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Remote Control and Safety Upgrades at the Yarragadee MOBLAS-5 Station

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Introduction

To enable more efficient operation of the SLR system at Yarragadee after the installation of the AuScope VLBI antenna, several modifications have been made to the standard MOBLAS configuration. Many of these modifications have improved operator safety and job satisfaction, but have not impacted at all on the MOBLAS data quality standards.

Remote operations

Since the MOBLAS system arrived in 1979, SLR operations have been performed from inside the telescope trailer. The AuScope VLBI system came on-line in 2010. The 12 m antenna is located about 100 m from the SLR vans and a new control and operations building for the VLBI system was built between the MOBLAS vans and the antenna.

While routine operations are performed from the University of Tasmania, system monitoring and disk module swapping and conditioning are performed by the Yarragadee staff on single-person SLR duties. We could see that this was going to be inefficient and onerous if the SLR operator was going to be stationed in the SLR van 60 m away. Hence the need to remote the SLR operator console to the VLBI control and operations building.

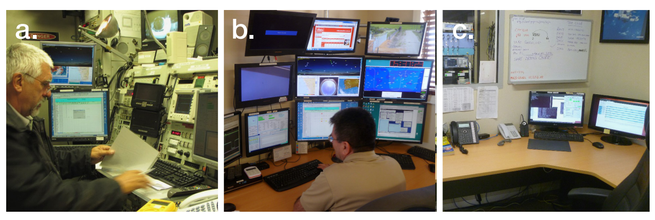

Image 1: (a.) Standard MOBLAS console; (b.) New SLR console; (c.) VLBI console.

Remote console implementation

With the current MOBLAS configuration the following needed to be remoted:

- Display and control chassis #2 functions including servo control and program mode.
- Laser interlock functions.
- ND wheel control.
- MCP HV settings.

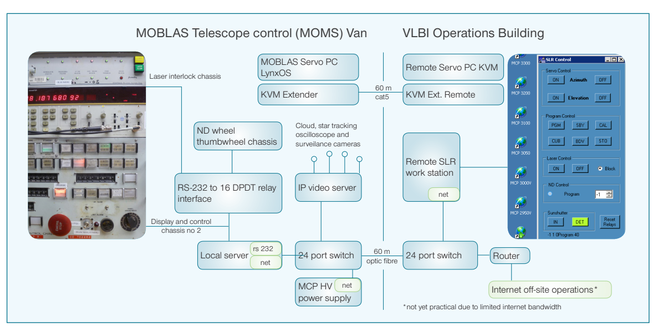

Figure 1: How the interfaces have been implemented.

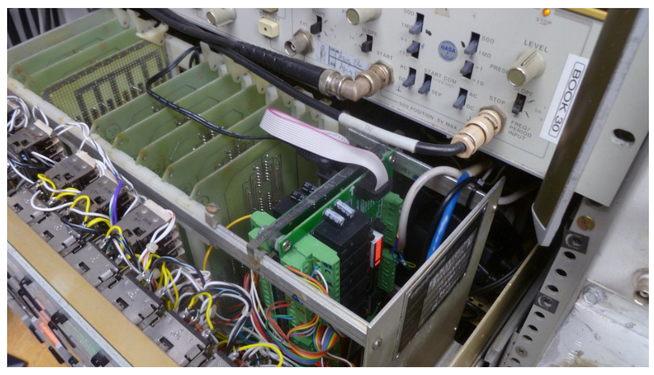

Image 2: The rs232 relay bank inside the D&C2 chassis.

The MOBLAS MOMS console is still fully functional and SLR passes can still be taken there if required.

Safety and efficiency measures

We have eliminated the need for operators to go onto the hazardous raised telescope platform by making the following improvements:

Automated translator

The translator automatically rotates into the calibration position once the telescope moves below 5 degrees elevation and rotates into satellite mode above 8 degrees. There is also a shield fixed to the permanent safety rails to block any direct returns from the two prime calibration piers.

Automated boom arm riser

On opening the mount in preparation for tracking operations, once the roof has rolled back the boom arm is raised by the automated boom arm riser. An interlock switch prevents the servos being activated before the boom arm is completely raised. The boom lowers automatically once the close switch is activated. An interlock prevents the roof closing before the boom is completely lowered.

Boom arm diverter

When tracking to the west the boom arm cables often impede the laser as it exits the transmit telescope. To allow the operator to move the boom out of the beam without climbing the mount, a beam diverter mechanism has been built.

Permanent safety rails

Many years ago we removed the clamshell door mounted safety rails from the mount and installed a permanent ground based railing system. This eliminates the need for the operator to go on the mount after or before closing the clamshell doors to install or remove the old rails.

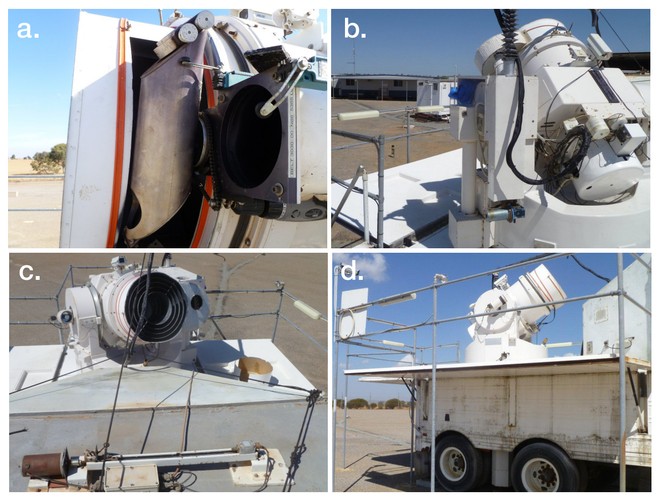

Image 3: (a.) Automated translator; (b.) Automated boom arm riser showing new operations building in background; (c.) Boom diverter; (c.) Safety rails.

Software enhancements

Several minor software enhancements have also been written to add to the standard MOBLAS software suite. These programs mainly aid and streamline the data processing packages and record keeping processes. Some examples are:

- **The log file pre-processor**:
  This program generates two log files, a non-amp and an amp, for each recorded log file. This means the operator can mix HSLR amp mode and standard non-amp passes and calibrations in each scenario. This is our standard operational mode.
- **The DOR/LOR data extraction routine**:
  This program strips the relevant data from each pass for the LOR and DOR reports eliminating the need for the operator to manually enter the data.
- **The QC monitor**:
  This routine shows results as they are generated by the gnp software, quickly alerting the operator to potential problem passes.

Conclusions

The modifications we have made to the standard MOBLAS system at Yarragadee have enabled us to operate remote from the MOMS van in a safer manner. These changes have made operations much more efficient, allowing us to maximise our data collection. The changes have in no way reduced data quality or changed the standard MOBLAS data metric.

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