

LOUDSPEAKING INTERCOMMUNICATION EQUIPMENT
SENIOR MAGNAPHONE (NORTHERN ELECTRIC CO.)

1. GENERAL

1.01 This section is issued to provide installation and maintenance information until a comprehensive practice can be written.

1.02 This section will consist of:

(a) A General Section.

(b) The Manufacturer's Instruction Bulletin, Senior Magnaphone SM6A SM12A.

1.03 General Section C53.900 applies to this equipment and should be read before proceeding with this Section.

1.04 Extension units EX12A and EX24A are not being standardized and will not be available for requisition. Where a master station is required for connection to more than 12 other stations, order equipment in accordance with Table I.

TABLE I

Connected Station No.	Unit Station Master Magnaphone Code
13-24	SM24B
25-36	SM36B
37-48	SM48B

1.05 Where a 6 station or 12 station master station is required for a 25 cycle area, use the SM12B. Equipment for more than 12 stations in a 25 cycle area can be provided as a special assembly.

1.06 A kit, nameplate, R19412-24, consisting of a moulded lucite nameplate with the name "The Bell Telephone Company of Canada" in three dimensional letters, and two nickel self-tapping screws, is available. This nameplate shall be affixed over the name "Northern Electric" on the face of substation and master stations. To install the nameplate, punch out with some sharp instrument the thin wall of material in the punch-out holes in the cabinet on either side of the name "Northern Electric". Place the nameplate and screw in the self-tapping screws.

1.07 A screwdriver, Phillips, of point size No. 1, blade length 3 inch is required for the installation of this equipment.

1.08 While most of the wiring consists of connecting the cable at the terminal strips, it is necessary to make modifications to the wiring inside the chassis. The following modifications may be made:

(a) Conversion of station selector keys from master station to substation use, Instruction Bulletin, Page 9.

(b) Conversion of station selector keys from substation to master station use, Instruction Bulletin, Page 9.

(c) The removal of straps on terminal strip TS1 on the Amplifier Chassis, and the connection of the four conductors from handset attachment, R197256A, Instruction Bulletin, Page 15.

(d) The modification of the wiring of station key for connection to the pre-selected all-call relay unit, Instruction Bulletin, Page 17.

(e) The modification of a station key for the long line remote control relays per R19807A. (Covered on Drawing R19807-7).

1.09 Both long line relays and all-call relays may be used on the same master.

1.10 Adjust the volume in accordance with instructions in the Instructions Bulletin on Page 6. A kit, volume control per R19109-60 is available for use in adjusting the volume at the substation. Install it in accordance with the information supplied with it.

1.11 Instruct the customer in operating the equipment in accordance with the operating instructions on tear-out sheet, pages 25 and 26, of the Instruction Bulletin. Tear out the above pages from the Instruction Bulletin supplied with the station and leave it with the customer. Destroy the bulletin to prevent it getting in company files.

INSTRUCTION BULLETIN SENIOR MAGNAPHONE



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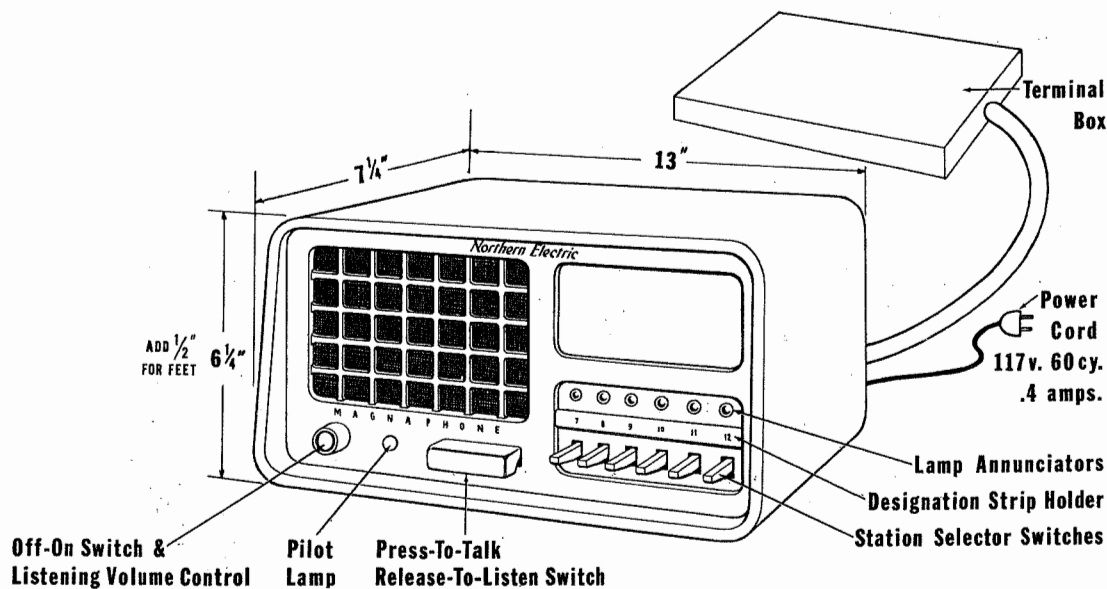
SECTION 1

DESCRIPTION:

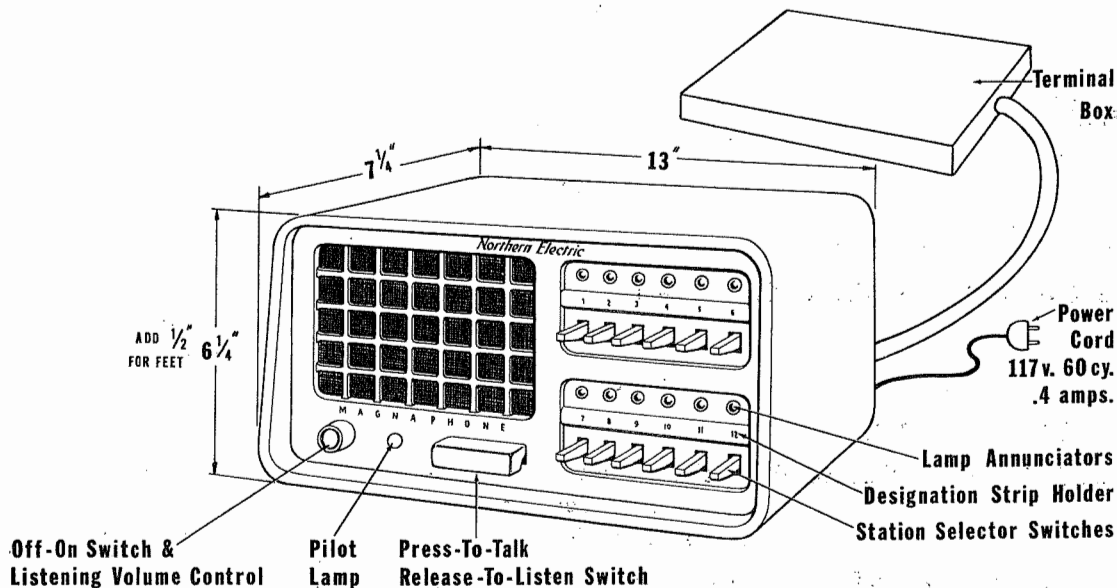
The Northern Electric Senior Magnaphone is a loudspeaker type of inter-communication equipment designed to fulfill the requirements for a practical and efficient method of intercommunication in modern business, industrial and domestic establishments. Although styled to meet the most exacting needs in office use, its construction in solid coloured urea plastic cases makes it equally applicable to the more rugged uses of industrial application. Salient features of the system are:

- * Simplicity of installation.
- * Long life leaf type switches and keys.
- * Balanced lines to minimize crosstalk.
- * Zero level 600 ohm Master-to-Master working.
- * Simplicity of operation.
- * Interference-free D.C. signalling.
- * No internal modifications for flexible application.
- * Dual volume control.

SM6A MASTER



SM12A MASTER

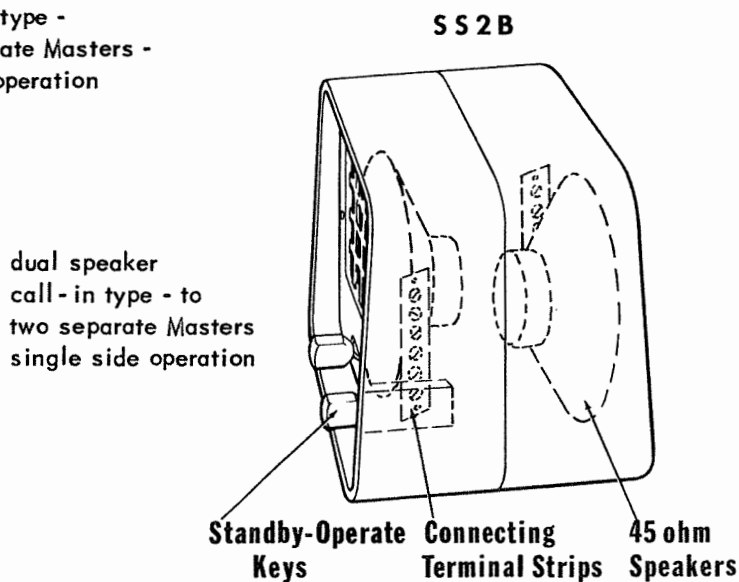
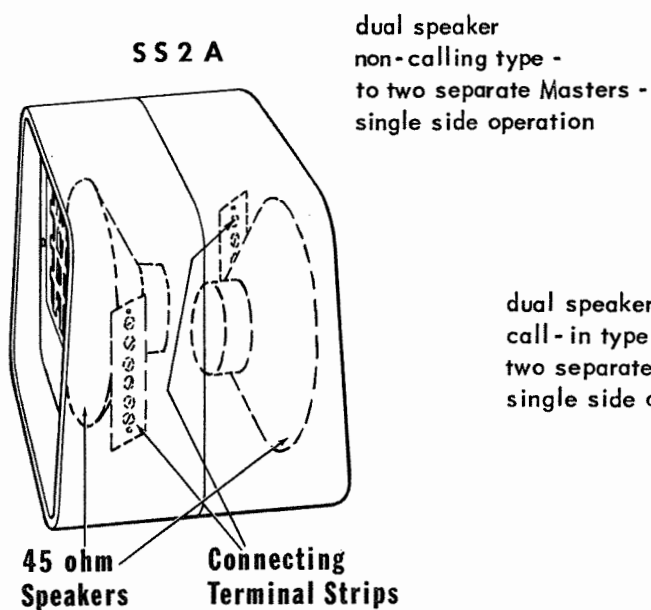
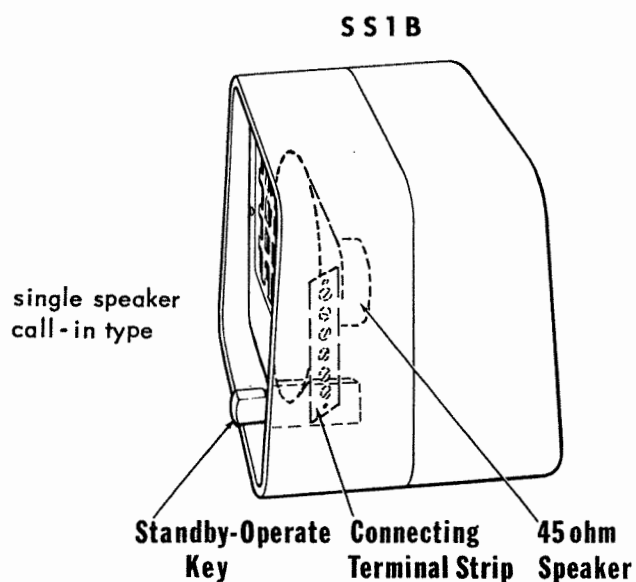
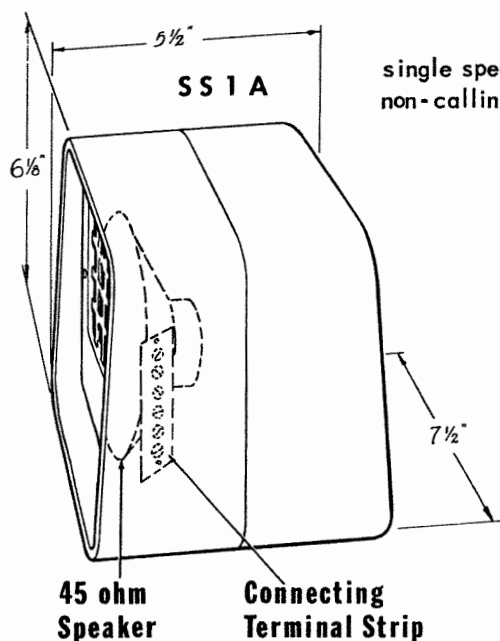


NOTE: SM12B Model is identical to the SM12A except that it is for operation from a 25/60 cycle power supply.

SPECIFICATIONS: SM6A & SMI2A MASTERS

<i>Impedance, Input and Output:</i>	Master - to - Substation; 45 ohms (nominal)			
	Master - to - Master; 600 ohms (nominal)			
<i>Output Power:</i>	5 watts (maximum)			
<i>Gain:</i>	90 db.			
<i>Noise:</i>	60 db below rated output			
<i>Signal Current:</i>	28 volts D.C.			
<i>Frequency Response:</i>	Adjusted for maximum intelligibility for voice transmission.			
<i>Power Supply:</i>	117 volts, 60 cycles, 0.4 amperes			
<i>Vacuum Tubes:</i>	12AX7, 6CM6, 6X4			
<i>Weight:</i>	<u>SM6A</u>	<u>SM12A</u>	<u>SS1A & B</u>	<u>SS2A & B</u>
	15 lbs.	16 lbs.	3 lbs.	4 lbs.
	18	18	5	6

SUBSTATIONS



SECTION 2

INSTALLATION:

Three basic wiring systems have been devised to simplify the illustration of the installation, together with the adaptability and flexibility of the new Magnaphone Senior Loudspeaker Intercommunication System. It should be emphasized that all three use the same basic units without modification, but the individual system requirements and the building layout will determine the appropriate system selection.

In Master-to-Master working, in-built compensated attenuation pads eliminate the necessity of constructing two custom built resistance wire networks for EACH Master-to-Master link installed.

"A" SYSTEM: The "A" system consists of a single Master station and any number of Substations up to the capacity of the particular Master. The number of Substations is extendible in multiples of twelve by the use of the EX12A and EX24A Extension Units. This system can be referred to as a high/low level system, in that, the outgoing signal from the Master is at high level and the incoming signal is at low level.

"B" SYSTEM: The "B" system consists of an all Master installation interconnected by a multi-conductor cable or cables depending on the physical layout of the system. The maximum number of Masters on this system depends on the models used as, for example, in using SM12A stations throughout, the total number is 13. The number can easily be extended by the use of EX12A and EX24A Extension Units. This is a balanced line, low level system operating at a nominal impedance of 600 ohms at approximately 0 dbm.

"C" SYSTEM: The "C" system is a combination of the "A" and "B" systems and combines Master-to-Master and Master-to-Substation intercommunication in one system. It provides the maximum flexibility but retains the features of SIMPLICITY OF INSTALLATION AND OPERATION.

PRIVACY AND SECRECY:

Magnaphone conversations are secret, in that they cannot be intercepted by other stations on the same or any other system, except in the case of conference calls deliberately established, or in the case of a single Substation connected to several Masters.

All Master stations give privacy, that is, no one can eavesdrop on what is happening in their vicinity. In the case of the Substations, privacy is an optional feature, governing the number of interstation conductors used and requiring no modification to Master or Substation. In Substation locations where remote answering is required, privacy must be sacrificed. Further details are shown on the typical Interstation Wiring drawing covering the "A" system.

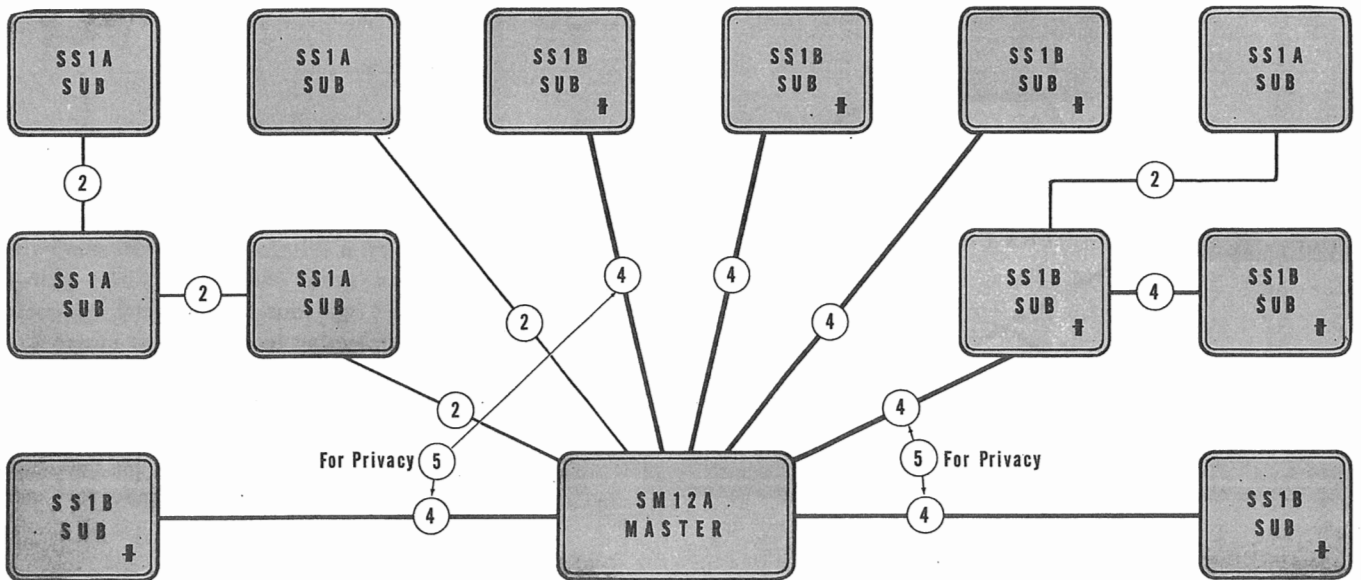
INTER-STATION CABLE:

A good grade of interphone type cable utilizing colour coded and twisted pair wires is recommended. The length of cable between stations will determine the wire size and the following chart can be used for this purpose.

Wire Gauge	Recommended Maximum Distance Between Stations (Signalling current limitation)
22	3000 Feet
19	6000 Feet
18	7500 Feet
16	12000 Feet

DESIGNATION STRIPS: To facilitate replacing the paper designation strip on the Master and Extension Units, two slots, one at each end, under the bottom edge of the plastic Designation Strip Holder, provide a means of inserting a strip of flexible material (such as a piece of cardboard) to force the existing strip upward to enable it to be withdrawn.

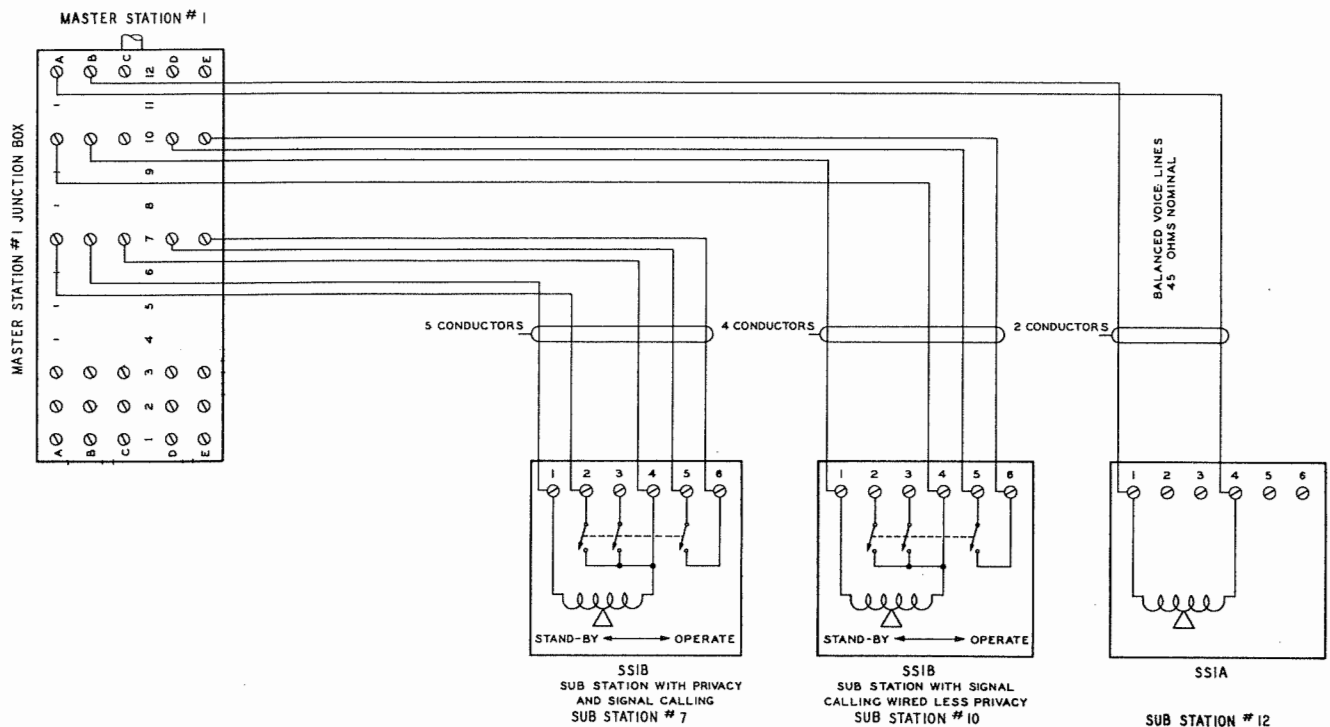
"A" SYSTEM SINGLE MASTER MULTIPLE SUBSTATIONS



Numbers in circles (4) indicate number of conductors

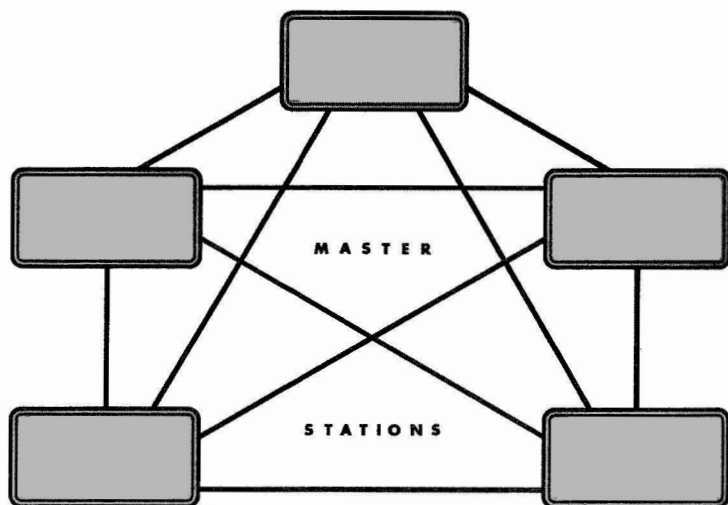
NOTE: If the "E" terminals on the Master station and the No. 6 terminal on the call-in type Substations can be PROPERLY grounded then the number of conductors between such interconnected stations may be reduced by one.

TYPICAL INTERSTATION WIRING



Where additional Master-to-Substation selector switches are required on either the SM6A or SM12A Masters, refer to section covering "Selector Switch Bank Wiring" for detailed switch conversion information.

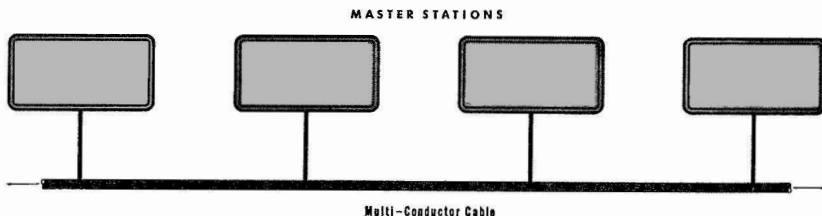
"B" SYSTEM MULTIPLE MASTER STATION



All Conductors Have ⑤ Wires

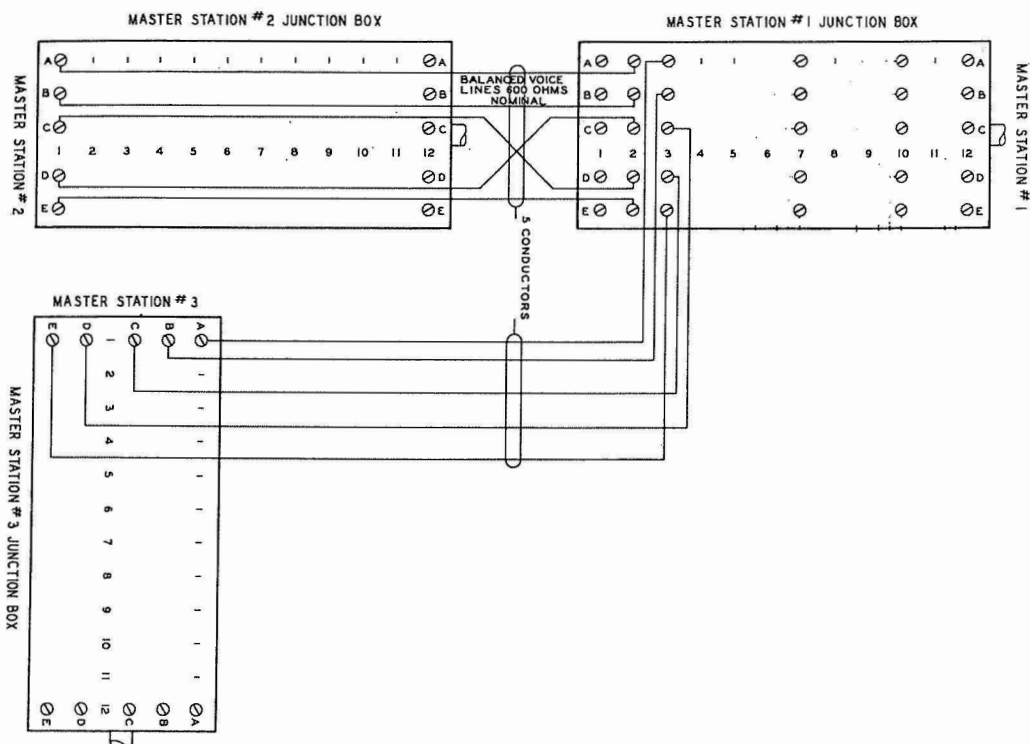
To obtain proper transmission level it is suggested that all listening volume controls be set at the mid-point and the amplifier gain controls (located on rear of cabinet) adjusted to give normal listening level at other stations.

Note: If the "E" terminals can be PROPERLY grounded, then the number of conductors may be reduced to 4.



An alternative to the above system of direct wiring is a multi-conductor cable run through all station locations as suggested in the associated sketch.

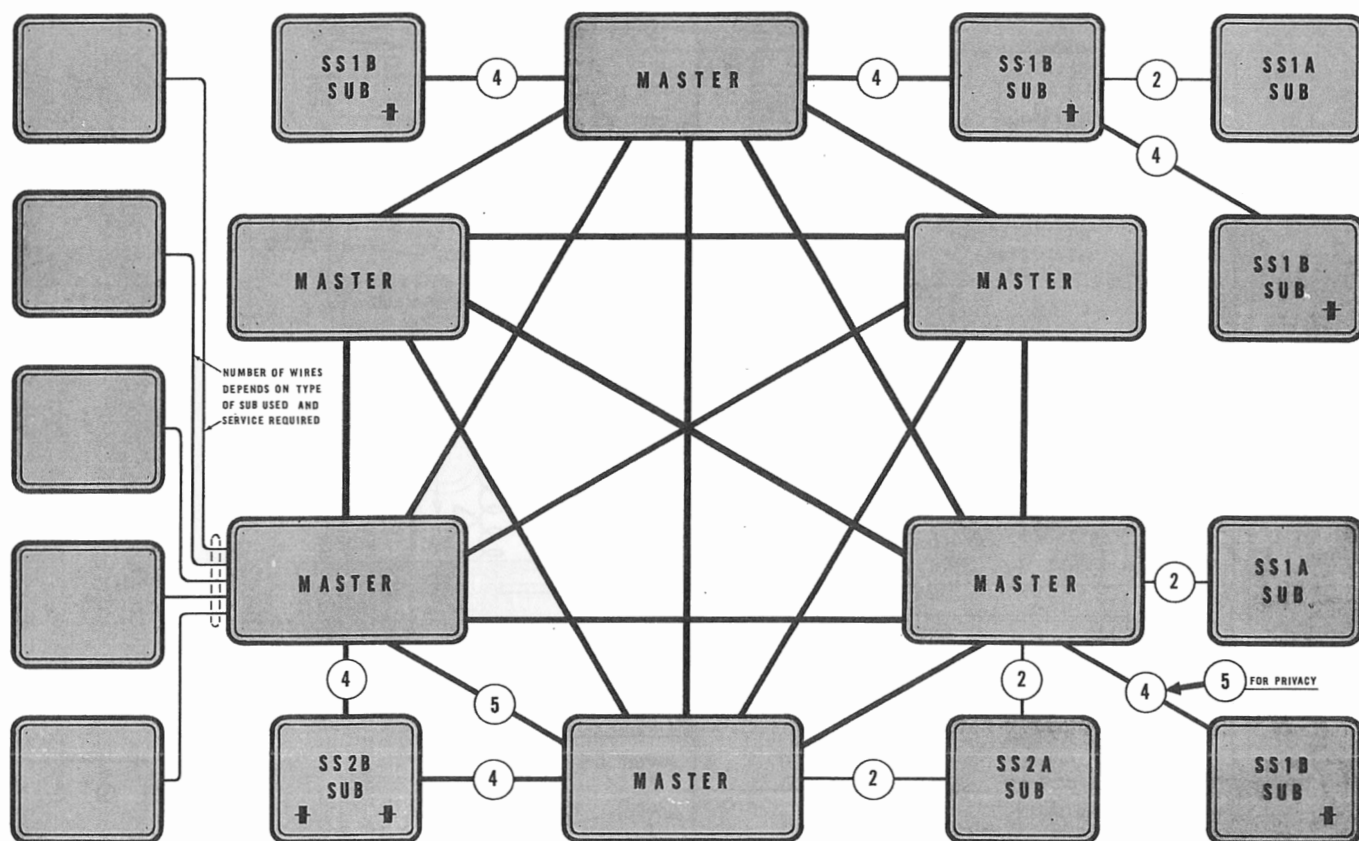
TYPICAL INTERSTATION WIRING



Where additional Master-to-Master selector switches are required on either the SM6A or SM12A Masters, refer to section covering "Selector Switch Bank Wiring" for detailed switch conversion information.

"C" SYSTEM

MULTIPLE MASTER WITH BRANCHING SUBSTATIONS



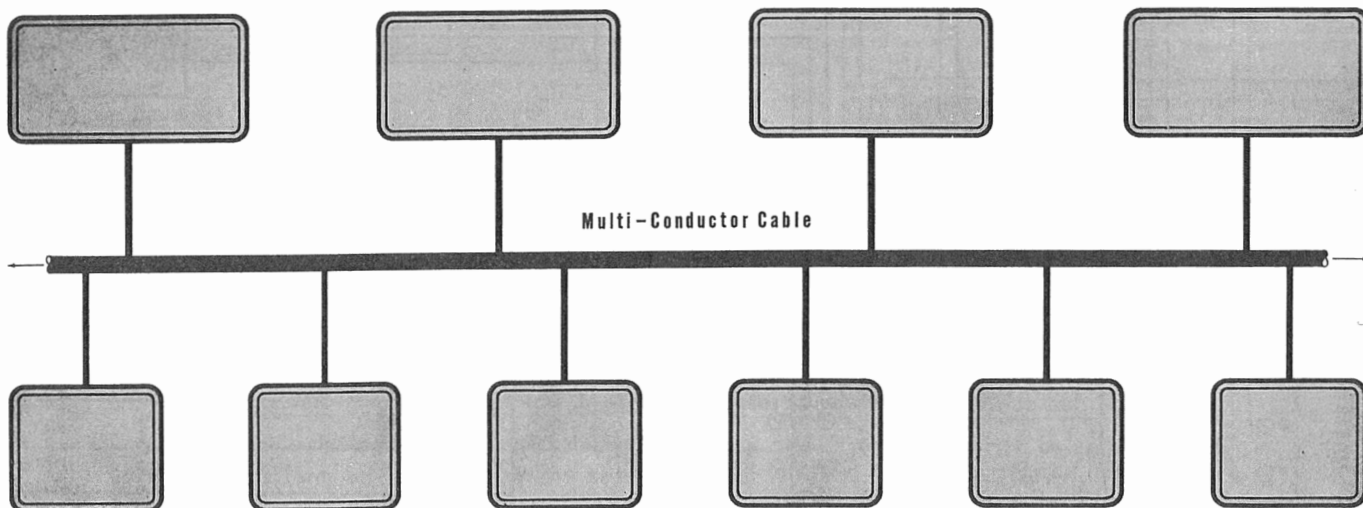
All Heavy Conductors Have ⑤ Wires

For any variation in the number of Master-to-Master or Master-to-Substation combinations, up to the capacity of the Master, refer to section covering "Selector Switch Bank Wiring" for detailed switch conversion information.

NOTE: If the "E" terminal on the Master stations and the No. 6 terminal on call-in type Substations can be PROPERLY grounded then the number of conductors between such interconnected stations can be reduced by one.

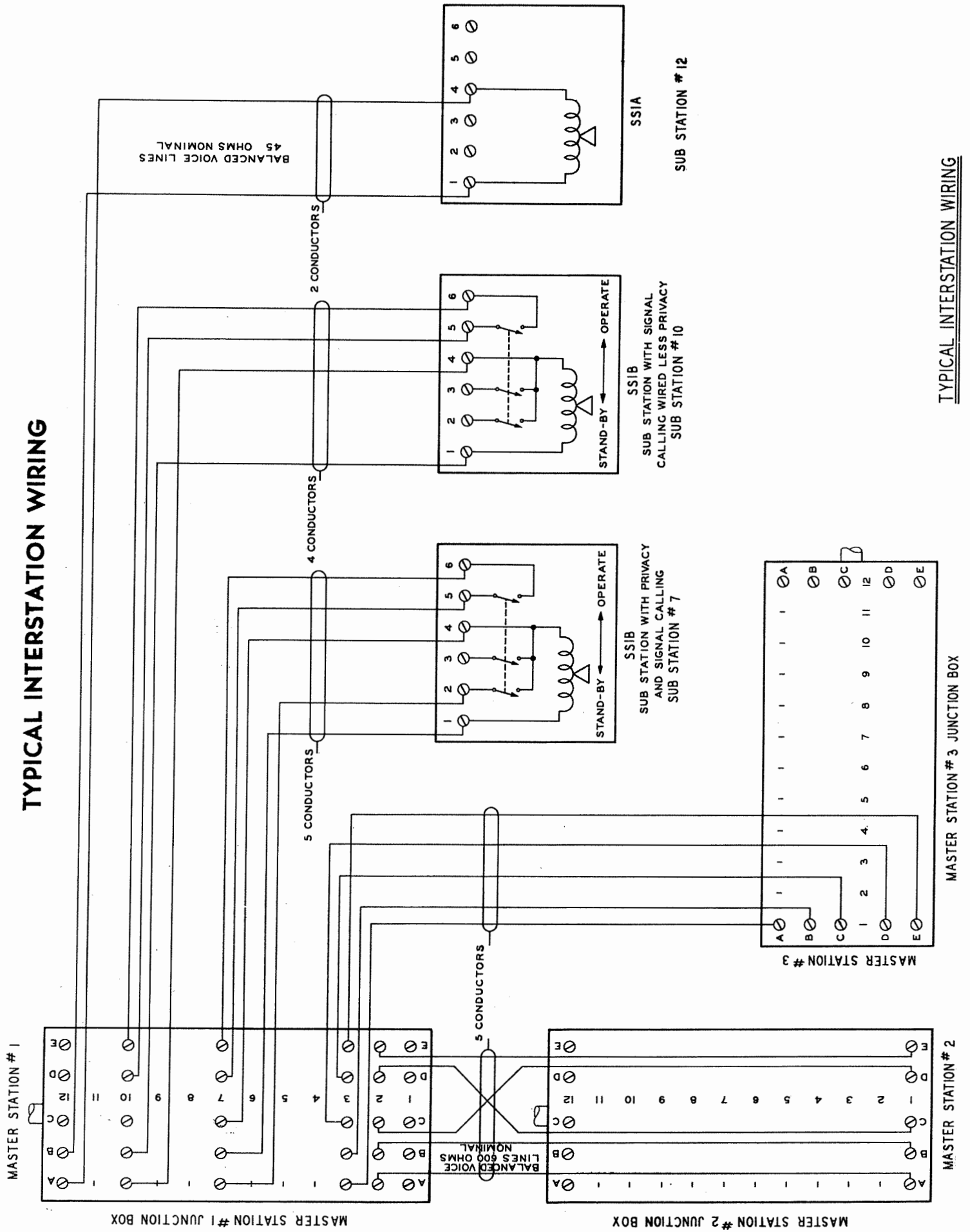
An alternative to the above system of direct wiring is a multi-conductor cable run through all station locations as suggested in the associated sketch.

MASTER STATIONS



SUB STATIONS

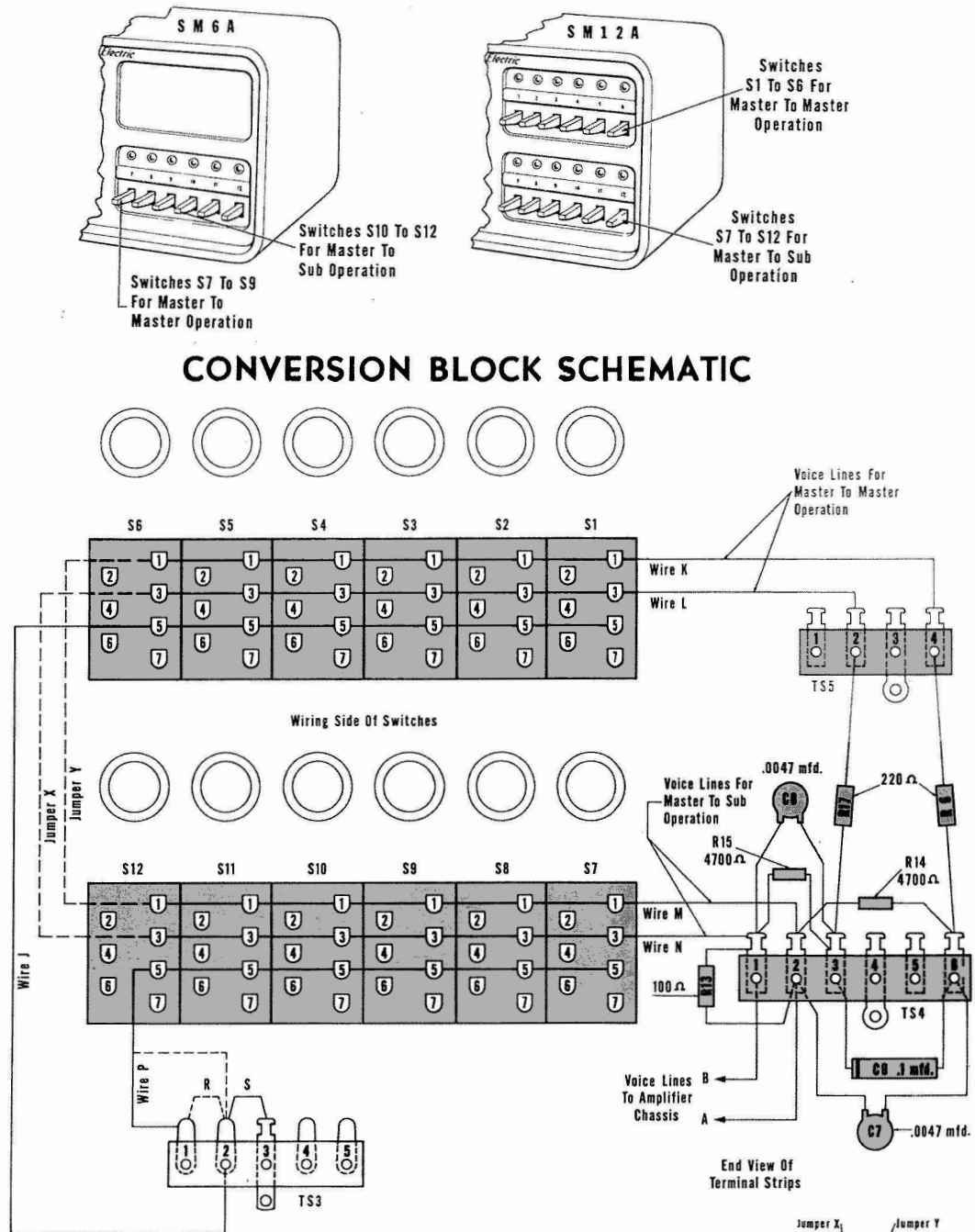
TYPICAL INTERSTATION WIRING



TYPICAL INTERSTATION WIRING

SELECTOR SWITCH BANK WIRING - MASTER STATION

Factory wiring of the selector switches is as illustrated below.



- To Convert S1 to S6 inclusive to Master to Sub Operation:**
- (a) Add jumpers X and Y
 - (b) Remove wires K and L
 - (c) Remove jumper wire S and add jumper wire R

- To Convert S7 to S12 inclusive to Master to Master Operation:**
- (a) Add jumpers X and Y
 - (b) Remove wires M and N
 - (c) Transpose wire P from Stand-off TS3 terminal 1 to terminal 2.

To Convert any Station Selector Switch for Master to Master or Master to Sub Operation.

- (a) Remove existing connection to terminals 1, 3 and 5 on the switch being converted.
- (b) Connect terminals 1 and 3, on the selector switch wires K and L respectively for Master to Master operation, or to wires M and N respectively for Master to Sub operation.
- (c) Connect terminal 5 on the selector switch to TS3 terminal 2 for Master to Master operation, or to TS3 terminal 1 for Master to Sub operation.

SECTION 3

OPERATION:

MASTER STATION

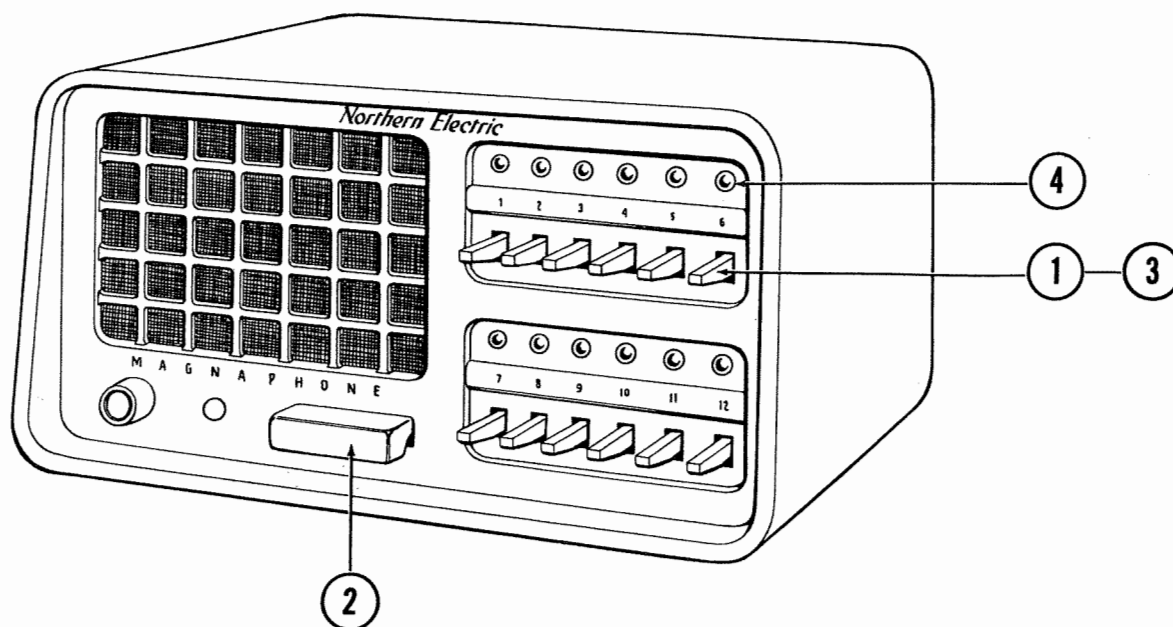
To CALL another station:

1. Depress appropriate station selector switch.

Associated annunciator lamp will glow when called station replies by depressing corresponding station switch or in the case of a "call-in" type Substation, by placing the key in the "Operate" position. When calling another Master, wait for lamp to light before speaking.

2. Depress "Press-to-talk" switch to talk – Release to listen.
3. On completion of conversation restore selector switch to normal position.

BUSY INDICATION: Failure of the annunciator lamp to light indicates that the called station is "busy".



To ANSWER incoming call:

On an incoming call the annunciator lamp ((4)) comes on and a chime sounds.

1. Depress the selector switch under the annunciator lamp registering the incoming call.
2. Depress "Press-to-talk" switch to talk ---Release to listen.
3. On completion of conversation restore selector switch to normal position.

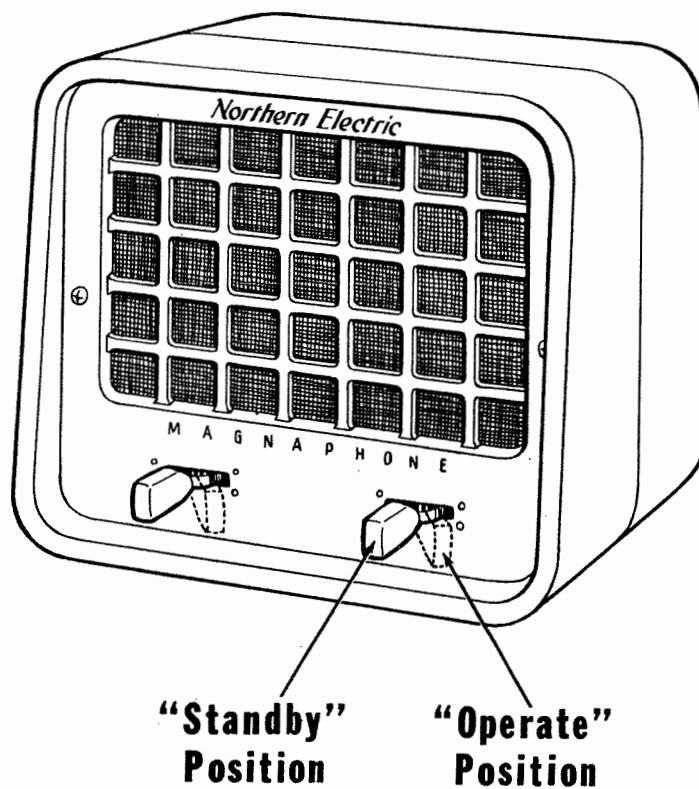
Note 1. If a called Master station does not answer immediately the call may be left registered or it may be cancelled by restoring the selector switch to the "normal" position.

Note 2. Leaving a call registered, for later answering, does not affect the operation of your Magnaphone. Further calls may be made or incoming calls answered. Neither is privacy affected because when the call is answered the corresponding annunciator lamp comes on and a chime sounds.

SUBSTATION

To ORIGINATE a call:

1. Place key in "Operate" position. This operates chime at Master station and lights associated annunciator lamp.
2. Wait for voice reply - carry on conversation.
3. On completion of conversation restore key to "Standby" position. If the Master station does not answer immediately, the call may be left registered or it may be cancelled by restoring the key to the "Standby" position.



To ANSWER a call:

The call will come in by voice calling from the Master station.

1. Place key in operate position.
2. Answer and carry on conversation.
3. On completion of conversation restore key to "Standby" position.

Note: On non-calling type Substations operation "2" only applies.

SECTION 4

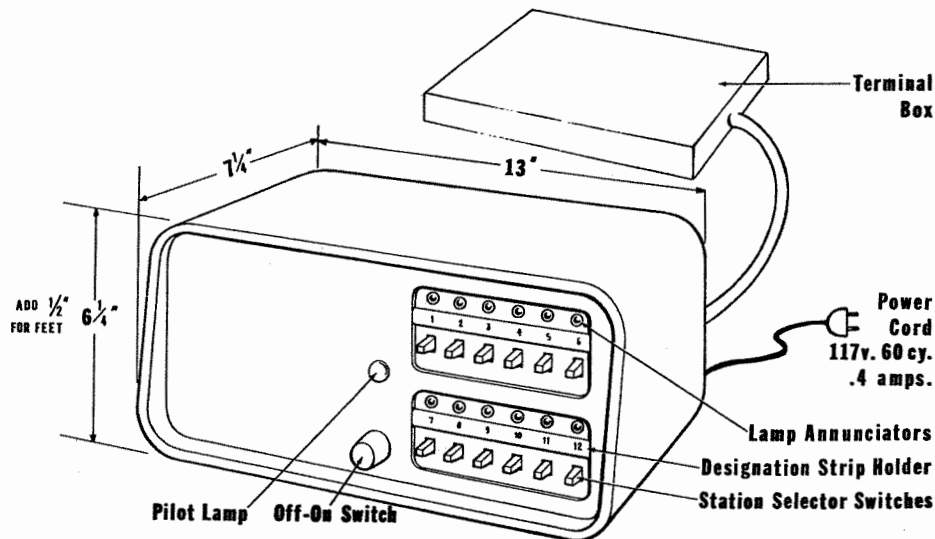
ACCESSORIES:

EX12A & EX24A EXTENSION UNITS:

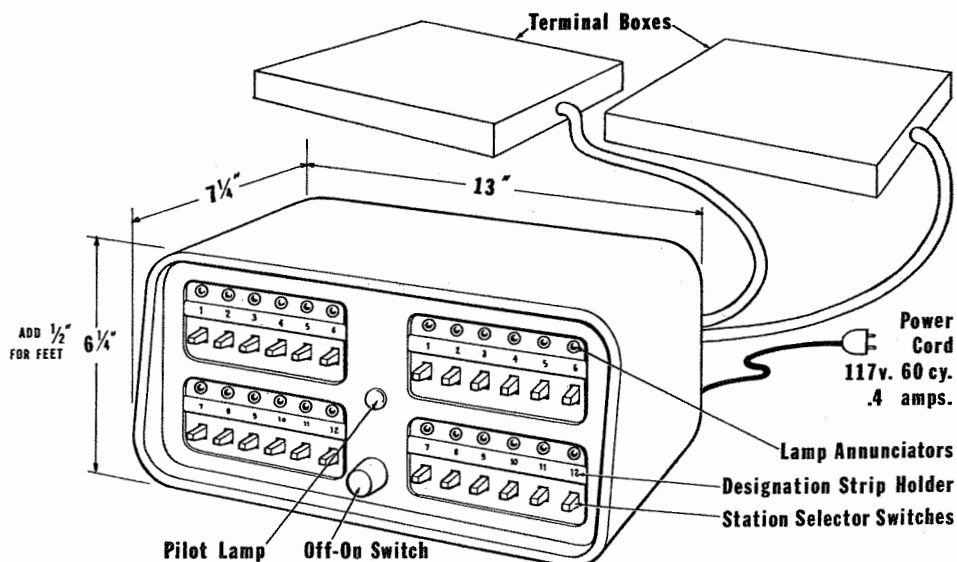
Where additional switching facilities are required beyond the capacity of the Master station being used Extension Switching Units are available as an accessory as illustrated below. The combination of the (SM6A) 6 station and the (SM12A) 12 station Masters with the EX12A and EX24A Extension Units provide switching facilities in multiples of six. As the Extension Switching Units have their own signal power supply, there is virtually no limit to the number of these units which can be incorporated in a system. No modification to the standard Master unit or the system wiring is required in attaching the EX12A and EX24A Units. These Extension Units are supplied with a separate cable with one end having four leads for soldering to the appropriate terminals of the 6 prong socket on the Master unit chassis. The other end is equipped with a Jones plug to provide a plug in feature to the Extension Unit. Each additional switching unit is likewise connected to the previous Extension unit by an identical cable.

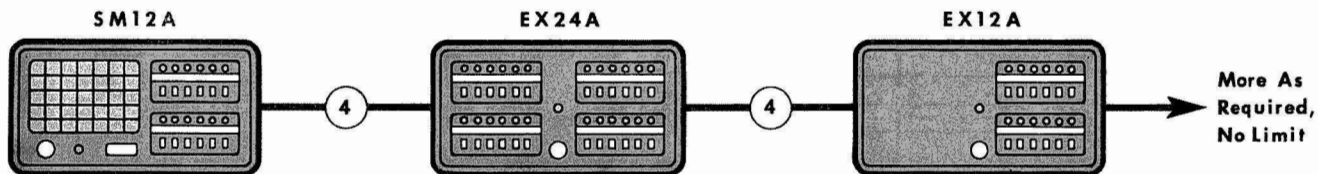
The selector switches on these Extension Units are wired at the factory in the same combination as the Master stations. The top bank (s) of switches is wired for Master-to-Master operation and the bottom bank (s) for Master-to-Substation operation. For any variation in the number of Master-to-Master or Master-to-Substation combinations, refer to the section covering "Selector Switch Bank Wiring" under Section 2, for detailed switch conversion information.

EX12A EXTENSION UNITS

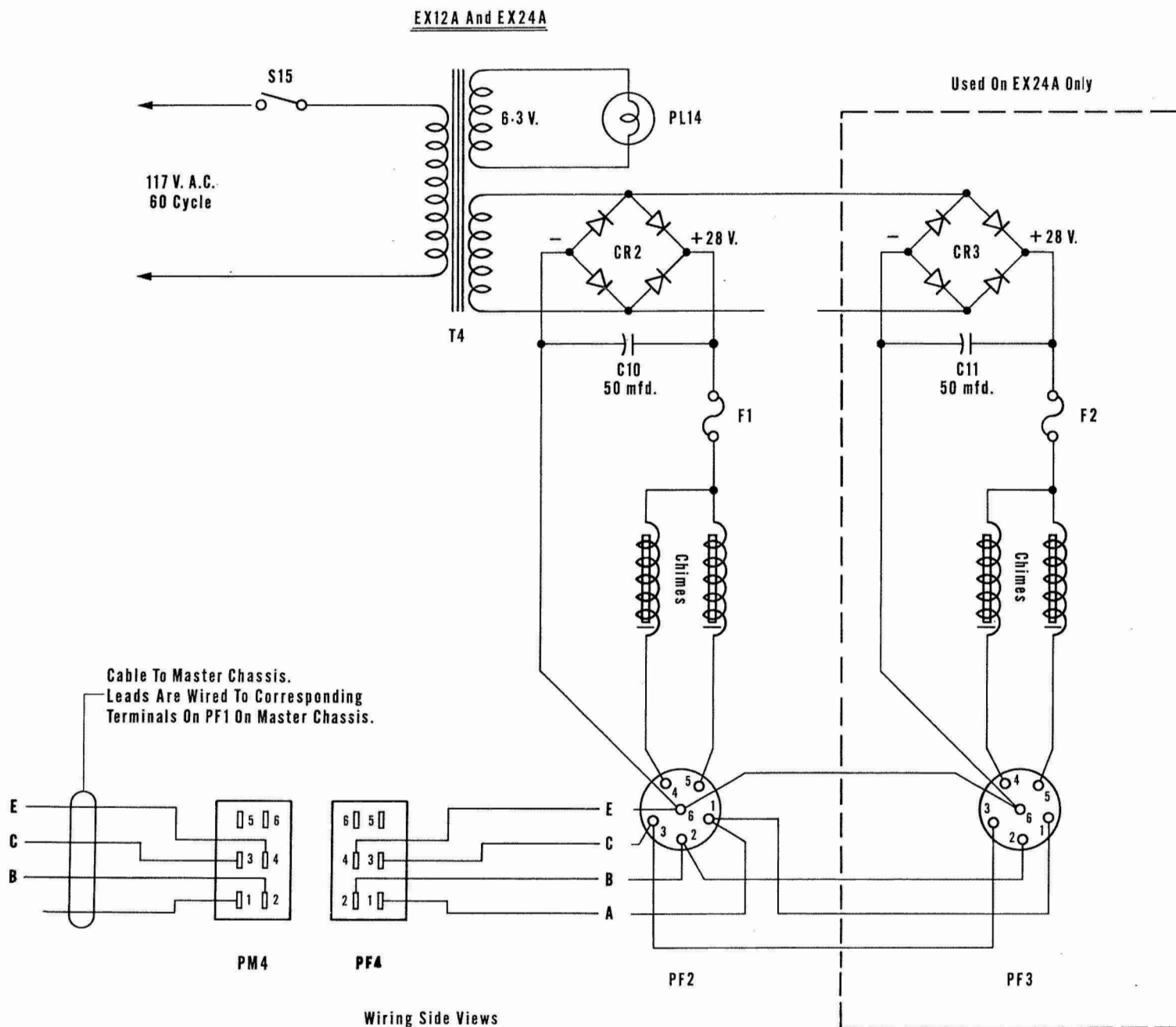


EX24A EXTENSION UNIT

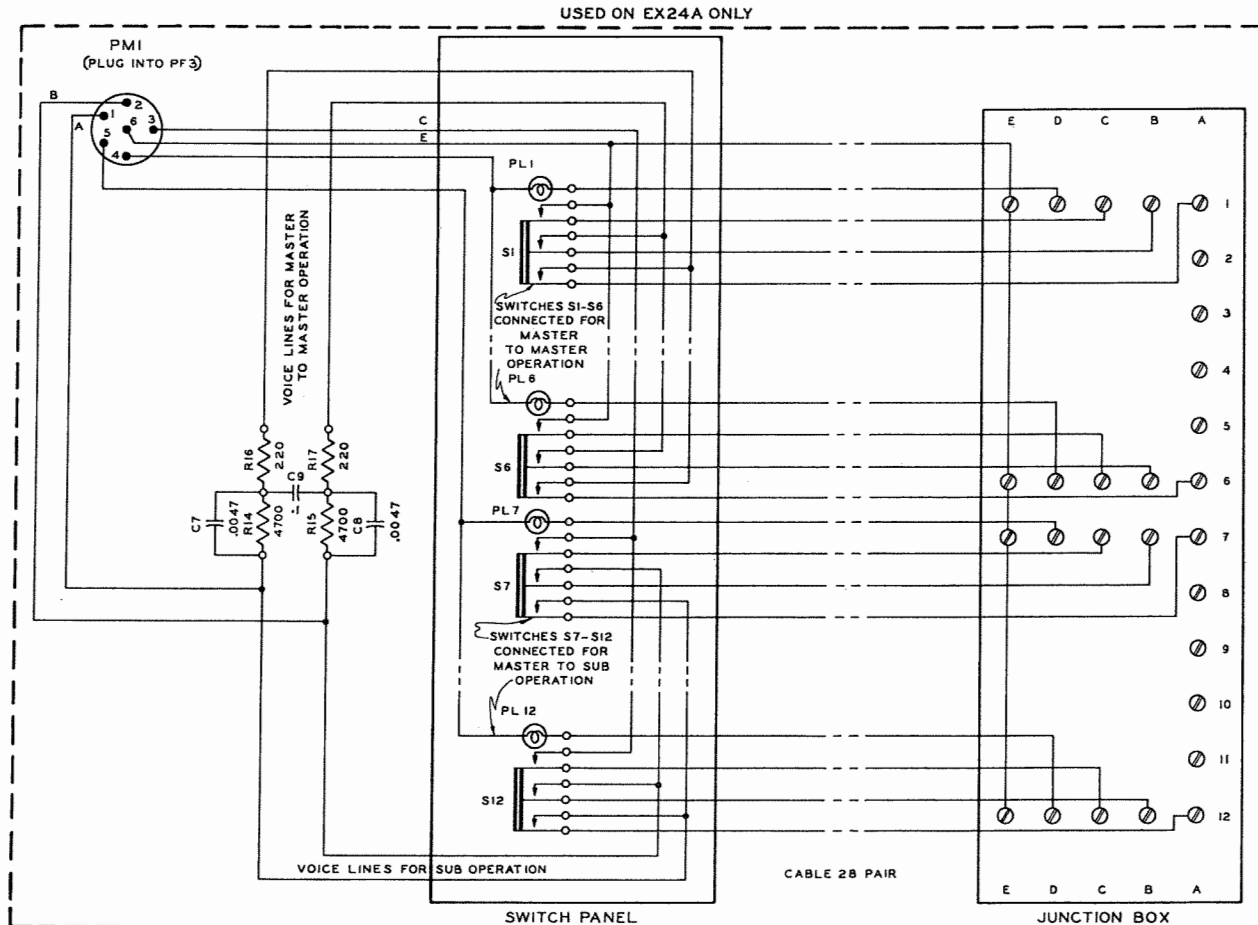
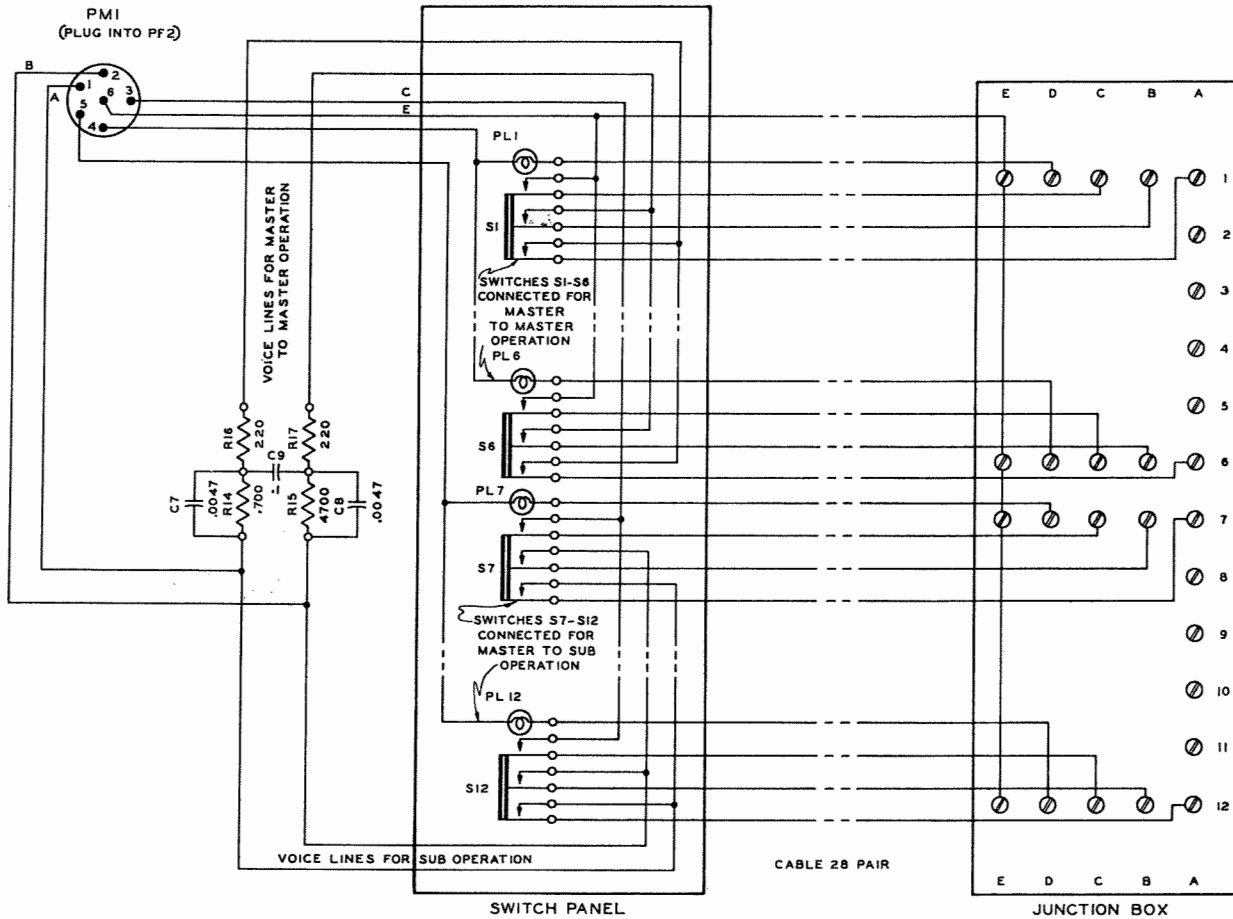




POWER SUPPLY CHASSIS SCHEMATIC

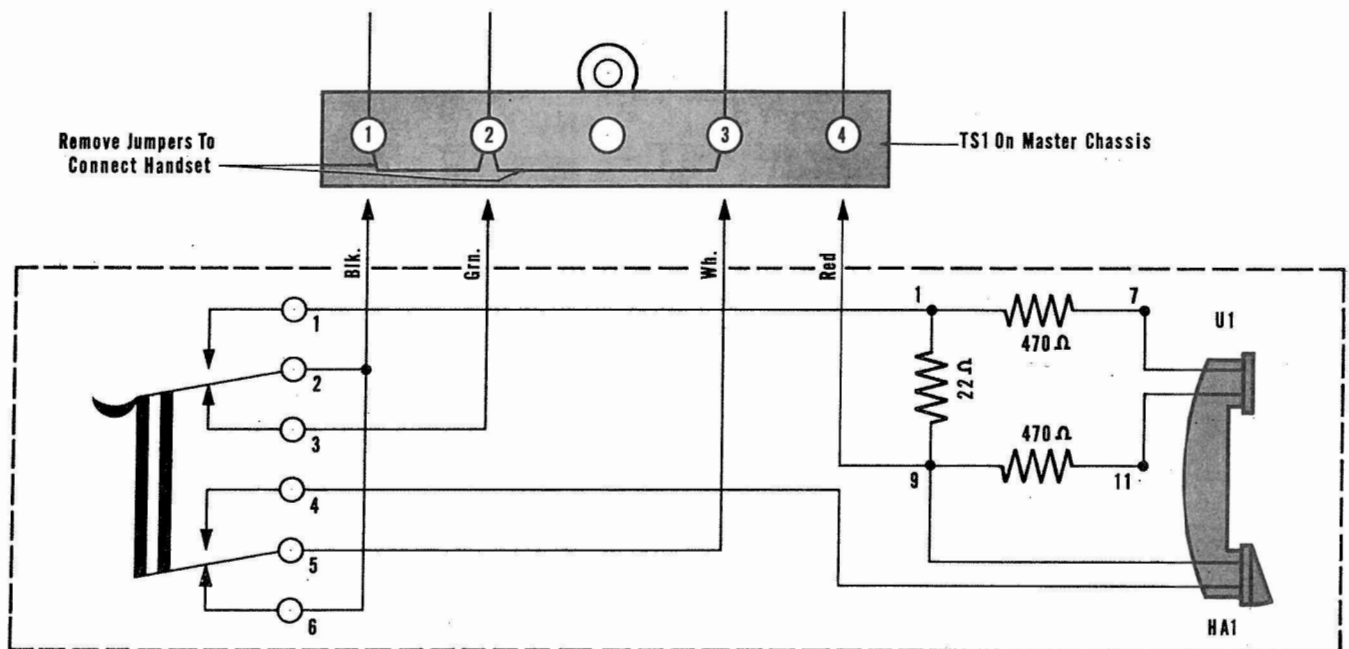
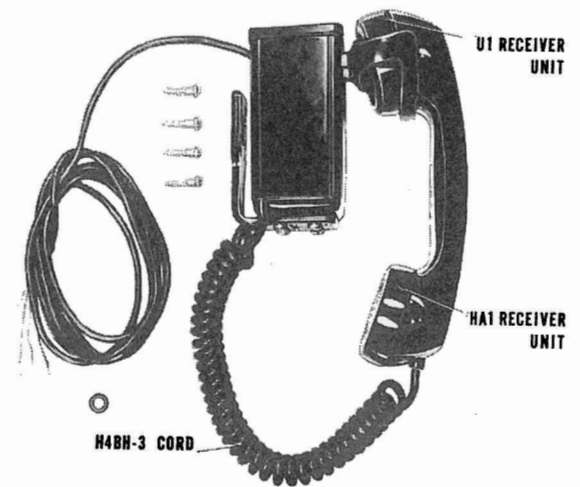


EX12A & EX24A SWITCH BANK SCHEMATIC



RI9726A HANDSET:

Where confidential listening communication is desired or essential, a telephone handset attachment is available for the Master unit. This is also a useful accessory where background noise level seriously affects transmission. As illustrated, the R19726A Handset mounts in the same manner as a regular telephone set. It is connected directly into the Master station and without modification to that unit.



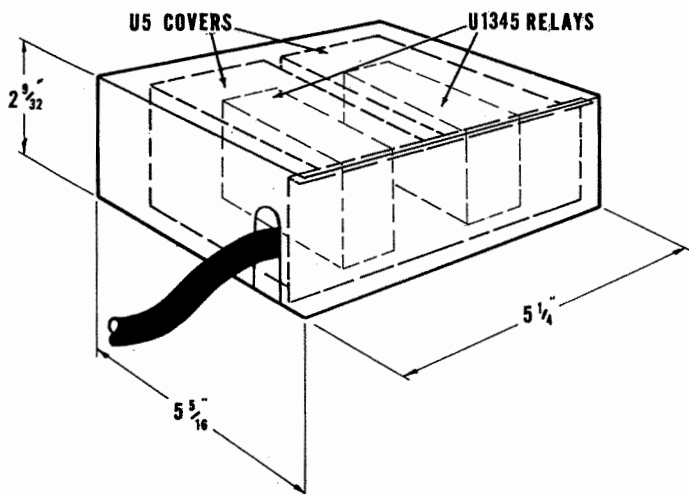
Optional Handset Attachment R19726

OPERATION:

- (a) Remove receiver from hook (which substitutes the Handset for the speaker).
- (b) Operate Master unit in normal manner.

PRESELECTED ALL-CALL: RI9730A RELAY UNIT

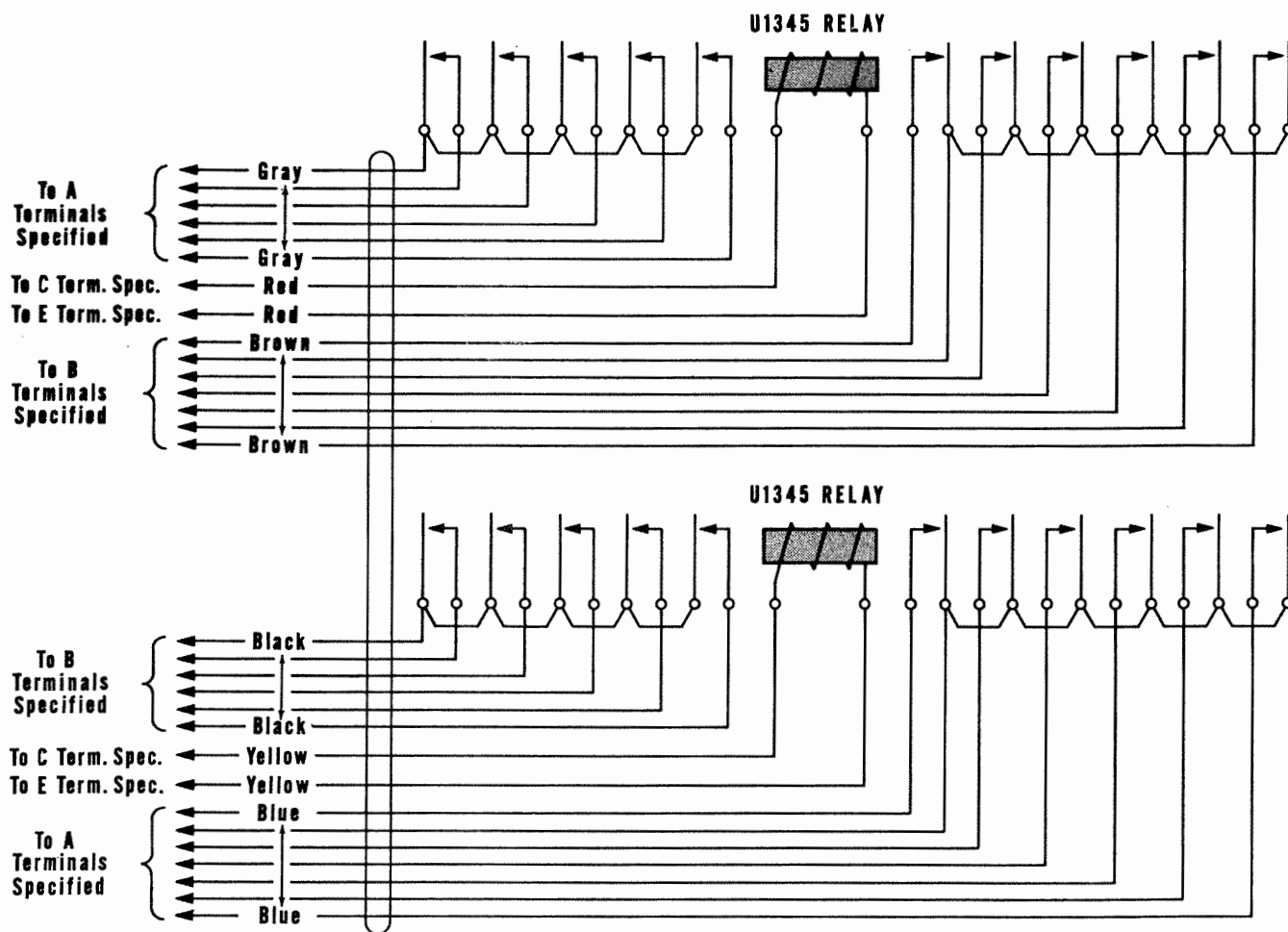
Selective group paging of Substations is another feature available on the Senior Magnaphone by the addition of an accessory unit and without alteration to the existing system wiring. The R19730A "All-Call" Relay Unit is designed and constructed to mount beside and is connected directly to the junction box of the Master unit. It consists essentially of two U1345 relays so wired as to permit pre-selected Substations to be paralleled by the operation of one or two selector switches as desired. Each relay is individually wired to accommodate a maximum of five Substations through one selector switch. By an alternate wiring, and without modification to either the relay unit or the junction box, the relays may be paralleled, in order to page any pre-determined number of Substations beyond five, and up to a total of eleven by the operation of a single selector switch.



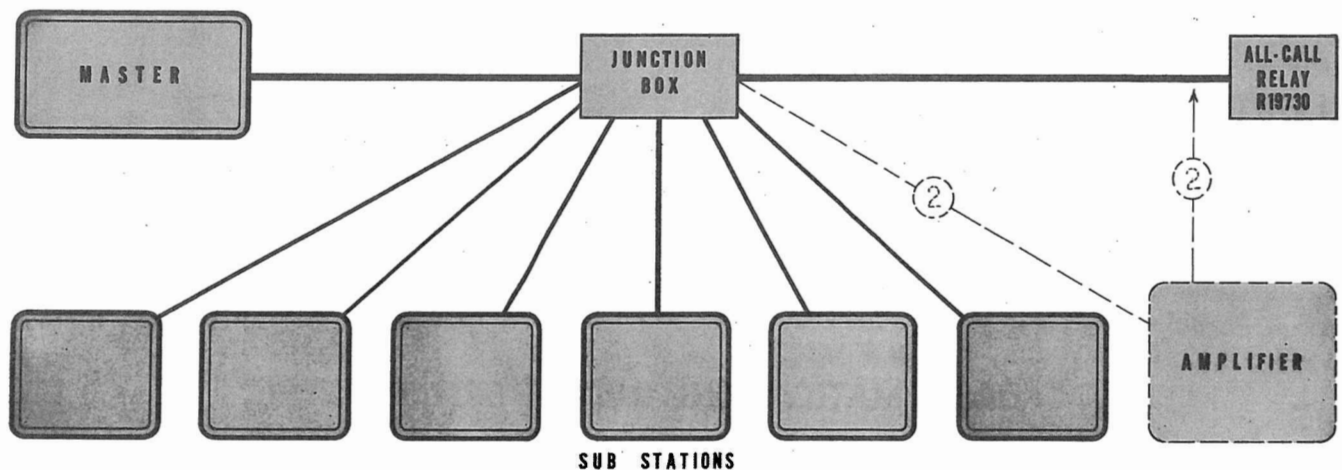
OPERATION:

- Depress All-Call selector switch (es).
- Press-to-talk.

SCHEMATIC



ALL-CALL BLOCK SCHEMATIC



INSTRUCTIONS FOR INSTALLING:

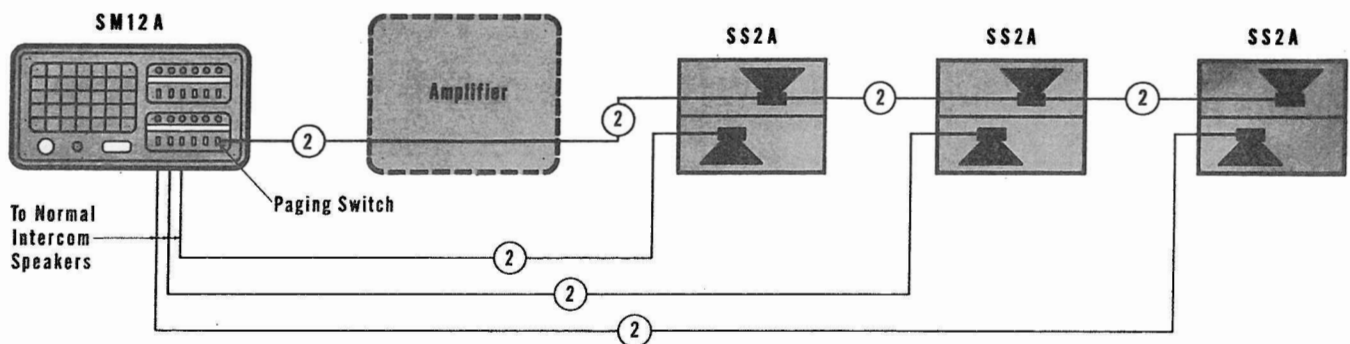
Switches S11 and S12 (or S12 alone) should be used for operating the All-Call relays. Reference should also be made to the schematic showing selector bank switch wiring.

Remove wire P from terminal 5 on S12 and reconnect to terminal 5 on S10. Cut the bus wire between terminals 5 on S10 and S11 for separate relay operation (or between S11 and S12 for combined relay operation). Connect terminal 5 on S12 to terminal 5 on TS3.

Connect cable from relay unit as follows. Red pair is connected to the C and E terminals of line 12 and the yellow pair to those of line 11 (or line 12 for combined operation). One grey wire is connected to the A terminal of line 12 and the others to the A or C terminals of the lines which are to be included in the group depending on whether the Substation concerned is non-private (use terminal A) or private (use terminal C). Similarly the brown wires are connected to B terminals. Black and blue wires are similarly connected to the A, B and C terminals of the second group and line 11; (or to remaining lines of a single group and line 12).

Where an amplifier is required in the paging circuit, its input is connected across the A and B terminals of line 11 or 12 as desired. The wires which would have been connected to these terminals are transferred to the amplifier output which is adjusted to match the required number of 45 ohm Substations in parallel.

As an alternative to the above relay kit for all-call paging or where economy dictates, because of the limited number of Substations to be paged, dual speaker Substations can be used as suggested in the following arrangement. A booster amplifier is indicated as an alternative where paging to noisy locations is required.

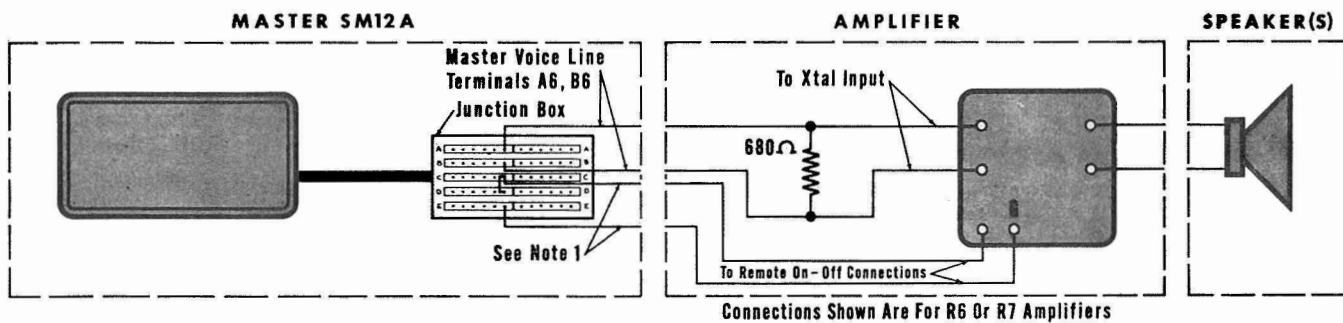


SECTION 5

ADDITIONAL FEATURES: LOUD PAGING

For extremely noisy locations, outdoor or large areas, where high volume paging is essential or desired, a booster or power amplifier with associated high power speaker (s) can be readily connected to the Master station for direct high level paging from any Master station in the system. Any number of Masters in the system can be paralleled to this booster amplifier input through their respective junction boxes and without any modification whatsoever to the Master units or the system wiring. This permits any Master so connected to page directly over this high level system. Several methods of incorporating this feature are shown in the following block schematics.

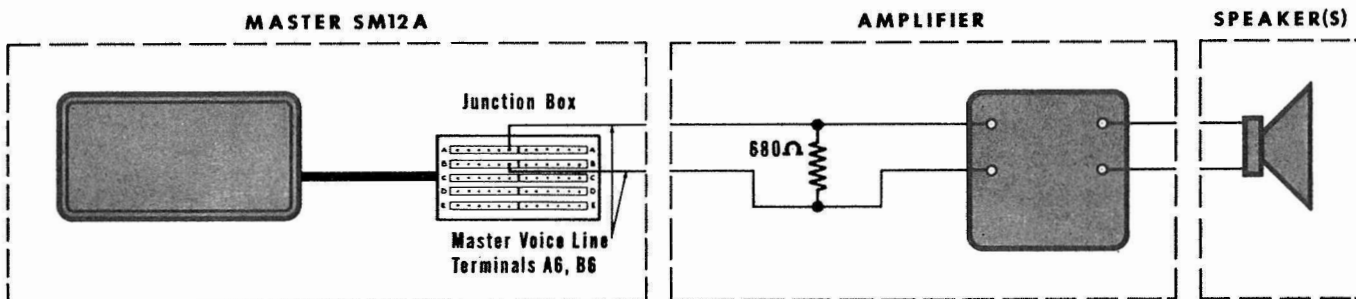
BLOCK SCHEMATIC USING NORTHERN ELECTRIC R6 OR R7 TYPE AMPLIFIERS



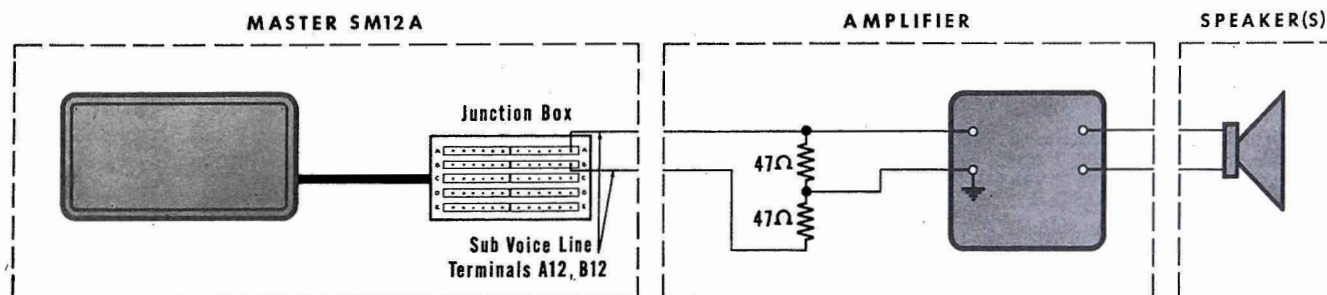
The above schematic shows high level paging incorporating the facility of remote muting as is available on the Northern Electric R6 or R7 type Amplifiers. If remote muting is not desired then omit the "remote On-Off connections", as shown in the following schematic.

Note 1. Where the remote muting line exceeds 5 ohms and a relay is required, controlled D.C. voltage is available across terminals D and C of the Master-to-Master selector switch being used.

Block schematic using Northern Electric R11 type or any suitable amplifier and utilizing Master-to-Master selector switch.

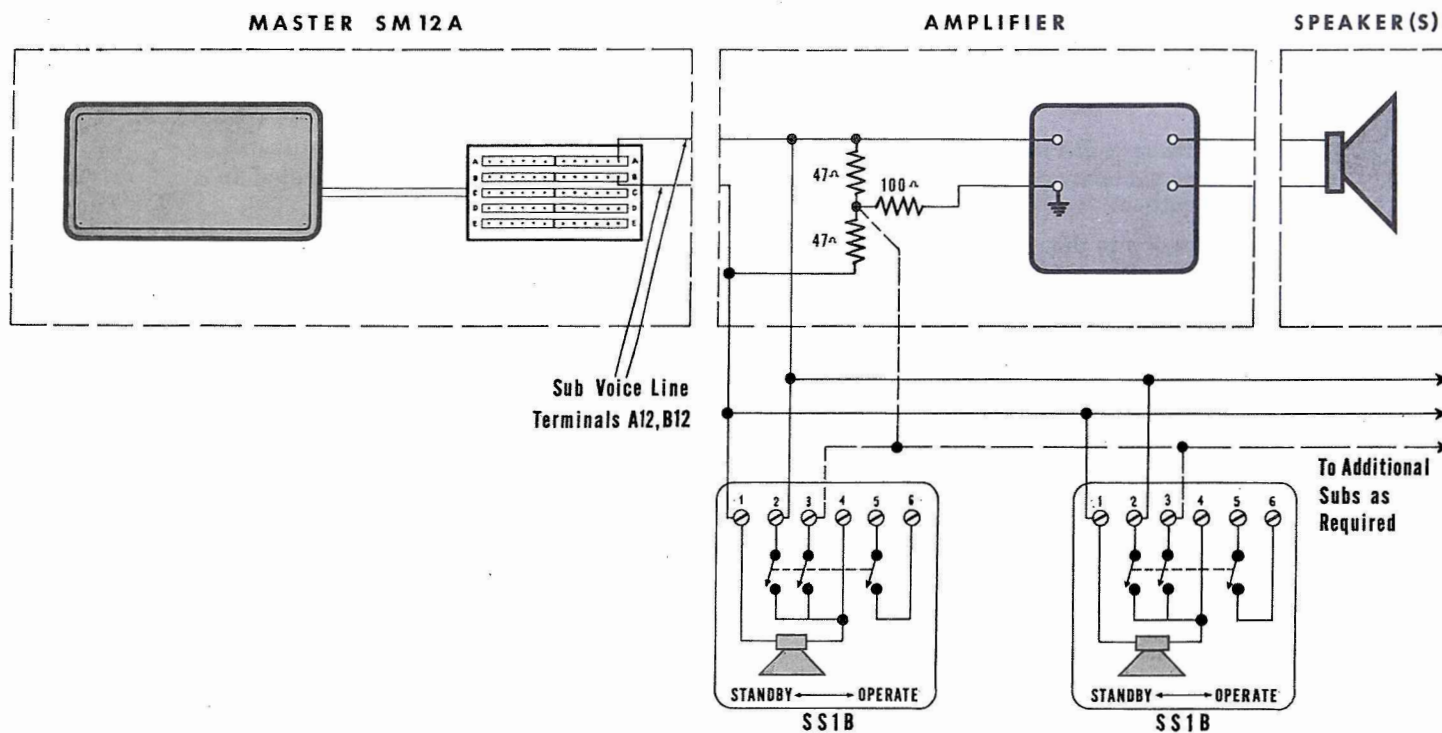


Block schematic using Northern Electric R11 type or any suitable amplifier and utilizing Master-to-Substation selector switch.



LOUD PAGING WITH TALK - BACK:

Where talk-back facilities are required combined with loud paging such is available on the system as illustrated in the following combined block schematic and wiring diagram.

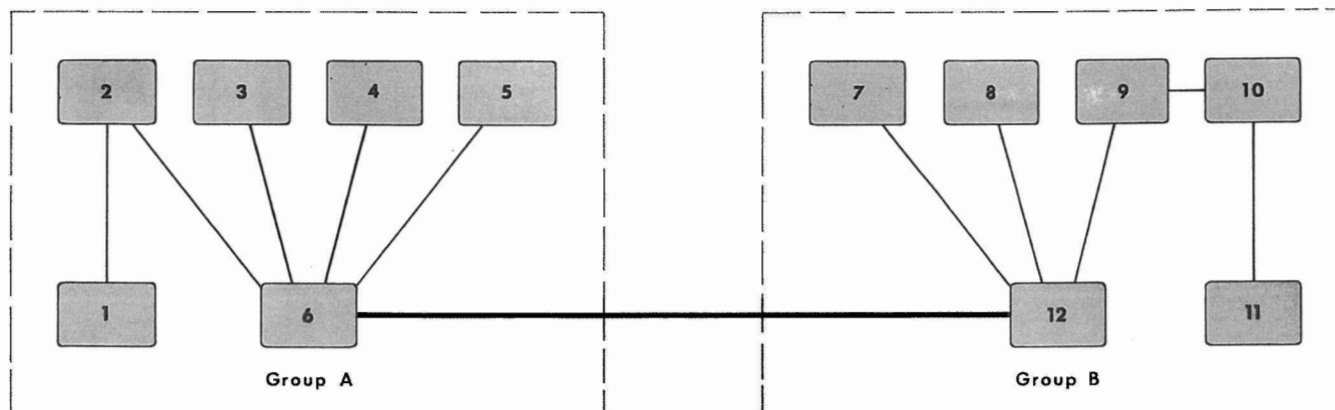


Where it is desired to mute the Master loud paging during reply to any one of the SS1B Substations, the connection shown in dotted lines should be added.

CONFERENCE FEATURE:

The ingenious in-built balanced compensated attenuation pad, resulting in a common line arrangement in the Master system, provides a unique conference feature, whereby any or all Masters in an individual system group may hold intercommunication conferences even though there may not be a direct connection between any number of these Masters in the group. Likewise any Master or number of Masters in any two or more groups may intercommunicate in a conference arrangement providing there is an interconnection between any two Masters, one in each group. The following block schematic illustrates this plus feature.

CONFERENCE FEATURE



It can be noted from the above typical diagram showing two individual systems interconnected by one 5 conductor cable that many combinations of Masters can operate in a conference hook-up such as the following example.

“Within group A, station No. 6 can establish a conference with any or all stations No.2, No. 3, No. 4 and No. 5. Station No. 2 can extend such a conference to include station No. 1. In addition, through the connection between stations No. 6 and No. 12, station No. 2, for example may be put in touch with any or all of stations No. 7, No. 8 or No. 9. In the extreme case, all twelve stations can take part in a general conference.”

From the above it can readily be realized that the extension of this feature is virtually limitless since in large systems, departments or areas (i.e. groups of Masters) may be interconnected in a network as outlined for individual Masters in the “B” type system.

No modification to the wiring of the units is required and neither is there any added complication in the operation of the units by the user. The limitation on the number of Master stations which may carry on communications in a conference is determined solely by the allowable loss of receiving level. As this is governed mainly by the noise level relative to sound level requirements and by the setting of the “receive” gain control, no attempt is made to chart this feature in the number of allowable stations. It can be assumed for example, that a conference involving 15 Masters would operate satisfactorily under normal conditions.

RI9807A RELAY UNIT:

For long line communication, beyond approximately 2 miles (as shown in the wire size chart) an accessory Remote Signalling Relay Unit is available to provide the required signalling current at the remote station. In addition this unit is so designed as to utilize one pair of wires for both annunciator and chime signalling as well as voice transmission, resulting in considerable economy on long line communication. Installation information is supplied with the Relay Unit.

USE OF SUBSTATION WITH SEVERAL MASTERS:

A Substation may be worked with several Master stations merely by paralleling the voice lines onto the Substation terminal strip. If an SS1B model is used, privacy is still obtained but the call in feature should be left disconnected, to avoid incorrect calling of Masters.

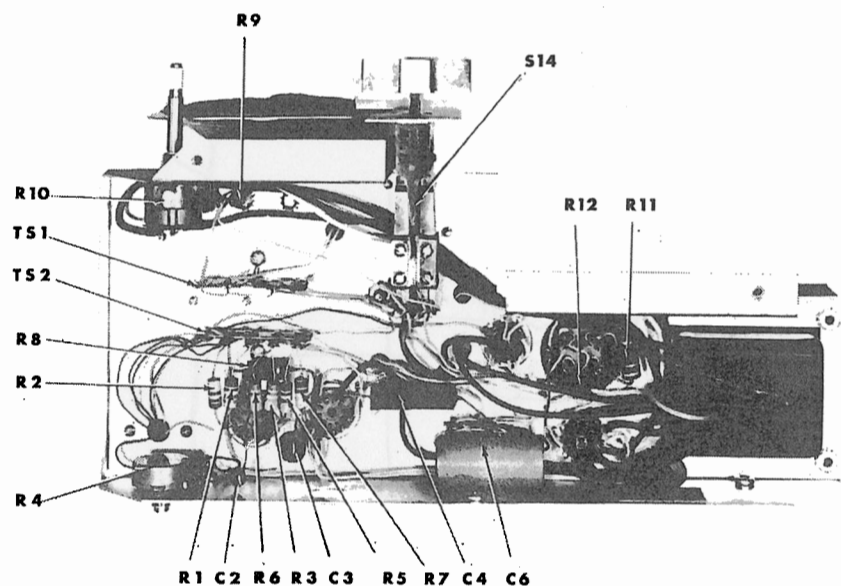
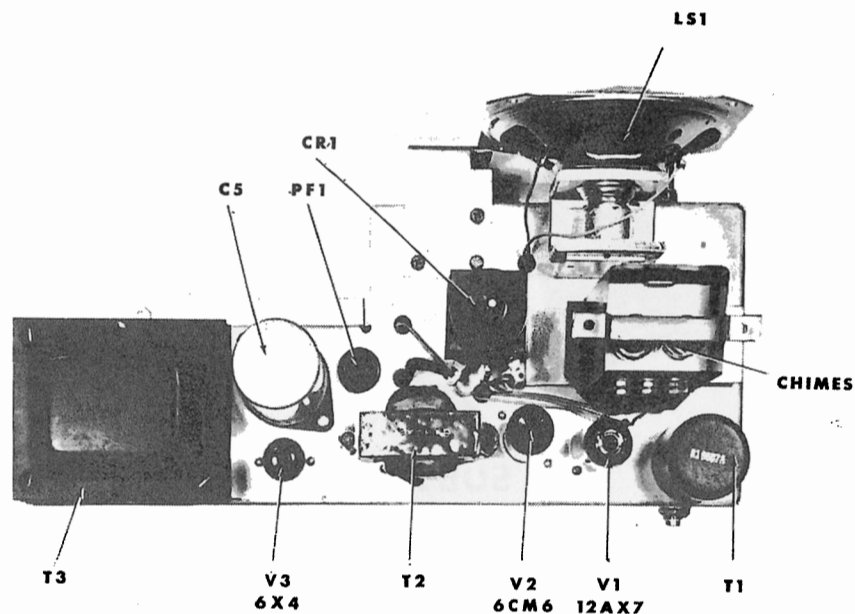
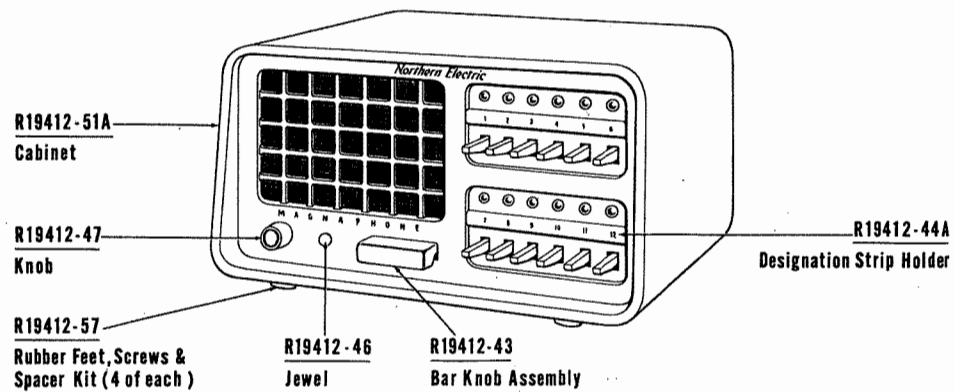
Where it is desired to avoid the possibility of interference, when two or more Masters are calling the same Substation, a selector switch may be mounted in one of the knockouts provided in the cabinet.

SERVICE INFORMATION:

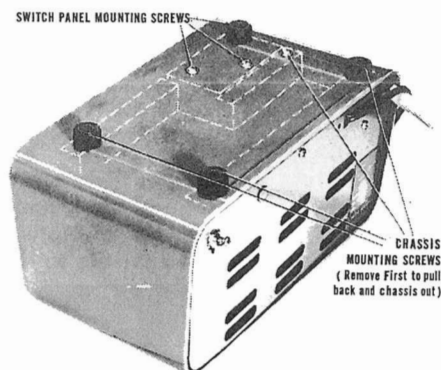
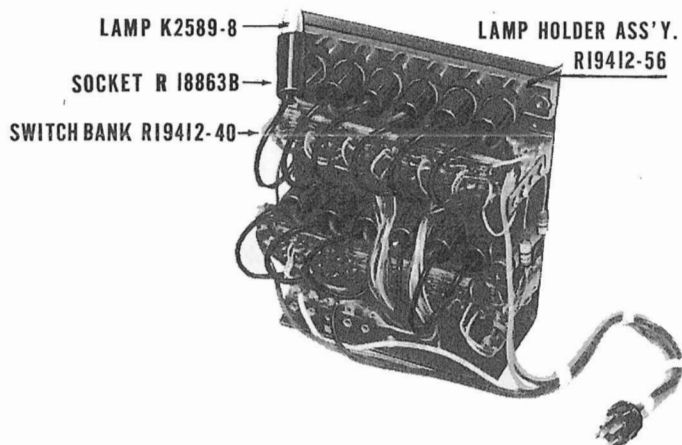
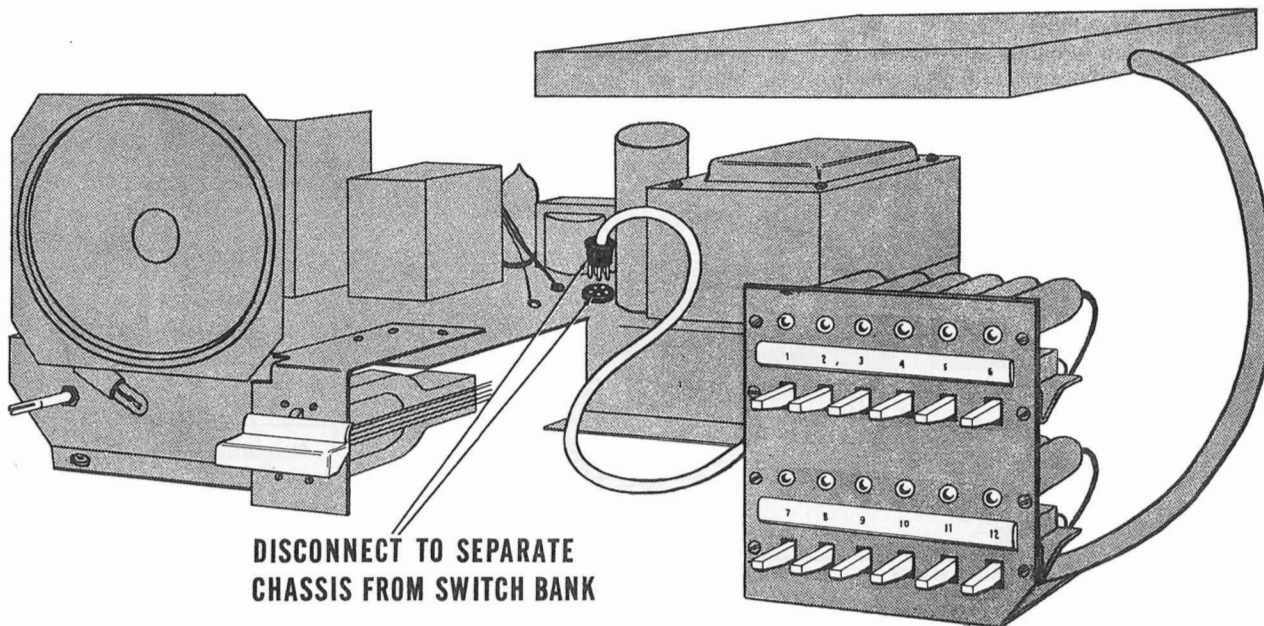
SECTION 0

The following illustrations demonstrate the extreme accessibility of all components of the Magnaphone Senior units. It will be noted that the main amplifier chassis can be withdrawn from the cabinet by the removal of four screws and one plug. Alternatively the amplifier may be removed from the cabinet, yet left connected to the switch assembly for "on-the-spot" servicing.

MASTER STATIONS



PLUG - IN CHASSIS FEATURE:



SUBSTATIONS

CABINET (half shell only)
R19109-30A

SPEED NUTS R12979-2

GRILLE CLOTH & BAFFLE
BOARD ASS'Y R19109-26A

SPEAKER MOUNTING
PLATE R19109-28

KEY HANDLE K10628-7

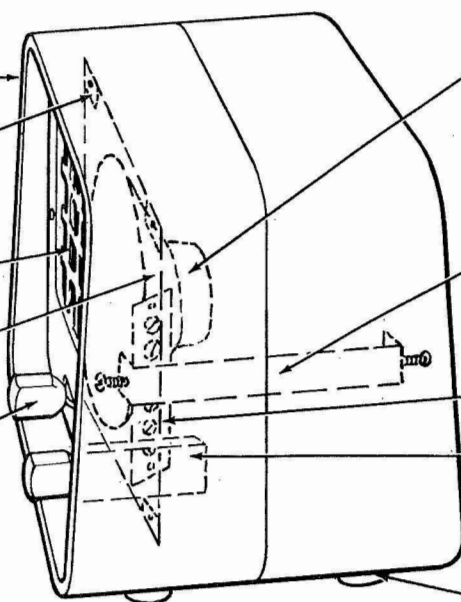
R19412-23A LOUDSPEAKER

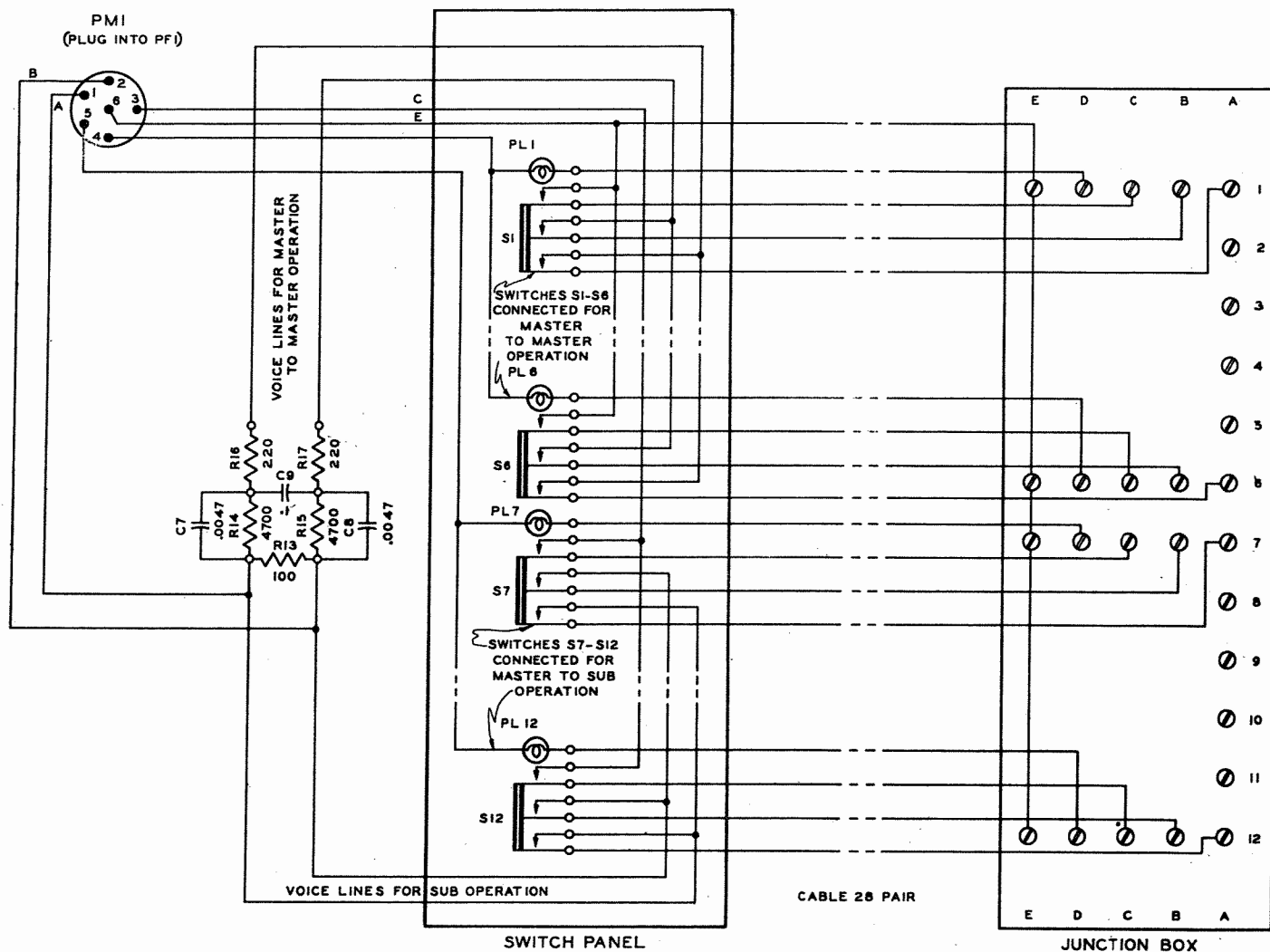
SPACER & SCREW
KIT R19109-36

CONNECTING TERMINAL
STRIP K10413-14

2-EC KEY UNIT

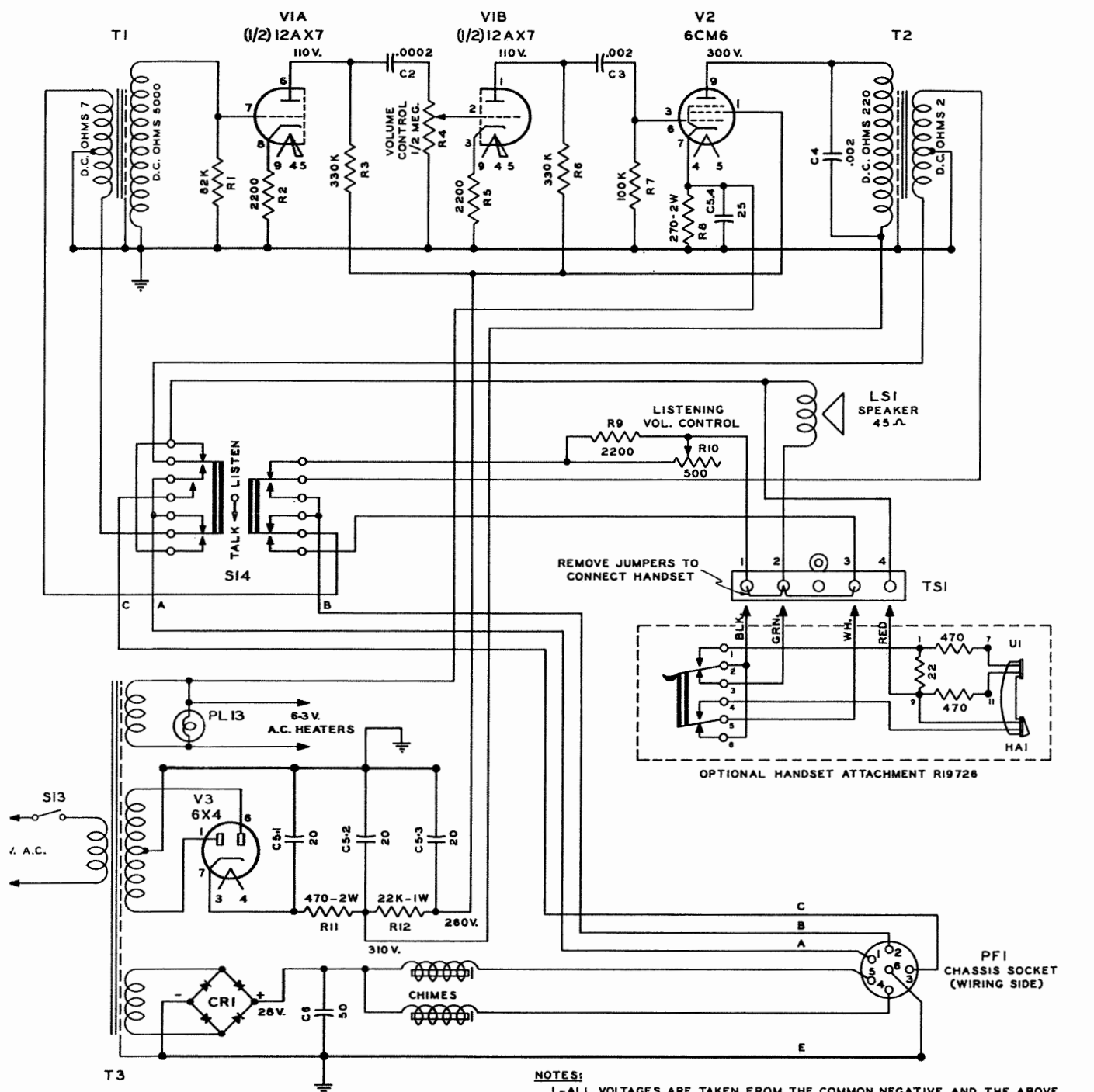
RUBBER FEET K10589-3





NOTE: SWITCHES S1-S12 ARE ASSOCIATED WITH JUNCTION BOX TERMINAL GROUPS 1-12 RESPECTIVELY. ON MASTER STATION TYPE SM6A SWITCHES S7, S8, S9 ARE CONNECTED FOR MASTER TO MASTER OPERATION, SWITCHES S10, S11, S12 ARE CONNECTED FOR MASTER TO SUB OPERATION.

SCHEMATIC DIAGRAM OF MASTER STATION SENIOR INTERCOM.



**SCHEMATIC DIAGRAM OF MASTER STATION SENIOR INTERCOM.
AMPLIFIER CHASSIS**

Northern Electric

SENIOR MAGNAPHONE

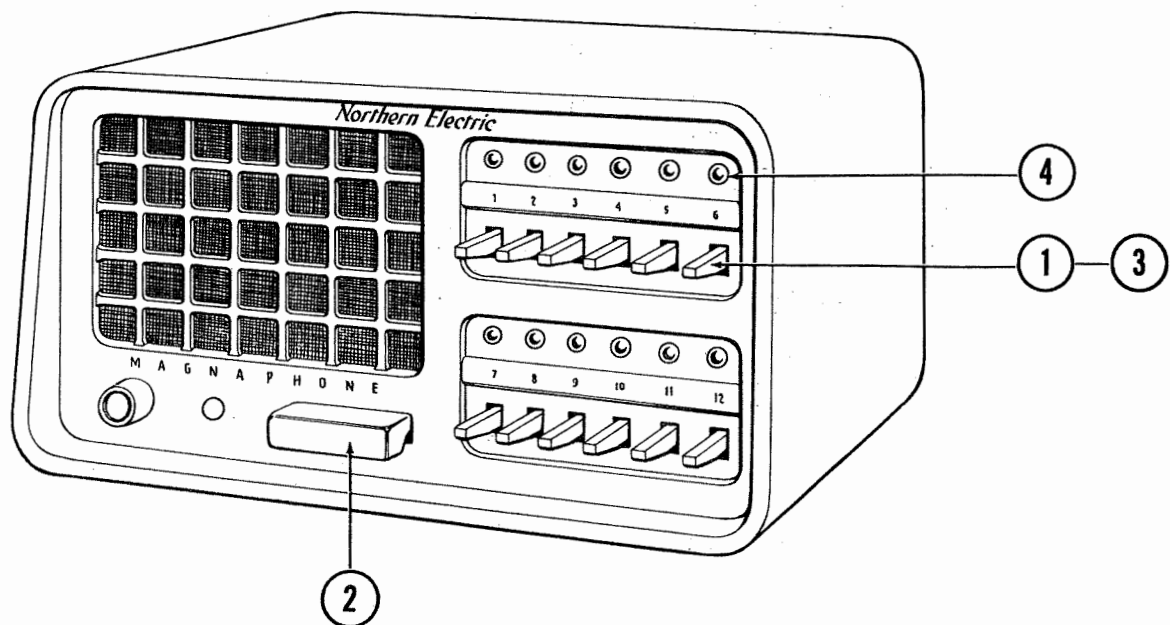
OPERATING INSTRUCTIONS

MASTER STATION

To CALL another station:

1. Depress appropriate station selector switch.
Associated annunciator lamp will glow when called station replies by depressing corresponding station switch or in the case of a "call-in" type Substation, by placing the key in the "Operate" position. When calling another Master, wait for lamp to light before speaking.
2. Depress "Press-to-talk" switch to talk - Release to listen.
3. On completion of conversation restore selector switch to normal position.

BUSY INDICATION: Failure of the annunciator lamp to light indicates that the called station is "busy".



To ANSWER incoming call:

On an incoming call the annunciator lamp (4) comes on and a chime sounds.

1. Depress the selector switch under the annunciator lamp registering the incoming call.
2. Depress "Press-to-talk" switch to talk ---Release to listen.
3. On completion of conversation restore selector switch to normal position.

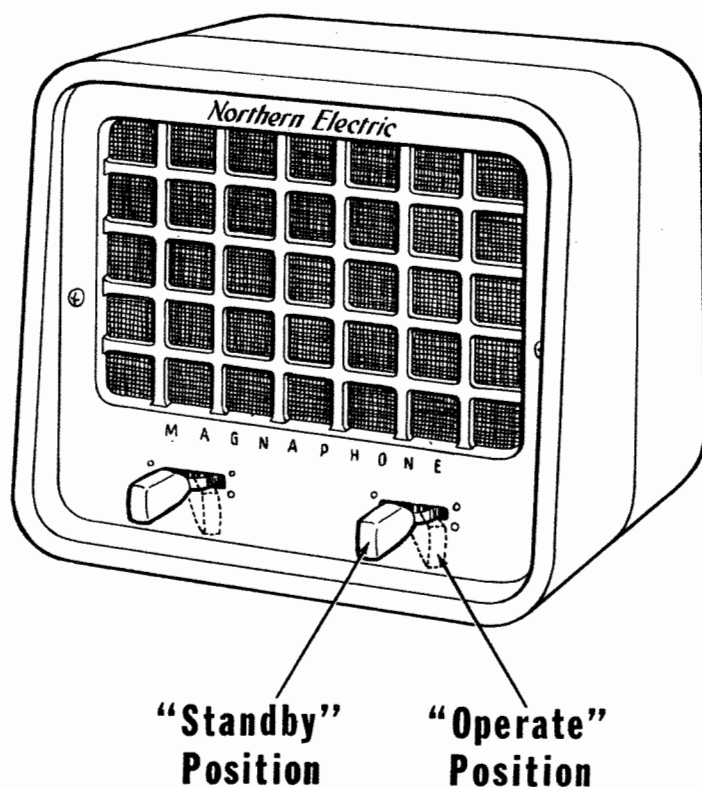
Note 1. If a called Master station does not answer immediately the call may be left registered or it may be cancelled by restoring the selector switch to the "normal" position.

Note 2. Leaving a call registered, for later answering, does not affect the operation of your Magnaphone. Further calls may be made or incoming calls answered. Neither is privacy affected because when the call is answered the corresponding annunciator lamp comes on and a chime sounds.

SUBSTATION

To ORIGINATE a call:

1. Place key in "Operate" position. This operates chime at Master station and lights associated annunciator lamp.
2. Wait for voice reply - carry on conversation.
3. On completion of conversation restore key to "Standby" position. If the Master station does not answer immediately, the call may be left registered or it may be cancelled by restoring the key to the "Standby" position.



To ANSWER a call:

The call will come in by voice calling from the Master station.

1. Place key in operate position.
2. Answer and carry on conversation.
3. On completion of conversation restore key to "Standby" position.

Note: On non-calling type Substations operation "2" only applies.

Replacement Parts List

Circuit Symbol	Description	Part Number	Value	Rating	Tolerance ± %	Manuf. or Type	Circuit Symbol	Description	Part Number	Value	Rating	Tolerance ± %	Manuf. or Type
C2 C3 C4 C5 C6 CR1	AMPLIFIER CHASSIS Capacitor, Ceramic disc Capacitor, Ceramic disc Capacitor, Ceramic disc Capacitor, Electrolytic Capacitor, Electrolytic Rectifier	R19412-35 R19412-23B	200 ufd .002 ufd .002 ufd 20-20-20/25 50 ufd .45 amp	500 V 500 V 500 V 450 V/25 V 50 V 40 V	20 20 20 20 20 20	Sarkes 3N26-2B1-AS N.E. Co. N.E. Co. Amphenol 78-86S Mazda 47	CR2, CR3 C10, C11 F1, F2 PF2, PF3 PF4 PM4 PL14 S15 T4	EXTENSION SWITCHING UNITS Rectifier Capacitor, Electrolytic Fuse 3AG Socket, 6 prong molded Socket Plug Pilot Lamp Switch Power Transformer Chimes ON-OFF Switch Knob ALL-CALL RELAY KIT R19730A Relay (400 ohm coil) Relay Cover	R13645-5 R19714A R19412-35 R19412-47 U1345 U5	.45 amp 50 ufd 3 amp .15 amp 17-28V	40V 50V 250V 6-8V 41.5 ma.		Sarkes 3N26-2B1-AS Littlefuse 3 AG Amphenol 78-86S Jones S-306-AB Jones P-306 CCT Mazda 47 N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co.
LS1 PF1 PL13 R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 S13 S14 T1 T2 T3 T4 V1 V2- V3	Speaker Socket, 6 prong molded Pilot Lamp Resistor Resistor Resistor Volume Control & Switch Resistor Resistor Resistor Resistor Volume Control Resistor Switch-Part of R4 Switch, Talk-Listen Transformer, Input Transformer, Output Transformer, Power, 60 cycle Transformer, Power, 25/60 cycle Vacuum Tube, 12AX7 Vacuum Tube Vacuum Tube Cabinet Assembly Rubber Foot Kit (4) Jewel, Pilot Lamp Knob, Volume Control Knob Assembly, Bar Screw Kit, Key (12 No. 3-56)	R19412-34 R19607A R19608A R18569A R18569B 12AX7 6CM6 6X4 R19412-51A R19412-57 R19412-46 R19412-47 R19412-43 R19412-58	45 ohm .15 amp. 82K 2200 330K 1/2 meg. 2200 330K 100K 270 2200 500 470 22K	6-8V 1/2 W 1/2 W 1/2 W 1/5 W 1/2 W 1/2 W 1/2 W 2 W 1/2 W 1/2 W 2 W 1 W	20 20 20 20 20 20 20 20 20 10 20 30 10 20	N.E. Co. N.E. Co. N.E. Co. N.E. Co.	TELEPHONE HANDSET ATTACHMENT R19726A Receiver Unit Receiver Unit Handset Cord	U1 HA1 H4BH-3					N.E. Co. N.E. Co. N.E. Co. N.E. Co.
C7 C8 C9 PL1 to PL12 PM1 R13 R14 R15 R16 R17	SWITCH PANEL Capacitor Capacitor Pilot Lamps Plug (6 prong) Resistor Resistor Resistor Resistor Resistor Switch Bank Switch Knob Kit (part of R19412-40) Designation Strip Holder SUB STATIONS Cabinet (1/2 shell) Baffle Board Assembly Speaker Speaker Mid. Plate 2-EC Key Unit Key Knob, Ivory Key Unit Screw Kit (12) Terminal Board Spacer & Screw Kit (2) Rubber Foot Screw Nut	R19412-40 R19412-49 R19412-44A R19109-30A R19109-26A R19412-23A R19109-28 2-EC Key K10628-7 R19109-35 K10413-14 K10413-14 K10589-3 R12979-2	.0047 ufd .0047 ufd 0.1 ufd 0.1 amp 100 4700 4700 220 220	500V 500V 500V 28V 1/2 W 1/2 W 1/2 W 1/2 W 1/2 W	20 20 20 20 20 20 20 20 20	G.E. No. 1820 Amphenol No. 71-6S N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co. N.E. Co.	ADD THE FOLLOWING: SWITCH PANEL Lamp Holder Assembly, R19412-56, N.E. Co. Cable & Junction Box Assembly, R19412-55, N.E. Co. R19807 RELAY UNIT Relay, 221-CP, N.E. Co. Repeating Coil, 94E, N.E. Co. Potentiometer, 200, K10583-201, N.E. Co. R19109-46 SWITCH KIT Switch, R19109-45, N.E. Co. Knob, R19721-2, N.E. Co. R19109-60 VOLUME CONTROL KIT						

- NOTE -

CORRECTIONS.

C2 should read value .002 ufd.
CR1, CR2
& CR3 should read N.E. Co. R19412-5
R4 should read Volume Control, R18593J, 1/2 meg.,
1/2 W., ± 30%, N.E. Co.
R10 should read Volume Control & Switch, R17361-2,
500, 1/5W., ± 20%, N.E. Co.
PL12 should read K2589-8, N.E. Co.

- NOTE -

CORRECTIONS.

C2 should read value .002 ufd.
CR1, CR2
& CR3 should read N.E. Co. R19412-5
R4 should read Volume Control, R18593J, 1/2 meg.,
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500, 1/5W., ± 20%, N.E. Co.
PL12 should read K2589-8, N.E. Co.

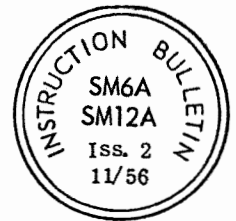
ADD THE FOLLOWING:

SWITCH PANEL
Lamp Holder Assembly, R19412-56, N.E. Co.
Cable & Junction Box Assembly, R19412-55, N.E. Co.
R19807 RELAY UNIT
Relay, 221-CP, N.E. Co.
Repeating Coil, 94E, N.E. Co.
Potentiometer, 200, K10583-201, N.E. Co.
R19109-46 SWITCH KIT
Switch, R19109-45, N.E. Co.
Knob, R19721-2, N.E. Co.
R19109-60 VOLUME CONTROL KIT

Northern Electric

COMPANY LIMITED

SENIOR MAGNAPHONE

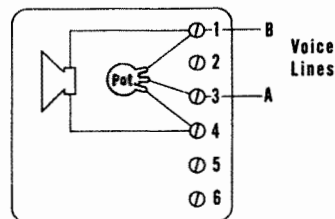


ADDENDUM No. 1

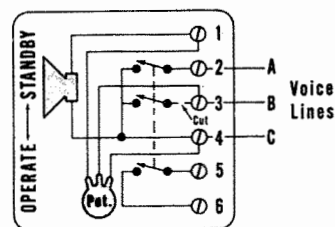
On installations where it is required to arrange for different sound levels at the Substations, the following information is provided. Where a potentiometer type of control is desired, it may be mounted by means of the knockout provided on the front of the cabinet. Any appropriate control of suitable physical size may be used but listed under Method No. 1 are suitable potentiometers of both the carbon and wire wound types.

METHOD 1-ADJUSTABLE

SS1A

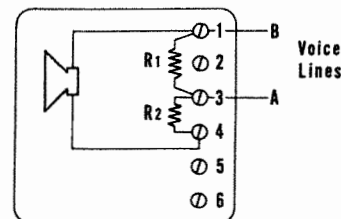


SS1B

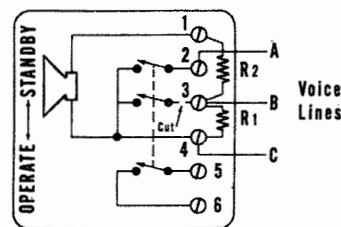


METHOD 2-FIXED

SS1A



SS1B



Centralab Potentiometer
Model 2, 15/16" dia.,
250 ohms.

Mallory Potentiometer
Model C200P, 1-1/16" dia.,
200 ohms.

Attenuation

3 db
6 db
9 db
12 db
15 db
18 db

Value R1

100 ohms
100 ohms
100 ohms
100 ohms
100 ohms
100 ohms

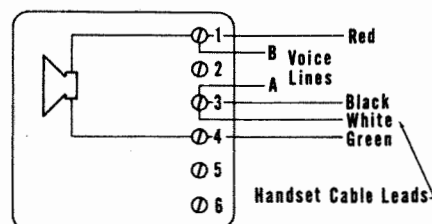
Value R2

10 ohms
47 ohms
100 ohms
180 ohms
270 ohms
470 ohms

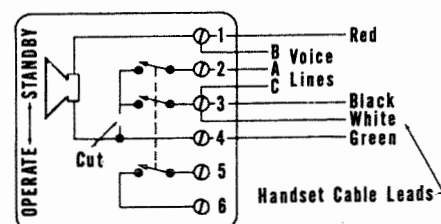
RI9726A HANDSET:

The instructions on page 15 of the bulletin includes application and installation information for its use with a Master station. The Handset can also be used in conjunction with the Substations and without modification to either unit or alterations in the system wiring. The following block schematics provide the required wiring information.

SS1A



SS1B



SELECTOR SWITCHBANK WIRING:

The conversion block schematic on page 9 should be titled "SM12A MASTER". The associated drawing on a smaller scale in the lower right hand corner is the switch bank block schematic for the SM6A MASTER.

LOUDSPEAKING INTERCOMMUNICATION

EQUIPMENT

SENIOR MAGNAPHONE (N.E.CO.)

1. GENERAL

1.01 This Addendum to Section C53.903, Issue A, is issued to provide installation and maintenance information covering the accessory equipment:

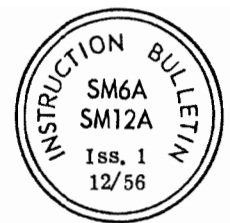
R19807 Remote Signalling Relay Unit.
R19109-46 Substation Switch Kit.

R19109-60 Substation Volume Control Kit.
R19726A Handset.

1.02 This Addendum consists of this covering sheet and Addendum #2 to the Senior Magnaphone Instruction Bulletin, SM6A, SM12B, Issue 1.

Northern Electric

COMPANY LIMITED
BELLEVILLE, ONTARIO



SENIOR MAGNAPHONE

ADDENDUM No. 2

RI9807 REMOTE SIGNALLING RELAY UNIT

(Supplementing information on page 20)

For long line communication between two Masters (beyond approximately 2 miles as listed in the wire size chart) an accessory remote signalling relay unit provides the required signalling current at the remote station to operate the audible signal and lamp annunciator. Two type RI9807A Relays, one at each Master, are required for each such circuit. Two conductors and a good ground (3 conductors) serve to provide both annunciator and audible signalling as well as voice transmission. This results in considerable economy on long lines where full signalling facilities may be obtained over distances up to 12 or 15 miles (depending on the size of conductors).

The use of this remote signalling unit in no way effects the operation of the Senior Magnaphone as outlined in the operating instructions forming part of this bulletin.

INSTALLATION INSTRUCTIONS:

This unit is used in conjunction with a Senior Master Magnaphone to permit operation of two Master units over a long line pair or over a telephone line pair. Complete voice and signalling facilities are possible.

- (a) Remove the Master station chassis from the cabinet. Use any one "Master to Sub" Selector Switch (S7 to S12 on SM12 type Masters, S10 to S12 on SM6 type Masters) as the remote signalling switch. Lift the bus from terminal 5 on this switch and connect terminal 5 to Terminal 3 of TS3 (refer to detail drawings under Selector Switch Bank Wiring Master Stations).
- (b) On the underside of the Master station junction box remove the bus wire from E12. Solder both wires of the slate-white pair to this point. Move existing Substation wiring, if any, from E12 to any other E terminal.
- (c) Mount the Remote Signalling unit adjacent to the Master station junction box. Make connections to the junction box screw terminals associated with the above selected remote signalling relay as listed below and as shown on the accompanying wiring diagram.

RELAY UNIT WIRE COLOR

Brown
Blue
Black
Red
Green
White

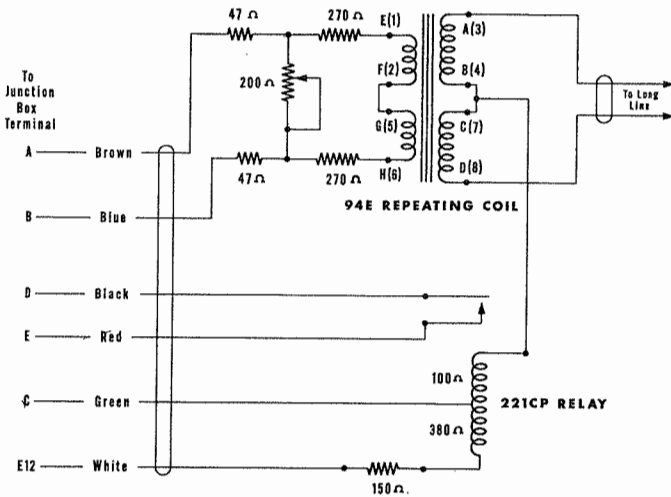
JUNCTION BOX SCREW TERMINALS

A
B
D
E
C
E12

Connect the E terminal to which the red wire is connected to a good ground. Connect the two conductor cable to the long line or telephone pair wires.

LINE LENGTH - The recommended maximum loop resistance is 3500 ohms (8 miles using #26 gauge wire). This may be increased to 5000 ohms (12 miles) if the line voltages are approximately equal at each end. This distance may be increased considerably if a larger size conductor, such as #22, is used.

ADJUSTMENTS - Owing to the Master stations ability to provide for widely varying line losses, care must be taken to ensure that the volume levels are equalized at each end of the line so that zero level is not exceeded. Adjust the rear volume control on the Master stations for approximately equal level (set potentiometer midway for preliminary adjustment). If one Master station is already installed make the same volume adjustment on the new unit. Make the final sound level adjustments by similar adjustment on the potentiometers under the plug buttons in each Relay unit.

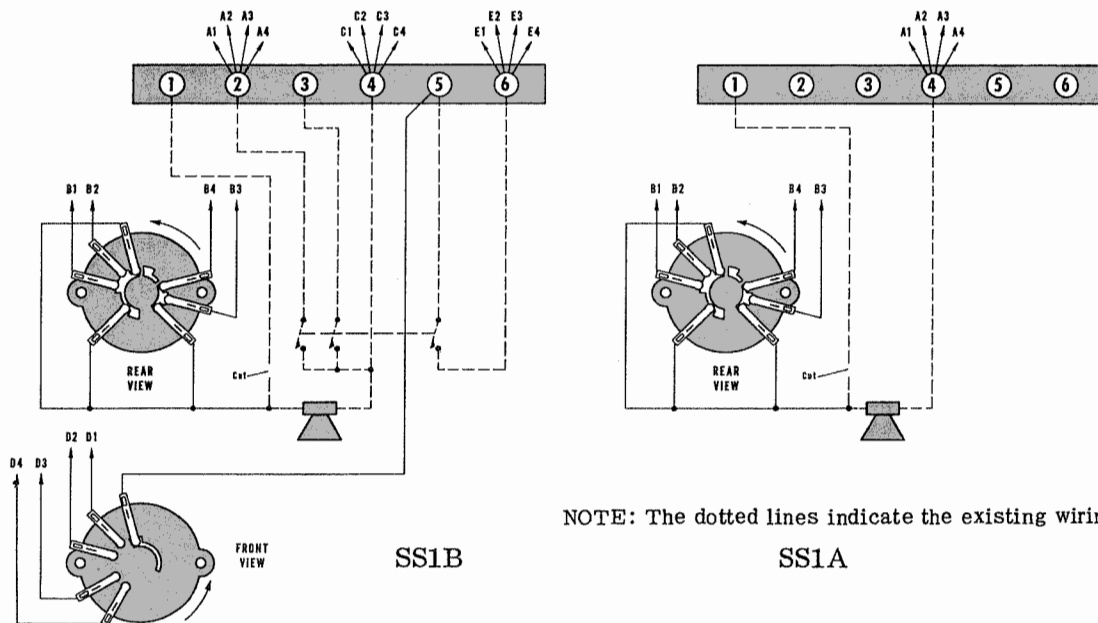


R19109-46 SUBSTATION SWITCH KIT:

The R19109-46 Switch Kit permits the connection of one SS1A, SS2A or SS1B Substation to a quantity of up to four Master stations. Call in facilities are not affected and full privacy and secrecy are maintained on all calls.

On the SS1A and SS2A Substations, these switches can be mounted in either or both knockouts as provided in the front of the cabinet. In using the SS1B, this switch should be mounted on the left hand side (facing cabinet).

Wiring information for the installation of this kit is shown in the accompanying drawings.



OPERATION:

To originate or answer a call:

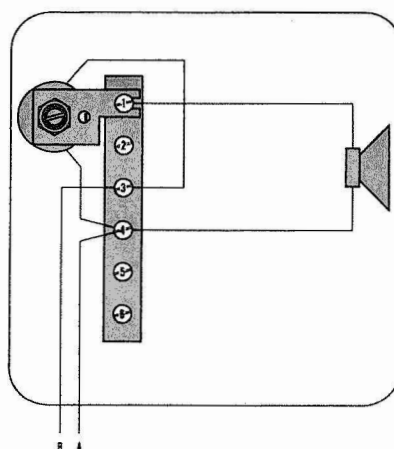
- Turn the selector switch to the desired position and operate in the normal manner.
- When finished return the key and switch to the standby-position in that order.

NOTE: The Master station must identify itself when calling a Substation.

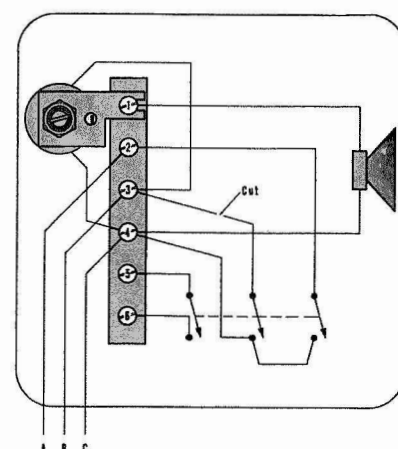
RI9109-60 SUBSTATION VOLUME CONTROL KIT:

(Supplementing and superseding information on Addendum No. 1)

This kit is available as an accessory for installations where it is required to arrange for different sound levels at the Substations. It consists of a 200 ohm, screw-driver adjusted potentiometer assembled on a bracket for mounting directly to the terminal strip.

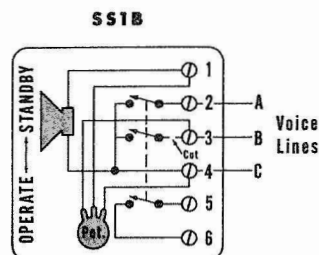
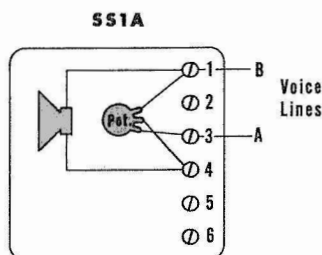


SS1A

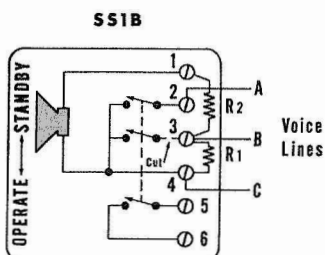
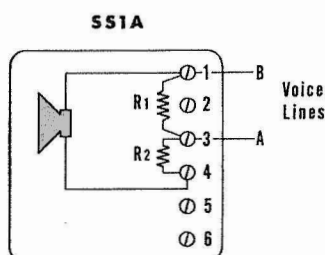


SS1B

Where an external adjusted volume control is desired a conventional type potentiometer such as the Centralab Model 2, 15/16" dia., 250 ohms (carbon type) or the Mallory C200P, 1-1/16" dia., 200 ohms (wire wound type) can be mounted in one of the knockouts provided in the case and wired in accordance with the following diagrams.



If a fixed level adjustment is preferred the following wiring details and attenuation/resistance table is provided for your guidance.



Attenuation	Value R1	Value R2
3 db	100 ohms	10 ohms
6 db	100 ohms	47 ohms
9 db	100 ohms	100 ohms
12 db	100 ohms	180 ohms
15 db	100 ohms	270 ohms
18 db	100 ohms	470 ohms

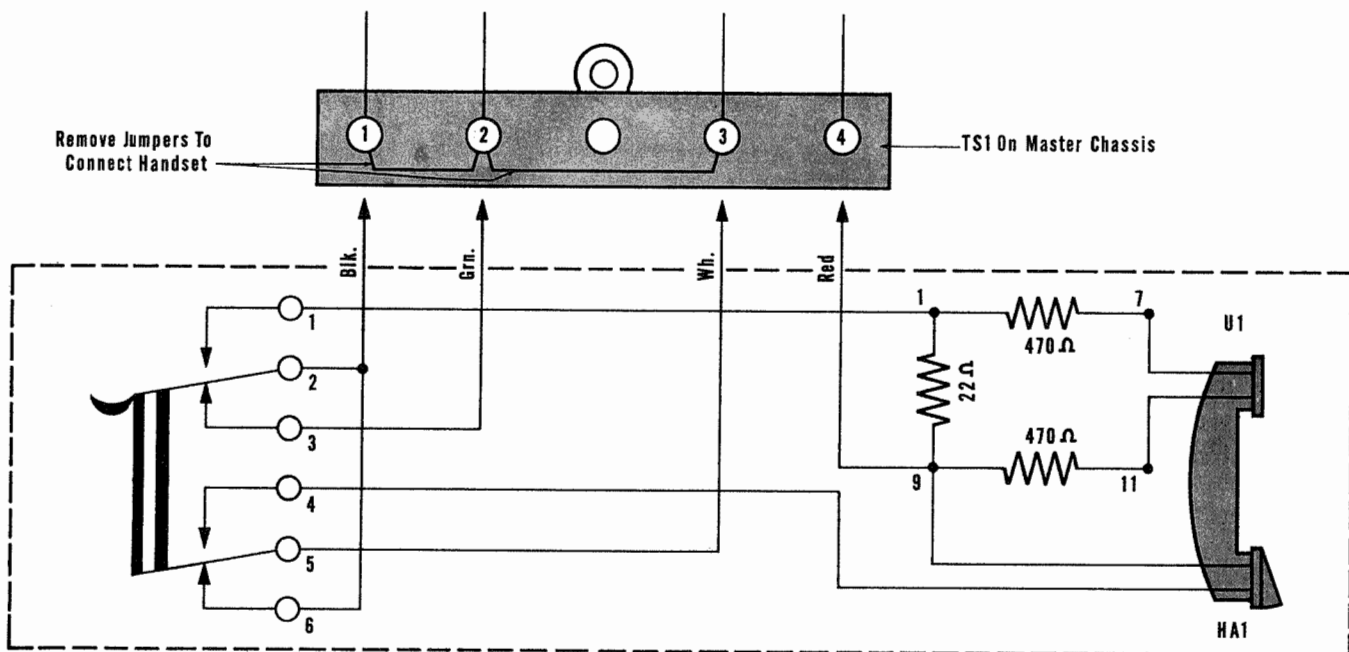
RI9726A HANDSET:

(Supplementing and superseding page 15 and part of Addendum No. 1)

Where confidential listening communication is desired or essential a telephone handset is available. As illustrated, the RI9726A Handset mounts in the same manner as a regular telephone set. It connects directly to the SS1A and SS1B Substations or to the Master Station and without modification to the units. When the handset is to be used with the SS2A or SS2B Substation, the #6017B key can be used to switch the handset to either half of the station. No modification to the present wiring is necessary for this application and all circuit connections remain as illustrated throughout the bulletin. The following block schematics provide the required wiring information.

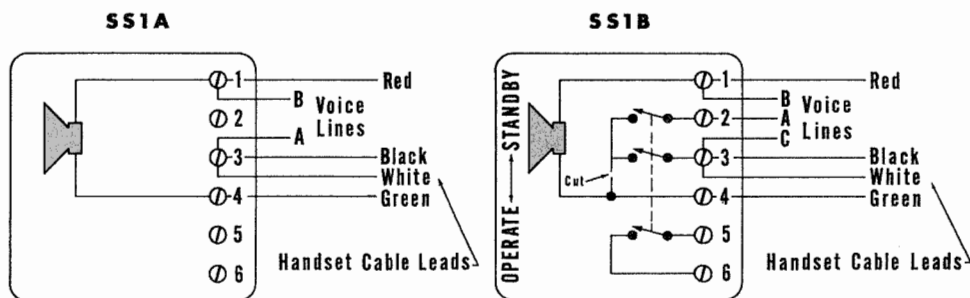
Remove the Master station from its cabinet and insert the grommet supplied with the handset attachment into the hole (covered by a plug-button) provided in the back plate. Bring the handset attachment cable through the grommet to the far four lug terminal strip. Knot the cable inside the chassis to prevent strain on the terminals. Remove the two jumpers on the terminal strip and connect cable as shown in the following sketch.

MASTER STATIONS

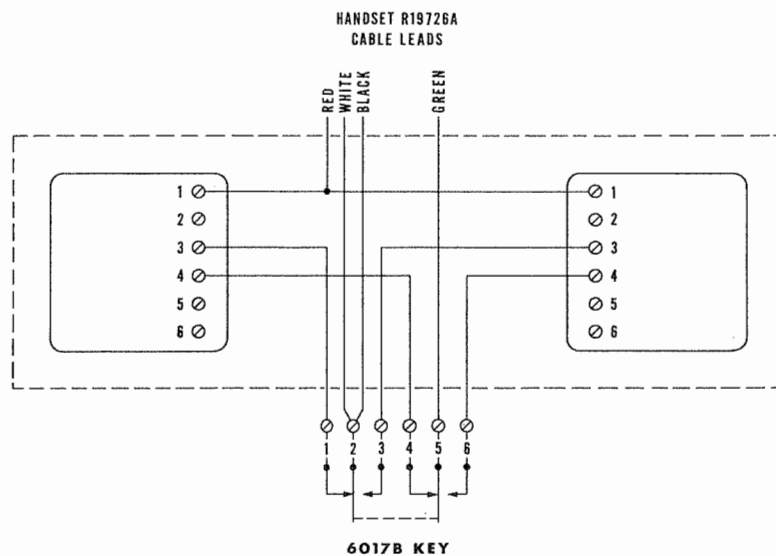


Optional Handset Attachment R19726A

SUBSTATIONS



CONNECTION TO SS2A OR SS2B SUBSTATIONS



6017B KEY

OPERATION:

- Remove Receiver from hook (which substitutes the handset for the speaker).
- Operate unit in normal manner.