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**NANOSECOND WAVEFORM ELECTRONICS
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INSTRUCTIONS

MODEL AVO-5D-PS PULSE GENERATOR

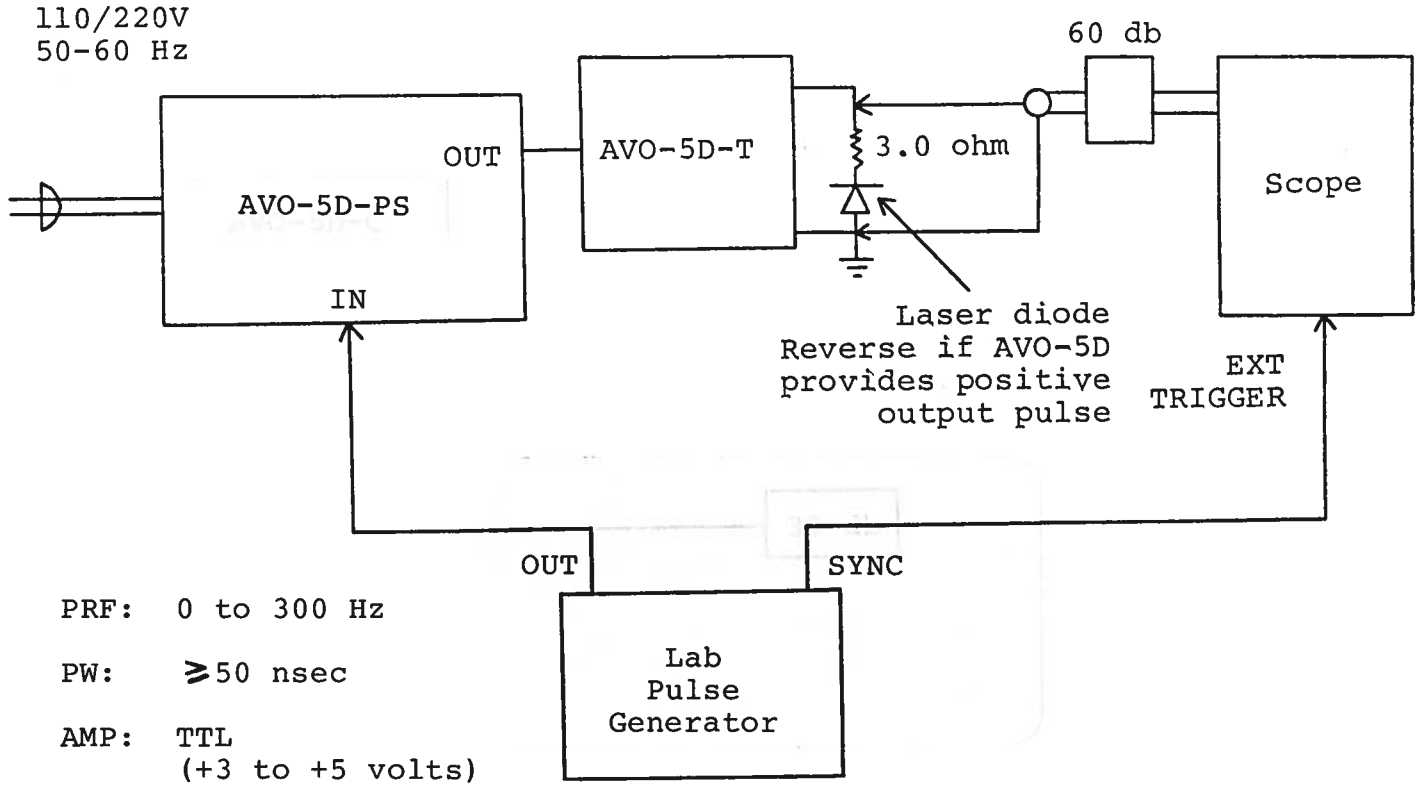
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WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation or liability assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

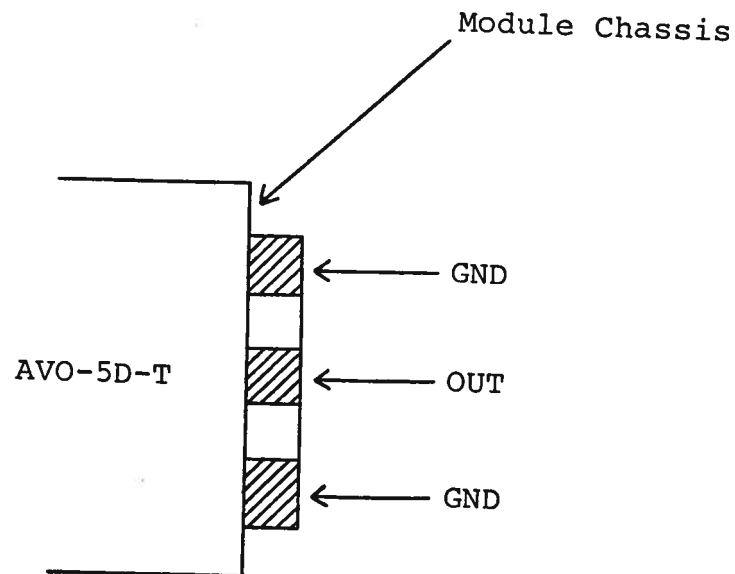
Fig. 1

PULSE GENERATOR TEST ARRANGEMENT

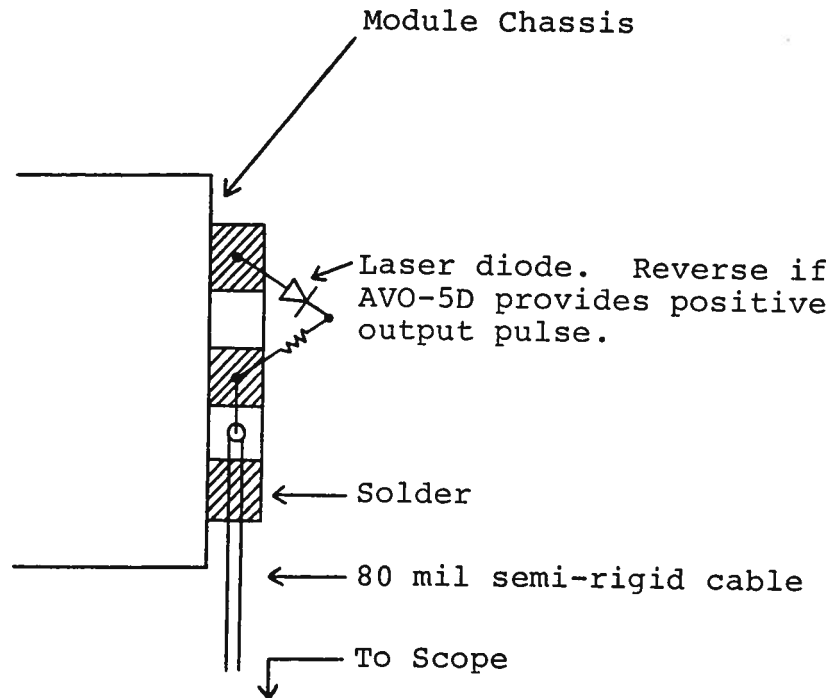


Notes:

- 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 10 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-5D-T transformer module transforms the 200 volt output of the AVO-5D mainframe to 100 volts to 3 ohm. The AVO-5D-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 (2.5 to 3.5 ohm 1/2 W carbon composition resistor) should be connected between the OUT and GND terminals using very short leads ($\ll 0.5$ 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:

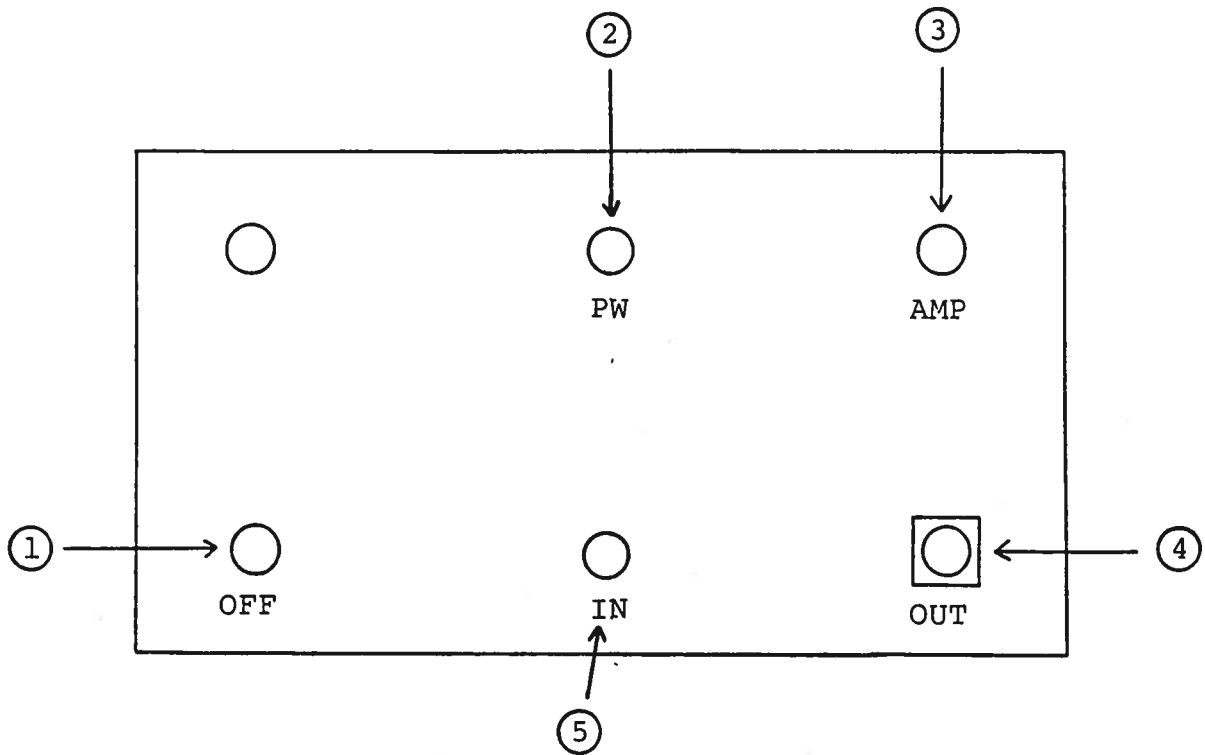


Take care to insure that during soldering the OUT conductor is not shorted to the chassis. Also, use minimal heat when soldering.

- 3) To voltage control the output pulse width, remove the jumper wire between banana plugs A and B on the back panel and apply 0 to +10V to connector B ($R_{IN} \gg 10K$). (option).
- 4) To voltage control the output amplitude, remove the jumper wire between banana plugs A and B on the back panel and apply 0 to +10V to connector B ($R_{IN} \gg 10K$). (option).

Fig. 2

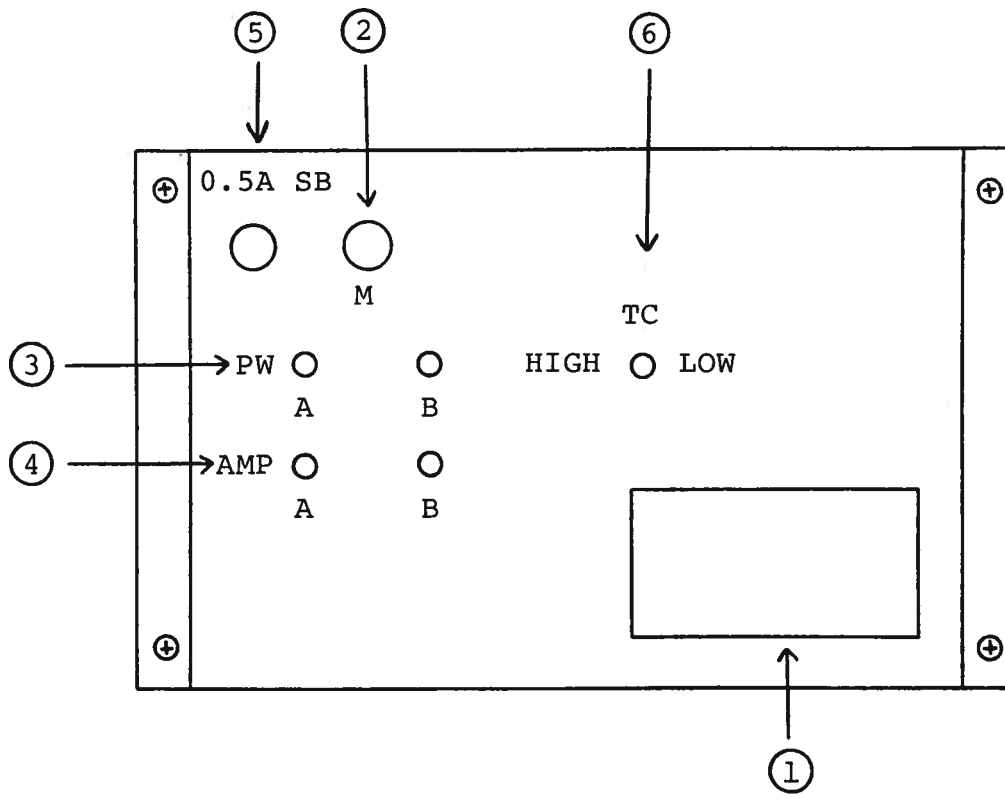
FRONT PANEL CONTROLS



- (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 100 nsec to 5.0 usec.
- (3) AMP Control. The output pulse amplitude is controlled by means of the one turn potentiometer (AMP).
- (4) OUT Connectors. Four SMA connectors for four miniature coaxial cables connected to the AVO-5D-T module.
- (5) TRIG Input. The external trigger signal is applied at this input. The output pulse at (4) appears about 50 nsec after the application of the TRIG pulse.

Fig. 3

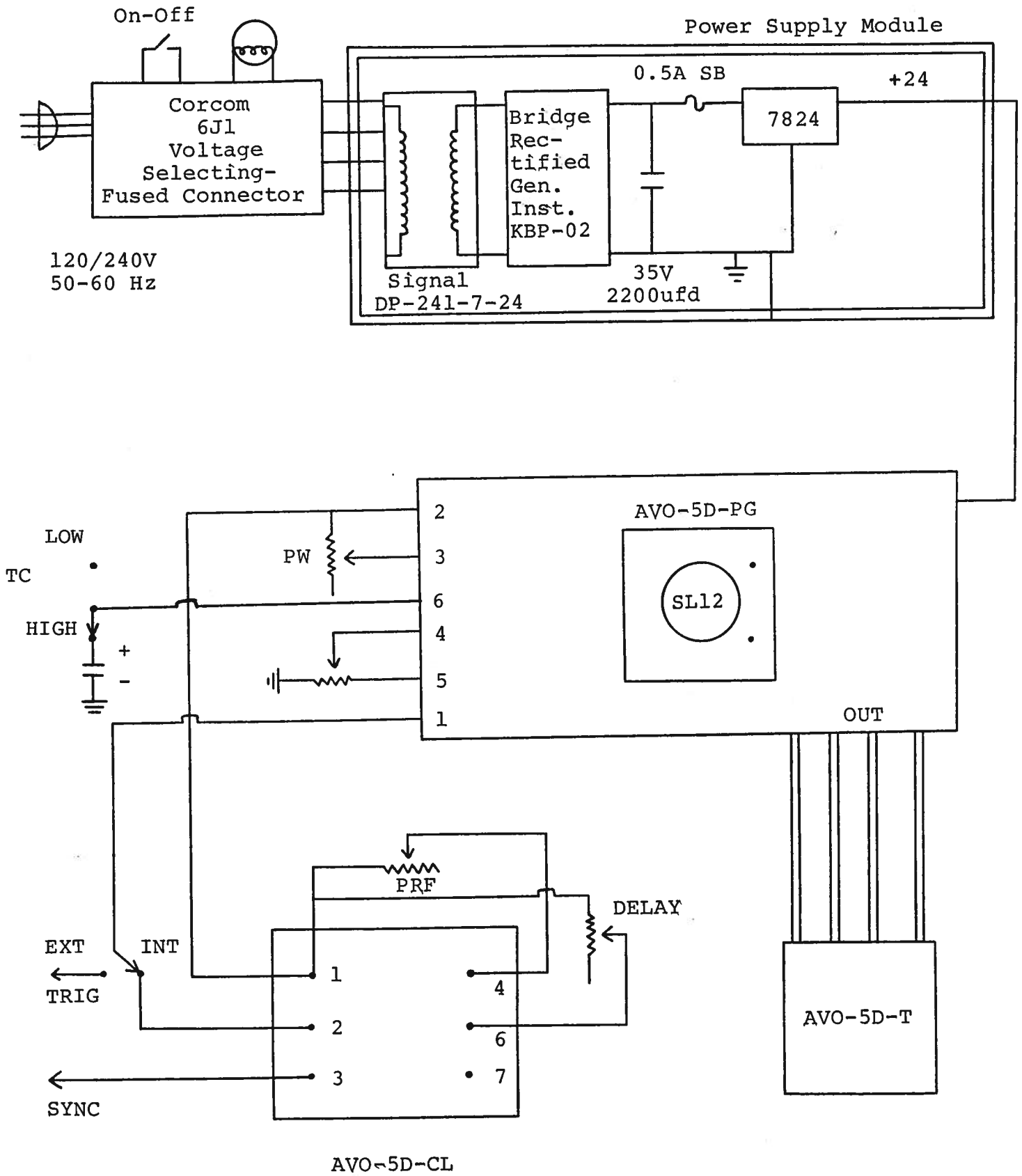
BACK PANEL CONTROLS



- (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.
- (2) MONITOR Output (M). Output voltage (to fifty ohms) at this point (V_M) can be related to AVO-5D-T output current (I_{OUT}) as follows (option):
$$I_{OUT} = 1.6 V_M \quad (\text{Volts and Amps})$$
- (3) To voltage control the output pulse width, remove the jumper wire between banana plugs A and B and apply 0 to +10V to connector B ($R_{IN} \geq 10K$). (option).
- (4) To voltage control the output amplitude, remove the jumper wire between banana plugs A and B and apply 0 to +10V to connector B ($R_{IN} \geq 10K$). (option).
- (5) 0.5A SB. This fuse limits the DC prime power supplied to the output stage and will blow in the case of severe overloading.
- (6) TIME CONSTANT CONTROL. Two position switch controls the decay time of the output amplitude when the control pot (or DC control voltage) is changed. The time constant in the LOW position is approximately 10 times lower than for the HIGH position. The output pulse droop is about 10 times higher for the LOW position than for the HIGH position so the LOW position should only be used for pulse widths less than 0.5 usec.

Fig. 4

SYSTEM BLOCK DIAGRAM



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

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

- 1) AVO-5D-PG pulse generator module
- 2) AVO-5D-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 the rear panel 0.5A SB fuse or some of the output switching elements (SL12) 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 SL12 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 SL12 switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis.

Schroff

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