

STATUS RECOMMISSIONING OF SALRO-SLR

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ABSTRACT

The paper describes the current status of SALRO-SLR.

1. INTRODUCTION

Saudi Arabian Laser Ranging Observatory (SALRO) has been described in reference [1] in detail¹. KACST have contracted Applied Data Systems (ADS) of Jeddah, to organise and perform the following:

1. re-commission the SALRO (get it working reliably again);
2. regular limited data acquisition and comprehensive system maintenance;
3. give training to its employees.

This contract carries on from EOS' short presence last year. While last year's work was useful, it barely scratched the surface. General system condition indicates that maintenance has assumed a low priority in the years since the SALRO FAT, and as such, the re-commission process is consuming more time than originally anticipated.

It is planned to mark the end of the re-commissioning phase by subjecting the system to a MINI-FAT benchmarking process.

There was repair work completed on MRCS cabling, display, addition of cooling fans, CAMAC crate power supply, A900 computer system and interface card replacement, power-supply adjustment, replacement cooling fans, and MTU re-configuration. The delay Control PCB was re-worked to get stable Q-switch and pulse-slicer output. The SPAD mounting also has been repaired.

2. CONFIGURATION & CALIBRATION WORK

The HP LAN was re-established and commissioned with new PC's in the building. The ICCD camera was bore-sighted and is operating. The NASA Normal Point Software debug (Y2K stuff) has been reconfigured and there was a revision of system fiducials design and manufacture of new mechanical controls as well. The timing system was re-configured and calibrated and ball-park adjustments have been done to the discriminator. The bright-star tests (HP5370 & HP5359) are now at 50 (70 ns > theoretical limit (flashlight into detector).

3. MINI-FAT FOR SALRO

The remaining known system works required for MINI-FAT:

1. Laser mode-locker: 70MHz RF amplifier is weak (awaiting replacement)

DCB upgrade requires completion

2. Discriminator optimization
3. Noise on hand-paddle
4. Dome: azimuth drive gearboxes need re-shimming;
slit: bearings, chains and sprockets need servicing
azimuth rollers need replacement

The laser and air-conditioning systems have consumed the majority of time so far. It is expected that once the laser mode-locker is fully operational again, the system characterisation will progress quite quickly.

While a number of SLR passes have been tracked, no data has yet been transmitted because of the situation with the laser. Finalizing the laser work is currently the highest priority, and we hope to be releasing our first engineering data within a couple of weeks.

We anticipate reaching the MINI-FAT status within 3 months. Keeping in mind that the air-conditioner and initial laser repairs consumed 10 full weeks between them, I conclude that progress is more than satisfactory.

4. MICROCOSM ORBIT PROCESSING SYSTEM

KACST has installed an Orbit Processing System for orbit analysis³. This analysis center can process SLR and GPS data. It can also produce accurate orbits, station coordinates, baselines, and deformation measurements. The system consists of:

- 1- Two Personal Computers with LAN type 10/100.
- 2- EOS GPS/SLR Win NT orbit processing software, including: Microsoft NT user I/F for orbit software, full license Microcosm orbit processing engine, and full software integration and testing on computer hardware. There was training on installation, processing, and basic orbit determination. The orbit processing system soon will be used as a center analysis for both SLR and GPS³.

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