WHELEN®
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Installation Guide:
WPA™ Series Waterproof Amplifier

Automotive: Sirens/Switches

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) 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.

- **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!

Form No.13236F (050608)

***For warranty information regarding this product, visit* www.whelen.com/warranty**

INTRODUCTION...

This manual outlines the procedures necessary for the installation of the WPA™ Series Waterproof Amplifier. This includes the 100 Watt models (WPA112, WPA124) and 58 Watt models (WPA512 and WPA524).

Mounting the WPA Series Waterproof Siren Amplifier:

Caution: If the amplifier is mounted vertically, it must be oriented so that the connector end of the amplifier is facing downward!

1. Locate a suitable mounting location for the WPA. Do not mount this product in any location where it may be exposed to extreme temperatures.
2. Be sure that the remote amplifier fits properly and does not interfere with any vehicle components.
3. Position the remote amplifier on the proposed mounting location. Using an awl or other suitable tool, scribe the mounting surface where the mounting holes are to be drilled.

Caution: As mounting the* WPA *will require drilling, it is absolutely necessary to make sure that no other vehicle components could be damaged by the drilling process. If damage is likely, select a different mounting location.

4. Carefully drill the mounting holes in the areas scribed in step 3. The diameter of these holes will be determined by the size of the mounting hardware and the thickness of the mounting surface.
5. Using the supplied #10 x 3/4" sheet metal screws and #10 external tooth lock washers, secure the remote amplifier to the mounting location.

Wiring the WPA Series Waterproof Amplifier:

Connecting To Power:

1. Following the factory wiring harness, extend the RED and BLACK wires to the battery.

WARNING! All customer supplied wires that connect to the positive terminal of the battery must be sized to supply at least 125% of the maximum operating current and FUSED at the battery to carry that load. DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!

2. Connect the RED wire to one end of a user supplied fuse block. Do *not* connect this unit to the battery yet!
3. Connect the BLACK wire directly to the vehicle's chassis ground (typically adjacent to the battery).

Connecting To Your Speaker:

1. Route the ORANGE and BROWN wires towards your speaker.
2. Connect the ORANGE wire to the POSITIVE (+) terminal on the speaker.
3. Connect the BROWN wire to the NEGATIVE (-) terminal on the speaker.

Note: The two (2) BLUE wires are used to connect your two-way radio's external speaker to the WPA for radio rebroadcast. This is an optional connection and does not effect the other operations of the WPA.

Wiring The WPA Siren Amplifier Radio Rebroadcast Wires (BLUE):

1. Locate the two wires that connect the external speaker to the vehicle's two-way radio.
2. Cut one of these wires and splice one of the BLUE wires into this circuit.
3. Cut the remaining speaker wire and splice the remaining BLUE wire into this circuit.

Note: ***Radio rebroadcast will NOT work with amplified remote speakers! If your remote speaker is amplified (i.e.: contains a power amp circuit in the speaker assembly), do not enable the radio rebroadcast feature.***

Connecting To Your Horn Relay (Optional):

Note: This option can only be enabled when using customer supplied switches.

1. Locate your vehicle's horn relay. Now locate the wire that connects the vehicle horn to the horn relay output and cut this wire.
2. Extend each end of the cut wire (using a minimum 16 gauge wire) to a user supplied SPDT (single pole/double throw) horn transfer switch.
3. Connect the wire coming from the horn relay output to the switch "wiper" as shown in Figure 1.
4. Connect the wire coming from the horn to one side of the switch as shown in Figure 1.
5. Connect the WHITE/GREEN wire to the other side of the switch as shown in Figure 1.

Wiring The *WPA*™ Series Waterproof Amplifier To The Controls

If the WPA[M] series control head (optional) is not used, siren configuration and functionality are determined by user supplied switches connected to the WPA amplifier. A brief explanation of each of the function wires will serve as a guide to help determine the best configuration for your specific needs (see table 1):

RED/WHITE Provides current for customer supplied switch operation (0.5 amp max).

WHITE/GREEN Connects to a user supplied horn transfer switch (see Figure 1). This enables the vehicle horn ring to control the siren.

WHITE/BROWN Activates the Wail tone.

WHITE/RED Activates the Yelp tone.

WHITE/BROWN + WHITE/RED Activates Piercer™ tone.

WHITE/ORANGE Enables Hands-Free operation.

WHITE/YELLOW Activates Airhorn tone.

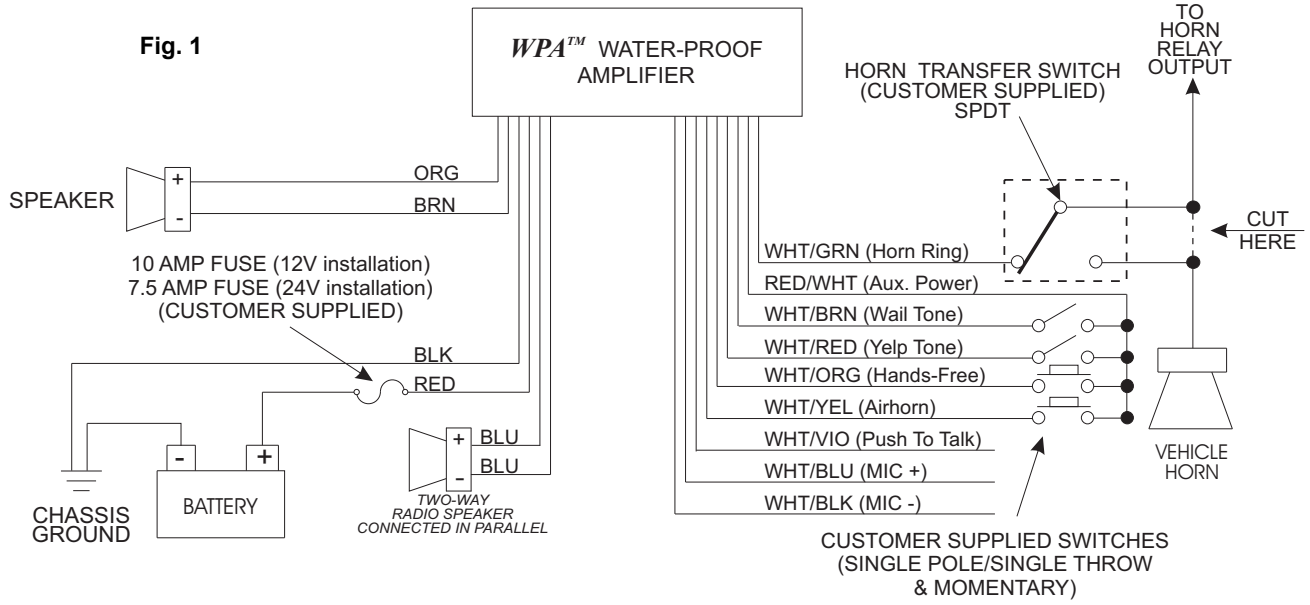
Table 1

TONE CONTROL TABLE	+ Battery Terminal	+ Battery Terminal	+ Battery Terminal	+ Battery Terminal	+ Battery Terminal	+ Battery Terminal	+ Battery Terminal
WHITE/BROWN	WAIL	↓	↓	↓	↓	↓	↓
WHITE/RED	→	YELP	↓	↓	↓	↓	↓
WHITE/BROWN & WHITE/RED	→	→	PIERCER™	↓	↓	↓	↓
WHITE/ORANGE	→	→	→	HANDS-FREE MODE	↓	↓	↓
WHITE/YELLOW	→	→	→	→	AIRHORN	↓	↓
WHITE/RED & WHITE/ORANGE	→	→	→	→	→	MANUAL MODE	↓
WHITE/BROWN & WHITE/RED & WHITE/ORANGE	→	→	→	→	→	→	RADIO MODE

WHITE/RED + WHITE/ORANGE Places *WPA* in Manual Mode. Applying +12VDC to these wires will activate a tone that rises in pitch to a preset level.

WHITE/BROWN + WHITE/RED + WHITE/ORANGE Places *WPA* in Radio Mode. In this mode any signal that is received by the vehicle's two-way radio will be simultaneously broadcast over the vehicle's loud speaker.

Fig. 1



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

ACTIVATION OF THIS SIREN MAY DAMAGE UNPROTECTED EARS!

Wear Protection!

⚠CAUTION

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

Hands-Free Siren Activation...

The WPA™ Series Waterproof Amplifier, when installed according to the wiring diagram above, offers the ability to activate siren tones using the vehicle's steering wheel horn ring. After the horn transfer switch has been set to siren operation, the hands-free mode is enabled when the customer installed control switch, connected via the WHT/ORG wire, is closed. When the hands-free mode is enabled, pressing the horn ring button will start the Wail siren tone. A second press of the horn ring button will change the siren tone from Wail to Yelp. A third press will change the siren tone from Yelp to Piercer™. The siren tones will continue to cycle from Wail to Yelp to Piercer with each subsequent press of the horn ring button. Two, rapid presses on the horn ring button ends hands-free siren tone generation until the horn ring button is pressed again. At that time the cycle is repeated.

To exit the hands-free mode, end current siren tone, turn off the customer installed switch for the hands-free mode and return the horn transfer switch to its normal operating position. Normal vehicle horn operation is then restored.

Manual Siren Activation (Manual Mode)...

The WPA Siren Amplifier, when installed according to the wiring diagram (Figure 1), offers manual siren activation using the vehicle's steering wheel horn ring as a momentary switch. After the horn transfer switch has been set to siren operation, the horn ring button will now activate the manual siren tone. The manual siren tone "ramps up" to a predetermined level and continues at that level until the manual switch is released. When the switch is released, the tone is immediately terminated.

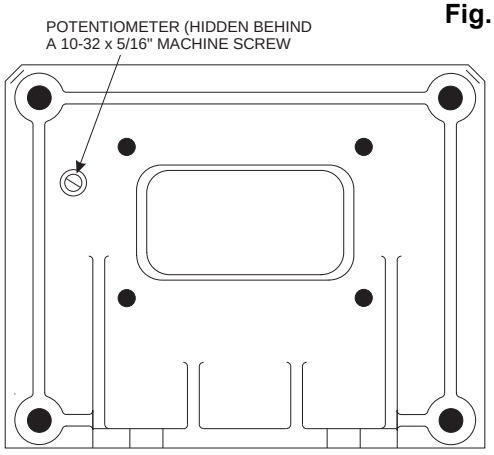
To Adjust the Radio Repeat Levels...

Before using the WPA Series Waterproof Amplifier, the Radio Repeat output volume must be adjusted to satisfactory operating levels. To adjust this level, a small, flat-blade screwdriver is needed.

Radio Repeat Volume

Locate the Radio Repeat adjustment port (potentiometer) to the left of the 12-position input port on the remote amplifier. The potentiometer is hidden behind a 10-32 Phillips head machine screw. Once this screw is removed, set the volume level of the vehicle's two-way radio to its normal operating volume. Place the amplifier in Radio Repeat mode. Insert the screwdriver in the Radio Repeat adjustment port and turn in a clockwise direction to increase the sound to its maximum desired volume. Return the Phillips head screw to its original position (see Fig. 2 below).

Fig. 2



REAR VIEW OF THE AMPLIFIER

WPA™ SIREN SPECIFICATIONS

SPEC:	***WPA112™***	***WPA124™***	***WPA512™***	***WPA524™***
INPUT VOLTAGE	*13.5 VDC ± 20%*	*26.5 VDC ± 20%*	*13.5 VDC ± 20%*	*26.5 VDC ± 20%*
INPUT CURRENT (OFF)	*0 mA*	*0 mA*	*0 mA*	*0 mA*
INPUT CURRENT (STANDBY)	*10 mA (TYP.)*	*5 mA (TYP.)*	*10 mA (TYP.)*	*5 mA (TYP.)*
INPUT CURRENT (SIREN)	*8 Amps (TYP.)*	*4 Amps (TYP.)*	*5 Amps (TYP.)*	*3 Amps (TYP.)*
OUTPUT VOLTAGE	*34 V RMS (MAX.)*	*34 V RMS (MAX.)*	*25 V RMS (MAX.)*	*25 V RMS (MAX.)*
SPEAKER	*(1) 11 ohm*	*(1) 11 ohm*	*(1) 11 ohm*	*(1) 11 ohm*
OUTPUT POWER @ 15 VDC	*105 WATTS (MAX.)*	*105 WATTS (MAX.)*	*58 WATTS (MAX.)*	*58 WATTS (MAX.)*
CONROL VOLTAGE	*INPUT VOLTAGE*	*INPUT VOLTAGE*	*INPUT VOLTAGE*	*INPUT VOLTAGE*
CONTROL CURRENT	*125 mA (TYP.)*	*125 mA (TYP.)*	*125 mA (TYP.)*	*125 mA (TYP.)*
HORN RING VOLTAGE	*INPUT VOLTAGE OR GROUND*	*INPUT VOLTAGE OR GROUND*	*INPUT VOLTAGE OR GROUND*	*INPUT VOLTAGE OR GROUND*
HORN RING CURRENT	*15 mA (TYP.)*	*15 mA (TYP.)*	*15 mA (TYP.)*	*15 mA (TYP.)*
OPERATING TEMP.	*-30° C TO +60° C*	*-30° C TO +60° C*	*-30° C TO +60° C*	*-30° C TO +60° C*
OPERATING HUMIDITY	*95% NON-CONDENSING*	*95% NON-CONDENSING*	*95% NON-CONDENSING*	*95% NON-CONDENSING*