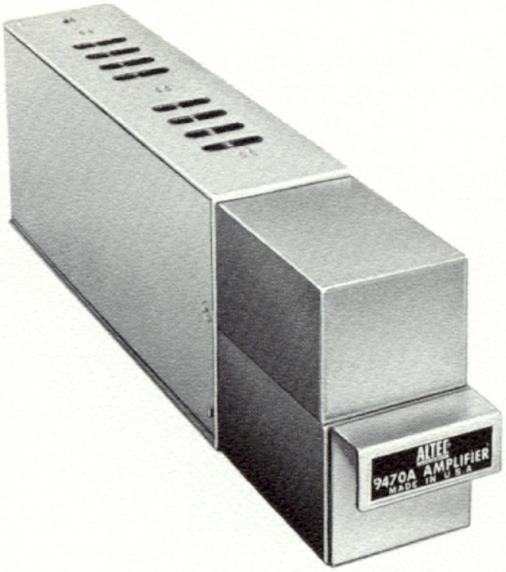
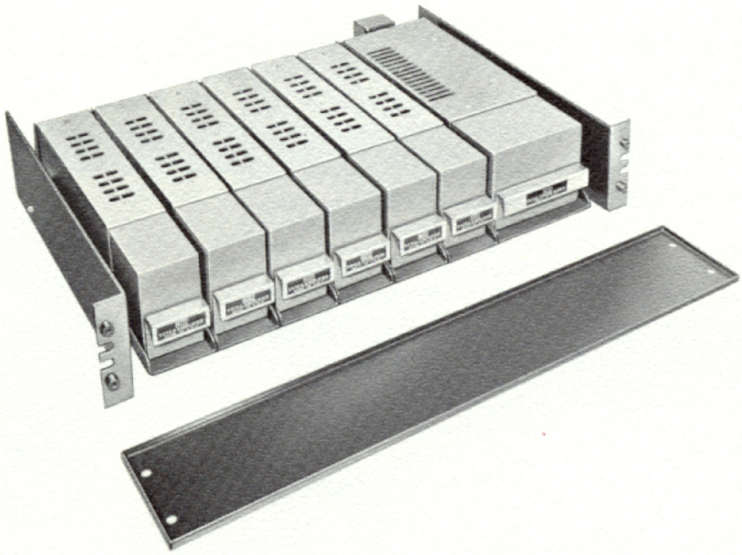
9470A AMPLIFIER

9470A





Features

Designed to perform as: Line, Booster, Program or Preamplifier

Modern — All Silicon Solid-State Design

Surpasses Specifications of Tube Types

Frequency Response: 20-20,000 cps, ±.5 db

Low Distortion

Inputs and Outputs Completely Isolated

Astatically Balanced Transformers

Low Heat Generation

Only 130 ma Required for Full +27 dbm Output

Rugged—Compact—Fully Enclosed Construction

Lightweight

Plug-in Design

SURPASSES RECORDING AND BROADCAST STANDARDS
DESIGNED FOR:
RECORDING, MOTION PICTURE STUDIOS — AM, FM, & TELEVISION STUDIOS — SCHOOLS — LABORATORIES — THEATERS PUBLIC ADDRESS "PROGRAM CIRCUITS" — STEREO RECORDING OF DISC, TAPE, & FILM

The Altec 9470A amplifier introduces an engineering 'break-through' in solid-state professional quality amplifiers for use in recording, broadcasting and television studios. The high efficiency, extremely wide frequency response, low distortion, and virtual absence of hum and output noise enables the Altec 9470A amplifier to exceed all requirements for that vital link in any first-line audio system — the preamplifier — delivering 0.5 watt, the 9470A amplifier uses all silicon transistors which permit the amplifier to operate continuously at 85° C., (185°F.), without derating, and still provide operational stability not attainable with tube-type amplifiers. Transistor circuitry plus specially designed, astatically balanced transformers, enables the 9470A to reach a noise figure of —127 dbm, with unterminated input. The total harmonic distortion does not exceed 0.25%, 50-20,000 cps when strapped for the +18 or +27 dbm output capacity, and is less than 1.0%, 20-20,000 cps, with +27 dbm output. Overload Recovery Time is 5 microseconds for 100% overload.

The Altec 9470A amplifier will produce either +18 or +27 dbm, depending on external strapping. Utilizing transformers on both input and output with multiple impedance ranges, complete isolation is afforded for ease of matching the 9470A to associated equipment. Fully enclosed construction insures that cross-talk is held to a minimum and is negligible even when adjacent amplifiers are operating with different signals and receive power from a common Altec 9550A power supply.

Complex audio systems require the use of many different types of amplifiers to accomplish the mixing, level changing, impedance matching and amplification needed to produce the finest recording-broadcast quality. The Altec 9470A amplifier has been designed — electrically and mechanically — to function as a preamplifier, booster amplifier or program amplifier, enabling the engineer to base his entire console design around a single amplifier type. All necessary wiring and impedance selection, via strapping, is accomplished on the 9850A tray socket, allowing the 9470A amplifier to be interchanged with any other 9470A amplifier, regardless of its position in the circuit, without making any modifications to the amplifier or changing the channel balance or output levels. The use of Altec 9470A amplifiers in this fashion makes it possible to eliminate many of the types of amplifiers needed — facilitates ease of replacement — and reduces the spare amplifiers required to one type.

The Altec 9470A amplifier has been designed to meet the most rigid specifications and built under exacting standards with precision components to insure that each amplifier will not deviate in performance, but is identical in operation (within the tolerance specified) and may be used in the most critical applications where balance must be maintained between two or more amplifiers. Produced under these conditions the 9470A amplifier will meet all the needs of the most sophisticated audio system, without any selection whatsoever, (as required by some manufacturers) whether used for recording, broadcasting, telecasting, specialized sound or public address systems or precision laboratory testing, and excells in performance, reliability, and trouble-free operation.

ALTEC LANSING®

A quality company of LTV Ling Altec, Inc.

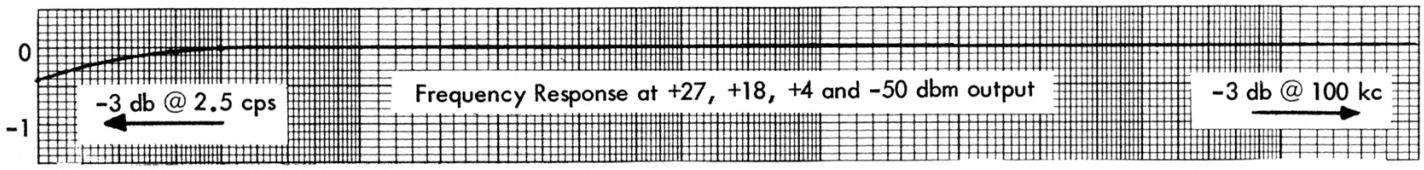
1515 S. Manchester Ave., Anaheim, Calif. 92803

New York

ALTEC

RECORDING & BROADCASTING EQUIPMENT

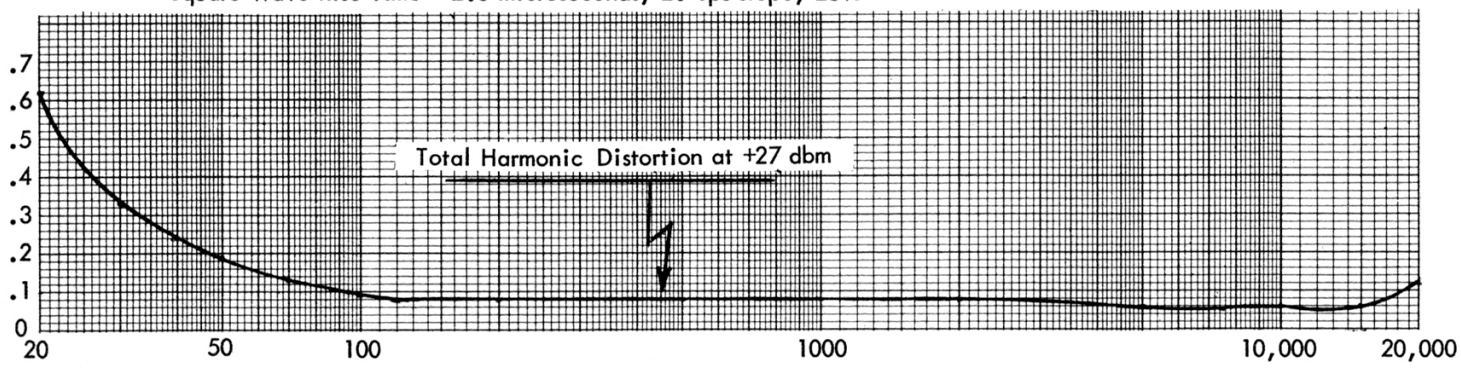
ALTEC 9470A AMPLIFIER



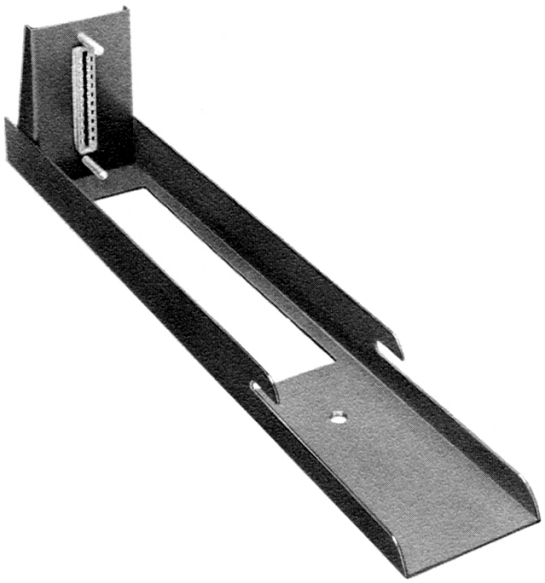
DC Input 24 vdc @ 130 ma, 3.12 watts

Noise, Unweighted
Unterminated Input = -127 dbm
Gain 45 db

Square Wave Rise Time = 2.5 microseconds, 20 cps slope, 25%



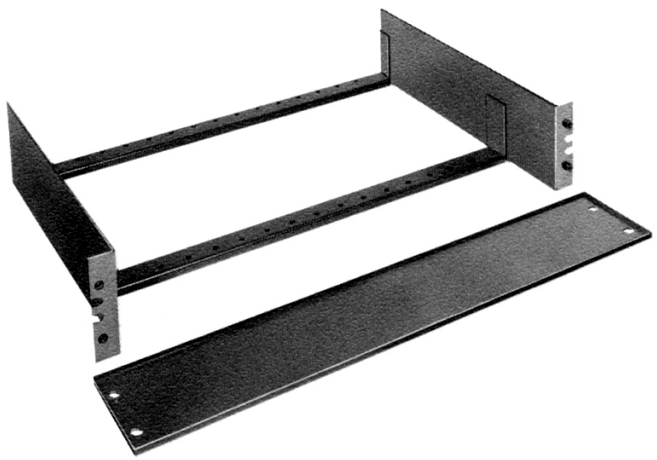
FREQUENCY IN CYCLES PER SECOND



9850A MOUNTING TRAY

The Altec 9850A mounting tray is an accessory for the Altec 9470A amplifier and is supplied with a receptacle for mating with the plug on the rear of the 9470A amplifier. All wiring required for operation of the 9470A amplifier can be accomplished on the receptacle of the 9850A mounting tray, allowing instant replacement of the 9470A amplifier.

For rack or turret applications the 9850A mounting tray is mounted on the 9800A mounting frame which will accommodate eight of the 9850A mounting trays. The 9850A mounting tray is two inches wide, two and three-quarter inches high and twelve inches long. The tray is finished in Altec Green and weighs 11 ounces.



9800A MOUNTING ASSEMBLY

The Altec 9800A mounting frame is an accessory for the Altec 9850A and 9852A mounting trays. The 9800A mounting frame is designed for rack or turret applications where space and appearance is of utmost importance. The 9800A will accommodate four 9852A mounting trays, (used with the 9550A power supply, or a combination of the two, e.g., six 9850A mounting trays and one 9852A mounting tray.

The 9800A mounting frame is 19" wide, 3½" high, and 12¼" deep. The mounting frame is finished in Altec Green and weighs 2 pounds, 10 ounces.

9550A DESCRIPTION

9550A POWER SUPPLY

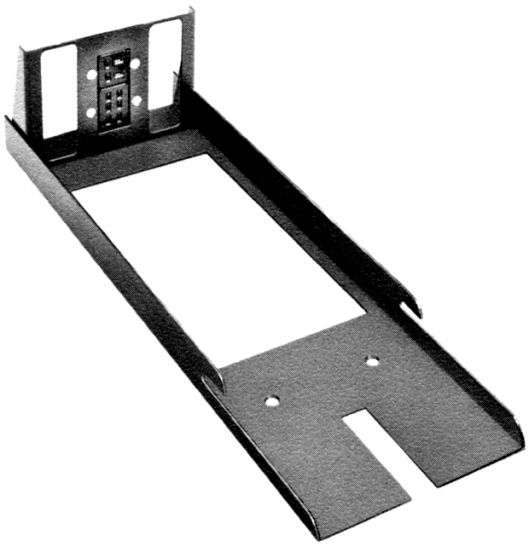
The Altec 9550A power supply is an *all* solid-state device using silicon diodes in a full wave bridge rectifier and delivers 24 vdc at 2 amperes with excellent regulation provided by 5 silicon transistors and 3 zener diodes. The design of the 9550A power supply includes an external sensing circuit to insure that the output voltage will remain constant regardless of line voltage fluctuations. Output ripple and noise is only *200 microvolts* under the full two ampere load.

Capable of supplying power to 15 Altec 9470A amplifiers operating with full +27 dbm output, the 9550A occupies only 3" of vertical rack or turret space and is only $3\frac{13}{16}$" wide. The 9550A can operate continuously at 75 degrees C., (167 degrees F.), without derating any specifications including the regulation figure of 1.0%, no load to full load and/or line variation from 105 vac to 135 vac or 210 vac to 270 vac.

Complete isolation between the ac input and the dc output is afforded by the use of two connectors on the rear of the 9550A power supply. The 4-pin connector, used for the ac input—either *120* vac or *220* vac—is located directly above the 6-pin connector used for the dc output and the sensing circuits. Even with the additional isolation afforded by the use of dual connectors, the convenience of plug-in operation has been retained to facilitate ease of wiring and replacement. An accessory Connector Cover (Altec *50057*) should be installed over the terminal to eliminate the shock hazard.

The output voltage of the 9550A power supply is adjustable from 22 vdc to 26 vdc by means of a screwdriver adjustment on the rear of the power supply. The circuitry and components of the 9550A are protected by fuses not only in each side of the ac line, but also in the regulator circuit, and are of the fast-acting type easily accessible on the rear of the unit.

As with all Altec products, only the highest grade components and finest workmanship are used in the 9550A power supply to insure uniform performance and trouble-free operation.



9852A MOUNTING TRAY

The Altec 9852A mounting tray is an accessory for the Altec 9550A power supply. The 9852A tray is supplied with recptacles for mating with the plugs on the rear of the power supply. All wiring required for operation of the 9550A power supply can be accomplished on the recptacles on the rear of the 9852A mounting tray, allowing instant replacement of the 9550A power supply. An accessory Connector Cover (Altec 50057) should be installed over the terminal to eliminate the shock hazard.

For rack or turret applications the 9852A mounting tray is mounted on the 9800A mounting frame which will accommodate four of the 9852A mounting trays. The 9852A tray is four inches wide, three inches high and 12 inches long. The tray is finished in Altec Green and weighs 15 ounces.

9550A SPECIFICATIONS:

Type:	Solid-state power supply.
Input:	120 vac, 50/60 cycles @ .75 amp, full output, or, 220 vac, 50/60 cycles @ .40 amp., full output.
DC Output:	24 vdc @ 2 amperes, regulated.
Circuit:	Full-wave bridge rectification.
Sensing Circuit:	24 vdc to the load at all times. (May be connected to remote load.)
Output Ripple and Noise:	2 ampere load = 200 microvolts rms. 1 ampere load = 75 microvolts rms.
Regulation:	1.0%, no load to full load and/or line variation of 105 to 135 vac, or line variation of 210 to 270 vac.
Output Voltage Adjustment:	Adjusted for 24 vdc when shipped. Output adjustable from 22 to 26 vdc.
Power Transformer:	Utilizes astatically balanced construction.
Fuses:	Two, 2 ampere (fast acting) in the ac line. Two, ½ ampere (fast acting) in the regulator circuit.
Rectifier Complement:	Four 1N3569 Silicon diodes.
Regulator Complement:	One — 1N706 zener diode. One — 1N712 zener diode. One — 1N751 zener diode. One — 2N1700 silicon transistor. One — 2N3055 silicon transistor. Three — 2N2712 silicon transistors.
Power Consumption:	70 watts at full load.
Operating Conditions:	75° C. (167° F.) maximum cabinet or turret temperature for continuous duty, without derating.
Electrical Connections:	All connections are made to a 4 and 6 pin connector on the Altec 9852A tray.
Dimensions:	$3\frac{13}{16}$" wide, 3" high and $11\frac{3}{8}$" long.
Terminals:	Plug-in.
Finish:	Light Gray baked enamel and cadmium iridited.
Weight:	6 pounds, 12 ounces.
Accessories:	Altec 9852A tray. Altec 50057 Connector Cover Altec 9800A mounting assembly. (Accommodates 4 Altec 9550A power supplies)

The Altec 9550A power supply will power up to **15** Altec 9470A amplifiers at +27 dbm output and up to **28** at +18 dbm output.

ALTEC 9470A

PERFORMANCE SPECIFICATIONS

Type:	Preamplifier, booster amplifier, or program amplifier.
Gain:	45 db. (input terminated)
Frequency Response:	±0.5 db, 20-20,000 cps.
Source Impedance:	50, 150, or 600 ohms, balanced or unbalanced. (center tap on 600 ohms)
Load Impedance:	150 or 600 ohms, balanced or unbalanced. (center tap on 600 ohms)
Output Impedance:	Less than 5% of nominal load.
Power Output:	+27 dbm maximum, 20-20,000 cps.
Distortion:	Less than 1% total harmonic distortion, 20-20,000 cps, with +27 dbm output.
Noise Level: (unweighted, 10 to 25 kc band-pass)	Equivalent input noise, −127 dbm, (input unterminated).
Overload Recovery Time:	5 microseconds for 100% overload; continuous overload will not damage the amplifier.
Controls:	None.
Power Requirements:	24 vdc @ 130 ma with +27 dbm output. 24 vdc @ 70 ma with +18 dbm output.
Isolation:	Transformers on input and output.
Circuit:	3 stage, Class A, push-pull, direct coupled.
Operating Conditions:	85° C. (185° F.) maximum cabinet or turret temperature for continuous duty, without derating.
Heat Dissipation:	3.12 watts when strapped for +27 dbm output, 1.7 watts when strapped for +18 dbm output.
Dimensions:	3" high by 1¾" wide by 11" deep.
Finish:	Light Gray baked enamel and cadmium iridited.
Weight:	3 lbs.
Electrical Connections:	All electrical connections are made to a 20-pin plug on the rear of the 9470A amplifier.
Accessories:	Altec 9850A tray for mounting the 9470A amplifier. Altec 9800A mounting frame, accommodates eight 9470A amplifiers in 9850A mounting trays, or, six 9470A amplifiers in 9850A mounting trays and one 9550A power supply in a 9852A mounting tray. Altec 9550A power supply, designed to power up to fifteen 9470A amplifiers at full output.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The amplifier shall be of the plug-in type, fully enclosed, and shall employ all solid-state devices, (transistors and diodes), throughout. The amplifier shall have a frequency response of ±.5 db, 20-20,000 cps, a gain of 45 db, and shall not dissipate more than 3.12 watts and shall not require more than 130 ma at 24 vdc when delivering +27 dbm output. With an output of 0.5 watt the amplifier shall be capable of operating at 85° C. without derating. The amplifier shall employ astatically balanced transformers and shall have an equivalent noise input figure of −127 dbm with no input termination. The amplifier shall not exceed 0.25% total harmonic distortion, 50-20,000 cps with +18 or +27 dbm output and shall recover from a 100% overload in 5 microseconds.

The amplifier shall be capable of operating as a preamplifier, booster amplifier, or program amplifier without making any internal or external changes to the amplifier, and shall be capable of interchanging with any other amplifier of the same type without changing channel balance or output power settings. The amplifier shall provide complete isolation, both input and output, by means of transformers, and shall be capable of supplying output impedances of 150 or 600 ohms, input impedances of 50, 150 and 600 ohms, balanced or unbalanced on both input and output.

The circuit board of the amplifier shall be gold-plated etched and all connections for the amplifier shall be made on a 20-pin plug on the rear of the amplifier. The amplifier shall have dimensions not exceeding 3" high by 11¾" wide and 11" long, and shall weigh no more than 3 pounds. The amplifier shall be finished in Light Gray baked enamel and shall be cadmium iridited.

The amplifier shall meet all the above conditions when receiving power from a power supply capable of delivering 24 vdc at 2 amperes at all times by means of external sensing circuits, maintaining regulation within 1.0%, no load to full-load, and/or a line variation of 105 to 135 vac, and shall have no more than 200 microvolts rms output ripple and noise, and generate no more than a 20 millivolt transient when switching from full load to no load. The power supply shall have full-wave rectification and a power transformer with astatically balanced construction. The power supply shall utilize solid-state design and shall occupy no more than $3\frac{13}{16}$" of width, 3" of height and 11⅜" of length and shall be of plug-in construction with capabilities of instant replacement in rack or turret applications. The power supply shall be capable of operating from 120 vac or 220 vac with all wiring and strapping necessary to accomplish input and output connections terminated on a connector external of the supply. Any amplifier or power supply not conforming to the above conditions and specifications shall be deemed unacceptable under this specification.

The amplifier shall be Altec Lansing model 9470A.

The power supply shall be Altec Lansing model 9550A.

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.

LITHO IN U.S.A. CP-1270-5K

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

ALTEC LANSING

9470A AMPLIFIER
9550A POWER SUPPLY

OPERATING INSTRUCTIONS

9550A POWER SUPPLY

ALTEC SOLID STATE SOUND

9470A AMPLIFIER

DESCRIPTION

The Altec 9470A amplifier is a highly reliable, all semi-conductor amplifier, designed to function as a preamplifier, booster amplifier, line amplifier or program amplifier. Both input and output are isolated, using transformers that are astatically and magnetically balanced to virtually eliminate pickup of external magnetic and electrostatic fields. Utilizing six silicon transistors, operating push-pull, the amplifier is three stage, direct coupled, with negative feedback to assure absolute stability and perfect reproduction of the program material. The amplifier only requires 130 ma @ 24 vdc and dissipates 3.12 watts, making it possible to operate many amplifiers from a common power supply in a rack or turret application without causing undue heat rise which could adversely affect associated equipment. The compact design and totally enclosed construction makes the 9470A amplifier ideally suited for rack or turret mounting since all connections and control functions are handled on the connector on the rear of the unit, when inserted in the 9850A mounting tray, allowing the amplifier to be instantly removed and replaced with any other 9470A amplifier without changing any wiring or control settings.

9550A SPECIFICATIONS

Type:	Solid-state power supply.
Input:	120 vac, 50/60 cycles @ .68 amp, full output, or, 220 vac, 50/60 cycles @ .40 amp, full output.
DC Output:	24 vdc @ 2 amperes, regulated.
Rectifier Circuit:	Full-wave bridge rectification. 14 amp. regulator transistor.
Sensing Circuit:	24 vdc to the load at all times. (May be connected to remote load.)
Output Ripple and Noise:	2 ampere load = 200 microvolts rms. 1 ampere load = 75 microvolts rms.
Regulation:	0.01%, no load to full load and/or line variation of 105 to 135 vac, or line variation of 210 to 270 vac.
Output Voltage Adjustment:	Adjusted for 24 vdc when shipped. Output adjustable from 22 to 26 vdc.
Power Transformer:	Utilizes astatically balanced construction.
Fuses:	Two - 2 ampere (fast acting) in the ac line. One - 2.5 ampere (fast acting) in the regulator circuit.
Rectifier Complement:	Four 1N3569 Silicon diodes.
Regulator Complement:	One — 1N706 zener diode. One — 1N712 zener diode. One — 1N751 zener diode. One — 2N1700 silicon transistor. One — 2N3055 silicon transistor. Three — 2N2716 silicon transistors.
Power Consumption:	70 watts at full load.
Operating Conditions:	75° C. (167° F.) maximum cabinet or turret temperature for continuous duty, without derating.
Electrical Connections:	All connections are made to a 4 and 6 pin connector on the Altec 9852A tray. (ac input on 4-pin connector, dc output on 6-pin connector.)
Dimensions:	$3\frac{13}{16}$" wide, 3" high and $11\frac{3}{8}$" long.
Terminals:	Plug-in.
Finish:	Light Gray baked enamel and cadmium iridited.
Weight:	6 pounds, 12 ounces.
Accessories:	Altec 9852A tray. Altec 9800A mounting assembly. Altec 50057 cover for rear connectors.

9470A SPECIFICATIONS

Type:	Preamplifier, booster amplifier, or program amplifier.
Gain:	45 db. (input terminated).
Frequency Response:	±0.5 db, 20-20,000 cps.
Source Impedance:	50, 150, or 600 ohms, balanced or unbalanced. (center tap on 600 and 150 ohms).
Load Impedance:	150 or 600 ohms, balanced or unbalanced. (center tap on 600 ohms).
Output Impedance:	Less than 5% of nominal load.
Power Output:	+27 dbm maximum, 20-20,000 cps.
Distortion:	Less than 1% total harmonic distortion, 20-20,000 cps, at +27 dbm output.
Noise Level: (unweighted, 10 to 25 kc band-pass)	Equivalent input noise; −127 dbm, (input unterminated).
Overload Recovery Time:	5 microseconds for 100% overload; continuous overload will not damage the amplifier.
Controls:	None.
Power Requirements:	24 vdc @ 130 ma strapped for +27 dbm output. 24 vdc @ 70 ma strapped for +18 dbm output.
Isolation:	Transformers on input and output.
Circuit:	3 stage, Class A, push-pull, direct coupled.
Operating Conditions:	85° C. (185° F.) maximum cabinet or turret temperature for continuous duty, without derating.
Heat Dissipation:	3.12 watts when strapped for +27 dbm output, 1.7 watts when strapped for +18 dbm output.
Dimensions:	3" high by $1\frac{3}{4}$" wide by 11" deep.
Finish:	Light Gray baked enamel and cadmium iridited.
Weight:	3 lbs.
Electrical Connections:	All electrical connections are made to a 20-pin plug on the rear of the 9470A amplifier.
Accessories:	Altec 9850A tray. Altec 9800A mounting frame, accommodates eight 9470A amplifiers in 9850A trays, or six 9470A amplifiers in 9850A trays and one 9550A power supply in a 9852A tray. Altec 9550A power supply, designed to supply power to fifteen 9470A amplifiers strapped for +27 dbm output, or, twenty-seven 9470A amplifiers strapped for +18 dbm output.

ALTEC LANSING

RECORDING & BROADCASTING EQUIPMENT

1515 S. Manchester Ave., Anaheim, Calif.

New York

50010-2 Price $ .21

Litho in USA C/P 11/65

A Division of LTV Ling Altec, Inc.

INSTALLATION

ELECTRICAL

The 50, 150, and 600 ohms source impedance and the 150 and 600 ohm load impedance terminations are available at the connector so that wiring changes, or strapping within the amplifier is not required. By this means any amplifier is correctly matched when inserted into any tray that is properly wired for its particular function. Figure 1 is a table for wiring the connector on the tray and Fig. 2 illustrates the connector.

FUNCTION	Z	STRAP	CONNECT TO	CT
INPUT CONNECTIONS:				
HI-Z microphone inputs, 600-ohm matching transformers, etc.	600Ω	1-B, 2-C, 3-D	A & 4	2-C
150-ohm input	150Ω	1-B, 3-D, A-C, 2-4	A & 4	1-B
50-ohm input	50Ω	1-2-3-4, A-B-C-D	A & 4	
OUTPUT CONNECTIONS:				
Nominal 600-ohm loads, low-impedance amps, etc.	600Ω	9-L	10 & K	9-L
150-ohm amplifiers, low-level lines, etc.	150Ω	9-10, L-K	10 & K	
POWER OUTPUT:				
+18 dbm output	any	No Strapping	10 & K	
+27 dbm output	any	5 to 6	10 & K	
POWER SUPPLY CONNECTIONS:				
DC		No Strapping	Pos. to pin 7, Neg. to pin H	
Sense Circuit		" "	Pos. to pin 7, Neg. to pin H	
AC (110 vac)		3-4, 1-2	1 & 3	
AC (220 vac)		2-4	1 & 3	

Figure 1

POWER REQUIREMENTS

The Altec 9470A amplifier requires 24 vdc at 130 ma for correct operation. The Altec 9550A power suply is capable of supplying power to fifteen 9470A amplifiers operating at full output, but it may be used with any lesser number. To insure 24 vdc to all amplifiers connected to a single power supply, the 9550A power supply had been designed with sensing voltage circuits. When properly connected, the sensing voltage circuit provides a constant voltage to all amplifiers, regardless of wiring lengths. Figure 3 is a block diagram of the 9550A power supply connected to a number of 9470A amplifiers showing the correct wiring procedure.

INSTALLATION

MECHANICAL

Each Altec 9470A amplifier requires one 9850A tray whether used in rack mounted applications, console or bench use. The 9850A tray has a gold-plated receptacle for mating with the plug on the rear of the 9470A amplifier. The amplifier is slid into the 9850A tray and is aligned with the two pins on the tray for positive receptacle insertion.

If rack or turret use is planned, the Altec 9800A mounting frame will be required. The 9800A mounting frame accommodates either the 9470A amplifier or the 9550A power supply, when inserted in their respective trays and may be mounted in many combinations to provide flexibility of application. For example: 1 power supply and 6 amplifiers, 2 power supplies and 4 amplifiers, etc. See Fig. 2. Mechanical installation is extremely simple as the tray for the 9470A amplifier mounts with two screws on the mounting frame and the tray for the 9550A power supply uses four.

The 9800A mounting frame is supplied with a front panel which allows the rack or turret to be pressurized for ventilation of associated equipments.

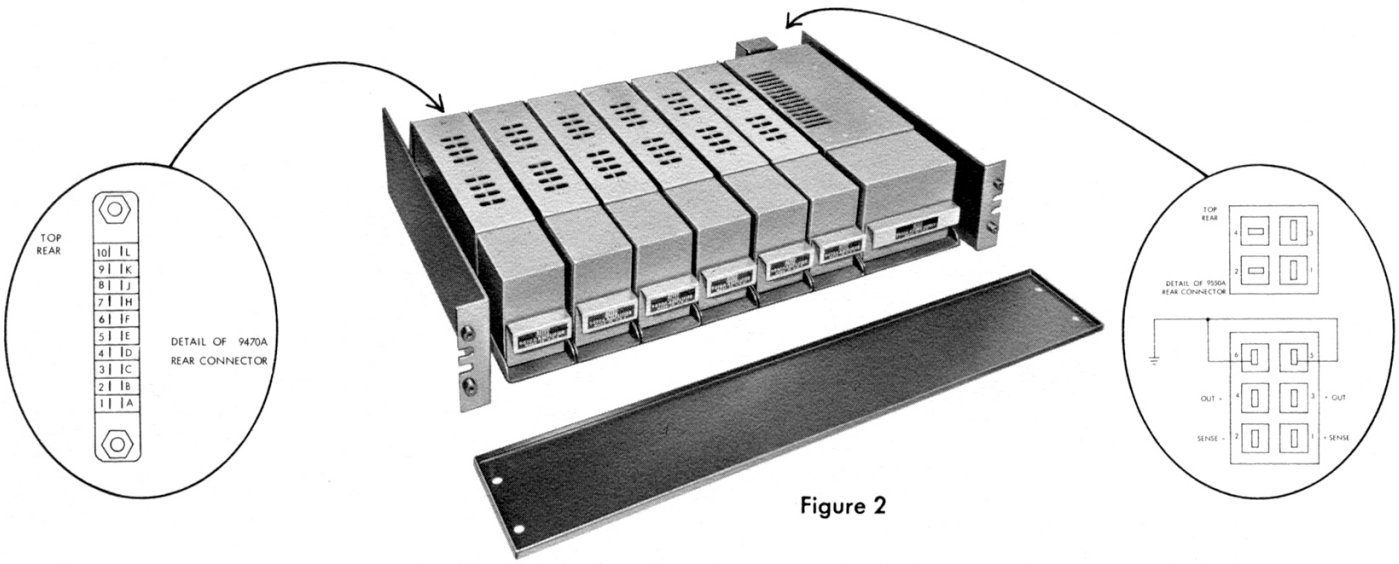


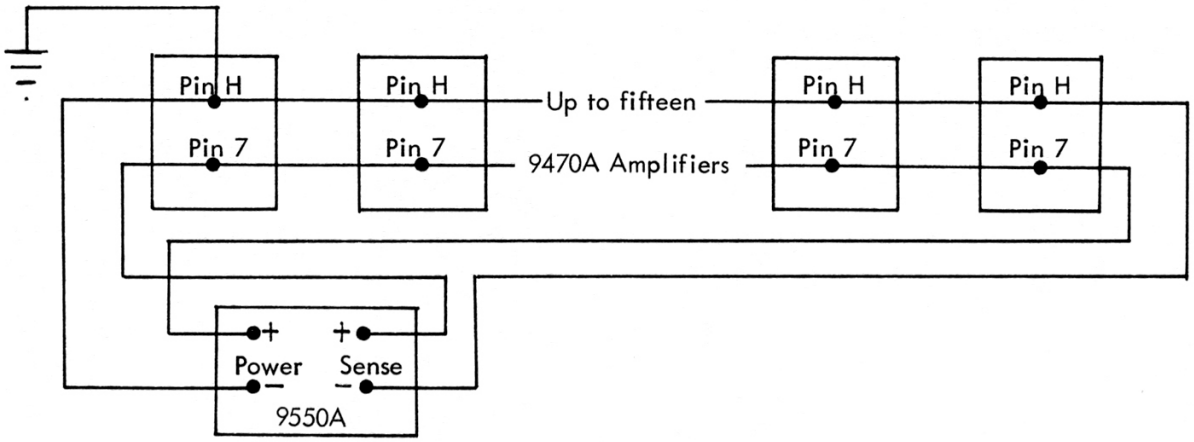
Figure 2

RECOMMENDED WIRING AND GROUND PRACTICES

To aid in the application of the 9470A amplifier, some recommended methods of connecting the amplifier into various types of systems with different components are diagramed in the following figures.

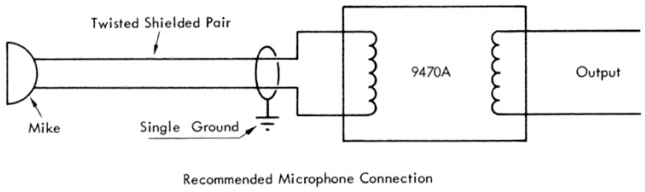
In some circumstances, it is necessary to provide matching resistive loads for passive circuits, such as equalizer networks, filters, attenuators, etc. This can be accomplished by strapping the appropriate resistor across the input. A 680 ohm resistor strapped across pins A and 4 will match the input impedance to standard 600 ohm lines. No resistive strapping is necessary across the output. Suggested methods are illustrated in Fig. 5.

The 9470A amplifier is equipped with transformers on both input and output to allow the audio circuitry to operate balanced. If for any reason it is necessary to ground one side of the line, make sure all ground connections are brought to a common point before attaching to the chassis. Seemingly faulty operation of equipment is quite often the result of having more than one ground point, causing hum in the equipment because of the ground loop currents. Common ground points are noted in Figure 6.

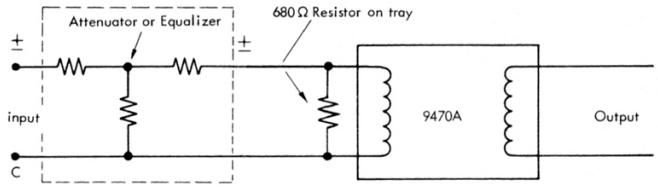


Proper Power Wiring for 9470A Amplifiers with Sensing Voltage Connections.

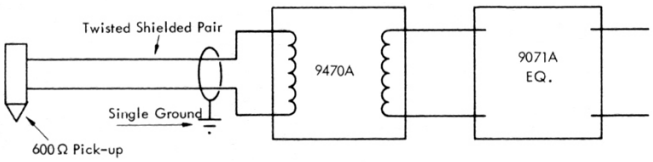
Figure 3



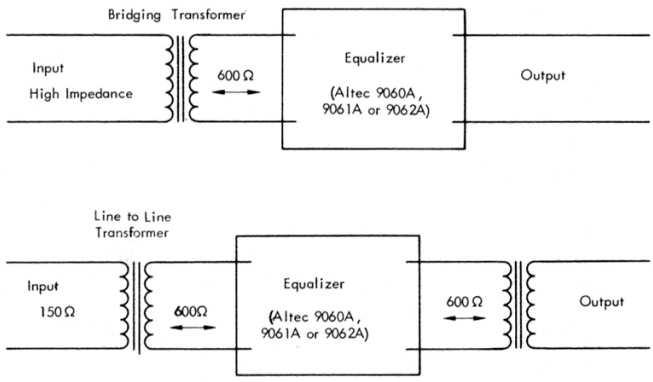
Recommended Microphone Connection



Recommended Attenuator or Equalizer Connections

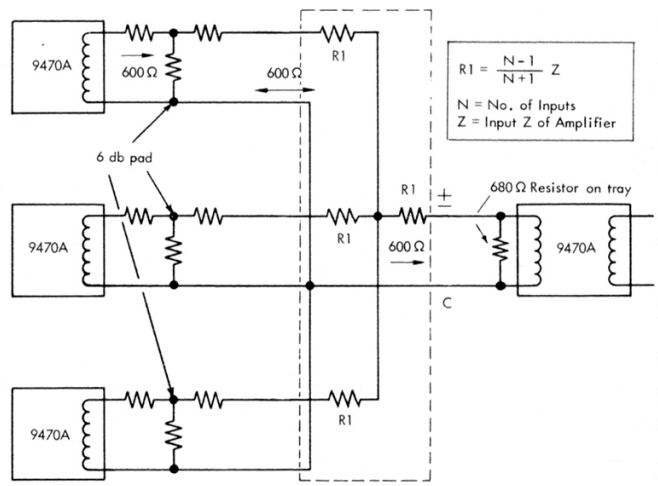


Recommended Phono Connection



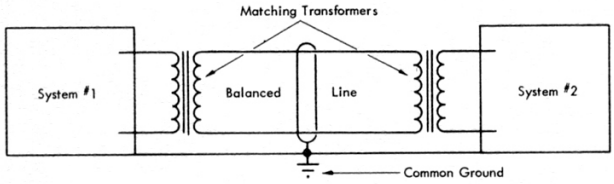
Recommended Impedance Matching for Equalizers

Figure 4

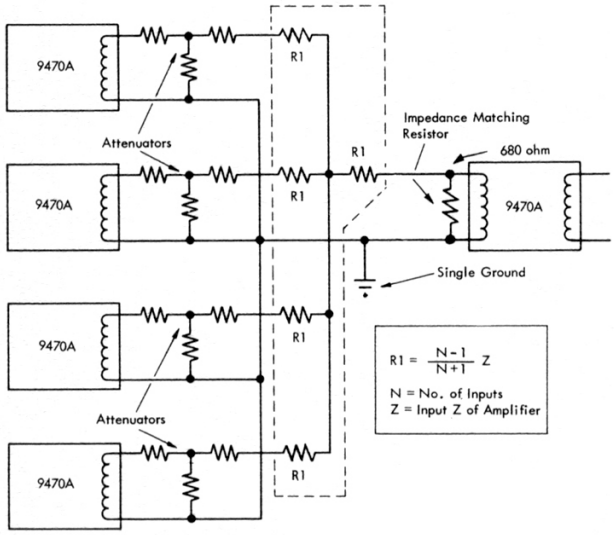


Recommended Means of Providing Isolation

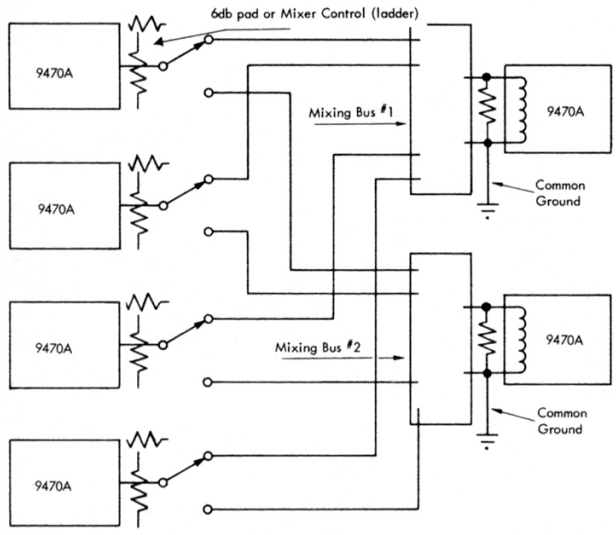
Figure 5



Recommended Means of Tying The Grounds of Two Systems Together



Recommended Mixing Bus Connections



Recommended Means of Interconnecting Two Mixing Buses

Figure 6

MAINTENANCE

In the event of a failure in the 9470A amplifier, it is recommended that the unit be returned to the factory for servicing. If field repair is made, note that transistors Q1-Q2, Q3-Q4, and Q5-Q6 operate as matched pairs and should never be changed singly as the beta parameters of the transistors may not be matched properly. Many of the resistors are matched in value and must be carefully selected before replacement. After replacing any component in the 9470A amplifier, check the unit for proper operation by comparing the performance to the specifications.

PARTS LIST: 9470A Amplifier

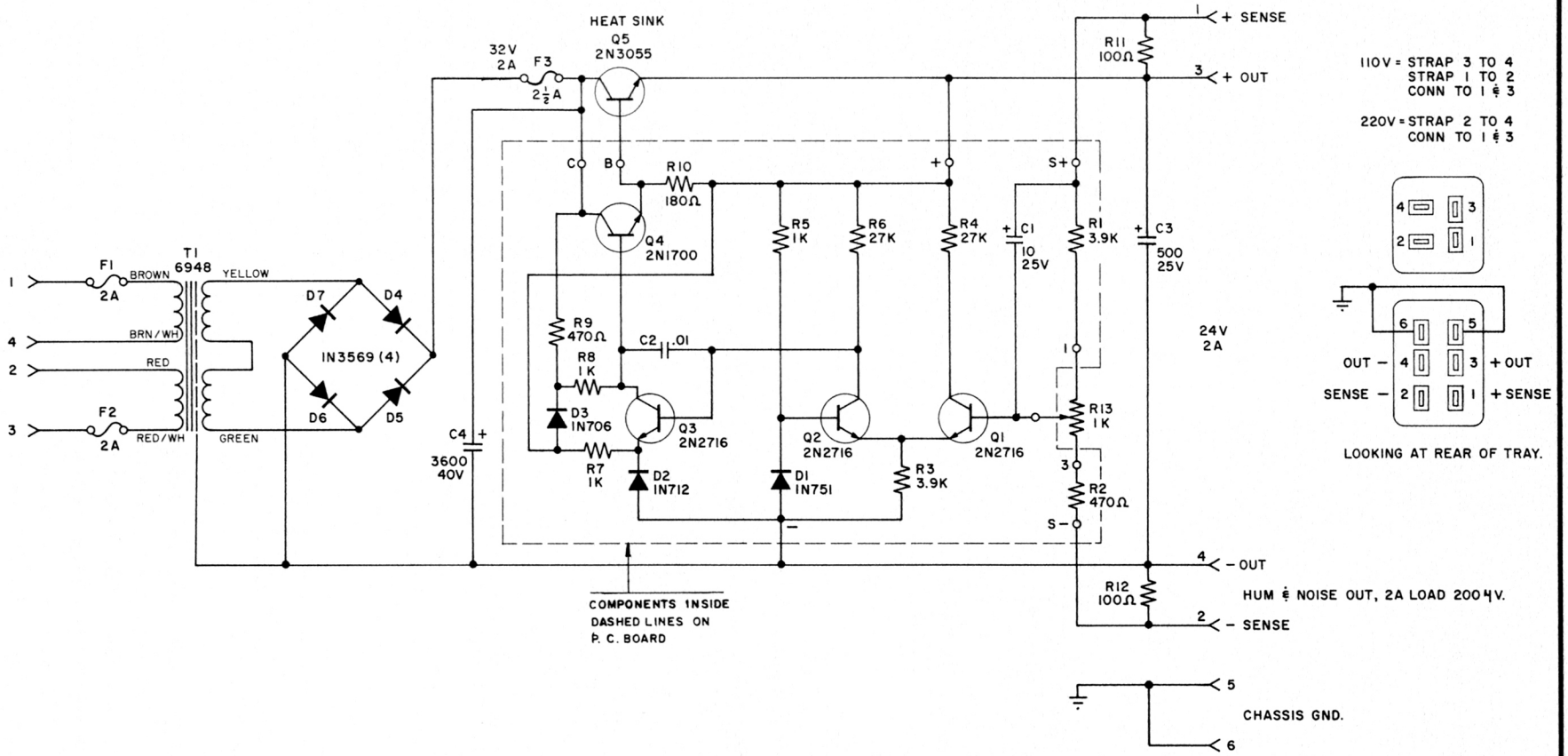
R1	Resistor, 1 M, ½W, 5%, (A.B.)	
R2	Resistor, 1 M, ½W, 5%, (A.B.)	
R3	Resistor, 1 M, ½W, 5%, (A.B.)	
R4	Resistor, 1 M, ½W, 5%, (A.B.)	
R5	Resistor, 330 Ω, ½W, 5%, (A.B.)	Matched Pair
R6	Resistor, 330 Ω, ½W, 5%, (A.B.)	
R7	Resistor, 470 K, ½W, (Corning C20)	Matched Pair
R8	Resistor, 470 K, ½W, (Corning C20)	
R9	Resistor, 9.1 K, ½W, 5%, (A.B.)	Matched Pair
R10	Resistor, 9.1 K, ½W, 5%, (A.B.)	
R11	Resistor, 220 K, ½W, 5%, (A.B.)	
R12	Resistor, 680 Ω, ½W, 5%, (A.B.)	
R13	Resistor, 47 K, ½W, 5%, (A.B.)	
R14	Resistor, 110 Ω, ½W, 5%, (A.B.)	
R15	Resistor, 22 Ω, ½W, 5%, (A.B.)	
R16	Resistor, 10 K, ½W, 5%, (A.B.)	
C1	Capacitor, .01 mfd, 400 v, (Sprague 2PS-S10)	
C2	Capacitor, .047 mfd, 200 v. (Sprague 2PS-S47)	
C5	Capacitor, .00027 mfd ±5%, 500 v. mica	
C6	Capacitor, .00027 mfd ±5%, 500 v. mica	
C7	Capacitor, 25 mfd, 25 v (Sprague TE-1207)	
C8	Capacitor, 100 mfd, 25 v (Sprague TE-1211)	
T1	Transformer, Altec Part Number 4813	
T2	Transformer, Altec Part Number 15280	
CR1	Diode, 1N456A	
CR2	Diode, 1N456A	
Q1	Transistor	Altec Part Number 50074
Q2	Transistor	
Q3	Transistor	Altec Part Number 50073
Q4	Transistor	
Q5	Transistor, 2N3053	Matched Pair
Q6	Transistor, 2N3053	

PARTS LIST: 9550A Power Supply

R1	Resistor, 3.9K, ½ W, 5%, A.B.
R2	Resistor, 470Ω, ½ W, 5%, A.B.
R3	Resistor, 3.9K, ½ W, 5%, A.B.
R4	Resistor, 27K, ½ W, 5%, A.B.
R5	Resistor, 1K, ½ W, 5%, A.B.
R6	Resistor, 27K, ½ W, 5%, A.B.
R7	Resistor, 1K, ½ W, 5%, A.B.
R8	Resistor, 1K, ½ W, 5%, A.B.
R9	Resistor, 470Ω, ½ W, 5%, A.B.
R10	Resistor, 180Ω, ½ W, 5%, A.B.
R11	Resistor, 100Ω, ½ W, 5%, A.B.
R12	Resistor, 100Ω, ½ W, 5%, A.B.
R13	Potentiometer, 1K, CTS 37389
C1	Capacitor, 10 mfd, 30 v, Sprague, TE-1204
C2	Capacitor, .01 mfd, Sprague, 4TM-S10
C3	Capacitor, 500 mfd, 25 v, Sprague, TVA-1209
C4	Capacitor, 3600 mfd, 40 v, Sangamo, DCMX-85°
T1	Transformer, Altec #6948
D1	Diode, 1N751
D2	Diode, 1N712
D3	Diode, 1N706
D4	Diode, G.E. 1N3569
D5	Diode, G.E. 1N3569
D6	Diode, G.E. 1N3569
D7	Diode, G.E. 1N3569
Q1	Transistor, G.E. 2N2716
Q2	Transistor, G.E. 2N2716
Q3	Transistor, G.E. 2N2716
Q4	Transistor, RCA 2N1700
Q5	Transistor, RCA 2N3055
F1	Fuse, Standard 3 AG, 2 Amp.
F2	Fuse, Standard 3 AG, 2 Amp.
F3	Fuse, Standard 3 AG, 2½ Amp.

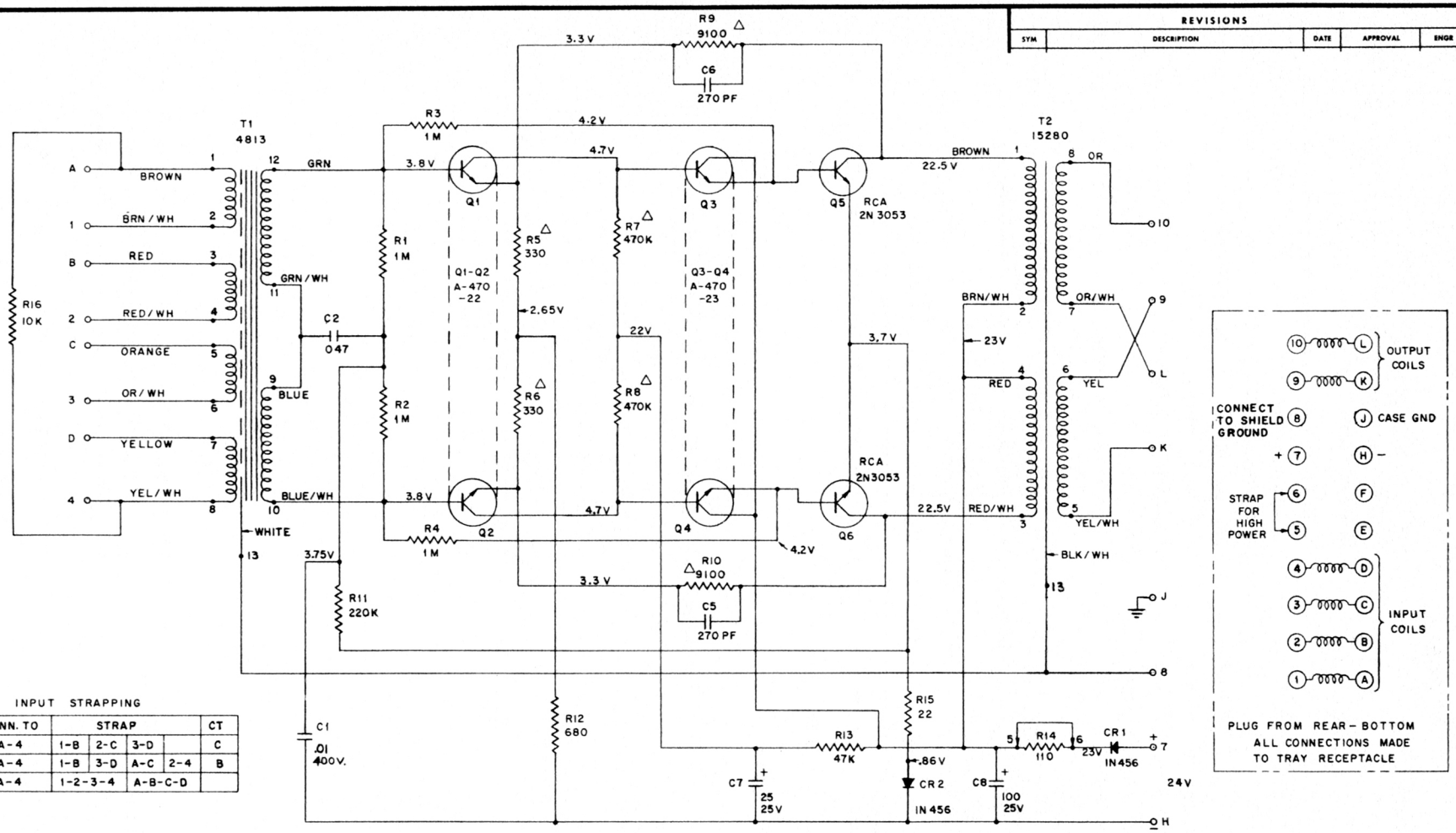
Figure 7

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	ENGR
2	REMOVED R14 RESISTOR	8-24-65		



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACT. 2 PLACE DEC. 3 PLACE DEC.	ORIGINAL DATE OF DRAWING 9 - 15 - 64 DR. BY GILBERT CHKD. KA ENGR.	SCHEMATIC 9550A POWER SUPPLY	ALTEC LANSING CORPORATION A subsidiary of Ling-Temco-Vought, Inc. ANAHEIM, CALIFORNIA
NEXT ASSY 9550A USED ON APPLICATION	ENGR. Q. C.	SCALE CODE ALC-89	C 9550-10 SHEET 1 OF 1

Figure 8



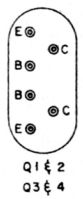
INPUT STRAPPING

Z	CONN. TO	STRAP				CT
600	A-4	1-B	2-C	3-D		C
150	A-4	1-B	3-D	A-C	2-4	B
50	A-4	1-2-3-4		A-B-C-D		

STRAP 5 & 6
FOR + 27 DBM

OUTPUT STRAPPING

Z	CONN TO	STRAP	CT
600	10-K	9-L	9-L
150	10-K	9-10 & L-K	NONE



NOTE:
CAUTION - USE HEAT CLIP ON LEADS
WHEN SOLDERING TRANSISTORS

5. Q5 & Q6 MUST HAVE BETA BETTER THAN 125 AT 50 MA & MATCHED WITHIN 10%.
4. Q3 & Q4 BETA 80+ EACH PAIR MATCHED WITHIN 5%
3. Q1 & Q2 BETA 100+ EACH PAIR MATCHED WITHIN 5%
2. △ RESISTORS MATCHED TO 1% OF EACH OTHER
MATCH SETS FROM STOCK
2-330Ω A.B. 1/2W 5%
2-9100Ω A.B. 1/2W 5%
2-470K CORNING C-20 1/2W
1. ALL RESISTORS EXCEPT R7 & R8 A.B. 1/2W 5%
NOTES:

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	ENGR

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACT. 2 PLACE DEC. 3 PLACE DEC.

ORIGINAL DATE OF DRAWING 7-14-64
DR. BY R.M. Alexander
CHKD. T.H.
ENGR.
ENGR.
Q. C.

NEXT ASSY | USED ON
APPLICATION

9470A
SCHEMATIC

ALC 53

SCALE | CODE

ALTEC
LANSING CORPORATION
LTV A subsidiary of Ling-Temco-Vought, Inc.
ANAHEIM, CALIFORNIA
C 9470A-10

SHEET 1 OF 1