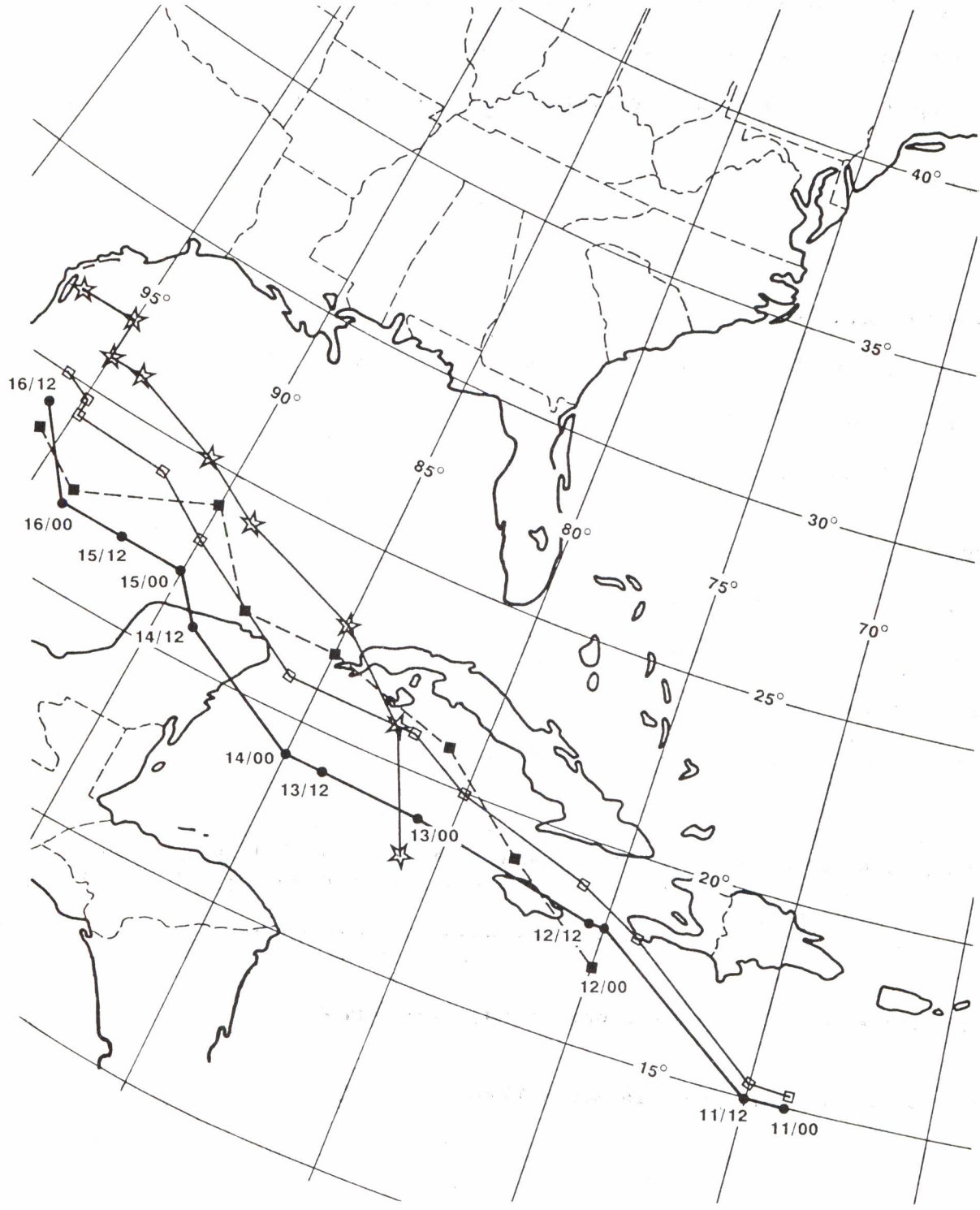
European Centre for Medium Range Weather Forecasts

ECMWF NEWSLETTER

Shinfield Park, Reading, Berkshire RG2 9AX, England. Tel: U.K. (0734) 876000, Int. (44 734) 876000, Telex: 847908

Number 44 - December 1988



IN THIS ISSUE

COVER: The track of hurricane Gilbert as analysed (dots) and predicted at ECMWF based on 10/9 (open squares), based on 11/9 (full squares) and on 12/9 (stars).

This Newsletter is edited and produced by User Support.

The next issue will appear in March 1989.

In 1989, ECMWF will once again be offering training both in usage of the Centre's computing facilities and in advanced meteorology. Details of these courses are to be found on pages 23 and 24 respectively.

The attention of computer users is drawn to the article on page X giving details of the proposed timetable for the withdrawal of Cyber NOS/BE services. The article on page 14, describing the facilities of the new Cray Fortran compiler, CFT77, will also be of interest to computer users.

CHANGES TO THE OPERATIONAL FORECASTING SYSTEM

Recent changes

On 22 November 1988, a modification of the surface scheme was implemented in order to correct some of the deficiencies of the 2m temperature forecasts. The modification includes two features:

- an adjustment of the root profile: the values of the root percentage in each of the 3 soil layers in the previous scheme were 15% (surface), 70% (intermediate) and 15% (climate). The revised values are 50% (surface), 50% (intermediate) and 0% (climate); this means that in the absence of precipitation, the soil moisture is now depleted in the entire root zone and no root extraction is allowed from the climate reservoir (the deepest of the three soil model layers);

- a modification to the background vegetation cover in dry situations: no plant transpiration is allowed if the soil wetness in the root zone is lower than a threshold value, the wilting point. In the previous scheme, this meant that the soil wetness could not decrease below this threshold in a grid box fully covered by vegetation; in order to allow the bare ground regime to go on drying the soil, the background vegetation cover is now decreased linearly to 0 when the root soil wetness decreases from the wilting point to 0.

These modifications ensure that both in the data assimilation cycle and in the forecast the surface evaporation will lead to depletion of the equivalent soil moisture. They correct some, but only some, of the deficiencies noticed in the post-processed 2m temperature during spring and the beginning of summer 1988.

Planned changes

(i) The surface analysis code will be replaced by a new one. It is mainly a technical development, the analysis of surface variables is now performed inside the context of the main analysis program (rewritten in September 1986) rather than in a separate step. Little meteorological impact is expected on the SST and snow analysis (the only surface variables currently analysed). However, the SST computations will use as input the 2 degree mesh SST analysis from the NMC (instead of the 5 degree mesh). Thus more details are expected on the initial SST field used to run the ECMWF operational model.

(ii) The adoption of the vertical finite element scheme and of new radiation and convection schemes is planned for early 1989.

- Bernard Strauss

* * * * * * * * * * * *

HURRICANE GILBERT

GILBERT was first detected by satellite imagery and was described as a 'normal tropical storm' in the warning bulletin issued by the National Weather Service, Miami, on 10 September 1988 at 1600 UTC. Later on, having caused serious damage and loss of life, its mature stage was described as an 'extremely dangerous hurricane'.

During the following two days, GILBERT moved slowly but steadily towards the west with gusts of 135 knots. Cayman Island, the western part of Cuba and Jamaica were seriously affected by the intensity of the hurricane. According to aircraft reports, the central pressure was 934 hPa at 1300 UTC on 13 September.

At noon on 14 September, the maximum wind speed was reported as 160 knots and the central pressure was again extremely low: 891 hPa and the vortex started to fill; this was the final, mature stage of the cyclone. On 17 September the cyclone was absorbed into the mid-latitude circulation and was no longer classified as a tropical storm.

As far as the location of the vortex is concerned, the accuracy of the ECMWF forecast was quite impressive (Fig. 1). The tracks produced by the forecasts up to day 5 during the period were in good agreement with the reports received from Miami, the forecast based on 10 September 1988 was of acceptable accuracy up to day 7 (Figs. 2 and 3). Obviously the model at its present resolution of T106 cannot properly describe the gradients occurring towards the centre of the hurricane and both the analysis and the forecasts of wind speed were underestimated, the pressure at the centre was also much too high. Nevertheless, the performance achieved by the model exceeded expectations for this kind of phenomenon.

- Taskin Tuna

* * * * * * * * * * * *

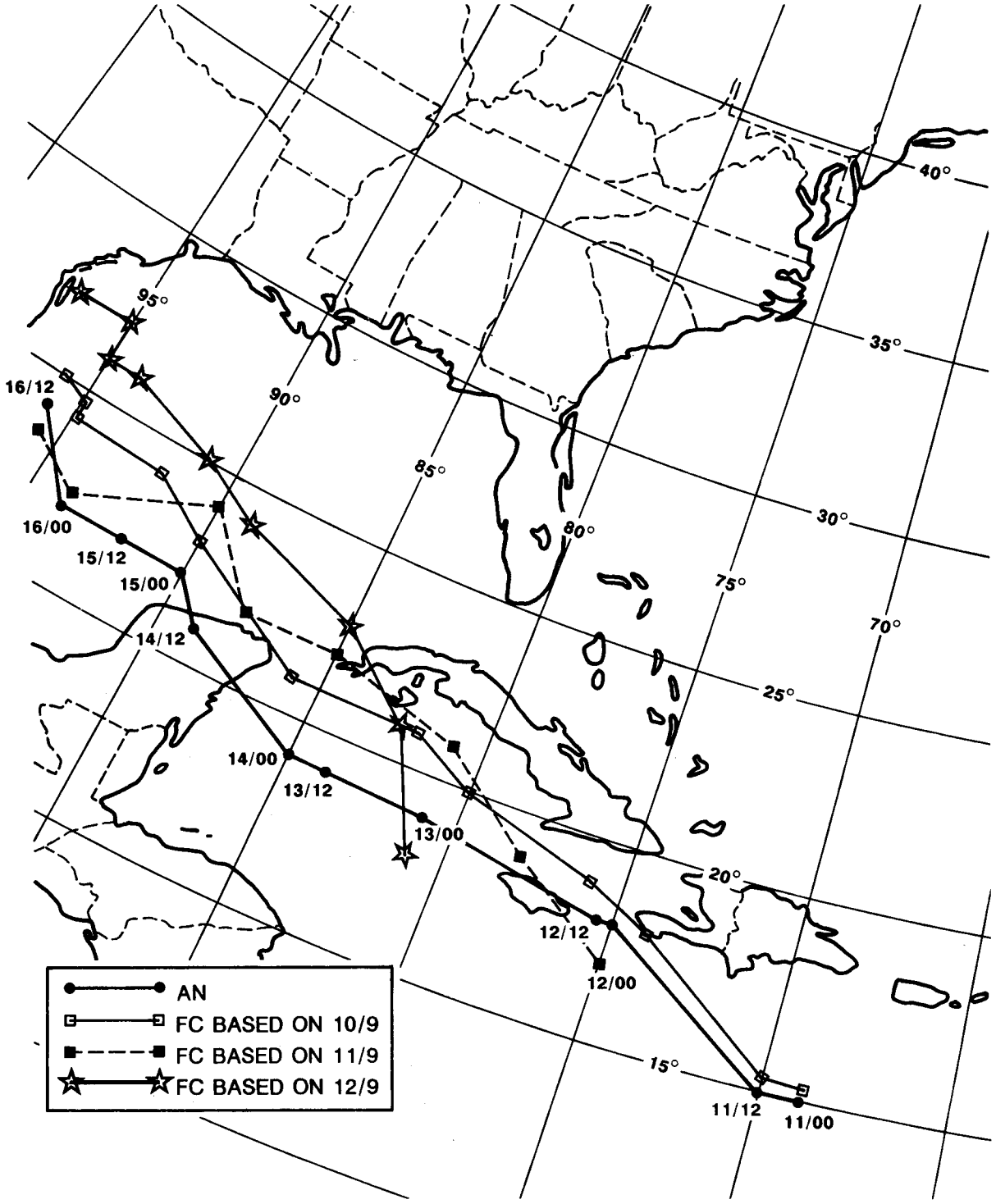


Fig. 1: ECMWF analysed (AN) and predicted (FC) tracks of hurricane Gilbert

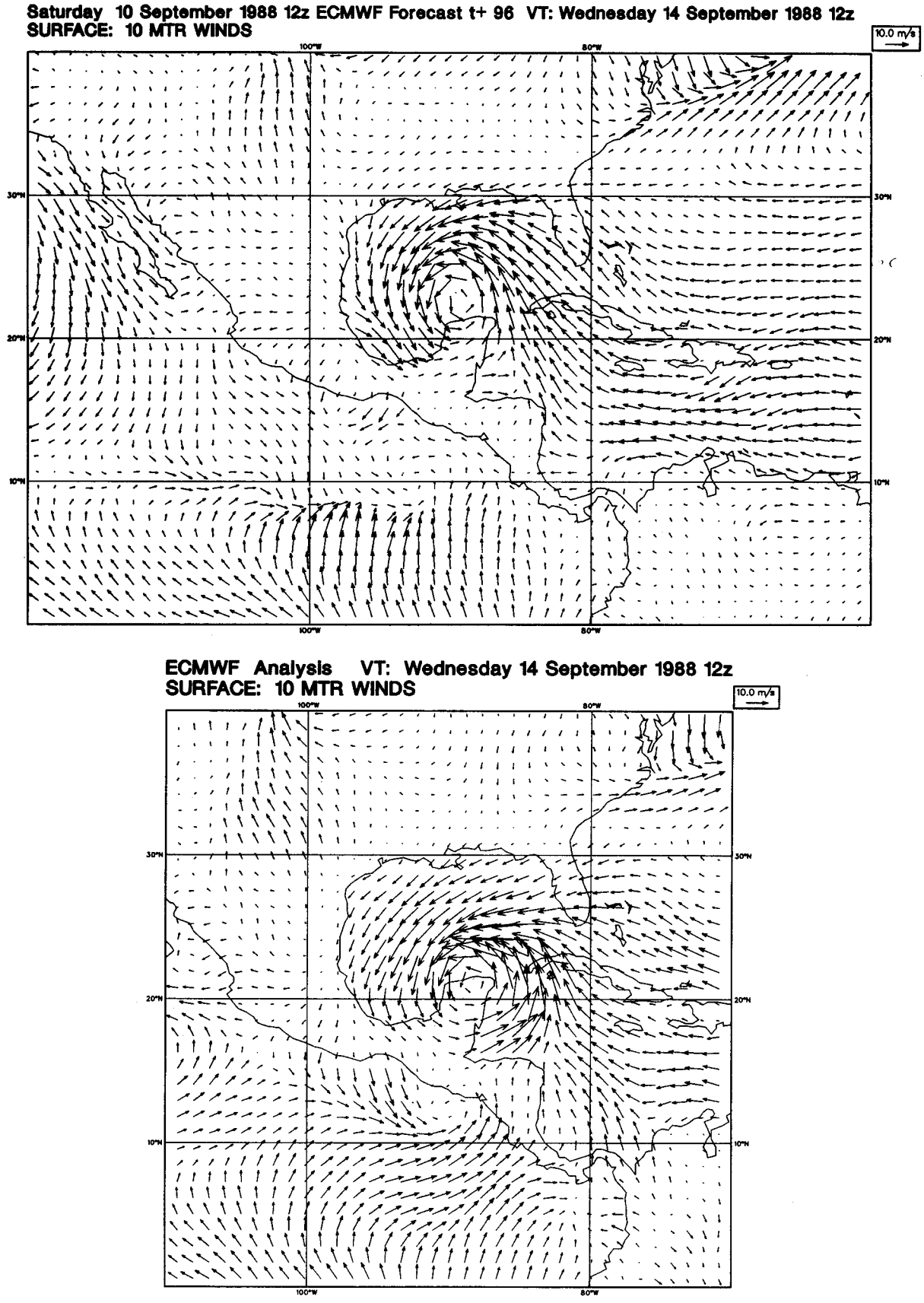


Fig. 2: D+4 forecast based on 10 September 1988 (top) and verifying analysis (bottom)

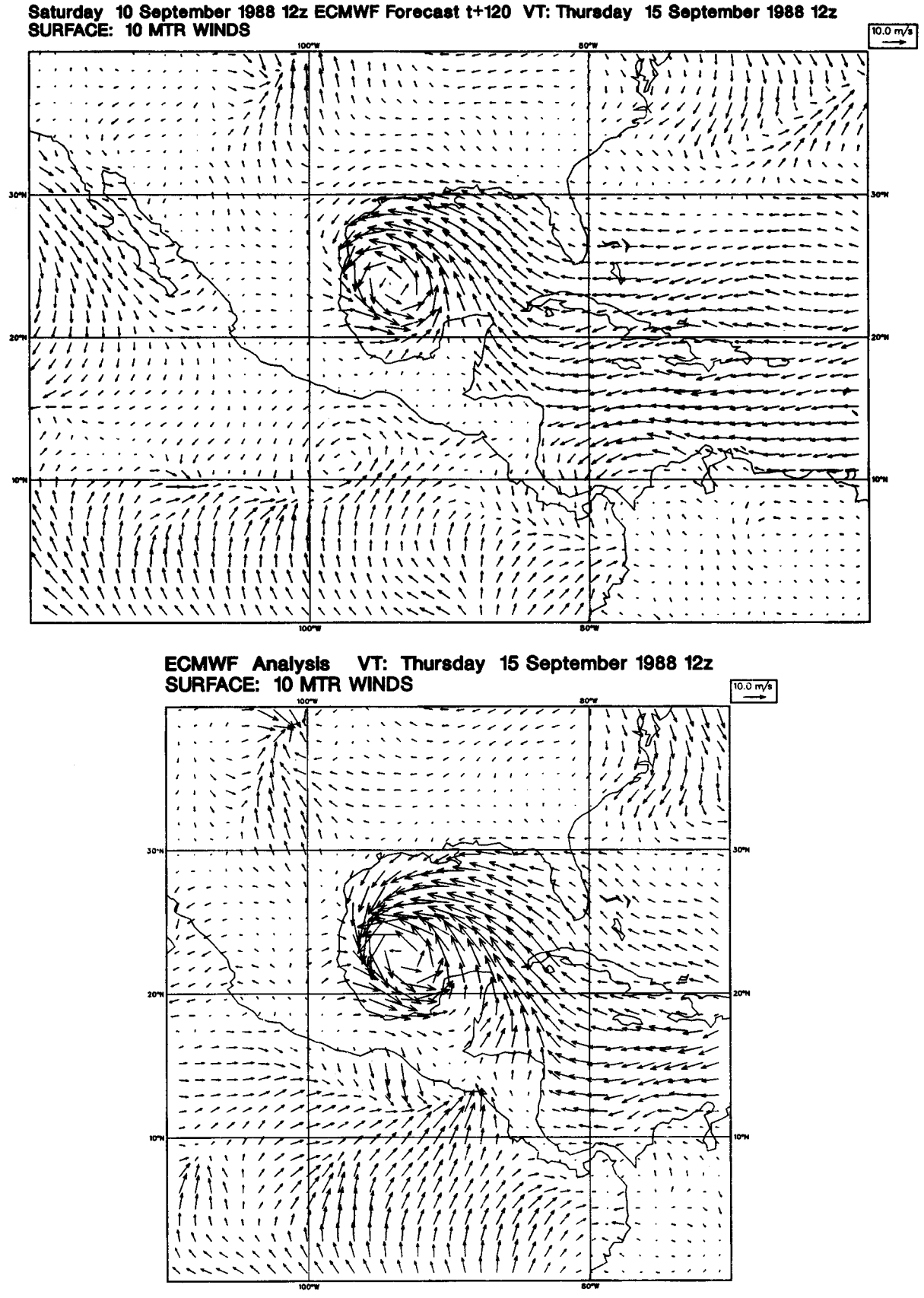


Fig. 3: As for Fig. 2 for the D+5 forecast and verifying analysis

STRONG CYCLOGENESIS IN THE SUBTROPICAL NORTH PACIFIC

On 4 November 1988 an intense cyclogenesis occurred at the southern tip of a mid-latitude upper-air trough penetrating far south into the subtropical belt of the North Pacific towards Hawaii. The development resulted in a dramatic change in the weather pattern over Hawaii, interrupting the prevailing north-easterly trade winds by strong south-westerlies with heavy convection.

Fig. 1 shows the evolution of the 10m wind field in the central North Pacific from 3 to 5 November 1988, 12 UTC, and Fig. 2 gives the corresponding forecast out to 72 hours based on 2 November, 12 UTC analysis data. Fig. 3 gives the corresponding local forecast for Honolulu, depicting the change in the flow, predicting the precipitation, but underestimating the intensity of the events to some extent.

The failure of the news media to predict the change in the weather on Wednesday was interesting. According to the 500 hPa grid products received at ECMWF, NMC Washington produced forecast guidance based on data of 2 November which was similar to the ECMWF model output. However, it was noted in the daily verification result that the RMS error went up significantly for the subsequent forecasts from 2 and 3 November. Forecasts from Tokyo exhibit the same characteristics, while the ECMWF runs are mainly affected on 3 November 1988. It is suspected that the forecast errors are related to data problems over the Pacific. This is under investigation.

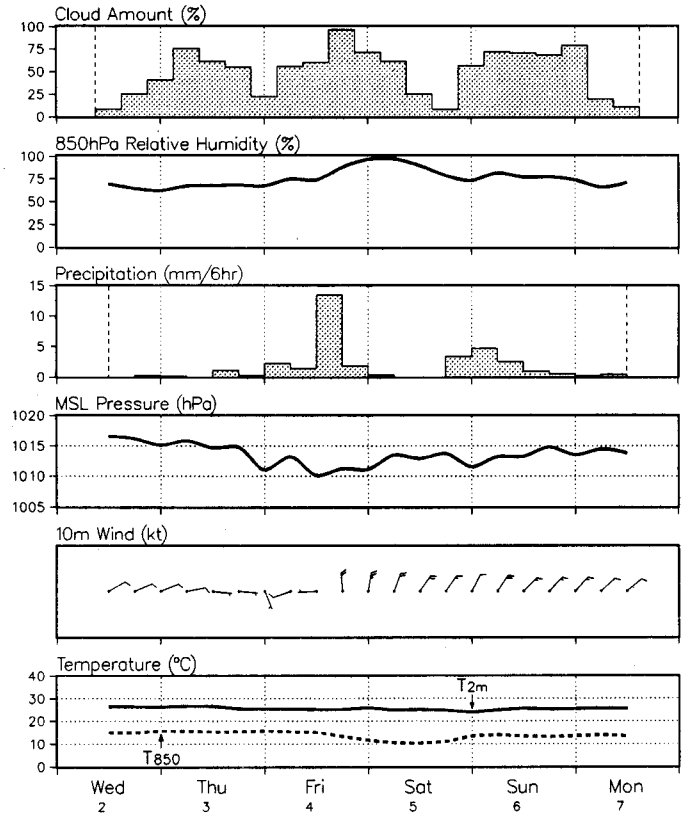
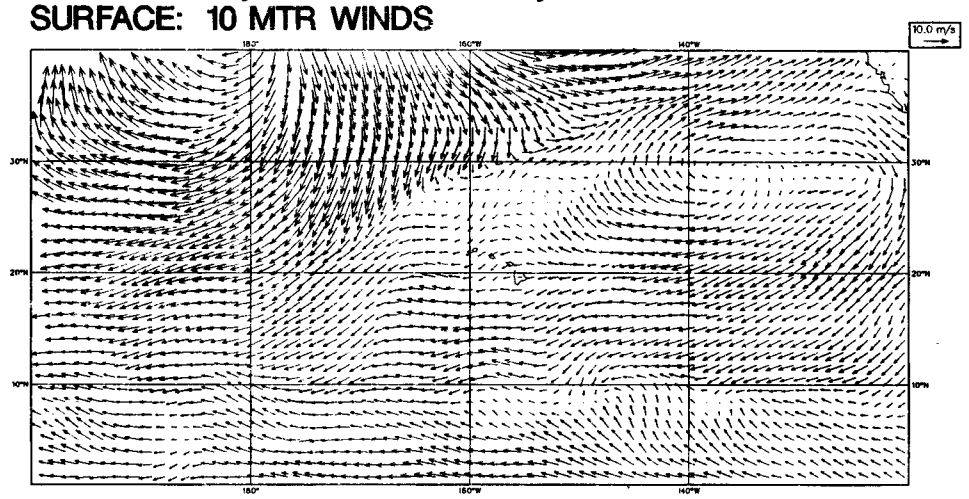
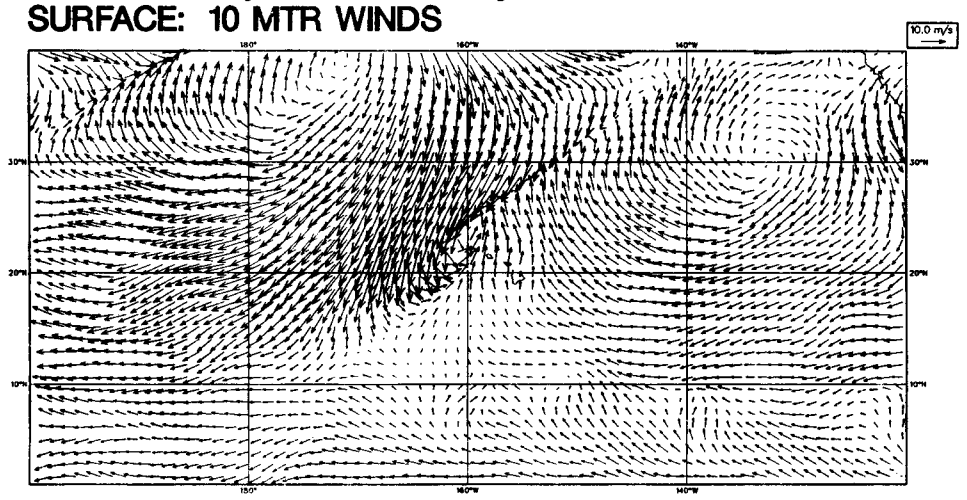


Fig. 3: Metgram for Honolulu based on the ECMWF forecast from 2 November 1988

- Taskin Tuna

* * * * * * * * * * * *





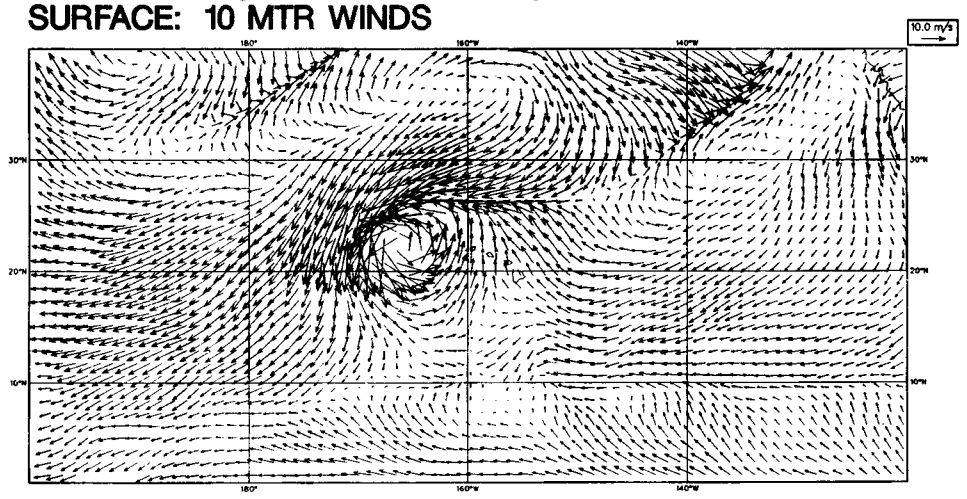


Fig. 1: Surface wind analysis

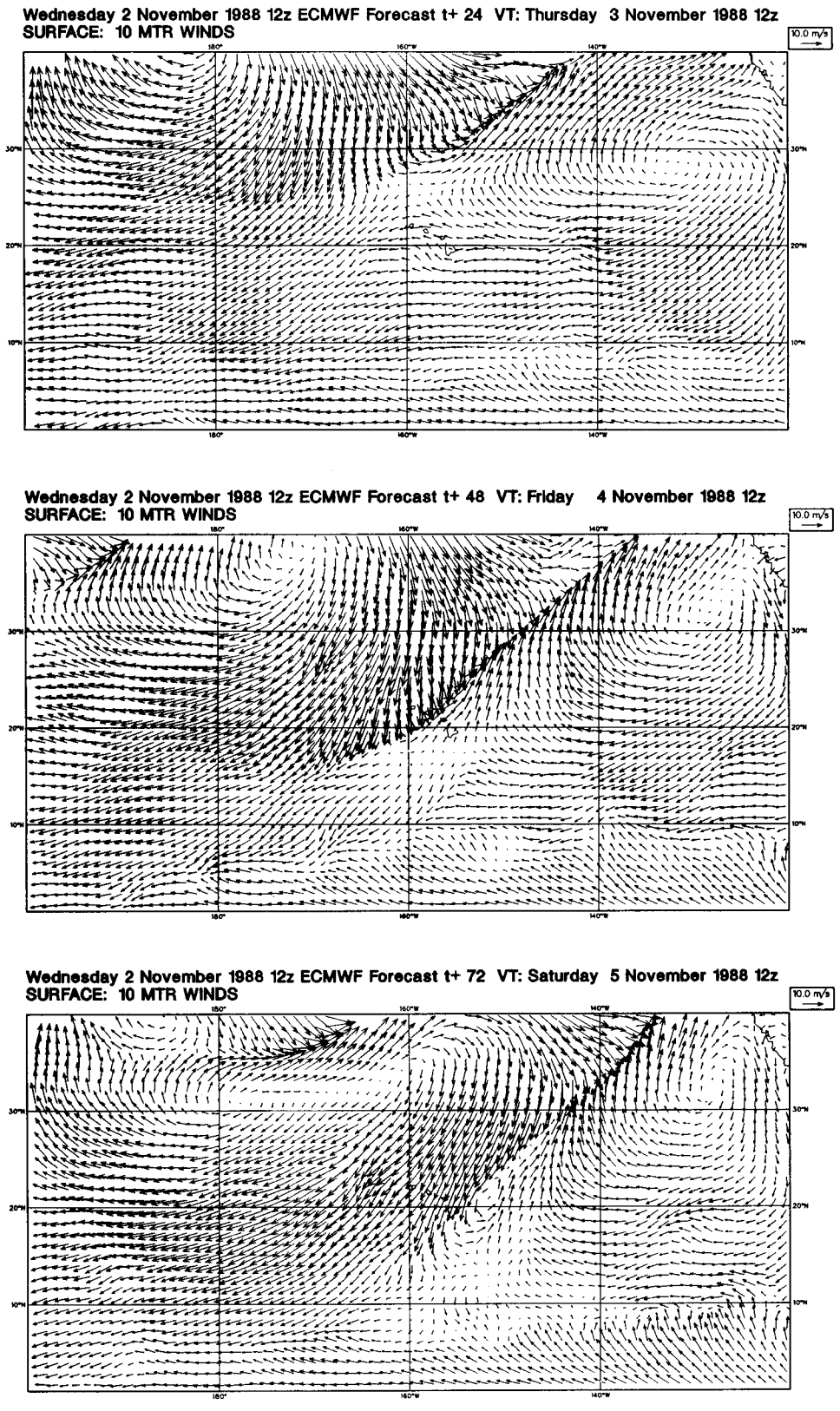


Fig. 2: Surface wind forecast based on 2 November 1988

THE AUTOMATIC WEATHER STATION ON INACCESSIBLE ISLAND

This remote South Atlantic station was first noticed while examining a list of data collection platforms that reported on the GTS with apparent positions of 00N 00E. It was soon found that these were fixed stations which were not being located by Argos. What was a little strange was that not all fixed stations reported such a zero position; some reported non-zero locations (also bad), and some reported good locations.

It was decided to adopt the obvious short-term solution by putting all the fixed GTS platforms into location mode for a few days. This was immediately successful for all platforms - except Inaccessible Island, which never sent more than 3 messages during a satellite overpass and which resolutely failed to locate.

Contact with the South African Weather Bureau at Pretoria, owners of the platform, revealed that the mast supporting the antenna (and some of the sensors) had been blown over after deployment. It was also discovered that the station was sited at an altitude of 500 metres, which, of course, had important implications later for the recalibration of the pressure sensor. Nonetheless, it was seen as something of a challenge to force the system to locate this platform using only the 3 messages available, and thus to transmit to the GTS useful observations from this very data sparse area.

The normal Argos location process, using 4 or more messages, re-computes the platform transmitter frequency on each occasion. However, Argos can perform locations using only 3 messages provided this frequency is accurately known from other sources. As the frequency of the Inaccessible Island platform was not known, the nominal value of 401.650 MHz was tried as a first-guess. Locations were then computed by the system, but with a mean error of about 100 km, which was considered unacceptable.

Ways were therefore studied of improving the frequency estimate, knowing the approximate position of the platform - more or less the inverse of the normal location process. The final approach adopted was to compare the Doppler shifts measured by the satellite over several passes with those expected knowing the relative positions and velocity of spacecraft and transmitter. A variational technique was used which sought to minimise the lease squares errors resulting from the comparison, as a function of assumed transmitter frequency and location. The best estimate of frequency was then re-input to the location processing and a satisfactory result (with an error of about 3 km) finally created in the platform file.

Attention was now directed to the sensor calibrations. The wind sensors were clearly useless, owing to the fallen mast, and it also looked as though the temperature sensor was faulty, although its output did, however, rise and fall in a reasonable way. The pressure sensor was of course reporting about 60 hPa too low, owing to the station altitude. While methods do exist for reducing the in-situ pressure to a sea-level value (as expected in DRIBU reports), they require a knowledge of the temperature at the station to achieve a reasonable accuracy.

It was therefore decided to include the faulty temperature sensor in a compensation formula, but scaled by a factor 'k', which was then estimated by a least squares comparison with ECMWF analysis fields over several weeks. Finally, the platform was introduced on the GTS, reporting sea-level pressure only, at the end of February 1988. Latest statistics show it still to be performing satisfactorily, with an RMS error of about 2 hPa with respect to the ECMWF fields, little different from typical Southern Ocean drifter figures.

I am especially grateful to Alan Radford at ECMWF for giving me the data, and the encouragement, on which to base this exercise.

(Fig. 1 below shows an example of an observation from Inaccessible Island after correction, demonstrating good agreement both with the analysed field and with nearby observations.)

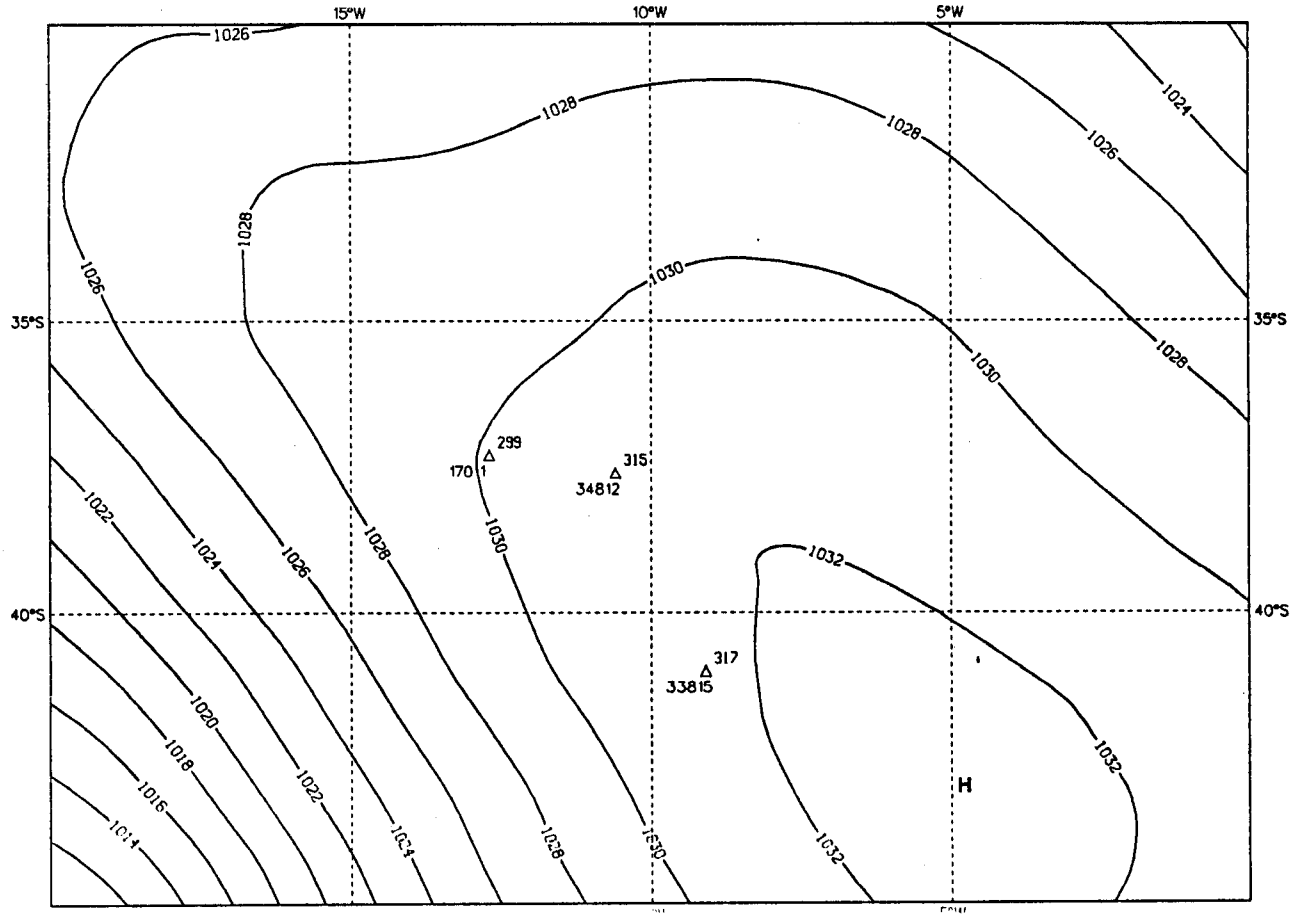


Fig. 1: ECMWF analysed mean sea level pressure field together with observations from Inaccessible Island (station identifier 17011) and two drifting buoys (identifiers 34812 and 33815) for 18 UTC, 7.10.88

- David Meldrum, Technical Co-ordinator, Drifting Buoy Co-operation Panel, Toulouse

* * * * * * * * * * * *

WORKSHOP ON PARAMETRISATION OF FLUXES OVER LAND SURFACES

24-26 October 1988

ECMWF organises regular workshops to assess the current state of knowledge on topics of direct relevance to its objectives and to provide guidance for its programme of research. The workshop held on 24-26 October 1988 considered the parametrisation of fluxes over land surfaces in Numerical Weather Prediction models. This is a field of growing interest in climate modelling, where the forcing by the lower boundary condition is of prime importance in the determination of the model's steady state. It is only in the last few years that this problem has received attention in forecast models, primarily with a view to improving the simulation of weather elements, near surface temperature, humidity and wind, low-level cloudiness and precipitation. Since April 1987 the ECMWF model contains a simple parametrisation for the effects of vegetation cover, and the possibilities for validating and improving this scheme were a central concern at this workshop.

The workshop was organised in the usual ECMWF pattern of 1½ days of lectures, followed by one day of discussion within smaller groups and a final general session to discuss the conclusions and recommendations of the working groups.

After a general introduction of the topic, presentations started with a review of data sets from field experiments which can provide the input and the physical reference for developing land surface parametrisation schemes. This was complemented by a review of modelling studies and the description of numerical experimentation conducted on land surface schemes by various GCM groups, including various stages in the representation of vegetation and soil properties. The last few talks covered the key question of the availability of relevant large scale or global data from in situ measurements and satellite observations.

The working groups had the task of synthesising these themes and presenting recommendations for the Centre's future research activity. The first group concentrated on the observational basis and design of land-surface parametrisation schemes and their "local" validation against results from field experiments. The HAPEX-MOBILHY data set is now at a stage where validation studies are possible and it is hoped that this will also be the case for FIFE in the near future.

The second group covered the various problems relating to the implementation, initialisation and impact of land-surface schemes within forecast models and discussed the possibilities of sensitivity studies and the intercomparison of schemes between various research groups.

The third group discussed the availability of global data sets which can be used to define geographically dependent key parameters such as albedo and vegetation resistance. It also addressed the problem of the validation of surface schemes at the continental or global scale.

In conclusion, this workshop showed that an adequate representation of land-surface processes, including the effects of vegetation, is becoming an important component of forecast models. Developments in this field require a dialogue between experimentalists, modellers and specialists in satellite observations and this is what actually took place during this week in a very constructive atmosphere. It is hoped that this will lead to better co-ordination in the use of data sets available currently and in the future as input to, and a basis for the validation of, forecast or climate models.

- Gilles Sommeria-Klein

* * * * * * * * * * * *

CFT77

The December 1986 issue of the Newsletter (No. 36) contained an article on CFT77. Since then, this compiler has improved to such an extent that it is now used for major codes at ECMWF. The main problem we had experienced in using it had been its failure to compile some of the more complicated routines of the analysis code. We now have a version of the compiler which compiles both the analysis and the forecast model, and which is being used to develop ECFILE and the "in-core model", as well as other codes.

In the earlier Newsletter article it was mentioned that compilation speeds were considerably slower than those of CFT but that the execution speed was expected to be faster. This has proved to be the case, with compilations taking about 3 times longer, but execution being between 10 to 50% (in exceptional cases) faster.

The extra features of CFT77 which are not available in CFT are:

- 31 character symbolic names including the underscore '_' character;
- a subset of the proposed Fortran 8X standard array syntax;
- automatic arrays.

So it is now possible to have meaningful names for variables in programs, for instance, instead of the variable 'MAXRTY' 'MAX_RETRY_ATTEMPTS' could be used. Use may also be made of statements such as:

```
A = SIN(B)
C(:2) = A*B
THE_MAXIMUM_VALUE = MAX(A,B,C(:1),C(:2))
```

where all these variables are arrays, i.e.:

```
DIMENSION A(10), B(10), C(10,2), THE_MAXIMUM_VALUE(10).
```

Finally, automatic arrays are actual arrays, the size of which is determined at run-time. These arrays are allocated on the heap when the subroutine declaring them is entered and released on the subroutine's exit. This requires that the 'MM' parameter is used on the LDR statement or 'HEAP' with SEGLDR. For instance:

```
   SUBROUTINE   MATRIX_INVERT (X,Y,N,M)
   DIMENSION    X(N,M,), Y(M,N)
   DIMENSION    WORK_SPACE_A(N*M)
 1             ,WORK_SPACE_B(MAX(N,M)/MIN(N,M))
 2             ,WORK_SPACE_C(100,2)
```

Here we have 3 workspace arrays which will exist only for the duration of MATRIX_INVERT activity.

N.B.: Use of these 3 features means that CFT can no longer be used as a fall back compiler.

The control statement for CFT77 has parameters similar to those of CFT, but there are some new ones and some of the old ones have different options.

The format of the control statement is:

```
CFT77 (ALLOC = alloc, B = bin, C = cal, CPU = cpu:hdw
      ,E = lvl, EDN = errdn, I = input, INTEGER = n
      ,L = list, OFF = str, ON = str, OPT = opt, TRUNC = n
      ,DEBUG, INDEF, LIST, STANDARD)
```

Of these parameters: **ALLOC, B, C, E, I, L** and TRUNC have the same values and meanings as for CFT.

Of the others

- CPU = cpu:hdw — always code CPU=:EMA
- EDN = errdn — this is the dataset to receive error message listings and defaults to EDN=$OUT
- INTEGER = n — this specifies 64 or 46 bit integer arithmetic and defaults to OPT=46 (CFT has 64 default or 24)
- OPT = opt — this specifies the level of optimisation and can be FULL, OFF or NOVECTOR; with ZEROINC or NOZEROINC.
  The default is OPT=FULL:NOZEROINC
- DEBUG — this generates the symbol tables for the DEBUG utility (cf.ON=X for CFT). This is NOT the default
- INDEF — this causes allocated but uninitialised memory to be set to an uninitialised variable, which can increase CP time. This is NOT the default.
- LIST — this enables all available kinds of output listing except LOOPMARK(ON=M), and includes generated code, full cross reference and vectorisation information. Please do NOT use LIST as it generates huge amounts of listing
- STANDARD — this causes non-ANSI usage to be noted
- ON = str, OFF = str — default is ON=PQR OFF=AFGHMJOSX

	A - off	-	aborts job on fatal errors
	F - off	-	flowtrace
	G - off	-	generated code
	H - off	-	lists header for each subroutine
	J - off	-	one-trip DO-loops
	M - off	-	loopmark
	O - off	-	array-bounds checking
	P - ON	-	allows double precision OFF=P changes to single precision
	Q - ON	-	abort compilation after 100 fatal errors
	R - ON	-	rounds on multiply instructions
N.B.	S - off	-	enables source listing. N.B. OFF=S by default
	X - off	-	enables cross reference.

- Neil Storer

* * * * * * * * * * * *

PROPOSED TIMETABLE FOR WITHDRAWAL OF CYBER NOS/BE SERVICES

This article is based on a memorandum distributed to ECMWF staff and Member State Computing Representatives recently.

Overview

NOS/BE is the Cyber operating system which has been used at the Centre since its inception. It is no longer really suitable for the Centre's needs and has been superseded by other facilities. Once the NOS/BE service terminates, the overall working environment for users will be as follows:

- a supercomputer system (currently the Cray X-MP/48) for most of the batch work;
- an IBM based system for data storage (ECFILE for general files, MARS for meteorological data) and stranger tape handling;
- a VAX based system for telecommunications and Member State interactive service;
- other VAX machines for graphics, data acquisition and preprocessing;
- the Cyber 855 running NOS/VE for interactive access, plus some MARS and MAGICS work.

Batch service

All remaining NOS/BE batch programs should be moved elsewhere over the next 12 months. Users are recommended to commence this transfer process in good time as, for financial reasons, the NOS/BE service cannot be continued beyond the end of 1989.

At sometime during 1989 the ECMWF graphics package MAGICS will be implemented on the NOS/VE system. The version of MAGICS used will be that using the GKS interface only. Users still using the original ECMWF graphics Contour Package are reminded that this system will not be implemented under NOS/VE. Such users are advised to move to MAGICS over the next 12 months.

INTERCOM

It was proposed in ECMWF News Sheet 225 (24 October 1988) that this service will cease as of 31 December 1988 for the general user. A restricted access service will remain available as necessary for certain specialist functions, e.g. operational forecast suite support, Cray accounting, SYSSET space control, etc. In addition, it will continue to be available for Research users who require access to PREPAN, until a month after the NOS/VE version of PREPAN becomes available.

Data storage

Data to be kept beyond 1989 and currently stored on the NOS/BE system, either on disk or tape, should be moved over the next 12 months into ECFILE. NOS/BE tapes cannot easily be read on other systems, hence it is assumed that after 31 December 1989 all remaining NOS/BE tapes will be destroyed.

Access to ECFILE is available now from the Cray, and shortly from NOS/VE. A VAX/VMS interface is planned for later.

SYSSET dump tapes

These tapes, effectively holding an archive of past work, go back to 1981. In order to ensure that a last minute rush of requests for file reloads is not received from users, it is proposed to phase out these tapes gradually, as shown below. Users will be given a warning about one month prior to each deadline to remind them to have retrieved any files they require, so they may be copied into ECFILE. It is regretted that there is technically no easy way for NOS/VE to read NOS/BE dump tapes.

Dump tapes covering	Proposed deletion of tapes
1981 - 1983	31 January 1989
1984	31 March 1989
1985	30 June 1989
1986	30 September 1989
1987 - 1989	31 December 1989

Stranger tapes

Stranger tapes will in future be handled via the IBM system. Access for the general user will be from the Cray via Superlink. Users will be expected to copy incoming stranger tapes into ECFILE and use them from there. Likewise the contents of outgoing stranger tapes will be collected in ECFILE and then copied in one go to the stranger tape itself.

Experiments are now being conducted to establish how this service can best be provided. It remains to be seen whether it will also be practical to copy tapes direct on the IBM into and out of ECFILE without involving the Cray.

GETDATA archives

Currently, only observational data are still being fed into the GETDATA archive, all other forecast suite data are now going into MARS. Back data from the GETDATA archives are being copied into MARS. By the termination date of the NOS/BE service all GETDATA archive data that is going to be kept will have been copied into MARS. At that point, the GETDATA archive tapes will be released.

Cray station

Currently all Cray jobs are input via the Cyber NOS/BE queue system through the Cyber-Cray station. Work is underway to provide the Cray with a direct RHF link to LCN. Once this is operational, Cray jobs will be input direct from VAX/VMS or Cyber NOS/VE to the Cray. At this time the job card format for all such jobs will have to change from the present Cyber (NOS/BE) format to Cray COS format.

Member States are reminded that some ECNET FTP implementations rely on the Cyber job card format to select a suitable filename for the Remote Job file transferred to ECMWF.

File transfer to/from NOS/VE

Currently files from other systems are transferred to NOS/VE through NOS/BE and the dual state interface. This will be replaced by a direct NOS/VE connection through RHF to LCN, allowing MFLINK type file transfers. Moving files into/from ECFILE will also use this NOS/VE LCN connection.

- Geerd-R. Hoffmann

* * * * * * * * * * * * *

SENDING MESSAGES TO ECMWF VIA ELECTRONIC MAIL

The Centre has implemented various electronic mail systems. The article below gives details of the systems available and the addresses of individuals who may be contacted.

VAX MAIL via DECNET

For sites connected to ECMWF by DECNET, VAX mail may be sent to the following address:

```
ECMWF::'name'
```

where 'name' is the same as for use by PSS below. Note that the cluster node name ECMWF may be aliased to something else at a given site.

VAX MAIL via ECNET

For sites connected to ECMWF by ECNET the /MAIL option under the console operator display may be used.

VAX MAIL via PSS

The majority of ECMWF technical and scientific staff have VAX mail boxes, though it should be noted that the frequency with which individuals log on to the VAX system varies considerably.
Use the following as the VAX mail address (in response to the To: prompt)

```
PSI%234273400166::'name'
```

where 'name' is the surname of the person to whom the mail is addressed e.g. Bengtsson. If known, the 'name' can also be the person's 3 character ECMWF computer identifier.

DIALCOM

A limited number of users at ECMWF have access to this service. Currently the following mail boxes are available:

10081:EML002	Dr. L. Bengtsson	Director
: 3	Dr. D. Söderman	Deputy Director
: 4	Dr. D. Burridge	Head of Research
: 5	Mr. G-R. Hoffmann	
: 6	Mr. P. Gray	
: 7	Dr. H. Böttger	
: 8	Mr. R. Gibson	
: 9	Mr. M. O'Brien	
: 10	Dr. A. Hollingsworth	
: 11	Dr. W. Heckley	

* * * * * * * * * * * *

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

No.	Still Valid Article
16	Checkpointing and program termination
67	Attention Cyber BUFFER IN users
73	Minimum Cyber field length
89	Minimum field length for Cray jobs
93	Stranger tapes
120	Non-permanent ACQUIRE to the Cray
121	Cyber job class structure
127	(25.1.82) IMSL Library
135	Local print file size limitations
136	Care of terminals in offices
140	PURGE policy change
152	Job information card
158	Change of behaviour of EDIT features SAVE, SAVEX. Reduction in maximum print size for AB and AC
164	CFT New Calling Sequence on the Cray X-MP
172	Change to CFT Compiler default parameter (ON=A)
176	Archival of Cyber permanent files onto IBM mass storage
178	TIDs on Cray include 2 chara. TID plus 3 chara. source computer ID. Caution with ACQUIRE on RERUN jobs
183	NEXT version of Cray ECLIB and CONVERT
186	PROCLIB changes
187	CFT 1.14. Bugfix 4 Maximum memory size for Cray jobs
189	ROUTEDF
190	Using ROUTE to direct RJE output to the Centre
194	NOS/BE level 664 Preventive maintenance schedules
197	MARSINT - subroutines for transformation from spectral to Gaussian or regular lat.-long. grid, and Gaussian to/from regular lat.-long. grid PROCLIB changes
198	Using the MOHAWK printer
201	New Cray job classes
203	Magnetic tape problems and hints on avoiding them
204	VAX disk space control
205(8/7)	Mispositioned cursor under NOS/VE full screen editor
206	MARSINT software changes
207	FORMAL changes under NOS/VE Job submission from within a Cray job, using LAUNCH
208	Restriction of Cray JCL statement length
210	ECMWF data archives
212	MFICHE command from NOS/VE
213	Changes to MARSINT software

* * * * * * * * * * * *

THE METEOROLOGICAL TRAINING COURSE, 17 April - 16 June 1989

The ECMWF meteorological training course will take place again in spring 1989. The objective of the course is to assist Member States in advanced training in the field of numerical weather forecasting. Students attending the course should have a good meteorological background. Some practical experience in numerical weather prediction is an advantage.

The course is divided into three modules:

Numerical Weather Prediction I
Met 1 - (17 April - 5 May 1989).
Data assimilation, numerical methods and adiabatic formulation of models

Numerical Weather Prediction II
Met 2A - (8 - 19 May 1989).
Parametrisation of diabatic processes

Met 2B - (22 - 25 May 1989).
General circulation, systematic model errors and predictability

ECMWF Products
Met 3 - (5 - 16 June 1989).
Use and interpretation of ECMWF products

Modules Met1 and Met2 will be of most interest to young scientists who are involved in the development of numerical models for operational forecasting or research. Some changes have occurred in these modules. In Met1 more attention will be given to the adiabatic formulation of models, in particular of the ECMWF model. In Met2B the problem of predictability will be examined. Attention will be given to theoretical aspects (strange attractors) and to practical aspects. Module 3 is more directed towards those staff in the meteorological services who are (or will be) using ECMWF products, either directly as forecasting staff, or in development work aimed at maximising the benefits to users of the Centre's products.

Students can attend any combination of the modules. However, those attending only Met2 are expected to have a good knowledge of the topics covered in Met1. The modules Met2A and 2B can be taken independently. Participation in Met3 does not require attendance at the other modules.

In each module there will be lectures, exercises and problem or laboratory sessions. There will also be some computing, though no computing experience will be assumed. Participants are encouraged to take an interest in the work of ECMWF and to discuss their own work and interests with the staff of the Centre. All the lectures will be given in English and a comprehensive set of lecture notes will be provided.

Application forms and booklets will be mailed to the meteorological services of Member States and many universities and institutions by the beginning of January 1989. If you do not have access to one of these, copies can be obtained from Els Kooij-Connally at ECMWF.

The Centre does not charge a course fee for participants from Member States.

Applications from within Member States should be channelled through the relevant national meteorological service, but those from non-Member States should be sent to the Secretary-General of WMO.

* * * * * * * * * * * *

COMPUTER USER TRAINING COURSE

The Centre will offer a computer user training course for Member State personnel and ECMWF staff from 20 February to 3 March 1989. Full information and a request for nominations will shortly be sent to all Member States, nominations from ECMWF staff will be invited via Section Heads.

The course will cover 4 broad areas across the two weeks:

1. How to run a Cray job

   - overview of ECMWF computer system
   - Cray service, including job submission, debugging, UPDATE and libraries
   - file storage, including ECFILE, stranger tapes, and moving files between systems
   - interactive service
   - remote user service.

2. MARS

   - archive and data services
   - formats
   - user interface
   - data retrieval.

3. MAGICS

- overview and concepts
- plot layout, mapping and coastlines
- data input
- contouring
- specialist plotting (wind fields, observations, etc.)
- specification groups
- recent additions.

4. Cray in more depth

- hardware in detail
- filing system and file structure
- I/O efficiency
- vectorising, multitasking
- procedures, libraries.

Throughout the course, each day will be split approximately into half lectures and half practical sessions.

- Andrew Lea

* * * * * * * * * * * *

ECMWF PUBLICATIONS

TECHNICAL MEMORANDUM NO. 146	Mid-latitude atmospheric prediction on time scales of 10-30 days
TECHNICAL MEMORANDUM NO. 147	Convection and its parametrisation - recent progress
TECHNICAL MEMORANDUM NO. 148	Typhoon bogus observations in the ECMWF data assimilation system
WORKSHOP PROCEEDINGS	Meteorological operations systems, 7-11 December 1987
WORKSHOP PROCEEDINGS	Techniques for the horizontal discretisation in numerical weather prediction models, 2-4 November 1987

The winter monsoon during AMEX. A quick look atlas 10-15 February 1987

* * * * * * * * * * * *

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.

	Newsletter No.*	Date	Page
CRAY			
Bi-directional memory	25	Mar. 84	11
Buffer sizes for jobs doing much sequential I/O	14	Apr. 82	12
CFT 1.11 Subroutine/function calling sequence change	19	Feb. 83	13
CFT 77	36	Dec. 86	12
CFT 1.14	32	Dec. 85	22
COS 1.14	32	Dec. 85	22
Cray X-MP/48 - description of	30	June 85	15
Cray X-MP/22 - hints on using it	26	June 84	10
Dataset storage	13	Feb. 82	11
Multifile tapes - disposing of	17	Oct. 82	12
Multitasking ECMWF spectral model	29	Mar. 85	21
	33	Mar. 86	9
	& 37	Mar. 87	5
Public Libraries	T5	Oct. 79	6
CYBER			
Arithmetic instructions - comparative speeds of execution on the Cyber front ends	14	Apr. 82	17
Cyber front ends - execution time differences	15	June 82	9
Buffering or non-buffering on Cyber?	15	June 82	10
CMM-Fortran interface	10	Aug. 81	11
Cyber 855 - description of	21	June 83	18
Dynamic file buffers for standard formatted/ unformatted data	3	June 80	17
Formatted I/O - some efficiency hints	4	Aug. 80	9
FTN5 - effective programming	9	June 81	13
	& 10	Aug. 81	13
- optimisation techniques	14	Apr. 82	13
	& 15	June 82	10
Magnetic tapes - hints on use	T2	Apr. 79	17
- making back-up copies	1	Feb. 80	9
- stranger tapes: slot numbers	36	Dec. 86	15
Public libraries	T5	Oct. 79	6

* * * * * * * * * * * *

* T indicates the original Technical Newsletter series

USEFUL NAMES AND 'PHONE NUMBERS WITHIN ECMWF

			Room*	Ext.**
Director	-	Lennart Bengtsson	OB 202	2001
Head of Operations Department	-	Daniel Söderman	OB 010A	2003
ADVISORY OFFICE - Open 9-12, 14-17 daily			CB Hall	2801
Other methods of quick contact:	-	Telex (No. 847908)		
	-	Telefax (No. 869450)		
	-	COMFILE (See Bulletin B1.5/1)		
Contact scientific and technical staff via VMS MAIL, addressed to surname				
REGISTRATION				
Project Identifiers	-	Pam Prior	OB 016	2384
Intercom & Section Identifiers	-	Tape Librarian	CB Hall	2315
COMPUTER OPERATIONS				
Console	-	Shift Leaders	CB Hall	3333
Reception Counter) Tape Requests)	-	Tape Librarian	CB Hall	2315
Terminal Queries	-	Norman Wiggins	CB 028	2308
Operations Section Head	-	Peter Gray	CB 023	2370
Telecoms Fault Reporting	-	Michael O'Brien	CB 035	2306
DOCUMENTATION	-	Pam Prior	OB 016	2384
Distribution	-	Els Kooij-Connally	OB 316	2752
LIBRARIES (ECLIB, NAG, CERN, etc.)	-	John Greenaway	OB 017	2385
METEOROLOGICAL DIVISION				
Division Head	-	Horst Böttger	OB 008	2060
Applications Section Head	-	Rex Gibson	OB 101	2400
Operations Section Head	-	Bernard Strauss	OB 004	2420
Meteorological Analysts	-	Taskin Tuna	OB 005	2424
	-	Alan Radford	OB 006	2421
	-	Alex Rubli	OB 003	2425
Meteorological Operations Room	-		CB Hall	2426/2427
COMPUTER DIVISION				
Division Head	-	Geerd Hoffmann	OB 009A	2050
Operating Systems Section Head	-	Claus Hilberg	CB 133	2350
User Support Section Head	-	Andrew Lea	OB 018	2380
GRAPHICS PROJECT				
Project Leader	-	Jens Daabeck	OB 013	2375
RESEARCH DEPARTMENT				
Head of Research Department	-	David Burridge	OB 119A	2005
Computer Co-ordinator	-	David Dent	OB 123	2702

* CB - Computer Block
OB - Office Block

** The ECMWF telephone number is READING (0734) 876000
international +44 734 876000