Data Saving and Banking at La Silla

S. Vidal, ESO

The main job of the computer operator is organizing and saving the data acquired with all telescopes operating at La Silla in a magnetic tape bank. A short description of his duties and of the standardized procedures is given here intending to make them widely known.

But first a few words regarding ESO rules on this subject:
- Although the observers have the right to keep their data as personal property, they are of course encouraged to hand over their tapes so that they can be banked by the operators.
- All data (saved in the La Silla bank) obtained by any astronomer may only be used by another astronomer if the latter has a written consent of the observer.
- All data saved (bank tapes as well as the copies left as backup at the computer centre) are presently kept indefinitely. New guidelines about the future of the data bank may however restrict this period to e. g. two years. It must be emphasized that the medium now in use for banking (magnetic tapes) under the existing physical conditions (i. e. temperature and humidity) does not guarantee a lifetime exceeding a few years.
- Tape copies taken home by the observers are ESO property and are therefore expected to be back at La Silla or the ESO Headquarters at Garching within 6 months after borrowing them from the Observatory.
- Although the data saving is the operators' duty, the observers share the responsibility for a good saving: they have to use the right day-of-the-week magtape, fill in the labels properly, put tapes in the DATA TAPES mailbox (hotel), request for additional data handling and final tape copies (when needed) well in advance, etc.
- Top priority for the operator's activity as well as for the computer centre resources goes to the daily saving and banking of data. For other common computing services requested, priority is stated by the system manager, or, in his absence, by the operator on duty himself.

General Comments

Although optical disk devices are seriously being considered, magnetic tapes are still used at La Silla as the standard mass data storage. Attention has to be drawn however to a few weaknesses of this medium, in order to improve the integrity of recorded data:
- Magnetic tapes should be kept far from magnetic or any other radiation. We often find tapes on top of, or near to, the terminals or its peripherals. Recorded data might be destroyed within a magnetic field stronger than 50 oersted.
- Sequential access mode of big magnetic tapes is time-consuming and rather tedious, whereas, on the other hand, banking onto small tapes results in waste of physical space and tapes.
- Temperature is a big destroyer of data or even physically of tapes. Long exposure to sunlight in a car caused almost melting of a mag-tape containing a three nights observing run of IDS some years ago. Of course, there was no way to retrieve these data because banking was not running yet and the tape went straight to the trash. Most manufacturers specify environmental ranges between 10°C to 40°C while operating and between −20°C to 65°C in non-operating conditions. Ideal temperatures are in the range 15 to 25 degrees Celsius.

- For long-term banking of data, a dust free operating atmosphere has to be considered since the efficiency of reading and writing magnetic tapes is affected by dust.
- Some other parameters also play a minor role. Among these: relative humidity, atmospheric pressure, physical orientation, etc.

All of these points call for an ideal solution since one cannot take these magnetic bank tapes to the bottom of the cellar, for they will be used from time to time in retrieval of old files. From my side I would say that a well-organized metallic cupboard not too far from the magnetic tape drives, within the special environment of the computer rooms, would make a good "freezer" for those data intended to be kept as long as possible. Tapes coming with hanging plastic rings would do better, if the cupboards were permanently closed to dust, because of space limitations for big libraries.

Two main types of data are found among the various acquisition systems and instruments in use at La Silla: Image data files in IHAP format from CCD, IDS, CES, CASPEC, EFOSC, etc., and photoelectric photometry files; each of these banked separately. Other types, listed according to the amount of data already stored are: Infrared photometry, Fast photometry, Walraven and Exorset photometries, Polarimetry, Coravel (1) measures, etc. . . . Walraven's name stands for a special photometer in use at the Dutch 92 cm telescope, whereas Exorset stands for acquisition and control programmes running on a Motorola 6809 microprocessor installed at the Danish 50 cm telescope which outputs data on floppy disk.

Procedure

At every telescope there are wooden racks containing a "day-of-the-week" set of magnetic tapes with labels to be filled in by the observer, they are intended to keep the original data acquired for at least a week or, usually, an entire observing run. The labels inform the operators about the data of the night (or day). Two "scratch" tapes are also provided for possible breakdowns of the computer and missing EOF marks after the last output of data.

Any suspected abnormal recording must be reported on written labels to operators. Valid data have been unconsciously overwritten and lost for they were not properly labelled.

All tapes (and other data media used) are taken from the DATA TAPES mailbox at the hotel to the computer centre by morning. After banking of the data these tapes are taken back to the telescopes, on the same day if possible, for they might be used for off-line reduction.

Image Data

Since there are no IHAP facilities at the computer centre, three image data banks are handled with the RTE-IVB system operating the ESO 1.52 m telescope in the 3rd floor terminal and banktapes kept there. While the direct CCD image bank from the ESO/MPI 2.2 m telescope is kept at the VAX/750 room in the 3.6 m telescope for off-line reduction facilities, the CCD image bank coming from the Danish 1.54 is being kept in the same building and all other image banks are kept at the computer centre. Banking image data is being organized chronologically since December 1st, 1983, when S. Vidal and R. Arancibia (current computer operators) took over all data