



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

MODEL AV-155A-PS-P PULSE GENERATOR

S.N. :

EC Declaration of Conformity

We

Avtech Electrosystems Ltd.
P.O. Box 5120, Stn. F
Ottawa, Ontario
Canada K2C 3H4

declare that the AV-155A-PS-P pulse generator meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance pertains to the following specifications as listed in the official Journal of the European Communities:

EN 50081-1 Emission

EN 50082-1 Immunity



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 assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

Phone: 613-226-5772 or 1-800-265-6681
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CAUTION

To avoid possible damage to the laser diode, the following start up and shut down sequences should be followed:

START UP SEQUENCE

- 1) POWER switch is OFF (i.e. button out).
- 2) Set amplitude controls fully CCW.
- 3) Set OPERATE-STANDBY switch to STANDBY position.
- 4) Solder connect the laser diode to the output terminals.
- 5) Apply prime power by setting the POWER switch in the ON position (i.e. push button in).
- 6) Set OPERATE-STANDBY switch to OPERATE position.
- 7) Set amplitude to desired level. Do not change the position of the OPERATE-STANDBY switch from OPERATE to STANDBY without first setting the amplitude controls to fully CCW.

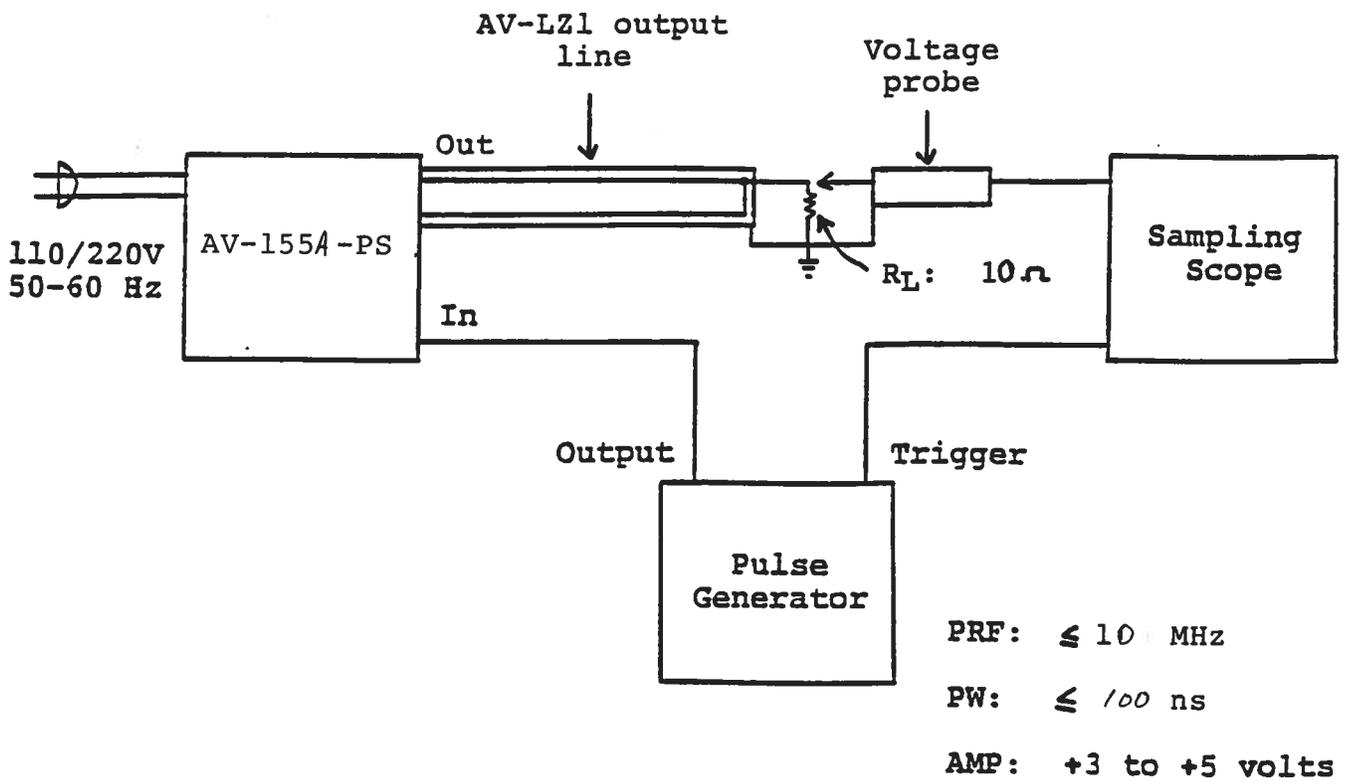
SHUT DOWN SEQUENCE

- 1) Set amplitude controls fully CCW.
- 2) Set OPERATE-STANDBY switch to the STANDBY position.
- 3) Turn off the prime power by pushing the POWER switch button.
- 4) Remove the laser diode from the output terminals.

Fig. 1

MODEL AV-155B-PS-NAPP1 PULSE GENERATOR TEST ARRANGEMENT

(RESISTIVE LOAD, NO DIODE)



Notes:

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (probes, cables, connectors, etc.) should exceed 50 MHz.
- 2) It is recommended that the unit be first tested using a non inductive one Ohm resistive load and the load voltage be monitored using a scope voltage probe.
- 3) When the MODE switch is in the A position the unit operates as a voltage to current converter as follows:

$$I_{OUT} = 0.05 V_{IN}$$

Note that in this mode, the input amplitude should not exceed +4 Volts and also note that the pulse width, amplitude and DC bias controls on the front panel are inactive.

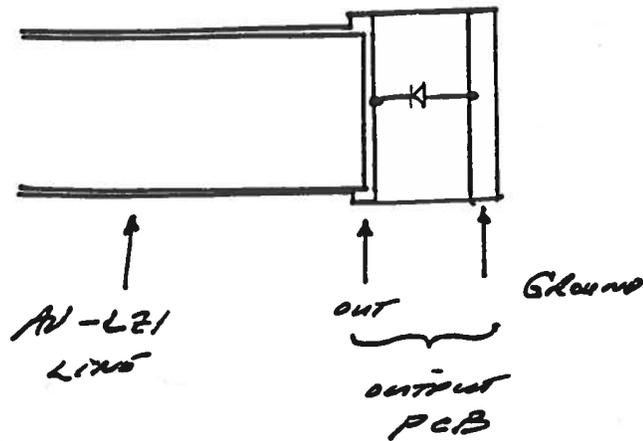
- 4) When the MODE switch is in the B position, the unit requires a TTL input trigger pulse (PW > 50 ns) and the output pulse width, amplitude and DC bias are controlled by the front panel controls as follows:

PW: 20 ns to 200 ns
200 ns to 2 us

AMP: 0 to +200 mA

BIAS: 0 to +200 mA

- 5) When the MODE switch is in the $PW_{OUT} = PW_{IN}$ position, the output pulse width equals the input trigger pulse width but the amplitude is controlled by the front panel AMP control.
- 6) The input trigger rate should not exceed 10 MHz as this may result in damage to the unit.
- 7) The diode load should be solder connected (as shown below) to the end of the AV-LZ1 flexible line which protrudes from the front panel.



- 8) The diode impedance should equal the characteristic impedance of the output line (1 Ohm). If the diode impedance is higher than one Ohm, the output rise time will be higher than 50 ns. This problem may be solved by replacing the AV-LZ1 line with a higher impedance version. The flexible output transmission line (AVTECH Model AV-LZ1) may be changed by desoldering the line from the 1/16" glass epoxy circuit board which protrudes from the -PG module. The -PG module is accessed by removing the four Phillips screws on the back panel of the instrument. The top cover will then slide back (and off), thereby exposing the -PG module.
- 9) If the diode impedance is less than one Ohm, the output waveform may exhibit severe overshoot. Also, if the diode has significant induction (> 10 nh) overshoot will be observed and for this reason the diode lead lengths must be extremely short (≤ 0.1 inches).
- 10) Monitor Function. The rear panel BNC connector provides a coincident replica of the output pulse. For $R_L \geq 1K$.

$$I_{LOAD} = 74 V_M \text{ (Volts, mA)}$$

$$\text{For } R_L = 50 \text{ Ohm}$$

$$I_{LOAD} = 148 V_M \text{ (Volts, mA)}$$

V_M is the monitor output Volt. Amplitude is determined using a scope.

- 11) The AV-155A unit can be converted from 110 to 220V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.
- 12) For additional assistance:
- Tel: (613) 226-5772
 Fax: (613) 226-2802

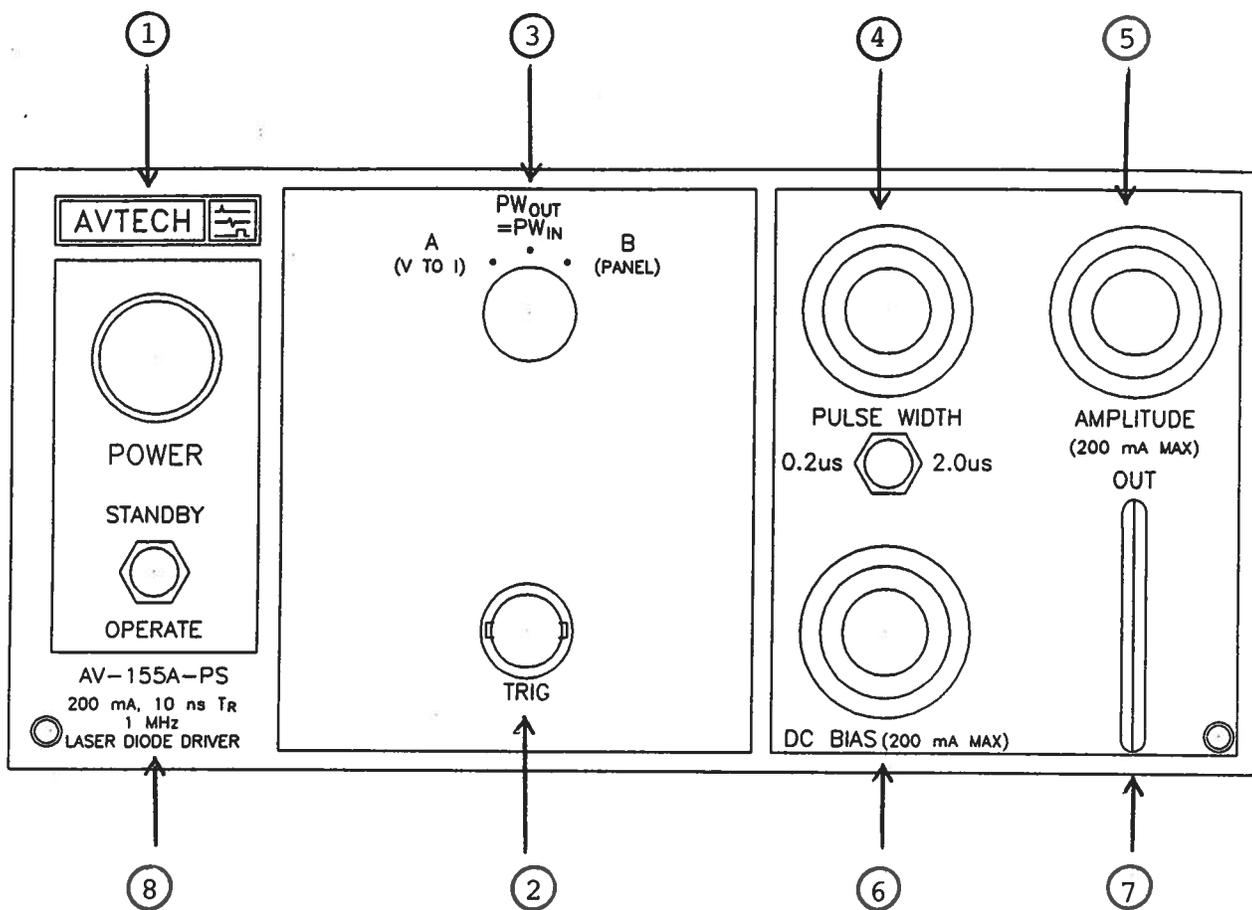


Fig. 2

FRONT PANEL CONTROLS

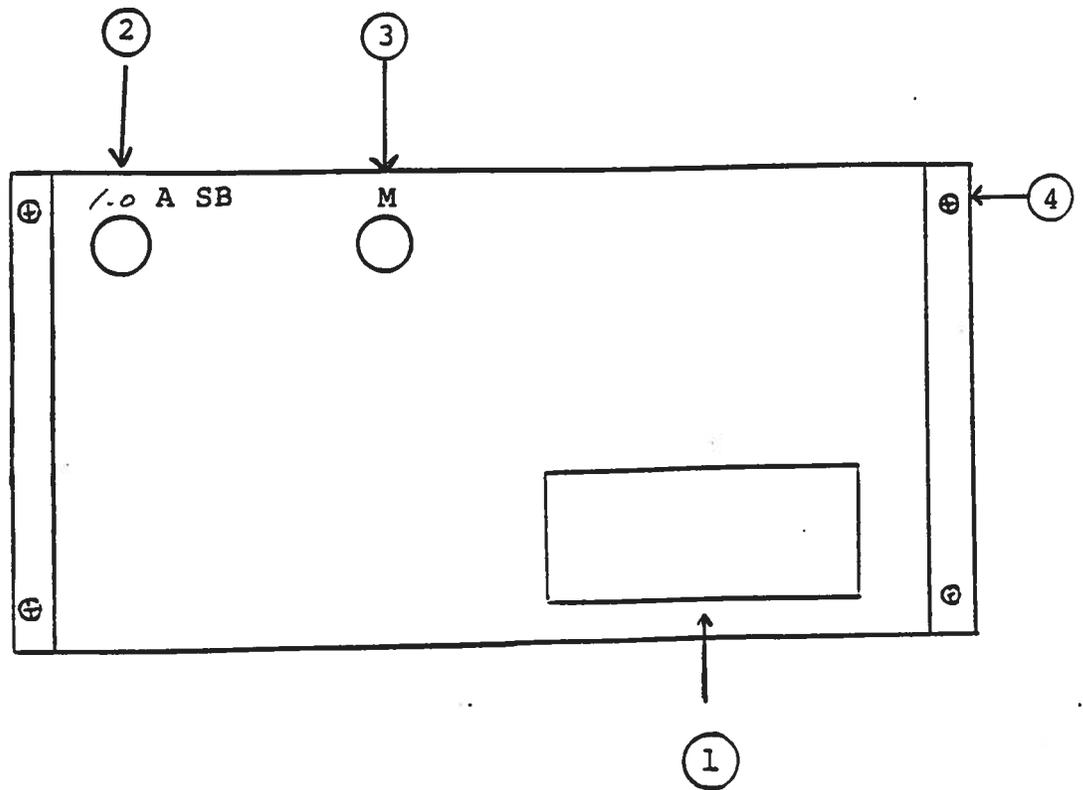
FRONT PANEL CONTROLS

- (1) POWER SWITCH. Applies power to all stages.
- (2) TRIG BNC MODE. When the MODE switch is in the A position, the unit operates as a voltage to current converter. ($I_{OUT} = 0.05 V_{IN}$). The front panel PW, AMP and DC bias controls are inactive. When the MODE switch is in the B position, the unit requires a +3 to +5 Volt trigger pulse ($PW \geq 50$ ns). The PW, AMP and DC bias controls are active in this mode. When the MODE switch is in the $PW_{OUT} = PW_{IN}$ position, the output pulse width equals the input trigger pulse width but the amplitude is controlled by the front panel AMP control.
- (3) PULSE WIDTH. Varies output pulse width as follows (B MODE only):

20 ns to 200 ns
200 ns to 2 us
- (4) PULSE AMPLITUDE. Ten turn amplitude control varies output pulse amplitude from 0 to +200 mA.
- (5) DC BIAS AMPLITUDE. Ten turn offset control varies DC offset from 0 to +200 mA (B MODE only).
- (6) OUT. 1 meter long AV-LZ1 flexible output line protrudes from the front panel. Diode load and series matching resistor to be solder connected to end of line.
- (7) STANDBY-OPERATE. When this switch is in the STANDBY position, a set of relay controls shorts out the laser diode whether the prime power is ON or OFF. When the switch is in the OPERATE position, the relay contacts open, provided the prime power is on. See the START UP and SHUT DOWN SEQUENCE notes preceding Fig. 1 for a full discussion of the operation of this switch.

Fig. 3

BACK PANEL CONTROLS



BACK PANEL CONTROLS

- (1) Power Entry Module. Detachable line cord connects to this point. Also contains voltage selector card and line fuse (0.50 A SB).
- (2) 1.0 A SB Fuse. Limits current supplied to the output stage.
- (3) Monitor Option. SMA connector provides a coincident replica of the output pulse. For $R_L \geq 1K$.

$$I_{LOAD} = 74 V_M \text{ (Volts, mA)}$$

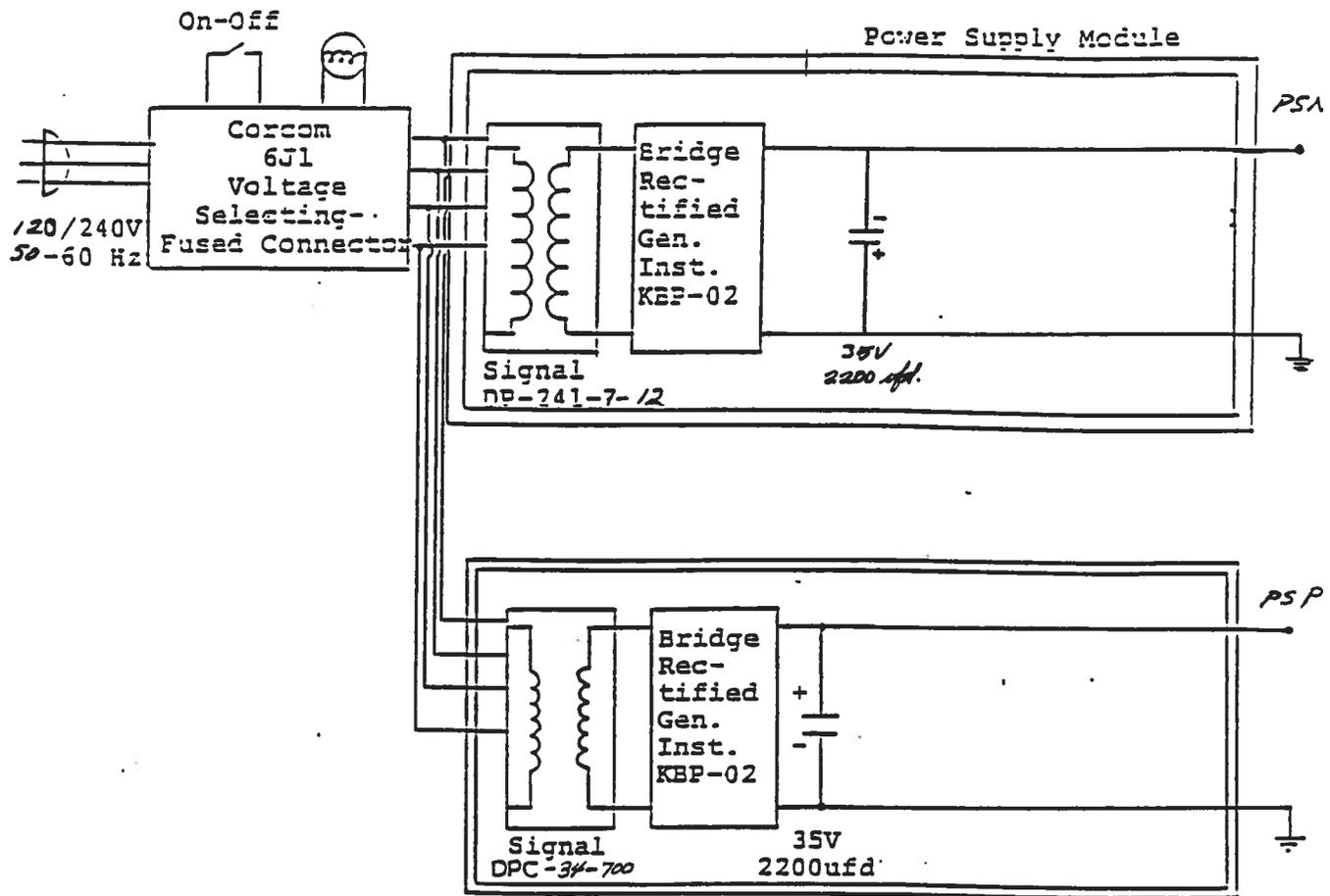
$$\text{For } R_L = 50 \text{ Ohm}$$

$$I_{LOAD} = 148 V_M \text{ (Volts, mA)}$$

- (4) Cover Screws. To remove the top cover, remove the 4 Phillips screws and the top cover may then be slid back and off.

Fig. 4

POWER SUPPLY



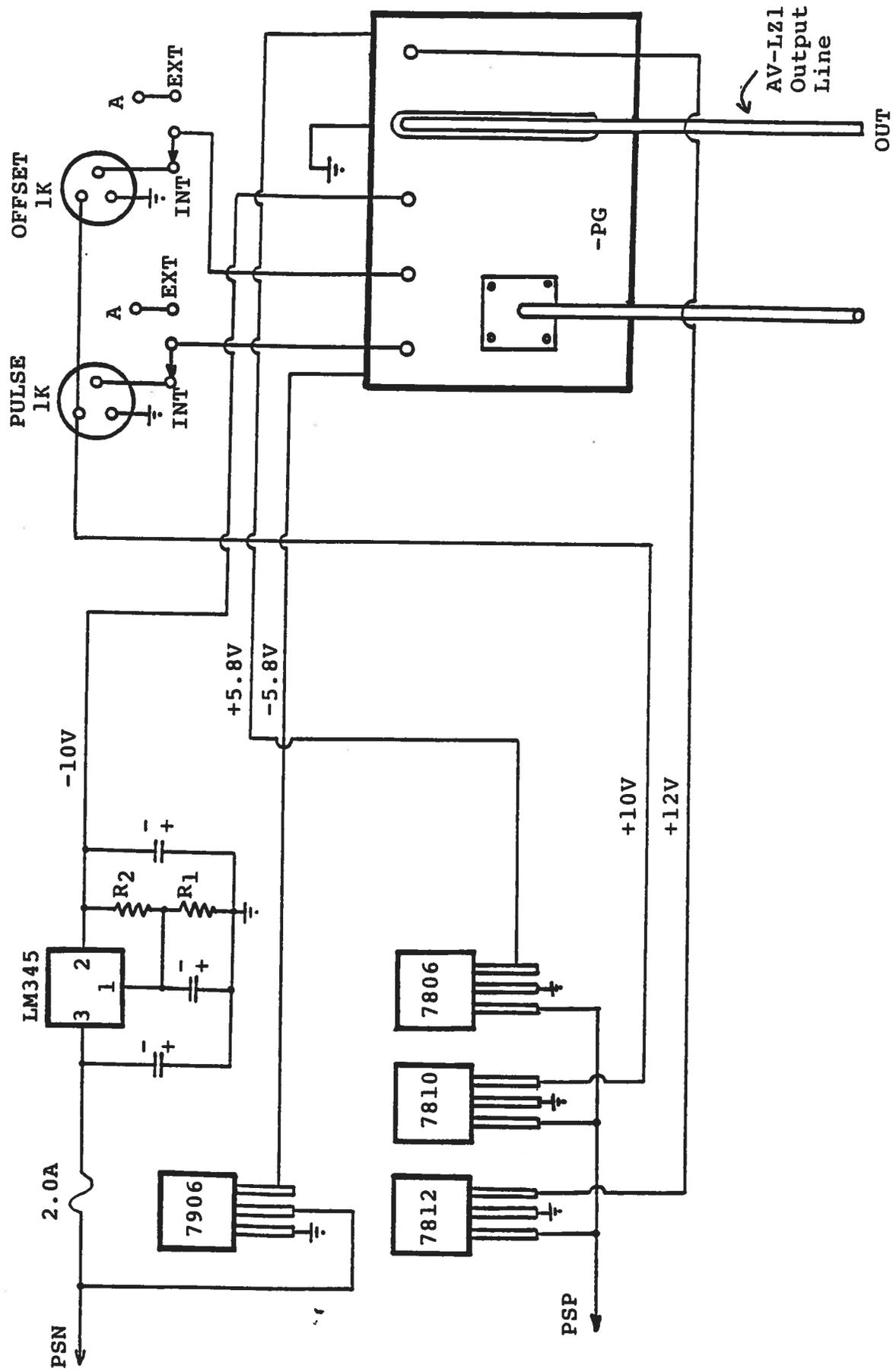


Fig. 5: AV-155-PS-DUP3 BLOCK DIAGRAM

February 27/98

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