User Manual
For
Amron International, Inc.

Model 2820A-XX & 2825A-XX Series
Portable Two Diver Communicators

S/N _____

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1   INTRODUCTION AND SPECIFICATIONS

1.1   INTRODUCTION

Congratulations on purchasing the most advanced and powerful portable communicator in the diving industry! Our engineering team has integrated the latest in digital advancements to produce the industry's most intelligible and reliable diver communicators. Our built-in quality that Amron is known for makes the 2820A & 2825A series the most versatile and durable communicators anywhere in the world!

The AMCOM II Series is a family of full-featured hard-wired, two-diver communicators. The AMCOM II is offered in two basic versions. The units are identical except the Model 2825A series has independent microphone and earphone volume controls for each diver and the tender. The 2820A series has a single earphone volume control for diver's volume (down-link) and a single volume control for the tender (up-link).

All models come standard with a built-in internal charger and can be operated from either a 90-264 V_{AC}, internal 12 V_{DC} battery, or an external 12 V_{DC} power source.

All communicators are supplied with an outdoor weather resistant AC power entry module located on the case, and country specific locking AC power cord of your choice.

There are options available to fit your application such as DSP3 Helium Speech Unscrambler and 28B Wireless Tender.

The 2820A-XX and 2825A-XX series has the ability to operate in the 2-Wire and Full Duplex (4-Wire) mode, as well as both modes being used simultaneously. Full Duplex (4-Wire) mode is required when using the Inhalation Noise Reduction or Wireless Tender features.

Only Amron offers **Microphone Auto Detection** that identifies the type of microphone each diver is using and automatically adjusts for optimum performance. This portable diving communicator has the ability to work with both dynamic and pre-amplified microphones in either 2-Wire or 4-Wire modes.

1.2   SPECIFICATIONS

Input Impedance (Each Input) .... 250 Ohms
Frequency Response .... 300 - 10000 Hz
Common Mode Rejection .... 40 dB Minimum
Current Drain Maximum Full Volume ....3 Amps
Minimum Quiescent .... 0.190 Amps
Output Impedance .... 4 Ohm
Power Supply Voltage .... 12 V_{DC} Nominal (9 V_{DC} Min - 16 V_{DC} Max)
AC Power Operating Range .... 90-264 V_{AC}, 50-60 Hz
Sensitivity (Input) ....0.5 mV
Output Power (RMS @ 4 Ohm Load, 12 VDC) ....10 Watts Audio

1.3   BATTERY LIFE

Model 2820A-11 .... 45 Hours
Model 2825A-11 .... 45 Hours
Model 2825A-12 .... 31 Hours
Model 2825A-13 .... 32 Hours

1.4   MATERIALS, WEIGHTS & DIMENSIONS

Front Panel .... Stainless Steel, Powder Coated
Enclosure... High Impact UV Resistant Plastic
Enclosure Color .... Bright International Yellow
Length   .... 14.5 In. (36.8 Cm)
Width   .... 9.0 In. (22.9 Cm)
Height   .... 10.0 In. (25.4 Cm)
Model 2820A-11 with AC Power Module and Internal Charger .... 16.25 Lbs. (7.37 Kg)
Model 2825A-11 with AC Power Module and Internal Charger .... 16.95 Lbs. (7.69 Kg)
Model 2825A-12 with DSP3 Helium Speech Unscrambler Option............. 17.25 Lbs. (7.82 Kg)
Model 2825A-13 with 28B Wireless Tender Option .... 17.15 Lbs. (7.78 Kg)

2   OPTIONS AND ACCESSORIES

The following options are available to customize the 2825A Series AMCOM communicators. Options have to be ordered at the time of purchase or the communicator has to be returned to AMRON for the option to be installed.

2.1   **OPTIONS**

-11 AC POWER WITH INTERNAL CHARGER
Commercial styletwo diver rechargeable communicator with binding posts comes standard with AC power module, country specific locking power cord, and hand held microphone.

2.1.1   **-12 HELIUM SPEECH UNSCRAMBLER (HSU)**
The communicator has all the features of the Model 2825A-11 plus Amron's DSP3 Helium Speech Unscrambler (HSU) using the state-of-the-art Digital Signal Processor (DSP) technology to correct raw helium speech into clear, intelligible voice. This option includes a complex noise reduction filter to improve communications in situations with high background noise levels.

-13 WIRELESS TENDER OPTION
The communicator has all the features of the Model 2825A-11 plus the wireless tender option. The wireless option includes communicator master module, remote module, remote module charger, remote wireless tender headset, remote ultra-light headset, and carrying case. The wireless tender option allows the tender freedom to move around up to 200 feet from the communicator. The wireless tender option does require the divers to be wired in Full Duplex (4-Wire) mode.

2.2   **ACCESSORIES**

The following accessories are available for the AMCOM III communicator. Accessories can be ordered at any time.

2.2.1   Item No. **2401-28** AMRON HEAVY-DUTY HEADSET (Dual Ear Muffs)

The Model 2401-28 is a high quality heavy-duty Telex headset with dual ear muffs and boom microphone. It has superior sound quality and comes equipped with color-coded dual banana plugs, 6-foot (1.8-meter) cord, and mates directly to communicator.

2.2.2   Item No. **2401SM-28** AMRON HEAVY-DUTY HEADSET (Single Ear Muff)

The Model 2401SM-28 is a high quality heavy-duty Telex headset with a single ear muff and boom microphone. It has superior sound quality and comes equipped with color-coded dual banana plugs, 6-foot (1.8-meter) cord, and mates directly to communicator.

2.2.3   Item No. **2460-28** AMRON STANDARD HEADSET (Dual Ear Muffs)

The Model 2460-28 is a light and comfortable headset with dual ear muffs and designed for extended wear at an economical price. It comes equipped with color-coded, dual banana plugs that mate directly to AMCOM diver communicators. The spiral cord can extend up to 8 feet (2.4 meters).

2.2.4   Item No. **2460SM-28** AMRON STANDARD HEADSET (Single Ear Muff)

The Model 2460-28 is a light and comfortable headset with a single ear muff and designed for extended wear at an economical price. It comes equipped with color-coded, dual banana plugs that mate directly to AMCOM diver communicators. The spiral cord can extend up to 8 feet (2.4 meters).

2.2.5   Item No. **2490-28** NOISE REDUCTION HEADSET (Dual Ear Muffs)

The Model 2490-28 Active Noise Reduction (ANR) headset isolates and reduces topside noise in loud environments dramatically, allowing the tender and divers to communicate more clearly and comfortably with increased intelligibility.

Amron's Active Noise Reduction Headset features two key technologies, unmatched active noise reduction and unique dynamic noise cancelling microphone. The proprietary electronic circuitry design shapes and equalizes incoming audio signals to provide a clean full sound quality that enhances intelligibility of the intercom audio.

The headset comes equipped with dual ear muffs, color-coded dual banana plugs, 6-foot (1.8-meter) cord, and mates directly to the communicator.

2.2.6   Item No. **2490SM-28** NOISE REDUCTION HEADSET (Single Ear Muff)

The Model 2490SM-28 Active Noise Reduction (ANR) headset isolates and reduces topside noise in loud environments dramatically, allowing the tender and divers to communicate more clearly and comfortably with increased intelligibility.

Amron's Active Noise Reduction Headset features two key technologies, unmatched active noise reduction and unique dynamic noise cancelling microphone. The proprietary electronic circuitry design shapes and equalizes incoming audio signals to provide a clean full sound quality that enhances intelligibility of the intercom audio.

The headset comes equipped with a single ear muff, color-coded dual banana plugs, 6-foot (1.8-meter) cord, and mates directly to the communicator.

2.2.7   Item No. **2405-28** AMRON PUSH-TO-TALK MIC

The Model 2405-28 is a dynamic hand-held push-to-talk microphone that provides excellent sound quality to the diver. It comes equipped with a spiral cord that can extend up to 6 feet (1.8 meters).

2.2.8   Item No. **2405NC-28** AMRON NOISE CANCELLING PUSH-TO-TALK MIC

The Model 2405-28 is a noise cancelling hand-held push-to-talk microphone that provides excellent sound quality to the diver. It comes equipped with a spiral cord that can extend up to 6 feet (1.8 meters).

2.2.9   Item No. **2822-28** AMRON REMOTE WALK-AND-TALK MODULE

Designed for Full Duplex (4-Wire) applications, the Model 2822-28 provides the tender with mobility around the dive site while maintaining communications with the diver. It comes equipped with a small clip-on belt module that contains the connectors for the headset, and 25 feet (7.6 meters) of lightweight flexible cable. Custom cable lengths are available upon request.

2.2.10 Item No. **2821-28** AMRON REMOTE PUSH-TO-TALK MODULE

Designed for 2-Wire applications, the Model 2821-28 provides the tender with mobility around the dive site while maintaining communications with the diver. It comes equipped with a small clip-on belt module that contains a push-to-talk switch, connector for the headset, and 25 feet (7.6 meters) of lightweight flexible cable. Custom cable lengths are available upon request.

2.2.11 Item No. **190-0650-01** AMRON WIRELESS TENDER HEADSET (Single Ear Muff)

A single ear muff headset that is compatible with the 28B Wireless Tender option. Additional headsets can be ordered to allow other crew members, supervisors, crane operators, etc. to monitor the conversation.

2.2.12 Item No. **190-0650-02** AMRON WIRELESS TENDER HEADSET (Dual Ear Muffs)

Dual ear muffs headset that is compatible with the 28B Wireless Tender option. Additional headsets can be ordered to allow other crew members, supervisors, crane operators, etc. to monitor the conversation.

3 CONTROLS AND CONNECTIONS

Before using the AMCOM II series diver communications system, you should familiarize yourself with its operating controls and connections. Improper use of controls and connections will deprive the user of the full benefits of this communication system.

3.1 TENDER CONTROLS & CONNECTIONS

3.1.1 **AC POWER LED** to identify the presence of AC power. When the communicator is plugged into AC power, the Green LED will be on regardless if the communicators POWER SWITCH is on or off.

3.1.2 **POWER SWITCH** –controls power to the communicator.

3.1.3 **SPEAKER SWITCH** –allows the tender to turn off the speaker. If the tender is using a headset, it may be necessary to turn off the speaker in order to prevent acoustic feedback.

3.1.4 **PUSH-TO-TALK (ALL DIVERS)** –allows the tender to talk to all the divers when operating in the 2-Wire mode. It is not necessary to use this control in the Full Duplex (4-Wire) mode and tender wearing a headset.

3.1.5 **TENDER MICROPHONE VOLUME** (2825A series only) – controls the volume level for the tender's microphone and/or PANEL MICROPHONE. Rotate knob clockwise to increase the tender's volume to all the divers.

3.1.6 **TENDER EARPHONE VOLUME** –controls the volume level for the tender's earphone and/or PANEL SPEAKER. Rotate this knob clockwise to increase the volume from all the divers

3.1.7 **BATTERY CONDITION INDICATOR** – a steady GREEN LED light indicates battery charge level is good. Blinking GREEN LED light indicates battery charge level is at a low level with less than 3 hours of running time available. Steady RED LED light indicates battery charge level is below the level necessary to guarantee proper operation.

WARNING: When BATTERY CONDITION INDICATOR is steady RED LED light, the batteries should be replaced or recharged immediately.

3.1.8 **PANEL SPEAKER** – is a waterproof acoustic horn speaker that allows the tender to listen to the divers. The volume level is controlled by the EARPHONE VOLUME controls and it can be turned off using the SPEAKER SWITCH.

3.1.9 **PANEL MICROPHONE** – is a water-resistant condenser microphone that allows the tender to talk to the divers using the PUSH-TO-TALK BUTTONS. The volume level is controlled by the MICROPHONE VOLUME controls. The PANEL MICROPHONE is muted when the SPEAKER SWITCH is turned off.

WARNING: Do not plug or cover the PANEL MICROPHONE hole. This may reduce or eliminate the tender-to-diver communications, and possibly damage the microphone.

3.1.10 **TENDER HEADSET JACKS (BLACK)** –are dual banana jacks (color-coded black) that functions as both an output (earphone) and input (microphone) for the tender as controlled by the PUSH-TO-TALK BUTTON and PUSH-TO-TALK JACK. Using this connection, the tender can be wired in either 2-Wire or Full Duplex (4-Wire) mode regardless of the mode used for the diver.

To connect the tender in the Full Duplex (4-Wire) mode, connect the earphone (black) banana plug of the headset to this jack and the microphone (red) to the TENDER MICROPHONE jack (red) as shown in wiring diagram section 3.6. In this mode, the tender does not have to use the PUSH-TO-TALK BUTTON to communicate with a diver who is also connected in the Full Duplex (4-Wire) mode. This configuration can be used even if the diver is connected in 2-Wire mode. In that situation, the tender is required to use the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK.

The headset microphone is always active, which means that there can be acoustic feedback between the PANEL SPEAKER and the microphone if the tender is near the communicator. To prevent this, the PANEL SPEAKER can be turned off using the SPEAKER SWITCH. Another option is to move the tender away from the communicator by using the Amron Model 2822-28 Walk-and-Talk Module accessory. This allows the tender to communicate while other members of the surface crew listen using the PANEL SPEAKER. This module comes with 25 feet (7.6 meters) of cable (custom cable lengths are available).

The tender can also be connected in 2-Wire mode by stacking both the earphone (black) and microphone (red) banana plugs into this jack as shown in wiring diagram section 3.5. The diver does not have to be connected in 2-Wire mode if the tender is in 2-Wire mode. In order to talk to the diver, the tender must use either the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK. Since the headset microphone is not active until one of the push-to-talk methods is used, there is no chance for acoustic feedback to occur and surface conversation or noise is not transmitted to diver and the PANEL SPEAKER can be left on. This may, for some situations, make for a better overall diving experience. If the tender requires more mobility at the dive site, the Amron Model 2821-28 Remote Push-to-Talk Module can be used to extend the headset cable. It includes a push-to-talk button on a clip-on belt module and comes standard with 25 feet (7.6 meters) of cable (custom cable lengths are available).

The tender may also use the optional Amron Model 2405-28 Push-to-Talk Microphone. This microphone comes with two color-coded banana plugs. The black plug goes into the TENDER HEADSET jack and the yellow plug goes in the PUSH-TO-TALK JACK as shown in wiring diagram section 3.5. To communicate with the diver, the tender presses the button on the side of the microphone. There is no chance of acoustic feedback since the PANEL SPEAKER is cut off when the tender uses the microphone. When using the Push-to-Talk Microphone, the SPEAKER SWITCH must be turned on in order to hear the diver.

3.1.11 **TENDER MICROPHONE JACKS (RED)** – are dual banana jacks (color-coded red) that functions as the microphone input from the tender's headset. It is only used if the tender is in Full Duplex (4-Wire) mode.

3.1.12 **PUSH-TO-TALK JACKS (YELLOW)** – are dual banana jacks (color-coded yellow) that allows for remote keying of the push-to-talk function of the communicator. It is use by the Push-To-Talk Microphone (Amron Model 2405-28) and the Remote Walk-And-Talk Module (Amron Model 2822-28).

The difference between using the PUSH-TO-TALK JACK and PUSH-TO-TALK SWITCH is that the switch allows the tender to communicate using the PANEL MICROPHONE. If both are used at the same time, the PANEL MICROPHONE is active. This allows another crew member to talk to the diver using the PANEL MICROPHONE even if the tender is away from the communicator using the Remote Push-to-Talk Module in 2-Wire mode.

3.1.13 **EXTERNAL BATTERY JACKS** – The communicator can be powered using an external battery or power supply using color coded TIP jacks. The red TIP jack is the positive power input and the black is the negative power input. The input voltage must be between 9 and 15 V_{DC} and must be able to supply a peak current of 3 Amps for proper operation. It is recommended that the minimum wire gauge size to be 18 AWG or larger with a maximum length of 3 feet (1 meter).

WARNING: If you use an external power supply, the maximum voltage cannot exceed 16 Volts.

3.1.14   **AUDIO OUT –** is a single RCA Phono jack (color-coded black) that provides a transformer isolated of both the diver and tender communications. It is designed to drive the standard line-level inputs of audio or video recorders with input impedances as low as 600 Ohms.

3.1.15   **SEALED AC POWER ENTRY MODULE –** is located on the right side of the case and outdoor rated offering IP 65 protection to the communicator and IP54 protection to the cord connection. The internal battery charger has a universal input AC voltage range from 90-264 VAC over a frequency range from 50-60 Hz.

3.1.16   **COUNTRY SPECIFIC LOCKING AC POWER CORD** – is supplied with every communicator and country type is selected at time of order. The outdoor rated power cord locks into the weather resistant AC Power Entry Module located on the side of the communicators case, offering IP 54 protection to the cord connection.

3.2   **DIVER CONTROLS & CONNECTIONS**

DIVER EARPHONE VOLUME – has separate earphone volume controls for each diver. This allows the tender to adjust the optimum earphone volume level for each individual diver.

3.2.1   **DIVER MICROPHONE VOLUME** – has separate microphone volume controls for each diver. This allows the tender to adjust the optimum microphone volume level for each individual diver.

3.2.2   **DIVER PUSH-TO-TALK SWITCH** – provided for each diver and used only in the 2-Wire Mode. This function allows the tender to carry on a private conversation with only the diver(s) selected.

3.2.3   **DIVER MICROPHONE CONNECTION (RED)** – is a dual 5-way binding post jack (color-coded red) that functions as both an output (earphone) and input (microphone) for the diver as controlled by the PUSH-TO-TALK BUTTON and PUSH-TO-TALK JACK. Using this connection, the diver can be wired in either 2-Wire or Full Duplex (4-Wire) mode.

To connect the diver in 2-Wire mode, connect both the diver microphone and earphone to this jack. If the diver umbilical uses banana plugs, simply stack both plugs into this jack as shown in the 2-Wire wiring diagram section 3.5. In this mode, the diver microphone will be active and heard on tender headset and/or PANEL SPEAKER unless the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK is used. When a pre-amp microphone is used in the 2-Wire mode setup, it is required to have special speakers supplied only by Amron. Contact Amron for more information.

To connect the diver in Full Duplex (4-Wire) mode, connect the diver microphone to this jack and the diver earphone the DIVER EARPHONE jack simply stack both plugs into this jack as shown in the 2-Wire wiring diagram section 3.6. The diver can use this mode even if the tender is wired in 2-Wire mode.

3.2.4   **DIVER EARPHONE CONNECTION (BLACK)** – is a dual 5-way binding post jack (color-coded black) that functions as the output for the diver's earphone. It is only used when the diver is in Full Duplex (4-Wire) mode.

3.3   **HELIUM SPEECH UNSCRAMBLER (DSP3) CONTROLS**

The controls for the DSP3 Helium Speech Unscrambler (HSU) are located in the options panel on the right side of the front panel as shown below.

3.3.1   **ON/OFF SWITCH** – Allows the selection of air (OFF) or helium (ON) operation. In the OFF position, the divers' microphone signal bypasses the HSU. In the ON position, the microphone signals are routed to the HSU and the tender can adjust the controls as necessary.

3.3.2   **TREBLE BOOST** – Selects the amount of gain added to the High Frequency (HF) portion of the divers' microphone signals. This compensates for the HF drop-off in the sensitivity of most microphones. The TREBLE BOOST feature allows for optimum frequency enhancement and improved intelligible speech from the diver's voice.

3.3.3   **DEPTH CONTROL** – Selects the amount of frequency correction performed by the HSU to produce intelligible speech. This control uses a multi-turn potentiometer and is equipped with a turn counting knob and lock. Once the desired setting is reached, the lock can be used to prevent accidental changes to this control.

3.3.4   **NOISE REDUCTION FILTER** – The Noise Reduction Filter (NRF) uses a complex Digital Signal Processor algorithm based on a statistical-model of human voice activity to capture the background noise and reduce it without affecting the divers' speech. The noise level can be reduced by up to 17dB.
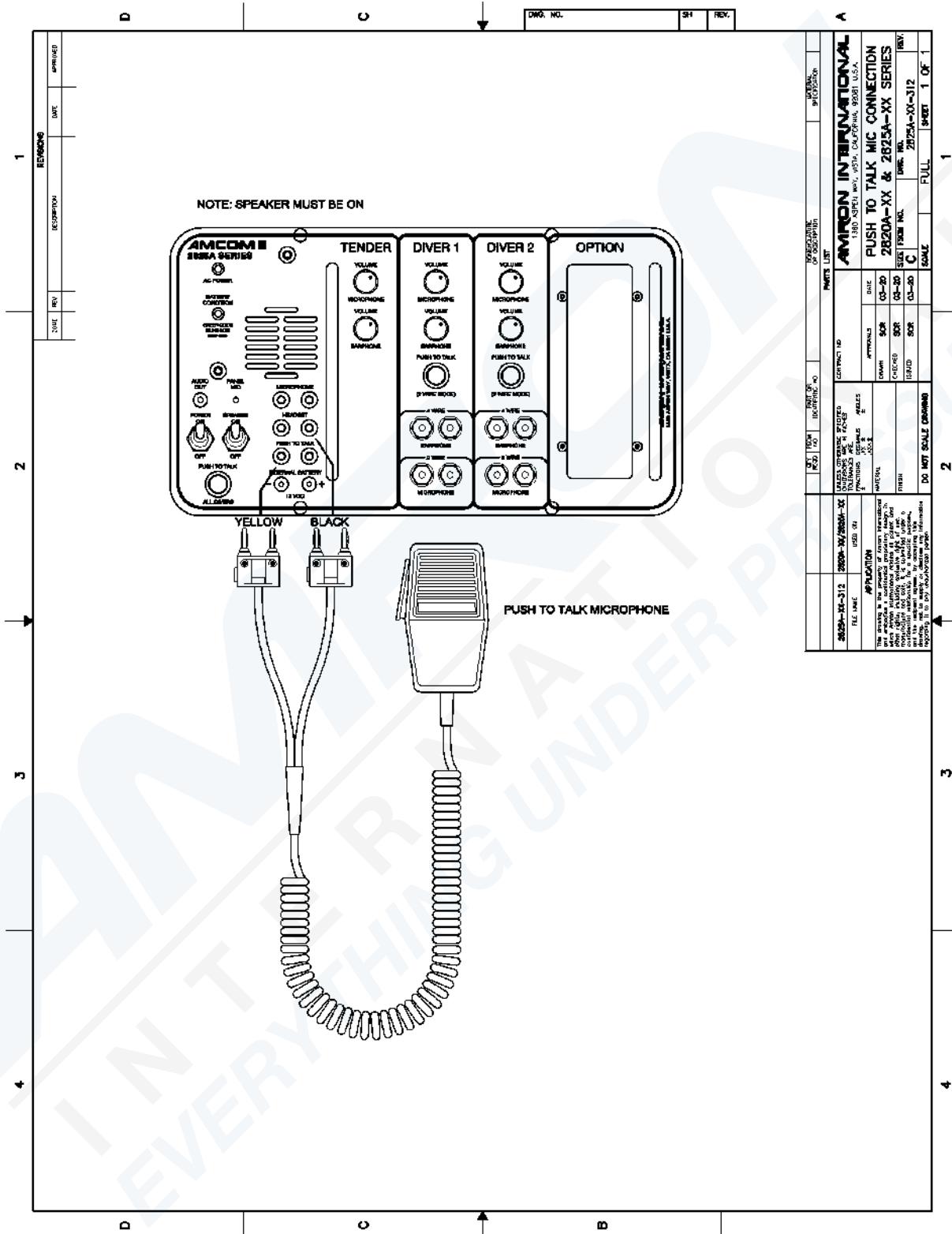
3.4   **WIRELESS TENDER (28B) CONTROLS**

3.4.1   **BASE STATION ON/OFF/VOLUME** – control is located on the bottom right side of the Base Station. It turns on and off the power to the Wireless Tender Base Station and adjusts the volume level by rotating the knob in either direction.

3.4.2   **BASE STATION CHANNELS 1 & 2** – programming buttons are located on the rear side of the base-station. Up to 3 remote headsets can be programed per channel.

3.4.3   **WIRELESS REMOTE HEADSET ON/OFF & VOLUME** – controls are located on the headset ear muff. The top button powers on and off the headset, and the up/down arrows control the headset volume.

3.4.4   **RECHARGEABLE BATTERY** – is located on the opposite ear muff from the controls and boom mic.

3.5 DRAWING, 2-WIRE CONNECTIONS

3.6 DRAWING, FULL DUPLEX (4-WIRE) CONNECTIONS

3.7 DRAWING, OPERATOR CONNECTIONS, HAND HELD MICROPHONE

3.8 DRAWING, OPERATOR CONNECTIONS, HEADSET

4   OPERATION

The AMCOM II portable diver communicators are supplied in a durable yellow enclosure. To open the enclosure, release the two latches on the front of the unit and raise the lid. The lid of the communicator can be removed by sliding the lid to the side.

The AMCOM II panels are graphically divided into sections starting from left to right: Tender Controls, Diver Controls, and Options. Items within these areas are functions or controls relating to the Tender, Diver(s) or Optional items.

WARNING: When operating your Amron Diver Communicator from AC mains, it is critical to use a Ground Fault Circuit Interrupter (GFCI) and/or isolation transformer for tender and diver safety. Surges and spikes are common on AC lines found onboard ships, from local generators, or at the end of a long extension lines. These spikes can exceed 1kV! Such spikes can be high enough to cause the input fuses on the power supply to blow and, in extreme cases, actually damage the charging circuitry. Amron uses a medical grade power supply to isolate such faults to ensure that they will not cause a safety issue for the diver or tender. Amron cannot guarantee that non-Amron power supplies meet the same high standards and strongly advises against using any such device to power your diver communicator.

4.1   BATTERY CHARGING

4.1.1   To charge the battery after use, simply connect power cord to an AC outlet rated from 90-264 V_{AC}, 50-60 Hz. The charger will automatically adjust to the input voltage.

4.1.2   The unit should be placed on charge and left on charge until the unit is to be used again. This ensures the unit will always be ready to use, and the batteries are fully charged. The charger is designed not to damage the batteries when left on continuous charge. Full charge will occur in ten hours (depending on the battery age and the surrounding temperature). If the unit is in constant use (daily) it is recommended the unit be left on charge during the weekend to top off the batteries. Batteries must be recharged periodically, a minimum of at least once every six months.

4.1.3   An internal 12V_{DC} sealed lead-acid battery is supplied standard for backup operation in the event of a loss of AC power. The switch over to battery operation is completely automatic, and occurs whenever AC power is interrupted. The internal 12V battery is maintained at full charge while the unit is operating from AC power. AC power indicator on the option panel confirms the presence of AC power.

4.1.4   Operating time for the 12V rechargeable battery depends on multiple factors such as age of the battery, number of cycles, and temperature. A sealed lead-acid battery typically has a life span of 300 cycles or 3 years, and can be charged at any time.

NOTE: Do not continue to operate the rechargeable battery below the Low Battery Condition or permanent damage will occur. When the battery condition indicator turns to red, turn the unit off and charge batteries.

4.2   **BATTERY CONDITION**

4.2.1   **POWER ON – BATTERY CHECK**

Turn power switch "ON" and observe the battery condition indicator. The battery indicator will display the condition of the battery.

- "STEADY GREEN" light indicates the battery has sufficient voltage to operate the unit.

- "BLINKING GREEN" light indicates the battery is low and will need charging shortly, three hours of operating time remain.

- "STEADY RED" light indicates the battery voltage is too low to operate the unit. Communication should stop.

NOTE: A battery, which has not been used for a period of time, will display a higher voltage state when initially turned on, this will rapidly dissipate. This condition is known as a surface charge, when the battery is placed under a load the voltage will fall rapidly. It is a good idea to leave the unit on for five minutes before relying upon the battery condition indicator.

4.3   **BATTERY INSTALLATION**

The 2820A-XX & 2825A-XX series communicators are supplied with a single 12V gel-cell, sealed lead-acid battery. To remove and install the battery, remove the four brass thumb screws from the front panel and lift unit out of the case. Set brass screws aside in a safe place where they won't be lost. Set unit on flat stable surface with front panel facing up. Remove two screws on each side of the chassis. Lift out radio using the handles and set it on its right side (side away from speaker). The 12V battery is now accessible. Lift out battery and remove color-coded slide terminals. Install the battery and close unit in the reverse order.

4.4   **MODES OF OPERATION**

The 2820A and 2825A series have the ability to operate in either 2-Wire or Full Duplex (4-Wire). Both the diver and tender can be connected in either mode and a combination of modes can be used. If either the diver or the tender is wired in 2-Wire mode, the tender must use a push-to-talk, either the PUSH-TO-TALK ALL SWITCH or PUSH-TO-TALK JACK, when talking to the diver.

2-Wire communication is defined as a single communication path, normally the diver is the priority signal path – tender listens to diver. Signal reversing is accomplished by pushing the PUSH-TO-TALK BUTTON – diver hears tender. Often times a 4-conductor communication cable is used with 2 wires tied together as a pair for redundancy, this is still a 2-Wire system. Since only one person can talk at a time, there is a level of discipline that goes with using 2-Wire mode in order to obtain clear communication. One advantage of 2-Wire is that the tender's microphone is not active unless one of the two push-to-talk controls, PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK, are active. This eliminates any possible acoustic feedback between the tender's microphone and the PANEL SPEAKER. It also prevents noise from the surface reaching the diver and allows the tender to communicate with other members of the surface crew without involving the diver.

Full Duplex (4-Wire) communication is defined as a dual communication path, a signal path (a pair of wires) for up-link and a signal path (a pair of wires) for down link. A common example of Full Duplex communication is the telephone. Full Duplex (4-Wire) with a tender wearing a headset has the advantage of natural communication without having to use the PUSH-TO-TALK BUTTON. This keeps the tender's hands free to perform other tasks. It does not require the same level of discipline to achieve clear communications that 2-Wire does. It has the advantage that neither the diver nor the tender is cut off when the other is talking, allowing the tender and all divers to constantly communicate with each other. Because the diver's microphone is not connected in parallel with the earphone, the diver is louder and potentially clearer in Full Duplex (4-Wire) mode.

4.4.1   2-WIRE OPERATION

To connect the diver in 2-Wire mode, connect the communication umbilical wires to the DIVER MICROPHONE (RED) binding post jack on the communicator as shown in the wiring drawing in section 6. If the umbilical uses a banana plug, simply insert the plug into the binding post jack. Verify that it is firmly and completely seated. This may require that the external plastic nut be tightened down. If the umbilical uses bare wires, loosen the external plastic nut of the binding post jack. Either insert the bare end of the wire into the hole in the metal shaft of the binding post or firmly wrap the wire around the shaft. Tighten the nut until the bare wire is firmly fastened by the nut. The nut should not be fastened on the insulation of the wire nor should any of the bare wires touch.

The tender can operate in the 2-Wire mode without a headset or push-to-talk microphone. When the tender wants to talk to the diver, he presses the PUSH-TO-TALK BUTTON on the front panel and speaks clearly into the PANEL MIC. When done speaking, the tender releases the PUSH-TO-TALK BUTTON to allow the diver to communicate.

When the tender uses a headset, follow the wiring diagram in section 3.8. Please note that when in the 2-Wire mode, the tender must press the Push-to-Talk Switch on the front panel to be heard.

When using the Amron Model 2405-28 Hand Held Push-to-Talk Microphone, follow the wiring diagram in section 3.7. Always talk close to the microphone, with the edge of the lip guard just touching the upper lip. This is important because the noise-canceling feature accepts close sounds best and discriminates against sounds greater than 1/2-inch (12 mm) away.

If using the Amron Remote Walk-and-Talk, Model 2821-28, the tender may press the Push-To-Talk Switch on the belt module to speaker to the divers.

4.4.2   **4-WIRE OPERATION**

To connect the diver in Full Duplex (4-Wire) mode, connect the communication umbilical wires to the DIVER MICROPHONE and DIVER EARPHONE jacks as shown in wiring diagram in section 3.6. If the umbilical uses a banana plug, simply insert the plug into the correct binding post jack. Verify that it is firmly and completely seated. This may require that the external plastic nut be tightened. If the umbilical uses bare wire ends, loosen the external plastic nut of the binding post

jack. Either insert the bare end of the wire into the hole in the metal shaft of the binding post or firmly wrap the wire around the shaft. Tighten the nut until the bare wire is firmly fastened by the nut. The nut should not be fastened on the insulation of the wire nor should any of the bare wires touch. The diver microphone will be louder in Full Duplex (4-Wire) mode than in 2-Wire mode. This can be a significant advantage when using longer dive umbilical cables.

To use Full Duplex (4-Wire) mode, the tender must use a headset and connect per the wiring diagram in section 3.6. When not wearing a headset, the tender will have to use the PUSH-TO-TALK BUTTON to communicate to the divers. The tender can also use the PUSH-TO-TALK BUTTON to cut off the AUDIO AUXILIARY INPUT signal from the diver even if the tender is connected in Full Duplex (4-Wire) mode. When the tender uses a headset, the SPEAKER SWITCH should be turned off to prevent acoustic feedback.

Acoustic feedback can also be avoided by moving the tender away from the communicator by using the Amron Model 2822-28 Remote Walk-and-Talk Module with 25-foot-long cable or the 28B Wireless Tender Option.

NOTE: Acoustic feedback may occur when operating with a standby diver who does not have his hat/helmet on. This can be avoided by turning his DIVER MICROPHONE VOLUME control down. This cuts off his microphone but will enable him to monitor the diver/tender conversation via his earphone.

4.5   VOLUME CONTROLS (2-WIRE)

4.5.1   Turn power switch to ON, turn speaker switch to ON.

4.5.2   If a headset is available, the tender should use it initially to talk and listen to himself. If adjustments are required, increase or decrease volume (controls). This will establish a system volume level.

4.5.3   If a headset is not available, adjust all volume controls to mid-scale. Tender has to depress PUSH-TO-TALK BUTTON in order to talk to divers. One diver at a time, the Tender and Diver talk to each other during Tender adjusting volume controls as below:

4.5.4   Tender - While diver is speaking, adjust Tender Volume Control to a comfortable level.

4.5.5   Diver - Depress the push-to-talk switch and while talking into the panel microphone, adjust diver volume control to a comfortable level for the diver.

4.6   VOLUME CONTROLS FULL DUPLEX (4-WIRE)

4.6.1   The upper row of volume controls set the microphone volume, the lower row of volume controls set the earphone volume. Tender controls are considered master controls. The optimum settings are when controls are closely matched, with differences compensating for differences in diver levels.

Turn unit on and adjust volume controls as follows:

4.6.2   Tender should don headset and talk to himself. If adjustments are required, increase or decrease Tender volume (controls). This will establish a system volume level.

4.6.3   Tender (Volume Controls)

- Earphone – Divers talk, while tender adjusts to a comfortable listening level.
- Microphone – Tender talks and divers determine a comfortable listening level, having the tender adjust as needed.

4.7   HELIUM SPEECH UNSCRAMBLER OPTION

4.7.1   HELIUM SPEECH UNSCRAMBLER (DSP3)

The Helium Unscrambler option is installed into the option panel located on right side of the communicator. A Communicator with this option accommodates a wide range of operating depths. This state-of-the-art digital design can accommodate a multitude of functions ranging from the correction of the diver's raw helium speech to normal intelligible voice levels, advance treble boost and complex noise reduction filters (NRF)

Diver radios configured with this option are only supplied with the AC power option. This is due to the power requirements of the Unscrambler option. The radio can be operated in the air mode by turning the HSU off.

Amron's advanced NOISE REDUCTION FILTER (NRF) incorporates a complex DSP algorithm which filters out background noise while allowing the diver's speech to be clear and intelligible. Amron NRF automatically captures the frequency spectrum of applied background noise within the audio frequency bandwidth and reduces it without affecting the diver's speech.

The Treble Boost Control provides a means of adjustment to enhance the diver's microphone performance. The treble boost feature allows for optimum frequency enhancement and improved intelligible speech from the diver's voice.

The Depth Control is used to change the amount of shift in the frequency of the diver's voice. The depth control is advanced as the diver's depth increases. There is a certain amount of interaction between the controls, and also a difference between diver voices, therefore it is necessary to tune the unit to the diver. Intelligibility is the desired result; each operator will find a combination which works best. The frequency shifting algorithm changes the amount of correction to the raw helium speech. The Depth Control is a multi-turn control with a locking feature. This allows the tender to finely adjust the level necessary and lock the control to prevent accidental adjustments.

At power-up, all the controls should be in the minimum (far left) position. Have the diver speak and adjust the DEPTH CONTROL as necessary to achieve the best speech quality. Then adjust the TREBLE BOOST as necessary to improve the quality. There is some interaction between these controls so you may have to go

back and adjust the DEPTH CONTROL. Once the best speech quality settings are found, the NOISE REDUCTION FILTER can be adjusted, if necessary, to reduce any background noise.

Operating in 2-Wire and Full Duplex (4-Wire) modes are possible with the HSU. In 2-Wire mode, the tender's push-to-talk switch interrupts signals from the diver. In Full Duplex mode, the tender will hear the diver at all times and tender must use a headset to talk to the divers without using the push-to-talk switch. Use of a headset to monitor helium speech is strongly recommended to enhance intelligibility.

4.8   ACTIVE NOISE REDUCTION (ANR) OPERATION

4.8.1   Not all noise cancellation headsets are the same. Amron's new series of Active Noise Reduction (ANR) headsets isolates and reduces topside noise in very loud environments dramatically, allowing the tender and divers to communicate more clearly and comfortably with increased intelligibility. The headset is available with dual muffs for optimum noise reduction or a single muff.

4.8.2   Amron's Active Noise Reduction Headset features two key technologies, unmatched active noise reduction and unique dynamic noise cancelling microphone. The proprietary electronic circuitry design shapes and equalizes incoming audio signals to provide a clean full sound quality that enhances intelligibility of the intercom audio.

4.8.3   The headsets ergonomic design provides unmatched comfort and performance allowing it to be worn longer. Adjustable headband provides comfortable settings for a wide variety of head sizes and shapes with lightweight, but durable material. Proprietary cushion design provides a critical acoustical seal around the ears (even over glasses) that provides passive noise reduction, low clamping force, and user comfort for extended use.

4.8.4   Durable and robust design made to endure the wear and tear of everyday use, and the temperature and environmental extremes in outdoor environments such as sunshine, rain, and snow.

4.8.5   When used with Amron's communicators with the Inhalation Noise Reduction (INR) feature, you now have a complete system that can eliminate both diver inhalation noise and topside noise, making Amron's communicators the most versatile and unique in the world.

Models Available:

2890-28   Noise Cancelling Deluxe Headset with Boom Mic (Dual Ear Muffs)
2890SM-28   Noise Cancelling Deluxe Headset with Boom Mic (Single Ear Muff)

4.9 **WIRELESS TENDER (28B) OPERATION**

4.9.1   Amron's full duplex 28B Wireless Tender has the capabilities to operate in two separate channels (1 & 2) with up to three (3) topside remote users per channel, totaling a maximum of six (6) remote topside users. By pressing the conference button located on the base station, all remote topside users from both channels (1 & 2) can now communicate with each other and the divers. This allows HANDS FREE OPERATION for the tender, supervisors, crane operators, and required support staff members while keeping in constant contact with the divers. There are many other benefits of being hands free such as checking equipment or simply performing other tasks.

4.9.2   The Wireless Tender base station is located inside the lid of the communicator. Additional Remote Wireless Headsets can be purchased separately. The system operates at a frequency of 1.92-1.93 GHz with an operating range of up to 400 meters in open space. The operating time is 6 hours per battery, and battery charging time is 3 hours.

4.9.3   The 28B Wireless Tender Option interfaces with the communicator. When speaking into the remote headset, the unit transmits an RF signal to the communicator, then sends the signal down the umbilical to the diver.

4.9.4   When the diver speaks, the signal is sent up the umbilical to the communicator, and then transmitted as an RF signal to the communicators base station and remote wireless headsets.

4.9.5   The standard headset is an over-the-ear dual ear muff design with 270-degree adjustable boom swivel microphone that allows the headset to be worn with the boom on the right or left side as desired.

4.9.6   The Wireless Tender ON/OFF/VOLUME is controlled by rotating the power/volume knob located on the bottom right side of the base station. The volume can be adjusted as needed.

4.10   **CLEARING THE BASE-STATION PROGRAMMING**

4.10.1   Remove base-station from the Amron Communicator lid. Channel selection buttons "1" and "2" are located on the rear side of base-station.

4.10.2   Turn Amron Communicator Power "ON".

4.10.3   Press the base-station #1 programming button until the Red LED starts flashing.

4.10.4   Press the base-station #1 programming button 7 times. The Red LED will begin rapid flashing, and then will go out. At this point, the base-station has no remotes programmed to channel 1.

4.10.5   Press the base-station #2 programming button until the Red LED starts flashing.

4.10.6   Press the base-station #2 programming button 7 times. The Red LED will begin rapid flashing, and then will go out. At this point, the base-station has no remotes programmed to channel 2.

4.10.7   The headsets channels are now cleared of programming to the base-station.

Follow the "Base-Station Programming Instructions" to link headsets.

4.11   **BASE-STATION PROGRAMMING INSTRUCTIONS**

4.11.1   All "Remote" headsets to be fully charged and in the "OFF" position.

4.11.2   Remove base-station from the Amron Communicator lid. Channel selection buttons "#1" and "#2" are located on the rear side of base-station.

4.11.3   Turn Amron Communicator power "ON".

4.11.4   Press and hold the base-station's programming button "#1" (to program to channel #1) or "#2" (to program to channel #2) until the Red LED begins to flash rapidly. This indicates that the base-station is ready to link to a Remote Headset.

4.11.5   Press the Power button on the Remote Headset and release. The Power button should be flashing blue, and ready to be programmed.

4.11.6   Press REMOTE Headset volume DOWN arrow 3 times and release.

4.11.7   Press and HOLD the volume UP arrow until the Blue LED begins flashing, then release. Within a few seconds, the Blue LED will turn off and then back on when the pairing process is complete.

4.11.8   In order to program additional headsets, power down all "Remote" headsets by holding the power button down for at least 2 seconds. The LED on the "base-station" will go out. Press and hold the programming button of the channel you wish to program until the Red LED begins flashing, then repeat steps 5 and 7 for each additional headset.

Each base-station can have up to 3 remote headsets linked to each channel.

5   MAINTENANCE AND TROUBLESHOOTING

The following section describes the procedures for checking the operation of your diver communicator, general maintenance procedures, and how to troubleshoot common problems.

5.1   FULL DUPLEX (4-Wire) CHECK

This procedure checks the communicator functions in the Full Duplex (4-Wire) mode.

1.   Set all volume controls to the mid-scale (halfway) position.

2.   Turn the SPEAKER SWITCH off to avoid acoustic feedback.

3.   Turn on the communicator and verify the BATTERY CONDITION INDICATOR is on or blinking. If the LED does not come on at all, then replace or recharge the battery. If that does not resolve the problem, then go to the troubleshooting section to determine the cause.

4.   Identify the microphone and headset leads. When using an Amron headset, the microphone is the red banana plug and the headset is the black banana plug.

5.   Plug the microphone lead into the TENDER MICROPHONE (red) jack and the headset lead into the TENDER HEADSET (black) jack.

6.   Don the headset and talk into the microphone. You should be able to hear yourself in the headset. Adjust the DIVER TO TENDER VOLUME control and verify the level can be adjusted to a comfortable level.

7.   Move the headset microphone lead to the DIVER MICROPHONE (red) jack. Talk into the microphone. You should be able to hear yourself in the headset. Adjust the DIVER TO TENDER VOLUME control and verify that the level can be adjusted to a comfortable level.

8.   Move the headset lead to the DIVER EARPHONE (black) jack. Talk into the microphone. You should be able to hear yourself in the headset.

9.   This completes the check of the Full Duplex (4-Wire) function of the communicator. If at any point in the test you were not able to hear yourself in the headset as indicated by the test, refer to the troubleshooting section to determine the cause.

5.2   2-WIRE CHECK

This procedure checks the communicator functions in the 2-Wire mode.

1.   Set all the volume controls to the mid-scale (halfway) position.

2.   Turn the SPEAKER SWITCH off to avoid acoustic feedback.

3.   Turn on the communicator and verify the BATTERY CONDITION INDICATOR is on or blinking. If the LED does not come on at all, then replace or recharge the battery. If that does not resolve the problem, then go to the troubleshooting section to determine the cause.

4. Identify the microphone and headset leads. When using an Amron headset, the microphone is the red banana plug and the headset is the black banana plug.

5. Plug the microphone lead into the TENDER HEADSET (black) jack and the headset lead into the DIVER MICROPHONE (red) jack.

6. Don the headset. Talk into the microphone while pressing the PUSH-TO-TALK BUTTON. You should be able to hear yourself in the headset. Adjust the TENDER TO DIVER VOLUME control and verify that the level can be adjusted to a comfortable level.

7. Unplug the microphone lead. Turn on the SPEAKER SWITCH. Press the PUSH-TO-TALK BUTTON while speaking into the PANEL SPEAKER. You should be able to hear yourself in the headset. Adjust the TENDER TO DIVER VOLUME if necessary and verify that the level can be adjusted to a comfortable level.

8. Plug the microphone lead into the TENDER HEADSET (black) jack. Short the PUSH-TO-TALK JACK (yellow) with a short piece of wire. Talk into the microphone and verify that you hear yourself in the headset. Remove the short. Turn off the SPEAKER SWITCH.

9. Move the microphone lead to the DIVER MICROPHONE (red) jack and move the headset lead to the TENDER HEADSET jack.

10. Talk into the microphone and verify you can hear yourself in the headset. The PUSH-TO-TALK BUTTON should not be pressed. Adjust the DIVER TO TENDER.

5.3 GENERAL MAINTENANCE

The AMCOM II diver communicator is designed to provide years of continuous, failure-free service when properly used and maintained. There are a few important things that the user can do to extend the life of their equipment.

1. Handle the diver communicator with care. Do not throw it around or drop it. Select a work area where the communicator and wire connecting to it are out of everyone's way so it is not knocked over.

2. Clean the communicator after use or when needed. If the equipment is on an extended work program, have the tender clean the equipment during slow work periods. Rinse off salt deposits with fresh water. Clean the diver connections with a mild vinegar and water solution using a soft brush. Rinse off the connectors with water after cleaning.

5.4 RECOMMENDED MAINTENANCE SCHEDULE

The following sections outline the recommended scheduled maintenance for the communicator and communicator.

5.4.1   DAILY MAINTENANCE

Wipe off any accumulated salt or salt spray on the front panel or connectors using a clean, damp cloth. Pay particular attention to where the various front panel components attach to the panel. Inspect the outer case for any damage.

5.4.2   WEEKLY MAINTENANCE

Wipe off any accumulated salt or salt spray on the front panel or connectors using a clean, damp cloth. Pay particular attention to where the various front panel components attach to the panel. Inspect the outer case for any damage.

- Inspect the PUSH-TO-TALK BUTTON, binding posts and volume controls for smooth operation.

- Inspect the case lid O-ring for any damage and replace if necessary.

5.4.3   6 MONTH CHECK

Wipe off any accumulated salt or salt spray on the front panel or connectors using a clean, damp cloth. Pay particular attention to where the various front panel components attach to the panel. Inspect the outer case for any damage.

- Inspect the PUSH-TO-TALK BUTTON, binding posts and volume controls for smooth operation.

- Inspect the case lid O-ring for any damage and replace if necessary.

- Inspect the front panel gasket for any damage and replace if necessary.

- Recharge the battery.

- Perform the 2-Wire and 4-Wire (Full Duplex) system checks as described in sections 5.1 or 5.2.

5.4.4   YEARLY CHECK

For maximum service life, it is recommended that the diver communicator be sent back to Amron for a yearly check.

5.4.5   LONG TERM STORAGE

If the diver communicator is to be stored for a period greater than 30 days, it is recommended that it be stored in a cool dry location. Make sure that the POWER SWITCH is turned off during storage. The communicator should be stored with power cord connected to AC Power to ensure that the communicator will be fully charged and ready to use when needed.

5.5 **TROUBLESHOOTING**

Most problems are usually simple issues that can often be found by careful inspection of the diver communicator, diving umbilical, and diver wiring. The following section will describe the troubleshooting procedure for several common issues. If these sections do not cover your particular issue, it is recommended that the diving umbilical be disconnected from the diver communicator and the check-out procedures in section 5.1 or 5.2 be conducted. If the diver communicator passes the check-out procedures then the issue is most likely in the umbilical connections, the umbilical itself, or the wiring of the diver's hat/helmet.

5.5.1 **CONNECTION ISSUES**

Most diver communicator problems are caused by bad connections. Making good connections will result in years of good communications. For longer life, all connections should be soldered and copper wire must be tinned. It is strongly suggested that dual banana plugs be used topside to provide convenient and secure connections.

All cable splices must be soldered. Splices should be staggered and covered with shrink tubing (preferably shrink tubing with an adhesive sealant) and a general splice cover to protect the connections. Potting the splices to create a reliable splice is preferred but not necessary to create a reliable splice.

5.5.2 **LOW BATTERY INDICATION**

The BATTERY CONDITION INDICATOR indicates the battery level or state-of-charge by monitoring the battery voltage. The battery voltage can be measured independently using a Voltmeter by measuring the voltage across the EXTERNAL BATTERY JACK. The voltage has to be 9 Volts or greater for the communicator with rechargeable battery to operate. It is recommended that the communicator be recharged for at least 10 hours if the measured voltage is less than 12 Volts (depending on the age of the battery and the surrounding temperature). If the BATTERY CONDITION INDICATOR indicates a low (blinking LED) or bad (off LED) after charging, then either the battery is bad and needs to be replaced or the charger has malfunctioned.

5.5.3 **UNIT NOT OPERATING**

The most common reason that a diver communicator appears to be dead when the POWER SWITCH and SPEAKER SWITCH are turned on is a bad or loose battery. Check the battery per section 4.2.1. If the battery is good, then disconnect any diving umbilical and perform the communicator check out procedure per section 5.1 or 5.2.

If the battery and battery connections appear good and the communicator fails the check-out procedure, then remove the screws holding the front panel. Lift the front panel up carefully as the panel components are connected to a Printed Circuit Assembly (PCA) by a wire harness. Verify that the connectors on the PCA are firmly seated. Check that the wire harnesses are soldered to the various connectors, controls, and speaker. There should be no loose wires in the system. Remove the fuse from the PCA. It is marked FH1 and is a cylindrical component.

Verify that the fuse is good by checking the continuity with a multi-meter. If the fuse is open, replace with the same type: 3.15 Amp, 250V, Fast Acting. Close the front panel; re-install the screws and re-test the communicator. If the communicator still appears dead, contact Amron for further assistance.

5.5.4 LOW VOLUME

Check the volume control settings and adjust if necessary. Check the diver connections and verify that the diver and tender are connected as intended. Verify the wires and connector are clean and tight. Check the BATTERY CONDITION INDICATOR and test the battery if necessary. If the problem persists, disconnect the diver umbilical and perform the communicator check out procedure per section 5.1 or 5.2. If the communicator fails the check-out procedure, contact Amron for further assistance.

If the communicator checks out, then the problem is likely in either the diver umbilical communication cable, the wiring of the diving hat/helmet, or the diver's microphone/earphone.

5.5.5 GARBLED VOICE TO DIVER

The TENDER TO DIVER VOLUME control is set too high. Reduce this control until the voice signal clears. If this does not solve the problem, check the diver's earphone for corrosion or other defect. Replace if necessary. If the tender is using a headset, remove the headset and communicate to the diver by pressing the PUSH-TO-TALK BUTTON and talking into the PANEL SPEAKER. If this solves the problem then the tender headset may be wet or defective. If the tender is using the PANEL SPEAKER to talk to the diver, check the speaker for any accumulated water. Drain the speaker if necessary. If these steps do not solve the problem, then disconnect the diver umbilical and perform the communicator check out procedure per section 5.1 or 5.2. If the communicator fails the check-out procedure, contact Amron for further assistance. If the communicator checks out, then the problem is likely in the diver umbilical communication cable. If possible, substitute a known good cable to verify.

5.5.6 GARBLED VOICE TO TENDER

The DIVER TO TENDER VOLUME control is set too high. Reduce this control until the voice signal clears. If this does not solve the problem, check the diver's microphone for corrosion or other defect. Replace if necessary. If the tender is using a headset, remove the headset and listen to the diver using the PANEL SPEAKER. If this solves the problem then the tender headset may be wet or defective. If the tender is using the PANEL SPEAKER to talk to the diver, check the speaker for any accumulated water. Drain the speaker if necessary. If these steps have not solved the problem, then disconnect the diver umbilical and perform the communicator check out procedure per section 5.1 or 5.2. If the communicator fails the check-out procedure, contact Amron for further assistance. If the communicator checks out, then the problem is likely in the diver umbilical communication cable. If possible, substitute a known good cable to verify.

5.5.7 DIVER CUTS OFF

This is usually caused by an intermittent connection between either the umbilical and the diver communicator or the umbilical and the diver's hat/helmet. The intermittent connection could also be inside the diver's hat/helmet. Check all connections to verify that they are clean and tight. If the problem continues, substitute the communication cable with a known good cable. If this solves the issue, then the communication cable in the original umbilical is damaged and needs to be replaced or repaired. If none of these solutions fixes the problem, contact Amron for further assistance.

5.5.8 FEEDBACK FULL DUPLEX (4-Wire) MODE

There are two forms of feedback that can affect the communicator: acoustic feedback and cable crosstalk. Acoustic feedback occurs when an active microphone is close enough to pick up and amplify the signal from a speaker or earphone. The required distance between the microphone and speaker/earphone is dependent on the volume setting and the amount of acoustic isolation. For example, a tender headset left sitting on a work table my cause acoustic feedback. When the tender dons the headset at the same volume level, the acoustic feedback will no longer occur. The tender's head provides acoustic isolation between the microphone and earphone of the headset. The same is true for the diver's microphone and earphone.

To troubleshoot acoustic feedback issues first determine the source. One way to quickly determine the source of the acoustic feedback is to cover each active microphone with your hand, one at a time. Another method is to adjust the volume controls one at a time. The volume control that stops the feedback indicates the source. For example if the TENDER TO DIVER VOLUME control stops the feedback, then the problem is likely in the diver's hat/helmet. Common sources are feedback between the tender's headset microphone and the PANEL SPEAKER of the communicator. If the tender wants to operate with the headset and leave the PANEL SPEAKER on, Amron recommends the tender move away from the communicator by using the Amron Model 2822-28 Remote Walk-and-Talk Module. This module provides an "extension" cord for the tender headset allowing the tender to operate away from the communicator.

Crosstalk is caused by signal leakage between the microphone and earphone wires in the umbilical cable. In a good cable with all the wires open (not connected), the resistance between any two wires should be greater than 10 Meg-Ohms. Over time, the cable can be damaged and this resistance drops to the point that crosstalk can occur. When this occurs, the communication cable in the umbilical should be replaced. For a temporary solution, you can try swapping the position of the diver earphone wires on the DIVER EARPHONE jack. If you are using a banana plug, simply unplug the diver earphone and rotate by 180 degrees before reconnecting. If this does not solve the problem and the umbilical cannot be immediately replaced, then operate in 2-Wire mode until a replacement umbilical can be used. Amron strongly recommends the use of the Amron CC1 communication cable. It has been specially designed for clear communications and long service life.
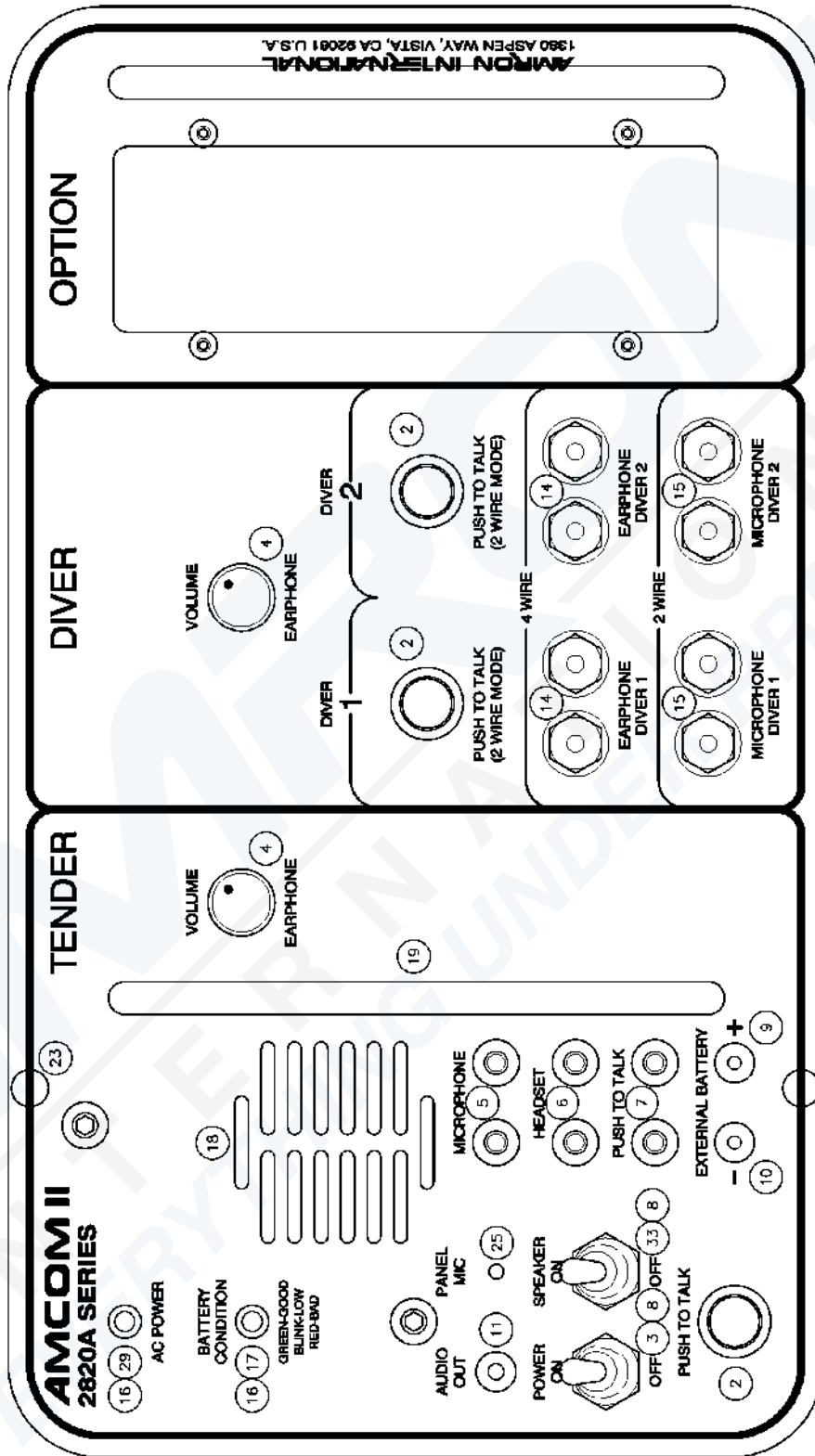
5.5.9 **PUSH-TO-TALK DOES NOT WORK**

If used, check the connection to the handheld microphone. A common issue is that the yellow banana plug is not properly seated in the PUSH-TO-TALK JACK. If the tender is using the PANEL SPEAKER as the microphone with the PUSH-TO-TALK BUTTON, make sure the SPEAKER SWITCH is turned on. If neither of these solves the problem, there could be a broken wire inside the diver communicator. Open the front panel and inspect. If that does not resolve the problem then contact Amron further assistance.
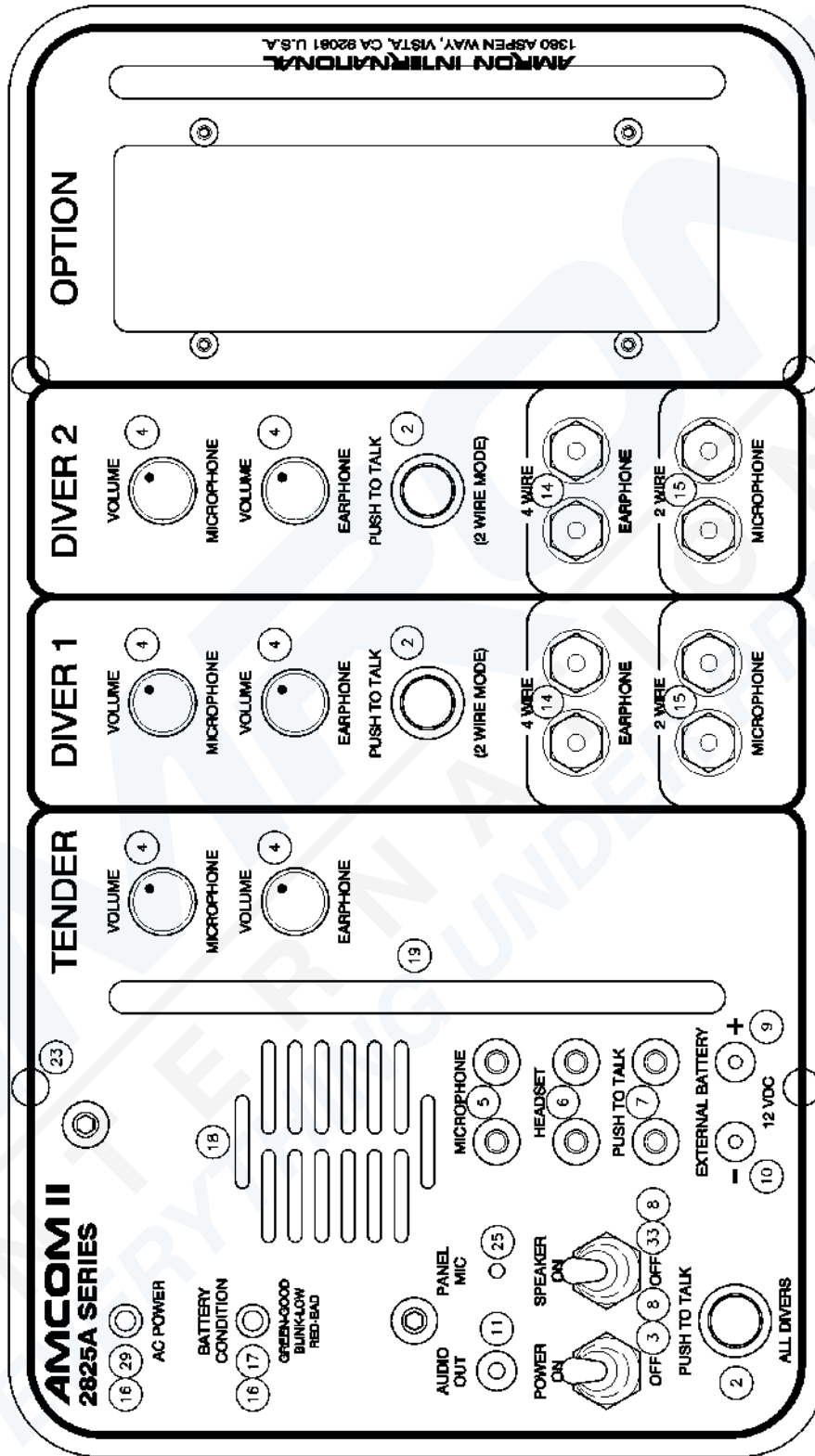
6   DRAWINGS

The reference numbers shown on the parts identifier drawings correspond to the parts lists listed in the parts lists section.
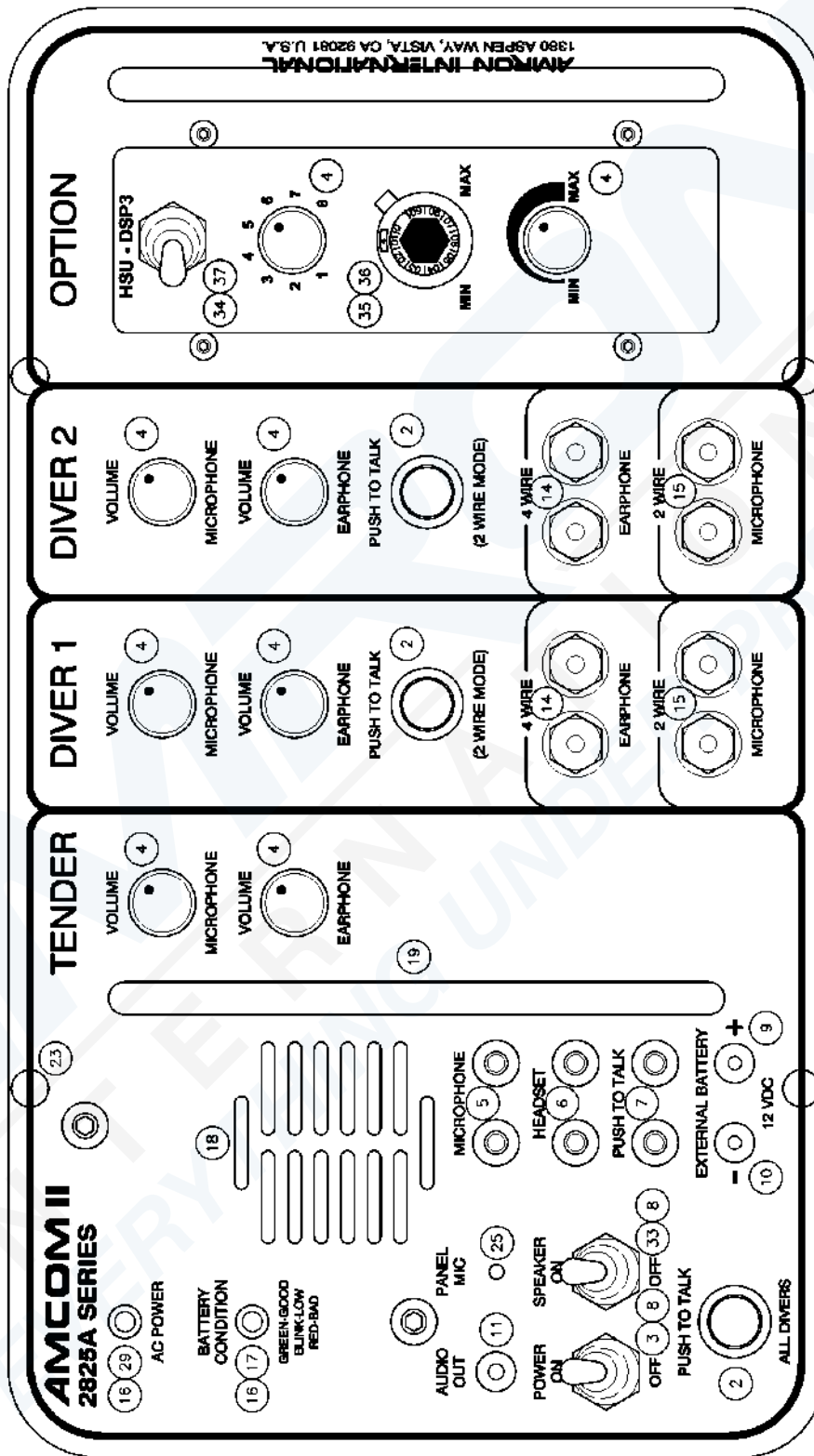
6.1 PARTS IDENTIFIER, MODEL 2820A-11 WEATHER RESISTANT AC POWER MODULE
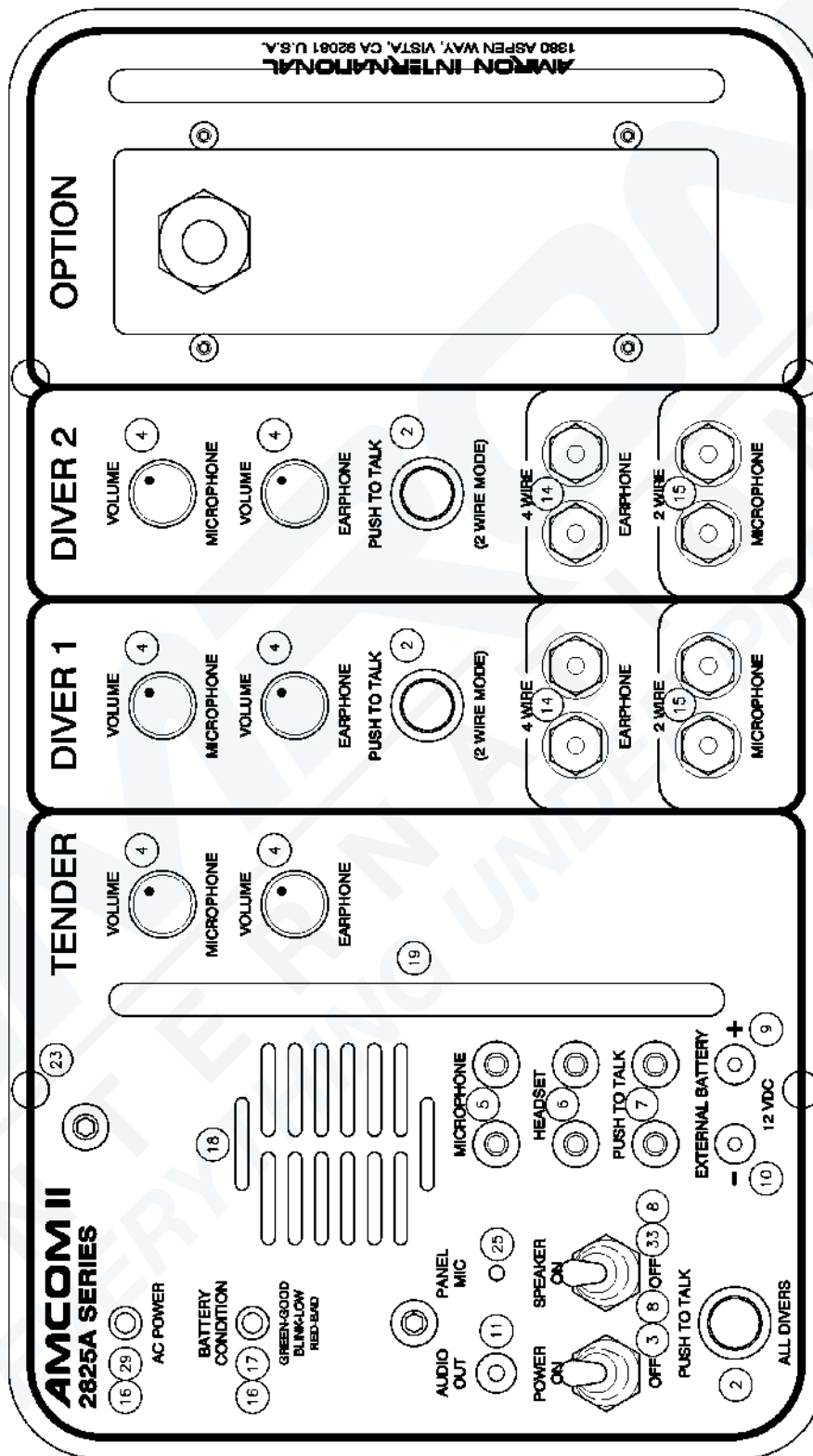
6.2   **PARTS IDENTIFIER, MODEL 2825A-11 WEATHER RESISTANT AC POWER MODULE**

6.3   **PARTS IDENTIFIER, MODEL 2825A-12 WEATHER RESISTANT AC POWER MODULE & DSP3 HELIUM SPEECH UNSCRAMBLER**

6.4   **PARTS IDENTIFIER, MODEL 2825A-13 WEATHER RESISTANT AC POWER MODULE & 28B WIRELESS TENDER**

7   PARTS LISTS

The parts lists include both mechanical and electrical parts. The following information will be useful in interpreting data which is not self-explanatory.

REVISIONS

The parts lists in this manual are for the current model of diver communicator as of the printing date.

To Order Replacement Parts Contact:

Amron International, Inc.
1380 Aspen Way, Vista, California, 92081 U.S.A.
Telephone: (760) 208-6500 Fax: (760) 599-3857
Email: sales@amronintl.com
Web: www.amronintl.com

When ordering replacement parts, you should give as much information as possible to enable us to supply the correct part. This information should include the part number, description, reference designator, value, radio model number, and serial number. Failure to provide sufficient information may hinder our ability to fill your parts orders promptly and correctly.

7.1   PARTS LIST FOR 282XA-XX SERIES FRONT PANEL ASSEMBLIES

REF	PART NO.	DESCRIPTION
2	PBSWITCH	SWITCH PUSH BUTTON SEALED N.O
3	7580K6	SWITCH TOGGLE SPST
4	P16NP-10K	POTENTIOMETER 10K OHM W/KNOB
5	1498-102	JACK, BANANA RED
6	1498-103	JACK, BANANA BLACK
7	1498-107	JACK, BANANA YELLOW
8	5168	SEAL HALF BOOT TOGGLE GREY
9	105-0602-001	JACK, TIP RED
10	105-0603-001	JACK, TIP BLACK
11	ME161-2003	JACK, PHONO W/NYL WSHRS NKL/BLK
14	14002B	5-WAY BINDING POST (BLACK)
15	14002R	5-WAY BINDING POST (RED)
16	LEDHOLDER-BLK.25	MOUNTING CLIP FOR 5MM LED
17	LT2462-24-D51	LED, BI-COLOR RED/GREEN
18	SA818	SPEAKER 8 OHM 15 WATT
19	492	HANDLE ROUND 1.5X5.5X5/16
23	8-32X3/4KTSB	SCREW KNURLED THUMB BRASS 3/4
25	24XX-MIC	MICROPHONE ASSY ELECTRET
29	LEDGREEN	LEDGREEN BRITE
33	757-3522	SWITCH TOGGLE DPST ON-ON
34	SW-201	SWITCH TOGGLE ON/OFF DPDT
35	113-10K0-05	POTENTIOMETER; 10K OHM +/-5%

REF	PART NO.	DESCRIPTION
36	190-0500-15	KNOB; TURN-COUNTING DIAL
37	SWB-0001	BOOT TOGGLE SOFT GRAY

7.2   PARTS LIST, MODEL 2820A-11, WEATHER RESISTANT AC POWER MODULE

PART NO.	DESCRIPTION
570-1008-23	2-DV AMPLIFIER PC CARD, STANDARD
2820-302	CASE ASSEMBLY WITH POWER MODULE
2820A-400	FRONT PANEL ASSEMBLY
2824-502	CHASSIS ASSEMBLY
190-0101-00	POWER SUPPLY
2890-05	BATTERY, 12 VDC, RECHAREABLE
282XA-UM	USER MANUAL, 2820A-01 & 2825A SERIES

7.3   PARTS LIST, MODEL 2825A-11, WEATHER RESISTANT AC POWER MODULE

PART NO.	DESCRIPTION
570-1008-20	2-DV AMPLIFIER PC CARD, DELUXE
2820-302	CASE ASSEMBLY WITH POWER MODULE
2825A-400	FRONT PANEL ASSEMBLY
2824-502	CHASSIS ASSEMBLY
2405-28	HAND HELD MICROPHONE, PUSH TO TALK
190-0101-00	POWER SUPPLY
2890-05	BATTERY, 12 VDC, RECHAREABLE
282XA-UM	USER MANUAL, 2820A-01 & 2825A SERIES

7.4   PARTS LIST, MODEL 2825A-12, WEATHER RESISTANT AC POWER MODULE & DSP3 HELIUM UNSCRAMBLER OPTION

PART NO.	DESCRIPTION
570-1008-20-HSU	2-DV AMPLIFIER PC CARD PROGRAMED FOR HSU
570-1006-02	26DSP3 HSU PC CARD ASSEMBLY
2820-302	CASE ASSEMBLY WITH POWER MODULE
2825A-400	FRONT PANEL ASSEMBLY
2824-502	CHASSIS ASSEMBLY
2405-28	HAND HELD MICROPHONE, PUSH TO TALK
190-0101-00	POWER SUPPLY
2890-05	BATTERY, 12 VDC, RECHAREABLE
282XA-UM	USER MANUAL, 2820A-01 & 2825A SERIES

7.5 **PARTS LIST, MODEL 2825A-13, WEATHER RESISTANT AC POWER MODULE & 28B WIRELESS TENDER OPTION**

PART NO.	DESCRIPTION
570-1008-20	PC CARD ASSEMBLY AMCOM II DELUXE
570-1012-01	WIRELESS CONTROLLER CARD ASSY (28B)
2820-302	CASE ASSEMBLY WITH POWER MODULE
2825A-400	FRONT PANEL ASSEMBLY
2824-502	CHASSIS ASSEMBLY
2405-28	HAND HELD MICROPHONE, PUSH TO TALK
190-0101-00	POWER SUPPLY
2890-05	BATTERY, 12 VDC, RECHAREABLE
190-0650-02	REMOTE WIRELESS HEADSET, DUAL EAR MUFFS
190-0650-03	BASE STATION, 8 PORT CHARGER, SPARE BATTERY
282XA-UM	USER MANUAL, 2820A-01 & 2825A SERIES

7.6 **PARTS LIST, 2820-302 CASE ASSEMBLY WITH POWER ENTRY MODULE**

PART NO.	DESCRIPTION
2820-3006	LID GASKET (3 FT. REQUIRED)
2820-3031	PANEL GASKET
160-0500-01	POWER ENTRY MODULE, WEATHER RESISTANT
130-1002-01	FUSE, 4A 250V SLO-BLO 5X20 MM (2 EA. REQUIRED)

7.7 **28XXA-FS-02 FIELD SPARES KIT FOR 2820A, 2825A**

PART NO.	DESCRIPTION	QTY.
7580K6	SWITCH TOGGLE SPS	1
757-3522	SWITCH TOGGLE DPST ON-ON	1
PBSWITCH	SWITCH PUSH BUTTON SEALED N.O	2
8-32X3/4KTSB	SCREW KNURLED THUMB BRASS ¾	2
P16NP-10K	POTENTIOMETER 10K OHM W/KNOB	2
105-0602-001	JACK, TIP RED	1
105-0603-001	JACK, TIP BLACK	1
5168	SEAL HALF BOOT TOGGLE GREY	2
1498-102	JACK, BANANA RED	2
1498-107	JACK, BANANA YELLOW	2
1498-103	JACK, BANANA BLACK	2
14002B	5-WAY BINDING POST (BLACK)	2
14002R	5-WAY BINDING POST (RED)	2
0034.6019	FUSE 3.15A/250V MICRO QUICK	1

PART NO.	DESCRIPTION	QTY.
	(FOR 570-1008-XX AMPLIFIER CARD)	
LEDHOLDER-BLK.25	MOUNTING CLIP FOR 5MM LED	2
LT2462-24-D51	LED; BI-COLOR RED/GREEN	2
LEDGREEN	LED GREEN BRITE	2
130-1002-01	FUSE; 4A; 250V; SLO-BLO;5X20MM (FOR 160-0500-01 POWER ENTRY MODULE)	2

8   LIMITED WARRANTY AND SERVICE POLICY

Amron International, Inc.

LIMITED WARRANTY & SERVICE POLICY

LIMITED WARRANTY

AMRON INTERNATIONAL, INC., (Amron) warrants that its manufactured products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment as described in Amron's literature covering this product. Oxygen Treatment Hoods and accessories are excluded and limited to 90 days. Amron's obligation under this warranty is limited to the repair of or replacement, at Amron's option, of defective material. This warranty shall not cover defects which are the result of misuse, negligence, accident, repair or alterations.
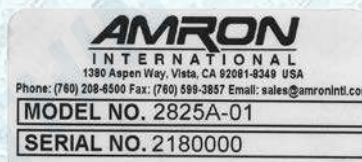
SERVICE POLICY

For technical assistance or to request a repair, please complete one of the following:

- *Amron Communicator Repair* : https://www.amronintl.com/communicator-repair-form
- *Repair Request* (all other products): https://www.amronintl.com/repair-form
- Call (760) 208-6500, Monday – Friday, 8 a.m. to 5 p.m. PST.

Both MODEL NO. and SERIAL NO. are required fields to be entered on the *Amron Communicator Repair Request* form and can be found on the products identification label as shown below.

"Sample" Product Identification Label

AMRON
INTERNATIONAL
1380 Aspen Way, Vista, CA 92081-8349 USA
Phone: (760) 208-6500 Fax: (760) 599-3857 Email: sales@amronintl.com
MODEL NO. 2825A-01
SERIAL NO. 2180000

Do not return any product without obtaining a RMR (Return Materials Request). Detailed return instructions will be provided at the time of request.

1380 Aspen Way, Vista California 92081-8349 U.S.A
Phone: (760) 208-6500 Fax (760) 599-3857
Email: sales@amronintl.com   Web: www.amronintl.com