![ECMWF logo] European Centre
for Medium Range Weather Forecasts

ECMWF NEWSLETTER

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Number 12 – December 1981

IN THIS ISSUE:

Message from Jean Labrousse

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

COVER: Map showing the telecommunications lines now established.
Continuous lines represent medium speed lines, dotted
lines, low speed lines implemented at present. See also
article on Page 10.

This Newsletter is edited and produced by User Support for the Operations
Department of ECMWF.

The next issue will appear in February.

After a little over seven years spent in the Centre I am leaving to
take up a new position in my home country. When I accepted the post of Director
of the Centre two years ago, I could not foresee that I would have to leave so
soon after my appointment. Two years is probably too little to enable one to
achieve a great deal in such a position. However, taking into account the
decision made by the Council during the last session,to elect Dr. Bengtsson to
replace me, I have no doubt that the Centre will continue to progress and that
its products, as well as its service, will improve under such good leadership.
In any case,in my new capacity as Director of the French Meteorological Office
I will continue to follow closely developments at the Centre and will try to
give all my support to its activities.

This ECMWF Newsletter has been a good vehicle to maintain contact
between the Centre and its community, the members of which I know personally.
May I use this vehicle to convey to all of you my farewell. I hope that the
excellent collaboration which has existed in the past between the Centre and
the community of Users will continue to the benefit of us all.

                                        – Jean Labrousse

ECMWF OPERATIONAL SCHEDULE, DATA AND DISSEMINATION

Introduction

The ECMWF model in many ways behaves differently from the models available operationally
to most Member States in the recent past. These models normally underpredicted develop-
ments and smoothed the flow successively as the integration proceeded. No proper
physics was normally included in these models, in particular radiation, and it was
therefore common that these models became increasingly warm and also more stable, in
contrast to the ECMWF model which performs in the opposite way.

A series of Meteorological Bulletins is being published in order to increase the
knowledge and awareness of the users of the ECMWF forecasts concerning the ECMWF
forecasting system. To ensure wider distribution of the material, this and the next
Newsletter will contain extracts from some of these Meteorological Bulletins.

The ECMWF daily operational schedule

Since 1 August 1979, the European Centre for Medium Range Weather Forecasts (ECMWF)
has been carrying out numerical weather forecasts to ten days ahead, operationally;
five days per week until 1 August 1980, and daily since that date.

The suite of jobs which comprise the operational forecast is large, consisting, on
average, of more than 300 Cyber jobs and 150 Cray jobs each 24 hours. The scheduling
of these jobs is handled by the Supervisor, which is a continuously running Cyber job
controlling the launching of all operational forecast jobs on both machines.

In principle, the operational meteorological function of ECMWF is the same as that of
other large numerical forecasting centres. Figure 1 shows the daily schedule for
production of the operational forecasts. Data acquisition is a process which takes
place intermittently throughout the day, as data becomes available on the Global
Telecommunications System of the World Meteorological Organisation. Preprocessing of
the data, including quality control and storing of the reformatted data in the Reports
Data Base, is carried out at times which have minimum impact on the batch usage of the
computer system, i.e. around midday and again at the end of the normal working day.

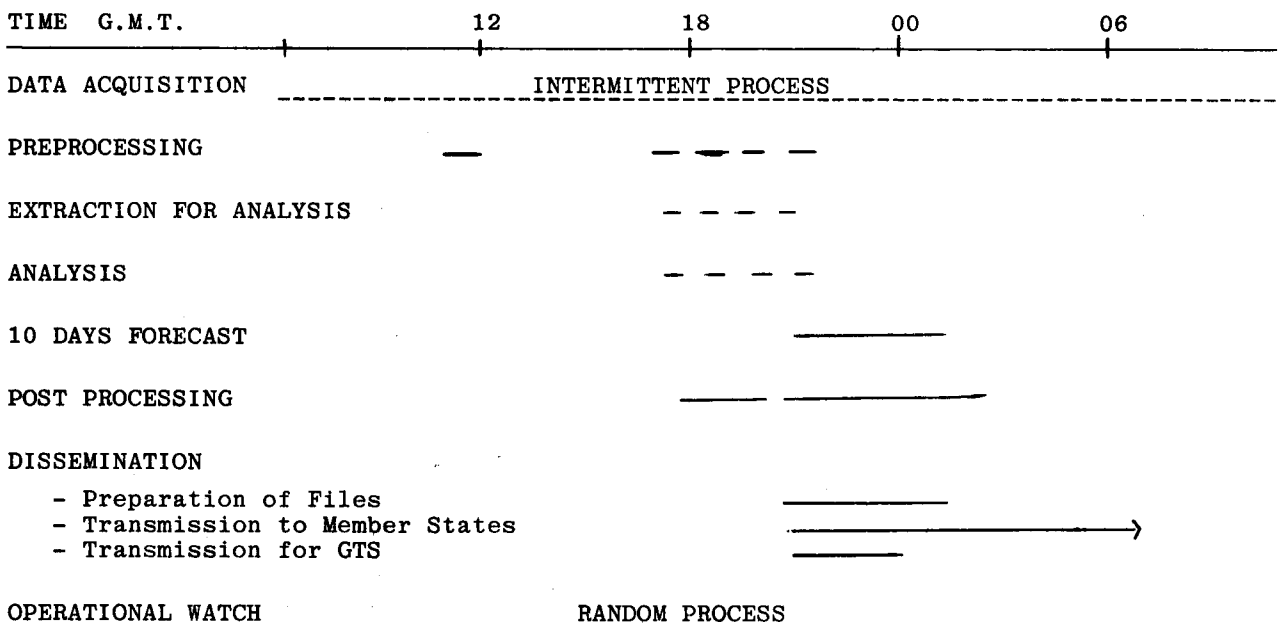| TIME G.M.T.	12	18	00	06
DATA ACQUISITION	INTERMITTENT PROCESS			
PREPROCESSING	—	— — —		
EXTRACTION FOR ANALYSIS		— — — —		
ANALYSIS		— — — —		
10 DAYS FORECAST			———————	
POST PROCESSING			——— ————————	
DISSEMINATION				
- Preparation of Files			————————	
- Transmission to Member States			———————————————————————⟶	
- Transmission for GTS			————	
OPERATIONAL WATCH	RANDOM PROCESS			

FIGURE 1.   ECMWF DAILY OPERATIONAL TIMETABLE, OCTOBER 1981

Analyses, valid for 18Z the previous day, and for 00Z, 06Z and 12Z the current day, are carried out during the evening. Each analysis uses observations made within ± 3 hours of the analysis time. The most important analysis, that for 12Z, uses the data from 0901Z to 1500Z available on the GTS up to 2045Z.

The 10-day forecast, taking about 3½ hours elapsed time on the Cray computer, starts at 2130Z and is completed at around 0100Z. As a measure of the reliability of the daily operation, a record is kept of the termination times of the forecasts on the Cray. Approximately 45% of the forecasts terminate within 15 minutes of the scheduled time of 0100Z, while 90% terminate within one hour. Less than 1 forecast in 20 is delayed more than 2 hours, the usual reason for long delays being computer malfunction.

Post-processing, including transforming the parameters from the model coordinate system to one more suitable for users of the forecasts, is carried out as the operational run proceeds.

Observational meteorological data are acquired from the Global Telecommunications System (GTS) of the World Meteorological Organisation. Figure 2 shows that ECMWF has two links with the GTS, one via Bracknell, the other via Offenbach, each link acting as a back-up for the other. Figure 2 also shows the ECMWF network for dissemination of its products; this will be considered further below.

Since ECMWF has a global analysis system, all available observational data from the entire global domain are required, including surface observations from land and sea (SYNOP), radiosonde reports from instrumented balloons (TEMP), weather reports from commercial aircraft (AIREP), atmospheric temperature measurements from polar-orbiting satellites (SATEM), wind observations from geostationary satellites (SATOB) and reports from drifting buoys or oceanographic reports (SEA).

Each day, around 35,000 separate weather reports are received at ECMWF. After reception, the reports are checked, some are corrected and the reports are stored in the ECMWF Reports Data Base.

ECMWF NETWORK · OCTOBER 1981

——— Medium speed line
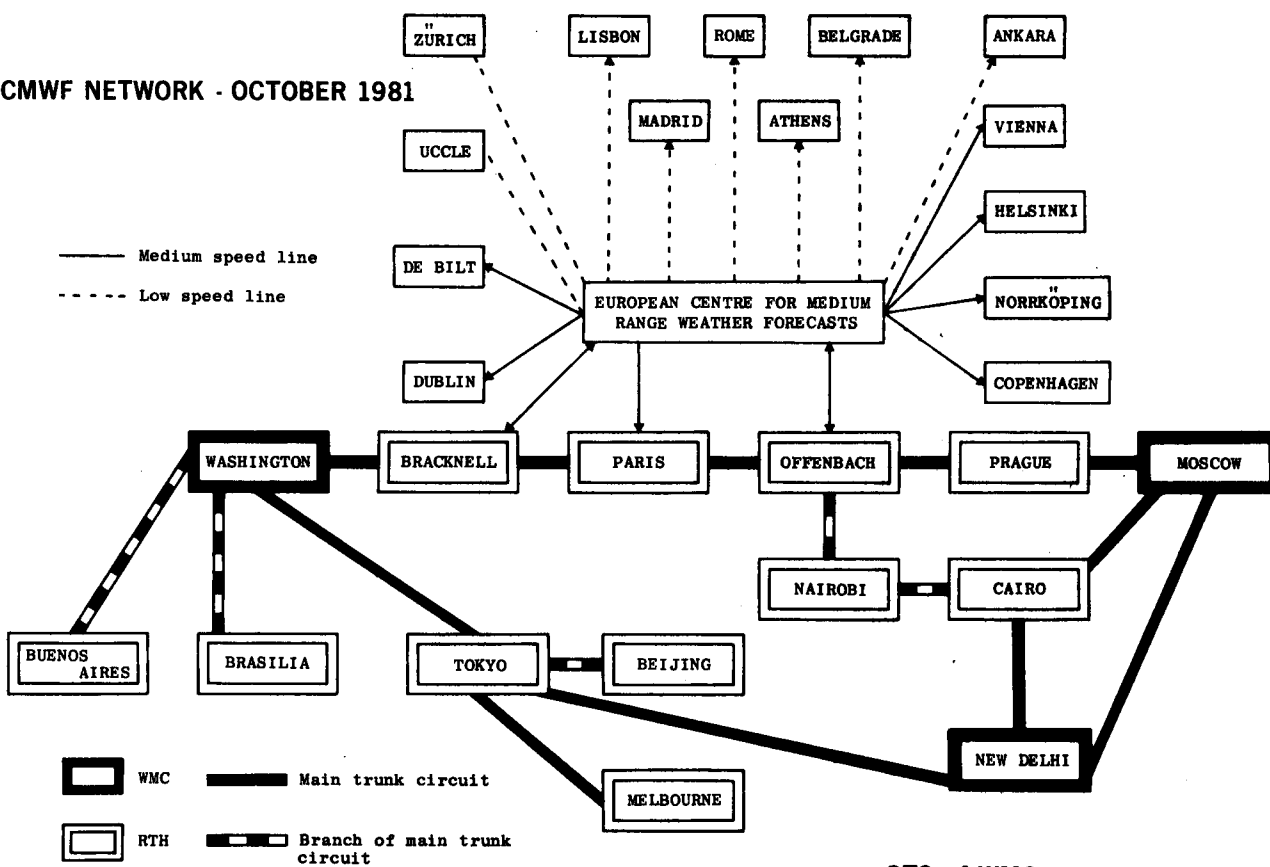
- - - - - Low speed line

GTS of WMO

Dissemination of Analyses and Forecasts

Dissemination of the results of the analyses and forecasts to the Member States is by transmission in coded digital form on medium-speed lines in the majority of cases (see Figure 2). By the end of 1981, only five Member States will still be serviced via low-speed lines.

In requesting products from ECMWF, the Member States use Meteorological Bulletins in the M3 classification "The dissemination of ECMWF results to Member States". The following Bulletins are available:

M3.1/1(1): The formats and headings of messages for the dissemination of
            ECMWF products.

M3.2/1:   Codes used in the dissemination of ECMWF numerical products.

M3.3/1(1): The presentation of ECMWF products to Member States.

M3.4/1(2): ECMWF current product catalogue.

Table 1 in Bulletin M3.3/1(1) shows the wide range of products potentially available to the users of ECMWF products. Considering the number of parameters, levels in the atmosphere and time steps in the forecast, over 2000 global fields per day are potentially available from each forecast. Only a limited selection of these fields is made available on the Global Telecommunications System of the WMO; these include surface pressure and 1000 mb geopotential height analyses and forecasts to five days for the Northern Hemisphere, analyses of wind at 850 and 200 mb in the equatorial belt and, for the Southern Hemisphere, as for the Northern Hemisphere, but only to four days.

                                                    - Austin Woods

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A SIGNIFICANT CHANGE TO THE OPERATIONAL SUITE

A change was made to the operational suite on 10.11.81, to incorporate a modification in the method of vertical interpolation (p→σ) of the humidity increment produced in the analysis. Although the change itself was minor, its impact on the model's initial humidities, and on the predicted rainfall in the early stages of the forecast are quite noticeable and the purpose of this brief account is to make users aware of the change and its effects.

As with the mass and wind analysis, the analysis of humidity is performed with pressure as the vertical coordinate. This analysis is followed by a vertical interpolation to the model's σ-layers, where the quantity interpolated is an analysis increment rather than the full field of the variable in question. The vertical interpolation of the humidity analysis increments is performed in terms of relative humidity (R.H.) (although the quantity analysed in the p-layers is layer-integrated humidity mixing ratio (HMR)). Having computed the increment of R.H. for a σ-layer, it is then necessary to add this to a first guess R.H. value. To compute the latter, the procedure prior to the 10.11.81 had been to use the first guess values of HMR and temperature. Having thus arrived at a new RH value this was converted back to an HMR by using the newly analysed temperature. It is possible, with such a procedure, to have a zero increment of RH, but to end up with an increased mixing ratio purely because of a temperature increase (i.e. analysed temperature > first guess temperature). Where there is a persistent bias to low temperatures in the first guess field which the analysis corrects, there will be an artificial addition of moisture to the model's initial state. Unfortunately, there is

just such a bias in the first guess field at 12Z, particularly over Africa and primarily because of the absence of a diurnal cycle in the model. A correction to the procedure was introduced on 10.11.81. In deriving the first guess R.H. the newly analysed temperature is now used. This is more logical and also ensures that where the humidity analysis increment is zero, the mixing ratio of the first guess field is preserved.

The impact of this change on the model's initial humidities and on the predicted rainfall over Africa, was considerable. Fig. 1 shows the meridional cross section of rainfall occurring in the first 24 hours of two operational forecasts for the African region. Introduction of the change has produced a 40% reduction in rainfall over the region, primarily in a belt south of the equator where previously the model had tended to develop vigorous low level circulations associated with strong convective activity. Users may have noticed similar features in the Centre's forecasts during October when the model (incorrectly) developed tropical storms over Sudan which moved northwards over Egypt in the first few days of the forecasts. These erroneous storms were a consequence of the incorrectly high initial humidities presented to the model.

The impact of the change is even evident in the global rainfall statistics of the forecasts. In the first 24 hours of a typical forecast the global rainfall is reduced by 15-20%. The greater part of this reduction occurs in the tropics but there is some impact on mid latitudes which can only be properly quantified over a prolonged period of time.

Users of the forecasts are advised to take note of the change, particularly if diagnostic studies are being made.
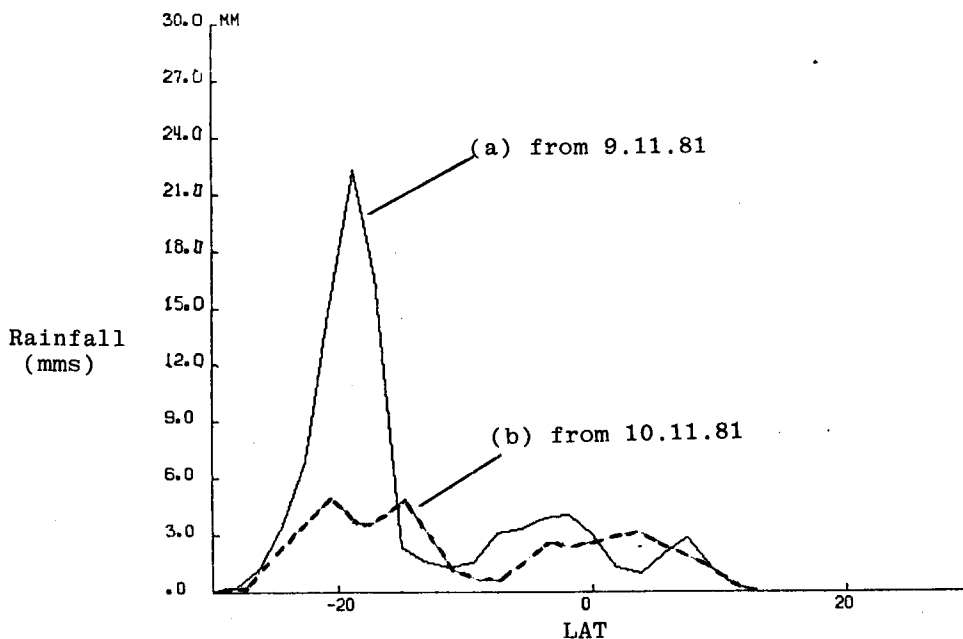

Fig. 1   Meridional cross section of 24 HR rainfall for the African region $(0^{\circ}-40^{\circ}E)$ in two
operational forecasts (a) from 9.11.81- before the change
(b) from 10.11.81, after the change

- Dave Shaw

*NEW FEATURES IN COS 1.10

The major new feature in COS 1.10 is the enhanced JCL. CSP, the control statement processor, supports control statement blocks which provide the user with the following capabilities:

Procedure definition. This allows the user to group together a series of control statements in libraries, parameters to the procedures being substituted during processing.

Conditional control statement processing. This allows the user to identify control statements that are to be processed only if certain conditions are met.

Iterative control statement processing. This allows the user to identify control statements that are to be processed repetitively.

Users of CCL, Cyber Control Language, will be familiar with these concepts.
A full description of the enhanced JCL is given in the Cray-OS Version 1 Reference Manual, updated to describe Version 1.10. The main differences to note between CCL and JCL are:

Pseudo-registers.

CCL has 1 global and 3 local pseudo-registers, RG1 and R1 to R3.
JCL had 8 global and 8 local registers, G0 to G7 and J0 to J7.

Intrinsic functions.

CCL provides intrinsic functions such as FILE and NUM.
JCL does not provide intrinsic functions.

Labels

CCL conditional and iterative expressions use labels as block terminators.

```
e.g.    IFE,R1.EQ.1,LAB1.              | WHILE,R2.GT.0,LOOP1.
        :                              | SET,R2=R2-1.
        ENDIF,LAB1.                    | :
        IFE,R1.EQ.2,LAB2.              | ENDW,LOOP1.
        :                              |
        ENDIF,LAB2.                    |
        IFE,(R1.NE.1` .AND. R1.NE.2),LAB3.|
        :                              |
        ENDIF,LAB3.                    |
```

JCL conditional and iterative expressions do not use labels, they rely on the block structure alone.

```
e.g.    IF(J1.EQ.1)              LOOP.
        :                        EXITLOOP(J2.LE.0)
        ELSEIF(J1.EQ.2)          SET(J2=J2-1)
        :                        :
        ELSE.                    ENDLOOP.
        :
        ENDIF.
```

Open and close parentheses MUST be used in JCL conditional statements.
        e.g. IF(J1.EQ.1)   <u>NOT</u> IF,J1.EQ.1.

Symbol printing

The CCL 'DISPLAY' statement is used to output the octal and decimal value of a CCL symbol or expression to the user's dayfile.

The JCL 'PRINT' statement is used to output the octal, decimal and ASCII value of a JCL symbol or expression to the user's logfile.

With COS 1.10 extra messages are put in the user's logfile at end of job. These
messages contain the following information:

        Time waiting for JXT
        Number of dataset open calls.
        Number of dataset close calls.
        Number of memory resident datasets
        Amount of temporary file space used.
        Amount of permanent file space accessed.
        Amount of permanent file space saved.
        Minimum memory used
        Maximum memory used
        Execute memory integral
        I/O wait memory integral
        Blocks received from front-end
        Blocks sent to front-end
        Total units used.

Of these, probably the most useful for the user are: Time waiting for JXT and the
maximum memory used. The former gives the length of time that the job was in the
input queue. The latter, when converted to octal and divided by 1000 octal, is the
value which the user should put on the 'CM' or 'M=' parameter. e.g. 28160 represents
CM67.

When reviewing a CRAY job at a terminal using PAGE or TYP, it is possible to look at
the last few messages in the logfile using the PAGE command:

        T40,*,-=/END OF JOB/,-

Broken down this means:

        T40 - display from column 41
        *   - skip to the end
        -=/END OF JOB/ - skip backwards looking for 'END OF JOB'
        -   - skip to 23 lines before this one.

'T40' gets rid of the real time, CPU time and the name of the message processor.
Of course, to get back to column 1, you type 'T0'.

                                                        - Neil Storer

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CYBER 730E

At the time of writing (16th November) the new peripherals for the Cyber 730E have
been delivered to site and are being installed. The Cyber 730E CPU is undergoing a
factory trial and is due to be shipped from the factory in Toronto, Canada, on 24th
November. It should be delivered here towards 28th November.

Shortly after delivery, we expect a Cyber 175 power-off, which will be scheduled at
short notice. Acceptance of the new disc equipment is expected to begin on approx-
imately 1st December and acceptance of the Cyber 730E and the rest of the peripherals
should begin on about 14th December.

Following a successful provisional acceptance, a further week or two of testing and
integration into our service will be necessary. It is therefore expected that the
Cyber 730E will enter service during the first half of January. As more information
becomes available, it will be published in the newssheets.

                                                        - Peter Gray

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ALLOCATION OF COMPUTER RESOURCES TO MEMBER STATES IN 1982

At its 14th session, Council approved the allocation of computer resources to Member States for 1982, as shown below. These allocations will come into effect on Monday 4 January.

Note that for the "average" job

- 1000 Cray units equals approximately 1 Cray CP hour
- 1650 Cyber units equals approximately 1 Cyber CP hour

Details of how a unit is constructed are given in ECMWF Computer Bulletin B1.2/1.

Member State	Allocation of CRAY-1 units (1000s)	Allocation of CYBER units (1000s)	CYBER mass storage allocation (Mwords)
Belgium	0	0	0
Denmark	47	19	2.0
Germany	181	40	10.0
Spain	63	18	1.0
France	190	40	10.0
Greece	15	0	0.3
Ireland	25	0	2.0
Italy	97	17	10.0
Yugoslavia	30	5	2.0
Netherlands	35	15	2.0
Austria	27	9	0.5
Portugal	27	5	0.5
Switzerland	0	3	0
Finland	43	10	5.0
Sweden	61	30	9.5
Turkey	0	0	0
U.K.	137	85	10.0
Special Projects			
Finland	15	10	4.0
UK	20	5	0.2
ALPEX (IADC)	25	182	-
Reserve	13	6	-
TOTAL	**1051**	**499**	**69.0**

At its 3rd session (9-12 June 1981) the Technical Advisory Committee used two new guidelines in drawing up the above allocation proposals. These were that:

i)   A small amount of computer resources should be reserved for Member States who have initially not expressed any requirements, but later require small resources for certain tasks e.g. retrieving data from the Centre's archives. This reserve was agreed to be 10% of the Cray-1 and Cyber units which would have been allocated to those Member States under the standard Council rules. For 1982 that comes to 13K and 7K units respectively.

ii) There be a possibility to convert up to 25% of a Member State's Cray-1 resources to Cyber units on the basis of the relative cost to the Centre in providing these units. This guideline was applied in the above table to transfer some Cray-1 resources for ALPEX into extra Cyber resources.

The allocation of Cyber mass storage, at 69 Mwords, exceeds the total space available to Member States (50 Mwords); this was done because, in practice, it has been observed that most Member States do not take up their full allocation all the time. However, it must be pointed out that should many Member States take up their full allocation simultaneously, such that the 50 Mwords is exceeded, then the Centre would have to take appropriate action to reduce the total to 50 Mwords (e.g. by dumping the least recently used files to tape).

- Andrew Lea

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NFEP TERMINAL STATISTICS

COUNTRY	AVERAGE TOTAL DATA (KCHAR /DAY)		From 15/9/81 to 9/11/81 DATA RATE (CH/SEC)	
	INPUT	OUTPUT	INPUT	OUTPUT
Denmark	1.34	1259.3	139.3	210.4
FR. Germany	4609.97	2608.13	62.8	343.1
Ireland	0.916	2068.06	57.8	200.3
*Spain	.0	329.75	.0	13.7
France	71.01	1904.51	308.7	294.9
*Greece	.0	493.77	.0	13.2
*Italy	.0	*******	.0	*****
*Yugoslavia	.0	44.18	.0	6.6
*Netherlands	.0	199.8	.0	13.1
Austria	10.9	712.43	240.9	200.9
*Portugal	.0	147.28	.0	6.4
Test+	0.445	695.09	2.0	149.3
Finland	17.34	1904.06	327.6	333.5
Sweden	124.72	3416.68	317.5	305.7
*Turkey	.0	228.05	.0	6.8
United Kingdom	4882.42	1208.5	62.6	149.3

*low speed line only

+ used for medium speed lines in test mode (Netherlands)

*******: Distorted information. It was not possible to recover the correct information.

Explanations

TOTAL DATA   Input data is data acquisition (UK and Germany only) plus remote job entry (medium speed lines only). Output data is batch output (medium speed lines only) plus dissemination data.

DATA RATE   gives the average transmission speed in characters per second for an input or output file, respectively, including overheads at all levels of protocol.

Comments

DATA RATE output: The value for the UK is low; there are problems with the acknowledgement procedure. The situation may improve with the installation of our new RC system. Problems which cause our HDLC driver to break connection resulted in low values for the Netherlands. We hope that the new RC system will also improve this. Input: The values for Germany and the UK are, as normal, low, since they send data real-time when they are available. The value for Ireland is abnormally low, since they were testing remote job submission. The figure for Austria is very good,

- Philippe Quoilin

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TELECOMMUNICATIONS SCHEDULE

Eight Member States (Denmark, Federal Republic of Germany, France, Ireland, Austria, Finland, Sweden and the United Kingdom) now have medium-speed circuits in operation, two are being connected (Netherlands and Portugal), while five have low speed circuits. At its 14th session, Council approved a revised implementation schedule for the remaining medium-speed circuits as shown in Table 1.

At its 3rd session (9-12 June 1981) the Technical Advisory Committee noted that there is a growing number of contacts and communications on day to day practical matters between the Centre and Member States in connection with various operational, meteorological and computing aspects (e.g. notification of delays occurring in the overnight operational run, request for repeats of products, computing queries). At present such communications are made in an ad hoc way using telephone or telex, with consequent expense in use of these public networks, and using scarce man-power resources in the Centre to send the same message individually to several Member States. For Member States having a medium-speed connection, there is an independent low speed circuit available - the so-called "secondary channel". Accordingly, the Committee recommended that day to day communications and service messages between the Centre and Member States in relation to operational, meteorological and computing matters be transferred between the Centre and Member States by using the secondary channel for Member States with medium speed connections to the Centre, or actual low speed lines for other Member States. This would save the expense of using public networks, and the Centre can readily implement a "broadcast mode" for transmission of the same message over all links at the same time. The independent low speed line will be used, as previously recommended, at a speed of 50 bauds using CCITT Alphabet No.2. Accordingly, Member States, having, or setting up medium speed connections with the Centre were recommended, to make arrangements appropriately to terminate and monitor the low speed channel. Also in connection with this question, the Committee requested the Centre to investigate simpler ways for message transfer over low speed lines.

At its 14th session, Council also endorsed the above TAC recommendations.

TABLE 1

Member State	Date previously approved	Revised date	Speed (bits per second)
Spain	May 1981	November 1981	2400
Belgium	July 1981	1982[1]	4800
Greece	September 1981	May 1982	2400
Italy	September 1981	January 1983	4800
Yugoslavia	January 1982	July 1983	2400
Switzerland	January 1984	July 1984	2400
Turkey	January 1982	January 1985	2400

[1] Only year indicated on request of the Member State concerned.

- Andrew Lea

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GRAPHICAL SEMINAR

The seminar "Graphical Applications in Meteorology" took place at ECMWF from 19 to 23 October. It was well attended, with no less than 13 of ECMWF's Member States present at the meeting.

Several Member States expressed the desire to hold small workshops in the future on particular topics, such as the use of GKS (The Graphical Kernel System - the graphics standard on which ECMWF is basing its device-independent graphical software), 3D etc.
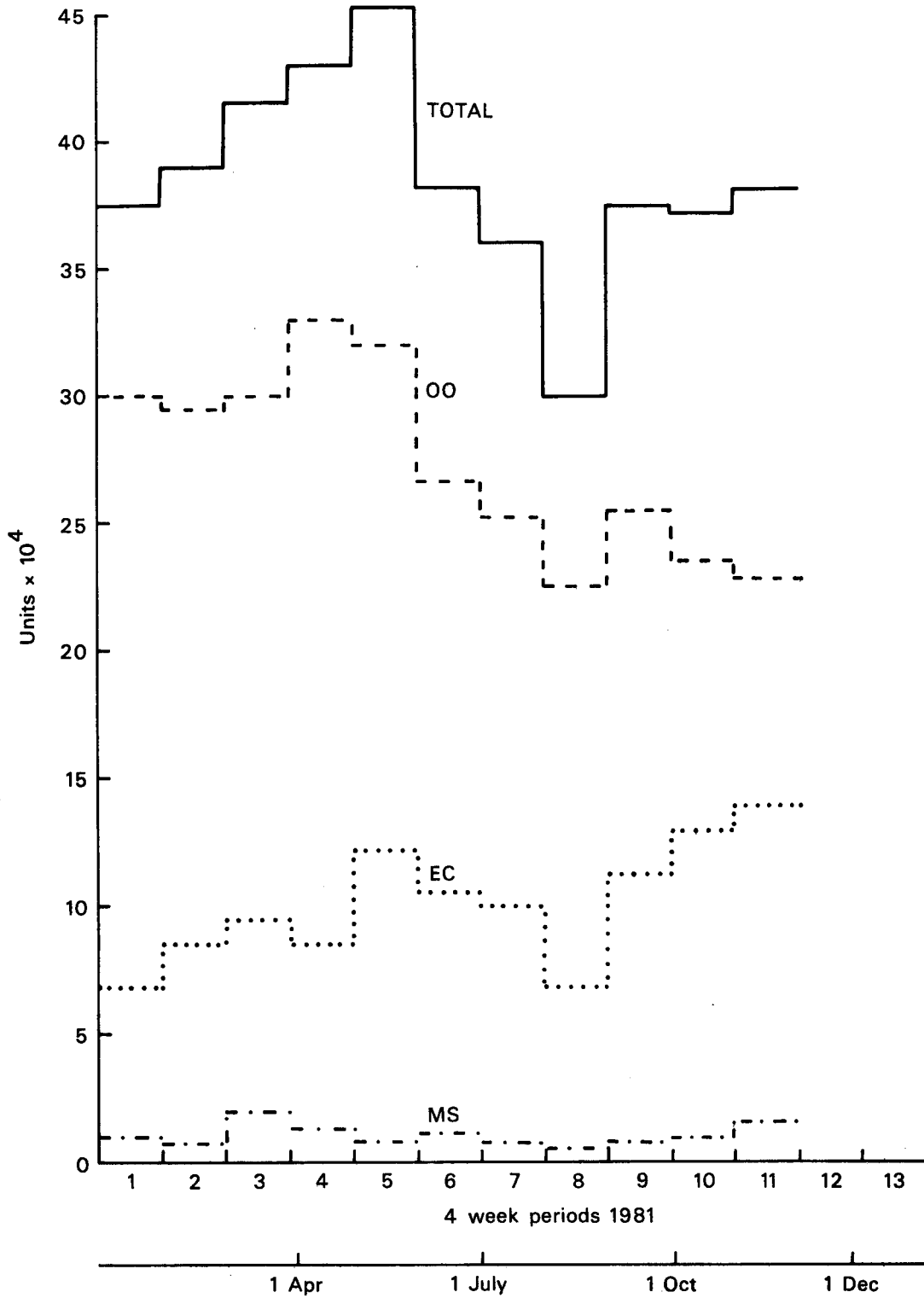
It was felt to have been a sufficiently worthwhile venture to suggest holding another in two years time. By then, there will have been enough advances and new developments to be able to cover new ground.
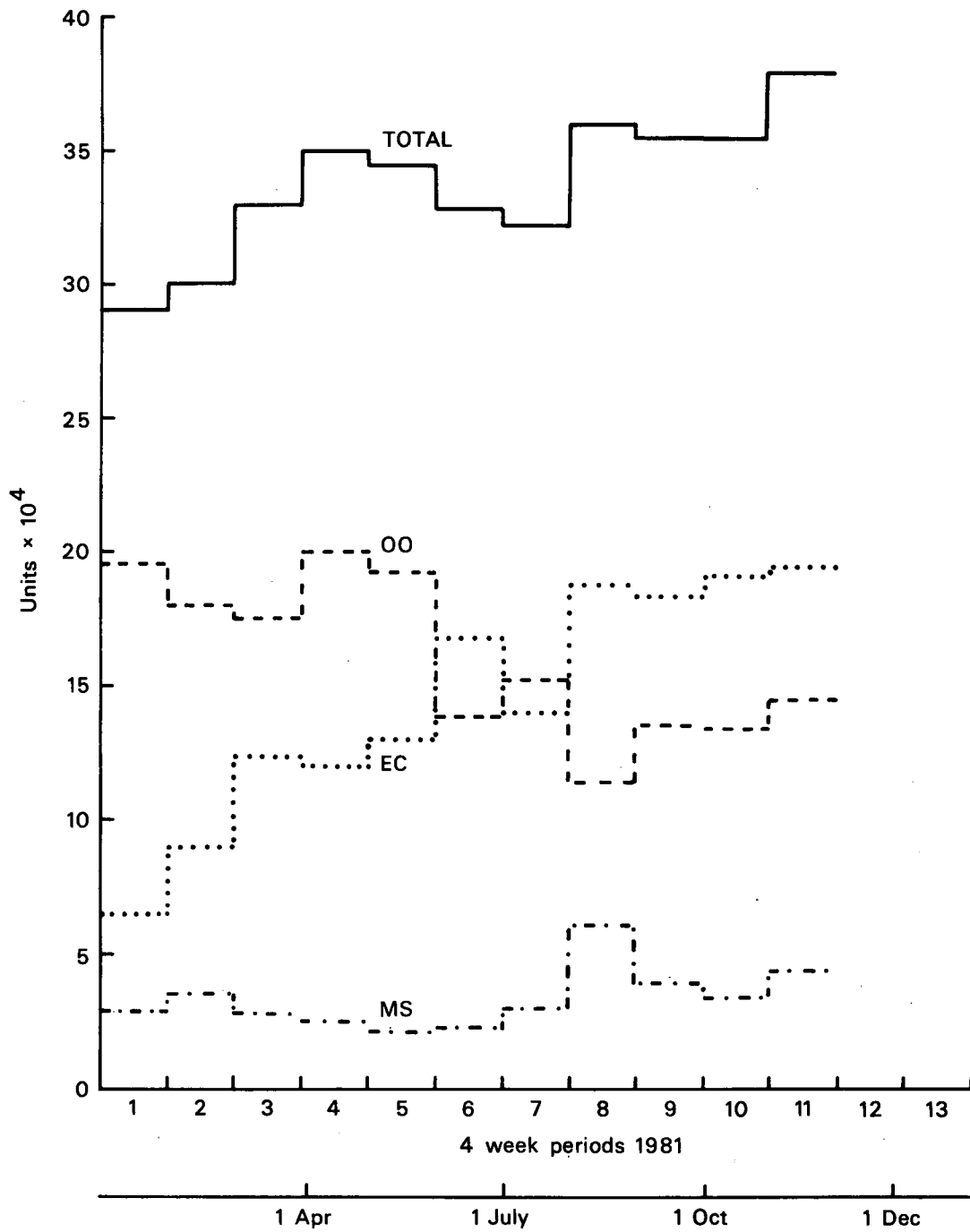
- Howard Watkins

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COMPUTER USAGE STATISTICS 1981

CYBER UNITS USED PER 4 WEEKLY PERIOD

Total = total usage less those jobs classed as systems overheads
OO = operational suite running
EC = Centre users
MS = Member State users, including Special Projects

CRAY UNITS USED PER 4 WEEKLY PERIOD

MEMBER STATES COMPUTING REPRESENTATIVES' MEETING

The second meeting of Member State Computing Representatives was held at the Centre on 14-16 October. Twelve Member States were represented: Denmark, Spain, France, Greece, Ireland, Italy, Netherlands, Austria, Switzerland, Finland, Sweden and the UK.
The meeting was primarily designed to bring everyone up to date with computer activities at the Centre over the past 12 months, and to inform them of immediate plans and changes for the coming 12 months. In addition, each Representative explained briefly his State's recent and planned activities concerning the Centre, especially with regard to the status of their link to the Centre, and projects which are (or will be) using the Centre's computer facilities.

Last year's meeting included some educational sessions to ensure that everyone was at the same level of knowledge regarding the Centre's activities, and also some general interest sessions in which the Centre reported on specific investigations it had carried out, which might have been of interest to Member States e.g. future mass storage systems, commercially available graphics hardware etc. This year it was felt unnecessary to run further educational sessions, however two general interest sessions were included, namely initial comparisons of the Cray-1 and Cyber 205 computers. Finally, the Centre also talked about high speed local networks in general terms, as the Centre is about to begin a detailed study of such networks, with a view to acquiring one within the next 2-3 years.

The overall reaction of Representatives to this meeting was very favourable; not only was the meeting itself useful and informative, but it also allowed personal contact amongst the Representatives, and between the Representatives and Centre staff. Such personal contacts are considered vital to the smooth running of ECMWF's service to remote users. Opinion was split, however, as to whether future meetings should be annual, or every 2 years. As a compromise, it was suggested that there be 2 meetings every 3 years.

                                                              - Andrew Lea

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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 124). All other News Sheets are redundant and can be thrown away.

No.	Still Valid Article
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
67	Attention Cyber BUFFER IN users
73	Minimum Cyber field length
89	Minimum field length for Cray jobs
93	Stranger tapes
98	Cray symmetric multiply (rounding factors)
101	Allocations and priority groups 1981
106	Gandalf PACXIV upgrade
108	SUBMIT
114	Cray jobcard memory parameter
116	TEMP
118	Terminal timeout
119	New version of FICHE
120	Non-permanent ACQUIRE to the Cray
	Local terminal line speeds
121	NOS/BE Version 1.5, level 538 (including new Cyber job class structure)
122	Cyber FORTRAN News (level 538, FTN4 & FTN5)
122 (12 Oct.)	COS 1.10-1.08 differences
124	COS 1.10 illegal syntax

                                                              - Andrew Lea
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COMPUTER TRAINING COURSES

The Centre is offering another series of training courses for Member States personnel and ECMWF staff. Information has been sent to the Member States and nominations to attend are now invited. Nominations from ECMWF staff will shortly be invited via Section Heads.

Course B   BASIC USAGE   15-19 March

This is intended for anyone who will be actually programming the Cray-1, to give them sufficient experience to run simple work. It will also introduce them to some of the Cyber facilities they may need to complement their Cray activity. Prior knowledge of another computing system, plus a knowledge of Fortran, is required. An optional 5th day (19 March) is devoted to explaining how to use ECMWF's meteorological database and archive system.

Course C   CRAY USER COURSE   22-26 March

An in-depth course for those who will make heavy use of the Cray-1 and its many unique facilities. Intending participants will be expected to know how to run simple jobs on the Cray-1.

Course D   CYBER USER COURSE   29 March - 2 April

Again, an in-depth course, this time for those who will make detailed use of the Cybers in conjunction with the Cray-1. Among other things, it will cover Cyber file handling (including private tapes and discs), and program preparation facilities (UPDATE, debugging etc.). Intending participants will be expected to know the basics of a Cyber NOS/BE system.

- Luigi Bertuzzi

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ECMWF PUBLICATIONS

Technical Memorandum No. 39:	Higher order closure schemes.
Technical Memorandum No. 40:	The production of a new orography, land-sea mask and associated climatological surface fields for operational purposes.
Technical Memorandum No. 42:	A case study of an over-intensified cyclone development in the ECMWF model.
Technical Memorandum No. 43:	Preliminary results of the investigation into the quality of ECMWF forecasts in the tropics.
Technical Report No. 26:	Tropical influences on stationary wave motion in middle and high latitudes.
Workshop May 1981:	Report on the workshop on the implementation of GKS at ECMWF, 14-15 May 1981.

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CALENDAR OF EVENTS AT ECMWF

15-19 March 1982	Course B	
22-26 March 1982	Course C	see details above
29 March - 2 April	Course D	
28/29 April 1982	Council 15th session	
18/19 November 1982	Council 16th session	

VACANCIES AT ECMWF

Fluency in one of the working languages of the Centre (English, French, German), and a good knowledge of at least one of the others, is required for both posts.

POST: SCIENTIST

FUNCTION: This post is in the Model Division and the work to be carried out will involve one or more, depending on the experience of the successful candidate, of the following tasks:

(i)   Dynamical formulation of forecasting models;

(ii)   Development of numerical integration techniques for the primitive equations;

(iii) Development of parameterization methods for primitive equation models.

QUALIFICATIONS: A university education or equivalent in meteorology, mathematics or physics. Several years experience in research and development of forecasting models in meteorology.

STARTING DATE: As soon as possible.

CLOSING DATE: 15 December 1981.

POSSIBLE VACANCY

POST: ADMINISTRATIVE ASSISTANT (PERSONNEL)

FUNCTION: Assisting the Head of Section in carrying out the duties of the Section, in particular:

- Giving day-to-day assistance to the staff with any queries relating to their employment;

- drafting routine correspondence in connection with recruitment of staff, i.e. organisation of interviews, calling for references, drafting of contracts of employment for temporary and permanent staff, consultants and experts etc.

- handling all incoming mail of a routine nature;

- assisting new-coming staff and their families, in particular non-U.K. staff, in taking up residence in the host country and taking care of other items of welfare;

- preparing documentation to be sent to U.K. authorities giving required information on new and present staff;

- maintaining personnel files;

- completing and controlling mission orders, claims for reimbursement of expenses etc.

- calculating salaries and allowances;

- preparing monthly payments of salaries and allowances;

- deputising for the Head of Personnel Section.

QUALIFICATIONS: Good standard of secondary education and substantial relevant experience of the type of work outlined above. Experience in this field with International Organisations would be a distinct advantage.

STARTING DATE: As soon as possible

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.

* T indicates the original Technical Newsletter series

USEFUL NAMES AND 'PHONE NUMBERS WITHIN ECMWF

		Room*	Ext**
Head of Operations Department	- Daniel Söderman	OB 010A	373
ADVISORY OFFICE - Open 9-12, 14-17 daily Other methods of quick contact: - telex (No. 847908) - COMFILE (see Bulletin B1.5/1)		CB 037	308/309
Computer Division Head	- Geerd Hoffmann	OB 009A	340/342

COMPUTER OPERATIONS

		Room*	Ext**
Console	- Shift Leaders	CB Hall	334
Reception Counter Terminal Queries Tape Requests	- Judy Herring	CB Hall	332
Operations Section Head	- Eric Walton	CB 023	351
Deputy Operations Section Head	- Graham Holt	CB 035	209
DOCUMENTATION	- Pam Prior	OB 016	355
Libraries (ECMWF, NAG, CERN, etc.)	- John Greenaway	OB 017	354

METEOROLOGICAL DIVISION

		Room*	Ext**
Division Head (Acting)	- Austin Woods	OB 008	343
Applications Section Head	- Joel Martellet	OB 011	360
Operations Section Head (Acting)	- Horst Böttger	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 Púmpel	OB 106	380
Meteorological Operations Room		CB Hall	328/443

REGISTRATION (User and Project Identifiers, INTERCOM)		Room*	Ext**
	- 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

		Room*	Ext**
Fault Reporting	- Pierre-Pascal Regnault	CB 028	397/375
User Support Section Head	- Andrew Lea	OB 003	348

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* CB - Computer Block
OB - Office Block

** The ECMWF telephone number is READING (0734) 85411, international +44 734 85411