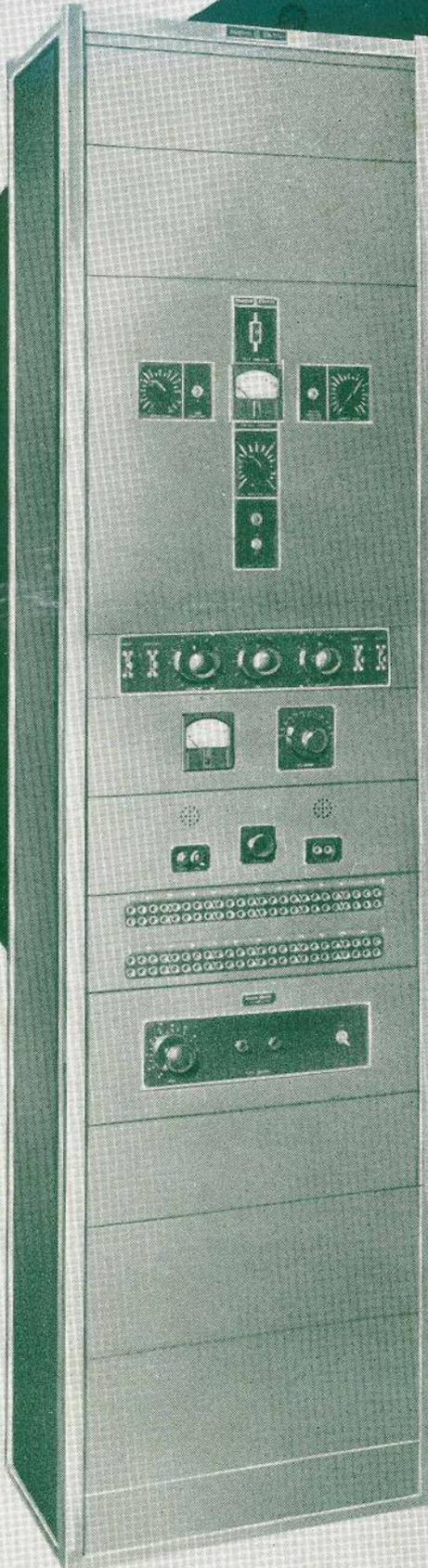


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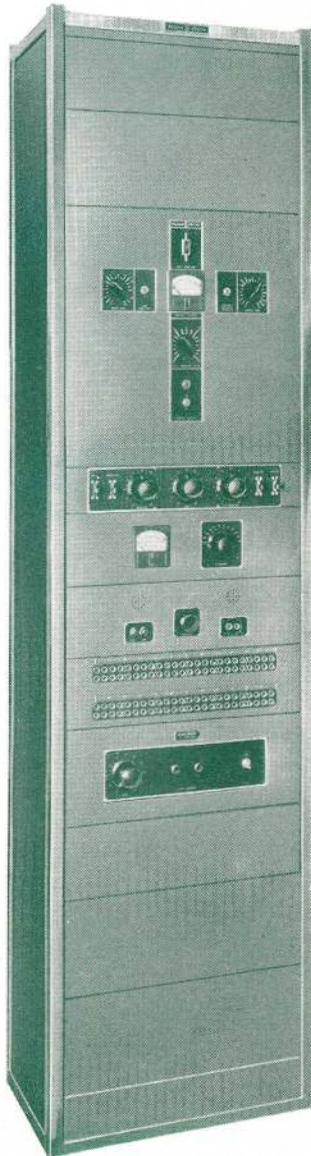


Western Electric

SPEECH INPUT BAY

705 A

for
**BROADCAST
TRANSMITTER
STATION
INSTALLATION**



- (A) 993C MOUNTING PLATE
- (B) 7" BLANK MAT
Space for two 279A Equalizer Panels
- (C) 110A PROGRAM AMPLIFIER
- (D) 261B KEY SWITCHING
AND CONTROL PANEL
- (E) 751A VOLUME INDICATOR
- (F) *260A TELEPHONE PANEL
- (G) 222A JACK PANEL
- (H) *106A AMPLIFIER
(Spare Line Amplifier)
- (J) 288A TERMINAL PANEL
(160 Terminals)
- (K) 7" BLANK MAT
Space for main power switch or other
apparatus
- (L) 94C MONITORING AMPLIFIER

(Panel designations "A", "B", etc., correspond to those on simplified schematic, page 8)

*Wired for but not furnished as part of 705A Speech Input Bay.

705A SPEECH INPUT BAY

The standard 705A Bay Assembly illustrated above contains in addition to the 110A Program Amplifier, a 94C Monitoring Amplifier together with the following panels: — key switching-gain control, line repeating coil-equalizer, volume indicator, jack, terminal and blank mats for unused spaces. Sufficient space and bay wiring are provided in the assembly for the addition of a 260A Telephone Panel for order wire service and a 106A Amplifier to be used for announcing or as a spare line amplifier. There also is space for two 279A Adjustable Equalizer-Attenuator Panels and a power switching or apparatus panel or other unit which may be required for a specific installation.

Western Electric

705A Speech Input Bay

A development of Bell Telephone Laboratories, the research laboratories of the American Telephone and Telegraph Company and the Western Electric Company

THE 705A Speech Input Bay, specially designed by Bell Telephone Laboratories for Radio Broadcast Station installation, combines the popular 110A Program Amplifier in a complete assembly with other Western Electric units ordinarily required for program control at transmitter locations. The Bay serves as the link between telephone lines from broadcast studios or other program sources and the input to the radio transmitter.

THE BAY ASSEMBLY

The 705A Speech Input Bay is assembled in a sturdily built and attractive gray cabinet (83 $\frac{3}{4}$ " high, 21 $\frac{1}{2}$ " wide and 13 $\frac{1}{8}$ " deep) — available with either plain gray or with stainless steel trim. The finish of all panel mats as well as of the sides and rear door is in gray to harmonize. A perforated plate in the top of the cabinet provides the necessary ventilation.

All mats are held in place by concealed machine screws which may be quickly loosened. This permits removing the mats so that terminal strips and internal panel wiring are readily accessible.

The bottom of the cabinet is open for the entrance of external connecting cables from ducts or conduit. All cables except that for the AC power supply are run up one side of the bay and connected to a terminal strip near the center. The terminal block for the AC connection is on the opposite side nearer the bottom.

The 705A Bay can be furnished completely factory wired and assembled. However, if desired, the Bay Assembly may be ordered less any individual

panels which the station has or which are not needed. Individual panels can be furnished to stations that prefer to make up their own bays.

The panels which are supplied as standard equipment are as follows:

993C Mounting Plate (Position "A", illustration page 2)

This plate includes one 119C line repeating coil. There is space for an additional 119 type line repeating coil and a 119B Repeating Coil which is used in the announcing channel.

As shown in the schematic, the connection of the line repeating coil for 150 ohms produces a degree of equalization for nominal 600 ohm lines in cable. For open wire and other instances where a 600 ohm input is desired, the primary windings of this coil are changed easily to a series arrangement. There is space on the 993 Plate for the addition of two 23A Equalizers.

7" Blank Mat (Position "B", illustration page 2)

Either one or two 279A Panels described under Accessory Apparatus may be mounted in this space.

110A Program Amplifier (Position "C", illustration page 2)

The 110A Program Amplifier may be properly considered the heart of the 705A Bay. This amplifier makes it possible to increase average percentage of modulation and, consequently, give better station coverage.

The 110A Program Amplifier is designed for input levels in the range of -35 to $+5$ db and will furnish output levels up to $+20$ db. It has input and output impedances of 600 ohms; a maximum overall gain of 55 db; a gain frequency characteristic flat within 1 db from 30 to 10,000 cycles; distortion less than 1% under normal operating conditions; adjustable gain control (two potentiometers, each of which has 19 steps of 1 db each and an "OFF" position); all AC operation from a 105-125 volt 50-60 cycle power supply with a consumption of approximately 87 watts; recessed panel construction (occupies $19\frac{1}{4}$ " of rack space).

In addition to its use in the 705A Bay, the 110A Amplifier may be used advantageously at studios and other locations in the broadcast system.

261B Key Switching and Control Panel (Position "D", illustration page 2)

The 261B Key Switching and Control Panel provides the following facilities: key selection of either of two incoming lines and either of two outgoing lines each with "OFF" position; key selection for monitor system between channel output and either radio monitor or other source, also with an "OFF"

position; key switch for substituting local emergency announcing channel for program feed — key interlocked with the monitor system to provide loudspeaker cut-off; line gain control with a 51 db range and an "OFF" position; monitor gain control and gain control for radio monitor source.

The 261B Panel containing all the controls necessary for normal operation may be removed to a location remote from the Bay; such as at a control desk, if this should be a more convenient arrangement.

751A Volume Indicator Panel (Position "E", illustration page 2)

The 751A Volume Indicator Panel has a general purpose, copper oxide type volume indicator meter with indirect illumination and a range switch. The meter is capable of measuring, with mid-scale deflection, program levels across the 600 ohm circuit in 2 db steps from -10 to +10 db (6 milliwatts = 0). The meter scale itself is calibrated from -10 db to +6 db, the 0 level being at mid-scale.

222A Jack Panel (Position "G", illustration page 2)

The 222A Jack Panel contains adequate jacks for patching and testing and terminals for connection. A total of 96 jacks are supplied.

288A Terminal Panel (Position "J", illustration page 2)

The 288A Panel consists of 16 terminal units of 10 terminals each, providing a total of 160 terminals.

7" Blank Mat (Position "K", illustration page 2)

This space is provided for mounting a main power switch or other chosen apparatus.

94C Monitoring Amplifier (Position "L", illustration page 2)

The 94C is particularly designed for use as a monitoring amplifier.

Its characteristics are: Input impedances between 0 and 12,000 ohms (600 ohms as used in 705A Bay); output 500 or 8 ohms; a frequency response flat within ± 1 db from 30 to 10,000 cycles; a gain of approximately 45 db; an output power of 12 watts with less than 5% total harmonics; an output noise level of -60 db weighted; 105-125 volt 45-65 cycle AC operation, with a consumption of approximately 100 watts; recessed panel construction (height of panel 7").

ACCESSORY APPARATUS

In addition to the panels furnished as part of the bay equipment just described, the following panels may be used to advantage. Provision has been made in the cabinet and bay cable to accommodate them.

23A Equalizer and 279A Equalizer Panel

Either the 23A or 279A Equalizer Panel or both may be employed, if equalization is desired to correct the non-uniformity of transmission in the range from 35 to 8,000 cycles of non-loaded telephone cable circuits employed for the transmission of high quality program material.

When fixed equalization is required, the 23A Equalizer is recommended and may be mounted on the 993C Mounting Plate. When adjustable equalization is desired, the 279A Equalizer Panel is recommended.

The 279A Panel is an adaptation of the 23A Equalizer circuit. It permits rapid adjustment of equalization to meet the requirements of less frequently used program lines when an equalizer is not required continuously for each line. The panel may be switched from line to line and equalization quickly effected by pre-determined settings of the three control knobs on the front of the panel.

A variable attenuator of the constant impedance type, which provides a maximum attenuation of 50 db in 5 db steps is incorporated also in this panel and is controlled by a fourth knob. This attenuator is wired to separate terminals so that by connecting these terminals through patching jacks the attenuator may be used either with the circuit to which the equalizer portion of the panel is connected or it may be patched to any other circuit which matches its 600 ohm impedance.

279A Panel occupies 3½" of mounting space.

The 23A Equalizer and 279A Equalizer Panel will be used to supplement each other in many instances.

By the use of either the 23A Equalizer or 279A Equalizer Panel, non-loaded cable circuits, consisting entirely of one gauge, can be equalized up to the following approximate lengths:

For Equalization with Maximum Deviation of 1 DB		For Equalization with Maximum Deviation of 2 DB	
Gauge	Length (Miles)	Gauge	Length (Miles)
16	21.5	16	25.0
19	10.0	19	11.5
22	6.5	22	7.0

260A Telephone Panel (May be mounted in position "F", illustration page 2)

The 260A Telephone Panel provides for order wire communication between operating points in a radio broadcasting system through circuits leased from an operating telephone company.

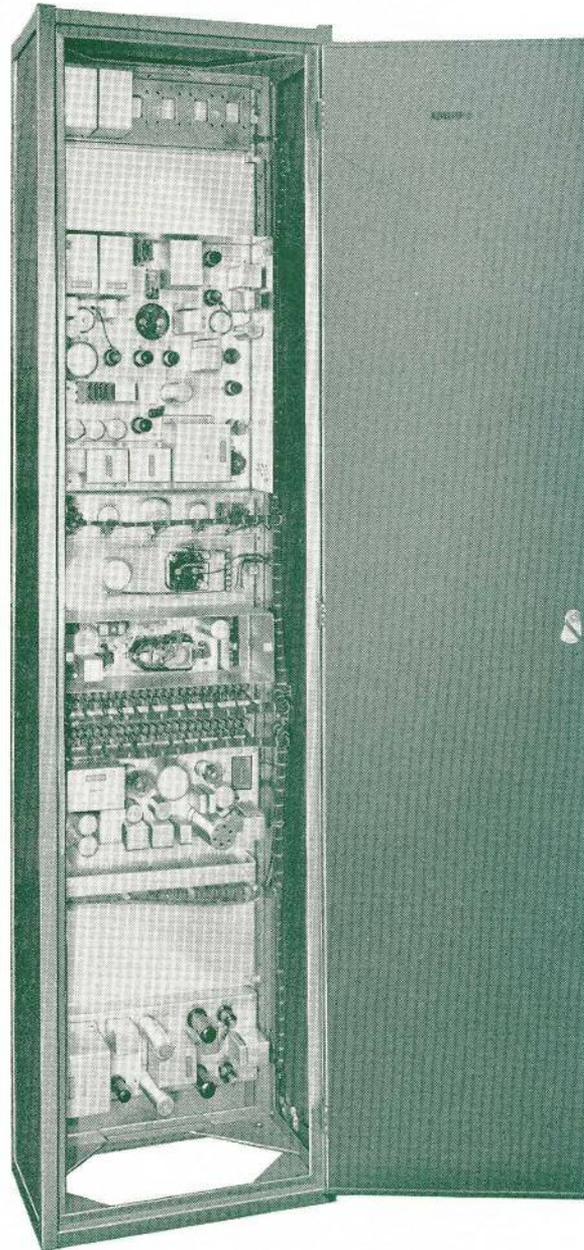
This panel will terminate one order wire line. It permits the use of standard telephone instruments such as the 206A Hand Telephone Set, an operator's telephone set (head set and chest transmitter); or both, if desired.

The component parts of this unit are assembled on a recessed metal panel $5\frac{1}{4}$ " high. The 260A Panel normally requires a 12 volt DC power source. It may, however, be operated from a $4\frac{1}{2}$ volt dry battery, a mounting for which is provided in the panel.

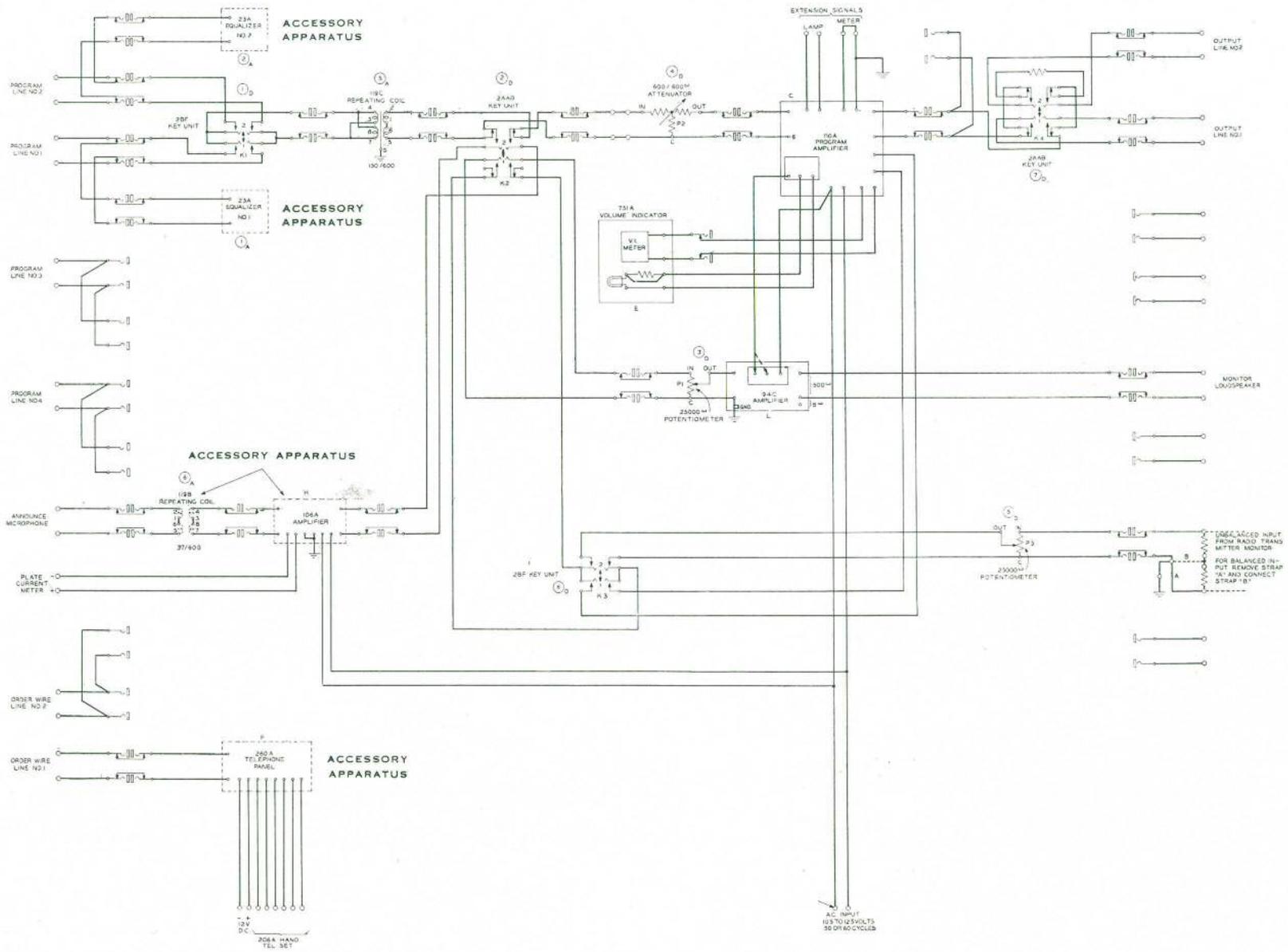
106A Amplifier (Position "H", illustration page 2)

The 106A Amplifier is recommended as the fundamental part of an announcing channel which may be completed by the addition of a high quality microphone and the 119B Repeating Coil mentioned under heading "993C Mounting Plate", page 4. The amplifier will also serve as a spare line amplifier.

The 106A Amplifier incorporates the Western Electric system of stabilized feedback and possesses the following characteristics:— input impedances of 600 or bridging 10,000 ohms; output impedance 600 ohms; a frequency response flat within ± 1 db from 30 to 10,000 cycles with a gain of approximately 45 db; a gain control range of 38 db; distortion less than 1%; a noise level —75 db weighted; operation from a 105-125 volt, 50-60 cycle AC power source with a consumption of approximately 45 watts; recessed panel construction (occupies 7" of mounting space).



Rear view of 705A BAY illustrating the high quality of workmanship employed. Note especially the compact assembly, accessibility, extra mounting space and effective cable form.



8

SIMPLIFIED SCHEMATIC OF THE 705A SPEECH INPUT BAY

TYPICAL PERFORMANCE DATA

INPUTS

Number of Lines

Two Program 150 or 600 ohms (key selection)

One Announcing Microphone 30 ohms (with addition of 106A Amplifier and 119B Repeating Coil)

Range of Input Levels

Minimum single frequency level at which Bay can be operated and compression obtained -35 db (0 db = 6 milliwatts)

Minimum equalized program level -35 db

Minimum level from radio transmitter monitor tap to obtain full output of 12 watts from 94 type amplifier -14 db (level -5 to 0 db recommended to provide ample adjustment margin)

Minimum input level from announcing microphone 45 db less than input line level for which equipment is adjusted for radio transmitter or program line feed

OUTPUTS

Number of Lines

Two 500 to 600 ohm circuits (key selection)

POWER REQUIRED

Normal consumption approximately 187 watts and with addition of one 106A Amplifier approximately 232 watts at 105-125 volt, 50-60 cycle AC supply

CABINET DIMENSIONS

83 $\frac{3}{4}$ " high, 21 $\frac{1}{2}$ " wide and 13 $\frac{1}{8}$ " deep

PROGRAM CHANNEL OPERATING DATA

Overall Gain

55 db

Line Gain Control Range

51 db

Frequency Response

Uniform within ± 1 db from 30 to 10,000 cycles

Level

Normal output level 0 db
Maximum output level obtainable for driving transmitter or line +20 db

Noise Level

-65 db weighted (as the ear would hear it)

Distortion

Less than 1% under normal operating conditions

MONITOR CHANNEL OPERATING DATA

Output Impedances

500 or 8 ohms

Output Power

Standard amplifier output maximum 12 watts (with minor conversion 20 watts)

Frequency Response

Essentially flat between 35 and 10,000 cycles

Distortion

At maximum output total harmonics less than 5%

ORDERING INFORMATION

Orders should specify:

- 1—Basic 705A Speech Input Bay with 17A (plain gray trim) or 17B (stainless steel trim) Cabinet
- 1—Set of vacuum tubes (for 110A and 94C Amplifiers)
- 1—Monitoring Loud Speaker (750A or 751A Loud Speaking Telephone)
- 1—Assortment of Patching Cords consisting of P2AA Cord (please specify colors: white, red, green, black and lengths: 1', 2', 3', 4' and 6') each equipped with two 241A Plugs (black shell) or 241B (red shell)

Customers who now own the 110A Amplifier and wish to order the Bay less the Amplifier should specify:

- 1—Basic 705A Speech Input Bay with 17A (plain gray trim) or 17B (stainless steel trim) Cabinet, less 110A Amplifier
- 1—Set of vacuum tubes (for 94C Amplifier)
- 1—Monitoring Loud Speaker (750A or 751A Loud Speaking Telephone)
- 1—Assortment of Patching Cords consisting of P2AA Cord (please specify colors: white, red, green, black and lengths: 1', 2', 3', 4' and 6') each equipped with two 241A Plugs (black shell) or 241B (red shell)

When a local announcing channel is desired please order additionally:

- 1—106A Amplifier with one set of vacuum tubes
- 1—119B Repeating Coil (mounts on 993 plate)
Microphone and accessories as required

When line equalization is desired please order additionally:

- One or two 23A Equalizers (mounts on 993 plate)—For fixed equalization
- One or two 279A Equalizer Panels (when only one 279A Panel is used, one 3½" blank mat is also required)—For adjustable equalization

Where a spare line coil is desired please order additionally:

- 1—119C Repeating Coil (also mounts on 993 plate)

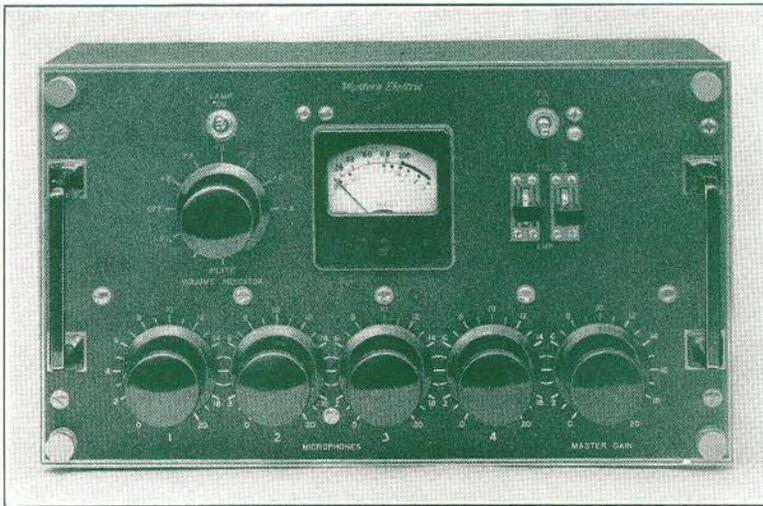
Where an order wire telephone set is desired for bay mounting please order additionally:

- 1—260A Telephone Panel
- 1—206A Hand Telephone Set or
- 1—Operators Telephone Set (headset and chest transmitter) consisting of:
 - 1—396A Transmitter
 - 1—528 Receiver
 - 1—L-4-F Cord with 289A Plug
 - 1—3A Transmitter Attachment

FOR FURTHER INFORMATION

Further information regarding this or other Western Electric Speech Input Equipment may be obtained by addressing any distributor whose name will be found on the last page of this bulletin.

OTHER WESTERN ELECTRIC SPEECH INPUT EQUIPMENT

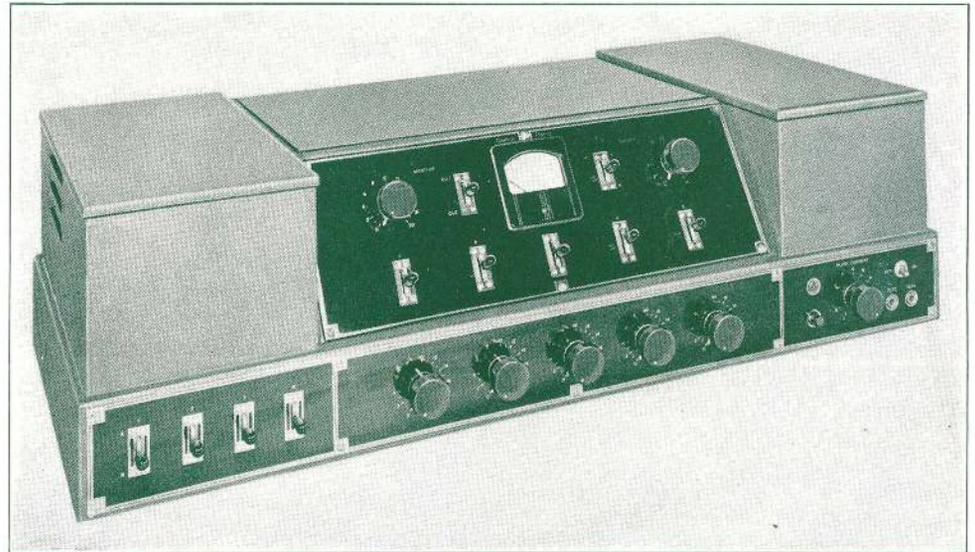


22 TYPE PORTABLE SPEECH INPUT

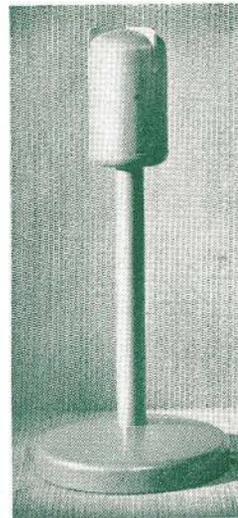
Small, light, rugged, designed for fast set-up. 22B and 22C equipments similar in all respects except for volume indicator meters. Both operate from AC supply or batteries — 4 mike mixers and main gain control. For further information Western Electric Bulletin T-1527.

23 TYPE, SINGLE UNIT, SPEECH INPUT EQUIPMENT

The 23A and 23B popular console models differ only in arrangement of controls. Both present a re combination of flexibility, simplicity of operation and high quality. For further information Western Electric Bulletin T-1468.



630A Microphone
Table Mounting



633A Microphone
with Table Mounting
Fixed Non-directional
Position



639A Microphone
Table Mounting

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