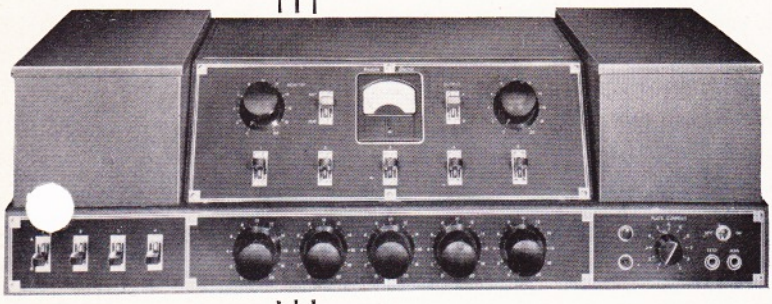
SPEECH INPUT
23C
Western Electric

AM or FM Speech Input Equipment



Complete

A C OPERATED AMPLIFIER

and CONTROL ASSEMBLY for

BROADCASTING SERVICE

THE 23C SPEECH INPUT EQUIPMENT provides a complete AC Operated Amplifier and Control Assembly suitable for AM or FM radio broadcasting service. It is capable of serving either one or two studio layouts and can be used as part of a system incorporating additional units whose outputs are coordinated and switched at a common point such as a Master Control Room.

It provides complete facilities for program production, audition and monitoring, as well as for monitoring on incoming lines. It will accommodate eight studio microphones or low output level transcription tables, control room announce and talkback microphone and four remote lines or other medium level inputs.

It is a proven design. The use of a pre-mixing amplifier stage for each low level input, stabilized feedback and factory controlled assembly and wiring all contribute to assure high signal-to-noise ratio and low distortion under studio operating conditions.

The 23C differs from its predecessor, the 23B, in that the frequency range has been extended to make it suitable for FM service and it has a volume indicator reading in vu. Mushroom type mixer knobs with wide skirts, raised pointers and knurling facilitate fingertip control and improve appearance. Two colors of flat type key handles with concave finger surfaces are used.

The equipment includes four microphone input circuits with pre-mixing amplifiers, and one input circuit for incoming program lines, all of which are combined in a 5-channel mixer. A three stage amplifier, with master gain control, following the mixer, amplifies the signals to the level required for outgoing program lines or output switching systems in master control rooms. An indirectly lighted volume indicator meter is connected across the output circuit and terminals are provided for an extension meter. The equipment also includes a monitoring amplifier with provision for operating three loud speakers. Cut-off relays operated from contacts on the microphone keys are included in the loud speaker circuits.

Switching keys are provided for selecting any of four microphones or equivalent program sources

in each of two studios. A "talk-back" key substitutes a microphone in the control room for the studio microphone for talking back into the studio during rehearsals or for making announcements from the control room. The program line input circuit has four keys arranged to connect any one of four incoming program lines to the mixer circuit or to the monitor amplifier for preliminary monitoring. An output switching key connects the output of the equipment to either of two outgoing program lines and in the intermediate position terminates the unit in 600 ohms.

The output of the line amplifier operates into a line isolation pad which, in turn, feeds the output line terminals. The volume indicator meter is bridged across the input to this pad and calibrated to indicate the 0 vu or 100% mark when the level is +8 vu at the output line terminals. This provides adequate level to take care of line equalization and other losses, and still provide some margin for adjustment. For lower levels to the line, the resistances of the isolation pad may be replaced by other standard resistances of the same type, as required.

Monitoring is carried on through a separate monitoring amplifier which has a level control and a three-position input switch for monitoring the output of the main amplifier; for preliminary checking of line programs and for connection to some external source as, for example, a radio monitor or a master cue line.

Additional useful features included are: provision for duplicate volume indicator meter at a remote point; jack and rotary switch for measuring plate current of vacuum tubes with external meter; jack for headphone monitoring of main channel when loud speaker cannot be used and key and lamp for use in signalling system.

Installation problems are greatly simplified inasmuch as all incoming connections except the AC supply are made at one small terminal panel. For reasons of economy, efficiency, and better load distribution, the 12V DC signal supply power for operating the loud speaker cutoff relays and the signal lamp is not incorporated in this cabinet. (A KS-7593 Rectifier is recommended for each 2 to 3 23C Units).

Typical Technical Data

ELECTRICAL CHARACTERISTICS

MAIN SYSTEM:

Gain	96 db through microphone channels. 64 db through program line channels.
Mixer Controls	20 steps. 17 steps of 1½ db each tapering to cut-off on last three steps.
Master Gain	20 steps. 17 steps of 2 db each tapering to cut-off on last three steps.
Operates From	Microphone Circuits — 30 or 250 ohms. Program Line Circuit — 600 ohms.
Internal Input Impedance	Microphone Circuits — Open Circuit. Program Line Circuit — 600 ohms.
Operates Into	600 ohms.
Internal Output Impedance	600 ohms.
Output Power	See curves of distortion vs. output level.
Distortion	Distortion of main amplifier at an output level (single frequency) of +18 dbm* is less than ¾ of 1% at 5000 and 400 cycles and approximately 1% at 50 cycles.
Electrical Noise	Under normal operating conditions, referred to a single frequency output level of +18 dbm*, the signal-to-noise ratio is 60 db with 78 db net gain and this ratio increases as the gain is decreased.

* dbm = Single Frequency level referred to 1 milliwatt.

MONITOR AMPLIFIER

Gain	51 db working from 600 ohms through input transformer T9. When connected to output of line amplifier for normal monitoring, output of monitor amplifier is approximately 18 vu above output of line amplifier.
Gain Control	19 — 2 db steps and "OFF" position.
Operates From	600 ohms when connected to external circuits.
Internal Input Impedance	600 ohms when used with input transformer T9 for monitoring external circuits.
Operates Into	750 ohms — Three 250-ohm loud speakers in series or combination of 250-ohm loud speakers and 250-ohm load resistors in series.
Internal Output Impedance	450 ohms.
Output Power	2.5 watts with approximately 5% distortion at 400 cycles. 1.5 watts with approximately 1% distortion at 400 cycles. (Divided among three loud speakers).

POWER SUPPLY

105 to 125 volts, 50 to 60 cycles AC. Approximately 90 watts. Power for relay and signal light operation (12 volts DC, .25 ampere) must be supplied from external source. Western Electric KS-7593 Rectifier is recommended.

MECHANICAL CHARACTERISTICS

Dimensions	34" long, 14½" wide, 9¾" high.
Weight	Approximately 110 pounds.
Construction	Console Type Cabinet designed to mount on table.
Finish	Chassis and covers — dark gray crinkled lacquer. Control Panels — black photo-etched.

ACCESSORY PARTS

VACUUM TUBES — (Specify on Order as Required)

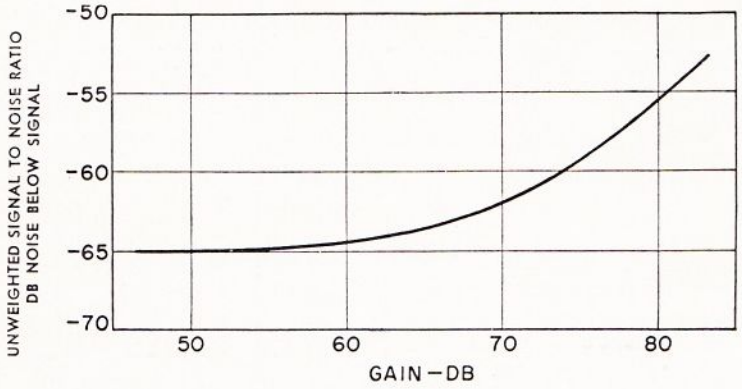
Schematic Designation	Quantity Required	Ordering Code	Function
V1 — V4	4	1603	Pre-Mixing Amplifier Tubes.
V5, V6, V8	3	1603	Low and Intermediate Level Amplifier Tubes.
V7, V9	2	42	Power Amplifier Tubes.
V10	1	83V	Power Supply Rectifier Tube.

1 — Plate Current Meter (Two Scale 0-1, and 0-50 milliamperes).

1 — KS-7593 Rectifier (or equivalent signal supply current source).

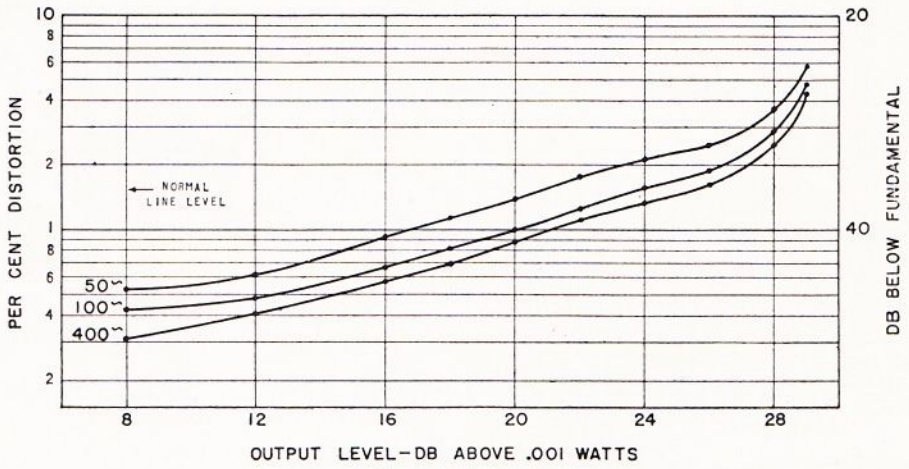
1 — 2 conductor cord equipped with Western Electric 47A Plug or equivalent.

Typical Performance Characteristics

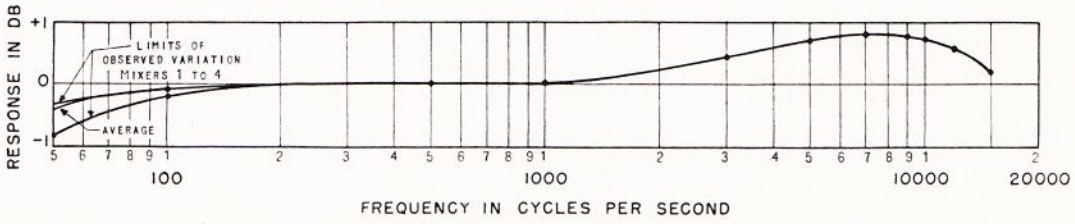


Typical unweighted signal to noise ratio for output level of + 16 dbm.

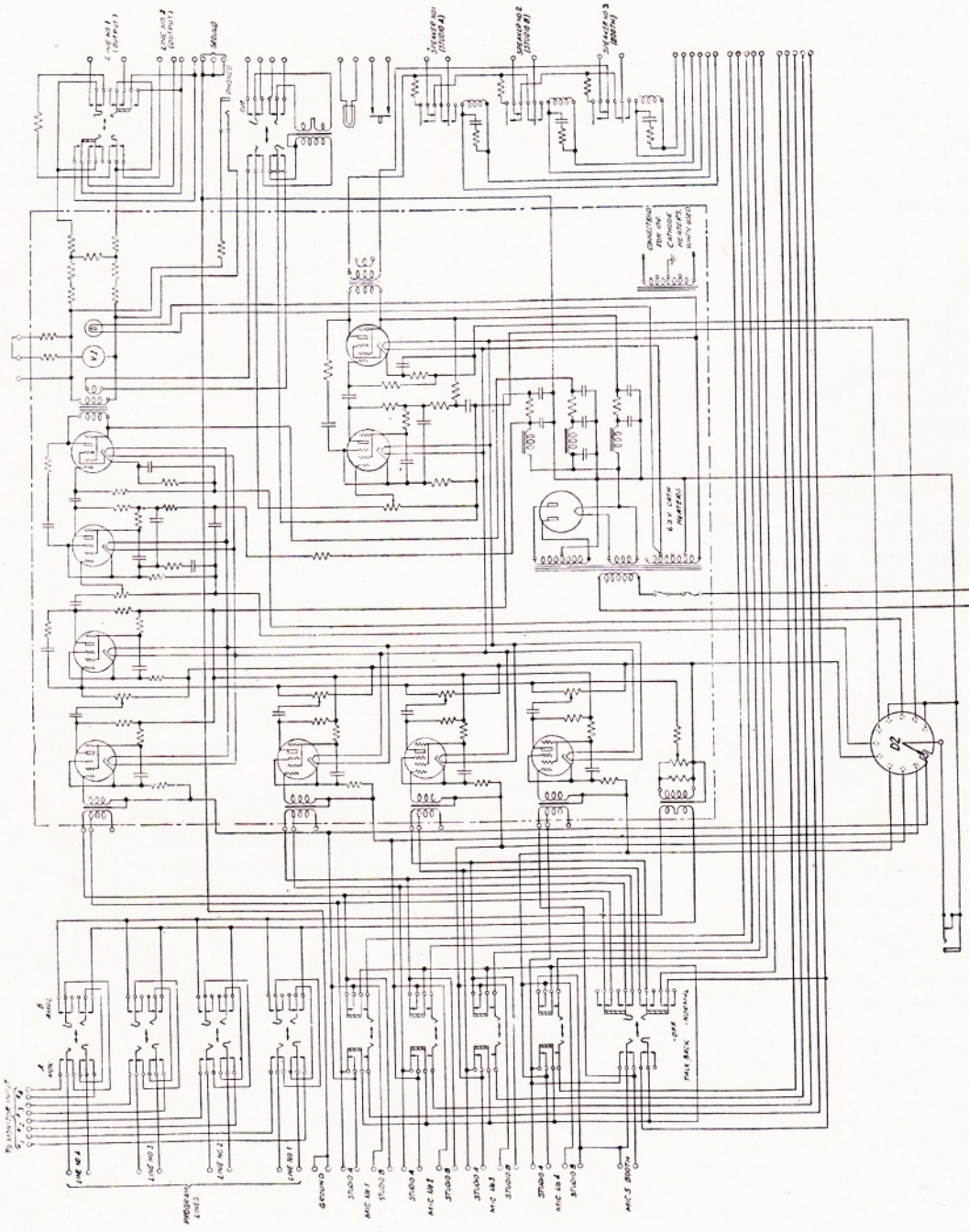
(Master gain set at 14 db and mixer control changed to obtain various values of overall gain.)



Typical harmonic distortion



Typical frequency response characteristics



Schematic, 23C Speech Input

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