


INSTRUCTION MANUAL



TYPE
PLUG-IN

Tektronix, Inc.

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Tektronix International A.G.

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070-230

TYPE K
PLUG-IN UNIT
SERIAL

VERTICAL
POSITION

INPUT

AC DC

1 MEG.
20 μ F

VOLTS/CM

2 1 .5
.5 10 20
20

DC BAL.

VARIABLE

GAIN ADJ.

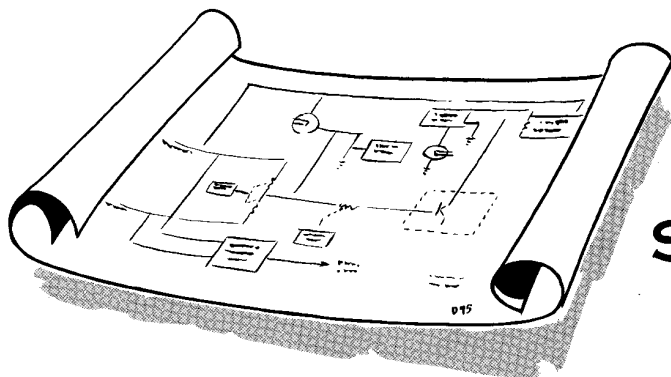
CRATED



FAST-RISE
CALIBRATED PREAMP
.05-20 V/CM DC COUPLED
PREAMP RISE TIME = .004 μ SEC

TEKTRONIX, INC.

PORTLAND, OREGON, U.S.A.



SECTION 1

SPECIFICATIONS

NOTE

At earlier serial number ranges, the Type K was described as Type 53/54K. The designation was later changed to Type K. For purposes of this manual, all serial ranges will be referred to as Type K.

GENERAL DESCRIPTION

The Type K Plug-In Unit is a fast rise calibrated preamp, designed to be used as a preamplifier for Tektronix Type 530-, 540- and 550-Series Oscilloscopes.

TYPE K SPECIFICATIONS

Transient Response

Preamp Alone—6 nanoseconds.

With Type 541, 541A, 543, 545, 545A and 555—12 nanoseconds.

With Type 531, 531A, 533, 535 and 535A—.031 microseconds.

With Type 551 — .014 microseconds.

Frequency Response

With Type 541, 541A, 543, 545, 545A and 555.

Passband—DC to 30 mc, 2 cps to 30 mc ac. Down 3 db $\pm 1/2$ db at 30 mc, 6 db at approximately 41 megacycles, 12 db at approximately 55 megacycles.

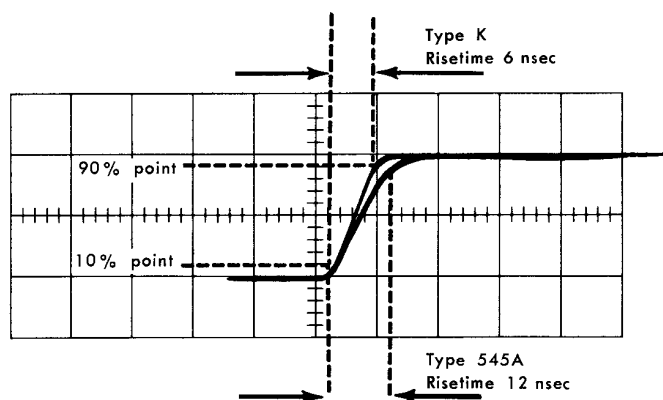


Fig. 1-1. Comparison of risetimes of the Type K Preamp and a Type 545A Oscilloscope.

With Type 531, 531A, 533, 535 and 535A.

Passband—DC to 15 mc.

With Type 551.

Passband — DC to 25 mc.

Deflection Factor—DC to 25 mc.

Step Attenuator

Nine positions, calibrated, from .05 v/cm to 20 v/cm, accurate within 3 percent when set on any one step.

Maximum Allowable Combined dc and peak ac Voltage

Input—600 v.

Input Impedance—1 megohm, 20 μ f.

With P410 probe—10 megohms, 7.5 μ f.

With P6000 probe—10 megohms, 11.5 μ f.

Mechanical Specifications

Construction—Aluminum-alloy chassis.

Finish—Photo-etched anodized panel.

Weight—3 $\frac{1}{2}$ pounds.

Accessories

2—Instruction Manuals

FUNCTIONS OF CONTROLS AND CONNECTORS

INPUT	UHF coaxial connector to preamp.
AC, DC	Switch to insert or remove coupling capacitor for ac or dc operation.
VERTICAL POSITION	Control to position the oscilloscope trace vertically.
VOLTS/CM	Switch to select accurate, frequency-compensated attenuators which provide the sensitivity indicated, when the VARIABLE control is in the CALIBRATED position.
VARIABLE	Variable gain control over a ratio of about 2 to 1.
DC BAL.	Screwdriver front-panel control to set the dc levels so the trace will not shift vertically when the VARIABLE control is rotated.
GAIN ADJ.	Screwdriver front-panel control adjusts amplifier gain to calibrate VOLTS/CM control.

SECTION 3

CIRCUIT DESCRIPTION

General

The Type K Preamp has a maximum sensitivity of .05 volts per centimeter and a rise time of approximately .006 micro-seconds. The circuit consists of one stage of amplification preceded and followed by cathode followers.

Input Attenuators

The VOLTS/CM switch inserts frequency-compensated attenuators into the input circuit. When properly adjusted, the input resistance and capacitance of the unit remains unchanged as the attenuators are inserted. The AC-DC switch inserts or removes a blocking capacitor in the input circuit. In serial numbers 101-352, C5611 compensates for the high-frequency characteristics of the larger capacitor.

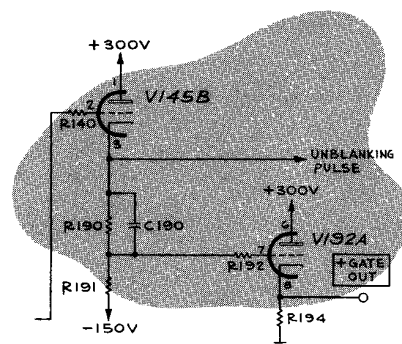
Input Cathode Follower

The input cathode follower, V5701, reduces to a minimum the input capacitance presented by the amplifier and isolates the input circuits from changes in capacitance as the VARIABLE gain control is varied. R5661 is a current-limiting resistor to limit the grid current in the event an excess voltage is applied to the input.

The DC BAL. control, R6731, (R5511 serial numbers 101-352) provides a means of setting the two cathodes of the amplifier stage to the same dc level so that there will be no shift of the trace as the VARIABLE control is rotated. In serial numbers 101-352 Cathode Follower V5701A reduces amplifier drift caused by V5701B since the two cathode followers tend to drift in the same direction.

Amplifier

The amplifier stage V6111 and V6101, is a common-



cathode phase-splitter amplifier. Coils L6101A and L6101B (L6201 and L6211 serial numbers 101-352) form peaking networks in the plate circuits. R6261 provides the current for the amplifier plates, and a tap to the heater string provides a low impedance at this point.

The VARIABLE VOLTS/CM control, R6101, varies the gain over a 2-to-1 ratio by varying the degeneration in the cathode circuit. The GAIN ADJ. control sets the gain to agree with the front-panel calibration when the VARIABLE control is completely clockwise to the CALIBRATED position.

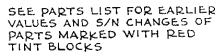
Vertical positioning is produced by two dual potentiometers connected to the plates of the amplifier so that current through one plate load is increased when the potentiometer is adjusted to reduce the current through the other plate load. The VERT. POS. RANGE control has about twice the range of the VERTICAL POSITION control and allows the positioning to be set so the trace is centered when the VERTICAL POSITION control is centered.

Output Cathode Follower

Two sets of cathode followers follow the amplifier stage in order to provide minimum capacitance to the amplifier and drive the capacitance of the interconnecting plug and main-amplifier input circuit. The second cathode follower is modified by the addition of resistors in the plate circuits and by capacitors cross-connected from each plate to the opposite cathode, to improve the high-frequency balance of the unit.

H.F. Peaking (S/N 353 and up)

The H.F. PEAKING control, R6541, varies the current in the output cathode followers. This changes the impedance at the cathodes and changes the effect of the series peaking coils, L6601 and L6611, tied to these cathodes.



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KF