

HAM ISI List of “Gotchas,” Needs, and Reminders

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1 Needs

- Small portable 10-ton press to press in dowel pins, GS-13 bushings, bearing for trolley wheels, etc.
- Official hardware count.
- 25 ft. of 15 and 25 pin, Class B patch cables for CPS satellite boxes and GS-13s.
- Official mass budget at each bulk stage of the build. E.g. with optics table, but no GS-13s or side-walls.
- 1/4-20x2.5” silver plated, vented hardware to secure hockey puck adjustment masses.
- Class A vacuum podded STS-2. Must also include lifting chain, lifting braces, breakout box, locker box, host box and the following cables: 25 pin Class B STS-2 to Breakout, 9 pin Breakout to locker box cable, orange breakout to hostbox cable, hostbox to readout box cable
- Testing patch cables, each about 25 *ft* in length. This includes six (2) D3 Male to Female cables for Actuator Power, four (4) D25 Male to Female cables for GS-13, and two (2) D15 Male to Female cables for Position Sensor Satellite Boxes.
- End of assembly procedure. This includes position sensor and GS-13 installation, adjustment mass placement, wiring and cabling of electronics, routing pictures, etc.
- Class B 1/4-20x2.5” bolts and nuts to attach HAM6 feedthroughs to actuator securing braces, when you mount the the feedthroughs for testing.
- Class B 1.5 mm allen wrench for position sensor targets.
- Class B ~2 inch flat head screw driver for actuator power cable hook-up.
- At least 6 Class B dial indicators, and posts of varying lengths with 1/4-20 bolt ends.
- Class B Files, of varying lengths and sizes
- Class B feeler/depth gauge

2 Reminders

- BNC cables from position sensors to satellite boxes CANNOT be extended or patched. They are calibrated for that length of wire, and longer will introduce unwanted signal noise.
- Position sensor satellite boxes MUST an evenly balanced 18 V. Op-amps on the CPS circuit boards are very sensitive to powering without equal voltage.
- Helicoil cable breadboards.

- If GS-13s aren't unlocking, one can try an "emergency unlocking" by cranking up the voltage on the locker box to 15 to 17 Volts. It also helps to be as close the pod as possible, i.e. use a breakout board at the HAM6 vacuum flange.
- Use the GS-13 emulator box to test the cabling that goes to the GS-13 vacuum pod. The cables MUST be pinned right, or it jams the locking motor or fries the internal pre-amp board.
- Drill out cable side of actuator power holes to accommodate larger cable diameter.
- Install septum window cover before any work is done inside HAM6.
- Insulate all CPS BNC barrel connections. They are very sensitive to electrical shorts.
- Optimize adjustment plate mass placement such that no keel mass on panels under H3, and to the left of V2 (i.e. the sides that are perpendicular to the support tubes).
- Remove backshells of patch cables on "clean side," so that they connect well with feedthroughs and satellite boxes.
- Modify D3 actuator power cables such that shield wire cannot touch backshell.
- Pay attention to non-silver plated bolts. Any bolt going into stainless should be silver plated!
- The following modifications were made to ISI Coil Drivers (S/n's 101 and 103) by Rich Abbott. See http://ilog.ligo-la.caltech.edu/ilog/pub/ilog.cgi?group=detector&date_to_view=03/07/2008&anchor_to_scroll_to=2008:03:07:13:35:28-abbott
 1. Changed $R_4 = R_{20}$ from $10\text{ k}\Omega$ to $100\text{ k}\Omega$. This increases input impedance and decreases voltage divider action with the output resistor in the AI chassis.
 2. Omitted R_{15} . This sets the input differential receiver gain to 1/2 Volts per Volt.
 3. Omitted R_1 . This eliminates one of the two dewhitening stages.
 4. Changed C_{Add1} to 33 pF . This change stabilizes the whitening stage to avoid a $\sim 1\text{ MHz}$ oscillation.
 5. NOT DONE: Change $R_{47} = R_{46}$ to $2\text{ k}\Omega$. Brian O. wants to think more about the implications. We have plenty of time to do this in the future.