

User Manual
for
Amron International, Inc.

**Amron Model 2810E-2001
Single Lock Chamber Communicator**

S/N _____



1380 Aspen Way, Vista California 92081-8349
United States of America
Phone: (760) 208-6500
Fax (760) 599-3857
email: sales@amronintl.com
web: www.amronintl.com

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1. INTRODUCTION AND SPECIFICATIONS

1.1 INTRODUCTION

The 2810E-2001 is the newest member of the Amron International AMCOM series of chamber communicators. The 2810E-2001 is a full featured, panel mounted, single chamber communicator that uses state-of-the-art electronics and introduces several new features. The first new feature is a digital audio power amplifier which significantly reduces the current draw, nearly doubling the battery life. The 2810E-2001 uses a new audio filtering network for improved sound clarity and communications. An auxiliary audio input allows chamber occupants to listen to audio from a MP3 player while remaining in constant communication with the operator. Please note that this feature is only available for a chamber operating in the 4-Wire mode. These new features allow the AMCOM I 2810E-2001 to remain the most advanced single chamber communicator on the market. To enjoy all the features, it is important that the operator read and understand the entire manual including all warnings.

The 2810E-2001 can operate in 2-Wire or Full Duplex (4-Wire) communication modes. There is a single volume control for the up-link (Operator) and another volume control for the down-link (Chamber). Designed for a long and dependable service life, the 2810E-2001 has a stainless steel front panel with a waterproof speaker and heavy-duty switches with waterproof seals. The 2810E-2001 is enclosed in a rugged, aluminum housing with power and chamber connections located on the back panel.

1.2 ELECTRICAL SPECIFICATIONS

Input Impedance (Microphone Inputs)	300 Ohms
Frequency Response	300 - 4000 Hz
Common Mode Rejection (minimum).....	40 dB
Entertainment Input Impedance	>47 kOhms
Current Drain Maximum Full Volume	3 Amps
Typical Quiescent.....	55 mAmps
Minimum Load Impedance	2 Ohms
AC Supply Voltage	115/230 VAC, 50/60 Hz
Nominal Power Supply Voltage.....	12 VDC
Operational Supply Voltage	9-8 VDC
Sensitivity (Input).....	7.2 mV _{RMS}
Maximum Output Power (4 Ohm Load, 14 VDC).....	20 Watts
Battery Life (typical).....	85 Hours

1.3 MECHANICAL SPECIFICATIONS

Panel	Powder Coated Stainless Steel
Enclosure	Black Anodized Aluminum
Height	6.75 in. (17.2cm)
Width	10.75 in. (27.3cm)
Chassis Clearance Depth	7.0 in. (17.7cm)
Weight With Batteries	
2810E-2001	11.5 Lbs. (5.2kg)

1.4 MODEL 2810E-2001 FRONT PANEL

All of the controls for the Model 2810E-2001 are located on the front panel including the connectors for the operator handheld microphone or headset, tape recorder and auxiliary audio input. The 2810E-2001 comes with the Amron Model 2405-28 PUSH-TO-TALK handheld microphone.

The 2810E-2001 can be used in a stand-alone application or panel mounted. Four holes, located on the front panel, allow the unit to be securely mounted for a clean, professional look.



1.5 MODEL 2810E-2001 REAR PANEL

The AC power cord and the chamber connectors are located on the rear panel of the 2810E-2001. The Model 2810E-2001 comes equipped with a sealed lead-acid rechargeable battery and an internal universal input (115/230 VAC) battery charger. The battery charger has medical grade electrical isolation for maximum safety to the chamber occupants.



1.6 ACCESSORIES

Amron produces a series of accessories designed to operate with the entire line of AMCOM diving communicators.

1.6.1 Amron Heavy-Duty Headset - Model 2401-28

The Model 2401-28 is a heavy-duty headset with boom microphone. It comes equipped with color-coded, dual banana plugs that mate directly to AMCOM chamber communicators. It includes a six foot (1.8 meter) cord.

1.6.2 Amron Standard Headset - Model 2460-28

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

1.6.3 Amron Push-to-Talk Microphone - Model 2405-28

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

1.6.4 Amron Remote Walk-and-Talk Module - Model 2822-28

Designed for Full Duplex (4-Wire) applications, the Model 2822-28 provides the operator with mobility around the chamber room while maintaining communications with the chamber. 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.

1.6.5 Amron Remote Push-to-Talk Module - Model 2821-28

Designed for 2-Wire applications, the Model 2821-28 provides the operator with mobility around the chamber room while maintaining communications with the chamber. 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.

1.6.6 Audio Adaptor Cable - Amron Part Number 180-1000-00

A 2 meter long cable with two RCA Phono plugs that connect the auxiliary audio input to a standard 3.5 mm stereo phone plug which mates to the headphone jack of most common portable audio devices.

1.6.7 Amron Standard Headset - Model 2460-31R

This light and comfortable headset is designed for extended wear by chamber occupants. The Model 2460-31R features an adjustable boom microphone, vinyl cushioned adjustable ear pads and a spiral cord that can be extended up to 8 feet (2.4 meters). It can be plugged into the headset jacks of most models of Amron Chamber Speakers.

1.6.8 Amron Chamber Speaker - Model 3110

The Model 3110 Chamber Speaker includes a push-to-talk switch along with a headset connector. The speaker provides the occupants the ability to listen to audio entertainment either via the speaker or headset. When the occupants want to talk to the operator, the push-to-talk switch on the chamber speaker must be pressed even if the headset is in use.

1.6.9 Amron Chamber Speaker - Model 3115

The Model 3115 Chamber Speaker allows the operator to monitor conversations within the chamber with the speaker wired in 2-WIRE mode. There is a speaker on/off switch that allows occupants to turn off the speaker for private conversations. The operator can talk to the occupants by using the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK. The Model 3115 also features a headset jack wired in Full-Duplex (4-Wire) mode that allows an occupant to enjoy audio entertainment by using the Model 2460-31R headset along with talking to the chamber operator without the use of the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK. This speaker is approved for US Navy chambers.

1.6.10 Amron Chamber Speaker - Model 3113

The Model 3113 Chamber Speaker has all the features of the Model 3115 except for the speaker on/off switch.

1.6.11 Amron Inner-Lock Combo Box - Model 3125

The Model 3125 features a talk-back speaker with on/off switch and headset jack that operates in the same manner as the Model 3115. It also includes a sound-powered phone with bracket, chamber temperature probe, scrubber power circuit wiring, chamber environmental conditioning unit wiring and electrical penetrator adaptor all together in a single pre-wired, pre-tested housing.

1.6.12 Amron Outer-Lock Combo Box - Model 3126

The Model 3126 features a talk-back speaker with on/off switch and headset jack that operates in the same manner as the Model 3115. It also includes the sound-powered phone and bracket like the Model 3125 but does not have the additional chamber function wiring of the 3125.

2. WARRANTY AND SERVICE POLICY

2.1 LIMITED WARRANTY

Amron warrants that its manufactured products are free from defects in material and workmanship under normal use and service, as described in all literature covering the products for a period of 90 days from date of shipment. Amron's obligations under this warranty are limited to the repair of, or replacement of materials at Amron's discretion. This warranty shall not cover defects which are the result of misuse, negligence, accident, repair, or alterations.

2.2 SERVICE POLICY

For technical assistance or to request a repair, please call (760) 208-6500, Monday – Friday, 8 a.m. to 5 p.m. PT. Have the model number and serial number handy and be prepared to offer as much information as possible about the problem.

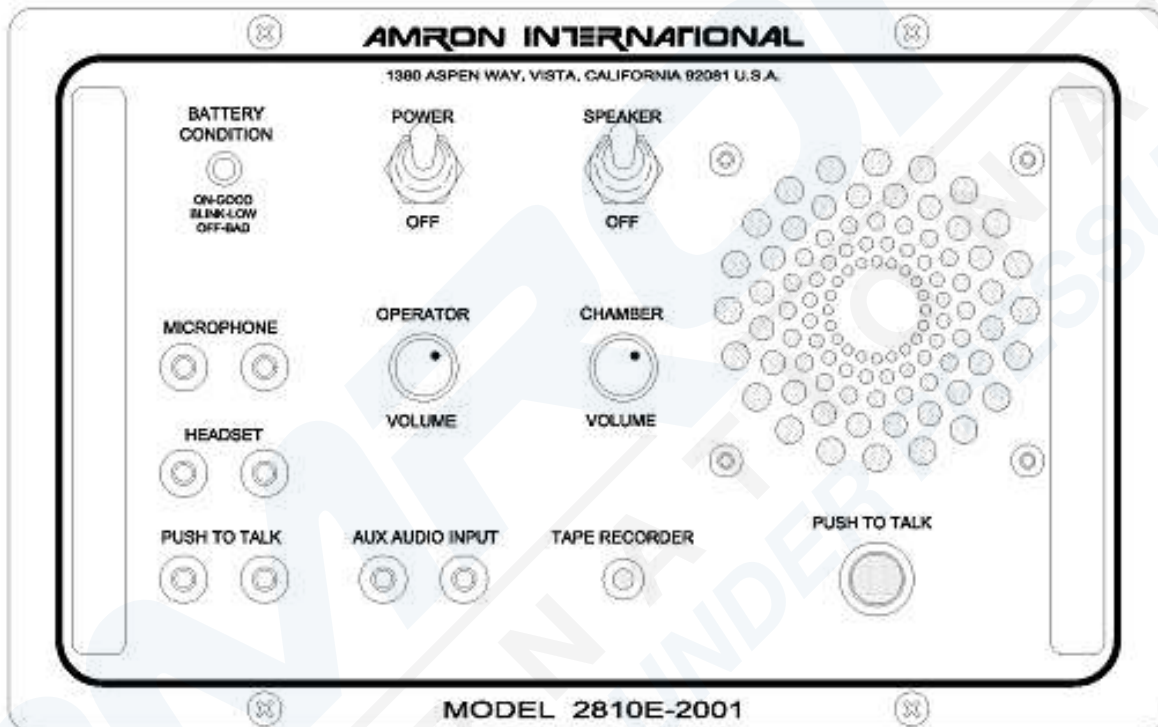
Please do not return any product without obtaining a return authorization number. Detailed instructions will be provided at the time of request.

3. CONTROLS AND CONNECTIONS

Before using the 2810E-2001 chamber communicator, the operator should be familiar with all the controls and connections. While reading this manual, you will find capitalized words such as PANEL SPEAKER. These words are to remind the reader that additional information can be found in this section of the manual.

3.1 OPERATOR AND CHAMBER CONTROLS

The following controls are located on the front panel of the 2810E-2001



- 3.1.1 POWER SWITCH - The power on/off control.
- 3.1.2 SPEAKER SWITCH - This switch allows the operator to turn off the speaker. If the operator is using a headset, it may be necessary to turn off the speaker in order to prevent acoustic feedback.
- 3.1.3 PUSH-TO-TALK BUTTON - This button allows the operator to talk to the chamber when operating in the 2-Wire mode. It is not necessary to use this control in the Full Duplex (4-Wire) mode. When using Full Duplex mode, this control allows the operator to interrupt the chamber by forcing the chamber into listen only mode.
- 3.1.4 CHAMBER VOLUME - This control sets the volume for the chamber's earphone including any signal from the AUXILIARY AUDIO INPUT. Rotate this knob clockwise to increase the volume.

- 3.1.5 OPERATOR VOLUME - This control sets the volume for the operator's earphone and/or panel speaker. Rotate this knob clockwise to increase the volume.
- 3.1.6 PANEL SPEAKER - A waterproof, acoustic speaker that allows the operator to listen to the chamber occupants and acts as a microphone by using the PUSH-TO-TALK BUTTON. The volume level is controlled by the CHAMBER TO OPERATOR VOLUME control and it can be turned off using the SPEAKER SWITCH.
- 3.1.7 BATTERY CONDITION INDICATOR - This LED is used by the operator to determine the available battery level. A steady green light means that the battery charge level is greater than 30%. When the battery reaches approximately 30% remaining life, the LED will start blinking at a rate of about once per second. When the battery reaches its end-of-charge, the LED will turn off and the 2810E will go into shutdown mode to prevent damaging the communicator or rechargeable battery. It is advised that the 2810E-2001 be connected to an AC outlet as soon as possible once the BATTERY CONDITION INDICATOR starts blinking. While there should be enough time to safely complete a normal diving operation, the exact amount of time is dependent on the age and condition of the sealed lead acid battery.
- 3.1.8 OPERATOR HEADSET - This is the dual banana jack (color-coded black) that functions as both an output (earphone) and input (microphone) for the operator as controlled by the PUSH-TO-TALK BUTTON and PUSH-TO-TALK JACK. Using this connection, the operator can be wired in either 2-Wire or Full Duplex (4-Wire) mode regardless of the mode used for the chamber.

To connect the operator 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 OPERATOR MICROPHONE jack (red). In this mode, the operator does not have to use the PUSH-TO-TALK BUTTON to communicate with a chamber occupant who is also operating in the Full Duplex (4-Wire) mode. This configuration can be used even if the chamber is wired in 2-Wire mode. In that situation, the operator 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 operator is near the 2810E-2001. To prevent this, the PANEL SPEAKER can be turned off using the SPEAKER SWITCH. Another option is to move the operator away from the 2810E-2001 by using the Amron Model 2822-28 Walk-and-Talk Module accessory. This allows the operator to communicate while other members of the chamber operations crew listen using the PANEL SPEAKER. This module comes with 25 feet (7.6 meters) of cable (custom cable lengths are available).

The operator can also be connected in 2-Wire mode by stacking both the earphone (black) and microphone (red) banana plugs into the OPERATOR HEADSET jack (black). The chamber does not have to be connected in 2-Wire mode if the operator is in 2-Wire mode. In order to talk to occupants, the operator 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 the chamber and the PANEL SPEAKER can be left on.

This may, for some situations, make for a better overall communication experience. If the operator requires more mobility, 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 operator may also use the included Amron Model 2405-28 Push-to-Talk Microphone. This microphone comes with two color-coded banana plugs. The black plug goes into the OPERATOR HEADSET jack and the yellow plug goes in the PUSH-TO-TALK JACK. To communicate with the chamber, the operator 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 operator uses the microphone. When using the Push-to-Talk Microphone, the SPEAKER SWITCH must be turned on in order to hear the occupants.

- 3.1.9 OPERATOR MICROPHONE - This is a dual banana jack (color-coded red) that functions as the microphone input from the operator's headset. It is only used if the operator is in Full Duplex (4-Wire) mode.
- 3.1.10 PUSH-TO-TALK JACK - This is a dual banana jack (color-coded yellow) that allows for remote keying of the push-to-talk function of the 2810E-2001. The difference between using the PUSH-TO-TALK JACK and PUSH-TO-TALK BUTTON is that the button allows the operator to communicate using the PANEL SPEAKER as a microphone. If both are used at the same time, the PANEL SPEAKER is active as a microphone. This allows another operation crew member to talk to the occupants using the PANEL SPEAKER even if the operator is away from the 2810E-2001 using the Remote Push-to-Talk Module in 2-Wire mode.
- 3.1.11 RECORDER OUTPUT - This is a single RCA Phono jack (color-coded black) that provides a transformer isolated output of both operator and occupant communications. It is designed to drive the standard line-level inputs of audio or video recorders with input impedances as low as 600 Ohms. The RECORDER OUTPUT will not record the signal from the AUXILIARY AUDIO INPUT.
- 3.1.12 AUXILIARY AUDIO INPUT - This is a set of two RCA Phone jacks (color-coded red and white) that provides a means to connect an external audio signal for occupant entertainment. Although this input will accept a stereo audio source, it will be converted into a monaural signal before going to the chamber. This signal is not heard in either the operator headset or the PANEL SPEAKER. The earphone output of most MP3 players can be connected to this input using an adaptor cable like the Amron Audio Adaptor Cable (Amron Part Number 180-1000-00). This feature will only work if the chamber is wired in Full Duplex (4-Wire) mode.

There is no separate volume control provided for the AUXILIARY AUDIO INPUT. The audio device provides the volume control. It is advised at the start of chamber operations, and before the external audio device is turned on, that the operator adjust and verify the CHAMBER VOLUME level is correct and comfortable for occupants. Then starting with the lowest volume, adjust the volume on external devices until a comfortable level is achieved. If the operator is connected in the Full Duplex (4-Wire) mode, the volume level should not be so loud as to prevent

occupants from hearing the operator. If the operator is connected in the 2-Wire mode, then the entertainment will be cut off whenever the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK is used. The PUSH-TO-TALK BUTTON can be used by the operator to cut off the entertainment even if the operator is connected in the Full Duplex (4-Wire) mode.

WARNING!

The AUXILIARY AUDIO INPUT is not electrically isolated from the circuitry of the 2810E-2001. Any external equipment connected to the input should not be AC powered or connected to the AC mains indirectly through any equipment without the proper isolation. Failure to follow this warning may result in electrocution or death.

WARNING!

To ensure clear communications when using the AUXILIARY AUDIO INPUT, it is critical that the volume level of the external audio device be set at a level below that of the operator's microphone as described above. It is recommended that the operator use the PUSH-TO-TALK BUTTON when talking to the occupant(s) as this cuts off the signal from the AUXILIARY AUDIO INPUT.

3.2 CHAMBER CONNECTIONS

The chamber connections are located on the rear left side of the communicator.

CHAMBER MICROPHONE - This is a dual banana jack (color-coded red) that functions as both an output (earphone) and input (microphone) for the chamber occupants as controlled by the PUSH-TO-TALK BUTTON and PUSH-TO-TALK JACK. Using this connection, the chamber can be wired in either 2-Wire or Full Duplex (4-Wire) mode regardless of the mode used for the operator.

3.2.1 Full Duplex (4-Wire) Mode

Connect the chamber microphone red banana plug (AUDIO UPLINK) to the red jack located on rear side of chassis and the chamber earphone black banana plug (AUDIO DOWNLINK) to the black jack located on rear side of chassis. Occupants can use this mode even if the operator is wired in 2-Wire mode, for example, to take advantage of the audio entertainment feature of the 2810E-2001.

3.2.2 2-Wire Mode

Double stack the chamber microphone (red banana plug) and the earphone (black banana plug) to the red jack located on the rear side of chassis. If occupants are using a headset, connect both the headset microphone and earphone to this jack. In this mode, the chamber speaker will act as a microphone and be heard on operator's headset and/or PANEL SPEAKER unless the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK is activated.

- 3.2.3 CHAMBER EARPHONE - This is a dual banana jack (color-coded black) that functions as the output for chamber occupant's earphone. It is only used when the chamber is in Full Duplex (4-Wire) mode.

4. OPERATION

The 2810E-2001 is a panel mounted chamber communication system designed to provide reliable voice communications between the chamber operator and occupants..

4.1 CHARGING THE BATTERY

The Model 2810E-2001 is supplied with an internal sealed lead acid battery. To charge the battery, connect the AC power cord located on the back panel to an AC outlet. The internal battery charger is able to operate on 115 and 230 VAC lines without the user having to make any adjustments.

The 2810E-2001 internal battery charger is designed to charge the battery in float mode so the charger can be left on indefinitely, without damage, to ensure the battery is fully charged and the unit is ready to use. A fully discharged battery will take approximately 10 hours to reach full charge (depending of the age of the battery and the surrounding temperature). To ensure maximum service life, the battery should be fully charged at least once every six months.

The operating time for a fully charged battery is approximately 85 hours. The exact operating time depends on the age of the battery and the ambient temperature. The sealed lead acid battery used in the 2810E-2001 has a service life of 300 full charge/discharge cycles or 3 years. The BATTERY CONDITION INDICATOR will start to blink when the battery has approximately 30% remaining charge. To maximize the service life, the battery should be recharged as soon as possible after the indicator starts to blink. When the battery reaches the full discharge state, the 2810E-2001 will shut down to prevent damage to both the battery and the electronics.

4.2 INITIAL POWER ON - BATTERY CONDITION CHECK

Turn all the volume controls to minimum and turn on the POWER SWITCH. The state of the battery is shown on the BATTERY CONDITION INDICATOR as follows:

- STEADY GREEN - the battery is good and has more than 30% remaining life
- BLINKING GREEN - the battery is low and has less than 30% remaining life

The BLINKING GREEN light provides a warning that the battery is low and should be changed or recharged before starting chamber operations. When the indicator starts BLINKING GREEN during operation, it means that there is, depending on age of the battery and the ambient temperature, approximately 24 hours of remaining life. This should be sufficient time to safely complete chamber operations or to connect the 2810E-2001 to an AC power source. A battery that has not been used for a long period of time will exhibit a higher voltage than the actual charge state. This is known as surface charge and will quickly dissipate once the unit is turned on. It is recommended that the unit be left on for 5 minutes before relying on the BATTERY CONDITION INDICATOR.

WARNING!

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 2810E-2001 internal battery charger to blow and, in extreme cases, actually damage the charger circuitry. Amron has designed this battery charger to isolate such faults to ensure that they will not cause a safety issue for the operator or chamber occupants. Amron strongly recommends that the 2810E-2001 be operated on AC circuits protected by a Ground Fault Circuit Interrupters (GFCI) for additional safety.

4.3 MODES OF OPERATION

The 2810E-2001 has the ability to operate in either 2-Wire or Full Duplex (4-Wire). Both the operator and chamber occupants can be connected in either mode or a combination of modes can be used. For example, the chamber can be connected in Full Duplex (4-Wire) mode to take advantage of the new entertainment feature while the operator is wired in 2-Wire mode. If either the operator or the chamber is wired in 2-Wire mode, the operator must use a push-to-talk, either the PUSH-TO-TALK BUTTON or PUSH-TO-TALK JACK, when talking to chamber occupants.

2-Wire communication is defined as a single communication path; normally a chamber occupant is the priority signal path, the operator listens to the occupants. Signal reversing is accomplished by pushing the PUSH-TO-TALK BUTTON, the occupant hears the operator. 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 operator'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 operator's microphone and the PANEL SPEAKER. It also prevents noise from the outside reaching chamber occupants and allows the operator to communicate with other members of the chamber operations crew without involving occupants. If the chamber is connected in 2-Wire mode, the AUDIO AUXILIARY INPUT cannot be used to deliver entertainment to the occupants.

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) has the advantage of natural communication without having to use the PUSH-TO-TALK BUTTON. This keeps the operator's hands free to perform other task. It does not require the same level of discipline to achieve clear communications that 2-Wire does. It has the advantage that neither a chamber occupant nor the operator is cut off when the other is talking. Because the chamber microphone is not connected in parallel with the chamber earphone, the occupant is louder and potentially clearer in Full Duplex (4-Wire) mode.

4.3.1 2-WIRE

Turn power switch to ON, turn speaker switch to ON, and adjust both volume controls to mid-scale. The operator has to depress PUSH-TO-TALK BUTTON in order to talk to chamber occupants. Operator and occupants talk to each other while the operator adjusts the volume controls as below:

OPERATOR VOLUME

While chamber occupant is talking, the operator adjusts this volume control to a comfortable hearing level.

CHAMBER VOLUME

While operator depresses the appropriate PTT switch and talks into the panel speaker, headset microphone or handheld microphone, the operator adjusts the volume control to a comfortable hearing level for the occupant.

4.3.2 FULL DUPLEX (4-WIRE)

Turn power switch to ON; turn speaker switch to OFF; adjust both volume controls to mid-scale. Operator and occupants use headsets and talk to each other while the operator adjusts the volume controls as below:

OPERATOR VOLUME

While chamber occupant is talking, the operator adjusts this volume control to a comfortable hearing level.

CHAMBER VOLUME

While operator is talking, the operator adjusts this volume control to a comfortable level for the chamber occupants. If the AUXILIARY AUDIO INPUT will be used, the volume level of the external audio device should not be higher than the operator's voice.

WARNING!

To ensure clear communications when using the AUXILIARY AUDIO INPUT, it is critical that the volume level of the external audio device be set at a level below that of the operator's microphone as described above. It is recommended that the operator use the PUSH-TO-TALK BUTTON when talking to the chamber occupant(s) as this cuts off the signal from the AUXILIARY AUDIO INPUT.

5. MAINTENANCE

The following section describes the procedures for checking the operation of your 2810E-2001 chamber communicator, general maintenance procedures, and how to troubleshoot common problems.

5.1 CHAMBER COMMUNICATOR CHECK PROCEDURES

The following are a series of step-by-step procedures to perform a functional check of your 2810E-2001 communicator using only a headset. These steps check all communication functions of the 2810E in both 2-Wire and Full Duplex (4-Wire) mode. If the communicator checks out using these procedures, then any communication problems are probably located somewhere else in the system setup.

5.1.1 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 OPERATOR MICROPHONE (red) jack and the headset lead into the OPERATOR HEADSET (black) jack.
6. Don the headset and talk into the microphone. You should be able to hear yourself in the headset. Adjust the OPERATOR VOLUME control and verify the level can be adjusted to a comfortable level.
7. Move the headset microphone lead to the CHAMBER MICROPHONE (red) jack. Talk into the microphone. You should be able to hear yourself in the headset. Adjust the OPERATOR VOLUME control and verify that the level can be adjusted to a comfortable level.
8. Move the headset lead to the CHAMBER EARPHONE (black) jack. Talk into the microphone. You should be able to hear yourself in the headset. Adjust the CHAMBER VOLUME control and verify that the level can be adjusted to a comfortable level.
9. Connect a source device, such as a MP3 player, to the AUXILIARY AUDIO INPUT. Set the volume control of the device to low and start playing music.

The music should be heard in the headset. Adjust the volume as required. Verify that the music is cut off when the PUSH-TO-TALK BUTTON is pressed.

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.

5.1.2 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 OPERATOR HEADSET (black) jack and the headset lead into the CHAMBER 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 CHAMBER 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 CHAMBER VOLUME if necessary and verify that the level can be adjusted to a comfortable level.
8. Plug the microphone lead into the OPERATOR 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 CHAMBER MICROPHONE (red) jack and move the headset lead to the OPERATOR 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 OPERATOR VOLUME control and verify that the level can be adjusted to a comfortable level.

5.2 GENERAL MAINTENANCE

The 2810E-2001 chamber 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 chamber communicator with care. If not panel mounted, do not throw it around or drop it. Select a work area where the communicator and wires connecting to it are out of everyone's way so it does not get knocked over.
2. The 2810E-2001 rechargeable battery should be recharged after use or as soon as possible when the BATTERY CONDITION INDICATOR starts blinking.

5.2.1 BATTERY REPLACEMENT

1. Remove all AC power.
2. Turn off unit.
3. Disconnect all cables.
4. Remove 4 ea. pan head Phillips screws: 2 ea. on each side of "AMRON INTERNATIONAL" & 2 ea. on each side of "MODEL 2810E-2001".
5. Lift the 2810E-2001 out of chamber control panel.
6. Remove 4ea. 8-32x1/2 pan head Phillips screws: 2ea. from both sides of radio chassis.
7. Tilt front panel to side of chassis.
8. Remove 2 ea. screws from side of chassis that secures battery bracket.
9. Disconnect the two slide terminals from battery.
10. Lift out battery.
11. Replace with new battery.
12. Connect the two slide terminals to battery, RED wire to Positive, BLACK wire to Negative.
13. Re-install battery bracket and 2 ea. screws.
14. Permanently tighten screws.
15. Place panel on top of chassis, being careful not to pinch or damage any wires.
16. Install 4 ea. screws on side of chassis and tighten.
17. Install communicator into cutout on air control panel.
18. Install and tighten 4 ea. screws to secure radio to air control panel.

19. Perform Power On - Battery Check
20. Plug 2810E-2001 into AC power and allow battery to charge for 4 hours (depending of the age of the battery and the surrounding temperature).

5.2.2 RECOMMENDED MAINTENANCE SCHEDULE

The following sections outline the recommended scheduled maintenance for the 2810E-2001.

1. **DAILY MAINTENANCE** - Wipe off any accumulated dust or dirt 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.
2. **WEEKLY MAINTENANCE** - Wipe off any accumulated dust or dirt 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.
3. **6 MONTH CHECK** - Wipe off any accumulated dust or dirt 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, toggle switches and volume controls for smooth operation.
 - Perform the 2-Wire and Full Duplex (4-Wire) system checks as described in section 5.1.

5.2.3 YEARLY CHECK

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

5.2.4 LONG TERM STORAGE

If the chamber 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 2810E-2001 should be stored plugged into an AC outlet to ensure that the communicator will be fully charged and ready to use when needed.

5.3 TROUBLESHOOTING

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 chamber wiring be disconnected from the communicator and the check-out procedures in section 5.1 be conducted. If the chamber communicator passes the check-out procedures then the issue is most likely in the chamber wiring.

5.3.1 LOW-BATTERY INDICATION

The BATTERY CONDITION INDICATOR indicates the battery level or state-of-charge by monitoring the battery voltage. The voltage has to be 9 Volts or greater for the 2810E-2001 communicator to operate. 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.

Before replacing either battery, the battery connections should be checked by opening the battery compartment and inspecting the wires. Verify that the wires are firmly attached and that the RED wire is connected to the positive terminal and that the BLACK wire is connected to the negative terminal.

5.3.2 UNIT NOT OPERATING

The most common reason that a chamber 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 5.3.1. If the battery is good, then disconnect any chamber wiring and perform the communicator check out procedure per section 5.1.

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 a 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 per section 2.2 for further assistance.

5.3.3 LOW VOLUME

Check the volume control settings and adjust if necessary. Check the chamber connections and verify that the chamber and operator are connected as intended. Verify the wires and connectors are clean and tight. Check the BATTERY CONDITION INDICATOR and test the battery if necessary. If the problem persists, disconnect the chamber wiring and perform the communicator check out

procedure per section 5.1. If the communicator fails the check-out procedure, contact Amron per section 2.2 for further assistance.

If the communicator checks out, then the problem is likely in either the chamber wiring, the wiring of the chamber speaker(s), or an occupant's headset.

5.3.4 GARBLED VOICE TO THE CHAMBER

The CHAMBER VOLUME control is set too high. Reduce this control until the voice signal clears. If this does not solve the problem, check the chamber speaker and/or headsets for corrosion or other defect. Replace if necessary. If the operator is using a headset, remove the headset and communicate to an occupant by pressing the PUSH-TO-TALK BUTTON and talking into the PANEL SPEAKER. If this solves the problem then the operator headset may be wet or defective. If these steps have not solved the problem, then disconnect the chamber wiring and perform the communicator check out procedure per section 5.1. If the communicator fails the check-out procedure, contact Amron per section 2.2 for further assistance. If the communicator checks out, then the problem is likely in the chamber wiring.

5.3.5 GARBLED VOICE TO THE OPERATOR

The OPERATOR VOLUME control is set too high. Reduce this control until the voice signal clears. If this does not solve the problem, check the chamber speaker or occupant's headset microphone for corrosion or other defect. Replace if necessary. If the operator is using a headset, remove the headset and listen to the occupant using the PANEL SPEAKER. If this solves the problem then the operator headset may be wet or defective. If these steps have not solved the problem, then disconnect the chamber wiring and perform the communicator check out procedure per section 5.1. If the communicator fails the check-out procedure, contact Amron per section 2.2 for further assistance. If the communicator checks out, then the problem is likely in the chamber wiring.

5.3.6 CHAMBER CUTS OFF

This is usually caused by an intermittent connection either between the chamber wiring and the chamber communicator or the cable penetrator and the chamber speaker or occupant headset. Check all connections to verify that they are clean and tight. If the problem continues, then substitute the communication cable with a known good cable. If this solves the issue, then the communication cable is damaged and needs to be replaced or repaired. If none of these solutions fixes the problem then contact Amron per section 2.2 for further assistance.

5.3.7 FEEDBACK - FULL DUPLEX (4-WIRE) MODE

There are two forms of feedback that can affect the 2810E-2001: 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, an operator headset left sitting on a work table may cause acoustic

feedback. When the operator dons the headset at the same volume level, the acoustic feedback will no longer occur. The operator's head provides acoustic isolation between the microphone and earphone of the headset. The same is true for an occupant's headset 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 CHAMBER VOLUME control stops the feedback, the problem is likely in an occupant's headset or chamber speaker. Common sources are feedback between the operator's headset microphone and the PANEL SPEAKER of the 2810E-2001. If the operator wants to operate with the headset and leave the PANEL SPEAKER on, Amron recommends the operator move away from the 2810E-2001 by using the Amron Model 2822-28 Remote Walk-and-Talk Module. This module provides an "extension" cord for the operator headset allowing the operator to operate away from the 2810E-2001.

Crosstalk is caused by signal leakage between the microphone and earphone wires in the communications 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 occupant's earphone wires on the CHAMBER EARPHONE jack. If you are using a banana plug, simply unplug the chamber earphone and rotate by 180 degrees before reconnecting. If this does not solve the problem and the chamber wiring cannot be immediately replaced, then operate in 2-Wire mode until a replacement umbilical can be used. Amron strongly recommends the use of the shield, twisted pair communication cables.

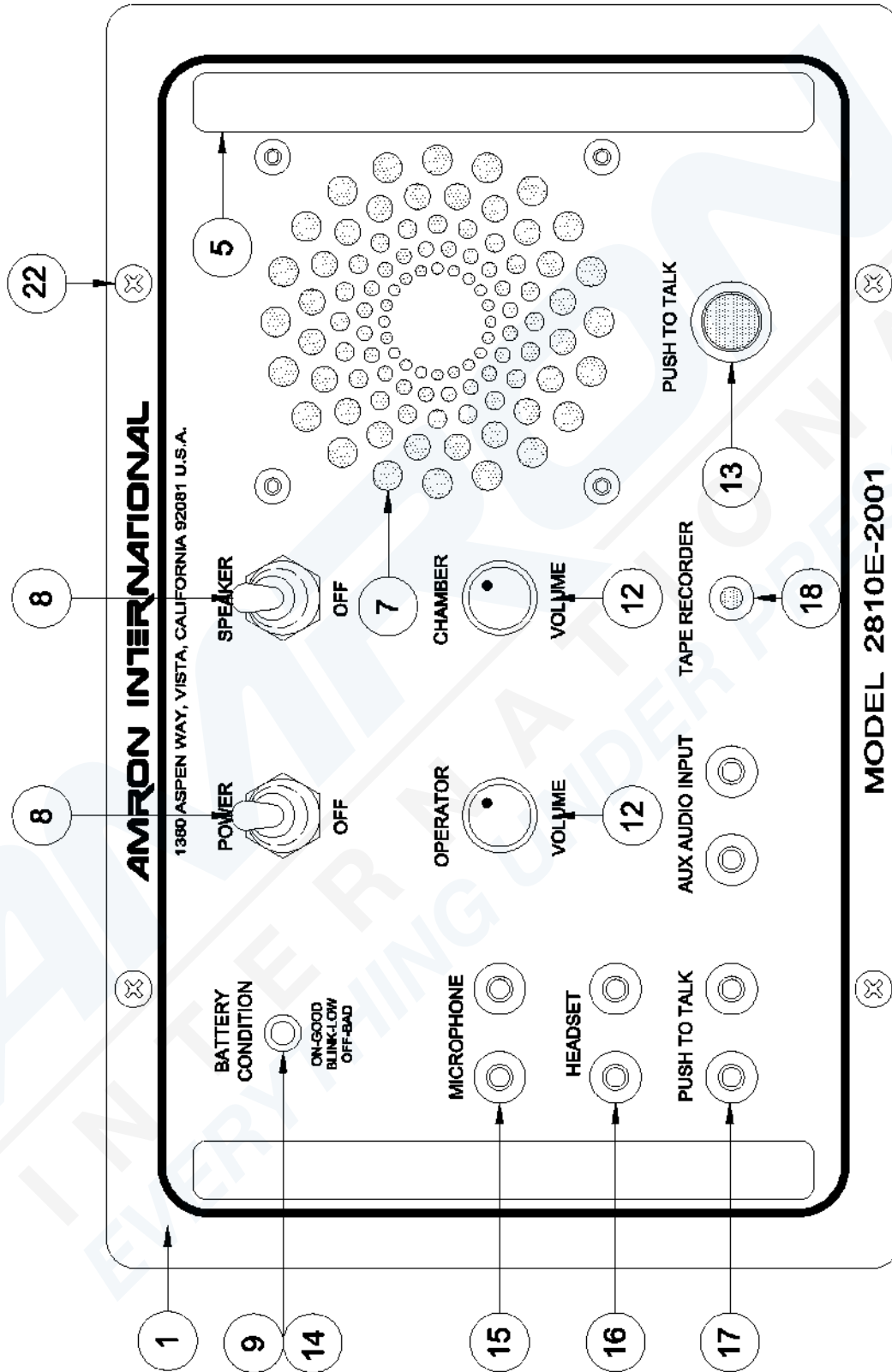
5.3.8 PUSH-TO-TALK DOES NOT WORK

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 operator 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 chamber communicator. Open the front panel and inspect. If that does not resolve the problem then contact Amron per section 2.2 for further assistance.

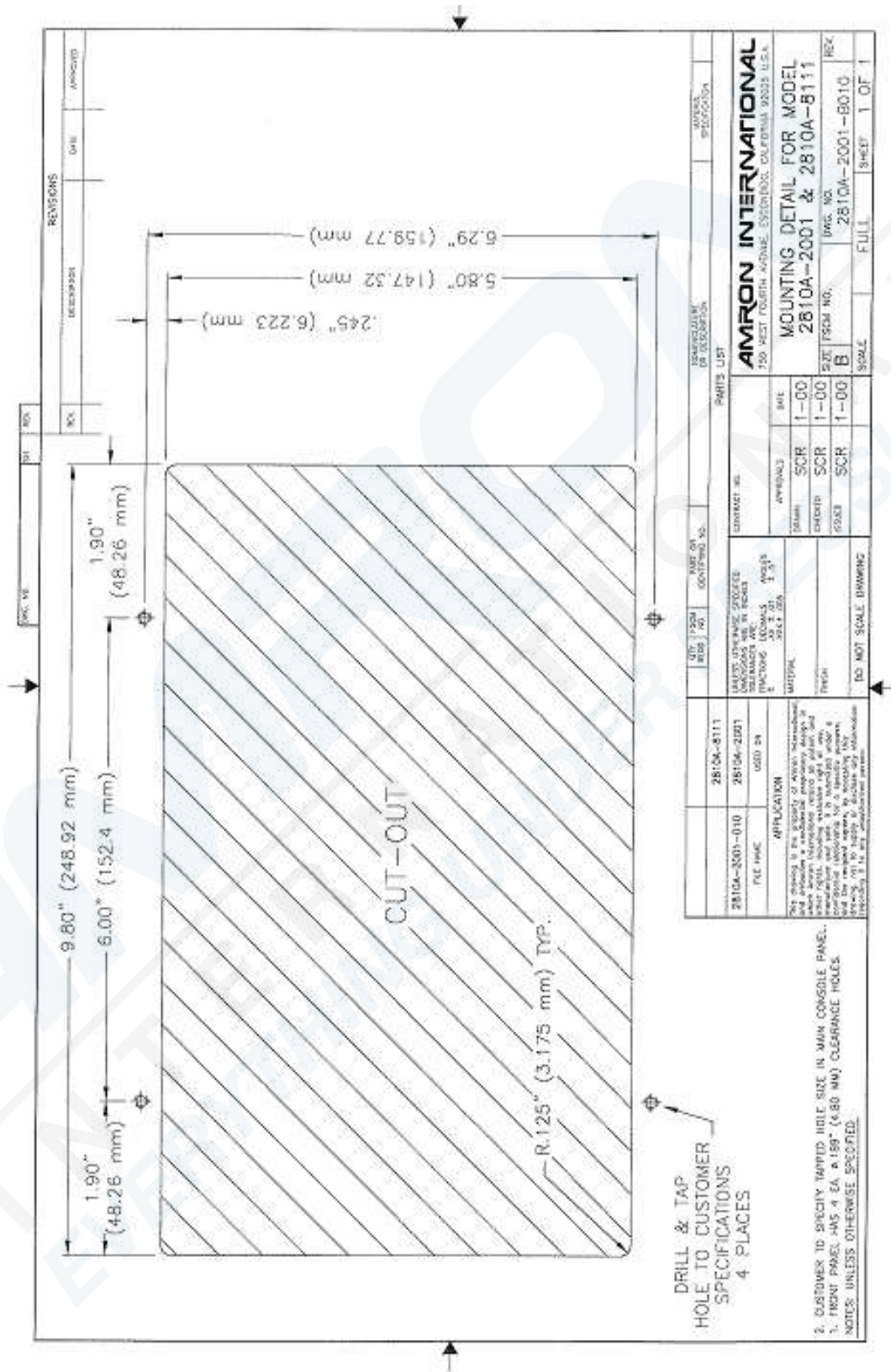
6. DRAWINGS

The following drawings illustrate the electrical and mechanical details of the chamber communication unit. The corresponding parts lists for each drawing are detailed in the parts lists section, or are included as part of the drawing. All drawings are at their current revision level as of the date of printing. Amron reserves the rights to revise the documentation without notification.

6.1 FRONT PANEL PARTS LOCATOR, MODEL 2810E-2001



6.2 MOUNTING DETAIL, MODEL 2810E-2001



7. PARTS LIST GENERAL

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 chamber 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 MODEL 2810E-2810E TOP ASSEMBLY

Reference	Part Number	Description
1	2810E-2001-001	Front Panel, Model 2810E-2001
N/S	2001-005	Bracket Support Rail
N/S	2820-015	Rail Short Card Support
N/S	2001-022	Chassis Battery Box Universal
5	2001-007	Handle Complete Black
N/S	570-1000-03	PCA, Single Chamber Communicator
7	100-0000-00	Speaker, 3.5 inch, 8Ω, 16W
8	SW-201	Switch, Toggle, DPDT
9	LEDGREEN	LED, Green, Bright
N/S	6-32x3/8HSBHC	Screw, 6-32X3/8in, S/S
N/S	6NUTSSL	Nut, Locking, 6-32, S/S
12	P16NP-10K	Potentiometer, 10kΩ, w/knob
13	PBSWITCH	Switch, Pushbutton, Sealed
14	LEDHOLDER-BLK.25	LED Mounting Clip, 5mm
15	1498-102	Jack, Banana, Red
16	1498-103	Jack, Banana, Black
17	1498-107	Jack, Banana, Yellow
18	ME161-2003	Jack, RCA, Black, Panel Mount
51	160-1001-01	Jack, RCA, Red, Panel Mount
52	160-1001-02	Jack, RCA, White, Panel Mount
N/S	10-32x3/4SSPSP	Screw, 10-32X3/4in, S/S, Phillips
N/S	10LWSSS	Washer, Split Locking, #10, S/S
N/S	8-32x5/8SSPHP	Screw, 8-32X5/8in, S/S, Phillips
N/S	8-32x3/8SSPHP	Screw, 8-32X3/8in, S/S, Phillips
N/S	8ISW	Washer, Internal Start, #8, S/S
N/S	8NUTSS	Nut, 8-32, S/S
N/S	8NUTSSL	Nut, Locking, 8-32, Locking
N/S	4-40x5/8SSPHP	Screw, 4-40X5/8in, S/S, Phillips
N/S	4NUTSSL	Nut, Locking, 4-40, S/S
N/S	1902A	Standoff, 4-40X1/4in, Nylon, Hex
N/S	3207	Grommet, 0.114-0.250in Hole
N/S	P-2392	Power Cord, AC, Euro Style, 3 Conductor
N/S	2823-6003	Charger Chassis Assembly
N/S	2890-05	Battery, Rechargeable, SLA, 12V/7.2A-hr
N/S	1-480698-0	Connector, 2-Circuit, Plug
N/S	350550-3	Contact, Socket, 14-20 AWG
N/S	43025-1200	Receptacle, 12 Pin, Micro-Fit
N/S	43025-1600	Receptacle, 16 Pin, Micro-Fit
N/S	43030-0007	Contact, 3.0mm, Female Socket
N/S	39-01-4040	Receptacle, 4 Pin, Mini-Fit
N/S	39-01-2060	Receptacle, 6 Pin, Mini-Fit
N/S	39-00-0039	Terminal, Female, Crimp Mini-Fit

Reference	Part Number	Description
N/S	2-520194-2	Terminal, Slide, 0.187 Series, 18-22 AWG
N/S	3500	Cable Tie, Nylon, 3/32inX3.5in
N/S	2405-28	Microphone, Handheld w/PTT Switch
N/S	2810E-2001-UM	User Manual, 2810E-2001
N/S	TAT-1/8	Heat Shrink Tubing, 1/8in, Black
N/S	8/18-22	Terminal, Ring, #8, 18-22 AWG

7.2 2810A-FS-01 FIELD SPARES KIT

Reference	Part Number	Description	Quantity
1	105-0603-001	Jack, Tip Black	1
2	105-0602-001	Jack, Tip Red	1
3	1498-103	Jack, Banana Black	2
4	1498-102	Jack, Banana Red	2
5	1498-107	Jack, Banana Yellow	2
6	14002B	5-Way Binding Post Black	2
7	14002R	5-Way Binding Post Red	2
8	7580K6	Switch, Toggle SPST	1
9	5168	Seal, Half boot Toggle Gray	1
10	PBSWITCH	Switch, Push Button, Sealed	1
11	P16NP-10K	Potentiometer, 10k Ohm w/knob	1
12	LEDGREEN	LED Green Brite	1
13	LEDHOLDER-BLK.25	Mounting Clip for 5mm LED	1
14	0034.6019	Fuse, 3.15A/150V Micro Quick	1
15	0034.6617	Fuse, 1.5A/250V Slow Blow	2