



Preliminary P4



**M/A-COM
CS-7000 Control Station**

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1 SAFETY INFORMATION

1.1 SAFETY CONVENTIONS

The following conventions are used throughout this manual to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. M/A-COM, Inc. assumes no liability for the customer's failure to comply with these standards.



The **WARNING** symbol calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** symbol until the conditions identified are fully understood or met.



The **CAUTION** symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in a risk of danger, damage to the equipment, or severely degrade the equipment performance.



The **NOTE** symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.



The **ESD** symbol calls attention to procedures, practices, or the like, which could expose equipment to the effects of Electro-Static Discharge. Proper precautions must be taken to prevent ESD when handling circuit modules.



The electrical hazard symbol is a **WARNING** indicating there may be an electrical shock hazard present.

2 GENERAL DESCRIPTION

The M/A-COM CS-7000 Control Stations shown in Figure 2-1 and Figure 2-2 are state-of-the-art Control Stations. The slimline design of the CS-7000 Control Station provides a convenient method to equip offices, shops and other remote locations with radio communications.

At the heart of the CS-7000 Control Stations are the M5300 and M7300 transceiver. The M5300 transceiver is a single band transceiver capable of EDACS®, Conventional, and P25 modes of operation. The M7300 transceiver is a dual band 700/800 MHz transceiver capable of EDACS, Conventional, P25, and OpenSky® modes of operation. Both transceivers may be equipped with the Scan (Figure 2-1) or System (Figure 2-2) model CH721 Control Head.

The CS-7000 Control Station may also be equipped with a remote interface board allowing remotely located desktop station controllers to share radio communications with the local operation of the Desktop Station.

The Desktop Station is available in the following three models:

- Desktop Station configuration with only local controls.
- Desktop Station configuration with local and remote control capability.
- Remote mount configuration with remote control capability.

Local Control Desktop Station model CT-013892-001 shown in Figure 2-1 is designed to provide local control of an M5300 or M7300 transceiver (shown with a Scan Control Head) in a desktop control station configuration.

Local/Remote Control Desktop Station model CT-013892-002 shown in Figure 2-2 includes a built-in remote controller board and front panel controls. This model is designed to provide local and remote control operation.

Remote station model CT-013892-003 (not shown) features are similar to the Local/Remote Control Desktop Station, however without a control unit or speaker, and with a blank faceplate and power LED.



Figure 2-1: CT-013892-001 Local Control Station with Scan Head (Front View)



Figure 2-2: CT-013892-002 Local/Remote Control Station with System Head (Front View)

3 CONTROLS AND CONNECTIONS

3.1 LOCAL CONTROL STATION

Front panel controls, indicators, and other operator features are shown in Figure 3-1. The following are general descriptions of each feature.

3.1.1 DC Power Indicator

A DC power indicator is located on the front-left station panel. This indicator illuminates when the station's main built-in power supply is turned on and supplying DC voltage to Control Station.

3.1.2 Transceiver

The CS-7000 Control Station may be equipped with an M5300 or M7300 transceiver, respectively. The M5300 transceiver is a single band transceiver capable of EDACS, Conventional and OpenSky modes of operation. The M7300 transceiver is a dual band 700/800 MHz transceiver capable of EDACS, Conventional, P25, and OpenSky modes of operation. Both transceivers include the CH721 control head.

3.1.2.1 Transceiver ON/OFF/Volume Control

Local Control Stations rely on the transceiver's ON/OFF-Volume control for volume level setting. Refer to Section 3.2.4 when setting the volume on remote control stations.

3.1.2.2 Local Microphone

The transceiver's microphone connector shown in Figure 3-1 is used for local control stations. Refer to Section 3.2.1 when connecting a microphone to a remote control station.

3.1.3 Local Speaker

The station contains a front firing local speaker for improved performance.

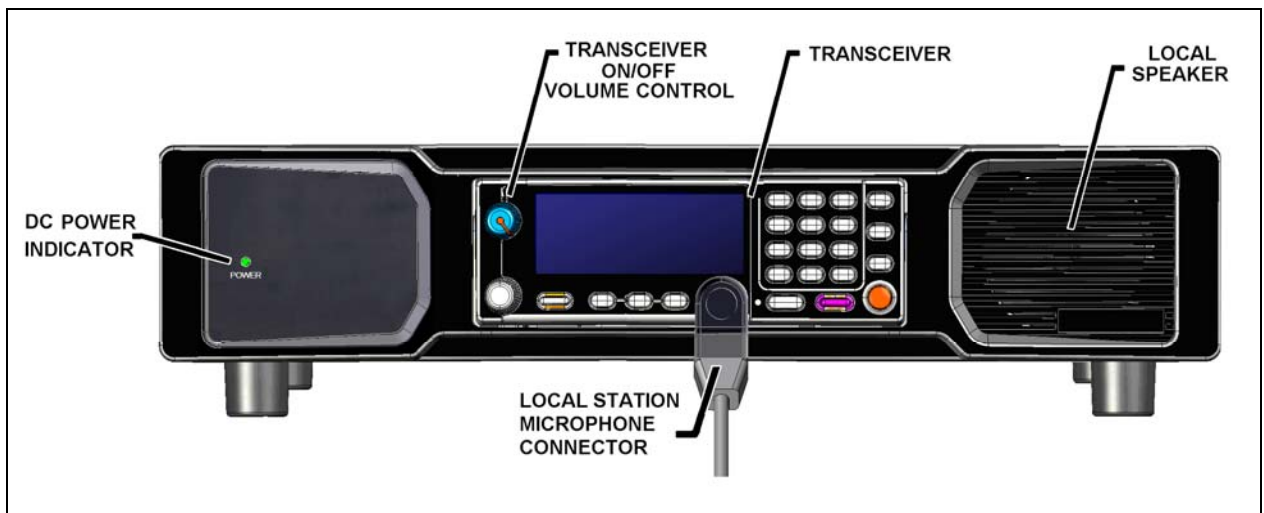


Figure 3-1: Front Panel Features – Local Control Station

3.2 REMOTE CONTROL STATION

In addition to the features found on the local control station, remote control stations include the features described in the following sub-sections.

3.2.1 Remote Station Microphone

The microphone for remote control stations is connected to the remote station microphone connector as shown in Figure 3-2. See Section 3.1.2.2 when connecting a microphone to a local control station.



The Control Station's microphone **MUST** be connected to the Control Station's remote station microphone connector found on the front-left faceplate panel. Connecting the Control Station's microphone to the transceiver will result in improper operation of the remote control features.

3.2.2 Intercom Switch

The Intercom switch places the Control Station in one of two intercom modes, or normal mode. The Intercom switch may be set to one of the following three (3) settings:

M (UP - Momentary position): This is a spring loaded momentary position that places the local station in the INTERCOM mode until the operator releases the switch, at which time it will return to the OFF position. Holding the INTERCOM switch in the M position, and keying the Local Station Microphone, will NOT key the transceiver. Local Station Microphone audio will be heard only at remote controllers until the switch is released.

OFF (Center position): This position is the NORMAL mode. Transmissions made from the Local Station Microphone will key the transceiver and transmit audio will be heard only over-the-air. Remote controllers will also hear the Control Station's Local Microphone audio if the REMOTE switch is set to the ON position.

ON (Down position): This position places the Control Station operation in the INTERCOM mode. Transmissions made from the Local Station Microphone will NOT key the transceiver, Local Station Microphone audio will be heard only by Remote Controllers, and transmissions made by Remote Controllers will only be heard over the Local Speaker (Remote Controller transmissions will not key the transceiver).

3.2.3 Remote Switch and LED Indicator

The Remote switch provides the local control operator the ability to enable access by remote controllers. The Remote switch may be set to one of the following two (2) settings:

ON (Down position): This position is the NORMAL mode of operation. It enables Remote Controller access to the Control Station and illuminates the Remote Indicator LED. Remote Controllers will be able to transmit or receive over-the-air via the Control Station's transceiver.

OFF (UP position): This position disables radio access to and from Remote Controllers. In this position, Remote Controllers will not be able to transmit or receive over the Control Station's radio.



The Remote Switch must be set to the ON position to allow remote controllers to transmit and receive over-the-air via the Control Station's transceiver.

3.2.4 Station Volume Control

The Station Volume Control functions as the Control Station's master volume control on stations equipped with the remote control option. The volume control setting for the transceiver is pre-programmed to a fixed level to ensure proper Control Station operation in remote applications.

3.2.5 VU Meter

Control Station is equipped for remote control operation also includes a VU Meter. The VU Meter displays, in bar graph format, line audio levels to and from remote controllers.

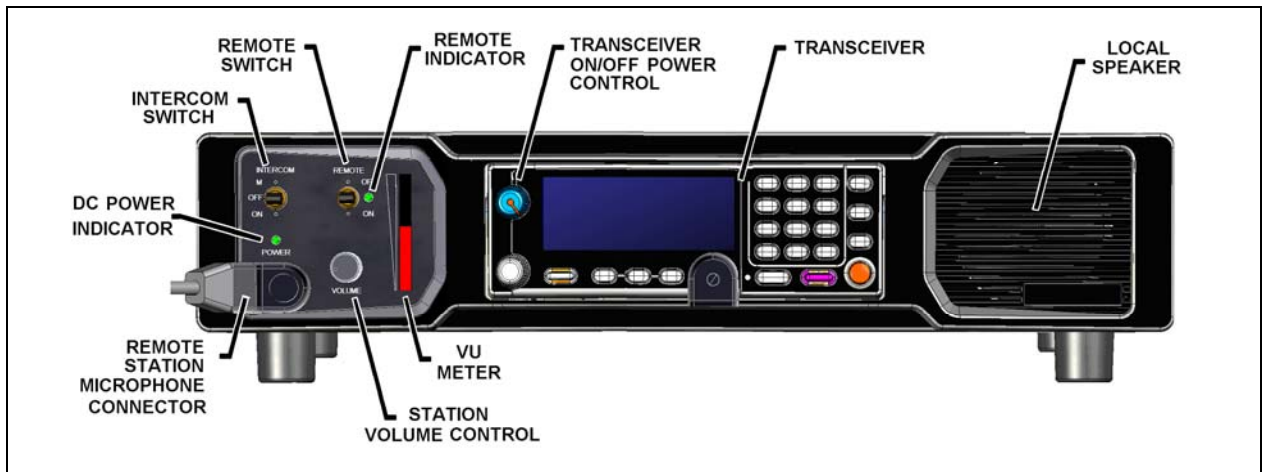


Figure 3-2: Front Panel Features – Remote Control Station

3.3 REMOTE MOUNT STATION

The CS-7000 Remote Mount Station (not shown) is designed for applications where access to local user controls is not required. The Remote Mount Station is housed in a 2-RU high rack mountable enclosure and equipped only with a front panel power LED. Rear panel features are as described in Section 3.4. This model is fully remote controlled and does not include any front panel user controls, a control unit, rubber feet, or a front panel speaker.

3.4 REAR PANEL FEATURES

All versions of the CS-7000 Control Station share similar rear panel features. The following sub-sections provide a brief description of the available rear panel features.

3.4.1 AC Power Switch/Cord/Fuse Assembly

The AC Power Switch/Cord/Fuse assembly is located on the left side of the rear panel when facing the rear panel. As indicated it serves as the main Control Station ON/OFF switch, AC cord receptacle, and houses the fuses for the main AC line input. This switch controls AC power to the 120/240, 50/60 Hz internal AC power supply.

3.4.1.1 AC Power Switch

The main AC Power Switch for the Control Station is located on the left side of the rear panel (when facing the rear panel), and is part of the AC Power Switch/Cord/Fuse assembly.

3.4.1.2 AC Power Cord Receptacle

The AC Power Cord receptacle for the Control Station is located on the left side of the rear panel (when facing the rear panel) and is part of the AC Power Switch/Cord/Fuse assembly. The receptacle is an industry standard IEC-302 type 3-pin power connector.

3.4.1.3 AC Fuse

The main AC power fuses for the Control Station are located on the left side of the rear panel (when facing the rear panel) and is part of the AC Power Switch/Cord/Fuse assembly. Caution should be taken when replacing a suspected blown fuse to ensure the proper value replacement fuse is re-installed. Fuse replacement should only be attempted by authorized service personnel.

3.4.2 Antenna Connector

The Control Station antenna connector located on the rear panel is a 50 ohm Type-N female panel-mounted connector. Care must be taken to ensure proper antenna connections at all times.

3.4.3 Internal Fan

The Control Station employs an internal cooling fan which is mounted inside the cabinet near the center of the rear panel. The fan opening must at all times be kept clean and free of objects that potentially block the free flow of air.

3.4.4 Earth Ground

The Earth Ground connection is a #10-32 stud used to help dissipate any stray electrical currents away from the station and to earth ground. This connection should be made before applying AC power to the Control Station.

3.4.5 CAN Port

The Controller Area Network (CAN) port is similar to standard serial ports and supports full-duplex connectivity to optional M/A-COM devices. However, unlike standard serial ports, multiple CAN devices may share a common CAN bus. A CAN bus is limited to a maximum distance of 250 ft. between the two furthest devices connected to the CAN bus. The Control Station can be connected anywhere along the bus. A fiber optic CAN bus extender may be used when CAN bus distances greater than 250 feet is required.

3.4.6 Phone Line Connection (Optional)

The Phone Line connection is an RJ-11 type connection used to connect remotely located tone remote controllers to the station via a 2-wire or 4-wire dedicated phone line.

3.4.7 Computer Connection

The Computer connection is an RJ-45 type Ethernet port. This port is used to communicate locally with the Control Station via PC for programming, while the LAN port is connected to a Voice-over-Internet Protocol (VoIP) controller network.

3.4.8 LAN

The LAN connection is an RJ-45 type Ethernet port. This port is used to connect the desktop to a VoIP controller network. The controllers may access Control Station functions, commands, and handle transmit and receive audio as IP packets making this a superior option for users with IP connectivity.

3.4.9 Serial A

The Serial A connection is a USB Type B connection, and used to access the transceiver's serial USB programming port.

3.4.10 Serial B

The Serial B connection is a DB-9 DCE female connection, and used to access the transceiver's serial Rs-232 programming port.

3.4.11 External I/O

The External I/O connector is a DB-25 female connection. This port provides access to local controlling features of the transceiver such as PTT, TX audio, RX audio, etc. Foot switches and other local external customer devices may be connected to the Control Station using this connector.

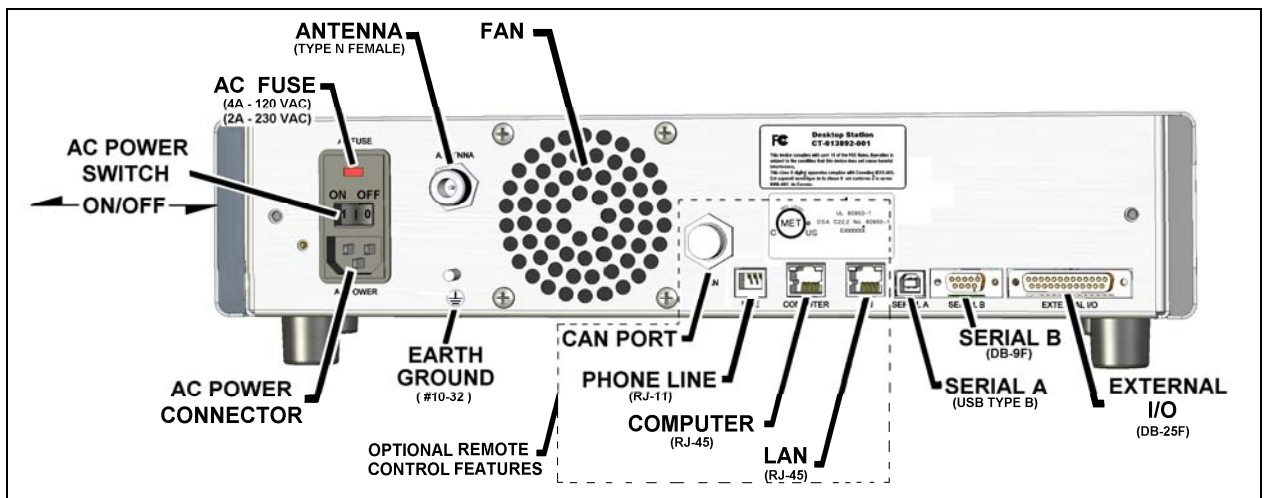


Figure 3-3: Rear Panel Features – Local and Remote Stations

4 CONTROL STATION OPERATION

4.1 POWERING UP THE STATION

1. Make sure the Control Station is connected to a functional AC power outlet.
2. On the Control Station's rear panel (refer to Figure 3-3), turn on the main ON/OFF power switch located just above the AC power cord. The front panel Power Indicator should be illuminated green.
3. Turn on the transceiver's ON/OFF Power switch (refer to Figure 3-1).

4.2 GENERAL OPERATION

4.2.1 Setting Up And Using The Control Station Transceiver

Receiving and transmitting a message is affected by how the transceiver installed into the Control Station is programmed, and how the supporting communications system operates. Refer to the specific Mobile Radio Operator's Manual or Quick Guide for a detailed description and operation for the transceiver installed in the Control Station. Contact your local system administrator or other trained and qualified operators for system information.

4.2.2 To Receive a Call (Local-Only Control Stations)

1. Set the transceiver to the desired System, Group, or Channel (depends on radio programming) using the System/Group or Channel knob. The Control Station is now ready to receive messages from other radios in the system.
2. When the first call is received, it may be necessary to adjust the VOLUME control to the desired listening level. Use the transceiver's VOLUME control to set the volume level.

4.2.3 To Make (Transmit) a Call (Local-Only Control Stations)

1. If more than one channel is available, select the proper channel using the radio's System/Group Channel knob.
2. For conventional (non-trunked) systems, press the monitor button on the microphone and listen to make sure no one else is using the channel.
3. Press the PTT switch on the microphone, and then speak into the microphone using a normal speaking voice. Always release the PTT switch as soon as the message is completed, and listen for an answer to the call.

4.2.4 To Receive a Call (Remote Controlled Stations)

1. Set the transceiver to the desired system, group, or channel (depends on radio programming) using the System/Group/Channel knob.
2. Set the REMOTE switch on the Control Station to the ON (down) position so remote controllers can also hear received messages. The Control Station is now ready to perform the following:
 - Receive messages over-the-air from other radios in the system.
 - Pass the received signal to remote controllers connected to the Control Station.
 - Receive transmissions from remote controllers.

- When the first call is received, it may be necessary to adjust the volume control to the desired listening level. Use the Station Volume Control to set to local speaker volume level. Setting this control does not affect the volume level heard by remote controllers.

4.2.5 To Make (Transmit) a Call (Remote Controlled Stations)

- If more than one channel is available, select the proper channel using the radio's System/Group/Channel knob.
- Set the REMOTE switch to the ON (down) position to allow remote controllers to key the Control Station.
- The Control Station is now ready to transmit messages over-the air from remote controllers connected to the Control Station.
- For conventional (non-trunked) systems, press the monitor button on the microphone, or set the INTERCOM switch to the M (up) position and listen to make sure no one else is using the channel.
- Press the PTT switch on the microphone, and then speak into the microphone using a normal speaking voice. Always release the PTT switch as soon as the message is completed, and listen for an answer to the call.

4.3 REMOTE CONTROL OPERATION

Control Stations equipped with Intercom and Remote switches may be remotely controlled. The Intercom and Remote switches determine when remote controllers connected to the Control Station may send and receive messages via the Control Station.

4.3.1 Enabling Remote Control

Perform the following steps to enable Remote Control Capability:

- Make sure the Control Station is powered up (refer to Section 4.1).
- Set the INTERCOM switch to the OFF (center) position.
- Set the REMOTE switch to the ON (down) position.



NOTE

Setting the INTERCOM switch to OFF (center) position and the REMOTE switch to ON (down) position is typically the NORMAL mode of operation for remote control equipped Control Stations.

4.3.2 Disabling Remote Control

Perform the following steps to disable Remote Control operation:

- Make sure the Control Station is powered up (see Section 4.1).
- Set the INTERCOM switch to the OFF (center) position.
- Set the REMOTE switch to the OFF (up) position.



NOTE

Setting the REMOTE switch to the OFF position disables communications to and from remote controllers including intercom operation.

4.4 INTERCOM OPERATION

Control Stations equipped with Intercom and Remote switches may make intercom calls to and from remote controllers connected to the Control Station. The Intercom and Remote switches determine when and how the Control Station makes intercom calls.

4.4.1 Continuous Intercom Operation (Intercom-Only Mode)

The Continuous Intercom mode of operation allows transmissions between the Control Station and Remote Controllers (over-the-air transmissions via the Control Station are disabled during this mode).

Perform the following steps to make an Intercom call:

1. Make sure the Control Station is powered up (see Section 4.1).
2. Set the INTERCOM switch to the ON position.
3. Set the REMOTE switch to the OFF position.
4. Press and hold the PTT switch on the Local Station Microphone at the beginning of each transmission. Release the PTT switch at the end of each transmission.



In the Continuous Intercom mode, neither audio from the Local Station Microphone or a remote controller will be transmitted over-the-air. Only intercom communications is possible!

4.4.2 Momentary Intercom Operation

The M position on the Intercom switch is spring-loaded (momentary) and returns the switch to the OFF position when released. This switch position allows the Control Station's local operator to make an intercom call without leaving the Control Station in continuous intercom mode. This is a convenient position to use since the ON position disables over-the-air transmissions from the Control Station.

Perform the following steps to make a Momentary Intercom call:

1. Make sure the Control Station is powered up (see Section 4.1).
2. Set the INTERCOM switch to the M position.
3. Set the REMOTE switch to the OFF position.
4. Press and hold the PTT switch on the Local Station Microphone at the beginning of each transmission. Release the PTT switch at the end of each transmission.
5. Release the INTERCOM switch when the intercom call is complete.



Audio from the Local Station Microphone or a remote controller will NOT be transmitted over-the-air during this switch configuration. Only intercom communications are possible!

5 REFERENCE MATERIAL

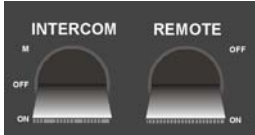



It may be necessary to consult one or more of the following manuals. These manuals will also provide additional guidance if you encounter technical difficulties during the installation or testing processes.

Table 5-1: Reference Documents

DOCUMENTATION	MANUAL NUMBER
CS-7000 Installation Manual	MM-014714-001
M5300 Transceiver Operator's Manual	MM-012125-001
M5300 Transceiver Quick Guide when using OpenSky Systems	MM-012997-001
M5300 Transceiver Quick Guide when using P25, EDACS, or Conventional Systems	MM-013232-001
M7300 Transceiver Operator's Manual	MM-014718-001
M7300 Transceiver Quick Guide when using OpenSky Systems	MM-014368-001
M7300 Transceiver Quick Guide when using P25, EDACS, or Conventional Systems	MM-014369-001

6 INTERCOM AND REMOTE SWITCH SUMMARY

Table 6-1: Summary of Remote and Intercom Switch Positions

SWITCH POSITIONS	PTT BUTTON ¹ STATUS	TRANSMIT PRIORITY ²	COMMENTS
INTERCOM AND REMOTE ENABLED 	Receive Mode (No PTTs Pressed).	N/A	The Control Station's receiver audio is heard at the Control Station's speaker, and Remote Controller's speaker.
	PTT on Control Station Microphone Pressed.	1	Audio from Control Station's microphone is heard at the Remote Controller's speaker.
	Intercom Mode Selected on the Remote Controller and PTT Pressed.	2	Audio from Remote Controller's microphone is heard at the Control Station's speaker.
	Transmit Channel Selected on the Remote Controller and PTT Pressed.	2	Audio from Remote Controller's microphone is heard at the Control Station's speaker, and transmitted over-the-air.
INTERCOM-ONLY (REMOTE DISABLED) 	Receive Mode (No PTTs Pressed).	N/A	The Control Station's receiver audio is heard at the Control Station's speaker.
	PTT on Control Station Microphone Pressed.	1	Audio from Control Station's microphone is heard at the Remote Controller's speaker.
	Remote Controller PTT Pressed.	2	Microphone audio from Remote Controller is heard at the Control Station's speaker.
REMOTE ENABLED 	Receive Mode (No PTTs Pressed).	N/A	The Control Station's receiver audio is heard at its speaker, and Remote Controller's speakers. ¹
	PTT on Control Station Microphone Pressed.	1	Audio from Control Station's microphone is heard at Remote Controller's speaker, and transmitted over-the-air.
	Intercom Mode Selected on the Remote Controller and PTT Pressed.	2	Microphone audio from Remote Controller is heard at the Control Station's speaker.
	Transmit Channel Selected on the Remote Controller and PTT Pressed.	2	Audio from Remote Controller's microphone is heard at the Control Station's speaker, and transmitted over-the-air.
REMOTE DISABLED 	Receive Mode (No PTTs Pressed).	N/A	The Control Station's receiver audio is heard at the Control Station's speaker.
	PTT on Control Station Microphone Pressed.	1	Audio from the Control Station's microphone is transmitted over-the-air.

- Regarding all PTT actions, it is possible for the Control Station to be programmed to hinder all PTT actions when its receiver is unmuted (receiving an over-the-air call). PTT actions are restored once the receiver is muted.
- PTT actions from the Control Station's microphone will always take precedence over PTT requests from Remote Controllers.

7 WARRANTY

- A. M/A-COM, Inc. (hereinafter "Seller") warrants to the original purchaser for use (hereinafter "Buyer") that Equipment manufactured by or for the Seller shall be free from defects in material and workmanship, and shall conform to its published specifications. With respect to all non-M/A-COM Equipment, Seller gives no warranty, and only the warranty, if any, given by the manufacturer shall apply. Rechargeable batteries are excluded from this warranty but are warranted under a separate Rechargeable Battery Warranty (ECR-7048).
- B. Seller's obligations set forth in Paragraph C below shall apply only to failures to meet the above warranties occurring within the following periods of time from date of sale to the Buyer and are conditioned on Buyer's giving written notice to Seller within thirty (30) days of such occurrence:
1. for fuses and non-rechargeable batteries, operable on arrival only.
 2. for parts and accessories (except as noted in B.1) sold by Seller's Service Parts Operation, ninety (90) days.
 3. for P7200, P7100IP, P5400, P5300, P5200, P5100, P3300, PANTHER™ 405P and 605P, M7300, M7200 (including V-TAC), M7100 IP, M5300 and M3300 radios, two (2) years.
 4. for all other equipment of Seller's manufacture, one (1) year.
- C. If any Equipment fails to meet the foregoing warranties, Seller shall correct the failure at its option (i) by repairing any defective or damaged part or parts thereof, (ii) by making available at Seller's factory any necessary repaired or replacement parts, or (iii) by replacing the failed Equipment with equivalent new or refurbished Equipment. Any repaired or replacement part furnished hereunder shall be warranted for the remainder of the warranty period of the Equipment in which it is installed. Where such failure cannot be corrected by Seller's reasonable efforts, the parties will negotiate an equitable adjustment in price. Labor to perform warranty service will be provided at no charge during the warranty period only for the Equipment covered under Paragraph B.3 and B.4. To be eligible for no-charge labor, service must be performed at a M/A-COM factory, by an Authorized Service Center (ASC) or other Servicer approved for these purposes either at its place of business during normal business hours, for mobile or personal equipment, or at the Buyer's location, for fixed location equipment. Service on fixed location equipment more than thirty (30) miles from the Service Center or other approved Servicer's place of business will include a charge for transportation.
- D. Seller's obligations under Paragraph C shall not apply to any Equipment, or part thereof, which (i) has been modified or otherwise altered other than pursuant to Seller's written instructions or written approval or, (ii) is normally consumed in operation or, (iii) has a normal life inherently shorter than the warranty periods specified in Paragraph B, or (iv) is not properly stored, installed, used, maintained or repaired, or, (v) has been subjected to any other kind of misuse or detrimental exposure, or has been involved in an accident.
- E. The preceding paragraphs set forth the exclusive remedies for claims based upon defects in or nonconformity of the Equipment, whether the claim is in contract, warranty, tort (including negligence), strict liability or otherwise, and however instituted. Upon the expiration of the warranty period, all such liability shall terminate. The foregoing warranties are exclusive and in lieu of all other warranties, whether oral, written, expressed, implied or statutory. NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR EXEMPLARY DAMAGES.

This warranty applies only within the United States.

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