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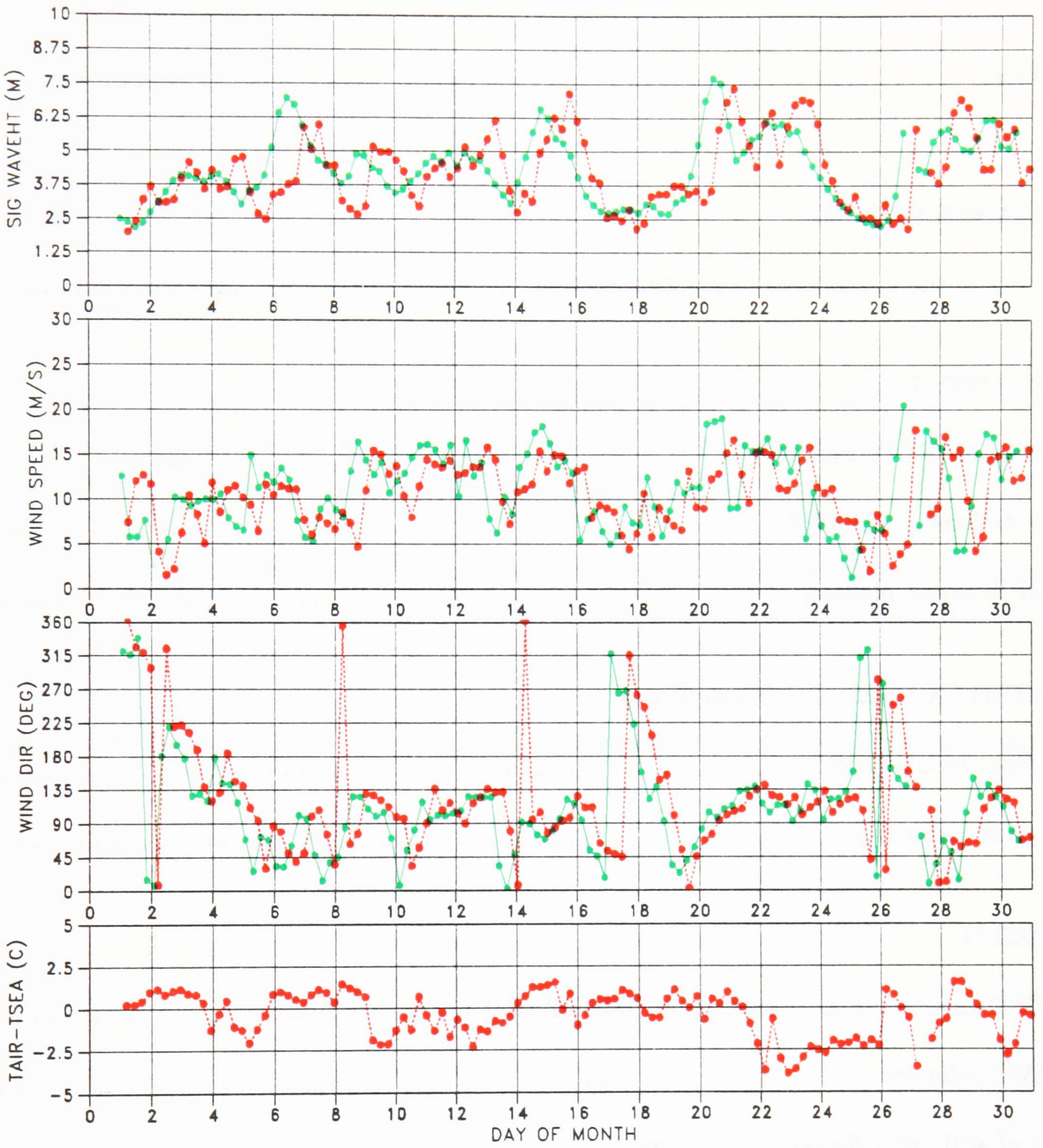

WAVES

MODEL MEAN = 4.3 STDEV = 1.3
BUOY MEAN = 4.2 STDEV = 1.3
LSQ FIT: SLOPE = 0.78 INTR = 0.99
RMSE = 0.77 BIAS = 0.07
CORR COEF = 0.83 SI = 0.18

WINDS

MODEL MEAN = 10.9 STDEV = 4.3
BUOY MEAN = 10.2 STDEV = 3.7
LSQ FIT: SLOPE = 0.90 INTR = 1.67
RMSE = 2.79 BIAS = 0.69
CORR COEF = 0.78 SI = 0.27

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European Centre for Medium-Range Weather Forecasts
Europäisches Zentrum für mittelfristige Wettervorhersage
Centre européen pour les prévisions météorologiques à moyen terme

IN THIS ISSUE

COVER: Example of curve drawing with symbols - see article on page 11

This Newsletter is edited and produced by User Support.

The next issue will appear in December 1991.

The article describing changes to the operational forecasting system gives an early report on the implementation of the operational T213 model, a major step in the Centre's activities. More information will follow in the next edition of the Newsletter.

In the computing section, we have reprinted an interesting article on the finalisation of the new FORTRAN 90 standard, and there is also an article describing the scope of the MAGICS graph plotting facility.

Users of the Centre's computer systems will find the article on the move to UNICOS 6 particularly helpful.

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CHANGES TO THE OPERATIONAL FORECASTING SYSTEM

Recent changes

A high resolution analysis and forecasting system at T213 31 levels was put into operations on 17 September 1991 (i.e. the first forecast from the new model was based on 12 UTC of 17 September).

In addition to the change of resolution, the new model includes the following aspects:

- the Gaussian grid used for the computation of the physics is now a reduced Gaussian grid, i.e. the number of grid points along a latitude circle decreases towards the poles in order that the spacing of the points be approximately 60 km on the whole globe. The effective resolution in the free atmosphere is around 100 km at half wavelength;

- several changes are made to the dynamics of the model, including use of a semi-Lagrangian advection scheme and modified horizontal diffusion. A change in the link between the dynamics and the parametrisation of vertical diffusion is expected to reduce the surface wind by about 3% over sea and about 10-15% over land;

- a new version of the cloud scheme, mainly to allow the stratiform clouds to form in any number of layers instead of the three layers in the previous version.

Synoptic evaluation of the high resolution model during parallel runs has shown many noticeable differences compared to the T106 model. Generally the new system tends to produce sharper and more active structures at all scales. The differences between the two forecasts have been especially apparent during marked events such as a split in the polar vortex and some intense cyclogenesis; in the majority of these cases the new model performed significantly better than the T106 model. However, while the kinetic energy of the model stays at more realistic levels during the ten days of the forecast, it should be noted that the new model tends to produce and maintain intense synoptic features also during the later stages of the forecast when the predictive skill is on average declining.

The comparison of objective verification results for the two models has indicated that in general anomaly correlation coefficients are slightly better for the new model and RMS errors are slightly worse. This is in agreement with the synoptic evaluation; in particular, the increase in RMS errors can be traced back to the general sharpening of the synoptic pattern.

Concerning weather parameters, as expected the better description of the orography leads to improved accuracy of the 2m temperature forecasts in mountainous and coastal areas. The spatial distribution of precipitation is generally more realistic, but the amounts of convective precipitation are still overestimated.

Users are encouraged to monitor the performance of the new high resolution forecasting system and report on their experience.

Planned changes

The first-guess checks of wind and humidity observations will be enhanced.

- Bernard Strauss

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FORTRAN 90 FINALISED

I am delighted to tell you that the new FORTRAN standard was finalised, down to the last editorial detail, on 11 April. The technical content was completed last year, which is why the name 'FORTRAN 90' has been chosen. This corresponds exactly to the situation with FORTRAN 77, which was completed in 1978.

FORTRAN 77 was a modest revision of FORTRAN 66 and the ANSI Committee X3J3 felt under tremendous pressure to add further features such as dynamic storage and array syntax. It therefore went immediately into a 'tutorial' mode, learning about experiences in other languages, and aimed to produce a new standard in 1982. In fact, by 1982 most of the new features had been agreed, each as a separate extension, and the task of integrating everything into a new document began. This was when I attended my first meeting, and I became a member of X3J3 at the start of 1983. I expected that the unknown x in the title 'FORTRAN 8x' would be 8 at most.

The basic reason for the delay was the difference of opinion between those who wished to see a large range of new features and those with more modest goals. A ballot of X3J3 held in April 1986 was 16 to 19 against the draft of that date and led to some slimming down of the language. A second ballot held in January 1987 showed that better agreement had been reached (29-7) and a draft was issued for public comment later that year. Over 400 letters were received, representing varying shades of opinion, some welcoming the power and safety of the new features but many saying that the language was too complex and lacked certain popular extensions. The rules of X3J3 say that at this stage, no change may be made without a 2/3 majority vote. This led to deadlock for two meetings. Finally, in September 1988, the ISO Committee WG5, despairing of ever seeing a standard emerge from X3J3, defined exactly which changes it required and set a timetable for the preparation of a second draft.

Since 1988, progress has been steady, although there have always been about 10 no votes for successive versions of the whole language, not enough to prevent acceptance by a 2/3 majority. A second draft was issued for public comment in 1989 and the 150 responses were largely favourable. A third draft in 1990 provoked only 29 letters.

What are the new features? Here is a very brief summary.

1. Dynamic storage allocation. The fact that all FORTRAN 77 arrays are static is a very big deficiency.

2. Operations on whole arrays and many intrinsic procedures for arrays. Not only does this give greater expressive power, but it will enable the portable exploitation of a variety of parallel and vector hardwares.

3. User-defined derived data types composed of arbitrary data structures and operations upon those structures.

4. The ability to write internal procedures and recursive procedures, and to call procedures with optional and keyword arguments. This will make libraries much more friendly to use.

5. Parametrization of the intrinsic types, to permit processors to support short integers, very large character sets, more than two precisions for real and complex, and packed logicals.

6. Pointers.

7. Facilities for defining collections called 'modules', useful for global data definitions and for procedure libraries. These support a safe method for encapsulating derived data types.

8. A means for the language to evolve by labelling some features that have replacements even in FORTRAN 77 as 'obsolescent', possibly to be deleted in the next revision.

9. Enhancements to the source form, including names of up to 31 characters, in-line comments, and a free form that is more appropriate to use at a terminal.

10. New control constructs such as the SELECT CASE construct and a label-free form of the DO.

11. Improvements to the input-output facilities, including handling partial records and a standardised NAMELIST facility.

12. Improved facilities for numerical computation including a set of numeric inquiry functions.

13. Many new intrinsic procedures.

14. Requirements on a compiler to detect the use of constructs that do not conform to the syntax of the language or are obsolescent.

The ISO standard will be a replacement for FORTRAN 77, but within USA those opposing such a big revision persuaded the parent Committee X3 to make it an additional standard, despite the opposition of X3J3.

The last few years have seen a steady increase in the number of people attending X3J3 meetings, mainly from the vendors. Many of them have been actively working on implementations, but are unwilling to commit themselves to dates for release of compilers. The first is NAG, which has announced its system. It is written in C to produce a C object code and was designed mainly to assist development of a FORTRAN 90 library, but is a full compiler. It has already been used to check all the examples in my book with Mike Metcalf. Production compilers are likely to appear

from 1992 onwards. If you want to have the power and safety of the new features, without the need to rewrite your code in another language, put pressure on a vendor whenever you get a chance.

- John Reid, Atlas Centre Numerical Analysis Group

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The Cray compiler (CFT77) supports the following FORTRAN 90 features:

* dynamic allocation
* a subset of the array syntax
* recursive procedures
* long variable names
* NAMELIST.

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WORKSTATIONS AT ECMWF

Introduction

This article provides some information on the workstations in use at ECMWF, giving brief historical details, describing what they are and what they are used for, and indicating future plans. Parts of this article are based on contributions from colleagues at ECMWF.

The history of workstations at ECMWF

ECMWF first acquired workstations at the end of 1988. Before that, staff members used PCs to log into the mainframes. NOS/VE was and still is the common host for program development and batch submission. However, once the CRAY Y-MP/8 began running using UNICOS, UNIX workstations became an attractive alternative to PCs. UNIX is the only operating system that can give a uniform environment across all ECMWF's computers.

The Centre began by purchasing two SUN workstations as part of SUN's Catalyst programme. In exchange for developing an application on SUN equipment, in ECMWF's case that application being MAGICS, the equipment itself was provided at substantial discount. Originally ECMWF purchased a mixture of SUN 386i and SUN 4 SPARC systems, later purchases being SPARC systems only.

Subsequent to that initial purchase, further systems were obtained in 1989/90 to aid migration to UNICOS. They were used as a productivity tool to speed up that migration.

As part of a Digital Europe External Research Agreement the Centre acquired three DECstations in use by the Graphics Group.

Currently, there are two types of users, those that do most of their work on their workstation, and those (the majority) who continue to work on NOS/VE. UNIX workstations have been demonstrated to offer both groups an environment with improved productivity.

What is a workstation?

A workstation is similar to a PC, both are microprocessor based desk top systems. Three areas make up the strength of workstations:

1. The Operating System

A workstation runs an operating system which is similar to that of a mini or a mainframe computer, and gives the corresponding advantages, but at a price substantially less than either. Most workstations run UNIX, UNIX providing a near standard user interface. However, there are some differences between vendors in the user and programming interface. Both vendors and international standards committees are slowly trying to eliminate these differences. ECMWF is closely following the process of international standardization and its ultimate aim is for all operating systems to follow the post UNIX standard, known as POSIX.

2. Networking

Although a workstation can run on its own, it offers a much closer integration in a networked environment than the PC. Network services include network file access, remote login, remote execution and remote procedure calls.

3. Graphics

A workstation uses a high-resolution graphics screen. The X Window System developed by MIT is run on all Centre workstations. X11 has become the de-facto standard for windowing systems on workstations. X11 is a networked system that makes display and processing independent of each other. It consists of two parts; **the server** which handles the display on the workstation; and **the client** which is the X11 application program.

For example, X11-based debuggers are run on UNICOS, presenting their output on a local workstation and on PCs with X11 servers.

The types of workstations in use

The following desktop workstations are in use:

> twenty-seven SUN SPARCstations with colour monitors, 24 MB memory, plus a local disk for the operating system and local swap space. SunOS release 4.1.1 is the operating system;
>
> three DECstation 5000/200 with colour monitors, 24 MB memory, local disk, graphic accelerators, and Digital ULTRIX release 4.2. These three workstations are used by the Centre's Graphics Group.

The Centre currently has 3 SUN SPARCstation 4/370 file-servers. All provide a portion of the filespace for the workstation users. All three have an ULTRAnet connection to the CRAY and the IBM. Two of them act as gateways between the CRAY and Ethernet. All traffic between the CRAY

and the VAXes goes via these servers, making them important for the operational forecast. One also acts as a post office, relaying mail within ECMWF and to the outside world through the Internet connection.

Centre PC and "dumb terminal" users can log on to a server, or workstation, and access UNIX facilities, although they are unable to use the X11 windows based environment.

Workstation services

File Access

The disks on the file servers are available to all the workstations, and to UNICOS, through SUN's NFS (Network File System). Each office workstation is configured in the same way and it is immaterial to the user which workstation he/she logs into. The workstation users have access to UNICOS files and vice versa, workstation files are also available from UNICOS. Users can thus do program development on the workstation. They can test their programs locally before running the production version on UNICOS.

Electronic Mail

The Centre now has an integrated mail system connecting all its main computers. Mail to staff members is automatically routed to one host. The Member State users will soon be added to the mail system, and will be given the choice between reading their mail at home or at ECMWF.

Currently the Centre's PCs are not part of this integrated mail system, but will be once a suitable X400 based interface has been made available.

Graphics

ECMWF is using GKS (MAGICS) and Postscript as its major graphics tools. X11 was recently introduced as the de-facto standard for developing interactive applications. It is intended to integrate GKS into the X11 environment.

X11 has two competing user and application environments. OpenLook is supported by Unix International (AT&T, SUN and others) and Motif is supported by OSF (IBM, Digital, HP and others). OpenLook and Motif applications can share the physical screen. After evaluation of both OpenLook and Motif, ECMWF has decided to opt for Motif, but to develop applications in such a way that they can also run in an Open Look environment. The XDesigner system has been bought to aid MOTIF applications development.

Current ECMWF workstation facilities

Before the Centre adopted the above mentioned policy, the first two X11-based applications were developed using SUN's OpenLook toolkit, XView. These were:

Metbatch an X11-based system to define plots to be generated on the Cray; and

Xsection an X11-based program to define and view cross-sections of the atmosphere generated by the numerical models.

Other workstation applications and facilities include:

MAGICS a workstation version of MAGICS is available. The first version runs on SUN workstations, and a DECstation version is in preparation;

MicroMAGICS/UNIX an interactive tool to create MAGICS charts in a UNIX environment.

Future workstation applications

Workstation applications under development are:

Ecfile a new interface to CFS using X11/Motif, providing the workstation user with direct access to CFS on the Data Handling System;

METVIEW/ws this will be the future tool for interactive visualisation of meterological data;

MARS this initial workstation version of MARS will access on-line fields from the fdb database. Later a full service will be developed covering both fields and observations;

Summary

ECMWF has had workstations for only a short period and is still in an early development phase, both with regards to the number of workstations and the services provided. So far, workstations have been a positive experience. Much time has been saved by applications developers, especially

those responsible for cross-machine applications. To be able to monitor applications on different machines simultaneously, or several applications on one machine, has proved a great benefit. Moving from window to window can achieve in a second or two something which before took minutes. This done many times a day makes for great savings.

Their full capacity is still far from being used, but new applications are being learnt, and written. It will be a challenge to move smaller tasks away from the CRAY, freeing it to do what it is really good at, namely intensive compute bound operations. Workstation performance is improving rapidly, and new models are produced every year. The Centre's present SUNs are already surpassed by a factor of 4 by the newest models. A strategy of gradual replacement is considered the soundest; as new applications demand higher performance so the most critical positions can be filled by high-end workstations.

The Centre's four-year plan indicates that its system environment will be UNIX (later POSIX) based. It is planned to terminate the NOS/VE service in 1993, and to move to a more uniform UNIX environment with workstations.

- Ditlef Martens

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MAGICS GRAPH PLOTTING

Graph plotting in MAGICS is the plotting of line charts (curves), bar charts and area charts within a set of axes. Graph plotting is achieved in MAGICS by calling ACTION routine PGRAPH. This will only draw one graph each time it is called.

To plot a graph, it is necessary to pass information to MAGICS that describes the graph required. This information is passed to MAGICS via one-dimensional arrays, holding the X and Y values of the graph. The X/Y values refer to the X and Y axes which should be set up by the user. MAGICS AXIS facilities should be used to define the required axis system.

The user can control the line_style, colour and thickness of each graph and a legend describing the graph may be plotted.

Parameters associated with graph plotting all start with the prefix GRAPH, e.g. GRAPH_LINE_STYLE. These parameters describe the input data and type of graph plotting required, i.e. curve, bar chart or area chart. They also describe the attributes of the graphs, e.g. line_style, colour and thickness of plotted output.

Types of graph plotting

There are three types of graph plotting available, Line Charts (Curves), Bar Charts and Area Charts.

Curve plotting

Curve plotting in MAGICS means the drawing of polylines, where the lines to be drawn are described by their X and Y values within a defined set of X/Y axes. Any number of curves may be drawn on the same set of axes. However, action routing PGRAPH must be called for each curve. The user may define the line style, colour and thickness of each curve to be plotted and by using variations of these three parameters, users can plot many curves and still distinguish them from one another. There are two different methods of drawing curves: **Straight**, where the points on the curve are joined by straight lines, and **Rounded**, where a smoothing algorithm is applied to the curve.

It is possible to plot curves marked with symbols. Symbols in this case are MAGICS symbols (see Appendix C, MAGICS REFERENCE MANUAL) and are plotted on the position of each data point on the curve. Symbols only may be plotted, which means that only the symbols are plotted and none of the curve itself is plotted.

Each curve drawn can have a blanking applied to it, if required. That is, a certain area on each side of the curve can be blanked and any previous plotting in those areas removed.

Fig. 1 shows curve drawing with symbols and blanking; Fig. 2 shows a simple curve drawing example. The front page is another example of curve drawing with symbols.

Missing data

Missing data occurs when the data presented for graph plotting contains data that is outside the current axis system in either the X or Y direction. The user may also instruct MAGICS to ignore data above or below certain values. This applies to both the X and Y axes. The user has three options for dealing with missing data: IGNORE, JOIN or DROP.

(1) **IGNORE**. MAGICS will only plot that part of the curve for which data exists. This means that, if there are missing data, no lines will be drawn from the point preceding the missing data or to the point following.

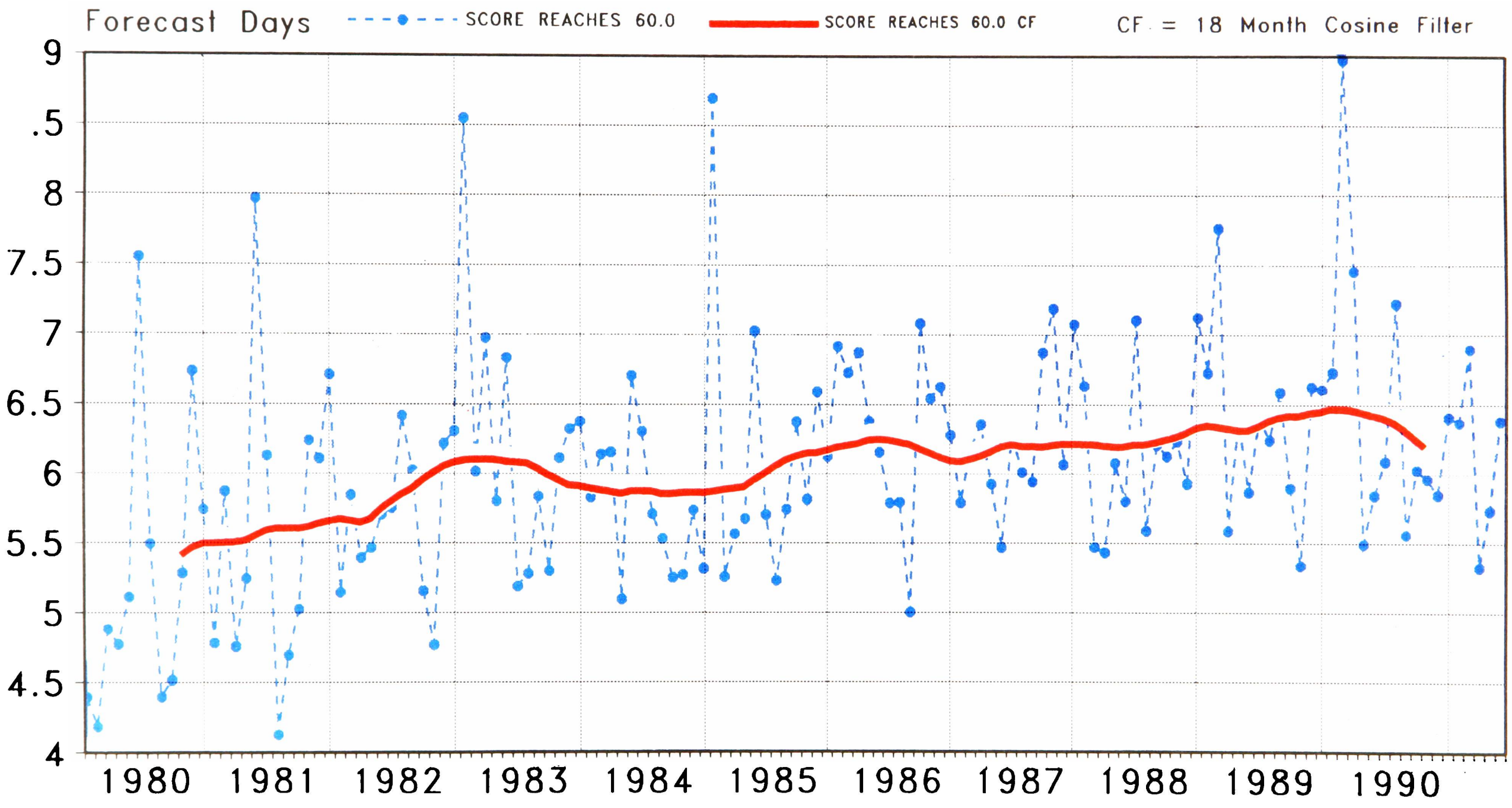


Fig. 1 Curve drawing with symbols and blanking.

(2) **JOIN**. This option means that the curve will be drawn as if the missing points do not exist. In this case the part of the curve, from the point preceding the missing data to the point following it, will be drawn.

(3) **DROP**. This means that, if there are missing data, the curve will continue to be drawn but, from the point preceding the missing data to the point following it, the curve will be plotted along the X axis. The curve will drop vertically from the point preceding the missing data to the X axis and will rise vertically to the point following the missing data.

There are parameters to control the colour, line_style and thickness of missing data curves. Fig. 3 shows how MAGICS deals with all three options for missing data.

Bar chart plotting

Bar chart plotting in MAGICS is the plotting of vertical bars within a defined axis. Each bar in the chart is defined by its X values and by the lower and upper Y values. The X and Y values relate to the X and Y axes respectively. The X value gives the position of centre of the bar in the X direction. The width of the bar may be set by the user as desired, the default value being half the distance between major ticks on the X axis. If any of the X and Y values would cause any part of the bar to be drawn outside the subpage, this part of the bar will not be plotted. By default, the bars are shaded but, if shading is turned off, the outline of the bars will be drawn. Three types of shading are available: SOLID, HATCH and DOT. The colour of the shading and the density of dots required may be set by the user.

The standard bar chart in MAGICS consists of one set of data per graph. The following are some examples of the type of bar charts that can be plotted. Please note that these bar charts are not available in MAGICS by name but are user-generated by setting MAGICS parameters:

(1) **Clustered**. In this case, a different bar chart can be plotted for each different set of data. The different bars can be placed next to each other, by varying the X axis values, and can be coloured and/or shaded differently.

(2) **Overlapping**. Here, the bars for the second set of data can be moved slightly to one side and then plotted over the first set.

(3) **Hidden**. This resembles overlapping bars, except that the second set of bars is plotted in the same position as the first.

(4) **Stacked**. The second set of bars can be plotted on top of the first set. Thus, both sets of bars should be completely visible.

The annotation of bar charts can be done manually or automatically. Fig. 4 gives an example of an overlapping bar chart.

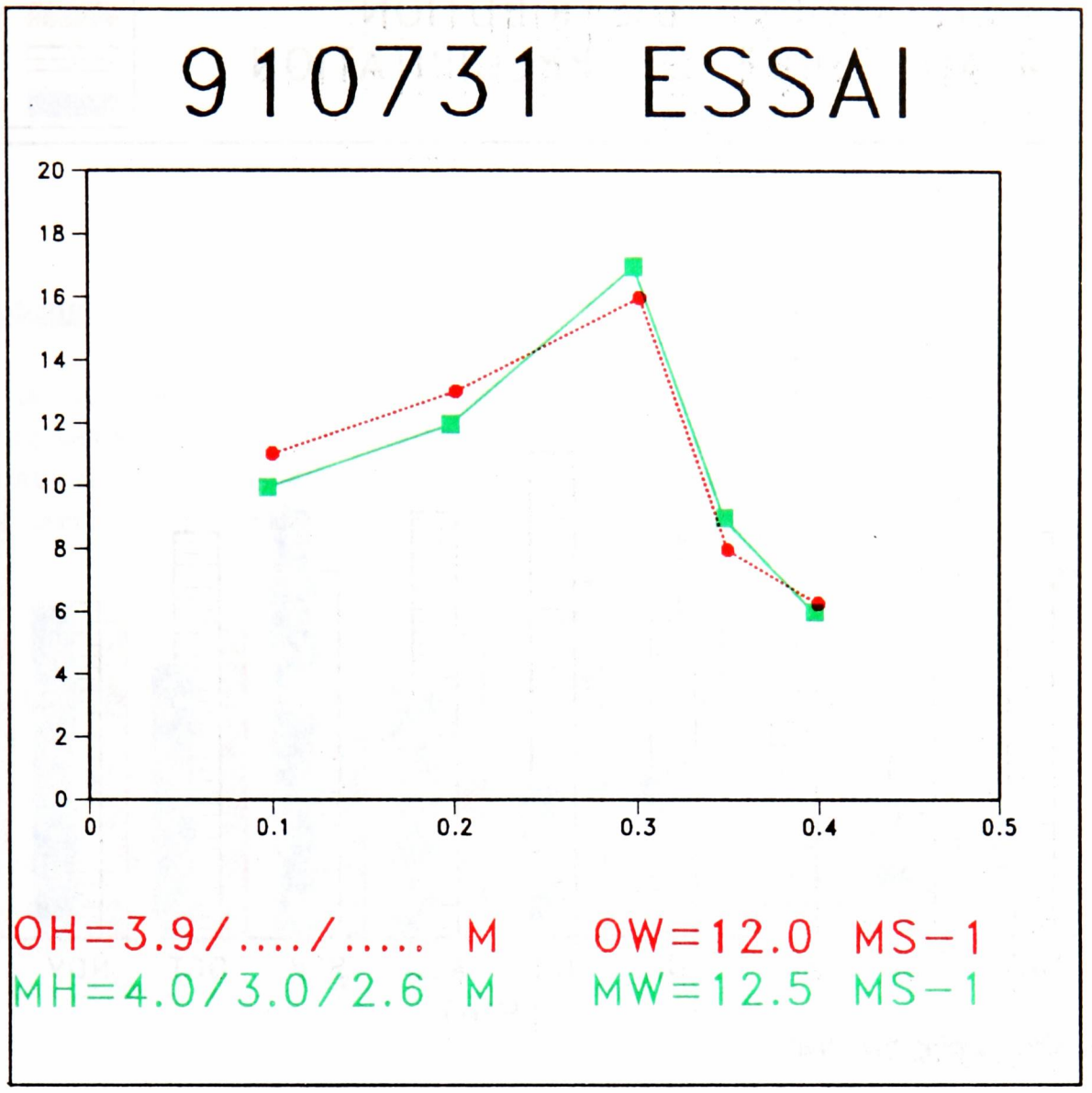
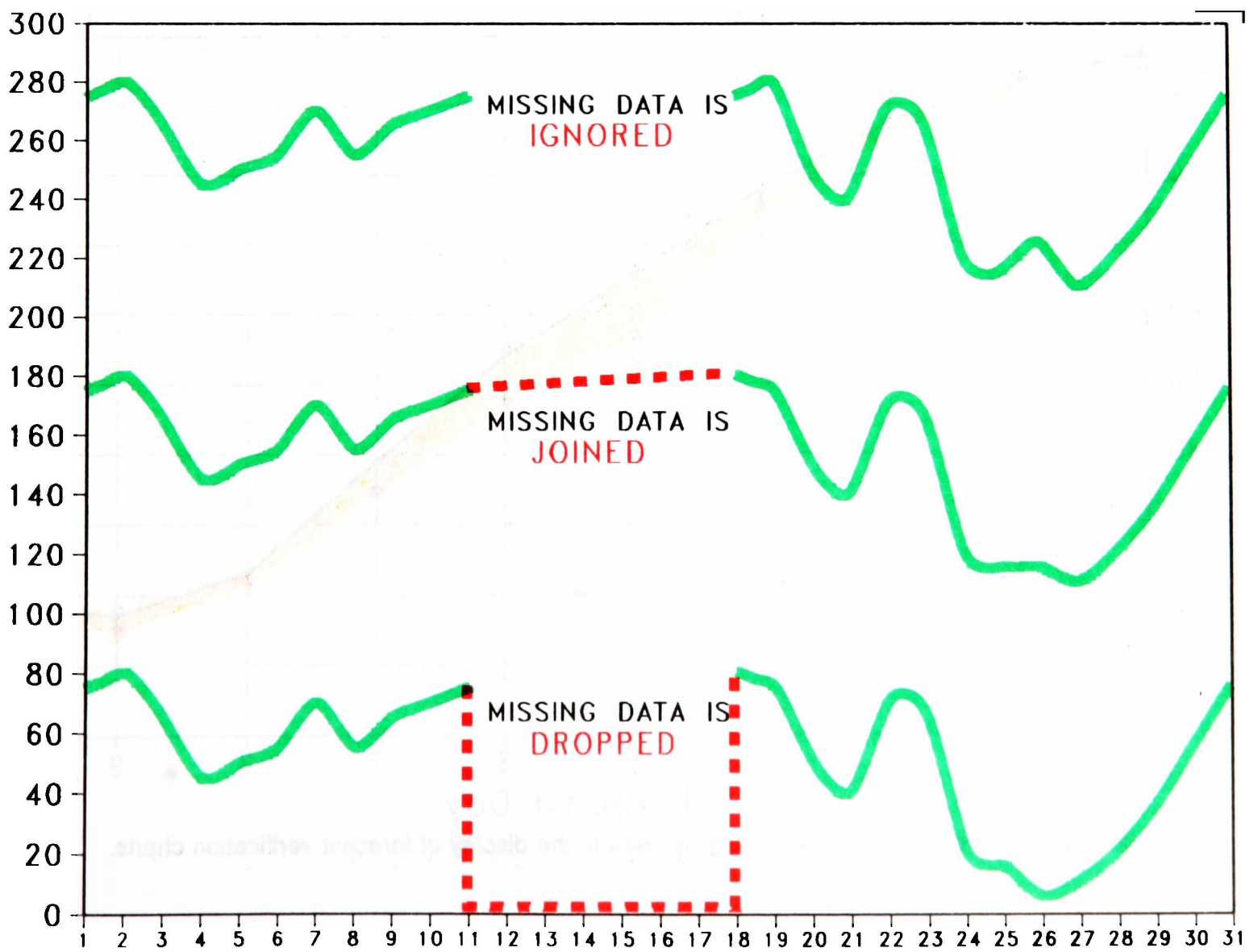


Fig. 2 Curve drawing with symbols.



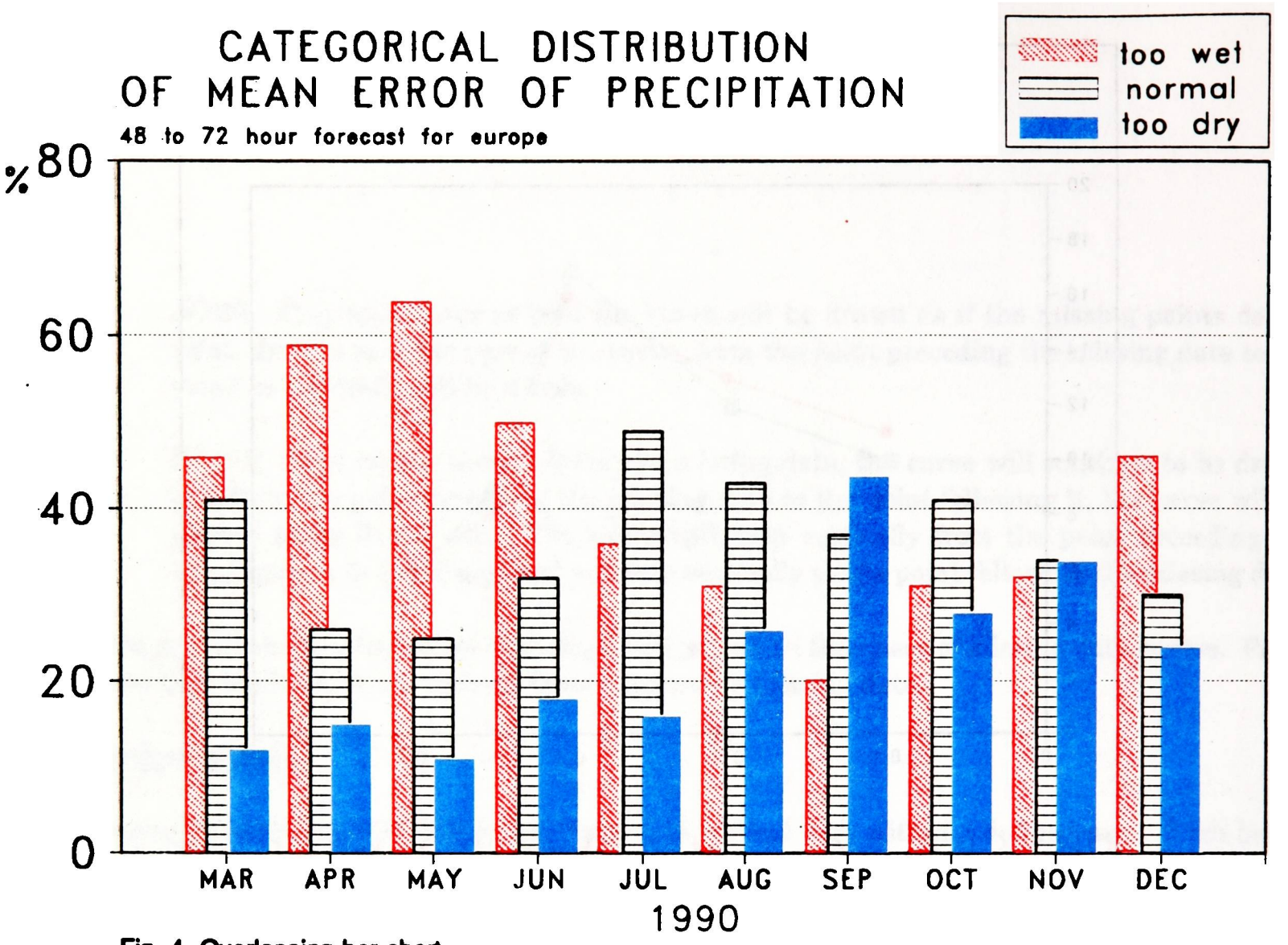


Fig. 4 Overlapping bar chart.

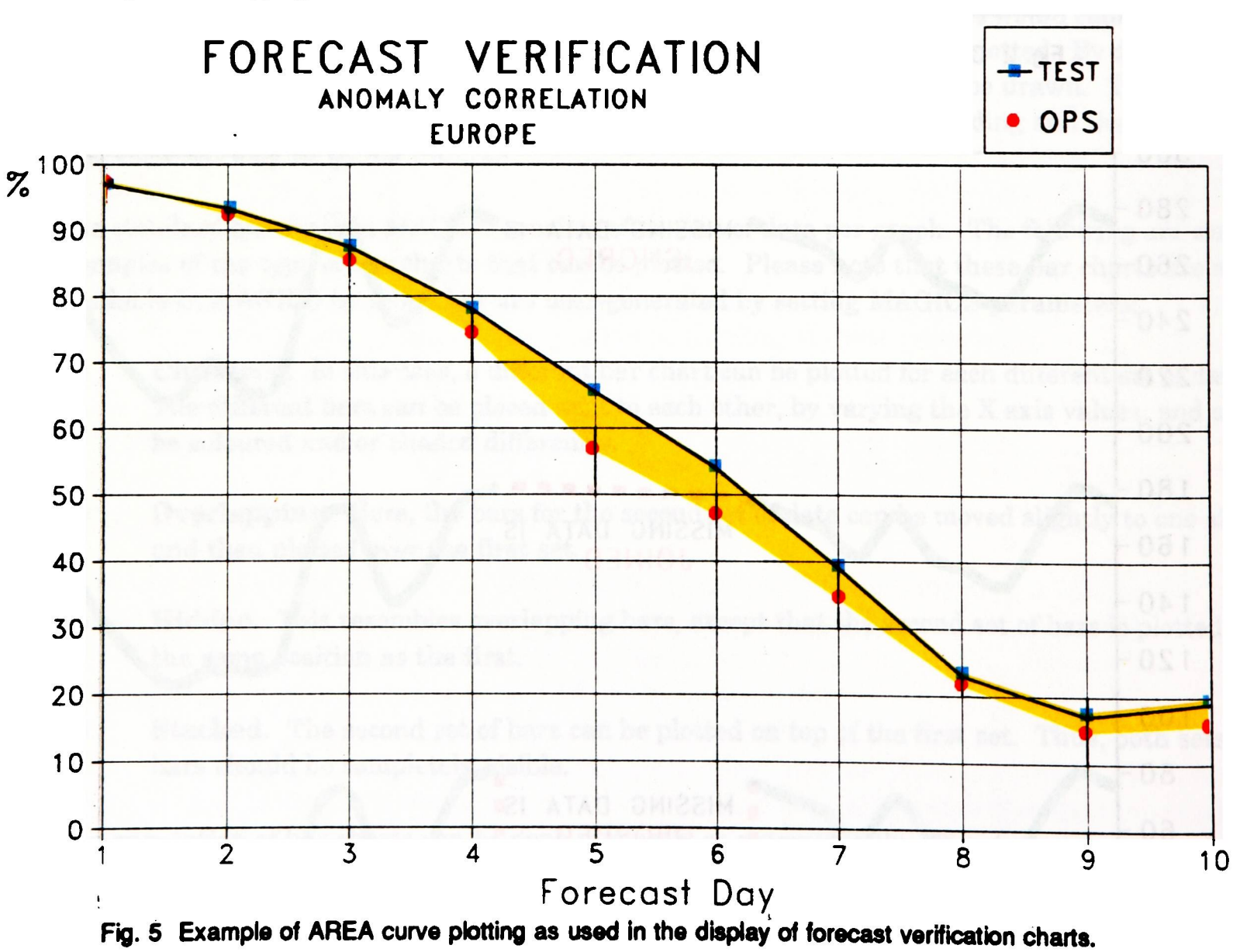


Fig. 5 Example of AREA curve plotting as used in the display of forecast verification charts.

Area chart plotting

An area chart is one in which the area between two curves can be shaded. If the second curve is defined as being along the X axis, the area chart will appear to have only one curve and the area underneath that curve will be shaded. The colour of the shading and the density of dots may be defined by the user. Fig. 5 gives an example of area chart plotting.

Graph legend

It is possible to plot a legend to describe the graphs plotted. The legend plotted depends on the type of graphs required - bars, curves or area curves. A curve legend will basically consist of a description of each curve plotted in the current page, i.e. line_style, colour, thickness.

If symbols have been plotted, an example will appear in the legend. A bar chart or area chart legend will consist of a box filled with the same type of shading as used in the plotting. The legend text in graph plotting should be supplied by the user but, if not supplied, MAGICS will plot a default text. Examples of the legend plotting can be seen in all the figures.

- **Paddy O'Sullivan**

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THE MOVE TO UNICOS 6

We are currently testing UNICOS 6.0 and soon will be testing UNICOS 6.1 at ECMWF. Version 6.1.5 should become the production operating system on the Y-MP later this year. This article aims to point out new features present in this system as well as any problems which could arise due to incompatibilities and differences between UNICOS 6 and UNICOS 5. In this article the present tense is used to mean "under UNICOS 6".

Incompatibilities and differences

1. CHOWN

The "chown" command is now restricted to super-user. This is to comply with POSIX standards. **N.B.** This restriction will initially be suspended, and will not be imposed until next year. However, you should modify any applications which use this command or system call before UNICOS 6 becomes the production system.

2. EOF & IEOF

The "EOF" & "IEOF" subroutines no longer exist. You should convert any Fortran programs that use these subroutines to use the "END=" option on "READ" statements before UNICOS 6 becomes the production system.

3. ASSIGN

The format of the "ASSIGN" environment file has changed and as a result absolute binaries from UNICOS 5.1 will not work with the UNICOS 6 "assign" command. Any such binaries will need to be rebuilt.

4. IOSTAT

The values returned by the "IOSTAT=" parameter of Fortran I/O statements have changed. They are now in the region 1000 to 2000.

5. AQIO

The status values returned by "AQIO" routines have changed.

6. DLOG

The "DLOG" math routine now returns more accurate results which could differ from those produced on UNICOS 5.1.

7. NICV & NOCV

Problems can occur if a decimal number (one with a decimal point) is read by a formatted READ statement when there are more than 28 significant digits before the decimal point. This also occurs if the number is actually coded in the source of a Fortran or C program. Some numbers which required rounding before being printed used to be rounded incorrectly. This has been corrected.

8. UTIMES

The "utimes()" system call has been renamed to **cutimes()** due to a clash of names.

9. STAT

The new "stat" structure (system call) is now the default.

10. MATHLIB VERSION 2

A set of new, highly accurate single-precision math routines is available in **/lib/libmv2.a** under UNICOS 6. It is NOT the default, but will become so at UNICOS 7. these routines can be linked with Fortran programs, e.g. by using the "-l mv2" parameter on SEGLDR. They are not bit for bit compatible with the default math routines.

11. ERRNO

The definition of "errno" in **/usr/include/errno.h** has changed. If you explicitly define errno, e.g.

```
extern int errno;
```

then delete this definition and use the above include header file instead, i.e.

```
#include <errno.h>
```

12. FLOWTRACE & PERFTRACE

"FLOWTRACE" & "PERFTRACE" no longer write their reports automatically at the end of the user program's execution. Instead they write to the files "flow.data" and "perf.data" in the current directory. These files can then be post-processed using the "flowview" and "perfview" utilities.

13. LIBRARY RESTRUCTURE

Routines in the following libraries:

libauto,	**libbsd,**
libenv,	**libflow,**
libmt,	**libnet,**
librpc,	**libyp,**

have been moved into either **liby** or **libc.**

14. CC & SCC

The Cray Standard C Compiler (SCC) is now the default. So both the "CC" and "SCC" commands reference this compiler.

New features and enhancements

1. MESSAGE SYSTEM

The "message system" is a set of commands, library routines and files that provides the following benefits:

* standardised coding mechanism for issuing messages to the user;

* a message explanation retrieval facility;

* user control of the format (& possibly language) of messages received.

The "explain" utility can be used to obtain more information about specific messages.

2. CDBX

"CDBX" contains quite a few enhancements including the ability to debug live, multitasked or segmented applications.

3. WATCHWORD

"WATCHWORD" allows user programs to identify quickly and inexpensively those modules which may be changing the contents of certain memory addresses. Once found, the "watchpoint" capability of CDBX can be used to isolate the specific instructions.

4. APM

The Autotasking Performance Monitor "apm" provides the user with both summary and detailed information on the performance of autotasked applications. This information can be accessed through a report, through a simple ASCII interface, or with a graphical X Window interface.

5. ATCHOP

The "atchop" tool assists in debugging autotasked programs.

6. ATSCOPE

The "atscope" tool is an X Window interface which helps users to transform loops that Autotasking does not detect automatically so that they run in parallel.

7. FLOWTRACE & FLOWVIEW

Numerous enhancements have been made to "Flowtrace". These are in 3 areas:

* removing limitations that made Flowtrace difficult or awkward to use;

* adding new data-gathering features;

* changing the default behaviour.

After the user's program has run, "flowview" can be run and the data examined in any number of ways. The information can be accessed through a report, through a simple ASCII interface, or through an X Window interface.

8. GMAT

This Geographical Multiprocessing Analysis Tool has been enhanced and now has an X Window interface.

9. HPM

The Hardware Performance Monitor "hpm" has had the default counter group changed to 0, and the output can now be post-processed by "perfview".

10. PERFTRACE & PERFVIEW

Similar enhancements have been made to Perftrace as those to Flowtrace.

The "perfview" tool is similar to "flowview" described earlier.

11. PROCSTAT & PROCRPT

These have been enhanced to provide more I/O statistics reported for each Fortran I/O unit.

12. PROF & PROFVIEW

The "profview" tool is also similar to "flowview" described earlier.

13. PERFSCRIPTS

The "perfscripts" command helps users to do their own processing of their program performance data from Flowtrace, Perftrace, prof and hpm.

14. LIBSCI

Most of the routines in the scientific library have now been compiled with Autotasking. A single-processor version can be enforced by setting the shell environment variable:

NCPUS=1 export NCPUS	Bourne Shell
setenv NCPUS 1	C Shell.

15. LIBC

the "libc" library contains many new routines in support of the POSIX standard. Also math functions have been added to support "long-double" (128-bit) and complex arithmetic.

16. LIBU

The "libu" library contains several new Fortran-callable subroutines giving the user the functionality of the "assign" command from within Fortran programs. These routines are:

ASSIGN, ASNFILE, ASNUNIT, ASNRM and ASNCTL.

IEEE numeric conversion routines are also now available.

17. MEMORY-RESIDENT FILES

The MR capability allows the user to declare that certain files should reside entirely in memory. A similar SDS capability has been added for SSD.

18. KSH

The Korn shell "ksh" is now available. ksh combines Bourne shell (sh) compatibility with a C shell-like (csh) history mechanism. ksh also provides several additional features and is likely to become the POSIX standard shell.

I hope that this article has given a flavour of things to come when the UNICOS 6 system goes into production, and helps in planning for that event. If you have any specific queries about any of the items presented in this article, please contact the User Support Section at ECMWF.

- Neil Storer

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STILL VALID NEWS SHEETS

Below is a list of News Sheets that still contain some valid information which has not been incorporated into the Bulletin set or republished in this Newsletter series (up to News Sheet 271). All other News Sheets are redundant and can be thrown away.

No.	Still Valid Article
204	VAX disk space control
205(8/7)	Mispositioned cursor under NOS/VE full screen editor
207	FORMAL changes under NOS/VE
212	MFICHE command from NOS/VE
214	NAG Fortran Library Mark 12 News Sheets on-line
224	Job information cards
230	Access to AB printer via NOS/VE CDCNET
235	VAX public directory - how to create
236	Alternative VAX graphics service for in house users
247	Use of CFSPATH/TARGET parameter within MARS retrievals
248	Changes to the Meteogram system
253	Copying/archiving NOS/VE catalogs to ECFILE Copying complete UNICOS directories to ECFILE
254	UNICOS carriage control
260	Wasting time on incomplete plots Changes to PUBLIC directories for VAX users
261	Meteogram system on UNICOS

No.	Still Valid Article
265	Lost UNICOS outputs submitted via RJE or VAX Microfiche changes
266	Reminders on how to import/export magnetic tapes
267	Checking on your UNICOS account usage
268	Changes to WMO FM 92 GRIB
270	Changes to the Meteogram system; Advisory Office
271	New ECFILE features on UNICOS

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ECMWF VACANCY ANNOUNCEMENTS ON OMNET MAIL

The European Centre for Medium-Range Weather Forecasts has started to announce its scientific and technical vacancies on the EURO.NEWS bulletin board of OMNET.

EURO.NEWS is a special interest bulletin board on the OMNET electronic mail network; it carries announcements and reports on pan-European meetings, job postings, calls for proposals, and other items that are of specific interest to European scientists.

Posts at the Centre are open to nationals of the 18 European Member States of ECMWF. Remuneration and conditions of employment follow those of international organisations.

The vacancy notices in EURO.NEWS are abbreviated.

They will be mainly of interest to those with qualifications in meteorological or computing science, or in related subjects.

It is hoped that this will reach the attention of potentially interested scientists, especially Europeans based outside Europe who might not otherwise become aware of these vacancies; OMNET is available to scientists, institutes, laboratories, universities, and similar institutions world-wide.

- Austin Woods

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ECMWF CALENDAR 1991

9-13 September	Seminar: Numerical methods in atmospheric models
16-18 September	Workshop: Fine-scale modelling for parametrization schemes
30 Sept.-2 October	Scientific Advisory Committee - 19th session
2-4 October	Technical Advisory Committee - 16th session
7-24 October	Computer User Training Course
8-10 October	Finance Committee - 47th session
13-15 November	Workshop: Predictability
18-22 November	Workshop: Meteorological operational systems
3-4 December	Council - 35th session
24-26 December	***ECMWF holiday***

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INDEX OF STILL VALID NEWSLETTER ARTICLES

This is an index of the major articles published in the ECMWF Newsletter plus those in the original ECMWF Technical Newsletter series. As one goes back in time, some points in these articles may have been superseded. When in doubt, contact the author or User Support.

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* T indicates the original Technical Newsletter series

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USEFUL NAMES AND 'PHONE NUMBERS WITHIN ECMWF

			Room*	Ext.**
DIRECTOR	-	David Burridge	OB 202	2001
HEAD OF OPERATIONS DEPARTMENT	-	Michel Jarraud	OB 010A	2003
ADVISORY: Available 9-12, 14-17 Monday to Friday				2801 (Bleeper 139)
Other methods of quick contact:	-	Telex (No. 847908)		
	-	Telefax (No. 869450)		
	-	VMS MAIL addressed to ADVISORY		
REGISTRATION				
Project Identifiers	-	Pam Prior	OB 225	2384
User Identifiers	-	Tape Librarian	CB Hall	2315
COMPUTER OPERATIONS				
Console	-	Shift Leaders	CB Hall	3333
Reception Counter	-	Tape Librarian	CB Hall	2315
Tape Requests	-	Tape Librarian	CB Hall	2315
Terminal Queries	-	Norman Wiggins	CB 026	2308
Telecoms Fault Reporting	-	Michael O'Brien	CB 028	2306
DOCUMENTATION - Distribution	-	Els Kooij-Connally	Library	2751
LIBRARIES (ECLIB, NAG, etc.)	-	John Greenaway	OB 226	2385
METEOROLOGICAL DIVISION				
Division Head	-	Horst Böttger	OB 007	2060
Applications Section Head	-	Rex Gibson	OB 101	2400
Operations Section Head	-	Bernard Strauss	OB 004	2420
Meteorological Analysts	-	Ray McGrath	OB 005	2424
	-	Anders Persson	OB 002	2421
	-	Alex Rubli	OB 003	2425
Meteorological Operations Room	-		CB Hall	2426/7
COMPUTER DIVISION				
Division Head	-	Geerd-R. Hoffmann	OB 009A	2050
Systems Software Section Head	-	Claus Hilberg	CB 133	2350
User Support Section Head	-	Andrew Lea	OB 227	2380
Computer Operations Section Head	-	Peter Gray	CB 023	2300
GRAPHICS GROUP				
Group Leader	-	Jens Daabeck	OB 016	2375

RESEARCH DEPARTMENT

Head of Research Department	- Anthony Hollingsworth	OB 119A	2005
Computer Co-ordinator	- David Dent	OB 123	2702

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* CB - Computer Block
OB - Office Block

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EARN/Bitnet: The ECMWF address on the EARN/Bitnet network is UKECMWF. Individual staff addresses are the first 8 characters of their surname, e.g. the Director's address is BURRIDGE@UKECMWF

DEC MAIL: Contact scientific and technical staff via VMS MAIL, addressed to surname.