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SINCE 1975

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INSTRUCTIONS

MODEL AVRL-6-C-M1-OS PULSE GENERATOR

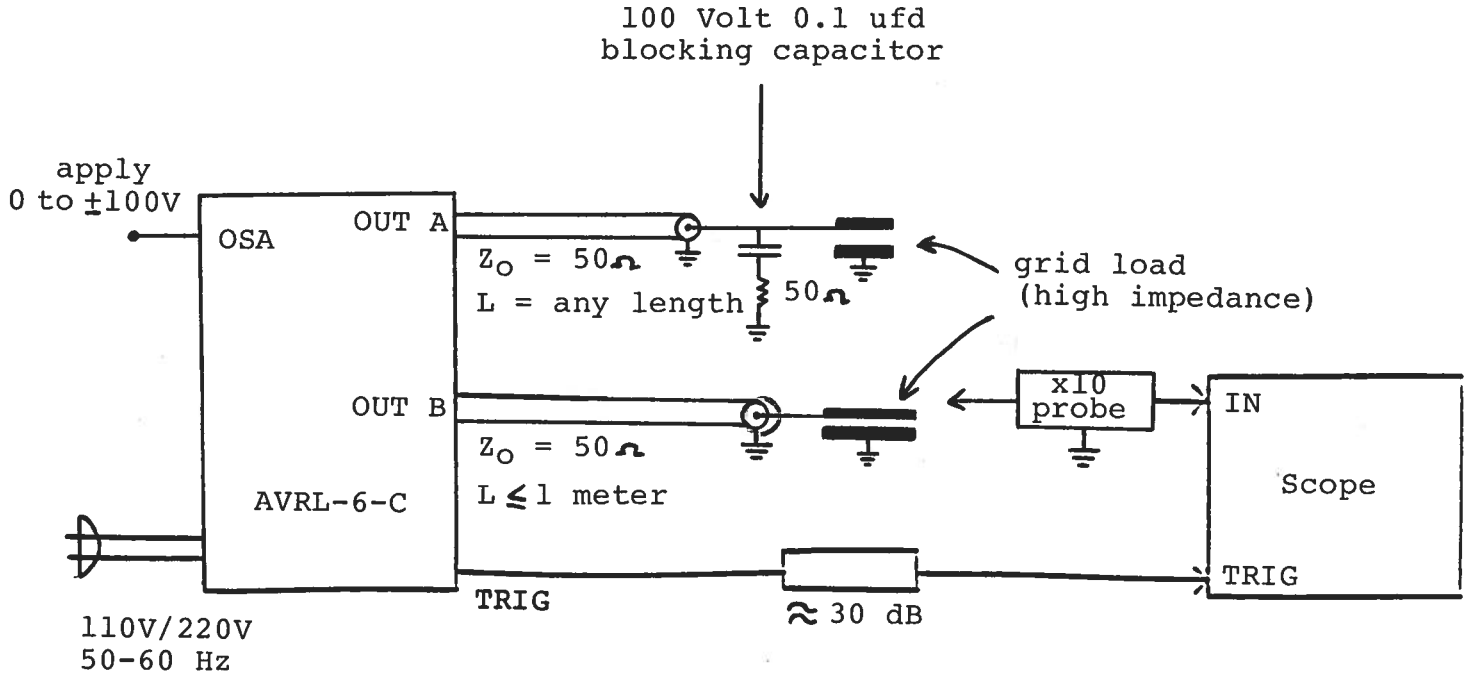
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WARRANTY

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. A scope with a bandwidth of at least 50 MHz should be used to view output B while a scope bandwidth of at least 500 MHz is required for viewing output A.
- 2) Output A is designed to operate into a 50 Ohm load. The arrangement shown in Fig. 1 is recommended when the AVR L unit is used to pulse a biased high impedance load (A out). Output B is designed to operate directly into a high impedance load (10 K or higher). **WARNING:** Output B may fail if operated into a 50 Ohm load. The arrangement shown in Fig. 1 is recommended when the B output is used to pulse a biased high impedance load.
- 3) Output A amplitude is variable from 0 to +100 Volts while output B is variable from -100V to -750 Volts. Care should be taken to insure that the scope, the load resistor and any attenuators used can withstand this high voltage.
- 4) The output pulse width for output A is variable from 5 ns to 100 ns via the pulse width A control. The output pulse width for output B is variable from 5 us to 40 us using the front panel PW B control.
- 5) The relative delay between OUT A and OUT B may be varied from 0 to 10 us using the delay AB ten turn control.
- 6) 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 DELAY control controls the relative delay between the reference output pulse provided at the TRIG output and the main outputs. This delay is variable over the range of 0.04 us to 40 us as follows:

	MIN	MAX
Range 1	0.04 us	0.4 us
Range 2	0.4 us	4 us
Range 3	4 us	40 us

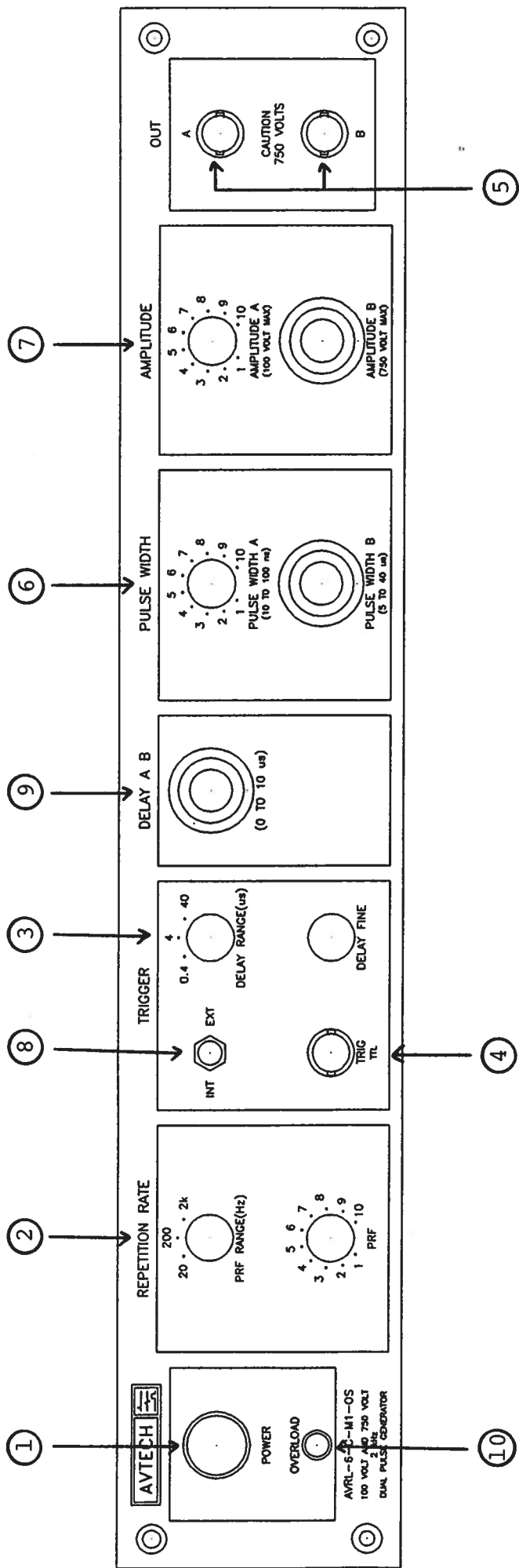
- 7) To obtain a stable output display the PRF control on the front panel should be set mid range. The front panel INT-EXT toggle switch should be in the INT position. The DELAY controls and the scope triggering controls are then adjusted to obtain a stable output. The scope may then be used to set the desired PRF by rotating the PRF and PRF FINE controls.
- 8) An external clock may be used to control the output PRF of the AVRL unit by setting the front panel INT-EXT toggle switch in the EXT position and applying a 50 ns (or wider) TTL level pulse to the TRIG BNC connector input.
- 9) CAUTION: The output stage is protected against overload condition by a 1.0 A slow blow fuse on the main frame back panel. However, the output switching elements may fail if the unit is triggered at a PRF exceeding 2 kHz or at duty cycles exceeding 8% (for B OUT). Heating and subsequent likely failure of the output stage is reduced if the following action is taken where possible:
 - a) PRF is kept to a minimum, i.e. operate in a low PRF range when possible rather than in a high PRF range.
 - b) Keep the output PW to a minimum.
- 10) OVERLOAD INDICATOR. AVRL 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)

11) The 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.

12) For further assistance:

Tel: 613-226-5772

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FRONT PANEL CONTROLS

Fig. 2

- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF from 2 Hz to 2 kHz as follows:
- | | | |
|---------|--------|--------|
| Range 1 | 2 Hz | 20 Hz |
| Range 2 | 20 Hz | 200 Hz |
| Range 3 | 200 Hz | 2 kHz |
- (3) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (4) and the main output (5). This delay is variable over the range of 0.1 to about 100 us.

	MIN	MAX
Range 1	0.04 us	0.4 us
Range 2	0.4 us	4 us
Range 3	4 us	40 us

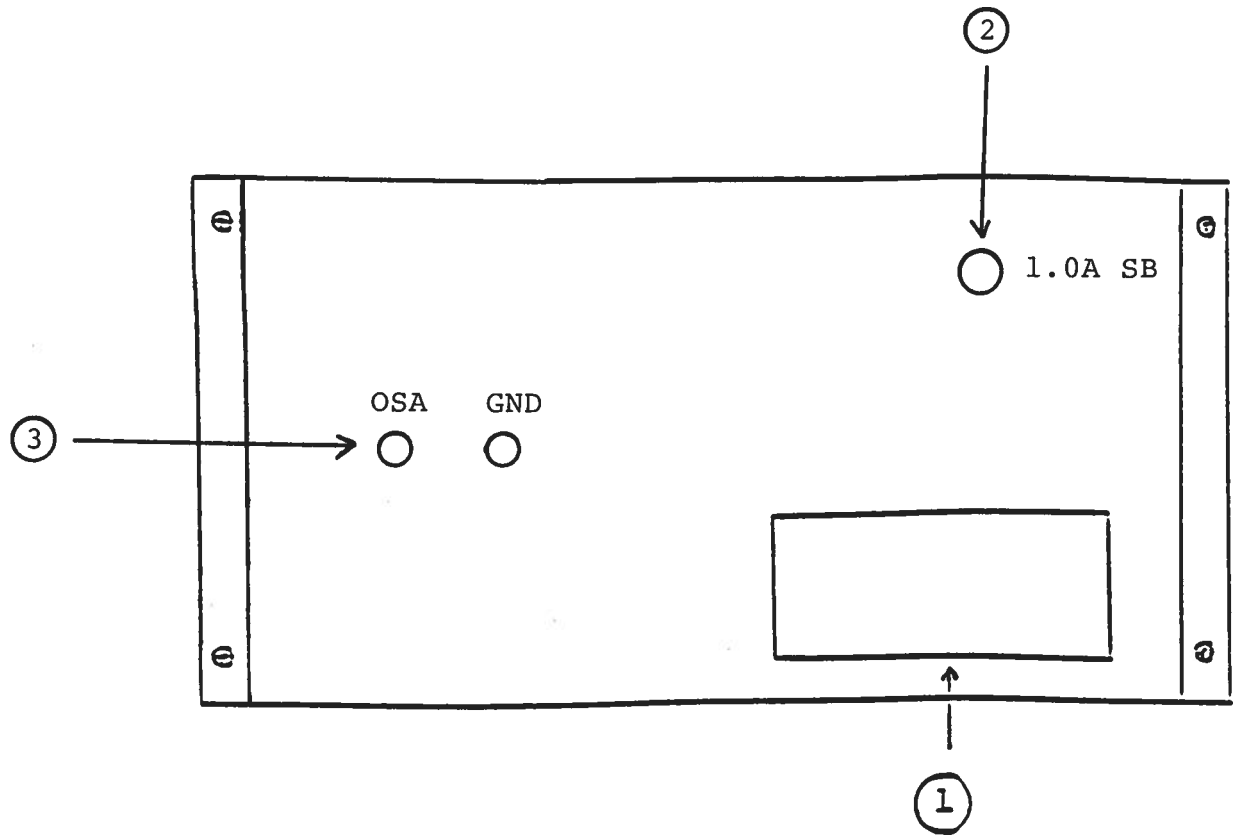
- (4) TRIG Output. This output is used to trigger the scope time base. The output is a TTL level 100 ns (approx.) pulse capable of driving a fifty Ohm load. This output precedes the main output. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.
- (5) OUT Connectors. BNC connectors (A and B) provides output to a 50 Ohm load (OUT A) and to a high impedance load (OUT B).
- (6) PW Controls. A one turn control which varies the pulse width of OUT A from 10 to 100 ns and a ten turn control which varies the pulse width of B from 5 to 40 us.
- (7) AMP Control. A one turn control which varies the amplitude of OUT A from 0 to +100 Volts (to $R_L = 50$ Ohms) and a ten turn control which varies the output pulse amplitude from -100 to -750V (to $R_L \geq 100K$).
- (8) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVRL unit is controlled via an internal clock which in turn is controlled by the PRF control. With the toggle switch in the EXT position, the AVRL unit requires a 50 ns (or wider) TTL level pulse applied at the TRIG input in order to trigger the output stages.
- (9) DELAY A-B. A ten turn control which delays OUT B with respect to A by 0 to 10 us.

(10) OVERLOAD INDICATOR. AVRL 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



- (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 (1.0 A SB).
- (2) 1.0A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.
- (3) OSA. To DC offset the A output, apply 0 to ± 100 VDC to the OSA solder terminal. Note that a DC blocking capacitor must be placed in series with the 50 Ohm resistor as shown in Fig. 1.

TOP COVER REMOVAL AND RACK MOUNTING

- 1) The interior of the instrument may be accessed by removing the four Phillips screws on the top panel. With the four screws removed, the top cover may be slid back (and off).
- 2) The -R5 rack mount kit may be installed after first removing the one Phillips screw on the side panel adjacent to the front handle.

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

CAUTION: Potentials as high as 750 Volts DC are employed in the interior of this instrument so extreme caution must be exercised when attempting repairs. The following parts may be at high potential:

- a) Part No. SLR7-A-P and Part No. SLR7-A-N (and associated leads and capacitors).
- b) Pins 1 and 2 on module AVRL-7B-PS (and associated leads and capacitors).

The AVRL-6-C consists of the following basic modules:

- 1) AVRL-6-PG pulse generator modules (P and N)
- 2) AVRL-6-PS power supply module
- 3) AVRL-6-PW pulse width module
- 4) AVRL-6-CL clock module
- 5) +36, +40, +24 Volt power supplies

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that the 1.0 A slow blow fuse or the main power fuse on the rear panel has blown. Replace if necessary. If the unit still does not function, it is most likely that some of the output switching elements (IRFAG50) 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 top cover plate. The cover plate is removed by removing the 4 Phillips screws on the back panel. **NOTE:** First turn off the prime power. **CAUTION:** Thoroughly ground the IRFAG50 cases to discharge the 750 Volts power supply potential. The IRFAG50 may be removed from the mounting bracket and checked on a curve tracer and replaced if necessary. AVTECH Part No. SLR7-A consists of the two transistors mounted on the bracket with insulating washers, 1 K resistors and output cable.

Aug. 23/96

-RS

Disk: AVRL

Name: 6CM105.INS