# Year 2000 Issues and the NRAO

When the Year 2000 (Y2K) arrives in just over 800 days, the potential exists for many computer systems, software, and "smart" hardware containing embedded microprocessors to malfunction. The convention of using 2 digits for the year instead of 4 has created a potential century-change time bomb inside date-aware software and hardware. Its effects may be widespread, and disastrous for organizations which are unprepared.

The NRAO has begun assessing the potential for Y2K problems in its own hardware and software. We believe that our Y2K problems will be manageable, as long as we move aggressively to address them soon. We have formed a working group with representatives from each of the NRAO's major sites, and from the Business and Personnel divisions, to identify and help mitigate potential Y2K problems. The members of this group are: R. Simon and G. Hunt (Computer Division), A. Beasley (AOC), C. Bignell (Personnel), A. Bridle (Charlottesville), J. Desmond (Fiscal), J. Hagen (Tucson), and B. Vance (Green Bank).

As part of our efforts to raise awareness and foster internal communications about Y2K matters, a web page has been created at http://www.cv.nrao.edu/y2k/. NRAO users may find this web site a useful source of links to information available on the Internet about Y2K issues.

A detailed inventory of the NRAO's possible points of exposure to Y2K problems is now underway. The observatory does not use massive amounts of customized date-aware computer software, so we should not face the severe problems which confront many businesses and financial institutions. We recognize, however, that we are not immune to such problems. The broad areas where potential risks exist are as follows:

**Fiscal, Payroll, and Personnel:** These functions at the NRAO are of high priority for the smooth operation of the Observatory. Many have been outsourced to vendors with aggressive Y2K compliance efforts, and their progress will be monitored closely. Those supported by internally-written software are actively being reviewed.

**Telescope Operations:** Most of NRAO's online systems should be Y2K compliant by design, because they rely on Julian dates unaffected by the century change. Because of the uniqueness and complexity of these systems we plan to evaluate their Y2K compliance by actual testing as soon as possible after an overall code review. Detailed tests will require considerable planning to ensure a straightforward return to normal operations once the tests are done.

**Embedded Chips:** Many of our most complex electronics systems use embedded PC's and chips. Detailed testing will be needed to reveal if any mission-critical systems are not Y2K compliant, and thus require update or replacement. There are numerous old Intel-architecture based computers in use, many of which are not expected to be fully Y2K compliant. The essential question is "how important is their non-compliance?." We will focus our attention initially only on mission-critical systems, as identified by the site managers; others will be renovated or replaced as part of normal refurbishment.

**Communications:** Our phone systems and PBX's, the NRAO Intranet linking our sites, the Internet, and long distance telephone services are all potentially vulnerable. We are reviewing the weaknesses or potential problems in the hardware that we own.

**Utilities and Other Key Outside Services:** We are aware that, even if we have our own house in good order by the Year 2000, preparedness in the commercial and governmental world around us is a matter for great concern. Our Y2K contingency planning will therefore consider possible disruptions in outside services and utilities essential for our operations.

**Computing Facilities and Software:** The century change problem can affect the operating systems, utility scripts, and application software run on Observatory computers, including UNIX workstations, PC's, and Fiscal systems. An initial review of NRAO's vulnerabilities in these areas is in progress. Of particular interest to users of FITS data is the fact that the original FITS specification was not Y2K compliant; a new FITS specification is now available and will be incorporated into NRAO software which reads or write FITS data (for further details see ftp://fits.cv.nrao.edu/fits/documents/proposals/year2000.txt).

The full size of the Y2K problem at NRAO can not be accurately estimated until inventory, assessment, and initial testing of critical and high priority systems have been completed. We hope to complete this phase of Y2K work at the NRAO by the end of 1997.

***R.S. Simon and A.H. Bridle***
***NRAO Newsletter, 1 October 1997***