

03RM

Personal Alarm System

03RM Installation & Operation Guide

T0DA0202-001, Rev B
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1.0 GENERAL DESCRIPTION

1.1 Purpose

The MSI Personal Alarm Receiver/Transmitter system is specifically designed to provide reliable yet economical protection for roving personnel. The 03RM ultrasonic receivers are installed throughout the protected facility. Personnel carry the battery-powered, ultrasonic Personal Alarm Transmitter. A person in trouble need only press the alarm button on the transmitter to activate the nearest receiver and summon help quickly. This basic ultrasonic transmitter and receiver alarm locating system can be used with a variety of annunciation and control equipment as part of a complete personal alarm system.

1.2 Features

Portable Transmitter (PAT/S)

Latching push button activation.

Rugged case molded from Lexan plastic.

Unique reversible pocket clip.

Leather holster for wearing on belt (optional).

Continuous transmission on activation assures positive reception.

Low-battery indicator

Man-down option

Portable Transmitter (PAT/C)

Latching push button activation.

Keeper pin activation

Compact size

Rugged case molded from Lexan plastic.

Unique stainless steel pocket clip.

Continuous transmission on activation assures positive reception.

Low-battery indicator

3 point lanyard

Receiver (03RM)

Rugged tamperproof design.

Simplified mounting to a standard electrical box.

Up to 50-foot receiving range.

Red LED alarm lamp.

Remote self-test

1.3 Specifications

Transmitter PAT/S (standard size)

Circuit components	100% solid state, conformal coated circuit boards
Dimensions	3.8"H x 2.4"W x .9"D
Weight	4 oz.
Battery life	100 hours of continuous transmitting time, low battery monitor
Activation	Latching, push/push switch ("man-down" optional) ("pull pin" optional)
Battery type	Lithium, 9V
Battery access	Compartment accessible with tool provided by manufacturer

Transmitter PAT/C (compact size)

Circuit components	100% solid state, conformal coated circuit boards
Dimensions	2.35"H x 1.5"W x .8"D
Weight	1.5 oz.
Battery life	Approximately 1 year, low battery monitor
Activation	Latching, push button switch and pull activation
Battery type	Lithium, 9V battery pack
Battery access	Compartment accessible with security hex key provided

Receiver (03RM)

4 models available:	03RM - standard indoor unit 03RM/IV - includes integrated video camera 03RM/WP - weatherproof unit for indoor or outdoor use
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	03RM/WPH - weatherproof unit with thermostatically controlled heater for low temperature outdoor use
Circuit components	100% solid state, conformal coated circuit boards
Size	Fits 4" square x 2.12 deep double-gang box with or without plaster ring (requires 3.5" x 2.75" opening) 03RM/WP and 03RM/WPH supplied with two gang, weather proof box with gasket
Mounting	Tamper-resistant screws (furnished)
Power requirement	03RM, 03RM/WP: 12 VDC to 24 VDC (max) 40 mA 03RM/IV: 12 VDC to 24 VDC (max), 120 mA 03RM/WPH: Receiver unit 12 VDC to 24 VDC (max) 40 mA, Heater unit 12 VDC to 24 VDC (max) from separate supply, .5 A to 1.0 A depending on voltage
Connection	Removable plug-in terminal block
Supervision	Relay activation on loss of power Enclosure tamper switch
Range	Variable -- up to 50 ft.
Alarm output	Relay contact. Configurable as normally open, normally closed, supervised or non-supervised. Dry Contact Relay Red LED on face plate illuminates on alarm.
Aux Alarm Contact	Normally Closed (NC) or Normally Open (NO) rated 1 Amp, 30 VDC
Audio assessment	Pre-amplified audio is provided
Moisture Barrier	Installed in 03RM/WP and 03RM/WPH units
Finish	Stainless steel
Tamper Switch	2 NC magnetic reed switches (.25 Amp, 12 VDC)
Self-Test	Alarm is activated when 6 to 24 VDC is applied at Test terminal (relative to power return) for a minimum of 3 seconds

2.0 THEORY OF OPERATION

2.1 System Concept

- 2.1.1 Ultrasonic refers to sound waves with frequencies above the range of human hearing. The MSI Personal Alarm Transmitter/Receiver System uses ultrasonic signals because they do not penetrate structural barriers such as walls, ceilings or windows; so, an ultrasonic source can be reliably located. At the same time, the ultrasonic signal will bounce off most surfaces, providing signal coverage even though a line-of-sight path to the receiver may not exist. The ultrasonic signal bounces very well from hard surfaces such as concrete block and glass, and to a lesser degree from soft surfaces such as carpet and drapes.
- 2.1.2 Nuisance alarms are reduced to a minuscule level due to Magal-Senstar's unique method of using two ultrasonic frequencies in a preset modulation pattern. To produce an alarm, a signal must not only consist of the two frequencies but must also be coded in the proper pattern. This method makes a false alarm far less likely than with any similar personal alarm system.

2.2 Transmitter (PAT/S or PAT/C)

- 2.2.1 Roving personnel carry a lightweight battery-operated personal alarm transmitter. The role of the small transmitter is to quickly summon help when necessary. This means that the location of the individual is important.
- 2.2.2 The portable transmitter contains a large alarm button that must be pressed to activate the transmitter. The button is large for easy access but recessed to eliminate inadvertent activation. The PAT/C can also be activated by pulling the built-in switch stem (pull pin activation is optional for the PAT/S)

- 2.2.3 When pressed, the alarm button latches to continuously transmit the alarm signal. The alarm transmission continues until the button is pressed again to reset.
- 2.2.4 The transmitted signal is ultrasonic (very high frequency sound), consisting of two different but precise signals in a preset modulation pattern. Figure 2-1 shows the transmitter block diagram. The approximate frequency of each signal is 40 kHz. Two frequencies are used to reduce the nuisance alarms that have plagued earlier ultrasonic alarm systems. An ultrasonic frequency is chosen because the signal will not penetrate walls and, therefore, provides the location of the person in trouble.

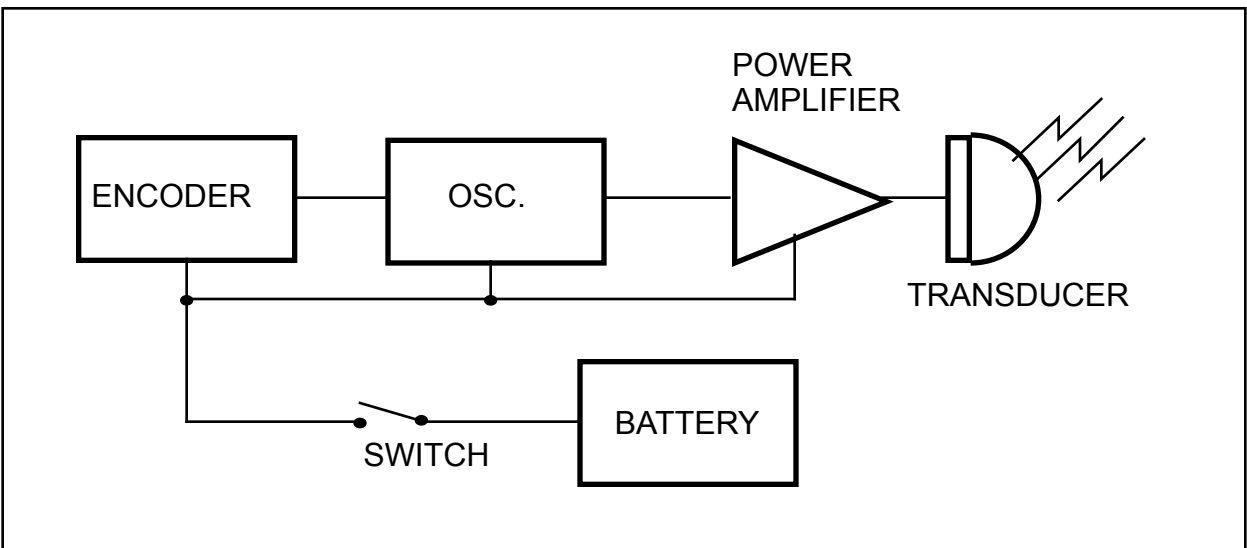


Figure 2-1 Transmitter Unit

- 2.2.5 Battery power for the PAT/S is provided by a Lithium battery capable of providing power for up to 100 hours of continuous transmitting time or several years in normal operation. The PAT/C is powered by A 9V Lithium battery pack which provides an operating life of about 1 year. Battery voltage is constantly monitored, and a low battery indication is given when battery capacity falls below a preset limit. However, the battery life should not be relied upon without periodic testing. Magal-

Senstar manufactures a simple plug-in tester that allows you to quickly check the operation of each transmitter. To ensure the transmitter is in perfect working condition, the test should be conducted on each transmitter daily.

2.2.6 Please see the Personal Alarm Transmitter Operation Guide in the Appendix.

2.3 Receiver (O3RM)

2.3.1 The O3RM receiver is typically mounted in a two-gang electrical box in walls or ceilings throughout the protected area. It receives ultrasonic signals, determines if an alarm signal is present and provides an output accordingly.

2.3.2 An alarm is indicated when the receiver detects both specific alarm frequencies in the correct time sequence. Then the alarm and auxiliary contacts latch and the red front panel LED lights to indicate an alarm has been received.

2.3.3 Each O3RM contains a self-test generator which when activated simulates the Transmitter's alarm output. The self-test generator is activated by applying a 3 second minimum, 6-24 VDC pulse to the terminal thereby producing an alarm condition.

2.3.4 The alarm contact, auxiliary contact and LED latch each time an alarm is received, and remain latched as long as an active transmitter is within range. The unit remains latched for approximately 5 seconds after the transmitter is turned off. The alarm contact is jumper configurable for normally open, normally closed, supervised or non-supervised operation.

2.3.5 Two normally closed magnetic reed switches are used to detect tampering. They are actuated by the self-adhesive magnets supplied with the O3RM and installed on the inside surface of the electrical box. As the O3RM is removed from its box the

switches open. A jumper is provided to select either supervised or non-supervised tamper switch operation.

- 2.3.6 The 03RM is equipped with a microphone and pre-amplifier to provide an audio output. A volume control potentiometer is provided to adjust audio output level.
- 2.3.7 A dual-range sensitivity control varies the receiver range.
- 2.3.8 Input power to the 03RM must be 12 volts to 24 volts DC. Multiple 03RM units may be powered from one source as long as voltage and current requirements are considered. Power should not be shared with any other system.
- 2.3.9 All connections to the 03RM are made through a 10 pin removable connector (12 pin connector for 03RM/IV).
- 2.3.10 The 03RM can be ordered with an integrated video camera as the 03RM/IV. The video output signal is 1.0v p-p, negative sync, 75 ohm (unbalanced). Coax connection is by two screw terminals or BNC connector provided.
- 2.3.11 The 03RM can be ordered with special weather protection for outdoor use. The 03RM/WP provides moisture protection, and the 03RM/WPH includes the moisture protection and a thermostatically controlled heater for use in cold climates. The heater equipped model draws .5 to 1.0 amp during heater operation depending on supply voltage and should be powered by a separate supply.

3.0 RECEIVER PLACEMENT

3.1 Receiver Placement

- 3.1.1 Place receivers to provide maximum coverage for the desired area. Facility conditions can help determine where receivers can be placed. Examples are:
 - 3.1.1.1 For "new construction" installations, receivers are normally placed in ceilings, with wiring in conduit. High ceiling areas may require receivers be placed in walls.
 - 3.1.1.2 A facility, new or existing, with suspended ceilings will normally place receivers in the ceiling, with or without a conduit system depending on code requirements.
 - 3.1.1.3 Existing facilities with limited access may require the use of wall-mounted detectors and Wiremold-type wire protection.
- 3.1.2 One 03RM alarm receiver mounted in a typical ceiling location will provide coverage in a 50-foot radius from the receiver. Most normal-sized rooms can be covered with one receiver.
- 3.1.3 Large areas and hallways will require more detectors. Typical spacing could be as far as 100 feet between devices. However, we recommend typical spacing of no more than 80 feet so "dead" spots are avoided.
- 3.1.4 Locate receivers centrally with unobstructed views of the protected area where possible, to provide more uniform coverage. Do not place receivers in the direct path of high velocity air currents from heating ducts or fans, especially if the audio output is utilized.

- 3.1.5 If no solid barriers exist between adjacent zones, locate receivers as far from each other as possible while maintaining sufficient coverage. This will minimize multiple alarms.
- 3.1.6 If 03RM/IV Receivers are used, camera placement considerations typically dictate receiver location. The standard camera lens supplied has a view angle of 120°. For a rectangular room locate the 03RM/IV in the ceiling as close to a corner as possible with the camera mount angled toward the center of the room. This mounting provides the best view of the room, but always make sure alarm detection is adequate from all points in the room. If ceiling mounting is not possible, locate the 03RM/IV in a corner as high on the wall as possible with the camera mount angled toward the center of the room.

4.0 INSTALLATION

4.1 General

- 4.1.1 Installation of the 03RM requires no special equipment. Standard wire installation tools can be used. Additional tools required are the standard hand tools used during any similar electronic system installation.
- 4.1.2 You may need a high quality digital volt-ohmmeter, preferably battery operated. This meter will be used for all measurements and adjustments.

4.2 Receiver (03RM) Installation

- 4.2.1 The receiver has a depth of approximately 1-1/4 inch, so a mounting box with a minimum 2 inch depth is required. Critical mounting dimensions are shown in Figure 4-1. Typical mounting boxes are as follows:

- 4" square, w/ two-gang ring (Bowers #4-SDW and #408 or equivalent)

- 4" square, two-gang box, 2-1/8" deep (Bowers #132-W or equivalent)

- 03RM/WP and 03RM/WPH receivers include a two gang weather proof universal box with gasket suitable for flush or surface mounting.

- 4.2.2 Tamper switch activation is by way of two self-adhesive permanent magnets supplied with the receiver. Position these magnets on the inside surfaces of the box using the template provided. See Figure 4-2. Use the wipe included with the receiver to clean the box surface before placing self-adhesive magnets. The self-adhesive backed magnets are designed for direct application to any clean, smooth surface (normally a metal or plastic back box). If no back box is used or if it is recessed far below the wall or ceiling surface some alternative

method for mounting the magnets may be required. Contact the factory for assistance.

4.2.3 Receiver mounting is standard double gang by way of the receiver's semiflush face plate. The receiver is attached to the backbox using the four tamper-resistant screws furnished with the unit.

4.2.4 Wiring connections are via a 10-position plug-in connector. Attach the wiring to the connector before plugging the connector into circuit board. The wiring must be attached to the connector in accordance with Figure 4-3.

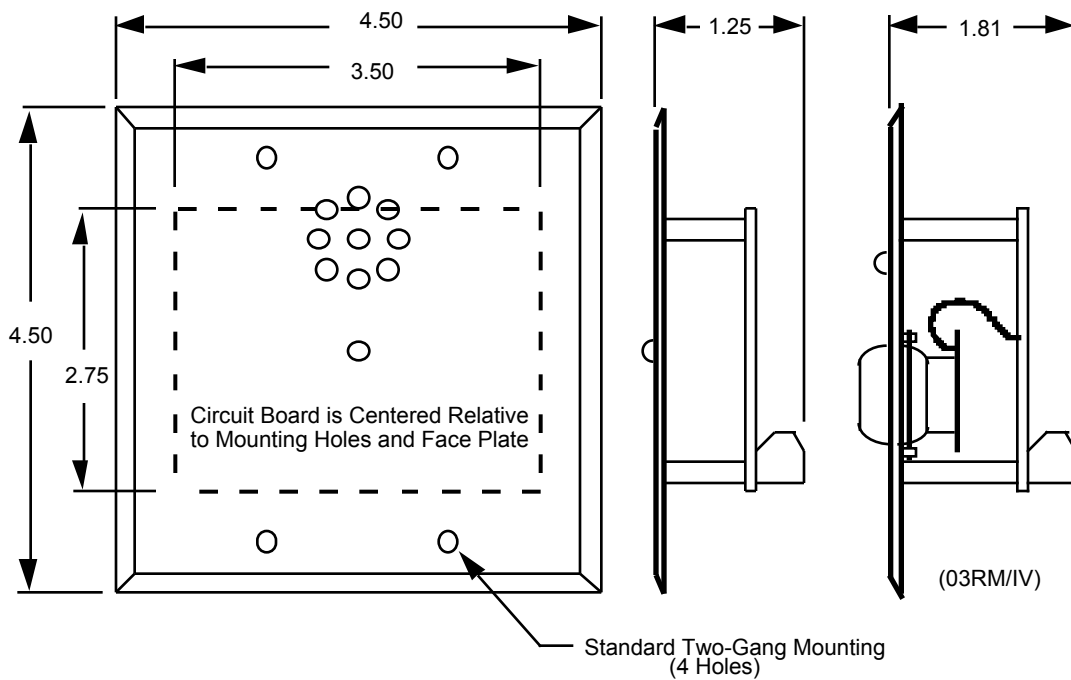
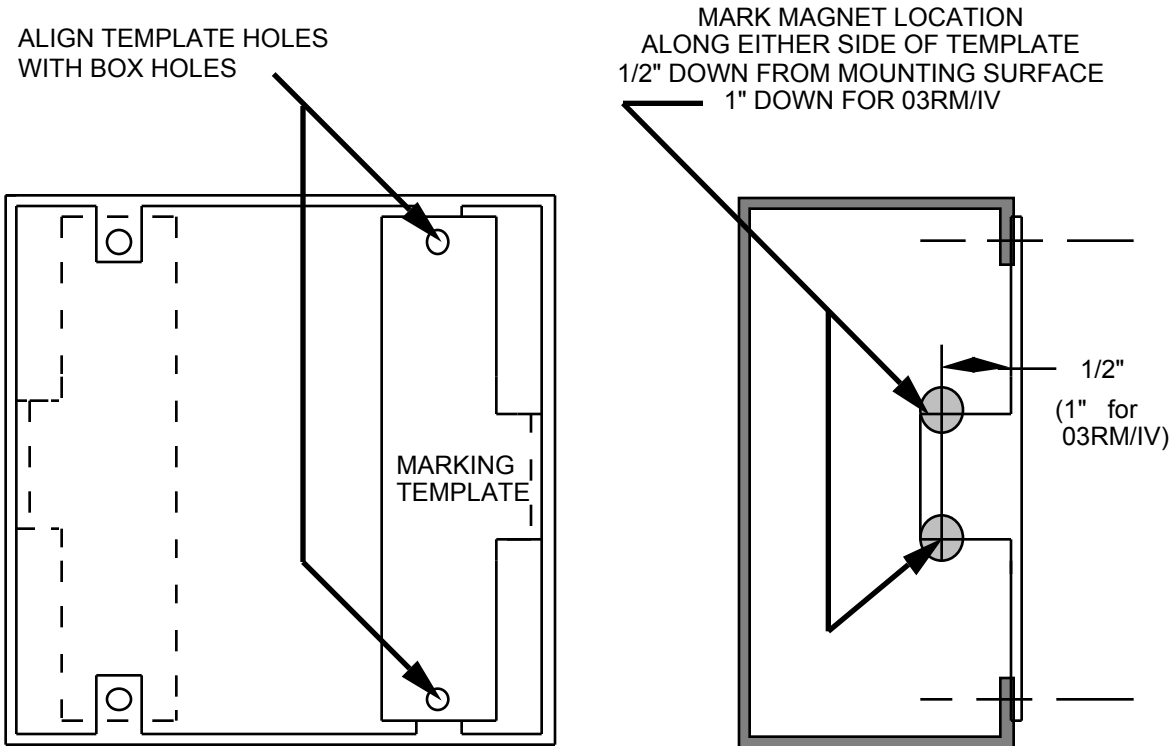


FIGURE 4-1. 03RM Receiver Mounting Dimensions



MARK BOTH RIGHT AND LEFT SIDES OF THE BOX BY ALIGNING TEMPLATE TO EACH PAIR OF BOX HOLES.

STRIP BACKING PAPER FROM SELF-ADHESIVE MAGNETS AND CENTER THEM AT MARKED LOCATIONS.

FIGURE 4-2. Magnet Position for Tamper Switch Activation

4.2.5 Set the alarm, tamper, auxiliary alarm and audio output jumpers to suit your particular annunciation system. Refer to Figure 4-3 and Table 4-2.

- 4.2.5.1 Alarm contact output configuration:
- Normally closed (open on alarm) - jumper JP6 in NC position
 - Normally opened (close on alarm) - jumper JP6 in NO position
 - 3K ohm supervision - jumper JP10 NOT installed
 - No supervision - jumper JP10 installed

4.2.5.2 Tamper contact supervision (tamper contacts are normally closed - open on tamper):
3K ohm supervision - jumper JP8 NOT installed
No supervision - jumper JP8 installed

4.2.5.3 Auxiliary alarm and audio output configuration is set using jumper JP9. See Table 4.2 for jumper settings and function description.

4.2.6 Always allow a service pigtail to the receiver. Carefully plug in the circuit board connector, coil the service-length cable, and slide the receiver into the backbox. Attach the receiver using the four 6-32 tamperproof screws furnished with the unit.

NOTE: You may wish to leave the receiver loosely mounted until you connect the system and begin initial testing.

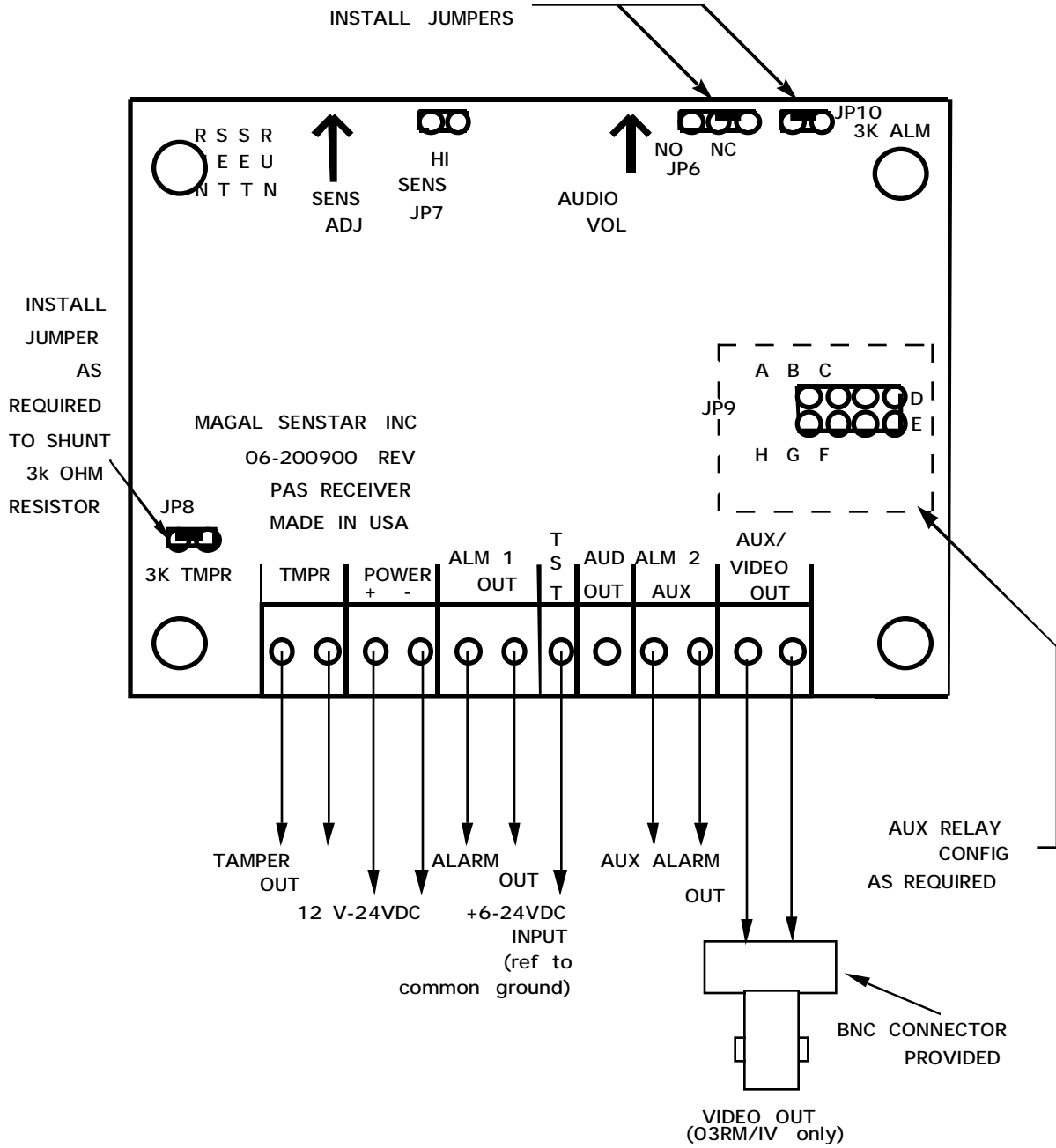
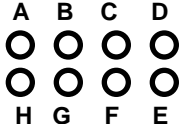
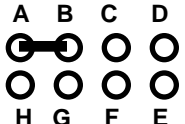
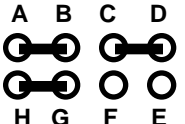
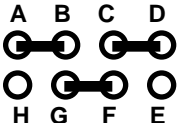
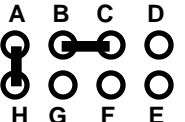


Figure 4-3 Alarm Jumper and Supervision Resistor

**Table 4-2
03RM RECEIVER JUMPER SETTINGS**

Function	JP9 Jumper Settings
No Audio/No Aux Relay	 <p>No Jumpers Installed</p>
Std Audio/No Aux Relay	 <p>Jump A-B</p>
Std Audio/Aux Relay N.O.	 <p>Jump A-B, C-D, H-G</p>
Std Audio/Aux Relay N.C.	 <p>Jump A-B, C-D, G-F</p>
Audio Switching/No Aux Relay	 <p>Jump A-H, B-C</p>

Function Definitions:

Standard Audio: Audio signal is always available at audio terminal of 03RM receiver.

Auxiliary Relay: Auxiliary alarm relay contacts actuate with alarm relay; configurable for normally open (N.O.) or normally closed (N.C.) operation.

Audio Switching: When PAS zones consist of multiple receivers, the auxiliary contact can be used to switch on the audio only for the receiver in alarm. This eliminates possible audio clutter which could result from combining the audio signals from several receivers.

- 4.2.7 Particular attention should be paid in specifying and installing the wiring because many problems occurring after installation are traced to the incorrect type or installation of wiring.
- 4.2.8 All wiring must be installed in accordance with the latest edition of the National Electrical Code. Wiring should be installed in conduit whenever possible. The personal alarm system wiring should be separated from the wiring of all other systems.
- 4.2.9 During installation, all wiring should be tested for grounding and shorts. After wiring installation but before equipment is connected, check each conductor for shorts between conductors and connections to ground.
- 4.2.10 In applications where only dry alarm, tamper and auxiliary contact outputs (no audio) are utilized, the recommended wiring is minimum 22 gauge with overall jacket. Stranded conductors are preferred over solid conductors. Use multi-conductor cable with different jacket colors whenever possible.

NOTE: Heater power wiring for 03RM/WPH units requires 18 gauge minimum due to the higher current required for heater operation. A larger wire size may be required depending on number of units and distance from power supply.

No. _____ 03RM and 03RM/WP X .040 = _____ Amps

No. _____ 03RM/IV X .120 = _____ Amps

Total current load = _____ Amps

WIRING CHART

Stand alone 03RM	2 - Power 2 - Tamper 2 - Alarm 2 - Aux. Alarm 2 - Self-Test	22 AWG stranded wire * (See Figure 4-3)	
	2 - Audio (if used)	twisted, shielded pair * 22 AWG	
	Coax-Video (03RM/IV Only)	RG-59/U Coax**	

***NOTE:** This is for known dry, interior installations ONLY. If wet conditions exist, cable with a High Density Polyethylene jacket is required.

****NOTE:** Use where cable runs do not exceed 1,000 ft.

Copper braided shield at 93% coverage or greater.

Center conductor:

DC resistance of 15 ohms per 1,000 feet or less (15 ohmsM')

Stranded where there will be cable movement (i.e. pan/tilt, elevator)

Solid copper not copper weld or steel

Cable Impedance of 75 ohms.

NOTE: Tamper, alarm self test and audio are commoned to power ground, and may be wired using a 3 pair stranded, individually shielded cable 22 AWG. AUX alarm will require a separate pair.

TABLE 4-3 03RM Wiring Chart

5.0 SYSTEM TESTING

5.1 Final Tests

5.1.1 This test procedure is a guideline for system adjustment and final testing. This procedure and test forms should also be used to obtain final approval of the system installation by the customer.

NOTE: Complete system testing is very important since personnel will be using the system to report alarms in potentially life threatening situations.

5.1.2 Alarm tests will consist of using a PAT Personal Transmitter to activate each receiver in every zone. The results should be recorded on copies of Table 5-1.

5.1.3 Be sure your test transmitter(s) have fresh batteries. It is preferred that the test transmitters be checked using the MSI transmitter test fixture before beginning system testing.

5.1.4 Before beginning, fill out copies of Table 5-1 showing zones to be tested. You may wish to record more than one test per zone.

5.1.5 System testing must confirm full receiver coverage in protected zones, proper receiver operation and proper alarm annunciation.

5.1.6 Start with the appropriate zone. At each receiver you will record the following: (Refer to Table 5-1)

Alarm received

Alarm LED present

Alarm reset

Tamper switch operation (if utilized)

Auxiliary contact operation (if utilized)

- 5.1.7 Test each receiver with the transmitter placed at 15-20 feet. Test again at about 40 feet or at an extreme of the room if less than 40 feet.

- 5.1.8 Refer to the adjustment sections if sensitivity adjustment is required. Retest after any adjustments.

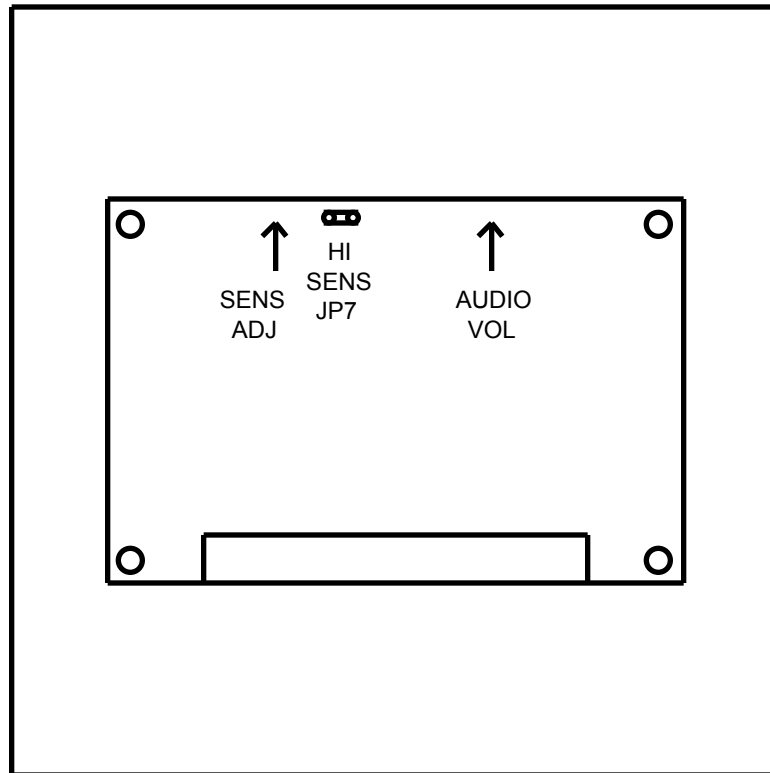
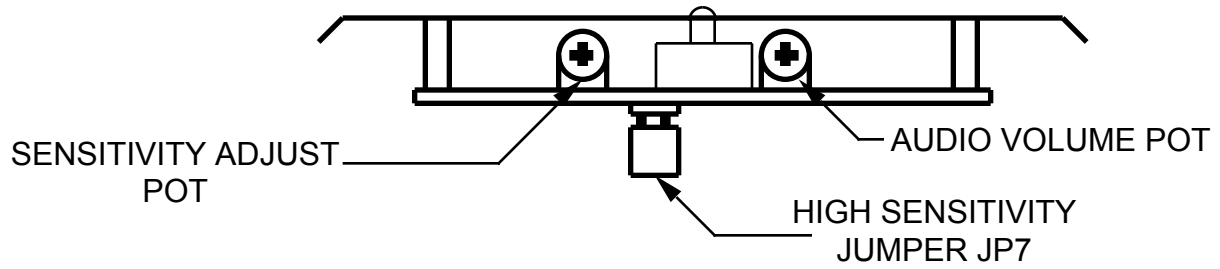
5.2 Alarm Sensitivity Adjustment

- 5.2.1 The ultrasonic alarm sensitivity is adjusted at maximum by the factory for alarm reporting up to 50 feet and normally needs no field adjustment. Reducing sensitivity should only be considered if a transmitter sets off alarms in adjacent areas (e.g., through closed doorways, etc.).
- 5.2.2 This adjustment procedure should not be used unless absolutely necessary.
- 5.2.3 Receiver sensitivity is infinitely adjustable within two ranges. Receivers are supplied in the high sensitivity range (jumper JP7 installed) with the Sensitivity Adjustment potentiometer set at maximum (full clockwise). See Figure 5.1. The low sensitivity range is selected by removing JP7.
- 5.2.4 Using a known good transmitter with fresh battery, periodically set off alarms at the receiver location requiring adjustment. Slowly change sensitivity by turning the control in the proper direction. Do not turn the adjustment potentiometer more than 10 degrees between tests. DO NOT OVER ADJUST.
- 5.2.5 Turning the adjustment clockwise increases sensitivity. Counterclockwise reduces sensitivity. If sensitivity must be reduced further, remove jumper JP7 and continue tests until the desired coverage is obtained. When adjustment is complete, make sure coverage is adequate to detect alarms from all positions within the zone.

5.3 Audio Volume Adjustment

5.3.1 The audio volume control potentiometer is located as shown in Figure 5.1.

5.3.2 Turn the pot clockwise to increase volume; counterclockwise to reduce volume.



Audio Volume Adjustment

Figure 5-1

6.0 MAINTENANCE

6.1 Periodic Tests

6.1.1 Each personal transmitter should be tested each day before use. Using the Magal-Senstar transmitter test device is recommended. If not available, designate a zone for daily testing.

6.1.2 Once per quarter each receiver should be tested using a known good transmitter. Inspect each device for physical damage, LED and alarm output. Record tests on a copy of Table 5-1.

6.2 Cleaning/Adjustment

6.2.1 Special cleaning and adjustments are not required if the system adequately passes the system testing.

6.3 Special Requirements

6.3.1 The facility management may have requirements and procedures that require additional maintenance and testing beyond those listed herein.

6.3.2 If questions arise about maintenance and testing please contact your factory representative.

7.0 TROUBLESHOOTING

7.1 Systematic Testing

7.1.1 Problems sometimes occur due to equipment failures. However, in most cases problems are caused by human or installation related items. Several of these items are:

Shipping damage

Disturbed wiring or connections

Incorrect connections

Physical damage

7.1.2 Always look for the simplest problem first. For example, always check for power supply voltages before starting any further circuit testing.

7.1.3 When approaching a system malfunction, look first for a related activity that could have caused the problem. This will help you go directly to possible problem areas and/or obtain more accurate factory assistance. Examples are:

Recent maintenance actions or installations of other equipment in the same area or equipment rooms.

Water damage.

7.2 Problem Identification and Resolution

7.2.1 Table 7-1 is provided to help you find and resolve system defects. Before proceeding to make more detailed tests proceed as follows:

TABLE 7-1
TROUBLESHOOTING GUIDELINES

SYMPTOM	POSSIBLE CAUSE	RECOMMENDED SOLUTION
TRANSMISSION NOT RECEIVED IN ZONE	TRANSMITTER BAD	<ul style="list-style-type: none"> → TEST TRANSMITTER USING MSI TESTER → TEST TRANSMITTER IN ANOTHER ZONE → TEST WITH ANOTHER KNOWN GOOD TRANSMITTER
	03RM FAILED	<ul style="list-style-type: none"> → ACTIVATE SELF-TEST USING WIRE JUMPER FROM + POWER TO TEST TERMINAL. REPLACE 03RM IF LED DOES NOT LIGHT UP. → TEST WITH A KNOWN GOOD TRANSMITTER. REPLACE 03RM IF LED DOES NOT LIGHT UP.
ALARM IS RECEIVED BUT NO RED LED ON 03RM	DEFECTIVE LED	→ REPLACE 03RM
TAMPER ALARM ON ONE OR MORE DEVICES	03RM FRONT PLATE NOT SECURE	→ SECURE PLATE
	BAD TAMPER SWITCH	→ CHECK WITH OHM METER AND REPLACE IF NECESSARY
	TAMPER SWITCH MAGNETS MISSING OR NOT LOCATED PROPERLY	→ CHECK INSIDE OF 03RM ENCLOSURE, USE TEMPLATE FOR MAGNET LOCATION
	BAD WIRING AND CONNECTIONS	→ TEST AND REPAIR
HUM IN AUDIO SIGNAL	CABLE SHIELD IMPROPERLY GROUNDED	→ CHECK SHIELDS FOR GROUNDING AT RECEIVER AND PARC-3. USE OHM METER TO CHECK RESISTANCE. CORRECT AND RETEST.
	SHIELD NOT CONNECTED	→ TEST CONNECTIONS. REPAIR AND RETEST.
	AUDIO LINE GROUNDED	→ USE OHM METER TO TEST FOR RESISTANCE TO GROUND. REPAIR AND RETEST.

APPENDIX

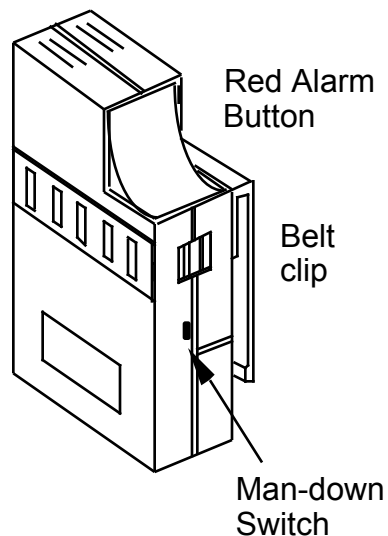
YOUR MSI PAT (Personal Alarm Transmitter)

Provides personal protection by notifying the central control facility of your location whenever emergency assistance is requested. When activated, your PAT sends a coded ultrasonic signal (high-frequency sound) to receivers which relay your emergency signal to the central control point. Once activated, the emergency signal is transmitted in all directions. You DO NOT have to point your PAT at the receiver/s.

A PAT/S Model

A.1 SENDING AN ALARM

- A.1.1 **ACTIVATE** the emergency signal by depressing the red button located on top of your PAT/S. Once pressed, the red button will latch down even though you remove your hand. Your PAT/S will constantly send the emergency signal until the red button is reset. **RESET** the alarm by pressing the red button again. The button will rise and your PAT/S is reset.



A.2 TEST YOUR PERSONAL ALARM TRANSMITTER REGULARLY

- A.2.1 The optional test will quickly verify the correct PAT/S operation.

A.3 WEARING YOUR PAT/S

A.3.1 WEAR your PAT/S either directly on your belt or in the optional leather holster. You may also clip your pat outside of the clothing. Do not cover your PAT/S with a heavy jacket, robe or lab coat.

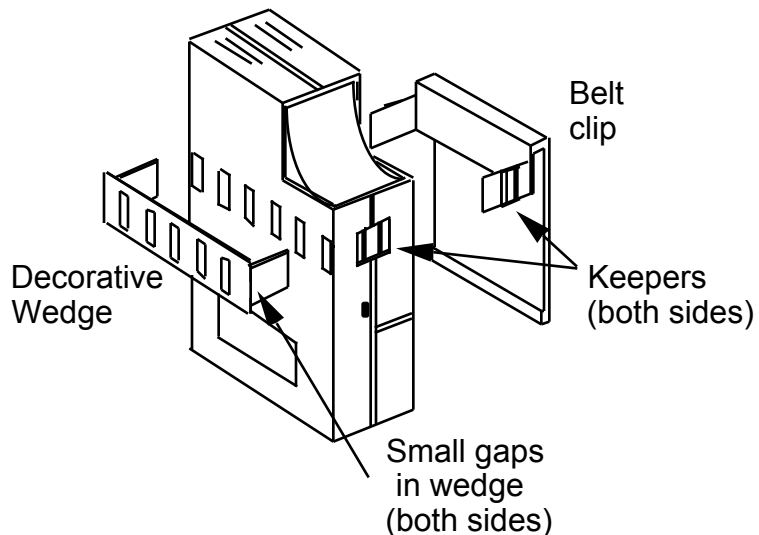
A.3.2 The belt clip can be placed on either the right side or the left side, allowing easy operation by either right or left handed people. If you wish to move the belt clip to the opposite side, proceed as follows:

A.3.2.1 Turn your PAT/S so the narrow side is facing you.

A.3.2.2 Insert a blunt object in the small gaps of the decorative wedge and gently lift the wedge away from the PAT/S. Remove the wedge from the PAT/S.

A.3.2.3 Remove the belt clip by gently pressing the keepers and sliding the belt clip from the PAT/S. Insert the belt clip on the opposite side of the PAT/S.

A.3.2.4 Reinstall the decorative wedge by gently pressing it into the openings opposite the belt clip.



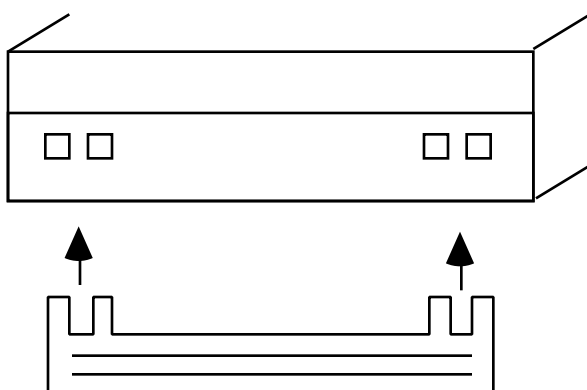
A.4 LOW BATTERY INDICATION

A.4.1 Your PAT/S includes a LOW BATTERY alarm. When the battery has approximately 8 hours of operation remaining, a short audible beep will be heard every 45 seconds. The signal will repeat until a new battery is installed.

A.4.2 NOTE: Use 9 Volt lithium battery for longer life.

A.5 BATTERY COMPARTMENT TOOL

A.5.1 To remove the battery cover insert tool into holes releasing compartment lock located on the bottom of the unit.



A.6 THE OPTIONAL MAN-DOWN FEATURE

A.6.1 Your PAT/S may be equipped with the optional MAN-DOWN feature. The MAN-DOWN alarm will automatically transmit an emergency signal whenever you are in a prone position. The MAN-DOWN feature may be enabled or disabled via an on/off switch.

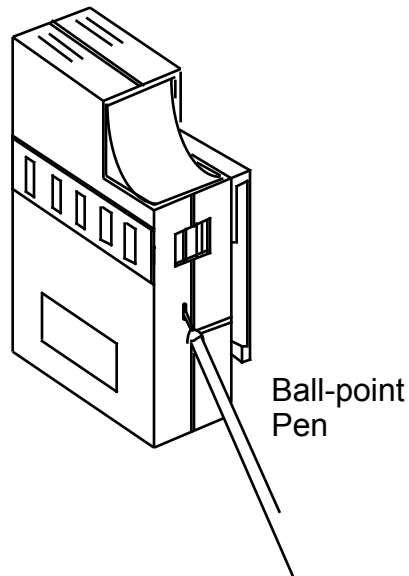
A.6.2 TURN ON the MAN-DOWN feature by inserting a blunt object such as a ball point pen into the small hole located on the side of the unit just below the red alarm button and press the switch into the up position (toward the red button). When ON, your

PAT/S will emit an audible warning tone every time the unit is tilted.

A.6.3 After 4 seconds of warning tone, your PAT/S will activate, sending the alarm signal. Once activated, your PAT/S will continue to transmit until the man-down feature is turned off.

A.6.4 TURN OFF the man-down feature by inserting a blunt object into to the small hole and pressing the switch into the down position (away from the red button).

A.6.5 The MAN-DOWN feature should be turned OFF whenever your PAT/S is removed from your belt or stored.



B PAT/C Model

B.1 SENDING AN ALARM

B.1.1 BY PUSH-BUTTON: ACTIVATE the emergency signal by depressing the gray button located on top of your PAT/C. Once pressed, the button will latch down even though you remove your hand. Your PAT/C will constantly send the emergency signal until it is reset. RESET the PAT/C by pressing the gray button again to release it from its locked position. The button will rise and your PAT/C is now reset.

B.1.2 BY KEEPER SWITCH: Your PAT/C can also be activated by pulling the keeper switch located at its base. This allows the unit to be worn on a breakaway type lanyard, keeper chain, etc. The unit is reset by pushing the gray button on the top.

B.1.3 CAUTION: For proper operation, push the activation button only once. Your PAT/C should remain in its lock activation position until assistance has arrived and the situation resolved.

B.2 LOW BATTERY INDICATION

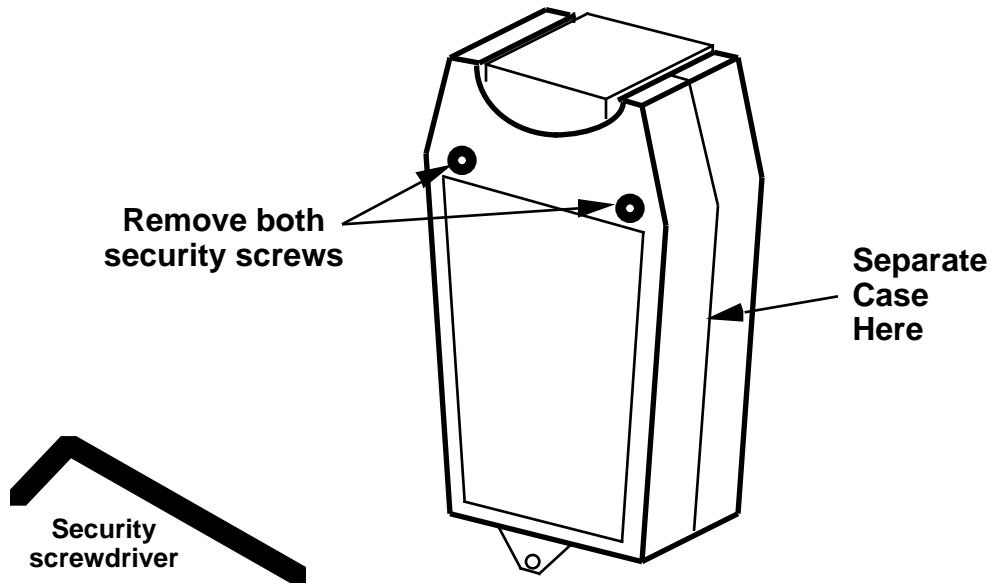
B.2.1 Your PAT/C includes a LOW BATTERY alarm. When the battery has approximately 8 hours of operation remaining, a short audible beep will be heard every 2 minutes. This warning tone will repeat until new batteries are installed. If the warning tone ceases, the battery power has been completely depleted and your PAT will be inoperative.

B.3 INSTALLING NEW BATTERIES

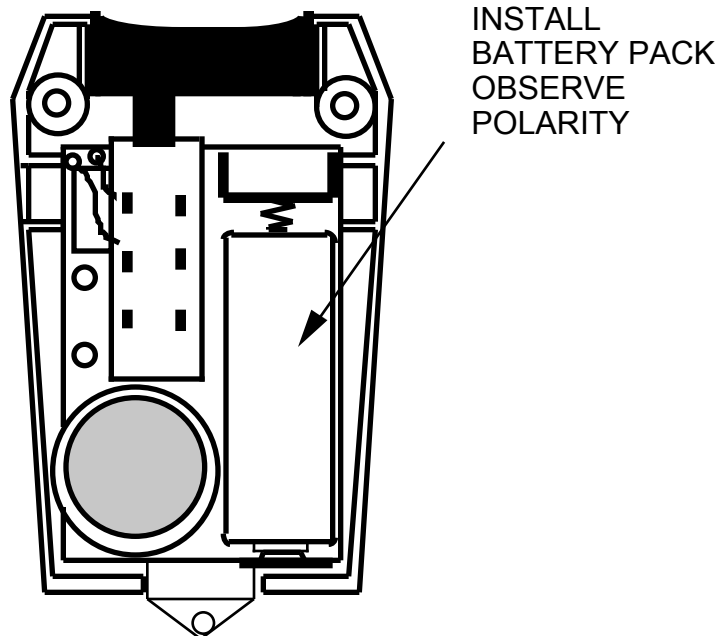
B.3.1 Turn the PAT/C so the back side (with clip) is facing you.

B.3.2 Remove both security screws above the clip with the small security screwdriver provided with the PAT/C.

B.3.3 Separate case.



B.3.4 Remove the old battery pack and install a new one. Observe polarity.



B.3.5 Replace front of case by inserting bottom tab in slot above keeper switch first and then bring case together.

B.3.6 Insert screws and tighten securely.

B.4 WEARING YOUR PAT/C

B.4.1 The PAT/C can be clipped directly on your belt, a pocket, lapel or attached to clothing or break-away necklace with the keeper ring. Wear or carry the unit outside of clothing. Do not cover your PAT/C with heavy jacket, robe or lab coat. The activation button is top center to accommodate either right or left handed people.

B.5 REMOVE AND DISCARD THE PLASTIC TAB PROTECTING THE BATTERIES DURING SHIPMENT BEFORE USING YOUR PAT FOR THE FIRST TIME.

