



## Features:

- 40 Watts Power
- Wide Frequency Response
- Metering Circuits
- 70 Volt Line Connection
- Meter Illumination
- Over Temperature Warning Indicator
- Plug-in Line Transformer
- Switch Controlled "High Pass Filter"
- Switch Selected Power Line Setting

## RECORDING STUDIOS • TELEVISION STUDIOS BROADCAST STUDIOS • PUBLIC ADDRESS SYSTEMS

The Altec 128B Power Amplifier is a rack-mounted AC operated power amplifier designed primarily for professional recording use. Other applications for the 128B amplifier include top echelon sound reinforcement, public address systems, television and broadcast studios. The 128B features built-in meter, for measuring vacuum tube space current, and transformer thermal protection—"THERMEGUARD." The "Thermeguard" is an exclusive feature found only in the 128B. In addition to thermal protection, the power transformer is fitted with a heavy copper flux shield which reduces the AC field, allowing operation in closer proximity to low-level equipment without inducing hum that would otherwise be possible. Meter illumination, over temperature warning indicator, switch selected power line setting, switch controlled high pass filter, plug-in line transformer, and speaker impedance load taps as well as the 70 volt line connection are features of the 128B design.

The power transformer of the Altec 128B is equipped with an automatic re-setting thermal-type circuit breaker. This device is located within the windings of the power transformer and will sense any excessive rise in temperature due to tube malfunction, component failure, excessively high ambient temperatures due to inadequate ventilation or the presence of other excessive heat producing apparatus.

Each of the amplifier tubes contained in the 128B amplifier can be checked for space current by means of the front panel meter. The right hand selector switch on the front panel connects the meter to the appropriate meter shunt in turn as indicated by the panel marking.

The Altec 128B "Thermeguard" Amplifier is equipped with a "High Pass Filter" of the resistance capacitance type for high quality sound reinforcement. The "High Pass Filter" provides attenuation of approximately 8 db at 250 cycles per second.

The Altec 128B "Thermeguard" power amplifier is equipped with two line voltage taps so that it may be operated at the most optimum setting in relation to the supply line.



A Division of *LS* Ling Altec, Inc.

1515 S. Manchester Ave., Anaheim, Calif.  
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# ALTEC 128B

## SPECIFICATIONS

<b>Type:</b>	Power Amplifier	<b>Noise Level:</b>	85 db below rated output
<b>Gain:</b>	64 db	<b>Controls:</b>	Front Panel — Volume Control, continuously variable, Power and Meter Selection Switch Chassis — Line Voltage Selection Switch and High Pass Filter Switch, both with locking plates
<b>Input Sensitivity:</b>	0.9 volt rms		
<b>Power Output:</b>	40 Watts at less than 2% THD, 30-20,000 cps	<b>Power Supply:</b>	105/125 volts, 50/60 cps, 125 watts
<b>Frequency Response:</b>	$\pm 1$ db 3-30,000 cps	<b>Tubes:</b>	2-6CG7, 2-CA7/EL34, 1-5AR4
<b>Input Impedance:</b>	100,000 ohm potentiometer	<b>Dimensions:</b>	8 $\frac{3}{4}$ " High, 19" Wide, 7" Deep
<b>Source Impedance:</b>	150 and 600 ohms with 15095 Plug-in Line Transformer	<b>Color:</b>	Dark Green
<b>Load Impedance:</b>	4(12.6 v.), 8 (18 v.), 16 (25 v.), 125(70 v.) ohms ungrounded	<b>Weight:</b>	27 lbs.
<b>Output Impedance:</b>	Less than 17% of nominal load impedance	<b>Special Features:</b>	High Pass Filter for protection of horn-loaded drivers Power Transformer thermally protected ("Thermeguard") against overload or high ambient temperatures, metering space current.

## ACCESSORIES

See "Altec Amplifier Accessories" Sheet for 15095 "Plug-in" Transformer. 12984 cabinet.

## ARCHITECTS AND ENGINEERS SPECIFICATIONS

The amplifier shall be of the rack-mounting type measuring not more than 8 $\frac{3}{4}$ " H, 19" W, and 7" D. The amplifier shall include a meter and necessary switching facilities to inspect the performance of each vacuum tube by measuring space current. Any amplifier not including these features shall not be acceptable under these specifications.

The amplifier shall be equipped with an automatic re-setting Thermeguard thermal-type circuit breaker. The circuit breaker must be located within the windings of the power transformer and be capable of sensing any excessive rise of temperature, component failure. The amplifier shall automatically recycle into operation when safe temperatures have been re-established and any power amplifier not including this safety feature shall not be acceptable.

The amplifier shall be equipped with a High Pass Filter that provides attenuation of 8 db at 250 cps.

Power output shall be 40 watts with less than 2% total harmonic distortion over the frequency range of 30-20,000 cycles. The frequency response shall be  $\pm 1$  db from 3-30,000 cycles.

The noise level shall be 85 db below the rated output. The overall gain of amplifier shall not be less than 64 db. The output impedance shall be less than 17% of the nominal load impedance. The load impedance shall be 4(12.6 v.), 8(18 v.), 16(25 v.) and 125(70 v.) ohms ungrounded. The input shall be (A) 100,000 potentiometer, or (B) plug-in transformer with not less than 30 db shielding and having impedances of 125/150 and 500/600 ohms.

The power supply of the amplifier shall be 105/125 volts, 50/60 cps, 125 watts.

The tube compliment of the power amplifier shall consist of two 6CG7, two 6CA7 or EL34 and one 5AR4. The unit shall be finished in green and weigh approximately 27 lbs.

Any power amplifier which does not have a tertiary winding in the output transformer for isolation of the output circuit from the amplifier ground shall not be deemed acceptable under these specifications.

The Power Amplifier shall be Altec Lansing Model 128B.

**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

**128B**  
**"THERMEGUARD"**  
**POWER AMPLIFIER**

## OPERATING INSTRUCTIONS



Figure 1

### SPECIFICATIONS

<b>Type:</b>	Power Amplifier
<b>Gain:</b>	64 db
<b>Input Sensitivity:</b>	0.9 volt rms
<b>Power Output:</b>	40 watts at less than 2 THD, 30-20,000 cps
<b>Frequency Response:</b>	±1 db 3-30,000 cps
<b>Input Impedance:</b>	100,000 ohm potentiometer
<b>Source Impedance:</b>	150 and 600 ohms with 15095 Plug-In Line Transformer
<b>Load Impedance:</b>	4 (12.6 v.), 8 (18 v.), 16 (25 v.), 125 (70 v.) ohms ungrounded.
<b>Output Impedance:</b>	Less than 17% of nominal load impedance.
<b>Noise Level:</b>	85 db below rated output.

### DESCRIPTION

The 128B Altec Power Amplifier is a rack-mounted AC-operated power amplifier designed for professional recording, sound reinforcing, and all public address applications that require low distortion over a wide frequency range. The 128B is the deluxe counterpart of the popular 1568A and utilizes tube metering circuits, transformer thermal protection ("Thermeguard"), and low residual distortion over a wide frequency range. In addition to thermal protection, the power transformer is fitted with a heavy copper flux shield which reduces the AC field, allowing operation in closer proximity to low-level equipment without inducing hum that would otherwise be possible. Meter illumination, over-temperature warning indicator, switch selected power line setting, switch controlled high pass filter, plug-in line transformer, and speaker impedance load taps as well as the 70 volt line connection are features of the 128B design.

### METERING CIRCUITS

Each of the four amplifier tubes in the 128B can be checked for space current by means of the front panel meter (Figure 1). The right-hand selector switch on the front panel connects the meter to the appropriate meter shunt in turn as indicated by the panel marking. Meter indication within the green area is considered satisfactory. Output tubes, V3 and V4, conduct more current when the amplifier is driven to full output than they do in the idle condition. The meter shunts for these stages have been selected so that the meter normally rests at the 100% point in the absence of signal. Although normal program material raises the average current flow only a small amount, it would be possible with high-level sustained tones such as from organ reproduction to cause the meter to be pegged if the switch is left in the V3-V4 position. It is therefore recommended that the normal rest position be at V1 or V2.

<b>Controls:</b>	Front Panel — Volume Control, Continuously variable composition, Power and Meter Selection Switch
<b>Power Supply:</b>	105/125 volts, 50/60 cps, 125 watts
<b>Tubes:</b>	2 — 6CG7, 2 — 6CA7/EL34, 1 — 5AR4
<b>Dimensions:</b>	8 3/4" High, 19" Wide, 7" Deep
<b>Color:</b>	Dark Green
<b>Weight:</b>	27 lbs.
<b>Special Features:</b>	High Pass Filter for protection of horn-loaded drivers  Power Transformer thermally protected ("Thermeguard") against overload or high ambient temperatures.

### PROTECTIVE FEATURES

The power transformer of the 128B Amplifier is equipped with an automatic re-setting thermal-type circuit breaker. This device is located within the windings of the power transformer. It will sense excessive rise of temperature due to tube malfunction, component failure, excessively high ambient temperature due to inadequate ventilation or the presence of other heat-producing apparatus. Should the thermostat operate, the illuminated meter will darken and the red over-temperature indicator directly above the meter will illuminate (Figure 1). The amplifier will then automatically recycle into operation as soon as safe temperatures have been re-established.

### HIGH PASS FILTER

Horn-loaded driver loudspeakers are used in paging or voice reinforcing systems where excellent intelligibility is required in the presence of high noise levels, the effects of wind and other disturbances. This type of loudspeaker is limited in power handling capability below the cut-off frequency of the horn and must be protected against excitation in this frequency range. The 128B Amplifier is equipped with a two-section high-pass filter of the resistance capacitance type. The "High Pass Filter" provides attenuation of approximately 8 db at 250 cps. The filter is inserted in the circuit by placing the switch labeled "High Pass Filter" to the "In" position. The switch is located on the chassis surface adjacent to vacuum tube V1 (Figure 2). To change the switch setting, remove the screw holding the locking plate so that the switch may be operated. The locking plate should be re-assembled on the switch to prevent unauthorized or inadvertent changing of the switch position. The locking plate is used to hold the switch in either position by inverting the part as required. The characteristic of the high-pass filter is shown on the accompanying frequency response chart (Figure 4).



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13760-1

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Litho in U.S.A. C/P 1/65 1500

## POWER LINE VOLTAGE SELECTOR

The 128B Power Amplifier is equipped with two line voltage taps so that it may be operated at the most optimum setting in relation to the supply line. Selection of the tap is by means of a switch labeled "Line" located on the chassis surface adjacent to the power transformer (Figure 2). As shipped, the switch is in the 117 volt to 125 volt position and secured with a locking plate. Unless measurements indicate conclusively that the power line voltage at the installation runs below 117 volts, the line connection should not be changed. The line switch is secured in the same manner as described in the high pass filter paragraph. It is recommended that the apparatus always be operated with the locking plate in place.

## MECHANICAL INSTALLATION

The cabinet or other enclosure in which the 128B Amplifier is mounted should have adequate provisions for air entry and exit. The amplifier is constructed with a low top silhouette that provides a minimum of impediment to the flow of air around the vacuum tubes and other components. The shield which separates the power tubes from each other and the power transformer is heated by radiation and in turn provides a large area in the air stream with which to give up this heat. When the amplifier is placed immediately above other heat-producing apparatus, the ambient temperature of its immediate environment is increased and can result in reduced component life. Should this occur, and the thermal circuit breaker becomes operative, provisions should be made to reduce the temperature in the general area. This can be done by spacing the amplifier away from other heat-producing apparatus by inserting the Altec 10399 1 $\frac{3}{4}$ " perforated panel above and below the 128B.

## INPUT CONNECTIONS

Two pairs of input connections are provided on the 128B Amplifier (Figure 2) Terminals 1 and 2, which connect directly to the input potentiometer, are provided for unbalanced high impedance sources, and to bridge unbalanced low impedance lines having signal voltage of .9 or higher. Terminal 2 is grounded. Terminals 3 and 4 connect to a standard octal socket into which an Altec 15095 line matching transformer can be inserted. The 15095 transformer provides isolated source impedances of 150 and 600 ohms and accommodates levels up to +15 dbm. When the unit is shipped, the 600 ohm connection is available at Terminals 3 and 4. Straps on the octal socket must be changed in order to make use of the 150 ohm impedance. Strapping information is shown on the schematic diagram (Figure 5).

## OUTPUT CONNECTIONS

Connections for speakers of 4, 8, and 16 ohms are provided on the output terminal strip (Figure 2). The 124 ohm tap provided is the nominal 70 volt line connection. In matching speakers to the amplifier, use the output tap which most nearly equals the speaker impedance. If the load impedance falls between two output terminal values, use the terminal of lower impedance.

70 volt line: The 70 volt distribution system permits connection of a large number of speakers, each operating at a selected power level without the necessity for computing load and amplifier impedances. In this system, each speaker is equipped with a transformer (Altec 15000 series transformers) having a number of taps rated in terms of power. The tap is selected which gives the power desired for the individual speaker. The total of the power settings for all speakers should be equal to, or less than, the amplifier power rating. The 128B Amplifier is equipped with outputs to drive either a 70 volt line or a 25 volt line. The output windings are ungrounded and may, therefore, be used to run balanced lines if required. Care should be exercised in the wiring of the rack to isolate speaker lines from input lines since they both appear on the same end of the amplifier.

## TEST AND SERVICING

Should the amplifier become inoperative, it should first be determined that the power supply line is continuing to deliver current. If the thermal breaker within the transformer has operated, the meter illumination will have darkened and the red warning light on the front panel (Figure 1) will be illuminated. Returning the amplifier to normal temperature will correct this problem. If the meter is illuminated but the amplifier fails to pass signal, the panel meter may be used to determine which tube or stage has failed. Vacuum tube V1 is a dual triode unit. If the first section of this tube becomes inoperative, the meter placed in the V1 position will read full scale. Should the second section of V1 fail, the meter will read zero. V2 is likewise a dual triode. Should only one section of this tube fail, the meter will read about half scale. Should both sections fail, the meter will read zero. In positions V3 and V4, zero meter indication will result from an inoperative tube and full scale indication will result from a tube having a shorted element. Failure of the meter to indicate in any of the tube positions at the same time that the meter is illuminated would indicate failure of the rectifier V5. In conducting tests in order to determine conformance of the amplifier to the performance specifications, the exact line voltage for the line switch setting must be used. In the 117 to 125 volt position, the exact line voltage is 125 volts, and in the 105 to 117 volt setting, the exact line voltage is 117 volts.

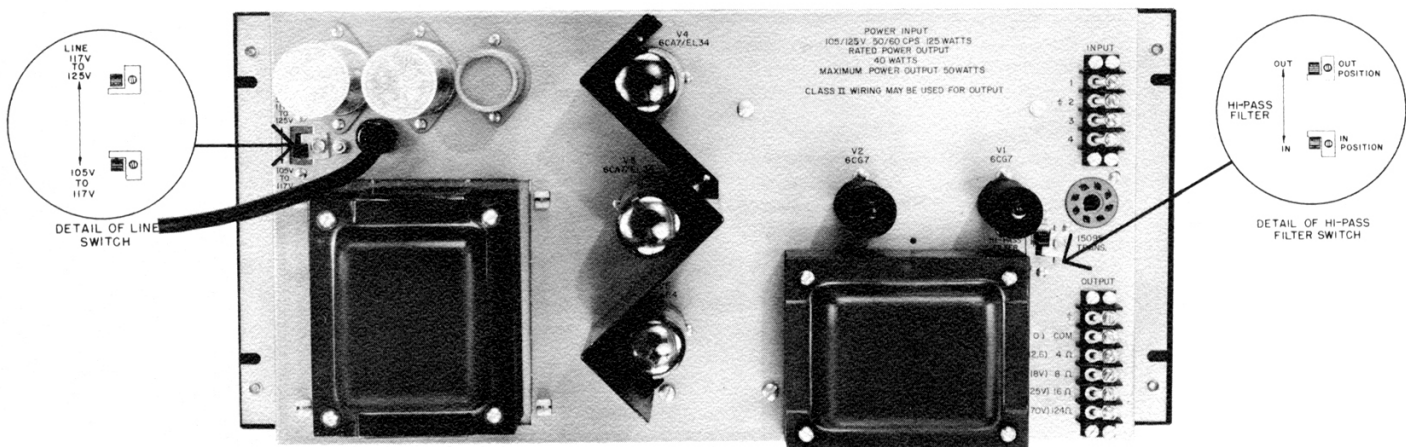
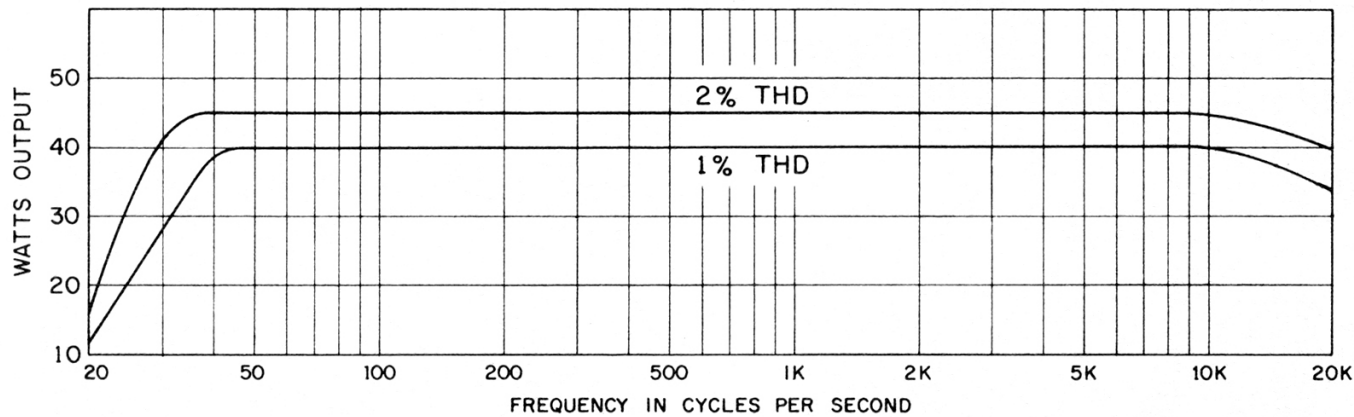


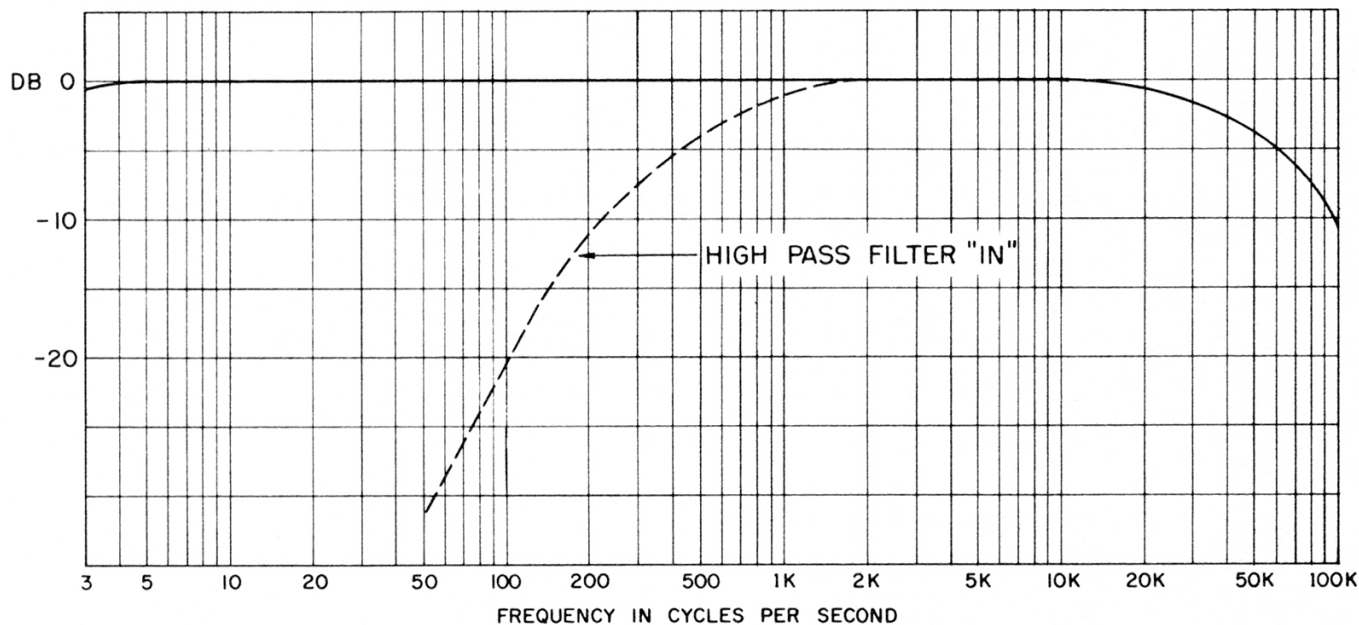
Figure 2

**128B AMPLIFIER  
POWER VS FREQUENCY AT SELECTED T.H.D.**



**Figure 3**

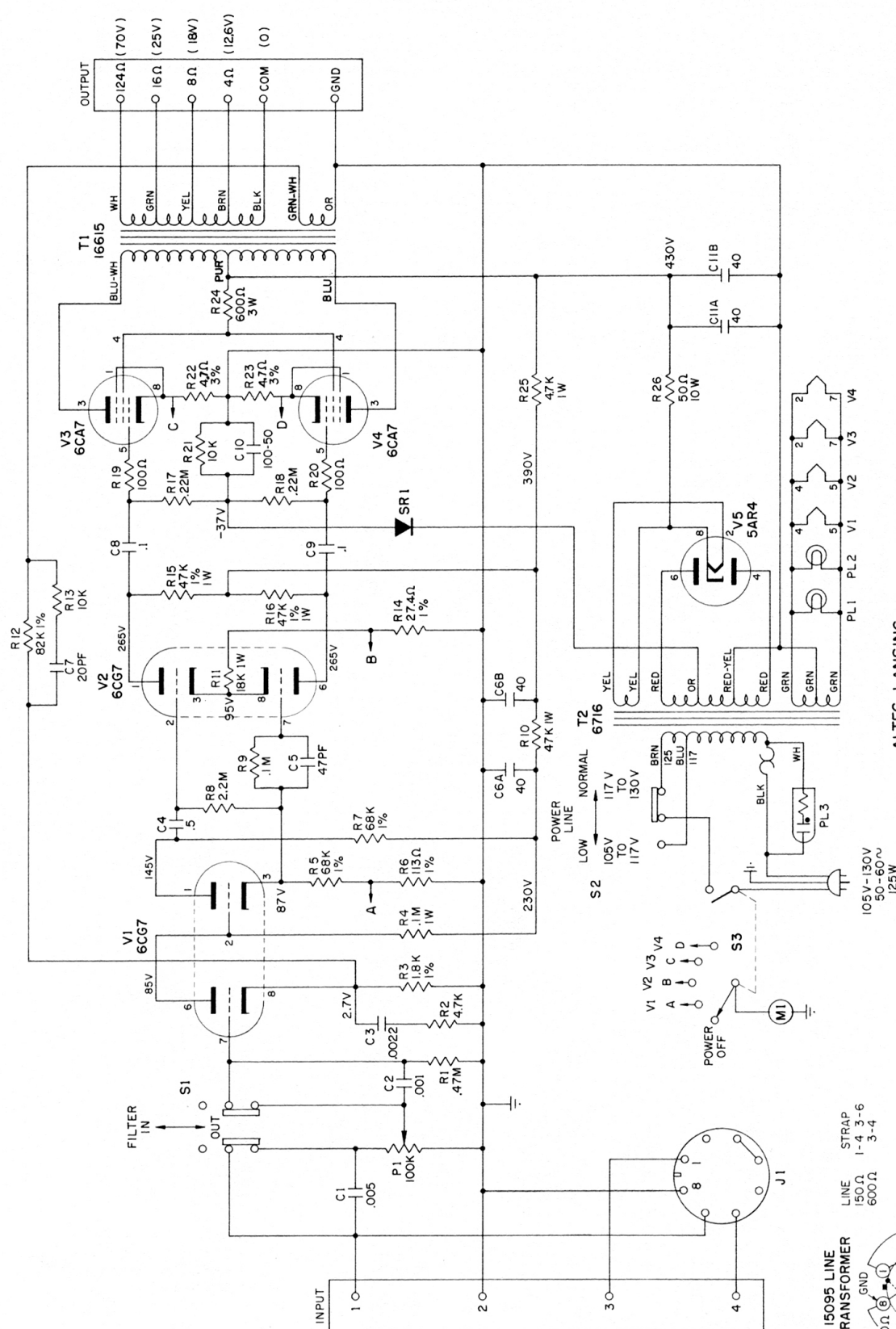
**128B AMPLIFIER  
TYPICAL FREQUENCY RESPONSE**



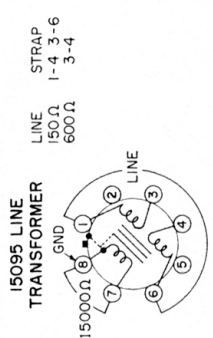
**Figure 4**

**128B PARTS LIST**

C1	.005 mfd $\pm 20\%$ Disc Erie Type 801	R10	47,000 ohms $\pm 10\%$ 1.0 watt
C2	.001 mfd $\pm 10\%$ Disc Erie Type 831	R11	18,000 ohms $\pm 10\%$ 1.0 watt
C3	.0022 mfd $\pm 10\%$ Disc Erie Type 801	R12	82,000 ohms $\pm 1\%$ $\frac{1}{2}$ watt Deposited Carbon
C4	.5 mfd 400 v. Tubular Paper Pyramid Imp.	R13, 21	10,000 ohms $\pm 10\%$ $\frac{1}{2}$ watt
C5	47 mmf $\pm 10\%$ Disc Erie Type 831	R14	27.4 ohms $\pm 1\%$ $\frac{1}{2}$ watt, Deposited Carbon
C6A, 6B, 11A, 11B	40-40 mfd 500 v. Mallory FP288-85° C.	R15, 16	47,000 ohms $\pm 1\%$ 1.0 watt Deposited Carbon
C7	20 mmf $\pm 10\%$ Disc Erie Type 831	R17, 18	220,000 ohms $\pm 10\%$ $\frac{1}{2}$ watt
C8, 9	.1 mfd 400 v. Tubular Paper-Micramold Tropicap	R19, 20	100 ohms $\pm 10\%$ $\frac{1}{2}$ watt
C10	100 mfd 50 v. Mallory WP 064-85° C.	R22, 23	3.3 ohms $\pm 3\%$ 1.0 watt — Dalohm RLS-1A
J1	Tube Socket, Octal, Cinch 12543	R24	600 ohms $\pm 5\%$ 3 watt, Ohmite Axial Lead
M1	Meter, 0-200 Micro Amp. — Altec 5981	R25	4700 ohms $\pm 10\%$ 1.0 watt
P1	Potentiometer 100K $\pm 20\%$ Type "J" A Taper Dim. B $\frac{3}{8}$ ", Dim. A $\frac{5}{8}$ " Plain Round Shaft	R26	50 ohms $\pm 10\%$ 10 watt, (RW20G-500, Commercial Grade)
PL1, 2	Lamps — 1847	S1	Slide Switch, Stackpole SS-50
PL3	Pilot Light Assembly — Eldema BG3-RC-S-2H-35K	S2	Slide Switch, Stackpole SS-36-1
R1	470,000 ohms $\pm 10\%$ $\frac{1}{2}$ watt	S3	AC & Meter Switch — Altec 13717
R2	4700 ohms $\pm 10\%$ $\frac{1}{2}$ watt	SR1	Silicon Rectifier- Altec 13871
R3	1800 ohms $\pm 1\%$ $\frac{1}{2}$ watt Deposited Carbon	T1	Output Transformer — Altec 16615
R4	100,000 ohms $\pm 10\%$ 1.0 watt Deposited Carbon	T2	Power Transformer — Altec 6716
R5, 7	68,000 ohms $\pm 1\%$ $\frac{1}{2}$ watt Deposited Carbon	V1, 2	6CG7, Vacuum Tube (RCA)
R6	113 ohms $\pm 1\%$ $\frac{1}{2}$ watt Deposited Carbon	V3, 4	6CA7/EL34 Vacuum Tube (Amperex, Mullard)
R8	2.2 M ohms $\pm 10\%$ $\frac{1}{2}$ watt	V5	5AR4 Vacuum Tube (GE, Amperex)
R9	100,000 ohms $\pm 10\%$ $\frac{1}{2}$ watt		



ALTEC LANSING  
128B AMPLIFIER



LEGEND  
Ω = OHMS  
K = 1000 Ω  
M = 1,000,000 Ω  
ALL CAPACITANCE VALUES IN  
MFD UNLESS OTHERWISE INDICATED

FIRST MADE FOR  
TOLERANCES EXCEPT AS NOTED: FRACT. & 1/16" DEC. & 1/32" DEC. HOLE SIZES 0 TO 1/16" & .001 OVER 1/16" & .008 ANGULAR ± 1/8"

REV	DATE	BY	CHKD.	DESCRIPTION
1	10-28-51	WJ	WJ	CHG. NIPPE CALCD. T1
2	11-10-51	WJ	WJ	R 22, 23, 24, 25, 26
3	1-24-52	WJ	WJ	R 22, 23, 24, 25, 26

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SCHEMATIC  
128B AMPLIFIER

DR. W. GILBERT - 7623-3