

INSTRUCTIONS

MODEL AVL-2A-PS-CM1-OS-150 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

Fax: 613-226-2802 or 1-800-561-1970

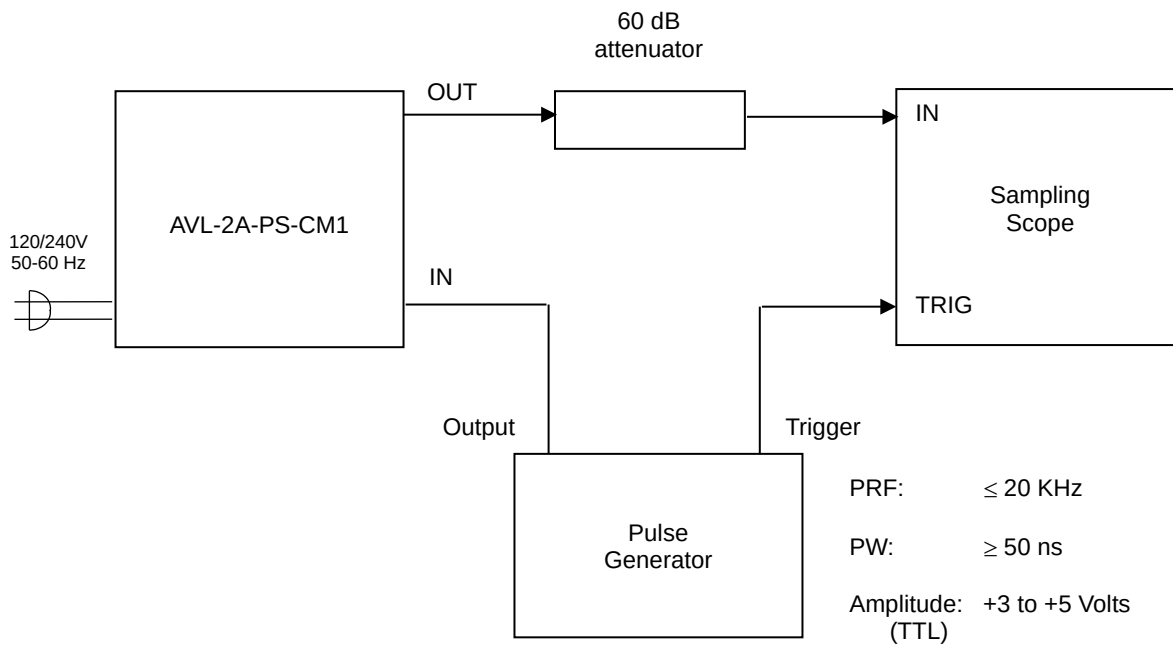
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FIG. 1: PULSE GENERATOR TEST ARRANGEMENT

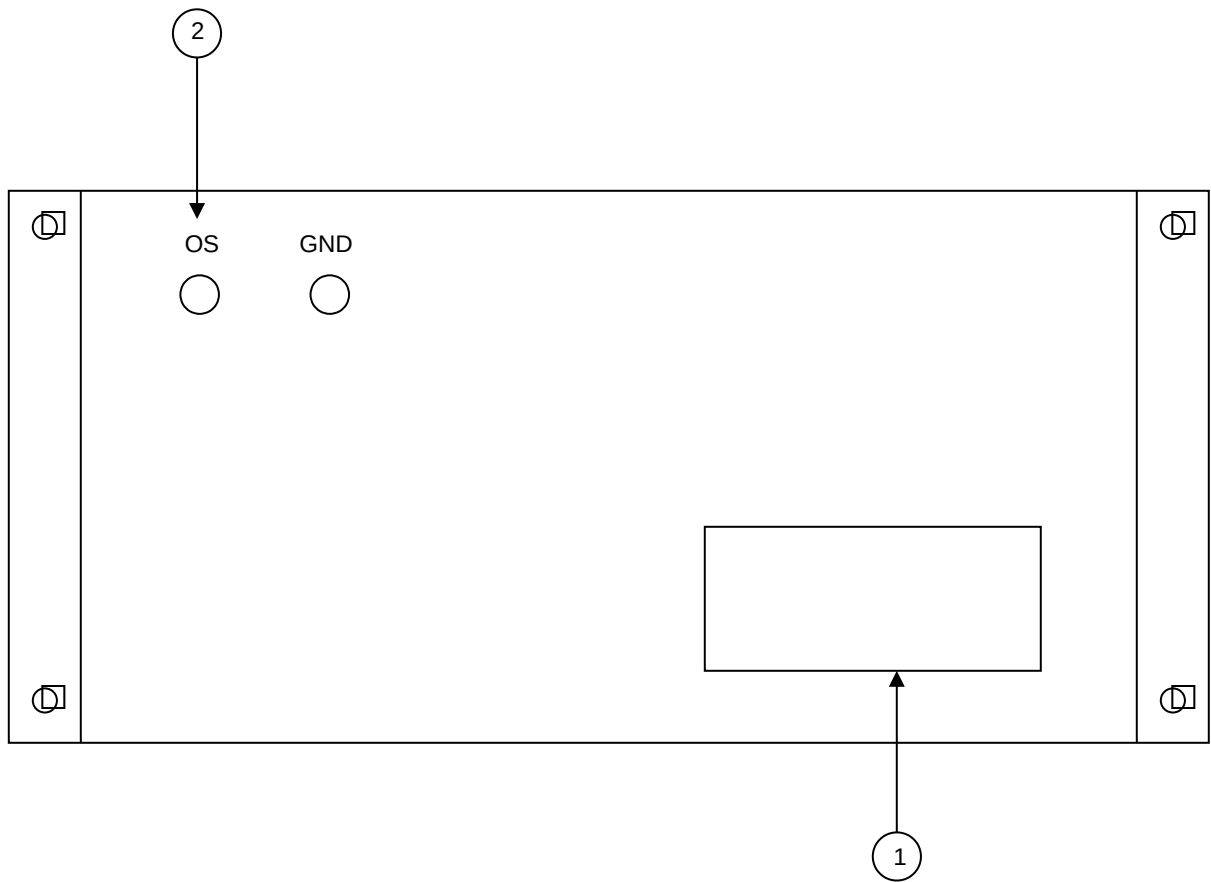


GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 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 output pulse width is controlled by means of the one turn potentiometer (PW). The pot should initially be set mid-range and the pulse width adjusted using an oscilloscope. The output will degenerate to an impulse and eventually vanish as the pot is turned fully counter clockwise. Units with the -W option are shipped with an 8 inch length of RG-58 cable connected between ports A and B on the back panel. This cable provides a maximum PW of about 100 nsec. The PW pot control is active over about 900 with this cable. The maximum PW may be extended up to 400 nsec by attaching RG-58 cable lengths of about 100 feet between ports A and B. With 100 feet of cable attached, the PW pot control is active over about 3000. The maximum attainable PW varies linearly with cable length for cable lengths between 6" and 100 feet. CAUTION: Insure that the input power is off before attempting to change the cable between ports A and B. Potentials as high as 400V exist on the centre conductor between ports A and B.
- 4) The output pulse amplitude is controlled by means of the one turn potentiometer (AMP) and the HIGH-LOW switch adjacent to the AMP control. With the switch in the HIGH position, the output amplitude is variable over the range of 75 to 170 volts while in the LOW position the output amplitude is variable over the range of about 0 to 150 volts.
- 5) The output amplitude may be controlled electronically by placing the rear panel EA switch in the ON position and applying 0 to +10 volts to the EA solder terminal. Note that the front panel manual amp control is still unctional when the EA switch is in the ON position (EA option).
- 6) Model AVL-2A can withstand an infinite VSWR on the output port but is intended for operation with 50 ohm loads.
- 7) NOTE: The lifetime of the switching elements in the pulse generator module is proportional to the running time of the instrument. For this reason the prime power to the instrument should be turned off when the instrument is not in use. In the case of failure, the switching elements are easily replaced following the procedure described in the following section.

- 8) The desired DC offset is applied to the back panel OS terminals which are connected to the output centre conductor via a high quality RF inductor. Do not exceed ± 150 , 0.1 Amp. (option).
- 9) The back monitor output provides an attenuated replica (20 db down) of the output less DC offset. The monitor output is designed to operate into a 50 ohm load. (option).
- 10) The unit can be converted from 120 to 240V 50-60 Hz operation by adjusting voltage selector card in the rear panel fused voltage selector-cable connector assembly.
- 11) For additional assistance:
Tel: (613) 226-5772
Fax: (613) 226-2802
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FIG. 2: 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 (0.5A SB).
- (2) OS. The desired DC offset is applied to the back panel OS terminals, which are connected to the output center conductor via a high quality RF inductor. Do not exceed $\pm 150V$, 0.1 Amp. (option).

REPAIR PROCEDURE

- 1) **WARNING:** Before attempting any repairs, note that potentials as high as 400 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 module (AVL-2A-PG)
 - c) Power supply module (AVL-2A-PS)
 - d) Clock module (AVL-2A-CL)
 - e) Power supply board

The three modules are interconnected as shown in Fig. 1.

- 3) If no output pulse is provided by the AVL-2A unit, turn off the prime power supply and remove the top cover panel by removing the four Phillips screws on the back side of the instrument. The top cover will then slide out to expose the interior. Apply a scope probe or voltmeter to pin 6 of the AVL-2A-PG unit. Turn on the prime power supply. A voltage of about 360 to 380 volts should be read at pin 6. If the voltage is zero or much less than 380 volts, then one of the switching transistors (Part No. SL3) in the AVL-2A-PG module has probably failed. **WARNING:** The cases of the transistors are at potentials as high as 380 volts. 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. Pull the transistor out of the socket. With the unit un-triggered turn on the prime power supply and measure the voltage from the case of the remaining transistor to ground. If the 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 6 on the AVL-2A-PG module should be in the range of 360 to 380 volts. If the voltage is less then the AVL-2A-PS module must be replaced.

The AVL-2A-CL-CM1 module is functioning properly if:

- a) The TTL level output at pin 2 varies from 50 Hz to 20 KHz as the PRF control is varied.

- b) The relative delay between the output at pins 2 and 3 varies by about 100 to 200 nsec as the DELAY control is varied.

FIG. 3: POWER SUPPLY

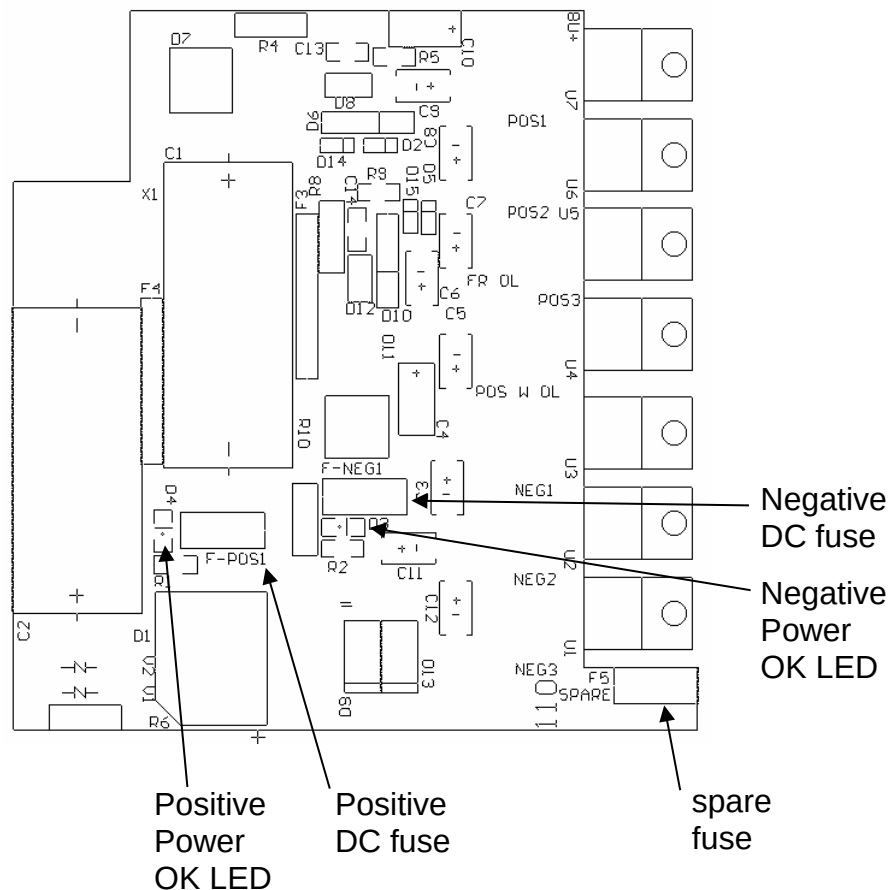
Notes:

- 1) All module chassis are grounded to main chassis and to each other via separate ground lines.
- 2) WARNING: The line connecting pin 1 of AVL-2A-PS to pin 6 of AVL-2A-PG is a potential of 375 to 400 Volts.

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 spare fuse may be used to replace one of the other fuses, if required.

The three fuses on this circuit board are 0.5A slow-blow fuses, Littlefuse part number R452.500. (This fuse can be ordered from Digikey, www.digikey.com. The Digikey part number is 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.

PERFORMANCE CHECK SHEET