AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
ENGINEERING . MANUFACTURING

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INSTRUCTIONS

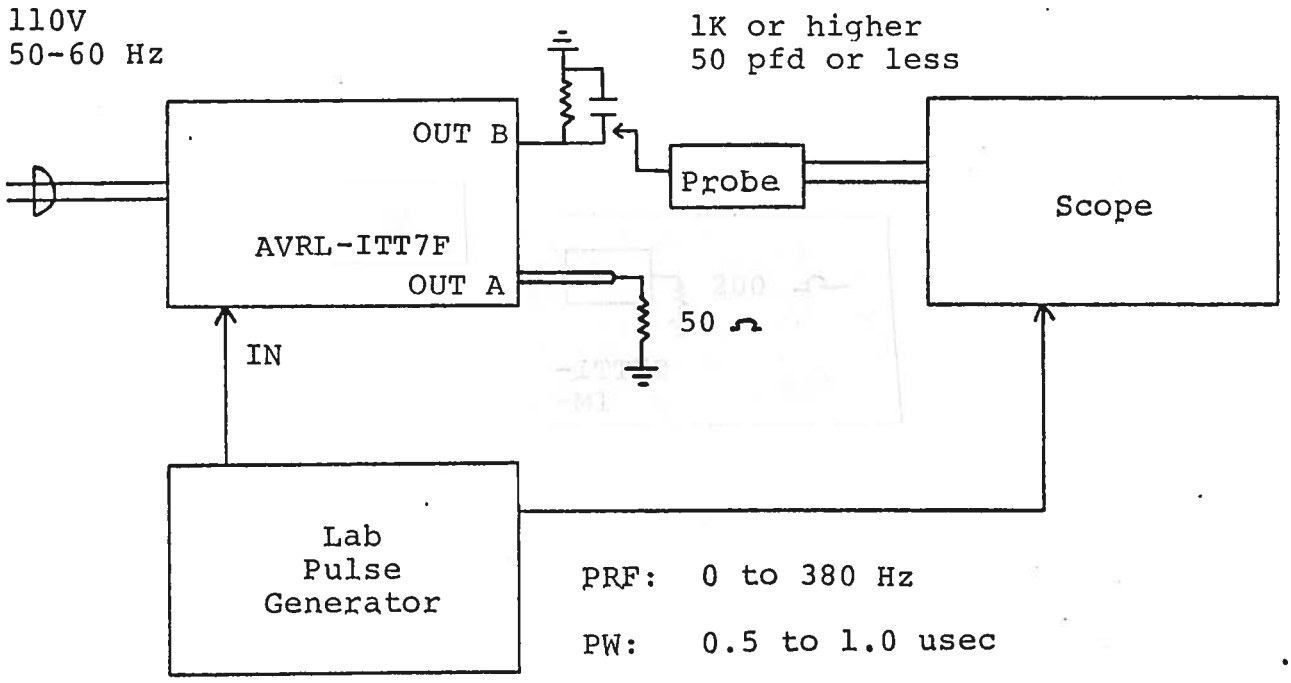
MODEL AVRL-ITT7F-OS-ED PULSE GENERATOR

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 dissembled, 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.

TEST ARRANGEMENT



PRF: 0 to 380 Hz

PW: 0.5 to 1.0 usec

AMP: +2 to +5V (TTL Levels)

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 the outputs.

2) Both output amplitudes are fixed at -200 V. Care should be taken to insure that the scope and the load resistor can withstand this high voltage (and high output power for wide output pulse widths).

3) The output pulse width for output A is variable from 5 nsec to 10 nsec by adding 50 ohm coaxial to the PW A connector. Cable such as RG 174 or RG 58 (or better) is recommended. The output pulse width increases by 3 nsec for every additional foot of cable added. CAUTION: The center conductor at the PW A port is at a potential of about 400 volts so the prime power should be turned off when replacing or adjusting the PW cable.

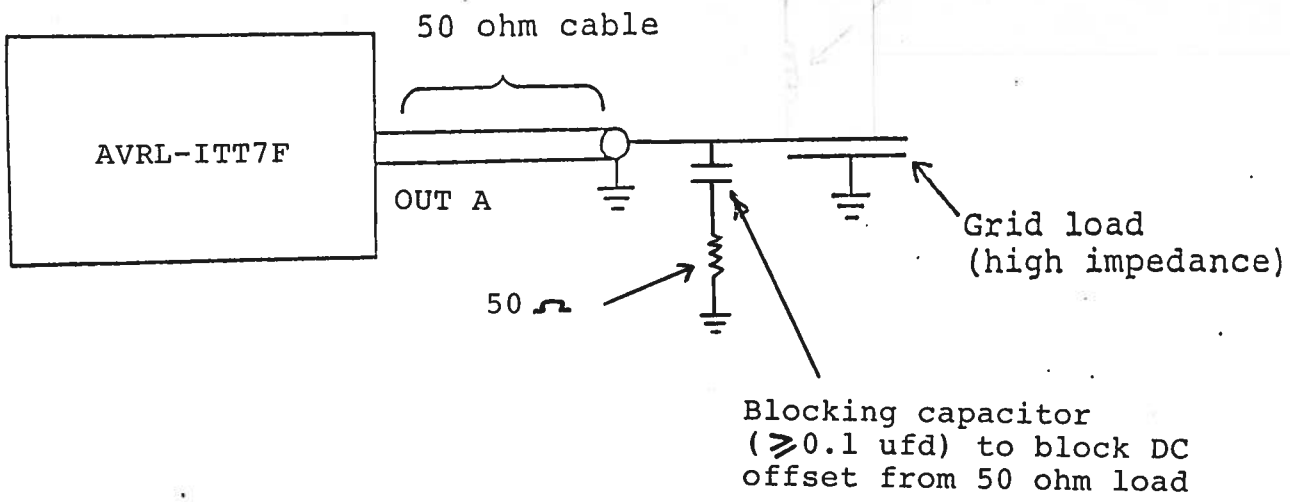
4) The output PW for output B is variable from 10 nsec to 150 nsec via the ten turn PW B control.

5) The output PRF is equal to the input PRF applied to the IN port. Note that both A and B outputs may fail if above PRF specifications and duty cycle are exceeded or if the load capacitance specification is exceeded.

6) Output A is designed to operate into a 50 ohm load.

7) Output B is designed to operate directly into a high impedance load (1 K or higher). WARNING: Unit may fail if operated into a 50 ohm load.

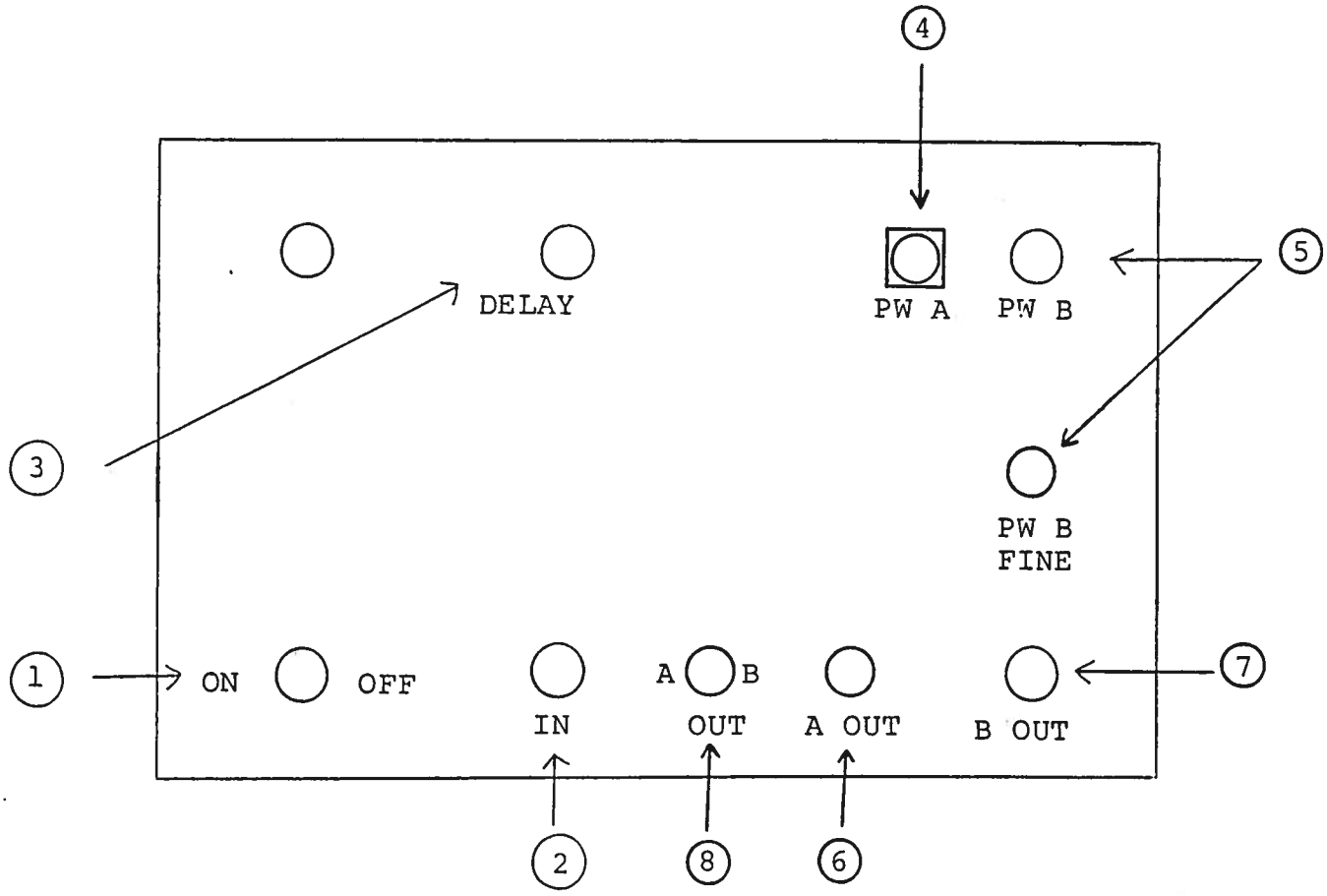
8) To DC offset A or B connect the desired potential (0 to ±50 volts) to the rear panel OS terminals. Note that when using a DC offset on output A, a DC blocking capacitor should be placed in series with the 50 ohm resistor as shown below:


50 ohm cable
AVRL-ITT7F
OUT A
50 Ω
Grid load
(high impedance)
Blocking capacitor
(≥0.1 ufd) to block DC
offset from 50 ohm load

9) The output switching elements (SL9H) in output B will probably fail if the output of the unit is accidentally short-circuited or if the unit is operated at high output pulse width - high PRF combinations. The switching elements are easily replaced following the instructions given in the REPAIR Section.

10) The propagation delay through the unit is controlled from 20 nsec to 150 nsec by means of the front panel ten turn delay control.

FRONT PANEL CONTROLS



(1) ON-OFF Switch. Applies prime power to all stages.

(2) IN. Input trigger for A and B outputs applied here (TTL levels, 0.5 to 1.0 usec).

(3) DELAY. Varies propagation delay from IN to OUT as follows:

	A OUT	B OUT
RANGE 1:	20 nsec to 150 nsec	30 nsec to 150 nsec

(4) PW A. SMA connector to which fifty ohm cable is attached to control output pulse width of A channel. Pulse width increases 3 nsec for each additional foot of cable added. Use RG 174 or RG 58 (or better) cable.

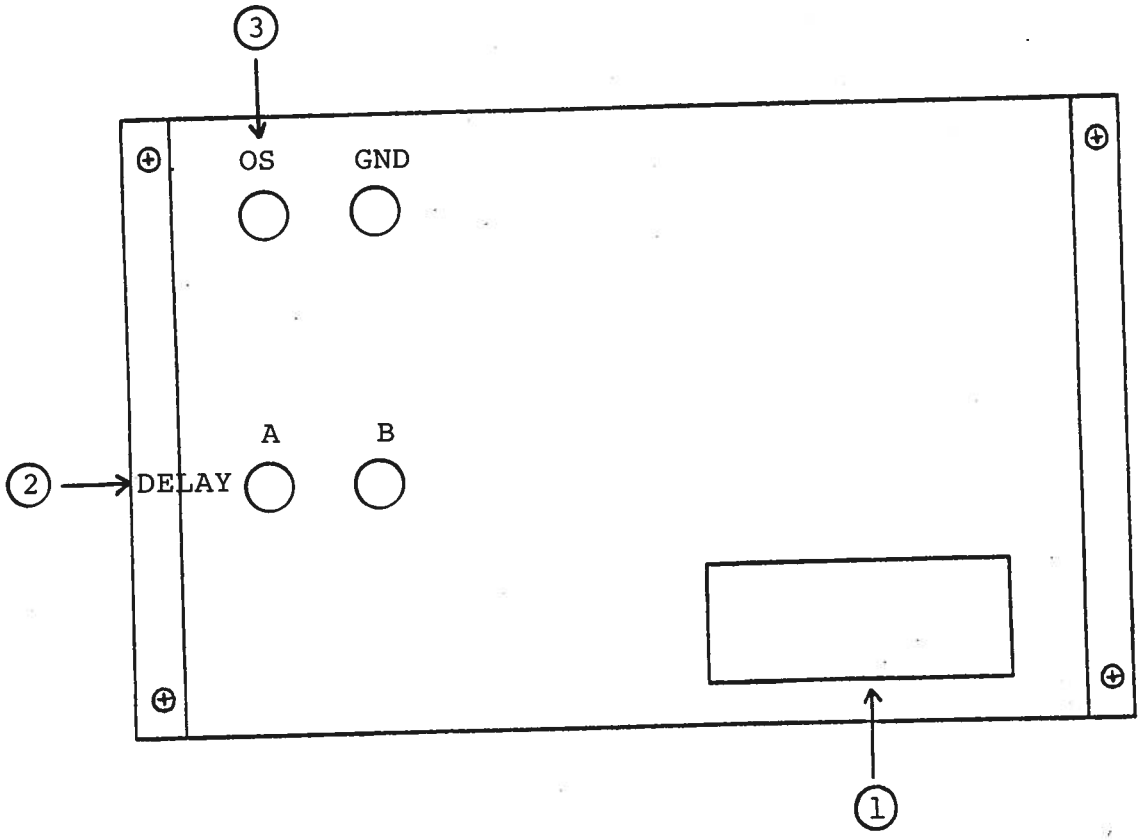
(5) PW B. Ten turn control used to vary pulse width of output B from 10 nsec to 150 nsec.

(6) OUT A Connector. SMA connector to connect to 50 ohm load.

(7) OUT B Connector. BNC connector used to connect output of B to high impedance load.

(8) A-B OUTPUT Switch. With switch in the A position, pulse generator A is connected to the output connector (A) and the B pulse generator is disabled. With switch in the B position, pulse generator B is connected to the output connector (8) and the A pulse generator is disabled.

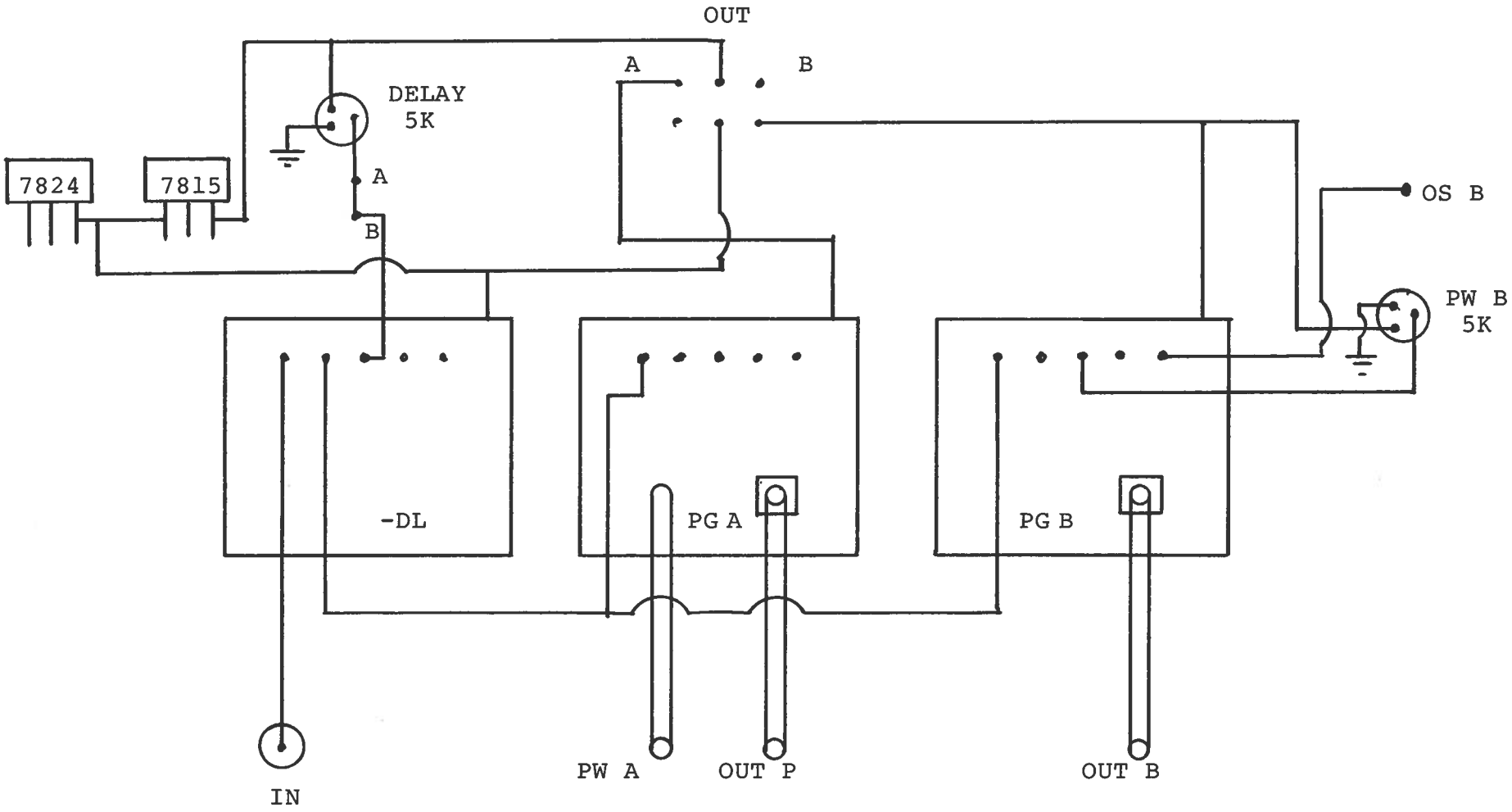
BACK PANEL CONTROLS



(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) ELECTRONIC DELAY. To voltage control the propagation delay, remove the jumper wire between banana plugs A and B and apply 0 to +10V to connector B ($R_{IN} \geqslant 10K$). (ED option).

(3) 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.



AVRL-ITT7F-ED-OS

REPAIR PROCEDURE

1) WARNING: Before attempting any repairs, note that potentials as high as 400 volts are employed in the chassis structure.

2) The pulse generator is constructed from the following subsystems or modules:

   a) Metal chassis
   b) A pulse generator module (AVRL-ITT7F-PGA)
   c) B pulse generator module (AVRL-ITT7F-PGB)
   d) Delay module (AVRL-ITT7F-D)
   e) +24V power supply board

   The modules are interconnected as shown in the following diagram.

3) If no output is provided by the B output then it is most likely that the SL9H switching elements in the output stages have been damaged and should be replaced using the following procedure:

   i) Turn off prime power and remove cover plate on bottom of instrument (two 2-56 screws).

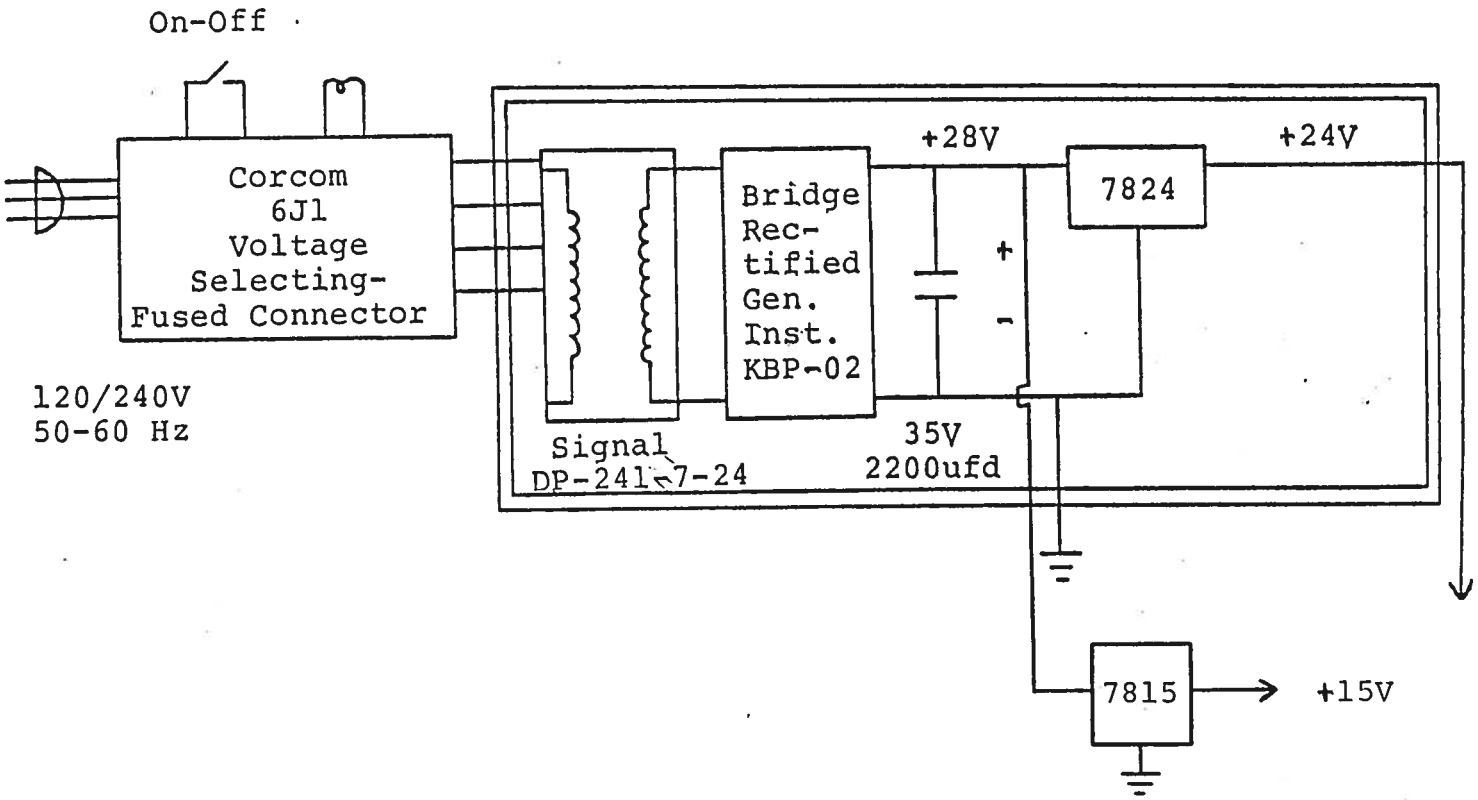
   ii) By means of a screwdriver, briefly ground the tabs of the two SL9H transistors to discharge the bypass capacitors.

   iii) Extract the old SL9H transistors from their socket by means of needle-nosed pliers.

   iv) Install replacement SL9H transistors and install cover plate.

4) The PG A unit is a sealed module and must be returned to AVTECH for repair purposes.

POWER SUPPLY BOARD



+24 VOLT POWER SUPPLY

The AVRL-ITT7F consists of the four standard modules and a power supply board which supplies +24 volts (600 mA max) to the modules. In the event that the unit malfunctions, remove the instrument top cover, thereby exposing the modules. Measure the voltage at the +24 V pin of the PS module. If this voltage is substantially less than +24 volts, unsolder the line connecting the power supply board output and connect a 50 ohm 10 W load to the power supply output. The voltage across this load should be about +24 V DC. If this voltage is substantially less than 24 volts the power supply board is defective and should be repaired or replaced. If the voltage is near +24V then see instructions in preceding section.

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August 25, 1987.

4 MOD FEB 2 1988

Charles Taner
Purchasing Dept.
ITT Inc.
Electro-Optical Products Div.
P.O. Box 3700
Fort Wayne, IN 46801

Dear Mr. Taner:

With reference to recent telephone conversations with Tom Lynch, this will confirm that Avtech can supply a special purpose pulse generator meeting the following specifications:

Model designation: AVRL-ITT7F-ED.

Output amplitude:	A Output	B Output
	-200V to 50 Ω	-200V to $R_L \geq 1K$. BNC output connector.
Pulse width:	5.0 nsec to 10 nsec. Controlled by adding external miniature 50 ohm delay line (3 nsec per foot) to SMA connector.	Variable from 10 nsec to 150 nsec via front panel control (10 turn).
Rise time:	≤3.0 nsec.	≤5 nsec.
Fall time:	≤3.0 nsec.	≤5 nsec.

PRF:	20 Hz to 380 Hz.	20 Hz to 380 Hz.
	Note that both A and B require external 0.5 usec TTL input trigger signal. Output PRF equals input PRF.	
Delay:	20 nsec to 150 nsec via ten turn counting control or via 0 to +10 volts applied to rear panel solder terminal (R_{IN} >10K).	30 nsec to 150 nsec via ten turn counting control or via 0 to +10 volts applied to rear panel solder terminal (R_{IN} >10K).
Input connectors:	BNC.	
Prime power:	110/220V switchable, 50-60 Hz.	
Package size and format:	4" x 12" x 16". Anodized, extruded aluminum chassis.	
Price:	[illegible] each US, FOB Destination.	
Delivery:	60-90 days ARO.	
Terms:	Net 30 days.	
Shipping:	Transportation via Emery Air Freight included in above price.	

I thank you for this opportunity to quote on your requirements and I hope you will contact me again if you require any modifications or clarifications.

Yours truly,

Walter J. Chudobiak
Chief Engineer

WJC:pr
cc Tom Lynch

Schroff 02.04.88