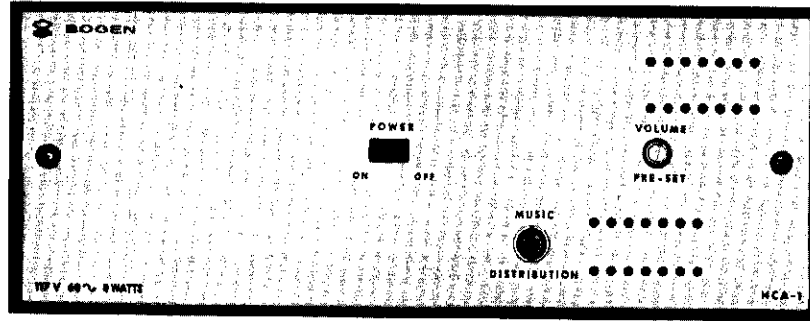
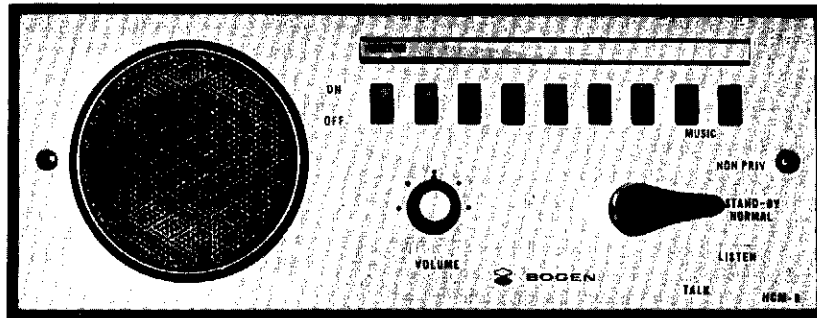


BOGEN DELUXE HOME COMMUNO-PHONE SYSTEM

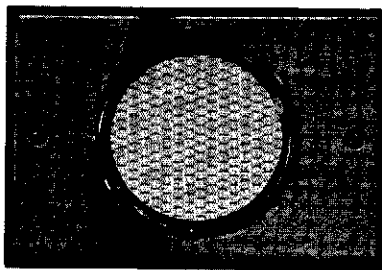
MODEL
HCA-1
AMPLIFIER



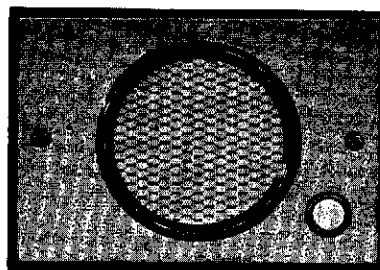
MODEL
HCM-9
CONTROL STATION



MODEL
HCR-1
REMOTE UNIT



MODEL
HCR-2
REMOTE UNIT



INSTALLATION AND OPERATING MANUAL

READ THOROUGHLY BEFORE OPERATING EQUIPMENT

DESCRIPTION

The Bogen Deluxe Home Communo-Phone System has been designed to provide a versatile, labor saving inter-communication system for homes and similar buildings. This system can have combinations in any desired arrangement of control stations and remote stations with a total of 9 stations in any one system. The amplifier unit is fully transistorized for trouble free operation. The output of a radio receiver may be connected to the MUSIC DISTRIBUTION jack and any control station may be wired to receive the music broadcast. The system continues to operate normally, even while a broadcast is distributed, and an incoming call will override the music.

The Deluxe Home Communo-Phone System consists of the following parts:

a. Model HCA-1 Amplifier - This is a transistorized amplifier and power supply. The unit uses flush mount back box model RBA-F. This box may also be used to surface mount

the HCA-1 in an inconspicuous place such as a closet or basement.

b. Model HCM-9 Control Station - This unit is used wherever privacy and selective origination of calls are desired. The control station may call other control stations or remotes. The HCM-9 Control Station uses a model RBM-F back box for flush mounting.

c. Model HCR-1 Remote - This is a remote speaker, non-private unit which cannot originate calls. Model RBR-F back box is used for flush mounting; back box Model RBR-S is used for surface mounting.

d. Model HCR-2 Remote - This is a remote speaker with a built-in push button for a doorbell. This is a nonprivate unit which cannot originate calls. The HCR-2 may use back box RBR-F for flush mounting, or back box RBR-S for surface mounting.

OPERATION

IMPORTANT POINTS TO REMEMBER

Always bear in mind that only one station may talk at one time in this system.

When originating a call, always identify your station.

Leave the function switch in the STAND BY NORMAL position, unless monitoring another control station.

Always adjust the VOLUME when receiving, never when talking.

A control station must have its MONITOR switch in the ON position in order to monitor another control station.

In order for a control station to be monitored by another control station, the monitored station must have its function switch in the NON PRIV position.

HCA-1 AMPLIFIER-POWER SUPPLY

The front panel of this unit has a POWER ON-OFF switch, a screw driver adjust PRE-SET VOLUME control and a MUSIC DISTRIBUTION input jack. After the unit has been installed, the POWER switch is placed in the ON position and the volume adjusted, the amplifier need not be touched during normal operations. When the system is not in use the amplifier power supply draws very little current. When closing the house for an extended period of time, more than two weeks, it is advisable to turn off the power.

HCM-9 CONTROL STATION

The control station has 8 selector slide switches, each with an ON and OFF position for selection of specific stations to listen to, or to communicate with. A write-in identification strip is located above the slide switches for identification of other control stations and remotes.

The MONITOR slide switch, located on the extreme left, is used to monitor other control stations. When the MONITOR switch is in the ON position and the function switch is in the LISTEN position, the control station can monitor any other control station that has its function switch in the NON-PRIVATE position.

The instructions are divided into 5 categories which coincide with the 5 positions of the function selector switch. *It is essential to follow operating instructions carefully.*

1. STAND BY NORMAL: With the function switch in the STAND BY NORMAL position the control station may be called by another control station. This should be the normal position when control station is not in active use. In this position the control station will not be disturbed by other communications and will still be able to receive a directed call.

2. TALK: Select desired control station or remote with selector switch. Depress function selector lever to TALK position and call the desired station, *identifying your station at the same time.* Release the lever to LISTEN position and listen for acknowledgement of call. When acknowledgement is received, again depress the lever to TALK and

resume talking.

3. LISTEN: Upon hearing a call and the identity of the calling station, select that station with the proper selector switch, depress the function lever to TALK and then acknowledge the call. Release the lever to LISTEN position and listen.

NOTE

Do not have two control stations in simultaneous communication with the same remote station. Under such conditions, if one control station is in TALK while another is in LISTEN, a loud squeal will be heard at the listening control station and at the remote station.

4. NON-PRIVATE: With the function selector in the NON-PRIV position a control station may be monitored from any other control station which has its function switch in the LISTEN position and its MONITOR switch ON. When a control station has its function switch in any position other than NON PRIV, the station has complete privacy against eavesdropping.

5. MUSIC: The MUSIC position allows the control station to receive program material. The system continues to operate normally and a call from another control station will override the program.

CAUTION

The above instructions are for properly installed music sources. Insufficient music audio power can cause low volume, while excessive power can damage components in the system. Consult the Installation section for further information.

6. VOLUME: The control stations have a VOLUME control for setting the sound level. Always adjust this control when receiving, never when talking. When a control station is being monitored, make certain to leave its VOLUME control at a high enough level to permit calls to be made to the monitored station.

INSTALLATION

Installation of the Bogen Deluxe Home Communo-Phone System is not difficult, but requires careful and methodical work. Read this Installation section carefully before proceeding.

In most installations the back boxes will be installed first, the interconnecting cables second, and the units connected and installed last. Such a procedure will be followed here and the information is presented in that order.

Read the Location paragraph below and decide where to place each unit. Then, install the back boxes as directed.

Next, study the General Wiring Requirements and the System Wiring paragraphs. Determine the number and types of cables required, and install the cables between the back boxes.

Next, study the appropriate section which describes the type of system you want to install. There are three basic types: Systems with one HCM-9 and 8 remotes, systems with nine HCM-9 control stations and no remotes, and mixed systems with more than one HCM-9 and at least one remote. Read the paragraph "Sample Method of System Wiring." Finally, wire in the units to the system and secure the units to the back boxes.

LOCATION

The following factors must first be considered before installing the Deluxe Home Communo-Phone system.

- ACCESSIBILITY:** Considerable thought must be given to the prospective location with regard to ease of access. The location should be such that furniture will not be in the way.
- MOUNTING:** Consideration should be given to the strength of the mounting surface. Do not mount back boxes in plaster without first anchoring securely.
- EASE OF WIRING:** Consider the wiring problem thoroughly before starting the installation. Read all wiring instructions carefully before proceeding with actual wiring.

IMPORTANT: Be certain that steam lines and other hot surfaces are not in contact or in close proximity to these units or their respective cables. Also, be sure that all cables will be properly supported. Loose or broken connections will result from sagging cables.

BACK BOXES

Instructions for installing the back boxes, which are packed separately, are included with the units. After deciding on the equipment locations, install the back boxes as directed.

GENERAL WIRING REQUIREMENTS

Four types of cabling are required for the system. A power line is required at the Model HCA-1 Amplifier location. A single twisted-pair cable is required from each HCR remote unit to the nearest Model HCM-9 Control Unit. A cable containing three twisted pairs is required from the Model HCA-1 Amplifier to the nearest HCR-9 Control Unit. Finally, a multi twisted-pair cable is required between control units.

NOTE

If the system contains only one HCM-9 and all other stations are remotes, the multi twisted-pair cable is not required.

The system is designed to be a permanent installation and, in most cases, wires will be covered up inside the walls. This means that thought must be given not only to the present installation, but to future requirements. For example, if two control stations and four remotes are installed, the system has six units and requires a certain number of interconnecting wires. If, at some future time, it is decided to add three more remotes to the system, more interconnecting wires will be needed. If these wires are not provided at the time of the original installation, it will be

necessary to run additional twisted-pair cables inside the walls. Table I lists the numbers of twisted-pair leads required for each type of installation. Figure 1 shows the cabling required in a system containing only one HCM-9 Control Station, while Figure 2 illustrates a typical system using more than one HCM-9.

TABLE I. MODEL HCM-9 INTERCONNECTION CABLES FOR VARIOUS SYSTEMS

Number of Units in System (HCM-9'S plus HCR-1's & HCR-2's)	Number of Twisted Pairs Required in Cable.
2	6
3	7
4	8
5	9
6	10
7	11
8	12
9	13

Another factor to consider is the possibility of wires being damaged either during or after installation. If there are no spare wires in the system, repair of a broken or shorted pair may present a considerable problem.

It is best to provide spare wires for maintenance and for future expansion at the time of installation. The extra cost for the additional wires will, in the long run, be a wise investment. Table II lists some of the commercially available cables suitable for use with the system. All the twisted pairs listed are #22 AWG wire. Heavier gauge wire may be used, but not smaller.

TABLE II. TYPICAL COMMERCIAL CABLES SUITABLE FOR INTERCOM

Number of Twisted Pairs in Cable	Wire Type Number	
	Bogen	Belden
*15	—	8749
13	—	8754
11	1411S	8753
9	—	8748
6	—	8747
**4	—	8757
**3	—	8742
***1	1401S	8740

* Will handle maximum-sized system and provide two extra twisted pairs.
 ** For connecting Model HCA-1 Amplifier.
 *** For connecting Model HCR remotes.

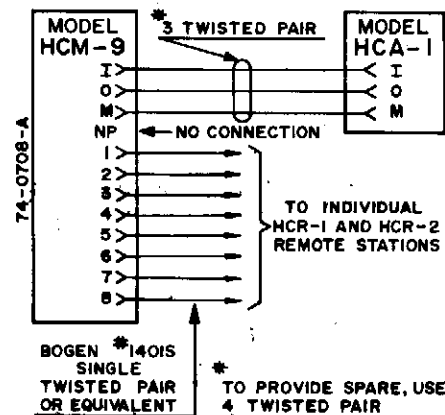


Figure 1 - System of One HCM-9 and 8 Remotes

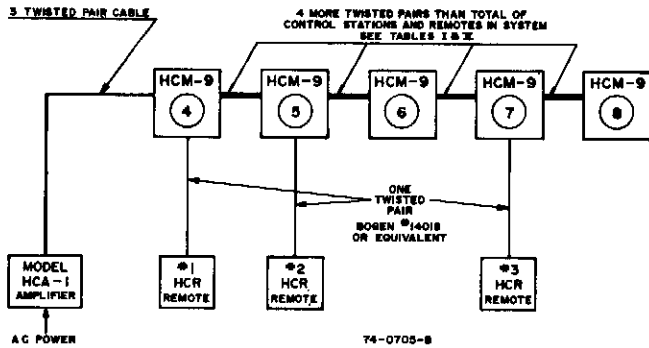


Figure 2 - Typical Mixed System

SYSTEM WIRING

Common to each control station, install an unshielded cable (consisting of twisted pairs) in which the number of twisted pairs is equal to four more than the total number of control stations and remotes in the system. Between the amplifier and the nearest control station, install an unshielded cable consisting of three individually twisted pairs. From each remote to the nearest control station, install a single unshielded twisted pair. Cable lengths will vary with each installation.

NOTE

Always leave at least one foot of extra cable at each station to facilitate connections.

Tag the corresponding twisted pairs at each location with the same number to simplify identification. When the actual connections are made, keep a record of how the wire numbers correspond to the intercom circuits.

The paragraph "Control Station Installation" provides general instructions for installing the HCM-9 Control Stations. Wiring instructions are provided in the next three paragraphs, which provide instructions for the three basic types of systems and show sample wiring charts.

Install the control stations as directed in the general paragraph, and refer to the specific paragraph which corresponds to your system for wiring instructions.

A blank work sheet is included with this manual. Fill in the sheet as you go along, listing the number of the twisted pair, the colors of the wires making up the twisted pair, and the connections for the pair at each station.

NOTE

Always maintain the same polarity of twisted pairs between control stations. If a blue wire is connected to the left side of the "I" terminal, it must always be connected to the same side on the "I" terminals of all control stations.

CONTROL STATION INSTALLATION

CHASSIS INSTALLATION: The HCM-9 chassis is attached to the RBM-F back box in the following manner:

1. Insert the HCM-9 chassis in the back box between the mounting brackets, with the slide selector switches at the top. Insert only two of the #6 screws (provided) in the side holes in the mounting brackets; do not tighten these screws all the way. Pull the chassis out from the top, allowing it to hinge on the two screws. The three terminal boards on the rear of the chassis are now exposed to permit ease in wiring.

2. Connect the cable wires to the terminal strips in accordance with the appropriate system wiring paragraph.

3. After all other HCM-9 wiring is completed connect the wire leads with the clips to the HCM-9 speaker terminals, located on the rear of the front panel.

4. After wiring is completed and cable is correctly

connected, permanently mount the HCM-9 chassis to the back box. Push the chassis back up against the back box and secure with the remaining two #6 screws and tighten all screws.

5. Attach the front panel with the two #6 screws provided. Attach the knobs to the front panel. An Allen type key is supplied for securing the lever knob.

AMPLIFIER INSTALLATION

Power to the HCA-1 is made available by means of an ordinary power line through a 7/8" knockout for conduit or armored cable. Connect the power line to the receptacle bracket wires; use wire nuts, or splice wires and use insulating tape. Be sure to insulate power line. Attach the receptacle bracket to RBA-F box with four of the #6 by 1/4" screws supplied.

The signal from the HCA-1 is made available by means of an unshielded cable consisting of three individually twisted pairs connected to the six-terminal board, marked "I", "O," and "M". These three (3) twisted pairs should be connected to the nearest control station corresponding terminals "I", "O," and "M". For connection diagrams, see figures 6 and 7. For schematic, see figure 8.

Attach the HCA-1 chassis to the RBA-F box with four of the #6 by 1/4" screws provided. Plug the amplifier line cord into the receptacle. Secure the front panel in place with the two #6 plated screws supplied.

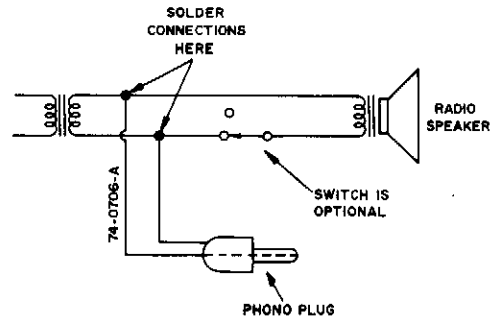


Figure 3 - Typical Connection of Radio to Phono Plug

The HCA-1 features a music input jack. For music or broadcast distribution, the output of a radio receiver should be connected to the amplifier music input jack.

NOTE

Radio program may be distributed only to control stations, not to remote stations.

The wiring should be as shown in figure 3. The output connections from the radio speaker voice coil should be connected and soldered with two-conductor cable to a standard phono plug.

The average model table radio output impedance is in the area of 3.2 ohms, and approximately 1/2 watt output power. This is adequate for one or two HCM-9 speakers only and will not give satisfactory volume for 9 speakers. If this type of music source is used, it is recommended that a maximum of only two HCM-9 stations be connected for music at any given time. In this case the two 10-ohm resistors (R1 and R3) mounted on the HCM-9 function selector switch should be shorted out in both HCM-9 units; see figure 8.

When using a radio with more power, eg. one with a 4 ohm output and 3 or more watts available, up to five HCM-9 units can be connected for music simultaneously. A radio with an output of 5 watts or more and an output impedance of 8 ohms can supply sufficient power for 8 or 9 HCM-9 units.

CAUTION

Do not connect the full output of hi-fi amplifiers into the system. Set the amplifier gain control to a low level and slowly increase until the desired output is

obtained through the intercom. Failure to follow this practice can result in damage to the intercom and/or amplifier.

1. SYSTEM OF ONE HCM-9 AND 8 REMOTES.

A system consisting of one HCM-9 Control Station and 8 remotes is shown in figure 1. Install a three-pair cable (Birnback 4733 or equiv.) from the HCM-9 to the Model HCA-1 Amplifier station, connecting the terminals in parallel, i.e., "I" to "I", "O" to "O", and "M" to "M". Connect a single twisted pair (Bogen 1401S or equivalent) from each remote station to the corresponding numbered terminals on the HCM-9.

2. SYSTEM OF NINE CONTROL STATIONS.

This paragraph provides instructions for wiring a system which contains only HCM-9 Control Stations. Two types of connections are required: common (parallel) connections

and staggered connections. Table III is a sample connection chart for this type of system. Refer to this chart while reading the explanations of the common and staggered connections.

After completing the wiring, a small modification to each Model HCM-9 is required, as described in C, below.

a. COMMON CONNECTIONS: Common connections are those which connect straight through to the same terminals on all control stations. For example, terminals "I" of station 4 are connected to terminals "I" of station 3 and to terminals "I" of station 5, which in turn are connected to terminal "I" of station 6, and to terminals "I" of station 7, and so forth. The common connections of the system are terminals "I", "O", "M", and "NP". The "NP" terminal should be connected only if the monitoring feature of the Home Communo-Phone System is desired. Refer to figure 4 for interconnection and to figure 8 for schematic.

TABLE III. ALL CONTROL STATIONS SAMPLE CROSS CONNECTION CHART

CABLE WIRES			INDIVIDUAL CONTROL STATION CONNECTIONS*								
System Conn.	Pair Number	Pair Color Code	Bed Room Station	Nur-sery Station	Dining Room Station	Kitchen Station	Living Room Station	Play Room Station	Laun-dry Station	Base-ment Station	Den Station
			1	2	3	4	5	6	7	8	9
I	1	Black - Red	I	I	I	I	I	I	I	I	I
O	2	Black - White	O	O	O	O	O	O	O	O	O
M	3	Black - Green	M	M	M	M	M	M	M	M	M
NP	4	Black - Blue	NP	NP	NP	NP	NP	NP	NP	NP	NP
1	5	Black - Yellow	B	1	1	1	1	1	1	1	1
2	6	Black - Brown	2	B	2	2	2	2	2	2	2
3	7	Black - Orange	3	3	B	3	3	3	3	3	3
4	8	Red - White	4	4	B	4	4	4	4	4	4
5	9	Red - Green	5	5	5	5	B	5	5	5	5
6	10	Red - Blue	6	6	6	6	6	B	6	6	6
7	11	Red - Yellow	7	7	7	7	7	7	B	7	7
8	12	Red - Brown	8	8	8	8	8	8	8	B	8
9	13	Red - Orange	1	2	3	4	5	6	7	8	B
-	14	Green - White	Spare								
-	15	Green - Blue	Spare								

* Numbers indicated here are control station terminal board numbers.

NOTE: This chart is drawn for a system incorporating 9 control stations. Horizontal columns are connections with the same color wire. Vertical columns are the terminal connections at each individual control station to which the wires connect. Each terminal number designates a pair of terminals.

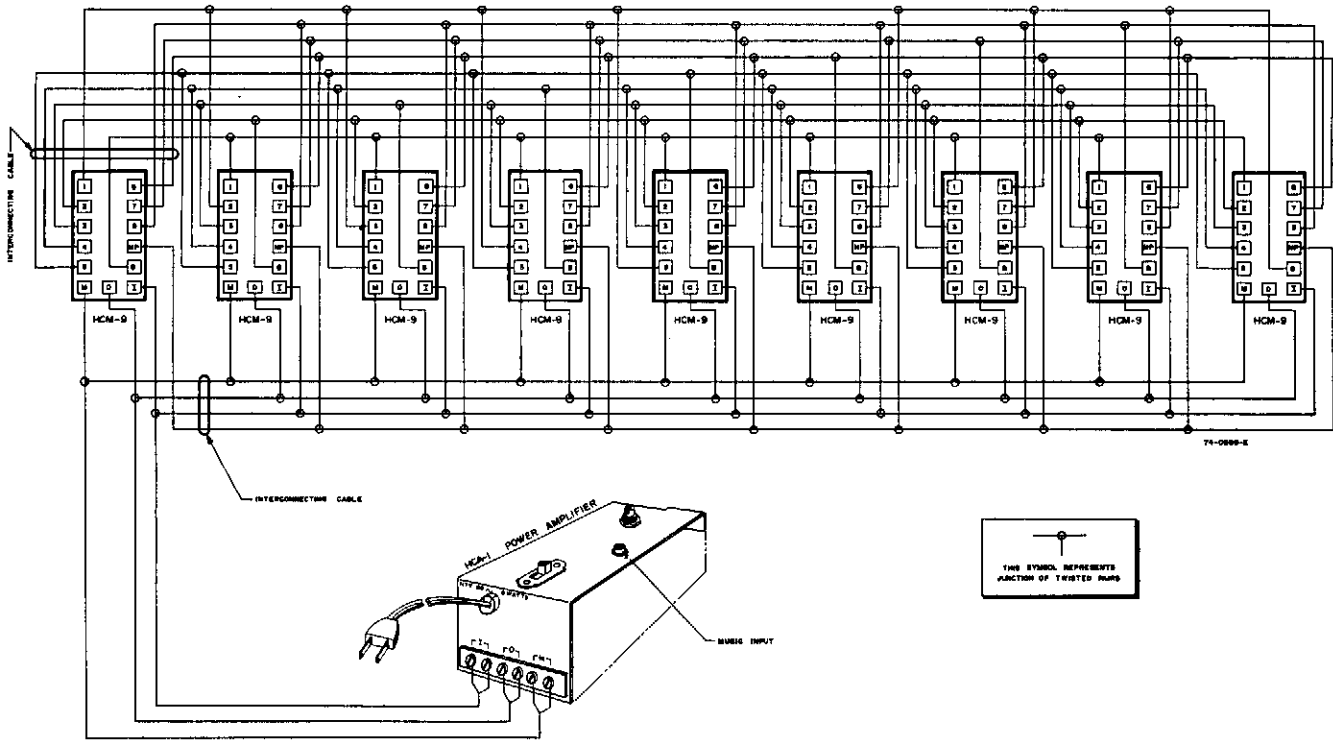


Figure 4 - Interconnection Diagram for Nine HCM-9 Stations

b. STAGGERED CONNECTIONS: Terminals "B" are the connections for the "break-in" line and these terminals are used at every control station. Terminals B are connected to the line for the given control station (see figure 5 and refer to Table III). For example, at control station 5, the B terminals are connected to the twisted pair which goes to every other control station's terminals 5. Therefore when any other control station places the selector switch for station 5 in the ON position, connection is made to the control station 5 "break-in" line.

In a system incorporating nine stations, the wiring for the 9th control station is different than any of the other stations. Station 9's terminals "B" (break-in) are connected at each control station to the terminal number corresponding to the particular control station. For example at station 5, terminals 5 are connected to the line which goes to station 9, terminals B. Also at station 6, terminals 6 will be connected to station 9, terminals B. In this manner, the switch at each control station (except station 9) corresponding to its own station number becomes the switch for control station 9. In an installation having less than nine stations, no connections are made to the terminal number corresponding to the same control station number at each individual control station.

c. MODIFICATIONS TO HCM-9'S: Figure 5 shows the location of the remote bus lines on the rear of the units. The modification consists merely of cutting the bus wires at the proper point. Figure 5 shows the location of the point, as does the schematic diagram figure 8 (note 4).

3. MIXED SYSTEM WIRING. (See figure 6)

This paragraph provides instructions for wiring a system which contains a mixed combination of remote stations and two or more HCM-9 Control Stations. Two types of connections are required: common (parallel) connections and

staggered connections. Table IV is a sample connection chart for this type of system. Refer to this chart while reading the explanations of the common and staggered connections.

After completing the wiring, a small modification to each Model HCM-9 is required, as described in paragraph c, below.

a. COMMON CONNECTIONS: Common connections are those which connect straight through to the same control stations. The common connections are the "I", "O", "M", and "NP". The "NP" should be connected only if the NON PRIVATE mode of operation used in monitoring is desired.

The remote stations are also common connections with respect to the control stations. For example, Remote No. 2 will connect to the No. 2 terminals of all HCM-9 units, Remote No. 4 connects to the No. 4 terminals, etc.

NOTE

Always connect remotes from terminals No. 1 on the HCM-9 and work up toward terminals No. 8.

b. STAGGERED CONNECTIONS: Terminals marked "B" are the connections for the "break-in" line and these terminals are used at every control station. The "B" connection for any control station represents that station to all other control stations. For example, the "B" terminals of control station 4 (twisted-pair No. 8) is connected to the station No. 4 terminals of the remaining control stations; the "B" terminals of control station 7 (twisted Pair No. 11) is connected to the station No. 7 terminals of the remaining stations, etc.

Note the remote stations are common connections. In this system, there are a total of eight stations; therefore, no listing is shown for station 9. It is recommended that a spare pair of wires be left in the cable to accommodate future installation of station 9.

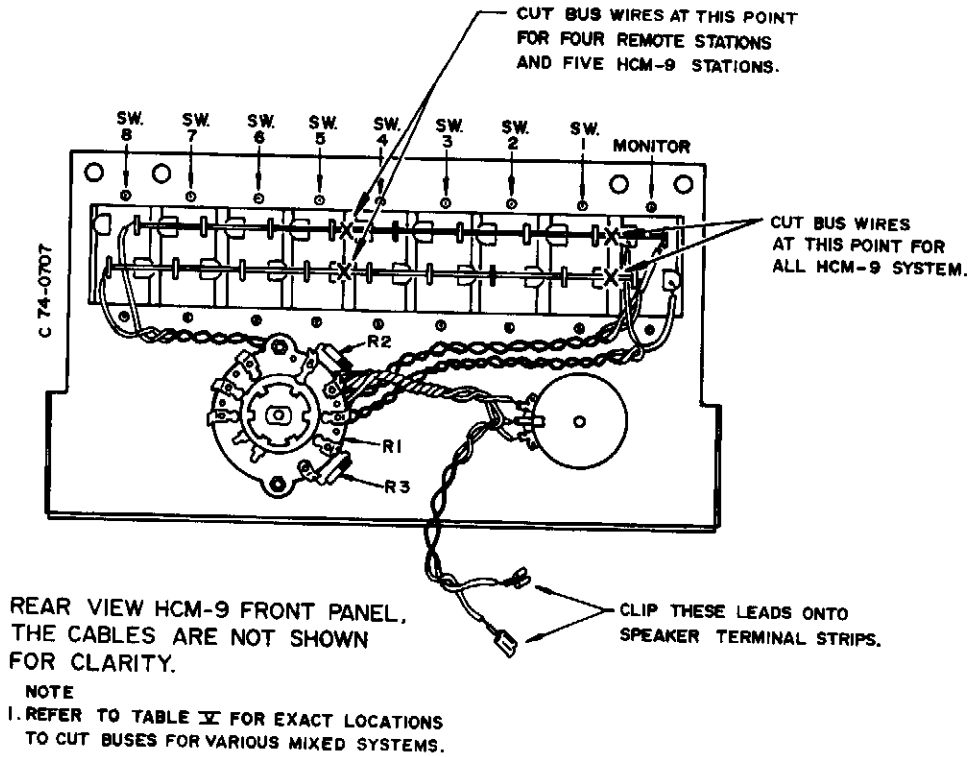


Figure 5 - Model HCM-9 Control Station, Modification Procedure

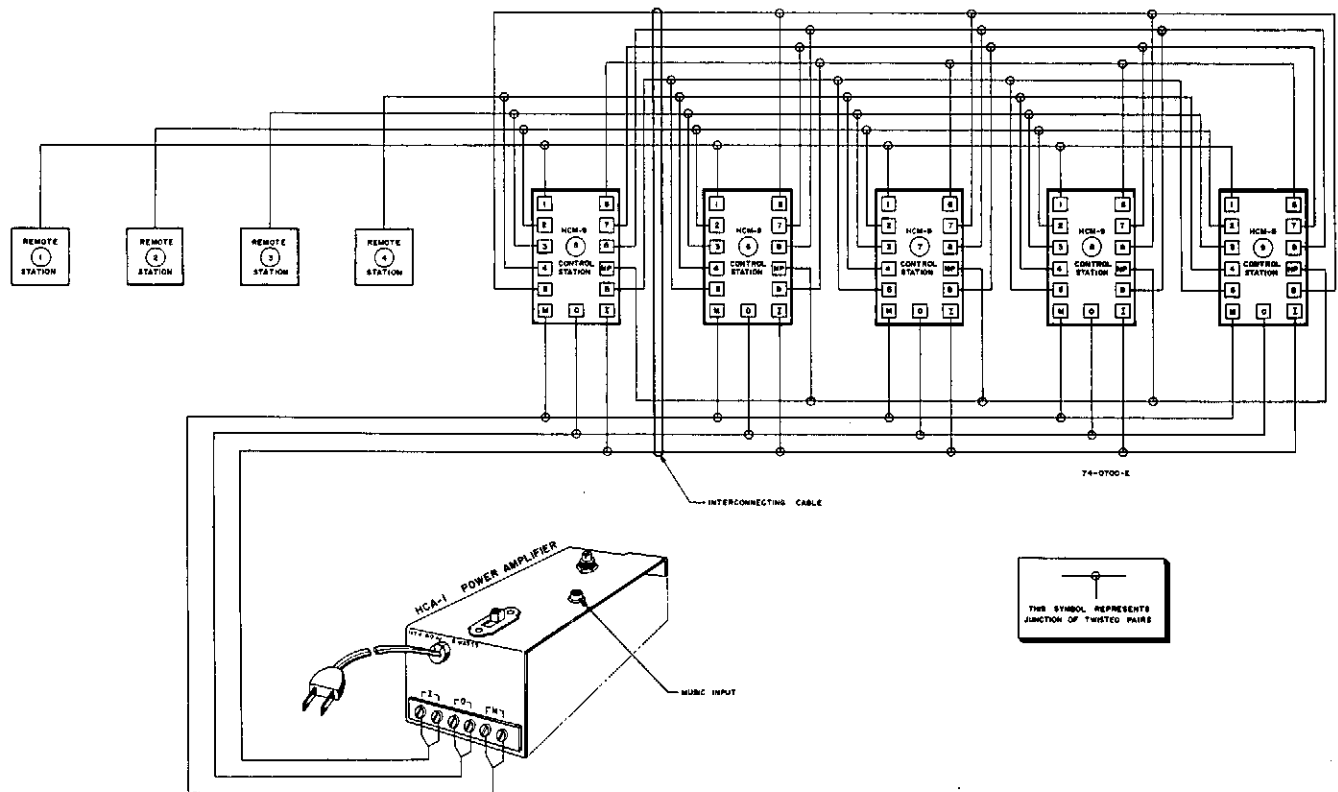


Figure 6 - Mixed System, Interconnection Diagram

c. **MODIFICATIONS OF HCM-9'S:** Figure 5 shows the location of the remote bus lines on the rear of the units. The modification consists merely of cutting the bus wires at the proper point. Figure 5 shows the location of the point; Figure 8 is the schematic diagram of the unit.

All remote stations of each system must be connected to the lower terminal numbers of each HCM-9, starting with terminals 1 and working toward higher numbers. After the required remote station terminals are determined, the two

remote bus wires in each HCM-9 (which are connected to each of the selector switches) must be cut at the point between the highest remote switch number and the lowest control station number. Remote stations are connected to the nearest control station by means of an unshielded twisted pair. Table V below is arranged to give the point on the remote bus line which must be cut for a variety of combinations. Table IV is a sample work chart employing the same procedure as shown in Table III.

TABLE IV. MIXED SYSTEM SAMPLE CROSS CONNECTION CHART

	CABLE WIRES		INDIVIDUAL CONTROL STATION CONNECTIONS*									
		Pair Color Code	Remote Stations			Control Stations						
			Den Station 1	Nursery Station 2	Front Door Station 3	Bedroom Station 4	Kitchen Station 5	Dining Room Station 6	Play Room Station 7	Base-ment Station 8		
COMMON CONNECTIONS	I	1	Black - Red				I	I	I	I	I	I
	O	2	Black - White				O	O	O	O	O	O
	M	3	Black - Green				M	M	M	M	M	M
	NP	4	Black - Blue				NP	NP	NP	NP	NP	NP
REMOTE LINES SAME TERMINALS	1	5	Black - Brown	BLK - BRN			1	1	1	1	1	1
	2	6	Black - Yellow		BLK - YEL		2	2	2	2	2	2
	3	7	Black - Orange			BLK - ORN	3	3	3	3	3	3
CONTROL STATIONS LINES	4	8	Red - Green				B	4	4	4	4	4
	5	9	Red - White				5	B	5	5	5	5
	6	10	Red - Blue				6	6	B	6	6	6
	7	11	Red - Yellow				7	7	7	B	7	7
	8	12	Red - Brown				8	8	8	8	8	B
	9	13	Red - Orange				Spare					
	-	14	Green - Blue				Spare					
	-	15	Green - White				Spare					

* Numbers indicated here are control station terminal board numbers.

NOTE: This chart is drawn for a system incorporating 5 control stations and 3 remote stations. Horizontal columns are connections with same color wire. Vertical columns are terminal connections at individual control stations to which wires connect. Each terminal designation applies to a pair of terminals.

TABLE V. MIXED SYSTEM MODIFICATIONS

Quantity of Remotes	Quantity of HCM-9s	Cut between Station Switches
1	8	1 & 2
2	7	2 & 3
3	6	3 & 4
4	5	4 & 5*
5	4	5 & 6
6	3	6 & 7
7	2	7 & 8

*Shown as note 3 on HCM-9 schematic, Figure 8.

SAMPLE METHOD OF SYSTEM WIRING

The following steps outline a suggested method to follow when wiring from control station to control station. The method outlined is made up in conjunction with the sample work sheets, Tables III and IV. The sample shown in Table III is a system composed of 9 control stations. The sample shown in Table IV is made up of three remote stations and 5 control stations.

1. The HCA-1 Amplifier unit will have a 3 twisted pair unshielded cable connected to the nearest control station. The connections are to terminals 'T', 'O,' and 'M'.
2. From each remote station to the most convenient control station, connect an unshielded twisted pair.
3. Take an unshielded cable consisting of twisted pairs; the number of unshielded twisted pairs shall be 4 more than the total number of control stations and remotes in the system. Strip down the end and expose the twisted pairs for length of one foot at each control station. If it is necessary to use more than one cable, mark both ends with tape or a tag for identification before installing. Using Bogen cable type 1411S as an example, each twisted pair will have an individual color and a common color. In Bogen cables the common color is white.

CAUTION

When working with this type of cable, it is important

that when each cable is stripped the common color should not unravel from its color-coded mate.

4. Starting with the first station in system, label each station with a number. Make a master directory of station number and location.
5. Fill out the blank spaces on the work sheet carefully. Follow the examples shown in Tables III and IV.
6. As is shown in Table IV, the common connections and the remote connections will always be the same. Write down these letters and numbers on the work sheet.
7. Making certain that the colors of the actual cables and work sheet coincide fill out the remainder of the work sheet; use the procedure shown in Table IV.

Now that the work sheet is completed, each vertical row will be the color connections for each individual control station. In systems employing less than the maximum number of stations, eliminate right hand columns (starting on right and going left) and bottom columns. Use only as many columns as there are stations in the system.

8. Each connection shown on the charts (Tables III and IV) is actually the connection of a pair of wires. It is important that at each set of terminals on respective units, that the same relative connections (one left and one right) of colors be maintained. As an example, for terminals "5" on each of the control stations the left terminal "5" has the colored wire and the right hand terminal "5" has the common wire. It is recommended that a system of standardization be used - all colored wires on left hand terminals and all common wires on right hand terminals.
9. At each control station, connect the color shown to the terminals indicated on the work sheet in the appropriate right hand column. All junctions are at the terminals of the control stations only. Following the procedures outlined herein, the system installation should be completed.
10. Using the procedures given in the OPERATION section of this manual, two people should now test the system for satisfactory operation.

NOTE

Before making the installation permanent by plastering in cables, etc., check carefully all connections for sturdiness and check for satisfactory operation.

SERVICE

Each Deluxe Home Communo-Phone System part was thoroughly tested at the factory. If the units are properly installed, no operating difficulty should be encountered. However, if trouble is encountered immediately after installation, examine all connections for looseness or a break. Check the amplifier and all control stations for output. Cross check with this sheet as much as possible to locate the trouble. If it is found that the difficulty cannot be corrected, call in a Bogen representative or other competent serviceman for inspection of the system.

Sometimes complaints are received that there is no privacy when the HCM-9 is in the STAND-BY NORMAL and LISTEN positions. This may be due to a failure to carry out the modification described in paragraph c on page 6 or on page 8. The bus wires must be cut as shown in figure 5 and in Table V.

Oscillation between stations may be caused by acoustic feedback or high frequency squeal. Acoustic feedback (howling) may result from placing speakers too close together in the same wall, and this practice should be avoided in the installation. High frequency squeal may be caused by poor pairing of conductors in the cable. In some cases, if the condition is not too severe, it may be remedied by de-

creasing the amplifier gain. Turn the pre-set volume control on the HCA-1 amplifier down until the howling or squeal disappears.

If trouble ever develops with your unit, do not hesitate to ask our advice or assistance. We are interested in your Bogen Communications units as long as you have them. Information can be obtained by writing to: Service Department, Bogen Communications, P.O. Box 500, Paramus, N. J. 07652

When communicating with us, give the model number of your unit. Completely describe the difficulty encountered. Describe the effects each operating control has upon the symptoms of trouble. Include details on electrical connections to associated equipment and list such equipment.

When we receive this information, we will send you service information if the trouble appears to be simple. If trouble requires servicing, we will send you the name and address of the nearest Bogen authorized service agency to which you can send your unit for repair.

When shipping your unit, pack instrument well, using the original shipping carton and filler material to prevent damage in transit. Send unit, *fully insured* and prepaid. The unit will be promptly repaired and returned to you, prepaid.

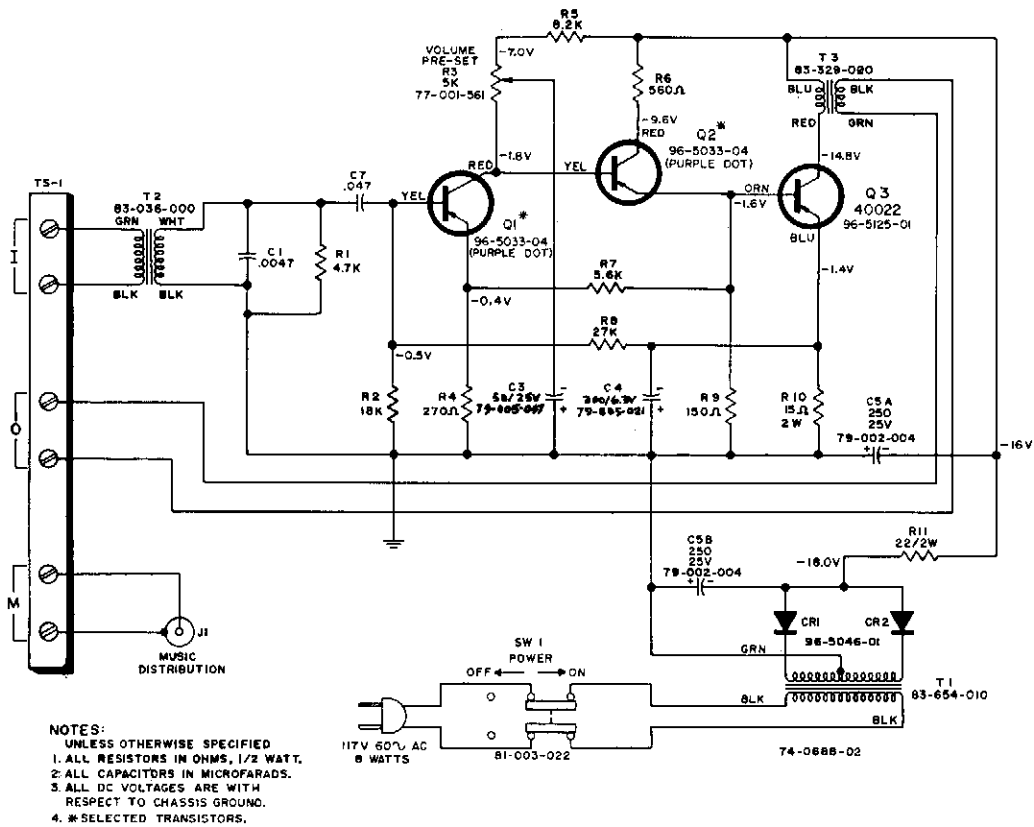


Figure 7 - Model HCA-1 Amplifier, Schematic Diagram

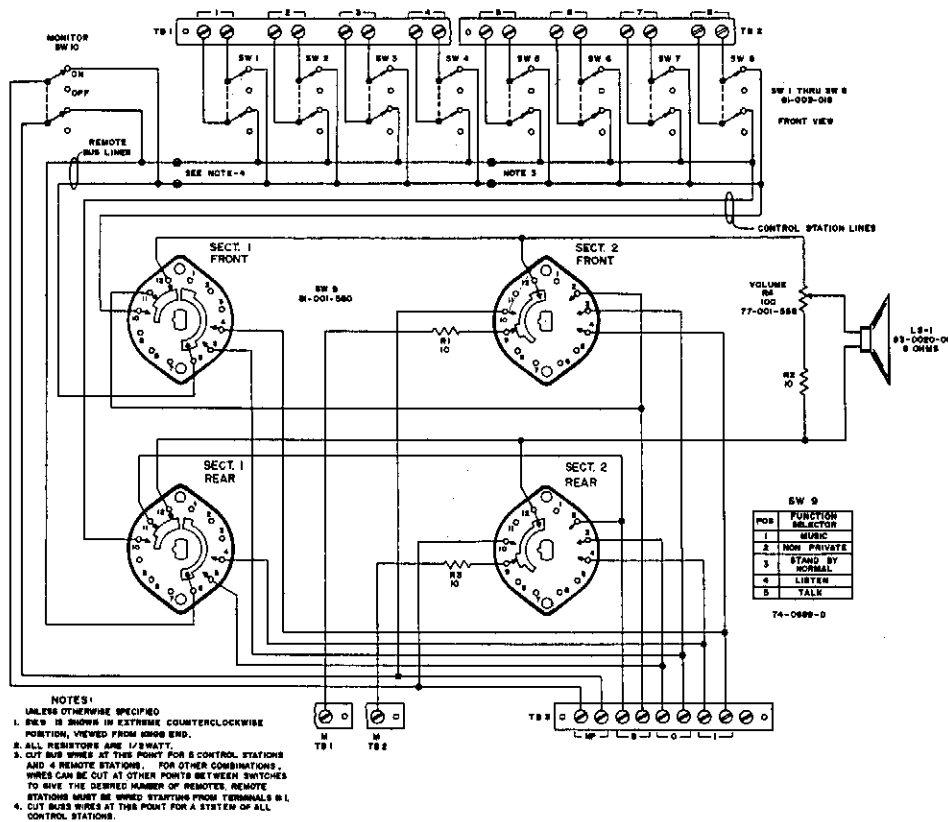


Figure 8 - Model HCM-9 Control Station, Schematic Diagram

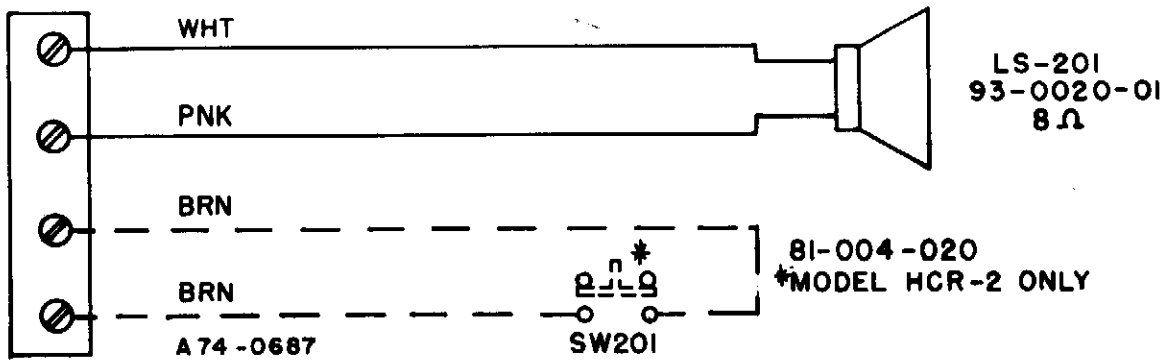


Figure 9 - Models HCR-1, HCR-2 Remote Stations, Schematic Diagram

WORK SHEET

CABLE WIRES			INDIVIDUAL CONTROL STATION CONNECTIONS								
CONN.	NUMBER	PAIR COLOR CODE	STATION	STATION	STATION	STATION	STATION	STATION	STATION	STATION	STATION
			1	2	3	4	5	6	7	8	9
I											
O											
M											
NP											

ALWAYS THE SAME TERMINALS

NOTE: Follow the sample work chart shown in the instruction manual.