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INSTRUCTIONS

MODEL AVO-7A-C-ESIC 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

MODE A

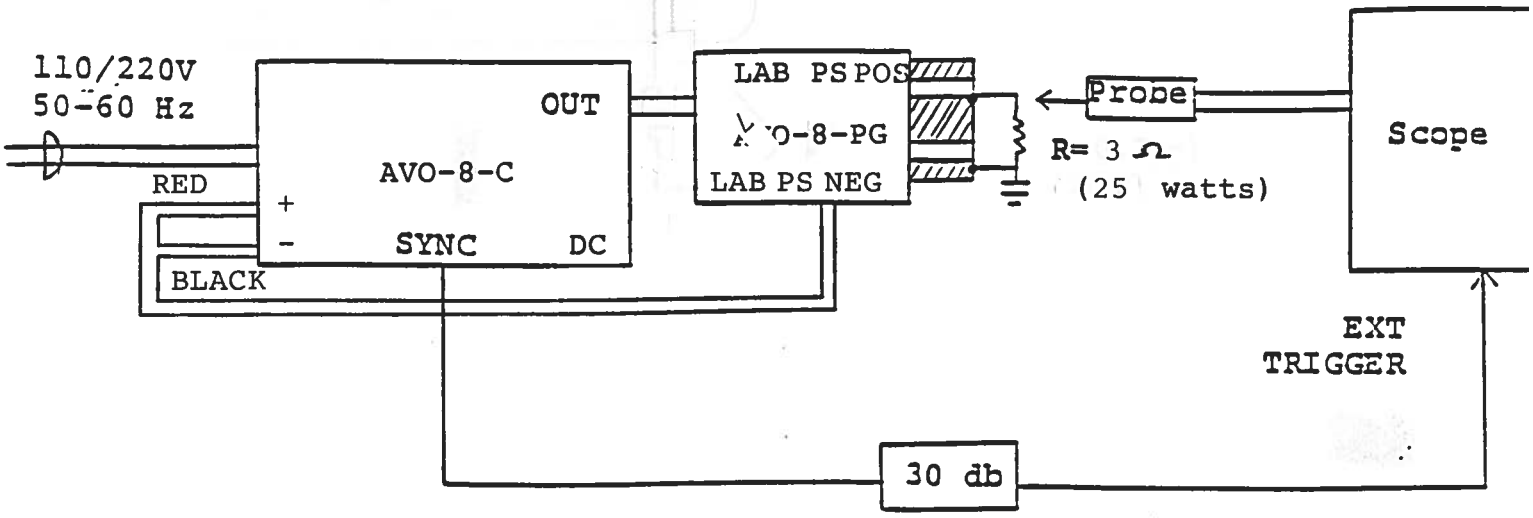
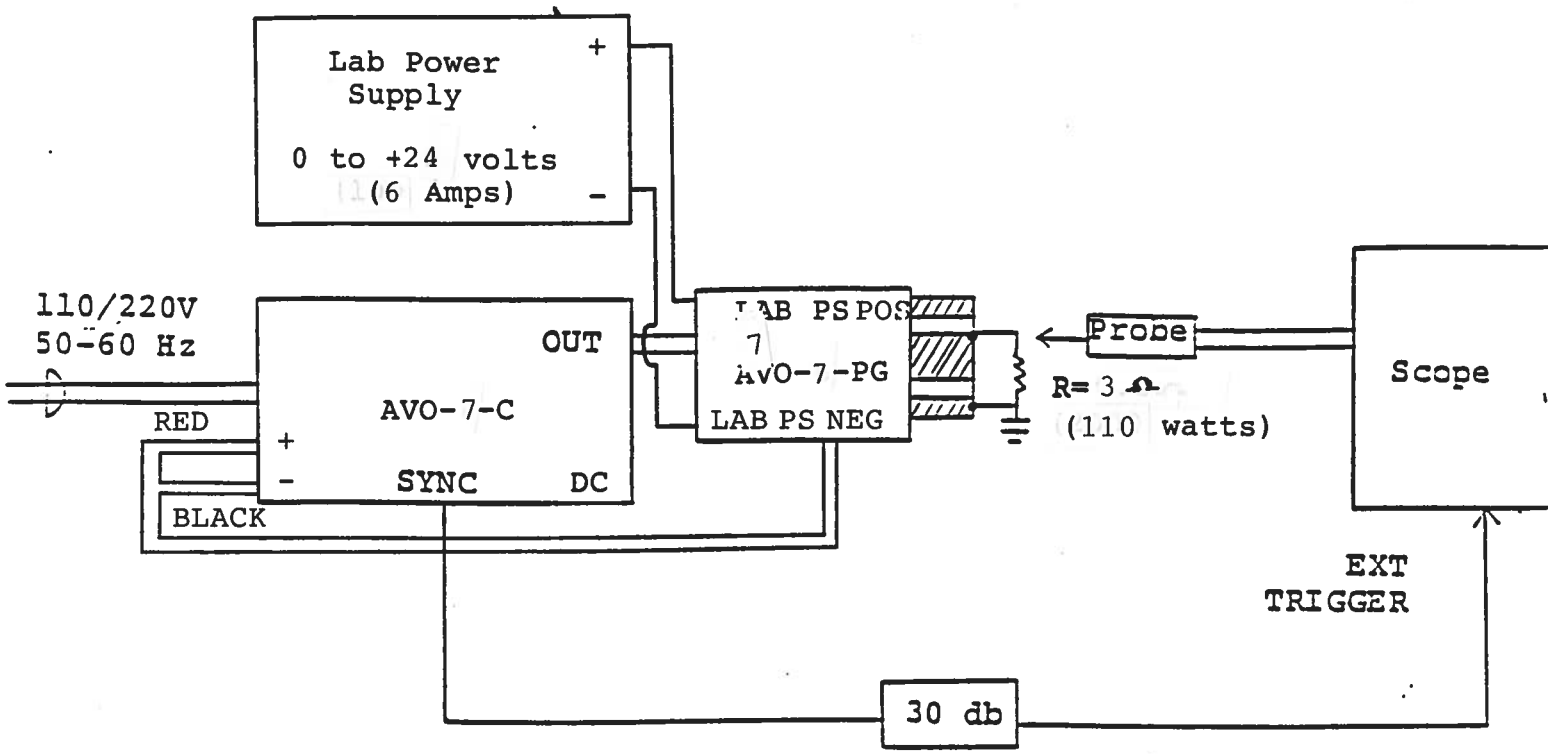


Fig. 1

PULSE GENERATOR TEST ARRANGEMENT

MODE B



GENERAL OPERATING INSTRUCTIONS
(MODE A)

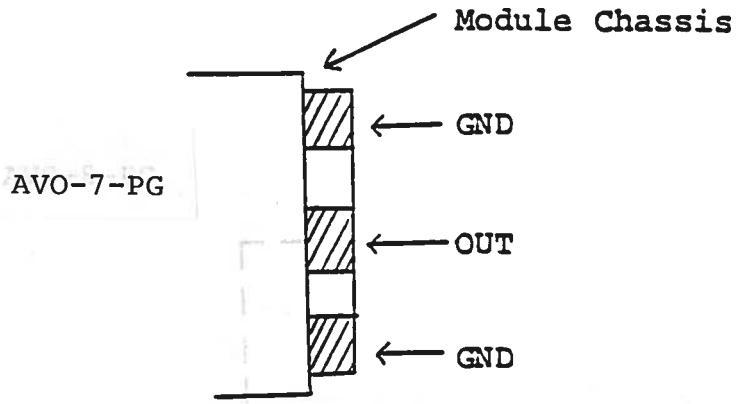
1) The equipment should be connected in the general fashion shown above. Since the AVO unit provides an output pulse rise time as low as 0.1 usec a fast oscilloscope (at least 50 MHz) should be used to display the waveform.

2) Set the MODE A-B switch in the A position. In this position, the output pulse amplitude is controlled by the AMP control and the output prime power is supplied by the mainframe. Note that in this mode the duty cycle must not exceed 20%.

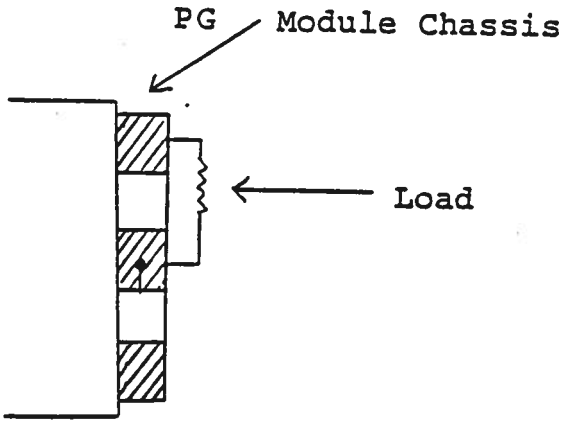
3) The sync output channel provides TTL level signals. To avoid overdriving the TRIG input channel of some scopes, a 30 db attenuator should be placed at the input to the scope trigger channel. The SYNC output precedes the main output when the front panel LEAD-LAG switch is in the LEAD position. The SYNC output lags the main output when the switch is in the LAG position.

4) To obtain a stable output display the PW and PRF controls on the front panel should be set mid-range (insure that duty cycle is less than 20%). The front panel TRIG toggle 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 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).


Module Chassis
GND
AVO-7-PG
OUT
GND

The load should be connected between the OUT and GND terminals using very short leads (≪1.0"). Leads of up to 12" may be used but heavy wire (eg. #12) twisted pair or 1/2" wide strips of copper plate should be used in order to reduce the deterioration of rise time.



Take care to insure that during soldering the OUT conductor is not shorted to the chassis. Also, use minimal heat when soldering.

6) The output pulse width is controlled by the 5 position range switch and one turn fine control.

7) The output amplitude is controlled by the one turn AMP control.

8) 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.

9) The AVO-7-C is designed to supply up to 6 amperes peak to a maximum load voltage of 20 volts. Factory tests are conducted with a 3.0 ohm load capable of dissipating at least 25 watts. Higher load resistance values may be used.

10) Model AVO-7-C will operate with a duty cycle at least as high as 20% when operating in MODE A. For higher duty cycles (to 90%) use MODE B as follows:

MODE B

1) Set the MODE A-B switch in the B position and connect a 24 volt 6 ampere lab power supply to the RED and BLACK banana terminals on the -PG module. The amp control on the mainframe is now inactive and the pulse out amplitude is controlled by the amplitude of the lab power supply ($V_{PULSE} \approx V_{PS}$ - 1.0 volt).

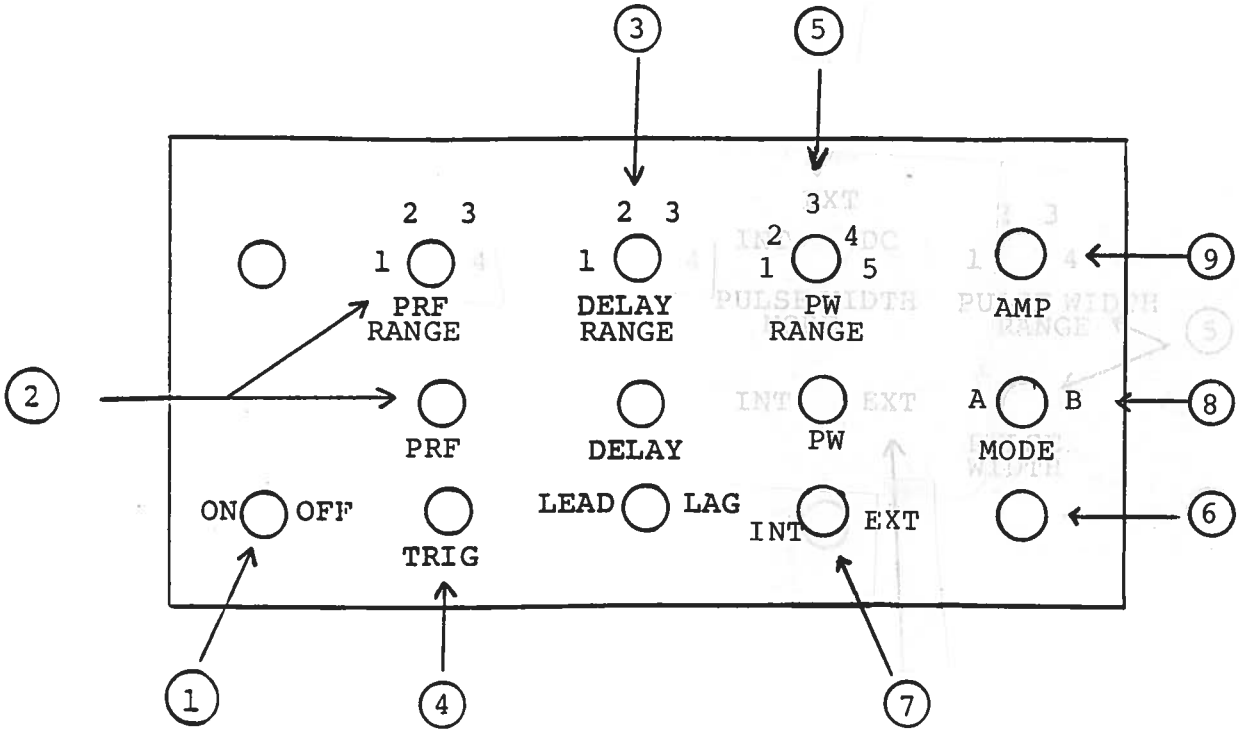
2) The unit will now operate with duty cycles as high as 90%. Take care to insure that the lab power supply voltage does not exceed 24 volts.

3) 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.

4) If additional assistance is required, call (613) 226-5772.

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 1 KHz as follows:

Range 1	1	Hz	to 10	Hz
Range 2	10	Hz	to 100	Hz
Range 3	100	Hz	to 1.0	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 as follows:

Range 1	0.2	us	to 10	us
Range 2	10	us	to 100	us
Range 3	10	ms	to 100	ms

The TRIG output precedes the main output when the LEAD-LAG switch is in the LEAD position and lags when the switch is in the LAG position

(4) TRIG Output. This output is used to trigger the scope time base. The output is a TTL level 100 nsec (approx.) pulse capable of driving a fifty ohm load.

(5) PW Control. A one turn control and five position range switch which varies the output pulse width as follows:

Range 1	1.0	us	to 10	us
Range 2	10	us	to 100	us
Range 3	100	us	to 1	ms
Range 4	1	ms	to 10	ms
Range 5	10	ms	to 100	ms

(6) OUT Connector. A multi pin connector which attaches the 2 foot cable from the pulse generator module to the main frame.

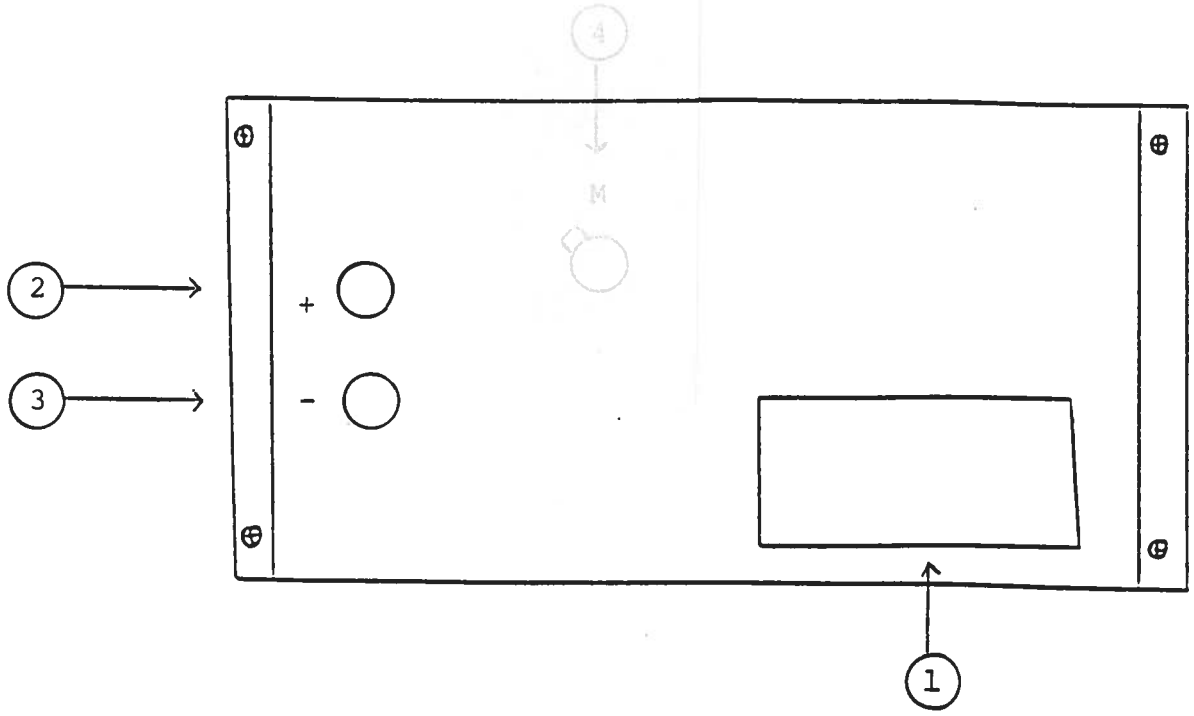
(7) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVO unit is controlled via an internal clock which in turn is controlled by the PRF controls. With the toggle switch in the EXT position, the AVO unit requires a 0.2 usec TTL level pulse applied at the TRIG input in order to trigger the output stages. In addition, in this mode, the scope time base must be triggered by the external trigger source.

(8) MODE AB. With the MODE switch in the A position the output amplitude is controlled by the AMP control (9) and the unit will operate with duty cycles as high as 20%. With the switch in the B position, the AMP control is inactive and a lab power supply (0 to 24 volts, 6 amperes) must be connected to the -PG module banana terminals. This lab power supply then supplies the output prime power and controls the pulse amplitude.

(9) AMP. Controls output pulse amplitude when MODE A-B switch is in the A position.

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 (1.0 A SB).

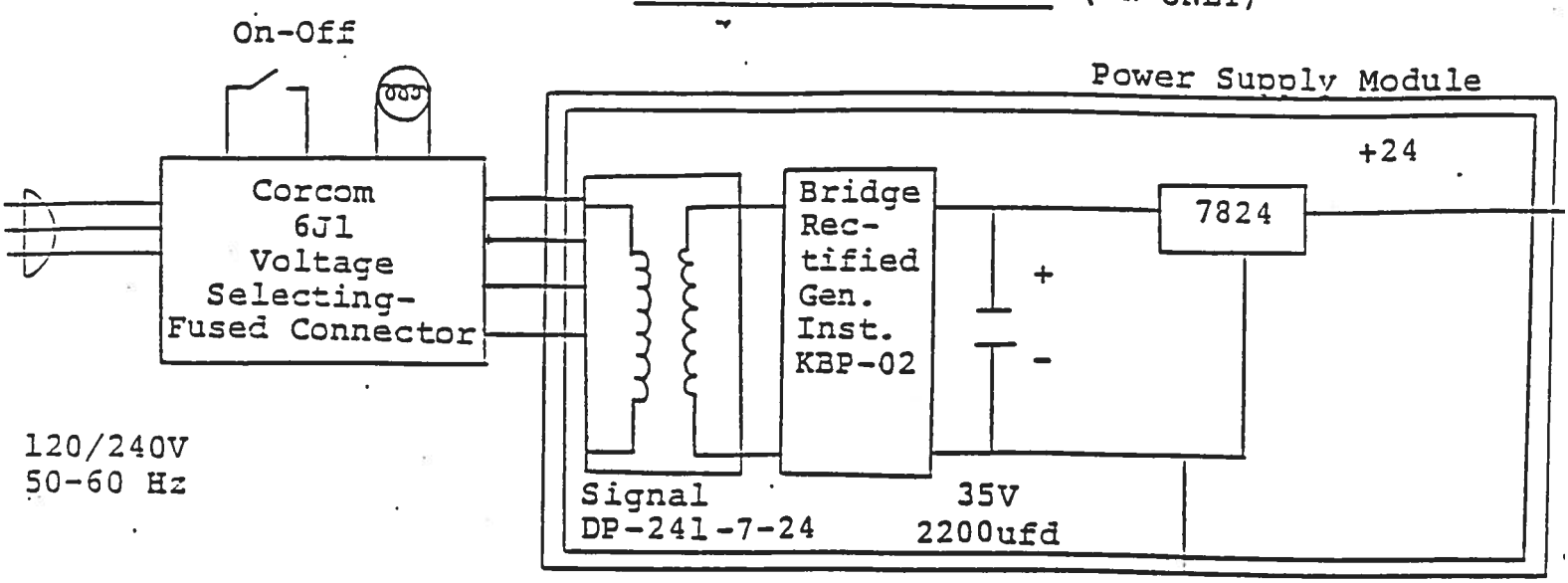
(2) RED BANANA. RED lug on 1/4" BLACK cable from PG module connects to this terminal.

(3) BLACK BANANA. BLACK lug on 1/4" BLACK cable from PG module connects to this terminal.

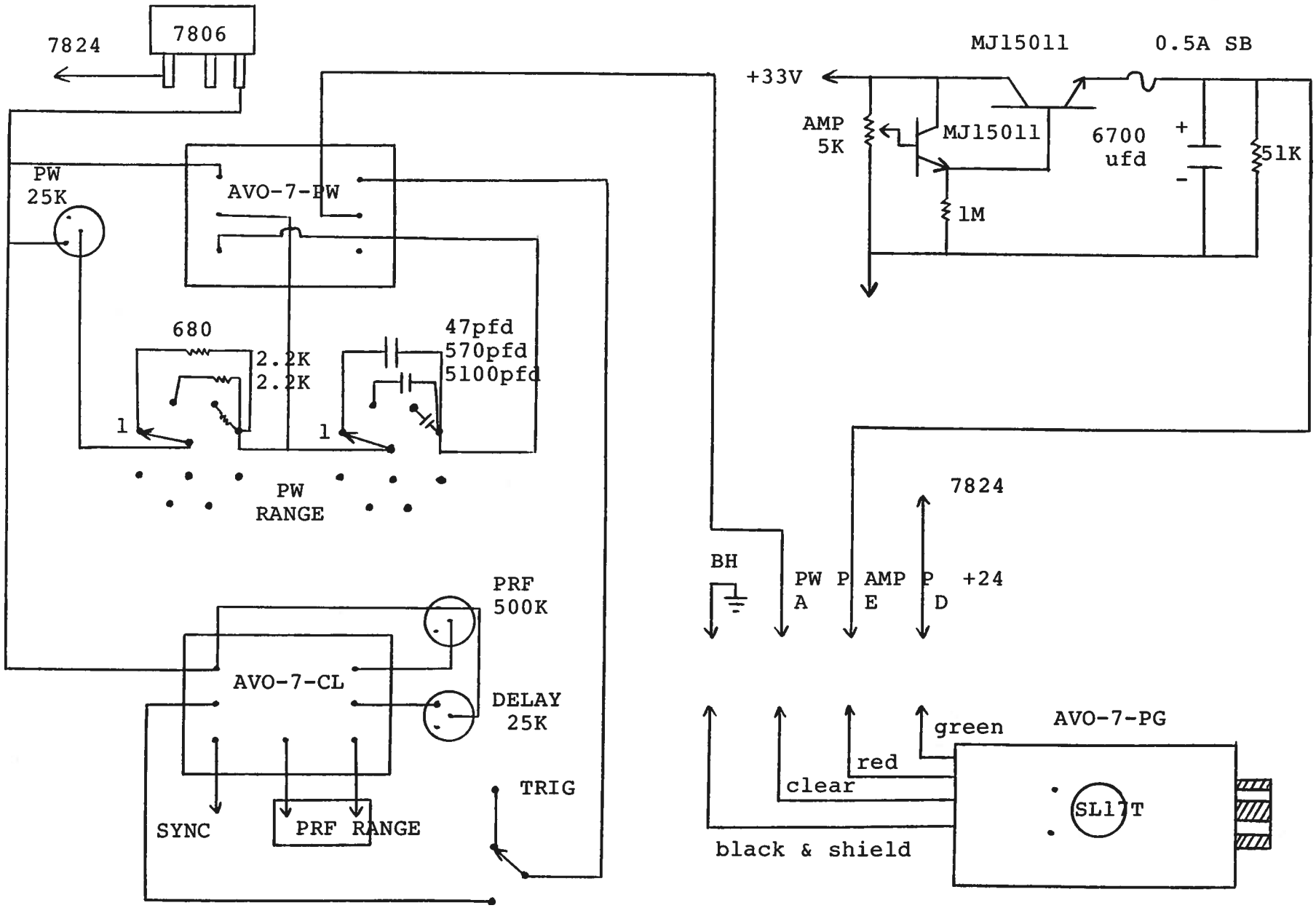
(4) 2.0 AMP SB FUSE. Limits DC current supplied to output stage when MODE A-B switch is in the A position. Fuse will blow if output duty cycle exceeds 20%.

Fig. 4

SYSTEM BLOCK DIAGRAM (-N ONLY)



AVO-7-C BLOCK DIAGRAM (-P ONLY)



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

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

1) AVO-7-PG pulse generator module
2) AVO-7-CL clock module
3) +24V power supply board
4) AVO-7-PW 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 2.0 A slow blow fuse or the main power 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 (SL17T1) may have failed due to an output short circuit condition or to a high duty cycle condition. The switching elements may be accessed on the bottom side of the -PG module. NOTE: First turn off the prime power. CAUTION: Briefly ground the SL17T1 tabs to discharge the 24 volts power supply potential. The elements may be removed from their sockets by means of a needle nosed pliers after removing the two 2-56 Phillips screws which attach the tabs to the body of the AVO-7-PG module. The SL17T1 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. If the switching elements are not defective, then the four Phillips screws on the back panel should be removed. The top cover may then be slid off and the operation of the clock and power supply modules checked. The clock module is functioning properly if:

a) 0.1 usec TTL level outputs are observed at pins 2 and 3.
b) The PRF of the outputs can be varied over the range of 1 Hz to 1 KHz using the PRF controls.
c) The relative delay between the pin 2 and 3 outputs can be varied by at least 1 msec by the DELAY control.

The sealed clock module must be returned to Avtech for repair or replacement if the above conditions are not observed.

Schroff 02.21.91