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## INSTRUCTIONS

MODEL AVR-4B-PS-P-EAD-PAS1 PULSE GENERATOR

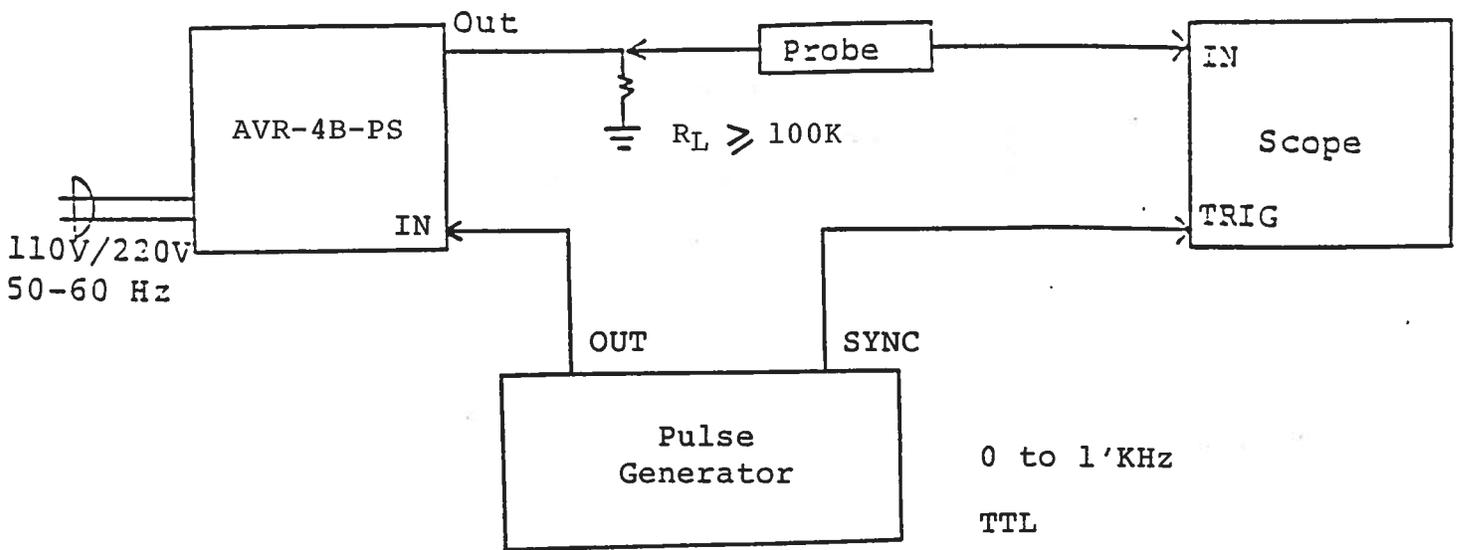
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## WARRANTY

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 bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.
- 2) With the AB mode switch in the A position, the output pulse width is controlled by the 6 position PW range switch and the one turn PW control as follows. (Note that the unit may fail if operated at duty cycles exceeding 50%):

	<u>PW MIN</u>	<u>PW MAX</u>
1)	1 us	10 us
2)	10 us	100 us
3)	100 us	1 ms
4)	1 ms	10 ms
5)	10 ms	100 ms
6)	100 ms	1 sec

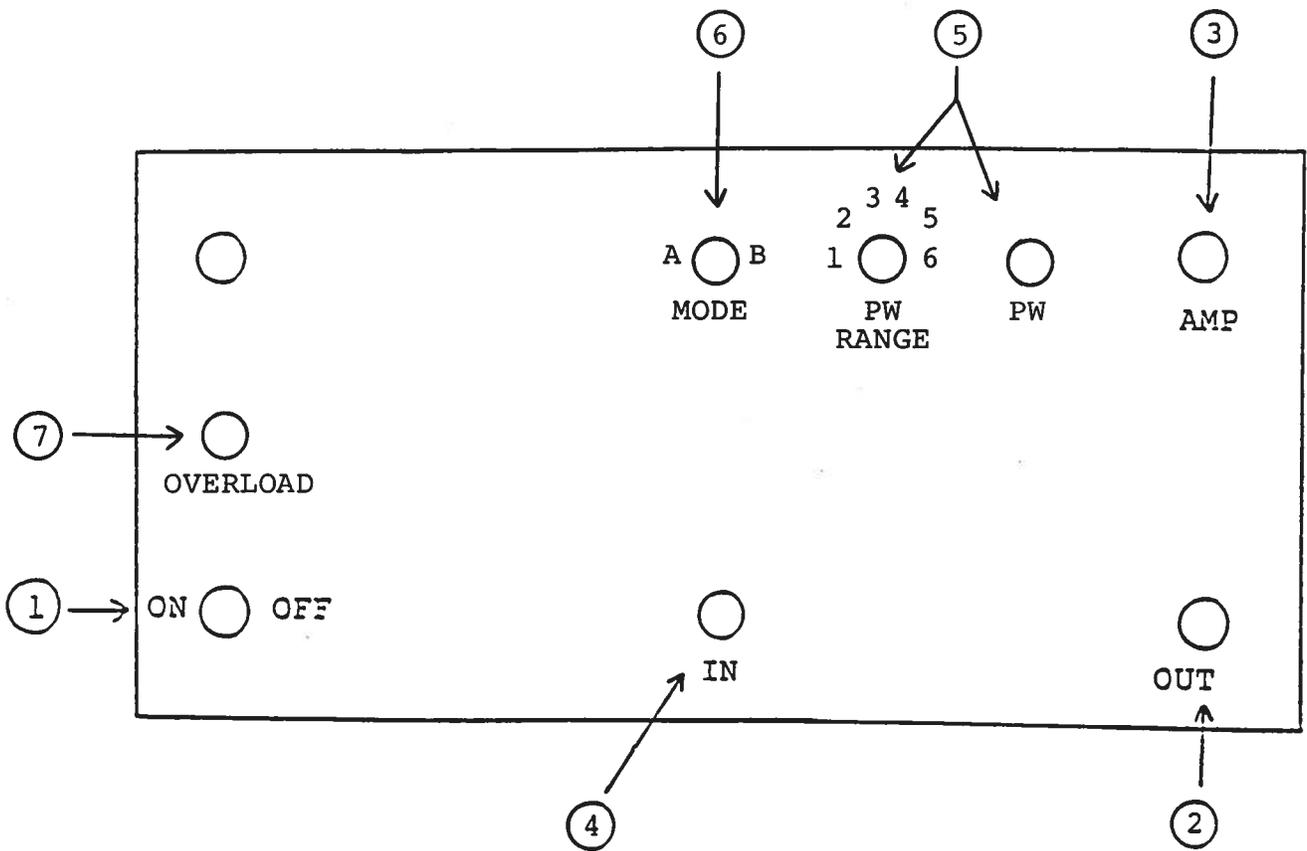
- 3) With the AB mode switch in the B position, the output pulse width is equal to the input trigger pulse width (TTL).
- 4) The output pulse amplitude is controlled by means of the front panel one turn AMP control. Note that the output amplitude decreases very slowly when the AMP control is turned CCW. This is normal and is due to the presence of very large DC bypass capacitors in the output stage. The large capacitors are necessary to limit the pulse top droop at wide pulses (eg. 1 second).
- 5) EWA 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 9 to 16 (PIN 9 = LSB, PIN 16 = MSB) to the rear panel D connector.
- 6) CAUTION: The unit is designed to operate into a high impedance ( $\geq 100K$ ) and may fail if operated into 50 ohms (or other low impedances). Also note that the unit is backmatched to 50 ohms in order to limit ringing and overshoot. As a result the rise time will increase as long lengths of coaxial cable are added to the output connected. Normally the cable length should not exceed about one meter.
- 7) CAUTION: The output stage is protected against overload condition by a 1.0 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 1 KHz or at duty cycles exceeding 50%. 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, ie. operate in a low PRF range when possible rather than in a high PRF range.
  - b) Keep the output PW to a minimum.
- 8) AVR 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, call (613) 226-5772 or Fax (613) 226-2802.

Fig. 2

FRONT PANEL CONTROLS



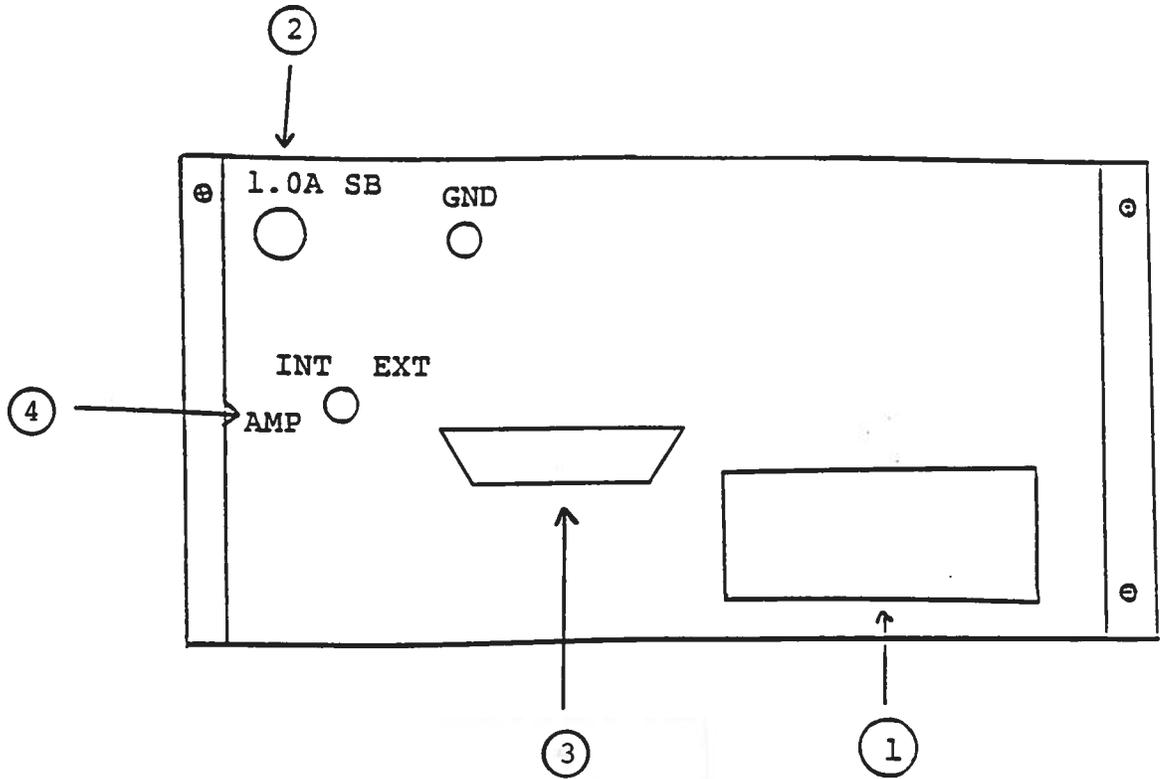
- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) OUT Connector. BNC connector provides output to a high impedance load ( $\geq 100K$ ).
- (3) AMP Control. A one turn control which varies the output pulse amplitude from 0 to 300 V.
- (4) TRIG Input. The external trigger signal is applied at this input (TTL, PW  $> 50$  ns).
- (5) PW Control. A one turn control and 6 position range switch which varies the output pulse width from 1  $\mu$ sec to 1 sec when MODE AB switch is in the A position. The minimum and maximum PW for each range are as follows (note that the unit may fail if operated at duty cycles exceeding 50%):

RANGE	PW MIN	PW MAX
1	1 $\mu$ s	10 $\mu$ s
2	10 $\mu$ s	100 $\mu$ s
3	100 $\mu$ s	1 ms
4	1 ms	10 ms
5	10 ms	100 ms
6	100 ms	1 sec

- (6) AB MODE. When switch is in the A position output pulse width is controlled by PW controls (5) while if switch is in the B position, the output pulse width equals the input trigger pulse width.
- (7) AVR 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

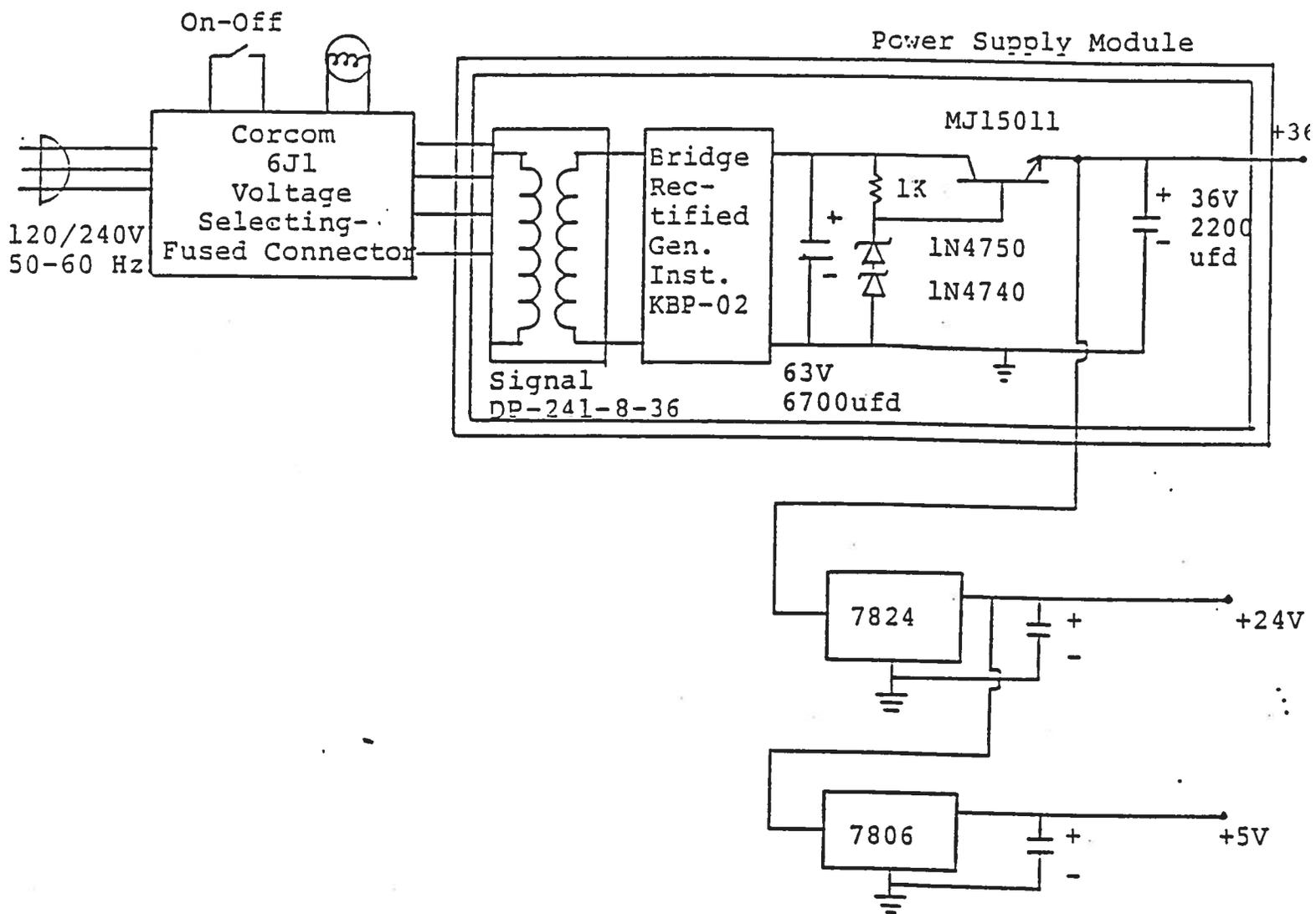


- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse (0.5 Amp SB).
- (2) 1.0A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.
- (3) EAD D Connector. 24 PIN amphenol panel receptacle No. 57-40240. Mates with 57-50240.
- (4) EAD option: To digitally control the output amplitude (in 256 increments) set the switch (4) in the EXT position and apply a parallel TTL control to PINS 9 to 16 (PIN 9 = LSB, PIN 16 = MSB) to the D connector (4). PIN 24 is ground.

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

Fig. 4a

POWER SUPPLY



## SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVR-4B-PS consists of the following basic modules:

- 1) AVR-4-FW-FG pulse generator module
- 2) AVR-4-PS power supply module
- 3) AVR-4-FW pulse width module

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that the 1.0 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 (SL22T) 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 plates 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 SL22T tabs to discharge the 350 volts power supply potential. The elements may be removed from their sockets by means of a needle nosed pliers. The SL22T 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 SL22T switching elements, take care to insure that the short lead (of the three leads) is adjacent to the back of the chassis.

Schroff

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