

Nos. 347, 347-12, 348

ULTRASONIC & RANGE EXTENDER

The No. 347 ADEMCO-Sonic Ultrasonic Motion Detector and (when used) its No. 348 Range Extender emit invisible and inaudible sound waves which detect the presence of a moving object (such as an intruder). Their ultrasonic transmitting heads saturate the area with a pattern of inaudible, high frequency sound waves and their receiving heads pick up the sound waves after they have been modified by the "imprint" or "look" of the protected area.

The No. 347-12 ADEMCO-Sonic is a 12V. DC version of the No. 347. Except as noted herein, these instructions apply equally to the No. 347 and No. 347-12. The No. 348 Range Extender may be used with either the No. 347 or No. 347-12.

A pattern of sound waves 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 units and an alarm signal is initiated via a relay wired into the protective circuit of the alarm system.

The No. 347 ADEMCO-Sonic can be used alone to provide protection in indoor areas of approximately 12 by 25 feet or, supplemented by the No. 348 Range Extender, in twice this area. In very large areas, any number of No. 347/348 pairs can be used.

The ADEMCO-Sonic system can provide "two-zone" protection as well. The No. 348 Range Extender may be installed in a room or area that is separate from the No. 347 to which it is connected.

PRELIMINARY PRECAUTIONS

Inspect the area to be protected carefully before installing any units. Even though the ADEMCO-Sonic contains circuitry to minimize such effects, there are conditions, as described below, which may appear as motion to the detectors and result in unwanted alarms. When determining locations for the units, 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.

VIBRATIONS such as those resulting from loose fitting doors, and show windows or walls that shake when traffic passes. Locate the units on sturdy inside walls 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 No. 347 may interact with some TV sets equipped with remote control. This may be checked prior to installation by placing the No. 347 in the same room with the TV and applying its power with the TV on. If there is interaction (erratic TV channel switching, etc.), both should not be used in the same room. Alternatively, the No. 455 (4 Zone) Ultrasonic Master Control with No. 456 or 457 Transceivers may be used (with an added ON/OFF switch in the transceiver leads as described in the No. 455's installation instructions).

The best location for the units is 4 to 7 feet from the floor, safely away from drafts. Do not locate the units too near the ceiling since when aimed downward for maximum coverage the same floor drafts will be confronted.

COVERAGE CONSIDERATIONS:

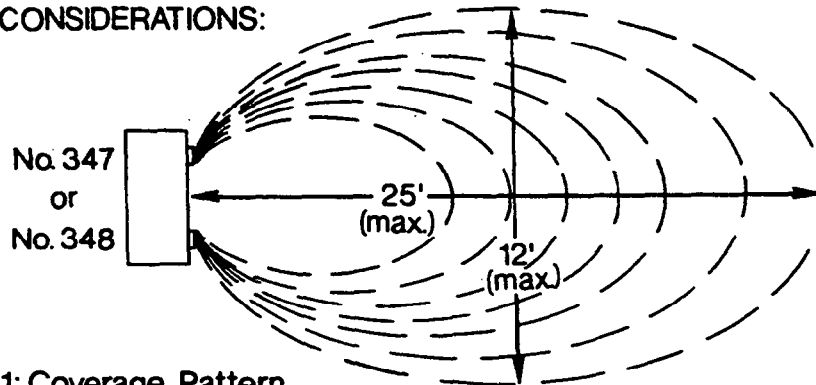


Diagram 1: Coverage Pattern

The pattern of the ultrasonic waves emitted by the Nos. 347 and 348 is oblong. Nominally, at maximum sensitivity, the range of the coverage is approximately 25 feet and the width of the pattern is approximately 12 feet. Actual coverage, however, is affected by these 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 units. Examples of this kind of surface are carpeted floors, draperies, heavy plush furniture, etc.

HUMIDITY & TEMPERATURE: Ultrasonic waves are affected by atmospheric humidity and temperature. Between the best and worst combinations of conditions, range can change by over 50%.

TYPICAL LAYOUTS:

By keeping in mind considerations of surface reflections, humidity location and other factors (mentioned below), the installation may be laid out.

Each No. 347 ADEMCO-Sonic may be used alone or in connection with one No. 348 Range Extender. Any number of No. 347/348 pairs may be placed in the same or different areas without interfering with each other as long as the following basic positioning rules are observed:

1. Do not direct units at each other unless the distance between them exceeds 60 feet. Diagrams 2c and 2e illustrate this. In this case, No. 347's only should be used, as wiring between the Nos. 347 and 348 is limited to 50 feet.
2. Units may be placed on opposite walls or the same walls provided their centers are offset at least 12 feet from each other. Diagrams 2a and 2f illustrate this, with paired units along the same wall.

3. A No. 348 Range Extender may be placed in a separate room, if desired, to provide "second zone" protection. See diagram 2a.
4. Back to back installation may be considered. See Diagram 2b.
5. Placement in adjacent corners as shown in Diagram 2d is effective.
6. Don't place different pairs of units too close together as some range shortening can occur.

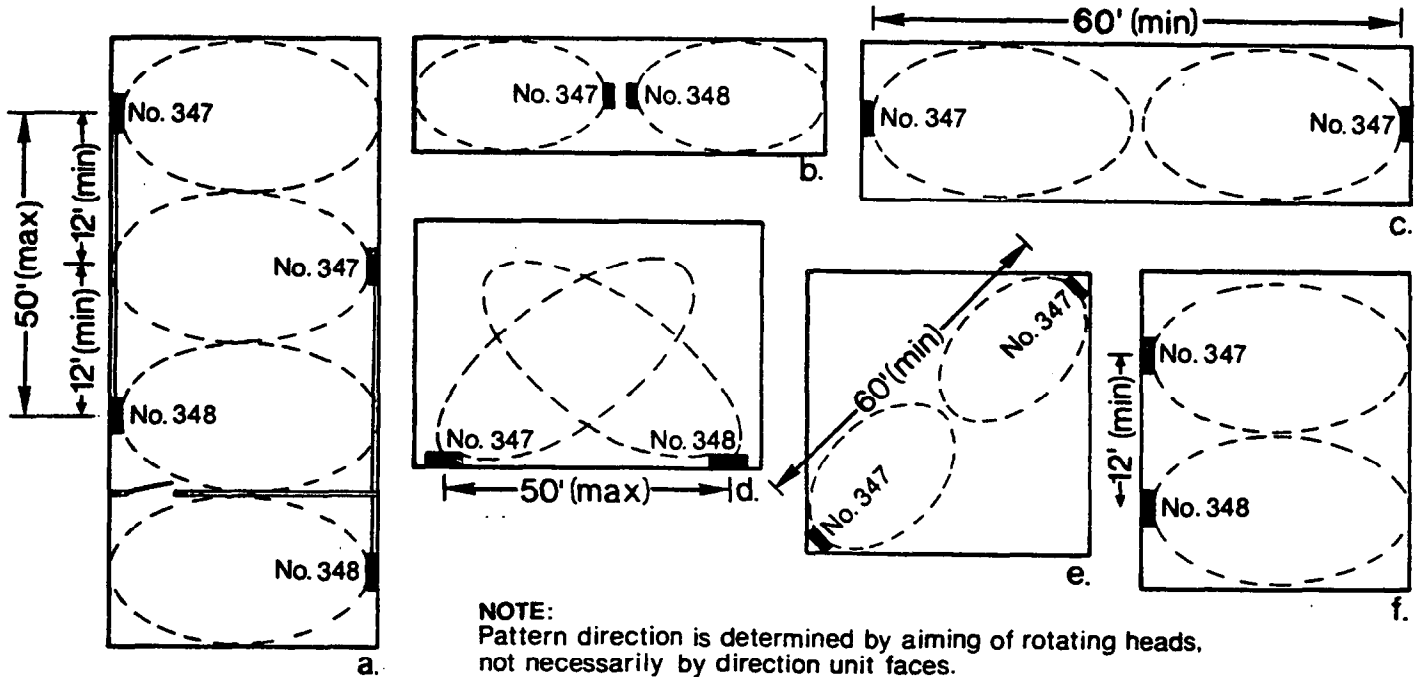


Diagram 2: Typical Layouts

INSTALLATION and WIRING:

Mounting:

The housings of the Nos. 347 and 348 lend themselves to wall or corner mounting. Mounting brackets are not necessary. Wirewells at the rear unit and "break-away" knockouts adjacent to each wirewell permit concealed or surface wiring to be installed.

The units can be mounted with their long dimension either vertical or horizontal.

Wiring Connections:

Diagram 3 shows the wiring connections required for the Nos. 347 and 348. (No. 347-12; Diagram 3A.) The connections should be made in this order:

1. Place the No. 347's On-Off Test Switch in the OFF (center) position.
2. Connect the No. 347 ADEMCO-Sonic to the No. 348 Range Extender (if used) as shown in Diagram 3. (No. 347-12; Diagram 3A). Use 3 #22 twisted pairs as indicated for a maximum run to the No. 348 of 50 feet.

NOTE: If no No. 348 is being used, disregard the connections for it. Instead, connect a jumper between terminals PROTECT, and POS. (#) of the No. 347 as shown.

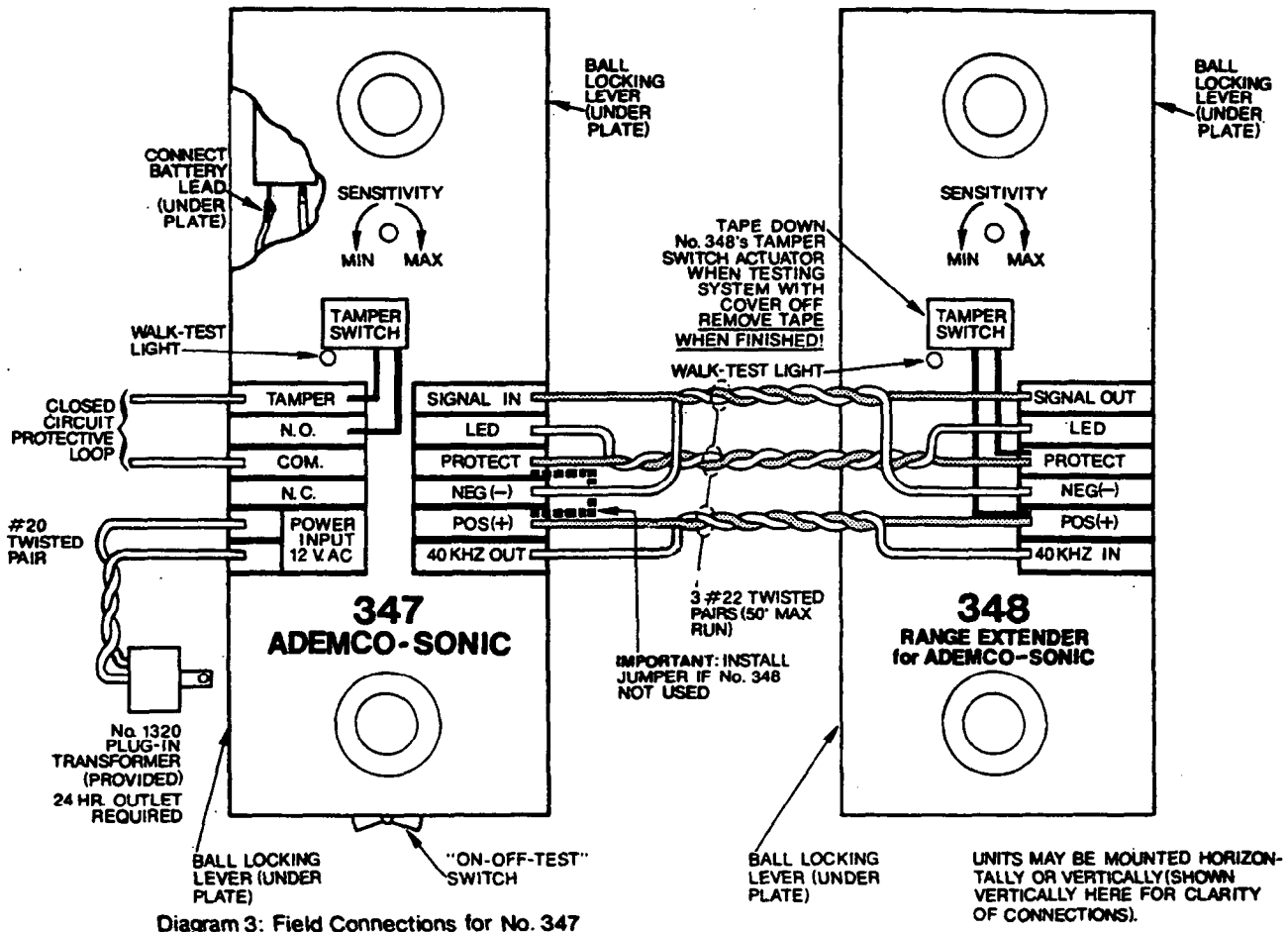


Diagram 3: Field Connections for No. 347

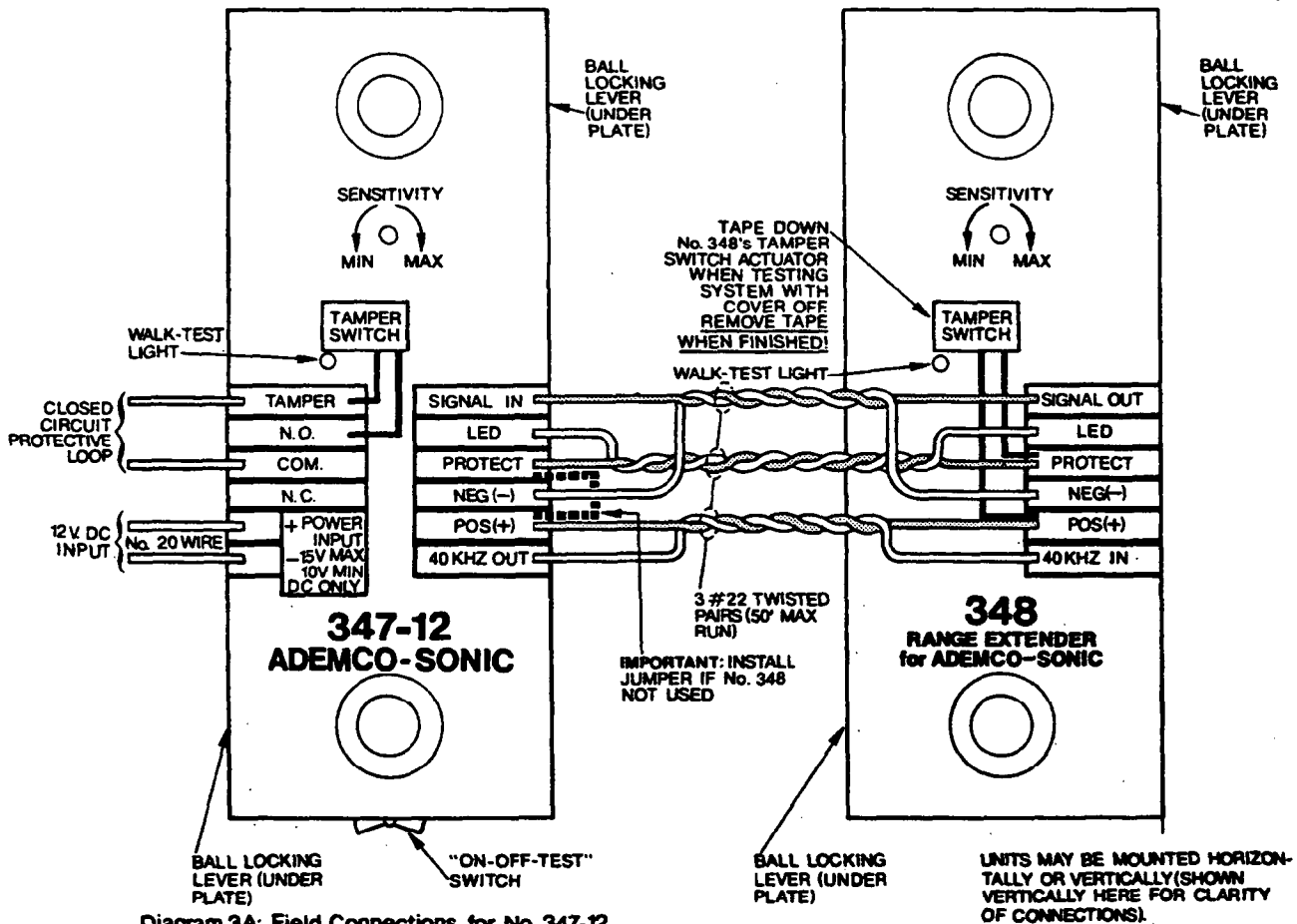


Diagram 3A: Field Connections for No. 347-12

3. Make sure the tamper switches are connected as shown in Diagrams 3 and 3A.
4. To connect to a closed circuit protective system, connect across terminals COM and TAMPER. (NOTE: When the units are operating, and are "set" in non-alarm condition, the No. 347's alarm relay is energized, the No. 347's terminals COM, N.O. and TAMPER are closed and terminals COM and N.C. are open.)
5. Connect the No. 347's red battery lead to the battery terminal. (No. 347-12: Not applicable.)
6. Connect the No. 1320 Transformer (Supplied) to the No. 347's terminals marked "POWER INPUT, 12 V.AC" with #20 twisted pair and plug the transformer into a 120 V.AC outlet that is ON for 24 hours a day. Make certain that the outlet cannot accidentally be turned OFF, so that the No. 347's built-in standby battery remains charged. (No. 347-12: Connect 12V. DC supply to the No. 347-12's POWER INPUT terminals. Use #20 wire.)

ADJUSTMENT and TESTING:

The adjustment and testing of the Nos. 347 and 348 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 25 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. Set the No. 347's ON-OFF-TEST Switch in the TEST position. In this position the walk test light on the No. 347 and 348 will light when the unit is triggered and go out when the unit restores.
2. If a No. 348 Range Extender is being used, remove its front cover (otherwise proceed to Step 3) and:
 - a. Set its Sensitivity Control to MIN (counterclockwise).
 - b. Temporarily tape down its tamper switch actuator to permit system adjustments to be made while its cover is removed. (Alternatively, a temporary jumper can be placed across its PROTECT. and POS. (+) Terminals.)
 - c. Aim its rotating transmitter and receiver heads into the area to be protected. It is best to aim them in approximately the same direction. The ball mounted heads may be released for aiming by swinging out their locking levers (as indicated on the units). The heads can be adjusted up to 45 degrees from center in any direction and relocked in place by returning the locking levers to their original positions.

3. Remove the front cover from the No. 347 ADEMCO-Sonic and:
 - a. Set its Sensitivity Control to MIN (counterclockwise).
 - b. Aim its rotating transmitter and receiver heads into the area to be protected as described in paragraph 2c above.
 - c. If the No. 348 Range Extender is not being used, make sure a jumper has been installed across the PROTECT. & POS (+) Terminals in the No. 347.
4. Adjust the No. 347's Sensitivity Control (clockwise to INCREASE, counterclockwise to DECREASE range) to obtain the desired coverage of the area to be protected as evidenced by WALK TESTS conducted as follows:
 - a. With no motion in the protected area, the light on the No. 347 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 No. 347. 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 that permits the first one or two steps of movement to go undetected.
 - 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.
5. If a No. 348 Range Extender is being used, repeat Steps 4a, b, c, d, e for it. The light on the No. 348 will light when the unit triggers and go out when the unit restores.

NOTE: The settings of the Nos. 347 and 348 are inter-related in that a change in the No. 347's sensitivity control may affect the range of the No. 348. Be sure to recheck the coverage of the No. 348 whenever the sensitivity control of the No. 347 is changed.

6. Once the sensitivity controls are set, remove (if installed in Step 2B above) the tape from the No. 348's tamper switch or the temporary jumper and replace the front covers of the Nos. 347 and 348.
7. Next, standby operation should be tested by unplugging the line transformer. Make sure that the battery in the No. 347 has had a chance to charge for at least an hour before checking. The system should continue to operate with the transformer unplugged. (No. 347-12: Not applicable.)
8. When all tests are complete, placing the No. 347's ON-OFF-TEST switch in its ON position will switch off the walk test lights so that they will no longer light when the units are triggered. (This is the only difference between the switch's ON and TEST position.)

NOTE: The No. 347's alarm relay operates normally, whether the switch is in the ON or TEST position. During an alarm an open will appear across the No. 347's COM and TAMPER terminals.

TURBULENCE WARNING SYSTEM:

The ADEMCO-Sonic'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 ADEMCO-Sonic may remain in the alarm condition and the control cannot be set.

1. Place the No. 347's ON-OFF-TEST switch in its TEST position. Move in front of the unit (or the No. 348) to trigger it. Then stand still. If turbulence is present in the area the walk test light on the No. 347 (and/or No. 348) will remain on or take much longer than normally (one or two seconds) to go off (restore).
2. Refer to the "Preliminary Precautions" listed under LAYOUT herein. If the cause of the turbulence cannot be located and eliminated, the sensitivity setting(s) of the unit(s) may have to be reduced or the transmitter and receiver heads in the unit(s) re-aimed to obtain stable operation.

MAINTAINING PROPER OPERATION and COVERAGE:

In order to maintain the Ademco-Sonic system in proper working condition, it is important that the following be explained to and observed by the user of the system.

1. The plug-in transformer should be kept in its socket and continuous 120 V.AC supplied to it at all times, so that the standby battery remains charged.
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.
4. The ADEMCO-Sonic system should be kept ON 24 hours a day. No alarm will be initiated while the main protective system is OFF. If the ADEMCO-Sonic is ever turned OFF, however, while the main protective system is ON, an immediate alarm will result.

GENERAL SPECIFICATIONS:

	No. 347	No. 348	No. 347-12
<u>Physical:</u>			
Width:	5 1/4" (13.3 cm)	same	same
Height:	13 3/4" (35.0 cm)	as	as
Depth:	3" (7.6 cm)	No. 347	No. 347
Weight:	4 lbs. (1.8 Kg)	3 lbs. (1.4 Kg)	3 lbs. (1.4 Kg)
<u>Electrical:</u>			
Voltage:	12 V.AC (from No. 1320 Plug-in Transformer)	fed from No. 347	12V. DC Nominal (15V. DC max., 10V. DC min.)

Current: 0.4A, 12V.AC (No. 347 alone, or in combination with No. 348)

150 ma DC (alone, or with No. 348)

Standby: Rechargeable power supply for Nos. 347 and 348 built into No. 347.

Not applicable

15 hrs. standby, No. 347 alone
(14 hrs. standby, with No. 348)

TO DETERMINE IF FUSE HAS BLOWN:

Check across (+) and (-) terminals with 0-6 V.DC voltmeter. No voltage will appear if fuse has blown.

TO CHANGE FUSE:

- (1) Disconnect power input and one battery lead.
- (2) Remove 4 chassis mounting screws and carefully separate chassis from its base.
- (3) Change fuse. Avoid disturbing adjacent components.
- (4) Reassemble chassis to base and replace battery lead.

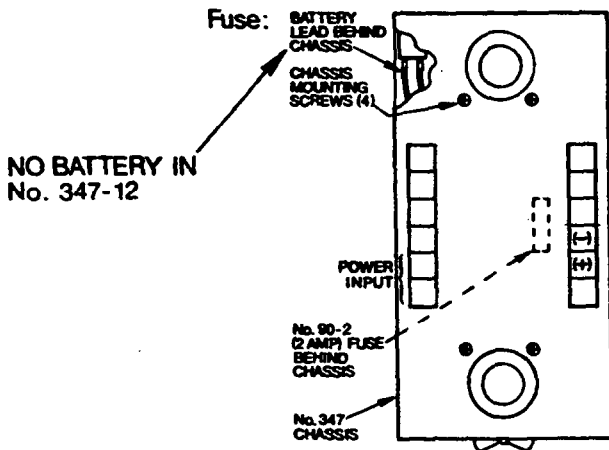


Diagram 4: Fuse Information For No. 347 Ademco-Sonic. If unit stays in alarm, fuse may be blown.

TROUBLESHOOTING Nos. 347, 347-12, & 348

TROUBLE: 1. AREA OF COVERAGE CHANGES.

PROBABLE CAUSE

REMEDY

- | | |
|---|---|
| A. <u>Customer has moved furniture or equipment.</u> | A. <u>Adjust aim to avoid turbulence or relocate unit and caution customer.</u> |
| B. <u>Substantial change in the temperature and humidity in protected area.</u> | B. <u>Increase or decrease the sensitivity adjustment according to the change that has taken place.</u> |

TROUBLE: 2. UNIT GOES INTO ALARM FOR NO APPARENT REASON.

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|---|--|
| A. <u>Drafts or air turbulence are creating an alarm condition.</u> | A. <u>Check for Air Ducts and sources of drafts that may have been missed during the initial installation.</u> |
| B. <u>Sensitivity adjustment may be too high.</u> | B. <u>Readjust as per instructions.</u> |
| C. <u>Birds or small animals are entering building (especially warehouses).</u> | C. <u>Check for and eliminate all possible entry points for cats, dogs, birds, rodents, etc.</u> |
| D. <u>Unit(s) not plugged into a 24-Hour outlet.</u> | D. <u>Make certain that all units are plugged into outlets which are not turned off at night.</u> |
| E. <u>Interconnecting wire between Nos. 347 and 348 (if used) exceeds a maximum of 50 feet.</u> | E. <u>Relocate units so that interconnecting wire run is less than 50 feet.</u> |
| F. <u>Strong ultrasonic noise such as telephone bells, hissing steam, compressed air, airline landings or takeoffs, nearby.</u> | F. <u>Unit(s) should be relocated to keep the transceivers from picking up ultrasonic noise. Telephone bell interference may be reduced by drilling a 1/8" hole in the gongs and taping their perimeters. Refer to "preliminary precautions" section in Nos 347-348 Installation Instructions.</u> |

TROUBLE: 3. UNIT DOES NOT RESPOND TO WALK TEST.

- | | |
|--|--|
| A. <u>Transmitter and receiver heads aimed improperly.</u> | A. <u>See Adjustment and Testing section, step 2(c).</u> |
| B. <u>If using a No. 347 only, no jumper across PROTECT & POS (+) terminals inside UNIT.</u> | B. <u>INSTALL jumper as per Adjustment and Testing section, step 3(c).</u> |
| C. <u>Sensitivity control set too low.</u> | C. <u>See ADJUSTMENT and TESTING, step 3 and 4.</u> |

D. Improper operation using No. 348.

D. Check wiring between the 347 and 348.

TROUBLE: 4. STANDBY OPERATION FAULTY.

PROBABLE CAUSE

REMEDY

Battery not fully charged.

Allow battery to charge for at least 1 hour (standby operation should be checked frequently. If battery can no longer be recharged, it must be replaced).

TROUBLE: 5. UNIT NOT OPERATING (NO. 347-12 ONLY).

PROBABLE CAUSE

REMEDY

No power.

Check for live 12 volt DC input to unit.