Nos. 450, 450-6, 450-12
ULTRASONIC DETECTORS (B)

GENERAL INFORMATION

The Nos. 450, 450-6 and 450-12 Ultrasonic Motion Detectors emit invisible and inaudible sound waves which detect the presence of a moving object (such as an intruder). Each unit contains a receiver transducer and a transmitter transducer which may be independently aimed straight ahead or up to 45° to either side. The units mount flat against a wall (or ceiling) without any need for brackets.

The No. 450 is powered from a plug-in transformer (included and contains a rechargeable standby power supply. The Nos. 450-6 and 450-12 require power from a 6V. DC and 12V. DC source respectively and do not need nor contain, built-in standby power. Except as noted herein, these instructions apply equally to the Nos. 450, 450-6 and 450-12.

Each of the detectors can provide indoor protection for an area up to approximately 30 feet long and 14 feet wide. Additional detectors can be used in larger areas without interfering with each other.

The pattern of sound waves emitted by these units is set up by reflecting off of walls, ceiling, floor, furniture and other stationary objects in the area. Any movement of objects or persons in the area causes some waves to be reflected at a changed frequency (known as the Doppler effect). When the frequency of the received waves changes, the shift is detected by the electronic circuitry in the unit and an alarm signal is initiated via a relay wired into the protective circuit of the alarm system.

Normally, the detector's transmitter and receiver will operate at all times regardless of whether the control to which it is connected is ARMED or DISARMED. Whenever (and while) motion is detected, the unit's LED will light and its relay contacts will transfer. Alternatively, when the detector is connected to a control that can provide a suitable switched voltage signal to indicate the control's ARMED or DISARMED state, the detector can be programmed to provide optional modes of LED, relay and transmitter operation. See OPTIONAL OPERATING MODES herein.

The Nos. 450-6 and 450-12 have an additional provision for use of an external LED which can duplicate remotely the indication of the detector's built-in LED.

An optional remote monitor is available (such as the No. 453) for connection to up to two detectors. It indicates disturbance levels in the protected area(s) and can be used with a chart recorder for a permanent record of disturbance levels and alarm conditions. Complete instructions accompany the remote monitor.

PRELIMINARY PRECAUTIONS:

Inspect the area to be protected carefully before installing any units. Even though the detector contains circuitry to minimize such effects, there are conditions, as described below, which may appear as motion to the detector and result in unwanted alarms. When determining a location for the unit, take care to avoid the following:

AIR CURRENTS such as created by space heaters, air conditioning vents, rising heat from radiators or baseboard heaters and strong drafts, or walls that shake when traffic passes. Locate the unit on a sturdy inside wall wherever possible.

HIGH-PITCHED SOUNDS from telephone bells or radiator valves located directly in the area to be protected.

MOVING OBJECTS such as house pets or other animals on the premises as well as hanging objects that tend to sway or open doors that can be moved by air currents.

TELEVISION SETS WITH REMOTE CONTROL. The 40 KHz signal used by the detector may interact with some TV sets equipped with remote control. This may be checked prior to installtion by placing the unit in the same room with the TV and applying its power with the TV on. If there is interaction (erratic TV channel switching, etc.), the transmitters in model Nos. 450 and 450-6 may be programmed (by cutting a jumper) to turn off automatically while the main control is disarmed (see OPTIONAL OPERATING MODES). The No. 450-12 should not be used in the same room if there is TV interaction.

Note: If TV interaction involving the TV's remote ON/ OFF control occurs, the detector must be re-aimed and/or relocated so as to avoid interaction.

The best location for the unit is 4 to 7 feet from the floor, safely away from drafts.

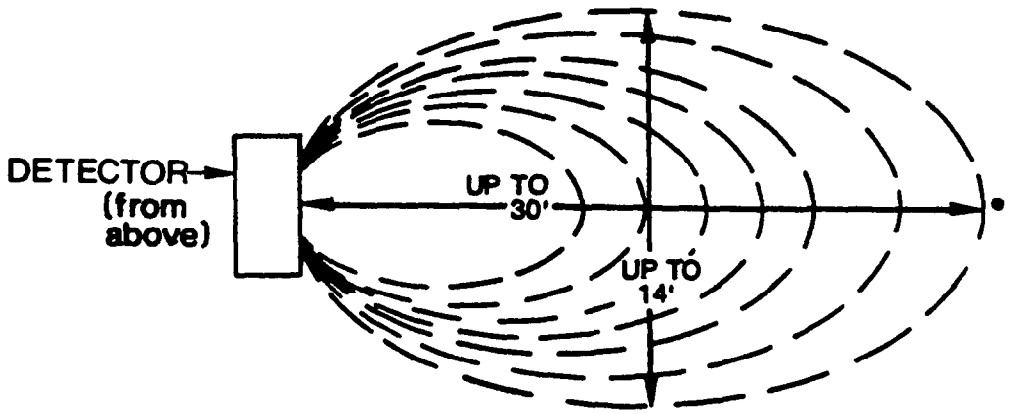


Diagram 1: Coverage Pattern

COVERAGE CONSIDERATIONS:

The pattern of the ultrasonic waves emitted by the detector (when aimed straight ahead) is oblong and at maximum sensitivity has a nominal range of up to 30 feet and a width of approximately 14 feet. Actual coverage, however, is affected by these factors:

ORIENTATION AND AIMING: With the detector mounted with its long dimension vertical, its transmitter and receiver transducers can be aimed straight ahead or from side to side.

SURFACE REFLECTION: In areas that have highly reflective surfaces, coverage is greater because the surfaces are hard and easily reflect ultrasonic waves. Glass, tile floors, mirrors, walls and most solid surface areas are considered reflective surfaces.

INSTALLATION AND WIRING

Mounting:

The detector is designed for mounting flat against the wall. Mounting brackets are not necessary. When mounting on a metal surface, use the insulating hardware kit included with the detector to isolate the unit's chassis from ground.

The unit should normally be mounted with its long dimension vertical to permit its transducer heads to be aimed to the side or straight ahead as required. If desired, however, any mounting position may be used, including ceiling mounting.

WIRING CONNECTIONS

See Diagrams 3a, 3b, 4a and 4b. Connections should be made in this order:

1. Terminals NO, C and NC: To connect to a closed circuit protective system, use terminals NO and C.

2. Remote Terminals GND and SIG are provided for optional connection to a Remote Monitor (such as No. 453). If used, see instructions with the monitor. (The No. 453 is powered from the AC line via its individual transformer and cannot be powered from the detector's power source.)

   Note: For the No. 450-6 or 450-12, the GND connection must be taken from the negative (-) DC power input terminal (see Diagram 3b).

3. (Nos. 450-6 or 450-12 Only) Optional External LED. Connect as shown in Diagram 3b. Also cut the YELLOW jumper on the PC board (see Diagram 4b). Note: The LED's positive (+) lead may be run directly from the DC source if the run is shorter than from the detector.

4. Control Post and Options: See OPTIONAL OPERATING MODES. If one of the options is to be selected, run the necessary lead(s) between the detector(s) and the main control and cut the necessary jumpers. CAUTION: If either of the "Transmitter Day Shut Off" options is selected, do not cut jumpers until completing steps 5 and 6 and the ADJUSTMENT AND TESTING and TURBULENCE WARNING SYSTEM sections.

   a. (No. 450 Only) 12V. AC Terminals: Connect the No. 1320 Transformer (supplied) to these terminals and plug it into a 120V. AC outlet that is on for 24 hours a day. Make certain that the outlet cannot accidentally be turned OFF, so that the No. 450's built-in standby battery remains charged.

   b. (No. 450-6 Only) 6V. DC Terminals: Connect these terminals to a 6V. DC source that can provide 90 ma continuously. Observe polarity! Continuous auxiliary capacities for some typical controls are:

No. 1022:	150 ma	No. 330R-25, 340R-25:	250 ma
No. 1023:	350 ma	No. 332R-50, 342R-50:	750 ma
No. 1024:	200 ma		

   c. (No. 450-12 Only) 12V. DC Terminals: Connect these terminals to a 12V. DC source that can provide 48 ma continuously. Observe polarity!

6. (No. 450 Only) Battery Lead: Disconnect the unit's RED battery lead from the DUMMY POST on the PC board and connect it to the +6V POST (see Diagram 4a). If unit is removed from service for any reason, RED Lead must be replaced on DUMMY POST to prevent damage to battery.

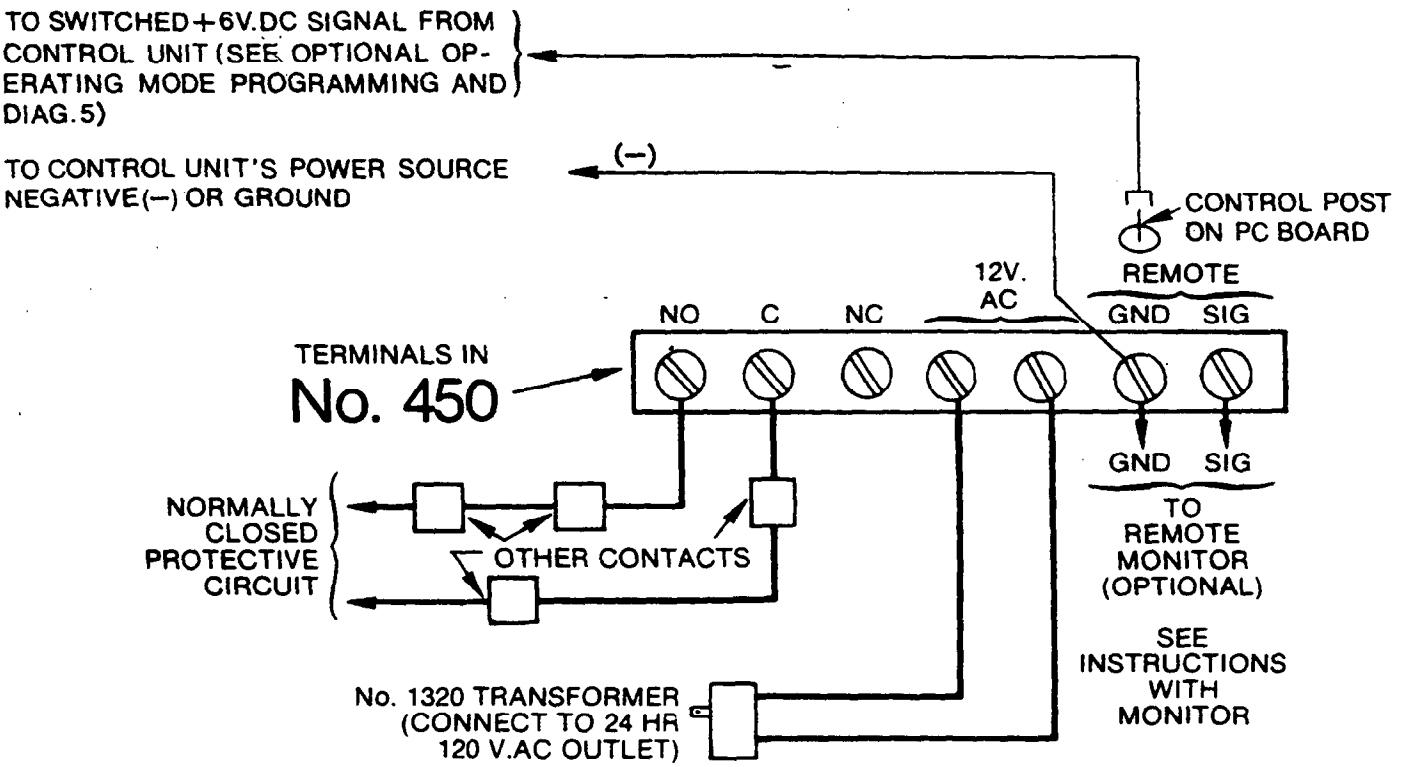


Diagram 3a: TERMINAL CONNECTIONS, No. 450 Only

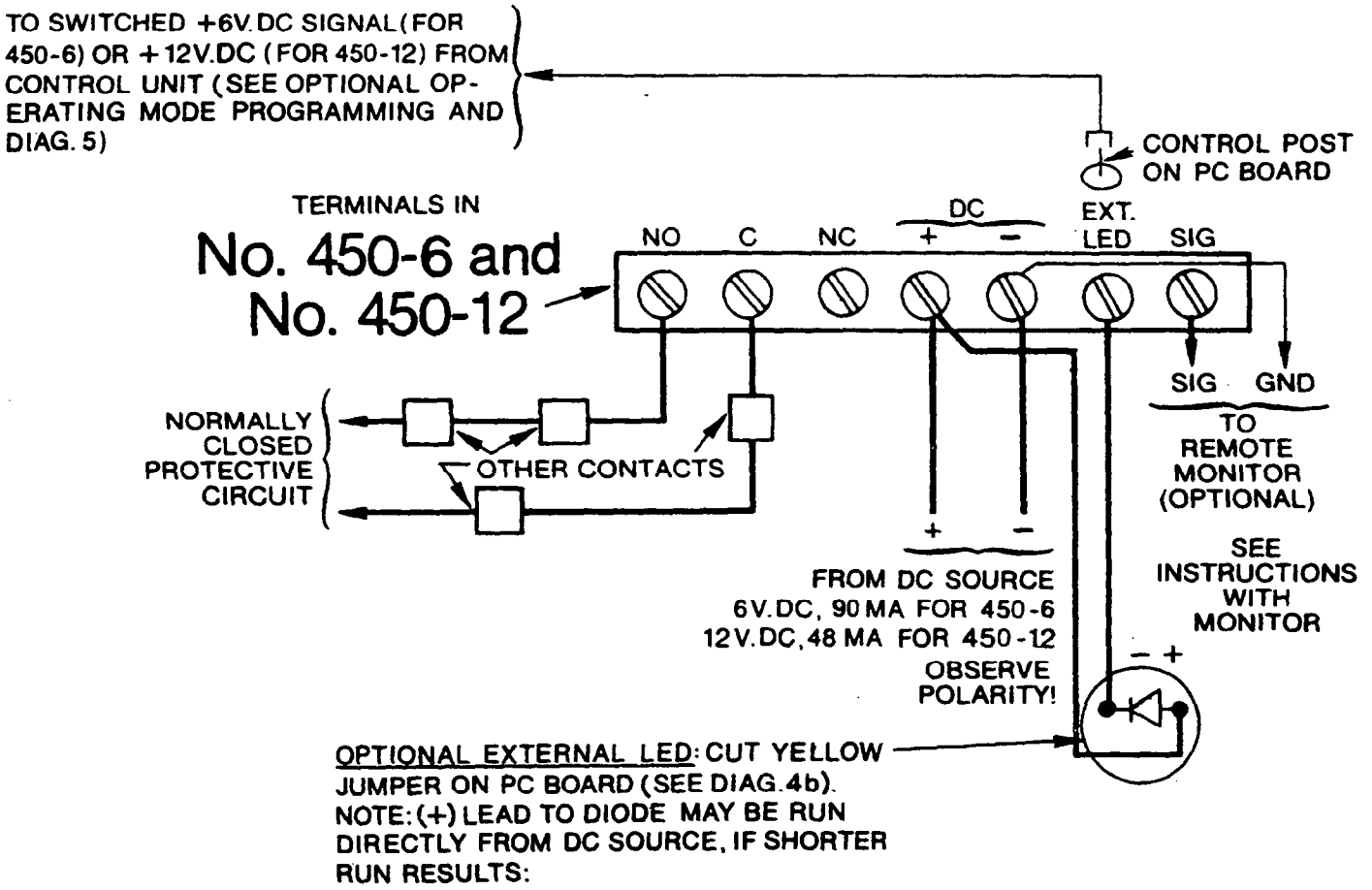


Diagram 3b: TERMINAL CONNECTIONS, Nos. 450-6, 450-12 Only

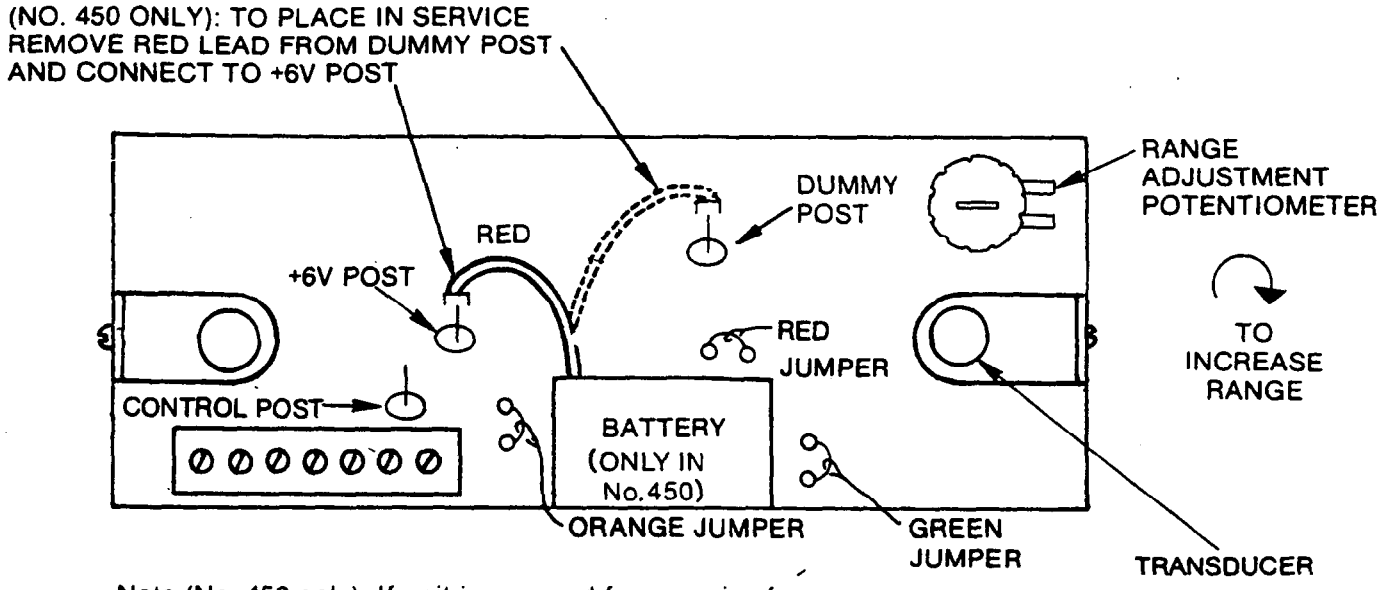


Diagram 4a: No.450; POST, JUMPER AND ADJUSTMENT LOCATIONS

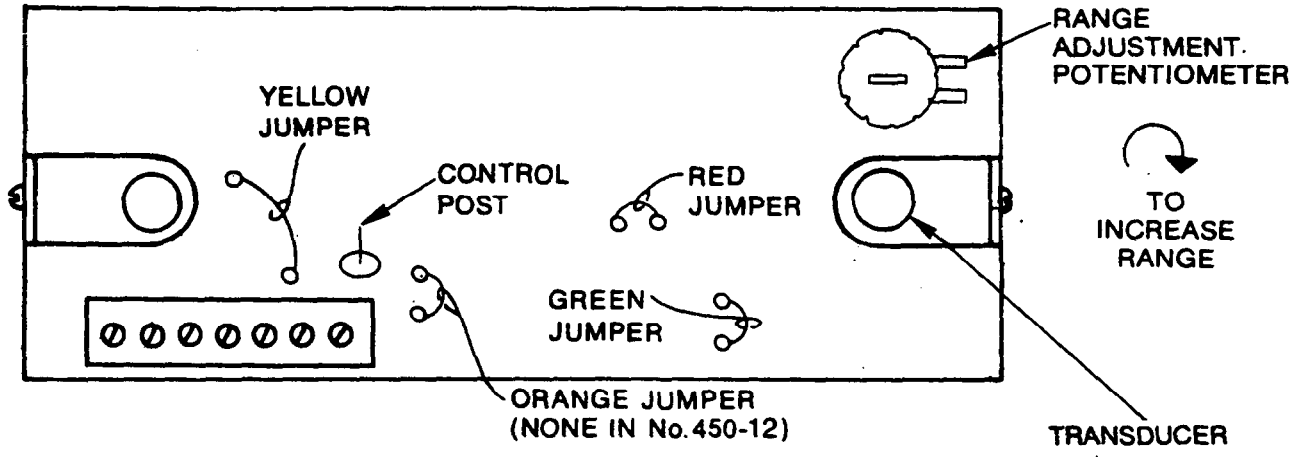


Diagram 4b: Nos. 450-6, 450-12; POST, JUMPER AND ADJUSTMENT LOCATIONS

OPTIONAL OPERATING MODES:

As shipped from Ademco, each detector's LED and relay will function together, at all times, regardless of whether the main protective system control is ARMED or DISARMED. While motion is detected, the LED will light and the relay contacts will transfer.

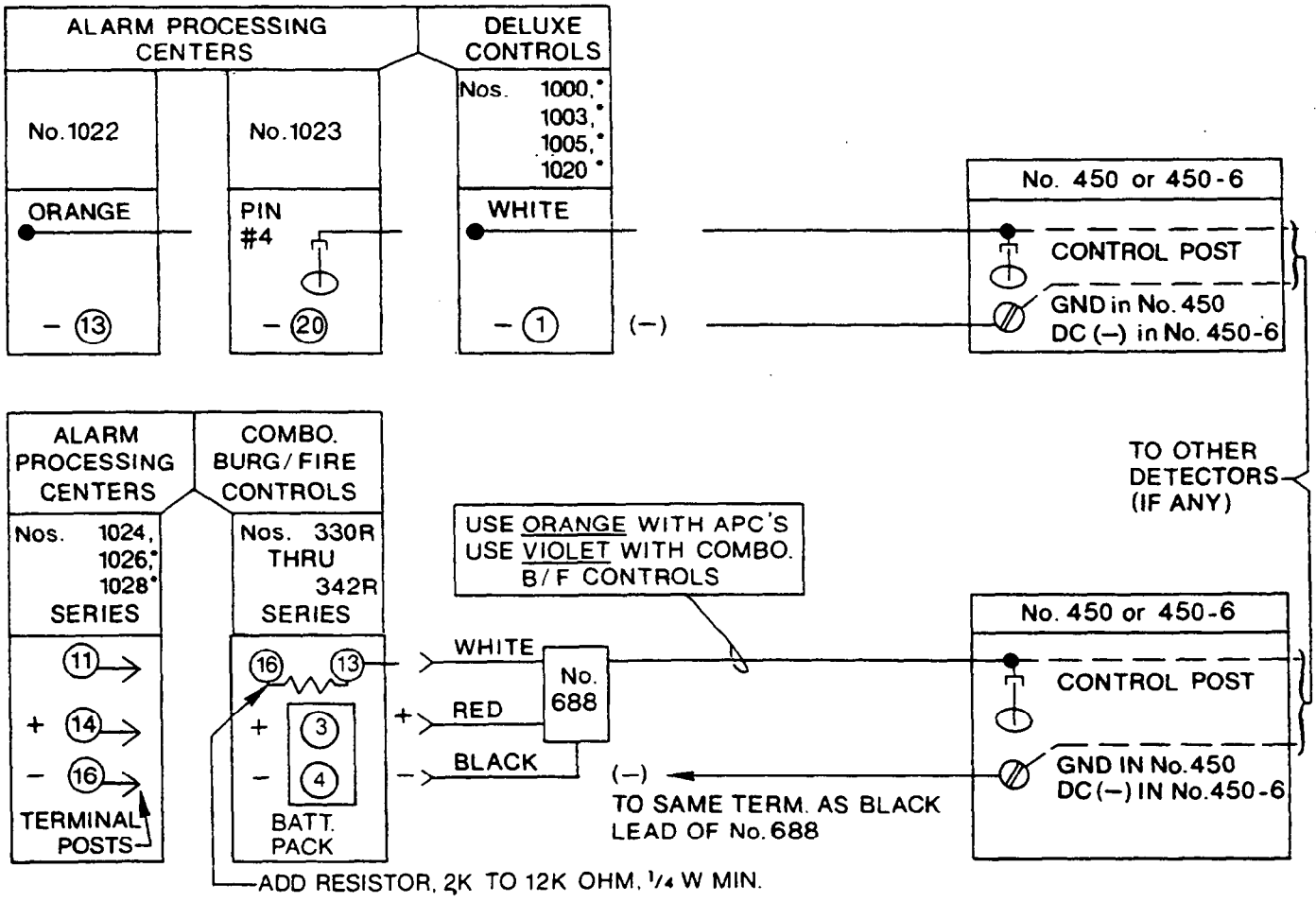
When used with a control that can provide a suitable switched voltage to the detector's CONTROL POST to signal whether the control is ARMED or DISARMED, the detector can be programmed (by cutting various combinations of jumpers on the unit's PC board) to provide optional modes of operation as described in this section.

Switched Voltage Signal for CONTROL POST

CAUTION: Before cutting jumpers, make sure that the control can provide the proper switched voltage signal to the CONTROL POST, as shown in the following table:

	REQUIRED CONTROL POST SIGNAL		
MODEL NO.	SYSTEM DISARMED	SYSTEM ARMED	INPUT IMPEDANCE
450, 450-6	+6V	0V	10K ohms
450-12	0V	+12V	50K ohms

Diagram 5 shows typical sources of switched positive (+) control voltage signal for Nos. 450 and 450-6. Note that some controls permit direct connection to the detector and others require a No. 688 Opening/Closing Switching Module to be used between the control and the detector.



* CAUTION: Controls with (*) may not be used to provide 6V. DC power for No. 450-6 Detectors. A separate power source (such as a No. 492 or 493 Battery Pack) would be required for detector power.

Diagram 5: TYPICAL SOURCES OF SWITCHED (+) CONTROL VOLTAGE SIGNAL FOR OPTIONS

CONTROL OPTIONS AND PROGRAMMING

In all of the options described below, the detector relay will be silent and inactive (remain locked in) during the DISARMED period. During the ARMED period the relay will transfer to the alarm position whenever motion is being detected.

The options are programmed by cutting the colored jumper(s) on the PC board. See Diagrams 4a and 4b for locations.

The options are summarized in the tabulation at the end of this section.

1. Night LED Disable Option: In this mode the LED (and any remote LED) will be inactive (remain OFF) during the ARMED period and active (indicate when motion is being detected) during the DISARMED period. TO SELECT: CUT THE GREEN JUMPER.

2. Intrusion Memory Option: In this mode the LED(s) will be inactive during the ARMED period but should an intrusion occur in the protected area the alarm relay will transfer and this fact will be stored in the detector's memory. When the system is DISARMED, the LED on any detector which had signaled and stored an alarm will light and remain lit until cleared. The LED memory can be cleared by momentarily ARMING and then DISARMING the system. The LED(s) will then respond ON and OFF normally to motion detected in the protected area during the DISARMED period. TO SELECT: CUT THE GREEN AND THE RED JUMPERS

3. (Nos. 450 and 450-6 Only) Transmitter Day Shut-off Option with Intrusion Memory):

   IMPORTANT: Before exercising this option, see the "ADJUSTMENT and TESTING" and "TURBULENCE WARNING SYSTEM" SECTIONS. Otherwise, the ORANGE jumper will have to be temporarily reconnected to perform walk testing with a visual LED indication.

   In this mode, the detector's transmitter will shut off during the DISARMED period and thus eliminate possible interaction with TV ultrasonic remote control devices used in the same area. The intrusion memory will function as in option 2 above, but the only LED indication will be the intrusion memory status during the DISARMED period. TO SELECT: CUT THE GREEN AND THE RED AND THE ORANGE JUMPERS.

   Note: With this option selected, a remote monitor (such as the No. 453) may not be used.

4. (Nos. 450 and 450-6 Only) Transmitter Day Shut-off Option (No LED Function):

   IMPORTANT: Before exercising this option see the "IMPORTANT" notice under option 3. It applies here as well.

   In this mode, the detector's transmitter will shut off as in option 3 above, but there will be no intrusion memory function. The LED will be inactive during the ARMED as well as DISARMED periods. TO SELECT: CUT THE GREEN AND THE ORANGE JUMPERS.

DETECTOR OPTION PROGRAMMING SUMMARY

(PROPER CONTROL POST VOLTAGE SIGNAL REQUIRED. SEE INSTRUCTIONS)

OPTION	JUMPERS CUT	DETECTOR FUNCTION			
		CONTROL ARMED		CONTROL DISARMED	
		LED	RELAY	LED	RELAY
AS RECEIVED	NONE	ACTIVE	ACTIVE (NORMAL)	ACTIVE (WALK TEST)	ACTIVE
NIGHT LED/ DAY RELAY DISABLE	GREEN	INACTIVE (OFF)			INACTIVE (LOCKED IN)
INTRUSION (LED) MEMORY	GREEN, RED			INTRUSION MEMORY AND (AFTER RESET) ACTIVE (WALK TEST)	
XMTR DAY* SHUT-OFF (WITH LED MEMORY)	GREEN, RED, ORANGE*			INTRUSION** MEMORY ONLY	
XMTR DAY* SHUT-OFF(WITHOUT LED MEMORY)	GREEN, ORANGE*			INACTIVE** (OFF)	

*NOT AVAILABLE ON MODELS 450-12, 454-12. **FOR LED WALK TEST, ORANGE JUMPER MUST BE INTACT. YELLOW JUMPER (IF PRESENT) ENABLES OPTIONAL REMOTE LED WHEN CUT.

ADJUSTMENT and TESTING

IMPORTANT: No. 450 and 450-6 Only) If either Transmitter Day Shut-off Option is to be selected, follow the procedure in this section before exercising that option.

The adjustment and testing of the detector should be conducted with the protected area cleared of all people. In some business establishments it will be more convenient to do this after hours. The protective system's control should be OFF during the procedure to prevent unwanted alarms from being sounded.

NOTES: Do not attempt to set individual protection ranges for more than 30 feet.

Generally it is best to keep individual protection ranges to a minimum, protecting strategic areas and not entire rooms or large sections of open space.

1. Remove the front cover from the detector.

2. Aim the transmitter and receiver transducers as required for the area to be protected. Refer to Diagram 1. Each transducer may be released for aiming by temporarily loosening its securing screw located at the end of the chassis. Aiming up to 45° to either side of "straight ahead" is possible.

   Caution: If a transducer is turned more than 45°, it is designed to prevent the cover from being replaced.

3. Adjust the Sensitivity Control located on the chassis (clockwise to INCREASE, counterclockwise to DECREASE range) to obtain the desired coverage as evidenced by WALK TESTS conducted as follows:

   a. With no motion in the protected area, the light on the detector should be OFF.

CONTROL OPTIONS AND PROGRAMMING

In all of the options described below, the detector relay will be silent and inactive (remain locked in) during the DISARMED period. During the ARMED period the relay will transfer to the alarm position whenever motion is being detected.

The options are programmed by cutting the colored jumper(s) on the PC board. See Diagrams 4a and 4b for locations.

The options are summarized in the tabulation at the end of this section.

1. Night LED Disable Option: In this mode the LED (and any remote LED) will be inactive (remain OFF) during the ARMED period and active (indicate when motion is being detected) during the DISARMED period. TO SELECT: CUT THE GREEN JUMPER.

2. Intrusion Memory Option: In this mode the LED(s) will be inactive during the ARMED period but should an intrusion occur in the protected area the alarm relay will transfer and this fact will be stored in the detector's memory. When the system is DISARMED, the LED on any detector which had signaled and stored an alarm will light and remain lit until cleared. The LED memory can be cleared by momentarily ARMING and then DISARMING the system. The LED(s) will then respond ON and OFF normally to motion detected in the protected area during the DISARMED period. TO SELECT: CUT THE GREEN AND THE RED JUMPERS

3. (Nos. 450 and 450-6 Only) Transmitter Day Shut-off Option with Intrusion Memory):

   IMPORTANT: Before exercising this option, see the "ADJUSTMENT and TESTING" and "TURBULENCE WARNING SYSTEM" SECTIONS. Otherwise, the ORANGE jumper will have to be temporarily reconnected to perform walk testing with a visual LED indication.

   In this mode, the detector's transmitter will shut off during the DISARMED period and thus eliminate possible interaction with TV ultrasonic remote control devices used in the same area. The intrusion memory will function as in option 2 above, but the only LED indication will be the intrusion memory status during the DISARMED period. TO SELECT: CUT THE GREEN AND THE RED AND THE ORANGE JUMPERS.

   Note: With this option selected, a remote monitor (such as the No. 453) may not be used.

4. (Nos. 450 and 450-6 Only) Transmitter Day Shut-off Option (No LED Function):

   IMPORTANT: Before exercising this option see the "IMPORTANT" notice under option 3. It applies here as well.

   In this mode, the detector's transmitter will shut off as in option 3 above, but there will be no intrusion memory function. The LED will be inactive during the ARMED as well as DISARMED periods. TO SELECT: CUT THE GREEN AND THE ORANGE JUMPERS.

DETECTOR OPTION PROGRAMMING SUMMARY

(PROPER CONTROL POST VOLTAGE SIGNAL REQUIRED. SEE INSTRUCTIONS)

OPTION	JUMPERS CUT	DETECTOR FUNCTION			
		CONTROL ARMED		CONTROL DISARMED	
		LED	RELAY	LED	RELAY
AS RECEIVED	NONE	ACTIVE	ACTIVE (NORMAL)	ACTIVE (WALK TEST)	ACTIVE
NIGHT LED/ DAY RELAY DISABLE	GREEN	INACTIVE (OFF)			
INTRUSION (LED) MEMORY	GREEN, RED			INTRUSION MEMORY AND (AFTER RESET) ACTIVE (WALK TEST)	INACTIVE (LOCKED IN)
XMTR DAY* SHUT-OFF (WITH LED MEMORY)	GREEN, RED, ORANGE*			INTRUSION** MEMORY ONLY	
XMTR DAY* SHUT-OFF(WITHOUT LED MEMORY)	GREEN, ORANGE*			INACTIVE** (OFF)	

*NOT AVAILABLE ON MODELS 450-12, 454-12. **FOR LED WALK TEST, ORANGE JUMPER MUST BE INTACT. YELLOW JUMPER (IF PRESENT) ENABLES OPTIONAL REMOTE LED, WHEN CUT.

ADJUSTMENT and TESTING

IMPORTANT: No. 450 and 450-6 Only) If either Transmitter Day Shut-off Option is to be selected, follow the procedure in this section before exercising that option.

The adjustment and testing of the detector should be conducted with the protected area cleared of all people. In some business establishments it will be more convenient to do this after hours. The protective system's control should be OFF during the procedure to prevent unwanted alarms from being sounded.

NOTES: Do not attempt to set individual protection ranges for more than 30 feet.

Generally it is best to keep individual protection ranges to a minimum, protecting strategic areas and not entire rooms or large sections of open space.

1. Remove the front cover from the detector.

2. Aim the transmitter and receiver transducers as required for the area to be protected. Refer to Diagram 1. Each transducer may be released for aiming by temporarily loosening its securing screw located at the end of the chassis. Aiming up to 45° to either side of "straight ahead" is possible.

   Caution: If a transducer is turned more than 45°, it is designed to prevent the cover from being replaced.

3. Adjust the Sensitivity Control located on the chassis (clockwise to INCREASE, counterclockwise to DECREASE range) to obtain the desired coverage as evidenced by WALK TESTS conducted as follows:

   a. With no motion in the protected area, the light on the detector should be OFF.

b. Walk into the protected area from several different points. The range of protection can be determined by observing the light on the detector, it will light whenever the unit triggers (motion in the area) and go out when the unit restores (area is still).

c. The walk test is best conducted by walking toward or away from the unit rather than across its coverage pattern.

d. It should be kept in mind that the unit has a built-in delay. Expect to see motion detection only after 2 steps have been taken.

e. Any high-pitched noise or vibration in the area should be noted during the tests, since they may be responsible for unwanted triggering of the unit.

4. Replace the unit's cover when proper coverage has been obtained. Make sure the hole for the walk test light lines up with the LED on the chassis.

5. Test standby operation (No. 450 Only) by unplugging the line transformer. Make sure that the battery in the No. 450 has had a chance to charge for at least an hour before checking. The system should continue to operate with the transformer unplugged; however, the walk test LED will not function.

TURBULENCE WARNING SYSTEM

IMPORTANT: Nos 450, 450-6 Only) Perform this prior to exercising either Transmitter Day Shut-off Option, if one is to be selected.

The detector's "Turbulence Warning System" can provide a check for the presence of air turbulence if difficulties have been experienced with setting the main protective system control. With turbulence present the unit may remain in the alarm condition and the control cannot be set, or a false alarm may occur later.

1. Move in front of the detector to trigger it. Then stand still. If turbulence is present in the area, the walk test light will remain on or take much longer than normally (one or two seconds) to go out (restore).

2. Refer to the PRELIMINARY PRECAUTIONS section on Page 74. If the cause of turbulence cannot be located and eliminated, the sensitivity setting of the unit may have to be reduced or the transducers in the unit re-aimed to obtain stable operation. An optional remote monitor (such as the No. 453) can be used to provide additional data on turbulence and other disturbances.

MAINTAINING PROPER OPERATION and COVERAGE

In order to maintain the detector in proper working condition, it is important that the following be observed by the user.

1. Power should be provided at all times.

   a. (No. 450 Only): The plug-in transformer should be kept in its socket and continuous 120V. AC supplied to it so that the standby battery remains charged.

   b. (Nos. 450-6 and 450-12 Only): The unit's DC source should have standby power available for emergencies.

2. Units should never be relocated without the advice or assistance of the alarm service company.

3. The physical surroundings of the protected area should not be changed. If furniture or stock is moved, or air-conditioning or additional heating is installed, the system may have to be readjusted by the alarm service company.

GENERAL SPECIFICATIONS

		No. 450	No. 450-6	No. 450-12
Physical:	Width:	4 1/2" (11.4 cm)	(same)	(same)
	Height:	10 1/8" (25.7 cm)		
	Depth:	2" (5.1 cm)		
Electrical:	Voltage:	12V. AC from No. 1320 Plug-in Transformer (supplied)	6V. DC	12V. DC
	Current:	0.3A	90 ma	48 ma
	Standby:	12 hrs. with built-in rechageable battery (No. 582, supplied)	None built-in	None built-in

TROUBLESHOOTING Nos. 450, 450-6, 450-12 (B) Nos. 454, 454-6, 454-12 (B)

The following assumes a detector operating "as received". If optional operating mode has been selected, relay and/or LED operation may vary, depending on the option. It is advisable to reconnect cut option jumpers when troubleshooting.

TROUBLE 1: UNIT GOES INTO ALARM INTERMITTENTLY FOR NO APPARENT REASON AND WALK-TEST LIGHT GOES ON WHEN ALARM CONDITON EXISTS.

	CAUSE	REMEDY
A.	Sensitivity control set too high. Attach remote ultrasonic monitor (such as No. 453) to unit and check signal level when area is "still". Confirm absence of high background level. Check for two step walk sensitivity in protected area.	Readjust unit's sensitivity control. See ADJUSTMENT AND TESTING.
B.	Air turbulence is causing stationary objects to appear to move. Use remote ultrasonic monitor (eg. No. 453) to check signal level when there is no motion in the area. Confirm presence of high background level.	Locate source of turbulence. May be from heaters, vents, air conditioners, fans, blowers or drafts. Eliminate or direct air flow away from unit or aim unit away from turbulence or reposition unit if necessary. See TURBULENCE WARNING SYSTEM section. Walk-test system after adjustment to confirm coverage.
C.	Drafts and creating motion in drapes, display material or overhead lighting fixtures. Attach ultrasonic monitor (eg. No. 453) and check signal level when area is "still". Confirm presence of high background level.	Locate source of motion. Eliminate motion or aim unit away from source of motion or reposition unit if necessary. Walk-test unit after adjustment to confirm coverage.
D.	Ultrasonic noise is introducing frequencies which are similar to those which result from the presence of a moving object. Attach ultrasonic monitor (eg. No. 453) and check signal level when area is "still". Confirm presence of high background level. Turn nearby equipment and machinery on and off and note effect on background level. Ring telephone and observe the effect.	Check for machinery or escaping air or steam which may be causing ultrasonic noise. Telephones and other bells may also have an ultrasonic component. It may be possible to aim the transducers away from the noise source or reposition the unit to minimize noise pickup if the noise cannot be diminished, changed or eliminated so as to avoid ultrasonic interference.

E.	Birds or other small animals are entering area (particularly in warehouses).	Check for and eliminate all possible entry points for birds, cats, dogs, rodents, etc. Contact exterminator if necessary.

TROUBLE 2: UNIT GOES INTO ALARM INTERMITTENTLY OR CONTINUOUSLY FOR NO APPARENT RESON AND WALK-TEST LIGHT DOES NOT COME ON WHEN ALARM CONDITION EXISTS.

	CAUSE	REMEDY
A.	(Nos.450,454 only) Transformer not plugged into a 24 hour AC outlet. With no AC supplied, the unit's standby battery may be depleted to a point where the alarm relay will drop into the alarm state. When AC is restored the battery recharges and the process repeats when AC is again removed. Note: Walk-test LED is designed to remain off during AC power interruption in order to conserve battery power as well as to indicate that AC has been interrupted.	Check for presence of AC for 24 hours per day on outlet. Do not use switched outlets or outlets controlled by timers.
B.	(Nos.450,454 only) Transformer or wiring malfunction which deprives detector of AC supply.	Disconnect AC power wires from detector and check for presence of 12V. AC at output terminals of transformer. If absent, replace transformer. If present, check for 12V. AC across power wires at detector. If absent, wiring is defective. Check wires for opens and shorts.
C.	(Nos. 450-6, 450-12, 454-6, 454-12 only) DC voltage supply to detector from panel or power supply is inadequate or absent. PROPER POLARITY ON DC POWERED UNITS MUST BE OBSERVED.	Check for proper DC voltage at terminals of detector. If absent, check for proper voltage at panel or power supply terminals with wiring disconnected. If present, wiring to detector is faulted. Check for open and shorted conditions in wiring. If proper DC voltage is absent, consult instructions for panel or power supply.

TROUBLE 3: RELAY OPERATES NORMALLY BUT WALK-TEST LIGHT DOES NOT OPERATE.

	CAUSE	REMEDY
A.	(Nos. 450, 454 only) System operating from standby battery (AC absent) and battery charge not yet depleted.	See TROUBLE 2 and CAUSE/REMEDY 2A.
B.	LED malfunction. Check for broken or shorted leads.	Return Unit to Ademco for service (obtain Return Authorization Number from Ademco before returning.)

TROUBLE 4: AREA OF COVERAGE CHANGES.

CAUSE	REMEDY
A. Customer has repositioned furniture or equipment in premises, or customer has adjusted range control.	Caution customer that changes in layout can affect coverage. Readjust or relocate the unit according to Installation Instructions. Be certain that unit has not been tampered with.
B. Substantial change in temperature and/or humidity in the protected area.	Increase or decrease the sensitivity as necessary to compensate for the changes in conditions. Note: Setting full range under worst case conditions may result in excessive range under best case conditions. In areas where conditions vary widely some compromise may be necessary to achieve reliable coverage under all conditions.

TROUBLE 5: UNIT DOES NOT APPEAR TO BE OPERATING.

CAUSE	REMEDY
A. Unit is not receiving power.	Check for presence of appropriate input voltage at terminals of unit. (Nos. 450, 454 only) Be certain that unit's battery lead has been moved from DUMMY (shipping/storage) POST to its active +6 V. DC POST.
B. Sensitity Control at MINIMUM.	Increase sensitivity control to achieve proper walk-test. Use of remote ultrasonic monitor (eg. No. 453) would be helpful in avoiding trouble caused by background conditions. See TROUBLE 1 and its CAUSES AND REMEDIES.

NOTES ON NOS. 450 AND 454 ULTRASONIC DETECTORS (B VERSION)

The CONCEPT 450 series of Ultrasonic Intrusion Detectors has been both expanded and improved in what is known as the "B" version. The new series of the Nos. 450 and 454 Ultrasonic Intrusion Detectors incorporates a 6 volt DC unit which can be powered from an Alarm Processing Center, Deluxe Control or Combination Control having a suitable rechargeable power supply.

In addition, all the new 450 and 454 detectors have improved sensitivity and crosswalk response for better catch without sacrificing the immunity to false alarms which was the hallmark of the original 450 and 454. When used in conjunction with a control which has the ability to indicate its armed/disarmed status with a switched DC voltage, you can select:

1. WALK TEST LIGHT DISABLE AT NIGHT
2. ALARM MEMORY
3. SILENT RELAY DURING THE DAY
4. TRANSMITTER SHUT-OFF DURING THE DAY

The switched voltage to indicate the panel status may be provided over a single pair of conductors from any Alarm Processing Center (except No. 1030); Deluxe Controls Nos. 1000, 1003, 1005, 1020; and Combination Controls Nos. 330R, 332R, 340R, and 342R. The Nos. 450 and 454 use the voltage from the panel, or from a No. 688 Switching Module connected to the panel, to determine their "day" and "night" operating modes.

1. WALK-TEST LIGHT DISABLE AT NIGHT

By cutting a single jumper, the walk test LED can be disabled when the panel is armed. If an intrusion occurs, the relay will signal an alarm with no visual indication (to the intruder) that an alarm has been registered.

In the "DAY" mode (when the panel is DISARMED), the walk-test LED functions normally, indicating that the detector is functioning properly.

2. ALARM MEMORY

By cutting two jumpers, the installer adds individual Alarm Memory to the night LED disable function. If an intrusion occurs while the system is armed, there is still no visual indication to the intruder that the relay in the 450 or 454 has signalled the alarm. The fact that there was an alarm is stored in the memory of each detector which sensed an intrusion.

When the system is disarmed, those detectors which have no stored alarm information will display normal walk-test indication. On any detector which signalled an alarm, the LED will illuminate at this time and remain on to allow the subscriber (or person responding) to walk through the areas and quickly identify those areas in which an intrusion occurred without changing the memory status.

The alarm memory indicators will remain on until the memory is cleared by momentarily re-arming the control panel. The LEDs will then function normally as walk-test indicators.

3. SILENT RELAY DURING THE DAY

Should the sound of the alarm relay during the "day" (disarmed) period be annoying to the subscriber, the capability exists of silencing the relay while in the disarmed state. Simply connect the switched voltage to the unit and the relay will automatically be locked in standby during the disarmed period, but will be fully active when the system is armed.

The subscriber (or installer) will still have a visual walk-test indication but there will be no signal to the protective circuit that motion is present while the system is disarmed. When the system is armed, the relay functions normally. During the disarmed period, the relay is locked into the "silent" mode.

4. TRANSMITTER SHUT-OFF DURING THE DAY

On occasion, interference problems with television remote controls has been encountered, which led to less than ideal field modifications.

Now, by cutting a pair of jumpers, the transmitter(s) can be shut off automatically whenever the panel is disarmed. The alarm relay will be locked-in and thus walk-testing cannot be done while the transmitter is off. The LED will display only alarm memory indications.

When the system is armed, the transmitter comes on, and the detector functions normally.

REMOTE LED INDICATION

On the DC powered detectors (both 6 V. DC and 12 V. DC), a single home run wire may be connected to a remote LED indicator. This LED will exactly duplicate the function of the detector LED, indicating present motion and alarm memory status (if selected as an option).

POWERING THE D.C. DETECTORS

The new 450-6 and 454-6 draw 90 ma., while their companions, the 450-12 and 454-12 draw 48 ma. They may be powered from any panel which can provide filtered DC with adequate current capacity. When selecting remote powered 6 V. or 12 V. DC units, one central power supply can be used for the entire system.

CONTROL		CONTINUOUS CURRENT	MAX NUMBER OF 6 V. DC ULTRASONICS POWERED
1022		150 ma	1
1023		350 ma	3
1024		200 ma	2
330R)			
332R)	-25	250 ma (No. 492)	
340R)	-50	750 ma (No. 493)	2
342R)			8

There is still more than enough capacity in most of the panels to power the 6 volt ultrasonic detectors and still retain the capability to use a digital keypad and digital communicator.