

1569A Power Amplifier

1569A



Features:

- Underwriters approved
- Low power consumption
- Inputs and outputs may be safely paralleled
- 70V and 25V outputs
- Low cost per watt
- High and low impedance inputs
- Built-in speaker protection
- Low installation costs
- Full 80 watt output
- Simplified installation

POWER AMPLIFIER FOR: PUBLIC ADDRESS - SOUND REINFORCEMENT SCHOOLS - FACTORIES - MILITARY COMPLEXES THEATRES - CHURCHES - "GIANT VOICE" WARNING SYSTEMS RAIL, BUS, AND AIR TERMINALS

The 1569A power amplifier will provide 80 watts of power with great stability under conditions of varying line voltage, changing tube characteristics and long unloaded speaker lines of high capacitance. This amplifier is part of the "Building Block 1500 Series" which provide fully integrated public address facilities.

The straight-forward circuitry of the amplifier provides unusual reliability. It is possible for as many as three power tubes and one rectifier tube to fail without removing the amplifier from service. It will withstand "hot switching" and other punishment which the amplifier may be given by non-technical operators.

Installation costs have been materially reduced since all input and output connections are made to simple barrier-type terminal blocks on the rear of the chassis and the amplifier contains a pre-wired three conductor power cord. For reduced system cost, the amplifier contains a low frequency cut-off which will provide from 0 to 22 db of attenuation at 250 cycles for the protection of driver type loudspeakers.

Two inputs are provided, one for unbalanced low or high impedance lines with a minimum of 0.9 volt signal strength, and one which connects to the accessory Altec 15095 plug-in line transformer for isolation from balanced lines of 150 or 600 ohms. These two inputs can be used simultaneously for greater facility.

The amplifier will accommodate output loads of 4, 8, 16 and 62 ohms; the corresponding output voltages being 18, 25, 36 and 70 volts. The great stability of the circuit makes it possible for two of these amplifiers to be paralleled both at input and output.

On special order, the Model 1569AT is available which incorporates tube testing circuitry within the amplifier. The associated control switch and meter are mounted on the front panel for ease of operation. Any one of the six tubes in the amplifier circuitry may be checked for proper operation by selecting the desired tube with the front panel switch and observing its condition on the meter. This feature enables the operator to tell at a glance if the amplifier is functioning in a normal manner, and if not, which tube is at fault.

The 1569A or 1569AT amplifier can be mounted in either the standard Rack or in a standard wall or table type cabinet. When used with associated components of sufficient quality to realize its full potentialities, the 1569A is ideal for higher powered public address, paging, music distribution and sound reinforcement systems.



A Division of *ESV* Ling Altec, Inc.

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

SPECIFICATIONS

Gain:	68 db
Input Sensitivity:	0.9 volts
Power Output:	80 watts at less than 2% thd 60-20,000 cps 80 watts at less than 5% thd 40-20,000 cps
Frequency Response:	± 1 db 5-30,000 cps, ± 5 db 1-100,000 cps
Input Impedance:	70,000 ohm potentiometer
Source Impedance:	150 or 600 ohms with 15095 plug-in transformer
Load Impedance:	4 (18 V), 8 (25 V), 16 (36 V), 62 (70 V) ohms ungrounded
Output Impedance:	Less than 15% of nominal load impedance
Noise Level:	80 db below rated output
Controls:	Volume control, continuously variable, composition
Power Supply:	117 volts, 50/60 cps, 240 watts
External Power Available:	117 volt AC receptacle on chassis
Tubes:	Two 6CG7, four 6CA7/EL34, two 5U4GB
Dimensions:	8 $\frac{3}{4}$ " H, 19" W, 8" D
Color:	Green
Weight:	27.5 lbs.
Special Features:	For 1500 series applications. This amplifier has a two-stage built-in Hi-Pass filter
On Special Order:	The Altec 1569AT Amplifier is provided with a meter on the front panel to test the tubes of the amplifier for proper operation. As indicated in the drawing, Figure 1, a six-position selector switch below the meter allows each tube of the amplifier to be checked.

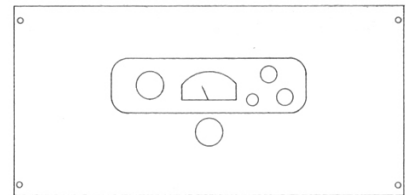


Figure 1

ACCESSORIES

15095 Plug-in Line Transformer.

See Amplifier Accessories sheet for relay racks, mounting cabinets, and other amplifier accessories.

ARCHITECTS AND ENGINEERS SPECIFICATIONS

The power amplifier shall be of the rack mounting type measuring not more than 8 $\frac{3}{4}$ " H, 19" W, and 9" D. The amplifier shall include a continuously variable volume control of the composition type on the front panel, together with pilot light, fuse holder, and on-off switch. The front mat shall be hinged for easy access to the front portion of the amplifier for maintenance. Any amplifier utilizing a common "radio type" volume control and not including these features shall not be acceptable under these specifications.

The power output shall be 80 watts with less than 2% total harmonic distortion over the frequency range of 60 to 20,000 cycles, and 80 watts with less than 5% total harmonic distortion over the frequency range of 40 to 20,000 cycles. The frequency response shall be ± 1 db 5 to 30,000 cycles, or ± 5 db 1 to 100,000 cycles. The noise level shall be 80 db below rated output. The overall gain of the amplifier shall be no less than 68 db. The output impedance shall be less than 15% of nominal load impedance. The load impedance shall be 4 (18 v), 8 (25 v), 16 (36 v), 62 (70 v) ohms ungrounded. The input sensitivity shall be .9 volts rms for rated output. The input impedance shall be 70,000 ohm volume control, and the source impedance 150 or 600 ohms with 1595 plug-in transformer. The amplifier shall utilize a low-frequency cutoff, providing from 0 to 22 db of attenuation at 250 cycles for the protection of driver loudspeakers. The amplifier shall operate from 117 v 50/60 cycles and shall not draw more than 240 watts from the primary circuit. The tube complement shall consist of two 6CG7, four 6CA7/EL34, two 5U4GB. The unit shall be finished in green and shall weigh in the order of 27.5 pounds.

Negative feedback must be derived from a tertiary winding in the output transformer. Amplifiers employing grounded outputs or other means of feedback will not be acceptable.

ADD FOR 1569 AT:

The amplifier shall incorporate tube testing facilities. The meter and selector switch of the tube testing facility shall be front panel mounted and shall enable an operator to select, in turn, each of the six tubes of the amplifier circuitry and, therefore, determine the operating condition of these tubes.

Any amplifier not meeting the above specifications shall be deemed unacceptable under this specification.

The amplifier shall be the Altec Lansing Model 1569A, (tube-test model, use 1569AT).

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.



1569A AMPLIFIER

OPERATING INSTRUCTIONS



SPECIFICATIONS

Type:	Power Amplifier
Gain:	68 db
Input Sensitivity:	0.9 volt
Power Output:	80 watts at less than 2% thd 60 to 20,000 cps 80 watts at less than 5% thd 40 to 20,000 cps
Frequency Response:	± 1 db, 5-30,000; ± 5 db, 1-100,000 cps
Input Impedance:	70,000 ohm potentiometer
Source Impedance:	150, 600 ohms with 15095 Plug-in Transformer
Load Impedance:	4 (18 v), 8 (25 v), 16 (36 v), 62 (70 v) ohms ungrounded
Output Impedance:	Less than 15% of nominal load impedance
Noise Level:	80 db below rated output
Controls:	Volume control, continuously variable, composition
Power Supply:	117 volts, 50/60 cps, 240 watts
External Power Available:	117 volt ac receptacle on chassis
Tubes:	2-6CG7, 4-6CA7/EL34, 2-5U4GB
Dimensions:	8 $\frac{3}{4}$ " high, 19" wide, 8" deep
Color:	Dark green
Weight:	27.5 lbs.
Special Feature:	Two stage high-pass-filter for protection of horn loaded drivers
Accessory:	15095 Plug-in Transformer



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

12548-3 Price \$.14
Litho in USA C/P 11/65

GENERAL DESCRIPTION

The 1569A Amplifier is a rack mounted, AC operated power amplifier intended for use in sound reinforcing, paging, music distribution, or any application requiring low distortion, wide frequency range, complete stability with any type of load, reliability of operation, ease of servicing or low cost.

At 80 watts distortion is less than 2% at any frequency from 60 to 20,000 cycles per second. The frequency response is within 5 db of mid range value from 1 cycle per second to 100 KC. The feedback circuit is designed for stability under conditions of varying line voltage, varying tube characteristics, and all types of loads including long unloaded speaker lines having considerable capacitance. The tubes are conservatively operated under CCS (continuous commercial service) ratings of their manufacturer, and the amplifier has been shown to withstand "hot switching" and other punishment which might be encountered in the hands of untrained operators. As many as three output tubes and one rectifier may fail without interrupting operation.

The amplifier occupies five units of rack space (8 $\frac{3}{4}$ "") and has a hinged front panel on which are mounted the power switch, fuse, pilot light and a continuously variable gain control. All circuitry is completely accessible for servicing when the front panel is open. The amplifier is equipped with a 3-wire power cord terminating in a 3-pin cap. Input and output terminals are provided in the form of barrier-type terminal blocks mounted on the outer surface of the chassis.

INPUT CONNECTIONS

The 1569A Amplifier is equipped with two pairs of input connections. Terminals 1 and 2, connecting directly to the input potentiometer, are provided for unbalanced high impedance sources, and to bridge unbalanced low impedance lines having a signal voltage of 0.9 volt or higher.

Terminals 3 and 4 connect to a standard octal socket which accommodates the accessory plug-in transformer. With the 15095 Transformer, balanced or unbalanced lines of 150, 600 ohms up to a level of +8 dbm may be connected to input 3-4. The octal socket is normally connected for 500/600 ohm operation; the other impedances may be obtained by strapping the terminals in accordance with the diagram shown on the schematic.

OUTPUT CONNECTIONS

Outputs accommodate nominal loads of 4, 8, 16 and 62 ohms, the corresponding full-drive output voltages being 18, 25, 36 and 70 volts.

Speaker Matching: Use the output tap which most nearly equals the total speaker impedance. If the load impedance falls between two output terminal values, favor the terminal of lower impedance.

70 Volt Line: The 70 volt distribution system permits connection to a large number of speakers, each to operate at its own power level as required, without the necessity for computing impedances. In this system each speaker is equipped with a transformer containing a number of taps rated in terms of power, and the tap is selected which gives the power desired for that speaker. The total of the power settings for all speakers should be equal to or less than the amplifier system power rating. The 1569A Amplifier is equipped with outputs to drive both a 70 volt line and a 25 volt line.

Protection of Horn Loaded Drivers: Driver loudspeakers coupled to horns are used in paging or voice reinforcing systems where excellent intelligibility is required in the presence of high noise levels, effects of wind, and other disturbances. When a loudspeaker system dividing network is not available the diaphragm of the driver loudspeaker may be protected from low frequency power by the use of the R-C low frequency cut-off filter in V1 grid circuit (see schematic). As shipped, capacitors C1 and C2 are strapped out. By cutting one or both of these straps attenuation is introduced as shown in the table, depending upon the impedance of the source.

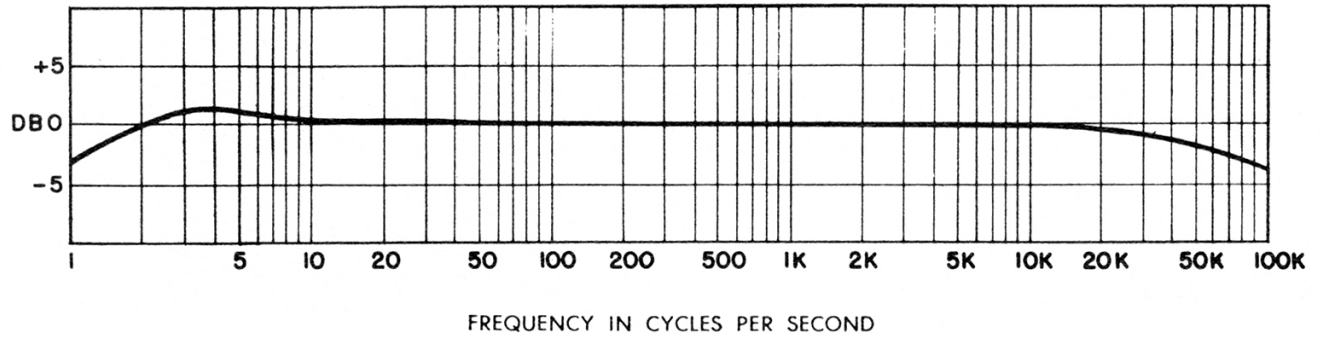
Effect of High Pass Filter

Source Impedance	Strapping	250	500	1000	2000 cps
100,00 ohms	One strap cut	-6.5	-3	-1	-0.2 db
	Both straps cut	-16	-8	-3.5	-1.2 db
Low	One strap cut	-13	-8	-3.5	-1.2 db
	Both straps cut	-22	-12	-4.2	-1.5 db

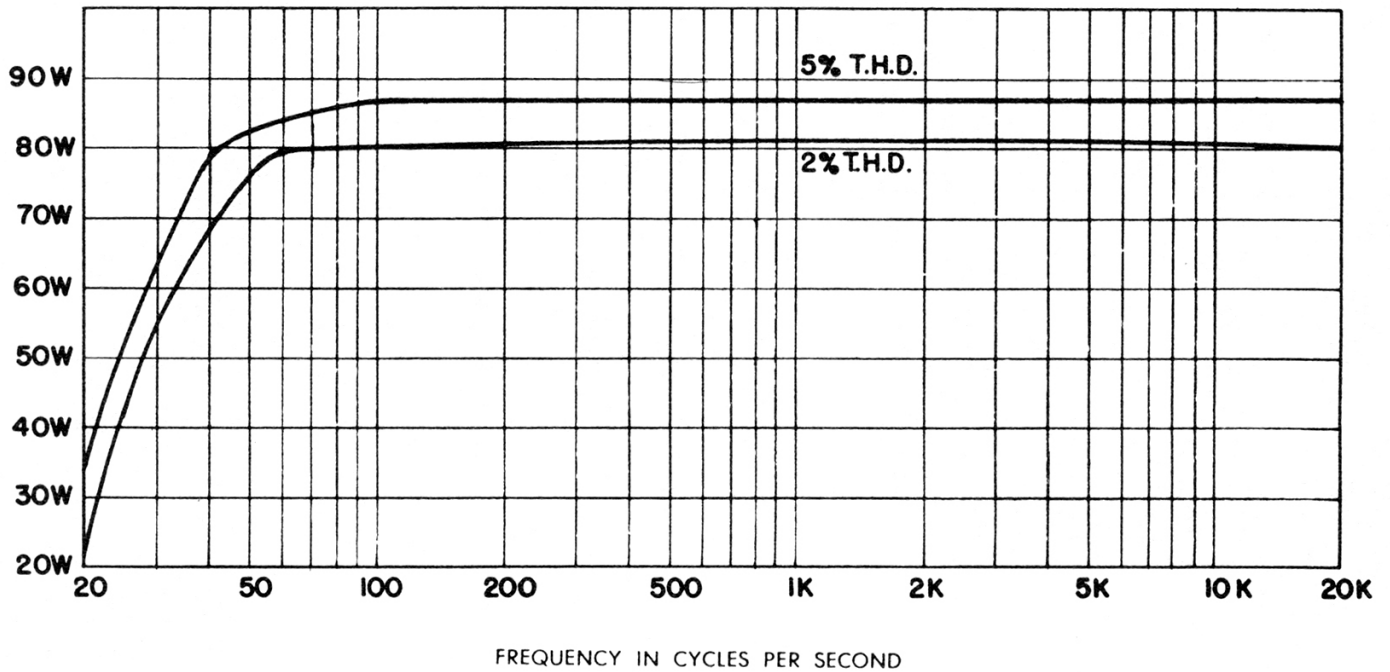
CONTROLS

The only controls on this amplifier intended for normal operation are the power switch and the gain control. Potentiometer P2, which establishes the bias voltage for the output tubes, is set at the factory and will probably not require readjustment over a long period of operation. If, due to ageing of the rectifier, the bias voltage should drop below the value indicated on the schematic, it will be desirable to reset P2. Measurement should be made with an accurate voltmeter, at a line voltage of 117 volts, and with no signal applied.

**I569 A AMPLIFIER
TYPICAL FREQUENCY RESPONSE**



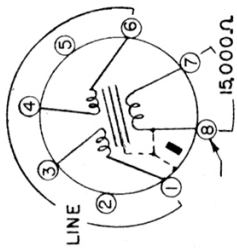
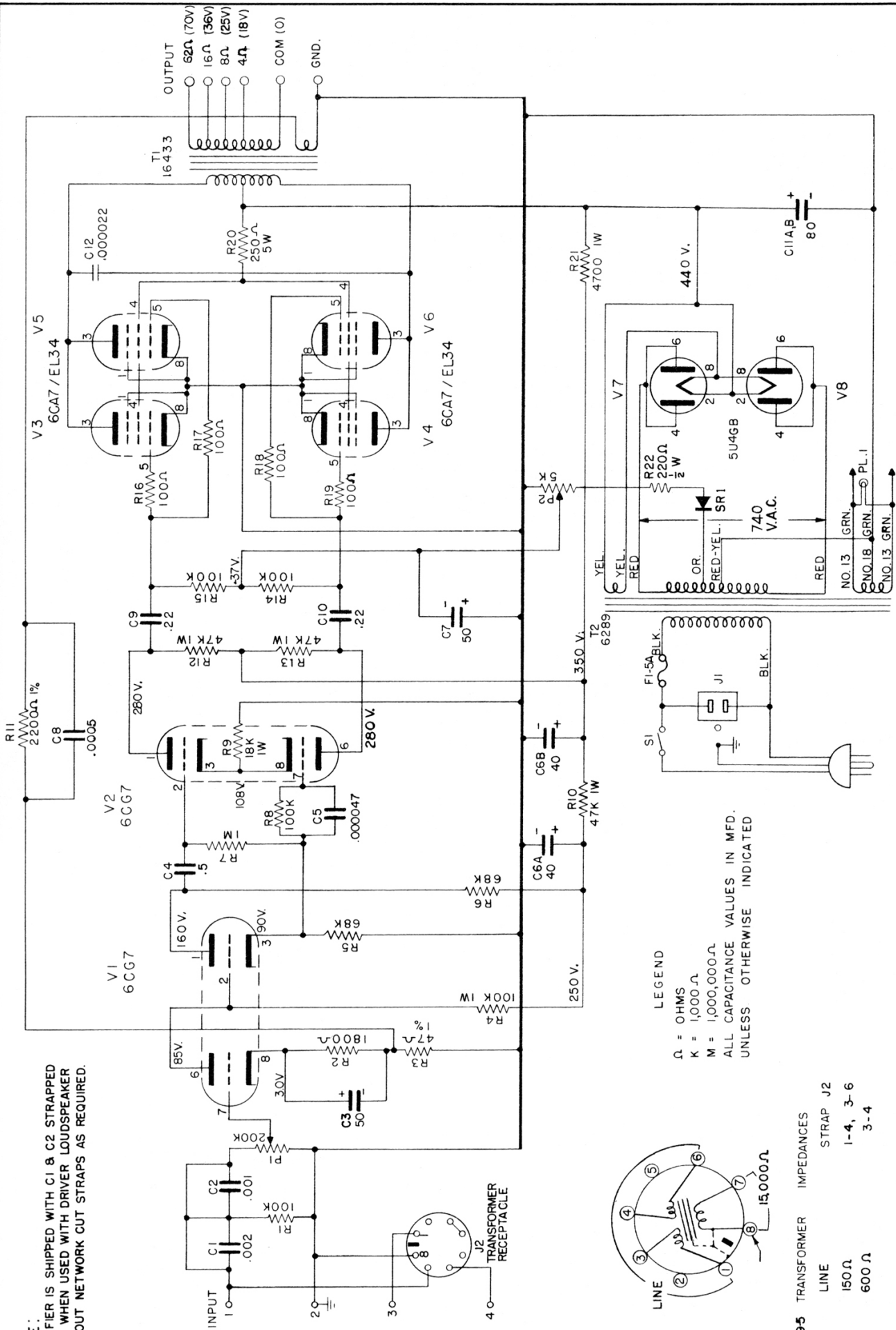
**I569 A AMPLIFIER
FREQUENCY VS POWER AT SELECTED T.H.D.**



PARTS LIST

C1	.002 mfd. ± 10% ceramic disc Erie 811-202	R10,12,13	47,000 Ω ± 10%, 1 W.
C2	.001 mfd. ± 10% ceramic disc Erie 811-202	R11	2200 Ω ± 1%, 1/2 W. deposited carbon
C3	50 mfd. 6 V. Mallory TT	R16,17,18,19	100 Ω ± 10%, 1/2 W.
C4	.5 mfd. 400 V. CD PJ4P5	R20	250 Ω 5 Watt Ohmite Brown Devil
C5	.000047 mfd. ± 10% ceramic disc Erie 831-470	R21	4700 Ω ± 10%, 1 W.
C6,11	40 x 40 mfd. 500 V. Mallory FP288	R22	220 Ω ± 10%, 1/2 W.
C7	50 mfd. 50 V. Mallory TC	P1	200,000 Ω Altec 12435
C8	.0005 mfd. ± 10% ceramic disc Erie 811-501	P2	5,000 Ω Mel-Rain type FFF-1
C9,10	.22 mfd. 400 V. Sprague 4TM-P-22	F1	5 amp., 3 AG
C12	.000022 mfd. 2500 V. mica, Arco VCM 20-220	PL1	Mazda #44
R1,8,14,15	100,000 Ω ± 10%, 1/2 W.	S1	Switch Altec 12536
R2	1800 Ω ± 10%, 1/2 W.	SR1	Rectifier -- G.E. 1N1491
R3	47 Ω ± 1%, 1/2 W. Deposited carbon	J1	Alden 402 ACEHG receptacle
R4	100,000 Ω ± 10%, 1 W.	T1	Output Transformer Altec 16433
R5,6	68,000 Ω ± 10%, 1/2 W.	T2	Power Transformer Altec 6289A
R7	1 megohm ± 10%, 1/2 W.	V1,2	6CG7 Vacuum Tube
R9	18,000 Ω ± 10%, 1 W.	V3,4,5,6	6CA7/EL34 Vacuum Tube
		V7,8	5U4GB Vacuum Tube

NOTE:
AMPLIFIER IS SHIPPED WITH C1 & C2 STRAPPED
OUT. WHEN USED WITH DRIVER LOUDSPEAKER
WITHOUT NETWORK CUT STRAPS AS REQUIRED.



15095 TRANSFORMER IMPEDANCES
LINE STRAP J2
150Ω 1-4, 3-6
600Ω 3-4

LEGEND
Ω = OHMS
K = 1,000 Ω
M = 1,000,000 Ω
ALL CAPACITANCE VALUES IN MFD.
UNLESS OTHERWISE INDICATED

ALTEC LANSING 1569A AMPLIFIER

FIRST MADE FOR
TOLERANCES EXCEPT AS NOTED; FRACT. 5 1/64" DEC. 1 .000" HOLE SIZES 0 TO 1/2" ± .001 OVER 1/2" ± .008 ANGULAR ± 1/2°

ISSUE	APPROV'D	DATE	CHANGE
1		6-12-57	
2		9-24-58	.5 WAS 22 (C4)
3		12-10-58	AC RECEPT. WAS GROUNDED
4		1-22-59	REVISIONS
5		3-22-59	REVISIONS
6		3-22-59	REVISIONS

ANAHEIM, CALIFORNIA
1569A AMPLIFIER
SCH-MATIC
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