



SMT IF Upgrade 2006

Engineering Minutes

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An engineering meeting was held Friday morning, 23 Jun 2006 to discuss refinements to the block diagram and schedule issues concerning the SMT IF upgrade and the side-band separating 1.3 mm receiver. Attending the meeting were David Forbes, Gene Lauria, Martin McColl, George Reiland, and Robert Freund. No one from management attended the first hour. The topics discussed were:

1. Acceptance of previous meeting summaries,
2. Refining the block diagram
3. Project schedule.

Bob distributed draft summaries of two previous meetings, June 9 and 15, 2006. He asked that they be reviewed for completeness and correctness. He will issue "official" versions by e-mail.

Bob also distributed two new block diagrams. There was some discussion of the corresponding block diagrams. George indicated that the new 345 GHz receiver would not be ready by October. Bob will again amend the block diagrams to remove the 345 GHz vintage receiver and to incorporate other changes.

Gene described his receiver schedule by introducing a second version of his Gantt chart. He identified 4 major "critical path" tasks; receiver electronics, receiver 4-channel IF processor, new LO system, and deliveries of the bandpass filter for the MAC IF processors.

The receiver electronics task involves all Dewar electronics, construction and assembly of the two inserts, and the construction of support electronics. The support electronics task involves the construction of a new card cage, its configuration, and wiring.

The receiver's 4-channel IF processor won't be ready until about November 8 due primarily to issues involved in purchasing expensive and long lead time items; filters and RF switches. Dave reported conversations that he had with Mark Buglewicz concerning purchasing policy. Mark indicated that purchases exceeding \$ 15K should be processed by Karen Kenegy and purchases between \$ 5K and \$ 15K should be purchased by University Purchase Order. There was a short discussion on University policy concerning "A" tags on identical items purchased on one PO and

Page 2 of 4	SMT IF Upgrade 2006	Doc: Engineering Minutes Date: Friday June 23, 2006
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assembled into numerous separate instruments. To further our experience with purchasing, Martin was asked to start the ordering process of the Varian turbo-type vacuum pump, an expensive and long lead time item.

Gene asked George for a schedule for the LO construction. Gene indicated that the LO due date was early September. George identified the major LO activities; design and parts ordering of components and waveguide for the Gunn chain, modification and installation of a second phased lock box into the dual Gunn PLL system, and design and construction of control electronics and a computer interface for the dual Gunn PLL system.

George was concerned that there might not be enough space available in the receiver frame to hold two phase lock boxes. He estimate that an addition 3U (5.25") might be required.

A short discussion followed on space availability in the receiver frame. Dave indicated that he also needed additional space. He estimated that the IF processor would need a 17" deep chassis. The last critical path item on Gene's list was the construction of the modified MAC IF processor system. The major issue with the 12-Meter MAC modules is the replacement of the 9.9 GHz bandpass filter. The new filters will be centered at 10.4 GHz with a 1.2 GHz bandwidth. Five are needed, they are expensive and have long delivery times. The other major issue concerns the system's computer interface and control. A duplicate of the main control board doesn't exist. The original is based upon a "Bud" board with custom application circuitry. A search of our computer files and PC board layout plans files is needed.

The last topic discussed was what type of RF switch would best satisfy all the requirements. After a lengthy discussion, a decision was taken to use single pole 4-position self-terminating switches. These switches would eventually be used in the receiver IF processor, the left receiver room receiver selector switch, the facility total power system, the channel steering system (cross-point switch), and the filter bank selector.

The 5 action items are summarized below:

Page 3 of 4	SMT IF Upgrade 2006	Doc: Engineering Minutes Date: Friday June 23, 2006
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1. Bob will update and distribute new block diagrams for Phase I and II.
2. Martin will initiate the order process for the replacement Varian turbo vacuum pump.
3. George will develop an LO schedule.
4. The order process will begin for the 4 - 8 GHz bandpass filters and the 9.9 to 10.9 bandpass filters.
5. A search will begin for the PC board layout plans for the MAC control microprocessor board.

The 1 decision taken is described below:

1. Use single-pole 4 position self terminating switches in 5 applications.