

**M & S SYSTEMS, INC.****ROUGH-IN INSTALLATION INSTRUCTIONS****FOR MUSICAL INTERCOM MODELS MC170, AND MC350A**

**NOTE: FAILURE TO COMPLY WITH THESE INSTRUCTIONS WILL VOID PRODUCT WARRANTY!**

**GENERAL**

1. These instructions are designed to provide the installer with all the information necessary to properly install the system. The installation is a crucial link in providing the user with a top quality product. If you take the time to read all instructions before you begin the installation, many errors will be avoided. Most errors will not be discovered until after the walls are finished out and the system is installed and tested. To correct errors at this stage will take much time and expense.
2. **IF YOU HAVE ANY QUESTIONS, OR NEED TECHNICAL ASSISTANCE WITH YOUR INSTALLATION, PLEASE CONTACT OUR TECHNICAL SERVICES DEPARTMENT AT 800-366-9422.**

**IF YOU NEED HELP PLANNING YOUR LAYOUT, PLEASE CONTACT YOUR LOCAL SALES REPRESENTATIVE OR CALL OUR CUSTOMER SERVICE DEPARTMENT AT 800-877-6631.**

**DOs and DONTs**

**WIRING:** (Wiring errors are the primary cause of problems in an installation.)

1. **USE ONLY M & S SYSTEMS BRAND CABLE.** The cable is constructed with electrical specifications necessary for proper audio performance. **IMPORTANT: THE USE OF NON M & S BRAND CABLE WILL VOID PRODUCT WARRANTY.**  
  
**USE MS4XSC (recommended) or MS4X** for remotes, room speakers, and room speakers with door release.  
**USE MS7XSC** for room speakers with remote scan  
 (Do not exceed 350 feet for any one run or 1000 feet for the system.)  
  
**USE MS4DCXSC (recommended) or MS4DCX** for door speakers.  
 (Do not exceed 350 feet for any one run.)
2. Run a single cable from the master unit location to each remote or speaker location. **DO NOT LOOP CABLE FROM ONE SPEAKER TO ANOTHER.** Looping will cause electronic feedback.
3. **DO NOT STAPLE CABLES!** Staples cause shorts.
4. **DO NOT BUNDLE CABLES TOGETHER.** This can cause signal crosstalk.  
Cables can be bundled together if using shielded cable (MS4XSC, MS4DCXSC, and MS7XSC)
5. **DO NOT SPLICE CABLES.** Splices are unreliable.
6. **KEEP CABLES AT LEAST 18 INCHES FROM FLUORESCENT LIGHT FIXTURES, DIMMER CONTROLS, AND ALL OTHER WIRING.** This includes AC wiring, security cable, and other control wires. These can cause a "hum" or "buzzing" sound in the intercom.  
This rule is not as critical if using shielded cable (MS4XSC, MS4DCXSC, and MS7XSC), but should still be followed when possible.
7. Keep cables away from objects such as heating and air conditioning ducts, metal construction plates, and anything else with sharp edges that can damage the cables.
8. **DO NOT RUN CABLES IN METAL CONDUIT.** This can change the electrical characteristics of the cable.  
Cables can be run in a metal conduit if using shielded cable (MS4XSC, MS4DCXSC, and MS7XSC)
9. Outside cable runs should be underground through PVC conduit (one cable per conduit). This cable is not weather proof, therefore, it must be protected.
10. If extra cables are run for possible future speaker additions, care must be taken that these cables do not get connected to the master unit. Unterminated cables (no speaker) connected to the master unit will cause electronic feedback that will damage the master unit.

**SPEAKERS:**

1. **SPEAKER LIMITS ARE AS FOLLOWS:**  
  
**MC170 SERIES:** 6 rooms plus 2 doors  
**MC350A SERIES:** 12 rooms plus 2 doors
2. **DO NOT LOCATE SPEAKERS IN OUTSIDE WALLS.** Insulation materials will change speaker range and efficiency. Temperature changes in the wall will affect speaker life.
3. **DO NOT LOCATE SPEAKERS IN SAUNAS.** They will not withstand the extreme heat and moisture.

4. **DO NOT LOCATE SPEAKERS NEAR DIMMER TYPE LIGHT SWITCHES.** This will cause AC interference in the intercom.
5. Locate speakers at a minimum of 10 feet from the master unit or another speaker. Speakers too close to each other, directly facing each other, or back to back in the same wall, will result in acoustic feedback in the intercom.
6. When using remote controls, do not connect more than 2 speakers to the remote. Remember to count all speakers when determining speaker limit.

#### **MASTER UNIT:**

1. Have a qualified electrician run a "120VAC/60Hz with ground" power connection direct from the power panel to the master unit. **THE SYSTEM REQUIRES A DEDICATED POWER SOURCE** to assure no interference from other equipment caused by looped power circuits. The ground is necessary for proper radio reception.
2. **DO NOT LOCATE MASTER UNIT IN AN OUTSIDE WALL.** Insulation materials will restrict air flow and cable routing. Restricted air flow and temperature changes in the outside wall will affect the life of the master unit.
3. Locate the master unit in an accessible location. Do not locate the wall housing closer than 2 inches from wall corners, cabinets, counter tops, etc. This is the minimum clearance required to mount the master unit in the wall housing.

#### **ANTENNAS:**

1. Isolate the antenna leads from the intercom cables by running them through a separate hole in the ceiling plate and in the top plate of the wall housing. If grouped together, the intercom cables can shield the antenna leads. This will reduce radio reception.
2. Keep the antenna leads away from metal duct work and aluminum backed insulation. These can also shield the antenna leads.
3. If metal siding or metal roofing materials are used, an outside antenna installation may be required for radio reception.

#### **ROUGH-IN**

The rough-in installation should be made during new construction prior to the application of wall covering material, however, "RETROFIT" instructions are included where applicable.

1. With the back flush with the back of the wall studs, nail the wall housing in a level position with the bottom about 52 inches above the floor for single wall housings and about 45 inches for combo wall housings (Fig. 1). **RETROFIT:** Cut an opening between wall studs for the following applications.

**SINGLE WALL HOUSING:** 7 1/8 inches high by 14 3/8 inches wide.

**COMBO WALL HOUSING:** 14 1/8 inches high by 14 3/8 inches wide.

**IMPORTANT: THE USE OF A NON M & S BRAND WALL HOUSING WILL VOID PRODUCT WARRANTY.**

2. With the raised surface extending into the room, nail speaker mounting ring to a wall stud in a level position at a center height of normal light switches (Fig. 2). Drive a nail into the wall stud as shown (to be used to secure cable until speaker connection is to be made). Repeat for all speaker locations. **RETROFIT:** Cut an opening at the edge of a wall stud for the following applications.

**5 INCH SPEAKER RING:** 7 1/2 inches high by 5 1/2 inches wide.

**8 INCH SPEAKER RING:** 9 3/4 inches high by 8 1/4 inches wide.

**REMOTE CONTROL RING:** 4 inches high by 6 1/4 inches wide.

Mount with flange "sandwiched" between the wall covering and the wall stud.

3. Drill 1 inch diameter holes in the top plate, above the master unit location and each speaker location, to allow cables to be routed through the attic. There should be a minimum of 4 holes above the master unit location and 1 hole above each speaker location (Fig. 3).
4. Run 1 cable (MS4XSC or MS4X) from the master unit location to each room speaker location. Allow 18 inches of excess cable on each end. Secure the cable on the speaker end to the nail added in step 2, and secure all cables to each other inside master unit wall housing. This is to prevent cables from getting lost inside the walls before system is installed (Fig. 3).
5. Run 1 door cable (MS4DCXSC or MS4DCX) from the master unit location to each door speaker location. Allow 18 inches of excess cable to each end. On the door speaker end suspend the correct plastic or metal enclosure on the cable about 50 inches above the floor (porch) so the brick mason can flush and level it in the brick wall (Fig. 4). If wood or aluminum siding is used, secure plastic or metal enclosure flush and level with the finished wall. Secure the cable at the master unit end with the rest of the cables.
6. Run the AM antenna (orange wire) and the FM antenna (300 ohm dipole) from the master unit location to the attic and secure the ends with a nail. The FM antenna should form a "T". Secure the antenna cables at the master unit end with the rest of the cables (Fig. 3).
7. Using a minimum 14AWG cable w/ground, a qualified electrician should make the primary electrical connection to the transformer assembly contained in the top of the master unit wall housing (Fig. 1). **FOLLOW ALL LOCAL CODES.**

**NOTE:** There is an additional transformer assembly in the bottom of combo wall housings that needs to

be wired.

8. Place cardboard from the rough-in kit inside the master unit wall housing to protect the interior surfaces, cables and transformer assembly from paint damage.

#### OPTIONAL SPEAKER ARRANGEMENTS:

1. **Speakers with Remote Controls:** At each remote control location, nail remote control mounting ring, with the raised surface extending into the room, to a wall stud in a level position at a center height of normal light switches (Fig. 5). Drive a nail into the wall stud as shown (to be used to secure cable until speaker connection is to be made). With the raised surface extending into the room, nail speaker mounting ring to the ceiling joist or wall stud (Fig. 6). Drive a nail into the joist or stud as shown (to be used to secure cable until speaker connection is to be made). Run a single cable (MS4XSC or MS4X) from the master unit location to each remote control location. Then run a single cable (MS2X) from the remote control location to the speaker location (Fig. 3). Secure all cables as previously described.
2. **Speakers with Remote Volume Controls:** At each remote volume control location, attach a single gang box to a wall stud at a center height of normal light switches. Make sure the Single Gang Box extends past the wall stud and into the room so it will be flush with the sheet rock when it is applied (Fig. 7). Next, nail speaker mounting ring to the ceiling joist or wall stud with the raised surface extending into the room (Fig. 6). Drive a nail into the joist or stud as shown (to be used to secure cable until speaker connection is to be made). Run a single cable (MS4XSC or MS4X) from the master unit location to each remote volume control location (the black and white wires are not used). Then run a single cable (MS2X) from the remote volume control location to the speaker location. Tie a loose knot in the cables pulled through the single gang box so they cannot be pulled into the wall. Secure other ends of cables as previously described.
3. **Outdoor Speakers:** Run a single cable (MS4XSC or MS4X) from the master unit location to each outdoor speaker location and secure the cable to the correct plastic or metal enclosure by wrapping the cable around a small piece of wood (Fig. 4 or 8). Secure the cables at the master unit location by tying in a loose knot with all the other cables.
4. **Speakers with Remote Scanning Capability (MC350A only):** Attach mounting ring at each remote scanning location as described in Rough-In, Step 2. Then run a single cable (MS7XSC) from the master unit location to each remote scanning location. Secure cable as previously described.
5. **Speakers with Door Release Capability (MC350A only):** Attach mounting ring at each door release location as described in Rough-In, Step 2. Run a single cable (MS4XSC or MS4X) from the master unit location to each door release location. Secure the cable as previously described.
6. **RETROFIT:** Surface mount plastic or metal enclosures are available for all door speakers, all indoor and outdoor room speakers and all remote controls. These enclosures mount directly on the surface of most wall coverings.

#### OPTIONS:

1. **Door or Gate Release Mechanism (MC350A only):** Run a single cable (MS2DX) from the master unit location to the door release mechanism. Connect the red and blue wires (MS2DX) to the two wires or terminals of the door release mechanism (Fig. 9). Run another single cable (MS2DX) from the master unit location to a remote transformer (RT35) mounted on a 4 square box. Connect the red and blue wires (MS2DX) to the two Yellow wires from the RT35 (Fig. 10). Have a qualified electrician run a "120VAC/60Hz with ground" power cable to the 4 square box and connect this cable to the primary (white and black) leads of the RT35. Secure the cables at the master unit location by tying in a loose knot with all the other cables.

The switch contacts to operate the door or gate release are located at the master. The switch contacts will handle up to 24 VAC at 4 Amps. The door release switch contacts are very versatile and can be used with many AC door or gate release mechanisms. Be sure to use the wire and power supply or transformer specified by the door or gate release being used. The MC350A cannot be used with a DC door or gate release.

2. **External Music Sources (AWPM):** Chose a location for the AWPM that will be easily accessible to the sources that are to be connected to the system (close to the Stereo receiver, TV, or VCR for example). At this location, attach a single gang box to a wall stud at a center height of normal wall outlets (Fig. 3). Make sure the Single Gang Box extends past the wall stud and into the room so it will be flush with the sheet rock when it is applied (Fig. 7). Run the Red and the Black shielded audio cables (included in the AWPMRX) from the master unit location to the AWPM location. Secure the audio cables with a loose knot after they have been pulled through the single gang box. Secure the audio cables at the master unit location by tying in a loose knot with all the other cables.

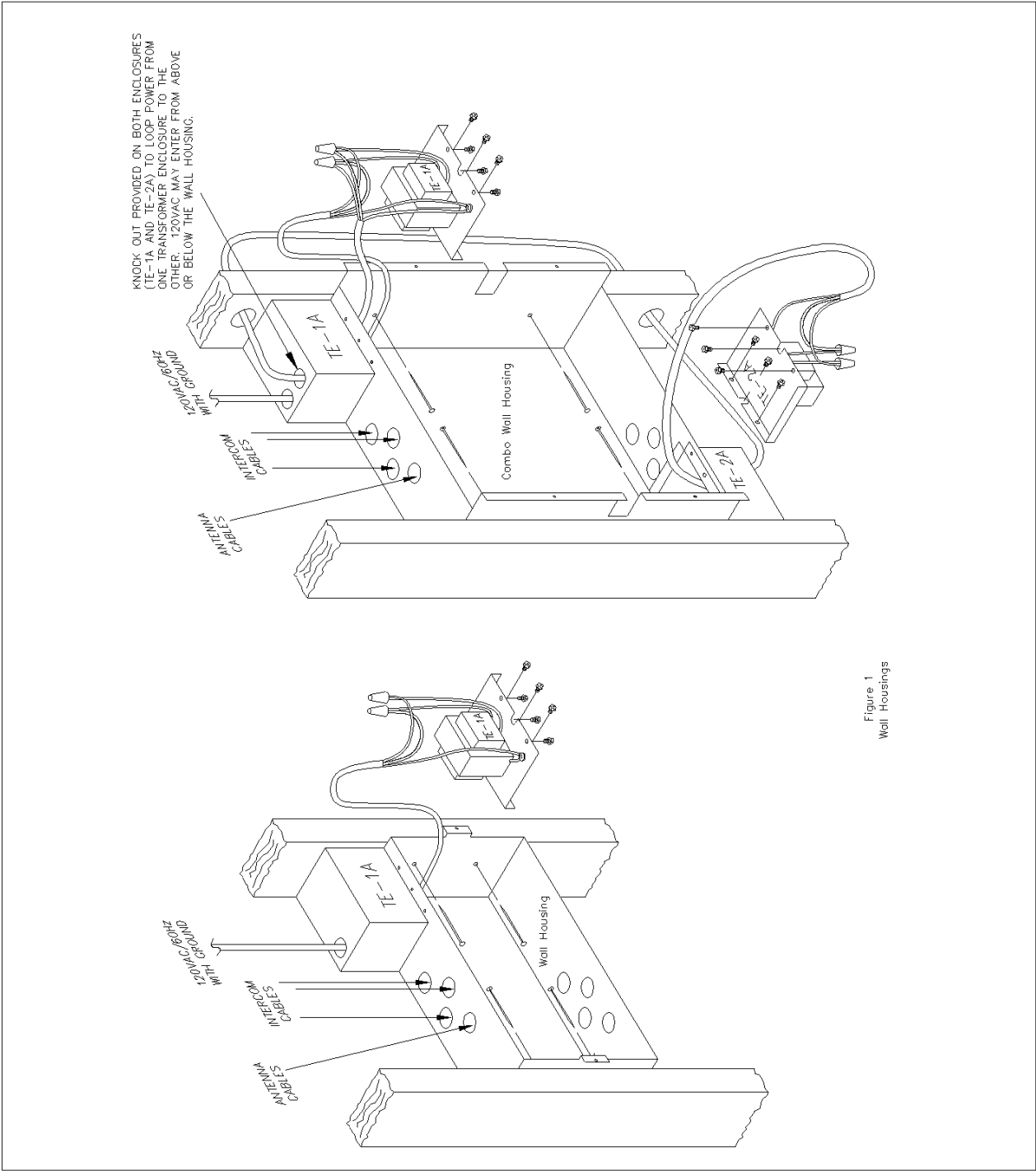


Figure 1  
Wall Housings

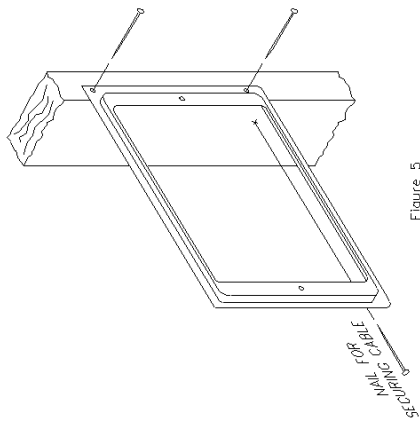


Figure 5  
Remote Control Mounting Ring

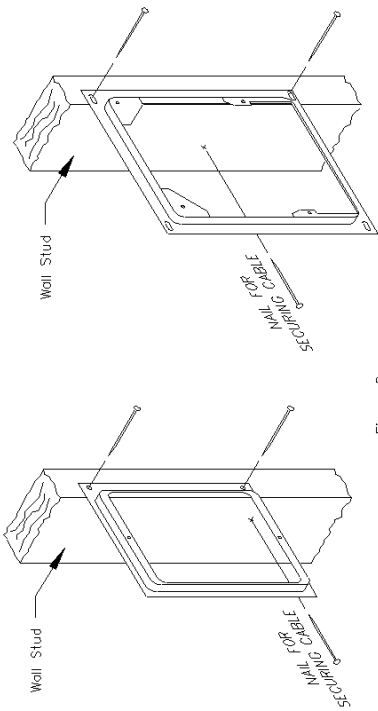


Figure 2  
Speaker Mounting Rings

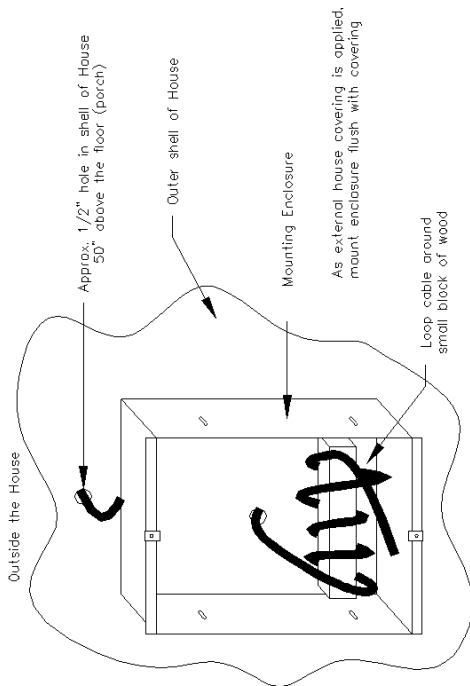


Figure 4  
Mounting Enclosure (Flush Mount)

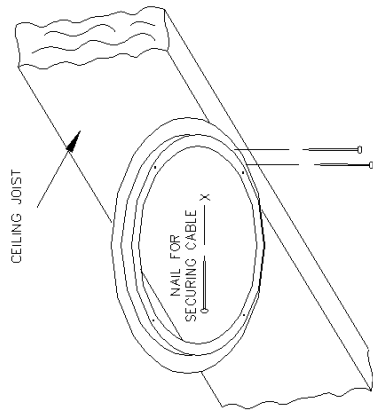


Figure 6  
Speaker Mounting Ring

Figure 3  
Typical Installations

