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## INSTRUCTIONS

MODEL AVB2-C-OCIC PULSE GENERATOR

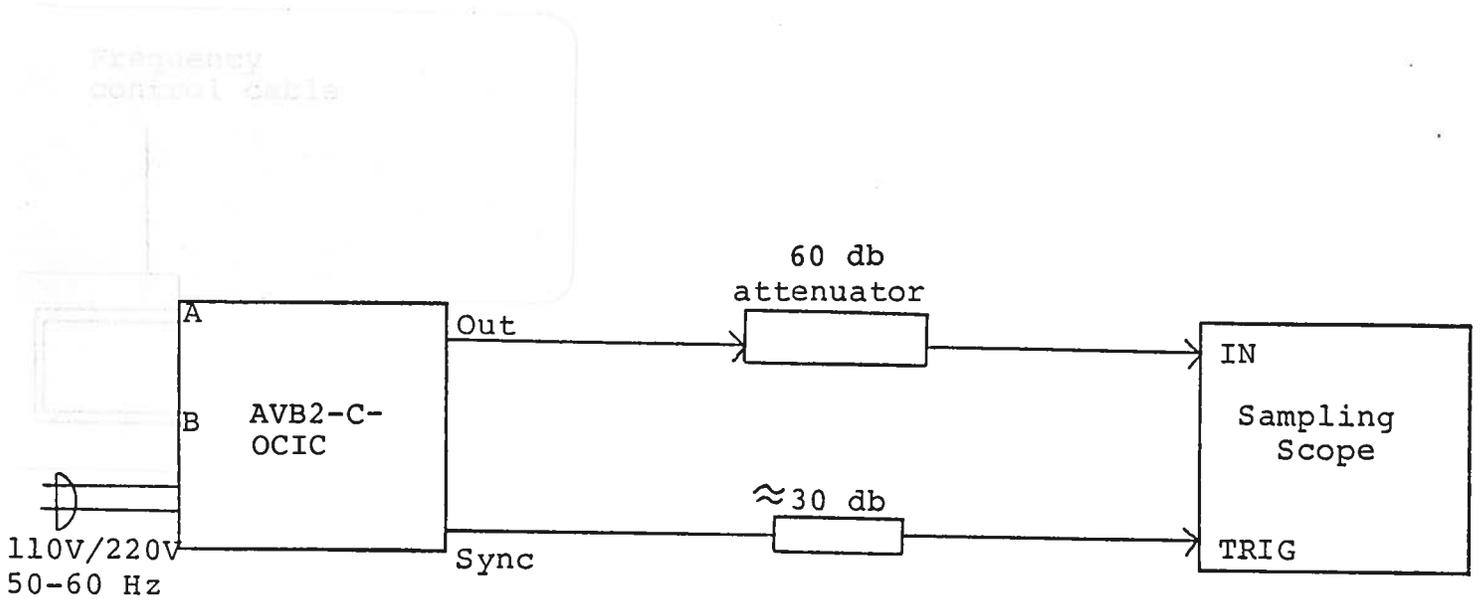
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## WARRANTY

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



Notes:

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed one gigahertz.
- 2) The use of 60 db attenuator at the sampling scope vertical input channel will insure a peak input signal to the sampling scope of less than one volt.
- 3) The sync 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.
- 4) To obtain a stable output display the PRF control on the front panel should be set mid-range while the PRF range switch may be in either range. The front panel TRIG toggle switch should be in the INT position. The front panel 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 control and by means of the PRF range switch.
- 5) MONITOR Output. The front panel monitor output provides an attenuated replica (20 db down) of the output. The monitor output is designed to operate into a 50 ohm load.
- 6) The output frequency is controlled by the PULSE WIDTH P, PULSE WIDTH N and TPN one turn controls. To establish the desired operating frequency the following sequence is recommended:
  - a) Set TPN max clockwise.
  - b) Adjust PULSE WIDTH N control to attain desired pulse width for negative-going swing (see Fig. 2).
  - c) Adjust PULSE WIDTH P control to attain desired pulse width for positive-going swing (see Fig. 2).
  - d) Rotate TPN counter-clockwise to reduce TPN to zero.
  - e) Some final iterative adjustments of the three controls may be necessary to fine-tune the output frequency.
- 7) The output amplitude is fixed at about 425 volts.

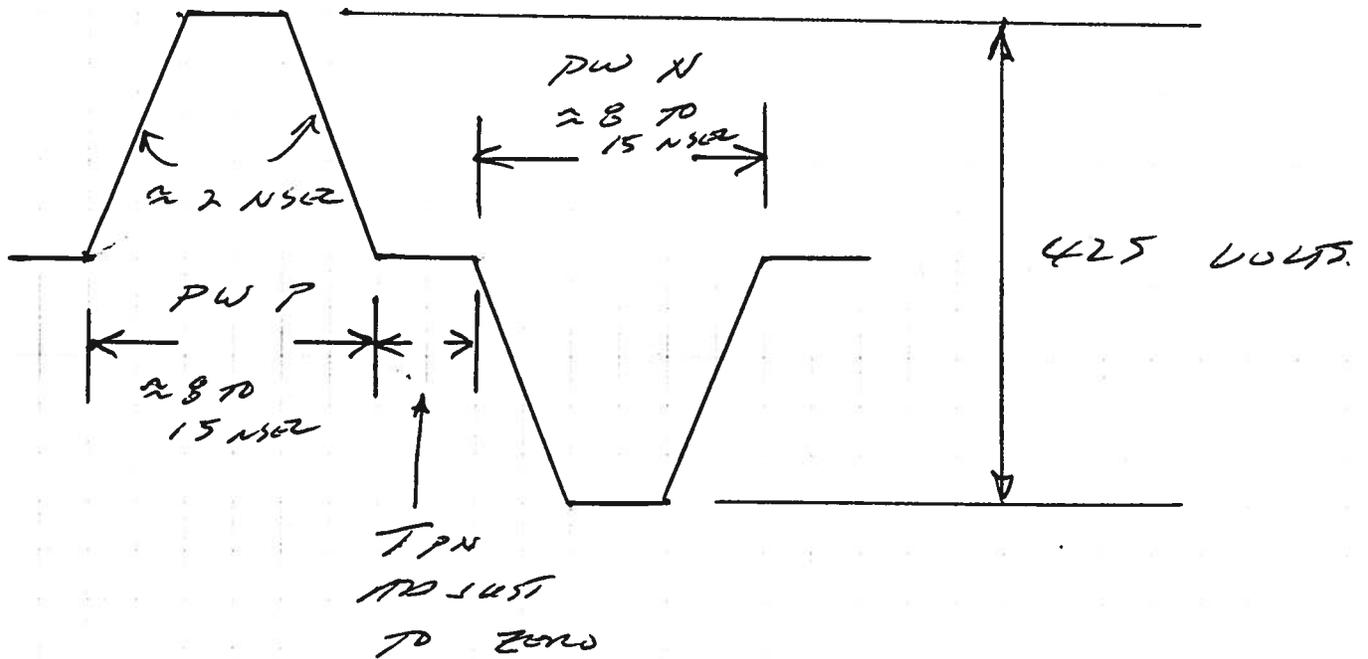
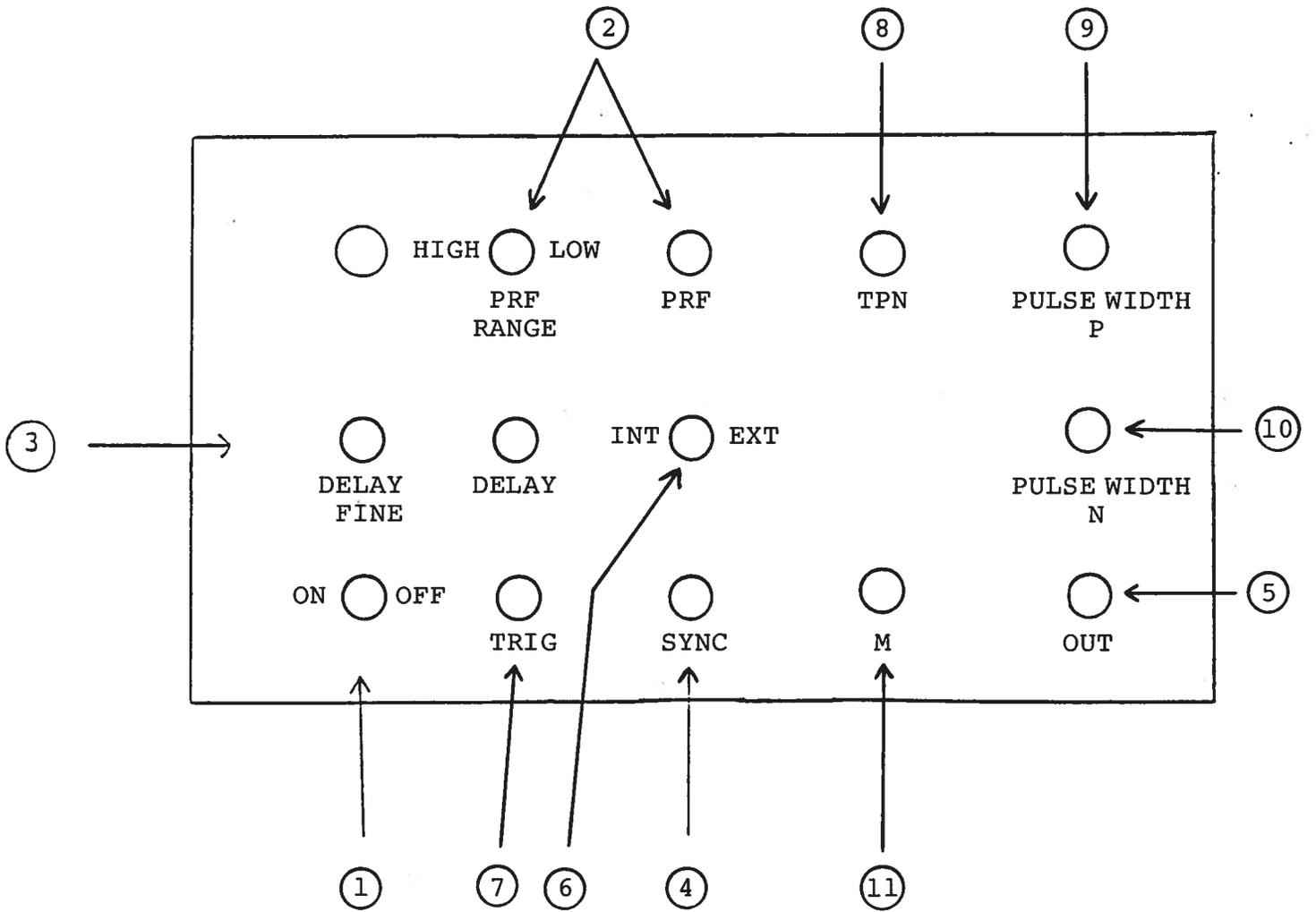


Fig 2: AVB2 - C - OCIC OUTPUT WAVEFORM.

Fig. 3

FRONT PANEL CONTROLS



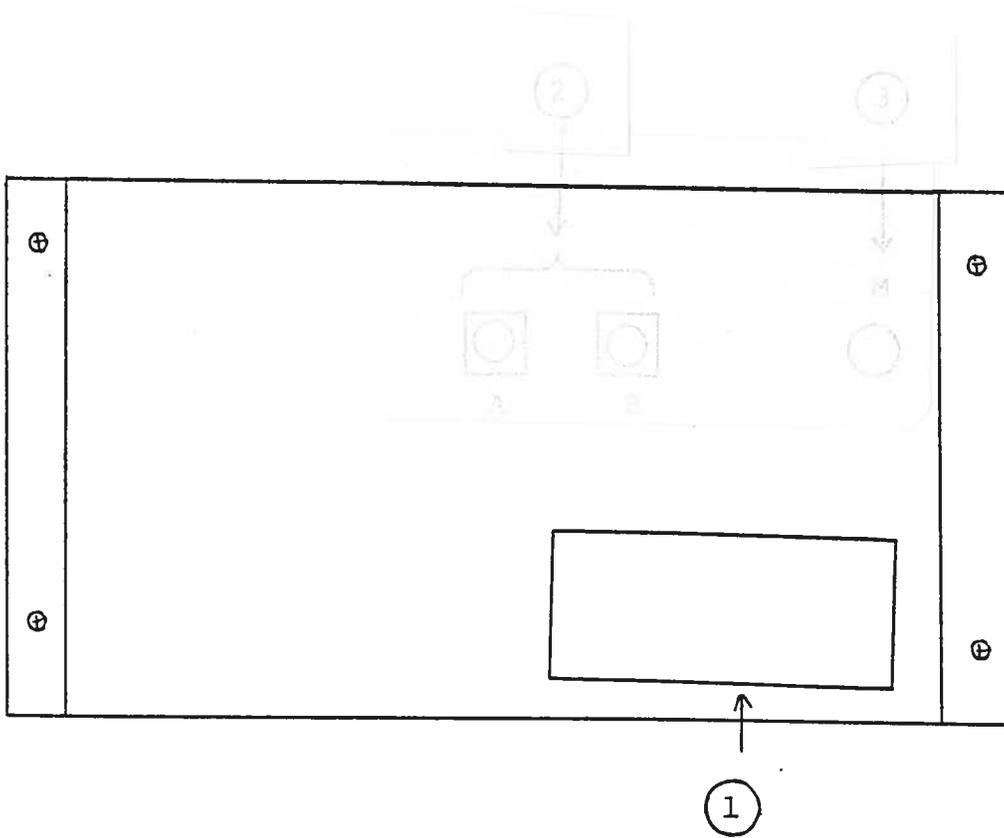
- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. The PRF RANGE and PRF controls determine output PRF as follows:

	PRF MIN	PRF MAX
LOW Range	20 Hz	2 KHz
HIGH Range	0.2 KHz	20 KHz

- (3) DELAY Controls. Controls the relative delay between the reference output pulse provided at the SYNC output (6) and the main output (5). This delay is variable over the range of 0 to at least 500 nsec.
- (4) SYNC Output. This output precedes the main output (5) 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.
- (5) OUT. BNC connector applies output to 50 ohm load.
- (6) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVB2 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 AVB2 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.
- (7) TRIG Input. The external trigger signal (TTL, PW > 50 nsec) is applied at this point when the EXT-INT toggle switch is in the EXT position.
- (8) TPN. One turn pot controls time separation between positive and negative voltage swing.
- (9) PULSE WIDTH P. Controls width of positive-going voltage swing.
- (10) PULSE WIDTH N. Controls width of negative-going voltage swing.
- (11) MONITOR OUT. BNC connector provides attenuated (x10) coincident replica of output (to 50 ohms).

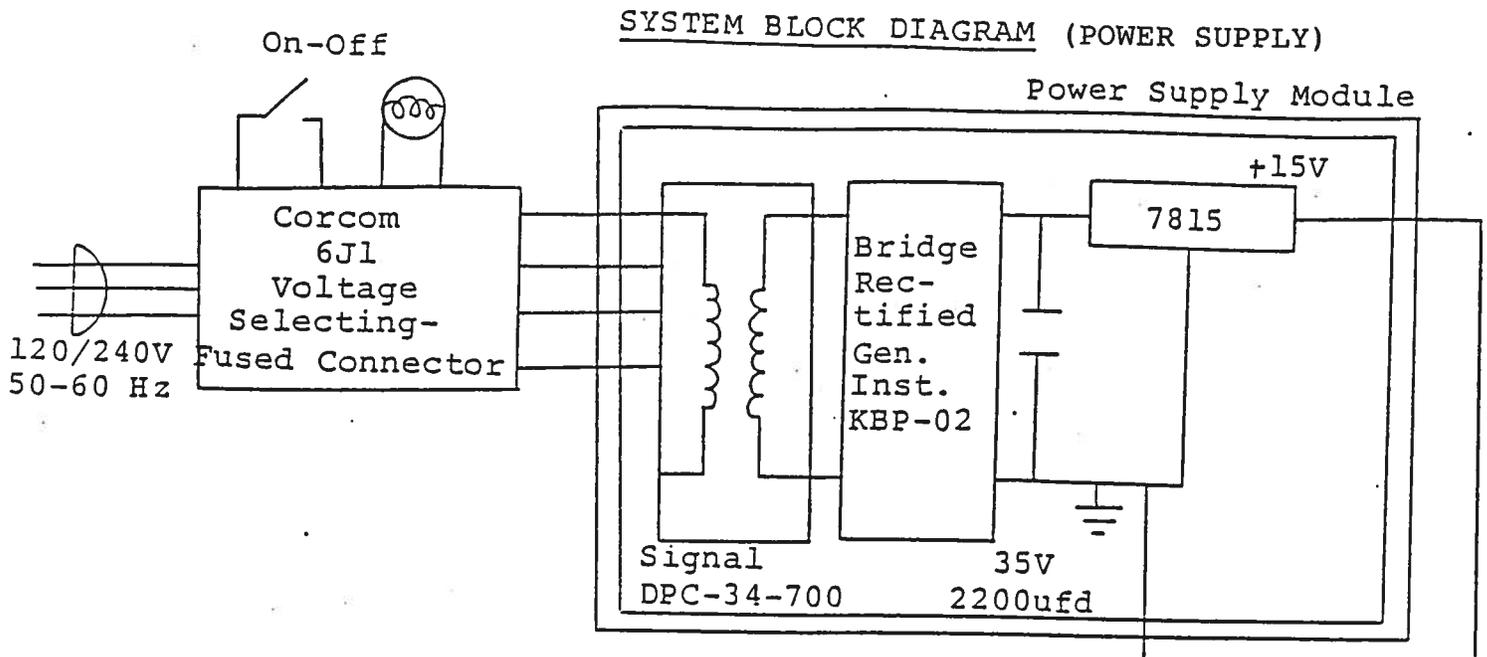
Fig. 4

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.

Fig. 5



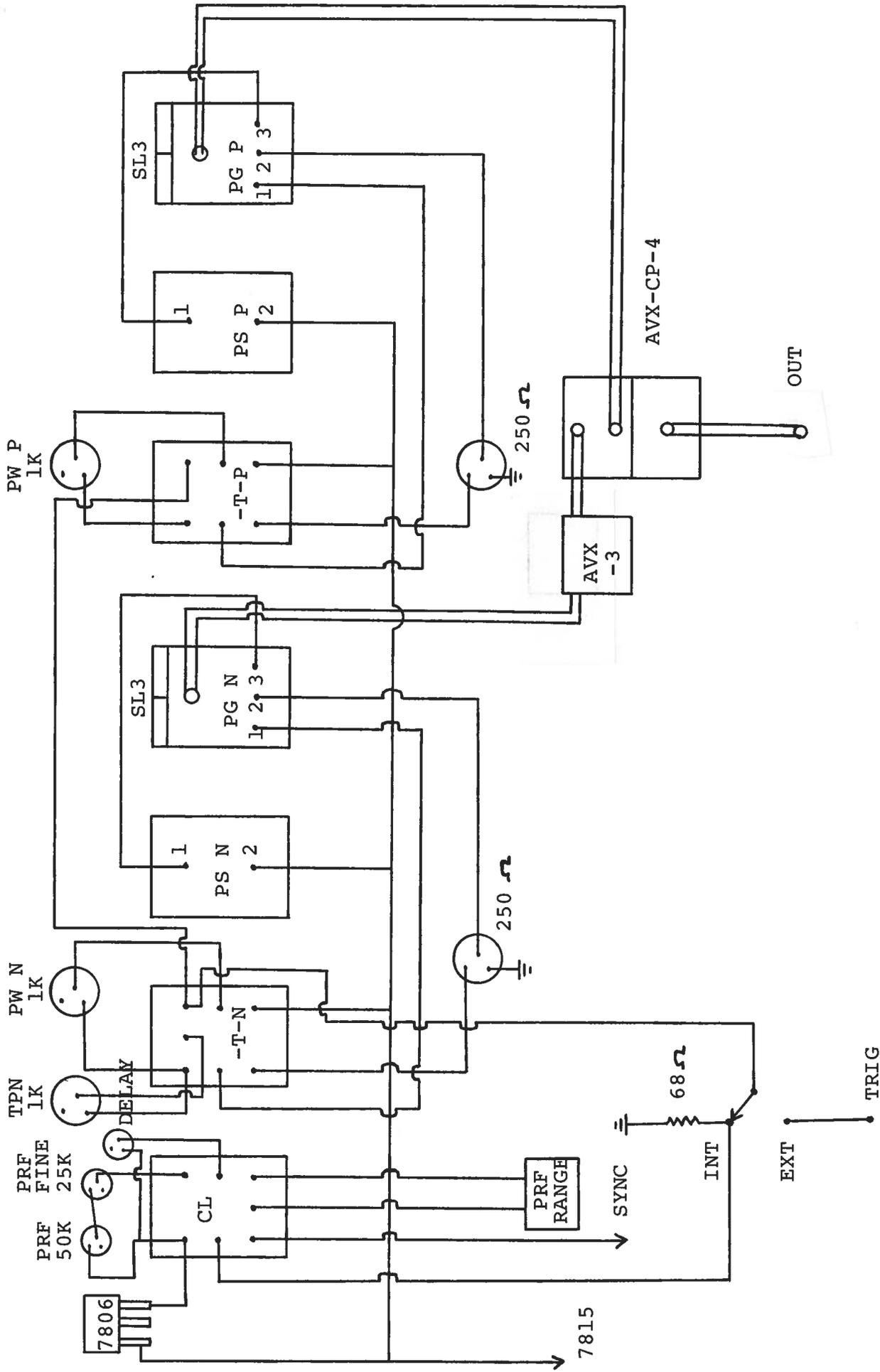


Fig. 6: BLOCK DIAGRAM

**WARNING:** The lines connecting pin 1 of the -PS modules to pin 3 of the -PG modules is at a potential of 360 to 380 volts. Also, the SL3 cases are at a potential of 360 to 380 volts.

## REPAIR PROCEDURE

- 1) **WARNING:** Before attempting any repairs, note that potentials as high as 300 volts are employed in the chassis structure.
- 2) The pulse generator is constructed from the following basic subsystems or modules:
  - a) Metal chassis
  - b) Pulse generator modules (OCIC-PG), two
  - c) Delay line modules (-DL), two
  - d) Timing modules (-T), two
  - e) Power supply modules (-PS), two
  - f) Clock module (-CL), one
  - g) Inverting transformer AVX-3
  - h) Power combiner, AVX-CP-4

The 9 modules are interconnected as shown in Fig. 6.

- 3) If no output pulse is provided by the unit, turn off the prime power supply and remove the top cover panel by removing the four Phillips screws on the back of the instrument. Apply a scope probe or voltmeter to pin 3 of the -PG unit. With the unit untriggered, turn on the prime power supply. A voltage of about 360 to 380 volts should be read at pin 3. Alternatively, the voltage may be measured on the cases of the SL3 switching elements. If the voltage is zero or much less than 360 volts, then one of the switching transistors (Part No. SL3) in the -PG module has probably failed. With the prime power supply off remove one of the transistors by removing the two 2-56 screws which secure the transistor in its socket. **CAUTION:** Before touching or removing the transistor, the cases should be briefly shorted to the instrument case to discharge charged capacitors (as high as 400 volts). Pull the transistor out of the socket. With the unit untriggered turn on the prime power supply and measure the voltage from the case of the remaining transistor to ground. If this voltage is about 360 to 380 volts then the transistor which was removed is defective and should be replaced. If the voltage which is measured is less than 360 volts then the transistor still in position is defective and should be replaced. Note that the two transistors are completely interchangeable (Order Avtech Part No. SL3). Note that with both transistors removed, the voltage at pin 3 on the -PG module should be in the range of 360 to 380 volts. If the voltage is less then the -PS module must be replaced. If both the -PS module and the -PG module are not found to be defective then the -T module is suspect.

Schroff

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Edition A

-M

UNCLASSIFIED

1) The output pulse is provided by the unit, turn off the  
power supply, and remove the tap from panel B.

2) The pulse generator is connected to the unit.  
Panel A is connected to module 1.

- a) Unit module 1
- b) Pulse generator module 011-011A, two
- c) Delay line module 011-011, two
- d) Timing module 011-011, two
- e) Power supply module 011-011, two
- f) Unit module 011-011, one
- g) Inverting transistor 011-011
- h) Power supply 011-011

The 2 modules are interconnected as shown in Fig. 2.

3) If no output pulse is provided by the unit, turn off the  
power supply, and remove the tap from panel B.  
Remove the four 100-ohm resistors in the back of the  
instrument. Apply a scope probe or a timer to pin 2  
of the PE unit. With the unit unpowered, turn on the  
power supply. A voltage of about 50 to 250 volts  
should be read at pin 2. Alternatively, the voltage may  
be measured on the scope of the PE unit (see element  
1). The voltage is zero or much less than 250 volts, then  
one of the switching transistors (Part No. 011-011) in the  
PE module has probably failed. With the power supply  
off, remove one of the transistors by removing the  
two 250-ohm resistors which secure the transistor in its  
socket. (Caution: Before touching or removing the  
transistor, the case should be properly grounded to the  
instrument case to discharge the lead capacitor. See step  
1.) The voltage at the transistor out on the scope  
is now the unit unpowered turn on the power supply  
and measure the voltage from the case of the remaining  
transistor to ground. If this voltage is about 50 to  
250 volts, then the transistor which was removed is  
operative and should be replaced. If the voltage which  
is measured is less than 50 volts from the transistor  
still in position, the transistor and output are replaced.  
Repeat the two transistors are completely  
interchangeable. Under voltage test 011-011A, 011-011  
with both transistors removed, the voltage at pin 2 on  
the PE unit should be in the range of 50 to 250  
volts. If the voltage is less than the PE unit must  
be replaced. If both the PE unit and the PE module  
are not found to be defective, then the PE module is  
operative.