

INSTALLATION INSTRUCTIONS

OVERVIEW

A Passive Infrared (PIR) Sensor is designed to detect movement in the interior of a structure. The PIR Sensor detects infrared temperature changes such as that which is emitted from the human body. The coverage area of a PIR sensor is divided into several zones and the PIR senses infrared temperature change in these zones. Any sudden thermal movement across these zones will cause the PIR to send an alarm signal to the CPU.

The DS-924 Motion Detector (PIR)...

- contains an RF transmitter capable of transmitting at least 1000 feet open air.
- is powered by a 3.5 VDC Lithium battery which will last 3 to 4 years.
- sends a supervisory signal to the CPU every 69 minutes.
- has a masking kit to mask portions of the coverage.
- can use different lenses to fit installation requirements.
- has a motion lockout feature. Once the transmitter transmits the lockout feature will not allow the transmitter to transmit again for 3 minutes. The lockout feature is designed to prolong the lithium battery life.
- has a built in walk test feature.
- has an operating temperature of 10° to 120° F.

NOTE: It is important to read the Detection Systems instruction (also included) for proper set up and testing of the PIR.

The following are some guidelines for installation:

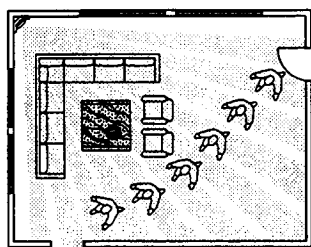
DO...

- try to keep all sensors within 100 feet of the CPU. The 100 foot distance recommendation is given as a starting guideline. The DS-924 has an open air range of at least 1000 feet, but the installation environment will influence this range.
- mount the PIR so there is a reference point (such as a wall) at the end of its detection pattern.
- mount the sensor so that an intruder will most likely walk across the detection pattern. Refer to Fig. 1.
- mount the sensor 5 to 8 feet above the floor.
- mount on an outside wall facing in.
- mount on a surface which is rigid and free from vibration.

DON'T...

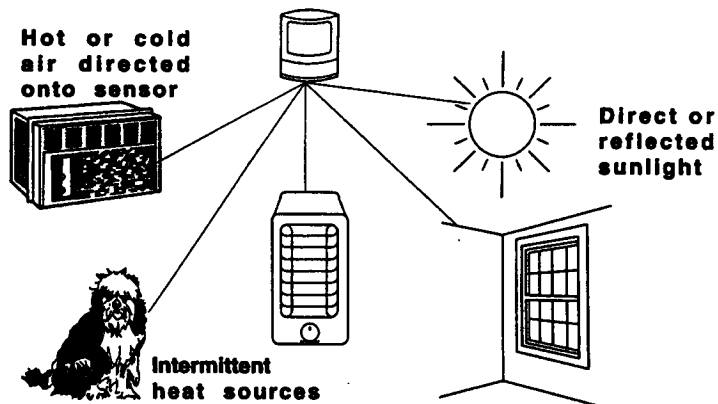
- mount in direct sunlight. See Figure 2.
- aim at air conditioners, heat vents, wood stoves, fireplaces, intermittent heat source, etc., see Figure 2.
- aim at solar heated walls or non-insulated metal walls.
- aim at moving objects (ceiling fan, pets, etc.), see Figure 2.
- mount the sensor where it can be exposed to moisture.
- place in locations where the temperature will exceed the sensor's operating limits of 10° to 120° F.
- mount in areas with excessive metallic surfaces or electrical wiring as these areas may inhibit the sensor's RF signals from reaching the CPU.
- mount in an area where the coverage may be blocked by any temporary items such as boxes or freight.

Figure 1



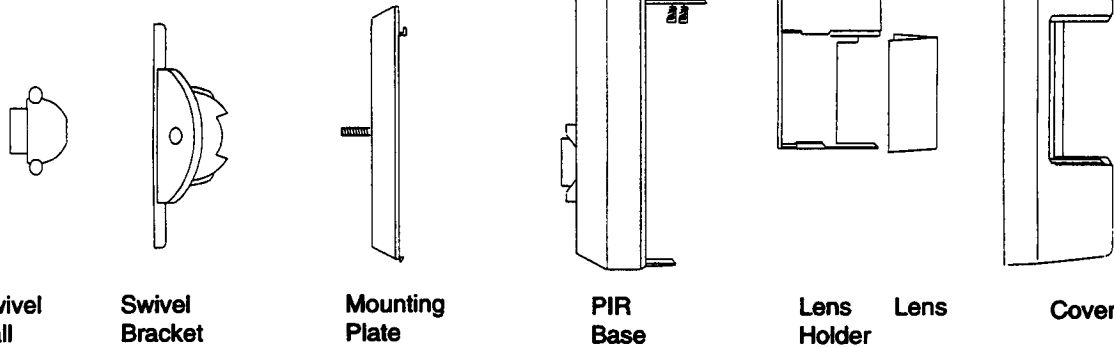
Overhead view

Figure 2



INSTALLATION

Components side view:



MOUNTING WITHOUT SWIVEL BRACKET

1. Remove Mounting Plate by gently pushing in with your thumb and prying it away from the PIR base (Fig 7), then remove PIR cover as shown in Figure 3.

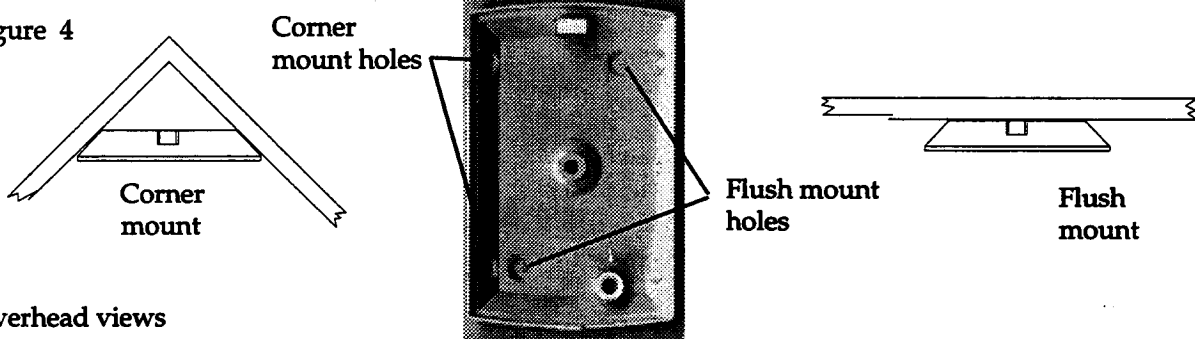
NOTE: If mounting on dry wall or plaster, we recommend drilling a 1/8 " pilot hole first. This will help determine what material is inside the wall then you can determine if a dry wall anchor or if just the #6 x 1" wood screw should be used.

Figure 3



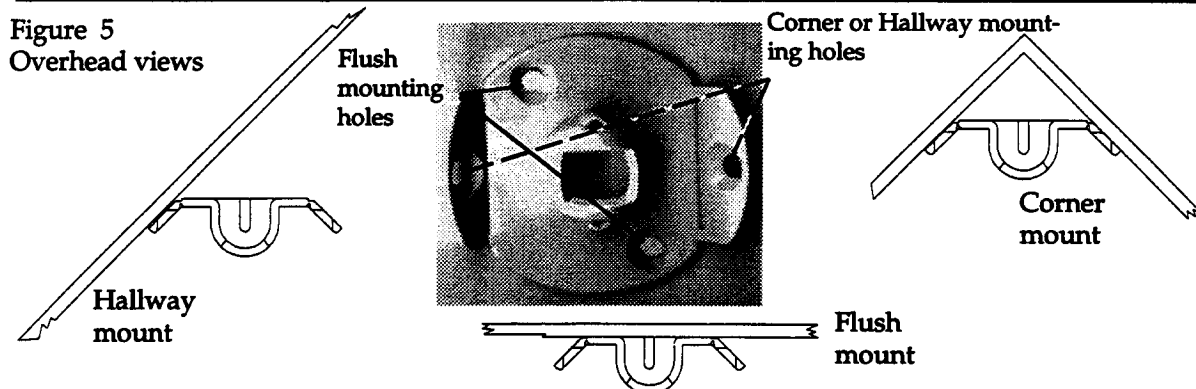
2. Secure the Mounting Plate using either corner mount knock outs or surface mount knock outs according to the installation needs. Refer to figure 4. Use the # 6 x 1" wood screws provided with the PIR.
3. Replace PIR body into Mounting Plate, and secure it to the mounting plate with the Mounting plate screw. Refer to Fig. 8 for screw location.
4. Replace Cover.

Figure 4



Overhead views

Figure 5



MOUNTING WITH SWIVEL BRACKET

1. Remove Mounting Plate by gently pushing in with your thumb and prying it away from the PIR base.

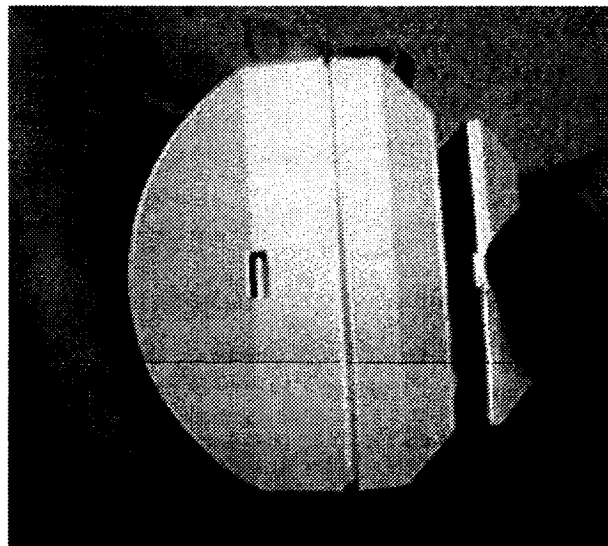
NOTE: If mounting on dry wall or plaster, we recommend drilling a 1/8 " pilot hole first. This will help determine what material is inside the wall then you can determine if a dry wall anchor or if just the #6 x 1" wood screw should be used.

2. Mount Swivel Bracket with # 6 x 1" wood screw for corner mount, flat surface or flat surface with a hallway orientation. Refer to Fig 5.

Figure 6



Figure 7



Securing the mounting plate to swivel bracket

Mounting plate removal

3. Using # 6 x 5/8" metal screw mount Mounting Plate to Swivel Bracket. Tighten until snug Do Not fully tighten screw at this time. Refer to Fig 6.

4. Replace PIR base into Mounting Plate. Check the PIR for correct alignment (refer to Detection Systems instruction for walk test procedure) and when done gently remove PIR base from Mounting Plate and fully tighten metal screw in the Swivel Bracket.

5. Replace PIR base into Mounting Plate, and secure it to the Mounting plate screw. Refer to Figure 8 for screw location.

6. Replace cover.

LENS REPLACEMENT

See the DS924 instructions for details on the different lens coverage and lens replacement. Many lens options are available for the DS924 PIR. If you require a different detection pattern for your application, select the appropriate lens from the DS924 installation instructions. A list of ITI part numbers and associated lens patterns is provided below.

ITI Part No.	Lens Pattern
13-286	Long range Lens
13-287	Pet Alley Lens
13-288	Wide Angle Lens

PROGRAMMING

The programming cable for this PIR must be plugged in backwards (in relation to other ITI sensors) to program correctly.

The open end of the programming cable must face away from the black chip. With the Handheld Programmer, program the PIR as a Motion Sensor, Type 2.

NOTE: The lockout option should not be used on a DS-924 PIR.

SX-V Programming

Typically the sensor number for an SX-V system will be numbers 60-67.

CareTaker Programming

For a CareTaker system use program level 9 or 10. Program the house code.

RF Commander Programming

For an RF Commander system, program sensor number 12 or 13. Program the house code.

NOTE: Refer to the appropriate CPU installation manual for detailed sensor programming information.

WALK TESTING

NOTE: Refer to the Detection Systems installation instructions for specific walk testing procedures.

Figure 8

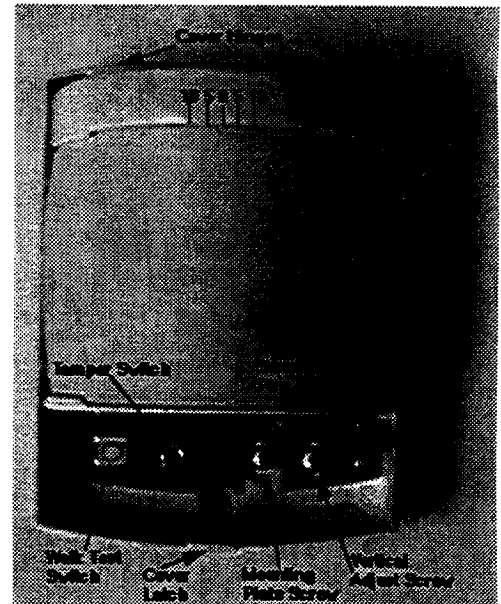
NOTE: Refer to the CPU installation manual for specific testing procedures.

RF TESTING

General guidelines for performing a Dealer Sensor Test are:

1. Open the cover on the PIR and press the Walk Test switch for approximately 3 seconds. Refer to Figure 8 for switch location.
2. Replace the PIR's cover.
3. Using the appropriate touchpad for the CPU, enter the applicable Dealer Sensor Test code for that CPU.
4. Move across the detection pattern until Walk Test LED turns ON, stop your motion.
5. Note the number of beeps (from the CPU) indicating how much of the RF signal (rounds) from the PIR the CPU heard.

NOTE: On Walk Test you must allow 10 seconds between trips. Walk Test will end automatically once the PIR sees no motion for 90 seconds.



Internal view

FCC NOTICE

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference that may be received, including interference that can cause undesired operation.

Changes or modifications not expressly approved by Interactive Technologies, Inc. can void the user's authority to operate the equipment.

INSTALLATION INSTRUCTIONS

INSTALLATION INSTRUCTIONS

DS924/DS924P Passive Infrared (PIR) Intrusion Detectors - Wireless

1.0 GENERAL INFORMATION

The DS924/DS924P are high performance wireless passive infrared (PIR) intrusion detectors designed to provide an alarm signal upon the detection of an intruder moving into or through its coverage pattern.

Technology designed into the DS924/DS924P is based on the transmission of infrared energy; all objects transmit infrared energy. The warmer an object is the more infrared energy transmitted. With two balanced sensing elements combined with receiver technology, the DS924/DS924P detect the change in infrared energy that occurs when a target passes through its view, a stable background.

A coverage pattern, consisting of sensor fingers (to detect the target) is arranged in a side-by-side array. The total number of fingers will be determined by the type of optical lens used. The fingers are grouped by opposite polarity into pairs or zones (see page 4 for standard and optional patterns).

The DS924/DS924P use Motion Analyzer Processing (MAP) to determine alarm conditions. MAP provides the detectors with outstanding catch performance and unsurpassed false alarm immunity.

- **INPUT POWER:** 3.6 VDC; 5 micro-amps (μ a) typical when the Walk Test LED is disabled. Power is supplied by a 3.6 volt, .85 ah, 2/3AA lithium battery (Saft LS3 or equivalent).

- **ESTIMATED BATTERY LIFE:** Over 5 years under recommended testing and operating conditions. Battery life is dependent upon transmitter activity and current draw.

- **COVERAGE:**

Broad (Standard on DS924)	35' by 40'
Pet (Standard on DS924P)	35' by 40'
Barrier	35' by 3'
Narrow Pet	60' by 7'
Long Range	70' by 7'
Dense Wide Angle	35' by 110°
Dual Corridor	(2) 70' barriers and 35' by 35' center

- **INTERNAL COVERAGE POINTABILITY:** +2° to -10° Vertical; \pm 10° Horizontal. Each 2° of movement equals 1 1/4 feet of pattern shift at 35 feet. (The supplied bracket allows an external form of pointing.)

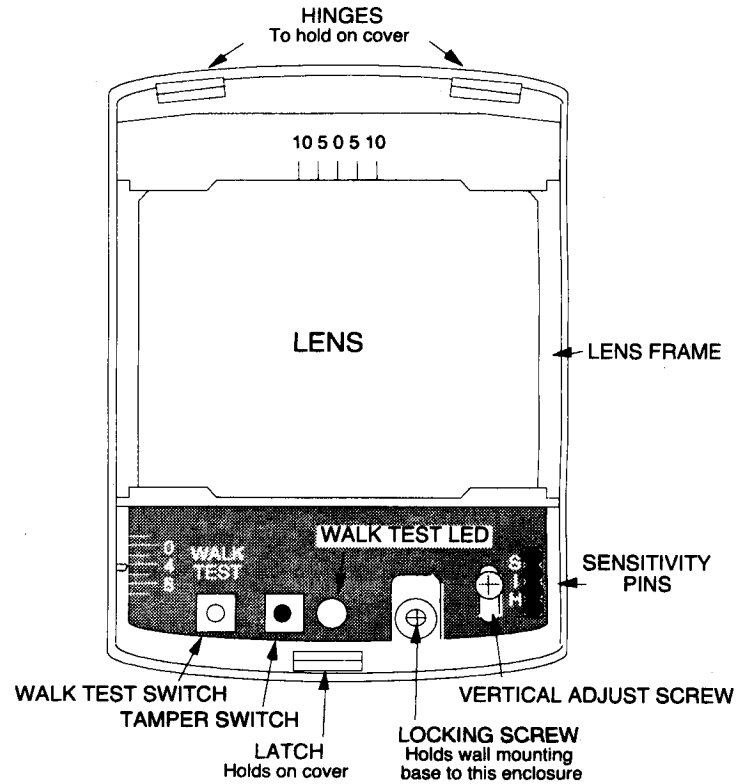
- **SENSITIVITY:** Field selectable for Standard, Intermediate, or High Sensitivity.

- **ALARM OUTPUT CONDITIONS:** Solid state, low on alarm output; $V_{sat} = 0.1V$ typical @ 750 μ a. No alarm = 2.7 Megohm pull-up to V_{batt} .

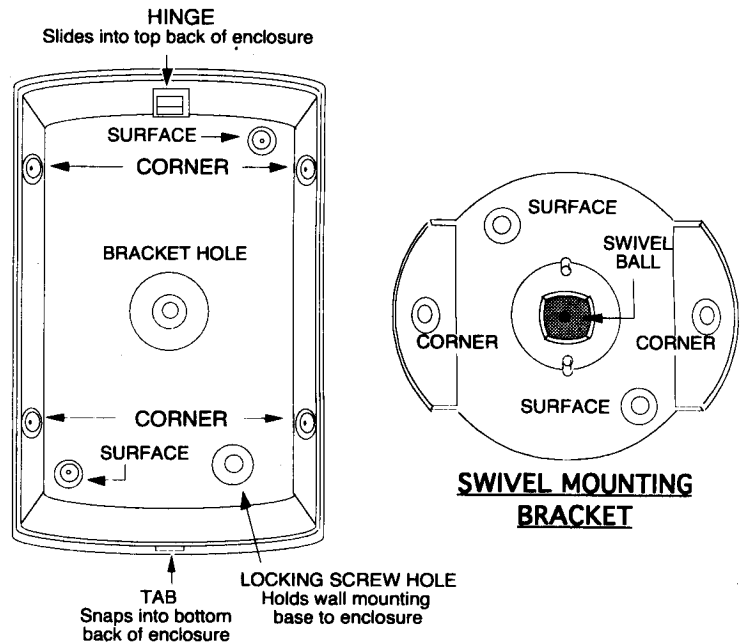
- **TAMPER:** A cover activated tamper switch results in an open circuit when the cover is removed. The tamper switch is grounded when the cover is on.

- **TEMPERATURE:** The storage and operating range is -20°F to +120°F (-29°C to +49°C). UL Temp. range is +32° to +120°F (0° to +49°C).

- **OPTIONAL LENSES:** OLS (Standard on DS924), OLB94 Barrier, OLP94 Pet Avoidance (Standard on DS924P), OLR94 Long Range Barrier, OLV94 Wide Angle, OLC94 Dual Corridor, and OLN94 Narrow Pet. OLN94 is not for use in UL certificated installations.



FRONT VIEW OF ENCLOSURE WITH COVER OFF



WALL MOUNTING BASE

2.0 MOUNTING

Select a location likely to intercept an intruder moving across the coverage pattern. Review pattern side views on page 4 to estimate best mounting height. Recommended mounting height is 6½ feet. Maximum height is 10 ft (DS924). For the DS924P, see "Pet Lens Considerations" on page 3.

- **Always pre-test the detector location. Hold the detector in the desired mounting location, then ensure it activates the control panel.**

NOTE: Do not mount the detector near large metal objects (e.g. heating ducts) which may absorb or reflect some of the transmitted radio signals.

2.1 Surface or Corner Mounting (without swivel bracket)

- Remove the unit's cover by gently inserting a screwdriver into the notch at the bottom of the cover.
- Completely loosen the wall mount base screw.
- Remove the wall mounting base from the enclosure by pulling it up and out from the bottom with your thumbnail.
- Punch out 2 appropriate holes (surface or wall mount) in the wall mount base (see page 1, bottom drawing).
- Using the rear of this base as a template, mark the location of the punched-out holes on the mounting surface and pre-start the mounting screws.
- Firmly mount the wall mount base.
- Skip to "Attaching the Enclosure" below.

2.2 Swivel Bracket Mounting

- Mount the swivel bracket to the mounting surface using the corner or surface mount screw holes. If surface mounting, the corner mount tabs may be removed.
- Loosely start the swivel ball screw through the wall mount base's center hole and into the grey swivel ball.
- Aim the wall mount base in the desired direction and tighten the screw.

2.3 Attaching the Enclosure

- Attach the enclosure to the wall mount base by sliding the top rear hole of the enclosure over the hinge at the top of the wall mount base. Now snap the bottom into place.
- Tighten the wall mounting base screw to secure the enclosure to the wall mount.
- Replace the cover by sliding the two tabs at the back top of the cover into the hinges of the enclosure, then snap the bottom into place.
- For added security, the cover may be screwed to the latch protruding from the bottom inside of the enclosure. The screw hole in the cover needs to be punched-out.

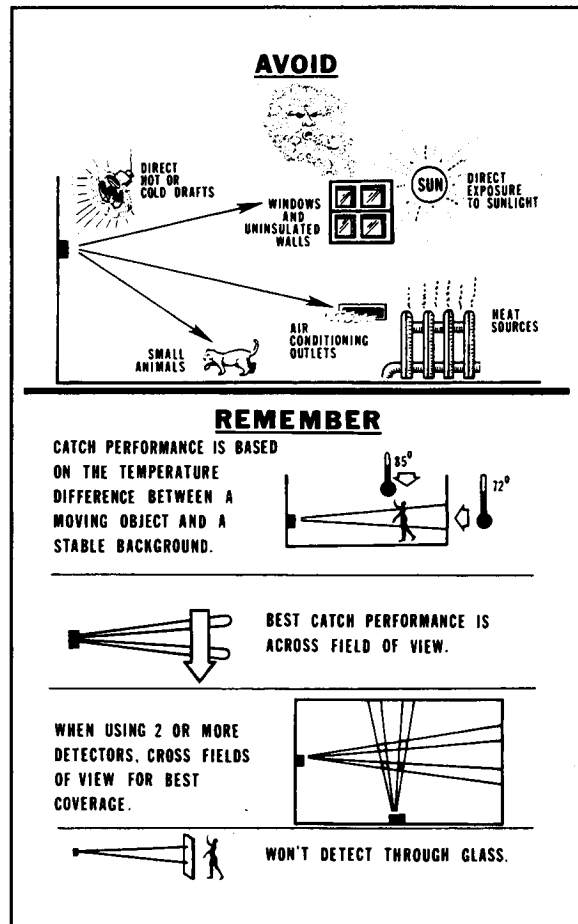
3.0 SET UP FOR WALK TESTING

Choose the proper coverage pattern. If it is necessary to replace the lens, perform the following:

- Remove the cover of the detector.
- Remove the existing lens by grabbing each side and pulling it away from the unit.
- Replace with the appropriate lens by inserting the corners of the lens behind the tabs in the lens frame. Install the new lens with its smooth side facing out (toward you) and the rough side facing inward. The cut corners indicate the top.

- The coverage pattern may be aimed by moving the circuit board and/or lens. The circuit board adjusts by loosening the vertical adjust screw and sliding the circuit board up or down.

Note: The coverage pattern may be subject to an increase or decrease in length when swiveling the unit up or down.



4.0 SENSITIVITY SELECTION

Locate the Sensitivity pins. Select a setting of Standard, Intermediate, or High.

- **Standard Sensitivity:** The recommended setting for Broad coverage patterns. Tolerates environment extremes on this setting. Not recommended for Long Range or Barrier type patterns.
- **Intermediate Sensitivity:** The recommended setting for Long Range or Barrier type patterns; or for any location where an intruder is expected to cover only a small portion of the protected area. Tolerates normal environments on this setting.
- **High Sensitivity:** Fast response to intruder signals. For use in quiet environments where thermal and illumination transients are not anticipated.

For selection, place the shorting cap across the pin pairs as shown below:



Note: If the shorting cap is not used or incorrectly mounted, the detector defaults to Intermediate.

5.0 WALK TESTING

Press the Walk Test switch. This will start a Walk Test Mode timer with a time period of about 75 seconds.

- When the Walk Test mode is activated, any activity in the detector's coverage pattern will cause an alarm and causes the Walk Test Mode timer to re-start. After activation, repeated pressing of the Walk Test switch has no effect on the timer; only alarms will reset the timer.

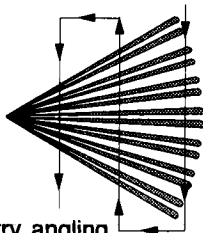
NOTE: Use the Walk Test Activation switch only for walk testing and setup. Repeated or prolonged use in the walk test mode will reduce expected battery life.

The detector is shipped with its battery installed and power applied. However, if the battery was just replaced, wait at least three minutes after applying power to activate the Walk Test mode. (Refer to the Input Power section on page 1 for voltage and type. Observe proper polarity when installing a new battery.)

Replace the cover and snap it into place to close the tamper switch.

NOTE: Walk testing should be done across the coverage pattern.

- The edge of coverage is determined by the first flash of the walk test LED. This will change depending upon the sensitivity setting.



Walk test the unit from both directions to determine the boundaries.

- If rated range can not be achieved, try angling the coverage pattern up or down to assure the pattern is not aimed too high or low. The angle of the pattern may be adjusted by aiming the swivel bracket and/or vertically positioned between -10° and $+2^\circ$ by loosening the Vertical Adjust screw to slide the circuit board up or down. Sliding the board up will angle the pattern downward.

Tighten the screw when positioning is completed.

- The pattern may also be moved $\pm 10^\circ$ horizontally by rotating the lens left or right.

6.0 FINAL

Turn on all heating and air conditioning sources that normally would be active during the protection period. Stand away from the unit and outside the coverage pattern, then monitor for alarms.

- After set up and tests are completed, and there has been no activity in the detector's coverage pattern for approximately 75 seconds, the Walk Test LED will flash to indicate the unit is automatically disabling the Walk Test mode and the LED. This will maximize battery life.

NOTE: When the Walk Test mode is disabled, an alarm can be transmitted only after three (3) minutes have passed since the previous alarm. This three minute lockout time reduces unnecessary transmissions in high traffic areas and extends battery life.

7.0 OTHER INFORMATION

7.1 Maintenance

- At least once a year, the range and coverage should be checked in accordance with the section "Set Up and Walk Testing."
- To assure continual daily operation, the end user should be instructed to walk through the far end of the coverage pattern to assure an alarm output prior to arming the system.

7.2 Detection coverage gaps

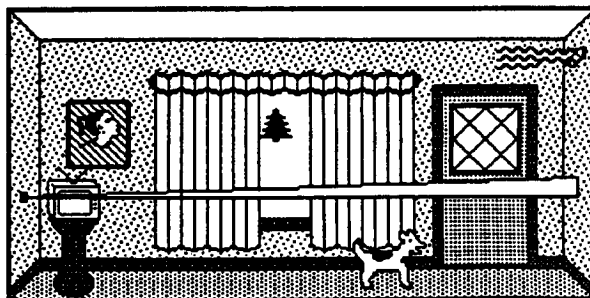
- Detection gaps may exist on units mounted over 6 1/2 feet high. Use of the swivel bracket may affect the size of coverage gaps. In such cases, gaps can be minimized by adjusting the coverage pattern downward. The result of this, however, will be some loss of forward range. If rated range and minimum gaps are desired, the unit should not be mounted higher than 6 1/2 feet from the floor.

7.3 Transmitter connections

- +3.6V and GND connections are used to provide +3.6 volts and ground to the radio transmitter.
- TAMPER connection is at ground with the cover on. Radio requires a pull-up resistor.
- ALARM connection provides low on alarm. Maximum sink current = 750 μ A.

8.0 PET LENS CONSIDERATIONS

The Pet Lens provides protection in installations where pets move about freely. Suggested mounting height is 3 to 5 feet.



- Because the unit will be installed lower than normal, position it to have a clear line-of-sight across the room.
- To provide an accurate safety margin, install the unit no lower than twice the height of the pet, but never lower than 3 feet.
- Make sure the field of view is free of all furniture or other objects upon which the pet could climb or jump, resulting in unwanted alarms.

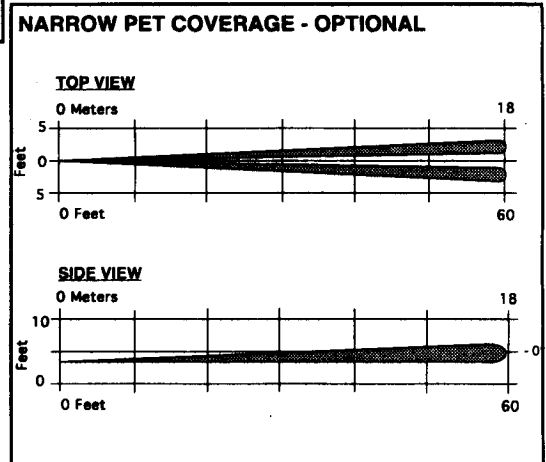
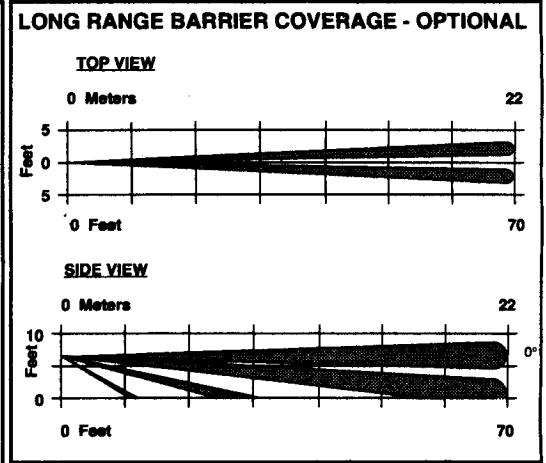
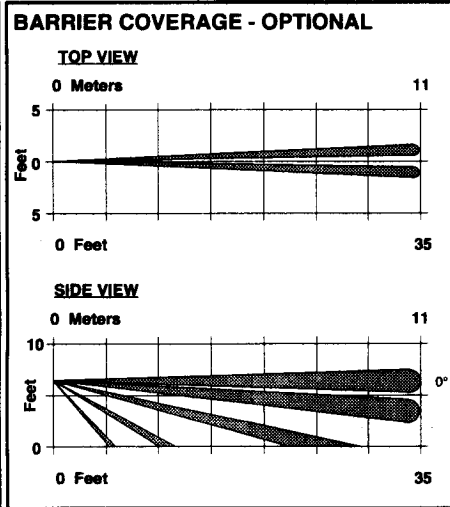
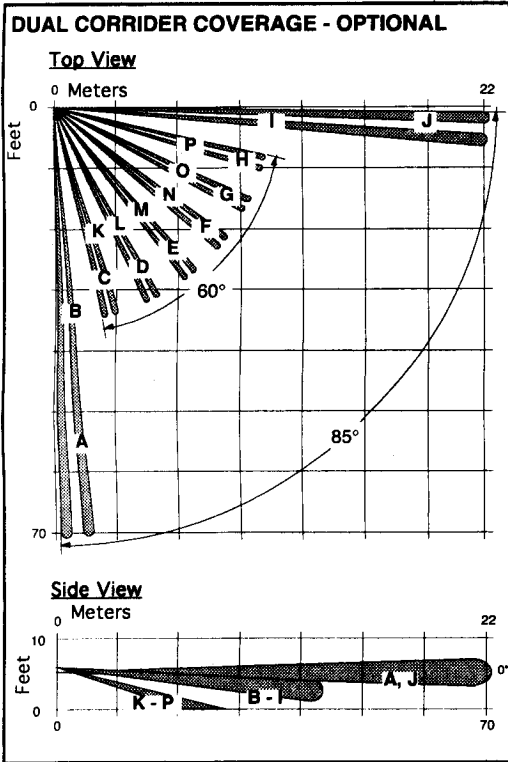
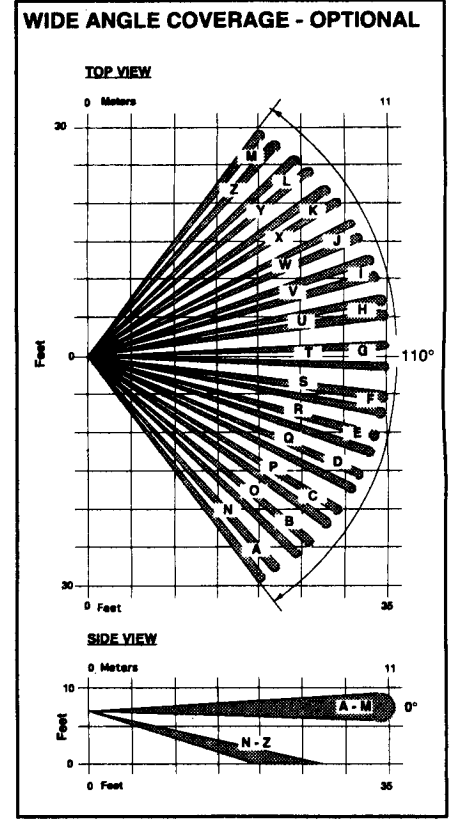
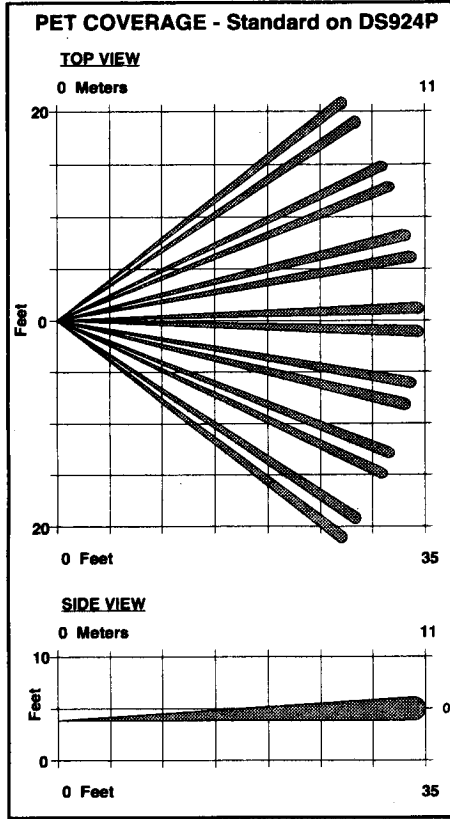
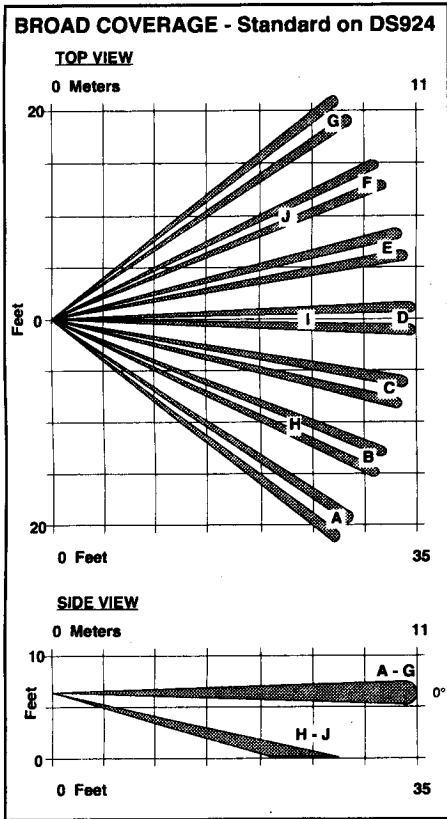
9.0 COVERAGE MASKING

A masking kit for the standard lens is provided. This can be used to eliminate part of the coverage pattern. To mask part of the coverage, perform the following:

- Select the part of the coverage pattern to be masked using the drawings on page 4.
- Peel the desired masking label from the kit and apply it to the inside of the lens.

10.0 PATTERNS

• The patterns are shown with the circuit board at 0°



• For units mounted at 6.5 feet, a good starting angle is -4°. For units using the Pet or Narrow Pet lens mounted between 3 and 5 feet, a good starting angle is 0°.



Printed on recycled paper

