

Installation Instructions

Model 479BA D-30 Drive-Thru Intracom System

(78-9236-2695-2)

Model R-30 Remote Station

(78-8028-9005-9)

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A. Contents

Item	Part Number	Description	Qty.
1	78-8028-9150-3	Installation Instructions	1
2	See parts list	D-30 Mainstation (Main)	1
3	78-8028-9042-2	Cable Clamp	1
4	26-1002-8025-9	Connector Housing, 2-pin	2
5	78-8005-3232-3	Screw, 8-32 x 3/4 inch Machine	1
6	78-8028-9069-5	Cable Assy., 8 Foot	1
7	78-8028-9024-9	Guide, Mounting	4
8	26-1000-4190-9	Screw, 6-20 x 1/4 inch	12
9	78-8028-8990-3	Bracket, Mounting	1
10	78-8028-9283-2	Transformer, Plug-in 14 VAC, 15 VA	1
11	78-8028-9075-2	Screwdriver/Switch Tool	1
12	78-1754-9456-2	Operating Instructions	1
13	78-8028-8969-7	Warranty Card	1
14	34-4305-5040-1	Dealer Receiving Card	1

Note: Check for shipping damage. If you find damage, notify the shipping company and 3M Sound Products Order Dept. immediately. 3M processes any claims against the shipping company on items 3M has shipped. If someone else has reshipped components, they must make the claim. If making a claim, retain all packaging and components for inspection by the shipping company.

B. Introduction

While intended primarily for a drive-thru menu sign intracom with several second channel capabilities, you can also use the Model 479BA "D-30" dual-channel intracom system for such point-to-point communication applications as drive-thru, passthrough windows, security guard-to-vehicles and as a gas station/truck stop intercom. The D-30 mainstation (Main) has a second "B" channel with input and output options for:

- The Model R-30 Remote Station, a flex mic or a handset as a second location talking to the "A" speaker. The R-30 can also monitor the Main "A" speaker conversation and be called by the Main over the "B" channel.
- An 8-ohm speaker inside for use as a monitor speaker, a speaker for order-call page or order-call with talk-back capability.
- An 8-ohm speaker outside for a passthrough window or another menu sign.

Follow these instructions carefully to help assure proper installation and reliable operation. They describe drive-thru applications because they are the most common. For other applications, mount the Main as shown in figure 2 and connect it to other components as shown in figures 6 through 11.

The Main contains several internal factory-set jumpers which require change for some applications. Refer to figure 4 and to the Customer Analysis and Installation Survey provided by your salesperson for proper jumper settings. Section F contains installation instructions for the optional R-30 Remote Station. Section H covers volume adjustments.

We recommend that you use one of the following 3M speakers with the D-30 for best voice quality. If the application calls for a surface-mounted speaker, the 3M Security Speaker/Mic (SSM) provides greater security with some sacrifice in voice quality. While the D-30 "works" with any 8-ohm speaker, we have matched these 3M speakers to the D-30 for best voice quality and reduced noise pickup. Some applications may require use of a separate microphone located at the bottom center (54 inches high) for best pickup of the customer's voice.

Part Number	Description	Normal Application
78-8028-9810-7	Outside speaker/mic (OSM)	In the menu sign and as a monitor at the grill.
78-8028-9047-1	Security speaker/mic (SSM)	Security surface-mount on pass-through window mullion or on menu sign.
78-8028-9196-6	Speaker/mic assembly with stainless faceplate	Provides better voice quality in curbside post applications.
78-8028-9231-1	Microphone assembly Use with above or OSM. NOTE 1.	Use where excessive noise requires improved voice pickup via curbside post.
78-8028-9185-9	Speaker and mic assembly NOTE 1.	Separate mic and speaker for better voice pickup.

NOTE 1 - Microphone requires a separate twisted-pair shielded cable in addition to speaker cable (usually SDG).

C. Installing Outside Components

WARNING:

A cable connecting from the Main to a speaker in the drive-thru menu sign must route through a conduit that is SEPARATE from that for the sign lighting. Do not under any circumstances route audio or low voltage cables in the same conduit with 120 VAC wiring. This violates the National Electrical Code and presents a hazard.

Figure 5 shows typical conduit requirements, equipment locations, cable routings and wire connections for a drive-thru menu order system using the 3M air switch vehicle detection system. Figures 6 - 11 show wire connections for other vehicle detection systems and accessories. To mount and connect outside components:

1. **OUTSIDE SPEAKER/MIC** - Mount a 3M OSM inside the menu sign or a 3M SSM on the sign surface 54 inches above the roadway. If there is no grill area for an OSM, drill a pattern of 1/4-inch holes.
2. **SPEAKER/DETECTION CABLE** - Route the 3M Speaker/Detection Cable (78-8016-9851-1) from the Main to the menu sign as shown in figure 9. You can use two 18-gauge twisted-pair cables as a substitute.
3. **SODAR CABLE** - If installing Sodar, also pull the RG-58A/U shielded coaxial cable specified in the SODAR instructions at the same time as the speaker/detection cable. A single 18-gauge twisted-pair cable is sufficient for the audio when using Sodar.

4. VEHICLE DETECTION COMPONENTS - Install chosen components.

- Magnetic Loop System - Install a prefab loop kit (lay-in) or magnetic loop kit (cut-in) and route loop lead-in into the menu sign per instructions enclosed with the kit. Solder the lead-in to the speaker/detection cable.
- Sodar System - Attach Sodar transducer and shield to menu sign and connect to coaxial transducer cable per Sodar instructions.
- Air Hose System - Drill a 5/8-inch hole for the air switch nozzle in the sign bottom and two holes appropriate for #8 machine or sheet metal mounting screws. Mount the air switch with the nozzle down and connect the wires as shown in Figure 5. Then attach approximately 16 feet of air hose to the air switch nozzle and then route and clamp the hose to the curb as shown in the inset of figure 5. Use a hose anchor or a hose plug to close the open end of the hose.

5. OPTIONAL MENU CLIPBOARD COMPONENTS - Drill a 3/8-inch hole in the bottom of the menu sign and install the menu clipboard components per figure 1.

D. Mainstation and Remote Station Mounting Methods

Both the Main and the R-30 Remote have four rubber feet for countertop placement, but permanent surface attachment prevents movement which could break connections. The mounting guides and "A" mounting bracket enclosed with each unit provide various mounting methods. The optional pedestal-mount methods shown in figures 2-D, 2-E and 2-F place the unit closer to the operator for better voice clarity, easier control access and lower listening volume.

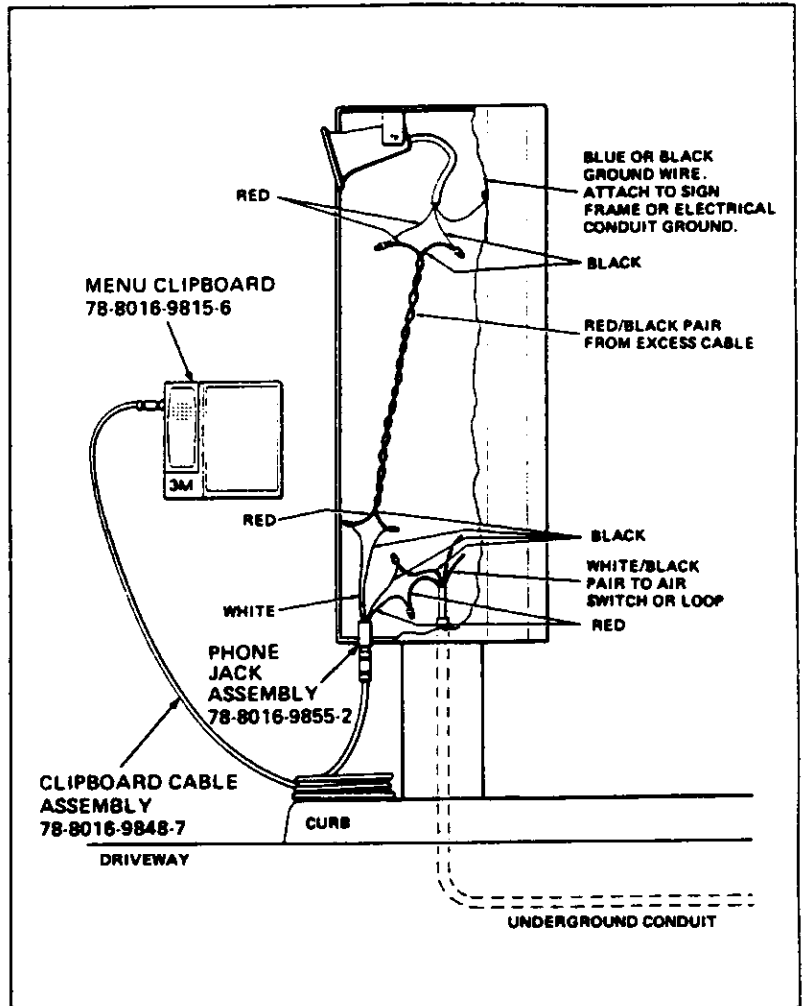


Figure 1. Menu Clipboard Wiring

GENERAL MOUNTING INSTRUCTIONS

1. Attach the "A" bracket to the wall, electrical box or pedestal.
2. Attach the four mounting guides using eight screws per figure 2-A.
3. Remove Main from cabinet and set jumper options per Sales Installation Survey and figure 4.
4. Remove the cable clamp and two-pin spacer connector from the "A" channel socket.
5. Connect the enclosed 8-foot plug-in cable to the "A" channel socket per figures 6 through 11 and the following descriptions.

GENERAL MOUNTING INSTRUCTIONS - CONTINUED

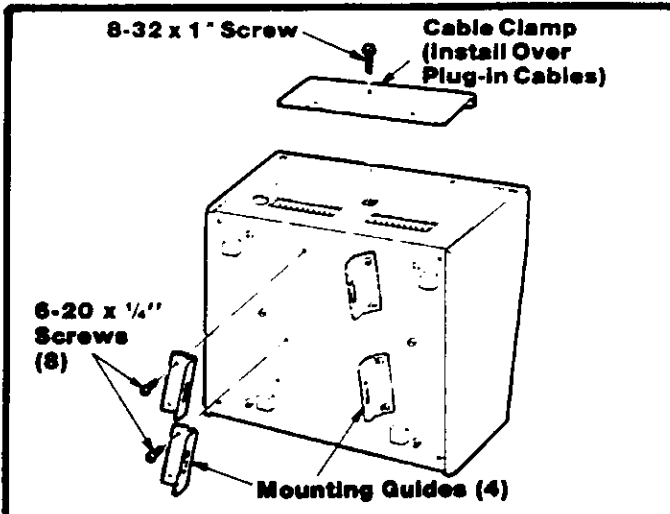
6. If connecting any components to the "B" channel socket, remove the two-pin plug and connect an optional 8-foot or 25-foot "B" channel plug-in cable.
7. Reinstall the cable clamp (or optional rear wire cover in its place).
8. Slide Main/guides into "A" bracket temporarily. Fasten after checkout.

You can add an optional rear wire cover (78-8028-9062-0) in place of the cable clamp to cover the connections for appearance and protection. Install the rear wire cover per its instructions.

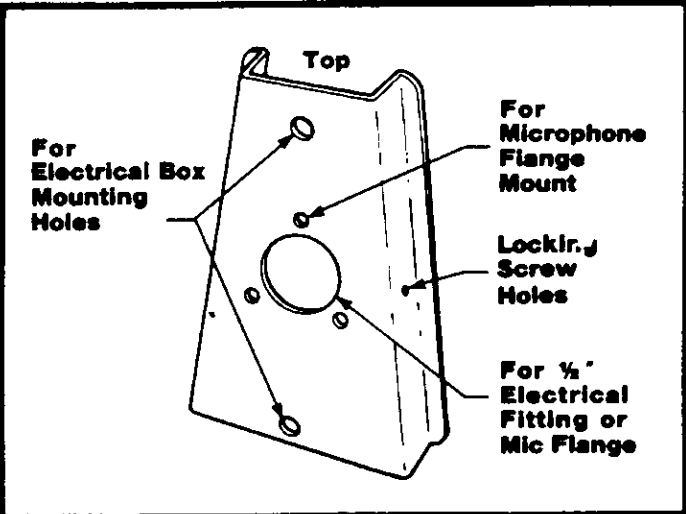
E. Installing Inside Components

Install and connect the inside components per figures 6 through 11 and the following.

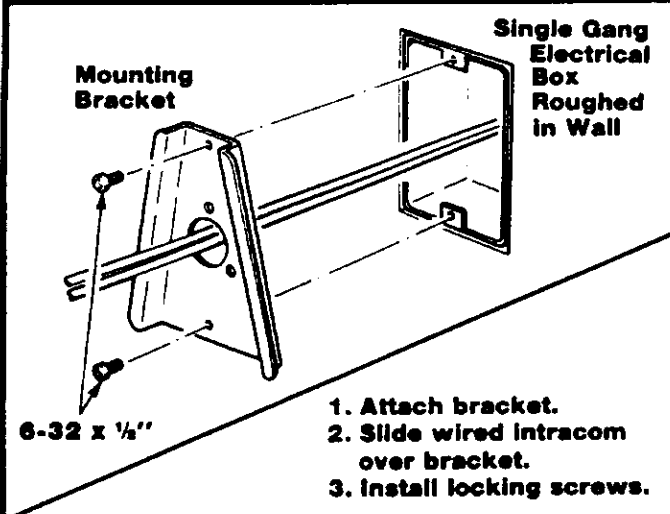
1. **ROUTING CABLES** - Route the speaker/detection cable and cables from any optional components to the Main location. If the plug-in transformer cable will route through conduit or wall to the Main, do so now.
2. **ATTACHING MOUNTING GUIDES AND "A" BRACKET** - If not using the "A" mounting bracket, go to step 3.
 - a. **MOUNTING GUIDES** - Attach the four mounting guides to the Main per figure 2-A.
 - b. **"A" MOUNTING BRACKET** - Attach the mounting bracket to the wall, an electrical box per figure 2-C or to the optional 3M Pedestal Mount per its instructions.
3. **CONNECTIONS TO MAINSTATION PLUG-IN CABLES** - The Main includes an "A" channel plug-in cable which provides connections for most accessory components. Use of an R-30 Remote Station and other components requires separate purchase of a "B" channel plug-in cable. Use two 12-terminal strips as shown in figures 6 through 11 to connect components to the Main plug-in cables. Terminal strips provide a neater and easier-to-troubleshoot installation than wire nuts or crimp connectors. (**Special Note:** The 12-terminal strips are not included as installation components. They must be ordered separately; 3M Part Number 26-1004-0752-2.)
 - a. Mount an "A" terminal strip (and a "B" terminal strip - if needed) within reach of the plug-in cables, either above or below the Main. If only connecting a speaker to the "B" channel, you could route a twisted pair to the Main and connect via the two-pin connector supplied with the Main instead of the plug-in cable and terminal strip.
 - b. Apply the "A" terminal decal near its terminal strip and do the same for the decal included for the "B" terminal strip (if used).
 - c. Route the plug-in cable(s) from the D-30 through the hole in the "A" bracket, through the pedestal (if used) to the terminal strip.
 - d. Separate and strip the 12 "A" cable wires, insert each wire color in the terminal designated on the decal and tighten each screw firmly. Repeat for the "B" cable and terminal (if used).
 - e. Connect the outside speaker/mic to "A" terminals 11 and 12 and connect wires from all other components to "A" and "B" terminals as shown in figures 6 - 11. You may need to connect more than one wire to some terminals. Tighten all screws firmly.



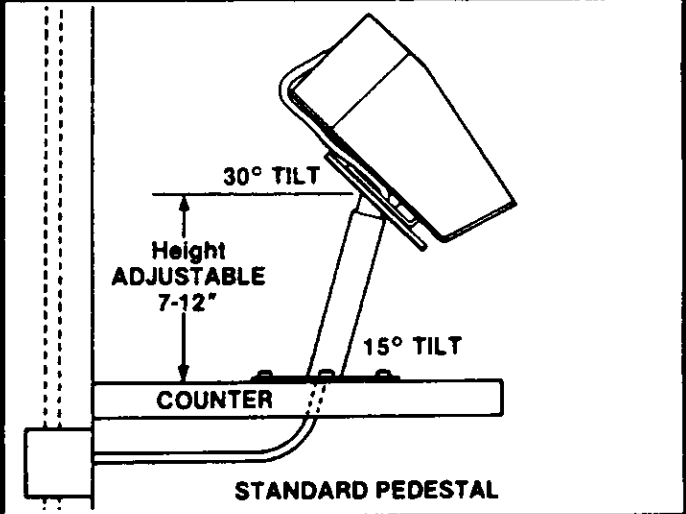
A. Attaching Mounting Guides



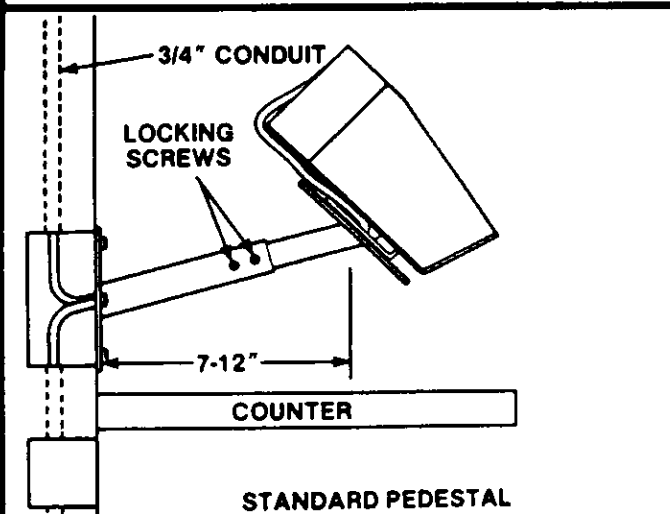
B. Mounting Bracket Features



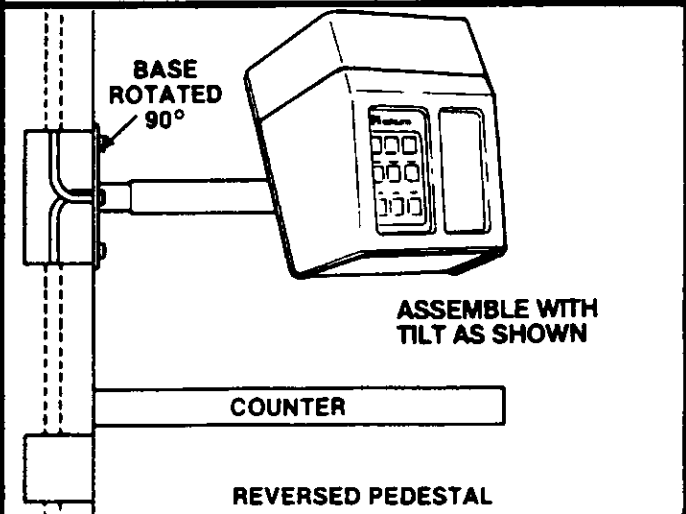
C. Wall Mounting



D. Countertop Pedestal



E. Wall Pedestal



F. Ceiling Pedestal

Figure 2. Intracom Mounting Methods

4. OPTIONAL FOOTSWITCHES - There are three possible footswitch connections:

- MIC #1 Talks to "A" - Connect a footswitch to "A" terminals 7 and 8 per figures 6 - 8.
- MIC #2 Talks to "A" - Connect a footswitch to "B" terminals 7 and 8 per figure 9 when using the optional flex mic as a second talk location. **Note** - Cannot be connected when using a Remote Station.
- R-30 Remote Station talks to "A" - Connect a footswitch either to "B" terminals 8 and 9 or add a two-conductor 1/4-inch phone plug such as Switchcraft 228, 250 or 270 and insert it into the footswitch jack on the R-30 per figures 6 - 8.

5. OPTIONAL FLEX MICROPHONES - You can connect external microphones to two separate inputs on the Main. For best results, use one of the following 3M microphones depending on customer requirements:

- Flex mic without switch (78-8010-4847-7) for VOX or footswitch talk activation.
- N.O. flex mic (78-8010-4873-3) with the switch contacts for the mic jumpered and the relay switching (blue and black) wires connected to the 1TA footswitch terminals for optional grip-to-talk T/L activation in addition to the "A" switch, a footswitch or VOX.

Add an external flex mic for any of three different purposes per figure 9 and the following:

- VOX OPTION - The VOX (Voice Actuated Switching) option requires:
 - 1) Connection of an external flex mic to "A" terminals 4, 5 and 6.
 - 2) Disconnection of the internal microphone connector from the analog (lower) circuit board J102 connection.
 - 3) Opening jumper SW107 (figure 4) to increase the #1 preamp gain for the lower output of a flex microphone.
 - 4) Opening jumper SW103 (figure 4) to enable VOX option.
 - 5) Adjustment of the R9 VOX sensitivity for proper talk trigger.
 - IMPROVE VOICE CLARITY AND REDUCE NOISE PICKUP - Addition of an external flex microphone to replace the internal microphone requires the first three out of the five actions for the VOX option. If using a N.O. flex. mic., connect the blue and black wires to "A" terminals 7 and 8 for talk switching. Jumper the mic switch contacts to allow footswitch operation.
 - A SECOND MICROPHONE LOCATION TO TALK TO THE "A" SPEAKER - Connect a flex mic to "B" terminals 5, 6 and 7 and open jumper SW108 to increase the #2 preamp gain for the lower output of a flex microphone. Connect only one mic to this second "talk to A" point. You can connect a monitor speaker and open SW105 for listen audio. **Note** - You cannot use a remote station when using a #2 flex mic.
6. OPTIONAL MONITOR SPEAKER - You can monitor the "A" channel conversation over any 8-ohm speaker connected to "B" channel terminals 11 and 12 or over a R-30 Remote Station. You can connect both a monitor speaker and an R-30 to these terminals (sharing the five-watt "B" amplifier output) but connect no more than a total of four speakers. Connect a volume control for each monitor speaker to provide local volume control. Jumper switches SW104 and SW105 along with the R4 volume control provide the monitor function. Refer to figure 4 and open the appropriate switch per the following:
- No monitor of "A" heard at "B" (as shipped) - SW104 and 105 closed
 - "B" monitors outgoing "A" audio (#1 mic) - Open SW104
 - "B" monitors incoming "A" audio (outside) - Open SW105
 - "B" monitors both sides of "A" conversation - Open SW104 and SW105

7. **OPTIONAL PHONE JACK ASSEMBLY FOR PLUG-IN CONNECTION OF AN EARPHONE, HEADSET OR EXTERNAL SPEAKER.** - Install the phone jack assembly 78-8028-9153-7 and attach a 1/4-inch three-conductor phone plug to the device you will plug in per the phone jack instructions.
8. **OPTIONAL HANDSET** - You can use one or more 78-8028-9282-4 handsets with the D-30 for private listening. Order the 78-8028-9219-6 handset cradle separately to provide a hanger for the handset. Connect in either of the two following methods:
 - **HANDSET METHOD #1 ("B" CHANNEL)**

Connect one or more handsets to the "B" channel terminals per figure 10 to use a handset as a second or remote talk to "A" channel point. Open internal jumper switch SW105 to send incoming audio monitor to the handset receiver. This connection allows use of either the D-30 internal speaker and mic or the handset. It allows using handsets in a location away from the D-30 like a remote station. We suggest changing SW106 (on rear chassis) to "AUTO" for automatic standby when using the handset for remote operation. You cannot use an R-30 Remote Station or a #2 flex mic when using this handset connection. You can still connect a "B" channel speaker for monitor or order-call page, but the handset will hear this also.
 - **HANDSET METHOD #2 ("A" CHANNEL USING PHONE JACK ASSEMBLY)**

Install the phone jack assembly previously described per its instructions and connect the handset to the "A" terminals and the phone jack as shown in figure 11. The handset mic replaces the internal mic in this connection and plugging into the phone jack disconnects the internal speaker. You must disconnect the internal electret mic, allowing the operator to only converse over the handset. The phone jack does allow the operator restoration of the D-30 listen speaker by simply unplugging the handset plug.
9. **OPTIONAL PRESENCE ALERT** - Use the presence alert to provide tone and vehicle presence indication at a second location if needed. Remember that you can adjust R5 to provide alert tones over the "B" channel speaker or Remote Station. Connect the presence alert per its instructions and figures 6 - 11.
10. **VEHICLE DETECTION COMPONENTS** - Connect the chosen detection system:

Note: You must use either a loop detector or Sodar vehicle detection to provide vehicle presence indication and to use the optional automatic audio off feature.

- a. **Loop Detector** - Mount and connect the loop detector per its instructions and figure 6. Connect the yellow detector wire to "A" terminal 2 and the brown wire to terminal 3.
- b. **Sodar Detector** - Mount and connect the SODAR Detector per its instructions and figure 7. Connect a wire from Sodar terminal 3 to "A" terminal 4 and Sodar terminal 4 to "A" terminal 3.
- c. **Air Switch** - Connect the white speaker/detection cable wire coming from the air switch to Main "A" terminal 2 and the black wire to terminal 3 as shown in figures 5 and 8 - 11.

F. Installing Optional Remote Station (R-30)

The R-30 provides a second talk point to the "A" speaker in place of the second flex mic. In addition, you can set the Main internal jumpers to have the R-30 monitor the Main "A" speaker conversation. You can also call the R-30 from the Main via the "B" channel and converse without being heard over the "A" channel speaker. The R-30 can receive the vehicle tone, can accept a footswitch and features the same mounting bracket concept and high reliability "touch" switching as the Main. The R-30 receives DC voltage from and uses the amplifiers within the Main. You can use only one R-30 with a Main. If you require vehicle presence indication at the R-30 location, install the optional Presence Alert nearby per Section E-9.

1. R-30 CONTENTS (SEE FIGURE 3)

Item	Part Number	Description	Qty.
1	See parts list	R-30 Remote Station	1
2	78-8028-9017-4	Mounting Guide	2
3	78-8028-8990-3	Mounting Bracket	1
4	26-1000-4190-9	Screw, Self-Tap, Phil. 6-20 x 1/4 in.	8
5	78-8028-9043-0	Cable Clamp	1
6	78-8005-3232-3	Screw, Machine, Slotted 8-32 x 3/4 in.	2
7	78-8028-9039-8	Cable Assembly, 8-Foot	1

2. **MOUNTING** - Attach the "A" mounting bracket to an electrical box per figure 2-C or to a pedestal mount per its instructions. Attach the mounting guides per figure 3 using the hardware included.

You can add the optional rear cover (78-8028-9062-0) either to cover the plug-in connector or as an alternate way to mount the R-30. Attach the cover per its instructions.

3. **ROTATING SWITCH PANEL FOR VERTICAL MOUNTING** - You must rotate the switch panel 90 degrees to allow vertical mounting.

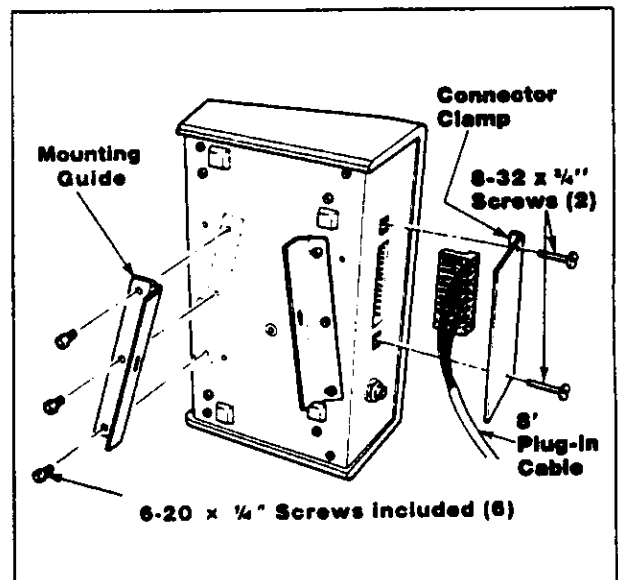


Figure 3. Attaching R-30 Mounting Guides

TO ROTATE THE R-30 SWITCH PANEL:

- Separate the top and bottom cabinets (four outer screws on bottom).
- Loosen the four outer screws holding the switch panel to the cabinet.
- Remove the four inner screws holding the mounting tabs and rotate each tab out of the way.
- Lift out the switch panel and rotate it to the desired position. The R-30 works best with the switch panel at the bottom.
- Rotate the four mounting tabs back in position and reinstall the four inner mounting screws. Be sure that you position the two mounting tabs under the switch panel.
- Tighten the four.
- Rejoin the cabinets and reinstall the four screws.

4. **CONNECTIONS** - The R-30 connects to the Main "B" channel via a six-pair plug-in cable system. These cable connectors contain a polarizing key in pin #1 that prevents connection to the "A" channel. An 8-foot plug-in cable comes with and normally attaches to the R-30. Connection to the Main requires an additional plug-in cable which you choose based on the length of cable required between units.

- Purchase a second 8-foot plug-in "B" cable (78-8028-9039-8) for a total of 16 feet.
- Purchase a 25-foot plug-in "B" cable (78-8028-9040-6) for a total of 33 feet.
- Purchase two 25-foot plug-in "B" cables (78-8028-9040-6) for total of 50 feet.
- Purchase two 12-pin connector kits (78-8028-9048-9), the special insertion tool (26-1004-0842-1) and 6-pair (not 12-conductor) cable and make your own plug-in cable. We recommend the same cable we use in the plug-in cable assemblies, West Penn #654 "Perfect Pair" cable, because the color stripe with each black wire helps prevent costly wiring errors.

We recommend that you use a second 12-terminal strip (26-1004-0752-2) to connect the two plug-in cables together as shown in figures 6 - 8. To connect the R-30 to the Main using the terminal strip:

- a. Plug the 8-foot "B" cable assembly (with polarizing key) onto the R-30 connector and route the cable below counter or above ceiling.
- b. Attach the connector clamp to the rear of the R-30 per figure 6.
- c. Mount the terminal strip and apply the "B" connection decal included with the Main.
- d. Connect the 12 color-coded cable wires to the terminals per the decal and figures 6 - 8. Firmly tighten each screw.
- e. Connect the 25-foot "B" channel cable to the "B" channel connector on the back of the D-30 and route the cable to the terminal.
- f. Connect these 12 color-coded cable wires to the same terminals per the decal and figures 6 - 8. Firmly tighten each screw.

G. Changing Main Jumper Options

Some Main features and optional components described previously require that you change Main internal jumper switches. To change jumpers, separate the Main cabinets (four screws at bottom corners) and open any jumpers indicated by feature selections on the Customer Analysis and Installation Survey Form provided by your salesperson. To open a jumper switch, gently push down the spring arm and move it sideways to unhook it (similar to opening a safety pin). Figure 4 shows jumper switch locations and a checklist for all options. The Main has three jumper options not described elsewhere.

1. **ALERT TONES** - Switch SW201 on the logic (upper) PC board provides selection of either "REPEAT" or "SINGLE" alert tones. The factory "REPEAT" setting provides slowly repeating alert tones canceled by any talk to "A" activation. Repeat tones are best for prompt operator response and to avoid failing to hear the alert and not answering a customer. If your customer desires single tone operation, change SW201 to "SINGLE" (toward middle of board). Adjust R5 and R6 for tone volume or turn to minimum for no tones.

(continued on page 11)

D-30 "B" INTRACOM SYSTEM JUMPER SWITCH OPTIONS

Feature	Options	Setting
Speaker/mic at "A" channel.	Single speaker/mic (like OSM) Mic separate from speaker	*WJ101 and WJ102 uncut Cut WJ101 and WJ102
"B" channel input.	8-ohm speaker/mic (like the OSM) R-30 (electret mic)	*SW102 set to "B SPKR" SW102 set to "REMOTE"
Voice-operated talk switching.	VOX off VOX on	*SW103 closed SW103 open
B channel speaker (or Remote) monitors Main - A channel conversation.	No monitor Monitor talk (outgoing) Monitor listen (incoming) Monitor both talk and listen	*SW104 and SW105 closed SW104 open SW105 open SW104 and SW105 open
Automatic standby (cannot use with air switch)	MAN (Manual standby) AUTO (Automatic standby)	*SW106 closed SW106 open (Don't open with an air switch)
Mic #1 Type (#1 preamp gain)	Internal Mic External Mic (Flex Mic)	*SW107 closed SW107 open
Mic #2 Type (#2 preamp gain)	R-30 at B #2 Flex Mic at B	*SW108 closed SW108 open
Type of alert tone signal	Slowly repeating tones Single tone	*SW201 toward outside SW201 toward inside

* Indicates factory setting of that switch

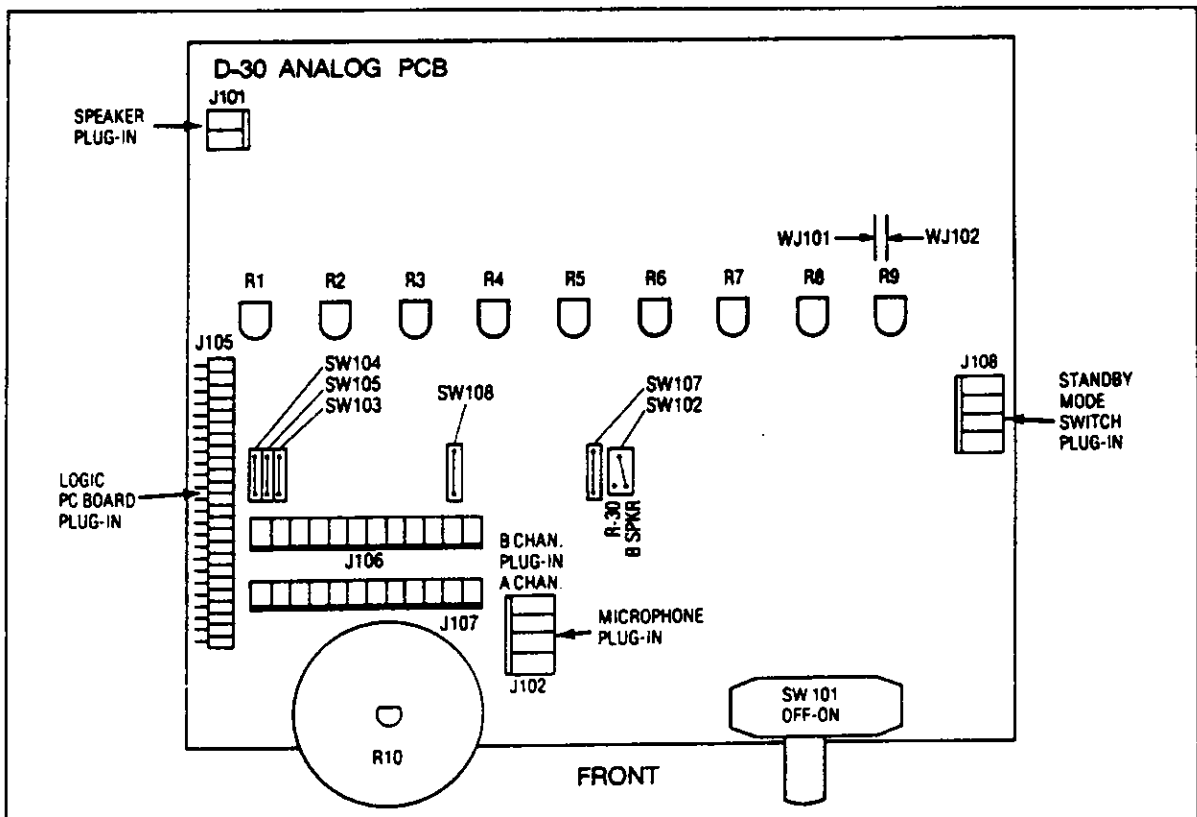


Figure 4. D-30 "B" Jumper Switch Locations

2. **AUTOMATIC STANDBY** - The D-30 automatically turns on the listen audio (switches from STANDBY to LISTEN modes) upon vehicle detection. Normally the operator must touch the STANDBY switch to silence the audio after a vehicle leaves (manual standby). Change switch SW106 (located on rear chassis) to "AUTO" for automatic standby. This feature silences the listen audio automatically when a vehicle leaves, eliminating the need for operator action. Automatic standby is not possible with an air switch vehicle detection system. **Note** - If using this feature, instruct the customer concerning this switch location and purpose. They must change back to "MAN" to hear the "A" channel with no vehicle detection or if the vehicle detection fails.
3. **SEPARATE OUTSIDE MICROPHONE** - Jumper wires WJ101 and WJ102 normally allow use of the "A" speaker both as a speaker, and through the jumpers, as a microphone. If you wish to connect a separate outside microphone, in addition to a speaker, then cut both jumper wires (see figure 4) and connect one of the special 3M low impedance microphones to "A" terminals 9 and 10 using twisted-pair shielded cable. Connect the shield to terminal 8 and leave it unconnected at the microphone end.

H. System Checkout and Volume Balancing

1. **CONNECT TRANSFORMER TO MAIN** - Insert the transformer cable plug into J116, the power jack on the back of the Main.
2. **TEMPORARY MAINSTATION MOUNTING** - Connect the "A" cable and the "B" cable (if used) to the matching connectors on the back of the Main and temporarily mount the Main per one of the following.
 - **Mounting Bracket** - Install the cable clamp on the rear of the Main as shown in figure 2-A and slide the Main temporarily onto the "A" mounting bracket.
 - **Optional Rear Wire Cover** - Install the optional the rear wire cover per its instructions in place of the cable clamp and mounting bracket system. Slide the keyholes over the mounting screws and slide sideways to hold in place temporarily. **Note** - You can add the cover and still use the "A" mounting bracket if desired.
3. **PLUG IN TRANSFORMER** - Plug in the power transformer to a 120 VAC, 60Hz outlet. The "A" channel green "LISTEN" LED should illuminate and the vehicle tone should sound (if R6 is turned up) when you turn on the switch.

- 4. **VOLUME BALANCING, VOX SENSITIVITY ADJUSTMENT AND FUNCTION CHECK** - The Main contains no master volume control. It has a listen volume control for the operator, and nine internal volume controls to be adjusted and balanced by the installer as follows. Some volume adjustments are only necessary when using certain accessories. Set all unused volume controls to minimum.

Note - Use care and the special plastic screwdriver tool enclosed with the Main for the nine volume adjustments accessible through the bottom of the Main. Excessive force will break the controls.

D-30 INTERNAL VOLUME CONTROLS

Vol	Labelled	Detailed Description
R1	Main to A	Volume of operator heard at "A" channel speaker.
R2	Remote to A or Second Mic to A	Volume of 2nd operator heard at "A" speaker.
R3	Main to B	Volume of operator heard at "B" channel speaker.
R4	A to B	Volume of "A" channel customer heard at "B" speaker.
R5	Vehicle detect to B	Volume of vehicle detect tone heard at "B" speaker.
R6	Vehicle detect to main	Volume of vehicle detect tone heard over D-30 speaker.
R7	B to main	Volume of "B" speaker/mic heard over D-30.
R8	A to main	Volume of "A" speaker/mic heard over D-30.
R9	VOX trigger sensitivity	Volume of operator speaking into flex mic that triggers talk switching. Speak about 2 inches from mic.
R10	Volume	Operator's listen volume over internal speaker.

**D-30/R-30 SYSTEM OPERATION CHECK AND VOLUME ADJUSTMENT PROCEDURE
(SET ALL UNUSED CONTROLS TO MINIMUM)**

- a. Set the listen volume (operator's knob) to its mid-position.
- b. With someone outside to help, press and hold the "A" talk switch (red LED illuminates). Adjust R1, the "MAIN TO A" talk volume heard over the outside speaker while speaking into the Main. Release the "A" talk switch (the green LED illuminates). Adjust R8, the "A TO MAIN" volume control, for suitable listen volume.
- c. If using a remote station or a #2 flex mic, activate its talk switch and adjust R2 for the "REMOTE or 2ND MIC TO A" talk volume heard over the outside speaker/mic.
- d. If using a remote station set the volume control on the remote station to midrange. While someone outside speaks, adjust R4, the "A TO B" monitor volume heard over the R-30 remote station or "B" channel monitor speaker. If you need to talk to the remote station or "B" channel speaker, press and hold the "B" talk switch and observe the red light. Adjust R3, the "MAIN TO B" volume. The R-30 volume control also affects both of these volumes. Release the switch and observe the green listen light. If you need to hear the remote or "B" speaker talk back, adjust R7, the "B TO MAIN" volume heard over the Main internal speaker. The Main operator volume control also affects this volume.
- e. Press the standby switch to silence the Main (green LED goes out).

D-30/R-30 SYSTEM OPERATION CHECK AND VOLUME ADJUSTMENT PROCEDURE (SET ALL UNUSED CONTROLS TO MINIMUM)

- f. Test vehicle detection (if used). Presence detection should light the yellow "VEHICLE" light, produce slowly repeating tones heard over the Main speaker (or a single tone if SW201 set to "SINGLE") and turn on the "A" listen audio. Pulse detection such as from an air switch produces the same turn-on results as above except that the yellow "VEHICLE" light will flash with each tone and does not indicate vehicle presence.
- g. Adjust R5, the "VEHICLE DETECT TO B" tone volume heard over the remote station or "B" channel speaker. Adjust R6, the "VEHICLE DETECT TO MAIN" tone volume heard over the Main internal speaker. Actuate any "TALK TO A" switching to cancel repeating tones. If you don't want tones, set the appropriate control to minimum.
- h. STANDBY MODE SELECTOR - If you change the standby mode selector on the rear chassis to "AUTO", loss of vehicle detection will automatically switch the D-30 to standby, silencing the audio. Air switch vehicle detection requires the "MAN" (manual) mode setting, where the operator must press the STANDBY switch to silence the audio.
- i. If using the VOX option, adjust R9, the "VOX TRIGGER SENSITIVITY" control to set the audio level picked up by the external flex mic that will trigger VOX talk operation. Be sure to stress to all operators the importance of sufficient voice loudness and a close microphone-to-mouth distance for proper VOX operation.
- j. Set any unused volume controls to minimum.
- k. If using a footswitch, flex mic, or handset, check talk switching.
- l. If used with menu clipboard, check its operation.
- m. Instruct the operator and give the enclosed operating instructions.
- n. Keep these instructions for reference.

I. Service Information

Most new installation problems result from wiring errors or from missed instructions so recheck everything if you have a problem. Be sure you have properly set the internal jumper switches for the options used and adjusted the internal volume controls. Refer to the 3M service manual for schematics, troubleshooting and parts information.

Users should contact their local authorized 3M Sound Products dealer for service on these products. For the name of your local dealer, repair or installation assistance, contact 3M Sound Products Technical Service at (612) 733-4912.

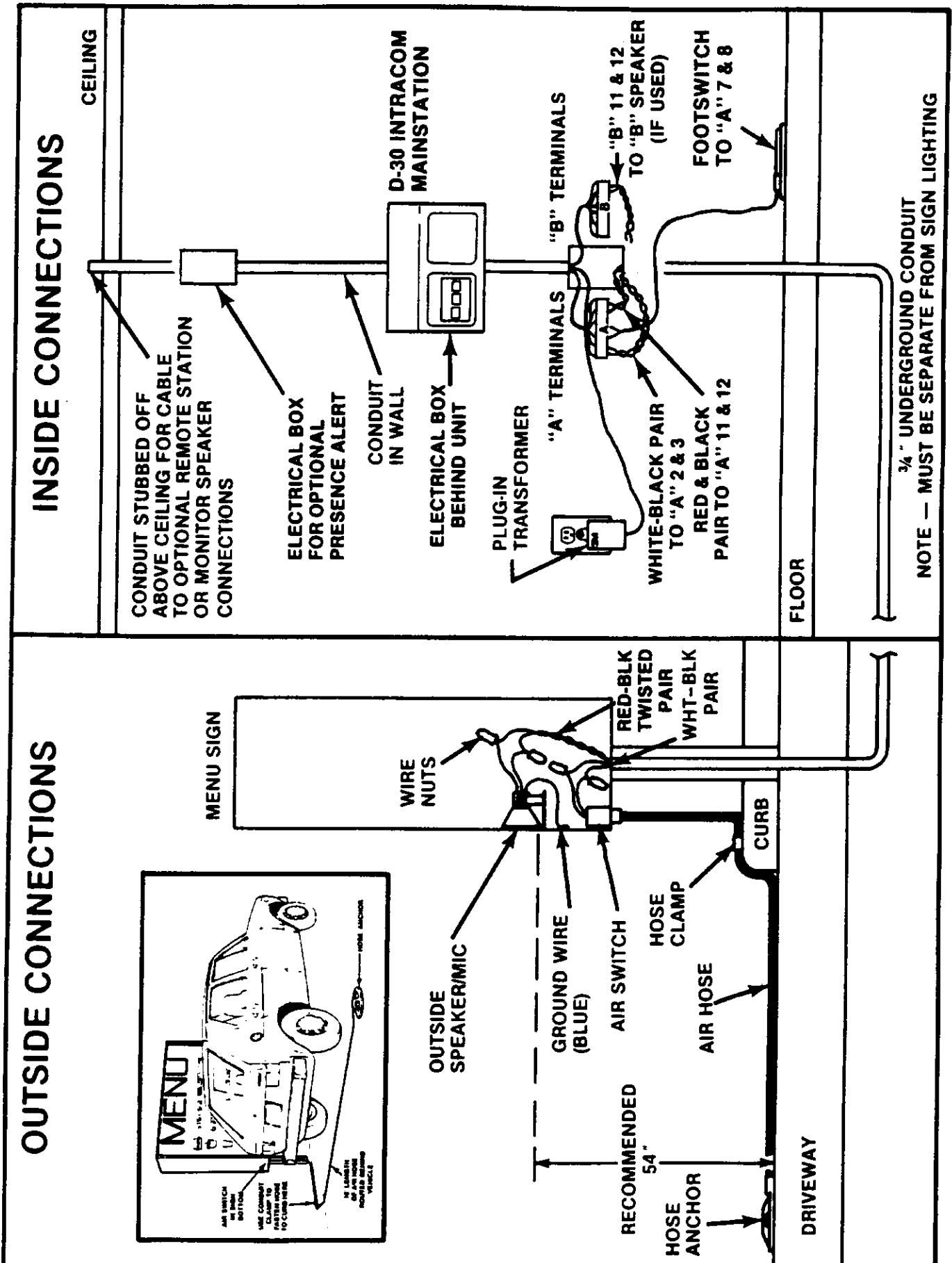


Figure 5. Typical D-30/Air Hose Mounting and Conduit System

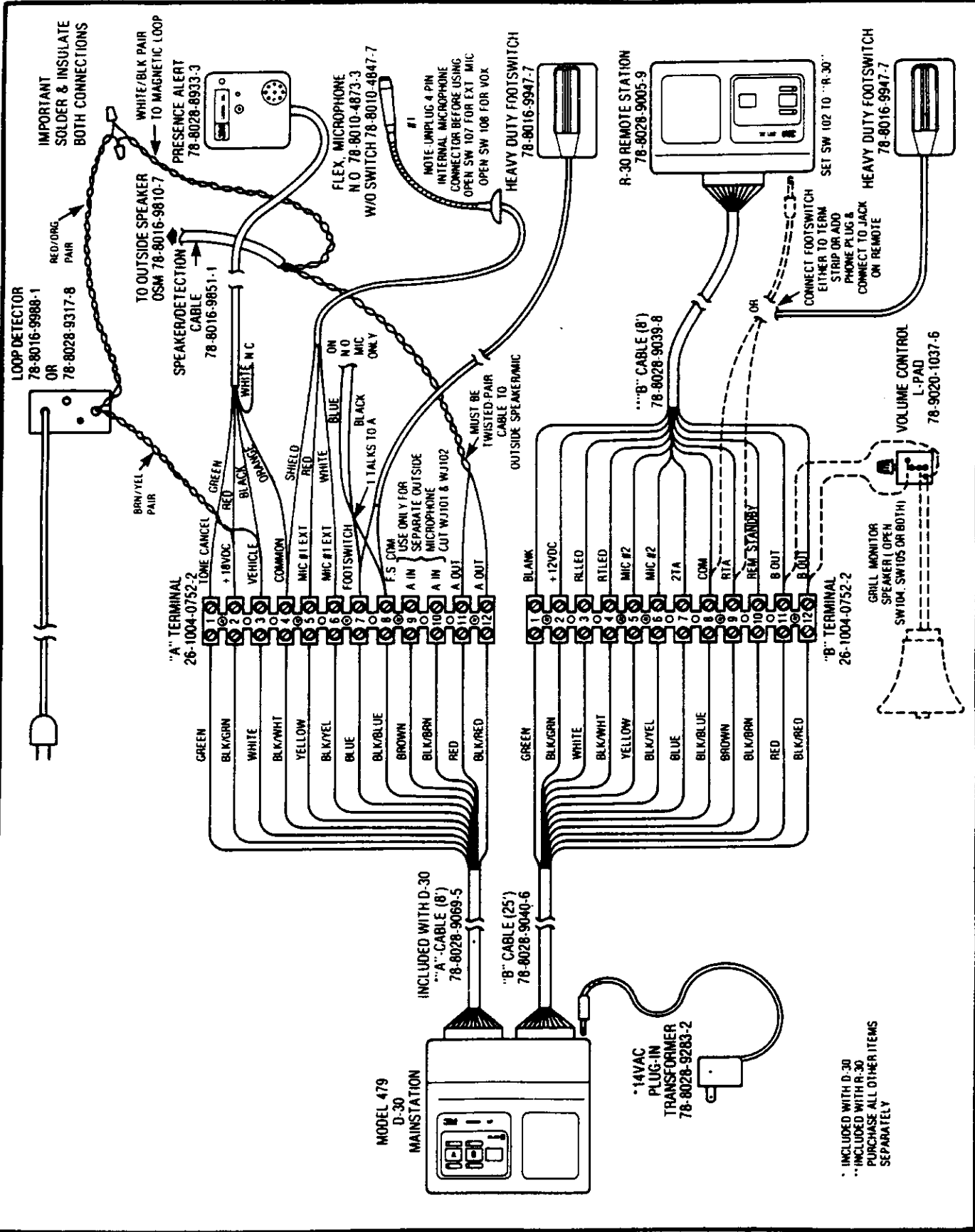
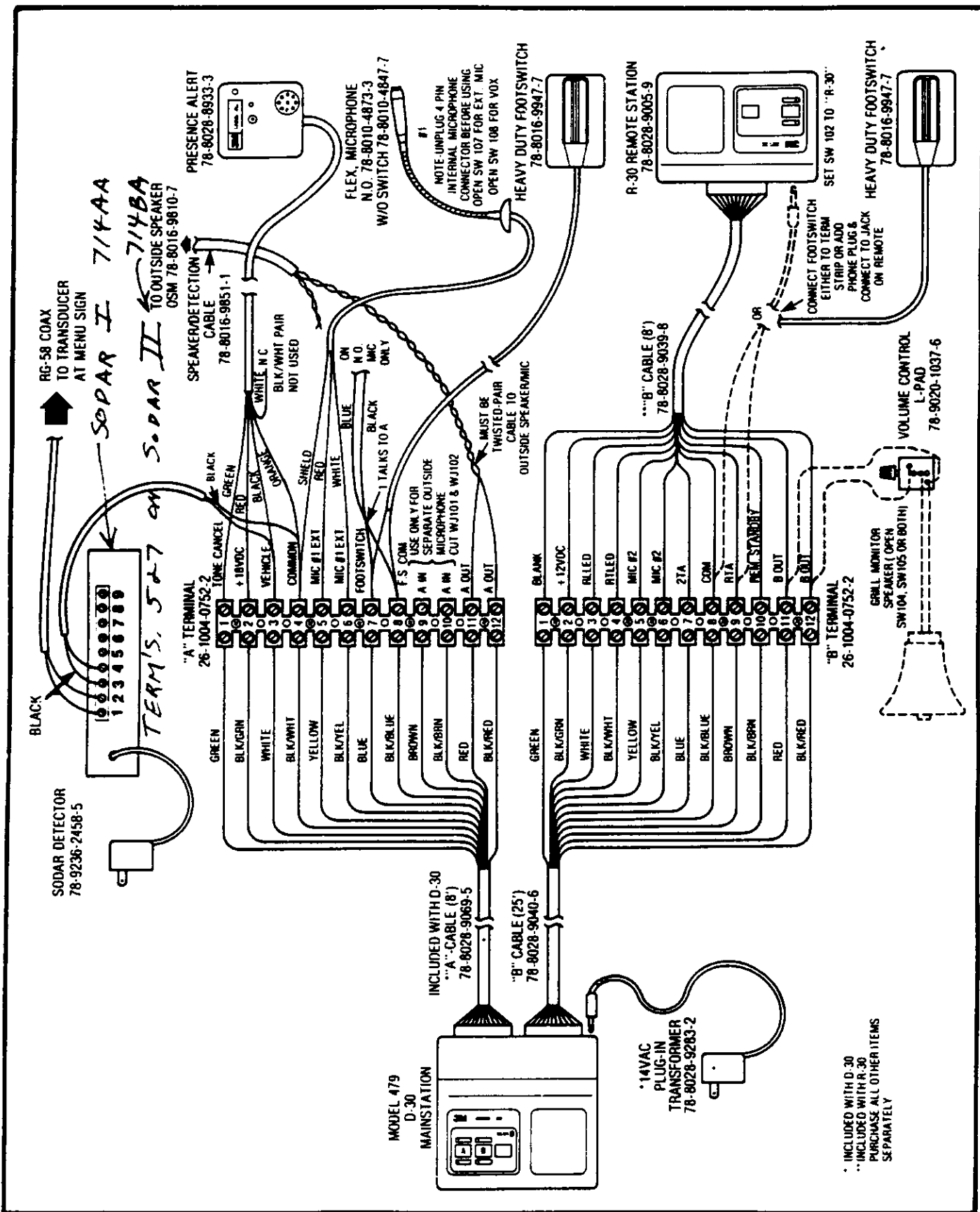


Figure 6. Typical D-30/R-30/Magnetic Loop Connections



* INCLUDED WITH D-30
 ** INCLUDED WITH R-30
 PURCHASE ALL OTHER ITEMS SEPARATELY

Figure 7. Typical D-30/R-30/Sodar Connections

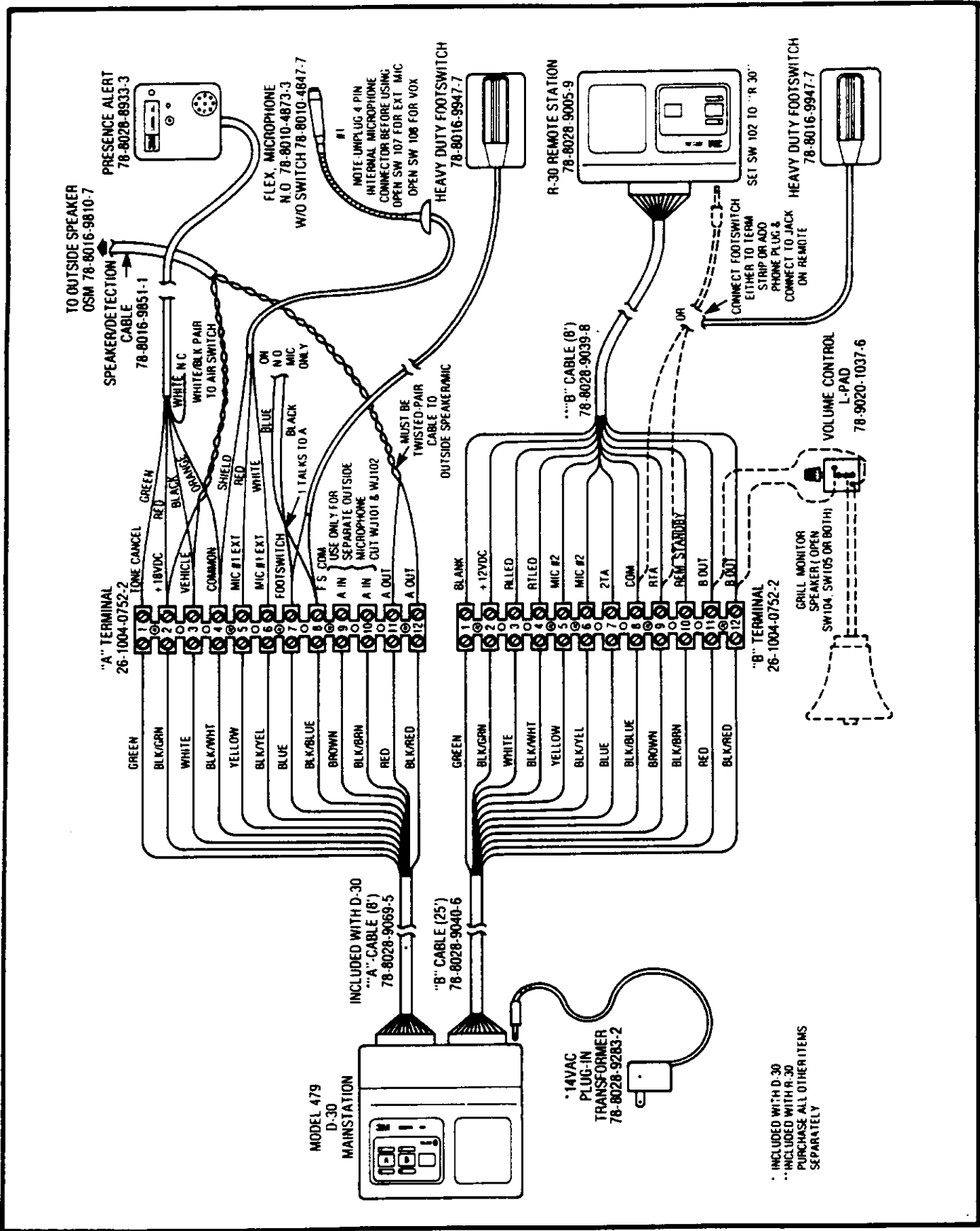


Figure 8. Typical D-30/R-30/Air Switch Connections

- * INCLUDED WITH D-30
- ** INCLUDED WITH R-30
- *** PURCHASE ALL OTHER ITEMS SEPARATELY

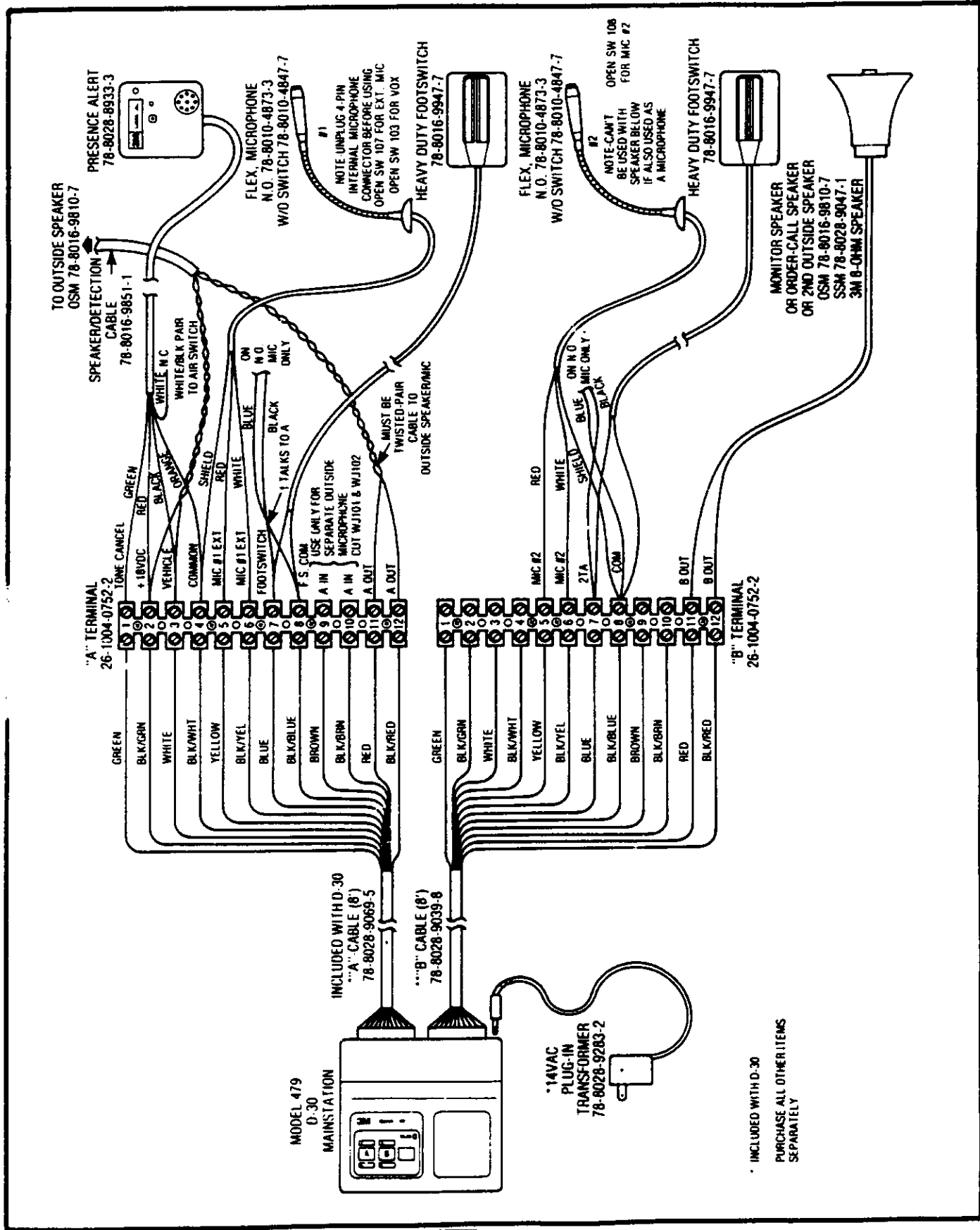


Figure 9. Typical D-30/#2 Flex Mic/Monitor Speaker Connections

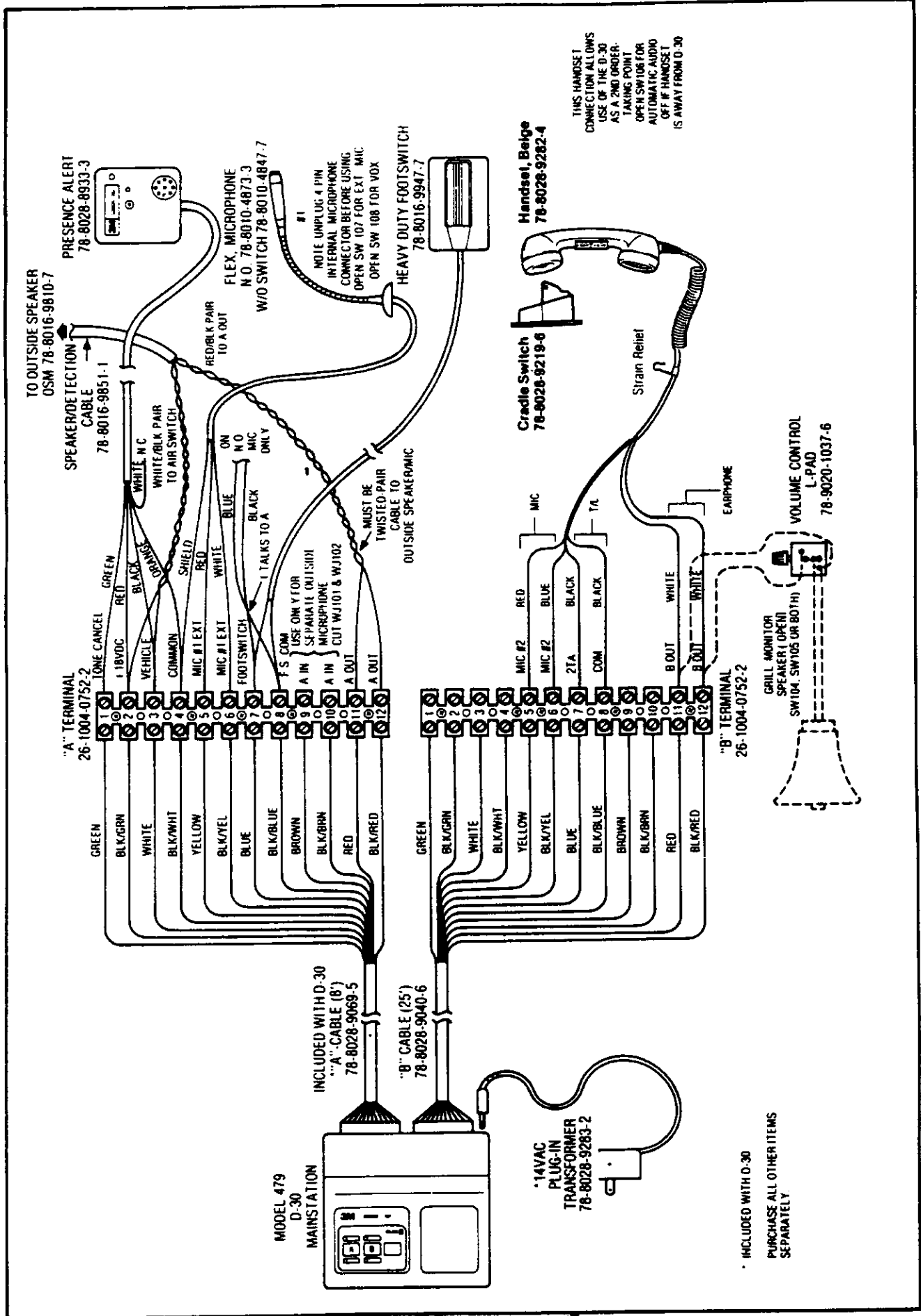


Figure 10. D-30 Connections - With Handset on "B" Channel

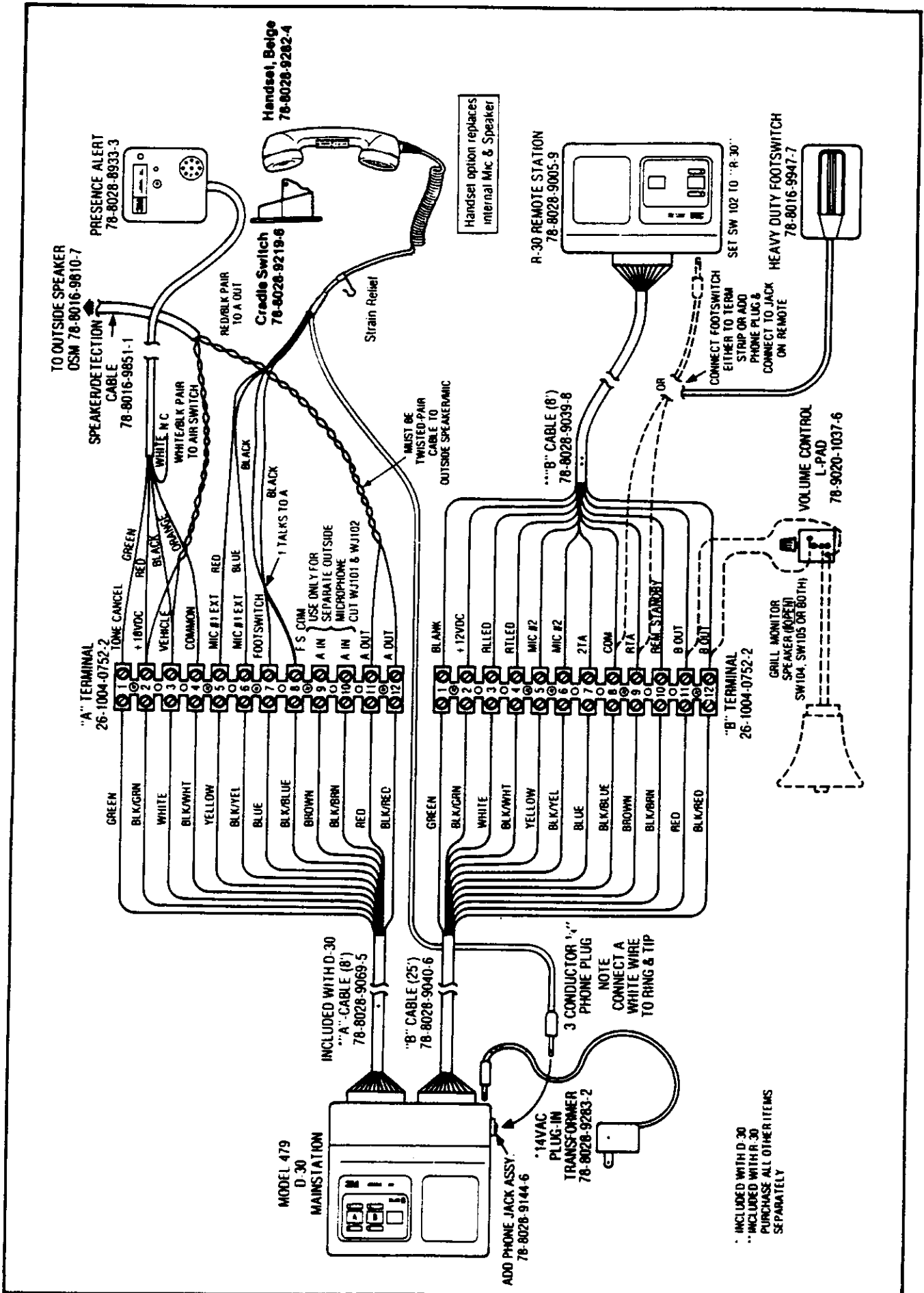


Figure 11. D-30 Connections - With Handset Replacing Mic