

AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
ENGINEERING . MANUFACTURING

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INSTRUCTIONS

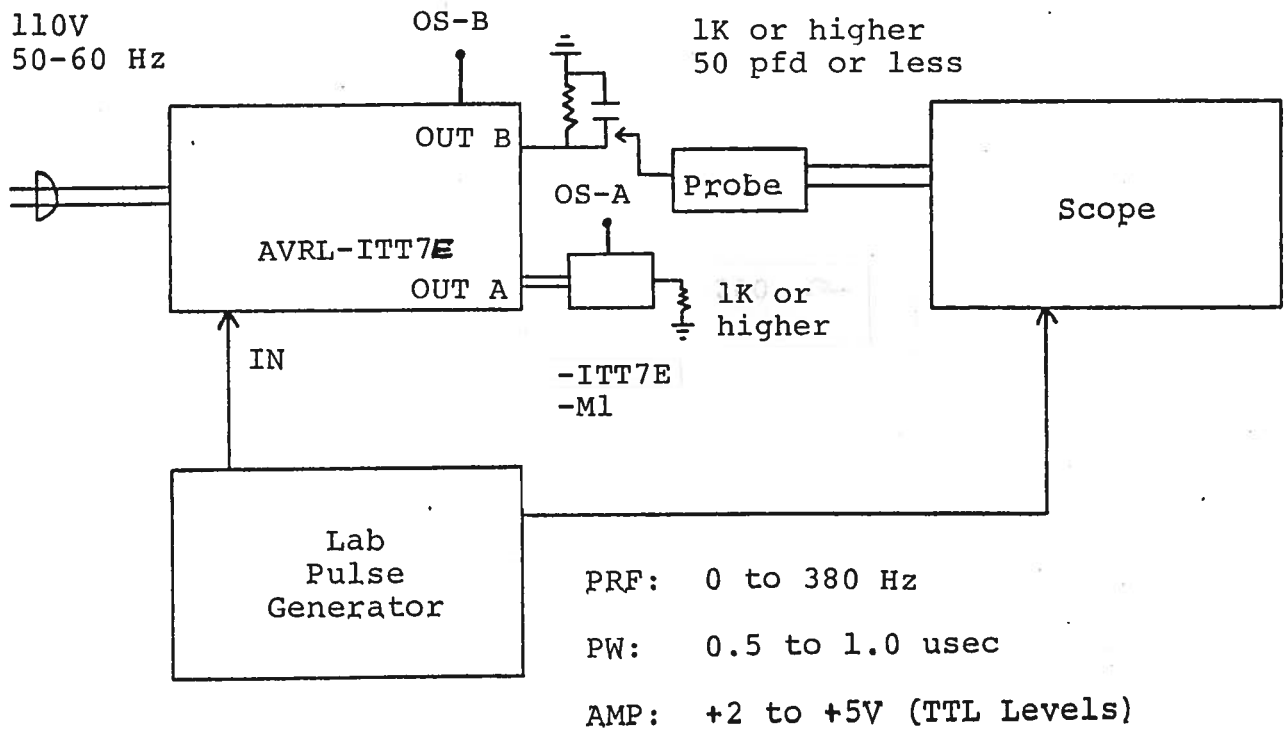
MODEL AVRL-ITT7E-05 PULSE GENERATOR

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 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.

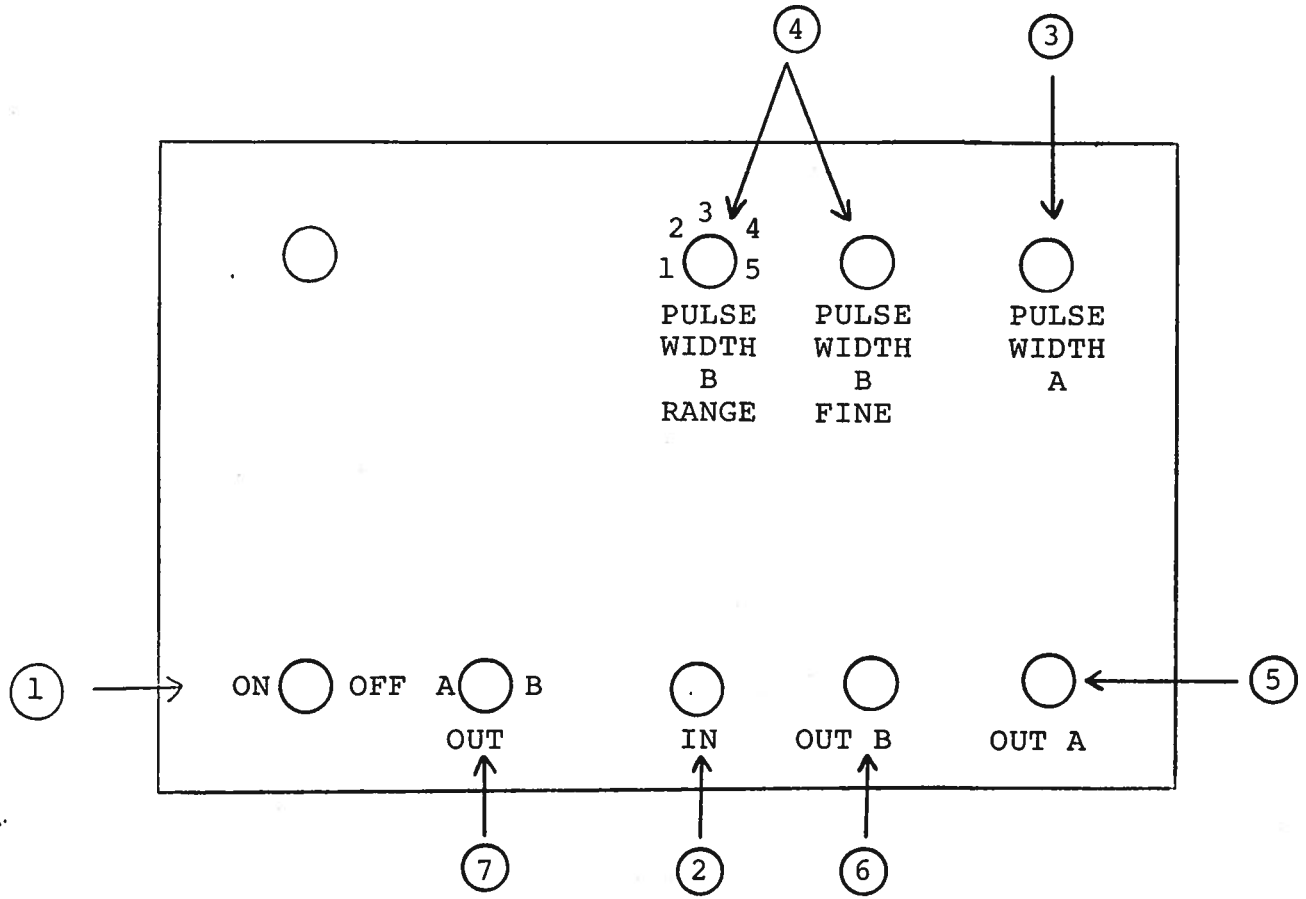
TEST ARRANGEMENT



Notes:

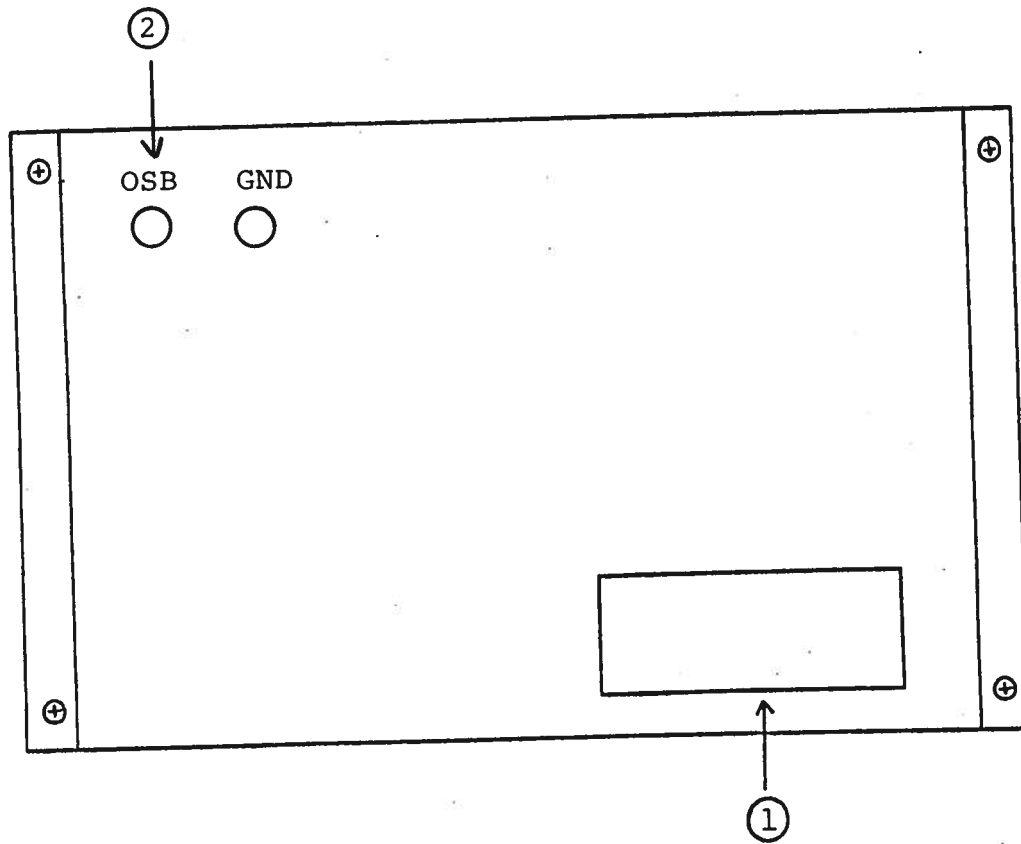
- 1) The equipment should be connected in the general fashion shown above. A scope with a bandwidth of at least 50 MHz should be used to view the outputs.
- 2) Both output amplitudes are fixed at -200 V. Care should be taken to insure that the scope and the load resistor can withstand this high voltage (and high output power for wide output pulse widths).
- 3) The output pulse width for output A is variable from 5 nsec to 100 nsec by means of the ten turn PW A control.
- 4) The output PW for output B is variable from 100 nsec to 5 msec via the 5 position range switch and ten turn control (PW B).
- 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) The ITT7E-M1 module connects to the OUT A port via a 50 ohm cable. The length of this cable is not critical. The high impedance load is placed in parallel across the ITT7E-M1 output terminals.
- 7) Outputs A and B are 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 offset output A connect the desired offset voltage (0 to ± 50 volts) to the OS A terminals on the ITT7E-M1 module.
- 9) To offset output B connect the desired offset voltage to the back panel OS B terminals.
- 10) The output switching elements (SL4) for 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.
- 11) CAUTION: The instrument may be damaged if the load capacitance exceeds 50 pfd or if the load resistance is less than 1 K. Note that coaxial cables connected to the pulse generator output ports typically contribute 15 pfd per foot of length and so this capacitance must be included in the total.

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) PW A. Ten turn control will vary PW of A output from 5 to 100 nsec.
- (4) PW B. Ten turn control and 5 position range switch used to vary pulse width of output B from 100 nsec to 5.0 msec as follows:
 - RANGE 1: 100 nsec to 1.6 usec
 - RANGE 2: 1.0 usec to 12 usec
 - RANGE 3: 6.5 usec to 120 usec
 - RANGE 4: 80 usec to 1.2 msec
 - RANGE 5: 0.7 msec to 6.0 msec
- (5) OUT A Connector. SMA connector to which ITT7E-M1 module is connected via fifty ohm cable. High impedance load for A channel connects to output terminals on ITT7E-M1 module.
- (6) OUT B Connector. BNC connector used to connect output of B to high impedance load.
- (7) 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 (B) 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) OS-B. To offset output B, apply desired DC offset (0 to ± 50 volts) to OS-B solder terminals.

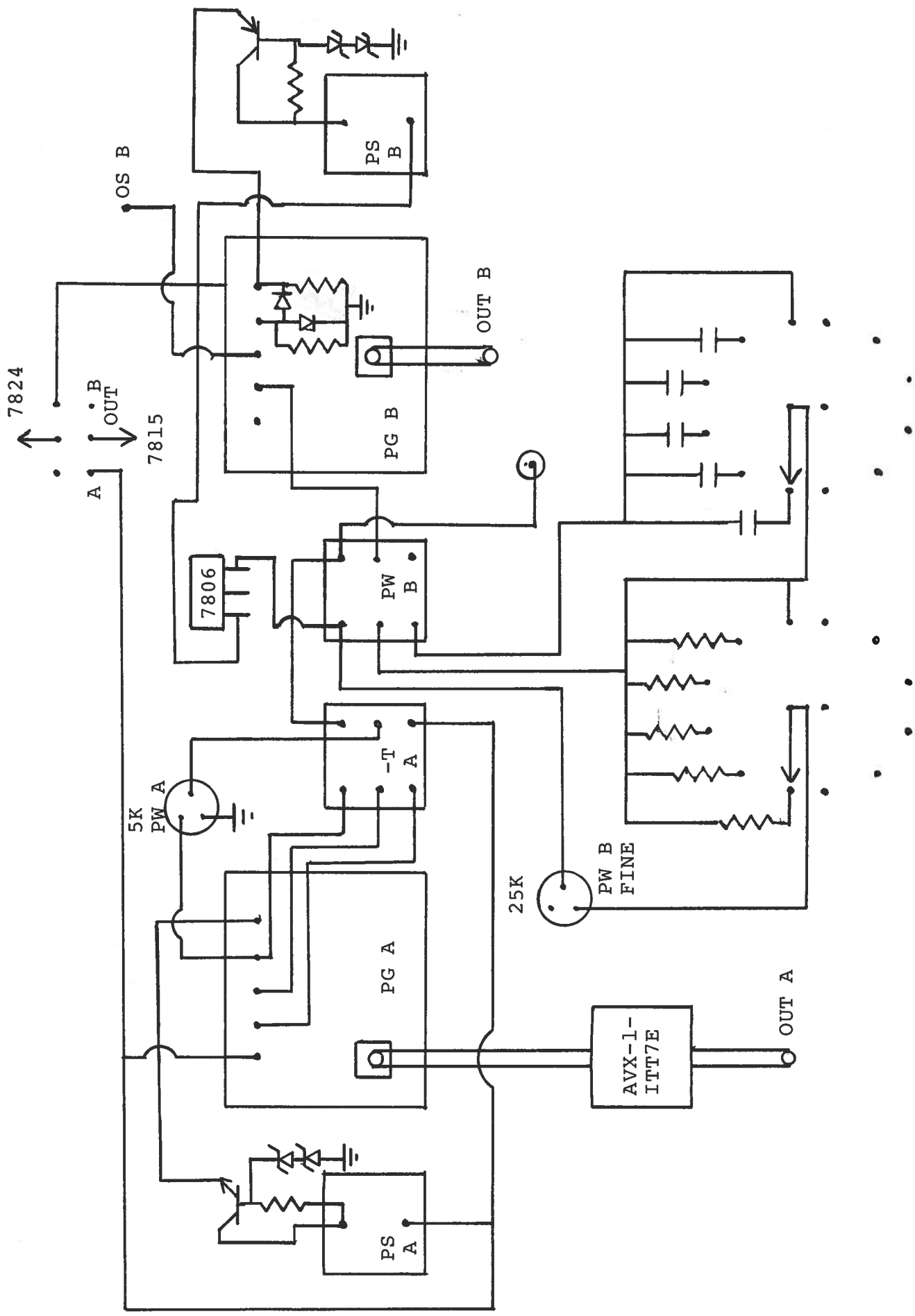
REPAIR PROCEDURE

- 1) **WARNING:** Before attempting any repairs, note that potentials as high as 360 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-ITT7E-PGA)
 - c) B pulse generator module (AVRL-ITT7E-PGB)
 - d) Delay module (AVRL-ITT7E-TN-T)
 - e) +24V power supply board
 - f) B pulse generator power supply (AVRL-ITT7E-PSB)
 - g) A pulse generator power supply (AVRL-ITT7E-PSA)
 - h) Output B PW control module (AVRL-ITT7E-PWB)

The modules are interconnected as shown in the following diagram.

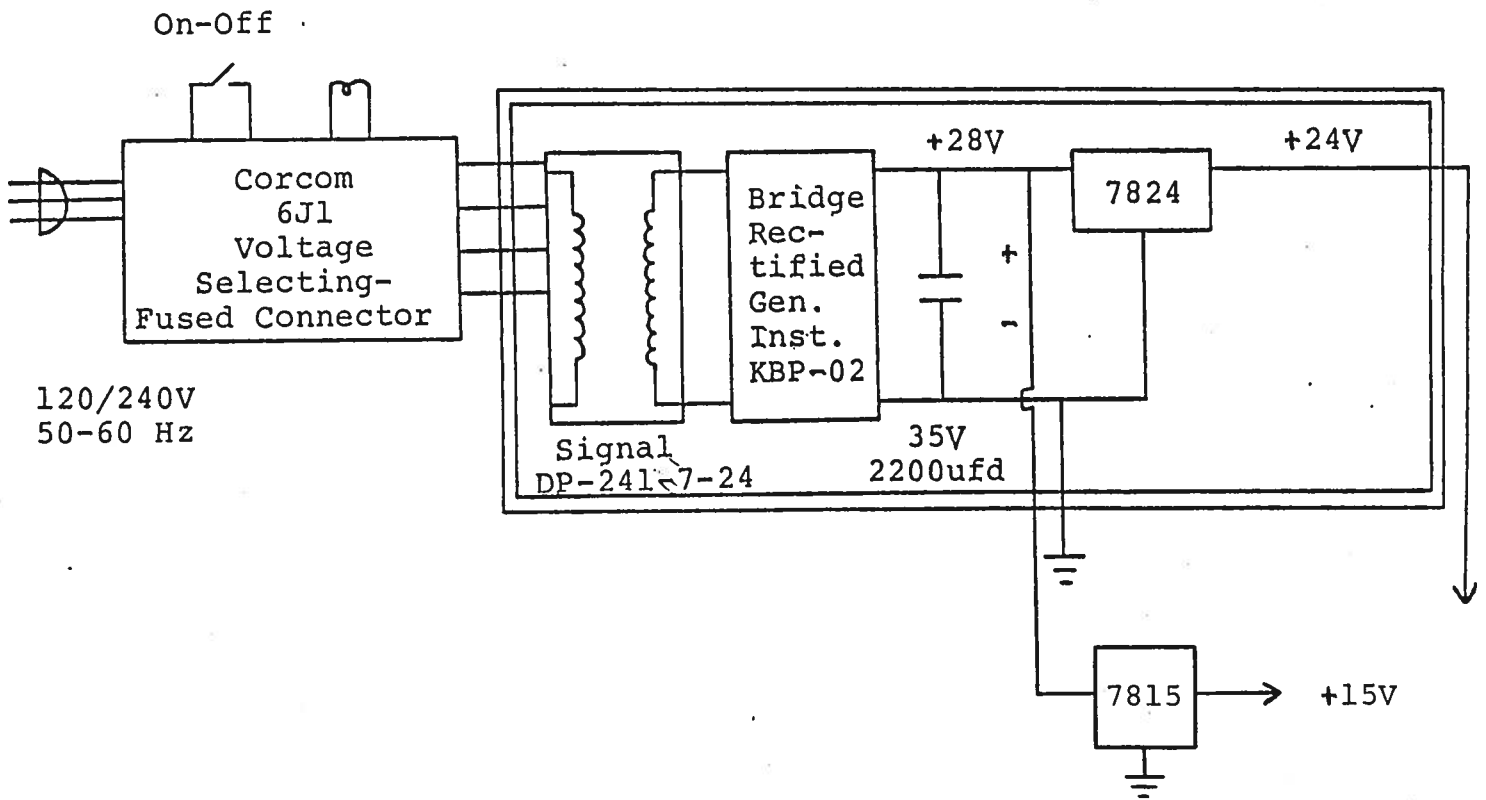
- 3) If no output is provided by the B output then it is most likely that the SL4 switching elements in the output stages have been damaged and should be replaced using the following procedure:
 - i) Turn off prime power and remove cover plate on bottom of instrument (two 2-56 screws).
 - ii) By means of a screwdriver, briefly ground the tabs of the two SL4 transistors to discharge the bypass capacitors.
 - iii) Extract the old SL4 transistors from their socket by means of needle-nosed pliers.
 - iv) Install replacement SL4 transistors and install cover plate.
- 4) If no output is provided by the A output then it is most likely that the SL3 switching elements in the output stages have been damaged and should be replaced using the following procedure:
 - i) Turn off prime power and remove the four Phillips screws on the back panel of the instrument. The front cover may then be slid off.
 - ii) By means of a screwdriver, briefly ground the cases of the two SL3 transistors to discharge the bypass capacitors.

- iii) Extract the old SL3 transistors from their sockets after removing the 4 2-56 screws.
- iv) Install replacement SL3 transistors and install cover plate.



AVRL-ITT7E-OS

POWER SUPPLY BOARD



+24 VOLT POWER SUPPLY

The AVRL-ITT7E consists of the six 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.

3264

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TELEX 053.4591

September 11, 1987.

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-ITT7E

Output amplitude:	<u>A Output</u>	<u>B Output</u>
	-200V to $R_L \geq 1K$.	-200V to $R_L \geq 1K$.
	Solder terminal output on 1" x 1" x 1" module connecting to mainframe via miniature 50 ohm cable.	BNC output connector.
Pulse width:	5.0 nsec to 100 nsec. Controlled by one turn control.	Variable from 100 nsec to 5 msec via front panel controls. (5 position range switch and ten turn fine control).
Rise time:	≤ 3.0 nsec.	≤ 10 nsec.
Fall time:	≤ 3.0 nsec.	≤ 10 nsec.

PRF: 0 to 1 KHz. 0 to 50 Hz.

Note that both A and B require external 0.5 usec TTL input trigger signal. Output PRF equals input PRF.

Delay: 90 nsec 90 nsecs

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: Qty. 1-5 units: \$3,400.00 US each
FOB Destination

Qty. 5-10 units: \$3230.00 US each
FOB Destination

Qty. 10-15 units: \$3080.00 US each
FOB Destination

Delivery: Qty. 1-5 units: 45-60 days ARO.
Qty. 5-10 units: 60-90 days ARO.
Qty. 10-15 units: 90-120 days ARO.

Thank you for your continuing interest in our products.
Please give me a call if you require any additional information.

Yours truly,

Walter J. Chudobiak
Chief Engineer

WJC:dk
cc Tom Lynch

Schroff

02.01.88

\$3,400.00 US each
FOR Destination

\$3,250.00 US each
FOR Destination

\$3,000.00 US each
FOR Destination

42-60 days ARG.
60-90 days ARG.
90-120 days ARG.