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INSTRUCTIONS

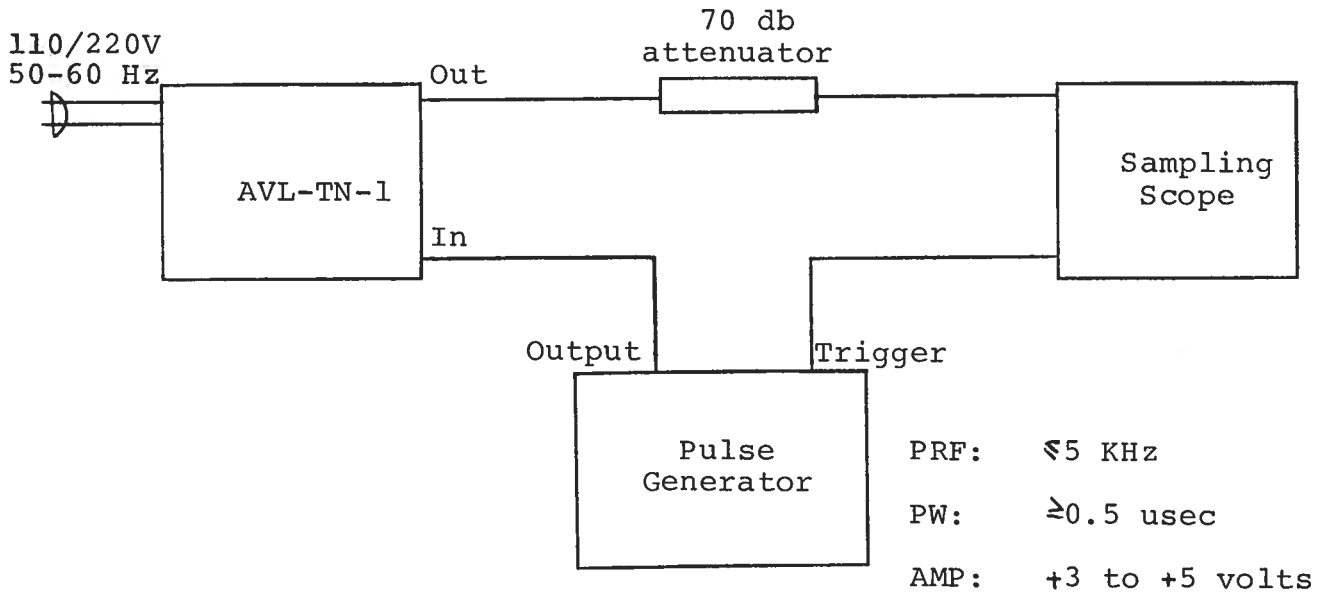
MODEL AVL-TN-1 PULSE GENERATOR

S.N. :

WARRANTY

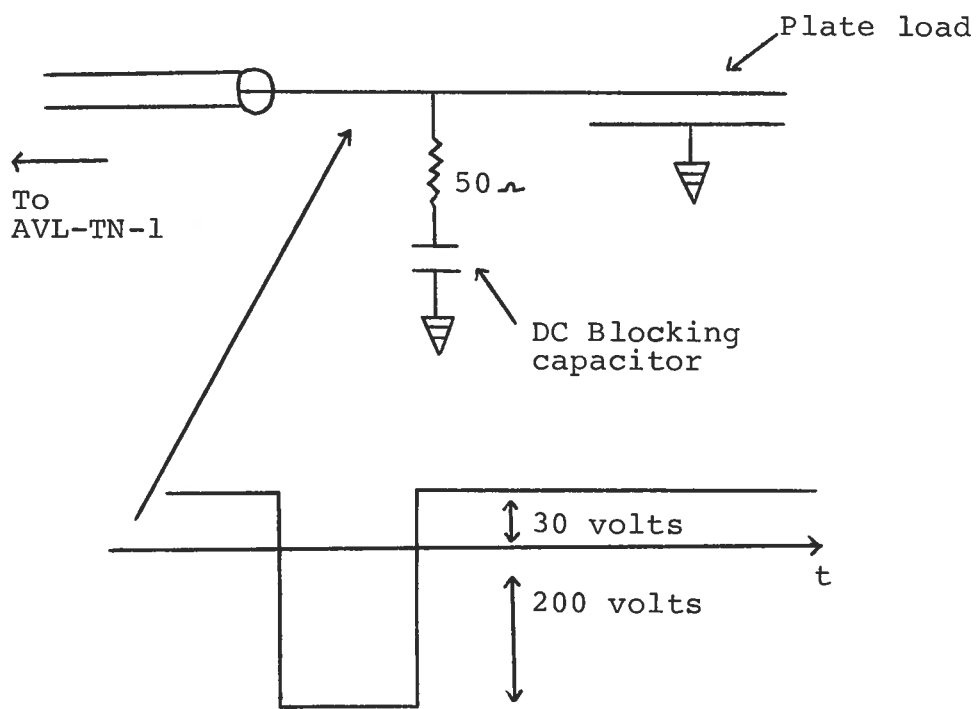
Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech 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.

MODEL AVL-TN-1 PULSE GENERATOR TEST ARRANGEMENT



GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 1.0 GHz.
- 2) The use of a 70 db attenuator will insure a peak input signal to the sampling scope of less than one volt. **WARNING:** Model AVL-TN-1 may provide a peak power output in excess of 2. KW. The peak power rating of the attenuator must exceed this limit.
- 3) In general, the source pulse generator trigger delay control should be set in the 0.1 to 1.0 usec range. Other settings should be as shown in the above diagram.
- 4) The Model AVL-TN-1 pulse generator can withstand an infinite VSWR on the output port.
- 5) **WARNING:** Model AVL-TN-1 may fail if triggered at a PRF greater than 5 KHz.
- 6) The output pulse width is controlled by means of the one-turn potentiometer (PW). The pot should initially be set mid-range and the pulse width adjusted using an oscilloscope. The output will degenerate to an impulse and eventually vanish as the pot is turned fully counter-clockwise.
- 7) The output amplitude is fixed at -230 volts to a 50 ohm load. An offset of +30 volts is applied to the output by placing the rear panel switch in the +30 volt position. The +30 volt supply is limited to a maximum current of 1 mA. Therefore a DC blocking capacitor should be used to insulate the DC offset from the 50 ohm load impedance. In the absence of a blocking capacitor, a constant DC current of 1 mA will flow to the 50 ohm load. The following circuit illustrates how a -230 pulse with a +30 volt offset may be applied to a low-capacitance plate load. Note that all leads should be as short as possible (≤ 0.1 inch).



- 8) Note: The lifetime of the switching elements in the pulse generator module is proportional to the running time of the instrument. For this reason the prime power to the instrument should be turned off when the instrument is not in use. In the case of failure, the switching elements are easily replaced following the procedure described in the following section.

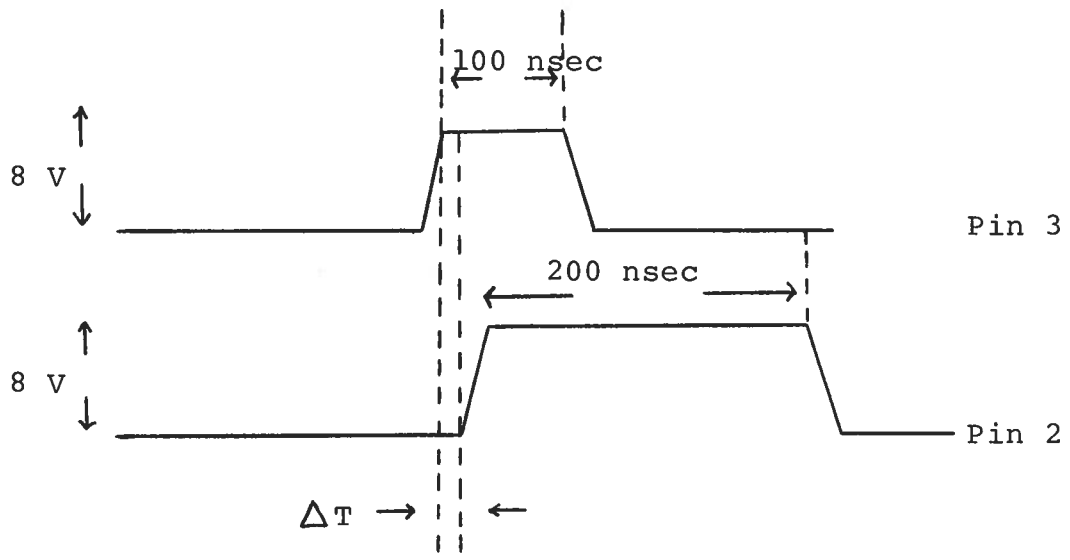
REPAIR PROCEDURE

- 1) WARNING: Before attempting any repairs, note that potentials as high as 370 volts are employed in the chassis structure.
- 2) The pulse generator is constructed from the following basic subsystems or modules:
 - a) Metal chassis
 - b) Pulse generator module (AVL-TN-PG)
 - c) Delay line module (AVL-2-DL)
 - d) Timing module (AVL-TN-T)
 - e) Power supply module (AVL-2-PS)
 - f) Power supply module (AVL-TN-PS2)
 - g) Power supply board

The modules are interconnected as shown in Fig. 1.

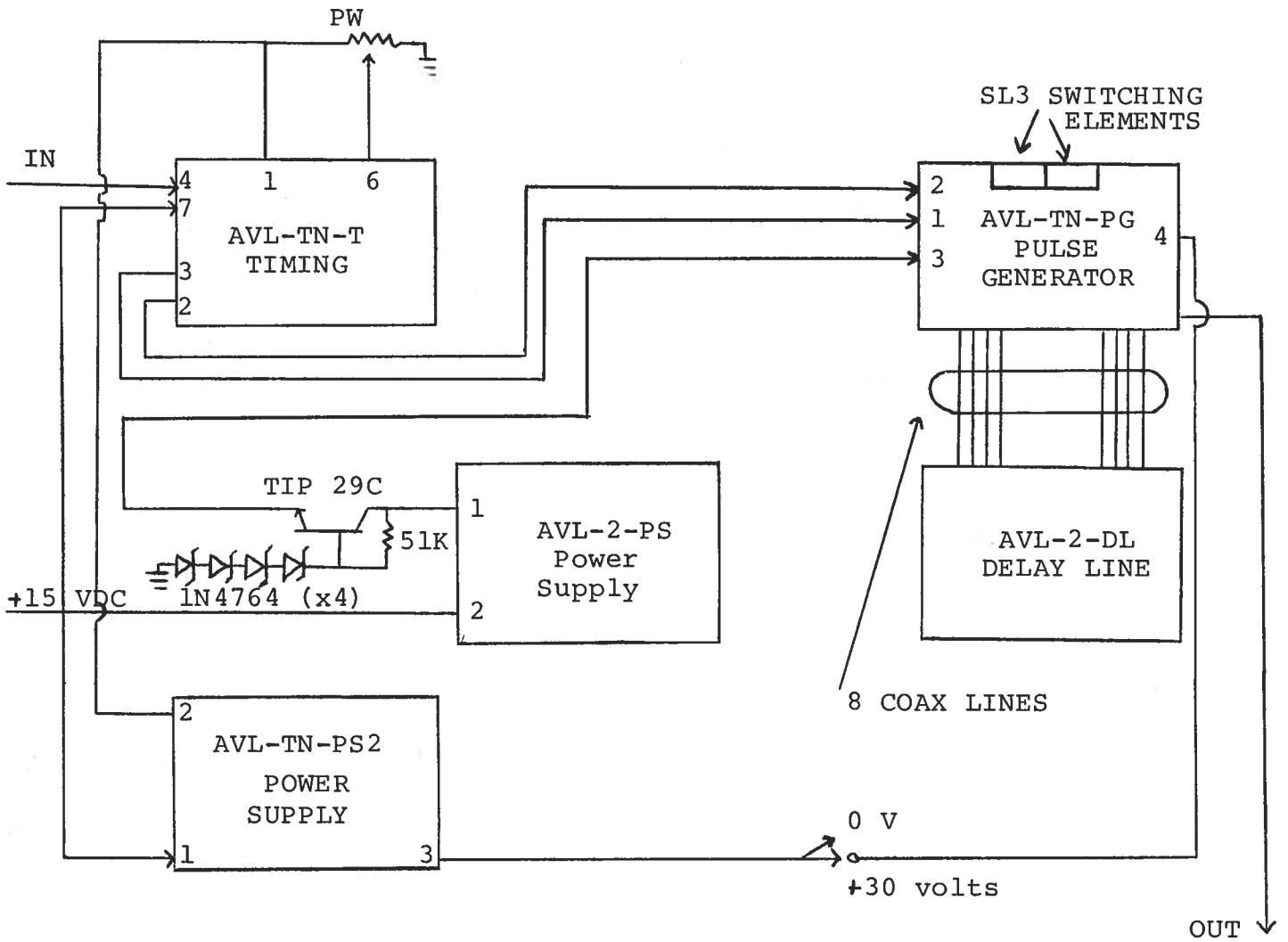
- 3) If no output pulse is provided by the AVL unit, turn off the prime power supply and remove the top cover panel by removing the four Phillips screws on the back of the instrument. Apply a scope probe or voltmeter to pin 3 of the AVL-PG unit. With the unit untriggered, turn on the prime power supply. A voltage of about 350 to 360 volts should be read at pin 3. Alternatively, the voltage may be measured on the cases of the SL3 switching elements. If the voltage is zero or much less than 350 volts, then one of the switching transistors (Part No. SL3) in the AVL-PG module has probably failed. With the prime power supply off remove one of the transistors by removing the two 2-56 screws which secure the transistor in its socket. CAUTION: Before touching or removing the transistor, the cases should be briefly shorted to the instrument case to discharge charged capacitors (as high as 400 volts). Pull the transistor out of the socket. With the unit untriggered turn on the prime power supply and measure the voltage from the case of the remaining transistor to ground. If this voltage is about 350 to 360 volts then the transistor which was removed is defective and should be replaced. If the voltage which is measured is less than 350 volts then the transistor still in position is defective and should be replaced. Note that the two transistors are completely interchangeable (Order Avtech Part No. SL3).

Note that with both transistors removed, the voltage at pin 3 on the AVL-PG module should be in the range of 350 to 360 volts. If the voltage is less then the AVL-2-PS module must be replaced. If both the AVL-2-PS module and the AVL-TN-PG module are not found to be defective then the AVL-TN-T module is suspect. Connect one scope probe to pin 3 of the -T module and a second probe to pin 2 of the -T module. With the scope triggered externally by the pulse generator providing the trigger input signal to the AVL unit, the waveform at pins 2 and 3 of the -T module should resemble:



As the PW pot is varied over its full range ΔT should vary from about 0 to approximately 100 nsec. If the waveforms at pins 2 and 3 do not resemble the above, then the -T module is defective and should be replaced. If the waveforms do resemble the above then the -PG module is at fault and should be replaced. Replacement modules should be ordered by part No. (eg. AVL-TN-PG) from Avtech. The AVL-TN-PS2 unit provides the +30 volt to the AVL-TN-OS unit and a -10V bias to the AVL-TN-T unit. The AVL-TN-OS unit inverts the output pulse generated by the AVL-2-PG unit and couples the +30 volt bias to the center conductor of the output line.

Fig. 1 SYSTEM BLOCK DIAGRAM WITH WIRING AND PIN CONNECTIONS

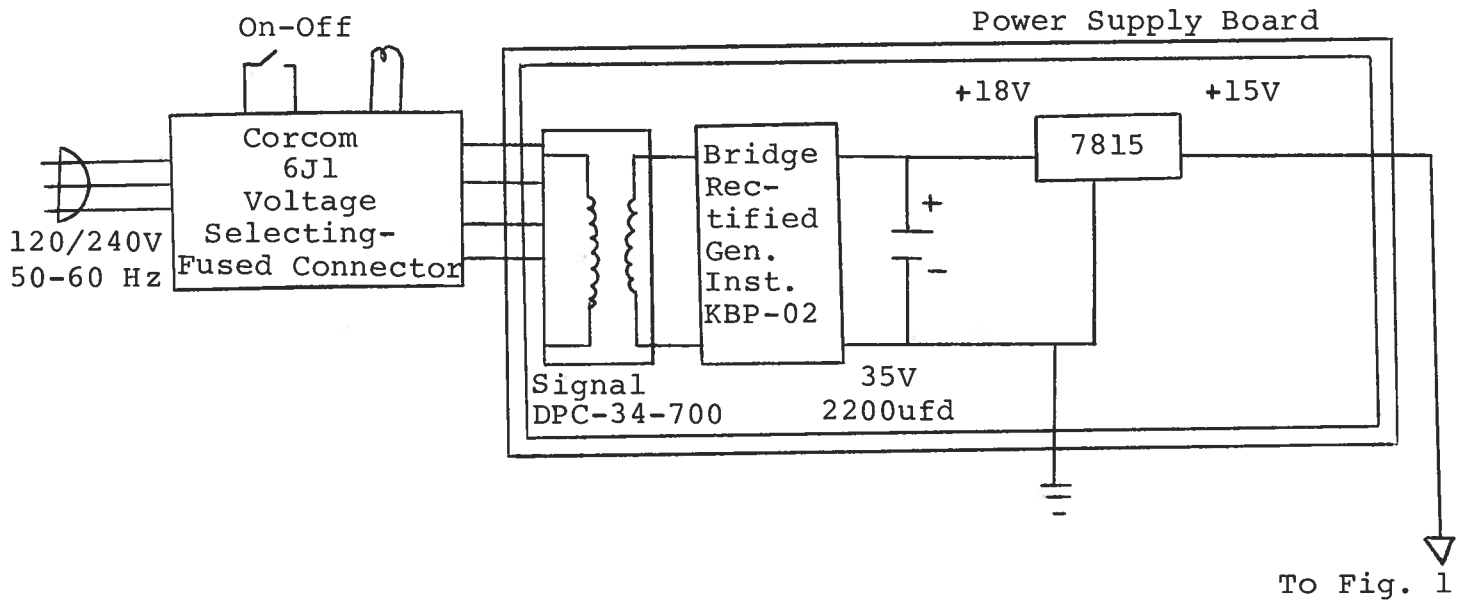


Note:

- 1) All interconnect lines are ribbon cable.
- 2) All module chassis are grounded to main chassis and to each other via separate ground lines.
- 3) **WARNING:** The line connecting pin 1 of AVL-2-PS to pin 3 of AVL-TN-PG is at a potential of 350 to 370 volts.
- 4) The power supply board supplies +15 volts (600 mA max) to the pulse generator modules. In the event that the AVL unit malfunctions, measure the voltage at the +15 V pin of the -T module. If this voltage is substantially less than +15 volts, unsolder the line connecting the power supply board and -T module and connect a 50 ohm 10 W load to the power supply output. The voltage across this load should be about 15 V DC. If this voltage is substantially less than 15 volts, the power supply board is defective and should be repaired or replaced. If the voltage is near +15V then see instructions in preceding section.

Fig. 2

POWER SUPPLY BOARD



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September 14, 1981.

Mr. John Bolton
Tracor Northern Inc.
2551 West Beltline Highway
Middleton, WI 53562

Dear John:

Re: Your letter of August 25, 1981

I am pleased to offer a quotation for the following special unit intended for possible application with the ITT 25 WM and IT 18 MM intensifiers:

Model Designation:	AVL-TN-1.
Output Voltage:	-230 V (fixed, to capacitance load shunted by 50 ohms).
Rise Time:	≤1 nsec to 50 ohm load, no capacitance. ≤2.5 nsec to 50 ohm load shunted by 32 pfd (ITT 18 MM). ≤4.0 nsec to 50 ohm load shunted by 60 pfd (ITT 25 MM).
Fall Time:	≤2 nsec to 50 ohm load, no capacitance. ≤3 nsec to 50 ohm load shunted by 32 pfd (ITT 18 MM). ≤4.5 nsec to 50 ohm load shunted by 60 pfd (ITT 25 MM).
Pulse Width:	Variable from 5 nsec to 100

nsec (FWHM) via one turn front panel control. Control could be remoted if necessary.

Jitter: <50 psec.

Rep. Rate: 0 to 1 KHz.

Delay: <100 nsec (can not achieve 50 nsec at this point in time for a unit providing a PW max of 100 nsec. Possibly could achieve 50 nsec for unit providing PW max of 30 nsec.

Output Bias: Provides fixed bias of +30V on output center conductor. ON-OFF switch included for the bias. 50 ohm resistor load must include blocking capacitor to insure that high DC current does not flow (see attached diagram).

Input Signal: TTL 5V, 0.5 usec.

Input Voltage: 110/220V, switchable, 50-60 Hz.

Input & Output Connectors: BNC.

Temperature Range: 0 to +50° C.

Dimensions: 4 x 6 x 8 inches. Avtech package style E, see Cat. No. 4, page 8.

Weight: 5 lbs.

Chassis Material: 20 ga steel, blue enamel with brushed Al front panel, engraved lettering.

Price: 1-4 units
5-10 units
11-20 units

Delivery: 1-4 units
5-10 units
11-20 units

Terms: 2% 10, Net 30 days.

Please contact me if you require any additional information or modifications to the above specifications.

Thank you for your interest in our products and we look forward to further word from you.

Yours truly,

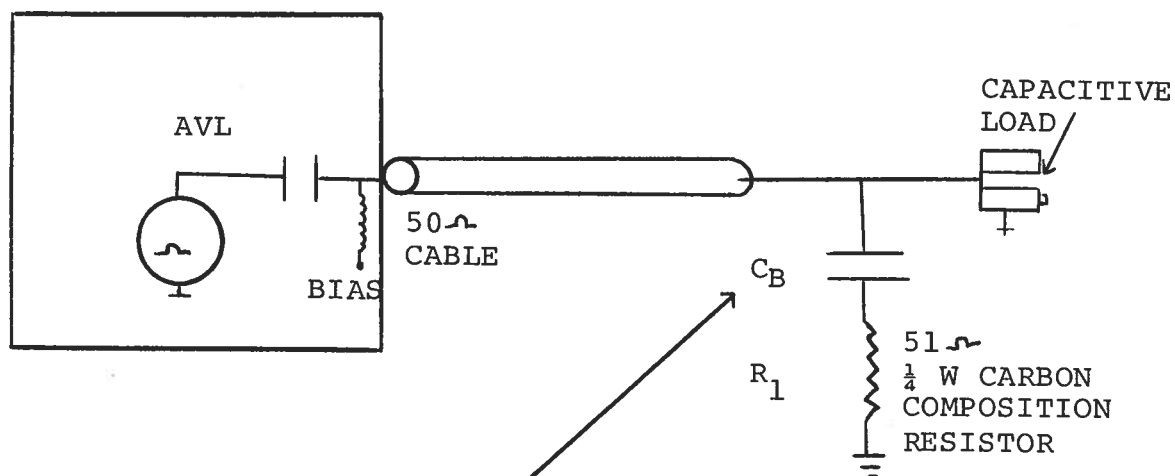
W.J. Chudobiak
Chief Engineer

WJC:pr
Encl.

CONNECTION OF CAPACITIVE LOADS

TO AVL PULSE GENERATORS

The AVL series requires a 50 ohm resistance load impedance. Therefore, capacitive loads should be shunted by a 50 ohm resistor as shown below. If a DC bias is to be placed on the capacitance load via an internal offset feature on the AVL unit, then a blocking capacitor C_B should be placed in series with the 50 ohm resistor to insure that a high DC current does not flow. Specifications for suitable resistors and capacitors are given on the following drawing.



0.1 ufd, 500 V
Ceramic capacitor
Erie Rep Cap type
8141-500 ZSU-104M is
suitable
All lead lengths less
than 0.1 inch.