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SINCE 1975

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INSTRUCTIONS

MODEL AVL-2-C-ESA 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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World Wide Web: <http://www.avtechpulse.com>

EC Declaration of Conformity

We

**Avtech Electrosystems Ltd.
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**declare that the AVL-2-C-ESA pulse generator meets the intent of
Directive **89/336/EEC** for **Electromagnetic Compatibility**.
Compliance pertains to the following specifications as listed in the
official Journal of the European Communities:**

EN 50081-1 Emission

EN 50082-1 Immunity



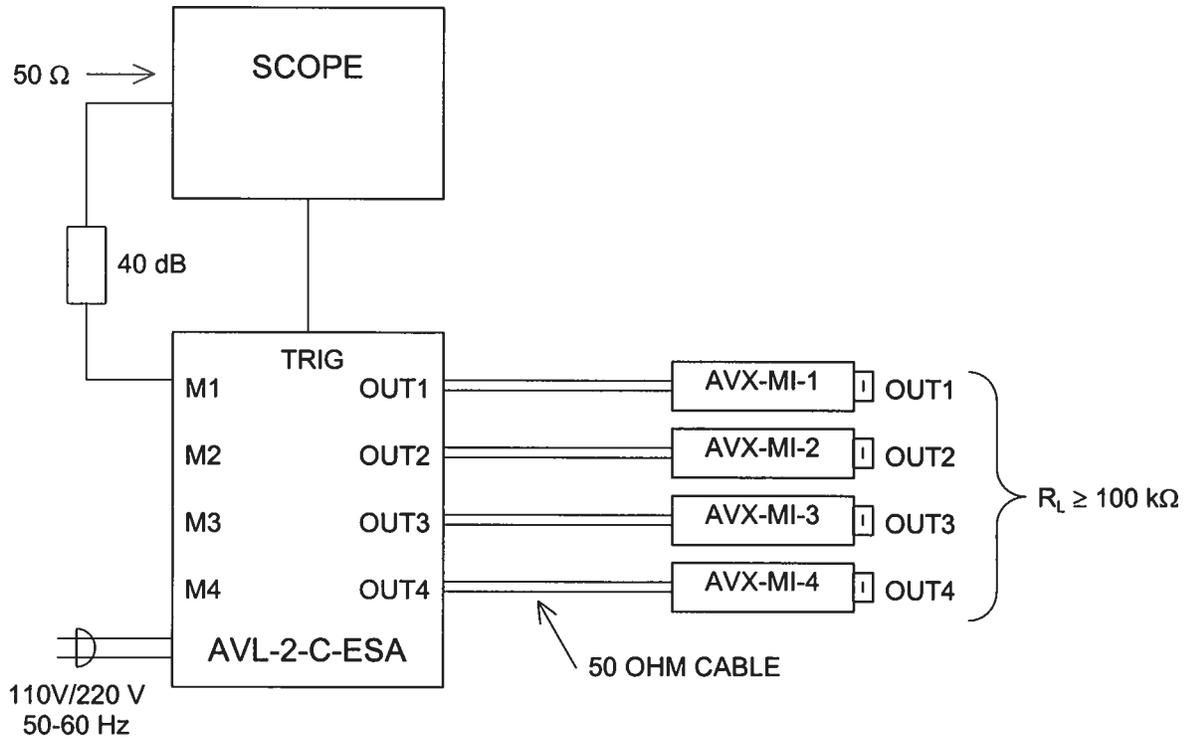


FIG 1 - BASIC SYSTEM CONFIGURATIONS

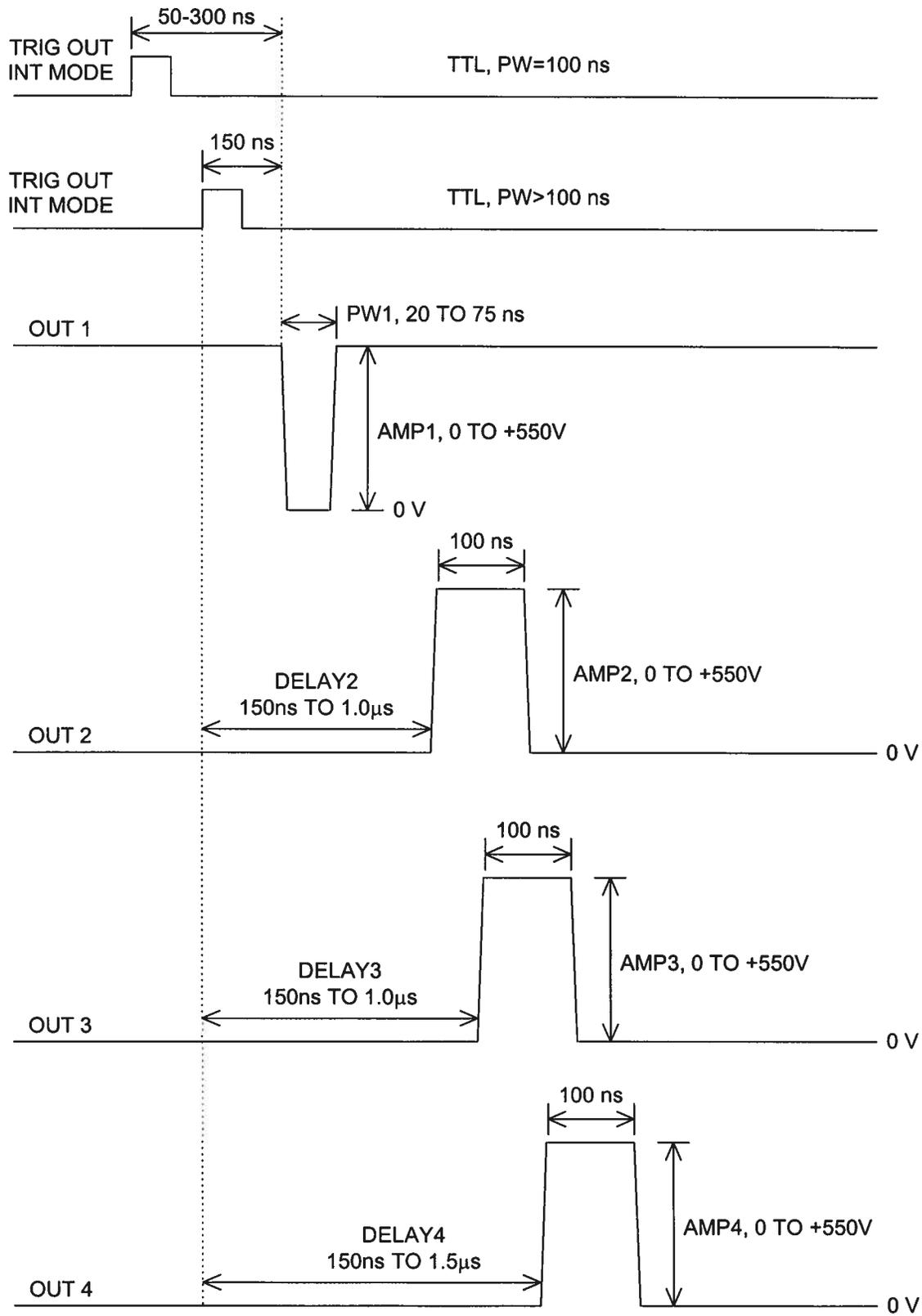


FIG 2 - TRIGGER WAVEFORMS AND AVX-M1 OUTPUT WAVEFORMS

GENERAL INSTRUCTIONS

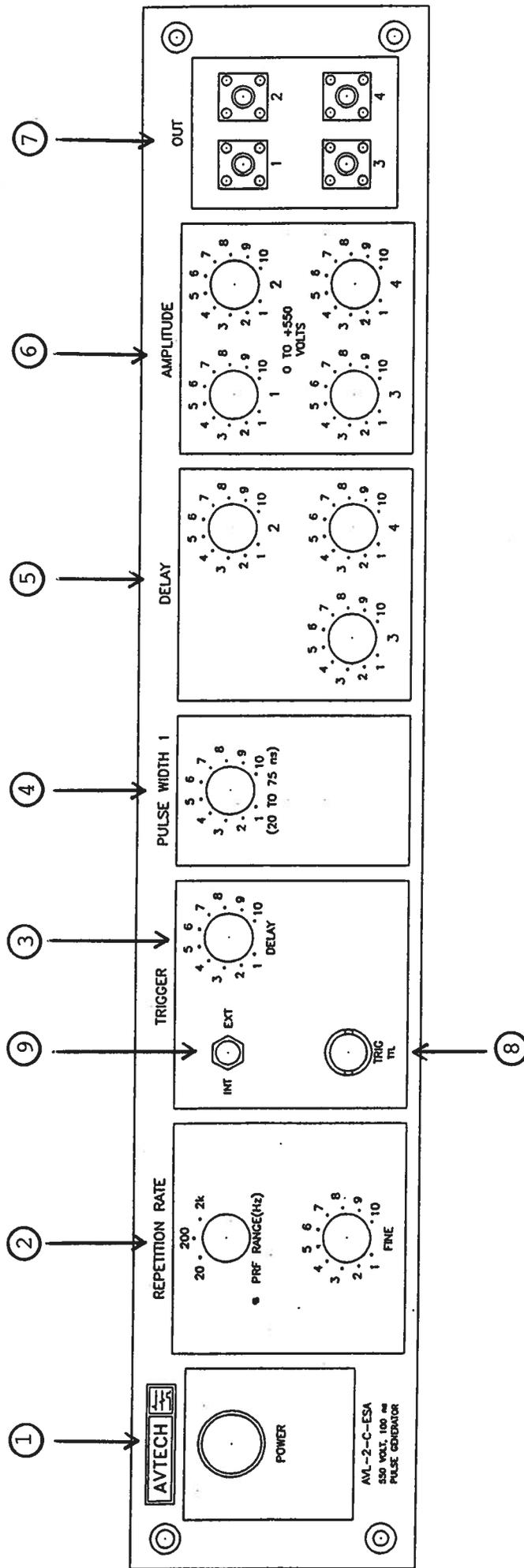
- 1) The system should be configured as shown in Fig 1. The output waveforms will be of the form shown in Fig 2.
- 2) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed one gigahertz.
- 3) The output waveforms should be monitored using the M_1 , M_2 , M_3 and M_4 monitor outputs on the back panel. 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. The input impedance to the scope must be 50 Ohms. M_2 , M_3 and M_4 provide attenuated ($\times 1/20$) coincident replicas (to 50 Ohms) of the outputs of the AVX-M1-2, AVX-M1-3 and AVX-M1-4 output modules. The M_1 output also provides an attenuated coincident replica ($\times 1/20$ of output 1), but without the DC component. Consequently, the M_1 output will appear as a negative going pulse with a maximum amplitude of about 27 Volts (and without a DC component). The M_1 , M_2 , M_3 and M_4 outputs will all exhibit some undershoot and overshoot on the pulse top (for about 10 ns). This perturbation is a consequence of a small reflection from the input to the AVX-M1 module (and does not appear on the output of the AVM-M1 module.
- 4) The TRIG output channel provides TTL level signals.
- 5) 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 trigger 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. The output 1 is delayed with respect to the TRIG output by about 50 to 300 ns depending on the trigger DELAY control setting.
- 6) The output pulse width for channel 1 is controlled by means of the front panel one-turn PW control. The pulse widths for channels 2, 3 and 4 are fixed at 100 ns.
- 7) The output pulse amplitude for each output is controlled by means of the four one turn potentiometers (AMP).

- 8) As shown in Fig 2, outputs 2, 3 and 4 may be delayed with respect to output 1 using the three one turn delay controls (0 to 850 ns for 2 and 3 and 0 to 1.35 us for 4).
- 9) An external clock may be used to control the output PRF of the AVL unit by setting the front panel TRIG toggle switch in the EXT position and applying a 100 ns (or wider) TTL level pulse to the TRIG BNC connector input. In this mode the output 1 is delayed with respect to the input by 150 ns. For operation in this mode, the scope time base must also be triggered by the external clock. WARNING: Model AVL-2 may fail if triggered at a PRF greater than 2 kHz.
- 10) The AVX-M1 output modules must always be terminated in a high impedance (> 100 K). The AVL-2 unit may fail if the unit is operated into a 50 Ohm load. The leads connected to the AVX-M1 output terminals must not exceed several centimeters or the output risetimes will be degraded and severe ringing may be observed.
- 11) CAUTION: Modules AVX-M1-2, AVX-M1-3 and AVX-M1-4 are interchangeable, but module AVX-M1-1 is not and so great care must be taken to insure that only the AVX-M1-1 module is connected to output 1 on the mainframe front panel. The AVX-M1 output modules connect to the mainframe via the supplied 24" 50 Ohm cables. This cable length may be increased, but note that it will also increase the associated propagation delay (1.5 ns/ft).
- 12) CAUTION: The AVX-M1-1 output has a DC output voltage as high as +550 Volts. Before connecting to the load turn the Amp 1 control max counter clockwise and turn off the prime power. Wait several minutes before connecting the load to allow the DC voltage to discharge.
- 13) 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.
- 14) The unit can be converted from 100 to 220V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.

15) For additional assistance:

Tel: (613) 226-5772

Fax: (613) 226-2802



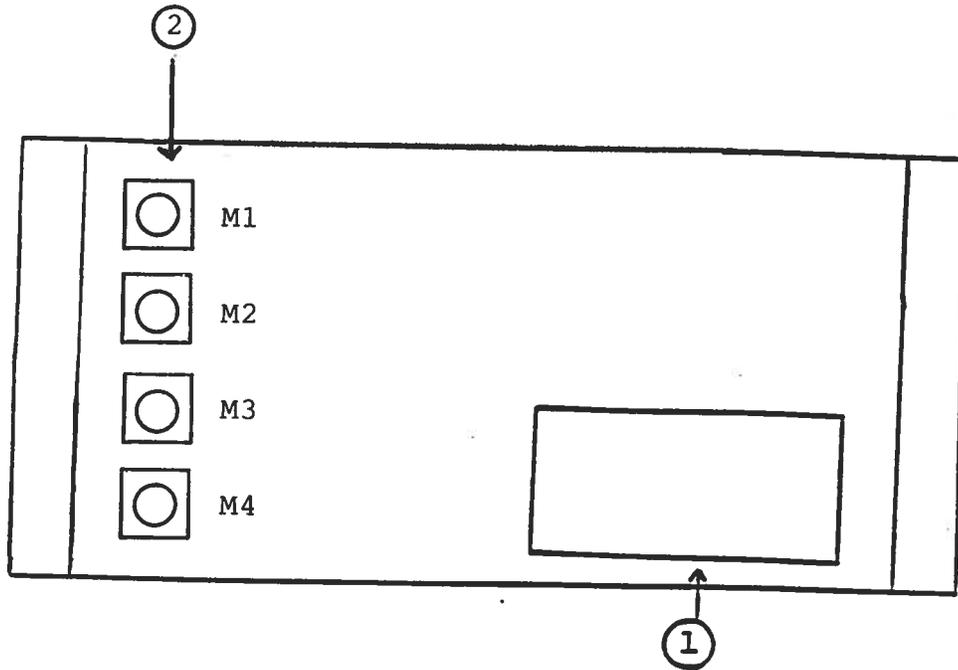
FRONT PANEL CONTROLS

Fig 3.

- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF from about 2 Hz to about 2 kHz. The operating PRF should be set using a scope.
- (3) TRIGGER DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output and OUT 1. This delay is variable over the range of about 50 to 300 ns (see Fig 2).
- (4) PW 1 Control. A one-turn control which varies the output pulse width from 20 to 70 ns (for OUT 1 only).
- (5) DELAY. Three one turn controls delay the leading edges of OUT 2, OUT 3 and OUT 4 with respect to the leading edge of 1 as follows (see Fig 2):
 - 2) 0 to 850 ns
 - 3) 0 to 850 ns
 - 4) 0 to 1.35 ns
- (6) AMP Control. The output pulse amplitude at the AVX-M1 outputs are controlled by means of the four one-turn AMP potentiometers. As shown in Fig 2, the output amplitudes vary from 0 to 550 Volts.
- (7) OUT Connector. The AVX-M1 output modules connect to these four SMA connectors using the supplied 24" 50 Ohm cables.
- (8) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVL unit is controlled via an internal clock which in turn is controlled by the PRF RANGE and PRF FINE controls. With the toggle switch in the EXT position, the AVL unit requires a 100 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 Output. This output precedes the main output (7) and is used to trigger the sampling scope time base. The output is a TTL level 100 ns (approx.) pulse capable of driving a fifty Ohm load.

Fig. 3

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 Amp).

- (2) MONITOR OUTPUTS. M_2 , M_3 and M_4 provide attenuated ($\times 1/20$) coincident replicas (to 50 Ohms) of the outputs of the AVX-M1-2 and AVX-M1-3, and AVX-M1-4 output modules. The M_1 output also provides an attenuated coincident replica ($\times 1/20$ of output 1), but without the DC component. Consequently, the M_1 output will appear as a negative going pulse with a maximum amplitude of about 27 Volts (and without a DC component). The M_1 , M_2 , M_3 and M_4 outputs will all exhibit some undershoot and overshoot on the pulse top (for about 10 ns). This perturbation is a consequence of a small reflection from the input to the AVX-M1 module (and does not appear on the output of the AVX-M1 modules. The M outputs should be connected to a 50 Ohm scope via a 40 db attenuator.

TOP COVER REMOVAL AND REPAIRS

- 1) To remove the top cover, remove the four Phillips screws on the top cover and then slide the cover back and off.
- 2) It is strongly recommended that the unit be returned to the factory for any servicing since DC potentials as high as 390 Volts and 550 Volts are employed throughout the chassis. These points are shielded and marked with the high Voltage symbol.

