (para 3-13b).
6	No transmission to other control set when talking on private interphone line.	Defective control set Defective system cabling .	Replace control set (para 3-13 b). Check cabling para 3-12.

lead at the plug connector end of the cable to check for continuity.

(6) After making the continuity check, remove all shorts at the opposite end of the cable and replace the control set in its mounting.

h. *Aircraft Cable Plug Connector Pin Termination Chart.* The chart below lists pins on the aircraft cable plug connector which connects to J1 at the rear of the control set. The *Pin* column lists only the pins used by the control set. The *Connection* column lists the external equipment or circuit connected through the aircraft cable to the pins on the plug connector.

Aircraft Cable Plug Connections (Ilates With J1)

Item	Pin Numbers	Connection
1	3 and 22	Microphone input.
2	5 and 23	Earphone output.
3	19 and 8 ----	Interphone line.
4	19 and 30 -..	Input from receiver No. 1.
5	19 and 31 _____	Input from receiver NG. 2.
6	19 and 32 . . . _	Input from receiver No. 3.
7	19 and 29 _____	Input from receiver No. 4.
8	19 and 12 _____	Input from vhf navigation receiver.
9	18 _____	Ground.
10	37 -----	28-volt power supply.
11	19 and 11 _____	Input from low frequency navigation receiver.
12	19 and 27 _____	Input from emergency receiver.
13	19 and 13 _____	Marker beacon receiver.

Item	Pin Numbers	Connection
14	'19 ----	Audio common.
15	33	Keying line for transmitter No. 1.
16	34 _ -----	Keying line for transmitter No. 2.
17	3 5 - . . -	Keying line for transmitter No. 3.
18	1 _ -----	Keying line for transmitter No. 4.
19	19 and 24 .	Output to transmitter No. 1.
20	19 and 25	Output to transmitter No. 2.
21	19 and 26 .	Output to transmitter No. 3.
22	19 and 28	Output to transmitter No. 4.
23	16 . . -----	Hot mike control lead.
24	19 and 6 - . -	Private interphone line.
25	19 and 10 ----	Output to alternate transmitter.

3-13. Removal and Replacement procedures

a. *General.* Instructions for the removal of the entire control set and for the removal of all authorized maintenance parts are given in b, c, d, and e below.

b. Removing Control Set C-1611D/AIC.

(1) Rotate the eight Dzus fasteners one-quarter turn counterclockwise.

(2) Pull the control set from its mounting in the aircraft as far as it will go.

(3) Rotate the two screw-type fasteners on

the rear connector one-quarter turn counterclockwise.

(4) Disconnect the aircraft plug connector from receptacle J1 at the rear of the control set by pulling on it and rocking it gently.

c. Removing Control Knobs.

(1) Loosen the setscrews as follows:

(a) Use a No. 6 Allen wrench to loosen one setscrew in the transmit-interphone selector switch knob.

(b) Use a No. 4 Allen wrench to loosen the two setscrews in the VOL control knob.

(2) Pull the knob from its shaft.

(3) Remove the engraved skirt from the transmit-interphone selector switch knob by re-

moving the two screws located on the back of the skirt.

d. Removing Panel Lights. Rotate the panel light housing counterclockwise and pull it out. Panel light housing and lamp is a one-piece component unit.

e. Removing Plastic Switch Protector.

(1) Remove the two panhead screws that secure the plastic switch protector to the front panel.

(2) Carefully lift the plastic switch protector away from the front panel.

f. Replacement. Replacement procedures are accomplished in reverse order from the removal procedures above.

CHAPTER 4

AUXILIARY EQUIPMENT

Section I. GENERAL

4-1. Introduction

a. This chapter describes Discriminator, Discrete Signal MD-736/A. The MD-736/A is used as auxiliary equipment in conjunction with the Control, Intercommunication Set C-1611D/AIC.

b. This chapter covers functioning, operation, organizational maintenance, cleaning, and inspection of equipment. Equipment that cannot be corrected at the organizational level must be removed from the aircraft and referred to higher category of maintenance. Initial installation instructions are covered by the modification work order (MWO) applicable to the particular aircraft. Wiring instructions to the interphone junction box may vary from one aircraft to another. Configuration manuals for the particular aircraft should be available for needed reference.

4-2. Purpose and Use

a. Discriminator, Discrete Signal MD-736/A provides filtering of the transmit audio signals from the very high frequency (vhf), ultra high frequency (uhf), and high frequency (hf), radio signals that pass through the interphone systems of military aircraft.

b. The MD-736/A also functions to disable

frequency-modulated (f m) radio reception when a vhf, uhf, or hf radio transmitter is being used in the aircraft.

4-3. Technical Characteristics

Input Channels 4 (uhf, vhf, hf, and fm radio).

Power requirements 27.5 ± .5 vdc.

Dimensions:

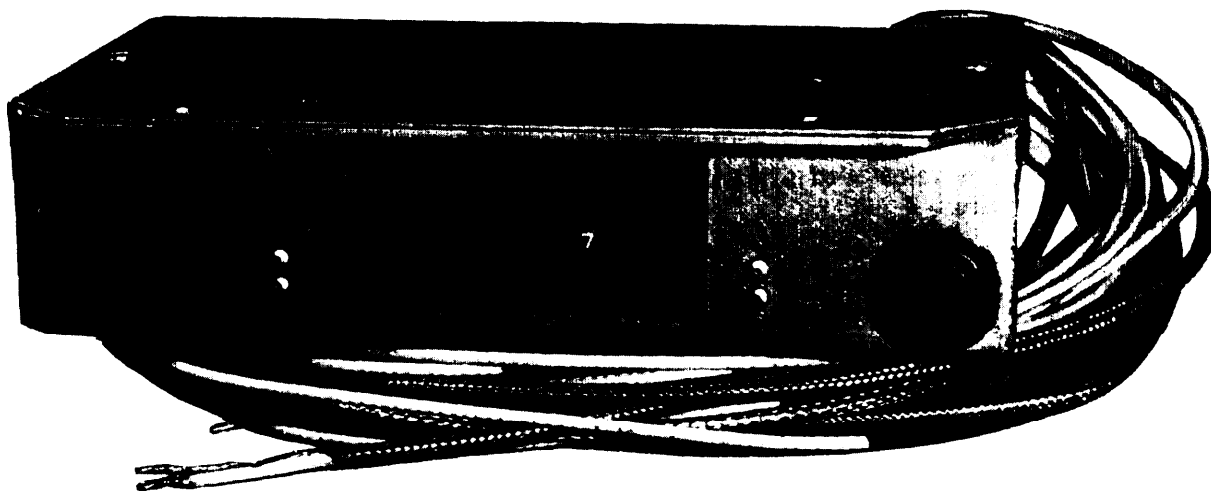
Height..... 1 3/16 in.

Width..... 3 5/8 in.

Depth..... 5 5/16 in.

4-4. Description of Discriminator, Discrete Signal MD-736/A

The MD-736/A is a separately housed unit containing a printed circuit board protected by a metal cover. Wire connections to the aircraft interphone junction box are passed through a hole on one side of the MD-736/A. Additional holes in the base of the metal housing provide for mounting the MD-736/A to the inside wall of the aircraft, or to the interphone junction box. There are no controls or indicators on the MD-736/A and the unit functions automatically when the aircraft radio equipment is activated.



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Figure 4-1. Discriminator, Discrete Signal MD-736/A.

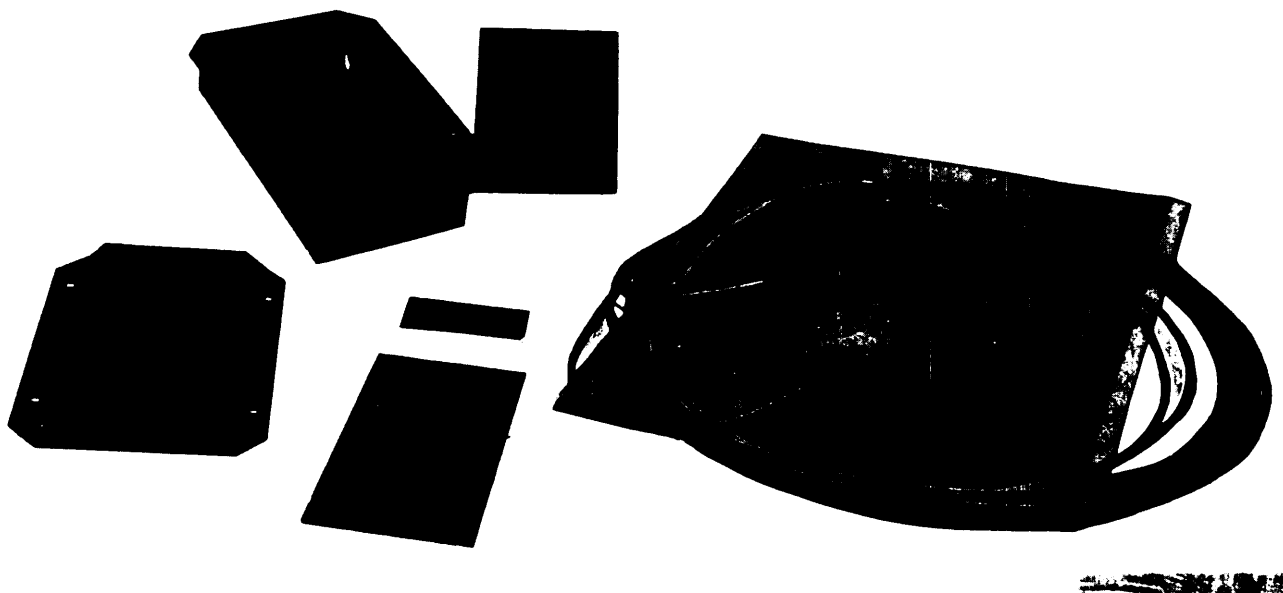


Figure 4-2. Discriminator, Discrete Signal MD-736/A components kit.

Section II. OPERATION

4-5. Operating Procedures

The MD-736/A is operated remotely from the pilot, copilot or crewmember position. Refer to the appropriate aircraft configuration manual for the radio equipment installed, whose signals will activate the MD-736/A.

4-6. Preventive Maintenance

The preflight checks and the periodic preventive maintenance checks and services on the MD-736/A are performed concurrently with the C-1611D/AIC except under the special conditions listed below:

a. When the MD-736/A is reinstalled after it has been removed for repairs.

b. At least once a week if the MD-736/A is maintained in a standby condition. The chart below specifies the preflight checks and services that must be performed.

Perform the checks and services in the sequence listed. All deficiencies will be recorded in accordance with the requirements of TM 38-750.

WARNING

Be sure the main power switch 01 the aircraft is in the off position before performing preventive maintenance checks and services.

4-6. 1. Preflight Checks and Services Chart (MD-736/A)

Sequence No.	Item to be inspected	Procedure	References
1	Fm radio operation -----	Operate fm radio system for normal reception.	Applicable aircraft configuration manual.
2	Hf radio operation -----	Operate hf radio system for normal operation.	Applicable aircraft configuration manual.
3	Vhf radio operation --- _	Operate vhf radio system for normal operation.	Applicable aircraft configuration manual.
4	Uhf radio operation _ _ _	Operate uhf radio system for normal operation.	Applicable aircraft configuration manual.

Paragraph 4-7 deleted, ■

4-8. Troubleshooting

Troubleshooting procedures for the MD-736/A at the organizational level consist of determining its functional reliability as described in paragraph 4-2. If the MD-736/A fails to function as de-

scribed, remove the faulty unit and replace it with a new one or one known to be functioning normally. If the MD-736/A still fails to function, system troubleshooting is required and should be referred to a higher category of maintenance,

CHAPTER 5

SHIPMENT AND LIMITED STORAGE

Section 1. SHIPMENT AND LIMITED STORAGE

5-1. Disassembly of Equipment

There are no disassembly procedures required for removing the control set from the aircraft. Removal instructions are found in paragraph 3-13.

5-2. Repacking for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedure outlined below whenever possible.

a. Material Requirements. The following materials are required for packaging the C-1611D/AIC control set.

<i>Material</i>	<i>Quantity</i>
Fiberboard shipping box	1
Fiberboard, corrugated	2 sq ft
Reinforced paper tape	2 ft
Barrier bag. -----1
Adhesive tape	2 ft

b. Packing. Package the control set as outlined below.

- (1) Cushion the control set on all surfaces with corrugated cardboard.
- (2) Secure and wrap with adhesive tape.
- (3) Place in the barrier bag.
- (4) Pack in the fiberboard box.
- (5) Seal the fiberboard box with reinforced paper tape.

■ Section II deleted.

APPENDIX A

REFERENCE

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
SB 11-573	Painting and Preservation of Supplies Available for Field Use for Electronics Command Equipment.
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment Used by the Army.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment, Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-5831-201-20P	Organizational Maintenance Repair Parts and Special Tools Lists for Control, Intercommunication Set C-1611D/AIC and Discriminator, Discrete Signal MD-736/A.
TM 11-5831-201-34P	Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Repair Parts and Special Tools) for Control, Intercommunication Set C-1611D/AIC (NSN 5831-00-933-9822) and Discriminator, Discrete Signal MD-736/A. (NSN 5821-00-937-7633).
TM 11-6625-203-12	Operator's and Organizational Maintenance Manual: Multimeter: AN/URM-105, and AN/URM-105C (including Mtdtimeter ME-771U and ME-77C/U).
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Control, Intercommunication Set C-1611D/AIC. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

- a. *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.
- b. *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.
- c. *Service.* To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.
- d. *Adjust.* To rectify to the extent necessary to bring into proper operating range.
- e. *Align.* To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.
- f. *Calibrate.* To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the ac-

curacy of the instrument being compared with the certified standard.

g. *Install.* To set up for use in an operational environment such as an encampment, site, or vehicle.

h. *Replace.* To replace unserviceable items with serviceable like items.

i. *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. *Overhaul.* Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

k. *Rebuild.* The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

l. *Symbols.* The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

C-3. Explanation of Format

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

b. *Column 2, Component Assembly Nomenclature.* Column 2 lists the noun names of components, assemblies, subassemblies, and modules on which maintenance is authorized.

c. *Column 3, Maintenance Functions.* Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

<i>Code</i>	<i>Maintenance category</i>
C	Operator/crew
O	Organizational maintenance
F -----	Direct support maintenance
H -----	General support maintenance
D -----	Depot maintenance

d. *Column 4, Tools and Equipment.* Column 4 specifies, by code, those tools and test equipments required to perform the designated function. The numbers appearing in this column refer to

specific tools and test equipment which are identified in table I.

e. *Column 5, Remarks.* Self-explanatory.

C-4. Explanation of Format of Table 1, Tool and Test Equipment Requirements

The columns in table I are as follows:

a. *Tools and Equipment.* The numbers in this column coincide with the numbers used in the tools and equipment column of the maintenance allocation chart. The number indicate the applicable tool for the maintenance function.

b. *Maintenance Category.* The codes in this column indicate the maintenance category normally allocated the facility.

c. *Nomenclature.* This column lists tools, tests, and maintenance equipment required to perform this maintenance functions.

d. *Federal Stock Number.* This column lists the Federal stock number of the specific tool or test equipment.

e. *Tool Number.* Not used.

Section II. MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS										TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL		
	CONTROL, INTERCOMMUNICATION SET C-1611D/AIC	0	0	0				0				1 & 6	Organizational limited to replacement of lamps, knobs, and switch protector. Organizational testing limited to functional test only. Direct Support repairs also include test and replacement of switches S1 to S7, Relay K1, VOL Control R1, and Resistors R2 to R5.
A1	SWITCHBOARD A1		F						F			2, 4, 5, 7, & 8	
A2	HEADSET AMPLIFIER A2		F					F			D	2, 3, 4, 5, 7, & 8	
A3	MICROPHONE PREAMPLIFIER A3		F					F				2, 4, 5, 7, & 8	
A4	MIKE AMPLIFIER AND POWER FILTER A4		F					F				2, 4, 5, 7, & 8	

Table I. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		C-1611D/AIC (continued)		
1	O	MULTIMETER AN/URM-105	5625-581-2036	
2	F, H, & D	MULTIMETER TS-352(*)/U	6625-242-5023	
3	H & D	ANALYZER, SPECTRUM TS-723A/U	6625-668-9418	
4	F, H, & D	AUDIO OSCILLATOR AN/URM-127	6625-783-5965	
5	F, H, & D	MULTIMETER METER ME-26(*)/U	6625-360-2493	
6	O	TOOL KIT TK-101/G	5180-061-5176	
7	F, H, & D	TOOL KIT TK-105/G	5180-010-3177	
8	F, H, & D	TEST SET, RADIO TS-1588, AIC	6625-895-6046	

By Order of the Secretary of the Army:

Official:

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*Major General, United States Army,
The Adjutant General.*

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