

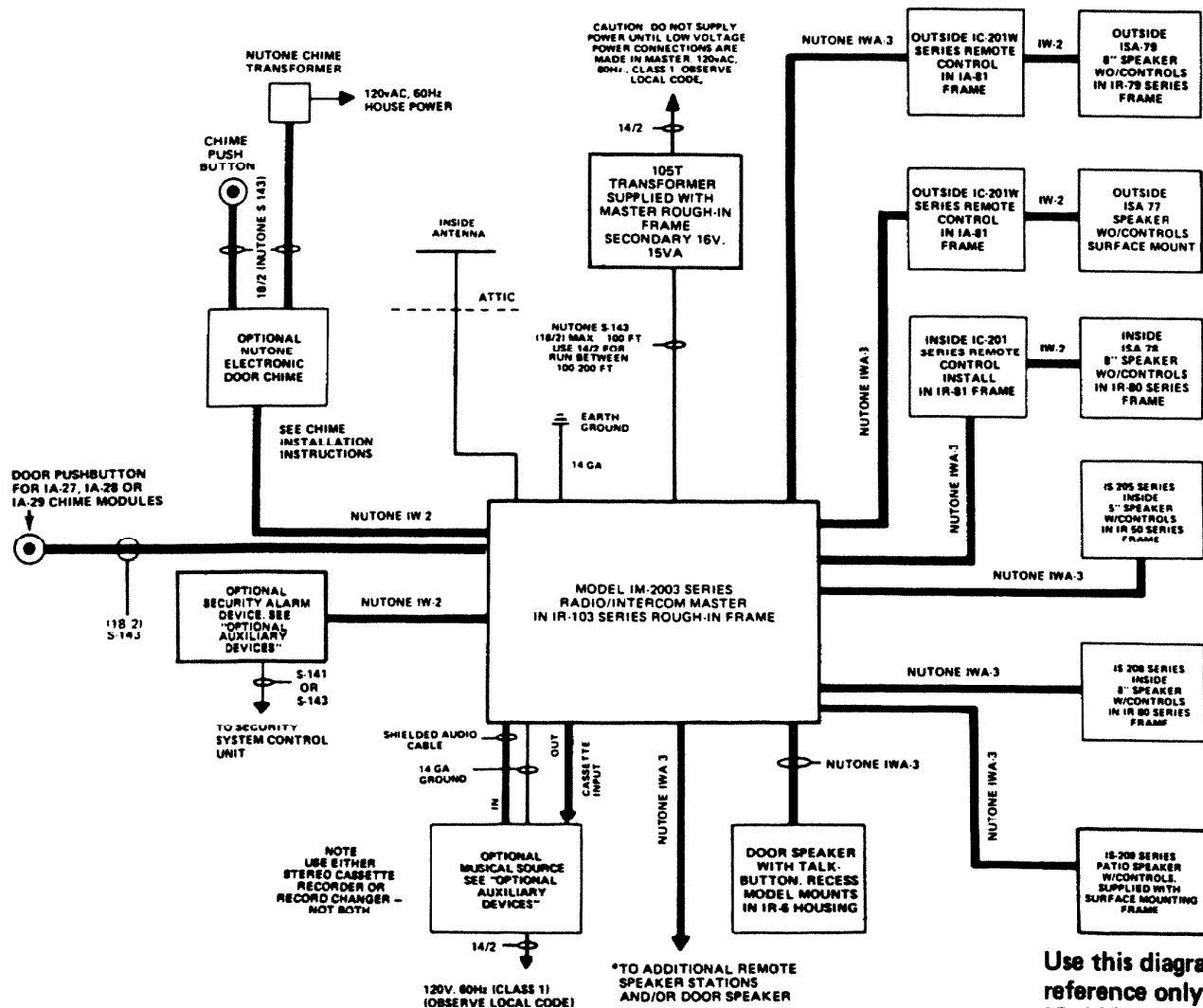
Radio-Intercom System

MODEL: IM-2003 SERIES MASTER STATION

This booklet contains information for installing the IM-2003 Series master station. All system wiring and rough-in frames should be installed before mounting and wiring the master station.

Refer to the installation instructions packaged with the Model IR-103 Series rough-in frame for detailed wiring information. For more detailed information on wiring and mounting other system components (i.e., speakers, remote controls, etc.), refer to the installation instructions packaged with each separate component.

IM-2003 SERIES REPRESENTATIVE WIRING ILLUSTRATION



Use this diagram for reference only — see IR-103 rough-in frame installation instructions for detailed wiring.

WIRING INSTALLATION GUIDELINES

WIRING SPECIFICATIONS:

NuTone IW-2: 22 GA. Twisted Pair.
NuTone IWA-3: Flat Ribbon Type 3-wire (22 GA.) Cable.
NuTone S-143: 18 GA. 2-Conductor Insulated.
No. 14/2: 120V. 60Hz Power Cable. Class 1, U.L. Listed.
(Not supplied by NuTone)
14 GA.: Ground Wire (Not supplied by NuTone)

SPEAKER WIRING:

*An individual 3-wire cable IWA-3 must be connected from each remote speaker station to the terminal board in the master unit. Maximum 300 feet. Maximum total of IWA-3 per system is 600 feet.

MAXIMUM NUMBER OF SPEAKERS – Nine remotes and two door speakers.

IMPORTANT: NUTONE CANNOT BE RESPONSIBLE FOR IMPROPER RADIO-INTERCOM OPERATION THAT RESULTS FROM INTERFERENCE GENERATED BY LIGHT DIMMERS, FLUORESCENT LIGHTING FIXTURES, AND SIMILIAR ELECTRICAL PRODUCTS. SUCH INTERFERENCE MUST BE CORRECTED AT THE SOURCE. AS AN AID TO HELP REDUCE THIS INTERFERENCE, ALL REMOTE SPEAKER WIRES AND CABLES MUST BE PLACED AT LEAST 12 INCHES FROM ANY A.C. POWER WIRING.

ASSEMBLING THE MOUNTING HINGES

1. Assemble hinge and bracket as shown in Figure 1.
2. Use two No. 6 x 9/16" screws (provided) to secure each hinge and bracket assembly to the mounting bosses on the master panel. See Figure 2.

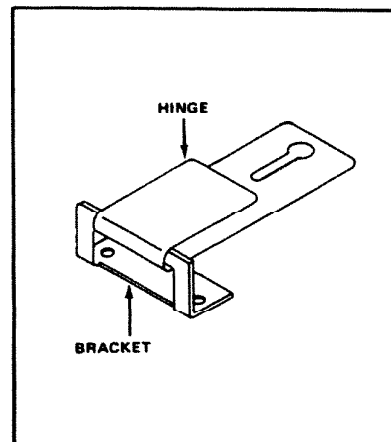


FIGURE 1

MOUNTING THE MASTER PANEL

1. For rough-in frames which are recessed into the wall opening. Insert two No. 6 x 3/8" screws (provided) into the front two holes in the rough-in frame. Do not completely tighten screws. See Figure 3.
2. For rough-in frames which are mounted flush with the wall. Insert two No. 6 x 3/8" screws (provided) into the back two holes in the rough-in frame. Do not completely tighten screws. See Figure 3.
3. Align master panel with rough-in frame.
4. Attach master panel to rough-in frame by placing keyhole slots in both mounting hinges over screw heads in rough-in frame. See Figure 4.
5. Slide one hinge toward inside of rough-in frame as far as possible and securely tighten the screw. Position and secure the second hinge. See Figure 5.

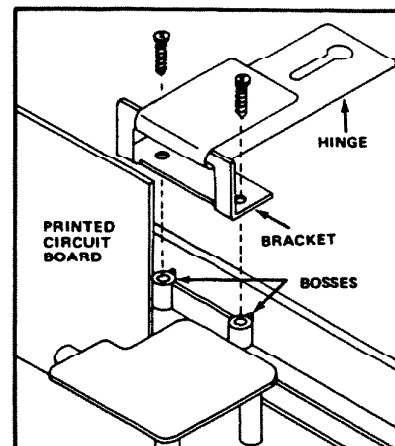


FIGURE 2

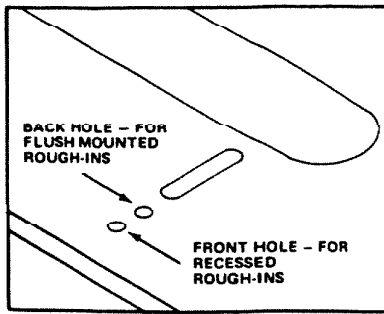


FIGURE 3

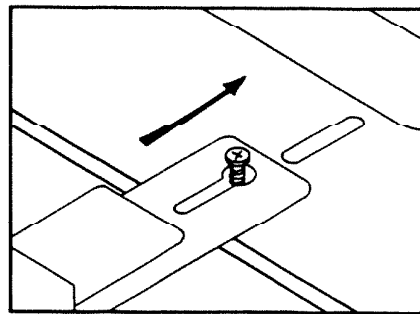


FIGURE 4

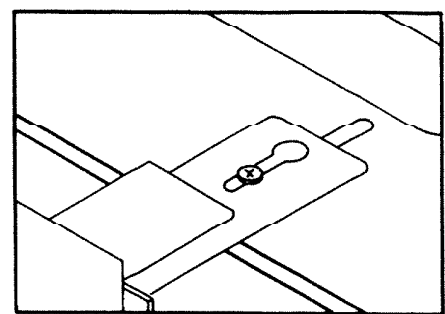


FIGURE 5

6. Attach support strap to rough-in by placing hook into hole in rear flange of rough-in frame. See Figure 6.
7. Use two No. 6 x 3/8" screws to attach mounting brackets to rough-in frame. Secure ground wire lug under one screw in the right side bracket. Make sure brackets flush to wall or rough-in. See Figure 6.
8. Place antenna plug onto two pins on tuner board. See Figure 6.

HARDWARE PACKAGE CONTENTS	
Part Description	Included
Hinge Assembly	2
Mounting Bracket	2
No. 6 x 9/16" screws	4
No. 6 x 3/8" screws	6
No. 6 x 3/4" screws	2

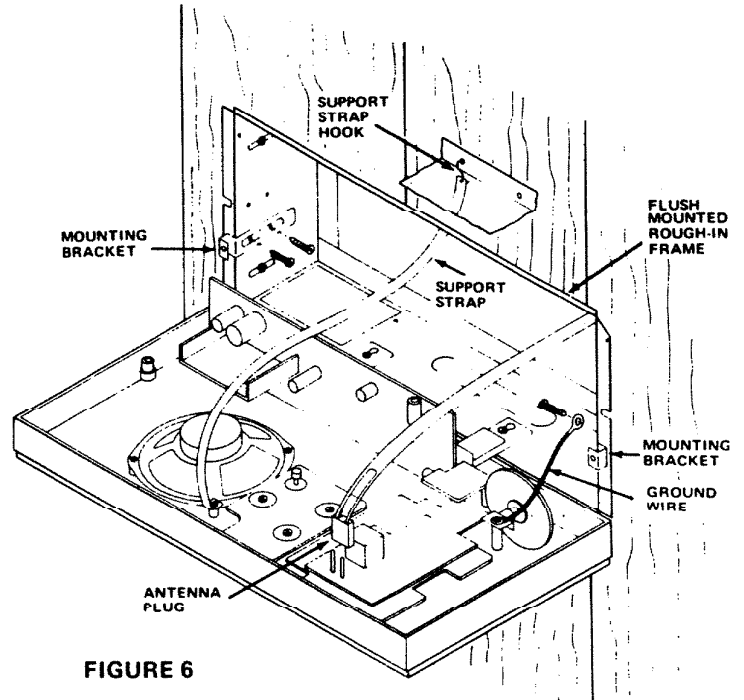


FIGURE 6

WIRING CONNECTIONS

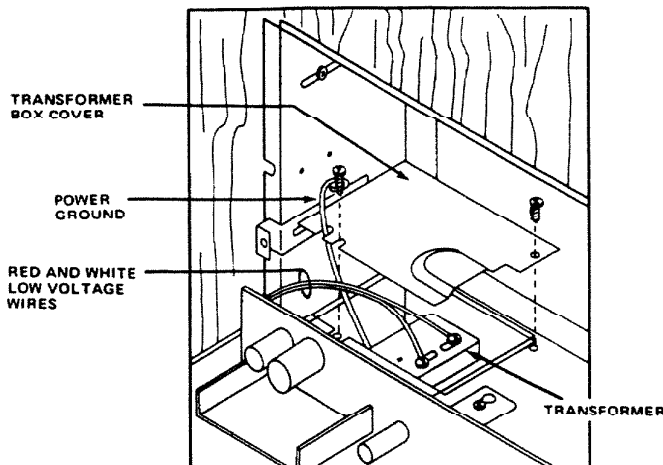


FIGURE 7

CONNECTING THE TRANSFORMER

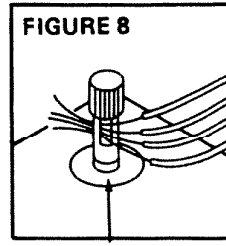
Before connecting any wiring to the terminal board, turn off power to the transformer.

1. The transformer's primary leads should already be connected to the 120vAC house supply wiring.
2. Connect two low voltage wires (red and white) to the transformer's terminal screws. See Figure 7.
3. Dress wires through raised section of transformer box cover and secure box cover with two screws. See Figure 7.
4. Make sure power ground is secured under one screw. See Figure 7.

WIRE MATCHING CHART

NuTone has adopted the use of a new 3-wire color-coded cable. If you are replacing an older model Radio-Intercom, use this chart to match the "copper/center/silver" designations of older wiring with the blue/grey/red-stripe color-coded wire.

OLD CABLE	NEW CABLE	
	Insulation	Wire
Copper	Blue	Copper
Center	Grey	Center
Silver	Red Stripe	Silver



GREY/CENTER WIRES CONNECT TO BINDING POST

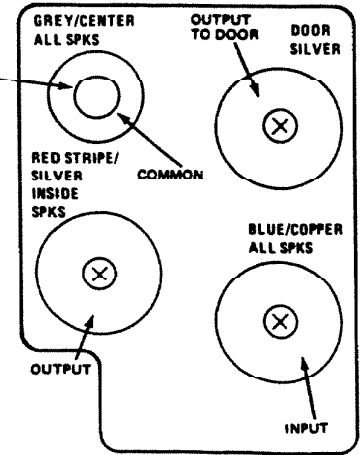


FIGURE 9

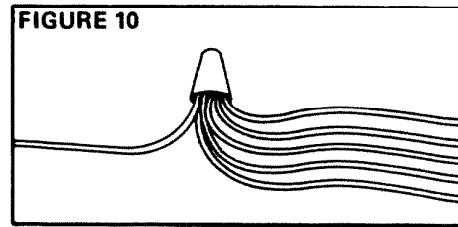
CONNECTING THE REMOTE SPEAKER WIRING

NOTE: All speaker and door wiring must return directly to master unit. Do not connect wiring from speaker to speaker.

1. Dress all speaker wiring through the oblong wiring holes in the rough-in frame. All wiring connections are made to the master unit's terminal board.
2. Connect all **GREY** wires to binding post marked **GREY/CENTER**. See Figures 8 and 9. Tighten binding post securely with pliers.
IMPORTANT: All grey wires must connect directly to binding post. Do not connect grey wires to common jumper wire.
3. Twist all **RED STRIPE** wires together and connect to a common jumper wire using a wire nut. See Figure 10.
4. Connect common jumper wire from **RED STRIPE** wires to terminal screw marked **RED STRIPE/SILVER**. See Figure 11. Securely tighten terminal screws.
5. Twist all **BLUE** wires together and connect to a common jumper wire using a wire nut. See Figure 10.
6. Connect common jumper wire from **BLUE** wires to terminal screw marked **BLUE/COPPER**. See Figure 11. Securely tighten terminal screw.

7. Completed wiring will look as shown in Figure 12. Of course, more speakers will require more wires. Figure 12 shows wiring for two speakers and a door speaker.

NOTE: Connecting all **RED STRIPE** and **BLUE** wires to a common jumper wire may not be necessary unless more than three speakers are being connected. Whichever method is used, the installer must insure a good connection to the terminal screws.



CONNECTING WIRES TO COMMON JUMPER WIRE

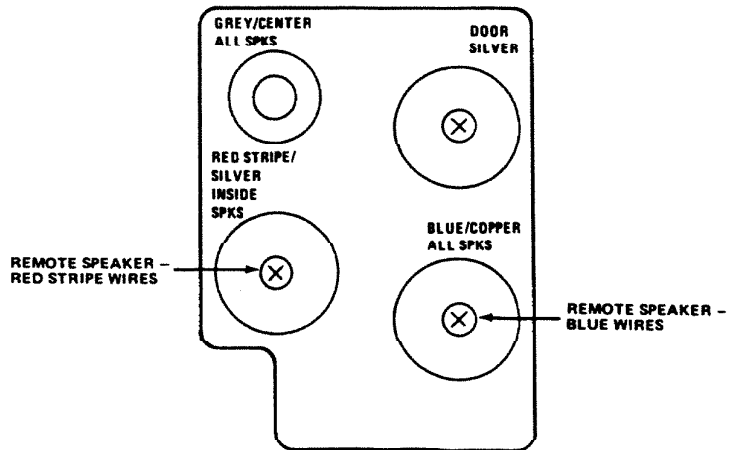


FIGURE 11

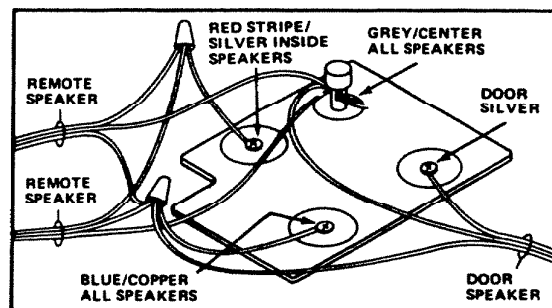


FIGURE 12

CONNECTING THE DOOR SPEAKER WIRING

1. Connect **RED STRIPE** wire from door speaker to terminal screw marked **DOOR SILVER** on the master unit's terminal board. See Figure 13.
2. Connect **GREY** wire from door speaker to binding post marked **GREY/CENTER** on master unit's terminal board. See Figure 13.
3. Connect **BLUE** wire from door speaker to terminal screw marked **BLUE/COPPER** on master unit's terminal board. See Figure 13.

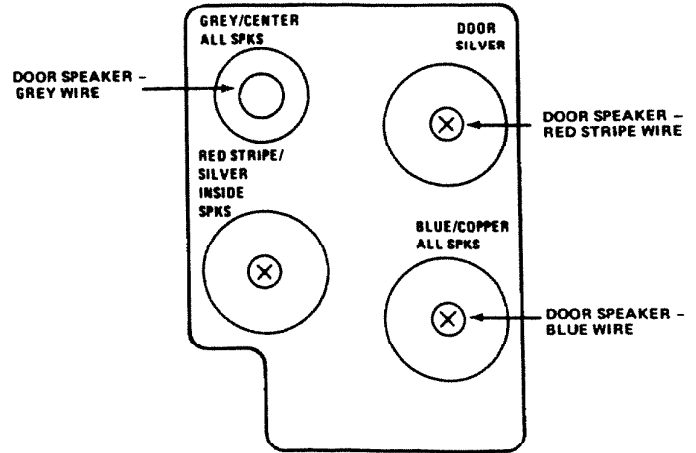


FIGURE 13

CONNECTING OPTIONAL ELECTRONIC CHIME AND SECURITY ALARM

1. Connect **IW-2 (22/2, twisted pair)** from electronic chime to binding post marked **GREY/CENTER** and to terminal screw marked **BLUE/COPPER**. See Figure 14.
2. Connect **IW-2 (22/2, twisted pair)** from Intruder/Fire Alarm Control Unit and/or electronic alarm horn to binding post marked **GREY/CENTER** and to terminal screw marked **BLUE/COPPER**. See Figure 14.

NOTE: DO NOT CONNECT CHIME OR ALARM WIRES TO DOOR SPEAKER TERMINALS. (See Electronic Chime and Security System Installation Instructions for complete wiring details.)

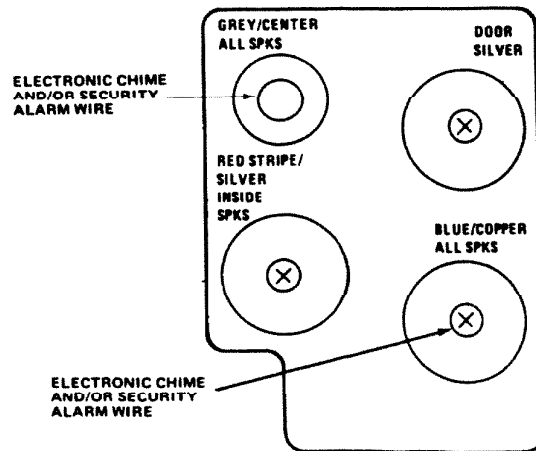


FIGURE 14

CONNECTING OPTIONAL ACCESSORIES

1. To connect an optional Record Changer or Cassette Player/Recorder, locate the **AUXILIARY INPUT** and **RECORD OUTPUT** jacks on the master panel. See Figure 15.
2. To play the phonograph or tape player over the intercom system, insert the accessory's output plug into the master panel's **AUXILIARY INPUT** jack. See Figure 15.
3. To use the radio as a program source for recording on the Cassette Record/Player, insert the player's input plug into the master panel's **RECORD OUTPUT** jack. See Figure 15.
4. Connect ground wire between accessory's rough-in and intercom master's rough-in.

Refer to installation instructions supplied with the accessory for information about adaptors necessary for connection to IM-2003 Series Master Station.

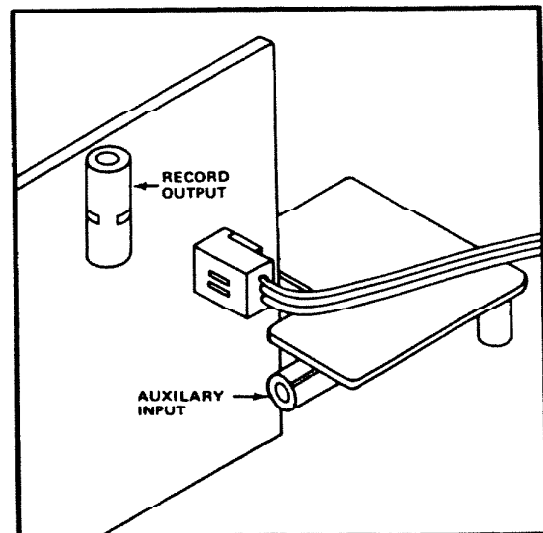


FIGURE 15

SYSTEM OPERATING CONTROLS

RADIO AND PROGRAM CONTROLS

Radio On/Off Pushbutton — Press the **RADIO** button to the **ON** (\uparrow) position to supply power to the radio. The red **RADIO INDICATOR LIGHT** will illuminate. Press and release the button to the **OFF** (\downarrow) position to turn off the radio.

Note: The intercom is constantly powered. It can be used and auxiliary program sources (phono or tape) can be played through the system whether power is supplied to the radio or not.

Program Select Switch — Slide the switch to select the program source: **AM**, **FM**, **AUX** (Phono or Tape). The orange indicator will appear above the selected program source.

Tuning Wheel — Turn the **TUNING** wheel to tune the radio.

Radio Frequency Dial — The orange pointer shows you the **AM** and **FM** frequencies to which you've tuned the radio.

Master Panel Volume Control — Slide the control marked **VOLUME THIS SPEAKER** from left to right to increase the Master Panel's speaker volume.

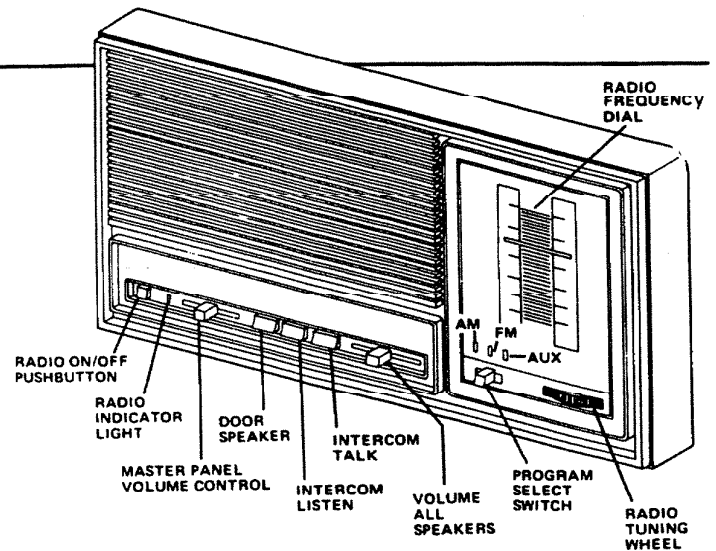
Volume All Speakers — Slide the control marked **VOLUME ALL SPEAKERS** from left to right to increase volume at all speaker stations (including the Master Panel). This control sets the volume level for the entire system.

INTERCOM CONTROLS

Master Panel Volume Controls — Slide the control marked **VOLUME THIS SPEAKER** from left to right to increase the intercom volume level at the Master Panel.

Volume All Speakers — Slide the control marked **VOLUME ALL SPEAKERS** from left to right to set intercom volume levels at all speaker stations (including the Master Panel). This control sets the intercom volume level for the entire system.

Intercom Talk — Depress button marked **TALK** to make a call to other speaker stations. Keep the button depressed while you are talking.



Intercom Listen — Depress the button marked **LISTEN** to hear a reply from another station. Pressing the **LISTEN** button at the Master Panel allows the person at the remote speaker to reply "hands free" — that is, without pressing the remote speaker's **TALK** button.

If the person at the remote speaker presses that speaker's **TALK** button, it is not necessary to press the Master Panel's **LISTEN** button to hear the reply from the remote speaker station.

Door Speaker — Press the button marked **DOOR SPEAKER** to the **ON** (\uparrow) position to use the door speaker. The button will latch in the **ON** position.

When the **DOOR SPEAKER** button is latched in the **ON** position, all program material (radio, phono, tape) will be played over the door speaker.

To make a call to the door, latch the **DOOR SPEAKER** button in the **ON** position and use the **INTERCOM TALK** and **LISTEN** buttons as you would for any remote station.

When you have finished your call to the door speaker, release the **DOOR SPEAKER** button to the **OFF** (\downarrow) position.

At any time, a person may initiate a call from the door speaker by depressing the door speaker's **TALK** button. The call will be heard at all stations whether the Master Panel's **DOOR SPEAKER** button is depressed or not.

OPERATIONAL CHECKOUT

If the Radio-Intercom does not operate according to the following Instructions, refer to the **INSTALLER'S TROUBLE-SHOOTING GUIDE**, pages 7 and 8.

SETTING VOLUME

1. Turn all remote stations' volume controls to maximum volume.
 2. Slide the master station's **VOLUME ALL SPEAKERS** control to approximately 1/3 volume.
 3. Depress master station's **RADIO** button. Indicator light should come on.
 4. Slide master station's **VOLUME THIS SPEAKER** control to maximum volume.
 5. Set **PROGRAM SELECT SWITCH** to **AM** or **FM** and use tuning wheel to tune in a radio station of reasonable strength and quality.
 6. Adjust the **VOLUME ALL SPEAKERS** control so there is sufficient volume at the remote station that requires the highest volume (such as a large living room or family room). Generally, the **VOLUME ALL SPEAKERS** does not have to be set to more than 1/3 volume.
 7. Adjust all remote stations' volume controls as necessary.
- 6.

INTERCOM OPERATION

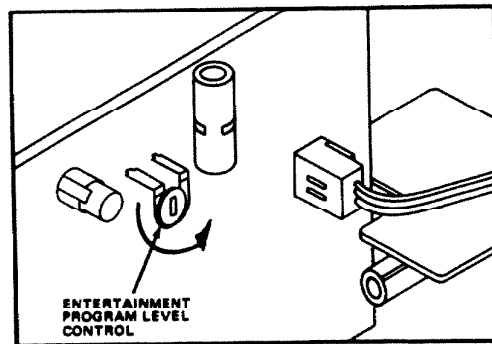
1. Make intercom calls from the master and all remote stations. See "Operating Controls," above.
2. Test intercom operation to the door speaker(s).
NOTE: Only the master station is equipped with a **LISTEN** button. This button allows all intercom control at the master and "hands free" operation at the remote and door speakers.
3. Depress the **MONITOR** switch at all remote stations. With the radio playing, have someone speak or make a noise near the remote speaker (**not directly into the speaker**). The voice or noise should be heard over the radio at the master station. Test each speaker for this function.
See the Model IM-2003 Series Operator's Manual for a more detailed explanation of the Radio Intercom system's operation.

INSTALLER'S TROUBLESHOOTING GUIDE

TROUBLE	POSSIBLE CAUSE	POSSIBLE REMEDY
1. No radio, no intercom.	1. No electrical power.	1. Be sure there is 120vAC, 60Hz power to transformer primary. Next, check 16vAC to intercom Master from transformer secondary. Check continuity of wiring from transformer.
2. No radio, no intercom.	2. Defective transformer.	2. Replace transformer.
3. No radio, intercom working (radio light on).	3a. Faulty Master Station.	3a. Isolate Master Station from installation by removing all wires from terminal board. Refer to Figure 12. With power on, radio should be playing at Master. If no radio, Master is probably faulty. If radio plays, reconnect wires to terminal board.
	3b. Installation problem.	3b. Check terminal board for shorted terminals or miswired cables. Remove one 3-wire cable at a time to locate faulty line. When radio comes on, check speaker connections and run continuity check of speaker wiring. Also check for water-damaged patio remote control.
	3c. Antenna problem.	3c. Check for shorted antenna connection. Remove antenna connection from tuner board and touch each pin with metallic object — if radio plays, antenna is not functioning; be sure it is installed properly. In weak signal areas, an outside antenna may be necessary.
4. Low or distorted radio volume.	4. Incorrect volume setting.	4. Follow "Setting Volume" instructions under OPERATIONAL CHECKOUT. See Operator's Manual.
5. Low or no intercom volume from remote speaker in MONITOR mode.	5a. Improper operation.	5a. Be sure remote speaker set for MONITOR has volume control set in NORMAL RANGE and receiving speaker has volume controls set in NORMAL RANGE. Follow "SETTING VOLUME" instructions in Operational Checkout.
	5b. Volume All Speakers adjustment.	5b. Follow these instructions whenever the radio tends to overpower transmissions from a remote speaker in the MONITOR mode. These instructions will help you get the proper balance between the radio and the monitored speaker. 1. Set VOLUME ALL SPEAKERS control to midpoint. 2. Set master to tape or phono position. 3. Set volume control for each remote speaker and speaker in master station to the middle of the normal range. 4. Set master to AM or FM and tune to a strong AM or FM station. 5. Adjust VOLUME ALL SPEAKERS control for a desired listening level.
6. System squeals when using intercom.	6a. Shorted wire on master or remote terminal board.	6a. Check for short between terminals or loose wire.
	6b. Two or more Remote Stations on same wire run to Master.	6b. Make separate cable (IWA-3) runs from each Remote Station to the Master.
	6c. Speakers in adjacent rooms mounted on common wall, or mounted back to back.	6c. If speakers are mounted directly back to back, one speaker will have to be relocated. If speakers are in a common wall, try placing fiberglass insulation behind each speaker, or isolate the speakers from the wall by placing rubber washers or weather stripping between speaker and wall.
	6d. Improper wire used in installation.	6d. NUTONE MODEL IWA-3 3-CONDUCTOR, FLAT-RIBBON CABLE MUST BE USED.
7. Hum in speakers.	7a. Intercom wiring runs too close to household AC power wiring.	7a. Keep intercom wiring as far as practical from household AC power wiring. Do not run intercom wiring parallel to AC power wiring.
	7b. Shorted intercom power wiring or power wiring shorted to ground.	7b. Check power connections to Master and connections to transformer.
	7c. Interference from household electrical fixtures.	7c. For fluorescent lighting interference, use filters (G.E. 89G635 or equivalent, purchase locally).
8. Static.	8a. Loose ground connection.	8a. Check ground connection to Master and connection to earth ground source.
	8b. Interference from household electrical fixtures.	8b. For fluorescent lighting interference, use filters (G.E. 89G635 or equivalent, purchase locally).
	8c. Interference from household electrical appliances.	8c. Correct interference at the source; fish tank, heater, hand tool, coffee pot, etc.

(CONTINUED ON NEXT PAGE)

TROUBLE	POSSIBLE CAUSE	POSSIBLE REMEDY
9. Remote Station not working.	9a. Wire installation.	9a. Check terminal board for broken wire or loose connection. Check continuity of wire.
	9b. Speaker.	9b. Check continuity of speaker. Clean speaker and switch controls. Check with speaker known to be in working order.
10. No door communication.	10a. Wire installation.	10a. Check continuity or wiring. Check connections at speaker and Master.
	10b. Speaker.	10b. Check with a speaker known to be in working order.
11. Optional electronic chime does not work through intercom, or low volume.	11a. Wire installation.	11a. Be sure chime is wired to proper terminals on Master board and connections are good.
	11b. Improper operation.	11b. Be sure chime is electronic model. Be sure radio-intercom system is on. Check control settings and system volume control on Master station.
	11c. Chime.	11c. Increase volume control on chime. Check electronic pickups and continuity of chime input wiring.
12. Cannot receive radio station which is received by another radio in home.	12. Faulty antenna connection.	12. Antenna should be located in attic and connected to tuner in Master. Check antenna connector to be sure it is firmly connected to pins on tuner board.
13. When a call is made from a remote speaker, the voice cannot be clearly heard over the program source.	13. Factory-set Entertainment Program level control improperly adjusted.	13. Set Master Station VOLUME ALL SPEAKERS between 1/2 and 2/3 full volume. Use a small screwdriver. Carefully make a slight COUNTERCLOCKWISE adjustment of the Level Control. This will decrease the radio level relative to intercom level. Check override improvement; make further adjustment if necessary.



SECURING THE MASTER PANEL

1. Check all wiring connections to make sure they are complete and correct.
2. Check to make sure antenna connection is secure.
3. Dress all wiring away from master unit's speaker to avoid interference with speaker operation.
4. Position master panel over rough-in frame and align screw holes in master panel with mounting brackets.
5. Secure master panel to rough-in mounting brackets with two provided No. 6 x 3/4" screws. See Figure 17.

Please refer to IM-2003 Series Homeowner's Manual for Warranty Information. If Homeowner's Manual has been misplaced, write to: NuTone, Madison and Red Bank Roads, Cincinnati, Ohio 45227. Attention: Department of National Service.

NuTone Inc.

Scovill

Madison and Red Bank Roads, Cincinnati, Ohio 45227
Printed in Taiwan Rev. 12/86, Part No. 49135

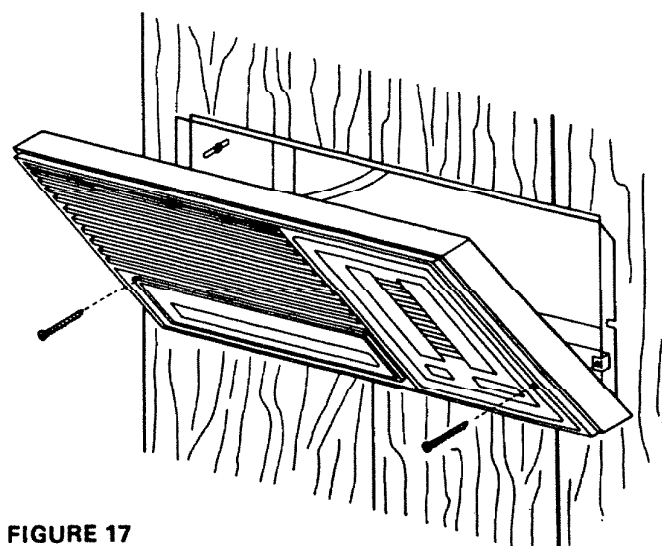


FIGURE 17