MODIFICATION NOTICE FOR
TYPE 507

EFFECTIVE SERIALNUMBER 128

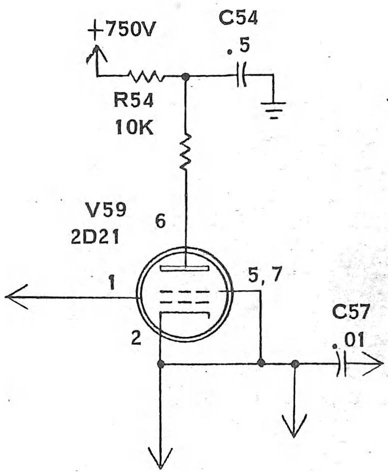
CHANGE

R50 FROM 47K 1/2W FIXED COMP 10% 302–473
TO 10K 1/2W FIXED COMP 10% 302–103

C57 FROM .001 uf
TO .01 uf

ADD

C54 PBT .5 uFD 1000V 285–538
R54 10K 1/2W FIXED COMP 10% 302–103



MODIFICATION NO 2092
SWEEP TRIGGER & TRIP PULSE
JUNE 5, 1959

MODIFICATION NOTICE FOR
TYPE 507
EFFECTIVE SERIAL NUMBER 128

CHANGE C267 FROM 1.5 TO 4.7

C260 FROM .01 TO 47 PF

MODIFICATION NO 2092
TIME MARK GENERATOR
JUNE 5, 1959

CORRECTION FOR TYPE 507

R667 SHOULD BE LABELED R674.

HEATER WIRING DIAG
POWER SUPPLY CHASSIS
JUNE 5, 1959

MODIFICATION NOTICE FOR
TYPE 507
EFFECTIVE SERIAL NO 142

CHANGE C267 FROM 4.7 PF 500V 281-501
TO 1.5 PF 500V 281-529

MODIFICATION NO 2171
TIME MARK GENERATOR
JUNE 5, 1959

MODIFICATION NOTICE FOR
TYPE 507
EFFECTIVE SERIAL NUMBER 142

CHANGE R635 FROM 39K 1/2W FIXED COMP 10% 302-393
TO 36K 1/2W FIXED COMP 10% 302-563

R636 FROM 18K 1/2W FIXED COMP 10% 302-183
TO 27K 1/W FIXED COMP 10% 302-273

R637 FROM 180K 1/2W FIXED COMP 10% 302-184
TO 270K 1/2W FIXED COMP 10% 302-274

R655 FROM 100K 1/2W FIXED COMP 10% 302-104
TO 300K 1/2W FIXED COMP 10% 302-334

R656 FROM 27K 1/2W FIXED COMP 10% 302-273
TO 82K 1/2W FIXED COMP 10% 302-823

R657 FROM 270K 1/2W FIXED COMP 10% 302-274
TO 820K 1/2W FIXED COMP 10% 302-824

MODIFICATION NO 2174
POWER SUPPLY
JUNE 5, 1959

MODIFICATION NOTICE FOR
TYPE 507
EFFECTIVE SERIAL NO 142

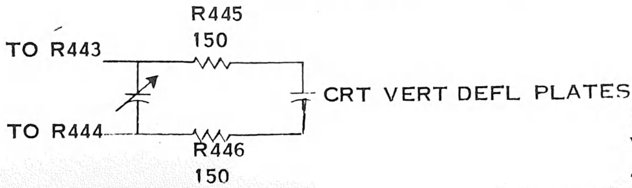
REMOVE L324 2.5μH COIL 108-055

MODIFICATION NO 2191
HORIZONTAL AMPLIFIER
JUNE 5, 1959

MODIFICATION NOTICE FOR
TYPE 507
EFFECTIVE SERIAL NUMBER 170

ADD R445 150 1/2W FIXED COMP 10% 202-151

R446 150 1/2W FIXED COMP 10% 302-151



MODIFICATION NO 2229
VERTICAL AMPLIFIER
JUNE 5, 1959

CATHODE-RAY OSCILLOSCOPE
TYPE 507

INSTRUCTION MANUAL

TEKTRONIX, INC.

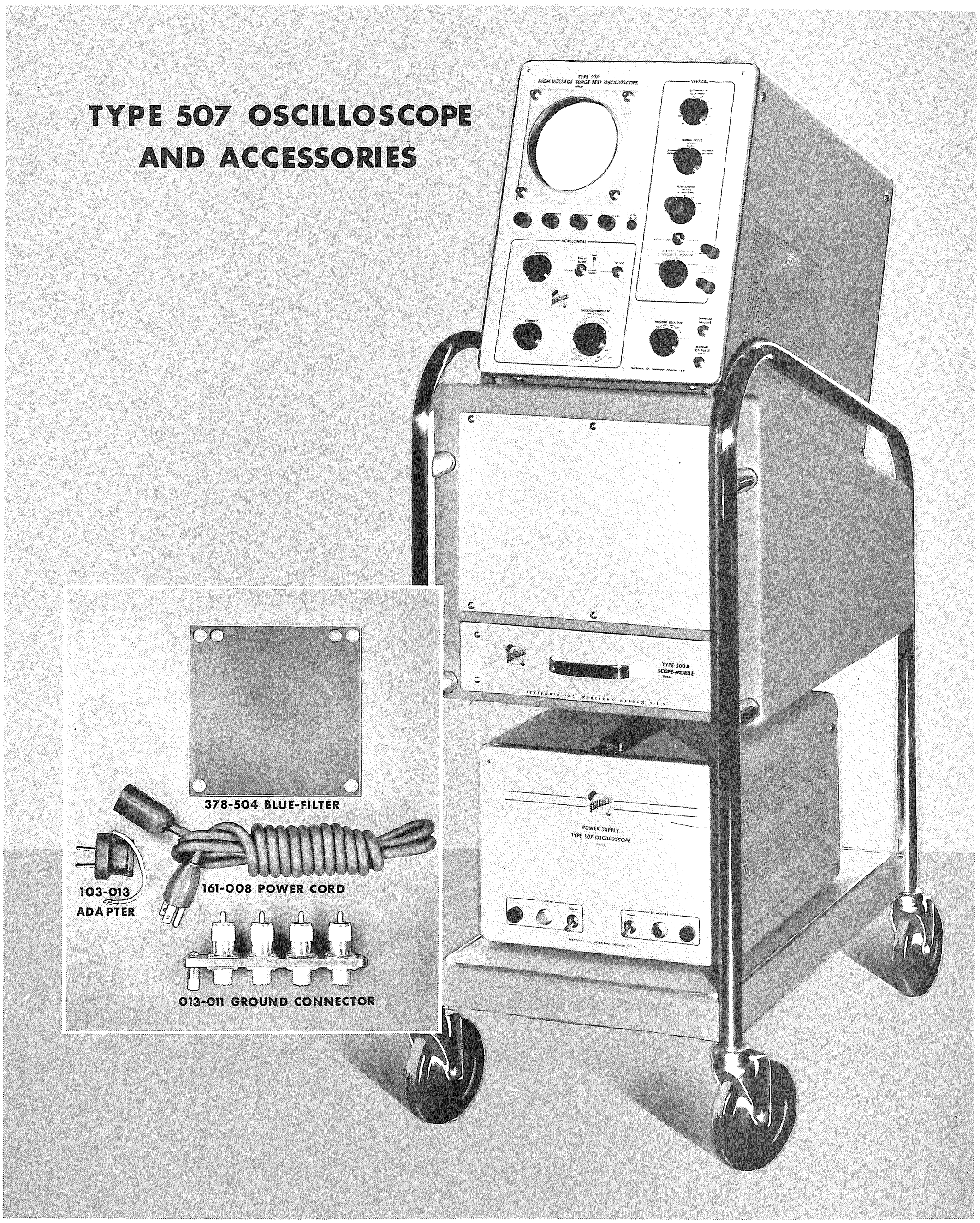
MANUFACTURERS OF CATHODE-RAY AND VIDEO TEST INSTRUMENTS

Sunset Highway and Barnes Road • P. O. Box 831 • Portland 7, Oregon, U. S. A.

Phone: CYpress 2-2611 • Cables: Tektronix

IM-507-1

TYPE 507 SERIAL NUMBER ________


TYPE 507 OSCILLOSCOPE
AND ACCESSORIES
TYPE 500A
SCOPE-MOBILE
POWER SUPPLY
TYPE 507 OSCILLOSCOPE
378-504 BLUE-FILTER
161-008 POWER CORD
103-013
ADAPTER
013-011 GROUND CONNECTOR

CONTENTS

GENERAL DESCRIPTION

The Tektronix Type 507 Oscilloscope is a specialized instrument designed primarily for high-voltage surge testing as applied to power transformers, high-voltage insulators, lighting arrestors and allied components, and their associated design and acceptance tests.

The use of a 24-kv accelerating potential on a new type cathode ray tube permits photographic recording of single sweeps at the maximum writing-rate permitted by the vertical deflection and sweep circuits. The vertical deflection system provides a risetime of approximately 5 millimicroseconds and a sensitivity of approximately 50 v/cm. An external length of delay cable can be inserted into the vertical-input signal circuit to permit viewing of the leading edge of the waveform which triggers the sweep. Time markers are available for convenient calibration of the sweep.

The Type 507 consists of two units, indicator and power supply, mounted on a Scope-Mobile, thus making a convient mobile unit. If desired, the units may be lifted off the Scope-Mobile for bench use.

VERTICAL DEFLECTION SYSTEM

Transient Response

Risetime between 10-percent and 90-percent amplitude points is about 5 millimicroseconds (.005 microseconds). A passive damping network inserted in the deflection leads is adjusted for optimum transient response without overshoot or ringing.

The maximum vertical sensitivity with a Type T507P cathode-ray tube operated at 24-kv accelerating is 50 v/cm.

Attenuator

A step attenuator with a characteristic impedance of 72 ohms is provided in the vertical-input signal circuit. The attenuator is composed of ten equal resistors of 7.2 ohms each, mounted on a tap switch. The percentage of input signal applied to the deflection plates can be selected by the tap switch from 10 percent to 100 percent in 10-percent steps.

Signal Mode

A three-position switch reverses the deflection-plate polarity; the center position of the switch is used in conjunction with a trigger-selector switch to apply markers for photographing time references.

Positioning Switch

The Type 507 has a seven-step vertical-position switch with 50-volt steps of —150 v, —100 v, —50 v, 0, +50 v, +100 v and +150 v. A separate two-position switch selects either 50-volt steps or continuously variable adjustment.

External Voltmeter Connections

Terminals are provided for a high-impedance (5000Ω/v) dc voltmeter, permitting vertical calibration when using the variable positioning.

Signal Delay

Two standard UHF connectors are provided on the rear of the instrument for insertion of an external length of delay cable into the vertical-input signal circuit. Choice of the appropriate length and type of cable is at the discretion of the user; no delay cable is furnished with the instrument. A signal delay permits the sweep to be triggered and under way before the signal is applied to the vertical deflection plates.

SWEEP CIRCUIT

Type

Triggered, hard-tube bootstrap sweep circuit with inverter to produce balanced deflection.

Rates

An eleven-position switch selects rates of .02, .05, .1, .2, .5, 1, 2, 5, 10, 20 and 50 MICROSECONDS/CM, with a maximum displacement error of 2 percent over the center 8 cm of the 10-cm sweep length.

Sweep Starting Time

The horizontal sweep starts approximately 100-mμsec after the signal or triggering pulse arrives at the rear-panel connector. An inserted signal delay of approximately 150 mμsec permits the sweep to be triggered and under way before the signal is applied to the vertical deflection plates.

Duty Cycle Limitation

A duty-cycle limiting control automatically limits the duty cycle of the sweep circuit to about 10 percent to avoid exceeding the dissipation limits of some of the circuit components. The limiting system serves purely a protective function and does not provide a frequency dividing operation.

The following table shows the maximum permissible repetition rate for each of the available sweep times per centimeter.

SWEEP TIME	MAXIMUM REPETITION RATE
50 μsec/cm	600 c/s
20 μsec/cm	1.5 kc
10 μsec/cm	3 kc
5 μsec/cm	6 kc
2 μsec/cm	10 kc
1 μsec/cm	20 kc
.5 μsec/cm	50 kc
.2 μsec/cm	50 kc
.1 μsec/cm	50 kc
.05 μsec/cm	50 kc
.02 μsec/cm	50 kc

Triggering

A triggering phase-inverter amplifier in conjunction with a selector switch permits the sweep circuit to be triggered from either positive- or negative-going portions of the observed signal, or from positive or negative triggers from an external source. A trigger voltage range of 100 volts to 3000 volts amplitude will be adequate for stable triggering. The MARKER position on the selector switch must be used when time markers are desired.

Sweep Mode

A two-position switch provides for either repetitive or single-sweep operation. When the switch is in the single-sweep position, pressing the RESET button arms the sweep circuit. The sweep can then be triggered internally, by MANUAL TRIGGER, or by an external trigger. The

MANUAL TRIGGER switch is primarily for photographing a zero reference line and any or all of the calibrated vertical position lines, to create, in effect, a parallax-free graticule.

POWER SUPPLIES

Cathode-Ray Tube Accelerating Voltage

An oil-sealed supply of the a-f oscillator type provides 24 kv (+20 kv and —4 kv) for the accelerating potentials. The —4-kv supply is regulated to compensate for load changes and line-voltage changes.

Low-Voltage Supply

A separate power unit provides regulated dc voltages for the indicator unit of +750, +475, +225 and —250 volts. The unit also provides an unregulated voltage of +360 volts for the oscillator in the high-voltage supply for the crt circuit.

Power Requirements

600 watts at 117 volts. Voltage range 105-125 or 210-250 volts, 60-cycle, single-phase ac. Two primary circuit fuses are provided for protection against sustained over-load conditions.

MISCELLANEOUS

Cathode Ray Tube

A Type T507P cahode-ray tube with P11 phosphor is furnished with the Type 507 unless another phosphor is specified.

Construction

Contained in two separate units of convenient size, normally mounted on a Tektronix Type 500A Scope-Mobile. The anodized chassis and the blue wrinkle-finished cabinets are made of an aluminum alloy. Photo-etched anodized panels are employed.

Dimensions

Indicator unit: 16-3/4" high, 13" wide, 23-5/8" deep.
Power unit: 10½" high, 13" wide, 17½"deep.

Weight

Indicator unit	50 lbs.
Power Unit	39 lbs.
Type 500A Scope-Mobile	35 lbs.

FUNCTIONS OF CONTROLS AND CONNECTORS

6.3V 1A. AC	Tip jack from heater bus.
SCALE ILLUM.	Variable resistor controlling brightness of lamps illuminating graticule over face of cathode-ray tube.
ASTIGMATISM	Potentiometer controlling the voltage at the astigmatism anode of the cathode-ray tube. Proper setting of the voltage at this anode, with respect to the deflection plates, permits the spot to be focused sharply in both dimensions simultaneously.
INTENSITY	Potentiometer controlling dc grid voltage of the cathode-ray tube and thereby the brightness of the trace.
FOCUS	Potentiometer controlling the voltage applied to the focusing anode of the cathode-ray tube for focusing the trace.

HORIZONTAL

POSITION	Twin differentially-connected potentiometer controlling average potential of cathode-ray tube horizontal deflection plates, thereby adjusting horizontal position of sweep.
SWEEP MODE	Two-position toggle switch to select either repetitive or single-sweep operation.
RESET	Button-switch arms the sweep circuit when the SWEEP MODE switch is in the SINGLE SWEEP position. The READY light indicates that a single sweep will be produced upon reception of a trigger pulse from the signal to be observed (or photographed), from an external trigger source, or from the manual-trigger circuit (obtained by depressing the MANUAL TRIGGER switch).
STABILITY	Potentiometer controlling grid bias of negative multivibrator tube. Determines optimum point of triggering.
MICROSECONDS/CM	Gang switch controlling sweep duration and sweep rate. Selects appropriate multivibrator pulse length, and sweep generator charging capacitor and resistor. Switch also selects TIME MARKERS for convenient calibration of the sweep.
TRIGGER SELECTOR	Switch selecting source and polarity of sweep-triggering voltage.
MANUAL TRIGGER	Button-switch provides manually-controlled trigger for sweep generator.
MANUAL TRIP PULSE	Button-switch provides pulse of approximately 700 volts amplitude and 5 μsec. width at TRIP PULSE OUT connector on rear panel of instrument.

VERTICAL

ATTENUATOR	Switch selects percentage of input-signal voltage applied to vertical deflection plates.
SIGNAL MODE	Three-position switch reverses deflection-plate polarity with respect to signal being observed. The center position on the switch connects the output of the Time-Mark Genrator to the vertical deflection plates.
POSITIONING 50 VOLT STEPS	Seven-position switch to control voltage at cathode-ray tube vertical deflection plates in 50-volt steps. Each position of the switch causes the beam to shift approximately 1 centimeter in the vertical plane. This switch is connected into the circuit when the toggle switch immediately below it is in the 50 VOLT STEPS position.
POSITIONING VARIABLE	Potentiometer controlling average potential of cathode-ray tube vertical deflection plates, providing continuous adjustment of vertical position of beam. This control is connected into the circuit when the toggle switch immediately below it is in the VARIABLE position.
50 VOLT STEPS VARIABLE	Toggle switch determines whether vertical positioning is continuously variable or in 50-volt steps.
VARIABLE DEFLECTION SENSITIVITY MONITOR	Switch connects arm of VARIABLE positioning control to EXTERNAL VOLTMETER connectors on front panel of instrument to monitor the variable dc positioning voltage. Polarity of voltage may be reversed.

REAR-PANEL CONNECTORS

SIGNAL IN	UHF connector to TRIGGER SELECTOR switch and to SIGNAL OUT DELAY LINE connector.
SIGNAL OUT TO DELAY LINE	UHF connector receives signal internally from SIGNAL IN connector. An external length of delay cable may be connected between this connector and the SIGNAL IN FROM DELAY LINE connector.
SIGNAL IN FROM DELAY LINE	UHF connector to vertical ATTENUATOR switch.
EXTERNAL TRIGGER INPUT	UHF connector to TRIGGER SELECTOR switch.
TRIP PULSE OUT	UHF connector to thyratron in Trip Pulse circuit to make available externally a pulse of approximately 700 volts amplitude and 5 μsec. duration.

EXTERNAL POWER SUPPLY

DC SUPPLIES POWER	ON-OFF switch on power supply unit controlling ac line voltage to primary of plate-supply transformer; pilot lamp indicates ON position.
AC HEATERS	ON-OFF switch on power supply unit for controlling ac line voltage to unit; pilot lamp indicates ON position,

CIRCUIT DESCRIPTION

SWEEP

A linear triggered sweep is available with eleven fixed, accurately timed sweeps ranging from .02 microseconds per centimeter to 50 microseconds per centimeter. The basic waveform is generated by a pentode clamp with a cathode-follower bootstrap linearity corrector. Push-pull deflection is accomplished at output level by addition of a plate-output unity-gain phase-inverter stage, shown on the Horizontal Amplifier circuit diagram.

Trigger Phase Changer

A trigger selector switch selects the source of trigger signal and V4 and V14 reverse the phase, if necessary, to provide the trigger amplifier with the required negative signal.

Trigger Limiter Amplifier

The trigger limiter stage V24 operates with zero bias. The negative pulse from the trigger inverter-amplifier drives this tube to plate-current cutoff. Choice of the proper value of quiescent plate current and the use of a plate-load resistance of low value results in a very steep positive pulse limited in amplitude to about 10 volts. This positive pulse is then used to drive V34.

Trigger Switch Tube

The resulting negative pulse at the plate of V34, coupled through the coupling diode V102 to the plate of the minus multivibrator V105, triggers the sweep.

Trigger Coupling Diode

The trigger-coupling diode V102 serves to disconnect the plate of the trigger-switch tube V34 from the plate of the negative multivibrator tube V105 when the plate voltage of V105 drops below that of V34.

Multivibrator

V105 and V115 operate as a plate-coupled monostable multivibrator for the purpose of converting a triggering pulse into a pulse of controllable duration suitable for operating the sweep generator and unblanking circuits. The SWEEP STABILITY control, by varying the bias on the grid of V105, determines the optimum point of triggering.

Duty Cycle Limiter

The duty-cycle limiting circuit is designed as a protective circuit to prevent the horizontal amplifier V324 from exceeding its dissipation rating. This is accomplished by sampling the output of the plus multi cathode-follower V133 and feeding this voltage through an integrating network (R125-C125) to the grid of the difference amplifier V116 (pentode section). A rise in the voltage at this grid forces the grid of the minus multi V105 toward cutoff which results in a multivibrator waveform shorter than normal for the sweep speed being used. Since the length of the multivibrator waveform determines the sweep length, as the duty cycle is increased the sweep length is shortened.

A compensated divider located at the grid of the triode section of V116 provides a second means of controlling the multivibrator. This circuit is not duty-cycle conscious, but rather samples the trigger lock-out circuitry. During the trigger locked-out configuration the grid of the triode section is pulled down sufficiently to lock out the multivibrator until the trigger-lockout circuit is reset.

Sweep-Trigger Lockout

When the SWEEP MODE switch is in the SINGLE SWEEP position the thyraton V49 conducts and its plate drops. This action produces two results: (1) It pulls down the grid of the triode section of V116 and switches all of the current to the pentode section. This cuts off V105 and forces the multivibrator to remain in its quiescent state; (2) It pulls down the screen of V34 through the cathode follower V63A and V34 cuts off. With V34 cut off, the triggers are prevented from reaching plate of V105 and initiating a sweep.

When the RESET button is depressed, C48 discharges and the resulting negative pulse at the plate of V49 extinguishes the thyratron. The resulting rise in voltage at the plate of the thyratron then pulls up the screen of V34 and permits this tube to conduct. It also pulls up the cathode of V63B and ignites the READY light. This indicates that the trigger circuit is now armed and the next trigger to arrive at the grid of V34 will produce a sweep.

As the multivibrator switches to its unstable state, and then reverts back to its stable state, a negative pulse is produced at the plate of V105. This pulse is differentiated in the grid circuit of V49 and the resulting positive pulse fires the thyratron; this action locks out the trigger circuit again and prevents the sweep from being started from the next trigger. Depressing the RESET button will then arm the trigger circuit again and permit one sweep to be produced upon reception of a trigger.

Manual Trigger

The sweep may be triggered manually, if desired, by depressing the MANUAL TRIGGER button. C25 is charged to about +20 volts from the divider R25-R26. When the MANUAL TRIGGER switch is depressed C25 discharges into C22, creating a negative pulse at the top of C25. The negative pulse is coupled through the diode V22 and C26 to the grid of V24 where it activates the trigger circuitry to initiate a sweep.

Sweep Generator Clamp Circuit

In the quiescent state, the parallel clamp tubes V164 and V174 conduct heavily and their plates are down. When the multivibrator is triggered, the resulting negative pulse at the plate of V105 is coupled to the grids of the clamp tubes and interrupts the flow of plate current very rapidly. The plate voltage of the clamp tubes then begins to rise at a rate determined by the charging rate of C177. This charging rate is determined by the value of C177 and R176, both of which are selected by the MICROSECONDS/CM timing switch. The small choke L162 in the grid circuit of the clamp tubes provides a 10-millimicrosecond delay to enable the unblanking circuit to reach full voltage before the sweep starts.

Bootstrap Circuit

For C177 to charge linearly rather than exponentially the voltage across the timing resistor R176, and hence the charging current, must remain constant. This action is accomplished by the sweep cathode-follower V173 and the bootstrap tubes V183-V193. The rise in voltage at the cathodes of V173, as C177 charges, pulls up the cathodes of the bootstrap tubes. This rise in voltage is coupled to the top of R176A and keeps the voltage across the timing resistor more nearly constant.

Decoupling Diode

A decoupling diode V172, in series with the +475-volt supply to the plates of the clamp tubes, offers low resistance to the quiescent plate current of the clamp tubes but disconnects the upper end of the timing resistor from the +475-volt supply when the bootstrap action raises the cathode of the diode above +475 volts.

Sweep Cathode Follower

The sweep cathode-follower V173 provides the positive-going sweep sawtooth voltage for the right-hand deflection plate in the cathode-ray tube. This stage also drives the grid of the sweep phase inverter to provide the negative-going sweep sawtooth voltage for the left-hand deflection plate.

Sweep Inverter

The phase-inverter V324 (Horizontal Amplifier diagram) operates as a unity-gain amplifier to supply the negative-going sawtooth sweep voltage to the left-hand deflection plate of the cathode ray tube. The gain of this stage is kept low by virtue of the frequency-compensated feedback network between plate and grid. V313A and V313B provide a low-impedance bias and screen voltage, respectively, for the phase-inverter tube V324.

DC Restoration

Th diodes V332A and V332B remove the accumulated charge from the sweep-coupling capacitors C324 and C325, permitting the sweep to start at the same position on the cathode-ray tube regardless of the repetition rate of the sweep.

Unblanking Amplifier

During the waiting period, between sweeps, the bias on the cathode-ray tube is such that the beam current is completely cut off. As soon as a trigger pulse appears and a sweep starts, a positive pulse of approximately 100 volts is required at the grid of the cathode-ray tube to turn the beam on. This pulse must have a very fast risetime and a very flat top to insure fast unblanking and uniform image brightness. Both conditions are accomplished by the unblanking amplifier V144-V154 and the associated cathode follower V153.

The negative pulse at the plate of the minus multivibrator V105 is coupled to the grids of the unblanking amplifier via a frequency-compensated voltage divider. The shunt-compensated plate-load impedance of the amplifier circuit produces a positive pulse having a very fast risetime. The cathode-follower circuit V153 provides a high-impedance, low-capacitance load to the amplifier, at the same time providing a low-impedance driving source for the grid of the cathode-ray tube. The cathode-follower V143 provides a low-impedance source of screen voltage for the amplifier tubes. The UNBLANKING ADJ. R146 provides a means of adjusting the screen voltage to obtain the desired 100-volt unblanking pulse.

Trip Pulse

A thyratron pulse generator produces a manually-initiated pulse at a rear-panel connector for triggering a trip-pulse generator. In the quiescent state the divider R52-R53 holds the grid of the thyratron below cutoff. When the MANUAL TRIP PULSE switch is depressed C50 charges and the positive pulse developed at the grid fires the thyratron. Since the thyratron is connected as a cathode follower, the cathode pulls up sharply to develop the output pulse of approximately 700 volts. In producing the output pulse, however, the cathode voltage approaches sufficiently close to the voltage at the plate to extinguish the thyratron and return the circuit to its quiescent state.

VERTICAL DEFLECTION SYSTEM

Since the Type 507 does not contain a vertical amplifier, the vertical defection circuit consists mainly of an attenuator and a positioning network.

The input signal is developed across the 72-ohm attenuator resistance. The desired percentage of the input signal is selected from a tap on the divider by means of the ATTENUATOR switch, from where the signal is coupled to one of the vertical-deflection plates in the cathode-ray tube. The other vertical deflection plate is connected to ground to accommodate the single-ended input signal.

When the SIGNAL MODE switch is in the EXTERNAL NORMAL position, positive-going portions of the input signal produce upward deflection in the cathode-ray tube; in the EXTERNAL REVERSED position, positive-going signals produce downward deflection. In the INTERNAL MARKER position of the switch, time markers from the Time-Mark Generator are coupled to the lower deflection plate and the upper plate is connected to ground.

Either of two positioning circuits may be connected into the vertical deflection circuit. When the toggle switch SW435 is in the 50 VOLT STEPS position, a tapped divider connected between +150 volts and —150 volts is connected into the circuit. By means of the POSITIONING switch, the positioning voltage may be selected in 50-volt steps between these two limits. Test points and adjustments are provided to accurately set the upper and lower voltage for the divider.

When SW435 is in the VARIABLE position, a continuously variable positioning control is connected into the circuit. The VARIABLE positioning control is part of a divider connected between +225 volts and —250 volts. The resistance values in the divider are such that the range of positioning voltage is about 325 volts, a bit greater than the 300-volt range provided by the 50 VOLT STEPS control. Front-panel EXTERNAL VOLTMETER connections are provided to monitor the VARIABLE positioning voltage. The VARIABLE DEFLECTION SENSITIVITY MONITOR switch may be used to reverse the voltmeter connections, or to disconnect the VARIABLE position control from the front-panel voltmeter connections if desired.

CATHODE-RAY TUBE CIRCUIT

The NE2 neon glow lamps across the INTENSITY control potentiometer and MAX. INTENSITY variable resistor maintain the INTENSITY potentiometer terminal voltage constant regardless of cathode-ray tube cathode current, thereby stabilizing the intensity adjustment.

The purpose of the MAX. INTENSITY control is to adjust the minimum grid bias setting available by the INTENSITY control to a safe value thus preventing damage to the cathode-ray tube screen in case the INTENSITY control is advanced too far.

The FOCUS control potentiometer varies the voltage at the focusing ring to focus the trace; the ASTIGMATISM control potentiometer varies the voltage at the astigmatism anode to focus the spot in both dimensions simultaneously.

The GEOM. ADJ. potentiometer varies the field as the beam emerges from the deflection system to control the linearity at the extremes of deflection.

HIGH-VOLTAGE POWER SUPPLY

All accelerating potentials for the cathode-ray tube are provided by a high-voltage supply employing an audio oscillator operating at a frequency of approximately 1500 cycles. Four high-voltage rectifier tubes in a voltage-quadrupling circuit provide +20,000 volts; a single half-wave rectifier tube provides —4000 volts. The high-voltage rectifiers, capacitors, resistors and transformers are all oil-immersed.

HIGH-VOLTAGE OSCILLATOR AND REGULATOR CIRCUIT

The screen voltage of the high-voltage oscillator V820 is regulated to maintain a constant —4000 volts of rectified output so that the deflection sensitivity of the cathode-ray tube will not be affected by line-voltage or load changes. A sample of the —4000-volt output, obtained from a tap on the divider consisting of R212 and R213, is compared to the regulated —250-volt supply through V814A. Any "error" voltage that may exist is amplified by V814A and V814B and is applied to the screen of the oscillator tube V820. This will change the output of the oscillator in a direction to compensate for the error. The —4KV ADJ. R814 controls the bias on V814A and is adjusted so that the output voltage is exactly —4000 volts. This same circuit indirectly regulates the +20,000-volt supply since the oscillator furnishes energy for both supplies.

The time-constant network associated with the V804 circuit delays the application of screen voltage to the oscillator tube slightly when the power is first turned on. This permits the oscillator circuit for the heaters (V830) to bring the heaters up to emission before the application of plate voltage in the rectifier tubes.

TIME-MARK GENERATOR

An electron-coupled Colpitts oscillator V250B is gated off and on by a free-running multivibrator circuit V225A and V225B through the cathode-follower V250A. The gated time markers are then amplified in V264 and are coupled to the cathode-ray tube vertical deflection circuit when the SIGNAL MODE switch is in the MARKER position.

The time markers are also coupled through C267 to the grid circuit of the cathode-follower V243A, where they are superimposed on the multivibrator waveform and fed to the trigger circuitry so that the sweep can be triggered by the markers when the TRIGGER SELECTOR switch is in the MARKER position. The diode V242 clamps the grid of V243A to prevent the negative pulses of the differentiated multivibrator waveform from producing a trigger.

—250-Volt Supply

The —250-volt supply employs a full-wave rectifier tube V612 and a capacitor-input filter system. The supply is regulated by comparing the voltage across V619, a gas-diode voltage-regulator tube, to that obtained from a divider connected across the output, through a comparator tube V614. The —250V ADJ. control R625 determines the percentage of total voltage that appears at the grid of V614 and thus determines the total voltage across the divider.

If line-voltage or load fluctuation tend to change the output voltage, an error signal exists between the grid and cathode of V614. The error signal is amplified by V614 and V627A. The resulting change in voltage at the plate of V627A, which will be in a direction to compensate for any change in output voltage, is coupled through the rectifier to the output to keep this voltage constant.

+225-Volt Supply

The +225-volt supply employs selenium rectifiers in a full-wave, bridge circuit. This supply is regulated by comparing to ground (the cathode of V634) the voltage of a point near ground potential obtained from the divider R644-R645 connected between the +225-volt bus and the regulated —250-volt supply. Any error signal that exists is amplified and inverted in polarity by V634 and coupled through the paralleled cathode-followers V647A, V647B and V627B to the output to prevent the output voltage from changing. C644 improves the response of the circuit to sudden changes in output voltage. This supply also provides a +360-volt unregulated output for the oscillator tube in the high-voltage supply.

A small sample of the unregulated bus ripple appears at the screen of V634 through R637. This produces a ripple component at the grids of the cathode followers that is opposite in polarity to the ripple appearing at the plates, and tends to cancel the ripple at the cathodes and hence on the +225-volt bus. This same circuit also improves the regulation in the presence of line-voltage variations.

+475-Volt Supply

Rectified voltage from terminals 9 and 10 of the power transformer is added to the voltage supplying the +225-volt regulator to supply power for the +475-volt regulator. The regulator circuit of this supply functions in the same manner as that of the +225-volt supply.

+750-Volt Supply

A full-wave rectifier V672 is employed in the +750-volt supply. The rectified output of this tube is added to voltage supplying the +475-volt regulator to supply power for this supply.

This supply is regulated by comparing to the regulated +475-volt bus (the cathode of V674) a voltage near +475 volts obtained from the divider R684-R685 connected between the +750-volt bus and ground. Any error signal is amplified by V674 and is applied to the grid of the cathode-follower V687. The cathode of V687 then acts to prevent the voltage on the +750-volt bus from changing.

MAINTENANCE

PREVENTIVE MAINTENANCE

Ventilation

Care must be taken to assure free ventilation of both units inasmuch as some of the components are operated at dissipation levels such that excessive temperatures will result without adequate air circulation.

To assure free passage of air the units should be placed so that the air intakes are not blocked by other apparatus or furniture, and the filters should be kept clean.

Washable "E-Z KLEEN" air filters are used at the air intake ports of both units. The following filter cleaning instructions are given by the filter manufacturer:

(1) If grease or dirt load is light, remove filter from installation and flush dirt or grease out of filter with a stream of hot water or steam.

(2) If load is too heavy for treatment in (1) above, prepare mild soap or detergent solution in pan or sink deep enough to cover filter when laid flat. Agitate filter up and down in this solution until grease or dirt is loosened and carried off filter.

(3) Rinse filter and let dry.

(4) Dip or spray filter with fresh Filter Coat, or other approved adhesive. Filter Coat is available from local representative of Research Products Corp. in the one-pint Handi-Koater with spray attachment or one-gallon and five-gallon containers.

Transformer Connections

Unless we are instructed otherwise we ship the Type 507 Oscilloscope connected for 105 to 125 volts, 50 to 60 cycles ac. However, provisions are made for easy conversion to operation at 210 to 250 volts, 50 to 60 cycles. The three transformers T601, T602 and T701 are provided with split input windings which are normally connected in parallel for 117-volt operation, but which can easily be connected in series for 234-volt operation. Each of these split windings terminates in a nest of four terminal lugs arranged in a square on a bakelite terminal board, on the underside of the chassis, and are numbered 1, 2, 3 and 4 in clockwise rotation.

Terminals 1 and 3 are connected to one winding, and terminals 2 and 4 are connected to the second winding. The ac input leads are connected to terminals 1 and 4 whether for 117-volt or 234-volt operation, so that these leads do not have to be moved when conversion is made from one to the other operating input-voltage level.

When wired for 117-volt operation terminals 1 and 2 are joined by a bare bus wire, and terminals 3 and 4 are similarly joined. To convert to 234-volt operation, remove the bare bus wires between these terminals and substitute a single connecting wire between terminals 2 and 3.

The fuses mounted at the front of the Power Unit should be changed to accommodate the reduction in input current. Refer to the circuit diagram for the correct rating of fuses to be used for either 117-volt or 234-volt operation.

ANALYZING TROUBLE

A good percentage of the troubles that occur are likely to be found in the tubes and it is therefore advisable to check tubes before extensive tests are made on other components. Tube checks should preferably be made by direct substitution. Tube failures may result in failure of other components or may be caused by failure of other components so that it is advisable to examine all components associated with an offending tube.

CAUTION: VOLTAGES HIGH ENOUGH TO BE DANGEROUS ARE PRESENT AT SEVERAL PLACES IN THIS INSTRUMENT, AND INASMUCH AS MAINTENANCE MUST BE PERFORMED WITH

THE POWER CIRCUITS ENERGIZED, THE UTMOST CAUTION MUST BE OBSERVED. BOTH THE +750-VOLT AND THE +475-VOLT SUPPLIES ARE POTENTIALLY MORE DANGEROUS THAN THE 4-KV AND 20-KV SUPPLIES. THE +750-VOLT AND THE +475-VOLT SUPPLIES HAVE MUCH LOWER INTERNAL IMPEDANCE. USE ONLY INSULATED TOOLS. STAND ON A DRY FLOOR AND DO NOT LEAN WITH THE BARE ARMS ON THE FRAMEWORK OF THE INSTRUMENT. IF POSSIBLE, KEEP ONE HAND IN YOUR POCKET.

Fuses

The fuses located on the front panel of the power supply provide over-current protection. If the DC SUPPLIES fuse blows, the first step in locating the trouble should be to determine whether the trouble is in the power unit or the indicator unit. This can be determined by disconnecting the inter-unit power cable. If a new fuse blows with the cable disconnected, the trouble is in the power unit and the usual types of checks for capacitor failure and tube shorts should be made until the trouble is isolated.

If the fuse does not blow except when the inter-unit cable is connected, however, the trouble is likely to be found in the indicator unit. In this case, first measure the resistance to ground at each dc voltage bus to determine if any are below 15,000 ohms. The dc voltage buses can be located at the plugs which connect to the inter-unit cable as follows:

Pin 1	+750 volts
Pin 2	+475 volts
Pin 3	+360-volt unregulated
Pin 4	+225-volts
Pin 8	—250 volts

If no low-resistance circuits are found to exist, it is possible there is a type of tube short that occurs only when both heater and plate volatges are applied. By lifting individual bus wires from the power plug in the indicator unit, and turning the power on the offending circuit can be isolated to one drawing current from one of the regulated supplies. Then, by tracing the color-coded bus wire, or by referring to the circuit diagram, the circuits drawing current from this supply can be determined and you can then troubleshoot in these circuits until the one at fault is identified.

If the regulated voltages are off in value, look for trouble in the power supply. If all voltages are off in value look for trouble in the —250-volt supply to which all other supplies are compared. If all voltages are low V612 may be low in emission or V619 may not be conducting. If all voltages are high V619 may be shorted, in which case the —250-volt bus should indicate about —350 volts.

If individual voltages are off check the voltage at the plate of the series regulator tube involved for evidence of low cathode emission. Check the resistance and voltage at the grid of the reference tube for evidence of failure in the voltage divider.

Sweep

If a spot can be made to appear at left center under normal operating conditions, but no sweep occurs advance the STABILITY control full clockwise. If a sweep occurs with this control adjustment, the difficulty may be in the trigger circuit. Turn the TRIGGER SELECTOR to MARKER and the SIGNAL MODE switch to INTERNAL MARKER; then back off on the STABILITY control and attempt to trigger the sweep rather than permit it to free run. If the sweep can be triggered by the internal marker, but you were not able to trigger the sweep with an external trigger or by the signal, then check for failure of the divider at the SIGNAL IN or EXTERNAL TRIGGER INPUT connectors.

If the sweep can not be triggered by the marker generator, measure the amplitude of the multivibrator waveform at the cathode of V243A with another oscilloscope. The peak-to-peak amplitude of the multivibrator waveform (not that of the superimposed markers) should be about 5 volts at this point. If adequate output is obtained, look for low gain in the trigger amplifier.

Cathode-Ray Tube Power Supply

In case of failure of the 20-kv power supply, determine whether the oscillators supplying ac input voltage to the high-voltage and filament supplies are functioning properly. This can be determined by measuring the dc grid voltages of the two oscillator tubes using 20,000-Ω/v meter. The voltage at the grid of V820 should be about —27 volts, and the voltage at the grid of V830 should be about —23 volts. Or alternately, the ac voltages may be observed on another oscilloscope.

If it is determined that failure has not occured in the oscillator circuits, it is recommended that your Tektronix field engineer be consulted in regard to repair of the supply in the nearest Tektronix field maintenance office.

ADJUSTMENT

1. Power Supply Unit

—250 VOLTS: Connect voltmeter to pin 8 of power plug on underside of power unit or on underside of indicator unit. Adjust R625 labeled —250 V ADJ. as accurately as possible.

NOTE: Be sure your meter is accurate; many portable voltmeters are in error by as much as three percent.

2. Cathode-Ray Tube Voltage Supply

—4 KV: Turn INTENSITY control full counterclockwise. Connect 20,000-Ω/v voltmeter to ungrounded end of C841 (the junction of C841, C840 and R840, located in the vicinity of the four high-voltage neon glow lamps, near the panel supporting the —4 KV ADJ., GEOM. ADJ. and MAX. INTENSITY controls). Make sure your voltmeter is set for negative polarity and to the proper scale. Adjust R814 labeled —4 KV ADJ. as accurately as possible.

3. Cathode-Ray Tube Intensity

Maximum intensity is adjusted by means of R851 labeled MAX. INTENSITY. Turn STABILITY control full counterclockwise and INTENSITY control full clockwise; adjust R851 until a spot just appears on the screen.

4. Cathode-Ray Tube Unblanking

Set the MICROSECONDS/CM control to 10, turn STABILITY control full counterclockwise, and connect a 20,000-Ω/v voltmeter across R154, the plate-load resistor for V144 and V154. R154 is the large 25-watt resistor located near the panel that supports the DUTY CYCLE LIMITED and UNBLANKING controls. Adjust R146, labeled UNBLANKING, for 100-volt drop across R154. The UNBLANKING adjustment controls the screen voltage of V144 and V154 to adjust their plate current.

Remove the voltmeter leads from R154, set the MICROSECONDS/CM control to 2 and turn the STABILITY control full clockwise. Connect the probe from another oscilloscope to the cathode of V153, and adjust L154 (next to R154) for maximum overshoot at the leading edge of the positive pulses displayed; this will occur when L154 is adjusted for maximum inductance.

5. Cathode-Ray Tube Geometry Adjust

The operating voltages required for best linearity at the extremes of deflection may vary somewhat between cathode-ray tubes. The GEOM. ADJ. control R861 accommodates this variation.

Free run the sweep by turning the STABILITY control full clockwise, and position the trace to the top line of the graticule. Adjust the GEOM. ADJ. control for best linearity. Position trace at bottom of graticule and check linearity; a compromise setting of the GEOM. ADJ. control may be necessary for best overall linearity.

6. Sweep Duty Cycle Limit

Set the MICROSECONDS/CM switch to 2 and free run the sweep by turning the STABILITY control full clockwise; set the SIGNAL MODE switch to EXTERNAL NORMAL. Connect the probe from another oscilloscope to the cathode of V133, and adjust the test oscilloscope for a sweep speed of 50 μsec/division. Adjust the DUTY CYCLE LIMITED control R137 so that the duration between pulses, on the crt of the test oscilloscope, is about ten times the pulse duration. Jitter in the right hand pulse displayed on the test oscilloscope is normal, since the sweep is free running rather than triggered.

Set the MICROSECONDS/CM control on the Type 507 to .05, and adjust the sweep speed of the test oscilloscope so that the positive pulse of the displayed square wave is approximately 10 centimeters (or divisions) in length. At this fast sweep rate the rise and fall of the positive pulse will be spread out considerably; make the 10-centimeter (or divisions) measurement from the start of the rise to the start of the fall. Then turn the MICROSECONDS/CM switch to .02 and adjust C112L, located on the MICROSECONDS/CM switch, for a 9-centimeter (or division) length of the positive pulse.

7. Time-Mark Generator

Before adjusting the timing of the markers or the sweep circuit (next step), be sure the power supply voltages are correct. Also make sure the the instrument is thoroughly warmed up; heaters should be on thirty minutes and plate voltage should be on for five minutes before any adjustments are made.

To adjust the timing of the markers another **accurately-timed** oscilloscope is required; preferably one with a fast enough sweep so that there is a calibrated rate of .05 microseconds/division. Any Tektronix oscilloscope of the 530, 540 or 550 series, or the Type 517 oscilloscope, may be employed for this purpose.

Set the SIGNAL MODE switch to the INTERNAL MARKER position, and set the MICROSECONDS/CM switch to the 10 μSEC marker position. Connect the probe of the test oscilloscope to the junction of C267 and C268, and adjust the test oscilloscope for a triggered sweep rate of 10 microsconds/division. Adjust L258A for one marker per division on the test oscilloscope. L258A is one in a row of four coils located next to the MICROSECONDS/CM switch near the front panel; L258A is the coil furthest from the front panel.

Set the MICROSECONDS/CM switch to one of the 5 μSEC marker positions, and adjust the test oscilloscope for a sweep speed of 5 microseconds/division. Adjust L258E, located just ahead of L258A, for one marker per division.

Set the MICROSECONDS/CM switch to one of the .5 μSEC marker positions, and adjust the test oscilloscope for a sweep speed of 5 microseconds/division. Adjust L258J, located just ahead of L258E, for one marker per division.

Set the MICROSECONDS/CM switch to one of the .05 μSEC. marker positions, and adjust the test oscilloscope for a sweep speed of .05 microseconds/division. In those oscilloscopes having a HF SYNC mode, it may be more convenient to operate in this mode with a synchronized sweep than to trigger the sweep. Adjust L258N for one marker per division.

With the set up unchanged from the previous step, adjust L253 and L264 for maximum amplitude of the displayed pulses. L264 tunes very sharply and its adjustment is critical; L253 is broadly tuned and will have less affect on the pulse amplitude.

8. Sweep Timing

To adjust the timing of the sweeps, display the time markers on thee cathode-ray tube of the 507 by setting the SIGNAL MODE switch to the INTERNAL MARKER position and the TRIGGER SELECTOR switch to the MARKER position. For each setting of the MICROSECONDS/CM control listed in the following table it may be necessary

MICROSECONDS/CM CONTROL	ADJUST	ADJUST FOR
2	*C177E for timing *R304 for linearity	4 markers/cm
.02	**C303 for linearity **C177L for timing	4 cycles/10 cm.
.05	C177K	1 cycle/cm
.1	C177J	2 cycles/cm
.2	C177H	4 cycles/cm
.5	C177G	1 marker/cm
1	C177F	2 markers/cm
2	Recheck settings listed above	
5	R176J	1 marker /cm
10	R176G	2 markers/cm
20	R176E	4 markers/cm
50	R176C	5 markers/cm or 1 marker/minor division

***C177E and R304 interact; it will be necessary to work back and forth between these two adjustments for best results.**

****C177L and C303 interact; it will be necessary to work back and forth between these two adjustments for best results.**

to slightly readjust the STABILITY and INTENSITY controls to obtain a stable display of the markers with suitable brightness. The timing of the high-speed sweeps is adjusted by means of the timing capacitors C177E to C177L located on the timing switch; the linearity of the faster sweeps is adjusted by means of C303 located on the black bakelite panel near the neck pins of the cathode-ray tube. The timing of the slower sweeps is adjusted by means of the timing resistors R176C to R176J, located on the brown bakelite panel alongside the timing switch. The linearity of the slower sweeps is adjusted by means of the LOW FREQ. COMP. control R304, located on the back bakelite panel opposite C303.

Before retiming the sweep, make sure the timing of the time-markers is accurate (see step 7) and that the instrument is thoroughly warmed up. For best results the sweep should be timed in the sequence indicated in the table.

9. Vertical Positioning Voltage

Connect a voltmeter to the +150-volt test point and adjust the +150 V POS CAL control R418 for exactly +150 volts; then connect the voltmeter to the —150-volt test point and adjust the —150 V POS CAL control R421 for exactly —150 volts. These two controls inter-act so it will be necessary to work back and forth between the two controls to obtain the proper setting of each.

10. Vertical High-Frequency Compensation

The series inductor L413 and the shunt capacitor C445 are adjusted at the factory to obtain optimum risetime characteristics in the vertical deflection circuit. These controls will normally require no further adjustments.

TYPE 507
PARTS LIST CORRECTIONS

F601	change to	3 amp	SLO-BLO				159-015
F602	change to	5 amp	SLO-BLO				159-006

CAPACITORS

C114	change to	20 µf	EMC	Fixed	500 v	290-147
C114B	remove					
C177M	change to	12 pf	Cer	Fixed	500 v	
				plus or minus 1.2pf		281-505
C190	should read	C190B				
C191	remove					
C195	remove					
C273	change to	.01 µf	Discap	Fixed	500v	283-002
C701	add	.1 µf	Discap	Fixed	500v	283-008
C703	add	.1 µf	Discap	Fixed	500v	283-008
C705	add	.1 µf	Discap	Fixed	500v	283-008
C707	add	.1 µf	Discap	Fixed	500v	283-008
C713	remove					
C840	change to	.001 µf	Discap	Fixed	500v	283-000
C857	add	.02 µf	Discap	Fixed	600v	283-006
C859	add	.0068 µf	PTM	Fixed	5000v	285-509
C860	add	.0068 µf	PTM	Fixed	5000v	285-509

INDUCTORS

L154 change to 6.5-13 µh Var 114-023

RESISTORS

R1	change to	150 Ω	2w	Fixed	Comp	10%	306-151
R50	remove						
R54	change to	220 Ω	1/2w	Fixed	Comp	10%	302-221
R172	remove						
R190	add	600 Ω	10w	Fixed	WW	5%	308-148
R191	change to	470 Ω	2w	Fixed	Comp	10%	306-471
R196	change to	40 Ω	10w	Fixed	WW	5%	308-012
R198	change to	470 Ω	1w	Fixed	Comp	10%	304-471
R285	add	22 Ω	1/2w	Fixed	Comp	10%	302-220
R336	change to	2X220k	2w	Var	Comp	HORIZ POS	311-031
R601	should read	C610					

SWITCHES

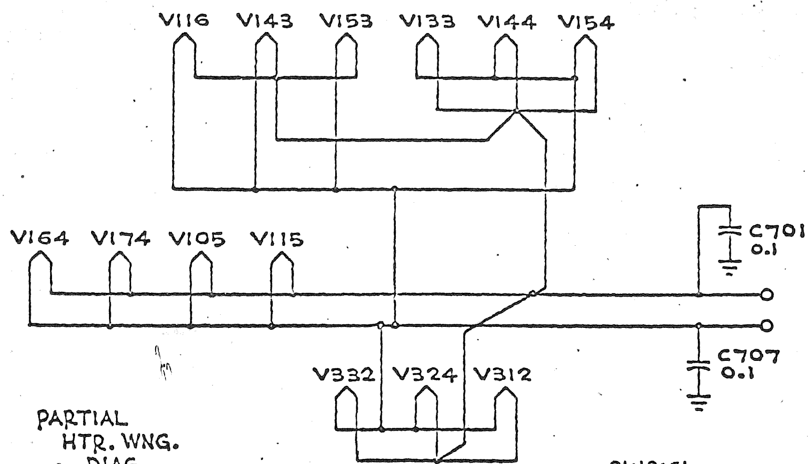
SW405 change to ATTENUATOR unwired 260-214, wired 262-169

SELENIUM RECTIFIERS CHANGED TO SILICON RECTIFIERS

SR630	change to	D632	A,B,C,D Silicon Diode	152-023
SR650	change to	D652	A,B,C,D Silicon Diode	152-023

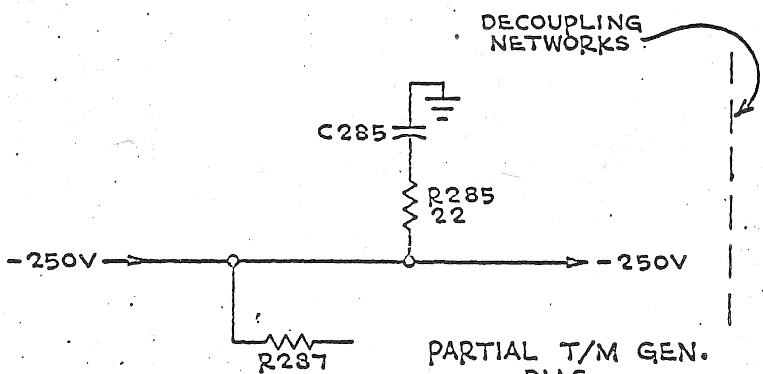
VACUUM TUBES

V859 change to T507P11 154-137



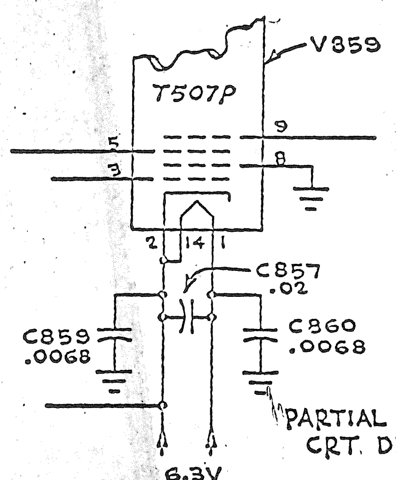
PARTIAL
HTR. WNG.
DIAG.

01·10·61
TP



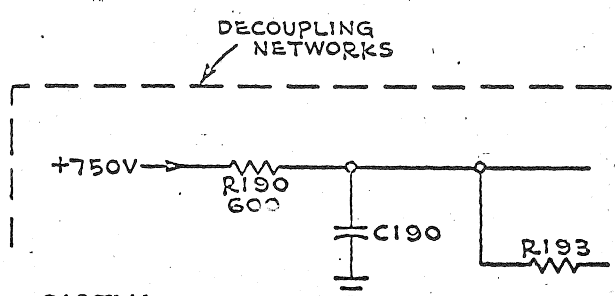
PARTIAL T/M GEN.
DIAG.

01·10·61
TP



PARTIAL
CRT. DIAG

01·10·61
TP



PARTIAL
SWP. GEN.
DIAG.

01·10·61
TP

TYPE 515 MOD. 2812
Effective s/n 6131

TYPE 507 MOD. 2814
Effective s/n 221

C743	changed to	.001	5000 v	Cer.	Fixed	283-021
C840	changed to	.001	500 v	Cer.	Fixed	283-000

FIND IT NECESSARY TO ORDER THESE STRIPS FOR REPLACEMENT, BE SURE TO CONSULT THIS SHEET. INCLUDE A DESCRIPTION OF THE PART, PART NUMBER, INSTRUMENT TYPE AND SERIAL NUMBER.

CERAMIC STRIP PARTS LIST

	PART NUMBER
STUD, CLIP, MOLDED NYLON	355—046
SPACER, MOLDED NYLON, 5/32" HEIGHT	361—007
SPACER, MOLDED NYLON, 1/4" HEIGHT	361—008
SPACER, MOLDED NYLON, 3/8" HEIGHT	361—009
CERAMIC STRIP, 7/16" BY 3 NOTCHES	124—092
CERAMIC STRIP, 7/16" BY 5 NOTCHES	124—093
CERAMIC STRIP, 7/16" BY 7 NOTCHES	124—094
CERAMIC STRIP, 7/16" BY 9 NOTCHES	124—095
CERAMIC STRIP, 7/16" BY 11 NOTCHES	124—106
CERAMIC STRIP, 3/4" BY 1 NOTCH	124—100
CERAMIC STRIP, 3/4" BY 2 NOTCHES	124—086
CERAMIC STRIP, 3/4" BY 3 NOTCHES	124—087
CERAMIC STRIP, 3/4" BY 4 NOTCHES	124—088
CERAMIC STRIP, 3/4" BY 7 NOTCHES	124—089
CERAMIC STRIP, 3/4" BY 9 NOTCHES	124—090
CERAMIC STRIP, 3/4" BY 11 NOTCHES	124—091

MODIFICATION NOTICE

CLIP-MOUNTED CERAMIC STRIPS

YOUR INSTRUMENT MAY BE EQUIPPED WITH CLIP—MOUNTED CERAMIC STRIPS. IF YOU FIND IT NECESSARY TO ORDER THESE STRIPS FOR REPLACEMENT, BE SURE TO CONSULT THIS SHEET. INCLUDE A DESCRIPTION OF THE PART, PART NUMBER, INSTRUMENT TYPE AND SERIAL NUMBER.

CERAMIC STRIP PARTS LIST

	PART NUMBER
STUD, CLIP, MOLDED NYLON	355—046
SPACER, MOLDED NYLON, 5/32" HEIGHT	361—007
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SPACER, MOLDED NYLON, 3/8" HEIGHT	361—009
CERAMIC STRIP, 7/16" BY 3 NOTCHES	124—092
CERAMIC STRIP, 7/16" BY 5 NOTCHES	124—093
CERAMIC STRIP, 7/16" BY 7 NOTCHES	124—094
CERAMIC STRIP, 7/16" BY 9 NOTCHES	124—095
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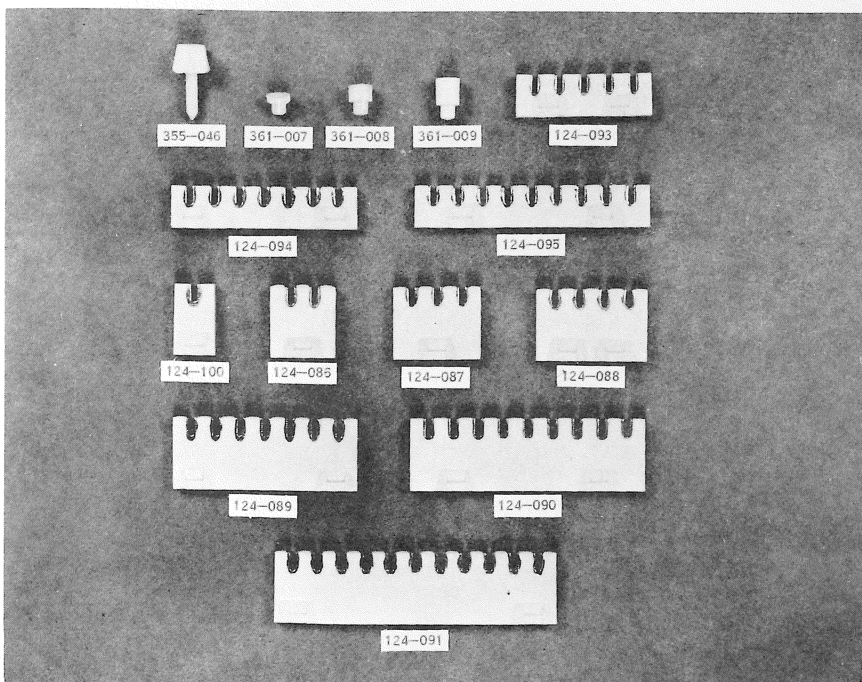
CERAMIC STRIP, 3/4" BY 1 NOTCH	124—100
CERAMIC STRIP, 3/4" BY 2 NOTCHES	124—086
CERAMIC STRIP, 3/4" BY 3 NOTCHES	124—087
CERAMIC STRIP, 3/4" BY 4 NOTCHES	124—088
CERAMIC STRIP, 3/4" BY 7 NOTCHES	124—089
CERAMIC STRIP, 3/4" BY 9 NOTCHES	124—090
CERAMIC STRIP, 3/4" BY 11 NOTCHES	124—091



CERAMIC STRIPS AND MOUNTINGS USED IN TEKTRONIX EQUIPMENT.

PARTS LIST

For an explanation of the abbreviations used in this parts list, see the indexed sheet marked ABBREVIATIONS.

Bulbs

			Tektronix Part Number
B65	Neon, Type NE-2	READY	150-002
B155	Neon, Type NE-2		150-002
B601	Incandescent, #47	AC POWER	150-001
B602	Neon, Type NE-51		150-003
B701	Incandescent, #47	Graticule Light	150-001
B702	Incandescent, #47	Graticule Light	150-001
B840	Neon, Type NE-2		150-002
B841	Neon, Type NE-2		150-002
B842	Neon, Type NE-2		150-002
B843	Neon, Type NE-2		150-002

Fuses

F601	3 amp	159-015
F602	5 Amp	159-006

Capacitors

C9	47 μμf	Cer.	Fixed	500 v	±9.4 μμf	281-518
C10	.01 μf	Cer.	Fixed	500 v		283-002
C11	.01 μf	Cer.	Fixed	500 v		283-002
C13	.1 μf	Manufactured by Tektronix				285-556
C20	.01 μf	Cer.	Fixed	500 v		283-002
C22	.02 μf	Cer.	Fixed	150 v		283-004
C25	.001 μf	Cer.	Fixed	500 v		283-000
C26	270 μμf	Cer.	Fixed	500 v	10%	281-543
C29	6.25 μf	EMT	Fixed	300 v		290-000
C30	47 μμf	Cer.	Fixed	500 v	±9.4 μμf	281-518
C34	.005 μf	Cer.	Fixed	500 v		283-001
C47	100 μμf	Cer.	Fixed	350 v	±20 μμf	281-523
C48	.01 μf	Cer.	Fixed	500 v		283-002
C50	.01 μf	Cer.	Fixed	500 v		283-002
C54	.5 μf	PBT	Fixed	1000 v		285-538
C55	.001 μf	PTM	Fixed	1,000 v		285-502
C57	.01 μf	Cer.	Fixed	1,000 v		283-013
C104A,B	2x20 μf	EMC	Fixed	450 v		290-037
C108	12 μμf	Cer.	Fixed	500 v	±0.6 μμf	281-508
C112A	.01 μf	PTM	Fixed	600 v		285-511
C112B	.0039 μf	Mica	Fixed	500 v	5%	283-531
C112C	.002 μf	Mica	Fixed	500 v	5%	283-529
C112D	.001 μf	Mica	Fixed	500 v	5%	283-527
C112E	500 μμf	Mica	Fixed	500 v	5%	283-523
C112F	250 μμf	Mica	Fixed	500 v	5%	283-543
C112G	100 μμf	Mica	Fixed	500 v	5%	283-506

Capacitors *(continued)*

						Tektronix Part Number
C112H	47 μμf	Mica	Fixed	500 v	5%	283-501
C112J	27 μμf	Cer.	Fixed	500 v	±2.7 μμf	281-512
C112K	12 μμf	Cer.	Fixed	500 v	±1.2 μμf	281-505
C112L	4.5-25 μμf	Cer.	Var.	500 v		281-010
C114	20 μf	EMC	Fixed	450 v		290-037
C114B	20 μf	EMC	Fixed	450 v		290-036
C116	100 μμf	Cer.	Fixed	350 v	±20 μμf	281-523
C125	.01 μf	Cer.	Fixed	500 v		283-002
C130	47 μμf	Cer.	Fixed	500 v	±9.4 μμf	281-518
C141	47 μμf	Cer.	Fixed	500 v	±9.4 μμf	281-518
C143	6.25 μf	EMT	Fixed	300 v		290-000
C160	47 μμf	Cer.	Fixed	500 v	±9.4 μμf	281-518
C171A,B	2x15 μf	EMC	Fixed	350 v		290-034
C172	1 μf	PBT	Fixed	600 v		285-541
C177A	.0022 μf	Mica	Fixed	500 v	10%	283-530
C177B	750 μμf	Mica	Fixed	500 v	5%	283-524
C177C	360 μμf	Mica	Fixed	500 v	5%	283-519
C177D	150 μμf	Mica	Fixed	500 v	10%	283-544
C177E	7-45 μμf	Cer.	Var.	500 v		281-012
C177F	7-45 μμf	Cer.	Var.	500 v		281-012
C177G	7-45 μμf	Cer.	Var.	500 v		281-012
C177H	7-45 μμf	Cer.	Var.	500 v		281-012
C177J	7-45 μμf	Cer.	Var.	500 v		281-012
C177K	7-45 μμf	Cer.	Var.	500 v		281-012
C177L	7-45 μμf	Cer.	Var.	500 v		281-012
C177M	12 μμf	Cer.	Fixed	500 v	±1.2 μμf	281-506
C184	.1 μf	Manufactured by Tektronix				285-556
C188	.1 μf	Manufactured by Tektronix				285-556
C190	.5 μf	PBT	Fixed	1,000 v		285-538
C191	80 μf	EMC	Fixed	500 v		290-058
C194	.001 μf	PTM	Fixed	1,000 v		285-502
C195	80 μf	EMC	Fixed	500 v		290-058
C198	2x15 μf	EMC	Fixed	350 v		290-056
C201	.0047 μf	PTM	Fixed	6,000 v		285-507
C202	.0047 μf	PTM	Fixed	6,000 v		285-507
C203	.0047 μf	PTM	Fixed	6,000 v		285-507
C204	.0047 μf	PTM	Fixed	6,000 v		285-507
C205	.0047 μf	PTM	Fixed	6,000 v		285-507
C206	.0047 μf	PTM	Fixed	6,000 v		285-507
C207	.0047 μf	PTM	Fixed	6,000 v		285-507
C208	.0047 μf	PTM	Fixed	6,000 v		285-507
C209	.0047 μf	PTM	Fixed	6,000 v		285-507
C210	.0047 Pf	PTM	Fixed	6,000 v		285-507
C211	.0047 μf	PTM	Fixed	6,000 v		285-507
C214	.0068 μμf	PTM	Fixed	5,000 v		285-509

Capacitors *(continued)*

						Tektronix Part Number
C215	.0068 μf	PT	Fixed	5,000 v		285-509
C216	.0068 μf	PT	Fixed	5,000 v		285-509
C217	.0068 μf	PT	Fixed	5,000 v		285-509
C221	.1 μf	Manufactured	by Tektronix			285-556
C221A	.002 μf	Mica	Fixed	500 v	5%	283-529
C221E	200 μμf	Mica	Fixed	500 v	5%	283-511
C221J	22 μμf	Cer.	Fixed	500 v	±2.2 μμf	281-511
C231A	.002 μf	Mica	Fixed	500 v	5%	283-529
C231E	200 μμf	Mica	Fixed	500 v	5%	283-511
C231J	22 μμf	Cer.	Fixed	500 v	±2.2 μμf	281-511
C240	10 μμf	Cer.	Fixed	500 v	±.5 μμf	281-504
C241	10 μμf	Cer.	Fixed	500 v	±.5 μμf	281-504
C250	.01 μf	Cer.	Fixed	500 v		283-002
C256	22 μμf	Cer.	Fixed	500 v	±4.4 μμf	281-510
C258A	.01 μf	PTM	Fixed	600 v		285-511
C258B	.022 μf	PTM	Fixed	600 v		285-516
C258E	.002 μf	Mica	Fixed	500 v	5%	283-529
C258F	.006 μf	Mica	Fixed	500 v	±5%	283-546
C258J	200 μμf	Mica	Fixed	500 v	5%	283-511
C258K	470 μμf	Mica	Fixed	500 v	10%	283-522
C260	47 μμf	Cer.	Fixed	500 v	10%	281-518
C266	.1 μf	Manufactured	by Tektronix			285-556
C267	4.7 μμf	Cer.	Fixed	500 v	±1 μμf	281-501
C268	.01 μf	Cer.	Fixed	500 v		283-002
C273	.01 μf	Cer.	Fixed	150 v		283-003
C281A,B	2x20 μf	EMC	Fixed	450 v		290-037
C285	2x15 μf	EMC	Fixed	350 v		290-056
C287	2x15 μf	EMC	Fixed	350 v		290-056
C301	7 μμf	Cer.	Fixed	500 v	±0.25 μμf	281-502
C303	4.5-25 μμf	Cer.	Var.	500 v		281-010
C306	.001 μf	Cer.	Fixed	500 v		283-000
C313	.01 μf	Cer.	Fixed	500 v		283-002
C317	.01 μf	Cer.	Fixed	500 v		283-002
C318	.01 μf	Cer.	Fixed	500 v		283-002
C324	.01 μf	Cer.	Fixed	500 v		283-002
C325	.01 μf	Cer.	Fixed	500 v		283-002
C332	.01 μf	Cer.	Fixed	500 v		283-002
C339	.01 μf	Cer.	Fixed	500 v		283-002
C413	.01 μf	Cer.	Fixed	500 v		283-002
C442	.01 μf	PTM	Fixed	600 v		285-511
C445	0.7-3 μμf	Tub.	Var.	500 v		281-027
C448	6.25 μf	EMT	Fixed	300 v		290-025
C449	6.25 μf	EMT	Fixed	300 v		290-025
C610A,B	2x20 μf	EMC	Fixed	450 v		290-036
C619	.01 μf	PTM	Fixed	400 v		285-510

Capacitors *(continued)*

						Tektronix Part Number
C628	.01 μf	PTM	Fixed	400 v		285-510
C630	125 μf	EMC	Fixed	350 v		290-052
C631	125 μf	EMC	Fixed	350 v		290-052
C632	125 μf	EMC	Fixed	350 v		290-052
C644	.01 μf	Cer.	Fixed	500 v		283-002
C650	125 μf	EMC	Fixed	350 v		290-044
C651	125 μf	EMC	Fixed	350 v		290-044
C664	.01 μf	PTM	Fixed	400 v		285-510
C670	125 μf	EMC	Fixed	350 v		290-044
C684	.01 μf	PTM	Fixed	400 v		285-510
C713	.01 μf	Cer.	Fixed	500 v		283-002
C804	.25 μf	PTM	Fixed	600 v		285-534
C810	.022 μf	PTM	Fixed	400 v		285-515
C811	2x20 μf	EMC	Fixed	450 v		290-036
C813	.1 μf	PTM	Fixed	600 v	20%	285-526
C817	6.25 μf	EMT	Fixed	300 v		290-000
C820	.01 μf	PTM	Fixed	400 v		285-510
C821	.01 μf	PTM	Fixed	400 v		285-510
C822	.047 μf	PTM	Fixed	600 v		285-520
C830	6.25 μf	EMT	Fixed	300 v		290-000
C831	2x15 μf	EMC	Fixed	350 v		290-056
C833	.01 μf	PTM	Fixed	400 v		285-510
C834	.022 μf	PTM	Fixed	600 v		285-516
C840	.001 μf	PTM	Fixed	3000 v		285-503
C841	.0068 μf	PTM	Fixed	5000 v		285-509
C855	.0068 μf	PTM	Fixed	5000 v		285-509
C861	.01 μf	Cer.	Fixed	500 v		283-002
C866	.01 μf	Cer.	Fixed	500 v		283-002

Inductors

L115	22 μh	Fixed	108-150
L142	280 μh	Fixed	108-015
L154	6.3-13 μh	Var.	114-023
L162	7.1 μh	Fixed	108-020
L253	3.3-7 μh	Var.	114-017
L258A	320-500 μh	Var.	114-016
L258E	320-500 μh	Var.	114-016
L258J	32-561 μh	Var.	114-015
L258N	2.5-4.2 μh	Var.	114-010
L264	3.3-7 μh	Var.	114-017
L324	2.5 μh	Fixed	108-055
L413	.5-1 μh	Var.	114-043

Resistors

						Tektronix Part Number
R1	150 Ω	2 w	Fixed	Comp.	10%	304-151
R3	18 k	2 w	Fixed	Comp.	10%	306-183
R4	820 Ω	½ w	Fixed	Comp.	10%	302-821
R7	18 k	2 w	Fixed	Comp.	10%	306-183
R8	820 Ω	½ w	Fixed	Comp.	10%	302-821
R9	15 k	½ w	Fixed	Comp.	10%	302-153
R10	470 k	½ w	Fixed	Comp.	10%	302-474
R13	15 k	½ w	Fixed	Comp.	10%	302-153
R14	15 k	10 w	Fixed	WW	5%	308-024
R16	560 Ω	½ w	Fixed	Comp.	10%	302-561
R18	470 k	½ w	Fixed	Comp.	10%	302-474
R20	470 k	½ w	Fixed	Comp.	10%	302-474
R22	1 meg	½ w	Fixed	Comp.	10%	302-105
R23	10 meg	½ w	Fixed	Comp.	10%	302-106
R24	1 meg	½ w	Fixed	Comp.	10%	302-105
R25	10 meg	½ w	Fixed	Comp.	10%	302-106
R26	1 meg	½ w	Fixed	Comp.	10%	302-105
R28	220 Ω	½ w	Fixed	Comp.	10%	302-221
R29	15 k	1 w	Fixed	Comp.	10%	304-153
R30	39 k	½ w	Fixed	Comp.	10%	302-393
R32	10 k	½ w	Fixed	Comp.	10%	302-103
R34	2.7 k	½ w	Fixed	Comp.	10%	302-272
R40	22 k	2 w	Fixed	Comp.	10%	306-223
R41	100 k	½ w	Fixed	Comp.	10%	302-104
R42	820 k	½ w	Fixed	Comp.	10%	302-824
R45	10 k	½ w	Fixed	Comp.	10%	302-103
R46	100 k	½ w	Fixed	Comp.	10%	302-104
R47	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R48	18 k	½ w	Fixed	Comp.	10%	302-184
R49	1 meg	½ w	Fixed	Comp.	10%	302-105
R50	47 k	½ w	Fixed	Comp.	10%	302-473
R51	1 k	½ w	Fixed	Comp.	10%	302-102
R52	390 k	½ w	Fixed	Comp.	10%	302-394
R53	1 meg	½ w	Fixed	Comp.	10%	302-105
R54	10 k	½ w	Fixed	Comp.	10%	302-103
R55	1 meg	½ w	Fixed	Comp.	10%	302-105
R56	220 Ω	½ w	Fixed	Comp.	10%	302-221
R63	220 k	1 w	Fixed	Comp.	10%	304-224
R65	100 k	½ w	Fixed	Comp.	10%	302-104
R67	10 meg	½ w	Fixed	Comp.	10%	302-106
R104	5.6 k	2 w	Fixed	Comp.	10%	306-562
R105	15 k	10 w	Fixed	WW	5%	308-024
R106	27 Ω	½ w	Fixed	Comp.	10%	302-270
R108	750 k	½ w	Fixed	Prec.	1%	309-010
R109	200 k	½ w	Fixed	Prec.	1%	309-051

Resistors *(continued)*

						Tektronix Part Number
R112	120 k	1 w	Fixed	Comp.	10%	304-124
R114	6.8 k	2 w	Fixed	Comp.	10%	306-682
R115	1.5 k	5 w	Fixed	WW	5%	308-061
R116	150 k	½ w	Fixed	Comp.	10%	302-154
R117	10 k	½ w	Fixed	Comp.	10%	302-103
R118	47 k	1 w	Fixed	Comp.	10%	304-473
R120	120 k	½ w	Fixed	Comp.	10%	302-124
R121	120 k	½ w	Fixed	Comp.	10%	302-124
R122	100 k	2 w	Var.	Comp.	SW STABILITY	311-026
R125	2.2 meg	½ w	Fixed	Comp.	10%	302-225
R130	470 k	½ w	Fixed	Comp.	10%	302-474
R131	820 k	½ w	Fixed	Comp.	10%	302-824
R135	10 k	2 w	Fixed	Comp.	10%	306-103
R136	180 k	½ w	Fixed	Comp.	10%	302-184
R137	100 k	2 w	Var	Comp.	DUTY CYCLE LIMIT	311-026
R138	100 k	½ w	Fixed	Comp.	10%	302-104
R141	180 k	½ w	Fixed	Comp.	10%	302-184
R142A	1.2 meg	½ w	Fixed	Comp.	10%	302-125
R142B	820 k	½ w	Fixed	Comp.	10%	302-824
R142C	270 k	½ w	Fixed	Comp.	10%	302-274
R142D	100 k	½ w	Fixed	Comp.	10%	302-104
R142E	3.3 k	½ w	Fixed	Comp.	10%	302-332
R142F	3.3 k	½ w	Fixed	Comp.	10%	302-332
R142G	1.2 k	½ w	Fixed	Comp.	10%	302-122
R145	22 k	½ w	Fixed	Comp.	10%	302-223
R146	2 meg	2 w	Var.	Comp.	UNBLANKING ADJ.	311-042
R151	47 Ω	½ w	Fixed	Comp.	10%	302-470
R154	1 k	25 w	Fixed	WW	5%	308-038
R155	100 Ω	½ w	Fixed	Comp.	10%	302-101
R156	15 k	2 w	Fixed	Comp.	10%	306-153
R157	100 Ω	½ w	Fixed	Comp.	10%	302-101
R160	15 k	10 w	Fixed	WW	5%	308-024
R161	100 k	1 w	Fixed	Comp.	10%	304-104
R165	47 Ω	½ w	Fixed	Comp.	10%	302-470
R171	3 k	10 w	Fixed	WW	5%	308-073
R172	56 Ω	2 w	Fixed	Comp.	10%	306-560
R176A,B	1.5 k	25 w	Fixed	WW	5%	308-040
R176C	250 k	2 w	Var.	Comp.		311-032
R176D	270 k	2 w	Fixed	Comp.	10%	306-274
R176E	250 k	2 w	Var.	Comp.		311-032
R176F	270 k	2 w	Fixed	Comp.	10%	306-274
R176G	250 k	2 w	Var.	Comp.		311-032
R176H	270 k	2 w	Fixed	Comp.	10%	306-274
R176J	250 k	2 w	Var.	Comp.		311-032
R176K	270 k	2 w	Fixed	Comp.	10%	306-274

						Tektronix Part Number
R176L	150 k	2 w	Fixed	Comp.	10%	306-154
R176M	150 k	2 w	Fixed	Comp.	10%	306-154
R176N	39 k	2 w	Fixed	Comp.	10%	306-393
R176P	39 k	2 w	Fixed	Comp.	10%	306-393
R176Q	22 k	2 w	Fixed	Comp.	10%	306-223
R176R	22 k	2 w	Fixed	Comp.	10%	306-223
R176S	30 k	10 w	Fixed	WW	5%	308-027
R176T	7.5 k	10 w	Fixed	WW	5%	308-022
R176U	4.5 k	20 w	Fixed	WW	5%	308-033
R177F	2.7 k	½ w	Fixed	Comp.	10%	302-272
R177G	1.8 k	½ w	Fixed	Comp.	10%	302-182
R177H	1.2 k	½ w	Fixed	Comp.	10%	302-122
R177J	820 Ω	½ w	Fixed	Comp.	10%	302-821
R177K	680 Ω	½ w	Fixed	Comp.	10%	302-681
R177L	390 Ω	½ w	Fixed	Comp.	10%	302-391
R178	56 Ω	½ w	Fixed	Comp.	10%	302-560
R179	56 Ω	½ w	Fixed	Comp.	10%	302-560
R180	15 k	10 w	Fixed	WW	5%	308-024
R181	47 Ω	½ w	Fixed	Comp.	10%	302-470
R182	47 Ω	½ w	Fixed	Comp.	10%	302-470
R184	15 k	10 w	Fixed	WW	5%	308-024
R186	47 Ω	½ w	Fixed	Comp.	10%	302-470
R187	47 Ω	½ w	Fixed	Comp.	10%	302-470
R188	15 k	10 w	Fixed	WW	5%	308-024
R191	220 Ω	½ w	Fixed	Comp.	10%	302-221
R193	22 Ω	½ w	Fixed	Comp.	10%	302-220
R196	47 Ω	2 w	Fixed	Comp.	10%	306-470
R197	150 Ω	1 w	Fixed	Comp.	10%	304-151
R198	220 Ω	½ w	Fixed	Comp.	10%	302-221
R201	100 meg	2 w	Fixed	Comp.	10%	314-005
R202	100 meg	2 w	Fixed	Comp.	10%	314-005
R203	50 meg	2 w	Fixed	Comp.	10%	314-004
R204	50 meg	2 w	Fixed	Comp.	10%	314-004
R205	50 meg	2 w	Fixed	Comp.	10%	314-004
R206	50 meg	2 w	Fixed	Comp.	10%	314-004
R207	1 meg	½ w	Fixed	Comp.	10%	302-105
R208	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R209	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R210	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R212	22 meg	½ w	Fixed	Comp.	10%	302-226
R213	50 meg	2 w	Fixed	Comp.	10%	314-004
R214	220 k	½ w	Fixed	Comp.	10%	302-224
R221	33 k	½ w	Fixed	Comp.	10%	302-333
R223	10 k	½ w	Fixed	Comp.	10%	302-103
R224	100 k	½ w	Fixed	Comp.	10%	302-104

Resistors *(continued)*

						Tektronix Part Number
R226	1 meg	½ w	Fixed	Comp.	10%	302-105
R228	47 k	2 w	Fixed	Comp.	10%	306-473
R229	100 Ω	½ w	Fixed	Comp.	10%	302-101
R233	10 k	½ w	Fixed	Comp.	10%	302-103
R234	100 k	½ w	Fixed	Comp.	10%	302-104
R236	1 meg	½ w	Fixed	Comp.	10%	302-105
R240	47 k	½ w	Fixed	Comp.	10%	302-473
R241	47 k	½ w	Fixed	Comp.	10%	302-473
R242	47 k	1 w	Fixed	Comp.	10%	304-473
R250	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R251	47 Ω	½ w	Fixed	Comp.	10%	302-470
R253	560 Ω	½ w	Fixed	Comp.	10%	302-561
R256	560 Ω	½ w	Fixed	Comp.	10%	302-561
R260	4.7 k	½ w	Fixed	Comp.	10%	302-472
R261	330 k	½ w	Fixed	Comp.	10%	302-334
R263	100 Ω	½ w	Fixed	Comp.	10%	302-101
R264	270 Ω	½ w	Fixed	Comp.	10%	302-271
R266	10 k	½ w	Fixed	Comp.	10%	302-103
R272	100 k	½ w	Fixed	Comp.	10%	302-104
R273	120 k	½ w	Fixed	Comp.	10%	302-124
R281	120 Ω	1 w	Fixed	Comp.	10%	304-121
R287	1 k	½ w	Fixed	Comp.	10%	302-102
R301	330 k	1 w	Fixed	Comp.	10%	304-334
R302	1 k	½ w	Fixed	Comp.	10%	302-102
R303	100 k	½ w	Fixed	Comp.	10%	302-104
R304	500 k	2 w	Var.	Comp.	L.F. COMP	311-034
R312	470 k	½ w	Fixed	Comp.	10%	302-474
R313	120 k	½ w	Fixed	Comp.	10%	302-124
R314	68 k	½ w	Fixed	Prec.	1%	309-042
R315	490 k	½ w	Fixed	Prec.	1%	309-002
R317	370 k	½ w	Fixed	Prec.	1%	309-055
R318	666.6 k	½ w	Fixed	Prec.	1%	309-007
R324	10 k	10 w	Fixed	WW	5%	308-023
R332	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R334	150 k	½ w	Fixed	Comp.	10%	302-154
R335	150 k	½ w	Fixed	Comp.	10%	302-154
R336	2x220 k	2 w	Var.	Comp.	HORIZ. POS.	312-010
R339	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R402	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R403	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R404	7.2 Ω	5 w	Fixed	Prec.	±.2%	*310-554
R405	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R406	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R407	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R408	7.2 Ω	5 w	Fixed	Prec.	±.2%	

*These resistors are specially selected. Tektronix part number 310-544 is for the complete set of resistors. To order single resistors orded by this part number plus the suffix letter stamped on the resistor body.

						Tektronix Part Number
R409	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R410	7.2 Ω	5 w	Fixed	Prec.	±.2%	*310-554
R411	7.2 Ω	5 w	Fixed	Prec.	±.2%	
R413	220 Ω	½ w	Fixed	Comp.	10%	302-221
R416	39 k	½ w	Fixed	Comp.	10%	302-393
R418	50 k	2 w	Var.	Comp.	+150 POS. CAL.	311-023
R419	120 k	½ w	Fixed	Comp.	10%	302-124
R420	120 k	½ w	Fixed	Comp.	10%	302-124
R421	50 k	2 w	Var.	Comp.	—150 POS. CAL.	311-023
R423	56 k	½ w	Fixed	Comp.	10%	302-563
R425	100 k	½ w	Fixed	Prec.	1%	309-045
R426	100 k	½ w	Fixed	Prec.	1%	309-045
R427	100 k	½ w	Fixed	Prec.	1%	309-045
R428	100 k	½ w	Fixed	Prec.	1%	309-045
R429	100 k	½ w	Fixed	Prec.	1%	309-045
R430	100 k	½ w	Fixed	Prec.	1%	309-045
R434	470 k	½ w	Fixed	Comp.	10%	302-474
R435	470 k	½ w	Fixed	Comp.	10%	302-474
R438	47 k	½ w	Fixed	Comp.	10%	302-473
R439	250 k	2 w	Var.	Comp.	VARIABLE POS.	311-032
R440	68 k	½ w	Fixed	Comp.	10%	302-683
R442	100 k	½ w	Fixed	Comp.	10%	302-104
R443	560 Ω	½ w	Fixed	Comp.	10%	302-561
R444	560 Ω	½ w	Fixed	Comp.	10%	302-561
R448	220 Ω	½ w	Fixed	Comp.	10%	302-221
R449	220 Ω	½ w	Fixed	Comp.	10%	302-221
R601	10 Ω	1 w	Fixed	Comp.	10%	304-100
R613	56 k	½ w	Fixed	Comp.	10%	302-563
R614	39 k	½ w	Fixed	Comp.	10%	302-393
R616	100 k	½ w	Fixed	Comp.	10%	302-104
R618	1 meg	½ w	Fixed	Comp.	10%	302-105
R620	1 k	½ w	Fixed	Comp.	10%	302-102
R624	143 k	1 w	Fixed	Prec.	1%	310-088
R625	10 k	2 w	Var.	WW	—250 ADJ	311-015
R626	68 k	1 w	Fixed	Prec.	1%	310-054
R627	4.5 k	10 w	Fixed	WW	5%	308-021
R628	470 k	½ w	Fixed	Comp.	10%	302-474
R630	10 Ω	1 w	Fixed	Comp.	10%	304-100
R631	10 Ω	1 w	Fixed	Comp.	10%	304-100
R635	39 k	½ w	Fixed	Comp.	10%	302-393
R636	18 k	½ w	Fixed	Comp.	10%	302-183
R637	180 k	½ w	Fixed	Comp.	10%	302-184
R638	1 meg	½ w	Fixed	Comp.	10%	302-105
R640	1 k	½ w	Fixed	Comp.	10%	302-102
R641	1 k	½ w	Fixed	Comp.	10%	302-102

*These resistors are specially selected. Tektronix part number 310-544 is for the complete set of resistors. To order single resistors orded by this part number plus the suffix letter stamped on the resistor body.

Resistors *(continued)*

						Tektronix Part Number
R642	1 k	½ w	Fixed	Comp.	10%	302-102
R644	610 k	½ w	Fixed	Prec.	1%	309-006
R645	666.6 k	½ w	Fixed	Prec.	1%	309-007
R647	1 k	25 w	Fixed	WW	5%	308-037
R648	1 k	25 w	Fixed	WW	5%	308-037
R650	10 Ω	1 w	Fixed	Comp.	10%	304-100
R655	100 k	½ w	Fixed	Comp.	10%	302-104
R656	27 k	½ w	Fixed	Comp.	10%	302-273
R657	270 k	½ w	Fixed	Comp.	10%	302-274
R658	470 k	½ w	Fixed	Comp.	10%	302-474
R660	1 k	½ w	Fixed	Comp.	10%	302-102
R661	1 k	½ w	Fixed	Comp.	10%	302-102
R664	970 k	½ w	Fixed	Prec.	1%	309-012
R665	500 k	½ w	Fixed	Prec.	1%	309-003
R667	12 k	8 w	Fixed	WW	5%	308-069
R670	100 Ω	2 w	Fixed	Comp.	10%	306-101
R672	100 k	½ w	Fixed	Comp.	10%	302-104
R674	100 k	½ w	Fixed	Comp.	10%	302-104
R675	100 k	½ w	Fixed	Comp.	10%	302-104
R676	39 k	½ w	Fixed	Comp.	10%	302-393
R677	220 k	1 w	Fixed	Comp.	10%	304-224
R678	470 k	½ w	Fixed	Comp.	10%	302-474
R680	1 k	½ w	Fixed	Comp.	10%	302-102
R681	47 Ω	½ w	Fixed	Comp.	10%	302-470
R684	600 k	½ w	Fixed	Prec.	1%	309-004
R685	1 meg	½ w	Fixed	Prec.	1%	309-014
R687	30 k	10 w	Fixed	WW	5%	308-027
R701	50 Ω	2 w	Var.	WW	SCALE ILLUM	311-055
R713	100 k	½ w	Fixed	Comp.	10%	302-104
R801	220 k	½ w	Fixed	Comp.	10%	302-224
R802	33 k	½ w	Fixed	Comp.	10%	302-333
R804	6.8 meg	½ w	Fixed	Comp.	10%	302-685
R811	1.5 k	½ w	Fixed	Comp.	10%	302-152
R812	330 k	1 w	Fixed	Comp.	10%	304-334
R813	1 k	½ w	Fixed	Comp.	10%	302-102
R814	2 meg	2 w	Var.	Comp.	—47V ADJ.	311-042
R815	3.3 meg	½ w	Fixed	Comp.	10%	302-335
R817	10 k	2 w	Fixed	Comp.	10%	306-103
R820	120 k	½ w	Fixed	Comp.	10%	302-124
R821	1 k	½ w	Fixed	Comp.	10%	302-102
R830	470 Ω	1 w	Fixed	Comp.	10%	304-471
R831	33 k	½ w	Fixed	Comp.	10%	302-333
R833	82 k	½ w	Fixed	Comp.	10%	302-823
R834	3.3 k	½ w	Fixed	Comp.	10%	302-332
R840	22 k	½ w	Fixed	Comp.	10%	302-223

Resistors *(continued)*

						Tektronix Part Number
R841	3.3 meg	2 w	Fixed	Comp.	10%	306-335
R843	3.3 meg	2 w	Fixed	Comp.	10%	306-335
R845	3.3 meg	2 w	Fixed	Comp.	10%	306-335
R847	2 meg	2 w	Var.	Comp.	FOCUS	311-043
R849	1 meg	2 w	Fixed	Comp.	10%	306-105
R851	2 meg	2 w	Var.	Comp.	10%	311-043
R853	1 meg	2 w	Var.	Comp.	INTENSITY	311-041
R855	2.2 meg	½ w	Fixed	Comp.	10%	302-225
R861	2 meg	2 w	Var.	Comp.	GEOM ADJ.	311-042
R866	500 k	2 w	Var.	Comp.	ASTIG.	311-034

Switches

			unwired	wired
SW10	TRIGGER SELECTOR		260-219	
SW22	MANUAL TRIGGER		260-016	
SW40	SWEEP MODE		260-134	
SW48	RESET		260-016	
SW50	MANUAL TRIP PULSE		260-016	
SW176	MICROSECONDS/CM		260-220	262-170
SW405	ATTENUATOR		260-214	
SW425	POSITIONING		260-217	262-168
SW435	VARIABLE		260-014	
SW440	VARIABLE DEFLECTION SENSITIVITY MONITO		260-218	
SW445A*	SIGNAL MODE (MARKER)	(Front)	260-216	
SW445B*	SIGNAL MODE	(Rear)	260-215	
SW601	AC POWER		260-199	
SW602	DC POWER		260-199	
SW820	HIGH VOLTAGE		260-014	

*May be ordered separately.

Selenium Rectifiers

SR630	8 Plates/leg	106-054
SR650	7 Plates/leg	106-053

Transformers

T205	120-033
T206	120-034
T601	120-110
T602	120-111
T701	120-109

Thermal Cut-Out

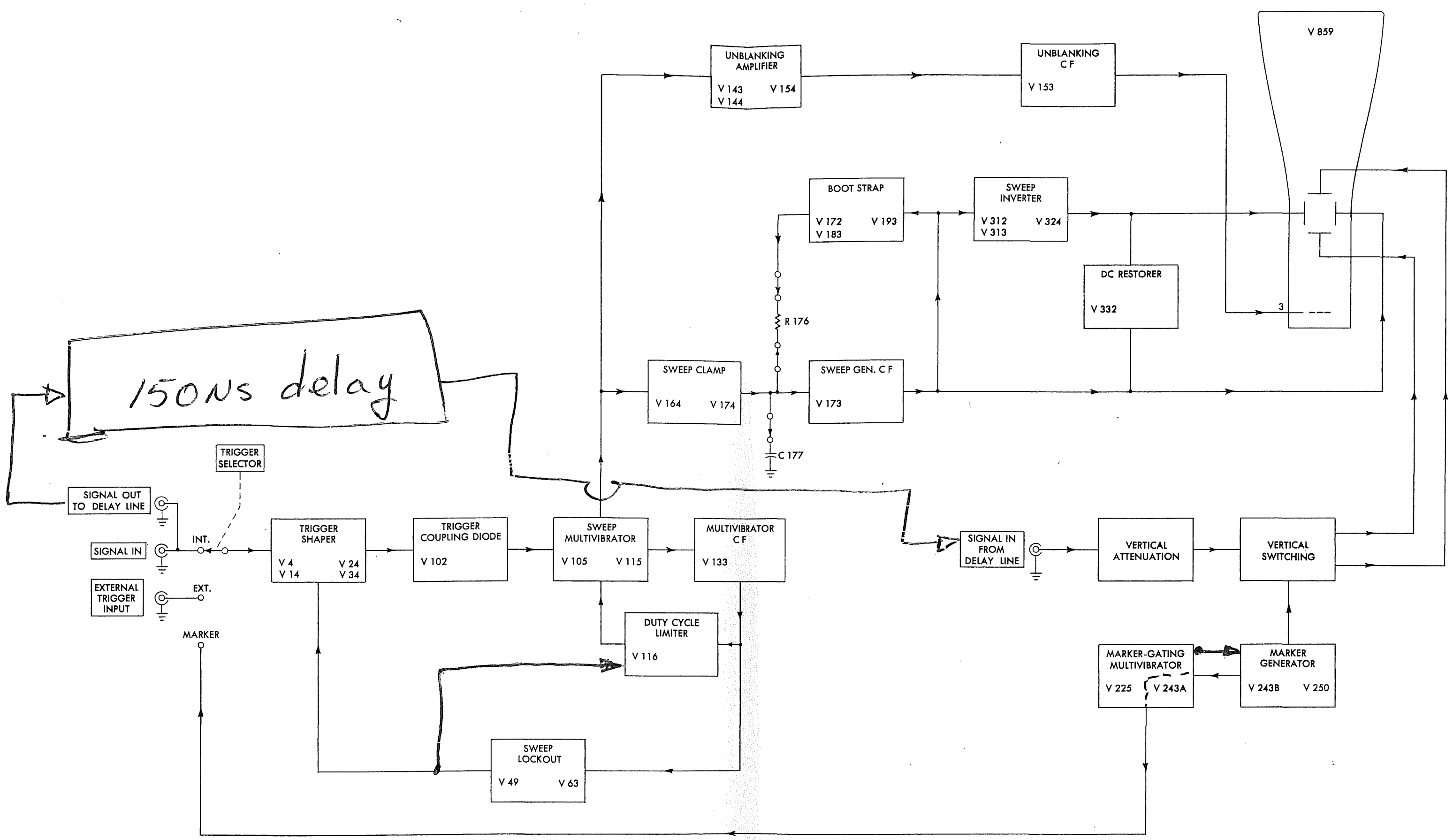
		Tektronix Part Number
TK601	137°	260-120
TK701	128°	260-070

Vacuum Tubes

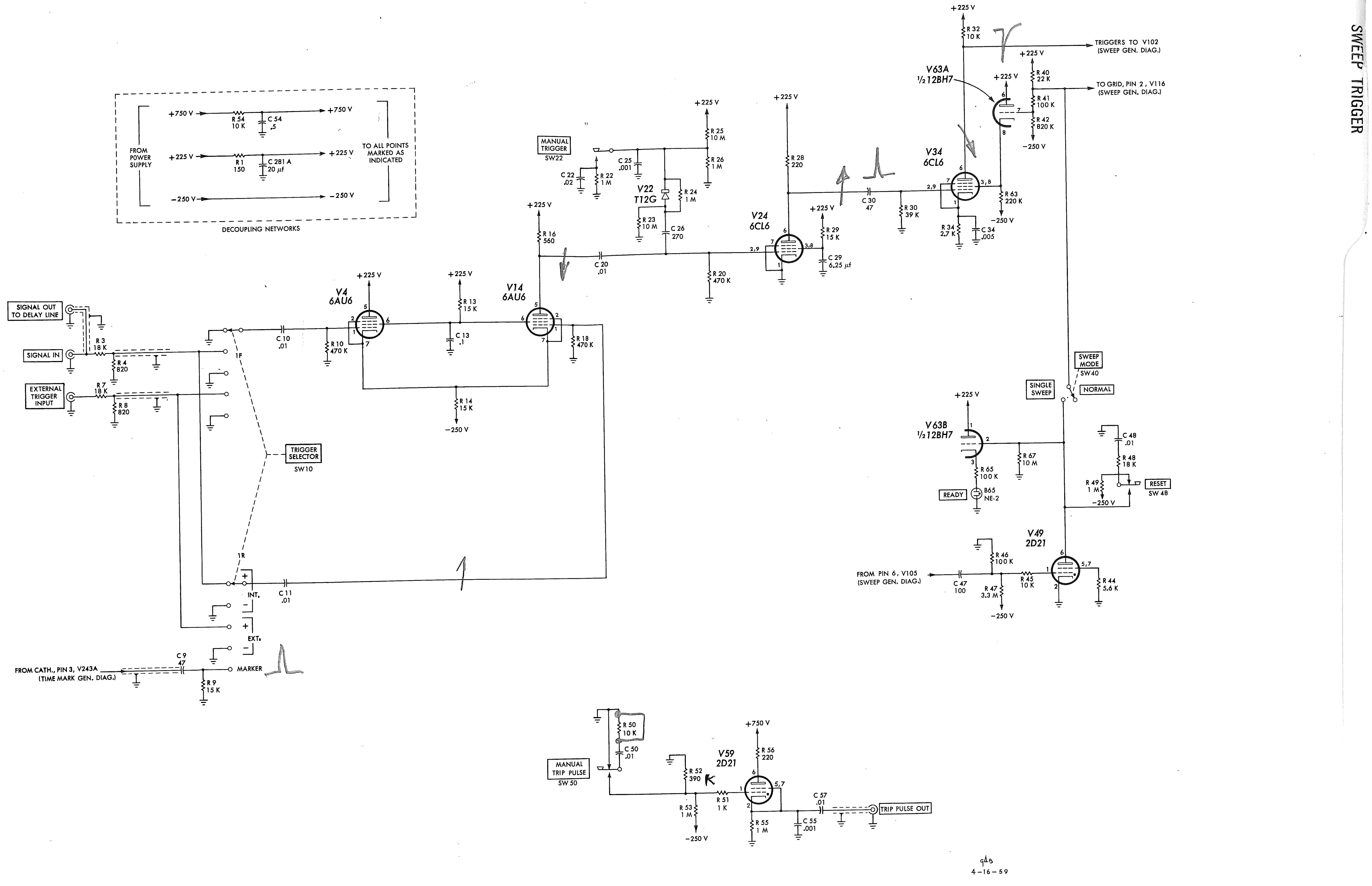
V4	6AU6	154-022
V14	6AU6	154-022
V22	T12G	158-001
V24	6CL6	154-031
V34	6CL6	154-031
V49	2D21	154-171
V59	2D21	154-171
V63	12BH7	154-046
V102	6X4	154-035
V105	6CL6	154-031
V115	6CL6	154-031
V116	6AN8	154-078
V133	6BQ7A	154-028
V143	6AS5	154-018
V144	6CL6	154-031
V153	12BH7	154-046
V154	6CL6	154-031
V164	6CL6	154-031
V172	6X4	154-035
V173	12BH7	154-046
V174	6CL6	154-031
V183	12BH7	154-046
V193	12BH7	154-046
V201	1X2	154-005
V202	1X2	154-005
V203	1X2	154-005
V204	1X2	154-005
V205	1X2	154-005
V225	6BQ7A	154-028
V242	T12G	158-001
V243	6BQ7A	154-028
V250	6AN8	154-078
V264	6CL6	154-031
V312	6AL5	154-016
V313	12AU7	154-041
V324	6AG7	154-012
V332	6AL5	154-016
V612	6X4	154-035
V614	6AU6	154-022
V619	5651	154-052

Vaccuum Tubes *(continued)*

		Tektronix Part Number
V627	6080	154-056
V634	6AU6	154-022
V647	6080	154-056
V654	6AU6	154-022
V667	6080	154-056
V672	6X4	154-035
V674	6AU6	154-022
V687	6AU5	154-021
V804	6C4	154-029
V814	12AU7	154-041
V820	6AU5	154-021
V830	6AQ5	154-017
V859	T53P11	154-137


150NS delay
SIGNAL OUT TO DELAY LINE
SIGNAL IN
EXTERNAL TRIGGER INPUT
TRIGGER SELECTOR
INT.
EXT.
MARKER
TRIGGER SHAPER
V 4 V 24
V 14 V 34
TRIGGER COUPLING DIODE
V 102
SWEEP MULTIVIBRATOR
V 105 V 115
MULTIVIBRATOR C F
V 133
DUTY CYCLE LIMITER
V 116
SWEEP LOCKOUT
V 49 V 63
UNBLANKING AMPLIFIER
V 143 V 154
V 144
UNBLANKING C F
V 153
BOOT STRAP
V 172 V 193
V 183
SWEEP INVERTER
V 312 V 324
V 313
DC RESTORER
V 332
SWEEP CLAMP
V 164 V 174
SWEEP GEN. C F
V 173
R 176
C 177
V 859
3
SIGNAL IN FROM DELAY LINE
VERTICAL ATTENUATION
VERTICAL SWITCHING
MARKER-GATING MULTIVIBRATOR
V 225 V 243A
MARKER GENERATOR
V 243B V 250

2-16-59
T.D.B.

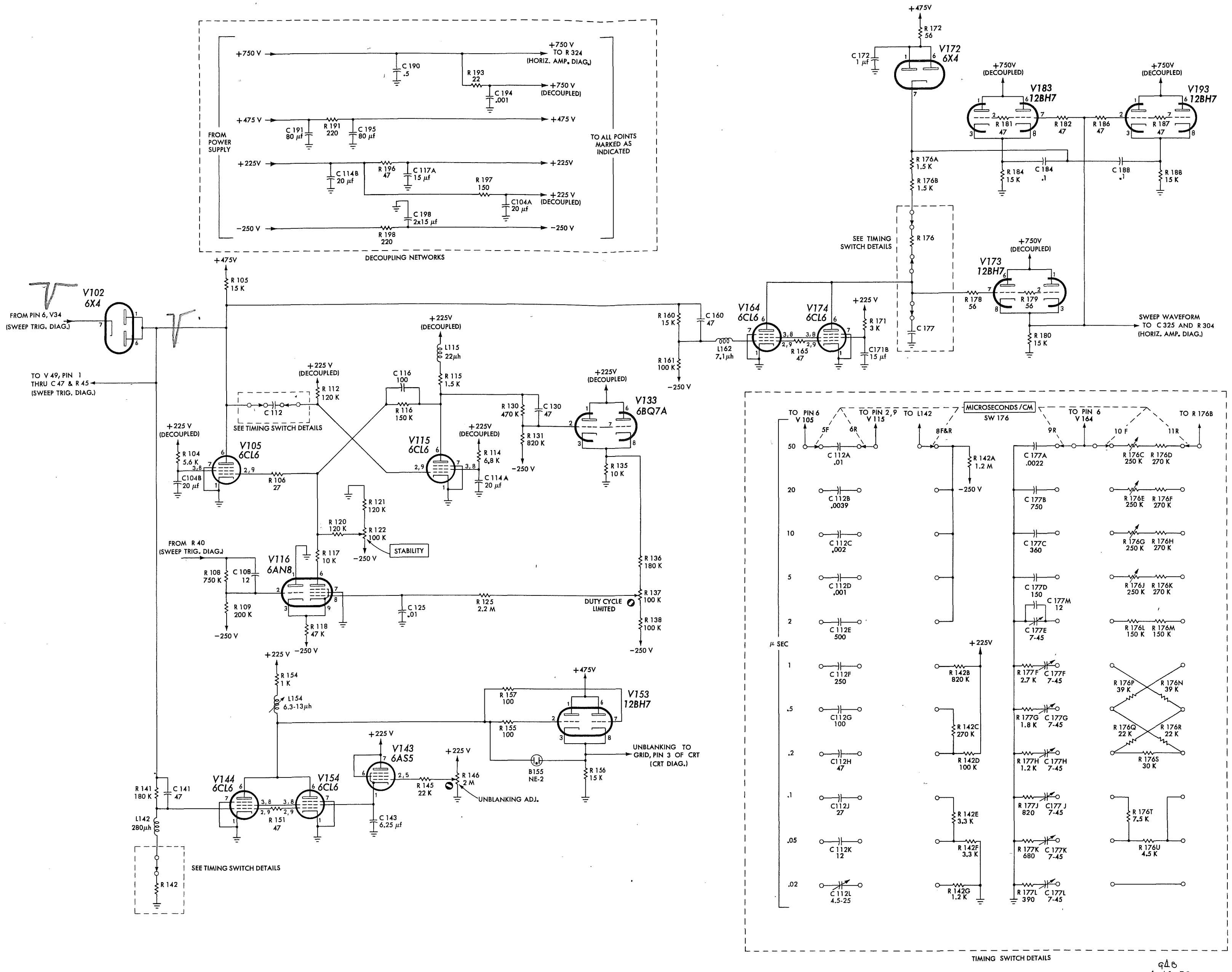


TYPE 507 OSCILLOSCOPE

A

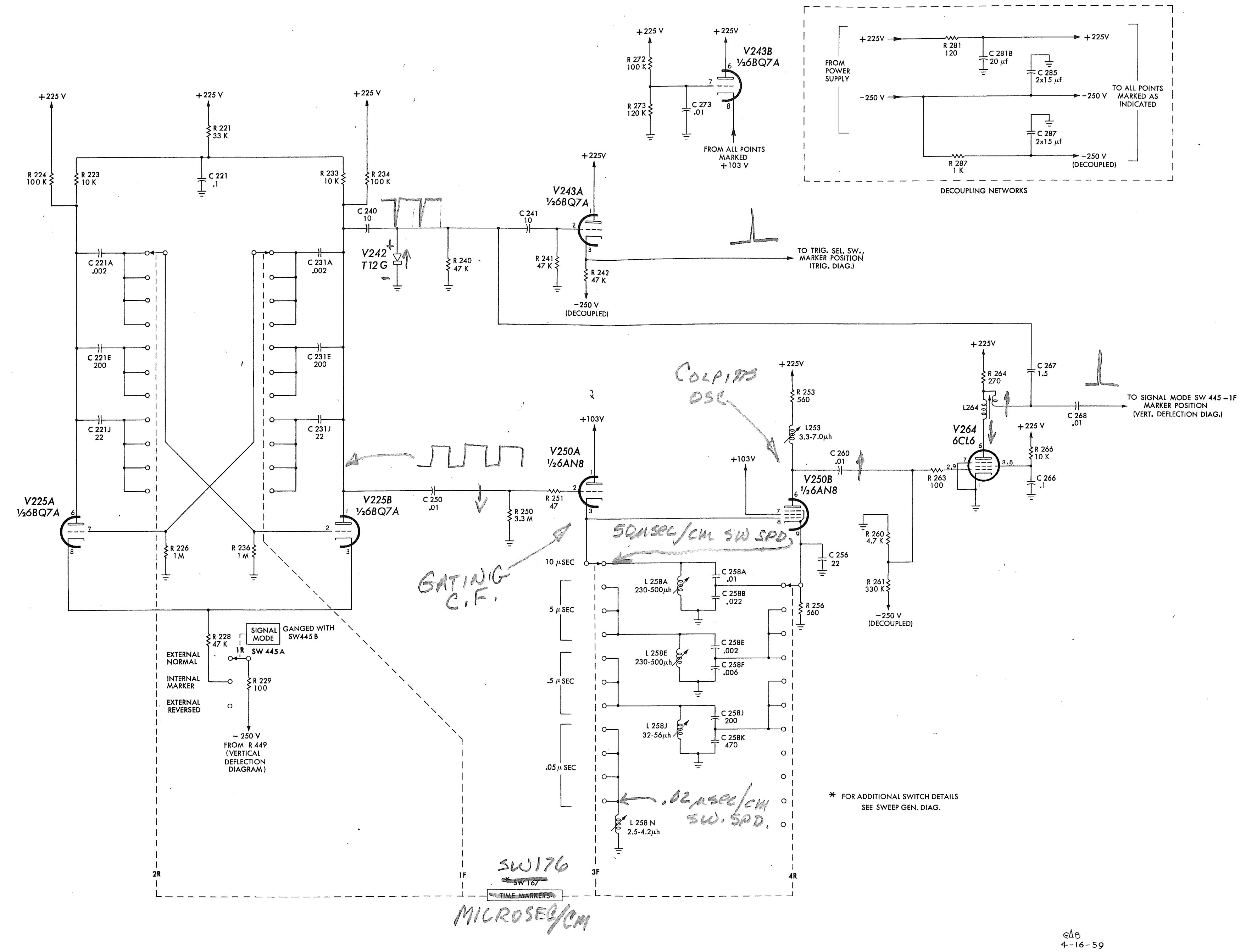
SWEEP TRIGGER & TRIP PULSE

Like 517, Man!

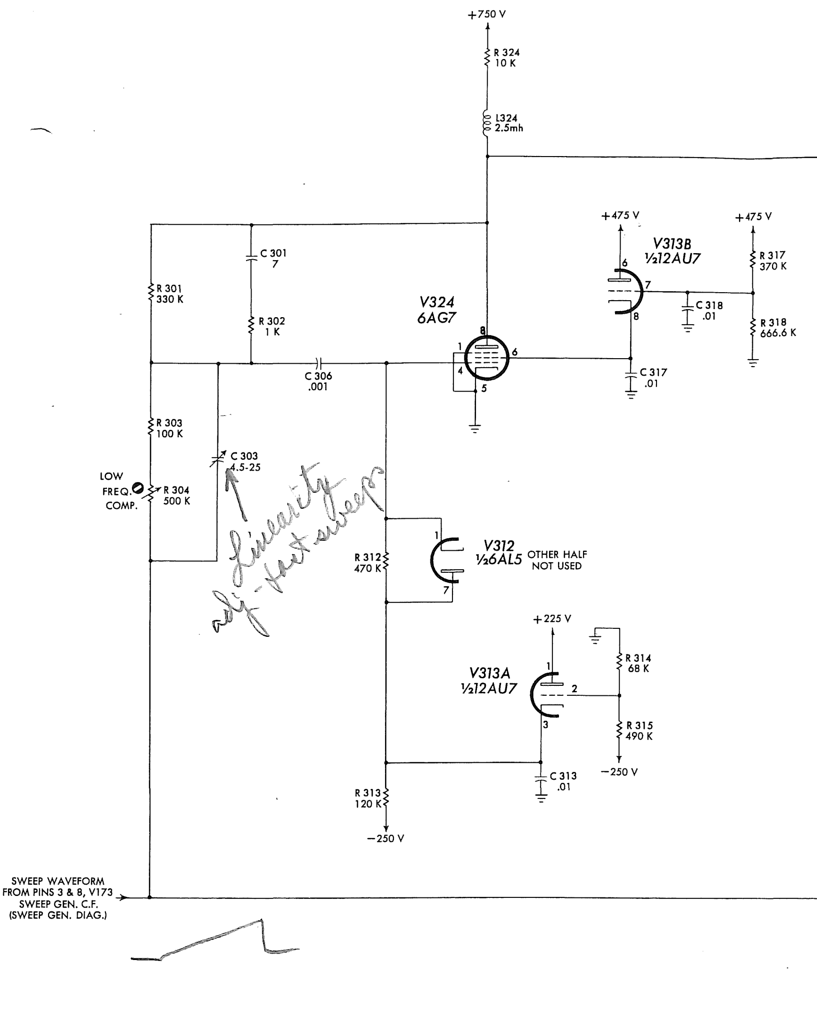


948
4-16-59

SWEEP GENERATOR



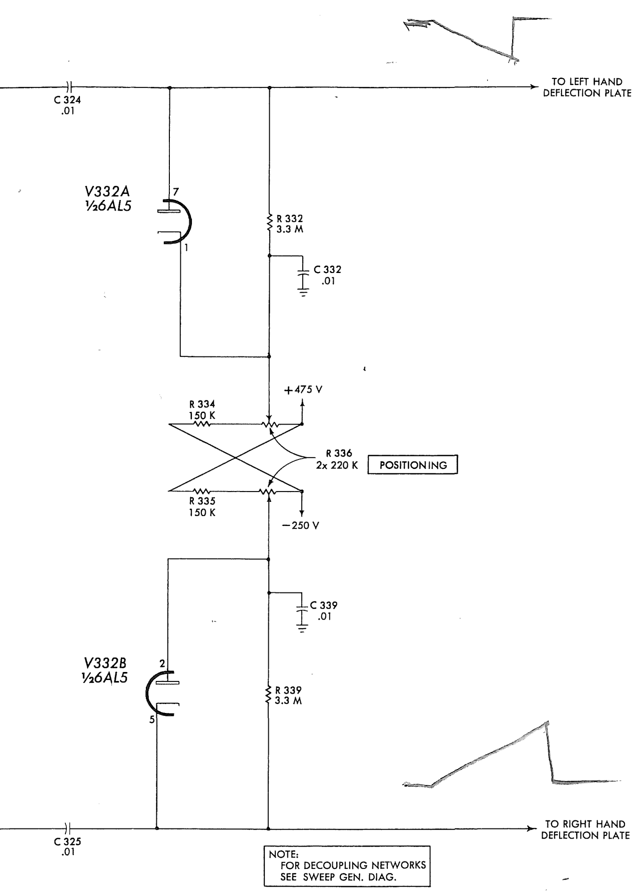
TIME-MARKER GENERATOR



TYPE 507 OSCILLOSCOPE

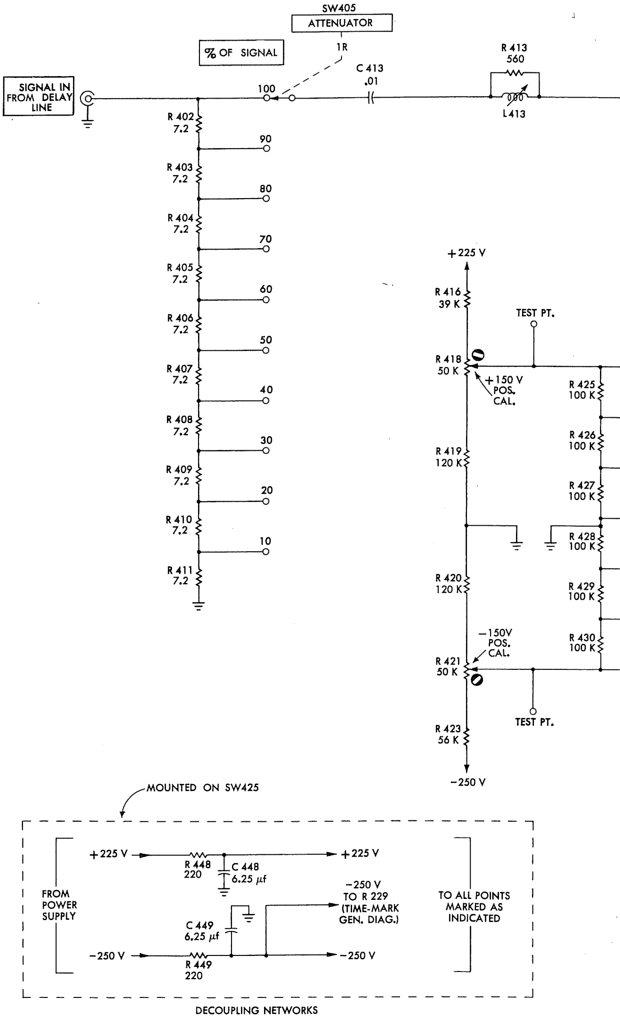
A

gain of 2

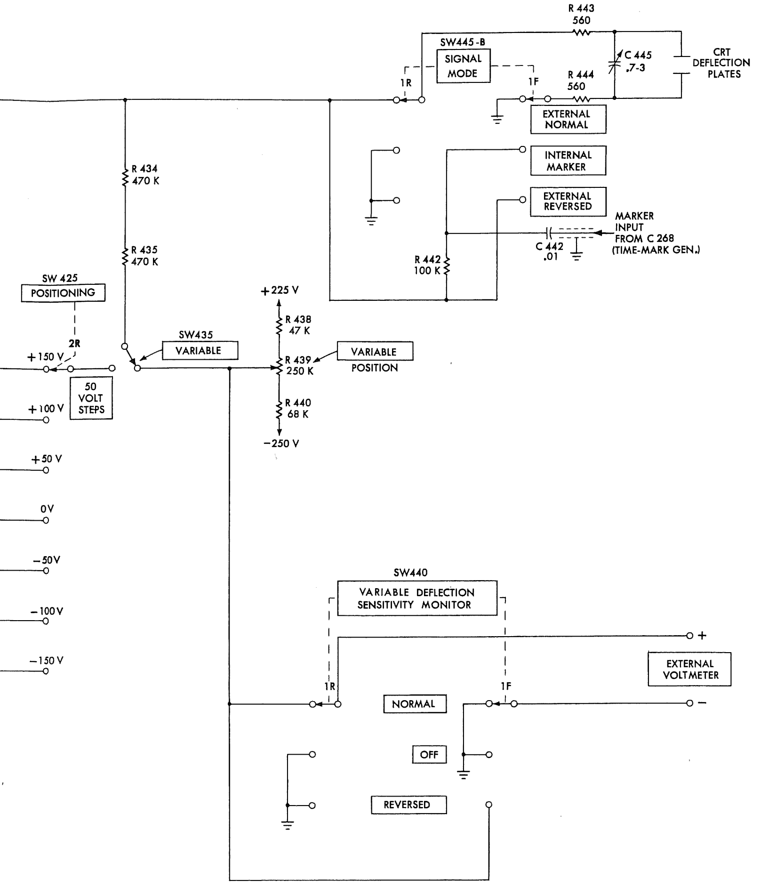


HORIZONTAL AMPLIFIER

10-29-58
JDB



TYPE 507 OSCILLOSCOPE

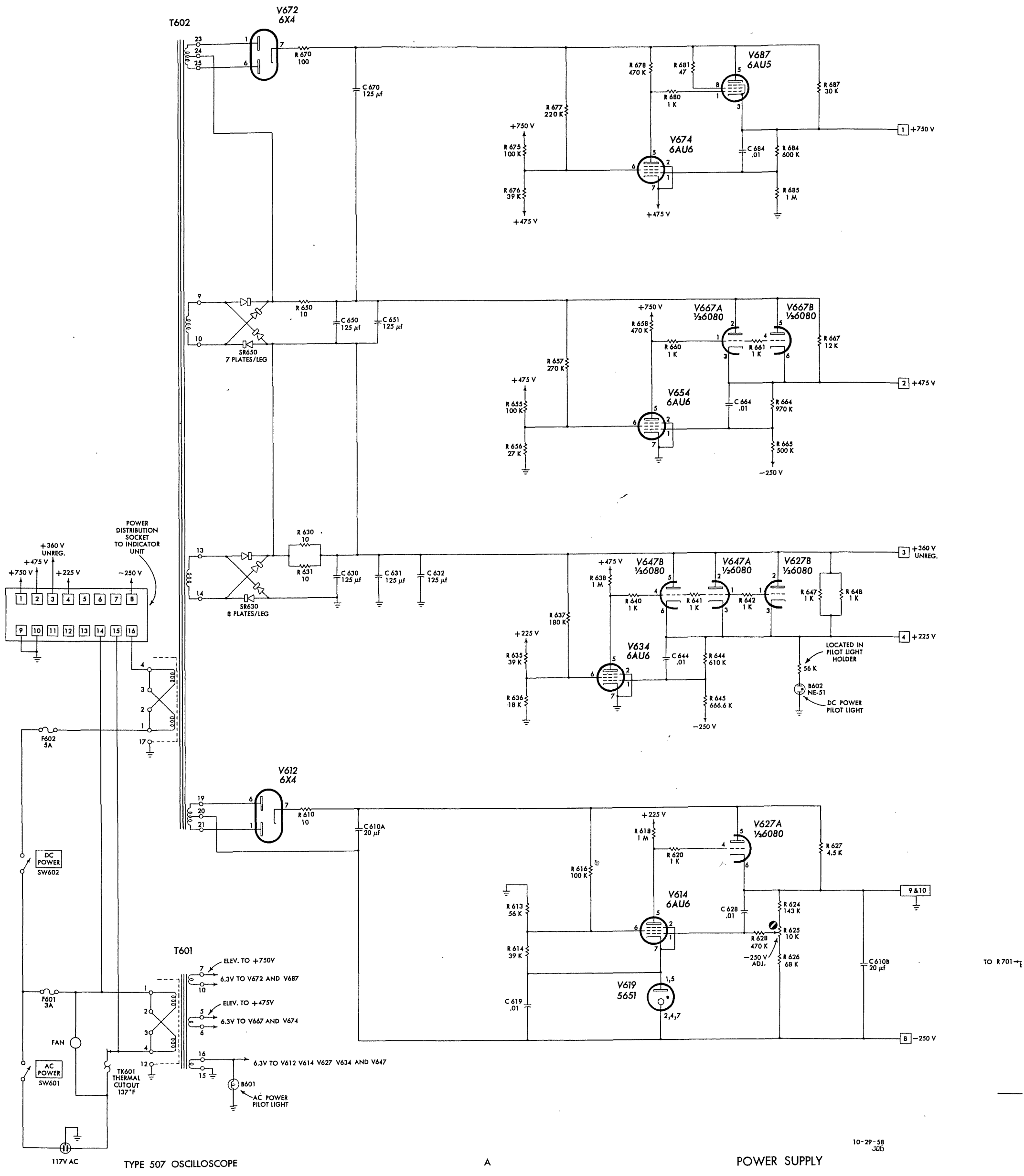


A

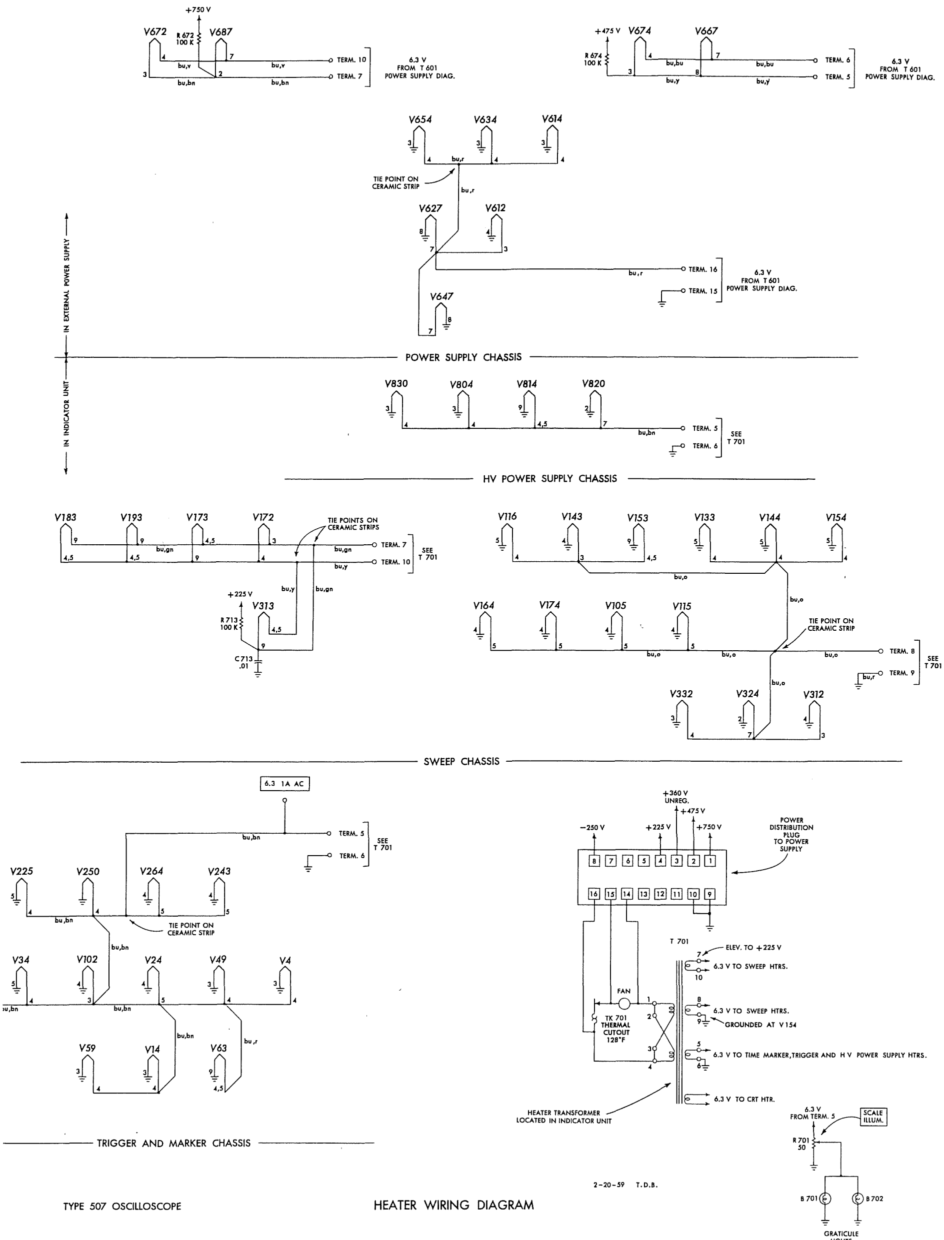
VERTICAL DEFLECTION SYSTEM

GAB
4-1-59

VERTICAL AMPLIFIER



TYPE 507 OSCILLOSCOPE | A | POWER SUPPLY | 10-29-58



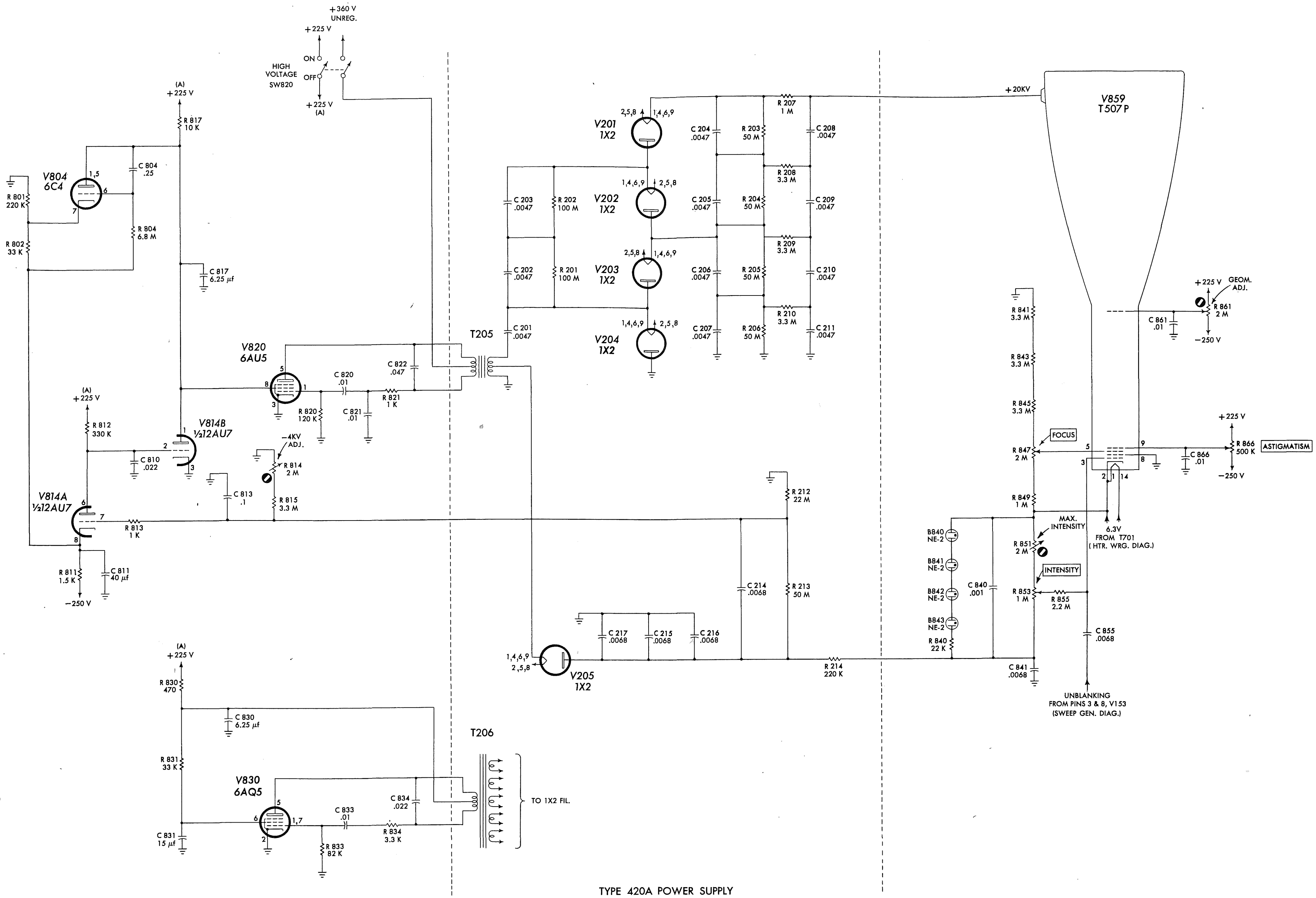
2-20-59 T.D.B.

TYPE 507 OSCILLOSCOPE

HEATER WIRING DIAGRAM

P.S. 4

HEATER WIRING


+360 V
UNREG.
+225 V
ON
OFF
HIGH
VOLTAGE
SW820
+225 V
(A)
V804
6C4
R 801
220 K
R 802
33 K
R 817
10 K
C 804
.25
R 804
6.8 M
C 817
6.25 μf
V820
6AU5
C 820
.01
C 822
.047
R 820
120 K
C 821
.01
R 821
1 K
-4KV
ADJ.
R 814
2 M
R 815
3.3 M
C 813
.1
V814B
½12AU7
V814A
½12AU7
R 812
330 K
C 810
.022
R 813
1 K
R 811
1.5 K
C 811
40 μf
-250 V
T205
V201
1X2
V202
1X2
V203
1X2
V204
1X2
V205
1X2
C 201
.0047
C 202
.0047
C 203
.0047
R 201
100 M
R 202
100 M
C 204
.0047
C 205
.0047
C 206
.0047
C 207
.0047
R 203
50 M
R 204
50 M
R 205
50 M
R 206
50 M
R 207
1 M
R 208
3.3 M
R 209
3.3 M
R 210
3.3 M
C 208
.0047
C 209
.0047
C 210
.0047
C 211
.0047
R 212
22 M
C 214
.0068
R 213
50 M
C 217
.0068
C 215
.0068
C 216
.0068
R 214
220 K
+20KV
V859
T507P
R 841
3.3 M
R 843
3.3 M
R 845
3.3 M
FOCUS
R 847
2 M
R 849
1 M
MAX.
INTENSITY
R 851
2 M
INTENSITY
R 853
1 M
R 855
2.2 M
B840
NE-2
B841
NE-2
B842
NE-2
B843
NE-2
R 840
22 K
C 840
.001
C 841
.0068
C 855
.0068
6.3V
FROM T701
(HTR. WRG. DIAG.)
UNBLANKING
FROM PINS 3 & 8, V153
(SWEEP GEN. DIAG.)
GEOM.
ADJ.
R 861
2 M
C 861
.01
C 866
.01
R 866
500 K
ASTIGMATISM
V830
6AQ5
R 830
470
C 830
6.25 μf
R 831
33 K
C 831
15 μf
C 833
.01
C 834
.022
R 833
82 K
R 834
3.3 K
T206
TO 1X2 FIL.
TYPE 420A POWER SUPPLY

10-29-58
508

ABBREVIATIONS USED IN OUR PARTS LISTS

Cer.	ceramic	m	milli
Comp.	composition	Ω	ohm
EMC	electrolytic, metal cased	Poly.	polystyrene
EMT	electrolytic, metal tubular	Prec.	precision
f	farad	PT	paper tubular
h	henry	Tub.	tubular
k	thousands of ohms	v	working volts dc
meg	megohms	Var.	variable
μ	micro	w	watt
$\mu\mu$	micromicro	WW	wire wound
GMV	guaranteed minimum value		

ABBREVIATIONS USED IN OUR CIRCUIT DIAGRAMS

Resistance values are in ohms. The symbol k stands for thousands. A resistor marked 2.7 k has a resistance of 2,700 ohms. The symbol M stands for million. For example, a resistor marked 5.6 M has a resistance of 5.6 megohms.

Unless otherwise specified on the circuit diagram, capacitance values marked with the number 1 and numbers greater than 1 are in $\mu\mu$f. For example, a capacitor marked 3.3 would have a capacitance of 3.3 micromicrofarads. Capacitance values marked with a number less than 1 are in μf. For example, a capacitor marked .47 would have a capacitance of .47 microfarads.

Inductance values marked in mh are in millihenrys. Inductance values marked in μh are in microhenrys.

Your instrument WARRANTY appears on the reverse side of this sheet.

SERIAL NO. ________

IMPORTANT

Include the INSTRUMENT TYPE and the above SERIAL NUMBER in any correspondence regarding this instrument. The above serial number must match the instrument serial number if parts are to be ordered from the manual. Your help in this will enable us to answer your questions or fill your order with the least delay possible.

WARRANTY

All Tektronix instruments are fully guaranteed against defective materials and workmanship for one year. Should replacement parts be required, whether at no charge under warranty or at established net prices, notify us promptly, including sufficient details to identify the required parts. We will ship them prepaid (via air if requested) as soon as possible, usually within 24 hours.

Tektronix transformers, manufactured in our own plant, carry an indefinite warranty.