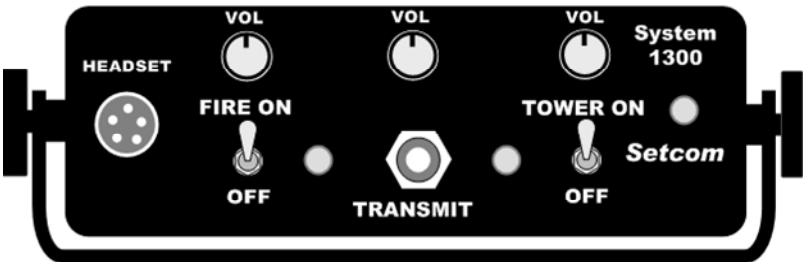
Installation and Operations Manual

System 1300



M-1205

Rev 4

Table of Contents

1. GENERAL

This Operating Instruction describes the features, components, installation, and operation for the Setcom System 1300 Intercom and Radio Mixer. Prior to commencing installation, read this manual completely through and check the components ordered against those received. Prior to installation the radio, alternator, and vehicle battery should be in good working order. Any pre-existing receive or transmit problems with the radio should be corrected prior to installation of the intercom.

2. SYSTEM DESCRIPTION

The Setcom System 1300 is a vehicular intercom/radio mixer designed specifically for use at airports or other applications with demanding dual radio receive and transmit requirements. The System 1300 employs Split-Audio. For radio transmit headsets, the Tower Radio is heard in the right ear only and the Fire Operations and intercom are heard in the left ear only. This makes it easier for crew members monitoring and transmitting on both radios to separate and understand incoming audio. Each crew member has separate controls for each of the three audio inputs. Each crew member's station controls are independent from other crew member's. This allows each crew member to select his own primary radio that can be distinguished by both the volume and the right and left side separation. The System 1300 is modular and can be configured from a single man system to an eleven position aerial. This manual will discuss the most commonly used modules and system configurations. A System Diagram specific to the configuration you purchased is prepared and is included with this manual when the unit ships from the factory. A copy is maintained in a master file at Setcom allowing us to determine your exact configuration for troubleshooting or upgrading purposes.

2.1. STANDARD FEATURES SYSTEM 1300

- Radio Receive/Transmit capability for two radios
- Simultaneous transmit capability on two radios
- Split-Audio reception
- Audio-only input port for a third radio or other audio device
- Separate volume controls for AM radio, FM Radio and the intercom audio at each Receive/Transmit position.
- Only the keying station transmits on radio
- Fully isolated Master Station with double shielded interconnecting cabling preventing crosstalk between channels
- RFI and EMI protection
- Hand microphones and cabin speakers are retained and may be used normally
- Radio transmit capable headsets can be used with a portable radio or can be connected to the aircraft intercom circuit with the proper adapter

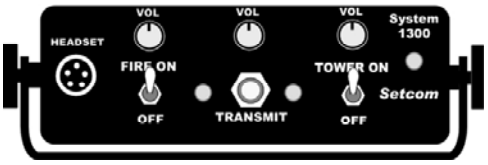
2.2. AVAILABLE OPTIONAL FEATURES

- Radio Select Module expands receive/transmit access to three radios
- Up to four jumpseat positions with intercom access and Split-Audio radio monitor
- Dual-Radio Split-Audio Weatherproof Remote Station for use at a pump station or for marine applications
- Intercom-only tailboard/mechanic's station
- Up to five, intercom and full radio access crew member positions.
- Portable Radio Adapter Cable, Aircraft Intercom Adapter Cable

3. SYSTEM COMPONENTS

3.1. MS-1310 MASTER STATION

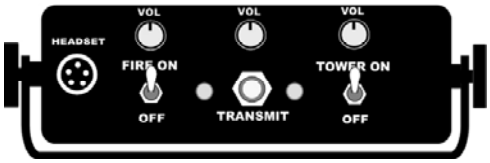
MS-1310 Master Station



The MS-1310 Master Station provides a jack-in point for one operator. It provides ports for radio interface and two full featured remote stations. It also provides a mini-plug port for audio only input of a third radio or other audio accessory. The central three-position radio transmit switch offers a “Select-and-Key” feature for radio transmission. To respond to the radio heard in the right ear, the momentary toggle is held to the right. To key the radio heard in the left ear, the switch is held to the left. Variants such as the MS-1310B and MS-1310X allow for single or dual footswitch options. The specific components used on each delivered system are detailed in the System Diagram prepared for each system.

3.2. RS-1310 REMOTE STATION

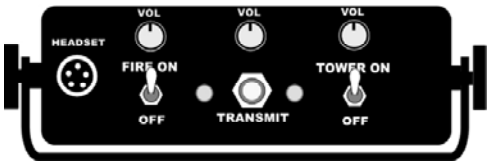
RS-1310 Remote Station



With the exception of the power light, the RS-1310 Remote Station and MS-1310 Master Station are functionally identically from the standpoint of the crew. The RS-1310 is connected to the MS-1310 by a Master Remote Cable. See Section 4. As with the MS-1310, many variants of the RS-1310 are available offering remote PTT, footswitches and the ability to daisy-chain another full-featured remote station.

3.3. REMOTE STATION WITH EXPANSION PORT

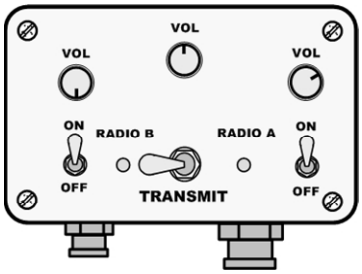
RS-1310-6 Remote Station with Expansion Port



The RS-1310-6 Remote Station with Expansion Port is identical in function to the RS-1310 with the exception it is housed in a deeper box and has a daisy-chain port for an additional remote station. Either another RS-1310 can be plugged into this port or the weatherproof RS-1310W/2 for use at the Pump Panel Station or for Marine applications. Note that the RS-1310-6 should always be plugged into the left side remote port of the MS-1310 as shown in Sections 4.7, 4.9 and 4.10.

3.4. RS-1310W/2 WEATHERPROOF REMOTE STATION

RS-1310W/2 Weatherproof Remote Station



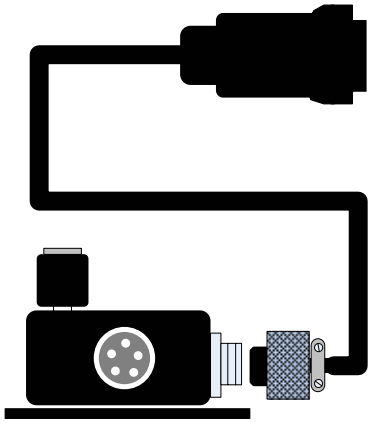
The RS-1310W/2 is a weatherproofed version of the RS-1310 Remote Station. There are again several variants, but the most commonly used model is the RS-1310W/2. This is our recommended model for a dual radio pump panel station. The transmit switch on this variant is a locking toggle switch. When used in conjunction with the CSB-1310D/R-2 Headset, the transmit frequency is selected by the two-position locking radio select switch and a PTT button located in the in-line box associated with the headset keys the selected radio. This surface mount enclosure is rated for continuous exposure to ultra-violet rays and has a gasketed lid and watertight connections for the interconnect cable and headset. All knobs and switches are weatherproof.

3.5. MRC-__ MASTER REMTOE CABLE

Master Remote Cable

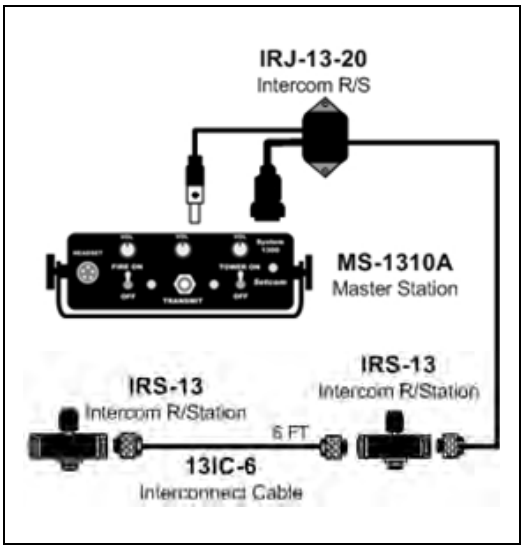
Master and Remote Stations are connected with an 18-Pin Conxall connector terminated cable assembly. Cables come is various standard lengths. The most commonly used in the cab are a MRC-4 four foot cable and the MRC-8 with an eight foot cable. For connecting a full featured pump station, a MRC-30 or MRC-40 are most commonly used but alternate cable lengths are available.

3.6. JS-1315-3 JUMPSEAT STATION



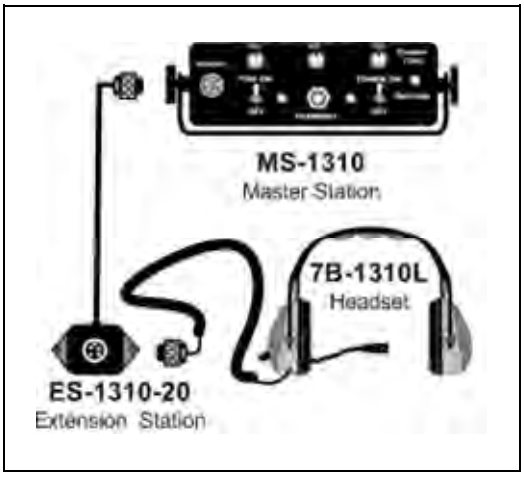
The JS-1315-3 is a Jumpseat Station with radio monitor intercom access capability. It is connected to a standard MS-1310 Master Station through an available remote station port. It is connected with the MJSC-20 Master/Jumpseat Cable. The intercom volume knob is located on this station. Radio volume knobs are located on the CSB-1310JSR Jumpseat Headset. This station is normally used for a three man configuration where only two crew members need radio transmit access and there is an available remote station port on the master station. If more than one jumpseat station is required then an IRJ-13-20 needs to be used in conjunction with the daisy-chainable IRS-13 Jumpseat Station (See 3.7).

3.7. IRJ-13-20 INTERCOM RADIO JUNCTION MODULE



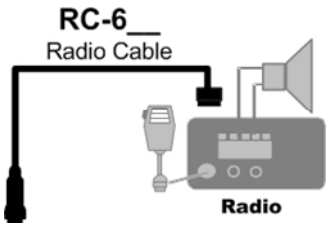
If more than one jumpseat station with radio monitor and intercom access is needed, the IRJ-13-20 Intercom Radio Junction Module, configured as shown left, is required. A MS-1310A with an intercom only port is needed along with the one IRS-13 Intercom Radio Station per jumpseat position. Each additional IRS-13 station needs a 13IC-6 Interconnect Cable as shown left. This configuration is commonly used on structural pumpers being used at an airport. A four man system plus a full-featured dual-radio pump panel station can be easily accommodated. Driver and Captain would have radio access and the two or four jumpseat positions would monitor the radios and have intercom access. See Sections 4.5 & 4.6 for representative system diagrams showing this configuration.

3.8. ES-1310-20 EXTENSION STATION



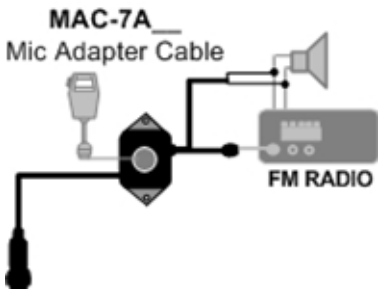
A radio transmit headset can plug directly into the MS-1300 Master Station or RS-1310 Remote Station. More commonly, the headset jack-in point is remoted to a location behind and over the operator's shoulder. The MS-1310 or RS-1310 is located within his field of vision for ease of operating the controls. The standard extension station cable length for an ARFF vehicle is 20 feet. This allows the cable to be routed cleanly either behind the headliner or under the floor mat.

3.9. RC-6-__ RADIO CABLE



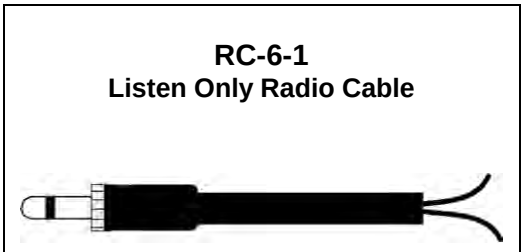
If the radio has an accessory port, it can be interfaced to the master station with a RC-6XX. Setcom uses a two or three position alphanumeric code to identify the Setcom interface. The part number shipped to you will have the XX in the above example replaced the Setcom code for the model of radio you are interfacing to. Radio cables are normally a length of shielded cable terminated at either end with a connector. The connector to the master station is a six pin Conxall. The radio end is the connector specific to the make and model of the radio. **NOTE! The AM or TOWER radio must be connected to the right circuit and the FM radio to the FIRE or left circuit. The gain levels in the master station are set to match the level required by each radio. These levels are normally different and connecting the radio out of order will cause over modulation on one radio and under modulation of the other.** Tower Right and FIRE + Intercom Left, pioneered by Setcom, is now an industry standard used at airports across the country.

3.10.MAC-7A__ MICROPHONE ADAPTER CABLE



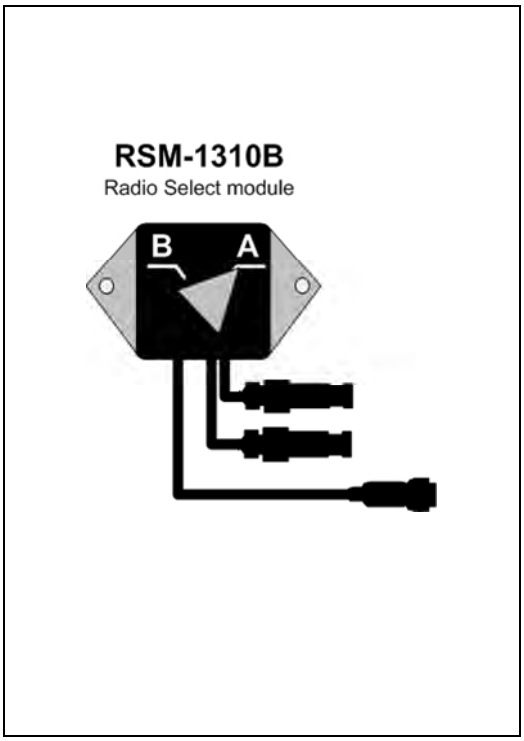
A microphone adapter cable interfaces the MS-1310 Master Station to a radio through the handmic port and external speaker leads. The standard handmic is plugged back into the MAC. This method of interface is used when the radio is not equipped with an accessory port. **NOTE! The AM or TOWER radio must be connected to the right circuit and the FM radio to the FIRE or left circuit. The gain levels in the master station are set to match the level required by each radio. These levels are normally different and connecting the radio out of order will cause over modulation on one radio and under modulation of the other**

3.11. RC-6-1 LISTEN ONLY RADIO CABLE



The RC-6-1 Listen Only Radio Cable plugs into the 1/8” mini-plug port on the back of the standard MS-1300 Master Station and all master station variants. When connected to the audio-out of a third radio or other audio device, the MS-1300 will mix the incoming audio from the third radio to the intercom circuit and it will be heard in the left ear speaker. The intercom volume knob on each crew member’s station will move third radio volume up and down with the intercom level. Additionally, the volume can be increased generally to the MS-1310 by using the volume knob on this additional audio device. See Section 4.3 for typical installation

3.12. RSM-1310_ RADIO SELECT MODULE



The Radio Select Module provides a method of sharing the FIRE or left radio circuit between two radios. This means a total of three receive/transmit radios on the system. If the two radios are operating on the same microphone level, and the crew want to simultaneous monitor both radios, then a RSM-1310B is used. Transmit will be on the selected radio. There are several RSM variants allowing the operator to:

- accommodate mixing two radios with different microphone levels
- monitor and transmit on the selected frequency only
- allow the crew a choice between monitoring one or both radios by adding a mode switch to the RSM

The specific RSM-1310 for your configuration will be shown on the System Diagram provided with your System 1300. Examples of configurations with the radio select module can be seen in Section 4.7 and 4.8.

3.13. CSB-1310 SERIES HEADSETS

The CSB-1310R and CSB-1310L are the right and left dress, behind-the-head springband configuration, radio transmit headsets. The behind-the-head springband design allows it to be worn with a hat or fire helmet. It features an amplified electret microphone on a flexible boom, seven-foot coil cord and a Noise Reduction Rating (NRR) of 24 decibels. The one piece support sling runs thru molded in slots in the cups. An exploded view of this headset is provided in Section 8.6 of this manual.

3.14. 7B-1310 SERIES HEADSETS

The 7B-1310R and 7B-1310L are the right and left dress, over-the-head springband, radio transmit headsets. This series is also called the High-Comfort Headset as it achieves a NRR or 24 decibels with about half the weight and less pressure against the head. It cannot be worn with a fire helmet. It features an amplified electret microphone on a flexible boom and a seven-foot coil cord.

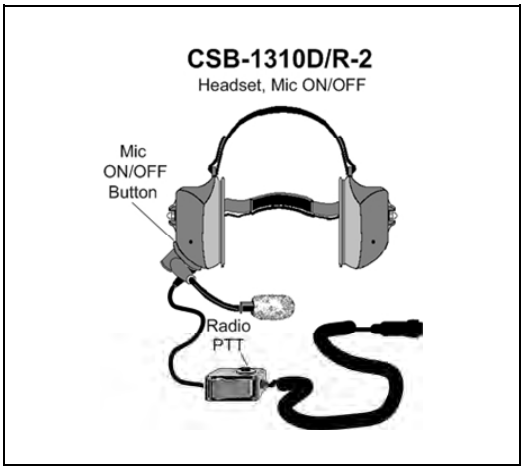
3.15. CSB-1310JS SERIES JUMPSEAT HEADSETS

The CSB-1310JSR and CSB-1310JSL are the right and left dress, behind-the-head springband configuration, jumpseat headsets. The behind-the-head springband design allows it to be worn with a hat or fire helmet. It features an amplified electret microphone on a flexible boom, seven-foot coil cord and a Noise Reduction Rating (NRR) of 24 decibels. They provide Split-Audio radio listen with individual volume controls for the AM, FM and Intercom audio. The AM & FM volume controls are in the cups. The intercom volume is in the jumpseat station as shown in Sections 3.5 and 3.6. The Intercom is on the dress side speaker; Right Dress heasdsets have intercom in the right speaker and Left Dress headsets have intercom in the left speaker. The one piece support sling runs thru molded in slots in the cups. An exploded view of this headset is provided in Section 8.7 of this manual.

3.16.7B-1310JS JUMPSEAT HEADSETS

The 7B-1310JSR and 7B-1310JSL are the right and left dress, over-the-head springband, jumpseat headsets. They provide Split-Audio radio listen with individual volume controls for the AM and FM radio audio. The AM & FM volume controls are in the cups. The intercom volume control is in the Jumpseat Station as shown in Sections 3.5 and 3.6. The Intercom is on the dress side speaker; Right Dress heasdsets have intercom in the right speaker and Left Dress headsets have intercom in the left speaker.This series is also called the High-Comfort Headset as it achieves a NRR or 24 decibels with about half the weight and less pressure against the head. It cannot be worn with a fire helmet. It features an amplified electret microphone on a flexible boom and a seven-foot coil cord.

3.17. CSB-1310D/R-2 WEATHERPROOF RADIO ACCESS HEADSET



The CSB-1310D/R-2 is the right dress, behind-the-head springband, weatherproof headset intended for use at a pump panel station or other exterior application. The behind-the-head springband design allows it to be worn with a hat or fire helmet. It features an amplified electret microphone on a flexible boom, fourteen-foot coil cord terminated with a weatherproof connector and a Noise Reduction Rating (NRR) of 24 decibels. It provides Split-Audio radio access with intercom when plugged into the RS-1310W/2 Weatherproof Remote Station. The one-piece support sling runs thru molded-in slots in the cups. An exploded view of this headset is provided in Section 8.8 of this manual.

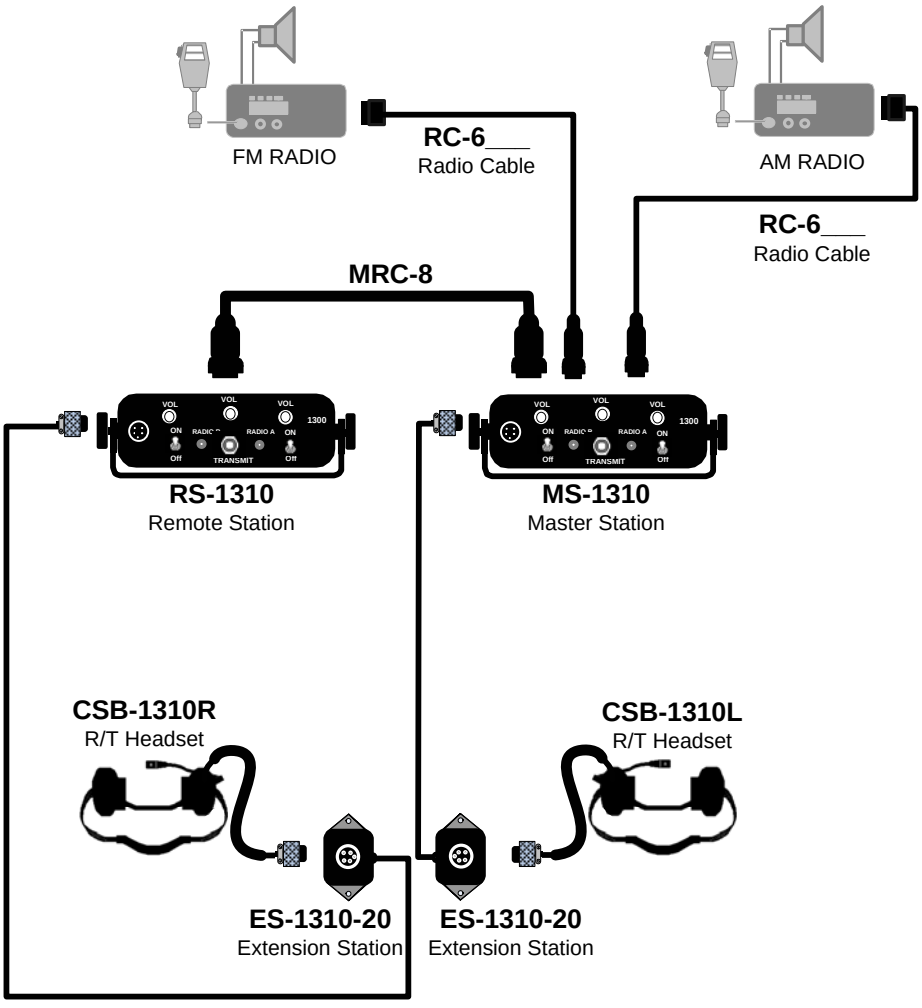
4. REPRESENTATIVE SYSTEMS

4.1. TWO-MAN/TWO POSITION BASIC SYSTEM

System 1300

Two Man Split Audio System

1300\ARFF\CSB\2x2RC.pdf

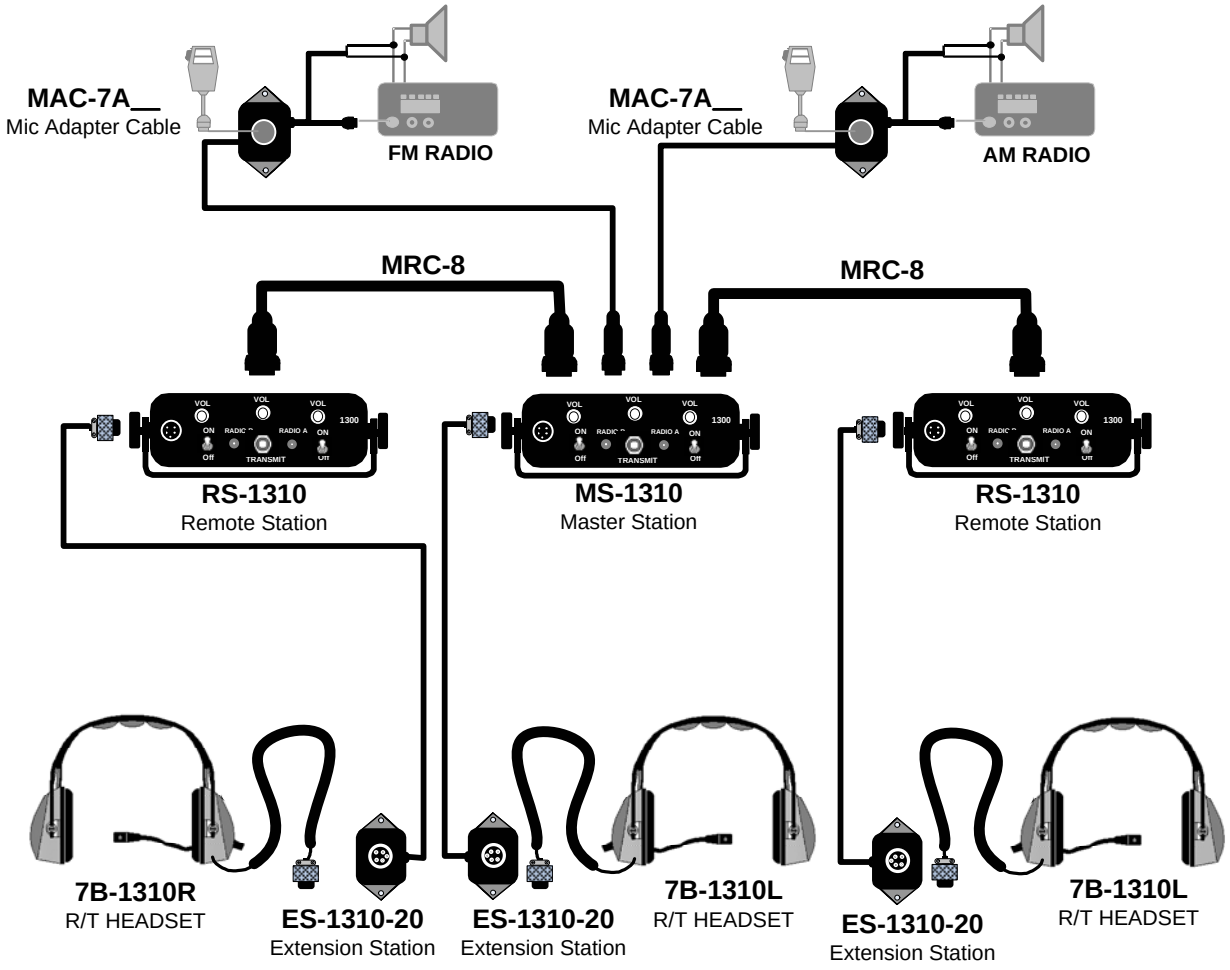


4.2. THREE-MAN/THREE-RADIO TRANSMIT POSITIONS SYSTEM

System 1300

Three Man Split Audio System

1300\ARFF\7B\3xES.pdf

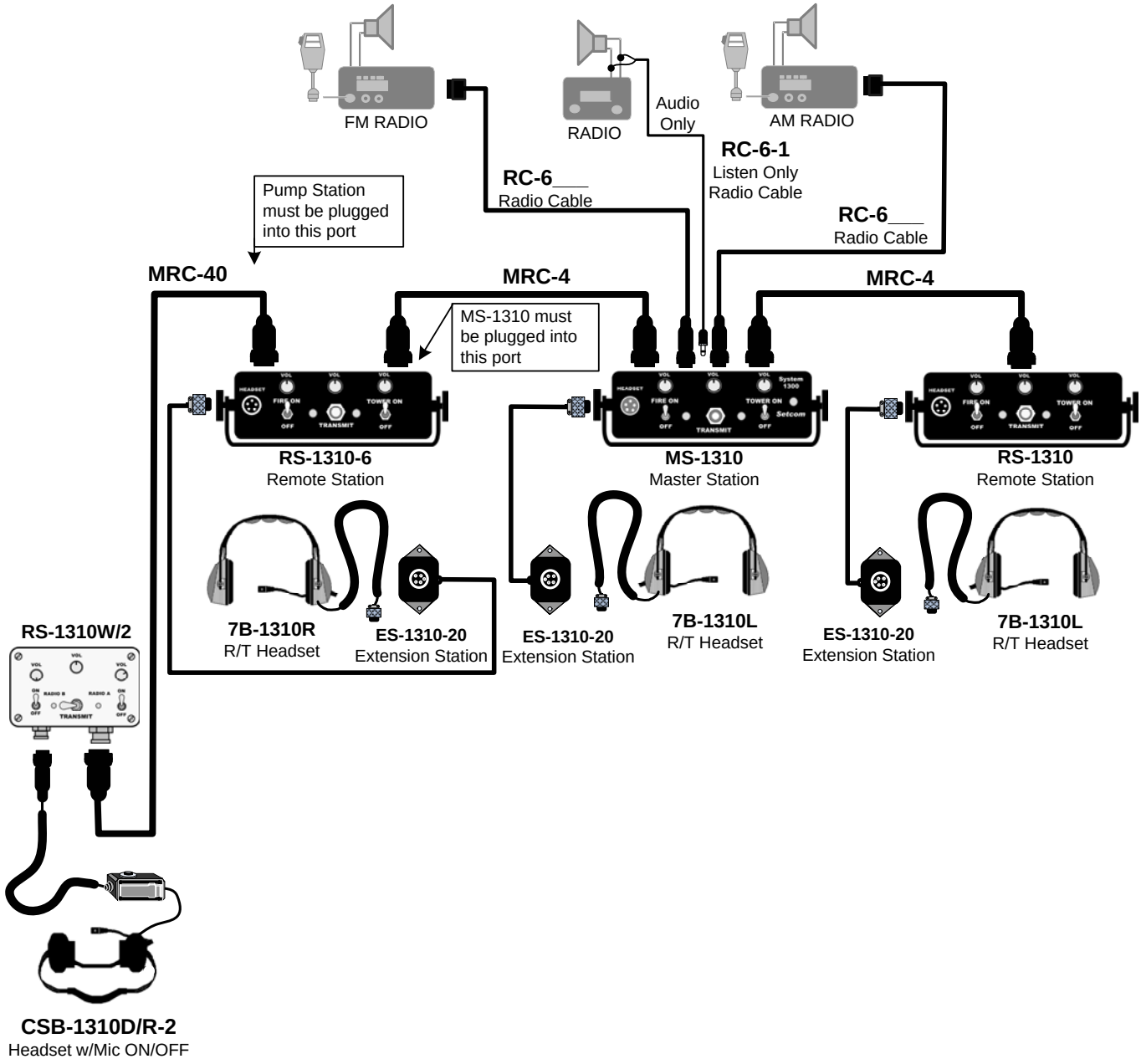


4.3. THREE-MAN/FOUR POSITION SYSTEM

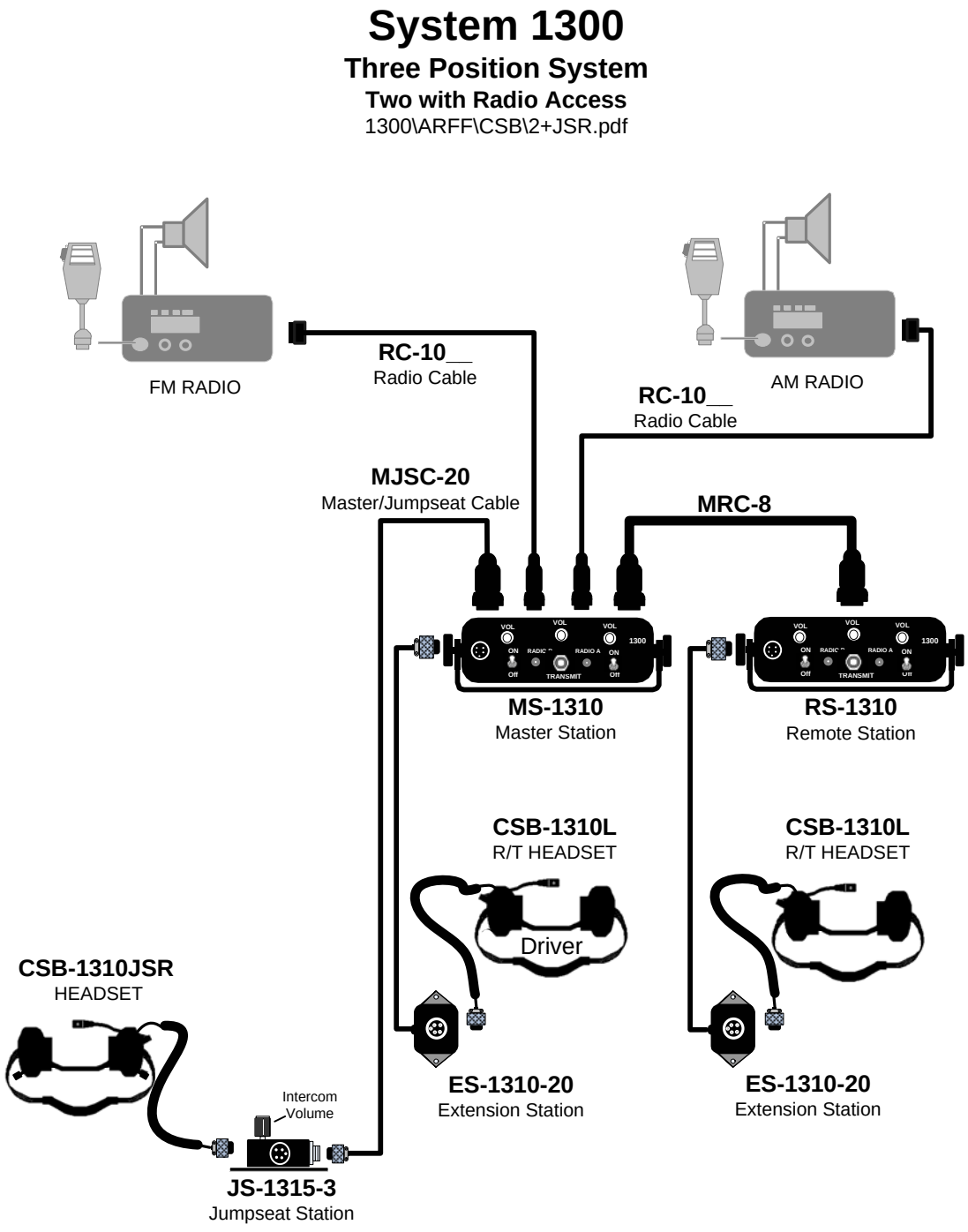
System 1300

Three-Man/Four-Position System

1300\ARFF\7B\3x4x2RC.pdf



4.4. THREE POSITION SYSTEM – TWO WITH RADIO ACCESS



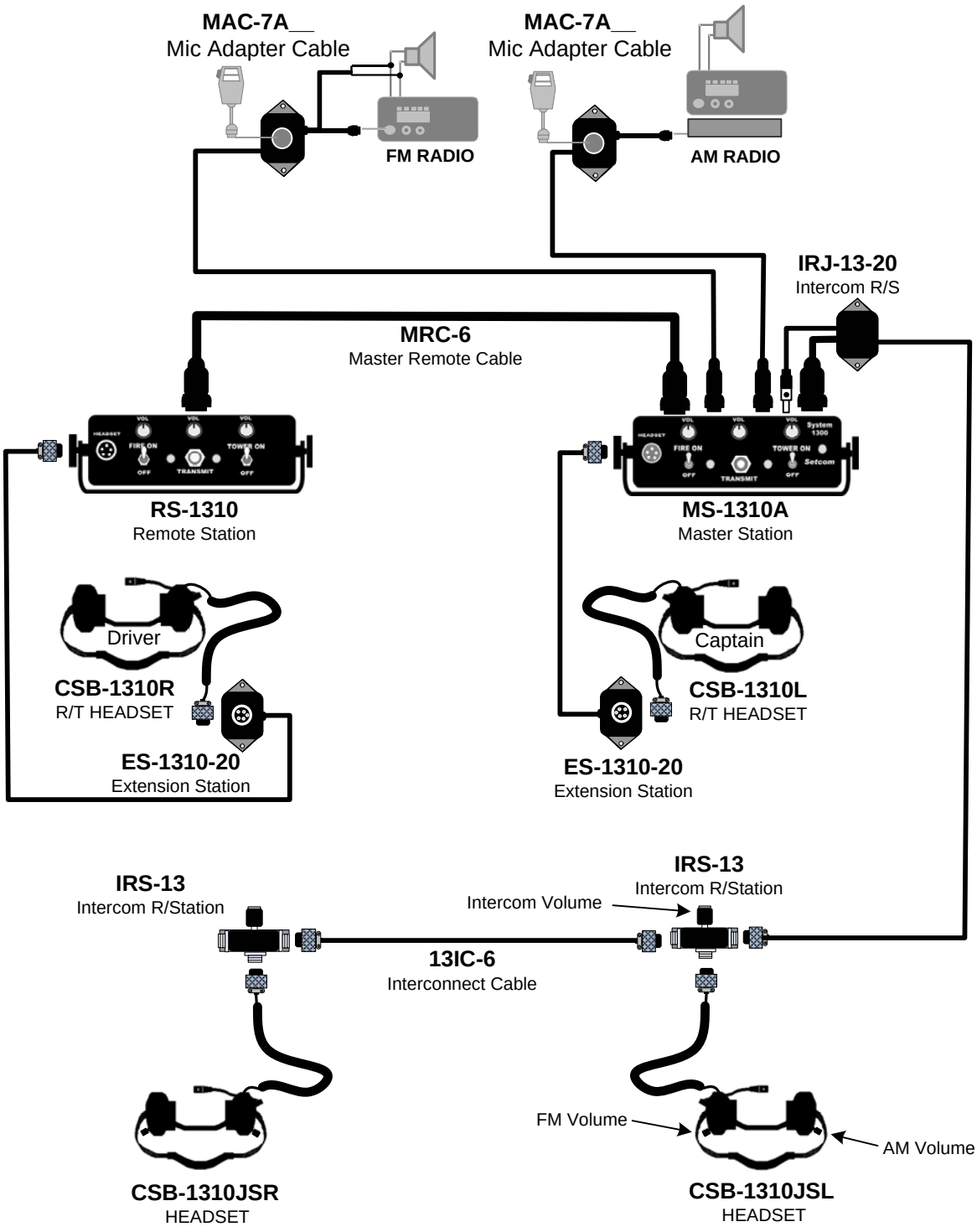
4.5. FOUR-POSITION –TWO WITH RADIO ACCESS

System 1300

Four Man System

Two with Radio Access

1300\ARFF\CSB\4xIRJ.pdf



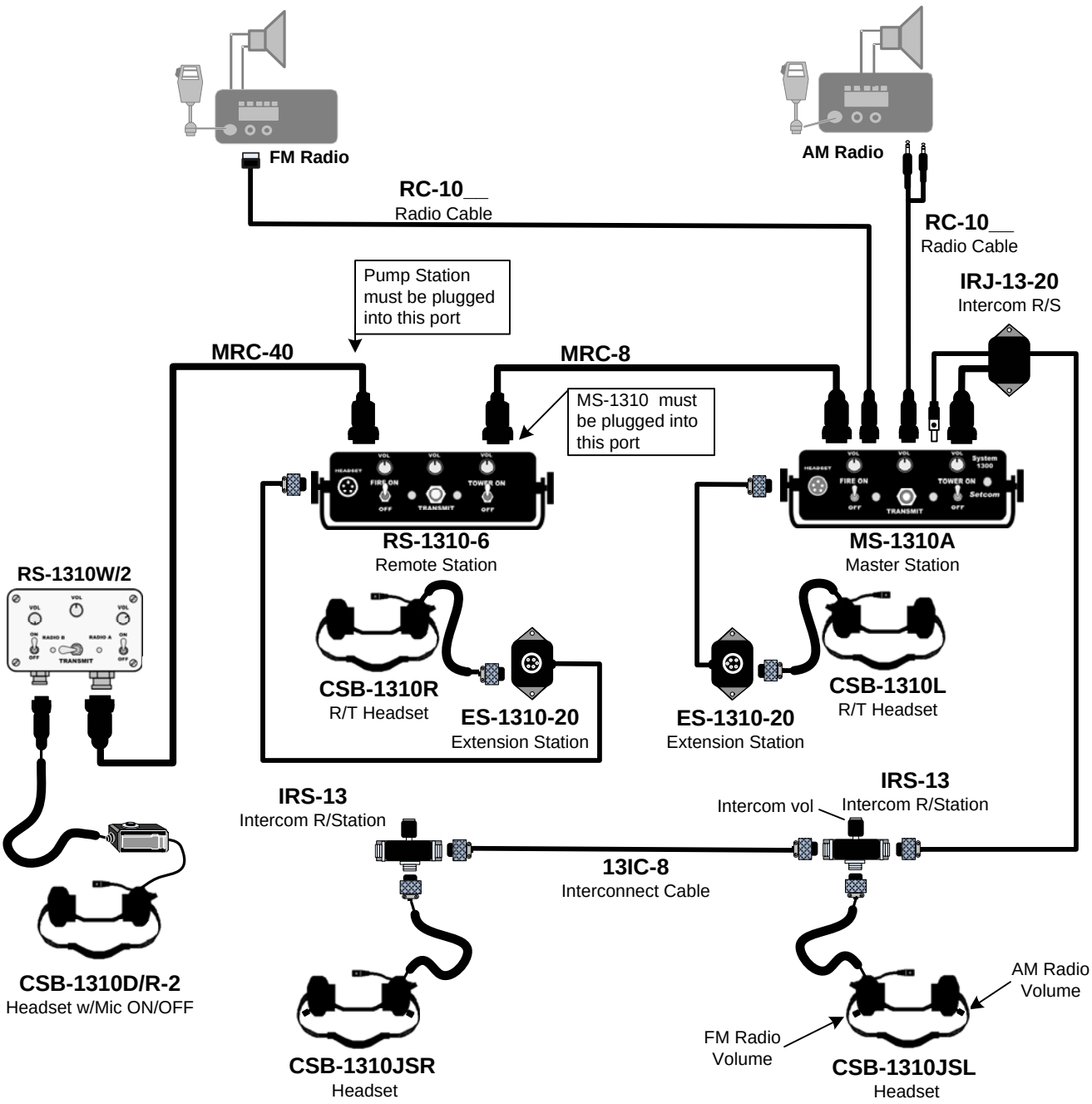
4.6. FOUR-MAN/FIVE-POSITION SYSTEM – THREE WITH RADIO ACCESS

System 1300

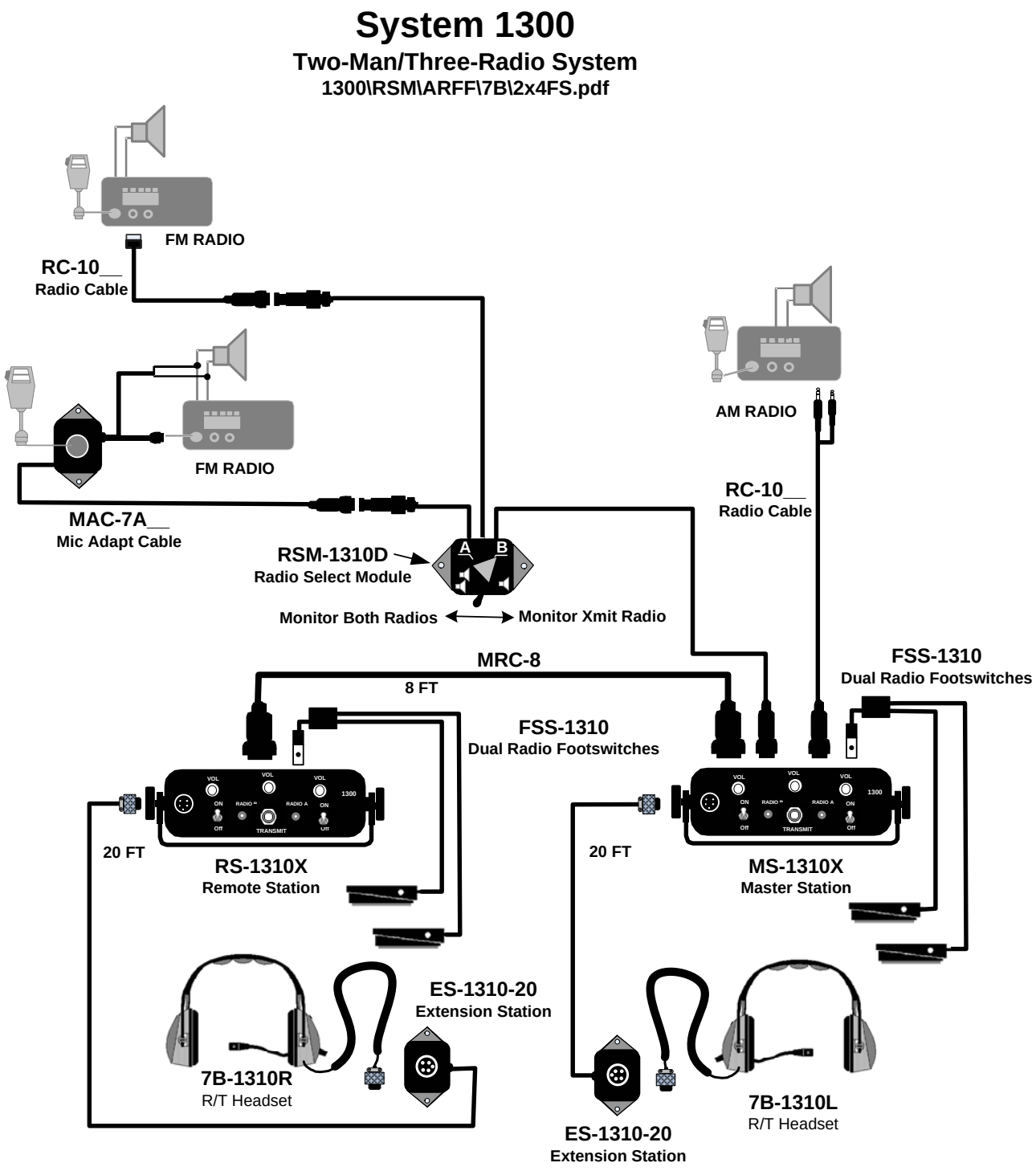
Four Man/Five Position System

Three positions with Radio Transmit Access

1300\Pumper\CSB\4x5x2RC.pdf



4.7. TWO-MAN/THREE RADIO SYSTEM

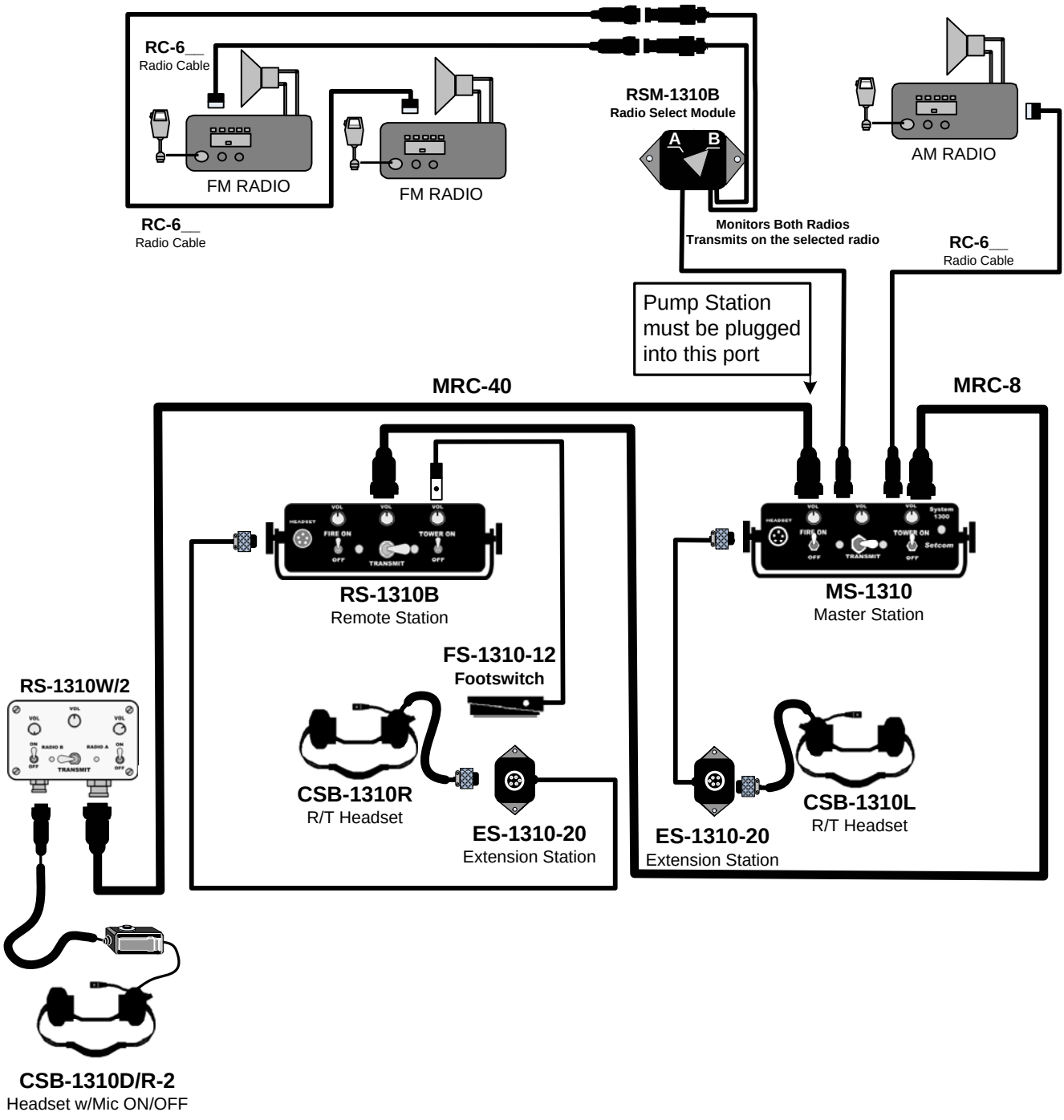


4.8. TWO-MAN\THREE-POSITION\THREE-RADIO SYSTEM

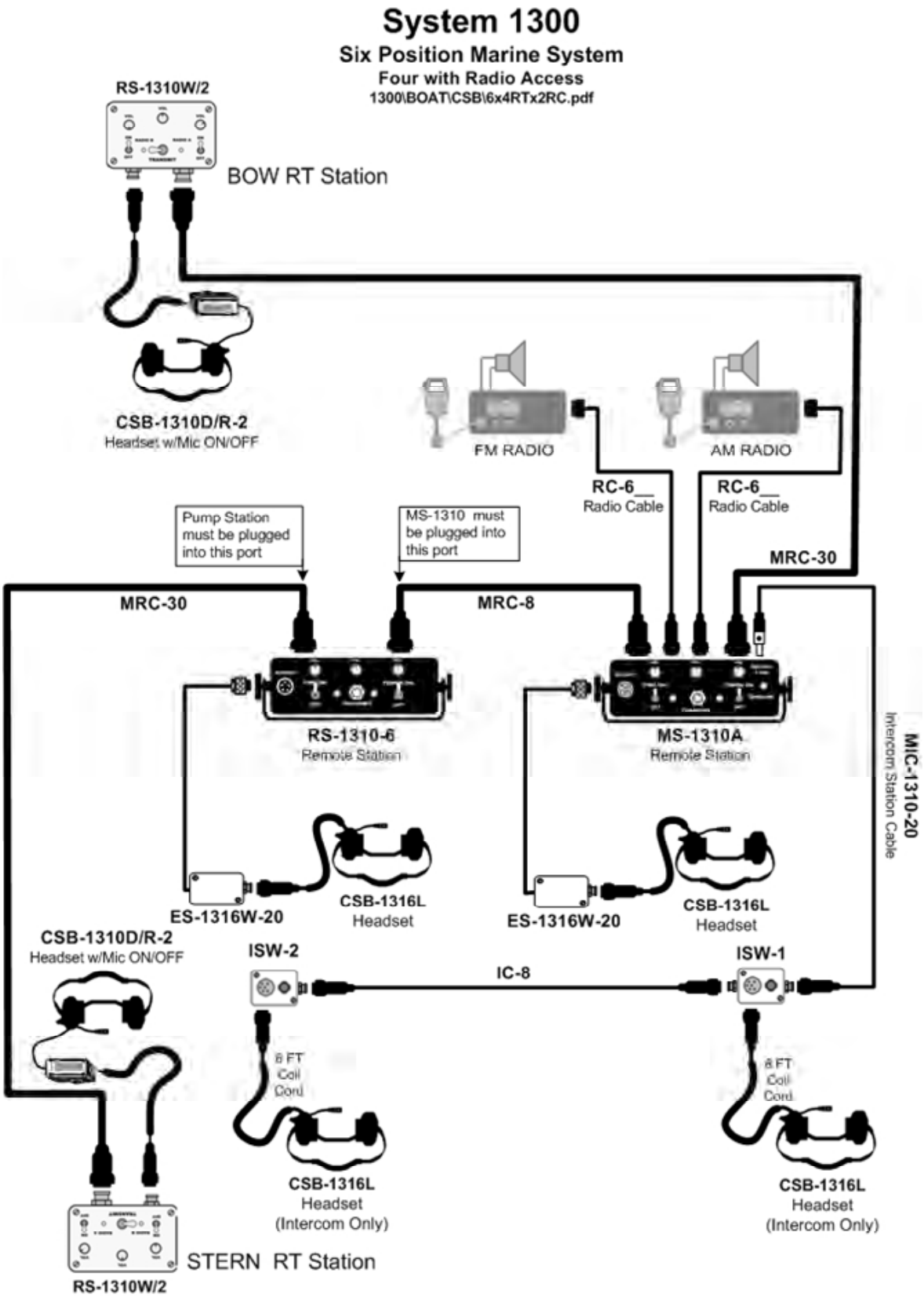
System 1300

Two-Man/Three-Position/Three-Radio System

1300\RSM\Pumper\CSB\2x3x3RC.pdf



4.9. SIX POSITION MARINE SYSTEM - FOUR WITH RADIO TRANSMIT ACCESS



5. INSTALLATION

5.1. BEFORE STARTING

Prior to installing hardware, be sure you have an overall understanding of the system you are installing. Compare the number of stations, headsets, dress, make and models of radios to the System Diagram prepared for your order and insure they agree with the hardware you have received. The MS-1300 Master Station is set at the factory to correctly modulate the radios identified at the time of purchase. The MS-1300 will interface to these radios without need of any internal adjustments. If the radio model is changed before installation, a different radio interface device (MAC-7A Mic Adapter Cable, RC Radio Cable,) and a different position on the internal pots as shown in Section 6 may be required to allow the MS-1300 to correctly modulate the new radio(s). You will need to call our toll free service line 800-966-1034 ext 732 to determine the correct radio interface device. Instructions on how to set the internal pots are given in Section 6. After you have determined that all components, including cable lengths, are correct; you are ready to start **Note! If you need to exchange components, now is the time to contact the factory. Have a copy of the invoice or packing slip and your System Diagram for reference and call 1-888-6SETCOM (888-673-8266) ext 450.**

5.2. NEGATIVE GROUND

The Setcom MS-922 is designed for 12-volt negative ground electrical system. If vehicle has a positive ground, a DC converter must be used.

5.3. PRE-EXISITING CONDITIONS

Due to the fact the headset will reduce background noise by over 90%, any alternator whine or other objectionable noise will become more noticeable. Presence of such noise can be detected prior to intercom installation by placing your ear directly against the radio speaker with a normal volume setting on your radio, and with the vehicle engine running. Check both with a modulated carrier being received and with the radio in the standby mode. In some instances it may be necessary to connect a set of headphones across the speaker if it is not possible to listen directly to the speaker itself. If a problem exists and you have a Motorola or M/A-COM radio with a remote control head, first check the power leads. These radios will normally have two leads for power. The orange wire (Motorola) is connected to the ignition switch; the green lead is connected to a continuously hot 12-volt power source. The green wire typically powers the speaker audio amplifier. Connecting a suitable filter in line with the green lead will usually reduce alternator whine to an acceptable level. Filters such as Radio Shack Part Number 270-051 can be used and are inexpensive. If there is detectable whine in the transmitted signal, a similar filter should be installed in series with the orange lead.

5.4. GENERAL CONSIDERATIONS

It best to first locate and mount the MS-1300 Master Station and the microphone adapter/radio cables followed by ES-1310-20 Extension Stations (If included with your configuration) and then the RS-1310 Remote Station(s). Take into consideration the interconnecting cabling routing, station orientation, and drilling location to determine the installation position. When location has been determined, insure that pilot holes will not damage hidden vehicle components such as radiators, electrical wiring, etc. Mark hole locations with a pencil and/or center punch. Using a #25 drill bit, drill pilot holes. Number 6 sheet metal screws, supplied in the PN-21-8003 Installation Kit if purchased, are recommended. Using the number 6 sheet metal screw, screw down the station until it is held snugly. When mounting enclosures to steel backing panels greater than 1/16” thick or aluminum panels greater than 1/8” thick, it is advisable to use self tapping machine screws or to drill and tap for the mounting screws. This precaution will eliminate the possibility of shearing off the screw heads during installation. Pass through holes for the interconnecting cabling connectors should be 3/4" for the smaller Conxall connectors. The hole size for the 18 Pin Conxall used on the Master Remote Cables is $1^{1/8}$ inches. Split ring grommets as provided in the installation kit (if purchased) should be installed in pass through holes to protect system cabling. Double-sided tape may **NOT** be used to mount the enclosure for the MAC-7A, ES-1310 or similar enclosures. The backs of these components are configured to be popped out for repair access. The mounting screws also serve to secure the backs in place.

5.5. MS-1310 MASTER STATION INSTALLATION

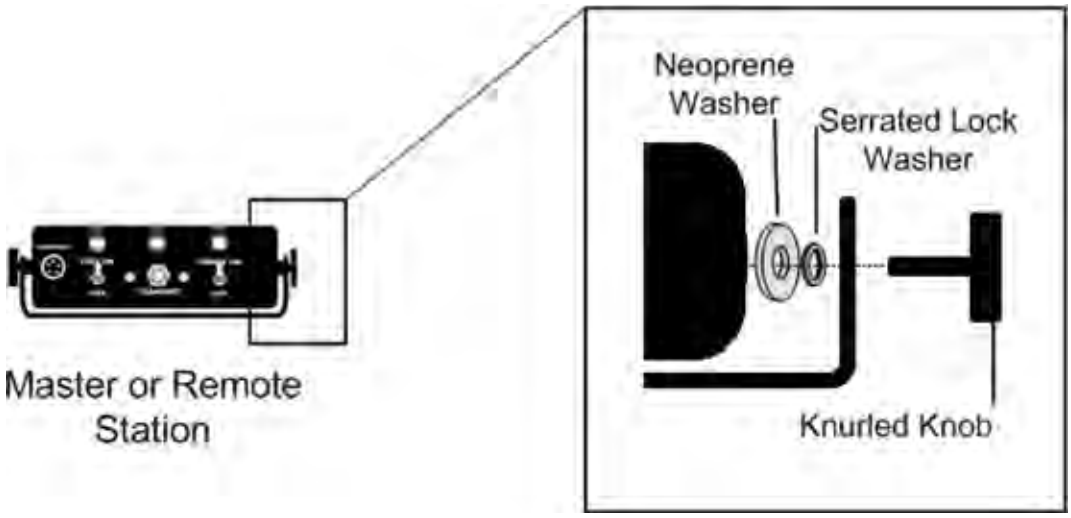
Select a convenient mounting location. The MS-1310 also serves as one crew member station and the operator will need to be able to easily access the controls.

5.5.1. From the standpoint of the crew, the MS-1310 and RS-1310 offer the same functionality. Since the MS-1310 will interface with both the radios and the remote stations, it should be located to optimize connecting the cabling and servicing one of the crew members. The location should be chosen as to not interfere with normal operations of the crew.

5.5.2. The ES-1310-20 Headset Extension Station allows the headset connection port to be remoted behind and above the operator's shoulder while keeping the MS-1300 in the operator's field of view.

5.5.3. A three foot power cord with stripped leads is supplied for connection to source of nominal 12VDC and chassis ground. The power cable can be found in the 30-001 Accessory Kit with the trunnion. It is terminated on one end in a two connector plug that will mate with the red and black lead hard-wired into the back of the MS-1310 Master Station. The power cable must be connected to a 12VDC power source via the 1 amp fuse in the red positive lead wire. The black negative lead wire must be connected to good ground point. Many manufactures provide accessory connection points in their vehicles. Alternately, connecting the power and chassis ground to the same power and ground connection point as used for the radio will optimize performance.

5.5.4. A trunnion for mounting both the MS-1310 and RS-1310 stations can be found in the accessory kits packed with the stations. The below figure shows how to install the trunnion to the station.

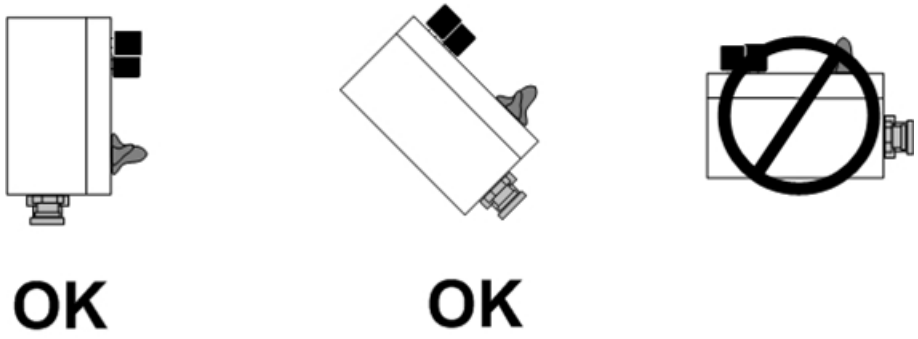


5.6. RS-1310 REMOTE STATION INSTALLATION

The same considerations used for the MS-1310 should be used in the installations of the RS-1310. The only difference is the only connection needed for the RS-1310 is the MRC Master Remote Cable that connects it to the master station. All power, ground and radio interface for the remote station is through the master remote cable. **Note**! **If your are mounting a RS-1310-6 Remote Station with an expansion port it should be plugged into the left side remote port of the MS-1310 as shown in 4.3, 4.6 and 4.9.**

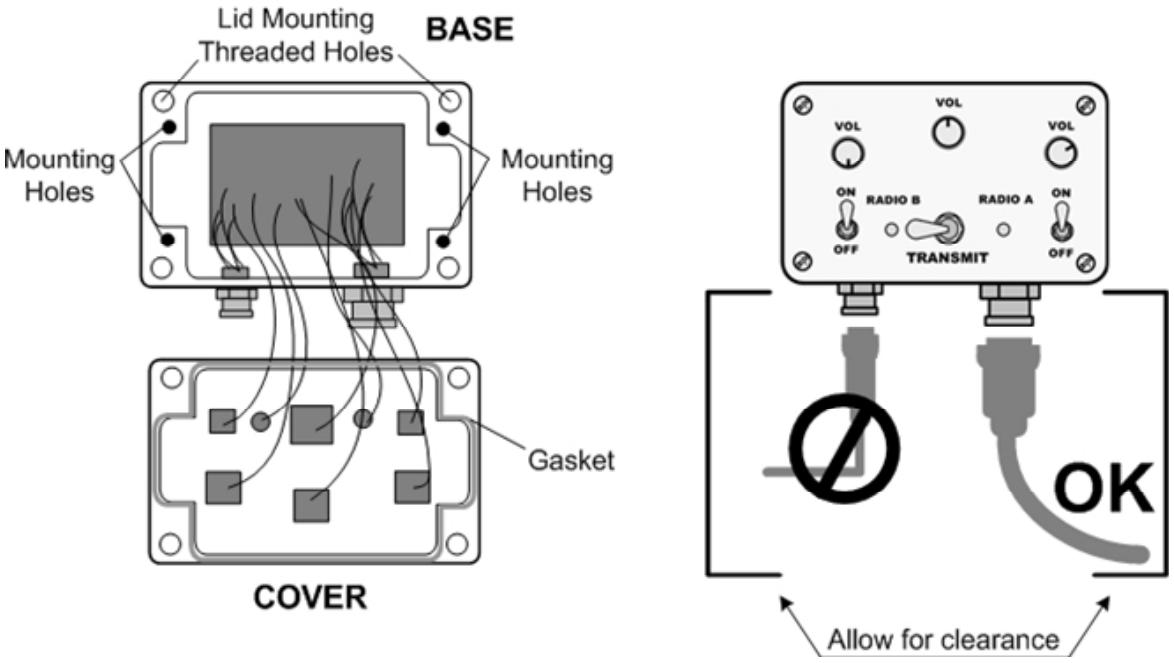
5.7. RS-1310W/2 WEATHERPROOF REMOTE STATION INSTALLATION.

5.7.1. The functionality of this station is the same as the RS-1310; the difference is that it is housed in a weatherproof enclosure with a gasketed lid and controls. Care needs to be taken during installation to preserve the integrity of the enclosure. Below figure shows acceptable mounting for the enclosure.



5.7.2. To secure the station, four mounting screw holes are located at the bottom four corners of the base. To access these mounting holes the cover must be removed (see figure below). Since the mounting holes are outside of the gasketed interior, no provision for sealing the holes from water need be made. Prior to removing the cover, locate the template supplied with the station. Select the mounting location and insure there is enough clearance for the MRC Master Remote Cable and connector accessed. Also, insure the headset cable can easily be plugged in. **Caution! Drilling a mounting hole into this enclosure will compromise the watertight integrity of the component and void the warranty.**

DO NOT DRILL HOLES IN THE ENCLOSURE! MOUNTING HOLES PROVIDED



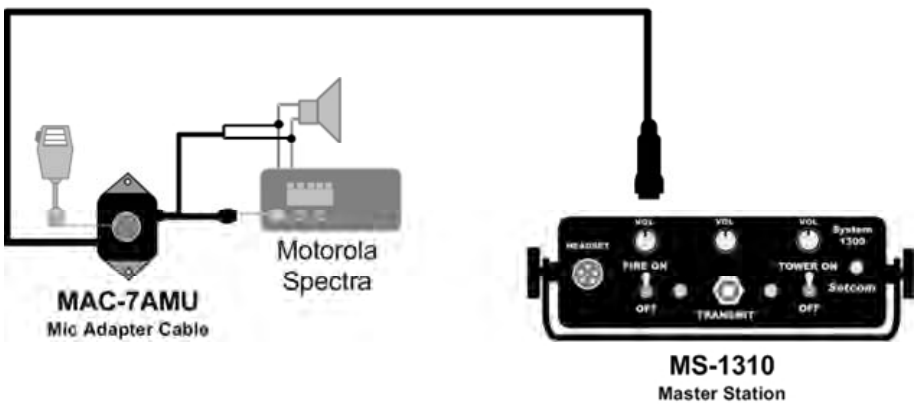
5.8. MASTER REMOTE CABLES MRC-(LENGTH). Note that Master Remote Cables are terminated on both ends with an 18 Pin Conxall connector. If you have more than one MRC, and they are difference lengths, determine where the cables are to be routed and be sure to use the right length for each application. Before starting, insure the cable lengths you have are sufficient for your installation! If you have any doubts, now is the time to exchange your cable for a longer length. Even a short extension cable is an expensive alternative compared to a longer cable. Disconnecting the connector for installation should not be necessary and is not recommended. Route cable along existing grooves or ducting as much as possible. Keep all cabling from interfering with normal crew operations? Tie-wrap and clamp cables as necessary to prevent movement. These connectors are keyed, watertight and feature an O-ring seal and a twist lock connection. To connect it is necessary to first line up the key and then a little force is necessary to compress the O-ring before turning the bezel 90 degrees to lock the connector in place.

5.9. MICROPHONE ADAPTER CABLE MAC-7AXX. Setcom uses a two or three position alphanumeric code that will replace the generic XX shown. This code will identify the not only the make and model of the radio but also the method of interface to the radio. It is possible that the radio may have two or more codes assigned depending on alternative methods of interface available. Some radios will have more than one style of hand microphone connector and also an accessory port or accessory cable as another method of interface.

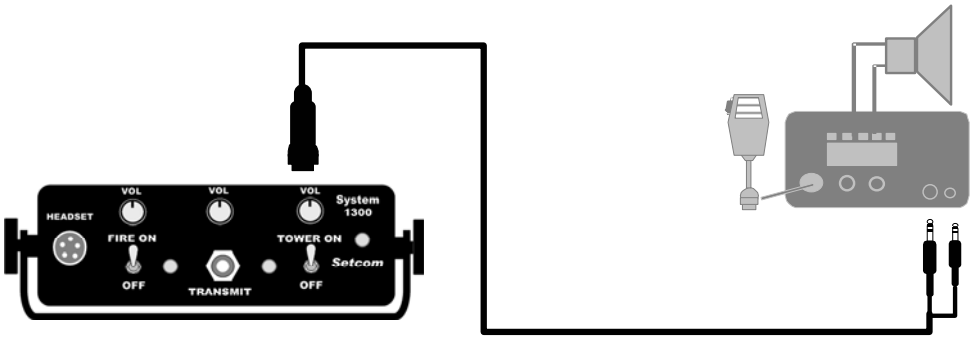
5.9.1. The MAC should be located close to the radio or the radio control head, usually 11 inches. Remove the hand microphone from the radio/control head. Attach the MAC radio cable to the radio/control head through the hand mic port. Position all cables to prevent interference with normal operation prior to finalizing the MAC location.

5.9.2. Some radios will not have receive audio on the hand mic port. In these cases, a flying lead(s) from the MAC needs to be connected in parallel to the speaker connections for the radio. If the MAC has two flying leads for speaker connection as shown in Motorola Spectra interface below, parallel the MAC leads to the radio speaker leads. If the MAC you have has a single lead, this needs to be connected to speaker-high. If you cannot identify the speaker-high lead, connect the MAC lead to either of the two speaker leads. If the audio level is too low, connect to the other lead, this should be the speaker-high lead and give you a good level of receive audio. You cannot damage the radio by this procedure. On many radios you will be able to connect to either external speaker lead with the same result. In some cases, mating connectors to the original hand mic connector are not available for installation in the MAC. In such cases, a generic connector is provided with the MAC and you will need to modify your microphone. Cut the connector off the hand microphone and install the supplied connector. A schematic to determine correct pin-outs is included with the MAC. After connection to the MAC, perform a radio check using the hand microphone.

Typical MAC-7A Installation



5.10. RC-6XX RADIO CABLE (TERMINATED). The radio cable will be a length of cable with a six-pin Conxall connector on one end and the appropriate radio connector on the other end. Setcom uses a two/three alphanumeric code that will replace the generic XX show above. This code will identify not only the make and model of the radio but also the method of interface to the radio. It is possible that the radio may have two or more codes assigned depending on the method of interface. Some radios will have more than one style of hand microphone connector and also have accessory port or accessory cable methods of interface. A radio cable can be used with radios that provide an accessory port. The number following the RC- indicates the length of the cable in feet. A RC-6Y3 would indicate a six foot radio cable for an Icom A110 with OPC871 external jacks option.



5.11. RC-6 RADIO CABLE UNTERMINATED. Some radio dealers or installers may wish to develop their own interface for a radio Setcom does not provide a plug-in interface for. This can be accomplished with an RC-6 Unterminated Radio Cable. Again the 6 stands for the length of the cable in feet and alternate lengths are available. The color codes for the unterminated leads are supplied in Section 8.3.

5.12. RADIO RECEIVE LEVELS. The MS-1310 Master Station has no internal adjustment for radio receive levels. Radio transmit levels are discussed in Section 6. All radio-receive system-wide adjustments are made using each radio's volume control. Set each remote station and the master station volume control for maximum radio receive level on both the TOWER and FIRE circuits. For CSB-1310JSR/L Jumpseat Headsets with radio volume controls in the cups, also set these volume controls to maximum. **CAUTION! Start with a low volume setting on each radio before donning a headset**. Try each headset and set the radio volume controls to a level slightly higher than comfortable while wearing the headset. Mark radio volume knobs to easily re-establish these settings. Alternatively you can stake the radio volume control at these levels. In normal use make sure to note the position of the radio volume controls when first entering the vehicle and donning a headset, this will prevent an uncomfortable loud blast in your ears that can occur if both the radio volume knobs and the headset volume control are set to near maximum.

5.13. JUMPSEAT STATIONS

Setcom has a number of different jumpseat stations but the installation considerations are similar.

5.13.1. IRS-13 Jumpseat Stations with the IRJ-13-20 Intercom Radio Junction Module. This version offers up to four crew member's intercom access with radio split-audio monitoring. Intercom audio is picked up from the intercom-only port on the back of the MS-1310A Master Station and radio audio is gathered by plugging the IRJ-13-20 into an available remote station port on the back of the MS-1310A. Both ports must be present and available to successfully jack-in the IRJ-13-20. The dash 20 indicates the cable length in feet. As with other cable lengths, before starting the installation, be sure that cable length is sufficient the reach the first IRS-13 in the daisy-chain of IRS-13 stations. Each IRS-13 station has a jack-in point and volume control for one headset as-well-as an expansion port for the next station in the chain. The AM and FM radio volume controls are located in the jumpseat headset cups. Each IRS-13 should be positioned taking into account the dress of the headset that will be plugging in and the position in the next IRS-13 in the chain. A 13IC-6 Interconnect Cable is used to connect the IRS-13 stations together. You will have several of these cables if you have multiple jumpseat stations. Since these cables may be of different lengths, be sure to layout where you will place each station and insure each cable is of sufficient length for it's location in the configuration. Refer to 4.5 to see a diagrammatic representation of this installation.

5.13.2. IS-1 and IS-2 Intercom-Only Stations. The IS-1 is a daisy-chainable intercom-only station. It plugs into the intercom-only port on a MS-1310A Master Station. The IS-2 is an intercom-only station without the expansion port so it should be the last station in the chain for installation purposes. Mounting provisions are otherwise the same as the IRS-13 covered in Section 5.12.1. The ISW-1 and ISW-2 are weather-proof counterparts housed in an enclosure that allows for exterior or marine applications. These four stations do not provide for radio monitoring. They will; however, monitor any audio plugged into the audio-only port on the back of the MS-1310 as this audio is mixed with the intercom circuit. There is an intercom volume control on each station for controlling the headset plugged into that station.

5.13.3. JS-1315-3 Jumpseat Station. If there are only two radio access positions in the vehicle and the third position requires only radio-listen with intercom-access, a single JS-1315-3 Jumpseat Station can be used. This station plugs into the standard MS-1310 remote port and makes it easy to upgrade a two-man system to this three man configuration. See Section 4.4.

5.14.CSB-SERIES HEADSETS

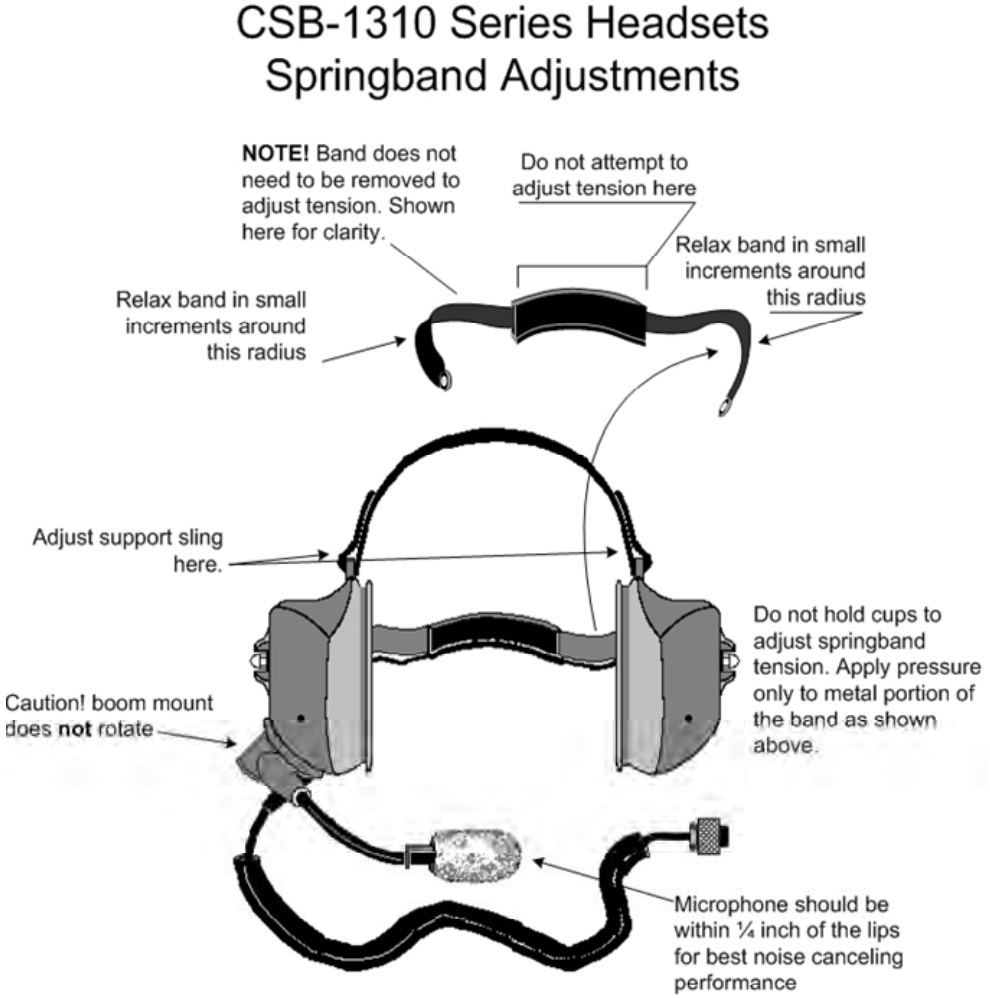
5.14.1. Adjusting the headset for a comfortable fit. Before donning the headset, note the position of the radio volume knobs as described in Section 5.12. If these are set correctly, don the headset and position the boom-mounted microphone directly in front of your mouth, no more than 1/4 inch from your lips. Adjust your individual volume control to a comfortable listening level.

5.14.2. Radio transmit headsets have no controls on the cups; volume controls for each radio and the intercom are on the remote station the headset plugs into.

5.14.3. CSB-1310JSR or CSB-1310JSL Jumpseat Headsets with radio listen and intercom access will have a volume control for each radio mounted in the cups.

5.14.4. Jumpseat positions that connect to an intercom-only station will use the CSB-1310R or CSB-1310L radio transmit style of headset. When plugged into an intercom only station they will function as an intercom only headset. This is for commonality and the headset can be used interchangeable at radio transmit or intercom-only stations.

5.14.5. Springband adjustment. All CSB Series headsets have a springband to seal the ear pads against the operator's head to provide hearing protection. Operators with oversize heads may find the pressure uncomfortable and can relax the band while still retaining enough tension to provide hearing protection. Follow the instructions in the below diagram to release spring tension without damage to the springband. Retain enough pressure to fully seal the ear pad against the head.



6. TRANSMIT LEVEL ADJUSTMENTS

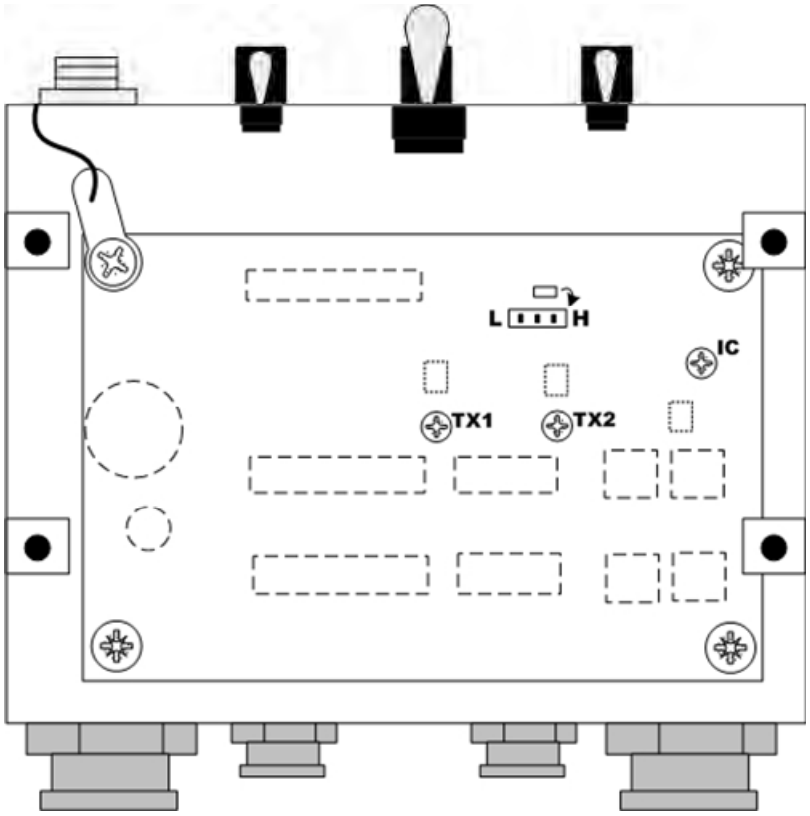
The System 1300 can be set to interface with a wide range of two-way radios through the use of mini-potentiometers located on the mother board in the MS-1310 Master Station. Normally these will be set prior to shipment for the radio interface devices accompanying the order and no further adjustment is necessary. Alternatively, the customer can identify the radios at time of purchase if a master station only is being purchased. If no radios are identified, the master will be set for Motorola level on the Fire Operations or left circuit and Icom level for the Aviation or right circuit. In the evident the radios are changed after installation, a different radio interface device and a change in level settings will most likely be required. All level adjustments can be accessed by removing the bottom of the MS-1310 Master Station.

6.1.1. First disconnect the positive lead then negative lead of the power cable, radio cables and Master Remote Cables (in that order) from the MS-1310.

6.1.2. Remove the MS-1310 from its trunnion mount. You can leave the trunnion itself secured in place.

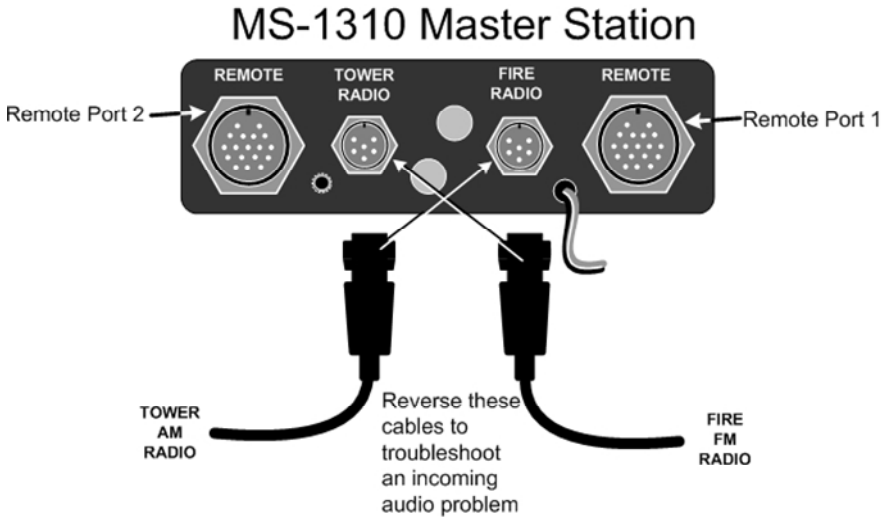
6.1.3. Remove the four Philips head screws on the bottom of the MS-1310. Withdraw the base to expose the mother board.

6.1.4. On the mother board you will find three mini-pots and a L-H jumper. See figure below. The pots are labeled TX1 for the Fire Radio, TX2 for the Tower or AM radio and IC for the Intercom Audio. The LO-HI jumper lowers the TX2 output by a factor of ten allowing easier adjustment for AM radios with low mic levels. The mini-pots with the jumper in the H position have a range of 1-300 Milli-volts.



7. TROUBLE SHOOTING *toll free service line 1-888-6Setcom ext 732 (888-673-8366 ext 732)*

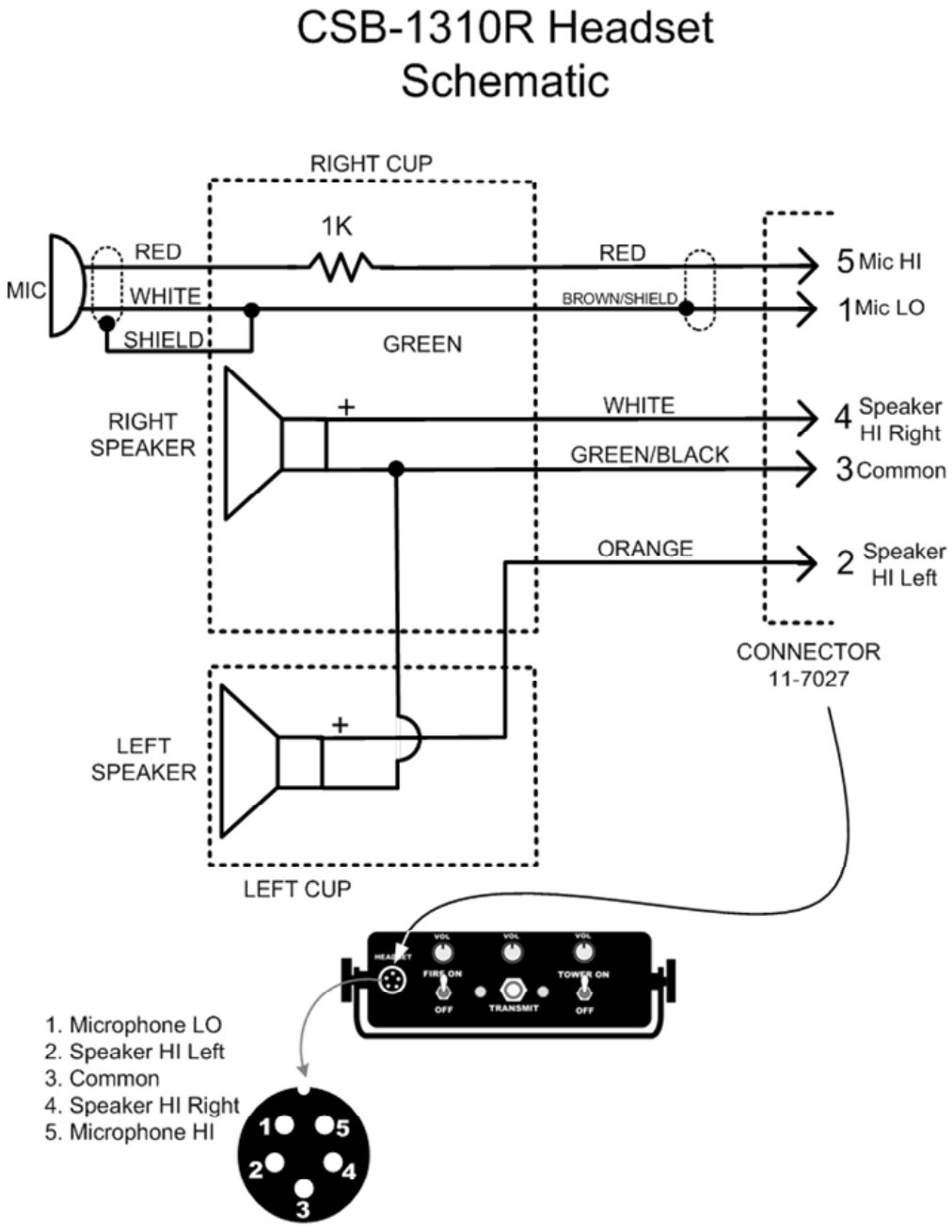
PROBLEM	Description and Probable Solutions
Weak transmit on radio.	When wearing headsets and hearing side tone (your own voice in your headset via intercom) it is normal that you will talk softer than when using a hand mic without the headset. Insure lip mic is no more than 1/4" from the lips and that you are talking at sufficient volume. If transmit is still weak, the internal setting of the MS-1310 may be set for the incorrect level for your radio, see Section 6.0. If you still have problems contact Setcom Technical Support ***1-888-6Setcom ext 732 (888-673-8366 ext 732)***
No transmit on radio, Intercom working normally	Insure all connectors are fully seated. Be sure you are using a radio transmit headset at a radio transmit station. Use handmic and see if radio will transmit normally. See Section 6.0 regarding the adjustment of transmit levels. If intercom and hand mic function normally but you still cannot transmit with headset, contact Setcom.

Radio receive audio is heard in the cabin speaker but not in the headsets. Transmit functions OK.	Insure that the volume controls are turned up and the radio mode toggle switch is in the ON position. Check and confirm any "flying lead(s)" from a MAC are correctly connected to the speaker-hi lead of the radio (see Section 5.9.). If a radio cable is being used, insure you are connected to the speaker-high lead (See Section 5.10.). Is this doesn't solve the problem, reduce the variables by reducing the numbers of components connected to the master station. By disconnecting both MRC-__ Master Remote Cables from the MS-1310 Master Station, disconnecting the ES-1310 Extension Station and connecting a CSB-1310R or CSB-1310L Headset directly to the "HEADSET" port on the front of the Master Station (The station with the green power light) you will have the most basic operable system. If you have two intercom-only jumpseat stations, an IRJ-13-30 Junction Box will be connected to the MS-1310 Master Station by both an 18 Pin Conxall connector and a small three-conductor XLR(silver and black) connector; disconnect both connectors from the master. If in this configuration the headset receives audio from both radios, and you can transmit on both radios, the problem is a short in the MRC Master Remote Cable and this component will need t be replaced. If you still have no inbound audio from one radio, for trouble shooting purposes only, switch the radio cables on the back of the MS-1310. Plug the AM Radio into the "FM" side (Left Ear channel) and the FM radio into the "AM" side (Right Ear Channel).  If the problem follows the radio cable then the problem is likely with the radio cable. This could be a broken lead or the wrong cable for the radio. If the audio problem stays with the same circuit, for example if "No FM audio on the FIRE side becomes "No AM audio on the FIRE side", the trouble is most likely within the Master Station and it will need to be returned for repair or replacement. Contact Setcom Technical Support ***1-888-6Setcom ext 732 (888-673-8366 ext 732). If you are instructed to return a station for repair or replacement, be sure to label each connector as to where it needs to be plugged back it. .*** This is best done by attaching masking tape to the cable with a label detailing which port on the master station or other point it should be plugged into.
A steady hum is heard in the headset.	Insure the vehicle is not connected to a battery charger. Being connected to a battery charger will many times cause a 60 cycle hum in the headsets.

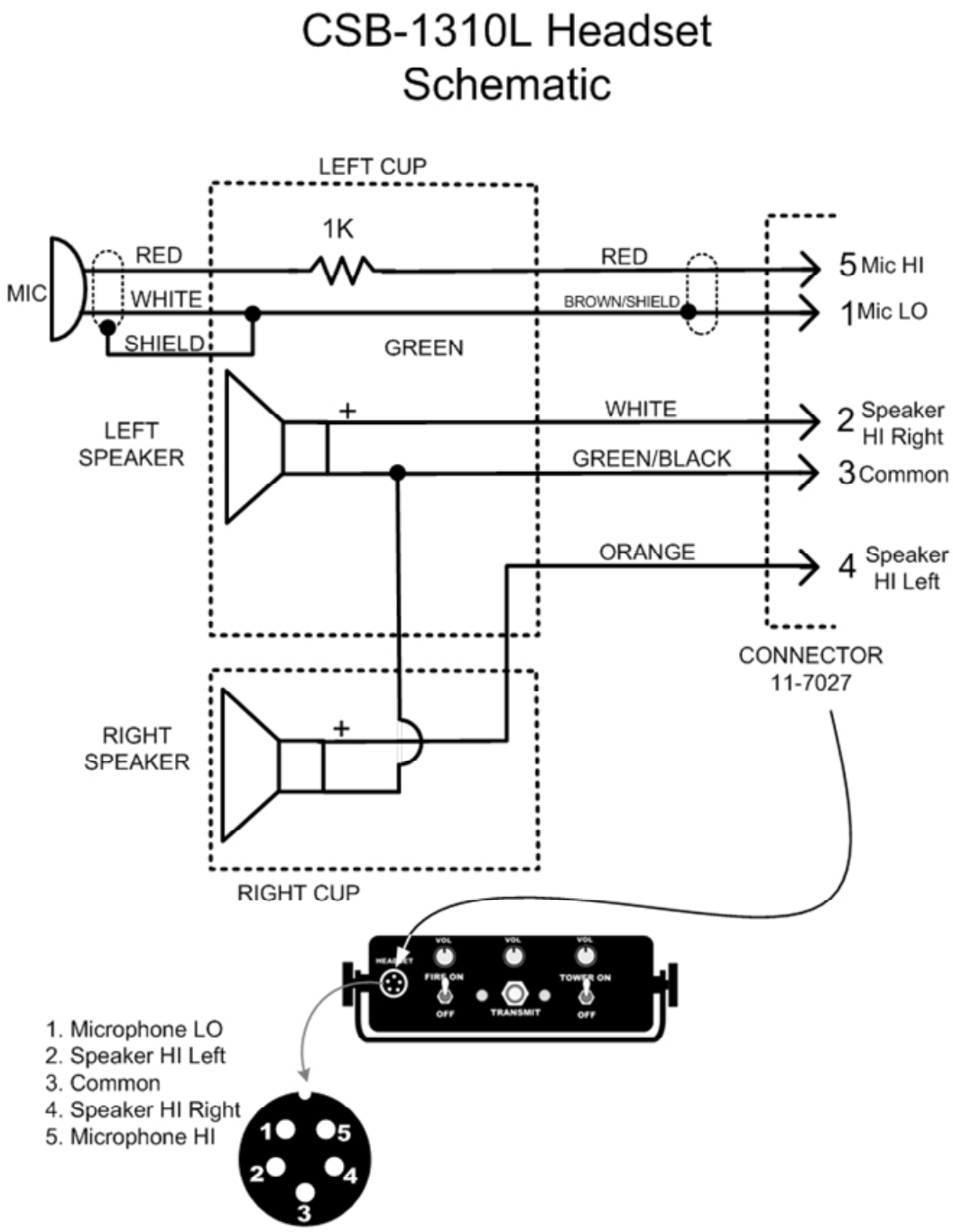
Alternator whine.	Alternator whine may be heard in the headset at all times with the engine running, or just when a radio message is being received. Occasionally, whine is heard only on the transmitted signal being received by another station, but not at other times. Alternator whine is recognized as a moderately high pitched rough tone that rises and falls in pitch as the vehicle engine speed increases and decreases. Locating the source of the problem and affecting a cure requires a methodical approach.
Alternator whine is heard in headset at all times.	First determine if this is coming in on the radio cable or power cable. Disconnect the radio cable/MAC from the MS-1310 one at a time. If the whine stops or is greatly reduced, the indicated radio is possibly the source. If not, the whine probably is due to excessive AC ripple on the battery power leads. Check with battery switch set to *1*, *2*, and *both* positions if so equipped, and note any difference in the level of whine. If one battery is worse than the other or when on the "*both*" position, suspect a weak battery or bad connections.
Excessive Ripple (see *Alternator whine is heard in the headset at all times* for description)	• Old, weak, or badly sulfated battery • Defective alternator rectifier diode • Corroded battery terminal connections • Poor engine ground strap or connection Recharge or replace the battery (ies) or clean and tighten the connections. A preliminary test of the rectifier diodes and regulator can be made with an accurate voltmeter. When the engine is running at a fast idle (about 1000 RPM) there should be between 13.4 and 14.2 volts at the battery terminals. Turn on headlights and other high current electrical accessories and note any large drop in voltage that may be due to a defective diode. Have any suspicious alternators checked by a qualified mechanic.
Excessive Ripple (cont.)	If there is no defect found in the system, it may be just *noisier* than average. Installing an external line filter such as Radio Shack P/N 270-051, on the FM radio may reduce the interference to an acceptable level.
Alternator whine coupled via the radio cable	Check for any inadvertent grounding of any interconnecting cable shields to vehicle ground. For example, if you routed cable through a hole cut in the vehicle without the use of a grommet, the rough edge of a hole may have cut the protective jacket and the cable shield is grounded. Also be certain that the lead is connected to only the microphone low terminal of the radio, if such exists, and not to chassis ground. Little or no change in the presence of whine when the external power source is used indicates the problem may be associated with the radio itself. Many mobile radios, particularly those with remote control heads, utilize power leads for the receiver and low-level transmitter circuits separate from the main heavy-duty leads for the transmitter power output amplifier. Noise on the audio output that is hardly discernible when the cabin speaker is used can become overwhelming when heard through a noise-reducing headset. The headset reduces outside noise by over 90% and places the earpiece very close to the ear making the noise and/or interference seem much louder. Generally a filter placed in the lead supplying power for the audio stages of the radio will reduce the amount of whine to an acceptable level. On most Motorola radios the green power lead from the control head should be filtered. The same type filter listed earlier, a Radio Shack Part Number 270-051 is usually satisfactory.

8. SCHEMATICS

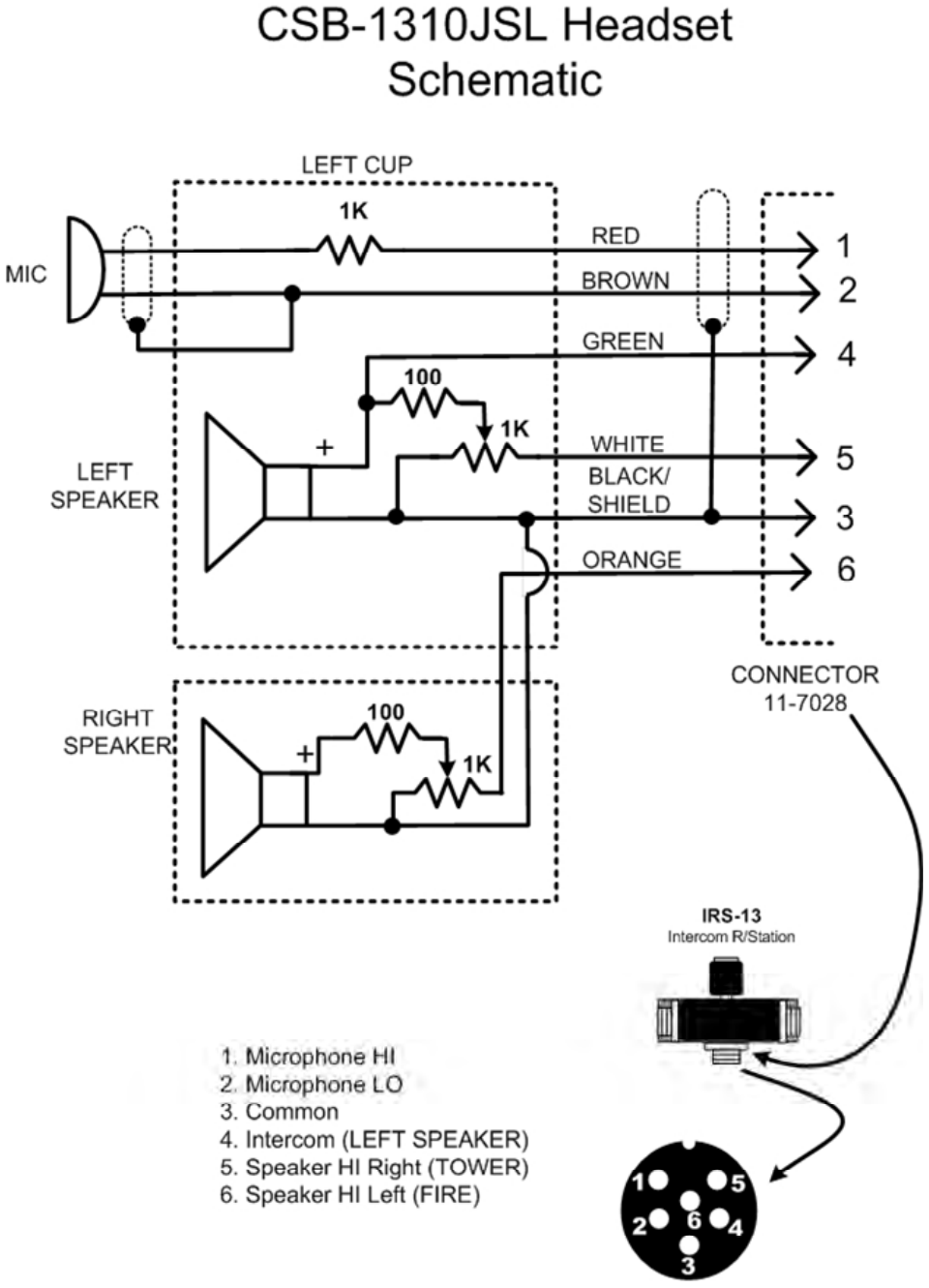
8.1. CSB-1310R HEADSET SCHEMATIC



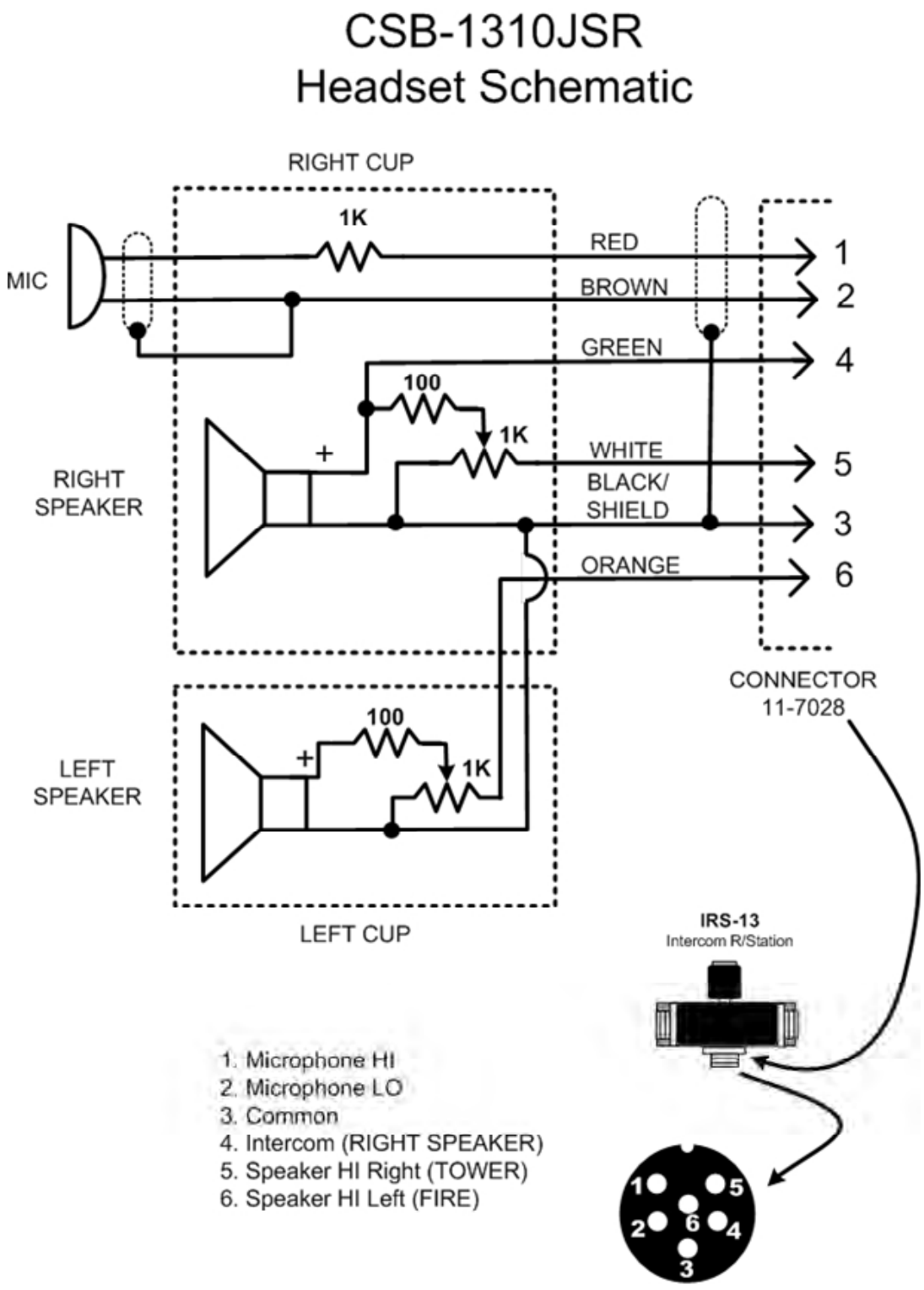
8.2. CSB-1310L HEADSET SHEMATIC



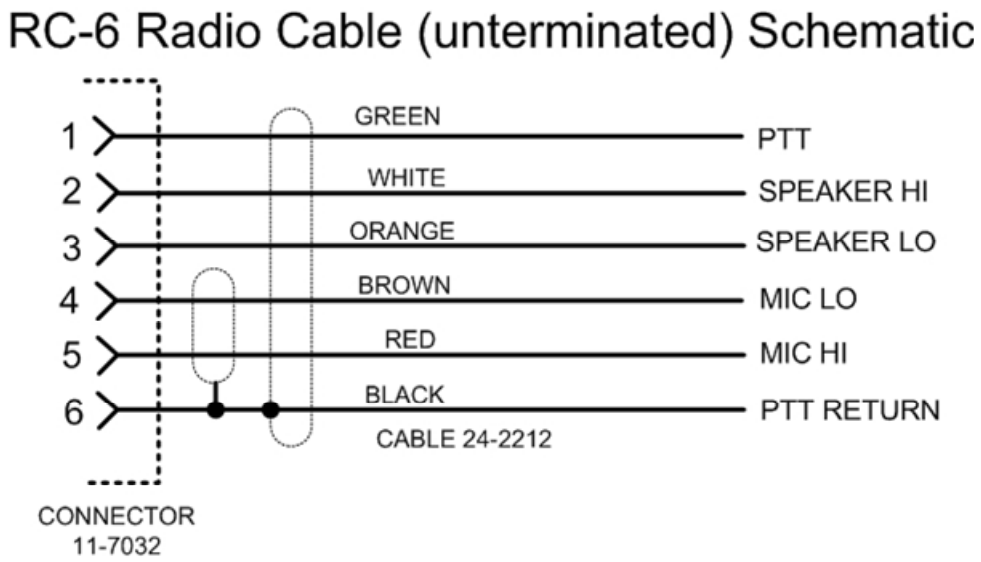
8.3. CSB-1310JSL JUMPSEAT HEADSET SCHEMATIC



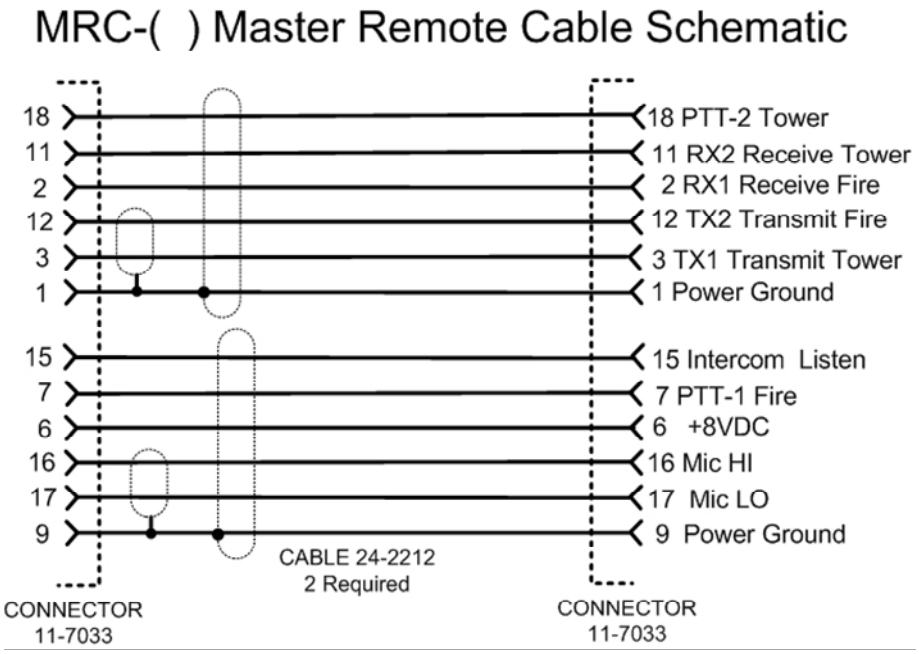
8.4. CSB-1310JSL JUMPSEAT HEADSET SCHEMATIC



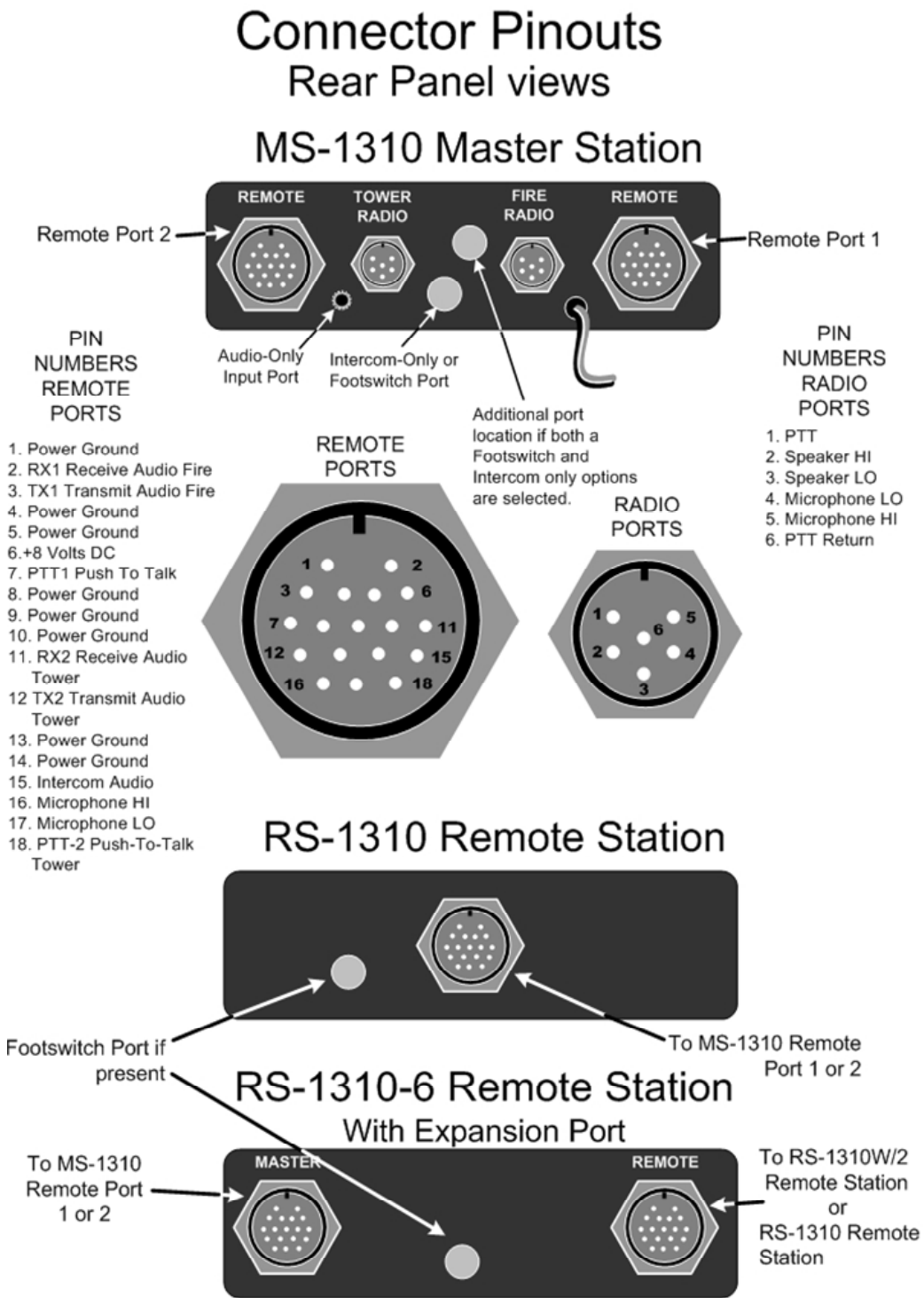
8.5. RC-( ) RADIO CABLE SCHEMATIC



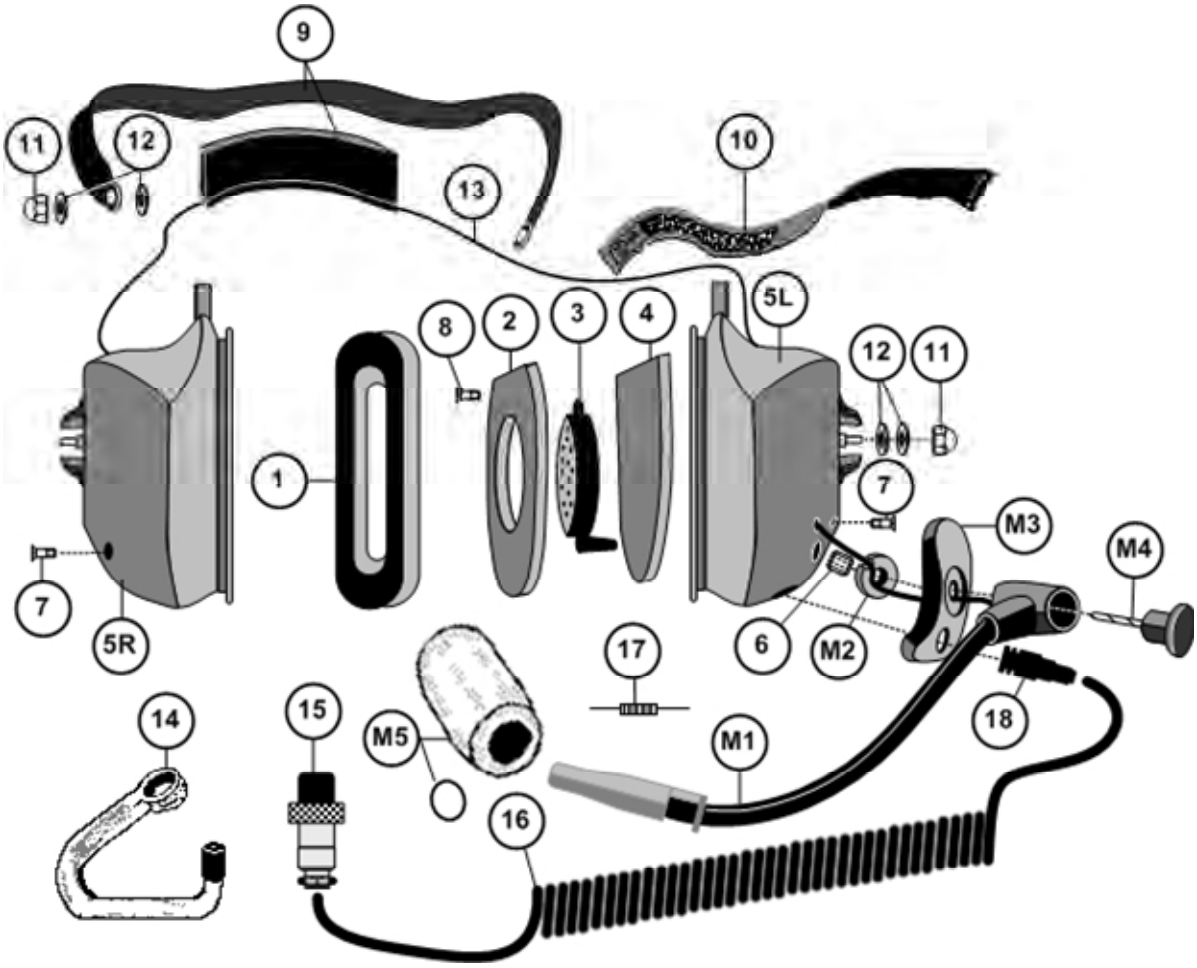
8.6. MRC- ( ) MASTER REMOTE CABLE SCHEMATIC



8.7. MS-1310, RS-1310, RS-1310-6 REAR PANEL VIEWS

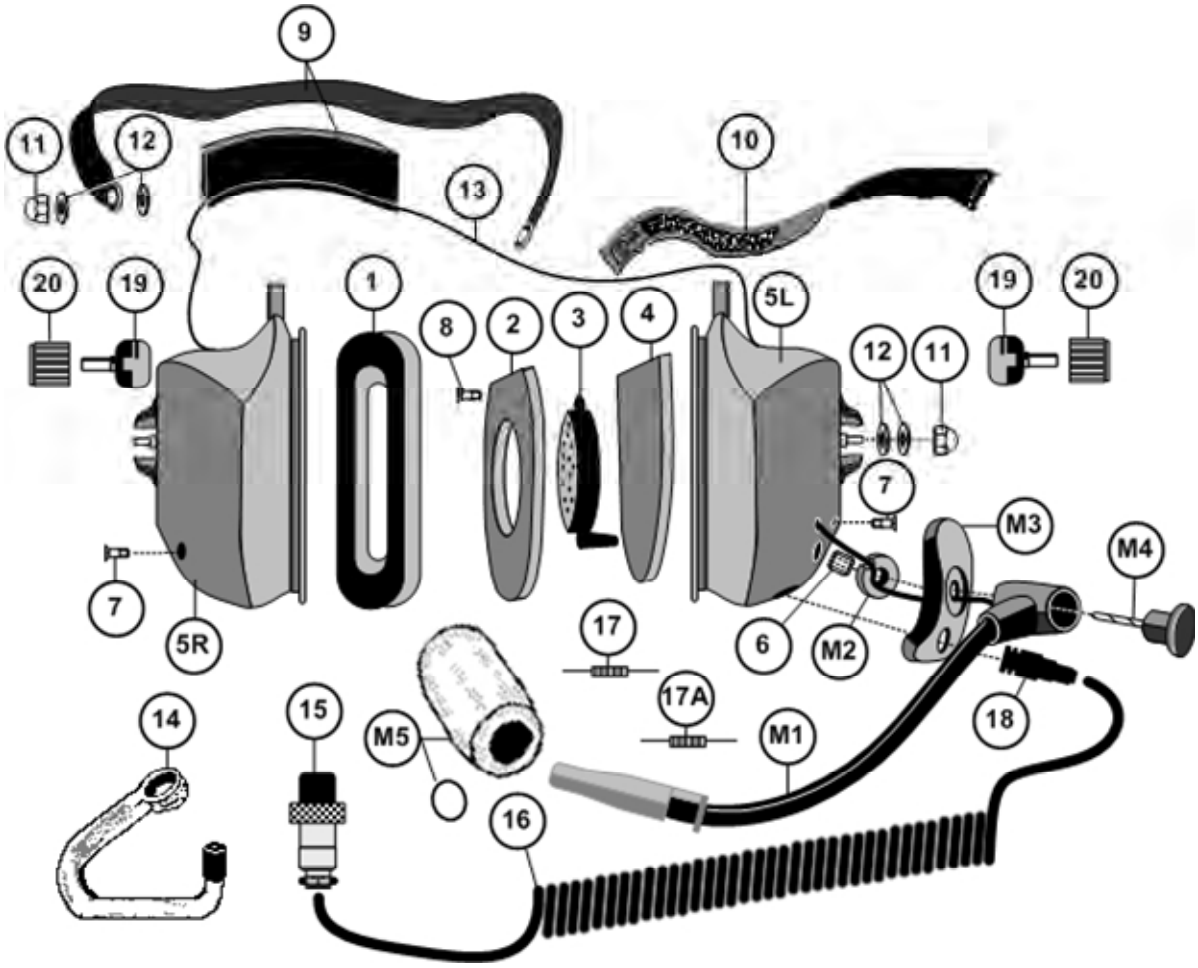


8.8. CSB-1310L AND CSB-1310R EXPLODED VIEW



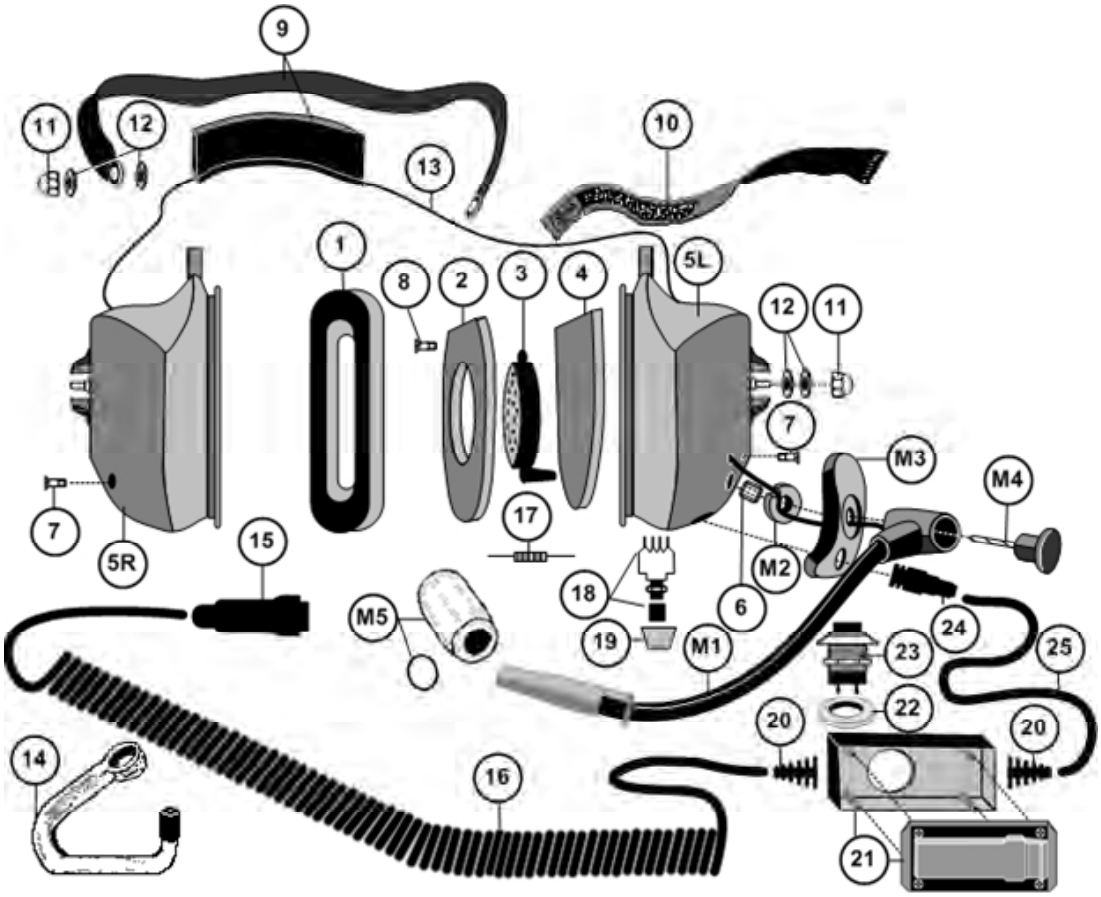
ITEM	DESCRIPTION	P/N	QTY	ITEM	DESCRIPTION	P/N	QTY
1	Ear pad	15-5021	2	11/12	Set includes 2 Cap Nuts and four washers	21-8000	1 Set
2	Acoustical Pad, Outer	15-5005	2				
3	Speaker Assembly	23-5024	2	13	Speaker Cable, Parallel	24-4014	1
4	Acoustical Pad, Inner	15-5004	2	14	Hanger Ass'y, headset	14-7014	1
5L	Left Cup, drilled for mount	13-1680NS	1,0	15	Jack, In-Line 5 pin	11-7027	1
5LA*	Left Cup, Speaker only	13-1628S	0,1	16	Coil Cord, 7 foot	24-3435	1
5R	Right Cup, Speaker only	13-1611S	1,0	17	Resistor, 1K ohm, 1/4	02-2102	1
5RA*	Right Cup, drilled for mount	13-681NS	0,1	18	Strain relief	18-2026	1
6	Insert, threaded	21-3001	1	M1	Flex Boom, Amplified	23-1025	1
7	Screw, Philips, Type A, blk	HDWR-5	2	M2	Stabilizer	12-4015	1
8	Screw, Philips, Type A, blk	HDWR-7	2	M3	Adapter Base, flex boom	14-5013	1
9	Headband, complete	14-0027	1	M4	Adapter Cap Screw	21-2505	1
10	Strap, Support Sling	12-2034	1	M5	Windscreen w/retainer	15-5035	1
*Exploded view shows a CSB-1310L Left Dress Headset. 5LA and 5RA show the cup part numbers for the Right Dress version. All other part numbers remain the same.							

8.9. CSB-1310JSL AND CSB-1310JSR EXPLODED VIEW



ITEM	DESCRIPTION	P/N	QTY	ITEM	DESCRIPTION	P/N	QTY
1	Ear pad	15-5021	2	13	Speaker Cable, Parallel	24-4014	1
2	Acoustical Pad, Outer	15-5005	2	14	Hanger Ass'y, headset	14-7014	1
3	Speaker Assembly	23-5024	2	15	Jack, In-Line 6 pin	11-7028	1
4	Acoustical Pad, Inner	15-5004	2	16	Coil Cord, 7 foot	24-3435	1
5L	Left Cup, drilled for mount	13-1682AS	1,0	17	Resistor, 1K ohm, 1/4	02-2101	2
5LA*	Left Cup, Speaker only	13-1628S	0,1	17A	Resistor, 100 ohm, 1/4	02-2102	1
5R	Right Cup, Speaker only	13-1611AS	1,0	18	Strain relief	18-2026	1
5RA*	Right Cup, drilled for mount	13-683NS	0,1	19	Pot, 1K ohm	07-0004	2
6	Insert, threaded	21-3001	1	20	Knob, 1/8" shaft	09-0004	2
7	Screw, Philips, Type A, blk	HDWR-5	2				
8	Screw, Philips, Type A, blk	HDWR-7	2	M1	Flex Boom, Amplified	23-1025	1
9	Headband, complete	14-0027	1	M2	Stabilizer	12-4015	1
10	Strap, Support Sling	12-2034	1	M3	Adapter Base, flex boom	14-5013	1
11/12	Set includes 2 Cap Nuts and four washers	21-8000	1 Set	M4	Adapter Cap Screw	21-2505	1
				M5	Windscreen w/retainer	15-5035	1
*Exploded view shows a CSB-1310JSL Left Dress Headset. 5LA and 5RA show the cup part numbers for the Right Dress version. All other part numbers remain the same.							

8.10.CSB-1310D/R-2 EXPLODED VIEW



ITEM	DESCRIPTION	P/N	QTY	ITEM	DESCRIPTION	P/N	QTY
1	Ear pad	15-5021	2	19	Dress Nut	21-4502	1
2	Acoustical Pad, Outer	15-5005	2	20	Strain Relief	18-2002	2
3	Speaker Assembly	23-5024	2	21	Housing with clip	13-3064	1
4	Acoustical Pad, Inner	15-5004	2	22	Gasket	16-0001	1
5L	Left Cup, drilled for mount	13-1628S	1	23	Switch, Push Button with nut and washer	08-3002	1
5R	Right Cup, speaker only	13-1681NAS	1				
6	Insert, threaded	21-3001	1	24	Strain relief	18-2026	1
7	Screw, Philips, Type A, blk	HDWR-5	2	25	Cable, upper	24-2205	2.9ft
8	Screw, Philips, Type A, blk	HDWR-7	2				
9	Headband, complete	14-0027	1				
10	Strap, Support Sling	12-2034	1	M1	Flex Boom, Amplified	23-1025	1
11/12	Set includes 2 Cap Nuts and four washers	21-8000	1 Set	M2	Stabilizer	12-4015	1
				M3	Adapter Base, flex boom	14-5013	1
13	Speaker Cable, Parallel	24-4014	1	M4	Adapter Cap Screw	21-2505	1
14	Hanger Ass'y, headset	14-7014	1	M5	Windscreen w/retainer	15-5035	1
15	Jack, In-Line 6 pin	11-7032	1				
16	Coil Cord, 14 foot	24-3444	1				
17	Resistor, 1K ohm, 1/4	02-2101	2				
18	Switch, PO/PO w/cap	08-3006	1				

9. WARRANTY

Setcom's Standard One Year Limited Warranty covers this product. If product is found to be defective during the warranty period it must be returned to Setcom for repair or replacement, do not attempt to repair in the field without discussing with Setcom Tech Support as this may void the warranty. Include a copy of the packing list or invoice, a brief description of the problem, your name, contact number and email address (if you have one). Package defective parts carefully and return them by traceable means to:

Setcom Corporation, 1400 N. Shoreline Blvd., Mtn. View, CA 94043 Attn.: Warranty Service

10. TECHNICAL SUPPORT

If you have any problem installing or operating this system, have a copy of the packing list or invoice available, a copy of your system diagram, write down the Setcom PN from the label on each component and contact Setcom Technical Support at:

1-888-6SETCOM (888-673-8266) ext 732 (1-650-965-8020-732 for international calls)
Or email:
tech@setcomcorp.com

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