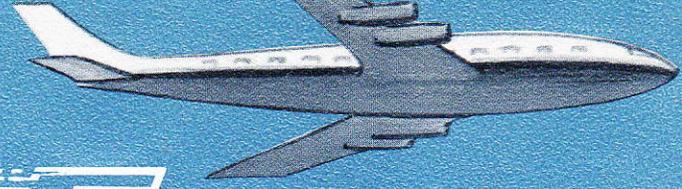
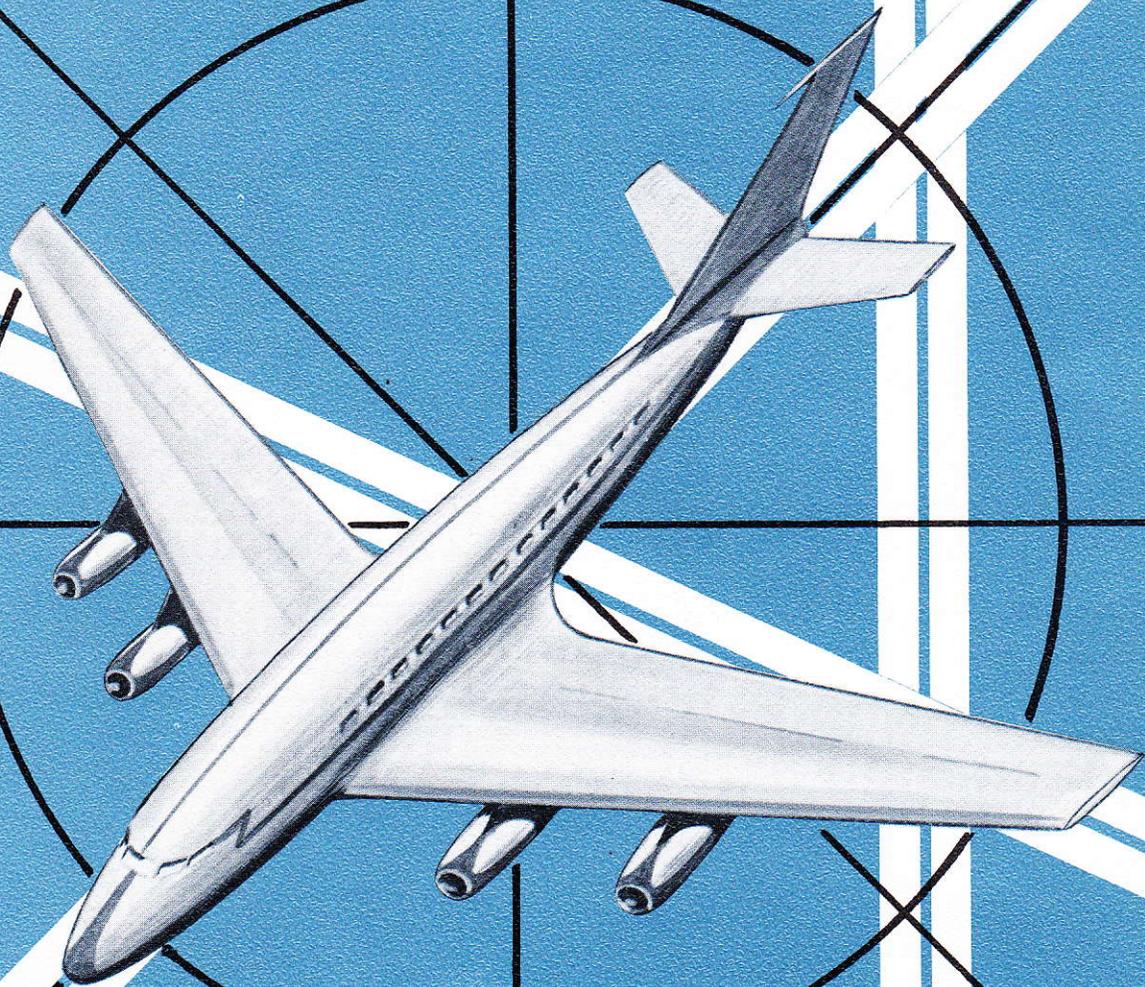


JET AGE



SOUND SYSTEMS

for MODERN AIRPORTS

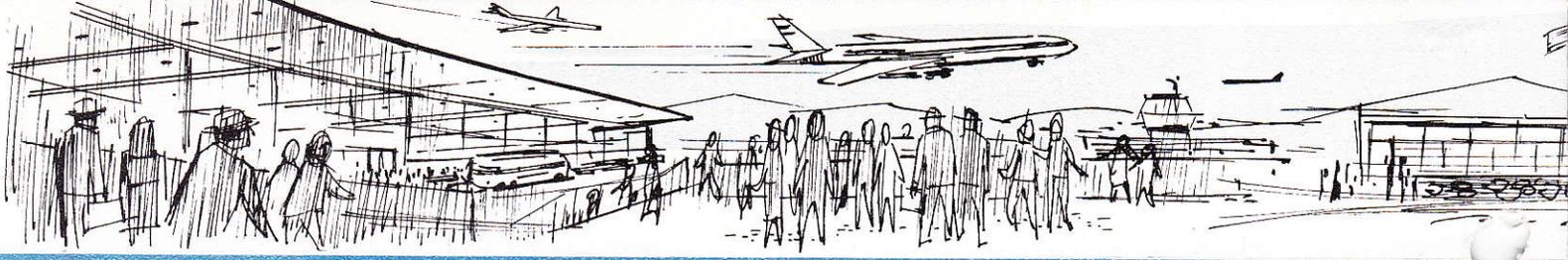


featuring ...
EXCLUSIVE ALTEC SOUND INNOVATIONS

- NOALA
- SEQR
- THERMEGUARD
- GIANT VOICE
- MULTICELLULAR HORNS
- SECTORAL HORNS



A Division of *LSV* Ling Altec, Inc.
1515 South Manchester Ave., Anaheim, Calif.



RELIABILITY in every facet — This is the imperative requirement of an airport sound system paced to the rapidly accelerating JET AGE. Vastly increased noises of jets and turbo-props — the growing number of persons traveling by air — heavier aircraft traffic — larger terminals — enhanced attention to travelers' expediency and comfort — speed-up of baggage handling — greater concern with public demands and opinions — have obsoleted all previous concepts of airport sound systems. Where many of today's air terminal sound and communication systems simply happened, now they must be carefully designed to cope with a host of critical situations.

Mr. R. C. Coffeen of Burns and McDonnell Engineering Company, Kansas City, Missouri, summed up the matter in a paper delivered in May, 1962 before the AIEE in St. Louis, Missouri:

THE PROBLEM DEFINED

The following conversation, though fictitious, could have occurred at any number of our major commercial airports including some of the more recently constructed facilities billed as "jet age" terminals:

Joe and George are waiting for the departure of their flight which is being delayed by minor mechanical difficulties on a Friday afternoon, one of the busiest times for most airports:

Joe: Say George, wasn't that last announcement for our flight?

George: You've got me, Joe. I couldn't understand much of what he said.

Joe: Well, I suppose we should walk over to the ticket counter and check the information board.

George: Yeah, I suppose we should but with this crowd we probably won't be able to get close enough to read the board when we get there.

This conversation serves to focus our attention on the problem of inadequate auditory and visual communications with airline passengers and airport visitors at many of our large air terminals. Is this problem new? No, it is not . . .

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 and a central announcing station by means of microphones, telephone hand sets, or any automatic pre-recorded flight announcing equipment can be adapted. Emergency service microphones at the Security office or 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 a product of many Altec exclusive sound innovations to safeguard over-all system performance . . . "NOALA" — "SEQR" — "THERME-GUARD" — "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.

RELIABILITY is personified in Altec's (pat. pending) 7464 "NOALA"®, acronym for: (Noise Operated Automatic Level Adjustment), which fills one of the most important requirements of modern, public air terminal and airline maintenance hanger systems. "NOALA" operates from strategically located sensing microphones and 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 is able to clearly hear and understand each flight announcement, rather than experience the conditions outlined in the above "Problem Defined."

RELIABILITY is emphasized in the amplifier protection system. "Therme-Guard" . . . another Altec exclusive. This anti-heat device automatically reduces the line voltage to the equipment whenever the operating temperature rises dangerously, due to any cause, and allows continued operation until the circuit temperatures return to normal. "Therme-Guard" is an integral part of the power amplifier, requiring no extraneous wiring or circuitry.

RELIABILITY is insured in conservative Altec designs which makes it unnecessary to rely on the "crutch" of plate relays commonly found in amplifier equipment of lower capabilities. All components of Altec airport systems are designed for continuous 24 hour industrial duty.

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 published performance specifications of Altec amplifiers has been certified through rigid tests conducted by the independent acoustical consulting firm of Louis S. Goodfriend and Associates, Montclair, New Jersey.

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 featuring a wide, smooth frequency response protected from quality degradation by exclusive Sintered Bronze Filters.

RELIABILITY that Altec sound products will meet the safety and protection standards of the national electrical code is attested by approval of Underwriter's Laboratories.

RELIABILITY as to 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 cone-type radio loudspeakers, folded, air columned 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 office communication systems, home radio and television sets.

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 unknown manufacture. Altec is the only manufacturer in the United States that designs and manufactures, 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." Rigid quality control is established in Altec's plant under MIL-Q-9858.

RELIABILITY of Altec systems is solidly founded on the experience of Altec's engineering organization which goes back almost 40 years into Western Electric Company. Today, Altec has become the acknowledged leader in the field of audio engineering. More than 60% of motion picture theatres equipped for stereophonic sound use Altec. One-third of the nation's largest stadiums, auditoriums and arenas use Altec. Altec pioneered the "Giant Voice" sound system which has been selected by many Air Force bases as the modern way to deliver precise verbal alerts, instructions and paging over base-wide areas. Many civilian airports are fully equipped with Altec sound systems. (See back cover for sample case histories.)

The **RELIABILITY** and maximum flexibility of Altec industrial grade sound system components are capable of providing every desirable feature for airline passenger control and comfort . . . meeting the exacting requirements of present and future air terminal sound system needs.

ALTEC 687A ANNOUNCE MICROPHONE

Altec manufactures 14 different microphones ranging from its famed M-20 Professional Condenser Microphone, frequency response 20 to 20,000 cps, to the latest 687A Announce Microphone. The 687A is ideally recommended for airport use — it can be hand-held, conveniently located on hanger facilities for use at gates; or mounted on a desk stand. The versatile 687A features a quality push-to-talk/lock-to-talk switch with spare contacts to operate distant relays. Plus, an exclusive adjustable, variable bass response that can be equalized for best voice reproduction in various ambient noise environments.



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

Many airlines prefer to use the regular telephone handset for paging. Since ordinary telephone handsets use carbon transmitters — intelligibility of announcements over the sound system is seriously degraded. This condition of degradation can be eliminated and intelligibility of speech greatly improved through the broadcast quality of Altec's 697A non-cancelling dynamic microphone with built-in transistor amplifier. The 697A is a direct replacement of the carbon transmitter found in most phone handsets. It provides uniform frequency response from 100 to 5,000 cps (versus 300 to 3,000 cps for carbon types). — The 695A (complete with built-in transistor amplifier) and the 696B (without built-in transistor amplifier) both featuring noise-cancelling and close-talking features are especially useful in two-way radio, paging, and intercommunication systems operated in high ambient noise environment. Frequency response 100 to 5,000 cps.



COMPARE!

Altec Microphone with Sintered Bronze Filter vs. Microphone without Filter

REMARKABLE SINTERED BRONZE FILTER

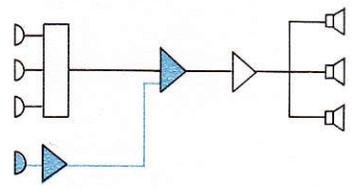
Most perfect acoustical filter known... this exclusive Altec development provides absolute protection against the gradual degradation of quality so commonly experienced in ordinary microphones caused by the microphone magnet constantly attracting microscopic airborne magnetic particles onto the diaphragm, which in turn, loads and restricts diaphragm motion and destroys high frequency response. No other filter is as effective in preventing magnetic dust entry as the sintered bronze filter. Most Altec microphones, including the 687A and 690A, are equipped with protective sintered bronze filters.

7464 NOALA CONTROL PANEL

The exclusive NOALA system senses varying ambient noise levels and automatically increases or decreases the output level of the sound system in relation to the noise level.

In airport passenger waiting areas, for example, arriving or departing jet aircraft may cause the noise level to rise 20 to 24 db — sufficient to mask the intelligibility of announcements almost to the vanishing point. With NOALA operating in the air-terminal sound system, the power to the loudspeakers automatically rises in step with the increased noise level to maintain standards of intelligibility and to over-ride the highest noise levels. When the noise subsides the volume of the announcement also automatically drops. The NOALA anti-noise automatic level control feature has proven its great value and significance in up-grading reliability of performance in military and Air Force installations.

The system may be installed and operated in two forms: in one a "lock-up" feature is utilized, in the other the adjustment function is continuously variable. **AUTOMATIC VOLUME ADJUSTMENT RANGE:** four steps of 5 db per step — 20 db total. **SENSITIVITY THRESHOLD:** between 60 and 75 db adjustable.

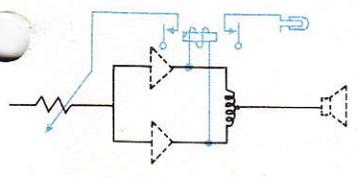


7740 "SEQR" CONTROL PANEL

Altec's "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 the "SEQR" Control Panel. Failure of one amplifier will have no effect on the load impedance as seen from the output terminals of the surviving 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 change will occur in the level directed to the actual load except on peaks of program as the signal supplied to the input of the surviving amplifier is increased by the "SEQR" panel. This increase makes up for losses due to the amplifier failure. 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 sub-normal 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 260A, 128B, 1568A, 1569A or 1570B Amplifiers.



SING...

reliability begins at the conceptual stage of a sound component and step by step is carried through by professional engineers to quality controlled production, to the specification and installation by an authorized Altec Engineering sound contractor.



COMPRESSOR AMPLIFIERS

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 acoustic level assures high intelligibility and freedom from blasting of sound to travelers' ears often caused by sudden, emotional bursts into a microphone.



POWER AMPLIFIERS

Altec power amplifiers are available in a variety of sizes: 40-80-175 and 260 watts to economically accommodate every airport requirement. Each is built to uncompromising standards of precision, accuracy and broadcast quality.

Altec electronic amplifiers are considered the world's finest for sensitivity, stability and long life, and are designed for continuous 24-hour operation. (A) All Altec amplifiers employ high efficiency circuits and develop less than 3% harmonic distortion over the entire operating range compared in contrast to the 5% distortion rating of ordinary P.A. amplifiers which is excessive for airport applications. (B) Altec power amplifiers are provided with built-in, two-stage Hi Pass filters for protection of horn loaded drivers. (C) Altec power amplifiers are equipped with pilot lamps, and are, or can be equipped with panel meters for testing condition of vacuum tubes. (D) Altec amplifiers have tapped power transformers for optimum operation from any power line voltage from 105 to 130 volts. (E) All Altec amplifiers have standard 70 volt speaker distribution connections to meet requirements of local ordinances for multiple speaker installations. All speaker connections are isolated from amplifier circuitry to provide maximum installation flexibility. (F) Negative feedback is obtained from a special tertiary winding in the output transformer employed in all Altec power amplifiers to free the load circuit from the amplifier ground. (G) All Altec amplifiers carry a minimum frequency rating of 20 to 20,000 cycles, ± 1 db, which is far superior to ordinary P.A. amplifiers. (H) Altec power amplifiers have hinged-drop front panels to provide quick access to circuitry for easy service. (I) In addition to the forementioned power amplifiers,

Altec offers two sizes in 18 and 35 watts of complete packaged amplifiers with multiple inputs, as well as a completely transistorized 50 watt amplifier for special applications.

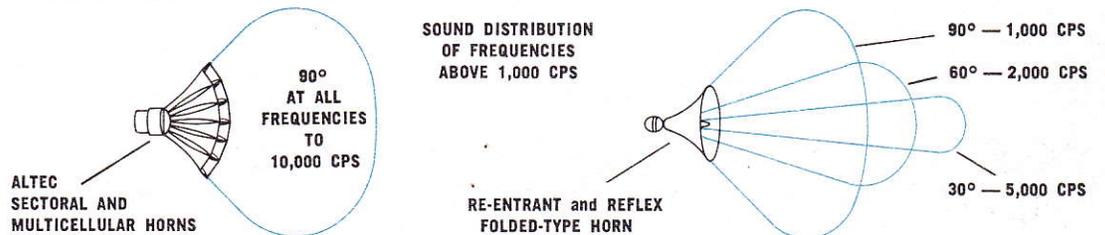
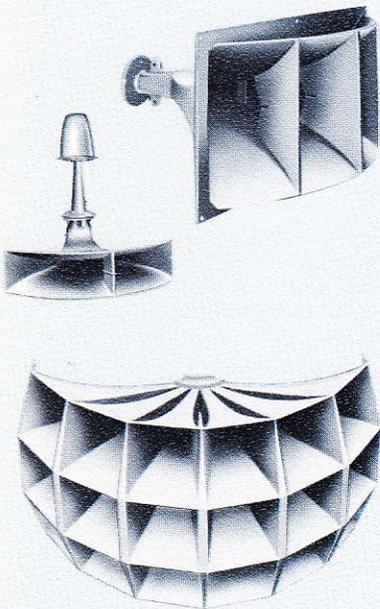
MULTICELLULAR HORNS, SECTORAL HORNS

Horn type speakers are required in hangers and to cover outdoor airport aprons, parking fields, etc. Only horns that are tailored to operate above 300 to 500 cycles can effectively project pages, announcements and emergency directions through the variable high ambient noises encountered in these large areas.

The Multicellular Horn represents a cluster of straight exponential high frequency horn cells that 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 projection to provide perfect coverage of vast outdoor areas — such as used in "Giant Voice" systems in military command installations. Multicells are available in either 300 or 500 cycle sizes.

Altec cast aluminum Sectoral Horns provide inexpensive, space-saving means for uniform control of projection angle over smaller areas with excellent projection above 500 cycles.

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 cycles shrinks to only 15° to 30°. On the other hand, both the Multicell and the Sectoral Horn provides even, wide-angle horizontal distribution throughout the frequency range for complete coverage of broad areas. (See graphic illustration below).



LOUDSPEAKERS

Of a number of Altec 8" speakers — particularly recommended, is the 755C. This loudspeaker was originally designed by Bell Telephone Laboratories and has been a standard of quality for many years. Altec engineers, by the application of a new ceramic magnet of Indox V, have increased the flux density to 9,000 gauss, and have lowered the cone resonance to improve low frequency reproduction.

The 755C Loudspeaker features a rare combination of plus factors... (A) A single 755C 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 the back of this page). (B) Slim profile (8" circumference — 2 1/4" deep) — This unique "pancake" design allows convenient installation in shallow ceiling and wall areas. (C) With an extended 40 to 15,000 cycle range the 755C assures crisp, intelligible speech and high fidelity background music reproduction. (D) A heavy gauge steel frame completely seals the speaker's driver element against dirt and magnetic dust for continuous reliable, trouble-free operation.

The illustration on the right clearly indicates the wide angle projection ability of the 755C Altec Loudspeaker in comparison with conventional type speakers of the same size. The unique design of the 755C 8" Loudspeaker benefits the only true wide angle cone type reproducer and eliminates "dead spots" between speakers. The 755C Loudspeaker permits full angle coverage of all areas, with the number of speakers used reduced to an economical minimum.

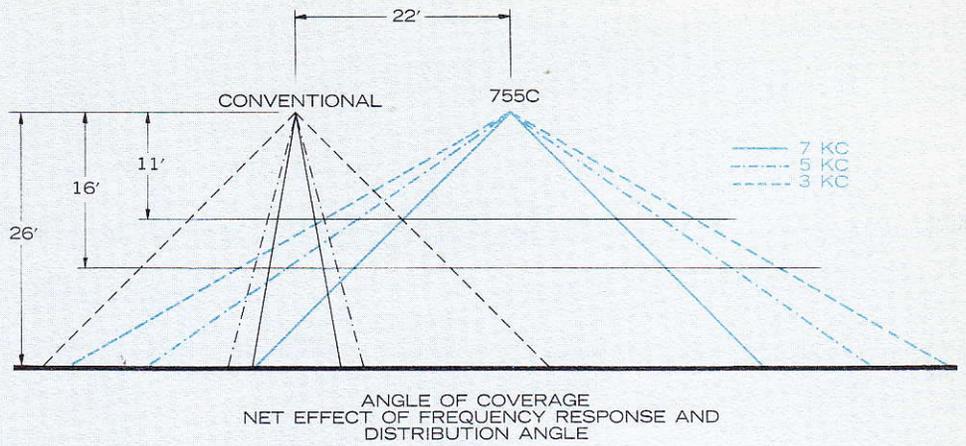


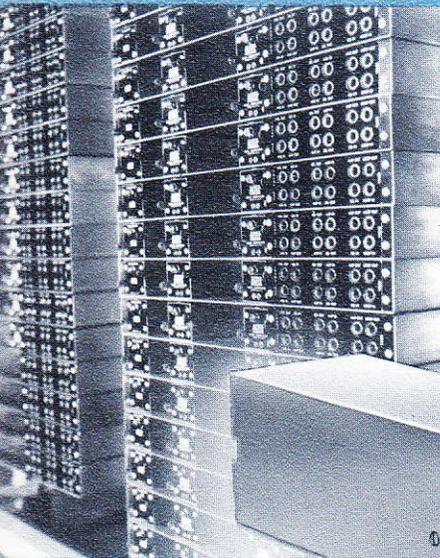
Photo on the left is a typical bay of power amplifiers used in an Altec airport sound system. The cabinets contain the control and amplification elements of the system together with many test facilities.

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 rebranded parts of dubious origin. Only Altec can fulfill the important specification: "All products must be of the same manufacturer." Altec is the only manufacturer in the United States that makes its own units... microphones, amplifiers, loudspeakers, transformers, control equipment.

ALTEC TELEPHONE REPEATERS USED IN AIRLINE COMMUNICATIONS SYSTEM

One of the foremost airline companies in the country, Delta Air Lines, maintains their 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 Shown
1/2 Actual Size.



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

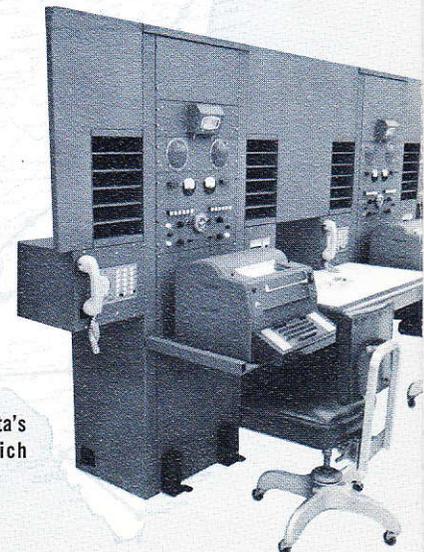


Photo on the right shows, in part, Delta's central communications board which employs Altec circuit components.

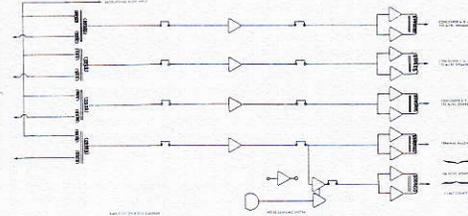
CASE HISTORY FILE 61-28

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 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!



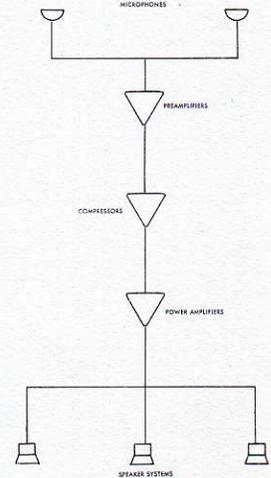
CASE HISTORY FILE 61-23

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 materiel, ALTEC is relied on to perform as specified.

NOTE: Because of obvious greater superiority over conventional siren and other coded signal systems, the OCD authorities of Salina, Kansas, selected a giant ALTEC voice warning system to blanket that prime target area. 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.



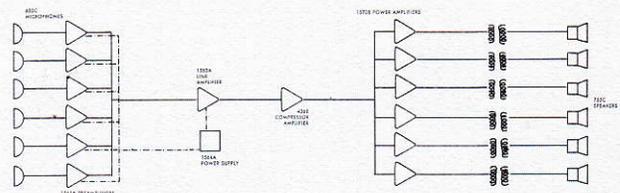
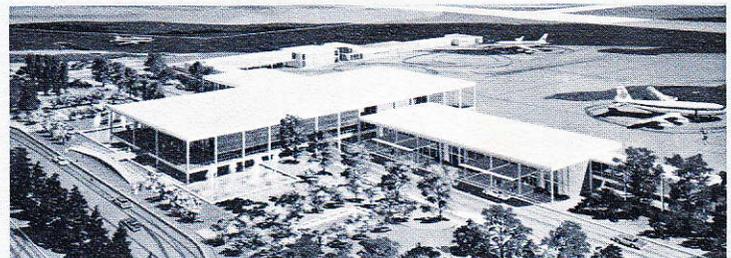
CASE HISTORY FILE 61-15

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 air craft.

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 755C "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.



FOR MORE DETAILED INFORMATION AND SPECIFICATIONS
CONTACT AN
AUTHORIZED ALTEC ENGINEERING SOUND CONTRACTOR