

*EUROPEAN CENTRE FOR
MEDIUM-RANGE WEATHER FORECASTS*

*THE DESCRIPTION OF THE
ECMWF/WCRP LEVEL III-A GLOBAL ATMOSPHERIC DATA ARCHIVE*

1994

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ORDER FORMS

PART I Description of the Archive

ECMWF has created and maintains an archive of level III-a atmospheric data in support of projects associated with the World Climate Research Program (WCRP). It is intended that this archive eventually accommodates the 10 year period beginning 1 January 1985, fulfilling ECMWF's role as a Tropical Ocean and Global Atmosphere (TOGA) Level III Atmospheric Data Centre.

The archive is subdivided into three classes of data sets:

- Basic Level III Data Sets
- Advanced Operational Analysis Data Sets
- Supplementary Fields Data Set.

The data sets are based on quantities analysed or computed within the ECMWF data assimilation scheme.

The Basic Data Sets contain selected analysed values in a compact form at a resolution of $2.5^\circ \times 2.5^\circ$. They are particularly suitable for users with limited data processing resources. Derived quantities (fluxes, etc.) are not included, but can in principle be calculated from the data provided in the data sets.

The Advanced Data Sets have a higher time and space resolution and contain more surface parameters. These data sets are significantly larger than the Basic Data Sets. They should only be used where high resolution is essential; in this respect they are particularly suited for use in conjunction with case studies and as initial conditions for high resolution models.

The Supplementary Fields Data Set contains additional surface data, fluxes and net radiation data derived from short-range forecasts used as first-guess data for the analyses. Most of the fields in this data set contain values accumulated over the first 6 hours of the forecast. The exceptions, total cloud cover fields, contain instantaneous 6-hour forecast values.

The archive is currently maintained using the WMO FM 92-IX Ext GRIB (grid in binary) form of data representation, with a non-standard version of GRIB Table 2 (see Appendix A). All fields of data are global within the archive.

A full extraction service is supported, enabling users to obtain sub-areas of data and data at various resolutions on regular Gaussian or latitude/longitude grids, or as spherical harmonics with selected triangular truncation. All extracted data are delivered using the GRIB representation.

Appendix B gives approximate volumes of data, in terms of megabytes per year, for each complete data set in different representations and with different resolutions.

PART II The ECMWF/TOGA Basic Level III Data Sets

These data sets contain uninitialised analysis values interpolated to a 2.5° x 2.5° regular latitude/longitude grid. This grid is co-located with the 5° x 5° and 2.5° x 2.5° grids used for ECMWF data distribution daily on the Global Telecommunications System (GTS).

Three data sets are separately supported:

- a Surface Data Set
- an Upper-Air Data Set
- a Consolidated Data Set.

For each data set the following is relevant:

- period supported - 1 January 1985 to current date;
- fields are uninitialised analyses for 0000 UTC and 1200 UTC each day;
- each parameter at each level is stored as a field of grid point values on a 2.5° x 2.5° regular rectangular mesh in latitude rows starting at the north and working southwards; within each row values run from west to east starting at the 0° meridian;
- data are stored in FM 92 GRIB using sufficient bits to ensure that the grid point values can be retrieved to an accuracy consistent with the analysis methods used;
- production of the archive has been made as automatic as possible using techniques which enable the data sets to be updated daily.

The Surface Data Set contains

- surface pressure, surface temperature (level 1)*, MSL pressure, u- and v-components of wind at 10m**, temperature at 2m, dewpoint at 2m, surface geopotential and land-sea mask.

The Upper-Air Data Set contains

- 14 standard pressure levels, 1000, 850, 700, 500, 400, 300, 250, 200, 150, 100, 70, 50, 30 and 10 hPa;
- standard pressure level, 925 hPa, from 1 January 1992 onwards;
- geopotential, temperature, vertical velocity, u- and v-components of horizontal wind**, and relative humidity at each level.

Since the Upper-Air Data Set is separately maintained from the Surface Data Set, separate requests must be made for each, and the extracted data cannot be interspersed.

* See Appendix F

** See Appendix C

The Consolidated Data Set contains

- data corresponding to the Upper-Air Data Set together with data comprising the Surface Data Set.

The mode of storage of the Consolidated Data Set within the archive is such that data must be retrieved globally, for all parameters, all levels, and in monthly units.

PART III The ECMWF/TOGA Advanced Operational Analysis Data Sets

These data sets contain uninitialised analysis values at the resolution of the data assimilation system in operational use at ECMWF. Since the resolution and internal representation of the archive may vary according to changes in ECMWF's operational practice, data services associated with these data sets include the provision of interpolation to requested resolutions and representation forms.

Two data sets are separately supported:

- a Surface and Diagnostic Fields Data Set
- an Upper-Air Data Set.

For both data sets the following is relevant:

- period supported - 1 January 1985 to current date;
- fields are uninitialised analyses for 0000 UTC, 0600 UTC, 1200 UTC and 1800 UTC each day;
- each parameter at each level is stored as a field either of grid point values, or of spherical harmonic co-efficients;
- data are stored in FM 92 GRIB using sufficient bits to ensure that the values represented can be retrieved to an accuracy consistent with the analysis method used;
- production of the archive has been made as automatic as possible using techniques which enable the data sets to be updated daily.

The Surface and Diagnostic Fields Data Set contains

- surface pressure, surface temperature and wetness (level 1)*, snow depth, MSL pressure, u- and v-components of wind at 10m**, temperature at 2m, dewpoint at 2m, surface temperature and wetness (level 2)*;
- surface geopotential+, land-sea mask+, surface roughness+, albedo+, climatological deep-soil temperature and wetness++, soil temperature and wetness (level 3)+++.
- Data is represented on a N48 Gaussian grid (48 lines of latitude, located according to a Gaussian distribution between the pole and the equator for each hemisphere, with a regular spacing of 1.875° between points along each latitude row) for the period 1 January 1985 - 30 April 1985, on a N80 Gaussian grid (80 lines, with 1.125° between points along each row) for the period 1 May 1985 - 16 September 1991 and on a N160 Quasi-regular Gaussian grid (160 lines with varying numbers of points along each row, see Appendix E) thereafter;

* See Appendix F

** See Appendix C

+ These fields are not available before 15 July 1986

++ These fields are not available before 15 July 1986 or after 4 August 1993

+++ These fields are not available before 4 August 1993, see Appendix F

- grid point values are stored in latitude rows starting at the north and working southwards; within each row values run from west to east, starting at the 0° meridian.

The Upper-Air Data Set contains

- 14 standard pressure levels, 1000, 850, 700, 500, 400, 300, 200, 250, 200, 150, 100, 70, 50, 30 and 10 hPa;
- standard pressure level, 925 hPa, from 1 January 1992;
- geopotential, temperature, vertical velocity, u- and v-components of horizontal wind*, and relative humidity at each level;
- data is currently represented as spherical harmonics with triangular truncation at wave number 63 (T63) for the period 1 January 1985 - 30 April 1985, at wave number 106 (T106), for the period 1 May 1985 - 16 September 1991, and at wave number 213 (T213) thereafter.
- spherical harmonic co-efficients are stored as defined by code figure 1 in tables 9 and 10 of FM 92-IX Ext GRIB.

Since the Upper-Air Data Set is separately maintained from the Surface Data Set, separate requests must be made for each, and the extracted data cannot be interspersed.

* See Appendix C

PART IV The ECMWF/TOGA Supplementary Fields Data Set

The Supplementary Fields are derived from 6-hour forecasts used as "first-guess" for analyses within ECMWF's data assimilation system. Data are archived at the resolution of the operational system in use at ECMWF. Since the resolution and internal representation of the archive may vary according to changes in ECMWF's operational practice, data services associated with this data set include the provision of interpolation to requested resolutions and representation forms.

The **Supplementary Fields Data Set** is comprised as follows:

- period supported - 1 January 1985 to current date;
- fields are 6-hour forecast values valid for 0000 UTC*, 0006 UTC*, 1200 UTC* and 1800 UTC* each day;
- each parameter is stored as a field of grid point values, in latitude rows starting at the north and working southwards; within each row values run from west to east starting at the 0° meridian;
- internal data is represented on a N48 Gaussian grid (48 lines of latitude, located according to a Gaussian distribution between the pole and the equator for each hemisphere, with a regular spacing of 1.875° between points along each latitude row) for the period 1 January 1985 - 30 April 1985, on a N80 Gaussian grid (80 lines, with 1.125° between points along each row); for the period 1 May 1985 - 17 September 1991, and on a N160 Quasi-regular Gaussian grid (160 lines with varying numbers of points along each row, see Appendix E) thereafter;
- data are stored in FM 92 GRIB using sufficient bits to ensure that the grid point values can be retrieved to an accuracy consistent with the generating methods used;
- production of the archive has been made as automatic as possible using techniques which enable the data set to be updated daily.

The **Supplementary Fields Data Set** contains:

- total cloud cover, surface sensible heat flux, surface latent heat flux, surface thermal radiation, surface solar radiation, top thermal radiation, top solar radiation, East-West surface stress, North-South surface stress.

* Hour of data in GRIB Section 1 is 1800 UTC of the previous day for 0000 UTC, 0000 UTC for 0600 UTC, 0600 UTC for 1200 UTC and 1200 UTC for 1800 UTC.

Users of the Supplementary Fields Data Set should note the following statement which was issued by the Research Department at ECMWF in April 1990.

Users of the ECMWF low level wind data, in particular over the oceans, should be aware of an inconsistency that exists between the archived surface stress values and the stresses calculated diagnostically from archived low level wind fields and temperatures.

Using the ECMWF parametrisation diagnostically for example, produces stresses that are higher than archived model values because of the impact of the time algorithms used for the model's boundary layer scheme.

PART V**Requests for Data**

In addition to providing the computer resources to set up and update this global archive, ECMWF provides a service in extracting reasonable sub-sets of the data (including sub-areas).

The data, together with software to unpack FM 92 GRIB will be supplied on IBM tapes or cartridges or 8mm Exabyte cartridges. A fee (in pounds sterling or US-Dollars) will be charged to cover the data extraction and data interpolation (if required), the provision of tapes/cartridges, the processing of the request, and the dispatch to the user by air mail. These charges are "marginal costs" and ECMWF does not accept any liability for errors or omission in the data, or for any loss or damage arising from its use. However, users may report back to ECMWF any problems they encounter reading or using the data. To ensure that the fee charged reasonably reflects the processing required, the following formula is used:

$$\text{COST} = \alpha N (1 + \beta) + \alpha \gamma M + \alpha \delta T$$

where α is the "unit cost" (currently £90)

N is the number of data units to be written
(1 data unit = 150 megabytes)

T is the number of tapes or cartridges to be written

β is 0 if interpolation is NOT required
1 if interpolation IS required

γ is 1/12 for the Basic Data Set (surface)
1/3 for the Basic Data Set (upper-air)
0 for the Basic Data Set (consolidated)
1 for the Advanced Operational Data Set (surface)
1 for the Advanced Operational Data Set (upper-air)
1/3 for the Supplementary Fields Data Set.

M is the number of months or part months comprising the period for which data are requested.

δ = 1 for 1600 bpi tapes
0 for other media.

This charge will remain in force until 31 December 1994.

Note that this cost is based on 4 component parts:

αN to cover the cost of providing tapes/cartridges, handling, mail and basic extraction

$\alpha \beta N$ to cover the extensive processing costs required to interpolate data and/or to convert from spectral to grid point

$\alpha \gamma M$ to cover the processing costs involved in accessing data within the archive; this cost is greater for the high resolution data than for the basic data set, reflecting the magnitudes of the respective volumes of those data within the archive.

$\alpha \delta T$ to cover additional tapes, handling and mail for low density media.

Note also that, in the context of the above, "interpolation" is defined as:

- generating grid point data from spherical harmonic coefficients,
or
- converting Gaussian grid point data to regular latitude/
longitude, or
- converting grid point data to any resolution other than that used
to store the data within the archive.

The extraction of lower truncation spherical harmonic coefficients is NOT counted as interpolation, because the computing resources required are relatively trivial.

Requests from each data set are processed and costed separately. Note that the number of tapes/cartridges required will depend on the amount of data, block length etc. requested.

It should be noted that the most cost effective access to large amounts of data is supported in terms of long periods extracted as a reasonably full sub-set of the basic data sets. To this end, special arrangements enable data from the Consolidated Data Set to be supplied at one "unit cost" per month of data. Since the supply of data from the Consolidated Data Set requires less resources to process, ECMWF reserves the right to satisfy requests for large amounts of data from the Basic Data Sets by this means, charging according to the scale of charges for the original request or for the Consolidated Data Set, according to which charge is the cheaper.

The minimum charge for any order for this archive is £135.

Requests for data have to be made using the standard order forms, using one form for each request. An order form for each data set is included at the back of this brochure. All options are pre-defined and must be selected by marking the boxes on the form.

A user can define:

- the time interval;
- sub-areas based on regular rectangular areas with edges along latitude and longitude lines (such areas will be processed as minimum required areas, extra values outside the area specified may be supplied);
- fields selected by parameter and (if appropriate) level;
- representation and resolution (for the Advanced Operational Analysis and Supplementary Fields Data Sets only).

Data will be delivered on unlabelled IBM 3420 9-track magnetic tapes written at 1600 or 6250 bpi or on unlabelled IBM 3480 18-track or 36-track magnetic cartridges written at 38,000 bpi or on 8 mm Exabyte cartridges. Each request will be delivered on tapes/cartridges. GRIB decoding software will be supplied as the first file on at least one of the tapes/cartridges.

Whenever possible, and unless the user specifies otherwise on the order form, IBM 3420 tapes will be packed in transit cases to prevent the tapes being damaged during delivery. All customers are requested to return the blue security transit cases as soon as possible to the address given below. Any tapes that appear to be faulty or that cannot be read for any reason should be returned in the transit cases. A charge of £100 will be made for each

transit case not returned unless special arrangements are made in advance.
Transit cases should be returned to:

Tape Library
E C M W F
Shinfield Park
Reading/Berks.
RG2 9AX
UNITED KINGDOM

The GRIB decoding software will be supplied at no extra charge. The file containing the software, written in FORTRAN 77 with some C routines for the SUN version, will contain 80 byte records within 800 byte, fixed length blocks.

Data will be written to IBM tapes and cartridges with fixed length tape blocks with a maximum tape block size equal to or less than either 30,000 bytes, or a value requested by the user. Tape block sizes will be computed according to the field lengths of the data requested, to maximise the use of the tape/cartridge. Each GRIB message will begin at the beginning of a tape block. Details of tape block lengths will be supplied with each set of data extracted.

Data will be written to 8 mm Exabyte tapes as one or more archive files. Each archive file will contain one data file up to 50 megabytes in size. Archive files will be written to tape sequentially using the UNIX 'tar' command so that individual files can be extracted as required.

The "unit cost", α , will be 90 pounds sterling, and the costing formula described above will be applied. Tapes/cartridges will be dispatched to user by air mail only - no arrangements will be entered into with third party carriers.

Discounts will be given for large orders as follows:

orders in excess of £ 1,500	-	10% of that part of the normal charge which exceeds £1,500
orders in excess of £ 5,000	-	£350, plus 20% of that part of the normal charge which exceeds £5000
orders in excess of £10,000	-	£1,350, plus 25% of that part of the normal charge which exceeds £10,000.

To get a costing for the supply of data, the appropriate order form should be completed and returned to ECMWF. Extraction of data will commence as soon as confirmation of the order is received. An invoice will be sent shortly after the tapes containing the requested data have been dispatched.

Requests for data should be addressed to:

The Director
E C M W F
Shinfield Park
Reading/Berks.
RG2 9AX
UNITED KINGDOM

Please note that according to the ECMWF Council rules governing the provision of data, organisations within the Member States are requested to contact their national meteorological service, whose written approval is required before ECMWF can commence extracting data for the order.

The cost charged for the supply of ECMWF data to organisations within the Member States may vary from the cost given by the formula on page 8, depending on the charging policy of the national meteorological services.

The Member States are as follows: Belgium, Denmark, Germany, Spain, France, Greece, Ireland, Italy, Yugoslavia, The Netherlands, Norway, Austria, Portugal, Switzerland, Finland, Sweden, Turkey, United Kingdom.

PART VI Summary of ECMWF/TOGA data available

1. ECMWF/TOGA Basic Level III Surface Data Set

Data type: surface data - uninitialised analysis
Times: 00 UTC, 12 UTC
Dates: 1 January 1985 onwards
Area: global or sub-area
Resolution: 2.5/2.5 degree regular latitude/longitude grid

Parameters: surface pressure
 soil temperature (level 1)**
 mean sea level pressure
 10 metre u
 10 metre v
 2 metre temperature
 2 metre dewpoint temperature
 surface geopotential
 land-sea mask

2. ECMWF/TOGA Basic Level III Upper Air Data Set

Data type: upper-air data - uninitialised analysis
Times: 00 UTC, 12 UTC
Dates: 1 January 1985 onwards
Area: global or sub-area
Resolution: 2.5/2.5 degree regular latitude/longitude grid
Levels: 1000,850,700,500,400,300,250,200,150,100,70,50,30,10 hPa
 (925 hPa from 1 January 1992)

Parameters: geopotential
 temperature
 vertical velocity
 u-velocity
 v-velocity
 relative humidity

3. ECMWF/TOGA Basic Level III Consolidated Data Set

Data type: surface and upper air data - uninitialised analysis
Times: 00 UTC, 12 UTC
Dates: 1 January 1985 onwards
Area: global
Resolution: 2.5/2.5 degree regular latitude/longitude grid
Levels: 1000,850,700,500,400,300,250,200,150,100,70,50,30,10 hPa
 (925 hPa from 1 January 1992)

Surface
parameters: surface pressure
 soil temperature (level 1)**
 mean sea level pressure
 10 metre u
 10 metre v
 2 metre temperature
 2 metre dewpoint temperature
 surface geopotential
 land-sea mask

** See Appendix F

Upper-Air

Parameters: geopotential
 temperature
 vertical velocity
 u-velocity
 v-velocity
 relative humidity

4. ECMWF/TOGA Advanced Operational Analysis Surface and Diagnostic Fields Data Set

Data type: surface data - uninitialised analysis
Times: 00 UTC, 06 UTC, 12 UTC, 18 UTC
Dates: 1 January 1985 onwards
Area: global or sub-area

Model resolution: 1 January 1985 - 30 April 1985
= 1.875 degree regular latitude/longitude grid*
N48 Gaussian grid

1 May 1985 - 16 September 1991
= 1.125 degree regular latitude/longitude grid*
N80 Gaussian grid

17 September 1991 onwards
= 0.5625 degree regular latitude/longitude grid*
N160 Quasi-regular Gaussian grid

Parameters: from 1 January 1985

surface pressure
soil temperature (level 1)**
soil wetness (level 1)**
snow depth
mean sea level pressure
10 metre u
10 metre v
2 metre temperature
2 metre dewpoint temperature
soil temperature (level 2)**
soil wetness (level 2)**

from 15 July 1986

surface geopotential
land-sea mask
surface roughness
albedo

from 15 July 1986 to 3 August 1993

climatological deep-soil wetness
climatological deep-soil temperature

from 3 August 1993

soil temperature (level 3)**
soil wetness (level 3)**

* Data may be extrapolated to .5/.5 degrees regular latitude/longitude grid

** See Appendix F

5. ECMWF/TOGA Advanced Operational Analysis Upper Air Data Set

Data type: upper-air data - uninitialised analysis
Times: 00 UTC, 06 UTC, 12 UTC, 18UTC
Dates: 1 January 1985 onwards
Area: global or sub-area

Model resolution: 1 January 1985 - 30 April 1985
= 1.875 degree regular latitude/longitude grid*
N48 Gaussian grid
T63 spherical harmonics (global fields only)

1 May 1985 - 16 September 1991
= 1.125 degree regular latitude/longitude grid*
N80 Gaussian grid
T106 spherical harmonics (global fields only)

17 September 1991 onwards
= 0.5625 degree regular latitude/longitude grid*
N160 Gaussian grid
T213 spherical harmonics (global fields only)

Levels: 1000,850,700,500,400,300,250,200,150,100,70,50,30,10 hPa
(925 hPa from 1 January 1992)

Parameters: geopotential
temperature
vertical velocity
u velocity
v velocity
relative humidity

6. ECMWF/TOGA Supplementary Fields Data Set

Data type: surface data - first guess
Times: 00 UTC, 06 UTC, 12 UTC, 18 UTC
Dates: 1 January 1985 onwards
Area: global or sub-area

Resolution: 1 January 1985 - 30 April 1985
= 1.875 degree regular latitude/longitude grid*
N48 Gaussian grid

1 May 1985 - 16 September 1991
= 1.125 degree regular latitude/longitude grid*
N80 Gaussian grid

17 September 1991 onwards
= 0.5625 degree regular latitude/longitude grid*
N160 Quasi-regular Gaussian grid

* Data may be extrapolated to .5/.5 degrees regular latitude/longitude grid

Parameters: total cloud cover
 surface sensible heat flux
 surface latent heat flux
 surface thermal radiation
 surface solar radiation
 top thermal radiation
 top solar radiation
 East-West surface stress
 North-South surface stress

APPENDIX A

SUMMARY OF ECMWF VERSION OF TABLE 2 FOR WMO FM 92-IX EXT. GRIB

(This Table is used instead of Table 2 of FM 92-IX Ext. GRIB)

FIELD CODE	FIELD NAME	UNITS
129	Geopotential (at the surface = orography)	$m^2 s^{-2}$
130	Temperature	K
131	U-velocity	$m s^{-1}$
132	V-velocity	$m s^{-1}$
134	Surface pressure	Pa
135	Vertical velocity	$Pa s^{-1}$
139	Soil temperature (level 1)**	K
140	Soil wetness (level 1)**	m (of water)+
141	Snow depth	m
146	Surface sensible heat flux*	$* Wm^{-2}$
147	Surface latent heat flux*	$* Wm^{-2}$
151	Mean sea level pressure	Pa
157	Relative humidity	%
164	Total cloud cover	(0 - 1)
165	10 metre u	$m s^{-1}$
166	10 metre v	$m s^{-1}$
167	2 metre temperature	K
168	2 metre dewpoint temperature	K
170	Soil temperature (level 2)	K
171	Soil wetness (level 2)	m (of water)+
172	Land/sea mask	(0, 1)
173	Surface roughness	m
174	Albedo	-
176	Surface solar radiation*	$* Wm^{-2}$
177	Surface thermal radiation*	$* Wm^{-2}$
178	Top solar radiation*	$* Wm^{-2}$
179	Top thermal radiation*	$* Wm^{-2}$
180	EW surface stress*	$* Nm^{-2}$
181	NS surface stress*	$* Nm^{-2}$
183	Climatological deep soil temperature/soil temperature (level 3)**	K
184	Climatological deep soil wetness/soil wetness (level 3)**	m (of water)+

* denotes field accumulated over 6 hours since start of forecast.

** See Appendix F

+ Scaled to the depth of the surface layer. The values can be interpreted as the amount of water in a layer 7 cm deep.

APPENDIX B

TABLE OF DATA VOLUMES

The following table gives approximate volumes of data which can be obtained from the ECMWF/TOGA data sets, in terms of the number of units of data per year of data, where one unit of data = 150 megabytes, for each complete data set in different representations and with different resolutions:

	Lat/Long Grid			Gaussian Grid		Spherical Harmonics	
	2.5°	1.125°	0.5°	N80	N160	T106	T213
Basic Surface Data Set	1	-	-	-	-	-	-
Basic Upper Air Data Set	10	-	-	-	-	-	-
Basic Consolidated Data Set	n/a	-	-	-	-	-	-
Advanced Surface and Diagnostic Fields Data Set	4	18	87	17	45	-	-
Advanced Upper Air Data Set	25	121	610	121	324	28	108
Supplementary Fields Data Set	2	9	46	9	24	-	-

U- and V-Wind Components at the Poles

In 1991 it was discovered that, on a regular latitude/longitude grid, the ECMWF u- and v-components of wind were incorrect at the poles. The problem was that the horizontal components of wind gave inconsistent polar values of wind magnitude and direction. Changes have been made to the interpolation routines used to create the ECMWF/TOGA Basic Data Sets and to extract data from the ECMWF/TOGA Advanced Data Sets and the Supplementary Fields Data Set. These changes have had the following effects on u- and v-wind fields at the poles:

- (a) **Surface data.** The grid points at each of the poles will contain horizontal wind components from the nearest neighbouring Gaussian latitude circle interpolated to the required resolution. For the T213 model the nearest latitude circle is ± 89.578132 .
- (b) **Upper air data.** The grid points at each of the poles contain the correct horizontal wind components derived from the spherical harmonics coefficients, i.e. the values of the wind magnitude derived from the horizontal wind components will be constant, while the u- and v- components oscillate with a wave number 1 pattern around the poles.

From 1 January 1992, all u- and v-wind components at the poles supplied from the ECMWF/TOGA Advanced Data Sets will be in the format described in (a) and (b) above.

From 1 January 1992, u- and v-wind components at the poles supplied from the ECMWF/TOGA Basic Data Sets for periods from 1 July 1991 onwards will be in the format described in (a) and (b) above. Data for periods before this date will contain incorrect values at the poles*.

* Appendix D contains a method for calculating wind components at the poles using the values at a neighbouring latitude circle. This is only one method that can be used. The user may wish to use another method for calculating polar winds, for example by using a polar stereographic projection.

**CALCULATION OF WIND AT THE POLE FROM VALUES
AT A NEIGHBOURING LATITUDE CIRCLE**

Given winds U_i, V_i $i = 1, 2, 3, \dots, NLON$ along a latitude circle close to the pole, compute

$$U^{(1)} = \frac{1}{NLON} \sum_{i=1}^{NLON} (U_i \cos \lambda_i - V_i \sin \lambda_i)$$

$$V^{(1)} = \frac{1}{NLON} \sum_{i=1}^{NLON} (V_i \cos \lambda_i + U_i \sin \lambda_i)$$

where

$$\lambda_i = 2\pi (i-1) / NLON$$

$U^{(1)}, V^{(1)}$ approximate wind at the pole for longitude $i=1$ based on the wave number 1 components of U and V along the latitude.

Winds at other longitudes are given by

$$U_i^{pole} = U^{(1)} \cos \lambda_i + V^{(1)} \sin \lambda_i$$

$$V_i^{pole} = V^{(1)} \cos \lambda_i - U^{(1)} \sin \lambda_i$$

Example

Using T213 wind data at 500 hPa (from September 1991):

Distance of latitude circle from pole	2.5°	1.5°	.421868°*
NLON	144	240	640
Relative error in wind strength	2.9%	2.2%	0.1%
Absolute error in wind direction	13°	7°	0.7°

* Gaussian latitude nearest to pole

N160 Quasi-regular Gaussian Grid

The N160 Gaussian grid, introduced with the operational spectral model on 17 September 1991, has an irregular number of points along a line of latitude as well as an irregular interval between latitudes. The number of points along each line of latitude are listed below. The first point in each row is on the 0 meridian. The grid points along each line of latitude are evenly spaced. The grid is symmetric about the Equator.

Row	Latitude (deg)	Points per row	Row	Latitude (deg)	Points per row	Row	Latitude (deg)	Points per row
1	89.5702	12	55	59.2511	360	109	28.9235	576
2	89.0132	16	56	58.6894	360	110	28.3619	576
3	88.4530	20	57	58.1278	360	111	27.8003	576
4	87.8921	24	58	57.5662	360	112	27.2387	576
5	87.3308	30	59	57.0046	360	113	26.6770	576
6	86.7694	40	60	56.4430	360	114	26.1154	576
7	86.2080	45	61	55.8813	360	115	25.5538	600
8	85.6465	50	62	55.3197	375	116	24.9922	600
9	85.0850	60	63	54.7581	375	117	24.4305	600
10	84.5235	64	64	54.1965	375	118	23.8689	600
11	83.9619	72	65	53.6348	384	119	23.3073	600
12	83.4003	75	66	53.0732	400	120	22.7457	600
13	82.8388	80	67	52.5116	400	121	22.1841	600
14	82.2772	90	68	51.9500	400	122	21.6224	600
15	81.7156	96	69	51.3884	400	123	21.0608	600
16	81.1540	100	70	50.8267	405	124	20.4992	600
17	80.5924	108	71	50.2651	432	125	19.9376	640
18	80.0308	120	72	49.7035	432	126	19.3760	640
19	79.4692	120	73	49.1419	432	127	18.8143	640
20	78.9076	128	74	48.5803	432	128	18.2527	640
21	78.3460	135	75	48.0186	432	129	17.6911	640
22	77.7844	144	76	47.4570	450	130	17.1295	640
23	77.2228	144	77	46.8954	450	131	16.5678	640
24	76.6612	150	78	46.3338	450	132	16.0062	640
25	76.0996	160	79	45.7722	450	133	15.4446	640
26	75.5380	160	80	45.2105	480	134	14.8830	640
27	74.9763	180	81	44.6489	480	135	14.3214	640
28	74.4147	180	82	44.0873	480	136	13.7597	640
29	73.8531	180	83	43.5257	480	137	13.1981	640
30	73.2915	192	84	42.9641	480	138	12.6365	640
31	72.7299	192	85	42.4024	480	139	12.0749	640
32	72.1683	200	86	41.8408	480	140	11.5132	640
33	71.6067	216	87	41.2792	500	141	10.9516	640
34	71.0450	216	88	40.7176	500	142	10.3900	640
35	70.4834	216	89	40.1559	500	143	9.8284	640
36	69.9218	225	90	39.5943	500	144	9.2668	640
37	69.3602	240	91	39.0327	500	145	8.7051	640
38	68.7986	240	92	38.4711	512	146	8.1435	640
39	68.2370	240	93	37.9095	512	147	7.5819	640
40	67.6753	256	94	37.3478	512	148	7.0203	640
41	67.1137	256	95	36.7862	540	149	6.4587	640
42	66.5521	256	96	36.2246	540	150	5.8970	640
43	65.9905	288	97	35.6630	540	151	5.3354	640
44	65.4289	288	98	35.1014	540	152	4.7738	640
45	64.8672	288	99	34.5397	540	153	4.2122	640
46	64.3056	288	100	33.9781	540	154	3.6505	640
47	63.7440	288	101	33.4165	540	155	3.0889	640
48	63.1824	300	102	32.8549	540	156	2.5273	640
49	62.6208	300	103	32.2932	576	157	1.9657	640
50	62.0592	300	104	31.7316	576	158	1.4041	640
51	61.4975	320	105	31.1700	576	159	0.8424	640
52	60.9359	320	106	30.6084	576	160	0.2808	640
53	60.3743	320	107	30.0468	576			
54	59.8127	324	108	29.4851	576			

N.B. On a regular N160 Gaussian grid the interval along a latitude is .5625 degrees

SOIL DEPTHS

For periods **before 4 August 1993** the following fields are available:

- surface temperature and surface soil wetness for the sub-surface layer
0 - 7 cm
- deep-soil temperature and wetness for the sub-surface layer 7 - 49 cm
- climatological deep-soil temperature and wetness for the sub-surface
layer 49 - 91 cm.

For periods **from 4 August 1993** the following fields are available:

- surface temperature and wetness (level 1) for the sub-surface layer
0 - 7 cm
- surface temperature and wetness (level 2) for the sub-surface layer
7 - 21 cm
- surface temperature and wetness (level 3) for the sub-surface layer
21 - 100 cm.

**ORDER FORM FOR ECMWF/TOGA BASIC
LEVEL III-A SURFACE DATA SET**

Name: _____

Organisation: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email Address: _____

Telex: _____

Please indicate which category given below nearest describes the organisation, and the users, which will use the data and give further information where appropriate:

Member State National Meteorological Service

Non-Member State National Meteorological Service.

Government body / institute active or with interests in the meteorological field.

Other non-profit seeking organisation; please state main source of funds below.*

Commercial

International organisation; please state main agency below.*

* Specify main source of funds or main agency as appropriate: _____

Please indicate which machine(s) you will be using to read and decode the data in order to help us determine which version of the software package to deliver:

CRAY

VAX

IBM RS6000

SUN

SGI

Other; please specify: _____

Please complete the remainder of the form according to your requirements:

OUTPUT FORMAT: All data will be supplied in FM 92 GRIB, on IBM tape or cartridge or EXABYTE tape. Data written to IBM tapes will be written with fixed length tape blocks, each GRIB message beginning with a new tape block. Tape block lengths will be 30,000 bytes or less.

Max. block length in bytes for IBM tapes /cartridges:

--	--	--	--	--

MEDIA: IBM 3420 Tape (1600 bpi)*

(select one option) IBM 3420 Tape (6250 bpi)*

IBM 3480 Cartridge (18-track)

8mm Exabyte Cartridge

* Unless an 'X' is entered in the adjacent box, IBM 3420 tapes will be dispatched in transit boxes to reduce the risk of damage to the tapes. ECMWF requires that these boxes be returned at the customer's expense.

--

DATA TYPE: Uninitialised analysis data

DATES: Start date (YYMMDD)

End date (YYMMDD)

TIMES: 0000 UTC

1200 UTC

AREA: Select EITHER the whole globe:

--

OR a sub-area:

northern latitude**

western longitude**

southern latitude**

eastern longitude**

				•				
				•				
				•				
				•				

**For latitudes, + represents north, - represents south of the equator; for longitudes + represents east, - represents west of the 0 degree meridian.

REPRESENTATION/RESOLUTION:

Lat/long grid

X

grid length

2	•	5	0	0	0
---	---	---	---	---	---

degs.

PARAMETERS:

Surface pressure

Surface temperature / soil temperature (level 1)¹

10 metre u

10 metre v

2 metre temperature

2 metre dewpoint temperature

Mean seal level pressure

Surface geopotential

Land-sea mask

Notes:

¹ Surface temperature field was renamed surface temperature (level 1) on 4/8/93.

Data are supplied by ECMWF subject to the following conditions:

1. The supplied data will not be supplied in whole or in part to any third party without the authorisation of ECMWF.
2. Articles, papers, or written scientific works of any form, based in whole or in part on data supplied by ECMWF, will contain an acknowledgement concerning the supplied data. The data may be cited as follows: "ECMWF 1994. The Description of the ECMWF/WCRP Level III-A Global Atmospheric Data Archive."
3. Although every care has been taken in preparing and testing the data, ECMWF cannot guarantee that the data are correct in all circumstances; neither does ECMWF accept any liability whatsoever for any error or omission in the data, or for any loss or damage arising from its use.
4. Access to the data is restricted to the scientists within the organisation of the data recipient, working on the same computer installation.
5. The recipient of the data will accept responsibility for informing all data users of these conditions.

This is to certify that I/we agree to the above conditions with respect to the supply of data by ECMWF.

Signed: _____ Date: _____

Payment is preferred in pounds sterling. The invoice will be in £ sterling, with the equivalent in US\$.

Please note that according to the ECMWF Council rules governing the provision of data, organisations within the Member States are requested to contact their national meteorological service, whose written approval is required before ECMWF can commence extracting data for the order.

For ECMWF internal use only

Date of order received/confirmed	<input type="text"/>
Number of IBM tapes/cartridges supplied	<input type="text"/>
Number of Exabyte tapes supplied	<input type="text"/>
Amount charged for order	<input type="text"/>
Invoice number	<input type="text"/>
Budget reference	<input type="text"/>

a) Authorised	_____	_____
	Department Head	Date
b) Approved	_____	_____
	Financial Comptroller	Date

**ORDER FORM FOR ECMWF/TOGA BASIC
LEVEL III-A UPPER AIR DATA SET**

Name: _____

Organisation: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email Address: _____

Telex: _____

Please indicate which category given below nearest describes the organisation, and the users, which will use the data and give further information where appropriate:

Member State National Meteorological Service

Non-Member State National Meteorological Service.

Government body / institute active or with interests in the meteorological field.

Other non-profit seeking organisation; please state main source of funds below.*

Commercial

International organisation; please state main agency below.*

* Specify main source of funds or main agency as appropriate: _____

Please indicate which machine(s) you will be using to read and decode the data in order to help us determine which version of the software package to deliver:

CRAY

VAX

IBM RS6000

SUN

SGI

Other; please specify: _____

Please complete the remainder of the form according to your requirements:

OUTPUT FORMAT: All data will be supplied in FM 92 GRIB, on IBM tape or cartridge or EXABYTE tape. Data written to IBM tapes will be written with fixed length tape blocks, each GRIB message beginning with a new tape block. Tape block lengths will be 30,000 bytes or less.

Max. block length in bytes for IBM tapes /cartridges:

--	--	--	--	--

MEDIA: IBM 3420 Tape (1600 bpi)*

(select one option) IBM 3420 Tape (6250 bpi)*

IBM 3480 Cartridge (18-track)

8mm Exabyte Cartridge

* Unless an 'X' is entered in the adjacent box, IBM 3420 tapes will be dispatched in transit boxes to reduce the risk of damage to the tapes. ECMWF requires that these boxes be returned at the customer's expense.

--

DATA TYPE: Uninitialised analysis data

DATES: Start date (YYMMDD)

End date (YYMMDD)

TIMES: 0000 UTC

1200 UTC

AREA: Select EITHER the whole globe:

--

OR a sub-area:

northern latitude**

western longitude**

southern latitude**

eastern longitude**

				•				
				•				
				•				
				•				

**For latitudes, + represents north, - represents south of the equator; for longitudes + represents east, - represents west of the 0 degree meridian.

REPRESENTATION/RESOLUTION:

Lat/long grid

X

grid length

2

•

5

0

0

0

deg.

LEVELS (hPa):

PARAMETERS:	1000	925 ¹	850	700	500	400	300	250	200	150	100	70	50	30	10
Geopotential															
Temperature															
Vertical velocity															
U-velocity															
V-velocity															
Relative humidity															

Note:

¹ The pressure level 925 hPa is not available before 1/1/92.

Data are supplied by ECMWF subject to the following conditions:

1. The supplied data will not be supplied in whole or in part to any third party without the authorisation of ECMWF.
2. Articles, papers, or written scientific works of any form, based in whole or in part on data supplied by ECMWF, will contain an acknowledgement concerning the supplied data. The data may be cited as follows: "ECMWF 1994. The Description of the ECMWF/WCRP Level III-A Global Atmospheric Data Archive."
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4. Access to the data is restricted to the scientists within the organisation of the data recipient, working on the same computer installation.
5. The recipient of the data will accept responsibility for informing all data users of these conditions.

This is to certify that I/we agree to the above conditions with respect to the supply of data by ECMWF.

Signed: _____ Date: _____

Payment is preferred in pounds sterling. The invoice will be in £ sterling, with the equivalent in US\$.

Please note that according to the ECMWF Council rules governing the provision of data, organisations within the Member States are requested to contact their national meteorological service, whose written approval is required before ECMWF can commence extracting data for the order.

For ECMWF internal use only

Date of order received/confirmed	<input type="text"/>
Number of IBM tapes/cartridges supplied	<input type="text"/>
Number of Exabyte tapes supplied	<input type="text"/>
Amount charged for order	<input type="text"/>
Invoice number	<input type="text"/>
Budget reference	<input type="text"/>

a) Authorised	_____	_____
	Department Head	Date
b) Approved	_____	_____
	Financial Comptroller	Date

**ORDER FORM FOR ECMWF/TOGA BASIC
LEVEL III-A CONSOLIDATED DATA SET**

Name: _____

Organisation: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email Address: _____

Telex: _____

Please indicate which category given below nearest describes the organisation, and the users, which will use the data and give further information where appropriate:

Member State National Meteorological Service

Non-Member State National Meteorological Service.

Government body / institute active or with interests in the meteorological field.

Other non-profit seeking organisation; please state main source of funds below.*

Commercial

International organisation; please state main agency below.*

* Specify main source of funds or main agency as appropriate: _____

Please indicate which machine(s) you will be using to read and decode the data in order to help us determine which version of the software package to deliver:

CRAY

VAX

IBM RS6000

SUN

SGI

Other; please specify: _____

Please complete the remainder of the form according to your requirements:

OUTPUT FORMAT: All data will be supplied in FM 92 GRIB, on IBM tape or cartridge or EXABYTE tape. Data written to IBM tapes will be written with fixed length tape blocks, each GRIB message beginning with a new tape block. Tape block lengths will be 10,560.

MEDIA: IBM 3420 Tape (1600 bpi)*
(select one option) IBM 3420 Tape (6250 bpi)*
IBM 3480 Cartridge (18-track)
8mm Exabyte Cartridge

* Unless an 'X' is entered in the adjacent box, IBM 3420 tapes will be dispatched in transit boxes to reduce the risk of damage to the tapes. ECMWF requires that these boxes be returned at the customer's expense.

--

DATA TYPE: Uninitialised analysis data

DATES: Start date (YYMM)
End date (YYMM)

TIMES: 0000 UTC
1200 UTC

AREA: Whole globe

REPRESENTATION/RESOLUTION:

Lat/long grid

X

grid length

2	•	5	0	0	0
---	---	---	---	---	---

degs.

SURFACE PARAMETERS:

Surface pressure
Surface temperature / soil temperature (level 1)¹
10 metre u
10 metre v
2 metre temperature
2 metre dewpoint temperature
Mean sea level pressure
Surface geopotential
Land-sea mask

UPPER AIR PARAMETERS:

Geopotential
Temperature
u-velocity
v-velocity
Vertical velocity
Relative humidity

UPPER AIR PRESSURE LEVELS:

1000,925²,850,700,500,400,300,250,200,150,100,70,50,30,10 hPa

Notes:

- ¹ Surface temperature field was renamed surface temperature (level 1) on 4/8/93.
- ² The pressure level 925 hPa is not available before 1/1/92.

Data are supplied by ECMWF subject to the following conditions:

1. The supplied data will not be supplied in whole or in part to any third party without the authorisation of ECMWF.
2. Articles, papers, or written scientific works of any form, based in whole or in part on data supplied by ECMWF, will contain an acknowledgement concerning the supplied data. The data may be cited as follows: "ECMWF1994. The Description of the ECMWF/WCRP Level III-A Global Atmospheric Data Archive."
3. Although every care has been taken in preparing and testing the data, ECMWF cannot guarantee that the data are correct in all circumstances; neither does ECMWF accept any liability whatsoever for any error or omission in the data, or for any loss or damage arising from its use.
4. Access to the data is restricted to the scientists within the organisation of the data recipient, working on the same computer installation.
5. The recipient of the data will accept responsibility for informing all data users of these conditions.

This is to certify that I/we agree to the above conditions with respect to the supply of data by ECMWF.

Signed: _____ Date: _____

Payment is preferred in pounds sterling. The invoice will be in £ sterling, with the equivalent in US\$.

Please note that according to the ECMWF Council rules governing the provision of data, organisations within the Member States are requested to contact their national meteorological service, whose written approval is required before ECMWF can commence extracting data for the order.

For ECMWF internal use only

Date of order received/confirmed	<input type="text"/>
Number of IBM tapes/cartridges supplied	<input type="text"/>
Number of Exabyte tapes supplied	<input type="text"/>
Amount charged for order	<input type="text"/>
Invoice number	<input type="text"/>
Budget reference	<input type="text"/>

a) Authorised _____
Department Head Date

b) Approved _____
Financial Comptroller Date

**ORDER FORM FOR ECMWF/TOGA ADVANCED OPERATIONAL
ANALYSIS SURFACE AND DIAGNOSTIC FIELDS DATA SET**

Name: _____

Organisation: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email Address: _____

Telex: _____

Please indicate which category given below nearest describes the organisation, and the users, which will use the data and give further information where appropriate:

Member State National Meteorological Service

Non-Member State National Meteorological Service.

Government body / institute active or with interests in the meteorological field.

Other non-profit seeking organisation; please state main source of funds below.*

Commercial

International organisation; please state main agency below.*

* Specify main source of funds or main agency as appropriate: _____

Please indicate which machine(s) you will be using to read and decode the data in order to help us determine which version of the software package to deliver:

CRAY

VAX

IBM RS6000

SUN

SGI

Other; please specify: _____

Please complete the remainder of the form according to your requirements:

OUTPUT FORMAT: All data will be supplied in FM 92 GRIB, on IBM tape or cartridge or 8mm EXA-BYTE tape. Data written to IBM tapes will be written with fixed length tape blocks, each GRIB message beginning with a new tape block. Tape block lengths will be 30,000 bytes or less.

Max. block length in bytes for IBM tapes /cartridges:

--	--	--	--	--	--

MEDIA: IBM 3420 Tape (1600 bpi)*

(select one option) IBM 3420 Tape (6250 bpi)*

IBM 3480 Cartridge (18-track)

8 mm Exabyte Cartridge

* Unless an 'X' is entered in the adjacent box, IBM 3420 tapes will be dispatched in transit boxes to reduce the risk of damage to the tapes. ECMWF requires that these boxes be returned at the customer's expense.

--

DATA TYPE: Uninitialised analysis data

DATES: Start date (YYMMDD)

End date (YYMMDD)

TIMES: 0000 UTC

0600 UTC

1200 UTC

1800 UTC

AREA: Select EITHER the whole globe:

--

OR a sub-area:

northern latitude**

western longitude**

southern latitude**

eastern longitude**

				•				
				•				
				•				
				•				

**For latitudes, + represents north, - represents south of the equator; for longitudes + represents east, - represents west of the 0 degree meridian.

2&4

Climatological deep soil temperature^{8&9}

⁹ Fields are not available before 15/7/86.

Data are supplied by ECMWF subject to the following conditions:

1. The supplied data will not be supplied in whole or in part to any third party without the authorisation of ECMWF.
2. Articles, papers, or written scientific works of any form, based in whole or in part on data supplied by ECMWF, will contain an acknowledgement concerning the supplied data. The data may be cited as follows: "ECMWF 1994. The Description of the ECMWF/WCRP Level III-A Global Atmospheric Data Archive."
3. Although every care has been taken in preparing and testing the data, ECMWF cannot guarantee that the data are correct in all circumstances; neither does ECMWF accept any liability whatsoever for any error or omission in the data, or for any loss or damage arising from its use.
4. Access to the data is restricted to the scientists within the organisation of the data recipient, working on the same computer installation.
5. The recipient of the data will accept responsibility for informing all data users of these conditions.

This is to certify that I/we agree to the above conditions with respect to the supply of data by ECMWF.

Signed: _____ Date: _____

Payment is preferred in pounds sterling. The invoice will be in £ sterling, with the equivalent in US\$.

Please note that according to the ECMWF Council rules governing the provision of data, organisations within the Member States are requested to contact their national meteorological service, whose written approval is required before ECMWF can commence extracting data for the order.

For ECMWF internal use only

Date of order received/confirmed	<input type="text"/>
Number of IBM tapes/cartridges supplied	<input type="text"/>
Number of Exabyte tapes supplied	<input type="text"/>
Amount charged for order	<input type="text"/>
Invoice number	<input type="text"/>
Budget reference	<input type="text"/>

a) Authorised	_____	_____
	Department Head	Date
b) Approved	_____	_____
	Financial Comptroller	Date

**ORDER FORM FOR ECMWF/TOGA ADVANCED OPERATIONAL
ANALYSIS UPPER AIR DATA SET**

Name: _____

Organisation: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email Address: _____

Telex: _____

Please indicate which category given below nearest describes the organisation, and the users, which will use the data and give further information where appropriate:

Member State National Meteorological Service

Non-Member State National Meteorological Service.

Government body / institute active or with interests in the meteorological field.

Other non-profit seeking organisation; please state main source of funds below.*

Commercial

International organisation; please state main agency below.*

* Specify main source of funds or main agency as appropriate: _____

Please indicate which machine(s) you will be using to read and decode the data in order to help us determine which version of the software package to deliver:

CRAY

VAX

IBM RS6000

SUN

SGI

Other; please specify: _____

Please complete the remainder of the form according to your requirements:

OUTPUT FORMAT: All data will be supplied in FM 92 GRIB, on IBM tape or cartridge or EXABYTE tape. Data written to IBM tapes will be written with fixed length tape blocks, each GRIB message beginning with a new tape block. Tape block lengths will be 30,000 bytes or less.

Max. block length in bytes for IBM tapes /cartridges:

--	--	--	--	--

MEDIA: IBM 3420 Tape (1600 bpi)*

(select one option) IBM 3420 Tape (6250 bpi)*

IBM 3480 Cartridge(18-track)

IBM 3480 Cartridge(36-track)

8mm Exabyte Cartridge

* Unless an 'X' is entered in the adjacent box, IBM 3420 tapes will be dispatched in transit boxes to reduce the risk of damage to the tapes. ECMWF requires that these boxes be returned at the customer's expense.

--

DATA TYPE: Uninitialised analysis data

DATES: Start date (YYMMDD)

End date (YYMMDD)

TIMES: 0000 UTC

0600 UTC

1200 UTC

1800 UTC

AREA: Select EITHER the whole globe:

--

OR a sub-area:

northern latitude**

western longitude**

southern latitude**

eastern longitude**

				•				
				•				
				•				
				•				

**For latitudes, + represents north, - represents south of the equator; for longitudes + represents east, - represents west of the 0 degree meridian.

REPRESENTATION/RESOLUTION:

(select one option)

Lat/long grid

Gaussian grid

Spherical harmonics

grid length

	•			

degs.¹

number of latitudes, N

2&4

triangular truncation

3&4&5

LEVELS (hPa):

PARAMETERS:	1000	925 ⁶	850	700	500	400	300	250	200	150	100	70	50	30	10
Geopotential															
Temperature															
Vertical velocity															
U-velocity															
V-velocity															
Relative humidity															

Notes:

- For a lat/long grid, the grid length which represents the model resolution is 1.875 for the period 1/1/85 to 31/4/85; 1.125 for the period 1/5/85 to 16/9/91; and 0.5625 thereafter. From 17/9/91, data may be extrapolated to a lat/long grid with grid length 0.5.
- For a Gaussian grid, the number of latitude lines between a pole and the equator is required: the model resolution is N48 for the period 1/1/85 to 31/4/85; N80 for the period 1/5/85 to 16/9/91; and N160 thereafter. Data will not be extrapolated to higher resolutions.
- For spherical harmonics, the triangular truncation is required: model resolution is T63 for the period 1/1/85 to 31/4/85; T106 for the period 1/5/85 to 16/9/91; and T213 thereafter. Data will not be extrapolated to higher resolutions.
- Software to interpolate data to a lat/long grid cannot be supplied by ECMWF.
- Data can only be supplied for the whole globe.
- The pressure level 925 hPa is not available before 1/1/92.

Data are supplied by ECMWF subject to the following conditions:

1. The supplied data will not be supplied in whole or in part to any third party without the authorisation of ECMWF.
2. Articles, papers, or written scientific works of any form, based in whole or in part on data supplied by ECMWF, will contain an acknowledgement concerning the supplied data. The data may be cited as follows: "ECMWF 1994. The Description of the ECMWF/WCRP Level III-A Global Atmospheric Data Archive."
3. Although every care has been taken in preparing and testing the data, ECMWF cannot guarantee that the data are correct in all circumstances; neither does ECMWF accept any liability whatsoever for any error or omission in the data, or for any loss or damage arising from its use.
4. Access to the data is restricted to the scientists within the organisation of the data recipient, working on the same computer installation.
5. The recipient of the data will accept responsibility for informing all data users of these conditions.

This is to certify that I/we agree to the above conditions with respect to the supply of data by ECMWF.

Signed: _____ Date: _____

Payment is preferred in pounds sterling. The invoice will be in £ sterling, with the equivalent in US\$.

Please note that according to the ECMWF Council rules governing the provision of data, organisations within the Member States are requested to contact their national meteorological service, whose written approval is required before ECMWF can commence extracting data for the order.

For ECMWF internal use only

Date of order received/confirmed	<input type="text"/>
Number of IBM tapes/cartridges supplied	<input type="text"/>
Number of Exabyte tapes supplied	<input type="text"/>
Amount charged for order	<input type="text"/>
Invoice number	<input type="text"/>
Budget reference	<input type="text"/>

a) Authorised _____
Department Head Date

b) Approved _____
Financial Comptroller Date

**ORDER FORM FOR ECMWF/TOGA
SUPPLEMENTARY FIELDS DATA SET**

Name: _____

Organisation: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email Address: _____

Telex: _____

Please indicate which category given below nearest describes the organisation, and the users, which will use the data and give further information where appropriate:

Member State National Meteorological Service

Non-Member State National Meteorological Service.

Government body / institute active or with interests in the meteorological field.

Other non-profit seeking organisation; please state main source of funds below.*

Commercial

International organisation; please state main agency below.*

* Specify main source of funds or main agency as appropriate: _____

Please indicate which machine(s) you will be using to read and decode the data in order to help us determine which version of the software package to deliver:

CRAY

VAX

IBM RS6000

SUN

SGI

Other; please specify: _____

Please complete the remainder of the form according to your requirements:

OUTPUT FORMAT: All data will be supplied in FM 92 GRIB, on IBM tape or cartridge or EXABYTE tape. Data written to IBM tapes will be written with fixed length tape blocks, each GRIB message beginning with a new tape block. Tape block lengths will be 30,000 bytes or less.

Max. block length in bytes for IBM tapes /cartridges:

--	--	--	--	--

MEDIA:

IBM 3420 Tape (1600 bpi)*

(select one option)

IBM 3420 Tape (6250 bpi)*

IBM 3480 Cartridge (18-track)

8mm Exabyte Cartridge

* Unless an 'X' is entered in the adjacent box, IBM 3420 tapes will be dispatched in transit boxes to reduce the risk of damage to the tapes. ECMWF requires that these boxes be returned at the customer's expense.

--

DATA TYPE:

6-hour forecast

DATES:

Start date (YYMMDD)

End date (YYMMDD)

TIMES:

0000 UTC

0600 UTC

1200 UTC

1800 UTC

AREA:

Select EITHER the whole globe:

--

OR a sub-area:

northern latitude**

western longitude**

southern latitude**

eastern longitude**

				•				
				•				
				•				
				•				

**For latitudes, + represents north, - represents south of the equator; for longitudes + represents east, - represents west of the 0 degree meridian.

REPRESENTATION/RESOLUTION:

(select one option)

Lat/long grid

grid length

	•				
--	---	--	--	--	--

degs.¹

Gaussian grid

number of latitudes, N

2&4

PARAMETERS:

Surface sensible heat flux⁵

Surface latent heat flux⁵

Surface solar radiation⁵

Surface thermal radiation⁵

Top solar radiation⁵

Top thermal radiation⁵

U-component of surface stress⁵

V-component of surface stress⁵

Total cloud cover

Notes:

- ¹ For a lat/long grid, the grid length which represents the model resolution is 1.875 for the period 1/1/85 to 31/4/85; 1.125 for the period 1/5/85 to 16/9/91; and 0.5625 thereafter. From 17/9/91, data may be extrapolated to a lat/long grid with grid length 0.5.
- ² For a Gaussian grid, the number of latitude lines between a pole and the equator is required: the model resolution is N48 for the period 1/1/85 to 31/4/85; N80 for the period 1/5/85 to 16/9/91; and N160 thereafter. Data will not be extrapolated to higher resolutions.
- ⁴ Software to interpolate data to a lat/long grid cannot be supplied by ECMWF.
- ⁵ Fields contain values which have been accumulated over 6 hours since the start of the forecast.

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3. Although every care has been taken in preparing and testing the data, ECMWF cannot guarantee that the data are correct in all circumstances; neither does ECMWF accept any liability whatsoever for any error or omission in the data, or for any loss or damage arising from its use.
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5. The recipient of the data will accept responsibility for informing all data users of these conditions.

This is to certify that I/we agree to the above conditions with respect to the supply of data by ECMWF.

Signed: _____ Date: _____

Payment is preferred in pounds sterling. The invoice will be in £ sterling, with the equivalent in US\$.

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	Department Head	Date
b) Approved	_____	_____
	Financial Comptroller	Date