

# 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 AVR-A-1-C-P-EBA2 PULSE GENERATOR

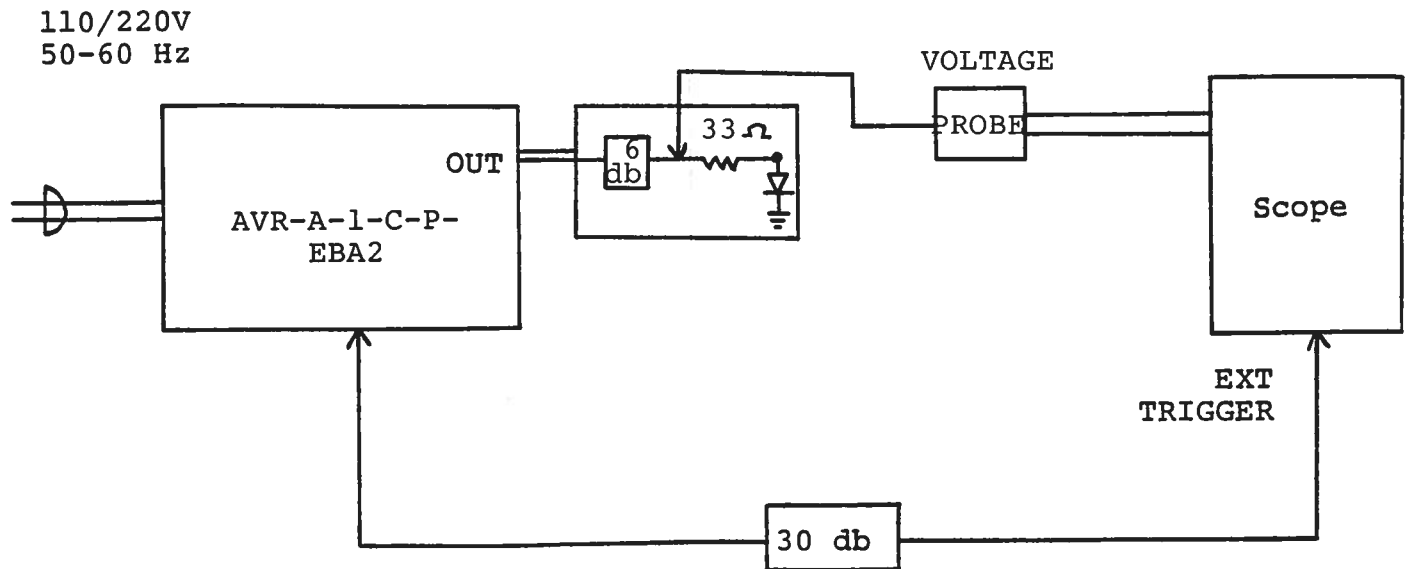
S.N.:

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

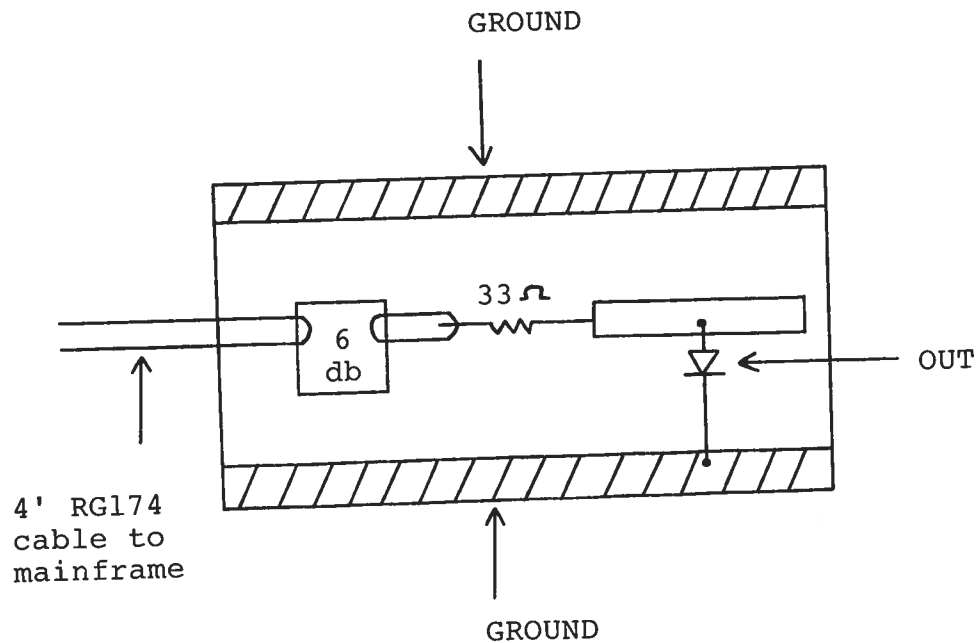
Fig. 1

PULSE GENERATOR TEST ARRANGEMENT



Notes:

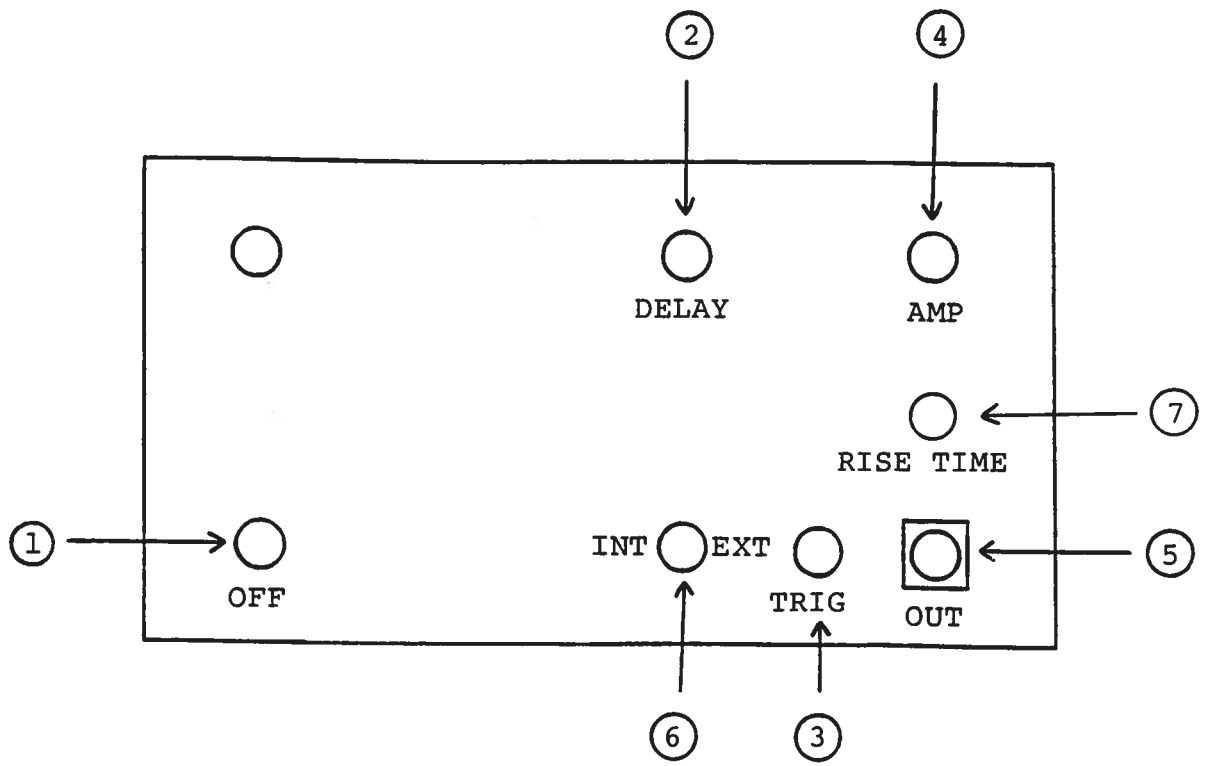
- 1) The equipment should be connected in the general fashion shown above. Since the AVR unit provides an output pulse rise time as low as 10 nsec a fast oscilloscope (at least 50 MHz) should be used to display the waveform.
- 2) The TRIG output channel provides TTL level signals. To avoid overdriving the TRIG input channel of some sampling scopes, a 30 db attenuator should be placed at the input to the sampling scope trigger channel.
- 3) 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 main output is delayed with respect to the TRIG output by about 0 to 1 usec depending on the DELAY control setting.
- 4) The microstrip output module matches the laser diode to the mainframe (33 ohm series resistance). With the 6 db attenuator, the voltage at the input to the 33 ohm resistor may be varied from 0 to at least 100 volts thereby providing a maximum diode current of 3 amperes. If the attenuator chip is de-soldered, the maximum voltage rises to 200 volts, thereby allowing peak currents of 6 amperes. The diode current may be ascertained by monitoring the voltage across the 33 ohm resistor or by placing a low value resistance (eg. 1 ohm) between the diode cathode and ground.



- 5) The output pulse width is fixed at 400 ns. However, a one turn locking pot in the interior of the instrument permits a  $\pm 10\%$  pulse width variation.
- 6) The output pulse amplitude is controlled by means of the front panel one turn AMP control. To voltage control the output, set the rear panel switch in the EXT position and apply 0 to +10 volts between terminal A and ground ( $R_{IN} > 10K$ ). (option).
- 7) The output rise, fall time is variable from about 20 to 50 ns using the one turn rise time control.

Fig. 2

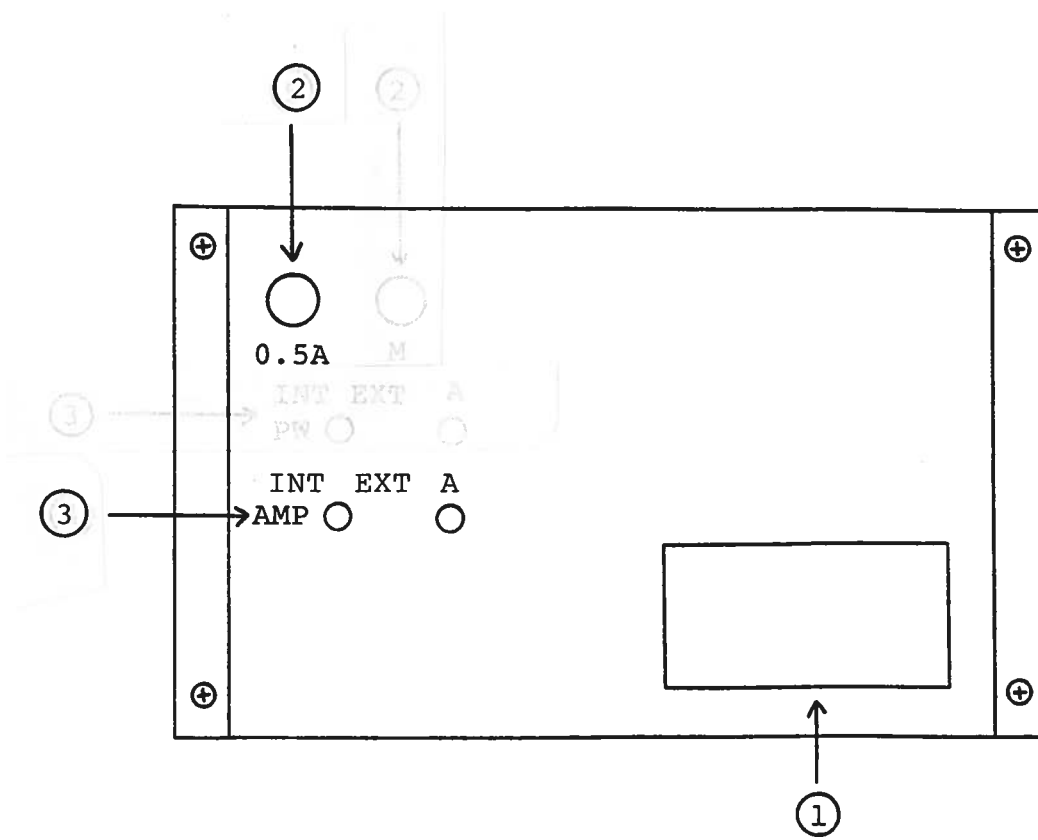
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (3) and the main output (5). This delay is variable over the range of about 0 to 1 usec.
- (3) TRIG Output. This output precedes the main output (5) and is used to trigger the scope time base. The output is a TTL level 100 nsec (approx) pulse capable of driving a fifty ohm load.
- (4) AMP Control. The output pulse amplitude is controlled by means of the one turn potentiometer (AMP).
- (5) OUT Connector. Provides output to microstrip output board via 4' RG174 cable.
- (6) EXT-INT Control. With this toggle switch in the INT position, the PRF of the unit is controlled via an internal clock which is set at a PRF of 1 KHz. With the toggle switch in the EXT position, the unit requires a 0.2 usec 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.
- (7) RISE TIME. One turn control which varies output rise, fall time from about 20 ns to 50 ns. Control should normally be set mid-range. Note that if the interior HIGH-LOW switch is set in the LOW position, then the rise time control range is about 10 to 20 ns.

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 (0.25 A SB).
- (2) 0.5A SB. This fuse limits the DC prime power supplied to the output stage and will blow in the case of severe overloading.
- (3) 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 ( $R_{IN} > 10K$ ). (option).

## SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVR-A-1-C-P-EBA2 unit consists of the following basic modules:

- 1) AVR-A-1-EBA2-PG-P pulse generator module
- 2) AVR-A-1-CL clock module
- 3) +24V power supply board

The modules are interconnected as shown in Fig. 4. The clock module controls the output PRF and the relative delay between the main output and the SYNC outputs. The PG pulse generator module generates the output pulse. In the event of an instrument malfunction, it is most likely that the rear panel 0.5A SB fuse or some of the output switching elements (SL4) may have failed due to an output short circuit condition or to a high duty cycle condition. The switching elements may be accessed by removing the cover plate on the bottom side of the instrument. NOTE: First turn off the prime power. The elements may be removed from their sockets by means of a needle nosed pliers. The SL4 is a selected VMOS power transistor in a TO 220 packages and may be checked on a curve tracer. If defective, replacement units should be ordered directly from Avtech. When replacing the SL4 switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis. If the switching elements are not defective, then the four Phillips screws on the back panel should be removed. The top cover may then be slid off and the operation of the clock and power supply modules checked. The clock module is functioning properly if:

- a) 0.1 usec TTL level outputs are observed at pins 2 and 3.
- b) The PRF of the outputs is fixed at 1.0 KHz.
- c) The relative delay between the pin 2 and 3 outputs can be varied by at least 1 usec by the DELAY control.

The sealed clock module must be returned to Avtech for repair or replacement if the above conditions are not observed. The power supply board generates +24V DC to power the other modules. If the voltage is less than +24V, turn off the prime power and unsolder the lead from the 7824 regulator chip on the power supply board. Solder a 100 ohm 5 watt resistor to the 7824 output to ground and turn on the prime power. A voltage of +24 volts should be read. If the voltage is less then the power supply board is defective and should be repaired or replaced.

Schroff

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