

INSTRUCTIONS

MODEL AVO-9C-C PULSE GENERATOR

S.N.: 9884

## 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

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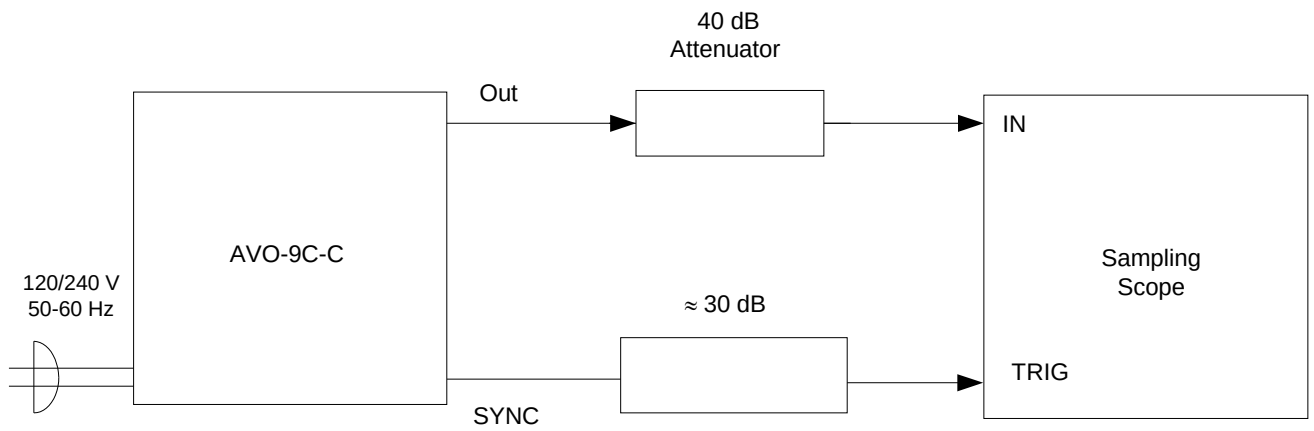
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Manual Reference: /fileserver1/officefiles/instructword/avo-9/AVO-9C-C, SN 9884, ed 1.doc, created July 5, 2001

FIG. 1: PULSE GENERATOR TEST ARRANGEMENT (AVX-S1 Module Disconnected)



## 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 5 gigahertz.
- 2) The use of 40 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 a +500 mV 10 ns pulse.
- 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 control and the scope triggering controls are then adjusted to obtain a stable output. It is recommended that the DELAY control first be set max counter clockwise and then turned clockwise until a stable display is obtained. The scope may then be used to set the desired PRF by rotating the PRF control and by means of the PRF range switch. The stability of the display on some sampling scopes is very sensitive to the trigger delay setting, particularly at high PRF (e.g. 10 to 25 MHz). If necessary, consult your sample scope instructions manual for the proper triggering method.
- 5) The output pulse width is controlled by means of the front panel one-turn PW control. The control should initially be set maximum clockwise and the pulse width adjusted using an oscilloscope. Rotation of the PW pot causes the position of the falling edge of the pulse to change. For the PRF range of 0 to 25 MHz, the output pulse width is variable over the range of 0 to 10 ns. CAUTION: The output pulse width is PRF-dependent and so the PW reading given by the dial will not be valid at all PRF settings.
- 6) The output pulse amplitude is controlled by means of the front panel one-turn AMP control.
- 7) The unit provides a 300 ps rise time at the OUT port. For units with the -TR option, the rise and fall time can be set at approximately 0.3, 0.4, 0.7, 1.2 and 2.0 ns using the five position front panel TR switch. To use the switch connect the OUT port to the TRIN port. The variable rise time output is then available at the TROUT port.
- 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 10 ns (or wider) TTL level pulse to the TRIG BNC connector input. The AVMM unit triggers on the rising edge of the input trigger pulse. For operation in this

mode, the scope time base must also be triggered by the external clock rather than from the TRIG output.

- 9) WARNING: Model AVO-9C-C may fail if triggered at a PRF greater than 25.0 MHz.
- 10) The Model AVO-9C-C pulse generator can withstand an infinite VSWR on the output port.
- 11) Dual Polarity Option. To invert the output of the AVO-9C-C unit, connect the AVX-2-T unit to the OUT port. An inverted pulse is then obtained at the OUT port of the AVX-2-T unit. To offset the inverted pulse, apply the desired DC potential to the DC terminal on the AVX-2-T module. Note that a male-to-male SMA sex changer must be used to connect the AVX-2-T module to the OUT SMA terminal.
- 12) The AVO-9C-C 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.
- 13) For additional assistance:

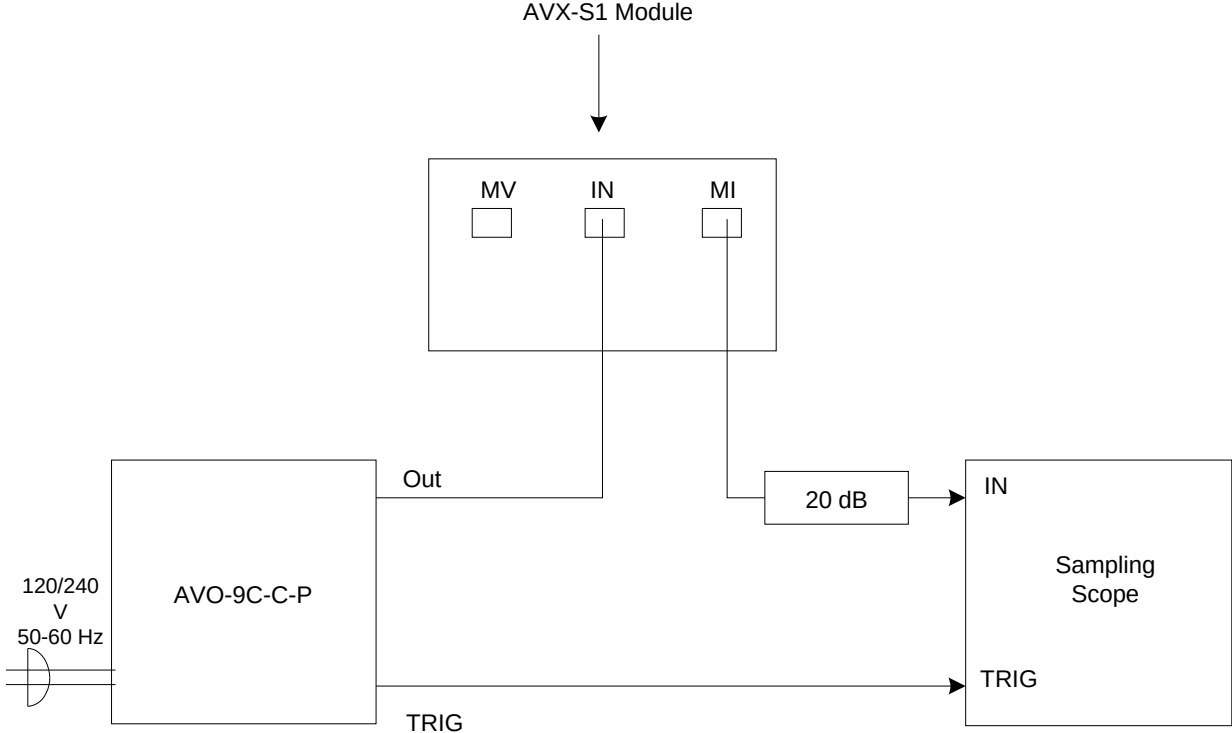
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FIG. 2: PULSE GENERATOR TEST ARRANGEMENT (AVX-S1 Module Connected)



## GENERAL DESCRIPTION

- 1) The AVX-S1 module should be connected to the pulse source mainframe via the supplied 24" RG174 cable.
- 2) Gently insert the diode package leads into the 7-pin socket assembly. Pins 8 to 14 contact the AVX-S1 pin sockets. Pin 12 contacts the diode cathode via the 20-Ohm package-contained series resistor. Pin 11 contacts the anode and is grounded.
- 3) The diode package may be secured in position by installing two 2-56 Philips screws in the two tapped holes in the mounting ledge. It may be necessary to loosen the two 4-40 Philips screws to reposition the height of the L-shaped monitor ledge.
- 4) A forward DC bias may be applied to the laser diode by connecting a DC current to Pin 3 of the diode package. The application of a small forward bias often yields a more ideal diode current waveform (as observed on the MI port). Note that the DC port must be shorted to ground if a bias is not applied.
- 5) Connect the MI port to a scope via 20-dB attenuator.
- 6) The diode pulse current (Amps) and the Voltage at  $M_I$  (Volts) are related as follows:

$$I_D = 0.4 (V_{MI} - V_{MV}), V_D = 10 V_{MV} - 20 I_D$$

AVX-S1, S.N. 9884

FUNCTIONAL EQUIVALENT CIRCUIT

PACKAGE

AVX-S LASER DIODE BIAS INSERTION UNITS DATA SHEET

## SPECIFICATIONS

FIG. 2: FRONT PANEL CONTROLS

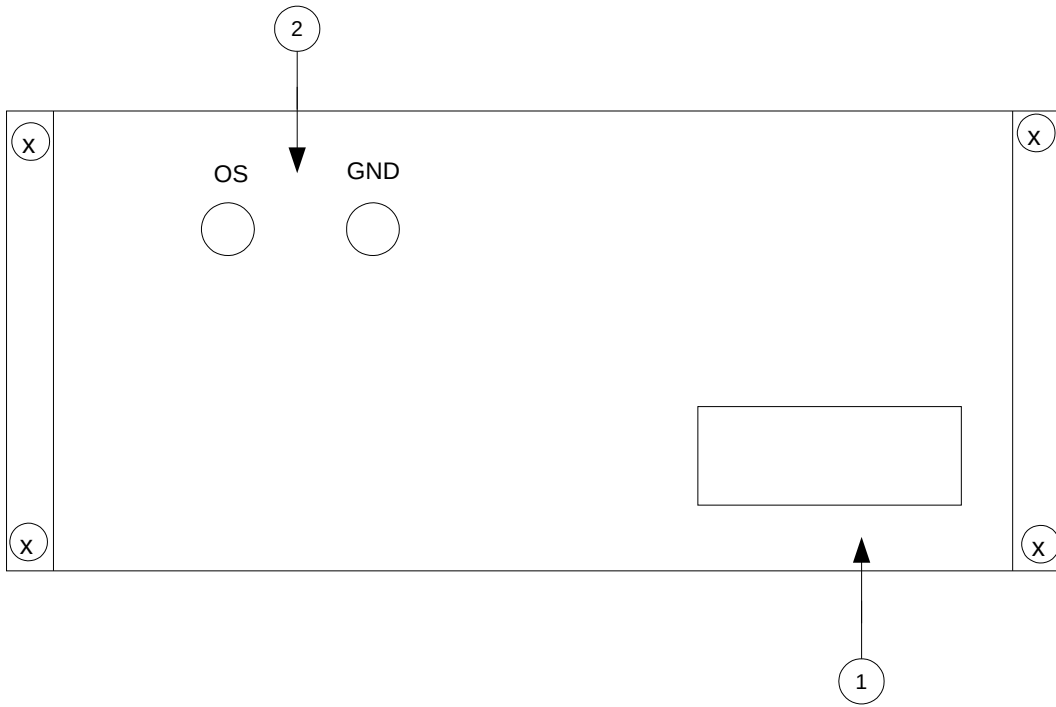
## FRONT PANEL CONTROLS

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

	PRF MIN	PRF MAX
Range 1	10 kHz	40 kHz
Range 2	40 kHz	150 kHz
Range 3	150 kHz	600 kHz
Range 4	600 kHz	3.0 MHz
Range 5	3.0 MHz	12 MHz
Range 6	12 MHz	25 MHz

- (3) DELAY Control. Controls the relative delay between the reference output pulse provided at the SYNC output (4) and the main output (7). This delay is variable over the range of 0 to at least 100 ns.
- (4) SYNC Output. This output precedes the main output (7) and is used to trigger the sampling scope time base. The output is a 500 mV 10 ns (approx.) pulse capable of driving a fifty-ohm load.
- (5) PW Control. A one-turn control which varies the output pulse width.
- (6) AMP Control. A one-turn control, which varies the output pulse amplitude from 0 to max output to a fifty ohm load.
- (7) OUT Connector. SMA connector provides 300 ps rise time output to a fifty-ohm load.
- (8) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVMM 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 AVMM unit requires a 10 ns (or wider) 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) TRIG IN. When the INT-EXT switch is in the EXT position, a TTL level trigger pulse is applied to the BNC connector.

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.

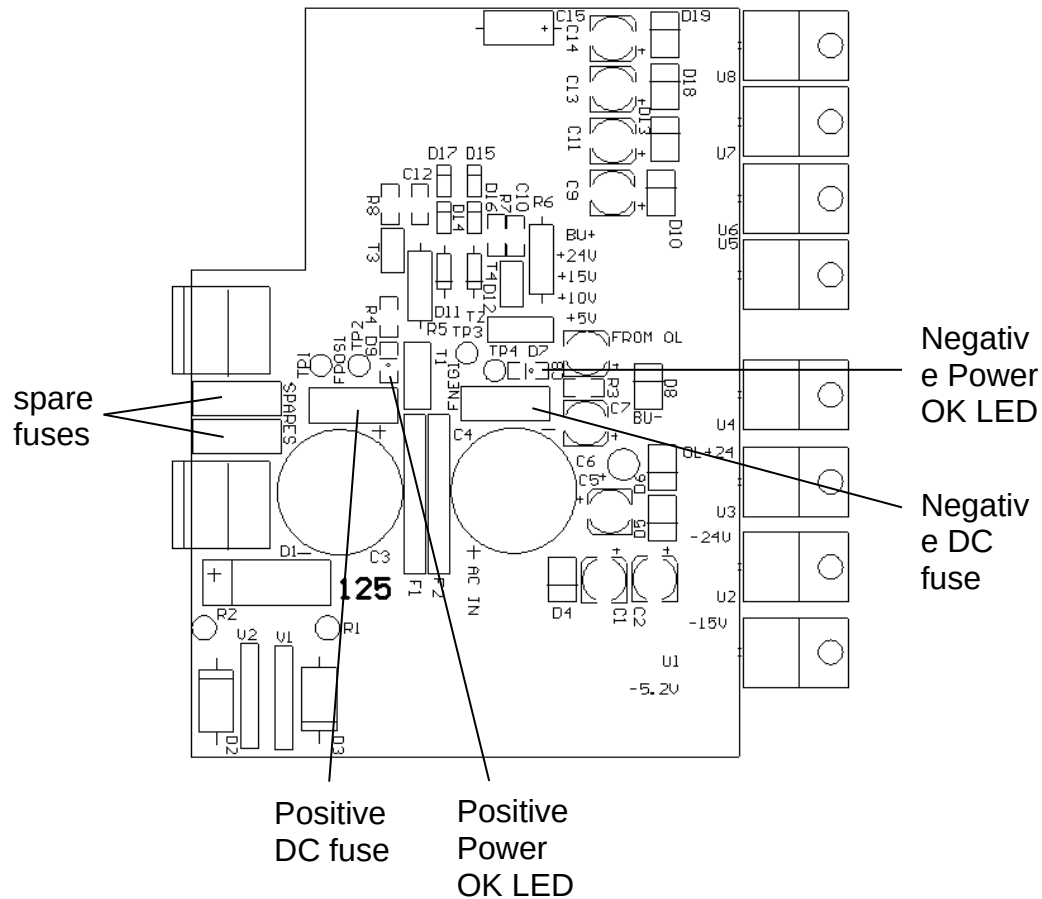
If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse.

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

## POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three main fuses, plus two spares. 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 two spares) are located on the internal DC power supply, as shown below:



The positive fuse and one of the spare fuses on this circuit board are 1A slow-blow fuses, Littelfuse 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 and the second spare fuse are 0.5A slow-blow fuses (Littelfuse 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. (Spare 1 Amp and 0.5 Amp fuses are provided on the circuit board. They may be transferred to the active fuse locations using needle-nose pliers.)

PERFORMANCE CHECK SHEET