GNIRS SERVICE AND CALIBRATION MANUAL

1. Introduction

This is the Service and Calibration Manual for the Gemini Near Infrared Spectrograph (GNIRS). This manual is intended for use when servicing what is assumed to be a nominally working instrument at Gemini. It is not intended as a description of the assembly and test procedures carried out prior to delivery and commissioning. The starting point for most procedures is therefore the assembled instrument, located in an appropriately equipped laboratory.

1.1 Organization

There are eight manual sections and several appendices. These are organized as follows:

- **Section 1. Introduction and overview**
- **Section 2. Safety.** General procedures required when working on the instrument (e.g., safety, cleanliness, etc.). This section is not intended as a comprehensive laboratory manual or tutorial. Instead, it represents a summary, which assumes that all work will be carried out by people with proper training and adequate experience.
- **Section 3. Instrument Description.** Overview of the instrument, including sub-system nomenclature. For more details on capabilities, consult the User's Manual.
- **Section 4. Instrument Preparation and Installation.** Procedures required to prepare the instrument for use on the telescope, install it, remove it, and prepare it for additional service (if required).
- **Section 5. Maintenance and Common Procedures.** Two sub-sections cover required maintenance procedures and other common procedures. All of these procedures will likely be carried out multiple times during the life of the instrument, probably at least once or twice a year.
- **Section 6. Troubleshooting.** This section outlines procedures used to identify and resolve possible problems. Diagnostic procedures are included, which may be run as a part of initial set-up on the telescope, in order to verify that the instrument is functioning correctly.
- **Section 7. Calibration.** This section outlines procedures used to calibrate or recalibrate mechanisms, temperature controls, and the flexure compensator. The procedures required to change the instrument configuration tables (software) are also described.
- **Section 8. Major Surgery.** This section covers the procedures required to disassemble (and re-assemble) GNIRS down to the level of individual sub-systems, including removal of optics. Further disassembly (down to individual components) can be carried out with the aid of these sections plus the full set of mechanical drawings. None of these procedures is considered "routine", in that it is quite possible that few if any of them will ever have to be carried out during the life of the instrument.

- **Section 9. Shipping Container.**
  This section covers the procedures required to remove and install the instrument into the shipping container. The shipping container will be needed if instrument is shipped from telescope site to other facilities during the lifetime of the instrument. Safety issues related to the shipping container are addressed in this section.

- **Appendices.** Appendices include checklists, configuration file listings, and other reference information.

1.2 What Is Not Covered

GNIRS contains three sub-systems supplied by Gemini. These comprise the following:

- On-Instrument Wavefront Sensor (OIWFS)
- Gemini Array Controller (GNAAC)
- Integral Field Unit (IFU)

The GNIRS service manual includes procedures required when dealing with these sub-systems as complete entities, but procedures required to deal with problems *within* the sub-systems are covered (or should be covered) by documentation provided separately.