



Overall Y2K Status Summary

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Telescope Operations

In theory, NRAO's telescopes are Y2K compliant by design because they use Julian day numbers for internal time calculations. Reviews of the control software for many NRAO telescopes (including the VLA, the VLBA, the 12 Meter, and the 140 Foot) were completed in 1997.

Small problems were corrected for the VLA, which was tested in 1997 October. It successfully observed sources and obtained fringes when the system time was advanced by three years. One minor problem turned up in the VLA operating system, which was corrected during routine maintenance.

The VLBA control software was reviewed and tested as much as possible in advance of a compliance test for VLBA operations that was carried out in 1999 February. The test was designed to test the complete system, from scheduling to data processing. There were no major surprises. Monitor data was correct following a reboot of all site computers with the date advanced, and the array operators successfully exercised some tools. A few other operations programs remain to be tested, along with some aspects specific to space VLBI. The data taken during the Y2K exercise were correlated successfully in 1999 April. One minor issue (a 1000-day ambiguity in date decoding at the playback drives) was revealed and fixed.

Y2K tests of the 12 Meter control system and on-the-fly data recording and analysis were carried out successfully in 1998 June. A few minor bugs were found; all have been fixed.

The Green Bank Interferometer control software has been evaluated and made Y2K compliant.

The NRAO does not currently intend to operate the 140-ft telescope in Green Bank beyond the end of 1999. Assessment of the control software for the Green Bank 140-foot telescope has been completed; if it proves necessary to operate the 140-foot beyond the end of 1999, we believe that the changes needed could be made in a short period of time.

Financial Systems

NRAO's key financial management software and payroll systems are purchased from outside vendors with active or complete Y2K compliance efforts. All software and hardware for NRAO's financial systems has been upgraded to versions certified by their manufacturers to be Y2K-compliant. Although NRAO's own customizations to these systems had been tested and verified as compliant, the vendors recommended against full testing using production systems. However, as a result of recent reorganization within the Fiscal divisions, there is now a spare system running the same software, which could be used to verify Y2K compliance of NRAO's data. Such tests are now being discussed and will be scheduled during May 1999.

Although Y2K-compliant, the older model of IBM AS/400 computer used for our J. D. Edwards purchasing and accounting package will soon cease to be supported by IBM; the version of the software we have is also being replaced by the manufacturer. A major upgrade of this platform is therefore necessary, whether to a newer release/model of the same products or to something entirely different. A review of software which supports these critical functions is underway, with a view to evaluating the state of PC-based client-server packages in this market. Y2K compliance will of course be a mandatory requirement of any alternative that may ultimately be recommended. A report is expected by the end of April 1999.

NRAO Software

All NRAO software which understands the FITS (Flexible Image Transport System) data format has now been updated to begin using the new Y2K-compliant format for date-related keywords. This includes the UNIPOPS package as well as AIPS, AIPS++, and the software which records VLBA data in FITS format for distribution and archiving.

Y2K Hardware Inventory

A comprehensive inventory of all NRAO date-aware hardware was completed in late 1997. This inventory is being updated as new hardware is acquired. Older hardware which performs critical functions that will be affected by the Y2K problem was replaced in 1998.

Hardware: PCs

PCs have a great deal of variation in their degree of Y2K compliance depending on hardware and firmware revisions. Many older PCs will have a problem with the century bit in their real-time clocks after the year 2000. A large selection of software is available for updating this automatically during the first reboot after the turn of the century. NRAO has selected a freeware program to provide a patch to automate this update in systems that run unattended at remote locations, such as the MMA site in Chile. This update only needs to be done once, so systems at sites with local support can be done by hand; in such cases it is better to have fewer software packages involved. Newer PCs are not affected by this problem.

Communications and Networking

The ancient telephone PBX in Green Bank has been replaced; there are no Y2K compliance issues with the new one, which is leased. The PBX in Charlottesville needs a minor update to prevent calendar inaccuracies in the voicemail system; this will be applied in early 1999. The few remaining old computer network routers are being replaced with models which are Y2K-compliant.

Third-Party Software

Our goals for third-party (non-NRAO) computing applications are:

- A. To provide Y2K-compliant hardware, OS, networking and basic software suites to all users so that essential operations are not impaired by internal non-compliance.
- B. To provide platforms on which the Y2K compliance of less critical, or less-widely used, third-party date-aware applications can be tested by computer division staff or knowledgeable users.

The number of less critical applications is too large for everything to be tested, but vendor compliance information and user priorities can be used to narrow down which date-aware applications should be tested. An inventory of all third-party software installed and supported by computer division staff, under both UNIX and Windows, was performed in the first quarter of 1999. (Note: mission-critical software was identified in 1997 and has already been specifically addressed; here we refer to programs that are used regularly but which would not seriously affect fundamental Observatory operations should they malfunction.) Observatory staff are being contacted to determine which of the several hundred items in the inventory are most important to their daily work, as well as to ensure that date-aware software installed by individual employees is accounted for. Y2K compliance information for as many of the most popular packages as possible is being maintained as part of the inventory, which is accessible via the WWW from within the NRAO. (For a copy of the inventory, please contact Ruth Milner, rmilner@nrao.edu). In-house utilities on UNIX systems will also be evaluated. One UNIX "time machine" test system, with its date advanced to the year 2000, has been set up in Charlottesville. Other such test systems, with various architectures, will be set up during the second quarter of 1999. Individual users will be able to access these systems, to test either more esoteric software which they use on an occasional basis, or specialized packages which can be tested only by knowledgeable users. While no major problems are anticipated, the date fields in large NRAO databases such as that used for telescope maintenance tracking will be inspected for any compliance issues.

Outside Services

We are continuing efforts to obtain Y2K compliance status information from outside providers (such as utilities, communications and financial institutions) at all NRAO sites. In some cases these organizations have made fairly extensive information available on the world-wide web; in others it has proven more difficult to get a response.
