

4
EDITION



B R O A D C A S T

AUDIO

E Q U I P M E N T

for

A M • F M • T E L E V I S I O N

MICROPHONES

CONSOLES

CUSTOM EQUIPMENT

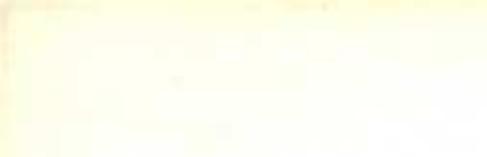
AMPLIFIERS

RACK EQUIPMENT

TURNTABLES

RECORDERS

SPEAKERS



1



BROADCAST AUDIO EQUIPMENT CATALOG

(Fourth Edition)

PRICE \$1.00



RADIO CORPORATION OF AMERICA

Broadcast and Television Equipment

Camden, N. J.

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ABOUT THIS CATALOG

This Catalog is devoted solely to information on RCA audio broadcast equipment designed especially for broadcast station use. Other RCA Broadcast Equipment Catalogs contain similar information on AM, FM and TV transmitters, TV cameras, film and terminal equipment, antennas, transmission line equipment and accessories and test equipment.

The information contained in this catalog is intended to serve as a buying guide for the users of this type equipment. In the belief that broadcast engineers want facts, rather than generalities, the content has purposely been kept brief and factual. Readers who desire more information or individual bulletins on particular equipment items are invited to write to the RCA Broadcast Representative in the RCA Regional Office nearest them (see opposite page).

OTHER RCA TECHNICAL PRODUCTS

The RCA equipment described in this catalog is specifically designed for broadcast station and closed circuit use. RCA also manufactures many other electronic products including: two-way radio and microwave radio communication equipment; optical and magnetic film recording equipment; sound systems of all types; 16mm projectors and magnetic recorders; industrial inspection and automation equipment; scientific instruments, such as the electron microscope; industrial television systems; intercoms; and many types of custom-built equipment for industry, the military, educational and medical services. Information describing these products may be obtained from RCA Regional Offices.

HOW TO ORDER

The RCA Broadcast Audio Equipment shown in this catalog is sold directly through RCA Broadcast Representatives, who are familiar with broadcast equipment and related problems. One or more of these RCA Representatives are

located in each of the RCA Regional Offices listed below. Orders for equipment shown in this catalog, or requests for additional information, should be directed to the nearest one of these offices.

PRICES

The prices of the various equipment units shown in this catalog are given in a separate price list. Prices are listed in the order in which they are shown in the catalog. To determine the price of any equipment first note the page

on which it is shown in the catalog, then consult the price list in accordance with this page number. Equipments are identified by type and MI (Master Item) numbers which are used to identify apparatus on invoices and packing slips.

YOU CAN LOCATE YOUR NEAREST RCA REPRESENTATIVE FROM THIS LIST

REGIONAL OFFICES

Front and Cooper Streets
CAMDEN 2, NEW JERSEY
Woodlawn 3-8000

•

36 West 49th Street
NEW YORK 20, NEW YORK
Judson 6-3800

•

7901 Empire Freeway
DALLAS 35, TEXAS
Fleetwood 2-3911

•

1600 Keith Building
CLEVELAND 15, OHIO
Cherry 1-3450

200 Berkeley Street
BOSTON 16, MASSACHUSETTS
Hubbard 2-1700

•

1121 Rhodes-Haverty Building
134 Peachtree Street, N.W.
ATLANTA 3, GEORGIA
Jackson 4-7703

•

1006 Grand Avenue
KANSAS CITY 6, MISSOURI
Harrison 1-6480

•

1560 North Vine Street
HOLLYWOOD 28, CALIFORNIA
Hollywood 9-2154

420 Taylor Street
SAN FRANCISCO 2, CALIFORNIA
Ordway 3-8027

•

1186 Merchandise Mart Plaza
CHICAGO 54, ILLINOIS
Delaware 7-0700

•

1625 K Street, N.W.
WASHINGTON 6, D. C.
District 7-1260

•

2250 1st Avenue, South
SEATTLE 4, WASHINGTON
Main 2-8350

RCA MICROPHONES

General Information

The excellence of RCA microphones is the result of continued effort on the part of Engineering and Production personnel to produce a superior product. Out of this work have come the several types of broadcast microphones listed in the catalog. There is considerable overlap in the applications of the various types, but each does possess certain attributes which make it particularly well suited to some specific applications. These have been noted for each microphone in the catalog in order to assist in the selection of the microphone best suited for the intended application.

High Quality Broadcast and Television Microphones

Broadcast-type microphones such as the Types BK-1A, BK-5A, BK-6B, BK-10A and 77-DX all have certain common performance criteria which make them especially suited to this application. They have smooth response-frequency characteristics over the audio range, low distortion, high output levels, well-shielded output transformers to prevent hum pickup, and where necessary, are shock mounted to reduce the pickup of low frequency building rumble. Performance features which are unique to each particular type are listed and the applications discussed in the catalog.

Public Address Microphones for Broadcast Use

Public Address Microphones have been designed as economy microphones. In general, frequency range and sensitivity have been sacrificed to some extent in order to gain ruggedness and lower cost. The response limitations should be borne in mind when these microphones are used in Broadcast applications.

Unloaded Transformer Input

RCA Broadcast Microphones are designed to work into a microphone preamplifier whose input transformer is unloaded. Under this condition of operation the voltage appearing at the grid of the first tube results in a gain in signal-to-noise ratio of between 3 and 6 db as compared with a matched resistance load. The exact value will depend on whether the major source of thermal noise is in the microphone amplifier or in the microphone.

Microphone Resistance Loading

Microphones in which the moving system is highly damped will in general have their frequency response characteristics little changed by electrical loading. The BK-1A and 77-DX (in the pressure position) are examples of this.

Microphones which show output impedance variations with respect to frequency will have their response characteristics adversely affected by resistance loading. The Type BK-5A, and 77-DX (in the bi-directional and uni-directional positions) are examples of this. Resistance loading of these microphones will generally result in a loss in low frequency response.

150 Ohms vs. 250 Ohms

When microphones are connected to unloaded input transformers, impedance matching is not a consideration and the effects of connecting microphones with an output impedance of 150 ohms to a microphone amplifier designed to operate from a 250 ohm source and vice versa will usually be of small consequence. The effect on the level is shown in the tabulation below.

Mic. Output Impedance	Level Change db	
	250	150
250	0	+2.2
150	-2.2	0
Amp. Input Designation	250	150

In addition there will be some change in the overall response-frequency characteristic of the system below 100 cycles and above 5000 cycles, the magnitude depending on the connection and the design of both the microphone and the amplifier input transformer. Variations in response with the usual broadcast quality microphone amplifiers will in most cases not exceed ± 2 db.

When microphones are connected to a resistance load the following changes in level will result when the output is referred to a matched condition.

Mic. Output Impedance	Level Change db	
	250	150
250	0	-2.5
150	+2.0	0
Load Impedance	250	150

Microphones Shipped Less Plug

RCA microphones are supplied less the plug for connection to the wall outlet or amplifier system. This is done to allow the user to select any desired plug. As a convenience four types of Cannon plugs are catalogued and they may be ordered as an accessory if wanted.*

Microphone Mounting

RCA has standardized on the rugged $\frac{1}{2}$ " pipe thread for broadcast microphone mounting. This size thread makes it easy to add microphone stand extensions, booms, etc., for they may be easily made up locally from standard $\frac{1}{2}$ " pipe and fittings. Most of the stands listed may also be used with microphones having a $\frac{5}{8}$ -27 thread by removing an adapter which is supplied as a part of the stand. Various adapters are available for microphones should the use of the $\frac{1}{2}$ " pipe thread prove inconvenient.

* Microphones are shipped connected for 250 ohms since in normal usage an improved signal to noise ratio results when connected to a 150 ohm preamplifier input.

Effective Output Level

When a microphone is connected to an unloaded input transformer its power output cannot be expressed in dbm because no appreciable power is delivered by the microphone. The logical approach to the problem is to arrive at some level figure which, when combined with the conventionally measured amplifier gain, will give the correct output level for the combination. This figure is listed in the catalog for each microphone and is called the Effective Output Level. It differs from the EIA standard rating G_M in the value of sound pressure and source impedance. The EIA rating computation is based on a source impedance of 150 ohms for all microphones having output impedances between 75 and 300 ohms, and on a sound pressure of 0.0002 dynes per square centimeter.

The Effective Output Level calculation is based on the nominal microphone impedance and on a sound pressure of 10 dynes/cm².

The EIA standard defines the system rating (G_M) of a microphone as the ratio in decibels relative to 0.001 watt per 0.0002 dynes per square centimeter of the maximum electric power available from the microphone to the

square of the undisturbed sound field pressure in a plane progressive wave at the microphone position. Expressed mathematically:

$$G_M = (20 \log_{10} \frac{E}{P} - 10 \log_{10} R_{MR}) - 50 \text{ db.}$$

where E = the open circuit voltage of the microphone

P = the undisturbed sound field pressure

R_{MR} = the microphone rating impedance

Electrical reference level = .001 watt

Sound pressure = .0002 dynes/sq. cm.

While this may look complex the application is simple. For all practical purposes the output level of the microphone is obtained by adding to G_M , the sound pressure level relative to 0.0002 dynes per square centimeter. The sound pressure level of the program material can be measured with any of the several available sound level meters.

Hum Pickup Level

An arbitrary standard 60 cycle a-c field of 10⁻³ gauss has been established as a reference. It is fairly representative of fields measured at typical microphone locations in broadcast studios. The hum level is referred to .001 watt and is calculated in the same fashion as the Effective Output Level, using as the output voltage the voltage produced by the standard field.

Chart Showing Microphone Applications, Chief Characteristics and Recommended Mounts

Type No.	Use ³	Directional Characteristic	Effective Output Level ¹ and G_M ⁴	Output Impedance Ohms	Frequency Response cps	Hum Pick-up Level ²	Finish	Stand
77-DX	Program Announce	Poly-directional	-53 dbm G_M -147 db	30/150 250	50-15,000	-128 dbm	Satin Chrome & TV Gray	Boom, Desk, Floor
BK-1A	Program Announce	Non-directional	-53 dbm G_M -145 db	30/150 250	60-10,000	-109 dbm	Satin Chrome & TV Gray	Desk, Floor
BK-5A	Program Announce	Uni-directional	-56 dbm G_M -150 db	30/150 250	50-15,000	-128 dbm	TV Gray	Boom, Desk, Floor
BK-6B	"Off-Mike" Speech	Semi-directional	-67 dbm G_M -158 db	30/150 250	80-12,000	-112 dbm	TV Gray	Clip & Microphone Lanyard
BK-10A	Specialized Program	Ultra-directional	-55 dbm G_M -147 db	40/200 250	80-15,000	-127 dbm	Black & Low Gloss Gray	Boom
SK-35	Sports Announce	Bi-directional	-58 dbm G_M -150 db	200/15,000	50-10,000	-113 dbm	Satin Chrome & TV Gray	Hand, Desk, Floor
SK-39	Close Up Announce	Non-directional	-55 dbm G_M -150 db	250	70-9000	-95 dbm	Umber Gray	Hand, Desk, Floor
SK-45B	Intercom & Talkback	Non-directional	-56 dbm G_M -149 db	200/15,000	80-8,000	-109 dbm	TV Gray	Desk, Floor
SK-46	Radio & TV Announce	Bi-directional	-58 dbm G_M -150 db	200/15,000	50-10,000	-113 dbm	Satin Chrome & TV Gray	Hand, Desk, Floor

¹ Reference level 0.001 watt, sound pressure 10 dynes per square centimeter. This corresponds to a rating by the proposed EIA system at a sound pressure level of 94 db.

² Level referred to a hum field of 10⁻³ gauss.

³ For details refer to description of each particular type.

⁴ G_M = (EIA rating).

⁵ Also available in TV Gray as MI-11006-C.

POLYDIRECTIONAL MICROPHONE

TYPE 77-DX

FEATURES

- High quality reproduction with greater sensitivity over entire audio frequency range
- Styled for either radio or TV applications
- Choice of directional pattern to control ratio of direct-to-reverberant sound pickup
- Three-position voice-music switch allows selection of best operating characteristic
- Efficient shock mounting

USES

The RCA Type 77-DX Polydirectional Microphone is primarily intended for broadcast use either in the radio or television studio. Two models are available. The MI-4045-F finished in satin chrome and a low-gloss umber gray enamel is intended for AM or FM stations, while the MI-11006-C microphone is intended for television use and is therefore completely finished in a low-gloss umber-gray enamel which eliminates glaring reflections. Both instruments are high-fidelity microphones of the ribbon type which may easily be adjusted to obtain a variety of directional patterns. If used outdoors the Type 77-DX may require some additional protection against the wind.

As a uni-directional microphone the 77-DX has a wide pick-up angle on front which may be used to advantage as a general programs and announce studio microphone and for television boom operation. It is recommended for use on programs where it is desirable to cover a large area with a single microphone, on programs where studio acoustics are more live than optimum, and programs where it is desirable to eliminate audience noise originating behind the microphone. The 77-DX can also serve as a bi-directional instrument on programs where the players are grouped around the microphone or are seated on opposite sides of a table. In the non-directional position, the microphone is excellent for announce work or for out-door locations.

DESCRIPTION

The RCA Type 77-DX Polydirectional Microphone operates as a uni-directional, bi-directional or non-directional instru-



MI-11006-C

MI-4045-F

ment by positioning of a shutter to secure various areas of opening. The moving element is a thin corrugated metallic ribbon clamped at the ends and suspended in the air gap of a magnetic circuit consisting of an Alnico V permanent magnet and pole pieces. One side of the ribbon is open and the other is connected by means of a tube to a folded acoustically damped pipe contained in the center section of the microphone.

The tube connecting the back of the ribbon to the labyrinth is slotted directly behind the ribbon and fitted with the shutter which controls the directional properties of the microphone. When the opening is completely closed, the microphone operates as a non-directional pressure microphone; at the wide-open position the instrument becomes bi-directional. With the proper size opening the pattern becomes a cardioid by virtue of the phase shift which occurs. Openings smaller or larger than this critical size produce directional patterns with various sized rear lobes. Different amounts of low-frequency attenuation are obtained by a reactor shunting the output.

The shutter opening is operated by turning a slotted shaft which is brought out flush with the rear of the windscreen.

The shutter position is indicated on a plate mounted on the screen and marked "U", "N" and "B". Three additional markings "L-1", "L-2", and "L-3" are used as reference points for other directional patterns which may be obtained. If desired, the microphone may be locked in the uni-directional position by means of a cover plate marked "U". This fastens over the indexed plate. The bottom portion of the microphone contains an impedance matching transformer and switch for selecting response characteristics for voice or music. The switch shaft is slotted and accessible through a hole in the bottom of the lower shell. The transformer is exceptionally well shielded against stray magnetic fields.

The 77-DX will mount on any stand having a 1/2-inch pipe thread. Other stands will require a suitable adaptor. The microphone is cushion-mounted, and a fork mounting is provided so that the instrument may be fitted to the desired position. The microphone is connected for an output impedance of 250 ohms at the factory, but it may be adjusted for an output impedance of 30 or 150 ohms.

SPECIFICATIONS

Directional Characteristics.....Adjustable, 6 positions (see curves)
 Frequency Response.....50-15,000 cps
 Output Impedance.....250 ohms, may be changed to 30 or 150 ohms
 Load Impedance.....Unloaded input transformer
 EIA SystemGM

Effective Output Level (all output connections):
 Bi-directional.....-50 dbm* $G_M = -144$ db
 Uni-directional.....-53 dbm* $G_M = -147$ db
 Non-directional.....-56 dbm* $G_M = -150$ db

Hum Pick-up Level.....-128 dbm**
 Dimensions (overall).....11 1/2" long, 3 3/4" wide, 2 1/4" deep
 Weight:
 Microphone3 lbs.
 Cable1 1/2 lbs.
 Cable (MI-43-B, 3 conductor, shielded).....30 ft., no plug
 Mounting.....1/2" pipe thread

Stock Identification:
 Satin ChromeMI-4045-F
 Low Luster Gray.....MI-11006-C

Accessory

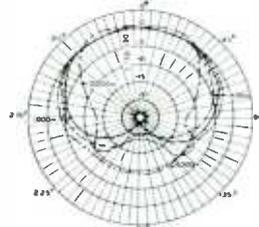
Protective Cloth Zippered Bag.....MI-4087

* Sound Pressure = 10 dynes/cm².
 ** Referred to a hum field of 1×10^{-3} gauss.

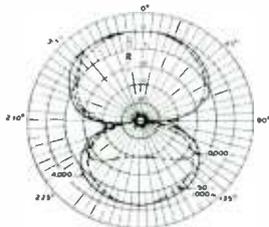
Typical Directional Patterns and Frequency Response Curves of 77-DX Polydirectional Microphone



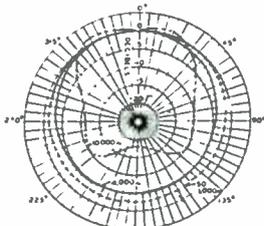
Rear view of 77-DX Microphone



UNI-DIRECTIONAL POSITION

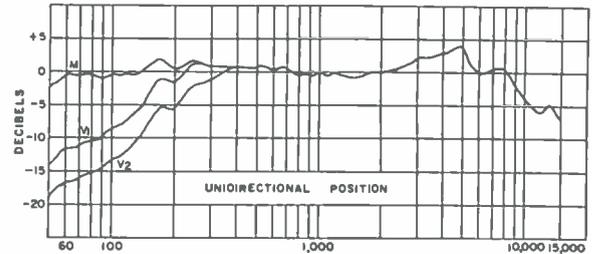


BI-DIRECTIONAL POSITION

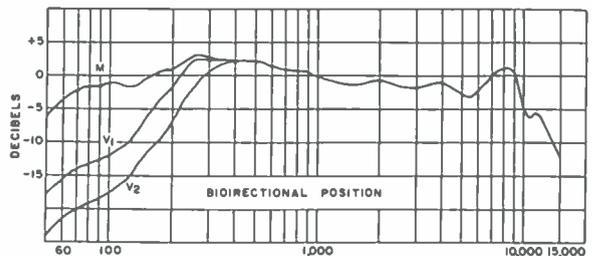


NON-DIRECTIONAL POSITION

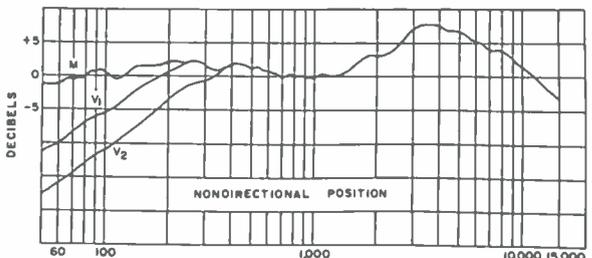
OPEN CIRCUIT RESPONSE OF A TYPICAL TYPE 77DX MICROPHONE



UNI-DIRECTIONAL POSITION



BI-DIRECTIONAL POSITION



NON-DIRECTIONAL POSITION

FREQUENCY IN CYCLES PER SECOND 472178-0

ULTRADIRECTIONAL MICROPHONE

TYPE BK-10A



FEATURES

- Simplifies microphone and camera placement problems—ultra-directional characteristics provide quality pickup under adverse conditions
- Lightweight for TV boom operation
- High quality reproduction over entire audio frequency range
- Maximum sensitivity lies on major mechanical axis
- Rugged construction—improved resistance to gun blasts
- Improved long-life flexible cable

USE

The RCA Type BK-10A Ultradirectional Microphone is designed to provide quality audio pickup under adverse conditions during television broadcast, radio broadcast, recording and public address. This is accomplished by a highly sensitive second order gradient directional characteristic which may be used to increase the signal to noise ratio of the microphone.

The BK-10A is a ribbon type bigradient uniaxial microphone with a frequency response that is essentially uniform from 80 to 15,000 cycles suiting it for reproduction of both speech and music. The response pattern and the improved signal to noise ratio simplify microphone and camera placements; and allows for greater distance between the microphone and the talent than heretofore possible. It is especially effective for TV studio boom use in high noise areas. Other uses indicated for the new microphone are: situations where feedback from monitor speakers is a problem; and controlling the level of the leading voice in a choral group. The microphone incorporates a filter which effectively reduces the possibility of damage to the instrument from sharp blasts and other violent noises. The axial directivity combined with a Boom Stand such as the KS-3B, make the microphone very easy to handle to keep the sound source "in focus."

DESCRIPTION

The Type BK-10A Ultradirectional Microphone is a second order gradient directional instrument with uniform frequency response from 80 to 15,000 cycles. Excellent directivity is accomplished by matching and combining the electrical outputs of two unidirectional ribbon microphone elements.

The unidirectional microphone elements are similar in construction and performance to those used in the BK-5A Microphone. Each element has a thin corrugated metallic ribbon clamped under light tension, thus making its natural frequency of vibration sub-audible. The ribbon is placed between the poles of a magnetic circuit. One side of the ribbon is open to the atmosphere, and the other side opens into an acoustical labyrinth which has phase shift openings. The labyrinth of each microphone element houses an impedance matching transformer. Each element has its own blast filter. In addition, the transformer is exceptionally well shielded against stray magnetic fields.

The BK-10A will perform satisfactorily in high hum fields because of its improved wiring and shielding. The elements are carefully matched so that the performance of each complements the other. In addition, the shock isolation mounting provided incorporates improved compact design features. This mount does not generate any noise and isolates the microphone effectively from its support. There are no rubber band mountings to wear out. The cable supplied with the microphone is braided tinsel cord 18

inches long which has been especially designed to attenuate "stand" noise.

The BK-10A has a low-gloss finish, which with compact mounting arrangement, provide minimum light reflection and minimum shadow. The output impedance of the microphone is 200 ohms for 150- and 250-ohm unloaded input transformers but may be changed at the terminal board to 40 ohms for 30- and 50-ohm input transformers. The output level is maintained at -56 dbm, and hum pick-up is reduced to a level of -130 dbm.

SPECIFICATIONS

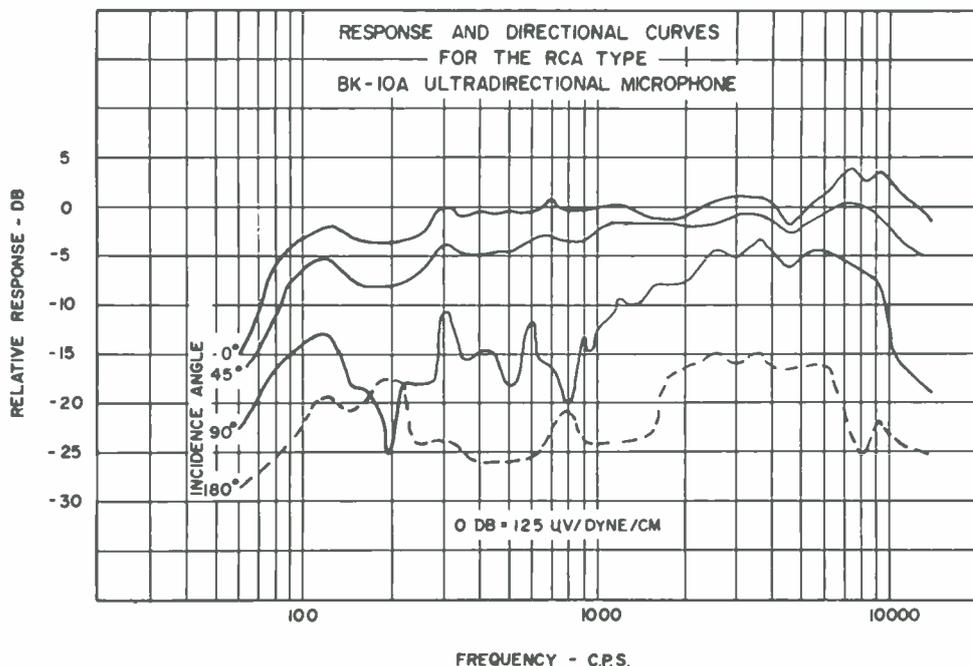
Directional Characteristic.....	Unidirectional 2nd Order Gradient Characteristic
Frequency Response.....	80 to 15,000 cps
Output Impedance.....	200 or 40 ohms
Load Impedance.....	Unloaded input transformer
Effective Output Level at 1000 cps.....	-56 dbm
EIA Rating (Gm).....	-150 db
*Hum Pickup Level.....	-130 dbm
Cable.....	Braided tinsel, 18 inches long
Dimensions (overall).....	10½" x 1¾" x 2¾"
Weight.....	2 lb., 8 oz. (less cable)
Finish.....	Two Tone, Black and Low gloss gray enamel
Stock Identification	MI-11018-A

Accessories

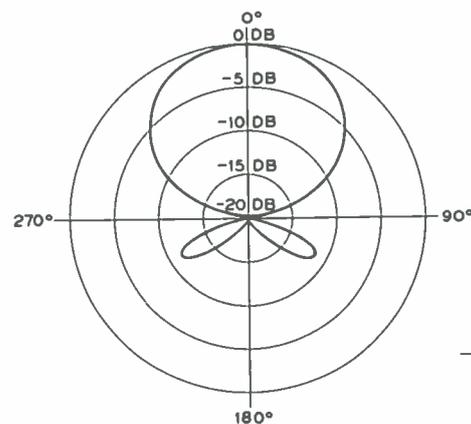
Microphone Boom and Stand.....	MI-11056
Microphone Boom and Perambulator.....	MI-26574

*Relative to a field of 1×10^{-3} gauss

Frequency Response Curves for BK-10A Microphone.



BK-10A Directional Characteristic.



PRESSURE MICROPHONE

TYPE BK-1A



FEATURES

- Lightweight rugged construction
- Attractive modern styling with non-reflective TV gray finish
- Convenient swivel mounting
- Ideal for interview type programs
- Not sensitive to wind or mechanical vibrations
- Frequency characteristic independent of source distance

USES

The BK-1A pressure microphone is designed for broadcast use in AM, FM and TV stations. Its construction makes it particularly well suited for remote pickups. The BK-1A features a smooth response and frequency range which make it suitable for reproducing both music and speech.

Rugged, insensitive to mechanical vibration, the BK-1A is the ideal microphone for outdoor use where constant handling by the announcer is necessary. Pleasingly styled, it effectively serves TV announce desk or conference programs where each participant has a microphone in the scene.

Characteristics of design and styling make the BK-1A desirable for: broadcasts where the microphone should blend with the scene; programs where the performer must work close to the microphone; and public address system use.

DESCRIPTION

The BK-1A is a pressure actuated type microphone. The sound pressure actuates a lightweight molded diaphragm attached to an annular coil assembly which is placed within a magnetic field. An acoustic circuit, coupled to the diaphragm, is proportioned so that the diaphragm velocity remains essentially constant for a constant sound pressure from 60 to 10,000 cycles. The coil is connected to an impedance matching transformer providing output impedances of 30, 150, and 250 ohms.

Non-directional when mounted vertically, a semi-directional characteristic is obtained when horizontally mounted, in which case the BK-1A is essentially non-directional for frequencies below 2000 cycles—the higher frequencies are attenuated more as the angle with the perpendicular to the diaphragm increases.

Versatility is assured by design which allows the BK-1A to be stand mounted on desk or floor or to be easily removed from the stand mountings for use as a hand microphone. A durable ball and socket joint located at the base of the stem makes selection of the best speaking angle easy, when used as a stand mounted microphone.

SPECIFICATIONS

Effective Output Level.....-52 dbm*
 Frequency Response.....60-10,000 cps
 Output Impedance.....30/150/250 ohms (connected for 250 ohms when shipped)

EIA Rating (G_M):
 250 Ohms-144 db
 150 Ohms-147 db
 30 Ohms-148 db

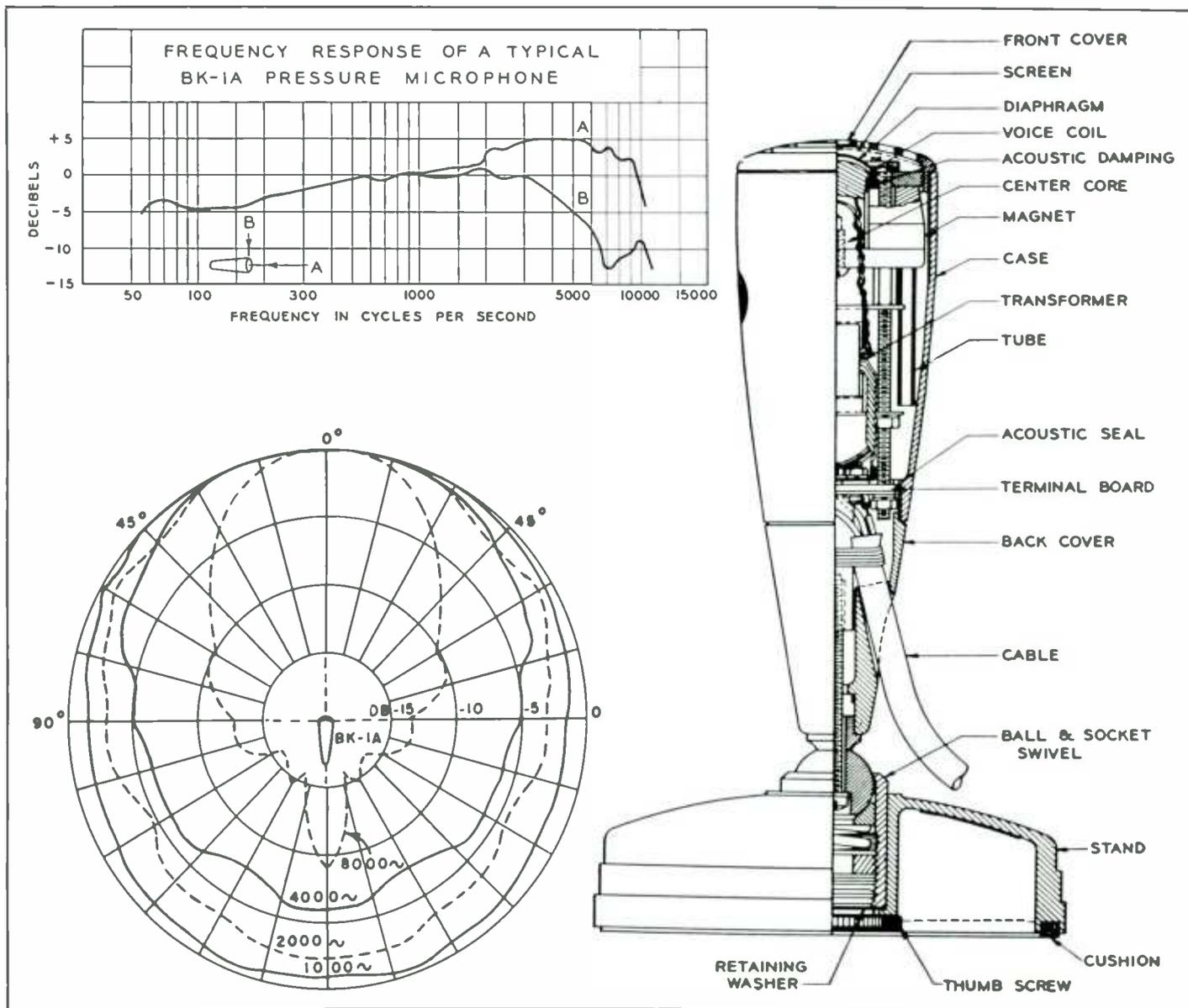
Directional Characteristic:
 Semi-directional.....When mounted horizontally
 Non-directional.....When mounted vertically
 Recommended Load Impedance.....Unloaded input transformer
 Hum Pickup Level.....-102 dbm (.001 gauss)

Length.....7¾" (including mounting)
 Diameter17/8"
 Weight.....18 oz. (less cable)
 Cable.....3-conductor shielded, 30 feet (no plug)
 Stand Fitting.....½" pipe thread
 Finish.....Low luster gray and chrome
 Stock IdentificationMI-11007

Accessories

Base, Type KS-11A.....MI-11008
 Floor StandMI-4068-G

* Referred to one milliwatt and a sound pressure 10 dynes/cm².



UNIAXIAL MICROPHONE

TYPE BK-5A

FEATURES

- Improved unidirectional characteristic with wide pickup angle on front
- Three position voice-music switch allows selection of most desirable operating characteristic
- Simplifies microphone and camera placement problems—maximum sensitivity lies on major mechanical axis
- Small size—ideal for TV boom operation
- Rugged construction—improved resistance to gun blasts
- Exceptionally good shielding permits operation in high hum fields
- Improved long-life flexible cable and boom mount

USES

The RCA Type BK-5A Uniaxial Microphone is a dependable, high-quality ribbon instrument possessing an improved unidirectional characteristic, and designed for broadcast use in AM, FM and TV stations. The microphone has a frequency response that is essentially uniform from 50 to 15,000 cycles. Its excellent response and frequency range, combined with its unexcelled cardioidal directional characteristic makes it ideal for reproducing both speech and music.

The microphone has been especially engineered with the television studio in mind. Since maximum sensitivity lies on the major mechanical axis, it is a one axis, or uniaxial type microphone. This directional characteristic simplifies microphone and camera placement problems. Incorporated in the unit is a blast filter which effectively reduces damage to the microphone from gun blasts and other violent noises. In addition, the small size, light weight, unobtrusive yet attractive gray finish and appearance render it especially suitable for television, but it is also admirably suited to general broadcasting and high-fidelity sound systems.



DESCRIPTION

The Type BK-5A Microphone is a unidirectional microphone in which the moving element is a thin corrugated metallic ribbon clamped under light tension to cause it to vibrate at its own resonant frequency. The ribbon is placed between the pole pieces of a magnetic circuit. One side of the ribbon is open to the atmosphere and the other opens on an acoustical labyrinth which has phase-shift openings giving the instrument its improved unidirectional characteristics. The labyrinth of the microphone houses an impedance matching transformer and switch for selecting response characteristics for voice or music.

A unique feature of the BK-5A is a blast filter consisting of two separate cloth layers supported by perforated metal screens. The filters effectively reduce damage to the microphone from gun blasts and other loud noises encountered in broadcast programming. In addition, the transformer is exceptionally well shielded against stray magnetic fields and can perform satisfactorily in high hum fields. As further protection for the sensitive vibrating ribbon a wind screen is available for use with the instrument. Its use is recommended if the instrument is to be used outdoors.

The integration of the blast filter, acoustic phase-shift network and especially designed connector to couple the ribbon to the labyrinth is responsible for the unique uni-axial characteristic of the BK-5A, and uniform frequency response over the entire aural spectrum. The microphone is housed in a tri-sectional casting which blends functions and appearance into a coherent whole. It is supported by a fork mounting which has a 1/8" straight pipe thread to fit RCA cushion mountings for either desk or floor stands. An improved shock mount based on panel meter mounts designed for military use is incorporated in the Boom Unit. This new mount isolates the microphone effectively from its support and does not generate any noise. There are no rubber band mountings to wear out and need replacement. A 30-foot flexible cable, supplied with the microphone, makes use of tinned cadmium bronze wire to provide longer life.



BK-5A Microphone with Wind Screen, MI-11011, and Boom Unit, MI-11012.

The small size and axial directivity aid in placing the BK-5A in inconspicuous fixed locations. There are no shiny external parts to reflect light and draw attention to the instrument. The axial directivity combined with the Boom Mount (MI-11012) make the microphone very easy to handle to keep the sound source "in focus." The addition of the wind screen to this combination does not cause a loss of the sense of the pickup axis.

SPECIFICATIONS

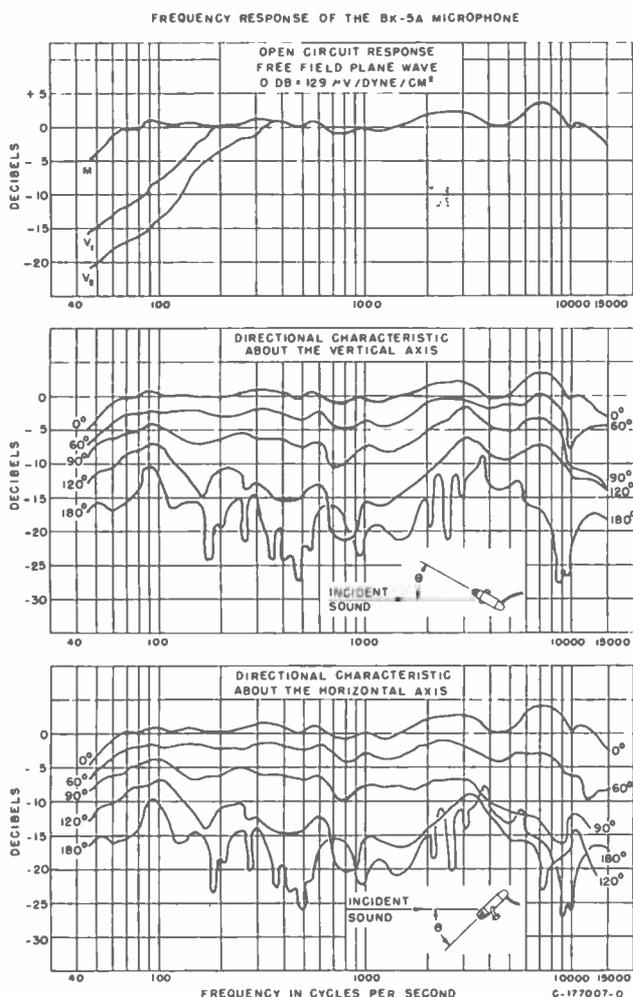
Performance Specifications

Directional Characteristic	Unidirectional
Frequency Response.....	50 to 15,000 cps
Output Impedance.....	250 ohms, may be changed to 30 or 150 ohms
Load Impedance.....	Unloaded input transformer
Effective Output Level at 1000 cps.....	-56 dbm
EIA Rating (G11) (150 ohm connection)	-150 dbm
*Hum Pickup Level.....	-128 dbm
Cable.....	3-conductor, shielded, 30 feet, no plug
Dimensions (overall).....	7" x 2 3/4" x 2 7/8"
Weight.....	1 pound, 11 ozs. (less cable)
Finish.....	Low luster gray enamel
Mounting.....	1/8" straight pipe thread (female)
Stock Identification	MI-11010

Accessories

Boom Unit	MI-11012
Wind Screen	MI-11011
Cushion Mounting Assembly.....	Stock No. 93973

* Relative to a field of 1×10^{-3} gauss.



MINIATURE DYNAMIC MICROPHONE

TYPE BK-6B

FEATURES

- Lightweight microphone with excellent speech balance when talking "off mike"
- Easily concealed in man's hand . . . in clothing . . . on TV settings
- Clip type lanyard for ease of looping about neck
- Wide-range frequency response
- Rugged construction . . . color and styling makes it blend with surroundings



USES

The RCA Personal (Type BK-6B) Microphone is especially designed for correct speech balance when used informally in television broadcasting interviews and public address applications. The frequency response and directional characteristics are engineered to complement human speech so that the microphone has excellent balance when the performer is talking "off mike".

The BK-6B may be worn by the performer; its small bulk and neutral color make it inconspicuous. The light weight and flexible cable permit free, unhampered movement of the performers. It may be wholly concealed in a man's hand during an interview, or it may easily be concealed on a set. The styling blends readily with any props, and is pleasing where it is exposed to direct view. It is best used, suspended from the neck, resting on the chest, where it attenuates the low pitched chest sounds while at the same time it points straight up toward the lips, the position in which it is most sensitive to the sibilant sounds that would normally be lost.

DESCRIPTION

A high quality instrument of the pressure actuated type, the Personal Miniature Dynamic Microphone has a frequency response from 80 to 12,000 cycles and a directional characteristic similar to the popular RCA 77-DX in the nondirectional voice "ONE" position. A special internal acoustic resonator is employed to support the response to lower frequencies and a damped resonator placed in front of the diaphragm reduces high frequency emphasis while extending the upper frequency limit. The result is a pleasing balance for speech when the microphone is used "off mike" or worn on the person.

The microphone as shipped from the factory is connected for an output impedance of 250 ohms. However the impedance may be changed to 30 or 150 ohms by a simple cable connection change. The special plastic motor diaphragm and coil assembly, output transformer and terminal board and bracket assembly are housed in a rugged and practically weather-proof case. The entire microphone



BK-6B Microphone used as a "necktie" mike. May be positioned beneath the necktie or exposed.

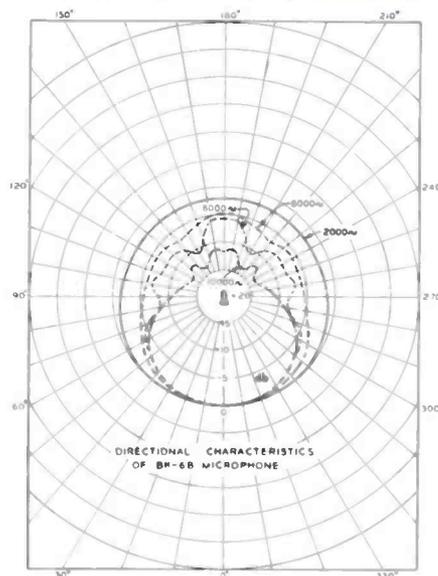
is only $2\frac{1}{16}$ " long and $\frac{1}{16}$ " in diameter and weighs but 2.3 ozs., less the cable.

The cable, especially designed for the BK-6B unit, has unusual flexibility combined with long life under conditions of severe abuse. The conductors are of cadmium bronze for high flexibility and long flex life. The shield is carbon-impregnated, conducting cotton overlaid with a light metallic braid. The conducting cotton ensures complete electrostatic shielding and the light, metallic braid keeps the series resistance of the shield low without making the cable excessively stiff. The external jacket gives a tough, neutral colored, protective covering to the cable. A lanyard is furnished for mounting the microphone conveniently about the neck.

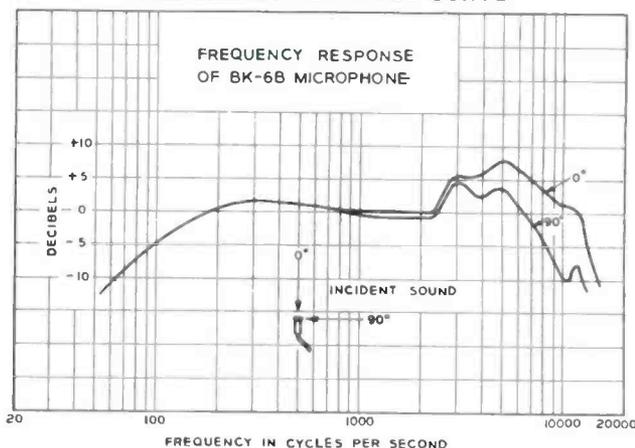
SPECIFICATIONS

Output impedance.....	250 ohms, can be changed to 30 or 150 ohms
Frequency Response.....	80-12,000 cps
Directional Characteristics.....	Semi-directional, see chart
Effective Output Level @ 1000 cps.....	-67 dbm (referred to a sound pressure of 10 d/cm ²)
EIA Sensitivity Rating.....	-158 db
Output Voltage (open circuit).....	.48 mv/d/cm ²
Hum Pickup.....	-112 dbm (referred to a hum field of 1 mg.)
Cable.....	30 ft. flexible, two conductor, shielded, no plug
Mounting.....	Removable lanyard for suspending about neck
Overall Dimensions.....	$2\frac{1}{16}$ " long x $\frac{1}{16}$ " diameter
Weight.....	2.3 ozs., less cable
Finish.....	Low luster gray
Stock Identification.....	MI-11017-A
Microphone Holder.....	MI-12086
19" flexible microphone stand for BK-6B.....	MI-12087

DIRECTIONAL CHARACTERISTICS



FREQUENCY RESPONSE CURVE



New type BK-6B Microphone shown with lanyard having clip fastener for convenient mounting.

PRESSURE MICROPHONE

TYPE SK-45B

FEATURES

- Rugged construction
- Economical, light weight, small in size
- Attractive appearance
- High or low impedance
- Dynamic type
- Excellent for announce work
- Swivel mounting

DESCRIPTION

The Type SK-45B Announce Microphone is suitable for talk-back or cue purposes. It may be used indoors or outdoors where a rugged, light weight microphone with good response to voice is required. It is a "close-talk" microphone.

This microphone is a pressure operated microphone employing the dynamic principle. The moving element is a thin molded diaphragm in which a single straight wire is embedded. This wire which is held in the airgap of a strong permanent magnet generates a small voltage of the same wave form as the sound acting on the diaphragm. The wire is connected to the primary of a small, but efficient transformer, in order to provide an output voltage sufficiently high to allow the output to be fed directly to the grid of the first input tube. The two conductor shielded cable is connected permanently to the microphone.

The change from high to low impedance (or low to high) is easily accomplished by changing one soldered connection in the head of the microphone.

A swivel arrangement allows tilting of the head forward or back through an arc of approximately 45 degrees each side of the vertical position. New streamlined design, rugged construction and attractive baked low luster gray enamel finish makes this microphone a welcome addition to any installation.



SPECIFICATIONS

Directional Characteristics:	
(Below 3000 cycles/sec.).....	Non-directional
(Above 3000 cycles/sec.).....	Semi-directional
Output Impedance.....	150 to 200 ohms balanced or 15,000 ohms†
Output Level at 1000 Cycles/sec.:	
Low Impedance.....	-56 db*
GM.....	-147 db
High Impedance.....	-58 db*
Hum Pickup Level.....	-106 dbm**
Frequency Range.....	70 to 12,000 cycles/sec.
Mounting.....	5/8" - 27 fixture thread
Dimensions:	
Height (including shank).....	5 1/2"
Width.....	1 5/8"
Depth.....	2"
Finish.....	Low luster gray enamel
Weight, with Cable.....	1 lb.
Stock Identification:	
Microphone and Cable (25 feet).....	MI-12045-B

† Stocked with soldered connection to the 200 ohm tap.

* Referred to 10 dynes per cm².

** Hum field 1 x 10⁻³ gauss.

0 db = 1 volt.

VELOCITY MICROPHONES

ANTI-NOISE TYPE SK-35 • PROGRAM TYPE SK-46



FEATURES

- Bi-directional characteristics over wide frequency range
- Light weight, small in size
- Modern styling blends pleasingly with any background
- Adjustable impedance taps
- Swivel mounting
- Extremely rugged construction

USES

The RCA Type SK-35 Anti-Noise and SK-46 Program Velocity Microphones have been designed for AM, FM and TV announcing. Both models are similar physically except that the SK-35 Microphone has internal insulation to adapt it for close announce or program use where it is desirable to attenuate the pickup of extraneous noise. This makes it particularly useful for sports announcements and for use in locations where the announcer can speak within one inch of the microphone. Its insulation makes it especially insensitive to wind and is highly recommended for outdoor use. The SK-46 is designed for indoor use especially for "on stage", announce booth and general program situations.

Both model velocity microphones feature excellent response and directional characteristics and their small size makes them valuable and versatile instruments where quality production of sound is desired. The directional characteristics reduce unwanted acoustical background noise, reflections and feedback. The microphones are virtually shock proof and will take a high degree of abuse without altering performance characteristics.

DESCRIPTION

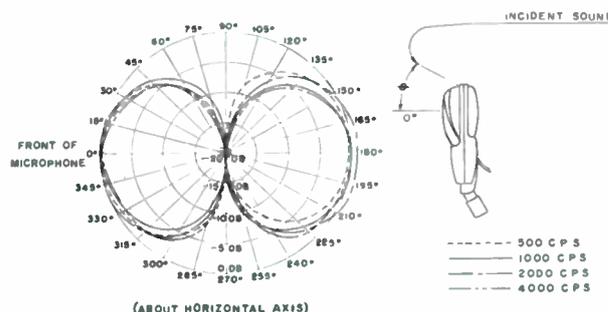
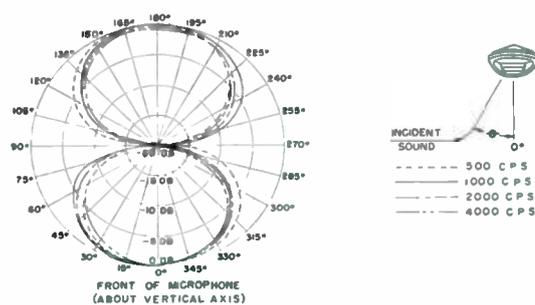
The RCA SK-35 and SK-46 are velocity microphones in which the moving element is a thin, corrugated metallic ribbon supported at the ends and placed between the poles of two small powerful magnets in a magnetic circuit. Because of its light weight, the motion of the ribbon corresponds very closely to the velocity of the air particles; therefore, the voltage generated by it is a faithful reproduction of the sound waves that traverse it. The ribbon is connected to the primary winding of a small efficient transformer whose secondary winding matches either 150-250 ohms or high impedance, as required. The change in impedance is easily accomplished by changing one soldered connection inside the microphone.

The excellent frequency response, high output level, absence of excitation due to breath, and anti-feed back characteristics are truly amazing. Above 1000 cycles, the discrimination against random unwanted sound is 19 db better than that obtained with a conventional pressure

microphone used at a distance of six inches. Below 1000 cycles, background noise discrimination increases to a value of 44 db at 100 cycles. The net result is a high-fidelity anti-noise microphone.

Acoustically designed screens protect the front and the back of the microphone from dirt and mechanical injury. Organdy and fiber glass inside the front and back of the microphone are used to damp the lightweight aluminum foil ribbon. The motor assembly uses Alnico magnets shaped to reduce magnetic leakage to a minimum, and increase the air gap flux density. This magnetic leakage is further reduced by means of a yoke or keeper.

A swivel arrangement permits tilting the microphone back approximately 85 degrees. Functional design incorporating excellent performance and rugged construction, attractively finished in low luster gray and satin chrome, makes this microphone a welcome addition to any installation. A two conductor shielded cable permanently attached to the microphone is connected for low impedance operation as stocked.



Directional Characteristics of the SK-35 and SK-46 Velocity Microphones.

SPECIFICATIONS

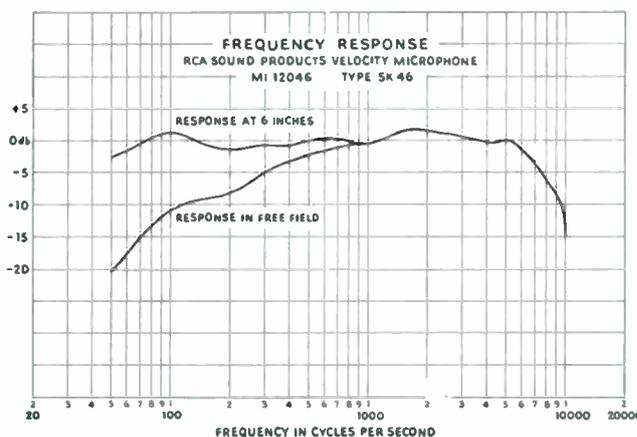
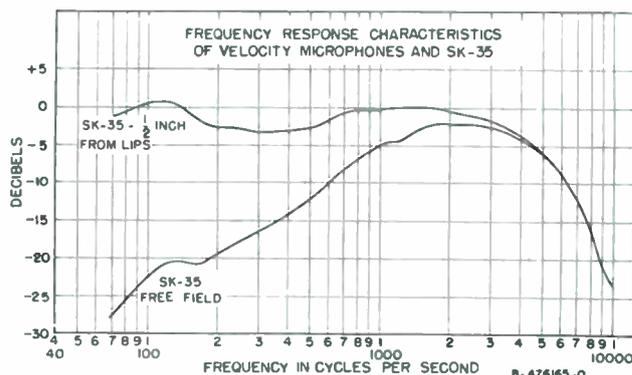
Directional Characteristics	Bi-directional
Output Impedance.....	200 ohms and 15,000 ohms*
Effective Output Level at 1000 cycles/second:	
Low Impedance	-58 dbm
G_M	-150 db
High Impedance.....	-60 db below 1 volt
Hum Pickup Level:†	
Low Impedance	-113 dbm
High Impedance	-94 db below 1 volt
Frequency Range.....	See charts
Output Voltage:	
Low Impedance117 $\mu\text{v}/\text{dyne}/\text{cm}^2$
High Impedance1020 $\mu\text{v}/\text{dyne}/\text{cm}^2$
Mounting	$\frac{5}{8}$ -27 fixture thread
Swivel.....	Approx. 85° backward
Cable.....	Two conductor, shielded
Dimensions:	
Height	5 $\frac{1}{8}$ "
Width	1 $\frac{29}{32}$ "
Depth	1 $\frac{3}{8}$ "
Finish.....	Low luster gray with satin chromium plated screen
Weight (less cable).....	.13 ounces
Stock Identification:	
Type SK-35 Anti-Noise Velocity Microphone.....	MI-12035
Type SK-46 Program Velocity Microphone.....	MI-12046

Accessories

Desk Stand	MI-13240-B
Floor Stand	MI-4096-A

* Stock with soldered connection to the 200 ohm top.

† Relative to field of 1×10^{-3} gauss.



AERODYNAMIC MICROPHONE

TYPE SK-39



FEATURES

- Light weight—small size—fits palm of hand
- Modern streamlined appearance
- Excellent for close talking application
- May be used outdoors—minimum response from wind
- Unaffected by temperature or humidity
- Alnico V magnet—high sensitivity with light weight
- Low impedance output—balanced

DESCRIPTION

This microphone has excellent response for close talking announce purposes. Because of its light weight and small size, it is ideal for remote pickup and mobile use. Performs very well for cuing and talk back operations and because of its rising high frequency characteristic it gives excellent intelligibility. Another application for which this unit is especially suited, is for use of an individual soloist, where a second microphone, usually a velocity type, is used to pick up the musical accompaniment. Either a floor stand or a desk stand may be used as a mounting or it may be fitted with a handle for use in sports announce work.

This microphone has been designed and constructed for dependable performance and rugged service. It is relatively insensitive to mechanical shock and wind disturbances and will withstand nominal exposure to moisture or rain due to its plastic diaphragm. The microphone is a pressure operated, moving coil type with Alnico V magnet. The attractively styled case is composed of two zinc die cast sections. This microphone may be used with any amplifier having an input impedance of 150/250 ohms.

SPECIFICATIONS

Frequency Response.....	70 cps to 9,000 cps
Directional Characteristics.....	Non-directional for frequencies below 2,000 cps; becoming less sensitive at the rear and sides as the frequency increases above 2,000 cps.
Output Level:	
Effective Output Level.....	-55 dbm, 180 x 10 ⁻¹¹ V/dyne/cm ² 250 ohm output—open circuit
EIA Microphone Rating G _{M1}	-150 db
Hum Pickup Level.....	-95 db (Hum field 0.001 gauss)
Output Impedance.....	250 ohms
Mounting.....	5/8"—27 fixture thread
Finish.....	Umber Gray
Dimensions.....	3 1/4" high, 2 7/8" wide, 2 3/4" deep
Weight.....	15 ounces, less cable
Cable Length.....	25 ft.—two conductor
Stock Identification.....	MI-12039-A

Accessories:

Desk Stand.....	MI-4092-E
Announce Stand.....	MI-4096-A
Desk Stand.....	MI-13240-B

MICROPHONE STANDS



Desk Stand, MI-4092-E.

USES

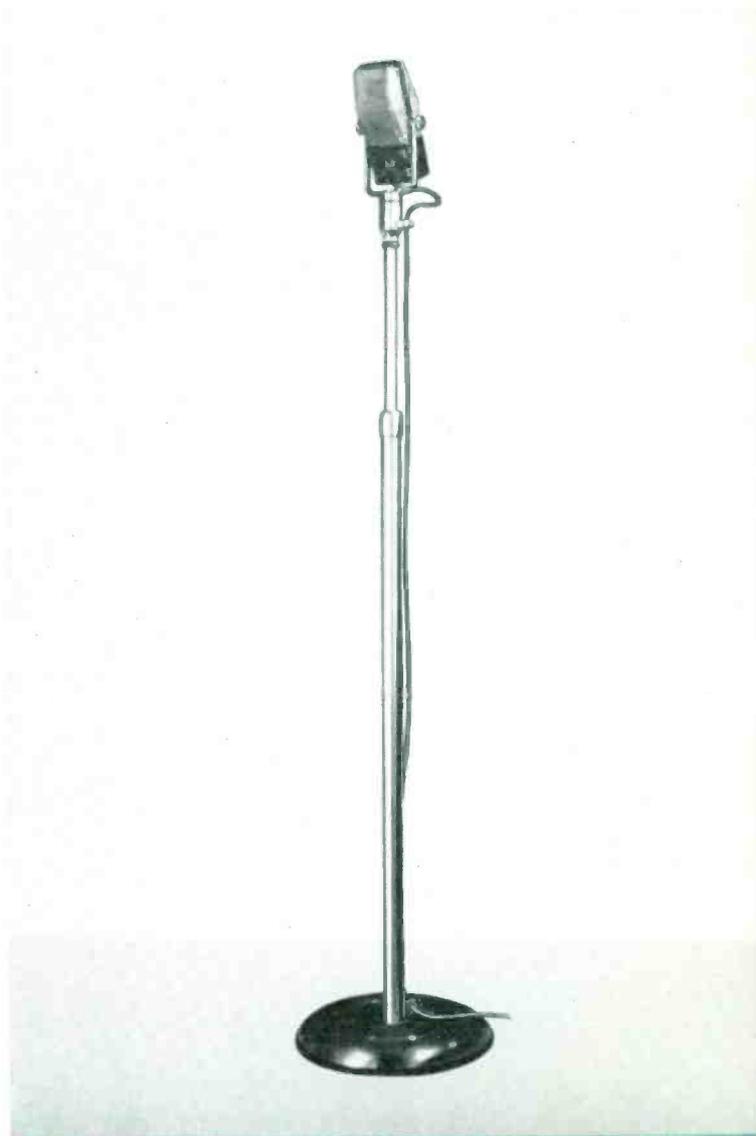
RCA offers to broadcasters a complete line of microphone stands in a variety of types and models for every application—station, auditorium, banquet hall, or stage. All are sturdily constructed and accommodate a variety of microphones. Each offers optimum design features to assure best results for its particular application.

In addition to various types of microphone stands, RCA also offers a wide variety in styling and price range to meet individual needs. The styling is modern and attractive, employing attractive metallic finishes for radio and entertainment applications, but using dull finishes designed to blend into the background in models which will find their chief use before the TV camera. A smartly designed table pushmike stand, MI-6427, is available for applications where it is necessary to turn the microphone on and off at the microphone position. Flexible microphone stands are a convenient type mounting where the operator needs the microphone as a permanent part of an installation yet wishes to push the microphone out of the way at times.

Floor Stand, MI-4090-A.

FEATURES

- Desk and Floor Stands to accommodate a variety of microphones
- Rugged construction
- Attractive appearance
- Easy to assemble or take apart
- Optimum design features built into each stand for its particular application
- Compact and convenient for portability



MICROPHONE DESK STANDS



ES-6427



MI-4096-A



MI-11008



MI-12066-B



MI-13240-B



MI-4092-E

Desk Stand, MI-11008

This Desk Stand is specifically designed for use with the type BK-1A Microphone. Its construction is simple, rugged and it is styled in dark umber gray finish. The BK-1A Microphone fits into the center hole and is secured by a knurled thumb screw and a retaining washer. A rubber cushion around its perimeter prevents marring of any surface.

Weight of Base.....19 oz.
 Diameter of Base.....4 $\frac{3}{8}$ "
 Weight, packed.....1 $\frac{1}{2}$ lbs.
 Finish.....Dark umber gray
 Stock IdentificationMI-11008

Desk Stand, MI-12066-B

This attractive base is designed primarily for use with the SK-Type microphones. It is of die cast metal 4 $\frac{1}{8}$ " long, 5 $\frac{3}{8}$ " wide and 1" high and is attractively finished in dark umber gray metalustre. The microphone is held rigidly in position by $\frac{5}{8}$ "-27 thread bolt. The bottom is rubber cushioned giving adequate protection to any finely finished surface.

Weight (unpacked).....1 $\frac{1}{4}$ lbs.
 Stock IdentificationMI-12066-B

Announce Stand, MI-4096-A

This attractively-designed announce stand is adjustable from 8 to 10 $\frac{1}{2}$ ", making it ideal for use on a desk or table. It is finished in chromium and black and features a 7 $\frac{1}{2}$ " base. The microphone mounting is a $\frac{5}{8}$ "-27 fixture thread. This stand can accommodate SK Series Microphones.

Weight (unpacked).....4 lbs.
 Stock IdentificationMI-4096-A

Desk Stand, MI-13240-B

This sturdily constructed desk stand is ideal for use with the lighter microphones where a low cost stand is needed. The stand is 6" high and the 4 $\frac{3}{4}$ "-diameter base is equipped with a rubber cushion. The stand is attractively finished in umber gray with polished chrome trim. As supplied the stand mounting is a $\frac{5}{8}$ "-27 fixture thread. For use with SK Series Microphones.

Weight (unpacked).....14 ozs.
 Weight (packed).....1 $\frac{1}{2}$ lbs.
 Stock IdentificationMI-13240-B

Desk Stand, MI-4092-E

This is a heavy-based desk stand designed especially for studio or announce use. It is attractive in appearance and easily mounts the heaviest of studio microphones. It can accommodate Type 77-DX, BK-1A and BK-5A Microphones.

The 91-C is finished in umber gray with satin chrome trim. The base is felt covered to prevent marring the surface on which it is placed. The stand is provided with alternate mounting extensions—one 3/4" and one 1 3/4", the choice depending on the type microphone to be mounted.

Microphone Mounting.....	1/2" pipe thread
Base Dimensions.....	4 1/2" x 6 5/8" x 3/4"
Finish.....	Umer gray wrinkle with satin chromium trim
Weight	4 lbs.
Stock Identification	MI-4092-E

Pushmike, Stand, ES-6427

This smartly designed table stand features a built-in microphone switch and is suitable for use with SK Series Microphones. The switch is of the D.P.D.T. long leaf anti-capacity type and permits turning the microphone on and off right at the microphone stand. It may also be used for "push-to-talk" operation or lock-in "Talk" position.

The stand is 4 3/4" high with 5 3/4" base and is attractively finished in chromium. The microphone mounting is for a 5/8"—27 male or female thread. Stock MI-12055 Adaptor is available on separate order for microphone with 1/2" pipe thread.

Weight (unpacked)	1 1/8 lbs.
Stock Identification	ES-6427
(Includes MI-6425 Pushmike Adaptor and MI-6426 Base)	

MICROPHONE FLOOR STANDS

Floor Stand, MI-4090-A

This Program Stand is used in broadcast studios where a stand is required which will be attractive in appearance and give stable support even to the heavier type of microphones. It is recommended for use with Microphone Types 77-DX, BK-1A, and BK-5A.

Pictured on page 21, is this sturdily constructed stand which will give stability to the heaviest microphones. The base is weighted and has equalizing projections which assure a firm position on an uneven floor. The column is equipped with a simple clamping device which permits height adjustments to be made easily and quietly without operating any release mechanism. The up and down operation is smooth and the locking operation positive. The patented clamp is mechanically simple and is ruggedly constructed to give years of service.

The stand as supplied may be used with any microphone having a 1/2" pipe thread and by simply removing an adaptor fitting with any microphone having a 5/8"—27 fixture thread.

The stand is finished in satin chrome to harmonize with RCA microphones. Cable guides are included to hold the microphone cord close to the stand at the base. Cable Hook, MI-11099-A is offered as an accessory item to further secure loose cables and hold them in place.

Height of Stand.....	Adjustable from 3'8" to 6'2"
Microphone Mounting.....	Standard 1/2" pipe thread or 5/8"—27 fixture thread
Diameter of Base.....	12 1/4"
Weight (unpacked).....	33 lbs.
Finish	Satin Chrome
Stock Identification	MI-4090-A
Accessory Item—Cable Hook.....	MI-11099-A

Portable Stand, MI-4093-C

DESCRIPTION

This stand is a folding, lightweight and rugged stand which is unexcelled for field use with the 77-DX, BK-1A and BK-5A Microphones. It features a tripod base and a patented clutch arrangement which permits height adjustments to be quickly made without the operation of a mechanical release.

SPECIFICATIONS

Height.....	Adjustable from 3' to 5'
Weight (unpacked).....	3 1/2 lbs.
Finish	Satin chrome
Microphone Mounting.....	1/2" pipe thread or 5/8"—27 fixture thread with adaptor removed
Stock Identification.....	MI-4093-C





ES-4068-G

ES-6208

Floor Stand, ES-4068-G

The ES-4068-G Floor Stand is used in broadcast studios where some stability of support may be sacrificed for ease

in moving from one spot to another. It may be used with the BK-1A, BK-5A, 77-DX and SK Series Microphones.

The column and telescoping tube are finished in polished chrome and the base in dark umber gray wrinkle to harmonize with RCA microphones. It has a smooth-operating clamping and release device.

The stand as supplied may be used with any microphone having a 5/8"-27 fixture thread. It is equipped with a heavy 12-inch base and is sturdily constructed.

Height of Stand.....	Adjustable from 34" to 62"
Microphone Mounting.....	5/8"-27 fixture thread
Diameter of Lower Tube.....	1"
Diameter of Base.....	12"
Weight (unpacked).....	14 lbs.
Finish:	
Base.....	Dark umber gray
Stand.....	Satin chrome
Stock Identification.....	ES-4068-G

Sectional Stand, ES-6208

The ES-6208 is a convenient and attractive stand for floor or banquet use. It is especially suitable for portable use since it may be taken apart into three sections for easy packing or carrying. The stand, which is in chrome, has a heavy 10-inch gray crackle base trimmed with satin-silver stripes. Use this stand with 77-DX, BK-1A and BK-5A Microphones.

Height (for floor use—3 sections).....	Adjustable from 3' 11" to 5'
Height (for banquet use—2 sections).....	Adjustable from 1' 6" to 2' 7"
Microphone Mounting.....	5/8"-27 fixture thread
Finish:	
Stand.....	Polished chromium
Base.....	Umer gray wrinkle with satin-silver stripes
Weight (unpacked).....	11 lbs.
Stock Identification.....	ES-6208

Gooseneck Stands

The MI-11745 and MI-11746 Flexible Microphone Stands are especially useful in locations where the microphone must be a permanent part of an installation yet must be adaptable to varying uses and be able to be pushed out of the way if necessary. These stands are particularly suitable for the BK-1A pressure microphone, but may be used with any of the smaller announce microphones such as the SK-35, SK-45 and SK-46.

Muting Bracket, MI-11747, is designed for use with the gooseneck stands and may be easily clamped to the side of a console, desk, or other solid flat surface.

SPECIFICATIONS

STANDS

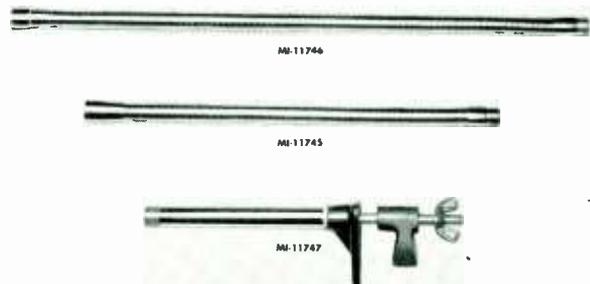
Finish.....	Polished chrome
Mounting.....	5/8"-27 thread (male fitting on one end, female on other)
Weight:	
MI-11745.....	1 lb.
MI-11746.....	1 1/2 lbs.
Length:	
MI-11745.....	13"
MI-11746.....	19"

BRACKET CLAMP

Finish:	
Base.....	Gray wrinkle
6" Stem.....	Polished chrome
Mounting:	
Base.....	5/8"-27 thread female
Stem.....	5/8"-27 thread male
Weight (Base and Stem).....	11 lbs.

STOCK IDENTIFICATION

13" Flexible Stand.....	MI-11745
19" Flexible Stand.....	MI-11746
Flexible Stand Bracket Clamp.....	MI-11747
Adaptor, 5/8"-27 Stand to 1/2" Mike.....	MI-12055



MICROPHONE BOOM AND STAND

TYPE KS-3B



The Type KS-3B Boom Stand may be conveniently folded for storage or transportation as shown in inset.

USES

The RCA Type KS-3B Microphone Boom and Stand affords proper microphone placement for: programs where the best microphone position cannot be reached with a conventional floor stand; piano pickup; orchestral pickup where the stand may be substituted for microphones suspended overhead; television programs where movement of the microphone is not required. This stand is recommended for use with the 77-DX and BK-5A Microphones.

DESCRIPTION

The KS-3B boom length and the counter balance overhang are easily adjustable, and the position selected is securely locked by wing-type handwheels. The microphone fitting is swivel mounted, thus eliminating the need of rotating the microphone when attaching it to the stand. Movement of the stand is quiet and easy because of the smooth-rolling

rubber-tired casters with which it is equipped. Once the stand is properly placed the casters can be locked by means of foot-operated locks. Cable supports are provided along the boom for the microphone cable.

For storage or for convenient transport the legs and the boom may be folded against the center column to make a relatively small package.

The KS-3B Boom Stand is finished in satin chrome and gray to harmonize with RCA microphones.

FEATURES

- Sturdy construction, strong tubing and castings
- Large base with rubber-tired casters
- Easily adjusted over wide range of heights and boom lengths
- Air cushion lowering brake, releases for easy lift
- Lightweight
- Positive locking adjustments

SPECIFICATIONS

Height of Stand.....	Adjustable from 5' 2" to 8' 8"
Horizontal Arm Adjustment (with overhang to rear).....	3' to 6'
Microphone Mounting.....	Standard 1/2" pipe thread
	5/8"—27 fixture thread with adaptor removed
Weight (unpacked).....	64 lbs.
Finish.....	Satin stainless steel and low luster gray
Stock Identification.....	MI-11056

MICROPHONE BOOM AND STAND

MI-11070

FEATURES

- Suitable for both TV and AM—rotates "Mike" through 360° by convenient wheel
- Permits the operator to "spot" directional pattern of mike for best pickup
- Three sturdy telescopic aluminum sections provide "length" adjustments from 6 to 18 feet
- Shockproof rubber mount for microphone
- Mike cable enclosed in boom
- Vertical adjustment 4 to 8 feet
- Base mounted on rubber-tired casters



USES

For broadcast AM and FM studio and Television applications the RCA MI-11070 Microphone Boom and Stand is used for: programs where the best microphone position cannot be reached with a conventional floor stand; piano pickup; orchestral pickup where the stand may be substituted for microphones suspended overhead; television programs of virtually all types. It is recommended for use with Type 77-DX and BK-5A Microphones.

DESCRIPTION

The Microphone Boom Stand, MI-11070, telescopes from 6 feet 10 inches to 18 feet with remote control of microphone made possible at all positions by a rear handwheel which rotates 360 degrees. It is equipped with a self leveling, vibration damping mount. The microphone cable runs through the boom to avoid "snarls" and interference with the television scenes.

Perfect balance is maintained by an adjustable, 25 pound steel counterweight which slides on the boom and locks securely at any position. The counterweight is made of steel, plated satin chrome and the boom swivel is cast

aluminum with a bronze stand swivel. The stand swivel has a tension spring to keep the boom in position when balanced. The stand is a two-section telescoping super strut which combines rigidity and strength with minimum weight.

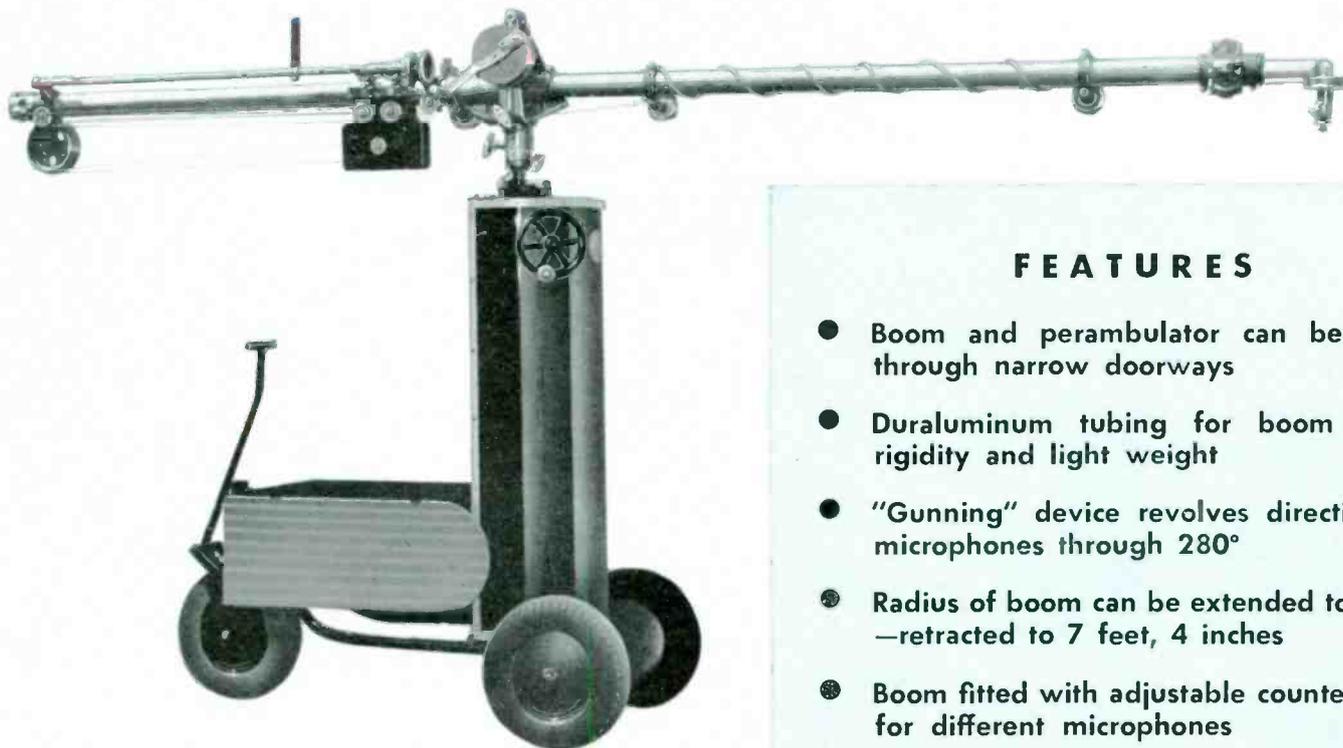
The vertical portion of the stand is constructed of telescopic steel tubing, and is adjustable in height from 4 feet to 8 feet. A Numo check and safety clamp are provided for the height adjustment. A spring shock absorber on the inner telescopic tube protects against shock if the height adjustment is carelessly loosened. The base is mounted on 4-inch rubber tired casters, and may be folded compactly for convenience in transportation or storage. A horizontal handle is provided at the top of the vertical section for convenience in dollying the stand.

SPECIFICATIONS

Height of Stand.....	Adjustable from 4' to 8'
Horizontal Arm Adjustment.....	Telescope 6' 10" to 18'
Microphone Mounting.....	Shockproof rubber mount with 1/2" pipe thread
Microphone Adjustment.....	Rear handwheel
Weight (approx.).....	70 lbs.
Finish.....	Satin, stainless steel and gray
Stock Identification	MI-11070

MICROPHONE BOOM AND PERAMBULATOR

MI-26574



FEATURES

- Boom and perambulator can be passed through narrow doorways
- Duraluminum tubing for boom assures rigidity and light weight
- "Gunning" device revolves directional microphones through 280°
- Radius of boom can be extended to 17 feet —retracted to 7 feet, 4 inches
- Boom fitted with adjustable counterbalance for different microphones
- Quiet in operation

USES

The MI-26574 Microphone Boom and Perambulator is designed for use in broadcast or television studios. It enables the operator to quickly place the microphone with respect to the sound source. He can closely follow the sound, or move from one source of sound to another easily and quietly. The boom accommodates such microphones as RCA Types 77-DX and BK-5A Microphones.

DESCRIPTION

The perambulator is constructed of steel tubing with drop-rim type wheels and pneumatic tires. The steering wheel swivels 180° and can be clamped to hold a given radius. The tiller when pushed back operates a toggle brake on the steering wheel. It is also provided with steps which aid the operator in mounting the platform when it is elevated. Operated by a hand wheel, the elevating column raises the boom from a height of 6 feet, 5 inches to 9 feet, 5 inches. The operating platform raises with the boom. The wheel tread of the perambulator can be narrowed to 27 inches and the leaf portions of the table can be lowered to permit passing the perambulator through a 30-inch door.

A hand crank governs extension and retraction of the boom, and a hand rail controls elevation and horizontal traversal. As the boom is retracted, the microphone cable is received on take-up sheaves. The movement of the telescoping member is counterbalanced by weights which can be adjusted to properly balance different microphones. Since many microphones are directional, the boom is fitted with a "microphone gunning" device which revolves the microphone through 280 degrees.

SPECIFICATIONS

Dimensions:	
Maximum Height (with boom pedestal elevated).....	9' 5"
Height (with pedestal lowered).....	6' 5"
Length of Boom:	
Extended	17'
Retracted	7' 4 1/2"
Weight:	
Boom (with gunning device and counterweights).....	102 lbs.
Perambulator	421 lbs.
Stock Identification	
MI-26574	
Boom Only	MI-26574-1
Perambulator Only	MI-26574-2

MICROPHONE ACCESSORIES

Type "XLR"

Microphone Receptacle (Male)
MI-11087-B



Microphone Plug (Female)
MI-11090-A



Microphone Receptacle (Female)
MI-11088-B



Microphone Plug (Male)
MI-11089-A



Type "XL"

Receptacle
MI-11069



Type "UA"



Microphone Plug
MI-11062



Receptacle
MI-11063



Cord Connector
MI-11061



Wall Receptacle
MI-4624-A

Type "P"



Microphone Plug
MI-4630-B



Cord Connector
MI-4620-B

MICROPHONE PLUGS AND RECEPTACLES

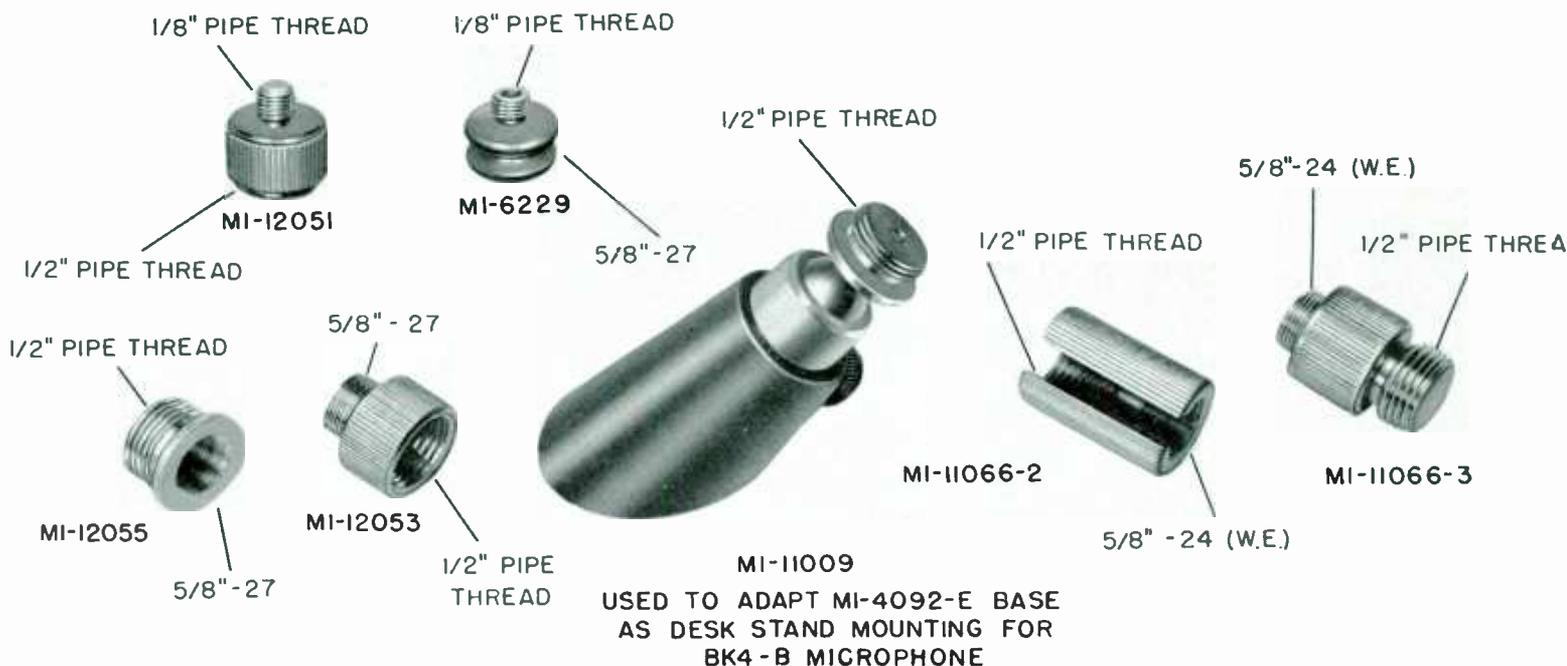
RCA microphones are sold without plugs in order that the purchaser may use any type desired. Three series of Cannon plugs which meet requirements for reliability and ruggedness are stocked. These include the "UA", the "P" Type Connectors and the "XLR" and "XL" matched family of small 3-contact connectors.

The "UA" connectors are splash-proof and shock-proof, and have gold-plated contacts for low-loss and noise-free operation. Flat top construction provides positive polarization. All have thumb action latch-lock for quick insertion and firm engagement and a 1 3/4-inch rubber sleeve handle for firm easy grip.

The "P" connectors are designed as panel receptacles and cable connectors for audio circuits. They accommodate wires up to No. 10, 15 ampere contact capacity and feature black phenolic insulation. The Cannon "XL" and "XLR"

type plugs and receptacles are miniature connectors especially favored with newer type miniature microphones and equipment. They have similar functions to the "P" type units.

Description	Cannon Stock No.	RCA Stock Identification
Female Plug for Microphone Extension Cable (mates with UA-3-12).....	UA-3-11	MI-11061
Male Plug for Microphone Cable (mates with UA-3-11 and UA-3-13)	UA-3-12	MI-11062
Flush Mounting Receptacle (mates with UA-3-12)	UA-3-13	MI-11063
Male Plug for Microphone Cords.....	P3-CG-12S	MI-4630-B
Wall Receptacle for Above Plug.....	P3-35	MI-4624-A
Note: The MI-4624-A Receptacle will fit in a standard a-c outlet box.		
Extension Cord—Female Connector.....	P3-CG-11S	MI-4620-B
Male Connector for BK-4A.....		MI-11069
Microphone Receptacle, Female.....	XLR-3-31	MI-11088-B
Microphone Receptacle, Male.....	XLR-3-32	MI-11087-B
Microphone Plug, Female	XLR-3-11C	MI-11090-A
Microphone Plug, Male.....	XLR-3-12C	MI-11089-A



MICROPHONE ADAPTORS

Here is a comprehensive stock of microphone adaptors suitable for microphones and stands used by broadcasters. The 1/2-inch standard pipe thread avails broadcasters of adaptors to suit any application.

Stand Thread	Microphone Thread	Stock Identification
1/2" pipe thread	1/8" pipe thread	MI-12051
1/2" pipe thread	5/8"-27	MI-12053
1/2" pipe thread	5/8"-24 (W.E.)	MI-11066-2
5/8"-24 (W.E.)	1/2" pipe thread	MI-11066-3
5/8"-27	1/8" pipe thread	MI-6229
5/8"-27	1/2" pipe thread	MI-12055
	1/2" pipe thread	MI-11009

MICROPHONE CABLES

RCA microphone cables are of rugged construction and are jacketed with a neoprene compound to insure long life. They are especially designed for broadcast service either studio or remote.

Cable MI-43-C

Use.....Cable for low impedance microphone circuits
 Type.....Three conductor, twisted
 Conductors.....Tinned cadmium bronze, stranded, equivalent to #20 AWG
 Insulation.....Special rubber compound
 Shield.....Tinned copper. Complete coverage without loss in flexibility
 Outer covering.....Brown neoprene compound
 Overall Diameter.....0.300 maximum
 Stock Identification (specify length in feet).....MI-43-C

Cable MI-13307-A

Type.....Two conductor, twisted
 Conductors.....Stranded, equivalent to #16 AWG
 Insulation.....Special rubber compound
 Shield.....Tinned copper. Complete coverage without loss in flexibility
 Outer Covering.....Black neoprene compound
 Overall Diameter.....0.300 maximum
 Stock Identification (specify length in feet).....MI-13307-A

Cable MI-13322

Type.....Two conductor, twisted
 Conductors.....Stranded cadmium bronze, equivalent to #24 AWG
 Insulation.....Special rubber compound
 Shield.....Conducting cotton with 60% coverage of tinned copper. (Complete coverage with greater flexibility)
 Outer Covering.....Brown neoprene compound
 Overall Diameter.....0.215 maximum
 Stock Identification.....MI-13322

INTERCONNECTING CABLES

The majority of cables required to interconnect the various components of a broadcast audio assembly are of a special type and cannot be readily purchased from the local

electrical dealer. In order to avoid unnecessary installation delays, RCA carries in stock four of the generally used special type cables.

Solid Conductor Cable, MI-33

Use.....General purpose Audio Transmission Line
 Type.....Shielded twisted pair, each conductor solid #20 tinned copper wire, with Vinyl resin insulation covered with lacquered rayon braid.
 Shield.....Tinned copper braid
 Overall DiameterApproximately .170"
 Color Code.....Red and black
 Rating300 volts
 Stock Identification (stocked in 1000 ft. rolls).....MI-33

Stranded Conductor Cable, MI-35

Use.....Especially recommended for 110 volt supply and filament circuits
 Type.....Shielded, twisted pair, stranded, composed of 16-.010 tinned copper conductors equivalent to #18 AWG
 Insulation.....Vinyl resin insulated with lacquered rayon braid
 Shield.....Tinned copper braid
 Overall DiameterApproximately .236"
 Color Code.....Red and black
 Rating300 volts
 Stock Identification (stocked in 1000 ft. rolls).....MI-35

Stranded Conductor Cable, MI-34

Use.....Recommended for audio circuits where extra flexibility is required
 Type.....Shielded, twisted pair, stranded, composed of 7-.010 tinned copper conductors equivalent to #22 AWG
 Insulation.....Vinyl resin insulated with lacquered rayon braid
 Shield.....Tinned copper braid
 Overall DiameterApproximately .166"
 Color Code.....Red and black
 Rating300 volts
 Stock Identification (stocked in 1000 ft. rolls).....MI-34

Stranded Conductor Cable, MI-13306

Use.....General purpose Audio Transmission Line
 Type.....Black Glazed Cotton covered shielded twisted pair, each conductor #22 AWG Stranded 71010, with Vinyl resin insulation covered with lacquered rayon braid.
 Shield.....Tinned copper braid
 Overall DiameterApproximately .200"
 Color Code.....Red and black
 Rating300 volts
 Stock Identification (stocked in 1000 ft. rolls).....MI-13306

CABLE HOOK, MI-11099-A

USES

Can be quickly attached to or removed from the 90-A or any other 1 1/4" round tube stand. It provides a convenient method of holding the cable. It saves wear on the cable when it is not in use.

DESCRIPTION

The Cable Hook is simple to install, and may be easily adjusted to the proper height. Merely tightening a smooth locking nut holds it in position.



SPECIFICATIONS

Weight15 oz.
 FinishSatin chrome
 Hole Diameter1 1/4"
 Stock IdentificationMI-11099-A

CABLE LACING CORD

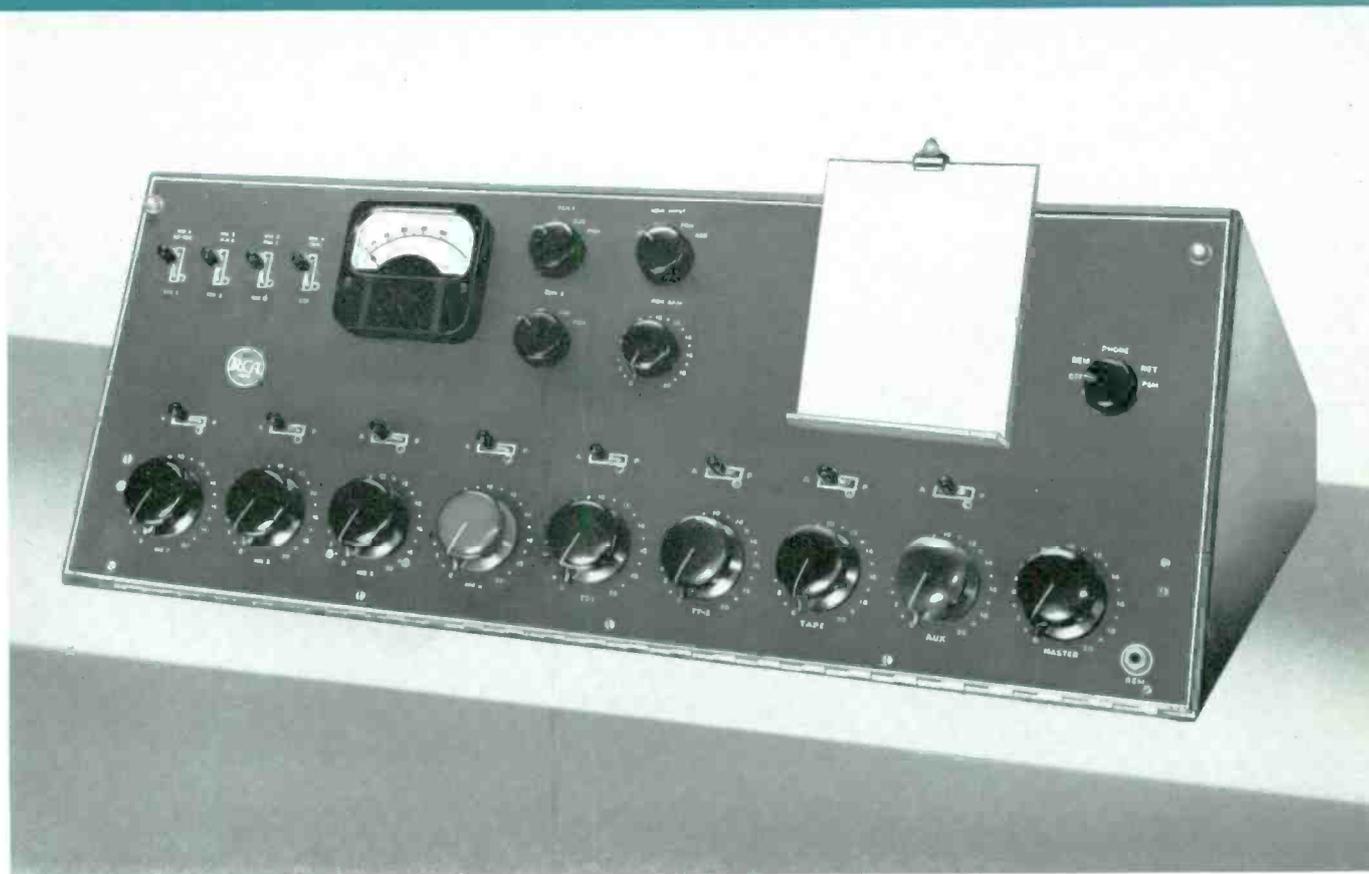


Lacing cord is available for general cable lacing and dressing uses. Cord is of strong material such as linen and hemp and thoroughly impregnated with a beeswax and paraffin mixture. Supplied in one pound spools as shown above.

Stock Identification	Type	Plys	Yds/lb	Average Break Strength
MI-11719-A	No. 6 med.	4	580 ±35	30 lbs.

STANDARD AUDIO CONSOLETTA

TYPE BC-3C



FEATURES

- Complete high-fidelity speech input system
- Provides facilities for thirteen inputs
- Modular construction, etched wiring sub-assemblies
- Compact size—entirely self contained (includes all amplifiers and power supply)
- Means for supporting script on front panel
- Styling matches other RCA audio consoles and is compatible with TV terminal equipment
- Headphone selection of network, remote, and program line

USES

The RCA Type BC-3C Standard Audio Console is a compact, self-contained, high-fidelity speech-input system providing audio amplification, switching, control and monitoring facilities essential to the operation of medium size radio or television broadcast stations. This model incorporates eight mixer positions, which control thirteen inputs. The console is sufficiently flexible to accommodate two studios, announce booth, control room, transcription turntables and auxiliary input circuitry.

The BC-3C is suitable for mounting on a flat top desk and is similar in styling and appearance to other RCA Audio Consoles. The unit provides maximum facilities at very low cost. It is economical to operate, and has been designed for operating convenience and ease of servicing.

DESCRIPTION

The Type BC-3C Standard Audio Console is a convenient audio control equipment mounted in a smartly styled housing of all-metal construction and finished in two-tone umber gray. A hinged front panel and removable cover provide access to tubes, switches, gain controls and other interior components.

An etched panel contains all operating controls, an illuminated volume indicator calibrated in VU's, and a rack designed to hold script. The mixer controls are assigned so as to offer the greatest flexibility and operating ease. The BC-3C will handle thirteen separate inputs with provisions for simultaneous mixing of any eight inputs. There is provision for feeding program cue or talkback to remote lines. Headset switching is provided for network, program and remote line monitoring. Cue positions are incorporated on turntable mixers. Separate audition and program channels are provided for maximum flexibility and the monitoring amplifier may be switched from the turntable cue position, program line, audition bus, or external input. The output of an off-air receiver or modulation monitor can be connected to this external position. All inputs are terminated when the switches are in the off position.

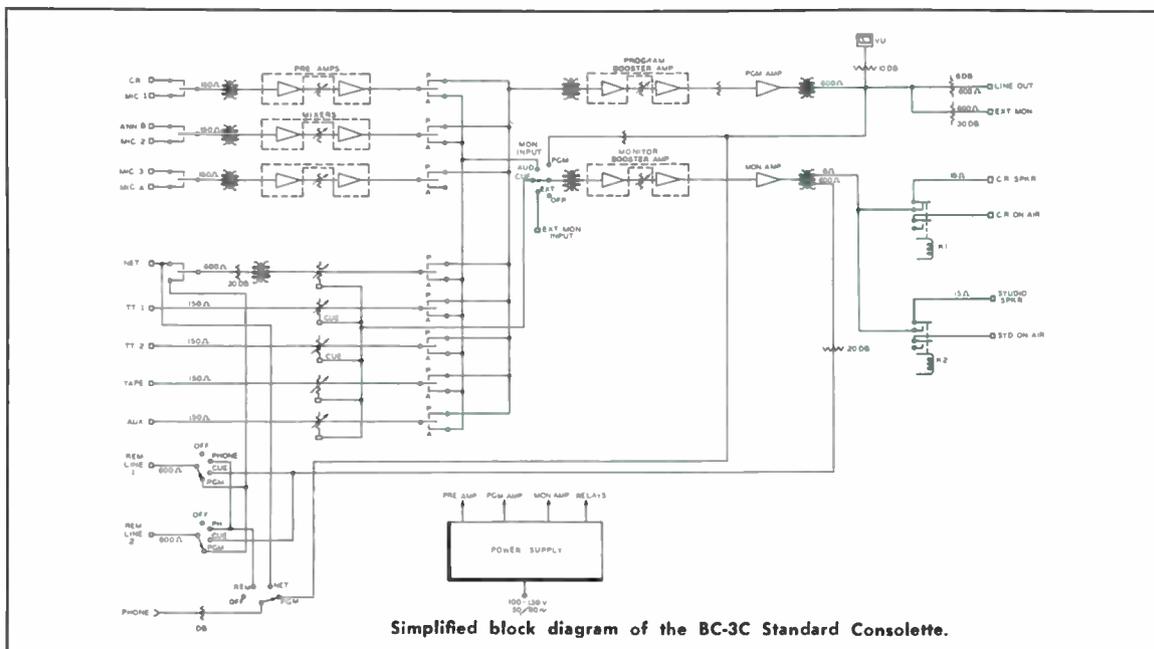
The BC-3C is of modular construction with etched wiring sub-assemblies. It has self-contained amplifiers and power supply. Three preamplifiers are utilized in the design plus monitoring and booster equipment. Recommended operating practice is for the inclusion of separate BA-26A preamplifiers mounted in each turntable cabinet. The unit control circuits include two 24 volt relays for control room and studio speaker and On Air light operation controlled by microphone selector and program-audition switches.

SPECIFICATIONS

- Inputs:**
 6 Microphones (4 Studio, 1 Control Room and 1 Announce Booth).....37.5/150/600 ohms
 2 Turntable, 1 Tape, and 1 Auxiliary Inputs.....150 ohms
 2 Remote Lines, 1 Network and 1 External Monitor.....600 ohms
- Outputs:**
 1 Program Line & 2 Remote Lines Cue 600 ohms +18 dbm
 2 Monitor Speakers16 ohms 3 W each
 1 External Monitor600 ohms -6 dbm
 1 Turntable Cue150 ohms 1 V rms
- Gain:**
 Microphone to Program Line.....108 db
 Network or Remote to Program Line.....32 db
 Turntable, Tape or Auxiliary to Program Line.....64 db
 Microphone to Audition Speaker.....124 db
 Microphone to Program Speaker.....144 db
 Microphone to External Monitor.....84 db
 Microphone to Remote Line (Cue).....106 db
 Network to Audition Speaker.....48 db
 Network to Program Speaker.....68 db
- Frequency Response:**
 Program ±1.5 db.....30-15,000 cps
 Monitor ±2.5 db.....30-15,000 cps
- Harmonic Distortion:**
 Program 18 dbm Output......1% @ 30 cps; .75% @ 50 cps;
 .05% @ 100-15,000 cps
 Monitor 6 W Total.....1.5% @ 50-10,000 cps
- Signal to Noise Ratio:**
 Program Channel, Mixer and Master Gain controls set for 68 db Gain.....68 db below 18 dbm output
- Tube Complement:**
 2 6V6-GT, 2 12AU7, 2 12AX7, 1 5R4GY, 5 12AY7, 5-MI-11299 (selected 12AY7)
- Power Requirements:**.....100-130 volts a-c, 50/60 cycles, 155 watts
Dimensions:.....33" wide, 11¼" high, 21¼" deep
Weight88 lbs.
Finish.....Two tone umber gray
Panel.....Reverse etched aluminum with dark umber gray enamel background
- Stock Identification**ES-11103-A

Accessories

- Tube KitMI-11486-A
 On-Air Light Relay.....MI-11702-A
 Warning LightsMI-11706 Series
 BA-26A Equalized Preamplifier.....MI-11436



Simplified block diagram of the BC-3C Standard Console.

AUDIO CONSOLETTA

TYPE BC-5B



FEATURES

- Single BC-5B controls nine inputs—four simultaneously
- Entirely self-contained
- Talkback or program cue to remote lines
- Four preamplifiers—all amplifiers etched wiring
- Modular construction—complete accessibility
- Off-air monitoring
- Head phone selection of network, remote, and program line
- Easily expanded for dual-channel broadcast use

USES

The Type BC-5B Audio Console, ES-11105-A, provides audio amplification, switching control and monitoring facilities for the operation of a small radio or television broadcast station. This low-cost console is self-contained with the power supply for amplifiers and relays mounted in the unit. The exclusive feature of "add-a-unit" audio control incorporated in the BC-5B permits "block building" as desired. The console is suitable for use either in combined studio/transmitter or remote studio installations.

A single BC-5B provides high quality switching and control facilities for accommodating one studio, control booth, two turntables, network, remotes and tape recorder. Addition of a second BC-5B doubles facilities and permits complete dual-channel operation. It is ideally suited for such "twin" or side-by-side installations. The audio console may also be used by television stations to provide audio sub-control, or to permit expansion of existing facilities. The equipment is styled to match all current RCA consolettes.

DESCRIPTION

The BC-5B Audio Console provides extremely flexible audio facilities for the small broadcast station. It includes three mixing channels for low level microphones and turntable inputs and one high level mixing channel, for network and remote line inputs. Nine input channels may be selected; the output of each mixing channel may be switched to either a program or audition bus. A VU meter and all switches and mixer controls essential to everyday programming are front-panel mounted.

Cue positions are incorporated on turntable mixer controls and terminals are available for connecting a separate cueing amplifier. Separate audition and program channels

are provided for maximum flexibility. The monitoring amplifier may be switched from the turntable cue position, program line, audition bus or an external position providing off-air monitoring from an off-air receiver or modulation monitor. All inputs are terminated when the switches are in the "off" position.

The BC-5B is a completely wired unit and has self-contained amplifiers and relay power supply. Four preamplifiers are utilized in the basic design and provision is made for the addition of external line equalizers. The fourth preamplifier is supplied wired for low gain to



The BC-5B hinged front panel and removable top cover provide complete access to all components including amplifiers and power supply.

permit its use with a remote line input. It can be easily modified, however, for high gain when desired.

The Audio Consolette is of all-metal construction finished in two-tone umber gray. A hinged front panel and removable cover provide complete access to all components, such as the key-selector switches, controls, mixers, terminal blocks and wiring. The VU meter is illuminated to facilitate readings. Muting relays provided in the unit may be used to actuate ON AIR warning light relays when such accessory signals are desired.

SPECIFICATIONS

Electrical Specifications

Inputs:			
4 Microphone (3 Studio, 1 Control Room).....	37.5/150/600 ohms		
2 Turntable	37.5/150/600 ohms		
2 Remote Lines	600 ohms		
1 Network	600 ohms		
1 External Monitor.....	150 ohms		
Outputs:			
1 Program Line	600 ohms	+18 dbm	
2 Monitor Speakers	16 ohms	3 W each	
1 External Monitor	600 ohms	-12 dbm	
2 Turntable Lines Cue	600 ohms	+18 dbm	
1 Turntable Cue	50,000 ohms	1 V	
Gain:			
Microphone or Turntable Input to Program Line.....	108 db		
Microphone or Turntable Input to Speaker.....	125 db		
Frequency Response:			
Program ±1.5 db.....	30-15,000 cps		
Monitor ±2.0 db.....	30-15,000 cps		
Harmonic Distortion:			
Program (+18 dbm output).....	1% at 30 cps; 0.75% at 50 cps;		
	0.5% 100 to 15,000 cps		
Monitor (6 watt total).....	1.5% at 50 to 15,000 cps		

Signal to Noise Ratio:

With Mixer, Master and Monitor Gain controls set to 10 and -50 dbm reference signal applied to the microphone or turntable inputs, or 16 dbm applied to the network or remote line inputs, hum and noise:

68 db below reference at program line output
66 db below reference at monitor output

Power requirements.....100-130 volts, 50/60 cps, 150 watts

Tube Complement

1-5R4GY	2-12AX7
5-MI-11299 (selected 12AY7)	2-12AU7
2-6V6-GT	6-12AY7

Dimensions.....19 1/2" wide, 11 1/2" high, 21 1/2" deep

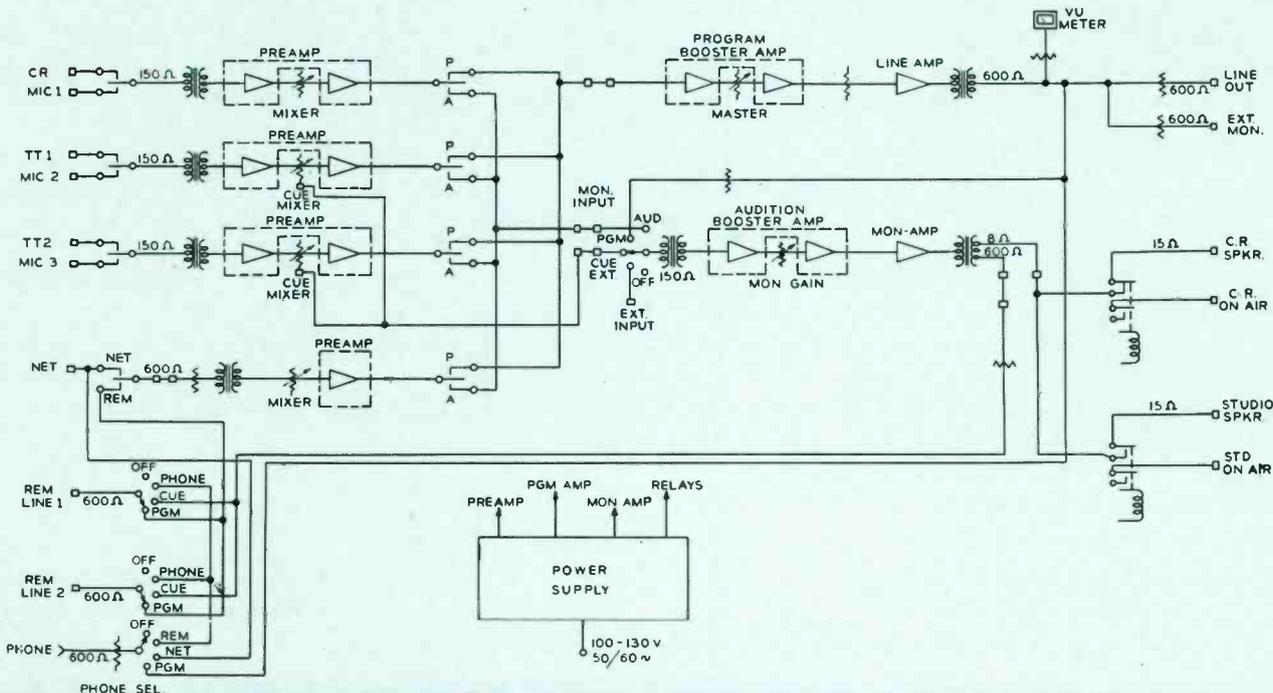
Weight.....66 lbs.

Finish.....Two tone umber gray

Stock Identification.....ES-11105-A

Accessories

Tube Kit for BC-5B.....	MI-11483-A
Warning Lights.....	MI-11706 Series
Signal Light Relay.....	MI-11702-A



DUAL-CHANNEL AUDIO CONSOLETTE

TYPE BC-6B



FEATURES

- Complete high-fidelity speech input system for larger radio or TV broadcast station with nine high level mixing channels—two program channels either to feed one or both program lines
- Complete dual channel facility for stereo programming—easily expanded for stereo sub-mixing
- Compact size—entirely self-contained (includes all amplifiers and power supplies)
- Dual monitoring channels, one for program monitoring and talkback, the other for feeding background to studios and cueing
- Incorporates new split-mixer technique
- Convenient switch for selecting two channel or single channel operation with two sub-master gain controls
- Twenty-two inputs available
- Dual power supplies—one for each channel for greater reliability
- Means for supporting script in space between VU meters
- Styling matches other audio consolettes and is compatible with TV terminal equipment



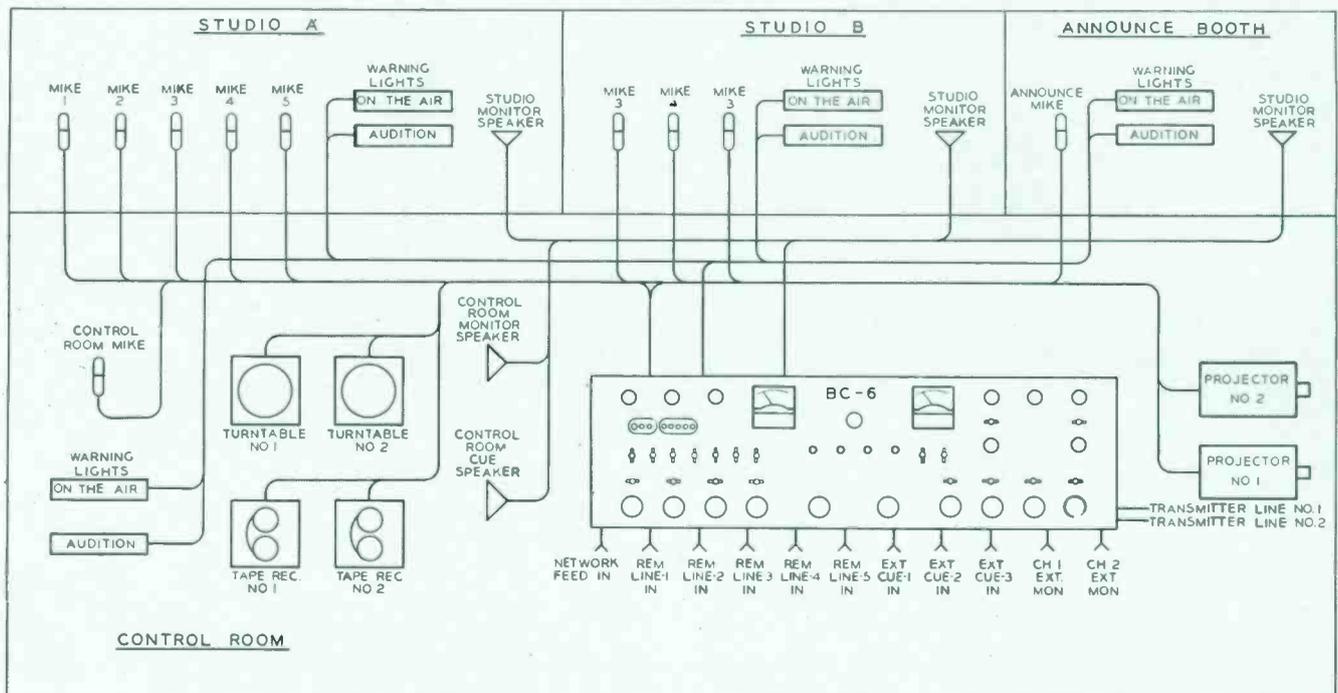
Etched front panel of the BC-6B Consolette showing entire operating facilities.

USES

The RCA Type BC-6B Split-Mixer, Dual Channel Audio Consolette provides the audio amplification, switching, control and monitoring facilities essential to operation of the larger radio or television broadcast station. This consolette incorporates nine mixer positions and provides all the facilities needed to accommodate one or more studios, announce booth microphone, control room microphone, two transcription turntables, tape, film, five remote lines, network and three cue circuits.

The nine mixer positions provided are assigned so as to offer the greatest flexibility and operating ease. The first five are low level microphone channels each with dual microphone input. Positions six and seven are also low level inputs and may be used for either turntable, tape or film sources; while the eighth mixer is used for network. The final mixer has provisions for five remote line inputs selected by rotary switch. The latter four mixer positions also provide cue facilities.

Simplified Facilities Diagram for the new RCA Type BC-6B Split Mixer, Dual Channel Audio Consolette.



DESCRIPTION

The BC-6B Split Mixer, Dual-Channel Audio Consolette is designed for operating convenience and ease of servicing—all amplifiers, control facilities and power supplies being contained in a single housing which offers utmost accessibility to all components. The unit is suitable for mounting on a flat top desk, and is similar in styling and appearance to the RCA BC-3C and BC-5B consolettes.

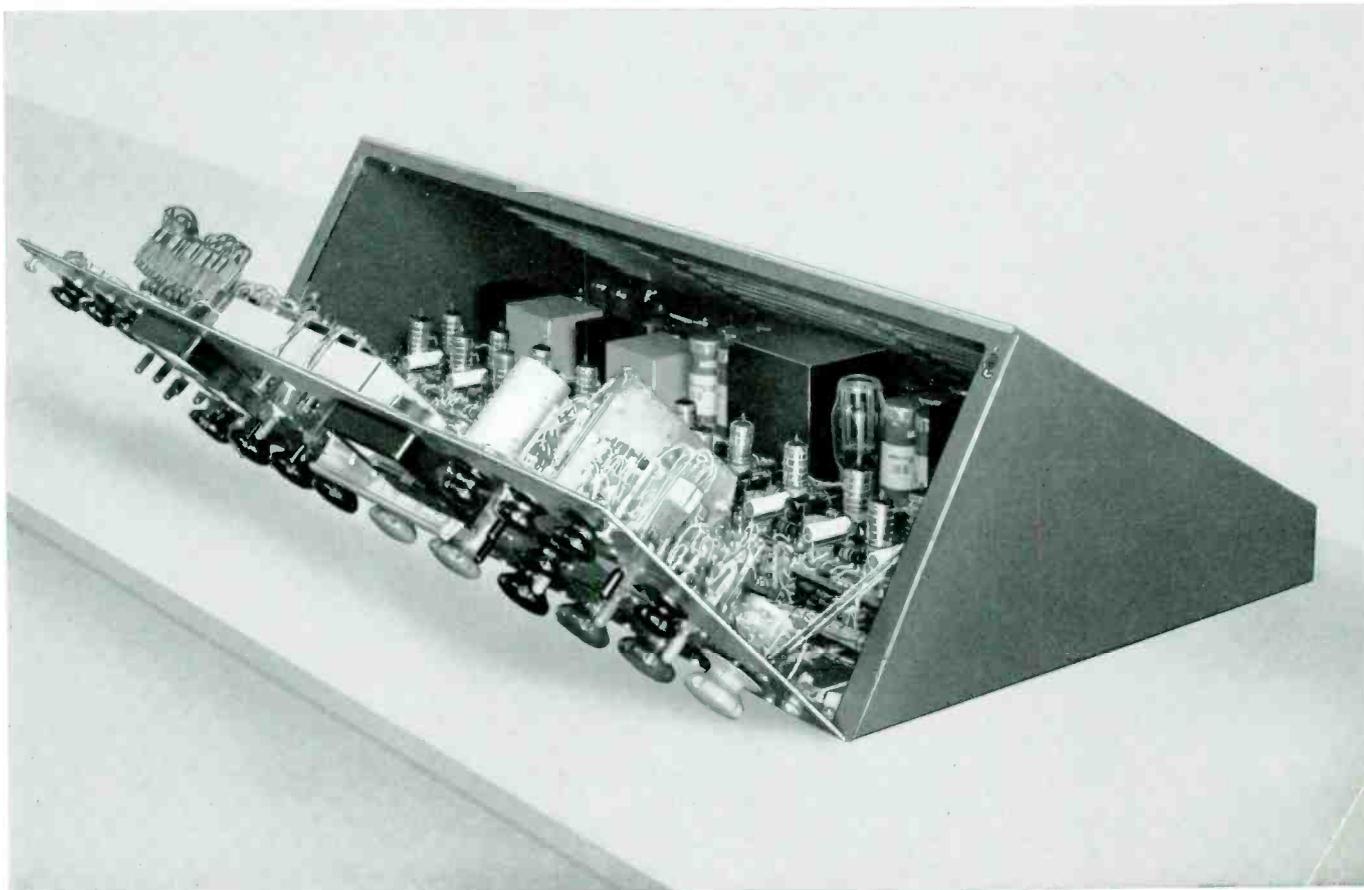
An etched panel contains all operating controls. It tilts forward for easy access to all contacts, switches, gain controls and other interior components. Two illuminated volume indicator meters are calibrated in VU's. They indicate level on each output channel. Monitoring and network headset jacks are supplied and headphones may be connected to the output of the program channels, remote lines, or the incoming network. Talkback facilities are included and permit talking back to studios, announce booth or remote lines. An Over-ride-Remote cue switch is provided which permits the remote operator to call in on any of the

remote lines and over-ride the program on the control room speaker.

Highest quality components are used throughout the BC-6B. Interlocked push-button switches are cam operated leaf type, assuring years of trouble-free operation. Improved fast relay circuits for speakers reduce the possibility of key clicks and audio feedback. The amplifiers are of a new, compact design of modular construction having dip-soldered etched wiring amplifier subassemblies similar to those designed for the BC-5B consolette.

The BC-6B has two power supplies, each powers a single channel and alternate pre-amplifiers thus providing greater continuity of service. Both are completely self-contained units. The total power input required is only 300 watts, 50 to 60 cps at 100 to 130 volts. The frequency response from any input to the line output is within ± 1.5 db from 30 to 15,000 cps. The total rms harmonic distortion is less than 0.5 percent from 100 to 15,000 cps at a line output level of 18 dbm.

Servicing of BC-6B Consolette is greatly simplified by hinged front panel and removable cover.



SPECIFICATIONS

Inputs:
 10 Microphones30/150 ohms
 2 Tape, Turntable or Film.....150 ohms
 5 Remote Lines600 ohms
 1 Network600 ohms
 3 Cue Lines20,000 ohms

Outputs:
 2 Program Lines600 ohms +18 dbm
 2 External Monitors600 ohms -6 dbm
 5 Speakers15 ohms 6 watts total
 5 Remote Lines (cue).....600 ohms +18 dbm

Gain:
 Microphone or Turntable Input to Program Line.....108 db
 Microphone or Turntable Input to Speaker.....141 db
 Network or Remote Line to Program Line.....42 db
 Cue Lines to Speakers.....48 db

Frequency Response:
 Program±1.5 db 30 to 15,000 cps
 Monitor±2.5 db 30 to 15,000 cps

Harmonic Distortion:
 Program (+18 dbm output).....1% at 30 cps, 0.75% at 50 cps,
 0.5% at 100 to 15,000 cps
 Monitor (6 watt total).....1.5% at 50 to 15,000 cps

Signal to Noise Ratio, Microphone to Program Line
 (68 db gain, +18 dbm output).....68 db

Power Requirement:.....300 watts, 100/130 volts, 50/60 cycles a-c

Tube Complement

2-5R4-GY	4-6V6-GT
4-12AU7	10-MI-11299 (RCA selected 12AY7)
4-12AX7	13-12AY7

Dimensions:.....38" wide, 11 1/2" high, 21 1/2" deep

Weight127 lbs.

Finish.....Two tone umber gray

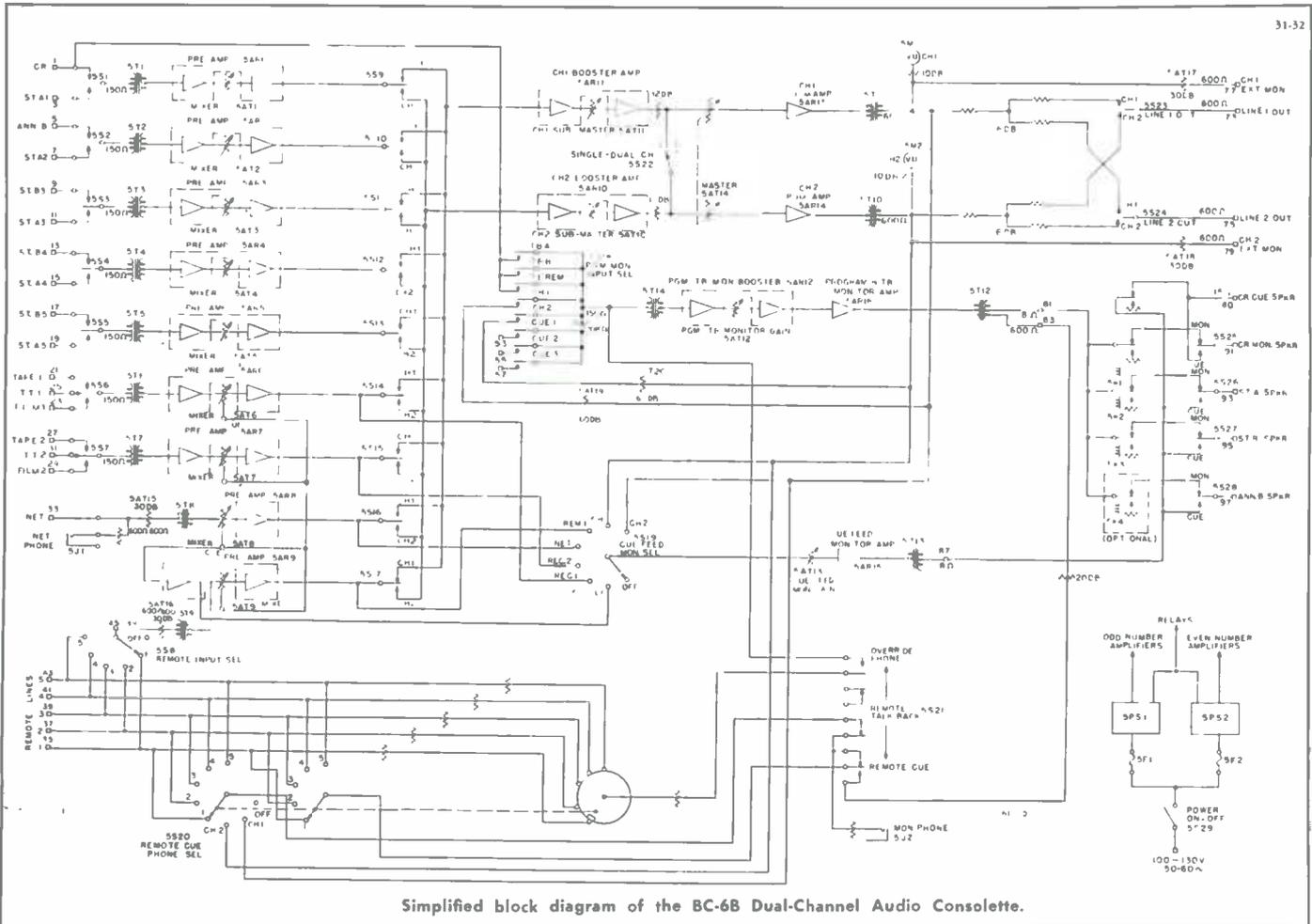
Panel.....Reversed etched aluminum with dark umber gray enamel fill

Equipment Supplied

BC-6B Dual-Channel Audio Console including amplifiers,
 power supplies, tubes and Instruction Book (IB-24788) ES-11106-A

Accessory

Tube Kit for BC-6B Console.....MI-11484-A
 Announce Booth Speaker Relay.....MI-11748
 On-Air Light Relay.....MI-11702-A
 Warning LightsMI-11706 Series



Simplified block diagram of the BC-6B Dual-Channel Audio Console.

STUDIO WARNING LIGHTS

MI-11706 SERIES



FEATURES

- Modern styling
- Satin chrome finish
- Available in five types
- Uniform illumination
- Easily mounted

USES

The MI-11706 series of warning lights is another new product to supplement the RCA line of modernistically designed studio equipment. These lights have been developed after many requests from broadcasters to furnish a studio warning light that has bold and uniformly illuminated lettering with an external design that would enhance the appearance of any studio.

DESCRIPTION

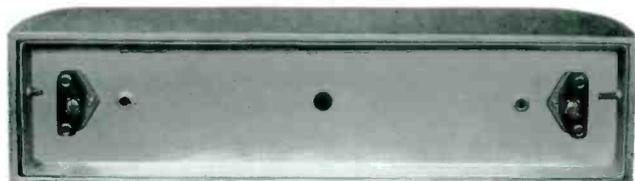
The lights are constructed of satin finish cast aluminum with trimmed etchings and tastefully styled for all studio furnishings. The sign is an opaque black glass with frosted translucent 2-inch letters, using a 40 watt 12-inch Lumiline lamp for a light source.

The interior or mounting base, containing the lamp, sockets and terminal strip for the a-c supply, is of separate metal

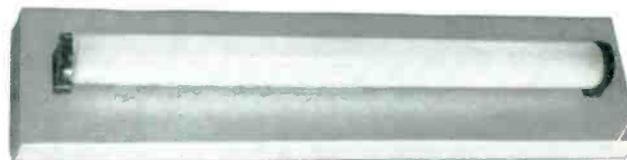
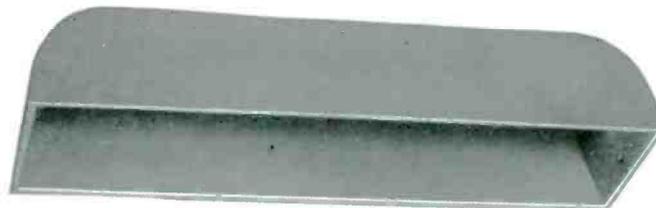
construction and insures adequate protection from wires short-circuiting. The complete interior is a wall mounting fixture and allows a new lamp to be replaced quickly by simply removing the outer case by two screws. The warning light is available with five signs as indicated below.

SPECIFICATIONS

Dimensions: (overall of case)	
Length	14"
Width	3 1/2"
Depth	2 11/16"
(Glass Sign Aperture)	
Length	9 3/4"
Width	2 3/4"
Weight (unpacked)	3 1/2 lbs.
Stock Identification:	
"ON-AIR"	MI-11706-1
"REHEARSAL"	MI-11706-2
"AUDITION"	MI-11706-3
"STANDBY"	MI-11706-4
"SILENCE"	MI-11706-5
Glass Only	MI-11718-1 to 5



Back view showing simplicity of construction and outer case mounting screws

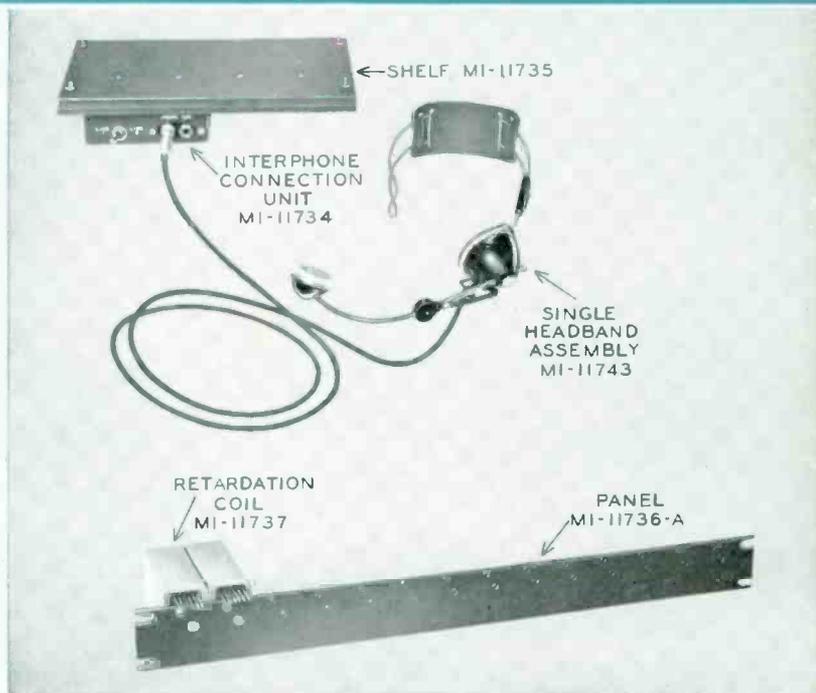


Outer case removed showing Lumiline illuminating lamp

INTERPHONE EQUIPMENT

FEATURES

- Convenient intercom with studio personnel or remote line as desired
- Can mount to console, desk, or wall
- Designed to be compatible with RCA TV equipment
- Simple circuit with anti-sidetone feature
- Regulated power supply



USES

RCA Interphone Equipment is designed to provide convenient switching and headset connection facilities for an internal communication system. Such a system is particularly useful for the radio or television broadcast studio since it allows talking and listening with selected personnel

and with a conference bus or remote private line as desired. Any number of interphone connections may be used. The 24-volt d-c regulated power supply provides interphone power for a system using up to 30 headsets simultaneously.

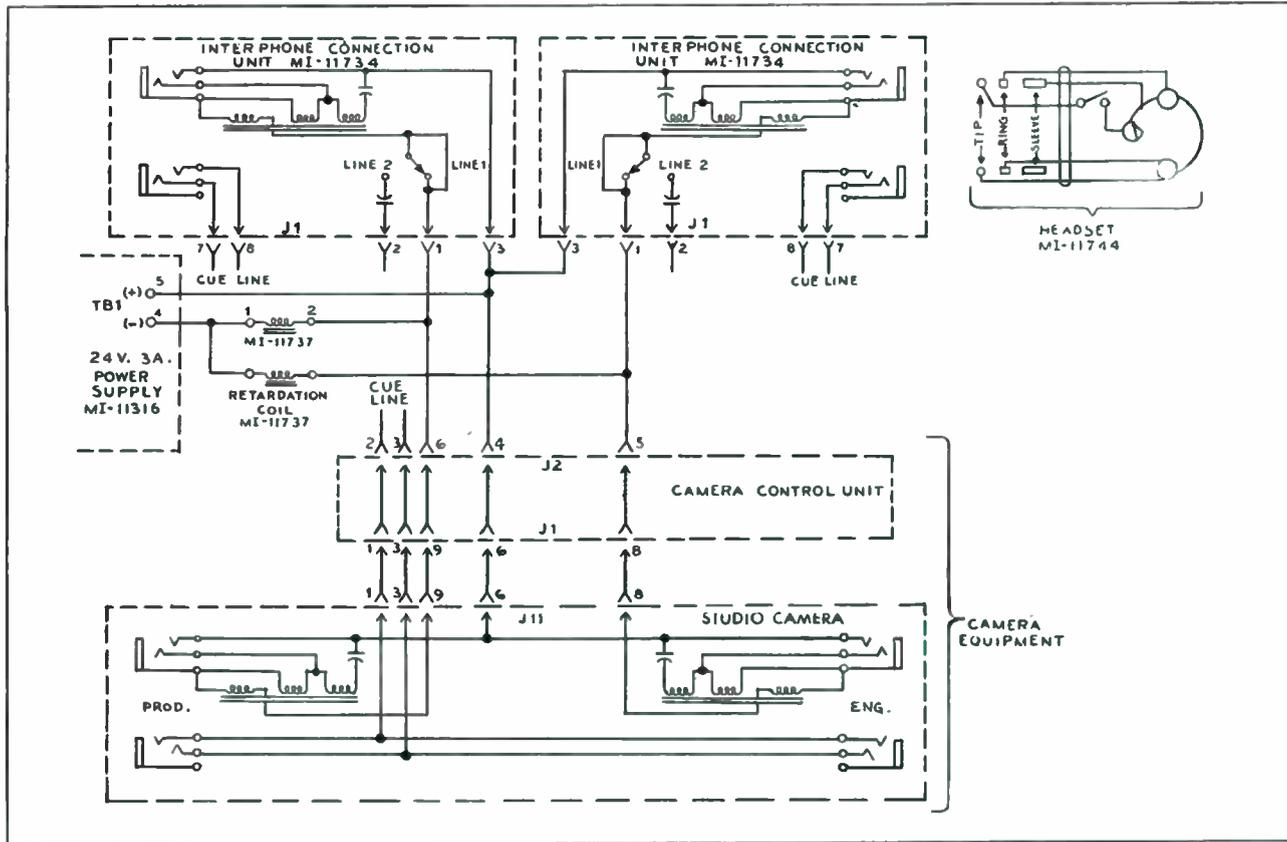
DESCRIPTION

Heart of the Studio Interphone System is the interphone Connection Unit, MI-11734, which consists of a compact jack box designed for plate mounting. The unit consists of a simple circuit having an induction coil and capacitor to provide an anti-sidetone feature. This results in local sounds being partially cancelled in the local earpiece. The circuit is housed in a small metal box having two phone jacks for use either with a single or a double headset as required, and a two-position toggle switch for selecting a local circuit or a remote line. A cable plug is mounted in the rear.

A Retardation Coil, MI-11737, permits simultaneous use of four carbon microphones such as one interphone connec-

tion unit and three camera headsets on a common battery or power supply. The coil permits a d-c power voltage to be imposed upon the two-wire telephone talking line. This audio frequency choke minimizes the effect of the power supply from lowering the two-wire telephone impedance at voice frequencies, and also allows adequate flow of direct current.

Mounting Panel, MI-11736-A, will permit mounting up to 14 retardation coils in the rack. Either a Single Headband Assembly, MI-11743, or a Double Headband Assembly, MI-11744, can be used for listening and talking with the Studio Interphone System.



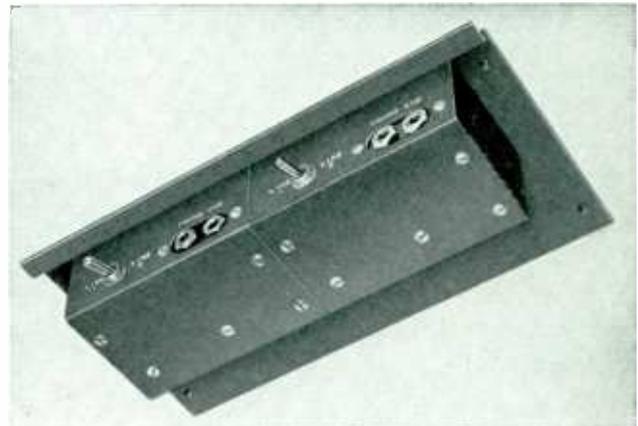
Schematic diagram of typical Interphone System.

SPECIFICATIONS

- D-C Resistance (Headset):
 Microphone Switch On 70 ohms approximately
 Microphone Switch Off Infinite
- Inductance at 1000 Cycles (Headset):
 Microphone Switch On 70 millihenries approximately
 Microphone Switch Off 245 millihenries
- D-C Resistance (Retardation Coil)..... 165 ohms
 Inductance (Retardation Coil)..... 3.4 henries
 Maximum Recommended Load Current..... 125 ma d-c
 Power Supply Regulated 24 volts, 3 amps, d-c
- Dimensions:
 Interphone Connection Unit 4 5/8" x 4 1/4" x 2 3/16"
 Retardation Coil..... 4 5/8" x 1 45/64" x 1 3/16"
 Mounting Plate..... 11" x 6 3/8"
 Retardation Coil Panel, MI-11736 19" x 1 3/4" x 3/16"
 Retardation Coil Panel, MI-11736-A 19" x 1 3/4" x 3/16"
 Regulated Power Supply..... 9" x 7 3/4" x 5 3/4"
- Weight:
 Interphone Connection Unit..... 1 lb., 11 ozs.
 Retardation Coil 15 ozs.
 Retardation Coil Panel, MI-11736 19 ozs.
 Retardation Coil Panel, MI-11736-A 18 ozs.
 Single Headbond Assembly..... 6 ozs. (less cord)
 Double Headbond Assembly..... 9 ozs. (less cord)
 Regulated Power Supply..... 25 lbs. (net)

Stock Identification of Interphone Components:

Interphone Connection Unit.....	MI-11734
Retardation Coil	MI-11737
Shelf for Mounting MI-11734.....	MI-11735
Panel (Accommodating 14 Retardation Coils).....	MI-11736-A
Single Headbond Assembly.....	MI-11743
Double Headbond Assembly.....	MI-11744
Regulated Power Supply.....	MI-11316



Console Shelf, MI-11735, has mounting accommodations for two Interphone Connection Units.

FEATHERWEIGHT HEADSETS

MI-11749 AND 11750

FEATURES

- Extremely lightweight—smooth, comfortable fit—can be worn for extended periods of time without fatigue
- High sensitivity
- Sturdy bakelite shells and caps
- Six-foot water-resistant cord
- Concealed terminals
- Choice of single or double ear-phones



USES

The MI-11749 and 11750 Featherweight Headsets are extremely lightweight offering the utmost wearing comfort for those engaged in control room monitoring, remote pickups, and other broadcast applications requiring headphone use. Both Single Headset, MI-11749, or Double Headset, MI-11750, are high quality units of durable molded black plastic, attractive in appearance, sensitive in response, and comfortable for use.

DESCRIPTION

The Featherweight Single Headset, MI-11749, consists of a single durable molded black plastic earphone, 2 1/4" in diameter attached to a 1/4" wide stainless spring steel headband adjustable for optimum wearing comfort. The phone has concealed terminals and is extremely sensitive, equaling in clarity and volume most double headsets. The headset has a d-c resistance of 2000 ohms and impedance of 9000 ohms. The unit weighs approximately 2 ounces.

The Double Headset, MI-11750, weighs only 4 1/2 ounces, and consists of double earphones identical to those of the single headset, mounted by spring adjustments to a double fabric covered double wire band headband. The unit has a d-c resistance of 5000 ohms and an impedance of 24,000 ohms.

Both headsets are fitted with a 6 foot water-resistant cord with a popular phone style plug. The bakelite body is practically non-breakable. The plug is 2 7/8" long overall, with 1 1/2" prong, 1/4" in diameter which fits all standard jacks. The cord pin tips are held by set screws.

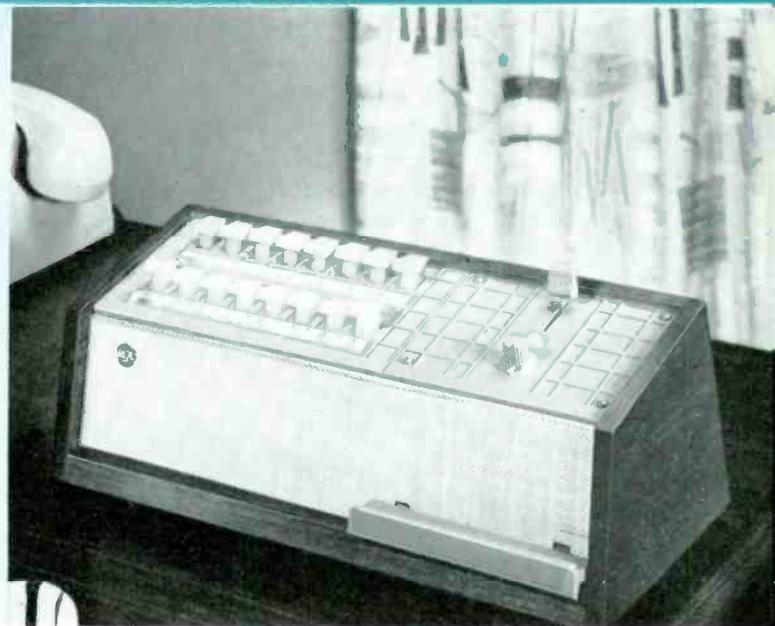
SPECIFICATIONS

	Single Earphone	Double Earphone
D-C Resistance	2,000 ohms	5,000 ohms
Impedance	9,000 ohms	24,000 ohms
Earphones	2 1/4" dia.	2 1/4" dia.
Terminals	Concealed	Concealed
Plug	Standard 1/4" jack	Standard 1/4" jack
Weight	2 ozs.	4 1/2 ozs.
Stock Identification	MI-11749	MI-11750

TRANSISTORIZED INTERCOM EQUIPMENT

FEATURES

- Excellent speech reproduction
- Compact, attractively styled cabinets
- Transistorized Amplifiers—low power consumption
- Easily installed
- Many models available to handle varied intercom needs
- Systems readily rearranged, or expanded— instant call—no warm-up provided



USES

RCA Transistorized Intercom is a new electronic intercommunication system which provides instant two-way voice communication. Its application covers all segments of industry, commerce, and institutions. Multi-Com can be effectively and economically applied wherever walls and distance separate individuals who must communicate. The equipment is easily installed, simple to operate, and requires little maintenance. It features excellent speech characteristics and reproduction quality, permitting the user to talk in normal, conversational tones.

The Intercom system has been designed to offer the high degree of flexibility required to meet a complete range of intercom functions and requirements. A complete system may consist:

- 1) Entirely of master instruments.
 - 2) Of one master instrument and one or more remote units.
 - 3) Of a combination of a number of master instruments, each with one or more remote or multiple remote units.
- Master instruments can be wired for confidential telephone operation.

DESCRIPTION

The RCA Transistorized Intercom equipment consists of master stations and compatible remote units that operate from a central, low-voltage power supply, rated 2 amperes, 30 watts, the voltage of which does not exceed 15 volts. The system permits the master station to call up 32 remote units by voice or any of the remote units to call the master station by signal lights. The system is entirely private for all combinations of units.

Intercom equipment is compact and handsomely styled to complement any office decor. Cabinets provided are of hand-rubbed walnut or blonde finish.

The master station contains a combination of loudspeaker-microphone, volume control, talk-listen switch, station

selector keys, a red busy light, and a chime to give audible indication of a call. The master stations are supplied with 8, 16, 24 or 32 selector keys depending on size system required. The selector keys are of the push type with a simple release mechanism, and are made of a translucent plastic that is illuminated by the call lights. The 8 and 16 key units are housed in cabinets measuring 12¾ inches long, 4½ inches high and 6¼ inches deep. Cabinets housing the larger 24 and 32 key master stations are 19¾ inches long.

The remote units are housed in matching cabinets 5½ inches long, 4½ inches high and 6¼ inches deep. They are equipped with a talk-listen switch and a volume control to adjust listening level.

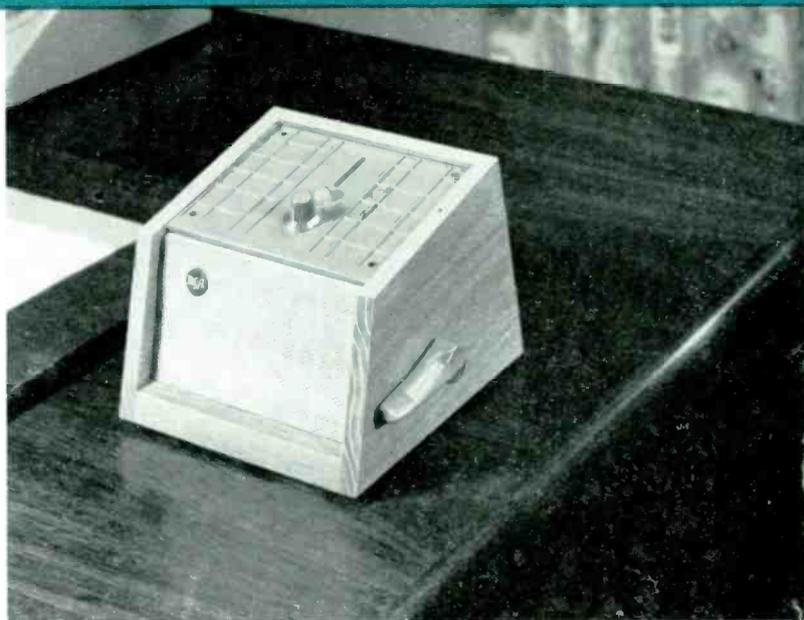
Both master stations and remote units employ three-inch dynamic loud-speakers that are acoustically and electrically compensated to provide good speech intelligibility without loss of fidelity. The gain of the system permits normal speech at a distance of two feet from the instrument and the sound level output is sufficient for speech to be understood at a distance of three feet from the instrument in noise levels of 92 db. Lines connecting the stations and remote units are at low impedance of approximately telephone level. All amplifiers are completely transistorized and protected against damage due to the application of a reverse supply potential equal to that of the power supply. They consume no power when the station is not in use, generate no heat, yet provide instant communication without any warm-up period.

By means of auxiliary equipment the RCA Transistorized Intercom System can provide many additional service functions. Quiet, confidential talks are made possible by telephone handsets that eliminate use of the talk-listen switch. The receivers mount on a convenient, desk side-hook switch. The system is wired for telephone to telephone communication or for telephone to master communication.

Master Stations are available with an "all-call" switch. This enables the station to call any number of predetermined master or remote stations simultaneously by merely depressing the switch before speaking into the station microphone. Master Stations are also available with a special relay permitting receipt of "all-call" signals from other master station equipment, but which are not provided with "all-call" origination switch. Master stations combining both facilities are also available. In all cases, the number of stations in the system subject to the receipt of an "all-call" need not be the same as the number that can originate an "all-call." Such conference calls are possible without requiring re-adjustment in volume control settings for satisfactory operation.

SPECIFICATIONS

Power Requirements.....	12V. dc, 12V ac from central, low voltage power supply
System Impedance.....	.50 ohm balanced line
Impedance.....	Low to match telephone level
Gain.....	Sufficient for normal speech at a distance of 2 feet from the instrument
Sound Level.....	Sufficient that normal speech can readily be understood at a distance of three feet from instrument in noise levels of 92 db.
Cabinets.....	Carefully constructed walnut and blonde cabinets with smooth, hand-rubbed finish
Dimensions (overall):	
8 and 16 Key Masters.....	12¾" long, 6¼" deep, 4½" high
24 and 32 Key Masters.....	19¾" long, 6¼" deep, 4½" high
Remote Units.....	5½" long, 6¼" deep, 4½" high
Weight:	
8 and 16 Key Masters.....	5½ lbs.
24 and 32 Key Masters.....	7½ lbs.
Remote Units.....	2 lbs.



Intercom Remote Unit, MI-38505-B

Equipment Supplied

Type SJR-1W	Remote Unit Walnut Case.....	MI-38505-W
Type SJR-1B	Remote Unit Blonde Case.....	MI-38505-B
Type SXJ-2	Power Supply, 30 watts, 2A.....	MI-38506
Type SXJ-5	Power Supply, 80 watts, 5A.....	MI-38507

MASTER UNIT

Type SJ-8W	8 Station, Walnut Case.....	MI-38508-W
Type SJ-8B	8 Station, Blonde Case.....	MI-38508-B
Type SJ-16W	16 Station, Walnut Case.....	MI-38516-W
Type SJ-16B	16 Station, Blonde Case.....	MI-38516-B
Type SJ-24W	24 Station, Walnut Case.....	MI-38524-W
Type SJ-24B	24 Station, Blonde Case.....	MI-38524-B
Type SJ-32W	32 Station, Walnut Case.....	MI-38532-W
Type SJ-32B	32 Station, Blonde Case.....	MI-38532-B

MASTER UNIT WITH ALL-CALL ORIGINATION ONLY

Type SJ-8WK	8 Station, Walnut Case.....	MI-38509-W
Type SJ-8BK	8 Station, Blonde Case.....	MI-38509-B
Type SJ-16WK	16 Station, Walnut Case.....	MI-38517-W
Type SJ-16BK	16 Station, Blonde Case.....	MI-38517-B
Type SJ-24WK	24 Station, Walnut Case.....	MI-38525-W
Type SJ-24BK	24 Station, Blonde Case.....	MI-38525-B
Type SJ-32WK	32 Station, Walnut Case.....	MI-38533-W
Type SJ-32BK	32 Station, Blonde Case.....	MI-38533-B

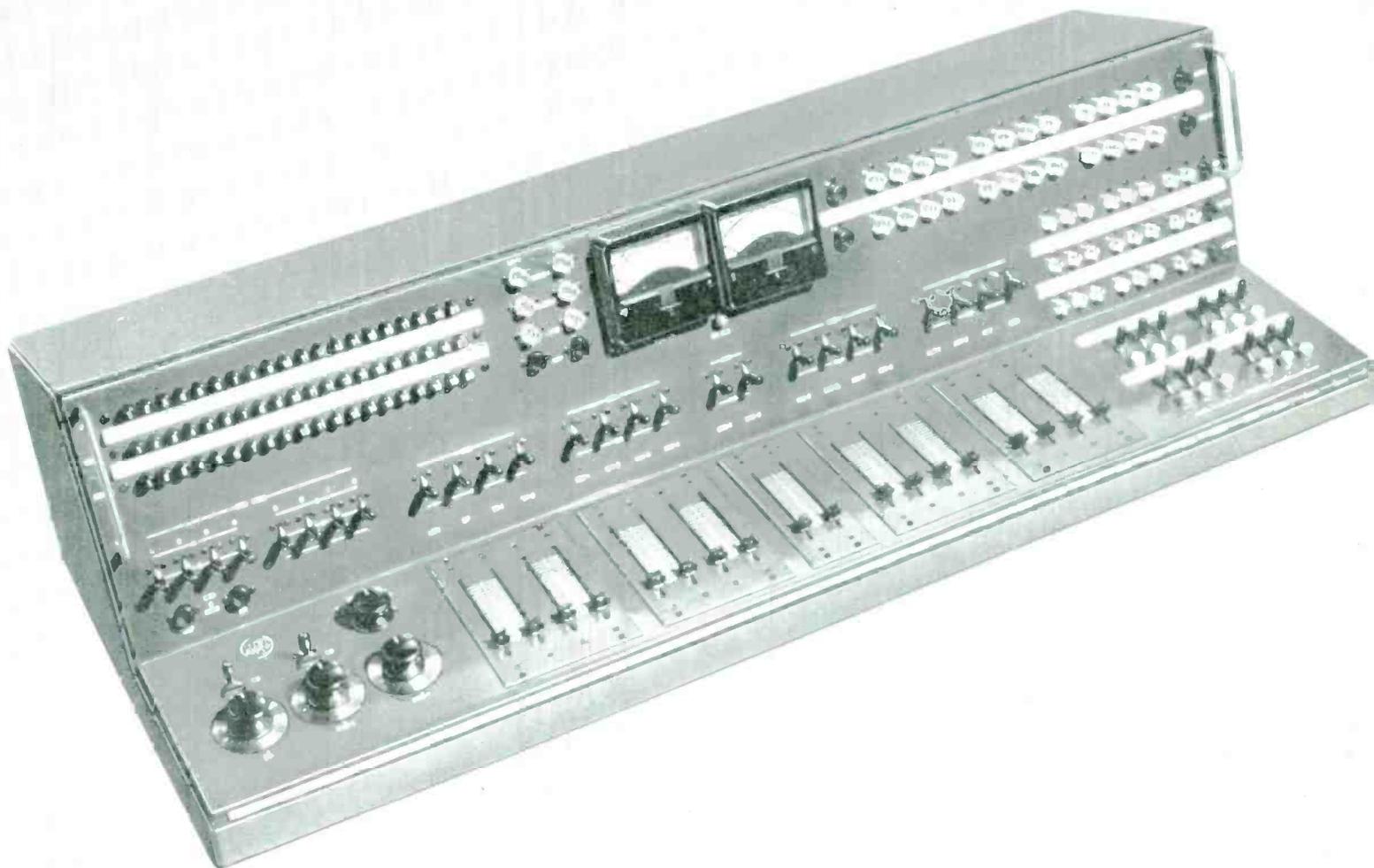
MASTER UNIT WITH FACILITY TO RECEIVE ALL-CALL

Type SJ-8WR	8 Station, Walnut Case.....	MI-38510-W
Type SJ-8BR	8 Station, Blonde Case.....	MI-38510-B
Type SJ-16WR	16 Station, Walnut Case.....	MI-38518-W
Type SJ-16BR	16 Station, Blonde Case.....	MI-38518-B
Type SJ-24WR	24 Station, Walnut Case.....	MI-38526-W
Type SJ-24BR	24 Station, Blonde Case.....	MI-38526-B
Type SJ-32WR	32 Station, Walnut Case.....	MI-38534-W
Type SJ-32BR	32 Station, Blonde Case.....	MI-38534-B

MASTER UNIT WITH ALL-CALL TO ORIGINATE AND RECEIVE REMOTES AND MASTERS

Type SJ-8WC	8 Station, Walnut Case.....	MI-38511-W
Type SJ-8BC	8 Station, Blonde Case.....	MI-38511-B
Type SJ-16WC	16 Station, Walnut Case.....	MI-38519-W
Type SJ-16BC	16 Station, Blonde Case.....	MI-38519-B
Type SJ-24WC	24 Station, Walnut Case.....	MI-38527-W
Type SJ-24BC	24 Station, Blonde Case.....	MI-38527-B
Type SJ-32WC	32 Station, Walnut Case.....	MI-38535-W
Type SJ-32BC	32 Station, Blonde Case.....	MI-38535-B

CUSTOM AUDIO EQUIPMENT



Linear faders replace knobs in this latest RCA custom designed audio control console.

FEATURES

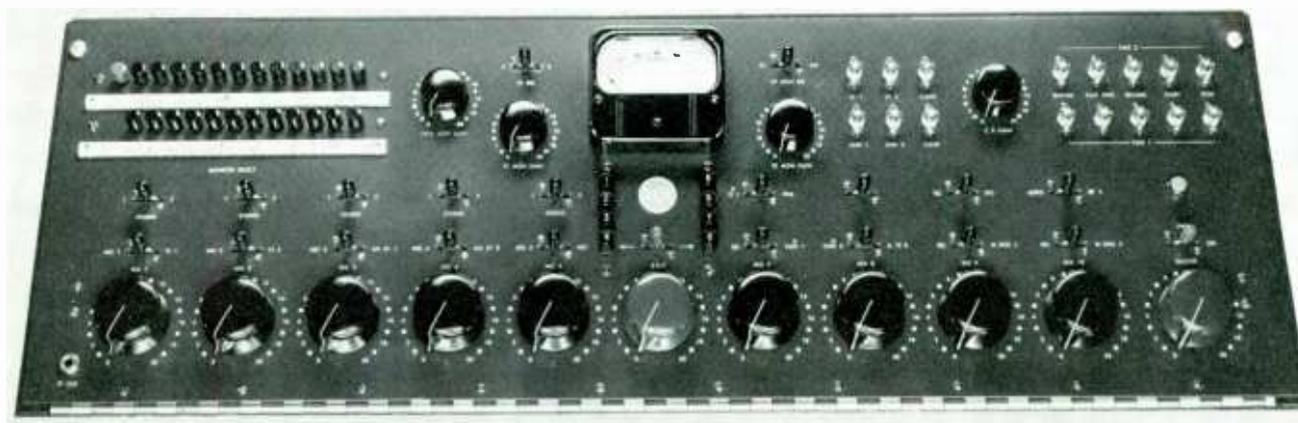
- Designs for Exact Customer Requirements
- Extensive Custom Engineering Service available for consultation
- Custom designs provide means for complete automation later, if desired
- Increased operating efficiency
- Reduced operating expense
- Instant "fool-proof" switching
- Increased station prestige with clients
- Possibilities for new business . . . More programs handled

In addition to a comprehensive line of standard studio control equipment, RCA specializes in custom designing and building complete speech-input systems to meet individual needs of stations and networks. Our engineers have worked closely with the nation's leading broadcast engineers in the design, production and installation of many custom equipments, a few of which are pictured on these pages. Studio-control systems such as these are tailor-made, combining just the right facilities for the control of program operations and the reproduction of high-fidelity sound.

Since no two broadcast stations have exactly the same operating requirements, equipment needs will differ for

each installation, ranging from special equipment for small and medium-size stations to more complex systems for the largest installation. In planning new installations, this "Custom-built" equipment service is available to every AM, FM, or Television station, and it includes the services of an entire RCA engineering staff. Broadcast station engineers, in some cases, may wish to lay out and design the system themselves, complete with specifications. In these instances, RCA will provide specifically built units or modify standard equipment to meet these specifications. On the other hand, where stations desire, RCA engineers will study station requirements, make overall and detailed layouts, and draw up specifications for equipment needed.

EXAMPLES OF RCA CUSTOM AUDIO EQUIPMENT

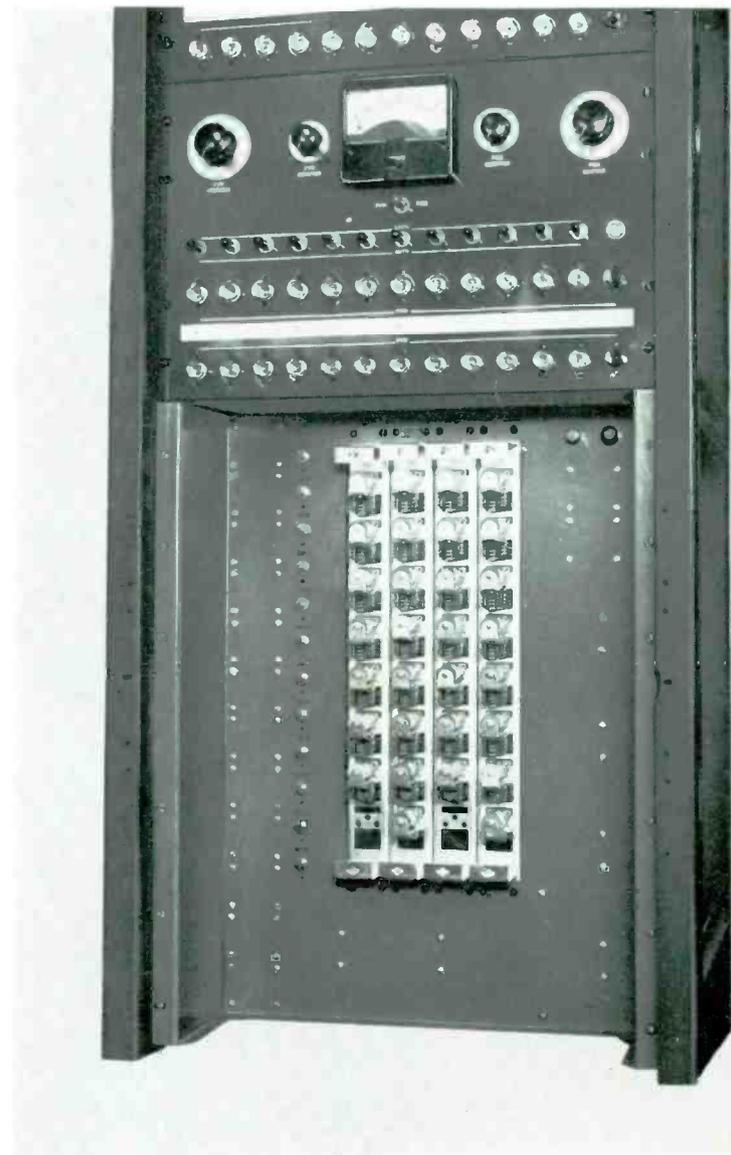


The custom audio console, shown here, was designed and built for WKRC. It includes many unique features, such as built-in remote control for two tape recorders including rewind, fast forward, record, start, and stop positions.

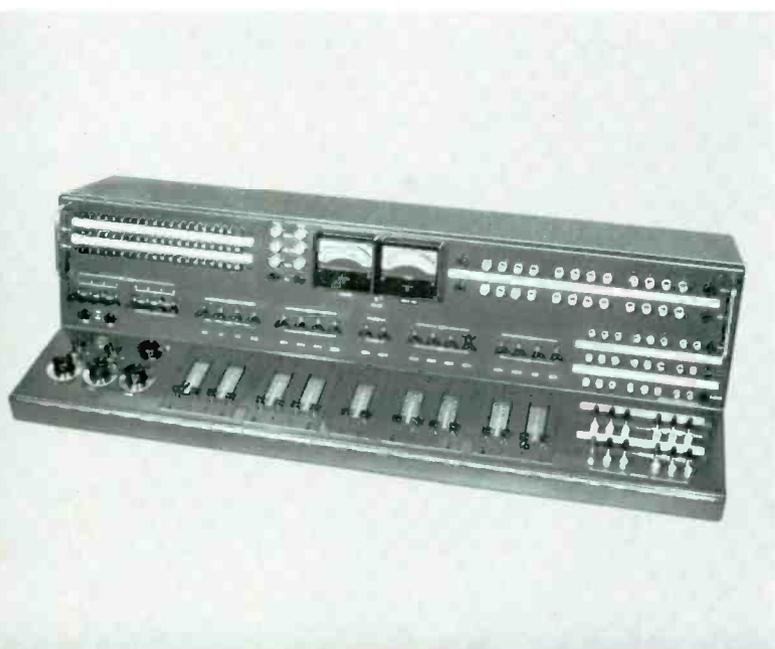


◀ Control and switching units used in the WTAE automation equipment. It permits switching of 15 program or preview program sources.

This is a custom relay switcher and control panel designed for the Triangle Publications Stations. Twelve program or preview program sources can be switched manually from the control console or by the automation system. ▶

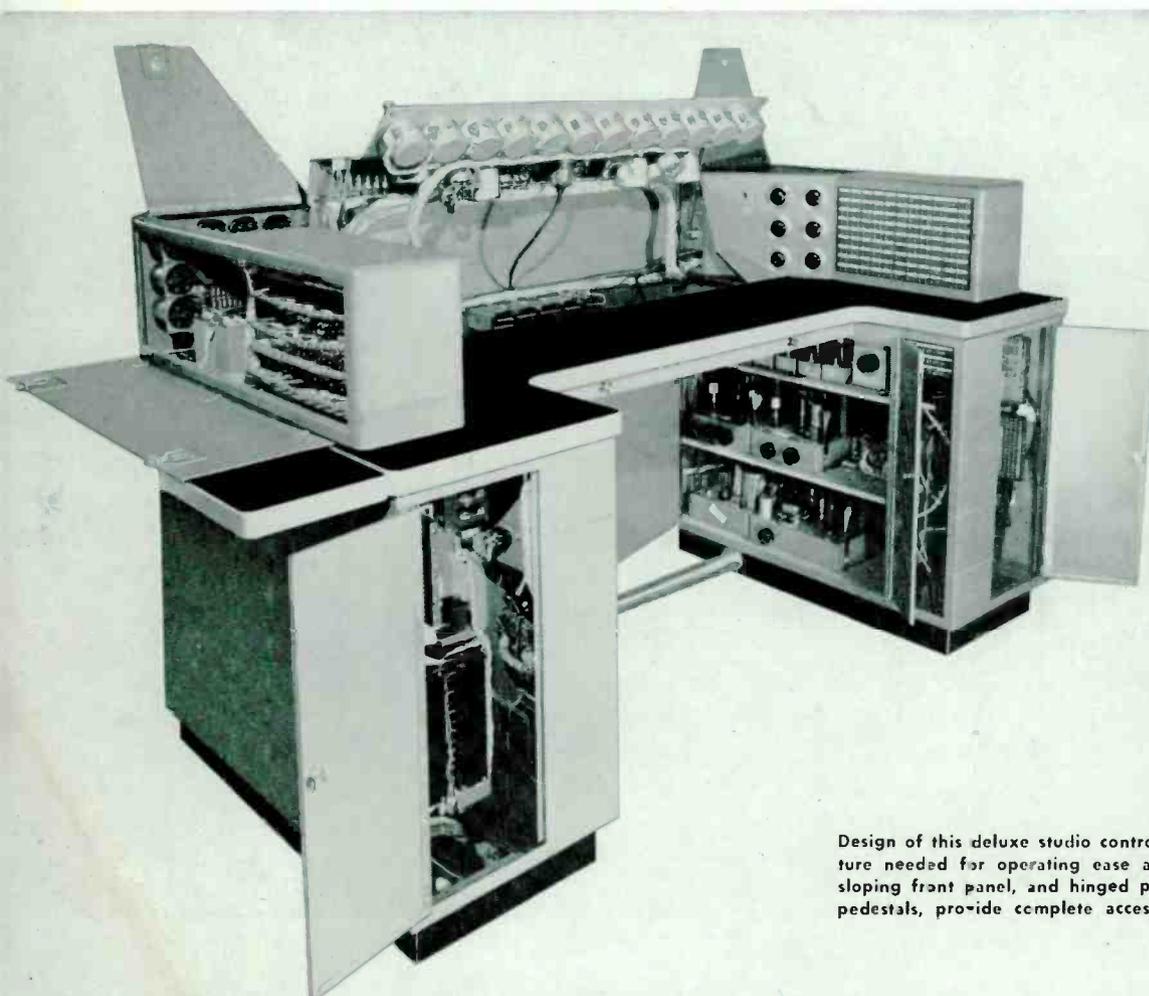
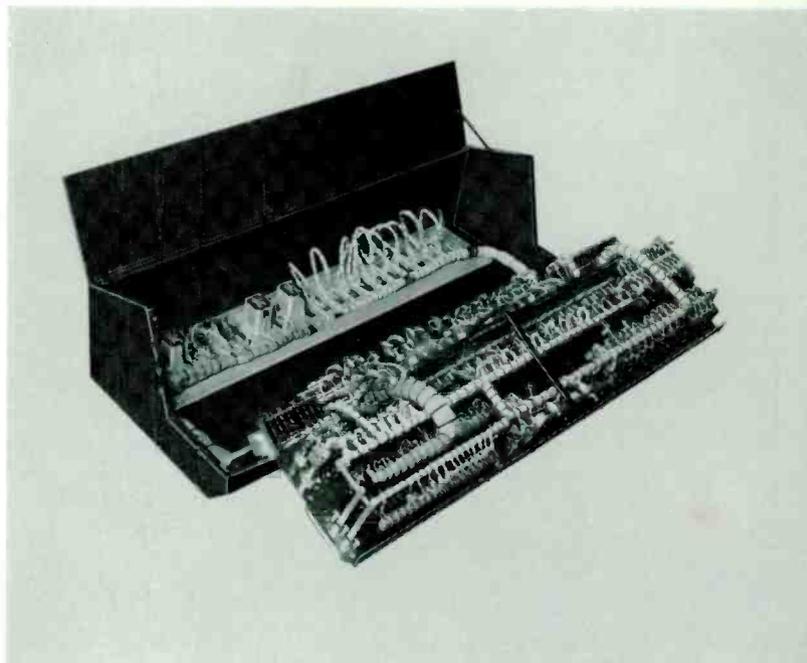
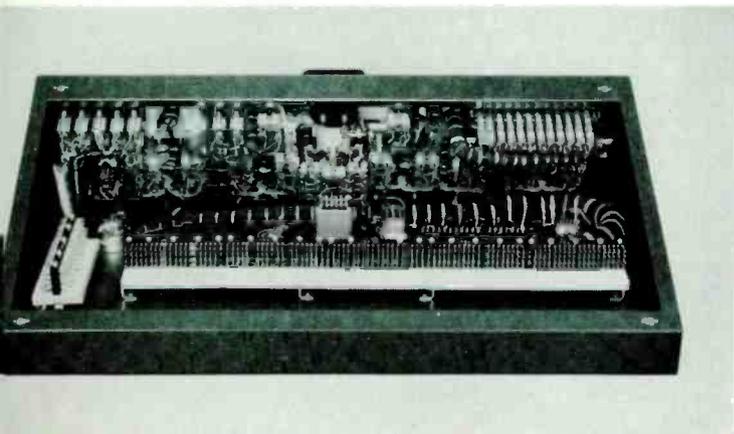


◀ Custom Control Console providing for twenty switchable inputs. The use of linear faders adds much to the versatility of the unit.



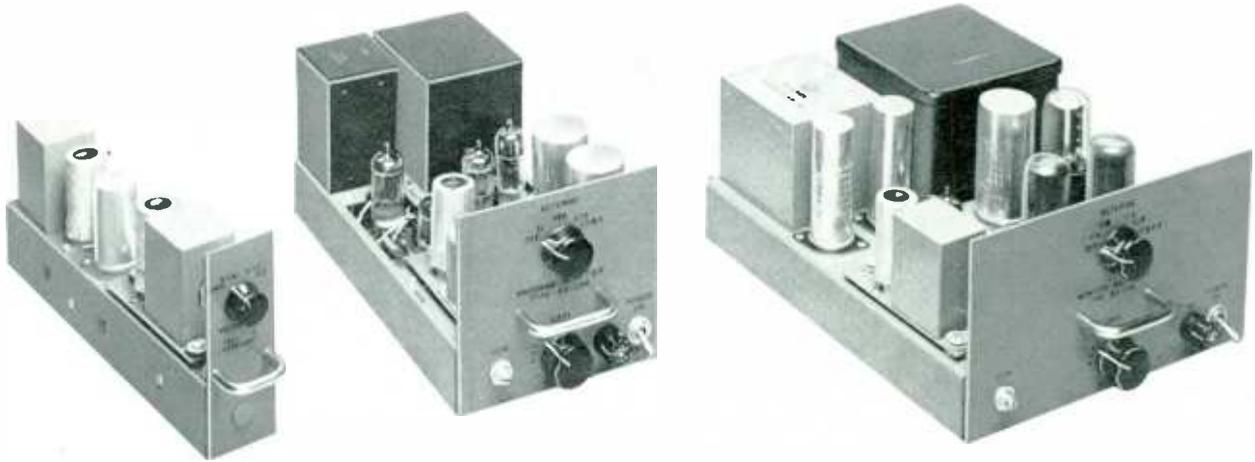
Custom equipment receives special attention to details, for instance precision wiring, and tilting panel for ease of maintenance. ▶

Precision and high quality design and workmanship make RCA custom audio equipment the best. Here all panel mounted contacts and components are exposed for maintenance. ▼



Design of this deluxe studio control console includes every feature needed for operating ease and convenience. The hinged sloping front panel, and hinged panel doors to all turrets and pedestals, provide complete accessibility to every component.

BROADCAST AMPLIFIERS



FEATURES

- Uniform performance
- Excellent frequency response
- Small size—handling ease
- Convenient front panel controls
- Suitable for rack, cabinet or shelf mounting
- Tube metering circuits
- High gain, low noise circuitry
- Reduced size accessories

DESCRIPTION

The RCA line of high-fidelity speech input amplifiers has been designed to provide stations with studio, recording and portable remote amplifiers which will offer the maximum in fidelity, flexibility, convenience and reliability. All amplifiers are suitable for FM having a uniform response to 15,000 cycles. Distortion and noise levels have been reduced to a very low value through careful engineering design and construction.

Attention is invited to gain and level references in this catalog, as follows:

db—refers to gain.

dbm—sine wave power measurement referred to 1 mw.

VU—refers to average program level as read on a standard VU meter. This value is subject to considerable variation from dbm but is generally considered 10 db below peaks.

Allowance must be made for program peaks to avoid amplifier overloading, for example, a pre-amplifier rated at +10 dbm should not be operated at more than 0 V'.

BA-21A PREAMPLIFIER AND ISOLATION AMPLIFIER



DESCRIPTION

The BA-21A is an ideal unit for use as a microphone preamplifier, turntable preamplifier or booster amplifier. Its high output level makes it applicable as a line amplifier. It may also be used as an isolation and bridging amplifier.

The BA-21A has been designed to obtain high gain using one RCA MI-11299, selected 12AY7 tube in the input stage and one 12AY7 in the output stage. The tubes are mounted vertically and the first stage is shock mounted to prevent microphonics. The circuit is conventional with unloaded input transformer, resistance-capacitance coupling between stages and transformer output. The distortion and hum level has been reduced to a very low value through proper circuit design and through the use of stabilized feedback. Cross talk between units is -75 db, 30 to 15,000 cycles when mounted side by side and operated from the BX-21A Power Supply.

With the addition of the MI-11278-E or F volume control kit to provide a 10,000 ohm input, the BA-21A may also be used as a bridging or isolation amplifier. The MI-11278-E or F kits can be mounted on the BA-21A chassis and be adjusted by either knob or screw driver. The MI-11278-F can be used for panel mounting remote from the amplifier.

As a bridging amplifier, the BA-21A has a maximum of 4 db gain with the volume control at minimum loss position

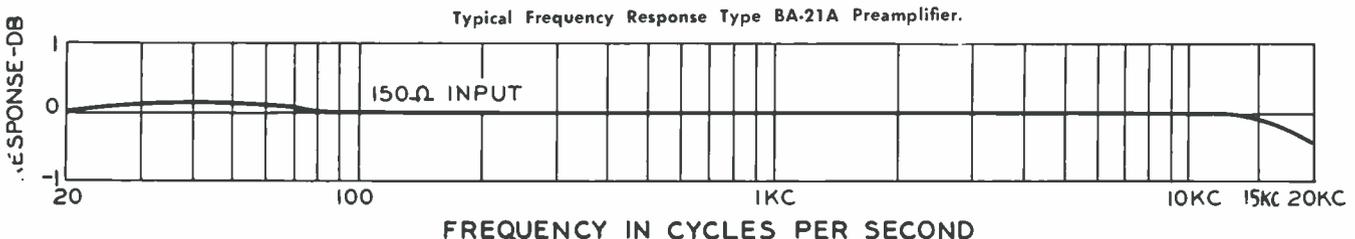
and bridging a 600-ohm line. Approximately 80 db of isolation between output and input is obtained with the amplifier in this arrangement. A switch is provided for metering a portion of the cathode voltage of each tube when connected to a high-resistance voltmeter such as the Type BI-1B. The unit is designed to operate from the BX-21A Power Supply or its equivalent. The power requirements are 6.3 volts a-c or d-c at 0.6 amperes and 285 volts d-c at 10 ma. Up to ten BA-21A Preamplifiers can be installed in a single BR-22A Panel and Shelf assembly and operated from one BX-21A Power Supply.

SPECIFICATIONS

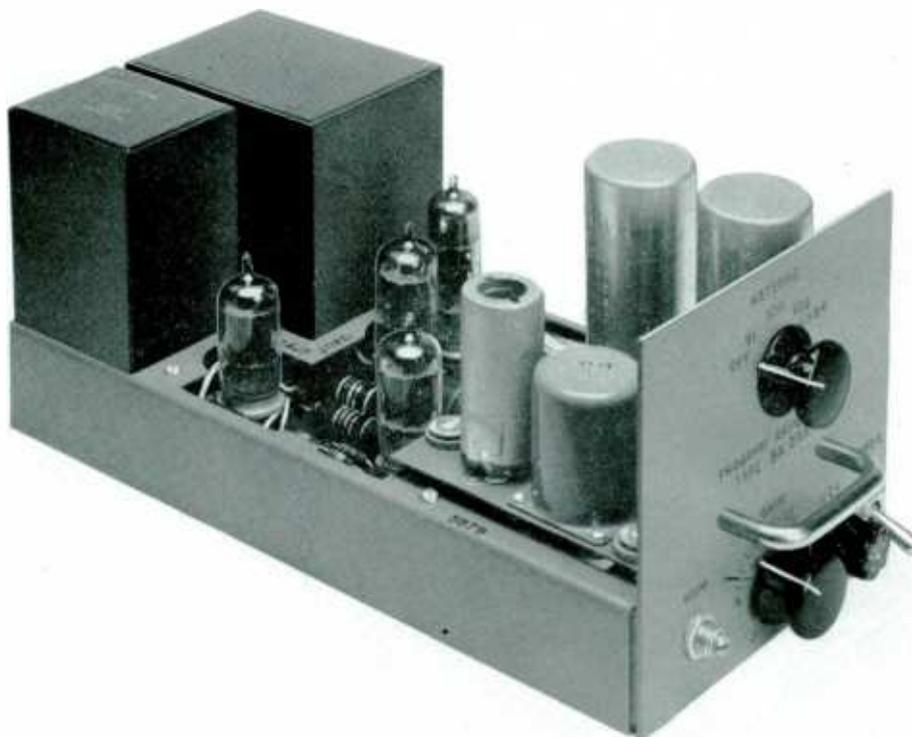
BA-21A AS PREAMPLIFIER:	
Source Impedance.....	37.5/150/600 ohms
Input Impedance (unloaded input transformer).....	Substantially above source impedance
Load Impedance (balanced or unbalanced).....	150/600 ohms
Maximum Input Level.....	-22 dbm
Maximum Output Level.....	18 dbm
Gain.....	40 db \pm 1 db
BA-21A AS ISOLATION AMPLIFIER (with MI-11278 Series Volume Control):	
Source Impedance.....	Up to 600 ohms
Input Impedance (through Volume Control).....	10,000 ohms
Load Impedance (balanced or unbalanced).....	150/600 ohms
Maximum Input Level, Volume Control at max.:	
Bridging 600 Ohms.....	14 dbm
Bridging 150 Ohms.....	20 dbm
Maximum Output Level.....	18 dbm
Maximum Gain.....	4 db
BA-21A AS EITHER PREAMPLIFIER OR ISOLATION AMPLIFIER	
Frequency Response.....	\pm 1 db 30-15,000 cps
Noise Level (Input and Output Terminated):	
Output.....	-82 dbm
Referred to Input.....	-122 dbm
Harmonic Distortion (18 db Output).....	0.75% at 30 cps
	0.5% at 50 to 15,000 cps
Tube Complement:	
1—Selected 12AY7, 1—12AY7	
Plate Power Supply.....	285 volts d-c at 10 ma
Filament Supply.....	6.3 volts a-c or d-c at 0.6 amps
Dimensions, Overall.....	Length 12 1/2", width 1 5/8", height 4 1/16"
Finish.....	Umber gray
Weight (unpacked).....	2 1/2 lbs.
Stock Identification (includes tubes).....	ES-11121

Accessories

Tube Kit (complete tube complement).....	MI-11482
Bridging Gain Control Kit (Screw-driver adjustment).....	MI-11278-F
(Knob adjustment).....	MI-11278-E
BX-21A Preamplifier Power Supply (furnishes filament and plate power for 1 to 10 BA-21A Preamplifiers).....	MI-11317
Type BI-1B Meter Panel (umber gray).....	MI-11388
BR-22A Mounting Shelf for rack mounting 1 to 10 preamplifiers or 1 power supply and 6 preamplifiers.....	MI-11597



BA-23A PROGRAM AMPLIFIER



FEATURES

- Etched wiring provides compact size and uniform performance
- Plug-in type for shelf mounting
- Maximum accessibility and dependable service
- Excellent frequency response
- High gain—low distortion—low noise level—high output
- Provision for tube metering
- Economical in price
- Small size
- Self-contained power supply

USES

The new BA-23A Program Amplifier is a very versatile high-fidelity amplifier designed for broadcast service. It incorporates special, high-quality, long-life components throughout and provides a maximum of accessibility to all circuit components. Its high gain and low distortion makes it ideal for use as: (1) Program or Line Amplifier, (2) Bridging Amplifier, (3) Isolation Amplifier.

The BA-23A is a plug-in type amplifier which has been designed for use with the BR-22A Mounting Shelf. This shelf permits quick and easy removal for servicing or interchanging units. The Type BR-22A Shelf provides mounting space for three Type BA-23A amplifiers with space for one additional preamplifier.

DESCRIPTION

The BA-23A employs etched wiring to insure uniformity of performance. It uses resistors with plenty of wattage rating in reserve and hermetically sealed transformers. Thus long-life, trouble-free operation and extreme accessibility of parts is assured. Components on the printed circuit board can be easily replaced.

All connections to the BA-23A are made through a 15 prong connector at the back of the amplifier which plugs into a socket supplied with the amplifier. Connections are provided from each cathode circuit through a selector switch to terminals on the plug. These connections permit metering of tube conditions by means of a high resistance voltmeter such as the RCA Type BI-1B.

The BA-23A Program Amplifier has three stages of amplification with an additional phase splitter driving the push-pull-parallel output stage. The input stage utilizes a type 5897 low noise pentode. A 12AX7 twin triode is used as second stage and phase inverter. The push-pull output stage consists of two 12AU7 tubes having their sections connected in parallel. A 6X4 is used as full wave rectifier in the self-contained power supply.

The gain control follows the input transformer to permit high level input without overloading the input stage. A continuous composition type control is used in the ES-11123 Program Amplifier, but space has been provided for a step type attenuator, if desired. A gain reduction of 15 db with a corresponding reduction in noise level may be obtained by changing a jumper on a voltage divider in the grid circuit of the second stage.

Inverse feedback is supplied from a tertiary winding of the output transformer to the cathode of the driver stage to stabilize gain and frequency response and to reduce distortion.

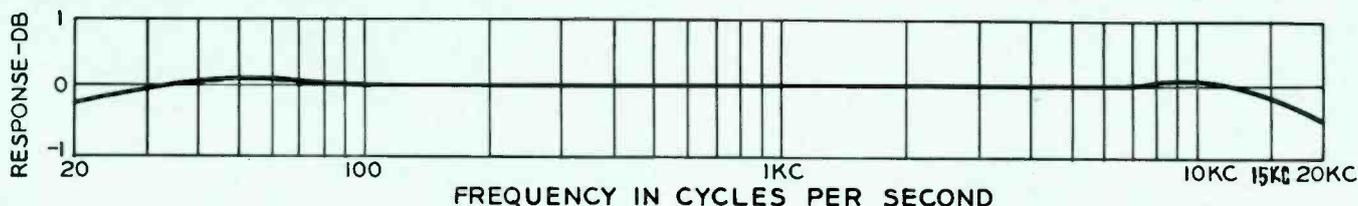
SPECIFICATIONS

Source Impedance.....	150/600 ohms balanced or unbalanced
Input Impedance (Matching).....	150/600 ohms
Input Impedance (Bridging).....	20,000 ohms
Load Impedance.....	150/600 ohms
Output Impedance.....	25/100 ohms
Maximum Input Level (Matching).....	-10 dbm
Maximum Input Level (Bridging).....	27 dbm
Maximum Gain (Matching).....	70 \pm 1 db high, 55 \pm 1 db low
Maximum Gain (Bridging).....	33 \pm 2 db high, 18 \pm 2 db low
Frequency Response.....	\pm 1 db 30-15,000 cps
Harmonic Distortion.....	0.5% rms max. at 30 dbm output, 30-15,000 cps
Noise Level (at output).....	-47 dbm at 70 db gain -62 dbm at 55 db gain
Metering Voltage.....	1.0 volt
Tube Complement:	
1—Selected 5879, 1—12AX7, 2—12AU7, 1—6X4	
Power Required.....	100-130 v, 50/60 cps 30 w (Transformer taps at 105, 115 and 125 v)
Mechanical Dimensions:	
Length.....	Chassis 10 $\frac{3}{8}$ " , overall 12 $\frac{1}{2}$ "
Height.....	4 21/32"
Width.....	5"
Weight.....	9 lbs.
Finish.....	Light umber gray lacquer
Mounting.....	Plug-in mounting on MI-11597 Mounting Shelf, Type BR-22A. The BA-23A Amplifier requires 3/10 of the shelf space. Three BA-23A Program Amplifiers may be mounted on one BR-22A Mounting Shelf with space for one additional BA-21A Preamplifier.
Stock Identification (includes tubes).....	ES-11123

Accessories

Tube Kit.....	MI-11480
Meter Panel, Type BI-1B (provides tube metering for 17 amplifiers).....	MI-11388
Mounting Shelf (for rack mounting of 3 BA-23A program amplifiers; requires 5 $\frac{1}{4}$ " of vertical rack space).....	MI-11597
Step Attenuator.....	MI-11751-2

**FREQUENCY RESPONSE
MI-11246-A PROGRAM AMPLIFIER
TYPE - BA-23A**

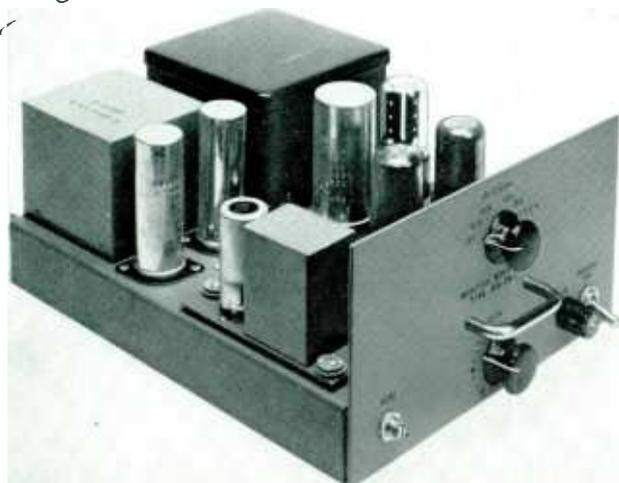


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BA-24A MONITORING AMPLIFIER

FEATURES

- Self-contained power supply
- High gain—used directly in talk-back circuits, without preamplifier
- 8 watts output with low distortion—uses feedback
- Suitable for cabinet or shelf mounting
- Ideal for recording and playback
- Tube metering circuits



DESCRIPTION

A high quality, high gain amplifier suitable for driving a loudspeaker directly from a microphone or turntable output. It has four stages of amplification with an interstage gain control. A phase splitter drives the push-pull output stage. Negative feedback is utilized to reduce distortion, stabilize gain and frequency response. The power supply is self-contained. The hum level is reduced to a minimum through the use of well shielded transformers, low noise tubes and careful circuit layout. A metering switch on the front panel is provided to check the condition of the tubes, with the metering voltage of 1 volt brought out at the connector plug.

The BA-24A is a high fidelity, high gain flexible 8 watt amplifier suitable for monitoring, audition, recording, and talk-back applications or it may be used in emergencies as a program or line amplifier. It is ideal for transcription playback booths since its 105 db gain is sufficient to operate an (LC-1A) Speaker directly from the output of a (BQ-51A) Turntable. The high gain feature also allows its use directly in studio talk-back circuits without an intervening preamplifier. The BA-24A is an excellent recording amplifier being suitable for both high quality recording and playback applications. Two may be mounted in a type BR-22A Mounting Shelf. The BA-24A has a plug-in type chassis using multi-conductor plugs.

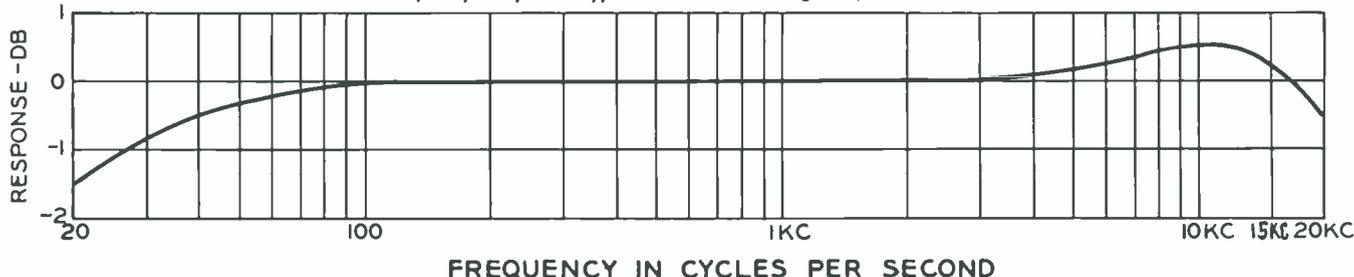
SPECIFICATIONS

Source Impedance.....	37.5/150/600 ohms
Input Impedance.....	Unloaded transformer, high in comparison with source impedance
Load Impedance.....	4/8/16/150/600 ohms
Output Impedance (approx.).....	1.3/1.8/3/21/78 ohms
Maximum Input Level.....	-30 dbm
Maximum Gain.....	104 db \pm 2 db
Frequency Response.....	\pm 2 db 30-15,000 cps
Maximum Output Level.....	10 watts (40 dbm)
Harmonic Distortion.....	Less than 1% 100-7500 cps
At 8 W (39 dbm output).....	Less than 2% 50-15,000 cps
Noise Level.....	-122 dbm referred to input (-18 dbm at output at 104 db gain)
Metering Voltage	1 volt
Tube Complement:	
	1—Selected 12AY7, 1—12AX7, 2—6V6-GT/G, 1—5Y3-GT/G
Power Requirement.....	100-130 volts, 50-60 cps, 70 watts
Dimensions:	
Length	10 $\frac{3}{8}$ " , 12 $\frac{1}{2}$ " overall
Width	8 $\frac{3}{8}$ "
Height	4 21/32"
Weight	16 $\frac{1}{4}$ lbs.
Finish.....	Light umber gray
Mounting.....	Plug-in mounting on BR-22A Mounting Shelf. Requires half the shelf space (two amplifiers may be mounted on each shelf.)
Stack Identification (includes tubes).....	ES-11124

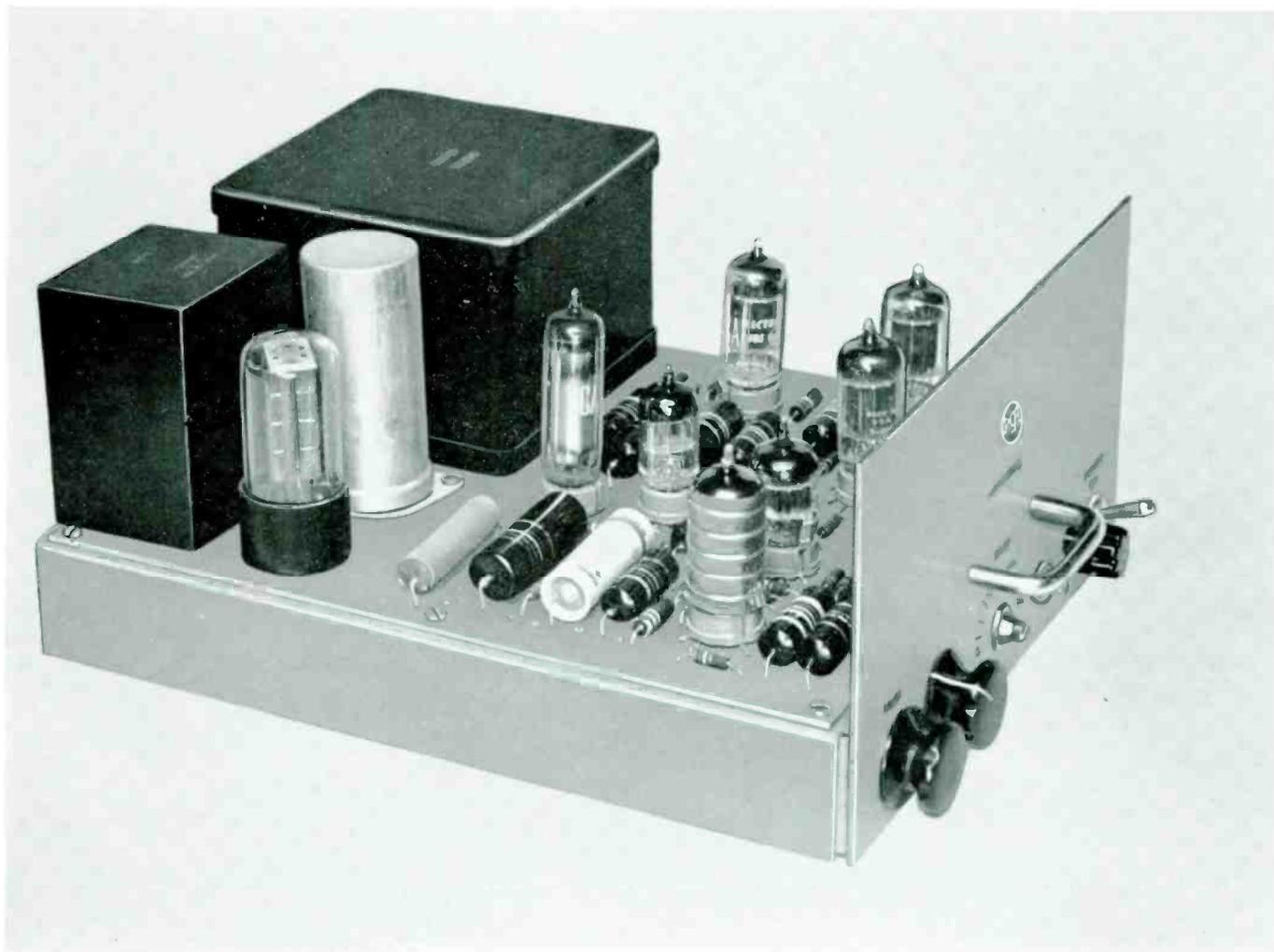
Accessories

Tube Kit	MI-11481
BR-22A Mounting Shelf (mounts two BA-24A).....	MI-11597
Meter Panel (for 17 amplifiers) (BI-1B).....	MI-11388
Bridging (remote volume control).....	MI-11278-E or F

Frequency Response Type BA-24A Monitoring Amplifier.



BA-25A AGC PROGRAM AMPLIFIER



FEATURES

- Maintains nearly constant average output level over wide variations of average input level
- Feedback circuits provide excellent frequency response—low harmonic distortion
- Small, compact, plug-in construction
- Provides automatic fading or remote gain control
- Self-contained power supply
- Metering switch provides quick tube check
- Convenient front panel controls
- Stabilized bias voltage

USES

The RCA Type BA-25A Automatic Gain Controlled Program Amplifier is an automatic level control unit designed to automatically control variations in audio program level. The unit is capable of maintaining a nearly constant average output level over wide variations of average input level. Such variations are often encountered when switching between the output of projectors, turntable pre-amps and other sound sources.

The amplifier may also be used in conjunction with an external bias source for remote gain control or automatic fading. This permits unattended remote audio operation. It may also be used as a program line compressor or as a master gain control for program line. The BA-25A may be used as a microwave input audio control, as an automatic fader control, or as a straight program amplifier without level control by removal of one tube disabling the automatic level control circuit.

DESCRIPTION

The new BA-25A Automatic Gain Controlled Program Amplifier is a small, compact amplifier mounted on a plug-in chassis for easy maintenance and replacement. Two amplifiers can be mounted on the MI-11597 Mounting Shelf which requires but 5.25 inches of rack space.

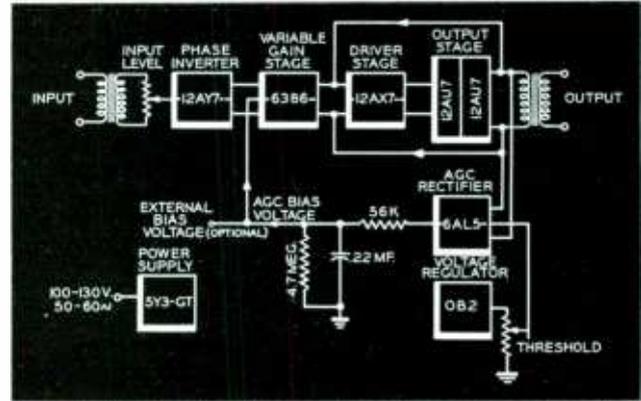
The circuitry of the BA-25A is straightforward. The input signal is applied through an input transformer and input level control to a phase splitter. The phase splitter drives a push-pull variable gain amplifier which utilizes a type 6386 remote-cutoff twin triode tube. The gain of this stage depends on the bias voltage, the more negative, the lower is the gain. The output of the variable gain stage is fed to a push-pull voltage amplifier and a push-pull parallel output stage. Negative feedback is applied over the output and driver stages. A portion of the output signal is supplied to a rectifier tube. An adjustable positive bias on this tube delays rectification of the signal until the output level exceeds the "threshold" value.

The rectified current is filtered through a resistance-capacitance network having a fast charge and slow discharge time constant. This voltage, which is negative with respect to ground, is applied as a bias voltage to the grids of the remote cut-off tubes. As the output level increases, the bias voltage becomes more negative, reducing the gain of the amplifier and thus reducing the increase in output level. This constitutes a closed loop system which tends to maintain a nearly constant output level as long as the input signal is sufficient to reach the threshold of compression.

Below the threshold level, which is adjustable by varying the rectifier delay bias, the amplifier is linear and the output level is therefore proportional to the input level. Above the threshold level, the increase in output level (expressed in db) is less than the increase in input level (also expressed in db). The ratio of the increase in input level to the increase in output level is the compression ratio. This compression ratio is a function of the threshold level. The higher the setting of the threshold level, the higher is the compression ratio.

For automatic fading or remote gain control, the negative bias voltage for the remote cut-off stage may be supplied by an external source. Since the gain of the remote cut-off stage is a function of the cathode current, the voltage drop across the cathode resistor of either section of the variable gain stage may be used as an indication of the amount of gain reduction.

A metering switch is provided on the BA-25A which measures the cathode current of the amplifier tubes to obtain a quick indication of the tube conditions. Other controls,



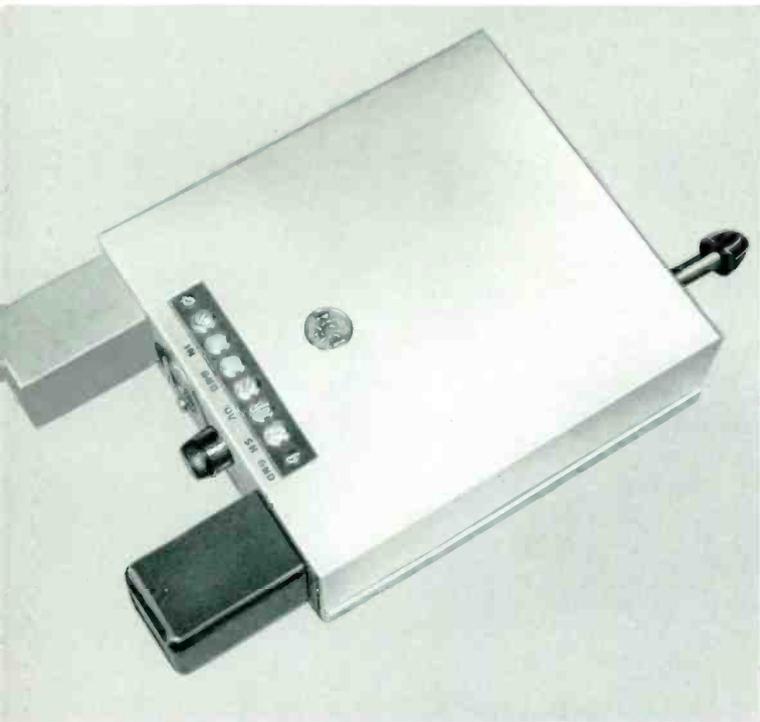
Simplified Block Diagram of BA-25A AGC Program Amplifier

all located on the front panel include: a hum control for adjusting the hum level to a minimum, the power switch, threshold level control, and input level adjustment control. An external attenuator may be used for adjusting the output level where necessary.

SPECIFICATIONS

Input Impedance....	150/600 ohms
Source Impedance ..	150/600 ohms
Output Impedance..	30/120 ohms
Load Impedance.....	150/600 ohms
Maximum Input Level .	-25 dbm
Maximum Output Level.....	+ 30 dbm
Maximum Noise Level, Output .	-46 dbm
Frequency Response	30-15,000 cps, ±1 db
Harmonic Distortion	30-15,000 cps, less than 1%
Gain, Maximum Below Verge of Compression.	70 db ±1 db
Threshold of Compression:	
Compression Ratio 3:1	Output Level 5 dbm
4:1	14 dbm
5:1	18 dbm
6:1	21 dbm
Attack Time Constant.....	12.5 milliseconds
Recovery Time Constant..	.1 sec.
Tube Complement:	
1—OB2, 1—5Y3-GT, 1—6AL5, 2—12AU7, 1—12AX7, 1—MI-11299 selected 12AY7, 1—6386.	
Power Requirements.....	100-130 volts, 50/60 cycles, 55 watts
Dimensions, Overall.....	12½" long, 8¾" wide, 4 21/32" high
Finish.....	Light umber gray
Weight	15 lbs.
Stock Identification (includes tubes).....	ES-11125
Accessories	
Tube Kit	MI-11487
Mounting Shelf, Type BR-22A, for 2 Amplifiers.....	MI-11597
Meter Panel, Type BI-1B, for 17 Amplifiers.....	MI-11388

BA-26A TURNTABLE EQUALIZING PREAMPLIFIER



FEATURES

- Built-in equalization conforming to NAB/RIAA specifications
- Etched wiring circuits—transistors used throughout
- Completely self-contained, including a-c power supply
- Free from microphonics
- Compact—easily mounted in turntable
- Insensitive to hum field pickup
- Adjustable high-frequency response

USES

The RCA Type BA-26A Turntable Equalizing Preamplifier is designed to provide both amplification and equalization of the output of studio transcription turntables employing either the RCA Type MI-11874-4 or RCA Type MI-11874-5 Pickup Heads. Low Impedance Broadcast types of variable reluctance Pickup Heads may be used by making a minor change in terminal connections of the preamplifier.

The equipment employs RCA low-noise type transistors in a three-stage amplifier utilizing selective feedback to achieve the equalizing curve. Characteristics of this curve are such that they follow the NAB/RIAA recommended curve from 50 to 15,000 cps. A self-contained a-c power supply utilizing germanium rectifier provides essentially noise-free operation.

The compact BA-26A economically replaces a bulkier combination of amplifier and separate equalizing filter. In the BQ-2B Turntable it is designed to be mounted in the same position and space previously occupied by the RCA Type MI-11887 passive equalizer.

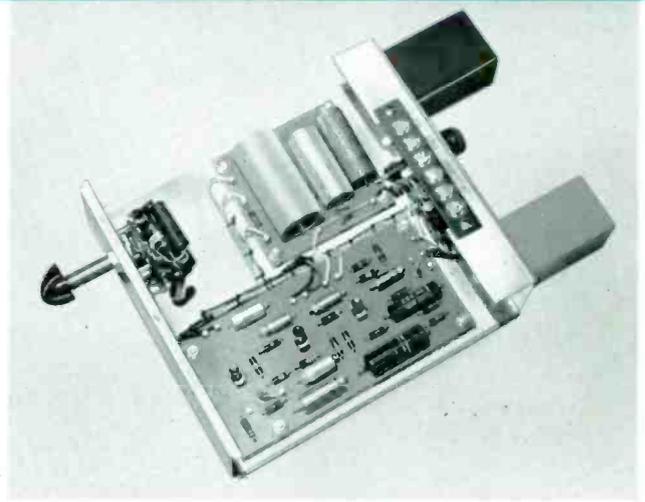


DESCRIPTION

The Type BA-26A Turntable Equalizing Preamp, MI-11436, is a compact transistorized amplifier with built-in equalization that conforms to the new industry standards. It has etched wiring assemblies contained in a shielded metal chassis which is designed to be mounted inside the turntable cabinet. A convenient slip-on cover is provided to allow access to component parts and transistors. An extended threaded shaft on a three-position filter switch allows ease of control from a knob on the top of the turntable. The switch provides for normal equalization, high frequency emphasis, and high frequency cut-off. This arrangement allows optimum performance for either AM, FM or TV broadcast operation.

The BA-26A Preamp is conservatively designed for long life. The RCA Type 2N175 low-noise transistor is used in the input stage followed by two Type 2N109 transistors to provide the required gain and output capabilities. One Type 1N91 germanium rectifier is used in the a-c power supply. The preamp exhibits complete freedom from microphonics that result from the use of vacuum tubes. The equalized output level is approximately -20 dbm with distortion less than 1.5 percent from 50 to 15,000 cps. Signal to noise ratio is rated better than 58 db, and power consumption approximately 2 watts. An output transformer is employed to provide either balanced or unbalanced output impedances of 150 and 600 ohms.

Etched wiring boards are utilized to provide stable trouble-free operation of the unit. By utilizing selective feedback within the amplifier itself it is unnecessary to use inductances to accomplish proper low-frequency equalization. The absence of such units make the BA-26A insensitive to



BA-26A Preamp with Cover Removed.

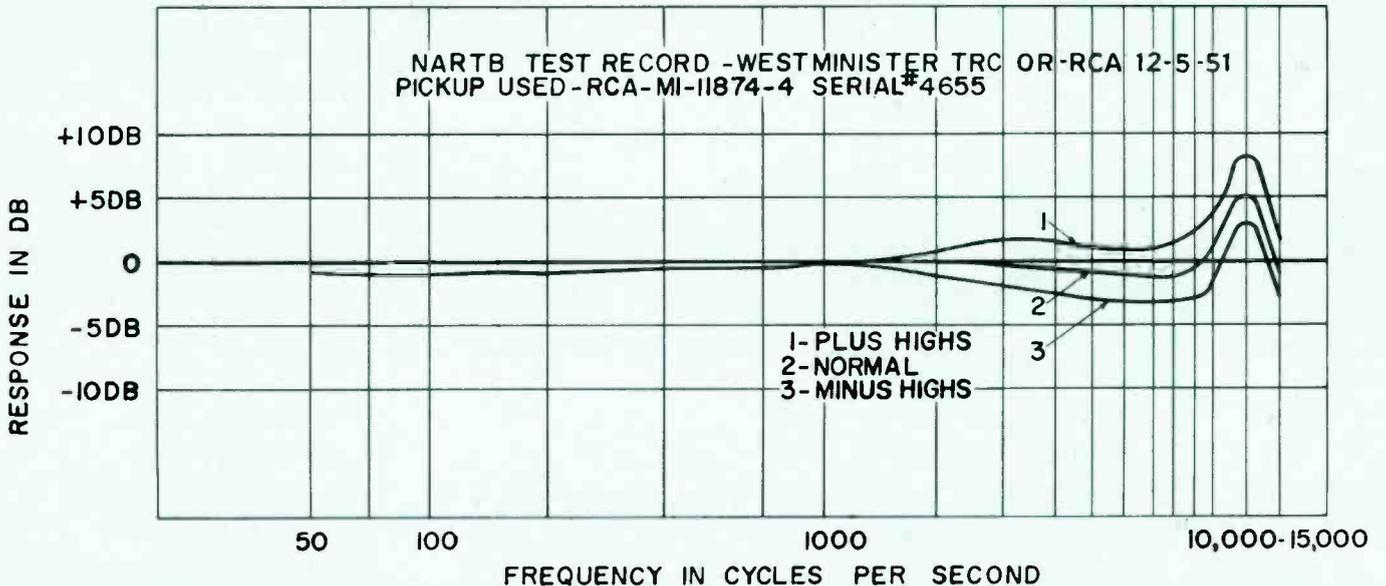
stray hum field pickup thereby greatly simplifying installation.

SPECIFICATIONS

Output Level ($E_{in} = 11$ mv at f of 1000 cps).....	-20 dbm ± 2 db
Distortion at -20 dbm from 50 to 15,000 cps.....	Less than 1.5%
Signal to Noise Ratio (Output level of -20 dbm and 150 ohm Resistor used at Input & Output).....	Better than 58 db
Output Impedance (balanced or unbalanced).....	150/600 ohms
Frequency Response (Using MI-11874-4 Pickup).....	See Curve
Power Requirements.....	3 Taps: 105/115/125 volts a-c, 50/60 cycles, single phase, 2 watts
Dimensions (overall):	
Height (including extended knob shaft).....	10 $\frac{3}{4}$ "
Width.....	2 $\frac{1}{2}$ "
Depth.....	6 $\frac{5}{8}$ "
Weight.....	4 lbs.
Stock Identification (includes transistors).....	MI-11436

Accessories

Transistor & Rectifier Kit including 2 Type 2N109 Transistors, 1 Type 2N175 Transistor, and 1 Type 1N91 Rectifier..... MI-11779



BA-6A LIMITING AMPLIFIER

FEATURES

- Prevents distortion and adjacent channel interference
- Low cost—high-quality performance
- Provides for a more effective use of transmitter power
- Compact, plug-in unit—requires little rack space
- Complete rotary switch selection of metering of all key functions provided

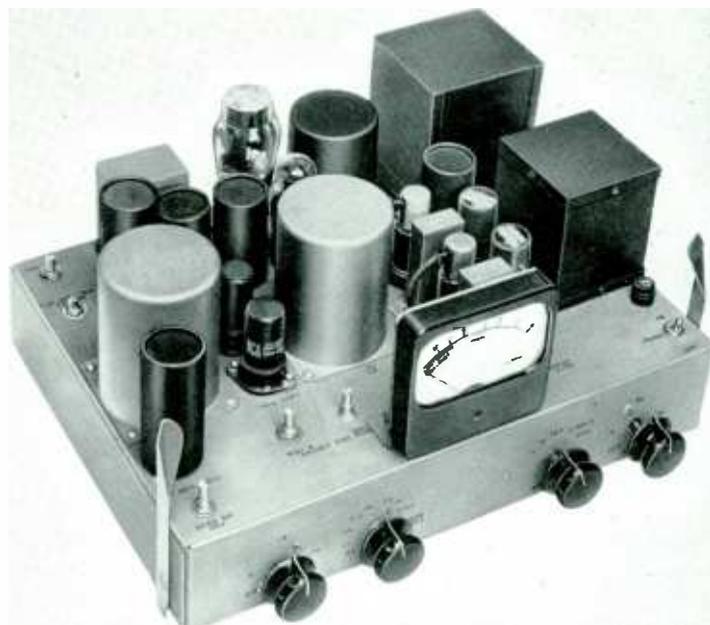
USES

The BA-6A Limiting Amplifier has been designed to provide economical, yet high-quality operation in the speech input channels of FM and AM broadcast and TV sound transmitters. It serves as an automatic means of limiting the audio signal peaks to a certain pre-determined level thereby preventing overmodulation or overloading with its consequent distortion and adjacent channel interference. This amplifier also provides for a more effective use of transmitter power by allowing the system to be operated as near maximum output as possible. It raises the average percentage modulation level several db without appreciably increasing the harmonic distortion.

The limiting characteristics of the BA-6A also readily adapt it for use in recording applications. For this use, it prevents over-cutting of the recording disc on heavy passages of music or speech and permits a marked improvement in the signal to noise ratio. Thus, the BA-6A Limiting Amplifier is an essential item for the successful operation of every broadcasting station and recording studio.

DESCRIPTION

The BA-6A is a balanced, three-stage amplifier which uses commonly available tube types that do not require special selection or matching. The use of high-quality components and the straightforwardness of design, employing only 9 tubes including rectifier and voltage regulator, insure a



maximum degree of reliability. Fewer tubes, fewer types (only 6) and fewer stages of simplified design result in lower tube costs, low initial cost and reduced power input requirements.

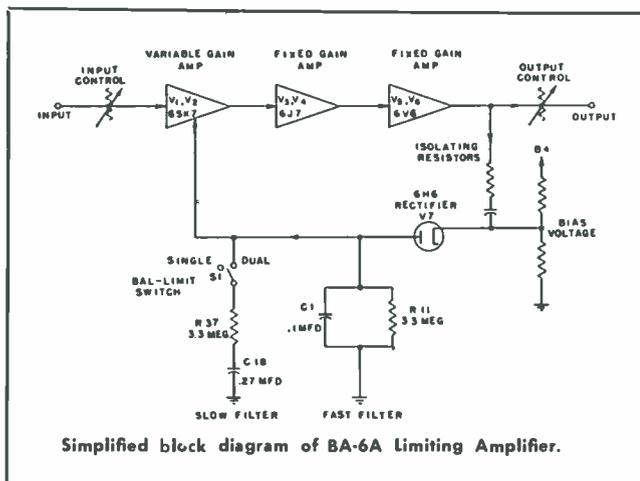
The BA-6A Limiting Amplifier also incorporates those features which are found in other RCA high-quality broadcast audio amplifiers. The amplifier with its self-contained power supply is constructed on a plug-in chassis for shelf mounting and is therefore readily removable for inspection and service. All controls, tubes, and plug-in capacitors are accessible from the front.

A rotary selector switch permits use of the four-inch illuminated meter for measuring gain reduction, the cathode current of all amplifier tubes, tube balance and d-c filament voltage. Plate and heater power are available for operating a pre-amplifier in applications where additional gain is required. The rotary switch (BAL-LIM) provided on the front panel also permits selection of a filter with either a single or dual time constant. In the "single" position the attack time is 0.0006 seconds. In the "dual" position the recovery time is lengthened to two seconds on sustained peaks.

The input transformer matches a 600 and 150-ohm line. A dual attenuator controls the input signal which is applied to the control grids of two 6SK7 remote cut-off pentodes of the variable gain stage. To minimize "thump" over a wide range of gain reduction, both the screen and cathode voltages of these tubes are adjustable and thus any pair of tubes may be balanced over the entire operating range. Switches on the front panel permit making the balancing adjustments quickly and without external equipment by applying an internal 60-cycle signal to the 6SK7 grids and using the front-panel meter to indicate balance.

As an additional means of maintaining balance, the first stage is transformer coupled to the second stage. The output stage is capable of delivering 10 watts to an adjustable 600-ohm output attenuator pad which is calibrated in 1 db steps. A continuous fine output adjustment is also provided to set the output level exactly. This is an important feature since a fraction of a db change in output level might result in a large increase of distortion in certain types of transmitting equipment. A full wave rectifier, connected to the output stage through coupling capacitors and isolating resistors, provides the gain control voltage.

Step-by-step input and output volume controls are provided. These controls are equipped with "dbm" scales to indicate input and output levels at the verge of compression. Auxiliary adjustable controls are: (1) hum balance, (2) zero adjustment of gain reduction meter scale, (3) vernier control for output level, (4) balance, and (5) heater voltage. It also provides two positions for balancing of tubes in the first stage. A power switch and fuse are provided. For rack mounting the MI-11599 Shelf should be used. A special umber gray door panel with meter cut-out is supplied with the BA-6A amplifier.



SPECIFICATIONS

Source Impedance.....600/150 ohms

Input Impedance.....600/150 ohms, balanced or unbalanced

Frequency Response:
 (30 to 15,000 cps, 1000 cps reference)
 Below verge of limiting.....±1 db
 Up to 20 db gain reduction.....+1 to -2 db

Input Level:
 Minimum (at limiting verge).....-24 dbm
 Maximum+14 dbm

Output Level:
 Maximum (limiting off) at 1000 cps.....38.5 dbm
 At verge of limiting with output controls in
 minimum attenuation position.....29.5 dbm ±1 db

Gain.....54 db ±1 db at 1000 cps, 600-ohm source
 to 600-ohm load

Gain Controls:
 Input.....20 steps, 2 db per step
 Output.....20 steps, 1 db per step and fine adjustment

Signal-to-Noise Ratio.....83 db at verge of limiting

Harmonic Distortion (Total RMS) 12 db gain
 reduction (100-15,000 cycles).....Less than 1%
 No gain reduction, 30 dbm output.....Less than 0.6% 50-15,000 cps
 Less than 1.2% 30 cps

Limiting Characteristic:
 Output at verge of limiting.....29.5 dbm ±0.5 dbm, output control
 in maximum gain position
 Compression ratio above verge of limiting.....20 db into 2 db

Time Constants:

	Attack	Release
Single	600 microsec.	0.33 sec.
Dual, Fast Action.....	600 microsec.	0.33 sec.
Dual, Slow Action.....	0.9 sec.	2 sec.

Tube Complement (not included with amplifier):
 2-6SK7, 2-6J7, 2-6V6-GT, 1-6H6, 1-OD3/VR150, 1-5R4GY

Power Required (Transformer taps provided for
 105, 115, and 125 v.) (100 to 130 v., 50-60 cy.).....105 watts

Dimensions:

Chassis.....16³/₁₆" long, 11³/₄" wide, 3" high
 Overall.....16³/₁₆" long, 14" wide, 7⁵/₁₆" high

Weight37 lbs.

Finish.....Dark umber gray

Mounting.....Plug-in mounting on MI-11599 Shelf

Stock Identification (includes tubes)..... ES-11126

Accessories

Tube Kit (complete tube complement).....MI-11289

ShelfMI-11599

BN-6B TRANSISTOR PORTABLE REMOTE AMPLIFIER



USES

The BN-6B Transistor Portable Remote Amplifier is an extremely lightweight, four channel amplifier designed especially for remote broadcast use. It affords amplification and control facilities for broadcast programs remote from the studio, amplifying low level signals to a level suitable for transmission over a telephone line to the studio. Four separate input channels are provided that can be operated either single ended or balanced. Complete cueing and monitoring facilities are included. The equipment uses transistors and germanium diodes throughout, and is completely self-contained for a-c or battery operation.

DESCRIPTION

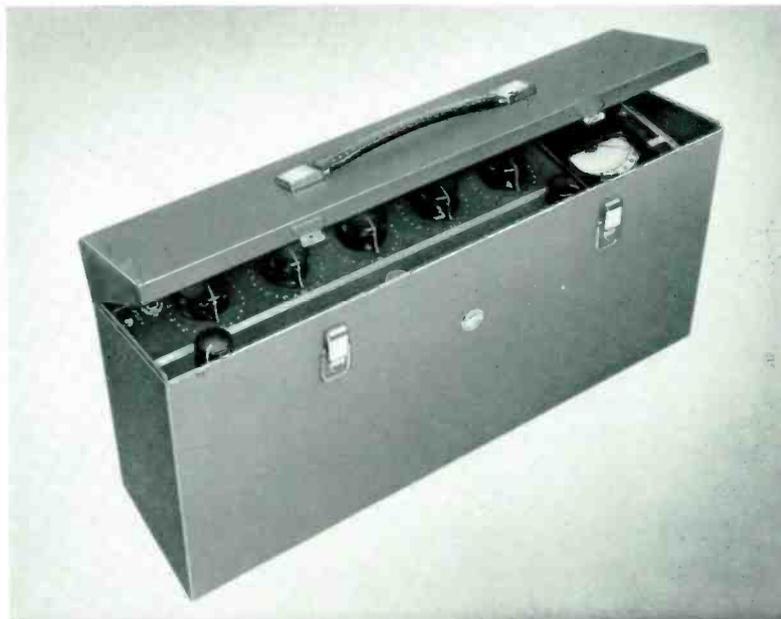
The RCA Type BN-6B Transistor Portable Remote Amplifier is a single, functionally styled unit in which an etched wiring board including all amplifier components and transistors, controls, batteries and alternate a-c power supply are all contained in a portable carrying case. The steel case, finished in umber gray, is ruggedly constructed and provided with a convenient leather handle. The top cover can be removed easily for quick set-up of the equipment. Special hinges permit the lid to be detached, reversed, and used as a special tilt-rest for the amplifier case in applications where inclined positioning of the control panel is desired.

FEATURES

- Completely transistorized
- Full 8 VU output to line
- High level mixing on all four channels
- Self-contained AC and battery power supplies—front panel selection of power
- Lightweight—weighs only 15 pounds
- Amplified cue signal from studio
- Convenient and durable carrying case

All controls are located on the front panel including an illuminated VU meter, four mixer controls, the master control, phone jack, cue switch, and power switch. For ease of servicing, the top cover may be detached and the amplifier chassis withdrawn from the case thereby exposing all components. Mercury cell batteries are self-contained in a convenient battery storage chamber located beneath the amplifier chassis. A rear cut-out in the case

BN-6B Remote Amplifier in metal carrying case.



SA-10C 10-WATT AMPLIFIER

FEATURES

- Excellent frequency response
- Noiseless mixing between channels
- High-gain low-noise circuitry
- High impedance inputs
- Microphone input easily converted to low impedance
- Compact, rugged, light weight construction



DESCRIPTION

The Type SA-10C Amplifier has been designed for application in sound systems where a low audio power output is required. It has its own built-in power supply for furnishing a-c and d-c power for the audio tubes.

The RCA SA-10C is a 10-watt amplifier especially designed to give constant performance and reliability with a wide frequency response at low distortion. The front escutcheon is a reversed etched plate which assures permanent control markings for ease of operation. The bottom cover extends slightly beyond the ends of the chassis. This projection protects the microphone and phonograph receptacles and provides a convenient means of securely mounting the amplifier on a shelf.

High quality microphone receptacle and phonograph jack are provided on the end of the chassis. Auxiliary a-c outlet and screw terminals for audio output connections together with a fuse and the a-c cord are located on the rear of the chassis. A volume control is provided for microphone input and a master control is supplied between the first and second stage. A treble control is provided. The output taps are 4, 8, 16 and 500 ohms (70 volts). The 70 volt or 500 ohm tap is balanced or unbalanced to ground as desired.

The amplifier is designed for either low or high impedance inputs. Should it be desired for low impedance, plug-in transformers are available for either a 50 ohm input or a 200 ohm input. (150 to 300 ohms.)

SPECIFICATIONS

Power Required.....	117 volts a-c, 60 cps, 70 watts
Power Output.....	10 watts at 100 to 5000 cps
Input Impedances:	
Microphone.....	250,000 ohms (minimum) at 1000 cps
Phonograph.....	330,000 ohms (minimum)
Output Impedances.....	4, 8, 16/500 ohms (70 volts)
Gain:	
Microphone Input.....	102 db \pm 2 db
Phonograph Input.....	87 db \pm 2 db
Frequency Response.....	\pm 2 db, 50 to 15,000 cps
Distortion.....	Less than 5.0% to 5000 cps and 10 watts output
Signal to Noise Ratio.....	53 db
Tube Complement (furnished with the unit):	
1—5Y3-GT	2—6V6-GT
1—6SL7-GT	1—6SJ7
Fuse (furnished with the unit).....	Type 3AG, 1 ampere
Dimensions (overall).....	Length 13", Depth 8 $\frac{3}{8}$ ", Height 6 $\frac{3}{4}$ "
Weight, Unpacked.....	11 $\frac{1}{2}$ lbs.
Chassis and Bottom Cover Finish.....	Dull black lacquer
Stock Identification (includes tubes).....	MI-12161

Accessories

Plug-in 200 Ohm Input Transformer.....	MI-12399
Plug-in 50 Ohm Input Transformer.....	MI-12398

SA-15B 15-WATT SOUND AMPLIFIER



DESCRIPTION

Modern styling, simple operation and top performance characterize this new 15 watt amplifier. The Type SA-15B offers high quality, dependable reproduction of sound from microphones and turntable or tape pickup. It is especially suitable for diversified sound applications such as music, paging, and speech reproduction.

The RCA SA-15B is a 15 watt amplifier especially designed to give constant performance and reliability. The perforated heavy steel cover is finished with a dark blue vinyl plastic. The front escutcheon is a reversed etched plate which assures permanent control markings for ease of operation. The bottom and top covers extend slightly beyond the ends of the chassis. The bottom projection protects the microphone receptacles and provides a convenient means of securely mounting the amplifier on a shelf. The cover overhang provides a sturdy hand grip for ease of carrying the amplifier.

Two high quality microphone receptacles and one phonograph jack are provided on the end of the chassis. One auxiliary a-c outlet, two polarized speaker outlets and a screw type terminal board for audio output connections are located on the rear of the chassis. Electrically, the circuits provide for mixing the microphone and phonograph inputs ahead of the tone controls. A volume control is provided for each input. Separate bass and treble attenuation controls are provided. The output taps are 4, 8, 16 and 333 ohms. The 333 ohm tap is a standard 70 volt tap balanced or unbalanced to ground. A pin jack connection to the phase inverter input is on the rear of the chassis

for paralleling two similar amplifiers to double the number of mixing inputs and power output. This connection is also useful as either an auxiliary input or output.

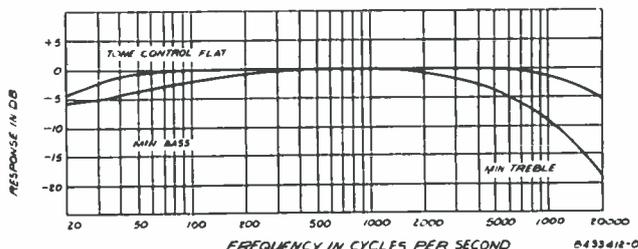
The amplifier is designed for either low or high impedance inputs. Should it be desired for low impedance, plug-in transformers are available for either 50 ohm input or 200 ohm input.

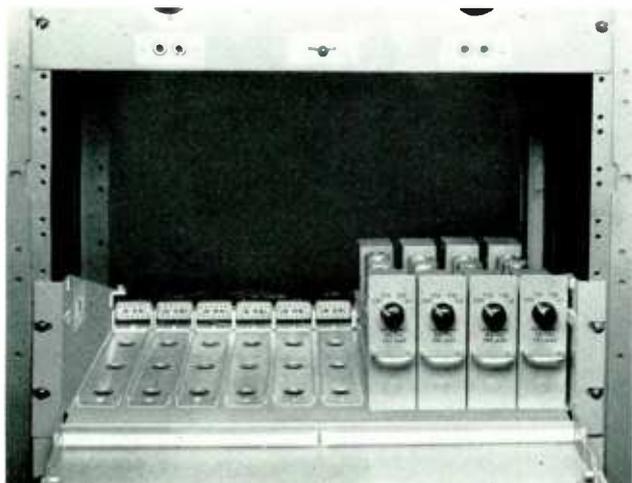
SPECIFICATIONS

Power Required.....	117 volts a-c, 60 cps, 130 watts	
Power Output.....	15 watts at 100 to 10,000 cps	
Input Impedances:		
Microphone.....	250,000 ohms (minimum) or 1000 cps	
Phonograph.....	200,000 ohms (minimum)	
Output Impedances.....	4, 8, 16, 333 ohms	
Gain:		
Microphone	110 db	
Phonograph	77 db	
Frequency Response.....	20 to 20,000 cps (see curve)	
Distortion.....	Less than 2% at 400 cps; less than 5% at 100 to 10,000 cps	
Signal to Noise Ratio:		
Microphone	55 db	
Phonograph	75 db	
Tube Complement:		
1—7025	1—6AU6	1—6SL7-GT
2—6L6-G	1—5Y3-GT	
Fuse (furnished with the Unit).....	Type 3AG, 1.5 amperes	
Dimensions (overall).....	Width 17", Height 8 1/4", Depth 11"	
Weight, Unpacked.....	30 1/2 lbs.	
Finish.....	Dark blue vinyl plastic cover	
Stock Identification (includes tubes):		
With Cover	MI-12156-A	
Less Cover	MI-12156-B	

Accessories

Input Transformer, Plug-in 150/250 ohms.....	MI-12399
Input Transformer, Plug-in 30/50 ohms.....	MI-12398
Remote Volume Control Kit.....	MI-14831
Amplifier Carrying Case with Two Speakers.....	MI-12766





Type BR-22A Mounting Shelf showing female plug connectors and guide tracks for mounting RCA plug-in amplifiers.

Reduced-Size Accessories

RCA Amplifier Accessories such as the Type BR-22A Mounting Shelf, Type BX-21A Power Supply, and other accessories used with the printed circuit amplifiers have been "miniaturized" to reduce rack and mounting shelf costs. Other improvements include better performance, greater uniformity and easier serviceability.

The BR-22A Mounting Shelf is only 5¼ inches high, 12½ inches deep and fits any standard 19-inch rack. The new line of amplifiers and power supplies are installed on the shelf by means of a guide assembly which is furnished with each plug-in unit. The shelf can accommodate the following equipment: Ten Type BA-21A Preamplifiers; or three BA-23A Program Amplifiers and one BA-21A; or two BA-24A Monitoring Amplifiers; or two BX-21A Power Supplies and two BA-21A's.

Summary of RCA Broadcast Amplifier Characteristics

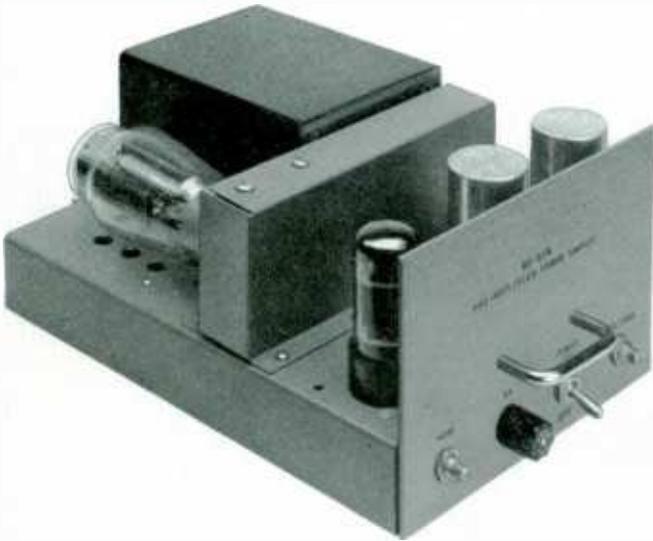
Type	Usage	Max. Gain db	Max. Input dbm*	Max. Output dbm*	Source Impedance Ohms	Load Impedance in Ohms	Type Mounting
BA-21A	Preamplifier	Matching 40	Matching -10	+18	37.5/150/600	150/600	Chassis or Rack
	Isolation Amp. with MI-11278-E or F Bridging Gain Control	Bridging 4	Bridging +40	+18	10,000	150/600	Chassis or Rack
BA-23A	Program Amp. Line Amp. Isolation Amp. Monitor Amp.	Matching 68 Bridging 25	Matching -10 Bridging 27	+30	150/600	150/600	Chassis or Rack
BA-24A	Monitoring or Recording Amplifier	104	-30	+40 dbm 10 watts	37.5/150/600	4/8/16/150/600	Chassis or Rack
BA-25A	AGC Program Amplifier	70	-25	+30	150/600	150/600	Chassis or Rack
BA-26A	Equalized Turntable Preamplifier	—	—	-20 dbm	—	150/600	Turntable Cabinet
BA-6A	Limiting Amplifier	54	Minimum at Verge of Limiting -24	+30	150/600	600	Chassis or Rack
BN-6B	Remote Portable Amplifier	90	-40	+18	30/150	150/600	Portable Case
SA-10C	Public Address Amp. Monitoring Amp.	Microphone 102 Phono 87	Microphone 0.01 volt Phono 0.15 volt	+40 dbm 10 watts	Microphone† 85,000 Phono 250,000	4/8/16/500	Chassis
SA-15B	Public Address Amp.; Monitoring Amplifier	Microphone 110, Phono 77	Microphone 0.0045 volt Phono 0.2 volt	41.7 dbm 15 watts	Mike 50 or 250. Phono 470,000	4/8/16/333	Chassis

* Reference level one milliwatt.

† May be converted to low impedance by using transformer MI-12399.

AMPLIFIER ACCESSORIES

TYPE BX-21A PREAMPLIFIER POWER SUPPLY



FEATURES

- Regulated d-c output voltage
- Exceptionally low hum level
- Plugs into BR-22A Mounting Shelf
- Supplies up to 10 BA-21A Preamplifiers
- Heater supply hum balancing potentiometer

USES

The Type BX-21A Preamplifier Power Supply is designed to provide d-c plate and a-c heater power for preamplifiers in which the hum level must be kept to a minimum. It is intended especially for use as a power supply for preamplifiers and isolation amplifiers such as the BA-21A.

DESCRIPTION

The BX-21A is designed for operation on any a-c line voltage between 100 and 130 volts, 50 to 60 cycles. A two ampere, glass-enclosed, time-delay fuse is mounted on the front of the chassis. This fuse is unaffected by high transient currents.

The power supply consists of a full wave, high vacuum tube rectifier followed by resistance capacitance filtering. The output voltage is adjustable over a range of 245 to 295 volts and is maintained constant with variations in line voltage and loading by a series regulator tube in conjunction with a voltage reference and amplifier. This circuit also functions to reduce the ripple voltage. A metering voltage of 1 volt corresponding to nominal output voltage of 285 volts is available at connector plug for wiring to a meter panel.

SPECIFICATIONS

Mounting.....Plug-in on BR-22A Mounting Shelf. Requires 2/5 of the shelf space. Two BX-21A Power Supply units may be mounted on one shelf with additional space for two BA-21A Preamplifiers, or 1 BX-21A Power Supply and 6 BA-21A Preamplifiers may be mounted on one shelf.

Power Required.....100 to 130 volts, 50-60 cycles, 130 watts

Fuse.....2 ampere, type MDL

Power Output:

D-c.....285 volts, up to 100 ma

A-c.....6.3 volts, up to 6 amperes

Ripple Voltage.....0.3 mv maximum

Tube Complement:

1—5R4GY, 1—6BX7-GT, 1—12AX7, 1—OA2

Dimensions and Weight:

Length12½"

Width6¼"

Height4 21/32"

Weight16 lbs.

FinishLight umber gray

Regulation.....0.5% no load to full load and line voltage variation of 5%

Stock Identification (includes tubes) ES-11111

Accessories

Tube Kit (complete tube complement) MI-11479

Panel and Shelf, Type BR-22A,
Umber Gray (for 2 Power Supplies)..... MI-11597

Type BI-1B Meter Panel (for 17 amplifiers or power supplies).....MI-11388

BR-22A MOUNTING SHELF

FEATURES

- High quality panel mounting for chassis type units
- Quick access to amplifiers and power supplies
- Easy insertion and removal of units
- Hinged front panel
- Conveniently installed from front of rack



USES

The BR-22A Mounting Shelf is capable of mounting the following quantities of specific equipments:

- 10 BA-21A Preamplifiers
- 3 BA-23A Program Amplifiers + 1 BA-21A
- 2 BX-21A Power Supplies + 2 BA-21A
- 2 BA-24A Monitor Amplifiers
- 2 BA-25A AGC Program Amplifiers

DESCRIPTION

This shelf will mount in the BR-84 series of racks, or in any 19 inch rack. It occupies 5¼ inches of rack space. Since the RCA plug-in amplifiers have a standard dimension in depth, they all fit perfectly in this shelf. They are slipped into the shelf from the front. The receptacles fit in such a manner that a small amount of free movement is permitted in all directions. This eases the alignment of the plugs and receptacles when the amplifiers are pushed into position. The wiring in back of the receptacles is protected by a cover which is fastened in place by two machine screws.

The opening in the front of the shelf is covered by a hinged panel, which may be opened to gain access to the amplifiers and any amplifier controls. The bottom of the shelf has ventilation holes.

A white paper designation strip which is protected by a transparent cellulose acetate strip on the inside bottom flange of the front panel is provided for marking the type number and function of the plug-in unit.

The front panel is perforated to provide additional ventilation. In installations where exposure of the amplifier controls is desired, the front panel may be disassembled from the shelf by removing two screws.

The amplifiers and power supplies are installed on the mounting shelf by means of guide strips and connector receptacles which are included with each amplifier and power supply. The receptacles are assembled to the guide strip which is then attached to the mounting shelf.

SPECIFICATIONS

Dimensions, Overall:

Width	19"
Height	5 7/32"
Depth	12 1/2"
Inside Width	17 1/8"
Weight, Unpacked.....	10 lbs.
Finish, Front.....	Two tone umber gray
Stock Identification	MI-11597

BR-2A PANEL AND SHELF

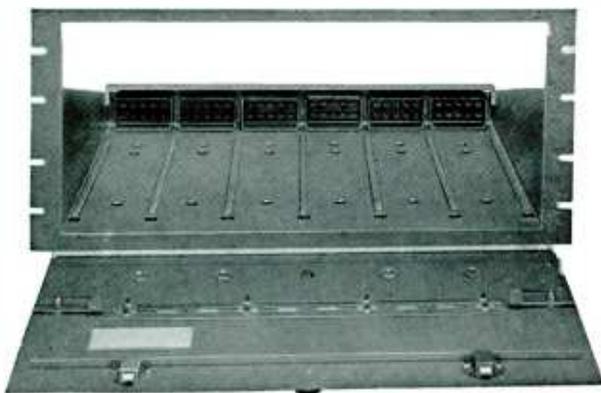
FEATURES

- High quality panel mounting for chassis type units
- Quick access to tubes
- Easy insertion and removal of units
- Provision for control shafts on front panel
- Conveniently installed from front of rack

DESCRIPTION

The BR-2A Shelf is designed to mount the BA-6A Limiting Amplifier, while the panel and shelf can be used to mount the Relay Power Supply, MI-11316. This shelf will mount in either the BR-19A or the BR-84 series of racks, or in any other standard 19-inch rack. It occupies $8\frac{3}{4}$ inches of panel space. Since the RCA plug-in amplifiers have a standard dimension in depth, they all fit perfectly in this shelf. They are slid into the shelf from the front and the connection plugs pushed into the receptacles at the rear. Guide bars fitting between the amplifiers assist in guiding them into position. All the plug-in amplifiers are equipped with levers which serve either to force them into position or to eject the plugs when dismounting them. The receptacles are mounted on individual U-shaped brackets, secured to the chassis of the shelf. They fit in such a manner that a small amount of free movement is permitted in all directions. This eases the alignment of the plugs and receptacles

Panel removed showing guide bars and receptacles.



when the amplifiers are pushed into position. The brackets are constructed with a small protruding stop on the lower front edge, preventing the amplifier from being forced to the point where it would exert undue pressure on the receptacle. Provision is made for holding six of these receptacles. The holes in the chassis which are provided for fastening the brackets are slightly oversized to permit perfect alignment during initial installation. The wiring in back of the receptacles is protected by a steel cover which is fastened in place by two machine screws.

The opening in the front of the shelf is covered by a matching panel. This panel is hinged across the center so that the top half may be opened to gain access to the vacuum tubes of the amplifiers. The bottom half has five shaft holes to provide for any controls which the amplifiers may have. When not in use, these holes are covered by small removable buttons. The bottom of the shelf has several round holes for ventilation and also a number of square holes into which fit the amplifier insertion levers.

The shelf may be obtained separately, if desired, or the shelf and panel together, as appropriate. It is supplied complete with mounting brackets, guide bars, and receptacle cover. The receptacles themselves are supplied with the amplifiers, and therefore need not accompany the shelf.

SPECIFICATIONS

Dimensions, overall:

Width	19"
Height	$8\frac{3}{4}$ "
Depth	$12\frac{3}{4}$ "

Inside Width $16\frac{7}{8}$ "

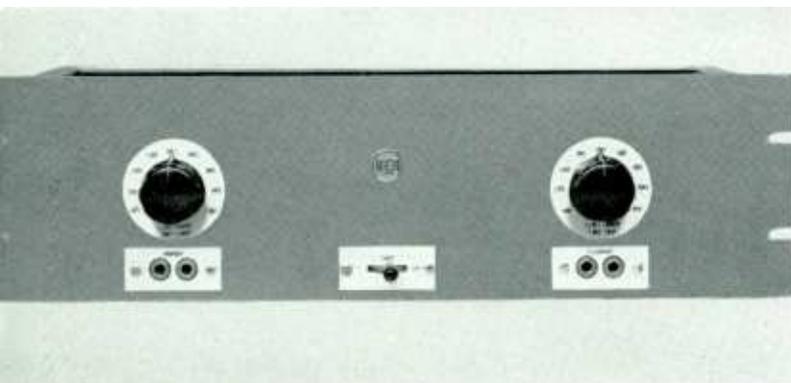
Weight, unpacked:

Shelf	12 lbs.
Panel	3 lbs.

Stock Identification:

Shelf (Umber Gray).....	MI-11599
Panel (Umber Gray).....	MI-11598-B

BE-21B VARIABLE SOUND EFFECTS FILTER



DESCRIPTION

The BE-21B furnishes a desirable means for producing a variety of special or unusual sound effects through control of the audio bandwidth of the transmitted program. It is especially useful in the production of dramatic plays for making programs sound "bassy" or "tinny" or for simulating the sound of telephone conversations, short wave radio communications or midjet radios.

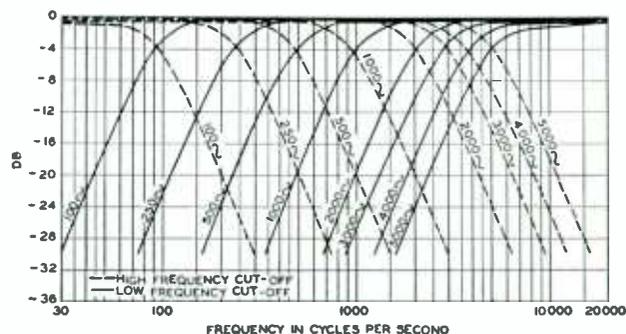
The BE-21B consists of high and low pass filters assembled on a panel with two selector panel switches. The switches have nine positions each and are calibrated for high and low cut-off frequencies of 100, 250, 500, 1000, 2000, 3000, 4000, and 5000 cycles. There is also an "off" position on each switch. A key switch is provided for removing the filter from the circuit thus making it possible to preset the

filter for the desired characteristics and insert it in the circuit instantly when required.

The 600 ohm input and output impedances of the filter enables it to be connected in any 600 ohm circuit or it may be used in a 250 ohm circuit with only a slight change in response characteristics.

SPECIFICATIONS

Source Impedance (unbalanced).....	600 ohms
Load Impedance	600 ohms
Input Level.....	-60 to +23 db'
Output Level (maximum)	+23 db'
Frequency Response.....	See curves
Insertion Loss.....	1 db or less at frequencies remote from cut-off
Dimensions, overall	
Height	5 1/4"
Width	19"
Depth	5"
Weight (unpacked).....	15 lbs.
Finish.....	Light umber gray
Stock Identification	MI-11723



BI-1B METER PANEL



DESCRIPTION

The BI-1B Meter Panel provides a convenient means for checking the cathode bias voltages of amplifier tubes and thereby furnishes an indication of the operating conditions of amplifier tubes and circuits. Metering terminals are provided on the miniature series of amplifiers for use with this panel. The mounting is for a BR-84 Series Standard cabinet rack.

The BI-1B consists essentially of a meter and switch mounted on a standard 3 1/2", 3/16" thick steel panel. The meter is a 3.0 volt d-c voltmeter having a resistance of 20,000 ohms per volt. The double section switch has

eighteen positions including the "off" position with the switch arms connected to the meter terminals. All connections to the panel are made to the switch contacts.

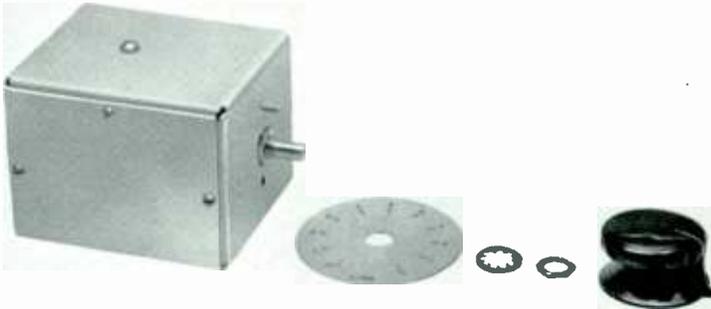
SPECIFICATIONS

D-c Voltmeter.....	0-3.0 volts, 20,000 ohm per volt
Metering Switch.....	17 position and "off," double pole
Dimensions (overall):	
Height	3 15/32"
Width	19"
Depth	2 1/4"
Weight (unpacked)	4 1/2 lbs.
Finish.....	Light umber gray
Stock Identification	MI-11388

BE-2A LINE EQUALIZER

FEATURES

- Provides line equalization to 15,000 cycles
- Equalization variable in steps of 3 db
- Small case mounts almost anywhere
- Parallel resonant circuits
- Convenient rotary selector switch for selecting different resistance values



adjustment of the equalizer consists of an audio-frequency oscillator such as the RCA Type WA-28A for use at the remote point, and a volume-indicator meter such as the WM-71A for use at the receiving point.

USES

The RCA Type BE-2A Line Equalizer is designed to equalize the non-linear frequency characteristics of a non-loaded telephone line. It is suitable for 15,000 cycle FM circuits. The small, low-cost unit is recommended for use on lines which are permanently installed and continuously used such as studio-to-transmitter lines and remote lines.

DESCRIPTION

The BE-2A Line Equalizer employs parallel resonant circuits and consists of a capacitor, a reactor, a series of resistors, and a rotary selector switch for selecting different resistance values. The resonant frequency of this circuit is just above the operating frequencies of associated equipment, so that the frequency characteristics of the equalizer below resonance are of interest. Examination of these characteristics (shown in the chart) reveals that the more resistance in series with inductor, the less the low-frequency attenuation of the equalizer. Any of the amounts of equalization shown by the frequency characteristics chart may be obtained by rotating the ten position selector switch to the proper dial setting, thereby inserting the desired resistance in the circuit. Varying amounts of equalization may be obtained in steps of approximately 3 db. The BE-2A does not include line transformers or master attenuators which should be ordered separately where required.

The equalizer circuit is housed in a cadmium plated metal case adaptable for mounting on a flat surface. It is especially recommended for mounting on a 3 1/2" x 19" panel for standard rack mounting. The equipment necessary for

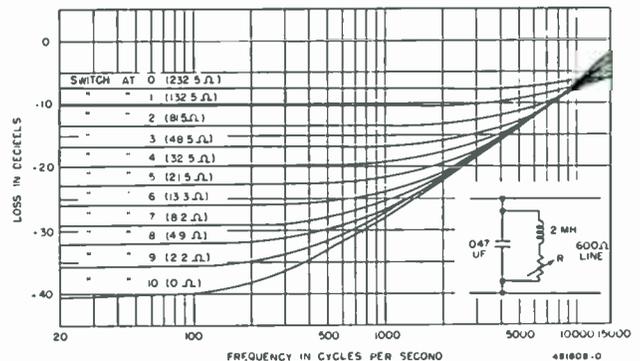
SPECIFICATIONS

Source Impedance	150 or 600 ohms
Equalization Frequency Limit	15,000 cycles
Insertion Loss (minimum at 1000 cycles)	7 db
Equalization Range (see attenuation characteristic curve)	1 to 40 db
Mounting	Single hole
Dimensions	2 7/8" wide, 2 1/2" high, 3 3/8" deep
Weight	1 1/4 lbs.
Finish	Cadmium plate
Stock Identification	MI-11752

Accessories

Mounting Panel 3 1/2" x 19"	MI-4591-B
Line Transformer	MI-11713

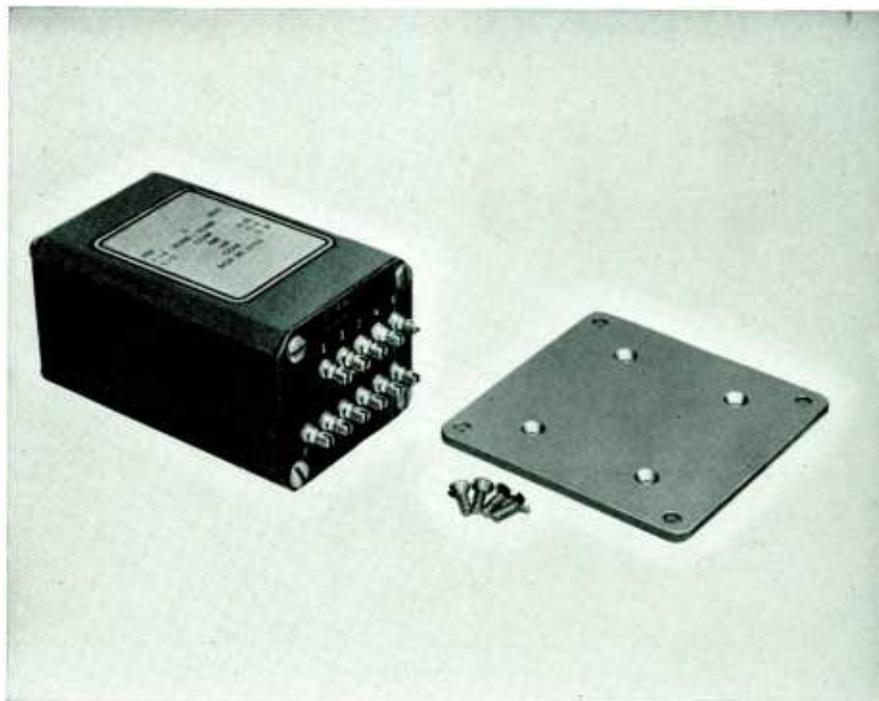
Frequency characteristic of Type BE-2A Line Equalizer.



LINE AND BRIDGING TRANSFORMERS

DESCRIPTION

RCA transformers are of the highest quality design having excellent frequency response. They are provided with electrostatic shields between primary and secondary and are furnished with heavily shielded cases. Cores are steel of high permeability. Terminals are located at one end, and diagrams of the connections are stenciled on the side of the case. Broadcasting stations may employ the RCA transformers between units with assurance that the overall fidelity of the system will be maintained.



LINE TRANSFORMER, MI-11713

The core structure, frequency characteristics and shielding of this transformer makes it an ideal unit for isolating line circuits. Its taps provide several combinations of available impedances.

Specifications (MI-11713)

Frequency Response..... $\pm 1/2$ db 20 to 20,000 cps

Primary Impedances		Secondary Impedances	
Ohms		Ohms	
150		150	
600		600	

Stock IdentificationMI-11713

BRIDGING TRANSFORMER, MI-11712

This transformer may be used as an input transformer for a bridging line amplifier or a monitoring amplifier. It may also be satisfactorily used where it is desired to bridge a program line to feed programs to other mixing or outgoing circuits such as normally employed in a master control room line distribution system.

Specifications (MI-11712)

Frequency Response..... $\pm 1/2$ db 20 to 20,000 cps.

Primary Impedances		Secondary Impedances	
Ohms		Ohms	
20,000		150	
		600	

Stock IdentificationMI-11712

GENERAL SPECIFICATIONS for MI-11713 and MI-11712

Dimensions, overall:

Transformer.....4" x 2 11/32" x 1 7/8"
 Baseplate.....3 1/4" x 3 1/4"

Mounting.....Four holes with center lines 2 3/4" x 2 3/4"
 Weight.....2 lbs. 14 ozs.
 FinishAluminum gray

PADS AND NETWORKS

DESCRIPTION

RCA offers a comprehensive selection of attenuator pads, bridging pads and dividing networks. The pads and networks are well constructed and insulated with precision wound resistors, assuring no internal reflection. The terminals are accessible and securely mounted with the connections stenciled in an appropriate place. The fixed balanced "H" type is available in four types, introducing losses of 6 db, 10 db, 20 db or 40 db. The dividing networks are available as tabulated below.

Fixed Pads—Balanced "H" Type

Input Impedance.....	600 ohms
Output Impedance.....	600 ohms
Insertion Loss.....	6, 10, 20 or 40 db
Stock Identification:	
6 db Pad.....	MI-4171-29
10 db Pad.....	MI-4171-30
20 db Pad.....	MI-4171-32
40 db Pad.....	MI-4171-39



MI-11704-A

Dividing Networks

Balanced Two-way, 600 ohms

Insertion Loss.....	6 db
Stock Identification.....	MI-11704

Balanced Three-way, 600 ohms

Insertion Loss.....	9.5 db
Stock Identification.....	MI-11704-A

Balanced Four-way, 600 ohms

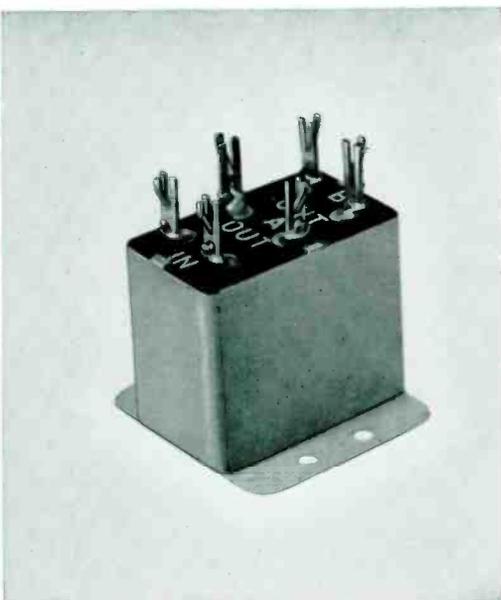
Insertion Loss.....	12 db
Stock Identification.....	MI-11704-B

Balanced Six-way, 600 ohms

Insertion Loss.....	15.6 db
Stock Identification.....	MI-11704-D

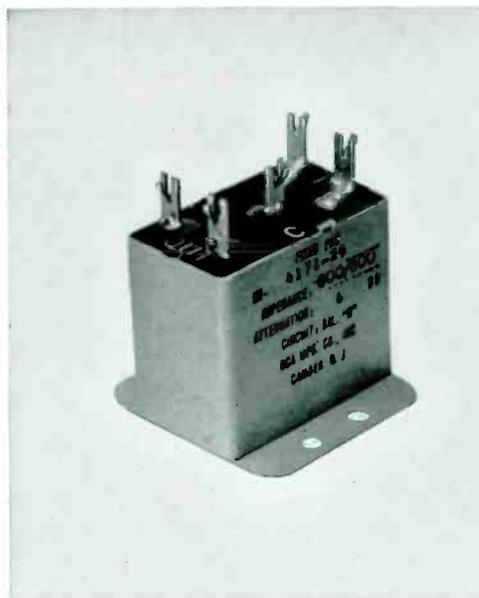
Bridge Pad (Balanced)

Input Impedance.....	600 ohms to two 600 ohm lines— isolation between lines about 45 db
Insertion Loss.....	10 db
Stock Identification.....	MI-11705



MI-4171-29 ►

◀ MI-11705



BRIDGING CONTROLS

DESCRIPTION

The MI-11278-E and -F Bridging Volume Controls are designed to provide a high resistance bridging input circuit for connections between any low impedance source and the 150/600 ohm input terminals of an amplifier. The use of one of these units makes it possible to pick up program material conveniently from a program buss or any low impedance terminated line without disturbing the operation characteristics of the buss or the line. Any line of +40 dbm or below may be bridged. The MI-11278-F Volume Control is designed to be mounted on the chassis of such amplifiers as the BA-21A and BA-24A. The center shaft of this control is notched for screwdriver adjustment. The MI-11278-E Volume Controls are designed for rear panel mounting on the same type amplifiers. They are supplied with dial knobs which mount on shafts extending through the panel.



MI-11278-F



MI-11278-E

SPECIFICATIONS

Input Impedances	20,000/10,000 ohms
Output Impedances.....	600/150 ohms
Insertion Loss*.....	31/24 db
Maximum Input Level.....	+40 dbm
Overall Dimensions:	
Length:	
MI-11278-E	2 ¹⁵ / ₁₆ "
MI-11278-F	2 ³ / ₁₆ "
Diameter	1 ³ / ₈ "
Weight4 1/2 ozs.
Stock Identification:	
For Panel Mounting (with knob).....	MI-11278-E
For Chassis Mounting (with screw-driver adjustments).....	MI-11278-F

* Bridging a 600-ohm line and operating into an amplifier with unloaded input requiring a source impedance equal to the output impedance of the control. The insertion loss when bridging a 150 ohm line is 42.5/36 db.

VU METER AND ATTENUATORS

DESCRIPTION

VU meters and attenuators are available as amplifier accessory equipment for indicating audio volume levels. Equipment is pictured at the left and may be ordered as follows:

Simpson VU Meter.....Stock #53064

Multiple Pad for calibrating the VU Meter
to the desired reference level.....Stock #19328

Zero Adjustment Pad.....Stock #19327

The complete kit is pictured at the left.



STANDARD CABINET RACKS

BR-84 SERIES



BR-84A



BR-84B



BR-84C

FEATURES

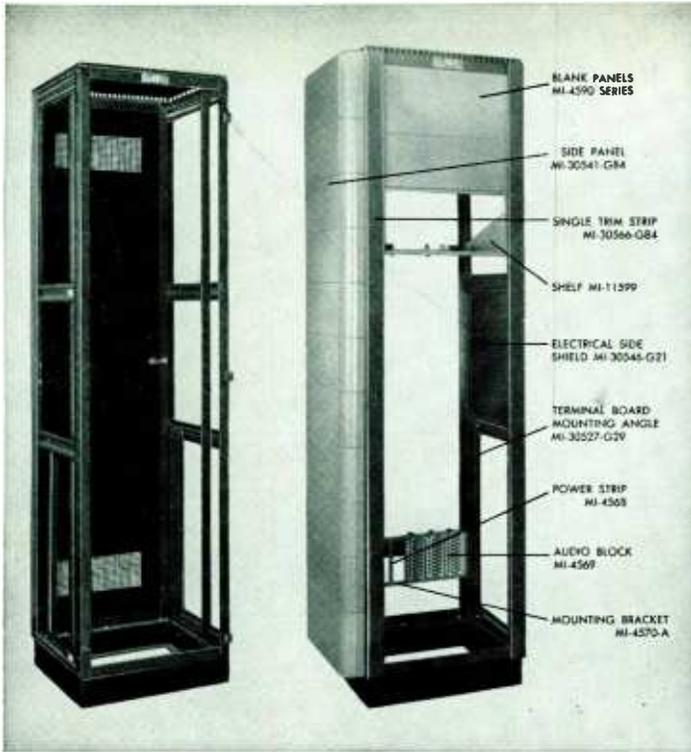
- Cabinets are same height as RCA transmitters—84"
- Total panel space 77"
- Available in many combinations to suit all studio applications
- Drilled and tapped for standard 19" panels
- Attractively styled to blend with all control room installations
- Suitable for fitting in a flush position to a side or rear wall
- Accommodates the heaviest equipment encountered in studio use
- Provides flexibility for future expansion

USES

The BR-84 series cabinet rack program is another of the new feature lines of RCA. The cabinet program is presented after years of practical experience in finally developing a flexible scheme for accommodating broadcast equipment.

DESCRIPTION

The five combinations of cabinets and accessories offer a versatile system for accommodating the user's immediate requirements with maximum accessibility for any future growth of the installation. Each rack may be mounted singly or, where desired, tandem together to facilitate the



BR-84D

BR-84E with Accessories

grouping of any number of cabinets. The cabinet is of sturdy metal construction, welded and bolted in one standard height and width. The ventilated top with slotted edges provides complete ventilation but protects the equipment from falling articles and dust. Vertical panel mounting angles have tapped holes at RMA standard locations to provide 77" of standard 19" panel mounting space. These angles may be installed to mount equipment within the cabinet, where doors are used, or flush with the front. When the latter method is desired, trim strips of neat design for panel mounting and clip fitting provide the finished appearance. The front and rear doors are of the universal type and may be hinged on the right or left side, to rotate in an arc of 180°. Electrical side shields are available in two sizes—21" for the center section, and 28" for the top and bottom sections. If found necessary after assembly, they may be fitted between racks of equipment. Terminal board mounting angles facilitate the mounting of power and audio blocks in a vertical or horizontal position. Additional terminal board mounting angles (MI-30527-G29) are available as accessories.

Units placed adjacently may be rigidly bolted together to produce a secure assembly. The cabinets are finished in a two-tone umber gray, with dimensional characteristics artistically blending with all RCA transmitters.

SPECIFICATIONS

Panel Width	19"
Panel Mounting Space (height).....	77"
Clearance for Door Swing.....	23"
Weight (BR-84A)	225 lbs.
Finish.....	Two-tone umber gray enamel except for the base which is black
Dimensions:	
Height	84"
Width—BR-84-A, -B (with side panels).....	28"
BR-84-C, -D, -E.....	22"
Width of Frame.....	22"
Depth of Frame.....	18"
Depth (including doors and handles).....	24 1/4"

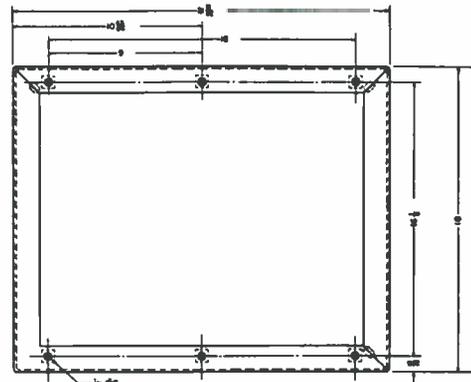
Stock Identification:

Type BR-84A consisting of one frame, one base, one top cover, one front door (non-ventilated), one rear door (ventilated), one pair of side panels, one set of terminal board mounting angles and one set of panel mounting angles and instruction book.....	ES-30951-A84
Type BR-84B, same as BR-84A, less front door only.....	ES-30951-B84
Type BR-84C, same as BR-84A, less side panels only.....	ES-30951-C84
Type BR-84D, same as BR-84A, less side panels and front door.....	ES-30951-D84
Type BR-84E, same as BR-84A, less side panels, front and rear doors.....	ES-30951-E84

Accessories

One Door (non-ventilated).....	MI-30530-G84
One Side Panel.....	MI-30541-G84
One Door (ventilated).....	MI-30535-G84
One Electrical Shield (for mid-section of rack) One Per Side.....	MI-30546-G21
One Electrical Shield (for top and bottom sections) Two Per Side.....	MI-30546-G28
*One Single Trim Strip	MI-30566-G84
*One Double Trim Strip Used where Two Cabinets Are Placed Together.....	MI-30568-G84
Terminal Board Mounting Bracket.....	MI-4570-A
Blank Panels	MI-4590 to 4599 Series
Audio Terminal Block	MI-4569
Power Terminal Strip.....	MI-4568
Set Terminal Board Mounting Angles.....	MI-30527-G29
Set of 2 Panel Mounting Angles.....	MI-30526-G84
BR-2A Panel and Shelf Assembly.....	MI-11598-B/11599
BR-22A Panel and Shelf Assembly.....	MI-11597
Ground Bus Kit.....	MI-11728

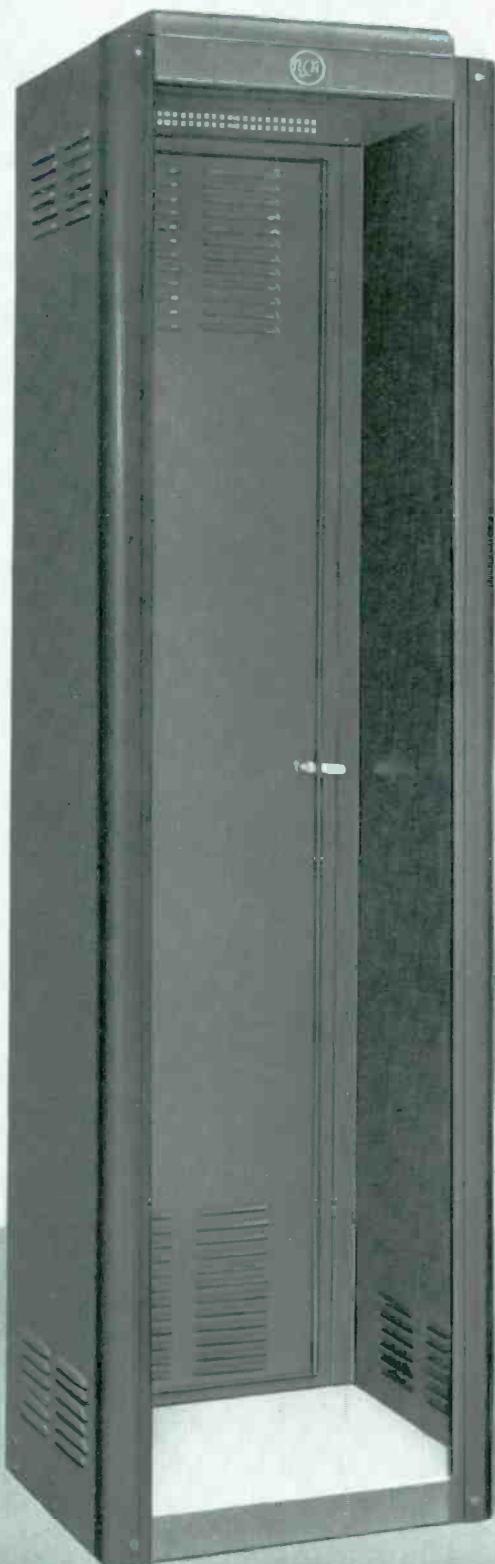
* Trim strips not required if front doors are used.



Layout and dimensions of cabinet base

CABINET RACK

TYPE BR-19A



FEATURES

- Lightweight cabinets designed to blend with all control room installations
- Provides flexibility for future expansion
- Constructed of $\frac{1}{16}$ " thick cold-rolled steel
- Drilled and tapped for standard 19" panels
- Modern streamlined styling

USES

The BR-19A Cabinet has been designed to accommodate broadcast equipment. The cabinets are of lightweight steel construction and offer new cost economies. They provide facilities for mounting standard 19" panels and shelves.

DESCRIPTION

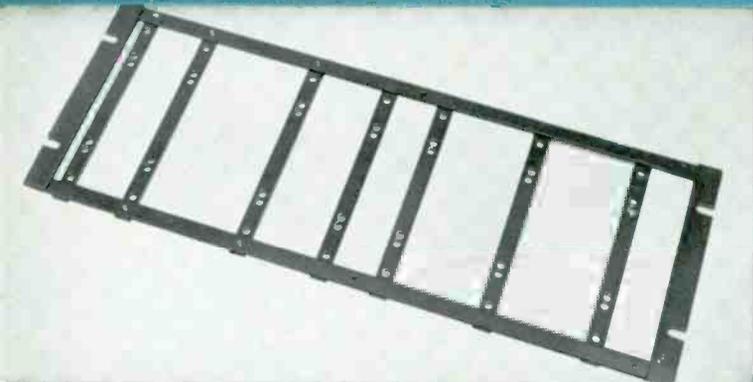
The BR-19A Cabinet Rack is constructed of $\frac{1}{16}$ " thick cold-rolled steel. It is provided with rear door only. All racks have quick detachable, new corner trims which are fastened to the front with two studs. This provides for rapid, finger-tip removal without the use of screwdrivers, etc. The cabinets are designed in keeping with modern streamlined styling, and have adequate ventilation through the use of rear, side, and top louvers and vents. Vertical corner mouldings cover the panel mounting screws and all panels fit into a recess so that the edges of panels are not exposed when the corner mouldings are removed.

The panel mountings consist of angle irons of $\frac{7}{64}$ " thick steel. Holes are accurately drilled and tapped 12-24 thread on universal centers for all types of panels. The BR-19A cabinet is finished in a two-tone umber gray in keeping with other RCA studio equipment.

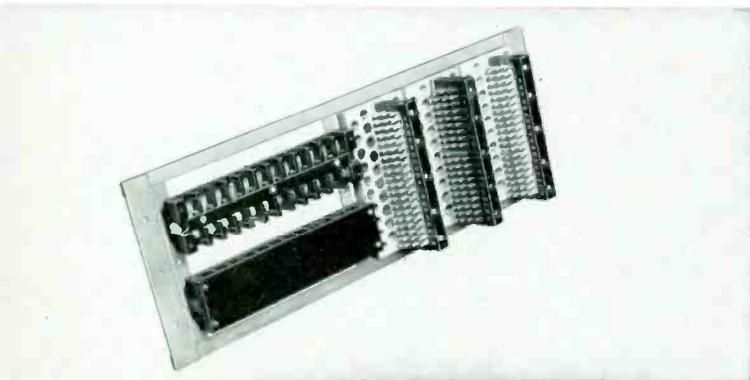
SPECIFICATIONS

Panel Width	19"
Panel Mounting Space (height).....	77"
Clear Inside Depth.....	16 $\frac{3}{4}$ "
Finish.....	Dark and light umber gray wrinkle
Material.....	$\frac{1}{16}$ " thick cold-rolled steel
Overall Dimensions.....	83 $\frac{1}{2}$ " x 22" x 18"
Weight	140 lbs.
Stock Identification	MI-11550

RACK ACCESSORIES



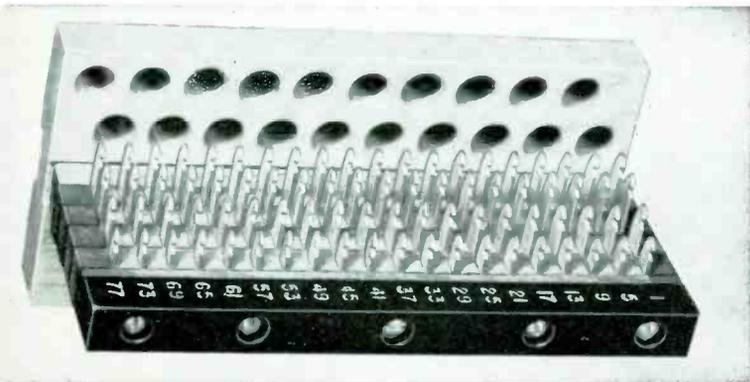
Terminal Block Mounting Bracket MI-4570-A.



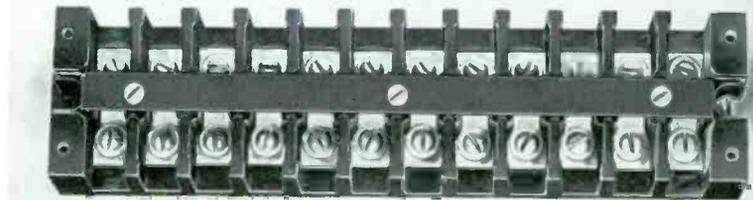
Terminal Block Mounting Bracket MI-4570-A with Terminal Blocks in position.



Power Terminal Block MI-4568.



Audio Terminal Block MI-4569.



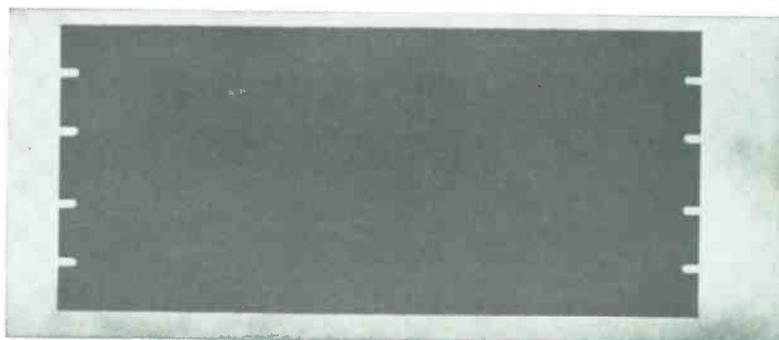
Power Terminal Block MI-4568 with cover removed.



Ground Bus Kit, MI-11728.

BLANK PANELS

A complete line of 19" blank panels is carried in stock for filling spaces on racks and cabinets not occupied by equipment panels. These blanks are also suitable for applications where equalizers, transformers, switches or other items must be panel mounted by the user. The stock of panels includes all standard widths from 1 3/4" to 10 15/32". They are 3/16" sheet steel and are finished and notched to match standard racks—the BJ-24 and BJ-12.



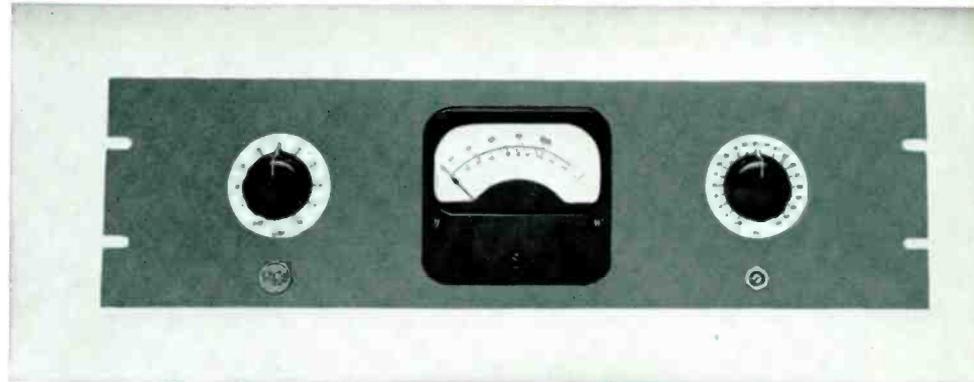
Panel Width

1	23/32"	Blank Panel, Umber Gray	MI-4590-A
3	15/32"	" " Umber Gray	MI-4591-B
5	7/32"	" " Umber Gray	MI-4592-B
6	31/32"	" " Umber Gray	MI-4593-A
8	23/32"	" " Umber Gray	MI-4594-B
10	15/32"	" " Umber Gray	MI-4595-B

BI-5A VU METER PANEL

FEATURES

- Measures audio volume levels from +4 to +40 vu
- Ten point selector connects up to 10 circuits
- Calibration curve supplied for loads other than 600 ohms
- Large illuminated VU meter



DESCRIPTION

The BI-5A Meter Panel employs the industry standardized VU Meter which embodies closely controlled electrical and dynamic characteristics combined with deliberate pointer action, moderate pointer speed, and small pointer overswing. It is intended as an audio level indicator for broadcasting, recording or wherever it is desired to read the level of one or more audio circuits with a rack mounting type of instrument.

The volume indicator panel assembly includes the VU meter, a two circuit ten point selector switch, a variable step-by-step attenuator (4 to 40 db attenuation), and a vernier control for making a fine adjustment of the level reading over a range of ± 0.5 db. The attenuator has a 1 milliwatt reference position which enables a level reading of zero VU.

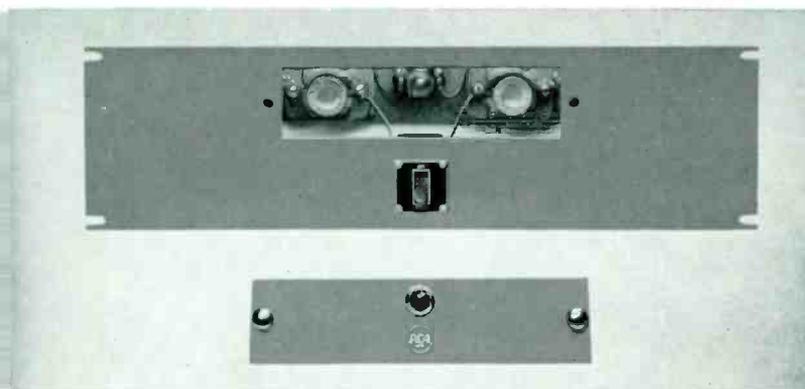
The VU meter scale is arranged with percent volts in black figures from "0" to "100" as the principal scale above the arc, and "vu" levels from "-20" to "0" to "+3" as supplementary figures in red below the arc.

The meter and attenuator are calibrated for use with a 600 ohm line, however, a calibration correction curve furnished with the instrument permits its use with loads other than 600 ohms. The ten point selector switch may be connected to any ten lines (or circuits). If one or more switch positions are connected to a jack strip, the number of circuits that may be monitored is unlimited. The meter is provided with the 6.3 volt lamp for illuminating the meter scale.

SPECIFICATIONS

Input Impedance (except on 1 milliwatt step).....	7500 ohms
Attenuator Steps.....	1 milliwatt position, +4 to +40 db in 2 db steps and off position
No. of lines that may be measured.....	1 to 10 inclusive
Mounting.....	Standard Cabinet Rack
Dimensions:	
Height	5 1/4"
Width	19"
Depth	3 3/4"
Finish.....	Light umber gray
Weight (unpacked).....	7 1/2 lbs.
Stock Identification	MI-11265-F

57-D SWITCH AND FUSE PANEL



The Type 57-D Switch and Fuse Panel is designed for use as a master input control of the a-c power supply. Ordinarily one such panel is used with each rack or channel of speech input units. The mounting is for a BR-84 Series Standard cabinet rack.

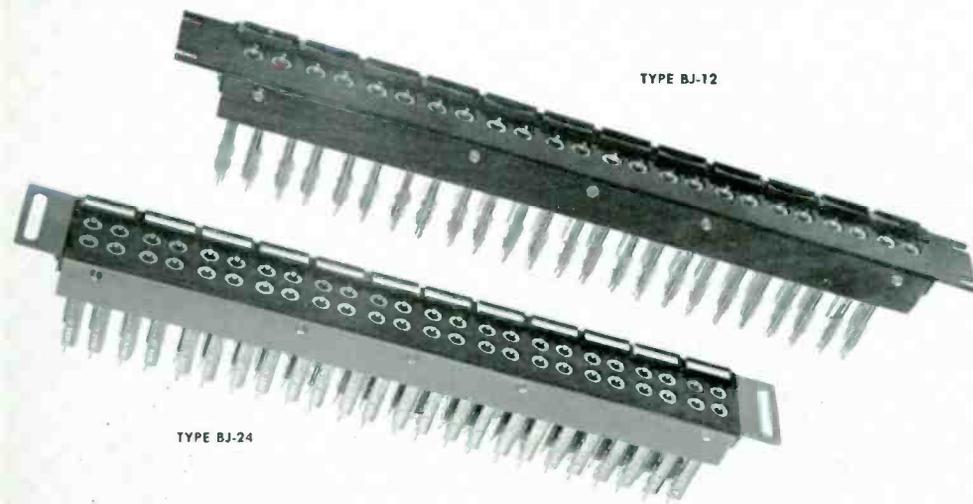
DESCRIPTION

On this panel are mounted and wired an indicator lamp with red cap, two single fuse blocks of the screw-plug type and a double-pole single-throw power switch. A removable door permits front panel access to fuses and pilot lamp.

SPECIFICATIONS

Switch.....	D.P.S.T., 250 volts, 30 amperes
Fuses (not furnished).....	Screw-plug type (rating depends upon equipment to be protected)
Dimensions, overall (panel thickness 3/16"):	
Height	5 7/32"
Width	19"
Depth	3 1/2"
Weight (unpacked).....	8 1/2 lbs.
Stock Identification:	
Light UMBER Gray.....	MI-4395-G

JACK PANELS, MATS AND CORDS



TYPE BJ-12

TYPE BJ-24

FEATURES

- Offset ground lugs—easy to wire
- Spacing of jack pairs prevents cross-circuit patching
- Bakelite strip reinforced to prevent warping or breakage

USES

Jack Panels, with their associated patch cords, are used with broadcast speech input systems to improve the overall operating flexibility. In addition to providing a convenient termination for program and order wire telephone circuits, closed-circuit jacks may be connected to provide "patch cord" access to the input and output circuits of individual units of the speech assembly. When connected for this purpose, the regular circuits are continuous through the jacks until a patch cord is inserted to make an external connection. With properly connected jacks, patch cords may be freely used in emergencies or for test purposes to interchange or transfer telephone lines, amplifiers, mixers, microphones, or other equipment items.

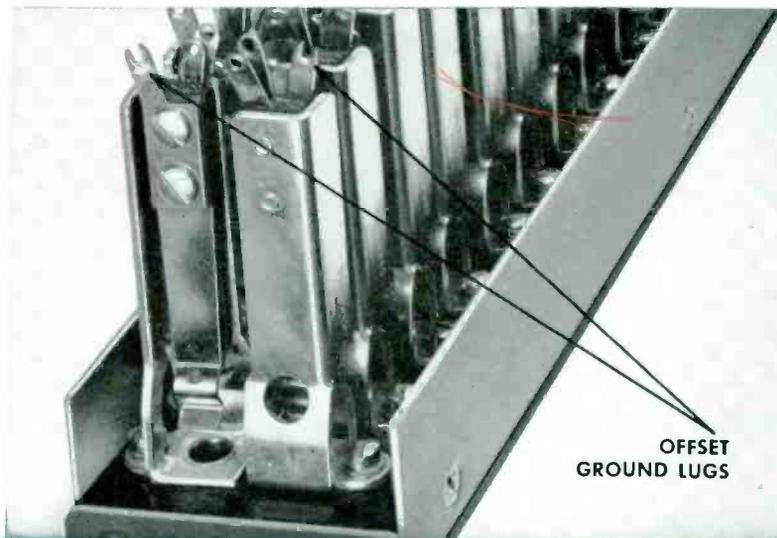
DESCRIPTION

The BJ-24 consists of two rows of twelve double jacks mounted on thick black bakelite and furnished with designation card holders. The BJ-12 is similar to the BJ-24 but has only one row of twelve double jacks. The jack sleeves of the BJ-24 and BJ-12 are chromium plated.

SPECIFICATIONS

Number of Jack Pairs	
BJ-24	24
BJ-12	12
Type of Jacks	Double jacks of standard closed circuit type
Dimensions	
BJ-24.....2 1/8" x 19"	BJ-12.....1 3/4" x 19"
Weight (unpacked)	
BJ-24.....5 1/2 lbs.	BJ-12.....3 lbs.
Stock Identification	
BJ-24 (RCA Standard)	MI-11645
BJ-12 (RCA Standard)	MI-11646

Photo below shows Convenient Offset Ground Lugs



OFFSET GROUND LUGS

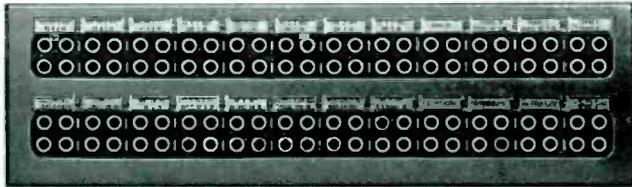
JACK MATS

Jack Mats are available for covering 1, 2, 3, or 4 type BJ-24 Double Jack Strips.

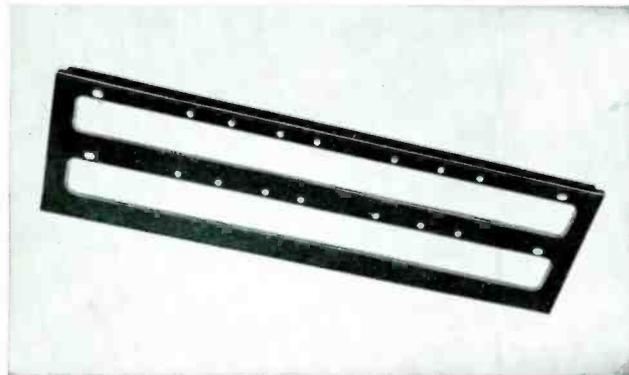
SPECIFICATIONS

Single BJ-24 Jack Strip Mat, overall size.....19" x 3 15/32"
 Umber GrayMI-11647-1

Double BJ-24 Jack Strip Mat, overall size.....19" x 5 7/32"
 Umber GrayMI-11647-2



MI-11647-2 Double Jack Mat shown with two double jack strips



MI-11647-2 Double Jack Mat

View of RCA BR-84 Standard Racks as used at Radio Station WHBQ, Memphis, Tenn. RCA BJ-24 Jack Mats are used in these racks.

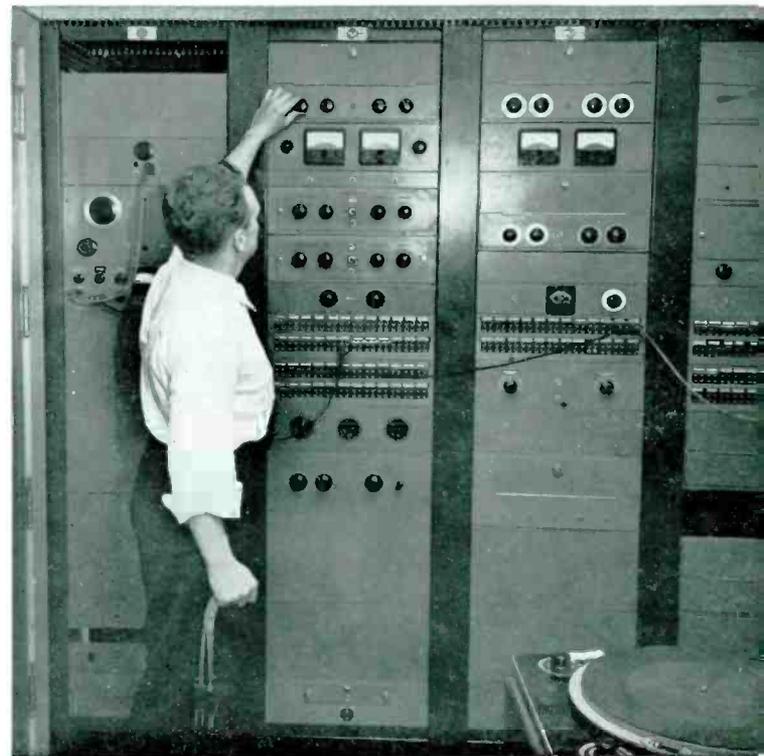
PATCH CORDS

RCA maintains a stock of patch cords for the convenience of broadcasting stations. The cords are standard telephone type using two double plugs. The MI-4652-B series has black shielding and the MI-4652-C series has gray shielding. Three lengths of patch cords are available as listed below:

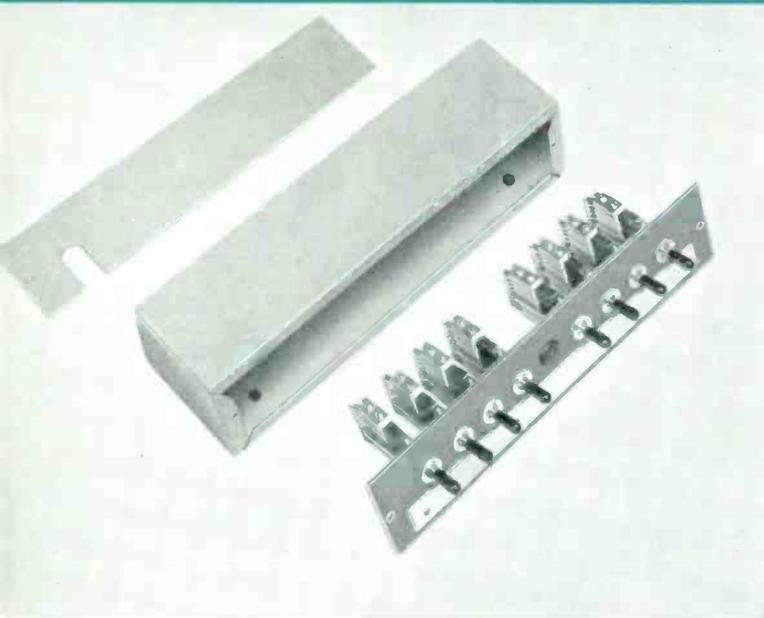
	Black	Gray
Two Foot Cord Length.....	MI-4652-B2	MI-4652-C2
Four Foot Cord Length.....	MI-4652-B4	MI-4652-C4
Six Foot Cord Length.....	MI-4652-B6	MI-4652-C6



Shielded Type Patch Cord



SWITCH, PANEL AND HOUSING



FEATURES

- Compact accessory item with facilities for 9 switches
- Easily mounted at any convenient location—desk, shelf, console or rack
- Long-life palladium switch contacts
- Styling matches RCA Audio and TV Studio Equipment
- Write-in designation strip

USES

The Switch, Panel and Housing Assembly provide an ideal and inexpensive means of augmenting any present switching installation. The compact Switch Housing Assembly, MI-11756, and removable Switch Panel, MI-11754, are designed to house up to nine manually operated Switches, MI-11755-2. The panel is styled to match RCA audio and TV studio equipment.

Station Engineers may use the Panel and Housing Assembly to accommodate pilot lights or other switches for special applications as well as the MI-11752-2 switches. The new switching assembly may be used to provide switching of audio outputs and inputs for tape recorders, intercom equipment, remote lines, etc. It is designed for desk or shelf mounting, but may be mounted in a 13½-inch TV console housing by means of a Basic Mounting Panel, MI-26252 or in a 22-inch console or standard rack by means of Rack Adaptor, MI-26254.

DESCRIPTION

Simple and inexpensive manually-operated switching equipment is made available by RCA in the form of unassembled Switch Panel, MI-11754 to which may be assembled up to nine MI-11755-2 lever-type, low-capacity leaf switches, lights, or other type switches which mount in single 15/32-inch hole. The equipment is designed to fit in Switch Housing Assembly, MI-11756.

The switch panel is made of reverse etched aluminum with nine 15/32-inch holes for mounting. Dummy plugs are supplied for all mounting holes left blank. An erasable write-in designation strip is provided for proper identification of the switching facilities. The housing is of sturdy steel construction with removable back panel for accessibility. The case has rubber feet which will not scar desk, table or shelf mounting area. The panel mounts in the case so as to provide a 15° sloping front for easier identification of the switching functions.

The MI-11755-2 switches are lever type low capacity leaf with 3 Form C contacts (single pole, double throw) on each side. The center position is neutral with one locking and one non-locking position. The construction of the key is such that the switch may be adjusted to be locking or non-locking in either position. The actuating lever has a nylon hub for long life, while all contacts are of long-life palladium. Switch contacts are rated 3 amperes, 120 volts, a-c non-inductive load. Two cable clamps provide secure fastening for all switch wiring installation to the front panel.

SPECIFICATIONS

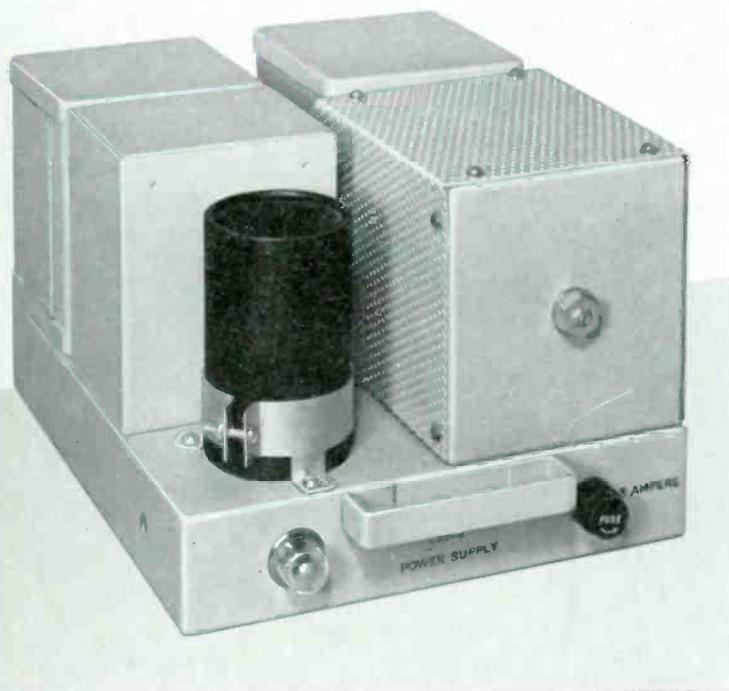
Switch Contact Capacity Rating.....	3 amps., 120 volts a-c, non-inductive load
Finish	Umber gray
Dimensions Overall:	
Width	11½"
Height	2-3/5"
Depth (top)	2¾"
Depth (bottom)	3½"
Weight.....	Approx. 5 lbs.
Stock Identification:	
Switch Housing Assembly.....	MI-11756
Switch Panel	MI-11754
Switch, 6 Form C, Single Pole, Double Throw, Contacts.....	MI-11755-2

Accessory Equipment

Basic Mounting Panel (for mounting 11754 switch panel in TV Console housing).....	MI-26252
Rack Adaptor (for mounting MI-11754 switch panel in 19" rack).....	MI-26254

REGULATED POWER SUPPLIES

MJ-11318-A and MI-11316



Regulated Power Supply, MI-11316.

DESCRIPTION

Compact size and low weight in proportion to power output are prime features of the Constant Voltage DC Power Supply, MI-11318-A. The equipment employs selenium rectifiers and provides very good load regulation over the entire operating range. The unit is designed to mount in standard 19-inch racks.

The MI-11316 is a selenium rectifier type power supply. It provides 3 amperes maximum 24 volts d-c, operating from a nominal 117 volts 50/60 cps source. This power supply is recommended for use with relay switching equipment. It is also required to operate the BCS-11A Master Switching Console.

This power supply may be mounted on a standard RCA panel and Shelf, BR-2A.

SPECIFICATIONS

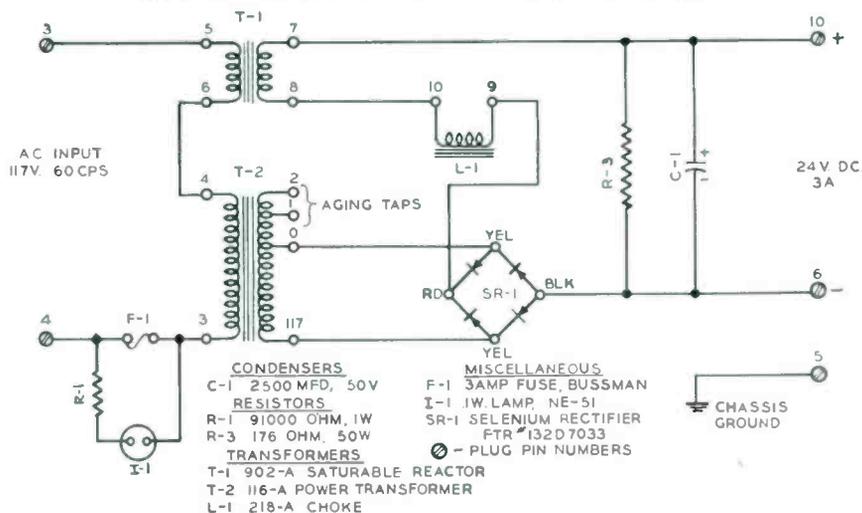
Constant Voltage DC Power Supply, MI-11318-A

Input..... 100-130 volts a-c, 60 cps, single phase, 144 watts
 Output..... 6 amperes, 24 volts d-c
 Efficiency Approx. 72%
 Regulation..... Line regulation within $\pm 1\%$,
 load regulation of less than 4% between 20% and 100% load;
 less than 0.8% ripple voltage
 Ambient Temperature..... 65°C max.
 Finish..... Light umber gray
 Size..... 19" wide, 5 $\frac{1}{4}$ " high, 9 $\frac{3}{4}$ " deep
 Shipping Weight..... Approx. 45 lbs.
 Stock Identification MI-11318-A

Regulated Power Supply, MI-11316

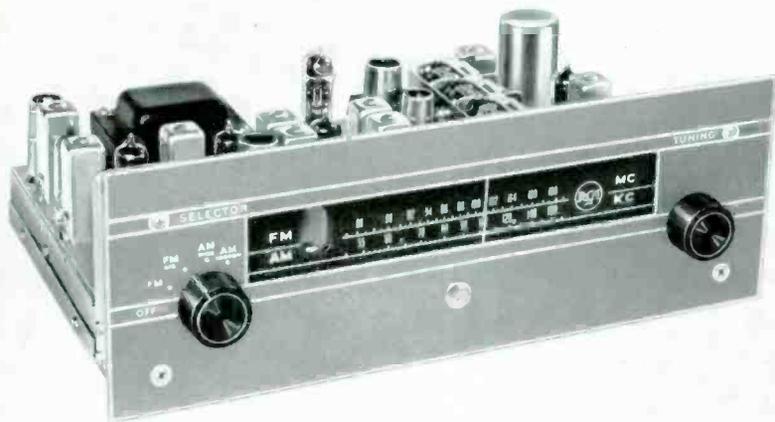
Input..... 100-130 volts, 60 cps, single phase, 117 watts
 Output..... 3 amperes, 24 volts d-c
 Regulation..... Better than 5% voltage regulation, no load to full load
 Ripple..... 60 and 120 cycle components, less than 3% at full load
 Size..... Length 9", Width 7 $\frac{3}{4}$ ", Height 5 $\frac{3}{4}$ "
 Weight 25 lbs.
 Shipping Weight..... Approximately 30 lbs.
 Finish..... Light gray baked enamel over zinc chromate primer
 on 16 gauge steel
 Stock Identification MI-11316

MI-11316 POWER SUPPLY SCHEMATIC DIAGRAM



AM-FM RADIO TUNER

TYPE ST-5



FEATURES

- Extended audio frequency range
- Extremely sensitive; minimum distortion
- High signal-to-noise ratio
- Drift-free automatic frequency control; variable control
- Equipped with a tuning eye for easy tuning
- Cathode-follower output stage
- Minimum radiation—well within FCC and EIA requirements
- Low impedance loop antenna
- Wide and narrow AM tuning

DESCRIPTION

The RCA ST-5 AM/FM Radio Tuner is designed for use where a central radio receiver is to be used with a sound distribution system. Due to its wide range frequency characteristics and low distortion rating, the ST-5 Tuner is especially adaptable to broadcast systems. It is also handy for off-air monitoring. When connected to a high-fidelity audio amplifier and speaker it will provide radio reception at its very finest. Special care has been taken in minimizing radiation to prevent interference with other radio receivers and television sets. Radiation is well within the FCC and EIA Limits over the entire FM band.

The MI-12116 is carefully designed to meet rigid specifications and conservatively rated for flawless performance. This sensitive tuner has frequency response of 20,000 ± 2 db from 50 to 15,000 cps. It is a 13 tube (including tuning eye and rectifier) AM/FM Tuner with a FM tuning range of 88-108 megacycles and an AM tuning range of 520-1650 kilocycles. The tuner is designed for use with an audio amplifier of 10,000 ohms or greater input impedance. The output of the tuner is fed into a standard phonojack mounted in the rear chassis apron. Three simple controls are used for operating the MI-12116 Tuner.

SPECIFICATIONS

Audio Frequency Response.....	Flat ± 2 db from 50 to 15,000 cps
Audio Frequency Response Overall.....	20 to 20,000
Tuning Range:.....	FM 88-108 mc AM 520-1650 kc
Intermediate Frequencies:.....	FM 10.7 mc AM 455 kc
Sensitivity: FM 2 microvolts for 20 db noise quieting (on 300 ohm input)	
AM 2 microvolts for 0.2 volt audio output	
Audio Output:.....	FM 1.5 v. with 75 kc deviation AM 1.5 v. with 60% modulation
Output Impedance.....	For use with audio amplifier of 10,000 ohms or greater impedance
Oscillator Radiation.....	Well within the FCC limit for maximum oscillator radiation over the entire FM band
Signal to Noise.....	60.5 db (75 kc deviation 20 mv signal)
Distortion.....	1.5% at 1.5 volt output (75 kc deviation 20 mv signal, 400 cycles)
Power Required.....	105-125 v. 50/60 cps, a-c, 50 watts
Controls.....	Tuning Selector—OFF, FM, FM (AFC), AM (Wide), AM (Narrow), Level Set (screwdriver adjustment)
Recommended Audio Cable Length.....	Up to 200 feet of shielded cable; or low-impedance cable up to 10,000 mmf total distributed capacitance
Antenna Inputs:.....	FM input, 300 ohms AM low impedance, high impedance
Tube Complement:	
	1—6AB4, 2—6BA6, 1—6BS8, 3—6AU6, 1—12AT7, 1—6CN7, 1—6AL5, 1—6BE6, 1—6BR5/EM80, 1—6X4
Whistle Filter:	
	An audio whistle filter provides at least 20 db rejection at 10 kc
Dimensions.....	6 $\frac{1}{2}$ " high, 14 $\frac{1}{4}$ " wide, 12 $\frac{3}{4}$ " deep
Weight.....	17 lbs. (shipping)
Stock Identification.....	MI-12116

MULTI-PURPOSE TURNTABLE

Type BQ-51A



FEATURES

- High-quality, 2-speed rim-drive mechanism for 33 $\frac{1}{3}$ and 45 rpm records
- Pre-assembled tone arm on turntable saves installation time
- Provision for mounting second tone arm for greater versatility
- Accommodates conventional recordings and magnetic discs
- Smooth and rapid starts within a half revolution
- Available as a mechanism for custom-built installations

USES

The RCA BQ-51A Multi-Purpose Turntable fulfills the broadcaster's need for a high-quality turntable mechanism to accommodate commercial disc recordings up to 12 inches in diameter at speeds of 33 $\frac{1}{3}$ and 45 rpm. It is also used for recording and playback of magnetic discs at 33 $\frac{1}{3}$ rpm.

The BQ-51A is available as a mechanism for mounting in custom-built arrangements. It may also be obtained as a complete assembly with a styled cabinet, MI-11809.

The tone arm supplied with the BQ-51A accommodates the RCA Pickup Heads, MI-11874-4, MI-11874-5, for playing conventional records, or the RCA Magnetic Head, MI-11955, for use with magnetic discs. It will also accept any standard, low impedance, reluctance-type pickup that conforms to EIA standards.

Provision for mounting a second tone arm, permits the selection of either standard or magnetic disc playback. Mounting facilities are provided for both the BA-26A Transistorized Preamplifier and the BA-51A Record/Reproduce Amplifier.

DESCRIPTION

The BQ-51A Multi-Purpose 12-inch Turntable is a 2-speed, rim-drive mechanism, utilizing a hysteresis synchronous motor. It is available for operation with a 60-cycle power supply, MI-11810, or for 50-cycle use, MI-11810-A.

The turntable platter is a sturdy aluminum casting. The platter and spindle assembly is held in the main support casting by oilite bushings and the thrust is supported by a single ball at the bottom end of the spindle. A foam rubber belt on the outside rim of the platter eliminates resonance effects. The drive motor is mounted on a separate plate, supported by vibration mounts to eliminate rumble. All posts and shafts which provide bearings for cams and arms are assembled to a common plate to insure proper alignment. The Cabinet Assembly, MI-11809, affords a simplified mounting for the drive assembly mechanism, operating controls, preamplifiers and other accessories.

A 2-position speed selector switch is provided on the turntable assembly. An "Off-On" selector control operates a mercury motor switch and simultaneously engages or disengages the rubber idler wheels. This feature relieves the idlers from pressure when set to the "Off" position.

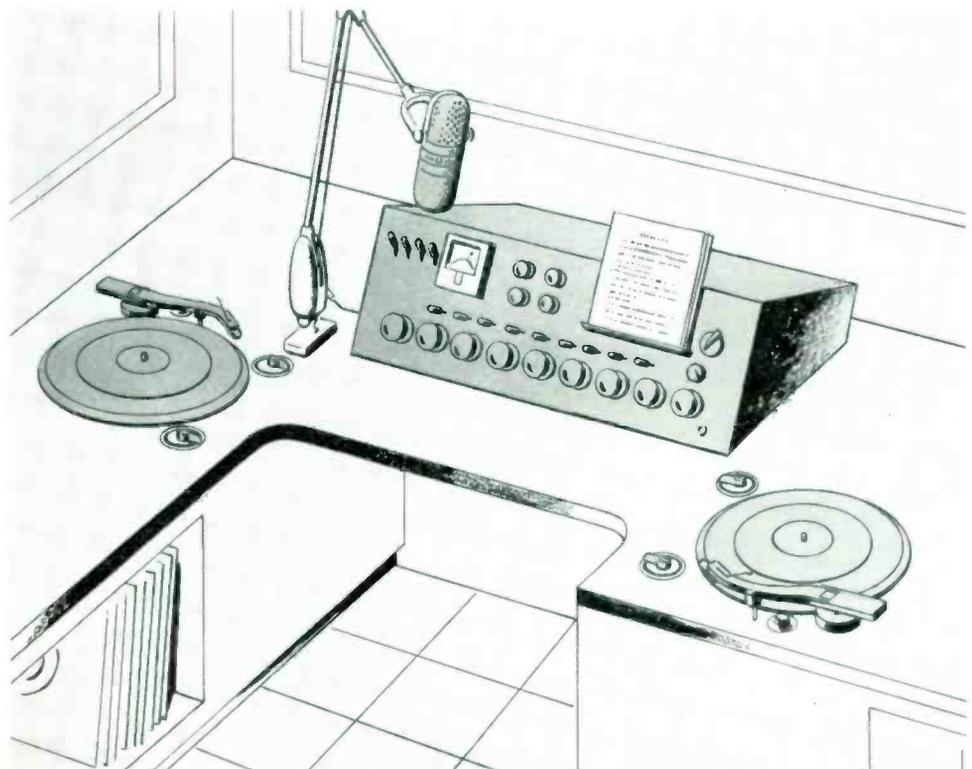
TURNTABLES

A cabinet of functional design is available to house the turntable equipment. It has a durable, umber-gray fabri-koid covering which is resistant to scuff and scratches. A 17 $\frac{3}{8}$ by 19 $\frac{3}{8}$ -inch hinged door is located on the front of the cabinet to permit ready access to the interior and

mounting facilities have been provided to accommodate either the BA-26A Transistorized Preamplifier, MI-11436, or the BA-51A Record/Reproduce Amplifier, MI-11903, or both equipments. Each turntable mechanism is supplied with an 8-foot power cord.



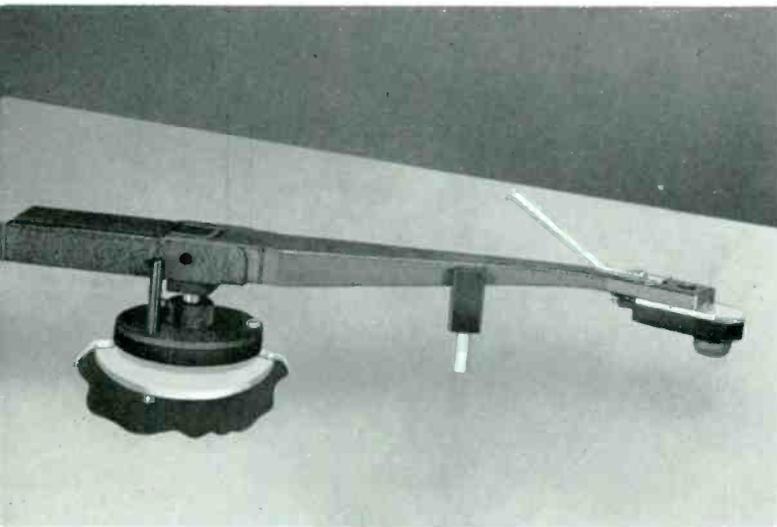
The Multi-Purpose Turntable, Type BQ-51A, showing the turntable mechanism, platter assembly and tone arm.



Simplified sketch showing how the BQ-51A is adaptable to custom-built installations.

LIGHTWEIGHT TONE ARM

MI-11894



USES

Lightweight Tone Arm, MI-11894, fulfills the need for a high quality broadcast pickup combination for playing magnetic and standard transcriptions. It has been designed primarily for use with the Magnetic Record/Reproduce Head, MI-11955, and RCA's plug-in Lightweight Pickup Heads, MI-11874-4 and MI-11874-5. In addition, it will also accept any pickup which mounts on standard 1/2-inch centers.

DESCRIPTION

The MI-11894 Lightweight Tone Arm accommodates the RCA Magnetic Record/Reproduce Head used in the Magnetic Disc System as well as RCA one mil or 2 1/2-mil Lightweight Pickups. The heads are readily interchangeable. The anti-friction vertical and lateral pivots and low mass allow the tone arm to track warped and eccentric records with a tracking error less than four degrees.

The lightweight tone arm has an adjustable counterweight controlled by an accessible thumb nut at the rear of the tone arm to allow accurate selection of stylus force.

The tone arm is hinged at the pivot center to allow easy access to the underneath portion of the arm, thus providing immediate access to the pickup and wiring. The tone arm handle introduces a new concept by providing finger-tip control directly behind the pickup stylus, thus enabling the user to sense by touch as well as to see more accurately where the stylus is being set down. The tone

FEATURES

- Designed for use with both magnetic disc record/reproduce head and standard record transcription pickups
- High-quality reproduction
- Less than four degrees tracking error on any standard record
- Low mass and anti-friction pivots permit tracking on warped and eccentric records
- Finger-tip control

arm can be mounted on any RCA 12" turntable. All necessary mounting hardware is included.

SPECIFICATIONS

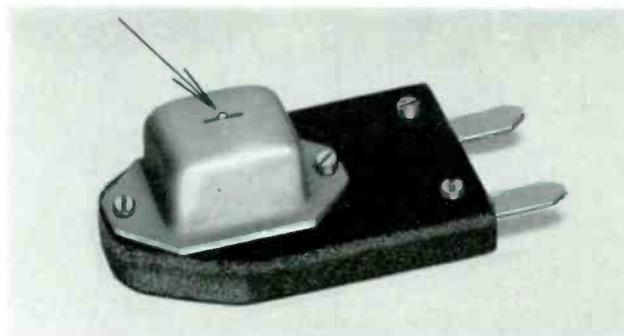
Tracking Error, 12-inch Record.....	4° max.
Pivot Bearings.....	Anti-resonant in vertical and horizontal planes
Tone Arm Head Receptacle.....	Plug-in type
Arm Finish.....	Light umber gray
Length of Arm.....	12"
Width of Arm.....	Tapered 1 1/2" to 1/2"
Height of Arm.....	Tapered 3/4" to 1/4"
Approx. Shipping Weight (arm, assembly, etc.).....	1 1/2 lbs.
Mounting.....	Approx. 8" from spindle center

Stock Identification

Tone arm assembly (less pickup heads) complete with tone arm rest and mounting hardware.....	MI-11894
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Accessory Equipment

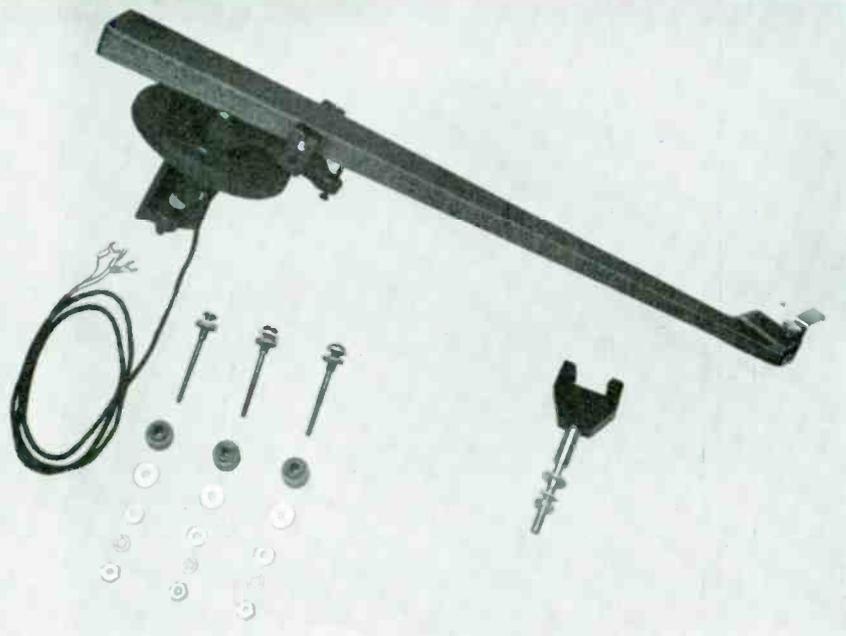
Magnetic Record/Reproduce Head.....	MI-11955
Lightweight Pickup, 1 mil.....	MI-11874-4
Lightweight Pickup, 2.5 mil.....	MI-11874-5



Magnetic Record/Reproduce Head, MI-11955.

LIGHTWEIGHT TONE ARM

MI-11885-A



FEATURES

- Used with RCA plug-in heads, provides high quality reproduction of 45 rpm and 33 $\frac{1}{3}$ rpm fine groove records, standard transcriptions and commercial records
- May be applied to any 16-inch turntable
- Less than 4 degrees tracking error on any standard record
- Low mass and anti-friction pivots permit tracking on warped and eccentric records.

USES

The new lightweight pickups and tone arm (MI-11874 series and 11885-A respectively) have been designed to fulfill the need for a high-quality broadcast pickup combination for playing fine groove records and standard transcriptions. A popular application of this new design is in combination

with the present Universal Pickups and 16-inch turntables. In such installations, the new unit provides the broadcaster with pickup and tone arm facilities for groove sizes associated with all three speeds.

DESCRIPTION

The lightweight tone arm is designed to function with two diamond stylus sizes (1 mil stylus for fine groove and 2 $\frac{1}{2}$ mil stylus for standard transcription and 78 rpm records). These are readily interchangeable as "plug-in" units.

Tone arm resonances have been carefully placed so that they are outside of the operating frequency range of the systems, thus assuring smooth response characteristics. Distortion due to tracking error in the arm and pickup has been reduced to a minimum by careful design. The anti-friction vertical and lateral pivots and

low mass allow the tone arm to track warped and eccentric records.

The required stylus forces are only a fraction of what was formerly considered necessary, thus assuring longer life for both the stylus and the record. Design of the pickup system permits interchange of the magnetic heads without necessitating any adjustment for correct stylus pressure. The stylus is readily visible, providing means for accurately spotting the pickup on the record.

LIGHTWEIGHT TONE ARM (Cont'd)

SPECIFICATIONS

- Tracking Error, 16-inch Record (C. D. 12").....4° max.
 - Pivot Bearings.....Anti-resonant bearings in vertical and horizontal planes
 - Tone Arm Head Receptacle.....Quick-lock, plug-in type
 - Construction of Arm.....Aluminum casting
 - Length of Arm.....15"
 - Width of Arm.....Tapered 1½" to ¾"
 - Height of Arm.....Tapered ¾" to 9/32"
 - Approx. Shipping Weight (arm, assembly, etc.).....3 lbs.
 - Mounting.....Approx. 12" from spindle center
- Stock Identification:
- Tone Arm (less pickup heads) includes assembly complete with tone arm rest and mounting hardware.....MI-11885-A



70-F Turntable with Pickup and Tone Arm installed at rear

LIGHTWEIGHT PICKUP HEADS

MI-11874-4 AND MI-11874-5

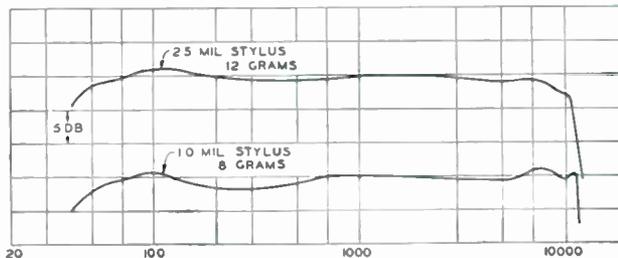
SPECIFICATIONS

Lightweight Lateral Magnetic Pickups

- Output Pickup Impedance.....135 ohms @ 1000 cycles
- Load Impedance.....Filter Output should be connected to unloaded input transformer of amplifier designed to operate from a 150 ohm source such as the BA-21A Preamplifier or the BA-26A Equalized Preamplifier.
- Compensation Required.....MI-11888 Equalizer or BA-26A Amplifier
- Frequency Response.....(See curve)
- Voltage Output.....Open circuit voltage at terminals of pickup head, reproducing 1000 cycle bond of 6.1 cm/sec. test record is 11 millivolts.
- Output Level of MI-11888 Equalizer Output.....Approx. -65 dbm
- Hum Level.....-120 dbm
- Pickup Weight.....MI-11874-4 (0.37 oz.); MI-11874-5 (0.51 oz.)
- Stylus Force in combination with Tone Arm, MI-11885-A:
 MI-11874-4.....8 grams MI-11874-5.....12 grams
- Stylus Tip Radius (Polished Diamond Stylus):
 MI-11874-4 (for fine groove).....1.0 mil
 MI-11874-5 (standard transcriptions).....2.5 mils
- Overall Dimensions (plug-in pickup heads):
 Excluding contact pins.....Width ¾", Depth ¾", Thickness 7/16"
- Stock Identification:
 1 mil, Pickup, Fine Groove (color, Red).....MI-11874-4
 2.5 mil, Pickup, St'd Transcription (color, Green).....MI-11874-5



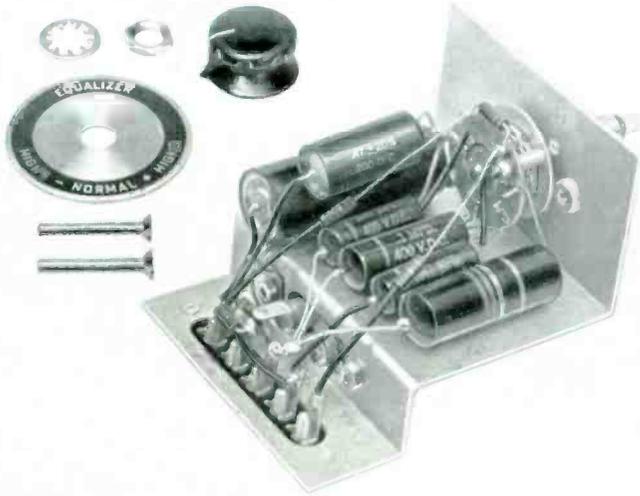
Plug-in Type Pickup Head, MI-11874-4



Typical response of Pickup, Tone Arm and Filter

PICKUP EQUALIZER

MI-11888



FEATURES

- Adjustable high frequency response
- Follows NAB curve
- Insensitive to hum pick-up
- Economical
- Compact—easy to mount in transcription turntables

USES

The MI-11888 Pickup Equalizer is used to filter the re-created audio frequencies of transcriptions before introduction into the audio amplifier system of broadcast and TV stations to achieve the most desirable response over the entire audio frequency range. The equalizer may be mounted in RCA transcription turntables and is designed for use with the MI-11874-4 Pickup Head for the reproduction of 45 or 33 $\frac{1}{3}$ rpm lateral cut fine groove records and the MI-11874-5 Pickup Head for the reproduction of 78 or 33 $\frac{1}{3}$ rpm lateral cut standard groove records.

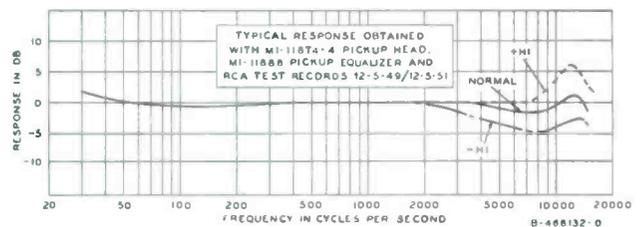
DESCRIPTION

The MI-11888 Pickup Equalizer consists of a capacitor-resistor network mounted on a plate, and separate diol plate, control knob, and hardware for mounting it in a transcription turntable. The right hand front corner of RCA turntables has been designated as best site for the equalizer in order to reduce noise pickup to the lowest possible value.

The equalizer is designed to be used with any amplifier having an unloaded input transformer and which has a flat response when operated from a 150 ohm source. Examples of this type of amplifier are the RCA BA-21A Preamplifier, the BA-24A Monitoring Amplifier and the microphone input of any RCA consolette. In order to compensate for variations in transcriptions, three responses can be chosen: (1) flat, (2) increased high frequencies, or (3) decreased high frequencies.

SPECIFICATIONS

Frequency Response.....	Variable over range of 30 to 10,000 cycles (see response curves)
Output level (using MI-11874-4 or -5 Pickup Heads)	Approximately -65 dbm (measured using RCA Test Record 12-5-51 at 1000 cycle reference level)
Output Impedance.....	150 ohms
Noise Level.....	Less than -120 dbm
Load Impedance.....	The output of the filter should be connected to the unloaded input transformer of an amplifier having a flat response and designed for operation from a 150 ohm source.
Dimensions Overall.....	3 $\frac{3}{8}$ " long x 2 $\frac{7}{8}$ " wide x 5 $\frac{1}{2}$ " hgh
Weight	3 $\frac{1}{4}$ lbs.
Stock Identification	MI-11888

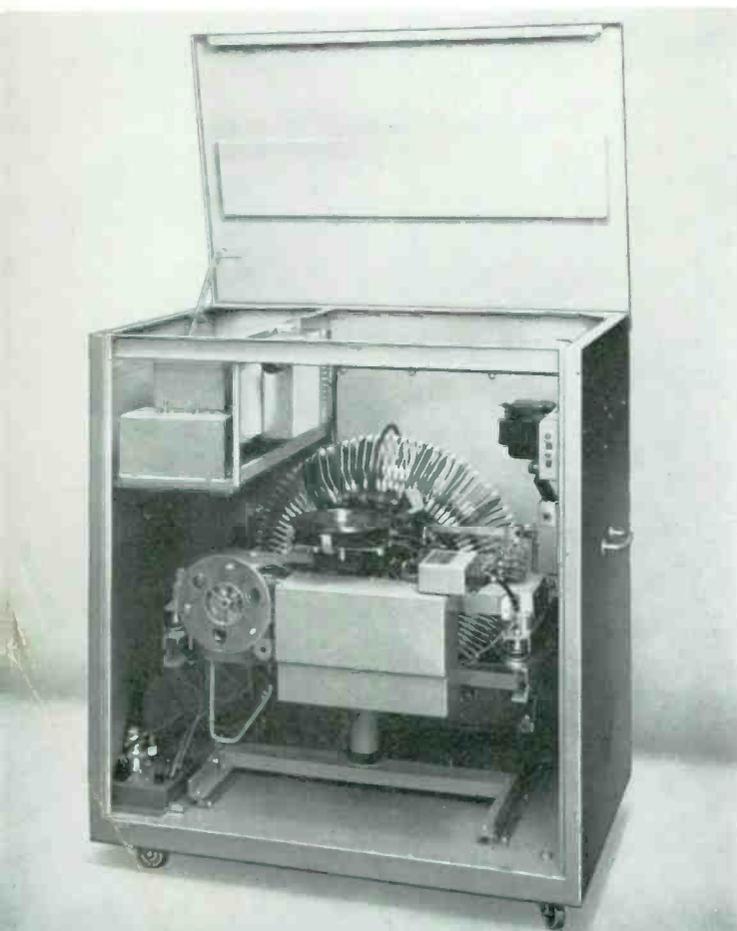


BQ-103 AUTOMATIC TURNTABLE

FOR PLAYING 45 RPM RECORDS

FEATURES

- Integral unit in RCA automation system of studio programming
- High record capacity—100 records or 200 selections—at your fingertips
- Automatic record cueing
- Remote control—random or sequential operation on one turntable
- Longer pickup head life
- Less handling—longer record life
- Self-contained power supply
- Remote preset and clearing of selections



USES

The new RCA BQ-103 Automatic Turntable with its feature of fixed sequential or random type of play provides high record capacity with an efficient, accurate and economical means of record programming and handling. The automatic turntable provides a means of playing a maximum of 100 "45" rpm records (200 plays) on a push button control basis. The turntable with its provisions for electrical remote control becomes an integral part of RCA's automation system of studio programming.

The new type turntable offers greater operating efficiency for the broadcast audio studio. Not only does it conserve control room space, but the capacity of the changer allows for the loading of the machine at relatively infrequent intervals. A savings results from decreased record handling and increased record life. Pickup head life is also increased since the exact placement of the styli is accomplished by an exact and gentle mechanical motion. This avoids broken diamonds and also results in less record damage than is possible by human operation. Less skilled operating personnel are able to operate the new type turntable.

DESCRIPTION

The Type BQ-103 Automatic Turntable consists of two pieces of equipment—the record handling and playing mechanism, MI-11845, and a separate control unit, MI-11844. The former consists essentially of a record magazine assembly, record transfer assembly, turntable assembly, memory assembly which is part of the selection system, a pulse receiver, mounting casting, and self-contained power supply all housed in a metal cabinet 31¼ inches wide, 35½ inches high and 22½ inches deep.

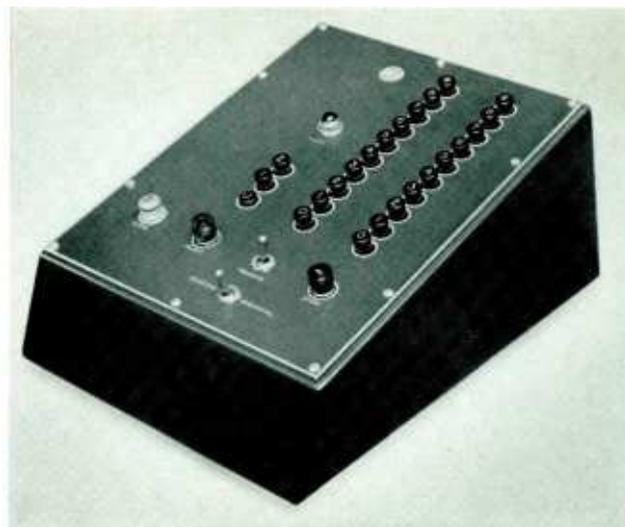
The control box contains the control circuits with the necessary push buttons for record selection and the functions of start, reject, etc., with suitable lamp indications of the operational status of the equipment. The BQ-103 has 23 push-buttons that permit selecting any of 200 record selections that can be housed in the magazine assembly. A check light is available for checking selection information. Two toggle switches are provided, one for designating either selective or sequential mode of operation, and a transfer switch for transferring selection information from the control box to the pulse receiver. Three illuminated push buttons include the start button, which lights up green when a record is on the turntable ready to play; a reject button which lights up red when the record is playing; and a clear push button for clearing all information stored in the memory mechanism.

The control unit has an etched aluminum control panel 10 inches wide by 14¾ inches high; mounted at a slope, it provides convenient operation. This control unit may also be rack mounted or set in other console housing equipment in the studio as desired.

Easy access to the record handling and playing mechanism cabinet is gained through a removable front panel. When the front panel is removed, service lights illuminate the interior. All components are easily accessible. A hinged top provides further access to units within the housing for routine playing and record changing operation. When the housing is "buttoned up" a small door in the front panel provides access to power switches. Cable access doors are located at the rear and in each side of the housing.

The record handling mechanism is mounted on a slide type frame which enables the entire mechanism to be pulled out of the cabinet and rotated for easy servicing. It is shock mounted to protect the automatic playing mechanism. The record magazine provides storage for one hundred "45" rpm records.

The record handling mechanism is fully automatic and sturdy. The record turntable is puck driven. The tone arm accepts standard EIA pickup mountings. The base on which the entire record handling mechanism is mounted



BQ-103 Control Unit, MI-11844.

is sturdily constructed of cast iron. This provides the high inertia necessary for smooth operation. As a convenience for loading records in the BQ-103, a toggle switch on the chassis in the housing permits rotation of the record magazine.

Below the handling mechanism in the base of the cabinet housing is mounted the junction box which houses control circuits, the d-c power supply and the fuses. The junction box serves to distribute electrical power to the various functioning parts of the turntable and control box. The equipment is designed to be operated from a line-voltage source of 100 to 125 volts, 60 cycles a-c only. The output of the equipment is normally fed to a standard equalized preamplifier such as the Type BA-26A. Ample space for mounting an accessory BA-26A pickup equalizer is available in the cabinet.

SPECIFICATIONS

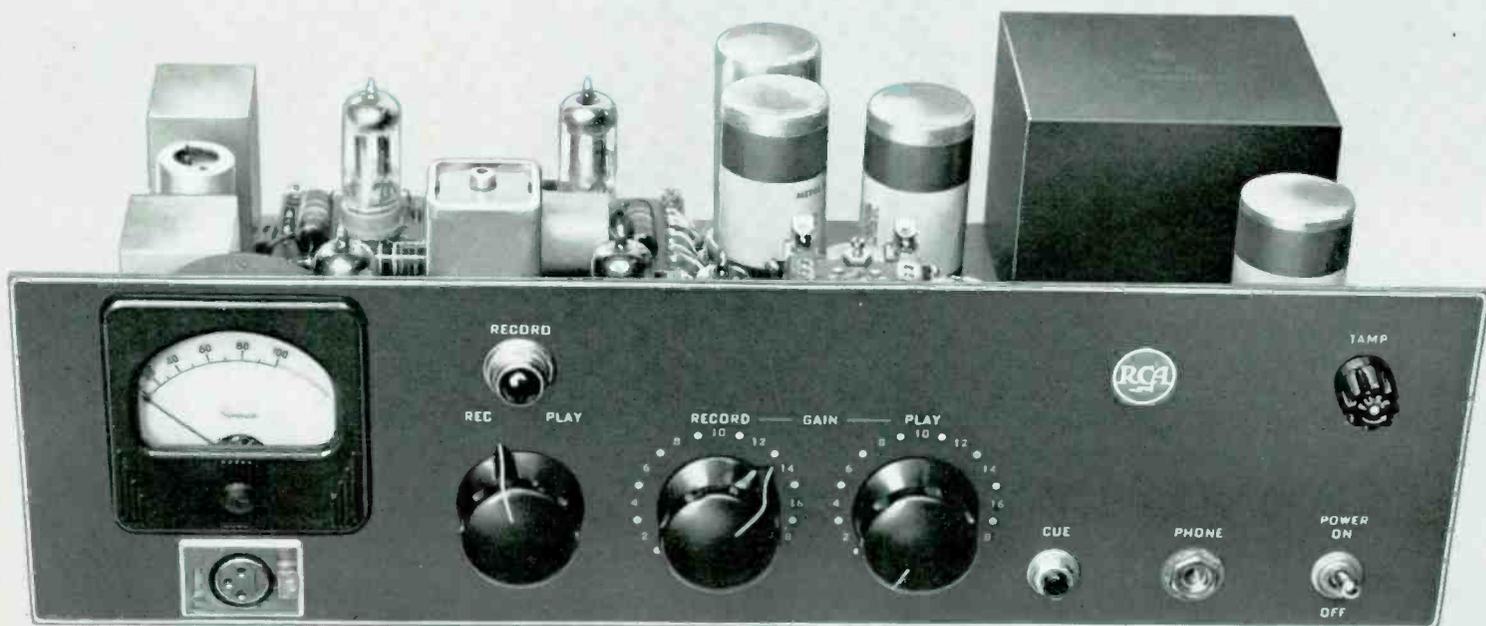
Record Handling Capacity.....	100 records (200 sides)
Turntable Speed.....	45 rpm
Power Supply.....	100-125 volts, a-c, 60 cycles, single phase
Wow and flutter.....	0.2 per cent or less
Rumble referred to 1 kc standard.....	-35 db 30 cps high pass filter -43 db 60 cps high pass filter -45 db 120 cps high pass filter
Dimensions (Overall):	
BQ-103 Automatic Turntable.....	31¼" wide, 35½" high, 22½" deep
Control Unit.....	10" wide, 6" high, 14¾" deep
Finish.....	Light & dark umber gray
Weight.....	200 lbs. approx.
Stock Identification	MI-11845/11844

Accessories

BA-26A Equalized Preamplifier.....	MI-11436
GE Replacement Stylus Tip, 1.0 mil diamond.....	4G-01D

MAGNETIC RECORD/REPRODUCE AMPLIFIER

Type BA-51A



FEATURES

- Records from microphone or bridging program line
- Illuminated volume indicator for record and reproduce functions
- AC bias provided for magnetic head
- Push-button controlled cue signal oscillator
- Cue-signal detection for operation with automatic turntable
- Self-contained power supply
- All controls conveniently accessible

USES

The BA-51A Amplifier is designed for both recording and reproducing in the Magnetic Disc System. The amplifier with its self-contained power supply may be installed either in the BQ-51A Manual Turntable or in the BQ-104 Automatic Turntable. Facilities are provided to record a cue signal at the beginning and ending of the program. These signals are utilized in the BQ-104 Automatic Turntables to "cue in" the disc to the start of the message and to "trip out" the change mechanism at the end of the message. Recordings may be made directly from a microphone plugged into the amplifier or from a program line. The output may be fed to a console or other speech input equipment. Provisions have been included in the design to guard against accidental erasure.

DESCRIPTION

The BA-51A Amplifier is designed for both recording and reproducing, the function being determined by means of the record-play switch. A red signal light is lit on front

panel when selection is on record. An illuminated volume indicator is provided for indicating levels which may be adjustable by means of independent gain controls for both record and reproduce functions.

A special feature is the push-button controlled 10 kc oscillator for supplying the cue signal at the beginning and ending of a program on a BQ-104 Automatic Turntable. To prevent a 10 kc signal component which may be present in the audio signal from actuating the cue circuit, a twin T-notch filter is inserted in the amplifier. The same circuit also prevents the cue signal from being reproduced in the program output when playing back and forms part of the tuned amplifier for detecting the cue signal.

A fuse and an on-off switch for the self-contained power supply are located on the front panel. Included also is a phono-jack which permits monitoring with headphones. In the design of the amplifier every possible precaution was taken to minimize hum and noise. The input transformer is extremely well shielded and the heater power of the input tube is obtained from a dc supply.

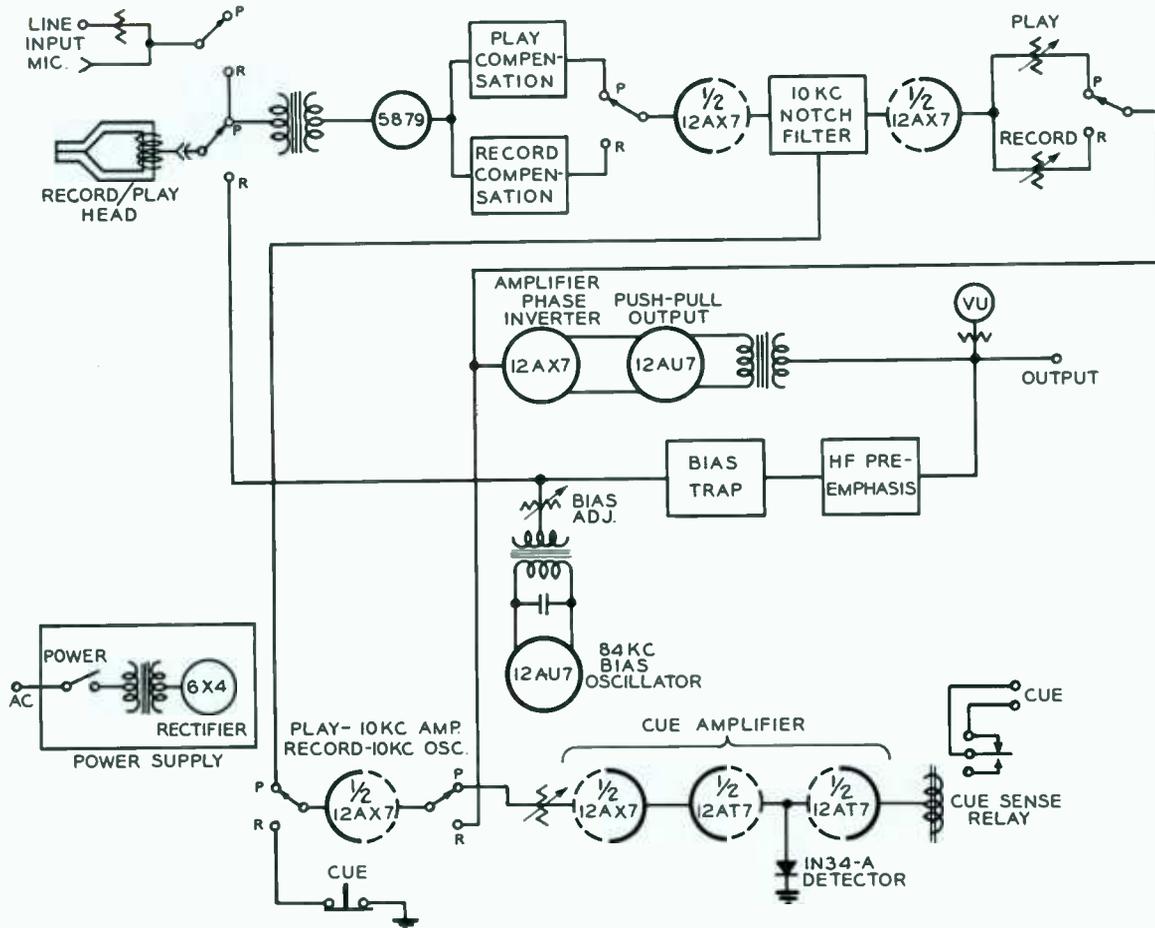
SPECIFICATIONS

Matching:	
Minimum Input Level.....	-60 dbm
Maximum Input Level.....	-30 dbm
Input Impedance.....	150 ohms
Bridging:	
Minimum Input Level.....	-17 dbm
Maximum Input Level.....	+13 dbm
Input Impedance.....	20,000 ohms
Output:	
Load Impedance.....	600 ohms
Maximum Output Level.....	0 vu
Bias Frequency.....	84 kc (approx.)
Cue Signal Frequency.....	10 kc
Power Required.....	100-130 volts; 50-60 cycles; 45 watts
Width.....	16.81"
Height.....	4.66"
Depth.....	8.86"
Weight.....	17 lbs.
Finish.....	Dark umber gray panel
Versatility.....	Mounting in BQ-51A or BQ-104 Turntables
Metering.....	Record and playback level shown on illuminated vu meter
Stock Identification (includes tubes).....	MI-11903

Accessory Equipment

Electron Tube Kit containing the following.....	MI-11488
1-6X4.....	3-12AX7
1-12AT7.....	1-MI-11298 (Selected 5879)
2-12AU7.....	

Schematic diagram of the RCA Type BA-51A, the Magnetic Record/Reproduce Amplifier.



MAGNETIC RECORDING DISC



FEATURES

- Optimum handling convenience
- Provides extreme durability
- Easy erasure
- Quick identification of recorded programs
- Greater programming convenience
- Both manual or automatic cueing
- Interchangeable with BQ-51A Manual or BQ-104 Automatic Turntables

USES

The Magnetic Recording Disc is designed for the recording of short announcements, such as spot commercials, station identification, special sound effects, etc. The available recording time is 60 seconds in duration, plus an additional 10 seconds for recording "cue-in" and "trip-out" signals on each side of the disc. The disc may be conveniently recorded and played back on the BQ-51A Manual Turntable, and may also be reproduced on the BQ-104 Automatic Turntable which stores up to 100 discs and makes available 200 selections.

DESCRIPTION

RCA Magnetic Discs are molded from a uniform dispersion of iron oxide particles in a synthetic elastomer (rubber type) binder with various plasticisers, lubricants and additives to give material the desired physical properties. An aluminum plate is imbedded between the two magnetic layers to provide rigidity. Grooves are molded for the guidance of the record/reproduce head. In addition, the grooves are separated by lands for better guidance of the head and magnetic isolation from the adjacent tracks. A distinctive label is provided with spaces for title, artist's and sponsor's names, recording time and date. The disc is identical in size and shape to the standard 45-rpm record. It is designed, however, to be played at 33 $\frac{1}{3}$ rpm when used in conjunction with the Magnetic Disc Head MI-11955 and the BA-51A Magnetic Record/Reproduce Amplifier, MI-11903.

SPECIFICATIONS

Magnetic surface with premolded grooves on both sides of disc	
Outside Diameter.....	6.875 \pm 0.015"
Center Hole Diameter.....	1.504 \pm 0.002"
Number of Program Grooves.....	39
Lead in, lead out and concentric grooves conform to specifications for 45-rpm discs	
Maximum Record Time.....	Each side at 33 $\frac{1}{3}$ rpm—70 seconds
Stock Identification.....	MI-11990 (ordered in sets of five only)

Optional Accessories

Magnetic Eraser	MI-11821
Set of Gummed Labels.....	MI-11989

MAGNETIC ERASER

MI-11821

FEATURES

- Provides fast, complete erasure of recordings on both sides of 7-inch magnetic discs and 1/4 inch tape reels
- Permits virtually unlimited reuse of discs and tape
- Minimizes disc and reel inventory problem
- Operates semi-automatically
- Housed in lightweight portable case



USES

The Magnetic Eraser, MI-11821, is a convenient device for assuring maximum utility from magnetic discs and reels by erasing recordings clearly, completely and quickly. Thus, each disc and tape reel can be used over and over again—many thousands of times. Inventory and investment for discs and reels can be kept to a minimum. The completely self-contained unit is extremely simple to operate.

DESCRIPTION

The Magnetic Eraser is housed in a case approximately 10 x 6½ x 7½ inches, weighing only 12 lbs. It operates from 110/120 power controlled by an on-off toggle switch. To erase, the disc is merely inserted into a slot which can be widened to accommodate a 7-inch reel of audio tape. A red pilot light is the "equipment-in-use" indicator. Complete erasure of both sides is accomplished simultaneously in 20 seconds.

Inside the case, a motor driven V-shaped pulley causes the disc or reel to rotate in the magnetic field set up by an inductance coil. Two revolutions are sufficient to demagnetized the iron oxide filings and thereby completely erase the recording, making it ready for immediate reuse.

The Magnetic Eraser, MI-11821, does an important job at modest cost. It is an especially efficient companion tool to the RCA Magnetic Disc Recording System.

SPECIFICATIONS

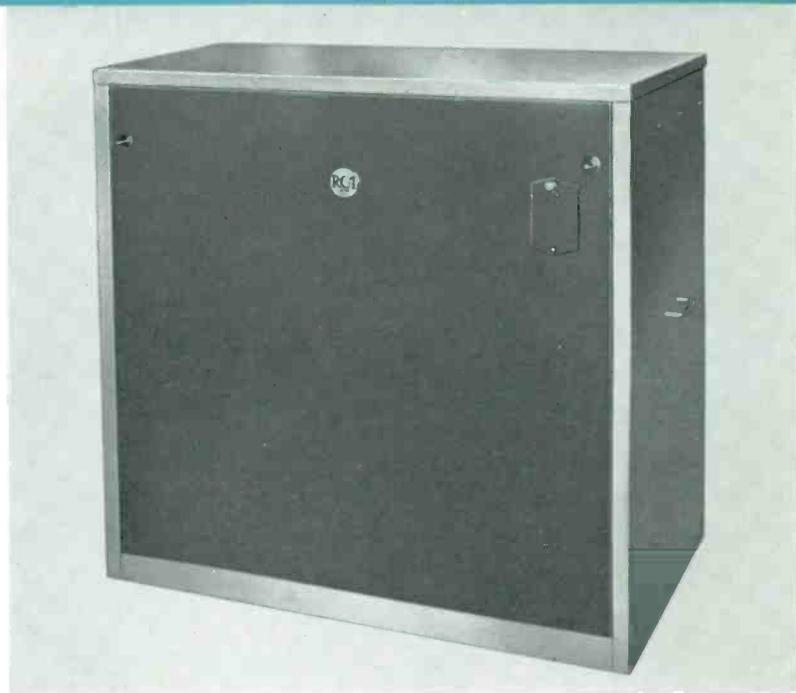
Power Supply.....	117 volts ac, 60 cycles, single phase
Current Required.....	5 amperes
Apparent Power Required.....	585 voltamperes
Power Consumption.....	175 watts
Coil:	
Electrical Rating.....	115 volts, 60 cycles, 4.5 amps
Resistance.....	8 ohms
Field (center).....	600 gauss
Motor.....	.5 oz. torque; freq. 50-60 cps; 115 volts; speed 60 rpm ±20%
Thermostat.....	Klixon—contact opens 200° ±5°, closes 170° ±5°
Dimensions (over-all).....	10¾" wide, 6½" high, 7½" deep
Weight.....	12 lbs.
Finish.....	Dark gray fabricod
Stock Identification.....	MI-11821

BQ-104 AUTOMATIC TURNTABLES

FOR PLAYING MAGNETIC DISCS

FEATURES

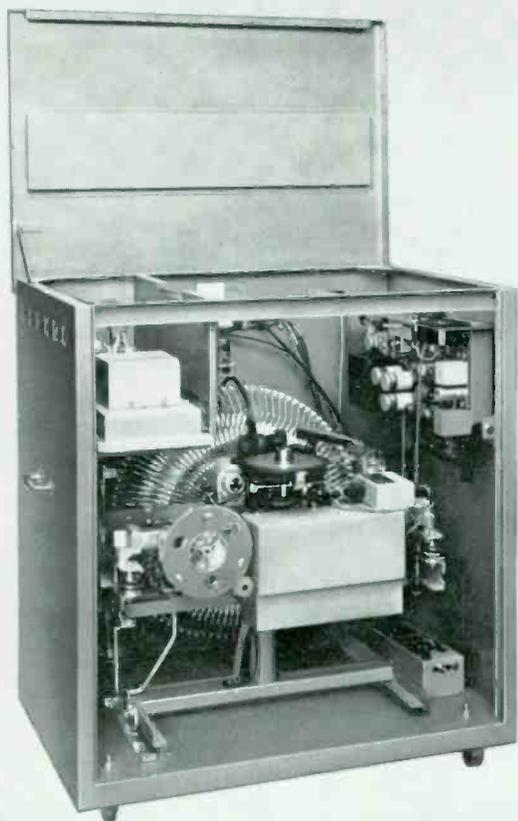
- Designed specifically for playback of magnetic disc recordings
- Affords very high degree of program flexibility
- Large disc capacity—up to 200 messages at your fingertips
- Remote control—random or sequential operation
- Compact unit may be located in most convenient area—conserves valuable control room space
- Integral unit in RCA audio automation system
- Very tight cueing possible when used with the BA-51 Record/Reproduce Amplifier



USES

Efficient, simplified, automatic handling of broadcast messages recorded on RCA magnetic discs is made possible on the BQ-104 Automatic Magnetic Disc Turntable. Since all manual operations such as selection, cue, start, stop, are made fully automatic, fewer operator "fluffs" result, and program flow is smoother for the listening audience.

The BQ-104 provides a convenient method of storing and playing back up to 100 $33\frac{1}{3}$ rpm magnetic discs (200 messages) on a push button control basis. The control permits selection of the discs in either random or sequential order. The sequential operation restricts selection to the order in which the recordings were placed in the machine. Memory facilities permit preselection of any number of recordings provided they are in an ascending numerical order. A clear button removes all preselections from the mechanism, thus last-minute program changes can be made seconds before a selection is to be played. The turntable with its provisions for electrical remote control becomes an integral part of RCA's automation system for audio programming.



DESCRIPTION

The Type BQ-104 Automatic Magnetic Disc Turntable consists of two pieces of equipment—the disc handling and playing mechanism, MI-11846, and a separate control unit, MI-11844-A. The former consists essentially of a disc magazine assembly, disc transfer assembly, turntable assembly, memory assembly which is part of the selection system, a pulse receiver, mounting casting, and self-contained power supply all housed in a metal cabinet 31¾ inches wide, 35½ inches high and 22½ inches deep.

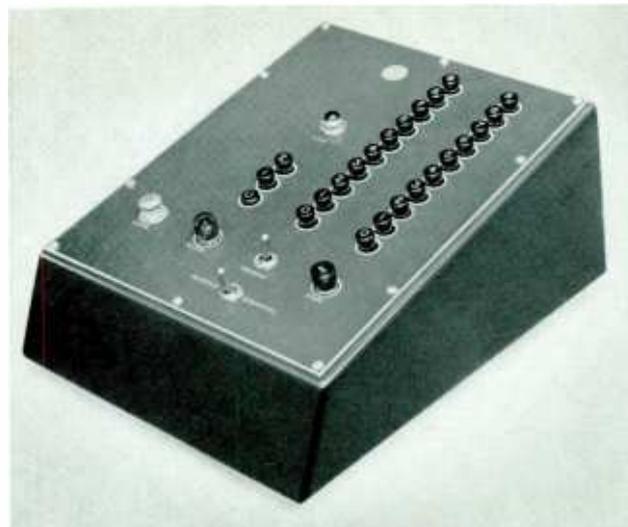
The control box contains the control circuits with the necessary push buttons for disc selection and the functions of start, reject, etc., with suitable lamp indications of the operational status of the equipment. The BQ-104 has 23 push buttons that permit selecting any of 200 recorded commercials or other material housed in the magazine assembly. A check light is available for checking selection information. Two toggle switches are provided, one for designating either selective or sequential mode of operation, and a transfer switch for transferring selection information from the control box to the pulse receiver. Three illuminated push buttons include the start button, which lights up green when a disc is on the turntable ready to play; a reject button which lights up red when the disc is playing; and a clear push button for clearing all information stored in the memory mechanism.

The control unit has an etched aluminum control panel 10 inches wide by 14¾ inches high; mounted at a slope, it provides convenient operation. This control unit may also be rack mounted or set in other console housing equipment in the studio as desired. Thirty feet of rubber jacketed cable are provided for interconnection between the control unit and the turntable. One or more control units may be parallel connected to permit operation of the BQ-104 from more than one location.

The disc handling mechanism is mounted on a slide type frame which enables the entire mechanism to be pulled out of the cabinet and rotated for easy servicing. It is shock mounted to protect the automatic playing mechanism. The disc magazine provides storage for one hundred 33⅓ rpm magnetic discs.

The disc handling mechanism is fully automatic and sturdy. The turntable is puck driven. The tone arm accepts the Magnetic Record/Reproduce Head, MI-11955. The base on which the entire disc handling mechanism is mounted is sturdily constructed of cast iron. This provides the high inertia necessary for smooth operation. As a convenience for loading discs in the BQ-104, a toggle switch on the chassis in the housing permits rotation of the disc magazine.

Below the handling mechanism in the base of the cabinet housing is mounted the junction box which houses control



BQ-104 Control Unit, MI-11844-A.

circuits, the d-c power supply and the fuses. The junction box serves to distribute electrical power to the various functioning parts of the turntable and control box. The equipment is designed to be operated from a line-voltage source of 100 to 125 volts, 60 cycles a-c only. The output of the equipment is normally fed to the BA-51A Record/Reproduce amplifier. Provisions for mounting the BA-51A Amplifier are available in the mechanism cabinet.

The BA-51A Amplifier is designed for both recording and reproducing in the RCA Magnetic Disc System, the function being determined by means of the record-play switch. An illuminated volume indicator is provided for indicating levels which may be adjustable by means of independent gain controls for both record and reproduce functions. Facilities are provided to record a cue signal at the beginning and ending of the program. These signals are used in the BQ-104 to "cue" in the disc to the start of the message and to "trip out" the change mechanism at the end of the message.

SPECIFICATIONS

Disc Handling Capacity.....	100 records (200 sides)
Turntable Speed.....	33⅓ rpm
Power Supply.....	100-125 volts, a-c, 60 cycles, single phase
Wow and Flutter.....	0.2 per cent or less
Rumble referred to 1 kc standard.....	-35 db 30 cps high pass filter -43 db 60 cps high pass filter -45 db 120 cps high pass filter
Dimensions (Overall):	
BQ-103 Automatic Turntable.....	31¾" wide, 35½" high, 22½" deep
Control Unit.....	10" wide, 6" high, 14¾" deep
Finish.....	Light & dark umber gray
Weight.....	200 lbs. approx.
Stock Identification.....	MI-11846/11844-A

Accessories

BA-51A Magnetic Record/Reproduce Amplifier (one required).....	MI-11903
Magnetic Record/Reproduce Head.....	MI-11955
Magnetic Eraser.....	MI-11821
Magnetic Disc (set of five).....	MI-11990

LOUDSPEAKERS AND ACCESSORIES



FEATURES

- Wide choice of speaker mechanisms offering excellent frequency response
- Alnico V magnets
- Low non-linear distortion
- Ideal for monitoring AM, FM and television programs
- Rugged construction
- Attractively styled housing for any location
- Transformers designed to couple wide variety of outputs

GENERAL INFORMATION

RCA offers to broadcasters a complete line of studio and station monitoring loudspeakers for use in monitoring and auditioning booths, hallway installations, talk-back applications, elevators and executives' offices. All RCA loudspeakers are designed to handle adequate power for the particular application for which they are designed. The LC-1A, representing the greatest advance in loudspeaker design, is obtainable for use in a choice of cabinet styles and finishes, thereby making it possible to conform to any of several interior decorating schemes. In addition, the LC-1A speaker mechanism may be obtained for those applications where it is desirable to use a special type, or custom-made, mounting.

In order to serve the wide variety of needs for loudspeakers around broadcasting stations, there is also included in this line a choice of permanent-magnet loudspeaker mechanisms. These mechanisms are intended to be mounted in one of the wall-mounting speaker housings. Loudspeaker Impedance Matching Transformers, MI-12368, MI-12369 and MI-11731 are designed for coupling a wide variety of outputs to these and many other types of loudspeakers. The quick-selection chart provides a convenient reference for selecting the proper RCA loudspeaker combination.

LC-1A DUO-CONE SPEAKER



FEATURES

- Excellent frequency response, uniform 50-15,000 cycles
- Low non-linear distortion
- Ideal for monitoring AM-FM television programs
- Alnico V magnets
- Wide angle sound radiation of all frequencies

DESCRIPTION

The LC-1A is a "Broadcast Quality" loudspeaker with a low distortion, wide angle distribution, of extended frequency range, and specifically designed for use in recording studios, executive offices, reception rooms, sponsors' booths or any location that warrants a pleasant setting and tasteful styling.

For applications where it is desired to mount the mechanism on a wall baffle, ceiling, etc., the speaker mechanism may be used with assurance that the entire frequency range will be realized. The speaker's outstanding performance makes it ideal for wide frequency range wide angle radiation.

The LC-1A is a duo-cone speaker mechanism of the direct radiated type, consisting of high and low frequency units mounted co-axially together. The 2-inch high frequency cone and the aluminum wound voice coil has a low mass utilizing the wide angle of the shallow, low frequency cone to effect its remarkable directional pattern (see curve). An equilibrium has been reached between the electrical and mechanical design to impart a high frequency radiation of 120 degree arc with a loss of approximately 6 db at 15,000 cps. This eliminates the conventional "beam effect" usually experienced at this frequency.

The low frequency system employs a large diaphragm with a high mass voice coil and produces the most desirable directional pattern with a handling capacity of 20 watts. Low distortion has been accomplished by a carefully designed balance of many contributing factors. Distortion usually experienced when handling large power in the 100-1,000 cycles range is eliminated by using a high mass coil and a massive rigid cone, coupled with a low fundamental frequency peak of 40 to 50 cycles. Above this frequency the stiffness of the suspension system of the cone does not appreciably affect the velocity and, therefore, minimizes distortion.

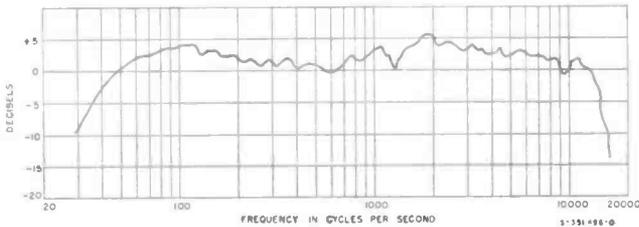
A feature of construction is the use of acoustical domes—largely responsible for smooth response. The series of domes placed on the speaker's large cone breaks up the unit's symmetry and eliminates the interference normally characteristic of the symmetrical shape without sacrifice of either highs or lows.

The cross-over network utilizes the physical characteristics of the cones to mutually vibrate in unison over the cross-over frequency region and merely employs one capacitor in the high frequency unit to limit its current at low frequencies.

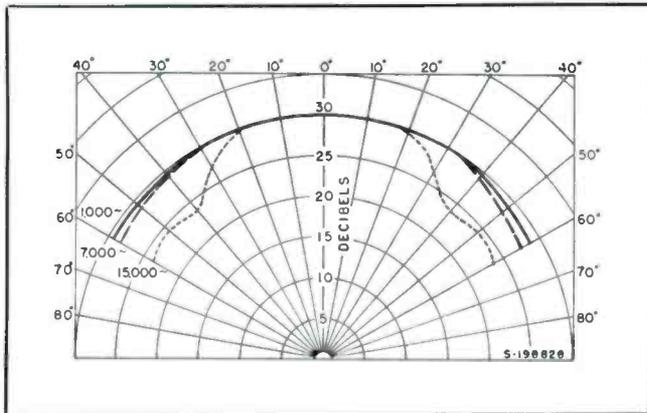


The MI-12464 Floor Cabinets for LC-1A loudspeaker may be mounted vertically or horizontally as shown.

The cabinet is a bass reflex or phase inverter type. The MI-12464-M is a high luster, mahogany cabinet with 6-inch matching legs. A blonde version of the MI-12464 model is available. Cabinets measure 32 by 25 by 16 inches and weigh approximately 50 pounds. The Wall Baffle, MI-11406, measures 37½ by 21¾ by 17⅞ inches and weighs 45 pounds.



Frequency Response Curve of LC-1A Speaker.



Directional Characteristics of LC-1A Speaker.

SPECIFICATIONS

LC-1A Speaker Mechanism

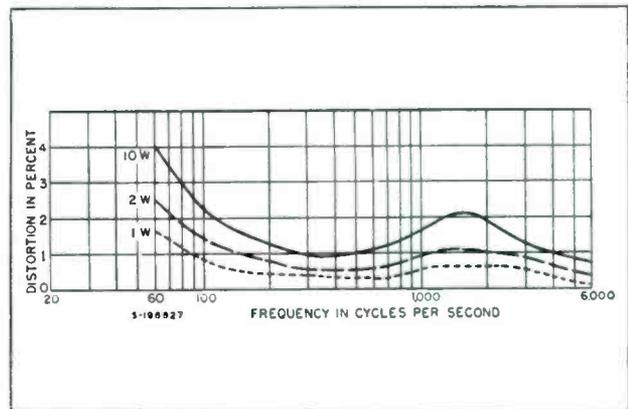
Impedance (nominal).....	15 ohms
Frequency Response (see curve).....	40-16,000 cps
Directional Characteristic.....	See curve
Power Handling Capacity.....	20 watts
Non-linear Distortion (for 10 watt output, 50-15,000 cycles)	Less than 4% at 60 cycles
Weight (unpacked).....	21 lbs.
Dimensions:	
Diameter (cone).....	15 5/16"
Diameter (bolt fixing circle).....	16 1/4"
Diameter (overall frame).....	17"
Stock Identification.....	MI-11411-A
(Mechanism only)	

Accessories

LC-1A Speaker Cabinet (Blonde).....	MI-12464-B
LC-1A Speaker Cabinet (Mahogany).....	MI-12464-M
LC-1A Wall Speaker Housing.....	MI-11406
Power Attenuator.....	MI-11708-A



The MI-11406 Wall Mount Speaker Housing accommodates the LC-1A Speaker Mechanism. This housing has been popular with broadcasters for many years as a space-saving unit which maintains the LC-1A Speaker "Broadcast Quality"



Harmonic Distortion of LC-1A Speaker.

SL-123 12-INCH SPEAKER



DESCRIPTION

The Type SL-123 Speaker Mechanism provides extended frequency response with excellent spatial distribution when used with a companion floor housing, MI-12464. This combination may be used in large executive offices, reception rooms, sponsors' booths or any location requiring broadcast quality reproduction.

The SL-123 Speaker Mechanism is an extended-range cone speaker coupled with a highly efficient tweeter unit designed for remarkably faithful reproduction over the 40 to 16,000 cycle range with excellent spatial distribution.

A special shape has been used for the curvilinear cone, and in addition the material for the cone has received particular attention. A further refinement is the damping ring in the outer suspension of both sound and tweeter cones which provides optimum acoustical impedance to effectively eliminate standing waves in the suspension and cone.

This development gives improved efficiency at the bass end and relatively smooth response at the high end of the spectrum. The method of cementing the concave center in the tweeter widens the angle of high frequency response.

FEATURES

- Extended range tweeter has wide angle distribution
- Concave center radiator construction with off-center tweeter provide smoother cross-over response
- Uniform frequency response 40 to 16,000 cycles
- Unique rubber damping on both high and low frequency units for smoother frequency response
- Alnico V magnets
- Ideal for monitoring AM, FM and TV

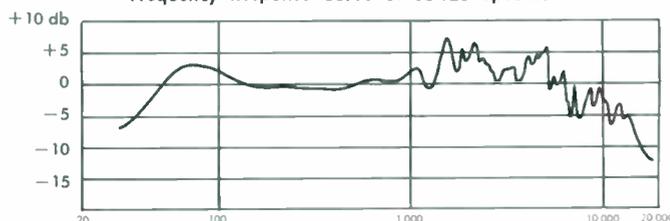
SPECIFICATIONS

Frequency Response.....	Uniform from 40 to 16,000 cycles. Usable response extends about 1/3 of an octave below lower value and a considerable amount above the upper value.
Axial Sensitivity.....	97 db at 4 ft. with 1 watt input
Crossover Network.....	5000 cycles
Input Impedance.....	8 ohms
Power Handling Capacity.....	15 watts
Magnet Material.....	Alnico V
Magnet Weights:	
Low Frequency.....	14.5 ozs.
High Frequency.....	1.47 ozs.
Over-all Diameter.....	12-7/32"
Mounting Data.....	8 equally spaced holes on 11 1/16" circle
Depth.....	6-5/32"
Weight.....	4 lbs.
Stock Identification.....	MI-12654

Accessories

Floor Console Cabinet (Mahogany).....	MI-12464-M
Floor Console Cabinet (Blonde).....	MI-12464-B
12" Speaker Cabinet (Wall Mounting).....	MI-11407-A

Frequency Response Curve of SL-123 Speaker.



SL-12 12-INCH SPEAKER



DESCRIPTION

The Type SL-12 Speaker Mechanism provides "Broadcast Quality" reproduction when used with companion housings, MI-12464 or MI-11407-A. This combination may be used in executive offices, reception rooms, sponsors' booths or any location requiring a pleasant setting and tasteful styling.

The SL-12 Speaker Mechanism is an extended-range single cone speaker. Its design provides uniform response from 50 to 16,000 cycles—avoiding frequency discrimination. The smooth response of the SL-12 is obtained by employing a curve-linear-shape cone of special pulp material. An outer suspension damping ring provides a matched terminating acoustical impedance. A distribution angle of more than 40° is obtained with the SL-12 Speaker Mechanism.

The MI-11407-A Housing is designed to house either 12-inch or 10-inch speaker mechanisms and projects sound downward at an angle of 30° or 60°. This permits mounting of the unit to provide either a long or short "throw". The housing is solidly constructed of ½-inch plywood with dark umber gray finish. The housing comes with an adaptor

plate for 10-inch speakers, which may be removed when it is desired to house a 12-inch speaker mechanism. The grille is of plastic woven cloth and covers the entire front panel. The housing presents a neat, compact appearance and is of the smallest practical size commensurate with good performance.

SPECIFICATIONS

Speaker Mechanism

Voice Coil Impedance.....	8 ohms
Frequency Response.....	50 to 16,000 cycles
Power Handling Capacity.....	10 watts
Overall Diameter	12 7/32"
Overall Depth	6 5/32"
Weight	4 lbs.
Stack Identification	MI-12458

Wall Housing

Dimensions (exterior):	
Overall Height	16 3/16"
Overall Width	25"
Overall Depth (front to back).....	11 1/2"
Volume.....	2700 cu. in.
Approximate Weight (unpacked).....	12 lbs.
Finish.....	Dark umber gray
Stack Identification	MI-11407-A

Accessories

Floor Cabinet (Mahogany).....	MI-12464-M
Floor Cabinet (Blande).....	MI-12464-B
12" Speaker Cabinet (Base Mounting).....	MI-11407-A
Matching Transformer (4, 8, 15 ohms).....	MI-11731



MI-11407-A Wall Housing used to house the MI-11408 Speaker Mechanism

12-INCH SPEAKER MECHANISM, MI-12418-B

FEATURES

- High sensitivity
- Smooth frequency response
- Balanced listening characteristic
- Equipped with transformer
- Alnico V permanent magnet
- Excellent power handling capability

DESCRIPTION

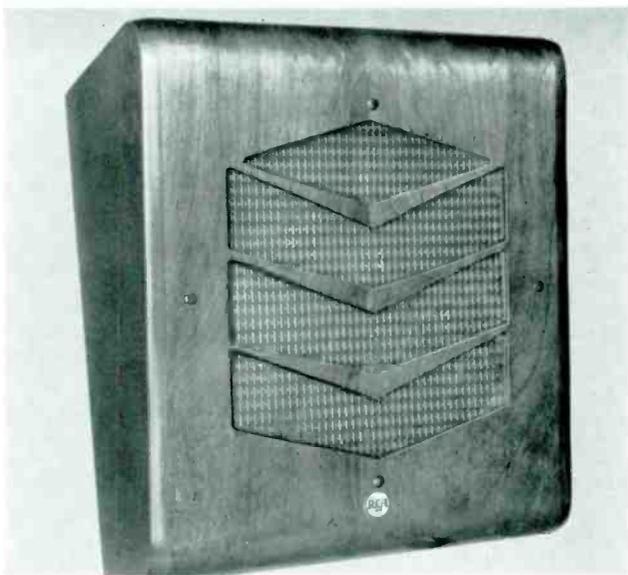
The MI-12418-B 12-inch Speaker Mechanism when used with its wall housing, MI-13253-A or MI-11407-A is suitable for use in many locations such as: reception rooms, corridors, offices, dressing rooms, workshops, etc. It may be used as a talk back and cue speaker in studios.

This is a straight edge cone permanent magnet type speaker mechanism of good sensitivity. The permanent magnet uses the new Alnico V metal, which is the best available material for the purpose. It permits high flux density in a smaller and lighter magnet, which contributes to the high efficiency of the speaker. The MI-12418-B also has the corrugated cone feature, which, by introducing just enough additional compliances, smooths and improves the frequency response characteristic. External metal parts of the MI-12418-B speaker are finished in umber gray metalustre. The speaker comes equipped with a matching transformer in place and wired to the speaker from the



6 ohm tap. Transformer impedances are 625, 1250, 2500, and 5000 ohms.

The top, front and bottom of the Wall Speaker Housing, MI-13253-A, is one-piece walnut finish veneer. The sides are 1/2-inch solid wood. To insure extra strength, it is constructed with curved edges. The speaker opening is covered with two tone grille cloth of woven plastic in a finish that matches the wood. The back of the unit is open and mounting brackets are furnished. The housing measures 16 1/2 by 14 by 8 1/2 inches maximum and weighs 3 lbs. and 10 ounces.



MI-13253-A Wall Housing for use with 12-inch Speaker MI-12418-B.

SPECIFICATIONS

Voice Coil Impedance.....	6-8 ohms
Frequency Response.....	50 to 8500 cycles
Power Capability.....	10 watts maximum
Axial Sensitivity.....	97 db at 4 ft. with 1 watt input
Magnet Material.....	Alnico V
Diameter.....	12 1/8"
Depth.....	5 5/8"
Mounting Data.....	8 equally-spaced holes on 11 1/16" circle
Net Weight.....	4 lbs. 4 ozs.
Stock Identification.....	MI-12418-B

Accessories

12" Wall Housing.....	MI-13253-A
Wall Housing.....	MI-11407-A
Transformer.....	MI-12368

10-INCH SPEAKER, MI-11408



DESCRIPTION

The MI-11408 Speaker Mechanism with its associated Wall Housing (MI-11407-A) is designed specifically to provide economical Broadcast Monitoring. Such applications include AM/FM and TV control rooms, clients' booths, offices and studios.

The MI-11408 Speaker employs a high-quality Alnico V permanent magnet and is capable of producing an undistorted output of 10 watts. The frequency response characteristic is such that the mechanism will give well balanced sound when used with its companion baffle. Speaker matching transformer MI-11731 is available for connecting to an 8-ohm or 15-ohm source. (Speaker voice coil impedance is 4 ohms).

SPECIFICATIONS

Frequency Range	60-7000 cycles
Power Handling Capacity	10 watts
Voice Coil Impedance.....	4 ohms
Overall Diameter	10 1/8"
Overall Depth	4 1/4"
Weight (unpacked).....	2 1/8 lbs.
Stock Identification	MI-11408

Accessory

10" Wall Housing.....	MI-11407-A
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10-INCH SPEAKER, MI-6333-D



DESCRIPTION

The MI-6333-D Speaker is a 10-inch permanent magnet cone type mechanism. The cone is of one piece and is corrugated, which results in smoother characteristics and improved performance. The permanent magnet is of Alnico V metal insuring permanence and stability of the field. To make the speaker more rugged, the cone is made moisture-resistant and a baking-type resin cement is used throughout. This speaker has an unusually good frequency response characteristic and capably handles large amounts of power. The gap flux density is high, contributing to the speaker's high sensitivity.

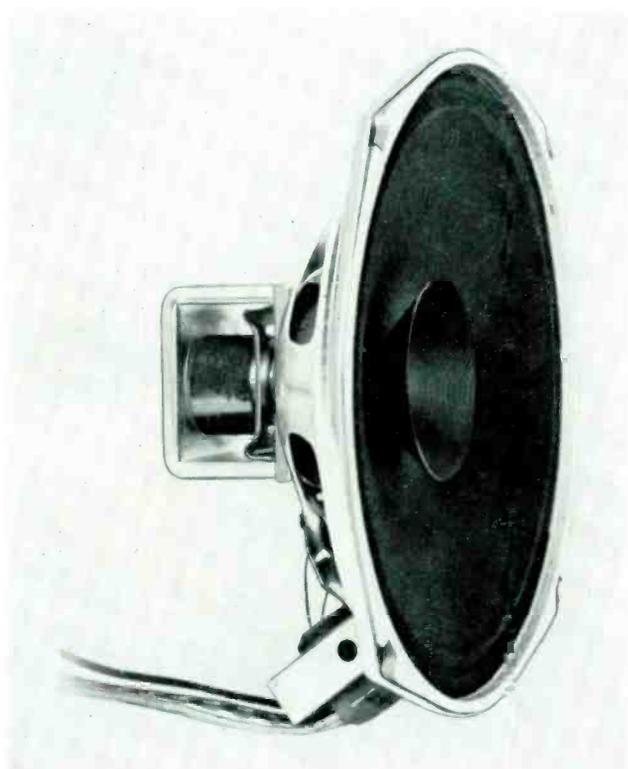
SPECIFICATIONS

Impedance.....	60 ohms at 400 cycles
Frequency Range.....	60 to 7000 cycles
Power Capacity.....	20 watts
Axial Sensitivity.....	95 db at 4 ft. with 1 watt input
Gap Flux Density.....	9500 lines/cm ²
Magnet	Alnico V
Magnet Weight	6.8 ozs.
Diameter	10 1/4"
Depth	5 5/8"
Mounting Data.....	4 equally spaced 9/32" x 7/32" holes on 9 5/8" circle
Net Weight.....	3 1/2 lbs.
Shipping Weight	5 1/2 lbs.
Stock Identification	MI-6333-D

Accessories

12" Wall Speaker Housing.....	MI-13253-A
Reducing Baffle	MI-13245-A

8-INCH SPEAKER MECHANISM, MI-12454-B



DESCRIPTION

The MI-12454-B is an eight-inch cone-type speaker with a permanent magnet field. The Alnico V magnet is the best commercially available material providing high flux density, permanence and stability with a minimum of size and weight. The cone, voice coil assembly and suspension are moisture resistant. A multi-tap line matching transformer is provided to enable the 3.2 ohm voice coil to present

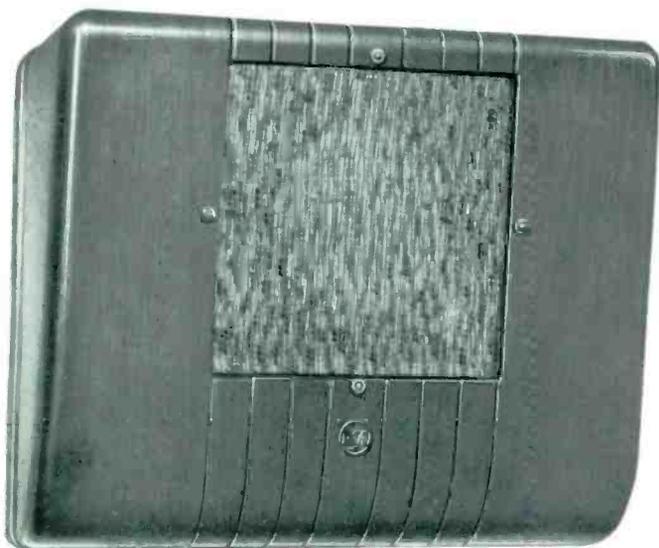
impedances of 700, 1400, 4000, 8000 or 16,000 ohms to a loudspeaker line.

The MI-6104 baffle is molded of walnut grained fire resistant thermosetting plastic. It has four heavy reinforcing ribs on the inner surface which provide additional strength and rigidity and form a frame for the removable speaker insert. The face of the insert is covered with an attractive two-tone plastic grille cloth. The housing measures 15¼ by 12¼ by 5⅝ inches maximum overall.

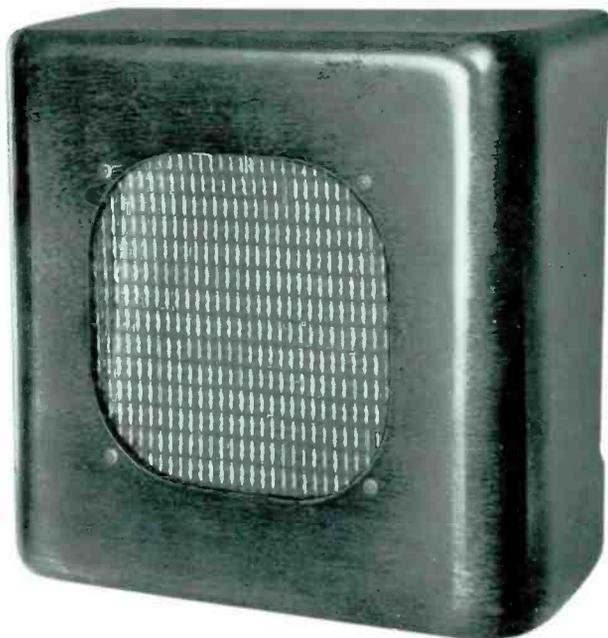
The speaker, MI-12454-B, factory-mounted in a compact walnut baffle, 10⅞ inches high, 11¼ inches wide and 6¼ inches deep, is available as MI-38300-3.

SPECIFICATIONS

Power Handling Capability.....	10 watts
Axial Sensitivity.....	96 db @ 4 ft. with 1 watt input
Frequency Response.....	50-15,000 cycles
Magnet Material and Weight.....	3.16 oz. Alnico V
Gap Flux Density.....	9000 lines/cm ²
Voice Coil Impedance.....	3.2 ohms @ 400 cycles
Voice Coil Size.....	¾"
Outside Diameter.....	8¼"
Depth.....	3½"
Mounting Data.....	4 equally spaced holes on 7⅝" bolt circle
Net Weight.....	.31 oz.
Shipping Weight.....	16 to a carton—35½ lbs.
Transformer Data:	
16,000 Ohms.....	Red-Black
8,000 Ohms.....	Red-Red/Black
4,000 Ohms.....	Red-Red/Yellow
1,400 Ohms.....	Black-Red/Black
700 Ohms.....	Red/Yellow-Red/Black
Stock Identification:	
8" Speaker Mechanism.....	MI-12454-B
8" Plastic Wall Speaker Housing.....	MI-6104
8" Speaker Mechanism factory enclosed in Walnut Baffle.....	MI-38300-3



8-inch Plastic Wall Speaker Housing, MI-6104.



MI-38300-3 Speaker Mechanism encased in Walnut Cabinet.

8-INCH HIGH FIDELITY SPEAKER, MI-12480

FEATURES

- High sensitivity
- Smooth frequency response 50 to 18,000 cycles
- Balanced listening characteristic
- Alnico V permanent magnet
- Excellent power handling capability
- Curvilinear cone plus a mechanically coupled high frequency cone

DESCRIPTION

This High Fidelity Duplex 8-inch cone type loudspeaker, MI-12480, is designed to fulfill requirements for high quality reproduction of voice or music in studios, executive offices, reception rooms, sponsors' booths or any location where the finest in an 8-inch speaker both as to frequency response and to styling is desired. It may be used with any standard 8-inch baffle, but it is recommended that for quality reproduction a minimum baffle size of 2½ cubic feet be used.

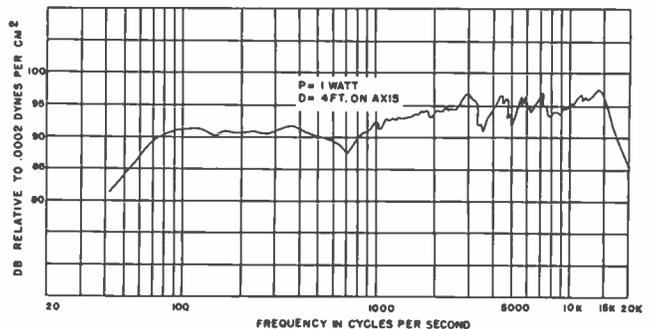
The smooth frequency response of the SL-8A Speaker is the result of extensive research. A special shape has been used for the curvilinear cone, and, in addition, the material for the cone has received particular attention. These two factors play important roles in giving a broad pattern to the speaker. A further refinement is the damping ring in the outer suspension of the cone which provides optimum acoustical impedance to eliminate effectively standing waves in the suspension cone. This gives improved efficiency at the bass end and relatively smooth response at the high end of the spectrum.

The mechanically coupled high frequency cone extends the smooth high frequency response well out beyond the normal listening range of the average listener.



SPECIFICATIONS

Frequency Response.....	50 to 18,000 cycles
Power Handling Capacity.....	10 watts
Magnet Weight.....	6.8 ounces
Input Impedance.....	8 ohms
Overall Diameter.....	8⅛ inches
Depth.....	4⅞ inches
Weight.....	2¾ pounds
Axial Sensitivity at 4 ft. 1 watt, see curve.....	.92 db
Cone Resonance (6½ cubic ft. cabinet).....	.74 cps
Mounting Data (EIA).....	4 equally spaced holes on a 7⅝" bolt circle
Stock Identification.....	MI-12480



7-INCH ACCORDION CONE SPEAKER



DESCRIPTION

The MI-12435-C is a 7-inch duplex accordion cone, permanent magnet type speaker mechanism with line matching transformer. It is equipped with a mechanical coupled high frequency cone. The magnet is Alnico V metal which permits high flux density and permanence of the field characteristics in a relatively small, light weight unit. The accordion edge cone, by introducing additional carefully controlled cone compliance, allows a lower resonant frequency than can ordinarily be obtained with conventional design. The frequency response of the MI-12435-C is thus comparable to that of much larger mechanisms. The speaker is furnished with a universal matching transformer with nominal primary impedance of 16,000; 8000; 4000; 1400 and 700 ohms; .3; .6; 1.2; 3.6 and 7.2 watts on 70 volt tap. The speaker has excellent frequency response, sensitivity and power handling capability. The exterior metal parts are protected against rust or corrosion by heavy plating.

The MI-12845 sloping front speaker housing is made with 1/2-inch solid wood sides and a one piece, walnut finish, wood veneer front, top, and bottom panel. The heavy wood sides and curved edge construction minimize the loss of low frequency sound energy in side vibrations normally inherent in enclosed housings. When used with the MI-12435 type accordion edge speaker, the housing provides exceptional tone quality with full low frequency response ordinarily lacking in reproducers of a comparable small size.

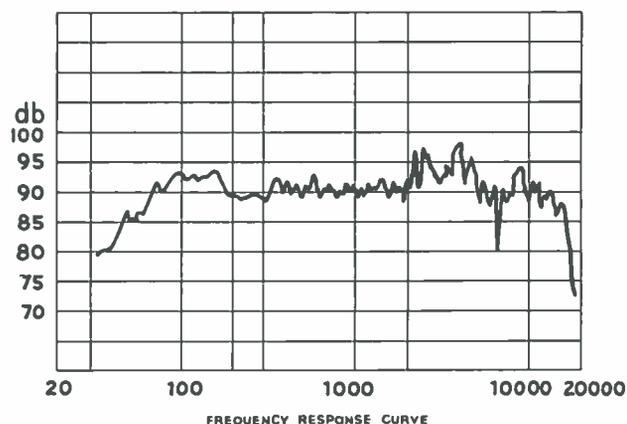
SPECIFICATIONS

Speaker Mechanism

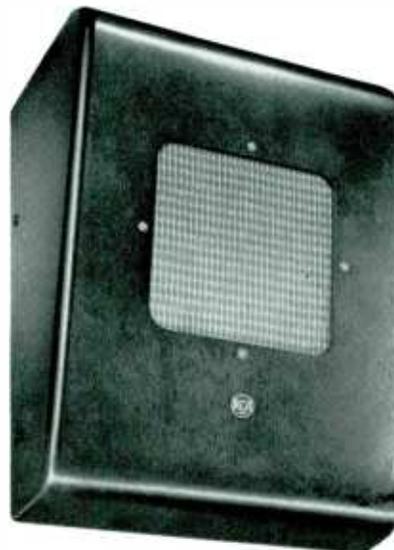
Voice Coil Impedance.....	3.2 ohms
Primary Impedances.....	700, 1400, 4000, 8000, or 16,000 ohms
Overall Frequency Response.....	30-14,000 cycles
Axial Sensitivity.....	92 db at 4 ft. with 1 watt input
Power Handling Capacity.....	.8 watts
Magnet Material.....	Alnico V
Flux Density.....	9800 gauss
Magnet Weight.....	3.16 oz.
Overall Diameter.....	7"
Overall Depth.....	3 1/2"
Mounting Data.....	4 equally-spaced 0.187" holes on 6 1/8" circle
Net Weight.....	.34 oz.
Shipping Weight.....	4 1/2 lbs.
Stock Identification.....	MI-12435-C

Wall Baffle

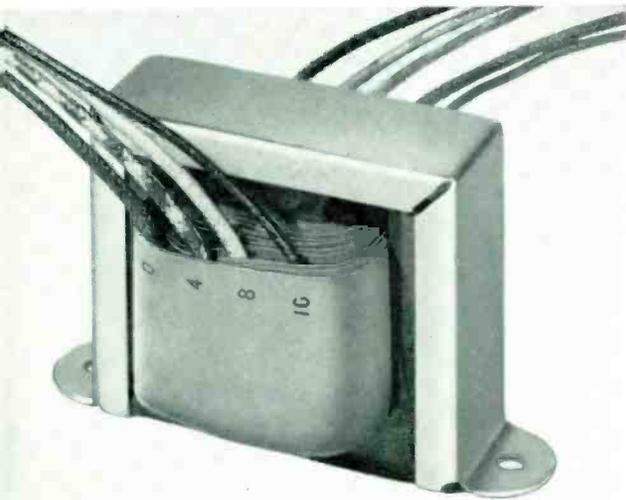
Material.....	Wood veneer front and 1/2" solid wood sides
Finish.....	Walnut
Grille Cloth.....	Two tone woven plastic grille cloth
Cubic Content.....	.900 cubic inches
Dimensions.....	17 1/8" high, 12 3/4" wide, 6 7/8" deep (max.)
Weight (unpacked).....	4 3/4 lbs.
Stock Identification.....	MI-12845



MI-12845 Wall Baffle.



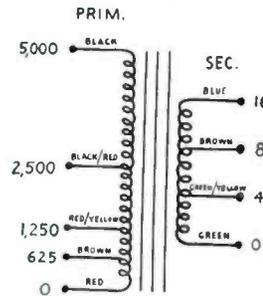
LINE MATCHING TRANSFORMERS, MI-12368, MI-12369 AND MI-11731



MI-12368

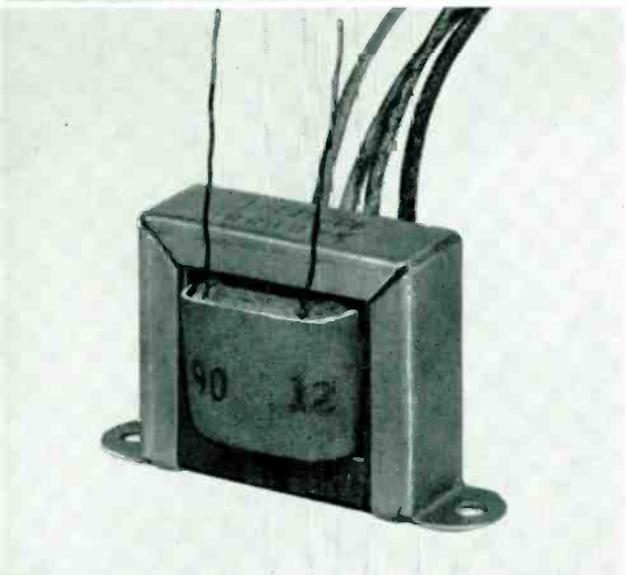
DESCRIPTION

This transformer has separate primary and secondary windings on a $\frac{7}{8}$ " x $\frac{3}{4}$ " core. The primary is tapped with 10" color coded leads to permit matching to a number of different speaker line impedances. The secondary is tapped with 10" color coded leads to match voice coil impedances of 4, 8, or 16 ohms.



SPECIFICATIONS

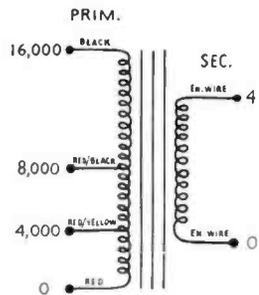
Frequency Response..... $\pm 1/2$ db from 60 to 10,000
 Distortion.....2% max. from 100 to 10,000 @ 8 watts
 Power Handling...Max. 16 watts of program material
 Mounting Centers $3\frac{1}{8}$ "
 Dimensions.....Height $2\frac{1}{4}$ ", Length $3\frac{3}{4}$ ", Width 2"
 Net Weight.....1 lb. 6 oz.
 Stock IdentificationMI-12368



MI-12369

DESCRIPTION

This transformer has separate primary and secondary windings on a $\frac{5}{8}$ " x $\frac{5}{8}$ " core. The primary winding is tapped with 10" color coded leads to match several different line impedances used in multiple speaker installations. The secondary matches any 3.2 to 4 ohm speaker



SPECIFICATIONS

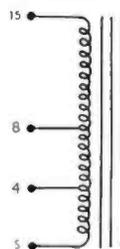
Frequency Response...1 db from 100 to 12,000 cycles
 Distortion.....2% max. from 100 to 8,000 @ 5 watts
 Power Handling.....Max. 8 watts program material
 Mounting Centers $2\frac{3}{8}$ "
 Dimensions.....Height $1\frac{5}{8}$ ", Length $2\frac{1}{16}$ ", Width $1\frac{1}{16}$ "
 Net Weight10 oz.
 Stock IdentificationMI-12369



MI-11731

DESCRIPTION

MI-11731 is a single-winding transformer used to match any combination of 4, 8 and 15 ohm speaker impedances. Soldering lugs are provided for making connections.



SPECIFICATIONS

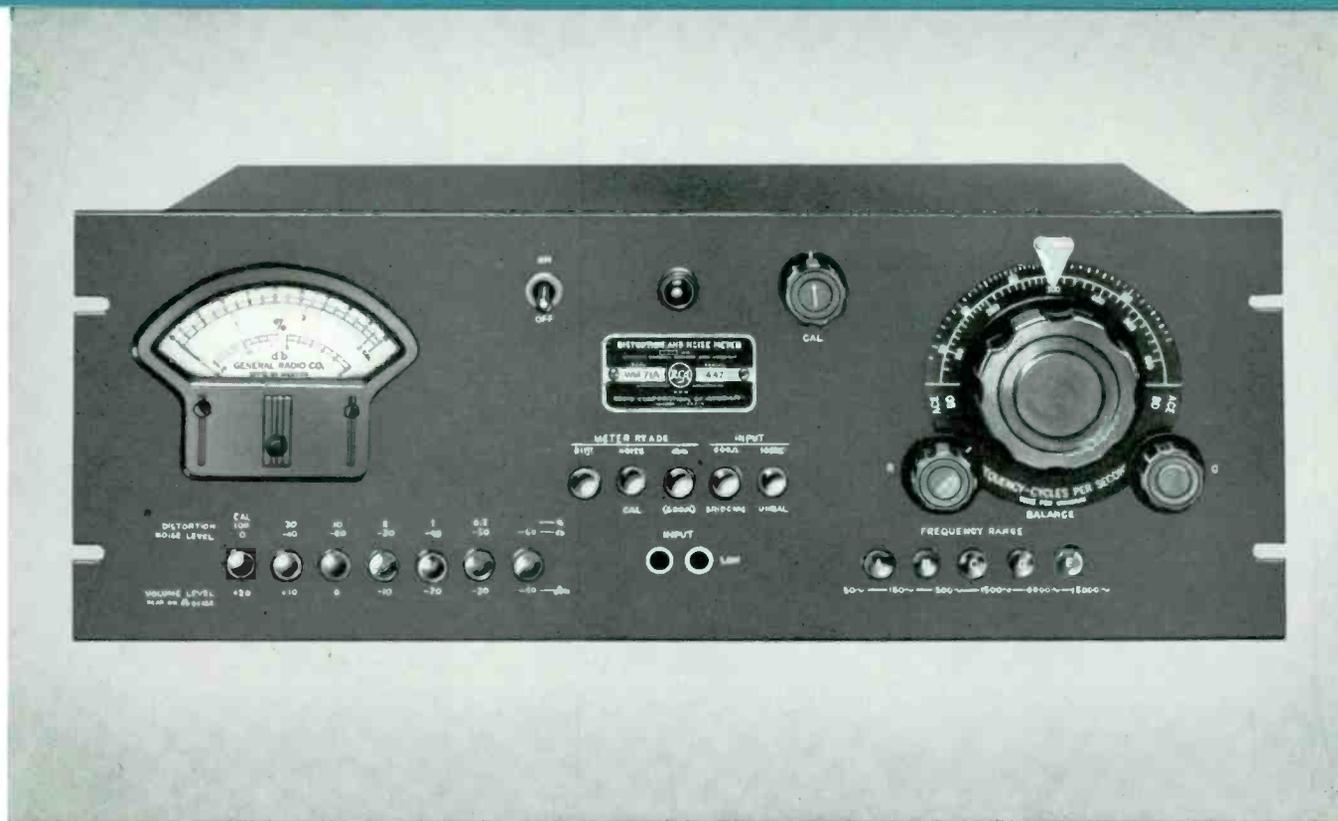
Frequency Response..... ± 1.0 db from 60 to 10,000
 Distortion.....2% max. from 100 to 10,000
 Power Handling8 watts
 Mounting Centers $2\frac{3}{8}$ "
 Dimensions...Height $1\frac{21}{32}$ ", Length, 2", Width $\frac{3}{4}$ "
 Net Weight10 oz.
 Stock IdentificationMI-11731

CHART SHOWING SPEAKER APPLICATIONS, RECOMMENDED HOUSINGS, AND SPECIFICATIONS

MI Number	Diameter (Inches)	Uses	Power Handling Capacity (Watts)	Frequency Range	Voice Coil Impedance (Ohms)	Floor Cabinet	Wall Housing
MI-11411-A LC-1A	15	Master program monitor, executive offices, clients' rooms, reception rooms, any application requiring maximum quality of sound reproduction	20	40-16,000 cps	15	MI-12464-B (Blonde) MI-12464-M (Mahogany)	MI-11406
MI-12654 SL-123	12	Program monitoring, executive offices, clients' rooms, reception rooms	15	40-16,000 cps	8	MI-12464-M/B	MI-11407-A
MI-12458 SL-12	12	Program monitoring, executive offices, clients' rooms, reception rooms	10	50-16,000 cps	8	MI-12464-M/B	MI-11407-A
MI-12418-B	12	Utility monitoring, spare program monitor, studio and announce booth cue, offices	15	50-8500 cps	8		MI-13253-A MI-11407-A
MI-11408	10	Utility monitoring, spare program monitor, studio and announce booth, cue, offices	10	60-7000 cps	4		MI-11407-A
MI-6333-D	10	Public Address, Studio talk-back, and intercom systems	20	60-7000 cps	6		MI-13253-A with MI-13245-A
MI-12454 MI-12454-A	8	Turntable cuing, dressing rooms, intercom, paging systems.	10	50-15,000 cps	4		MI-6104
MI-38300-3	8	Turntable cuing, dressing rooms, intercom, paging systems.	10	50-15,000 cps	4		Mounted in 8" baffle
MI-12480	8	Program monitoring, executive offices, clients' rooms, reception rooms	10	50-18,000 cps	8		MI-11407-A MI-6104
MI-12435-C	7	Public address, cuing, intercom systems	8	30-14,000 cps	3.2		MI-12845

DISTORTION AND NOISE METER

TYPE WM-71A



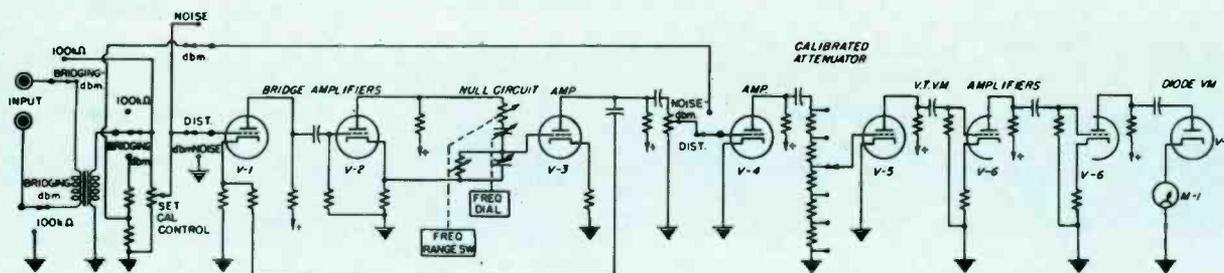
FEATURES

- Quick frequency selection
- Can be used as a wide range highly sensitive voltmeter or VU meter
- Distortion measurements, as low as 0.1%, quickly and easily made by one tuning adjustment
- Requires no direct connection to audio oscillator
- Audio oscillator distortion can be measured
- Tapped power transformer permits operation on either 105-125 volts or 210-250 volts
- Audio frequency range 50 to 15,000 cycles for distortion measurements; 30 to 45,000 cycles for noise and hum measurements

USES

Distortion and Noise Meter, RCA Type WM-71A, is a compact precision instrument for measuring the total distortion and the level of noise and hum in audio-frequency circuits. It permits continuous coverage of the audio frequency range, indicating directly the percentage of a-f distortion in modulators, speech amplifiers, a-f generators, receivers and other equipment employing audio frequencies. The instrument will give full-scale readings for distortion percentages as low as 0.3%, and is capable of measuring noise components at frequencies from 30 to 45,000 cycles.

The instrument has many uses in the communications laboratory and in the production testing of radio receivers as a wide-range, highly sensitive voltmeter for such measurements as signal-to-noise ratio, AVC characteristics and hum level. With the aid of an oscilloscope, individual hum and distortion components can be identified. When used with a linear detector such as the RCA Type BW-66F Amplitude-Modulation Monitor, the distortion and noise characteristics of broadcast and other radio-telephone transmitters can be measured.



Elementary schematic circuit diagram of the WM-71A Distortion and Noise Meter.

DESCRIPTION

The WM-71A Distortion and Noise Meter consists essentially of a high-gain amplifier, an r-c interstage coupling unit, a calibrated attenuator for adjusting the sensitivity, and a panel meter to indicate amplifier output.

The r-c interstage coupling unit balances to a sharp null at the frequency to which it is tuned, the null frequency being continuously variable and controlled from the panel. Degeneration is employed to maintain high stability in the amplifier and to provide flat transmission characteristics except within an octave of the null point.

In measuring distortion the audio-frequency signal is applied to the instrument and the null point is obtained to balance out its fundamental frequency, leaving only its harmonics and other distortion components which are indicated in percentage directly on the panel meter. When the modulated output of a radio transmitter is to be measured, a linear rectifier is required to produce the audio envelope. Any linear detector system having an undistorted output of 1.5 volts can be used.

A switch on the front panel provides for switching out the null circuit so that the instrument can be used as an extremely sensitive voltmeter for measuring hum and noise levels. Since the WM-71A has only one tuning control plus a small trimmer, it can be quickly set to any frequency over its range. This is a time-saving feature in making a series of measurements. Two input circuits are provided: a transformer for bridging a 600-ohm line, and a direct connection to the 100,000-ohm gain control. Input terminals are provided at the rear of the instrument for direct connection to the modulation monitor.

The instrument is relay rack mounted. All essential controls are located on the front panel. A large meter with an easily read, illuminated scale is provided, and percentage, decibel and dbm calibrations are included. The power supply is voltage regulated so that line surges have no appreciable effect on the instrument.

SPECIFICATIONS

Distortion Range.....	Full scale deflections for 0.3%, 1%, 3%, 10% or 30% distortion
Noise Measurement Range....	-80 db below reference calibration level, or 80 db below an audio-frequency signal of zero dbm level, at maximum sensitivity.
Audio-Frequency Range.....	50 to 15,000 cycles (fundamental), for distortion measurements; 30 to 45,000 cycles for noise and hum measurements.
Dbm Range.....	Power-level range is from +20 to -60 dbm (0 dbm is one milliwatt in 600 ohms)
Input Voltage Range.....	1.2 to 30 volts for the 100-kilohm input, and 0.8 to 30 volts for the 600-ohm bridging input
Accuracy.....	For distortion measurements $\pm 5\%$ of full scale for each range \pm residual distortion as noted below; for noise and dbm measurements, $\pm 5\%$ of full scale.
Residual Distortion Level:	
100-kilohm Input.....	0.05%, max., below 7500 c. 0.10%, max., above 7500 c.
Bridging Input.....	0.10%, max., between 50 and 70 c. 0.05%, max., between 70 and 7500 c. 0.10%, max., above 7500 c.
Residual Noise Level.....	Less than -80 db
Input Impedance.....	100,000 ohms unbalanced, and 600-ohm bridging input (10,000 ohms), balanced or unbalanced
Power Line.....	Tapped primary provides for operation on a-c line voltages of 105-125 volts, 50/60 cycles, single phase, or 210-250 volts, 50/60 cycles, single phase.
Power Consumption.....	65 watts
Tube Complement:	
4-6J5	1-6X5-GT
1-6H6	1-6K6-GT
1-6SN7-GT	2-OD3/VR150
Dimensions.....	19" wide, 7" high, 12" deep
Weight.....	37 $\frac{3}{4}$ lbs.
Finish.....	Umber gray lacquer

Equipment Supplied

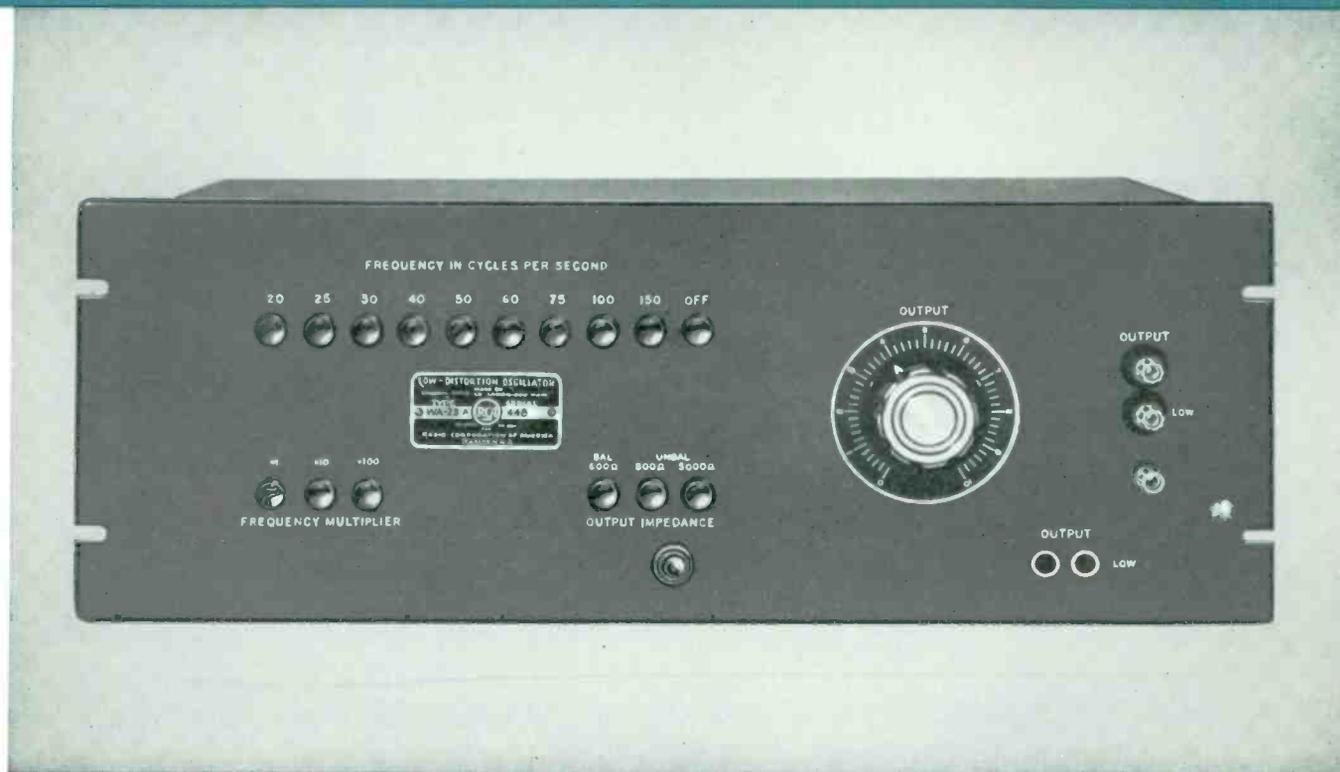
WM-71A Distortion and Noise Meter.....MI-30071-A
Including electron tubes, line connector, interconnecting cable, instruction book (IB-4071-1), and spare fuses.

Optional and Accessory Equipment

WA-28A Low Distortion Oscillator.....MI-30028-A
BI-11A Transmission Measuring Set.....MI-11350

AUDIO PUSH-BUTTON OSCILLATOR

TYPE WA-28A



FEATURES

- Very low distortion
- A high degree of frequency stability which makes this oscillator particularly adaptable for use with distortion meters employing r-c null networks
- Push-button selection of any one of 27 frequencies from 20 to 15,000 cycles
- Any other desired frequency within the normal range can be obtained by the use of plug-in resistors
- Duplicate output terminals on rear for relay-rack installation
- Chassis designed for mounting in standard equipment racks
- Ease of operation from front panel controls

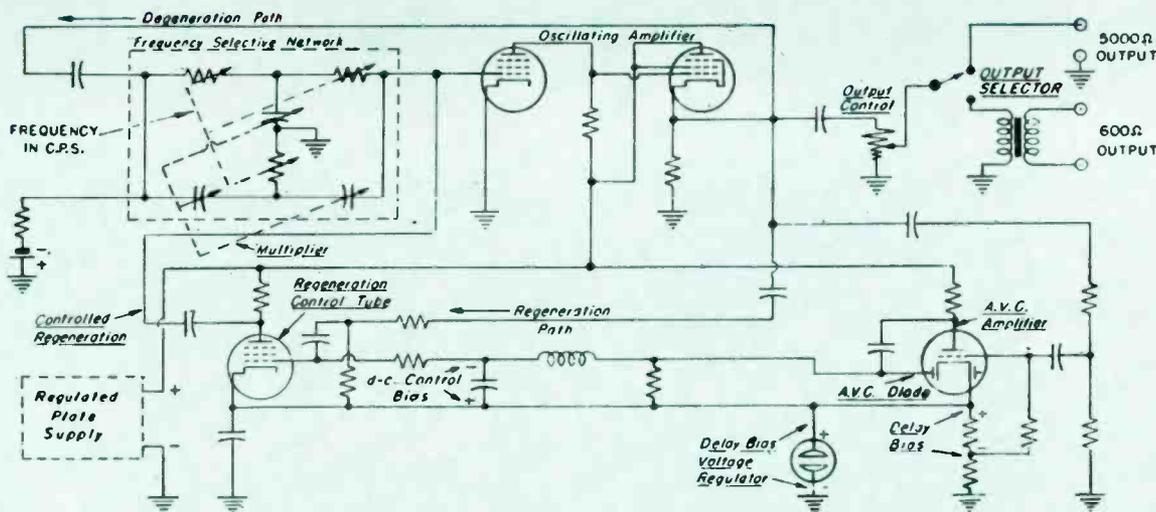
USES

The Type WA-28A Oscillator was designed particularly for use as a tone source for distortion measurements and as a power source for bridge measurements at audio frequencies. It is also satisfactory for use as a general-purpose laboratory oscillator.

The output frequencies include those recommended by the FCC for distortion measurements on broadcast transmitters. This oscillator is thus ideal for use with the Type WM-71-A Distortion and Noise Meter for rapid distortion measurements. The unusually pure waveform delivered by this oscillator at low frequencies makes distortion measurements possible at low frequencies.

DESCRIPTION

The WA-28A oscillator is of the resistance-capacitance type and uses an inverse feedback. Separate feedback networks control the frequency and amplitude independently, thus providing high stability and low distortion. The degenerative feedback which controls the frequency is obtained by means of a parallel-T network including mica capacitors and wire-wound resistors. The regenerative network includes an automatic control system whereby a high



Elementary schematic circuit diagram of the WA-28A Low Distortion Oscillator.

degree of stability is obtained together with low harmonic distortion, without requiring any manual feedback adjustments.

The instrument is mounted on a chassis fitting standard equipment racks. Controls on the front panel include ten frequency push-button switches. Three other push-buttons select the output impedance and a control is provided for adjusting the output voltage. Three frequency multiplier switches and two output jacks are also provided. Terminals are located inside the instrument which permit any specific frequency between the limits of 20 and 15,000 cycles to be obtained by insertion of a set of three calibrated resistors. The values of these resistors for any frequency may be obtained from the chart.

The output impedances available are: a constant 600-ohms balanced to ground, a 600-ohms unbalanced, and a 5000-ohm unbalanced. The 600-ohm output positions use transformer coupling and therefore can be operated either into a balanced line or a grounded line. The internal impedance is essentially constant at 600 ohms. The 5000-ohm output position can be operated unbalanced only. The output control is a potentiometer, and consequently the output impedance is not constant. The total harmonic distortion of any of the outputs will not exceed 0.1% when operating between 40 and 7500 cycles, and is never more than 0.25% when operating at extreme frequencies. The operation of the instrument is substantially independent of climatic changes in temperature and humidity.

Jack-top binding posts with standard $\frac{3}{4}$ -inch spacing and standard Western Electric double output jack are provided on the panel. A ground terminal is also provided. A standard multipoint connector provides duplicate output terminals on the rear of the instrument for relay-rack

installation. These terminals are disconnected when a plug is inserted in the Western Electric-type panel jack. The instrument is provided with power cord, multipoint connector and spare fuses.

SPECIFICATIONS

Frequency Range.....	27 fixed frequencies between 20 and 15,000 cycles	
Frequency Calibration.....	Adjusted within $1\frac{1}{2}\% \pm 0.1$ cycle	
Frequency Stability.....	Less than 0.02% frequency drift per hour after the first 10 minutes of operation	
Output Power.....	18 milliwatts into 600 ohms load, or 6.6 volts open circuit; 100 milliwatts into 5000 ohm load, or 30 volts open circuit; constant within ± 1 db throughout frequency range.	
Output Impedances.....	600-ohm balanced to ground 600-ohm unbalanced 5000-ohm unbalanced	
Waveform Distortion:		
5000-ohm Output.....	Less than 0.1% between 40 and 7500 cycles Less than 0.15% at other frequencies	
600-ohm Output.....	Less than 0.1% between 40 and 7500 cycles Less than 0.25% between 20 and 40 cycles Less than 0.15% above 7500 cycles	
Power Supply.....	105 to 125 (or 210 to 250) volts, 50/60 cycles, single phase	
Power Consumption.....	45 watts	
Tube Complement:		
1-6Y6-G	1-6SJ7	1-6SK7
1-NE-17	1-6SQ7	1-6X5
1-6B4-G	1-6SL7-GT	1-OD3/VR150
Dimensions.....	19" wide, 7" high, 12" deep	
Weight.....	32 $\frac{1}{2}$ lbs.	
Finish.....	Light umber gray	

Equipment Supplied

WA-28A Low-Distortion Oscillator, complete.....MI-30028-A
Including electron tubes, line connector, multiple point connector, instruction book (IB-4028-1) and spare fuses.

Optional and Accessory Equipment

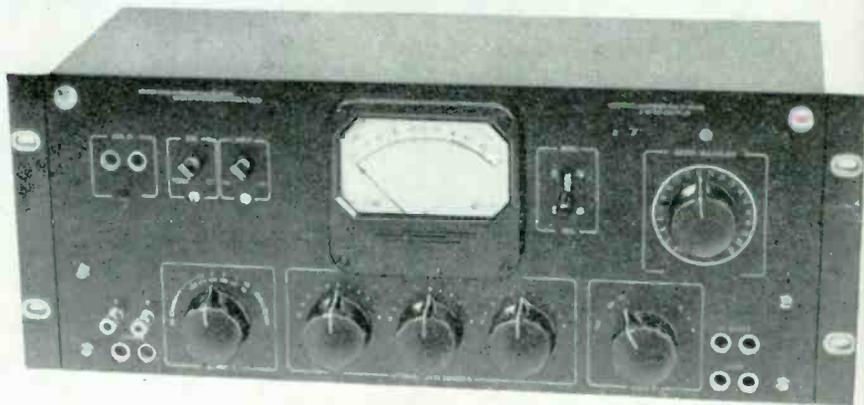
Noise and Distortion Meter, Type WM-71A.....MI-30071-A
Transmission Measuring Set, Type BI-11A.....MI-11350

TRANSMISSION MEASURING SET

TYPE BI-11A

FEATURES

- Simplifies audio measurement
- Eliminates lengthy calculations—direct reading
- ± 0.1 db accuracy over frequency range of 20 to 20,000 cycles
- Automatic correction for changes in load impedance



DESCRIPTION

The Transmission Measuring Set, Type BI-11A, is a simplified, accurate and direct-reading instrument designed for use in the following applications: (1) audio gain measurements; (2) audio loss measurements; (3) measurements of matching and bridging devices; (4) complex circuit measurements; (5) measuring mismatch loss and frequency response measurements. The instrument also may be used as an independent volume level indicator.

The instrument facilitates overall system measurements and may be used with the WA-28A Low Distortion Push-button Oscillator and the WM-71A Distortion and Noise Meter. It eliminates lengthy calculations and intricate setups. It is designed to provide accuracies conforming to FCC regulations and is particularly useful for broadcast stations in the master control room or at the transmitter.

The BI-11A Transmission Measuring Set consists of a volume indicator meter, input and output attenuators, an impedance matching system and jacks for convenient connections. A meter multiplier, which is geared to the load impedance shaft, provides an automatic correction for changes in load impedance. Convenient switches allow the volume indicator to be connected to the input of the attenuator system or to jacks for external connection. An output impedance switch allows matching to 600-250-150-16-8-4 ohm circuits.

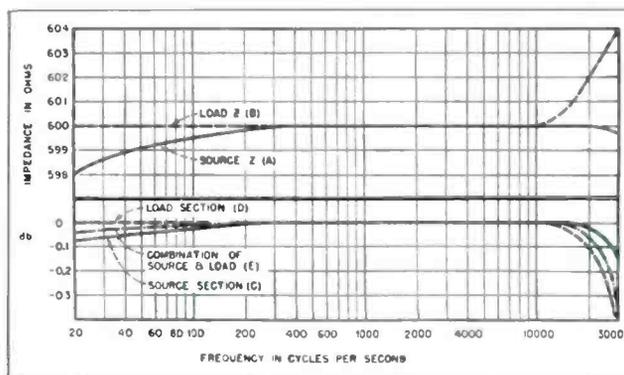
Level controls, switches, jacks and VU meter are located on the front of a standard 19 inch rack-type panel. The panel hinges forward to provide ready access to attenuators, jacks, switches and other components. Unit type assemblies (individual sections, such as source, attenuation and load) are readily removable for servicing. Each section is a complete assembly with its own jacks and terminal block.

SPECIFICATIONS

Frequency Range.....	20 to 20,000 cycles
Accuracy (independent of level from +4 to -110 dbm):	
Overall.....	± 0.1 db, 20 cycles to 20 kilocycles
Source and Load Impedances for Dial Indicators	
Over Entire Range.....	Within $\pm 2\%$
Network Resistors	$\pm 1.0\%$
Source Characteristics:	
Shielded Output can be used equally well on either balanced or unbalanced equipment	
Ranges (in steps of 0.1 db).....	+4 to -110 db -10 to -124 db
Range of Impedance:	
Internally Terminated	600-150 ohms
Unterminated	600-250-150-30 ohms
Internal isolation network for operating into non-linear devices.	
Load Characteristics (resistive load, ungrounded):	
Range of Load Levels.....	+4 to +42 VU @ 600 ohms
Range of Impedance.....	600-250-150-16-8-4 ohms
Dimensions.....	19" wide, 7" high, 8 1/4" deep
Weight	19 lbs.
Finish.....	Light umber gray
Stock Identification (includes tubes).....	MI-11350

Accessory Equipment

Low Distortion Push Button Oscillator.....	MI-30028-A
Distortion and Noise Meter.....	MI-30071-A



TRANSMISSION MEASURING SET

Audio Signal Generator and Level Meter—Model 452A



FEATURES

- Direct reading eliminates lengthy calculations
- Simplifies measurement of transmission characteristics of audio systems and their components.
- Generates signals ranging from mike to line level
- Measures signals from noise to line levels
- Wide frequency range
- Self-contained low distortion oscillator

USES

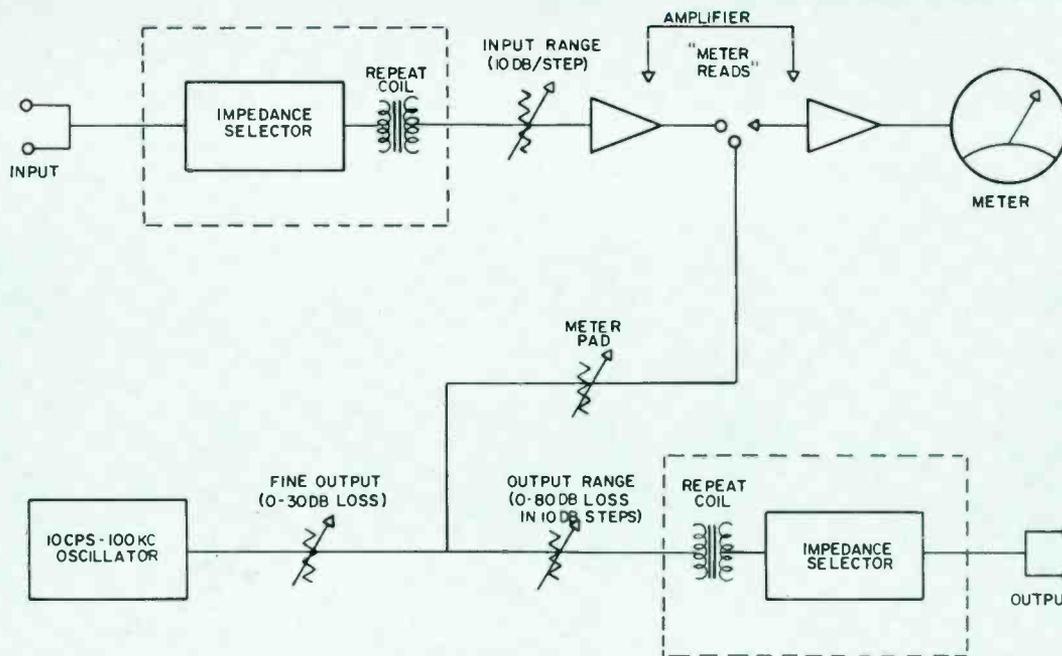
The Transmission Measuring Set, Model 452A, is a simplified, accurate and direct-reading instrument designed for use in the following applications: (1) audio gain measurements; (2) direct audio voltage and level measurement; (3) signal to noise ratio; (4) frequency response measurements; (5) low distortion signal source for distortion measurements. This unit should be standard equipment in broadcast stations, sound engineering laboratories and central telephone exchanges.

DESCRIPTION

The Waveforms, Inc., Model 452A transmission measurement set makes all previous transmission measuring and generating instruments obsolete. Unlike other types of transmission measuring instruments, the 452A combines both measuring and generating devices into one compact and easily mounted instrument. Whereas, other equipment used for the same purposes consist of a separate measuring set and separate generator, this new instrument combines all of these functions into one unit with interlocking controls. With the 452A, the engineer no longer is required to spend considerable time in complicated calculations, but merely turns a switch and automatically obtains a reading of the output level and measurement of the return signal.

The precision AC volt meter incorporated in the 452A permits direct measurements of all levels from noise to line. This is the only instrument which by the nature of its circuitry does not require correction of readings for different setting of input or output impedance. Unlike the now obsolescent fixed switch-tuned generators, the 452A has a continuously variable oscillator that permits the analysis and correction of unwanted "peaks" and "holes" in the response of a transmission system.

The OUTPUT section of the instrument consists of a continuously variable oscillator which delivers +20 dbm into a precision decade attenuator followed by a repeat coil. A



BLOCK DIAGRAM OF WAVEFORM 452A

panel switch permits instantaneous strapping of the repeat coil to match loads of 50, 150, 250, or 600 ohms, all balanced. The frequency range of the instrument so used is 15 cps—50 KC. A panel switch permits the repeat coils to be by-passed in which case the frequency range is 10 cps to 100 kc into a 600 ohm unbalanced load. The positions of the decade attenuator in dbm are +20, +10, 0, -10, -20, -30, -40, -50, and "No Signal." A Fine Output Control permits adjustment of signal output to any point between these settings. When the "Meter Reads" switch is in the "Output Level" position, the output is read automatically on the meter. The meter reading is simply added to the reading of the decade attenuator. No correction factor for impedance setting is required.

The INPUT section consists of an amplifier AC volt-

meter which is accurate over the range 10 cps—100 kc. An input repeat coil is switch strapped for matching or bridging circuits of 50, 150, 250, or 600 ohms balanced or unbalanced. A fifth position on this Input Impedance Selector connects the set's input terminals directly to the voltmeter, by-passing the repeat coil. With the repeat coil in the circuit, the meter range is 15 cps—50 kc. With the repeat coil out of the circuit, the meter range is 10 cps—500 kc, and the instrument input impedance is 10 megohms unbalanced. The meter range switch is a decade attenuator of twelve positions marked -60, -50, -40, -30, -20, -10, 0, +10, +20, +30, +40 and +50 dbm. Levels of above +20 dbm may only be read with the repeat coil out of the circuit ("high impedance" position). Because a linear meter movement is used, levels as low as -80 dbm may be read directly.

SPECIFICATIONS

GENERATOR:

Frequency Range:	
600 Ω unbalanced	10 cps—100 kc
50, 150, 250, and 600 Ω balanced	15 cps—50 kc
Frequency Accuracy	±1% (±1 cps)
Output Level Accuracy:	
600 Ω unbalanced	±¼ db 10cps—100 kc
150 and 600 Ω balanced	±¼ db 15 cps—15 kc
50 and 250 Ω	±½ db 15 cps—50 kc
	Relative
Output Impedance Accuracy:	
600 Ω unbalanced	±5% 10 cps—100 kc
150 and 600 Ω balanced	±5% 30 cps—15 kc
50 and 250 Ω balanced	Relative
Distortion	0.1% max. 30 cps—15 kc up to +10 dbm output
Noise	80 db below full output

Output Level Range	Continuously variable from +20 dbm to -60 dbm
LEVEL-METER:	
Calibration Accuracy:	
Unbalanced (10 Meg Ω)	±¼ db 10 cps—100 kc
150, 600 Ω balanced	±¼ db 15 cps—15 kc
50, 250 Ω balanced	±½ db 15 cps—50 kc
	Relative
Input Impedance Accuracy (Matching):	
150, 600 Ω balanced	±5% 30 cps—15 kc
50, 250 Ω balanced	Relative
Input Impedance (Bridging)	Above 10 k Ω
Meter Scales	0.1 and 0.3 volts; -12 to +2 dbm
Meter Ranges in dbm at all nominal impedances	-60 dbm to +50 dbm in 10 db steps
Meter Residual Noise	35 db below full scale on all ranges

WAVEFORMS' AUDIO TEST EQUIPMENT

AUDIO OSCILLATOR, MODEL 510-B



FEATURES

- Briefcase portable
- Constant $\frac{1}{2}$ db output
- Very low distortion
- 18 cycles to 1.1 megacycles

The Model 510-B is a precision source of sinusoidal signals in the Audio and Ultrasonic range. It has a frequency range of 18 cycles to 1.1 megacycles, with constant output of $\pm\frac{1}{2}$ db and calibration accuracy of $\pm 2\%$ ($\pm 1\%$ on special order). The stability is $\pm\frac{1}{2}\%$ with temperature and line voltage. A distortion of less than 2/10% over most of useful range and maximum output of 10 volts or 4 ma (+15 dbm into 2000 ohms) is provided. Source impedance is 400 ohms. Logarithmic output control is calibrated approximately in volts. The unit is briefcase portable weighing less than six lbs. The power requirements are 95-130 volts, 50-400 cycles, 40 watts. Unit measures 8" high, 6" wide, 10 $\frac{1}{2}$ " deep and weighs 12 pounds. Power consumption is 60 watts.

The following accessories are available:

Model T-10 Balanced Matching Transformer attachment for the 510-B provides 150 or 600 ohms balanced source. Flat $\pm\frac{1}{2}$ db from 18 cycles to 50 kc, Output +2 dbm. A T-11 Balanced Matching Transformer attachment for the 510-B provides 135 or 600 ohm balanced source. 600 ohms $\pm\frac{1}{2}$ db from 30 cycles to 200 kc. 150 ohms $\pm\frac{1}{2}$ db 20 cycles to 150 kc. Output +10 dbm.

The Series 100 Attenuators conveniently provide low signal levels from any oscillator or signal generator with standard $\frac{3}{4}$ " terminals. Dc to 2 mc, Model 101 has a 10:1 ratio; Model 102, 100:1 ratio; Model 103, 1000:1 ratio with $\pm 1\%$ accuracy.

GENERAL PURPOSE OSCILLATOR, MODEL 401-C

FEATURES

- 9 cycles to 120 kc
- $\frac{1}{4}\%$ distortion
- $\frac{1}{2}$ watt output
- Step attenuator

The Model 401-C is a general purpose Audio Oscillator featuring half watt power capability and an output attenuator. It has extended frequency range of 9 cycles to 120 kc, with constant output $\pm\frac{1}{2}$ db and calibration accuracy of $\pm 2\%$ ($\pm 1\%$ on special order). The stability is $\pm\frac{1}{2}\%$ with temperature and line voltage, and maximum output is 20 volts open circuit or $\frac{1}{2}$ watt into 600 ohms (+27 dbm, 17.3 volts). Distortion is less than $\frac{1}{4}\%$. An attenuator switch and logarithmic output control calibrated approximately in volts, for levels down to 1 millivolt is provided. Source impedance is less than 100 ohms.



SINE-WAVE GENERATOR, MODEL 512

FEATURES

- 9/10 cycle to 510 kc
- 1/10% distortion
- 2 watts output
- Step attenuator



The Model 512 is a precision source of sinusoidal signals from subaudio through the ultrasonic range. It has a frequency range of 9/10 cycle to 510 kc, with a constant output of $\pm 1/2$ db and calibration accuracy of $\pm 2\%$ ($\pm 1\%$ on special order). The stability is $\pm 1/2\%$ with temperature and line voltage. Distortion is less than 1/10% over most of useful range and the maximum output is 50 volts open circuit, or 2 watts into 600 ohms (34.5 volts, +33 dbm). The output is calibrated in four decade ranges from 5 millivolts to 50 volts, $\pm 10\%$. Source impedance is 50 ohms or less. The Model 512 is readily portable, weighing less than 18 lbs. The power requirements are 105-130 volts, 50-400 cycles, 110 watts.

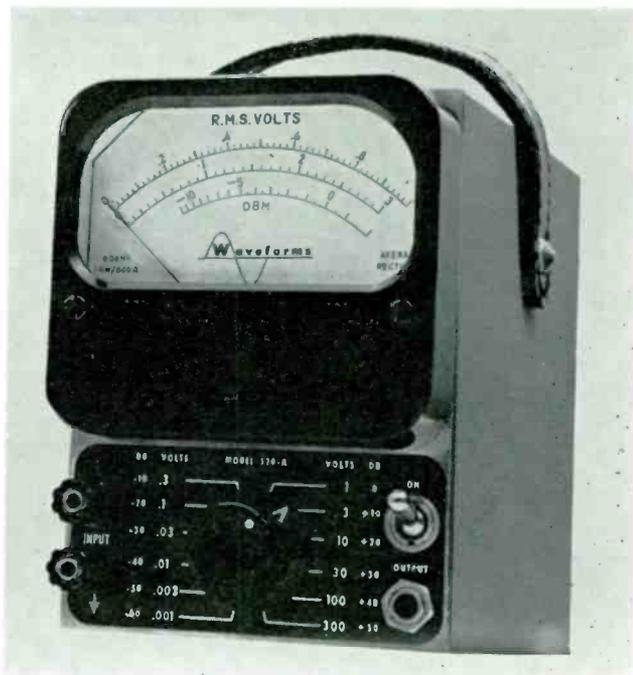
AMPLIFIER-VOLTMETER, MODEL 520-A

FEATURES

- 10 cycles to 2 megacycles
- 1.0 millivolt full scale
- 12 ranges to 300 volts
- Null indicator
- 5 cycles to 4 mc

The Model 520-A is a stable, general purpose AC voltmeter, null indicator, and decade amplifier, featuring high input impedance for negligible circuit loading, full-wave average rectifier for minimum waveform error, and extremely low pick-up from stray fields and power line.

It has a meter range from 1.0 millivolt full scale to 300 volts, permitting measurement to 100 microvolts and useful indications at still lower levels; -70 to $+50$ dbm in 10 dbm ranges. Its accuracy is $\pm 3\%$, 20 cycles to 1 mc; or $\pm 5\%$ 10 cycles to 2 mc and stability is $\pm 1\%$ with line voltage from 105-130 volts. The input impedance is 10 megohms shunted by 24 mmf; and amplifier gain is 1000. The meter is protected against overload. The equipment is briefcase portable weighing 6 lbs. An illuminated meter and mirror scale are available on special order. The voltmeter is rated 40 watts, 50-400 cycles.



RECOMMENDED WIRING PRACTICES

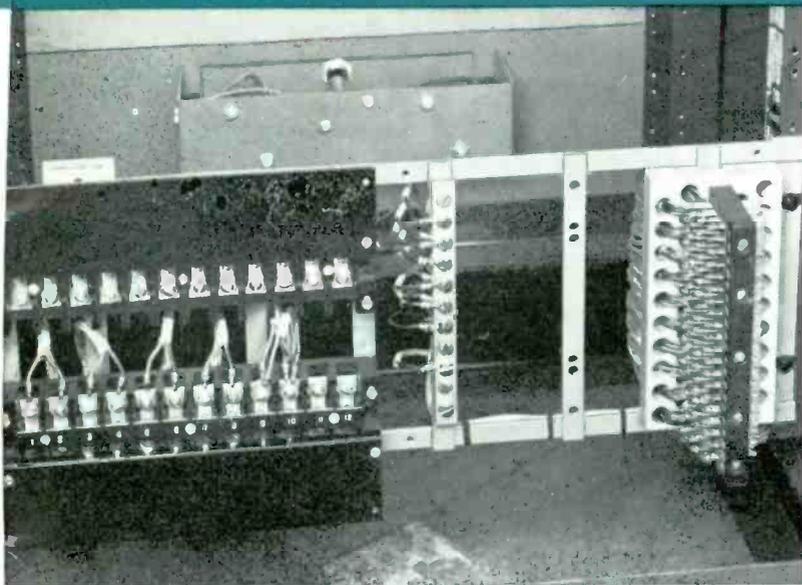


Photo of terminals at bottom of rack. Power terminals are at left, ground bus in center and audio terminals at right.

Almost every studio undergoes minor modifications from time to time, and the subject of proper wiring practice is raised. Modern standards require careful elimination of noise and crosstalk from the program circuits. It is not uncommon to spend many hours wiring in new components, only to find their performance reduced by the wiring itself. A tested and proven standard practice can avoid much wasted time.

There are two basic philosophies employed in practical approaches to the noise problem. In one system every circuit shield is carefully isolated from its neighbors and grounded at one point only. In the other, all the shields of one unit (such as a rack) are put in such close contact that a brute-force ground is provided for any stray currents that might be present. This latter approach is taken in RCA equipment with modifications as follows:

Every rack, cabinet or desk is wired as a unit to terminal boards. The terminal boards are placed as near as possible, consistent with accessibility, to the point where the external circuits enter the unit. See Figs. 1 and 2 for examples.

In a rack, as viewed from the back, all audio cables are run on the right side of the rack; and all signal, a-c and d-c power cables are run on the left side. All audio circuits are twisted pair conductors shielded with a tinned copper braid. Separate cables are formed for:

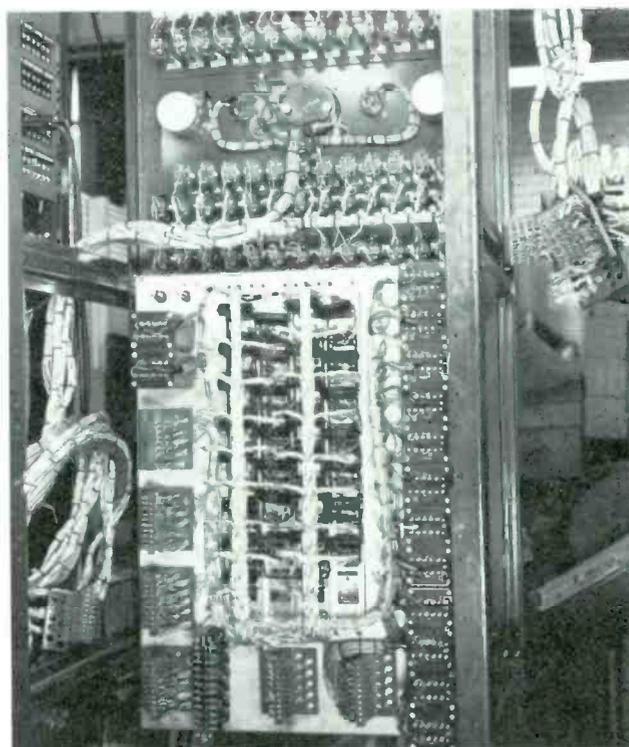
- (a) Microphone outputs, preamplifier outputs and other audio circuits with levels below -20 vu.
- (b) Mixer, line and channel circuits up to $+30$ vu.

- (c) Loudspeaker and other lines above $+30$ vu.
- (d) At times further subdivisions are made for convenience in bulk or because levels are widely separated.

Each cable is bound with lacing cord so the shields are in tight contact for their entire length. Where two audio cables cross or join, they should either be definitely insulated or bound together. It is better to have tight contact than to risk an intermittent noise source made by casual contact.

The ends of the individual shields are terminated either with "wedge-on" collars or with plastic tape. The shields are grounded to a main ground bus near the terminal block. A shielded ground lead is run from each amplifier chassis to the ground bus.

The a-c and d-c power circuits are handled similarly. All a-c circuits should be in twisted pair, shielded cable. The a-c current should be balanced in each pair. That is, one pair should not be used for one side of a circuit and a second pair for the other side. If more than one pair is needed for the load, two or more pairs should be used with part of the load on each. Plus and minus plate potentials should be carried in single conductor shielded cable. Shields are tied off and grounded the same as the audio circuits.



View of wiring at rear of a typical audio relay switcher and control panel. Equipment is mounted in standard broadcast rack.

Signal circuits do not require shielded wire. The frames of jacks should be tied together and grounded with a shielded wire the same as amplifier chassis.

In installing the equipment in a studio or control room the following rules have been found useful:

The pairs run in conduits should be grouped in the same general way as the cables in the racks. The audio conduits should be kept free from grounds to power conduits or power circuits. Low level audio circuits (less than -30 vu) should have the shields insulated from the conduits and from each other.

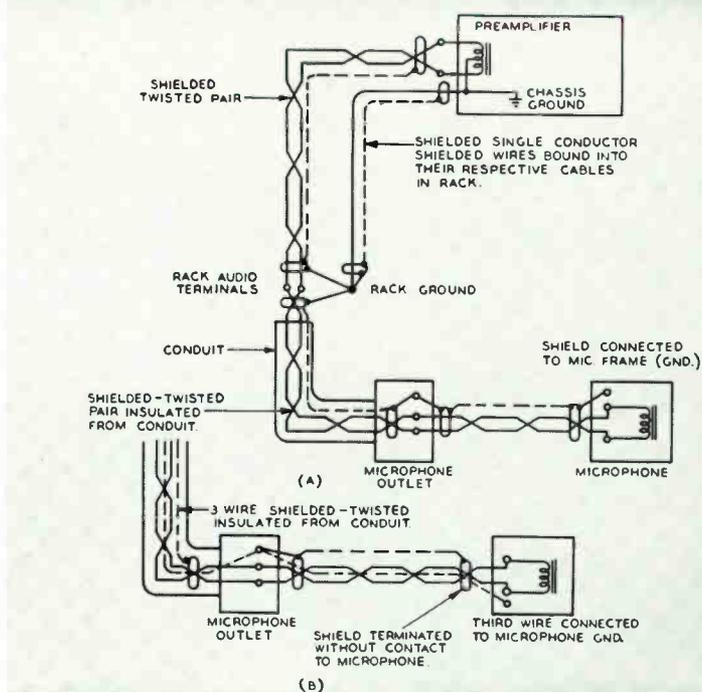
Splices should be avoided. Low level conduits should be well spaced from power conduits.

Signal and telephone circuits should not be run in the same conduit with program or power circuits. Telephone leads should be twisted pair. Power and audio grounds should consist of separate, heavy shielded leads to the main station ground.

TV circuits in general should be considered high level circuits and should therefore be kept away from low level audio circuits. In particular, pulsed lamp circuits should be routed as far away from projector photocell and preamplifier circuits as possible. Shields should be insulated from ground and the audio circuit and shield grounded only at the point of lowest level.

Typical good practice for microphones is shown in Fig No. 3a. In this case two conductor shielded wire, with insulation over the shield, is used for the conduit run and the microphone cord. Fig. No. 3b shows somewhat better practice in which 3-conductor shielded, insulated cable is used for the conduit run and microphone cord. This latter practice removes any ground current from the shield.

Turntable pickup circuits should be handled like microphones with particular care being taken to keep the



motor power circuits and their shields away from the audio circuits.

The input to mixer circuits is usually at comparatively high level, but the output is frequently very close to microphone level and the circuits should be treated in the same way. Fig. No. 4 shows typical good grounding practice in this respect. Unbalanced circuits may be used but are usually more difficult to handle if there is noise present. It will be noted that the only ground to this part of the system is at the point of lowest level and that all the circuits are balanced to ground. The center taps of the mixer attenuators are only tied to ground if special noise difficulty is encountered and tests indicate improvement. This occasionally happens on circuits which connect to remote lines or studio equipment with separate ground systems.

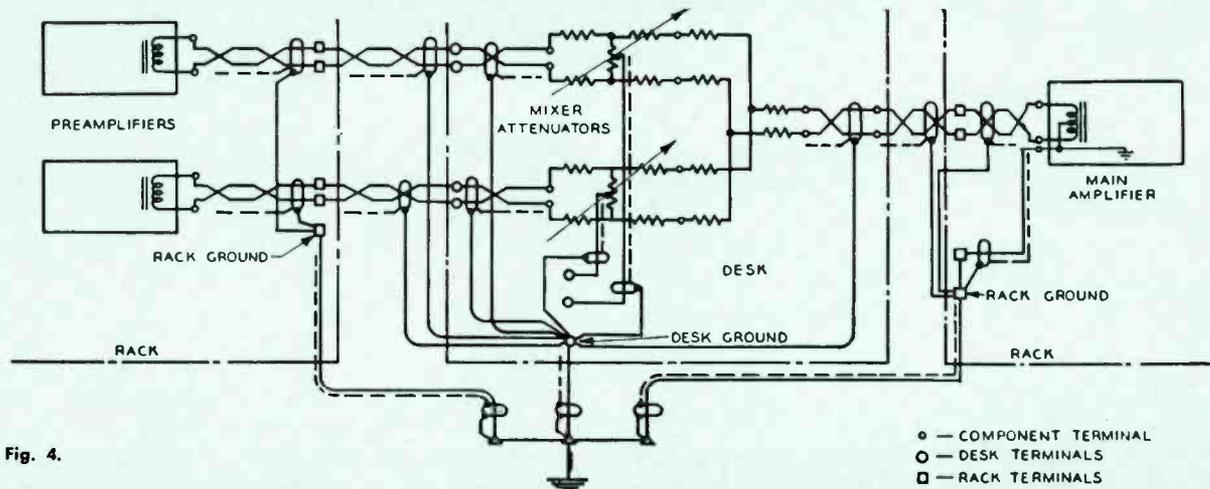
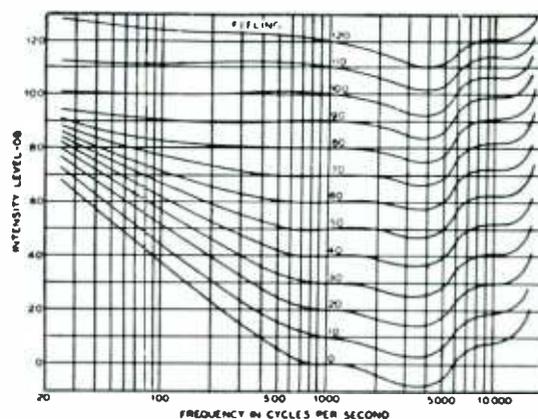


Fig. 4.

- — COMPONENT TERMINAL
- — DESK TERMINALS
- — RACK TERMINALS
- △ — STATION GROUND

AUDIO DATA SECTION

CONTOURS OF EQUAL LOUDNESS TO THE EAR

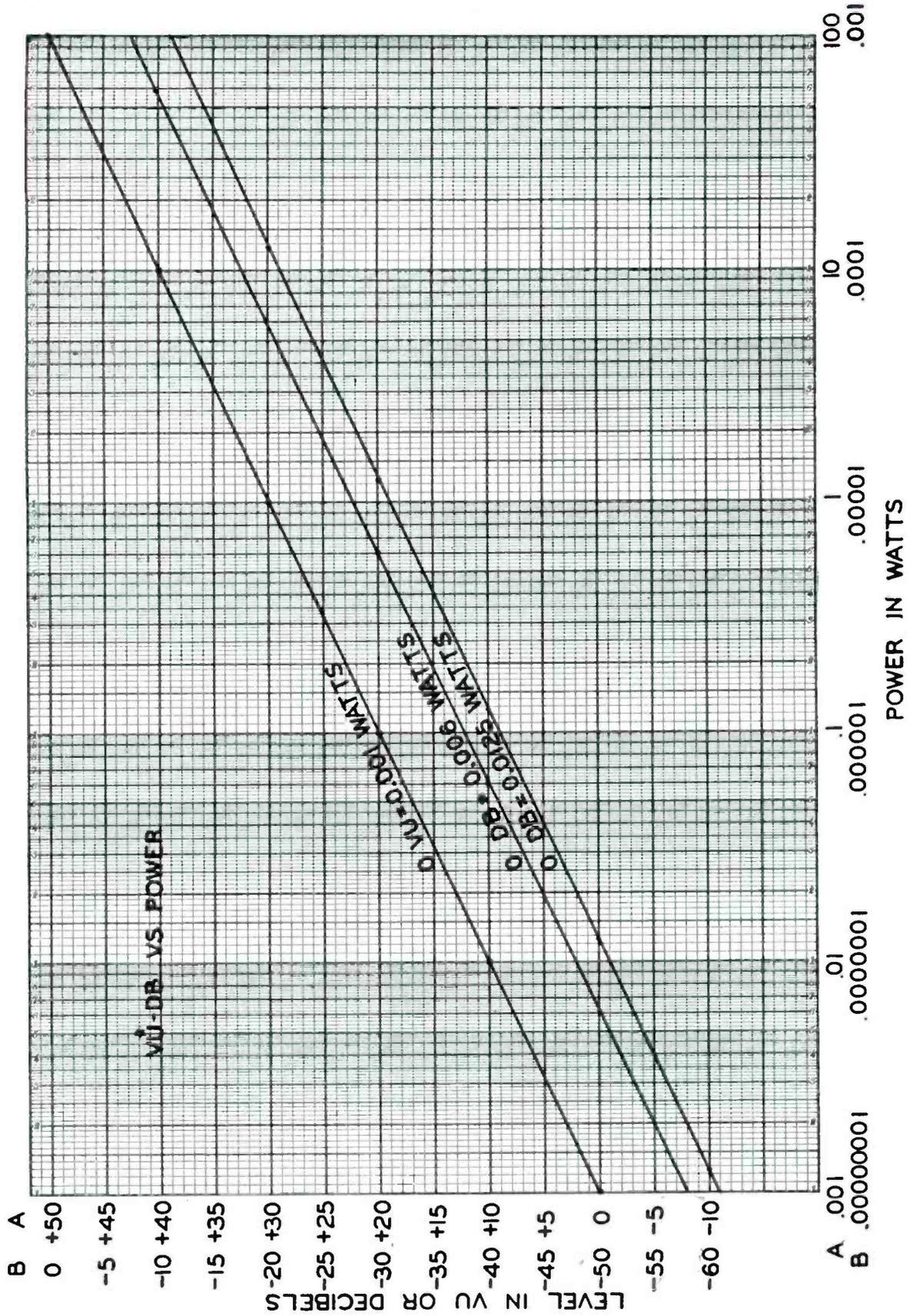


Loudness level contours.

Courtesy of the Acoustical Society of America

Impedance	600 Ohms															
	R ₁ Ohms	R ₂ Ohms														
0	0	∞	0	∞	0	∞	0	∞	0	∞	0	∞	0	∞	0	∞
0.1	3.58	50204	7.20	100500	3.60	100500	3.58	100500	7.2	100500	3.58	100500	7.2	100500	3.58	100500
0.2	6.82	26280	13.70	57380	6.85	57380	6.82	57380	13.8	57380	6.82	57380	13.8	57380	6.82	57380
0.3	10.32	17460	20.55	34900	10.28	34900	10.32	34900	21.0	34900	10.32	34900	21.0	34900	10.32	34900
0.4	13.79	13068	27.50	26100	13.80	26100	13.79	26100	28.2	26100	13.79	26100	28.2	26100	13.79	26100
0.5	17.20	10464	34.40	20920	17.20	20920	17.20	20920	35.4	20920	17.20	20920	35.4	20920	17.20	20920
0.6	20.9	8640	41.7	17230	20.85	17230	20.9	17230	43.2	17230	20.9	17230	43.2	17230	20.9	17230
0.7	24.2	7428	48.5	14880	24.25	14880	24.2	14880	50.4	14880	24.2	14880	50.4	14880	24.2	14880
0.8	27.5	6540	55.05	13100	27.53	13100	27.5	13100	57.6	13100	27.5	13100	57.6	13100	27.5	13100
0.9	31.02	5787	62.3	11600	31.2	11600	31.02	11600	65.4	11600	31.02	11600	65.4	11600	31.02	11600
1.0	34.5	5208	68.6	10440	34.3	10440	34.5	10440	73.2	10440	34.5	10440	73.2	10440	34.5	10440
1.5	48.8	3452	104.3	6950	52.1	6950	51.8	6950	113.4	6950	51.8	6950	113.4	6950	51.8	6950
2.0	68.8	2582	139.4	5232	69.7	5232	68.8	5232	155.4	5232	68.8	5232	155.4	5232	68.8	5232
2.5	85.9	2053	175.4	4195	87.7	4195	85.9	4195	200.4	4195	85.9	4195	200.4	4195	85.9	4195
3.0	102.7	1703	212.5	3505	106.2	3505	102.7	3505	247.8	3505	102.7	3505	247.8	3505	102.7	3505
3.5	119.2	1448	258.0	3021	129.0	3021	119.2	3021	297.6	3021	119.2	3021	297.6	3021	119.2	3021
4.0	135.8	1249	287.5	2651	143.8	2651	135.8	2651	351.0	2651	135.8	2651	351.0	2651	135.8	2651
4.5	152.2	1109	324.6	2365	162.3	2365	152.2	2365	407.4	2365	152.2	2365	407.4	2365	152.2	2365
5.0	168.1	987.6	364.5	2141	182.3	2141	168.1	2141	466.8	2141	168.1	2141	466.8	2141	168.1	2141
5.5	184.0	886.8	405.9	1956	203.0	1956	184.0	1956	530.4	1956	184.0	1956	530.4	1956	184.0	1956
6.0	199.3	803.4	447.5	1807	223.8	1807	199.3	1807	597.0	1807	199.3	1807	597.0	1807	199.3	1807
6.5	214.6	730.8	492.6	1679	246.3	1679	214.6	1679	667.8	1679	214.6	1679	667.8	1679	214.6	1679
7.0	229.7	665.2	537.0	1569	268.5	1569	229.7	1569	743.3	1569	229.7	1569	743.3	1569	229.7	1569
7.5	244.2	615.6	584.7	1475	292.4	1475	244.2	1475	822.6	1475	244.2	1475	822.6	1475	244.2	1475
8.0	258.4	567.6	634.2	1393	317.1	1393	258.4	1393	907.2	1393	258.4	1393	907.2	1393	258.4	1393
8.5	272.3	525.0	685.5	1322	342.8	1322	272.3	1322	996.6	1322	272.3	1322	996.6	1322	272.3	1322
9.0	285.8	487.2	738.9	1260	369.4	1260	285.8	1260	1091	1260	285.8	1260	1091	1260	285.8	1260
9.5	298.9	453.0	794.4	1204	397.2	1204	298.9	1204	1191	1204	298.9	1204	1191	1204	298.9	1204
10.0	312.0	421.6	854.1	1154	427.0	1154	312.0	1154	1297	1154	312.0	1154	1297	1154	312.0	1154
11.0	326.1	387.4	919.8	1071	480.9	1071	326.1	1071	1529	1071	326.1	1071	1529	1071	326.1	1071
12.0	350.1	321.7	1119	1002	530.5	1002	350.1	1002	1788	1002	350.1	1002	1788	1002	350.1	1002
13.0	380.5	262.8	1273	946.1	636.3	946.1	380.5	946.1	2080	946.1	380.5	946.1	2080	946.1	380.5	946.1
14.0	400.4	249.4	1443	899.1	721.5	899.1	400.4	899.1	2407	899.1	400.4	899.1	2407	899.1	400.4	899.1
15.0	418.8	220.4	1632	859.6	816.0	859.6	418.8	859.6	2773	859.6	418.8	859.6	2773	859.6	418.8	859.6
16.0	435.8	195.1	1847	826.0	923.2	826.0	435.8	826.0	3186	826.0	435.8	826.0	3186	826.0	435.8	826.0
17.0	451.5	172.9	2083	797.3	1042	797.3	451.5	797.3	3648	797.3	451.5	797.3	3648	797.3	451.5	797.3
18.0	465.8	152.5	2329	772.8	1172	772.8	465.8	772.8	4168	772.8	465.8	772.8	4168	772.8	465.8	772.8
19.0	470.0	136.4	2593	751.7	1335	751.7	470.0	751.7	4748	751.7	470.0	751.7	4748	751.7	470.0	751.7
20.0	490.4	121.2	2870	733.3	1485	733.3	490.4	733.3	5400	733.3	490.4	733.3	5400	733.3	490.4	733.3
22.0	511.7	95.9	3753	703.6	1877	703.6	511.7	703.6	6400	703.6	511.7	703.6	6400	703.6	511.7	703.6
24.0	528.8	76.0	4737	680.8	2369	680.8	528.8	680.8	7700	680.8	528.8	680.8	7700	680.8	528.8	680.8
26.0	542.7	60.3	5985	663.4	2992	663.4	542.7	663.4	9300	663.4	542.7	663.4	9300	663.4	542.7	663.4
28.0	554.1	47.8	7550	649.7	3775	649.7	554.1	649.7	11200	649.7	554.1	649.7	11200	649.7	554.1	649.7
30.0	563.0	37.90	9600	639.2	4750	639.2	563.0	639.2	13700	639.2	563.0	639.2	13700	639.2	563.0	639.2
32.0	570.6	30.16	11890	630.9	5967	630.9	570.6	630.9	16800	630.9	570.6	630.9	16800	630.9	570.6	630.9
34.0	576.5	23.95	15000	624.4	7500	624.4	576.5	624.4	20400	624.4	576.5	624.4	20400	624.4	576.5	624.4
36.0	581.1	18.98	18960	619.3	9480	619.3	581.1	619.3	24700	619.3	581.1	619.3	24700	619.3	581.1	619.3
38.0	585.1	15.11	23820	615.3	11910	615.3	585.1	615.3	29800	615.3	585.1	615.3	29800	615.3	585.1	615.3
40.0	588.1	12.00	30000	612.1	15000	612.1	588.1	612.1	35800	612.1	588.1	612.1	35800	612.1	588.1	612.1

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Boston 16, Mass.

200 Berkeley Street, Hubb

Camden 2, N. J.

Front & Cooper Streets, Camden 3-8000

Chicago 54, Ill.

1186 Merchandise Mart Plaza, Delaware 7-0700

Cleveland 15, Ohio

1600 Keith Bldg., Cherry 1-3450

Dallas 35, Texas

7901 Empire Freeway, Fleetwood 2-3911

Hollywood 28, Calif.

1560 N. Vine Street, Hollywood 9-2154

Kansas City 6, Mo.

1006 Grand Avenue, Harrison 1-6480

New York 20, N. Y.

36 W. 49th Street, Judson 6-3800

San Francisco 2, Calif.

420 Taylor Street, Ordway 3-8027

Seattle 4, Wash.

2250 First Avenue, South, Main 2-8350

Washington 6, D. C.

1625 K Street, N. W., District 7-1260



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