

# INSTALLATION AND OPERATION GUIDE FOR THE TC-200 INTERCOM AND THE TC-300, TC-400 AND TC-600 ACCESSORY MODULES

## IMPORTANT!

1. **PTT (PUSH-TO-TALK) SWITCHES MUST BE CONNECTED TO THE TC-200 FOR PROPER OPERATION.**

When using **BUILT-IN, YOKE-MOUNTED PTT SWITCHES**, the recommended method is to **COMPLETELY DISCONNECT THE PTT SWITCHES FROM THE AIRCRAFT TRANSCEIVER AND RECONNECT THEM TO THE TC-200.**

**PLUG-IN, PORTABLE PTT SWITCHES** (such as the Telex Model PT-300) typically have plugs for connection to the aircraft transceiver and jacks to plug in the headset mic plugs. **DO NOT PLUG THE HEADSET MIC PLUGS INTO THESE PTT SWITCHES BECAUSE THEN THE PTT SWITCHES WILL HAVE TO BE PRESSED TO TALK OVER THE INTERCOM!** Plug the PTT switches into the pilot and copilot PTT switch jacks on the TC-200 front panel. Plug the headsets directly into the TC-200 or TC-300 MIC and PHONE jacks.

Whatever type of PTT switches are used, the TC-200 automatically keys the transceiver when the PTT switches are pressed.

2. **CHECK TO SEE IF THE AIRCRAFT TRANSCEIVER HAS SIDETONE BEFORE INSTALLING THE TC-200.**

If the transceiver has sidetone, the pilot and copilot can hear their own voices in the headphones when transmitting. However, if the transceiver does not have sidetone, they cannot hear their voices when transmitting: this can be a problem when switching from intercom to transmit because the pilot and copilot can hear their own voices when talking over the intercom, but when they transmit, there is no voice signal and they may tend to think the transmitter is not working. This problem may be eliminated when using a transmitter without sidetone by modifying the TC-200 before installation. See Appendix B "Sidetone Modification". The modification is not necessary if the transceiver has sidetone.

# **TELEX**

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## INTRODUCTION

The Telex Model TC-200 Intercom is the central component of a modular aircraft intercom system which interfaces with the aircraft transceiver and provides hands-free, voice-activated intercom communications capability without interfering with normal transceiver use.

A basic system application — using a TC-200 only — permits intercom communication between a pilot and a copilot and allows both to access the transceiver. In this arrangement, the pilot and copilot headsets and PTT switches are plugged into the front panel of the TC-200. The rear panel plugs of the TC-200 are then plugged into the transceiver mic and phone jacks; power is provided via the cigarette lighter jack of the aircraft.

To use the transceiver, the pilot or copilot simply presses his PTT switch; the TC-200 automatically keys the transceiver and connects the pilot or copilot microphone to the transceiver. The appropriate transmit indicator on the TC-200 front panel also illuminates to indicate transmission.

To use the intercom, the pilot or copilot need only speak into his microphone. The voice activation circuit in the TC-200 turns on the intercom. The voice activation level may be set using the squelch control so that the intercom is not activated by ambient cockpit noise.

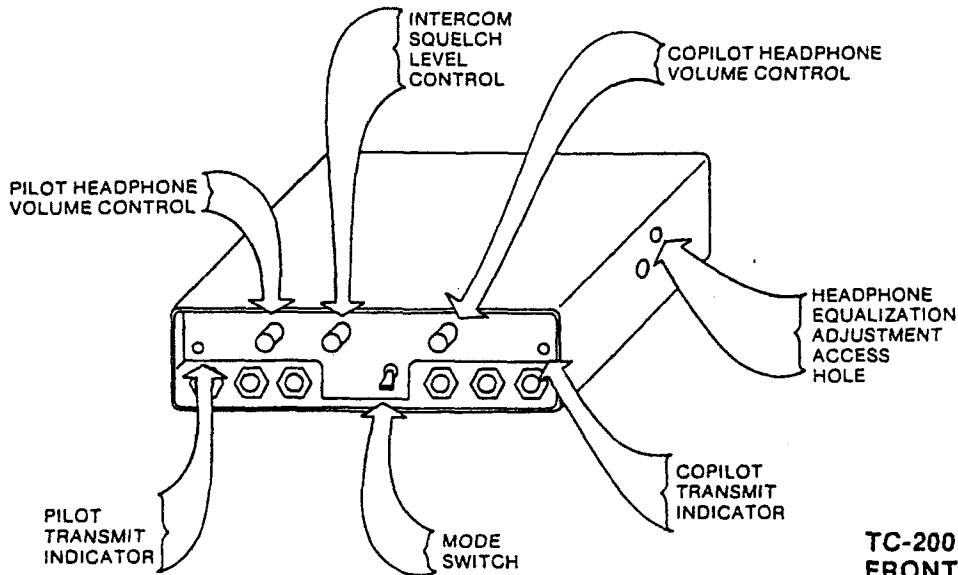
In some applications, it may be desired to position pilot and/or copilot headset and PTT switch jacks at a more convenient location. The Telex Model TC-300 Extension Module provides this capability. The TC-300 is equipped with a reversible plug which connects to the TC-200 rear panel to extend either the pilot or copilot jacks up to 5 feet. If the aircraft already has built-in remote jacks or PTT switches, these may be connected to the TC-200 in place of the TC-300.

The TC-200 can support input from an entertainment system (such as a tape player). In addition, the TC-200 provides an output for a flight recorder. This output continuously monitors the pilot headphone signal.

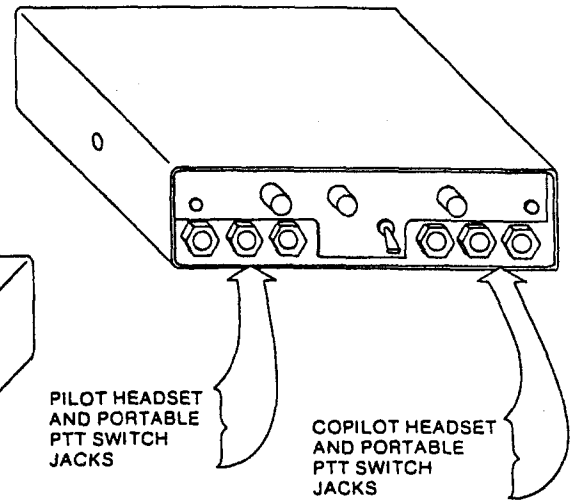
With the addition of a Telex Model TC-400 Expansion Module, two passenger headsets can be connected to the intercom system. A Telex Model TC-600 Expansion Module may be connected to the TC-400 to accommodate two additional passenger headsets, for a maximum of four passengers.

The TC-200 controls, indicators and connector functions are summarized in Figure 1.

### TC-200 CONTROLS AND INDICATORS



### TC-200 FRONT PANEL CONNECTOR FUNCTIONS



### TC-200 REAR PANEL CONNECTOR FUNCTIONS

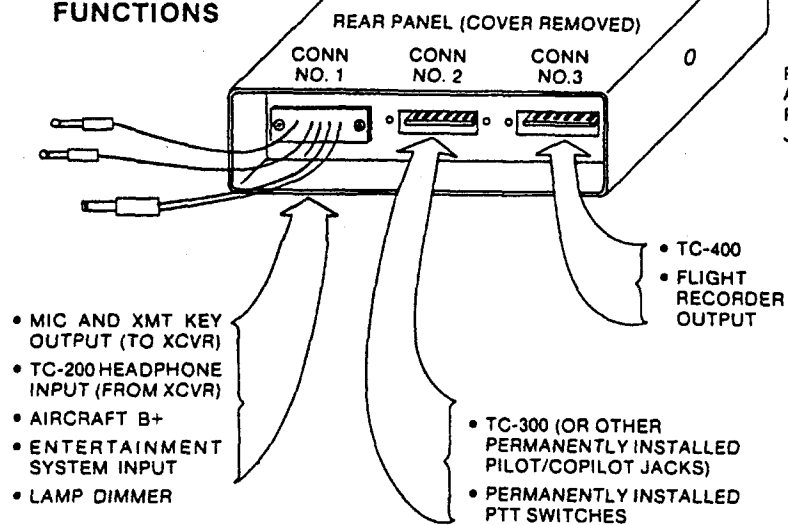


Figure 1. TC-200 Reference Guide

# INSTALLATION

## CONNECTIONS

Typical connections are illustrated in Figure 2. For nonstandard applications, refer to the appendices.

To gain access to the TC-200 rear panel connectors, remove the two Phillips-head screws securing the rear cover, and remove the cover.

The TC-200 panel lamps are factory-wired for 28-volt operation without a dimmer. To use the lamps with 14-volt electrical systems or with a lamp dimmer, see Appendix A, "Connector No. 1 Notes".

The factory-installed plug on connector no. 1 has a polarizing key which will allow it to plug into connector no. 1 in one direction only.

The TC-300 is plugged into connector no. 2 only. The TC-300 plug is reversible to extend either the pilot or copilot jacks. To extend the pilot jacks, plug the TC-300 into connector no. 2 with pins 1-6 up. To extend the copilot jacks, plug the TC-300 into connector no. 2 with pins 1-6 down. (Pin numbers are stamped on the back of the plug.)

The TC-400 plug has a polarizing key which will allow it to plug into connector no. 3 in one direction only.

The TC-600 may only be used with the TC-400. To connect the TC-600, remove two screws on each end of the TC-400 and remove the TC-400 bottom cover. Note the proper orientation of the TC-600 plug as shown in Figure 2, and position it on the pins on the bottom of the TC-400 circuit board.

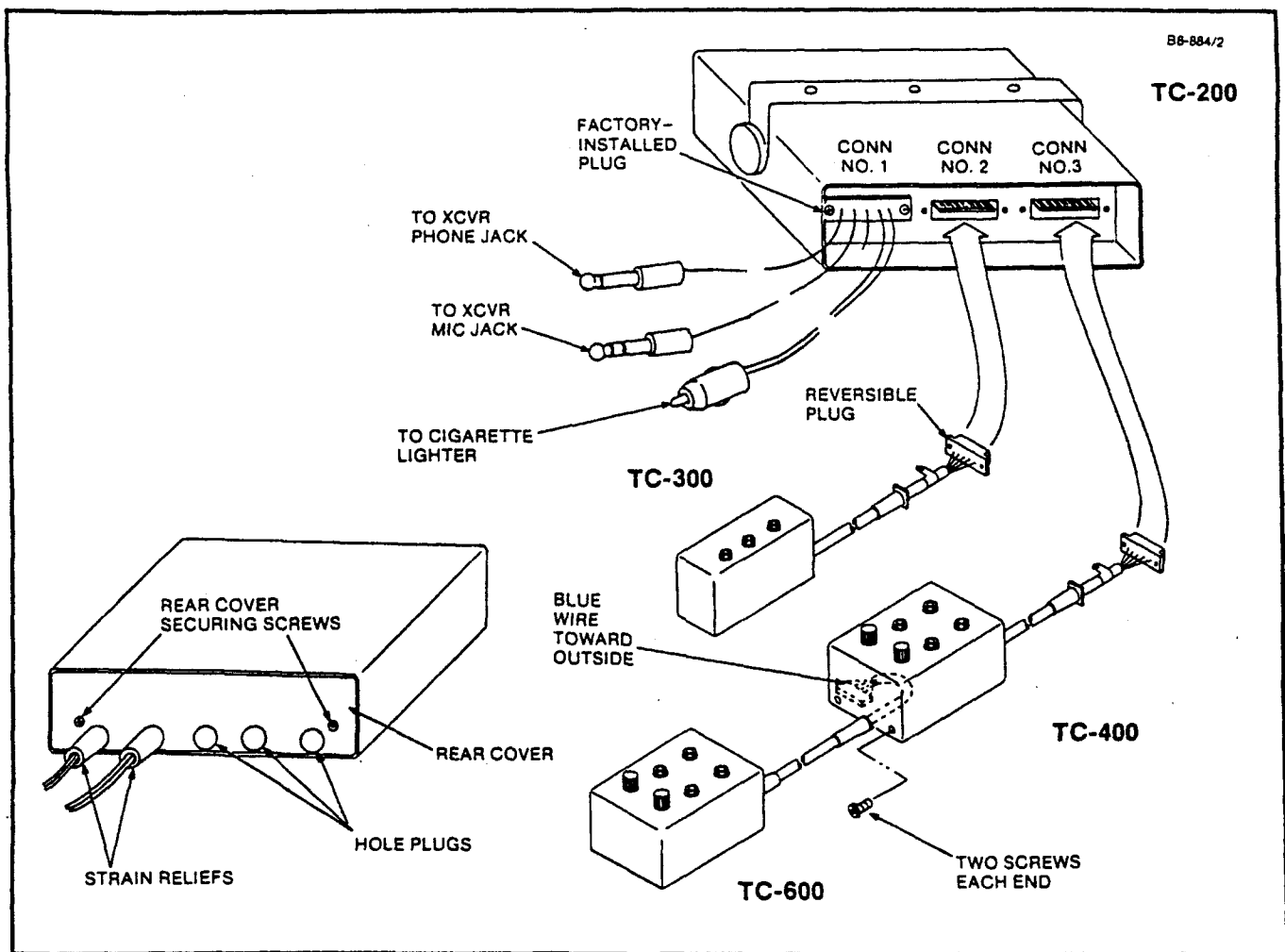


Figure 2. Typical Connections

Secure module connectors and cables to the back of the TC-200 as shown in Figure 3. Use the Phillips-head screws and fiber washers supplied with the accessories — save the slotted head screws for mounting the accessories.

Remove TC-200 rear cover hole plugs as necessary to slip module cable strain reliefs into the rear cover slots before reinstalling the cover.

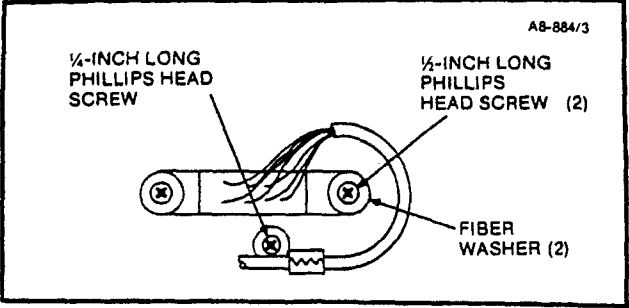


Figure 3. Securing Module Cables and Connectors

**MOUNTING COMPONENTS**

**CAUTION**

Areas where components are to be mounted must be free of electrical wiring. Check before drilling!

NOTE: Before permanently installing components, check all intercom and transceiver functions — see "System Checkout and Operation".

**TC-200 Under-Panel Mounting**

1. Temporarily install bracket on TC-200 using the washers and knobs supplied. Proper installation is shown in Figure 4.
2. Position TC-200 at desired mounting location and mark bracket outline.
3. Remove bracket from TC-200 and use it to mark the three (3) mounting hole positions at the mounting location.
4. Drill mounting holes using a 7/32-inch (5.5 mm) drill bit.
5. Mount the bracket using the three 1/2-inch slotted screws supplied, and then reinstall the TC-200.

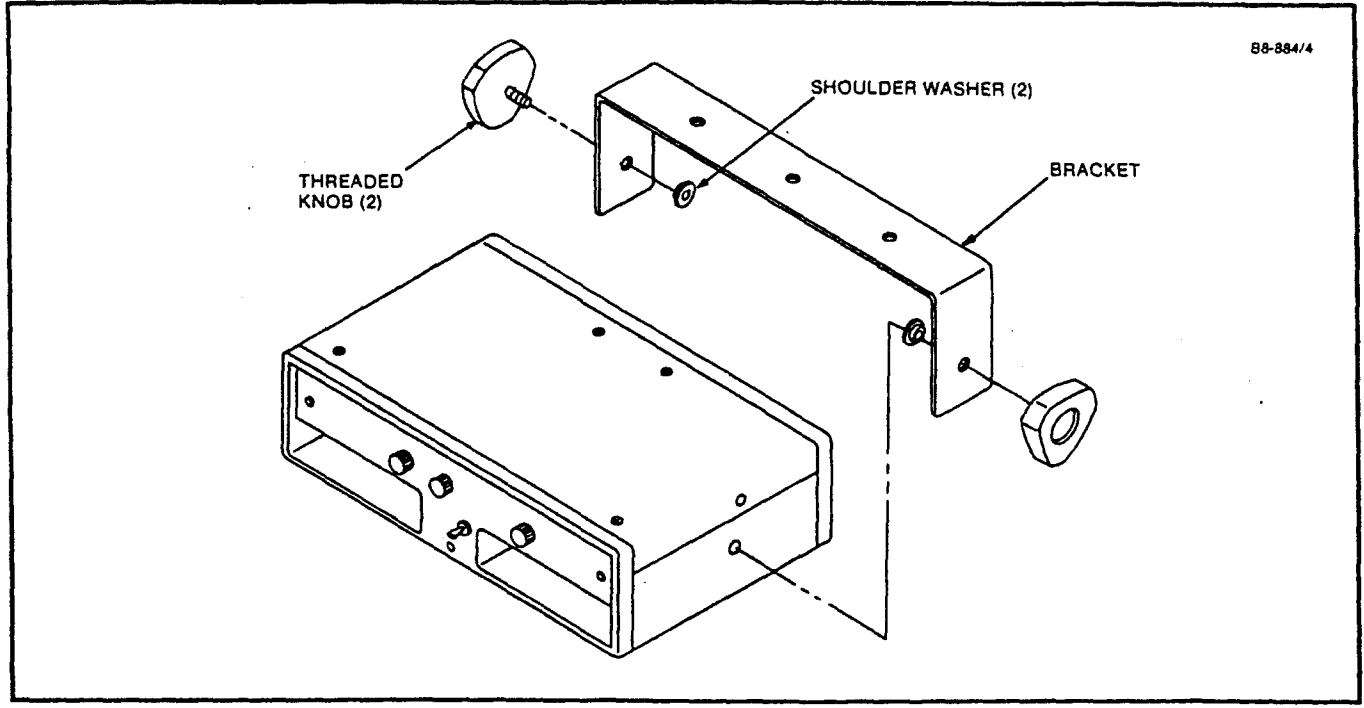
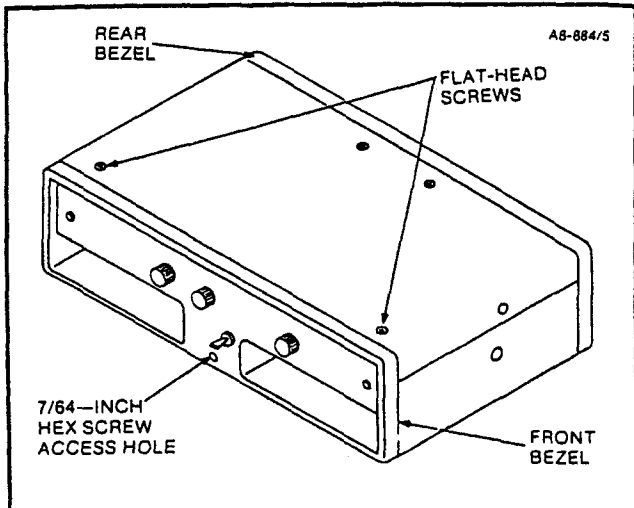


Figure 4. Bracket Installation

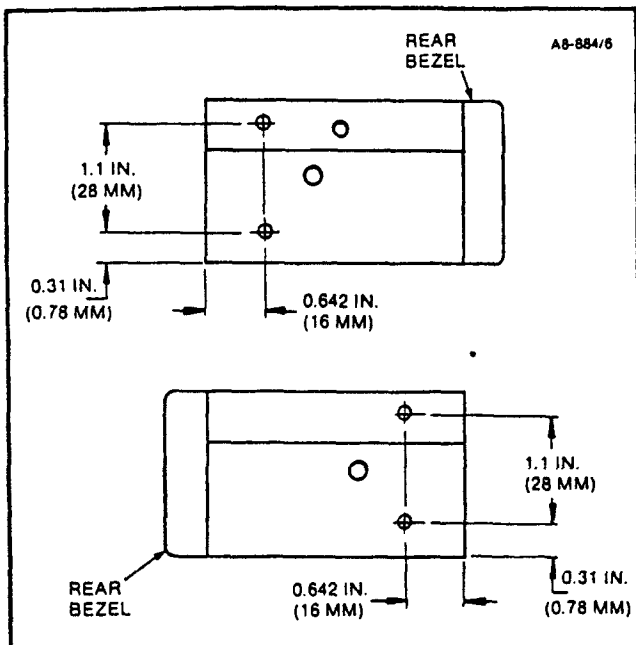
### TC-200 In-Panel Mounting

1. Remove four (4) flat-head screws securing the TC-200 front bezel to the aluminum housing. Also remove the hexagon screw securing the front bezel to the rear bezel. The hexagon screw is accessed through the hole in the front bezel using a 7/64-inch hexagon (allen) wrench. (See Figure 5.)



**Figure 5. Front Bezel Removal**

2. Pull out the front bezel with attached circuit boards and set aside.



**Figure 6. Hole Locations for In-Panel Mounting**

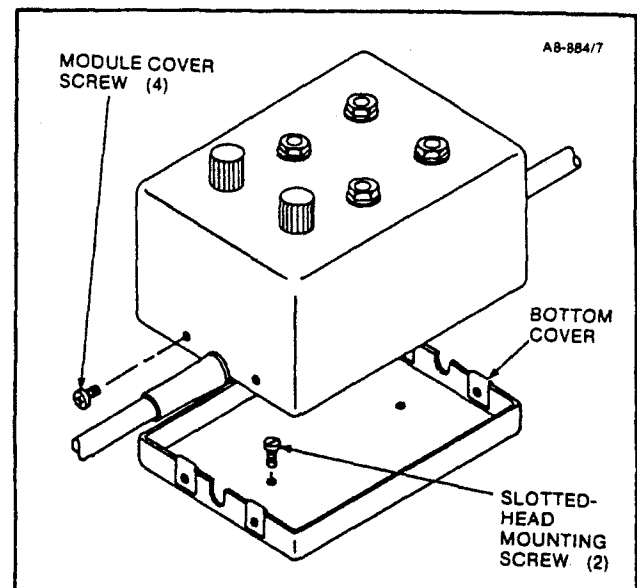
3. Mark and drill two (2) holes on each side of the TC-200 housing at the locations shown in Figure 6 using a 5/32-inch (4.0 mm) drill bit.

NOTE: Holes must be drilled only at these locations to avoid interference with circuit boards.

4. Clean away all metal filings and then mount the TC-200 housing to the aircraft panel rack using a screw inserted through each hole and secure to the panel rack with a lockwasher and nut.
5. Replace the front bezel and secure it using the 7/64-inch hexagon screw only.

### TC-300, TC-400 and TC-600 Module Mounting

1. Position the module at the desired mounting location and mark outline.
2. Remove the four screws securing the module bottom cover (Figure 7), and remove the bottom cover.



**Figure 7. Module Mounting (Typical)**

3. Reposition the bottom cover at the mounting location, and mark the two (2) mounting holes.
4. Drill mounting holes using a 5/32-inch (4.0 mm) drill bit.
5. Mount the bottom cover using the two 1/2-inch slotted screws supplied with the module.
6. Reinstall the module to its bottom cover.

## SYSTEM CHECKOUT AND OPERATION

1. Apply power to the TC-200. (Plug in cigarette lighter plug and/or turn on aircraft electrical system.)
2. Plug in pilot, copilot and passenger headsets and check for proper intercom operation in the three positions of the TC-200 mode switch as summarized in Table 1, Column 1. Set the TC-200 squelch control for desired voice activation level of the intercom.

NOTE: Inability of pilot and copilot microphones to activate intercom may indicate improperly connected portable PTT switches. See IMPORTANT note regarding portable PTT switch use on front cover of this booklet.

3. Turn on the transceiver and check reception in the three positions of the mode switch as shown in Column 2.

NOTE: If a distinct difference between intercom volume and transceiver volume is noted, adjust the headphone equalization control through the access hole in the side of the TC-200 using a small flat blade screwdriver.

4. Check pilot and copilot transmit operation in the three mode switch positions as shown in Column 3.

NOTE: If the transmitter is keyed, but no audio is heard at a receiver, permanently installed PTT switches may be improperly connected. See IMPORTANT note regarding permanently installed PTT switches on front cover of this booklet.

5. Turn on entertainment system and check operation in the three mode switch positions as shown in Column 4.
6. Activate flight recorder and check that it records all signals heard by the pilot.

**Table 1. Intercom System Operational Summary**

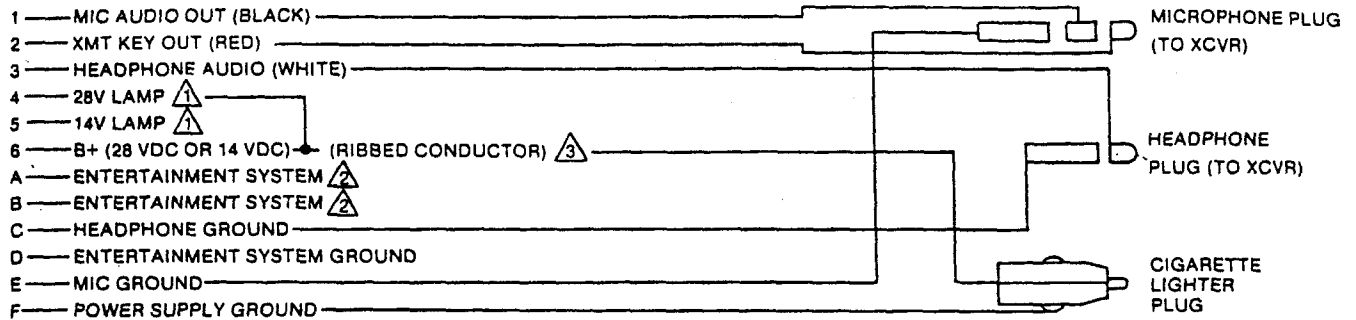
MODE SWITCH POSITION	COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
	INTERCOM USED BY:	TRANSCEIVER HEARD BY:	TRANSMITTER USED BY:	ENTERTAINMENT SYSTEM HEARD BY:
RADIO	Copilot Passengers	Pilot Only	Pilot Only	Copilot Passengers (Music interrupted during intercom)
ALL	Pilot Copilot Passengers	Pilot Copilot Passengers	Pilot Copilot (Intercom interrupted during transmit)	Pilot Copilot Passengers (Music interrupted during intercom, VHF radio or transmit)
COPILOT	Pilot Copilot	Pilot Copilot	Pilot Copilot (Intercom interrupted during transmit)	Passengers Only (Uninterrupted)

# APPENDIX A CONNECTOR PIN FUNCTIONS

## CONNECTOR NO. 1

88-884/8

### CONNECTOR NO. 1 PINS (SHOWING FACTORY WIRING)



### 1. Panel Lamp Wiring Options

The TC-200 panel lamps are factory-wired for 28-volt aircraft electrical systems with no dimmer (Figure 8A). For 14-volt operation, or operation with a dimmer, the wiring must be modified as follows:

- a. Remove power from the intercom.
- b. Access the factory-installed 12-pin plug inserted into connector no. 1 on the TC-200 rear panel.
- c. Make the required wiring changes to meet the particular requirements as follows:
  - (1) 28-volt system with dimmer: remove factory jumper wire connecting pins 4 and 6. Solder dimmer wire to pin 4 (Figure 8B).
  - (2) 14-volt system with no dimmer: unsolder factory jumper wire from pin 4 and resolder it to pin 5. Make a

short jumper wire and connect pin 4 to pin D (Figure 8C).

- (3) 14-volt system with dimmer: unsolder factory jumper wire from pin 6 and resolder it to pin D. Solder dimmer wire to pin 5 (Figure 8D).

### 2. Entertainment System

Either monaural or stereo entertainment system may be connected, but output of TC-200 is always monaural. To connect a monaural system, use either pin A or pin B. For stereo hookup, use pin A for one channel and pin B for the other. Connect the entertainment system ground to pin D.

### 3. Fusing

Cigarette lighter jack must be fused. A 1.0 amp circuit breaker is recommended. If the TC-200 is hard wired into the aircraft power supply line, a 1.0 amp fast-blow, in-line fuse is recommended.

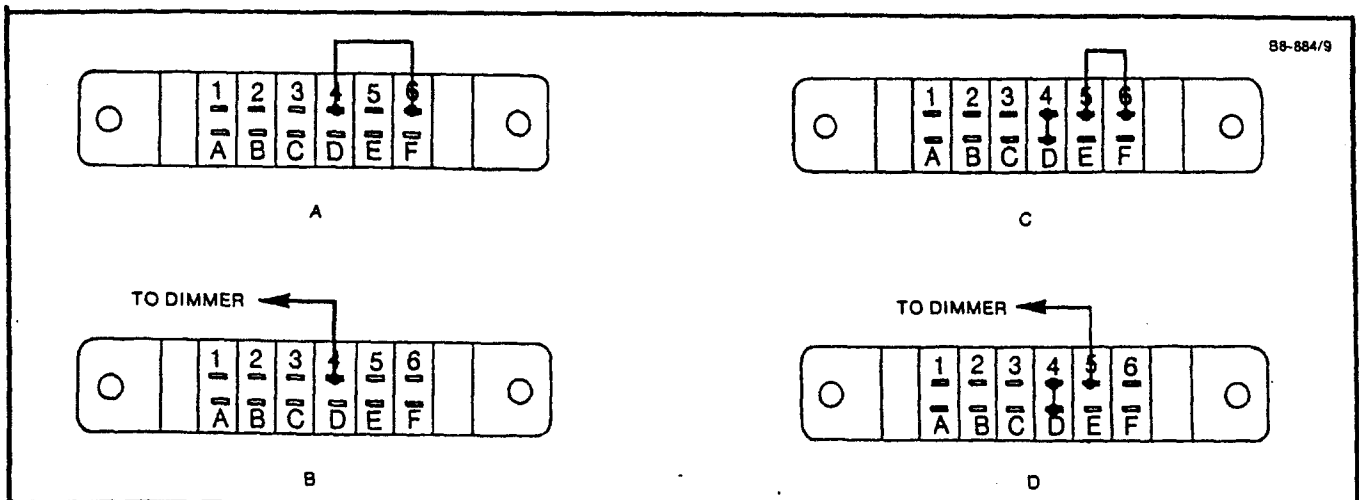


Figure 8. Panel Lamp Wiring Options



## CONNECTOR NO. 2

### CONNECTOR NO. 2 PINS

- 1 — NO CONNECTION
- 2 — PILOT HEADPHONE TIP (PHONE HOT)
- 3 — PILOT MIC RING (MIC HOT)
- 4 — PILOT MIC TIP (PTT SWITCH)
- 5 — PILOT MIC & PTT SWITCH GROUND
- 6 — PILOT HEADPHONE GROUND
- A — COPILOT HEADPHONE GROUND
- B — COPILOT MIC & PTT SWITCH GROUND
- C — COPILOT MIC TIP (PTT SWITCH)
- D — COPILOT MIC RING (MIC HOT)
- E — COPILOT HEADPHONE TIP (PHONE HOT)
- F — NO CONNECTION

### 1. Permanently Installed PTT Switches

PTT switches may be permanently installed to connector no. 2 using the extra 12-pin connector supplied with the TC-200.

NOTE: If a TC-300 is being installed with permanently installed PTT switches, solder the PTT switch lead wires to the appropriate pins of the TC-300 connector instead of using the extra 12-pin connector.

## 2. Extending Pilot/Copilot Jacks

### a. Connecting One TC-300

The TC-300 plug is reversible to extend either the pilot or copilot jacks. For extended pilot jacks, insert the plug with pins 1-6 up; for extended copilot jacks, insert it with pins 1-6 down.

### b. Connecting Two TC-300s

It is possible to connect two TC-300 Modules by unsoldering the leads from one TC-300 plug and resoldering them to the other TC-300. See Table 2. Unsolder the indicated lead from the first TC-300, and resolder it to the indicated pin on the second TC-300. When the second TC-300 is plugged into connector no. 2 with pins 1-6 up, the first TC-300 extends the pilot jacks, and the second TC-300 extends the copilot jacks.

Table 2. Connecting Two TC-300 Modules


Unsolder lead from First TC-300 Pin:	Resolder lead to Second TC-300 Pin:
A	6
B	5
C	4
D	3


### c. Connecting Built-in Remote Jacks

Built-in jacks should be disconnected from the aircraft transceiver and installed to connector no. 2 using the extra 12-pin connector provided with the TC-200.

## CONNECTOR NO. 3

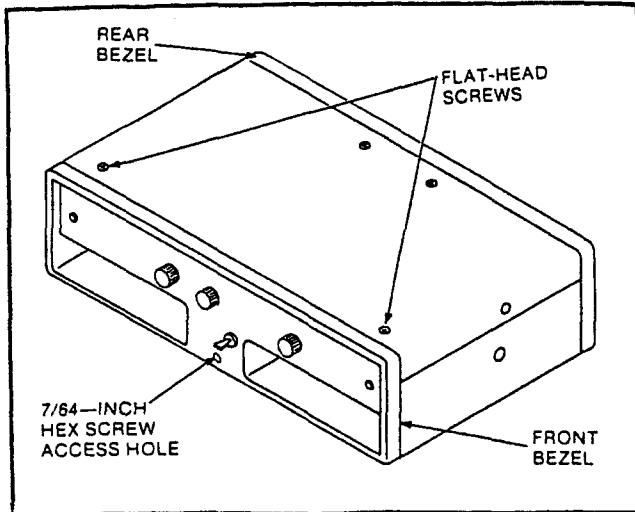
### CONNECTOR NO. 3 PINS

- 1 — RESERVED FOR TC-400
- 2 — TAPE RECORDER OUT 
- 3 — RESERVED FOR TC-400
- 4 — RESERVED FOR TC-400
- 5 — RESERVED FOR TC-400
- 6 — RESERVED FOR TC-400
- A — RESERVED FOR TC-400
- B — RESERVED FOR TC-400
- C — TAPE RECORDER GROUND
- D — NO CONNECTION
- E — RESERVED FOR TC-400
- F — RESERVED FOR TC-400

 The tape recorder output may be used for connection of a flight recorder. The tape recorder monitors all signals to the pilot headphones.

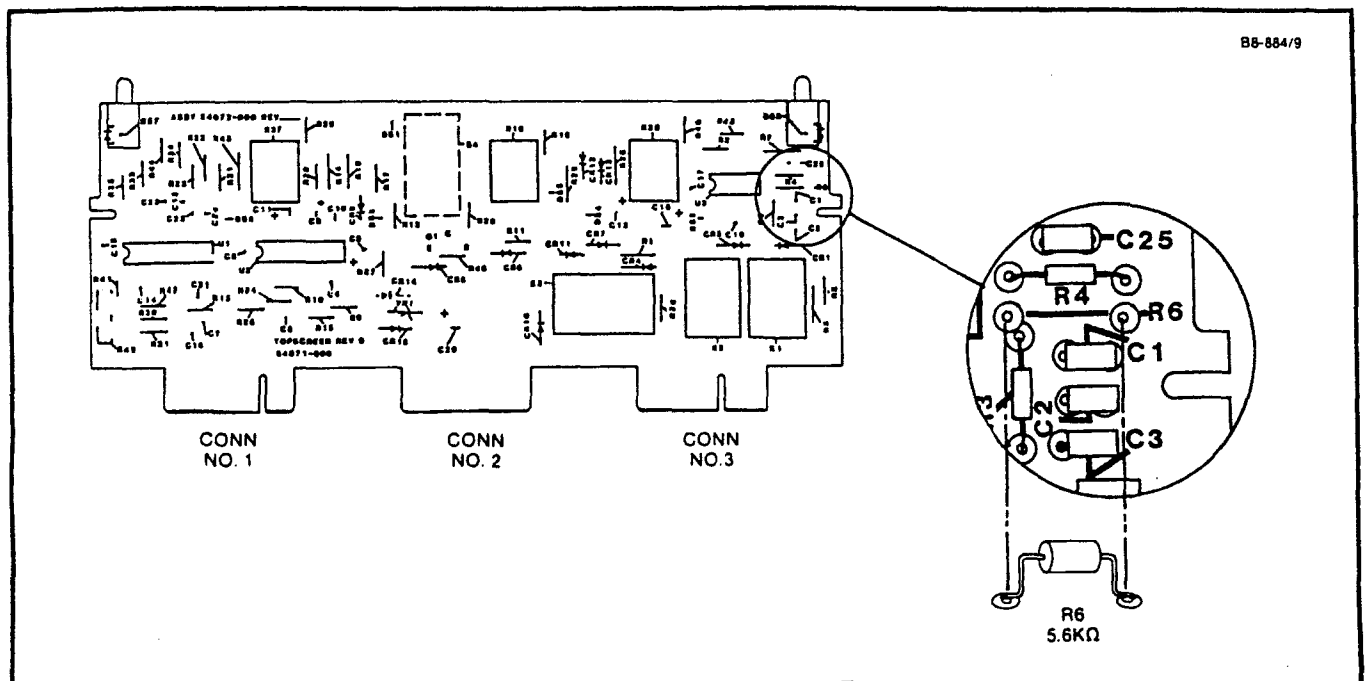
## APPENDIX B TC-200 SIDETONE MODIFICATION

NOTE: Requires one 5.6K  $\Omega$ ,  $\frac{1}{8}$ W,  $\pm 5\%$  resistor (local purchase).



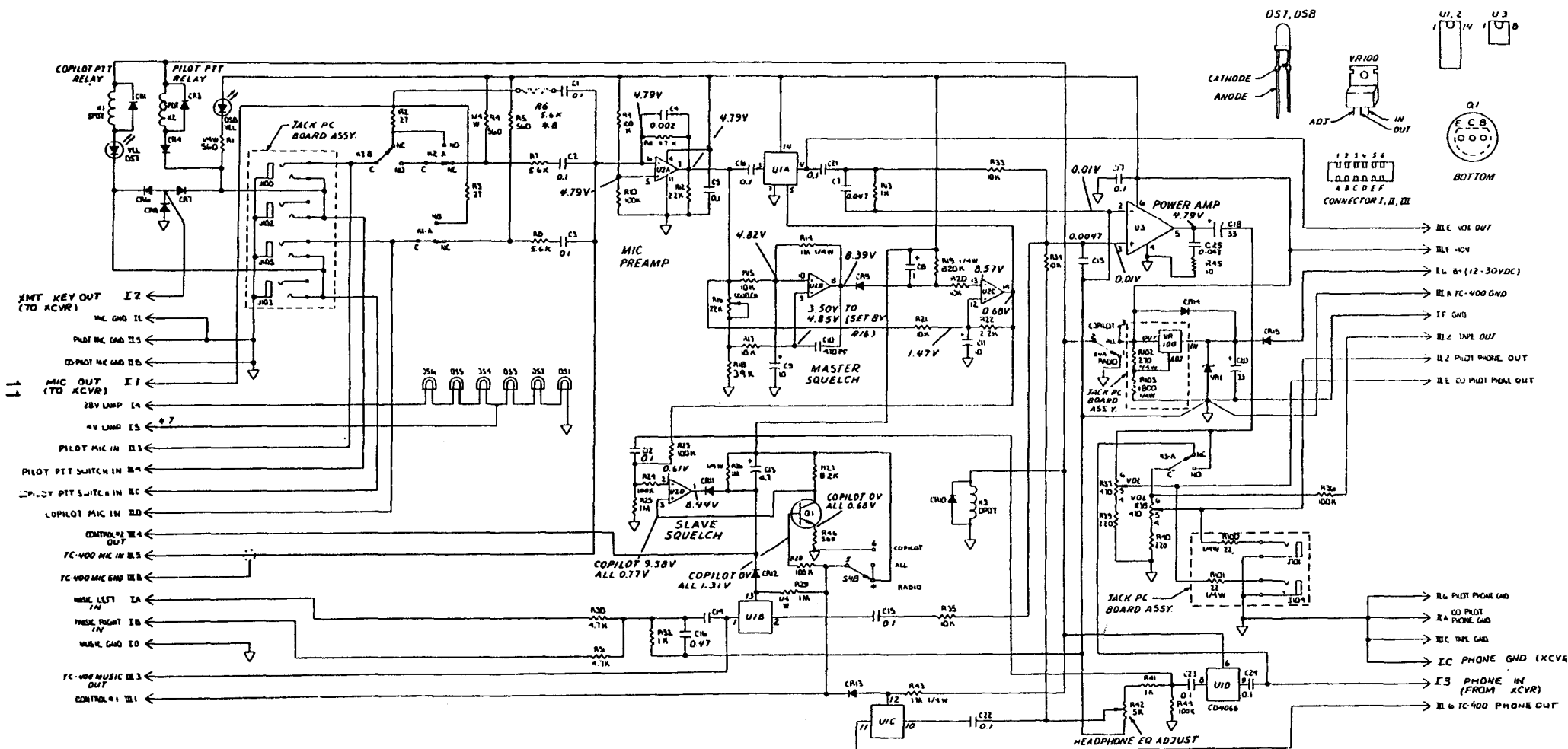
**Figure 9. Front Bezel Removal**

1. Remove 4 flat head screws holding front bezel to the aluminum housing.
2. Place a 7/64-inch hexagon socket (allen) wrench into the front access hole. Turn set-screw counterclockwise until front bezel is free of housing.
3. Bend and cut resistor leads, and then tack-solder the resistor to the circuit board at the location shown in Figure 10.
4. Reassemble unit.

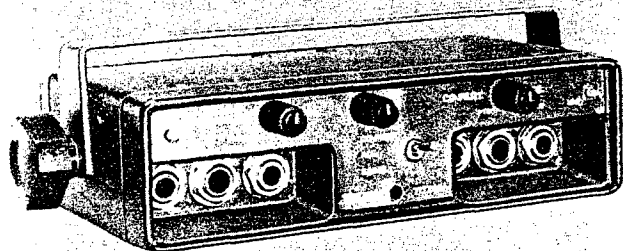


**Figure 10. Resistor Installation**

# APPENDIX C TC-200 SCHEMATIC DIAGRAM



## TC-200 INTERCOM and TC-300/TC-400/TC-600 Accessories



### General Description

The Telex Model TC-200 Intercom has been designed for a variety of aircraft applications. As an intercom, it can provide noise-free, voice-activated communications between pilot and copilot. The intercom can be expanded to include four additional stations on the intercom line. An entertainment system can also be added to ease the fatigue of long flights. The intercom allows normal use of the aircraft radio for the pilot or copilot with no interference from the intercom.

The lightweight housing is constructed of aluminum and the bezels are constructed of high-impact plastic. The intercom color is basic black. The total weight of the unit is 19 ounces (539 grams). The intercom is portable but can be panel mounted or installed under the aircraft instrument panel.

### Intercom Design Features

#### Mode Switch

This three position toggle switch, on the front panel, gives the pilot complete control of the intercom and access to the aircraft radio. For safety, the pilot always has radio reception and transmission capabilities. The modes are: COPILOT, ALL and RADIO.

#### Copilot Mode

In the COPILOT position, the pilot is on the intercom with the copilot. Both have access to the aircraft radio transmissions and reception while the passengers hear only the entertainment system.

#### All Mode

In the ALL position, the pilot is on the intercom with everyone. All can monitor radio messages and hear the entertainment system, but only the pilot or copilot can transmit on the aircraft radio.

#### Radio Mode

In the RADIO position, only the pilot can use the aircraft radio and is removed from the intercom. The copilot and passengers can talk or listen to the entertainment system. They cannot monitor the aircraft radio on the intercom.

#### Volume Controls

The pilot and copilot have separate volume controls on the front panel of the intercom for individual listening levels.

#### Squelch Control

The SQ (squelch) control is also located on the front panel of the intercom. It provides adjustment of the voice activation level for voice-activated microphones. Turning the squelch control counter clockwise increases the level of voice needed to activate the intercom.

#### Radio Transmissions

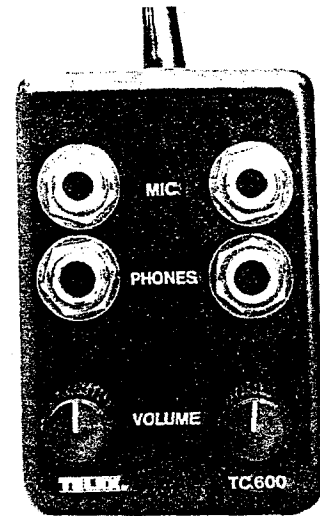
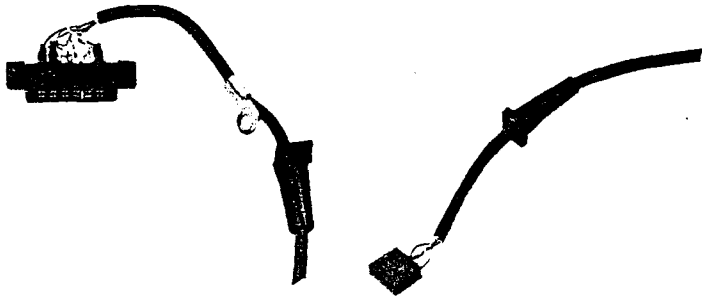
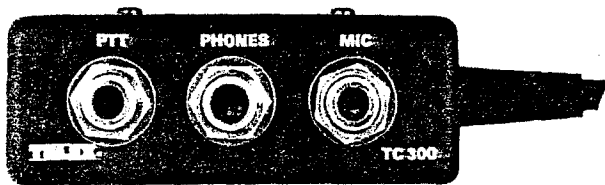
Radio transmission is clearly indicated by a yellow light-emitting diode (LED). A LED comes on when either the pilot or copilot use the push-to-talk (PTT) switch. The TC-200 circuitry cannot affect the modulation of the radio transmitter. This is due to the direct connection of the microphone to the radio transmitter. For safety, a fail-safe feature is built-in. With loss of electrical power to the intercom system, the pilot's headset is switched directly to the aircraft radio. This prevents loss of reception or transmission.

#### Lighting

For night operation, the front panel is illuminated by internal lamps. These lamps provide a clear identification of all controls. The lamps are factory-wired for a 28-volt system. (For illumination in a 14-volt system or dimmer systems, refer to the Wiring Diagrams and Installation Instructions 38108-884.)

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# TELEX




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## Accessory Description

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### TC-300 Accessory

The Telex Model TC-300 Accessory Jack Box is designed as an extension for the TC-200 Intercom input jacks. In tandem seating, the extension jack box will easily reach the TC-200 when positioned next to the rear seat. In side-by-side seating, the extension jack box can easily reach the TC-200 when positioned on the outboard side of the seats. The TC-300 plugs into the rear panel of the TC-200 Intercom. The TC-300 may be used as a portable unit, or it can be surface-mounted.

### TC-400 Accessory

The Telex Model TC-400 Accessory is an expansion unit that permits the user two remote stations. This unit could be located in the passenger area or near the two rear seats of a four-seat cabin. The unit plugs into the rear panel of the TC-200 Intercom. The TC-400 may be used as a portable unit, or it can be surface-mounted.

The unit requires the use of aircraft-type headsets having carbon or carbon-equivalent, amplified microphones. The TC-400 has two volume controls to adjust for individual passenger listening levels.

### TC-600 Accessory

The Telex Model TC-600 Accessory expands the TC-200 Intercom to four remote stations when used with the TC-400 Accessory. The TC-600 plugs into the TC-400 and uses the same type headsets as the TC-400. This module can be used as a portable unit, or it can be surface-mounted.

### Yoke Switch Connector

This connector is used with aircraft having yoke switches. It is required to connect the switches to the TC-200 Intercom. It is not used if a TC-300 Module is purchased.

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## Accessory Specifications

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### TC-300 Accessory

#### Jacks:

Microphone: 0.206-inch (5.15 mm) diameter  
 Headphone: 0.250-inch (6.25 mm) diameter  
 Push-to-Talk: 0.206-inch (5.15 mm) diameter

**Cord Length:** 60 inches (1.5 m)

**Dimensions:** 1.6 inches (40 mm) high; 1.2 inches (30 mm) wide; 3.2 inches (80 mm) long

**Weight:** 5.5 ounces (156 grams)

**Color:** Black

### TC-400/TC-600 Accessories

#### Jacks:

Microphone: 0.206-inch (5.15 mm) diameter  
 Headphone: 0.250-inch (6.25 mm) diameter

**Microphone:** Use carbon or carbon equivalent amplified microphone

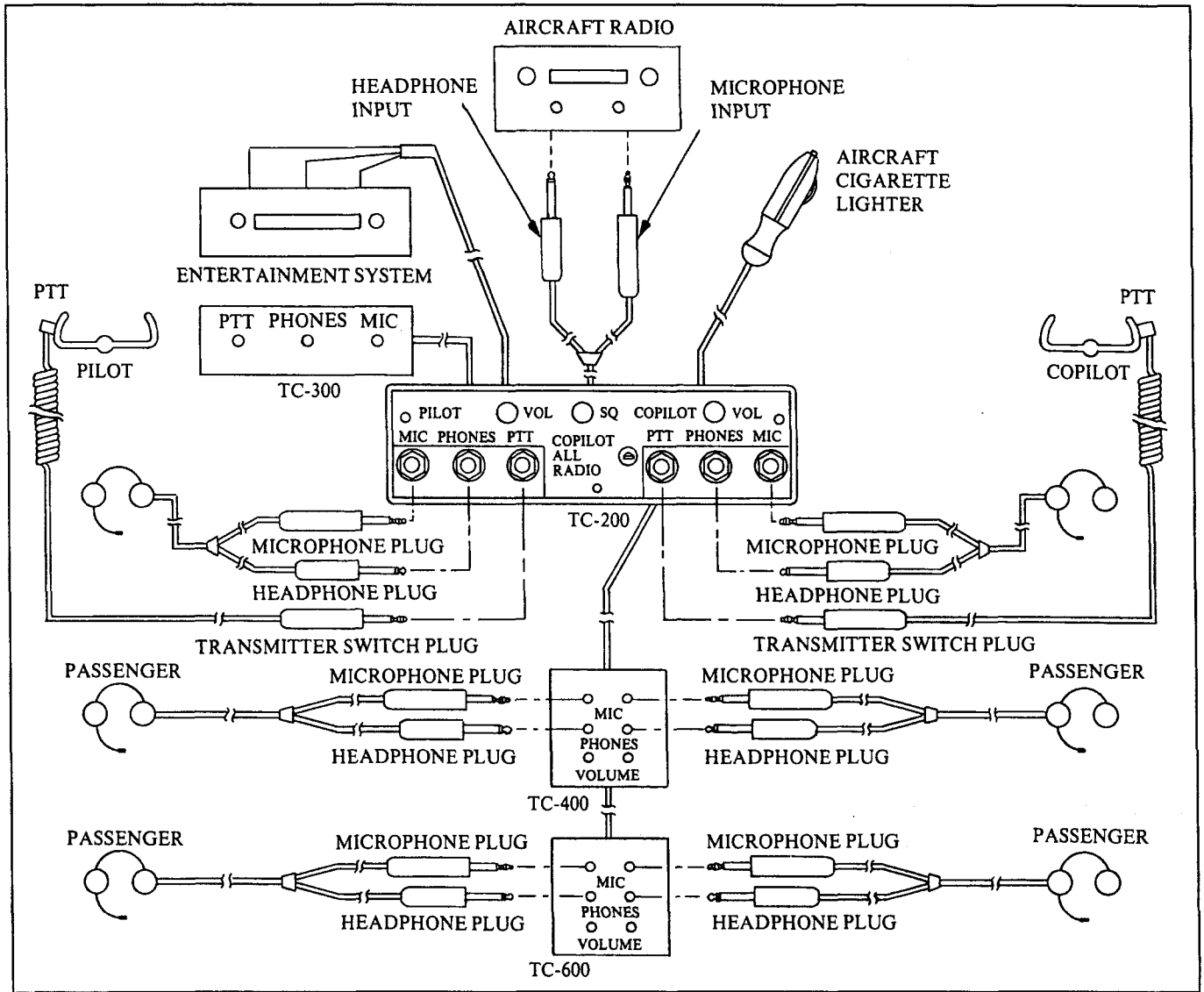
**Headphone:** Power output: 90 mW in 150 ohms;  
 Impedance: 150 to 600 ohms

**Cord Length:** TC-400: 110 inches (2.8 m); TC-600: 75 inches (1.9 m)

**Dimensions:** 2.2 inches (55 mm) high; 2.3 inches (57.5 mm) wide; 3.3 inches (82.5 mm) long

**Weight:** 8.8 ounces (249 grams)

**Color:** Black



Complete System Configuration

### Ordering Information

Model TC-200 Aircraft Intercom . . . . .	Cat. No. 64200-000
Model TC-300 Extension Accessory Module . . . . .	Cat. No. 64057-000
Model TC-400 Expansion Accessory Module . . . . .	Cat. No. 64055-000
Model TC-600 Expansion Accessory Module . . . . .	Cat. No. 64056-000
Model PT-300 Push-To-Talk Switch . . . . .	Cat. No. 63966-000
Model D-950 Headset . . . . .	Cat. No. 63950-000
Model E-951 Headset . . . . .	Cat. No. 63950-001
Yoke Switch Connector . . . . .	Cat. No. 64199-000

