



**AVTECH ELECTROSYSTEMS LTD.**  
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INSTRUCTIONS

**MODEL AVR-7B-PS-P-IBMB-EA-EAD-AT-R4 PULSE GENERATOR**

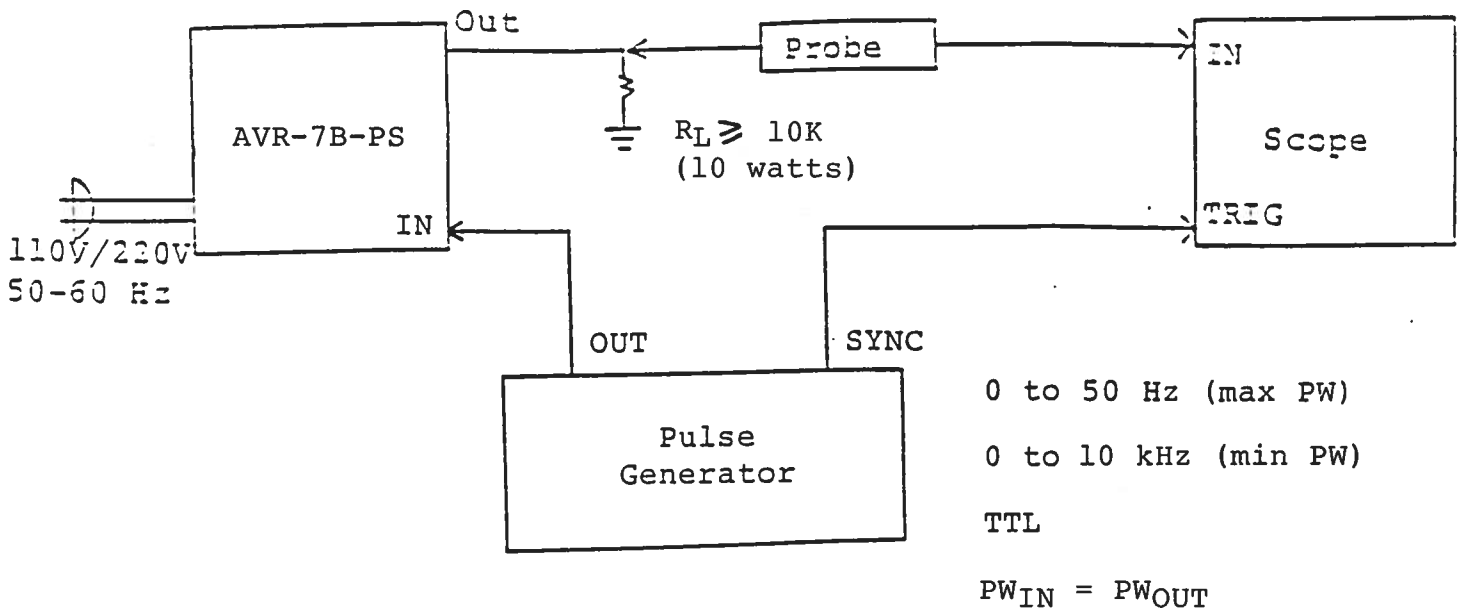
**S.N. :**

### 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



Notes:

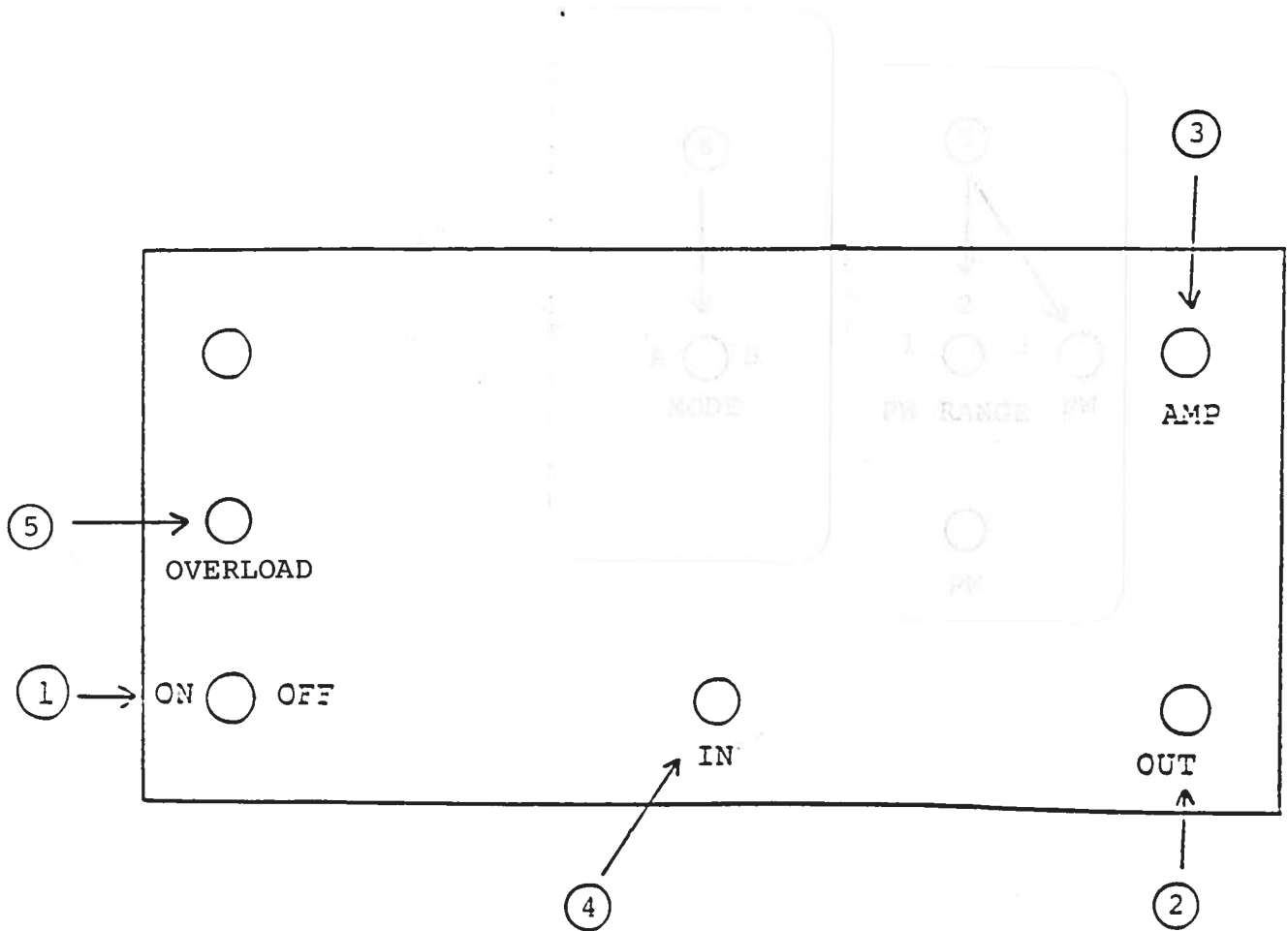
- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.
- 1A) CAUTION: THIS MODEL WAS DESIGNED TO OPERATE INTO A HIGH IMPEDANCE LOAD ( $R_L > 10K$ ) AND MAY FAIL IF OPERATED INTO A LOW IMPEDANCE LOAD (EG. 50 OHM).
- 2) The output pulse width equals the TTL level input trigger pulse width.
- 3) The output duty cycle should never exceed 10%. For example, for an output pulse width of 10 ms, the PRF should be less than 10 Hz.
- 4) The output pulse amplitude is controlled by means of the front panel ten turn AMP control. CAUTION: The AMP control should be rotated slowly (particularly when rotating CCW) so as to avoid over-stressing of the output stage. CAUTION: The output amplitude should be set to zero before turning the instrument ON or OFF. This will reduce possible over-stressing of the output stage.
- 5) EAD option: To digitally control the output amplitude (in 256 increments) set the rear panel switch in the EXT position and apply a parallel TTL control to PINS 1 to 8 (PIN 1 = LSB, PIN 8 = MSB) to the rear panel D connector (PIN 14 ground).
- 6) The AVR-7-PS features an output impedance of the order of several ohms (rather than 50 Ohms). The following consequences of this feature should be noted:
  - a) When used to switch some semiconductor devices (eg. bipolar and VMOS power transistors), the AVR unit will yield much faster switching times than those provided by 50 Ohm pulse generators.
  - b) The output switching elements may fail if the unit is inadvertently operated into a short circuit. The switching elements are easily replaced in the field following the procedure outlined in the REPAIR Section.
- 7) CAUTION: The output stage is protected against overload condition by a 2.0 A slow blow fuse on the main frame back panel. However, the output switching elements may fail if the unit is triggered at a PRF exceeding 10 kHz or at duty cycles resulting in an average output power in excess of 50 watts. Heating and subsequent likely

failure of the output stage is reduced if the following action is taken where possible:

- a) PRF is kept to a minimum, i.e. operate in a low PRF range when possible rather than in a high PRF range.
  - b) Keep the output PW to a minimum.
- 8) OVERLOAD INDICATOR. AVR-7 units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:
- 1) Reducing PRF (i.e. switch to a lower range)
  - 2) Reducing pulse width (i.e. switch to a lower range)
  - 3) Removing output load short circuit (if any)
- 9) The unit can be converted from 110 to 220V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector cable connector assembly.
- 10) For additional assistance:
- Tel: 1-800-265-6681  
Fax: (613) 226-2802

Fig. 2

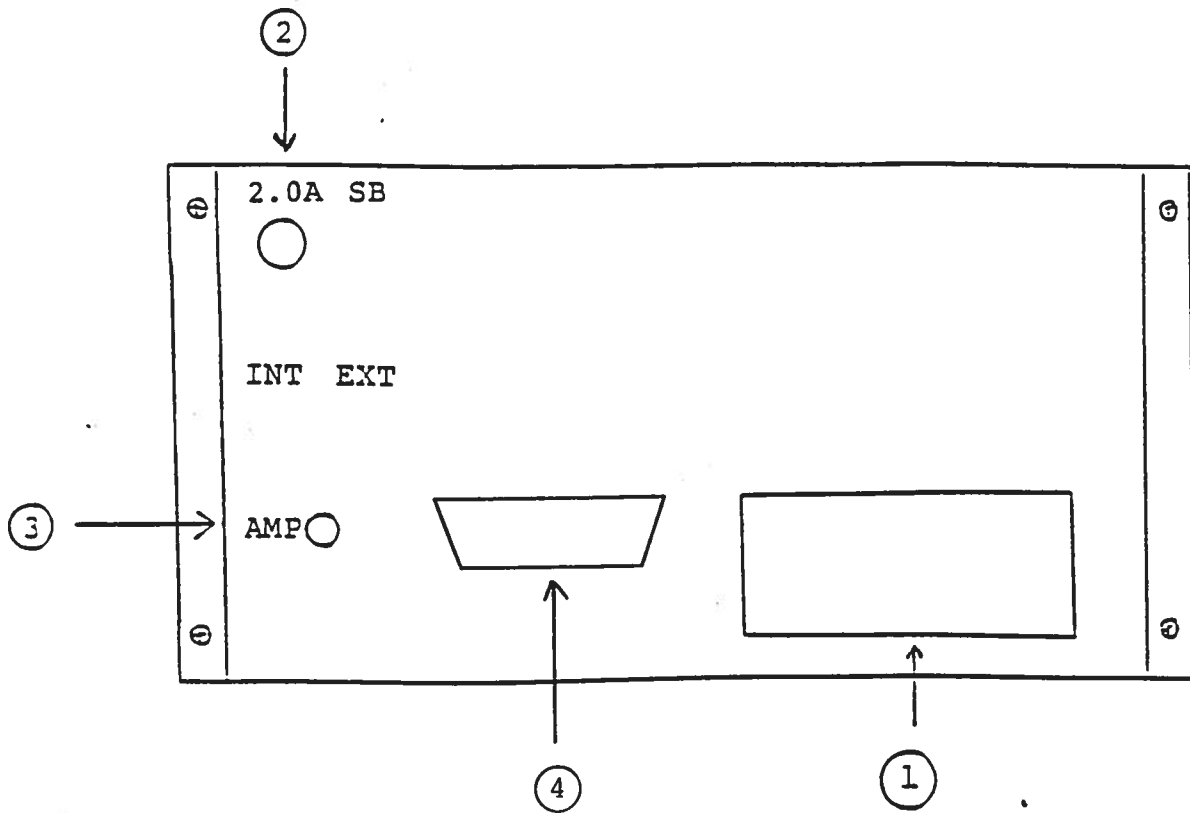
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) OUT Connector. N connector provides output to a high impedance load ( $R_L > 10K$ ).
- (3) AMP Control. A ten turn control which varies the output pulse amplitude from 0 to 800 V to a high impedance load.
- (4) TRIG Input. The external trigger signal is applied at this input ( $PW_{OUT} = PW_{IN}$ ).
- (5) OVERLOAD INDICATOR. AVR-7 units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:
  - 1) Reducing PRF (i.e. switch to a lower range)
  - 2) Reducing pulse width (i.e. switch to a lower range)
  - 3) Removing output load short circuit (if any)

Fig. 3

BACK PANEL CONTROLS (EAD OPTION UNITS)



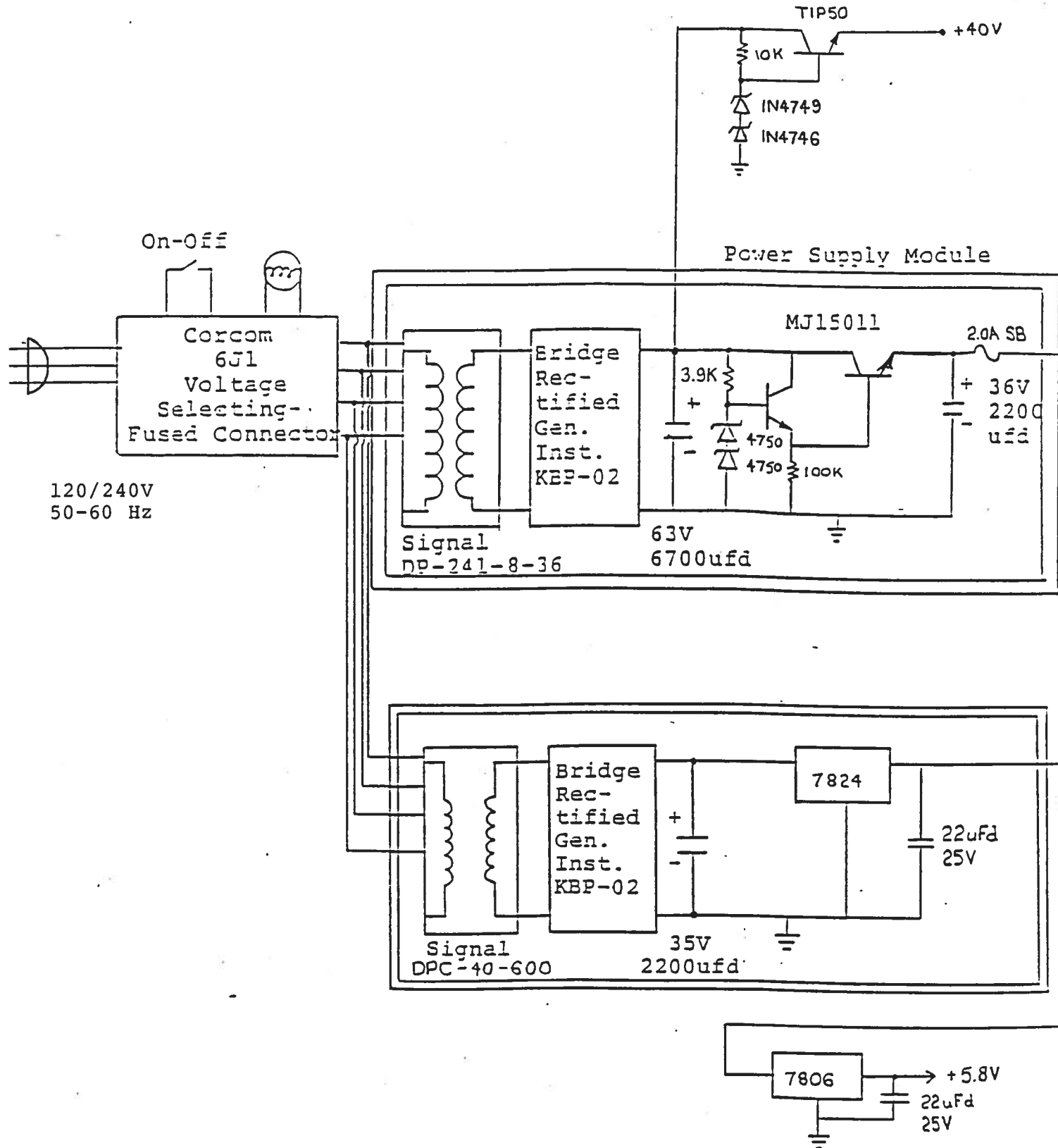


- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse (1.0 A SB).
- (2) 2.0A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.
- (3) EAD option. To digitally control the output amplitude (in 256 increments) set the switch (3) in the EXT position and apply a parallel TTL control to PINS 1 to 8 (PIN 1 = LSB, PIN 8 = MSB) to the D connector (5). PIN 14 is ground.

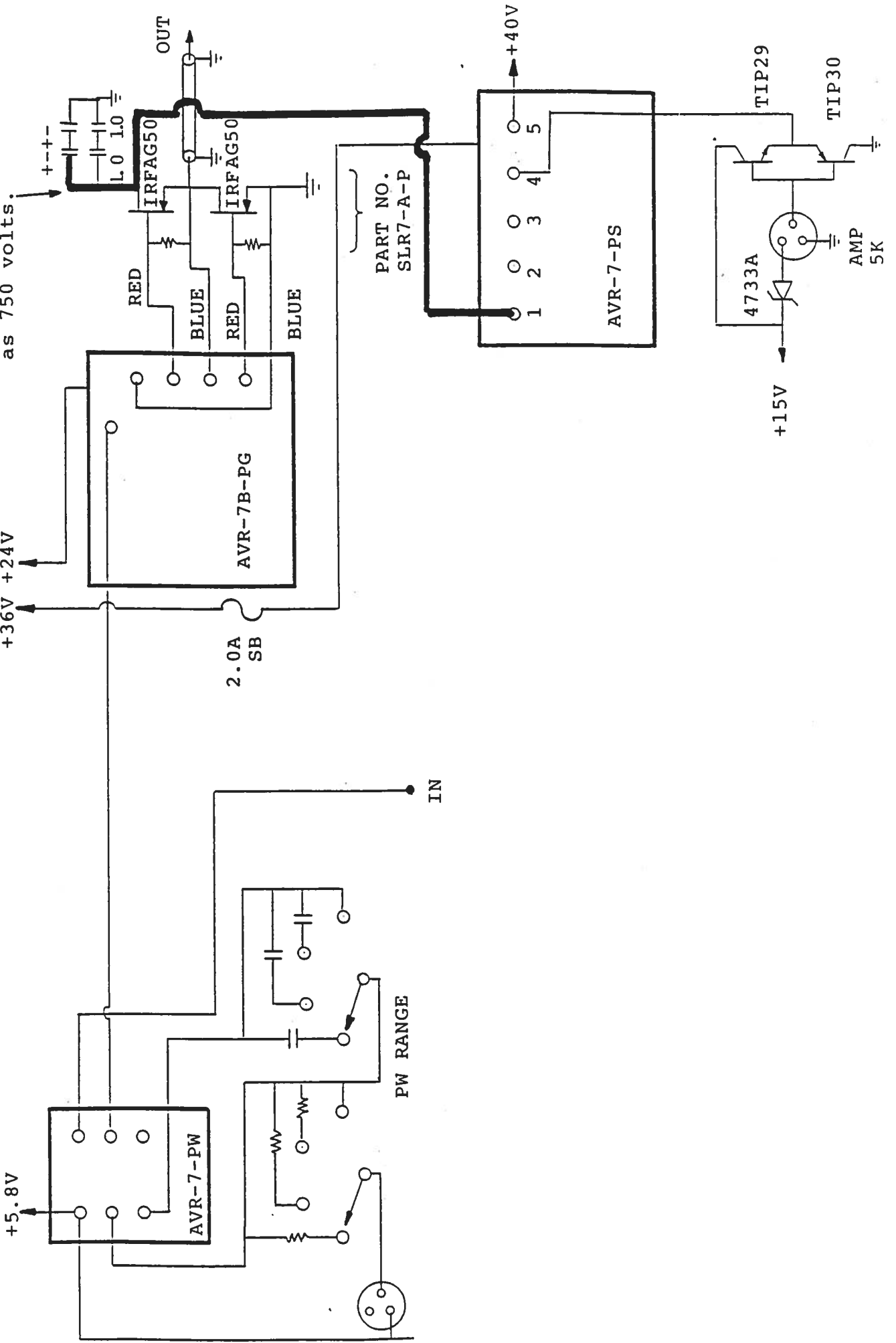
Logic Level	Volts	Current
0	0 to +0.8V	10 uA (max)
1	+2 to +5V	10 uA (max)

- (4) EAD D Connector. 14 PIN amphenol panel receptacle No. 57-60140. Mates with 57-50140.

# POWER SUPPLY



AVR-7B-PS



**CAUTION!!**

Points on this line are at a potential as high as 750 volts.

## SYSTEM DESCRIPTION AND REPAIR PROCEDURE

**CAUTION:** Potentials as high as 850 volts DC are employed in the interior of this instrument so extreme caution must be exercised when attempting repairs. The following parts may be at high potential:

- a) Pin 2 of module AVR-7B-PG (including associated leads and capacitors and Part No. SLR7-A).
- b) Pin 1 on module AVR-7B-PS (and associated leads and capacitors).

The AVR-7B-PS consists of the following basic modules:

- 1) AVR-7B-PW-PG pulse generator module
- 2) AVR-7B-PS power supply module
- 3) AVR-7B-PW pulse width module
- 4) +36, +40, +24 volt power supplies

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that the 2.0 A slow blow fuse or the main power fuse on the rear panel has blown. Replace if necessary. If the unit still does not function, it is most likely that some of the output switching elements (IRFAG50) 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 top cover plate. The cover plate is removed by removing the 4 Phillips screws on the back panel. **NOTE:** First turn off the prime power. **CAUTION:** Thoroughly ground the IRFAG50 cases to discharge the 850 volts power supply potential. The IRFAG50 may be removed from the mounting bracket and checked on a curve tracer and replaced if necessary. AVTECH Part No. SLR7-A consists of the two transistors mounted on the bracket with insulating washers, 1 K resistors and output cable.

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SYSTEM DESCRIPTION AND REPAIR PROCEDURES

CAUTION: Repairs to the system should be made only by qualified personnel. The interior of this instrument is exposed to high voltages and contains high energy capacitors. The following parts may be at high potentials:

- 1. Part of module 6WR-7B (isolated secondary leads and conductors and Part 101-117-01).
- 2. Part 1 of module 6WR-7B (and associated leads and conductors).

6WR-7B consists of the following basic modules:

- 1. 6WR-7B PW-7B power generator module
- 2. 6WR-7B IS power supply module
- 3. 6WR-7B PM power module
- 4. 6WR-7B CA off power module

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that the 500 mA line fuse or the main power fuse on the rear panel has blown. Replace if necessary. If the unit still does not function, it is most likely that some of the output relaying elements (RRASB) may have failed due to an output relay fault condition or to a high duty cycle condition. The relaying elements may be accessed by removing the top cover plate. The cover plate is removed by loosening the 4 Phillips screws on the back panel. NOTE: First turn in the gate screw. CAUTION: Improperly ground the 6WR-7B leads to discharge the 500 volt power supply capacitor. The RRASB may be removed from the instrument and checked on a power bench and replaced if necessary. WATER: Do not allow moisture to enter the instrument control or the block with a water sealant. If moisture and water enter