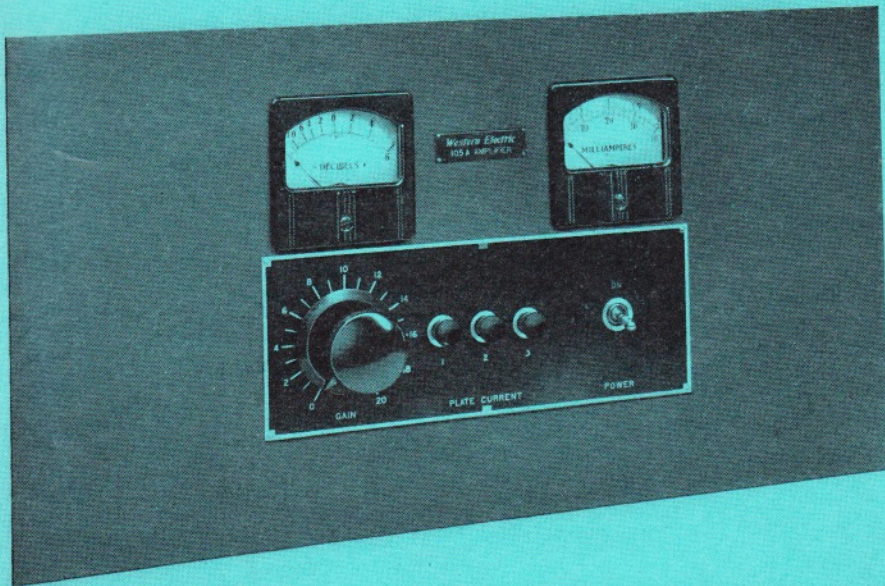


# *Western Electric*

## 105A PROGRAM AMPLIFIER



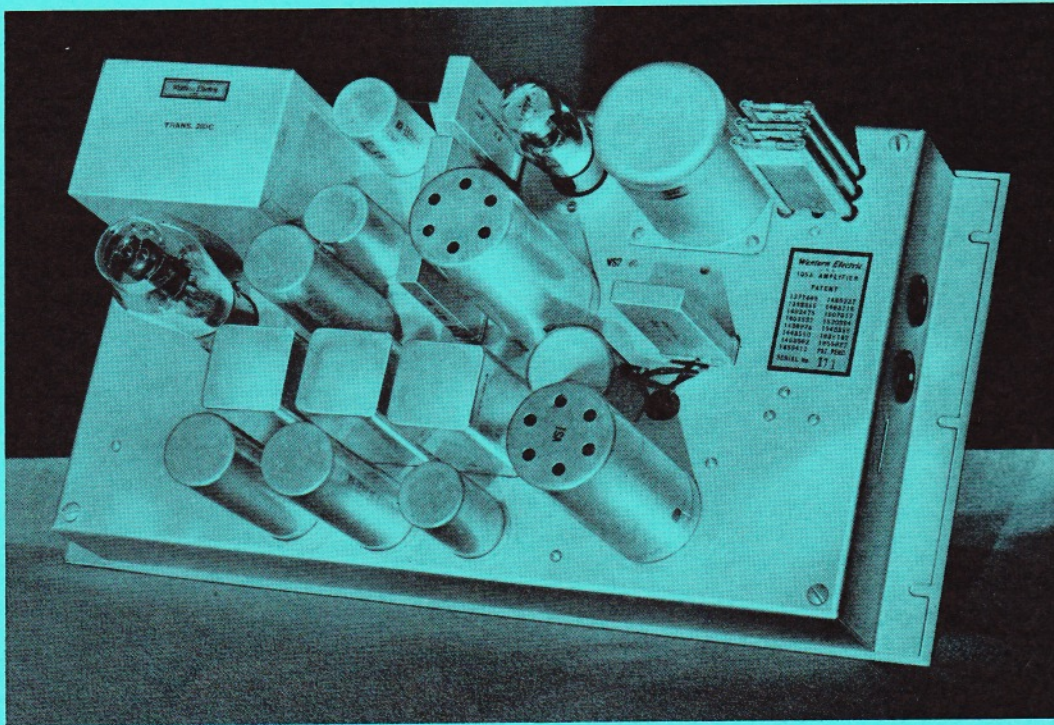
A Noteworthy  
Addition to  
Your Speech  
Input  
Installation

Embodying Such Features as Compactness and Resulting Economy of Space, Highest Overall Quality and Performance, Reliability, Efficient and Economical Operation.

THE 105A Amplifier, another of Western Electric's outstanding, space-saving amplifiers, was especially designed by Bell Telephone Laboratories for use as the main program amplifier in speech input equipments. It amplifies the output of modern broadcast microphones such as the Western Electric dynamic, or of a high level microphone mixing system using pre-amplifiers, such as the Western Electric 104 type, to a level sufficient for feeding into a wire line or output switching system.

*Western Electric*

105A PROGRAM AMPLIFIER

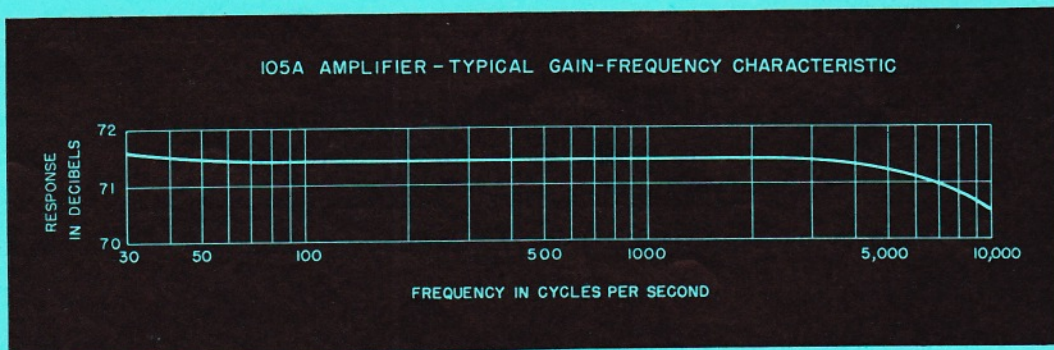


105A Line Amplifier—rear view

This compact, efficient 105A Amplifier with its unvarying, faithful performance, insured by stabilized feedback design, is an essential and vital part of high quality audio amplifying channels.

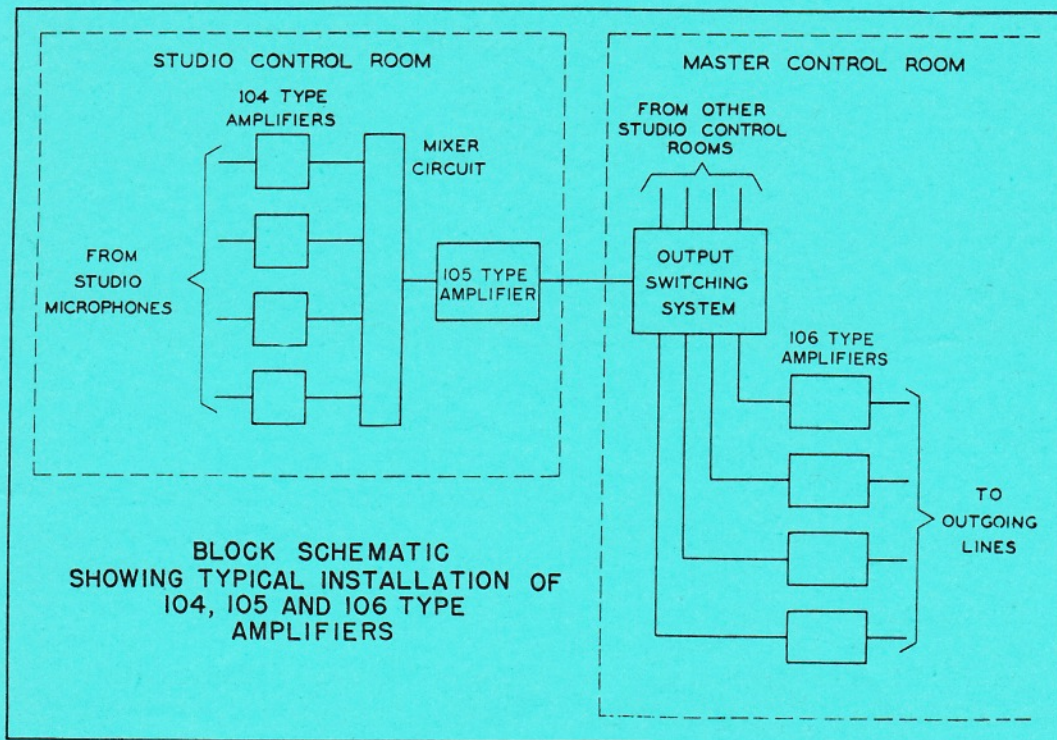
Designed for operation from impedances of 30 or 600 ohms and into an impedance of 600 ohms, this amplifier will operate equally well in conjunction with 500 ohm impedances.

The overall gain of the amplifier, including a 6 db isolation pad in the output circuit is approximately 70 db. When more gain is desired an increase to approximately 76 db can be effected by simply strapping out this pad. For monitoring, an



## Western Electric

### 105A PROGRAM AMPLIFIER



additional winding on the output transformer delivers a voltage approximately 20 db below the level of the main output. This winding may be connected directly to a Western Electric 94 type amplifier or to a monitoring system. The operation of this winding (impedance approximately 40 ohms) has no effect on the main output of the 105A Amplifier and eliminates the need for an isolation amplifier in an associated monitoring system.

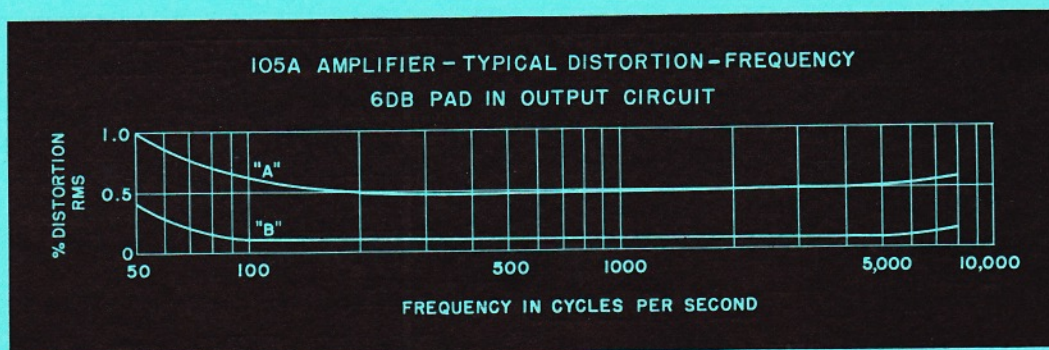
#### Assembly

Although only 10½" high on a 19" rack, the 105A Amplifier contains its own complete power supply as well as a 38 db gain control, a volume indicator meter and a separate plate current meter capable of serving a whole bay of equipment.

The recessed metal panel on which the component parts of the 105A are assembled is designed for mounting on a standard relay rack or in an equipment cabinet. This panel has a front mat which is fastened by four screws from the rear, and is easily removed to allow access to the wiring and terminals in the recessed portion of the panel. The gain control knob, three push type keys for plate current measurement, and the power supply switch project through the front mat for convenient operation from the face of the amplifier. The front mat is also equipped with a pilot lamp to indicate when the amplifier is energized. Two terminal strips

## Western Electric

### 105A PROGRAM AMPLIFIER



Curve "A"—Output Level + 10 db (.06 Watt)  
Curve "B"—Output Level 0 db (.006 Watt)

are provided in the amplifier; one for the audio frequency circuits, plate current meter and plate supplies for external amplifiers, and the other for the AC circuits.

### Gain Control

The 105A Amplifier is equipped with a gain control having nineteen 2 db steps of attenuation, providing a total attenuation of 38 db and an "OFF" position.

### Meters

A Western Electric KS-7992 Volume Indicator Meter and a Western Electric KS-10003 Plate Current Meter together with lamps located in the amplifier for illuminating their scales, are furnished for mounting on the front mat of the standard 105A Amplifier unless otherwise specified. These meters are connected by means of flexible leads to terminals on the amplifier panel. Either or both of these meters may be omitted and their places occupied by apparatus blanks supplied with the 105A Amplifier. These snap readily into place on the face of the unit, neatly covering the holes where meters would normally be installed. The meters also may be ordered separately as required.

The volume indicator meter is bridged across the input of the line pad and calibrated to indicate a fixed level into the pad. By changing straps on the amplifier terminal strip, this meter may be adjusted to indicate a level of 0, + 6 or + 10 db into the pad, corresponding to a level of - 6, 0 or + 4 db respectively, at the output terminals of the amplifier circuit. Provision is also made for connecting an external volume indicator meter. Under this latter condition, the meters may be adjusted to indicate a level of + 6 or + 10 db into the pad, corresponding to a level of 0 or + 4 db at the output of the amplifier.

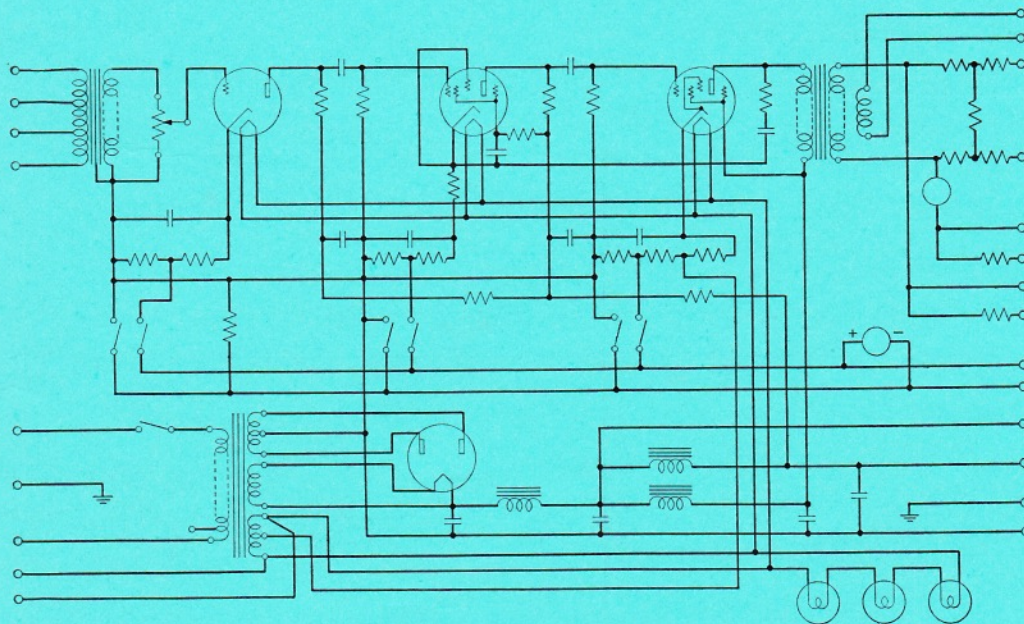
Three push-type keys on the front of the panel connect the plate current meter to indicate the plate currents of the vacuum tubes in the 105A Amplifier.

105A PROGRAM AMPLIFIER

This meter also may be used for measuring the plate currents of the vacuum tubes in 104 type pre-mixing amplifiers, 106 type amplifiers or in other 105A Amplifiers when these units are a part of the system. Usually one plate meter will suffice for each bay of equipment. The plate current meter has two scales; the upper scale (0 to 2 milliamperes) indicates the plate current of the first and second stage vacuum tubes, and the lower scale (0 to 40 milliamperes) indicates the plate current of the third stage vacuum tube.

**Self-Contained Power Supply**

The 105A Amplifier is completely AC operated. The power transformer is designed for operation from 105-125 volts, 50 or 60 cycles. The power consumption is approximately 48 watts at 120 volts. The self-contained supply is also sufficient to furnish filament and plate power for as many as six associated 104 type pre-mixing amplifiers, and when so used the power consumption will amount to approximately 60 watts. Should additional plate current be required for more than six amplifiers, an external filter section, consisting of a Western Electric 221A Retardation Coil, or equivalent, and an 8 microfarad condenser, are necessary. Terminals are provided on the 105A Amplifier for making power connections to 104 type amplifiers.



Schematic—105A Amplifier

## Western Electric

### SPECIFICATIONS

#### Electrical Characteristics

##### Gain

Approximately 70 db with isolation pad

Approximately 76 db without isolation pad

##### Output Power

.15 watt (+14 db) with pad

.6 watt (+20 db) without pad

##### Output Noise Level

-55 db unweighted and

-65 db weighted as the ear would hear it at maximum gain

##### Input Impedances

30 or 600 ohms

##### Output Impedance

600 ohms

##### Frequency Response

Variation within  $\pm 1$  db from 30 to 10,000 cycles

##### Distortion

At +10 db output of pad distortion less than 1% at any frequency from 50—8,000 cycles

##### Power Supply

105-125 volt, 50 or 60 cycle AC

##### Power Consumption

Approximately 48 watts at 120 volts

#### Vacuum Tubes

The following Western Electric Vacuum Tubes are required and should be ordered separately:

1 — 262B — (First Stage)

1 — 310B — (Second Stage)

1 — 336A — (Third Stage)

1 — 274A — (Rectifier)

#### Mechanical Characteristics

##### Dimensions

Height 10½"

Length 19"

Depth 7¾"

##### Construction

Recessed panel construction. Panel has removable front mat to allow access to wiring and terminals in recessed portion of panel.

##### Finish

The front mats are finished as listed below. The code number suffix indicates the color. The complete number including the suffix, should be specified in the order:

##### Code No.

105A-3

105A-15

##### Finish

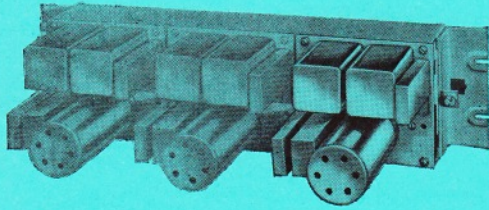
Rubber Finish, Black, Japan

Dark Aluminum Gray

# Other Western Electric

## Speech Input Amplifiers

### 104B SINGLE STAGE PRE-AMPLIFIER

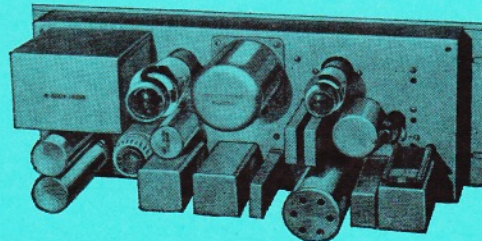


A high quality, low cost, fixed gain unit — extremely compact and economical to operate. Gain: approximately 28 db. Frequency response: flat within 1 db from 30 to 10,000 cycles. Impedances: 30 or 250 ohms input, 30 or 500 ohms output. Dimensions: 5¼" x 4⅞" x 6¾".

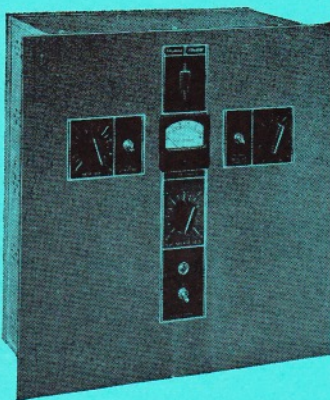
Three 104B's on 998 type mounting plate (as shown) occupy only 5¼" space on standard relay rack.

### 106A TWO STAGE AMPLIFIER

Incorporates Western Electric system of Stabilized Feedback. Impedances: input 600 or bridging (10,000); output 600. Frequency response: flat within  $\pm 1$  db from 30 to 10,000 cycles. Gain: approximately 45 db. Gain Control: range 38 db. Power supply: completely self-contained, operating from 105-125 volt, 50-60 cycle AC. Distortion level: less than 1% at 400 cycles for 20 db output. Noise level: -60 db unweighted, -75 db weighted (as the ear would hear it) at maximum gain. Occupies only 7" of standard rack space.



### 110A VOLUME LIMITING AMPLIFIER



Efficient utilization of channel capacity by non-distorting compression of excessive levels allowing higher average of transmission and modulation. Impedances 600 in and out. Input levels down to -35 db. Output levels up to +20 db. Maximum overall gain 55 db. Frequency response within 1 db from 30 to 10,000 cycles. Distortion less than 1%. Power supply self-contained operating from 105-125 volt, 50-60 cycle AC. Either metal or glass tubes. Occupies 19¼" panel space on 19" rack.



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