AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
ENGINEERING . MANUFACTURING

P.O. BOX 265
OGDENSBURG
NEW YORK
13669
(315) 472-5270

BOX 5120 STN. "F"
OTTAWA, ONTARIO
CANADA K2C 3H4
(613) 226-5772
TELEX 053-4591

INSTRUCTIONS

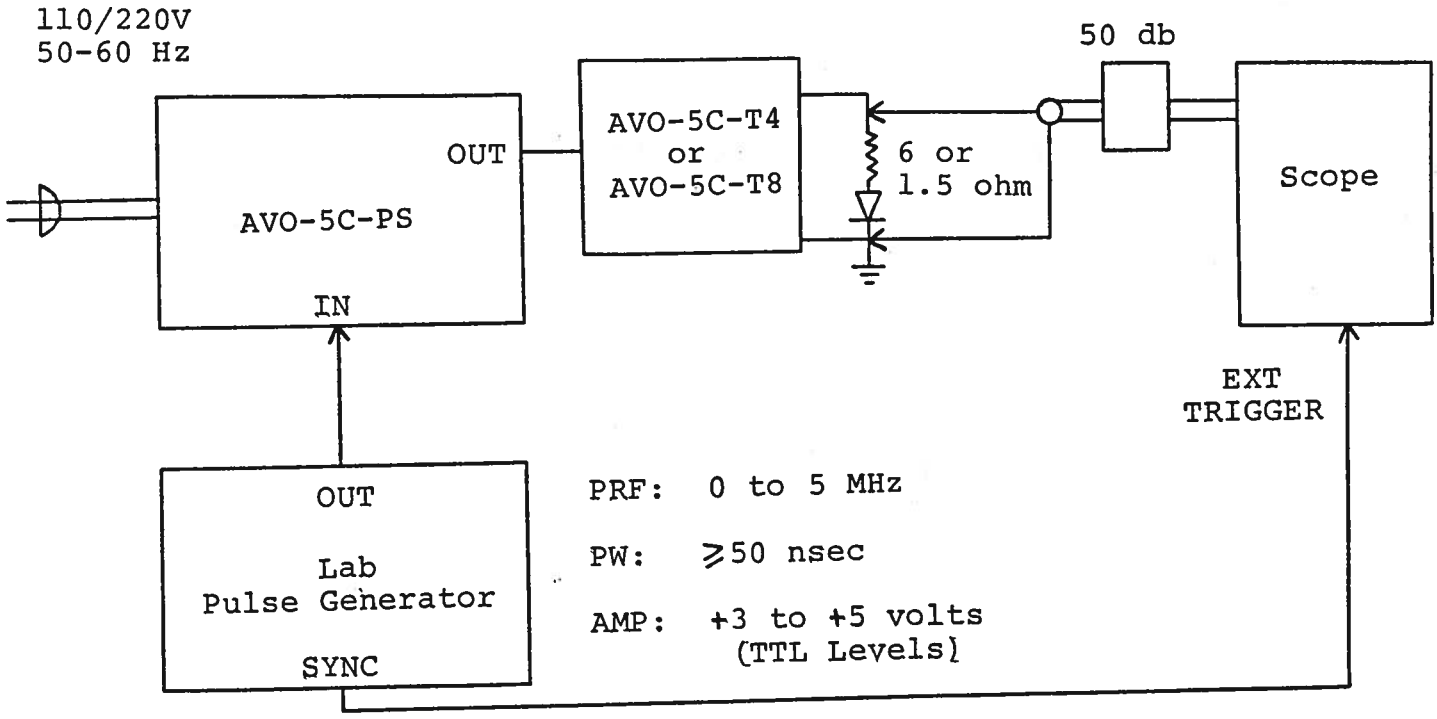
MODEL AVO-5C-PS PULSE GENERATOR

S.N.:

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 dissembled, 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.

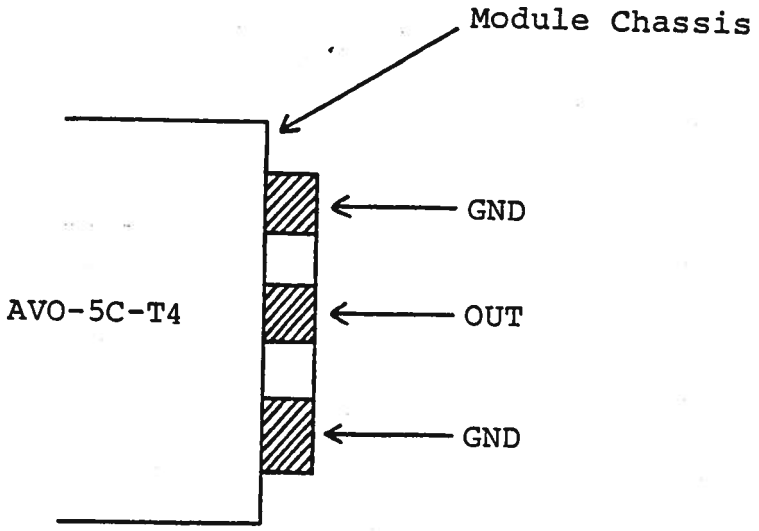
Fig. 1 PULSE GENERATOR TEST ARRANGEMENT



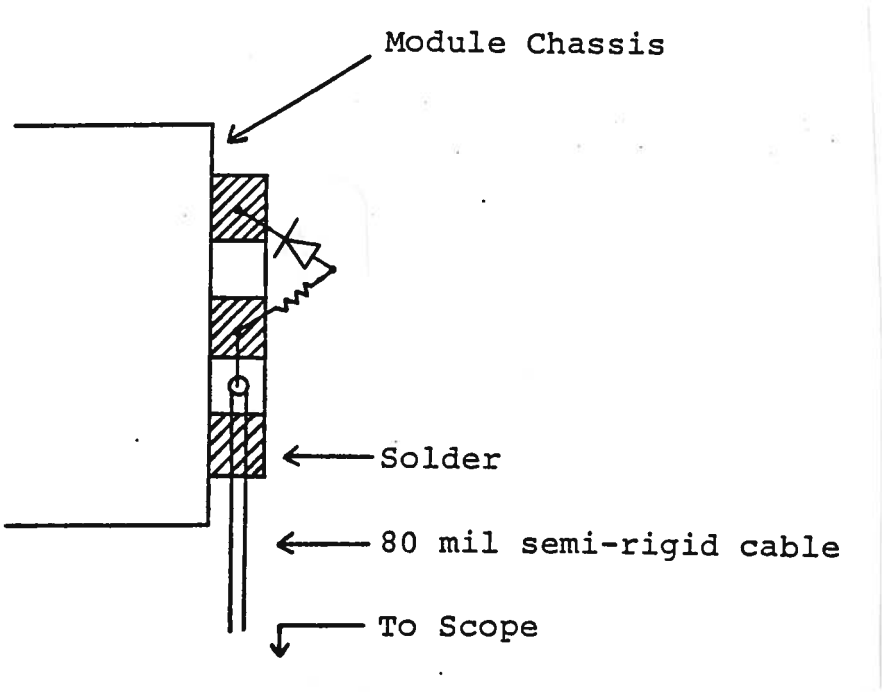
Notes:

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 5 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 50 db (or greater) attenuator should be used to insure a peak input to the scope of less than 0.5 volts.

2) The AVO-5C-T4 transformer module transforms the 50 volt output of the AVO-5C mainframe to 25 volts to 6.0 ohm to provide a peak diode as high as 4 amperes. (Use AVO-5C-T8 to obtain 8 amperes as discussed in paragraph 3). The AVO-5C-T4 module connects to the mainframe via two 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 (5.0 to 7.0 ohm 1/2 W 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:

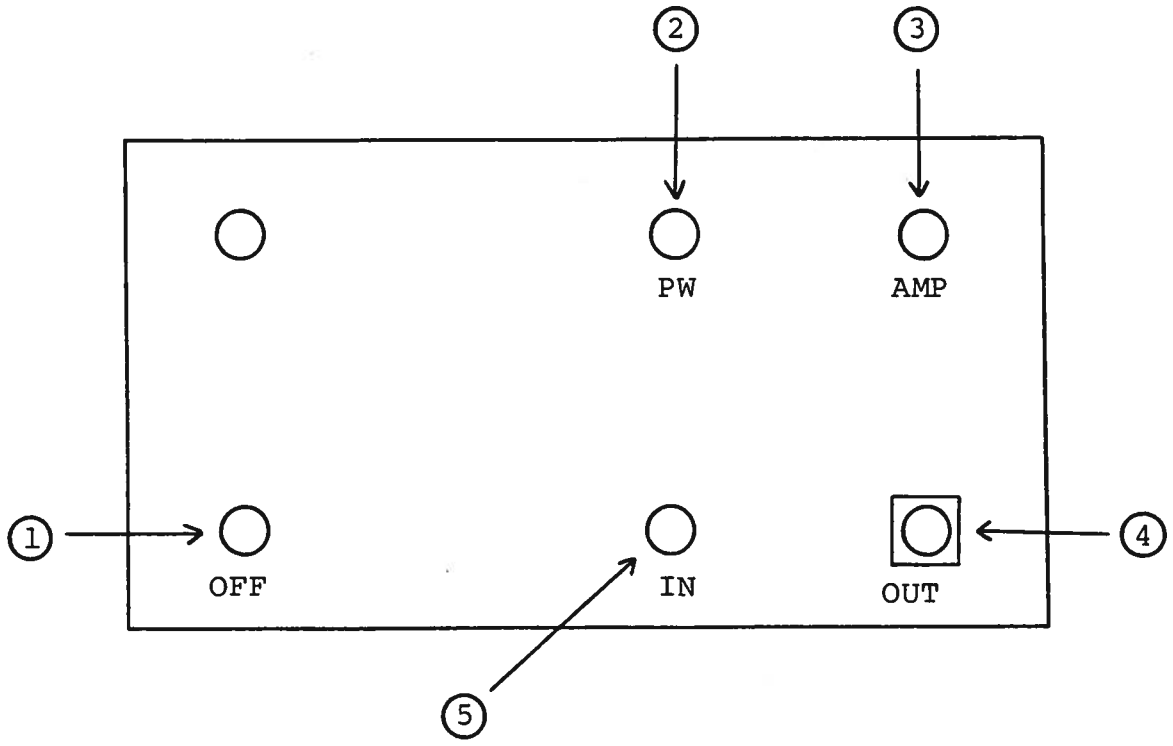


Take care to insure that during soldering the OUT conductor is not shorted to the chassis. Also, use minimal heat when soldering.

3) The AVO-5C-T8 module is used to obtain peak output currents as high as 8 amperes. This module transforms the 50 volt output of the AVO-5C mainframe to 12 volts to 1.5 ohms. The connections to the module are as per the AVO-5C-T4 module but the resistor should be about 1.5 ohm.

4) CAUTION: At maximum PRF and maximum pulse width, the AVO-5C unit provides an average output power as high as 20 watts. Considerable care must be taken to insure that the resistive load and the diode can dissipate this extremely high power. The power dissipated can be reduced by reducing the PRF and the pulse width. Note that the output duty cycle must not exceed 10% or the output switching elements may fail (see Repair Section).

Fig. 2 FRONT PANEL CONTROLS



(1) ON-OFF Switch. Applies basic prime power to all stages.

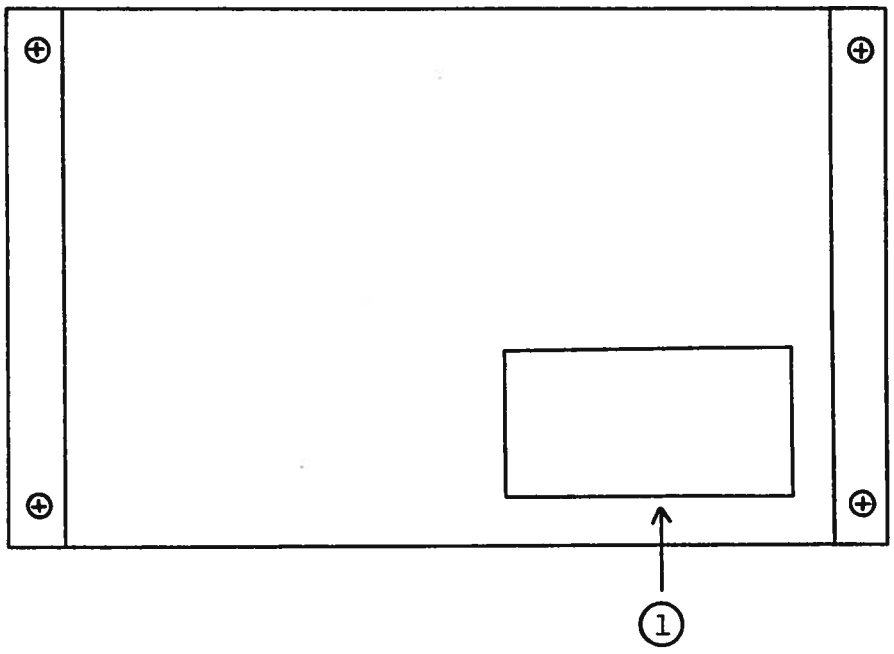
(2) PW Control. A one turn control which varies the output pulse width from 5 to 50 nsec.

(3) AMP Control. The output pulse amplitude is controlled by means of the one turn potentiometer (AMP).

(4) OUT Connectors. Two SMA connectors for two miniature coaxial cables connected to the AVO-5C-T module.

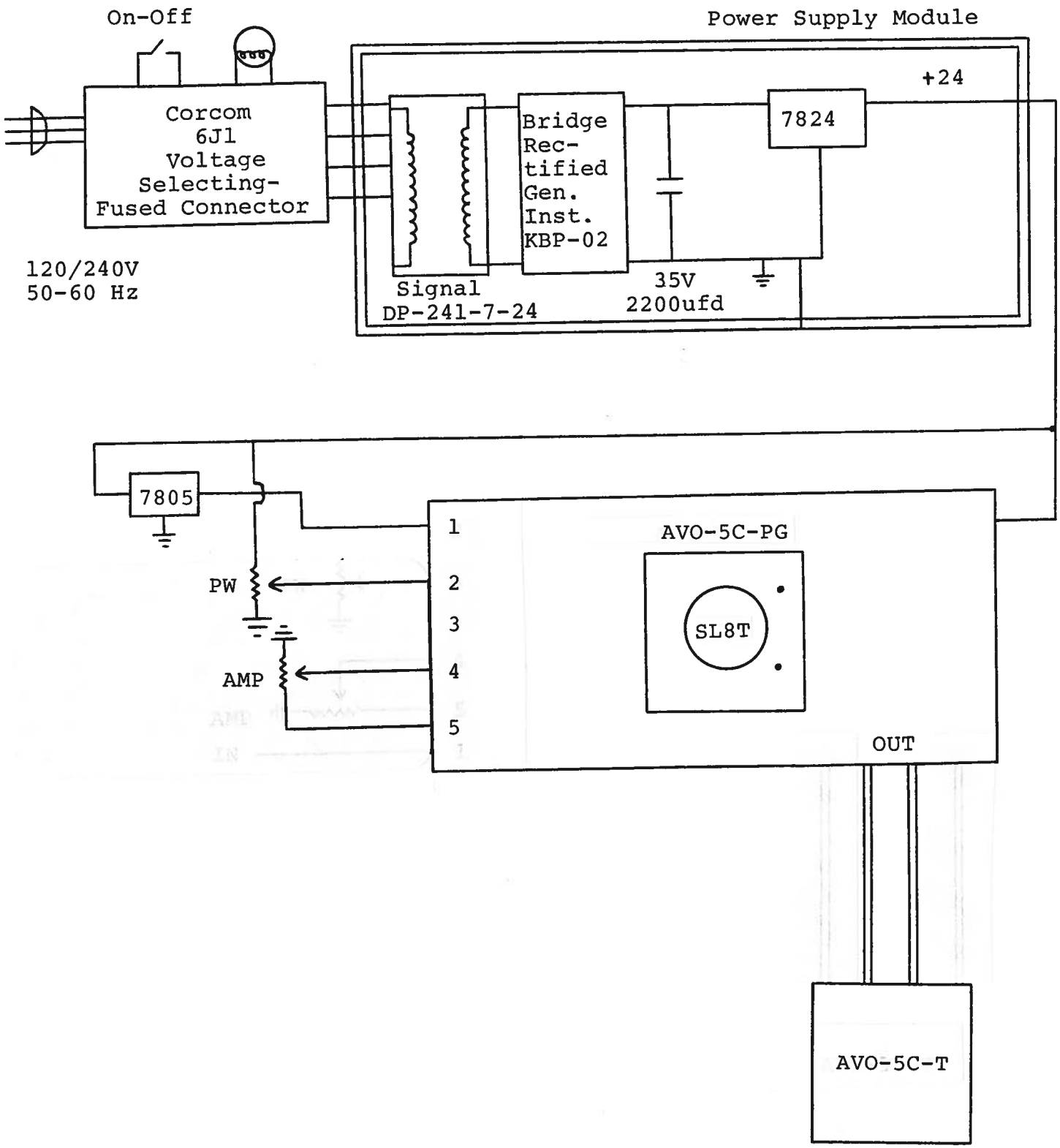
(5) IN. The external trigger signal is applied at this input.

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-5C-PS unit consists of the following basic modules:

1) AVO-5C-PG pulse generator module
2) +24V power supply board

The modules are interconnected as shown in Fig. 4 and Fig. 5.

In the event of an instrument malfunction, it is most likely that some of the output switching elements (SL8T) 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. The cover plate is removed by removing the two 2-56 Phillips screws. NOTE: First turn off the prime power. CAUTION: Briefly ground the SL8T tabs to discharge the -70 volts power supply potential. The elements may be removed from their sockets by means of a needle nosed pliers after removing the two counter sunk 2-56 Phillips screws which attach the small aluminum heat sinks to the body of the AVO-5C-PG module. The SL8T 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 SL8T switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis. The SL8T elements are electrically isolated from the small aluminum heat sinks but are bonded to the heat sinks using WAKEFIELD TYPE 155 HEAT SINK ADHESIVE. 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 modules checked. The power supply is functioning properly if it can provide up to 500 mA at +24V.

The sealed pulse generator module must be returned to Avtech for repair or replacement if the unit still will not operate.

Schroff 07.24.87