



# Memorandum

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**To:** Stefan Michalski  
**cc:** Band 6 Cartridge Group  
**From:** John Effland  
**Date:** 2007-09-20  
**Revisions:** 2007-09-20      jee      Initial  
**Subject:** Revised Production Schedule for ALMA-B and ALMA-J

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## 1. Summary

This memo provides estimates of the production rate for Band 6 Cartridges and shows the ALMA-J schedule integrated into the ALMA-B production plan. This memo refines our initial plan dated Mar 2007<sup>1</sup>.

Assuming an aggressive production schedule with a cartridge delivered every two weeks, the production rate stays ahead of the required delivery rate. The test schedule continues to include one day of scheduled downtime per cartridge plus 20 days of downtime for every 10 deliveries.

Continuing problems in testing and reworking the initial 8 cartridges, issues with the optics design, and questions about contractor deliveries (*e.g.* RAL's cold cartridge bodies) add considerable uncertainty to this preliminary schedule.

## 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 and -J cartridge delivery requirements, labeled "Carts Required, ALMA B+J," were obtained from your latest IPS "what if" analysis<sup>2</sup> and use the ship dates for Band 6 Cartridges. Also included are cartridge delivery dates 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 cartridge production rate<sup>3</sup> 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.

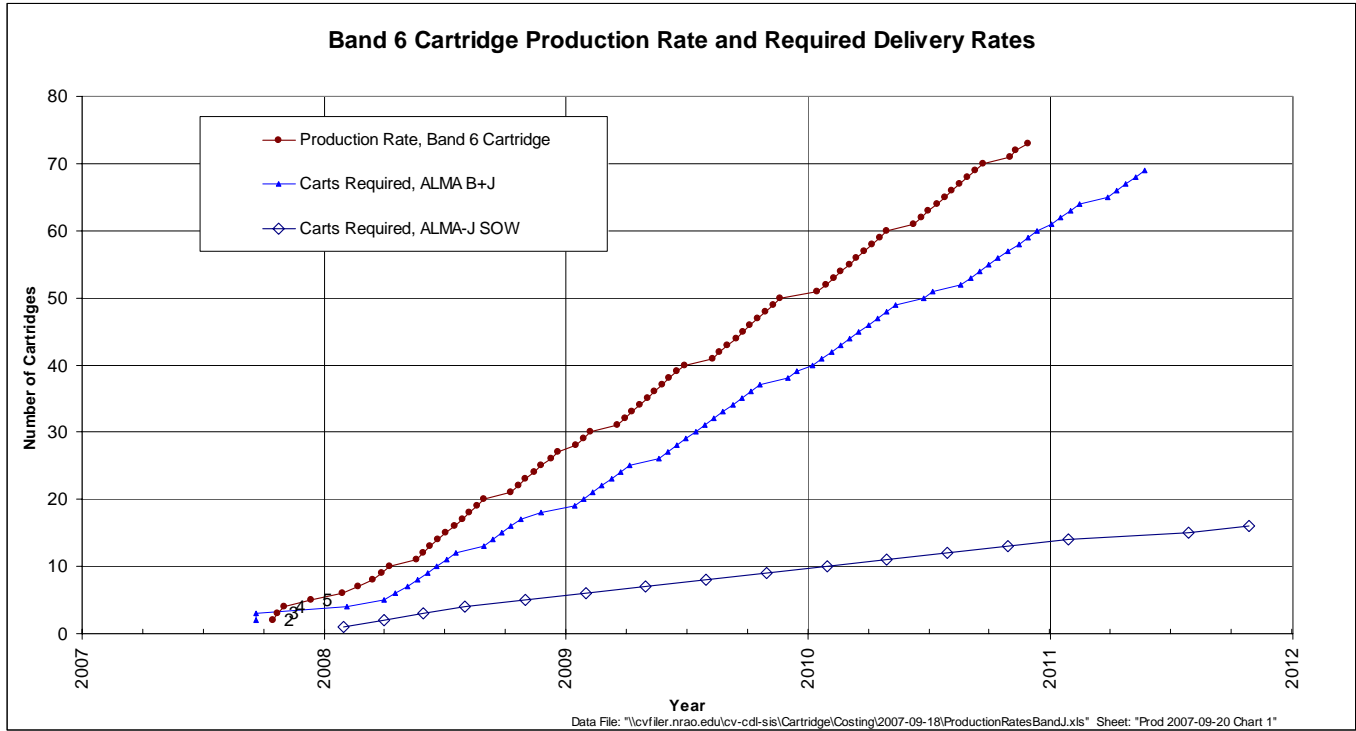
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<sup>1</sup> "Production Schedule for ALMA-B and ALMA-J," NRAO Memo to J. Webber from J. Effland, 2007-03-22 and available at <http://www.cv.nrao.edu/~jeffland/ALMA-J.pdf>

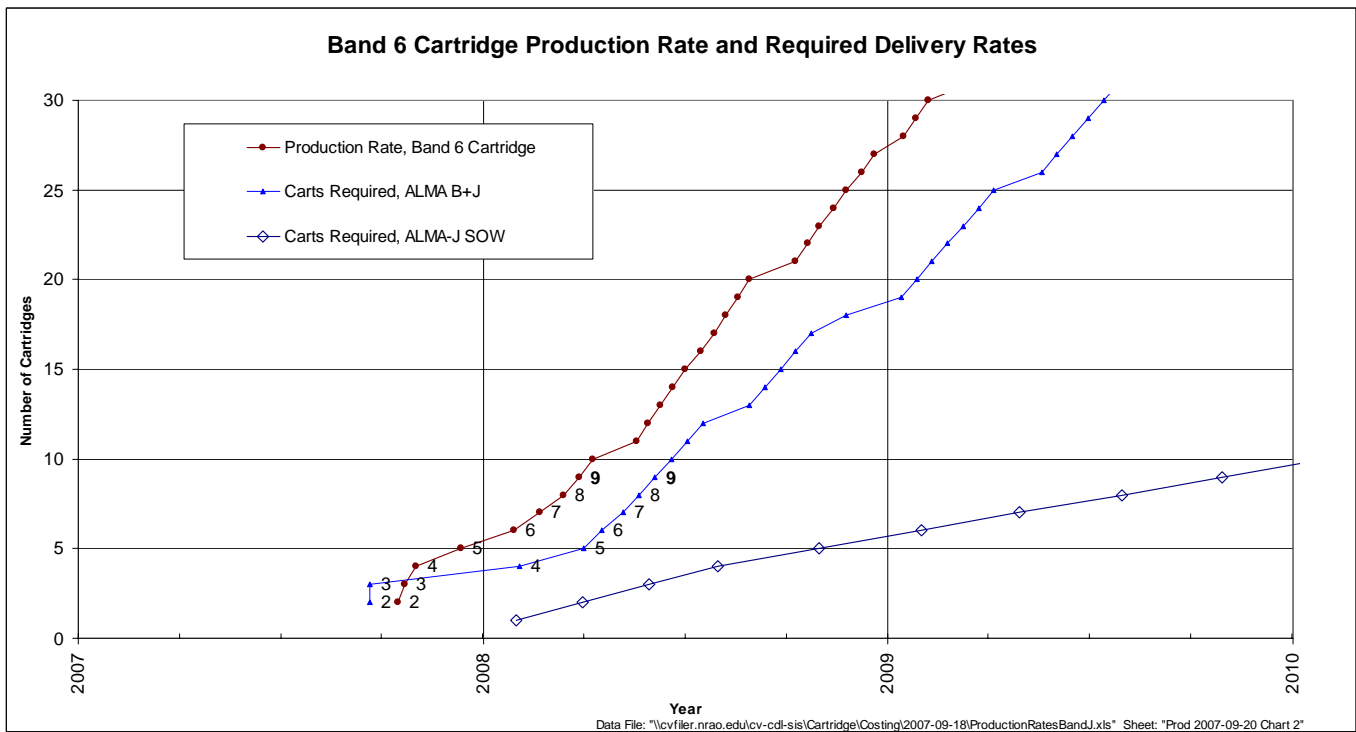
<sup>2</sup> From your e-mail dated Thu 2007-09-20 10:01 AM

<sup>3</sup> Production Rate from MS Project file at [\\cvfiler.nrao.edu/cv-cdl-sis/Cartridge/Costing/2007-09-18/B6OMT-NAOJ.mpp](http://cvfiler.nrao.edu/cv-cdl-sis/Cartridge/Costing/2007-09-18/B6OMT-NAOJ.mpp).

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 might be possible to further optimize the schedule by carefully arranging measurements to occur over some weekends, but the uncertainties mentioned earlier makes further optimization risky.



**Figure 1: Band 6 Cartridge Production Rate vs. Requirements**



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

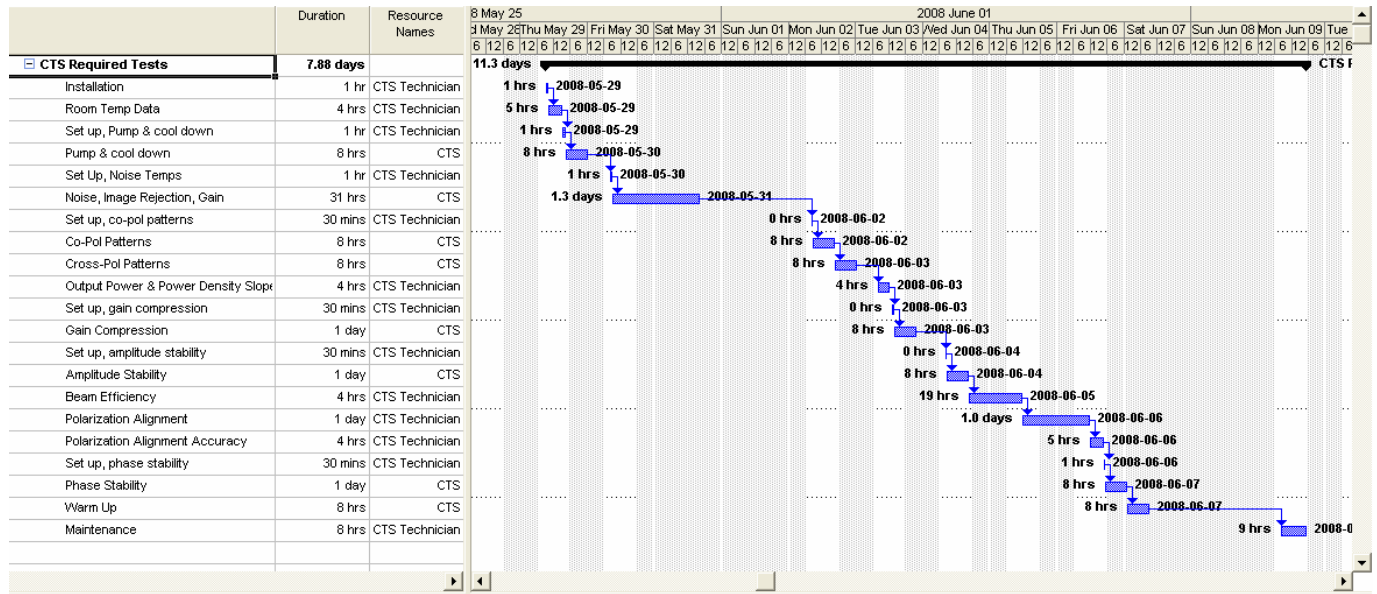


Figure 3: Sample Gantt chart Showing Typical Measurement Schedule