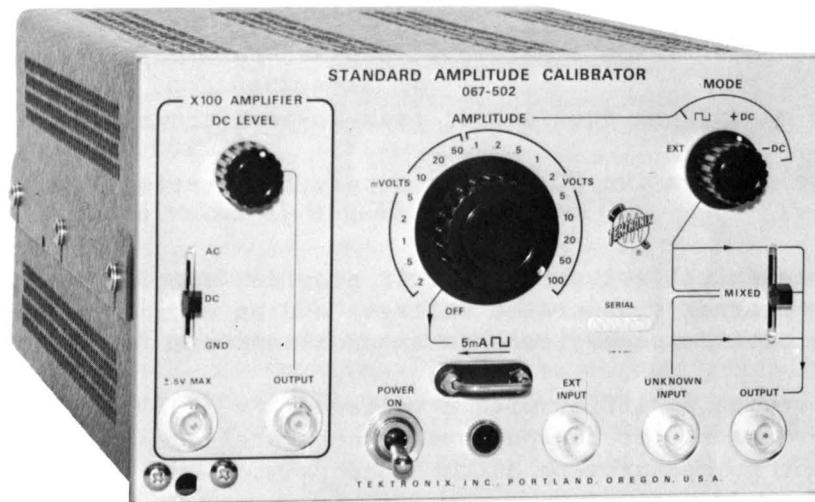


067-0502-00 CALIBRATION FIXTURE

Standard Amplitude Calibrator



The 067-0502-00 provides accurate ($\pm 0.25\%$) voltage for use in calibrating Tektronix Equipment. Amplitudes are available from 0.2 mV to 100 V in a 1-2-5 sequence. An electromechanical switching circuit provides for comparison between one of the internally generated voltages and an unknown external voltage. A general-purpose amplifier with a voltage gain of 100 ($\pm 1\%$) is built into the instrument for the purpose of accurately amplifying low-level signals prior to measurement of those signals.

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STANDARD AMPLITUDE CALIBRATOR

General Information

The 067-0502-00 STANDARD AMPLITUDE CALIBRATOR provides precise squarewave voltages for use in calibrating Tektronix equipment. Amplitudes are available from 0.2 mV to 100 V in a 1-2-5 sequence. Outputs available are:

1. Positive-going 1 kHz squarewave; peak-to-peak voltage accuracy within 0.25%.
2. 1 kHz 5 mA current squarewave; peak-to-peak accuracy within 0.25%.
3. Positive or negative DC voltage supply for testing attenuation ratio accuracy.

An electromechanical switching circuit provides alternate outputs of one of the internally generated voltages and an unknown externally applied voltage for precise comparisons on an oscilloscope.

A general-purpose amplifier with a voltage gain of 100 ($\pm 1\%$) is built into the instrument for the purpose of accurately amplifying low-level signals prior to measurement of those signals.

Dimensions; Approximately 5" H x 8" W x 12 1/4" D

Weight: Approximately 11 pounds

Operational Data

Input Connector

Input to X100 amplifier. Maximum input signal voltage (AC or DC coupled) is 0.5 volts p-p. Maximum input DC voltage (AC coupled) is ± 600 volts.

Output Connector

Output of X100 amplifier. ± 50 volts, ± 5 mA maximum output.

DC Level Control

Adjusts output DC level of X100 amplifier.

AC-DC-Gnd Switch

Selects coupling mode of X100 amplifier.

Amplitude Switch

Selects amplitude of 1 kHz squarewave, + and - DC, and connects 5 mA current loop.

Mode Switch

Selects signal to be applied to test function switch (3 position switch located directly above calibrator output connector).

Output Selector Switch (Not named)

Selects output signal. The selections are:

- Ext Input
- 1 kHz squarewave
- + DC
- DC
- Unknown Input
- Mixed combination of two

Ext Input Connector

Connects an external signal to Mode switch.

Unknown Input Connector

Connects an unknown voltage which is to be measured or adjusted.

Output Connector

Provides output signal as selected by Output Selector switch.

Internal Adjustments

DC Level Range

Establishes range of control of front panel DC Level control.

Grid Current

Adjusts screen voltages of V214 and V224 for minimum control-grid current.

X4000 Cal

Sets open-loop gain of X100 amplifier to 4000.

X4000-X100 Switch

Selects open or closed loop operation of X100 amplifier.

+225 Volts

Sets +100 V, +225 V, and +300 V power supplies.

-100 Volts

Sets -100 V power supply.

+300 Volts Floating

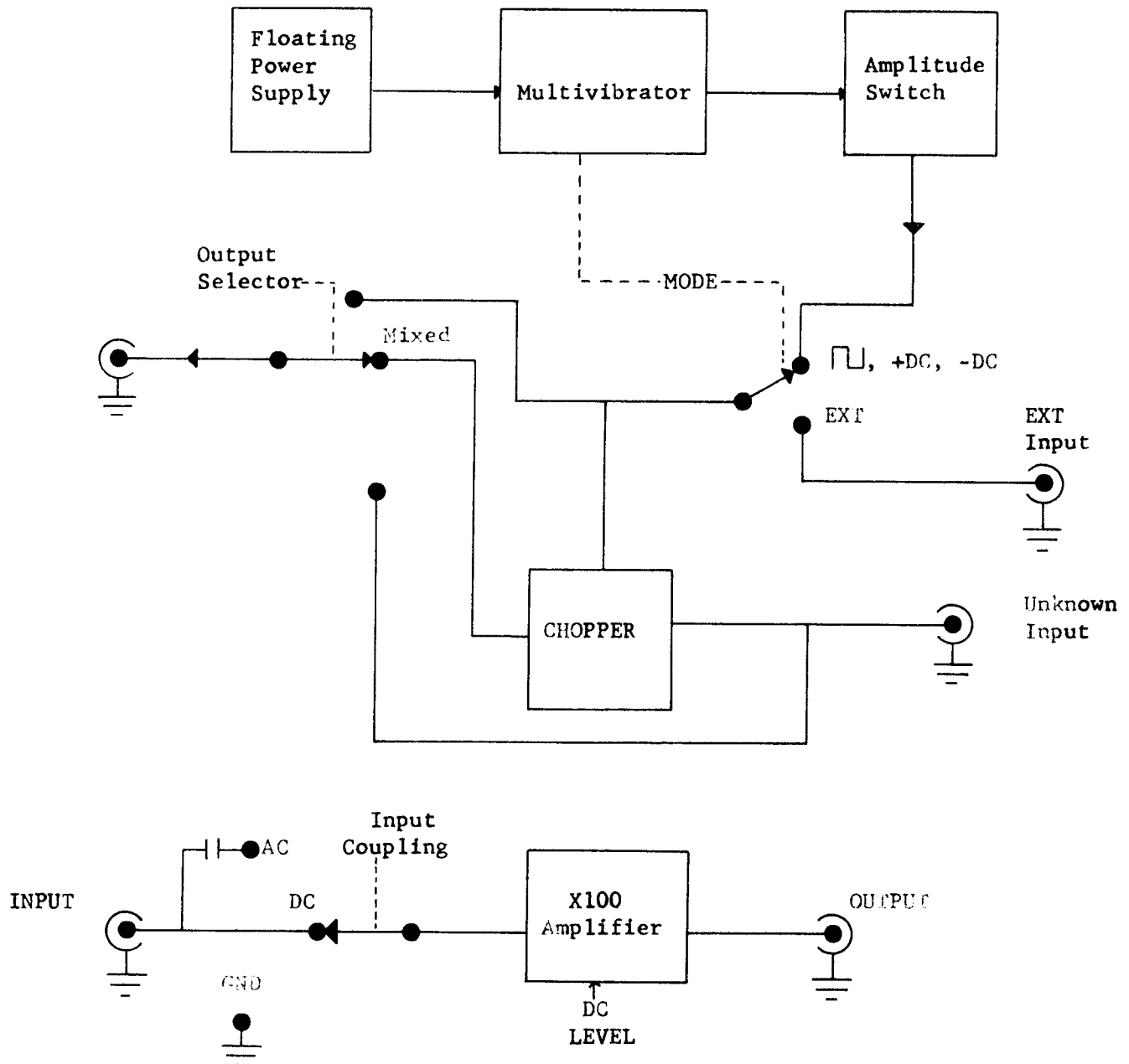
Sets +300 V floating power supply.

+225 Volts Floating

Sets +225 V floating power supply.

+100 Volts Floating

Sets +100 V floating power supply.

BLOCK DIAGRAM

DESCRIPTION OF
STANDARD AMPLITUDE CALIBRATOR
(Tek Part No. 067-0502-00)

Calibrator Specifications

The following Specifications apply to 1 kHz calibrator outputs when a 1-megohm load is connected to the OUTPUT connector:

Overall Accuracy: $\pm 0.25\%$
Ambient Temperature Range: 15°C to 35°C (59°F to 95°F).


X100 Amplifier Specifications

<u>Accuracy of Voltage Gain:</u>	± 1 percent with the zero-signal DC output voltage and adjusted to zero ± 0.5 volt.
<u>Ambient Temperature Range:</u>	15°C to 35°C (59°F to 95°F).
<u>Risetime:</u>	Less than 35 μs .
<u>Input Impedance:</u>	1 megohm paralleled by approximately 35 pF.
<u>Output Range:</u>	$\geq \pm 20$ volts, ± 5 mA.
<u>Output Resistance:</u>	Approximately 250 ohms (measured with 1 kHz squarewave).
<u>Noise:</u>	Less than 5 millivolts peak-to-peak at the output (with input grounded).
<u>Drift:</u>	Less than 1 volt per hour at the output after 15 minutes warmup.

Operation

Output Selector Switch:

The 3 position switch located directly above the calibrator OUTPUT connector selects the output signal.

In the "up" position, the output signal is one of the four selected by the MODE switch. The EXT position connects the EXT INPUT connector directly to the OUTPUT. The  position connects a positive-going 1 kHz squarewave, whose amplitude is set by the AMPLITUDE switch, directly to the OUTPUT. The +DC and -DC positions connect a DC voltage, whose amplitude is set by the AMPLITUDE switch, directly to the OUTPUT. In order to obtain the stated accuracy of the instrument, a 1 megohm load must be connected to the OUTPUT connector. In most cases, this load will be provided by the standard 1 megohm input resistance of the oscilloscope used.

In the "down" position, the UNKNOWN INPUT is connected directly to the OUTPUT.

In the MIXED position, a 60 Hz electromechanical chopper switches the output between the upper and lower positions of the output switch making the output signal a composite of the unknown input and the signal selected by the MODE switch. The purpose of the mixing is to allow a convenient comparison between the two signals selected. For example, an unknown DC voltage can be connected to the UNKNOWN INPUT and mixed with the accurate DC voltage generated by the Calibrator. Small differences between these voltages can be seen at the OUTPUT connector with a sensitive, AC-coupled oscilloscope.

In addition to comparisons, a positive-going or negative-going 60 Hz squarewave can be obtained from the Calibrator by setting the MODE switch to +DC or -DC, the Output Selector Switch to MIXED, and the UNKNOWN INPUT left open. For low voltages, it is desirable to connect a 50 ohm termination or attenuator to the UNKNOWN INPUT connector to provide a low impedance to ground. In similar manner, an external voltage can be converted to a 60 Hz squarewave.

Access to the chopper for comparison of two external voltages is provided. The voltages are connected to the EXT INPUT and UNKNOWN INPUT connectors, the MODE switch is placed at EXT, and the Output Selector Switch is placed at MIXED. The output signal is the composite of the two external voltages.

Amplitude Switch:

This switch determines the amplitude of the squarewave, +DC or -DC voltages selected by the MODE switch. It does not affect external voltages connected to the EXT INPUT connector.

When the AMPLITUDE switch is placed at OFF, the MODE switch is provided with zero volts at a source resistance of 1001 ohms.

The 5 mA position provides either a 5 mA squarewave or 5 mA DC through the current loop. The arrow above the current loop indicates the direction of conventional current flow when the MODE switch is in the squarewave of +DC position. In the -DC position, the current flows in the opposite direction through the loop.

X100 Amplifier:

Open-loop voltage gain is 4000, closed-loop voltage gain is adjustable to 100. The large amount of feedback provides the stable gain required.

One use of the amplifier is to accurately preamplify low-level signals before direct viewing or mixing with one of the standard voltages generated by the Calibrator. The switching transients of the chopper become troublesome at low levels making preamplification necessary for successful measurement.

Another use is to amplify the error signal present at the Calibrator OUTPUT when operating in the MIXED position.

Circuit Description

Clamp Circuit & Multivibrator:

The 100 volt reference voltage is established without the direct participation of an active element (transistor or tube). Since some characteristics of active elements change more with time than those of passive elements, it is possible to obtain a more accurate and stable reference voltage by using passive elements.

+100 VDC is established at the top of the resistive divider string by the +100 V (FL) clamp. The designation (FL) means "floating". 10 mA flows from the +300 V (FL) supply and divides at the plate of V115B. 5 mA flows into the 20 k Ω resistive divider and 5 mA flows into the +100 V (FL) supply. The output voltage is adjusted precisely to 100 volts. The forward voltage drops across the two diodes (6061) in the circuit change nearly the same amount with temperature keeping the output voltage nearly constant.

1 kHz squarewaves are generated by the multivibrator, V115. When V115B is on, its plate drops to about -50 volts, diverting the current from the +300 V (FL) supply into the tube, reverse biasing both diodes and allowing the output to fall to zero. Both sides of the multivibrator are identical to keep the current constant in the +100 V (FL) reference supply.

Negative output polarity is obtained by inverting the multivibrator output. The +300 V (FL) and +100 V (FL) supplies have a common bus (labelled "com"), not connected to the chassis, allowing any point in the floating supplies to be connected to ground. Hence, the two leads to the resistive divider are reversed by the MODE switch allowing current to flow in the opposite direction in the divider providing the negative output voltage.

Resistive Divider:

The resistor values were calculated to give the proper attenuation when an external load of 1 megohm is connected. In the AMPLITUDE switch positions 100 volts through 0.2 volts, the loading on the main divider is provided by the external load (test oscilloscope). In the positions 0.1 volt through 0.2 millivolts, an internal 1 megohm resistor is placed across this divider to replace the external load which has moved to the second divider (999 k Ω -1.001 k Ω).

Chassis-Ground Isolation:

When observing the lower output voltages (a few millivolts and less), 60 Hz ground currents flowing in the shield of the cable connecting the Calibrator and the indicator scope can produce voltage drops which add in series with the signal being observed producing objectionable "60 cycle hum". Most Tektronix oscilloscopes reduce this effect by isolating the calibrator output connector from ground with a 0.25 ohm resistor. This resistor reduces the current flowing in the cable shield.

However, in this instrument that technique cannot be used. DC voltages of a few millivolts also exist between the chassis of different instruments. Were an isolating resistor used, most of the DC voltage difference would appear across this resistor. Then, when a low-level signal from a separate instrument was being checked against the Calibrator signal, the mixed output would show a relative DC displacement between signals, making precise comparison difficult.

The method used in this instrument to minimize ground currents is isolation of the Calibrator chassis from the power line ground with two diodes. These diodes present a high resistance to the tens of millivolts found between chassis, but still provide the safety of a grounded chassis. In the event of a malfunction, the diodes (rated at 10 amperes) will not allow the chassis to become "hot" by more than their forward voltage drop (1 volt or so). The 10 ampere rating allows some component other than the diodes to fail, thereby removing the hazard.

Internal Load Resistors:

Resistors and suitable switching are part of the instrument in order to load each signal source (external, unknown, calibrator) with 1 megohm under most test conditions.

The 1 megohm input resistance of the test oscilloscope provides proper loading of the calibrator, external, and unknown inputs except when almost equal DC voltages are mixed and compared by using an AC-coupled oscilloscope. In this case, the coupling capacitor charges to the average of the DC voltages effectively removing the 1 megohm load. Hence, in the MIXED-DC and MIXED-EXT test combinations, both the calibrator and unknown voltages are provided with internal 1 megohm loads.

For the case where an unknown voltage is to be checked for its closeness to ground while loaded with 1 megohm, the amount of internal loading

necessary is less obvious. To make this check, the unknown voltage is connected to the UNKNOWN INPUT, the AMPLITUDE switch is turned to OFF, the Output Selector Switch is turned to MIXED, and the test oscilloscope is set for AC-coupling. When the vibrating arm of the chopper connects the unknown to the output, the unknown is presented with the series capacitor and input resistor of the scope. When the chopper arm connects the output to ground, the unknown is not loaded. Since the unknown is connected to the test scope one-half the time, the input capacitor charges to about one-half the unknown voltage. Therefore, the test scope presents an apparent input resistance of 2 megohms to the unknown. Since the unknown drives this 2 megohms only half the time, the average current supplied by the unknown is the same as if it were driving a constant load of 4 megohms. Since the unknown voltage in this case should be driving 1 megohm, circuitry in the Calibrator provides a load of $4/3$ megohm to the unknown, which in parallel with the effective 4 megohms, gives the required load of 1 megohm. This loading only occurs when the AMPLITUDE switch is in the OFF position.

X100 Amplifier:

High voltage gain extending to DC is obtained in one stage by "bootstrapping" the load impedance, making the apparent impedance much larger without requiring the excessively high supply voltage which would be necessary if a large value load resistor were used. The output tube, V263, restores the signal to ground. The differential input stage allows voltage gain without inversion plus a high resistance input achieved by bringing the feedback signal to the opposite grid. The differential connection also minimizes output voltage drift.

A switch is provided to open the feedback loop for convenient setting of the open-loop gain.

Floating Power Supplies:

The +300 V (FL) supply is series-regulated. It supplies current for the resistive divider and 100 volt reference supply. The +125 V (FL) is shunt-regulated and provides voltage only to the reference supply.

The +100 V (FL) reference supply achieves its good stability from the temperature-compensated and aged zener diode, the high gain dual transistor, Q456, the wirewound resistors in the feedback voltage divider, and the regulated source voltage. The matched resistors in the feedback divider are necessary to permit the voltage setting pot, R451, to meet the conflicting requirements of range and resolution.

The supplies are floating to permit inversion for negative output voltages.

Grounded Power Supplies:

The -100 V, +12.6 V, +100 V, +225 V, and +300 V supplies all provide power to the X100 amplifier. The heater voltages of the two amplifier input tubes are regulated DC primarily to minimize output voltage drift caused by line voltage changes.

6.3 Volts AC:

A virtual ground at the center of the transformer winding is established by two 100 ohm resistors in order to equalize output transients occurring in the electromechanical chopper.

CALIBRATION PROCEDURE
STANDARD AMPLITUDE CALIBRATOR
(067-0502-00)

EQUIPMENT REQUIRED:

- 1 Line Voltage Control Unit, GR Type W10MT3W
- 1 TYPE 530 or 540 Oscilloscope
- 1 TYPE D High-Gain Differential Plug-In Unit
- 1 Volt-ohm Meter, 20,000 m/V
- 1 X1 Probe (P6028 or equivalent)
- 2 42-inch BNC Cables (012-0057-01)
- 1 50-ohm BNC Termination (011-0049-00)
- 1 T Connector, BNC male to 2 female (103-0030-00)
- 1 Adapter, BNC dual binding post (103-0035-00)
- 1 Adapter, clip lead BNC (013-0076-00)
- 1 John Fluke Meter, Model 825 A
- 1 Resistor, 1 M Ω , 1/2 W, 1% (323-0481-00)

PRELIMINARY CHECKS:

- 1. Inspect visually. Precision WW resistors on the AMPLITUDE switch should not be touching one another and should be bent low enough to clear the case.
- 2. The input coupling capacitor to the X100 amplifier should be in a position to clear the case.
- 3. Check that the pilot light socket does not short-circuit the front panel current loop to ground.
- 4. Check polarity of ZZ/1000 neon voltage regulator tubes (mounted on ceramic strips). The anode (straight line on schematic) is indicated by a glass dot on the tube.
- 5. The fuse should be 0.8 amp, S.B.
- 6. Chassis-ground isolating diodes: Triplet multimeter should read about 1 k Ω resistance between power line ground lug and the chassis when the meter is on the X1 k range. Reverse the meter leads and read about 1 k Ω again.

7. Set all pots to midrange (1st time only or after extensive re-work). Place the X4000-X100 switch at X100.
8. Check power supply resistance to ground. Measure with positive ohmmeter lead grounded. Approximate values:

<u>Supply</u>	<u>Resistance</u>
+300 V (FL)	20 k Ω
+125 V (FL)	15 k Ω
+100 V (FL)	7 k Ω
-100 V	8 k Ω
+225 V	16 k Ω
+300 V	12 k Ω
+100 V	2 k Ω
+12.6 V	5 Ω
Common bus (tan wire) to ground	17 k Ω with MODE switch in -DC

POWER SUPPLIES:

9. After turning on power and allowing a few minutes warmup, adjust DC voltages in the following order:

+300 V (FL)
 +125 V (FL)
 +100 V (FL) - set approximately
 -100 V
 +225 V

10. Check the following DC voltages:

+300 V (between 290 V and 310 V)
 +100 V (between 93 V and 107 V)
 +12.6 V (between 11.5 V and 14 V)

11. Ripple (check at nominal line, 117 V; low line, 105 V; and high line, 125 V):

<u>Supply</u>	<u>Maximum peak-to-peak millivolts</u>
+300 V (FL)	10
+125 V (FL)	5
+100 V (FL)	2
-100 V	2
+225 V	10
+300 V	40
+100 V	2
+12.6 V	25

12. Install bottom half of case to establish normal operating temperatures below the chassis.

FRONT PANEL OPERATION OF CALIBRATOR:

13. Check for approximately correct squarewave output at all AMPLITUDE switch settings. Using current probe, check current loop for 5 mA squarewave.
14. Check for presence of +DC and -DC.
15. Check for presence of symmetrical and "clean" 60 Hz squarewaves (Output switch at MIXED, MODE switch at +DC and -DC). Put 50 ohm termination on UNKNOWN INPUT and examine waveform of 5 mV 60 Hz squarewaves. Waveform should be clean with only a slight tilt.
16. Apply an external signal to the EXT INPUT connector, place the MODE switch on EXT, place the output switch "up", and check for presence of the signal at the OUTPUT connector.
17. Apply the same signal to the UNKNOWN INPUT connector, place the Output switch "down" and check for the presence of the signal at the OUTPUT connector.

X100 AMPLIFIER:

18. Instrument should have been turned on for at least 30 minutes before the following adjustments are made.
19. Set Type D differential balance:
 - a. Place a BNC tee connector on INPUT B and connect INPUT A to BNC tee using a BNC cable. Connect a X1 probe to the other end of the tee.
 - b. Set Type D for A-B, AC, MILLIVOLTS/CM at 10, MV/CM MULTIPLIER at 10, VARIABLE to the CALIBRATED position.
 - c. Pick off a 10 volt squarewave from the divider with a X1 probe. (Top of rear wafer, 4th terminal from cw end).
 - d. Check that no squarewave is displayed. If necessary, adjust DIFF BAL for minimum squarewave. Ignore spikes.
20. Set the X4000-X100 slide switch to X100, (forward position). Set the amplifier input switch to GND.
21. Disconnect the cable from the BNC tee and connect it to the X100 amplifier OUTPUT. Connect a 1 megohm, 1/2 watt, 1% resistor to a BNC dual binding post adapter and connect the adapter to the tee on INPUT B. (The input impedance to the X1 probe is now 500 k Ω which is necessary for the proper loading of the divider.)
22. Set Type D to A, DC, MILLIVOLTS/CM to 100. Establish a CRT ground reference.
23. Set X100 Amplifier front panel DC LEVEL control to midrange.
24. Adjust GRID CURRENT to midrange.
25. Adjust DC LEVEL RANGE for zero output voltage.
26. Connect a 2 mV squarewave from calibrator OUTPUT to amplifier INPUT, using BNC cable.
27. Place gain switch at X4000, (Rear position).

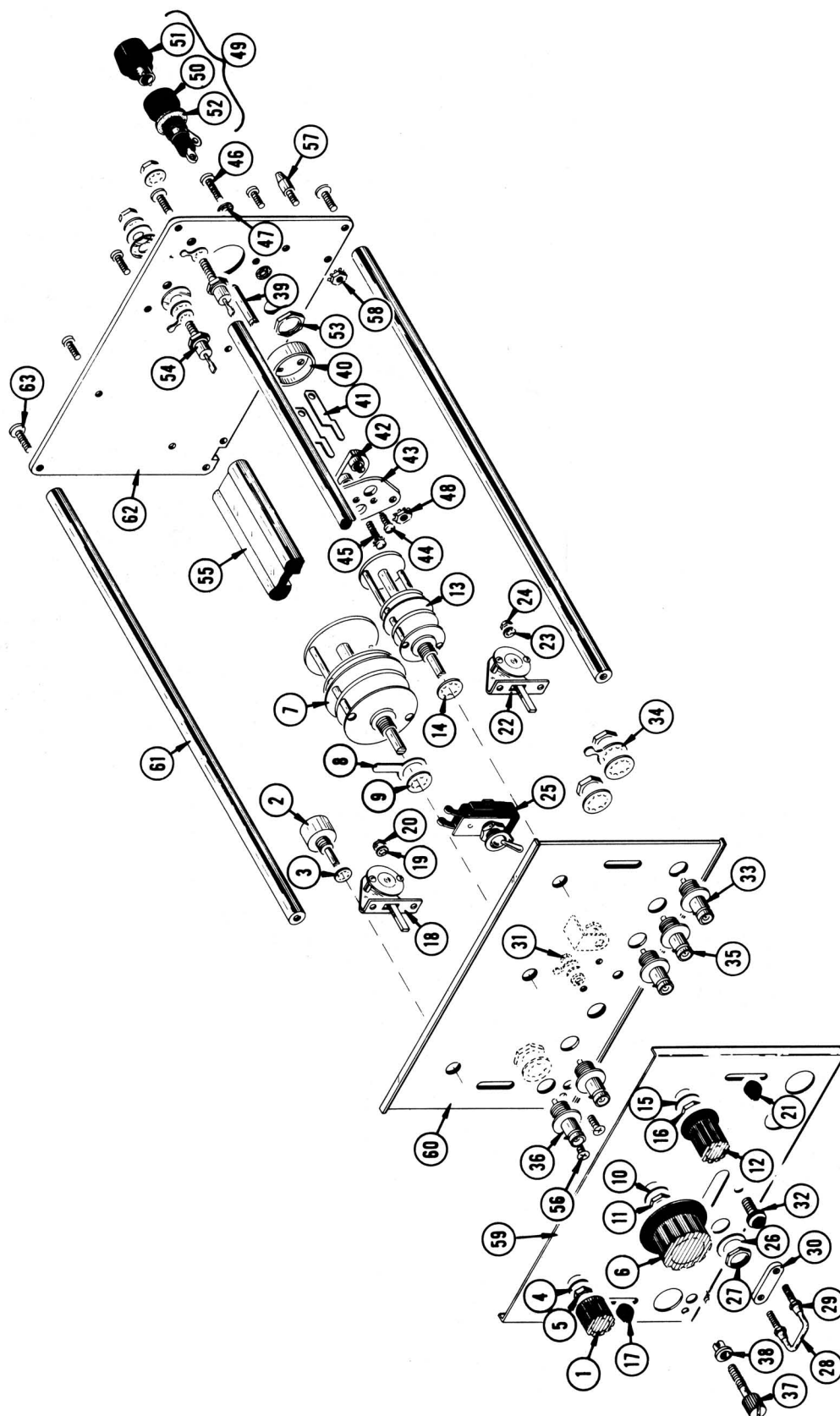
28. Set Type D MV/CM MULTIPLIER 20, oscilloscope Time/cm to 0.5 ms/cm.
29. Place X100 amplifier input switch at DC.
30. Adjust X100 Amplifier DC LEVEL so bottom of waveform is at ground potential. Ignore overshoot.
31. Adjust X4000 Cal for 4 cm of deflection, keeping bottom of waveform at ground with DC LEVEL.
32. Place gain switch at X100.
33. Increase input squarewave to 0.1 volt.
34. Set Type D MILLIVOLTS/CM switch to 10, MV/CM MULTIPLIER to 10, A-B, DC.
35. Adjust X100 for minimum squarewave (with these settings, a 1 cm squarewave indicates a gain error of one percent). Ignore spikes.
36. Check X100 amplifier risetime using test scope calibrator signal. Risetime should be less than 30 μ s.

100 VOLT REFERENCE SUPPLY:

37. Install the complete instrument case and allow temperature to stabilize for 10 minutes.
38. Check noise at X100 AMPLIFIER OUTPUT. Place input switch at GND. Peak-to-peak noise and ripple should be less than 5 millivolts.
39. Set AMPLITUDE to 100 VOLTS, MODE to +DC.
40. Connect a 1 megohm, 1/2 watt, 1% resistor between the binding posts of the BNC to Binding Post adapter. Attach this adapter to the BNC T connector and the T connector to the calibrator OUTPUT. Connect a BNC cable from the other side of the T connector to the BNC clip lead and then to the differential voltmeter being used.
41. Using a John Fluke Differential Voltmeter (Model 825 A or other model accurate to at least 0.025%), set the output to 100 volts, ± 10 millivolts. The access hole for this adjustment is located on the right side of the case. For the final adjustment, place the Fluke on the null sensitivity showing 100 millivolts from center-scale to full-scale. Each minor division then indicates 2 millivolts. If possible, set the +100 volts within ± 5 millivolts and -10 millivolts.
42. After the +100 volts is set, check that it changes less than ± 4 millivolts from high-line to low-line.
43. Check -100 volts DC for the same tolerance.
44. Measure and record the output voltage at all settings of the AMPLITUDE switch from 100 volts through 0.1 volts. Indicated voltage must be within $\pm 0.1\%$ of panel markings. In addition, the algebraic sum of the error on the 0.1 volt range and the worst error on any range from 100 volts through 0.2 volts must not exceed 0.15%.

<u>AMPLITUDE switch setting</u>	<u>±0.1% tolerance</u>	<u>±0.1% tolerance voltage limits</u>	
		<u>low</u>	<u>high</u>
100 V	±100 mV	S e t t o ± 1 0 m V	
50 V	±50 mV	49.950	50.050 (read last digit on meter)
20 V	±20 mV	19.980	20.020
10 V	±10 mV	9.990	10.010
5 V	±5 mV	4.9950	5.0050 (read last digit on meter)
2 V	±2 mV	1.9980	2.0020
1 V	±1 mV	0.9990	1.0010
0.5 V	±0.5 mV	0.49950	0.50050 (read last digit on meter)
0.2 V	±0.2 mV	0.19980	0.20020
0.1 V	±0.1 mV	0.09990	0.10010

FIG. 1 FRONT & REAR



MECHANICAL PARTS LIST-067-0502-00

FIG. 1 FRONT & REAR

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
1-1	366-0173-00		1	KNOB, charcoal--DC LEVEL
	- - - - -		-	knob includes:
	213-0004-00		1	SCREW, set, 6-32 x 3/16 inch, HSS
-2	- - - - -		1	RESISTOR, variable
	- - - - -		-	mounting hardware: (not included w/resistor)
-3	210-0046-00		1	LOCKWASHER, internal, 1/4 ID x 0.400 inch OD
-4	210-0940-00		1	WASHER, flat, 1/4 ID x 3/8 inch OD
-5	210-0583-00		1	NUT, hex., 1/4-32 x 5/16 inch
-6	366-0115-00		1	KNOB, charcoal--AMPLITUDE
	- - - - -		-	knob includes:
	213-0004-00		1	SCREW, set, 6-32 x 3/16 inch, HSS
-7	262-0806-00		1	SWITCH, wired--AMPLITUDE
	- - - - -		-	switch includes:
	260-0797-00		1	SWITCH, unwired
	- - - - -		-	mounting hardware: (not included w/switch)
-8	210-0207-00		1	LUG, solder, 3/8 ID x 5/8 inch OD, SE
-9	210-0012-00		1	LOCKWASHER, internal, 3/8 ID x 1/2 inch OD
-10	210-0840-00		1	WASHER, flat, 0.390 ID x 9/16 inch OD
-11	210-0413-00		1	NUT, hex., 3/8-32 x 1/2 inch
-12	366-0149-00		1	KNOB, charcoal--MODE
	- - - - -		-	knob includes:
	213-0004-00		1	SCREW, set, 6-32 x 3/16 inch, HSS
-13	260-0799-00		1	SWITCH, unwired--MODE
	- - - - -		-	mounting hardware: (not included w/switch)
-14	210-0012-00		1	LOCKWASHER, internal, 3/8 ID x 1/2 inch OD
-15	210-0840-00		1	WASHER, flat, 0.390 ID x 9/16 inch OD
-16	210-0413-00		1	NUT, hex., 3/8-32 x 1/2 inch
-17	366-0215-01		1	KNOB, charcoal--AC DC GND
-18	260-0798-00		1	SWITCH, lever--AC DC GND
	- - - - -		-	mounting hardware: (not included w/switch)
-19	210-0004-00		2	LOCKWASHER, internal, #4
-20	210-0406-00		2	NUT, hex., 4-40 x 3/16 inch

FIG. 1 FRONT & REAR (cont)

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
1-21	366-0215-01		1	KNOB, charcoal--MIXED
-22	260-0375-00		1	SWITCH, lever--MIXED
	- - - - -		-	mounting hardware: (not included w/switch)
-23	210-0004-00		2	LOCKWASHER, internal, #4
-24	210-0406-00		2	NUT, hex., 4-40 x 3/16 inch
-25	260-0134-00		1	SWITCH, toggle--POWER ON
	- - - - -		-	mounting hardware: (not included w/switch)
-26	210-0902-00		1	WASHER, flat, 0.470 ID x 21/32 inch OD
-27	210-0473-00		1	NUT, 12 sided, 15/32-32 x 0.634 inch
-28	214-0335-00		1	BOLT, current loop
	- - - - -		-	mounting hardware: (not included w/bolt)
-29	210-0593-00		2	NUT, current loop
-30	361-0059-00		1	SPACER, current loop, 1 3/32 inches long
	210-0849-00		2	WASHER, fiber, shouldered, #4
	210-0938-00		2	WASHER, flat, #2
	210-0259-00		2	LUG, solder, #2
-31	210-0405-00		2	NUT, hex., 2-56 x 3/16 inch
-32	136-0047-00		1	SOCKET LIGHT ASSEMBLY, w/red jewel
-33	131-0126-00		1	CONNECTOR, coaxial, 1 contact, BNC,
	- - - - -		-	w/mounting hardware
	- - - - -		-	mounting hardware: (not included w/connector)
-34	210-0255-00		1	LUG, solder, 3/8 inch
-35	131-0126-00		2	CONNECTOR, coaxial, 1 contact, BNC,
	- - - - -		-	w/mounting hardware
-36	131-0274-00		2	CONNECTOR, 1 contact, BNC, w/mounting hardware
-37	214-0553-00		1	LATCH SCREW, 1.388 inches long
-38	358-0255-00		1	BUSHING, latch, plastic

FIG. 1 FRONT & REAR (cont)

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	No. Disc	Q						Description
				Y	1	2	3	4	5	
1-	131-0102-00		B0499	1						CONNECTOR, 3 wire
	131-0102-01	B04500		1						CONNECTOR, 3 wire
	- - - - -			-						connector includes:
-39	129-0041-01			1						POST, ground
-40	200-0185-01			1						COVER, black plastic
-41	214-0078-00			2						PIN, connecting
-42	377-0051-00			1						INSERT, black plastic
-43	386-0933-00			1						PLATE
-44	213-0088-00			1						SCREW, thread forming, #4 x 1/4 inch, PHS
-45	211-0132-00			1						SCREW, sems, 4-40 x 1/2 inch, PHS
	- - - - -			-						mounting hardware: (not included w/conne
-46	211-0511-00			2						SCREW, 6-32 x 1/2 inch, PHS
	210-0202-00			1						LUG, solder, SE #6 (not shown)
-47	210-0811-00			4						WASHER, fiber, shouldered, #6
-48	210-0457-00			2						NUT, keps, 6-32 x 5/16 inch
-49	352-0002-00			1						ASSEMBLY, fuse holder
	- - - - -			-						assembly includes:
-50	352-0010-00			1						HOLDER, fuse
-51	200-0582-00			1						CAP, fuse, black
-52	210-0873-00			1						WASHER, rubber, 1/2 ID x 11/16 inch OD
-53	- - - - -			1						NUT
-54	- - - - -			2						DIODE, w/mounting hardware
-55	351-0122-00			1						GUIDE, slide
	- - - - -			-						mounting hardware: (not included w/guide
-56	211-0537-00		B041039	2						SCREW, 6-32 x 3/8 inch, THS
	211-0538-00	B041040		2						SCREW, 6-32 x 5/16 inch, 100° csk, FHS
	212-0044-00			1						SCREW, 8-32 x 1/2 inch, RHS (not shown)
	214-0680-00			1						PIN, locating (not shown)
-57	214-0680-00			1						PIN, locating
	- - - - -			-						mounting hardware: (not included w/pin)
-58	210-0457-00			1						NUT, keps, 6-32 x 5/16 inch
-59	333-1001-01			1						PANEL, front
-60	386-1241-00			1						PLATE, sub-panel
-61	384-0615-00			3						ROD, spacer
-62	386-0240-00			1						PANEL, rear
	- - - - -			-						mounting hardware: (not included w/plate
-63	212-0044-00			3						SCREW, 8-32 x 1/2 inch, RHS

FIG. 2 CHASSIS

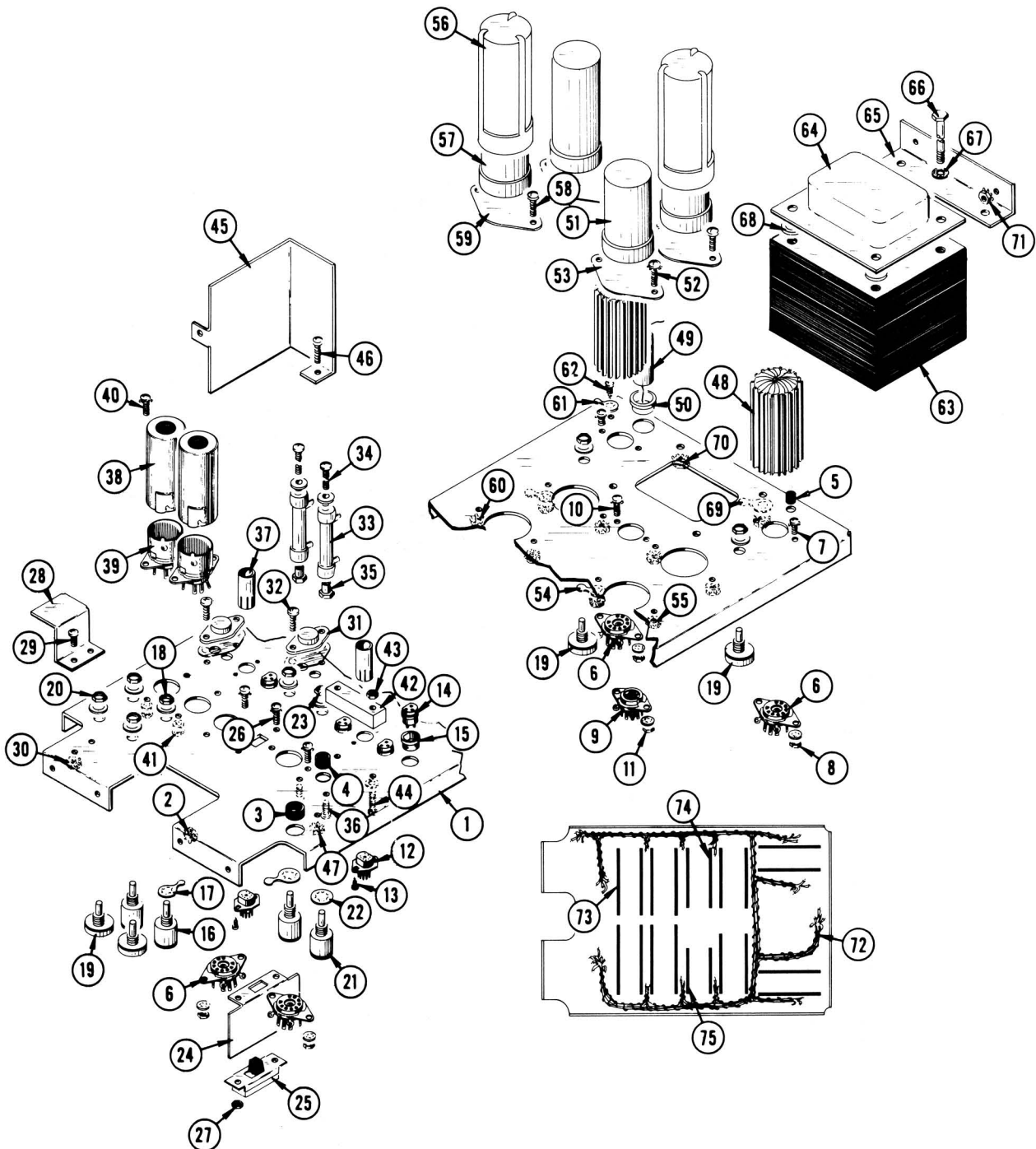


FIG. 2 CHASSIS

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
2-1	441-0735-00		1	CHASSIS
	- - - - -		-	mounting hardware: (not included w/chassis)
	211-0538-00		4	SCREW, 6-32 x 5/16 inch, 100° csk, FHS
	- - - - -		-	(not shown)
-2	210-0457-00		4	NUT, keps, 6-32 x 5/16 inch
	210-0407-00		3	NUT, hex., 6-32 x 1/4 inch (not shown)
	210-0006-00		3	LOCKWASHER, internal, #6 (not shown)
	211-0507-00		3	SCREW, 6-32 x 5/16 inch, PHS (not shown)
-3	348-0063-00		1	GROMMET, plastic, 1/2 inch diameter
-4	348-0056-00		1	GROMMET, plastic, 3/8 inch diameter
-5	348-0055-00		1	GROMMET, plastic, 1/4 inch diameter
-6	136-0015-00		4	SOCKET, tube, 9 pin
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/socket)
-7	211-0033-00		2	SCREW, sems, 4-40 x 5/16 inch, PHS
	210-0004-00		2	LOCKWASHER, internal, #4
-8	210-0406-00		2	NUT, hex., 4-40 x 3/16 inch
-9	136-0008-00		1	SOCKET, tube, 7 pin
	- - - - -		-	mounting hardware: (not included w/socket)
-10	211-0033-00		2	SCREW, sems, 4-40 x 5/16 inch, PHS
	210-0004-00		2	LOCKWASHER, internal, #4
-11	210-0406-00		2	NUT, hex., 4-40 x 3/16 inch
-12	136-0078-00		2	SOCKET, transistor, 8 pin
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/socket)
-13	213-0055-00		2	SCREW, thread forming, 2-32 x 3/16 inch, PHS
-14	136-0181-00		4	SOCKET, transistor, 3 pin
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/socket)
-15	354-0234-00		1	RING, socket mounting

FIG. 2 CHASSIS (cont)

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
2-16	- - - - -		2	RESISTOR, variable
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/resistor)
-17	210-0223-00		1	LUG, solder, 1/4 ID x 7/16 inch OD, SE
	210-0940-00		1	WASHER, flat, 1/4 ID x 3/8 inch OD
-18	210-0583-00		1	NUT, hex., 1/4-32 x 5/16 inch
-19	- - - - -		5	RESISTOR, variable
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/resistor)
	210-0940-00		1	WASHER, flat, 1/4 ID x 3/8 inch OD
-20	210-0583-00		1	NUT, hex., 1/4-32 x 5/16 inch
-21	- - - - -		1	RESISTOR, variable
	- - - - -		-	mounting hardware: (not included w/resistor)
-22	210-0012-00		1	LOCKWASHER, internal, 3/8 ID x 1/2 inch OD
	210-0940-00		1	WASHER, flat, 1/4 ID x 3/8 inch OD
-23	210-0583-00		1	NUT, hex., 1/4-32 x 5/16 inch
-24	337-0935-00		1	SHIELD, slide switch
-25	260-0451-00		1	SWITCH, slide
	- - - - -		-	mounting hardware: (not included w/switch)
-26	211-0033-00		2	SCREW, sems, 4-40 x 3/16 inch, PHS
-27	210-0406-00		2	NUT, hex., 4-40 x 3/16 inch
-28	337-0933-00		1	SHIELD, lever switch
	- - - - -		-	mounting hardware: (not included w/shield)
-29	211-0507-00		2	SCREW, 6-32 x 5/16 inch, PHS
-30	210-0457-00		2	NUT, keps, 6-32 x 5/16 inch

FIG. 2 CHASSIS (cont)

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
2-31	- - - - -		2	TRANSISTOR
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/transistor)
-32	211-0510-00		2	SCREW, 6-32 x 3/8 inch, PHS
	386-0143-00		1	PLATE, insulator
	210-0967-00		2	WASHER, plastic, shouldered, 0.157 ID x 3/8
	- - - - -		-	OD (not shown)
	210-0803-00		2	WASHER, flat, 0.150 ID x 3/8 inch OD (not sh
	210-0202-00		1	LUG, solder, SE #6 (not shown)
	210-0457-00		2	NUT, keps, 6-32 x 5/16 inch (not shown)
-33	- - - - -		2	RESISTOR
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/resistor)
-34	211-0553-00		1	SCREW, 6-32 x 1 1/2 inches, RHS
	210-0601-00		1	EYELET
-35	210-0478-00		1	NUT, hex., 5/16 x 21/32 inch
-36	211-0507-00		1	SCREW, 6-32 x 5/16 inch, PHS
-37	214-0269-00		2	HEAT SINK, transistor
-38	337-0007-00		2	SHIELD, tube
-39	136-0010-00		2	SOCKET, tube, 7 pin, w/shield
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/socket)
-40	211-0033-00		2	SCREW, sems, 4-40 x 5/16 inch, PHS
	210-0004-00		2	LOCKWASHER, internal, #4
-41	210-0406-00		2	NUT, hex., 4-40 x 3/16 inch
-42	- - - - -		1	RESISTOR, variable
	- - - - -		-	mounting hardware: (not included w/resistor)
-43	210-0405-00		2	NUT, hex., 2-56 x 3/16 inch
	210-0938-00		2	WASHER, flat, #2
-44	211-0034-00		2	SCREW, 2-56 x 1/2 inch, RHS
-45	337-0934-00		1	SHIELD, rotary switch
	- - - - -		-	mounting hardware: (not included w/shield)
-46	211-0507-00		1	SCREW, 6-32 x 5/16 inch, PHS
-47	210-0457-00		2	NUT, keps, 6-32 x 5/16 inch

FIG. 2 CHASSIS (cont)

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
2-48	337-0649-00		2	SHIELD, heat dissipating
-49	- - - - -		1	CAPACITOR
	- - - - -		-	mounting hardware: (not included w/capacitor)
-50	354-0068-00		1	RING, capacitor mounting
-51	- - - - -		2	CAPACITOR
	- - - - -		-	mounting hardware for each:
	- - - - -		-	(not included w/capacitor)
-52	211-0534-00		2	SCREW, sems, 6-32 x 5/16 inch, PHS
-53	386-0255-00		1	PLATE, metal, large
-54	210-0202-00		1	LUG, solder, SE #6
-55	210-0457-00		2	NUT, keps, 6-32 x 5/16 inch
-56	200-0293-00		2	COVER, capacitor, plastic, 1 ID x 3 9/16 inches
	- - - - -		-	long
-57	- - - - -		2	CAPACITOR
	- - - - -		-	mounting hardware for each:
	- - - - -		-	(not included w/capacitor)
-58	211-0543-00		2	SCREW, 6-32 x 5/16 inch, RHS
-59	386-0254-00		1	PLATE, fiber, large
-60	210-0457-00		2	NUT, keps, 6-32 x 5/16 inch
-61	210-0202-00		1	LUG, solder, SE #6
	- - - - -		-	mounting hardware: (not included w/lug)
-62	213-0044-00		1	SCREW, thread forming, 5-32 x 3/16 inch, PHS
-63	- - - - -		1	TRANSFORMER
	- - - - -		-	transformer includes:
-64	200-0379-00		1	COVER, transformer
-65	407-0364-00	699	1	BRACKET
	407-0204-00	700	1	BRACKET
-66	212-0522-00		4	SCREW, 10-32 x 2 1/2 inches, HHS
-67	210-0812-00		4	WASHER, fiber, shouldered, #10
-68	210-0853-00	699	2	WASHER, flat, 17/64 ID x 1/2 inch OD
-69	210-0223-00		1	LUG, solder, SE #10 long
	- - - - -		-	mounting hardware: (not included w/transformer)
-70	210-0457-00		2	NUT, keps, 6-32 x 5/16 inch
	211-0507-00		2	SCREW, 6-32 x 5/16 inch, PHS (not shown)
-71	220-0410-00		4	NUT, keps, 10-32 x 3/8 inch

FIG. 2 CHASSIS (cont)

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
2-72	179-1170-00		1	CABLE HARNESS
-73	124-0145-00		8	STRIP, ceramic, 7/16 inch h, w/20 notches
	- - - - -		-	each strip includes:
	355-0046-00		2	STUD, plastic
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/strip)
	361-0009-00		2	SPACER, plastic, 3/8 inch long
-74	124-0146-00		10	STRIP, ceramic, 7/16 inch h, w/16 notches
	- - - - -		-	each strip includes:
	355-0046-00		2	STUD, plastic
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/strip)
	361-0009-00		2	SPACER, plastic, 3/8 inch long
-75	124-0147-00		2	STRIP, ceramic, 7/16 inch h, w/13 notches
	- - - - -		-	each strip includes:
	355-0046-00		2	STUD, plastic
	- - - - -		-	mounting hardware for each: (not included
	- - - - -		-	w/strip)
	361-0009-00		2	SPACER, plastic, 3/8 inch long

FIG. 3 CABINET

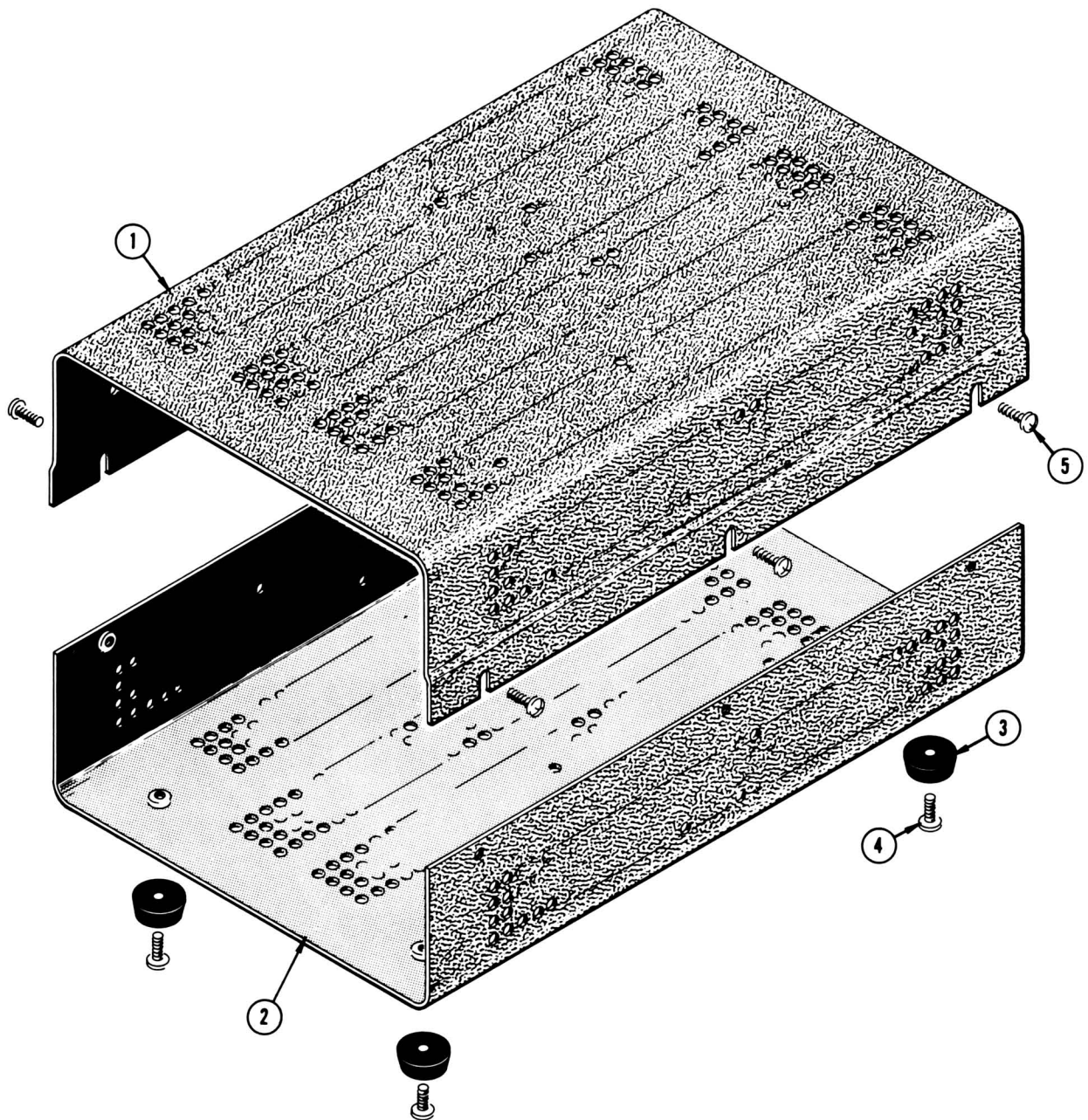


FIG. 3 CABINET

FIG. & INDEX NO.	TEKTRONIX PART NO.	SERIAL/MODEL EFF DISC	Q T Y	DESCRIPTION
3-1	390-0007-00		1	CABINET, top
-2	390-0006-00		1	CABINET, bottom
	- - - - -		-	cabinet includes:
-3	348-0001-00		4	FOOT, rubber
-4	211-0537-00		4	SCREW, 6-32 x 3/8 inch, THS
-5	211-0565-00		6	SCREW, 6-32 x 1/4 inch, THS

ELECTRICAL PARTS LIST - 067-0502-00

Values are fixed unless marked Variable.

Ckt. No.	Tektronix	Serial/Model No.		Description
	Part No.	Eff	Disc	
Bulb				
B307	150-0018-00		Incandescent, miniature	6.3 V #12
Capacitors				
Tolerance ±20% unless otherwise indicated.				
C112	283-0002-00		0.01 μF	Cer 500 V
C114	283-0511-00		200 pF	Mica 5%
C118	290-0159-00		2 μF	Elect. 150 V
C122	283-0002-00		0.01 μF	Cer 500 V
C124	283-0511-00		200 pF	Mica 5%
C143	283-0002-00		0.01 μF	Cer 500 V
C152	283-0003-00		0.01 μF	Cer 150 V
C153	283-0003-00		0.01 μF	Cer 150 V
C200	*285-0609-00		0.1 μF	MT 600 V 10%
C211	283-0001-00		0.005 μF	Cer 500 V
C214	283-0003-00		0.01 μF	Cer 150 V
C223	281-0550-00		120 pF	Cer 500 V 10%
C224	283-0057-00		0.1 μF	Cer 200 V +80%-20%
C237	283-0002-00		0.01 μF	Cer 500 V
C258	283-0002-00		0.01 μF	Cer 500 V

Ckt. No.	Tektronix	Serial/Model No.		Description	
	Part No.	Eff	Disc		
Capacitors (Cont)					
C262	283-0000-00		0.001 μF	Cer	500 V
C264	283-0002-00		0.01 μF	Cer	500 V
C312	290-0108-00		60 μF	Elect.	450 V
C321	283-0002-00		0.01 μF	Cer	500 V
C337	290-0194-00		10 μF	Elect.	100 V
C338	290-0000-00		6.25 μF	Elect.	300 V
C347	290-0149-00		5 μF	Elect.	150 V
C352	290-0173-00		200 μF	Elect.	250 V
C364	285-0623-00		0.47 μF	PTM	100 V
C367	290-0171-00		100 μF	Elect.	12 V
C372	285-0569-00		0.01 μF	PTM	200 V
C377	290-0198-00		17 μF	Elect.	150 V +30%-
C382	290-0212-00		2000 μF	Elect.	25 V
C387	290-0134-00		22 μF	Elect.	15 V
C388	290-0134-00		22 μF	Elect.	15 V
C412	290-0108-00		60 μF	Elect.	450 V
C419	283-0004-00		0.02 μF	Cer	150 V
C421	283-0002-00		0.01 μF	Cer	500 V
C447	283-0004-00		0.02 μF	Cer	150 V
C448	290-0149-00		5 μF	Elect.	150 V
C457	290-0201-00		100 μF	Elect.	15 V

Ckt. No.	Tektronix	Serial/Model No.		Description
	Part No.	Eff	Disc	
Capacitors (Cont)				
C468	290-0198-00		17 μF	Elect. 150 V +30%-15%
Diodes				
D110	*152-0061-00		Silicon	Tek Spec
D112	*152-0061-00		Silicon	Tek Spec
D120	*152-0061-00		Silicon	Tek Spec
D122	*152-0061-00		Silicon	Tek Spec
D257	152-0055-00		Zener	1N962B 0.4 W, 10 V, 10%
D300	*152-0274-00		Silicon	Replaceable by 1N1200
D301	*152-0274-00		Silicon	Replaceable by 1N1200
D312A,B	152-0066-00		Zener	1N3194
C,D				
D337	152-0101-00		Zener	1N3041B 1 W, 75 V, 5%
D347	152-0087-00		Zener	1N3044B 1 W, 100 V, 5%
D352A,B	152-0066-00		Silicon	1N3194
C,D				
D367	152-0124-00		Zener	1N938A 0.5 W, 9 V, 5%, TC
D382A,B	152-0066-00		Silicon	1N3194
C,D				
D387	152-0059-00		Zener	1M12.6Z5 1 W, 12.6 V, 5%
D412A,B	152-0048-01		Silicon	Replaceable by 1N2864
C,D				
D447	152-0134-00		Zener	1N3044A 1 W, 100 V, 10%
D457	152-0171-00		Zener Selected	1N944 0.5 W, 11.7 V, 5%

Ckt. No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Description
Fuse				
F301	159-0018-00		0.8 A 3 AG	Slo-Blo
Connectors†				
J150				
J151				
J158				
J200				
J268				
Transformers				
Q243	*151-0096-00	Silicon		Selected from 2N1893
Q337	151-0150-00	Silicon		2N3440
Q366	*151-0104-00	Silicon	Dual	Replaceable by 2N2913
Q373	*151-0096-00	Silicon		Selected from 2N1893
Q377	*151-0148-00	Silicon		Selected 40250 (RCA)
Q387	*151-0148-00	Silicon		Selected 40250 (RCA)
Q447	*151-0096-00	Silicon		Selected from 2N1893
Q456	*151-0104-00	Silicon	Dual	Replaceable by 2N2913
Q463	*151-0096-00	Silicon		Selected from 2N1893
Q467	*151-0096-00	Silicon		Selected from 2N1893

[†] See Mechanical Parts List.

Ckt. No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Description		
Resistors						
Resistors are fixed, composition, ±10% unless otherwise indicated.						
R110	303-0203-00		20 kΩ	1 W		5%
R112	302-0100-00		10 Ω	1/2 W		
R114	308-0025-00		20 kΩ	10 W	WW	5%
R115	316-0102-00		1 kΩ	1/4 W		
R117	309-0377-00		3 MΩ	1/2 W	Prec	1%
R118	302-0271-00		270 Ω	1/2 W		
R122	302-0100-00		10 Ω	1/2 W		
R124	308-0025-00		20 kΩ	10 W	WW	5%
R125	316-0102-00		1 kΩ	1/4 W		
R127	309-0377-00		3 MΩ	1/2 W	Prec	1%
R130 [†]	*310-0636-00		9900.01 Ω	8 W	Prec	
R131 [†]	*310-0637-00		6074.27 Ω	8 W	Prec	
R132 [†]	*310-0638-00		2018.50 Ω	8 W	Prec	
R133 [†]	*310-0639-00		1005.32 Ω	8 W	Prec	
R134 [†]	*310-0640-00		601.588 Ω	8 W	Prec	
R135 [†]	*310-0641-00		200.24 Ω	8 W	Prec	
R136 [†]	*310-0642-00		100.06 Ω	8 W	Prec	
R137 [†]	*310-0643-00		60.01 Ω	8 W	Prec	
R138 [†]	*310-0644-00		40.00 Ω	8 W	Prec	

[†] R130 thru R138, R142 and R143 - resistor assembly
Part No. *310-0653-00.

Ckt. No.	Tektronix	Serial/Model No.		Description		
	Part No.	Eff	Disc			
Resistors (Cont)						
R140	323-0481-00		1 MΩ	1/2 W	Prec	1%
R142†	*310-0646-00		999 kΩ	0.25 W	Prec	
R143†	*310-0645-00		1001.0 Ω	8 W	Prec	
R154	323-0481-00		1 MΩ	1/2 W	Prec	1%
R155	309-0093-00		4 MΩ	1/2 W	Prec	1%
R156	309-0093-00		4 MΩ	1/2 W	Prec	1%
R157	309-0023-00		2 MΩ	1/2 W	Prec	1%
R210	323-0481-00		1 MΩ	1/2 W	Prec	1%
R211	302-0474-00		470 kΩ	1/2 W		
R212	316-0470-00		47 Ω	1/4 W		
R214	316-0102-00		1 kΩ	1/4 W		
R216	308-0108-00		15 kΩ	5 W	WW	5%
R220	323-0190-00		931 Ω	1/2 W	Prec	1%
R221	311-0258-00		100 Ω, Var			
R222	316-0470-00		47 Ω	1/4 W		
R223	323-0385-00		100 kΩ	1/2 W	Prec	1%
R224	302-0102-00		1 kΩ	1/2 W		
R225	323-0347-00		40.2 kΩ	1/2 W	Prec	1%
R230	323-0354-00		47.5 kΩ	1/2 W	Prec	1%
R231	311-0160-00		50 kΩ, Var			

[†] R142, R143 and R130 thru R138 - resistor assembly
Part No. *310-0653-00.

Ckt. No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Description		
Resistors (Cont)						
R232	323-0354-00			47.5 kΩ	1/2 W	Prec 1%
R234	311-0153-00			10 kΩ, Var		
R236	305-0123-00			12 kΩ	2 W	5%
R237	311-0067-00			5 kΩ, Var		
R242	315-0102-00			1 kΩ	1/4 W	5%
R248	305-0273-00			27 kΩ	2 W	5%
R249	304-0334-00	670	669	330 kΩ	1 W	
R249	304-0274-00			270 kΩ	1 W	
R257	306-0333-00			33 kΩ	2 W	
R258	316-0104-00			100 kΩ	1/4 W	
R260	316-0470-00			47 Ω	1/4 W	
R261	316-0101-00			100 Ω	1/4 W	
R262	316-0100-00			10 Ω	1/4 W	
R263	308-0053-00			8 kΩ	5 W	WW 5%
R264	301-0221-00			220 Ω	1/2 W	5%
R267	321-0402-00			150 kΩ	1/8 W	Prec 1%
R268	311-0110-00			100 kΩ, Var		
R306	302-0101-00			100 Ω	1/2 W	
R307	302-0101-00			100 Ω	1/2 W	
R308	316-0104-00			100 kΩ	1/4 W	
R311	316-0100-00			10 Ω	1/4 W	
R312	306-0184-00			180 kΩ	2 W	

Ckt. No.	Tektronix	Serial/Model No.		Description		
	Part No.	Eff	Disc			
Resistors (Cont)						
R320	323-0467-00		715 k Ω	1/2 W	Prec	1%
R321	311-0154-00		50 k Ω , Var			
R322	323-0431-00		301 k Ω	1/2 W	Prec	1%
R323	302-0474-00		470 k Ω	1/2 W		
R324	316-0102-00		1 k Ω	1/4 W		
R325	302-0155-00		1.5 M Ω	1/2 W		
R326	316-0102-00		1 k Ω	1/4 W		
R327	302-0334-00		330 k Ω	1/2 W		
R328	302-0124-00		120 k Ω	1/2 W		
R329	302-0563-00		56 k Ω	1/2 W		
R337	304-0223-00		22 k Ω	1 W		
R347	302-0823-00		82 k Ω	1/2 W		
R351	304-0100-00		10 Ω	1 W		
R352	304-0333-00		33 k Ω	1 W		
R360	323-0188-00		887 Ω	1/2 W	Prec	1%
R361	311-0486-00		500 Ω , Var			
R362	324-0289-00		10 k Ω	1 W	Prec	1%
R364	316-0102-00		1 k Ω	1/4 W		
R365	323-0418-00		221 k Ω	1/2 W	Prec	1%
R366	323-0368-00		66.5 k Ω	1/2 W	Prec	1%
R367	324-0284-00		8.87 k Ω	1 W	Prec	1%

Ckt. No.	Tektronix	Serial/Model No.		Description		
	Part No.	Eff	Disc			
Resistors (Cont)						
R372	302-0331-00		330 Ω	1/2 W		
R373	302-0333-00		33 k Ω	1/2 W		
R377	308-0123-00		20 Ω	5 W	WW	5%
R380	302-0100-00		10 Ω	1/2 W		
R381	302-0100-00		10 Ω	1/2 W		
R382	302-0272-00		2.7 k Ω	1/2 W		
R387	304-0561-00		560 Ω	1 W		
R411	316-0100-00		10 Ω	1/4 W		
R412	306-0274-00		270 k Ω	2 W		
R418	303-0363-00		36 k Ω	2 W		5%
R419	303-0363-00		36 k Ω	2 W		5%
R420	301-0334-00		330 k Ω	1/2 W		5%
R421	311-0154-00		50 k Ω , Var			
R422	301-0104-00		100 k Ω	1/2 W		5%
R423	302-0474-00		470 k Ω	1/2 W		
R424	316-0102-00		1 k Ω	1/4 W		
R425	302-0125-00		1.2 M Ω	1/2 W		
R426	316-0102-00		1 k Ω	1/4 W		
R427	302-0274-00		270 k Ω	1/2 W		
R428	302-0823-00		82 k Ω	1/2 W		
R429	304-0823-00		82 k Ω	1 W		

Tektronix		Serial/Model No.		Description		
Ckt. No.	Part No.	Eff	Disc			
Resistors (Cont)						
R440	301-0912-00		9.1 kΩ	1/2 W		5%
R441	311-0487-00		30 kΩ, Var			
R442	301-0823-00		82 kΩ	1/2 W		5%
R447	308-0237-00		8.2 kΩ	5 W	WW	5%
R450	*310-0647-00		2.09 kΩ	4 W	Prec	
R451	311-0558-00		500 Ω, Var			
R452	*310-0648-00		17.41 kΩ	4 W	Prec	
R455	323-0354-00		47.5 kΩ	1/2 W	Prec	1%
R456	323-0380-00		88.7 kΩ	1/2 W	Prec	1%
R457	324-0296-00		11.8 kΩ	1 W	Prec	1%
R462	302-0331-00		330 Ω	1/2 W		
R463	302-0473-00		47 kΩ	1/2 W		
R467	302-0220-00		22 Ω	1/2 W		
R468	308-0272-00		20 kΩ	5 W	WW	5%

Switches

Unwired or Wired

SW130	Wired	*262-0806-00	Rotary	AMPLITUDE
SW130		260-0797-00	Rotary	AMPLITUDE
SW150		119-0016-00		CHOPPER

Ckt. No.	Tektronix Part No.	Serial/Model No. Eff	Disc	Description
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Switches (Cont)

Unwired or Wired

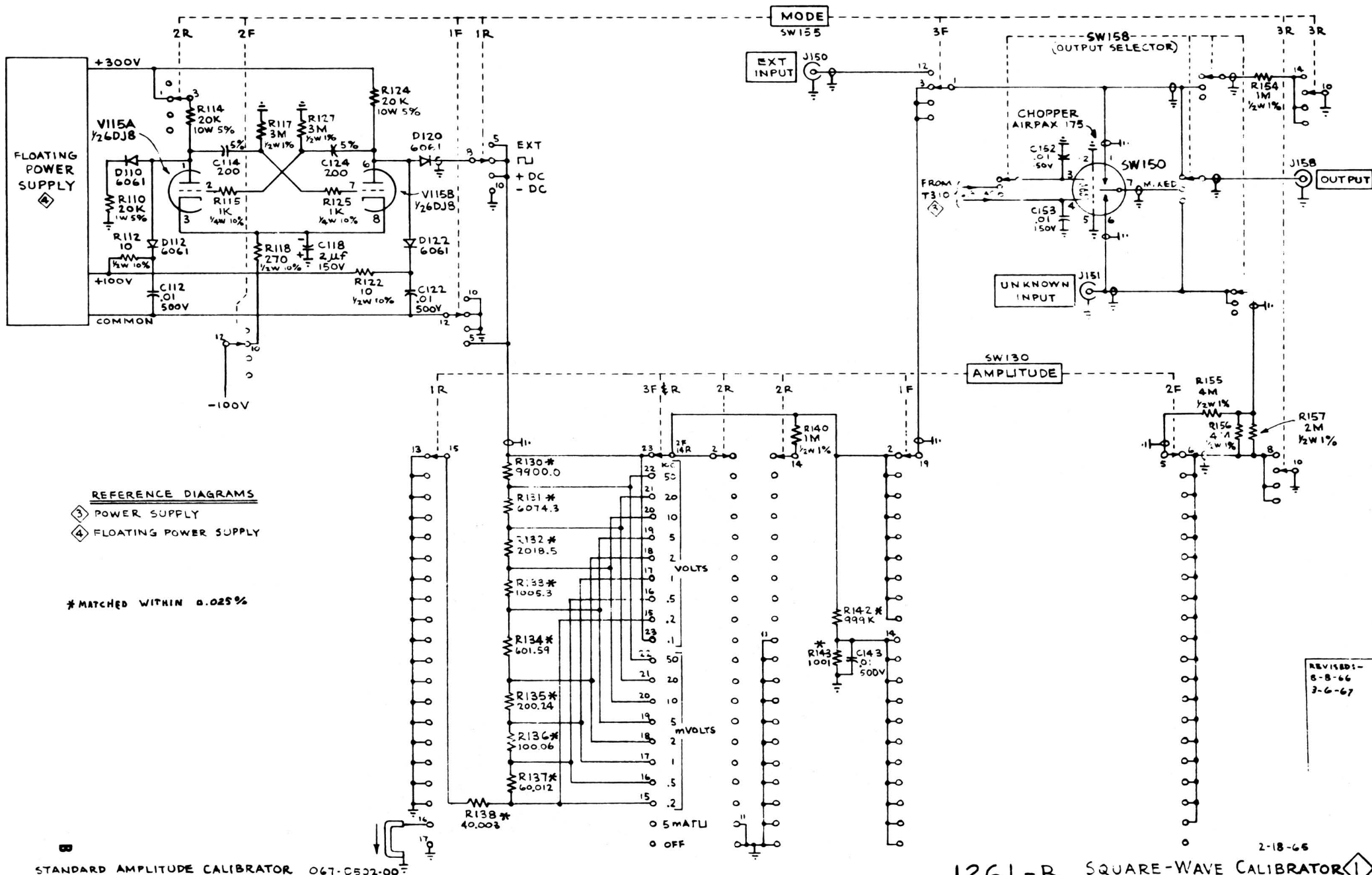
SW155	*260-0799-00	Rotary	MODE
SW158	*260-0798-00	Lever	FUNCTION
SW200	260-0475-00	Lever	INPUT SELECTOR
SW223	260-0451-00	Slide	MULTIPLIER
SW301	260-0134-00	Toggle	POWER

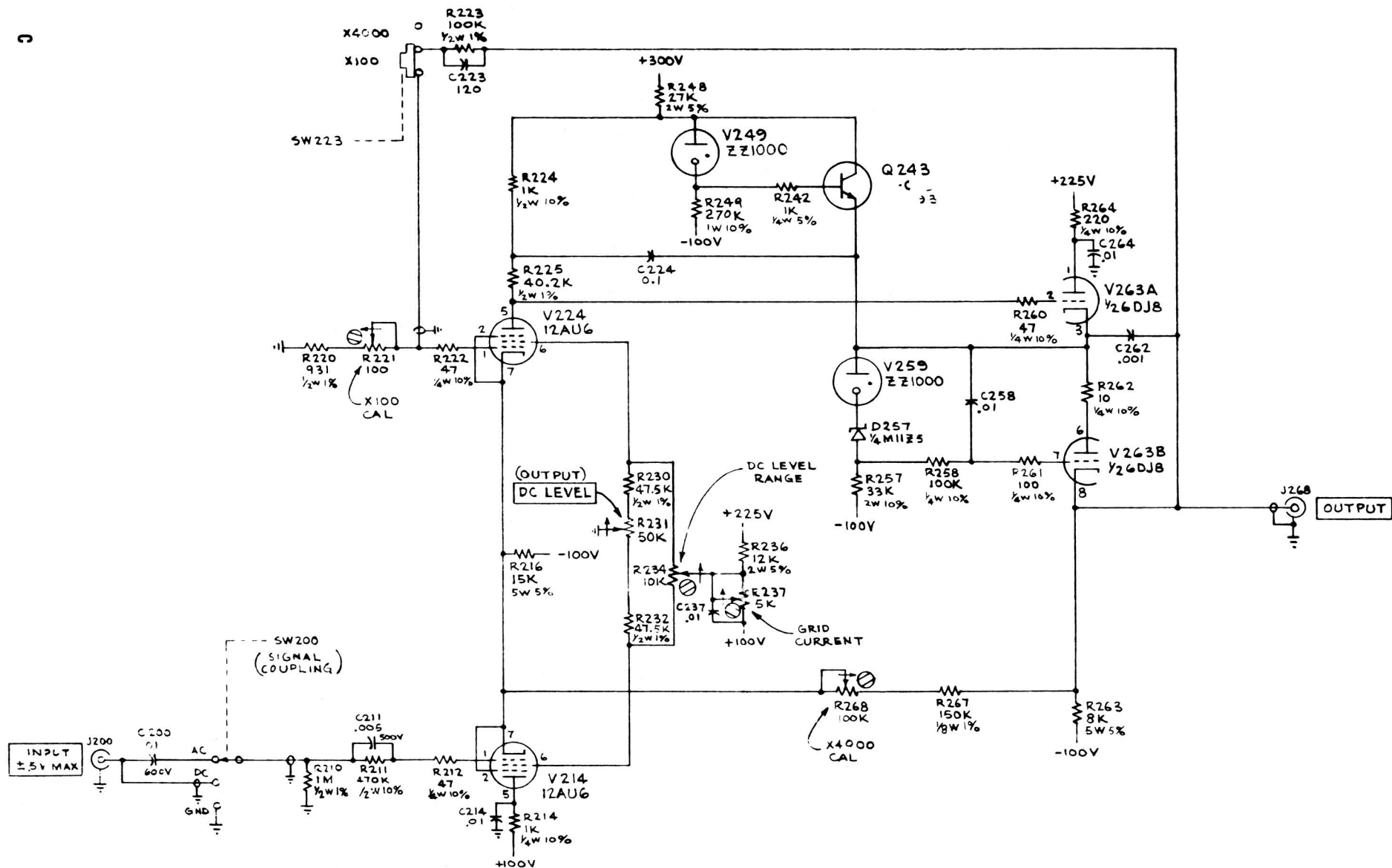
Transformers

T310	*120-0442-00	Power
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Electron Tubes

V115	154-0187-00	6DJ8
V214 } V224 }	*157-0071-00	12AU6 (matched pair)
V249	154-0370-00	ZZ-1000
V259	154-0370-00	ZZ-1000
V263	154-0187-00	6DJ8
V327	154-0260-00	7734
V419	154-0370-00	ZZ-1000
V427	154-0260-00	7734





STANDARD AMPLITUDE CALIBRATOR 067-502-00

2-18-65
X100 AMPLIFIER 2

1262-B



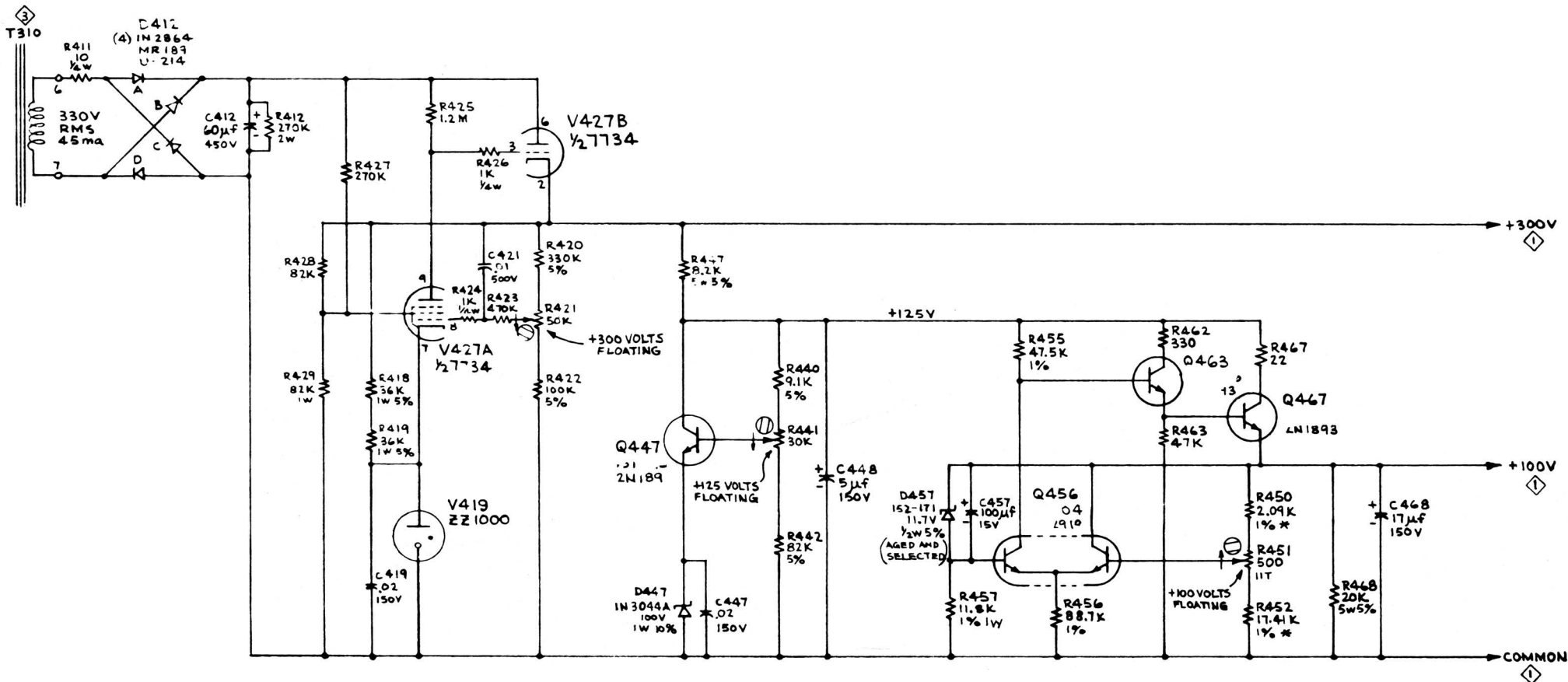
ALL RESISTORS ARE 1/2W 10%
UNLESS OTHERWISE NOTED

2-18-65

POWER SUPPLY

1263-B

REVISED:-
4-20-68
8-8-66
3-6-67



REFERENCE DIAGRAMS

- ① SQUARE-WAVE CALIBRATOR
- ③ POWER SUPPLY

NOTES:-

- * MATCHED TO 0.4%
- ALL RESISTORS ARE 1/2W 10% UNLESS OTHERWISE NOTED

STANDARD AMPLITUDE CALIBRATOR 067-0502-00

2-18-66
FLOATING POWER SUPPLY ④

1264-B