



TIDI

TIDI CDR

Fiber Optic Design

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TELESCOPE SUBSYSTEM

- **Fiber Optic Design**

- Requirements
 - Manufacturing Issues
 - Alignment issues
- Telescope Profiler**
- Top Deck Routing
 - Fab and Test Flow

- **Requirements**

- Combine 4 Telescope and 1 cal. optical inputs into a common Profiler input .

		# fibers
– Optical Field		
– Telescope	0.283 x 006 (in) rectangle	390
– Calibration	1.15 (in) dia. circular	350
– Profiler	5 ea. 90o co-axial sectors	390/field

- **Packing Factor ~ 0.75**
- **Fused Silica fibers with 50 μm core**
- **Provide mechanical protection to the optical fibers**
- **provide 1 pixel repeatability in bundle position for mate and de-mate**
- **Prevent optical fiber breakage**
- **Provide flexible interface across telescope gimbal**
- **Captive hardware for interface connections**
- **Estimated weight = 0.75 kg**

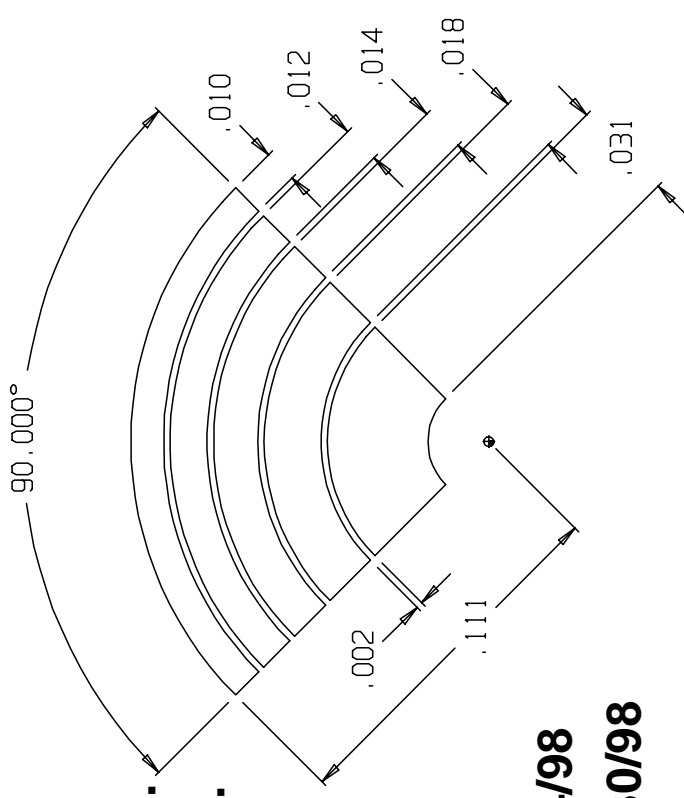
- **Manufacturing Issues**

- Fibers purchased from: **Fiberguide Inc.**
Poly Micro Inc.
- Engineering F.O. mfg. by **Dolan Jenner**
- Tolerance requirements
- Sheathing
- Deliver Schedule

Test cable delivered 3/4/98
Engineering cable delivered 4/30/98

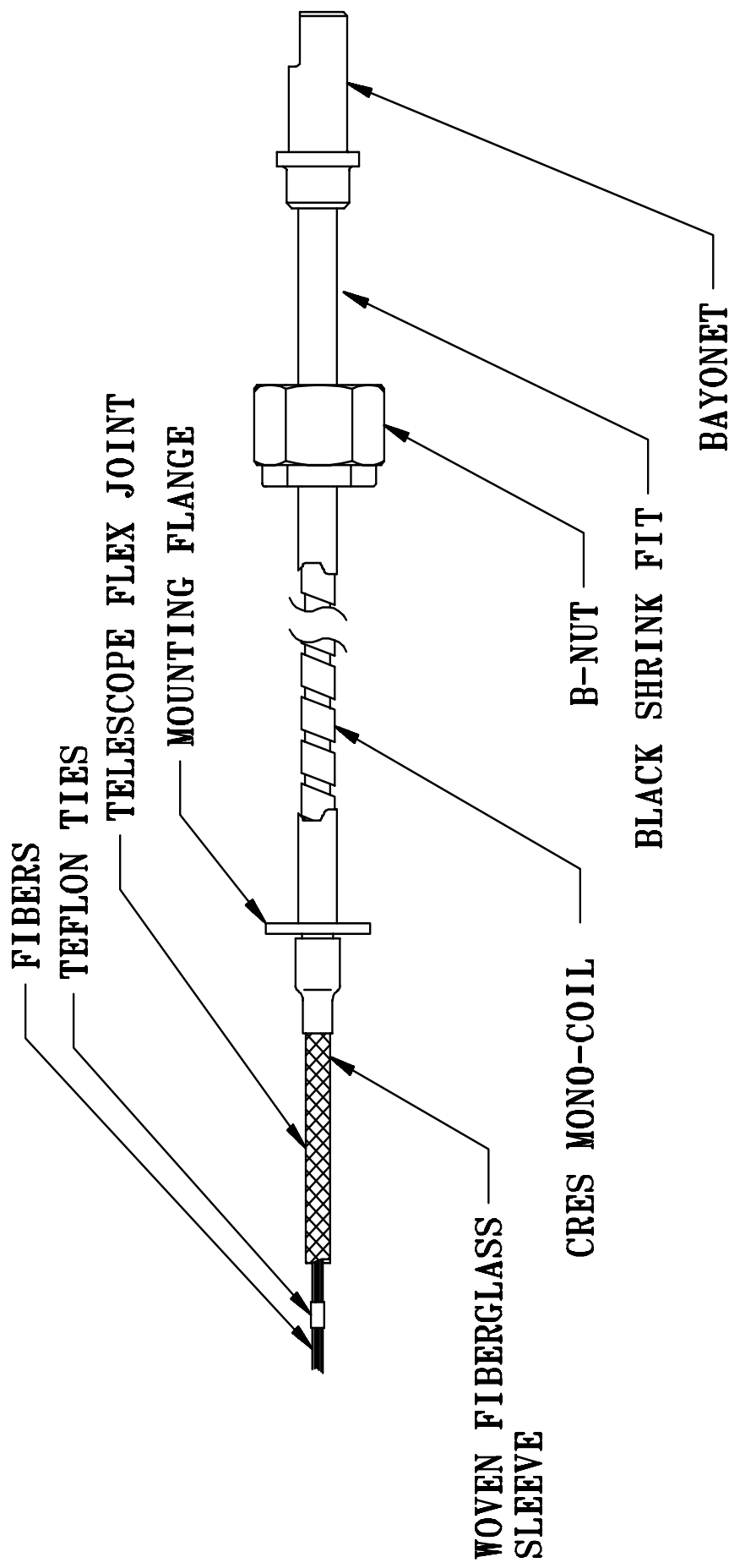
- **Flight Cable**

- Dolan Jenner chosen vendor
- No Major Issues



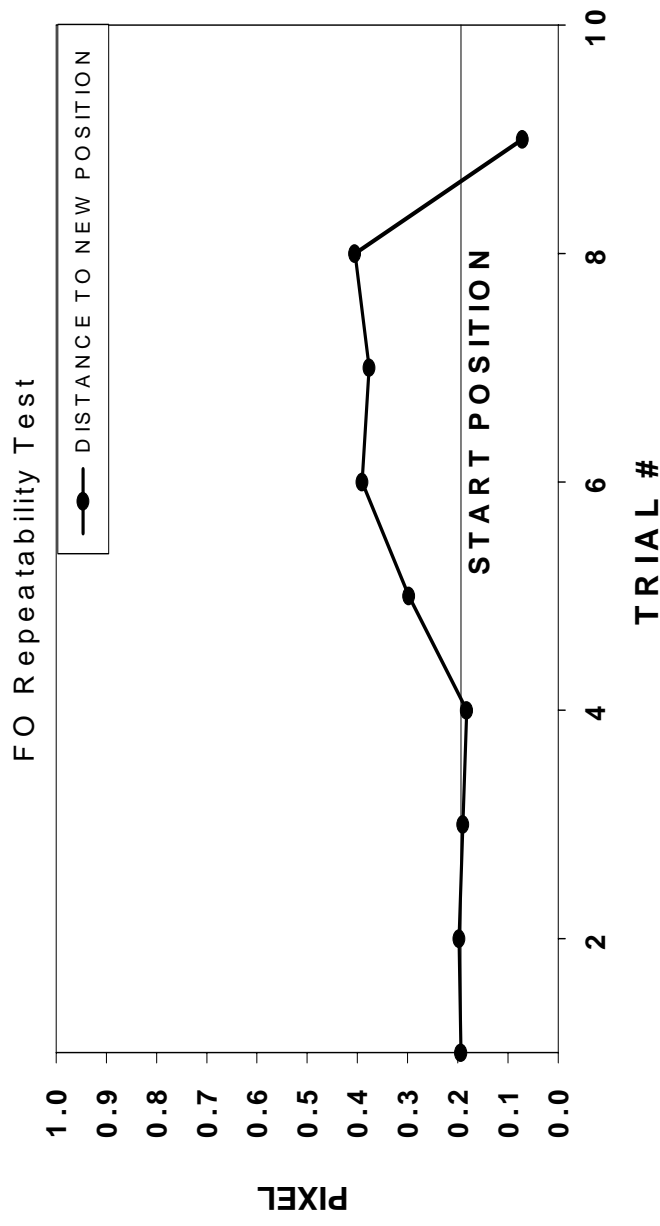
PROFILER FIBER OPTIC FIELDS
ASSEMBLED DIMENSIONS (in)

- **Fiber optic cable assembly details**



- **Alignment Test Results**

- Repeatability requirements:
1 pixel @ detector
1.9e-4 in @ FO
- Repeatability measured by test on optical breadboard and Lab CCD camera.
- Results:





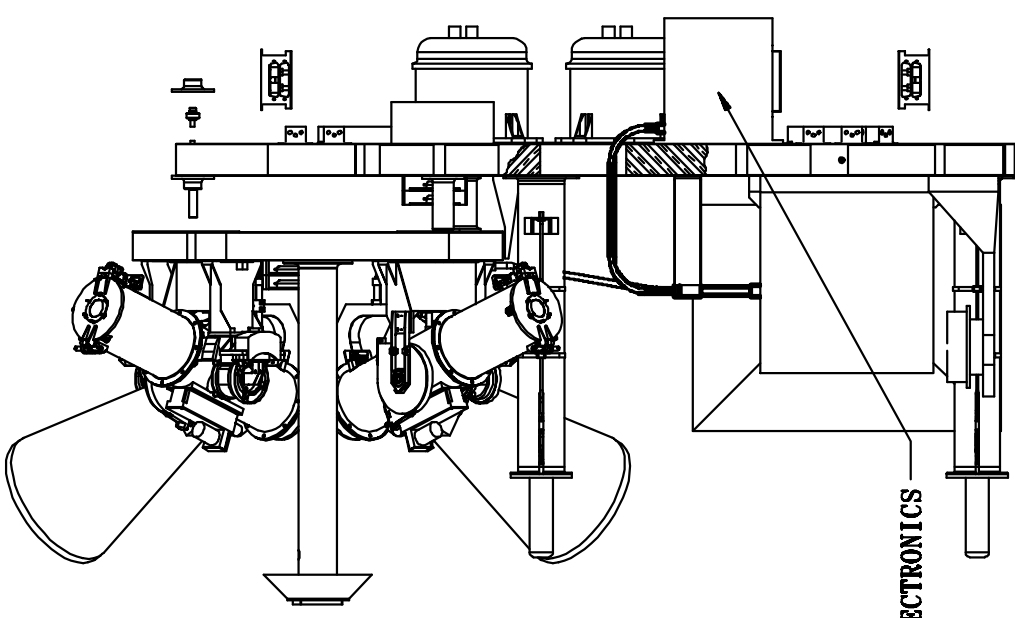
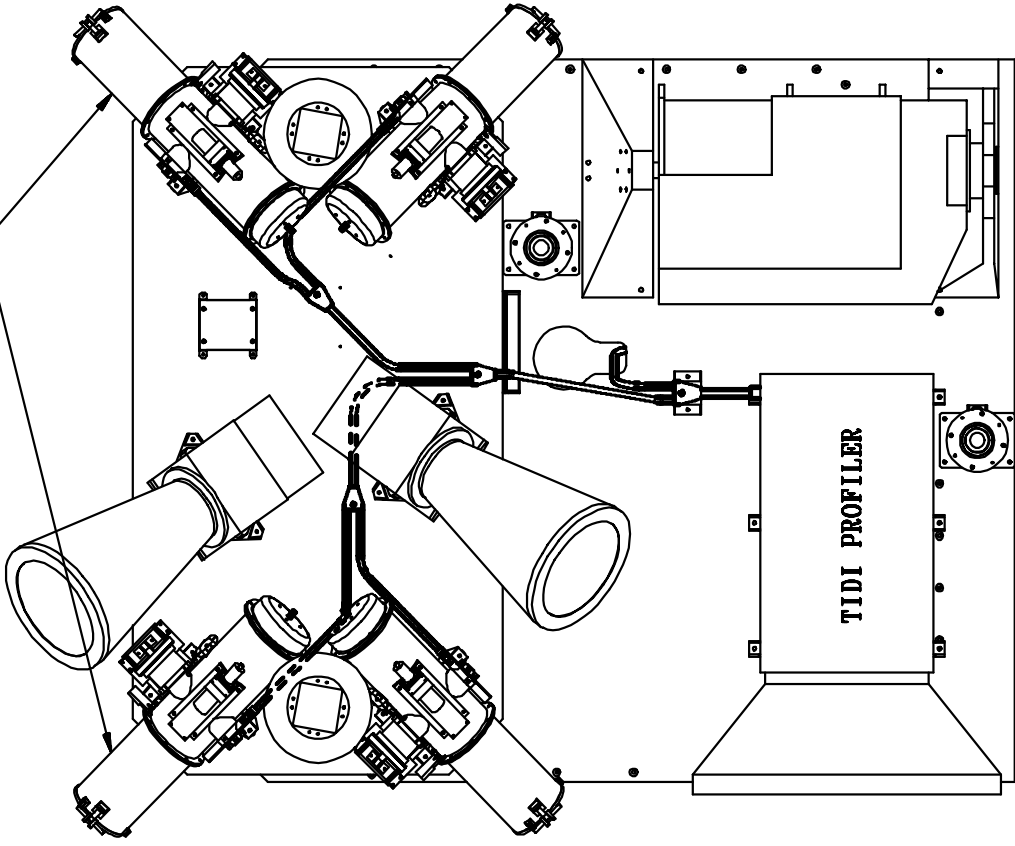
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TOP DECK ROUTING

- **Top Deck Routing**
 - Final lengths to be determined by S/C engineers before flight F.O. purchase order
 - Fiber optic assembly integrated like an electrical harness
 - Hard point attachments at each junction
 - F.O. connections made after TIDI components installed

PRELIMINARY TOP DECK ROUTING

TIDI TELESCOPES



FIBER OPTIC FAB/TEST FLOW

• Fab and Test Flow

