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**INSTRUCTIONS**

**MODEL AVIR-1-C-PN-AT 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 assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

### TECHNICAL SUPPORT

Phone: 613-226-5772 or 1-800-265-6681

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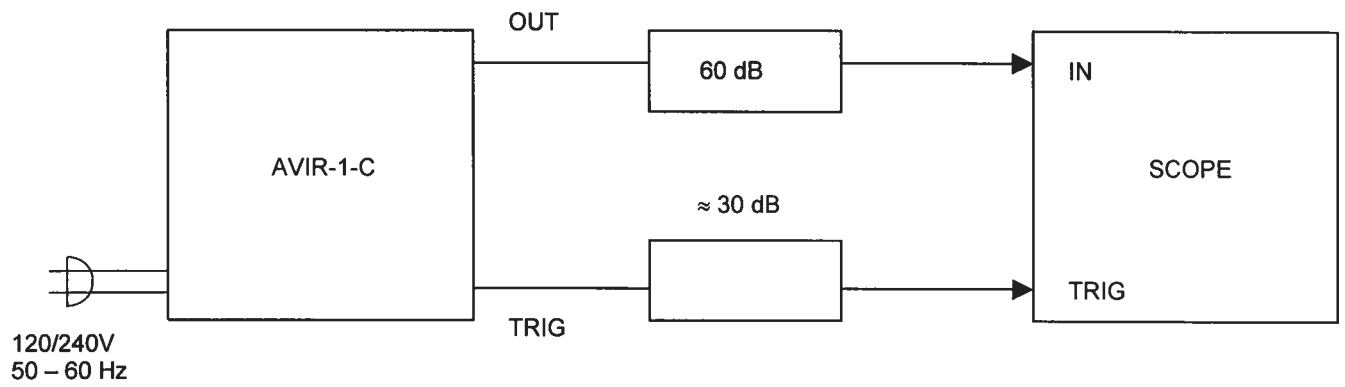
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FIG. 1: PULSE GENERATOR TEST ARRANGEMENT



## GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 500 MHz. A 60 dB attenuator will insure that less than 1 Volt is applied to the scope.

**CAUTION:** This unit requires a 50 Ohm load and failure may result if operated with a short-circuited or open circuited load. Such failures are not covered by the warranty.

- 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. 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 to 200 ns.
- 3) To obtain a stable output display the PRF control on the front panel should be set mid range. 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.
- 4) The output pulse width is controlled by means of the front panel one turn PW control. To voltage control the output pulse width, set the rear panel PW switch in the EXT position and apply 0 to +10V to BNC connector A ( $R_{IN} \geq 10K$ ). (EW option).
- 5) The output pulse amplitude is controlled by means of the front panel one turn AMP control. To voltage control the output amplitude, set the rear panel Amp switch in the EXT position and apply 0 to +10V to BNC connector A ( $R_{IN} \geq 10K$ ). (EA option)
- 6) The output polarity is controlled by the front panel two-position polarity switch (for -PN option units only).
- 7) An external clock may be used to control the output PRF of the unit by setting the front panel PRF range switch in the EXT position and applying a 50 ns (or wider) 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.

8) The unit can be converted from 120 to 240V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.

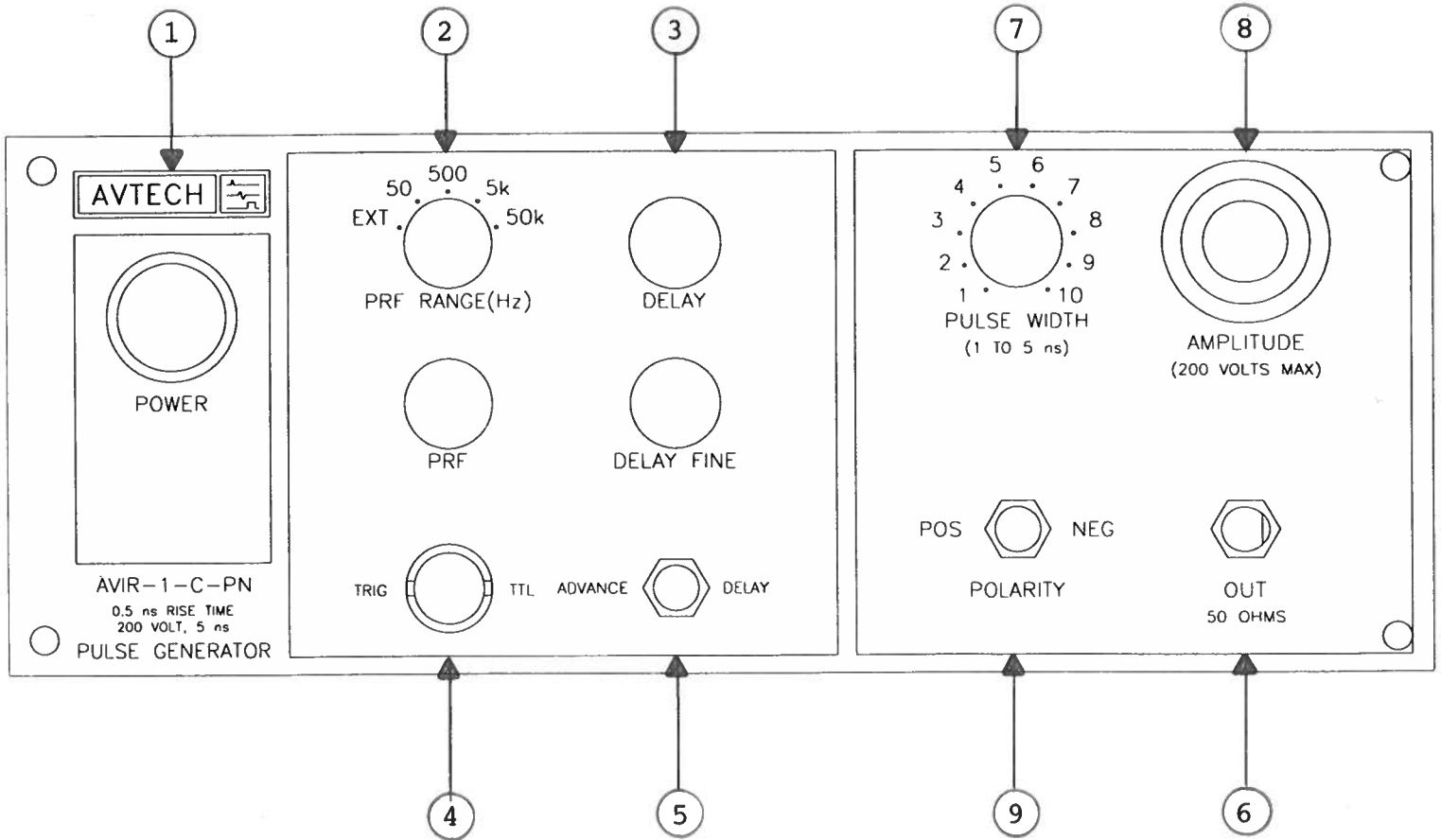
9) For additional assistance:

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FIG. 2: FRONT PANEL CONTROLS



## FRONT PANEL CONTROLS

- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. With this range switch in the 50, 500, 5K or 50K positions, the pulse repetition frequency (PRF) of the instrument is controlled by the internal clock oscillator, which in turn is controlled by the PRF range switch and fine control.

With the range switch in the EXT position, the instrument requires a 50 ns (or wider) TTL level pulse applied at the TRIG input in order to trigger the output stages.

- (3) DELAY Control. These controls vary the relative delay between reference output pulse provided at the TRIG output (4) and the main output (6). This delay is variable over the range of 0 to about 200 ns. Coarse and fine controls are provided. If the Advance/Delay switch (5) is set to "ADVANCE", the reference output on the TRIG output (4) precedes the main output (6). If the Advance/Delay switch (5) is set to "DELAY", the reference output on the TRIG output (4) lags the main output (6).

The delay is not adjustable when triggering externally.

- (4) TRIG Output. This connector has two functions. When triggered internally, this output provides a reference signal that can be used to trigger an oscilloscope scope time base. The output is a 2V, 200ns (approx.) pulse capable of driving a 50-Ohm load. Set the scope to trigger on the positive edge.

When triggering externally (i.e., the PRF range switch is in the EXT position), the external TTL-level trigger signal is applied at this point.

- (5) ADVANCE/DELAY SWITCH. This switch determines whether the reference output pulse on the TRIG connector (4) occurs in before the main output pulse (ADVANCE mode), or whether the reference pulse occurs after the main output pulse (DELAY mode). This switch is only useful when triggering internally.
- (6) OUT. This connector provides the main output pulse. The output is designed to drive 50-Ohm loads.
- (7) PULSE WIDTH. A one-turn control which varies the output pulse width.
- (8) AMPLITUDE. A one-turn control which varies the output pulse amplitude.
- (9) POLARITY. Two-position switch controls the polarity of the output pulse provided at (5) (for -PN option units only).



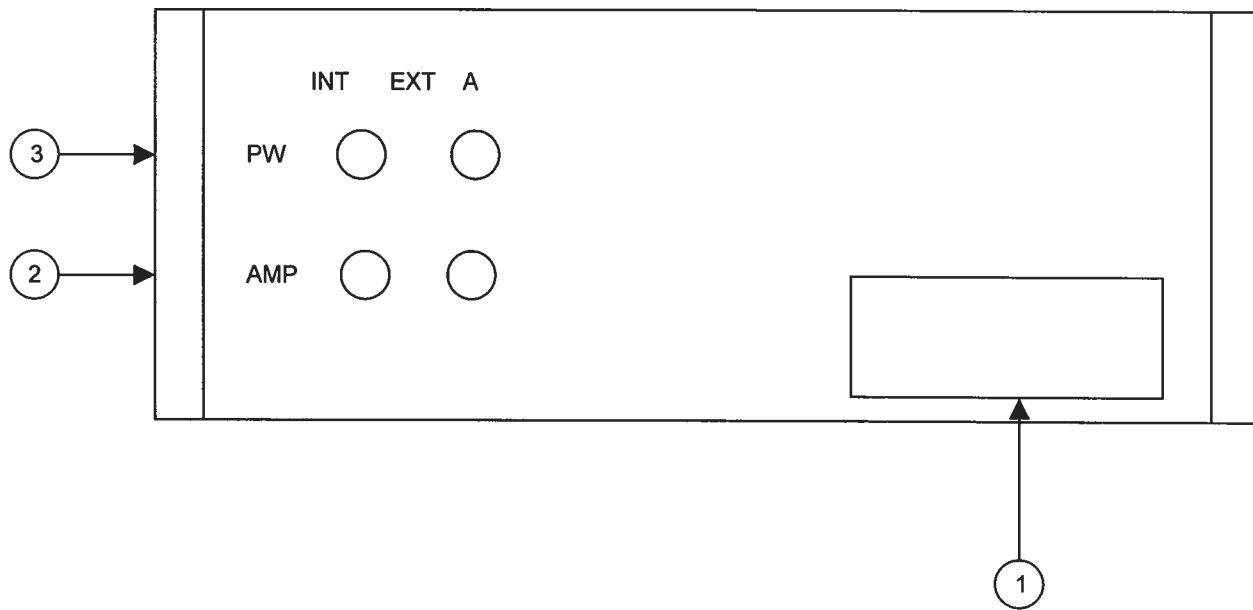
### TOP COVER REMOVAL

- 1) The interior of the instrument may be accessed by removing the four Phillips screws on the top panel (see Fig. 1). With the four screws removed, the top cover may be slid back (and off).

### ELECTROMAGNETIC INTERFERENCE

To prevent electromagnetic interference with other equipment, all used outputs should be connected to shielded 50 Ohm loads using shielded 50 Ohm coaxial cables. Unused outputs should be terminated with shielded 50 Ohm BNC terminators or with shielded BNC dust caps, to prevent unintentional electromagnetic radiation. All cords and cables should be less than 3m in length.

FIG. 3: BACK PANEL CONTROLS



## 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.

For AC line voltages of 110-120V, the power selector card should be installed so that the "120" marking is visible from the rear of the instrument.

For AC line voltages of 220-240V, the power selector card should be installed so that the "240" marking is visible from the rear of the instrument.

If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse.

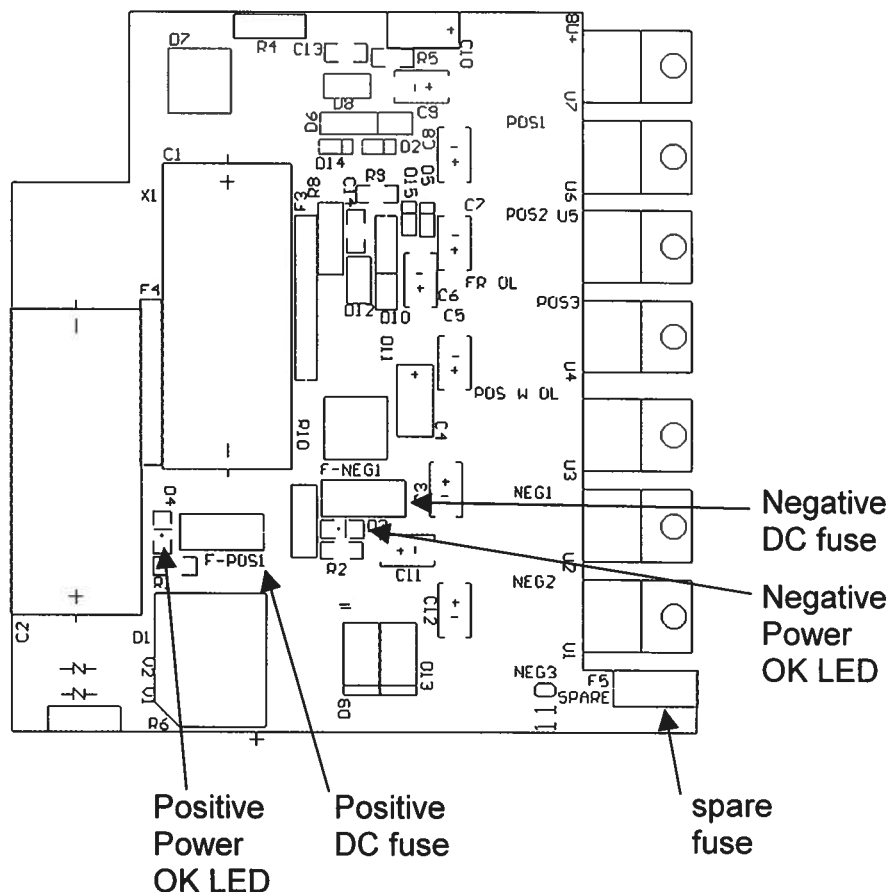
In the 120V setting, a 0.5A slow blow fuse is required. In the 240V setting, a 0.25A slow blow fuse is required.

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

## POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three fuses (plus one spare). One, which protects the AC input, is located in the rear-panel power entry module, as described in the “Rear Panel Controls” section of this manual. If the power appears to have failed, check the AC fuse first.

The other two fuses (plus one spare) are located on the internal DC power supply, as shown below:



The positive fuse and the spare fuse on this circuit board are 1A slow-blow fuses, Littlefuse part number R452001. (This fuse can be ordered from Digikey, [www.digikey.com](http://www.digikey.com). The Digikey part number is F1343CT-ND). The negative fuse is a 0.5A slow-blow fuse (Littlefuse R452.500, Digikey part number F1341CT-ND).

If you suspect that the DC fuses are blown, follow this procedure:

1. Remove the top cover, by removing the four Phillips screws on the top cover and then sliding the cover back and off.
2. Locate the two "Power OK" LEDs on the power supply circuit board, as illustrated above.
3. Turn on the instrument.
4. Observe the "Power OK" LEDs. If the fuses are not blown, the two LEDs will be lit (bright red). If one of the LEDs is not lit, the fuse next to it has blown.
5. Turn off the instrument.
6. If a fuse is blown, use needle-nose pliers to remove the blown fuse from its surface-mount holder.
7. Replace the fuse.

June 14/2001