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INSTRUCTIONS

MODEL AVL-AV-1-C PULSE GENERATOR

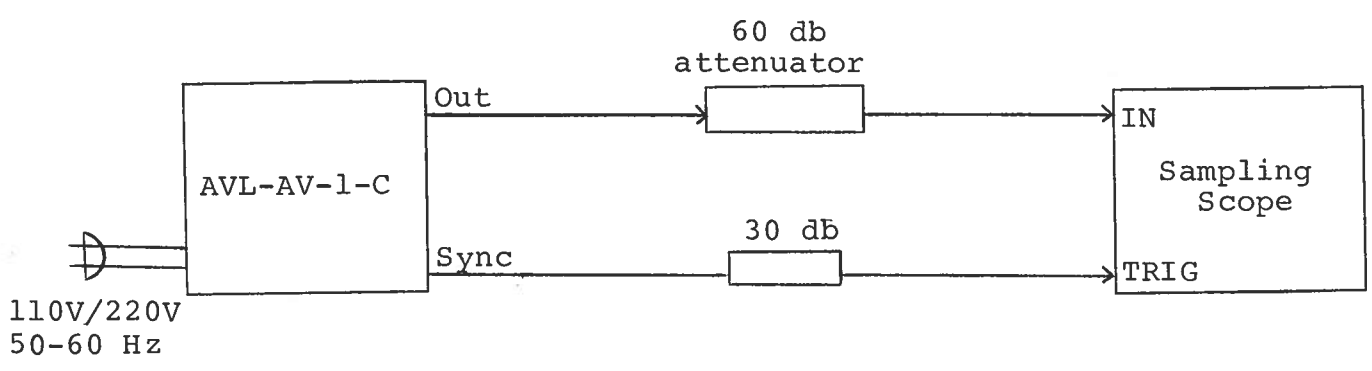
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WARRANTY

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



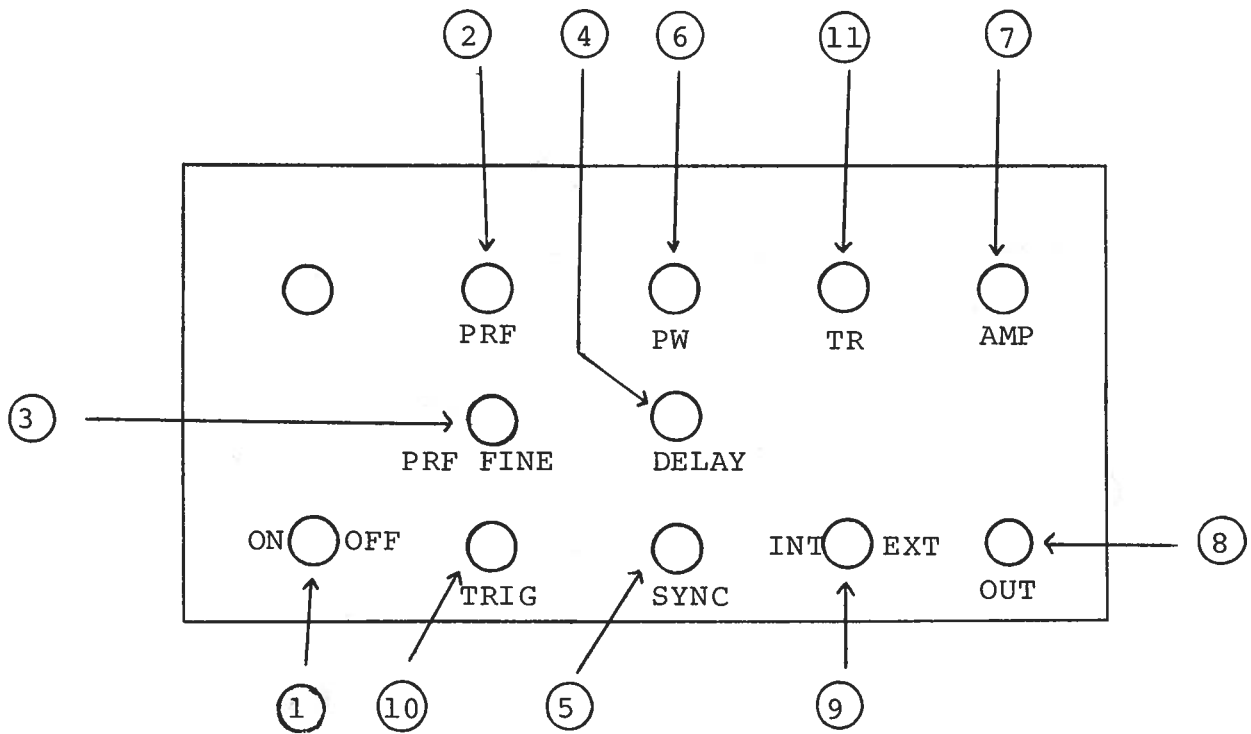
Notes:

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed one gigahertz.
- 2) The use of 60 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 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.
- 4) To obtain a stable output display the PRF and PRF FINE 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 and PRF FINE controls. The main output is delayed with respect to the SYNC output by about 0 to 150 nsec depending on the DELAY control setting.
- 5) The output pulse width is controlled by means of the one turn potentiometer (PW). The pot should initially be set mid-range and the pulse width adjusted using an oscilloscope. The output will degenerate to an impulse and eventually vanish as the pot is turned fully counter clockwise. Units with the -W option are shipped with an 8 inch length of RG-58 cable connected between ports A and B on the back panel. This cable provides a maximum PW of about 100 nsec. The PW pot control is active over about 90° with this cable. The maximum PW may be extended up to 400 nsec by attaching RG-58 cable lengths of about 100 feet between ports A and B. With 100 feet of cable attached, the PW pot control is active over about 300°. The maximum attainable PW varies linearly with cable length for cable lengths between 6" and 100". CAUTION: Insure that the input power is off before attempting to change the cable between ports A and B. Potentials as high as 400V exist on the centre conductor between ports A and B.
- 6) The output pulse amplitude is controlled by means of the one turn potentiometer (AMP).

- 7) 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 0.2 usec (approx.) TTL level pulse to the TRIG BNC connector input. For operation in this mode, the scope time base must also be triggered by the external clock rather than from the SYNC output. WARNING: Model AVL-AV-1 may fail if triggered at a PRF greater than 5 KHz.
- 8) Model AVL-AV-1 can withstand an infinite VSWR on the output port but is intended for operation with 50 ohm loads.
- 9) The desired DC offset is applied to the back panel OS terminals which are connected to the output centre conductor via a high quality RF inductor. Do not exceed ± 50 V 0.1 amp. (option).
- 10) The back monitor output provides an attenuated replica (20 db down) of the output less DC offset. The monitor output is designed to operate into a 50 ohm load. (option).

Fig. 2

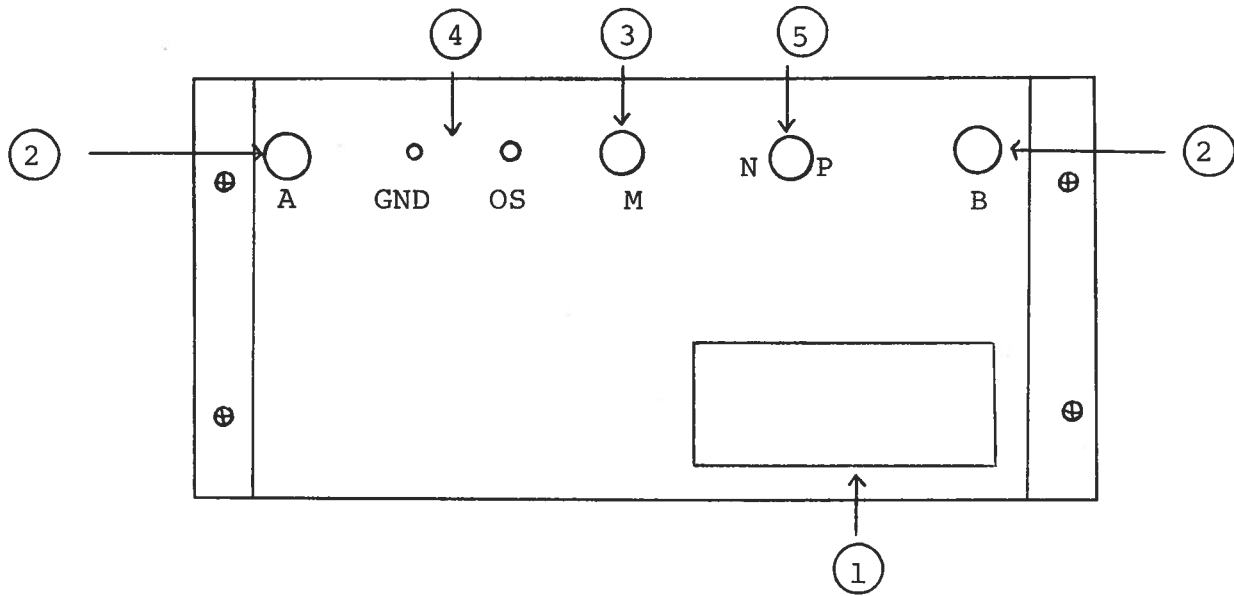
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF from about 50 Hz to about 5 KHz. The operating PRF should be set using a sampling scope.
- (3) PRF FINE Control. This control varies PRF but is about 10 times less sensitive than the main PRF control.
- (4) DELAY Control. Controls the relative delay between the reference output pulse provided at the SYNC output (5) and the main output (8). This delay is variable over the range of about 0 to 500 nsec.
- (5) SYNC Output. This output precedes the main output (8) and is used to trigger the sampling scope time base. The output is a TTL level 100 nsec (approx.) pulse capable of driving a fifty ohm load.
- (6) PW Control. A one-turn control which varies the output pulse width from 0 to 100 nsec (to 400 nsec for -W option).
- (7) AMP Control. The output pulse amplitude is controlled by means of the one-turn potentiometer (AMP).
- (8) OUT Connector. BNC connector provides output to a fifty ohm load.
- (9) 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 and PRF FINE controls. With the toggle switch in the EXT position, the AVL 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.
- (10) TRIG Input. The external trigger signal is applied at this input when the EXT toggle switch is in the EXT position. The output pulse at (8) appears about 350 nsec after the application of the TRIG pulse.
- (11) RISE TIME Control (Option). Varies rise and fall times in one nanosecond increments from about one to ten nanoseconds.

Fig. 3

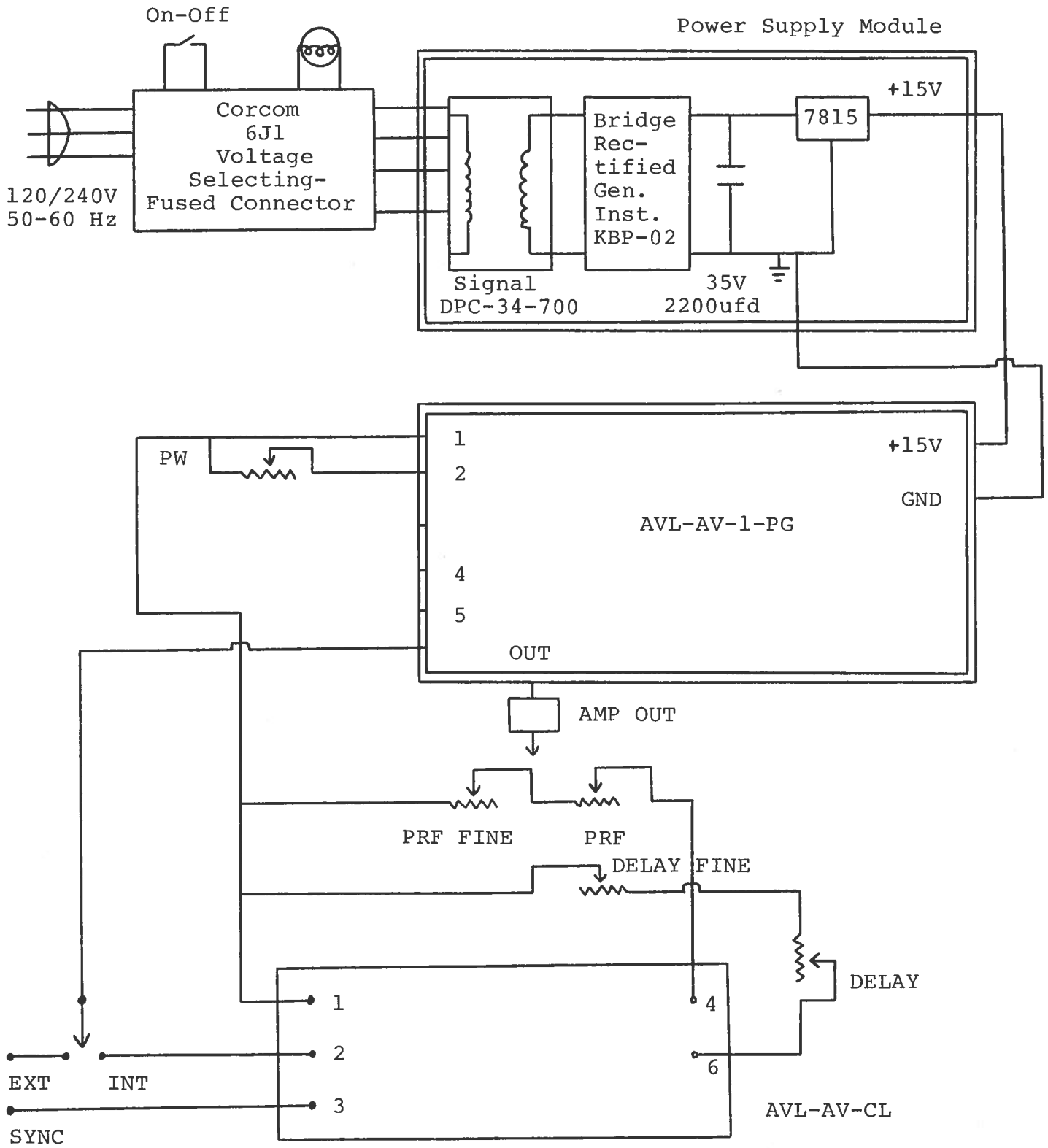
BACK PANEL CONTROLS



- (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.
- (2) PW Range Cable. Units with the -W option are shipped with an 8 inch length of RG-58 cable connected between ports A and B on the back panel. This cable provides a maximum PW of about 100 nsec. The PW pot control is active over about 90° with this cable. The maximum PW may be extended up to 400 nsec by attaching RG-58 cable lengths of about 100 feet between ports A and B. With 100 feet of cable attached, the PW pot control is active over about 300°. The maximum attainable PW varies linearly with cable length for cable lengths between 6" and 100".
CAUTION: Insure that the input power is off before attempting to change the cable between ports A and B. Potentials as high as 400V exist on the centre conductor between ports A and B.
- (3) MONITOR Output. The back monitor output provides an attenuated replica (20 db down) of the output less DC offset. The monitor output is designed to operate into a 50 ohm load. (Option).
- (4) DC Offset (OS). The desired DC offset is applied to the back panel OS terminals which are connected to the output centre conductor via a high quality RF inductor. Do not exceed $\pm 50V$, 0.1 amp. (Option).
- (5) OUTPUT POLARITY CONTROL (Option). With switch in (P) position, output is positive. With switch in (N) position, output pulse is negative.

Fig. 4

SYSTEM BLOCK DIAGRAM



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVL-AV-1-C consists of a pulse generator module (AVL-AV-1-PG), a clock module AVL-CL and a power supply board which supplies +15 volts (600 mA max) to the pulse generator module. In the event that the unit malfunctions, remove the instrument cover by removing the 4 Phillips screws on the back panel of the unit. The top cover may then be slid off. Measure the voltage at the +15 V pin of the PG module. If this voltage is substantially less than +15 volts, unsolder the line connecting the power supply and PG modules and connect 50 ohm 10 W load to the PS output. The voltage across this load should be about +15 V DC. If this voltage is substantially less than 15 volts the PS module is defective and should be repaired or replaced. If the voltage across the resistor is near 15 volts, then the PG module should be replaced or repaired. The sealed PG module must be returned to Avtech for repair (or replacement). The clock module provides a 0.1 usec TTL level trigger pulse at pin 2 to trigger the PG module and a 0.1 usec TTL level sync pulse at pin 3 to trigger the sampling scope display device. The output at pin 3 precedes the output at pin 2 by almost 0 to 100 nsec depending on the DELAY control setting. The clock module is powered by +5.8 V supplied by the PG module (from pin 1 to pin 1). With the INT-EXT switch in the EXT position, the clock module is disconnected from the PG module. 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 can be varied over the range of 0.05 KHz to 20 KHz using the PRF and PRF RANGE controls.
- c) The relative delay between the pin 2 and 3 outputs can be varied by at least 500 nsec by the DELAY controls.

The sealed clock module must be returned to Avtech for repair or replacement if the above conditions are not observed.

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-M

-OS

-TR

-PN

-W