National Radio Astronomy Observatory
Socorro, New Mexico

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To: VLBA Project
From:P.J. Rhodes
Subject: Remote Observing

During the last NUG observing session we tested the Pie Town VLBA stations remote observing capability. We controlled the observing from Socorro, but with the security of having some one at the station at all times. Remote observing during Mark III periods was not attempted as this system is still being de-bugged.

I have attempted to categorize the problems into the following areas; Safe remote antenna operation, Confident pointing and Mk II operations, and Mk III operations. The items listed will either prevent or make extremely difficult remote operation or observations.

SAFE REMOTE ANTENNA OPERATIONS

1. The NPL encoder electronics hangs up during power surges glitches. The Utility Interface Module will allow remote reset of both this and the ACU. We need to test if the ACU will auto stow the antenna if the NPL is hung and the computer is unreachable or crashed.
2. Several azimuth over speed conditions occurred and the antenna had to be put into standby and re-pointed. The indication of the fault is only on the ACU screen. If the antenna is placed into stand by and the elevation is still moving it shakes the antenna violently.
3. The ACU intermittently transferred to synchro from encoder and had to be re-set to encoder locally.
4. We are unable to get proper indications of antenna speed and motor current on the ACU monitor screen.
5. The ACU occasionally spontaneously aborts. When it is in normal computer mode the mode displays "ERROR".
6. The date does not consistently update when crossing 0000 hours. Usually there is a scan or source change at this time and the new position is not correct.
7. Several times the computer failed to respond to either a remote or local terminal and had to be re-booted locally.

RELIABLE Mk II OBSERVATIONS

1. The Mk II formatter (old) jumps in the days indications and has to be re-set locally.
2. The Mk II recorder playback levels all drifted during the last observing secession. These were set at the beginning of the secession.
3. The new Italian formatter output is too low to drive the buffer output of the recorder interface units. A good buffer system is needed to operate the Mk II recorders.
4. The M&C buss in the vertex room get hung during power glitches and must be rest locally.
5. The INIASTR program was restarted at the beginning of each program. We assumed this was necessary because we had run LOGDISK at the end of each program to prevent data from overflowing a floppy disk. S. Koski says LOGDISK kills LOGGER so INIASTR must be re established to obtain logger data. B. Clark disagrees. (Still unresolved). After re-establishing INIASTR you must re-set the computer clock see next item.
6. There is a 1 to 2 second delay between the clock screen when displayed at Pie Town and at a remote terminal. This could be due to delays in the DDS, VTERM or the modems. This makes it very difficult to set the station clock remotely. The Tech phone system will not allow 900 phone numbers so WWV must be called via FTS which may have satellite delays.
7. When pointing the antenna from the PARK position to a low Declination source, rising the antenna goes to the wrong cable wrap and tracks into the software limit and is required to un-wrap shortly after starting to track the source.
8. Some type of checker program to check critical observing parameters seems to be necessary. During the last NUG secession we were constantly changing "SCREENS" to check these parameters.
9. A dedicated DDS port and modem at the VLA should be available for remote observations.

RELIABLE Mk III OBSERVATIONS.

1. The Mk III formatter clock is unreliable and jumps several seconds. The formatter time can not be monitored remotely.
2. The VLBA Mk III recorder system hangs up and the tape can not be stopped without damage until it reaches the end of tape. Then it can be re-set via the computer. The only indication of this happening is on the TDC screen which fills the whole monitor. No other screens can be monitored while viewing this screen.

OTHER PROBLEMS.

1. Problems with rack cooling in the station HVAC system still exist.
2. The vertex room HVAC system needs several recharges during the year due to the flexible hose used.
3. The HVAC systems at Pie Town are NOT on the emergency power system therefore will not run during commercial power outages.
4. Stations security has been compromised due to the distribution of combinations to non NRAO personnel. The access gate and security grate over the entrance door need to be improved.