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NANOSECOND WAVEFORM ELECTRONICS
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INSTRUCTIONS

Model AVO-5B-PS-SL-1 Pulse Generator

S.N.:

WARRANTY

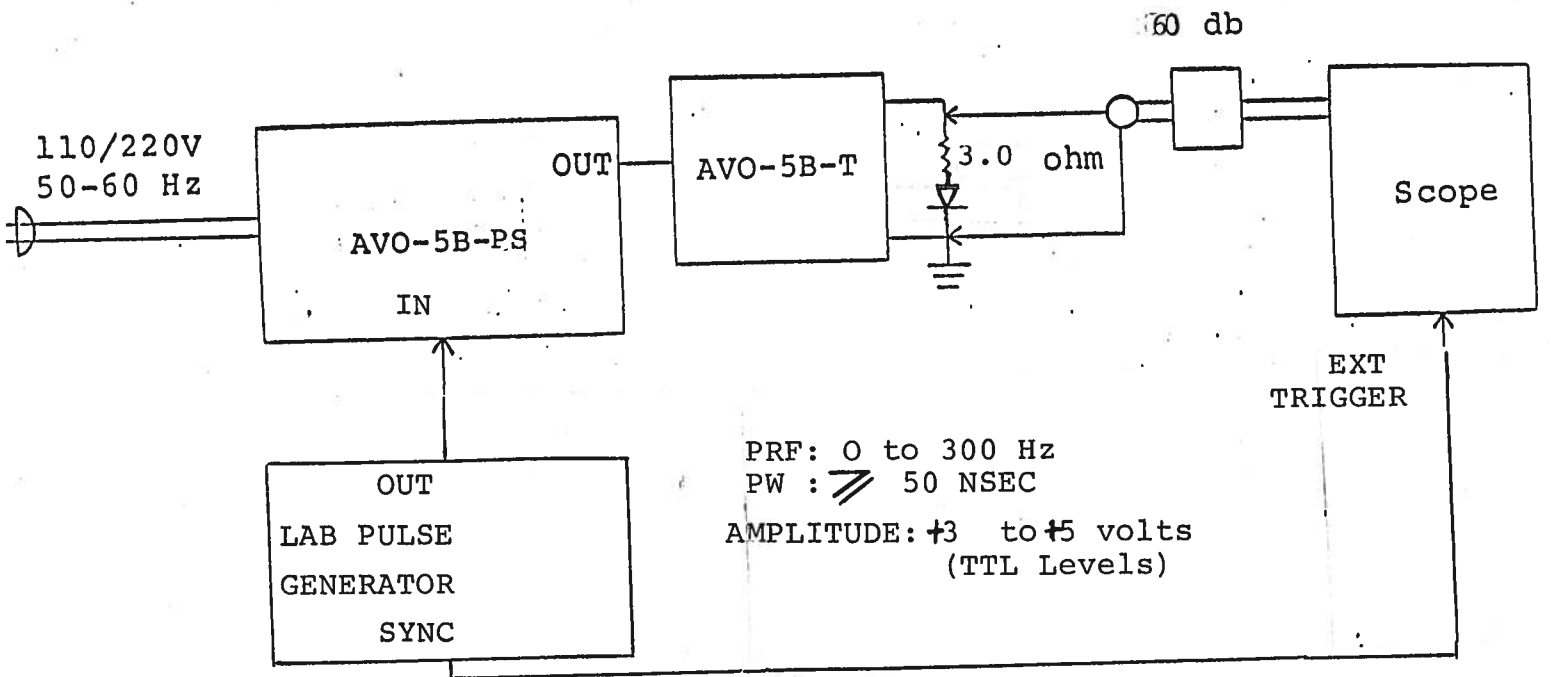
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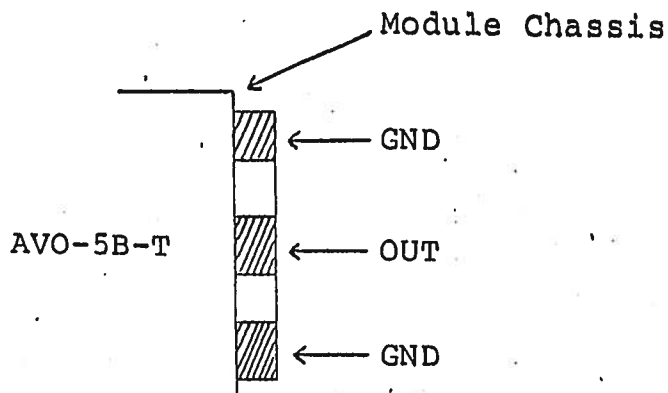
Fig. 1 PULSE GENERATOR TEST ARRANGEMENT



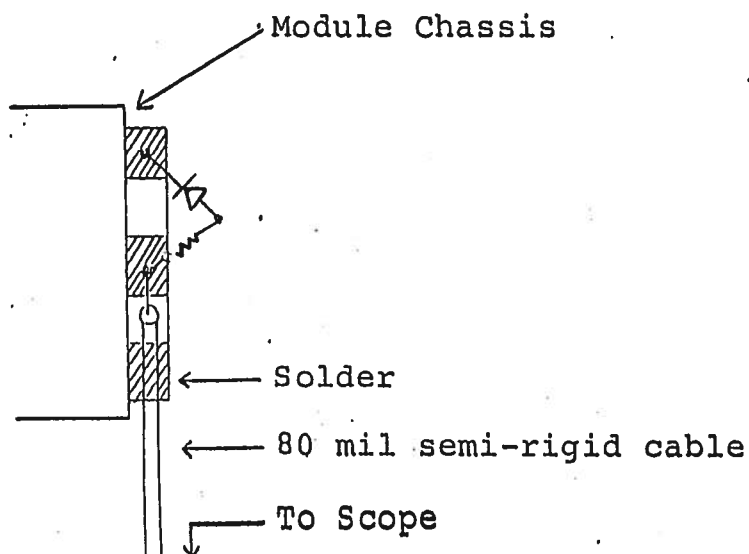
GENERAL OPERATING INSTRUCTIONS

- 1) The equipment should be connected in the general fashion shown above. Since the AVO unit provides an output pulse rise time as low as 20 nsec a fast oscilloscope (at least 50 MHz and preferably 200 MHz) should be used to display the waveform. If a sampling scope is used, a 60 db (or greater) attenuator should be used to insure a peak input to the scope of less than 0.5 volts.

- 2) The AVO-5B-T transformer module transforms the 180 volt output of the AVO-5B mainframe to 90 volts to 3.0 ohm. The AVO-5B-T module connects to the mainframe via four parallel 50 ohm miniature coaxial cables approx 2 feet in length. The output terminals of the transformer module consists of a short length of microstrip transmission line protruding from the module chassis. The OUT terminal is the center conductor which is bounded on both sides by the ground plane (see below):



The diode load and series resistor (3.0 to 4.0 OHM carbon composition resistor) should be connected between the OUT and GND terminals using very short leads (≤ 0.2 cm). The voltage across the resistor-diode load may be monitored by connecting a length of 80 mil semi-rigid 50 ohm cable as shown below:



Take care to insure that during soldering the OUT conductor is not shorted to the chassis. Also, use minimal heat when soldering. The voltage may also be monitored using a high impedance scope probe.

3) The output pulse amplitude is controlled by the one turn AMP control.

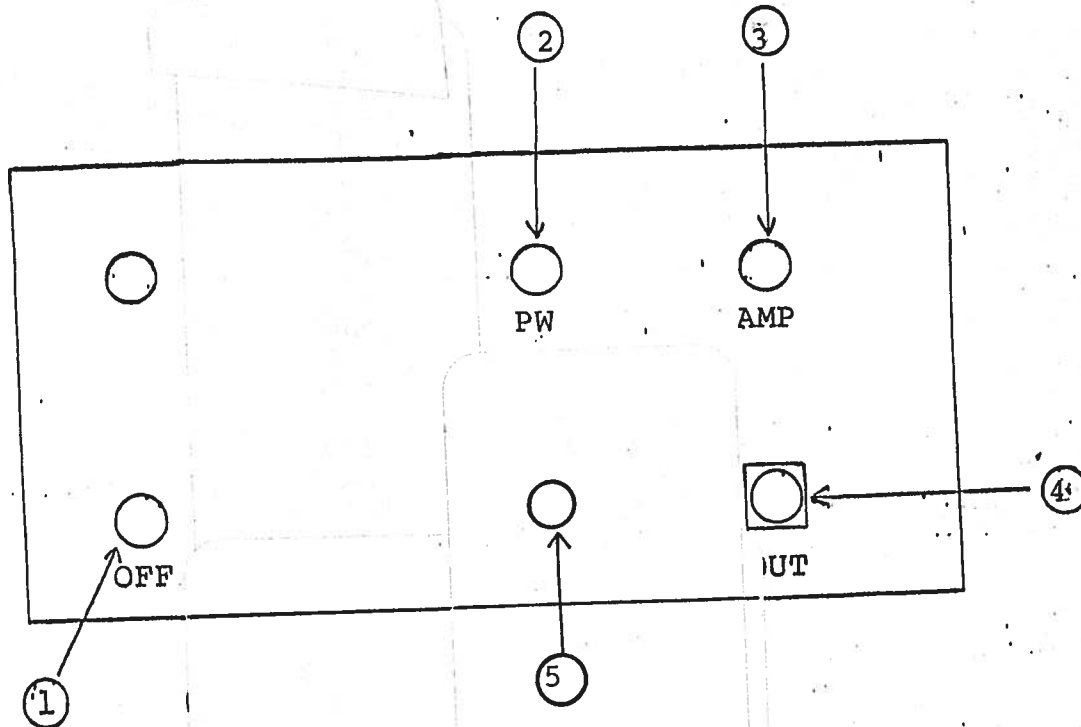
4) The output pulse width is controlled by the one turn PW control.

5) CAUTION:

The unit may fail if operated at a PRF exceeding 300 Hz at maximum output pulse width.

Fig. 2

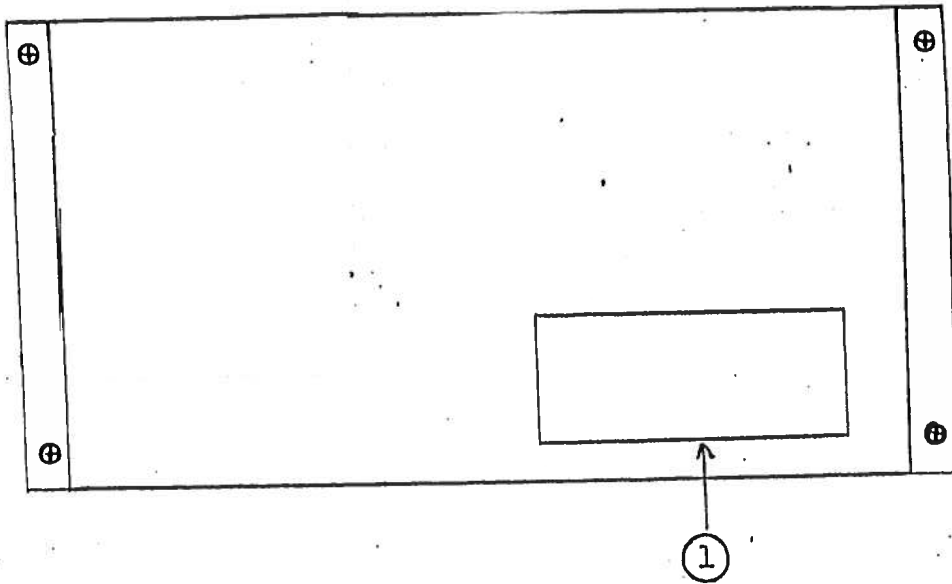
FRONT PANEL CONTROLS



- ① ON-OFF Switch. Applies basic prime power to all stages.
- ② PW Control. A one-turn control which varies the output pulse width from 0.2 to 4.0 USEC
- ③ AMP Control. The output pulse amplitude is controlled by means of the one-turn potentiometer (AMP).
- ④ OUT Connectors. 4 SMA connectors for 4 miniature coaxial cables connected. to the AVO-5B-T module.
- ⑤ IN. The external trigger signal is applied at this input.

Fig. 3

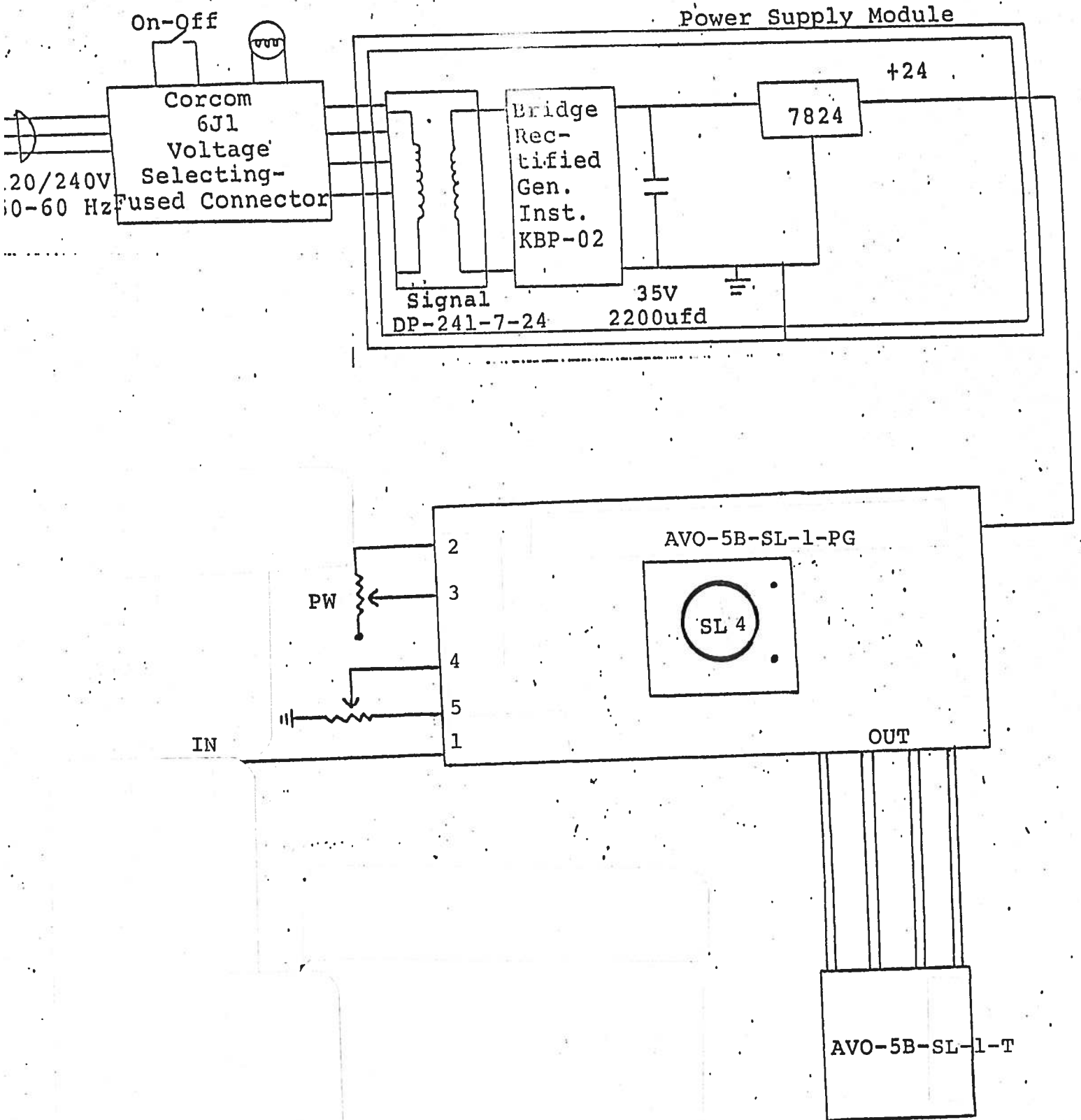
BACK PANEL CONTROLS



① FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse.

Fig. 4

SYSTEM BLOCK DIAGRAM



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVO-5B-PS unit consists of the following basic modules:

- 1) AVO-5B-SL-1-PG pulse generator module.
- 2) AVO-5B-SL-1-T transformer module.
- 3) +24V power supply board

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that some of the output switching elements (SL4) may have failed due to an output short circuit condition or to a high duty cycle condition. The switching elements may be accessed by removing the cover plate on the bottom side of the instrument. NOTE: First turn off the prime power. The elements may be removed from their sockets by means of a needle nosed pliers. The SL4 is a selected VMOS power transistor in a TO 220 packages and may be checked on a curve tracer. If defective, replacement units should be ordered directly from Avtech. When replacing the SL4 switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis.

If the switching elements are not defective, then the four Phillips screws on the back panel should be removed. The top cover may then be slid off and the operation of the power supply module checked.

The power supply board generates +24VDC to power the other modules. If the voltage is less than +24V, turn off the prime power and unsolder the lead from the 7824 regulator chip on the power supply board. Solder a 100 ohm 5 watt resistor to the 7824 output to ground and turn on the prime power. A voltage of +24 volts should be read. If the voltage is less then the power supply board is defective and should be repaired or replaced.

