

APO Imager - Schedule

The Imager Project has three stages

- A PROJECT is a unique endeavor having a definable beginning and end with results in a deliverable
- A deliverable is something tangible and measurable

The Imager can be thought of as having three stages

- 1) Design
- 2) Build
- 3) Integration

Design

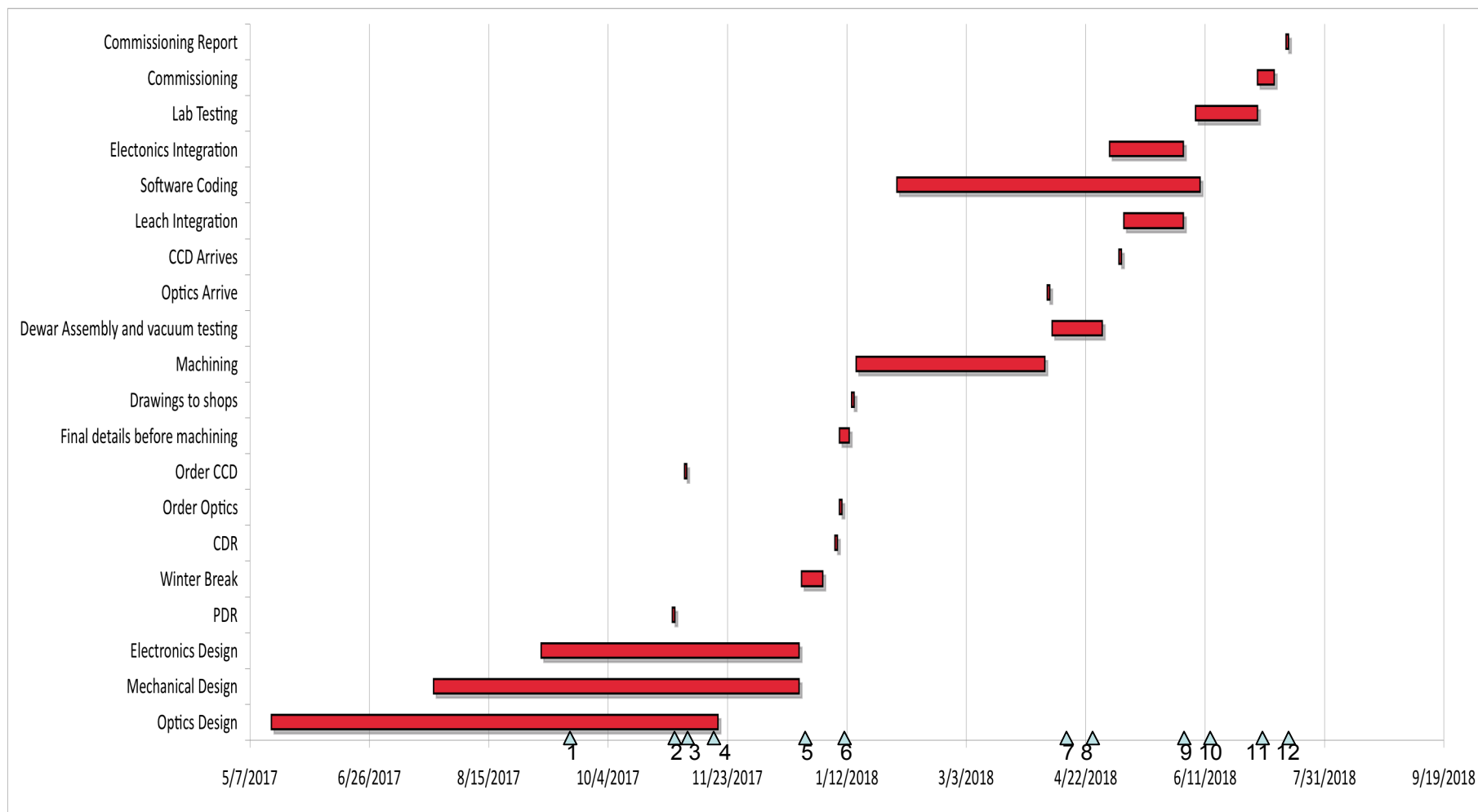
- Optical design (90% complete)
 - Have done a preliminary tolerance analysis but still need to polish this off before sending to optician
- Mechanical design (90% complete)
 - Need to add tolerances
 - Need to produce and review shop drawings
- Electronics design (10% complete)
 - Prototype designed and built for shutter control
 - Some custom PCB boards may need to be designed for motion control (FW) and inputs to I/O of PC104
 - Layout of instrument umbilical TBD

Build (external vendors)

- Optics (3 Lenses)
 - Sierra Precision Optics
- Filters (large ugriz set)
 - Custom Scientific
- Machine shops
 - CVE High Rolls, NM for most items (tolerances to 0.001 inch)
 - UW Physics shop for some items (tolerances to 0.001 inch)
 - Shop yet to be named for Aluminum Nitride parts
 - Commercial Electro Plating will do the “electroless” nickel plating work
- CCD
 - E2V
- CCD interfacing
 - Astronomical Research Cameras (ARC - Bob Leach)

Integration and Testing

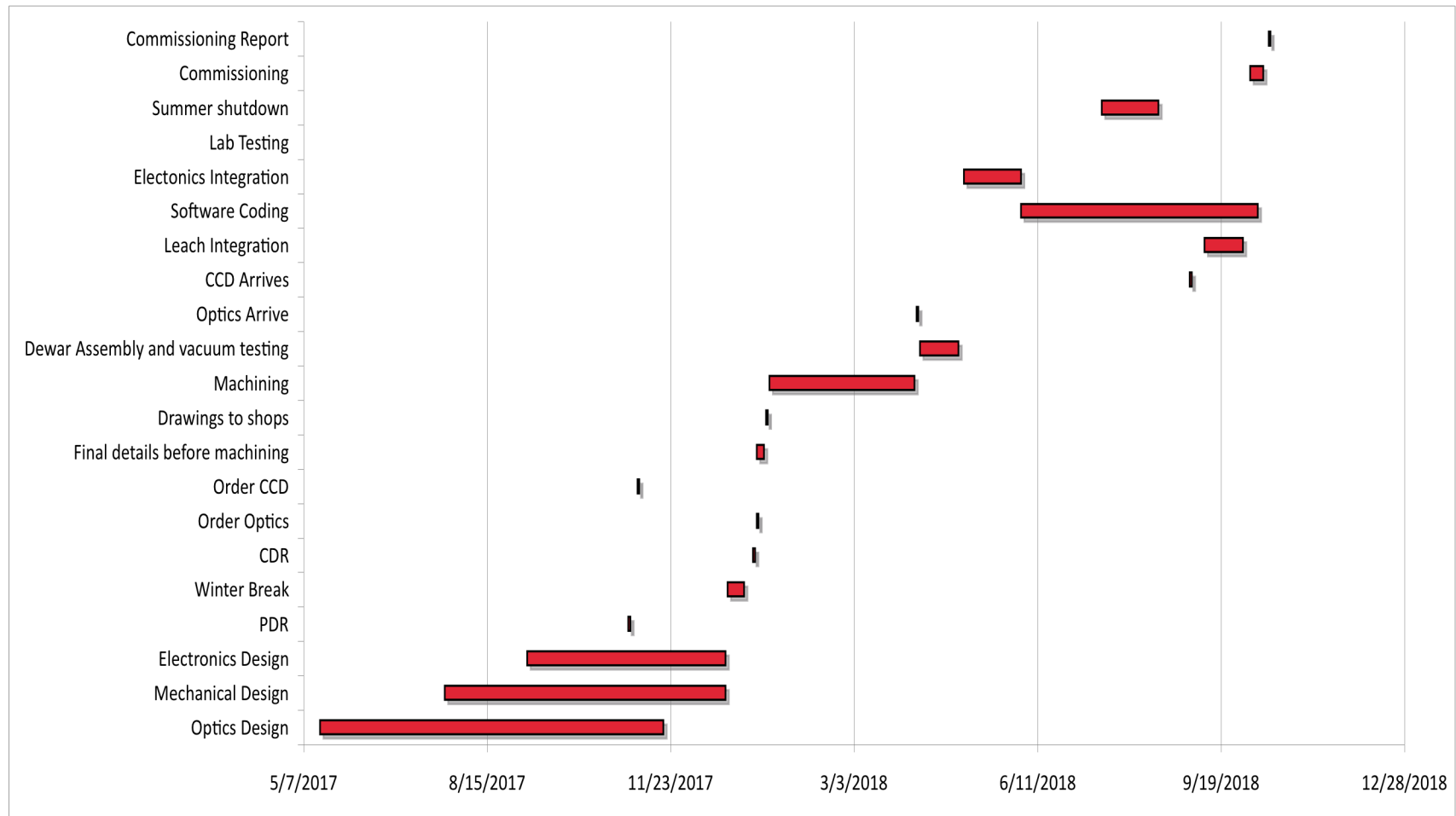
- Assembly and integration will take place in the Operations Building Instrument Lab and clean room.
 - CCD integration will take place in CA at ARC (Bob Leach's company)
- Lab testing and software integration will take place in the Instrument Lab
- 3 half nights (up to 3 full nights) will be requested for commissioning on the telescope



Milestones

1. Optics Design – determine F/ratio and choose a CCD
2. Mechanical, Optical and Electronics Designs – preliminary enough for the PDR
3. Order CCD – Reviewers satisfied enough with design concepts to order CCD
4. Optics Design – Tolerancing complete enough to freeze optical design
5. Mechanical and Electrical Designs – ready for CDR
6. CDR process complete – order Optics and start making shop drawings
7. Test fit parts and start assembly
8. Initial pump down of dewar (with test window)
9. CCD and dewar (with test window) go to Leach for integration
10. First light (bench) on detector with APO ICC
11. Full lab bench testing of complete mechanical and software
12. First light on sky

Schedule should the CCD take full 9 months ARO



Work Breakdown Schedule

	Start by:	Completed by	Duration
Optics Design	5/16/2017	11/19/2017	187
Mechanical Design	7/23/2017	12/23/2017	153 Based heavily on Optics Design.
Electronics Design	9/6/2017	12/23/2017	108 can be done in parallel with mechanical and optical design
PDR	10/31/2017	11/1/2017	1
Winter Break	12/24/2017	1/2/2018	9 Winter Break
CDR	1/7/2018	1/8/2018	1 most of the mechanical design should be completed, but still room for change
Order Optics	1/9/2018	1/10/2018	1 2 - 3 months ARO
Order CCD	11/5/2017	11/6/2017	1 6 - 9 months ARO
Final details before machining	1/9/2018	1/13/2018	4
Drawings to shops	1/14/2018	1/15/2018	1
Machining	1/16/2018	4/5/2018	79 machine materials between thanksgiving and new years, we may be able to machine some materials earlier
Dewar Assembly and vacuum testing	4/8/2018	4/29/2018	21
Optics Arrive	4/6/2018	4/7/2018	1
CCD Arrives	5/6/2018	5/7/2018	1 May not be available until August (6 - 9 month delivery)
Leach Integration	5/8/2018	6/2/2018	25 this is only valid if Leach is available and CCD is in hand. Once a schedule is determined we should try to lock down his time.
Software Coding	2/2/2018	6/9/2018	127 Can start early with some code development. Need about a week however after electronics integration to do complete software shakedown
Electronics Integration	5/2/2018	6/2/2018	31
Lab Testing	6/7/2018	7/3/2018	26 Getting rather close to summer shutdowns!
Commissioning	7/3/2018	7/10/2018	7 three half nights recommended: 1 half night, a break of 2 - 3 nights followed by 2 adjacent nights.
Commissioning Report	7/15/2018	7/16/2018	1