Go Beyond Normal Limits...℠

RITRON®
WIRELESS SOLUTIONS

Owner's Manual
GEN 3
LoudMouth® Wireless PA Receiver System

Updated for compatibility with
2013 FCC Narrowband Radios

plus

New features available in models with
SN# A100119000 or higher:

- **Relay Trigger Feature for Optional Strobe Light**
- **Record and Play Message DELAY Feature**
- **Record and Play Message REPEAT Feature**

Ritron Pub. 14500060 Rev. G 09/17

Call 800-USA-1-USA
For the right Wireless for your communication needs.

P.O. Box 1998 · Carmel, Indiana 46082-1998 · 317-846-1201 · Fax: 317-846-4978 · Email: ritron@ritron.com · www.ritron.com

Table of Contents

1 Getting Started

The Loudmouth® is a radio receiver that allows you to use your portable, base station or mobile 2-way radio to deliver voice messages directly to a PA speaker up to 2 miles away. The receiver and PA speaker is the ideal solution where hard-wired PA installation is simply impossible, too expensive, or temporary.

Your Loudmouth® receiver and PA speaker has been designed so that you can set it up quickly and start using it right away.

1.1 Loudmouth® receiver and PA speaker equipment

Check to be sure you received all the equipment necessary to install the Loudmouth® receiver and PA horn speaker.

List of items included with your Loudmouth® receiver and PA speaker:

LM-U450 or **LM-V150**.....Loudmouth® Radio Receiver with 5W audio amplifier
05500040 .....Horn Speaker with RCA phono plug and 25 ft. cable
RPS-1B .....Power Cube, 1.5A with 2.1mm coaxial DC connector
AFB-1545.....Dual-Band Antenna with BNC connector
RK-RQX-Q-MB .....Mounting Brackets

Need replacement items?
Contact your Ritron dealer, or Ritron directly at
800-USA-1-USA

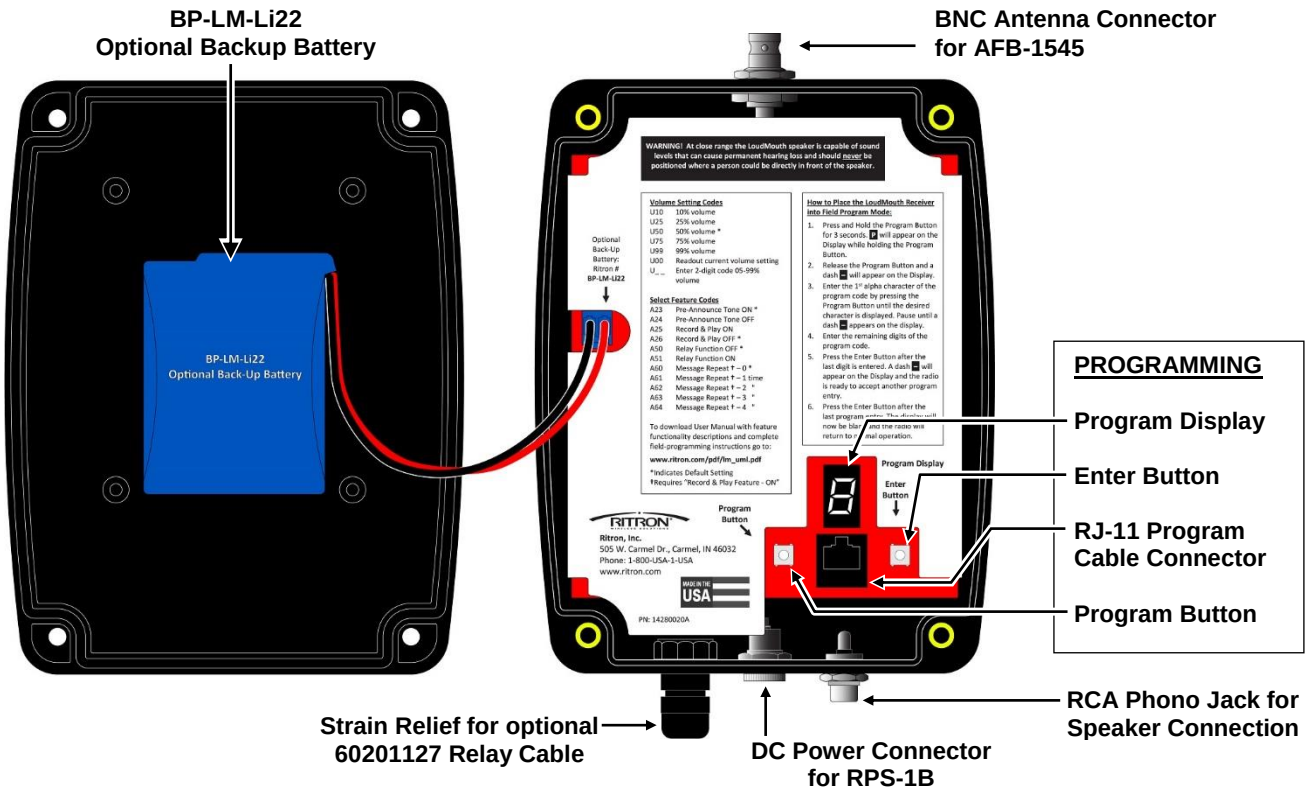
NOTES: The Power Cube and optional Backup Battery used with the Loudmouth® Receiver may vary depending on the Audio PA installed in the receiver. Refer to Section 5.6 - Loudmouth® Power Supply Requirements to determine the specific Power Cube and Backup Battery necessary for your Loudmouth® receiver.

* Ritron portable JMX-446D is also included when ordering the LM-U450SYSTEM, and the JMX-144D portable is included when ordering the LM-V150SYSTEM.

1.2 Loudmouth® receiver assembly

The Loudmouth® receiver and PA speaker is on any time power is applied to the receiver.

The Loudmouth® receiver must be opened to connect an optional BP-LM-Li22 battery or to program the Loudmouth®.



1. Loosen the 4 screws in the front corners of the case. These screws are retained to the housing with rubber O-rings, **DO NOT** remove the screws from the housing.
2. Separate the case front from the case back.
3. **Connect an optional BP-LM-Li22 backup battery** to the Loudmouth® receiver using the blue mating connectors shown above. The BP-LM-Li22 is secured to the case front with interlocking mushroom-head fastener strips. Press firmly on the battery to interlock the strips, snapping it into position as shown.
4. **Program the Loudmouth® receiver** per the instructions in the Programming section of this manual, leaving the RPS-1B power supply or BP-LM-Li22 backup battery connected to the radio. Press the **Enter** button twice before re-assembling the case to be sure the Loudmouth® is reset and ready for operation.
5. Carefully position the case front onto the case back. Secure the case halves by tightening the 4 screws in the front corners of the case.

Install the Mounting Brackets

Install the RK-RQX-Q-MB mounting brackets included with the product to the Loudmouth® case back. The recommended installation is with the brackets on each side as shown, installing the brackets top and bottom may reduce radio range.

1.3 Paging the Loudmouth® receiver and PA speaker

The Loudmouth® receiver and PA speaker can be paged with 2-way radios programmed for Quiet Call (CTCSS), Digital Quiet Call (DCS), 2-Tone Paging, or Selcall paging formats. Each format offers a unique method of paging the Loudmouth® receiver and PA speaker.

Refer to the Programming section of this manual for specific instructions on programming your Loudmouth® receiver and PA speaker to one of these selective signaling formats.

Ritron strongly recommends operation of the Loudmouth® receiver and PA speaker with one of the following selective signaling formats enabled.

Paging the Loudmouth® with Quiet Call (CTCSS) only:

- To page the loudspeaker a user simply presses the 2-way radio's PTT and speaks while on the Loudmouth® channel.
- Your 2-way radio must be programmed for a channel dedicated to Loudmouth® operation. Only those radios programmed with the Loudmouth® channel will be able to access the loudspeaker.
- The 2-way radio's Loudmouth® channel and the Loudmouth® receiver must be programmed for the same QC code. All Ritron radios offer 50 different field-programmable QC codes from which to choose.

Paging the Loudmouth® with Digital Quiet Call (DCS) only:

- To page the loudspeaker a user simply presses the 2-way radio's PTT and speaks while on the Loudmouth® channel.
- Your 2-way radio must be programmed for a channel dedicated to Loudmouth® operation. Only those radios programmed with the Loudmouth® channel will be able to access the loudspeaker.
- The 2-way radio's Loudmouth® channel and the Loudmouth® receiver must be programmed for the same DQC code. All Ritron radios offer 104 different field-programmable DQC codes from which to choose.

Paging the Loudmouth® with 2-Tone Paging:

- To page the Loudmouth® the 2-way radio must first send the correct 2-Tone Paging code. Once access to the loudspeaker is accomplished, the user simply presses the 2-way radio's PTT and speaks while on the Loudmouth® channel. After a period of inactivity the Loudmouth® is automatically reset, and will then require the correct 2-Tone Paging code to re-gain access.
- Only 2-way radios programmed to send the correct 2-Tone code on the Loudmouth® channel can access the Loudmouth® wireless PA speaker. However, once access is gained, any 2-way radio that operates on the Loudmouth® channel can access the loudspeaker up until the time that the Loudmouth® has automatically reset.
- Can be used in conjunction with QC or DQC for added security. The 2-way radio and the Loudmouth® receiver must be programmed for the same QC or DQC code.

Paging the Loudmouth® with Selcall:

- To page the Loudmouth® the 2-way radio must be programmed to send the correct Selcall code every time the PTT is pressed. The user simply presses the 2-way radio's PTT and speaks while on the Loudmouth® channel.
- Only 2-way radios programmed to send the correct Selcall code on the Loudmouth® channel can access the Loudmouth® wireless PA speaker.
- Can be used in conjunction with QC or DQC for added security. The 2-way radio and the Loudmouth® receiver must be programmed for the same QC or DQC code.

Ritron recommends the use of a dedicated channel frequency for Loudmouth® operation.

When operating on unique frequencies dedicated to loudspeaker operation:

- Your 2-way radios must be programmed for a channel dedicated to loudspeaker operation.
- Loudspeaker operation is limited to radios programmed with the dedicated Loudmouth® channel.
- The use of 2-tone or Selcall paging to address the Loudmouth® is not required, but can still be used if additional access security is desired.
- Without 2-tone or Selcall paging the loudspeaker can be addressed by simply selecting the Loudmouth® channel on your 2-way radio and pressing the PTT button to talk.
- You may need to license additional frequencies (not necessary with LM-V150 programmed for MURS frequencies, see Table 1 in the Programming section).

When operating on your normal 2-way communication frequencies:

- Messages broadcast on the Loudmouth® are also heard on your 2-way radios.
- Loudspeaker messages are not possible when the channel is being used for 2-way communications.
- The use of 2-tone or Selcall paging is required to address the Loudmouth®, otherwise all 2-way communication is heard on the loud speaker.
- Any user on your 2-way channel can broadcast over the loudspeaker once it is activated, even if their 2-way radio is not programmed with the correct 2-tone paging code.
- There is no need to license additional frequencies.

1.4 Compatibility with other RITRON model radios

The Loudmouth® receiver and PA speaker is available in both VHF (LM-V150, 150-165 MHz) and UHF (LM-U450, 450-470 MHz) business band frequencies. Loudmouth® can be accessed with radios programmed for Quiet Call (CTCSS), Digital Quiet Call (DCS), 2-Tone Paging, or Selcall paging formats. The following chart can be used to determine compatibility with existing Ritron radios.

VHF models compatible with LM-V150

Model	Type	QC	DQC	2-Tone	Selcall
JMX-141D	Portable	√			
JMX-144D	Portable	√	√	√	
JMX-146D	Portable	√			
JBS-146D	Base	√	√	√	
JBS-147D	Base	√	√	√	√
JBS-147M	Base	√	√	√	√
* JV-110	Portable	√	√	√	
RPM-160	Mobile	√	√	√	√
RQX-111	Callbox	√	√		√
RQX-117	Callbox	√	√		√
RQX-151	Callbox	√	√		
RQX-156	Callbox	√	√		√
RQX-157	Callbox	√	√		√
PT-150	Portable	√	√	√	√
PT-150M	Portable	√	√	√	√

UHF models compatible with LM-U450

Model	Type	QC	DQC	2-Tone	Selcall
JMX-441D	Portable	√			
JMX-444D	Portable	√	√	√	
JMX-446D	Portable	√	√	√	
JBS-446D	Base	√	√	√	
JBS-447D	Base	√	√	√	√
* JU-410	Portable	√	√	√	
RPM-460	Mobile	√	√	√	√
RQX-411	Callbox	√	√		√
RQX-417	Callbox	√	√		√
RQX-451	Callbox	√	√		
RQX-456	Callbox	√	√		√
RQX-457	Callbox	√	√		√
PT-450	Portable	√	√	√	√
PT-450-S	Portable	√	√	√	√

* 2-Tone paging available with Rev 6.0 or greater Firmware Only. See label inside radio battery compartment for firmware revision.

1.5 Determine the volume setting

Selecting the correct volume level is critical to the performance of the Loudmouth® receiver and PA speaker. Carefully consider the following before deciding on the appropriate volume setting. Refer to the Programming section of this manual for specific instructions on programming the Volume Level.

Ambient noise level should be considered first when selecting the volume level.

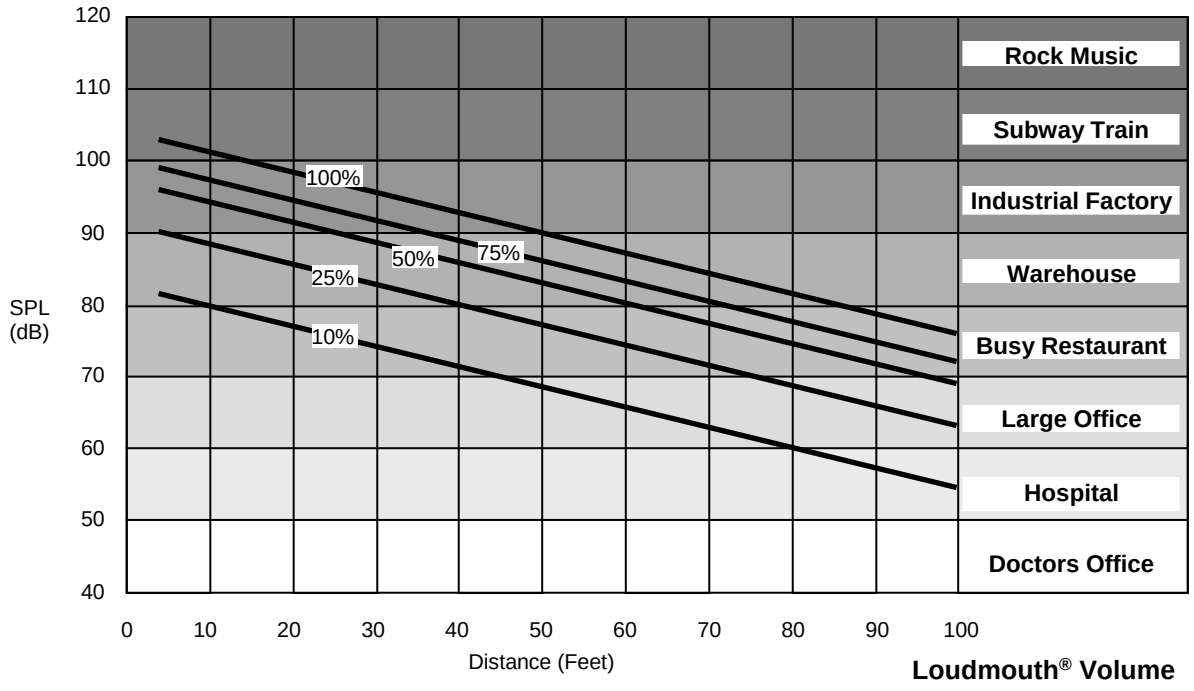
Increasing the volume level in an effort to cover a wider area will result in:

- Undesirably high volume when near the speaker.
- Low volume at the outer edges of the coverage area.
- A calling radio must be a greater distance from the Loudmouth® speaker to prevent feedback. (Feedback is the result of Loudmouth® speaker audio getting into the calling radio's microphone.)

When coverage of a large area is required, additional Loudmouth® speakers may be necessary for satisfactory performance. See the Installation section of this manual for details on how to install 2 speakers using a single Loudmouth® receiver, or multiple receivers and speakers.

1. Refer to the horizontal shaded bars on the chart below to determine the sound level that best represents your location. This should be the ambient, or average sound level. We will consider the maximum sound level when we locate the speaker.
2. Estimate the maximum distance (in feet) that the loudspeaker must be heard. Locate that distance on the chart below and follow it up to find the line that is in the middle of your shaded bar. This line indicates the optimum Loudmouth® volume level setting.

EXAMPLE: In the Ritron factory we need to cover a maximum distance of 50 feet on the factory floor with an ambient sound level similar to a warehouse. I find the vertical line at the bottom of the chart indicating 50 feet, and follow it up to the shaded bar indicating Warehouse. The 50% and 75% lines are in the middle of the Warehouse bar, indicating a required Loudmouth® volume setting between 50 - 75%.



2 Installation

Proper installation of the Loudmouth® wireless PA speaker is critical to the performance and overall satisfaction with your system. With careful consideration and planning Loudmouth® will cover up to 100 feet with a single speaker, and can cover an even wider range with multiple speakers and receivers. This section will help you plan an installation that is best suited for your environment.

2.1 Selecting the PA speaker location

Speaker location is critical to the performance of the Loudmouth® receiver and PA speaker. Consider the following factors before selecting a speaker location.

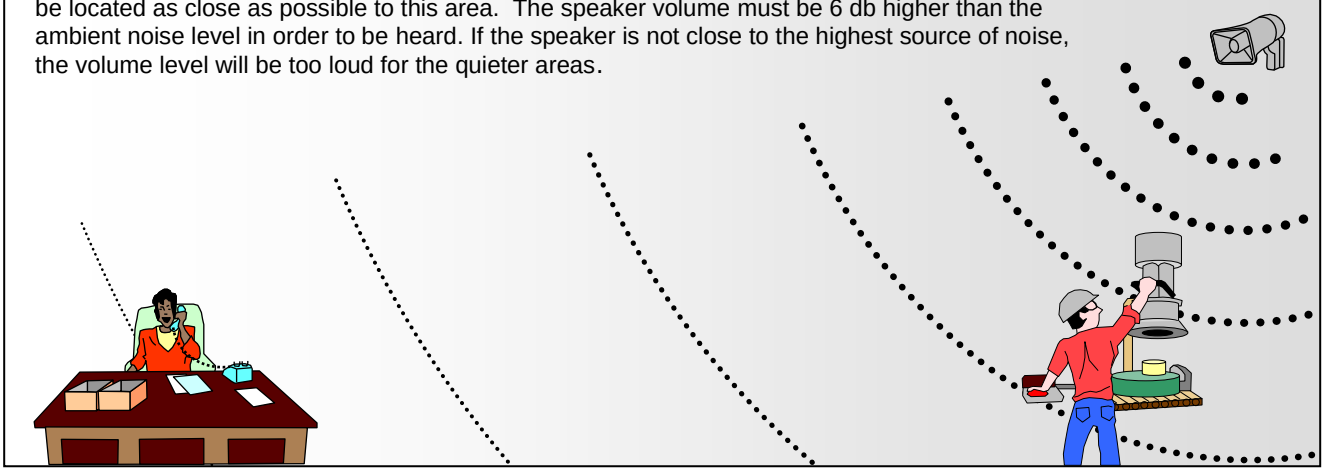
- The speaker can be installed either indoors or outdoors.
- Be sure there is a convenient source of 110VAC power for the RPS-1B power cube and that the radio receiver box can be located inside, out of the elements. The speaker has a 25 ft. cable, if you need more a standard RCA phono cable extension can be used (ie. Radio Shack Catalog #: 4202362).
- The speaker should not be in an area where the 2-way radio user addressing the speaker will typically be located. If the radio user is too close to the Loudmouth® speaker, feedback can occur due to loudspeaker audio getting into the radio microphone. This is a problem related to the 2-way radio, not the Loudmouth® speaker. The use of the Record & Play feature will eliminate this problem.

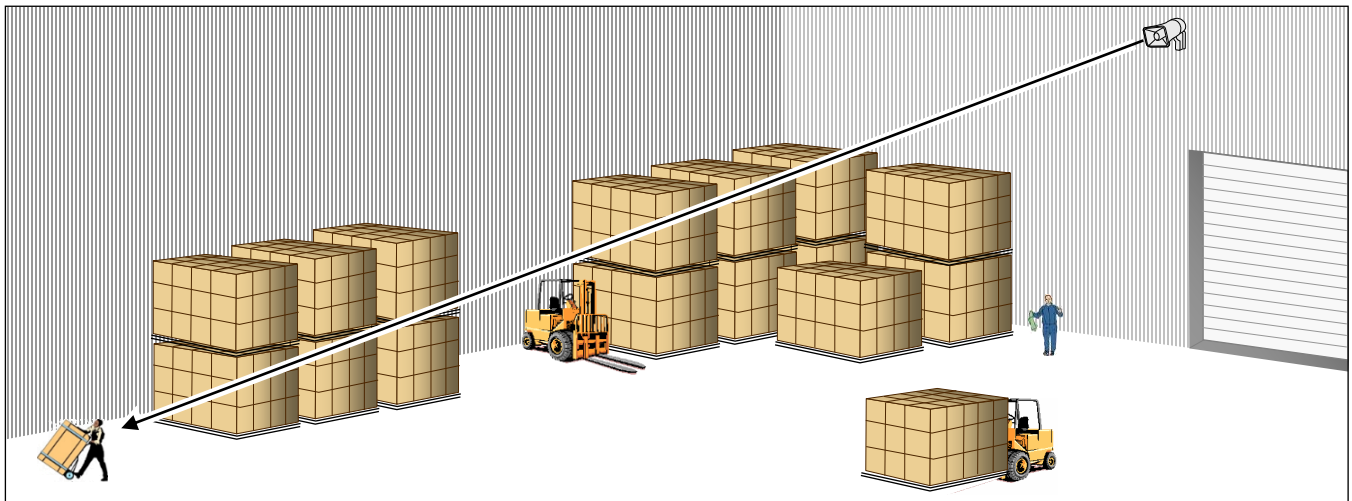
The speaker must be located at least 10 feet above head level.

At near range the Loudmouth® speaker is capable of sound levels that can cause permanent hearing loss and should never be installed in a location where a person could be directly in front of the speaker.

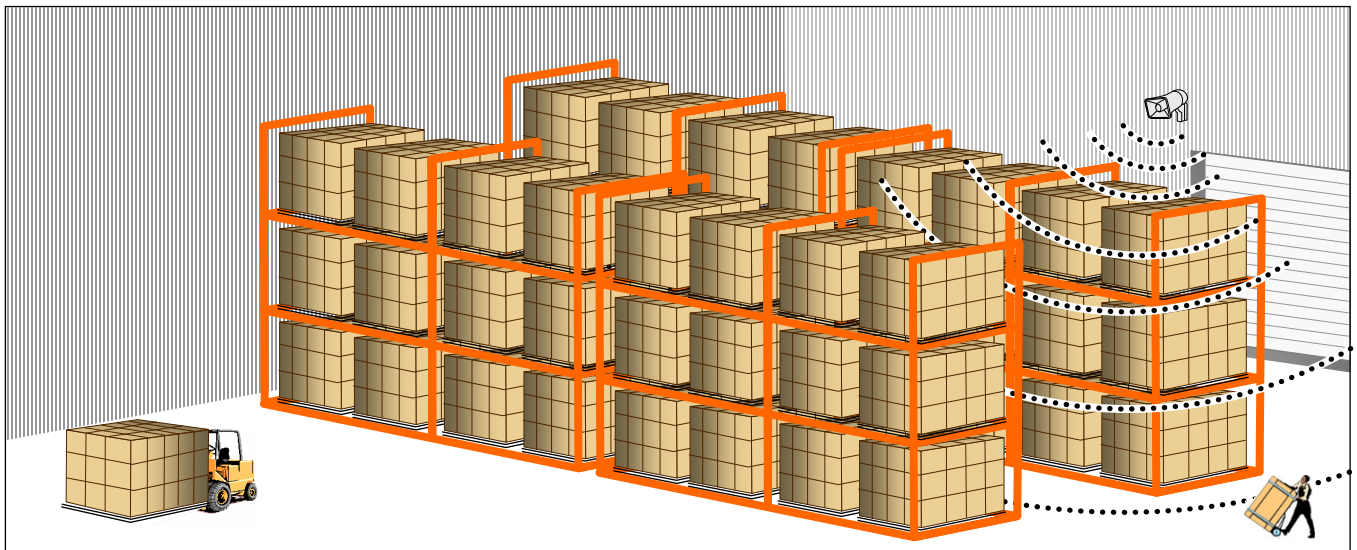
Install the Loudmouth® speaker close to the noisiest area you plan to cover.

If there is an area with a significantly higher ambient noise level, the Loudmouth® speaker should be located as close as possible to this area. The speaker volume must be 6 db higher than the ambient noise level in order to be heard. If the speaker is not close to the highest source of noise, the volume level will be too loud for the quieter areas.





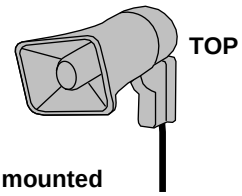
The Loudmouth® speaker should be mounted as high as practical and pointed toward the farthest location you need to cover.



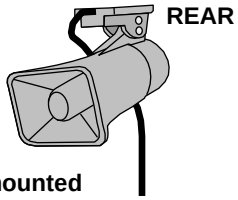
Large obstructions will significantly reduce the coverage area.
Do not place the speaker behind large, tall objects.

2.2 PA Speaker installation

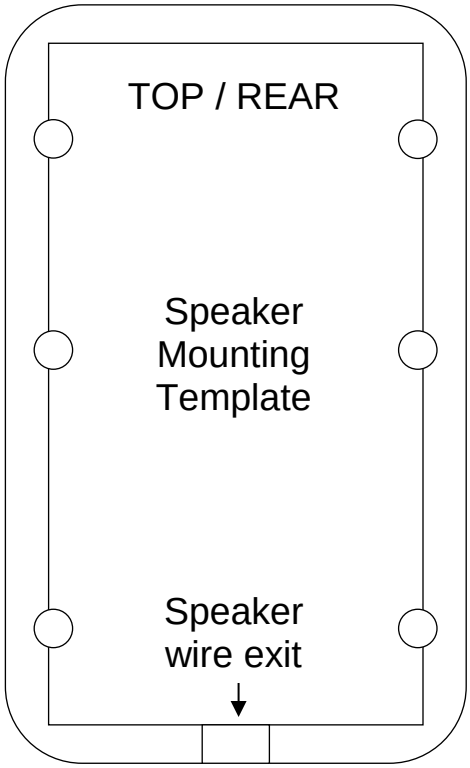
The speaker mount can be installed vertically on a wall, flat post or support column; or can be mounted horizontally from a ceiling or rafter beam.



Wall mounted



Ceiling mounted



Once the speaker location has been determined the Speaker Mounting Template may be used to mark the mounting surface. When using the Speaker Mounting Template keep in mind that the speaker wire exit is toward the floor on a wall mounted installation, and toward the front of the speaker in a ceiling mounted installation.

The Loudmouth® speaker may be secured to a variety of surfaces, with each installation presenting unique requirements for mounting hardware. With this in mind, mounting screws or hardware are not included with the Loudmouth®.

Guidelines for mounting the Loudmouth® speaker:

- The Loudmouth® speaker can be safely mounted to concrete, metal or wood surfaces. Other surfaces are possible provided they can support the weight of the speaker. If mounting to a drywall or concrete surface the use of expansion anchors is recommended.
- Secure the speaker tightly to the mounting surface, using all 6 mounting holes if possible. At high audio output levels the speaker can generate significant vibration and must be rigidly secured. This is particularly critical with drywall surfaces, which are highly susceptible to vibration damage.
- Be sure the speaker wire exits cleanly from under the speaker mounting bracket through the wire exit tunnel provided. Pinching the speaker wires could cause a short that will destroy the Loudmouth® receiver audio amplifier.
- Route the speaker wire closely against a wall or support beam. Speaker wire hanging in free space is easily snagged and could be pulled from the Loudmouth® receiver or worse yet, pulled from the speaker itself causing permanent damage.
- 1 inch long, #8 or #10 round-head screws should be used to mount the speaker. Wood screws, sheet metal screws, machine screws with nuts, or drywall anchors and screws will all work well depending on your specific requirements. Pan-head screws should not be used to prevent damage to the mounting bracket due to over-tightening.

Wood Screw

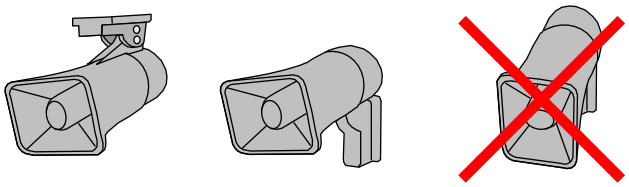
Sheet Metal Screw

Machine Screw with Nut

Drywall Anchor and Screw

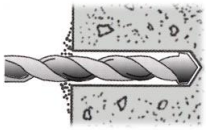
The Loudmouth® speaker should be mounted horizontally for the widest coverage

When mounted horizontally the Loudmouth® speaker will provide 90° horizontal and 60° vertical coverage without significant loss of sound level. Refer to the SPL chart on page 29 for typical sound levels at full volume.

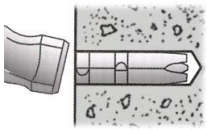


Installing Concrete Expansion Anchors

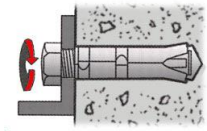
1. Drill hole of recommended diameter, see chart below, into the base material to a depth equal to, or slightly deeper than the length of the expansion shield. Clean out the hole of all dust and cuttings.



2. Place the Single Expansion anchor, nut end first, into the hole. The top end of the anchor should be flush or slightly below the base material surface.



3. Place the object to be fastened over the anchor in the base material and bolt into place. The bolt should engage 2/3 of the threads of the anchor.



2.3 Loudmouth® radio receiver installation

Installation of the Loudmouth® receiver is critical to the effective radio coverage of the radio loudspeaker system. Without proper installation the maximum possible distance between the calling radio and the Loudmouth® receiver will be significantly reduced.

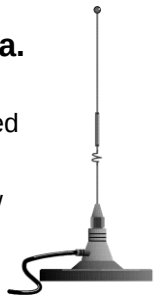
Guidelines for installing the Loudmouth® receiver:

- The radio receiver box must be located inside, out of the elements.
- Be sure there is a convenient source of 110VAC power for the RPS-1B power cube.
- The Loudmouth® receiver should be installed in a central location and as high up as possible for best radio coverage.
- For maximum radio coverage the antenna should be in a vertical orientation and should not be touching or surrounded by large metal objects. The receiver box can be mounted horizontally as long as the antenna is in a vertical position.
- Do not install the Loudmouth® receiver in a high traffic location with the possibility that the receiver box would be struck, become unplugged, or the speaker be disconnected.
- Do not wind, loop or otherwise allow the power cord from the RPS-1B power cube to contact the antenna. The power cord should be routed away from the antenna.

Radio range can be extended with the use of an external antenna.

The antenna can be installed at a higher elevation than is possible with the attached antenna.

The Ritron RAM-1545 VHF/UHF magnet-mount antenna has a 25 ft. cable to allow optimum antenna location.



2.4 Installing two PA speakers with a single Loudmouth® receiver

Many locations may require the installation of two speakers with a single Loudmouth® receiver. Two speakers are used when:

- Coverage is required over a large area.
- Large obstructions limit the effective range of a single speaker.
- A wall separates two coverage areas.
- The ambient noise level is low and individual speaker volume must be reduced (i.e. Hospital).
- The calling radio is in the area where the speakers are located and speaker volume must be reduced to prevent feedback.

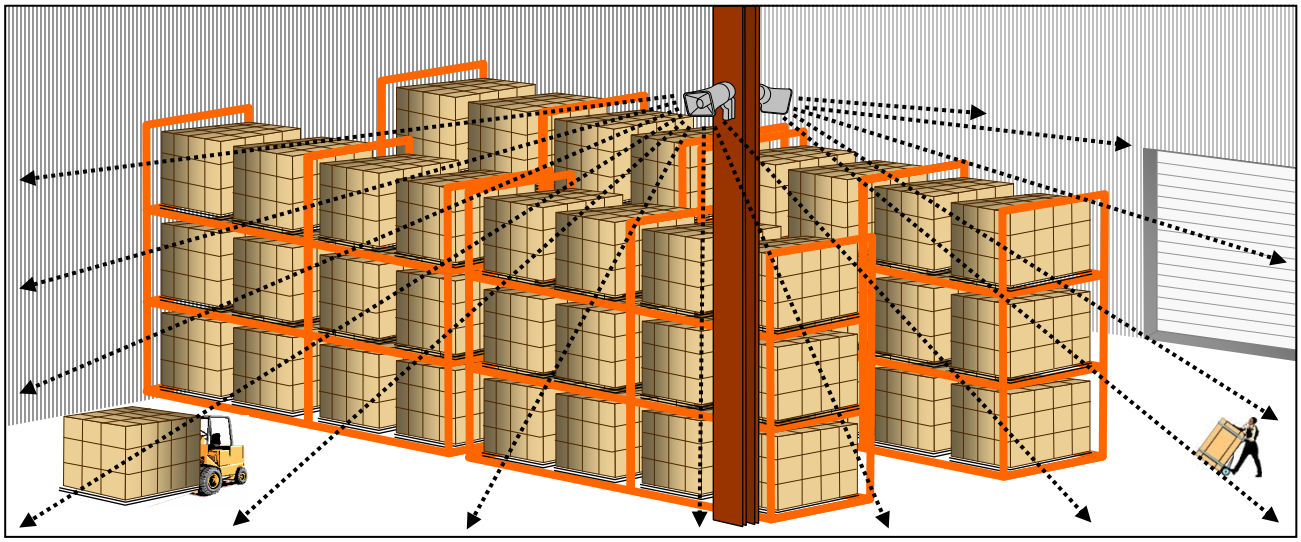
You can connect 2 speakers to a single Loudmouth® receiver using the Ritron model RYCONN RCA Male to 2 RCA Female Y-Adapter.

Optional 2nd PA speaker with 20 ft. cord and RCA phono connector. (Ritron PN# 05500040)

In some installations a single Loudmouth® receiver can be used to drive two speakers, while others will require a separate receiver for each speaker.

To cover a large area, or an area with large obstructions, place 2 speakers back-to-back in a central location.

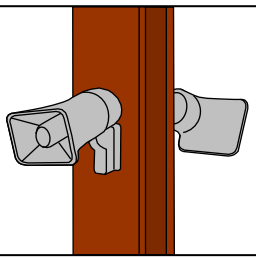
- The speakers should be mounted as high as possible and pointing away from each other.
- The 2 speakers can be driven by a single Loudmouth® receiver.
- Volume level may be reduced compared to a single speaker, making the system less susceptible to feedback.
-



Use 2 Speakers to reduce volume level

Surprisingly, the use of 2 speakers powered by a single Loudmouth® receiver can allow you to reduce the volume level in a quiet environment.

By covering an area with 2 centrally located speakers, installed back-to-back, the volume level can be cut in half.



2.5 Installing multiple Loudmouth® receivers and PA speakers

Many locations may require the installation of multiple Loudmouth® receivers and PA speakers. Multiple receivers and PA speakers are used when:

- Paging separate buildings is required.
- The coverage area is too large for a single receiver and PA speaker.
- Zone paging is required.
- Paging is required in more than one location.

Zone paging, or paging in more than one location requires a separate Loudmouth® receiver for each area.

- With zone paging all radios can operate on the same Loudmouth® radio frequency.
- Each Loudmouth® receiver can be programmed for a unique paging code, allowing selective paging to each zone.
- The Loudmouth® receivers can be programmed for an All Call* code that allows paging of all zones at once, or Group Call* to page more than one zone.
- Zone paging allows for volume levels that are programmed to the specific needs of that area.
- If zone paging is not necessary, all Loudmouth® receivers can be programmed for the same paging code.

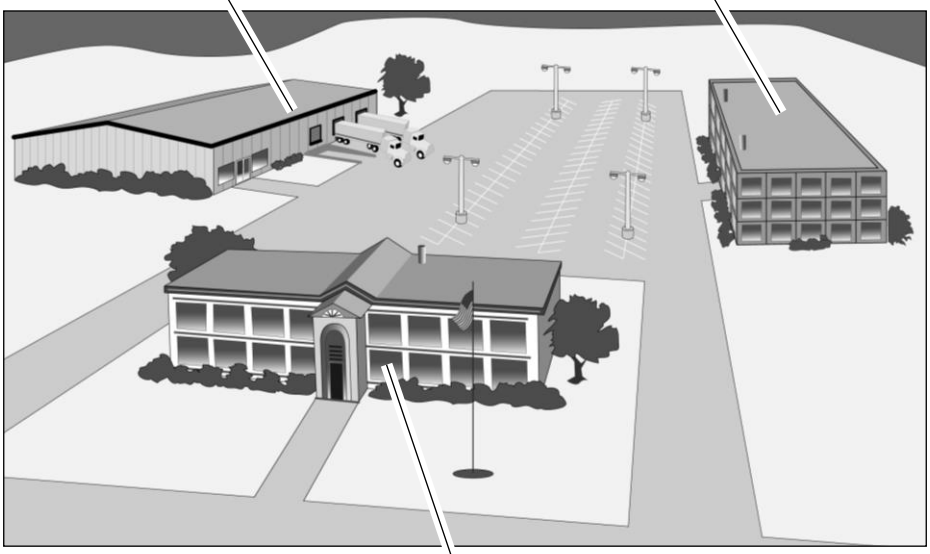
* All Call and Group Call code programming requires the Ritron Loudmouth® PC Programmer.

Zone 1 – Warehouse and loading dock

- Single Loudmouth® receiver with 2 speakers.
- One speaker is located inside the warehouse and the other is located outside for the loading dock.
- Speaker volume is set to 50% for the warehouse environment.

Zone 2 – Cafeteria

- Single Loudmouth® receiver with 1 speaker.
- The speaker is located inside the cafeteria area.
- Speaker volume is set to 25% for the restaurant environment.



Zone 3 – Sales office

- Single Loudmouth® receiver with 1 speaker.
- The speaker is located inside the Sales office.
- Speaker volume is set to 10% for the office environment.

Example of Zone paging

2.6 Vehicular installation

The Loudmouth® receiver can be powered with an optional Ritron model CCL-M cigarette lighter adapter for use in mobile applications.

- Route the CCL-M power cord away from the antenna and speaker wires.

CCL-M

> When the speaker is mounted on the roof of a vehicle at head level the volume level should be reduced to 50% or less to prevent hearing damage.

2.7 Temporary outdoor installation

The Loudmouth® receiver can be temporarily installed outdoor with the use of weatherproof enclosures.

LMH-100

The Ritron model LMH-100 is a weatherproof, fiberglass reinforced polyester enclosure designed to house the Loudmouth® receiver and antenna. Speaker and power connections are routed from the bottom of the enclosure through electrical conduit.

The LMH-100 includes:

- Dual stainless steel, pad lockable latches
- Nema 3 weatherproof, fiberglass reinforced polyester enclosure
- Mounting flanges for flat surface
- Dimensions: 13”H x 10.5”W x 5.5”D Weight: 8 lbs.

RSS-100

Ritron model RSS-100 10W solar panel kit can be used to power the Loudmouth® receiver without the need for the RPS-1B power supply in locations where AC power is not available.

The RSS-100 includes:

- 10-Watt solar panel with mounting bracket
- 7AH sealed rechargeable battery
- Solar charge controller
- Nema 3 weatherproof, fiberglass enclosure
- Mounting flanges for flat surface
- Dimensions: 12”H x 10.25”W x 6.25”D Weight: 10 lbs.

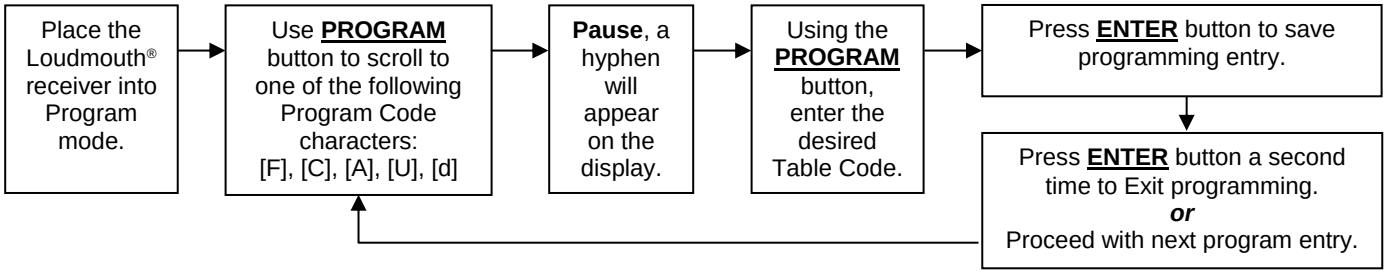
CKNM

The RPS-1B power cube can be temporarily plugged into an outdoor outlet with a large in-use weatherproof cover such as the Thomas & Betts® model CKNM (available in Lowe’s Hardware stores nationwide).

3 Programming

For most installations the Loudmouth® can be programmed in the field without the need for Ritron PC Programmer 12.0.8. Field programming is accomplished in 3 easy steps. First, the radio frequency and tone codes are entered. Second, the selective signaling code is entered (if used). Third, the Loudmouth® options and volume setting are entered.

3.1 Loudmouth® Field Programming Overview



Program Codes	Table Codes
F	Enter a 2-digit Frequency code from Table 1 ***and*** a 2-digit QC code from Table 2 ***or*** Enter a 2-digit Frequency code from Table 1 ***and*** a 3-digit DQC code from Table 3.
C	Enter a 2-digit, 2-Tone Paging code from Table 4 ***or*** Enter any 3 – 7-digit Selcall Paging Code.
A	Enter a 2-digit Loudmouth® Feature code from Table 5 to: • Enable or disable a Pre-Announce Tone. • Enable or disable Record and Play operation. • Set a Record and Play delay time. • Set to repeat a Record and Play message. • Enable or disable Weather Alert feature (VHF models only) • Enable or disable Battery Powered Operation. • Enable or Disable Power Save operation. • Set the Loudmouth® for wideband operation. • Enable or Disable Relay operation. • Reset Loudmouth® to Factory default programming.
U	Enter the desired Speaker Volume Level as a 2–digit number from 05 – 99.
d	Enter the 1-digit NOAA Weather Frequency code from Table 6 (**VHF models only**) This only programs the NOAA weather frequency, the Weather Alert feature must be enabled using the Special Features code in Table 5.

3.2 Readout Current Frequency, Tone and Selective Signaling Codes

1. Loosen the 4 screws in the front corners of the case. These screws are retained to the housing with rubber O-rings, **DO NOT** remove the screws from the housing.
2. Separate the case front from the case back, leaving the RPS-1B power supply or backup battery connected to the radio.
   NOTE: The voltage of the batteries must be greater than 6 VDC to program properly.
3. Press and release the **PROGRAM** button (See Loudmouth® receiver assembly on page 2 for location). The radio will immediately begin to display a series of digits; with each digit separated by a hyphen.
4. Write down all the digits. The first two digits indicate the frequency code and the next two digits the tone code; **see Table 1 and Table 2 on page 16.** In this example an LM-U450 is programmed to operate on the "Brown Dot" frequency of 464.500 MHz (Frequency code "04") with 100.0 Hz tone (Tone code "12").

FREQUENCY CODE TONE CODE

5. If a 5th digit is displayed, the Loudmouth® has been programmed for DQC and the last three digits indicate the DQC code; **see Table 3 on page 16.** In this example an LM-U450 was programmed to operate on the "Brown Dot" frequency of 464.500 MHz (Frequency code "04") with a DQC code of "723".

FREQUENCY CODE DQC CODE

6. If more than 5 digits are displayed, the radio has been programmed for Selective Signaling Decode. The frequency and tone codes will be displayed, followed by a "C", then the radio will display either the 2-digit, 2-Tone paging code (**see Table 4 on 17**) or the 3-7 digit Selcall code**.** In this example an LM-U450 was programmed to operate on the "Brown Dot" frequency of 464.500 MHz (Frequency code "04") with 100.0 Hz tone (Tone code "12") and 2-tone paging decode frequencies of 330.5 Hz and 569.1 Hz (2-Tone code "91")

FREQUENCY CODE TONE CODE PAGING CODE

7. If the Loudmouth® is PC programmed with any frequency not listed in **Table 1** on page 16, the radio will display a code "99" for the frequency code. The PC programmer will be required to readout the radios frequency programming.
8. Normal radio operation resumes after the programming information has been displayed.

2013 FCC Narrowband Mandate

On January 1, 2013, pursuant to the FCC Narrowband mandate, you will no longer be allowed to operate wideband transmitters (25 kHz) in the frequency bands from 150 MHz to 512 MHz.

Ritron will begin manufacturing narrowband compatible Loudmouth® starting in December 2012. At that time, customer orders will begin to be filled with radios manufactured for FCC narrowband compatibility. Specifically, table frequencies will be converted to narrowband. Since Part 15 receivers are not subject to the narrowband mandate, you will still be able to set the Loudmouth® for wideband operation via field programming (See Section 3.5 – Program Loudmouth® Features), or by using the PC Programmer. These radios will be clearly marked as "FCC Narrowband Compatible".

For a complete list of all Ritron radios capable of narrowband operation; a Ritron FAQ on the subject, and various links on the FCC website dealing with Narrowbanding go to:

www.ritron.com/narrowband

If you have any questions contact us at 1-800-872-1872.

3.3 Program Frequency & Tone Codes

To match other radios, the owner can select Frequency, Tone and DQC Codes from **Table 1**, **Table 2** and **Table 3**. In our example, we will program an LM-U450 to operate on the "Brown Dot" frequency of 464.500 MHz with 100.0 Hz tone.

04

1. Refer to **Table 1** to determine the two-digit frequency code and write it down.

12

2. Refer to **Table 2** to determine the two-digit tone code for 100.0 Hz and write it down.

3. Loosen the 4 screws in the front corners of the case. These screws are retained to the housing with rubber O-rings, **DO NOT** remove the screws from the housing.

4. Separate the case front from the case back, leaving the RPS-1B power supply or backup battery connected to the radio.

   NOTE: The voltage of the batteries must be greater than 6 VDC to program properly.

5. Press and **HOLD** the **PROGRAM** button. A "P" will appear on the program display as you enter program mode and the radio will beep rapidly.

6. Release the **PROGRAM** button after the beeping has stopped. The radio will emit a triple beep indicating that the radio is in program mode and a hyphen will appear on the program display.

7. Scroll to the character “F” by clicking the **PROGRAM** button until the program display shows the correct character. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the first digit of the frequency code.

FREQUENCY CODE

8. Enter the 1st digit of the frequency code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

9. Enter the 2nd digit of the frequency code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

TONE CODE

10. Enter the 1st digit of the tone code (or 1st digit of the DQC code) by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

11. Enter the 2nd digit of the tone code (or 2nd digit of the DQC code) by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

12. **FOR DQC CODES ONLY** – Enter the 3rd digit of the DQC code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

13. Press and release the **ENTER** button to save your programming. A triple beep will sound to indicate that programming was successful and a hyphen will appear on the program display. The radio is now ready for another program entry.

    NOTE: An error tone will sound if you attempt to save an incorrect code, an "E" will appear on the display. Check the digits you are attempting to enter, then re-enter.

14. Once you have made your final program entry, press the **ENTER** button a final time to exit programming mode. The Program display will be blank and the radio will be ready for use. The Loudmouth® will exit program mode automatically after 30 seconds if no program entries are attempted.

Table 1: Programmable Frequency Codes

VHF Business Band

Code	Frequency	Color Dot	BW
03	151.625	Red Dot	12.5 †
04	151.955	Purple Dot	12.5 †
05	151.925		12.5 †
06	154.540		12.5 †
07	154.515		12.5 †
08	154.655		12.5 †
10	151.715		12.5 †
09	151.685		12.5 †
11	151.775		12.5 †
12	151.805		12.5 †
13	151.835		12.5 †
14	151.895		12.5 †
15	154.490		12.5 †
16	151.655		12.5 †
17	151.745		12.5 †
18	151.865		12.5 †
24	151.700		12.5
25	151.760		12.5
26	152.700		12.5 †
99	Custom programmed		---

VHF MURS**

01	154.600	Green Dot	25
02	154.570	Blue Dot	25
19	151.820	MURS	12.5
20	151.880	MURS	12.5
21	151.940	MURS	12.5
22	154.600	MURS	12.5
23	154.570	MURS	12.5

UHF Business Band

Code	Frequency	Color Dot	BW
01	467.7625	J	125 †
02	467.8125	K	125 †
03	464.5500	Yellow Dot	125 †
04	464.5000	Brown Dot	125 †
05	467.8500	Silver Star	125 †
06	467.8750	Gold Star	125 †
07	467.9000	Red Star	125 †
08	467.9250	Blue Star	125 †
09	469.2625		125 †
10	462.5750	White Dot	125 †
11	462.6250	Black Dot	125 †
12	462.6750	Orange Dot	125 †
13	464.3250		125 †
14	464.8250		125 †
15	469.5000		125 †
16	469.5500		125 †
17	463.2625		125 †
18	464.9125		125 †
19	464.6000		125 †
20	464.7000		125 †
21	462.7250		125 †
22	464.5000		12.5
23	464.5500		12.5
24	467.7625		12.5
25	467.8125		12.5
26	467.8500		12.5
27	467.8750		12.5
28	467.9000		12.5
29	467.9250		12.5
30	461.0375		12.5
31	461.0625		12.5

UHF Business Band

Code	Frequency	Color Dot	BW
32	461.0875		12.5
33	461.1125		12.5
34	461.1375		12.5
35	461.1625		12.5
36	461.1875		12.5
37	461.2125		12.5
38	461.2375		12.5
39	461.2625		12.5
40	461.2875		12.5
41	461.3125		12.5
42	461.3375		12.5
43	461.3625		12.5
44	462.7625		12.5
45	462.7875		12.5
46	462.8125		12.5
47	462.8375		12.5
48	462.8625		12.5
49	462.8875		12.5
50	462.9125		12.5
51	464.4875		12.5
52	464.5125		12.5
53	464.5375		12.5
54	464.5625		12.5
55	466.0375		12.5
56	466.0625		12.5
57	466.0875		12.5
58	466.1125		12.5
59	466.1375		12.5
60	466.1625		12.5
61	466.1875		12.5
62	466.2125		12.5

UHF Business Band

Code	Frequency	Color Dot	BW
63	466.2375		12.5
64	466.2625		12.5
65	466.2875		12.5
66	466.3125		12.5
67	466.3375		12.5
68	466.3625		12.5
69	467.7875		12.5
70	467.8375		12.5
71	467.8625		12.5
72	467.8875		12.5
73	467.9125		12.5
74	469.4875		12.5
75	469.5125		12.5
76	469.5375		12.5
77	469.5625		12.5
99	Custom programmed		----

Canadian Models UHF Canada

01	458.6625	25
02	469.2625	25

VHF Canada

01	151.055	25
02	151.115	25

British Columbia

01	154.100	25
02	158.940	25

Notes: ** MURS frequencies do not require an FCC license. All other frequencies require an FCC license.
† Frequency code was 25 KHz bandwidth prior to the 2013 FCC Narrowband Mandate.
• BW is the bandwidth in kHz. 12.5 kHz = narrow band channel, 25 kHz = wide band channel.

Table 2: Interference Eliminator Programmable QC Tone Codes

Code	Frequency	Code	Frequency	Code	Frequency	Code	Frequency	Code	Frequency	Code	Frequency
01	67.0	10	94.8	19	127.3	28	173.8	37	241.8	46	189.9
02	71.9	11	97.4	20	131.8	29	179.9	38	250.3	47	196.6
03	74.4	12	100.0	21	136.5	30	186.2	39	69.4	48	199.5
04	77.0	13	103.5	22	141.3	31	192.8	40	159.8	49	206.5
05	79.7	14	107.2	23	146.2	32	203.5	41	165.5	50	229.1
06	82.5	15	110.9	24	151.4	33	210.7	42	171.3	51	254.1
07	85.4	16	114.8	25	156.7	34	218.1	43	177.3	00	**No Tone**
08	88.5	17	118.8	26	162.2	35	225.7	44	**No Tone**		
09	91.5	18	123.0	27	167.9	36	233.6	45	183.5		

Table 3: Digital Interference Eliminator Programmable DQC Tone Codes

Code	Code	Code	Code	Code	Code	Code	Code	Code	Code
023	065	132	205	255	331	413	465	612	731
025	071	134	212	261	332	423	466	624	732
026	072	143	223	263	343	431	503	627	734
031	073	145	225	265	346	432	506	631	743
032	074	152	226	266	351	445	516	632	754
036	114	155	243	271	356	446	523	645	
043	115	156	244	274	364	452	532	654	
047	116	162	245	306	365	454	546	664	
051	122	165	246	311	371	455	565	703	
053	125	172	251	315	411	462	606	712	
054	131	174	252	325	412	464	662	723	

3.4 Program Paging Codes

For paging, it is desirable to program the wireless speaker for 2-Tone or Selcall operation. The user is able to field program the radio for one of the 9 pre-determined 2-tone pairs specified in **Table 4**, or for a 3-7 digit Selcall code. 2-Tone codes correspond to field programmable 2-Tone encode (transmit) codes available in other RITRON portable and base radios. In our example we will program an LM-U450 to operate with 2-Tone Paging Code 94 frequencies of 389.0 and 669.9 Hz.

94

1. Refer to **Table 4** to determine the two-digit code for 2-tone decode on 389.0 and 669.9 Hz and write it down.
2. Loosen the 4 screws in the front corners of the case. These screws are retained to the housing with rubber O-rings, **DO NOT** remove the screws from the housing.
3. Separate the case front from the case back, leaving the RPS-1B power supply or backup battery connected to the radio.

   NOTE: The voltage of the batteries must be greater than 6 VDC to program properly.

4. Press and HOLD the PROGRAM button. A "P" will appear on the program display as you enter program mode and the radio will beep rapidly.

5. Release the **PROGRAM** button after the beeping has stopped. The radio will emit a triple beep indicating that the radio is in program mode and a hyphen will appear on the program display.

6. Scroll to the character “C” by clicking the **PROGRAM** button until the program display shows the correct character. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the first digit of the 2-Tone or Selcall code.

2-TONE CODE

7. Enter the 1st digit of the 2-Tone or Selcall code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

8. Enter the 2nd digit of the 2-Tone or Selcall code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the next digit.
9. **FOR SELCALL CODES ONLY** – Enter the 3rd, 4th, 5th, 6th, and 7th digits of the Selcall code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.

10. Press and release the **ENTER** button to save your programming. A triple beep will sound to indicate that programming was successful and a hyphen will appear on the program display. The radio is now ready for another program entry.

    NOTE: An error tone will sound if you attempt to save an incorrect code, an "E" will appear on the display. Check the digits you are attempting to enter, then re-enter.
11. Once you have made your final program entry, press the **ENTER** button a final time to exit programming mode. The Program display will be blank and the radio will be ready for use. The Loudmouth® will exit program mode automatically after 30 seconds if no program entries are attempted

Table 4: 2-Tone Paging Codes

Code	Tone 1	Tone 2
90	*	*
91	330.5	569.1
92	349.0	600.9
93	368.5	634.5
94	389.0	669.9
95	410.8	707.3
96	433.7	746.8
97	457.9	788.5
98	483.5	832.5
99	330.5	600.9
00	No Selective Signaling	

IMPORTANT NOTE:

* If the Loudmouth® displays 2-Tone Paging Code “90” on readout, it has been PC programmed for custom 2-Tone frequencies. Entering code “90” will cause the Loudmouth® to operate on the PC programmed custom 2-Tone frequencies.

3.5 Program Loudmouth® Features

The wireless speaker can be field programmed for a variety of features. Refer to **Table 5** for the two digit codes available for field programming. In our example we will program an LM-U450 for Record and Play operation. The Loudmouth® is set from the factory with these √ options **enabled.**

25	1.	Refer to **Table 5** to determine the two-digit feature code and write it down.
	2.	Loosen the 4 screws in the front corners of the case. These screws are retained to the housing with rubber O-rings, **DO NOT** remove the screws from the housing.
	3.	Separate the case front from the case back, leaving the RPS-1B power supply or backup battery connected to the radio. **NOTE:** The voltage of the batteries must be greater than 6 VDC to program properly.
	4.	Press and HOLD the PROGRAM button (See Loudmouth® receiver assembly on page 2 for location). A "P" will appear on the program display as you enter program mode and the radio will beep rapidly.
	5.	Release the **PROGRAM** button after the beeping has stopped. The radio will emit a triple beep indicating that the radio is in program mode and a hyphen will appear on the program display.
	6.	Scroll to the character "A" by clicking the **PROGRAM** button until the program display shows the correct character. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the first digit of the Feature code.
FEATURES CODE 	7.	Enter the 1st digit of the feature code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the next digit.
	8.	Enter the 2nd digit of the feature code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.
 	9.	Press and release the **ENTER** button to save your programming. A triple beep will sound to indicate that programming was successful and a hyphen will appear on the program display. The radio is now ready for another program entry. **NOTE:** An error tone will sound if you attempt to save an incorrect code, an "E" will appear on the display. Check the digits you are attempting to enter, then re-enter.
	10.	Once you have made your final program entry, press the **ENTER** button a final time to exit programming mode. The Program display will be blank and the radio will be ready for use. The Loudmouth® will exit program mode automatically after 30 seconds if no program entries are attempted.

Table 5: Loudmouth® Feature Codes

Code	Feature	Default	Description
	Special Features		
21	Reset to Factory Defaults		Resets Wireless Speaker to Factory default programming.
22	Display Radio Revision		Loudmouth® will display a sequence of 6 digits to identify operating code revision. This is helpful when troubleshooting the radio.
23	Pre-Announce Tone – On	√	Enable this feature to play a short tone over the Loudmouth® speaker whenever it receives a signal.
24	Pre-Announce Tone – Off		Disable Pre-Announce Tone
25	Record and Play – On		When set received messages are recorded and played back over the Loudmouth® speaker immediately after the received signal is removed.
26	Record and Play – Off	√	Disable Record and Play feature
27	One Speaker	√	Set when one speaker is used for maximum available volume.
28	Two Speakers		Set when two speakers are used for maximum available volume. **NOTE:** This feature is not required to drive 2 speakers on radios with firmware 23.05 or higher, or serial number A100119000 or higher.
29	Weather Alert – On		Enable this feature to receive local NOAA weather radio emergency broadcasts from the National Weather Service and play them over the Loudmouth® speaker. This feature is only available on the LM-V150.
20	Weather Alert – Off	√	Disable Weather Alert
	Wideband Operation ***(firmware revision 23.05 or higher, or serial number A100119000 or higher)***		
31	Wideband Operation Enable		When set the Loudmouth® is forced into wideband operation, regardless of programming.
30	Wideband Operation Disable	√	Loudmouth® reverts to the programmed bandwidth. See Table 1 on page 16 for the normal table frequency bandwidth.
	Battery Powered Operation		
41	Battery Operation – On	√	Set to extend battery life when powering the Loudmouth® with an external battery.
42	Battery Operation - Off		Set when powering the Loudmouth® with the RPS-1B or an external DC supply.
43	Power Save – On	√	Set to enable Power Save operation for battery powered Loudmouth®. This option will have no effect unless Battery Operation – On is set.
44	Power Save – Off		Set to disable Power Save operation for RPS-1B powered Loudmouth®.
	Relay Operation ***(firmware revision 23.05 or higher, or serial number A100119000 or higher)***		
51	Relay – On		For radios equipped with a relay, set this option for relay closure when the Loudmouth® receives a valid signal. The relay will remain closed as long as a signal is received. If Record and Play is enabled, the relay will close as soon as a signal is received and remain closed throughout any Record and Play Delay and Recorded Message Replay.
50	Relay – Off	√	Set to disable any relay operation.
	Record and Play Operation ***(firmware revision 23.05 or higher, or serial number A100119000 or higher)***		
60	Recorded Message Replay – 0 times	√	Recorded messages are repeated concurrently for the number of times programmed. (Record and Play must be enabled with code 25)
61	Recorded Message Replay – 1 time		
62	Recorded Message Replay – 2 times		
63	Recorded Message Replay – 3 times		
64	Recorded Message Replay – 4 times		
65	Record and Play Delay – 0 Sec.	√	Playback of a recorded received message is delayed for the programmed time whenever a valid incoming message is received. If the recorded message is longer than the programmed delay time the message plays back at the conclusion of recording. (Record and Play must be enabled with code 25)
66	Record and Play Delay – 5 Sec.		
67	Record and Play Delay – 10 Sec.		
68	Record and Play Delay – 15 Sec.		
69	Record and Play Delay – 20 Sec.		

3.6 Program Loudmouth® Volume

The wireless speaker can be field programmed for any volume level between 05-99% by entering the volume level as a 2-digit code. Field programming Speaker Volume Level sets both the voice and the pre-announce tone volume levels. The PC programmer is required for independent programming of the voice and the pre-announce tone volume.

In our example we will program an LM-U450 for 25% Speaker Volume Level. The Loudmouth® is set from the factory with a 50% volume setting.

25	1.	Refer to Section 1.5 - Determine the volume setting and write down the desired volume.
	2.	Press and **HOLD** the **PROGRAM** button (See Loudmouth® receiver assembly on page 2 for location). A "P" will appear on the program display as you enter program mode and the radio will beep rapidly.
	3.	Release the **PROGRAM** button after the beeping has stopped. The radio will emit a triple beep indicating that the radio is in program mode and a hyphen will appear on the program display.
	4.	Scroll to the character "U" by clicking the **PROGRAM** button until the program display shows the correct character. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the first digit of the volume setting.
VOLUME LEVEL 	5.	Enter the 1st digit of the volume setting by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the next digit.
	6.	Enter the 2nd digit of the volume setting by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will show a hyphen across the center of the display to indicate that it is ready to accept the next digit.
 	7.	Press and release the **ENTER** button to save your programming. A triple beep will sound to indicate that programming was successful and a hyphen will appear on the program display. The radio is now ready for another program entry. **NOTE:** An error tone will sound if you attempt to save an incorrect code, an "E" will appear on the display. Check the digits you are attempting to enter, then re-enter.
	8.	Once you have made your final program entry, press the **ENTER** button a final time to exit programming mode. The Program display will be blank and the radio will be ready for use. The Loudmouth® will exit program mode automatically after 30 seconds if no program entries are attempted.

IMPORTANT NOTE: Volume setting below 10% are entered as a 2-digit code with a first digit "0".

Checking the Current Volume Setting

To readout the current volume setting, follow the instructions above and enter a volume setting code "00". When you press the **ENTER** button the radio will immediately begin to display the 2-digit volume setting; with each digit separated by a hyphen.

3.7 Program the NOAA Weather Frequency

The LM-V150 can be programmed to play severe weather warnings originating from the National Weather service that are broadcast on one of seven NOAA weather frequencies. The Loudmouth® is shipped from the factory without a NOAA weather frequency selected. Before the Weather Alert feature can be used you must first select the local NOAA frequency.

1. Press and HOLD the PROGRAM button (See Loudmouth® receiver assembly on page 2 for location). A "P" will appear on the program display as you enter program mode and the radio will beep rapidly.

2. Release the **PROGRAM** button after the beeping has stopped. The radio will emit a triple beep indicating that the radio is in program mode and a hyphen will appear on the program display.

3. Scroll to the character “d” by clicking the **PROGRAM** button until the program display shows the correct character. **Pause**—the radio will sound a low tone and show a hyphen across the center of the display to indicate that it is ready to accept the NOAA Weather Frequency code.

4. Enter the Weather Frequency code by clicking the **PROGRAM** button until the program display shows the desired number. **Pause**—the radio sounds a low tone and will begin playing the NOAA weather broadcast over the Loudmouth® speaker. Monitor the channel for a few minutes to be sure it is the broadcast for your local area.

5. Press and release the **ENTER** button to save your programming. A triple beep will sound to indicate that programming was successful and a hyphen will appear on the program display. The radio is now ready for another program entry.

NOTE: An error tone will sound if you attempt to save an incorrect code, an "E" will appear on the display. Check the digits you are attempting to enter, then re-enter.

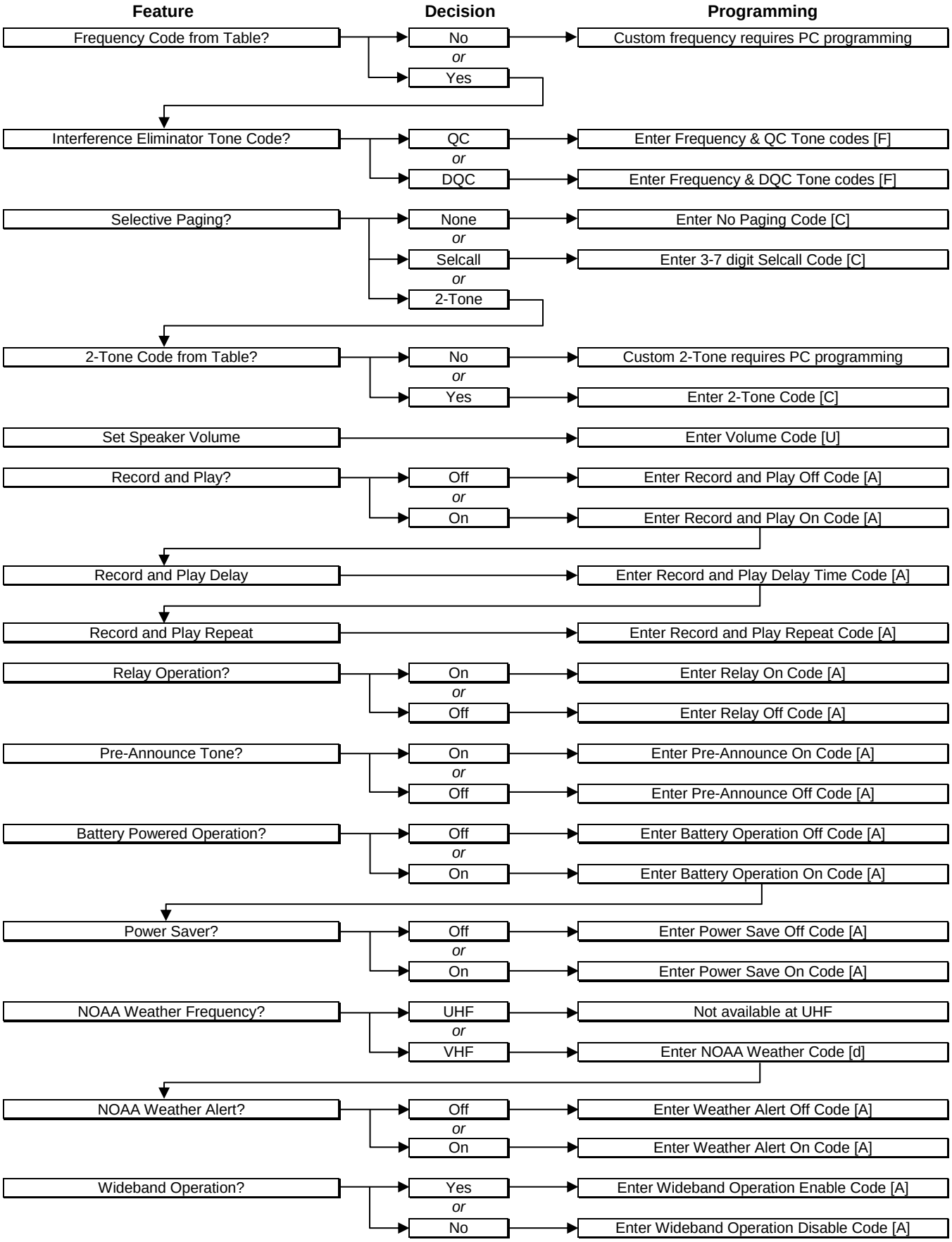
6. Once you have made your final program entry, press the **ENTER** button a final time to exit programming mode. The Program display will be blank and the radio will be ready for use. The Loudmouth® will exit program mode automatically after 30 seconds if no program entries are attempted.

Table 6: NOAA Weather Frequency Codes

Code	Frequency
1	162.400 MHz
2	162.425 MHz
3	162.450 MHz
4	162.475 MHz
5	162.500 MHz
6	162.525 MHz
7	162.550 MHz

A complete list of NOAA weather frequencies available in your area can be found at http://www.weather.gov/nwr/nwrbro.htm

3.8 Field Programming Flow Chart



4 Operation

Once installed, operating the Loudmouth® radio receiver requires no human contact. Portable, base station or mobile 2-way radios can deliver voice messages to a PA speaker with a simple press of the PTT button for either live or recorded playback. This section describes the subtle differences in operation for various Loudmouth® options and installations.

4.1 Basic Operation

Basic operation is defined as a Loudmouth® receiver programmed on a dedicated radio frequency with a QC or DQC code. The receiver is also programmed for 50% volume and a pre-announce tone.

1. Move to an area that is away from the Loudmouth® speaker to prevent feedback.
2. Be sure the microphone on the calling radio is pointed away from the Loudmouth® speaker.
3. Set the portable, base station, or mobile radio to the Loudmouth® channel.
4. Monitor the channel before transmitting to be sure there are no other radio users on the Loudmouth® frequency.
5. Press and hold the PTT button and pause for about 1 second, allowing the pre-announce tone to be heard.
6. Speak into the radio microphone to broadcast your message over the Loudmouth® speaker. If other radios are operating on the Loudmouth® channel they will also hear your message.
7. Release the PTT button when your message is complete.
8. Return the portable, base station, or mobile radio to the normal operating channel.

4.2 Selcall Paging

To access the Loudmouth® the 2-way radio must be programmed to send the correct Selcall code every time the PTT is pressed. The user simply presses the 2-way radio's PTT and speaks while on the Loudmouth® channel. Only 2-way radios programmed to send the correct Selcall code on the Loudmouth® channel can access the Loudmouth® wireless PA speaker.

1. Move to an area that is away from the Loudmouth® speaker to prevent feedback.
2. Be sure the microphone on the calling radio is pointed away from the Loudmouth® speaker.
3. Set the portable, base station, or mobile radio to the Loudmouth® channel.
4. Monitor the channel before transmitting to be sure there are no other radio users on the Loudmouth® frequency.
5. Press and hold the PTT button.
6. Wait until the entire Selcall code has been sent, and then an additional 1 second for the pre-announce tone.
7. Speak into the radio microphone to broadcast your message over the Loudmouth® speaker. If other radios are operating on the Loudmouth® channel they will also hear your message.
8. Release the PTT button when your message is complete.
9. Return the portable, base station, or mobile radio to the normal operating channel.

With Selcall Paging operation:

- Selcall paging can be used in conjunction with QC or DQC for added security. The 2-way radio and the Loudmouth® receiver must be programmed for the same QC or DQC code.

4.3 2-Tone Paging

To access the Loudmouth® the 2-way radio must first send the correct 2-Tone Paging code. Once access to the loudspeaker is accomplished, the user simply presses the 2-way radio's PTT and speaks while on the Loudmouth® channel. After a period of inactivity the Loudmouth® will automatically reset, and will then require the correct 2-Tone Paging code to re-gain access.

1. Move to an area that is away from the Loudmouth® speaker to prevent feedback.
2. Be sure the microphone on the calling radio is pointed away from the Loudmouth® speaker.
3. Set the portable, base station, or mobile radio to the Loudmouth® channel.
4. Monitor the channel before transmitting to be sure there are no other radio users on the Loudmouth® frequency.
5. Send the correct 2-Tone Paging code. Refer to your 2-way radio's user manual to determine how you send 2-tone paging codes.
6. Wait until the entire 2-tone code has been sent.
7. Press and hold the PTT button and pause for about 1 second, allowing the pre-announce tone to be heard.
8. Speak into the radio microphone to broadcast your message over the Loudmouth® speaker. If other radios are operating on the Loudmouth® channel they will also hear your message.
9. Release the PTT button when your message is complete.
10. If the radio PTT is pressed again before the Loudmouth® receiver has reset, the message will be heard on the speaker without the need for a 2-tone Paging code.
11. Return the portable, base station, or mobile radio to the normal operating channel.

With 2-Tone Paging operation:

- Once Loudmouth® receiver has decoded the correct 2-tone code any radio on the Loudmouth® channel can talk over the speaker without the need for 2-tone paging.
- After a 2-tone code has been successfully decoded, the programmable Two-Tone Reset Time sets the length of time the Loudmouth® receiver can go without receiving a signal before 2-tone is once again required for access. Factory default Two-Tone Reset Time is 5 seconds.
- Can be used in conjunction with QC or DQC for added security. The 2-way radio and the Loudmouth® receiver must be programmed for the same QC or DQC code**.**

4.4 Record and Play (30 seconds of record time MAXIMUM)

When 2-way radios are used in the same area as the Loudmouth® speaker, feedback may result that can render the system unusable. For those applications the Loudmouth® can be programmed to record the incoming messages and play them back over the speaker when the PTT button is released on the 2-way radio. Set the portable, base station, or mobile radio to the Loudmouth® channel.

1. Monitor the channel before transmitting to be sure there are no other radio users on the Loudmouth® frequency.
2. Press and hold the PTT button on your 2-way radio.
3. Speak into the radio microphone to record your message into the Loudmouth® receiver. If other radios are operating on the Loudmouth® channel they will hear your message as you record it.
4. Release the PTT button when your message is complete.
5. The pre-announce tone will be heard and the Loudmouth® speaker will begin playing your recorded message.
6. When finished, return the portable, base station, or mobile radio to the normal operating channel.

With Record and Play operation:

- Recorded messages are limited to a maximum of 30 seconds.
- Any of the selective signaling options can be used in conjunction with Record and Play.
- The Loudmouth® receiver cannot record (buffer) an incoming message while in the process of playing a message on the speaker.
- The Loudmouth® can be programmed to delay the playback of a recorded message. This is useful when using the Relay option for activation a strobe light to indicate that a speaker message is imminent. *(Requires firmware revision 23.05 or higher, or serial number A100119000 or higher)*
- The Loudmouth® can be programmed to repeat a recorded message concurrently for the number of times programmed. The pre-announce tone will only be heard once, before the start of the recorded message playback. *(Requires firmware revision 23.05 or higher, or serial number A100119000 or higher)*

4.5 Weather Alert

VHF models of the Loudmouth® can automatically play emergency weather warnings from the National Weather Service that is broadcast on one of the seven NOAA weather frequencies. The Loudmouth® will listen for emergency weather broadcasts any time it is not being used. To use this feature the Loudmouth® must first be programmed for your local NOAA weather frequency.

With Weather Alert operation:

- The Weather Alert feature is only available on the LM-V150 model.
- Your local NOAA weather frequency must be programmed into the LM-V150 and the Weather Alert feature must be ON per the instructions in the Programming section of this manual.
- If a severe weather notification from NOAA weather service occurs while the LM-V150 is in use the Weather Alert operation will not be activated.
- When a severe weather notification from NOAA weather service activates Weather Alert operation, the LM-V150 will broadcast the NOAA weather alert message non-stop until an end-of-message signal is received or 2 minutes elapses. The Loudmouth® cannot be used for regular paging operation as long as the weather alert message is being played.
- The maximum Weather Alert Time is set at the factory for 2 minutes, but is PC programmable from 20 seconds to 4 minutes. This time only matters if an end-of-message signal is not received from NOAA weather service.

The Loudmouth® receiver and PA speaker is not intended for use as a stand-alone weather receiver.

4.6 Battery Powered Operation

The Loudmouth® receiver can be equipped with an optional BP-LM-Li22 emergency backup battery that will temporarily power the radio if primary power from the RPS-1B is interrupted. The BP-LM-Li22 is a 2200mAH rechargeable battery pack that is charged by the Loudmouth® receiver and is not intended to operate the radio for an extended period of time. For applications where AC power for the RPS-1B is not available, the Loudmouth® receiver must be powered by an external +12 VDC battery. The Loudmouth® can then be configured for battery powered operation to maximize battery life.

Battery Operation Enable

Enabling this feature will put the audio amplifier into a standby mode except when a message is played.

- Depending on usage, this may double the battery life.
- The caller must wait approximately 1 second before speaking to allow the audio amplifier to turn on.
- If the Record and Play feature is used the caller does not need to wait before speaking.

Power Save

Enable this feature whenever the Loudmouth® is battery powered to extend battery life. When enabled the Loudmouth® receiver is in a low current “sleep” state the majority of the time, waking up periodically to see if there is an incoming message to be broadcast.

- Depending on usage, this may double the battery life.
- The length of time the Loudmouth® can “sleep” before it checks for a message is PC programmable from .5 to 8 seconds.
- With Power Save enabled the caller must wait approximately 2 second before speaking to allow the radio to wake up.

Low Battery Alert Tone

Enable this feature whenever the Loudmouth® is battery powered and a short tone will be heard at the end of each broadcast to indicate that the batteries need replacement or recharging.

Battery Operation with the 9/LM-PA-2 PA amplifier

Loudmouth® receivers were updated in late 2012 with the 9/LM-PA-2 audio amplifier. With this PA installed there is no delay time when operating the radio with Battery Operation enabled or Power Saver enabled. See Section 5.6 - Loudmouth® Power Supply Requirements to determine if your radio has the 9/LM-PA-2 installed.

4.7 Loudmouth® Options

Certain Loudmouth® options affect operation as follows:

Pre-Announce Tone
With this feature enabled the Loudmouth® will sound a short tone prior to each broadcast to notify listeners that a page is forthcoming.

One Speaker / Two Speakers
Set the Loudmouth® for one or two speaker operation to set the correct audio output level from the audio amplifier.

NOTE: This feature is not required to drive 2 speakers on radios with firmware 23.05 or higher, or serial number A100119000 or higher.

Relay Enable
For radios equipped with a relay, set this option for relay closure when the Loudmouth® receives a valid signal. The relay will remain closed as long as a signal is received. If Record and Play is enabled, the relay will close as soon as a signal is received and remain closed throughout any Record and Play Delay and Recorded Message Replay.

Record and Play Delay
The playback of a received, recorded message is delayed for the Record and Play Delay time whenever a valid incoming message is received. If the recorded message is longer than the Record and Play Delay time the message plays back at the conclusion of recording. For this feature to work Record and Play must be enabled.

Recorded Message Replay
Recorded messages are repeated concurrently for the number of times programmed. For this feature to work Record and Play must be enabled.

Field Programming Enable
With this feature enabled the radio can be programmed via the display and buttons on the radio, without the need for the PC programmer software. Disable this feature to prevent programming in the field and allow only PC programming.

4.8 How to Minimize Feedback

Feedback is the result of the Loudmouth® speaker audio getting back into the microphone of the radio being used to access the Loudmouth®. This is a problem with the calling radio, not the Loudmouth® receiver. Although the Loudmouth® is not intended to be used in the same area as the calling radio, steps can be taken to minimize the feedback effect.

Reduce Loudmouth® speaker volume
Do not set the Loudmouth® volume any high than is necessary to cover the intended area.

Use multiple speakers
The use of multiple speakers means you don't have to cover as large an area with each speaker, consequently, speaker volume can be reduced.

Maintain distance between the calling radio and the Loudmouth® speaker
In general, the calling radio should be at least 50 feet away from the speaker when the Loudmouth® is set for 50% volume. The necessary distance increases if the volume is turned up and decreases if the volume is turned down.

Make sure the radio microphone is turned away from the speaker
You do not want the speaker pointing directly into the microphone. Using your hand to shield the microphone can also reduce feedback.

Use a noise canceling microphone
Equip your calling radio with an optional noise-canceling microphone.

Record and Play feature eliminates feedback

The Record and Play feature completely eliminates feedback by recording your message and playing it back after you have finished sending it to the Loudmouth® receiver. See page 18 to enable the Record and Play operation.

The calling radio is not transmitting while the message is broadcast, so speaker audio cannot get into the calling radio microphone.

4.9 Relay Operation *(serial number A100119000 or higher)*

Radios with serial number A100119000 or higher are equipped with a relay that can be set for relay switch closure when the Loudmouth® receives a valid signal. The relay can be used to enable an optional strobe light for visual indication that a Loudmouth® speaker message is in process.

With the Relay Option enabled:

If Record and Play is disabled	The relay switch will close as soon as a valid signal is received, and will remain closed as long as the signal is present.
If Record and Play is enabled	The relay switch will close as soon as a valid signal is received and will remain closed until the recorded message has finished playing.
If Record and Play Delay is programmed	The relay switch will close as soon as a valid signal is received, and will remain closed for the delay time and until the recorded message has finished playing.
If Recorded Message Replay is programmed	The relay switch will close as soon as a valid signal is received, will remain closed for any Record and Play Delay time and until the recorded message has been repeated in it's entirety.

Relay Cable Assembly 60201127

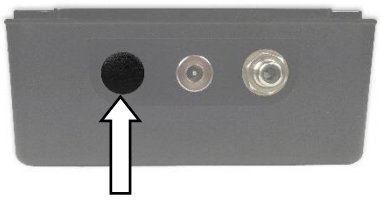
Optional Ritron cable assembly 60201127 (4-Conductor Cable, Loudmouth® Relay) is used to connect the Loudmouth® relay switch to an optional strobe light, or any other device where a simple switch closure is desired.

The 60201127 cable assembly includes:

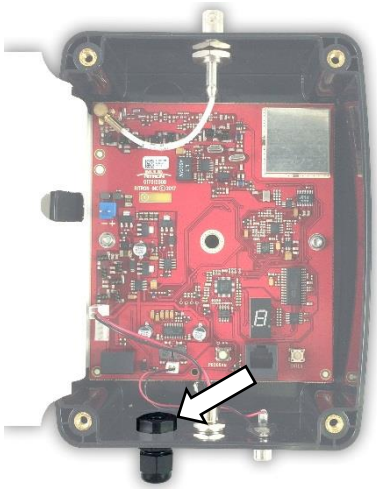
- 4-conductor cable with a mating connector to the Loudmouth® for easy installation.
- Heyco strain relief used to retain the 4-conductor cable to the Loudmouth® case and provide a weather seal.
- Refer to Relay cable assembly 60201127 Installation for instructions on installing the cable assembly into the Loudmouth®.

Relay Cable Assembly 60201127 Installation

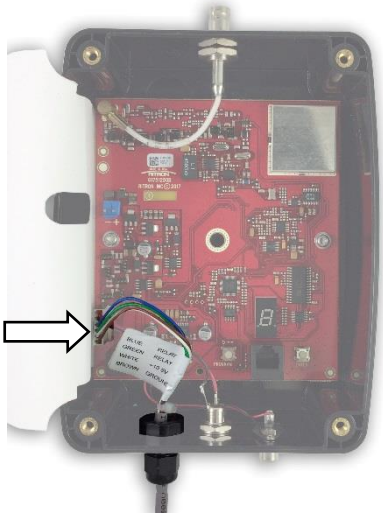
1. Loosen the 4 screws in the front corners of the case. These screws are retained to the housing with rubber O-rings, DO NOT remove the screws from the housing.
2. Separate the case front from the case back.
3. Disconnect the RPS-1B power supply and BP-LM-Li22 backup battery connected to the radio.



4. Remove the plug from the case bottom to expose the ½" hole used for the Heyco strain relief.
5. Pull back the instruction flap, exposing the printed circuit board.



6. Install the Heyco strain relief included with cable assembly 60201127. Do not tighten the sealing nut at this time.

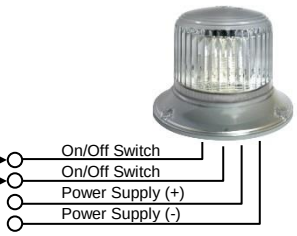


7. Pull cable assembly 60201127 through the strain relief from the inside as shown. Plug the cable assembly into the pcb connector and tighten the sealing nut.

Methods for Connecting the Relay Switch to a Strobe Light

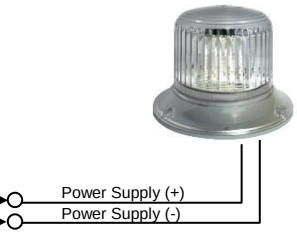
1. **A simple switch closure capable of handling 3A current.**
   Any strobe light used would require external power, either AC or DC.

60201127	Description	Strobe Light
Blue	Normally Open Switch Contact	On/Off Switch
Green	Common Switch Contact	On/Off Switch
White	+10.5V, 400mA MAX	No Connection
Brown	Ground	No Connection



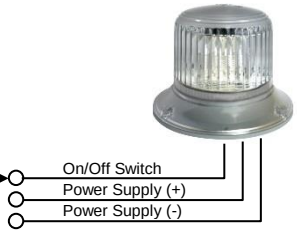
2. **Using the switch to connect 10.5 VDC from the Loudmouth®.**
   This allows a strobe light to be DC powered by the Loudmouth® when the relay is closed.

60201127	Description	Strobe Light
Blue	Normally Open Switch Contact	Power Supply (+)
Green	Common Switch Contact	Connect to White wire
White	+10.5V, 400mA MAX	Connect to Green wire
Brown	Ground	Power Supply (-)



3. **A switch closure to ground to activate.**
   Any strobe light used would require external power, either AC or DC.

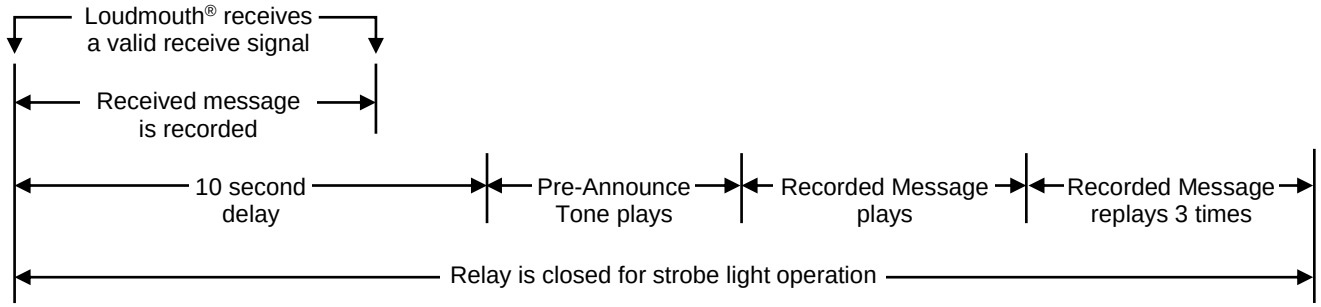
60201127	Description	Strobe Light
Blue	Normally Open Switch Contact	On/Off Switch
Green	Common Switch Contact	Connect to Brown wire
White	+10.5V, 400mA MAX	No Connection
Brown	Ground	Connect to Green wire



4.10 Radio Operation Timeline *(serial number A100119000 or higher)*

The following timeline explains operation for radios with serial number A100119000 or higher. In this example the Loudmouth® is programmed for:

- Record and Play
- Record and Play Delay of 10 seconds
- Record and Play Repeat 3 times
- Relay Operation Enabled
- Pre-Announce Tone Enabled

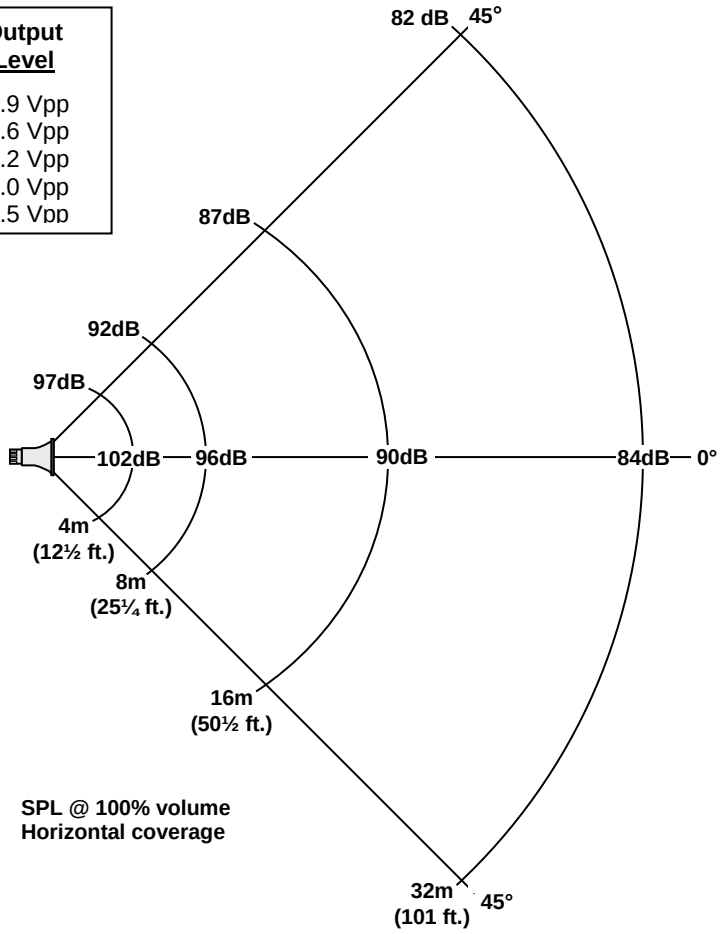


5 Specifications

5.1 Audio Output

Output power	60mW - 5.35W RMS adjustable
Sound pressure level	(see chart below)
Nominal coverage when wall-mounted	Vertical.....+/- 50°
(reference at 0° -5 dB)	Horizontal .....+/- 45°
Audio input level to power amplifier	180 mVPP
Audio output level	1.9 – 18.5 VPP
Audio speaker volume adjustment	10 – 100%
Frequency response	500 – 3000 Hz +/-5dB

Volume Setting	Power Output	SPL@ 16m	Output Level
10%	0.06 W	71 dB	1.9 Vpp
25%	0.33 W	78 dB	4.6 Vpp
50%	1.32 W	84 dB	9.2 Vpp
75%	3.06 W	87 dB	14.0 Vpp
100%	5.35 W	90 dB	18.5 Vpp



SPL @ 100% volume
Horizontal coverage

5.2 Power Requirements

STANDARD OPERATION

Operating Voltage	12 VDC	
Maximum operating current	1.2 A	
Standby current	100 mA	
Typical operating current (8Ω load)	10% volume.....115 mA	75% volume ..... 865 mA
	25% volume.....225 mA	100% volume ..... 975 mA
	50% volume.....600 mA	

BATTERY OPERATION

Standby current	70 mA
Battery Saver sleep current	65 mA
Battery Saver sleep time	programmable, 0.5 – 8 seconds

BP-LM-Li22 EMERGENCY BACKUP BATTERY (optional)

BP-LM-Li22 voltage	11.1 VDC
BP-LM-Li22 capacity	2200 mAH
BP-LM-Li22 charge current	550 mA maximum with battery fully discharged, < 10 mA maintenance charge
BP-LM-Li22 charge time	4 hours for 50% of capacity with battery fully discharged, 90% charged after 24 hours
BP-LM-Li22 battery life	2 hours of continuous talk time at 100% volume, 19 hours of standby time
Maximum current at 11.1 VDC	1.0 A for 1 speaker, 1.6A for 2 speakers

5.3 Loudmouth® Speaker

Speaker impedance	8Ω
Speaker power handling	30W
Speaker physical dimensions	horn diameter = 4” x 6” Overall length = 8”
Speaker enclosure material	ABS plastic
Speaker color	Gray (RAL# 7035)
Speaker weight	26.4 oz.
Speaker mounting	100° pivot mounted to plastic bracket.
Speaker environmental	indoor/outdoor
Speaker connector	RCA Phono plug molded to speaker wire
Speaker wire	25 feet, #20 AWG

WARNING! Audio output to speaker is bridge tied load (BTL). Grounding either connection to the speaker will result in failure of the Loudmouth® audio amplifier.

5.4 RPS-1B Power Cube

RPS-1B physical dimensions	2.93” L (74.5 mm) x 1.97” W (50 mm) x 1.14” H (29 mm)
RPS-1B mounting	Wall-mounted via 120 VAC plug.
RPS-1B connector	2.1mm coaxial DC plug molded to wire, center conductor = positive
RPS-1B environmental	indoor use only
RPS-1B input voltage	120 VAC, 60 Hz
RPS-1B output voltage	12 VDC @ 1.5A

5.5 Loudmouth® Receiver

Receiver physical dimensions	7.125”H x 5.5”W x 3.0”D
Receiver enclosure material	Hi- Impact Polycarbonate Thermoplastic
Receiver color	Black
Receiver weight	1.65 lb. (with AFB-1545 antenna and BP-LM-Li22 battery)
Receiver mounting	2 aluminum brackets to side of radio
Receiver environmental	indoor use only
Audio output connector	RCA phono jack
DC power connector	2.1mm coaxial DC jack (size M)
Antenna connector	50Ω BNC
Antenna	AFB-1545 dual-band (150-170 MHz, 450-470 MHz)
Selective signaling decode capability	• CTCSS (Quiet Call) • Digital Coded Squelch (Digital Quiet Call) • Selcall ID • 2-Tone Paging Decode
Noise squelch sensitivity	Programmable, factory set for 12 dB SINAD
Frequency response	300 - 3000 Hz, de-emphasized
Receiving System	Dual conversion superheterodyne
I.F. System	1st .....43.65 MHz 2nd ..... 450 kHz
QC/DQC decode time	per EIA Standards
2-Tone decode frequency range	300 – 1500 Hz
Selcall decode standard	EEA tone set, 3-7 digits

	LM-U450		**LM-V150**	
FCC ID	AIERIT27-450		AIERIT27-150	
IC ID	1084A-RIT27450		1084A-RIT27150	
Frequency range	450 - 470 MHz		150 – 165 MHz	
Synthesizer steps	6.25 kHz		2.5 kHz	
Frequency stability	+/-1.5 PPM (-30° to +60° C)		+/-2.5 PPM (-30° to +60° C)	
Modulation acceptance	wide narrow	+/- 5.0 kHz +/- 3.75 kHz	wide narrow	+/- 5.0 kHz +/- 3.75 kHz
Typical sensitivity (12 dB SINAD)	wide narrow	0.15 µV (-123 dBm) 0.19 µV (-121 dBm)	wide narrow	0.16 µV (-123 dBm) 0.18 µV (-122 dBm)
L.O. Injection	RX frequency – 43.65 MHz		RX frequency + 43.65 MHz	
Adjacent Channel (EIA)	wide narrow	-70 dB -60 dB	wide narrow	-70 dB -60 dB
Spurious rejection	wide narrow	-70 dB -60 dB	wide narrow	-70 dB -60 dB
Image rejection (EIA)	wide narrow	-60 dB -60 dB	wide narrow	-80 dB -80 dB
Intermodulation (EIA)	wide narrow	-65 dB -65 dB	wide narrow	-65 dB -65 dB
QC/DQC decode deviation requirement	wide narrow	500 – 850 Hz 350 – 500 Hz	wide narrow	500 – 850 Hz 350 – 500 Hz
2-Tone decode deviation requirement	wide narrow	2.5 – 3.5 kHz 1.5 – 2.5 kHz	wide narrow	2.5 – 3.5 kHz 1.5 – 2.5 kHz

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user’s authority to operate the equipment.

5.6 Loudmouth® Power Supply Requirements

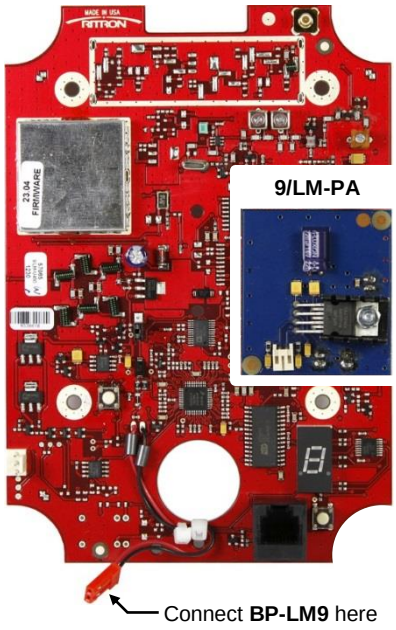
The Ritron LM-Series Loudmouth® receiver has different power supply requirements depending upon the audio PA module that is installed.

- LM receivers with the 9/LM-PA module require:
  Ritron model RPS-2B power supply and BP-LM9 Emergency Backup Battery
- LM receivers with the 9/LM-PA-2 module require:
  Ritron model RPS-1B power supply and BP-LM8-MH Emergency Backup Battery
- LM receivers with NO PA module require:
  Ritron model RPS-1B power supply and BP-LM-Li22 Emergency Backup Battery

MODELS AFFECTED:

LM-U450, LM-U450-CANADA, LM-V150, LM-V150-BC, LM-V150-CANADA, 9LM-U450-SP, 9LM-V150-SP

The audio amplifier module installed is easily identified per the following photos:



GEN 1

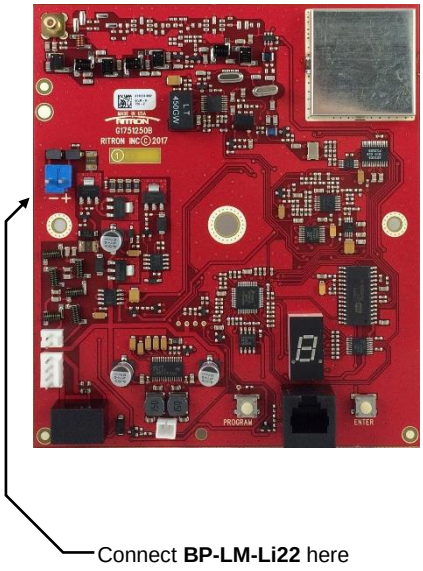
LM-Series Loudmouth® Receiver with **9/LM-PA** installed requires:

RPS-2B 15V, 1.5A power supply
and
BP-LM9 Emergency Backup Battery

GEN 2

LM-Series Loudmouth® Receiver with **9/LM-PA-2** installed requires:

RPS-1B 12V, 1.5A power supply
and
BP-LM8-MH Emergency Backup Battery



GEN 3

LM-Series Loudmouth® Receiver with **NO PA module** installed requires:

RPS-1B 12V, 1.5A power supply
and
BP-LM-Li22 Emergency Backup Battery

6 Warranty

WHAT THIS WARRANTY COVERS:

RITRON, INC. ("RITRON") provides the following warranty against defects in materials and/or workmanship in **RITRON Radios and Accessories** under normal use and service during the applicable warranty period (as stated below). "Accessories" means antennas, power cubes, and items contained in the programming and programming/service kits.

WHAT IS COVERED	FOR HOW LONG	WHAT RITRON WILL DO
Loudmouth® Radio Receiver	1 year*	During the first year after date of purchase, RITRON will repair or replace the defective product, at RITRON's option, parts and labor included at no charge.
Loudmouth® PA Horn Speaker	1 year*	
Accessories	90 days*	******After date of purchase*

WHAT THIS WARRANTY DOES NOT COVER:

- Any technical information provided with the covered product or any other RITRON products;
- Installation, maintenance or service of the product, unless this is covered by a separate written agreement with RITRON;
- Any products not furnished by RITRON which are attached or used with the covered product, or defects or damage from the use of the covered product with equipment that is not covered (such as defects or damage from the charging or use of batteries other than with covered product);
- Defects or damage, including broken antennas, resulting from:
  - misuse, abuse, improper maintenance, alteration, modification, neglect, accident or act of God,
  - the use of covered products other than in normal and customary manner or,
  - improper testing or installation;
- Defects or damages from unauthorized disassembly, repair or modification, or where unauthorized disassembly, repair or modification prevents inspection and testing necessary to validate warranty claims;
- Defects or damages in which the serial number has been removed, altered or defaced.
- Batteries if any of the seals are not intact.

IMPORTANT: This warranty sets forth the full extent of RITRON's express responsibilities regarding the covered products, and is given in lieu of all other express warranties. What RITRON has agreed to do above is your sole and exclusive remedy. No person is authorized to make any other warranty to you on behalf of RITRON. Warranties implied by state law, such as implied warranties of merchantability and fitness for a particular purpose, are limited to the duration of this limited warranty as it applies to the covered product. Incidental and consequential damages are not recoverable under this warranty (this includes loss of use or time, inconvenience, business interruption, commercial loss, lost profits or savings). Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. Because each covered product system is unique, RITRON disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

WHO IS COVERED BY THIS WARRANTY: This warranty is given only to the purchaser or lessee of covered products when acquired for use, not resale. This warranty is not assignable or transferable.

HOW TO GET WARRANTY SERVICE: To receive warranty service, you must deliver or send the defective product, delivery costs and insurance prepaid, within the applicable warranty period, to **RITRON, INC., 505 West Carmel Drive, Carmel, Indiana 46032, Attention: Warranty Department.** Please point out the nature of the defect in as much detail as you can. You must retain your sales or lease receipt (or other written evidence of the date of purchase) and deliver it along with the product. If RITRON chooses to repair or replace a defective product, RITRON may replace the product or any part or component with reconditioned product, parts or components. Replacements are covered for the balance of the original applicable warranty period. All replaced covered products, parts or components become RITRON's property.

RIGHTS TO SOFTWARE RETAINED : Title and all rights or licenses to patents, copyrights, trademarks and trade secrets in any RITRON software contained in covered products are and shall remain in RITRON. RITRON nevertheless grants you a limited non-exclusive, transferable right to use the RITRON software only in conjunction with covered products. No other license or right to the RITRON software is granted or permitted.

YOUR RIGHTS UNDER STATE LAW: This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Where This Warranty Is Valid: This warranty is valid only within the United States, the District of Columbia and Puerto Rico.