MODEL 170 CONTINUOUS GAS LASER

I. UNPACKING AND OPERATION

The Continuous Gas Laser has been preadjusted and aligned at the factory and is ready for almost immediate operation as described below.

1. Unpacking: The Laser is shipped in specially designed packaging to minimize the risk of damage in transit. It is suggested that this packaging be retained for possible reuse should it ever be necessary to return the instrument to the factory for repair.

2. Operation: Turn on the power switch, and then momentarily switch to start position thereby igniting the plasma tube. A pink glow emanating from the tube will indicate that ignition has occurred. If the tube has not ignited, wait several seconds and again switch to start position.

It has been found that in all gas Laser tubes there is a gradual loss of power due to the diffusion of helium through the tube walls. In order to compensate for this, the Laser tube has been overfilled during manufacture. As a result, the Laser output may initially be somewhat below its rated value, but the signal strength will increase with time as the gasses approach optimum pressure.

If Laser action does not occur, the "Plasma Tube Alignment" procedure detailed in the next section should be followed. It is recommended that the operator not attempt to achieve Laser action by random plasma tube adjustment.

II. PLASMA TUBE ALIGNMENT

If the plasma tube fails to produce the Laser beam after warmup as discussed above, the plasma tube has become jarred out of alignment during shipment. Since the Laser was tested in operation at the factory, misalignment will be very slight, and Laser action can be quickly restored by small adjustments of the alignment mechanism following the steps exactly as outlined below. Free-lancing or short-cuts in alignment procedure won't work - don't try them!)

1. With the tube on, locate the unit such that the output beam will appear on a light colored surface when laser action occurs. If an OTI power meter is available position the detector head in front of the output end.

2. Position yourself behind the unit (i.e. the end opposite the output beam) with a small bladed screwdriver in hand.

3. Insert the screwdriver into the horizontal adjustment access hole located on the right hand side of the top cover and engage the slotted adjusting screw.

4. Rotate the screwdriver clockwise to a maximum of 10 clicks, (you will feel a positive detent at each click) and observe the appearance of, or lack of, a laser beam.

5. If laser action does not occur rotate the horizontal adjustment 10 clicks counter-clockwise to return to zero.

6. From the zero position, rotate the horizontal adjustment a maximum of 10 clicks counterclockwise and again observe whether laser action occurs.

7. If at the completion of this excursion, no laser beam is seen, rotate 10 clicks clockwise to return to zero and remove the screwdriver from the horizontal adjustment screw.

8. Insert the screwdriver into the vertical adjustment access hole located on the top surface and repeat steps 4 through 7, i.e. 10 clicks clockwise, 10 clicks counter clockwise, 10 more clicks counter clockwise and 10 clicks clockwise to return to zero.

9. You have now completed a systematic search pattern along the horizontal and vertical axis in both the plus and minus direction from zero.

10. In most cases Laser action will have appeared during the previous search pattern. If, however the Laser beam has not appeared, the misalignment lies in some angular deviation from center, i.e. a combined component of both the vertical and horizontal movements, and a more complex search pattern is indicated.

11. Return to the adjustment screws and rotate 1 click clockwise on the horizontal adjustment and 1 click clockwise on the vertical adjustment. Continue adjusting, 1 click at a time on both axis until a maximum of 10 clicks has been registered on both axis. If laser action did not occur during this sequence, reverse the order to return to zero.

12. Search further by a combination of clockwise horizontal adjustment and counter clockwise vertical adjustment as in step 11.

13. If there is still no Laser action continue by using a combination of counter clockwise horizontal movement with clockwise vertical movement. To complete the final quadrant use a combination of counter clockwise rotation on both the horizontal and vertical adjusting screws per step 11.

NOTE: Always return the adjustment to the initial zero. Before attempting further changes in direction such that the search is <u>always</u> systematic and without guesswork.

14. Once the Laser beam appears, small adjustments in either or both of the axis will produce a maximum output. This event is best observed by a suitable detector; if such a unit is not available however, project the beam onto a light colored wall six to eight feet away and make the necessary adjustments to produce a spot of maximum intensity.

The maximum travel on the horizontal axis is 110 click stops, and on the vertical axis 180 click stops. If all else fails, rotate the horizontal adjustment screw clockwise until a solid stop is felt and back-off approximately 55 clicks. Having done this, move the vertical adjustment in a clockwise direction also until the stop is felt and reverse rotation for 90 clicks.

You are now in the approximate center of alignment and further excursions from this position should be controlled by the previous alignment procedure.

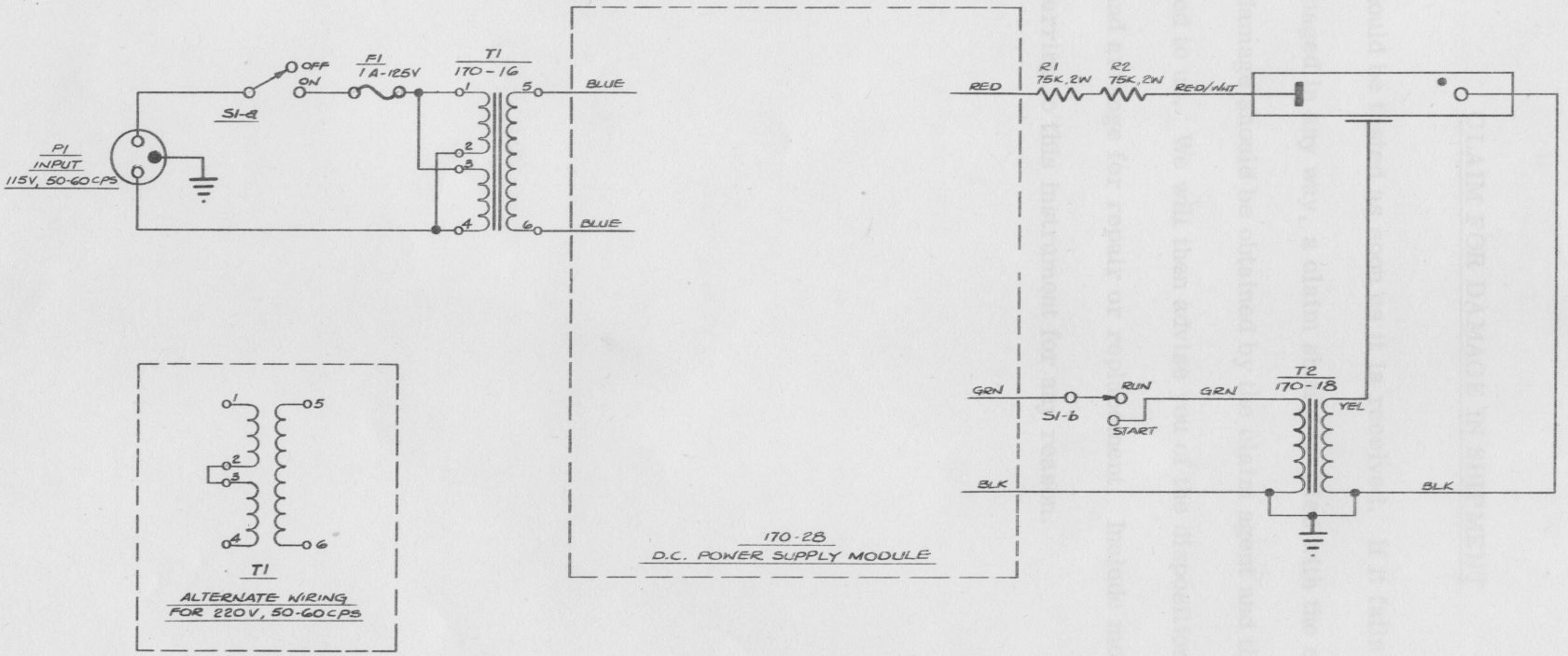
III. MAINTENANCE AND SERVICING

The sections below detail the few routine service operations associated with the use of this equipment.

1. Fuse Replacement: A fuse is located on the inside of the transformer housing; a blown fuse is indicated by the inability of the plasma tube to operate. Only one Ampere fuse should be used as replacement (Littlefuse No. 312001 or equal).

2. Parts Replacement: When ordering replacement parts, always refer to the Laser serial number and specific part number.

The plasma tube has an operating life in excess of one hundred hours and will not require frequent replacement. But, when necessary, the tube may be replaced



T1

ALTERNATE WIRING
FOR 220V, 50-60 CPS

TOLERANCES (EXCEPT AS NOTED)	OPTICS TECHNOLOGY, INC		
DECIMAL ±	—	SCALE —	DRAWN BY C.A.BERNARDO
FRACTIONAL ±	TITLE SCHEMATIC CW DC LASER		APPROVED BY
ANGULAR ±	DATE 2-4-66	DRAWING NUMBER 170-29	