system. In this respect the development of the CCD package took place at the right time. The ESO archive project has accomplished that for a number of telescopes and instruments the setup specifications are stored together with the data. In addition, the new MIDAS Data Organizer package offers a significant help in preparing the data for reduction (see above).

The new CCD package in MIDAS makes use of the output MIDAS table of the Data Organizer package that contains the science and calibration data and the relation between these two. The package provides commands to do the various bias calibration steps like combining calibration frames, subtraction of the bias level determined from the over-scan area or from a separate bias frame, correction for dark current, division by the correction for illumination, and correction for the fringe pattern. Also, tools are provided for trimming the frames of the unwanted over-scan strip, and for correcting the frame for bad pixels intensities. All operations steps that successfully finished are recorded in the descriptor of the reduced frame. This recording, which includes updating the HISTORY descriptor, avoids repetition of reduction sequences, and provides the user with the information on what has been done to the data.

By combining the basic reduction steps, a complete reduction pipeline procedure is built that enables the user to do an automatic reduction of all science frames. The pipeline procedure is controlled by a set of reduction keywords in combination with the information stored in descriptors of the data frames. Therefore, apart from commands that do the actual work, a number of commands help the user to manage keywords and descriptors.

1.4 Spectroscopy Packages

The long-slit spectroscopy package Long has been totally refurbished since the version 92NOV. It includes all functions of the previous packages Spec, Long and XSpectra as well as many additional features, such as batch reduction. The Long package now supports 1D and long-slit spectroscopy and includes a graphical user interface. A tutorial (command TUTORIAL/LONG) demonstrates the commands of the package.

A new package for spectral analysis has been developed by Juan Veliz at La Silla and is based on the graphical user interface XAlice. It provides basic functions for:

- flux integration, including continuum fitting and determination of line parameters like fwhm, equivalent width, flux and continuum level
- rebinning (logarithmic, frequency, red-shift)
- filtering by smooth or median filters
- multiple-component fitting by a set of gaussians.

2. Graphical User Interfaces

The version 93NOV includes four OSF/Motif based interfaces:

1. XHelp provides access to the on-line documentation. More functions have been implemented since the 92NOV version, including a history mechanism, strings search, files printing, context selection and feedback (problem report).
2. The new interface XDisplay implements a number of display related commands. It enables manipulation of images, LUTs, ITTs and cursor commands in an easier way.
3. The interface XLong is related to the new long-slit spectroscopy package Long. The interface allows the activation of calibration commands and provide convenient panels for arc lines identification and batch reduction.
4. The interface XAlice is related to the new spectral analysis package Alice (see Spectroscopy Packages).

All these interfaces conform to the ESO GUI Common Conventions which define the Look and Feel for all ESO interfaces in the fields of telescope and instrument control, archives and data analysis. In addition to the OSF/Motif XHelp interface, the 92NOV release included several Athena-based interfaces (XSpectra, XEchelle, XFilter, XStella). Some of them (XEchelle, XFilter, XStella) have not yet been ported to OSF/Motif and compiled versions for Sun and HP will be available through our anonymous ftp account.

3. Availability

The 93NOV release of MIDAS is scheduled for distribution in December 1993. An alpha version was frozen in July and tested internally. After this test, the beta version was shipped to more than 15 sites representing the major hardware platforms. Based on these test reports, the release will be finalized in November. The 93NOV MIDAS release will be verified on the following systems: SUN SPARC Solaris 1.x and 2.x, HP 9000, IBM PS/6000, DEC Ultrix-(MIPS), DEC VAX/VMS, DEC Open VMS (APX), Silicon Graphics and PC/Linux. DEC OSF/1 systems are not yet supported but a beta-test version is expected to be available in the spring of 1994. Sites must explicitly request the release, specifying the medium.

The MIDAS system is, at the moment, distributed free of charge to non-profit research organizations. They must sign a User Agreement with ESO in order to obtain the system. Information and requests for MIDAS should be directed to the Image Processing Group at ESO, Karl-Schwarzschild-Str. 2, D-85748 Garching, Germany, or through E-mail (Internet: midas@eso.org). A Hot-line service is also available at the same address. New releases and patches can be copied from the midas account on the Internet host 'ftphost.hq.eso.org'. Application packages and documentation are also available on our anonymous ftp account. A bulletin board can be accessed through the 'esobb' account on the Internet host 'bbhost.hq.eso.org'.

An ESO-MIDAS Implementation for PC/Linux

C. GUIRAO, ESO Image Processing Group

It may seem to be a contradiction to implement a large image processing system like ESO-MIDAS on PC type systems; however, they are becoming surprisingly powerful. Although normal reduction of data is better performed on workstations, the final analysis, which requires much more time for the interpretation of data than for actual computing, may be well suited for a PC. One of the main objectives is to provide an ESO-MIDAS implementation on a very inexpensive system that small institutes and even individual scientists can afford.

We decided to focus on Linux, a public domain Unix system, as the most suitable for the MIDAS community.

Linux not only satisfied the requirements to install MIDAS (C and Fortran compilers plus X11) but it also complies with ANSI-C and POSIX standards. In addition, it includes all the network software necessary to integrate the PC into a LAN. Linux is supported by the Free Software Foundation which also provides other public domain software (like GNU).

The popularity of Linux has increased enormously in the last months (as indicated by the "linux" newsgroup, one of the most active newsgroups on USENET), and with it the interest of the Astronomical community for having MIDAS ported to it. This became apparent during the 5th ESO/ST-ECF Data Analysis Workshop where the MIDAS Group showed the progress with PC port.

Now, the situation has improved substantially and we are glad to announce that the complete "core" of MIDAS has been successfully implemented and verified on Linux SLACKWARE 2.01. Some other MIDAS packages have also been tested by their authors (like `WAVELET`, `PEPSYS`, `ECHELLE` and `LONG`). A pre-release of the 93NOV release has already been distributed to several test-sites for a complete check-out.

The Graphic User Interface (GUI) packages for MIDAS are being ported to Linux. Two of them, XHelp and XDisplay, are already available while the rest will follow soon. The MIDAS GUIs are based on OSF/Motif which is a licence produce not included in the distribution of Linux. Thus, we can only distribute them in binary executable form as an option in the distribution tape. They will also be available under our "anonymous ftp" account.

Table 1: *Configuration of PC test system.*

Hardware	Software
i486DX/25 20 Mbytes RAM Adaptec 1542B SCSI board 1 Gbyte SCSI hard disk WD-8013 Ethernet board Local Bus S3 Video Card	Linux SLACKWARE 2.01 0.99.pl12 cc: GNU compiler 2.4.5 (included) f2c: f77 to C translator 22 (included) X11 R5 (included) Motif 2.1 (not required) MIDAS beta-release 93NOV (28 Mbytes)

The hardware and software configuration for the test system is given in Table 1 for information only. It does not mean to be the unique or minimum hardware setup. MIDAS requests only a 386 CPU, Linux release 0.99pl12 or higher, a minimum of 16 Mbytes of memory and some disk space depending on the amount of data needed. With shared libraries, the MIDAS executables and help files take around 30 Mbytes.

Table 2 gives a comparison of the performance of some MIDAS tasks on a PC and SPARCstation 2. It should be noted that on Linux there is no real Fortran compiler but a Fortran-to-C translator, and access to the disk on SPARCstation 2 is about 5 times faster than on our PC.

Both SunOS and Linux used the MIDAS shared library. The C-Whetstone benchmarks by H.J. Curnow and B.A. Wichman (1976, Computer Journal, Vol. 19, No. 1) were used to compute the "cwhetstones". The last columns with MIDAS benchmarks refer to the `filter/median` command executed on a 1000×1000 image and the Wavelet tutorial written 100 % in C code.

Besides the official distribution of MIDAS in source form, we intend to make a fully installed version for Linux available on the `midas ftp` account. It will be located in a subdirectory called "linux" and be available in two forms: one with sources (≈ 60 Mb) and another with only binaries (28 Mb), all packages included.

In order to limit our administrational overhead, we will not distribute the ESO-MIDAS PC/Linux version to individuals but only to registered sites. Thus, we will give MIDAS site managers permission to distribute PC versions of MIDAS to people associated with their institute.

Table 2: *Performance of MIDAS on a PC/Linux system.*

System	Core install	Size of core	Cwhetstones	Filter	Wavelet
PC/Linux, i486DX/25	49 min	11 Mb	10 MIPS	2435 sec	313 sec
SUN SPARCstation 2	30 min	26 Mb	10 MIPS	2045 sec	405 sec

DDS/DAT Tape Cartridges as New ESO Tape Standard

D. HOFSTADT, J. MELNICK, P. GROSBØL, ESO

The 9 track ½" tape format has during the last many years proved to be a very reliable tape standard for the exchange of data. Its main disadvantages are the relatively small data capacity per volume (approximately 200 Mbyte for a 2400-foot tape written with 6250 bpi) and very bad data density in terms of Gbyte per volume or mass. Large CCD detectors can now easily produce over a Gbyte of data per night. These facts demand that a new standard for data exchange must be adopted to facilitate easy transport of data acquired at La Silla.

Several aspects must be considered when choosing a new standard. The media must be reliable both in the sense of data security and with regard to support from multiple independent vendors. Its total storage capacity and data density are also important factors. Data transfer rates and speed of positioning on the media should be considered. Since many user sites would need to purchase devices for the chosen media, the price of both media and drives cannot be disregarded. A crude comparison of different media is given in the table, where values for the relative cost