

Schedule Overview

- Major Milestones:
 - Begin SSD production: April '01
 - Balloon flight: June '01
 - PDR: LAT Aug. 1, '01; TKR July?
 - Completed requirements documents and ICDs, schedules & budgets.
 - All dimensions final, with complete drawing package.
 - Designs and prototypes of all assembly fixtures.
 - Payload attachment finalized and tested.
 - Drafts of all assembly and production testing procedures.
 - Prototypes of trays, ASICs, and other electronics components.
 - ASIC devel. complete: Dec '01
 - E/M ready for test: May '02
 - Begin production of FE electronics modules: June '02
 - CDR: LAT July '02; TKR ?
 - All documentation and drawings ready for production and under configuration control.
 - Engineering model complete with most testing done.
 - Begin tray assembly: April '03
 - Qual towers completed: Sept '03
 - All towers completed: May '04

Engineering Model Definition

- Mechanical:
 - Complete tower of 19 trays to the final design, with trays fabricated in industry.
 - Trays loaded with converters and bias circuits, plus plane aluminized Si wafers assembled into ladders (preferably with wire bonds and encapsulation).
 - Full set of MCM boards and readout cables, with MCMs loaded with resistors (instead of ASICs) for the proper power and heat load. Complete with 90° interconnects, wire bonded and encapsulated.
- Electrical:
 - Up to 3 fully instrumented trays *in addition to* the mechanical tower. Minimum of one side of one tray fully instrumented. The decision will depend on whether we can do a wafer run of front-end chips on this time scale.
 - One or two complete cables of 9 MCM boards, each with at least one GTRC and one GTFE64, connected to the TEM.

Other Near-Term Reviews

NASA NAR

- At PDR time.

First Lehman review (D.O.E.)

- February 13, 14, 15 of 2001
- Schedules, budgets, funding, work breakdown, planning all in place

Electronics

- Requirements review of system, GTFE64, and GTRC in January.
- PDR of the same in June.
- CDR before fabrication run of ASICs

Budget Overview

- TKR budget from our NASA proposal roughly categorized by myself:

Management & system engineering	\$1,954
Project support	\$45
Travel	\$397
Tray/Tower Mech. Design	\$757
Fab tray panels, side walls, etc.	\$1,524
SSDs	\$8,220
QA and parts qualification	\$143
Electronics design	\$1,107
Electronics fabrication	\$1,392
Tray-assembly design, facilities, fixtures	\$2,010
Tray assembly	\$1,124
Engineering Model, including test	\$375
Fab readout cables	\$191
Tower assembly	\$173
Flight tower test and calibration	\$200
I&T	\$282
Balloon flight	\$50
Total	\$19,944

- Funding sources assumed in our NASA proposal:

Total	\$ 19,990
SLAC	\$ 9,877
UCSC	\$ 1,087
Hiroshima University,	\$ 4,796
INFN, Italy	\$ 4,230

However, we already have found significant overruns in both mechanical and electronics engineering needed at SLAC/Hytec.

Furthermore, the estimates for space qualification costs and assembly costs appear optimistic.

Possible Division of Work

- Formulation Phase (work in progress):
 - Tower/tray mechanical design: Hytec and SLAC.
 - Readout electronics: UCSC & SLAC. (Pitch adapter: Pisa)
 - Detector/bias/converter payload; design, thermal testing, adhesives: SLAC and Pisa.
 - Ladder/tray assembly & storage fixtures and procedures: SLAC and Pisa.
- Engineering Model:
 - Tray panel & sidewall fabrication: Hytec, SLAC + industry.
 - Dummy electronics modules: UCSC.
 - Dummy ladders and tray assembly: Italy & SLAC.
 - Tower assembly: SLAC.
 - Mechanical/thermal testing: Hytec & SLAC.
 - Assembly and test of functional electronics units: UCSC.
 - Assembly of functional ladders and tray(s): SLAC/Pisa.

Possible Division of Work

- Flight-Tower Fabrication
 - ASICs, MCM boards, and readout cables, including test and burn-in: UCSC + industry.
 - Pitch adapter: Pisa.
 - Tray panels and sidewalls: Hytec, SLAC + industry.
 - Bias circuits and converters, including mounting on tray panels: SLAC? Pisa?
 - SSD: Japan, INFN + industry.
 - Ladder assembly/test: INFN.
 - Mounting of ladders and MCMs on trays; final wire bonding and encapsulation: INFN.
- Testing of trays in cosmic ray telescope: INFN.
- Tower assembly: SLAC, INFN (at SLAC).
- Tower I&T: at SLAC with participation from all.