sound equipment

GRAYBAR ELECTRIC CO., INC.
910 CHERRY STREET
PHILADELPHIA 7, PENNA.

ALTEC
LANSING CORPORATION

9356 SANTA MONICA BLVD., BEVERLY HILLS, CALIF.
161 SIXTH AVENUE, NEW YORK 13, NEW YORK

Merging Three Big Names

GRAYBAR

WESTERN ELECTRIC

ALTEC LANSING

To offer the most complete line of SOUND EQUIPMENT in the world

Well Established Names All
Standing for QUALITY
Having REPUTATION
Carrying PRESTIGE

Banded together with Leading Sound Dealers to engineer any size Sound System.

Distributor in the United States

Graybar

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Executive Offices: 420 Lexington Avenue, New York 17, N. Y.

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Milwaukee

A National Electric Service

M I C R O P H O N E S

632A - Close talking Hand Microphone

633A - For General Utility Work

639A - Cardioid directional, three pick-up patterns

639B - Cardioid directional, six pick-up patterns

21B - Omni-directional, light weight and small size.

Available in six models:

Conventional Stand Mount

Overhead Suspension

Chest Plate

Desk Stand

Hand Mike

Lapel

MICROPHONE
633A
Western Electric

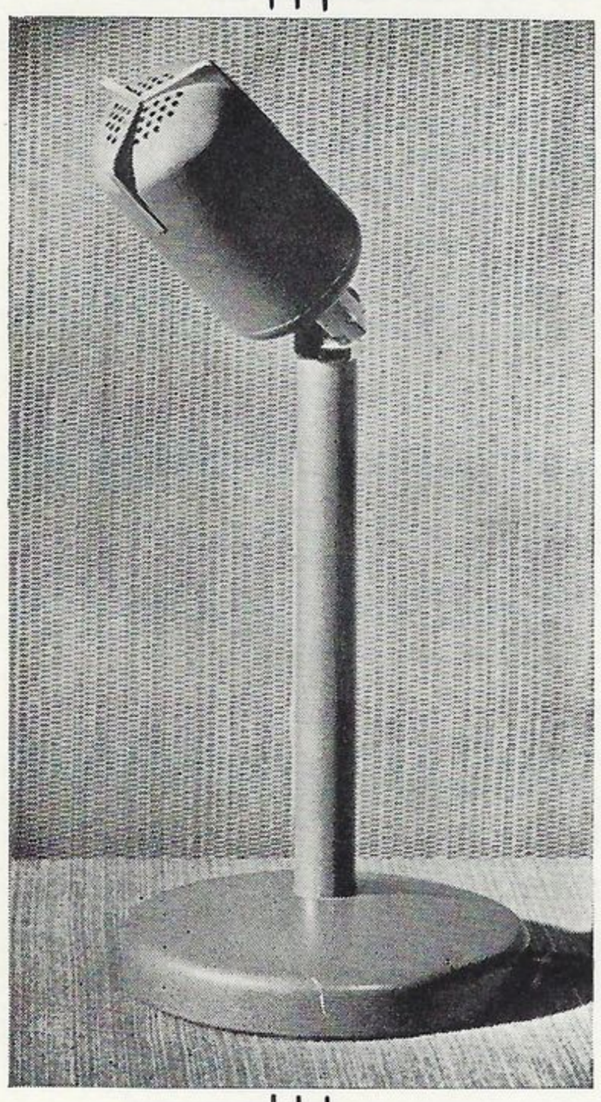
DYNAMIC MICROPHONE

for

RADIO BROADCASTING

and

SOUND SYSTEMS



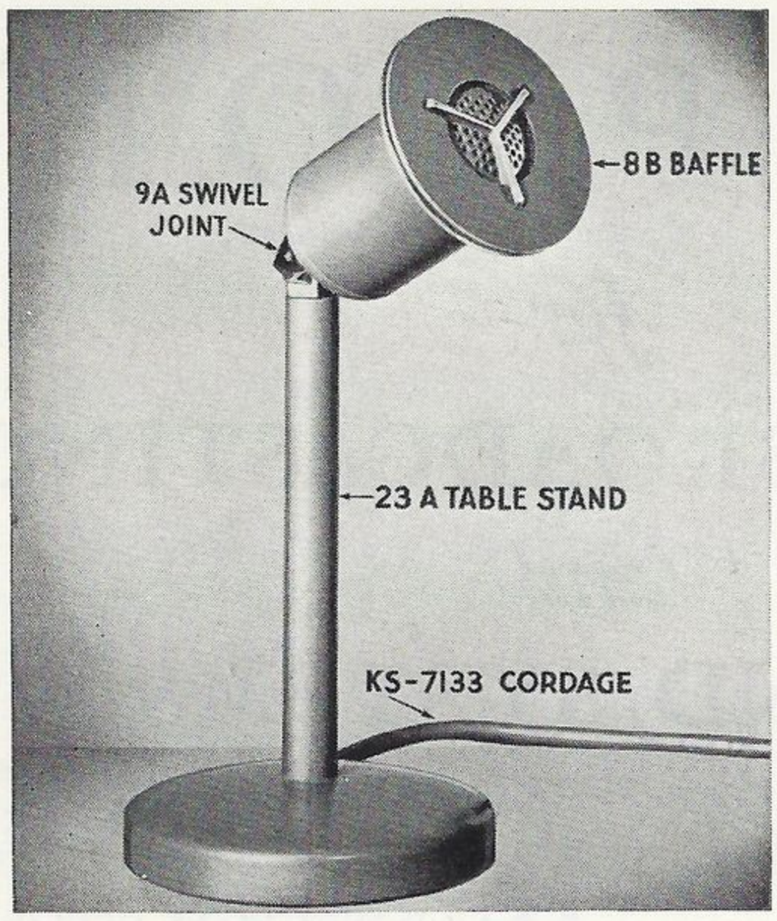
RUGGEDNESS, dependability, price, high quality and either non-directional or semi-directional performance are features which have contributed to the popularity of the Western Electric 633A Dynamic Microphone.

This microphone is intended for use in high quality radio broadcasting, public address, announcing, and sound distribution systems. It has an output impedance of approximately 20 ohms and can be used with amplifiers nominally rated at 30 ohms input. Because of this low impedance the microphone may be used at considerable distances from associated amplifying equipment.

For sound arriving at an angle of 90° to the front of the diaphragm the 633A has a uniform response over the frequency range of 35 to 15,000 cycles. Because of the symmetry of the microphone this response holds for all sound arriving in the line with the plane of the diaphragm. When desired sounds originate in this plane, the microphone will perform effectively as a non-directional type. (See curves on next page.) When used for this purpose the microphone is usually mounted vertically on a stand or suspended by its cordage.

For sounds arriving at other angles, the response varies until at a line perpendicular to the diaphragm, the response rises gradually 10 db from 1500 to 8000 cycles. The "in-between" characteristics or directional effects may be utilized by tilting the microphone at the desired angle. The 9A Swivel Joint is available for this purpose. The directional effect may be further accentuated by the use of the 8B Baffle, a disc 3¼" in diameter which fits snugly over the face of the micro-

Western Electric



phone and increases its sensitivity for sounds arriving at 0° over the range from 1000 to 5000 cycles. This feature is useful in helping speech sounds override surrounding noises. (See curves below.)

If the 633A Microphone is to be mounted in the same manner or interchangeably with the 639 type microphones, on table or floor stands equipped with a 442A Jack and 712A Adapter, a 311A Plug may be attached to the 9A Swivel Joint and wired to the microphone terminals. If desired, the 311A Plug can be attached directly to the microphone. The 22A Floor Stand or 23A Table Stand, as well as the 8B Baffle, the 9A Swivel Joint, 311A Plug and KS 7133 Cordage are accessory items.

SPECIFICATIONS FOR THE 633A MICROPHONE

Frequency Response — See curves below.

Power output level — When terminated by a resistance of 20 ohms the power output level is —59 dbm (0 level calibration 1 milliwatt 10 dynes/cm²), —79 dbm (1 dyne/cm²).

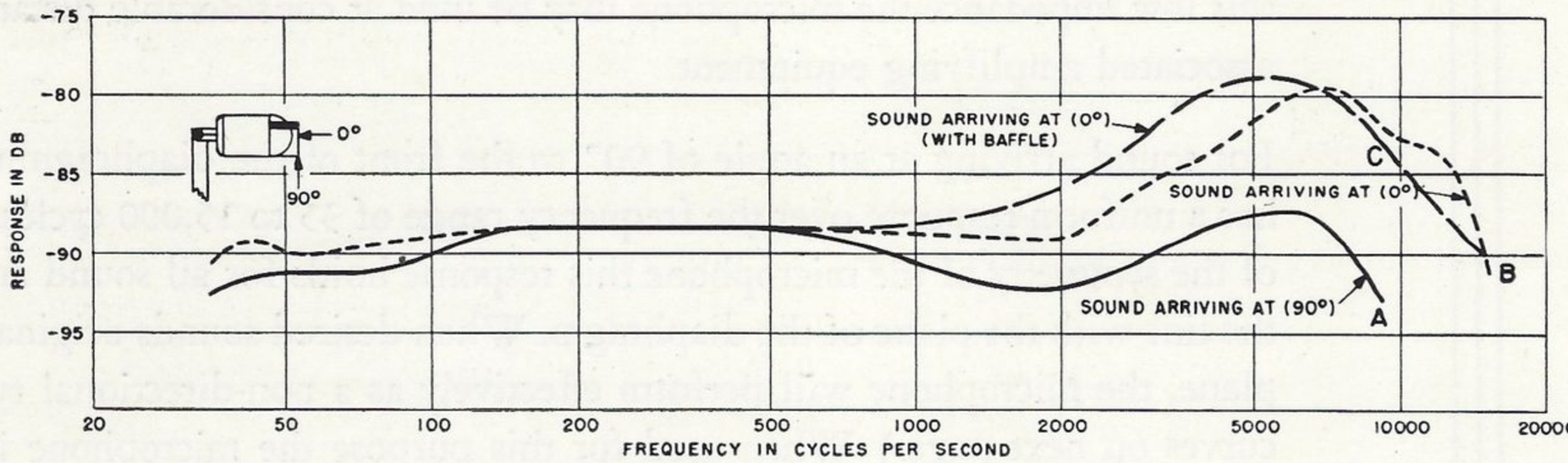
Sensitivity — Open circuit terminal voltage 90 db below 1 volt/dyne/cm² which is equivalent to 70 db below 1 volt/10 dynes/cm².

Output Impedance — Voice Coil 20 ± 2 ohms.

Dimensions — 3½″ long by 2″ diameter.

Finish — Dark Aluminum Gray.

Directional properties — See curves below.



TYPICAL FIELD RESPONSE FOR 633A MICROPHONE
0 DECIBELS = 1 VOLT PER $\frac{\text{DYNE}}{\text{CM}^2}$ (OPEN CIRCUIT VOLTAGE ACROSS OUTPUT IMPEDANCE OF 20 OHMS)

DISTRIBUTOR IN THE UNITED STATES

GRAYBAR ELECTRIC COMPANY

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General Offices: 1620 Notre Dame Street, W.

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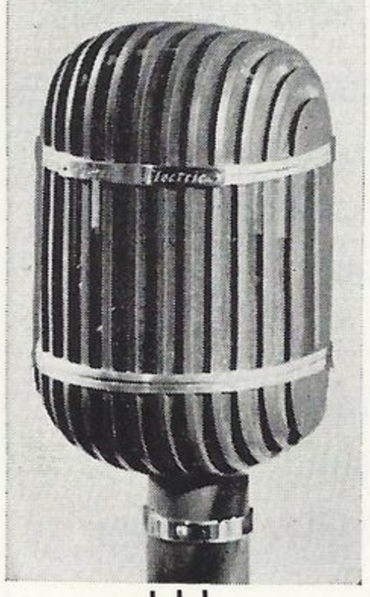
TWENTY-SIX OFFICES ACROSS CANADA

MICROPHONE
639A
Western Electric

CARDIOID MICROPHONE

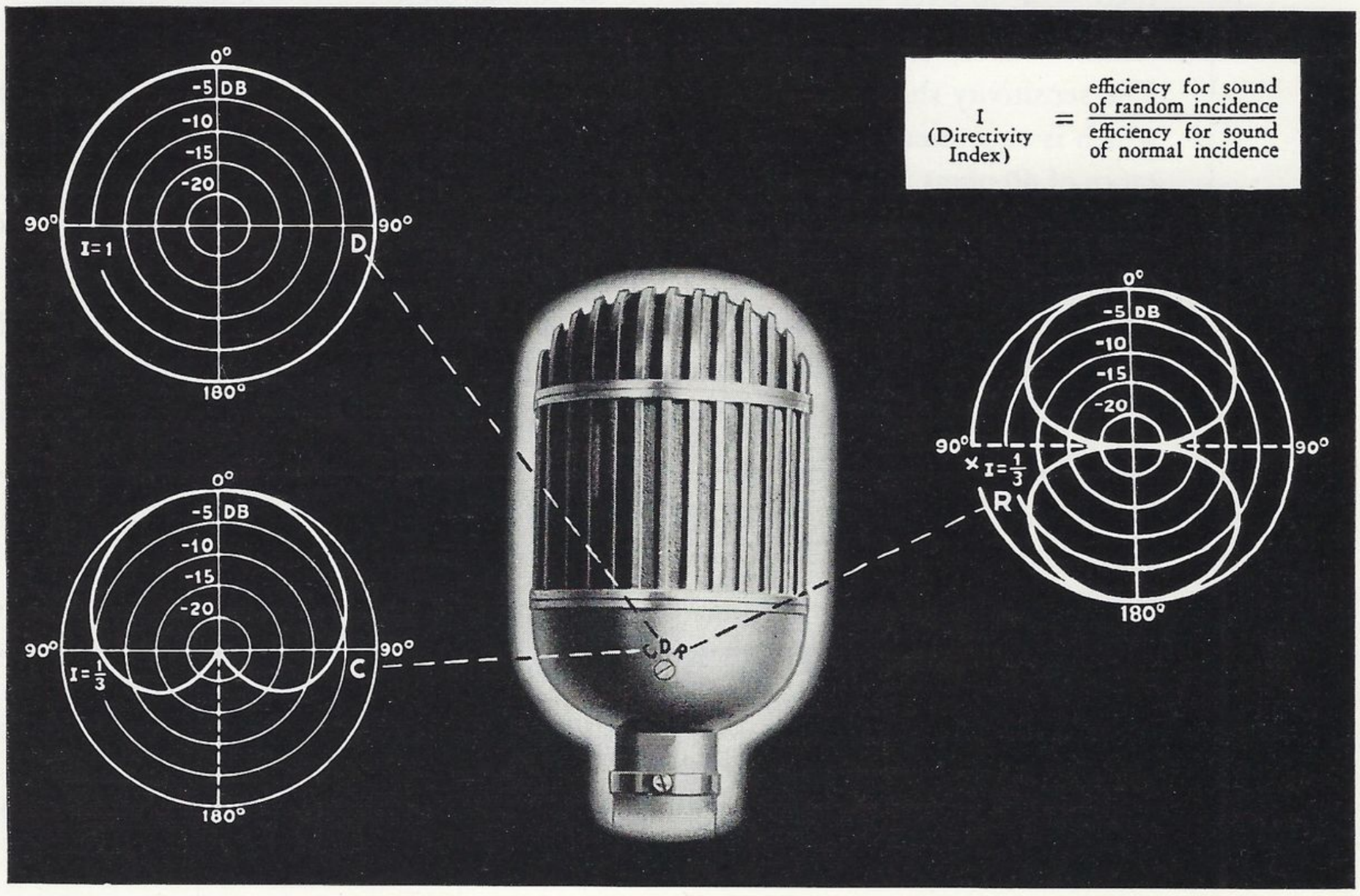
for
SOUND SYSTEMS
and
RADIO BROADCASTING



High quality and cardioid directivity of the Western Electric 639A Cardioid Microphone have brought it popular acceptance among public address and broadcast users — not only as an excellent all purpose microphone but also as the solution to many difficult microphone problems.

The Western Electric 639A Cardioid Microphone is a combination of a dynamic moving coil type pressure element and an improved ribbon type velocity element enclosed in an attractive housing which serves as a protective guard and as a wind screen.

When the outputs of these two elements are combined equally, the directional characteristic of the microphone is the heart shaped cardioid curve C, shown below. Use of the elements alone presents pattern D (dynamic) and R (ribbon).



Western Electric

The cardioid directional performance of the 639A over the entire useful frequency range insures a practical, wide angle pick-up of at least 120° at the front of the microphone over which the quality is unchanged and the sensitivity remains practically the same. Engineers in the sound field find this microphone invaluable for troublesome studio, theatre, auditorium, and night club jobs.

Stands and other accessories for use with Western Electric Cardioid Microphones are described in Sales Bulletin T-2336.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The microphone shall be the Western Electric 639A Cardioid Microphone or equivalent.

The microphone shall consist of a dynamic moving coil type pressure element and an improved ribbon type velocity element, assembled in a streamlined housing, arranged so that their outputs can either be used individually or combined equally. The three directivity patterns so provided shall be selectable through a screw driver operated switch mounted flush on the surface of the housing.

The pattern provided by combining the outputs of these elements shall be cardioid in form. The average discrimination between the front and back of the microphone shall be 20 db over the range 40 to 10,000 cycles per second. In the range from 70 to 7,000 cycles, the minimum discrimination at any frequency shall be 15 db.

The microphone shall have a smooth response and shall not deviate from the average more than ± 4 db over the range from 40 to 10,000 cycles. The average impedance throughout this range shall be in the order of 40 ohms.

The sensitivity shall be — open circuit terminal voltage 84 db below one volt/dyne/sq. cm. which is equivalent to 64 db below one volt/10 dynes/sq. cm. — when terminated by resistance of 40 ohms, the power output level shall be —76 vu (0 level calibration one milliwatt). The microphone shall have a height of 7½″ including the plug terminal, a length of 4-7/16″, a width of 3-7/16″, and a weight of 3¼ lbs.

The microphone shall be suitable for mounting either on a Western Electric 24A Table Stand or 22A Floor Stand, equipped with a 442A Jack and 712A Adapter, or equivalents, together with at least 10 ft. of KS-7133 two conductor shielded rubber covered cable or equivalent.

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MICROPHONE
639B
Western Electric

CARDIOID
6-WAY—MICROPHONE

for

RADIO BROADCASTING

and

SOUND SYSTEMS

WESTERN ELECTRIC presents a cardioid microphone — the 639B "6-way." In addition to the three performance patterns that are making the 639A so popular among broadcast and public address users, the 639B offers three additional directivity patterns which make this microphone particularly suited for use in difficult applications.

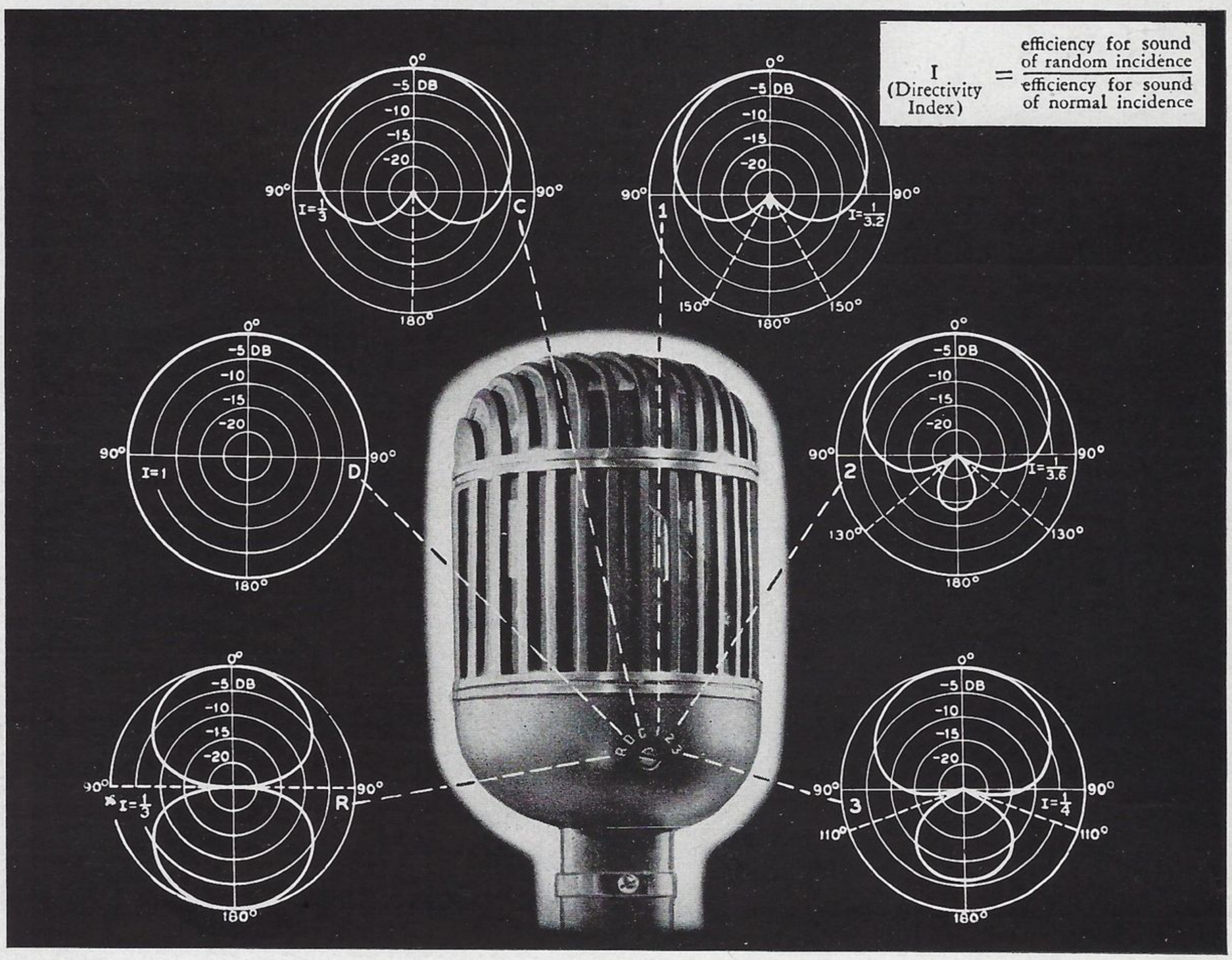
The 639B is a combination of a dynamic moving-coil type pressure element and an improved ribbon-type velocity element enclosed in an attractive housing which serves not only as a protective guard, but also as a wind screen. The outputs of these two elements when combined in various proportions yield patterns C, 1, 2, or 3 and when used alone, patterns D or R, illustrated on page 2. The added patterns 1, 2, and 3 reduce effects of reverberation to an even greater degree than the already famous 639A cardioid, and are of value to sound engineers.

The user will find that this microphone can be used advantageously to pick up sound under conditions where the pickup by other types of microphones would be very difficult. Conditions such as the following can be either improved or overcome by the use of the 639B with its directivity patterns which can be selected by means of a screw driver operated switch:

In the Studio—where sound treatment is not fully effective and further reduction in echo is desired.

In the Playhouse or Night Club—where there is an excess of audience noise or where it is desired to give the artist the freedom of working at a greater distance from the microphone.

In Public Address Installations—where acoustical feedback takes place before a satisfactory reinforcement level can be reached.



SPECIFICATIONS

Response — Essentially uniform 40 to 10,000 cycles.

Directivity — Six patterns R, D, C, 1, 2, and 3 selectable through a six position screw driver operated switch. At the angle of minimum response the average discrimination with respect to the zero degree response of the microphone is 20 db over the range of 40 to 10,000 cycles.

Sensitivity — When terminated by resistance of 40 ohms, the output level is —56 dbm for 10 dynes/sq. cm. or —76 dbm for 1 dyne/sq. cm. (0 level calibration one milliwatt). Open circuit terminal voltage 84 db below one volt/dyne/sq. cm. which is equivalent to 64 db below one volt/10 dynes/sq. cm.

Impedance — The impedance varies somewhat throughout the frequency range. The average impedance from 40 to 10,000 cycles is 40 ohms. It has been designed for use with equipments having input impedances from 25 to 50 ohms.

Signal to noise ratio — The signal for 1 dyne/sq. cm. sound pressure is 58 db above the thermal agitation noise generated within the microphone.

Dimensions

Height — 7½″ (including the plug terminal)
Length — 4 7/16″
Width — 3 7/16″
Weight — 3¼ pounds

Mounting — The 639B Microphone may be mounted on a floor or table stand (22A or 24A) equipped with a 442A Jack and 712A Adapter, 11A Transmitter Attachment, or equivalents.

Western Electric reserves the right, without notice, to make such changes in equipment, design, or components as progress in engineering or manufacturing methods may warrant.

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TWENTY-SIX DISTRIBUTING HOUSES ACROSS CANADA

7-H-48-5 Printed in U.S.A. WECO-T1755G

The ALTEC 21B

MINIATURE MICROPHONE

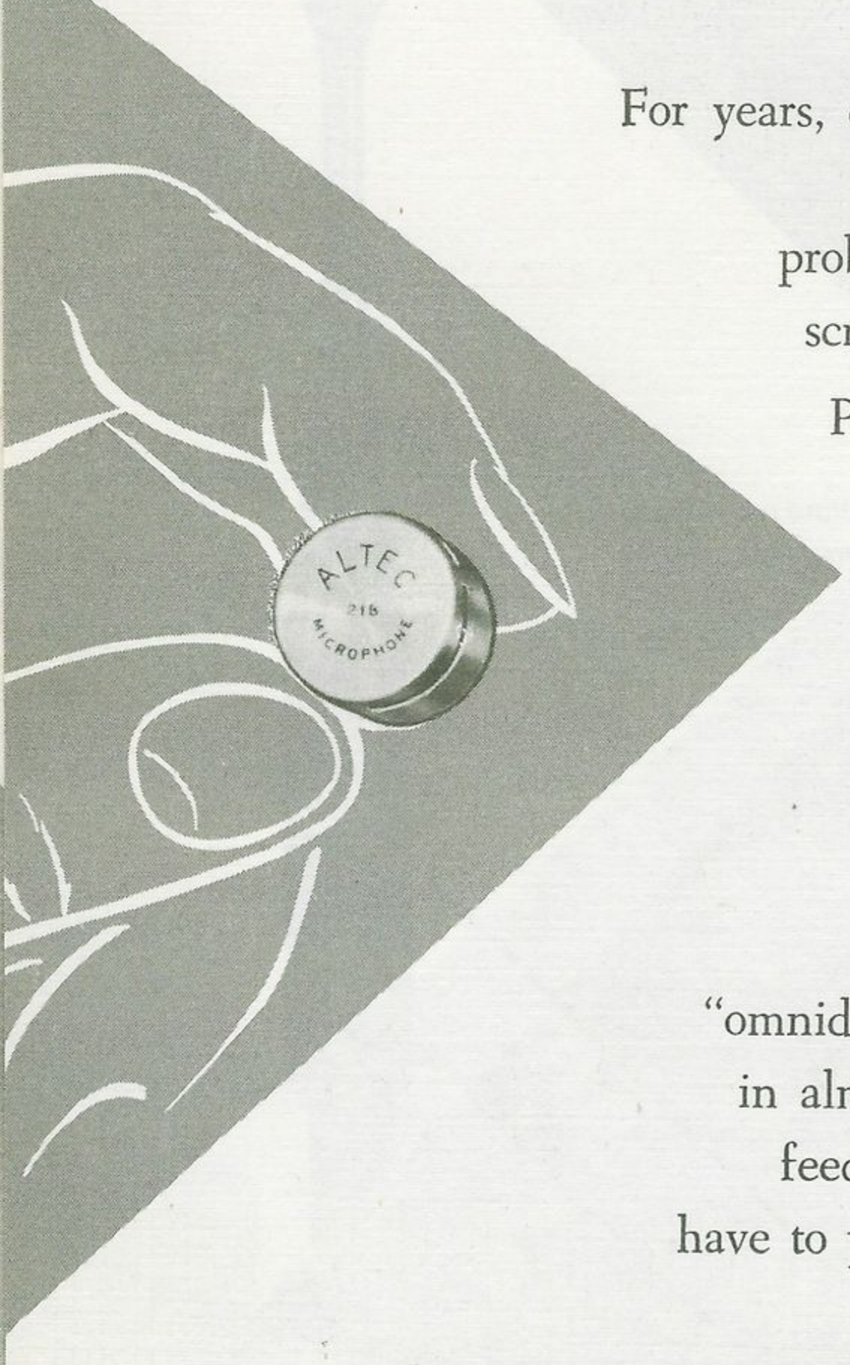
Jan Garber and his orchestra, at the Cocoanut Grove, Los Angeles

Jo Stafford recording for Capitol, with Paul Weston conducting

So small in size...

So perfect in performance

You scarcely realize it is there...
yet the **ALTEC 21B** sets a
new standard for sound reproduction



For years, engineers have been trying to redesign existing microphones for better performance and smaller size . . . ALTEC took a new approach to the problem: not "redesigning" what was already available, but starting from scratch with a dual specification: "The *best* quality and the smallest size."

Producing such a microphone was difficult. More than twenty "man-years" were spent in the design and engineering of the 21B. The result isn't just a "better mike"—smaller in size—but a mike, *smaller in diameter than a dime* . . . that sets a new standard in microphone performance . . . and introduces new pickup techniques far superior to those employed with other microphones.

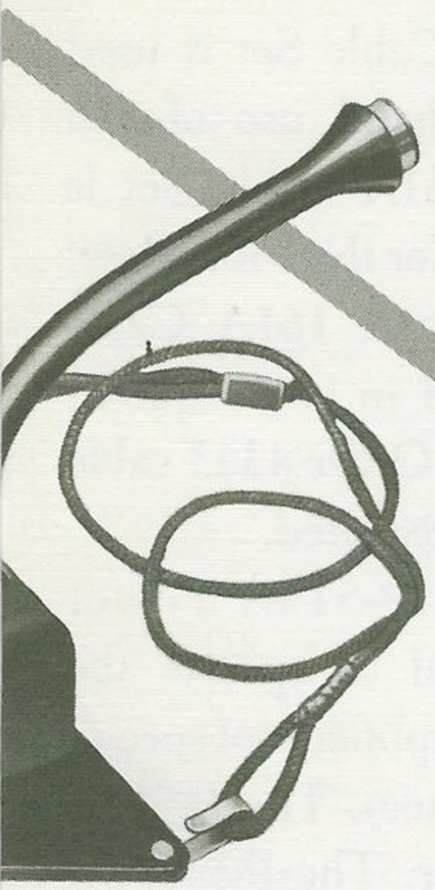
Going far beyond superlative performance and minute size, the ALTEC 21B has many other superior features. This microphone is "omnidirectional" in pickup, yet it has such a smooth frequency response that, in almost every P.A. application, higher acoustic gain can be obtained before feedback. It isn't necessary to point it at the sound source. Performers don't have to play to the "live" side of the mike . . . they can perform naturally, forget the presence of the microphone, for the 21B is "live" on all sides.

It is unnecessary to protect the ALTEC 21B from loud noises and shocks, strong winds, magnetic fields or dampness. All of these cause extreme distortion or permanent damage to other types of microphones . . . but the ALTEC 21B is fully protected against damage from even the most rugged field use. The 21B can be used under conditions where other microphones would be ruined. Dynamically the ALTEC 21B covers the complete audible range, both as to spectrum and loudness. In every way, quality, ruggedness and size, the 21B is the ultimate in microphones. Components are available to link the 21B to any existing installation.

talent deserves to be *seen* as well as *heard*!

Performers everywhere are welcoming an opportunity to "come out from behind the mike" where visible charms can be added to vocal!

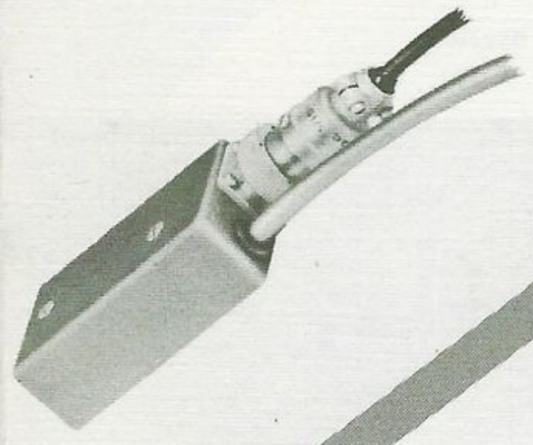
Now available... convenient mountings for every application



Chestplate

The 155A Chestplate is ideal for announcers, lecturers and others who find it necessary to move about while speaking. Suspended around the neck, the microphone always stays in the proper relationship to the user's voice. The close proximity, plus the fact that the 21B covers the full dynamic range, will always permit announcers to override crowd and other background noises. Output level to amplifier: *-48 db re 1 milliwatt for a sound field of 10 dynes/cm².*

The Starlighters recording



Stand

The 150A Base is used to stand mount the 21B. It is also used for suspension or hand use. The small size of the 21B and 150A Base makes it practically invisible on a stand or hanging overhead. Output level to amplifier: *-48 db re 1 milliwatt for a sound field of 10 dynes/cm².*

Lapel Model

The 28A Lapel Microphone and 154A Matching Unit provide lecturers, speakers, announcers and members of the clergy with a microphone that is virtually invisible. With the microphone clipped to the lapel or dress complete freedom of movement is provided. Output level to amplifier: *lower than other models to compensate for proximity of pickup.*

ALTEC 21B

MINIATURE MICROPHONE

The ALTEC 21B microphone is used with either the 150A Base or the 155A Chestplate. (See chart below.) The 28A Lapel microphone is used with the 154A matching unit. When ordering specify either 21B and 150A Base, 21B and 155A Chestplate or 28A and 154A Matching Unit.

The 155A Chestplate and 154A Matching Unit are permanently equipped with 25 feet of cable. When the 21B and 150A Base are ordered cable sets must be ordered separately. There are three standard cable sets 25 feet in length for use with the 150A Base.

The 152A Cable Set is required when the base is used on a microphone stand. It is equipped with a 5/8"-27 thread. The 153A Cable Set is used for suspension or hand use of the 150A Base. The 161A Cable Set is used as a desk stand for the 150A Base. The 152A, 153A and 161A Cable Sets may be ordered in any required length at extra cost. Order 4343 cable and specify length required.

The P-518A or P-519A Power Supplies are needed to operate the microphones into amplifiers not specifically designed for them. The P-518A is in a box container. The P-519A is designed for rack mounting.

OUTPUT IMPEDANCE:
30, 250, 500 ohms from power supply.

POWER REQUIREMENTS:
110 volts A.C. 60 cycles.

EXCLUSIVE FEATURES

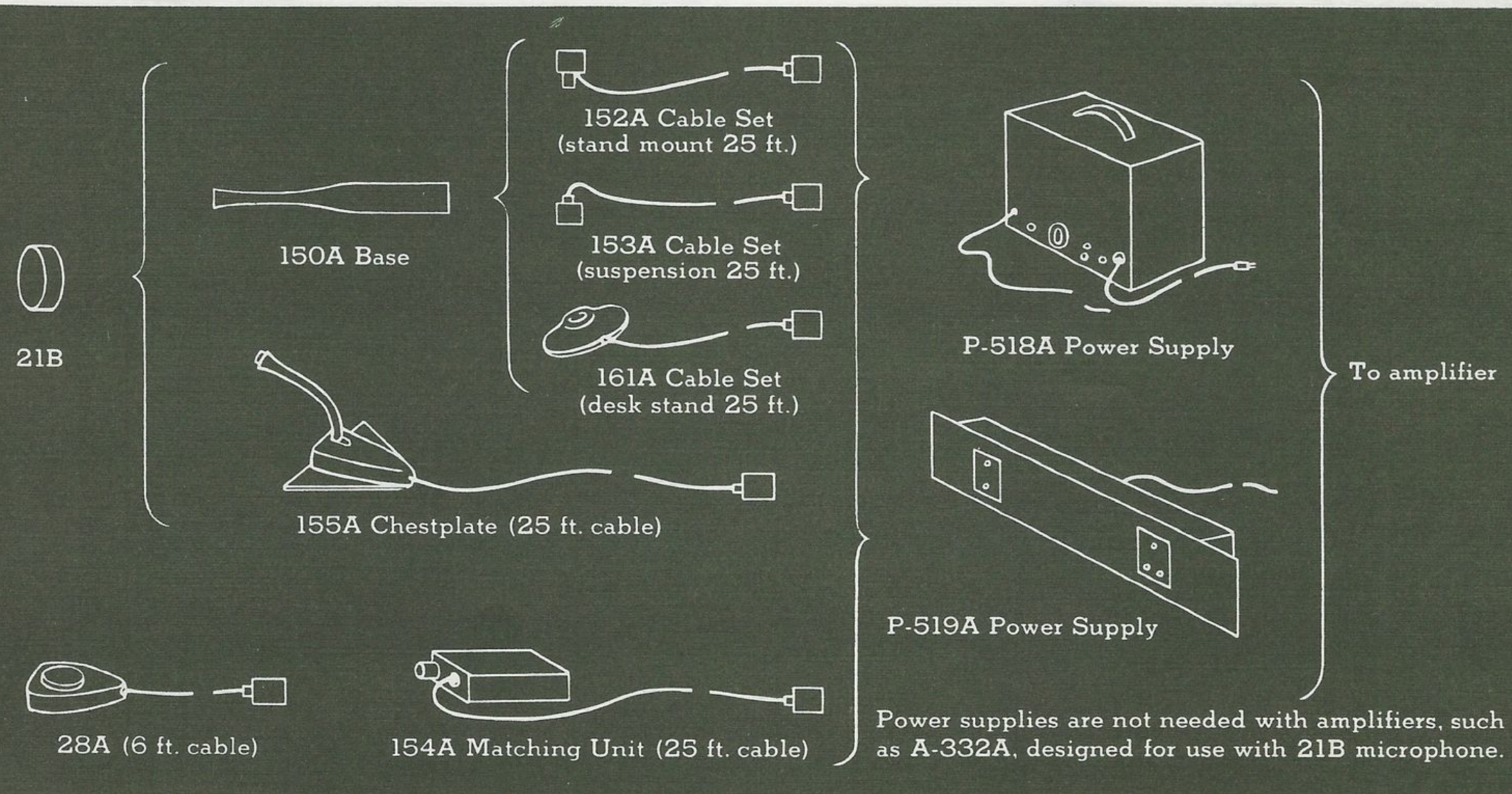
- small size
- omnidirectional
- less wind noises
- shock proof
- blast proof
- humidity proof
- non-magnetic

ACCESSORIES

10821 GALE SCREEN: This screen is used when the microphone is subjected to *extreme* wind or breathing conditions.

22A STAND with 3580 Adapter: A complete rugged floor stand for the 21B, adjustable from 42½" to 70".

162A SWIVEL: This swivel permits the microphone to be tilted when it is necessary to bring it close to the sound source. It may be used to mount the 152A Cable Set on any desk stand. The 163A SWIVEL will mount the 152A Cable Set to *any* Western Electric stand.



Power supplies are not needed with amplifiers, such as A-332A, designed for use with 21B microphone.

In demand wherever entertainers and public speakers perform...ALTEC 21B

the mike that became a must!

Alfred Newman scoring a motion picture for 20th Century-Fox

Frank DeVol conducts

ALTEC

LANSING CORPORATION

9356 SANTA MONICA BOULEVARD, BEVERLY HILLS, CALIFORNIA

161 SIXTH AVENUE, NEW YORK 13, NEW YORK

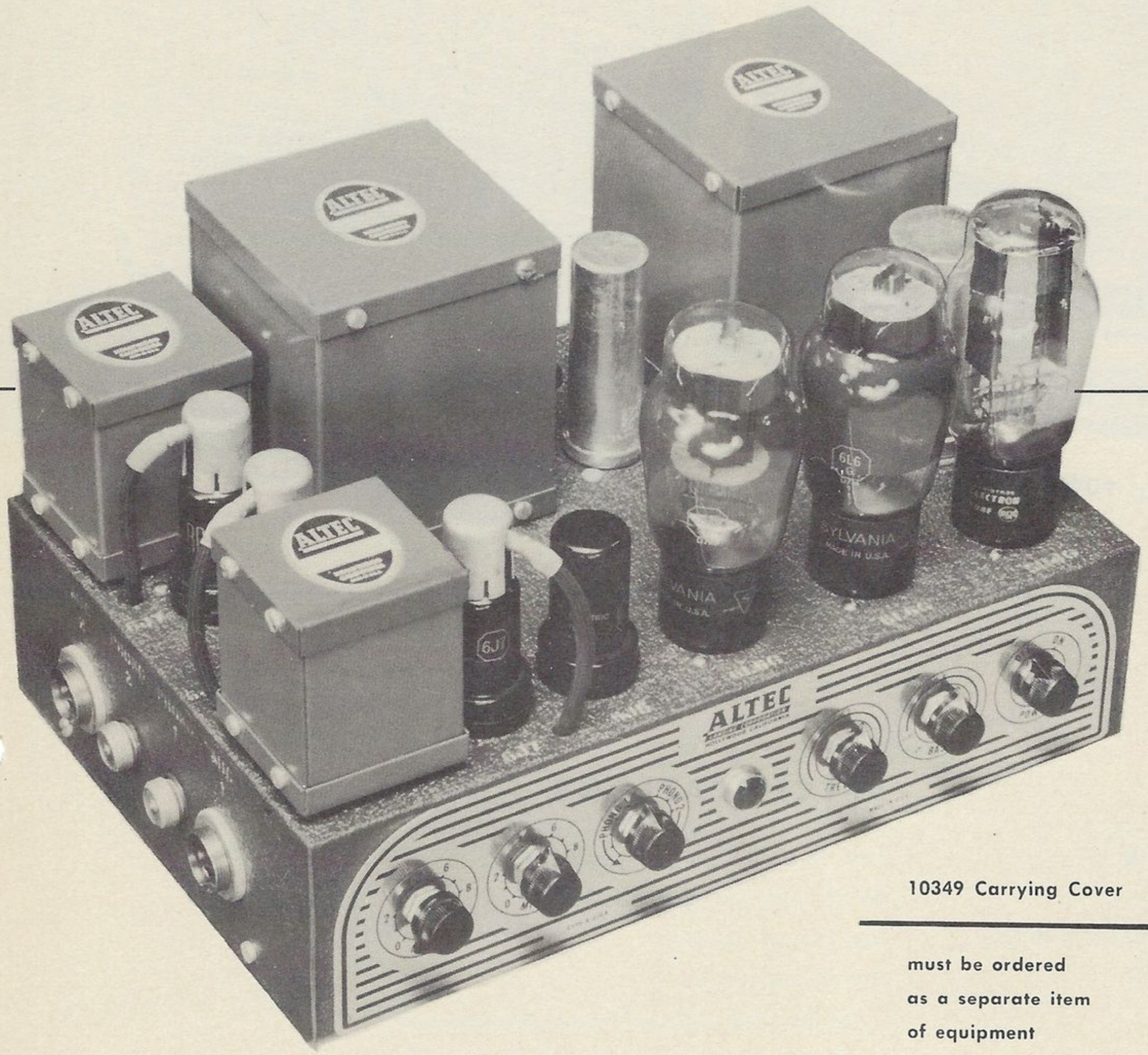
PRINTED IN U.S.A.—AL-1167

A M P L I F I E R S

A-324A	15 Watt	PA Package Amplifier complete with controls. Inputs for two low impedance Western Electric dynamic microphones, and two radio or crystal phono.
A-332A	18 Watt	PA Package Amplifier complete with controls. Inputs for two Altec Condenser Microphones and one for G. E. reluctance pick-up.
1420A	35 Watt 96 db gain	PA Rack Amplifier. Chassis also will mount one A-1410A Mixer Preamplifier.
1430A	75 Watt 98 db gain	PA Rack Amplifier. Chassis also will mount two A-1410A Preamplifiers.
A-287W	250 Watt 12 db gain	Rack Amplifier. Operates from 15 Watt Amplifier to supply high powers for ball parks, stadiums, factory paging and music systems, etc.
A-322C	Limiter	Rack Mounted Limiter Amplifier for PA, recording and broadcasting.
A-420	49 db gain	Rack Preamplifier.
1410A	36 db gain	Sub-panel Mixer Preamplifier with inputs for two Western Electric microphones, Mounts on A-1420A and A-1430A amplifier chassis.
1440A	65 db gain	Sub-panel Line Amplifier for remote control with A-1410A, A-1420A and A-1430A Amplifiers.
1450A		Apparatus Unit with matching transformer and 100,000 Ohm gain control.
30A		D. C. Power Supply. Provides power for 1410A and 1440A Amplifiers.
P511		Regulated D. C. Power Supply. Provides power for line, limiter and/or Preamplifiers.

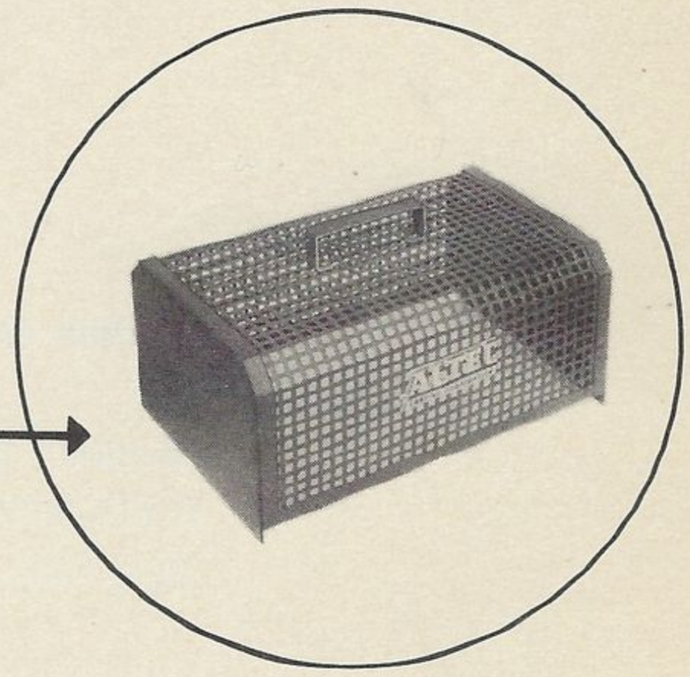
A-324 A AMPLIFIER

ALTEC
LANSING CORPORATION



10349 Carrying Cover

must be ordered
as a separate item
of equipment



The A-324 A Amplifier is a portable public address amplifier designed for use in high quality public address and music systems. It is engineered and manufactured to meet the high quality standards required of an amplifier when used in conjunction with Altec Lansing speakers.

OUTSTANDING FEATURES

1. Flat frequency response ±1 db from 20 cycles to 20,000 cycles (when tone controls are set for flat response).

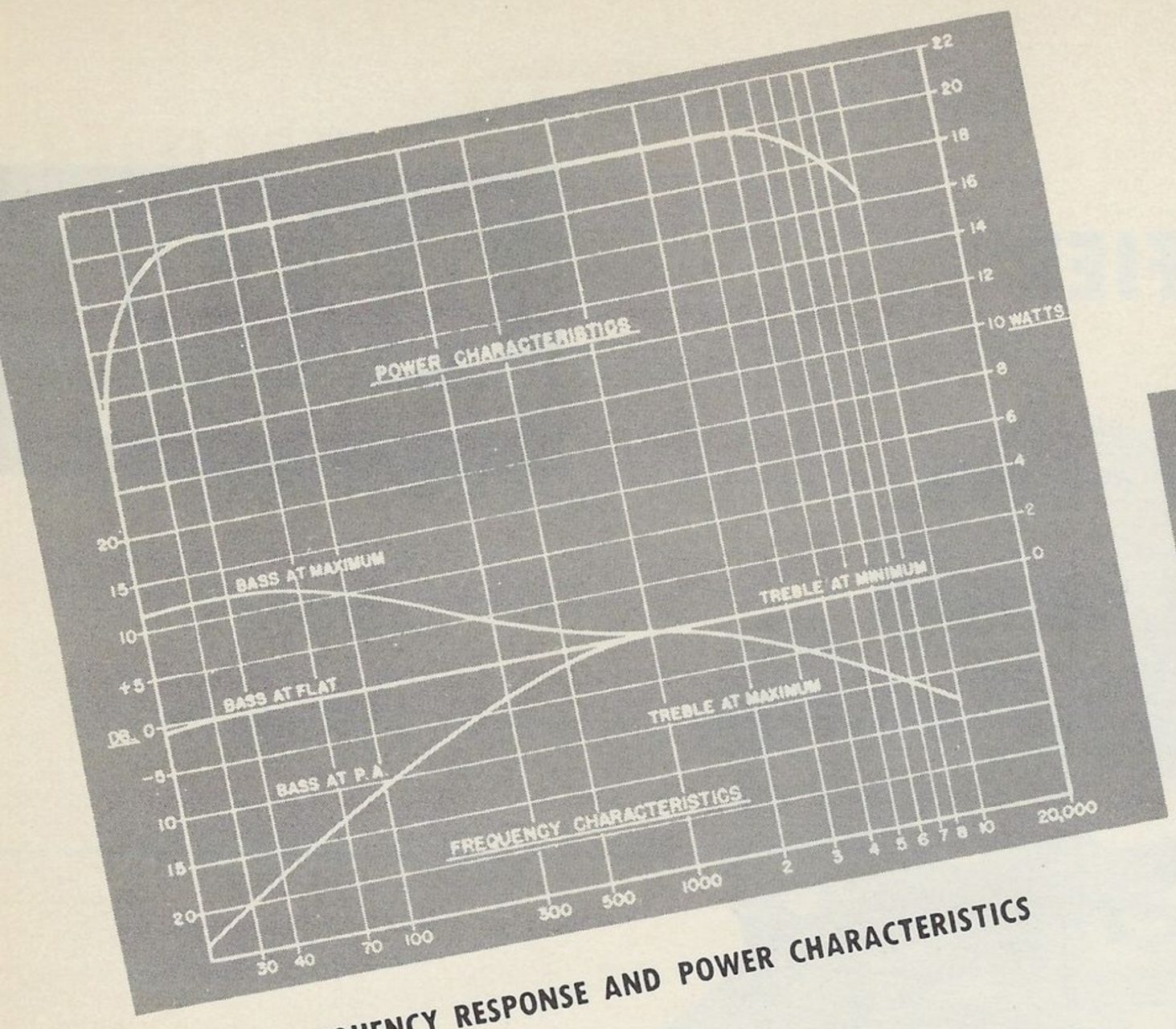
2. Full rated power output within 1 db from 30 cycles to 10,000 cycles.

3. Two high gain low impedance microphone inputs with individual volume controls on each input for mixing purposes.

4. Two low gain high impedance inputs for radio tuner, phonograph pickup or high impedance microphone. These two inputs have a dual fader type volume control which allows fading smoothly from one input to the other.

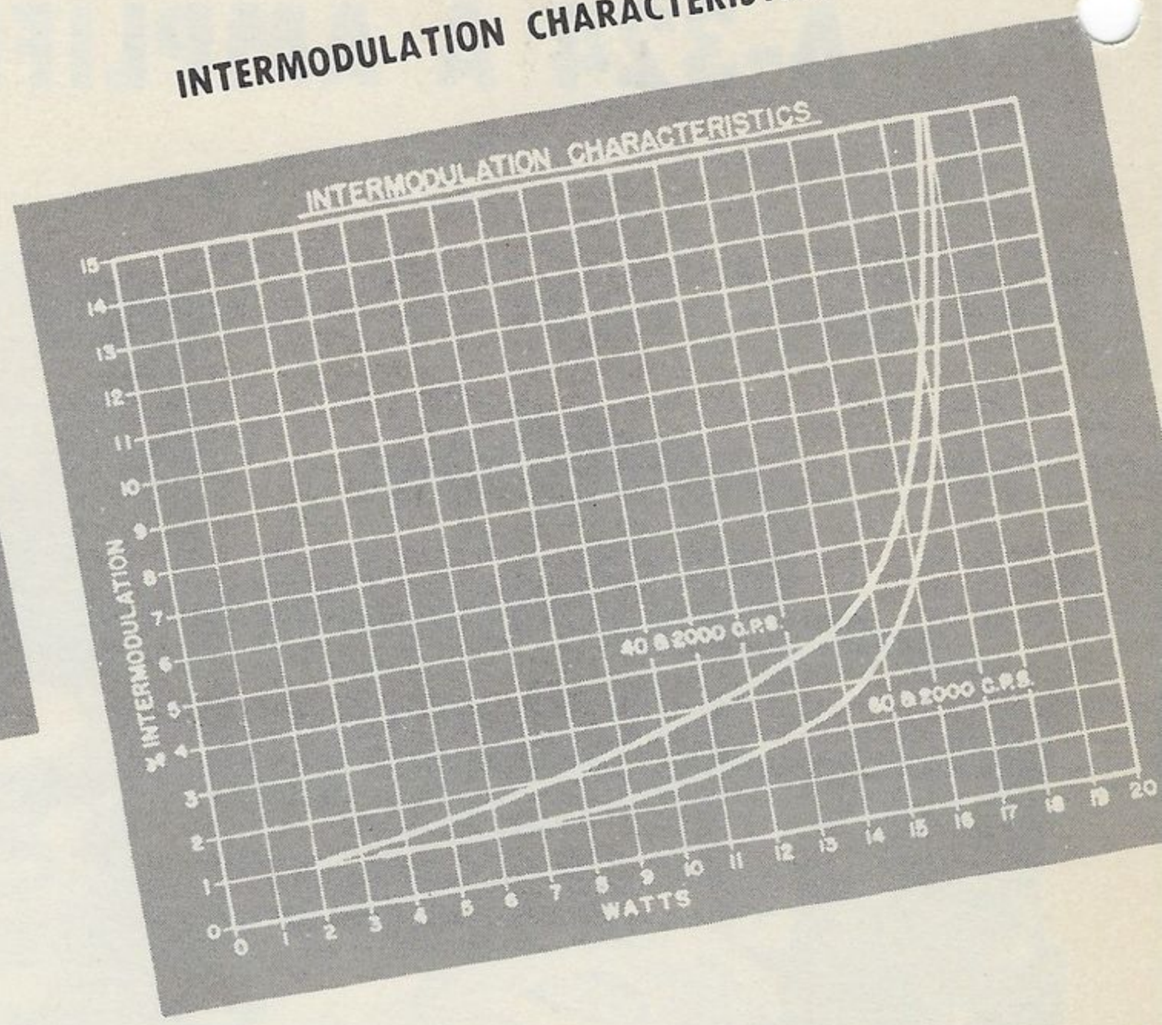
5. Continuous variable treble attenuator.

6. Continuous variable bass control.



FREQUENCY RESPONSE AND POWER CHARACTERISTICS

INTERMODULATION CHARACTERISTICS



SPECIFICATIONS

MAXIMUM GAIN:	**103** db both high gain positions
	72 db both low gain positions
FREQUENCY CHARACTERISTICS:	See Curves above
POWER OUTPUT:	See Curves above
NOISE LEVEL:	— 25 db (.006 watts ref.) high gain position
	— 45 db (.006 watts ref.) low gain position
IMPEDANCE:	Low Imp. — Microphone Inputs — 30, 250, 500/600 ohms
	High Imp. — Radio Phonograph Inputs — 500,000 ohms
	Outputs — 2.5-5 ohms; 6-12 ohms; 12-24 ohms
VACUUM TUBES:	3 — 6J7; 1 — 6J5; 2 — 6L6G; 1 — 5U4G
POWER SUPPLY:	110-125 Volts AC; 50-60 Cycles
DIMENSIONS:	9" x 12" x 9" high including dust cover
WEIGHT:	14 lbs.
COLOR:	Dark Gray, Crackle Finish
ACCESSORIES:	10349 Cover (supplied only on special order)

LITHO IN U.S.A. (REV. 1-48)

ALTEC LANSING CORPORATION

AL 1119

1161 NORTH VINE ST., HOLLYWOOD 38, CALIFORNIA • 250 WEST 57TH ST., NEW YORK 19, NEW YORK

SPEECH INPUT
PUBLIC ADDRESS
INDUSTRIAL SOUND
VOICE REINFORCEMENT
MUSIC SYSTEMS
MICROPHONES
AMPLIFIERS
REPRODUCERS
LOUDSPEAKERS
HORNS
CABINETS
TEST EQUIPMENT
TRANSFORMERS
AM-FM TUNERS
TELEVISION

ALTEC LANSING CORPORATION

AMPLIFIER

A-332A

DESCRIPTION

The A-332A Amplifier is an 18 watt, portable public address amplifier of the highest quality. It is designed to operate with the Altec 21B Microphone. There are two separate and independent microphone inputs and one input for variable reluctance phonograph pickup. Each input is provided with individual gain and bass controls. An overall high frequency droop control is also provided. The Altec 21B Microphones operate directly into the amplifier which contains the necessary power for the microphones. This eliminates the need for external power supplies. The A-332A Amplifier is housed in a grey metal container. The front panel is lighted and slanted for easy manipulation of the controls.

APPLICATION

The A-332A Amplifier is the answer to high quality public address or sound reinforcement systems that will meet the most stringent requirements of schools, churches, clubs, places of entertainment, etc. The Altec 21B Microphone can be used on a stand, as a chestplate, or as a lapel microphone. The two microphones used with the A-332A Amplifier may be any combination of the three basic types.

ADVANTAGES

The A-332A Amplifier is compact and of the highest quality. Inputs may be mixed in any ratio. There are separate bass controls for each input. The amplifier contains the necessary power supplies for the microphones, eleminating the need for external supplies. Greater flexibility and versatility is available since the amplifier will accommodate any of the three basic microphone types, (stand, chestplate, lapel). The A-332A Amplifier does not require any preamplifiers or other external units for any kind of operation. If more than 18 watts of power is required, the A-332A Amplifier may be used to drive the 75 watt Altec A-247B Amplifier.

See the Altec loudspeaker and the Altec 21B Microphone brochures to select the best components to complete your high quality system.

ORDERING INFORMATION

Order: A-332A Amplifier.

(OVER)

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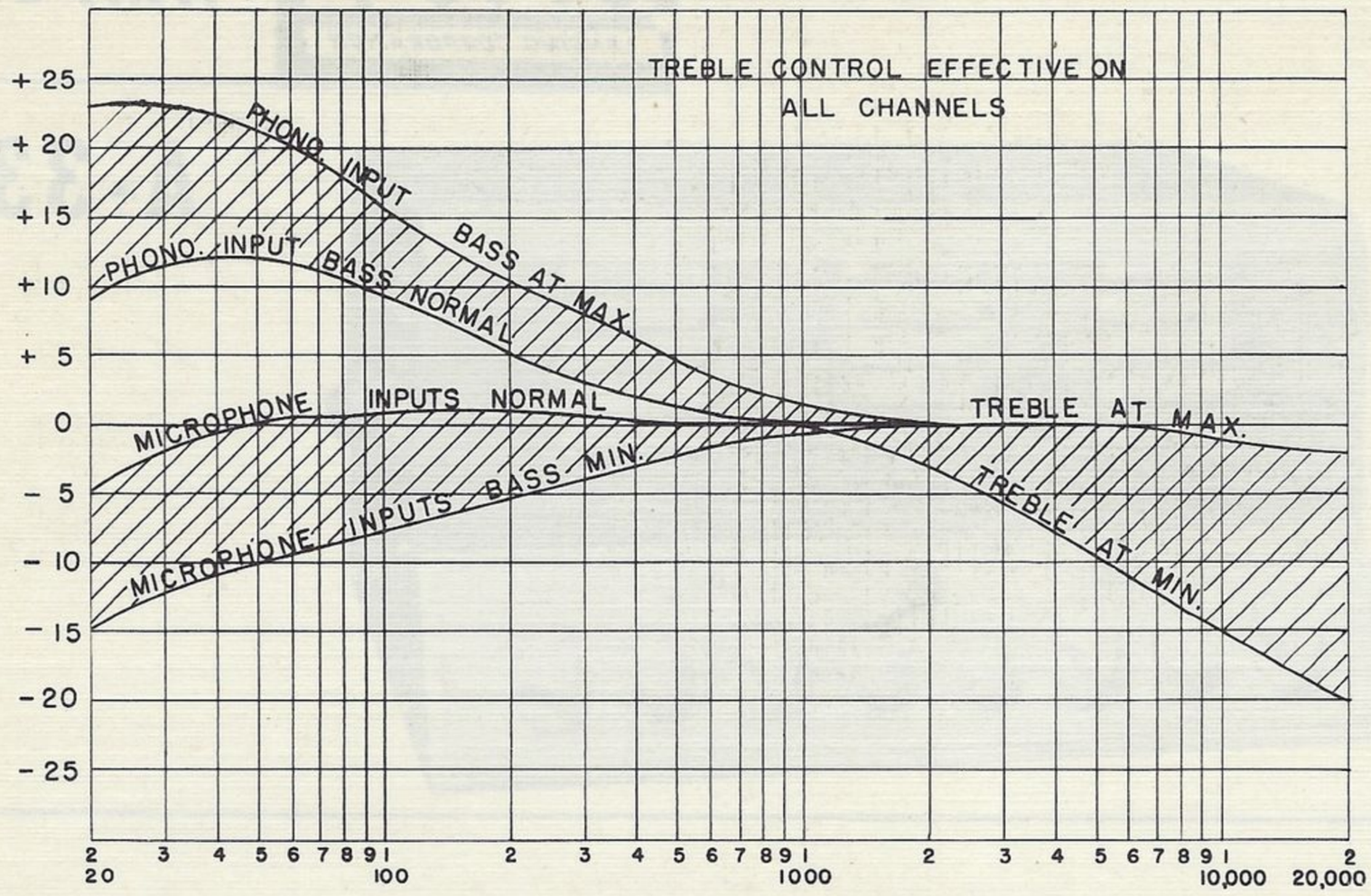
9356 Santa Monica Blvd., Beverly Hills, California
161 Sixth Ave., New York 13, New York

AL-1202—2
PRINTED IN U.S.A.

A-332A AMPLIFIER



TECHNICAL DATA

GAIN:	Microphone Channels; 110 db. Phonograph Channel; 106 db.
FREQUENCY RANGE:	See Chart.
POWER OUTPUT:	18 watts; 2% total harmonics.
NOISE LEVEL:	—27.2 dbm on microphone inputs, (.001 watt reference). —22.8 dbm on phonograph input, (.001 watt reference).
LOAD IMPEDANCE:	2, 4, 8, and 16 ohm load.
SOURCE IMPEDANCE:	For Altec 21B microphones and variable reluctance pickup.
POWER SUPPLY:	117 volts; 50-60 cycles.
TUBES:	4 — 6SJ7 2 — 6J5 2 — 6L6G 1 — 5U4G
DIMENSIONS:	17" wide; 11" deep; 9" high.
WEIGHT:	35 pounds.
COLOR:	Grey.

SPEECH INPUT
PUBLIC ADDRESS
INDUSTRIAL SOUND
VOICE REINFORCEMENT
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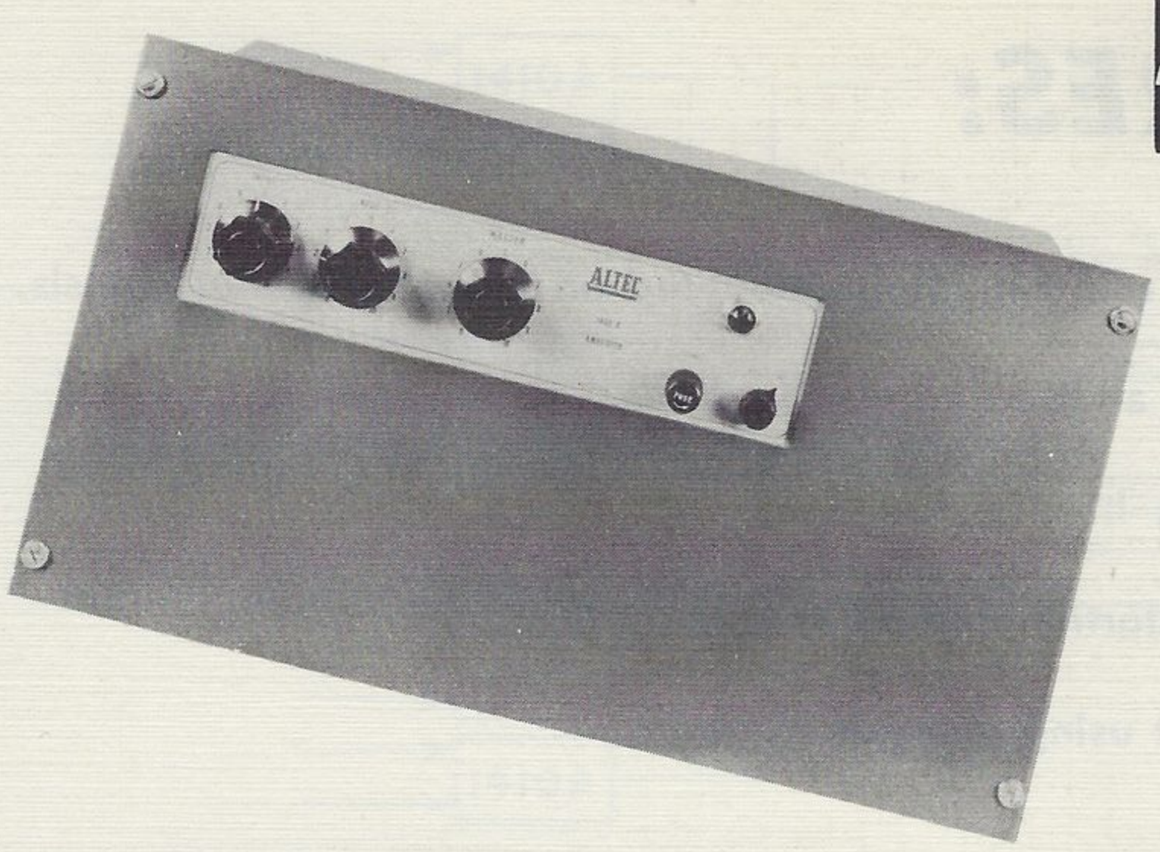

ALTEC LANSING CORPORATION

AMPLIFIERS

1410A
1420A
1430A
1440A
1450A
30A

DESCRIPTION

The 1400 series amplifiers and the 30A Power Supply form a versatile amplifying, preamplifying mixing group that can be adapted to meet all quality amplifying requirements.

The 1410 preamplifier is a two-channel high level mixer unit with mixer controls which may be removed for remote control. The two inputs are mounted compactly on a single chassis. Power for the 1410 is obtained from the 30A Power Supply or the 1420 or 1430 amplifier.

The 1420 and 1430 are rack mounted power amplifiers. The 1420 will deliver 35 watts of power; the 1430, 75 watts. The 1420 amplifier incorporates a power supply for three 1410 preamplifiers, one of which may be mounted integrally on the chassis with its mixer controls appearing on the control panel. This provides a total of 6 inputs; two on the amplifier and four located remotely. The 1430 amplifier incorporates a power supply for six 1410 preamplifiers and two may be mounted directly on the chassis. Thus, with four inputs on the chassis and eight located remotely, the 1430 amplifier has a total of twelve channels. A number of the 1420 or 1430 amplifiers' inputs may be used in parallel and their outputs used to drive separate systems. Their front panels are readily removed to expose all components for check. The front panels contain a power switch, master volume control, pilot light, fuse, and the necessary mounting holes for the 1410 preamplifier mixing controls.

The 1450 Apparatus Unit may be mounted on the chassis of either the 1420 or 1430 amplifier for line input.

The 1440 Line Amplifier has two stages with a low distortion and high signal-to-noise ratio. It is used in conjunction with the 30A Power Supply directly or with the 30A and one or more 1410 preamplifiers.

The 30A Power Supply is needed to supply the necessary power for the 1410 preamplifiers when they are not used in conjunction with the 1420 or 1430 amplifiers. The 30A Power Supply will accommodate three 1410 preamplifiers, two 1410 preamplifiers and one 1440 line amplifier or four 1440 line amplifiers. The 10956 Mounting Assembly is used to rack mount combinations of the 1410A, 1440A, 1450A and 30A when the mixer controls are mounted remotely.

APPLICATION

This entire series, singly or in combination, provides the highest quality amplification and mixing for use in the best public address and music systems in sports arenas, auditoriums, churches, stadiums, airports, industrial plants, railroad yards, and general high level paging.

ADVANTAGES

Dependability is insured in the amplifiers and the power supply by the use of components of generous size that will take continuous hard use without breakdown. Because of this large safety factor, the units may be operated in high ambient temperatures without overheating. The quality and compactness makes them ideal for every application. So versatile an integrated group always permits expansion of the installation to meet additional requirements at a later date.

(over)

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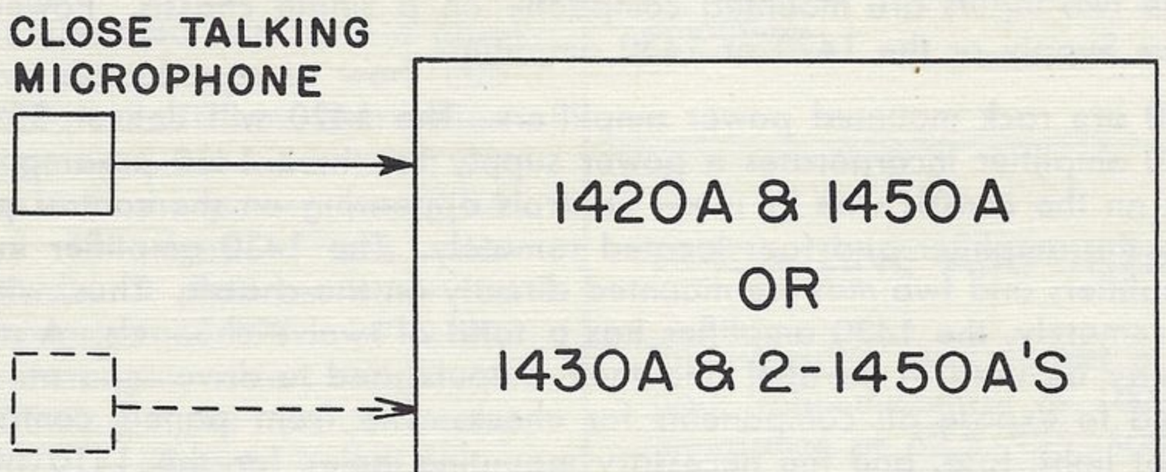
PLUS FEATURES:

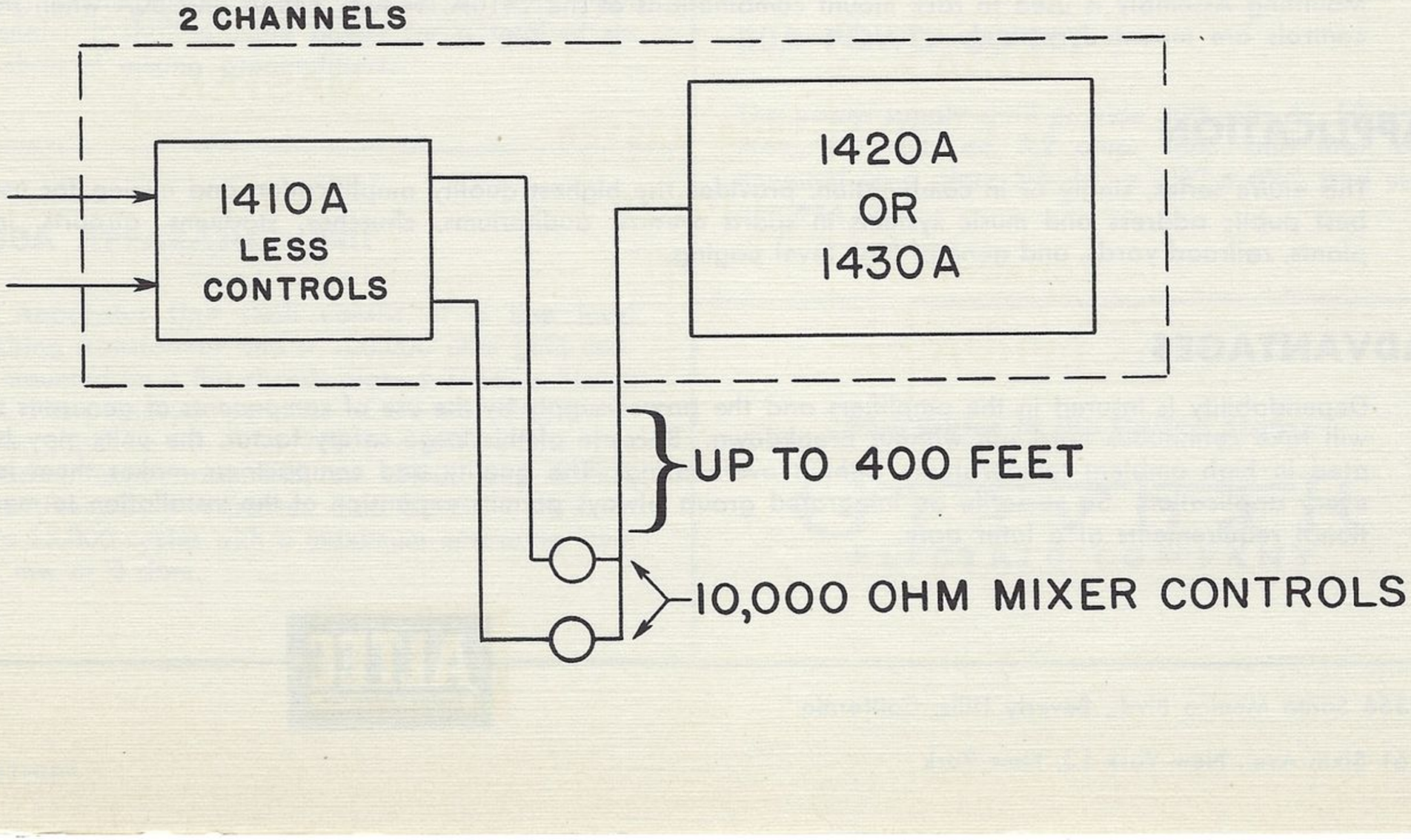
- ★ Preamplifiers and controls can be mounted on power amplifier chassis.
- ★ 70 Volt output in addition to standard speaker impedances.
- ★ Flexible "building block" design.
- ★ Extremely low distortion and noise level.
- ★ Low cost per watt using standard tubes.
- ★ Remote control.

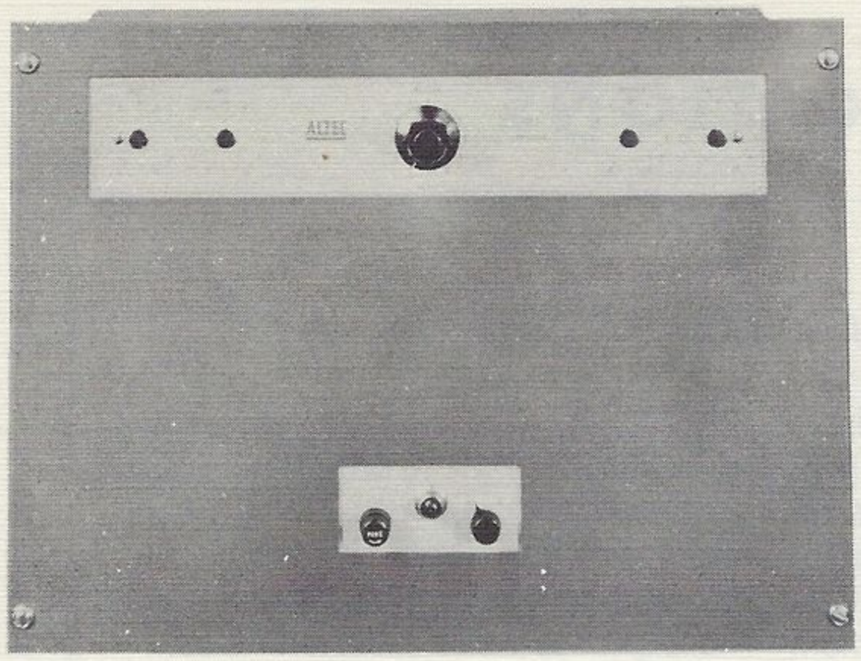
Examples of Building Block Designs:

(1)



(2) **For Remote Control**





1430A

1420A

1410A PREAMPLIFIER

Channels:	2.
Gain:	32 db (transformer terminated). 38 db (transformer unterminated).
Gain Control:	Continuous (100,000 ohms).
Frequency Response:	± 1 db. 50—15,000 cycles.
Power Output:	+ 9.5 dbm at 2% total harmonics.
Noise Level:	— 80 dbm.
Input Impedance:	30, 250, 600 ohms.
Load Impedance:	Not less than 10,000 ohms.
Power Supply:	300 V. dc, 15 ma. 6.3 V. ac, .6 amp.
Tubes:	2—6AQ6. 2—6C4.
Dimensions:	4-7/16" x 5-3/16" x 5"

1420A AMPLIFIER

Gain:	96 db.
Frequency Response:	± 1 db, 30—15,000 cycles.
Power Output:	35 watts with 5% total harmonics. 50—7500 cycles.
Noise Level:	— 20 dbm.
Input Impedance:	100,000 ohm volume control.
Output Impedance:	20% of nominal load.
Load Impedance:	4, 8, 16 ohms and 70 volt line.
Power Supply:	105—125 V. ac, 60 cycles.
External Voltages:	For one 1410A preamplifier mounted on chassis and two mounted externally.
Tubes:	4—6SJ7. 1—6SN7. 2—6L6G. 2—5U4G.
Dimensions:	19" x 10½" x 9".
Weight:	55 lbs.

1430A AMPLIFIER

Gain:	98 db.
Frequency Response:	± 1 db, 30—15,000 cycles.
Power Output:	75 watts with 5% total harmonics, 50—7500 cycles.
Noise Level:	— 20 dbm.

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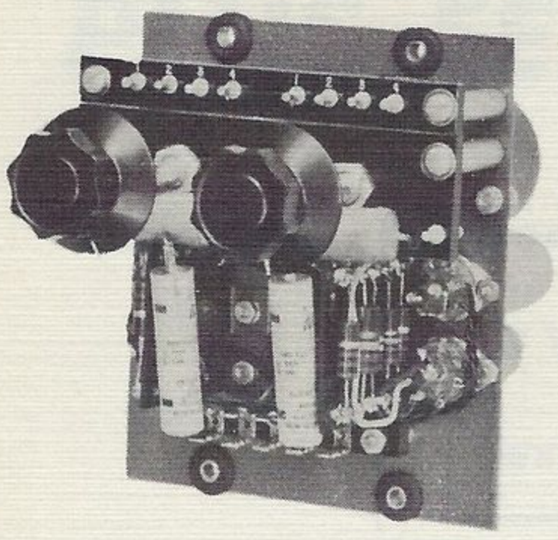
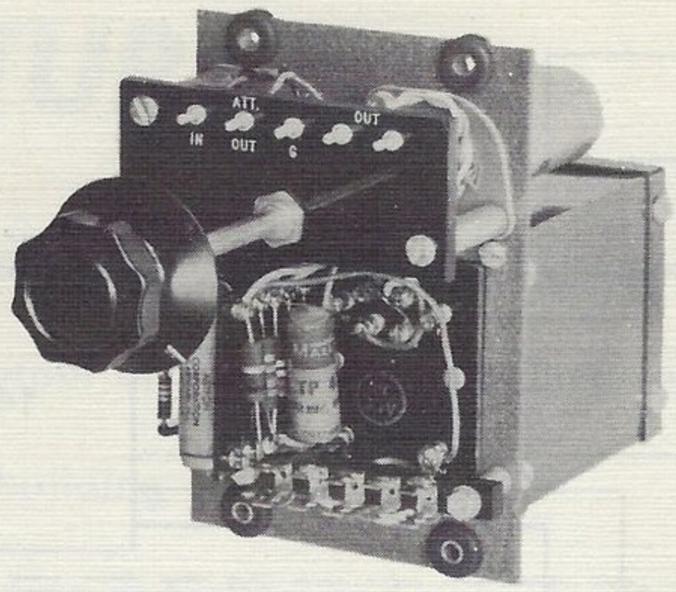
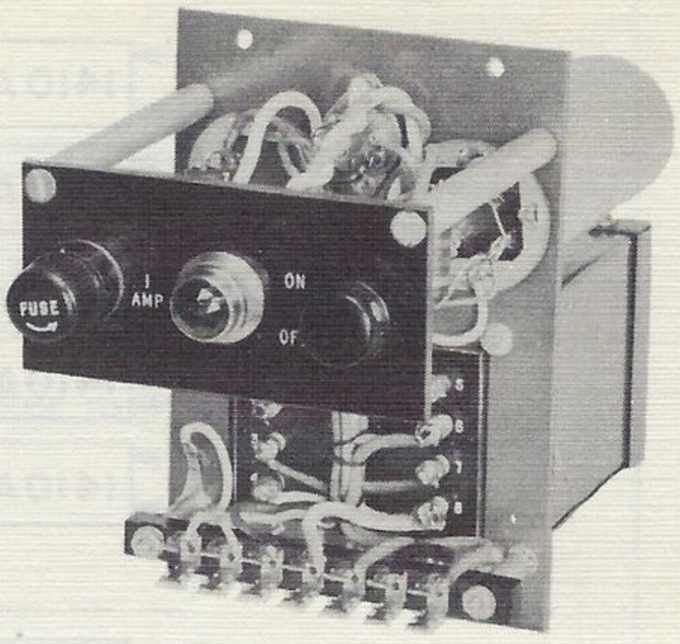


1410A



1440A



30A

Input Impedance:	100,000 ohm volume control.
Output Impedance:	20% of nominal load.
Load Impedance:	4, 8, 16 ohms and 70 volt line.
Power Supply:	105—125 V. ac, 60 cycles.
External Voltages:	For two 1410A preamplifiers mounted on chassis and four mounted externally.
Tubes:	4—6SJ7. 2—6SN7. 2—807. 3—5R4GY. 1—6AL5.
Dimensions:	19" x 14" x 9".
Weight:	60 lbs.

1440A LINE AMPLIFIER

Gain:	65 db.
Frequency Response:	± 1 db, 20—20,000 cycles.
Power Output:	+ 27 dbm with 5% total harmonics.
Noise Level:	— 55 dbm.
Input Impedance:	100,000 ohm volume control.
Load Impedance:	62.5, 125, 500 ohms.
Power Supply:	300 V. dc, 12 ma. 6.3 V. ac, .45 amp.
Tubes:	1—6AU6. 1—6C4.
Dimensions:	5-3/16" x 3½" x 6¼".

1450A APPARATUS UNIT

Transformer:	4610.
Primary Impedances:	30, 150, 250, 600 ohms.
Secondary Impedances:	15,000 or 60,000 ohms.
Operating Level:	0 dbm.
Frequency Response:	± 1 db, 50—15,000 cycles.
Gain Control:	100,000 ohms.
Dimensions:	5-3/16" x 3½" x 4½".

30A POWER SUPPLY

Output:	300 V. dc, 50 ma. max. 6.3 V. ac, 3.2 amp. max.
Input:	117 V. ac at 40 watts.
Dimensions:	5-3/16" x 3½" x 6¾".
Tubes:	1—6X4.

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ARCHITECTS SPECIFICATIONS

1410A PREAMPLIFIER

The amplifier shall consist of two individual preamplifiers mounted on one chassis plate having a dimension of 4-7/16" x 5-3/16" x 5" deep. Individual mixer controls shall be mounted on this same chassis so that high level mixing can be obtained from each preamplifier. The amplifier shall have the following characteristics: gain 32 db with input impedance of 30, 250 and 600 ohms; frequency range of 50 to 15,000 cycles ± 1 db; load impedance of not less than 10,000 ohms; a power output of + 9.5 dbm @ 5% total harmonics and an output noise of — 80 dbm. The tube complement shall be two 6AQ6 and two 6C4 vacuum tubes.

1430A AMPLIFIER

The amplifier shall be ac operated and have a gain of 98 db and shall have output taps to work into loads of 4, 8, 16 and 66 ohms (70 volt distribution tap). The frequency range shall be within ± 1 db from 30 to 15,000 cycles and the power output 75 watts @ 5% distortion. The signal-to-noise ratio shall be in excess of 68 db. It shall be made for rack mounting having dimensions of 19" x 14" x 9", be finished in dark aluminum gray color, weight 60 lbs., and use the following tube complements: 4—6SJ7; 2—6SN7; 2—807; 3—5R4GY; 1—6AL5.

The equipment shall be mounted on a recessed type chassis with proper holes for rack mounting and shall have an easily removable front mat which exposes the terminal strips and components. It shall have a front panel containing a power switch, pilot light, master gain control, fuse, and provision to mount the mixer controls associated with two mixing preamplifiers having a total of four input channels. It shall provide power for a total of six two-channel mixing preamplifiers.

1450A APPARATUS UNIT

The Apparatus Unit shall consist of a line level matching transformer and a 100,000 ohm gain control mounted on a flat chassis plate 5-3/16" x 3½" x 4½". The primary impedance of the matching transformer shall be 30, 150, 250 and 600 ohms. The secondary impedance shall be 15,000 and 60,000 ohms. Frequency responses shall be ± 1 db from 50 to 15,000 cycles with a maximum operating level of 1 mw or 0 dbm.

1420A AMPLIFIER

The amplifier shall be ac operated and have a gain of 96 db. It shall have output taps to work into loads of 4, 8, 16 and 140 ohms (70 volt distribution tap). The frequency range shall be within ± 1 db from 30 to 15,000 cycles; the power output, 35 watts @ 5% distortion. The signal-to-noise ratio shall be in excess of 66 db. It shall be for rack mounting, having dimenisons 19" x 10½" x 9", be finished in a dark aluminum gray color, weigh 55 lbs. and use the following tube complement: 4—6SJ7; 1—6SN7; 2—6L6G; 2—5U4G.

The equipment shall be mounted on a recessed chassis suitable for rack mounting and shall have an easily removable front mat which exposes the terminal strips and components. It shall have a front control panel containing a power switch, pilot light, master gain control, fuse, and provision to mount a two-channel mixing preamplifier. It shall provide power for a total of three, two channel mixing preamplifiers.

1440A LINE AMPLIFIER

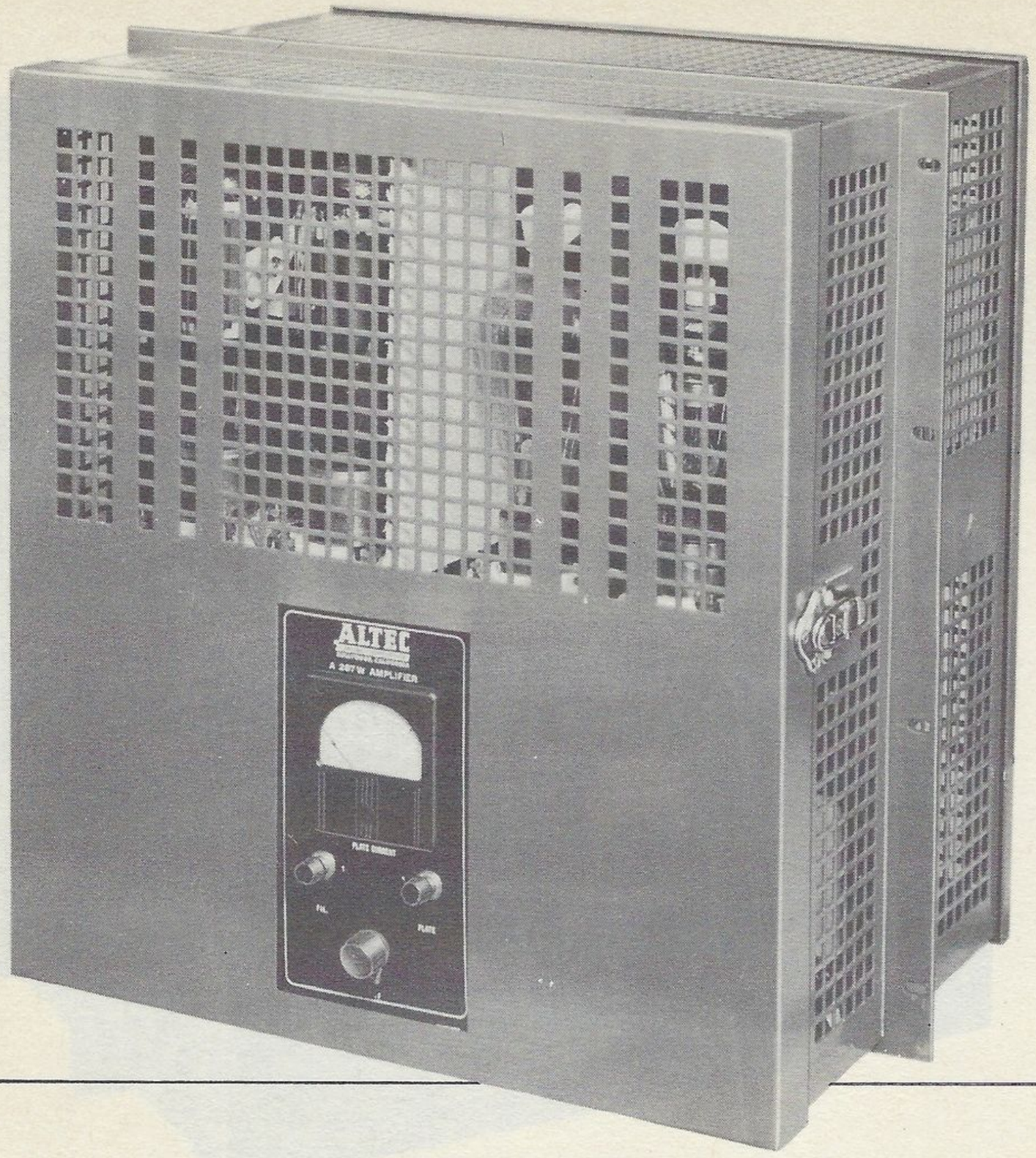
This amplifier shall consist of two stages having an input volume control of 100,000 ohms and a load impedance of 62.5, 125, 500 ohms. The gain shall be 65 db with a power output of + 27 dbm @ 5% distortion, and a signal-to-noise ratio of 80 db. The equipment shall be mounted on a plate, 5-3/16" x 3½" x 6¼", and shall use one 6AU6 and one 6C4 vacuum tube.

30A POWER SUPPLY

The power supply shall provide 300 volts dc, 50 ma. max., 6.3 volts ac, 3.2 amp. max., and shall be mounted on a plate 5-3/16" x 3½" x 6¾", and use one 6X4 tube.

Distributor in the United States

Graybar
ELECTRIC COMPANY



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A-287 W
AMPLIFIER

The A-287W amplifier is a 250 watt, Class B power amplifier especially adaptable to large public address and sound system installations where large audio powers are required in one package. The amplifier will develop full rated power of ¼ kilowatt in the range of 100 to 10,000 cycles.

The A-287W amplifier has been found to be especially adaptable in sound systems for large industrial plants, racetracks, ball parks, skating rinks, athletic arenas, airports, carillons, large auditoriums, outdoor uses where long distances and large areas are to be covered, and for special research applications.

The A-287W amplifier is a one stage amplifier using two 805 vacuum tubes and having a self contained power supply using two 866-A rectifier tubes. This amplifier has no input transformer and requires a driver amplifier having a minimum undistorted output of 15 watts with a 3000 ohm center tapped output impedance. The Altec Lansing A-127-B and A-255-A amplifiers are particularly designed for driving the A-287W.

Components of the A-287W amplifier are mounted on either side of a 3/16" steel tank plate.

The individual components such as resistors, condensers and transformers are designed for ample safety factor against momentary overloads and high line voltage.

Both the front and rear covers are readily removable for servicing. A door safety switch automatically turns off the high voltage supply when the front cover is removed, so as to protect the operator from shock when replacing vacuum tubes, fuses, etc. The front panel contains a power switch and a meter for testing vacuum tubes. The entire amplifier is designed for mounting on a standard relay rack.

SEE OTHER SIDE

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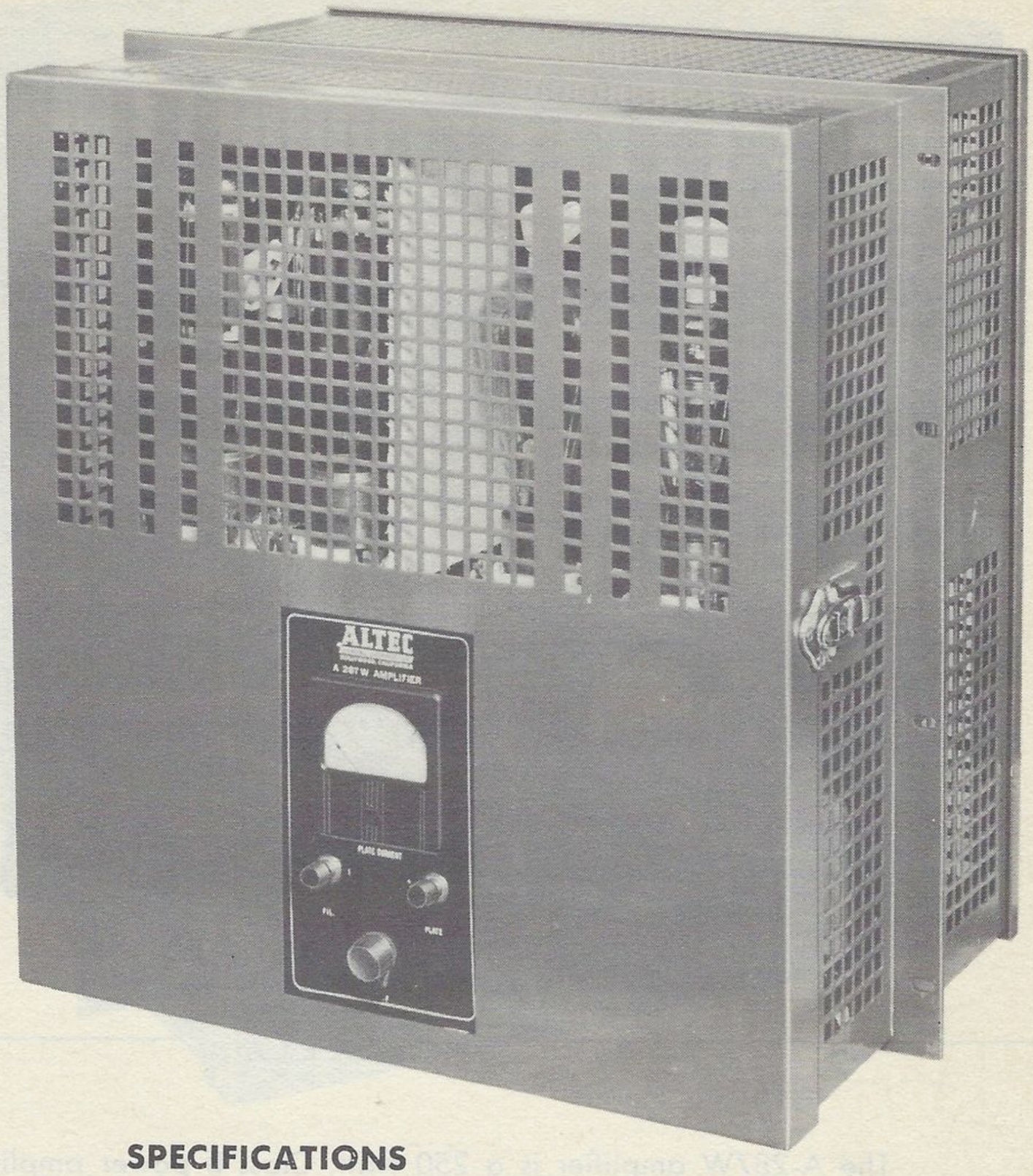
A-287 W AMPLIFIER



SPECIFICATIONS

GAIN	Approximately 12 db. from 3000 ohm impedance driver
FREQUENCY RANGE	Response will be within 1 db from 100 to 10,000 cycles.
POWER OUTPUT	250 watts (5% of total Harmonics)
NOISE LEVEL	Minus 27.8 db reference .006 watts
IMPEDANCE	Input—Use driver amplifier having minimum undistorted output of 15 watts and having an output impedance of 3000 ohms with center tap. Output—Taps to work into loads from 2.25-20 ohms.
POWER SUPPLY	105-130 volts—Taps for 105-117-130 volts. 50-60 cycles 700 watts Internally fused
NET WEIGHT	141 pounds
AMPLIFIER TUBES	2—805
RECTIFIER TUBES	2—866A
COLOR	Blue Gray
DIMENSIONS	19¼" high, 19" wide, 12½" deep

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RAPID ATTACK TIME!

AUTOMATIC VOLUME CONTROL!

LIMITS WITH LESS THUMP!

HIGH POWER OUTPUT!

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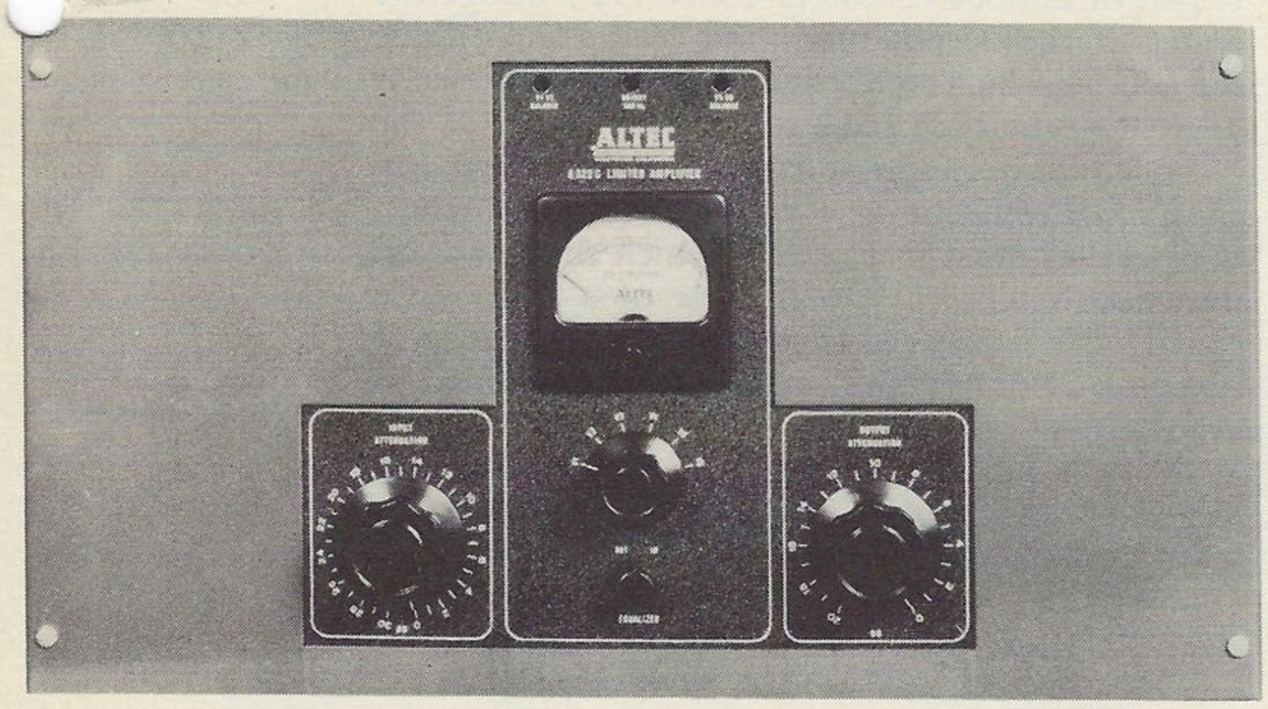
A-322C LIMITER AMPLIFIER



The A-322C Limiter Amplifier is invaluable for use in film and disc recordings, broadcasting, and public address applications. Its use in film and disc recordings prevents over-modulation and allows a higher average level of recording without danger of distortion. The use of the A-322C Limiter Amplifier in broadcasting reduces the human element in maintaining high modulation percentages without the danger of exceeding modulation limits. The use of the A-322C Limiter Amplifier in public address systems will adequately compensate for variations in volume resulting from changes in the speaker's position with respect to the microphone. Its use will prevent blasting and will allow the use of a higher sensitivity in the P.A. system without feedback. In high powered public address systems, the use of the limiter will prevent sudden or accidental peak volume from causing loudspeaker failure.

GENERAL DESCRIPTION

The A-322C Limiter Amplifier operates as a true linear amplifier up to a specified level and then limits the volume output beyond this point. The input impedance is 600 ohms, with a 5000 ohm bridging input provided. A total of 30 db input attenuation can be obtained in 1 db steps. The output impedance is 600 ohms with an attenuation of 20 db in 1 db steps.

The signal circuit consists of three balanced push

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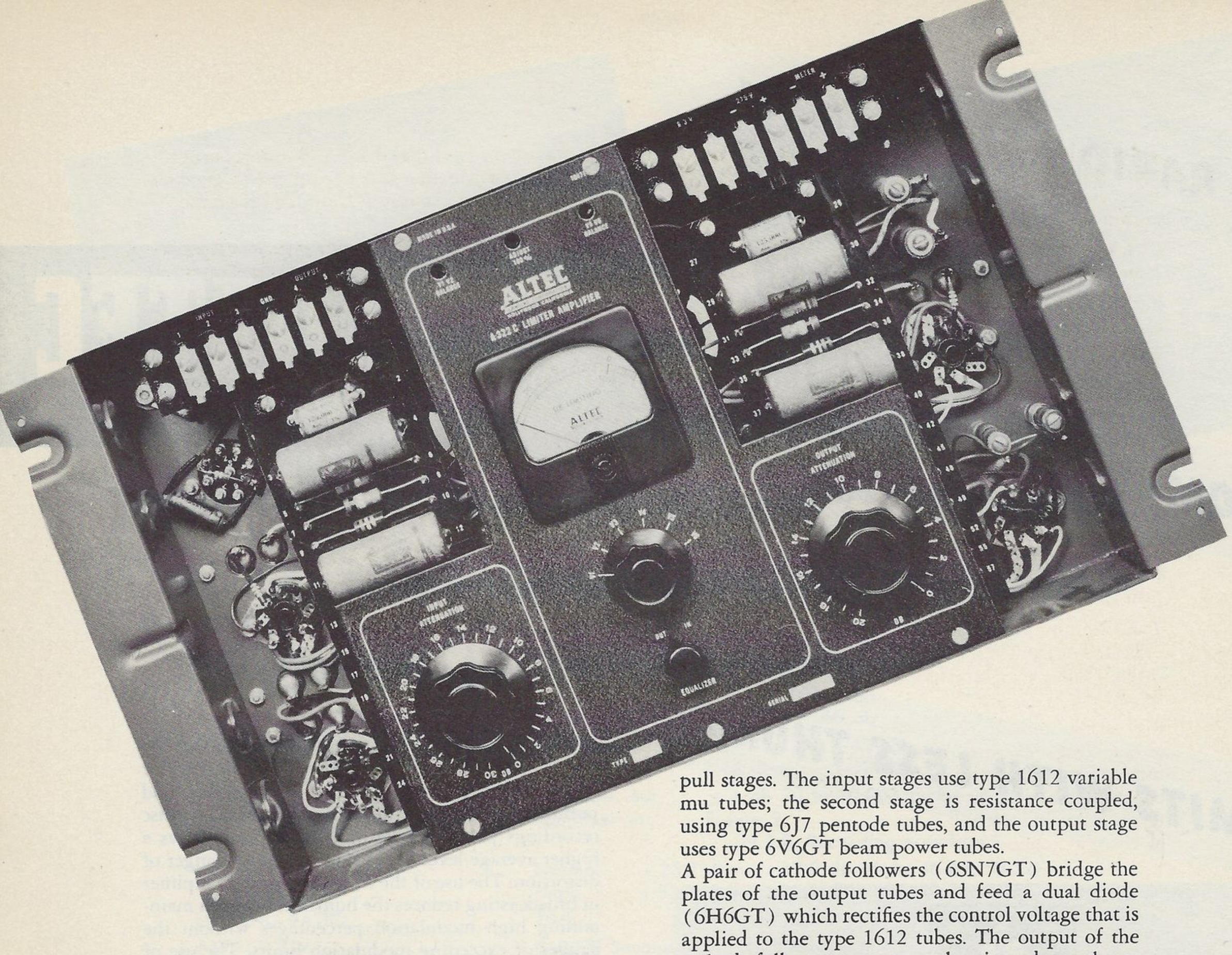

A-322C LIMITER AMPLIFIER

pull stages. The input stages use type 1612 variable mu tubes; the second stage is resistance coupled, using type 6J7 pentode tubes, and the output stage uses type 6V6GT beam power tubes.

A pair of cathode followers (6SN7GT) bridge the plates of the output tubes and feed a dual diode (6H6GT) which rectifies the control voltage that is applied to the type 1612 tubes. The output of the cathode followers appear as a low impedance charging source resulting in a very rapid "attack" time. This is illustrated in Figure 1 which shows a 2 db overshoot on the first half cycle of a 5000 cycle signal when it is keyed from no signal into 10 db of limiting. First amplifier stage is shock mounted to avoid microphonic pickup.

A meter is provided having a "100%" point and calibrated in DB LIMITING, so that the operator may know, at all times, the amount of limiting taking place. Provision is made for connecting a remote DB LIMITING meter.

OPERATION

"A 100%—DB LIMITING" meter is mounted on the front panel to measure either the plate current of the six tubes used in the three stages of push-pull amplification or the amount of limiting action taking place, depending upon the position of the

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meter selector switch. Limiting is observed by placing the meter switch in position V1, since limiting action is accompanied by a change in plate current of V1 and V2.

Check position V3, V4, V5, and V6 for approximate "100%" indication and change tubes, when necessary, to obtain balance.

Careful balance of V1 and V2 is important to the proper functioning of the unit. This is accomplished by setting of two screw driver adjustments in the upper left and center of the control panel.

Adjust "V1, V2 BALANCE" control for identical readings in positions V1 and V2 of meter switch. Selection of tubes used as V1 and V2 may be necessary to obtain a balance.

With meter switch in position V1, set "Adjust 100%" for "100%" meter indication.
Re-check operations for possible interaction of adjustments.

Two limiting thresholds are provided. These are indicated under "Specifications" as "normal" and "high." These may be selected by strapping on the RC Board.

Beyond the limiting point, which is adjustable, ten to one compression is obtained, therefore, a signal increase of 10 db results in an output increase of one db. The release time for the amplifier to recover its normal gain is set at 0.5 second, but can be varied by changing one resistor.

Provisions are made so that the N.A.B.-orthacoustic pre-emphasis equalization can be utilized to good advantage, since the limiting is controlled from the pre-equalized voltage.
With proper balancing, the "thump," when limiting, will be 50 db down from the signal level. This is accomplished through the use of well balanced transformers and other components.

INSTALLATION

The A-322C Limiter Amplifier is designed for standard relay rack mounting requiring six rack units.

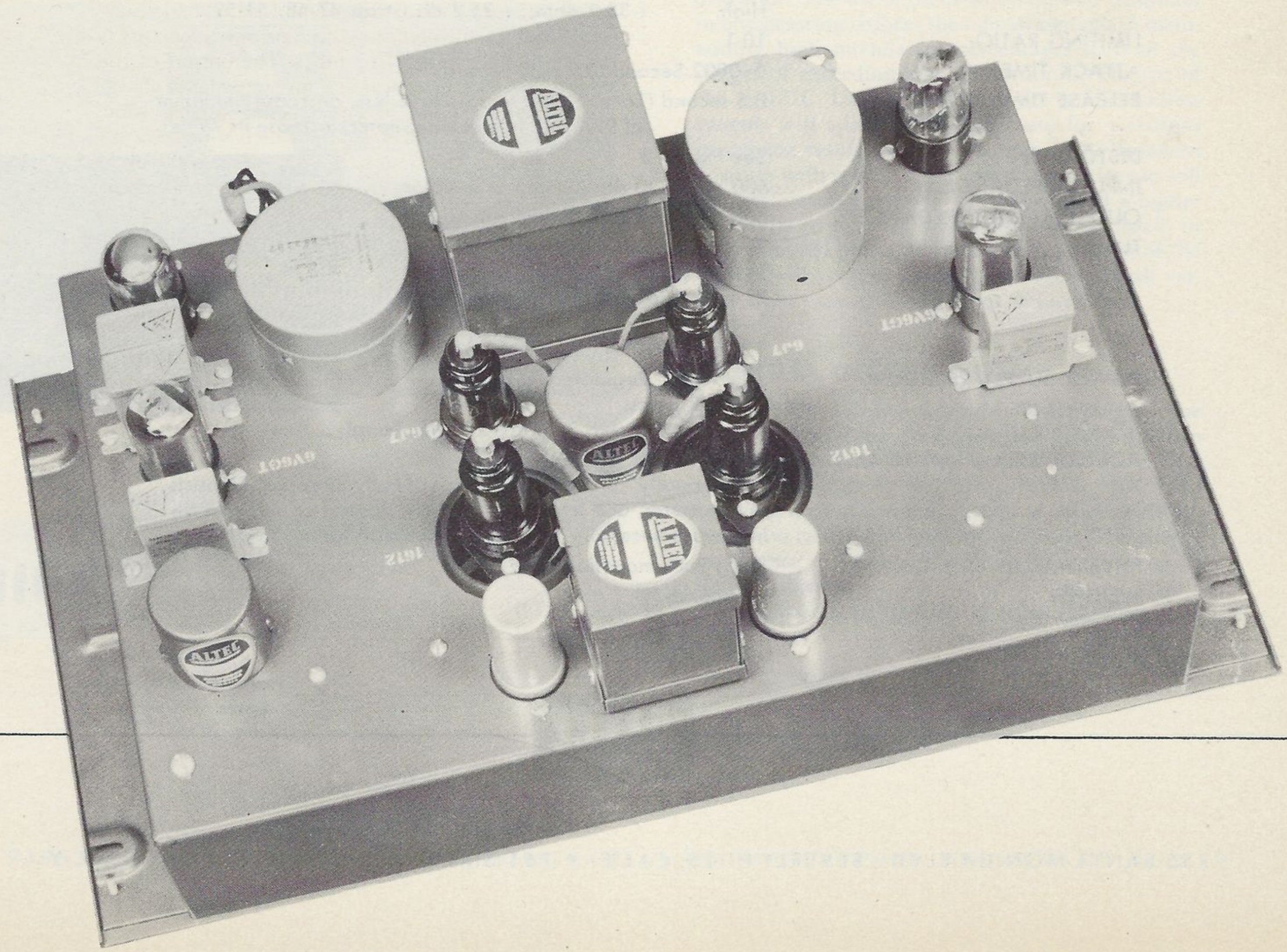
A ½" and ¾" conduit "knock-out" is provided in each end of the chassis for bringing leads in directly through a sign bushing or terminating conduit.

Signal leads are terminated in the upper left hand corner of the chassis (inside view). Connection can be made by soldering to lugs provided or by placing leads under binding head screws.

Grounding should be accomplished by strapping terminals 3, GND., and 4.

Power supply and extension meter leads are terminated in the upper right hand corner of the chassis (inside view).

Terminals are provided for connection of a remote meter. Meter leads should be insulated to withstand full "B" voltage.



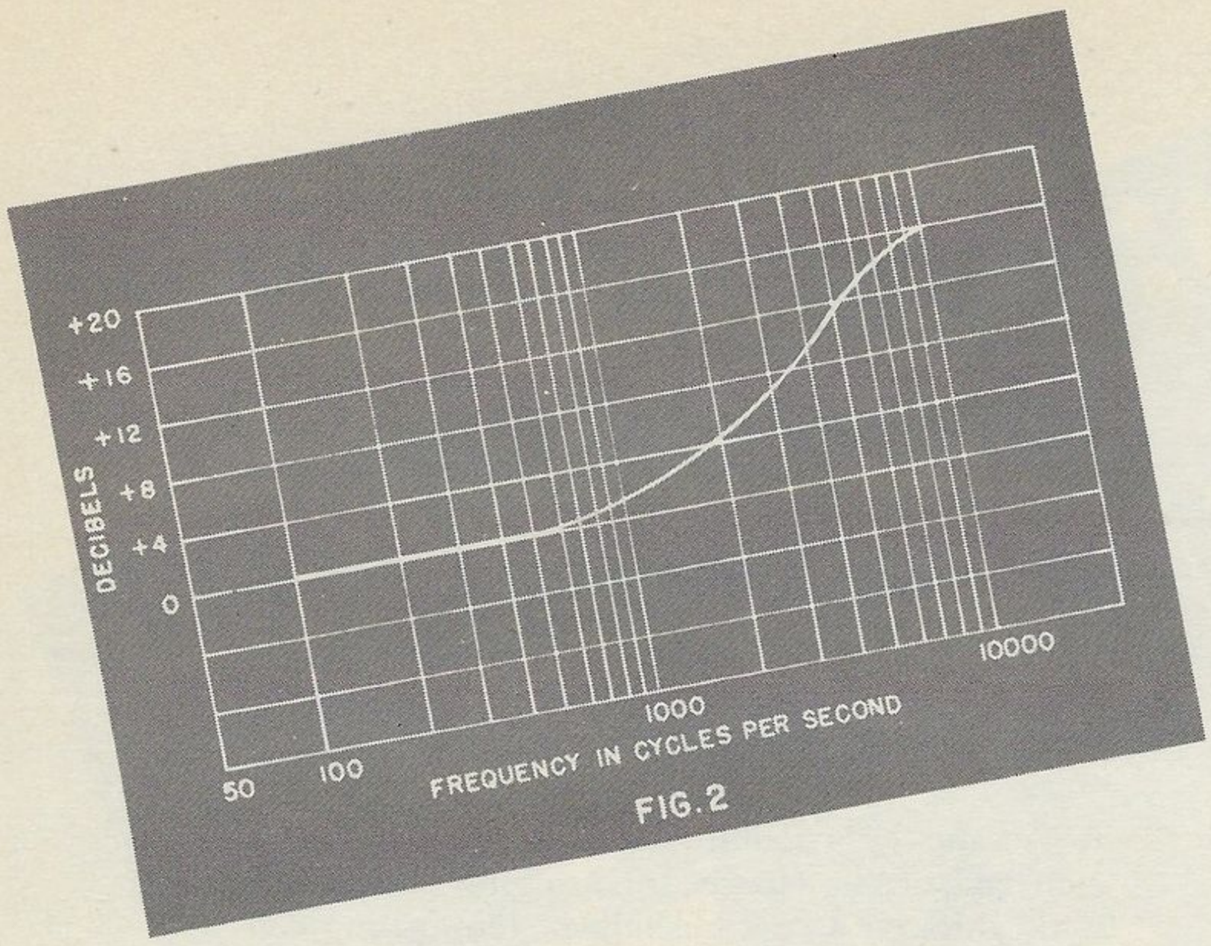


FIG. 2

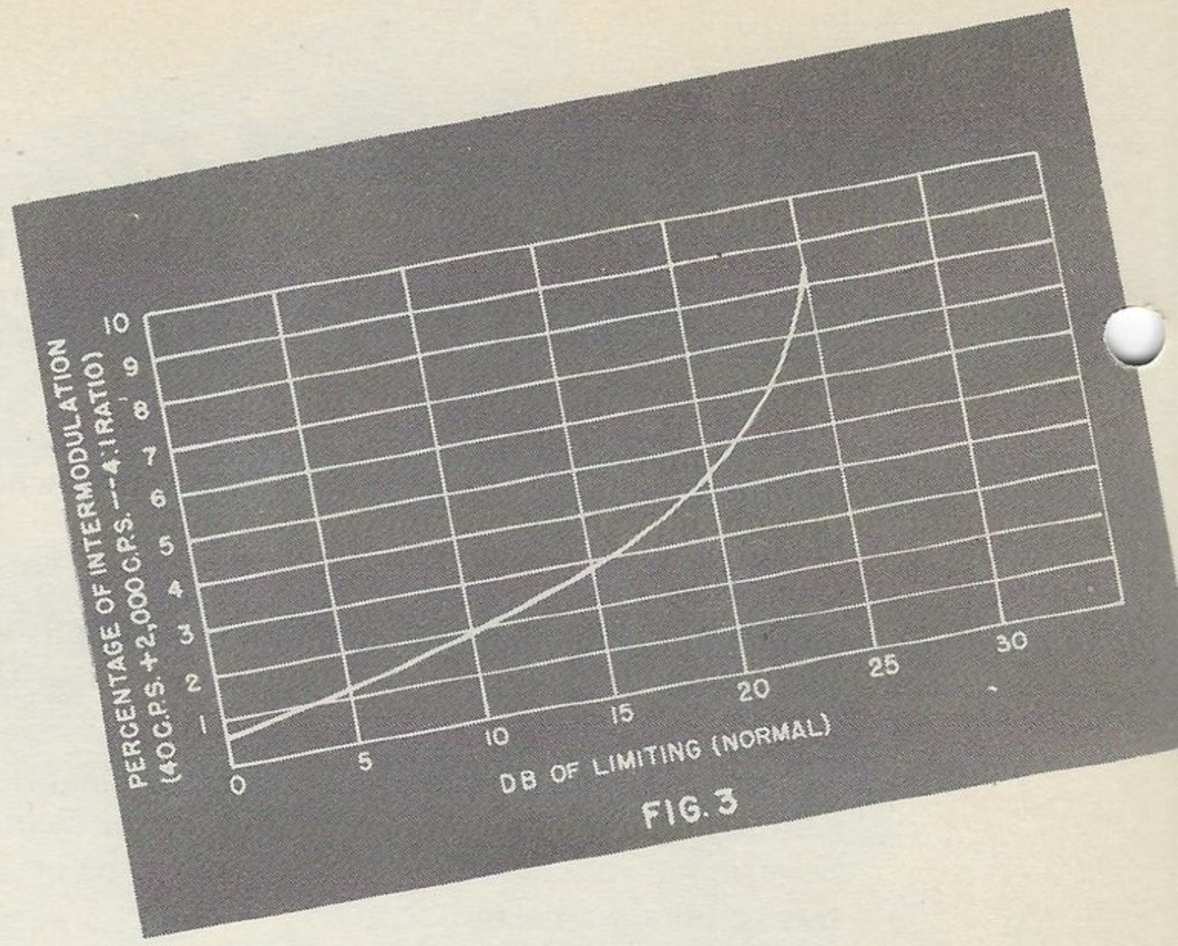


FIG. 3

SPECIFICATIONS

GAIN:	1000 cycles; Equalizer out: 68 db 1000 cycles; Equalizer in: 60 db
HUM AND NOISE:	Equalizer out: —37 dbm —45 db Equalizer in: —44 dbm —52 db
FREQUENCY RESPONSE:	Equalizer out: ±1 db 20 to 20,000 cycles Equalizer in: Figure 2 (N.A.B. Recording equalizer.)
LIMITING THRESHOLD:	Normal: +25.2 dbm; +17.2 db (strap 46-48; 50-52) High: +33.2 dbm; +25.2 db (strap 47-48; 51-52)
LIMITING RATIO:	10:1
ATTACK TIME:	0-.0002 Second (0.2 milli-second)
RELEASE TIME:	0.5 second (To make the release time less, decrease the value of R27, and to make it greater, increase its value).
DISTORTION:	See Figure 3
INPUT IMPEDANCE:	600 ohms; 30 db; 30 step attenuator
OUTPUT LOAD IMPEDANCE:	600 ohms; 20 db; 20 step attenuator
TUBES:	2—type 1612 2—type 6J7 2—type 6V6GT 1—type 6H6GT 1—type 6SN7GT
POWER SUPPLY REQUIRED:	275 V.D.C. Regulated @100 ma. 6.3 V. 2 amps. (Use Altec Lansing Regulated Power Supply)
ACCESSORIES: (No. 10474)	Remote meter assembly not normally supplied unless specifically ordered. Consists of one meter, one front mat, and one control panel, with all hardware necessary to make remote installation.
PHYSICAL:	Relay rack mounting 10½"
WEIGHT:	25 pounds
COLOR:	Blue-gray

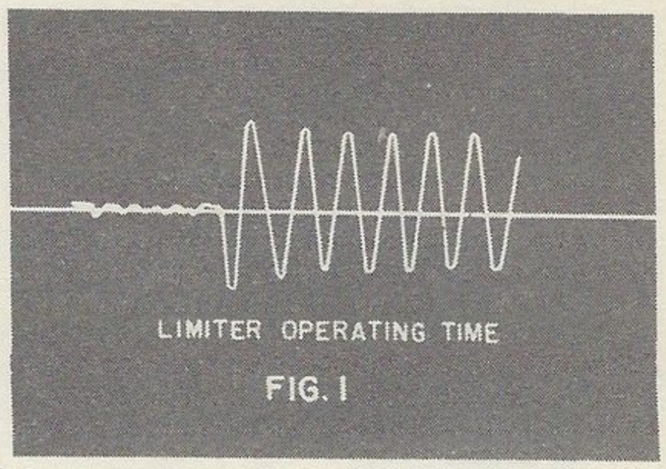


FIG. 1

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AL-1125

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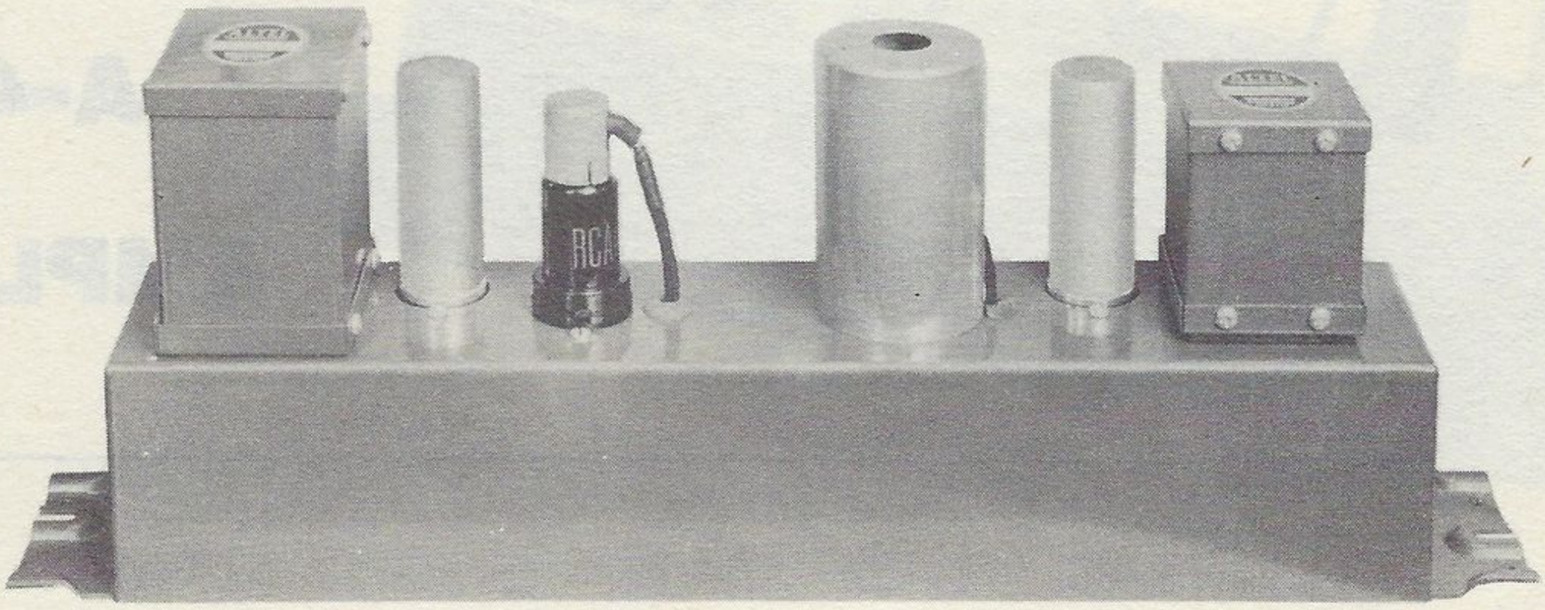
ALTEC
LANSING CORPORATION

A-420 AMPLIFIER

The A-420 pre-amplifier is designed to operate into the Altec Lansing A-127 and A-255 series amplifiers. These latter amplifiers have terminals to provide filament and plate supply for the A-420.



SPECIFICATIONS

GAIN	Normal 42 db high 49 db
FREQUENCY RANGE	20—20,000 cycles within 1 db (20—10,000 cycles on high gain)
MAXIMUM POWER OUTPUT	2 db below .001 watts
NOISE LEVEL	Minus 77 db from .001 watts at normal gain
IMPEDANCE	Input– 30/36, 250/300, 500/600
	Output 600/500, 300/250, 150/125, 75/62.5
POWER SUPPLY REQUIRED	6.3 volts at 0.6 amps 325 volts at 6 ma.
WEIGHT	12 pounds
TUBES	2—6J7 type
COLOR	Blue Gray
DIMENSIONS	3½" high, 19" wide, 72" deep

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LITHO IN U.S.A.
AL-1120

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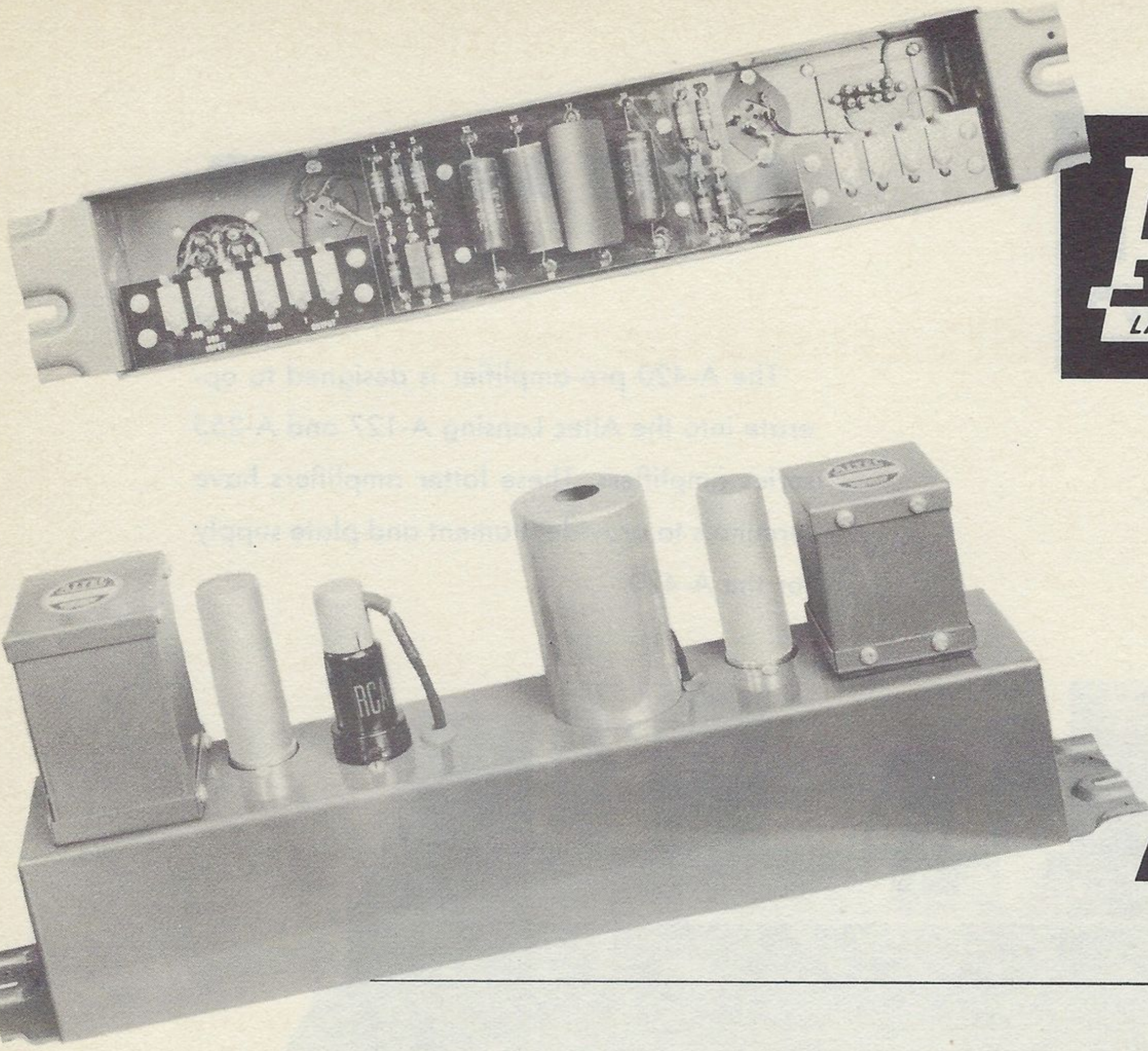

ALTEC
LANSING CORPORATION

A-420
AMPLIFIER

The A-420 AMPLIFIER is a two-stage fixed gain pre-amplifier. It is mounted on a 3½" relay rack panel of recessed pan construction. The input transformer provides 90 db of magnetic shielding. The output transformer is balanced and is designed for minimum pickup from external magnetic fields. Negative feedback is applied from the output to the cathode of the first stage. A strap for changing from high gain to standard gain is also provided in the design of the A-420 amplifier.

As a result of the high degree of transformer shielding the A-420 amplifier may be mounted in regions of high stray magnetic fields without danger of noise pickup.

All components provide a large safety factor and are easily accessible for test and servicing by removing the front mat.

The A-420 Amplifier is intended as a pre-amplifier for microphones; phonograph pickup and other applications where high quality amplification is desired.

SEE OTHER SIDE

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ALTEC
LANSING CORPORATION

P-511 REGULATED "DC" POWER SUPPLY

Automatic regulation is 1.0% for line voltage variations of ±10% from nominal which may be 105, 117 or 130 volts depending upon the primary tap selected.

This automatic regulation is accomplished through the use of a regulator tube as an automatically-variable resistor in series with the D.C. output. The control for the regulator tube is derived from another vacuum tube which amplifies the D.C. output so that it varies the bias of the regulator tube to maintain a constant output regardless of the load or line voltage. This type of regulated power supply has a very low internal impedance. This property is very desirable to reduce the effects of oscillation and motorboating in cases where several amplifiers are to be fed from the same power supply.

The unit will supply 3 amperes at 6.3 volts A.C. for operating filaments of associated amplifiers.

The P-511 Regulated "D.C." Power Supply is assembled on a rack chassis of recessed pan type construction for mounting in either a cabinet or a standard relay rack. The front mat is removable to permit speedy access to internal wiring and components for test and replacement.

SPECIFICATIONS

OUTPUT D.C. VOLTAGE	275 volts ±2%
LINE VOLTAGE REQUIREMENTS	105, 117, or 130 volts; selected by taps on transformer
OUTPUT CURRENT	100 milliamperes maximum @ 275 volts 3 amperes A.C. @ 6.3 volts
RIPPLE	1.0 millivolt
TUBES	1 — 6SJ7GT 1 — 6SA7GT 1 — OC3 1 — 5U4G or 5R4-GY
DIMENSIONS	5¼" high, 19" wide, 8½" deep
WEIGHT	23½ pounds
COLOR	Blue Gray

LITHO IN U.S.A. 6-1-47
AL—1137

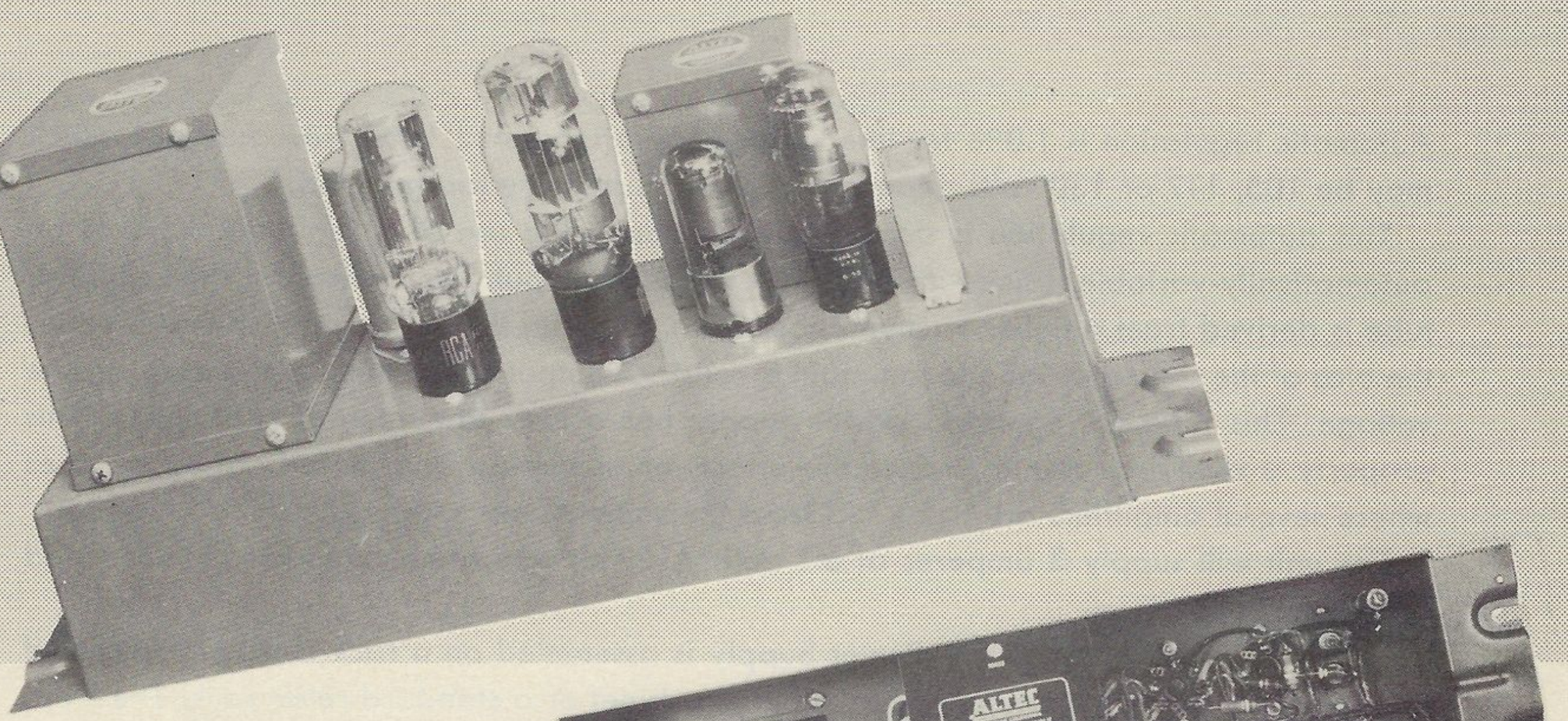
ALTEC
LANSING CORPORATION

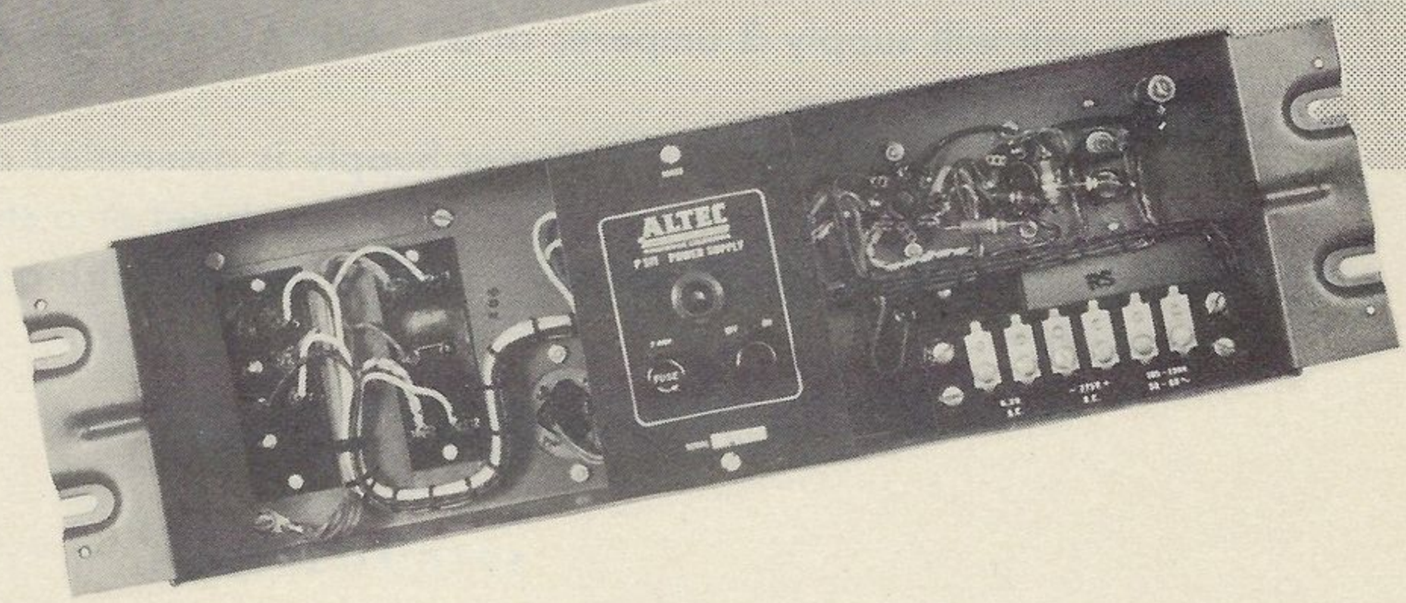
1161 NORTH VINE ST., HOLLYWOOD 38, CALIFORNIA • 250 WEST 57TH STREET, NEW YORK 19, NEW YORK

P-511

REGULATED "DC" POWER SUPPLY

ALTEC
LANSING CORPORATION





The P-511 REGULATED "D.C." POWER SUPPLY is an all A.C. operated power supply designed to meet many applications requiring an accurately maintained value of adjustable high voltage direct current with low ripple, over a wide range of primary voltage variations such as are usually encountered from Commercial power lines.

The P-511 will supply both D.C. plate and A.C. filament potential for operating pre-amplifiers, line amplifiers and/or a limiter amplifier. It is particularly adaptable to operate the Altec Lansing Limiter Amplifier A-322 which requires an accurately regulated plate supply for stable operation. Other Altec Lansing Amplifiers, a number of each which can operate from the P-511 Power Supply are the A-420 and A-422-A pre-amplifiers.

SEE OTHER SIDE

ALTEC
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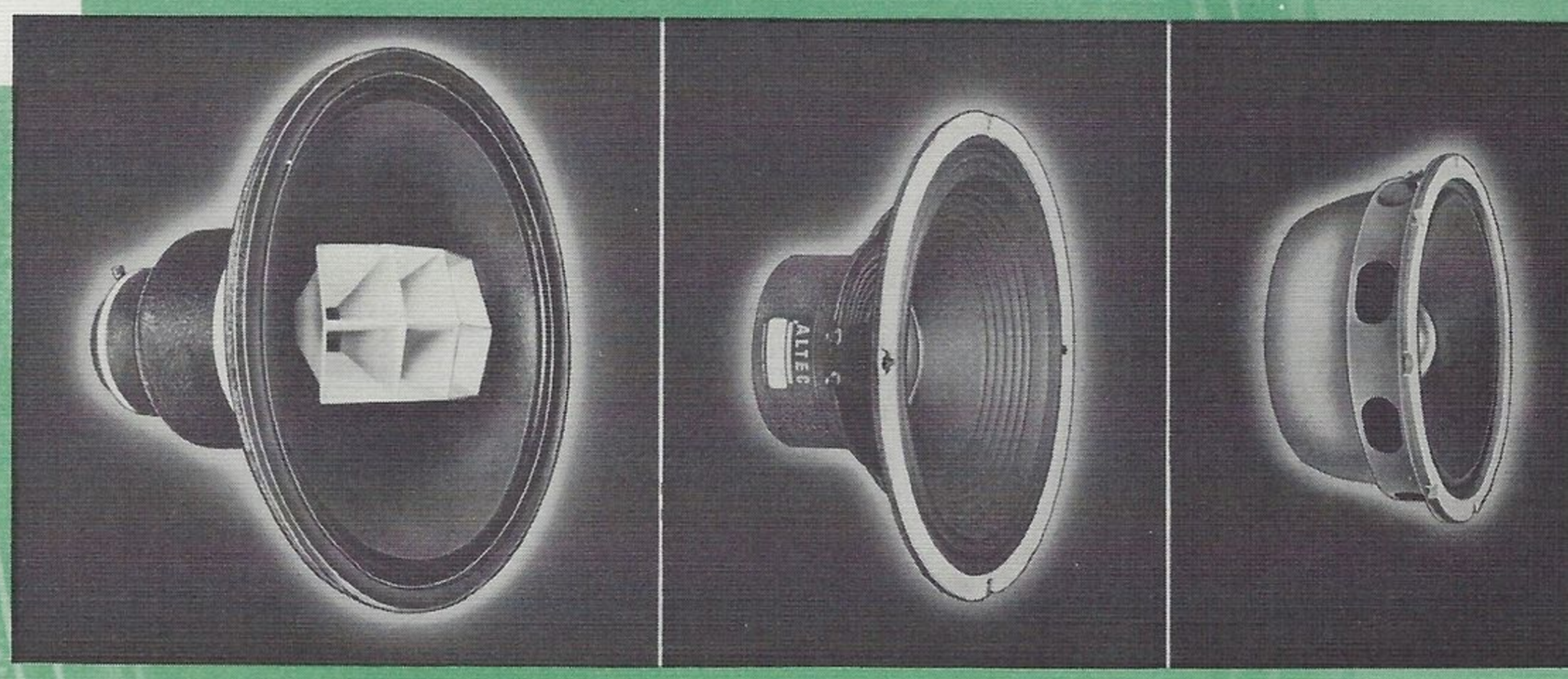
L O U D S P E A K E R S

755A - 8" 400B - 8"		Low level paging, low level Music distribution.
728B - 12" 600B - 12"		Medium level Speech and Music
754B - 12"		Phenolic cone for outdoor all-weather operation.
603B - 15"		General PA work.
803A - 15" 515 - 15"		High quality, high power "Woofers".
604B - 2 Way 757A - 2 Way		High quality Speech and Music.
720A 713C	On (31-A horn)32-A horn (KS-12024 horn)KS-12025 horn (KS-12027 horn)KS-12047 horn	High level paging and announcing through bad reverberation and high ambient noises in railroad stations, factories, bus terminals, airports, etc.
290	On (H-803 Multi cell)H-804 Multi cell (H-1003 Multi cell)H-1504 Multi cell (H-1803 Multi cell	High power PA for Arenas, Auditoriums, Stadiums, etc.
"Voice of The Theatre" Speaker Systems.		High Power Best Quality Music for Auditoriums, Band Shells, etc.

ALTEC

...always the finest



Altec exclusive design features give superior results in smoother frequency response, efficiency, ruggedness and trouble-free service... the best investment for your audio dollar!

These factors result in the recognized superiority of ALTEC speakers...

The quality of a speaker is determined largely by its frequency response, together with its efficiency, lack of distortion, etc.... However, the prime factor that has given ALTEC international acceptance and leadership in research, development and production of speakers and speaker systems as well as over 400 other audio products, has been the unceasing, steadfast determination by Altec research engineers and management to build into Altec products "always the finest" in practical, advanced design.

When ruggedness, economy, trouble-free operation, size, weight or other factors became a requirement or a limitation, Altec engineers tackled the problem without inhibitions... without restraint... and as a result Altec speakers have built into them many "exclusive" design features that cannot be found in other speakers. Each of these speakers has the same high quality, close tolerance, thoroughly tested Altec standard of workmanship... making this superb group of speakers an ideal choice for complete satisfaction.

If you have a specialty application or other technical speaker problem, from the smallest 8" unit to the largest two-way professional installation, contact your nearest Altec dealer, and listen to the finest reproduction of sound ...on an Altec speaker.

Close quality control is maintained by acoustical measurements made in Altec's $50,000 measurement laboratory in accordance with the American Standards Association in their Loudspeaking Testing Bulletin. You will find these response frequency characteristic measurements accurate ...methods and equipment are the same used to establish speaker system standards in the motion picture industry.

EXCLUSIVE DESIGN FEATURES: Direct radiating low frequency horn... Tangential compliance metal diaphragm in high frequency speaker... Both low and high frequency voice coils are edge wound flat wire... Field replaceable speaker cones and diaphragms... Truly exponential multicellular high frequency horns... Use of large Alnico V magnets... Large safety factor in design and rating... Highest efficiency.

Duplex Speaker

"An outstanding engineering achievement..." say authorities... for here is a professional speaker that has satisfied the critical needs of broadcast, recording, motion picture and other exacting specifications.

This complete two-way speaker system combines high and low frequency units into a single metal frame. It affords wide and smooth dispersion of high frequency sounds, 60 horizontal and 40 vertical, through a multicellular horn. This speaker-within-a-speaker construction properly phases and blends highs with lows... keeps them from clashing.

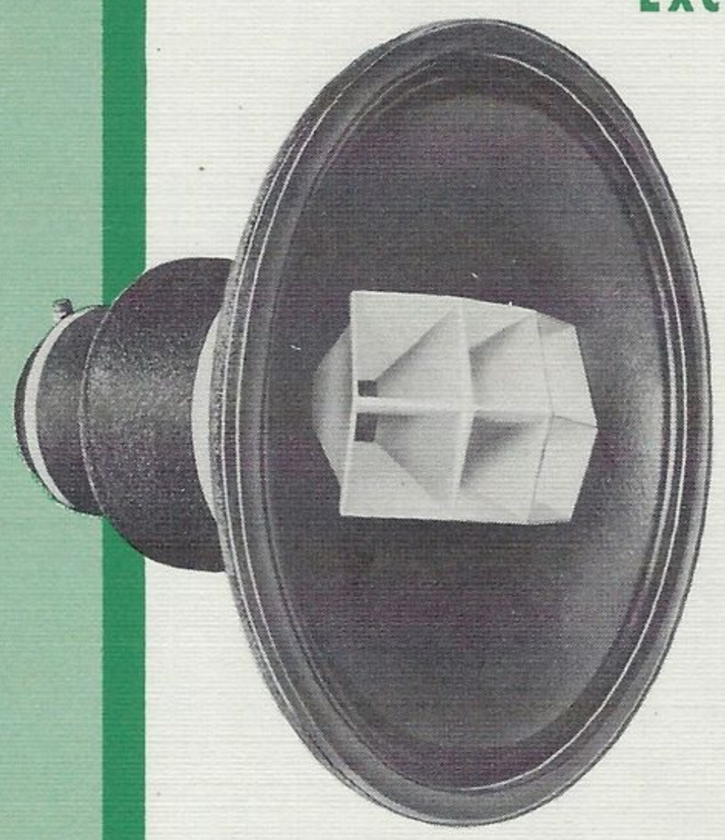
The low frequency segment of this duplex speaker fully covers the range from 30 cycles to the crossover at 1000 cycles. At this frequency the high frequency unit, embodying several Altec "exclusive" design features, begins its *unsurpassed* SMOOTH frequency response extending upwards to 16,000 cycles. Add the companion dividing network N-1000B for a perfect crossover and for adjustable control of the high frequencies... and you have the *finest!*

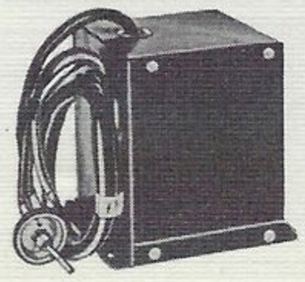
Specifications:

- Angle of Horizontal Distribution... 60 degrees
- Angle of Vertical Distribution... 40 degrees
- Power Rating... 30 watts
- Network Impedance... 16 ohms
- Speaker Diameter... 15-3/16 inches
- Depth... 11-1/8 inches
- Weight with Network... 40 lbs.

After making acoustic measurements of hundreds of speakers and speaker systems, Altec makes this unqualified statement: "...to the best of our knowledge, the frequency response of this 604B Duplex Speaker cannot be equaled by any speaker unit or speaker system outside the large theatre-type systems!"

604B





Exclusive Features:

Frequency Response—30 to 16,000 cycles

High Efficiency—

High Power Handling Capacity—

Compactness—speaker-within-a-speaker construction

Wide Frequency Distribution—smooth and even by use of multicellular horn

Low Distortion—almost no distortion of any kind

Dependability—Altec standard of workmanship has no equal

Multicell Dia-cone Speaker

603B

An economically priced speaker unit with outstanding quality and performance characteristics. This Dia-cone Speaker has many of the Altec "exclusive" design features found in the professional 604B Duplex. Altec's development of the dia-cone principle of reproducing frequencies above 2000 cycles from an aluminum diaphragm secured directly to the voice coil form has provided a superbly smooth frequency response. Add to this important feature the multicellular horn for wide and smooth distribution of high frequencies, the large 15″ cone for full bass reproduction, the large Alnico V permanent magnet, its massive circular magnetic circuit, and this 603B Dia-cone Speaker is the best choice where the installation does not seem to justify the 604B Duplex.

Specifications:

Angle of Horizontal Distribution . . . 60°
Angle of Vertical Distribution . . . 40°
Voice Coil Impedance . . . 8 ohms
Voice Coil Diameter . . . 3 inches
Power Rating . . . 25 watts
Weight . . . 18 lbs.
Speaker Diameter . . . 15-3/16 inches
Depth . . . 7 inches

Dia-cone 12 inch Speaker

600B

This speaker has the "Altec developed" dia-cone principle of high frequency reproduction from a metal diaphragm, secured directly to the voice coil form, and a three-inch voice coil made of edge wound flat aluminum wire. This 600B speaker design with its high efficiency, superior quality of reproduction, its new technique in cone treatment to smooth the frequency response, and other Altec "exclusive" design features, provides a unit unexcelled for home use, sound reinforcement systems, industrial applications, etc. Here is an exceptional value for your audio dollar . . . hear it at your nearest Altec dealer and be convinced.

Specifications:

Power Rating . . . 20 watts
Voice Coil Impedance . . . 8 ohms
Voice Coil Diameter . . . 3 inches
Speaker Diameter . . . 12¼ inches
Depth . . . 5¼ inches
Weight . . . 12 lbs.

Dia-cone 8 inch Speaker

400B

This is the ideal unit for those smaller critical uses where the benefits of a larger speaker is limited by space, weight, etc. This economical, highly efficient 8″ speaker uses the "Altec developed" dia-cone principle of high frequency reproduction from a metal diaphragm providing a superior frequency response. It incorporates other Altec "exclusive" design features, fine craftsmanship and the close tolerance found in larger speakers. This along with the use of an extra large Alnico V magnet results in much greater efficiency than is expected of this size speaker . . . determine this for yourself at the nearest Altec dealer . . . hear it and decide!

Specifications:

Power Rating . . . 12 watts
Voice Coil Impedance . . . 8 ohms
Voice Coil Diameter . . . 1¾ inches
Speaker Diameter . . . 8¼ inches
Speaker Depth . . . 3⅝ inches
Weight . . . 4 lbs.

CABINETS
recommended for use with ALTEC speakers

Important engineering features such as cabinet volume, internal damping and bracing, size of port, grille cloth, etc., all have their effect upon speaker efficiency. These cabinets have been specifically designed for use with the speakers listed herein. A choice from this group of cabinets will provide the perfect enclosure for your Altec speaker.

Be sure to include the SUFFIX letter on your code number when ordering. This letter indicates the size of baffle hole needed to accommodate the speaker.

If you prefer to build your own cabinet, write for ALTEC Lansing's engineering pamphlet which outlines some fundamental principles that will assist you in your design.

604B DUPLEX 15″ SPEAKER

recommended cabinets: 605A, 612A, 614A

603B MULTICELL DIA-CONE

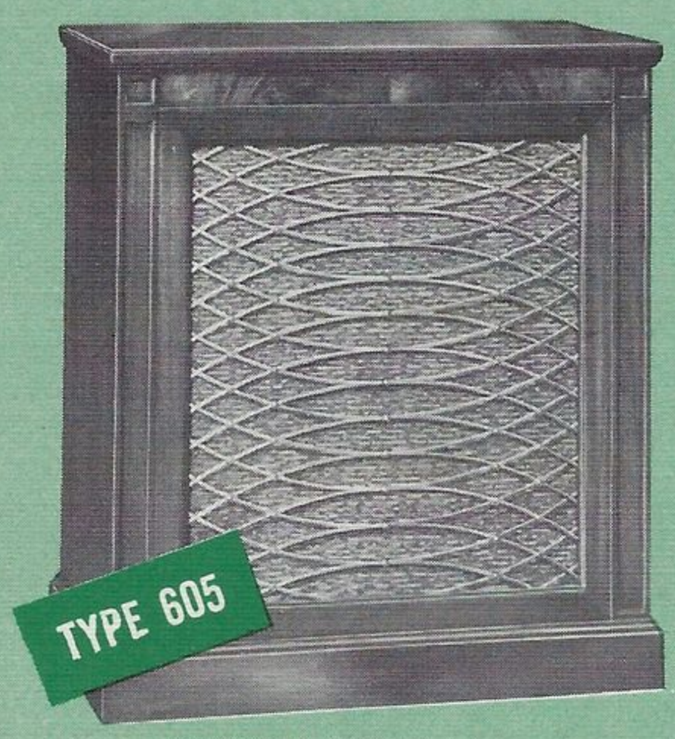
recommended cabinets: 605A, 612A, 614A

600B DIA-CONE 12″ SPEAKER

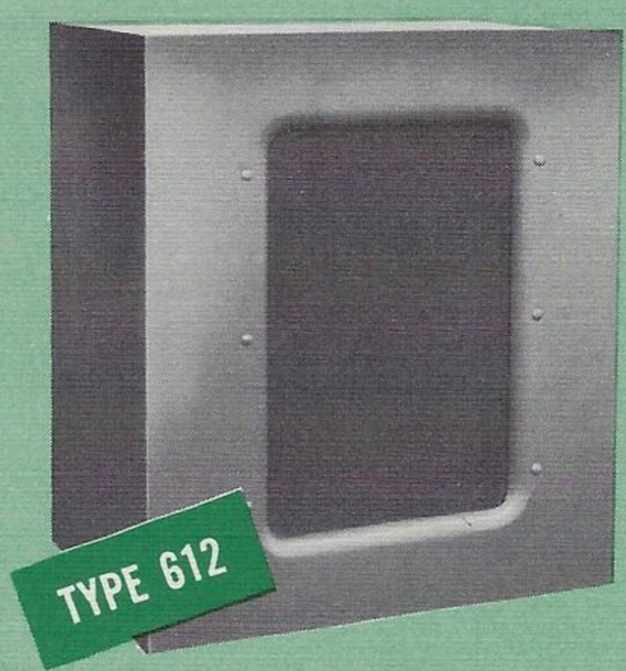
recommended cabinets: 612B, 614B, 618B

400B DIA-CONE 8″ SPEAKER

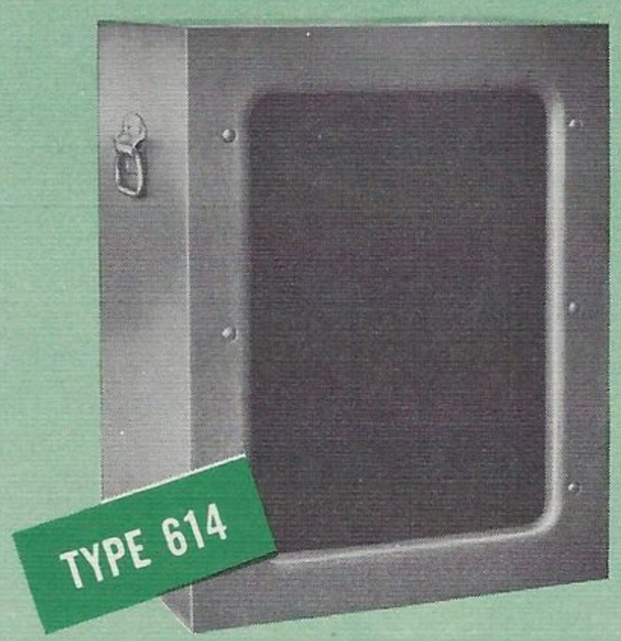
recommended cabinets: 614C, 618C



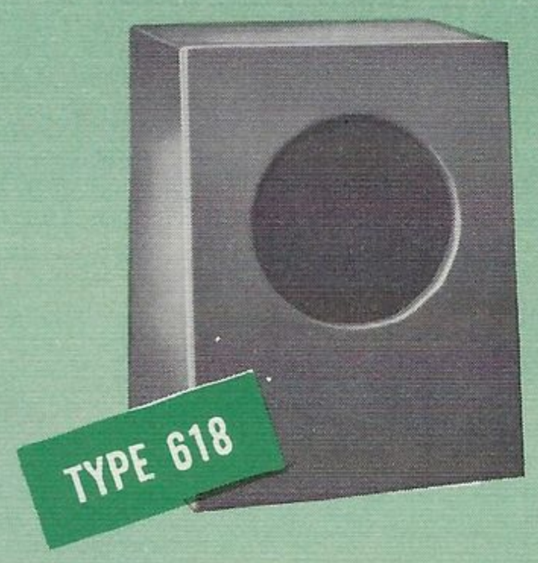
FURNITURE CABINET
Finish—Walnut or Mahogany
Dimensions—Height, 38″
Width, 30″
Depth, 16″



UTILITY CABINET
Finish—Blue Gray
Dimensions—Height, 29½″
Width, 25½″
Depth, 17¾″



PORTABLE UTILITY CABINET
Finish—Blue Gray
Dimensions—Height, 24¾″
Width, 18¾″
Depth, 14¼″



SMALL PORTABLE UTILITY CABINET WITH SLANTING FRONT
Finish—Blue Gray
Dimensions—Height, 22″
Width, 17″
Depth, 13¼″

DEALERS EVERYWHERE

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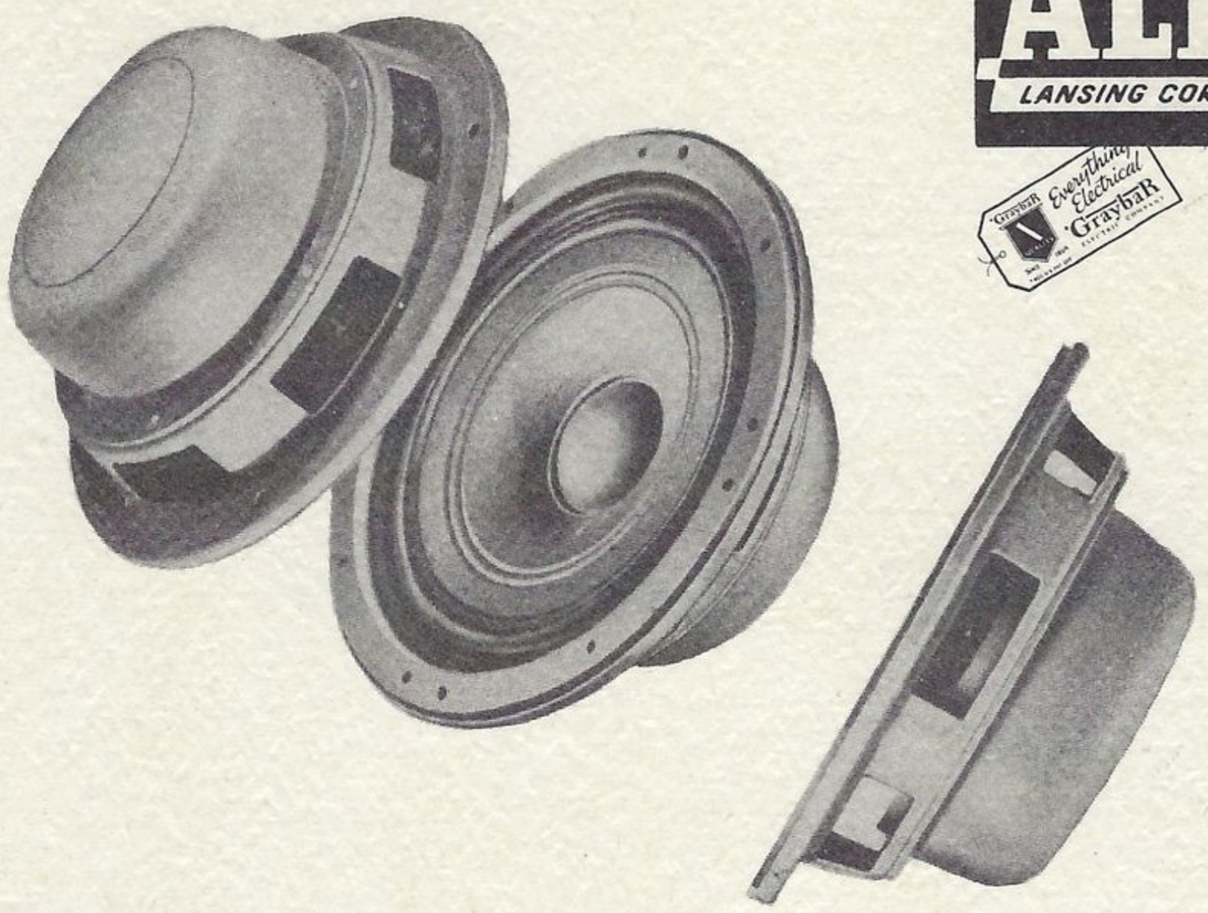
ALTEC LANSING CORPORATION

LOUDSPEAKER



Everything Electrical Graybar

755A

DESCRIPTION

The 755A Loudspeaker is a high quality unit in a small package—only eight inches in diameter and three inches deep. The extended frequency range of the loudspeaker assures crisp intelligible speech, and good music reproduction for public address systems. The wide coverage angle and medium power handling capacity make it ideal for multiple speaker installations. The frame of the 755A is heavy gauge steel and the entire unit is ruggedly constructed for continuous service. The shallow depth of the loudspeaker is very advantageous since it permits easy mounting in walls and ceilings of average depth.

APPLICATION

Ideal for low level distribution systems where multiple loudspeakers are used, such as wired program services, program distribution systems, public address installations and calling systems. Very good for broadcast station or recording studio monitoring, and perfectly suited for general utility use by the quality conscious in home installations.

ADVANTAGES

Exceptional frequency response; wide distribution angle; eight watts power handling capacity; compact size; shallow depth; rugged construction; versatility; quality at low cost.

TECHNICAL DATA

Frequency Response: 70-13,000 cycles.
Power Handling Capacity: 8 watts.
Voice Coil Impedance: 4 ohms.
Coverage Angle: 70 degrees.

Dimensions: 8 3/8" diam., 3 1/8" deep.
Weight: 4 pounds, 12 ounces.
Mounting Holes: Four equally spaced on 7 5/8" circle.
Speaker Enclosure: 2 cubic feet fully enclosed.

ORDERING INFORMATION

Order: 755A Loudspeaker.

Product may bear Western Electric Company or Altec Lansing Corporation label, depending upon factory in which it was produced.

1161 N. Vine St., Hollywood 38, California
161 Sixth Ave., New York 13, New York

ALTEC LANSING CORPORATION

AL-1201—1/50
PRINTED IN U.S.A.

Western Electric

728B Loud Speaker

Another in the series of

Loudspeakers which give

. . . the feeling of presence

THE 728B Loudspeaker represents an advanced application of the latest technique developed by the Bell Telephone Laboratories as a result of their never ending research and development in the interest of natural reproduction of sound.

It is particularly suitable for high quality Broadcast Station Monitoring, Wired Program Services, Sound Distribution Systems, Public Address, Radio Monitoring, and general utility.

This single direct-radiator type of loudspeaker with its compact construction, high power handling capacity, and low cost is ideally suited for application into new and existing sound systems where a wide frequency range must be reproduced by a single speaker. It is designed to respond to frequencies from 60 to 10,000 cycles.

The 728B is another in the famous series of Western Electric loudspeakers which give the *feeling of presence* — that characteristic which eliminates the consciousness that the program is coming through a loudspeaker.

Front view of the 728B Loudspeaker

SPECIFICATIONS FOR THE 728B LOUDSPEAKER

Frequency Response	Uniform 60 to 8,000 cycles with a gradual roll off to 10 db. down at 10,000 cycles.
Voice coil impedance	4 ohms
Coverage angle	50°
Power handling capacity	30 watts continuous
Efficiency	At a distance of 30 feet on axis the 728B will produce a level of 93.5 db above 10^{-16} watt per sq. cm. at 30 watts. This level is on a basis of a warble frequency covering a range from 500 to 2,500 cycles per second.
Diameter (overall)	12-11/32″
Depth (overall)	3-25/32″
Weight	17 pounds (approximate)
Baffle hole diameter	10-15/16″
Mounting holes	Four equally spaced on 11-9/16″ diameter.
Speaker enclosure required	3 cubic feet completely enclosed.

The low frequency response can be improved (within limits) by increasing the size of the speaker enclosure.

SPEAKER ENCLOSURE AND MOUNTING

For optimum performance under average conditions the enclosure should have a volume of three cubic feet, with no openings other than the baffle hole. Since its dimensions are not critical the enclosure can be designed to fit into almost any type of installation — a highly desirable feature.

Sloping-front cabinets are preferred in most installations. The following inside dimensions are for a typical three cubic foot enclosure that will give excellent results. Width 21″, height 23¾″, top depth 9¼″, bottom depth 12⅜″.

The enclosure should be constructed of wood not less than ¾″ thick. Inside surfaces of the box should be lined with sound absorbing material 1″ thick. If a grille cloth is used for covering the speaker it should be an open mesh material which has no audible effect on the high frequency response.

DISTRIBUTOR IN THE UNITED STATES

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5-G-47-25M

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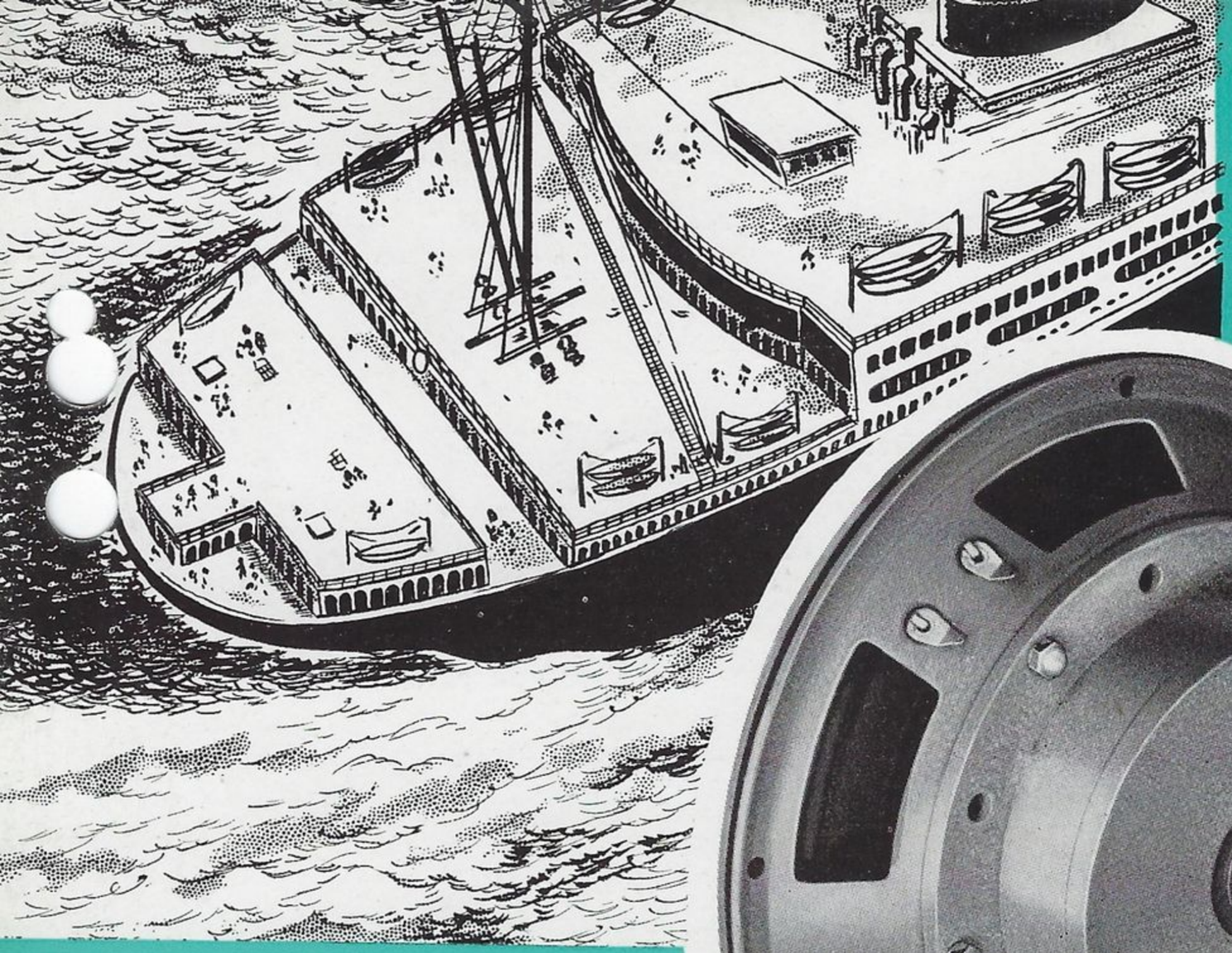
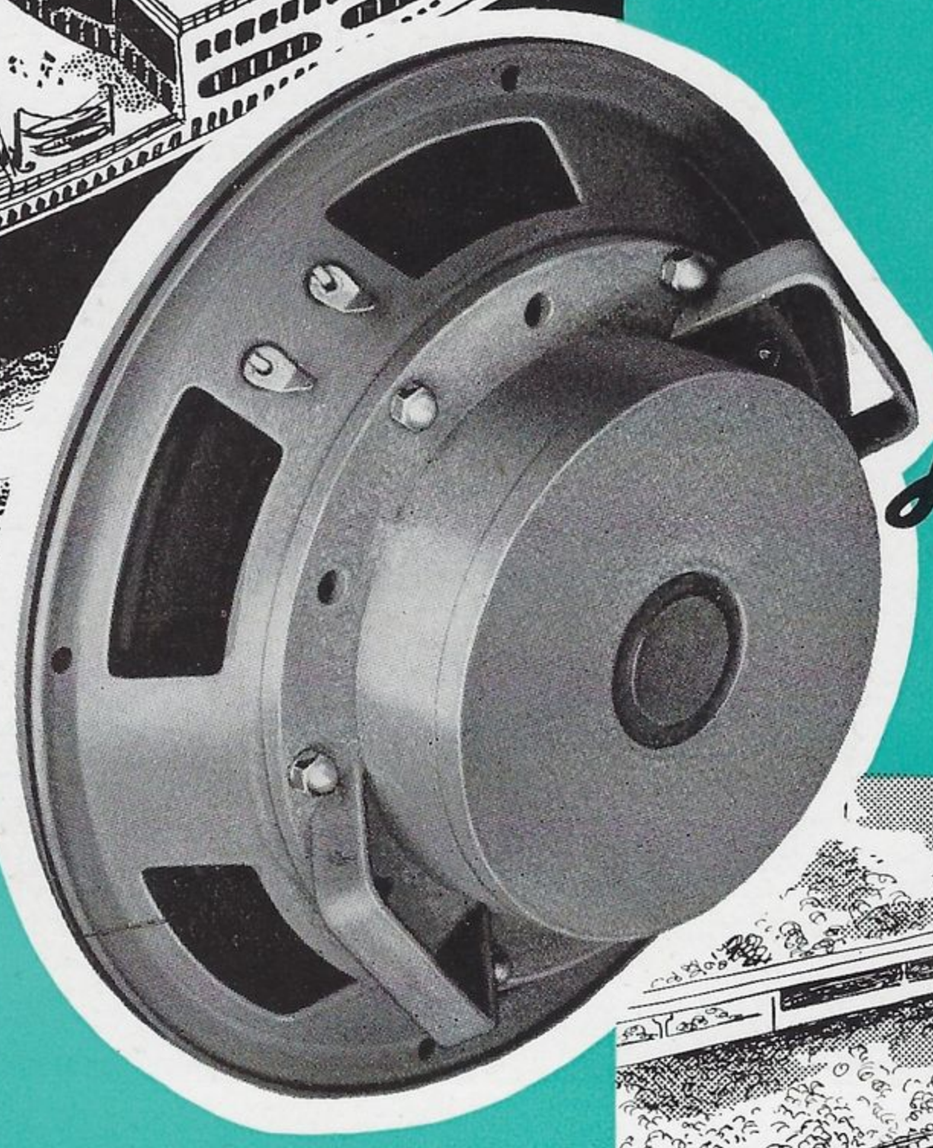


Western Electric 754B Loud Speaker



Another in the series of Loudspeakers which give . . . *the feeling of presence*

Western Electric, with its broad experience in producing equipment designed for application, has made available a loudspeaker especially suited for use where exposure and moisture are problems. For applications such as outdoor public address, program distribution systems, or sound distribution systems aboard ship, the 754B is the particular loudspeaker for the job.

Designed by Bell Telephone Laboratories, the 754B has a phenolic diaphragm, rugged construction, and excellent frequency response. Music and sound are reproduced so naturally that a psychological effect — *a feeling of presence* — is portrayed to the listener. An overall depth of only four inches for the 754B minimizes mounting space requirements. Optimum results for average conditions are obtained when the 754B Loudspeaker is mounted in a 3 cubic foot non-critically dimensioned enclosure.

The 754B is especially finished and protected for out-of-door use. All metal parts are treated with zinc plate and chromate and the exposed metal parts are finished in gray wrinkle.

FEATURES

Phenolic Diaphragm unaffected by moisture or salt spray
Excellent Frequency Response
Compact Rugged Construction
High Power Handling Capacity

TYPICAL SPECIFICATIONS

Frequency Response
60 to 8,000 cycles

Voice Coil Impedance
4 ohms

Coverage Angle
50°

Power Handling Capacity
30 watts continuous

Baffle Hole Diameter
$10\frac{15}{16}$″

Mounting Holes
Four equally spaced on $11\frac{9}{16}$″ diameter

Diameter Overall
13″

Depth Overall
4″

Weight
20 pounds

Finish
Treated with zinc plate and chromate and finished in gray wrinkle.

Speaker Enclosure Required
3 cubic feet completely enclosed.

Efficiency

At a distance of 30 feet on the axis the 754B will produce a level of 93.5 db above 10^{-16} watt per square centimeter at 30 watts input. This level is on a basis of a warble frequency covering a range from 500 to 2,500 cycles per second.

SPEAKER ENCLOSURE

For optimum performance under average conditions the enclosure should have a volume of three cubic feet with no openings other than the baffle hole. Since its dimensions are not critical the enclosure can be designed to fit into almost any type of installation — a highly desirable feature.

The following inside dimensions are for a typical three cubic foot enclosure, which produces excellent results. Width 21″, height $23\frac{3}{4}$″, top depth $9\frac{1}{4}$″, bottom depth $12\frac{3}{8}$″.

The enclosure should be constructed of wood not less than $\frac{3}{4}$″ thick. Inside surfaces of the box should be lined with sound absorbing material 1″ thick. If a grille cloth is used for covering the speaker it should be an open mesh material which has no audible effect on the high frequency response.

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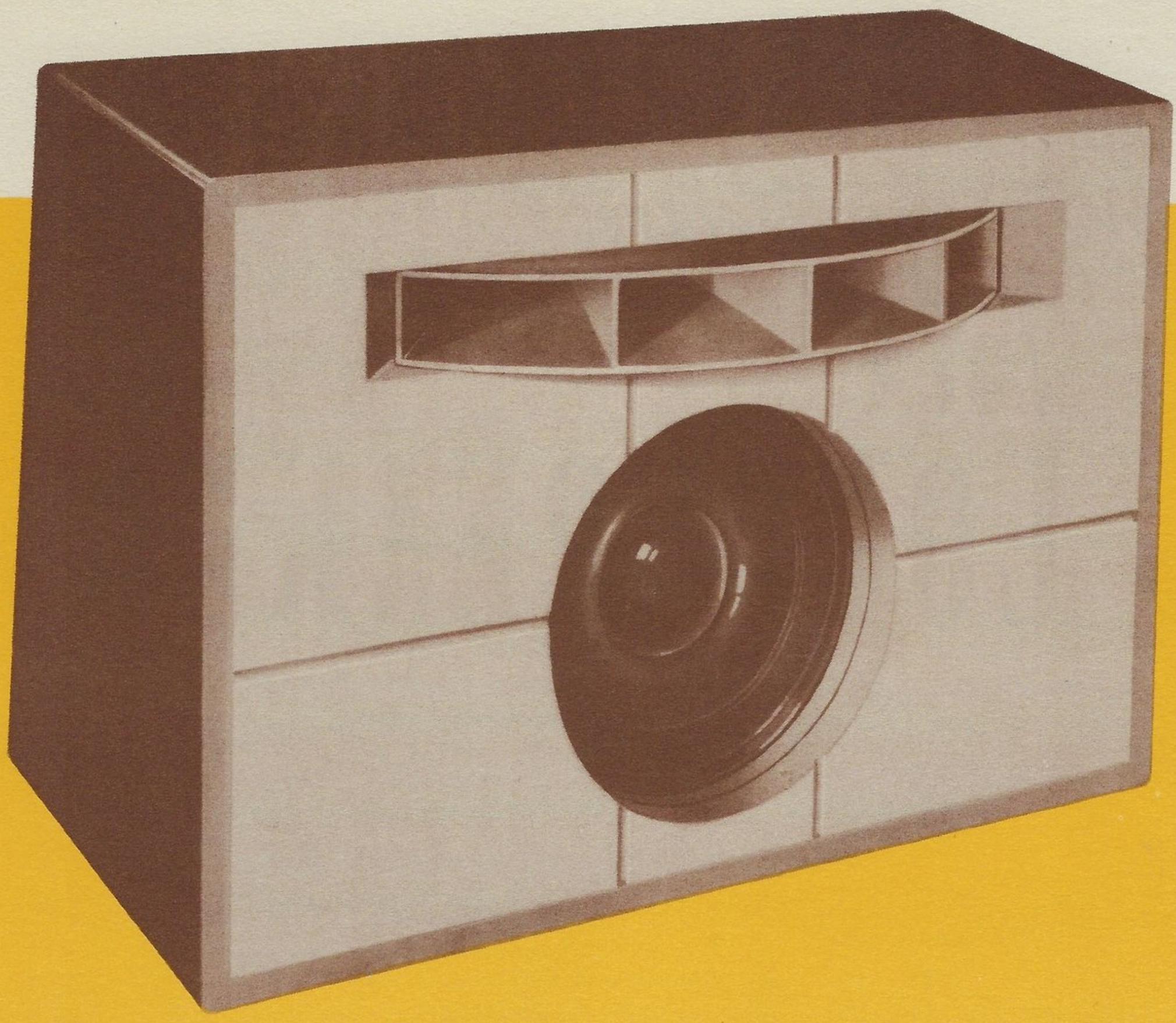
Western Electric

757A

LOUDSPEAKER

FOR THE FINEST IN MUSIC REPRODUCTION



THE 757A Loudspeaker has been developed at Bell Telephone Laboratories as the result of years of experience and leadership in building high quality sound reproducing equipment. It is an outstanding contribution to the sound reproduction field. The extended frequency response – uniform 60 to 15,000 cycles – and wide angle of distribution – make this loudspeaker ideal for recording studios, FM and AM broadcasting, program distribution systems, wired program services, and all other applications where highest quality in sound reproduction is required. The 757A is furnished in a utility cabinet which can be mounted in the walls of broadcast station control rooms, or it can be readily refinished (except for the acoustic material on the front) to blend into the architectural treatment of existing installations.

Where the decorative requirements make it desirable the utility cabinet can be easily mounted within a piece of furniture harmonizing with the other appointments.

The Western Electric 757A Loudspeaker utilizes two loudspeakers and a frequency dividing network. The low frequency loudspeaker is the Western Electric 728B which has been widely acclaimed for its unusual "presence" in reproduction. The high frequency loudspeaker is a 713C Receiver used in conjunction with a newly designed cast aluminum sectoral horn (KS-12027). The sectoral partitioning avoids reflections in the horn column. The horizontal sound distribution is 90 degrees. A suitable network is used to divide the audio input to the loudspeakers. A control is incorporated as a part of the network; it is pre-set at the factory for optimum performance; readjustment can be made when necessary to compensate for unusual acoustical conditions. The attenuator controls the over-all input to the high frequency receiver in four steps of approximately one db each, and is operated by means of a slotted screw in the rear of the cabinet.

Western Electric reserves the right, without notice, to make such changes in equipment design, or components as progress in engineering or manufacturing methods may warrant.

TYPICAL SPECIFICATIONS

Frequency Response	60 to 15,000 cycles
Crossover Frequency	1000 cycles
Coverage Angle	90° horizontal; 90° vertical
Power Handling Capacity	30 watts
Efficiency	At a distance of 30 feet on axis the 757A will produce a peak level of 93 db above 10^{-16} watt per square centimeter when reproducing speech and music at 30 watts.
Input Impedance	4 ohms (dividing network)
Cabinet	Acoustically treated front. Remainder of cabinet gray finish which can be refinished to blend with individual installations.
Dimensions	20" high, 30½" wide, 13¾" deep
Weight	82 pounds

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713C Loudspeaker RECEIVER for Sound Systems

WESTERN ELECTRIC'S 713C Receiver assures high quality in public address and monitoring systems in which dual loudspeakers are used. Designed by Bell Telephone Laboratories, this receiver mounts directly on to any one of four Western Electric Horns which are described herein. The 27A Receiver Attachment adapts the 713C Receiver for mounting on a fifth horn – the 31A Type.

A permanent magnet, moving coil, loudspeaking receiver primarily intended for use as a part of the 757A Loudspeaker and similar apparatus, it drives the high-frequency horn of a system using both this type and a low-frequency speaker. When coupled to any one of these horns, the 713C Receiver responds in the frequency range of 800 to 15,000 cycles. When frequencies below the low-frequency cutoff of the horn with which it is used are sufficiently attenuated, the 713C Receiver is capable of handling the full undistorted output of a 25-watt amplifier producing speech or music. The voice coil impedance is 4 ohms.

The 713C Receiver utilizes a small duralumin diaphragm in a magnetic structure excited by a permanent magnet. The voice coil which moves in an annular gap between the two field poles is attached to the duralumin diaphragm.

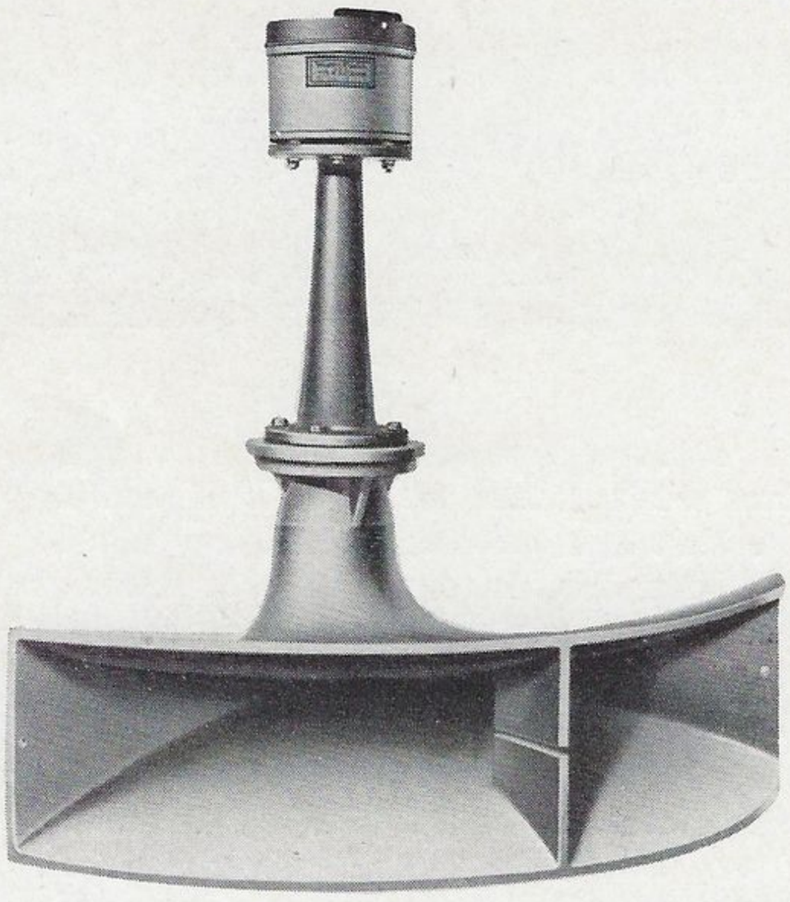
This receiver is approximately 4-5/16 inches in diameter and 4⅞ inches deep, and weighs about 8 pounds.

27A RECEIVER ATTACHMENT

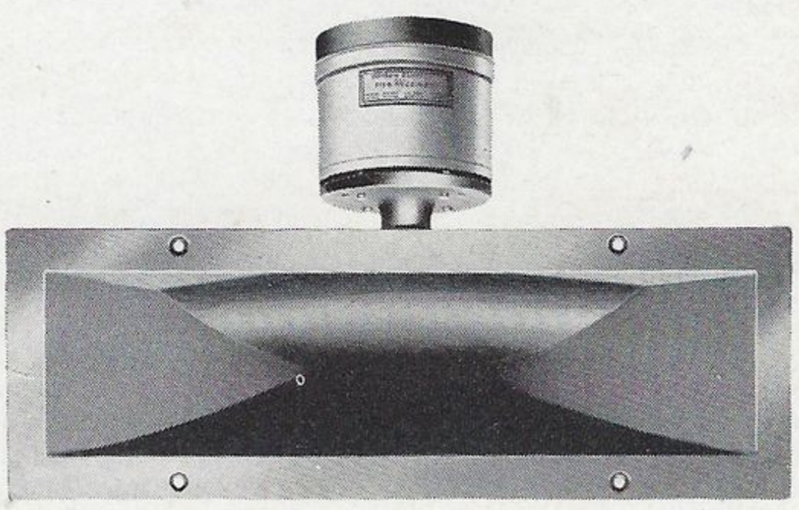
The Western Electric 27A Receiver Attachment serves as an adapter for coupling the 713C Receiver and the 31A Horn. This receiver attachment has the same finish as the 31A Horn. Made of aluminum, it weighs less than 1¾ pounds. The 27A Receiver Attachment is approximately 8 inches high and has flanges 4 inches in diameter at both ends.

Western Electric

713C



713C Receiver attached to 31A Horn by means of 27A Receiver Attachment



713C Receiver mounted directly on 32A Horn

The receiver for the high-frequency component of the high quality loudspeaker system shall be the Western Electric 713C or approved equivalent.

Note: Specify A, B or C below, depending on the distribution desired.

A. When coupled to a suitable horn, such as the Western Electric 31A, by means of the Western Electric 27A Receiver Attachment, the receiver shall have a response that is substantially uniform from 800 to 15,000 cycles. In this arrangement, the receiver shall be capable of reproducing speech or music at an intensity level of approximately 91 db above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn. When coupled to a suitable horn, such as the 31A, the horizontal coverage angle should be 120° and the vertical coverage angle should be 40°.

B. When coupled to a suitable horn, such as the Western Electric 32A, the receiver shall have a response that is substantially uniform from 800 to 15,000 cycles. In this arrangement, the receiver shall be capable of reproducing speech or music at an intensity level of approximately 93 db above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn. When coupled to a suitable horn, such as the 32A, the horizontal coverage angle should be 90° and the vertical coverage angle should be 60°.

C. When coupled to a suitable horn, such as the Western Electric KS-12024, KS-12025 or KS-12027, the receiver shall have a response that is substantially uniform from 800 to 15,000 cycles. In this arrangement the receiver shall be capable of reproducing speech or music at the following intensity db levels above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of these horns: KS-12024 96 db, KS-12025 94 db, KS-12027 93 db.

ENGINEERS' SPECIFICATIONS

When coupled to a suitable horn, such as the KS-12024, the horizontal coverage angle should be 50° and the vertical coverage angle should be 40°.

When coupled to a suitable horn, such as the KS-12025, the horizontal coverage angle should be 80° and the vertical coverage angle should be 40°.

When coupled to a suitable horn, such as the KS-12027, the horizontal coverage angle should be 90° and the vertical coverage angle should be 90°.

The receiver shall have a voice coil impedance of 4 ohms.

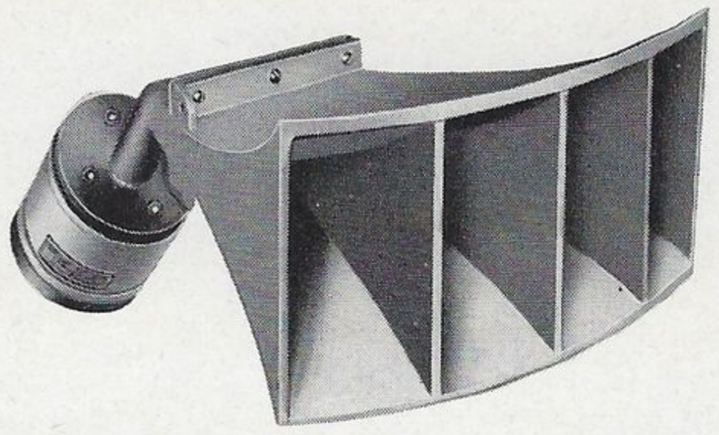
The receiver shall be a permanent magnet type and shall be equipped with a duralumin diaphragm to which an edgewise-wound aluminum ribbon voice coil is attached in such a manner as to provide for safe handling of the 25-watt power input capacity.

It shall be approximately 4-5/16 inches in diameter and 4⅞ inches deep, and shall weigh approximately 8 pounds.

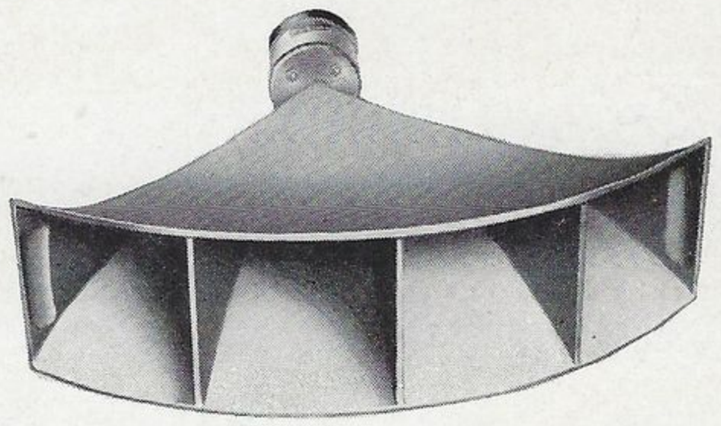
The associated low-frequency component of the high quality speaker system shall consist of a Western Electric 728B Loudspeaker or approved equivalent. The entire speaker system shall be housed in a wooden cabinet having an enclosed volume of at least three cubic feet. A suitable dividing network such as the Western Electric 702A and high frequency adjustable attenuator such as the Western Electric 700A shall be provided.

The complete high quality loudspeaker system, when equipped with a KS-12027 Horn shall be capable of reproducing, without appreciable distortion, a frequency range of 60 to 15,000 cycles and of providing a substantially uniform sound field over a horizontal angle of 90° and over a vertical angle of 90°.

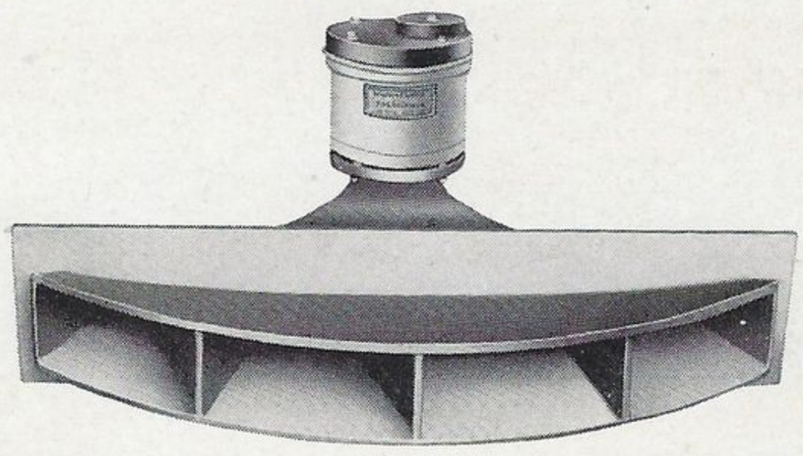
When handling the full undistorted output of a 30-watt amplifier in reproducing speech or music, the speaker system shall provide an intensity level of 93 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.



713C Receiver mounted directly on KS-12024 Horn



713C Receiver mounted directly on KS-12025 Horn



713C Receiver mounted directly on KS-12027 Horn

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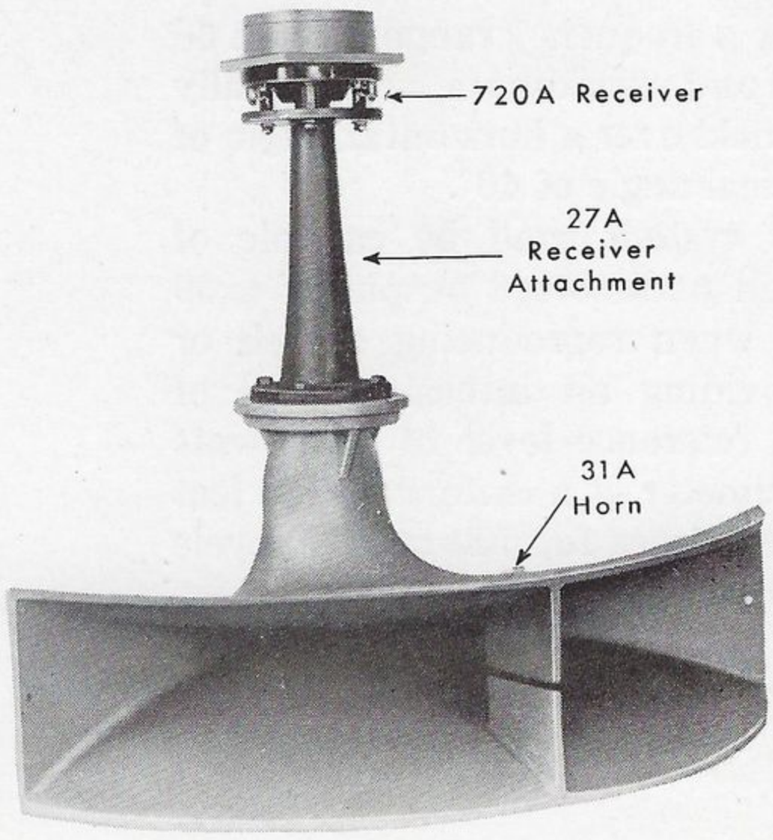
Western Electric

LOUD SPEAKING HORN

FOR SOUND SYSTEMS



31A HORN

The Western Electric 31A Horn is designed for speech or music reproduction in sound systems where wide angles of horizontal coverage are desired. This horn is used with either the Western Electric 720A Receiver or the Western Electric 713A Receiver when adapted with the 27A Receiver Attachment.

The 31A Horn is employed as the high frequency component of a high quality loud speaker system. The horn is capable of providing a uniform sound field over a horizontal angle of 120° and a vertical angle of 40°. It is an exponential horn and has a low frequency cut-off at 300 cycles.

This horn is a one piece aluminum casting finished with gray primer. It measures 23 inches wide by 9 inches high by 15 inches deep and weighs about 9½ pounds.

A bracket furnished with the horn provides a means for mounting it on a ceiling, sidewall, deck or platform and fixes the inclination at the desired angle.

27A Receiver Attachment

27A RECEIVER ATTACHMENT

The Western Electric 27A Receiver Attachment serves as an adapter for coupling the 713A or 720A Receivers and the 31A Horn. The receiver attachment has the same finish as the 31A Horn. Made of aluminum, it weighs less than 1¾ pounds. The 27A Receiver Attachment is approximately 8 inches high and has flanges at both ends which are 4 inches in diameter.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The horn shall be cast aluminum and finished with gray primer. It shall measure 23″ wide by 9″ high by 15″ deep.

Note: Insert either A or B—A when 31A Horn is specified for speech reproduction only with 720A Receiver; B when 31A Horn is used with 713A Receiver as part of a high quality loud speaker system.

A. The design of the horn shall be such that when equipped with the Western Electric 720A Receiver, or equivalent, it shall cover a frequency range of from 300 to 6500 cycles and provide a substantially uniform sound field over a horizontal angle of 120° and a vertical angle of 40°.

It shall also be capable when so equipped of handling the full undistorted output of a 30 watt amplifier when reproducing speech or music at 30 watts input from a 700 to 1300 cycle warble frequency source. Under these conditions, it shall provide a speech intensity level of +98 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

B. When used as a high frequency component of a high quality loud speaker system, the cut-over frequency should be between 700 and 1000 cycles. The design of the horn shall be such that when equipped with the Western Electric 713A Receiver, or equivalent, as part of a high quality loud speaker system, together with a suitable network and low frequency loud speakers such as Western Electric 728B dynamic type (mounted so as to have an enclosed volume of 3 cubic feet per unit), the combination shall form a speaker system capable of covering a frequency range of from 60 to 15,000 cycles and providing a substantially uniform sound field over a horizontal angle of 120° and a vertical angle of 40°.

The speaker system shall be capable of handling the full undistorted output of a 30 watt amplifier when reproducing speech or music and providing an intensity level of +91 db above reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn for 700 to 1300 cycle warble frequency band.

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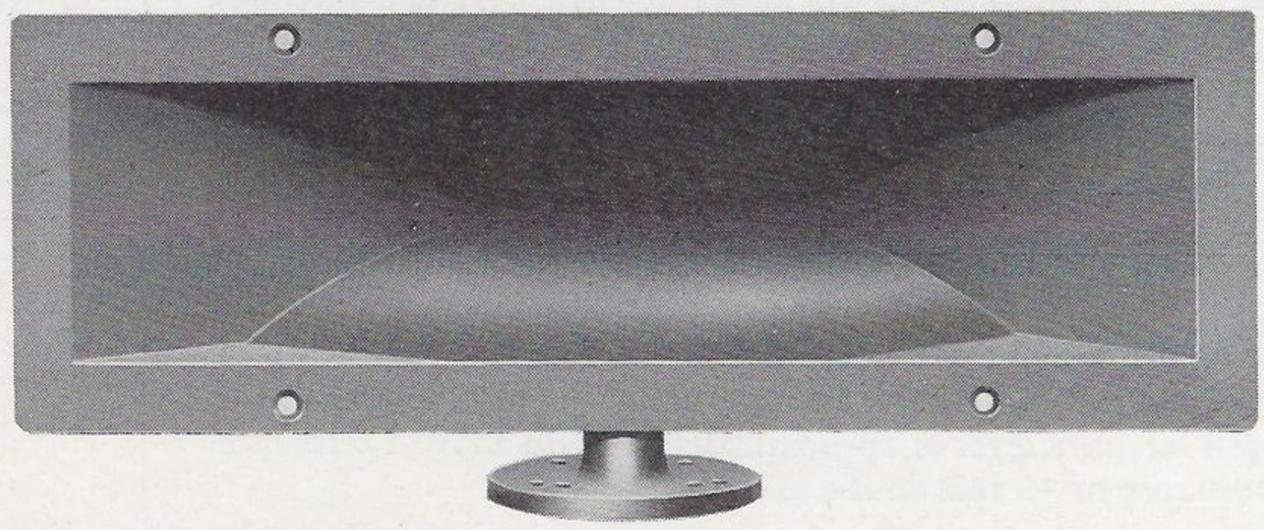
LOUDSPEAKING HORN
32A
Western Electric

32A LOUDSPEAKING HORN



for

SOUND SYSTEMS

THE WESTERN ELECTRIC 32A Horn is an exponential type horn designed for speech reproduction in sound systems where wide angles of horizontal coverage are desired.

The 32A Horn when equipped with the Western Electric 720A, 713B or 713C Receiver is capable of providing a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 60°.

In combination with a 720A Receiver, the 32A Horn will cover a frequency range from 500 to 6,500 cycles. The loudspeaker thus formed will handle the full undistorted output of a 30 watt amplifier when reproducing speech or music with frequencies around and below 500 cycles sufficiently attenuated. It will provide an intensity level of approximately 100 db above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn for the 720A when tested with a 700 to 1300 cycle warble frequency.

In combination with a 713B or 713C Receiver, the 32A Horn will cover a frequency range from 800 to 10,000 or 800 to 15,000 cycles, respectively. The loudspeaker thus formed will handle the full undistorted output of a 25 watt amplifier when reproducing speech or music with frequencies around and below 800 cycles sufficiently attenuated. It will provide an intensity level approximately 97 db for the 713B or 94 db for the 713C above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn based on rms peaks of speech or music.

The 32A Horn is a one piece aluminum casting finished with gray primer. It is equipped with a flange to facilitate mounting in a cabinet, baffle, or wall surface. The dimensions of the horn are 16 inches wide by 10 inches deep by 8½ inches high, and the weight is approximately 5 pounds.

Western Electric

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

Supply ___(quantity)___ Western Electric 32A Horn(s) or approved equivalent(s) which must possess the following characteristics:

The horn shall be cast aluminum and finished with gray primer. It shall measure 16 inches wide by 10 inches deep by 8½ inches high and shall weigh approximately 5 pounds.

NOTE: Insert A, B, or C—A, when the 32A Horn is specified for use with the 720A Receiver, B, when the 32A Horn is specified for use with the 713B Receiver, and C, when the 32A Horn is specified for use with the 713C Receiver.

A — The design of the horn shall be such that when equipped with the Western Electric 720A Receiver or equivalent, it shall cover a frequency range of 500 to 6500 cycles and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 60°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 30 watt amplifier when reproducing speech or music with all frequencies around and below 500 cycles sufficiently attenuated. Under these conditions, it shall provide a speech intensity level of approximately 100 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

B — The design of the horn shall be such that when equipped with the Western Electric 713B Receiver or equivalent, it shall cover a frequency range of from 800 to 10,000 cycles and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 60°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies around and below 500 cycles sufficiently attenuated. Under these conditions, it shall provide a speech intensity level of approximately 97 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

C — The design of the horn shall be such that when equipped with the Western Electric 713C Receiver or equivalent, it shall cover a frequency range of from 800 to 15,000 cycles and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 60°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies around and below 500 cycles sufficiently attenuated. Under these conditions, it shall provide a speech intensity level of approximately 94 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

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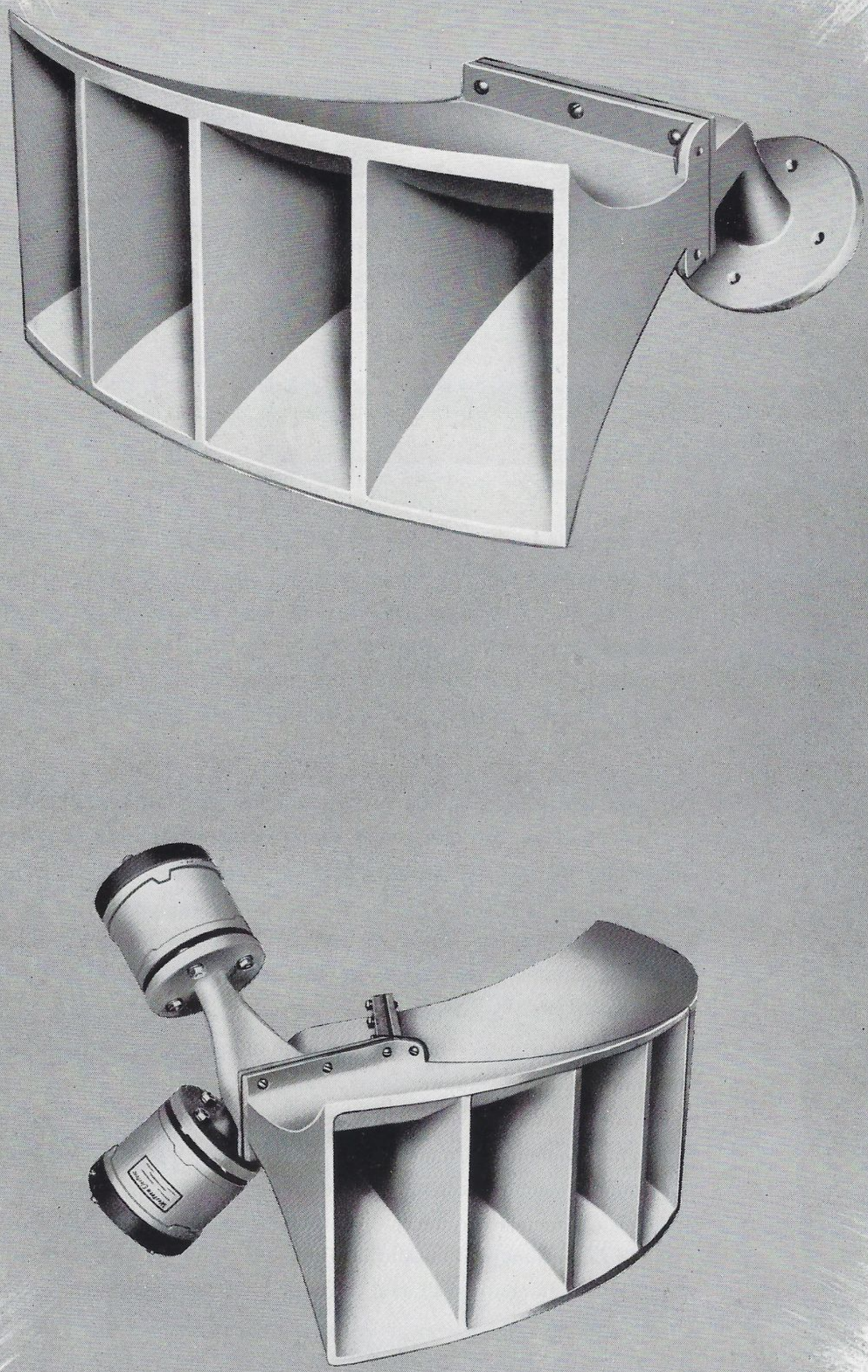

Western Electric

KS-12024 SECTORAL HORN

The Western Electric KS-12024 Sectoral Horn is an exponential type horn for speech and music reproduction in sound reinforcement systems. It is designed to be used with the Western Electric 713 or 720 type Receiver. When used with the 713 type Receiver, it is excellent for use in high fidelity public address systems when set up in conjunction with a high powered, low frequency direct radiator. When used with the 720A Receiver, the horn-receiver combination is an ideal single unit loudspeaking assembly for announcing or paging systems, or speech reinforcement systems in auditoriums or stadiums.

Western Electric KS-12024 SECTORAL HORN

When equipped with a 713 or 720 type Receiver, the KS-12024 Sectoral Horn is capable of providing a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 50° and a vertical angle of 40°. Two horns may be mounted adjacently and bolted together as shown in the photograph, when 100° coverage is required, or a cluster of horns may be formed to give 360° coverage.

The horn is provided with a flange, bolt holes and throat gasket to accommodate a 713 or 720 type Receiver. When equipped with the 713B Receiver, which has a phenolic diaphragm for rugged outdoor use, it will cover a frequency range of 800 to 10,000 cps, and when equipped with the 713C Receiver, it will cover a frequency range of 800 to 15,000 cps. The loudspeaker thus formed will handle the full undistorted output of a 25 watt amplifier when reproducing speech or music with frequencies below approximately 800 cps sufficiently attenuated. When the horn is equipped with the 720A Receiver, it will cover a frequency range of 500 to 6,500 cps; and the loudspeaker thus formed will handle the full undistorted output of a 30 watt amplifier when reproducing speech or music with frequencies below approximately 500 cps sufficiently attenuated. It will provide an intensity level of 100 db when used with the 713B Receiver, 96 db when used with the 713C Receiver, or 103 db with the 720A Receiver. All of these levels are above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

The dimensions of the horn are $16\frac{1}{2}$ inches long by $13\frac{5}{16}$ inches wide by $6\frac{3}{8}$ inches high. It weighs 7 pounds, and is finished in a durable black.

ARCHITECTS' and ENGINEERS' SPECIFICATIONS

Supply.....Western Electric KS-12024 Sectoral Horn(s) or approved equivalent(s) which must possess the following characteristics:

The horn shall be cast aluminum and finished in black. It shall measure 16 1/2 inches long by 13 5/16 inches wide by 6 3/8 inches high. It shall weigh approximately 7 pounds.

NOTE: Insert A, B, or C. A, when the KS-12024 Horn is specified for use with the 713B Receiver; B, when the KS-12024 Horn is specified for use with the 713C 4 ohm Receiver; C, when the KS-12024 Horn is specified for use with the 720A Receiver.

A — The design of the horn shall be such that when equipped with the 713B Receiver, or equivalent, it shall cover a frequency range of 800 to 10,000 cps and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 50° and a vertical angle of 40°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies below approximately 800 cps sufficiently attenuated. Under these conditions, it shall provide an intensity level of 100 db above reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

B — The design of the horn shall be such that when equipped with the Western Electric 713C Receiver, or equivalent, it shall cover a frequency range of from 800 to 15,000 cps and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 50° and a vertical angle of 40°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies below approximately 800 cps sufficiently attenuated. Under these conditions, it shall provide an intensity level of 96 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

C — The design of the horn shall be such that when equipped with the Western Electric 720A Receiver, or equivalent, it shall cover a frequency range of from 500 to 6,500 cps and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 50° and a vertical angle of 40°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 30 watt amplifier when reproducing speech with all frequencies below approximately 500 cps sufficiently attenuated. Under these conditions, it shall provide an intensity level of 103 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

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Western Electric

KS-12025 SECTORAL HORN

An exponential type horn for speech and music reproduction in sound reinforcement systems.

Western Electric

KS-12025

This horn is designed to be used with the Western Electric 713 or 720 type Receiver. When used with the 713 type Receiver, it is excellent for use in high fidelity public address systems when set up in conjunction with a high powered, low frequency direct radiator. When used with the 720A Receiver, the horn-receiver combination is an ideal single unit loudspeaking assembly for announcing or paging systems, or speech reinforcement systems, in auditoriums or stadiums.

When equipped with a 713 or 720 type Receiver, the KS-12025 Sectoral Horn is capable of providing a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 80° and a vertical angle of 40°.

The horn is provided with a flange, bolt holes and throat gasket to accommodate a 713 or 720 type Receiver. When equipped with the 713B Receiver, which has a phenolic diaphragm for rugged outdoor use, it will cover a frequency range of 800 to 10,000 cps, and when equipped with the 713C Receiver, it will cover a frequency range of 800 to 15,000 cps. The loudspeaker thus formed will handle the full undistorted output of a 25 watt amplifier when reproducing speech or music with frequencies below approximately 800 cps sufficiently attenuated. When the horn is equipped with the 720A Receiver, it will cover a frequency range of 500 to 6,500 cps; and the loudspeaker thus formed will handle the full undistorted output of a 30 watt amplifier when reproducing speech or music with frequencies below approximately 500 cps sufficiently attenuated. It will provide an intensity level of 98 db when used with the 713B Receiver, 94 db when used with the 713C Receiver, or 101 db with the 720A Receiver. All of these levels are above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

The dimensions of the horn are 19 inches long by 23-21/32 inches wide by 6⅜ inches high. It weighs 12 pounds, and is finished in a durable black.

SECTORAL HORN

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

Supply.....Western Electric KS-12025 Sectoral Horn(s) or approved equivalent(s) which must possess the following characteristics:

The horn shall be cast aluminum and finished in black. It shall measure 19 inches long by 23-21/32 inches wide by 6⅜ inches high. It shall weigh approximately 12 pounds.

NOTE: Insert A, B, or C. A, when the KS-12025 Horn is specified for use with the 713B Receiver; B, when the KS-12025 Horn is specified for use with the 713C 4 ohm Receiver; C, when the KS-12025 Horn is specified for use with the 720A Receiver.

A — The design of the horn shall be such that when equipped with the 713B Receiver, or equivalent, it shall cover a frequency range of 800 to 10,000 cps and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 80° and a vertical angle of 40°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies below approximately 800 cps sufficiently attenuated. Under these conditions, it shall provide an intensity level of 98 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

B — The design of the horn shall be such that when equipped with the Western Electric 713C Receiver, or equivalent, it shall cover a frequency range of from 800 to 15,000 cps and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 80° and a vertical angle of 40°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies below approximately 800 cps sufficiently attenuated. Under these conditions, it shall provide an intensity level of 94 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

C — The design of the horn shall be such that when equipped with the Western Electric 720A Receiver, or equivalent, it shall cover a frequency range of from 500 to 6,500 cps and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 80° and a vertical angle of 40°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 30 watt amplifier when reproducing speech with all frequencies below approximately 500 cps sufficiently attenuated. Under these conditions, it shall provide an intensity level of 101 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

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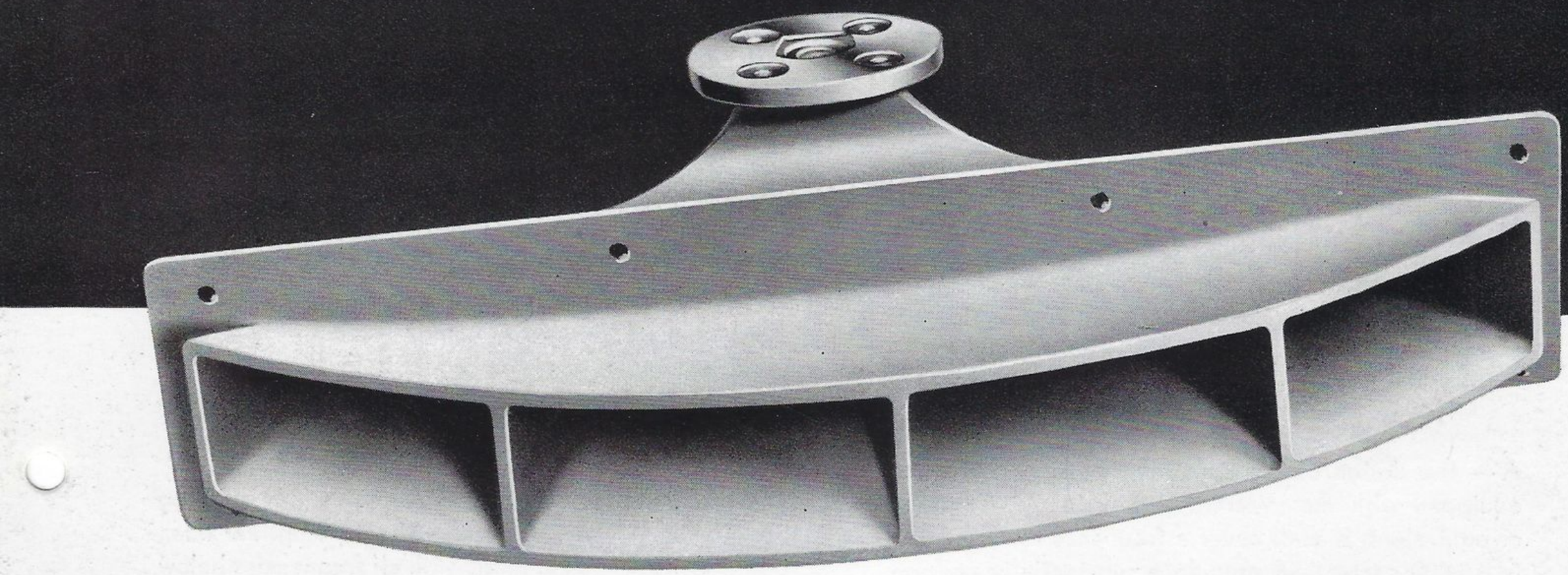
Western Electric

LOUDSPEAKING HORN for SOUND SYSTEMS



THE KS-12027 Sectoral Horn is an exponential horn made of cast aluminum. Its compact design makes it highly applicable for use in two-way loudspeaker systems where space limitations are a factor. While intended primarily for use as a part of a high quality speaker system such as the Western Electric 757A, the KS-12027 Horn may also be used to advantage as an independent speaker for sound reinforcement and monitoring purposes.

The KS-12027 Sectoral Horn when equipped with the Western Electric 713C or 720A Receiver is capable of providing a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 90°. The horn is sectoral in form and integrally cast partitions are provided to reduce reflection effects within the sound passage. The throat is given a downward bend of 90° in order to reduce the fore and aft space that is required. In combination with a 713C Receiver, the KS-12027 Horn will cover a frequency range from 800 to 15,000 cycles. The loudspeaker thus formed will handle the full undistorted output of a 25 watt amplifier when reproducing speech or music with frequencies below 800 cycles sufficiently attenuated. It will provide an intensity level of approximately 93 db

above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

In combination with a 720A Receiver, the KS-12027 Horn will cover a frequency range from 500 to 6,500 cycles. The loudspeaker thus formed will handle the full undistorted output of a 30 watt amplifier when reproducing speech or music with all frequencies below approximately 500 cycles sufficiently attenuated. It will provide an intensity level approximately 100 db above 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

Supply ..... Western Electric KS-12027 Horn(s) or approved equivalent(s) which must possess the following characteristics:

The horn shall be cast aluminum and finished with gray enamel. The approximate clearance dimensions shall be: length (center of front to rearmost edge of receiver flange) $13\frac{1}{2}$ inches, width of frontal area $19\frac{5}{16}$ inches, and height of frontal area $2\frac{9}{16}$ inches. It shall weigh approximately 10 pounds.

NOTE: Insert either A or B, A, when the KS-12027 Horn is specified for use with the 713C Receiver; B, when the KS-12027 Horn is specified for use with the 720A Receiver.

A — The design of the horn shall be such that when equipped with the Western Electric 713C Receiver, or equivalent, it shall cover a frequency range of 800 to 15,000 cycles and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 90°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 25 watt amplifier when reproducing speech or music with all frequencies below 800 cycles sufficiently attenuated. Under these conditions, it shall provide an intensity level of 93 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

B — The design of the horn shall be such that when equipped with the Western Electric 720A Receiver, or equivalent, it shall cover a frequency range of from 500 to 6,500 cycles and provide a substantially uniform coverage angle with respect to both frequency and intensity over a horizontal angle of 90° and a vertical angle of 90°.

It shall also be capable, when so equipped, of handling the full undistorted output of a 30 watt amplifier when reproducing speech or music with all frequencies below approximately 500 cycles sufficiently attenuated. Under these conditions, it shall provide an intensity level of 100 db above a reference level of 10^{-16} watt per square centimeter at a distance of 30 feet on the axis of the horn.

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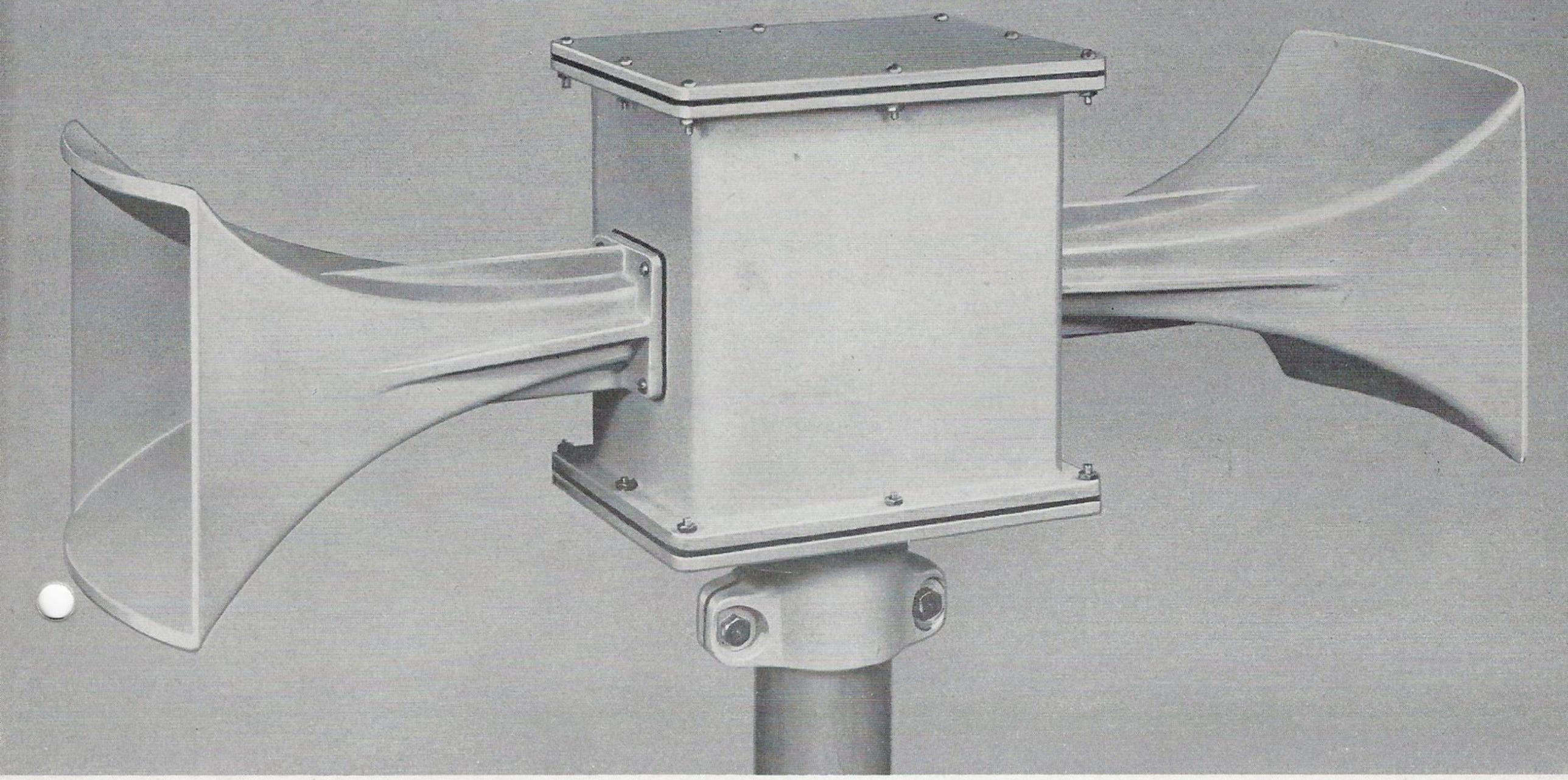
Western Electric

KS-12047 HORN



THE KS-12047 Horn is a bi-directional horn for high-level talk-back systems. It was designed at Bell Telephone Laboratories for Western Electric after extensive studies into the requirements of two-way talk-back systems in noisy locations, such as railroad yards, open pit mines, steel mills, and factories. It is also particularly suitable for announcing systems such as are used on railway platforms. The horn is weatherproof and ruggedly built to withstand severe industrial applications.

When equipped with a Western Electric 720A Receiver (driver unit), the horn may be operated at a continuous electrical power input of 30 watts, which will create a sound level of 100 db at 30 feet on the axis of the horn. Under background conditions of 60 db, the horn will project speech clearly to a distance of at least 300 feet over its rated angle of coverage. The directional properties of this horn confine the sound to the area to be covered. Thus, in railway stations, for example, train and other announcements can be directed along selected passenger platforms without disturbing persons elsewhere in the vicinity.

As part of a Western Electric Sound System, the KS-12047 Horn, equipped with a 720A Receiver, assures highly dependable and efficient results. When used in talk-back applications, such a system will give instant voice-to-voice contact between the central control point and persons working in remote locations. Based on actual tests it is estimated that the horn and receiver combination when used as a microphone will pick up speech within its coverage angle up to a distance of 100 feet.

TYPICAL SPECIFICATIONS

Coverage Angle Vertical, 30 degrees
Horizontal, 45 degrees

Dimensions Length 31⅝ inches, from tip of one horn to tip of other horn.
Width 9½ inches, over-all.
Height 13 3/16 inches.

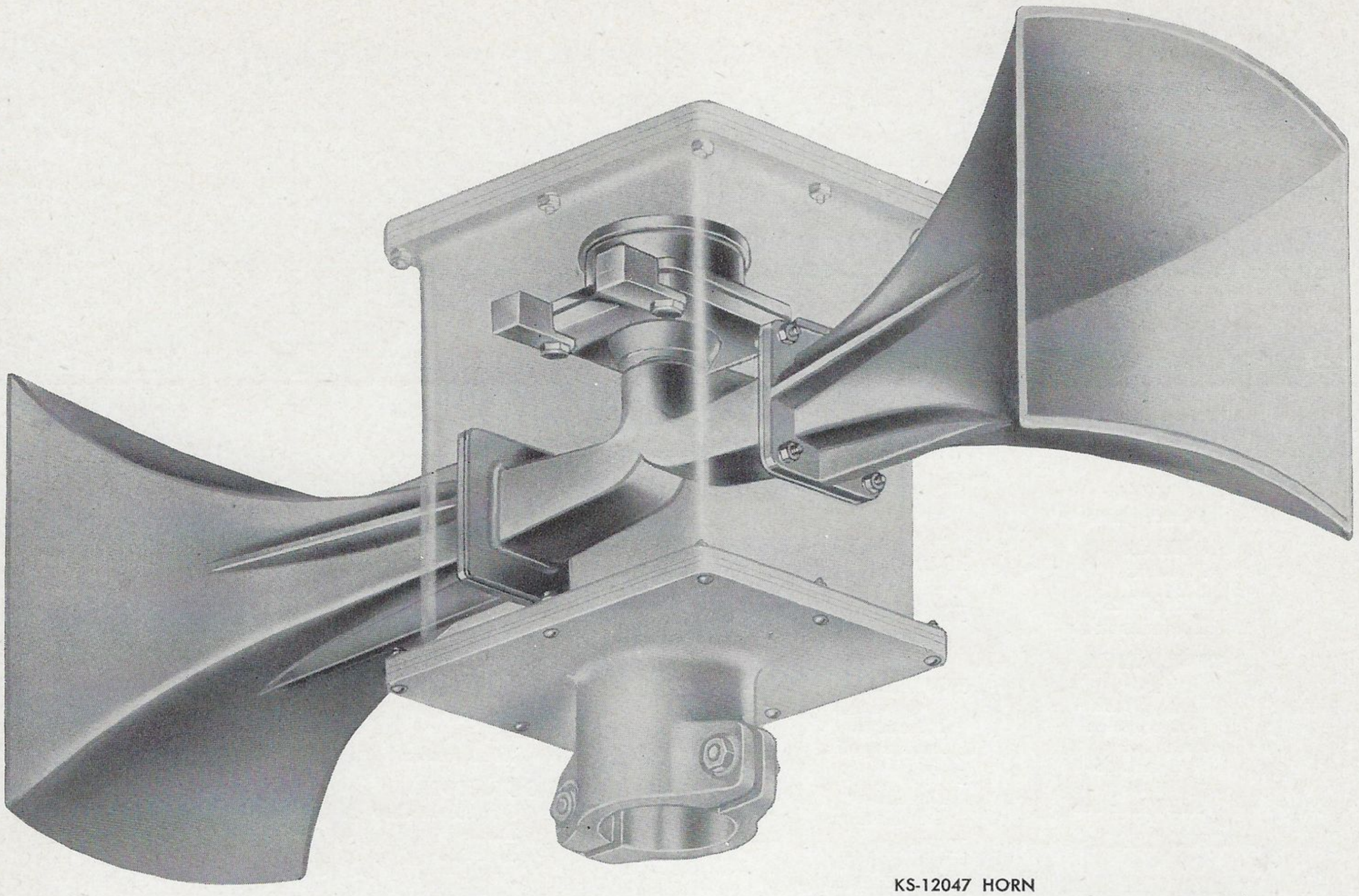
Weight Approximately 24 pounds.

Mounting Arranged to clamp on a standard 2½ inch pipe.

Loudspeaker unit Designed for Western Electric 720A Receiver.

Western Electric reserves
such changes in equipmer
gress in engineering or ma

C KS-12047 HORN



KS-12047 HORN

SKELETON VIEW OF KS-12047 HORN ASSEMBLED FOR USE. THE 720A RECEIVER SHOWN MUST BE ORDERED SEPARATELY.

KS-12047 HORN with 720A RECEIVER

(720A Receiver must be ordered separately)

Power Handling Capacity	30 watts continuous
Frequency Response	500—6500 cycles per second
Power Output Level (when used as a microphone)	—40 dbm for a sound pressure of 1 dyne per square centimeter. This sound level is approximately that of a man speaking loudly at a distance of 3 feet.
Sound level at a distance of 30 feet on the axis at 30 watts (sinusoidal)	100 db
Dimensions	3¼" (including studs) x 4 1/16"
Weight	4 pounds

right, without notice, to make design, or components as pro- acturing methods may warrant.

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LOUDSPEAKERS
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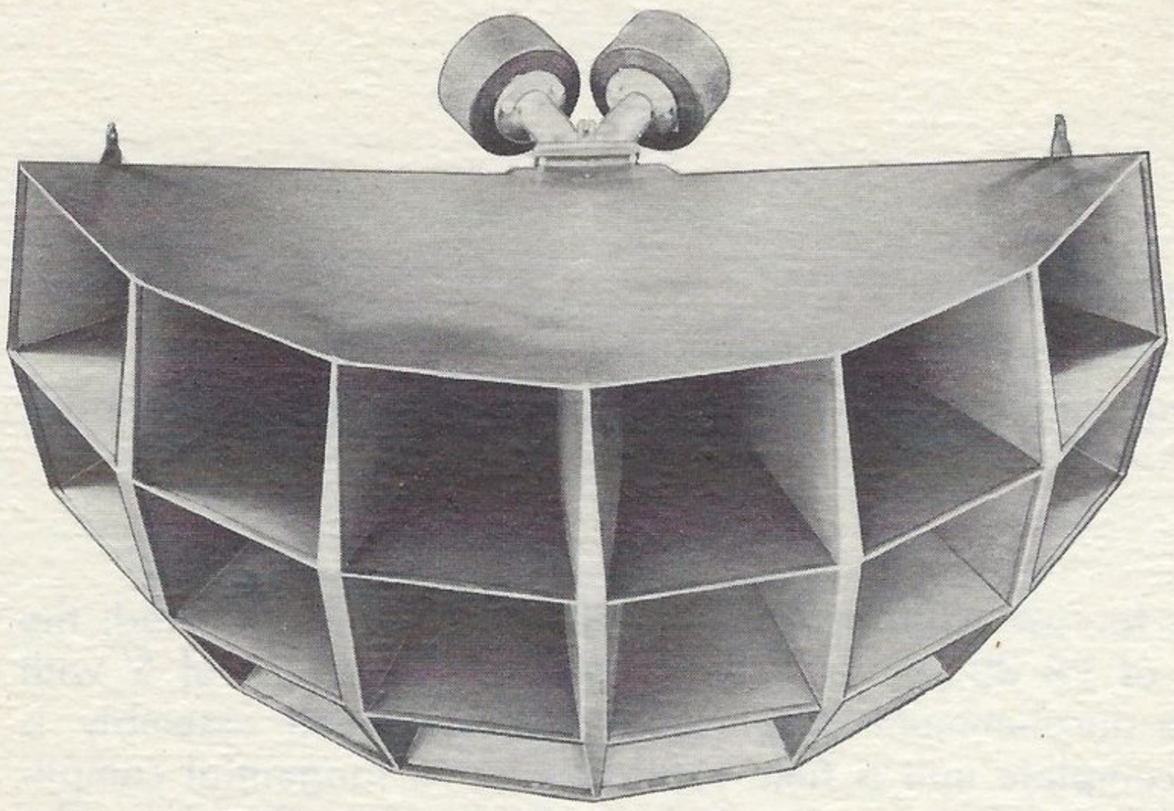
CABINETS
TEST EQUIPMENT
TRANSFORMERS
AM-FM TUNERS
TELEVISION



ALTEC LANSING CORPORATION

HORNS

MULTICELLULAR

DESCRIPTION

Altec multicellular horns are constructed by groups of exponential horn cells in different configurations to meet various distribution requirements. Each cell has a distribution angle of approximately twenty degrees. Different configurations are available to provide total distribution angles from 70° x 35° to 125° x 60°. For example, the 1505 horn has a distribution angle of 100° x 60°. The code number of the horn is arranged so the first one or two numbers indicate the number of cells and the last number the theoretical cutoff in hundreds of cycles. Thus, the 1505 horn has 15 cells and a cutoff of 500 cycles.

At distances of 200 feet or more, a 300 cycles horn will produce a sound quality equal to that obtained from a 500 cycle horn at half the distance. This is because a higher ratio of direct to reverberant sound reaches the listener from a 300 cycle horn than from a 500 cycle unit, giving a greater illusion of presence.

When used alone or with low frequency units, the N-500C dividing network should be employed. However, if the driving units are being used at less than 50% of rated power, an r-c network in the amplifier having an attenuation of 6 db per octave beginning at 800 cycles will be sufficient.

APPLICATION

These horns are designed for use in all applications where a large number of people, or a large area, must be covered with high intelligibility. The horns also find many applications in reverberant rooms and halls where their controlled directionality permits a higher level of gain before feedback.

ADVANTAGES

Multicellular horns are the most perfect horns that have been designed to give a smooth distribution pattern. These horns, when used with the Altec 290 high frequency driver unit, provide the highest possible quality over their rated frequency range. Smoothness of response decreases the tendency for acoustical feedback between microphone and loudspeaker. These multicellular horns provide a much higher degree of intelligibility at lower power than can be obtained from a horn of the re-entrant type. This factor, along with the extremely high efficiency of the units, greatly improves voice transmission in the presence of high background noise such as found in factories and at sports arenas.

(OVER)

ALTEC LANSING CORPORATION
1161 N. Vine St., Hollywood 38, California
161 Sixth Ave., New York 13, New York

AL-1207—1
PRINTED IN U.S.A.

ORDERING INFORMATION

Order horn by code number shown in specifications.
Order horn throat or throats by code numbers shown in specifications.
Order the proper number of 290 high frequency speaker units for use with the horn and throat.

290 SPEAKER

This speaker unit is designed specifically for use with all Altec multicellular horns. So used, the 290 speaker will produce a sound level of 98 db (ref 10^{-16} watts/cm^2) at a distance of 5' with an input of 0.1 watt at 1 kc. The entire duraluminum diaphragm and voice coil assembly is mounted in a cast bakelite ring and the complete unit is field replaceable. A tangential compliance on the diaphragm is used to provide a large excursion without distortion or damage. The voice coil is edge-wound flat aluminum ribbon to reduce weight and increase efficiency. An acoustically designed cap encloses the rear of the diaphragm and acts as a high pass filter to damp movement of the diaphragm at low frequencies.

POWER CAPACITY: 30 watts above 300 cycles.

IMPEDANCE: 24 ohms under normal horn loading conditions.

DIMENSIONS: Dia., 6⅛"; height, 4⅞".

WEIGHT: 21 lbs.

FREQUENCY RESPONSE: 500 - 10,000 cycles.

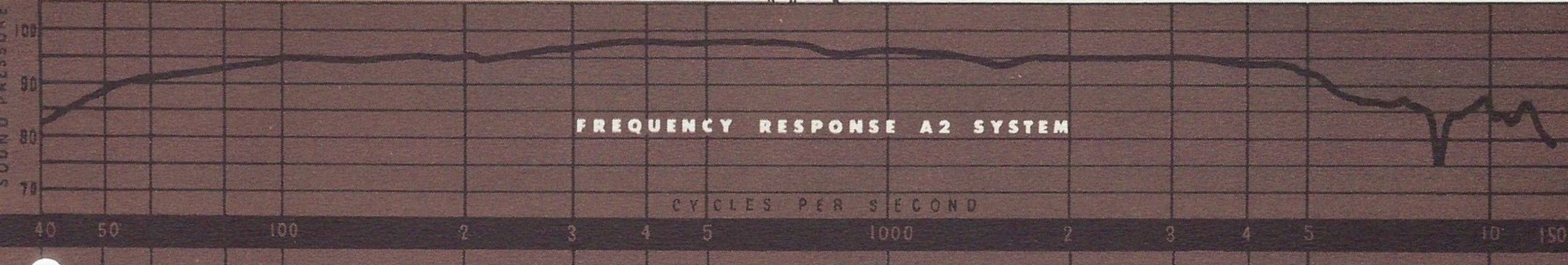
Horn Code No.	Cell Configuration	Sound Distribution		Dimensions	Throat Code No.			Net Weight
		Vertical	Horizontal	L-W-H	1 Unit	2 Units	4 Units	(Less Speakers)
H-1804	3x6	60°	125°	38x45x29			(2)30170	
							(1)30296	180
H-1803	3x6	53°	105°	35x43x25	30166	30172		184
H-1505	3x5	60°	100°	27x30x25		30172		90
H-1504	3x5	60°	105°	34x40x24			(2)30170	
							(1)30296	160
H-1203B	2x6	35°	105°	36x43x18	30210	30170		152
H-1005	2x5	40°	100°	27x30x17	30210	30170		55
H-1004	2x5	40°	110°	35x38x21			(2)30170	
							(1)30296	80
H-1003	2x5	35°	90°	35x40x18	30210	30170		131
H-808	2x4	40°	80°	17x18x9				10
H-805	2x4	40°	80°	27x24x17	30162			45
H-804	2x4	40°	80°	35x31x17		30172		75
H-803	2x4	35°	70°	36x32x17	30162			86

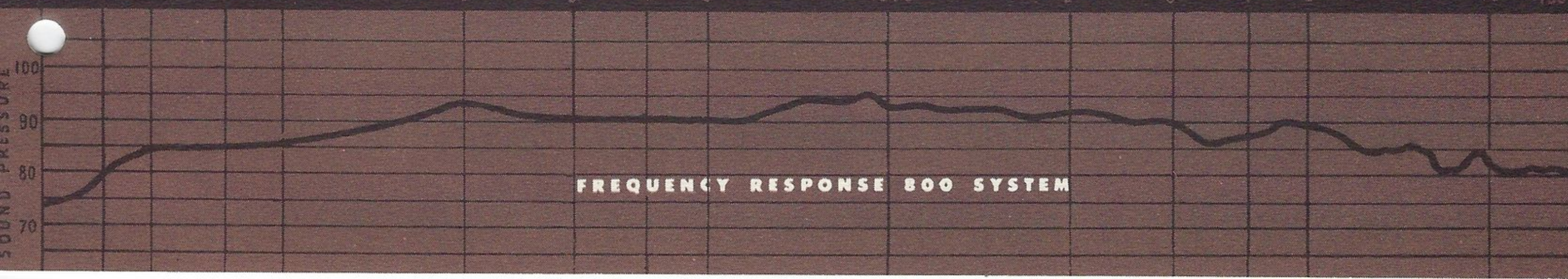
ALTEC LANSING

"VOICE OF THE THEATRE"

SPEAKER SYSTEMS

ALTEC LANSING CORPORATION





These factors result in the recognized superiority of the "Voice of the Theatre"

LIVE SCREEN PRESENCE for intimate dialogue.

HIGH INTELLIGIBILITY
for comfortable listening pleasure.

TRUE BASS REPRODUCTION
for greater music enjoyment.

GREATER OPERATING DEPENDABILITY
for less management worry.

HIGH ACOUSTIC EFFICIENCY
to prevent distortion from overload of amplifier.

SMOOTH FREQUENCY RESPONSE
covering entire recorded range of frequencies.

NO BACKSTAGE ACOUSTIC TROUBLE
causing boomy male voices.

DURABLE AND STURDY CONSTRUCTION
for dependable service.

EXCLUSIVE DESIGN FEATURES

- Direct radiating low frequency horn.
- Tangential compliance metal diaphragm in high frequency speaker.
- Low frequency speaker voice coil of edge wound flat copper wire.
- Field replaceable speaker cones and diaphragms.
- Truly exponential multicellular high frequency horn.
- High frequency speaker voice coil of edge wound flat aluminum wire.
- Use of large Alnico V P.M. Magnets.
- Large safety factor in design and rating.

Leading manufacturers of theatre sound systems include The Voice of the Theatre as standard equipment with their systems.

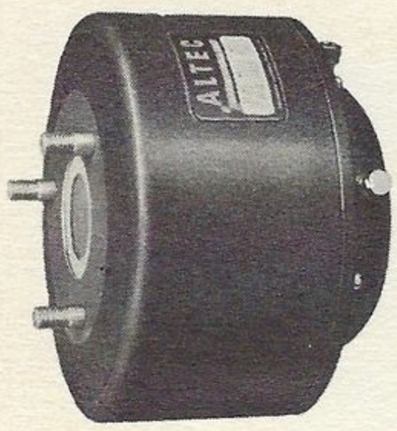
The purchase of The Voice of the Theatre is a long term investment capable of realizing full benefits from future technical developments for years to come.

Impartial acoustical measurement tests demonstrate the clear superiority of THE VOICE OF THE THEATRE over all other speaker systems. Note the frequency response curves on the front page. *These response curves have not been equaled by any other make of speaker system.*

ALTEC
LANSING CORPORATION

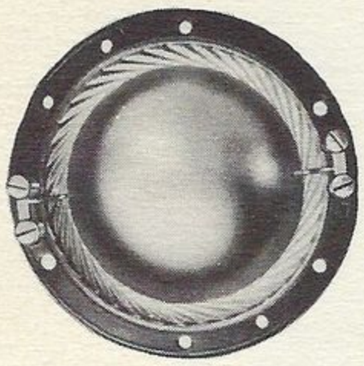
A SPEAKER SYSTEM IS NO BETTER THAN ITS COMPONENTS

These features of the "Voice of the Theatre" contribute to its superiority of performance



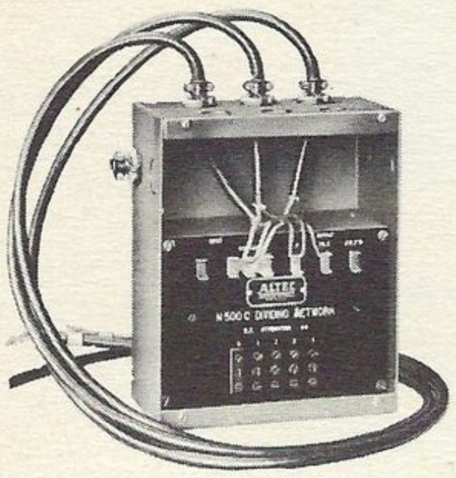
PRECISION BUILT HIGH FREQUENCY UNIT

The secret of the smooth high frequency response, great efficiency, live screen presence and high intelligibility of The Voice of the Theatre lies in the design of the 288 and 802B High Frequency Speaker Units. The very large Alnico V Permanent Magnet, plus extremely close manufacturing tolerances, plus the edge wound flat aluminum coil, contribute to these features. The Diaphragm Assemblies are field replaceable, eliminating the necessity of replacing and returning for repair the entire speaker unit in case of damage. The tangential compliance metal diaphragm is another important, superior feature of these units.



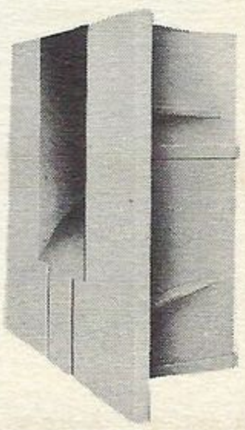
EFFICIENT AND RUGGED LOW FREQUENCY SPEAKER

The 515 and 803 Low Frequency Speaker Units are 15" speakers designed especially for the reproduction of low frequencies. They use the Altec Lansing principle of edge winding voice coil from flat ribbon wire for greater efficiency and power producing ability. The voice coil is 3" in diameter, allowing a more rigid coupling between the voice coil and the cone for better low frequency reproduction. The cone and voice coil assembly is field replaceable. A large Alnico V Permanent Magnet supplies the magnetic field.



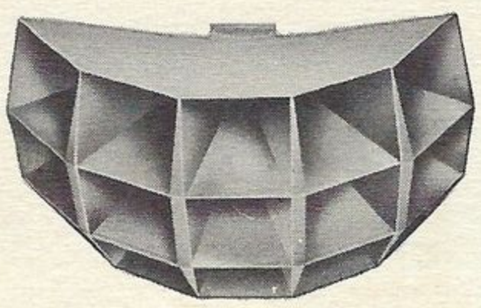
TWO-SECTION DIVIDING NETWORK

Both the N-500C Network and the N-800D Network are full two-section, parallel type, constant resistance networks with provisions for attenuating high frequency output so that the system can be adjusted to meet the requirements of any auditorium. The N-500C Network is designed for crossover at 500 cycles, and the N-800D Network, used with the "800" System, has a crossover at 800 cycles.



LOW FREQUENCY HORN UTILIZES ALL ENERGY

All types of Voice of the Theatre low frequency horns use the exclusive Altec Lansing design of direct radiation from the low frequency speaker through an exponential horn directly into the auditorium without the loss of frequencies which result in transmission through the conventional folded type low frequency horn. This exclusive design also completely eliminates annoying backstage reverberation and boominess. The design of the low frequency horn for direct radiation from the low frequency unit prevents the frequency response hole at crossover.



TRULY EXPONENTIAL HIGH FREQUENCY HORN

All types of high frequency horns used with The Voice of the Theatre systems consist of individual cells, each of which is truly exponential for best high frequency reproduction. There is no better way to obtain smooth high frequency distribution than through the use of the multicellular horn. Various configurations of cells are available so that ideal distribution can be obtained in any auditorium