

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
TEL: (613) 226-5772
FAX: (613) 226-2802
TELEX: 053-4591

INSTRUCTIONS

MODEL AV-107E-PS-IBM1 PULSE GENERATOR

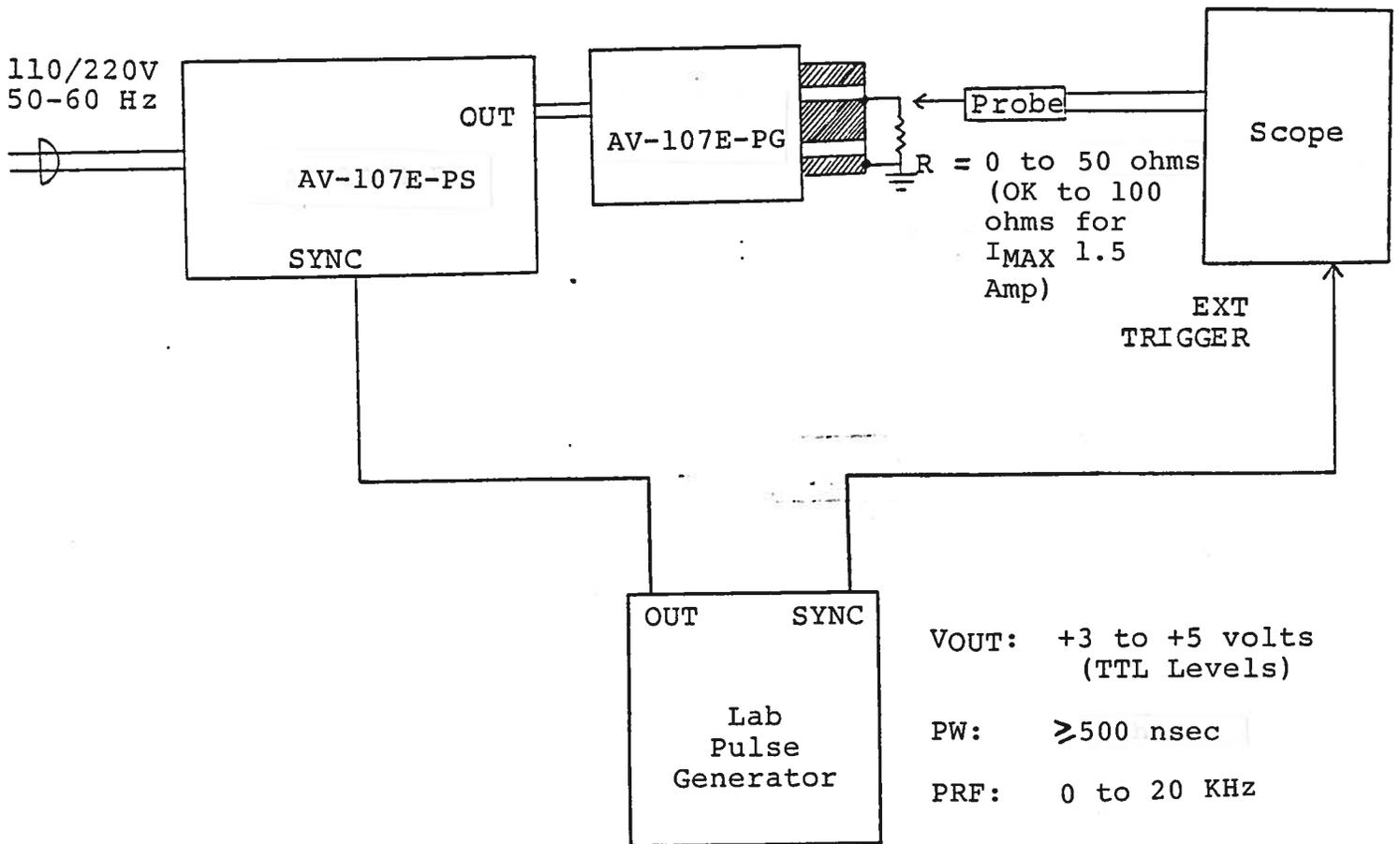
S.N.:

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 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.

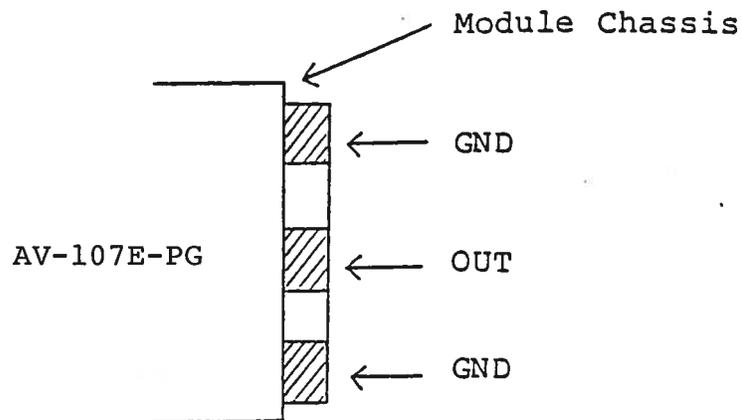
Fig. 1

PULSE GENERATOR TEST ARRANGEMENT

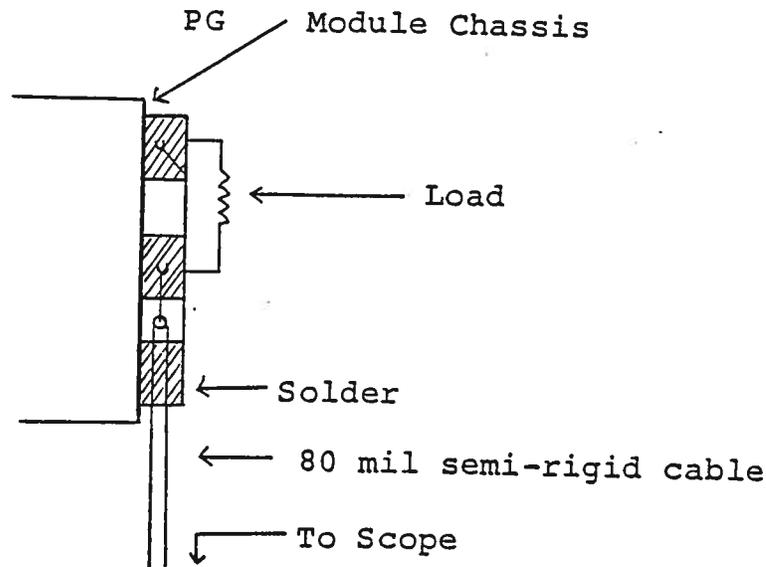


GENERAL OPERATING INSTRUCTIONS

- 1) The equipment should be connected in the general fashion shown above. Since the 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. Alternatively, the output current may be monitored using a current probe such as the TEKTRONIX Model CT-2.
- 2) The output pulse width is controlled by means of the front panel one turn PW control.
- 3) The output pulse amplitude is controlled by means of the front panel one turn AMP control.
- 4) The output terminals of the pulse generator 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 load should be connected between the OUT and GND terminals using very short leads ($\ll 0.5$ cm). The voltage across the load may be monitored by connecting a length of 80 mil semi-rigid 50 ohm cable as shown below (or by means of a high impedance scope probe). The current may be monitored using a current probe such as the TEKTRONIX Model CT-2.



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

- 5) MI Option. The MI output port on the AV-107-PG module provides a replica of the output current pulse when connected to a high impedance load ($R_L \gg 10K$). The output pulse load current (Amps) and the M output voltage (Volts) are related as follows:

$$I_{LOAD} = 3 V_M$$

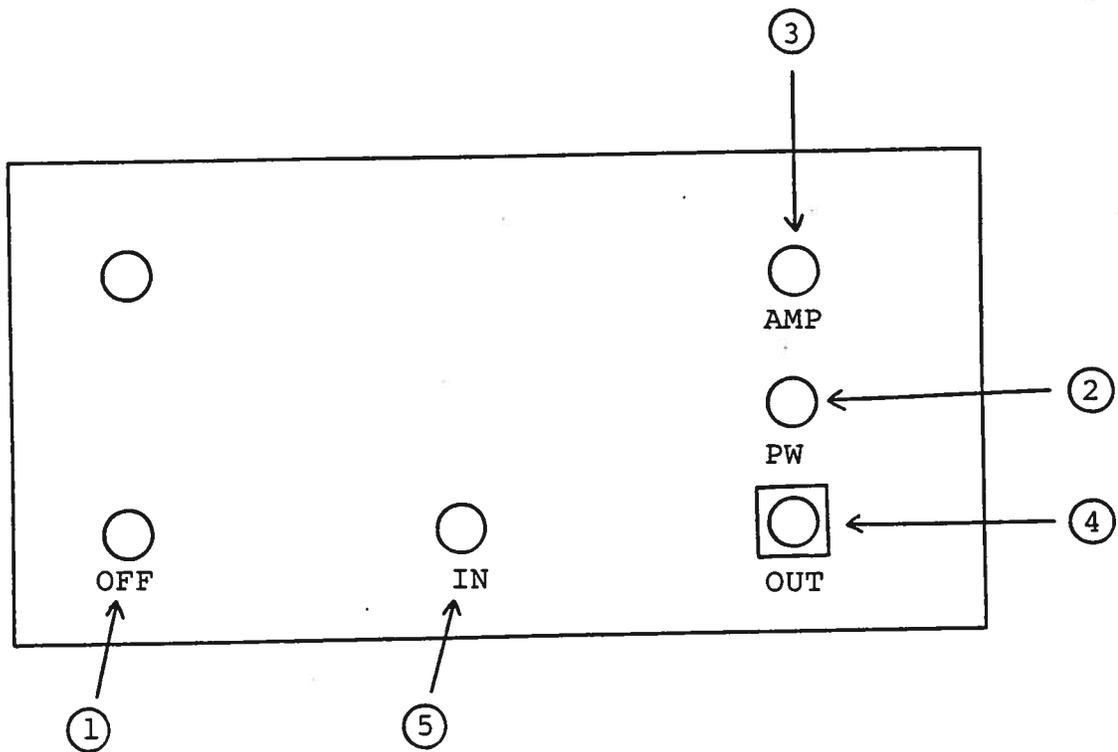
- 6) MV Option. The MV output port on the AV-107-PG module provides a replica of the output voltage pulse when connected to a high impedance load ($R_L > 10K$) as follows:

$$V_{LOAD} = 10 V_M$$

- 7) The AV-107 is specifically designed for driving resistive loads and laser diode loads with series resistance. The loads should be connected directly to the microstrip line protruding from the PG module with very short leads. The importance of short leads is critical as LENZ'S LAW will predict large voltage spikes. If a highly nonlinear load such as a zener diode or IMPATT diode is connected to the PG output oscillations may be observed. The oscillation can be controlled by introducing some series resistance. In addition, shunt capacitance (10 to 100 pfd) placed across the diode and/or across the PG output will serve to reduce oscillation.

Fig. 2

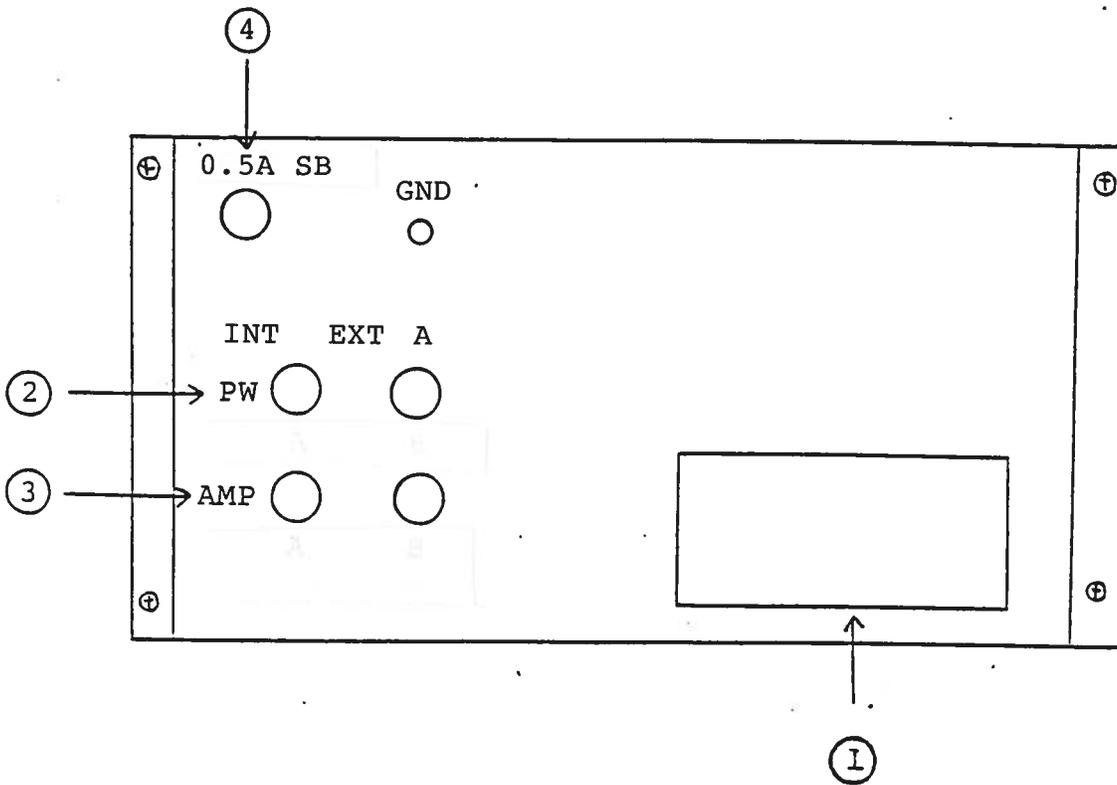
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PW Control. A one turn control which varies the output pulse width.
- (3) AMP Control. The output pulse amplitude is controlled by means of the one turn potentiometer (AMP).
- (4) OUT Connector. A multi pin connector which attaches the 2 foot cable from the pulse generator module to the main frame.
- (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.
- (2) To voltage control the output pulse width, set the switch in the EXT position and apply 0 to +10V between terminal A and ground ($R_{IN} \geq 10K$). (option).
- (3) To voltage control the output amplitude, set the switch in the EXT position and apply 0 to +10V between terminal A and ground ($R_{IN} \geq 10K$). (option).
- (4) 0.5A SB FUSE. Fuse limits DC current available to the output stage.

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AV-107E-PS unit consists of the following basic modules:

- 1) AV-107E-PG pulse generator module
- 2) +24V power supply board
- 3) +200V power supply module

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that either of the rear panel fuses have blown or that some of the output switching elements (SL14T) 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 -PG module. The cover plate is removed by removing the four counter sunk 6-32 Phillips screws. NOTE: First turn off the prime power. CAUTION: Briefly ground the SL14T tabs to discharge the 200 volts power supply potential. The elements may be removed from their sockets by means of a needle nosed pliers after removing the four counter sunk 2-56 Phillips screws which attach the small aluminum heat sinks to the body of the AV-107-PG module. The SL14T is a selected VMOS power transistor in a TO 220 package and may be checked on a curve tracer. If defective, replacement units should be ordered directly from Avtech. When replacing the SL14T switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis. The SL14T elements are electrically isolated from the small aluminum heat sinks but are bonded to the heat sinks using WAKEFIELD TYPE 155 HEAT SINK ADHESIVE.

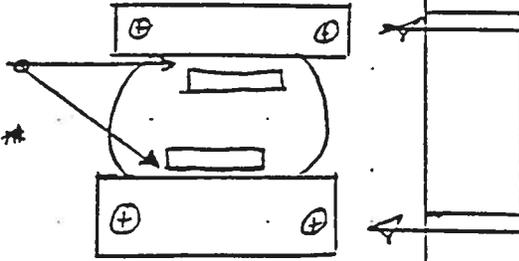
AV-107E-C SL14T HEAT SINKING

BACK

-P-P6

FRONT

155
HEAT SINK
ADHESIVE*



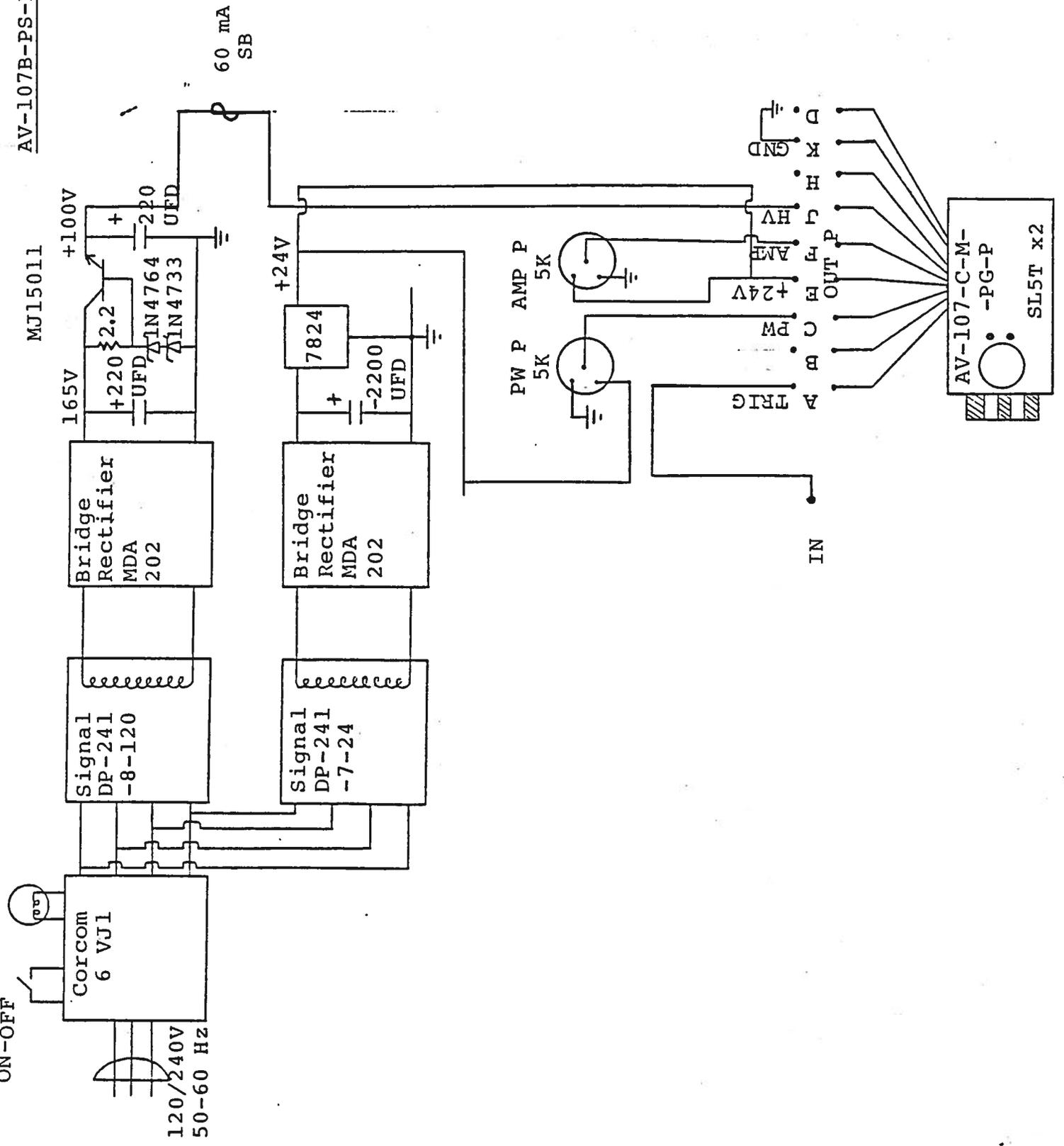
SIGNAL
LEADS



AV-107B-PS-P

MJ15011

ON-OFF



Schroff

09.12.89

-EW

-EA