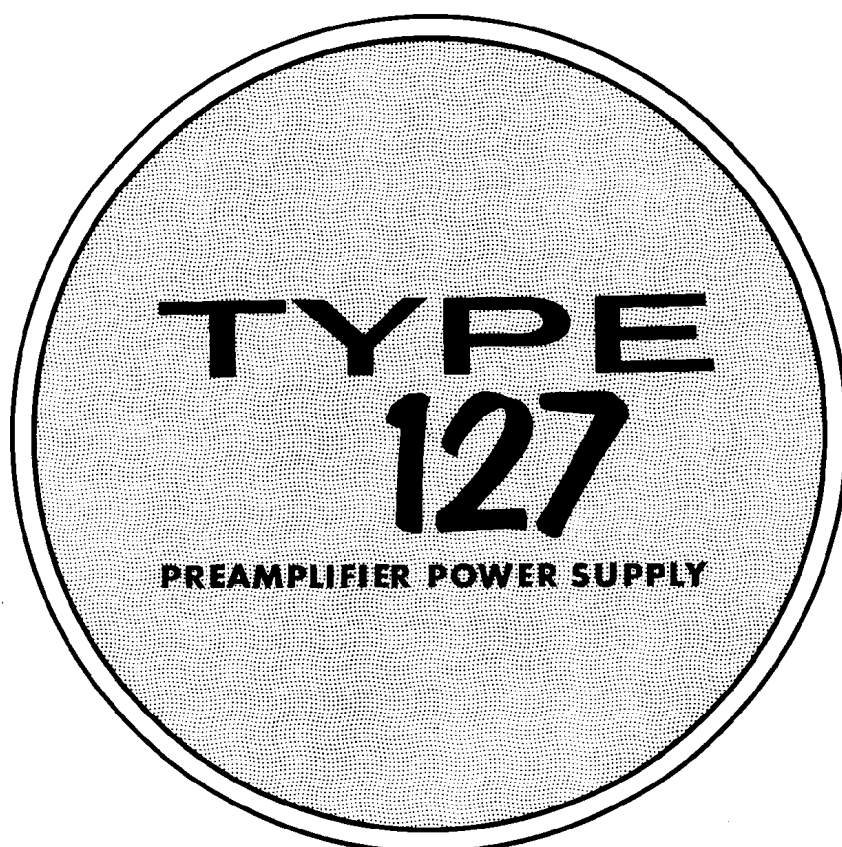
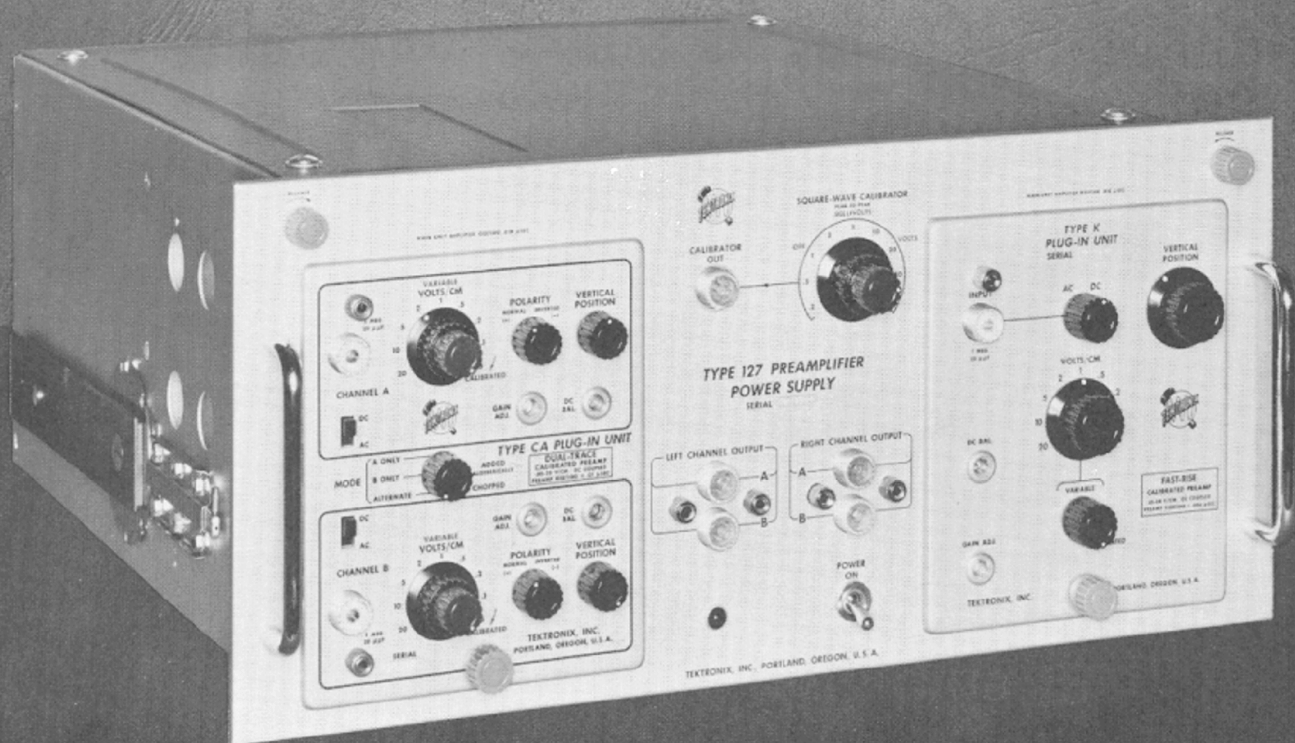


# INSTRUCTION MANUAL

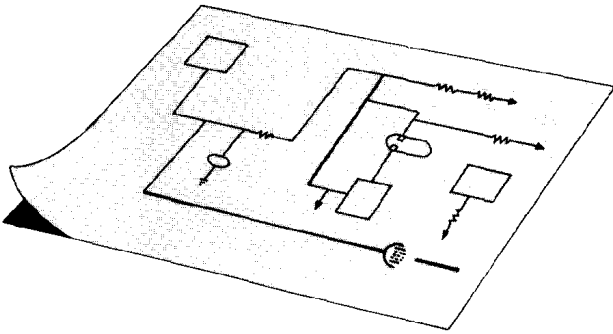


S. W. Millikan Way • P. O. Box 500 • Beaverton, Oregon • Phone MI 4-0161 • Cables: Tektronix

070-284



## SPECIFICATIONS



The Type 127 Preamplifier Power Supply is a rack-mounted unit containing a regulated power supply, two direct-coupled output amplifiers, and a square-wave calibrator. It permits the operation of Tektronix plug-in units separate from the oscilloscopes in which they are normally used. The Type 127 may be operated in conjunction with an oscilloscope to obtain increased wide-band sensitivity and multiple-trace displays.

CHARACTERISTICS OF EACH CHANNEL

	Both sides of push-pull output terminated in 170 ohms.	Both sides of push-pull output terminated in 1 megohm shunted by 50 $\mu$ f.
Nominal adjusted gain of the internal amplifier (push-pull output)	1	
Maximum gain of internal amplifier (push-pull output)	1.5	2.5
Passband*	dc to 19 mc	dc to 12 mc
Risetime*	.018 $\mu$ sec	.035 $\mu$ sec
Output Impedance		100 ohms
DC output-voltage range	+ or - 0 volts**	+ or - 10 volts
Peak Signal output voltage	+ or - .3 volts**	+ or - 3 volts

\*With Type K Plug-In Unit.

\*\*The no-signal output voltages must be set at zero to permit an undistorted output signal of + or - .3 volt.

### Other Characteristics

Output terminals are provided at both the

front and the back of the chassis to facilitate use of the Type 127 in permanent, rack-mounted equipment.

Rear terminals are provided to permit the introduction of triggering pulses into the Type CA Plug-In Units for utilization of the alternate-sweep feature of these units. The triggering pulse may be obtained from the +GATE OUT terminal on the front panel of the associated oscilloscope.

The 1-kc square-wave calibrator furnishes calibrating signals in the range from .2-milli-volt to 100-volts, peak-to-peak. The output waveform has a risetime suitable for use in adjusting the high-frequency compensation of attenuator probes. The accuracy of the calibrator-waveform amplitude is within 3% of the indicated value.

### Mechanical Specifications

Construction--Aluminum-alloy chassis. Slide-out mounting to rack.

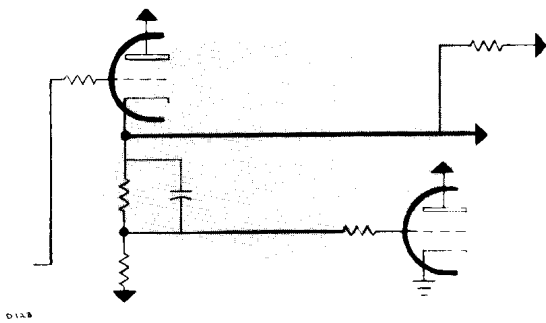
Finish-Photoetched, anodized panel.

Dimensions--8-3/4" high, 19" wide, 20" rack depth, 21-1/2" overall depth.

Ventilation--Filtered, forced air.

Weight--36 pounds.

Power Requirements--105 to 125 volts or 210 to 250 volts, 50-60 cycles. 450 watts maximum.



## SECTION 3

# CIRCUIT DESCRIPTION

NOTE: Left channel circuit designations are used in the circuit description. However, right channel circuitry is identical except for circuit numbers.

### Signal Amplifier

The purpose of the signal amplifier in the Type 127 is to provide a balanced output signal near ground potential, and to provide a low-impedance source from which a coaxial cable may be driven. The overall voltage gain of the amplifier is adjustable to one (push-pull output) when the outputs are terminated in 170 ohms.

The input pentodes operate as a difference amplifier whose gain is varied by changing the resistance between the cathodes (R409). The output of the pentodes is fed into a frequency-compensated voltage divider which attenuates the signal but permits the signal at the output of the cathode followers to appear near ground potential.

Controls R423 and R433 vary the voltage at the grids of the output cathode followers in order to set the dc output level. Changing the setting of these controls does not appreciably change the overall gain of the amplifier.

The network made up of R403 and C403 compensates for slow changes in plate current which occur with large changes in tube conduction (dc shift).

### Dual-Trace Switching Circuit

This circuit is in use whenever the alternate-sweep feature of the Type CA Plug-in Unit is used. Operation in this manner requires that a signal from the +GATE OUT connector on the oscilloscope be fed into the TRIG, SIGNAL INPUT binding post on the back of the Type 127.

The gating signal from the oscilloscope is fed into the triode section of V154. In the quiescent state, V154A is cut off, due to the negative voltage drop across R142 and R143.

As the gating waveform begins, V154A starts to conduct heavily and a negative-going spike appears at the control grid of V154B. Since V154B was near cutoff and must conduct heavily to cause the switching to occur, there is no further circuit action. However, on the trailing edge of the input gate, V154A goes to cutoff and its plate voltage rises rapidly. The control grid of V154B receives a large positive-going pulse which drives this tube into heavy conduction, causing the "CA" unit to switch from one channel to the other (see the Type CA instruction manual).

### Calibrator

The square-wave calibrating signal is generated by a plate-coupled, astable multivibrator. Its operation is described in detail in most texts on electronic circuitry. For our purposes, it is only necessary to know that V875 is switching between heavy conduction and complete cutoff at a 1 kilocycle rate. When V875 is not conducting, its plate voltage is determined by resistors R878, R882, and the setting of the Cal. Adj. control. This voltage is fed into V873B, of which the cathode circuit is a precision voltage divider. During the time when V875 is conducting heavily, V873B is driven beyond cutoff and its cathode voltage and the voltage at the output of the calibrator fall to zero.

Resistor R898 is used to provide some isolation of the calibrator-output ground terminal from the chassis. This isolation is necessary to prevent the introduction of ac ripple in the output signal when the calibrator output is connected to another instrument by a coaxial cable.

## Power Supplies

### Regulated Plate Supplies

The voltage-regulated power supplies in the Type 127 are all of the series-regulated type. All the positive supplies use the output voltage of the -150-volt supply for a reference voltage. The -150-volt supply uses a voltage-regulator tube, V629, to supply a stable reference voltage.

The +100-volt supply is a typical series-regulated supply and its action in maintaining a constant output voltage is described in the paragraphs that follow.

This supply uses only two tubes; a voltage amplifier (V644), and a series tube or cathode follower (V657). Resistors R656 and R657 are called sampling resistors because the voltage at this junction is used as a sample of the supply output voltage. The voltage at the junction of these two resistors is near ground potential (slightly negative) when the output voltage of the supply is near 100 volts.

If the -150-volt reference voltage is constant, any change in the output voltage of the power supply will result in a change in the same direction at the junction of the sampling resistors.

The action of the circuit is described by assuming a slight change in the output voltage. Let us assume the output voltage has increased

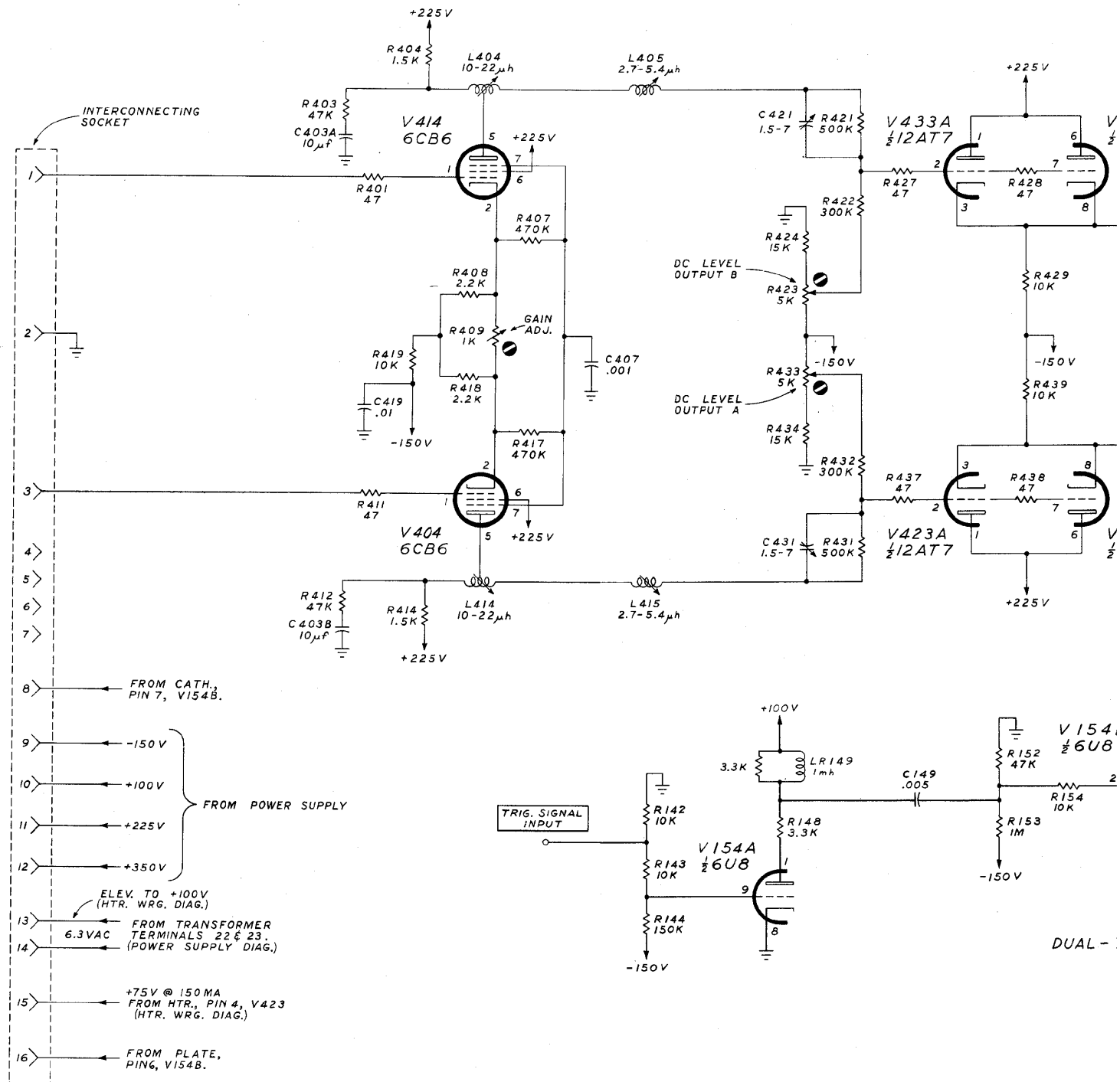
from +100 volts to +101 volts. The voltage at the junction of R656 and R657 then goes in a positive direction. V644 conducts more heavily since its bias voltage is decreased. The plate voltage on V644 then goes in a negative direction, driving the grids of V657 in a negative direction. Since the input and the output voltages of a cathode follower are in the same phase, the cathode voltage of V657 goes in a negative direction also. The output voltage of the supply then decreases. This decrease in the output voltage almost completely compensates for the increase in the output voltage we assumed at the beginning.

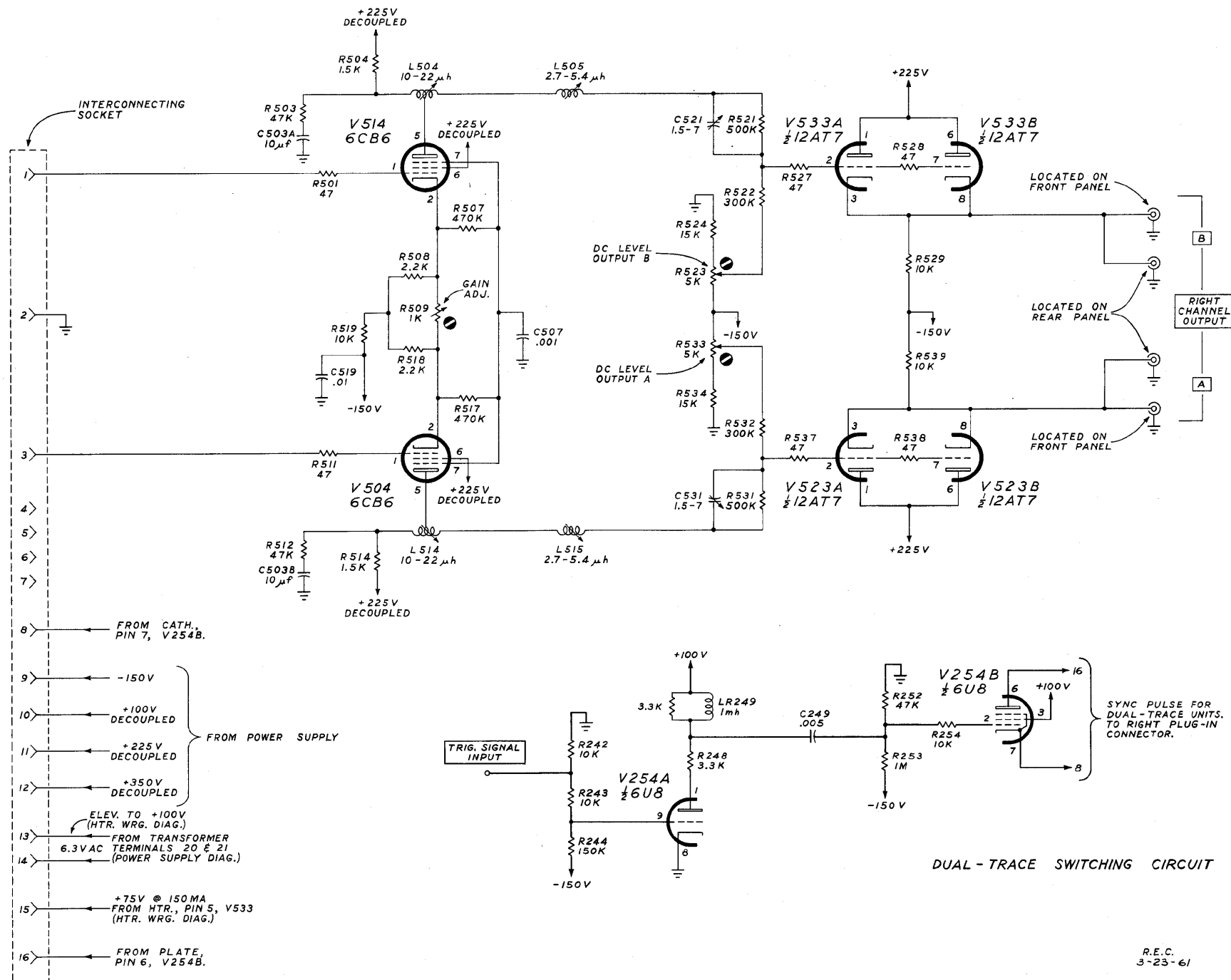
C656 improves the regulation of the supply against AC ripple by providing a larger sample of the AC signal appearing at the output of the supply to the grid of V644.

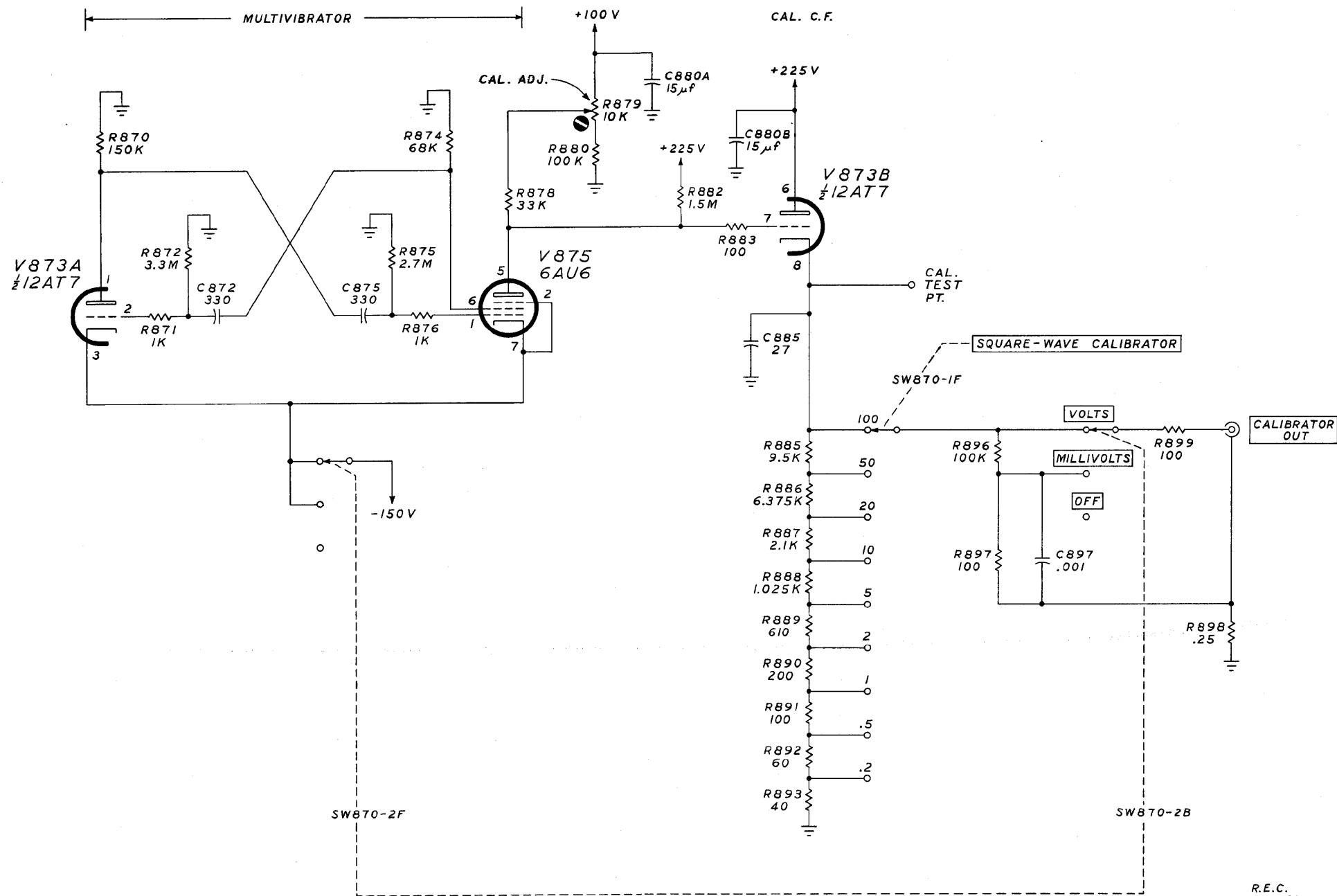
### Regulated Heater Supply

In addition to supplying plate voltage, the +100-volt supply furnishes the regulated voltage to the heaters of the cathode followers in the internal amplifiers and some of the tubes in the plug-in units.

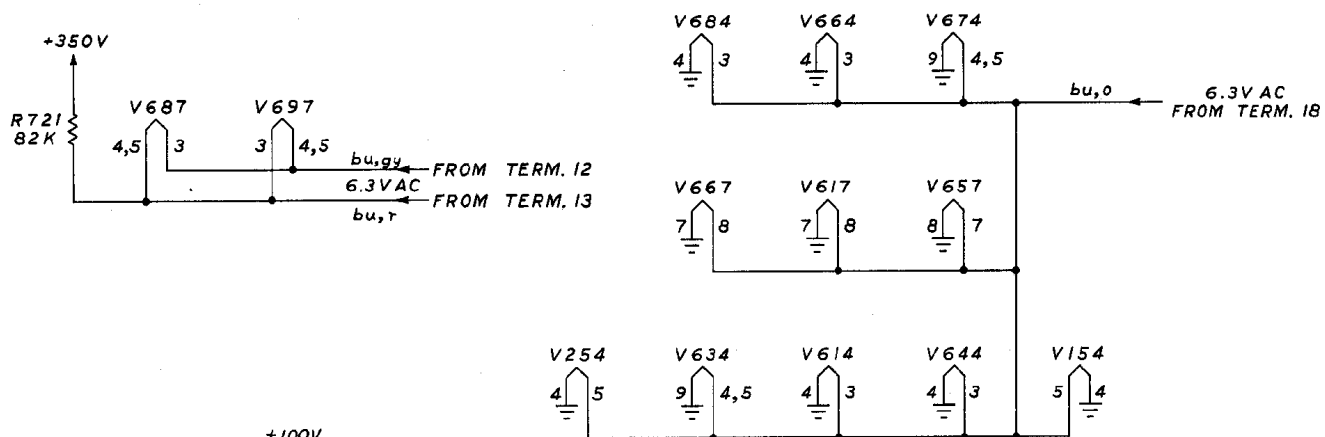
An undercurrent relay connected in series with the regulated heaters operates to keep the load on the +100-volt, +225-volt, and -150-volt supplies relatively constant by loading these supplies with fixed resistances when only one plug-in unit is used.



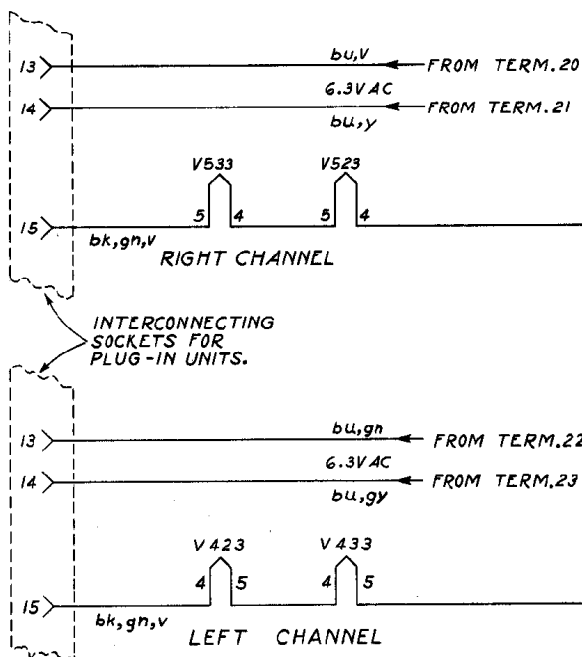
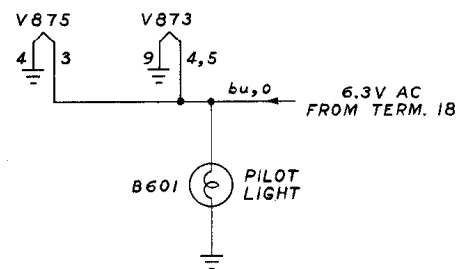
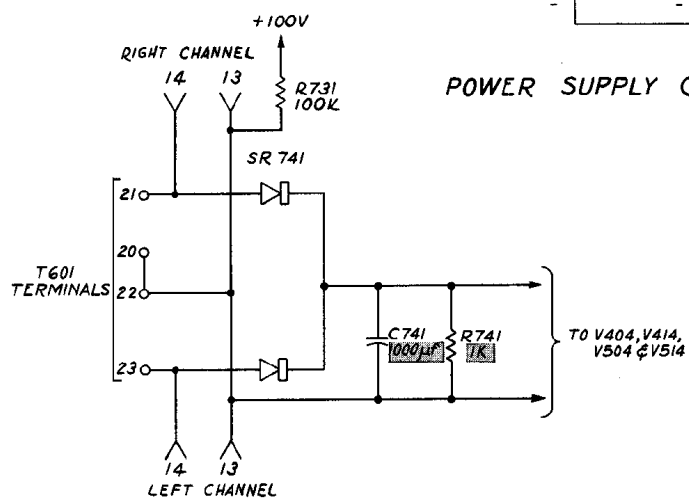




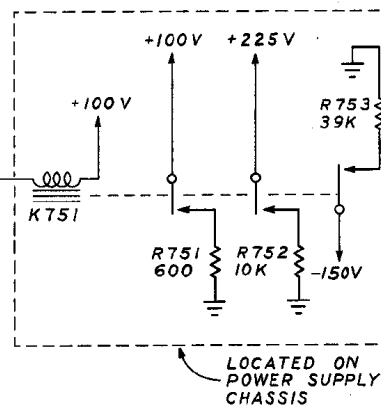




### POWER SUPPLY CHASSIS



### AMPLIFIER CHASSIS

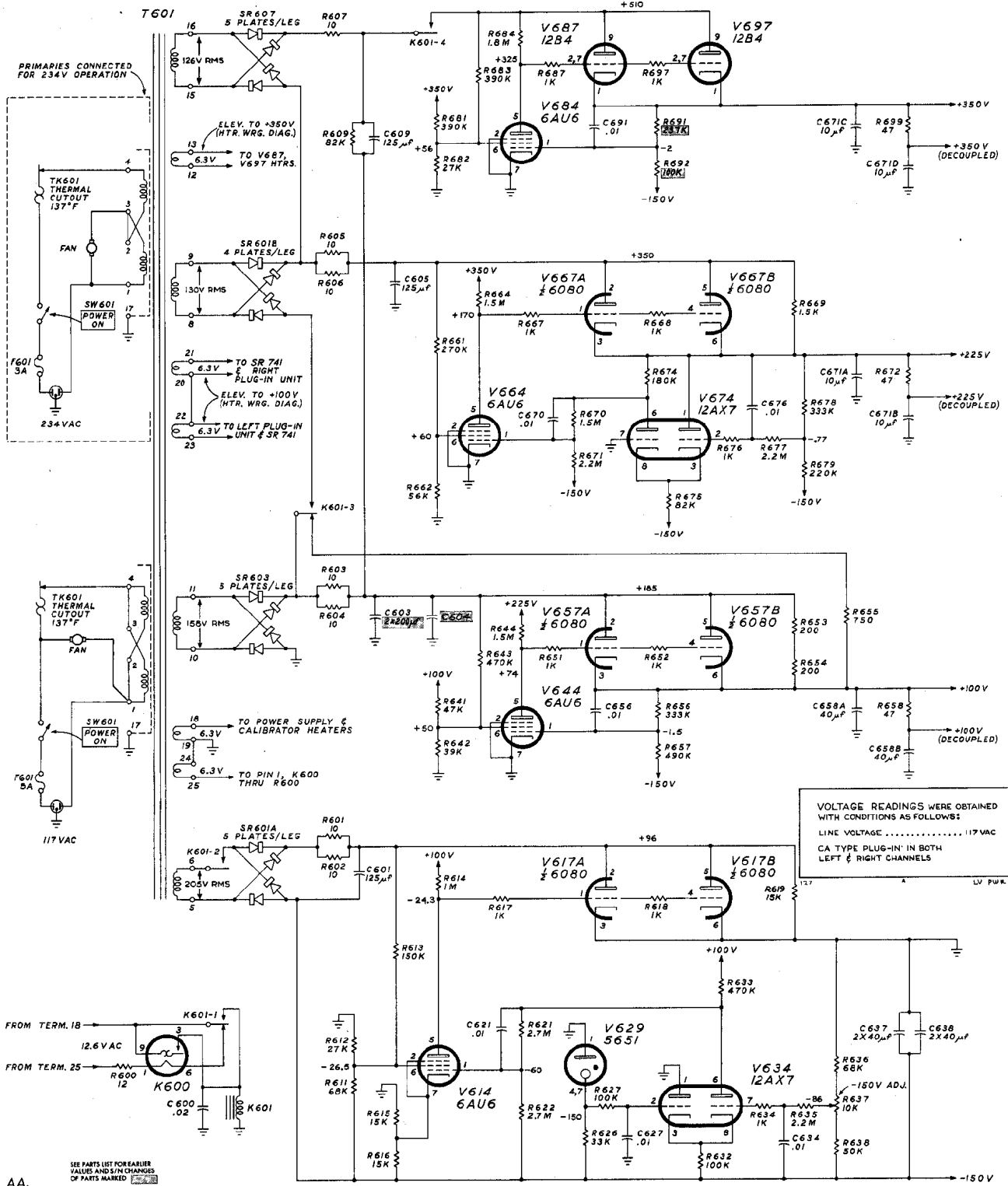


LOCATED ON  
POWER SUPPLY  
CHASSIS

R.E.C.  
3-23-61

TYPE 127

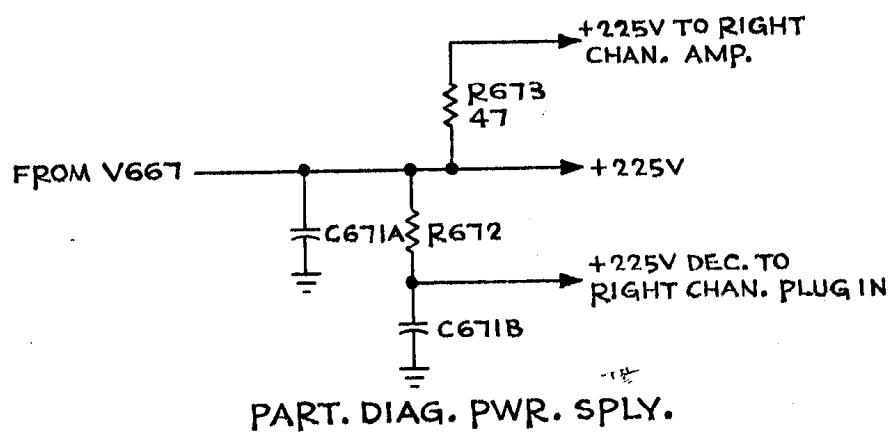
HEATER WIRING DIAGRAM



TYPE 127  
Mod. 3569  
S/N 950

R673 Add 47 ohm 1/2 w 10%

302-470



TYPE 127  
Part List Correction (4)

MECHANICAL

Should read:

PLATE,DUST COVER, TOP	SN101-649	386-758
PLATE,DUST COVER, TOP	SN650-up	387-032
PLATE,DUST COVER,BOTTOM	SN101-649	386-759
PLATE,DUST COVER,BOTTOM	SN650-up	387-033