



UNITROL

A Unit of Federal Signal

MAN-80K
REV. 14 FEB 03

80K AMPLIFIER

Sirens

Sirens with P.A.

Sirens with P.A. and Switching

INSTALLATION & OPERATION



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SECTION I - BASIC SYSTEM

Model 80K

USED WITH ALL MODELS

Containing electronic components for generating sounds, the Model 80K amplifier is the basic part of the siren and common to all models described in this Manual. It will be found in the same cabinet with its controls or in a separate cabinet remote from its controls.

External Components Include:

- a) Park Kill Wire- deactivates siren when grounded.
- b) Power Transistors (Rear) - Electrically "hot" during Siren/P.A. operation. Contact with metal objects will destroy them.
- c) Fuse (Rear) - In unlikely event of failure, do not overfuse.

PRECAUTIONS

- 1. Although the 80K has an extremely wide operating temperature range (-40F to + 185F), underhood installation where temperatures exceed 230F is not advised.
- 2. Cabinet is not waterproof.

BLOW-OUT PROOF TRANSISTOR PROTECTION

1. Output transistors, blown out in normal sirens by failures of the siren speaker or its wiring are protected in the Unitrol 80K by automatic circuitry.

- a) Short-circuited speaker or wiring stops siren sounds. A soft "popping" noise from the speaker or amplifier will occur 60 times per minute.
- b) Blown-out speaker (open coil) or disconnected speaker wire causes amplifier to emit siren sounds from amplifier but not from speaker.
- c) Primary input voltage above 16Vdc will cause shutdown of tone generating stages. No sounds will be emitted by the amplifier or siren speaker.

2. In all instances, amplifier operation will automatically resume when the external defect is repaired.

ASSEMBLY METHODS

1. Amplifier can be used with control units as follows:

- a) Remote - Amplifier is installed remotely from control unit and connected by a 4 foot or 15 foot cable.
- b) Single-Unit - Amplifier / control unit are plugged together and housed in one cabinet.

SECTION II - KAWASAKI SIREN

Model 80KM

STANDARD & OPTIONAL FEATURES

1. Model U80KM consists of a UMCO83 cable and Model 80K Amplifier. The cable interfaces the amplifier with Kawasaki handlebar switches that control WAIL and YELP.
 2. Optional connections or equipment can include:
 - a) Air Horn
 - b) Microphone & Cable (PA Kit)
- UPA1 - UMNCT-SB & UCARK

INSTALLATION

1. Set slide switch on bottom of amplifier to match power rating of siren speaker.
2. Install amplifier in left saddlebag with transistors down, connector up. U-brackets may be used for mounting, but amplifier life will be prolonged by "floating" amplifier in 1-1/2" - 2" medium-density foam.

CONNECTIONS

1. Locate Kawasaki wiring harness for siren. Removal of gas tank and / or inspection plate at left side may be necessary. Wires have insulated bullet connectors.
2. Connect siren speaker to BROWN wires from 12-pin amplifier connector.
3. Make balance of connections by matching Kawasaki wire colors with amplifier harness wires.

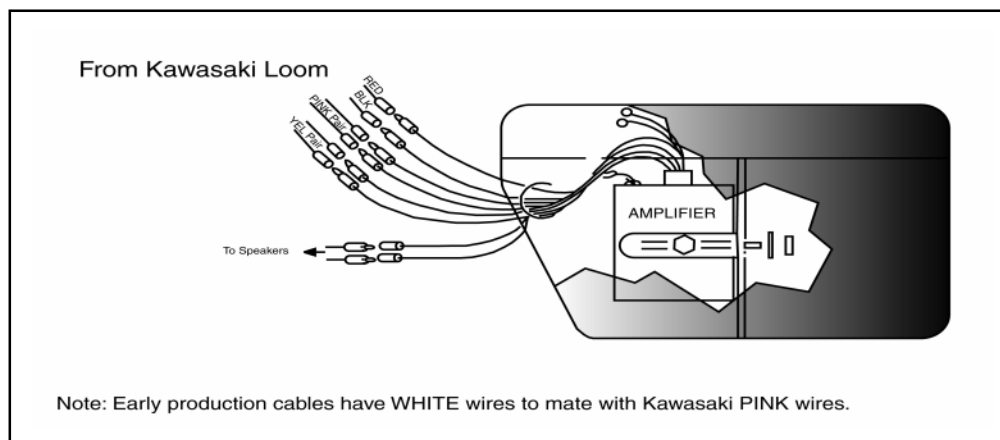
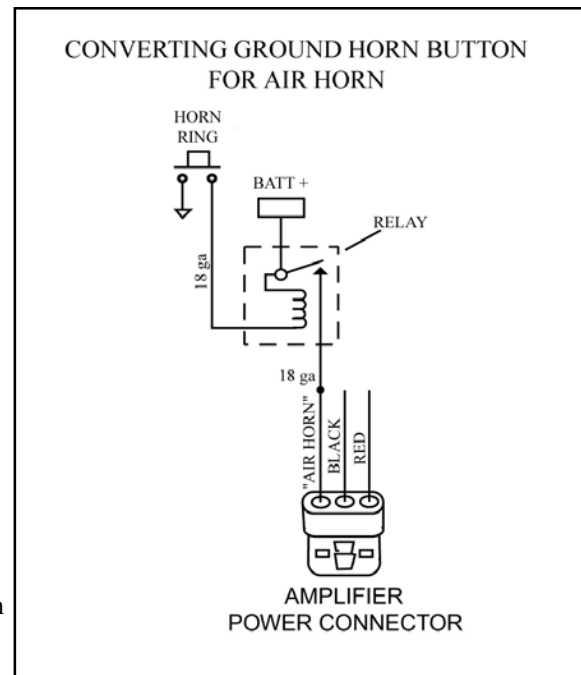
AIR HORN

1. +12V applied to the amplifier's "AIR HORN" wire (3-pin power connector) operates the air horn, +12V can be supplied by a separate switch or the regular horn button.
2. Separate Switch - Install a light duty (1 to 3 ampere) Single-Pole, Single-Throw (SPST), normally open push button switch.
 - a) Using 18 ga. (minimum), wire connect one switch terminal (either one) to source of +12V.
 - b) Connect other terminal to "AIR HORN" wire.

3. Horn Button - The Kawasaki horn circuit is grounded (-) which must be inverted to +12V by a relay. Using 18ga. wire for new connections, proceed as follows:

- a) Disconnect horn button wire from regular horns.
- b) Install a light duty (1A) Single-Pole, Single-Throw (SPST) relay (customer supplied).
- c) Of the relay's two coil connections, connect either one to battery (+). Connect other to horn wire button.
- d) Of the relay's two contact point connections, connect one (either one) to battery (+). Connect other one to "AIR HORN" wire.

See diagram below for schematic details noting that one coil terminal and one contact terminal both can go to the same battery (+) source.



SECTION III - BASIC SIREN SYSTEM

Model 180K

STANDARD & OPTIONAL FEATURES

1. System consists of a Model 180K toggle switch, CO29K cable and 80K Amplifier.
2. Switch controls siren, vehicle horn button, and can control one warning light:

Choice 1:

Down-Off/Siren-Off : horn ring blows horn.
 Middle-On 1: Siren rises and falls manually only as horn button is pressed and released.
 Up-On 2: Siren operates in **WAIL**; horn button activates 5-second **YELP**.

Choice 2:

Down-Off/Siren-Off : horn ring blows horn.
 Middle-On 1: Siren operates in **Wail**; horn button activates 5-second **YELP**.
 Up-On 2: Siren operates in **HI-LO**; horn button activates 5-second **HETRO**.

Optional Connections or Equipment can include:

- a) **AIR HORN** - See item 3 below.
- b) Microphone & radio P.A. - See Section V.
- c) Intrusion Alarm - See Section VIII.
- d) Two-Tone Siren Sounds - See Section IX.

AMPLIFIER INSTALLATION

1. If installing in Harley-Davidson motorcycle, "float" amplifier without brackets in 1-1/2" to 2" thick medium density foam at bottom and four sides. Use mounting brackets supplied for all other installations.
2. Connect RED and BLACK primary pigtails as shown. RED wire must be connected directly to battery (+) post or point nearest battery having heavy gauge wire.
3. If air horn is desired, install light duty (1-3A) SPST switch. Connect one side of switch to +12V. Connect other side to "AIR HORN" wire in 3-pin connector.

TOGGLE SWITCH INSTALLATION

1. Drill 15/32" hole. Make connections first.

HORN BUTTON or FOOT SWITCH

1. Foot switch may be used in place of, or in addition to, horn button for controlling siren.

Foot Switch Only- Install light-duty switch (1-3A). Connect one side of switch to ground (-) or positive (+), whichever is most convenient. Connect other side of switch to toggle switch terminal #9. Do not use terminals #7 and #8.

Horn Button and Foot Switch- Connect one side of foot switch to ground (-) or positive (+) to match horn button polarity. Connect other side of switch to terminal #9.

CHOICE of SOUNDS

1. See Standard & Optional Features and make connections to match choice.

Choice #1: Connect ORANGE wire to terminal #3; WHT/RED wire to terminal #6.

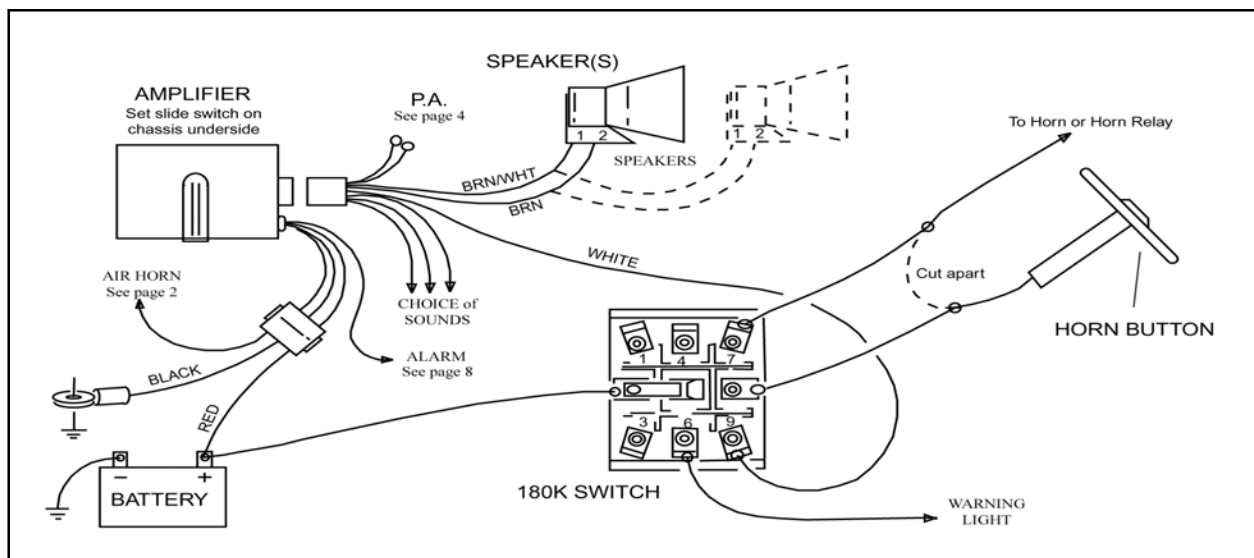
Choice #2: Connect BLUE wire to terminal #3; ORANGE wire to terminal #6.

WARNING LIGHT or FLASHER CONNECTION

1. A warning light may be connected to switch terminal #6 only as follows:
 - a) Warning light can not have separate on/off switch.

SIREN SPEAKER CONNECTIONS

1. Connect speakers as shown except if installing two amplifiers for Two-Tone system. See Section IX.



SECTION IV- PUBLIC ADDRESS KITS For Models 80KM & 180K

OPTIONAL PA KIT

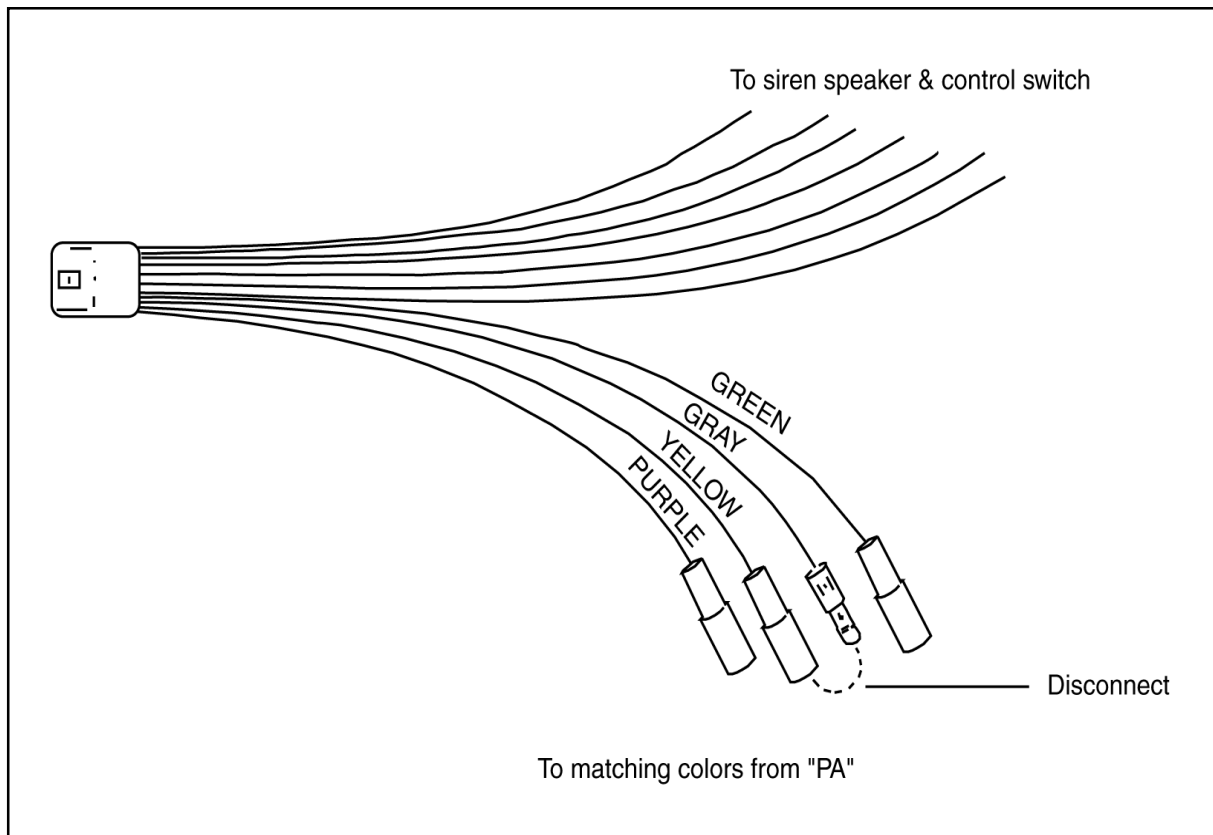
1. Models 80KM & 180K are shipped with cable assemblies having four wires (Yellow, Gray, Green & Purple) intended for connection of public address kit.
2. One PA kit is available (UPA1).

OPERATION

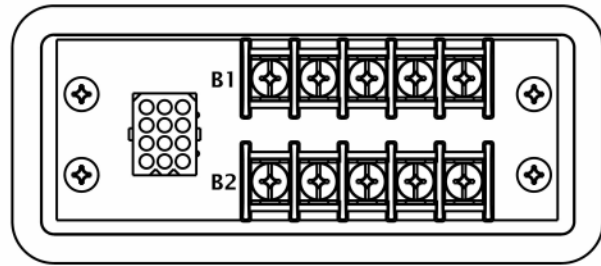
1. "PA" kit requires no switching. PA announcements are made by pressing the microphone button and talking. Siren sounds are stopped until mic button is released.

INSTALLATION

1. Locate area for jack installation. Allow 1" diameter clearance space for back portion of jack. Drill 3/8" diameter mounting hole.
2. Un-plug Yellow and Gray wires in 12-pin connector cable. Extend wires as needed and connect with wires of same colors coming from jack.
3. Connect Black ground wire from jack to vehicle chassis(-).
4. Plug microphone into jack.
5. Adjust gain potentiometer for desired output.



Section IV Cont. MODEL 183K



STANDARD & OPTIONAL FEATURES

1. The system consists of a Model UM183K controller, a UM80K amplifier and a UCO30-4 cable, (4 foot version), or a UCO30-15, (15 foot version).
2. The UM183K controller can control the siren and warning lights.
3. A 60 amp progressive slide switch supplies 20 amps of power per switch position.
4. Horn Ring Transfer
 - a. Horn and Horn Ring connections on the rear of a unit **MUST** be made to permit operation of Manual siren and Yelp of Hetro Override. See siren & warning light control for correct hook up of the Horn Ring circuit.
5. Indicator lights to alert the user that there is an active circuit at a glance.

Optional Equipment can include:

1. UPA2
 - a. UCAR-183K, P.A. cable
 - b. UMNCT-SB, P.A. microphone
2. UDMK, Dual Mode

SIREN & WARNING LIGHT CONTROL

The progressive slide switch position 1, 2, & 3 turn on warning lights. Position 3 turns on the siren and horn ring controls.

The toggle switch controls the siren's mode of operation during slide switch position 3.

OFF - No Siren.

MAN - Allows the siren to operate in manual mode.

AUTO - Siren & override functions automatically.

REAR CONNECTIONS

1. B1 terminals from left to right are:
 - a. Grd - Battery Ground
 - b. SPK - Siren Driver.
 - c. SPK - Siren Driver.
 - d. HORN - Spliced into the car horn circuit.
 - e. Ring - Spliced into the car horn circuit.
2. B2 terminals from left to right are:
 - a. +12V - Battery positive.
 - b. 1-2-3 - Slide switch output during position 1, 2, & 3.
 - c. 2-3 - Slide switch output only during switch positions 2 & 3.
 - d. 3 - Slide switch output during position 3 only.
 - e. 1- Slide switch output during position 1 only.

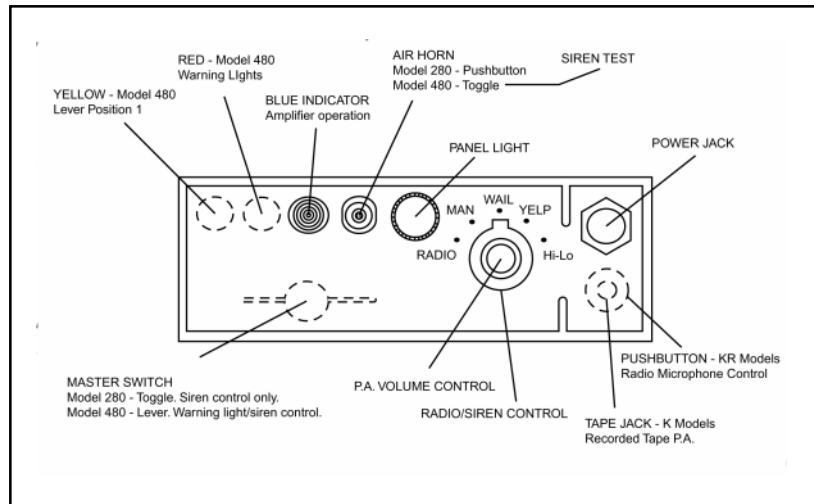
HORN RING CONNECTIONS

1. Cut wire apart between either the Horn Ring and the Horn Relay or between the Horn Relay and the vehicle Horn. Extend the wires to reach the rear of the control unit.
2. Connect the wires to the B1 terminals screws marked HORN and RING.

DO NOT REVERSE THE WIRES.

SECTION V - SIREN/PA SYSTEM

Operating Models 280K & 480K



STANDARD & OPTIONAL FEATURES

1. All models perform essentially the same in that a Master Switch turns the siren on and controls the vehicle horn ring. The horn ring and Unitrol rotary switch control siren sounds.
2. Other features include warning light control (most models), air horn, public address, power control for two-way radio, power jack, panel light, and indicator lights.
3. Optional connections or equipment can include:
 - a) Rocker Accessory Switch
 - b) Intrusion Alarm - See Section VIII
 - c) Two-Tone Siren sounds - See Section X

SIREN & WARNING LIGHT CONTROL

1. **Model 280** - Middle toggle position turns siren on, horn ring or spring-loaded. Right toggle position controls siren as described below.
2. **Model 480** - Lever position 1, 2, & 3 turn on warning lights. Lever position 3 turns on siren. Horn ring controls siren as described in next item.
3. The vehicle horn ring controls siren as follows:
 - During **MAN**: Siren rises and falls only as horn ring is manually pressed and released.
 - During **WAIL**: Horn ring activates 5-second Yelp.
 - During **HI-LO**: Horn ring activates 5-second Hetro.

AIR HORN & SIREN TEST

1. **Model 280** - Air horn operates by pressing miniature pushbutton switch.
2. **Models 480** - Air horn operates by pressing miniature toggle switch to "HRN". Siren operates without warning lights by pressing toggle to "TST".

OUTSIDE RADIO CALLS

1. Incoming radio calls are amplified over the outside siren speaker when the rotary switch is set on RADIO. Loudness is regulated by the inner rotary switch knob as well as the radio's volume control.

RADIO POWER CONTROL

1. The two-way radio may be left "on" at all times. The rotary switch keeps it ignition-controlled in **MAN**, **WAIL**, **YELP**, and **HI-LO** settings.
2. In RADIO setting, power to the radio is automatically switched to battery-direct so calls can be transmitted and received without ignition keys.

MICROPHONE PA

1. PA system operates by pressing microphone button. Siren, if operating, stops until button is released.
2. "**K**" models use a separate microphone for PA.
3. "**KR**" models use a radio microphone for PA. Microphone is controlled by lighted pushbutton switch:

OUT(unlighted) - Microphone controls radio.
IN(lighted) - Microphone controls PA system.

RECORDED TAPE PA

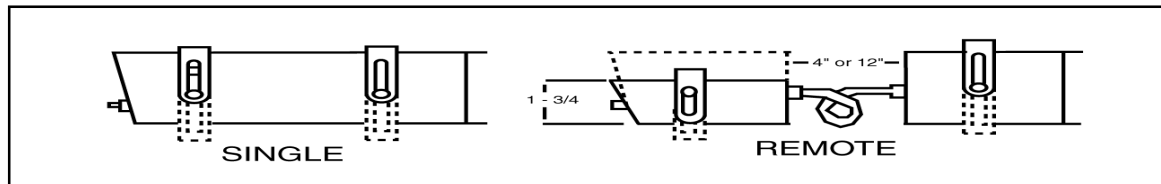
1. Recorded announcements can be played over PA system by setting rotary switch in RADIO and plugging headphone outlet of cassette player into tape jack at lower right. Jack is not available in models using the radio microphone for PA. See Section XI for plug wiring.

RADAR POWER JACK

1. 12V power can be supplied to any device drawing less than 18 amperes. See Section XI for plug wiring.

SECTION VI SIREN /PA SYSTEM

Installing Models 280K & 480K



STANDARD EQUIPMENT

1. System is housed in remote cabinetry as specified.
All models include:

- a) Two U-brackets.
- b) 12-Pin heavy-duty connector with pigtails.
- c) Remote cable for remote systems.

OPTIONAL EQUIPMENT

1. Options may include:
- a) Two amplifiers and short interconnect cable for Two-Tone siren systems. See Section IX.
 - b) Rocker switches for alley lights, shotgun rack, floodlights, etc.

PIGTAIL WIRE CONNECTIONS - 12-Pin

Connector

1. Connections of following pigtail wires is mandatory:

IGNITION: Supplies power to panel light, radio and accessory switches.

HORN RING and **HORNS:** Supplies siren control and normal vehicle horn operation.

SIREN SPKR (2): Connect speaker(s) as shown unless installing two amplifiers.

BLACK: Supplies system ground (-).

2. Numbered wires ("3", "2-3", etc.) are for warning lights.

TWO-WAY RADIO CONNECTIONS

1. **Audio** - If outside radio calls are desired inspect microphone plate on sloped underside:

a) If two WHITE housing with male blades exist, locate radio speaker. "T" into wires that run between speaker and radio head with 18ga. wire. Connect other ends to WHITE housings.

b) If WHITE housings do not exist or do not contain blades, audio connections will be established when radio cable is plugged into radio head.

2. **Radio Control** - If radio power control is desired locate the radio's transmit and receive control wires and proceed as follows:

- a) Tie both wires together.
- b) Extend with 18-ga. wire and connect to BLACK housing on microphone connector plate.

PA MICROPHONE

Plug microphone into connector contained in plate on sloped underside of control unit.

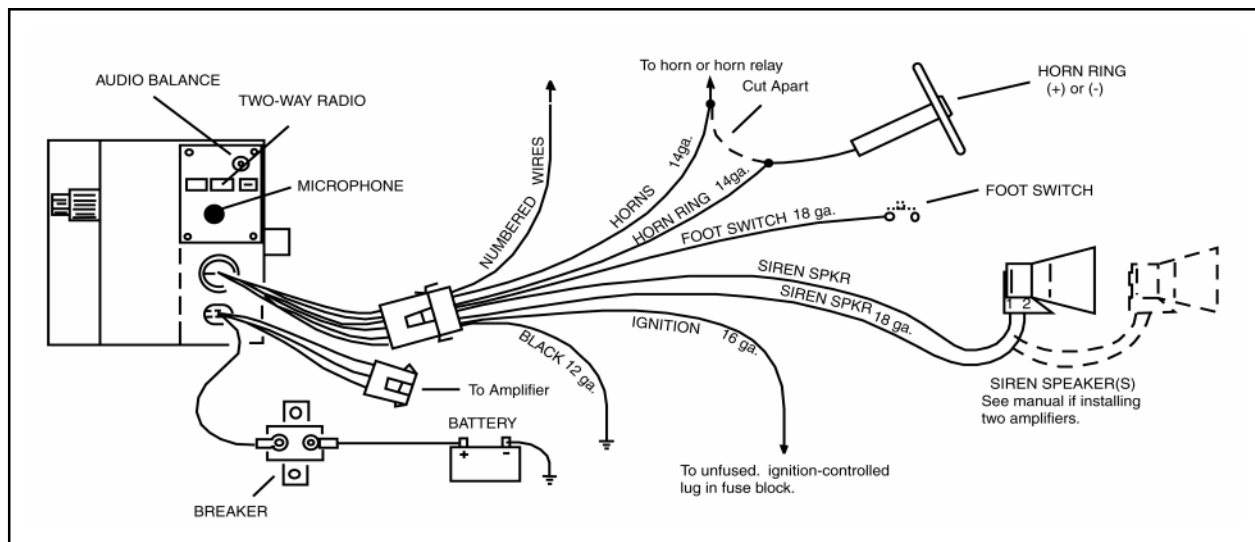
SYSTEM PRIMARY WIRE SIZE

1. Install circuit breaker near battery. Use following wire size for extending RED control unit primary wire:

Models 280K - 12 ga.

Models 480K & 480KR - 8 ga.

2. Connect breaker directly to battery (+) post or to any point near battery having heavy (6-ga. minimum) wire. Do not connect to alternator, ignition switch, or to any ignition - controlled source.



SECTION VI & VII SIREN/ PA SYSTEMS

Installing Models 280K & 480K (cont.)

FOOTSWITCH

1. A foot switch may be used in addition to or in place of the horn ring for siren controls.
2. Install light-duty (1-3 amp) foot switch. Using 18ga. (minimum) wire connect one terminal to ground (-) or battery (+), whichever is most convenient.
3. Connect other terminal to "foot switch" pigtail wire in 12-pin control connector.

SECTION VII - WARNING LIGHTS

NUMBERED WIRES

1. The 12-pin connector of each model contains numbered pigtail which can be used for controlling warning lights.
2. Numbers stamped on insulation correspond to Master Switch position that supply power (+12V).

WIRE SIZES

1. Proper warning light operation and protection against fires can be assured only when adequate wire size is used for the primary system as well as for warning lights.

SUGGESTED CONNECTIONS

1. Since there are no uniform lighting arrangements, there are no set rules for connecting wires. Instructions appearing below are only suggestions. You may prefer, and are encouraged to experiment with other connections that could better suit your requirements.

Model 280 - One Wire: 3

Use wire for controlling lights.

Model 480 - Five Wires: 1, 1-2, 1-2-3, 2-3, and 3.

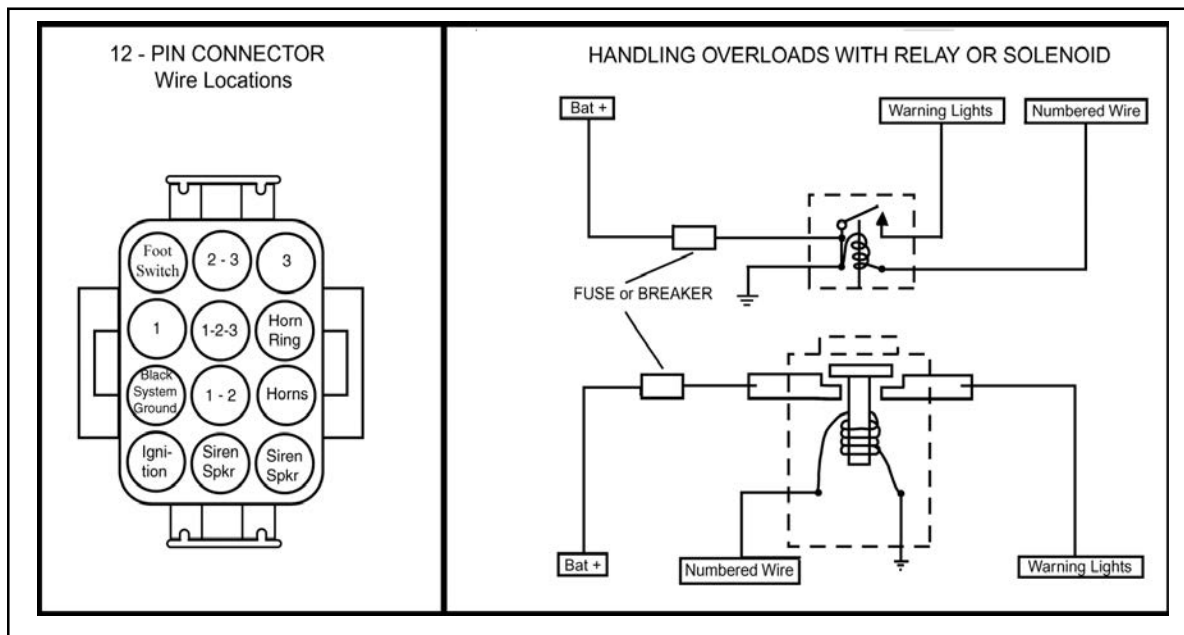
Use 1-2-3 for rear lights or lights of secondary importance; 2-3 for front lights or lights of greater importance; 3 for additional lights.

CURRENT LIMITS

1. **Model 280:** 15A Total. Limit of wire : 15A.
2. **Model 480:** 60A Total. Limit each wire:
 - 1/15 amperes
 - 1-2/15 amperes
 - 1-2-3/20 amperes
 - 2-3/20 amperes
 - 3/20 amperes

HIGHER CURRENT CAPACITY

1. Higher currents may be achieved by using a numbered wire to operate a heavy-duty relay or solenoid. 30 ampere continuous-duty relay and 100 ampere solenoids are available from automotive distributors. They should be rated for continuous duty. See drawing below for connections.



SECTION VIII - INTRUSION ALARM For All Models

PURPOSE & OPERATION

1. The **80K** amplifier is capable of producing a 1600 Hz. steady tone. The tone can be used to warn out-of-vehicle driver that the vehicle or its contents are endangered.
 2. The tone occurs when ground (-) is applied to the amplifier's "**ALARM**" wire. Ground can be supplied by a motion-detector device or by individual switches at the trunk, gas lid, and/or hood.
 3. A separate on/off switch may be used to permit normal use of the vehicle. The switch may be a keyed type or a concealed toggle having single-pull; single-throw contacts.
- Both types are available from radio parts stores. Connections are as follows:

- a) Using 18ga. wire, connect one switch terminal (either one) to "**ALARM**" wire.
- b) Connect remaining terminal as outlined below.

MOTION DETECTOR

1. Depending on manufacturer, a motion detector will have an output terminal or wire that becomes ground (-) or positive (+) when the detector senses vehicle movement. This output may be used as follows:

- a) Ground (-) Output:
Using 18ga. wire, connect output to remaining terminal of system on/off switch.
- b) Positive (+) Output:
Install a light duty (1 to 3A) - SPST relay. Use output to operate relay. Using 18 ga. wire, connect relay contacts so they apply ground to "**ALARM**" wire.

Note: If a relay is undesirable, the positive output may be used to operate siren sounds or the air horn:

- c) Connect one terminal (either one) of system on/off switch to desired pin in amplifier 12-pin connector (see faceplate for functions) or to "**AIR HORN**" wire in 3-pin amplifier power connector.

- d) Connect remaining terminal of system on/off switch to positive output of motion detector.

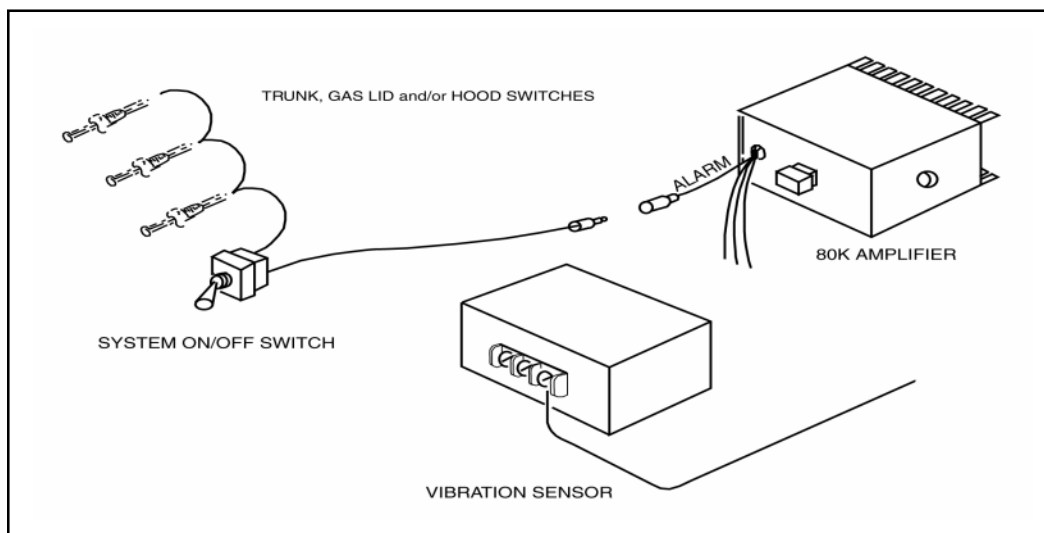
2. Connect remaining terminals of motion detector according to manufacturer's instructions.

INDIVIDUAL SWITCHES

1. Spring-loaded switches, like those used in cars for turning on interior lights are internally grounded and have SPST contacts. They also have one insulated terminal. Other switch styles, such as mercury tilt switches, can also be used.
2. Connect switches as follows:
Using 18ga wire, connect insulated terminal of all switches together. Connect one wire from joined switches to remaining terminal of system on/off switch.
3. If switches have two terminals, connect one (either one) to vehicle chassis. If internally grounded switches are being installed on a plastic or insulated surface, run an 18ga. wire from vehicle chassis to the switch body.

WARNING

If installed on the vehicle's exterior, the system on/off switch should be a water-resistant type or installed in a water-free area to prevent contact corrosion. Corrosion will eventually form a bridge across contacts that will freeze the switch in "on" condition thereby making the Intrusion Alarm active during normal vehicle use.



SECTION IX - TWO-TONE SYSTEMS For Model 180K

REQUIRED EQUIPMENT

1. Control Unit- Any existing 180 system can be used. No modifications or additional switches are needed.
2. Amplifiers- Two amplifiers, each housed in a separate cabinet, are required.
3. Cables- A UMC029T is needed for interconnecting the two amplifiers. UMC030K (4 foot or 15 foot long) is needed for interconnecting both amplifiers with the control unit.
- UMCO29K normally supplied with control switches.
4. Siren Speakers- At least one speaker must be used with each amplifier. Two speakers may be used as indicated by dotted lines in drawing.

Note: A speaker having one horn, but two driver units (such as 200 watt speaker), is electrically the same as two speakers.

AMPLIFIER INSTALLATION

1. Install first amplifier as indicated in drawing.
2. Set slide switch on bottom of amplifier chassis to match power rating of speakers to be used.
3. Install amplifiers with 4 inches maximum between cabinets.

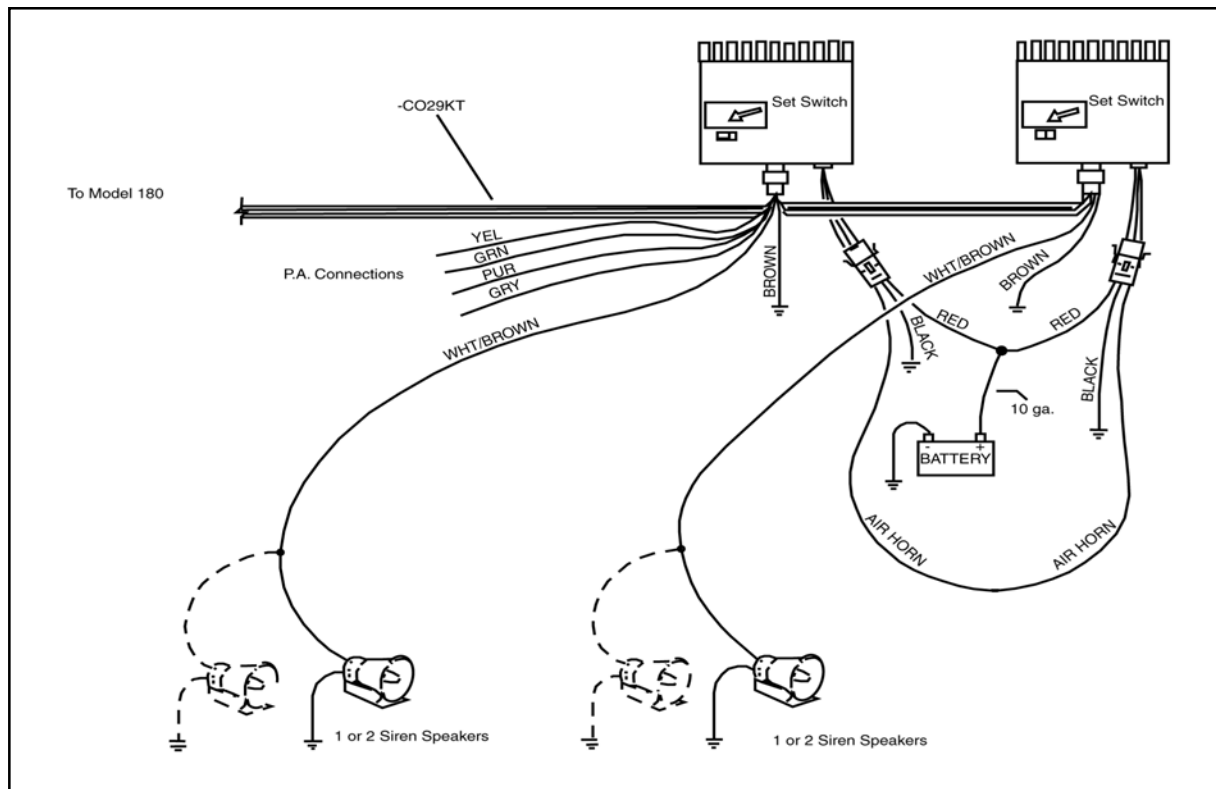
PRELIMINARY CONNECTIONS

1. Interconnect AIR HORN wires from both 3-pin amplifier connectors using the appropriate connector.
2. Interconnect ALARM wires from both amplifiers if Intrusion Alarm (Section VIII) is desired. If not wanted tape and do not use wire.
3. Connect one terminal (either one) of a siren speaker to vehicle chassis (-). Repeat for all other speakers using same terminal # of each speaker.
4. Connect the **BROWN** wire from each amplifier connector to chassis (-).
5. If it is desired, wires may be cut in the UMC029T to restrict the number of sounds available in the second amplifier.

FINAL CONNECTIONS

See drawing.

IMPORTANT: Keep **RED** amplifier primary wires equal in length. Connect both to a length of 10ga wires. Connect other end directly to battery (+) post or to an appropriate power distribution terminal. Do not connect to ignition switch or ignition - controlled circuit.



SECTION X - TWO-TONE SYSTEMS For Models 280K & 480K

REQUIRED EQUIPMENT

1. Control Unit - Any existing 280K or 480K control unit can be used. No modifications or additional switches are required.
2. Amplifiers - Two amplifiers, each housed in a separate cabinet, are required.
3. Cables - A UMC030T cable is needed for interconnecting the two amplifiers. UMC030K (4' or 15' long) is needed for interconnecting both amplifiers with the control unit.
4. Siren Speakers - At least one speaker must be used with each amplifier. Two speakers may be used as indicated by dotted lines in drawing.

Note: A speaker having one horn, but two driver units (such as a 200 watt speaker), is electrically the same as two speakers.

AMPLIFIER INSTALLATION

1. Install first amplifier as indicated in drawing.
2. Set slide switch on bottom of amplifier chassis to match power rating of speakers to be used.
3. Install amplifier with 4 inches maximum between cabinets.

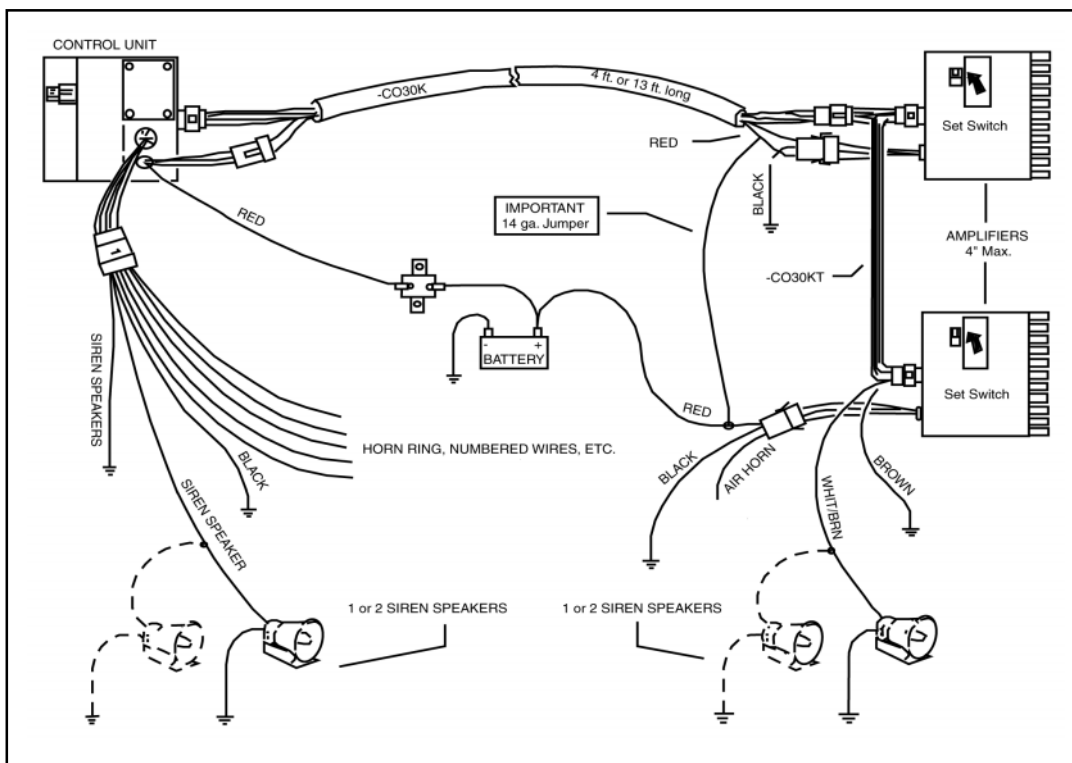
PRELIMINARY CONNECTIONS

1. Interconnect AIR HORN wires from both 3 - pin amplifier connectors using the appropriate connector.
2. Intrusion Alarm - See Section VIII.
3. Connect one terminal (either one) of one siren speaker to vehicle chassis (-). Connect same number terminal of remaining speakers to vehicle chassis(-).
4. Of the two SIREN SPEAKER wires coming from the 12-pin control unit pigtail connector, connect either one to vehicle chassis (-), and the other to the speaker.

FINAL CONNECTIONS

a) see drawings.

1. The RED primary wire from the added amplifier must connect directly to the positive (+) battery post or to an appropriate power distribution terminal.
2. It is vitally important for proper siren operation that a 12-ga (minimum) "jumper" be placed across the RED primary wires of each amplifier as indicated.



SECTION XI - GENERAL INFORMATION

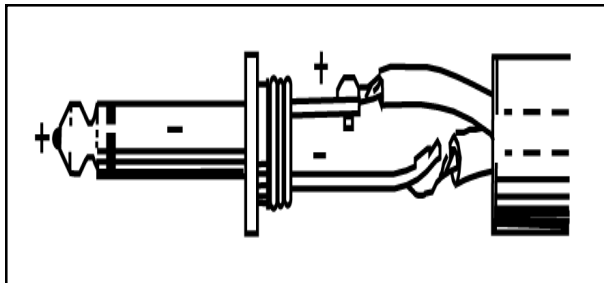
AMPLIFIER SPECIFICATIONS

Standby Current Drain	Zero
Current Drain During PA	800 Mils.
Maximum siren current Drain @ 200 Watts	15A.
Siren Output (Switch Adjustable)	58 to 200 Watts
WAIL and YELP Frequencies	500 to 1600 Hz.
HI-LO & HETRO Frequencies	625 & 575 Hz.
Intrusion Alarm Frequency	1600 Hz.
Air Horn Mid-Frequency	1050 Hz.
WAIL Repetition Rate	11 Per Minute
YELP Repetition Rate	240 Per Minute
HI-LO Repetition Rate	60 Per Minute
HETRO Repetition Rate	900 Per Minute
Audio Output with One Speaker	25 or 50 Watts
Audio Distortion	Less Than 10%
Reversed Input Polarity	Protected
Input Voltage Over 16Vdc	Protected
Speaker Short Circuit	Protected
Amplifier Restoration After Shorting	Automatic

NOTE : Hi - Lo is deleted in the state of CA. The tone is not recognized as a primary emergency warning tone as per Title 13.

POWER JACK PLUG

1. A radar, cord light or any device drawing less than 18 amperes can be operated from the power jack in Models **280K and 480K**. The jack accepts a two-contact "telephone" plug. Use 18ga. (minimum) insulated wire. Observe polarity.



TAPE JACK PLUG

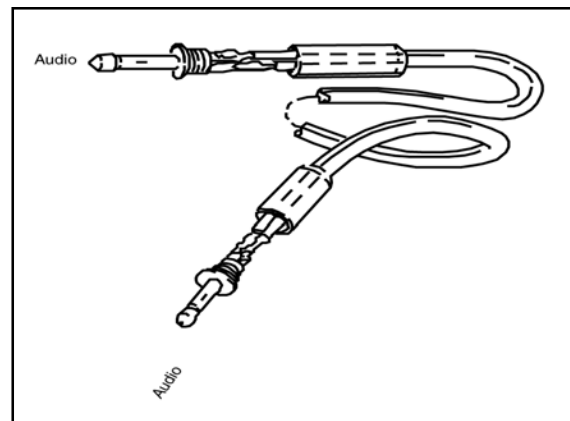
1. Recorded messages and music can be played over the PA system with Models **280K and 480K**. A cord plugs into the recorder's headphone jack at one end into the tape jack at the other end.
2. Only battery-operated recorders can be used. The Unitrol power jack cannot be used to power the recorder.
3. Audio connections may be obtained by using audio plugs with 20-24 gauge wire.

DETERMINING WIRE SIZE

1. It is essential to proper siren and warning light operation to use wires large enough to carry the load (amperes). Wires too small will create siren malfunctions and reduce warning light brilliance and can easily cause vehicle fires.
2. **Primary Wire Size** - Refers to model number and corresponding instructions in this Manual.
3. **Warning Light & Accessory Sizes** - Determine wire size by adding current drain (amperes) of all lights or accessories that will be connected to any one control wire from Unitrol.
4. **Warning Light Current Drain** - Lamps used in warning lights are frequently rated in terms of "watts" rather than "amperes". Simply divide watts by vehicle voltage (13 volts nominal). The result will be amperes.
5. **Motors & Relays** - Most motors used in warning light bars draw 1 ampere or less. Most relays draw 3 amperes or less.
6. Keep in mind that wire diameter increases as wire gauge number decreases.

INDICATOR LIGHT REPLACEMENT

1. Indicator lights in models 280K, 480K and Switchpak are designed to be replaced as a complete unit (the light bulb is molded into the indicator light body). The body is secured in place by barrel pressure. No hardware is used or required.
2. To replace, proceed as follows:
 - a) Pull control unit chassis forward and de-solder wire from the two lamp terminals.
 - b) Push indicator light from terminal-end until body passes through faceplate.
 - c) Reverse process to install replacement light using care not to overheat lamp terminals during soldering.



SECTION XII - WARRANTY & TECHNICAL SUPPORT

FIVE-YEAR WARRANTY & LIMITATIONS

UNITROL products described in this Manual are warranted to be free from defects in material and workmanship for five years from installation date. Any product found to be faulty will, at the factory's option after inspection, be replaced or repaired and returned without charge.

The Warranty does not cover any charges which may be incurred for removing a suspected defective unit, returning the suspected defective unit to the factory or for installing a replacement unit.

The Warranty does not cover units that have been tampered with or on which unauthorized repairs or modifications have been made nor does it cover units that have been abused or used beyond limits stated in specifications.

TECHNICAL SUPPORT

The easiest way to solve a **UNITROL** problem is to phone the factory. Outside California call toll-free **1-800-854-3375**. Inside California, call **(714) 871-3336**. Our office is open Monday through Friday 8:00 AM to 4:30 PM Pacific Standard Time.

We recommend that any suspect unit be returned to the factory for repair whether it is in Warranty or not. Technicians have constantly updated information and components.

Please include a brief description of the problem along with your **name and phone number** so we may contact you in the event bench tests do not reveal the in-vehicle problem.

SAFETY MESSAGE TO OPERATORS OF UNITROL ELECTRONIC SIRENS AND LIGHT/SOUND SYSTEMS

WARNING

The lives of people depend on your operation of UNITROL products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow.

Qualifications

To properly use a light system you must have a good understanding of general vehicle operation, a high proficiency in the use of safety warning equipment and thorough knowledge of State and Federal UNIFORM TRAFFIC CODES.

Sound Hazards

Your hearing, and the hearing of others in or close to your emergency vehicle could be damaged by loud sounds. This can occur from short exposures to very loud sounds or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to Federal, State or local recommendations. **OSHA Standard 1910.95** offers guidance on “**Permissible Noise Exposure**”.

All effective sirens and horns produce loud sounds which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

Sound Limitations

Maximum sound output will be severely reduced if any objects are in front of the speaker. If your installation has obstructions in front of the speaker, drive even more cautiously.

Frequently inspect the speaker to ensure that it is clear of any obstruction such as mud or snow, which will reduce maximum sound output.

Signaling Limitations

Be aware that the use of your visual and audible signaling devices does not give you the right to force your way through traffic. Your emergency lights, siren, and actions are REQUESTING the right-of-way.

Although your warning system is operating properly it may not alert everyone. People may not hear, see, or heed your warning signal. You must recognize this fact and continue driving cautiously.

Situations may occur which obstruct your warning signal when natural or man-made objects are between your vehicle and others, such as when you raise your hood or trunk lid. If these situations occur, be especially careful.

Driving Limitations

At the start of your shift, you should ensure that the warning system is securely attached to the vehicle and operating properly.

If the unique combination of emergency vehicle equipment installed in your vehicle has resulted in the light/siren controls being installed in a position that does not allow you to operate them by touch only, **OPERATE CONTROLS ONLY WHEN VEHICLE IS STOPPED.**

If driving conditions require your full attention, you should avoid operating the light/siren controls while the vehicle is in motion.

Continuing Education

File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees.

Failure to follow these safety precautions may result in property damage, serious injury, death to you, your passengers or to others.

SAFETY MESSAGE TO INSTALLERS OF ELECTRONIC SIRENS

WARNING

The lives of people depend on your safe installation and servicing of UNITROL products. It is important to read and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow before installation:

Qualifications

To properly install an electronic siren you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and service of safety warning equipment.

Sound Hazards

Your hearing and the hearing of others, in or close to your emergency vehicle, could be damaged by loud sounds. This can occur from short exposure to very loud sounds or from longer exposures to moderately loud sounds. For hearing conservation guidance, refer to federal, state, or local recommendations. **OSHA Standard 1910.95** offers guidance on “**Permissible Noise Exposure**”.

All effective sirens and horns produce loud sounds, which may, in certain situations, cause permanent hearing loss. You should minimize your exposure times and wear suitable hearing protection.

During Installation

DO NOT connect this system to the vehicle battery until **ALL** other electrical connections are made, mounting of all components is complete, and you have verified that no shorts exist.

Be sure the siren amplifier and speaker(s) in your installation have compatible wattage rating.

In order for the electronic siren to function properly, the ground connection must be made to a solid chassis component and not to an insulated point.

Sound output will be severely reduced if any objects are in front of this speaker. If maximum sound output is required for your application, you should ensure that the front of the speaker is clear of any obstruction.

Install the speaker(s) in a location which provides maximum signaling effectiveness and minimizes the sound reaching the vehicle’s occupants.

Installation of two speakers requires wiring speakers in phases.

DO NOT install equipment or route wiring or cord in the deployment path of an air bag.

Locate the control head so the vehicle, controls, and microphone can be operated safely.

When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.

If wiring is shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or flying molten metal.

After Installation

After installation, test the electronic siren, speaker system, and light system to ensure that it is operating properly.

Test all vehicle functions, including horn operation and vehicle light systems, to ensure proper operation.

After testing is complete, provide a copy of these instructions to the instructional staff and all operating personnel.

File these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.