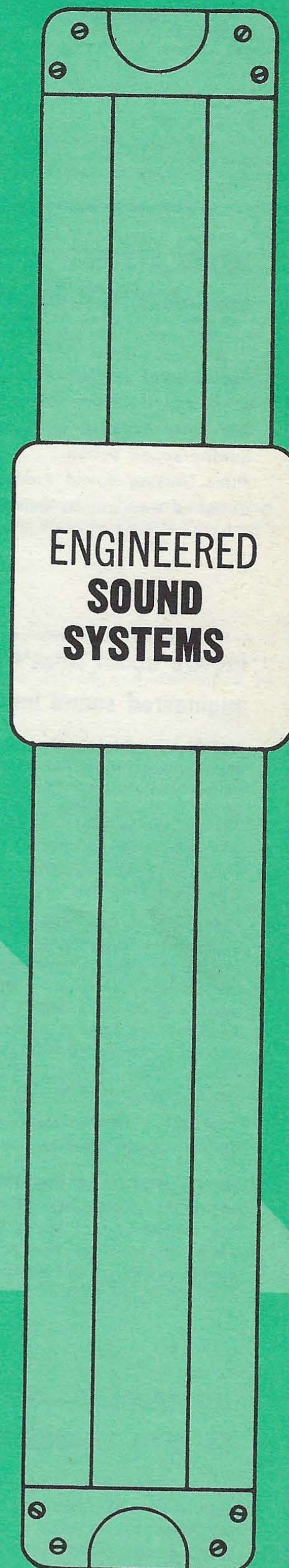
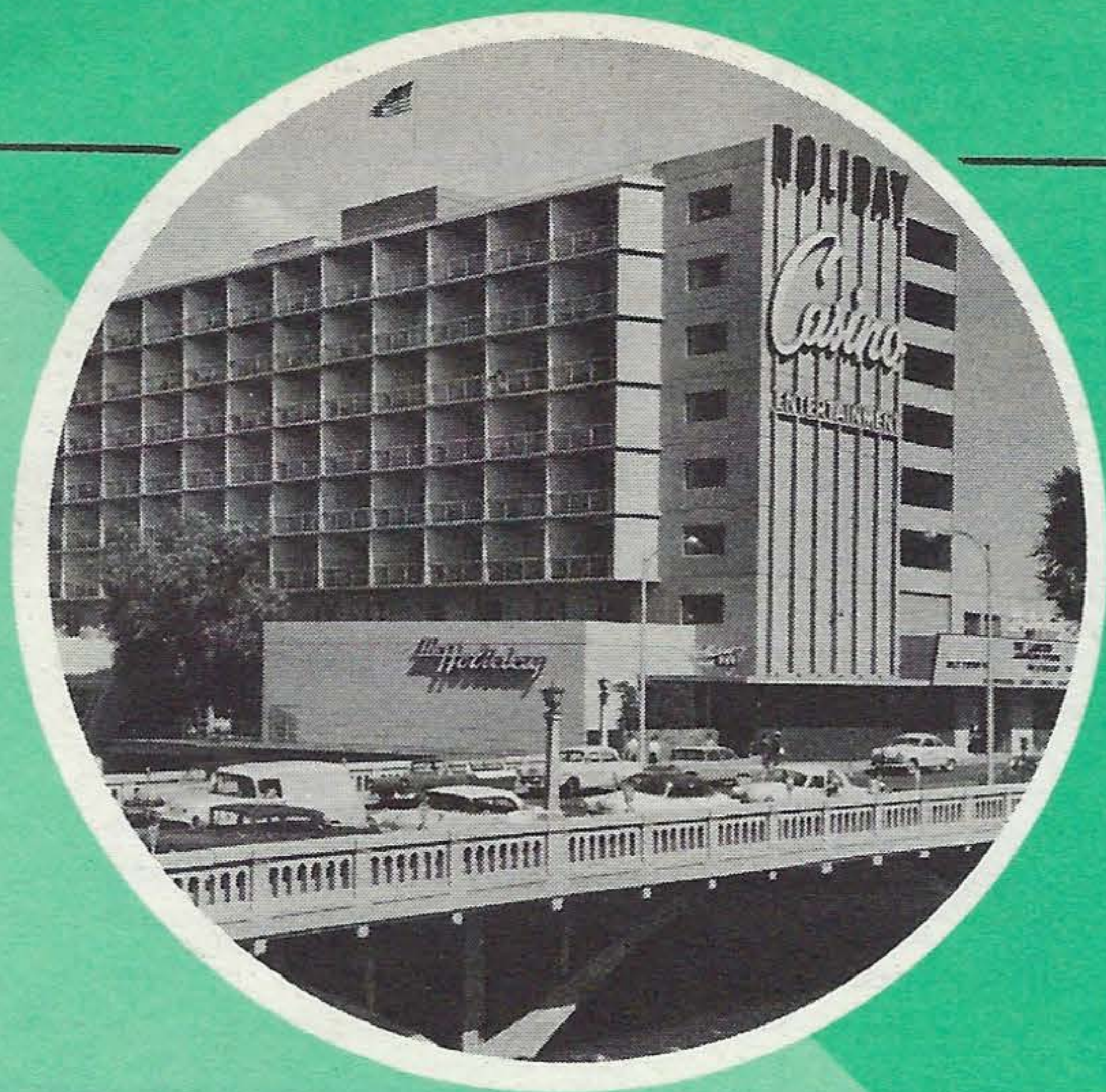
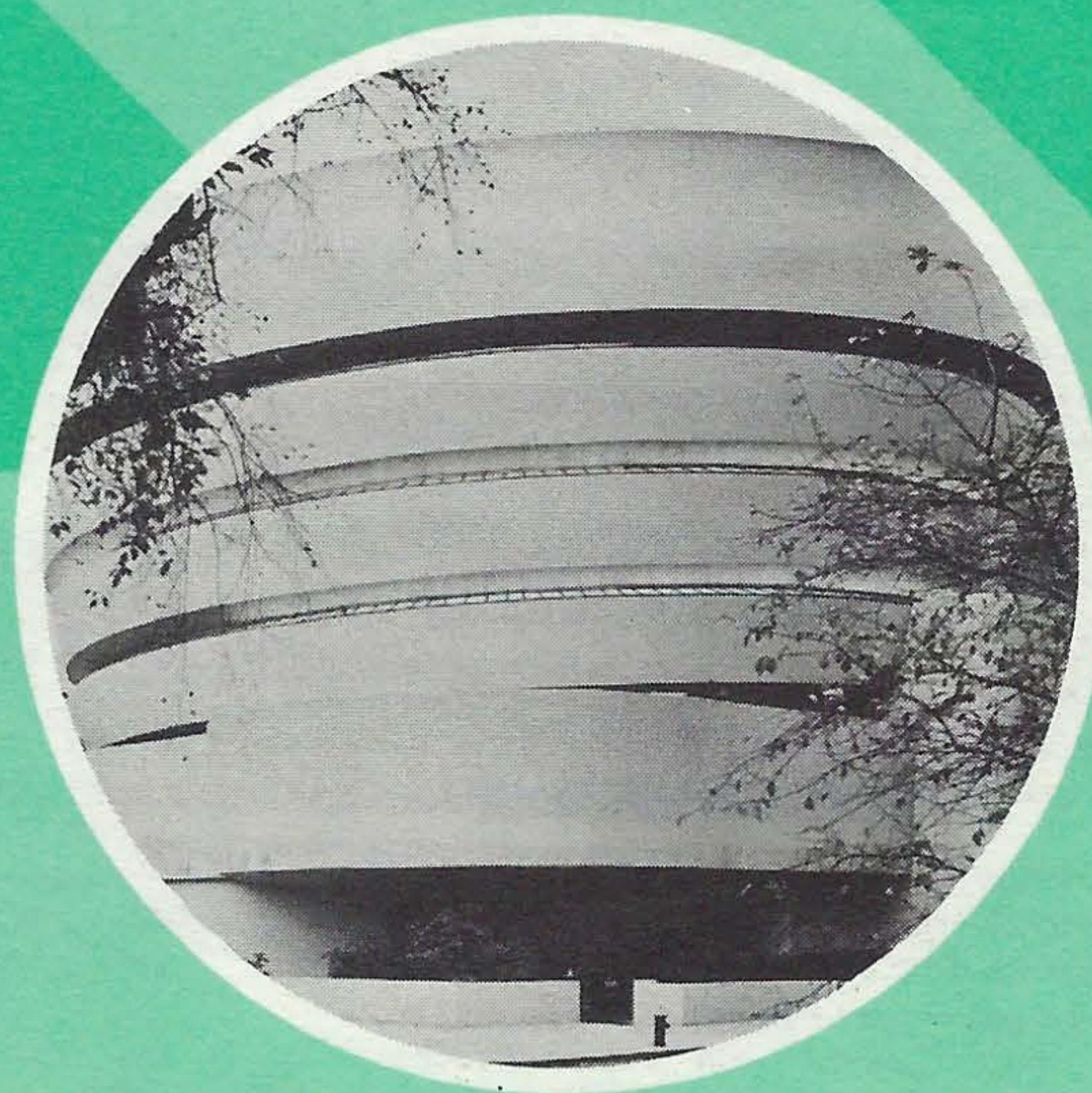




PLANNING GUIDE
for
ARCHITECTS
and
ENGINEERS



**ENGINEERED
SOUND
SYSTEMS**



ALTEC-LANSING CORPORATION
a subsidiary of LING-TEMCO-VOUGHT, Inc.
1515 SOUTH MANCHESTER AVENUE
ANAHEIM, CALIFORNIA



ALTEC LANSING CORPORATION

Since 1937, the name Altec* has earned an enviable world-wide recognition. Altec's past performances in the field of electronic science is a heritage—its reputation and achievements gained through creative and skillful engineering has contributed even greater substance and stability in its present progress to meet the ever-increasing demands and exacting requirements of the industry's challenges in the future.

Altec Lansing Corporation is proud that Altec equipment plays such a large and important part in the world's business and pleasure today. The name Altec has become synonymous with the finest in sound. The Blue Book of Satisfied Altec Customers lists the newest and finest in theatres, arenas, auditoriums, stadiums, hotels, hospitals, schools, churches, department stores, shopping centers . . . in government, commercial and industrial buildings all over the world—you'll find Altec engineered sound products.

*Altec—originally organized for the purpose of continuing one of the functions of a Western Electric Company subsidiary, known as the Electrical Research Products, Inc., then engaged in the theatre sound service and maintenance business.

SOUND SYSTEMS and ARCHITECTURAL PERFECTION

Architectural perfection is achieved only with the proper combination of design, selection of materials, and construction supervision . . . this same balance must be approached in the installation of a top quality sound system.

Altec Lansing Sound Products are world famous for quality—quality-designed and quality-built for quality performance.

Inquire about Altec's latest professionally-engineered sound innovations! . . .

"NOALA"—(Noise Operated Automatic Level Adjustment), a paging and announcing system that automatically adjusts its volume level based on ambient noise.

"REVOCON"—(Remote Volume Control), a new design that revolutionizes the entire concept of remote control volume by providing a means for controlling the gain of an amplifier from a point away from the amplifier's location.

"SEQR"—(Safety Equipment Requirements), an Altec "first" that contributes the highest degree of reliability to the operation of a sound system in airports, warning systems, military, commercial and industrial installations. It is a fail-safe unit for interconnecting power amplifiers operating in pairs, which insures, in the event of unbalancing of either amplifier, or failure of any kind, it will leave the remaining amplifier operating perfectly normal in continuing to supply programming at normal level to the loudspeakers. At the same time it operates an alarm signal light to call attention to the need for corrective service.

"GIANT VOICE"—Altec's High Level Voice Warning System for civil defense, natural disasters, fire control and military alerts.

NEW "VOICE of the THEATRE"—world famed since 1945, employs improved engineering design to fulfill requirements of magnetic tape for motion picture sound and recordings.

Keep informed of the many new improvements and developments in sound products and systems by Altec. Consult with your nearest authorized Altec Sound Contractor for complete up-to-date information.

THE PROBLEM—AND IT'S SOLUTION BY ALTEC ENGINEERING LEADERSHIP

To architects and engineers familiar with the outstandingly successful application of Altec engineering knowledge to sound reinforcement in all types of projects, a significant fact stands out clearly: repeatedly, Altec Sound Contractors are called in to engineer a sound reinforcement system after the previous system, made and installed by others, had clearly failed, or had, as a result of increasingly complex demands made on the system, become obsolete.

What knowledge, experience and superiority in the design function does Altec have that enable an Altec installed system to perform with complete reliable efficiency, in situations of widely differing composition and operation characteristics. The answer lies in a unique combination of two basic abilities that interact on one another: (1) superior knowledge, based on over 20 years of experience in dealing with area characteristics and the mechanics of operation in widely differing situations—and (2) a superior capacity for equipment design that produces a flexibility of application obtainable from no other source, and impossible of attainment from any organization lacking in these two basic—and interacting—abilities.

Both of these unique *interacting* abilities are derived from the basic experience acquired in the design of sound reproduction equipment for the motion picture theatre—both indoor and outdoor areas—with an infinite number of variables in acoustic conditions, noise levels, and other area characteristics. Altec Lansing continuously improves design and manufacturing of its sound products . . . producing and installing equipment of such astonishing *flexibility of application* that all variables are brought within the scope of a successful "fundamental equation."

ANALYSIS OF THE CONDITIONS OF THE AREA

Altec's 20 years experience in the sound field prove that no two areas—whether indoors or outdoors—are alike, even though a superficial resemblance is apparent. In approaching the problem of designing a sound reinforcement system for a specific situation, the following questions are asked, and the engineering answer found: What is the size of the area? What noise levels are encountered, and what is the character of the noise? Is it continuous or intermittent? Does the noise change in character with changes in the type of sound requirements? (i.e. voice, music, paging, announcing, etc.) What are the acoustic conditions and over what range do the conditions change with the sound requirements?

When the conditions have been analyzed, Altec is ready for the next step . . .

ANALYSIS OF THE MECHANICS OF THE OPERATION INVOLVED

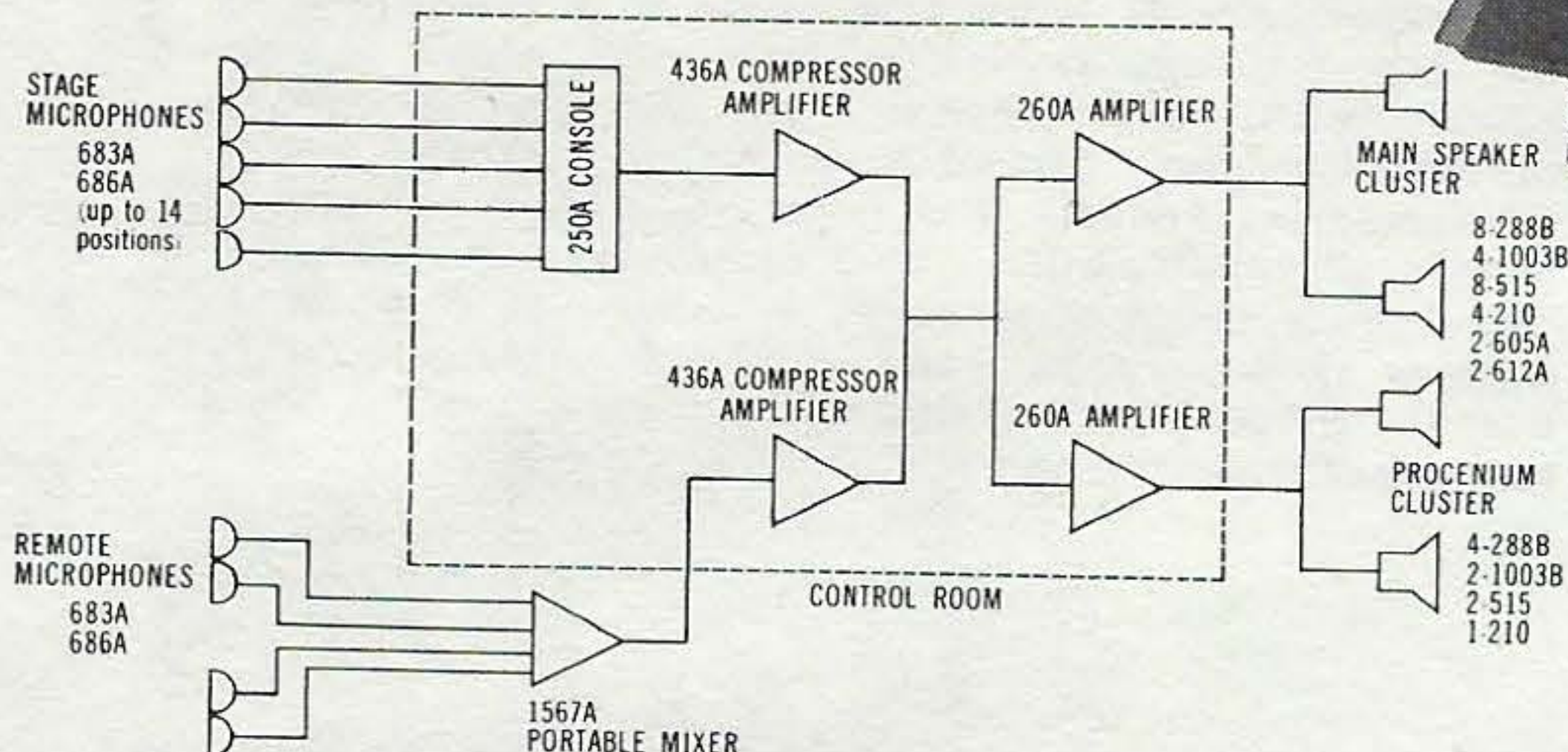
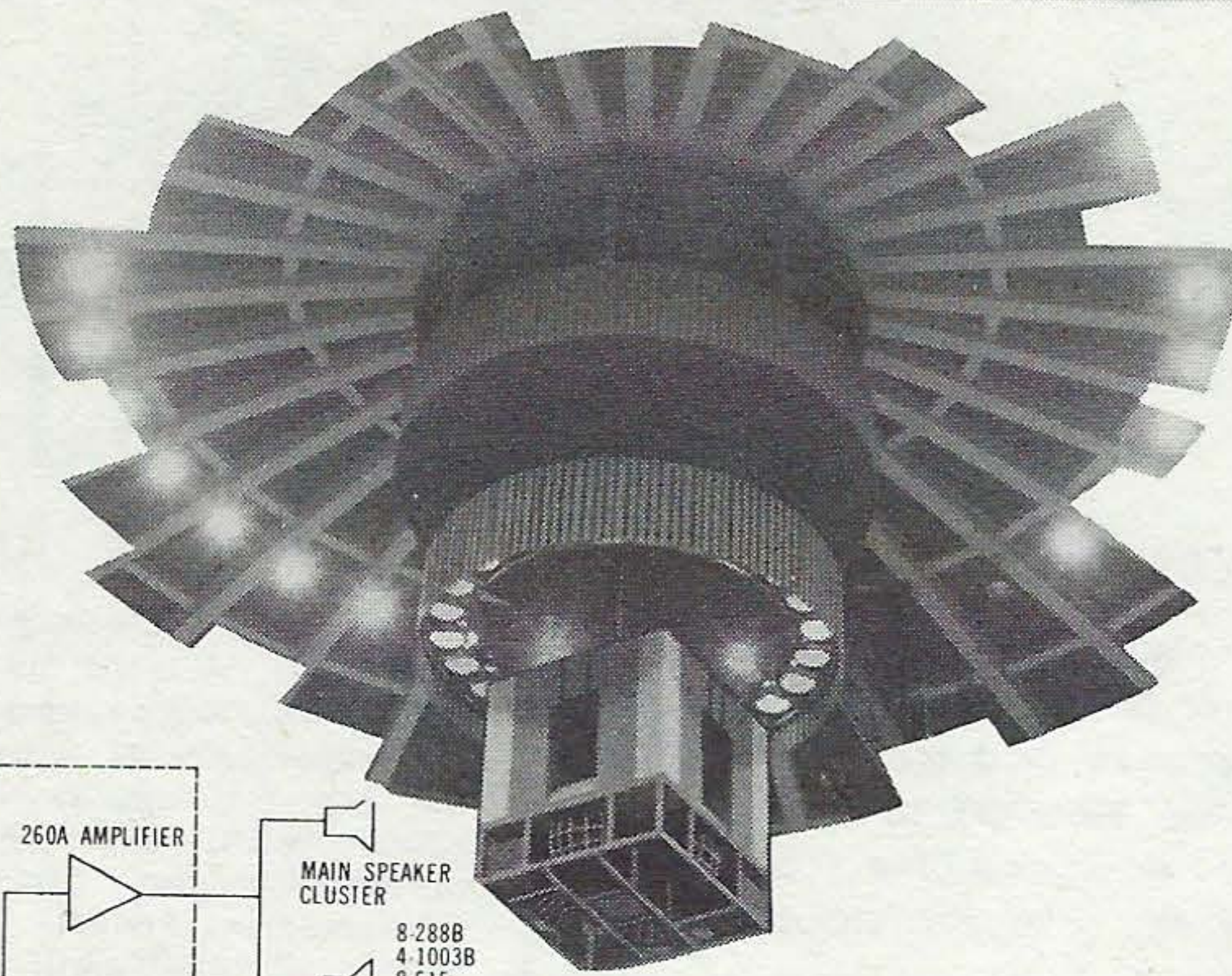
Based on the analysis of the conditions of the area, Altec now sets up complete engineering answers to the following questions: How many microphones are needed and where are they to be located? What speaker elements are chosen to provide the fullest flexibility of operation? Where are the loudspeakers to be located to preserve the proper illusion of any specific presentation? Is the equipment to be permanently placed, or must it be mobile, to cover a combination of uses? How are the high and low frequency elements of the loudspeaker system to be orientated so as to provide full, even coverage throughout the entire area? What is the correct number of pre-amplifiers, amplifiers, power supplies, and loudspeakers? How are these to be integrated to provide full assurance of continuity of operation under emergency as well as normal conditions? How are the parts of the system to be integrated in such a way that any part can be replaced without interrupting programming of material? What groups of microphones can be controlled by a single volume control? What single microphones are to be under single control? Or what combination of both is necessary for the achievement of balance in the effect of sound on the audience? What dynamic balance of the different elements entering the system must be obtained? When the answers to the foregoing have been reduced to elementary factors or design . . .

THEN, SELECTION IS MADE OF THE PROPER EQUIPMENT—IN THE CORRECT COMBINATIONS—TO EFFECT THE REQUIREMENTS OF THE INDIVIDUAL SYSTEM.

SOUND SOLUTIONS TO SOUND PROBLEMS

EXHIBITION
HALL

ALTEC Sound Contractor to Jacksonville Coliseum:
Fidelity Sound, Inc.,
Jacksonville, Florida



CASE HISTORY FILE 60-89:

The new \$3,000,000 Jacksonville Coliseum—large enough to house a huge three-ring circus under its dome-shaped roof—contains 50,000 feet of exhibition space, seats 11,500 spectators.

SOUND PROBLEM:

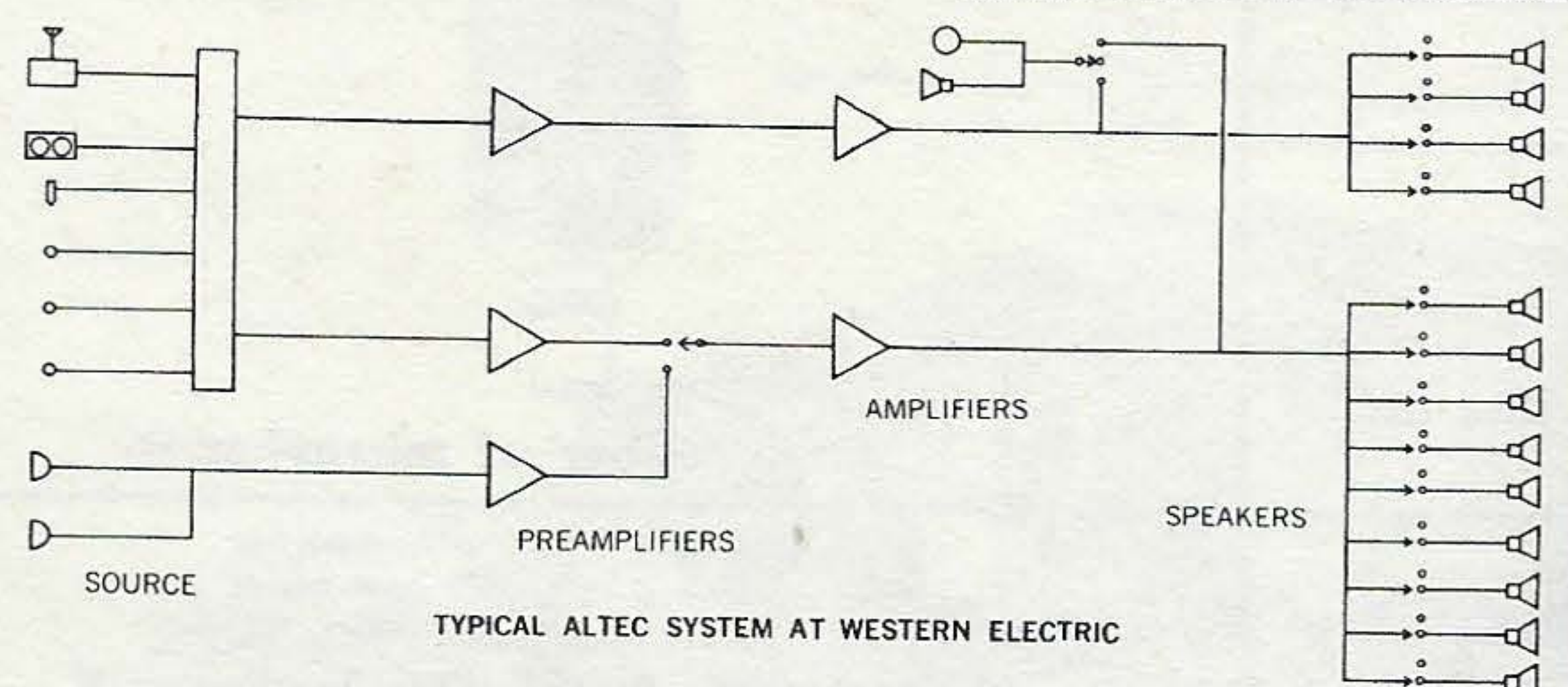
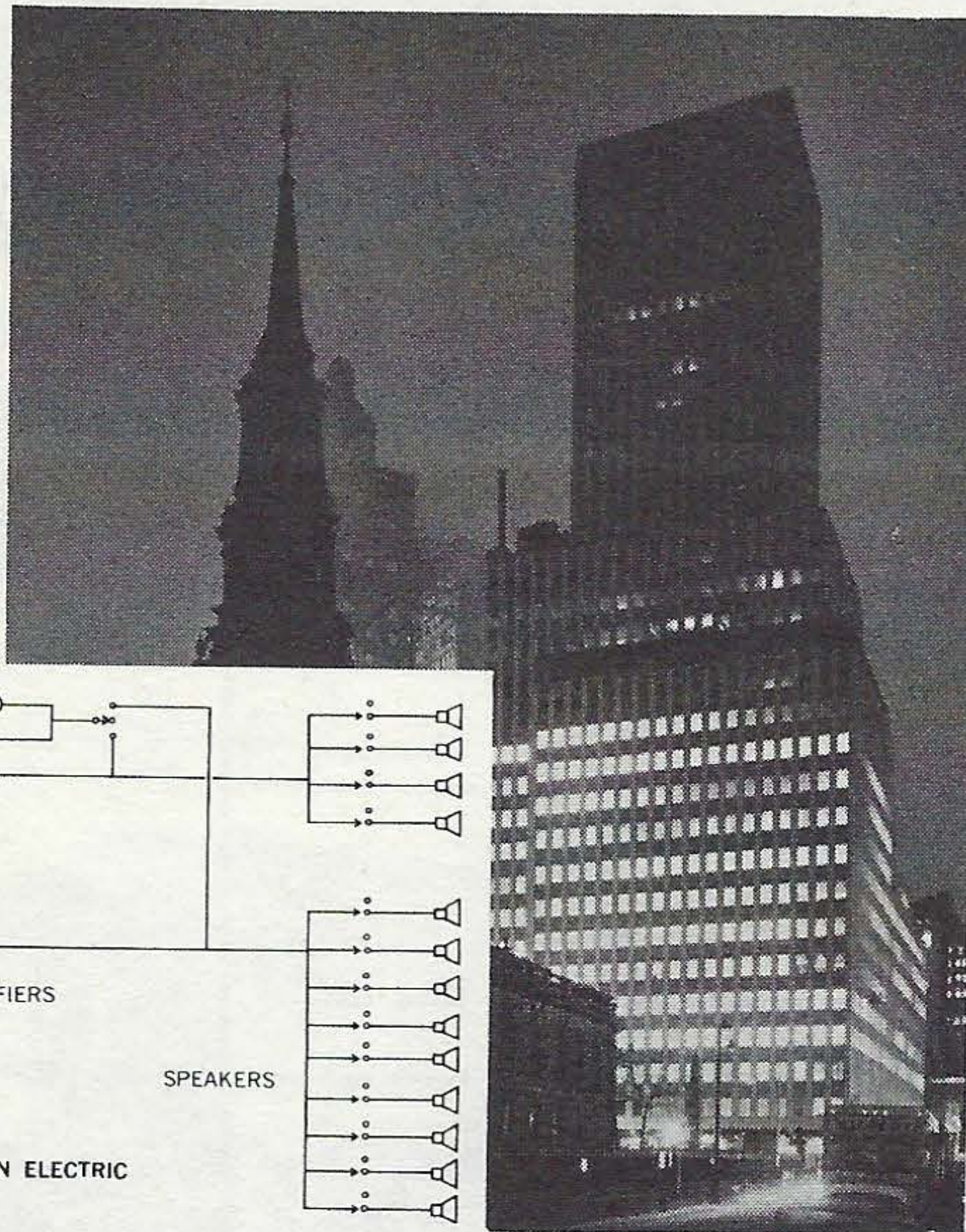
With basketball and ice shows running only hours apart, with conventions by day—theatricals at night, this spacious indoor arena required a multi-purpose sound system of unique flexibility . . . and quality to match!

SOUND SOLUTION BY ALTEC:

A custom ALTEC sound system that exceeded all competitive specifications while meeting competitive price was installed. It provides highest fidelity for musicals, crisp reinforcement for speech, and a remarkable clarity that overcomes the high ambient noise levels of sporting events. Engineering features distinctive to ALTEC audio equipment contribute to the effectiveness of this system. For simplicity and space-saving economy, only two ALTEC 260A Amplifiers are required to supply over 500 watts of distortion-free power. ALTEC 436A Compressor Amplifiers automatically prevent wide variation in acoustical output of the system caused by differences in voice intensity and distance of performers from microphones. An ALTEC Broadcast Console in the control room is supplemented by the portable ALTEC 1567A Mixer Amplifier for remote operations. ALTEC speaker clusters under the Coliseum's dome and the stereophonic proscenium systems (not illustrated) blend perfectly with the environment while contributing an architectural beauty of their own.

COMMERCIAL
BUILDINGS

ALTEC Sound Contractor to Western:
Sound Systems, Inc.
New York, N. Y.



CASE HISTORY FILE 61-28:

The Western Electric Building at 222 Broadway is one of New York City's newest skyscrapers. Housed here are Western Electric Company's general offices.

SOUND PROBLEM:

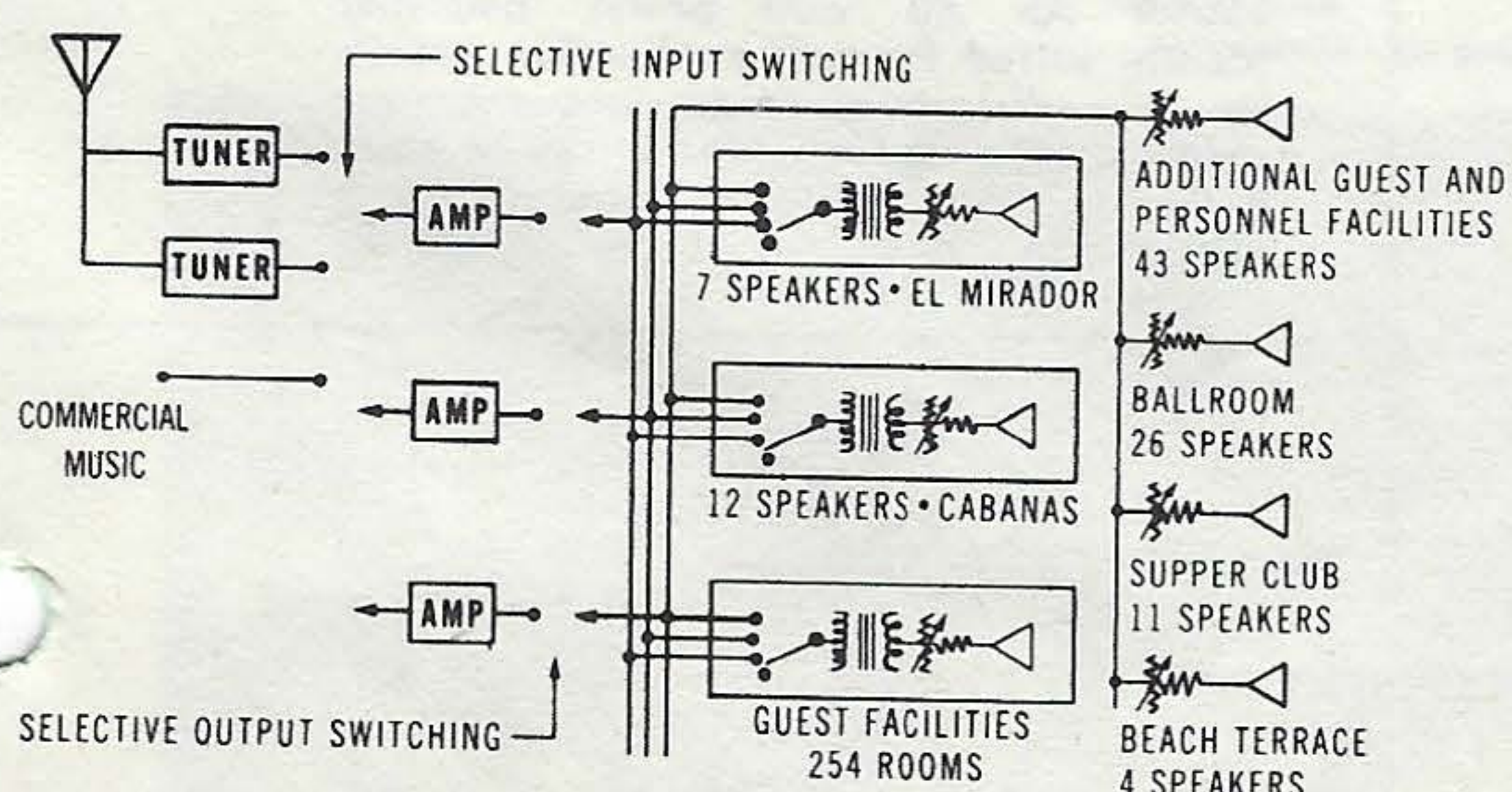
Three independently functioning sound systems were required to serve Western's public areas, meeting rooms, and music room. The systems selected had to meet the high standards offered and demanded by Western Electric Company.

SOUND SOLUTION BY ALTEC:

In every respect—from reliability to sound quality, from sophistication of design to ease of operation—Altec was selected to meet Western's standards. Altec Engineered Sound Products provide paging, public address, and background music. And, in Western's music room, famous Altec High Fidelity Components provide superb stereophonic reproduction.

HOTEL

ALTEC Sound Contractor to La Concha Hotel;
McKee Electric Inc., Mt. Vernon, New York in
cooperation with Sole Electric Inc., Puerto Rico.



CASE HISTORY FILE 59-36:

The luxurious resort and entertainment facilities at the new La Concha Hotel include 254 rooms, 12 pool-side cabanas, terrace gardens, supper club, ballroom, bar, and cafeteria.

SOUND PROBLEM:

Because of location, the system selected had to be easy to install, easy to operate. And, most important, the system had to have uncompromising durability.

SOUND SOLUTION BY ALTEC:

An ALTEC Sound System was installed. Three ALTEC 1570 Amplifiers provide a cumulative total of 525 watts of dependable power. This equipment—and all other ALTEC control and source units—were easily mounted in only two 84" racks. This compact ALTEC installation provides distortion-free power to more than 300 ALTEC Speakers on three separate systems, with three selectable channels in each.

LET ALTEC HELP SOLVE YOUR SOUND PROBLEM

SYSTEM COMPONENTS

MICROPHONES

From Altec's famed M-20 Professional Condenser Microphone through to a new microphone series introducing dramatic improvements in performance and styling! The experience in acoustical research combined in this new series brings a breakthrough in precision engineered microphone development, unprecedented feature for feature. Incorporating Altec's exclusive "sintered bronze filter" for unmatched protection against moisture, contaminants and blast—to Altec's new "golden" diaphragm with its remarkable smooth, wider frequency response and output, plus a host of other features mentioned on pages 6 and 7.

AMPLIFIERS AND CONTROLS

All Altec amplifiers represent gain and power ratings suitable, either alone or in combination, for public address, speech and music reinforcement systems from the smallest to the largest. Altec amplifiers are designed for continuous operation and meet the highest standards of performance.

LOUDSPEAKERS, HORNS

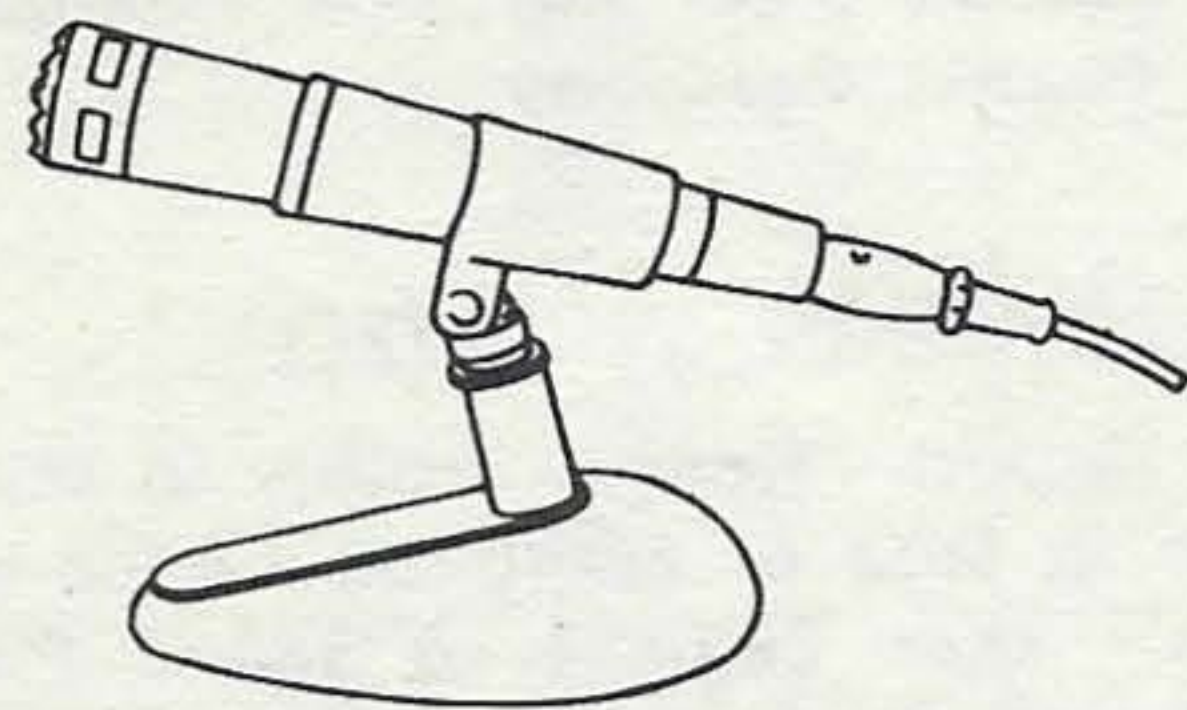
For public address and speech reinforcement systems to fully meet the need for superior performance, the quality of the loudspeakers used is of primary importance. The superiority of Altec loudspeakers is recognized in the broadcasting, motion picture, and allied professional fields, and Altec's high and low frequency loudspeakers have proved in public address and speech reinforcement systems that they produce an unmatched degree of intelligibility, naturalness, and dependability. A wide range of selection is available. Altec loudspeaker systems range from an 8"—12 watt speaker to a massive 100 watt installation. All Altec speaker units use a permanent magnet.

"Building Block Design," an ALTEC exclusive, means system flexibility

Each specialized component in the Altec Lansing catalog is designed to work in complete harmony with every other item in the Altec line. This feature allows a system to be built—component by component—to achieve the best possible results in an individual

installation. It also allows a system to be expanded or modified at any time without the expense and waste of special adaption equipment. An Altec "Building Block Design" sound system is never obsolete.

Examples of Altec sound systems . . . showing "building block" flexibility

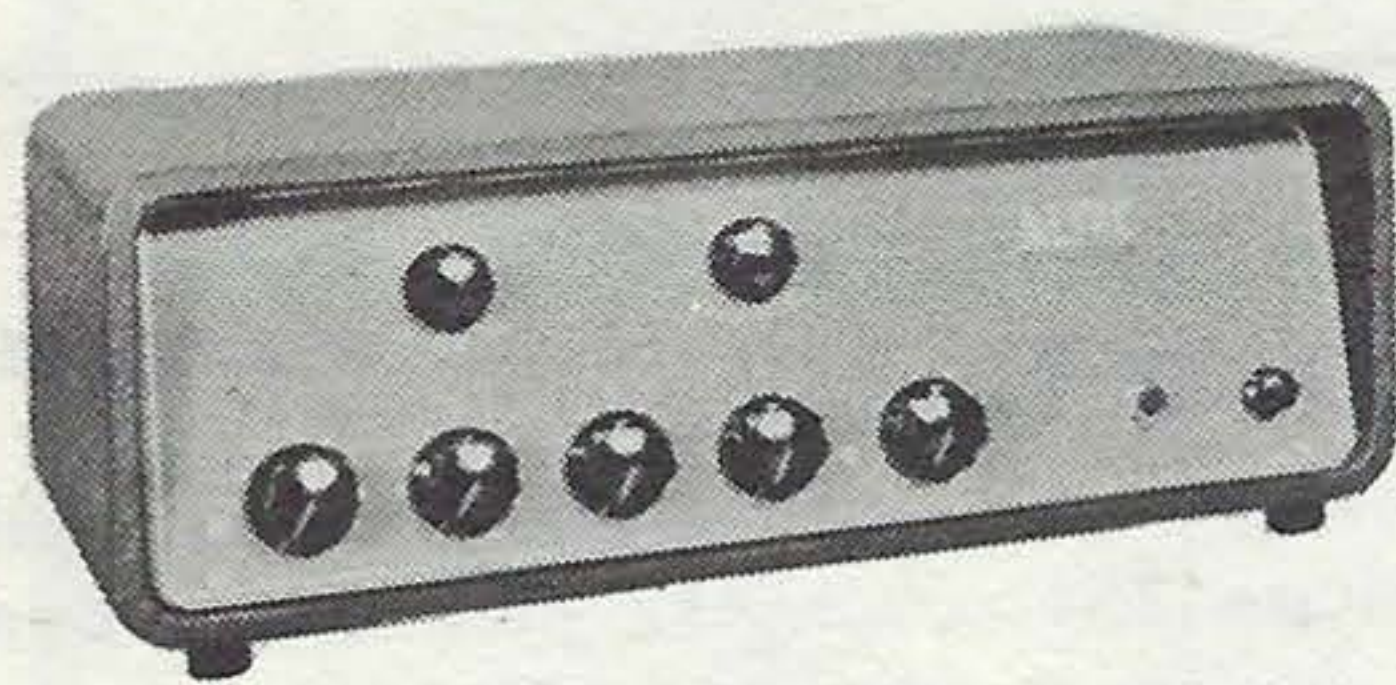


Four microphone inputs.

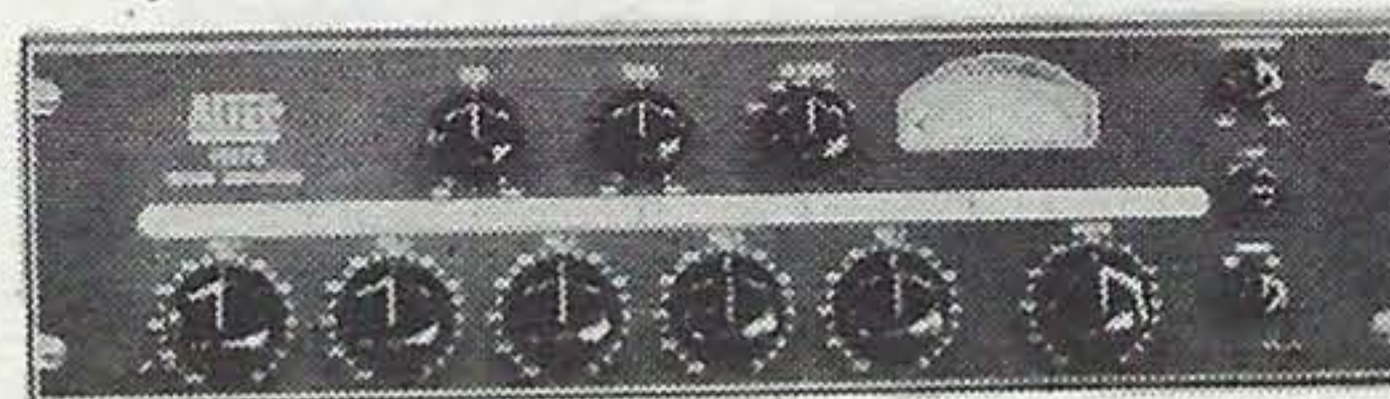
Four microphones plus one line input.



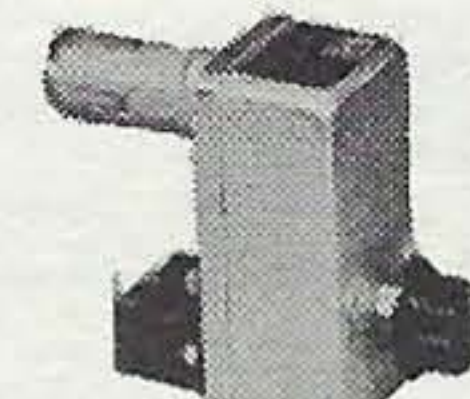
Any number of microphones.



342B A 35 watt Amplifier and Mixing Preamplifier with an ideal flexibility for any small public address system . . . permanent or portable.



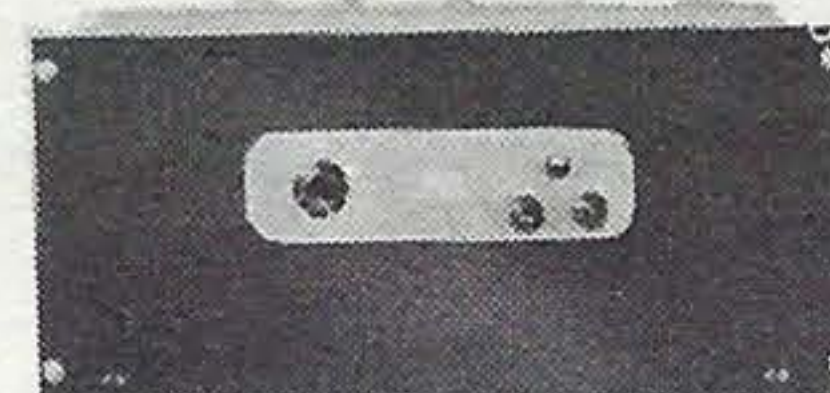
1567A A Mixer Amplifier of exceptional flexibility for use in p.a. systems and broadcast studios or as a remote, portable mixer. Performance of this self-powered mixer amplifier exceeds FCC requirements for both AM and FM broadcasting.



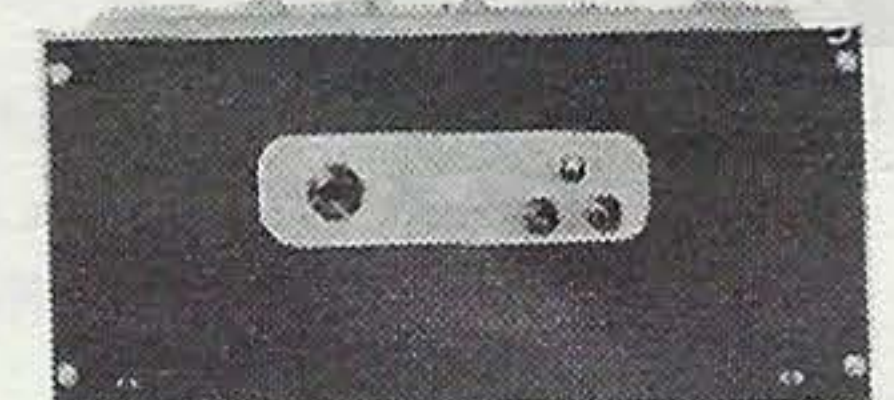
1561A A preamplifier with a compact low-noise microphone amplifier. Input, output, and power-supply connections are made with a plug-in "Varicon" connector.



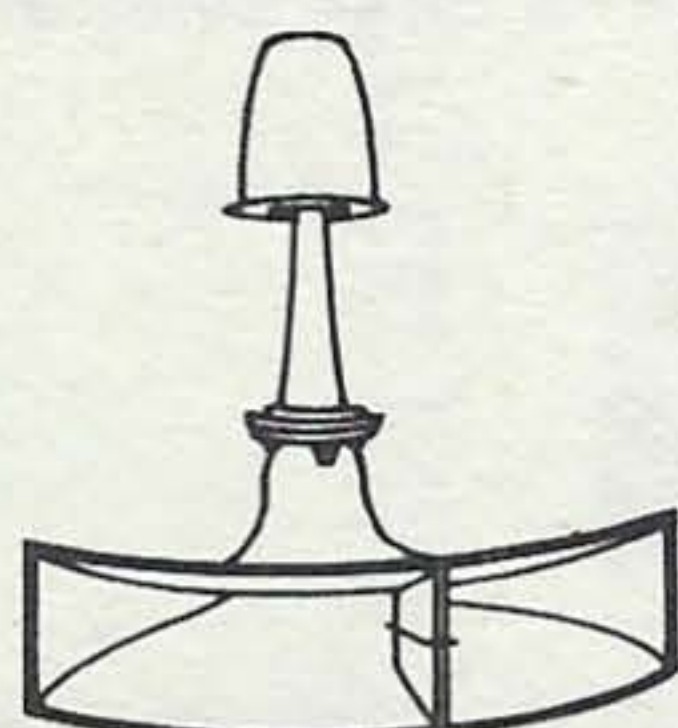
1563A A compact two-stage line amplifier with an input volume control. It will accommodate high- or low-impedance loads.



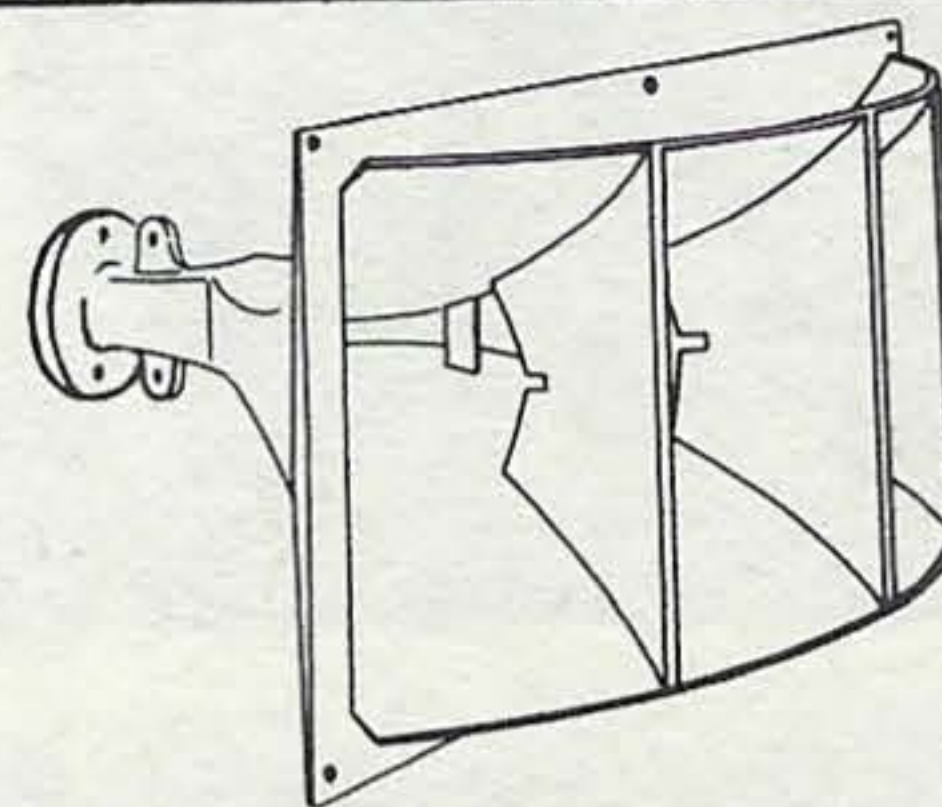
1568A A 40 watt Power Amplifier ideal for all types of public address, paging, music distribution and sound reinforcement systems requiring moderate power handling capacity.



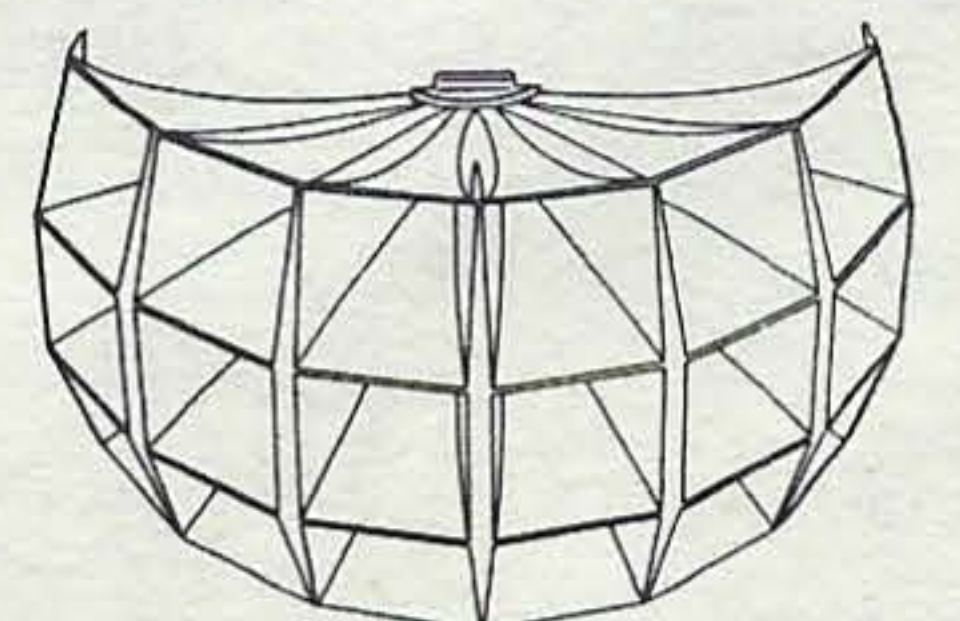
1569A An 80 watt power amplifier ideally suited for any application requiring low distortion, wide frequency response, high audio power, low current drain. For public address, paging, music distribution and sound reinforcement systems.



One or more horns or speakers.



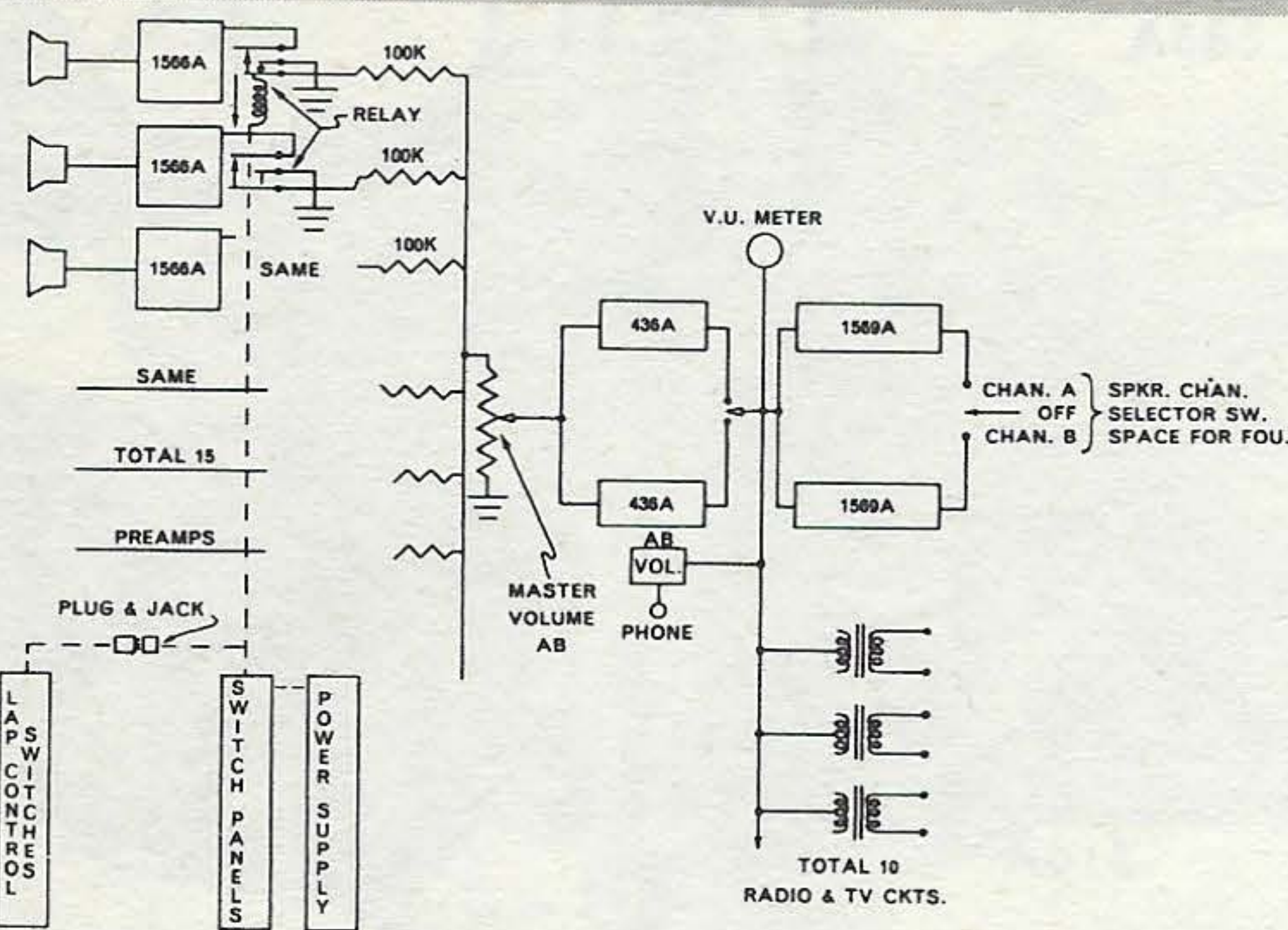
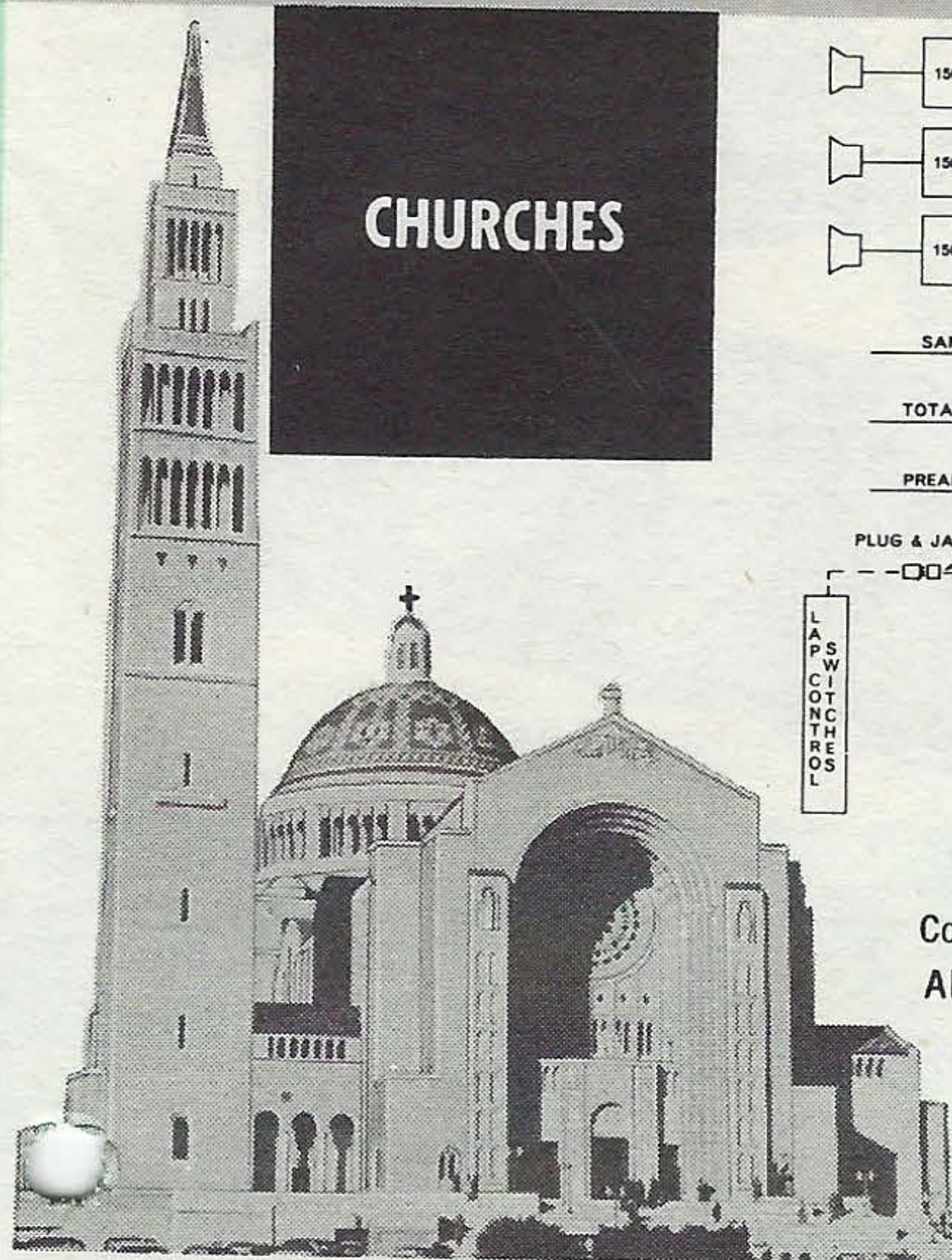
One or more horns or speakers.



Any number of horns, speakers or telephone lines.

SOUND SOLUTIONS TO SOUND PROBLEMS

CHURCHES



Consulting Engineer: John F. Maguire, Jr.—P.E.
ALTEC Sound Contractor to Catholic National Shrine:
Shrader Sound, Inc., Washington, D. C.

CASE HISTORY FILE 58-12:

The Shrine of the Immaculate Conception in Washington, D.C., was recently completed after 30 years of building. It is the largest cathedral in North America and is often called the Catholic National Shrine.

SOUND PROBLEM:

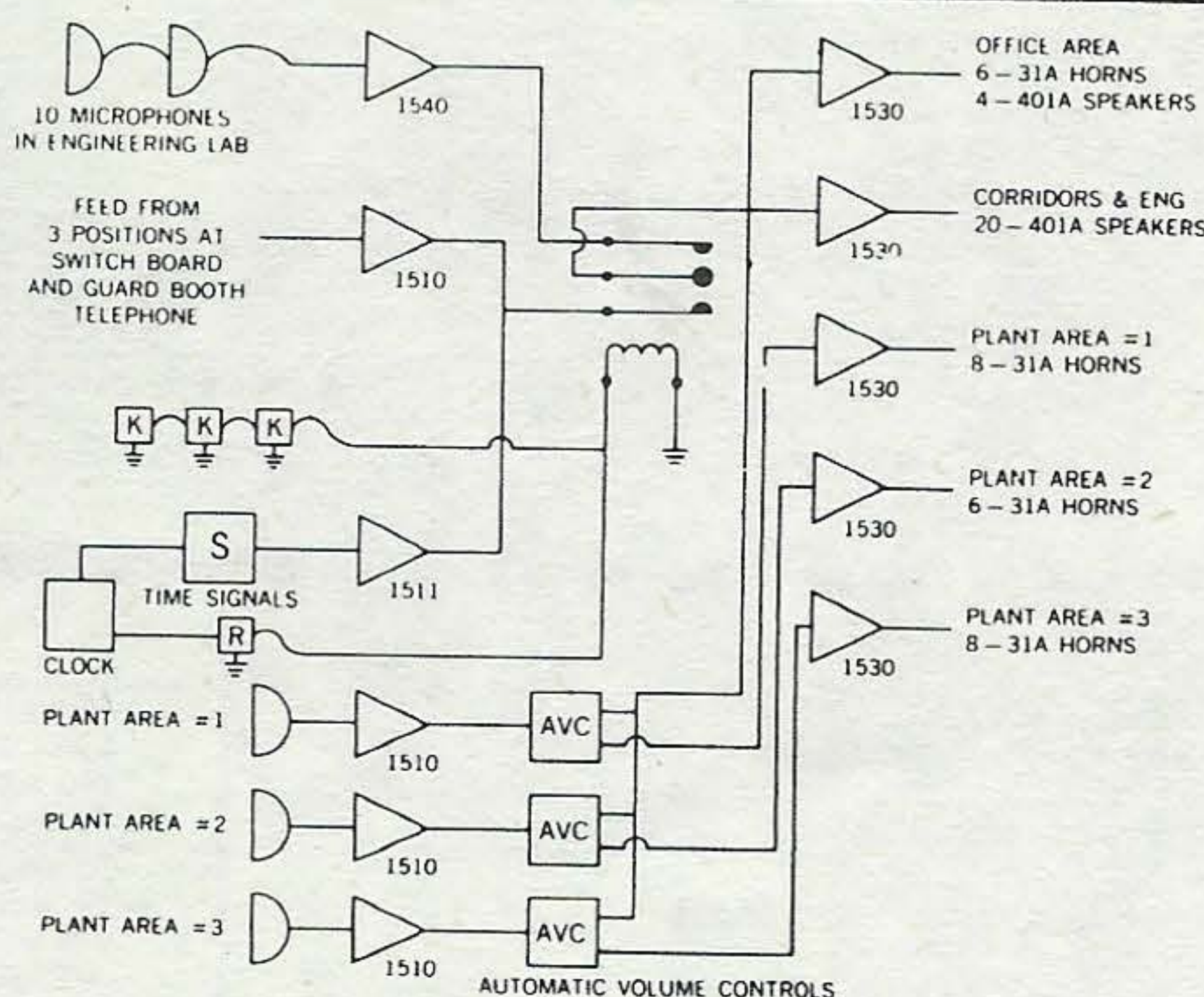
The Byzantine edifice—with a seating capacity of 2500 persons—required an elaborate sound system. Clear reinforcement of speech and widest possible sound distribution had to be provided without hang-over effects in spite of very difficult acoustical conditions due to no sound absorption material.

SOUND SOLUTION BY ALTEC:

More than 400 individual sound components were used to develop the custom Altec sound system that was installed. Miniature Altec Condenser Microphones that are no larger than a lipstick provide an indestructible pickup source from key locations, such as the; Bishop's Throne, altar, pulpit and steps leading to the altar allowing freedom of movement for the priests during services.

INDUSTRIAL

ALTEC Sound Contractor to
Vickers: H. A. Roseberry &
Son, Inc. Detroit, Mich.



CASE HISTORY FILE 59-24:

Three plant areas, executive offices, and an engineering laboratory are housed in the functionally modern Vicker's Administrative and Engineering Center in Detroit, Michigan.

SOUND PROBLEM:

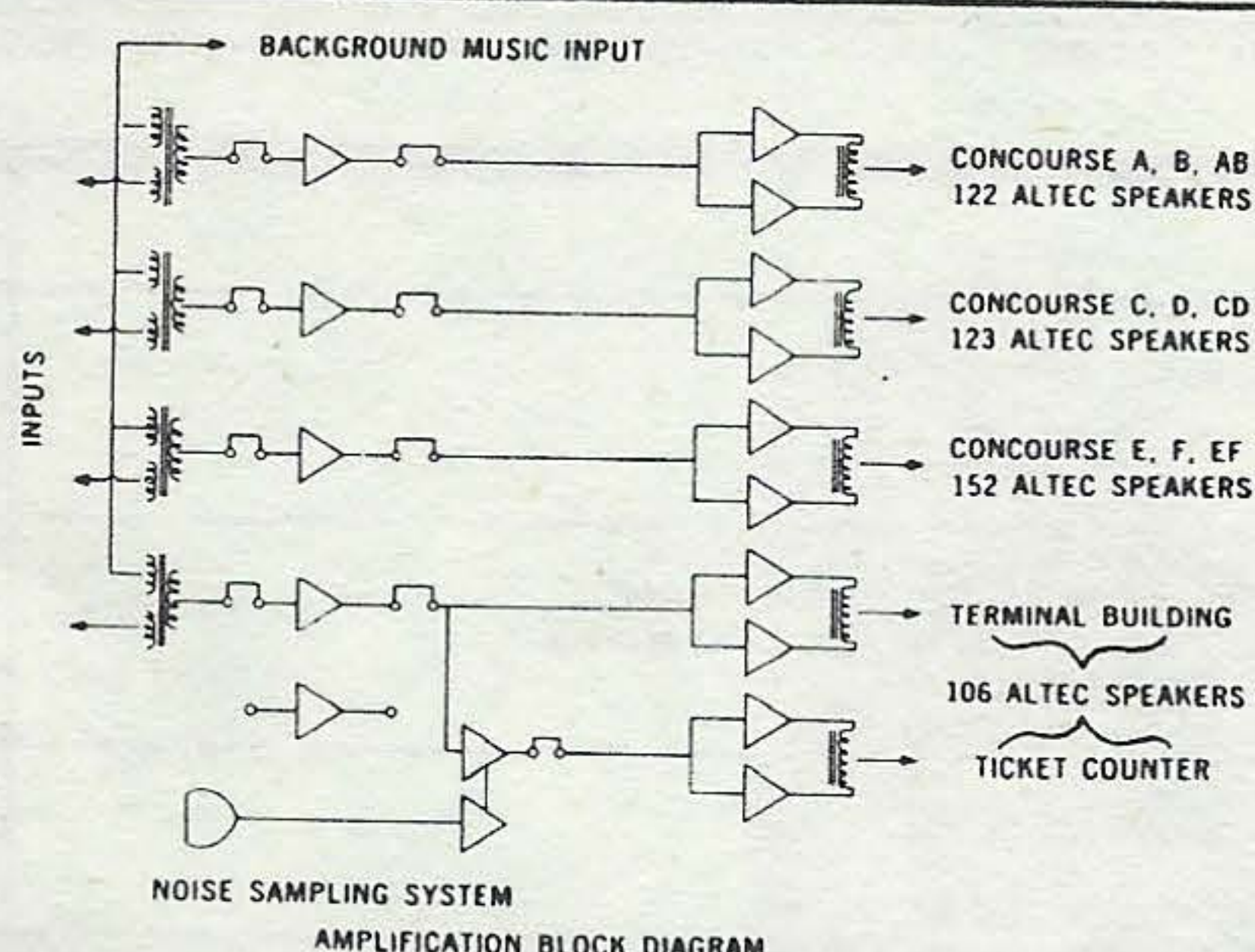
A paging and announcing sound system was required to cover the entire facility at this division of Sperry Rand Corporation. The system selected has to provide intelligible speech communication in the plant areas despite high ambient noise levels while assuring the lowest disturbance factor in the offices and laboratory.

SOUND SOLUTION BY ALTEC:

An industrial Altec sound system was selected and installed. This customized system services each plant area with only 6 to 8 Altec Sectoral Horns required for a total coverage of highest clarity. Here, automatic volume controls adjusted the sound level to overcome prevailing noise in the plant areas. All other areas are served by a distributed Altec system noted for pleasant, natural tones. The system also provides automatic audio time signals that operate through the clocking device.

AIR TERMINAL

ALTEC Sound Contractor
to Baker Audio Associates,
Atlanta, Georgia.



CASE HISTORY FILE 61-28:

The new Atlanta Airport required an "arrival and departure" announcing system to service the multi-level terminal building and six radial concourses with intricate connecting passageways.

SOUND PROBLEM:

The system selected had to provide fail-proof clarity of speech and virtually fail-proof operation to meet the demands of jet age traffic.

SOUND SOLUTION BY ALTEC:

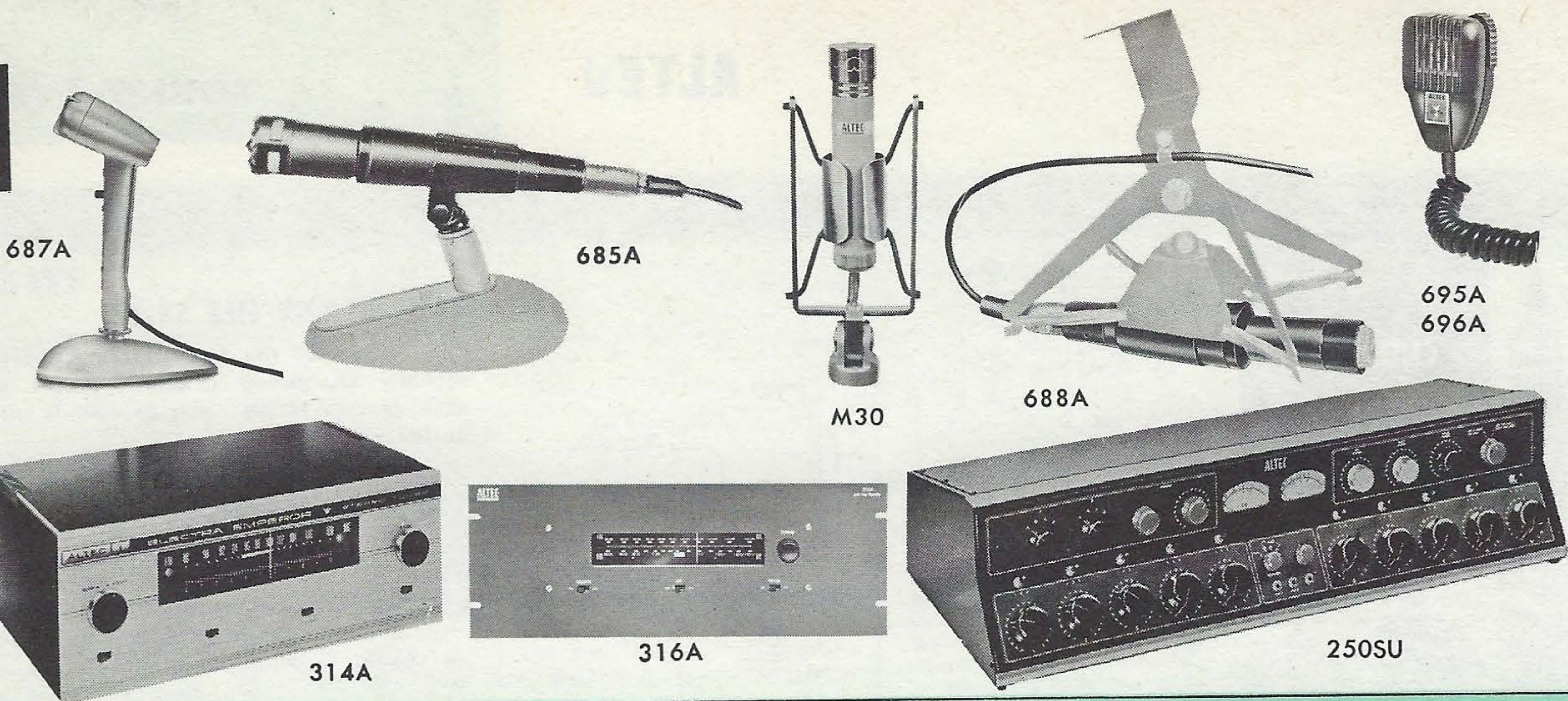
An Altec airport sound system, with over 500 Altec speakers, was selected and installed. It provides clear, intelligible arrival and departure announcements at all times and in all areas through its unique capacity to automatically adjust sound levels to compensate for frequent high intensity noise generated by jets. Optimum reliability is provided by a new Altec safety system that offers the most perfect protection against failure yet developed. Even if half of the amplifiers in the system become inoperative—and this is an extreme example—it will continue to function with normal effectiveness!



LET ALTEC HELP SOLVE YOUR SOUND PROBLEM



Every Altec custom sound system is individually engineered from over 200 audio components like those shown to the right—Contact an authorized Altec Sound Contractor nearest you for a complete full-line catalog on Altec Engineered Sound Products.



MICROPHONES

TUNERS

PREAMPLIFIERS
AMPLIFIERS
MIXERS

LOUDSPEAKERS
HORNS
DRIVERS

MODEL NO.	TYPE	FREQUENCY RESPONSE IN C.P.S.
M20	Professional Condenser Microphone	20-15,000
M30	Professional Condenser Microphone	20-20,000
632C	Close Talking Dynamic Microphone	100-10,000
633	Studio Dynamic Microphone	35-12,000
639	Studio Dynamic Microphone	40-10,000
681A	General Purpose Dynamic Microphone	50-18,000
682A	Studio Dynamic Microphone	45-20,000
683A	Studio Dynamic Microphone	45-15,000
684A	Professional Dynamic Microphone	35-20,000
685A	Professional Dynamic Microphone	40-16,000
686A	Lavalier Dynamic Microphone	70-20,000
687A	Moving Coil Dynamic Microphone	50-20,000
688A	Professional Dynamic Microphone	35-20,000
689A	Professional Dynamic Microphone	40-16,000
690A	Telephone Dynamic w/Transistor Amplifier	200-10,000
695A	Hand-held, dynamic noise-cancelling microphone/amplifier	100-5,000
696A	Hand-held, dynamic noise-cancelling microphone/amplifier	100-5,000

Note: Wind Screens, Desk and Floor Stands, Microphone Transformers, Mountings and all other accessories available.

MODEL NO.	TYPE	ANTENNA	FM MAXIMUM SENSITIVITY
314A	Stereo FM Tuner	Standard 300 ohms.	1.2mv for 20db quieting w/300 ohm antenna
316A	AM/FM Tuner	Standard 72/300 ohms.	3.5mv for 20db quieting w/300 ohm antenna

FM ANTENNA RADIATION meets FCC requirements on 314A, and 316A.

MODEL NO.	TYPE	OUTPUT
128B	Power Amplifier with ThermEguard	40 watts
250SU	Control Console with 10 pos. for stereo or mono	Line output
260A	Power Amplifier	260 watts
342B	Power Amplifier-channel mixer (4 microphone)	35 watts
351B	Solid State Power Amplifier	50 watts (music power)
356A	Power Amplifier w/Microphone, Line & Phono input	26 watts (music power)
357A	Multi-tone Generator (Three tone)	2.8 volt peak
436C	Compressor Amplifier w/Single Line Input	+24dbm (as straight amplifier)
438C	Compressor Amplifier-Microphone & Bridging input	+24dbm (as straight amplifier)
458A	Plug-in Preamplifier (used in 250SU)	+25dbm
459A	Plug-in Program Amplifier (used in 250SU)	+35dbm
1556A	Altalk Inter-Communication Amplifier	14 watts
1561A	Preamplifier, Single Position Custom Series Module	10v rms
1562A	Tone Control Amplifier Custom Series Module	2v
1563A	Line Amplifier Custom Series Module	+18dbm
1566A	Preamplifier, One Microphone (117VAC)	+10dbm
1567A	Mixer Amplifier—5 position (4 microphones, 1 line)	+18dbm
1568A	Power Amplifier	40 watts
1569A	Power Amplifier	80 watts
1570B	Power Amplifier with ThermEguard	175 watts
1577A	"Watchguard" Remote Testing Facility	No Power Loss
7464	NOALA Control Panel (Noise Operated Automatic Level Adjustment)	Line
7740	SEQR Control Panel for Fail-Safe Circuit	No Power Loss (power sum of two amplifiers)

Note: Input and Output Switch Panels, Emergency ("All-Call") Panels, Speaker Selector Panels, Input and Line Transformers, Monitor Panels and all other accessories available.

MODEL NO.	TYPE	POWER RATING-WATTS
A7	"Voice of the Theatre" Loudspeaker System	30
A7-500	"Voice of the Theatre" Loudspeaker System	30
50A	Bi-Acoustic Horn System	30
839A	Column Loudspeaker System	90
840A	Column Loudspeaker System	72
288C	Loudspeaker Driver for indoor use on Multicellular Horns	40
290D	Loudspeaker Driver for outdoor use on Multicellular Horns	100
730B	Loudspeaker Driver for use on Multicellular or Sectoral Horns	60
802D	Loudspeaker Driver for use on Sectoral Horns	30
804A	Loudspeaker Driver for use on Sectoral Horns	30
401B	8" Cone Loudspeaker	15
403A	8" Cone Loudspeaker	12
409A	8" Cone Wide-angle Loudspeaker	16
755C	8" Cone "Pancake" Wide-angle Loudspeaker	15
412C	12" Cone BiFlex Loudspeaker	20
414A	12" Cone Low Frequency Loudspeaker	25
601C	12" Cone Duplex Loudspeaker	20
415C	15" Cone BiFlex Loudspeaker	25
515B	15" Cone Low Frequency Loudspeaker	35
602C	15" Cone Duplex Loudspeaker	25
605A	15" Cone Duplex Loudspeaker	35
803B	15" Cone Low Frequency Loudspeaker	30
31A	Sectoral Horn—Cast Aluminum for outdoor use with 730B Driver	
511A	Sectoral Horn—Cast Aluminum for outdoor use with 730B, 802D or 804A Driver	
811B	Sectoral Horn—Cast Aluminum for use with 802D or 804A Driver	
825	Bass-Reflex/Front Horn Enc. (1-15" speaker)	
210	Bass-Reflex/Front Horn Enc. (2-15" speakers)	
410	Bass-Reflex/Front Horn Enc. (4-15" speakers)	
612	Utility Cabinet (Large)	
614	Utility Cabinet (Medium)	
618	Utility Cabinet (Small)	
622	Utility Cabinet (Wall)	

Multicellular Horns (2 to 18 cell configuration) for indoor use with 288C Driver and outdoor use with 290D and 730B Driver Low Frequency Horns, 210, 410 and 825, for use with 515B and 803B Low Frequency Loudspeakers in 2-way Systems.

Note: Horn Throats and Adaptors, Crossover Networks, 70v Transformers and all Loudspeaker Accessories Available.

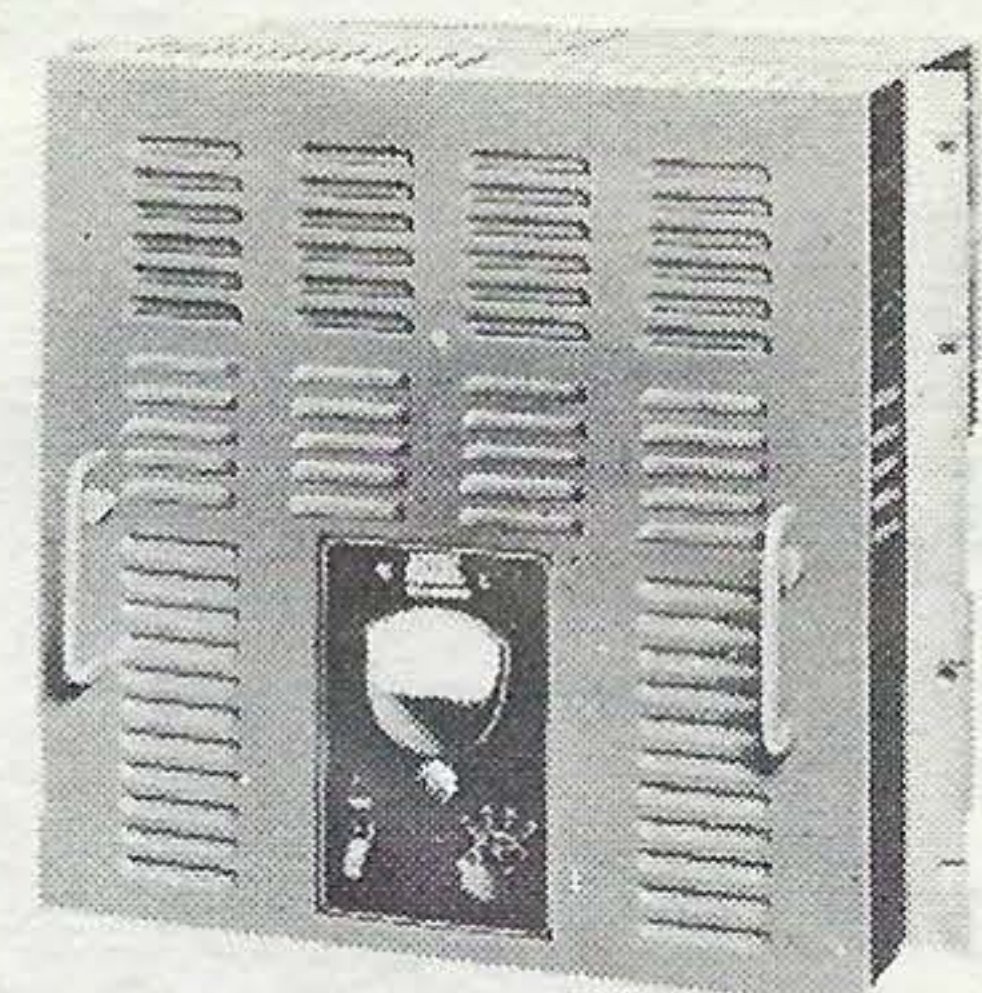


Altec Lansing is one of the few manufacturers of electronic equipment who submit their apparatus for approval by Underwriters' Laboratories, Inc.

ALTEC

ENGINEERED SOUND SYSTEMS

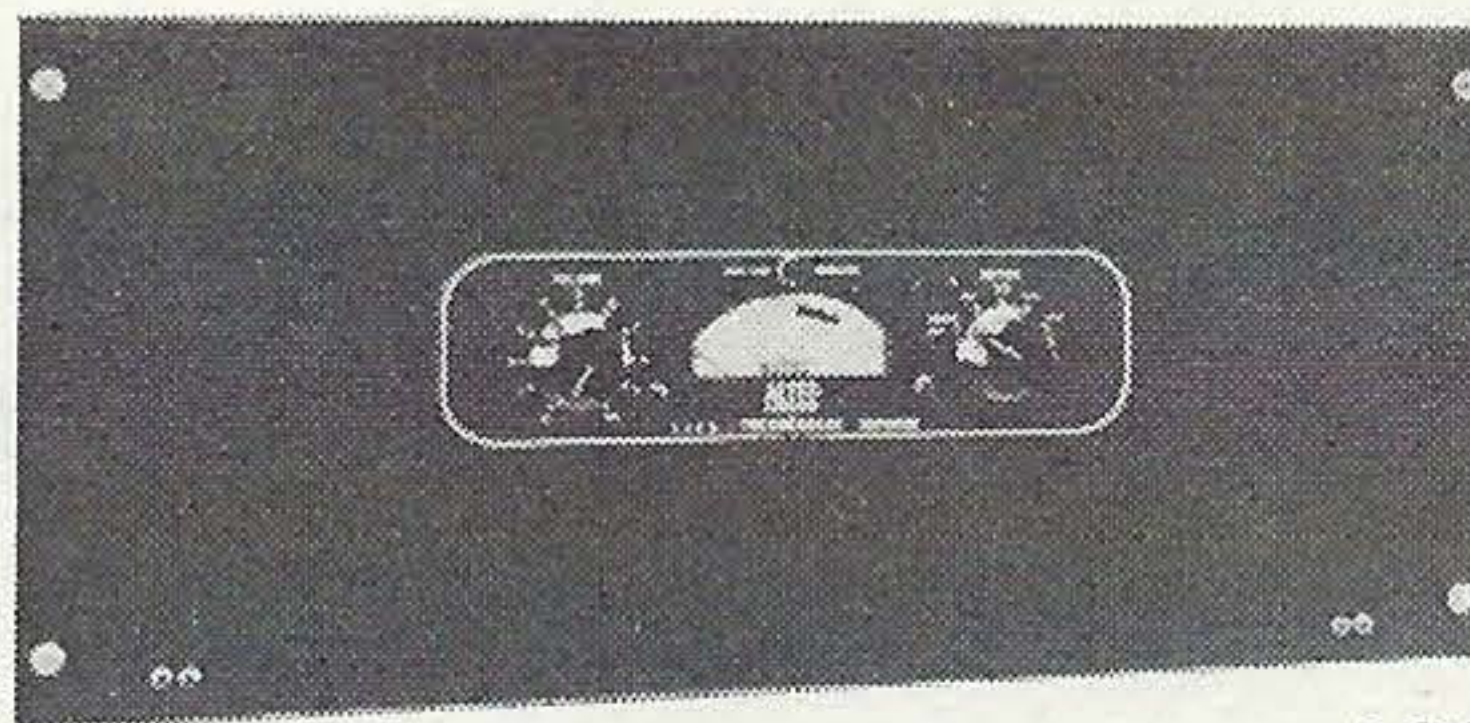
33a
AL



260A



7464-"NOALA"



128B



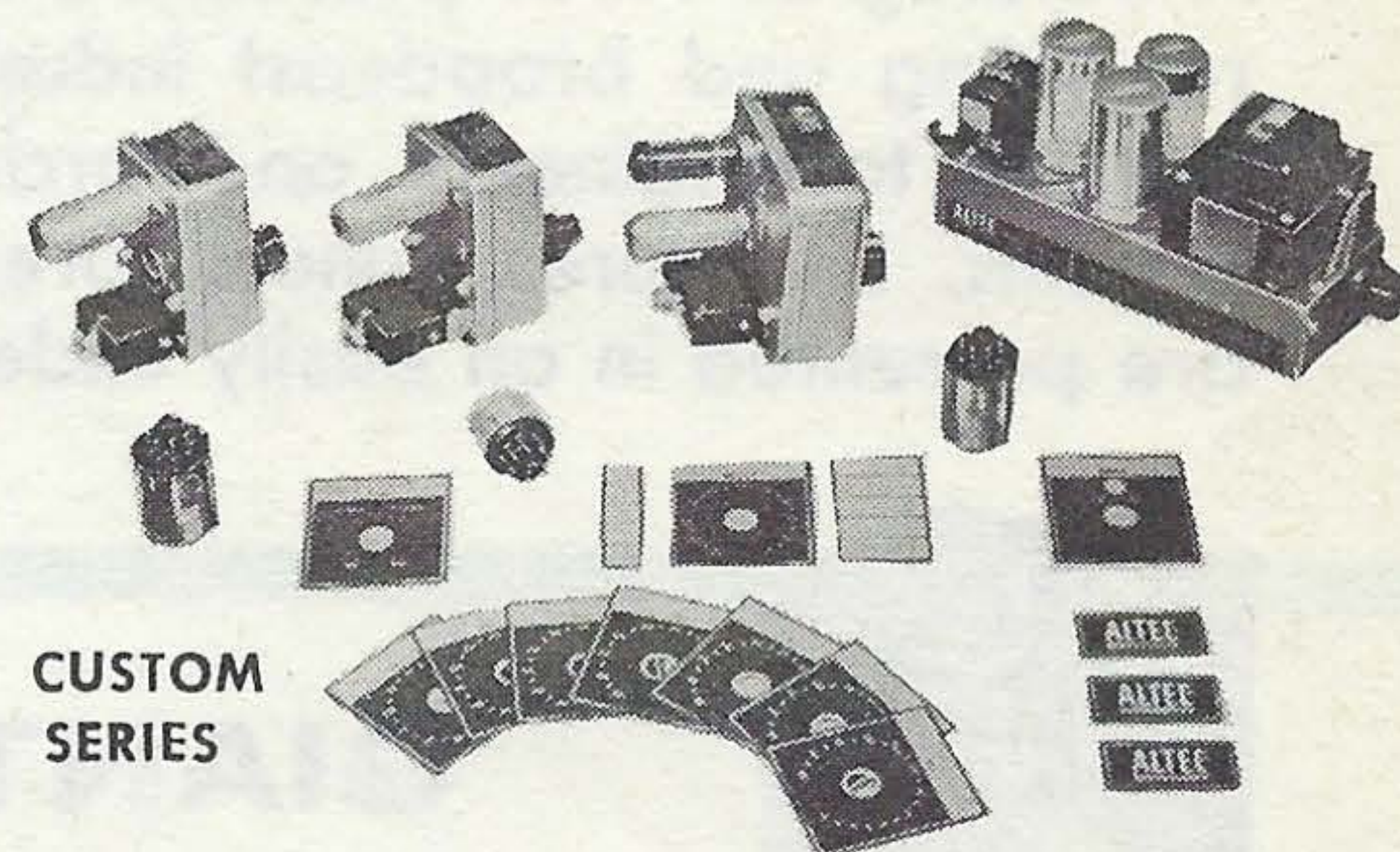
356A



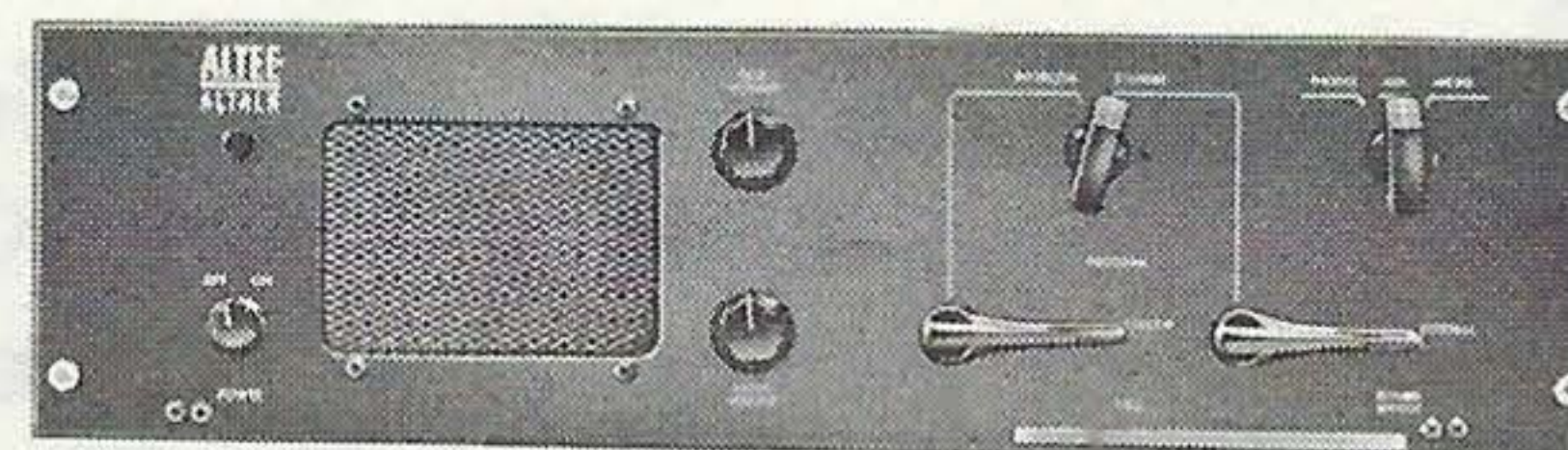
7740-"SEQR"



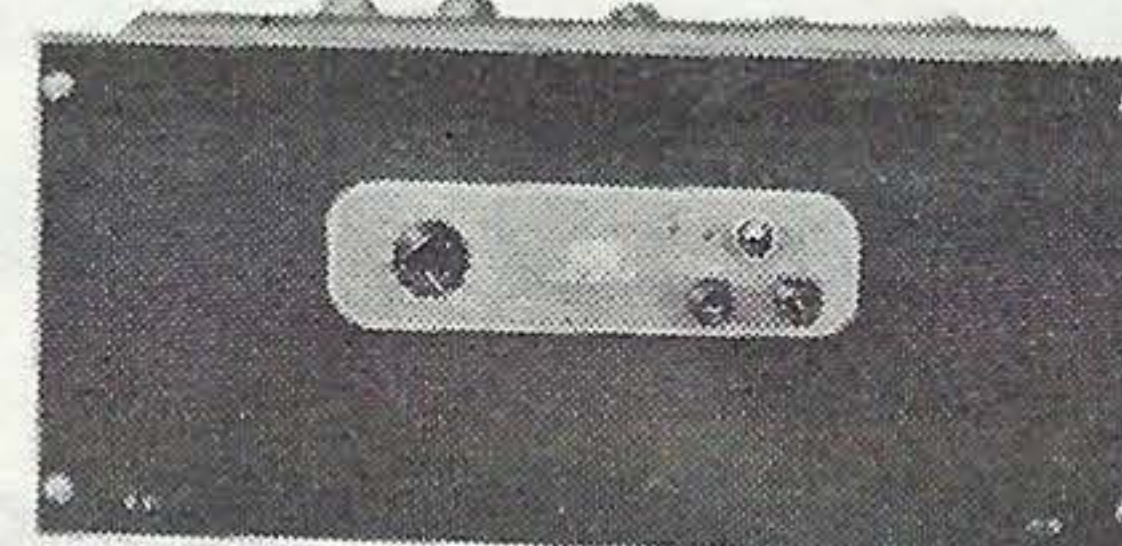
342B



CUSTOM
SERIES



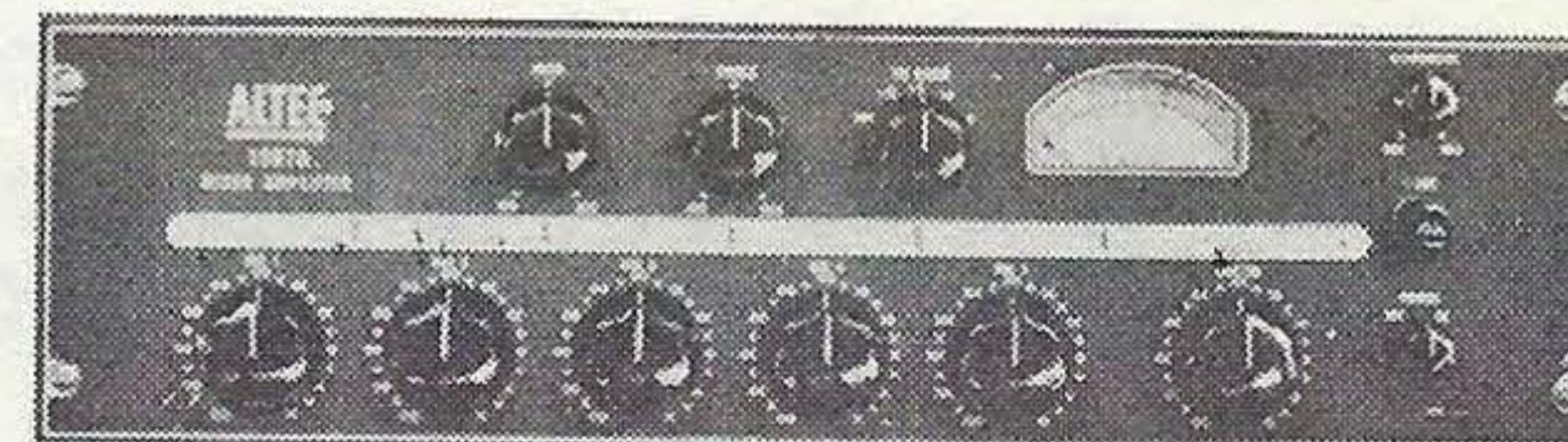
1556A



1568A



1570B



1567A



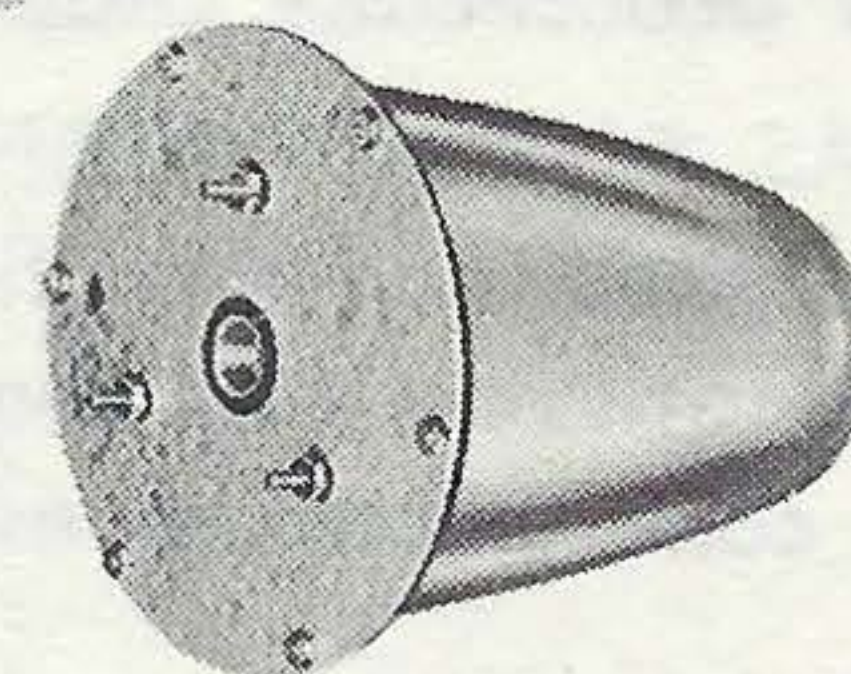
605A



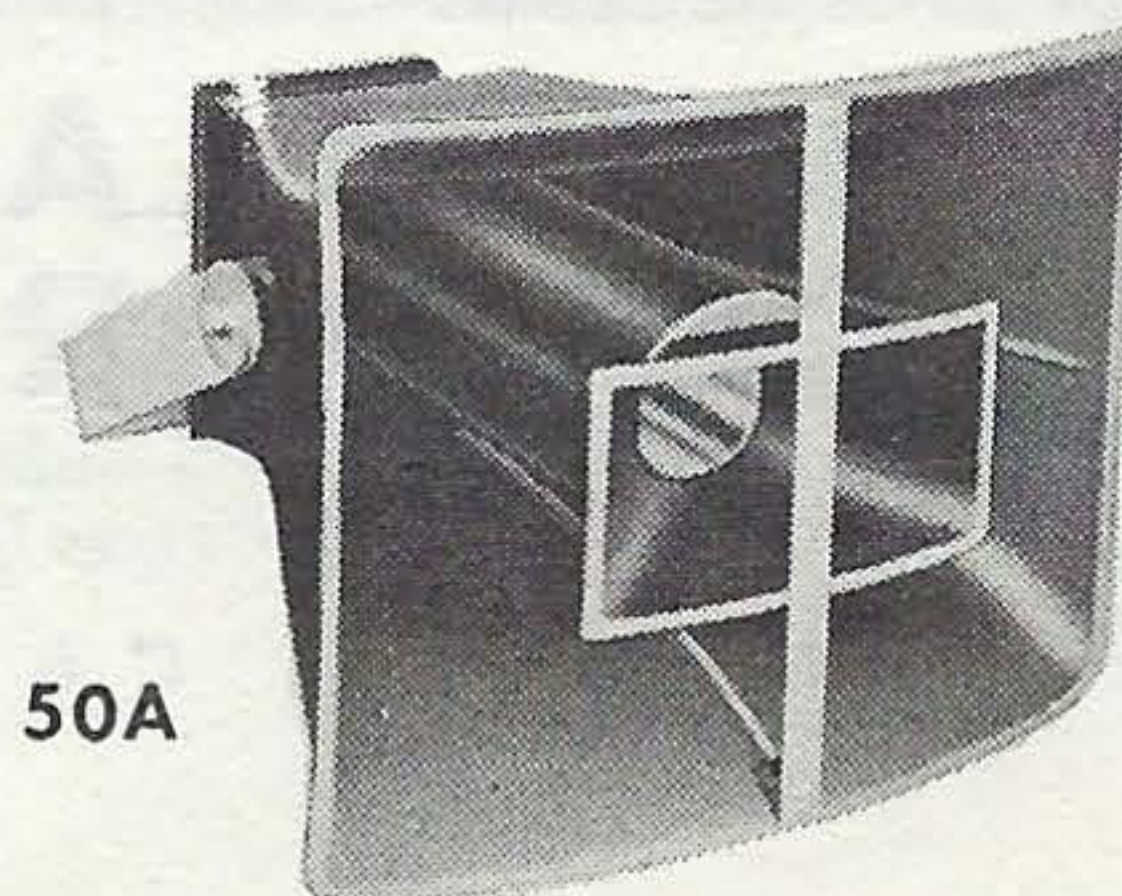
515B



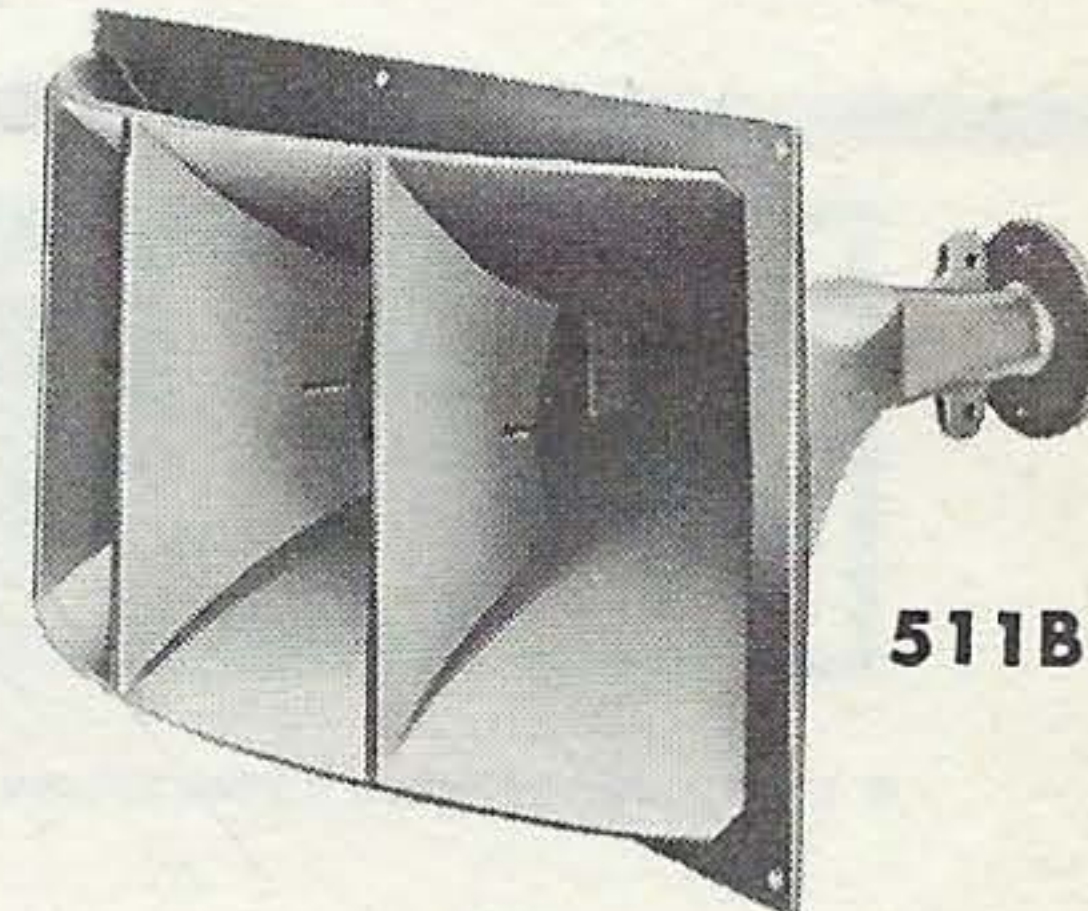
288C



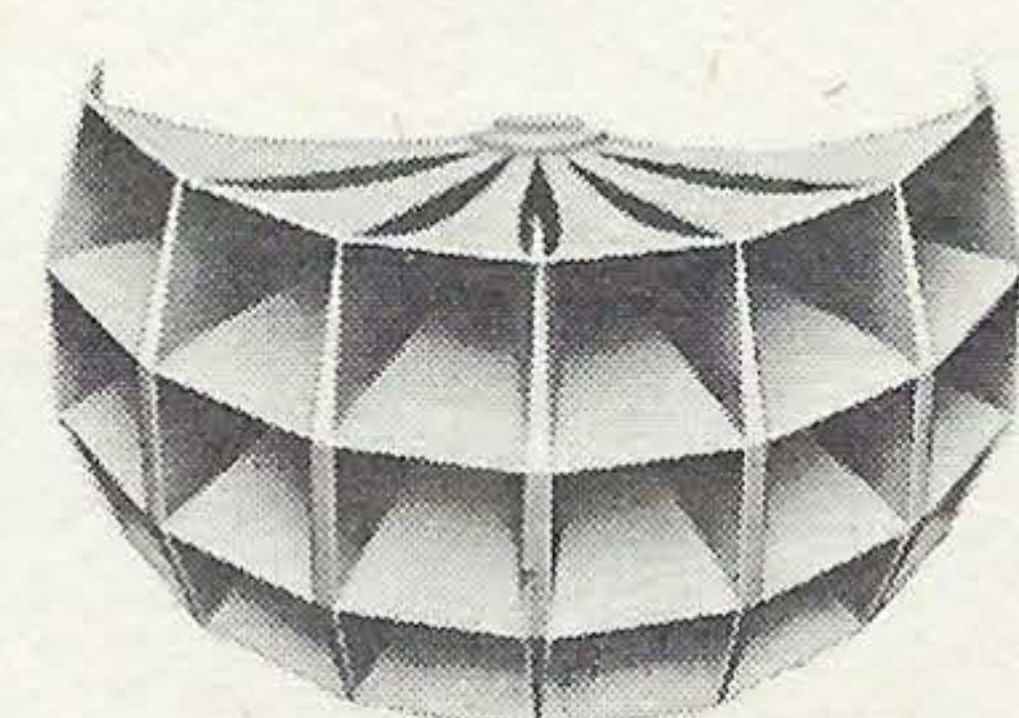
730B



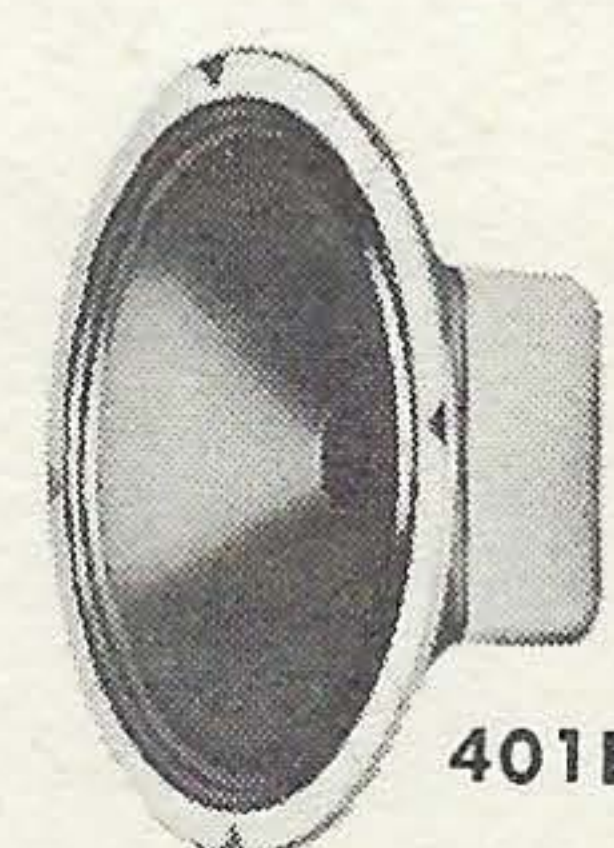
50A



511B



MULTICELLULAR



401B

OUTPUT IMPEDANCE— Ω	OUTPUT LEVEL—dbm 10 DYNES/CM ²	PICKUP PATTERN
30, 150, 600 & HiZ	—48	Omnidirectional
30, 150, 600 & HiZ	—53	Cardioid
30/50	—55	Omnidirectional
30 or 30 & 150/250	—55	Omnidirectional
30/50	—52	Cardioid
150/250 or 20,000	—55	Omnidirectional
30, 150 & 20,000	—55	Omnidirectional
30, 150 & 20,000	—54	Cardioid
30, 150 & 20,000	—55	Omnidirectional
30, 150 & 20,000	—54	Cardioid
30 & 150/250	—55	Omnidirectional
150/250 or 20,000	—55	Omnidirectional
30, 150 & 20,000	—55	Omnidirectional
30, 150 & 20,000	—54	Cardioid
100-inf.	(1 to 3v. av. varies w/load)	Omnidirectional
100 Ω to infinity	—44 dbv	Highly Directional
150/250 Ω or HiZ	—62	Highly Directional

BUILT-IN MULTIPLEX ADAPTOR	FREQUENCY RANGE	PANEL SPACE REQUIREMENTS
Time division. Type; separation better than 25 db-50-15,000cps.	87.6 to 108.3 mc	Sep. 7" mtg.
None	FM 88 to 108 mc—AM 550 to 1600 kc	Std. 7" rack mtg.

FREQUENCY RESPONSE IN C.P.S.	LOAD IMPEDANCE— Ω	SPACE REQUIRED	METER
± 1 db, 3-30,000	4,8,16,125	8 $\frac{1}{2}$ "	Yes (space current)
± 1 db, 30-15,000	600	For table mounts	Yes, VU, (2nd VU optl.)
$\pm .05$ db, 20-20,000	9 (70 & 130v)	18"	& space current
± 1 db, 20-20,000	4,8,16(70v)	Sep. 8 $\frac{1}{2}$ " mtg.	Yes (space current)
± 1 db, 20-20,000	8,16,250(70v)	Shelf mtg.	
± 1 db, 20-20,000	8,16,250(70v)	Sep. 5 $\frac{1}{2}$ " mtg.	
± 1.5 db, 30-15,000	30 to inf.	Mtg. on 1 $\frac{1}{2}$ " blank	Yes (compression)
	150/600	3 $\frac{1}{2}$ "	
± 1.5 db, 40-10,000	150/600	3 $\frac{1}{2}$ "	Yes (compression)
± 1 db, 20-20,000	150/600	Mounts in 250SU	in 250SU (space current)
± 1 db, 20-20,000	150/600	Mounts in 250SU	in 250SU (space current)
± 1 db, 20-10,000	50 (balanced)	5 $\frac{1}{2}$ "	
± 1 db, 20-20,000	Line Output	5 $\frac{1}{2}$ " multiple mtg.	
± 1 db, 20-20,000	68,000 Output	5 $\frac{1}{2}$ " multiple mtg.	
± 1 db, 20-20,000	150/600 or HiZ	5 $\frac{1}{2}$ " multiple mtg.	
± 1 db, 30-15,000	150/600 & HiZ	1 $\frac{1}{2}$ "	
± 1 db, 30-15,000	150/600 & HiZ	5 $\frac{1}{2}$ " or portable case	Optional (VU)
± 1 db, 5-30,000	4,8,16(25v) 124(70v)	8 $\frac{1}{2}$ "	Optional (space current)
± 1 db, 5-30,000	4,8,16,62(70v)	8 $\frac{1}{2}$ "	Optional (space current)
± 1 db, 10-50,000	4,8,16,32(70v)	10 $\frac{1}{2}$ "	
{ same as associated audio components in circuitry (all units) }	Amplifier input (600 Ω)	3 $\frac{1}{2}$ "	
	70 volt	7"	
		3 $\frac{1}{2}$ "	

IMPEDANCE— Ω	FREQUENCY RESPONSE IN CPS	PRESSURE SENSITIVITY* (in db)
16	35-22,000	124
16	35-22,000	126
8	175-12,000	118
16	Wide Range	123
16	Wide Range	126
24	500-16,000	131
4	300- 8,000	134
8	150- 8,000	130
16	500-22,000	126.5
16	500-22,000	124.2
8	60-12,000	108.8
8	70-11,000	109.7
8	70-11,000	109
8	40-15,000	107.2
8	40-15,000	113
16	30- 4,000	113
8	30-22,000	113
8	30-14,000	115
16	20- 1,000	118.4
8	20-22,000	115
16	20-22,000	118.4
16	20- 1,600	113.8

*At Rated Power

NOTICE: We recommend that you obtain your Altec products from factory trained authorized Altec Sound Contractors and Distributors. This will assure you of proper installation, a continuing source of knowledgeable advice, service, and quick warranty protection.

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AL-1310-2

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AL-1321

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