



AVTECH ELECTROSYSTEMS LTD.  
NANOSECOND WAVEFORM ELECTRONICS

□ P. O. BOX 265  
OGDENSBURG, NY  
U.S.A. 13669-0265  
TEL: (315) 472-5270  
FAX: (613) 226-2802

☒ BOX 5120 STN. F  
OTTAWA, ONTARIO  
CANADA K2C 3H4  
TEL: (613) 226-5772  
FAX: (613) 226-2802

INSTRUCTIONS

MODEL AVR-B-PS-R PULSE GENERATOR

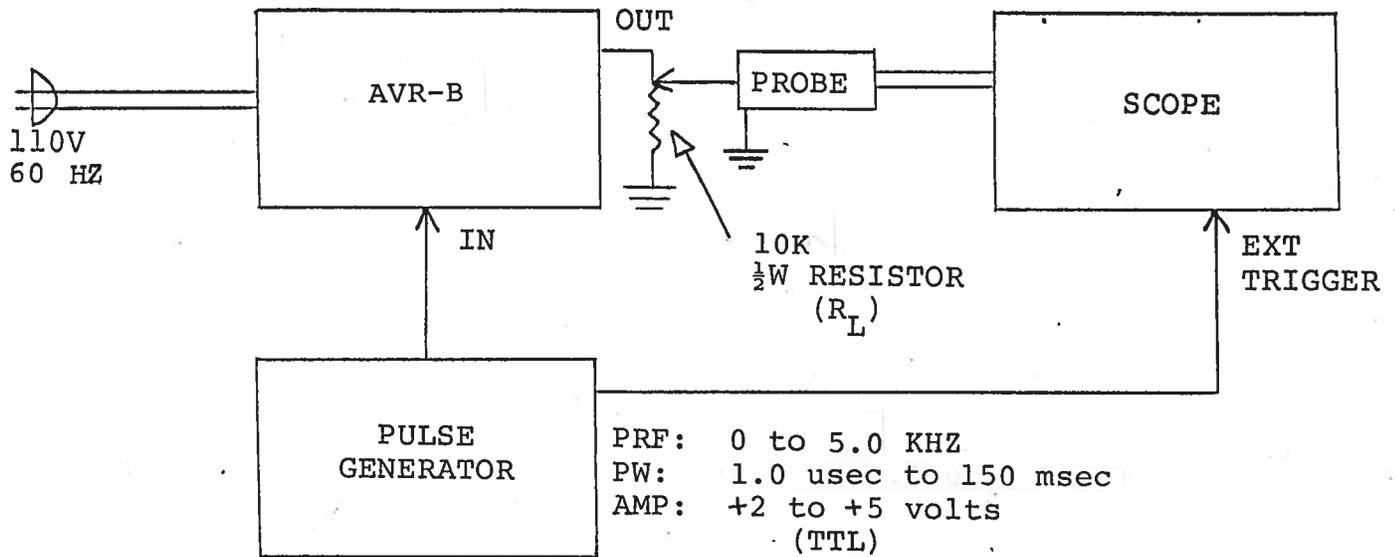
S.N.

## 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.

A.

TEST ARRANGEMENT



B.

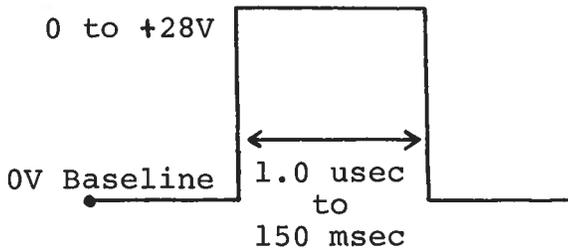
GENERAL OPERATING INSTRUCTIONS

- 1) The equipment should be connected in the general fashion shown above. Since the AVR unit provides an output pulse risetime as low as 3 nsec a fast oscilloscope (at least 50 MHz and preferably 200 MHz) should be used to display the waveform.
- 2) The magnitude of the output pulses is controlled by the front panel one turn pots (AMP A and AMP B). Clockwise rotation of the pots provides the maximum output.
- 3) The output pulse width and PRF are equal to the input trigger pulse values.
- 4) The maximum allowable PRF and PW combinations are related as follows:

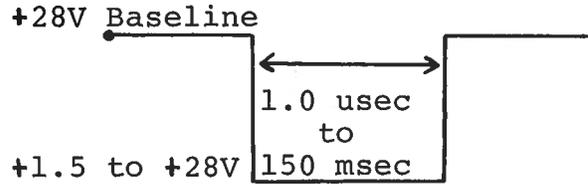
PW = 1 usec, PRF 0 to 5 KHz  
PW = 150 msec, PRF 0 to 3 Hz

The output amplitude will decrease if the above duty cycle limitations are exceeded and in extreme cases the unit may fail.

5) The output pulses A and B are as follows:



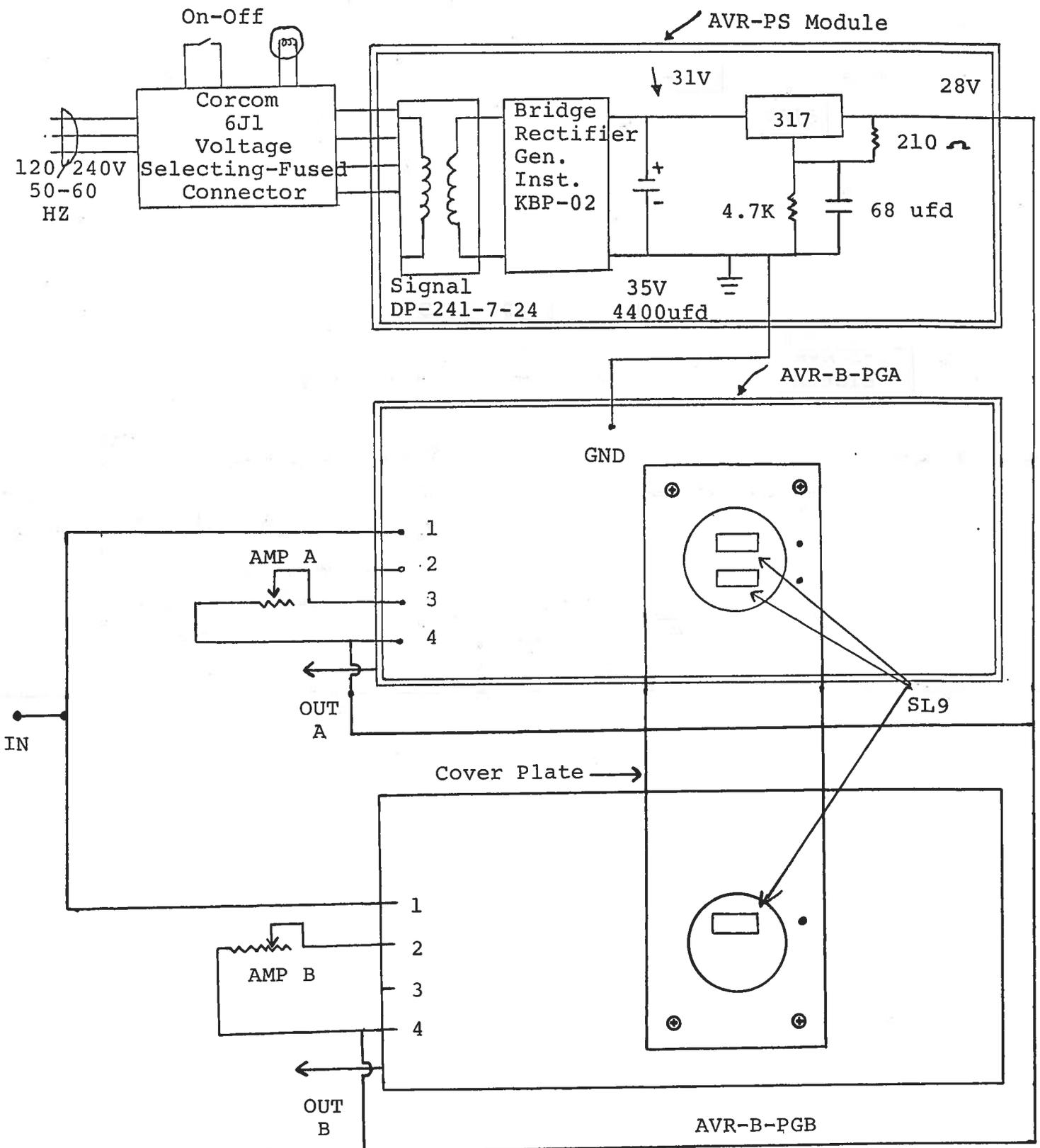
OUTPUT A



OUTPUT B

- 6) The outputs A and B are designed to operate into a high impedance load ( $R_L \geq 5\text{ K}$ ). The unit may fail if the load impedance is substantially lower than 5K.
- 7) Output pulse ringing and overshoot may be dampened by placing a low value capacitance (0 to 25 pfd) across the output load.
- 8) The output switching transistor may fail if the unit is severely overloaded. The transistors are easily replaced following the instructions in the next Section.

# SYSTEM BLOCK DIAGRAM AND REPAIR PROCEDURE



- 1) The AVR unit consists of four basic components or modules:
  - a) Metal chassis
  - b) AVR-PS module (Power Supply)
  - c) AVR-B-PGA module (Pulse Generator)
  - d) AVR-B-PGB module (Pulse Generator)

The modules are interconnected as shown above.

- 2) If the unit malfunctions, disconnect from the 60 Hz supply and the trigger source and remove the two screws on each side of the unit. With the screws removed, the chassis cover consisting of the top and two sides will lift upwards exposing the modules shown above.
- 3) Reconnect to the 60 Hz source and check the voltage on the line connecting the AVR-PS output to the +28 V pin of the AVR-PG modules. A voltage of +28 volts should be recorded. If the voltage is substantially less than +28 volts, disconnect the 60 Hz source and disconnect the line from the +28 volt pin. Connect a 100 ohm 8 watt resistance to the output of the AVR-PS module. Reconnect to the 60 Hz source and measure the voltage across this resistor. A voltage of +28 volts should be indicated. If the voltage is substantially less than 15 volts the AVR-PS module is defective and should be either repaired or replaced. If the measured voltage is equal to +28 volts then the SL9 switching elements in the AVR-PG module have probably failed. The SL9 switching elements are easily replaced by removing the cover plate on the instrument bottom side and extracting the SL9 switching elements from their sockets using a pair of needle nose pliers. Before attempting this first insure that the prime power is off.

Replacement SL9 units must be ordered directly from Avtech. When reinstalling the SL9 units in their sockets, insure that the shortest of the three terminals is adjacent to the black dot on the AVR-PG chassis. The AVR-B-PGA module requires 2 SL9 transistors while the AVR-B-PGB module requires 1 SL9 transistor.

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)