AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
ENGINEERING – MANUFACTURING

P.O. BOX 265
OGDENSBURG
NEW YORK
13669
(315) 472-5270

BOX 5120, STN. "F"
OTTAWA, ONTARIO
CANADA K2C 3H4
TEL: (613) 226-5772
FAX: (613) 226-2802
TELEX: 053-4591

INSTRUCTIONS

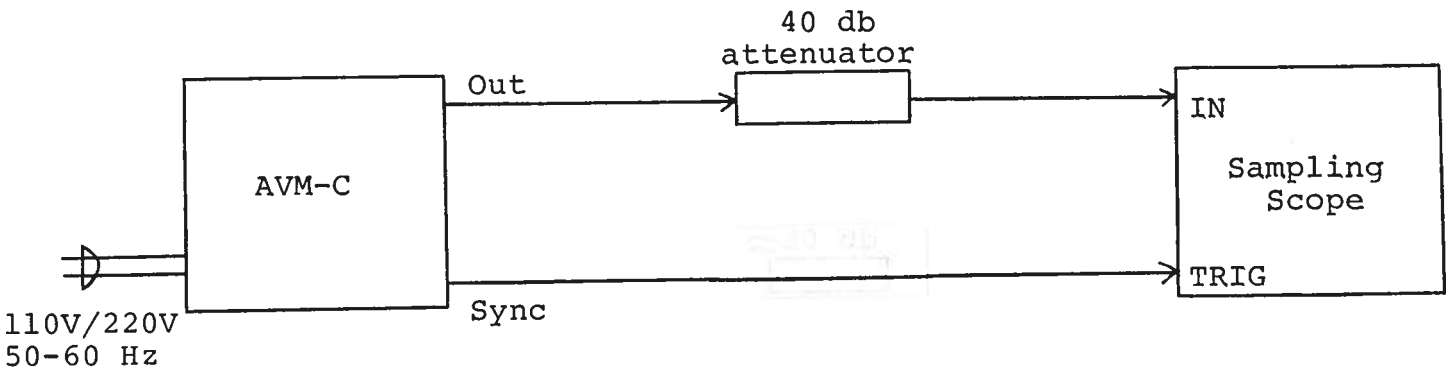
MODEL AVM-1-C-PN-M4 PULSE GENERATOR

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 or liability assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

Fig. 1 PULSE GENERATOR TEST ARRANGEMENT



PW RANGE A (1 KHz to 25 MHz)

1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed ten 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 0.2 volt 10 nsec pulse.

4) To obtain a stable output display the PRF controls 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 A control and the scope triggering controls are then adjusted to obtain a stable output. It is recommended that the DELAY A 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 and PRF FINE controls 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 (eg. 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 A 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.

6) The output pulse amplitude is controlled by means of the front panel one turn AMP control. The pulse width may change by several nanoseconds as the output amplitude is reduced from maximum to minimum. Therefore it is convenient to first set the desired amplitude and then set the desired pulse width.

7) To DC offset the output pulse connect a DC power supply set to required DC offset value to the back panel terminals marked O.S. The maximum attainable DC offset voltage is $\pm$50 volts.

8) An external clock may be used to control the output PRF of the AVM unit by setting the front panel TRIG toggle switch in the EXT position and applying a 15 nsec (or wider) TTL level pulse to the TRIG BNC connector input.

The AVM 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 SYNC output.

9) WARNING: Range A may fail if triggered at a PRF greater than 25.0 MHz.

10) To invert the output of the AVM 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 required DC level to the DC terminal of the AVX-2-T unit.

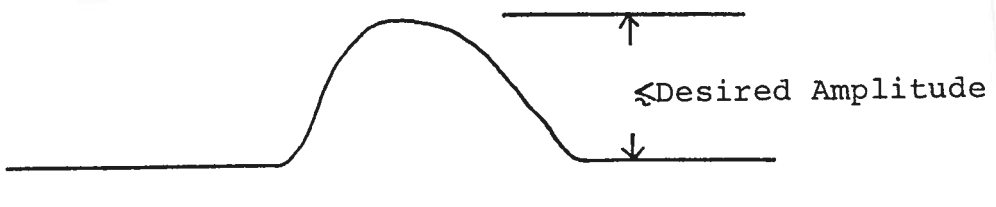
PW RANGE B (25 MHz to 90 MHz)

1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed ten gigahertz.

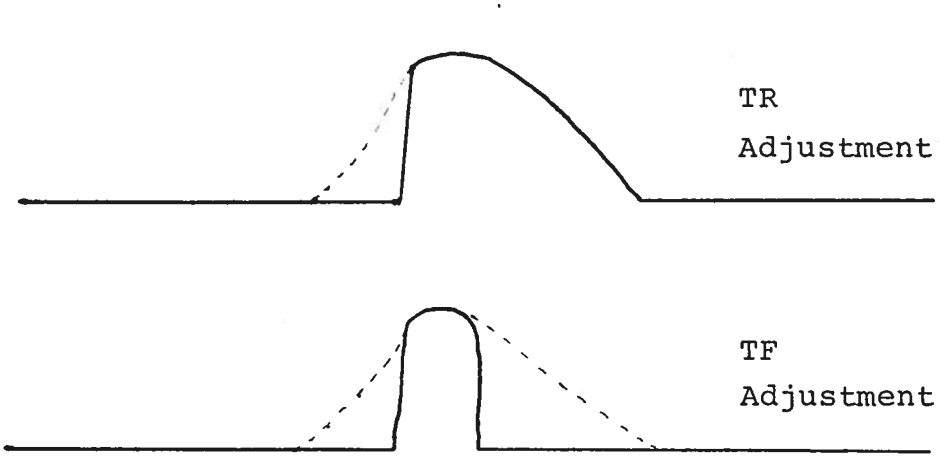
2) The use of 40 db attenuator at the sampling scope vertical input channel will insure a peak input signal to the sampling scope of less than one volt.

3) To obtain a stable output display the PRF control on the front panel should be set mid-range. The front panel TRIG toggle switch should be in the INT position. The scope triggering controls are then adjusted to obtain a stable output.

4) The output pulse shape and width is determined by the two front panel pot controls TRB and TFB. TRB controls the leading edge of the pulse while TFB controls the falling edge. Clockwise rotation of TRB and TFB increases the output pulse width. Initially rotate the TFB pot fully clockwise and set the TRB pot at mid-range. The output amplitude is controlled by the front panel AMP control. Initially the AMP control should be set mid-range. The CRT display will resemble the following:



5) Having obtained a display of the form shown above, the desired pulse width is then obtained by adjusting the two front panel pots TR and TF. Rotate TR counter clockwise from the positive set in step 2) until a sharp 100 psec leading edge is observed. Then rotate TF counterclockwise until the desired pulse width and fall time are obtained.



Further iterative adjustments of TR and TF will be necessary to simultaneously obtain the lowest rise time, lowest fall time, the desired pulse width, and pulse top shape, and low spurious signal level. If the input frequency is then changed it will be necessary to readjust AMP, TR and TF to establish the required pulse shape.

6) To trigger externally, set the INT-EXT switch to EXT and connect a sine wave generator to the TRIG connector. The output PRF will equal the sine wave PRF. The sine wave amplitude should be set at 0.3 VRMS.

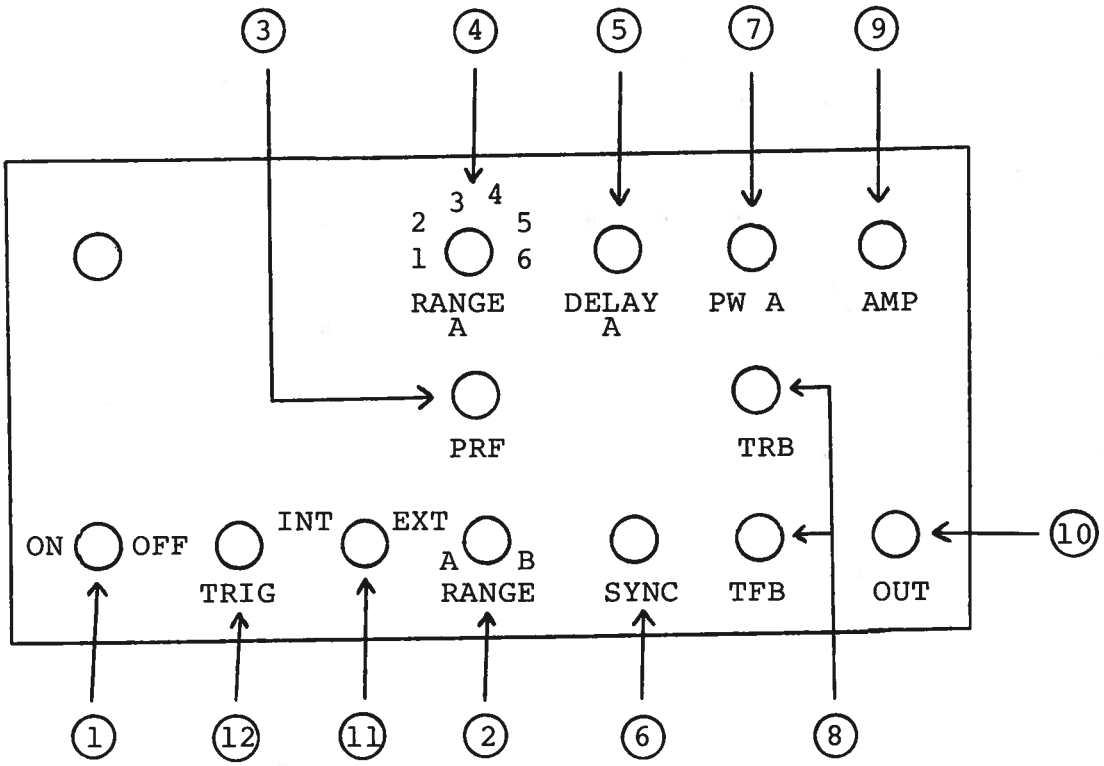
7) To DC offset the output pulse connect a DC power supply set to required DC offset value to the back panel terminals marked O.S. The maximum attainable DC offset voltage is ±50 volts.

8) To invert the output of the AVM unit, connect the AVX-2-T unit to the OUT port. An inverted pulse with a rise time <100 psec is then obtained at the OUT port of the AVX-2-T unit. To offset the inverted pulse, apply the required DC level to the DC terminal of the AVX-2-T unit.

9) CAUTION: The unit may fail if output amplitudes of greater than 10 volts are provided for extended periods of time.

10) The AVM-C unit can be converted from 110 to 220V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.

Fig. 2 FRONT PANEL CONTROLS



(1) ON-OFF Switch. Applies basic prime power to all stages.

(2) PRF Control. RANGE, PRF and RANGE A controls determine
(3) output PRF as follows:
(4)

	RANGE A		RANGE B	
	PRF MIN	PRF MAX	PRF MIN	PRF MAX
1	10 KHz	50 KHz	25 MHz	90 MHz
2	50 KHz	250 KHz		
3	185 KHz	650 KHz		
4	650 KHz	3.3 MHz		
5	3.3 MHz	13.3 MHz		
6	5.0 MHz	25 MHz		

(5) DELAY A Control. Controls the relative delay between the reference output pulse provided at the SYNC output (5) and the main output (9). This delay is variable over the range of 0 to at least 100 nsec.

(6) SYNC Output. For RANGE A this output precedes the main output (9) and is used to trigger the sampling scope time base. The output is a 200 mV 10 nsec (approx) pulse capable of driving a fifty ohm load. For RANGE B this output is approximately coincident with the main output (9) and is used to trigger the sampling scope time base. The output is a 30 mV sine wave capable of driving a fifty ohm load.

(7) PW A Control. A one turn control which varies the output pulse width.

(8) TRB, TFB. One turn controls which vary the output pulse width. The output pulse shape is determined by the two front panel pot controls TR and TF. TR controls the leading edge of the pulse while TF controls the falling edge. Clockwise rotation of TR and TF increases the output pulse width.

(9) AMP Control. A one turn control which varies the output pulse amplitude from 0 to max output to a fifty ohm load.

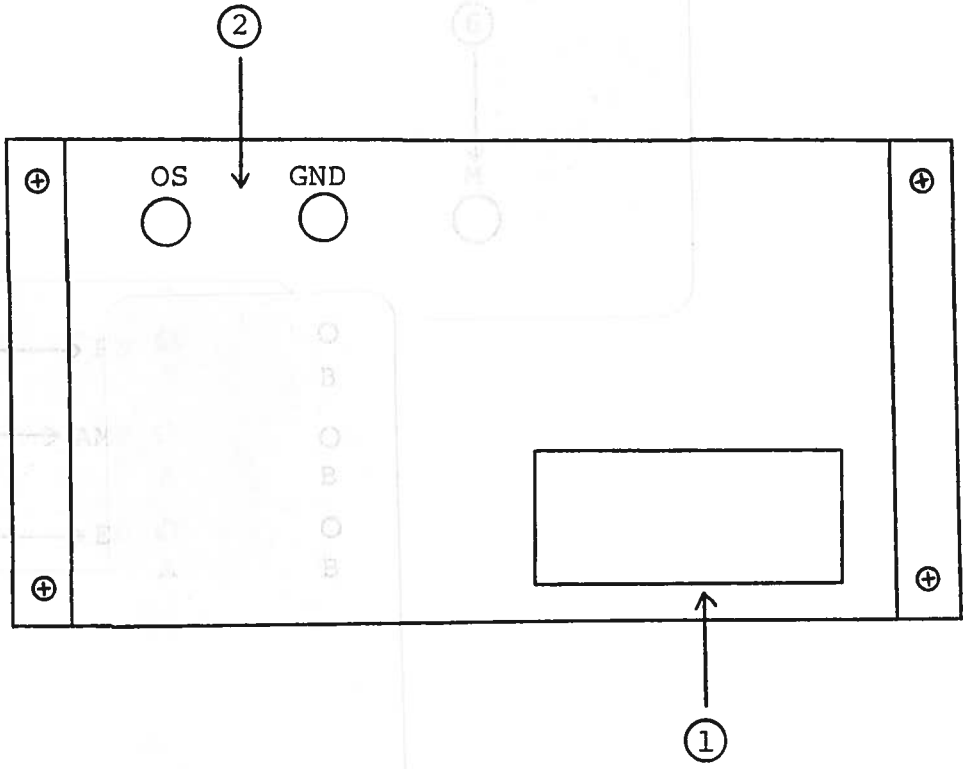
(10) OUT Connector. SMA connector provides output to a fifty ohm load.

(11) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVM unit is controlled via an internal clock which in turn is controlled by the PRF controls. For RANGE A with the toggle switch in the EXT position, the AVM unit requires a 15 nsec (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. For RANGE B with the toggle switch in the EXT position, the AVM unit requires a 0.3 V RMS sine wave 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.

(12) TRIG Input. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.

Fig. 3 BACK PANEL CONTROLS (for units without the OT or EO options)



(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.

(2) DC OFFSET Input. To DC offset the output pulse, connect a DC power supply set to the desired offset value to these terminals. The maximum allowable DC offset voltage is ±50 volts.

Schroff 10.06.89

-05