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INSTRUCTIONS

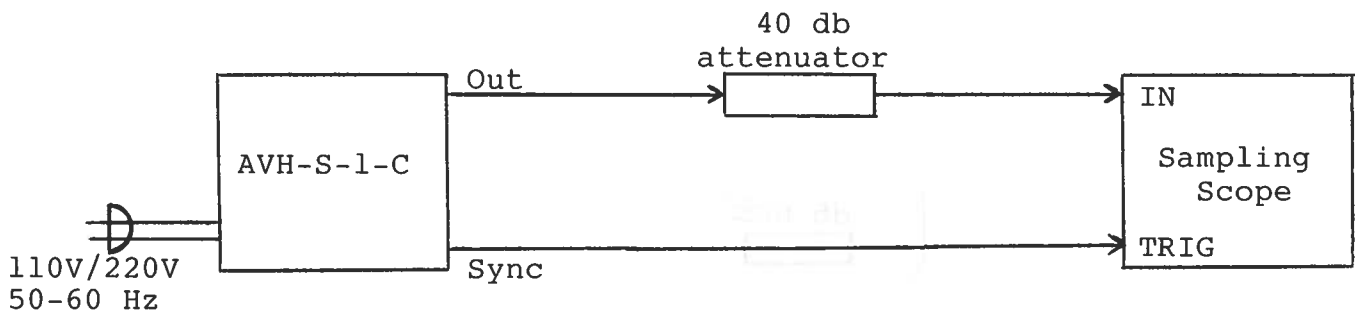
MODEL AVH-S-1-C IMPULSE GENERATOR

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.

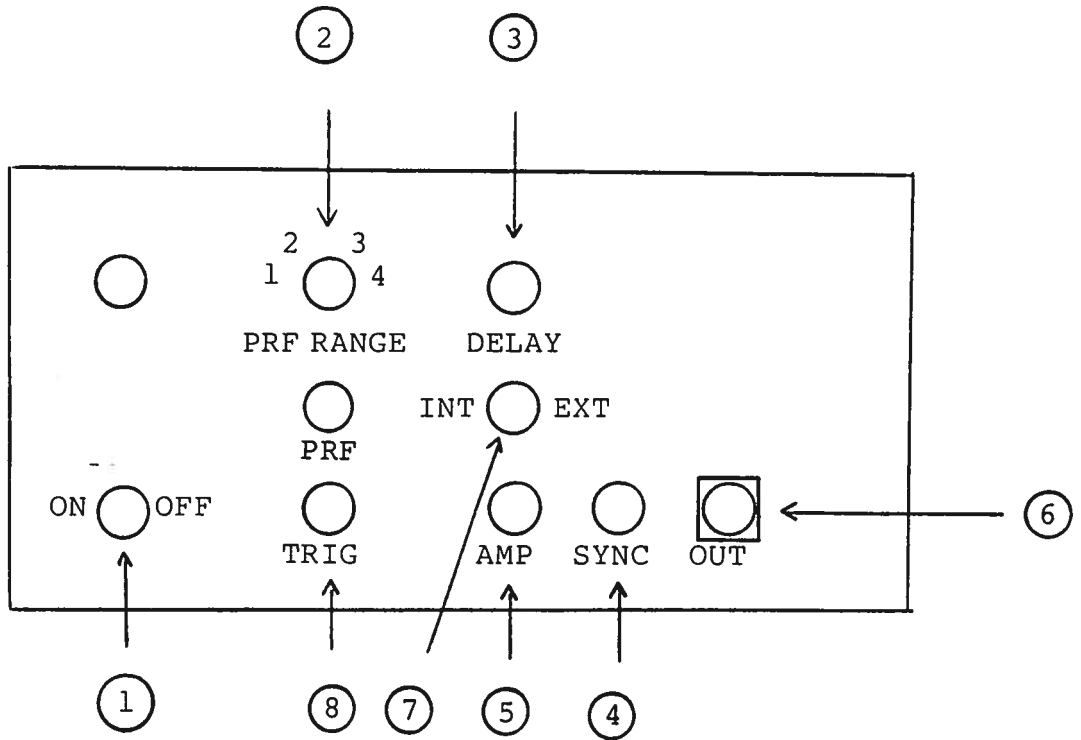
IMPULSE GENERATOR TEST ARRANGEMENT



Notes:

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 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 500 mV 20 nsec wide pulse to fifty ohms. The sampling scope should be set to trigger on the positive edge of the sync pulse.
- 4) To obtain a stable output display the PW and PRF controls on the front panel should be set mid-range. The front panel TRIG 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 controls.
- 5) The output pulse amplitude is controlled by means of the front panel one turn AMP control. Note that the AMP control must be near maximum clockwise to obtain an output (since the control is active for only about 45° of rotation).
- 6) Some properties of the output pulse may change as a function of the amplitude pot setting. For some demanding applications, it may be desirable to use a combination of external attenuators and the amplitude pot to achieve the desired output amplitude.
- 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. (option)
- 8) An external clock may be used to control the output PRF of the AVH 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.

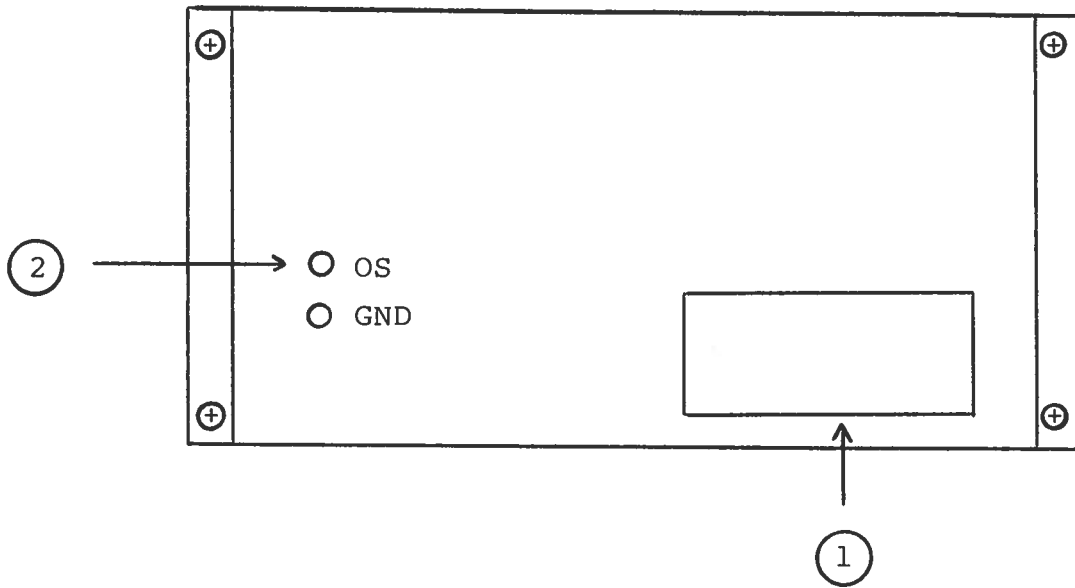
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF from 1.0 KHz to 1.0 MHz as follows:

Range 1	1.0 KHz	8 KHz
Range 2	8 KHz	to 40 KHz
Range 3	40 KHz	to 200 KHz
Range 4	200 KHz	to 1.0 MHz
- (3) DELAY Control. Controls the relative delay between the reference output pulse provided at the SYNC output (4) and the main output (6). This delay is variable over the range of 0 to about 150 nsec.
- (4) SYNC Output. This output precedes the main output (6) and is used to trigger the scope time base. The output is a 500 mV 20 nsec (approx.) pulse capable of driving a fifty ohm load. Set scope to trigger on positive edge.
- (5) AMP Control. A one turn control which varies the output pulse amplitude from 0 to 10V to a fifty ohm load. Note that the AMP control must be near maximum clockwise to obtain an output (since the control is active for only about 45° of rotation).
- (6) OUT Connector. SMA connector provides output to a fifty ohm load.
- (7) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVH 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 AVH 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.
- (8) TRIG Input. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.

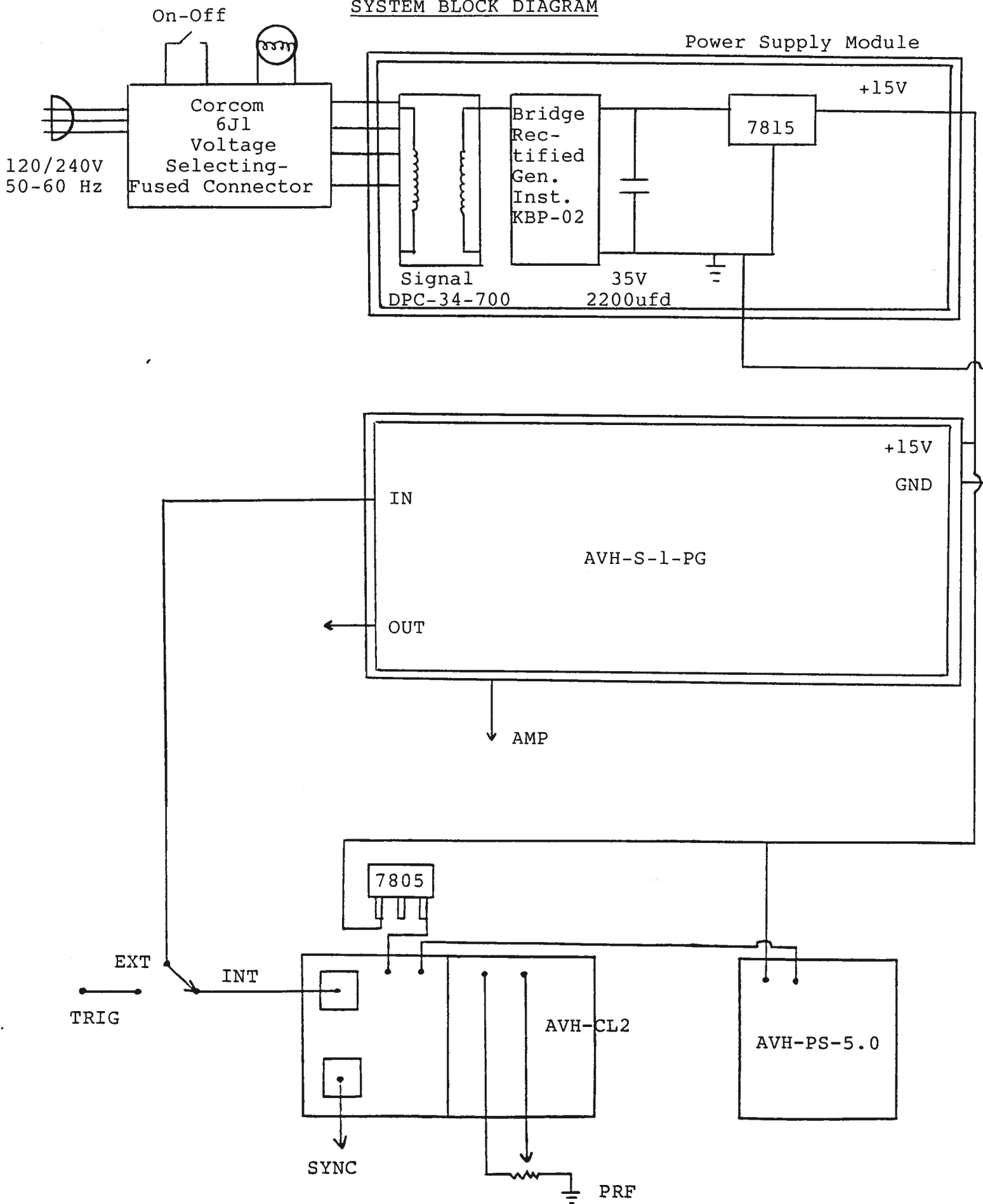
BACK PANEL CONTROLS



- 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) 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 (option).

SYSTEM BLOCK DIAGRAM



SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVH-S-1-C consists of a pulse generator module (AVH-S-1-PG), a clock module (AVH-S-1-C) 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 four Phillips screws on the back of the unit. The top cover may then be slid off. Measure the voltage at the +15V 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 synch 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 +15V. 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 0.1 KHz to 1 MHz using the PRF, PRF FINE and PRF RANGE controls.
- c) The relative delay between the pin 2 and 3 outputs can be varied by at least 100 nsec by the DELAY control.

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

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EXPERIMENTAL DATA FOR THE PAPER

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The first part of the paper is devoted to a general introduction to the topic. It starts with a brief review of the existing literature on the subject, followed by a statement of the objectives of the present work. The second part of the paper is devoted to the description of the experimental setup. It includes a detailed description of the apparatus used, the measurement techniques employed, and the procedures followed for data collection and analysis. The third part of the paper presents the results of the experiments. It starts with a discussion of the overall trends observed, followed by a more detailed analysis of the individual data points. The fourth part of the paper is devoted to a discussion of the implications of the results and a comparison with the theoretical predictions. The paper concludes with a summary of the main findings and some suggestions for future work.

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Editor A