



European Centre
for Medium Range Weather Forecasts

ECMWF NEWSLETTER

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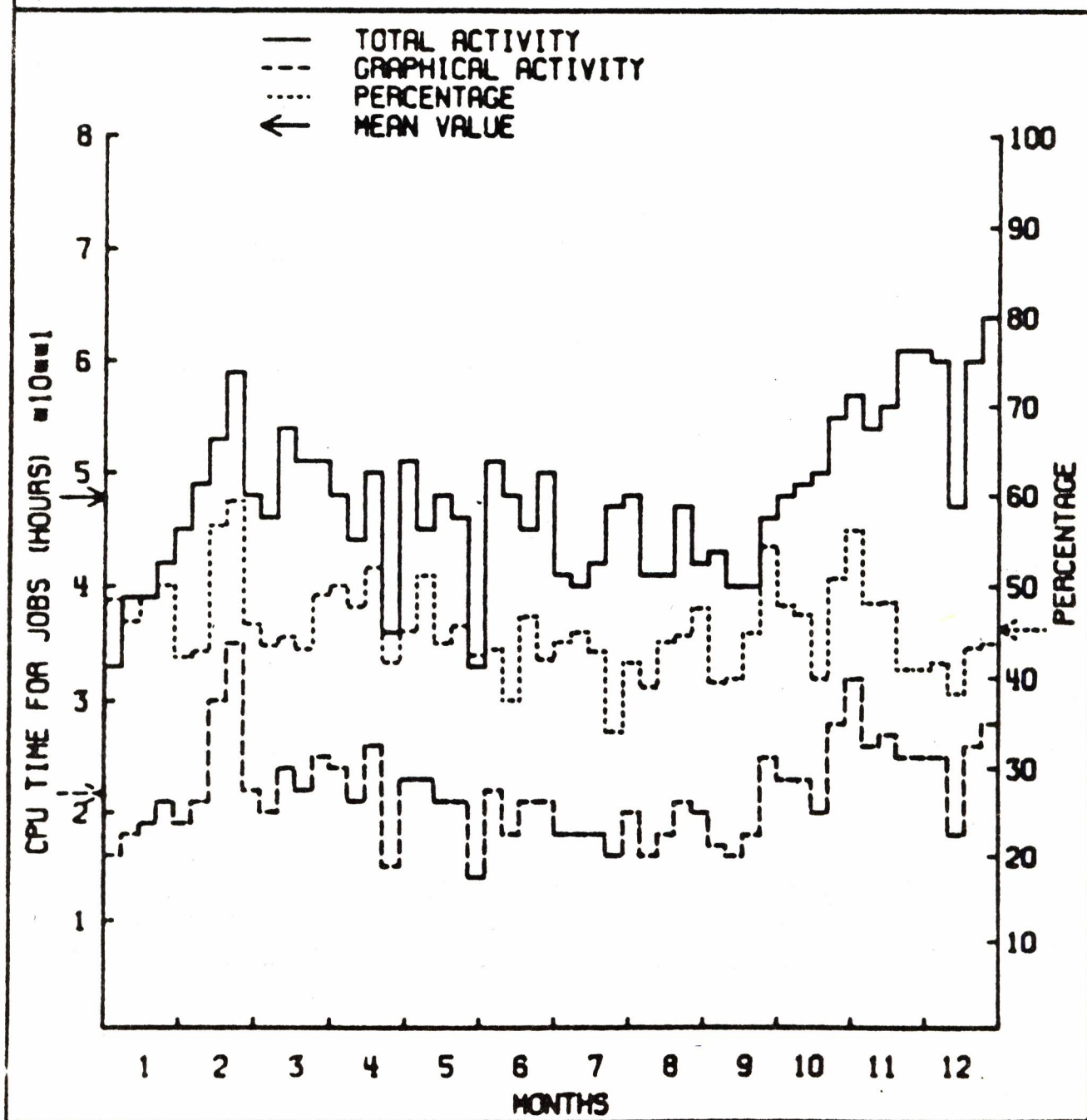
**NOT TO BE
TAKEN AWAY**

Number 8 - April 1981

GRAPHICS ACTIVITY 1980

BATCH

ID = ALL



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COMPUTING

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* NOTE : These articles directly concern the computer service, we recommend computer users read them all.	

COVER : The diagram shows the graphical batch activity on the Cyber during the year 1980, with respect to the total activity in terms of CPU time consumption.
The following must be made clear:
- the total CPU time is the user available CPU time (excluding system time and spot job time)
- the graphics CPU time represents the total time spent by those jobs which produce at least some graphical output.
See also page 13

CORRIGENDA

The article on "The Spectral Model" which appeared in ECMWF Newsletter No. 7 (February 1981) contained some typing errors which may have made the article difficult to read. The corrections are as follows:

- page 5, last line, should read:

$$so(4) \Rightarrow \frac{\partial F_n^m(t)}{\partial t} = R_n^m(t) \text{ for all } n \text{ and } m$$

- page 6, top line should read:
... and instead of having to study equation (3) at chosen points (λ_1, θ_j) we have to study....
 - page 6, 8th line from bottom of text should read:
... with $m \leq 63$ over the N48 grid point model.
 - The * appearing after the word "aliasing" on the 12th line from the bottom of the text is not connected with the asterisked footnote at the bottom of the text. Instead, the footnote refers to the third line from the bottom of the text. (An explanation of the term aliasing can be found in ECMWF Newsletter no. 5, page 2).
-

This Newsletter is edited and produced by User Support.
The next issue will appear in June.

ECMWF FORECASTS OF THE JANUARY FLORIDA FREEZE

The first economically destructive freeze in four years struck this year's Florida orange crop on 12-13 January 1981. The newspaper clipping, from the Tallahassee Democrat, describes some of the effects of the cold outbreak (figure 1) while the observation meteograms (figure 2) show the station temperature and surface pressure recorded at station 72223, which is situated west of Tallahassee, during the period 8-15 January 1981. Note the temperature fall and pressure rise in the period leading to 13 January, and the subsequent rise in temperature as the freeze ended.

The ECMWF forecasts since January 7 had been predicting a sharp temperature fall for the area. For example, figure 3 shows the D+6, D+5 and D+4 forecasts from 7th, 8th and 9th of the month and the verifying analysis. The heavy dashed line is the 850mb 0°C temperature isotherm, and the forecasts even had, in places, an over-prediction of the cold outbreak. The observed 850mb temperature over central Florida in the first days of January were typically around 8-10°C. The forecast meteograms of 2m temperature and surface pressure (figure 4) show the predicted temperature fall of around 9°C and subsequent rise, and the associated pressure changes in the forecast from 8 January. The diurnal temperature cycle, evident in figure 2, is not, of course, to be seen in the forecast. The forecast 10m winds show the predicted northerly flow associated with the southward advection of cold air.

Dr. L. Bengtsson, Head of Research at ECMWF, had brought a copy of this forecast with him to the International Conference on Early Results of FGGE, held at Tallahassee during this time. Professor Krishnamurti displayed the forecast on a noticeboard, and the conference delegates followed the progress of the prediction as it verified day by day. The success of the ECMWF forecast was carried as a news story in the local Tallahassee press.

Cold saps Florida's economy

Democrat staff and wire report

The first killer freeze in four years may have destroyed up to 20 percent of Central Florida's huge orange crop, industry officials said Tuesday in the wake of temperatures that broke state records set as long ago as 1886.

Gov. Bob Graham, declaring an emergency late Tuesday, lifted weight limits on trucks hurrying frozen citrus to processors, as a second night of frigid temperatures was expected throughout the lush groves in Florida's 34 citrus-growing counties.

Juice-yields do not drop sharply if the frozen fruit processed quickly, agriculture officials said.

Records fell with the thermometer throughout Florida early Tuesday, with a morning low of 13 in Jacksonville, 2 degrees below the previous January record set 95 years ago, and a 22 degree reading in Tampa that broke the record set in 1905. Miami had 32, the coldest for the date since 1962, and tourists seeking respite from cold weather back home shivered on Miami Beach, where a low of 36 broke the 43 degree record set in 1962.

Utility companies reported record electricity demand that forced rotating blackouts from Miami to the Florida-Georgia border, and power companies asked customers to conserve as much power as they could.

Between 300 and 400 Tallahassee homes lost electricity for a short time but not because of lack of capacity - the cold shrank power lines.

"A distribution line tightened up and actually pulled up into the circuit above it," said Gary Lawrence of the Tallahassee Utilities Department.

North Florida's farmers were affected by the freeze, though not so severely as in South Florida.

Jackson County Agriculture Director Leonard Cobb said winter grazing for beef cattle had been set back another three weeks. The grasses were already a month behind in growth because of a December drought, he said.

Ranchers will have to provide expensive hay, corn or peanut hulls for their herds to keep them alive.

The freeze, at the height of the oyster and shrimp season, brought fishing to a standstill along Florida's coast.

Figure 1 Newspaper report from the Tallahassee, Florida, Democrat of the freeze of January 1981

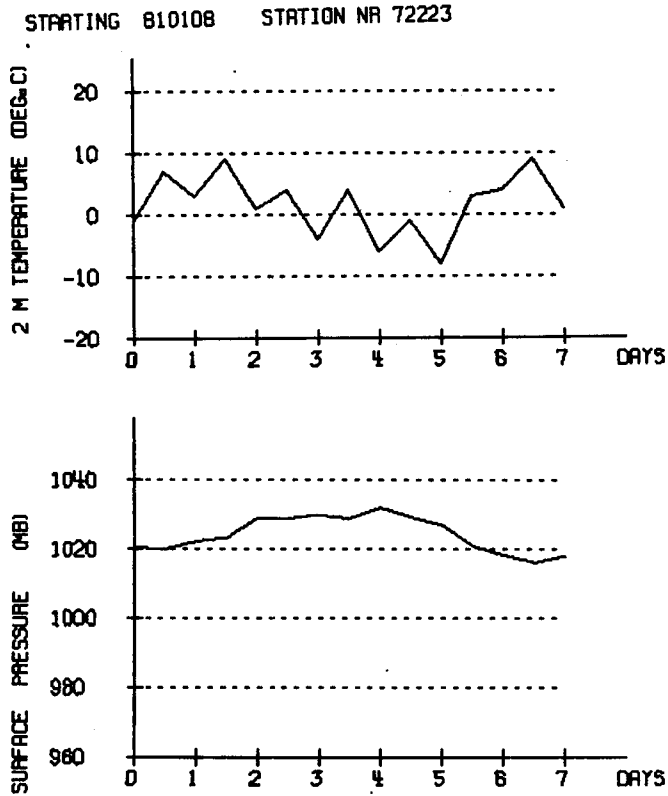
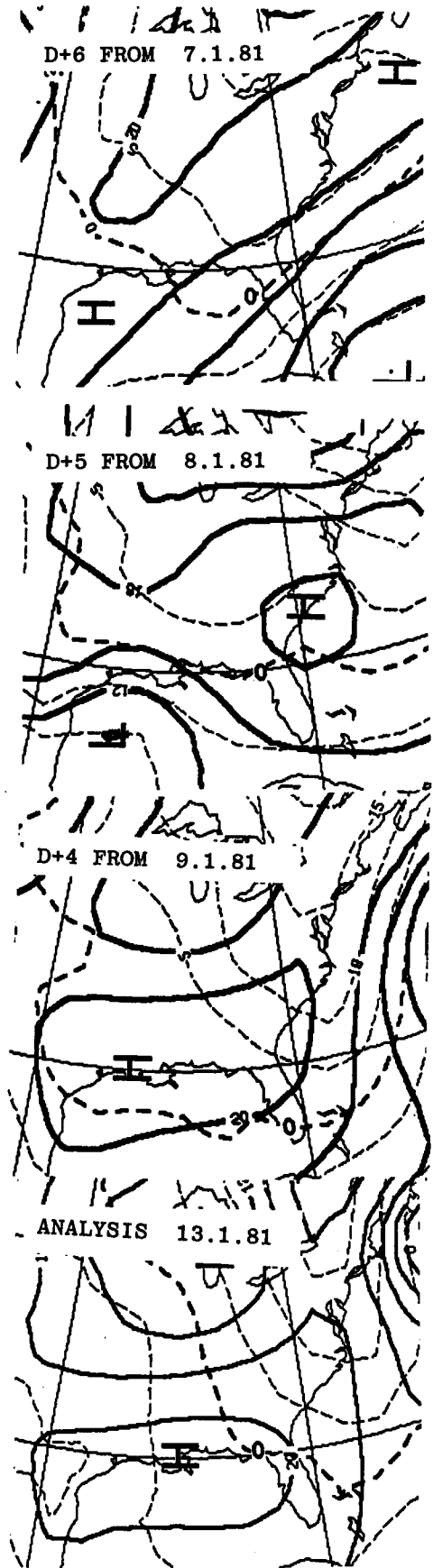


Figure 2 Observation meteograms of 2m temperature and surface pressure for station 72223 for the period 8-15 January 1981.

Figure 3 ECMWF forecasts (1000mb height, 850mb temperature) from 7, 8 and 9 January valid for 13 January and verifying analysis (bottom). The heavy dashed line is the 850mb 0°C isotherm.



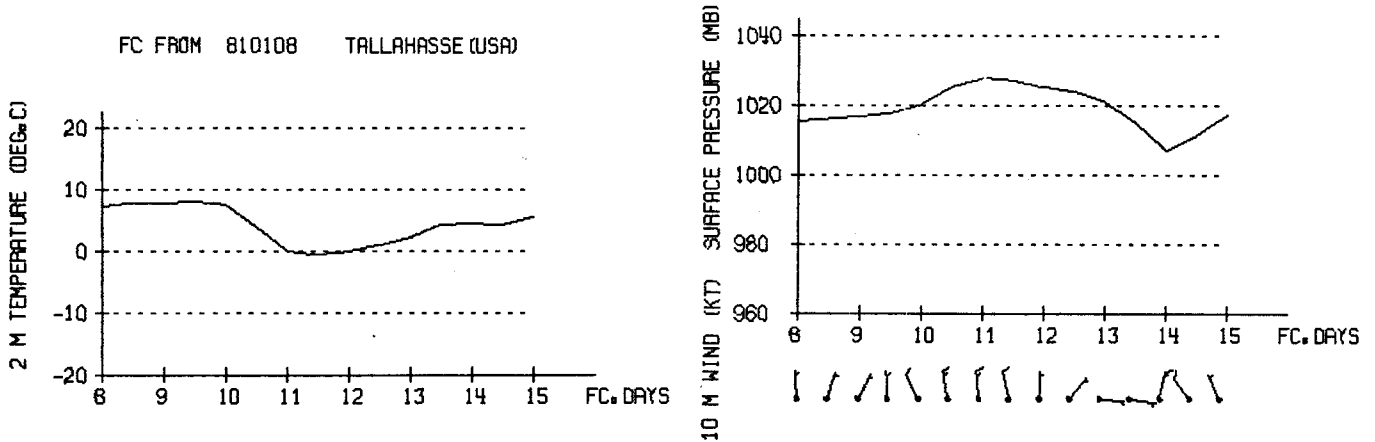


Figure 4 ECMWF forecast meteograms of 2m temperature (interpolated between the lowest model level and the surface) and surface pressure, interpolated to the area of Tallahassee from the four nearest grid-points, for the forecast from 8 January 1981. The forecast 10m wind, similarly interpolated, is also shown.

- Austin Woods

FACILITIES TO VERIFY AND DIAGNOSE FORECASTS PROVIDED BY THE DATA AND DIAGNOSTICS SECTION

A few years ago a package, VERIFY, for verifying forecasts was created. Since then, the number of options has grown considerably and it now provides an extensive set of plots for evaluating forecasts or for comparing different analyses. A new updated version of the documentation of the package will be available soon as appendix 5 in the ECMWF FORECAST MODEL DOCUMENTATION MANUAL. Only a general overview will be given here.

The package can be used by executing a procedure which launches a job with a sequence of programs. The first program reads the archived forecast data and creates data files in a fixed format. Whatever the formats of the archived data, they will be transformed to the same working format, which is zonal fourier series with wave numbers up to 20 for selected standard pressure levels. Because of this, there is some inflexibility in the system, e.g. it works only for the area north of 20°N or south of 20°S. On the other hand, it is very flexible in combining or comparing different datasets.

Verification measures are standard-deviations and anomaly correlations of temperature and height fields. Only zonal averages are given, they can optionally be averaged in meridional and vertical directions as well. Contributions by different zonal scales are provided. RMS-errors or anomaly correlations only due to errors in the intensity of disturbances or to errors in their positions can be separated. A skill score for predicting the positions of cyclones is provided. Definitions of these scores are given in the documentation of VERIFY.

Diagnostic measures are budgets of kinetic and available potential energy, fluxes of sensible heat, humidity and momentum, and spectra of many parameters. They are mostly presented in pressure-latitude cross-sections as zonal means; a separation in contributions by wavenumber groups is normally done. Not all of these are available through VERIFY, especially those including vertical velocity and humidity are excluded. However, a new package, which is just being developed, will make an almost complete set for the whole globe available, including generation of available potential energy and dissipation of kinetic energy calculated with a residual method. Budgets of kinetic energy, temperature and humidity for a selection of areas can be provided by a special program.

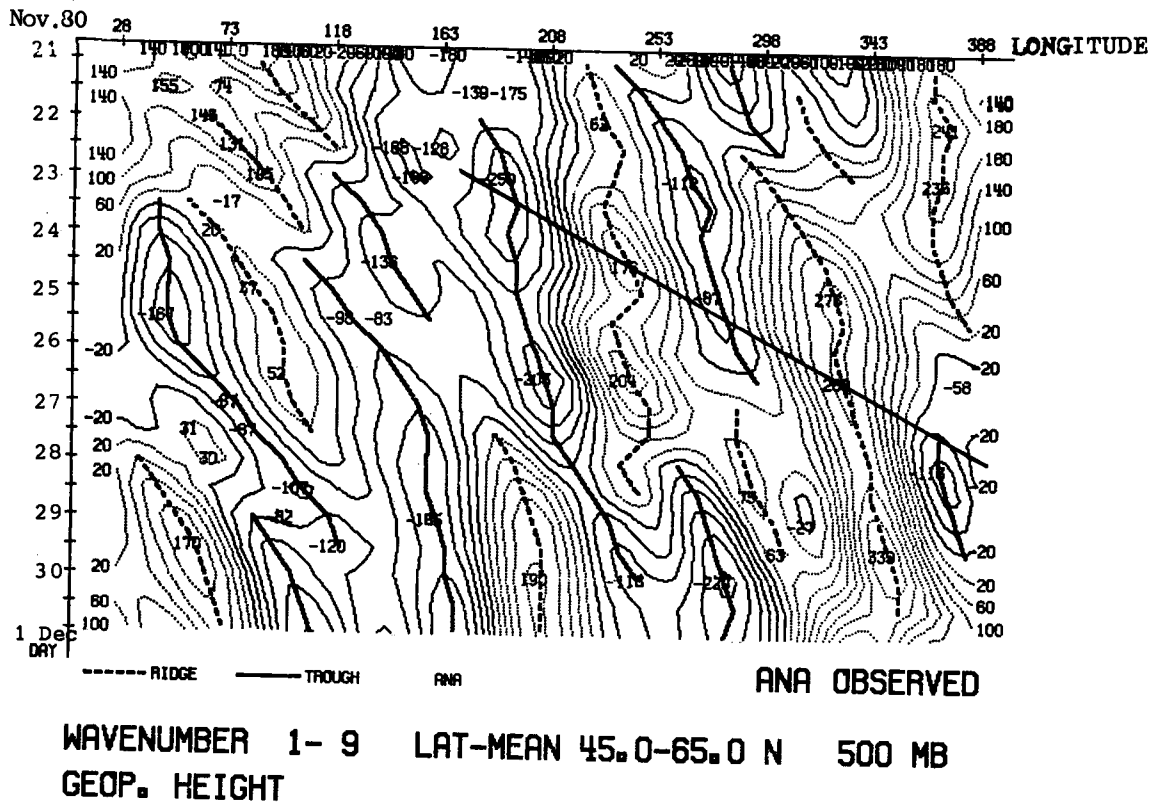


Fig. 1 : Hovmöller diagram, for explanations see text.

Further diagnostic tools within VERIFY, are plots of Hovmöller's trough-ridge diagrams, plots of dials for selected spectral coefficients, and plots of coefficients of Empirical Orthogonal Functions of the 500mb height fields.

A good selection of maps of several parameters at several levels is available, but an even wider selection can be provided by the plotting package VERPLO1.

The package VERIFY has also been extended to provide the same sort of verification and diagnostics for an ensemble of forecasts. Documentation of this ENSVERIFY is available, but has not been recently updated. This package also provides special verifications of 850mb temperatures and 1000mb geostrophic winds over Europe, North America or Australia. Typical examples can be seen in many technical reports, and in the monthly forecast reports. Technical Report No. 13 gives perhaps the best overview of the use of different plots.

To give one example of the plots produced by VERIFY, a Hovmöller diagram is shown in fig.1. For a latitudinal belt between 45° to 65°N, one can see the development of troughs and ridges in the 500mb height field during the course of time. Small scale features are filtered by using fourier series only up to zonal wavenumber 9.

The centres of the troughs and ridges are emphasised by bold dashed or solid lines respectively. The propagation of the waves mostly to the east is obvious in the plot. Often a sequence of extreme troughs and ridges can be seen moving eastward with a speed much larger than the wave propagation. The very bold straight line indicates such an energy dispersion, it is not plotted by the VERIFY program but can easily be found subjectively.

- Klaus Arpe

* NOS/BE PLANS IN 1981

In order to install and accept the second Cyber, it is necessary to embark on a NOS/BE software upgrade during 1981.

The first phase, comprising an upgrade from level 518 to level 530 has already begun. The level 518 system has been frozen, and the level 530 product set has been made available under NEXT. All users are urged to check their programs against the updated product set as soon as possible.

NOS/BE level 530 is scheduled to enter service in May 1981. From the user point of view, the operating system upgrade offers no new facilities (so no surprises either!), but there is an internal INTERCOM restructure which does not alter any user interfaces. The product set does include a few new features, listed below, along with one or two aspects which may cause difficulties.

1. UPDATE 1.4

This includes long line support and 8 bit ASCII code support. With this release of UPDATE, libraries can contain ASCII (8 bit character) card images, as well as the traditional 6 bit display code character card images. Optionally, the length of a card image can be extended to 256 characters.

2. FTN4

There are no major changes from our current FTN, apart from some bug fixes and some corrections to MANTRAP (PMD).

3. FTN5

This is the new CDC compiler that supports the FORTRAN 77 standard.

4. CMM

New library routines to allow program control, at execution time, of central memory requirements (user-callable Central Memory Manager routines).

5. LOADER

A field length requirement of 1000g extra words only, when loading an absolute program (i.e. overlay) by control card call, instead of the 14000g words currently used; this improvement will only be effective when the loaded program has a size not smaller than 14000g words (Small Absolute Loader).

Note that during preliminary testing of the next level of CDC products, it was discovered that a correction has been made to Record Manager so that it returns the exact length of a record, including any trailing spaces, rather than, as happens currently, returning the size rounded up to the nearest word. Anyone who uses this feature should alter their programs to work on both systems, if this is possible. If in any doubt, please contact User Support.

Later this year, it will be necessary to further upgrade the system to NOS/BE 1.5, level 538. This upgrade is essentially a "bug fix only" upgrade which should not have any impact upon users. Work on upgrading to level 538 will begin in May/June and the system is expected to enter service in September.

There are two aspects of the second Cyber which may affect users. In order to ensure that programs can be run on either the Cyber 175 or the second Cyber, the following information has been received from CDC:

1. Bugs in Cyber Record Manager mean that any absolute binary programs using record manager input/output must be reloaded under level 538 to ensure their correct operation on the second Cyber. This does not affect programs stored in source form or relocatable binary form, so is unlikely to affect many users.
2. Any users writing self modifying COMPASS code may run into problems on the second Cyber. Such practice is normally frowned upon as bad programming method, so it will surely not affect any ECMWF user. However, anyone who may be affected is advised to contact P. Gray, extension 323, for further information.

- Peter Gray

MERGING CRAY DATASETS ON THE CYBER

Cray datasets may be disposed to the Cyber and catalogued as Cyber permanent files by the simple Cray job control statement:

```
DISPOSE, DN=ANYDS, SDN=ANYPF, ID=ANY, ..... DF=TRBB, DC=ST.
```

Each execution of a Cray DISPOSE, as above, creates a permanent file cycle on the Cyber. Depending on whether DF=TR or DF=BB is used, the permanent file created contains either a Cray dataset in Cray format (Transparent) or a Cray dataset in Cyber format (Blocked Binary).

Cyber files containing TR Cray data can only be acquired individually by the Cray, i.e. a separate ACQUIRE control statement must be used for each file.

Cyber files containing BB Cray data can be merged into just one Cyber permanent file and acquired all together as a single data set.

The file merging on the Cyber can be achieved quite simply with SKIPF and COPYBF, i.e.

```
ATTACH, A, ANYPF, ....
SKIPF, A, 1.
ATTACH, B, ANYPF, .....
COPYBF, B, A.
:
EXTEND, A.
PURGE, B.
:
```

Following this, a Cray job using

```
ACQUIRE, DN=ANYDS, PDN=ANYPF, ID=ANY, DF=BB.
```

will be able to process all the original data sets merged into one, provided the reading program controls the occurrence of the End of File mark which will be found at the end of each original dataset.

- Luigi Bertuzzi

*SUBMIT AND DISPOSE

An ECMWF control statement and subroutine called SUBMIT is available on the Cray-1 to route a job into the Cray or Cyber input queue from an executing Cray job. We have recently learned that a new control statement SUBMIT will be included in a future release of COS. This new SUBMIT will have different parameters from the existing one and so it is advisable to change the name of ours, in order to avoid confusing name clashes.

Therefore, the present SUBMIT has been made available with the name LAUNCH and the two (identical) versions will co-exist until the COS SUBMIT goes into production. LAUNCH is available both as a control statement and as a subroutine (in ECLIB).

A very old subroutine called LAUNCH is still used by a few programs to perform the same task but with a different interface. This interface will be accepted by the new LAUNCH so there is no immediate need to change the source.

For the same reason, we have provided an alternative to CALL DISPOSE. There can be considerable confusion between DISPOSE in ECLIB and DISPOSE in \$SYSLIB. The new routine is called STAGE.

You are encouraged to change all references to SUBMIT and DISPOSE (ECLIB versions) and to avoid use of these entry points when writing new code.

Until new documentation has been produced, the calling sequence for LAUNCH may be found under SUBMIT, and the interface for STAGE under DISPOSE in the ECLIB documentation.

There will be a long overlap before SUBMIT and DISPOSE are removed from ECLIB.

- David Dent

OPERATION WITH STATE OF THE ART MAGNETIC MEDIA

In both the areas of magnetic tapes and magnetic discs, the performance improvements over the past years have been achieved primarily by changing the physical tolerances in the region of the recording head and the media. There have been further advances made in circuit techniques; for example, with the current CDC 885 discs, which employ a read amplifier integrated with the head assembly, thereby improving the signal to noise ratio at this level, and permitting the acceptance of lower signal levels from the read head (the reverse is true for writing). Other major advances have been in the use of error correction algorithms, to compensate for the critical performance of current advanced techniques. However, in the operational situation it is not so much the advances in circuit technology which are of concern, but rather the area of physical tolerances and the effects thereof.

The performance of magnetic tape at 6250bpi is very critical for reasons which are outlined later. It should be understood that 6250bpi means 6250 user bits (bytes) per inch, however, due to the error correction techniques, the actual density is 9042bpi.

The major factors affecting performance are:

1. The magnetic tape must give a high signal output at a much higher frequency than that used before 6250bpi.
2. The tape should not be abrasive; all tapes are, but the lowest possible coefficient of friction should be achieved.
3. The tape should not shed loose particles of oxide or material.
4. The environment in which the tapes and drives are installed must not permit airborne contamination to contact the recording head or the tape. In practice this is impossible, but every effort should be made to minimise such effects.
5. In the operator actions of loading and unloading tapes, the contamination risk is high, due to human hair, skin and particles from clothing contacting the tape or entering the drive.
6. Wear of the recording head, due to friction, will alter the magnetic field characteristics, thereby causing errors.
7. Contamination build-up on the recording head will cause separation of the tape from the recording head, thereby reducing the magnetic field strength and causing errors.

It is clear that, assuming a good magnetic tape product has been selected, and the recording heads are in good condition, and indeed, that the drives are in good working order, all other factors affecting performance are related to contamination of various forms.

It can clearly be seen from Figure 1 that smoke particles are far less damaging to tape performance than other forms of contamination, yet nevertheless, smoke particles are large enough to cause 100% signal loss at 6250bpi. Consequently, given all the critical aspects of 6250bpi tape technology, we are expected to know if bad performance is due to a tape or a drive; frequently, however, the real answer is neither, but, rather, contamination. This is proved by monitoring the performance of given tapes before and after cleaning the recording head of a drive. These, however, are controlled experiments, the normal daily performance is much more complex and misunderstood. The only practical solutions are to clean all tapes and recording heads as frequently as one can afford to. Errors on tapes can be monitored daily and when the error rate on a particular tape reaches a pre-determined level, it can be cleaned. The process of cleaning does not affect the data on a tape. Cleaning of recording heads is more difficult to solve, however, because of the time and care needed to complete the work well. It is very easy to clean a head quickly and find that its performance is worse afterwards, due to contaminants being left on the head from the cleaning materials.

In the case of magnetic discs of the exchangeable type, it is necessary to clean the surfaces of the disc at about six monthly intervals. This exercise itself is unpredictable, as the cleaning solution, which is alcohol based, leaves evaporation stains on the surface of the disc, if it is not polished correctly. These stains are sufficiently deep to lift the recording heads as the disc spins, thereby causing loss of signal.

New disc technology (e.g. CDC 885) has the disc and recording heads sealed in a case, therefore contaminants cannot reach the critical area so easily.

In spite of all the error correcting techniques, current tape and disc systems suffer greatly in performance from contamination. The ideal solution would be to install all tapes and discs in a sterile environment where people were not allowed to enter!

- Eric Walton

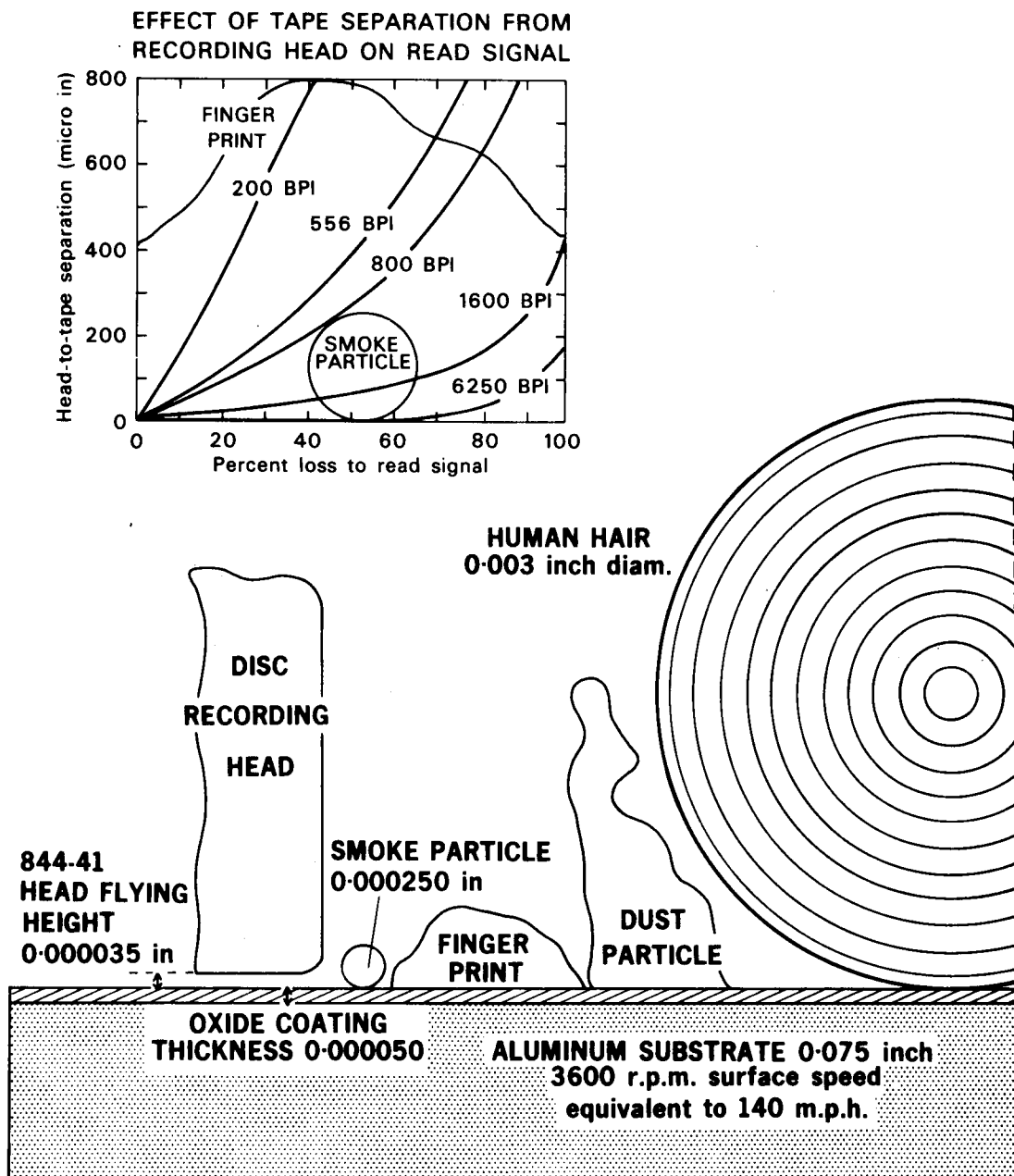


Figure 1

USER SUPPORT ACTIVITIES

A year ago, I reported on the current and planned activities of User Support. Since then, much has been achieved, this article reviews our immediate situation and new future plans.

The Section is 8 strong, including a member of Systems Software seconded for a period. Our prime function is to act as an interface between the user community on one side and the computer staff on the other: we provide a "conduit" through which information flows in both directions.

We provide on-going, or continuous, services and special project support. Our main on-going functions are well-known and include such things as:

- Advisory:** We man an advisory office on a rota basis to deal with all technical queries, problem solving, helping newcomers, provision of information etc. This service is detailed in ECMWF Computer Bulletin B1.5/1.
- Documentation:** Providing manufacturers' manuals and updates, writing additional documentation (e.g. bulletins) to cover areas not in the manuals, editing and supervising newsletters and news sheets. In other words, providing the complete spectrum of written information that users require.
- Training:** Twice a year we provide a series of courses ranging from a basic introduction to the computer facilities (for those familiar with another system elsewhere), to detailed Cray and Cyber training for those who want to use the machines in depth. Courses this year are in March and Sept/Oct. In addition, we arrange occasional training by others e.g. a series of specialised Cray-1 courses presented by Cray Research Inc. staff.
- Liaison:** Acting as the main interface with users. We run liaison meetings, provide specific contact points for Member States users, vet all outside requests for software developed at the Centre, or for data from the meteorological archives; in other words act as a knowledgeable interface between the Computer Division and the total user population.
- Accounts:** We produce regular statistics on user usage, and also maintain the register of those authorised to use the computer facilities.

All the on-going activities take well over half our effort, the remaining time is spent on special projects. Recent achievements in this area have included:

- ECLIB:** Provision of the first version of the ECMWF library containing some 25 major routines and utilities.
- Usage Control:** Introduction of the validation - monitor - control - account sequence now in use on both machines.
- File Handling:** Provision of user information needed for FILESET, and incorporating an interface to it through PROCLIB (the library of INTERCOM procedures).
- Working Groups:** Gathering information on such diverse topics as private pack usage, permanent file long term proposals, word processors, etc.
- Liaison:** Running the first Member State Computing Representatives' meeting.
- Efficiency:** Studying, and suggesting improvements to, several areas of the operational forecast suite - in particular quality control, analysis and post processing.

Our immediate and short term future workload includes:

- ECLIB: The release of several more routines and utilities.
- Liaison: Visits to several Member States, especially those who have implemented or are about to implement a medium speed link. This includes France, Denmark, Sweden and Finland. To propose a second Member State Computing Representatives' meeting.
- Efficiency: To provide improved versions of the Cray routines for random I/O, and for matrix inversion, these also being to improve the efficiency of the forecast suite.
- Bulletins: To continue to provide new bulletins on recently added facilities and to update existing ones as changes are implemented. Later this year, the Introductory Guide will need a thorough review.
- Training: To run courses in March, May and September/October.
- Usage Control: To propose a simplified interface and control scheme for the general user. To investigate schemes both to provide more performance statistics relating to all aspects of the machines, and to provide a magnetic tape library administration. Also, to put together Member State bids for computer resources for 1982-4 for the TAC to discuss.

- Andrew Lea

* * * * *

CRAY SOFTWARE PLANS

The upgrade to COS 1.08 took rather longer than expected, but was successfully completed on February 11th. Since then, COS 1.08 reliability has been very high, better than COS 1.07. The Systems group are now clearing a backlog of problems caused by the COS 1.08 delay, and are beginning the upgrade of CFT from version 1.07 to version 1.09. CFT version 1.08 is being skipped due to known reliability problems. CFT 1.09 is now available under NEXT and users are strongly advised to use it as soon as possible to test their programs.

Future plans for COS are as follows: in view of the disc upgrade later in the year, effort to implement COS 1.09 is not available; therefore, although COS 1.09 will be tested, and any bugs found will be corrected, it will not enter service. This procedure will greatly aid the implementation of COS 1.10 and CFT 1.10 later in the year. Experience has shown that skipping versions of COS without testing them, is not really viable, so this approach should ensure that COS 1.10 can be implemented in the autumn with the minimum number of problems.

A list of COS 1.10 features will not be available from Cray until late April, and so this list, along with a list of COS 1.09 features, will be published in a later newsletter.

- Peter Gray

* * * * *

MEMBER STATE CONTACT POINTS WITHIN USER SUPPORT

There is increasing contact required between User Support and Member State staff on day to day computer matters e.g. arranging visits, project registration and control etc. As Member State use increases, so I expect these contacts to increase. Further, User Support is being called upon within the Centre to provide such background information as Member State computer workload usage, and future requirements. This is often required in relation to plans and proposals being formulated within the Centre.

Currently, contact is made on an ad hoc basis as circumstances warrant. In future, a more systematic liaison will take place via "User Support contact points". Each Member State will be the responsibility of one member of User Support for general computer liaison and day to day contact. The User Support contact point shall become familiar with each particular Member State's usage of the Centre's computer facility, get to know personally the principal Member State staff, and keep in touch with future needs and developments of that Member State. Also, the Member State staff now have one member of User Support to turn to whenever they do not know who else to contact. The idea however is not to replace all existing channels of communication but to enhance them; for example, technical queries will still go to the Advisory.

The table below lists which User Support staff are the contact point for each Member State. For each person there is a back-up to cover for periods of absence of the main contact point. This is needed especially when it comes to such matters as arranging visits to the Centre and assisting in project control via registration and allocation changes.

- Andrew Lea

TABLE OF MEMBER STATE CONTACT POINTS WITHIN USER SUPPORT

Member State	User Support	
	Contact point	Back up
Belgium	Michel Miqueu	Pam Prior
Denmark	David Dent	John Greenaway
Germany	Norbert Kreitz	Pam Prior
Spain	Michel Miqueu	Pam Prior
France	Michel Miqueu	Pam Prior
Greece	Luigi Bertuzzi	John Greenaway
Ireland	Norbert Kreitz	Pam Prior
Italy	Luigi Bertuzzi	John Greenaway
Yugoslavia	Luigi Bertuzzi	John Greenaway
Netherlands	Luigi Bertuzzi	John Greenaway
Austria	Norbert Kreitz	Pam Prior
Portugal	Michel Miqueu	Pam Prior
Switzerland	Norbert Kreitz	Pam Prior
Finland	David Dent	John Greenaway
Sweden	David Dent	John Greenaway
Turkey	Luigi Bertuzzi	John Greenaway
United Kingdom	David Dent	John Greenaway

MEMBER STATE TECHNICAL AND COMPUTING REPRESENTATIVES

A year ago, the list of TAC and Computing Representatives was published. Since then, several changes have been made, so an up to date list is published below.

The third session of the TAC will meet at the Centre on 9-12 June. A preliminary agenda for this meeting has been sent to all Member States.

The Centre will shortly propose a second meeting of Member State Computing Representatives, the suggested dates will be 2 or 3 days in the week beginning 12 October.

- Andrew Lea

TABLE OF TAC AND COMPUTING REPRESENTATIVES

Member State	TAC Representative	Computing Representative
Belgium	Mr. W. Struylaert	Mr. W. Struylaert
Denmark	Mr. E. Busch	Mr. P. Henning
Germany	Dr. W. Buschner	Dr. R. Lamp
Spain	Mr. B. Orfila	Mr. M. Hortal
France	Mr. J. Lepas	Mr. L. Jouaillec/J.P. Bourdette
Greece	Mr. G. Barbounakis	Mr. G. Barbounakis
Ireland	Mr. W.H. Wann	Mr. D. Murphy
Italy	Dr. G. de Florio	Dr. G. de Florio
Yugoslavia	Mr. Z. Butigan	Mr. M. Gavrilov
Netherlands	Dr. A.P.M. Baede	Mr. G.D.G. Folkers
Austria	Dr. G. Wihl	Dr. G. Wihl
Portugal	Mr. S. Cristina	Mr. M.J. Rodrigues de Almeida
Switzerland	Mr. M. Haug	Mr. G. Siegwart
Finland	Mr. A. Lange	Mr. A. Lange
Sweden	Dr. R. Berggren	Mr. S. Orrhagen
Turkey	Director General	Director General
United Kingdom	Mr. D.H. Johnson	Dr. A. Dickinson

CYBER AND CRAY UPGRADES IN 1981

Contracts have been signed with Cray and CDC for the supply of upgrades to the two main layers of ECMWF's computing service during 1981.

The Cray disc upgrade, comprising 2 DCU-3 disc controllers and 3 DD-29, double density disc drives, is expected to arrive at Shinfield in late July, and, following a period of acceptance and integration, should enter service in September 1981. Cray Research will also deliver a second Cray/Cyber interface, for use with the second Cyber, in September 1981.

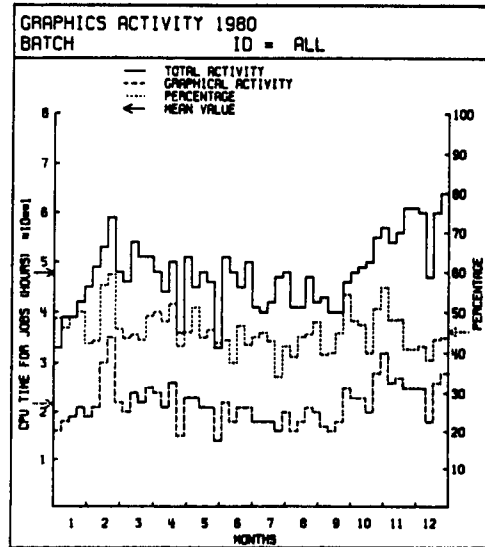
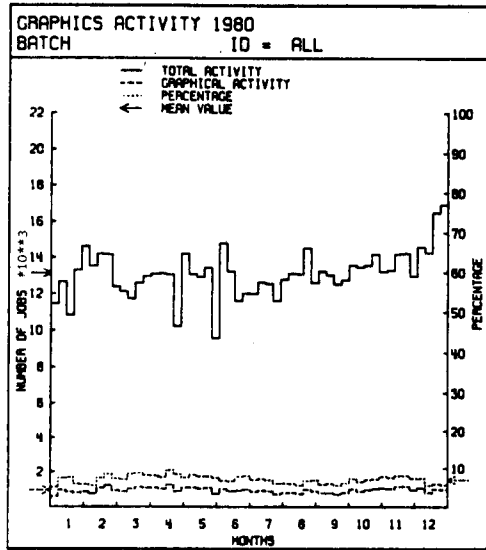
The second Cyber, comprising a CPU and memory, two additional 7155 disc controllers and 2 885 disc units (4 drives), and peripheral switching equipment for unit record devices and telecommunications processors, will be delivered in October, and following a period of acceptance and integration, should enter service in late November or December.

More detailed information will be published, when it becomes available.

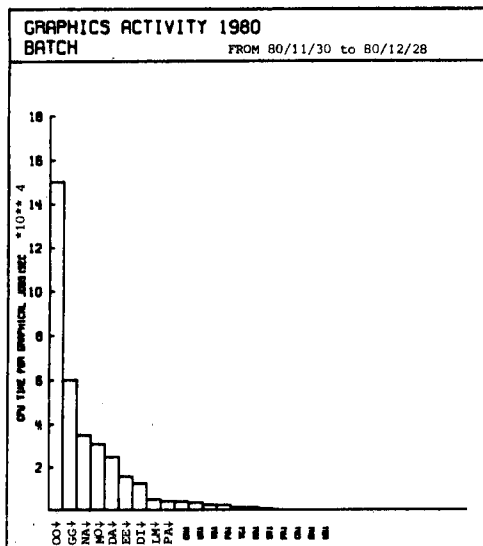
- Peter Gray

GRAPHICAL ACTIVITY ON THE CYBER DURING 1980

This article gives some information on Cyber graphical activity as measured from statistics put into the system dayfile by the main graphics software. Although statistics for the activity of the graphics routines alone are produced, they are not currently available in graphical form; the figures shown here relate to total usage of user jobs which involve some graphics.

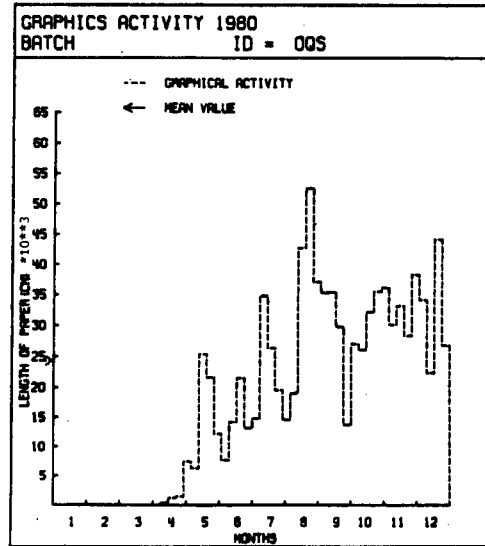
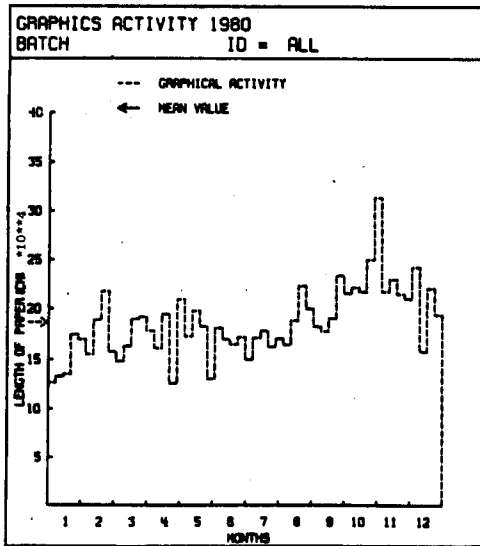


Although the graphical activity only represents 8% of the total number of batch jobs on the Cyber, it represents some 45% of the user available CPU time consumption.



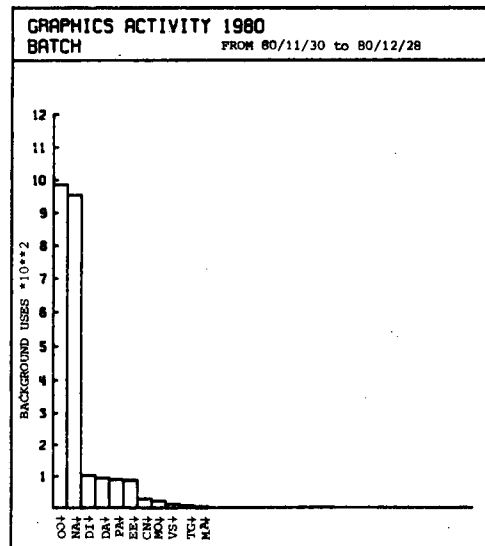
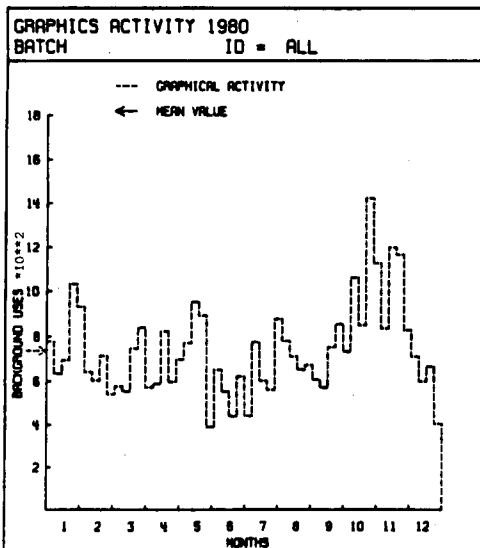
The December 1980 statistics show that the operational suite (OO+) is by far the largest consumer for graphics, FGGE comes second (GG+), Met. Applications (MA+) and Met. Operations (MO+) come next, followed by Data Analysis (DA+). These figures are very representative of the normal use of graphics.

*NB The + represents a group of ID's, i.e. with the same first two letters.



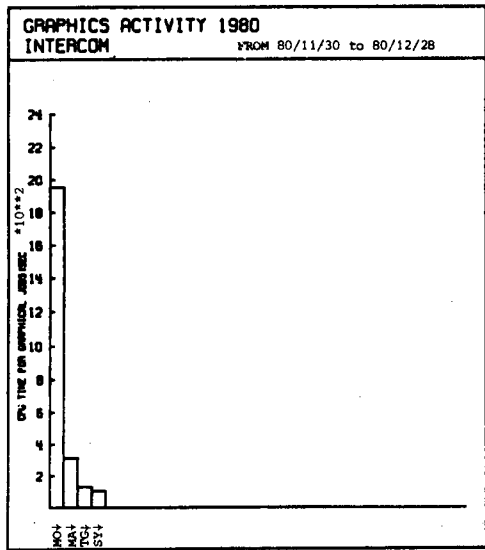
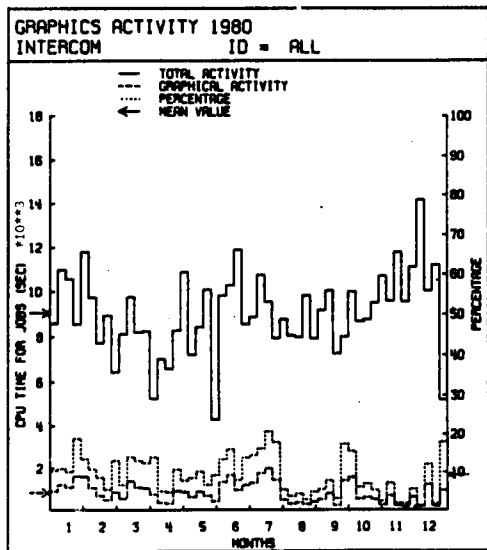
An average "nautical" mile of Versatec graphical output is produced every week. Cyber and Cray production are included in the diagram above.

Since March 1980, when the Contour Package was made available on the Cray, the graphics activity on the Cray, as revealed by the length of Versatec output, has grown continually (although rather irregularly). Unfortunately, no other usage figures are available for the Cray, at the moment.



The use of pregenerated backgrounds has been rather constant on average during 1980, except for the last 3 months when it first increased and then reduced in an alarming way. Using a pregenerated background has proved a saving not only in CPU time but also in I/O time.

The operational suite and Met. Applications are, as one would expect, heavy users of pregenerated backgrounds.



Compared to the batch activity, the Intercom activity in graphics is very low, as is the Intercom activity in general compared to the batch activity, i.e. less than 10%

From a quantitative point of view one can easily forecast a rather overall steady use of graphics for 1981; our latest statistics prove this point. However, by the middle of 1981, the current development in graphics (implementation of a "standard" basic graphical software, GKS, and the AYDIN meteorological workstation, which has now been provisionally accepted) will certainly quite improve the quality and variety of the graphical facilities at ECMWF.

- Alain Lemaire

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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 (up to News Sheet 108). All other News Sheets are redundant and can be thrown away.

- | <u>No.</u> | <u>Still Valid Article</u> |
|------------|--|
| 15 | Private packs on the Cyber (MOUNT/DISMOUNT) |
| 16 | Checkpointing and program termination |
| 19 | CRAY UPDATE (temporary datasets used) |
| 47 | Libraries on the Cray-1 |
| 53 | Writing 6250 bpi tapes (EEC parameter) |
| 54 | Things not to do to the Station |
| 56 | DISP |
| 65 | Data security on Cyber and Cray |
| 66 | New Cray Audit |
| 67 | Attention Cyber BUFFER IN users |
| 71 | Packs command |
| 73 | Minimum Cyber field length |
| 77 | ACCOUNT of an executing job |
| 86 | NOS/BE 1.4 introduction |
| 89 | Cray account validation (& minimum field length for Cray jobs) |
| 93 | Final validation |
| | Stranger tapes |
| 98 | Cray symmetric multiply (rounding factors) |
| 101 | Allocations 1981 |
| 106 | Gandalf PACXIV upgrade |
| 108 | CFT 1.09 |
| | SUBMIT |

The News Sheets which can be thrown away since this list was last published are numbers 11, 31, 42, 43, 50, 70, 75, 91, 97, 107.

- Andrew Lea

CALENDAR OF EVENTS AT ECMWF

29-30 April	Council (13th Session)
5-29 May	Training course A1: basic dynamic meteorology and numerical weather prediction.
18-19 May	Forecasters' meeting.
21-22 May	Scientific Advisory Committee (9th Session)
1-12 June	Training course A2: applications to ECMWF model of material in course A1.
9-12 June	Technical Advisory Committee (3rd Session).
15-26 June	Training course B: operational aspects of the ECMWF forecasting system.
4-19 September	ECMWF seminar. Topic this year: "Problems and prospects in medium and long-range weather forecasting".
21-25 September *	Computer training course B: Basic computer usage.
28 Sept. - 2 Oct.*	Computer training course C: Use of Cray-1.
5-9 October *	Computer training course D: Use of Cyber.
12-16 October *	Member States Computing Representatives' meeting (2nd Session).
19-23 October *	Graphics seminar
19-20 November	Council (14th Session)

* tentative dates only, courses/meetings to be confirmed.

ECMWF PUBLICATIONSFebruary - March 1981

Technical Memorandum No. 21 "A network of meteorological applications."

Technical Memorandum No. 24 "Evaluation of the ECMWF Operational Model Precipitation Forecasts in October-November 1980"

Technical Memorandum No. 25 "Comparison of barotropic and baroclinic forecasts for verification purposes".

Proceedings of 1980 ECMWF Seminar on "Data Assimilation Methods".

Technical Report No. 23 "Comparison of medium range forecasts made with models using spectral or finite difference techniques in the horizontal".

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.

	<u>Newsletter</u>		
	<u>No.*</u>	<u>Date</u>	<u>Page</u>
<u>CRAY-1</u>			
Computer Architecture	T2	Apr. 79	10
	T3	June 79	10
	T4	Aug. 79	8
Control of Cray jobs	7	Feb. 81	16
File transfer to a named device	T2	Apr. 79	14
Public Libraries	T5	Oct. 79	6
Software - level 1.08 of COS	7	Feb. 81	8
Submit and Dispose	8	Apr. 81	6
<u>CYBER 175</u>			
Cyber 175 processor described	1	Feb. 80	6
Discs - (844-41 double density)	T3	June 79	17
- use of private packs	T2	Apr. 79	24
Dynamic file buffers for standard formatted/ unformatted data	3	June 80	17
Formatted I/O - some efficiency hints	4	Aug. 80	9
FTN4 to FTN5 conversion	6	Dec. 80	15
Graphics - COM	7	Feb. 81	13
- hints on memory and time saving	T6	Dec. 79	20
- libraries	T5	Oct. 79	8
Libraries - NAG developments	T5	Oct. 79	7
- public libraries	T5	Oct. 79	6
Jobs - hints on processing	T2	Apr. 79	23
- input queue delays	4	Aug. 80	12
Magnetic tapes - hints on use	T2	Apr. 79	17
- LOOK9 analysis program	T3	June 79	18
- EEC parameter	T4	Aug. 79	14
- making back-up copies	1	Feb. 80	9
- Stranger tapes	5	Oct. 80	10
NOS/BE - Level 518 - 1.4 introduction	4	Aug. 80	8
- plans in 1981	8	Apr. 81	5
Permanent files - dumping	T6	Dec. 79	15
- RT=W, BT=I file structure	T1	Feb. 79	18
Terminals - moving and fault reporting	T3	June 79	26
- Newbury VDU problems	T3	June 79	26

GENERAL

Computing facility - status and plans	7	Feb. 81	7
Cyber-Cray link software	2	Apr. 80	13
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Cyber-Cray I/O efficiency comparison	1	Feb. 80	11
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Priority parameter on the JOB card	7	Feb. 81	8
Resource allocation for 1981	6	Dec. 80	11
Resource allocation - Council rules for	6	Dec. 80	10
Technical Advisory Committee - 2nd session	4	Aug. 80	1
Telecommunications - timetable for line installation	6	Dec. 80	11

METEOROLOGY

Baltic Storm of October 1980	6	Dec. 80	2
ECMWF Analysis and Data Assimilation System	T3	June 79	2
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	6	Dec. 80	7
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- production schedule	6	Dec. 80	5
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Operational Forecast Suite (EMOS)			
- general description	T1	Feb. 79	6
- data acquisition and decoding	T6	Dec. 79	1
- initialisation	T6	Dec. 79	4
- quality control	1	Feb. 80	3
- bulletin corrections (CORBUL)	2	Apr. 80	1
- archiving	3	June 80	4
- post processing	4	Aug. 80	3
Pseudo "satellite picture" presentation of model results	1	Feb. 80	2
Research Department activities			
- FGGE	3	June 80	8
Retrieval of data from the Centre's data bases	5	Oct. 80	3
Spectral model	7	Feb. 81	4

* T indicates the original Technical Newsletter series

USEFUL NAMES AND PHONE NUMBERS WITHIN ECMWF

		<u>Room*</u>	<u>Ext**</u>
Head of Operations Department	- Daniel Söderman	OB 010A	373
ADVISORY OFFICE - Open 9-12, 14-17 daily		CB 037	308/309
	Other methods of quick contact:		
	- telex (No. 847908)		
	- COMFILE (see Bulletin B1.5/1)		
Computer Division Head	- Geerd Hoffmann	OB 009A	340/342
COMPUTER OPERATIONS			
Console	- Shift Leaders	CB Hall	334
Reception Counter	}	CB Hall	332
Terminal Queries		- Judy Herring	
Tape Requests		CB Hall	332
Operations Section Head	- Eric Walton	OB 002	349/351
Deputy Operations Section Head	- Graham Holt	CB 033	476
DOCUMENTATION	- Pam Prior	OB 016	355
Libraries (ECMWF, NAG, CERN, etc.)	- John Greenaway	OB 017	354
METEOROLOGICAL DIVISION			
Division Head	- Roger Newson	OB 008	343
Applications Section Head	- Joel Martellet	OB 011	360
Operations Section Head	- Austin Woods	OB 107	406
Meteorological Analysts	- Ove Åkesson	OB 106	380
	- Veli Akyildiz	OB 104A	379
	- Horst Böttger	OB 104A	378
	- Rauno Nieminen	OB 104A	378
	- Herbert Pämpel	OB 106	380
Meteorological Operations Room		CB Hall	328/443
REGISTRATION (User and Project Identifiers, INTERCOM)	- Pam Prior	OB 016	355
Research Department Computer Co-ordinator	- Rex Gibson	OB 126	384
Systems Software Section Head	- Peter Gray	CB 133	323
TELECOMMUNICATIONS			
Fault Reporting	- Pierre-Pascal Regnault	CB 028	397/375
Section Head	- Fritz Königshofer	CB 130	310
User Support Section Head	- Andrew Lea	OB 003	348

* CB - Computer Block
OB - Office Block

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