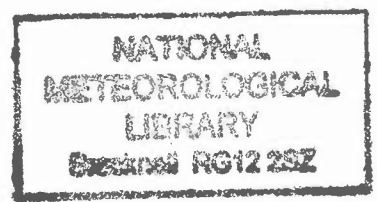


DUPLICATE ALSO



HADLEY CENTRE TECHNICAL NOTE NO. 11

DIGITIZATION OF METFORM DATA AND CONVERSION TO
FLATFILE INTEGER FORMAT

By

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October 1999

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Digitization of Metform data And Conversion to Flatfile Integer Format

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October 1999

Unkeyed data for the period 1920 to 1939 were found on "Metforms" in the U.K. Met Office Archive. Part of these data with sheet numbers 30001 through 42999A containing data for the period 1935 to 1939 were digitized by Atlantic Data Services Ltd., Blandford, Dorset, between January and April 1996 at a cost of £50,000 (around 10p per record). A total of 478,796 records were keyed - 20,030 header records and 458,766 data records. This article describes how the original records were digitized into EBCDIC, quality controlled and converted to Flatfile format in preparation for later conversion to the U.S. LMR format before merging into COADS.

METFORMS

A Metform is a pre-printed sheet of paper with enough space to allow up to 48 meteorological reports - 4 daily observations for 12 days. Usually only 1 or 2 observations are made each day and often the sheet is only part used. The forms are completed during the ship's voyage and sent to London from Ports of Call. Metforms containing consecutive reports were usually given the same sheet number with an alphabetic character appended e.g. 31426, 31426A, 31426B. Most of the forms are in excellent condition but a very small number (around 150) were found to be unsuitable for keying. Many have additional notes describing severe weather conditions near storms and barograph traces are often included. A marker on the EBCDIC record will indicate that additional manuscript notes are available in the Archive. A copy of the Metform can be seen in Appendix 2.

DIGITIZATION

The Metforms are part of the National Archive and as such are not allowed away from official premises. However, the Met Office Librarian agreed that for the purpose of digitization the documents could be sent to Atlantic Data Services in small batches. A copy of the contract to digitize the records can be found in Appendix 7. There were a total of 104 boxes of documents to be transferred and it was agreed that up to 10 boxes could be transferred at any one time. Atlantic Data Services transport would collect 10 boxes on each visit. The data would be keyed at their Offices in Blandford and the resulting tapes and the 10 boxes returned when the next batch of documents were collected. When the tapes were received at the Met Office Archives they were transferred to the Computer Room prior to transferring the data to disk on COSMOS. The tapes were later returned to Atlantic Data Services.

The following quality control checks were made by Atlantic Data Services as the data were keyed.

1. Directions for surface wind, wind waves and swell waves were restricted to: 000-360, one of the standard 32 compass points (N/E, NNE, NE, etc), CONF (confused), VAR (variable) and CALM.
2. Time was accepted on the 24-hour clock - 00 to 24.
3. Date was checked against a system calendar for acceptable dates.
4. Latitude values were accepted in degrees and minutes from 0 through 90 degrees.
5. Longitude values were accepted in degrees and minutes from 0 through 180 degrees.
6. Quadrant values for Latitude and Longitude could only be keyed as N, S, E, or W.
7. To reduce keystrokes the Day of the Week was not keyed but calculated from the reported date. Unfortunately this prevented a later comparison of Day of the Week against Date for quality control purposes.

Atlantic Data Services used a contract programmer to design quality control for their systems. A better QC package could have been created if more time had been available for discussion. It would also have improved the quality of the data if the records could have been keyed twice but, with the financial constraint this was not possible.

A keying format was devised for the data but after around 4,000 records had been keyed it was found that attached thermometer readings were occasionally recorded in degrees Kelvin. A second data format was then created to allow for three digits in all the temperature fields. A second header format was also created at this time to allow for a minor deficiency.

Ship details and weather reports were digitized for each Metform. The ship details were stored in the header record and the weather reports were stored in data records. For each Metform sheet keyed there is one header record and up to 48 weather records. Both header and data records are 150 bytes in length. The header record is prefixed with the indicator '1' and contains information about the ship (Metform number, Ship name, Captain's name, route and height of barometer, etc). Each weather record is prefixed with the indicator '2' and contains one weather observation. Details of the Header Format are given in Appendix 3 and details of the Data Format are given in Appendix 4.

The data were keyed in 81 batches and stored as separate files - MED1.EEMETF01.DATA to MED1.EEMETF81.DATA. The files have mixed formats and are archived until May 2001. Appendix 5 indicates the format used for each file.

QUALITY CONTROL

For convenience of working, the records were converted to a unified format - Header Format 1 (despite its minor deficiency) and Data Format 2 - shown in Appendix 3 and Appendix 4. They were then concatenated and stored as one large data set of 72Mbytes - MED1.EEMETFRM.DATA2. Quality control programs were written to identify queries/errors in the various fields.

QC Program 1. The Header records were quality controlled and corrected. Reference was made to the original Metform manuscript to correct spelling mistakes and find missing

items. An asterisk was keyed when the value to be keyed could not be understood by the typist. After examining the occasions of asterisks it was clear that only a small number of typists used them and this was usually when say, the Captain's name could not be read. When this was understood most of the illegal characters could be changed without reference to the original observation, but the manuscript was referred to when necessary. Header records were manually created for Metforms, which were not keyed. But in these cases no weather reports followed. The data were stored in MED1.EEMETFRM.DATA3. (See Appendix 1)

QC Program 2. Illegal characters in the digitized weather records were found and corrected. Illegal characters were defined as characters in numeric fields (e.g. Date, Time, Pressure, Temperature fields) or non-acceptable characters in alphanumeric fields. E.g. Wind direction, Weather. Asterisks were also found in these weather records. As each field was checked and quality controlled, the asterisks were examined. These were either removed and the field left blank, changed to the best estimate or corrected after reference to the original manuscript. Asterisks are still likely to be found in fields, which have not been fully checked, e.g. Cloud type and sea and swell reports. The corrected data were archived as MED1.EEMETFRM.DATA4 until 30 June 2001. See Appendix 1.

QC Program 3. Pressure was expected to be keyed in inches of mercury, but after examining the records two types of error were found.

1. In some sequences of reports the inches value was not keyed when the inches value did not change.

E.g. 0000 GMT 29.34 inches was keyed as 2934
 0600 GMT .56 inches was keyed as 56
 1200 GMT .89 inches was keyed as 89
 1800 GMT 30.02 inches was keyed as 3002

This keying practice occurred in reports from only a small number of ships and the errors were corrected manually.

2. Pressure was occasionally recorded in whole millibars or millibars and tenths. There was sufficient keying space for the digits when whole millibars were found but when tenths were found and when the pressure was greater than 999.9 millibars the 1,000's digit was ignored. The conversion program used later to create the Flatfile format added 10000 when the value found was less than 500. The pressure-corrected data set was archived as MED1.EEMETFRM.DATA5 (See Appendix 1).

QC Program 4. Quality control tests were made on the time and position parameters. The records within each Metform were quality controlled to ensure that time went forward and that positions were such that the speed between pairs of positions was reasonable (i.e. less than 30 knots). A program to use the reported ships course and speed could not be developed in the time available. Positions reported over land were also examined. Many errors were due to the incorrect quadrant being indicated when the route crossed the equator, meridian or dateline. Others were due to positions given in mixed units - whole degrees, degrees and minutes or minutes given with only one digit. The last case caused the degrees to be misread.

Positions reported with only one digit in the minute field were corrected by program. The program stored in MED1.EEPROGLB.FORM(CORPOS2), see Appendix 1, was used to auto-correct around 2,500 records reporting in this way. The program examined the positions from all the reports from one Metform sheet. If the speed was excessive between

two reports or the position was 'on land' then a zero digit was inserted in the tens position of the minute field. The quality control tests were repeated. If no query was raised then the additional zero was accepted. Otherwise the original observation was used.

After further quality control and examination of the original manuscript another 3,000 records were individually corrected using program CORRECT2, see Appendix 1. The 3,000 records include a small number of second corrections to those records wrongly corrected by CORPOS2. For convenience of storage the corrections were prepared in batches and contained in five files, CORDATA1 to CORDATA5, stored as members of MED1.EEPROGLB.FORM.

The corrections stored in CORDATA1 were used to correct MED1.EEMEFORM.CORR1 to create MED1.EEMETFRM.CORR2.

The corrections stored in CORDATA2 were used to correct MED1.EEMEFORM.CORR2 to create MED1.EEMETFRM.CORR3.

The corrections stored in CORDATA3 were used to correct MED1.EEMEFORM.CORR3 to create MED1.EEMETFRM.CORR4.

The corrections stored in CORDATA4 were used to correct MED1.EEMEFORM.CORR4 to create MED1.EEMETFRM.CORR5.

The corrections stored in CORDATA5 were used to correct MED1.EEMEFORM.CORR5 to create MED1.EEMETFRM.CORR6.

The final corrected data are stored in MED1.EEMETFRM.CORR6.

It was not possible in the time available to correct, absolutely, all the reported positions but it is estimated that there might be up to 1,000 positions which are incorrect by up to 5 degrees of latitude or longitude. None should be 'on land'. If an observation was found to be totally unusable the latitude and longitude were set to 9999 and 99999 respectively.

CONVERSION TO FLATFILE FORMAT

From the final quality controlled EBCDIC data set, a Flatfile version was created, using the program MED1.EEPROGLB.FORM(CREATFT2). Subroutines were used to decode each element and full details will be found as comments within these Fortran routines. Markers have been set in the Flatfile, when applicable, to indicate precision and units used in the original observation. A summary of the routines is given in Appendix 6. A preliminary version containing only date and position was created in March 1999 -

MED1.EEMETFRM.FLAT1 and a later version (FLAT3) using the meteorological elements (as listed in Appendix 6) was created in October 1999. These data sets contain 578 Mbytes. The program has not been fully checked and there are known faults in some of the subroutines. Comments on the reliability are shown in the Appendix.

Appendix 9 lists a sample of Flatfiles created from the Metforms and Appendix 8 itemizes the meteorological parameters stored in Flatfile.

From this Flatfile format the records were converted to the Long Marine Record for the incorporation into COADS.

List of Appendices

Appendix 1	Programs and Data Sets
Appendix 2	Photocopy of Metform Sheet number 37267
Appendix 3	Format of Header Records
Appendix 4	Format of Data Records
Appendix 5	Format used in Metform Data Files
Appendix 6	Conversion Subroutines
Appendix 7	Format for Flatfile
Appendix 8	Listing of sample Flatfiles created from Metforms
Appendix 9	Listing of Flatfiles from Metform Sheet number 37267
Appendix 10	Contract awarded to Atlantic Data Services Ltd.

Programs

1. MED1.EEPROGLB.FORM(CORRECT2) to apply corrections stored in CORDATA1 to CORDATA5.
2. MED1.EEPROGLB.FORM(CREATFT2) to convert Metform records to Flatfile records. This file includes all required Subroutines.
3. MED1.EEPROGLB.FORM(CORPOS2) converts minute values in single digits to double digits.

Data Sets

MED1.EEMETF01.DATA to MED1.EEMETF81.DATA - Original keyed data (81 files), archived using the Met Office UABR Facility until May 2001

MED1.EEMETFRM.DATA2 - Concatenated original keyed data. Deleted.

MED1.EEMETFRM.DATA3 - Corrected header records. Deleted.

MED1.EEMETFRM.DATA4 - Illegal characters removed. Archived until June 2001

MED1.EEMETFRM.DATA4.BACK - Backup copy of Illegal characters removed. Archived until February 2004

MED1.EEMETFRM.DATA5 - Pressure field corrected. Deleted.

MED1.EEPROGLB.FORM(CORDATA1 to CORDATA5) - Corrections for individual numbered reports. Used in conjunction with MED1.EEPROGLB.FORM(CORRECT2) above.

MED1.EEMETFRM.CORR6 - Final quality controlled Metform data, archived using Met Office UABR Facility until October 2004.

MED1.EEMETFRM.CORR6.BACK - Backup of final quality controlled Metform data, archived using Met Office UABR Facility until October 2009.

MED1.EEMETFRM.FLAT1.DISK - Early version of Flatfile data set (March 1999), archived using Met Office UABR Facility until July 2004.

MED1.EEMETFRM.FLAT1.BACK - Backup of early version of Flatfile data set (March 1999), archived using Met Office UABR Facility until October 2009.

MED1.EEMETFRM.FLAT2.DISK - Second version of Flatfile data set (June 1999), archived using Met Office UABR Facility until July 2004.

MED1.EEMETFRM.FLAT2.BACK - Backup of second version of Flatfile data set (June 1999), archived using Met Office UABR Facility until October 2009.

MED1.EEMETFRM.FLAT3 - Third (but incomplete) version of Flatfile data set (October 1999), archived using Met Office UABR Facility until July 2009.

The examples shown in Appendix 9 are printed from this data set.

Photocopy of Metform

SYNCHRONIZED WEATHER OBSERVATIONS OVER ALL OCEANS.

OCEAN CURRENT OBSERVATIONS.

(Rig and Steam or Motor)

Address to which acknowledgment for this report and the Marine Observer may be sent.

96 P.S.N.C. CANADA DOCK, LIVERPOOL

Motor

Ship. LOSADA

Captain. M. ARMSTRONG, D.S.O.

Voyage—From COLON.

to LIVERPOOL.

Year 1937				Ship's Position, Course and Speed				Wind at time of observation		Barometer			Temperatures		Weather		Cloud Types and Amount				Sea		Swell		REMARKS			
Month Day Year				Latitude	Longitude	True Course	Away from Ship (in hours)	Direction True	Force 0-12	Uncorrected reading	Atmospheric Pressure at Sea Level	Change or Tendency of Barometer	Air	Sea Surface	At time of observation	Past Weather	Visibility by Scale	Lower Cloud Type	Middle Cloud Type	Upper Cloud Type	Total Clouds in tenths	Direction True	Direction by Dougal Scale	Direction True	Direction by Dougal Scale	Information relating to duration of rain, times of arrival and departure from port, phenomena.		
Month Day Year				N.	W.													Type	Amt. In tenths	Type	Type							
May	19	Wed	12	12.55	75.11	056	8.4	ENE	5	29.95	84	29.77	Steady	82	83	C	C	8	cu	3	-	cu	7	ENE	3	-	-	
May	20	Thu	12	14.55	72.30	059	8.4	ESE	5	29.98	83	29.81	Steady	82	83	O	C	8	cu	5	-	cu	9	ESE	3	-	-	
May	21	Fri	12	16.57	69.29	060	8.0	NE	5	30.08	78	29.92	Rising Slightly	74	80	OR	OQ	6	cu	10	-	-	10	NE	3	-	-	
May	23	Sun	12	20.45	65.19	041	9.5	SE	5	30.17	80	30.02	Steady	78	79	C	C	8	cu	5	a-st	ci-st	7	SE	1	E	1	
May	24	Mon	12	23.25	62.32	044	9.0	ENE	2	30.14	78	30.00	Steady	73	77	pc	pc	8	st-cu	8	-	-	8	ENE	1	-	9	
May	25	Tues	12	26.24	59.52	043	9.0	Calm	0	30.13	77	29.99	Steady	75	76	bc	C	6	cu	1	a-cu	ci	4	-	-	N	1	
May	26	Wed	12	29.09	56.44	043	9.2	Calm	0	30.16	74	30.04	Steady	72	72	C	O	7	cu	4	a-cu	ci	7	-	-	N	1	
May	27	Thu	12	31.50	53.46	046	9.3	NW	3	30.13	74	30.02	Steady	70	70	O	O	8	cu	2	-	ci-st	8	NW	2	N	4	
May	28	Fri	12	34.05	50.38	048	9.0	NW	2	30.08	74	29.97	Steady	70	69	bc	bc	9	cu	2	-	-	2	NW	2	NW	4	
May	29	Sat	12	36.37	47.13	048	9.5	NW	2	30.07	72	29.97	Steady	73	68	bc	C	8	cu	2	a-cu	ci	4	NW	2	NE	7	
May	30	Sun	12	39.16	43.43	052	9.5	SSW	4	30.10	73	30.01	Steady	71	68	O	C	8	st-cu	7	a-st	-	9	SSW	3	E	4	
May	31	Mon	12	41.30	39.28	054	10.0	S	5	30.10	71	30.02	Steady	66	66	O	C	8	cu	7	a-st	-	9	S	4	SE	1	

Year	Month	Day	Time	From	To	Position				Set Direction True	Drift Nautical Miles	REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1937	Month	Day	Time	Day	Time	Latitude N	Longitude W	Latitude N	Longitude W																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
May	18	Mon	19	Mon	12.51	78.02	12.51	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20	14.50	78.20

Was the speed measured by Log or Revolutions? LOG
 State of Loading, Light or Deep? DEEP Was the Propeller immersed? YES
 General Remarks as to reliance which may be placed on observations:—

Additional Remarks.

It is requested that remarks upon interesting experiences and full descriptions of phenomena, etc., should be entered in this space with a view to publication in "The Marine Observer."

Particulars of Instruments:—(Please write word *Ship* in each case where not *M.O.*)

Barometer, (Mercury or Aneroid)? *Mercur.* When and where last compared? *Jan. 18. 1937 at Liverpool.*
 Maker of Instrument and No. (if any) *Chadburn, n° 2679.* Error? *(Too High, Correct } at 2.99 ins. Height above Sea Level, 40. It*
 Numbers and Description of other Instruments— *Thermometer by Cassell's Date Sheet disposed*

Requirements for next voyage may, with advantage, be notified direct to the appropriate Port Meteorological Officer or Merchant Navy Agent. See list in "Marine Observer."

The observations recorded herein have been carefully made, and the Register, Form 138 attached, contains a true record of the coded messages sent by W.T., together with particulars of communication.

(If not a Sighted Ship, cross out words in italics).

Date *June 4th 1937*

Approved *[Signature]*
 Signature of Captain.

Form 911

(1181) HY 11222 256 18 000 5/23 J.C.S. L.L. Gp 119/96

AIR MINISTRY. METEOROLOGICAL OFFICE, LONDON.

SHIP'S METEOROLOGICAL RECORD OF SYNCHRONIZED OBSERVATIONS.

Captains of ships in the list of regular voluntary observing ships in "The Marine Observer", who are not detailed for keeping a meteorological log, are requested to have the necessary observations made and entered on this form.

It is desired that in observing ships which have two officers in each watch, observations should be recorded at all four times each day; but when there is only one officer in a watch, the observations should be made and recorded only at the times which fall in daylight.

These synchronized weather observations made at Greenwich Mean Time in all parts of the world, at times agreed to internationally, are desired for synoptic charts and many other purposes.

On completion of each voyage, or at intervals of not more than two months, these forms should be folded and returned to the address hereon. Postage from ports in Great Britain, Northern Ireland, and the Irish Free State need not be prepaid. Postage incurred from ports abroad will be refunded upon request.

Copies of "The Marine Observer" are sent to all ships on the list regularly contributing observations on these forms, and the necessary blank forms are sent with "The Marine Observer" or Supplement monthly.

As a check on the Barometer, the test card (Blue postcard) should be completed and sent in every three months if Form 906 has not been renewed by the Port Meteorological Officer or Agent during that period.

Full instructions as to observation and keeping these records are given in the 5TH EDITION OF THE MARINE OBSERVER'S HANDBOOK.

METEOROLOGICAL OFFICE, AIR MINISTRY, W.C.2.

1st MAY, 1930.

LONDON, W.C.2.

Kingsway,

Air Ministry,

Meteorological Office (M.O.I.),

The Director,

ON HIS MAJESTY'S SERVICE.

LETTERS TO INDICATE THE STATE OF THE WEATHER.

- | | |
|--|---|
| b Blue sky (less than a quarter covered). | o Overcast sky (whole sky covered with one impervious cloud). |
| bc Sky partly cloudy (between one quarter and three quarters covered). | p Passing showers. |
| c Generally cloudy (more than three quarters covered). | q Squalls. |
| d Drizzle, or fine rain. | r Rain. |
| e Wet air without rain falling. | rs Sleet, i.e., rain and snow together. |
| f Fog. | s Snow. |
| fs Wet fog. | t Thunder. |
| g Gloomy. | tl Thunderstorm. |
| h Hail. | u Ugly, threatening sky. |
| lq Line Squall. | v Unusual visibility. |
| l Lightning. | w Dew. |
| m Mist. | x Dust haze; the turbid atmosphere of dry weather. |

FOG AND VISIBILITY SCALE.

- | | |
|--|-------------------------------------|
| 0 Dense fog. | Objects not visible at 50 yards. |
| 1 Thick fog. | " " " " 1 cable. |
| 2 Fog. | " " " " 2 cables. |
| 3 Moderate fog. | " " " " 3 miles. |
| 4 Mist or haze, or very poor visibility. | " " " " 1 mile. |
| 5 Poor visibility. | " " " " 2 miles. |
| 6 Moderate visibility. | " " " " 5 " |
| 7 Good visibility. | " " " " 10 " |
| 8 Very good visibility. | " " " " 20 " |
| 9 Excellent visibility. | Objects visible more than 30 miles. |

DOUGLAS SEA AND SWELL SCALES SEPARATELY.

SEA SCALE.		SWELL SCALE.	
Scale No.	Description.	Scale No.	Description.
0	Calm.	0	No Swell.
1	Smooth.	1	Low swell, short or average length.
2	Slight.	2	Low swell, long.
3	Moderate.	3	Moderate swell, short.
4	Rough.	4	Moderate swell, average length.
5	Very rough.	5	Moderate swell, long.
6	High.	6	Heavy swell, short.
7	Very high.	7	Heavy swell, average length.
8	Precipitous.	8	Heavy swell, long.
9	Confused.	9	Confused.

Great care should be taken to enter into their proper columns the scale number and direction of Sea and Swell separately.

Format for Header Records

Format 1	Format 2	Type of Data	Description of Entries
Column Numbers			
1	1	Record Type	1
2 - 6	2 - 6	} Sheet Number	{ 33001 to 43000
7	7	}	{ Blank, A, B, or C etc
8 - 14	8 - 14	Ship Type	Steam, etc
15 - 34	15 - 34	Ship Name	
35 - 54	35 - 54	Captain's name	
55 - 74	55 - 74	Voyage from	
75 - 94	75 - 94	Voyage to	
95 - 97	95 - 97	Measurement by	Log or revolutions
98 -102	98 -102	Loading	Light or Deep
103	103	Propeller immersed	Yes or No
104 -106	104 -106	Barometer	MERcury or ANeroid
107		Not used	
108 -112	107 -111	Bar error too High	
113 -117	112 -116	Bar error too Low	
118 -122	117 -121	at Barometer reading	
123 -127	122 -126	Height of barometer	
128 -129	127 -128	Day }	
130 -131	129 -130	Month }	of barometer check
132 -135	131 -134	Year }	
136 -150	135 -150	Not used	

Format for Data Records

Format 1	Format 2	Column Numbers	Type of Data	Description of Entries
		1	1 NAO Record Type	2
		2 - 6	2 - 6 AO } Sheet Number	{ 33001 to 43000
		7	7 AO }	{ Blank, A, B, or C etc
		8 - 9	8 - 9 NAO Year	35 to 39
		10 - 11	10 - 11 NO Month	01 to 12
		12 - 13	12 - 13 NO Day of Month	01 to 31
		14 - 16	14 - 16 NO Day of Week	MON to SUN
		17 - 18	17 - 18 NO Hour	00 to 24
		19 - 22	19 - 22 NO Latitude	000 to 900
		23	23 AO Hemisphere	N or S
		24 - 28	24 - 28 NO Longitude	0000 to 1800
		29	29 AO Hemisphere	E or W
		30 - 33	30 - 33 NAR Course	000 to 360
		34 - 35	34 - 35 NR Speed	00 to 99
		36 - 39	36 - 39 NAR Wind Direction	N to N/W, 000 to 360, CALM or
		VAR		
		40 - 42	40 - 42 NR Wind Force	0 to 012 or ./.
		43 - 46	43 - 46 NR Pressure as read	0-520, 2700-3200 or 9800-9999 mb/in
		47 - 48	47 - 49 N Attached thermometer	-5 to 99 (ie degs C and F)
		49 - 52	50 - 53 N Pressure true	0-520, 2700-3200 or 9800-9999 mb/in
		53 - 54	54 - 56 N Air Temperature	-20 to 99 (ie degs C and F)
		55 - 56	57 - 59 N Sea Temperature	-2 to 99 (ie degs C and F)
		57 - 59	60 - 62 NA Present weather	Alpha or 0 to 9
		60 - 62	63 - 65 NA Past Weather	Alpha or 0 to 9
		63 - 65	66 - 68 N Visibility	0 to 9 or ./.
		66 - 69	69 - 72 A Low Cloud type	Alpha
		70 - 71	73 - 74 N Amount of Low Cloud	0 to 10
		72 - 75	75 - 78 A Middle Cloud Type	Alpha
		76 - 79	79 - 82 A Upper Cloud Type	Alpha
		80 - 81	83 - 84 N Total Cloud Amount	0 to 10
		82 - 85	85 - 88 A Sea Wave Direction	N to N/W, CALM, VAR or CONF
		86 - 88	89 - 91 N Sea Wave Amount	0 to 9 or ./.
		89 - 92	92 - 95 A Swell Wave Direction	N to N/W, CALM, VAR or CONF
		93 - 95	96 - 98 N Swell Wave Amount	0 to 9 or ./.
		96	99 N Remark Indicator	1
		97 -150	100 -150	Not Used

./. - a report in a range. E.g. Wind force 4/5 means force estimated between force 4 and 5.

N - Numeric Characters	}	
A - Alphabetic Characters	}	
R - Right Adjusted	}	
L - Left Adjusted	}	
O - Value fills the field	}	
		These descriptions are only an indication of how the field may be formatted. They should not be relied upon.

Formats used in Metform Data Files

The manuscript records were digitized onto files MED1.EEMETF01.DATA to MED.EEMETF81.DATA using the following formats.

	Header Format 1	Header Format 2	Header Format 1	Header Format 2
EEMETF01.DATA	X	-	X	-
EEMETF02.DATA	-	X	X	-
EEMETF03.DATA }				
To }	X	-	-	X
EEMETF81.DATA }				

All subsequent concatenated and manipulated data sets were formatted as:

X	-	-	X
---	---	---	---

Conversion Subroutines

The meteorological elements are each converted from EBCDIC to integer format for inclusion in the Flatfile. The subroutine used is shown and a short description of the process is given. The main program and all the subroutines are stored as one module in: MED1.EEPROGLB.FORM(CREATFT2).

The subroutine READ is an enhanced Fortran read subroutine, which returns -32768 if the field is blank and returns two values if the field contains /

Year, Month Day and Time: Uses READ. 1900 is added to the year, otherwise no conversion is necessary.

Latitude and Longitude: Uses LATCON and LONCON. Converts to minutes for the Flatfile. The sign is changed to negative when hemisphere S or W is found. If invalid positions (i.e. -32768 or 99999) are found the record is not copied to the Flatfile record.

Ship's Course: Subroutine SHPCOR. Converts the ship's course in degrees to a single digit:

Crse degs:	0	023-067	068-112	113-157	158-202	203-247	248-292	293-337	338-022
Code:	0	1	2	3	4	5	6	7	8

The results using this subroutine have not been fully checked.

Ship's Speed: Subroutine SHSPD. Converts ship's speed from knots to a single digit:

Speed kts:	0	1 - 3	4 - 6	7 - 9	10 - 12	13 - 15	16 - 18	19 - 21	22 - 24	>24
Code:	0	1	2	3	4	5	6	7	8	9

The results using this subroutine have not been fully checked.

Surface Wind, Sea and Swell Wave Direction: Subroutine COMCON. Converts direction to 360-point compass. The input is either 32 character compass direction or degrees in 36-point compass.

360-point compass = 32-point compass * 360/32

CONF (confused), VAR (variable) and CALM are accepted. Confused and Variable are set to 990 (Standard MDB code). Calm is set to 0.

Markers - Flatfile item 93 - set when a surface wind direction report is found.

Markers - Flatfile item 138 - set when a sea or swell wave direction report is found.

The results for Sea and Swell conversion have not been fully checked.

Wind Force: Subroutine F2SPD. Converts Beaufort force to knots.

Force:	0	1	2	3	4	5	6	7	8	9	10	11	12
Speed kts:	0	2	5	9	13	19	24	30	37	44	51	59	64

If two force values are found (e.g.1/2) then the speed is stored as the average value rounded up (e.g.4 knots).

Sea Level Pressure: Subroutine MSPL. Converts pressure in inches or whole millibars to millibars and tenths. The subroutine allows for the missing 1000 millibar value. 10000 is added if the value as read is less than 500. If the value as found is outside normal limits, the Flatfile is set to -32768. No use was made of the Pressure value as read and the attached thermometer reading.

Marker - Flatfile item 137 - is set to show when the units were not originally in millibars.

Marker - Flatfile item 108 - is set to show when the pressure was measured in whole units.

Air and Sea Temperature: Subroutine TEMP2C. Converts temperature in whole degrees Fahrenheit or Fahrenheit and tenths to Centigrade degrees and tenths.

Marker - item Flatfile item 102 - is set to show that the Air Temperature was measured in Fahrenheit.

Marker - Flatfile item 107 - is set to show that the Sea Temperature was measured in Fahrenheit.

Marker - Flatfile item 99 - is set to show that the Air Temperature was measured in whole degrees.

Marker - Flatfile item 105 - is set to show that the Sea Temperature was measured in whole degrees.

Present and Past Weather: Subroutine WX2CD. Converts Present and Past Weather character values to modern 2 digit code. This routine has not been fully developed.

Visibility: Subroutine VISIBL. Converts visibility to decametres.

Code: 0 1 2 3 4 5 6 7 8 9

Visibility Decs: 0 5 20 50 100 200 400 1000 2000 5000

If two visibility values are found (e.g. 1/2) then the average value rounded up (e.g. 13 decametres) is stored in the Flatfile record. This routine has not been fully developed.

Total Cloud amount and amount of Low Cloud: Subroutine TEN28T. Converts tenths to oktas.

Tenths: 0 1 2 3 4 5 6 7 8 9 10

Oktas: 0 1 2 2 3 4 5 6 6 7 8

Marker – Flatfile item 135 – is set to show that cloud amount was originally measured in tenths.

Type of Low Cloud: Subroutine LOWCLD. To converts low cloud type to modern digit code. This routine has not been fully developed.

Type of Medium Cloud: Subroutine MEDCLD. To converts medium cloud type to modern digit code. This routine has not been fully developed.

Type of High Cloud: Subroutine HGHCLD. To converts high cloud type to modern digit code. This routine has not been fully developed.

Sheet Number: Subroutine LOGNUM. Converts sheet number to integer*10 to allow for character suffix. E.g. 12345 converts to 123450, 12345A to 123451 and 12345B to 123452. 12345I converts to 123459. Suffixes after this remain as 123459. However suffixes beyond G have not been found.

Subroutines which are believed to contain errors.

Ship's Course and Speed

Present and Past Weather

Visibility

Types of Low, Medium and High Cloud

Sea Swell direction and amount

Elements which have not been copied to the Flatfile format.

Pressure as read

Attached Thermometer

Amount of sea wave

Amount of swell wave

Format for Flatfile

Item Description
Number

1. Month
2. Year
3. Day
4. Hour
5. Latitude
6. Longitude
7. Wind Direction
8. Wind Speed
9. Present Weather
10. Past Weather
11. Total amount of Cloud
12. Type of Low Cloud
13. Type of Medium Cloud
14. Type of High Cloud
15. Amount of Low Cloud
16. Height of Low Cloud
17. Visibility
18. Dry Bulb Temperature
19. Wet Bulb Temperature
20. Dew Point
21. Vapour Pressure
22. Relative Humidity
23. Sea-Level Pressure
24. Sea Surface Temperature

Significant Cloud (Max 4 groups)

25.
to Not used by Metforms
36.

Vertical Visibility

37. Not used by Metforms

Visually Observed Wave reports (max 3 groups)

- | | | | |
|-----|-----|-----|-----------------------|
| 38. | 41. | 44. | Direction |
| 39. | 42. | 45. | Period (Half seconds) |
| 40. | 43. | 46. | Height (Half metres) |

Ship Identification

47. UK Series Number or Country of Origin i.e. 216 for Metforms
48. Ship, Logbook or Metform sheet.

Markers

49.
to Not used by Metforms
51.

Sea Ice

52.
to Not used by Metforms
56.

Miscellaneous reports

57. ds Ship's course
58. vs Ship's speed
59.
to Not used by Metforms
88.

Ships's Time

89.
to Not used by Metforms
92

Indicators – 0(False) or 1(True)

93. Wind Direction converted from 32 point compass.
94. Not used by Metforms
95. Not used by Metforms
96. Not used by Metforms
97. Not used by Metforms
98. Not used by Metforms
99. Air Temperature (dry) measured in whole degrees
100. Not used by Metforms
101. Not used by Metforms
102. Air Temperature originally in degrees Fahrenheit
103. Not used by Metforms
104. Not used by Metforms
105. Sea Temperature measured in whole degrees
106. Not used by Metforms
107. Sea Temperature originally in degrees Fahrenheit
108. Pressure reported in whole units (mm or mbs)

Quality Control Flags

109.
to Not used by Metforms
124.

Markers (expanded from item 50)

125.
to Not used by Metforms
134.
135. Cloud amount originally in tenths
136. Not used by Metforms
137. Pressure known not to be measured by barometer, not calibrated in millibars or
from barograph
138. Sea and Swell not originally in 36 point compass
139. Not used by Metforms
140. Sea and Swell reports originally in units other than half metres and seconds codes.
141.
to Not used by Metforms
156.

157.
to NCARD - Not used by Metforms
181.

182. Non-matching indicators – Not used in Metforms

183.
to Metform in EBCDIC (see Appendix 4)
220.

221.
to Not used by Metforms
312.

Ship identifiers

- 313 Metform Number
314 Set to blank
315 Set to blank

Listing of sample Flatfiles created from Metforms

The sequential record number is shown. The items shown are the first 156 items from the basic Flatfile record. The decoded values from the Card Image (in items 157 to 181) and Non-matching indicators (in item 182) are not used in Metforms and are not shown. The Metform EBCDIC image is shown after CARD : This is 99 characters long with + indicating a blank column. The Metform identifiers are shown after SHIP : i.e. Sheet number and blank Call Sign (printed as Hex 40).

```
RECORD NUMBER:      1
   8   1935      24      12      495      -53      360      13      0      0
   8       8 -32768 -32768       8 -32768 1000 189 -32768 -32768
-32768 -32768 10132 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 360 -32768 -32768
293 -32768 -32768 -32768 -32768 -32768 -32768 216 330010 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 5 5 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 1 -32768 -32768 -32768 -32768 -32768 1 -32768
-32768 1 -32768 -32768 -32768 -32768 -32768 0 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 1 -32768 1 1 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
CARD :233001+350824SAT124930N00521W242+13N+++4++2995+672992+66+++O++OV+7++STCU10+++++++10N+++3++WNW+3+++
SHIP : 330010 40404040 40404040
```

```
RECORD NUMBER:      9
   8   1935      27      6      425      -230      270      13      50      50
   8       8 -32768 -32768       8 -32768 400 200 -32768 -32768
-32768 -32768 10237 206 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 270 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 216 330010 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 5 5 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 1 -32768 -32768 -32768 -32768 -32768 1 -32768
-32768 1 -32768 -32768 1 -32768 1 0 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 1 -32768 1 0 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
CARD :233001+350827TUE064233N02302W242+13W+++4++3030+703023+68+690CDOD+6++STCU10+++++++10W+++2+++++4+++
SHIP : 330010 40404040 40404040
```

```
RECORD NUMBER:    1004
   8   1935      31      12      189      395      11      2      5      0
   7       8 -32768 -32768       7 -32768 400 339 -32768 -32768
-32768 -32768 10030 300 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 0 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 216 330190 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 3 5 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 1 -32768 -32768 -32768 -32768 -32768 1 -32768
-32768 1 -32768 -32768 1 -32768 1 0 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 1 -32768 1 0 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
-32768 -32768 -32768 -32768 -32768 -32768 -32768 -32768
CARD :233019+350831SAT121854N03930E150+13N/E+1++2965+962962+93+86Z++B++6++STCU09+++++++090+++1+++++
SHIP : 330190 40404040 40404040
```

RECORD NUMBER: 1005

8	1935	31	18	178	402	0	0	5	5
7	8	-32768	-32768	7	-32768	400	317	-32768	-32768
-32768	-32768	10024	317	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	216	330190	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	3	5	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 233019+350831SAT181745N04011E145+130+++0++2961+912960+89+89Z++Z++6++STCU09++++++090+++0++++++
SHIP : 330190 40404040 40404040

RECORD NUMBER: 1006

9	1935	1	0	167	409	0	0	5	5
7	8	-32768	-32768	7	-32768	400	317	-32768	-32768
-32768	-32768	10020	300	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	216	330191	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	3	5	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 233019A350901SUN001640N04055E147+130+++0++2961+922959+89+86Z++Z++6++STCU09++++++090+++0+++++0+++
SHIP : 330191 40404040 40404040

RECORD NUMBER: 1007

9	1935	1	12	145	424	315	2	0	5
0	-32768	-32768	7	0	-32768	2000	333	-32768	-32768
-32768	-32768	10017	311	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	216	330191	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	3	5	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 233019A350901SUN121432N04224E144+13NW++1++2961+952958+92+88B++Z++8+++++00+++CIST030+++1+++++0+++
SHIP : 330191 40404040 40404040

RECORD NUMBER: 1188

9	1935	17	0	516	-201	315	24	0	0
4	2	-32768	-32768	4	-32768	2000	133	-32768	-32768
-32768	-32768	9970	150	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	315	-32768	-32768
293	-32768	-32768	-32768	-32768	-32768	216	330240	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	6	5	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	0	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 233024+350917TUE005135N02008W269+13NW++6++9947+290997+56+59BC+BC+8++CU++05O+++O+++05NW++5++WNW+4++1
SHIP : 330240 40404040 40404040

RECORD NUMBER: 1227

10	1935	4	18	518	-211	349	13	0	0
8	8	-32768	-32768	8	-32768	2000	117	-32768	-32768
-32768	-32768	10150	139	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	349	-32768	-32768
23	-32768	-32768	-32768	-32768	-32768	216	330241	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	2	5	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	0	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 233024A351004FRI185148N02107W089+15N/W+4++0125+281015+53+57O++C++8++STCU10+++++++1ON/W+3++NNE+5+++
SHIP : 330241 40404040 40404040

RECORD NUMBER: 11001

9	1935	23	12	117	-244	270	9	0	18
1	2	-32768	1	1	-32768	2000	289	-32768	-32768
-32768	-32768	10119	267	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	270	-32768	-32768
45	-32768	-32768	-32768	-32768	-32768	216	332240	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	5	5	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 233224+350923MON121140N02422W+20715W+++++33003081298884+80+B++CQ+++8CU++01++++CI++02W+++++2NE+++++1+
SHIP : 332240 40404040 40404040

RECORD NUMBER: 111000

6	1936	23	12	162	601	225	30	5	5
0	-32768	-32768	7	0	-32768	2000	272	-32768	-32768
-32768	-32768	9997	256	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	225	-32768	-32768
225	-32768	-32768	-32768	-32768	-32768	216	353801	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	2	6	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	0	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 235380A360623TUE121614N06006E+07716SW++++70028301999781+78+OZ+OZ+++8++++00++++CIST10SW+++7SW++++7+
SHIP : 353801 40404040 40404040

RECORD NUMBER: 111002

6	1936	24	0	170	634	248	30	5	18
0	-32768	3	-32768	0	-32768	1000	283	-32768	-32768
-32768	-32768	10011	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	248	-32768	-32768
236	-32768	-32768	-32768	-32768	-32768	216	353801	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	2	6	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	-32768	-32768	-32768	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	0	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 235380A360624WED001659N06326E+07716WSW+++70042302001183++++CZ+CQ+++7++++00AC+++++09WSW+++7SW/W++71
SHIP : 353801 40404040 40404040

RECORD NUMBER: 111006

6	1936	26	6	167	730	248	30	80	80
8	7	-32768	-32768	8	-32768	400	272	-32768	-32768
-32768	-32768	10032	272	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	248	-32768	-32768
248	-32768	-32768	-32768	-32768	-32768	216	353801	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	4	6	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	0	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD : 235380A360626FRI061642N07258E+17016WSW+++70061300003281+81+OPQOPQ++6NB++10+++++10WSW+++7WSW+++81
SHIP : 353801 40404040 40404040

Listing of Flatfiles created from Metform Sheet number 37267 (shown in Appendix 2)

The sequential record number is shown. The items shown are the first 156 items from the basic Flatfile record. The decoded values from the Card Image (in items 157 to 181) and Non-matching indicators (in item 182) are not used in Metforms and are not shown. The Metform EBCDIC image is shown after CARD : This is 99 characters long with + indicating a blank column. The Metform identifiers are shown after SHIP : i.e. Sheet number and blank Call Sign (printed as Hex 40).

RECORD NUMBER: 200145

5	1937	19	18	129	-752	68	19	0	0
2	2	-32768	1	2	-32768	2000	278	-32768	-32768
-32768	-32768	10081	283	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	68	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	216	372670	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370519WED181255N07511W+056+8ENE+++52995084297782+83+C++C+++8CU++03++++CICI07ENE+++3++++++
SHIP :372670 40404040 40404040

RECORD NUMBER: 200146

5	1937	20	18	149	-725	113	19	0	0
4	2	-32768	1	4	-32768	2000	278	-32768	-32768
-32768	-32768	10095	283	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	113	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	216	372670	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370520THU181455N07230W+059+8ESE+++52998083298182+83+O++C+++8CU++05++++CICI09ESE+++3++++++
SHIP :372670 40404040 40404040

RECORD NUMBER: 200147

5	1937	21	12	169	-695	45	19	60	18
8	-32768	-32768	-32768	8	-32768	400	233	-32768	-32768
-32768	-32768	10132	267	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	45	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	216	372670	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370521FRI121657N06929W+060+8NE+++53008299299274+80+OR+OQ+++6CUST10++++++1ONE+++3++++++
SHIP :372670 40404040 40404040

RECORD NUMBER: 200148

5	1937	23	12	208	-653	146	2	0	0
4	3	2	7	4	-32768	2000	256	-32768	-32768
-32768	-32768	10166	261	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	146	-32768	-32768
90	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370523SUN122045N06519W+041+9SE/S++13017080300278+79+C++C+++8CUNB05AS++CIST07SE/S+++1E+++++1+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200149

5	1937	24	12	234	-625	79	5	80	80
6	8	-32768	-32768	6	-32768	2000	228	-32768	-32768
-32768	-32768	10159	250	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	79	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	216	372670	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370524MON122325N06232W+044+9E/N+++23014078300073+77+PC+PC+++8STCU08++++++08E/N+++1+++++9+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200150

5	1937	25	12	264	-599	0	0	0	0
1	2	3	1	1	-32768	400	239	-32768	-32768
-32768	-32768	10156	244	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
360	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370525TUE122624N05952W+043+9+++0++03013077299975+76+BC+C+++6CU++01AC++CI++04++++++N+++++1+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200151

5	1937	26	12	291	-567	0	0	0	0
3	-32768	3	1	3	-32768	1000	222	-32768	-32768
-32768	-32768	10173	222	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
360	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370526WED122909N05644W+043+9+++0+03016074300472+72+C++O+++7CUST04AC++CI++07++++++N+++++1+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200152

5	1937	27	12	318	-538	304	9	0	0
2	2	-32768	7	2	-32768	2000	211	-32768	-32768
-32768	-32768	10166	211	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	315	-32768	-32768
360	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370527THU123150N05346W+046+9NW/W++33013074300270+70+O++O+++8CU++02++++CIST08NW++++2N+++++4+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200153

5	1937	28	12	341	-506	315	5	0	0
2	2	-32768	-32768	2	-32768	5000	211	-32768	-32768
-32768	-32768	10149	206	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	315	-32768	-32768
315	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	1	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370528FRI123405N05038W+048+9NW+++23008074299770+69+BC+BC+++9CU++02++++++02NW++++2NW+++++4+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200154

5	1937	29	12	366	-472	293	5	0	0
2	2	3	9	2	-32768	2000	228	-32768	-32768
-32768	-32768	10149	200	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	293	-32768	-32768
45	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	1	1	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370529SAT123637N04713W+048+9WNW++23007072299773+68+BC+C+++8CU++02AC++CICU04WNW++2NE++++7+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200155

5	1937	30	12	393	-437	203	13	0	0
6	8	2	-32768	6	-32768	2000	217	-32768	-32768
-32768	-32768	10163	200	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	203	-32768	-32768
90	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	3	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370530SUN123916N04343W+052+9SSW++43010073300171+68+O++C+++8STCU07AS+++++09SSW+++3E+++++4+
SHIP :372670 40404040 40404040

RECORD NUMBER: 200156

5	1937	31	12	415	-395	180	19	0	0
6	2	2	-32768	6	-32768	2000	189	-32768	-32768
-32768	-32768	10166	189	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	180	-32768	-32768
135	-32768	-32768	-32768	-32768	-32768	216	372670	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	1	4	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	1	-32768	-32768	-32768	-32768	-32768	1	-32768
-32768	1	-32768	-32768	1	-32768	1	0	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768
-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768	-32768

CARD :237267+370531MON124130N03928W+05410S+++++53010070300266+66+O++C+++8CUCU07AS+++++09S+++++4SE+++++1+
SHIP :372670 40404040 40404040

Contract awarded to Atlantic Data Services Ltd.

Requirement for a contract to key marine meteorological data to a computer format.

1. Introduction.

1.1 Large amounts of previously unkeyed meteorological data from merchant ships for the period 1935 to 1939 have been found in the Met Office Archives at Scott House, Bracknell. Approximately 20,000 sheets (50m characters) containing meteorological observations are required to be keyed.

2. Data Keying Requirements.

2.1 The observations are to be transcribed to computer compatible data. It will not be necessary to re-key (verify) these data. The contractor should state the ability of the Company to transcribe these data and should quote the price for data entry program set-up and the all-in price in terms of 1,000 key depressions.

2.2 Data entry programs are required to perform quality control (as described in Appendix IV) and reformat the data to an agreed pattern. The QC limits listed in Appendix IV check values within a field. The contractor should state whether or not the data transcription system to be used will allow quality control routines to make validation checks between records. eg sequential date checks. Maintenance of these programs and occasional amendments detailed by the Met Office shall be the responsibility of the contractor.

3. Description of data to be provided for keying.

3.1 The data are held by the Met Office under the terms of the Public Record Act (1958) and are irreplaceable. These records must therefore be treated with utmost care. They must never be marked in any way and only pencils (never pens) should be used in the vicinity of these records.

3.2 There are 80 cardboard boxes of data and around 250 sheets are stored in each box. The sheets to be keyed are numbered from 33000 to 42999. Additional sheets have been numbered between existing numbers eg 34576, 34576A, 34576B, 34577 etc. The full total is estimated to be 20,000 sheets. Each sheet can contain up to 48 observations but between 20 and 30 is the usual range. Each observation is made up of 96 characters which gives approximately 50m key depressions.

3.3 An example of the Metform F911 is given in Appendix I. All the forms have the same format. The example has been reduced in photocopying from A2 to A4 size.

3.4 Data from both sides of the form is required for the "header" record, but the observational data is found on one side

only.

3.5 Appendix II describes the required format of the header.

3.6 Appendix III describes the required format of each observation.

4. Data Courier Service.

4.1 The contractor will be responsible for the safe and secure transport of these archive data to and from their offices on an agreed timescale.

4.2 The contractor should use his own courier service to collect and return data from the Met Office at agreed weekday times.

4.3 The charges for this courier service should be included in the contract price.

4.4 The contractor must meet the stated security and confidentiality needs of the Met Office.

5. Method of data transcription.

5.1 The contractor will need to write data entry and quality control programs. The quality control program should follow the requirements as set out in Appendix IV.

5.2 The contractor should state the cost of the set up programs required to provide data transcription to the required accuracy, quality and format that these limits require.

5.3 The method of data transcription, the equipment and software to be used must be stated and any changes/amendments agreed with the Met Office prior to implementation.

5.4 Compliance with UK and EC regulations for fast keying areas must be stated. ie Annex to Council Directive 90/270/EEC.

6. Format and quality control changes.

6.1 Occasional changes may be made to the quality control programs. The contractor should state his willingness to accommodate these changes and state any extra charge that may be levied.

6.2 The contractor should undertake completion of such amendments with 4 weeks of receipt of a written request to change.

6.3 The Met Office will need to agree all program changes and examine source code listings and data tests of format/quality control.

7. Accuracy.

7.1 The data sheets contain both alphabetic and numeric characters. Single digit errors are highly significant. Data transcription rates of less than 0.005% are required. This translates to less than 5 errors per 100,000 characters, where a character can be any non-blank alpha numeric character correctly positioned in the output format.

7.2 An illegible or doubtful figure should be transcribed as an asterisk *. The original paper copy should never be marked in any way.

8. Security and confidentiality.

8.1 The work is to be undertaken within the U.K.

8.2 The data are public records and remain the property of the Met Office. They must not be communicated to or held by a third party or to any subcontractor.

8.3 The contractor must confirm that he is accredited with ISO 9000 certification or its equivalent.

8.4 Met Office staff will wish to visit the contractors premises to check conditions.

9. Description of data to be returned to the Met Office.

9.1 The contractor should state his ability to return the computer compatible data on 6250bpi, No Label, IBM compatible, magnetic tape in EBCDIC but other formats (except CD ROM) can be considered.

9.2 The data should be returned as multiple files on a single volume.

9.3 The block size should not be greater than 27,000 bytes.

9.4 The archive paper copy must be returned in the same condition as it was received, in numbered batches consistent with the data sequence on the data media.

10. Time scales for data transcription.

10.1 Weekly data collections will be required.

10.2 Each collection should be completed and returned in 7 days. A reduction in turn round to 10 calendar days is permissible due to Christmas Public Holidays.

10.3 After returning the transcribed data to the Met Office, the contractor should arrange to hold a back up of all data keyed for a minimum of two months. Any additional charge for data recovery

should be stated.

10.4 The task must be completed by the end February 1996.

M.Jackson.

Hadley Centre

H003

x6238/01344-420926

Particulars of Instruments:—(Please write word *Ship* in each case where not *M.O.*)

Barometer, (Mercury or Aneroid)? *Mercury* Error? 100 High. 100 Low. at 29.75 in.
 Make of Instrument and No. (if any). *Went* Height above Sea level. 26 ft.
 Numbers and Descriptions of other Instruments—1. *Refined aneroid*—*State*

Requirements for next voyage *next*, with advantage, be notified direct to the appropriate Port Meteorological Officer or Merchant Navy Agent. See list in "Marine Observer."

The observations recorded herein have been carefully made, and the Register, Form 129 attached, contains a true record of the coded messages sent by H.T., together with particulars of communication.

(If not a Selected Ship, cross out words in italics).

Date *July 15/37*

William J. J. J.
 Signature and Rank of Principal Observing Officer.
W. J. J.
 Signature of Captain.

FORM 911.

WFO 2650, 1914-15, 1937, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

AIR MINISTRY.
 METEOROLOGICAL OFFICE, LONDON.

SHIP'S METEOROLOGICAL RECORD OF SYNCHRONIZED OBSERVATION

Captains of ships in the list of regular voluntary observing ships in "The Marine Observer", who are detailed for keeping a meteorological log, are requested to have the necessary observations made and entered in this form.

It is desired that in observing ships which have two officers in each watch, observations should be taken at all four times each day; but when there is only one officer in a watch, the observations should be made and recorded only at the times which fall in daylight.

These synchronized weather observations made at Greenwich Mean Time in all parts of the world, at the agreed to internationally, are desired for synoptic charts and many other purposes.

On completion of each voyage, or at intervals of not more than two months, these forms should be forwarded to the address hereon. Postage from ports in Great Britain, Northern Ireland, and the Irish Free State need not be prepaid. Postage incurred from ports abroad will be refunded upon request.

Copies of "The Marine Observer" are sent to all ships on the list regularly contributing observations, these forms, and the necessary blank forms are sent with "The Marine Observer" or Supplement monthly.

As a check on the barometer, the test card (blue postcard) should be completed and sent in every six months if Form 906 has not been renewed by the Port Meteorological Officer or Agent during that period.

Full instructions as to observation and keeping these records are given in the 5th Edition of "The Marine Observer's Handbook."

METEOROLOGICAL OFFICE, AIR MINISTRY, W.C.2.
 1st MAY, 1930.

LONDON, W.C.2.
 Kingsway.

The Director,
 Meteorological Office (M.O.1),
 Air Ministry.

ON HIS MAJESTY'S SERVICE.

LETTERS TO INDICATE THE STATE OF THE WEATHER.

- a Blue sky (less than a quarter covered).
- b Sky partly cloudy (between one quarter and three quarters covered).
- c Generally cloudy (more than three quarters covered).
- d Drizzle, or fine rain.
- e Fog.
- f Wet fog.
- g Cloudy.
- h Rain.
- i Low Squall.
- j Lightning.
- k Mist.
- l Overcast sky (whole sky covered with one impenetrable cloud).
- m Passing showers.
- n Squalls.
- o Rain.
- p Sleet, i.e., rain and snow together.
- q Snow.
- r Thunder.
- s Thunderstorm.
- t Very threatening sky.
- u Unusual visibility.
- v Dew.
- w Dust haze; the turbid atmosphere of dry weather.

FOG AND VISIBILITY SCALE.

- 1 Dense fog.
- 2 Thick fog.
- 3 Fog.
- 4 Moderate fog.
- 5 Mist of haze, or very poor visibility.
- 6 Poor visibility.
- 7 Moderate visibility.
- 8 Good visibility.
- 9 Very good visibility.
- 10 Excellent visibility.

DOUGLAS SEA AND SWELL SCALES SEPARATELY.

SEA SCALE.		SWELL SCALE.	
Scale No.	Description.	Scale No.	Description.
0	Calm.	0	No Swell.
1	Smooth.	1	Low swell, short or average length.
2	Slight.	2	Low swell, long.
3	Moderate.	3	Moderate swell, short.
4	Rough.	4	Moderate swell, average length.
5	Very rough.	5	Moderate swell, long.
6	High.	6	Heavy swell, short.
7	Very high.	7	Heavy swell, average length.
8	Principious.	8	Heavy swell, long.
9	Coasted.	9	Coasted.

Great care should be taken to enter into their proper columns the scale number and direction of sea and swell separately.

Header Record for each sheet.

	Field size characters	Field type
From Side I		
Sheet Number	6	A/N
Ship Type	7	A
Ship Name	20	A
Captains Name	20	A
Voyage - From	20	A
- To	20	A
Was the speed measured by log or revolution:	3	A (Log/Rev)
State of Loading - Light or Deep:	5	A (Light/Deep)
Was the propeller immersed:	1	A (Y/N)
General Remarks:	Not required	
From Side II		
Barometer (Mercury or Aneroid):	3	A (Mer/Ane)
Maker of Instruments:	Not required	
Error - Too High:	5	N
- Too Low:	5	N
- at:	5	N
When and where last compared:	Not required	
Height above Sea Level:	5	N
Numbers and description of other instruments:	Not required	
Date (dd/mm/yyyy)	2/2/4	N

Meteorological Observations.

Sheet Item Number	Length of field	Alpha and/or Numeric	Description
.	6	A/N	Sheet Number
.	2	N	Year
1	2	N	Month
2	2	N	Day of month
3	3	A/N	Day of week
4	2	N	Hour GMT
Position field course speed field			
4	4	N	Latitude (decimal not keyed)
	1	A	Latitude N or S
5	5	N	Longitude(decimal not keyed)
	1	A	Longitude W or E
7	3	A/N	True Course
8	2	N	Average Speed
Wind field			
9	4	A/N	Direction
10	3	N	Force
Barometer field			
11	4	N	Uncorrected reading (decimal not keyed)
12	2	N	Attached thermometer
13	4	N	True atmospheric pressure (decimal not keyed)
14	Not required		
Temperature			
15	2	N	Air
16	2	N	Sea
Weather			
17	3	A	At the time of observation
18	3	A	Past
Visibility			
19	3	N	Visibility by scale
Cloud			
20	4	A/N	Low - Type
21	2	N	- Amt
22	4	A/N	Middle - Type
23	4	A/N	Upper - Type
24	2	N	Total clouded
Sea			
25	5	A/N	Direction
26	3	N	Amount
Swell			
27	5	A/N	Direction
28	3	N	Amount
Remarks			
29	1	N	Set 1 if Remarks are found.

Total characters: 96

Range limits of parameters for quality control

Sheet Number: 33000 to 42999. A,B,C,D,E may be added
 Year: 1935 to 1939
 Month: 1 to 12
 Day of month: 1 to 31
 Day of week: SUN to SAT or 1 to 7
 Hour: 00 to 23
 Latitude: 0 to 9000
 N or S
 Longitude: 0 to 18000
 W or E
 True course: 0 to 360 degrees or 32 point compass - N, N by E,
 NNE, NNE by E, NE, NE by S etc
 Average Speed: 0 to 25
 Wind
 Direction: As "True course"
 Force: 0 to 12 One or two numbers may be given (eg 4/5)
 Barometer
 Uncorrected reading: 2800 to 3200
 Attached thermometer: -5 to 40
 True Atmospheric Pressure: 2800 to 3200
 Temperature:
 Air: -20 to 40
 Sea: -5 to 39
 Weather:
 At time of observation: b,c,f,g,h,l,m,o,p,q,r,s,t,v
 Past: As "At time of observation"
 Visibility:
 0 to 9 or two numbers may be given (eg 4/5)
 Cloud:
 Low - Type: Cu St Sc Cb Nb
 Low - Amt: 0 to 10
 Middle - Type: As, Ac
 Upper Type: Cs, Ci, Cc
 Total Clouded: 0 to 10
 Sea:
 Direction: As "True Course"
 Amount: As "Visibility"
 Swell:
 Direction: As "True Course"
 Amount: As "Visibility"
 Remarks: 0 or 1