European Southern Observatory

MIDAS Courier

Newsletter of the MIDAS Users' Community

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Editorial

As announced in the last issue of the *ESO Messenger* (No.75, March 1994), as of the beginning of this year a new Data Management Division is in operation at ESO. One of the main motivations for creating the division was to combine and coordinate ESO's activities in data handling, including calibration and archiving, and in providing scientific information concerning the ESO facilities. During the past months the main goals of the division have been defined, on the basis of which priorities are being set and manpower allocated.

In the new structure, the area of Data Analysis is taken care of by one of the four division groups: the Science Data Analysis Group (SDAG), previously known as the Image Processing Group (IPG). Among the main responsibilities of the group are the ESO-MIDAS project, the implementation of calibration and reduction software for data coming from the ESO telescopes, and to make, in collaboration with the other division groups, preparations for data processing facilities in the VLT era.

Clearly, these tasks will keep the SDAG rather busy. We therefore hope to establish fruitful collaborations with users, that will enable us to fulfil these tasks and the requirements of our, still growing, ESO-MIDAS user community.

During the last months of 1993 much work was done to prepare the 93NOV version which was finally released early December. Till now (21 March 1994) 236 copies of the new release (including binaries for PC/Linux) have been distributed. We are happy to see that a growing number of institutes (roughly 75% of the sites) explore the possibilities of networking and have obtained their MIDAS copy via ftp. In the mean time, the printed version of the documentation - now consisting of three volumes - has been sent out, finishing the release cycle for the 93NOV release. The full documentation is also available through anonymous ftp in PostScript format separated in individual chapters.

Although in principle ESO-MIDAS is released only once a year, on an exceptional basis we decided to prepare a minor release in May 1994 (94MAY version). This decision was made to fully support the DEC OSF/1 systems. The 94MAY minor release will only be available through ftp. No special documentation will be generated besides a new release of the ESO-MIDAS Environment document.

The usage of MIDAS at La Silla, in particular of the installations at the telescopes, has grown substantially since the last few years. Consequently, information concerning the status of MIDAS on La Silla becomes relevant to the user community, certainly, also in view of standard calibration procedures and quick-look facilities that will be developed in MIDAS with high priority. Therefore, starting with the next issue of the *Courier*, we intend to include a separate column about MIDAS on La Silla.

In this ESO-MIDAS Courier:

General, System and Application News

The MIDAS Group, *European Southern Observatory*

General News

New Major Release 93NOV

As announced in the Editorial, the 93NOV version of ESO-MIDAS has been released in the last month of 1993 and distributed in the first two months of this year. Copies can be obtained on magnetic tapes, written in either VAX/VMS backup or tar format, or via ftp. For all requests please send in the ESO-MIDAS request form. For ftp users, please be aware that the IP number for the ftp has changed to 134.171.40.2.

As usual, the ESO-MIDAS code is structured in five big segments (sub-directories): the Core (`prim`, including monitor and basic commands), the basic applications (`applic`), the standard reduction packages (`stdred`), the contributed packages (`contrib`), and the graphics user interfaces (`gui`).

The 93NOV release of MIDAS has been installed and verified on the following machines:

- IBM AIX Version 3 for RISC System/6000;
- Silicon Graphics IRIX Release 4.0.1 System V;
- Convex 3440, V10.1;
- DecStation ULTRIX V4.3 (Rev. 44);
- HP-UX A.08.07 E 9000/750;
- HP-UX B.08.00 A 9000/380;
- Sun SunOS 4.1.3;
- Sun Solaris 2.3;
- VAX/VMS V5.3 and V5.4;
- OPEN/VMS;
- PC/Linux Version 0.99pl12 and later.

In addition the 93NOV was partially installed on:

- DEC OSF/1 V1.3. From the minor release 94MAY on this OS is fully supported (see elsewhere in this *Courier*);
- PC/SCO;
- MacQuadra 800/A-UX;
- Stellar Stellix Release 2.3.

This new release of ESO-MIDAS has substantially gained in portability by using software standards provided by most computer manufactures. These standards are:

- Bourne Shell Language for scripts;
- Sockets for the Interprocess Communication System;
- Standard POSIX.1 for the Operating System Interface;
- Standard ANSI-C for the C code;
- Standard Fortran F77 for the Fortran code;
- Standard X11 R4/R5 as the window system;
- Standard Motif 1.1/1.2 for the graphics widget library.

Clearly, portability cannot be separated from general code quality and maintainability. Consequently, tools that lead to portability will enhance maintainability and code quality. For the 93NOV release the following tools have been used:

- Source Code Control System (SCCS). All original ESO-MIDAS sources are under SCCS which maintains a record of updates and allows to check when, why and who has made code changes;
- Gnu ANSI-C compiler, to test the ANSI compliance of the C code;
- Fortran Lint, a Fortran source code analyzer;
- Lint Plus, a C code analyzer;
- Purify, a run-time error detector for memory access;
- Quantify, a profiler and analyzer for performance evaluation.

Patches for the 93NOV release

A summary of patches for the 93NOV release of ESO-MIDAS can be found in the back of this ESO-MIDAS Courier. Currently, we are at patch level 3 (93NOVpl3). Patches can be retrieved from our ftp host. (ftphost.hq.eso.org or 134.171.40.2). To get the patches login under `midas`, and use our password. The patches are located in the directories `93NOV/unix` (for UNIX) and `93NOV/vms` (for VMS).

The distribution tape contains, besides the latest official release of ESO-MIDAS, the patches that had already been released at the time the tape was generated. These patches for ESO-MIDAS are included in the distribution tapes as a separate tar-format file.

Patches will not be distributed on tape to sites that have already received the distribution tape, except for very particular cases (e.g. those sites without access to Internet). Sites that have received and installed the distribution tape are strongly recommended to check for the existence of new patches in our anonymous ftp account under the `midaspub` directory on a regular basis.

New IP Number for "ftp" host

Due to organizational rearrangements in our Local Area Network, our ftp host "ftphost.hq.eso.org" has changed its IP number to 134.171.40.2 (previously 134.171.8.4). On this machine we continue to offer two different ftp accounts to access MIDAS files: the "anonymous" and the "midas" ftp accounts.

The "anonymous" (also "ftp") account is our ftp account to public domain ESO directories. In this account and under the directory "/midaspub" you will find the following files and directories:

- `/midaspub/courier`, which contains the compressed PostScripts files of the ESO-MIDAS Courier;
- `/midaspub/93NOV/doc`, which contains the LaTex and PostScript files for the complete documentation of the 93NOV release of MIDAS (Vol. A: System, Vol. B: Data Reduction, Vol. C: Command Description), as well as the MIDAS Environment document. The total size is around 3 Mbytes in compressed files;
- `/midaspub/93NOV/linux`, the 93NOV release of MIDAS in binary format, all MIDAS packages included, ready to run in a PC/Linux system. The total size is 9 Mbytes in compressed files that expand to 28 Mbytes after decompression.

"midas" is our restricted ftp account and is restricted to a list of activated IP Hosts from registered ESO-MIDAS sites (those with a valid ESO-MIDAS User Agreement). As such, this ftp service requires a password. We encourage anyone with access to the Internet to use it to retrieve everything related to MIDAS documentation, releases, patches, etc...

Not all our ESO-MIDAS sites are also registered to use this ftp account. If you are one of these non-registered sites, please contact Resy de Ruijsscher (resy@eso.org) to activate your site and to provide you with the corresponding password. Currently available under this account are:

- `/courier`, which contains the compressed PostScript files of the ESO-MIDAS Courier;
- `/93NOV/demo`, contains demos and tutorials of some packages for the 93NOV release of MIDAS;
- `/93NOV/doc`, as in `/midaspub/93NOV/doc` described above;
- `/93NOV/unix`, all you need to install the latest patch-level for the 93NOV release of MIDAS in UNIX systems;
- `/93NOV/vms`, all you need to install the latest patch-level for the 93NOV release of MIDAS in VMS systems.

Since February 1993 any user of MIDAS with access to the Internet can now retrieve the latest news about MIDAS releases and patches via the finger command. Just try:

`% finger midas@ftphost.hq.eso.org`

or `% finger midas@134.171.40.2`

New Minor Release 94MAY

As announced in the Editorial, in order to provide full support of the DEC Alpha machines running OSF/1, we intend to provide a 94MAY minor release. Currently this release is in its test state and distributed to beta-test sites for its final testing. It will be officially available to MIDAS sites by the end of May. Although it contains a number of new features and upgrades of the 93NOV release, it is only recommended to those sites with OSF/1 systems on which 93NOV cannot be installed. The 93NOV release will be still the official and fully supported release of ESO-MIDAS for all other systems, until 94NOV becomes available.

MIDAS Documentation

The user documentation for the 93NOV release has been distributed and is available under anonymous ftp (ftphost.hq.eso.org or 134.171.40.2). Login as ftp or anonymous and give your e-mail address as password. The directory is `midaspub/93NOV/doc`. Here you will find a number of ps-files which can either be printed chapterwise or as complete volumes (LaTex files are also available). For more information we refer to the *DOCREADME* file in this directory which gives an overview of the files available and their contents.

Please note that due to the creation of a new Volume C (Detailed Command Description) and merging of chapters in Volume B, the chapter numbering in both Volume A and B has changed.

If you are a registered MIDAS user site working with the 93NOV release and you have not received a printed copy of the user guide updates yet, please contact Resy de Ruijsscher (resy@eso.org) at ESO.

With the modification of the Standard Interfaces and the inclusion of the MIDAS Graphics Library (see below under System) as from May 1, 1994 a new version of the MIDAS Environment document (version 1.2) will also be available under anonymous ftp. Printed copies of this document will be mailed to the individual MIDAS user sites.

The document will apply from the ESO-MIDAS release 94MAY onwards.

System News

MIDAS Control Language

Significant modifications and enhancements have been implemented in the MIDAS Control Language, e.g. an improved debugger for debugging procedures, a more robust error handling and direct access to all data structures from within a procedure. To improve the information transfer, the support of help text for descriptors in the data files has been added. A prototype of communications protocols has been implemented to enable interaction of any stand-alone programme with MIDAS.

In/Output Redirection in the 94MAY Release

For some time the MIDAS user community expressed the wish for an easy and robust method to communicate between MIDAS and the host system. Thus, one could employ host system utilities for MIDAS reduction tasks and on the other hand system utilities could profit from MIDAS functionality. Because we didn't want to introduce a completely new twist to the MIDAS command syntax, the input/output redirection for MIDAS commands is implemented very similar to the Unix concept.

Output to ASCII files

In order to redirect the terminal output from a MIDAS command to e.g. a file *mystuff.dat*, one appends `" >mystuff.dat"` at the end of the "normal" MIDAS command (with a leading space). This is almost like in Unix, however, due to the MIDAS parser there cannot be a space between the ">" and the filename. For example, if we read in a bunch of 1-dim and 2-dim FITS files from disk and want to list only the 2-dim images, then:

```
INTAPE/FITS 1-999 data image
>afile; $grep "naxis: 2" afile
```

would do exactly that.

Normally, the output is written to a new ASCII file, if we want to append the data to an existing file, we must use ">>" instead of ">". So, e.g. if we want to save the contents of the descriptor HISTORY of frames *santa1.bdf*, *santa2.bd*f and *santa3.bdf* in the same file *kukiwu*, the commands

```
read/desc santa1 history >kukiwu
read/desc santa2 history >>kukiwu
read/desc santa3 history >>kukiwu
```

will do that.

Input from ASCII files

To use the contents of file *mystuff.dat* as input for a MIDAS command, one appends `<mystuff.dat` to the command (again, no space between the "<" and the filename). So, if we want to get the statistics of the 3 *santa* images, we could type:

```
$ls santa*.bdf >kukiwu; statist/
image <kukiwu
```

Note, that this redirection is also valid for VMS/OpenVMS.

Changes in the Standard Interfaces in the 94MAY release

This 94MAY release will be the first release in which the modified type definitions of arguments in the C-implementation of the Standard Interfaces are implemented. The modifications are:

- a change of the arguments of type "long int" to "int" in all SC and TC routines;
- a change of the type of the parameter 'unit' (e.g. in SCKRDC) from type "char **" to "int *".

These modifications were necessary in order to provide a clean port of MIDAS to a CPU with a 64-bit architecture, e.g. the Alpha chip from DEC running under the OSF/1 operating system (HP, IBM and SUN are also currently working on 64-bit chips).

A notification of these changes and a more detailed technical explanation were sent to all MIDAS sites in the summer of last year to obtain feedback from the user community and objections, if any. No negative response was received, so the modifications were implemented as proposed.

Nothing has changed with respect to the Fortran implementation of the Standard Interfaces, therefore users who wrote MIDAS applications in Fortran are not affected. Also the applications written in C will not feel the impact of these modifications as long as they are running on a 32-bit machine. However, we strongly recommend to update the relevant code as soon as possible.

The ESO-MIDAS Environment document which describes the Application Programming Interface for the MIDAS data structures will be upgraded accordingly in the coming months.

Note, that the original definition of the Standard Interfaces still applies to the 93NOV release of MIDAS.

New Graphics Library in the 94MAY Release

New in the MIDAS Environment is a standard MIDAS Graphics library. The library is meant for those who want to incorporate graphics into their Fortran or C applications that are fully compatible with graphics created by MIDAS commands. The library becomes available in the 94MAY release. For more information, see elsewhere in this *Courier.*

Application News

Refurbishment of the PLOT package

The MIDAS PLOT package of the 94MAY release is rewritten in C what you (hopefully) will notice by its improvement in performance. Also a number of limitations are lifted. For example, the `PLOT/CONTOUR` command no longer has restrictions on the frame size, in particular `PLOT/PERSPECTIVE` is much faster, and `PLOT/TABLE` is now ready for 3D tables. We have given it some nice options -- also useful for 2D tables -- which we will describe in following section.

Plotting of 3-dim tables

Lets start with good news for people with 2D tables: the parameter list of the `PLOT/TABLE` command is only extended and defaulted to give the same result as before. Thus, as first parameter you give your input table, as second and third you specify your data in the table. This can now be a combination of planes and vectors (in all 3 dimensions) or one axes as sequence number. In the help for this command you will find a detailed description for the syntax, rules and defaults applied to them.

If you have defined a plane in your table you may want to plot and/or connect points along one of the axes with different symbols and line types. This can be done in a rather awkward way by doing an `OVERPLOT` for each vector in your plane with different symbol and line types. With the new `PLOT/TABLE` command you can do this in one go, by giving a set of symbol and line types as resp. the fourth and fifth parameter. For example, if you have specified a plane with 5 vectors and give as fourth parameter `2,3,6` (= `STYPE`) and as fifth parameter `1,4` (= `LTYPE`), you will get 5 lines with resp. `STYPE 2,3,6,2,3` and `LTYPE 1,4,1,4,1`. The last parameter allows you to read your plane with the vectors along the second axis; your plane is flipped in X and Y on the fly. This is important because it determines which points are connected or shown with the same symbol.

Graphical User Interfaces

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

- XHelp provides access to the on-line documentation. More functions have been implemented since the 92NOV version, including a history mechanism, string search, files printing, context selection, and feedback (problem report).
- The new interface XDisplay implements a number of display related commands. It enables manipulation of images, LUTs, ITT, and cursor commands in an easier way.

- The interface XAlice is related to the new spectral analysis package ALICE
- The interface Xlong is related to the new long-slit spectroscopy package Long. The interface allows the activation of calibration commands and provides convenient panels for arc lines identification, batch reduction, etc.

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.

Spectrocopy news

As announced in the previous *Courier*, the LONG context for long-slit spectroscopy has been totally refurbished in the 93NOV version. The 94MAY minor release will include the latest version with a few additional features. Functions previously provided by different packages (Spec, Long, XSpectra) have been merged and the calibration process reviewed. More details about the improvement in the area of spectroscopy can be found in a separate contribution.

ESO-MIDAS Distribution Procedures

Carlos Guirao, *European Southern Observatory*

ESO-MIDAS releases

ESO-MIDAS is officially released once a year, normally at the end of November. At ESO-Garching there are, besides the official release, two other releases available to users of ESO-MIDAS, an internal frozen release and the development version. The name convention chosen for all these releases are:

- **rels** is the official release of MIDAS. It is officially named as yyNOV, where *yy* are the last two digits of the year; e.g 93NOV is the current official release of MIDAS. This is the unique release of MIDAS which is distributed to institutes who have signed a MIDAS User Agreement with ESO (currently 230).
- **new** is the latest internal release. It is the **test** release frozen normally three times a year (February, June and October) and made available to MIDAS users at ESO-Garching and ESO-LaSilla. It is a verified and reliable release of MIDAS that contains the new developments and improvements not found in the official release. The **new** release in June is called **beta-midas** release and it is the one used to generate the next official release in November. The **beta-midas** release is also distributed to a dozen beta-test sites, mainly using ftp connections.
- **test** is the development release. It is updated every night and compiled from scratch every week. This version of MIDAS has been made available to users for the unique purpose of having real users running and testing the latest developments not available on other releases.- Because of developments done every day, it is announced to users as un-reliable and un-supported.

The generation of a new release of MIDAS is done via a procedure called “freezing”. The procedure consists of the locking of all source files of MIDAS with the SCCS (Source Code Control System) tool. Then the delta (identifier for a given release) is incremented on all source files under SCCS.A new branch of the delta is also created (to allow development of the same file in parallel). A new directory with the name of the new release is created and then populated with the source files of the latest SCCS branch delta. The new version is compiled, verified and distributed to other domains at ESO. If the release is also the official release it is also copied to our ftp account for distribution.

Schedule for 94NOV release

The tentative schedule for the next official 94NOV release is as follows:

- July 1994: freezing of the alpha-release. This version is installed and verified on SunOS 4.1.3 and HP-UX A.09 which are the main systems maintained at ESO Garching and La Silla
- August 1994: installation on other systems. The alpha-release (only the core of MIDAS) is installed and verified on other platforms available at ESO and via Internet: Solaris, SG, VMS OPEN/VMS, DEC/Ultrix, IBM, Convex, OSF/1, PC/Linux.
- End August 1994: Beta-release. The new beta-release of MIDAS is distributed to beta-test sites (10-12 sites for 93NOV). They are supposed to test installation, documentation and MIDAS packages.
- Till End October 1994: Reports from beta-test sites.
- November 1994: freezing of the official release. MIDAS is tested and verified again on as many systems as are available. For packages, tutorials are executed as verification. The official release is made available to users of MIDAS at ESO.
- End November 1994: First distribution. MIDAS is made available on ftp accounts. It is then officially announced via mail to all sites with a signed User Agreement.
- December 1994: Start tape distribution of the official release of MIDAS to sites which explicitly issued a request, with a signed User Agreement and no Internet access.
- 1995: Distribution of patches. Patches for the official release are made available whenever circumstances require so. They are only distributed via ftp and on newly generated tapes.

Distribution of ESO-MIDAS

For the latest release of MIDAS, the 93NOV release, the distribution was done mainly via ftp connection (~ 175 copies retrieved via ftp versus 60 tapes distributed). We strongly encourage the use of ftp to retrieve the MIDAS release and documentation.

In the future distributions on tapes (QIC, DAT, EXABYTES and MAGTAPES) will only go to sites which explicitly have requested a tape, have a User Agreement, and no access to Internet. Currently, the amount of code and data files distributed is: 9.5 Mbytes for sources of MIDAS, 3.0 Mbytes for documentation in PostScript (Volume A, B and C), and 6.7 Mbytes for tutorial and demo files.

On ftp the complete MIDAS code is only available in a restricted account for registered sites with a valid User Agreement. Using anonymous ftp, i.e. without any restriction, MIDAS can also be obtained in binary format (currently only for PC/Linux). Till now a PC/Linux version of MIDAS was obtained by 75 registered sites.

Distributed files are, in order to save disk space and data transfer in the Internet, always in compressed format, and sometimes available in small chunked files to ease the transfer. These files are unique and identical for both system VMS and UNIX systems.

FITS Issues

Preben Grosbøl, *European Southern Observatory*

Introduction

Three new proposals to extend the FITS format have reached the final stage of review and are expected to be accepted as standards shortly. Two of the proposals deal with new FITS extensions (i.e. `BINTABLE` for binary 3D tables and `IMAGE` for maps) while the third defines general rules for physical blocking of FITS files.

BINTABLE Extension

The BINTABLE extension allows table data to be stored in binary form and is therefore up to 3 times more efficient in storage space than the `TABLE` extension format which requires all data to be stored in ASCII characters. The CPU intensive conversion between ASCII and binary formats is also avoided. Further, the new `BINTABLE` format can store a full array in a table entry and not just a single value. This and a special pointer type for columns open the way for transport of complex data structures (e.g. collections of spectra or images with full descriptions) when proper conventions are defined.

IMAGE Extension

The `IMAGE` extension is similar to a basic FITS header with data matrix. However, it makes it possible to store associated images of different size or/and scaling in the same FITS file (e.g. a detailed PSF or quality flags for the prime image).

Blocking Proposal

The Blocking proposal gives rules for physical recording of FITS files on different media. In general, FITS files may be written with a blocking factor between 1 and 10 of the logical FITS records size of 2880 bytes. For fix-block devices with an incompatible block size (e.g. QIC tapes with 512 bytes blocks) a FITS file is recorded as a byte stream.

INTAPE/OUTTAPE

The `INTAPE/OUTTAPE` commands in the 93NOV release were upgraded to accept these new FITS extensions. The new `BINTABLE` extension is used by default for tables due to its much higher efficiency. The ASCII table format can still be written by `OUTTAPE` using its `type=B` option. The MIDAS table file system was also significantly enhanced to provide storage structures similar to the `BINTABLE` definitions.

The original file name is saved in the FITS keyword `FILENAME` by `OUTTAPE` and will therefore be available in a descriptor `FILENAME` after restoring the file with `INTAPE`. An automatic rename is not done because it could give problems e.g. due to different naming convention for VMS and UNIX, or by overwriting existing files. The command `RESTORE/NAME` can be used explicitly. The new `INDISK` command provides an easy way to convert FITS files on disk. It includes both wild-card and automatic rename options.

The MIDAS Graphics Library

Richard van Hees, Rein Warmels, *European Southern Observatory*

Introduction

As announced in the Application News, the 94MAY release will contain a major upgrade of the MIDAS Graphics software. This upgrade was due in order to satisfy the increasing needs for a more flexible plot package, to lift limitations of some commands, and to enhance the `PLOT/TABLE` command to enable the graphical representation of MIDAS 3-dimensional tables. In order to finish this job successfully the complete graphics code was rewritten in C while in addition the MIDAS graphics keywords were restructured.

It was realized that the refurbishment of the graphics application code was an ideal moment to fulfil a long existing wish of those who want to develop their own MIDAS graphics applications: to provide, in addition to existing MIDAS plot commands, a MIDAS graphics high level library, callable from Fortan and C programmes as an extra easy-to-use-library on top of the low level Astronet Graphics Library (AGL).

Functionalities provided

The new MIDAS Graphics Interfaces library enable graphiical data representation in a reasonable flexible way. It can be used for graphical representation of most of the MIDAS internal data structures: bulk data frames (BDF), table files, keywords, and descriptors. Graphics created by application code that use routines of this graphical library are completely compatible with those create by MIDAS plot commands.

The interfaces are provided for both Fortran and for C. The library does not make reference to other libraries than the MIDAS Standard Interfaces and the low-level AGL library. Currently, it covers the following functionalities:

- control over the graphics setup. The setup is controlled by a number of MIDAS graphics specific keywords, whose contents can be changed by a number of interface routines. Similar to the command `SET/GRAPH` the values in the graphics keywords are accessed by name. Therefore, in case the graphics keyword structure needs upgrades in the future, the application code, i.e. the calling sequence to the interface routines, is not affected.
- open and close graphic devices and plot files. The open routine reads the graphics setup, initializes the device, and opens the plot file which will contain the graphics information written by subsequent calls to drawing routines in the graphics library
- plot a coordinate box. The library provides two routines for plotting a coordinate box: one that behaves similar to the command `PLOT/AXES`; the second offers a large number of options and makes use of the AGL axes routine;
- plot data. Data can be represented by symbols or lines or, via a separate routine, can be drawn in histogram format;
- plot text; This routine can be used to draw additional text on the graph;
- graphics cursor interactions.The graphics cursor routine returns coordinates referring to the current active coordinate system.

The set of interfaces is intended to cover the basic needs for doing software development for graphics data representation in MIDAS. If required, the lower level AGL library can still be used for functionality not provided by the MIDAS Graphic Library. However, when using routines from the AGL library, information about the graph, in partical the graphics setup, is not always saved. Hence, mixing calls to the MIDAS Graphic Library and the AGL library should be avoided.

The complete description can be found in the new version of the MIDAS Environment document.

The Long-Slit Package

Pascal Ballester, *European Southern Observatory*

Introduction

This article describes the latest 94MAY version which includes a few additional features, indicated hereafter by (94MAY).

The Long package now provides about 50 commands to perform all steps of the calibration/ reduction process and includes a MOTIF-based graphical user interface XLong, realized by C. Levin. One-dimensional spectra are handled by the package as a simpler case of long-slit spectra. An extension of the package for multiple-object spectroscopy is in preparation and should normally be available in the 94NOV release. A tutorial procedure demonstrates the different commands of the package.

Session Management

The Session Manager has been implemented in the context Long and provides a consistent set of commands to handle session keywords. This facility is now available in most of the standard reduction packages (CCD, Echelle, MOS and IRSPEC). All keywords of the package can be visualized by the command `SHOW/LONG`. Since there is an important number of keywords involved in the package, the command `SHOW/LONG` is organized in sections. For instance, `SHOW/LONG w` will display only wavelength calibration keywords. Information can also be obtained on the keywords with `HELP/LONG`, which is able to search keyword names as in `HELP/LONG wlcmtd` or to scan the keyword descriptions (e.g. `HELP/LONG pixel D` (94MAY)).

Keywords can be initialized using the command `SET/LONG`. Keyword names are checked and the syntax is flexible, allowing name truncation, arbitrary spaces and multiple assignments.

All sessions can be saved and retrieved with the commands `SAVE/LONG` and `INIT/LONG`. The lower level command `SAVINIT/LONG` can be used in read/write mode and allows saving all session keywords as descriptors of an image or a

Deadline for the next ESO-MIDAS Courier

The next issue of the ESO-MIDAS Courier, Volume 4, Number 1, will be published in the coming month October. This issue will include information concerning on-going projects of the MIDAS Group. Also, we hope to include a number of contributions by MIDAS users or software developers. Please, send your contributions, preferably in computer-readable format, to the MIDAS account or to the editor before September 30 (see back page for mail address).

table. For example, this command allows to document a completely reduced image or spectrum with the values of all calibration/reduction keywords.

Standard Orientation

The command `ROTATE/SPEC` (94MAY) enables rotating and/or flipping single images or catalogues, and in order to save disk space allows to remove each original frame after processing. Therefore the operation can be performed in one go on a catalogue of images and requires additional disk space for only one image. This solution was the preferred one compared to the option of allowing the different calibration/reduction routines to process the data in all orientations, which would have added unnecessary complexity to the code.

Wavelength Calibration

The previous version (92NOV) of the package included two different schemes for the wavelength calibration, namely a row-by-row and a two-dimensional calibration. The row-by-row scheme has been generalized: the arc spectrum is searched at equidistant steps (`YSTEP`). For each step a certain number of lines are averaged before detection (`YWIDTH`).

The wavelength calibration can be performed from initial identifications or in guess mode, using a previously saved session (command `CALIBRATE/LONG`). A two-pass wavelength calibration is performed by `CALIBRATE/TWICE`. Both methods generate a block-by-block table of coefficients to represent the dispersion relation.

The dispersion relation can be applied with the command `REBIN/LONG` which generates an image or with the command `APPLY/DISPERSION` which involves no data resampling and produces a table. A two-dimensional dispersion relation can be computed optionally (option `TWODOPT=YES`) and applied with the command `RECTIFY/LONG`.

Arc Line Identification

An experimental command `ESTIMATE/DISPERSION` is included in the package. This command avoids initial interactive arc line identifications and allows to start the wavelength calibration process from coarse estimates of the central wavelength and average dispersion. The syntax and implementation of this command will probably be changed in future versions. All feedback and comments will be welcomed.

Flux Calibration

In the revised version, the flux calibration involves three operations: In the first one the spectrum is corrected for atmospheric extinction with the command `EXTINCTION/LONG`. An instrumental response is generated in tabular format with `INTEGRATE/LONG`. This table can be plotted and interpolated (`RESPONSE/LONG`) to produce the response image. The science spectra can be calibrated in flux with `CALIBRATE/FLUX`.

Batch Reduction and GUI

Batch reduction is performed by the command `BATCH/LONG`. This command involves a large number of parameters and options and can be bet-configured better with the Graphical User Interface XLong. The interface provides visibility over the session keyword values and all available commands and options. Commands are generated and sent to MIDAS.

Expeditions in the MIDAS Jungle: Creating Images

Klaus Banse, *European Southern Observatory*

This time we will explore the different possibilities for creating images in MIDAS. Almost all commands in MIDAS which operate on images also produce a new result image, but here we want to concentrate on those commands that create a new image from scratch.

The first choice in that category is naturally (?) the `CREATE/IMAGE` command which creates 1-dim, 2-dim or 3-dim MIDAS images.This command uses the start values and step sizes of the image to calculate for each pixel its coordinate pair (x,y) which is then taken as argument for different functions to obtain an intensity for that pixel. For 3-dim images, however, you can only set all pixels to a constant value. The default function is a polynomial in x and y. Use the MIDAS help facility to list all the possible functions; here we just want to highlight a few options which are somewhat special.

With the option NODATA you create a *reference image*, an image with all the standard descriptors but no pixels. Several MIDAS commands need a reference image for specific options, e.g. to get the no. of axes and pixels for an operation but need no image data from that reference image. For example, `CREATE/IMAGE` itself is such a command.

With the option SEQUENCE, which is only valid for 1-dim images, you create a linear scale for a given interval [*a,b*], i.e. a ramp connecting points *a* and *b*. This is then a useful input image for building up functions via the `COMPUTE/IMAGE` command.

Another useful option is ASCII_FILE, that creates a MIDAS image which obtains its pixel values from data stored in an ASCII file (in free format), i.e. that is the way to get ASCII images into MIDAS. If none of the offered functions in `CREATE/IMAGE` is suitable for your specific needs, maybe you can build the image with the application procedure `func2d`, where you can use any combination of the usual mathematical functions. For example, `@a func2d arica 2,256,256 ? cos(x)*(x-y)*sin(x)*ln(y)` would build a 256x256 image *arica.bdf* according to the specified function. If you need randomly distributed data values the command `CREATE/RANDOM_IMAGE` is the right one for you. The syntax is the same as for `CREATE/IMAGE` but the function option selects a random distribution[1]. For example, the command `CREATE/RANDOM temuco 2,100,100 20.,18.,2.2,2.2` will create a 100*100 image *temuco.bdf* with start values = 20.,18., stepsizes = 2.2,2.2 and the pixel values of *temuco.bdf* will be determined according to a uniform distribution over the interval [0,1].

More closely related to astronomical needs is the command `CREATE/STAR` which creates the profile of a reference star as well as the context `GEOTEST` with commands to create artificial spectra and specific background images. For creative minds this context also includes the command `CREATE/ART_IMAGE` which offers options to experiment with Mandelbrot and Julia sets.

In case you work with Fourier transforms and need to do filtering in the frequency domain you can construct filter images via `CREATE/FILTER`. This command will create a Butterworth or exponential low/highpass filter.

Working with a display and/or graphics window gives you some more possibilities to construct new images in MIDAS. One special option of the `CREATE/IMAGE` command discussed above is `CREATE/IMA vallenar = GCURSOR`, where you choose the pixel values for a 1-dim frame *vallenar.bdf* via the cursor on the currently plotted image in the graphics window.

The command `GET/IMAGE` will create a MIDAS image from the contents of the display window, i.e. the pixel values will be between *0* and *(lutmax-1)*, where *lutmax* is the maximum number of colours available. With `COPY/DISPLAY` you get the contents of the display window and also all drawings/labels from the overlay plane merged into the resulting image (you actually do not need to send it to an output device if you are only interested in the image frame).

1. This application uses the NAG library

Another way to create MIDAS images is to convert images from another format into the MIDAS format. The most important format for transporting data between different systems (at least in the astronomical community) is the FITS format. Use `INTAPE/FITS` to get FITS files from tape or disk into MIDAS. The command `INDISK/FITS` is built on top of `INTAPE/FITS` to read FITS files from disk only. It offers options like wildcard characters and makes it easier to read in FITS files created by other data systems which employ file names not compatible with the ESO standard.

There exist several public domain packages like, e.g. *pbm* or *ImageMagick* which convert between many different image formats like GIF, TIFF, etc. - so, we don't need this functionality in MIDAS. The FITS format is also listed as a supported format in *ImageMagick*, however, the current version at ESO has problems with the FITS format. Therefore and since digital scanners usually produce TIFF files (at least as one of the available options), an application procedure `intiff.prg`(*) has been implemented to read TIFF files into MIDAS. This enables us to convert *printed* images into MIDAS. Besides the obvious 2-dim grayscale images it is desirable to get scanned 1-dim curves or spectra converted into the internal MIDAS format. This problem is addressed by the application procedure `scanima.prg`(*). For example, the command `@a intiff vallenar` gets the scanned plot of a spectrum as the 2-dim image *vallenar.bdf* into MIDAS. Then, the command `@a scanima.prg vallenar laserena` will recreate a 1-dim spectrum *laserena.bdf* (also a result table is possible).

The conversion of an image in ASCII format was already discussed above. In case your input image data is not equally spaced (e.g. event lists for X-ray data), you can use MIDAS tables to get your ASCII data converted into an image. `CREATE/TABLE` accepts formatted or free-form ASCII files as input and generates a MIDAS table. This table can then be converted into an image via the `CONVERT/TABLE` command which employs different methods like, e.g. polynomial fitting or spline interpolation for that. Also, the command `INTERPOLATE/TI` transforms table data to an image via an interpolation scheme.Whereas the command `COPY/TI` makes a straightforward copy to an image interpreting the input table as a data matrix.

Let's also look at how we can create 1-dim images from 2-dim images and vice the versa, in which case the `EXTRACT` commands offer many possibilities. `EXTRACT/IMAG` can be used to extract a single vector along an axis from a 2-dim or 3-dim image, e.g. the command `EXTRACT/IMAG copiapo = iquique[10.5,<:10.5,>]` will extract a column (at x = 10.5) of the 2-dim frame *iquique.bdf*. `EXTRACT/LINE` pulls a line out of a 2-dim frame at any direction (using bilinear interpolation), e.g. `EXTRACT/LINE valdivia = osorno[@10,@20:201,@30]`. The application procedure *`slicube.prg`* extracts 2-dim slices along any of the axes of a 3-dim frame.

With the command `GROW/IMAGE` you can build a 2-dim frame from a 1-dim one by repeating the single line as the rows or columns of the result image. Another method is employed in the command `ROTATE/1DIM` which rotates a 1-dim profile around its startpoint in the z-plane. For example, if you want to build a pointspread function you just need the cross-section of it (as a 1-dim frame) and then use `ROTATE/1DIM` to create the 2-dim psf. Currently, there is no corresponding single command to build 3-dim frames from e.g. a 2-dim frame. You would have to use `CREATE/IMAGE` to get a constant cube and then apply `INSERT/IMAGE` repeatedly to fill the different planes.

With an image loaded into the MIDAS display window there are several possibilities to extract a 1-dim frame from it. Via `EXTRACT/RTRACE` and `EXTRACT/CTRACE` you extract rows or columns from the displayed image. With the command `EXTRACT/TRACE` you extract a line in any direction (using the mouse and the arrow keys as second cursor to give the trace line the desired orientation). The commands `EXTRACT/ROTATED_IMAGE` and `EXTRACT/SLIT` extract 2-dim subframes which are not aligned with the x- or y-axis of the display (again bilinear interpolation is used). Whereas `EXTRACT/CURSOR` pulls out subframes which are aligned.

Also, the `VIEW/IMAGE` command has options to extract a row, a column or a 2-dim subframe of the displayed image.

Please note, that the procedures marked with an (*) are only available from the 94MAY release on.

The MIDAS 93NOV News File (with minor modifications and grouped by subject)

The following text contains a detailed summary of revisions and changes in the MIDAS application software during the period between the previous 92NOV and the new 93NOV release. MIDAS users can produce this text with the MIDAS `HELP [NEWS]` command.

System control

Midas Command Language Debugger - KB 921214
The command 'pause' has been added for Mdb, the Command language debugger, which similarly to the PAUSE command interrupts the debugged procedure and brings you back to the interactive level.
Then you can execute any MIDAS command. To continue with the debugging of the procedure use the CONTINUE command.
CREATE/DEFAULTS - KB 921216
There is no more limit on the number of commands for which you can define your own defaults.
SET/CONTEXT - KB 921218
The contexts have been restructured and are not hierarchically ordered anymore. Therefore, you can now clear any enabled context, not just the last one or all of them, as before. Also the total no. of enabled contexts has been raised. See the help for details.
IF command - KB 930118
We now also support .AND. and .OR. of two logical operations (e.g. `IF op1 .EQ. op2 .AND. op3 .GT. op4 THEN ..... ENDIF`) is now possible in a procedure. Please, note that only one `.AND.` or `. OR.` is possible since the max. no. of tokens per MIDAS command line is 10.
DO command - KB 930120
Start, end and stepsize of the DO loop may now also be names of integer keywords not just integer constants. See the help (via HELP/CL DO) for details.
DEFINE/LOCAL - KB 930222
The local keywords are now really "local" in the sense that they are by default not known at other procedure levels than the one where the defining MIDAS procedure is executing in. Before, they were also 'known' at all lower procedure levels, i.e. in procedures called from the procedure which has the DEFINE/LOCAL command. If you really want that, you have to use a new 4th parameter. Use the MIDAS command HELP/CL DEFINE/LOCAL to get the details.
Character descriptors/keywords - KB 930316
Finally, character arrays in descriptors and keywords are supported in MIDAS, i.e. either via MIDAS commands or the standard interfaces.
DEFINE/MAXPAR - KB 930322
New command DEFINE/MAXPAR has been added, to also check if too many parameters are passed to a procedure. See HELP/CL DEFINE/MAXPAR for details.
SET/MIDAS_SYS - KB 930323
Another option: debugger= has been added to this command (mainly useful for Unix systems where different debuggers are available). E.g. entering: SET/MIDAS debugger=ups will change from 'dbx' to the public domain Xwindow-based debugger 'ups'.
Just for MIDAS hackers: MAP,UNMAP/IMA - KB 930331
The undocumented, but nevertheless existing commands MAP/IMAGE and UNMAP/IMAGE have been removed. Caching of image file openings in MIDAS procedures is now done automatically and transparently to the user.
Help/Comments for descriptors - KB 930525
Now we support help-text for descriptors of MIDAS files. Adding help-text to an existing descr. is done via the new command: WRITE/DHELP. The descr. help is displayed via: SHOW/DESCR and also via: READ/DESCR with the option FULL (therefore the output from these commands has changed slightly). To access the help-text from Fortran or C programs two new standard interfaces have been implemented: STDRDH (SCDRDH) and STDWRH (SCDWRH) to read and write the help text.
CHANGE/DIRECTORY - KB 930616

Since MIDAS executes its applications in a child process (subprocess for VMS) which leaves no traces after termination, you cannot simply use the host command “$cd ...” (“$SET DEF ...” in VMS) to change the default directory once you are in a MIDAS session. The only way to change from one data directory to the next was to exit from MIDAS via ‘BYE’, change the directory while under the host operating system, and go back into MIDAS via ‘gomidas’. Now, the MIDAS command CHANGE/DIRECTORY will change the default directory inside the MIDAS session, i.e. you don’t have to go through the procedure described above anymore. See the help for details.

Immediate Commands - KB 930620

Up to now, only for keywords could one issue MIDAS commands like `keyword = key + {table,col,row} -20` for descriptors, image pixels and table elements one was restricted to commands like `table,col,row = value` Even worse, something like `table,col,row = 20 + key` would not display an error message but just fill the table element silently with the constant 20... Now, you can do things like `table,col,row = 20 + key-{image[@20,@30]}` or `image,descr = {table,row,col}+{image[@10,@10]} - {keyword}` but only for NON-Character descriptors and table elements. For e.g. descriptors of type CHARACTER no calculations as described above are supported.

inmidas,gomidas - CG 930811

New versions of the shell commands “inmidas” and “gomidas” has been developed to start a MIDAS session. They now accept several options in the command line. The man pages describe the syntax of these new scripts.

helpmidas - PB 930811

A new shell command “helpmidas” has been developed to start the GUI XHelp out of a MIDAS session. A man page describes the syntax of this command.

Input and output

INDISK/FITS - KB 931105

A new command has been added to simply and easily read FITS files into MIDAS. Consult the on-line Help for details.

Display and graphics

SET/CURSOR, GET/CURSOR - KB 930112

It is now possible to use also circular Region-of-Interest (ROI) in the XWindow environment. Use SET/CURSOR to define it and GET/CURSOR with the 2-cursor option. See the help for details.

CREATE/DISPLAY, /GRAPHICS - KB 930219

There is now the possibility of creating ‘shadow’ display/graphics windows, i.e. windows which copy the activity of another window. See the help for details.

GET/CURSOR - KB 931007

A continuous read-out mode has been added. Whenever you move the cursor (mouse) inside the display window the cursor coordinates are read and the corresponding world coords. and intensities displayed. See the help for details.

PLOT/HISTOGRAM and OVERPLOT/HIST - RHW 930514

An extra option has been included to facilitate hashing of the histogram. Also different types of histograms can be plotted: the usual staircase type and various bars types. For more info: read the help.

LABEL/GRAPH, OVERPL/LINE, OVERPLOT/SYMBOL - RHW/JV 930514

Using the graphics cursor, these commands now offer the possibility to define and re-define the position of the label, line, resp. symbol to be drawn. Again read the help texts of these commands.

PLOT/HISTOGRAM and OVERPLOT/HIST - RHW 930515

Once more. The commands now also give you the possibility to avoid plotting the excess bins. Since we were running out of parameters, to include this possibility the syntax is slightly modified: the parameters for binsize, minimum and maximum are combined in one parameter, and hence these values should now be separated by comma’s.

OVERPLOT/GRID - RHW 930516

Overplotting of a grid is available again. You can choose between connecting the large tickmarks or all tickmarks. Also, it is possible to plot the grid in the x, the y, or in both directions.

Image arithmatic, filtering

FILTER/... - KB 921214

All FILTER commands (except FILTER/COSMIC) have now an additional option in order to expand the input

frame or not. Also, two new filters, FILTER/MIN and FILTER/MAX have been added. See the help for details.
COMPUTE/IMAGE - KB 930105
The no. of possible operands in the expression has been increased to 21 (i.e. also 20 operators max.). Furthermore, you can specify the frame from which you want to copy the non-standard descriptors (used to be always the 1. input frame). See the help for details.

Graphical User Interfaces

CREATE/GUI DISPLAY - KB 930715
The new version of the Graphical User Interface for the display functions in MIDAS is now implemented. It follows the ESO GUI Common Conventions and incorporates modifications and enhancements forwarded to us by the users of the first prototype.
CREATE/GUI - PB 930811
The version 93NOV of MIDAS incorporates a set of four MOTIF based interfaces: XHelp for the on-line documentation, XDisplay for display-related commands, XLong for 1D and long-slit spectroscopy and XAlice for spectral analysis. All these interfaces conform to the ESO GUI Common Conventions which define the Look and Feel of all ESO interfaces in the fields of telescope and instrument control, archives and data analysis. The version 92NOV incorporated many Athena based interfaces (XSpectra, XEchelle, XFilter, XStella). Some of them (XEchelle, XFilter, XStella) have not been yet ported to MOTIF and compiled versions for Sun and HP will be available under anonymous ftp account on our host “ftphost.hq.eso.org”.
CREATE/GUI HELP - PB 930811
A new version of the XHelp Graphical User Interface has been implemented. It incorporates several new functions like a history, print, report/problem and the possibility to add and remove contexts. Like the initial version distributed in 92NOV, it is a standalone application.
CREATE/GUI LONG - PB 930811
A Graphical User Interface XLong has been implemented in complement to the refurbished package Long. This interface replaces the previous XSpectra interface.
CREATE/GUI ALICE - CL 930811
A Graphical User Interface XAlice has been developed for interactive analysis of spectral data. The main features are: flux integration, interactive filtering, red-shift rebinning and multi-gaussian fitting.

Context LONG and SPEC

CONTEXT LONG - PB 930811
The package Long has been totally refurbished since the 92NOV release. It incorporates 1D and long-slit spectroscopy and presents all functionalities previously spread in three different packages (Spec, Spectra and Long). A tutorial (command TUTORIAL/LONG) describes the commands of the package.
CONTEXT SPEC - PB 930811
The functions of the context Spec for reduction of 1D spectroscopy data are now covered by the package Long. The context Spec still exists but includes only some low-level commands used by both main spectroscopy packages Long and Echelle.

The MIDAS 94MAY News File
(with minor modifications and grouped by subject)

The following text contains a detailed summary of revisions and changes in the MIDAS application software during the period between the previous 93NOV and the new 94MAY release. MIDAS users can produce this text with the MIDAS `HELP [NEWS]` *command.*

System control

ASCII output - KB 931217
The output from any Midas command can now be sent to an ASCII file in a very similar way to e.g. in Unix.
In order to send the output of a Midas command to a file ‘kukiwu’ instead of the terminal, add to the command line the string “`>kukiwu`” in the end. If you want the output to go into the file and also to the terminal, add the string “`>kukiwu,terminal`”. The output file is created as a new file. If you want to append stuff to an existing file, add the string “>>kukiwu”. Please, note that there should be no blank between the ‘>’ or ‘>>’ and the filename!

Multiple commands per command line - KB 940119
As in interactive mode, you can now also write several commands per line in a Midas procedure. Please, recall that commands are separated by a semicolon (‘;’). If you want the char. ‘;’ not interpreted as a command separator, write ‘\;’ instead.

MIDAS filenames - KB 940126
Due to popular demand we removed the restrictions on Midas filenames, e.g. you can use again an image like ‘quasar01+12.bdf’. However, if you want to use such an image in a COMPUTE/IMAGE command you have to enclose the full name in quotes, e.g.: `comp/ima &a = "quasar01+12.bdf"-12`

SET/MIDAS=INSERT_MODE - KB 940126
A new option INSERT_MODE has been added to the command SET/MIDAS_SYSTEM in order start up always in InsertMode when editing a Midas command line. See the help of SET/MIDAS_SYSTEM for details.

EXECUTE/CATALOG - KB 940128
The command EXECUTE/CATALOG has been updated to be more flexible. Also the related SETUP commands, like WRITE/SETUP CATALOG, have been updated and documented completely.

Input and output

TIFF images - KB 940107
Now, images in TIFF format can be converted to MIDAS files via the command ‘@a intiff’. See ‘HELP/APPLIC intiff’ for details.

ASCII input - KB 940113
Any suitable Midas command can now obtain its input from an ASCII file in a very similar way to e.g. in Unix by using the string ‘<file_name’ instead of a parameter list. E.g. if the ASCII file ‘kukiwu’ contains 3 lines containing the filenames lola.bdf, mimi.bdf and petrita.bdf, then Midas > read/descr <kukiwu will execute the READ/DESCR command for all the 3 files. To be more explicit, the command will be executed for each line of the file, taking as parameters the contents of that line. Please, note that there should be no blank between the ‘<‘ and the filename!

Compressed images/tables - KB 940119
Now, Midas supports compressed images or tables (by compressed we mean the files xyz.bdf.Z created with the Unix ‘compress’ command). Therefore, this facility is only available for Unix systems not for VMS!! E.g. use “READ/DESCR itest.bdf.Z” to read the standard descriptors of the compressed image itest.bdf.

Table file operations

EXECUTE/TABLE - KB 931220
A new command EXECUTE/TABLE has been added. This command executes Midas commands which are stored in a table row. See the help for details.

Display

Resizing of windows - KB 940113
You can now resize the display or graphic windows of Midas. However, after that you have to reload or replot your image in order to assure the correctness of future cursor related commands.
3D-viewing - KB 932312
A new application procedure 'zperspec.prg' implements a perspective display of a 2-dim image. Use "HELP/APPLIC zperspec" to get the details.
.../AUX_WINDOW command - KB 940113
The names of the commands CREATE/AUX_WINDOW and COPY/AUX have been changed to CREATE/ZOOM and COPY/ZOOM (no change in the syntax). Also a new command DELETE/ZOOM has been added. See the HELP for details.
INITIALIZE/DISPLAY - KB 940126
Since Midas does not distinguish anymore between different window managers, the parameter 'window manager flag' in INIT/DISPLAY has been removed. Please, consult the help of the command for details.
Scanning plots - KB 940204
A new application procedure 'scanima.prg' has been implemented. Via '@a scanima' you can reconstruct a 1-dim frame from a 2-dim image containing the plot of that frame. So, e.g., if you just have a plot of a spectrum (hard-copy) do the following: go to the scanner in the user room, scan it and produce a TIFF file. Then read that file into Midas via '@a intiff' and finally rebuild the spectrum via '@a scanima'. Use "HELP/APPLIC scanima" to get detailed information.
VIEW/IMAGE - KB 940210
Continuous cursor readout and an option to calculate the magnitude of objects have been added to VIEW/IMAGE. See the help fo details

Graphics

Graphics system - RHW 940105
With the help of Richard van Hees (Department for Space Research, University of Groningen, Netherlands), the complete graphics subsystem was redesigned and rewritten in C. This work involved the following items: a: redesign of the graphics keywords in the MIDAS keyword structure; b: creation of a MIDAS standard graphics library that will be included in the new version of the ESO-MIDAS environment document; c: conversion the high level MIDAS graphics library from FORTRAN to C; d: conversion of the MIDAS graphics application code from FORTRAN to C.
In spite of the fact that this work meant a complete overhaul of the graphics code, the average MIDAS user will, except for the number of new features (see below) and big improvement in performance, not notice it (however, the results of the efforts will hopefully be appreciated),
Although the new system has been tested thoroughly during the months November and December it still may contain bugs, improper documentation, or other inconveniences. Therefore users are kindly asked to report these to me.
Graphics keywords - RHW 940105
Which the upgrade of graphics system most of the graphics keywords have changed their name, and/or their meaning, and/or their position. Hence, all procedures that do manipulate graphics keywords should be checked and, if needed, modified. The new graphics keywords are contained in PLISTAT, PLRSTAT, PLCSTAT, PLRGRAP, PLCMETA, and PLCDATA. For an overview of these keywords use the command HELP/KEYWORD PLxxxxx.
New standard graphics library - RHW 940105
Similar to the standard MIDAS libraries for the Standard Interfaces and the MIDAS Tables File System, there is now a standard library for MIDAS Graphics. This library provides a set of interface routines (both in FORTRAN and C) that can be used to enable data representation in a reasonable flexible way. The documentation will be included in the next version of the MIDAS Environment document. Copies are already available in my office (room 401).
Graphic windows - KB 940128
Now, also the internal info of the different graphics windows is saved like for the display windows. That means, that you can create several graphics windows at a time and switch among them (via ASSIGN/GRAPH) freely without losing the coordinate information in these windows. Note, however, that only parameters concerning the coordinate systems and the plotted data are saved. The general graphics parameters like line width (LWIDTH), colours (COLOUR, BCOLOUR), plot mode (PMODE) are not saved.

New naming convention for plot files - RHW 940208
In order to avoid conflicts in the names of plot files the naming convention of plot files has been revised. Now, for each assigned device the graphics system generates a plotfile with a name that starts with name of the assigned device (e.g. graph_wnd0, ps4ipg1, etc.), followed by MIDAS unit number, and with the extension ".plt" (e.g. graph_wnd00.plt, ps4ipg100.plt). Although this may look complicated, you will hard notice the change since in most cases the names of the plot files are not used.
Postscript devices - RHW 940208
Three new devices called postscript (default = landscape), postscript.l (for landscape), and postscript.p (for portrait) have been included. Assigning the graphic output to one of these devices (e.g. ASSIGN/GRA postcript) will generate a postscript file postscript.ps. These new "devices" ease the inclusion of encapsulated postscript graphics in your papers and documents.
PLOT/PERSPECTIVE - RvH/RHW 940105
A new version of PLOT/PERSPECTIVE has been installed. It is much FASTER than the old one and offers the possibility to draw the grid in the X, y, or both directions. Since making perspective plot of large areas doesn't make much sense (every thing will turn back), the limit is an area of 512x512 pixels. The meaning of the command parameters have slightly changed. They can now be understood.
PLOT/TABLE - RvH/RHW 940105
The plot table command has been upgraded to facilitate the representation of 3-dimension tables. This addition functionality was required by the ISO software group in the Netherlands how currently are writing and testing their (MIDAS) calibration and analysis software for the ISO project. Take some time, and read the help file for complete information.
PLOT/CONTOUR, PLOT/GRAY, PLOT/VECTOR - RvH/RHW 940105
The limit of 512x512 pixels has finally be lifted. All image sizes can now be plotted.
ASSIGN/GRAPH - RHW 940208
The FILE/NOFILE option in the command ASSIGN/GRA has been eliminated. Now, plot (meta) files, with the extension .plt, will always be created.

Context CCD

New Context CCD - RHW 940112
The first version of the new MIDAS CCD package has been released. The package allows you to reduce your CCD frames in a very flexible way, either in automatic or "manual" mode. This release is to be considered as beta test version. Therefore, users are urged to report bugs, problems, suggestions, improvements, or other comments of this nature to me (Rein Warmels, rwarmels@eso.org).
Context CCD - RHW 940114
At initialization of the CCD context a MIDAS table (eso_specs.tbl) and a MIDAS procedure (eso_descr.prg) will be copied into your working directory. The MIDAS table contains the specifications of the CCD's currently in use on La Silla (data taken from the ESO Users Manual 1993). This table is used by the LOAD/CCD command that will look into this table for the requested telescope/instrument parameters and to be loaded into the CCD keyword structure. The MIDAS procedure copies the names of the (default) ESO descriptors into the CCD keywords, and is executed when the CCD context is enabled. Both, MIDAS table and procedure can be simply modified. Read the help documentation of LOAD/CCD and INIT/CCD for more information.
COMBINE/CCD, MKCAL/CCD - RHW 940125
The exposure types of the input frames are now compared with the exposure type stored in the keyword 'exp'_type, where 'exp' is BS, DK, FF, SK, OT (the first parameter of the command). If a difference is found, i.e. you have included frame(s) with wrong (a) exposure type(s) the combining will be terminated.
Context CCD - RHW 940204
Several commands in the CCD package have been updated. In particular, the REDUCE/CCD command now takes care of several error conditions during the reduction pipeline. Also, a new table (eso_specs.tbl) containing the ESO specific CCD parameters will be created in the working directory when the CCD package is initialized.

The MIDAS 93NOV Patch File Summary (from the ftp account)

The following text contains the current (dated 25 March January 1994) information about the patch files for the ESO-MIDAS 93NOV release. The patch files can be obtained from `ftphost.hq.eso.org` *or 134.171.40.2).*

93NOVpl1

New or fixed in 93NOVpl1 compared to 93NOVpl0 (original 93NOV release):

- fixing some help files for the Data Organizer (`DO`) context;
- fixes in the MIDAS installation file `install.sh`;
- fixes in the MIDAS installation file `setup.sh`;
- `indisk.prg` and `indiskfits.hlq` updated.

93NOVpl0 can be updated to 93NOVpl1 by replacing only those files affected by the updated ones.

Directory: `93NOV/<system>/patches_pl0`

Files: `README`
`fix001.tar.Z*`
`fix002.tar.Z*`
`fix003.tar.Z*`
`fix004.tar.Z*`

93NOVpl2

New or fixed in 93NOVpl2 compared to 93NOVpl1:

- help files for `INTAPE/OUTTAPE` updated;
- bug fixed in the MIDAS tapeserver;
- Bug fixed to correctly setting descriptor `LHCUTS;`
- A new context included: `CCD;`
- Bug fixed with the `ADD/ICAT;`
- Man pages in `./93NOV/system/unix/*.l;`
- Upgrade in “installation” document;
- Bugs fixed in the installation procedures.

93NOVpl1 can be updated to 93NOVpl2 by replacing only those files affected by the updated ones.

Directory: `93NOV/<system>/patches_pl1`

Files: `README`
`patches_pl1.tar.Z`

93NOVpl3

New or fixed in 93NOVpl3 compared to 93NOVpl2:

- context `PEPSYS` is compiled without Fortran optimizer;
- `CCD` context bugs fixed in and upgrade of sources;
- bug fixed with the `REPORT/PROBLEM` command;
- bug fixed with `MAXIMUM` option in `AVERAGE` commands;
- update of `TUTORIAL`, and bug fixes for the `IRSPEC` context;
- adding option `NBORDI<0` in command `DEFINE/HOUGH` in `ECHELLE` context;
- documentation of `ESTIMATE/DISPERSION` in the `LONG` context;

- update in some installation scripts;
- adding warning messages in command CREATE/GUI;
- first implementation to support A/UX systems (Unix on Macs);
- checking descriptor_type when writing descriptors;
- bug fixed in INTAPE/FITS when reading tables containing I*2 (only HP);
- refurbishment of the CCD package;
- bug detected in Fortran compiler SC1.0.1 for SunOS 4.1.3;
- bug fixed for COMPUTE/IMA;
- TERMCAPFILE modified to support xterms on HP;
- bug fixed in PLOT/ASSIGN to translate logical names into system names;
- command EDIT/LONG added in the LONG package;
- warnings for zero dynamic range in data (PLOT/TABLE & PLOT/HISTOGRAM);
- bug fixed in VMS installation of MIDAS with default files;
- bug fixed with wildcard input;
- correct flag conservation option;
- making the CENTER algorithm more robust;
- bug fixed for VMS systems in INTAPE/OUTTAPE commands;
- 93NOV help files updated;
- fix EXTRACT/CURSOR for scaled images;
- some compilation errors in IBM/6000 for package WAVELET fixed;

93NOVpl2 can be updated to 93NOVpl3 by replacing only those files affected by the updated ones.

Directory: 93NOV/<system>/patches_pl2

Files: README
patches_001.tar.Z
patches_002.tar.Z
patches_003.tar.Z

ESO-MIDAS Request Form

This is a request form for release 93NOV of the ESO-MIDAS[1] system. To obtain a new release, please complete this form and return it to us (see reverse). Material will be shipped only to users with a valid ESO-MIDAS User Agreement. If you still have a tape or tape mailing box from the last release, you MUST return these before we send the new release.

ESO-MIDAS User Agreement No[2]: ______________________________

Technical Support Coordinator: ______________________________

E-Mail: ______________________________

Tape format:

- ◯ 1600 bpi VAX/VMS backup
- ◯ 6250 bpi VAX/VMS backup
- ◯ 1600 bpi TAR format
- ◯ 6250 bpi TAR format
- ◯ QIC-24 TAR format
- ◯ Exabyte 8200 TAR format
- ◯ DDS/DAT 4mm TAR format
- ◯ DDS/DAT 4mm VAX/VMS backup
- ◯ ftp (TAR files only)

Documentation requested:

- ◯ ESO-MIDAS User Guide 93NOV
- ◯ ESO-MIDAS Environment Version 1.2
- ◯ IDI-routines
- ◯ AGL Reference Manual Version 3.61

Date: ____________________ Signature: ____________________

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2. for new user agreements t.b.d.

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