

Laboratori Nazionali di Frascati

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TEKTRONIX 581 OSCILLOSCOPE.

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### A CONSTANT INPUT IMPEDANCE PLUG-IN FOR THE TEKTRONIX 581 OSCILLOSCOPE

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The Tektronix 581 oscilloscope has a 100 Mc/s bandwidth and an input probe whose impedance is claimed to be 100 kΩ shunted by 10 μμF capacitance. Actually the probe has a tendency to ring at about 100 Mc/s, due to stray inductance effects, as stated by the manufacturer. It has often been found desirable to have an input impedance whose magnitude is frequency-independent. This has been done with the circuit to be described that has been assembled on a blank plug-in chassis. Input signals may reach the main 'scope amplifier through two ways: via condenser C or via integrating network R<sub>1</sub>C<sub>1</sub> and vacuum-tube V<sub>1</sub>: if the differentiating network made up by C and the 'scope's amplifier's input resistance (93 Ω) has a time constant equal to R<sub>1</sub>C<sub>1</sub>, a network with all-

pass characteristics is obtained, due to the push-pull nature of the main amplifier. Inductance L and its associated resistors are added to compensate for the rise of input impedance at low frequencies due to condenser C. The unit has been designed for 125 ohm input impedance, but the values may be easily redesigned for a different impedance level. With this plug-in the oscilloscope possesses a bandwidth in excess of 100 Mc/s (about 3 nsec rise time), while the input impedance is constant within better than 3% up to at least 120 Mc. With the plug-in a slight reduction in sensitivity has been experienced (0.2 V/cm against 0.1 V/cm of the standard unit). This is due to the necessity of terminating the main amplifier on both sides. Vacuum tube V<sub>2</sub> terminates the amplifier at the far end.

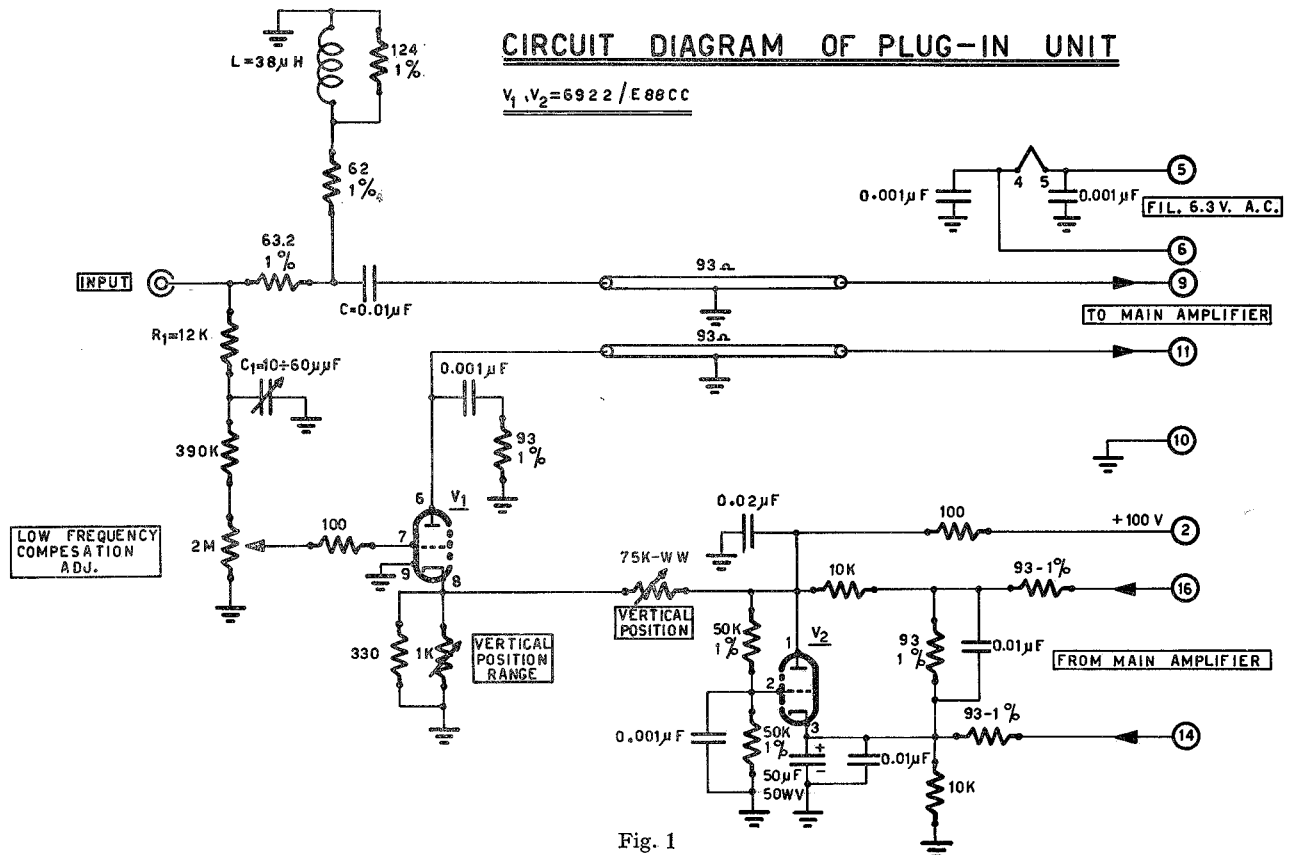


Fig. 1