



Memorandum

To: John Webber

cc: Band 6 Cartridge Group
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From: John Effland

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Subject: Production Schedule for ALMA-B and ALMA-J

1. Summary

This memo provides estimates of the production rate for Band 6 Cartridges and shows how the ALMA-J schedule will integrate into the ALMA-B production plan.

Assuming an aggressive production schedule with a cartridge delivered every two weeks, the production rate stays ahead of the required delivery rate until 2010, where it slips behind by 3 cartridges. The test schedule includes one day of scheduled downtime per cartridge plus 20 days of downtime for every 10 deliveries. At this point, further refinement to eliminate the negative slack occurring 3 years in the future seems fruitless given the large amount of uncertainty in the estimates.

2. Production Rates

Figure 1 shows the delivery requirements and estimated production rates for Band 6 cartridges, and Figure 2 is the expanded view near the beginning of production. ALMA-B cartridge delivery requirements were obtained from the IPS and assume the latest possible delivery dates for Band 6 cartridges. Required Band 6 cartridge delivery dates for ALMA-J are from the NAOJ draft Statement of Work (2007-03-15) with the first three dates changed to Jan, Mar, and May of 2008 as recommended by the Front End IPT. The sum of these two cartridge delivery requirements is shown in the graphs as “Carts Required, ALMA B+J”.

The cartridge production rate¹ assumes an aggressive schedule in which Band 6 cartridges nominally are delivered every two weeks with one day of scheduled downtime per cartridge and 20 days of scheduled downtime for every 10 cartridge deliveries. The entire Band 6 team feels strongly that these scheduled downtimes are essential to cover unforeseen equipment downtimes and other unanticipated delays.

The production rate was obtained using MS Project with test schedules similar to that shown in Figure 3, where measurements are conducted automatically over some nights and weekends. The calendar duration of each task is shown at the beginning of the task bar. NRAO holidays are included in the schedule, but not personal vacations. It should be possible to further optimize the schedule by carefully arranging measurements to occur over some weekends.

¹ Production Rate from MS Project file at <\\cvfiler.nrao.edu\cv-cdl-sis\Cartridge\Costing\2007-02-21\B6OMT-NAOJ.mpp>.

The production rate exceeds the required delivery rate until November of 2009, when cartridge production is estimated to slip behind by 1 cartridge until Jul of 2010 when it slips behind by 3 cartridges. A more rapid ramp-up of production or further efficiency improvements could eliminate these shortages. Production ramp-up is not scheduled to begin until March of 2008.

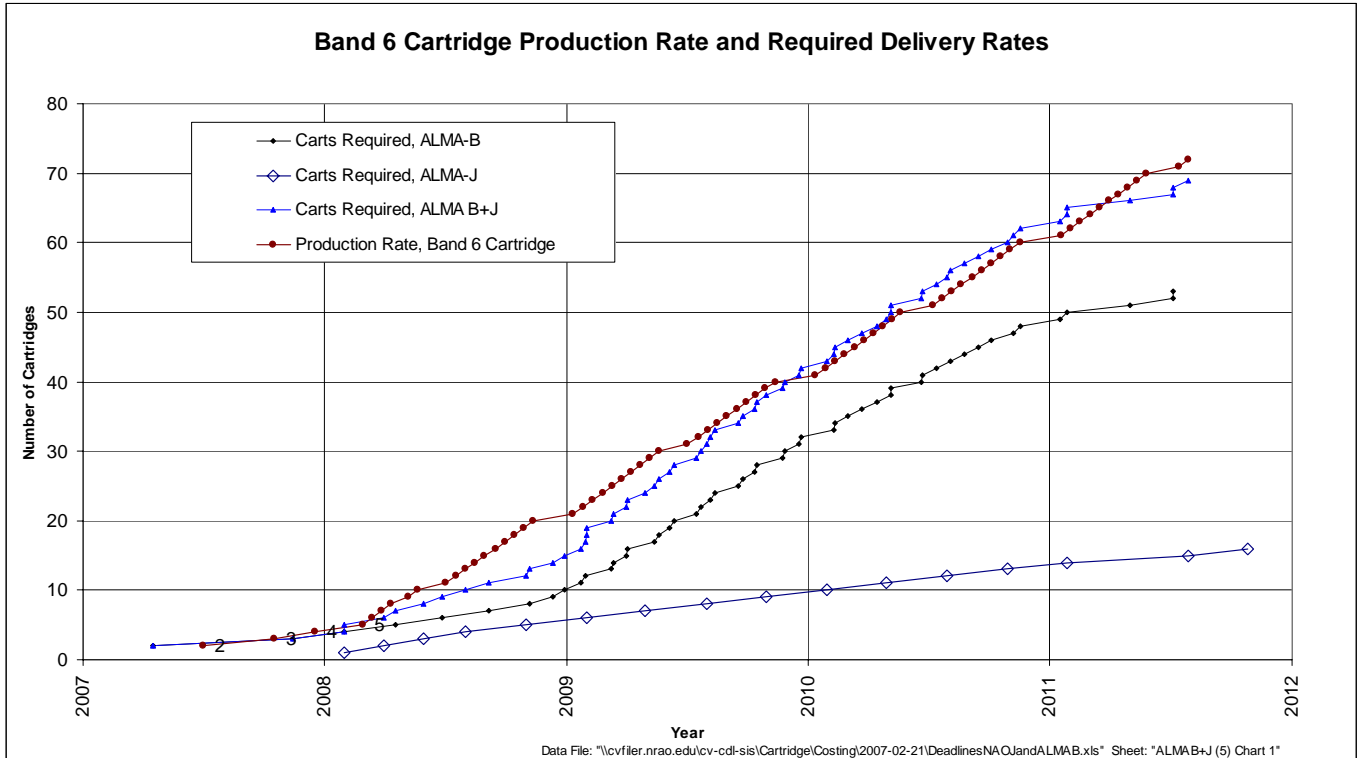


Figure 1: Band 6 Cartridge Production Rate vs. Requirements

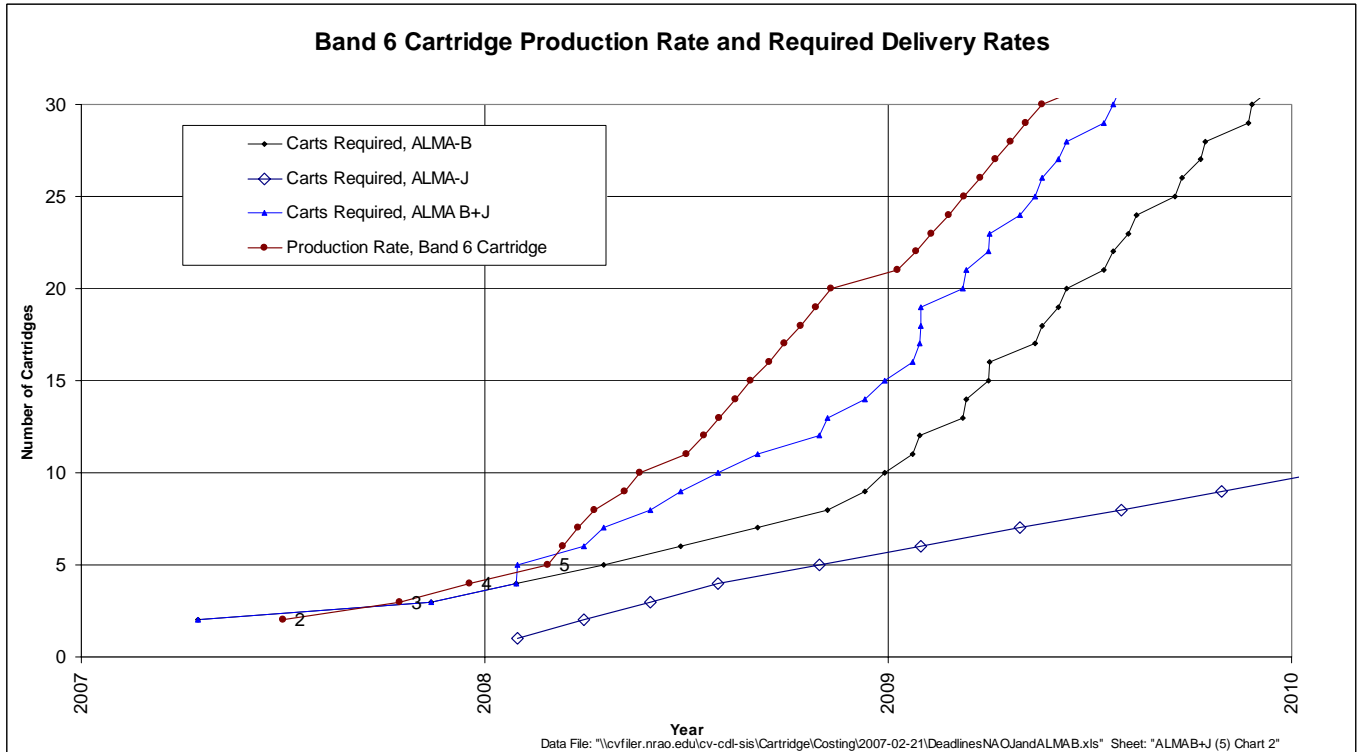


Figure 2: Expanded Scale for Band 6 Cartridge Production Rate vs. Requirements

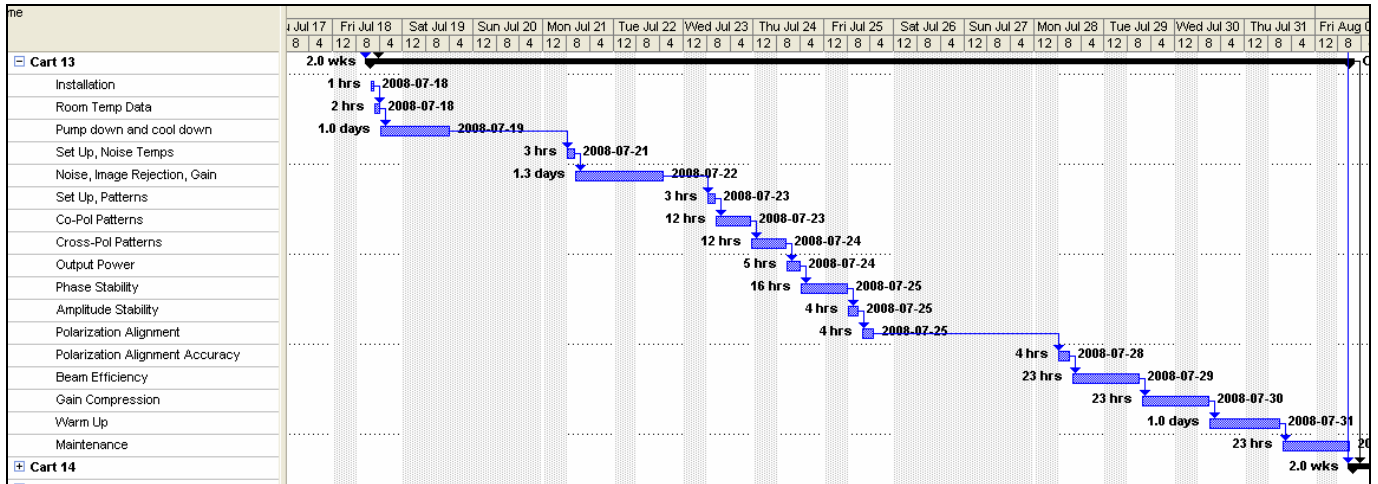


Figure 3: Sample Gantt chart Showing Typical Measurement Schedule