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INSTRUCTIONS

MODEL AVOZ-A3-C 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 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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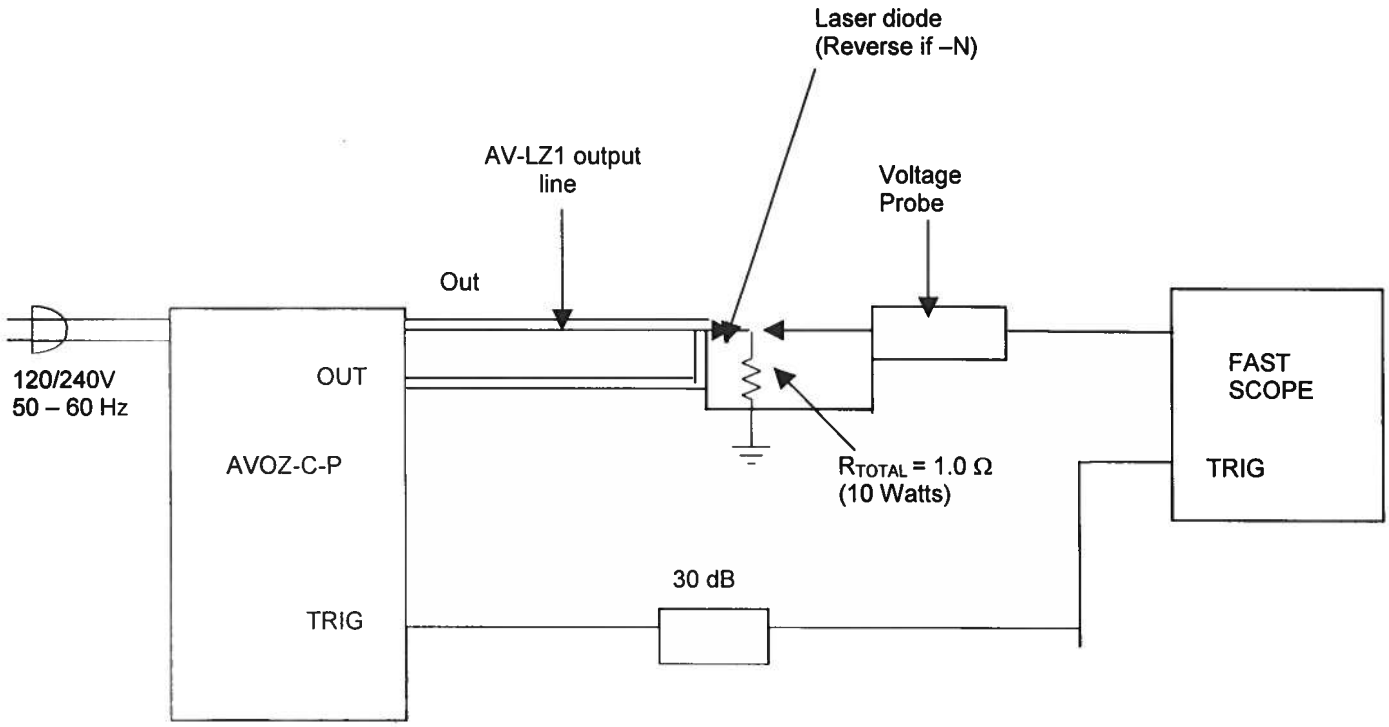
Manual Reference: Q:\office\instructword\Avoz\AVOZ-A3-Cedb.doc, created November 15, 1999

FIG. 1: PULSE GENERATOR TEST ARRANGEMENT



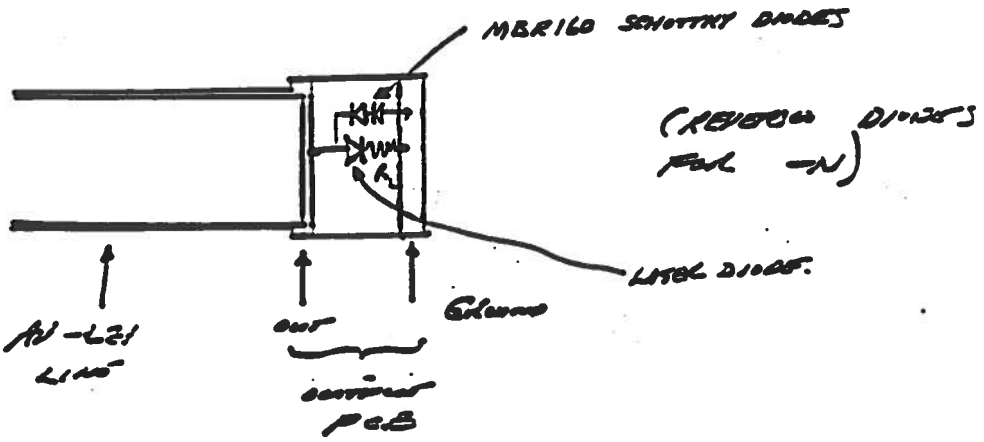
GENERAL OPERATING INSTRUCTIONS

1) The equipment should be connected in the general fashion shown above. Since the AVOZ unit provides an output pulse rise time as low as 20 ns a fast oscilloscope (at least 50 MHz) should be used to display the waveform. The low inductance 1 Ohm load should be capable of dissipating 10 Watts.

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.

3) To obtain a stable output display the PRF controls on the front panel should be set mid-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. The scope may then be used to set the desired PRF by rotating the PRF controls.

4) The AV-LZ1 flexible output line which mates with the "OUT" connector on the front panel of the mainframe has a characteristic impedance of one Ohm. The diode load and a non-inductive load resistor should be solder connected to the end of the line as shown below (using extremely short lead lengths (eg. 0.2 cm) so as to reduce inductance). The series combination of the laser diode and the load resistor R_L should present one Ohm to the end of the line. The mainframe generates up to 100 Volts to provide a peak load current of 100 Amperes. For many diodes, a load resistor of one Ohm may be selected as a first choice. The diode current may be monitored by monitoring the voltage across the resistor (or by means of a current probe). An ultra fast rectifier diode (eg. MBR160) may be placed across the laser diode to protect against reverse transients. Note that the net load resistance may be higher than one Ohm but in this case the peak current will be less than 100 Amperes.



5) The output pulse width is controlled by means of the front panel one turn PW control. To voltage control the pulse width, set the rear panel EW switch in the EXT position and apply 0 to +10V DC to connector A ($R_{IN} \geq 10K$).

6) 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 EA switch in the EXT position and apply 0 to +10V DC to connector A ($R_{IN} \geq 10K$).

7) When setting the pulse width and PRF (and amplitude) take care to insure that the duty cycle rating of 0.1% (eg. 1 us at 1 kHz) is not exceeded as this may result in damage to the unit.

8) AVOZ units with a serial number higher than 6500 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

   1) Reducing PRF (i.e. switch to a lower range)
   2) Reducing pulse width (i.e. switch to a lower range)
   3) Removing output load short circuit (if any)

9) 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.

10) For additional assistance:

Tel: (613) 226-5772
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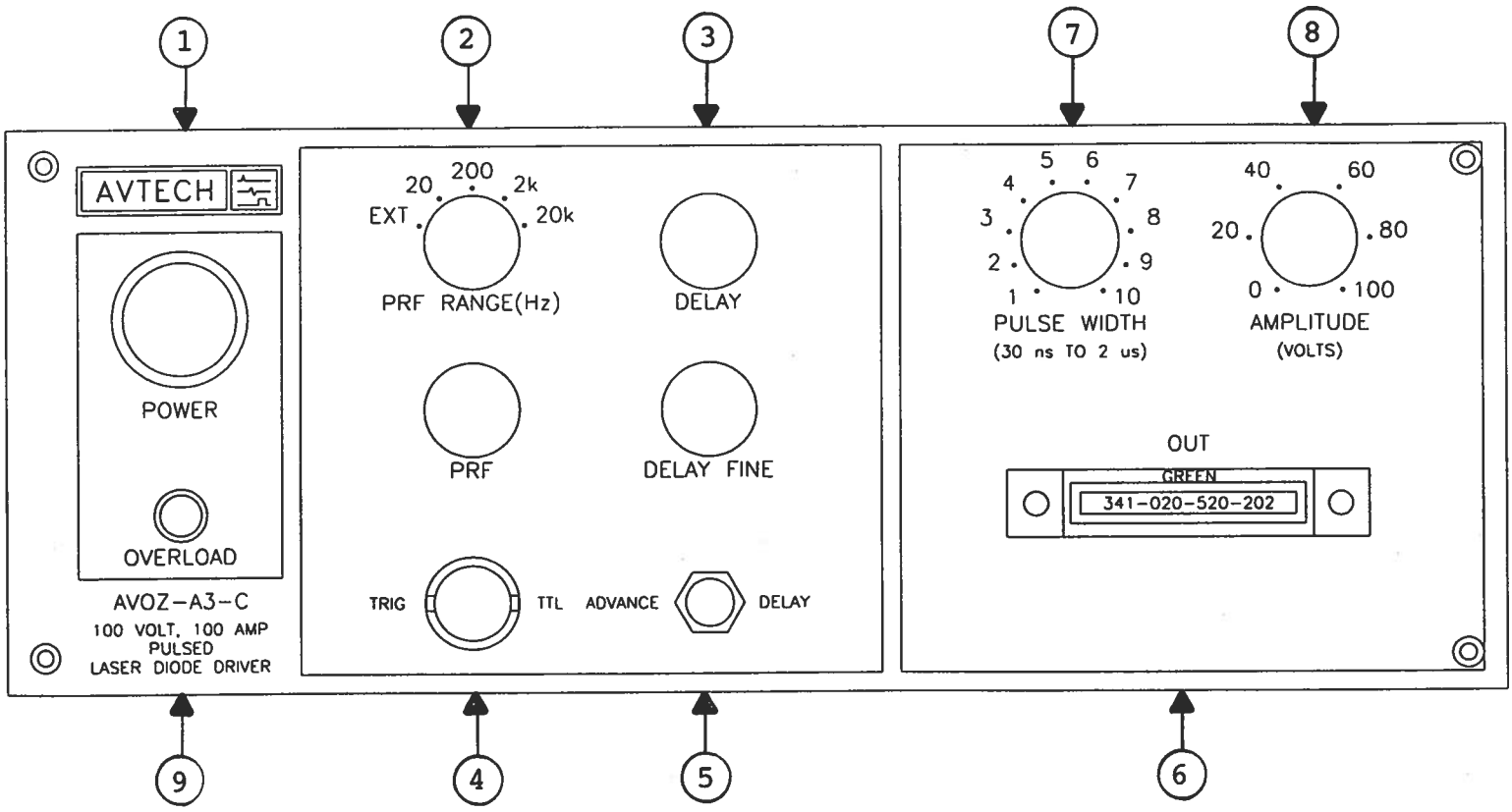
FIG. 2: FRONT PANEL CONTROLS



FRONT PANEL CONTROLS

(1) ON-OFF Switch. This is the main power switch. It applies basic prime power to all stages.

(2) PRF Control. With this range switch in the 20, 200, 2K or 20K 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 the 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 500 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 lags the main output (6).

The delay is not adjustable when triggering externally.

(4) TRIG Connector. 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, 200 ns (approx.) pulse capable of driving a 50-Ohm load. Set the scope to trigger on the positive edge.

When triggered 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 1-Ohm loads. 60 cm long AV-LZ1 flexible output line mates with this front panel connector. Diode load and series matching resistor to be solder connected to end of line. Total resistance to equal one Ohm to obtain 100 Amperes when mainframe outputs 100 Volts.

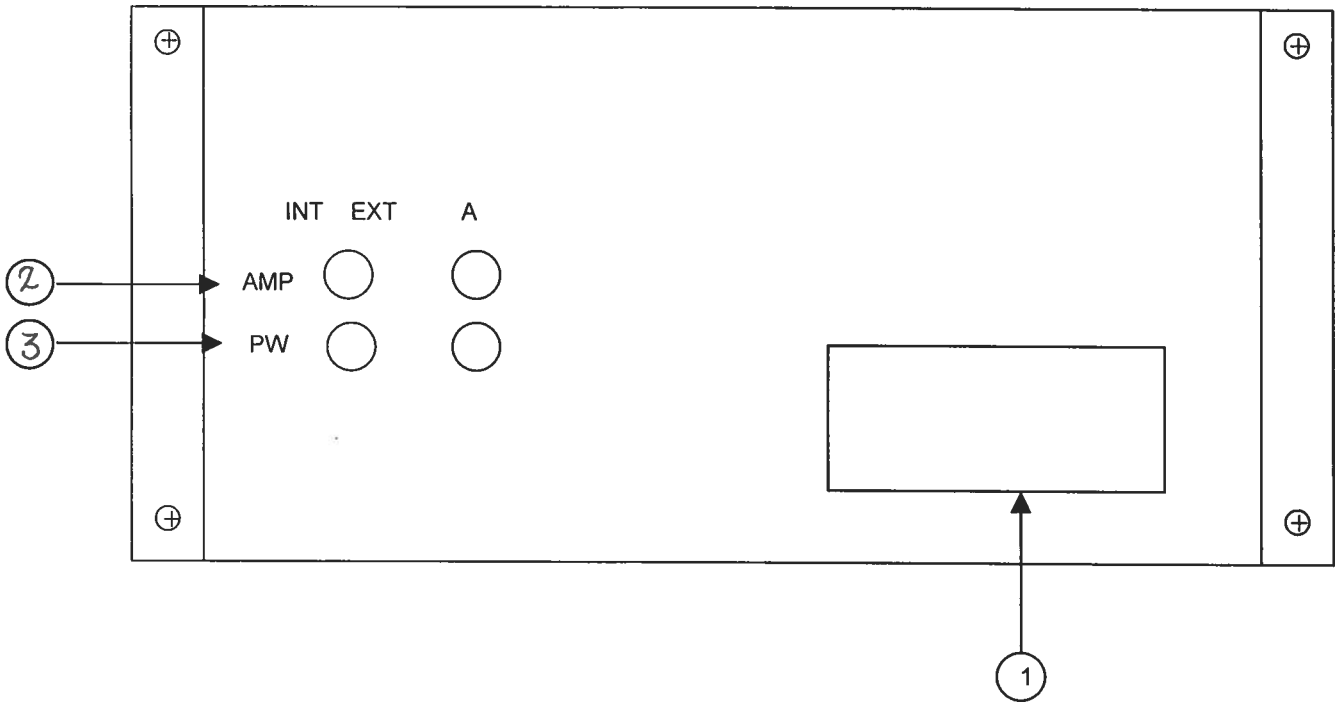
(7) PULSE WIDTH. A one-turn control which varies the output pulse width.

(8) AMPLITUDE. One-turn control varies output amplitude from 0 to 100 Volts (to 1 Ohm).

(9) AVOZ units with a serial number higher than 5600 are protected by an automatic overload protective circuit, which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

1) Reducing PRF (i.e. switch to a lower range)
2) Reducing pulse width (i.e. switch to a lower range)
3) Removing output load short circuit (if any)

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 (0.5 A SB).

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

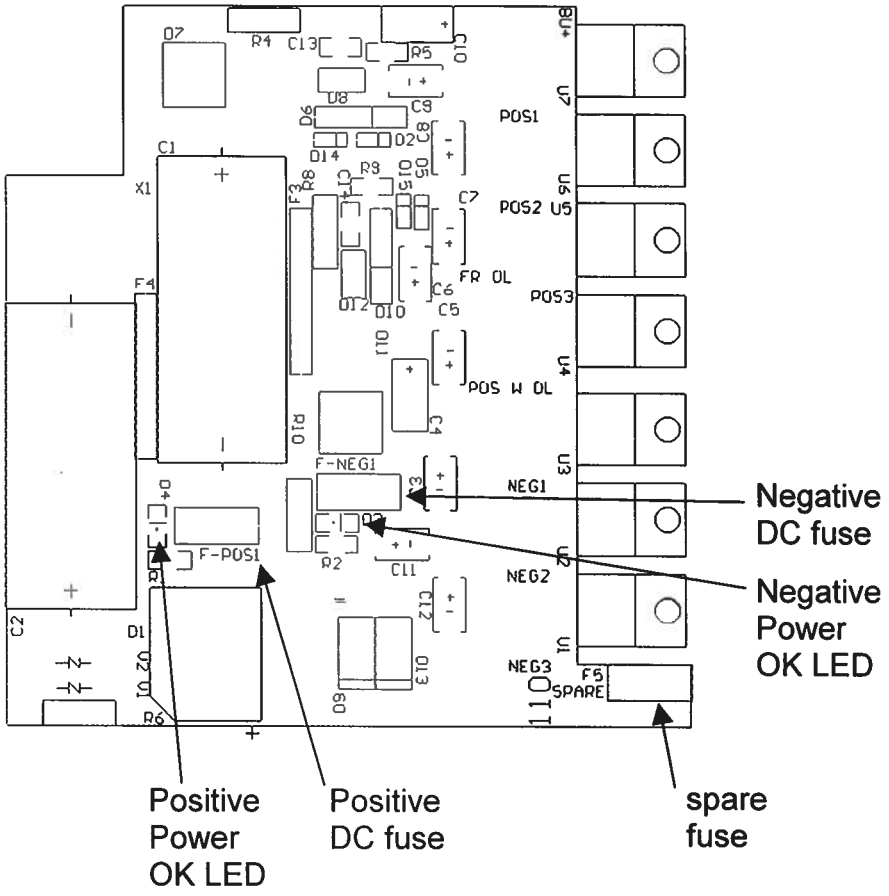
2) EA. To voltage control the output amplitude, set the switch in the EXT position and apply 0 to +10 Volts between terminal A and ground ($R_{IN} \geq 10K$). (option).

3) EW. To voltage control the output pulse width, set the switch in the EXT position and apply 0 to +10 Volts between terminal A and ground ($R_{IN} \geq 10K$). (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. 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.