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INSTRUCTIONS

MODEL AV0-7E-C-P-EA-EW-POL1 PULSE GENERATOR

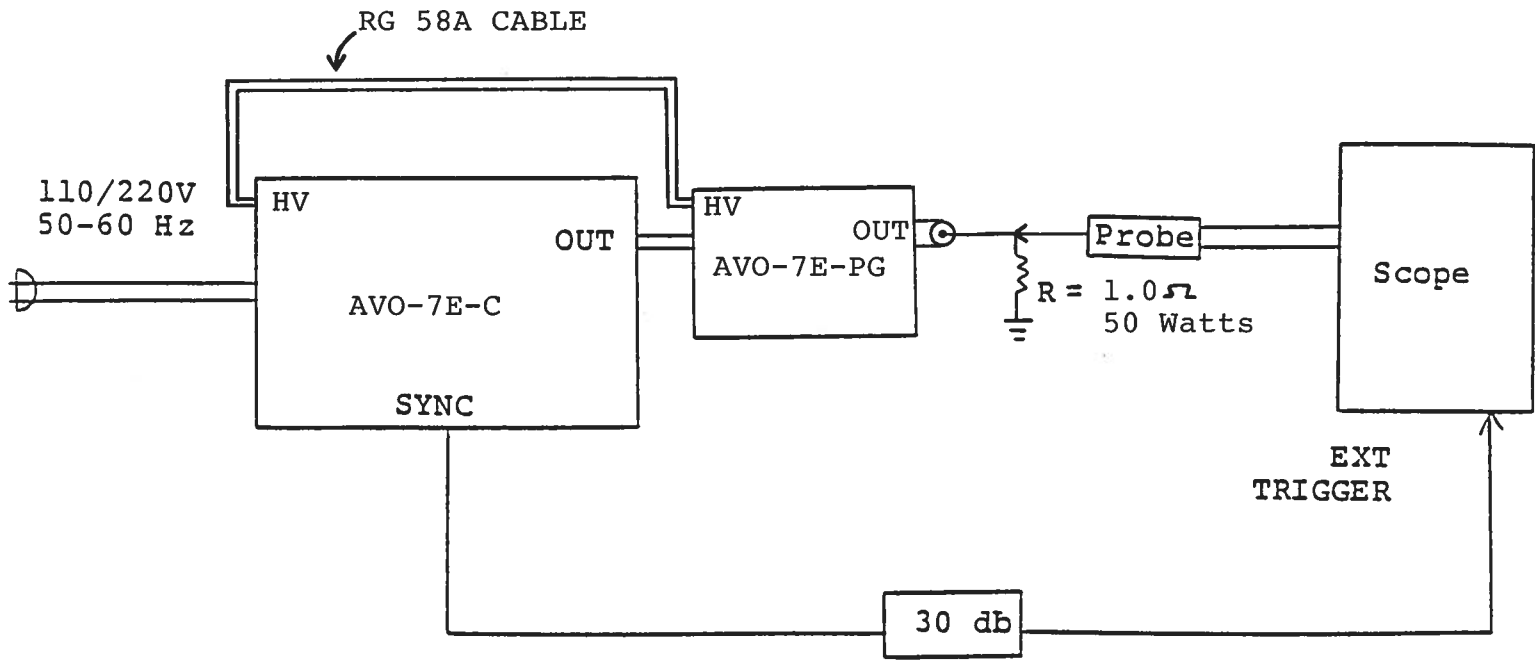
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WARRANTY

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



GENERAL OPERATING INSTRUCTIONS

- 1) The equipment should be connected in the general fashion shown above. Since the AVD unit provides an output pulse rise time as low as 100 nsec a fast oscilloscope (at least 50 MHz and preferably 200 MHz) should be used to display the waveform. The mainframe and the -PG output module must be connected as shown in Fig. 1. Note that the HV port on the -PG module and the HV port on the rear panel of the mainframe must be connected by the RG-58A cable.
- 2) The TRIG output channel provides TTL level signals. To avoid overdriving the TRIG input channel of some sampling scopes, a 30 db attenuator should be placed at the input to the sampling scope trigger channel.
- 3) To obtain a stable output display the PRF and PRF FINE controls on the front panel should be set mid-range. The front panel TRIG toggle switch should be in the INT position. The front panel DELAY control 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 and PRF FINE controls. The main output is delayed with respect to the SYNC output by about 100 nsec to 75 usec depending on the DELAY control setting. CAUTION: DO NOT EXCEED THE DUTY CYCLE RATING OF 10% (FOR 15 AMPS OUT, SEE #9).
- 4) To voltage control the output pulse width, set the rear panel switch in the EXT position and apply 0 to +10V between terminal A and ground ($R_{IN} \geq 10K$). (option).
- 5) To voltage control the output amplitude, set the rear panel switch in the EXT position and apply 0 to +10V between terminal A and ground ($R_{IN} \geq 10K$). (option).
- 6) To limit the maximum output to 5.0 Amps, set the rear panel 5-15 Amp switch in the 5 Amp position.
- 7) An external clock may be used to control the output PRF of the unit by setting the front panel TRIG toggle switch in the EXT position and applying a 0.2 usec (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 SYNC output.
- 8) The AVD-7E is designed to supply up to 15 amperes to a maximum load voltage of 20 volts. Factory tests are conducted with a 1.0 ohm load capable of dissipating at least 50 watts. Higher load resistance values may be used but the output voltage must be limited to 20 volts or less.

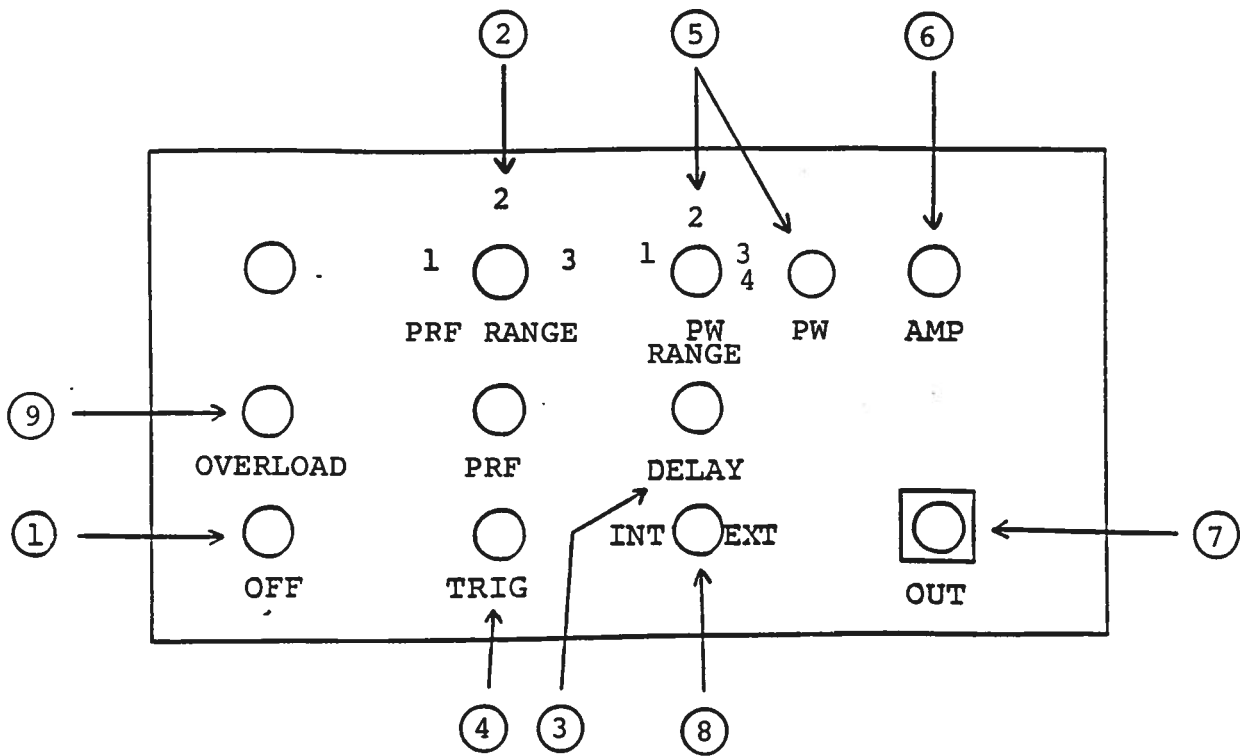
- 9) The maximum allowable PW as a function of PRF (and period) is as follows:

<u>PRF</u>	<u>PERIOD</u>	<u>MAX PW</u> (at 15 Amp)	<u>MAX PW</u> (at 5 Amp)
1 KHz	1 ms	100 us	300 us
100 Hz	10 ms	1 ms	3 ms
10 Hz	100 ms	10 ms	20 ms
5 Hz	200 ms	20 ms	20 ms

- 10) 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 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, ie. 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.
- 11) 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.
- 12) If application assistance is required, call (613) 226-5772 or Fax (613) 226-2802.

Fig. 2

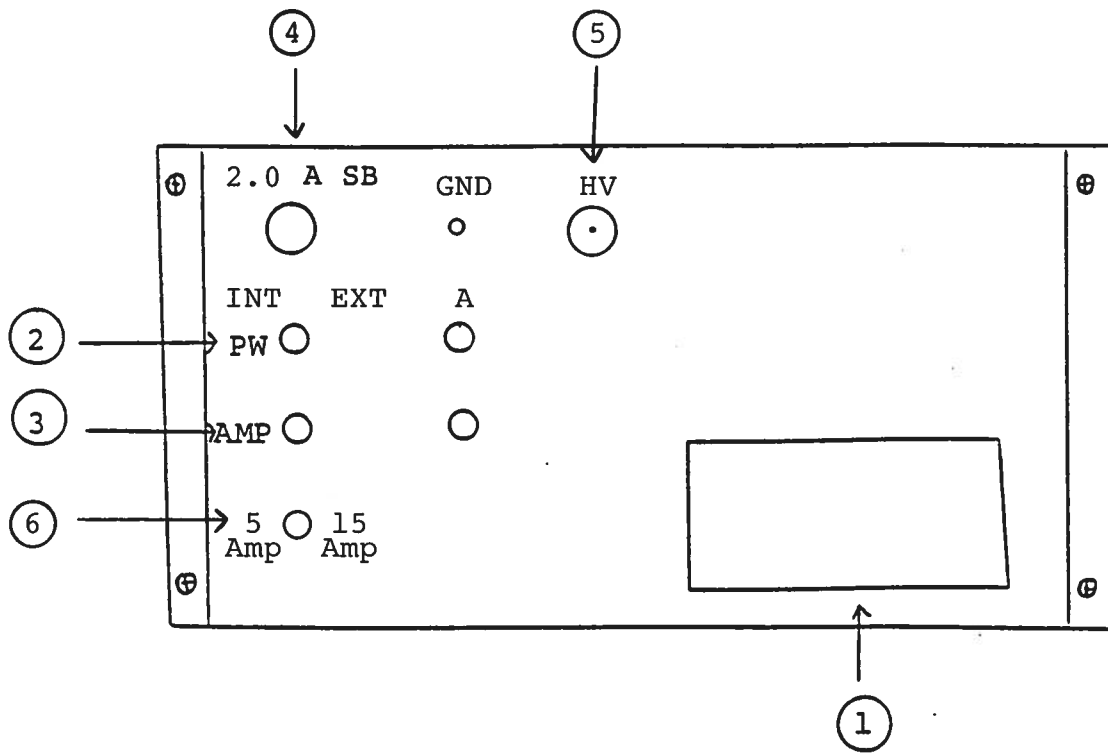
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF as follows:
- | | | |
|---------|--------|--------|
| Range 1 | 0.5 Hz | 50 Hz |
| Range 2 | 2 Hz | 200 Hz |
| Range 3 | 10 Hz | 1 KHz |
- (3) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (4) and the PG output. This delay is variable over the range of 100 nsec to about 75 usec.
- (4) TRIG Output. This output precedes the PG output and is used to trigger the sampling scope time base. The output is a TTL level 100 nsec (approx.) pulse capable of driving a fifty ohm load. The external trigger signal is applied at this input when the EXT toggle switch is in the EXT position. The output pulse appears about 100 nsec after the application of the TRIG pulse.
- (5) PW Control. A one turn control and four position range switch that varies PW as follows:
- | | |
|---------|-----------------|
| Range 1 | 2 us to 20 us |
| Range 2 | 20 us to 200 us |
| Range 3 | 200 us to 2 ms |
| Range 4 | 2 ms to 20 ms |
- (6) AMP Control. The output pulse amplitude is controlled by means of the one turn potentiometer (AMP). (10 turn if -AT option included).
- (7) OUT Connector. A multi pin connector which attaches the 2 foot cable from the pulse generator module to the main frame.
- (8) EXT-INT 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 controls. With the toggle switch in the EXT position, the AVO unit requires a 0.2 usec 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.
- (9) OVERLOAD. This option is not included in Model AVO-7E-C-P-EA-EW-POL1.

Fig. 3

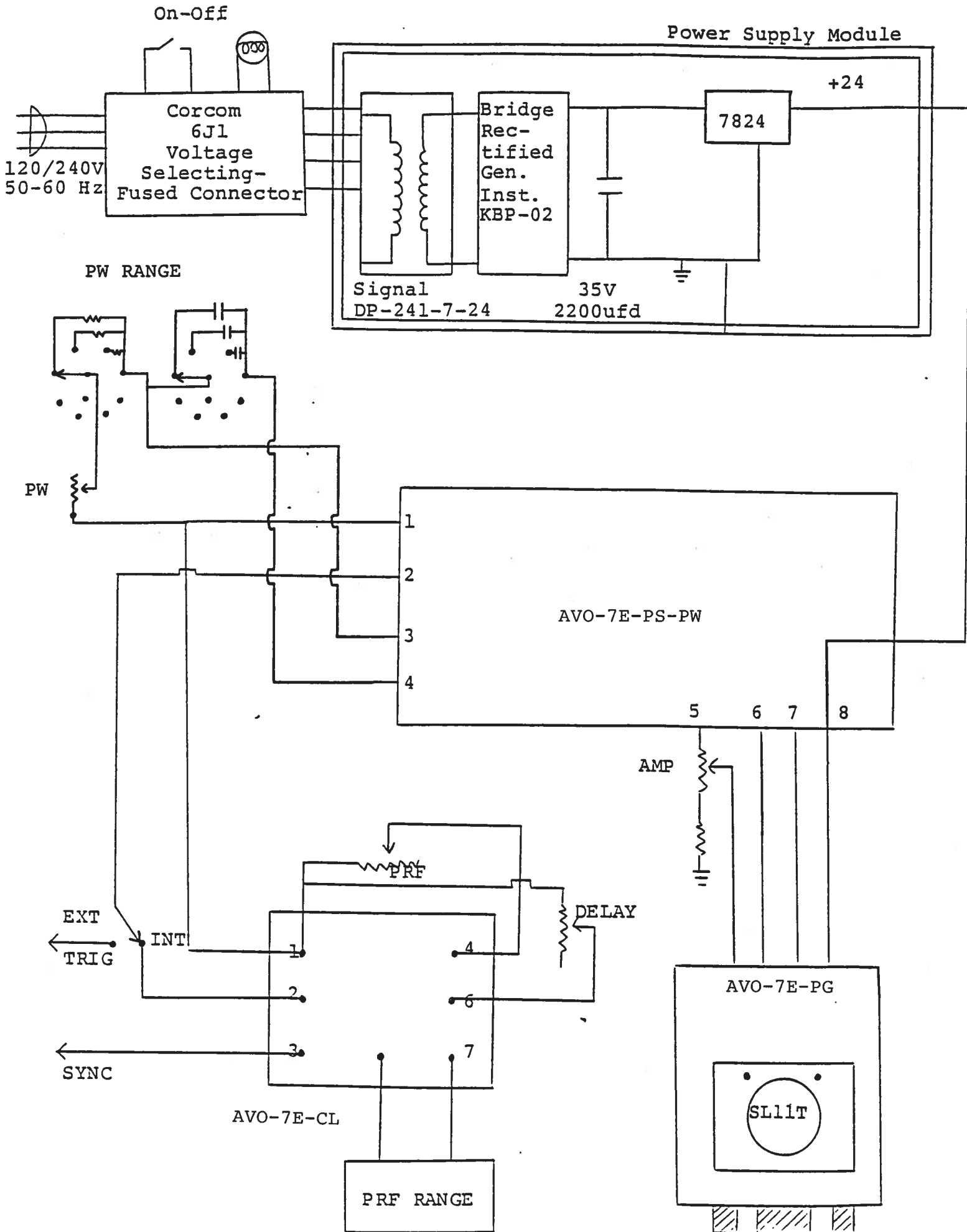
BACK PANEL CONTROLS



- (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 (1.0A SB).
- (2) To voltage control the output pulse width, set the switch in the EXT position and apply 0 to +10V between terminal A and ground ($R_{IN} \geq 10K$). (option).
- (3) To voltage control the output amplitude, set the switch in the EXT position and apply 0 to +10V between terminal A and ground ($R_{IN} \geq 10K$). (option).
- (4) 2.0 A SB FUSE. Protects output stage against overload conditions.
- (5) HV Connector. Four foot long RG58 cable from -PG module HV BNC connects to this BNC connector. Supplies +50 volts from mainframe to -PG module.
- (6) To limit the maximum output to 5.0 Amps, set the rear panel 5-15 Amp switch in the 5 Amp position.

Fig. 4

SYSTEM BLOCK DIAGRAM



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

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

- 1) AVO-7E-PG pulse generator module
- 2) AVO-7E-CL clock module
- 3) AVO-7E-EW pulse width control module
- 4) +24V power supply board and +50 volt power supply board
- 5) -15 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 2.0A 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.

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