



TC-3.1
Tri-Com, Triple Radio Interface

INSTALLATION & OPERATION MANUAL

REVISION B



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ORIENTATION

ITEMS INCLUDED WITH THE TRI-COM

The Tri-Com Triple Radio Interface comes with the items listed in Table 1. Make sure you have all of these items **BEFORE** proceeding with the installation of the Tri-Com.

QUANTITY	PART NUMBER	DESCRIPTION
2	450-0101-40	#8 Sheet Metal Screws
1	331-0003-00	Fuse, 1 Amp, Fast Blow
1	330-0001-30	In-Line Fuse Holder
1	600-0090-00	Installation and Operation Manual
1	420-0021-00	Interconnect Cable
1	505-0333-00	Mounting Bracket
3	110-5101-30	MR-0X Radio Interface Cable
1	420-0001-00	Power Cable Assembly
2	505-0672-10	Stack Mounting Brackets
1	108-0672-10	Tri-Com Triple Radio Interface Unit

TABLE 1:
Items Included With
The Tri-Com



ORIENTATION

The Tri-Com Triple-Radio Interface permits communication between a Firecom Apparatus Intercom System and up to three different communication systems (e.g., radios, cellular phones, etc.) All three systems will be monitored continuously. Three switches on the front of the Tri-Com allow the operator to select which system(s) will be transmitted on when the headset-mounted Push-To-Talk (PTT) button is pressed. It is possible to transmit on more than one of the communication systems simultaneously.

FRONT AND REAR PANELS

Figure 1 & 2 show the front and rear panels of the Tri-Com. Listed below are the different items found on the front and rear panels with an explanation of their use.

POWER INDICATOR

The Power Indicator is a red LED which lights up whenever power is applied to the Tri-Com.

COM CHANNEL SELECT SWITCHES

These three illuminated switches control which communication device(s) are selected for transmit. These switches light up when on.

POWER CONNECTOR

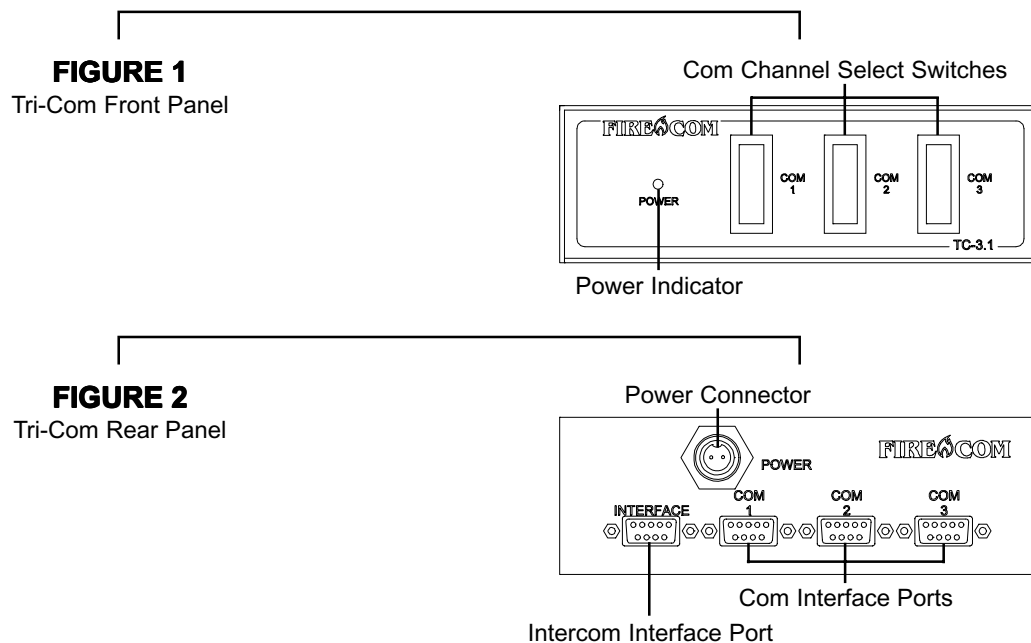
A 2-pin connector where the Power Cable Assembly is plugged in, interfacing the Tri-Com to the vehicle's power supply.

INTERCOM INTERFACE PORT

A 9-pin D-Sub connector which provides the interface of the Tri-Com to the Firecom Intercom System via the Interconnect Cable.

COM CHANNEL INTERFACE PORTS

Three 9-pin D-Sub connectors which provide the interface of the Tri-Com to the Communication devices via Mobile Radio Interface Cable.





ORIENTATION

DEFINITIONS

This section lists some of the more common terms used in this manual and gives their description. Familiarize yourself with these terms before proceeding with the installation of the Tri-Com.

Com Channel Interface Port:	A 9-pin D-sub on the rear of the Tri-Com. The connection point for the Radio Interface Cables which interface the communication devices to the Tri-Com.
Intercom Audio:	Audio present when communicating via the intercom system. Intercom Audio is heard only on-board the vehicle.
Intercom Interface Port:	A 9-pin D-sub on the rear of the Tri-Com. The connection point for the Interconnect Cable which interfaces the Tri-Com to the Intercom Unit.
Intercom Unit:	The main control unit for a Firecom Intercom System.
Intercom-Only Headset:	The Intercom-Only Headset receives both intercom and receive audio at all times. This headset has a Black or Yellow Push-To-Talk (PTT) button for intercom communication, and is NOT capable of radio transmission.
Interconnect Cable:	The cable connecting the Tri-Com to the Intercom Unit.
Radio Interface Cable:	The cable which plugs into the Com Channel Interface Port on one end, and connects to the communication device on the other.
Radio Interface Port:	A 9-pin D-Sub jack on the rear of the Intercom Unit.
Radio-Transmit Headset:	The Radio-Transmit Headset receives both intercom and receive audio at all times. The mic is always active for intercom communication, and has a Red Push-To-Talk (PTT) button for radio communication.
Receive Audio:	Audio from incoming transmissions. This is the same audio heard from the speakers on the communication system.
Transmit Audio:	Audio signals being transmitted on the communication system via a Radio-Transmit Headset with the Red Push-To-Talk (PTT) button.



INSTALLATION

PRE-INSTALLATION

BEFORE installing the Tri-Com make sure you have read AND UNDERSTAND the ENTIRE installation procedure.

If you have any questions regarding this installation procedure, contact your local Firecom Dealer.

If you are also installing a Firecom Intercom System, install the Intercom at this time. Follow the installation procedure in the *Intercom's Installation and Operator's Manual*. STOP when you reach the section on Radio Connections and continue with the procedure below.

If you are installing the Tri-Com onto an existing Firecom Intercom System, make sure you have the manual for the Intercom System available.

IMPORTANT

LOCATING THE TRI-COM

When choosing the location for the Tri-Com, the following items should be considered:

- q The Tri-Com should be located at a point that is near the intercom and radios and is convenient for operator access.
- q If the Tri-Com is being installed on a 3010 Series Intercom, or a 3000 Intercom, the Tri-Com can be mounted on top of the intercom. Figure 3 shows the Tri-Com stacked on top of the 3015 Intercom.

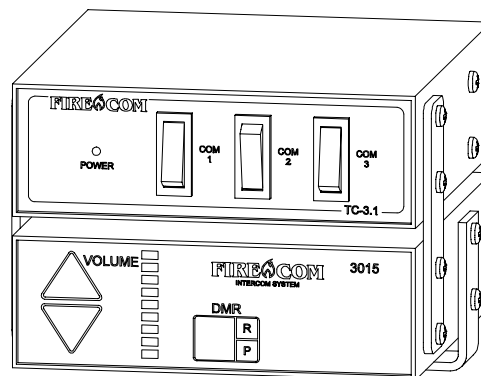
If the intercom is a 110 or 210, the Tri-Com CANNOT be stacked on top of the intercom.

IMPORTANT

- q Allow for at least 3 inches clearance on the sides and rear of the unit.
- q If the Intercom is also being installed at this time, follow the conditions for the location of the intercom listed in the Installation & Operation Manual for the Intercom System.

FIGURE 3

The Tri-Com Stacked on the 3015





INSTALLATION

MOUNTING THE TRI-COM

This section covers mounting the Tri-Com so that it stands on its own. If you wish to stack the Tri-Com on top of a 3000 or a 3010 Series Intercom, skip this section and proceed with [step #5](#) of this procedure (see "[Stacking The Units](#)", page 6).

1. Using the mounting bracket as a template, mark the location of the mounting holes.
2. Using a 1/8 inch drill bit, drill 2 holes for the supplied #8 sheet metal screws.

Before drilling, make sure the area behind the panel you are drilling holes in, is clear of any wires or other obstructions that could be damaged when drilling.

IMPORTANT

3. Install the mounting bracket with the sheet metal screws (Figure 4).
4. Remove the 4 screws (2 on each side) closest to the rear of the Tri-Com and mount the Tri-Com on the mounting bracket with the 4 screws (Figure 5).

DO NOT completely tighten the Tri-Com mounting hardware until the entire installation is complete

IMPORTANT

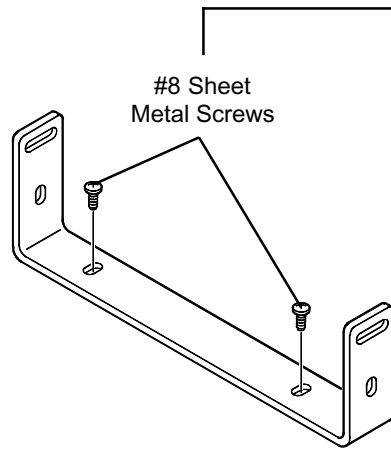


FIGURE 4
The Mounting Bracket

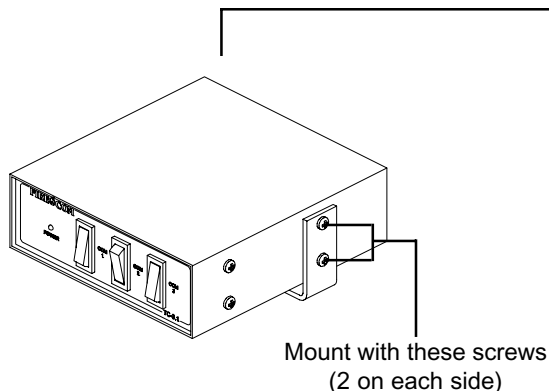


FIGURE 5
Mounting The Tri-Com



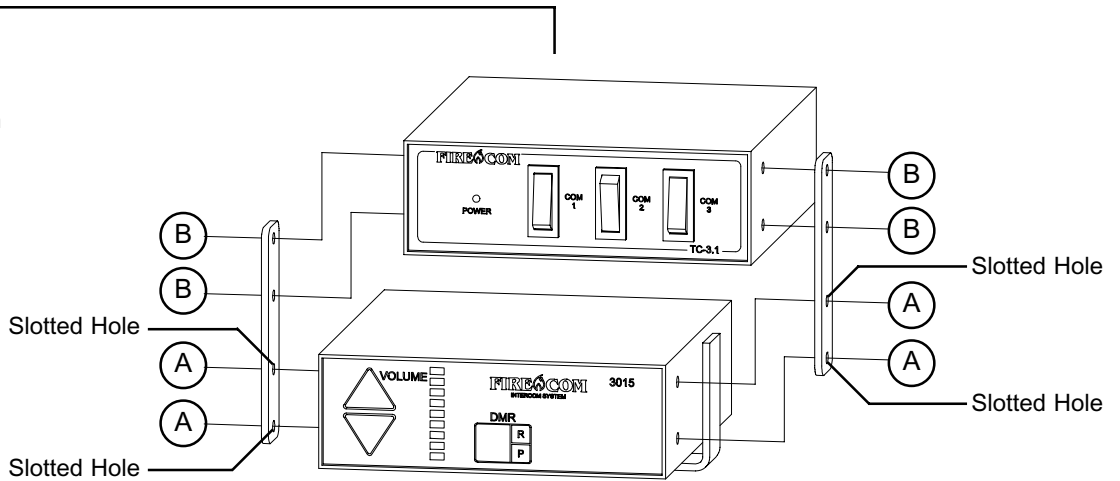
INSTALLATION

STACKING THE UNITS

If you wish to stack the Tri-Com on top of a 3000 or a 3010 Series Intercom, follow the steps below. Figure 6 shows the procedure for stacking the Tri-Com on top of the 3015 Intercom. If you will not be stacking the Tri-Com on top of the intercom, skip steps 5-7 and proceed with [step 8](#) (page 7).

5. If the Intercom is not mounted in place, follow the instructions in the Intercom's manual to mount it in the proper place.
6. Remove the 4 screws (2 on each side) closest to the front of the intercom unit (labeled "A" in Figure 6). Using the screws you just removed, mount the Stack Mounting Brackets (included) on the intercom as shown in Figure 6 using the "slotted" holes in the bracket..
7. Remove the 4 screws (2 on each side) closest to the front of the Tri-Com (labeled "B" in Figure 6) and mount the Tri-Com on the Stack Mounting Brackets with the 4 screws.

FIGURE 6
Stacking the Tri-Com on
the Intercom





INSTALLATION

CONNECTING THE TRI-COM TO THE INTERCOM

Before making any connections, make sure the apparatus master switch is OFF or the battery is disconnected!

IMPORTANT

The connection of the Tri-Com to the Intercom is made via the Tri-Com Interconnect Cable (Figure 7).

8. Connect one of the 9-pin plugs (Figure 7) to the Intercom Interface Port on the rear of the Tri-Com (Figure 8).

Tighten the 2 screws on the 9-pin plugs. If these screws are not tightened, the plug may vibrate loose and cause problems with transmission, reception or other radio interface problems

IMPORTANT

9. Connect the other 9-pin plug (Figure 7) to the Radio Interface Port on the back of the Intercom.

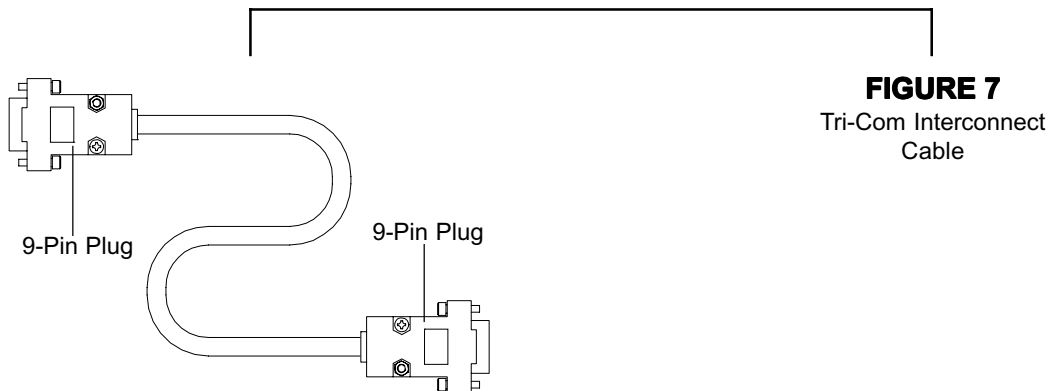


FIGURE 7
Tri-Com Interconnect
Cable

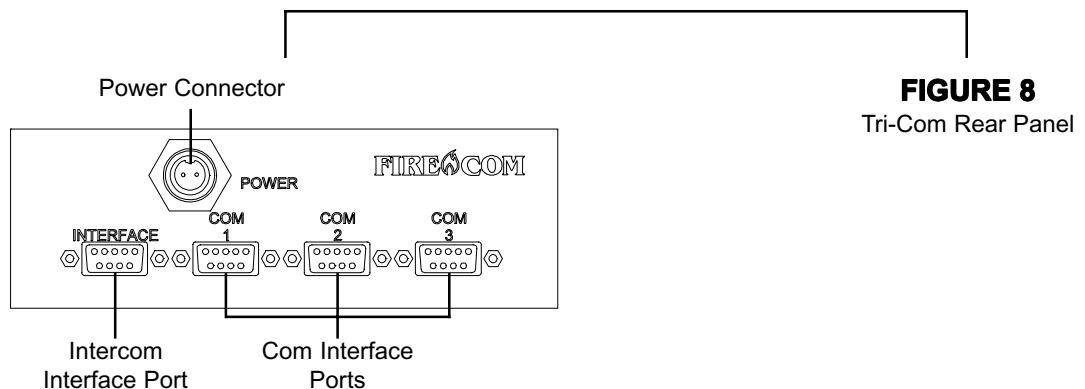


FIGURE 8
Tri-Com Rear Panel



INSTALLATION

POWER & GROUND CONNECTIONS

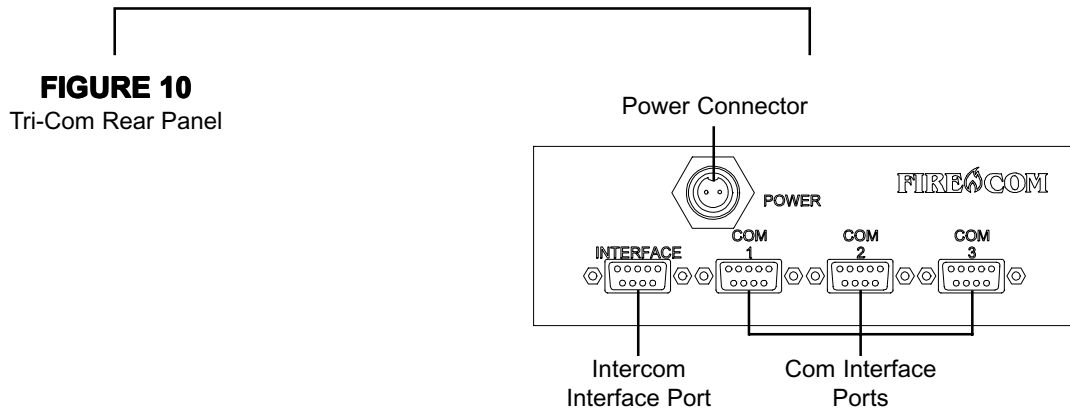
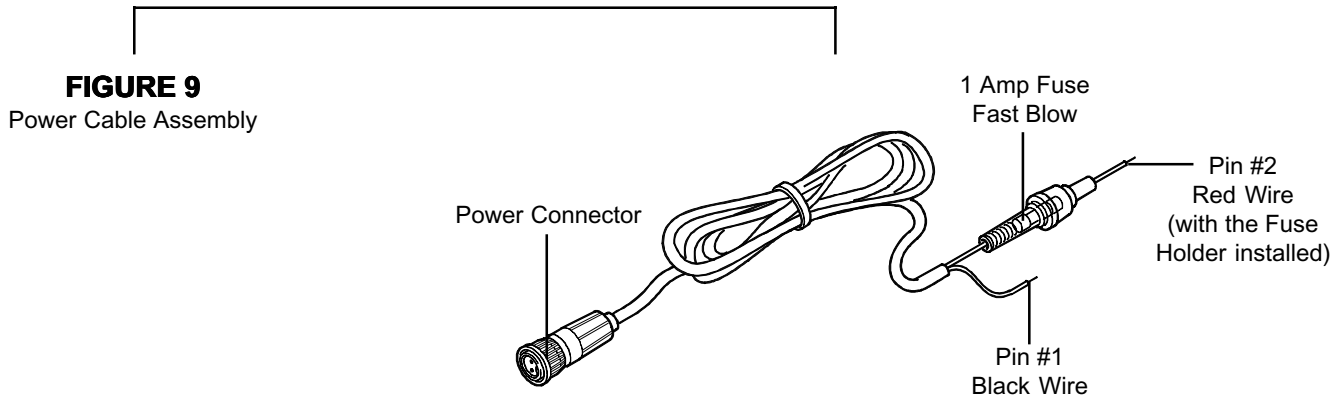
IMPORTANT Before making the power connections, make sure the apparatus master switch is OFF or the battery is disconnected!

10. Connect the Power Cable Assembly (Figure 9) to the Power Connector on the rear of the Tri-Com unit (Figure 10).
11. Connect the black wire (from pin 1) to the vehicle's negative ground.
12. Connect the red wire (from pin 2) to one end of the in-line fuse holder.

IMPORTANT The proper fuse for use with the Tri-Com is a 1 Amp, Fast-Blow fuse.

13. Connect the other end of the fuse holder to the vehicles switched +12 VDC.

IMPORTANT We suggest connecting the Tri-Com power connections to the apparatus power busses, preferably to the same point that the Intercom and the 2-way radios are connected.





INSTALLATION

CONNECTING TO THE COMMUNICATION DEVICES

To ensure proper operation, the connection to the communication devices should be performed by a Qualified Technician.

- 14. If you are connecting the Tri-Com to a mobile radio, and if you are using a radio-specific interface cable, install the cable appropriately and proceed to [page 10](#).

IMPORTANT

If you are unsure if your interface cable is the proper one, or if you want to know if Firecom manufactures a Radio-Specific Interface for your radios, contact your local Firecom Dealer.

IMPORTANT

- 15. Plug the 9-pin plug on the end of the supplied MR-0X Interface Cable (Figure 11) into the Com 1, Com 2 or Com 3 port on the rear of the Tri-Com ([Figure 10](#)).

Tighten the 2 screws on the plug of the MR-0X. If these screws are not tightened, the 9-pin plug may vibrate loose and cause problems with transmission, reception or other radio problems.

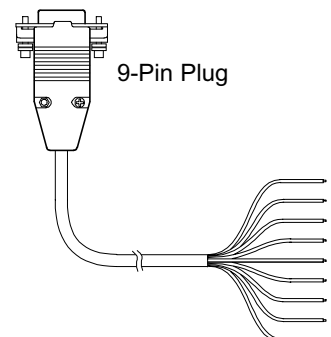
IMPORTANT

- 16. Using the information in Table 2, connect the wires on the MR-0X Interface Cable to the appropriate places on the communication device.
- 17. Repeat steps 14 through 16 of this procedure to interface the Tri-Com with the other 2 communication devices.
- 18. Once **ALL** the communication devices have been interfaced with the Tri-Com, proceed to [page 10](#).

PIN #	COLOR	FUNCTION
1	Brown	TX Audio Hi
2	Red	TX Audio Lo
3	Orange	PTT Hi
4	Yellow	PTT Lo
5	Green	Hook Switch Relay N.O. (3010 Series) Not Used (All Other Models)
6	Blue	RX Audio Hi
7	Violet	RX Audio Lo
8	Gray	Hook Switch Relay N.C. (3010 Series) Not Used (All Other Models)
9	Black	Hook Switch Relay C. (3010 Series) Not Used (All Other Models)

TABLE 2
MR-0X Wire Functions

FIGURE 11
MR-0X Interface Cable





INSTALLATION

3010 SERIES INTERCOM ADJUSTMENTS

IMPORTANT

The intercom **MUST** be adjusted **BEFORE** adjusting the Tri-Com. If the Intercom is **NOT** properly adjusted first, it may not be possible to achieve proper interface with the communication devices. Refer to the Intercom's Installation & Operation Manual for more information regarding the intercom adjustments.

DETERMINING THE ELECTRONICS VERSION

Before the 3010 Series Intercom can be adjusted to work with the Tri-Com, you must first determine which version of electronics are in the 3010 Series Intercom. This is determined by the Serial Number of your intercom. The serial number is located on a label on the bottom of the 3010 Series Intercom.

The serial number will be in one of two different formats:

1. 2548-XX

If the serial number is in this format, it will be necessary to [contact Firecom](#) (with the complete Model Number and Serial Number) for proper adjustment information.

2. E00253

In this format the letter at the beginning of the serial number may be E, F, G, or H.

- If the number after the letter is less than 10,000, it will be necessary to [contact Firecom](#) (with the complete Model Number and Serial Number) for proper adjustment information.
- If the number after the letter is greater than 10,000, the intercom has the current version of electronics. Proceed with the adjustment procedure starting with [step 19 on page 11](#).



INSTALLATION

3010 SERIES INTERCOM ADJUSTMENTS

The intercom **MUST** be adjusted **BEFORE** adjusting the Tri-Com. If the Intercom is **NOT** properly adjusted first, it may not be possible to achieve proper interface with the communication devices. Refer to the Intercom's Installation & Operation Manual for more information regarding the intercom adjustments.

IMPORTANT

Figure 12 shows the 3010 Series Circuit Board and points out the variable resistors and switches used in adjusting the Intercom. Figure 13 shows a larger view of a Range Switch Assembly.

The proper procedure for adjusting the intercom to interface with the Tri-Com is to have a Qualified Radio Technician, with a Service Monitor, set the Transmit and Receive Audio to "Unity Gain".

IMPORTANT

If a Qualified Radio Technician is **NOT** available, use the following procedure to adjust the intercom. The following procedure is **NOT** an exact adjustment and **MAY NOT** provide for a proper adjustment of the intercom to interface with the Tri-Com.

IMPORTANT

19. Set **BOTH** switches on Range Switch Assembly S1 to **ON** (use S2 if the Tri-Com is interfaced into Radio B on a 3020 or 3025).
20. Turn the adjustment wheel on VR5 all the way towards the front of the intercom (use VR6 if the Tri-Com is interfaced into Radio B on a 3020 or 3025).
21. Set VR3 to the middle of its adjustment range (use VR4 if the Tri-Com is interfaced into Radio B on a 3020 or 3025).
22. Continue with [step 29 on page 15](#) in this procedure.

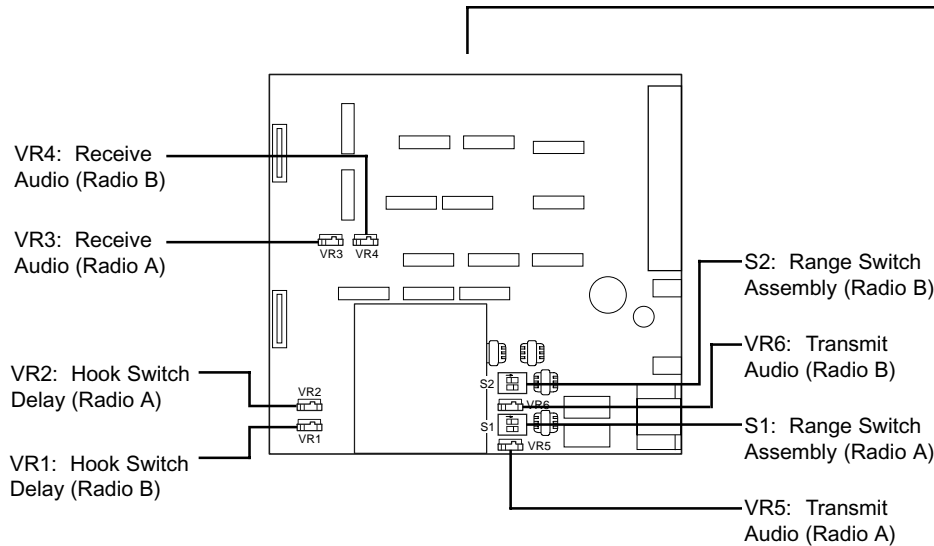
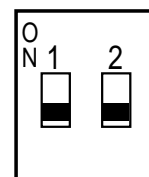


FIGURE 12
3010 Series Adjustments

FIGURE 13
Range Switch Assembly





INSTALLATION

3000C INTERCOM ADJUSTMENTS

IMPORTANT

The intercom **MUST** be adjusted **BEFORE** adjusting the Tri-Com. If the Intercom is **NOT** properly adjusted first, it may not be possible to achieve proper interface with the communication devices. Refer to the Intercom's Installation & Operation Manual for more information regarding the intercom adjustments.

DETERMINING THE ELECTRONICS VERSION

The instructions which follow, are for the Firecom 3000 Intercom version 3000C. Before adjusting the 3000 Intercom, it will be necessary to determine if your 3000 Intercom is a version 3000C. This is determined by the Serial Number of your intercom. The serial number is located on a label on the bottom of the 3000 Intercom.

The serial number will be in one of two different formats:

1. 2548

If the serial number is in this format, your intercom is a version prior to the 3000C and it will be necessary to [contact Firecom](#) (with the complete Model Number and Serial Number) for proper adjustment information.

2. C00253

In this format the letter at the beginning of the serial number may be C or D, your intercom is a version 3000C. Proceed with the adjustment procedure starting with [step 23 on page 13](#).

INSTALLATION

3000C INTERCOM ADJUSTMENTS

The intercom **MUST** be adjusted **BEFORE** adjusting the Tri-Com. If the Intercom is **NOT** properly adjusted first, it may not be possible to achieve proper interface with the communication devices. Refer to the Intercom's Installation & Operation Manual for more information regarding the intercom adjustments.

IMPORTANT

Figure 14 shows the 3000C Circuit Board and points out the Variable Resistors and switches used in adjusting the Intercom. Figure 15 shows a larger view of the Range Switch Assembly.

The proper procedure for adjusting the intercom to interface with the Tri-Com is to have a Qualified Radio Technician, with a Service Monitor, set the Transmit and Receive Audio to "Unity Gain".

IMPORTANT

If a Qualified Radio Technician is **NOT** available, use the following procedure to adjust the intercom. The following procedure is **NOT** an exact adjustment and **MAY NOT** provide for a proper adjustment of the intercom to interface with the Tri-Com.

IMPORTANT

23. Set **BOTH** switches on Range Switch Assembly S1 to **ON**.
24. Turn the adjustment wheel on VR4 all the way towards the left of the intercom.
25. Set VR6 to the middle of its adjustment range.
26. Continue with [step 29 on page 15](#) in this procedure.

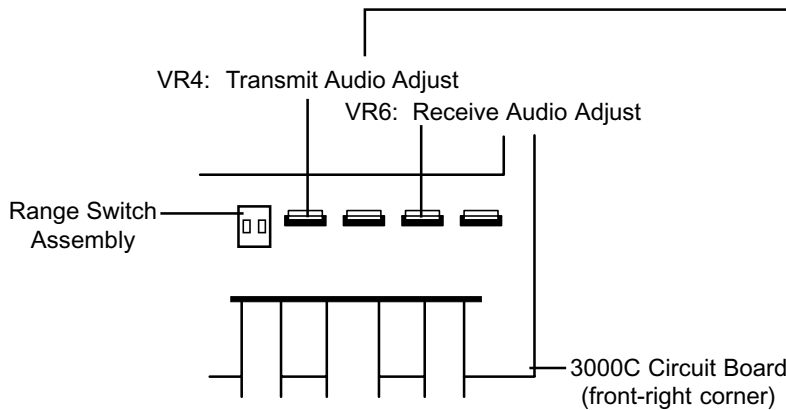
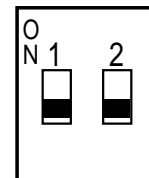


FIGURE 14
3000C Adjustments

FIGURE 15
Range Switch Assembly



INSTALLATION

110 OR 210 INTERCOM ADJUSTMENTS

IMPORTANT

The intercom **MUST** be adjusted **BEFORE** adjusting the Tri-Com. If the Intercom is **NOT** properly adjusted first, it may not be possible to achieve proper interface with the communication devices. Refer to the Intercom's Installation & Operation Manual for more information regarding the intercom adjustments.

Figure 16 shows the 110/210 Circuit Board and points out the Variable Resistors used in adjusting the Intercom.

27. The Transmit Audio and the Receive Audio **MUST** be adjusted by a radio tech with a service monitor. Adjust both of these to a setting which provides "Unity Gain."

- R1 adjusts the Receive Audio
- R3 adjusts the Transmit Audio

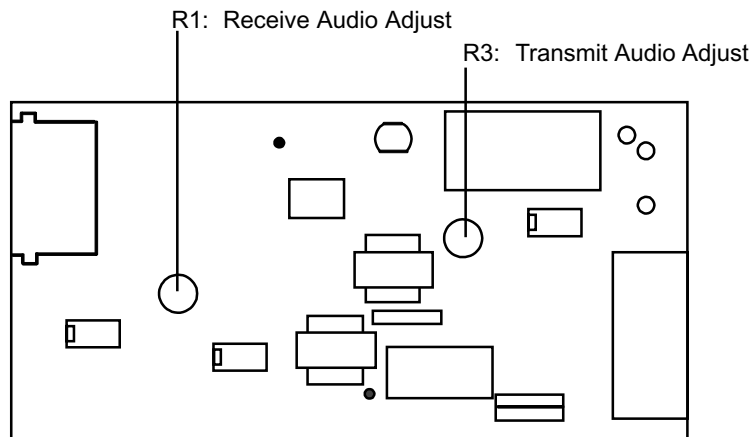
IMPORTANT

To properly adjust the 110 or 210 for interface to a Tri-Com, these adjustments MUST be performed by a Qualified Radio Technician.

28. Continue with [step 29 on page 15](#) in this procedure.

FIGURE 16

110 & 210 Adjustments



INSTALLATION

TRI-COM ADJUSTMENTS

RECEIVE AUDIO ADJUSTMENT

The Receive Audio Adjustment ensures that the volume of incoming transmissions from any of the Communication Systems are not drastically louder or softer than intercom communications. These adjustments are accomplished by adjusting VR4, VR5 and VR6 located on the circuit board inside the Tri-Com (Figure 17).

29. Turn the 2-way radio(s) on, and adjust the radio volume to the normal volume level for use **WITHOUT THE INTERCOM INSTALLED.**
30. **Com Channel 1:** Adjust VR6 in the Tri-Com to set the volume of incoming Radio Transmissions so that it is at the same level as the audio heard when listening to someone speak over the intercom.
31. **Com Channel 2:** Adjust VR4 in the Tri-Com to set the volume of incoming Radio Transmissions so that it is at the same level as the audio heard when listening to someone speak over the intercom.
32. **Com Channel 3:** Adjust VR5 in the Tri-Com to set the volume of incoming Radio Transmissions so that it is at the same level as the audio heard when listening to someone speak over the intercom.

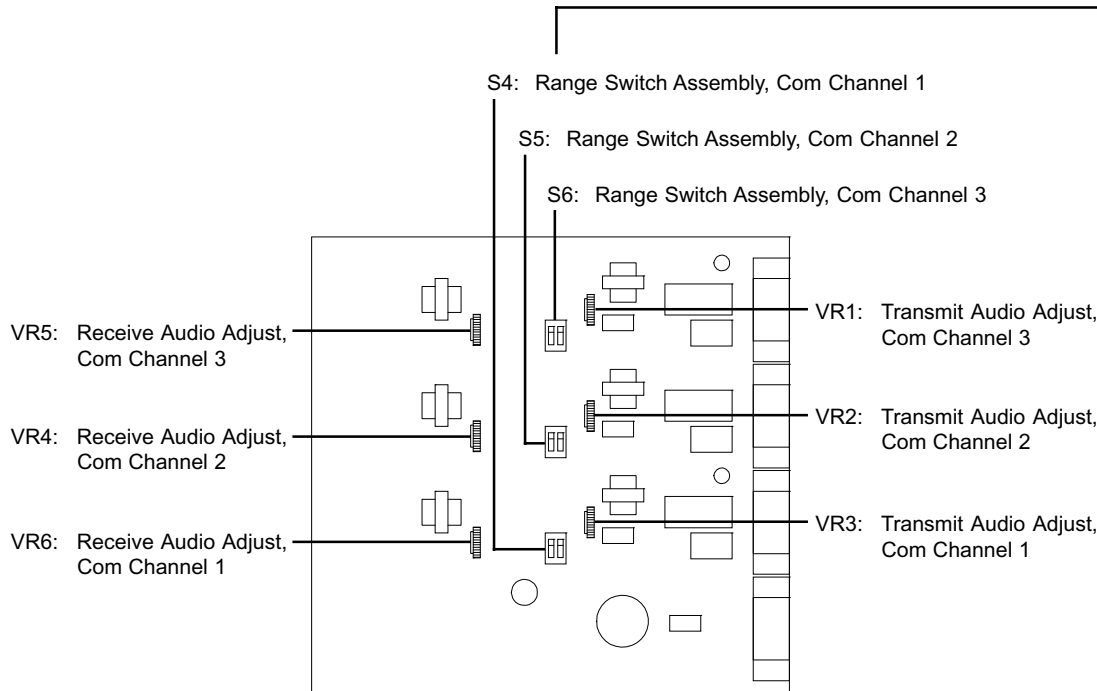


FIGURE 17
Tri-Com Adjustments



INSTALLATION

TRI-COM ADJUSTMENTS (cont.)

TRANSMIT AUDIO ADJUSTMENT

The Transmit Audio Adjustments in the Tri-Com are adjusted using the Range Switch Assemblies S4, S5 & S6 and Variable Resistors VR1, VR2 & VR3 (Figure 18). The Range Switch Assemblies (Figure 19) have 2 switches on each which select the range for the Transmit Audio Adjustment. Table 3 shows the switch settings for each range available.

The Variable Resistors adjust the Transmit Audio within the range selected by the Range Switch Assemblies.

33. Com Channel 1:

33a. Using the Com Channel Select Switches on the front of the Tri-Com (Figure 20), turn Com 1 on. Turn Com 2 & Com 3 off.

33b. **USING A SERVICE MONITOR**, use S4 & VR3 to adjust the Transmit Audio for proper transmitter deviation and no transmit audio clipping.

34. Com Channel 2:

34a. Using the Com Channel Select Switches on the front of the Tri-Com (Figure 20), turn Com 2 on. Turn Com 1 & Com 3 off.

34b. **USING A SERVICE MONITOR**, use S5 & VR2 to adjust the Transmit Audio for proper transmitter deviation and no transmit audio clipping.

35. Com Channel 3:

35a. Using the Com Channel Select Switches on the front of the Tri-Com (Figure 20), turn Com 3 on. Turn Com 1 & Com 2 off.

35b. **USING A SERVICE MONITOR**, use S6 & VR1 to adjust the Transmit Audio for proper transmitter deviation and no transmit audio clipping.

IMPORTANT

For proper adjustment of the Transmit Audio, these adjustments MUST be performed by a Qualified Radio Technician, using a service monitor.

INSTALLATION

TRI-COM ADJUSTMENTS (cont.)

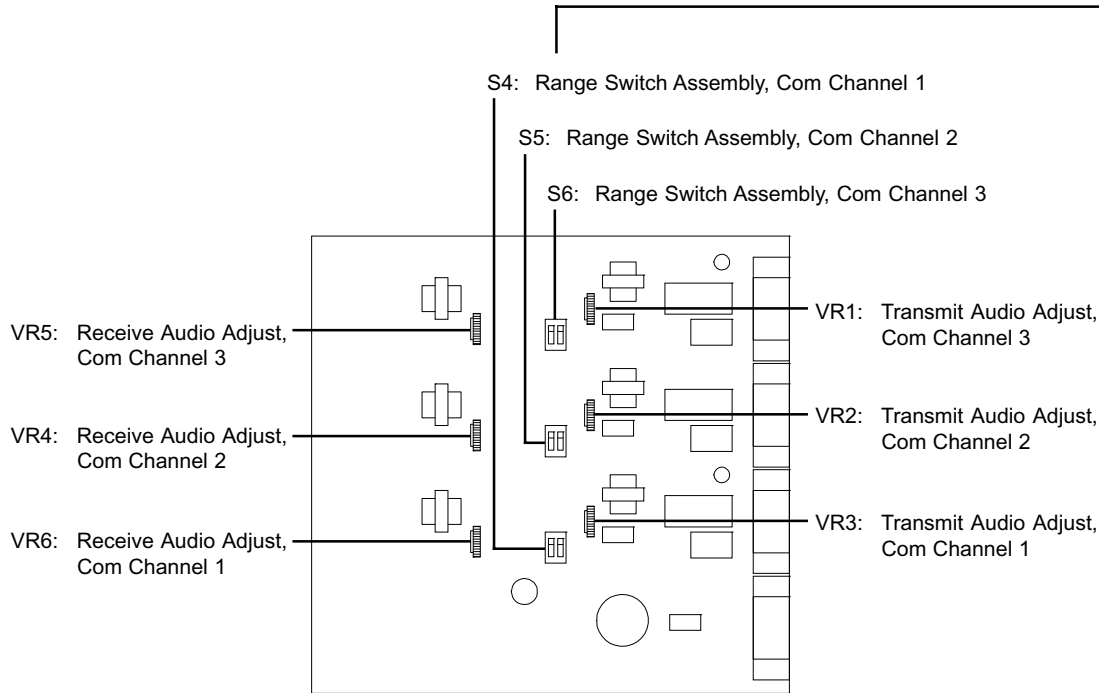


FIGURE 18
Tri-Com Adjustments

FIGURE 19
Range Switch Assembly

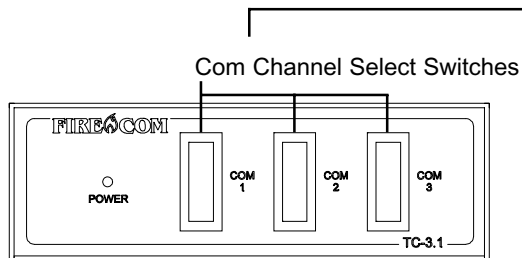
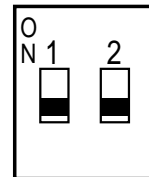


FIGURE 20
Tri-Com Front Panel

S1	S2	MIC TO OUTPUT GAIN
on	on	+20.8 dB to 0.8 dB
on	off	1.58 dB to -19 dB
off	off	-18.4 dB to -39.1 dB

(maximum signal at mic jack: 1.1v pk-pk)

TABLE 3
Range Switch Settings



OPERATION

When the Tri-Com is properly installed and adjusted, all crew members will hear inter-com communication and incoming transmissions from all 3 communication systems. Crew members wearing Radio-Transmit headsets will be able to transmit on the selected communication system(s) by pressing the red Push-To-Talk (PTT) Button on the headset.

SELECTING A COMMUNICATION SYSTEM

In order to transmit on a specific communication system, the appropriate Com Channel on the Tri-Com must first be active.

Pressing the upper portion of a Com Channel Select Switch on the Tri-Com will activate the Com Channel for transmission. When a Com Channel is active, the switch will also be lit. Figure 22 shows the front of the Tri-Com with Com Channel 1 active and Com Channels 2 & 3 off.

When the Red PTT on a Radio-Transmit Headset is pressed, the communication systems for ALL of the *active* Com Channels will key for transmit.

- If all 3 Com Channel switches are on and lit, transmission will occur simultaneously on all three communication systems.
- If none of the Com Channel Switches are on and lit, none of the communication systems will key for transmit, and no transmission will take place.

FIGURE 21
Tri-Com Front Panel

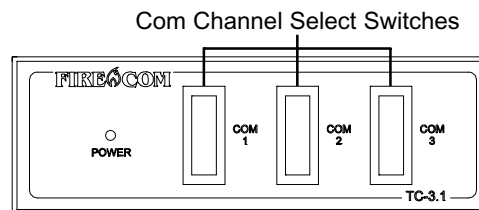
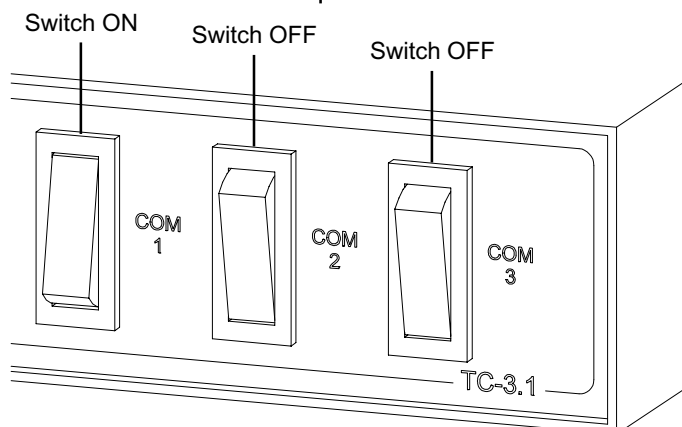


FIGURE 22
Com Channel Switch Positions





WARRANTY

TWO-YEAR LIMITED WARRANTY TO ORIGINAL PURCHASER

Sonetics Corporation warrants to the original purchaser of its products, that they will be free from defects in materials and workmanship, under normal and proper use, for the period of two years from date of purchase. Sonetics Corporation will repair or replace, at its option, any parts showing factory defects during this warranty period, subject to the following provisions. This warranty applies only to a new product which has been sold through authorized channels of distribution. All work under warranty must be performed by Sonetics Corporation. All returned products must be shipped to our address, freight prepaid, accompanied by a dated proof of purchase. The purchaser voids this warranty if he, she or others attempt to repair, service or alter the product in any way. This warranty does not apply in the event of accident, abuse, improper installation, unauthorized repair, tampering, modification, fire, flood, collision, or other damage from external sources, including damage which is caused by user replaceable parts (leaking batteries, etc.). This warranty does not extend to any other equipment or apparatus to which this product may be attached or connected. The foregoing is your sole remedy for failure in service or defects. Sonetics Corporation shall not be liable under this or any implied warranty for incidental or consequential damages, nor for any installation or removal costs or other service fees. This warranty is in lieu of all other warranties, express or implied, including the warranty of merchantability or fitness of use, which are hereby excluded. To the extent that this exclusion is not legally enforceable, the duration of such implied warranties shall be limited to two years from date of purchase. No suit for breach of express or implied warranty may be brought after two years from date of purchase.



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