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INSTRUCTIONS

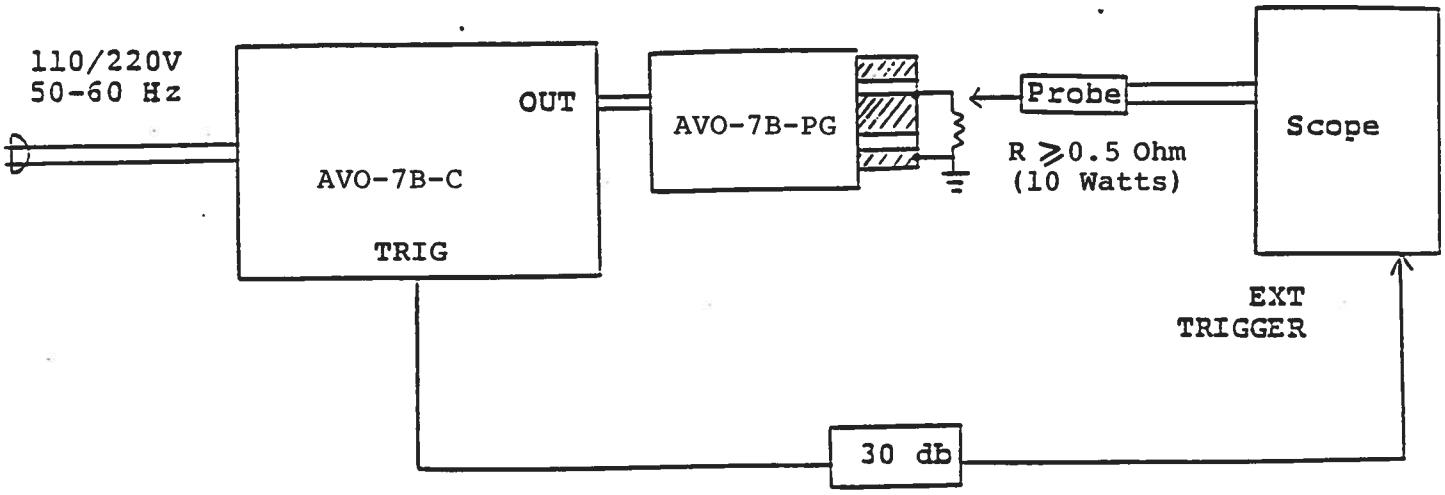
MODEL AVO-7B1-C-P-M-EA-BK1 PULSE GENERATOR

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 dissembled, 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 TRIG output channel provides TTL level signals. To avoid overdriving the TRIG input channel of some scopes, a 30 dB attenuator should be placed at the input to the scope trigger channel. The TRIG output precedes the main output when the front panel ADVANCE-DELAY switch is in the ADVANCE position. The TRIG output lags the main output when the switch is in the DELAY position.

3) The gray multi-pin cable from the -PG module must be plugged into the mainframe OUT connector and the BNC cable must be connected between the mainframe rear panel BNC HV connector and the -PG BNC HV connector.

4) To obtain a stable output display the PRF control on the front panel should be set mid-range. The front panel TRIG switch should be in the INT position. The DELAY controls and the scope triggering controls are then adjusted to obtain a stable output. The scope may then be used to set the desired PRF by rotating the PRF controls.

5) The output pulse width is controlled by means of the front panel one turn PW control (ten turn with -PWT option) 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 (0.5%).

	PW min	PW max
Range 1	0.1 us PRF max 1 kHz	1 us PRF max 1 kHz
Range 2	1 us PRF max 1 kHz	10 us PRF max 500 kHz
Range 3	10 us PRF max 500 Hz	100 us PRF max 50 Hz

To voltage control the output pulse width within each range, set the rear panel switch in the EXT position and apply 0 to +10 Volts between terminal A and ground ($R_{IN} \geq 10K$). (option).

6) The output pulse amplitude is controlled by means of the front panel one turn AMP control (10 turn for -AT option). To voltage control the output amplitude, set the rear panel switch in the EXT position and apply 0 to +10 Volts between terminal A and ground ($R_{IN} \geq 10K$). (option).

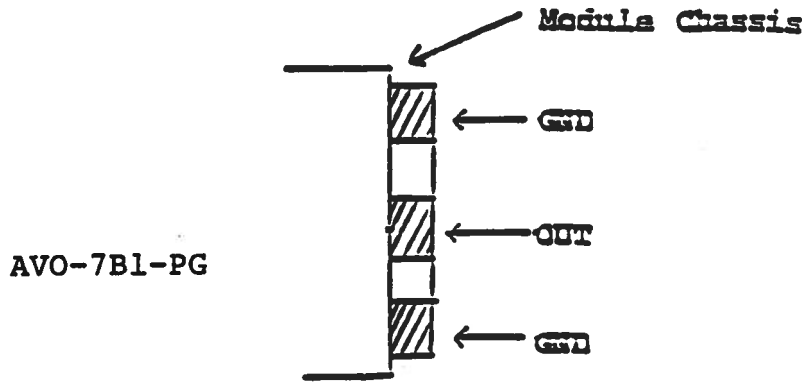
7) An external clock may be used to control the output PRF of the AVO unit by setting the front panel TRIG toggle switch in the EXT position and applying a 0.2 us (approx) TTL level pulse to the TRIG BNC connector input. For operation in this mode, the scope time base must also be triggered by the external clock rather than from the TRIG output. When triggered externally, the output pulse width is controlled by the front panel PW controls provided the MODE A-B switch is in the A position. The MODE A-B switch is accessed by removing the top cover (by removing the four Phillips screws on the cover and sliding the top cover back and off). When the MODE A-B switch is in the B position, the output pulse width equals the input trigger pulse width. The unit is shipped with the switch in the A position.

8) For single pulse manual operation, set the front panel INT-EXT-MAN switch in the MAN position and push the SINGLE PULSE button.

9) The DELAY control controls the relative delay between the reference output pulse provided at the TRIG output and the main output. This delay is variable over the range of 0.1 us to 100 us. The TRIG output precedes the main output when the ADVANCE-DELAY switch is in the ADVANCE position and lags when the switch is in the DELAY position.

	MIN	MAX
Range 1	0.1 us	1 us
Range 2	1 us	10 us
Range 3	10 us	100 us

10) 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 to the output using low inductance leads (as short as possible and as heavy a gauge as possible). The AV-LZ1 series of low impedance transmission line may be used.



11) The AVO-7B1 is designed to supply up to 40 Volts to a minimum load resistance of 0.5 Ohms (i.e. 80 Amperes). Factory tests are conducted with a 0.5 Ohm load capable of dissipating at least 10 Watts. Higher load resistance values may be used.

12) 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 duty cycle rating is exceeded. 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 the LOW PRF range when possible rather than in the HIGH range.
b) Keep the output PW to a minimum.
c) Keep the load resistance as high as possible.

13) AVO-7B1 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)

Note that the overload may light when the prime power is applied but the light will extinguish after a few seconds and the unit will then operate.

14) The rear panel monitor output SMA (M) provides an output voltage pulse (to 50 Ohms or higher) which is proportional to the current flowing through the microstrip output terminals (8 V ≈ 80 Amps).

15) 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.

16) For additional assistance:

Tel: (613) 226-5772
Fax: (613) 226-2802

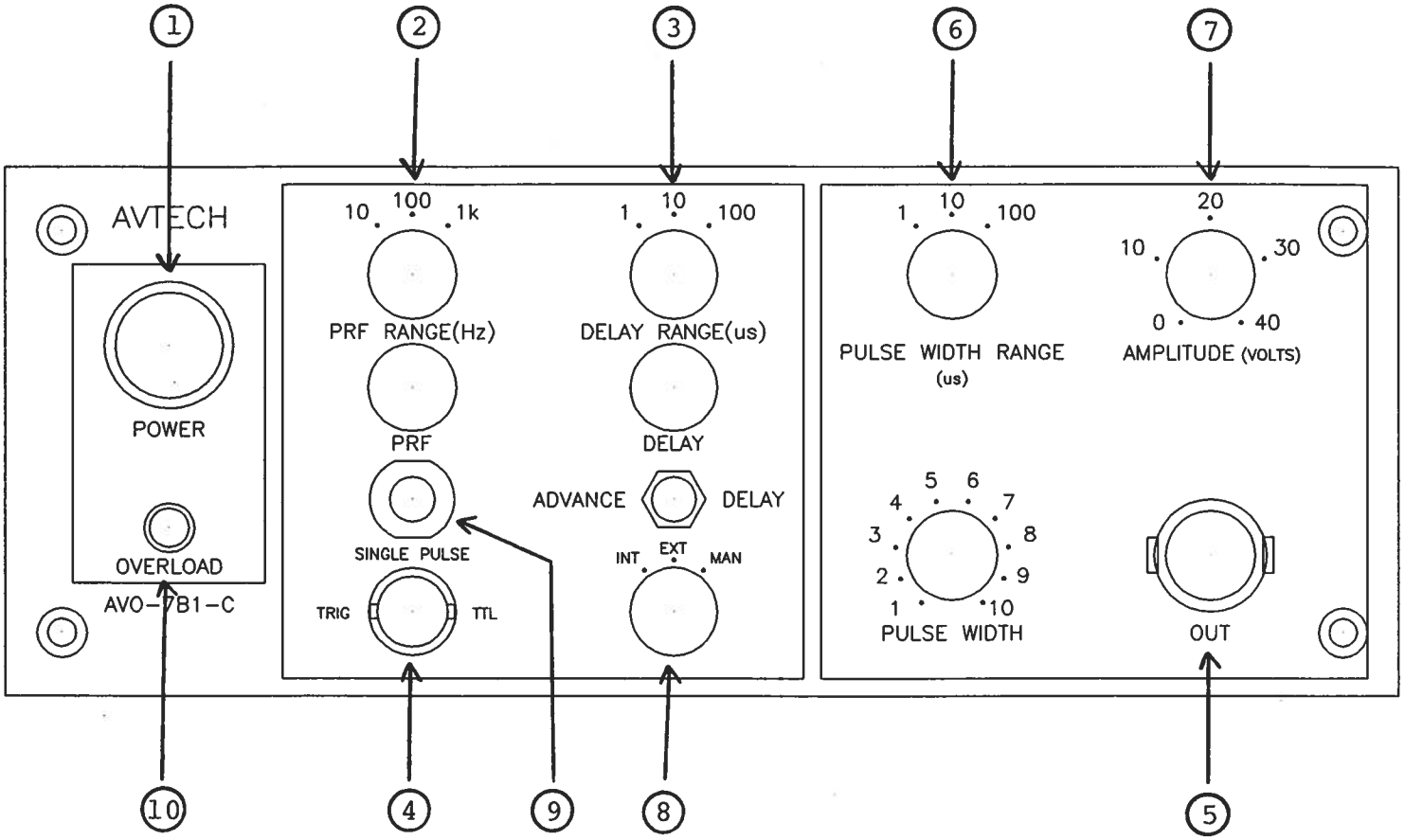


Fig. 2 FRONT PANEL CONTROLS

(1) ON-OFF Switch. Applies basic prime power to all stages.

(2) PRF Control. Varies PRF from 1 Hz to 10 kHz as follows:

1 Hz to 10 Hz
10 Hz to 100 Hz
100 Hz to 1 kHz

(3) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (4) and the main output (5). This delay is variable over the range of 0.1 to about 100 us. Delay LEADS or LAGS depending on the position of the ADVANCE-DELAY switch.

(4) TRIG Output. This output is used to trigger the scope time base. The output is a TTL level 100 ns (approx) pulse capable of driving a fifty Ohm load. This output precedes the output at (5) if the two-position ADVANCE-DELAY switch is in the ADVANCE position. This output follows the output at (5) if the switch is in the DELAY position. The delay range is variable from 0.2 us to 200 us. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.

(5) OUT Connector. A multi pin connector which attaches the gray 2 foot cable from the pulse generator module to the mainframe.

(6) PW Control. A one turn control (ten turn for -PWT option) and 3-position range switch which varies the positive output pulse width from 0.1 us to 100 us. 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 (0.5%).

	PW min	PW max
Range 1	0.1 us PRF max 1 kHz	1.0 us PRF max 1 kHz
Range 2	1.0 us PRF max 1 kHz	10 us PRF max 500 Hz
Range 3	10 us PRF max 500 Hz	100 us PRF max 50 Hz

(7) AMP Control. A one turn control (ten turn for -AT option) which varies the output pulse amplitude from 0 to 40 Amps (to $R_L \geq 0.5$ Ohms, 80 Amps max).

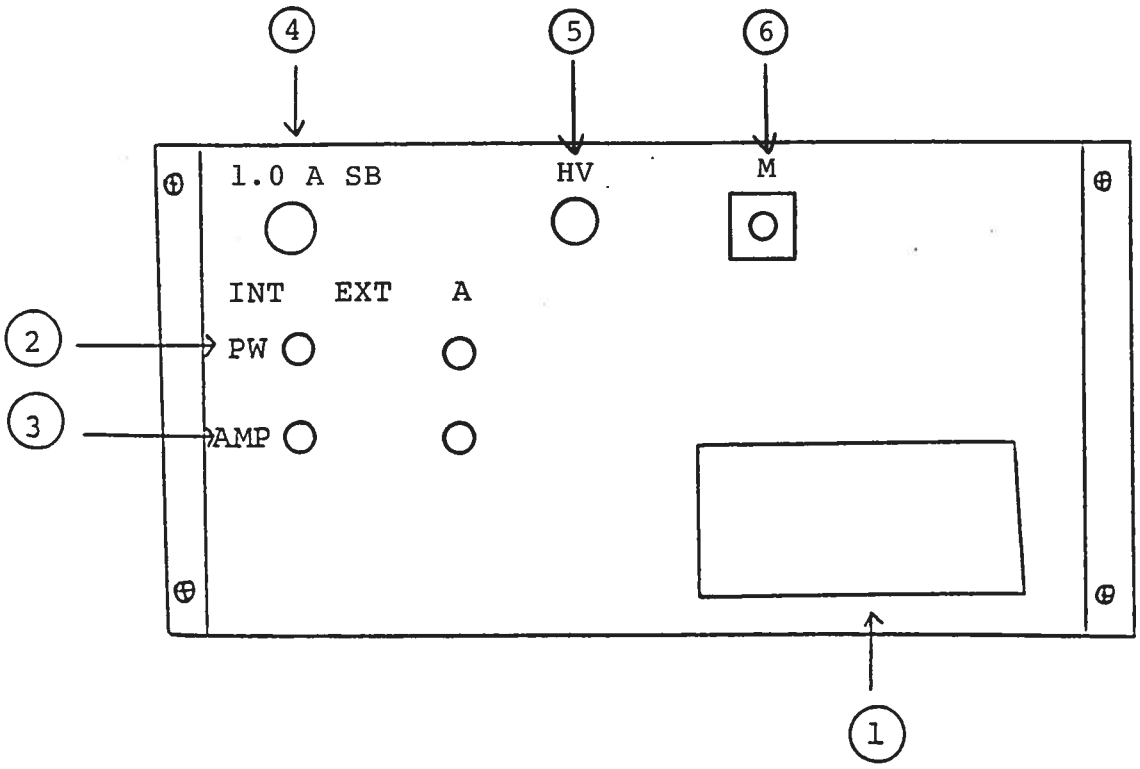
(8) INT-EXT-MAN Control. With this toggle switch in the INT position, the PRF of the AVO unit is controlled via an internal clock which in turn is controlled by the PRF control. With the toggle switch in the EXT position, the AVO unit requires a 0.2 us TTL level pulse applied at the TRIG input in order to trigger the output stages. In addition, in this mode, the scope time base must be triggered by the external trigger source. When triggered externally, the output pulse width is controlled by the front panel PW controls provided the MODE A-B switch is in the A position. The MODE A-B switch is accessed by removing the top cover (by removing the four Phillips screws on the cover panel and sliding the top cover back and off). When the MODE A-B switch is in the B position, the output pulse width equals the input trigger pulse width. The unit is shipped with the switch in the A position.

(9) SINGLE PULSE. For single pulse manual operation, set the front panel INT-EXT-MAN switch in the MAN position and push the SINGLE PULSE button.

(10) OVERLOAD INDICATOR. AVO-7B1-C 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 (0.5A SB).

(2) To voltage control the output pulse width, set the switch in the EXT position and apply 0 to +10V to the BNC terminal A ($R_{IN} \geq 10K$). (option).

(3) To voltage control the output amplitude, set the switch in the EXT position and apply 0 to +10V to the BNC terminal A ($R_{IN} \geq 10K$). (option).

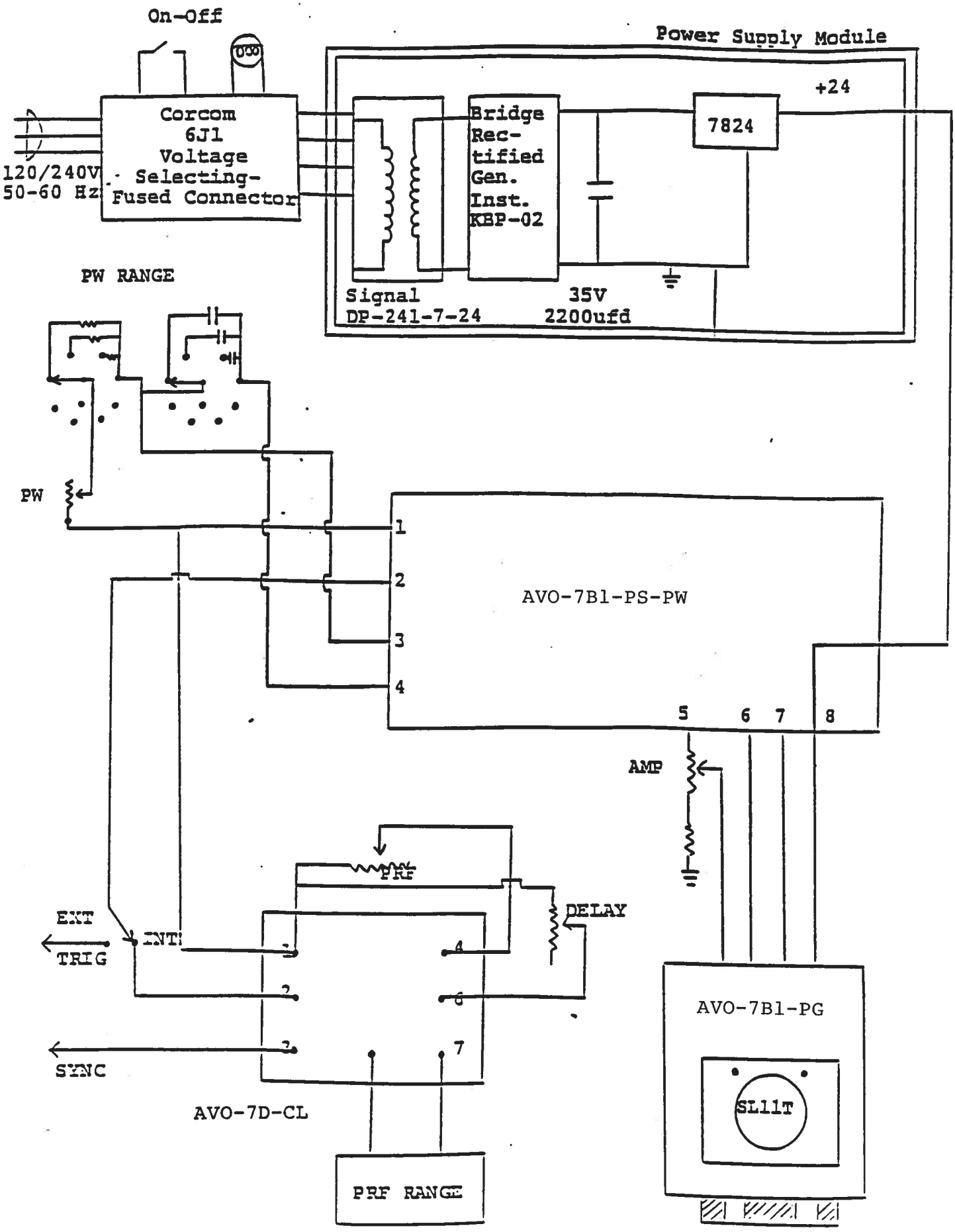
(4) 1.0 A SB FUSE. Protects output stage against overload conditions.

(5) HV Connector. 4 foot long RG58 cable from -PG module HV BNC connects to this BNC connector. Supplies 0 to +45 Volts from mainframe to -PG module.

(6) M OUT. SMA connector provides output voltage pulse (to $R_L \geq 50$ Ohms) which is proportional to load current through microstrip output terminals (8 Volts = 80 Amps). (option).

Fig. 4

SYSTEM BLOCK DIAGRAM



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVO-7B1-C unit consists of the following basic modules:

1) AVO-7B1-PG pulse generator module
2) AVO-7B1-CL clock module
3) AVO-7B1-PW pulse width control module
4) +24V power supply board and 140 Volt power supply 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 line fuse (1.0 Amp) 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 may have failed and the unit should be returned to the factory for repair.

Jan. 19/96

- PWT
- EW
- AT
- EA

Disk: AVO-7B, AVO-7C

Name: 7B1CMBK1.INS