

No.351-12 ULTRASONIC DETECTOR

GENERAL INFORMATION

The No. 351-12 Ultrasonic emits invisible and inaudible sound waves which detect the presence of a moving object such as an intruder. The ultrasonic transmitter saturates an area with a pattern of these inaudible, high frequency sound waves. Its receiving head picks up the sound waves after they have been modified by the "imprint" or "look" of the protected area.

This "look" is achieved by sound waves reflecting off walls, furniture, and other stationary objects in the room. Any movement of objects or persons causes some waves to be reflected at a changed frequency (known as the Doppler effect). When the frequency of the received waves changes from the transmitted frequency, the shift is detected by the electronic circuitry in the unit. This activates a relay wired into the protective circuit of the alarm system.

FINDING THE BEST LOCATION:

Inspect the inside premises carefully before installing. There are certain things to look for, such as air currents and vibrations, which appear as motion to the ultrasonic detector, triggering the alarm. When determining the best location, make certain the following are NOT present:

AIR CURRENTS created by space heaters, air-conditioning vents, rising heat from baseboard heaters and strong drafts on the floor.

VIBRATIONS such as those commonly caused by loose fitting doors and show windows or walls that shake when traffic passes. Always locate the unit on sturdy inside walls.

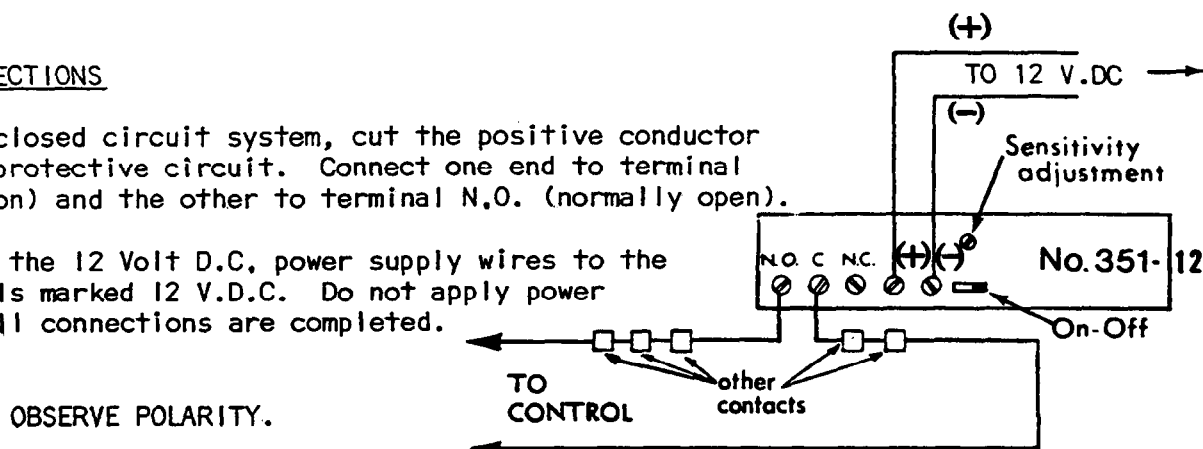
HIGH-PITCHED SOUNDS from telephone bells or radiator valves located directly in the area to be protected.

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

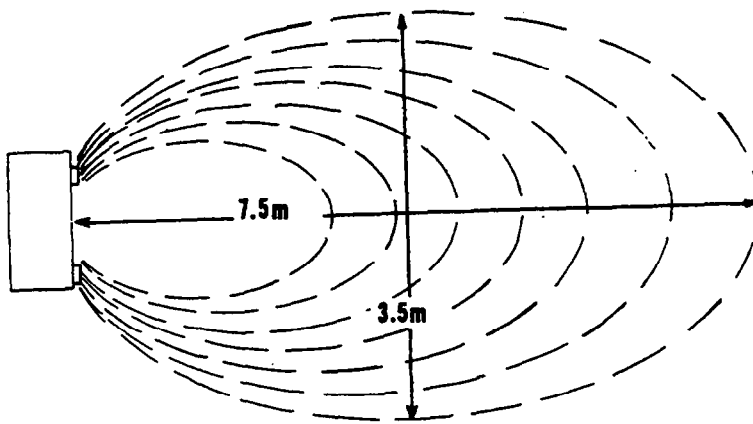
The ideal location for the No. 351-12 Ultrasonic is 1.25-2 meters (4 to 7 ft.) from the floor, safely away from drafts. Do not locate it too near the ceiling since the unit, when angled downward for maximum coverage, will confront the same floor drafts.

WIRING CONNECTIONS

1. In any closed circuit system, cut the positive conductor of the protective circuit. Connect one end to terminal C (common) and the other to terminal N.O. (normally open).
2. Connect the 12 Volt D.C. power supply wires to the terminals marked 12 V.D.C. Do not apply power until all connections are completed.



PATTERN AND RANGE SETTING



The pattern of the ultrasonic waves emitted by the No. 351-12 is oblong. Its range is approximately 7.5 meters long and 3.5 meters wide at its widest point.

The actual operating range of the No. 351-12 will vary according to two factors:

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.

Surfaces containing soft, sound-absorbing material tend to reduce the range of the No. 351-12. Examples of this kind of surface are carpeted floors, draperies, heavy plush furniture, etc.

HUMIDITY

Ultrasonic waves are affected by atmospheric humidity. Between the lowest and highest humidity levels the range can actually change 2:1. Therefore, it is wise to have a limited amount of overflow protection in the area.

ADJUSTING THE RANGE

You can increase or decrease the area to be protected by the sensitivity adjustment located in the rear of the unit. In a highly reflective room, reduce the range by turning the adjustment counter-clockwise. In a highly-absorbent location where the pattern will be smaller, turn the adjustment clockwise to increase the range.

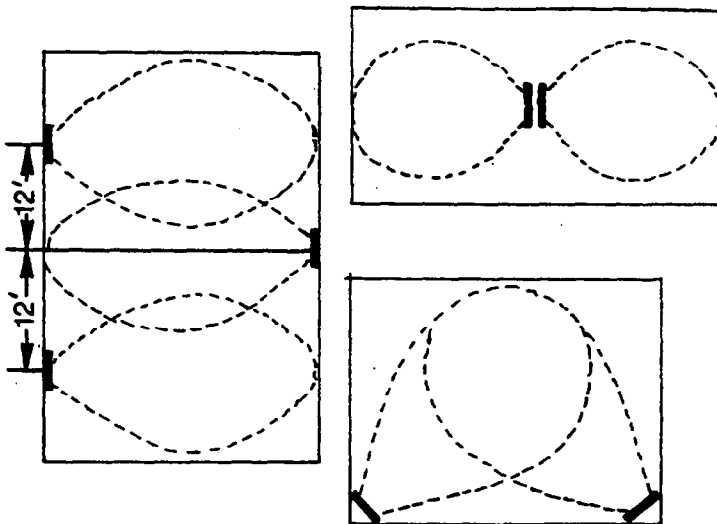
As a general rule, it is always best to keep the range of the No. 351-12 to a minimum: protecting strategic areas and not entire rooms or large sections of open space.

MULTIPLE INSTALLATION

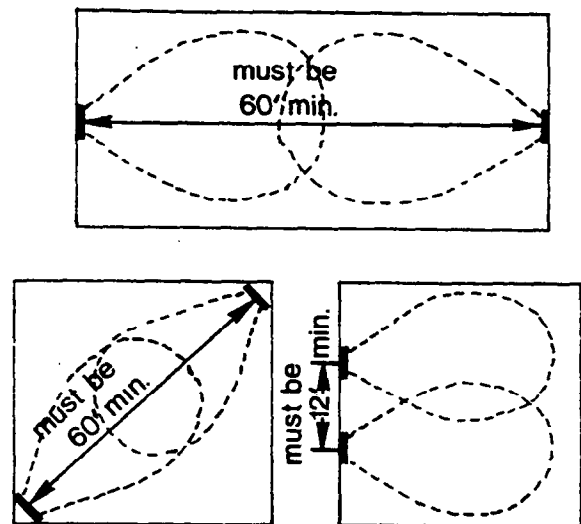
Keeping in mind considerations of surface reflections, humidity, location and other factors, the installation may be laid out.

Any number of No. 351-12 ultrasonics may be placed in the same area without interfering with each other, as long as certain basic rules of positioning are followed. A number of suggested patterns are shown as follows:

SUGGESTED INSTALLATIONS



POOR INSTALLATIONS



Note that for best results, the units should not be directed at each other unless the distance between them exceeds 18 meters. The units can be placed on opposite walls with at least 3.5 meters of space from center to center. Placement in adjacent corners is effective, too. However, don't place the units too close together, as some range shortening can occur.

SETTING AND TESTING

The area should be cleared of all people during the test. We suggest that in some business establishments it may be more convenient to set up the No. 351-12 after hours.

1. Every time the No. 351-12 Ultrasonic triggers, the lamp on the face of the unit will light. When there is no motion in the room (including your own), the test light should be OFF.
2. During the test be alert to any high-pitched noise or vibration in the area.
3. Conduct a walk test by walking into the protected area at several different points. You can determine the range of protection by observing the light.

NOTE: TO CONDUCT A PROPER WALK TEST, ALWAYS WALK DIRECTLY TOWARD OR AWAY FROM THE UNIT, AND NEVER ACROSS IT.

The unit has built-in delay that allows the first one or two steps of your movement to go undetected. Bear this in mind when conducting walk tests.

4. Remember you can control the range of protection by adjusting the sensitivity adjustment in back of the unit. Clock-wise to increase the range. Counter clock-wise to decrease the range. Once the sensitivity control is set, screw in the hinged terminal cover.

UNDERSTANDING THE TURBULENCE WARNING SYSTEM

On the No. 351-12 the "turbulence warning system" serves to check the level of air turbulence in a room throughout the day, making certain it is below the danger level. The "warning system" will prevent the setting of the main control if the turbulence is too high. The walk test lamp will stay lit to warn of this condition, allowing the customer to spot a potential false alarm. Once the turbulence is reduced, the lamp will go out and the customer can set the alarm system for the evening. The "turbulence warning system" now has no effect on the operation of the unit.

In the event that excessive turbulence has forced the unit to trip, the customer should check the premises for signs of new turbulence. If none can be located, the sensitivity adjustment on the No. 351-12 will have to be reset.

WHAT TO ADVISE THE CUSTOMER

It is important to inform the customer how he may maintain the system in proper working condition.

1. Never relocate the unit.
2. Never change the physical surroundings of the protected area. If furniture is moved or air-conditioning installed, the system may have to be readjusted.
3. Never turn the No. 351-12 OFF. It should operate 24 hours a day. No alarm will be transmitted when the control instrument is OFF. If the unit is ever turned OFF while the system is ON, an immediate alarm condition will result.

SPECIFICATIONS:

Voltage: 12 Volts D.C.
Current Drain: 80MA
Frequency: 40 KHz
Dimensions: 241MM x 127MM x 51MM (9 1/2" x 5" x 2")
Weight (net): 1.5 kg. (3 1/4 lbs.)

Optional Equipment: No. 353 Bracket for Wall Mounting (Recommended)
No. 352 "Wood Grain" Case

TROUBLESHOOTING

Nos. 351 & 351-12

TROUBLE: 1. WALK TEST LIGHT DOES NOT OPERATE, BUT RELAY CLICKS .

PROBABLE CAUSE

- A. System operating from standby battery.
- B. Walk test LED burned out.

REMEDY

- A. Check the voltage output of the plug-in transformer and the voltage input at the ultrasonic unit for 12 volts A.C.
- B. LED must be replaced.

TROUBLE: 2. AREA OF COVERAGE CHANGES.

- A. Customer has repositioned furniture or equipment in premises.
- B. Substantial change in the temperature and humidity in protected area.

- A. Caution customer that changes in layout can affect coverage. Readjust or relocate Ultrasonic.
- B. Increase or decrease the sensitivity adjustment according to the change that has taken place.

TROUBLE: 3. UNIT GOES INTO ALARM FOR NO APPARENT REASON.

PROBABLE CAUSE

- A. Drafts or air turbulence are creating the alarm condition.
- B. Birds or small animals are entering building (especially warehouses).
- C. Unit(s) not plugged into a 24-hour outlet.

REMEDY

- A. Check for air ducts and sources of drafts that may have been missed during the initial installation. See "Understanding the Turbulence Warning System".
- B. Check for and eliminate all possible entry points for cats, dogs, birds, etc.
- C. Make certain all ultrasonics are plugged into outlets that are live at all times.

TROUBLE: 4. SOME REMOTE CONTROL TELEVISIONS BEHAVE ERRATICALLY AFTER THE INSTALLATION OF A NO. 351.

PROBABLE CAUSE

No. 351 operates on similar frequency as some remote control televisions.

REMEDY

The 351 can be switched off while the TV is in use, with the built in ON-OFF switch. Note that when the unit is off, the protective circuit relay is open. The system cannot be armed until the 351 is turned ON. If the ON/OFF portion of the TV remote control is responding to the ultrasonic signals, then it is possible that with the 351 ON and transmitting, the TV

set may be turned on without warning.
In such a case, the unit must be re-
aimed or relocated.

TROUBLE: 5. UNIT IS NOT OPERATING (NO. 351-12 ONLY).

PROBABLE CAUSE

Unit is not receiving power.

REMEDY

Check for presence of 12 volts D.C.
input at rear of unit.