

Project Name:					
Second Generation Acquisition and Guidance Units:					
Business objective served by this project					
Improved Reliability, Maintainability and Capability of A&G which is a Gemini telescope core technology					
Project Manager	Lead Engineer	Project Scientist	System Engineer	Project Sponsor:	PDS Version/Date:
Stephen Goodsell	Richard Oram	Tom Hayward	Brian Walls	Eric Tollestrup	Ver 8 / Oct 20, 2010

Project Description

Issue Statement:

Gemini's A&G units function as the central nervous system for the entire telescope, which is fully active and requires a steady stream of wave front sensing data to preserve guiding, M1 mirror figure, and overall collimation, not to mention guard against wind shake and counter atmospheric tip/tilt aberrations. While the basic design concept used in Gemini's A&G's is sound (e.g., redundant peripheral guide probes, a highly articulated tertiary mirror, and an acquisition camera with associated high-resolution wavefront sensor), in practice these units have been **unreliable** in several areas.

In recent years engineering effort has gone into aggressive preventative maintenance which has reduced the down time associated with the A&G's but at the cost of telescope shutdowns and reduced science time. To avoid further delays in replacing the A&G units, Gemini will no longer treat these as substantially in-house development projects but instead will **contract them out**, along the lines used for instrumentation (e.g., competitive bid across the Partnership).

Near-term this will still require significant in-house effort to generate all of the technical requirements documents and ICDs, but overall this approach will accelerate the completion of this important project and keep the load on Gemini's engineering team to a minimum.

Since the GLAO concept and attempts to spawn the development of high speed NIR wavefront sensing arrays have not gone forward, as a consequence the new A&G's will be more modest in design than previously proposed, **preserving baseline functionality with a premium on system reliability**. (Taken from Project Mandate – Background Section)

Project Objective Statement (POS):

- Increase reliability of A&G Units (**Primary Objective**)
- Increase maintainability of A&G Units
- Preserve baseline functionality
- Increase capability of A&G Units
- Retain modularity of A&G Units

(Taken from Project Mandate – Project Objectives Section)

Project Flexibility:

Flexibility Matrix	Least Flexible	Moderately Flexible	Most Flexible
Scope			X
Schedule		X	
Resources		X	

Major Deliverables:

2nd Generation A&G Units fully commissioned at Gemini North and South (includes complete set of documentation and off telescope development/maintenance capability) (FINAL PRODUCT)

Assumptions:

- Internal Resources will be assigned from Eng, Science, and Dev groups
- Gemini Community & Board continues support of new A&G project

IS and IS NOT

- **IS:** Future long term A&G new needs for both GN and GS
- **IS NOT:** Corrective maintenance fixes to current A&G design flaws or capability limitations

Strategy and Resources

Milestones:

Stage 1: Instrument Requirements (Jan 11 – Mar 11)

- Instrument Requirements Document
- Outsourcing Strategy and Guidelines
- Stage Plan for Stage 2

Stage 2: Request for Proposals (Apr 11 – Sep 11)

- Signed Contracts
- Stage Plan for Stage 3

Stage 3: Preliminary Design (Oct 11 – Mar 12)

- Preliminary Design
- Signed Contract
- Stage Plan for Stage 4

Stage 4 Critical Design (Apr 12 – Dec 12)

Stage 5: Final Design (Jan 13 – Mar 13)

Stage 6: Fabrication (Apr 13 – Sep 13)

Stage 7: Integration and Test (Oct 13 – Mar 14)

Stage 8: On-site Acceptance Test (Apr 14 – Apr 14)

Stage 9: Post delivery Acceptance Test (May 14 – Jul 14)

Stage 10: On-sky Verification and Commissioning (Aug 14 – Dec 14)

Estimated Costs:

- Project Budget US\$ 4.3M

Core Team Members:

- Eric Tollestrup (210 hr / 12%)
- Stephen Goodsell (634 hr / 38%)
- Richard Oram (567 hr / 32%)
- Brian Walls (612 hr / 34%)
- Thomas Hayward (384 hr / 22%)
- Maxime Boccas (50 hr)
- Steve Hardash (40 hr)
- Rolando Rogers (40 hr)
- Nick Lock (40 hr)
- John White (42 hr)
- Harlan Uehara (42 hr)
- Chris Yamasaki (42 hr)
- Clayton Ah Hee (42 hr)
- #SSA GN (42 hr)
- #SSA GS (42 hr)
- Michael Sheehan (42 hr)
- Gustavo Arrigiada (92 hr)
- Doug Simons (14 hr)
- Andy Flach (123 hr)

Dependencies:

- Work will involve external agencies and proprietary information will be used.

Risks, Issues:

- Inter-group and intra-group communication is poorly done and attendance to project meetings and commitment is low.
- Upper management redefines observatory projects and cancels project mid-stream