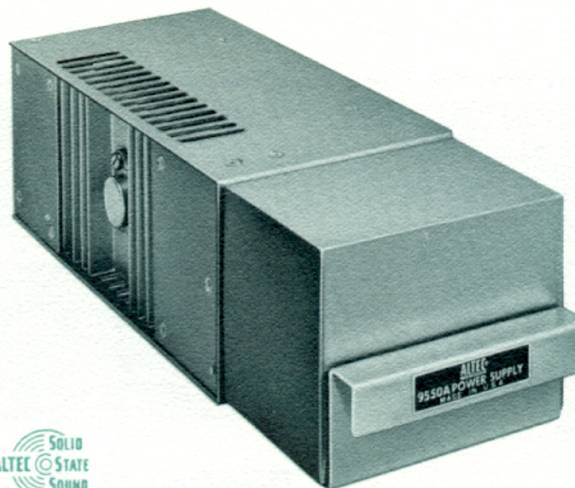
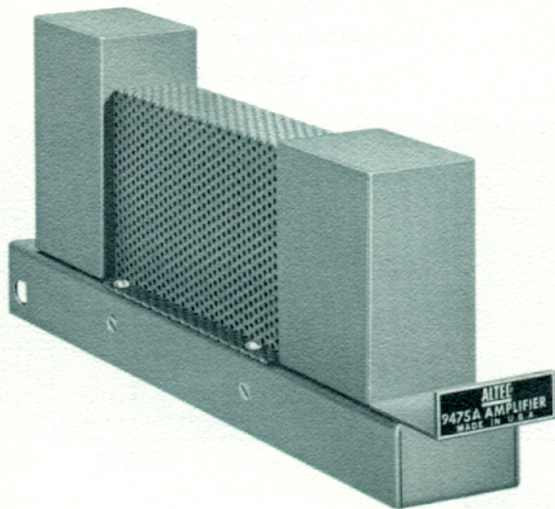


9475A Amplifier

9475A



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, ± 0.5 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 9475A 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 9475A amplifier to exceed all requirements for that vital link in any first-line audio system — the preamplifier — delivering 0.5 watt, the 9475A 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 9475A to reach a noise figure of -127 dbm, with unterminated input. The total harmonic distortion is less than 1.0%, 20-20,000 cps, with +27 dbm output. Overload Recovery Time is 5 microseconds for 100% overload.

The Altec 9475A amplifier will produce +27 dbm. Utilizing transformers on both input and output with multiple impedance ranges, complete isolation is afforded for ease of matching the 9475A 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 9475A 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 9475A amplifier to be interchanged with any other 9475A 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 9475A 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 9475A 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 9475A 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 excels in performance, reliability, and trouble-free operation.



A quality company of LTV Ling Altec, Inc.

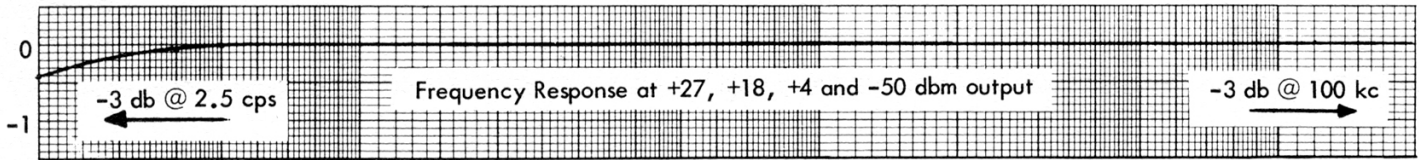
1515 S. Manchester Ave., Anaheim, Calif. 92803
New York

RECORDING &

BROADCASTING

EQUIPMENT

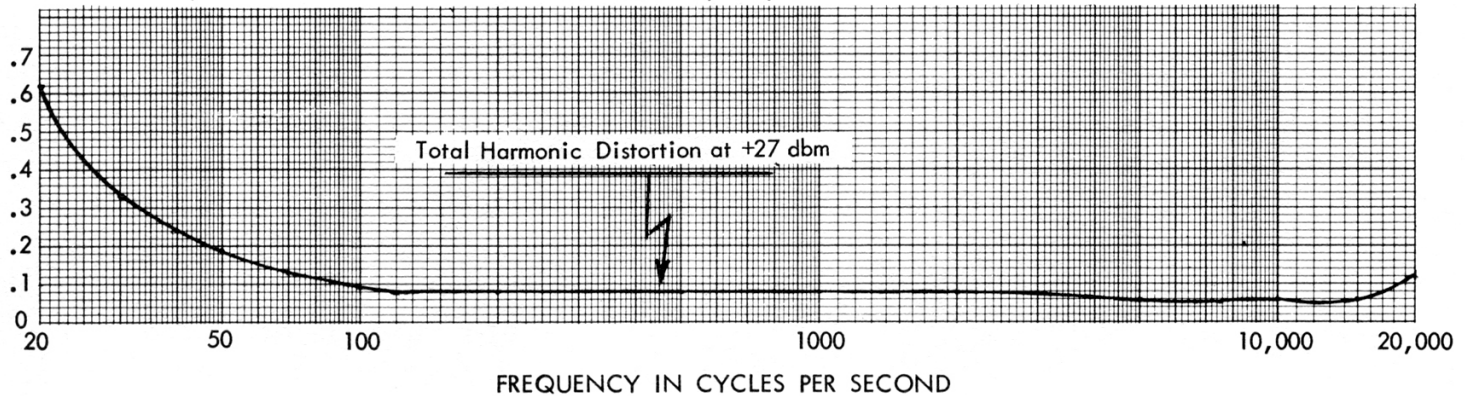
ALTEC 9475A



DC Input 24 vdc @ 130 ma, 3.12 watts

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

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



9550A DESCRIPTION

The Altec 9550A Power Supply, used with the Altec 9475A Amplifier, is an all solid-state unit using silicon diodes in full-wave bridge rectifier, and delivers 24 v dc at 2 amperes with excellent regulation provided by 5 silicon transistors and 3 zener diodes. The design of the 9550A 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 supply power to 15 Altec 9475A Amplifiers operating with full +27 dbm output, the 9550A occupies only 3" of vertical rack or turret space and is only 3 1/8" wide. The 9550A can operate continuously at 75 degrees C (167 degrees F) without derating any specifications including the regulation figure of 0.01%, no load to full load and/or line variation from 105 v ac to 135 v ac or 210 v ac to 270 v ac.

The output voltage of the 9550A power supply is adjustable from 22 v dc to 26 v dc 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

circuits, and are of the fast-acting type easily accessible at the rear of the unit.

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 v ac or 220 v ac — 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.

When used in conjunction with the 250SU Control Console, the 9550A Power Supply is not mounted within the console, but is mounted on an Altec 9852A Mounting Tray adjacent or near the console as the installation requires. An accessory Connector Cover (Altec 50057) should be installed over the terminal to eliminate the shock hazard. As with all Altec products, only the highest grade components and finest workmanship are used in the 9550A Power Supply, thus insuring uniform performance and trouble-free operation.

9475A SPECIFICATIONS:

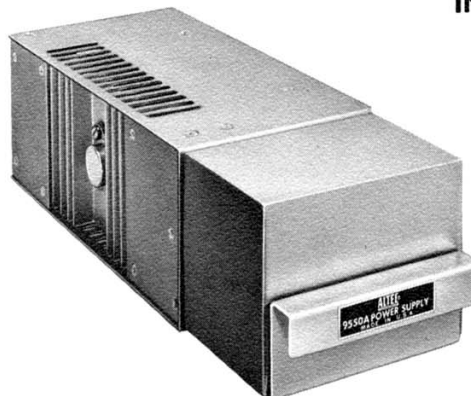
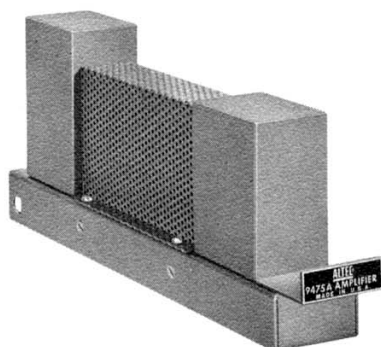
Type:	Preamplifier, booster amplifier, or program amplifier
Gain:	45 db. (input terminated)
Frequency Response:	±0.5 db from 20 to 20,000 cps
Source Impedance:	50, 150 or 600 ohms, balanced or unbalanced (center tap on 600 ohms)
Load Impedance:	150 or 600 ohms, balanced or unbalanced (center tap on 600 ohms)
Output Impedance:	Less than 5% of nominal load
Power Output:	+27 dbm maximum from 20 to 20,000 cps
Distortion:	Less than 1% total harmonic distortion from 20 to 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 v dc at 130 ma for +27 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 at +27 dbm output
Dimensions:	4" H x 1 3/4" W x 9 1/2" D
Finish:	Light Gray baked enamel and cadmium iridited
Weight:	3 lbs.
Electrical Connections:	All electrical connections are made to a 15-pin plug on the rear of the 9475A Amplifier
Accessories:	9550A Power Supply, designed to power up to fifteen 9475A amplifiers at full output 13225 Rack Mounting Assembly (accommodates 9 units) 13401 Mounting Tray Assembly

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.
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:	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.
Dimensions:	3 1/8" wide, 3" high and 1 1/8" deep.
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 9475A amplifiers at +27 dbm output.

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.

**ALTEC
LANSING****9475A AMPLIFIER
9550A POWER SUPPLY****OPERATING
INSTRUCTIONS****9475A AMPLIFIER DESCRIPTION**

The Altec 9475A solid state amplifier is a direct replacement for the tube-type Altec 458A Preamplifier and the Altec 459A Program Amplifier, and is designed to be used in the Altec 250SU Control Console, Custom Consoles, or existing sound systems employing rack mounted 458A and 459A amplifiers. (For other applications, the Altec 9470A Amplifier is recommended.) The 9475A is a highly reliable, all semi-conductor amplifier, designed to function as a preamplifier, booster amplifier, line amplifier or program amplifier. Input and output are isolated by transformers which are astatically and magnetically balanced and which 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 requires only 130 ma at 24 v dc and dissipates 3.12 watts, making it possible to operate many amplifiers from a common power supply without causing undue heat rise which could adversely affect associated equipment. A single 9550A solid state power supply will supply proper operating voltage to ten 9475A amplifiers. All connections and impedance selection functions are handled on the connector of the 13401 mounting tray into which the amplifier is inserted. This design feature makes it possible for the 9475A amplifier to replace any 458A or 459A amplifier (up to 0.5 watt level) without requiring wiring changes in existing consoles or systems.

9475A SPECIFICATIONS

Type:	Preamplifier, booster amplifier, or program amplifier
Gain:	45 db. (input terminated)
Frequency Response:	±0.5 db from 20 to 20,000 cps
Source Impedance:	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 from 20 to 20,000 cps
Distortion:	Less than 1% total harmonic distortion from 20 to 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 v dc at 130 ma for +27 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 at +27 dbm output
Dimensions:	4" H x 1¾" W x 9½" D
Finish:	Light Gray baked enamel and cadmium iridited
Weight:	3 lbs.
Electrical Connections:	All electrical connections are made to a 15-pin plug on the rear of the 9475A Amplifier.
Accessories:	9550A Power Supply, designed to power up to ten 9475A amplifiers at full output 13225 Rack Mounting Assembly (accommodates 9 units) 13401 Mounting Tray Assembly

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.
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. 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 — 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:	3¼" wide, 3" high and 11¾" deep.
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 10 Altec 9475A amplifiers at +27 dbm output.

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

**RECORDING & BROADCASTING EQUIPMENT**

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

42-02-050143-7 Price \$0.14

Litho in USA CP-671-0.5K

INSTALLATION

MECHANICAL

Each 9475A Amplifier is installed in the 250SU Console or 13225 rack mounting assembly by sliding the amplifier into the 13401 mounting tray and making certain that the connector is firmly engaged with the receptacle on the tray.

ELECTRICAL

The 150 and 600 ohms source impedance and the 150 and 600 ohms load impedance terminations are available at the connector so that wiring changes or strapping within the amplifier is not required. This design means any 475A Amplifier is correctly matched when inserted into any tray that is properly wired for its particular function. Wiring instructions for tray connectors are shown in Figure 1.

	OHMS	STRAP	CONNECT TO	CT
INPUT CONNECTIONS				
	600	4 to 6	2 and 8	4 and 6
	150	2 to 4, 6 to 8	2 and 8	—
OUTPUT CONNECTIONS				
	600	3 to 5	1 and 7	3 and 5
	150	1 to 3, 5 to 7	1 and 7	—
DC INPUT CONNECTIONS FROM POWER SUPPLY				
		no strapping	positive to 11 negative to 15	—
POWER SUPPLY CONNECTIONS				
	AC (110 v ac)	3 to 4, 1 to 2	1 and 3	—
	AC (220 v ac)	2 to 4	1 and 3	—
	DC	1 to 3, 2 to 4	positive pin, 3 negative pin, 4	—

FIGURE 1 — Wiring Connections Table

In some applications it may be necessary to provide matching resistive loads for passive circuits, such as equalizer networks, filters, attenuators, etc. This may be accomplished by strapping an appropriate resistor across the input. A 680-ohm resistor strapped across pins 2 and 8 will match input impedance to standard 600-ohm lines. Use a 390-ohm resistor for 150-ohm lines. No resistive strapping is necessary across the output.

The 9475A Amplifier is equipped with transformers on both input and output to allow the audio circuitry to operate balanced. If it is necessary to ground one side of the line, make certain that all ground connections are brought to a common point before attaching to the chassis. Ground loop currents may cause hum and seemingly faulty operation of the equipment is often the result of having more than one ground point.

MAINTENANCE

In the event of a failure in the 9475A Amplifier, it is recommended that the unit be returned to the factory for servicing. If field repair is made, it should be noted that transistors Q1 - Q2, Q3 - Q4, and Q5 - Q6 operate as matched pairs and should be replaced with a new matched pair. After replacing any component in the 9475A Amplifier, check the unit for proper operation by comparing the performance to the specifications.

9550A DESCRIPTION

The Altec 9550A Power Supply, used with the Altec 9475A Amplifier, is an all solid-state unit using silicon diodes in full wave bridge rectifier, and delivers 24 v dc at 2 amperes with excellent regulation provided by 5 silicon transistors and 3 zener diodes. The design of the 9550A 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 supply power to 10 Altec 9475A Amplifiers operating with full +27 dbm output the 9550A occupies only 3" of vertical rack or turret space and is only 3¹³/₁₆" wide. The 9550A can operate continuously at 75 degrees C (167 degrees F) without derating any specifications including the regulation figure of 0.01%, no load to full load and/or line variation from 105 v ac to 135 v ac or 210 v ac to 270 v ac.

The output voltage of the 9550A power supply is adjustable from 22 v dc to 26 v dc 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 circuits, and are of the fast-acting type easily accessible at the rear of the unit.

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 v ac or 220 v ac — 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.

INSTALLATION

The 9550A Power Supply is not mounted within the 250SU Console, but should be mounted on an Altec 9852A Mounting Tray adjacent or near the console as the installation requires. An accessory Connector Cover (Altec 50057) should be installed over the terminal to eliminate the shock hazard. Connections to the 250SU Console should be made with a #16 2-wire cable of approximately 4 feet in length. Connect the red wire to pins 1 and 3 on the 9852A tray and to pins 4 and 6 of a Jones S-306-CCT female connector. The black wire should be attached to pins 2 and 4 at the tray, and to pins 1, 3 and 5 at the Jones socket. Pins 5 and 6 at the tray should be grounded either through a 3-wire AC plug or with a separate lead to the console cabinet. (See Figure 2.)

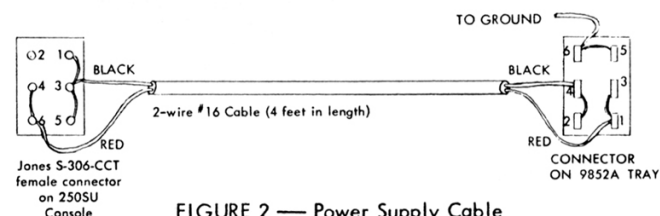


FIGURE 2 — Power Supply Cable

TRANSISTOR MAINTENANCE

Transistors are inherently long-life devices and normally should not require replacement in the life of the equipment. If it becomes apparent through systematic trouble-shooting that replacement is necessary, a few precautions must be observed.

PROTECTION

Transistors can be damaged by excessive heat. When removing or replacing a transistor soldered to tie points or to the etched circuit board, use a small soldering iron with an 1/8" diameter chisel tip.

Use small diameter, high tin content solder.

On etched circuit boards, use a toothpick inserted from the conductor side to clean out the holes before inserting the new transistor. High heat reduces conductor-to-board bonding. Pressure applied from the component side may cause the hold pad and conductor to be torn away from the board.

ORIENTATION

Transistors are packaged in various case sizes and types with various lead configurations. (See Figure 3 for typical packages.) Before removing a transistor from an etched circuit board or tie points, make a sketch of the orientation of the transistor leads with respect to the circuit board or tie points. Forming the leads on the new transistor to conform with the leads on the one being replaced also will aid in making proper connections.

Before removing small 'plug-in' transistors, note the position of the index tab with respect to the socket. Cut the leads on the new transistor to the required length and insert into the socket properly indexed.

POWER TRANSISTORS

When replacing power transistors, be sure that —

- (1) The mica insulator is not damaged,
- (2) No grit or metal particles are lodged between the transistor and the heat sink,
- (3) Both sides of mica insulator are covered with silicone grease or fluid,
- (4) Mounting screws are tight, and
- (5) The protective cover is in place.

TRANSISTOR TESTING

Transistors should be checked with a transistor tester. If one is not available, an ohmmeter may be used inasmuch as most transistor failures result in a collector-to-emitter short or open circuit. Remove the suspected transistor from the circuit. Connect the ohmmeter leads to the collector and the emitter (see Figure 3 for pin or lead configurations) and read on the low-ohm range. If the low reading is virtually the same when the ohmmeter connections are reversed, the transistor is shorted. If the ohmmeter ten high megohm range shows no reading for both connections of the ohmmeter, the transistor is open.

SERVICING ETCHED CIRCUIT BOARDS

Before removing or replacing components on etched circuit boards, read and observe the following precautions.

- (1) Use a small soldering iron with an 1/8" diameter chisel tip, and use a small diameter, high tin content solder.
- (2) Components may be removed by placing the soldering iron on the component lead on the conductor side of the board and pulling out the lead. Avoid overheating the conductor.
- (3) If the component is obviously faulty or damaged, clip the leads close to the component and then unsolder the leads from the board. Withdraw them from the component side.
- (4) Large components such as potentiometers and sockets may be removed by rotating the soldering iron from lead to lead and applying

steady pressure to lift the part free. If the part is to be replaced with a new one, follow the procedure outlined in (3) above.

- (5) Since the conductor part of the etched circuit board is a metal-plated surface covered with solder, use care to avoid overheating and lifting the conductor from the board. A method for repair is to solder a section of good conducting wire along the damaged area.
- (6) Clear the solder from the circuit board holes before inserting the leads of the new component. Heat the solder in the hole, remove the iron and quickly insert a pointed non-metallic object, such as a toothpick, from the conductor side.
- (7) Shape the new component leads and clip them to the proper length. Insert the leads in the holes, observing the same polarity or orientation as that of the removed component. Apply heat and solder on the conductor side.

PARTS LIST: 9475A Amplifier PARTS LIST: 9550A Power Supply

Reference Designator	Name and Description
C1	Capacitor, 0.01 mfd, 400 v (Sprague 4PS-510)
C2	Capacitor, 0.047 mfd, 200 v (Sprague 2PS-547)
C5, C6	Capacitor, 0.00027 mfd (CD-15-F-271J, matched)
C7	Capacitor, 25 mfd, 25 v (Sprague TE-1207)
C8	Capacitor, 100 mfd, 25 v (Sprague TE-1211)
CR1, CR2	Diode (1N456)
Q1 thru Q4	Transistor (2N3900A, matched)
Q5, Q6	Transistor (Altec 50137-2)
R1 thru R4	Resistor, 1 meg Ω \pm 5%, 1/2 w
R5, R6	Resistor, 330 Ω \pm 5%, 1/2 w (matched pair)
R7, R8	Resistor, 470,000 Ω \pm 1%, 1/2 w (Dale DCS-1/2, matched pair)
R9, R10	Resistor, 91,000 Ω \pm 5%, 1/2 w (matched pair)
R11	Resistor, 220,000 Ω \pm 5%, 1/2 w
R12	Resistor, 680 Ω \pm 5%, 1/2 w
R13	Resistor, 47,000 Ω \pm 5%, 1/2 w
R14	Resistor, 110 Ω \pm 5%, 1/2 w
R15	Resistor, 22 Ω \pm 5%, 1/2 w
R16	Resistor, 10,000 Ω \pm 5%, 1/2 w
T1	Transformer (Altec 4813)
T2	Transformer (Altec 15298)

Reference Designator	Name and Description
C1	Capacitor, 10 mfd, 25 v (Sprague TE-1204)
C2	Capacitor, 0.01 mfd, 400 v (Sprague 4PS-510)
C3	Capacitor, 500 mfd, 25 v (Sprague TVA-1209)
C4	Capacitor, 3600 mfd, 40 v (Sangamo DCMX-85*)
D1	Diode (1N751, Hughes)
D2	Diode (1N712, Hughes)
D3	Diode (1N706, Hughes)
D4 thru D7	Diode (1N3569, G. E.)
F1, F2	Fuse, 2 amp (Standard 3 AG)
F3	Fuse, 3 amp (Standard 3 AG)
Q1 thru Q3	Transistor (Altec 2712)
Q4	Transistor (2N1700, RCA)
Q5	Transistor (Altec 40934)
R1, R3	Resistor, 3900 Ω \pm 5%, 1/2 w
R2, R9	Resistor, 470 Ω \pm 5%, 1/2 w
R4, R6	Resistor, 27,000 Ω \pm 5%, 1/2 w
R5, R7, R8	Resistor, 1000 Ω \pm 5%, 1/2 w
R10	Resistor, 180 Ω \pm 5%, 1/2 w
R11, R12	Resistor, 100 Ω \pm 5%, 1/2 w
R13	Potentiometer, 1000 Ω (CTS 37389)
T1	Transformer (Altec 6948)

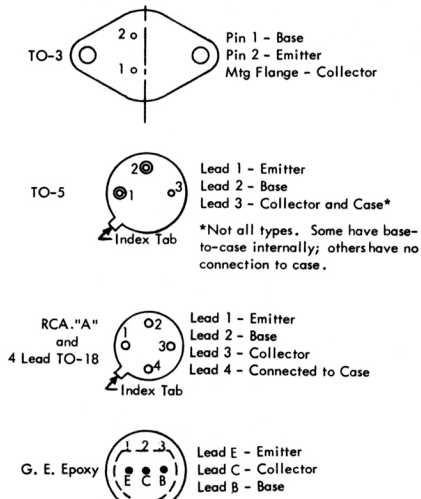
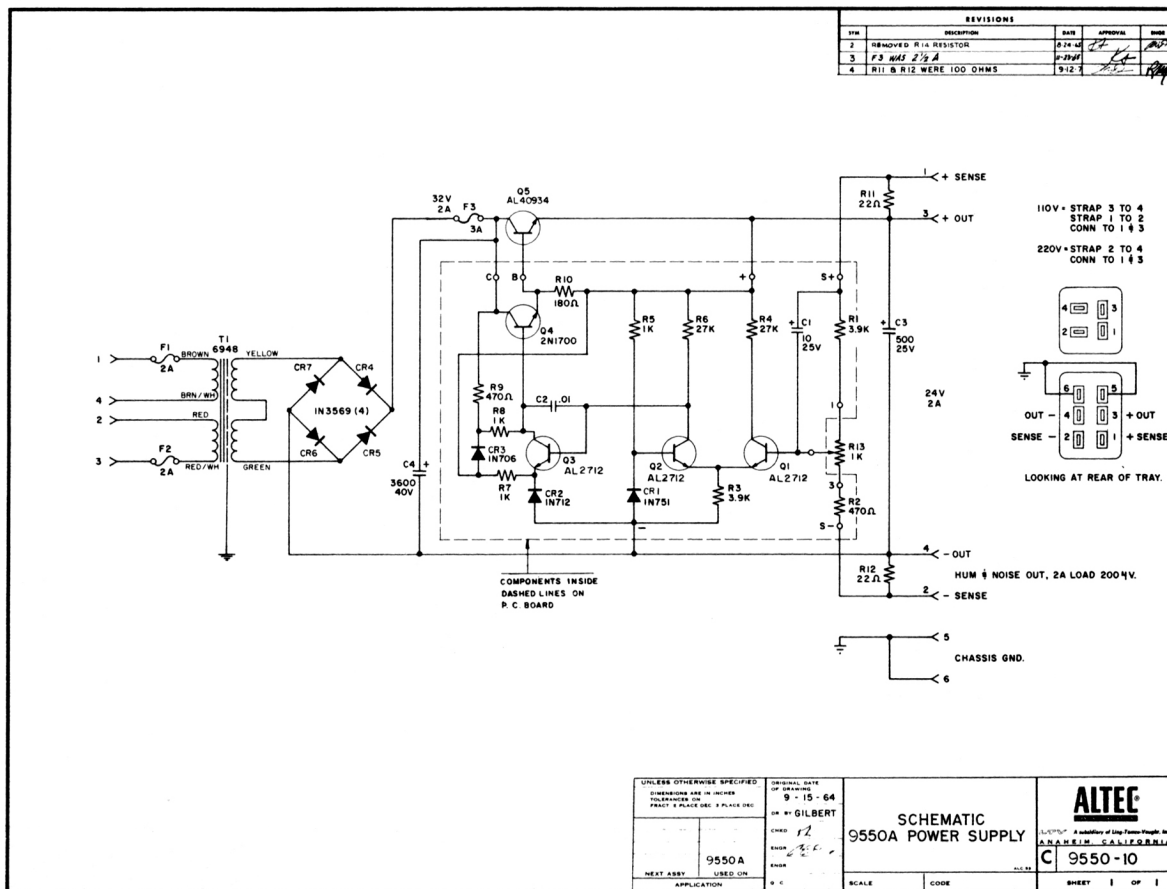
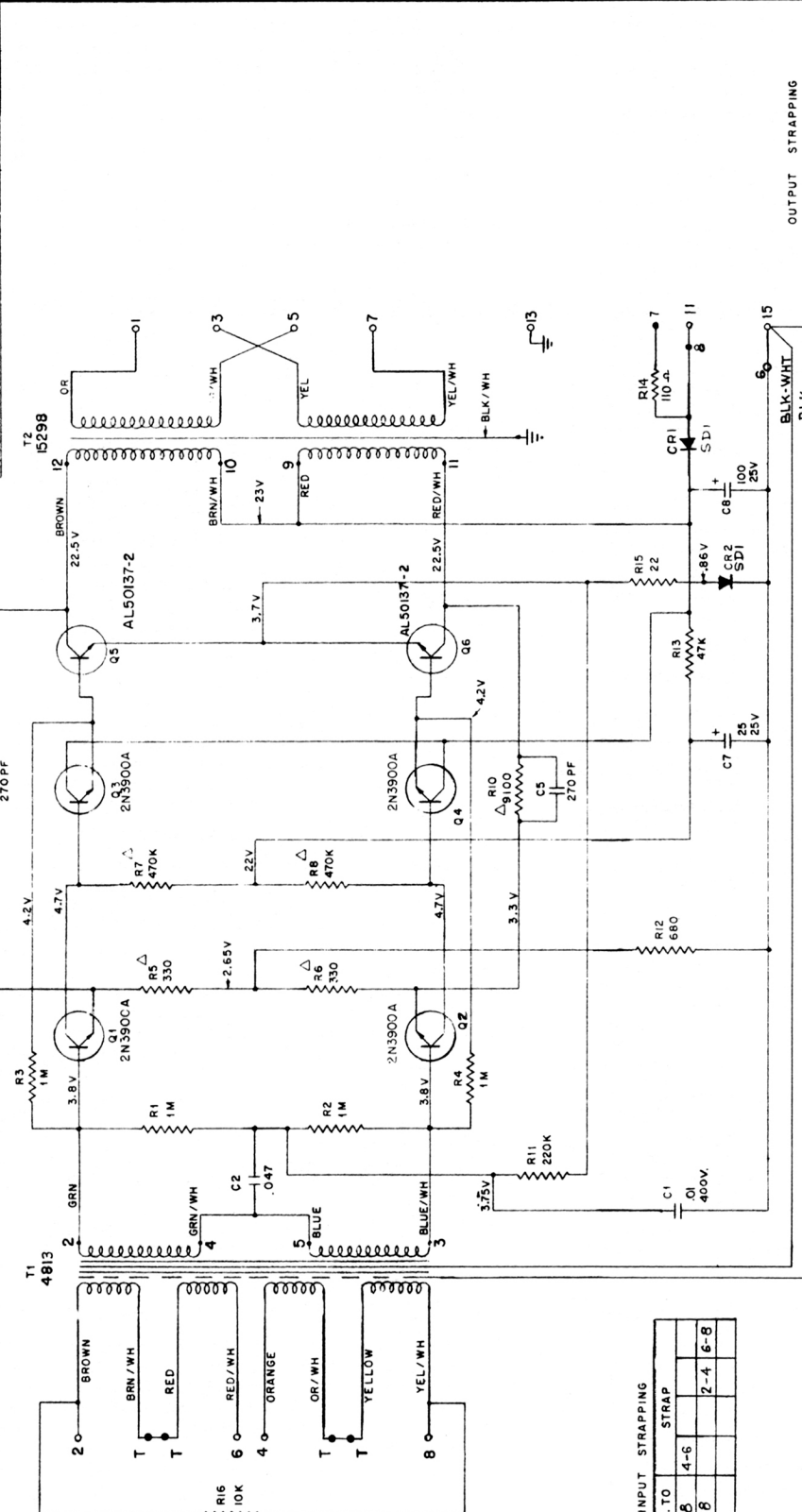


FIGURE 3 — Transistor Packages, Bottom View of Lead or Pin Configuration



REVISIONS		DATE	APPROVAL	ENGR
1	7-1-65	4-12-65	AS	
2	7-1-65	4-12-65	AS	
3	7-1-65	4-12-65	AS	
4	7-1-65	4-12-65	AS	



Z	CONN. TO	STRAP
600	2 & 8	4-6
150	2 & 8	2-4 & 6-8

Z	CONN. TO	STRAP
600	1 & 7	3-5
150	1 & 7	1-3 & 5-7

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

- 6. CIRCLED CONNECTIONS 0-5+ TERM. ON PLUG; DOTS -5+ EYELETS ON PC BOARD
- 5. Q5 & Q6 MUST HAVE BETA BETTER THAN 125 AT 50mA, MATCHED WITHIN 10%.
- 4. Q3 & Q4 BETA 80+ EACH PAIR MATCHED WITHIN 5%.
- 3. Q1 & Q2 BETA 100+ EACH PAIR MATCHED WITHIN 5%.
- 2. Δ 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%.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES ON
FRAC PLACE DEC 3 PLACE DEC

ORIGINAL DATE OF DRAWING
10-29-64
OR BY G. HOYT

ENGR. J. HULL

SCALE 3

CODE 9475A

SCHEMATIC

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SHEET 1 OF 1