

# WHELEN<sup>®</sup>

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### Installation Guide: WPA™ and BETA2™ Series Control Head

**DANGER!** Sirens produce extremely loud emergency warning tones! Exposure to these tones without proper and adequate hearing protection, could cause ear damage and/or hearing loss! The Occupational Safety & Health Administration ([www.osha.gov](http://www.osha.gov)) provides information necessary to determine safe exposure times in Occupational Noise Exposure Section 1910.95. Until you have determined the safe exposure times for your specific application, operators and anyone else in the immediate vicinity should be required to wear an approved hearing protection device. Failure to follow this recommendation could cause hearing loss!

#### Warnings to Installers

Whelen's emergency vehicle warning devices must be properly mounted and wired in order to be effective and safe. Read and follow all of Whelen's written instructions when installing or using this device. Emergency vehicles are often operated under high speed stressful conditions which must be accounted for when installing all emergency warning devices. Controls should be placed within convenient reach of the operator so that they can operate the system without taking their eyes off the roadway. Emergency warning devices can require high electrical voltages and/or currents. Properly protect and use caution around live electrical connections. Grounding or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or vehicle damage, including fire. Many electronic devices used in emergency vehicles can create or be affected by electromagnetic interference. Therefore, after installation of any electronic device it is necessary to test all electronic equipment simultaneously to insure that they operate free of interference from other components within the vehicle. Never power emergency warning equipment from the same circuit or share the same grounding circuit with radio communication equipment. All devices should be mounted in accordance with the manufacturer's instructions and securely fastened to vehicle elements of sufficient strength to withstand the forces applied to the device. Driver and/or passenger air bags (SRS) will affect the way equipment should be mounted. This device should be mounted by permanent installation and within the zones specified by the vehicle manufacturer, if any. Any device mounted in the deployment area of an air bag will damage or reduce the effectiveness of the air bag and may damage or dislodge the device. Installer must be sure that this device, its mounting hardware and electrical supply wiring does not interfere with the air bag or the SRS wiring or sensors. Mounting the unit inside the vehicle by a method other than permanent installation is not recommended as unit may become dislodged during swerving; sudden braking or collision. Failure to follow instructions can result in personal injury. Whelen assumes no liability for any loss resulting from the use of this warning device. PROPER INSTALLATION COMBINED WITH OPERATOR TRAINING IN THE PROPER USE OF EMERGENCY WARNING DEVICES IS ESSENTIAL TO INSURE THE SAFETY OF EMERGENCY PERSONNEL AND THE PUBLIC.

#### Warnings to Users

Whelen's emergency vehicle warning devices are intended to alert other operators and pedestrians to the presence and operation of emergency vehicles and personnel. However, the use of this or any other Whelen emergency warning device does not guarantee that you will have the right-of-way or that other drivers and pedestrians will properly heed an emergency warning signal. Never assume you have the right-of-way. It is your responsibility to proceed safely before entering an intersection, driving against traffic, responding at a high rate of speed, or walking on or around traffic lanes. Emergency vehicle warning devices should be tested on a daily basis to ensure that they operate properly. When in actual use, the operator must ensure that both visual and audible warnings are not blocked by vehicle components (i.e.: open trunks or compartment doors), people, vehicles, or other obstructions. It is the user's responsibility to understand and obey all laws regarding emergency warning devices. The user should be familiar with all applicable laws and regulations prior to the use of any emergency vehicle warning device. Whelen's audible warning devices are designed to project sound in a forward direction away from the vehicle occupants. However, because sustained periodic exposure to loud sounds can cause hearing loss, all audible warning devices should be installed and operated in accordance with the standards established by the National Fire Protection Association.

#### Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

**⚠ WARNING:** This product can expose you to chemicals including Methylene Chloride which is known to the State of California to cause cancer, and Bisphenol A, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

- Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.
- Whelen Engineering requires the use of waterproof butt splices and/or connectors if that connector could be exposed to moisture.
- Any holes, either created or utilized by this product, should be made both air- and watertight using a sealant recommended by your vehicle manufacturer.
- Failure to use specified installation parts and/or hardware will void the product warranty.
- If mounting this product requires drilling holes, the installer MUST be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr the holes and remove any metal shards or remnants. Install grommets into all wire passage holes.
- If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro®, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.
- Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.
- For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the NEGATIVE (-) battery post (this does not include products that use cigar power cords).
- If this product uses a remote device for activation or control, make sure that this device is located in an area that allows both the vehicle and the device to be operated safely in any driving condition.
- It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.
- FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!

**ACTIVATION OF THIS  
SIREN MAY DAMAGE  
UNPROTECTED EARS!**



**CAUTION**

Loud siren noise can cause hearing damage and/or loss. Refer to OSHA Section 1910.95 prior to putting ANY siren into service!

## **WARNING!**

**DISCONNECTING THE VEHICLE BRAKE LAMP CIRCUIT USING ANY SIRENS WITH RELAY OUTPUTS OR SWITCH CONTROLLERS COULD CAUSE VEHICLE OR PROPERTY DAMAGE, SERIOUS INJURY OR EVEN DEATH.**

**DISABLING THIS CIRCUIT IS A VIOLATION OF THE FEDERAL MOTOR VEHICLE SAFETY STANDARD FOR THE THIRD BRAKE LIGHT, AS WELL AS REAR BRAKE LIGHTS.**

**FUNCTIONS THAT BLACK OUT THE REAR BRAKE LIGHTS (SOMETIMES CALLED “BRAKE LIGHT CUT OUT”) MAY INTERFERE WITH THE BRAKE SHIFT LOCK MECHANISM, AND CAUSE THE VEHICLE TO MOVE UNEXPECTEDLY AND DANGEROUSLY.**

**DISCONNECTING THE BRAKE LIGHTS IN ANY WAY IS AT YOUR OWN RISK AND IS NOT RECOMMENDED BY WHELEN.**

## READ BEFORE INSTALLING!!!

Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area.

The User/Installer assumes full responsibility to determine the proper mounting location, based on providing ultimate safety to all passengers inside the vehicle. Whelen Engineering Co. assumes no liability or responsibility for determining individual applications or exact installation location criteria.

This manual outlines installation procedures for the WPA™ and BETA™ Series Control Head (Models WPA1™, WPA2™ and BETA2™). The WPA™ Series Control Head was designed for automotive, motorcycle and marine applications. Read this manual carefully before beginning the installation.

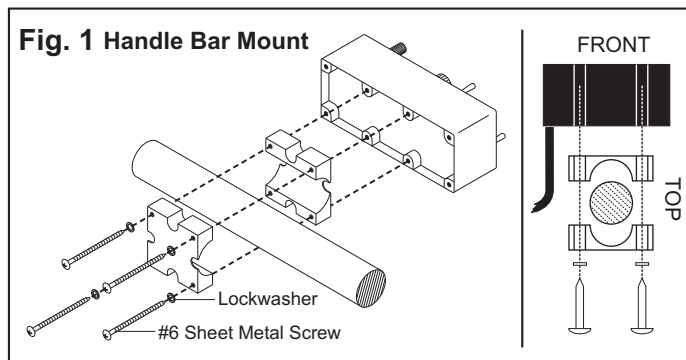
### Section I: Motorcycle Applications

For motorcycle applications, a special handlebar mounting bracket has been provided. Both the bracket and the control head mounting holes have been designed to allow the WPA1™ to be positioned in any of the following ways: centered on the bracket, off-set to the left of bracket, off-set to the right of the bracket or vertical to the bracket.

#### Mounting the WPA1™ Series Control Head

##### Handlebar Mount: (Fig. 1)

1. Locate a suitable mounting location for the WPA1. Any open space on the handlebars will be acceptable, provided the control head or bracket does not interfere with any motorcycle components or steering operations.
2. Position the bracket around the handlebar on the mounting location. Now place a #6 internal-tooth lockwasher (provided) onto a #6 x 2" sheet metal screw (provided) and insert through brackets and into the back of the control head (Fig. 1). Secure unit to handlebar and tighten firmly.



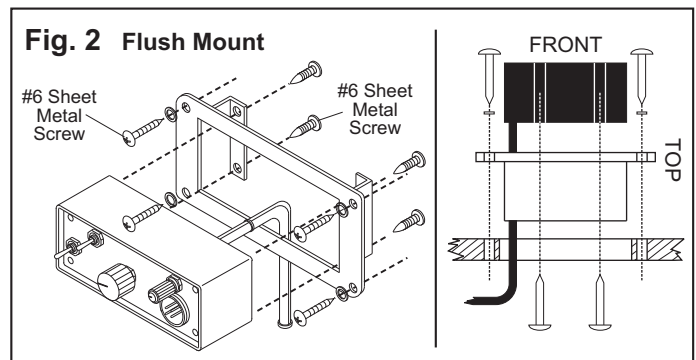
### Section II: Automotive & Marine Applications

The WPA2 & BETA2 Control Heads (the "WPA Series") can be mounted in four different styles: a flush mount and 3 surface mounts (Figures 2 through 5). Flush mounting (Figure 2), requires a special bracket (included with the WPA2 and available for the BETA2 & WPA1). Surface mounting uses the hardware included with your WPA1 Series Control Head.

**CAUTION!** Mounting will require cutting and drilling, it is absolutely necessary to make sure that no vehicle components could be damaged by the mounting process. Check both sides of the mounting surface and if damage is possible, select a different mounting location.

##### Flush Mount: (Fig. 2)

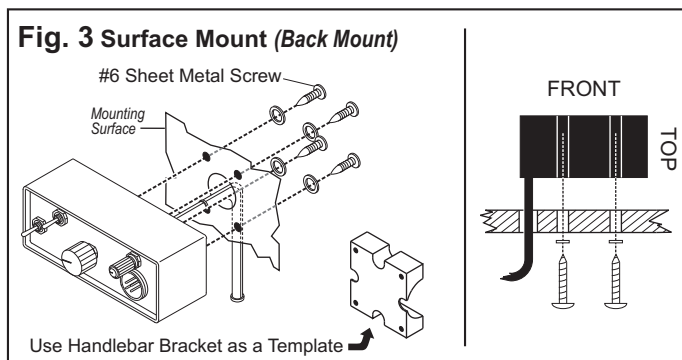
1. Locate a suitable mounting location for the control head. Be sure that the control head will fit properly and not interfere with any vehicle components.
2. Position the flush mount bracket (BETA2BKT) onto the proposed mounting location to use as a template. Using an awl or other suitable tool, scribe the guide lines (from which you will cut the opening) onto the mounting surface where the bracket is to go.
3. Carefully cut the opening into the mounting location.
4. Secure the control head to the bracket. Using the supplied sheet metal screws.
5. Slide the control head (with bracket attached) into the mounting hole you cut
6. Drill the screw holes, with an appropriately sized drill bit.
7. Using the supplied sheet metal screws, secure the control head / bracket to the mounting surface.



### Surface Mount / Back Mount: (Fig. 3)

**NOTE:** This mounting application is preferred over the other surface installations for security purposes. The face of the control head is left untouched and the screws are concealed behind the mounting panel. For this installation you will use the Handlebar Mounting Bracket for the WPA1™ (included) or the Flush Mount Bracket for the WPA2™ (included) as a screw hole template.

1. Locate a suitable mounting location. The dashboard is often a good choice. Be sure that the control head fits properly and does not interfere with any vehicle components.
2. Position the mounting bracket onto the proposed mounting location. Using an awl or other similar tool, scribe the mounting surface where the screw holes are to be drilled.
3. Cut a hole large enough for the wire harness to fit through.
4. Drill the screw holes using an appropriately sized drill bit.
5. Feed the wire harness through the hole, and using the supplied screws, secure the control head.



### Surface Mount / Front Mount: (Figs. 4 or 5)

1. Locate a suitable mounting location for the control head. The dashboard is often a good choice.
2. Be sure that the control head fits properly and does not interfere with any vehicle components.
3. Find the 8 hole location marks on the face of the control head. Choose the 4 holes that best suit your application. Using an utility knife or similar tool, make a small incision through the overlay at the chosen location marks. Place the screws through the holes (Fig. 3).
4. Position the control head on the proposed mounting location. Using an awl or similar tool, scribe the mounting surface where the mounting holes are to be drilled. Also mark the area where the passage hole for the wire harness will be located.
5. Cut a hole large enough to pass the wire harness through.
6. Drill mounting holes using an appropriately sized drill bit for the machine screws (Fig. 4) or sheet metal screws (Fig. 5) depending on which mounting style you use.
7. Feed the wire harness through the access hole and using the supplied mounting hardware, secure the control head using the mounting style you prefer (Figures 3 & 4).

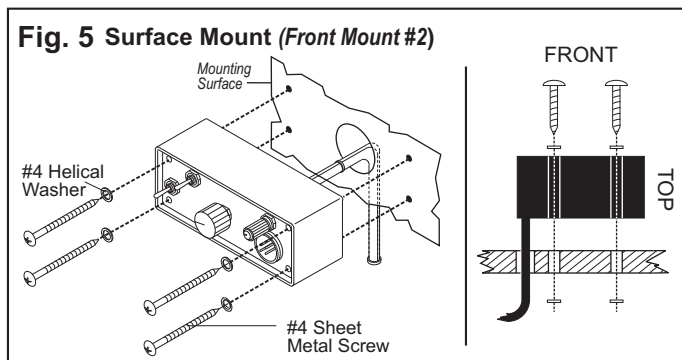
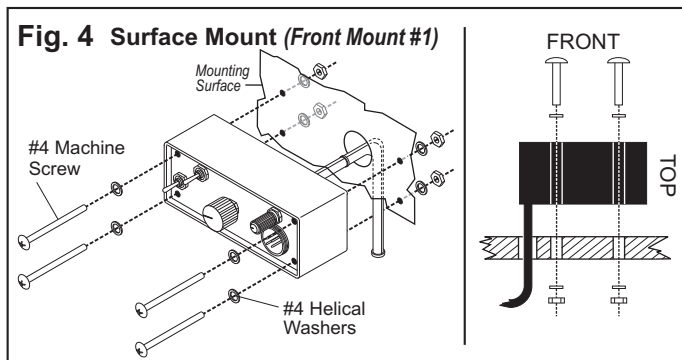
### Section III: Wiring the WPA1™ & WPA2™

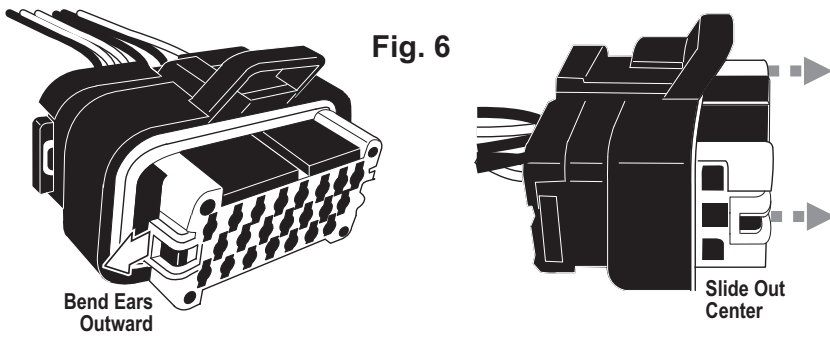
1. Route the wires from the control head to the remote siren amplifier.
2. Using the AMPSEAL chart and Fig. 7, insert the contact wires into their given positions on the plug connector. Push the contact wire straight into the appropriate circuit cavity as far as it will go. **IMPORTANT:** Before inserting the wires, you must release the internal wedge lock (see Fig. 6).

**WARNING!** Be sure not to pierce the insulation of the AMPSEAL plug assembly with a sharp point or any type of probing tool. The resulting pinholes in the insulation will allow moisture to invade the system by traveling along the wire strands. This compromises the effectiveness of the connector seals and will result in system failure.

**CAUTION!** Be sure that all contact wires for the control head have been placed in the correct spaces. A wire in the wrong place can cause serious damage to the remote siren amplifier system.

3. After inserting the wires, slide the center piece back into the housing until it is flush with the housing. This will re-lock the internal wedge lock.
4. Pull back on the contact wire with a force of 1 or 2 lbs. to be sure the retention fingers are holding the contact.
5. With wires secured in AMPSEAL plug connector, affix connector to header assembly on remote amplifier (Fig. 8).



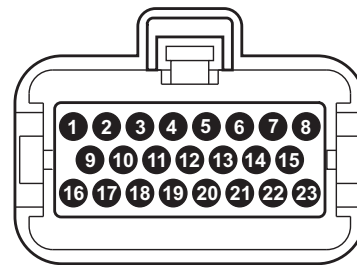


Before the wires can be inserted into their sockets, you must first release the Internal Wedge Lock. To do this you must bend both ears out slightly, while at the same time, sliding the center piece (shown in white) out no more than 1/4". This will release the internal wedge lock. After inserting the wires, slide the center piece back in to close the internal wedge lock. **NOTE:** Be careful not to bend the ears too far out as they might break off.

Table 1 / Ampseal Wiring Chart			
PIN	COLOR	PIN	COLOR
1	ORANGE	13	BROWN FROM CONTROL HEAD
2	INLINE FUSE HOLDER	14	YELLOW FROM CONTROL HEAD
3	WHITE FROM CONTROL HEAD	15	BLUE
4	BLACK	16	BROWN
5	WHT/BLK FROM CONTROL HEAD	17	N/C
6	GRAY FROM CONTROL HEAD	18	N/C
7	ORANGE FROM CONTROL HEAD	19	N/C
8	BLUE	20	N/C
9	GREEN FROM CONTROL HEAD	21	N/C
10	N/C	22	VIOLET FROM CONTROL HEAD
11	N/C	23	BLUE FROM CONTROL HEAD
12	N/C		

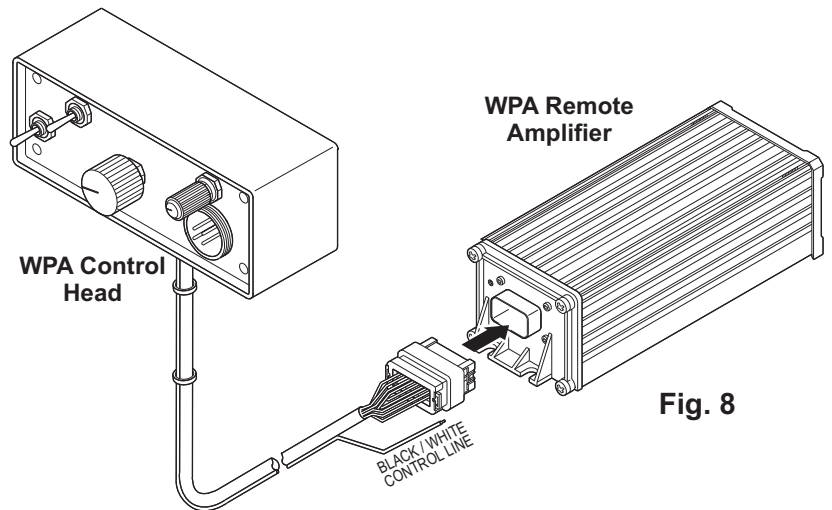
**Lighting Control:** The WPA™ series control head offers a BLACK/WHITE low-current control line that wire provides 12VDC / 250ma. This wire is activated when the "Siren/Lights Siren" toggle switch on the control head is moved to the "Lights Siren" position. In the "Siren" position this wire is disabled (Fig. 8).

**Wiring for the BETA2™ Control Head:** The BETA2 Series Control Head is not provided with the waterproof AMPSEAL plug connector. It is an automotive application and has been designed for an automotive amplifier (BETA112R). A 9-position female connector is provided with the BETA2. After routing the contact wires to the amplifier, take the 9-position female connector and insert it into the 9-position male connector located on the BETA amplifier (see Fig. 9 below for 9-position wire details).



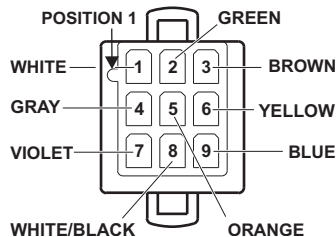
**Fig. 7**  
Rear View  
Ampseal  
Connector  
(P2)

<u>WPA CONTROL HEAD SPECIFICATIONS</u>	
INPUT VOLTAGE	10 to 32 VOLTS
INPUT CURRENT (OFF)	0 mA
INPUT CURRENT	500mA (MAX.)
OUTPUT VOLTAGE	INPUT VOLTAGE -1.4V
OUTPUT CURRENT	500mA (MAX.)
OPERATING TEMP.	-30° C. to +60° C.
OPERATING HUMIDITY	100% NON-CONDENSING
OPERATING SHORT PROT.	500mA POLY FUSE



**Fig. 8**

**Fig. 9**  
Rear View  
of Pin Housing



The installation of your control head will be complete after the fuse block wire of the remote amplifier is connected to the POSITIVE (+) terminal of the battery. After this connection has been made, inspect the fuses of the amplifier and at the battery. If either of these fuses is blown, carefully inspect all of the circuit wires and make sure they are wired correctly. Replace the blown fuses with ones of an identical amp rating. If these fuses blow after installation or activation, contact Whelen Engineering Technical Support.

## Section IV: Operating the WPA™ or BETA2™

### MICROPHONE

Pressing the microphone button will allow you to broadcast public address over the siren loudspeaker regardless of the rotary switch position. NOTE: This will override all other siren functions.

### ROTARY SWITCH

The Rotary Knob controls the siren and PA (Public Address) functions of the WPA / BETA2. There are 8 positions that may be selected including "Off" (Fig. 10). Functions are outlined below:

**RAD (Radio Repeat)** - When the rotary knob is in the RAD position, any signal that is received by the vehicle's two-way radio will be simultaneously broadcast over the vehicle's loudspeaker (The remote amplifier must be connected to the two-way radio speaker. See the WPA / BETA remote amplifier manual for the proper wiring and operation).

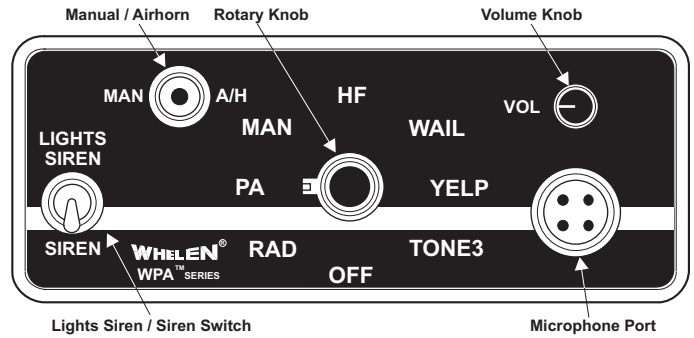
**PA (Public Address)** - When the rotary knob is in the PA position, public address functions are operational. Messages may be broadcast over the vehicle's loudspeaker via the WPA / BETA2 microphone. The volume level of PA transmissions is controlled by the volume knob. If the MAN / AIRHORN button is pressed while the rotary knob is in this position, an air horn siren tone will be generated by your vehicle's loudspeaker. This tone is generated until the horn ring button is released.

**MAN (Manual Siren)** - When the rotary knob is in the MAN position, pressing the MAN switch generates a tone that rises in pitch to a pre-set level. This tone is generated for as long as the MAN switch is pressed.

**HF (Hands Free Operation)** - When the rotary knob is in the HF position, the siren functions of the WPA / BETA2 are placed in a standby mode. Siren tones are activated by a single 'tap' of the MAN switch. The first tap produces a Wail tone (a steady, rise and fall tone). A second tap produces a Yelp tone (a fast, rise and fall tone). A third tap produces a Piercer™ tone (an extremely fast, rise and fall tone). The next tap returns the siren to a Wail tone and the cycle repeats itself. Two quick, successive taps will stop the siren.

**WAIL (Wail Tone)** - When the rotary knob is in the WAIL position, a steady, rise and fall tone is produced. A single tap on the MAN switch changes the siren tone to a Yelp pattern (a fast, rise and fall tone). A second tap, and the siren returns to a Wail tone.

Fig. 10



**YELP (Yelp Tone)** - When the rotary knob is in the YELP position, a fast, rise and fall tone is produced. A single tap on the MAN switch changes the siren tone to TONE3. A second tap, and the siren returns to a YELP tone.

**TONE3 (Piercer™ Tone / in Default Configuration)** - When the rotary knob is in the TONE3 position, an extremely fast, rise and fall tone is produced. Pressing on the MAN switch changes the siren tone to a simulated air horn tone for as long as the button is pressed. Releasing the button causes the siren to return to the Piercer tone.

**VOLUME KNOB** - The volume knob controls the volume of public address function. Volume is increased by rotating the knob in a clockwise direction and decreased by rotating the volume knob in a counter-clockwise direction. This knob has no effect on any siren tones produced.

**LIGHTS-SIREN / SIREN SWITCH** - The lights-siren/siren switch provides the operator with the ability to activate any lights that have been connected to the WPA circuit. In the siren position, siren control operates as described in this manual. Moving the switch to the lights-siren position not only allows siren control, but activates any lights connected to the control wires indicated on page 3.

**AIRHORN OVERRIDE / MANUAL SIREN SWITCH** - The Airhorn override switch will activate the simulated airhorn tone when pressed and will terminate upon release. The airhorn will override all of the WPA control head functions. The manual siren switch activates any of the simulated siren tones determined by the rotary switch position noted above.