European Southern Observatory

MIDAS Courier

Newsletter of the MIDAS Users' Community

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Editorial

During the MIDAS Users' Meeting following the Second Data Analysis Workshop in April 1990 a questionnaire was passed out to the participants. The purpose was to obtain input from the MIDAS users community as of how the various aspects of the MIDAS software, e.g. installation procedures, application software, documentation, could be improved. In addition, the questionnaire was also meant to find out if the interaction between the MIDAS group and the users should be improved, and if yes, how.

In a sense, the results obtained from the questionnaire were not too surprising. Already before this questionnaire suggestions were put forward to establish means for regular information exchange. In fact, the yearly MIDAS workshop was set up for that purpose. Lack of manpower prevented us from doing much more than that. However, it was clearly felt that the MIDAS Users' Meeting is not sufficient. A clear wish was to establish a MIDAS newsletter, to facilitate information exchange between the MIDAS group and the MIDAS community.

For the MIDAS group it is the right moment to start this newsletter. Various parts of the MIDAS system have been changed in the course of the last few years: the port to the UNIX world, the (re)definition of the Standard and Table Interfaces, the adoption of the X11 windows display system, and, most recently, the redesign of the MIDAS directory structure (see elsewhere in this Courier), to mention only the most important ones. Now the system is stabilized, for hopefully the next few years the newsletter can deal more with useful application software rather than with system and installation changes as would have happened if this newsletter would have been issued earlier. However, it is hoped that this newsletter will not only find its readers among those already familiar with MIDAS, but also among those who may become users in the not too far future. MIDAS has been defined as the on-line system for quick look analysis and image processing at ESO's Very Large Telescope (VLT). As a first step toward these new (on-line) applications, MIDAS will be installed on the New Technology Telescope (NTT) for doing near real time quality check of acquired data. With this development we anticipate that the MIDAS user community will grow rapidly.

This newsletter was made for the users to improve the information exchange between the MIDAS group and the MIDAS users on one hand, and between the users themselves on the other. Hence, we would like to see that it is not only the MIDAS group that will fill the Courier: contributions from MIDAS users are strongly encouraged.

We start the MIDAS Courier with two annual issues. We hope it will serve its purpose and, as usual, are open for your criticism, suggestion, and comments.

In this ESO-MIDAS Courier:

The MIDAS Group

1991 MIDAS Users' Meeting

General, System and Applications News

A New Installation Procedure

The MIDAS Bulletin Board

Major Improvements in the Table System

The Echelle Package Revised

The STARCAT-MIDAS Connection

The 91MAY News File

Problems found in the 91MAY release

The MIDAS Group: who is who and what do they do

This first MIDAS Courier offers an excellent opportunity to introduce the current members of the MIDAS group to you. Below, you will find the names of all who devote, partially or completely, their time to the MIDAS project, and their main areas of activity. Although the MIDAS group provides a telephone service to discuss MIDAS related issues by phone we would like to encourage you to use this service only in urgent cases, and to send your comments, suggestions, problems and error reports in written form either by E-mail, telefax or telex. All MIDAS support services are listed on the last page of this Courier.

Pascal Ballester is French, and obtained a M.Sc. at the Ecôle Nationale Superieure de Physique of Marseille. His background is mainly in the area of optics, image processing and computer science. Pascal joined the MIDAS group in spring 1990 and since then he is working on a new version of the Echelle package.

Klaus Banse, is German and received a Diplom in Mathematics from the Free University in Berlin and a M.Sc. in Computer Science from the University of Colorado in Boulder, USA. After having worked at ESOC in Darmstadt, he joined ESO in 1977 and was involved with MIDAS since its very beginning in 1980 as a VAX/VMS based system. He is responsible for the MIDAS monitor and the MIDAS command language as well as for the display oriented and general image processing applications inside MIDAS.

Preben Grosbøl is Danish and got his M.Sc. and Ph.D. from the University of Copenhagen in astronomy with a thesis on stellar dynamics. After a post-doctoral scholarship, he joined ESO as a fellow in 1979. He became staff member of the Image Processing Group in 1980 with responsibility for the ESO measuring machines, and head of the group in 1986. He is also chairman of the IAU FITS Working Group.

Carlos Guirao, is Spanish and left his position as an UNIX system programmer at Fujitsu, Spain to join the MIDAS group at ESO in January 1988. Since then he has been involved in the configuration and management of the UNIX-LAN at ESO, but still finds some time to deal with MIDAS installation procedures, MIDAS version-control and the MIDAS-operating system interfaces.

Michèle Peron is French, and obtained a M.Sc. in applied mathematics. She joined the MIDAS group two years ago. In the MIDAS project she is responsible for the table file system and is involved in the development of mathematical algorithms and some spectral applications. She also takes care of a large part of the MIDAS support, and frequently gives courses for internal and external users.

Resy de Ruijsscher is Dutch and just recently joined the MIDAS group. Before, she worked in England and for a firm in Munich where she managed the PC-LAN. Being now at ESO, she acts as the Image Processing Group secretary, and takes care of the MIDAS distribution and documentation.

Rein Warmels was born in The Netherlands. After finishing high school he studied astronomy at the University of Groningen where he obtained his M.Sc. and, in the area of extra-galactic radio astronomy, his Ph.D. He joined the MIDAS group in the fall of 1985. He is responsible for the software of the graphic subsystem, direct imaging and general astronomical applications. He is the editor of the MIDAS Courier.

Although his work is only loosely related with the MIDAS project we would also like to introduce **Miguel Albrecht** to you. He was born in Santiago de Chile where he grew up and finished high school. He earned his M.Sc. and Ph.D. degrees in Theoretical Astrophysics at the J. W. Goethe University in Frankfurt, Germany. He then moved to ESRIN, ESA's establishment in Frascati, Italy, where he had major responsibilities in the ESIS project. He joined ESO recently to take over and develop the archive of observations from ESO telescopes.

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100 ESO–MIDAS User Agreements

Recently, a milestone was reached in the ESO-MIDAS project: we are happy to announce that the 100th ESO-MIDAS User Agreement has been signed. The Agreement was signed by ESO and the Onsala Observatory, Sweden. We would like to thank and to congratulate the MIDAS users and, in particular, the Onsala Observatory.

1991 MIDAS Users' Meeting

Dietrich Baade,
European Southern Observatory

The annual ESO/ST-ECF Data Analysis Workshop is traditionally followed by the MIDAS Users' Meeting. The meeting started with an overview by members of the Image Processing Group of major recent and future developments of MIDAS. Michèle Peron summarized various enhancements of the MIDAS Table File System. Carlos Guirao described how the new directory structure will enable custom tailored MIDAS installations with only selected constituents of the entire system; this should be beneficial especially to users of smaller machines. The main report was given by Preben Grosbøl; topics included the new release procedures, the availability of temporary positions for long-term visitors to ESO's Image Processing Group (IPG) who wish to contribute new applications software, the systematic verification of commands in the MIDAS core, etc. With the exception of the Time Series Analysis Package, the 91MAY version of MIDAS will be a superset of the 88OCT version which was the last pure VMS version. Finally, he gave a short preview of the preliminary benchmarking results that were obtained in connection with the planned replacement of ESO's VAX computers by UNIX machines in the summer.

Because user feedback provides the most efficient quality control the bigger part of the morning had been reserved for questions, comments, and suggestions by the about the 50-60 external participants. The following necessarily is a very condensed excerpt: The intended reduction of the number of annual full-scale releases from two to one, but with incremental updates and bug fixes in between, did not meet objections. Questions about dependencies on commercial software libraries could be answered that the usage of such packages have already been considerably reduced. Where the elimination of external calls could not yet be achieved, dummy libraries are provided so that at least the installation is possible. Some inconsistencies were reported between the FITS writer used on La Silla and the MIDAS FITS reader. They occurred temporarily as a consequence of the gradual transition to the new ESO archive format. On some installations the performance of the plotting package was found unsatisfactory. The MIDAS Group will get in touch about this with the AGL group in Trieste. Also, questions related to a more menu-like (graphics) interface and the full support of various coordinate systems in MIDAS were asked. The MIDAS Group answered that these items are certainly on the wish list but currently have not a high priority. Furthermore, ESO-Garching does not presently see a realistic possibility to compile and maintain an extensive library of calibration data (standard star fluxes, laboratory wavelength lists, etc.). Whether this can be done by La Silla remains to be seen.

At the end of the meeting, H.-U. Zimmermann, T. Belloni, and C. Izzo of the neighbouring Max-Planck-Institut für Extraterrestrische Physik gave a lively 20-minute demonstration of the EXSAS system developed for the management and processing of the *ROSAT* All Sky Survey data. This very complex and versatile system is based entirely on MIDAS; upon request, the MPE will make it available to other MIDAS sites.

General, System and Applications News

The MIDAS Group, *European Southern Observatory*

The User Agreement

As mentioned in the MIDAS Memo (September 1990 issue of the ESO Messenger) the distribution policy of MIDAS has been changed slightly since the 90NOV release. From the 90NOV release on it is mandatory to sign an explicit ESO-MIDAS User Agreement in order to use the released software. User Agreements for ESO-MIDAS will have a duration of five years for non-profit research institutes with no reproduction charge whereas for other organizations a three year period with a reproduction charge will apply (currently DM 1,000)

After the **signed** form has been returned ESO will

allocate a User Agreement number, and add the agreement type, duration, purpose and reproduction charge if applicable. ESO will then sign the agreement and send a copy to you.

In some cases major organizations have indicated to have some difficulties with particular paragraphs in the user agreement. Obviously, slight modifications of the User Agreement are, within sensible limits, possible, but depend on the particular circumstances of the user. In case of problems and questions please contact Preben Grosbøl, Head Image Processing Group, ESO.

Please note, that new ESO-MIDAS releases will not be sent to user sites automatically. After announcement of a new release, a request specifically stating the tape format should be issued to ESO (possibly by E-mail). For the current 91MAY release requests may be issued to ESO, contact Resy de Ruijsscher.

New Environment Document

As has been announced in the last ESO Messenger (No. 63, March 1991) a completely new version of the MIDAS Environment Document is now available. This first official version (version 1.0) replaces and supersedes the old one (version 15 July 1987).

The document contains the complete description of the MIDAS environment. For those who plan to make contributions to MIDAS it is the source of information. It describes in detail the (new) MIDAS directory structure, the coding standards (rules for Fortran and C, MIDAS procedures, for code documentation, help files, etc), the Standard and the Table Interfaces. Like the old document this new MIDAS Environment Document contains a chapter about the integration of application software in the system. In addition, a new and more elaborate set of code and documentation examples have been included. In the present version these examples are restricted to Fortran; in forthcoming new versions C program examples will be included as well.

Suggestions for corrections and improvements are most welcome. Copies of the new document have been sent to all MIDAS sites. Additional copies can be obtained from the Image Processing Group of ESO, contact Resy de Ruijsscher.

MIDAS Verification

In the course of last year, together with the implementation of the new MIDAS directory structure (see under System News), a procedure was started to verify the so-called MIDAS core commands. Core commands were defined being those commands which should be put into the basic system. In the new directory structure the code for these commands can be found in the `prim` directory branch (see the next contribution). All core commands were grouped, according to functionality, into 8 groups. At ESO these groups were distributed among various people for careful checking: robustness of code, sensible defaults, correct and adequate documentation, useful error messages, etc. At this stage, at the moment of this first ESO-MIDAS Courier, roughly 75% of all core commands have be verified, and we hope to get this exercise done by the end of the summer. Hence, in the new 91NOV release all MIDAS core commands will be thoroughly checked.

System News

New directory structure In the 91MAY release you will find that the MIDAS directory structure has been modified considerably. The reasons for the restructuring were mainly twofold.

Firstly, we wanted to establish a certain hierarchy in the support level. Therefore, a basic MIDAS system or ‘core’ was created. This ‘core’ is required in all installations and contains the main libraries, the monitor and the basic MIDAS commands. Application code related to the basic MIDAS commands can be found in the `prim` directory branch. The ‘core’ MIDAS will be supported with the highest priority. Below this level you will find various MIDAS packages. They are optional and classified in three categories with decreasing support levels: applications, standard reduction and contribution packages. Code for these packages can be found in the `applic` (for general applications), `stdred` (for ESO instrumention), and `contrib` (for external contributions), respectively.

The second consideration was that the new design should enable a simple installation, as well as the inclusion of software contributions from elsewhere in MIDAS. Therefore, the directory branches for `stdred` and `contrib` are both split into various subdirectories each containing a complete software package (e.g. for a particular instrument).

A complete overview and description of the new directory structure can be found in the new environment document.

New Installation procedure A better presentation is now offered in the 91MAY release, new options have been added and others have been modified or

even re-written. More improvements are foreseen for forthcoming releases. In a separate contribution following this news a more detailed description is presented.

Change of device names In the 91MAY release the hardcopy device names have been redefined. Since the old definition of device names became confusing for the users at ESO Headquarters it was decided to simplify the scheme. In the 91MAY version, MIDAS uses the system names for the devices. When executed, MIDAS tries to read the local MIDAS device configuration file. If this local file does not exist, MIDAS reads the configurations file stored in the `monit` directory branch. This file defines the logical MIDAS names for (some) of the generic devices available. As an example, these could be:

1. PRINTER for the main line printer
2. LASER for Postscript b+w laser printer
3. COLOUR for PostScript colour laser printer
4. SLIDE for film recorder (slides)
5. PENPLOT for a pen plotter
6. tape0, tape1,... for tape devices

You have to edit the file to assign your physical devices to one of the logical names above (if existing at your site). All additional devices are accessible via their UNIX or VMS system names inside MIDAS. For more information consult the installvms or installunix documents in the `[.doc.install]` or `doc/install` directory.

Debugging tools A new context `DEBUG` has been added which is useful for debugging MIDAS procedures as well as executable modules. The context is enabled by the command `SET/CONTEXT debug` that will define the commands `DEBUG/PROCEDURE`, to debug MIDAS procedures, and `DEBUG/MODULE` for programs.

Support of postscript colour printer MIDAS now allows the use of a postscript colour laser printer. The generic MIDAS name for this device is COLOUR and is defined in the file devices.com (VMS) of devices.csh (UNIX) in the monit directory, which is device configuration file discussed above

Application News

DAOPHOT During his stay around the 3rd Data Analysis Workshop, Peter Stetson (Dominion Astrophysical Observatory) has implemented a new version of DAOPHOT. Some modifications were needed in order to let DAOPHOT know how the MIDAS data structures looks like (images and descriptors). This newest version is intended to run on all machines on which MIDAS can run. The code is put in the context DAOPHOT and will be enabled with the command `set/context daophot`. Because there was not enough time to check the code on the various machines, it was decided not to put DAOPHOT on the release tape. However, it is available and can be obtained from the MIDAS group. A mail to the MIDAS Hot-Line is sufficient.

New adaptive filter Gotthard Richter (Zentralinstitut für Astrophysik, Potsdam, Germany) recently visited ESO to implement a new command in MIDAS called `FILTER/ADAPTIVE`. The command, based on the Haar Transform, increases the signal-to-noise ratio in two-dimensional images, and is therefore especially useful in the area of surface photometry. In the image, the local-signal-to noise ratio is evaluated via the H-transform as a function of decreasing resolution: mean gradients and curvatures over different scale lengths (obtained from the H-coefficients of different orders) are compared to the corresponding expectation values of the noise. The order for which this signal-to-noise ratio exceeds a given parameter k indicates the local resolution scale length of the signal, and determines the size of the impulse response of the filter at this point. When the algorithm is finished some information on the noise statistics is given: the standard deviation, the expectation values of the gradients and the Laplace-terms at every order involved, and the number of pixels which became significant on every order by the gradient and by the Laplace-term, respectively. The remaining pixels are set to the maximum size response.

WARNING: Incorrect Flux Table Very recently, it was found that the flux standard star table L745X4 contained data pertaining to some other star than L745-46A. As of June 6th, this error has been corrected. The ratio of spline interpolations done separately in the correct and in the old, wrong table basically shows no trend with wavelength, i.e. both stars have the same slope over the Rayleigh-Jeans part of their spectra (as can be expected for hot white dwarfs). Where it is defined, the mean ratio is about 1.11 with all data points being within +-5% of the

mean except for three somewhat larger spikes around 390, 580, and 700 nm.

We take this opportunity to re-emphasize that ESO does not accept responsability for the correctness of any calibration data it provides. We try to exercise good care and apply reasonable judgement in compiling such data. However, every user has to verify personally whether the numbers he is using are adequate for his purposes.

A New Installation Procedure

Carlos Guirao, *European Southern Observatory*

Structure of the Installation

This article roughly shows the installation procedure for the present 91MAY release.

The first impression of any product is usually its installation procedure. A friendly presentation, a minimum interaction of the operator on the procces and the easiness to adapt itself to different needs and particular requirements, defines basically the requirements for a well-done installation procedure.

The MIDAS installation procedure has gone a long way since the first release of the portable version of MIDAS, the 89NOV. The whole MIDAS directory structure has been reconfigured and standards are given for new packages. This makes it easier for outside MIDAS developers to include their software (see elsewhere in this Courier).The directory structure is identical for both VAX/VMS and UNIX systems. The installation on both systems could just be reduced to:

1. The list of directories involved. It is prepared prior to the installation, and contains directories that form the MIDAS core, and directories of selected packages.
2. An installation procedure executed on each directory of the list.

Prior to the actual installation, a pre-installation procedure is executed on a smaller set of core directories to configure system dependent files.

Installation on UNIX Systems

The installation of MIDAS on UNIX systems is carried out by one single script command called `configmidas`. It guides the operator through the different steps of the installation via the selection of items from a main menu.

The `configmidas` script and other scripts are written in the Bourne-Shell language because of its high programming flexibility and portability between the different flavours of UNIX. Some of the options offered by `configmidas` to the operator are:

1. Listing and describing optional packages;
2. Selecting MIDAS packages to be included in the installation: none, all or your own choice;
3. Starting the MIDAS installation;
4. If the installation is cancelled it can be re-started where it stopped;
5. Cleaning MIDAS after installation;
6. Help for options above.

For each MIDAS directory involved in the installation and for the creation of targets we use the UNIX command `make` and `makefile` files. The use of rules, variables and definitions by `make`, makes it very convenient for the purpose of the MIDAS installation to adapt itself to different UNIX systems.

The `make` command, when it is applied to UNIX `makefile` files, plus a DCL translator filter, generates automatically the `makefile.com` files, the counterparts of the UNIX makefiles for VAX/VMS systems.

Installation on VAX/VMS systems

The new procedure to install MIDAS on VAX/VMS systems, introduced with the 91MAY release, comes with a very qualitative improvement compared to previous releases. The procedure, written in the VAX/VMS DCL language, is based on the same functionality and presentation of its counterpart in UNIX. Besides most of the options available for UNIX there are others like:

1. Selecting between the VMS or GNU C compiler;
2. Selecting between X11 or Deanza or your own display interface.

The installation checks the existence of required libraries prior to the actual installation, and creates them when needed.

Next Improvements

The diversity of UNIX-like systems offered by workstation manufacturers and the increasing appearance of new workstations in the market, push the MIDAS installation procedures towards an increase in its flexibility and portability. Our effort will basically be in the following areas:

- More straight forward installation. Reducing the dialogue with the operator;
- Check of UNIX commands needed for the installation: compilers, linkers, libraries, etc...;
- Check of resources of the system: disk space, limits, etc...;
- An automatic generation of the MIDAS Fortran-to-C interfaces;
- Write only code common for the two mayor UNIX trends: System V and BSD;
- Removing references to non-public domain products (NAG library);
- Verification tests for MIDAS interfaces;
- Formatted documentation (e.g. LaTeX).

Of course we are open to suggestions or complaints.

The MIDAS Bulletin Board: a preview

Trond Melen, *European Southern Observatory*

For a long time there has been a wish from the user community for a bulletin board type of service for discussions on MIDAS related topics. The service should make it possible for everybody to post messages on the bulletin board which then can be read by anybody interested.

The traditional approach is to create a mailing list to which users can subscribe. This solution is called a mail exploder and works fine as long as the set of subscribers is small and changes slowly. However, at some stage this approach gets unmanageable. The maintainer of the list wastes a lot of time adding and removing subscribers to and from the list, the system spends a lot of time processing the messages, the communication channels get filled with multiple copies of the same message going to different sites and the disk on the receiving hosts gets filled with multiple copies for the different users.

MIDAS is used by a large number of people at ESO and more than 100 external sites. The number of users interested in this service might therefore soon reach several hundred. After discarding the mailing list approach, the MIDAS group has decided to use the same software used for transferring news on the Usenet. This software is often referred to as just *news* and overcomes all the problems mentioned.

In *news* a message is called an article and a bulletin board is called a newsgroup. The articles are stored in a central spool area which is readable by everybody and is accessed through a program called a newsreader. This program uses a file in the users home directory to keep track of which newsgroups the user subscribes to and which articles he has already read. The user can decide himself which newsgroups he wants to subscribe to. Most newsgroups are global, i.e. the articles are distributed to all sites on the Usenet, but local newsgroups are also possible. After some time (5-21 days) a message expires, it is deleted from the spool area.

The MIDAS newsgroup is called *eso.midas* and is a local newsgroup at ESO. One day we hope the number of users interested in this newsgroup will be large enough to turn it into a global one, but for the time being external sites will have to connect to ESO for reading or transferring news articles. This can be done in several ways.

If you are on the Internet and have a newsreader installed on your system, you may set up your environment to use the newsserver *mc3.hq.eso.org* at ESO. The newsreader is normally called *rn*, *xrn*, *rrn*, *rnews* or *news*. This is the way *news* is available to local ESO staff. You may need to send a mail to *newsmaster@eso.org* to be allowed access to the server for your host(s).

If you have *news* installed locally, your system manager can set up *eso.midas* as a local newsgroup

at your site and use ESO as a *newsfeed* for this group. The news articles may be transferred over an Internet connection, over the public X.25 packet-switched network or over telephone modems. Details should be negotiated with *newsmaster@eso.org*.

The last alternative is to log in on *mc3.hq.eso.org* and read the *news* there. You get a **personal** account on this machine by sending a mail to *accountmaster@eso.org*. The mail must contain your firstname, surname, institute, phone number as well as electronic and postal address. Please allow us a week for processing the requests. Having the account, you can log in using the Internet, using the public X.25 packet-switched network (no. 2624 58900924) or using a telephone modem at 300, 1200 or 2400 baud (phone number available on request).

In special cases, requests for passing the news articles on to a mailing list at an external site will be considered. Personal requests unfortunately cannot be fulfilled.

The MIDAS Group will encourage all external sites to join the Usenet, or its European sister EUNet (European Unix Network). Information is available from EUUG (European Unix User Group), send an E-mail to euug@EU.net, a fax to +44 763 73255 or phone +44 763 73039. Joining this net will give you access to some 900 different newsgroups with a total volume of a few MB per day. A lot of source code for public domain software is available this way. Of special interest to astronomers are the newsgroups *sci.astro*, *sci.space* and *sci.physics*.

Major Improvements in the MIDAS Tables File System

François Ochsenbein, *European Southern Observatory and Observatoire de Strasbourg*
Michèle Peron, *European Southern Observatory*

The Table System in MIDAS was recently modified for a number of reasons:

1. to allow fast access to pieces of large tables on systems without file mapping;
2. to be compatible with the new FITS[1] Binary Table Extension (in preparation) which allows defining columns of a table as arrays, introducing then a 'depth' of the columns (that is why this standard is also called *3-D Tables*)
3. to allow better readability of some parameters, typically times and angles;
4. to allow easier access to sub-tables;

The faster access to large tables is hopefully transparent to the user. However, the `EDIT/TABLE` command has now a second parameter, a letter which can be `R` (read–only) or `I` (Immediate update) for visualizing or editing very large tables.

An array column is created with the command `CREATE/COLUMN` , where the data type includes a dimension within brackets. The command

```
CREATE/COLUMN mytable :FLUX -
   R*4(12) "Jy" E12.3
```

creates a column *FLUX* made of 12 numbers. Such an array is edited on the screen as a set of 12 numbers separated by commas, and can be entered with the same convention, e.g.

```
WRITE/COLUMN mytable :FLUX @1 -
   1,2,3,4,5,6,7,8,9,10,11,12
```

will add or replace the contents of the first row of column *FLUX* by the values 1 to 12. Unspecified values are defaulted to *NULL*.

The FORTRAN-format conventions used for the edition were extended to accommodate sexagesimal numbers and time values. Among other features, the new possibilities now include the 'formats' `R w.d` for the edition of right ascensions internally stored as degrees, and `s w.d` for declinations stored with the same units. Time values can now be stored as integer seconds elapsed since 1970 or as MJD double-precision numbers, and may be edited with the `T w.d` 'format', where 'decimals' refer to fractions of day.

An extended syntax was adopted for line and column designations in MIDAS commands allowing an easier access to sub-tables: commas can be used for enumeration, and a double-dot for ranges. The command

```
READ/TABLE MYTABLE :RA,DEC -
    @1..10,1000,9999..
```

displays the two columns RA and *DEC* for the rows 1 to 10, the row 1000, and rows 9999 until the end of the

[1] Flexible Image Transport System

table. The extended syntax for column designation can also be used in the SORT/TABLE command where several parameters can be used for sorting, like
SORT/TABLE MYTABLE :RA,:DEC(-)
which means: sort by increasing values of *RA*, and for identical values of *RA* sort by decreasing values of *DEC*.

The Echelle Package Revised

Pascal Ballester, *European Southern Observatory*

An extensive revision of the Echelle package is on its way, mainly consisting of algorithm improvements and user interface simplifications The revision also applies to the documentation.

New features in the 91MAY release

Wavelength calibration A more user friendly procedure of wavelength calibration is available under the command CALIBRATE/ECHELLE. Judge by yourself:

1. only four identifications are required instead of a typical forty;
2. the line catalogue of the calibration lamp does not need to include grating-dependent information like the order number anymore. Only wavelengths are required.

This procedure involves a physical equation, the echelle relation and regression analysis, to estimate the dispersion relation from a few initial identifications. Achieved accuracy on critically sampled frames is about one-tenth of a pixel (1 σ rms).

The command provides three different ways of performing the wavelength calibration. The application of the echelle relation requires first the knowledge of the frame orientation. The different options differ in the way to estimate this value.

1. A first method, which is also the default, makes use of overlap regions of adjacent orders. In these regions, the same lines occur twice on opposite sides of the frame. The location of the two occurrences of a line (or pair) gives the orientation of the frame. The identification of two pairs yields a global dispersion relation. An iterative process identifies new lines and improves the global dispersion relation. Eventually, an order—by—order solution is computed.
2. If the orders do not overlap, a second method requires the identification of four lines anywhere in the spectrum. The orientation of the frame is estimated by an optimum finding algorithm, followed by the iterative line identification iprecedure, and the final order-by-order solution.
3. A ‘‘Guess’’ option permits to calibrate a frame using a previous calibration. To avoid a common error, note that the previous calibration must result from one of the two options described above, not from the earlier commands CALIBRATE/CASPEC or/EFOSC.

Background determination The command BACKGROUND/ECHELLE is used to fit the interorder background by a bivariate polynomial. This global fit, however, often resulted in undesirable deviations from the local background level. The upgraded command now involves smoothing splines interpolation to estimate the instrumental background light. A smoothing factor enables you to control the rms least-squares residuals of the fitted solution.

Simplified set of commands High level commands have been made instrument independent, like CALIBRATE/ECH, FLAT/ECH, RESPONSE/ECH, REPEAT/ECH and REDUCE/ECH. During a transition period, old commands (qualifiers /CASPEC or /EFOSC) will exist in parallel. They will disappear with the 91NOV release.

What comes next

New algorithms

1. Optimal extraction. The optimal extraction of echelle data is more difficult than for other kinds of spectra (e.g. long slit), mainly because of the shortness of the slit, which makes the sky background unknown and the tilt of the orders. Therefore, classical methods, like Horne’s method, cannot be adapted. Recently designed algorithms, able to cope with tilted spectra, are currently examined.

2. The command `DEFINE/ECHELLE` will be upgraded to yield more accurate order locations, required by the optimal extraction, and a more user friendly detection of the orders, which in the case of highly contrasted, non-noisy data, like a flat field, can be done in an automatic way.
3. The so-called 'IUE-like' methods, implemented in command `RIPPLE/ECHELLE`, are intended to correct for the instrumental response function, using no standard star, by fitting a model of the blaze function to the data. It happens, however, that this model fits the real data inaccurately. The best way of course to get rid of this problem is to always take a standard star exposure (STD). However, for observers who, despite this warning, have no STD, mathematical methods will be tried out.

More documentation In addition to help files, new algorithms will be described in detail in documents intended to provide a full understanding of the methods. Such a document has been already written for the wavelength calibration procedure and can be found in Vol. B of the MIDAS documentation.

The STARCAT–MIDAS Connection

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STARCAT[2] is already known to many as a tool to access astronomical information in a uniform and user-friendly fashion. We would like to remind you here some of its outstanding features and highlight its relations with MIDAS.

Some STARCAT features

- STARCAT provides access to more than 40 astronomical catalogues, among which are the Guide Star Catalogue with 25 million entries, the IRAS point source catalogue, the HST observation log (updated daily) and soon also the ESO observation catalogue. For a complete list of available catalogues see below.
- STARCAT allows its users to qualify on any of the fields of a given catalogue. Several fields can be constrained this way in one single query.
- STARCAT features a `center` command which allows to retrieve objects within a cone in the sky. Any coordinate system at any epoch can be entered to specify the central position of the cone. The `center` can be combined with any other qualifications put on any other field.
- Output files can be used to store the results of the catalogue scan: we currently offer the choice between ASCII output files and MIDAS tables. A brand new feature, LaTeX output has been developed. It allows users to produces as an output from a search in STARCAT a `.tex` file which can be immediately incorporated into a document. The fields to be put into the output file can be freely chosen among those available on the screen. The MIDAS table can be used immediately in MIDAS for data reduction. (e.g., plotting, histograms, computations ...).
- Also, it is possible to produce a third type of output table: namely FITS table output. This allows for general portability: the output product can be easily transported over the network to any type of hardware and can also be used on non-MIDAS systems.
- STARCAT provides means to prepare a request for HST archive data. In the future, the system will also be used to prepare requests to retrieve ESO archive data as well as ESOLV archive data (to access the ESOLV archive data right now please contact one of the authors). The archive only produces FITS output files.

More on the MIDAS table output

MIDAS table output is very easily done with STARCAT. The `Output_file` command offers the choice between ASCII or MIDAS tables. Fields on the screen can be added to or rejected from the output

[2] STARCAT (Space Telescope Archive and CATalogue) has been jointly developed by the ESO/Archive, the ST-ECF Archive and the Space Telescope Science Institute Data Management Facility Group

table. Note that the following conversions are done in the output table:

field	ASCII	MIDAS
ra	hh mm ss(.d)	dd.dddddd
dec	dd mm ss(.d)	dd.dddddd
dates	dd mm yyy hh:mm:ss	sec_since_1980
num_fields	unchanged	unchanged
char_field	unchanged	unchanged

The field names in the MIDAS table are the same as the ones in the database table. The formats have been computed and should make sense for most of the fields. The units are usually reported in the MIDAS table when they are known in the original catalogue.

When creating MIDAS output tables, beware of the fact that a binary MIDAS table file is not necessarily portable. If it was created on a Sun computer, it generally needs to be used on a Sun. One cannot transport a MIDAS table from say a VAX to a Sun without first converting it to FITS format.

How to get access to STARCAT

To start up STARCAT, you have to be logged on the STESIS VAX/VMS computer. In the future, a dedicated Unix machine will also serve remote users via the Internet.

A captive account has been set up for both internal and remote users on the STESIS VAX as well as on Unix machines (for internal use). The account name is `starcat` with no password[3]

[3] From inside ESO, just type `starcat` from any account on any workstation to get access to the system.

Where to find more information?

More information is available under:

1. the STARCAT User Guide (ST–ECF O-02 series, Vol VI, edition 3.3, June 1991)
2. the STARCAT Documentation for On-Line Catalogues (ST-ECF and ESO-IPG Archive. Vol 1, Version 3.0 June 1990 and Vol. 2, Version 3.0 UPDATE December 1990)

These documents can be obtained by sending a letter or electronic mail to:
ESO/ST-ECF Archive
c/o: Susan Hill
Karl-Schwarzschild-Str. 2
W 8046 Garching bei München
Federal Republic of Germany
`SPAN: ESO::HILL`
`BITNET/EARN: hill@dgaeso51.bitnet`
`Internet: shill@eso.org`

Future interesting features

In the near future, a new service called *StarMail* will be released. It will allow users (mainly those with delicate network connections to ESO's computers) to ask for catalogue information in batch mode. A user will send a mail message to a special account at ESO and shortly after, the message will be analyzed, its content (STARCAT commands) executed and the results sent back to the user as a reply to his/her message. The foreseen usage of this facility will be for example the request of a large number of error boxes in the Guide Star Catalogue or in other very large catalogues. Documentation on this facility will be available shortly.

MIDAS Release Tapes and Cassettes

Due to the non-negligible cost of the tapes and cassettes used for the MIDAS distribution we kindly ask you to return these magnetic media, including, in the case of tapes, the green plastic boxes in which the tapes were packed. We can only provide MIDAS releases to sites which indeed have returned the release tapes or cassettes, with the exception, obviously, if a MIDAS release is requested for the first time.

A number sites with VAX stations have asked for a MIDAS release on a TK50 or TK70 cassette. We would like to repeat that ESO does not have such device and has no intention to buy one. Hence, MIDAS releases on these media can not be provided. Please, keep this in mind when you have plans to acquire a VAX station for MIDAS use at your site.

The MIDAS 91MAY News File (with minor modifications)

The following text contains a detailed summary of revisions and changes in the MIDAS application software during the period between the previous 90NOV and the new 91MAY release. MIDAS users can produce this text with the MIDAS command `news`.

COPY/ZDISPLAY - KB 901004 New command COPY/ZDISPLAY has been added to make also hardcopies of the zoom_window in XWindow devices. An extra zoom window is opened with e.g. the GET/CURSOR command if par5 is set to Window.

CREATE/DISPLAY - KB 901014 The overlay flag in this command has been dropped. Now there is always an overlay channel provided. The total no. of channels (image channels and the overlay channel) is the no. given in the command line increased by one. So, CREATE/DISP 1 400,400,10,10 2,400,400 will give you a display window with 2 image channels (no. 0 and 1) and overlay channel (no. 2) added automatically. Also you can create displays with smaller size than its image memories. E.g CREATE/DISP 2 400,400,10,10 1,800,800 will create a 400*400 display window with a 800*800 image channel and an overlay channel.

CONVERT/TAB - MP 901016 This command now also works with method FREQUENCY

SCROLL/CHAN - KB 901017 We now support true scrolling for XWindow displays using the arrow keys of the keyboard. This makes real sense only for image memories larger than the display window. See CREATE/DISPLAY above.

VIEW/IMAGE - KB 901019 This command has been updated and is now probably the most exciting command in MIDAS (believe it or not...)!!! Now, alphabetical keys are used for the different interactive functions like e.g. changing the zoom factor and switching from colour LUT to black+white. Use the help inside the command (hit the key "h" with the mouse pointing to the display window) to get a complete description. The arrow keys are now used to scroll the image. Note, that the same functionality is also provided in GET/CURSOR with the window option!

TUTORIAL/PLOT - RHW 901022 The option 'MULTI' to illustrate how you can make a nice plot layout with mulitiple coordinate boxes has been renamed to 'AXES'. The tutorial now also includes an example how to plot axes around (part of) a displayed frame.

COPY/DISPLAY - KB 901109 A PostScript colour laser printer has been added to the MIDAS output devices. Its MIDAS name is COLOUR and it is located in the MIDAS user room (immediately to the left when you enter the room). The time needed for a picture is about 10 minutes. (See also the entry about ASSIGN + PRINT further down)

BACKGROUND/ECHELLE - PB 901113 The algorithm of background has been improved and involves now smoothing splines polynomials instead of 2D polynomial. As a consequence the syntax is not exactly the same anymore. See the help for more details.

RIPPLE/ECHELLE - PB 901113 It is now possible to freeze the coefficients K and Alpha, which is expected to enable more efficient ripple corrections, especially if the spectra are very noisy. To do this, add the option F at the end of the command line. See the help for more details.

INTEGRATE/STAR - RHW 901129 The command syntax has been modified to make it similar to the command INTEGRATE/APERTURE. In addition, the INTERACTIVE option has been changed such that using the graphics cursor the user can modify the computed background and integration radius before the results are written to the output table. Finally, the default has been changed from AUTO to INTERACTIVE mode.

SET/CONTEXT DEBUG - KB 901212 New context "debug" has been added. This context defines new commands DEBUG/MODULE + DEBUG/PROCEDURE which are useful for debugging MIDAS procedures and MIDAS executable modules (programs). See the Help for details (once you have enabled the context "debug").

TRANSLATE/SHOW - KB 901212 New command TRANSLATE/SHOW has been added to show the "compiled" code of a MIDAS procedure (also within context debug). See the Help for details.

COPY/KEY - KB 901218 New command COPY/KEY has been added to copy several elements between keywords of same type. See the help for details.

TABLE FILE SYSTEM - FO, MP 910102 The Table File System has been upgraded in order to store arrays as table items. Only the very basic table applications can currently manipulate such arrays. The command syntax of the previous versions is still valid but the upgraded syntax includes some additions. An old table can be read and processed with the new Table File System. A command RETRO/TAB is provided to convert a 3-D table to the old format.

SET/MIDAS_SYSTEM - KB 910103 New command SET/MIDAS_SYSTEM has been added. This command replaces the old commands SET/USER, SET/ENVIRONMENT and SET/PROMPT. It also lets you control the timeout value. See the help for details.

ASSIGN/PRINT - KB 910104 ASSIGN/PRINT supports now also all the laser printers.

SET/GCURSOR - KB 910107 New command SET/GCURSOR has been added to define the cursor shape in the graphics window, currently only available for X11.

CREATE/IMAGE - KB 910108 New option SEQUENCE has been added to the command CREATE/IMAGE. This option creates a frame with pixel values as a linear scale in a given interval. This frame can then be used as input for other computations on the interval.

LOAD/IMAGE - KB 910110 New options have been added to the LOAD/IMAGE command: a) with the OVERWRITE option you can load images on top of already displayed ones b) the fixpoint parameter enables you to position the image anywhere on the screen See the HELP for details.

DRAW/IMAGE - KB 910110 The syntax has been cleaned up and a new parameter "fixpix" has been added to the DRAW/IMAGE command: the fixpix parameter enables you to position the plot anywhere on the screen in the horizontal direction (remember, the vertical offset was always possible via parameter "iaux").

SHIFT/IMAGE - KB 910116 New command SHIFT/IMAGE has been added to shift pixels and lines of an image. See the HELP for details.

COMPUTE/WEIGHTS - KB 910117 The syntax has been modified slightly to allow also the specification of the window with pixel, not just world, coordinates. See the HELP for details.

DECONVOLVE/IMA - MP 910118 The bug which was giving the error message “Warning, Total Flux=0" has been solved.

MIDAS command editing - KB 910121 Another possibility of recalling/editing previous MIDAS commands has been added by providing a substring of a previous command. Preceding that substring with a colon (:) the most recent command containing that substring is executed again. Preceding the substring with ":." or ".:" the command can be edited before being executed again. The difference between ":." and ".:" is the same as with ".no" and "no." where no is the number of a previous MIDAS command. Unix aficionados will recognize that this is very similar to the !xxx stuff... Assume, you have the command READ/KEY in_a in your command buffer, then you can recall that command via :in_a.

LONG SLIT NEWS - MP 910122 A new command SEARCH/RBR has been added. This command searches for lines on each row of the input frame. An average over pixels along the Y-axis can be formed prior to the line search. (see parameter YWIND) The identifications of lines (IDENTIFY/RBR) can be done now on any scan line of the input frame (see parameter YSTART). The command CALIBRATE/RBR will then compute the dispersion coefficients processing all the scan lines, starting for the YSTART row and going then to the top and the bottom of the frame. The speed of this command has been improved by a factor 4. A bug in the command REBIN/RBR has been also fixed (The command sometimes createda output frame containing crazy values....) Finally, the commands EXTRACT/SPECTRUM, FIT/SKY_SPEC and NORMALIZE/FLAT don’t belong to the core MIDAS any longer , but to this context LONG.

RESPONSE/SPEC - MP 910123 The command works now also with mode ADD.

LABEL/DISPLAY - KB 910124 A new option to use multiple strings and offsets which are stored in keywords has been added. See the help for details.

DRAW/... - KB 910125 A new option to draw multiple objects which are stored in a keyword has been added. See the help for details.

local keywords - KB 910128 Modifications concerning local keywords: As in the old VMS version of MIDAS, local keywords are now also known in all MIDAS procedures at a deeper level, not just inside the procedure where they are created (Eso para los muchachos de VILSPA...). Also, local keywords may have names 8 characters long like the global ones.

SELECT/TAB - MP 910201 The command was giving wrong results when using relational operators (.GE., .LE. etc). The problem has been solved...

REPORT/ERROR - KB 910204 This command has been removed (Error stack not existing in Unix...). Please, use the command REPORT/PROBLEM instead.

ASSIGN/..., PRINT/... - KB 910208 The naming scheme in MIDAS for output devices has been changed: We only have one MIDAS name per device group, i.e. LASER for black+white laser printers, COLOUR for colour laser printers, etc. These may and all additional devices of same type have to be accessed via the system names for printers/ plotters (e.g. ps2usr1) in the PLOT, PRINT + ASSIGN commands. For a cross reference list of MIDAS and system device names use the MIDAS command HELP [Printers].

CALIBRATE/ECHELLE - PB 910211 A new wavelength calibration procedure is installed in the echelle package, based upon a physical equation, the echelle relation, and regression analysis. The minimum number of visual identifications required from the user has been dramatically decreased, down to 4 lines. Moreover, the line catalogue can now be grating independent. For Thorium-Argon spectra, consider to use table $MID_CASPEC/thar.tbl.

ECHELLE NEWS - PB 910213 A set of instrument independent commands is now available in the echelle package, including: CALIBRATE/ECHELLE, FLAT/ECHELLE, RESPONSE/ECHELLE, REPEAT/ECHELLE and REDUCE/ECHELLE. These commands replace equivalent instrument dependent commands (qualifiers /CASPEC or /EFOSC), which are still available, but will be removed later.

NEW CONTEXT SPEC - PB, MP 910214 All commands related to monodimensional spectroscopy have been stored in a new context called SPEC: SEARCH/LINE, IDENTIFY/LINE, CALIBRATE/LINE, CALIBRATE/FLUX EXTINCTION/SPEC, FILTER/RIPPLE, PLOT/CALI, PLOT/IDENT, RESPONSE/SPEC, REBIN/WAVE, NORMAL/SPEC

CREATE/FUNC - MP 910215 The command now works correctly on UNIX systems. (it was not when you wanted to create several user functions)

COPY/IT - MP 910206 The command gives now reasonable labels to the columns of the output table.

New context SURFPHOT - RHW 910307 The contexts PHOTOM and MORPHOLO have been combined into a new context SURFPHOT. This context now contains all the applications which are in the area of surface photometry. Some commands are not available yet, but will be implemented a.s.a.p.

RECTIFY/IMAG - RHW 910307 This command has been moved to the new SURFPHOT context. Hence, in order to use it this context should be enabled first.

FIT/ELL1 - RHW 910314 A new command FIT/ELL1 has been added to the context SURFPHOT. It fits an ellipse to a two-dimensional frame and writes the result into an output frame. Do a SET/CONTEXT surfphot and read the help.

SET/PLOT - RHW 910319 A bug in the manual setting of the x and/or y axis has been removed. Previously, the manual setting of the x and/or y axis, using the SET/PLOT command, was overwritten if the area parameter in one of the following plot commands (e.g. PLOT/IMAGE) was not defaulted.

PLOT/AXES - RHW 910319 For consistency reasons, the command now also sets the global parameter for the x- and y-axis in manual mode. As a result, the effect of 'PLOT/AXES x-string y-string' will be the same as: 'SET/PLOT x-string y-string', followed by 'PLOT/AXES'. In both cases the x- and y-axis are set manually. They can be changed with another 'SET/PLOT' or PLOT/AXES' command (including the x-string and y-string parameters).

MODIFY/COLUMN , MODIFY/ROW - MP 910327 These commands now work if the column/row coordinates are taken from a table.

COPY/IT - MP 910402 A bug in this command has been removed. Previously, the output table was not correct if the number of rows of the output table was not equal to the number of allocated rows.

FILTER/ADAPTIVE - RHW 910427 A new command FILTER/ADAPTIVE has been implemented. The filter is based on the evaluation of the local noise statistics using the H-transform. The code has been developed and made available by Gotthard Richter of the Zentralinstitut fuer Astrophysik in Potsdam, Germany.

Local keywords - KB 910505 The (very) old syntax for defining local keywords: WRITE/KEYWORD L.TOTO/I/1/2 1,2 is not supported anymore!! Use: DEFINE/LOCAL TOTO/I/1/2 1,2 instead - consequently local keyword names may now also be up to 8 chars. long.

Problems found in the 91MAY Release

The following text contains a listing of problems found in the 91MAY release. Partially these problems are detected on both VMS and UNIX systems, partially only on one of these two. If you find one of the problems described below, check with your local MIDAS sites managers to get the solutions implemented.

VMS and UNIX Systems

1. A bug in the command `EDIT/FIT` has been found during the latest testing phase of the 91MAY release. To correct it, you have to modify the file:
   `$MIDASHOME/$MIDVERS/applic/fit/src/tablefit.for` (UNIX) or
   `MID_DISK:['MIDASHOME'.'MIDVERS'.APPLIC.FIT.SRC]tablefit.for` (VMS)
   Please, change the line 88 :
   ```
   IF (.NOT.NULL1 .AND. FUNC.NE.BLANK) THEN
   ```
   by
   ```
   IF (INDEX(FUNC,'(').NE.0) THEN
   ```

2. The commands `PRINT/LOG` and `ASSIGN/PRINT file temp.dat` can cause problems under certain conditions.To fix that, please update the general MIDAS login file
   `$MIDASHOME/$MIDVERS/prim/proc/login.prg` (UNIX)
   `MID_DISK:['MIDASHOME'.'MIDVERS'.PRIM.PROC]login.prg` (VMS)
   as follows:
   Add the following lines as the 2nd + 3rd line, i.e. just after the `ASSIGN/DEFAULT` command.
   ```
   WRITE/KEY PRIPRI/C/1/58 " " ALL
   WRITE/KEY PERROR/I/1/1 {ERROR(3)}
   ```

3. `COMPUTE/BARYCORR` has a problem with the FORTRAN compiler on some systems, e.g. on the SUN, but works fine on some others, e.g. VAX/VMS. To fix it, modify the file:
   `$MIDASHOME/$MIDVERS/prim/general/src/compxy.for (UNIX)`
   `MID_DISK:['MIDASHOME'.'MIDVERS'.PRIM.GENERAL.SRC]compxy.for (VMS)`
   in line 255:
   ```
   CALL BARVEL(JD,0,DVELH,DVELB)
   ```
   to
   ```
   CALL BARVEL(JD,0.0D0,DVELH,DVELB)
   ```

4. `VIEW/IMA` won't work on some systems e.g. on a DECstation. To fix this problem, modify the file
   `$MIDASHOME/$MIDVERS/prim/table/libsrc/tdcopyima.for` (UNIX)
   `MID_DISK:['MIDASHOME'.'MIDVERS'.PRIM.TABLE.LIBSRC]tdcopyima.for (VMS)`
   as follows: Add the following two lines:
   ```
   DATA IMAGE/' '/
   DATA TABLE/' '/
   ```
   after the line 61:
   ```
   DATA FORM/'G14.6'/
   ```

5. In the file `syskeys.dat` in `$MIDASHOME/$MIDVERS/monit` (UNIX) and
   `MID_DISK:['MIDASHOME'.'MIDVERS'.MONIT]` (VMS)
   the first element in the integer keyword `ERROR` is filled with 1. This causes a full error report and the plot package to create a large file containing debug information. To avoid this, change to value to 0 (as it was in previous releases).

6. For MIDAS installation with DAOPHOT: two typos were found in the routine
`$MIDASHOME/$MIDVERS/contrib/daophot/src/tbldaomid.for` (UNIX)
`MID_DISK:['MIDASHOME'.'MIDVERS'.CONTRIB.DAOPHOT.SRC]tbldaomid.for` (VMS)
causing an error message of 2 undefined symbols during linking: STKFN and TBLCLO. Change these names to STKFND and TBTCLO. The error only concerns the conversion routine to go from daophot tables to MIDAS tables.

7. The command `PRINT/TAB` can cause problems under certain conditions. To fix it, please update the following file :
`$MIDASHOME/$MIDVERS/prim/table/libsrc/tbread.c` (UNIX)
`MID_DISK:['MIDASHOME'.'MIDVERS'.PRIM.TABLE.LIBSRC]tbread.c` (VMS)

```
*** 190,200 ****
                        line[l] = value[l-lpos[k]+1];
                        for (l=m;l<=lpos[k+1]-1;l++) line[l] = ' ';
                            }
-                   }
          for (l=upos[ncol-1];l<term.columns;l++) line[l]= ' ';
  /*        line[term.columns] = '\0'; */
          SCTPUT(line);
          oscfill(line,term.columns,' ');
         }
       }
       if (status) SCTPUT (buf);
```

by

```
*** 190,200 ****
                        line[l] = value[l-lpos[k]+1];
                        for (l=m;l<=lpos[k+1]-1;l++) line[l] = ' ';
                            }
          for (l=upos[ncol-1];l<term.columns;l++) line[l] = ' ';
  /*        line[term.columns] = '\0'; */
          SCTPUT(line);
          oscfill(line,term.columns,' ');
+                       }
          }
       }
       if (status) SCTPUT (buf);
```

UNIX Systems

1. If you are working on a SUN workstation, remove the `-O` optimizer option for the C compiler in the local file `$MIDASHOME/local/make_options`.

2. The Step 2. of the Installation Guide should be:
Login in the system as the MIDAS user;
create the directory for the MIDAS release, e.g. /midas/91MAY : `% mkdir /midas/91MAY`
change the working directory as:`% cd /midas/91MAY`

and read the tape

3. You should remove or rename, if existing, the file `computer.h` in the directory `$MIDASHOME/local/incl`

4. If you are working on a DECstation with Ultrix, the installation in the main plot directory will fail. To fix this problem, please update the following file:
   `$MID_DISK:['MIDASHOME'.'PRIM.PLOT.SRC]spehpcntr.for` (VMS)
   `$MIDASHOME/$MIDVERS/prim/plot/src/spehpcntr.for` (UNIX)
   line 60
   ```
         INCLUDE   'MID_INCLUDE:PLTDAT.INC/NOLIST'
   ```
   should be:
   ```
   C     INCLUDE   'MID_INCLUDE:PLTDAT.INC/NOLIST'
   ```

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The following MIDAS support services are available for sending suggestions, comments or to obtain help when problems arise:

Telephone:	+49-89-32006456
Telex:	5282822 eso d, attn. MIDAS Courier
Telefax:	+49-89-3202362, attn. MIDAS Courier
SPAN:	ESO::MIDAS
EARN:	MIDAS@DGAESO51
Eunet:	midas@eso.uucp
Internet:	midas@eso.org