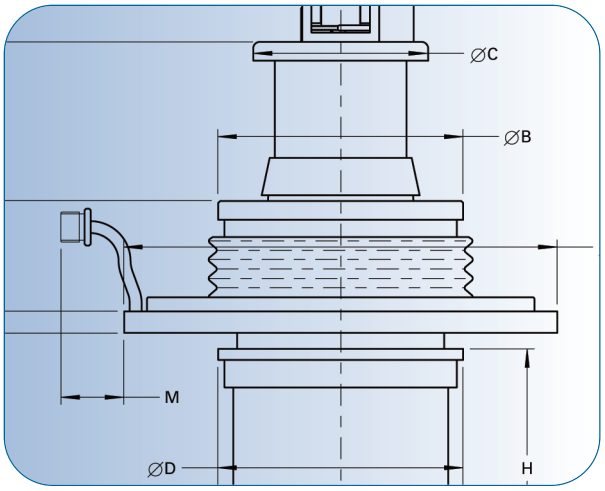
Electron Devices

# TECHNICAL BULLETIN

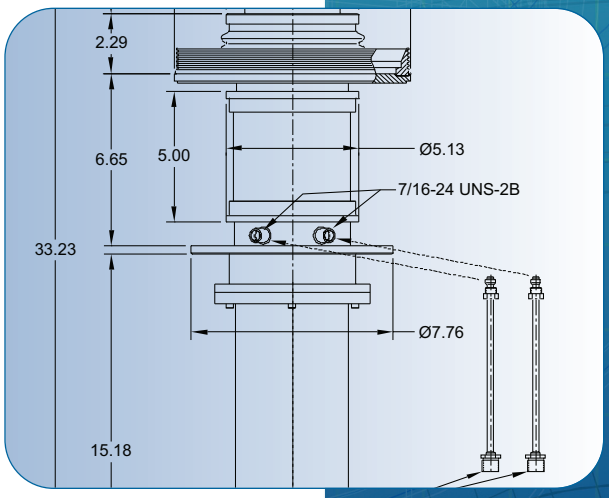
## USING THE L-3 IOTD-130D AS A REPLACEMENT FOR THE E2V D2130

This IOT was designed as a direct replacement for the e2v D2130 tube to be used in an existing e2v trolley.

- The primary difference between the D2130 and the L-3 IOTD130D is the location of the upper cooling pipe connections. The L-3 IOTD130D utilizes the standard drift tube cooling method with an isolated body/collector as opposed to the D2130 anode cooling and non isolated body/collector.




E2V D2130




L-3 IOTD

- The L-3 IOTD130D is supplied with water pipe adapters. Each adapter threads into the body drift section of the IOT and is sealed into place with the supplied "O" ring. The other end of the adapter is an Imperial Flex fitting that is identical to the fitting that is employed on the D2130 anode cooling lines. Connect the transmitter cooling hoses to the new Imperial connections; no extra plumbing or fittings are required.
  - It is always good practice to check the cooling trip point (minimum flow) when installing a new tube. The minimum flow through the body drift section is 1.3gpm. The collector is 14.5gpm.
- The collector cooling fittings are identical and are supplied with new gaskets.
- The L-3 IOTD130D utilizes a vac-ion pump to remove ions from the tube vacuum envelope. The connector on the L-3 tube differs from the D2130 therefore the tube is supplied with the ion cable that has the appropriate connectors in place. It simply substitutes for the D2130 ion cable.

Powering Microwave Systems into the Future

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- Good engineering practice suggests checking and verifying optimum electrode potentials when an IOT is replaced. Prior to applying high voltage and RF drive, the following procedures should be followed:
  - All L-3 tubes have the proper filament (heater) voltage labeled on the nameplate decal located on the collector. Adjust the transmitter's heater voltage to the nameplate value. Make the measurement in the high voltage junction box where the tube leads are connected.
    - **L-3 heaters operate at approximately 6.0vdc**
    - **D2130 typically operates between 7 to 8vdc**
  - Some transmitter manufacturers have implemented a black heat or passive standby mode. Heater voltage should be set to 1.0vdc lower then operating voltage if this mode is used.
  - L-3 IOTD130D is supplied with a test data sheet from factory testing. Locate the value of the bias (grid) voltage on the test data sheet. This voltage will serve as a starting point for setting the tube's idle current. L-3 recommends setting the starting point at least 10 volts higher (more negative) to compensate for calibration errors and ensure that the tube is cut off on first application of high voltage. If the data sheet is not available set the voltage to -150vdc.
  - Upon application of beam voltage the grid (bias) voltage should be adjusted for a beam idle current of 500mA ± 50ma.
  - If the cavity tuning was not disturbed during IOT disassembly/assembly then the tuning should only require some small adjustments to maximize performance and correct for differences in tube capacitance. Tuning should be performed by sweeping the tube and adjusting the input cavity for a minimized reflected response over the channel of operation then the output cavities and coupling adjusted for proper gain and bandwidth while maintaining flatness of ± .5dB over channel of operation.
  - If cavity tuning has been disturbed or new parts changed as well, refer to the trolley manufacturer's instruction manual to obtain the initial cavity settings for the channel of operation.
  - When the tube is properly tuned and video is applied it may be necessary to perform new corrections to ensure response is in compliance with the FCC mandates.


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