

**AVTECH ELECTROSYSTEMS LTD.**

**NANOSECOND WAVEFORM ELECTRONICS  
ENGINEERING . MANUFACTURING**

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INSTRUCTIONS

Model AVX-D4-L Delay 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.

## SPECIFICATIONS

### MODEL AVX-D4-L DELAY GENERATOR

Input trigger: TTL 0.1 to 10 usec. Will withstand input amplitude up to 25 V. Field replaceable protective diode shunts input trigger line. Trigger rise time 5 to 50 nsec. Input impedance switchable from 50 ohms to TTL level.

Delay M: Continuously variable from 0.4 usec to 10.0 usec via front panel 10 turn locking pot.

Delay AB: Continuously variable from -0.1 usec to 5.0 usec via front panel 10 turn locking pot. Delay resettable to 10 nsec.

Input to output jitter:  $\leq 1$  nsec.

Input to output drift:  
(8 hr. period +10C to +30 C)  $\leq 10$  nsec.

Output pulse width (A and B): 2 usec.

Output amplitude (A and B): +20 volts to 50 ohms. Output impedance approx. 10 ohms. Outputs will withstand short circuit.

Output rise and fall time: 20 nsec.

PRF range: 0 to 1 KHz.

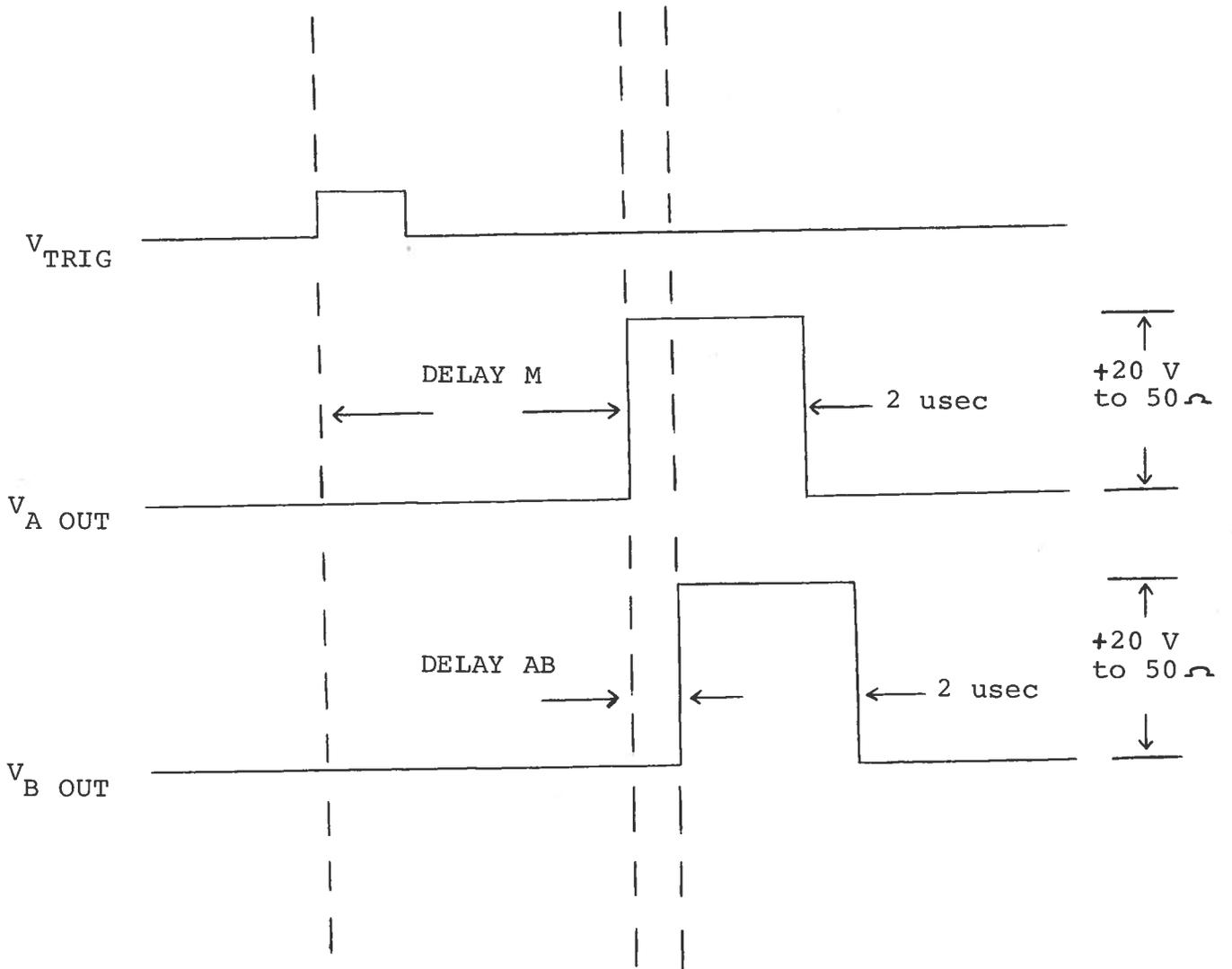
Input and output connectors: BNC.

Prime power: 120/240 V, 50-60 Hz switchable. Detachable cord with fuse.

Chassis size: 4 x 6 x 8 inches.

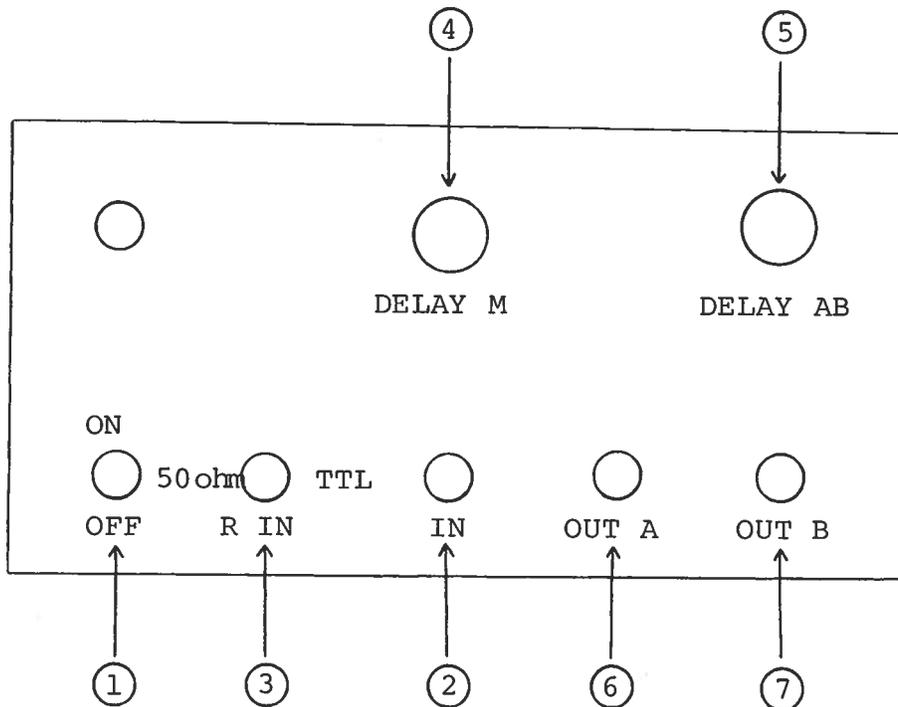
Other factors:

- a) Make +5 volt available in chassis.
- b) Leave 5" x 1.5" x 1.5" space clear in chassis.



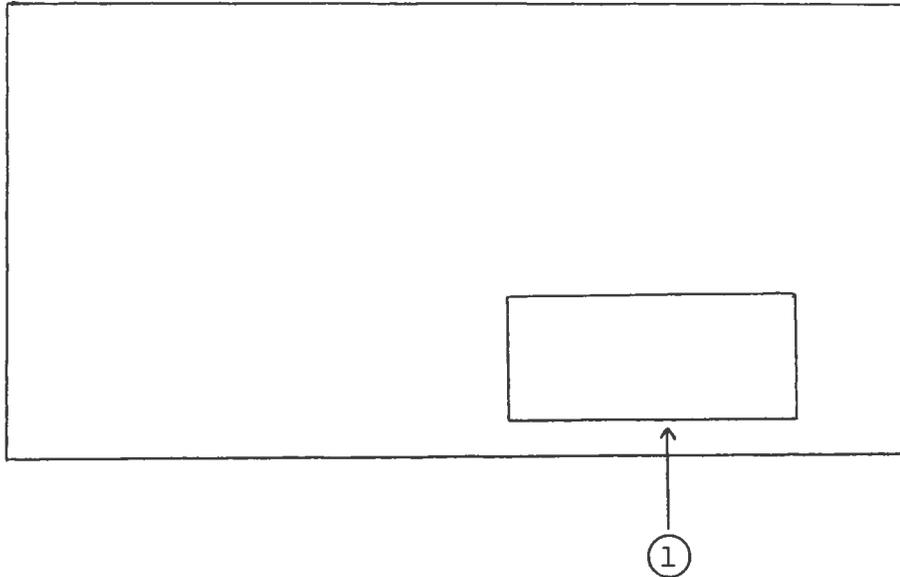
INPUT AND OUTPUT WAVEFORMS FOR AVTECH MODEL AVX-D4-L  
 DELAY GENERATOR

AVX-D4-L FRONT PANEL



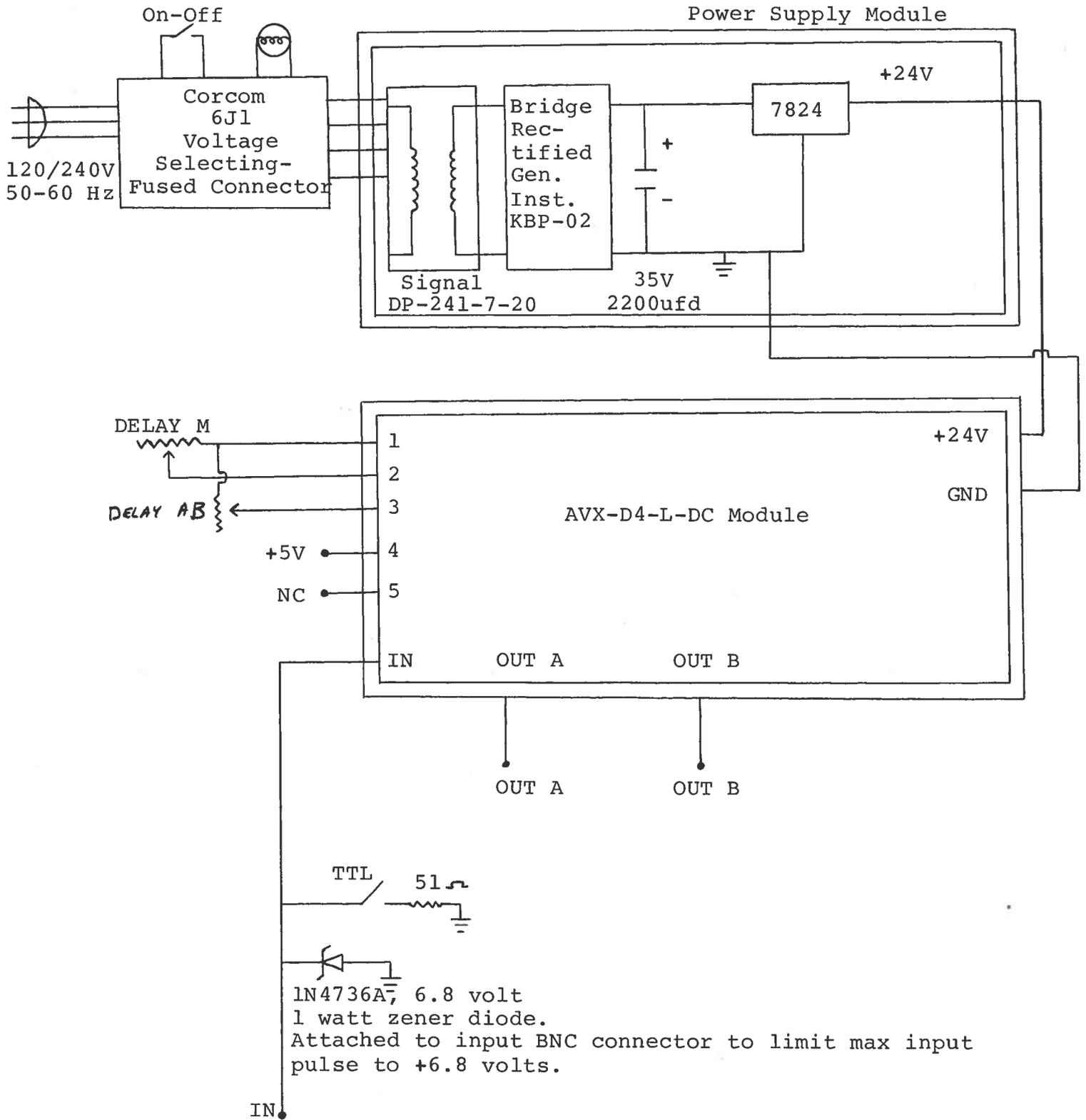
- ① ON-OFF Switch. Applies prime power to all stages.
- ② IN. BNC input trigger connector TTL level 0.1 to 10 usec pulse. Input protected by 5.8 volt zener diode.
- ③ TRIGGER INPUT IMPEDANCE. Input impedance switchable from either 50 ohm or TTL level.
- ④ DELAY M. 10 turn locking pot varies relative delay between OUT A and input trigger from 0.4 to 10 usec.
- ⑤ DELAY AB. 10 turn locking pot varies relative delay between OUT B and OUT A from -0.1 usec to 5.0 usec independently of setting of DELAY M.
- ⑥ OUT A. BNC connector provides +20V 2 usec pulse to 50 ohm load.
- ⑦ OUT B. BNC connector provides +20V 2 usec pulse to 50 ohm load.

## 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.

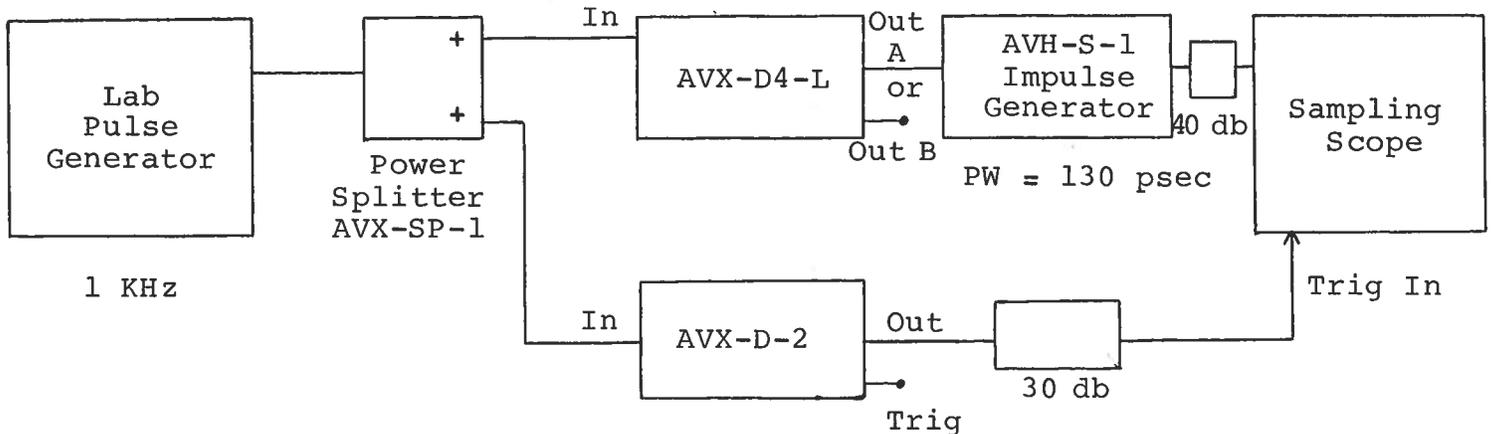
SYSTEM BLOCK DIAGRAM



- Notes:
- a) +5V available at pin 4 for powering accessories.
  - b) 5 x 1.5 x 1.5" volume available for future addition of accessories.

Model AVX-D4-L

Jitter and Drift Test Arrangement



- 1) A worse-case jitter test of the AVX-D4-L unit was conducted using the above arrangement. The use of two delay generators serves to:
  - a) Aggravate the jitter since the resultant jitter is the consequence of two units.
  - b) Allow triggering of the sampling scope with long delays (eg. 5 usec) on the AVX-D4-L unit.
- 2) The delays of the two units should be such that the time base of the sampling scope is triggered slightly ahead (eg. 20-100 nsec) of the application of the impulse to the vertical amplifier.
- 3) The pulse width of the impulse displayed on the sampling scope was about 300 psec, confirming therefore that the jitter for the AVX-D4-L unit was less than 1 nsec.
- 4) The position of the impulse changed by less than 5 nsec over a 2 hour running period.