

ALTEC AIRPORT SOUND SYSTEMS





Reliable Sound Systems are Indispensable to Every Modern Airport.

RELIABILITY in every part—Modern airports aren't just buildings any longer; they're *systems*. Burgeoning air traffic, heavier aircraft, speedier baggage handling, more complicated passenger routing in the terminals—all these and more impose severe demands on every facet of the air terminal system. Where yesterday, an air terminal sound system grew in no planned fashion from a simple crystal microphone and elementary loud-speaker system, today's system must accommodate the diverse requirements of paging, announcing, music reproduction, emergency warning, and special purpose communications, under a wide variety of acoustic conditions. Lack of reliability can cause not only inconvenience but actual danger and panic in some cases. This is why Altec Lansing, pioneer in inte-

grated sound systems, has stressed aerospace-level reliability in every section, sub-section, and component in its airport sound systems.

Mr. R. C. Coffeen, a well-known independent engineering consultant, summarized the matter in a paper delivered before the AIEE in St. Louis, Missouri. In a typical situation, a couple of businessmen wait in a large air terminal for minor difficulties on their aircraft to be corrected. Talking together, they don't quite register the words which announce their flight is now ready to resume. Perhaps one looks up, and asks the other if he heard the announcement. The other shrugs. Both go back to their business talk, in spite of a nagging, half-buried feeling that they might have missed their call. But the ticket and information counters are crowded ten deep, so neither

gets up to check. A little later, their flight leaves. They miss their trip. The airline chalks up two "no-shows." Everybody loses, because the sound system was not right for the situation where high background noise acoustical handicaps and passenger distraction immensely complicate the problem of transmitting intelligible information.

RELIABILITY to completely understand each departure and arrival flight announcement is demanded by the traveling public. Altec systems provide live announcements from individual ticket counters, from gate locations, passenger counters and a central announcing station by means of microphones, telephone hand sets, or any automatic pre-recorded flight announcing equipment. Emergency

service microphones at the Security office of airport manager locations can be provided with priority facilities for controlling large crowds both within and out of terminal, in parking lots and adjacent areas. Although Altec systems are designed primarily for voice announcing and paging—they are also capable as full-range high fidelity reproducing systems for background music.

RELIABILITY is the essence of many Altec exclusive sound innovations to safeguard and improve over-all system performance...“NOALA”—“SEQR”—“ACOUSTA-VOICE*”—WATCH-GUARD,” etc.

RELIABILITY in the form of “fail-safe” operation is a mandatory requirement in airport sound systems. A leading airport communications executive made the following statement: “Twenty minutes of system ‘down-time’ due to amplifier failure will result in two to three hours delay in aircraft departure from large airports.” Altec’s newly patented 7740 “SEQR”® control panel operates power amplifiers in parallel while continuously monitoring their outputs. Absolute dependability is assured by the simultaneous activation of a signal light and an audible alarm should either amplifier become subnormal. And the system continues to function at a reduced level.

RELIABILITY is personified in Altec’s patented “NOALA®”, acronym for Noise Operated Automatic Level Adjustment, which fills one of the most important requirements of modern, public air terminal and airline maintenance hangar systems. “NOALA,” using the speakers also as sound level sensing devices, automatically raises the volume of a sound system so that announcements and flight information will always be heard intelligibly despite the varying noise caused by arrival and departure of jet aircraft, and high noises generated by crowds in packed terminals. Every traveler can clearly hear and understand each flight announcement, rather than experience the conditions outlined by our two fictional businessmen.

RELIABILITY is assured by conservative Altec solid state designs. Silicon transistors are employed for long, trouble-free performance. All components of Altec airport systems are designed for continuous 24 hour industrial duty. All Altec solid state ampli-

*TM of LTV Ling Altec, Inc.—Patent Pending

fiers will operate with either AC or DC power sources, thus are not dependent on regular power lines in emergencies.

RELIABILITY as to constant intelligibility of speech and freedom from “blasting,” is insured by Altec compressor amplifiers. The level differences caused by individual voice intensities, together with varying distances of each speaking individual from the microphone, are minimized.

RELIABILITY of speech starts with the microphone—the crucial “first link” in the chain of quality sound reproduction. Each Altec microphone is a precision instrument designed to satisfy situation requirements such as close talking, noise cancelling for high noise areas or tailored to omni directional needs such as paging microphones. They may be mounted on desk stands, goosenecks, handsets or hand held.

RELIABILITY... Whether each spoken word in flight announcements or emergency instructions will be clearly understood is preset by the quality of the “last link” in the component chain of a sound system—the loudspeaker. Ordinary marginal quality radio loudspeakers, inexpensively produced or re-entrant horns cannot be relied upon to perform the mass communication function in an airport. Altec does not manufacture or sell low-quality ordinary loudspeakers such as those used in many office communication systems, home radio and television sets.

The final touch of perfection to any sound system is a service known as “ACOUSTA-VOICING.” Trained sound engineers “tune” the installation much as an organ is “voiced.” This assures maximum coverage and performance of the equipment. This Altec innovation maximizes the effectiveness of the sound system.

RELIABILITY of each Altec sound system is guaranteed by a perfect-working integration of matched high quality industrial components. Altec systems are not a miscellany of re-labeled and re-branded parts of various or unknown manufacture. Altec is the only manufacturer in the United States that designs and manufactures from raw material in its own plant... microphones, amplifiers, loudspeakers, transformers, control equipment. Only Altec can provide a single source responsibility and truthfully fulfills the important specification: “All products must be of the same manufacturer.”

ALTEC 650 & 687 ANNOUNCE & PAGING MICROPHONES



You can choose from 29 different Altec microphones ranging from the famous M-50 Professional Condenser Microphone, frequency response 20 to 20,000 Hz, to the latest 687B Announce Microphone. The 687B is ideally recommended for airport use—it can be hand-held, conveniently located in hangar facilities for use at gates; or mounted on a desk stand. The versatile 687B features a quality push-to-talk/lock-to-talk switch with spare contacts to operate distant relays. An exclusive, adjustable, variable bass response can be selected for best voice reproduction in various ambient noise environments. A sintered bronze filter prevents dust and moisture from attacking the microphone element.

ALTEC 695A/696B NCD MICROPHONE AND 697A MICROPHONE ASSEMBLY

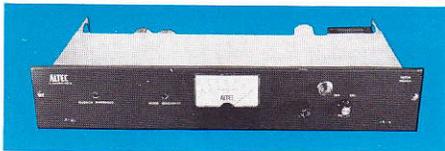


Want to avoid the garble of high background noise and the intelligibility degradation of an ordinary telephone (carbon mike) handset? Then use the broadcast-quality Altec 697A noise-cancelling dynamic microphone. Its built-in transistorized amplifier yields a frequency response of 100 to 5000 Hz, as compared with about 300 to 3000 Hz for most phone handsets. And the 697A is a direct replacement for the carbon transmitter found in most handsets.

Where you prefer a microphone instead of a handset, the Altec 695A provides the same noise-cancelling and full frequency features. For less demanding applications, the Altec 696B, which does not include the transistorized amplifier, provides excellent noise-cancelling with good sensitivity.

All three units, the 697A handset and the 695A & 696B microphones, are especially recommended for high-noise environments where close-talking, noise-cancelling units are indicated. In airport audio systems, they produce outstanding results as well as in two-way radio, paging, announcement, and intercommunication networks. Again, a sintered bronze filter protects the microphone cartridge from dust and moisture damage.

1605A NOALA® CONTROL PANEL

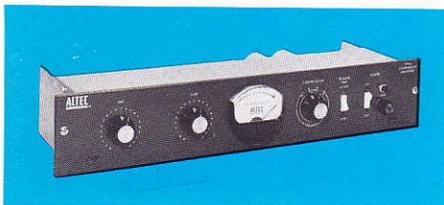


NOALA — "Noise Operated Automatic Level Adjustment." The exclusive NOALA system:

- Automatically adjusts paging levels relative to ambient noise.
- Eliminates unintelligible announcements.
- Instantaneous quench attack time.
- 26 dB continuously variable adjustment. No step level changing.
- Speaker system acts as sensing element. Noise sensing microphone not required.
- Multi-Speaker systems automatically act as multi-area sensors.
- External noise amplifier not required.
- No disruption due to dirty relay contacts.
- Microphone or extra cabling not required.
- Automatic switchover to battery operation during primary failure.

Relative Gain Indicator reads in dB of relative inserted gain from zero to +30. When NOALA is installed the insertion gain can be preset to allow for operating range as required during peak noise periods.

1591A SOLID STATE COMPRESSOR AMPLIFIER

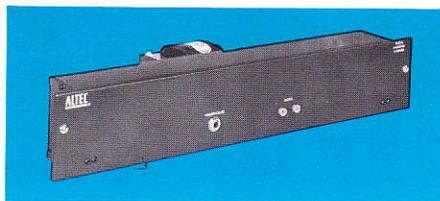


Altec compressor amplifiers are self powered, level-controlling, broadcast quality amplifiers with the versatility which makes them a must for airport sound systems. In response to a strong input signal they will reduce gain up to 30 dB automatically, rapidly, and quietly without the introduction of thumps. Level differences caused by different voice intensities and resulting from unequalized distances of announcers from the microphone can be minimized by their use. An important feature is that they automatically fade background music when voice announcements are made. Their unique ability to maintain a relatively constant output level assures high intelligibility and freedom from blasting of sound to travelers' ears often caused by sudden, emotional bursts into a microphone. The 1591A is available for use on 120-240 VAC, 50-60 Hz power lines or battery operated.

1603A SEQR® COUPLER CONTROL PANEL

Altec's all-solid-state "SEQR" contributes the highest degree of operating

reliability to a sound system. "Fail-safe" operation is assured by operating power amplifiers in parallel into a common matched load through a "SEQR" Control Panel. Failure of one amplifier will have no effect on the load impedance as seen from the output terminals of the sur-

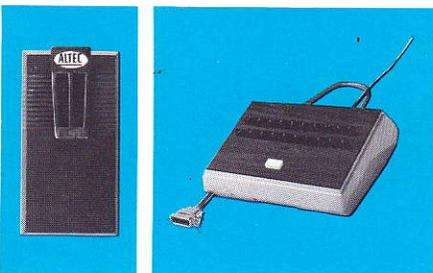


living amplifier. Should amplifier "A" fail to deliver its power output, amplifier "B" will continue to deliver power with complete safety. The "SEQR" feature will function even after failure incurred as a direct short on the failing power amplifier. No noticeable change of volume will occur in the projection of programming.

Aside from the built-in trouble light that automatically lights up in the event one amplifier has failed or become subnormal there are terminals provided to connect additional remote alarms such as buzzers, bells or other signal lines.

The "SEQR" unit occupies only 3½" of critical rack space and provides accommodations for operation with a pair of Altec 1568A, 1569A or 1570B Amplifiers. Also 1593A, 1594, 1590B, 351C.

ALTECALL™ POCKET PAGERS



ALTECALL® is a hands free, selective pocket page system of single or dual tone codes and voice signaling. Solid-state, the system operates by selecting the individual code number on the encoder console which automatically triggers the base station radio transmitter. The pocket receiver emits an audible signal of one or two tones, followed by a voice message. Each receiver responds only to the pre-selected code designated for that receiver.

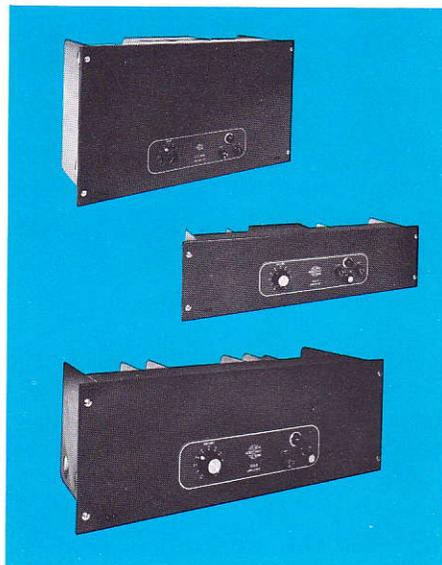
Optional features are provided such as group calling, remote control applications and "dial access" facilities to private telephone systems. The group call feature provides a means of alerting and transmitting a voice message simultaneously to a predetermined group of receivers. Individual calls may be directed to airport personnel in various locations such as maintenance, runway personnel, or security guards. The group call feature is essential where more than one individual must be alerted for fire, accidents, or medical assistance, or in any instance where an emergency situation exists.

ALTECOM™ INTERCOM SYSTEMS



Confidential, private conversations and conference facilities are provided by Altec single-channel and multi-channel intercom systems. Patented touch-dial station selection, together with modular solid-state circuit designs assure positive, instant contact with offices and functional departments.

1590, 1593, 1594, 1595 POWER AMPLIFIERS



Altec solid-state power amplifiers are available in a variety of sizes, 50, 100, 200 to ½ KW, to accommodate economically every airport requirement. Each is built to uncompromising standards of precision, accuracy and broadcast quality. Just look at these features:

- Less than 3% maximum harmonic distortion, compared with the usual 5%+.
- Built-in, two-stage, high-pass filters protect horn-loaded drivers.
- Tapped power transformers give optimum operation at several line voltages, 120 or 240 Volts AC 50 to 60 Hz.
- Stand-by battery operation available on most models.
- Standard 70-volt multiple-speaker connections meet local ordinances.
- All speaker connections isolated from amplifier circuitry for best flexibility.
- Negative feedback transformer winding frees load circuit from amplifier ground.
- Hinged-drop front panels allow easy access for servicing.

Each Altec system is designed by a competent sound engineer to fill the precise needs of each individual installation. Altec systems are not mass-produced or pre-packaged, and therefore do not include many useless features which the airport neither needs nor wants.

Each Altec system is a completely integrated system of matched high quality industrial components. Altec systems are not miscellany or re-labeled and re-branded parts. Only Altec can fulfill the important single-responsibility specification: "All products must be of the same manufacturer." Altec is the only manufacturer in the United States that makes all its own units: microphones, amplifiers, loudspeakers, transformers, control equipment.

In addition to the larger power amplifiers, Altec also offers a 20-watt solid state package with multiple inputs, as well as a completely solid state 50-watt amplifier for special applications.

MULTICELLULAR HORNS, SECTORAL HORNS



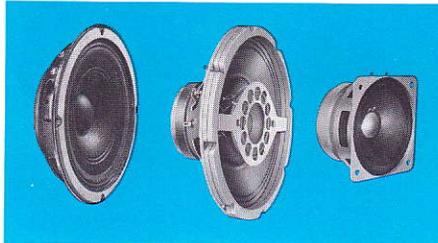
Horn type speakers are required in hangars and to cover outdoor airport aprons, parking fields, etc. As horns go down to 300 Hz, they effectively project pages, announcements and emergency directions through the variable high ambient noises encountered in these large areas.

The Multicellular Horn is a cluster of straight exponential high frequency horn cells which provide the most efficient and effective way to project very high level sound. A unique advantage of the multicellular horn is the fact that the component cells can be grouped in a variety of ways to tailor its horizontal and vertical distribution to provide perfect coverage of vast outdoor areas—such as used in "Giant Voice" systems covering entire cities and military command installations. Multicells are available in 300, 400 and 500 Hz sizes and in 2 to 18 cell clusters.

Altec cast aluminum Sectoral Horns provide inexpensive, space-saving means for uniform control of projection angle over smaller areas with excellent projection above 300 Hz.

Multicellular and Sectoral Horns have straight sound passages which provide distinct advantages over horns with folded sound passages, the sharp bends of which severely attenuate high frequencies and cause garbling distortion. The ordinary re-entrant or reflex horn and the column speaker are also handicapped by the fact that the beam-width becomes steadily narrower as frequency increases, to a point where sound coverage in the critical high frequency range between 2000 and 10,000 Hz shrinks to only 15° to 30°. On the other hand, both the Multicell and the Sectoral Horn provide even, wide-angle horizontal distribution throughout the frequency range for complete coverage of broad areas.

LOUDSPEAKERS



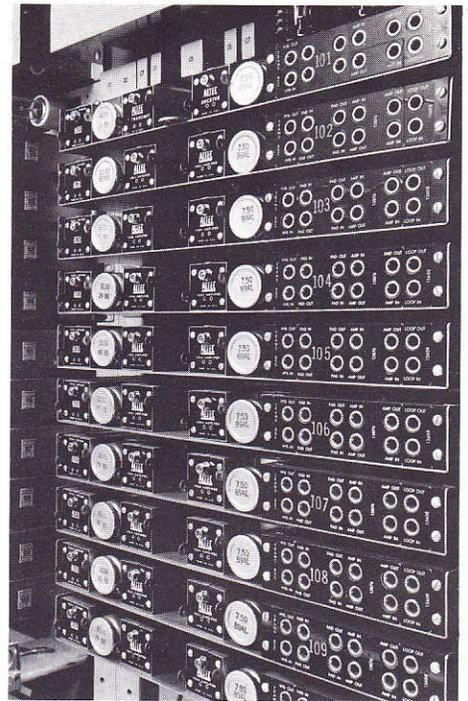
Of a number of Altec speakers particularly recommended are the 4" 405A and 8" 409B & 755E. Altec engineers, by the application of a new ceramic magnet of Indox V, have increased the flux density to 11,000 gauss, and have lowered the cone resonance to improve low frequency reproduction.

The Altec 405A speaker is an extremely shallow, compact 4" speaker providing true-high-fidelity reproduction. Through use of an Indox V high-flux magnet, the damped, high-compliance cone provides superb low frequency reproduction with smooth, extended frequency response upwards which is the equal of most larger speakers. Clear, intelligible speech and excellent music reproduction is assured from 60 Hz to 15,000 Hz.

These loudspeakers feature a rare combination of plus factors... (a) A single speaker covers a greater area than possible with several ordinary cone-type radio speakers. It provides a wide angle of 90° distribution without high frequency loss (see graphic illustrations on this page). (b) Slim profile—This unique design allows convenient installation in shallow ceiling and wall areas. (c) With a wide audio range the 405A, 409B and 755E assure crisp, intelligible speech and high fidelity background music reproduction. (d) Heavier magnets mean increased efficiency—more sound level output for dollars invested.

The unique design of the 755E 8" loudspeakers makes this the only true wide angle cone-type reproducers and eliminates "dead spots" between speakers. The 755E loudspeaker permits full angle coverage of all areas, with the number of speakers used reduced to an economical minimum.

ALTEC TELEPHONE REPEATERS USED IN AIRLINE COMMUNICATIONS SYSTEM



One of the foremost airline companies in the country, Delta Air Lines, maintains its own aircraft communication system (communications with aircraft in flight). With this system they talk from Atlanta with their pilots anywhere in the country on route to Los Angeles, New York, Miami, etc. Remote transmitters and receivers are stationed along all routes with some 70 unattended VHF stations controlled from the radio control position at the Atlanta base—this amounts to approximately two million square miles of VHF coverage. All inbound and outbound lines, isolating amplifiers, splitting amplifiers, compression amplifiers, low-level and high-level amplifiers to and from each position are Altec plug-in transistorized series.



Typical Altec Repeater Measures 1 3/4" x 1 3/4"

You'll find a practical solution of supplying increased service within decreased space in Altec's complete line of transistorized, miniaturized, plug-in repeaters and supporting equipment. The compact component shown above typifies the space-saving size of Altec repeaters, compressors, power amplifiers, equalizers, networks, relays, attenuators and other miniature devices.

CASE HISTORY FILE 61-28, Atlanta, Georgia Airport



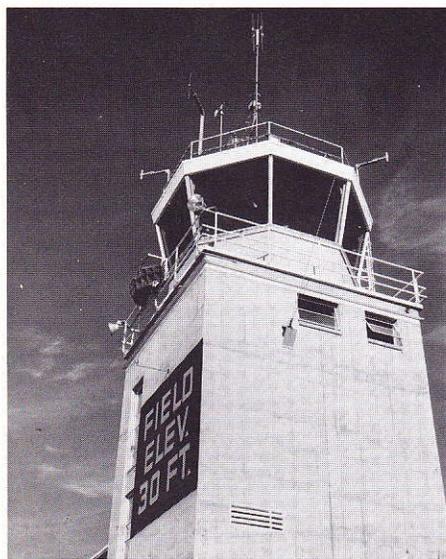
SOUND PROBLEM: The new Atlanta Airport required an arrival and departure announcing system to service the multi-level terminal building and six radial concourses with intricate connecting passageways.

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 fail-safe 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!*

CASE HISTORY FILE 61-23, Sherman Airfield



SOUND PROBLEM: An effective, failure-proof paging and alert system was required for field-wide ground control. The system selected had to provide absolute message clarity capable of overcoming the high intensity noise levels generated by the blast of jet engines.

SOUND SOLUTION BY ALTEC: Altec multicell horns and voice frequency drivers with associated Altec power and control equipment were selected. With Altec, flight line paging is effective 500 to 700 feet in front of each horn *during jet engine blasts in the adjacent taxi area*. At all other times, and with aircraft in the vicinity,

each Altec horn is audible at 1,000 yards. In this critical application, where no malfunction is minor and garbling could result in disaster to men and material, Altec is relied on to perform as specified.

NOTE: Because of obvious greater superiority over conventional siren and other coded signal systems, many U. S. cities have selected an Altec Giant Voice® warning system to blanket prime target areas. High level Altec voice command and warning systems are equally effective in many other critical military and civilian applications such as airfields, missile sites, firing ranges, general disaster control, and air defense facilities.

CASE HISTORY FILE 61-15, Tulsa, Oklahoma Airport



SOUND PROBLEM: The Air Terminal required a distributed speaker system for announcing departures and arrivals. The system selected had to reach every waiting traveler clearly and without fail in all areas of the terminal, regardless of high noise levels generated by aircraft.

A distributed system consists of many speakers located throughout the area to be covered. Ideally – to reduce equipment, amplification, and installation costs – the system should provide complete coverage with the smallest number of speakers. Only a system of highest quality and efficiency can offer both effectiveness and economy.

SOUND SOLUTION BY ALTEC: A custom Altec component system achieved the ideal balance between requirements and cost. 350 wide-range Altec 755E “Pancake” Speakers are widely separated yet provide highest intelligibility through their unique 90° distribution pattern. Only six 175-watt Altec 1570B Amplifiers power this installation. Volume from each of the 350 speakers is automatically maintained at a pre-set level by a single Altec 436B Compressor Amplifier. Close-talking Altec Microphones are mounted on Altec desk stand/switch assemblies that include warning lights to advise each airline when the system is in use.

CASE HISTORY FILE GM-69, Columbia, S. C. Airport



SOUND PROBLEM: Twenty-five service counters and departure gates required announcing facilities to feed into one hundred fifty-nine speaker stations ranging from quiet, air-conditioned rooms, to an outside garden.

SOUND SOLUTION BY ALTEC: Twenty-three Altec 696B noise-cancelling microphones and two Altec 632C microphones provided the clarity of transmission with

immunity from high background noise. One hundred fifty-eight Altec 409B speakers were completely adequate for sound levels at all announcement areas with the exception of the weather-exposed garden, where an Altec 50A (now 150A) Horn filled the bill. Seven Altec amplifiers of five different types were combined to provide the exact power and fidelity profile required to fit this complex audio system with its wide range of station requirements.

SUMMARY



Below: Escalator area of a typical International Airport. Altec sound systems are designed to operate at highest efficiency in crowded areas where ambient noise levels are extremely high.

The airport manager or governing commission which must install a sophisticated, multipurpose audio system will obtain the best system with the most reliability at the least cost by specifying a system made up of *matched, integrated subsections* all produced by the same manufacturer. In considering the requirements of the audio system, the purchaser or contractor should make adequate provision, under worst expected conditions, for obtaining *intelligibility* at all stations, *reliability*, and conformance to all applicable legal and industry *standards*. Altec Lansing, a pioneer in the audio field and, especially, in the design of airport audio communication & warning systems, offers a variety of tested, proven system components uti-

lizing the latest advancements in the audio art. These systems components are so matched in electrical and mechanical design that they can be integrated into any of a wide variety of systems for particular requirements to produce an audio system of the very highest quality available at any price, anywhere.

Choose Altec for complete sound-reinforcement & airport paging systems. For detailed technical information and specifications, contact your nearest authorized Altec sound engineering contractor, or write or telephone to Altec Lansing, 1515 South Manchester Avenue, Anaheim, California 92803, Telephone: (714) 774-2900.





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World's Largest Manufacturers of Sound Equipment Exclusively: Stereo Receivers, Speakers, Speaker Systems, Stereo Ensembles for the Home / Microphones, Control Consoles, Amplifiers, Speakers, Speaker Systems for Public Address Systems / Acosta-Voice Equalization / Audio Controls, Consoles, Amplifiers, Microphones, Monitors for Professional Broadcast, Recording & Motion Picture Studios & Theatre / Telephone Amplifiers & Associated Wire & Microwave Transmission Equipment / Power Supplies & Transformers / Doctors' Registry, Random Access School Systems, Inter-communication Systems for Residential, Business, Industry, Government and Military Installations.

