

INSTRUCTIONS

MODEL AV-155A-PS-P LASER DIODE DRIVER

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

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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: AV-155A-PS PULSE GENERATOR TEST ARRANGEMENT
(RESISTIVE LOAD, NO DIODE)

GENERAL OPERATING INSTRUCTIONS

- 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 +20 mA
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) This instrument is supplied with two types of output cables, which can be plugged in the OUT socket on the front panel:
 - The LZ3 flexible flat transmission line, which has a 3 Ohm characteristic impedance and a length of 1 meter. The diode impedance should equal the characteristic impedance of the output line (3 Ohms). If the diode impedance is higher than 3 Ohms, the output rise time will be higher than 50 ns. This

problem may be solved by replacing the AV-LZ3 line with a higher impedance version.

If the diode impedance is less than 3 Ohm, the output waveform may exhibit severe overshoot. The addition of a small series resistor will serve to reduce the 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).

- The RG174 50 Ohm cable (15 cm). A low impedance diode load may be connected to the output of this 50 Ohm cable provide some pulse degradation can be tolerated. Note that the rise time will degrade severely if an attempt is made to extend this 50 Ohm line beyond 15 cm.

CAUTION: When plugging either cable into the front panel OUT socket, insure that the "OUT" on the cable PCB is adjacent to the "OUT" on the front panel

- 8) Monitor Function. The rear panel BNC connector provides a coincident replica of the output pulse. For $R_L \geq 10K$:

$$I_{LOAD} = 116 V_M \text{ (Volts, mA)}$$

For $R_L = 50$ Ohm

$$I_{LOAD} = 232 V_M \text{ (Volts, mA)}$$

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

- 9) The AV-155A unit can be converted from 120 to 240V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.
- 10) For additional assistance:

Tel: (613) 226-5772
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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. ($I_{OUT} = 0.05 V_{IN}$).
- (3) 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.
- (4) PULSE WIDTH. Varies output pulse width as follows (B MODE only):
 - 20 ns to 200 ns
 - 200 ns to 2 us
- (5) PULSE AMPLITUDE. Ten turn amplitude control varies and two position switch vary output pulse amplitude as follows:
 - 0 to +20 mA
 - 0 to +200 mA
- (6) DC BIAS AMPLITUDE. Ten turn offset control varies DC offset from 0 to +200 mA (B MODE only).
- (7) OUT. 1 meter long AV-LZ3 flexible output line protrudes from the front panel. Diode load and series matching resistor to be solder connected to end of line.
- (8) 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 $R_L \geq 1K$.

$$I_{LOAD} = 116 V_M \text{ (Volts, mA)}$$

For $R_L = 50 \text{ Ohm}$

$$I_{LOAD} = 232 V_M \text{ (Volts, mA)}$$

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

PERFORMANCE CHECK SHEET