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## INSTRUCTIONS

MODEL AVR-3-PW-PS-PN-SNL1 PULSE GENERATOR

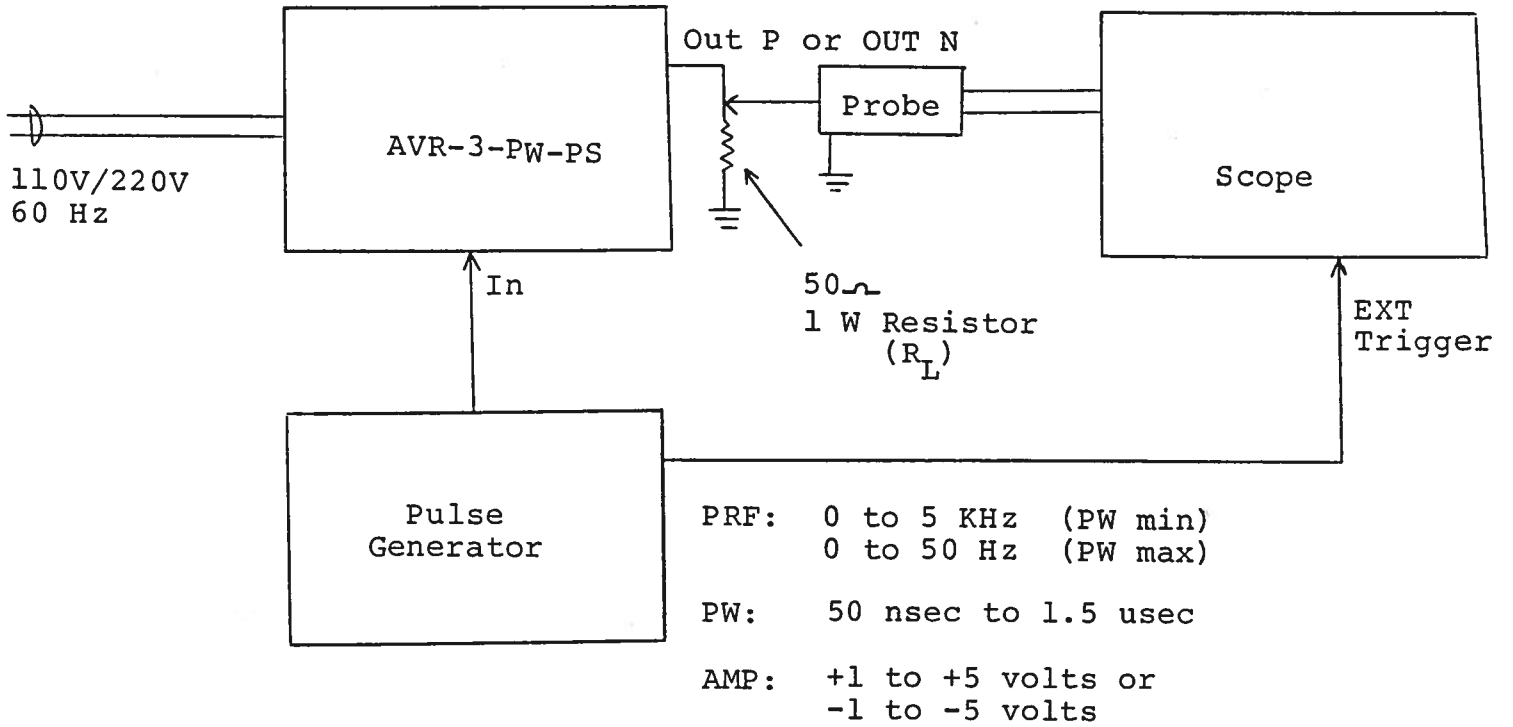
S.N.:

## 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:

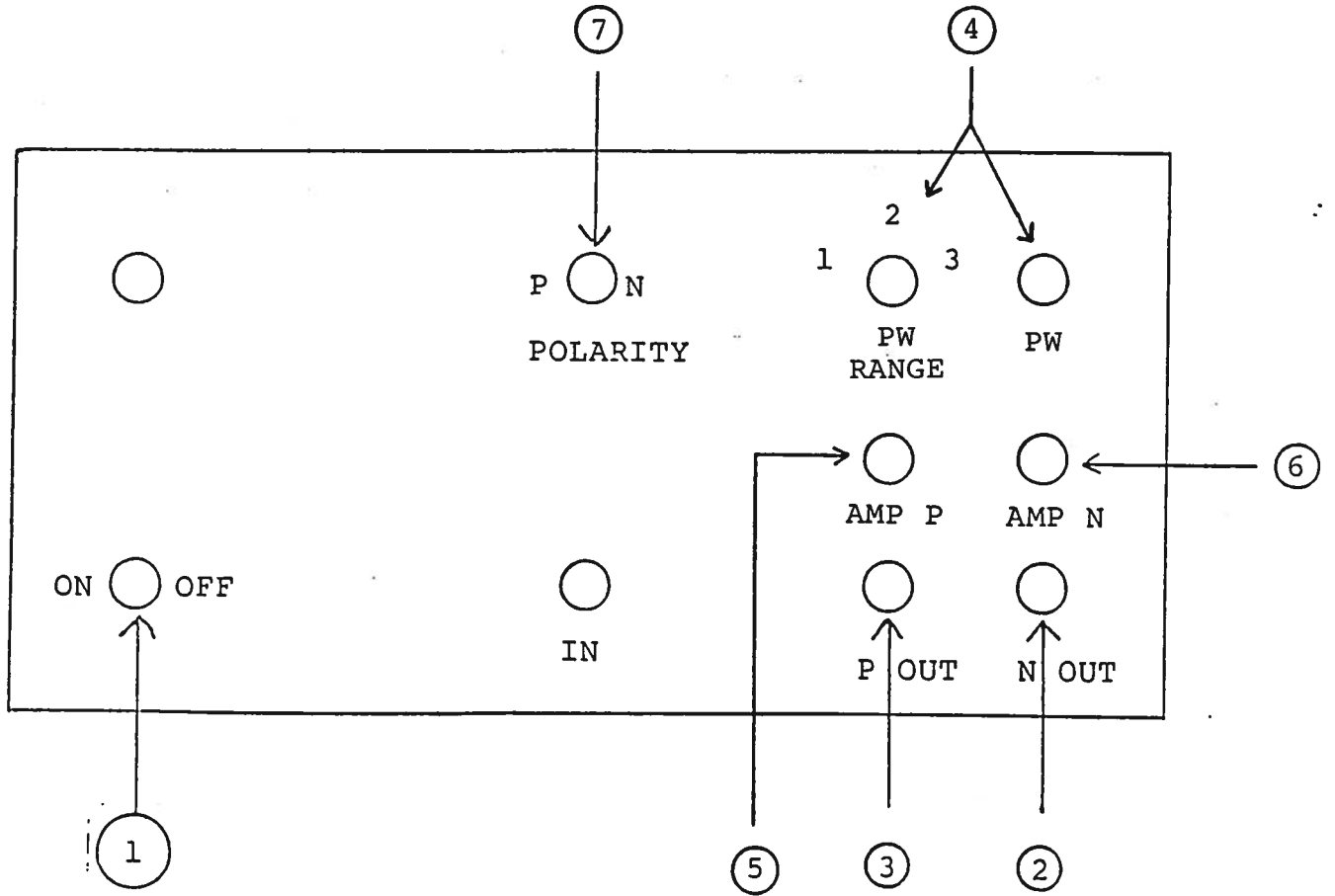
- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.
- 2) The use of 60 db attenuator at the scope vertical input channel will insure a peak input signal to the scope of less than one volt (necessary only if sampling scope used). If a high impedance real time scope is used, the pulse generator should be terminated using a shunt 50 ohm resistor.
- 3) The desired output polarity is selected by means of the front panel POLARITY switch. With the POLARITY switch in the P position, the negative output pulse generator is rendered inactive. Likewise, with the POLARITY switch in the N position, the positive pulse generator is rendered inactive.
- 4) The output pulse widths for the positive and negative outputs are controlled by means of the front panel one turn PW control and by the PW RANGE control. The minimum and maximum PW for each range and the corresponding maximum PRF are as follows. Note that the unit may fail if operated at duty cycles exceeding the above.

	PW min	PW max
Range 1	0.1 usec PRF max 1 KHz	1.0 usec PRF max 1 KHz
Range 2	1.0 usec PRF max 1 KHz	10 usec PRF max 500 Hz
Range 3	10 usec PRF max 500 Hz	100 usec PRF max 50 Hz

- 5) The output pulse amplitudes for the positive and negative outputs are controlled by means of the front panel one turn AMP P and AMP N controls.
- 6) The output PRF is equal to the input trigger pulse PRF.
- 7) The AVR-3-PW 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 AVR unit will safely operate in to load impedances in the range of 50 ohms to an open circuit. However, the fall time may degrade for load impedances higher than fifty ohms.
  - c) The AVR unit may be effectively converted to a fifty ohm output impedance generator by placing a fifty ohm 1/2 watt carbon composition resistor in series with the output of the unit and the load. The maximum available load voltage will then decrease to 100 volts (from 200 volts).
  - d) 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.
- 8) SNL1 Option. Allows unit to trigger from input trigger pulses in the range of  $\pm 1$  to  $\pm 5$  volts (50 nsec to 1.5 usec) rather than the standard +2 to +5 volts.

FRONT PANEL CONTROLS



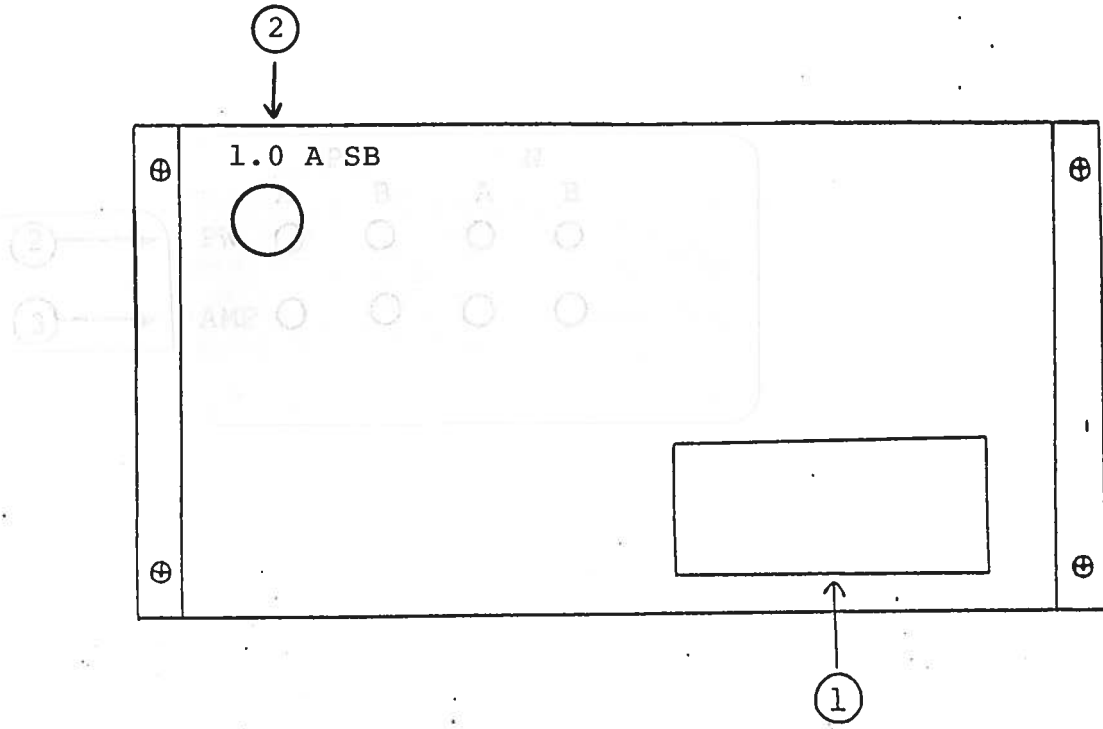
- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) OUT\_N Connector. BNC connector provides output to a fifty ohm load.
- (3) OUT\_F Connector. BNC connector provides output to a fifty ohm load.
- (4) PW Controls. A one turn control and 3 position range switch which varies the output pulse width from 0.1 usec to 100 usec. The minimum and maximum PW for each range and the corresponding maximum PRF are as follows. Note that the unit may fail if operated at duty cycles exceeding the above.

	PW min	PW max
Range 1	0.1 usec PRF max 1 KHz	1.0 usec PRF max 1 KHz
Range 2	1.0 usec PRF max 1 KHz	10 usec PRF max 500 Hz
Range 3	10 usec PRF max 500 Hz	100 usec PRF max 50 Hz

- (5) AMP\_P Control. A ten turn control which varies the positive output pulse amplitude from 0 to +200V to a fifty ohm load.
- (6) AMP\_N Control. A ten turn control which varies the negative output pulse amplitude from 0 to -200V to a fifty ohm load.
- (7) POLARITY Control. With the switch in the P position, the negative output pulse generator is rendered inactive. With the switch in the N position, the positive output pulse generator is rendered inactive.
- (8) IN. The external trigger signal is applied at this input (+1 to +5 volts, PW 50 nsec to 1.5 usec).

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 (0.5A SB).
- (2) 1.0 A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.

Fig. 3a

POWER SUPPLY

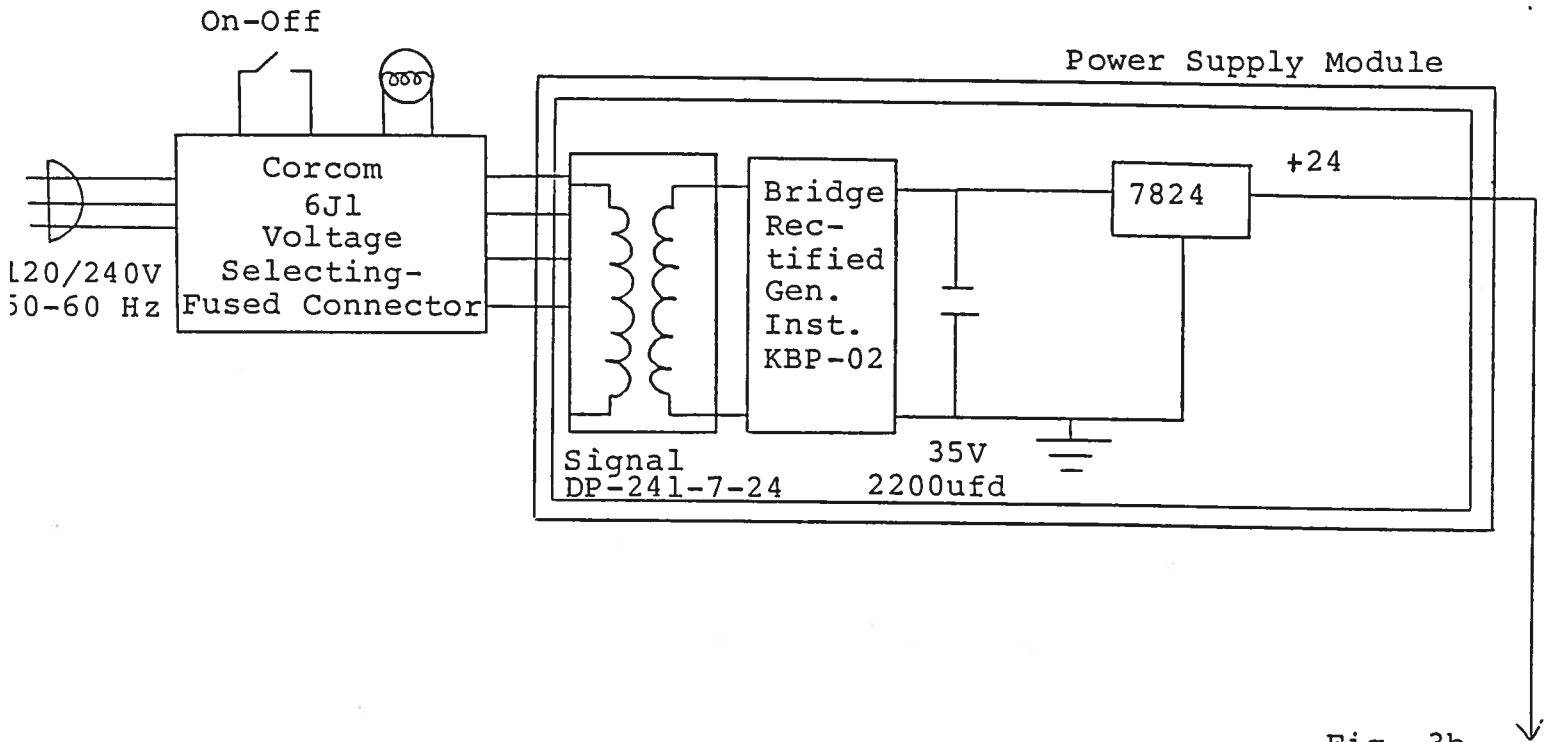


Fig. 3b

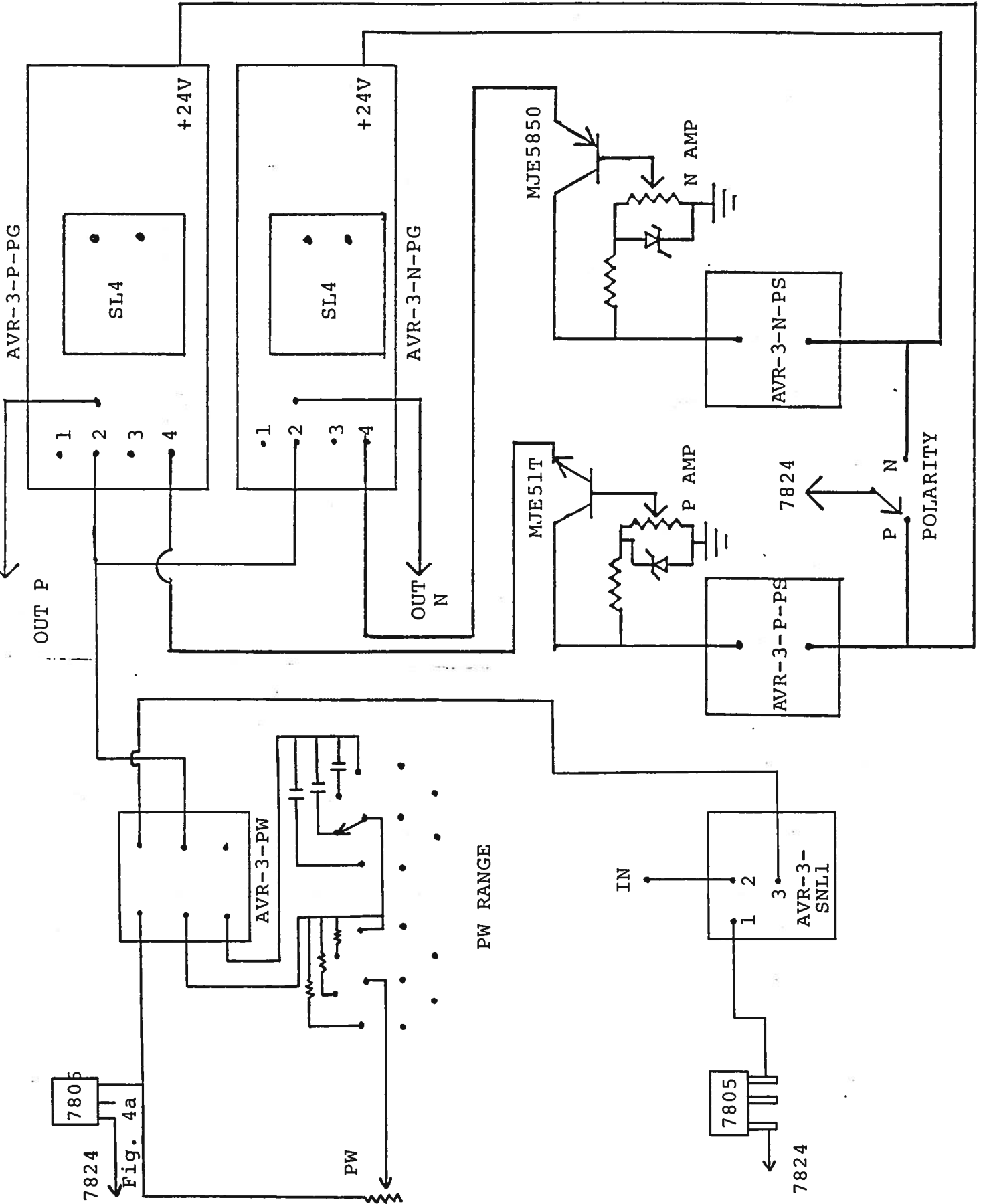


Fig. 4b SYSTEM BLOCK DIAGRAM (FOR NON EA, EW OPTION UNITS)

## SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVR-3-PW-PN consists of the following basic modules:

- 1) AVR-3-PW-PG pulse generator modules (-P and -N)
- 2) +24V power supply board
- 3) AVR-3-PS power supply modules (-P and -N)
- 4) AVR-3-SNL1 trigger module

In the event of an instrument malfunction, it is most likely that the rear panel 1.0A SB fuse or the 0.5 A SB line fuse or some of the output switching elements (SL4) 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. NOTE: First turn off the prime power. The elements may be removed from their sockets by means of a needle nosed pliers. The SL4 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 SL4 switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis. The power supply board generates +24V DC to power the other modules. If the voltage is less than +24V, turn off the prime power and unsolder the lead from the 7824 regulator chip on the power supply board. Solder a 100 ohm 5 watt resistor to the 7824 output to ground and turn on the prime power. A voltage of +24 volts should be read. If the voltage is less then the power supply board is defective and should be repaired or replaced.

Schroff

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Edition B