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Report on characteristics of WMO47 Metadata

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ABSTRACT

This report summarises the ship instrumentation information contained in the WMO publication *International list of selected, supplementary and auxiliary ships* between 1973 and 1994. The information from this publication has been converted to an electronic format and trends in instrumentation type and anemometer and platform heights documented. The format of the new datafile is described.

KEYWORDS

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REPORT ON WMO47 DATA

1. FORMAT OF FILES RECEIVED

ASCII text versions of the WMO47 publication for 1973 to 1992 (eg (WMO, 1980)) were obtained by ftp from Arlindo daSilva (who obtained them from Joe Elms at COADS). 1993 and 1994 were provided on disk by WMO. The ftp files had no indication of the year for each file and these had to be determined by comparison with the published reports. 1978 was missing and is was not clear which file was 1976, these were obtained directly from COADS. There was no problem with the file names they provided, in retrospect it would have been easier to get the files direct from COADS. The format of these files was complicated and information about this format was not initially available. The documentation from WMO is included in Appendix 1.

2. READING THE DATA INTO PSTAR

The text files described in section 1 were read into pstar format using the program "read47.F", which is included in Appendix 2. The pstar header for the output file is listed below.

```
DATA DESCRIPTION
****************                    ****************          Prefil:
                          Data Name: *WMO47     ruNM*         Postfl:
                                     ****************

Even samp:
Archive flag:                              Platform              Depth of  Depth of
Raw data flag: P                 **Type** ****Name**** *Number*  instrument  water
Instrument:WMO47 Info            SHIP       VOS                     0.00M     0.00M

Fields (Vars):  34    Data cycles: 160604    (2/3D: NROWS:   0   NPLANE:   0)
Start time:19/951001/000000  Position:  0.0000   0.0000( 0  0.00N   0  0.00E)
*************************************************************************
*   Field    * Units  *   Lower Limit   *   Upper Limit   * Absent data val *
*************************************************************************
*  1.COUNTRY *        *          98.000 *         151.000 *        -999.000 *
*  2.ID1     *        *    42424242.000 *    90909077.000 *        -999.000 *
*  3.ID2     *        *    48484899.000 *    99999999.000 *        -999.000 *
*  4.SHIPTYPE*        *          10.000 *          90.000 *        -999.000 *
*  5.BAR_TYPE*        *           1.000 *           4.000 *        -999.000 *
*  6.TEM_TYPE*        *           1.000 *           3.000 *        -999.000 *
*  7.TEM_EXP *        *           1.000 *           8.000 *        -999.000 *
*  8.HYG_TYPE*        *           1.000 *           3.000 *        -999.000 *
*  9.HYG_EXP *        *           1.000 *           8.000 *        -999.000 *
* 10.BARTYPE2*        *           1.000 *           4.000 *        -999.000 *
* 11.TEMTYPE2*        *           1.000 *           3.000 *        -999.000 *
* 12.TEMEXP 2*        *           1.000 *           8.000 *        -999.000 *
* 13.HYGTYPE2*        *           1.000 *           3.000 *        -999.000 *
* 14.HYGEXP 2*        *           1.000 *           8.000 *        -999.000 *
* 15.SSTMETH1*        *           1.000 *         999.000 *        -999.000 *
* 16.SSTMETH2*        *           1.000 *         999.000 *        -999.000 *
* 17.SSTMETH3*        *           2.000 *           2.000 *        -999.000 *
* 18.BAROGRA1*        *           1.000 *           2.000 *        -999.000 *
* 19.BAROGRA2*        *           1.000 *           2.000 *        -999.000 *
* 20.TELECOM *        *           1.000 *           7.000 *        -999.000 *
* 21.COMMS___*        *           1.000 *          13.000 *        -999.000 *
* 22.No_RADOP*        *           0.000 *          18.000 *        -999.000 *
```

* 23.HT_PLAT_*	*	0.000 *	198.000 *	-999.000 *
* 24.HT_ANE__*	*	0.000 *	143.000 *	-999.000 *
* 25.OTIST(1)*	*	1.000 *	999.000 *	-999.000 *
* 26.OTIST(2)*	*	1.000 *	17.000 *	-999.000 *
* 27.OTIST(3)*	*	1.000 *	17.000 *	-999.000 *
* 28.OTIST(4)*	*	1.000 *	16.000 *	-999.000 *
* 29.OTIST(5)*	*	2.000 *	17.000 *	-999.000 *
* 30.OTIST(6)*	*	5.000 *	17.000 *	-999.000 *
* 31.OTIST(7)*	*	14.000 *	14.000 *	-999.000 *
* 32.FOOT(1) *	*	107.000 *	1302.000 *	-999.000 *
* 33.FOOT(2) *	*	401.000 *	1302.000 *	-999.000 *
* 34.YEAR *	*	1973.000 *	1994.000 *	-999.000 *

The numerical codes for the variables are documented in Table 1. Data from three ships could not be coded. In 1973 the ship with callsign ONTE gave an invalid SST method of 'ELE' as did ship ZSAE between 1973 and 1981. Between 1973 and 1981 ship 5ZUE gave an invalid other instrument type of 'RAD'. All these have been coded as 999 in the data.

3. ASSESSMENT OF THE DATA

3.1 Corrections Made to Data

A program was written to list tables of the types of instrument for each country for each year. This made it possible to identify some of the more obvious errors present in the data. Errors found were: between 1978 and 1984 about 600 slings from the USA ships had been miscoded as screens. For this period and country, if the temperature and humidity housings were different, the humidity housing was changed from screen to sling. In 1992 the Netherlands listed no ships with whirling psychrometers, before and after there were 200-300. This was checked, then corrected. Between 1980 and 1985 Indonesian ships reported the temperature being measured with a whirling psychrometer and the humidity with a sling psychrometer, after this period, both were by sling. The temperatures reported as whirling psychrometer were changed to sling. The code number for the German Democratic Republic had been taken over by the Peoples Democratic Republic of Korea and that for New Caledonia by Croatia. New Caledonia and the GDR were assigned the new country codes of 98 and 99 respectively, see Table 1.

3.2 Timeseries of Instrumentation Carried

For the corrected data each instrument code has been plotted as a function of year in Figures 1. The order of the colours corresponds to the number of the codes given in Table 1. (ie black = 1, red = 2, green = 3, purple = 4, turquoise = 5, pink = 6, yellow = 7, orange = 8). The same plots are shown on three different scales (Figure 1a, number of ships 0 to 7000, Figure 1b, number of ships 0 to 1000 and Figure 1c, number of ships 0 to 100) to allow the less common instrument types to be shown.

Most ships (6-7000) carry aneroid barometers (including ships aneroid barometers and digital aneroid barometers), the number of mercury barometers declines from about 400 to 100 over the period. Over 90% of ships use mercury thermometers and there are about 500 ships with electric thermometers. Just under half the thermometers are exposed in a screen, about a quarter use slings, whirling and aspirated psychrometers account for approximately another 10% each. The decline in the number of mercury thermometers towards the end of the period is due to the decline in the total number of ships (see Figure 3). 60% of the ships measure humidity using a psychrometer, a handful of other ships use an electric or hair hygrometer. There is a gradual decline in the number, due to the decline in the number of selected ships (see Figure 3). The exposure of the hygrometer is in a screen on about 20% of the ships, slings account for slightly under 20%. Aspirated, whirling psychrometers, and ventilated screens account for the final 20%. The dominant SST method is engine intake, accounting for 55% of the ships, buckets are the only other common method with 28%. The sharp drop in numbers of ships carrying buckets is due to the Russian ships changing to engine intake (see the following section for a breakdown of instrumentation by country).

Figure 2 gives the numbers of each of the instruments in the 'other instruments' category. See Table 1 for meanings of codes.

Figure 3a shows the number of selected, supplementary and auxiliary ships as a function of time, the information for the additional years was obtained from WMO Report No 471 (WMO, 1982). Figure 3b shows the breakdown of ship numbers by merchant ship, trawler and also by selected, supplementary and auxiliary ships as derived from the WMO47 ASCII files.

Figure 4a shows the breakdown of the number of selected ships by country (see Table 1 for country numbers), Figure 4b shows the supplementary ships and Figure 4c the auxiliary ships.

3.3 Tables of Instrumentation by Country

For all countries with more than 3000 ships over the 22 years studied the instrumentation has been tabulated in Table 2. The barometer type, type of thermometer, the housing of the thermometer, type of humidity sensor, housing of the humidity sensor, method of sea surface temperature measurement and the types of ships recruited are tabulated. The countries tabulated separately are: Brazil, Canada, France, German Federal Republic, India, Netherlands, Japan, Poland, Russia, UK, USA and Yugoslavia. All the other countries have been combined in a single table.

The major users of screens are: Argentina, Australia, Canada, Japan, Philippines, Russia, UK and USA. Ventilated screens are used by Brazil, Japan and Korea. Slings are used by Brazil, Canada, Germany, USA and Yugoslavia. Whirling hygrometers are used by Belgium, France, Hong Kong, India and the Netherlands. Aspirated psychrometers are used by the old GDR, Poland, USA and Yugoslavia.

The major users of buckets are Belgium, Brazil, Canada, Germany, Netherlands, Russian and the UK. Engine room intakes are used by the old GDR, Argentina, Australia, Brazil, France, Germany, Japan, Korea, Philippines, Poland, Portugal, Russia, USA, Yugoslavia and Saudi Arabia. The Russian Federation/USSR ships changed from bucket to engine intake measurement in 1978, causing the step noted in Figure 1.

4. ANEMOMETER AND PLATFORM HEIGHTS

Figure 5 shows the mean anemometer and platform heights in WMO47 as a function of time. Error bars represent the standard error of the mean. The maximum in anemometer height around 1986 is largely due to the Canadian ships (presumably off-shore installations) and is the decrease in the influence of these very high values distorting the otherwise gentle upwards trend that is responsible for the apparent rapid increase towards 1994. Figure 6 shows how the anemometer and platform heights vary with country. The Russian ships have a particularly low mean anemometer height which decreases the overall mean significantly.

Looking only at countries which have, on average over the 22 year period, more than 20 selected ships in a year, Brazil, France, Japan, Poland and Russia predominantly use anemometers. Germany, Argentina, Belgium, India, Israel, Netherlands, New Zealand, Portugal, South Africa, Spain, Sweden, UK and Yugoslavia have less than 30% of selected ships carrying anemometers. Australia, Hong Kong, Norway, Sweden and the USA have between 20 and 50% of their selected ships carrying anemometers. Canada, Philippines, Singapore, Malaysia and China all have between 50 and 80% of their selected ships equipped with anemometers.

Figures 7 show the proportions of anemometers as a function of time for each of the countries that use anemometers. The numbers show the number of selected ships the particular country had in that particular year, the line represents the proportion of those selected ships that carried an anemometer. The overall trend is for the proportion of anemometers to increase with time.

The combination of both the increase in the proportion of ships carrying anemometers and the increase in mean anemometer height with time will lead to an increase in the observation height with time for wind speeds in datasets such as COADS. At the present time it is assumed that most of the ships that report weather observations are contained in WMO47, this will be checked later.

5. FORMAT OF OUTPUT FILES

Program 'pwriteout.F', in Appendix 3 writes out the data from the pstar WMO47 file into a text format using the same codes as used in the original document, but in a simpler format Another program then reads the ship name from the original WMO47 file, checks the callsigns are the same, and then adds the ship name to the end of the line. Appendix 4 gives an example of the format of the new text file. Program 'pwritenum.F', simply writes out the numbers from the pstar WMO47 file to an ASCII file, changing the order so they are in the same order as the text file from 'pwriteout.F',' see Appendix 5. The ship name is missing from this file, the callsign has been coded into two numbers, constructed from the ASCII decimal character set, see Appendix 6. The first two digits are the first letter of the callsign, the second two digits the second letter and so on. A blank has been coded as 99.

6. REFERENCES

WMO, 1980: *International List of Selected, Supplementary and Auxiliary Ships, WMO Report No. 47.* WMO, Geneva.

WMO, 1982: *Guide to Marine Meteorological Services, Second Edition, World Meteorological Organisation Report No. 471.* WMO, Geneva, 290 pp.

TABLES

Table 1

```
**************************************************************************
*                          WMO Publication No 47                         *
* International List of Selected, Supplementary and Auxiliary Ships *
**************************************************************************

**  Variables in file,  format,  column numbers

Year                                          I4    1  -  4
Country                                       A15   6  - 20
Callsign                                      A8    22 - 29
Shiptype                                      A7    31 - 37
Barometer type                                A3    39 - 41
Thermometer type                              A3    43 - 45
Condition of exposure of thermometer          A3    47 - 49
Hygrometer type                               A3    51 - 53
Condition of exposure of hygrometer           A3    55 - 57
2nd Barometer type                            A3    59 - 61
2nd Thermometer type                          A3    63 - 65
Condition of exposure of 2nd thermometer      A3    67 - 69
2nd Hygrometer type                           A3    71 - 73
Condition of exposure of 2nd hygrometer       A3    75 - 77
SST method                                    A3    79 - 81
2nd SST method                                A3    83 - 85
3rd SST method                                A3    87 - 89
Barograph type                                A3    91 - 93
2nd Barograph type                            A3    95 - 97
Number of radio operators                     I3    99 -101
Platform height                               I3    103-105
Anemometer height                             I3    107-109
Other instrument - 1                          A3    111-113
Other instrument - 2                          A3    115-117
Other instrument - 3                          A3    119-121
Other instrument - 4                          A3    123-125
Other instrument - 5                          A3    127-129
Other instrument - 6                          A3    131-133
Other instrument - 7                          A3    135-137
Telecommunication facilities :
   Telephony and telegraphy                   A3    139-141
   Teleprinter and satellite                  A4    143-146
Footnote 1                                    I4    148-151
Footnote 2                                    I4    153-156
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Shipname A25 161-185

** Codes used

** Type of barometer

1	AN	Aneroid barometer
2	SAN	Ships aneroid barometer
3	MER	Mercury barometer
4	DA	Digital aneroid barometer

** Type of thermometer

1	MER	Mercury thermometer
2	ELE	Electric resistance thermometer
3	ALC	Alcohol thermometer

** Conditions of exposure of thermometer

1	S	Screen (not ventilated)
2	VS	Screen (ventilated)
3	SL	Sling
4	W	Whirling
5	A	Aspirated (Assman type)
6	US	Unscreened
7	SG	Ship's sling
8	SN	Ship's screen

** Type of hygrometer

1	H	Hair hygrometer
2	P	Psychrometer
3	E	Electric

** Conditions of exposure of hygrometer

1	S	Screen (not ventilated)
2	VS	Screen (ventilated)
3	SL	Sling
4	W	Whirling
5	A	Aspirated (Assman type)
6	US	Unscreened

** SST

1	BU	Bucket
2	C	Engine intake
3	TT	Trailing thermistor
4	HC	Hull contact sensor
5	HT	Through hull sensor
6	RAD	Radiation thermometer
7	BTT	Bait tank thermometer
8	OT	Other

** Type of barograph

1	OS	Open scale barograph
2	SS	Small scale barograph

** Various other instruments

1	MAX	Maximum thermometer
2	MIN	Minimum thermometer
3	RT	Reversing thermometer
4	TSD	Temperature/salinity/depth probe
5	BAT	Bathythermometer
6	BT	Bathythermograph (towed)
7	XBT	Expendable bathythermograph
8	HA	Hand anemometer
9	A	Anemometer
10	SA	Ship's anemometer
11	AG	Anemograph
12	RG	Rain-gauge

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13    P     Pilot-balloon equipment
14    R     Radiosonde equipment
15    W     Radiowind or radarwind equipment
16    ST    Sea thermograph
17    RSD   Radar storm and meteorological phenomena detection

** Telecommunication facilities: Telephony and telegraphy
1     TMH   Radio telephone,  HF and MF radiotelegraphy
2     MH    HF and MF radiotelegraphy
3     TH    Radio telephone, HF radiotelegraphy
4     TM    Radio telephone, MF radiotelegraphy
5     H     HF radiotelegraphy
6     M     MF radiotelegraphy
7     T     Radio telephone

** Telecommunication facilities: Teleprinter and satellite
1     YIAE
2     YIA
3     YI
4     YE
5     YA
6     IE
7     IA
8     A     ARGOS communication facility
9     E     Environmental satellites communication facility
10    I     INMARSAT communication facility
11    Y     Direct printing radiotelegraphy

** Country code numbers

      98      NEW CALEDONIA  ( no longer in use )
      99      GDR            ( no longer in use )
     101      ARGENTINA
     102      AUSTRALIA
     103      BELGIUM
     104      BRAZIL
     105      CANADA
     106      CHILE
     107      DENMARK
     108      FINLAND
     109      FRANCE
     110      FRENCH POLYNESIA
     111      PDR KOREA            (was GDR)
     112      GFR
     113      GREECE
     114      HONG KONG
     115      ICELAND
     116      INDIA
     117      IRELAND
     118      ISRAEL
     119      ITALY
     120      JAPAN
     121      KENYA
     122      KOREA
     123      NETHERLANDS
     124      CROATIA        (was NEW CALEDONIA)
     125      NEW ZEALAND
     126      NORWAY
     127      PAKISTAN
     128      PHILIPPINES
     129      POLAND
     130      PORTUGAL
     131      ST PIERRE
     132      SINGAPORE
     133      SOUTH AFRICA
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134	SPAIN
135	SWEDEN
136	SWITZERLAND
137	THAILAND
138	USSR
139	UK
140	USA
141	YUGOSLAVIA
142	BULGARIA
143	BANGLADESH
144	CUBA
145	JAMAICA
146	TANZANIA
147	MALAYSIA
148	CHINA
149	INDONESIA
150	SRI LANKA
151	SAUDI ARABIA

** Shiptype codes

SEL	10	Selected ship
SEL SP	11	Selected ship (special)
SEL MER	12	Selected ship (merchant)
SEL TRW	13	Selected ship (trawler)
SUP	20	Supplementary ship
SUP MER	22	Supplementary ship (merchant)
SUP TRW	23	Supplementary ship (trawler)
SUP NUS	24	Supplementary ship (US recruited, not US registry)
AUX	30	Auxiliary ship
AUX OCC	31	Auxiliary ship (occasional, recruited on trip-to-trip or non-continuing basis)
AUX NUS	32	Auxiliary ship (US recruited, not US registry)

** Footnotes

0107	Operates during the period November to May
0110	Fixed drilling rig (in North Sea)
0112	Research and special purposes only
0113	Research and special purposes only, on duty November to May
0401	New type precision aneroid barometer
0904	???
1103	???
1105	???
1106	Hand-held anemometer - spare
1108	Humidity measured by psychometric methods and dewpoint estimation
1302	number of radio officers actually number of Ship's officers

****
* Information not included from original text files *
****

1 routing information
2 ship names (note that for ships that have been given a dummy callsign (ie **** then 3 digit number) a list of the ship names is included in the text file 'dummynames'
3 Type of barograph clock

****
* Notes *
****

There is no relevance in the order of the 'other instruments', any instrument can be in any column

Country codes for GDR and New Caledonia have been changed as their codes were taken over by the Peoples Democratic Republic of Korea and Croatia respectively.

There were no 3rd footnotes in the years 1973 - 1994. The meanings of the footnotes 0904, 1103 and 1105 have yet to be determined.

TABLE 2 - BREAKDOWN OF INSTRUMENTATION TYPES BY COUNTRY

OTHER COUNTRIES

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	992	0	74	64
1974	1046	0	72	71
1975	1060	0	73	99
1976	1046	0	72	71
1977	1125	0	28	121
1978	1065	14	41	120
1979	1065	14	41	120
1980	1231	18	32	121
1981	1238	20	25	120
1982	1237	20	25	119
1983	1261	20	24	124
1984	1173	97	20	176
1985	1182	113	20	176
1986	1126	125	18	169
1987	1085	165	18	172
1988	1057	187	4	166
1989	1047	188	4	169
1990	895	185	4	163
1991	876	209	4	156
1992	868	207	4	158
1993	865	223	4	163
1994	851	236	4	171

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	9	966	0
1974	15	1027	0
1975	14	1053	0
1976	15	1027	0
1977	9	1103	7
1978	24	1061	7
1979	24	1061	7
1980	27	1194	9
1981	25	1168	13
1982	32	1167	6
1983	37	1175	8
1984	33	1212	8
1985	21	1252	6
1986	21	1216	7
1987	21	1239	4
1988	19	1215	4
1989	23	1198	5
1990	16	1043	5
1991	18	1035	13
1992	18	1024	14
1993	18	1036	13
1994	18	1046	13

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	341	404
1974	415	389
1975	422	402
1976	415	389
1977	424	435
1978	444	437
1979	444	437
1980	462	466
1981	299	599
1982	297	606
1983	298	620
1984	357	612
1985	364	607
1986	352	586
1987	359	588
1988	353	587
1989	351	572
1990	355	409
1991	367	403
1992	371	404
1993	379	369
1994	387	364

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	1085	1	16
1974	1129	5	12
1975	1153	15	12
1976	1129	5	12
1977	1198	20	11
1978	1172	15	20
1979	1172	15	20
1980	1228	56	78
1981	1238	59	80
1982	1265	59	52
1983	1286	66	52
1984	1338	68	45
1985	1355	68	48
1986	1304	69	54
1987	1311	67	61
1988	1289	67	58
1989	1281	73	59
1990	1111	67	60
1991	1136	34	55
1992	1124	36	55
1993	1139	36	57
1994	1142	39	57

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	249	764	0	13	3	0	0	0
1974	261	800	0	15	3	0	0	0
1975	270	815	1	17	4	0	0	0
1976	261	800	0	15	3	0	0	0
1977	279	816	1	22	3	0	0	14
1978	298	746	1	30	3	0	2	26
1979	298	746	1	30	3	0	2	26
1980	361	849	1	31	3	0	0	26
1981	359	876	0	31	3	0	0	21
1982	357	861	2	54	3	0	0	17
1983	357	885	0	57	5	0	0	19
1984	336	914	0	59	4	0	0	18
1985	351	925	0	61	14	0	0	9
1986	292	944	0	64	13	0	0	10
1987	290	959	0	72	11	0	0	11
1988	285	949	0	73	11	0	0	10
1989	284	943	0	70	11	0	0	14
1990	266	799	0	77	12	0	8	9
1991	270	795	0	77	12	0	8	8
1992	279	781	0	82	11	0	8	7
1993	285	793	0	81	10	0	8	8
1994	284	806	0	80	10	0	8	8

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	385	121	186	191	156	61	0	0
1974	378	156	176	186	196	51	0	0
1975	386	187	238	144	183	41	0	0
1976	378	156	176	186	196	51	0	0
1977	410	206	207	165	170	69	0	0
1978	402	191	207	160	168	76	0	0
1979	402	191	207	160	168	76	0	0
1980	477	273	202	159	183	67	0	0
1981	493	309	187	134	162	90	0	0
1982	495	252	197	136	186	98	0	0
1983	514	251	196	131	200	110	0	0
1984	503	232	245	133	201	128	0	0
1985	497	222	283	138	204	108	0	7
1986	516	182	277	138	207	87	0	12
1987	514	214	276	125	214	87	0	2
1988	507	200	268	134	210	87	0	1
1989	502	174	272	157	199	93	0	9
1990	498	180	263	151	42	90	0	9
1991	477	187	236	150	44	96	0	29
1992	507	151	230	149	44	97	0	30
1993	475	144	229	158	77	98	0	42
1994	480	157	224	155	76	94	0	43

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	316	108	116	193	157	10	0	0
1974	321	147	111	187	198	14	0	0
1975	324	153	169	151	198	7	0	0
1976	321	147	111	187	198	14	0	0
1977	352	175	151	170	188	9	0	0
1978	382	152	136	171	187	16	0	0
1979	382	152	136	171	187	16	0	0
1980	439	221	136	171	199	14	0	0
1981	442	258	129	156	160	12	0	0
1982	440	221	137	158	183	17	0	0
1983	446	220	136	153	197	19	0	0
1984	440	194	219	153	198	13	0	0
1985	424	217	225	158	206	12	0	1
1986	411	177	216	154	243	12	0	1
1987	412	201	214	141	250	15	0	1
1988	401	190	212	149	246	20	0	1
1989	396	163	211	173	235	20	0	9
1990	399	166	204	166	73	23	0	14
1991	395	172	197	165	75	30	0	13
1992	431	132	196	156	75	29	0	18
1993	397	126	196	165	103	29	0	32
1994	398	139	197	162	102	22	0	34

SHIP TYPE

YEAR	SELECTED	SELECTED SPECIAL	SELECTED MERCHANT	SELECTED TRAWLER	SELECTED MERCHANT	SELECTED TRAWLER	SUPPLEMEN-TARY	AUXILIARY TRAWLER	SUPP MERCHANT	SUPP TRAWLER	AUXILIARY
1973	657	1	40	0	43	19	246	0	32	31	81
1974	653	1	35	0	45	19	320	0	32	31	72
1975	659	1	48	0	45	18	349	0	35	31	61
1976	653	1	35	0	45	19	320	0	32	31	72
1977	680	1	47	0	51	18	371	7	29	21	73
1978	703	11	123	18	0	0	302	9	0	0	140
1979	703	11	123	18	0	0	302	9	0	0	140
1980	767	11	134	21	0	0	367	9	0	0	152
1981	787	11	135	19	0	0	349	8	0	0	150
1982	808	12	145	20	0	0	309	10	0	0	162
1983	832	13	147	22	0	0	308	10	0	0	160
1984	818	11	156	22	0	0	344	7	0	0	168
1985	846	11	168	22	0	0	320	0	1	0	176
1986	746	10	180	22	0	0	347	0	1	0	192
1987	765	10	189	22	0	0	328	0	1	0	197
1988	753	4	185	22	7	0	318	0	1	0	197
1989	745	5	178	22	7	0	322	0	1	0	207
1990	746	1	47	0	0	0	318	0	1	0	216
1991	742	1	47	0	0	0	325	0	1	0	199
1992	708	9	73	0	0	0	321	0	0	0	196
1993	720	9	73	0	0	0	328	0	0	0	195
1994	725	9	73	0	0	0	328	0	0	0	196

BRAZIL

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	73	0	0	0
1974	79	0	0	0
1975	94	0	0	0
1976	79	0	0	0
1977	88	0	0	0
1978	111	0	0	0
1979	111	0	0	0
1980	178	0	0	0
1981	273	0	0	0
1982	320	0	0	0
1983	357	0	0	0
1984	357	0	0	0
1985	338	0	0	0
1986	315	0	0	0
1987	315	0	0	0
1988	332	0	0	0
1989	345	0	0	0
1990	353	0	0	0
1991	327	0	0	0
1992	327	0	0	0
1993	327	0	0	0
1994	327	0	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	5	69	0
1974	4	73	0
1975	4	86	0
1976	4	73	0
1977	5	81	0
1978	0	111	0
1979	0	111	0
1980	0	178	0
1981	0	273	0
1982	0	320	0
1983	0	357	0
1984	0	357	0
1985	1	336	0
1986	0	315	0
1987	0	315	0
1988	0	332	0
1989	0	345	0
1990	0	353	0
1991	0	327	0
1992	0	327	0
1993	0	327	0
1994	0	327	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	3	13
1974	3	8
1975	4	8
1976	3	8
1977	4	5
1978	23	1
1979	23	1
1980	33	2
1981	1	0
1982	0	0
1983	0	0
1984	0	0
1985	0	0
1986	1	2
1987	1	2
1988	0	2
1989	1	2
1990	1	2
1991	1	1
1992	1	1
1993	1	1
1994	1	1

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	74	0	0
1974	80	0	0
1975	95	0	0
1976	80	0	0
1977	89	0	0
1978	111	0	0
1979	111	0	0
1980	178	0	0
1981	273	0	0
1982	320	0	0
1983	357	0	0
1984	357	0	0
1985	338	0	0
1986	315	0	0
1987	315	0	0
1988	332	0	0
1989	345	0	0
1990	353	0	0
1991	327	0	0
1992	327	0	0
1993	327	0	0
1994	327	0	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	6	67	0	1	0	0	0	0
1974	6	70	0	4	0	0	0	0
1975	7	85	0	3	0	0	0	0
1976	6	70	0	4	0	0	0	0
1977	7	81	0	1	0	0	0	0
1978	23	88	0	0	0	0	0	0
1979	23	88	0	0	0	0	0	0
1980	33	145	0	0	0	0	0	0
1981	61	212	0	0	0	0	0	0
1982	73	247	0	0	0	0	0	0
1983	75	282	0	0	0	0	0	0
1984	75	282	0	0	0	0	0	0
1985	73	264	0	0	0	0	0	0
1986	78	237	0	0	0	0	0	0
1987	78	237	0	0	0	0	0	0
1988	93	239	0	0	0	0	0	0
1989	95	250	0	0	0	0	0	0
1990	99	254	0	0	0	0	0	0
1991	93	234	0	0	0	0	0	0
1992	93	234	0	0	0	0	0	0
1993	93	234	0	0	0	0	0	0
1994	93	234	0	0	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	2	72	0	0	0	0	0	0
1974	1	79	0	0	0	0	0	0
1975	1	90	3	0	0	0	0	0
1976	1	79	0	0	0	0	0	0
1977	0	88	1	0	0	0	0	0
1978	0	111	0	0	0	0	0	0
1979	0	111	0	0	0	0	0	0
1980	0	178	0	0	0	0	0	0
1981	0	212	61	0	0	0	0	0
1982	0	247	73	0	0	0	0	0
1983	0	282	75	0	0	0	0	0
1984	0	282	75	0	0	0	0	0
1985	0	265	73	0	0	0	0	0
1986	0	237	78	0	0	0	0	0
1987	0	237	78	0	0	0	0	0
1988	0	239	93	0	0	0	0	0
1989	0	250	95	0	0	0	0	0
1990	0	254	99	0	0	0	0	0
1991	0	234	93	0	0	0	0	0
1992	0	234	93	0	0	0	0	0
1993	0	234	93	0	0	0	0	0
1994	0	234	93	0	0	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	2	72	0	0	0	0	0	0
1974	0	77	0	0	0	0	0	0
1975	0	86	4	0	0	0	0	0
1976	0	77	0	0	0	0	0	0
1977	0	84	2	0	0	0	0	0
1978	0	88	23	0	0	0	0	0
1979	0	88	23	0	0	0	0	0
1980	0	145	33	0	0	0	0	0
1981	0	212	61	0	0	0	0	0
1982	0	247	73	0	0	0	0	0
1983	0	282	75	0	0	0	0	0
1984	0	282	75	0	0	0	0	0
1985	0	264	73	0	0	0	0	0
1986	0	237	78	0	0	0	0	0
1987	0	237	78	0	0	0	0	0
1988	0	239	93	0	0	0	0	0
1989	0	250	95	0	0	0	0	0
1990	0	254	99	0	0	0	0	0
1991	0	234	93	0	0	0	0	0
1992	0	234	93	0	0	0	0	0
1993	0	234	93	0	0	0	0	0
1994	0	234	93	0	0	0	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY	AUXILLARY
1973	6	35	33
1974	6	40	34
1975	7	50	38
1976	6	40	34
1977	7	38	45
1978	23	53	35
1979	23	53	35
1980	33	74	71
1981	61	86	126
1982	74	91	155
1983	75	100	182
1984	75	100	182
1985	73	100	165
1986	78	147	90
1987	78	147	90
1988	6	176	150
1989	8	183	154
1990	8	190	155
1991	7	172	148
1992	7	172	148
1993	7	172	148
1994	7	172	148

CANADA

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	188	0	0	0
1974	194	0	0	0
1975	209	0	0	0
1976	194	0	0	0
1977	105	59	0	0
1978	119	56	0	0
1979	119	56	0	0
1980	124	60	0	0
1981	124	54	0	0
1982	134	59	0	0
1983	143	89	0	0
1984	156	169	0	0
1985	164	228	0	0
1986	173	250	0	0
1987	167	198	0	0
1988	167	198	0	0
1989	184	205	0	0
1990	190	130	0	0
1991	185	138	0	0
1992	190	140	0	0
1993	190	140	0	0
1994	190	140	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	66	0
1974	0	72	0
1975	0	73	0
1976	0	72	0
1977	0	77	0
1978	0	93	0
1979	0	93	0
1980	0	99	0
1981	0	96	0
1982	0	99	0
1983	0	110	0
1984	0	115	0
1985	0	123	0
1986	0	128	0
1987	0	125	0
1988	0	125	0
1989	0	134	0
1990	0	129	0
1991	0	126	0
1992	0	122	0
1993	0	122	0
1994	0	122	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	67	0
1974	69	0
1975	70	0
1976	69	0
1977	74	0
1978	90	0
1979	90	0
1980	96	0
1981	92	0
1982	95	0
1983	107	0
1984	117	0
1985	122	0
1986	129	0
1987	125	0
1988	125	0
1989	133	0
1990	132	0
1991	127	0
1992	128	0
1993	128	0
1994	128	0

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	188	0	0
1974	192	2	0
1975	207	2	0
1976	192	2	0
1977	230	2	0
1978	253	2	0
1979	253	2	0
1980	266	2	0
1981	269	2	0
1982	295	0	0
1983	335	0	0
1984	433	0	0
1985	492	0	0
1986	520	0	0
1987	469	0	0
1988	469	0	0
1989	499	0	0
1990	421	0	0
1991	425	0	0
1992	428	0	0
1993	428	0	0
1994	428	0	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	96	24	0	0	0	0	0	0
1974	111	24	0	0	0	0	0	0
1975	114	24	0	0	0	0	0	0
1976	111	24	0	0	0	0	0	0
1977	138	11	0	0	0	0	0	0
1978	161	12	0	0	0	0	0	0
1979	161	12	0	0	0	0	0	0
1980	173	11	0	0	0	0	0	0
1981	182	11	0	0	0	0	0	0
1982	191	8	0	0	0	0	0	0
1983	204	7	0	0	0	0	0	0
1984	209	8	0	0	0	0	0	0
1985	212	9	0	0	0	0	0	0
1986	212	7	0	0	0	0	0	0
1987	220	7	0	0	0	0	0	0
1988	220	7	0	0	0	0	0	0
1989	242	7	0	0	0	0	0	0
1990	216	9	0	0	0	0	0	0
1991	219	9	0	0	0	0	0	0
1992	215	9	0	0	0	0	0	0
1993	215	9	0	0	0	0	0	0
1994	215	9	0	0	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	188	0	0	0	0	0
1974	40	2	152	0	0	0	0	0
1975	63	2	144	0	0	0	0	0
1976	40	2	152	0	0	0	0	0
1977	124	2	100	0	0	6	0	0
1978	155	2	93	0	0	5	0	0
1979	155	2	93	0	0	5	0	0
1980	166	2	96	0	0	3	0	0
1981	175	2	92	0	0	2	0	0
1982	198	0	85	0	0	2	0	0
1983	209	0	78	0	0	2	5	23
1984	219	0	83	0	0	2	5	98
1985	225	0	79	0	0	1	4	158
1986	229	0	75	0	0	1	2	190
1987	218	0	77	0	0	1	0	162
1988	218	0	77	0	0	1	0	162
1989	247	0	92	0	0	1	0	150
1990	245	0	88	0	0	0	0	84
1991	256	0	78	0	0	0	0	87
1992	264	0	73	0	0	0	0	87
1993	264	0	73	0	0	0	0	87
1994	264	0	73	0	0	0	0	87

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	66	0	0	0	0	0
1974	31	2	39	0	0	0	0	0
1975	42	2	29	0	0	0	0	0
1976	31	2	39	0	0	0	0	0
1977	66	2	9	0	0	0	0	0
1978	81	2	10	0	0	0	0	0
1979	81	2	10	0	0	0	0	0
1980	81	2	16	0	0	0	0	0
1981	85	2	9	0	0	0	0	0
1982	95	0	4	0	0	0	0	0
1983	107	0	2	0	0	0	0	1
1984	110	0	4	0	0	0	0	1
1985	119	0	3	0	0	0	0	1
1986	124	0	2	0	0	0	0	0
1987	120	0	4	0	0	0	0	1
1988	120	0	4	0	0	0	0	1
1989	127	0	7	0	0	0	0	0
1990	123	0	6	0	0	0	0	0
1991	120	0	5	0	0	0	0	0
1992	115	0	6	0	0	0	0	0
1993	115	0	6	0	0	0	0	0
1994	115	0	6	0	0	0	0	0

SHIP TYPE

YEAR	SELECTED	SELECTED MERCHANT	SELECTED TRAWLER	SUPPLEMEN-TARY	SUPP TRAWLER	AUXILLARY
1973	67	0	0	4	0	117
1974	72	0	0	2	0	120
1975	73	0	0	2	0	134
1976	72	0	0	2	0	120
1977	78	0	0	0	0	154
1978	92	0	0	2	0	161
1979	92	0	0	2	0	161
1980	100	0	0	1	0	167
1981	96	0	0	1	0	175
1982	98	0	0	1	0	196
1983	109	0	0	0	0	226
1984	119	1	0	0	0	314
1985	124	0	0	0	0	369
1986	128	0	0	0	0	393
1987	125	0	0	0	0	346
1988	125	0	0	0	0	346
1989	140	0	0	0	0	361
1990	135	0	0	0	1	288
1991	132	0	1	0	0	293
1992	134	0	1	0	0	298
1993	134	0	1	0	0	298
1994	134	0	1	0	0	298

FRANCE

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	189	0	0	0
1974	198	0	0	0
1975	205	0	0	0
1976	198	0	0	0
1977	221	0	0	0
1978	220	0	0	0
1979	220	0	0	0
1980	212	0	0	0
1981	206	0	0	0
1982	205	0	0	0
1983	202	0	0	0
1984	193	0	0	0
1985	203	0	0	0
1986	200	1	0	0
1987	181	0	0	0
1988	162	0	0	0
1989	159	0	0	1
1990	153	0	0	0
1991	148	0	0	0
1992	142	0	0	0
1993	140	0	0	0
1994	122	0	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	189	0
1974	0	198	0
1975	0	205	0
1976	0	198	0
1977	0	221	0
1978	0	220	0
1979	0	220	0
1980	0	182	30
1981	0	166	40
1982	0	156	49
1983	0	150	52
1984	0	143	50
1985	0	151	49
1986	0	148	53
1987	0	127	54
1988	0	102	60
1989	0	95	65
1990	0	88	65
1991	0	88	60
1992	0	81	61
1993	0	82	58
1994	0	62	60

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	88	101
1974	82	116
1975	86	119
1976	82	116
1977	107	114
1978	108	112
1979	108	112
1980	100	112
1981	81	125
1982	80	125
1983	75	127
1984	71	120
1985	69	116
1986	64	109
1987	61	94
1988	50	85
1989	45	82
1990	38	76
1991	34	76
1992	30	73
1993	25	77
1994	21	71

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	189	0	0
1974	198	0	0
1975	205	0	0
1976	198	0	0
1977	221	0	0
1978	220	0	0
1979	220	0	0
1980	182	30	0
1981	166	40	0
1982	156	49	0
1983	150	52	0
1984	142	51	0
1985	150	50	0
1986	148	53	0
1987	127	54	0
1988	102	60	0
1989	95	65	0
1990	88	65	0
1991	88	60	0
1992	81	61	0
1993	82	58	0
1994	62	60	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	3	186	0	0	0	0	0	0
1974	6	192	0	0	0	0	0	0
1975	4	201	0	0	0	0	0	0
1976	6	192	0	0	0	0	0	0
1977	10	211	0	0	0	0	0	0
1978	26	194	0	0	0	0	0	0
1979	26	194	0	0	0	0	0	0
1980	23	189	0	0	0	0	0	0
1981	33	173	0	0	0	0	0	0
1982	25	180	0	0	0	0	0	0
1983	31	171	0	0	0	0	0	0
1984	49	144	0	0	0	0	0	0
1985	51	149	0	0	0	0	0	0
1986	34	167	0	0	0	0	0	0
1987	29	152	0	0	0	0	0	0
1988	23	139	0	0	0	0	0	0
1989	21	139	0	0	0	0	0	0
1990	15	138	0	0	0	0	0	0
1991	16	132	0	0	0	0	0	0
1992	14	128	0	0	0	0	0	0
1993	13	127	0	0	0	0	0	0
1994	10	112	0	0	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	1	0	0	188	0	0	0	0
1974	0	0	0	198	0	0	0	0
1975	0	0	0	205	0	0	0	0
1976	0	0	0	198	0	0	0	0
1977	0	0	0	221	0	0	0	0
1978	0	0	0	220	0	0	0	0
1979	0	0	0	220	0	0	0	0
1980	30	0	0	182	0	0	0	0
1981	40	0	0	166	0	0	0	0
1982	49	0	0	156	0	0	0	0
1983	52	0	0	150	0	0	0	0
1984	50	0	0	143	0	0	0	0
1985	49	0	0	151	0	0	0	0
1986	53	0	0	148	0	0	0	0
1987	54	0	0	127	0	0	0	0
1988	60	0	0	102	0	0	0	0
1989	66	0	0	94	0	0	0	0
1990	65	0	0	88	0	0	0	0
1991	60	0	0	88	0	0	0	0
1992	61	0	0	81	0	0	0	0
1993	58	0	0	82	0	0	0	0
1994	60	0	0	62	0	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	0	189	0	0	0	0
1974	0	0	0	198	0	0	0	0
1975	0	0	0	205	0	0	0	0
1976	0	0	0	198	0	0	0	0
1977	0	0	0	221	0	0	0	0
1978	0	0	0	220	0	0	0	0
1979	0	0	0	220	0	0	0	0
1980	30	0	0	182	0	0	0	0
1981	40	0	0	166	0	0	0	0
1982	49	0	0	156	0	0	0	0
1983	53	0	0	149	0	0	0	0
1984	51	0	0	142	0	0	0	0
1985	50	0	0	150	0	0	0	0
1986	54	0	0	147	0	0	0	0
1987	55	0	0	126	0	0	0	0
1988	58	0	0	102	0	0	0	0
1989	64	0	0	94	0	0	0	0
1990	63	0	0	88	0	0	0	0
1991	59	0	0	88	0	0	0	0
1992	61	0	0	81	0	0	0	0
1993	58	0	0	82	0	0	0	0
1994	60	0	0	62	0	0	0	0

SHIP TYPE

YEAR	SELECTED	SELECTED SPECIAL	SELECTED MERCHANT
1973	189	0	0
1974	198	0	0
1975	205	0	0
1976	198	0	0
1977	221	0	0
1978	220	0	0
1979	220	0	0
1980	212	0	0
1981	206	0	0
1982	205	0	0
1983	0	14	188
1984	0	15	178
1985	0	14	190
1986	0	13	188
1987	0	13	168
1988	0	12	150
1989	0	13	147
1990	0	16	137
1991	148	0	0
1992	0	11	131
1993	0	11	129
1994	0	10	112

GERMANY

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	373	0	0	0
1974	392	0	0	0
1975	418	0	0	0
1976	392	0	0	0
1977	437	0	0	0
1978	435	0	0	0
1979	435	0	0	0
1980	417	0	0	0
1981	462	13	0	0
1982	471	9	0	0
1983	471	9	0	0
1984	469	0	0	0
1985	468	3	0	0
1986	472	3	0	0
1987	460	2	0	0
1988	448	1	0	0
1989	439	2	0	0
1990	594	3	0	0
1991	504	2	0	0
1992	566	2	0	0
1993	562	2	0	0
1994	562	2	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	331	0
1974	0	356	0
1975	0	401	0
1976	0	356	0
1977	0	411	0
1978	0	415	0
1979	0	415	0
1980	0	418	0
1981	0	475	0
1982	0	480	0
1983	0	480	0
1984	0	468	1
1985	0	470	1
1986	0	474	1
1987	0	460	1
1988	0	447	1
1989	0	439	1
1990	0	595	1
1991	0	505	1
1992	0	567	1
1993	0	563	1
1994	0	563	1

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	0	194
1974	0	219
1975	0	231
1976	0	219
1977	0	240
1978	0	254
1979	0	254
1980	0	256
1981	0	287
1982	0	298
1983	0	298
1984	0	329
1985	0	337
1986	0	364
1987	0	365
1988	0	369
1989	0	378
1990	0	532
1991	0	453
1992	0	501
1993	0	498
1994	0	498

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	372	1	0
1974	391	1	0
1975	417	0	0
1976	391	1	0
1977	437	0	0
1978	436	0	0
1979	436	0	0
1980	418	0	0
1981	475	0	0
1982	480	0	0
1983	480	0	0
1984	468	1	0
1985	470	1	0
1986	474	1	0
1987	460	1	0
1988	447	1	0
1989	439	1	0
1990	595	1	0
1991	505	1	0
1992	567	1	0
1993	563	1	0
1994	563	1	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	316	18	0	0	0	0	39	0
1974	338	13	0	0	0	0	41	0
1975	377	41	0	0	0	0	0	0
1976	338	13	0	0	0	0	41	0
1977	410	28	0	0	0	0	0	0
1978	412	25	0	0	0	0	0	0
1979	412	25	0	0	0	0	0	0
1980	393	24	0	0	0	0	0	0
1981	445	26	0	0	0	0	0	0
1982	458	21	0	0	0	0	0	0
1983	458	21	0	0	0	0	0	0
1984	452	17	0	0	0	0	0	0
1985	457	13	0	1	0	0	0	0
1986	461	14	0	0	0	0	0	0
1987	448	14	0	0	0	0	0	0
1988	436	13	0	0	0	0	0	0
1989	426	14	0	0	0	0	0	0
1990	421	171	0	0	0	0	0	0
1991	399	107	0	0	0	0	0	0
1992	431	137	0	0	0	0	0	0
1993	433	131	0	0	0	0	0	0
1994	433	131	0	0	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	1	0	372	0	0	0	0	0
1974	1	0	391	0	0	0	0	0
1975	0	0	417	0	0	0	0	0
1976	1	0	391	0	0	0	0	0
1977	0	0	434	0	0	0	0	0
1978	0	0	433	0	0	0	0	0
1979	0	0	433	0	0	0	0	0
1980	0	0	418	0	0	0	0	0
1981	0	0	475	0	0	0	0	0
1982	0	0	480	0	0	0	0	0
1983	0	0	480	0	0	0	0	0
1984	1	0	468	0	0	0	0	0
1985	1	0	470	0	0	0	0	0
1986	1	0	474	0	0	0	0	0
1987	1	0	460	0	0	0	0	0
1988	1	0	447	0	0	0	0	0
1989	1	0	439	0	0	0	0	0
1990	1	0	437	0	153	0	0	0
1991	1	0	422	0	83	0	0	0
1992	1	0	479	0	88	0	0	0
1993	1	0	494	0	69	0	0	0
1994	1	0	494	0	69	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	330	0	0	0	0	0
1974	0	0	356	0	0	0	0	0
1975	0	0	401	0	0	0	0	0
1976	0	0	356	0	0	0	0	0
1977	0	0	411	0	0	0	0	0
1978	0	0	415	0	0	0	0	0
1979	0	0	415	0	0	0	0	0
1980	0	0	418	0	0	0	0	0
1981	0	0	475	0	0	0	0	0
1982	0	0	480	0	0	0	0	0
1983	0	0	480	0	0	0	0	0
1984	1	0	468	0	0	0	0	0
1985	1	0	470	0	0	0	0	0
1986	1	0	474	0	0	0	0	0
1987	1	0	460	0	0	0	0	0
1988	1	0	447	0	0	0	0	0
1989	1	0	439	0	0	0	0	0
1990	1	0	437	0	158	0	0	0
1991	1	0	422	0	83	0	0	0
1992	1	0	479	0	88	0	0	0
1993	1	0	494	0	69	0	0	0
1994	1	0	494	0	69	0	0	0

SHIP TYPE

YEAR	SELECTED SPECIAL	SELECTED MERCHANT	SELECTED TRAWLER	SUPP MERCHANT	SUPP TRAWLER	AUXILLARY	AUXILLARY OCCASIONAL
1973	8	169	18	146	26	6	0
1974	10	192	17	146	22	5	0
1975	15	201	15	164	19	4	0
1976	10	192	17	146	22	5	0
1977	14	215	12	180	12	5	0
1978	13	229	13	164	12	6	0
1979	13	229	13	164	12	6	0
1980	12	236	10	146	9	5	0
1981	13	267	7	168	8	12	0
1982	16	278	7	152	5	22	0
1983	16	278	7	152	5	22	0
1984	14	307	8	111	2	27	0
1985	14	316	8	105	2	26	0
1986	13	343	7	82	2	0	28
1987	13	339	10	67	1	32	0
1988	14	338	9	53	1	34	0
1989	13	343	0	41	2	33	0
1990	18	473	32	40	3	31	0
1991	15	410	12	35	34	0	0
1992	16	455	11	47	1	38	0
1993	17	451	12	44	1	39	0
1994	17	451	12	44	1	39	0

INDIA

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	74	0	116	0
1974	97	0	104	0
1975	108	0	115	0
1976	97	0	104	0
1977	141	0	115	0
1978	132	0	133	0
1979	132	0	133	0
1980	123	0	143	0
1981	108	0	162	0
1982	120	0	149	0
1983	118	0	147	0
1984	107	0	159	0
1985	92	0	139	0
1986	87	0	129	0
1987	83	0	125	0
1988	81	0	105	0
1989	80	0	96	0
1990	79	0	102	0
1991	83	0	97	0
1992	81	0	92	0
1993	77	0	90	0
1994	72	0	87	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	44	0
1974	0	42	0
1975	0	42	0
1976	0	42	0
1977	0	45	0
1978	0	39	0
1979	0	39	0
1980	0	35	0
1981	0	40	0
1982	0	36	0
1983	0	32	0
1984	0	32	0
1985	0	26	0
1986	0	19	0
1987	0	18	0
1988	0	17	0
1989	0	15	0
1990	0	14	0
1991	0	13	0
1992	0	162	0
1993	0	163	0
1994	1	154	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	42	1
1974	41	1
1975	41	1
1976	41	1
1977	44	1
1978	39	0
1979	39	0
1980	35	0
1981	40	0
1982	36	0
1983	32	0
1984	32	0
1985	26	0
1986	19	0
1987	18	0
1988	17	0
1989	15	0
1990	14	0
1991	13	0
1992	18	0
1993	18	0
1994	17	0

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	173	0	0
1974	180	0	0
1975	200	0	0
1976	180	0	0
1977	232	0	0
1978	240	0	0
1979	240	0	0
1980	241	0	0
1981	245	0	0
1982	244	0	0
1983	242	0	0
1984	243	0	0
1985	225	0	0
1986	210	0	0
1987	201	0	0
1988	179	0	0
1989	163	0	0
1990	169	0	0
1991	168	0	0
1992	160	0	0
1993	158	0	0
1994	147	0	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	44	0	0	0	0	0	0	0
1974	42	0	0	0	0	0	0	0
1975	42	0	0	0	0	0	0	0
1976	42	0	0	0	0	0	0	0
1977	45	0	0	0	0	0	0	0
1978	39	0	0	0	0	0	0	0
1979	39	0	0	0	0	0	0	0
1980	35	0	0	0	0	0	0	0
1981	40	0	0	0	0	0	0	0
1982	36	0	0	0	0	0	0	0
1983	32	0	0	0	0	0	0	0
1984	32	0	0	0	0	0	0	0
1985	26	0	0	0	0	0	0	0
1986	19	0	0	0	0	0	0	0
1987	18	0	0	0	0	0	0	0
1988	17	0	0	0	0	0	0	0
1989	15	0	0	0	0	0	0	0
1990	14	0	0	0	0	0	0	0
1991	13	0	0	0	0	0	0	0
1992	14	0	0	0	0	0	0	0
1993	14	0	0	0	0	0	0	0
1994	13	0	0	0	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	0	173	0	0	0	0
1974	0	0	0	180	0	0	0	0
1975	0	0	0	199	0	0	0	0
1976	0	0	0	180	0	0	0	0
1977	0	0	0	232	0	0	0	0
1978	0	0	0	238	0	0	0	0
1979	0	0	0	238	0	0	0	0
1980	0	0	0	241	0	0	0	0
1981	0	0	0	245	0	0	0	0
1982	0	0	0	244	0	0	0	0
1983	0	0	0	242	0	0	0	0
1984	0	0	0	243	0	0	0	0
1985	0	0	0	225	0	0	0	0
1986	0	0	0	210	0	0	0	0
1987	0	0	0	201	0	0	0	0
1988	0	0	0	179	0	0	0	0
1989	0	0	0	159	0	0	0	0
1990	0	0	0	164	0	0	0	0
1991	0	0	0	163	0	0	0	0
1992	0	0	0	154	0	0	0	0
1993	0	0	0	152	0	0	0	0
1994	0	0	0	141	0	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	0	44	0	0	0	0
1974	0	0	0	42	0	0	0	0
1975	0	0	0	42	0	0	0	0
1976	0	0	0	42	0	0	0	0
1977	0	0	0	45	0	0	0	0
1978	0	0	0	39	0	0	0	0
1979	0	0	0	39	0	0	0	0
1980	0	0	0	35	0	0	0	0
1981	0	0	0	40	0	0	0	0
1982	0	0	0	36	0	0	0	0
1983	0	0	0	32	0	0	0	0
1984	0	0	0	32	0	0	0	0
1985	0	0	0	26	0	0	0	0
1986	0	0	0	19	0	0	0	0
1987	0	0	0	18	0	0	0	0
1988	0	0	0	17	0	0	0	0
1989	0	0	0	15	0	0	0	0
1990	0	0	0	14	0	0	0	0
1991	0	0	0	13	0	0	0	0
1992	0	0	0	162	0	0	0	0
1993	0	0	0	163	0	0	0	0
1994	0	0	0	155	0	0	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY	AUXILLARY
1973	44	129	26
1974	42	138	29
1975	42	159	30
1976	42	138	29
1977	45	188	31
1978	39	202	32
1979	39	202	32
1980	35	207	32
1981	40	206	32
1982	36	209	32
1983	32	210	31
1984	32	211	32
1985	30	207	38
1986	23	198	36
1987	25	195	36
1988	20	187	36
1989	17	174	35
1990	16	182	35
1991	17	181	35
1992	17	174	35
1993	17	176	35
1994	16	167	35

NETHERLANDS

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	278	0	29	0
1974	272	0	24	0
1975	272	0	22	0
1976	272	0	24	0
1977	238	0	18	0
1978	205	0	9	0
1979	205	0	9	0
1980	204	0	8	0
1981	204	0	3	0
1982	195	0	3	0
1983	244	60	2	0
1984	224	69	0	0
1985	206	90	0	0
1986	188	104	0	0
1987	220	94	0	0
1988	173	111	0	0
1989	153	126	0	0
1990	149	124	0	0
1991	153	129	0	0
1992	137	93	0	0
1993	126	74	0	0
1994	126	74	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	307	0
1974	0	296	0
1975	0	294	0
1976	0	296	0
1977	0	256	0
1978	0	214	0
1979	0	214	0
1980	0	212	0
1981	0	207	0
1982	0	198	0
1983	0	187	0
1984	0	173	0
1985	0	165	0
1986	0	159	0
1987	0	141	0
1988	0	129	0
1989	0	279	0
1990	0	273	0
1991	0	282	0
1992	0	230	0
1993	0	200	0
1994	0	200	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	0	289
1974	0	279
1975	0	275
1976	0	279
1977	0	250
1978	0	205
1979	0	205
1980	0	202
1981	0	199
1982	0	190
1983	0	189
1984	0	172
1985	0	164
1986	0	160
1987	0	143
1988	0	130
1989	0	257
1990	0	254
1991	0	257
1992	0	114
1993	0	128
1994	0	128

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	307	0	0
1974	296	0	0
1975	294	0	0
1976	296	0	0
1977	256	0	0
1978	214	0	0
1979	214	0	0
1980	212	0	0
1981	207	0	0
1982	198	0	0
1983	305	0	0
1984	291	0	0
1985	295	0	0
1986	291	0	0
1987	313	0	0
1988	283	0	0
1989	279	0	0
1990	273	0	0
1991	282	0	0
1992	230	0	0
1993	200	0	0
1994	200	0	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	289	12	0	0	6	0	0	0
1974	276	13	0	0	7	0	0	0
1975	269	18	0	0	7	0	0	0
1976	276	13	0	0	7	0	0	0
1977	231	18	0	0	7	0	0	0
1978	179	27	0	1	7	0	0	0
1979	179	27	0	1	7	0	0	0
1980	171	32	0	1	8	0	0	0
1981	164	35	0	1	7	0	0	0
1982	153	36	0	1	8	0	0	0
1983	138	42	0	1	6	0	0	0
1984	120	46	0	1	6	0	0	0
1985	110	49	0	1	5	0	0	0
1986	99	54	0	1	5	0	0	0
1987	86	52	0	0	3	0	0	0
1988	77	49	0	0	3	0	0	0
1989	231	48	0	0	0	0	0	0
1990	226	47	0	0	0	0	0	0
1991	236	46	0	0	0	0	0	0
1992	185	0	0	45	0	0	0	0
1993	156	0	0	44	0	0	0	0
1994	156	0	0	44	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	0	307	0	0	0	0
1974	0	0	0	296	0	0	0	0
1975	0	0	0	294	0	0	0	0
1976	0	0	0	296	0	0	0	0
1977	0	0	0	256	0	0	0	0
1978	0	0	0	214	0	0	0	0
1979	0	0	0	214	0	0	0	0
1980	0	0	0	212	0	0	0	0
1981	0	0	0	207	0	0	0	0
1982	0	0	0	198	0	0	0	0
1983	0	0	0	302	0	0	0	0
1984	0	0	0	287	0	0	0	0
1985	0	0	0	267	0	0	0	0
1986	0	0	0	230	0	0	0	0
1987	0	0	0	249	0	0	0	0
1988	0	0	0	239	0	0	0	0
1989	0	0	0	279	0	0	0	0
1990	0	0	0	273	0	0	0	0
1991	0	0	0	282	0	0	0	0
1992	0	0	0	230	0	0	0	0
1993	0	0	0	200	0	0	0	0
1994	0	0	0	200	0	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	0	0	0	307	0	0	0	0
1974	0	0	0	296	0	0	0	0
1975	0	0	0	294	0	0	0	0
1976	0	0	0	296	0	0	0	0
1977	0	0	0	256	0	0	0	0
1978	0	0	0	214	0	0	0	0
1979	0	0	0	214	0	0	0	0
1980	0	0	0	212	0	0	0	0
1981	0	0	0	207	0	0	0	0
1982	0	0	0	198	0	0	0	0
1983	0	0	0	187	0	0	0	0
1984	0	0	0	173	0	0	0	0
1985	0	0	0	165	0	0	0	0
1986	0	0	0	159	0	0	0	0
1987	0	0	0	141	0	0	0	0
1988	0	0	0	129	0	0	0	0
1989	0	0	0	279	0	0	0	0
1990	0	0	0	273	0	0	0	0
1991	0	0	0	282	0	0	0	0
1992	0	0	0	230	0	0	0	0
1993	0	0	0	200	0	0	0	0
1994	0	0	0	200	0	0	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY	AUXILLARY TRAWLER	SUPP TRAWLER	AUXILLARY
1973	307	0	30	0	83
1974	296	0	31	0	104
1975	294	0	28	0	122
1976	296	0	31	0	104
1977	256	0	22	0	91
1978	214	0	23	0	95
1979	214	0	23	0	95
1980	212	0	18	0	120
1981	207	0	16	0	127
1982	198	0	19	0	119
1983	187	104	0	15	0
1984	174	108	0	12	0
1985	165	119	0	13	0
1986	159	123	0	10	0
1987	141	165	0	8	0
1988	129	145	0	10	0
1989	140	139	0	0	0
1990	144	129	0	0	0
1991	144	138	0	0	0
1992	146	84	0	0	0
1993	128	72	0	0	0
1994	128	72	0	0	0

JAPAN

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	547	0	1	0
1974	549	0	1	0
1975	462	0	1	0
1976	549	0	1	0
1977	395	0	0	0
1978	382	0	0	0
1979	382	0	0	0
1980	360	0	0	0
1981	324	0	0	0
1982	386	0	0	0
1983	417	0	2	0
1984	477	0	2	0
1985	414	0	1	0
1986	410	0	0	0
1987	341	0	0	0
1988	224	0	0	0
1989	199	0	0	0
1990	131	0	0	1
1991	161	0	0	0
1992	116	0	0	0
1993	134	0	0	2
1994	322	0	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	548	0
1974	0	550	0
1975	1	464	0
1976	0	550	0
1977	0	395	0
1978	0	382	0
1979	0	382	0
1980	0	360	0
1981	0	324	0
1982	0	386	0
1983	1	418	0
1984	1	478	0
1985	0	409	0
1986	2	408	0
1987	0	340	0
1988	2	222	0
1989	1	198	0
1990	2	128	0
1991	2	153	1
1992	2	106	6
1993	1	128	7
1994	6	306	15

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	2	88
1974	4	82
1975	2	63
1976	4	82
1977	1	49
1978	0	49
1979	0	49
1980	2	56
1981	0	47
1982	1	57
1983	1	77
1984	1	90
1985	5	86
1986	0	92
1987	64	6
1988	0	47
1989	28	1
1990	28	0
1991	38	0
1992	28	0
1993	23	0
1994	74	0

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	138	6	404
1974	111	6	433
1975	112	3	349
1976	111	6	433
1977	98	2	295
1978	88	4	290
1979	88	4	290
1980	90	3	267
1981	72	2	250
1982	72	2	312
1983	76	2	341
1984	96	5	378
1985	87	10	318
1986	98	4	308
1987	62	5	274
1988	53	3	169
1989	53	5	141
1990	38	11	83
1991	50	14	97
1992	31	10	75
1993	46	9	81
1994	108	20	199

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	150	397	0	0	0	0	1	0
1974	110	439	0	0	0	0	1	0
1975	80	383	0	0	0	0	0	0
1976	110	439	0	0	0	0	1	0
1977	39	355	0	0	0	0	0	0
1978	27	355	0	0	0	0	0	0
1979	27	355	0	0	0	0	0	0
1980	33	324	0	0	0	0	3	0
1981	20	303	0	0	0	0	1	0
1982	27	358	0	0	0	0	1	0
1983	28	389	0	0	0	0	1	0
1984	20	457	0	0	0	0	2	0
1985	18	397	0	0	0	0	0	0
1986	12	396	0	0	0	0	0	2
1987	5	333	0	0	0	0	1	0
1988	5	219	0	0	0	0	0	0
1989	3	195	0	0	0	0	0	0
1990	7	125	0	0	0	0	0	0
1991	4	155	0	0	0	0	0	0
1992	5	108	0	0	0	0	0	1
1993	4	130	0	2	0	0	0	0
1994	20	302	0	4	0	0	1	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	497	39	7	0	5	0	0	0
1974	489	57	2	0	2	0	0	0
1975	406	54	0	1	2	0	0	0
1976	489	57	2	0	2	0	0	0
1977	393	0	2	0	0	0	0	0
1978	381	0	1	0	0	0	0	0
1979	381	0	1	0	0	0	0	0
1980	355	0	4	0	1	0	0	0
1981	320	1	3	0	0	0	0	0
1982	383	0	2	0	1	0	0	0
1983	415	0	3	0	1	0	0	0
1984	474	1	2	0	2	0	0	0
1985	412	1	0	0	2	0	0	0
1986	294	107	0	0	9	0	0	0
1987	86	244	0	0	10	0	0	0
1988	38	171	5	0	11	0	0	0
1989	51	145	2	0	1	0	0	0
1990	52	73	1	0	6	0	0	0
1991	94	63	1	0	3	0	0	0
1992	79	33	0	1	2	0	0	0
1993	85	43	1	0	7	0	0	0
1994	209	97	5	1	15	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	497	39	7	0	5	0	0	0
1974	489	57	2	0	2	0	0	0
1975	406	55	1	0	2	0	0	0
1976	489	57	2	0	2	0	0	0
1977	392	0	2	0	0	0	0	0
1978	381	0	1	0	0	0	0	0
1979	381	0	1	0	0	0	0	0
1980	355	0	4	0	1	0	0	0
1981	320	0	4	0	0	0	0	0
1982	383	0	2	0	1	0	0	0
1983	415	0	3	0	1	0	0	0
1984	474	1	2	0	2	0	0	0
1985	405	2	0	0	2	0	0	0
1986	293	108	0	0	9	0	0	0
1987	85	243	0	0	11	0	0	0
1988	40	173	1	0	10	0	0	0
1989	48	147	2	0	2	0	0	0
1990	51	71	1	0	7	0	0	0
1991	91	60	1	0	3	0	0	0
1992	77	34	0	0	3	0	0	0
1993	84	42	2	1	7	0	0	0
1994	208	97	4	2	16	0	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY	AUXILLARY
1973	462	81	5
1974	457	85	8
1975	401	58	7
1976	457	85	8
1977	332	60	3
1978	298	82	2
1979	298	82	2
1980	281	79	0
1981	257	67	0
1982	311	75	0
1983	301	118	0
1984	359	114	6
1985	304	102	9
1986	304	99	7
1987	276	62	3
1988	184	39	2
1989	133	65	1
1990	113	16	3
1991	140	19	2
1992	103	13	0
1993	119	17	0
1994	297	28	2

POLAND

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	211	0	0	0
1974	215	0	0	0
1975	228	0	0	0
1976	215	0	0	0
1977	219	0	0	0
1978	241	0	0	0
1979	241	0	0	0
1980	245	0	0	0
1981	241	0	0	0
1982	241	0	0	0
1983	241	0	0	0
1984	241	0	0	0
1985	243	0	0	0
1986	243	0	0	0
1987	234	0	0	0
1988	240	0	0	0
1989	243	0	0	0
1990	210	0	0	0
1991	204	0	0	0
1992	172	0	0	0
1993	172	0	0	0
1994	133	0	0	1

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	208	0
1974	0	210	0
1975	0	223	0
1976	0	210	0
1977	0	219	0
1978	0	241	0
1979	0	241	0
1980	0	245	0
1981	0	241	0
1982	0	241	0
1983	0	241	0
1984	0	241	0
1985	0	243	0
1986	0	243	0
1987	0	234	0
1988	0	240	0
1989	0	243	0
1990	0	210	0
1991	0	204	0
1992	0	172	0
1993	0	172	0
1994	0	133	1

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	0	211
1974	0	215
1975	0	228
1976	0	215
1977	0	219
1978	0	241
1979	0	241
1980	0	245
1981	0	241
1982	0	241
1983	0	241
1984	0	241
1985	0	243
1986	0	243
1987	0	234
1988	0	240
1989	0	243
1990	0	210
1991	0	204
1992	0	172
1993	0	172
1994	0	134

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	211	0	0
1974	215	0	0
1975	228	0	0
1976	215	0	0
1977	219	0	0
1978	241	0	0
1979	241	0	0
1980	245	0	0
1981	241	0	0
1982	241	0	0
1983	241	0	0
1984	241	0	0
1985	243	0	0
1986	243	0	0
1987	234	0	0
1988	240	0	0
1989	243	0	0
1990	210	0	0
1991	204	0	0
1992	172	0	0
1993	172	0	0
1994	133	1	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	0	211	0	0	0	0	0	0
1974	0	215	0	0	0	0	0	0
1975	0	228	0	0	0	0	0	0
1976	0	215	0	0	0	0	0	0
1977	3	216	0	0	0	0	0	0
1978	3	238	0	0	0	0	0	0
1979	3	238	0	0	0	0	0	0
1980	3	242	0	0	0	0	0	0
1981	3	238	0	0	0	0	0	0
1982	3	238	0	0	0	0	0	0
1983	3	238	0	0	0	0	0	0
1984	3	238	0	0	0	0	0	0
1985	5	238	0	0	0	0	0	0
1986	5	238	0	0	0	0	0	0
1987	7	227	0	0	0	0	0	0
1988	7	233	0	0	0	0	0	0
1989	7	236	0	0	0	0	0	0
1990	7	203	0	0	0	0	0	0
1991	6	198	0	0	0	0	0	0
1992	3	169	0	0	0	0	0	0
1993	3	169	0	0	0	0	0	0
1994	2	131	0	1	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	5	2	0	1	203	0	0	0
1974	7	2	0	1	205	0	0	0
1975	7	2	0	1	218	0	0	0
1976	7	2	0	1	205	0	0	0
1977	3	0	0	0	216	0	0	0
1978	2	0	0	0	239	0	0	0
1979	2	0	0	0	239	0	0	0
1980	2	0	0	0	243	0	0	0
1981	2	0	0	0	239	0	0	0
1982	2	0	0	0	239	0	0	0
1983	2	0	0	0	239	0	0	0
1984	2	0	0	0	239	0	0	0
1985	0	0	0	0	243	0	0	0
1986	0	0	0	0	243	0	0	0
1987	0	0	0	0	234	0	0	0
1988	0	0	0	0	240	0	0	0
1989	0	0	0	0	243	0	0	0
1990	0	0	0	0	210	0	0	0
1991	0	0	0	0	204	0	0	0
1992	0	0	0	0	172	0	0	0
1993	0	0	0	0	172	0	0	0
1994	0	0	0	0	134	0	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	2	2	0	1	203	0	0	0
1974	2	2	0	1	205	0	0	0
1975	2	2	0	1	218	0	0	0
1976	2	2	0	1	205	0	0	0
1977	2	0	0	0	217	0	0	0
1978	2	0	0	0	239	0	0	0
1979	2	0	0	0	239	0	0	0
1980	2	0	0	0	243	0	0	0
1981	2	0	0	0	239	0	0	0
1982	2	0	0	0	239	0	0	0
1983	2	0	0	0	239	0	0	0
1984	2	0	0	0	239	0	0	0
1985	0	0	0	0	243	0	0	0
1986	0	0	0	0	243	0	0	0
1987	0	0	0	0	234	0	0	0
1988	0	0	0	0	240	0	0	0
1989	0	0	0	0	243	0	0	0
1990	0	0	0	0	210	0	0	0
1991	0	0	0	0	204	0	0	0
1992	0	0	0	0	172	0	0	0
1993	0	0	0	0	172	0	0	0
1994	0	0	0	0	134	0	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY	AUXILLARY
1973	110	51	50
1974	110	55	50
1975	114	61	53
1976	110	55	50
1977	105	70	44
1978	110	71	60
1979	110	71	60
1980	112	76	57
1981	111	64	66
1982	111	64	66
1983	111	64	66
1984	111	64	66
1985	117	48	78
1986	117	48	78
1987	108	48	78
1988	108	57	75
1989	99	66	78
1990	95	66	49
1991	89	67	48
1992	62	62	48
1993	60	64	48
1994	52	59	23

USSR / Russian Federation

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	1197	0	0	0
1974	1229	0	0	0
1975	1273	0	0	0
1976	1229	0	0	0
1977	1352	0	0	0
1978	1412	0	0	0
1979	1412	0	0	0
1980	1458	0	0	0
1981	1463	0	0	0
1982	1464	0	0	0
1983	1459	0	0	0
1984	1449	0	0	0
1985	1463	0	0	0
1986	1458	0	0	0
1987	1410	0	0	0
1988	1406	0	0	0
1989	1678	0	0	0
1990	1675	0	0	0
1991	1671	34	0	0
1992	1666	34	0	0
1993	1569	60	0	0
1994	988	50	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	108	0
1974	0	102	0
1975	0	95	0
1976	0	102	0
1977	0	94	0
1978	0	9	0
1979	0	9	0
1980	0	14	0
1981	0	14	0
1982	0	19	0
1983	0	19	0
1984	0	19	0
1985	0	20	0
1986	0	20	0
1987	0	20	0
1988	0	22	0
1989	0	22	0
1990	0	21	0
1991	0	79	1
1992	0	158	4
1993	0	206	4
1994	0	54	4

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	0	1197
1974	0	1229
1975	0	1273
1976	0	1229
1977	0	1332
1978	0	1412
1979	0	1412
1980	0	1458
1981	0	1463
1982	0	1464
1983	0	1459
1984	0	1449
1985	0	1463
1986	0	1458
1987	0	1410
1988	0	1406
1989	0	1678
1990	0	1675
1991	180	1501
1992	251	1435
1993	262	1358
1994	157	874

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	1197	0	0
1974	1229	0	0
1975	1273	0	0
1976	1229	0	0
1977	1352	0	0
1978	1412	0	0
1979	1412	0	0
1980	1458	0	0
1981	1463	0	0
1982	1464	0	0
1983	1459	0	0
1984	1449	0	0
1985	1463	0	0
1986	1458	0	0
1987	1410	0	0
1988	1406	0	0
1989	1678	0	0
1990	1675	0	0
1991	1636	10	57
1992	1594	16	89
1993	1497	19	113
1994	906	18	114

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	1197	0	0	0	0	0	0	0
1974	1229	0	0	0	0	0	0	0
1975	1273	0	0	0	0	0	0	0
1976	1229	0	0	0	0	0	0	0
1977	1352	0	0	0	0	0	0	0
1978	148	1263	0	0	0	0	0	0
1979	148	1263	0	0	0	0	0	0
1980	131	1326	0	0	0	0	0	0
1981	126	1336	0	0	0	0	0	0
1982	0	1464	0	0	0	0	0	0
1983	0	1459	0	0	0	0	0	0
1984	0	1449	0	0	0	0	0	0
1985	0	1463	0	0	0	0	0	0
1986	0	1458	0	0	0	0	0	0
1987	0	1410	0	0	0	0	0	0
1988	200	1201	5	0	0	0	0	0
1989	276	1394	7	0	1	0	0	0
1990	278	1388	8	0	1	0	0	0
1991	283	1397	7	4	12	0	0	3
1992	291	1384	2	5	13	0	0	2
1993	266	1331	2	6	13	0	0	2
1994	145	858	3	6	12	0	0	2

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	1197	0	0	0	0	0	0	0
1974	1229	0	0	0	0	0	0	0
1975	1273	0	0	0	0	0	0	0
1976	1229	0	0	0	0	0	0	0
1977	1352	0	0	0	0	0	0	0
1978	1410	0	0	0	0	0	0	0
1979	1410	0	0	0	0	0	0	0
1980	1457	0	0	0	0	0	0	0
1981	1462	0	0	0	0	0	0	0
1982	1464	0	0	0	0	0	0	0
1983	1459	0	0	0	0	0	0	0
1984	1449	0	0	0	0	0	0	0
1985	1463	0	0	0	0	0	0	0
1986	1458	0	0	0	0	0	0	0
1987	1410	0	0	0	0	0	0	0
1988	1406	0	0	0	0	0	0	0
1989	1678	0	0	0	0	0	0	0
1990	1675	0	0	0	0	0	0	0
1991	1415	24	0	0	93	75	0	77
1992	1098	41	0	0	126	96	0	333
1993	962	36	0	0	192	115	0	318
1994	567	37	0	0	57	105	0	268

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	108	0	0	0	0	0	0	0
1974	102	0	0	0	0	0	0	0
1975	95	0	0	0	0	0	0	0
1976	102	0	0	0	0	0	0	0
1977	94	0	0	0	0	0	0	0
1978	9	0	0	0	0	0	0	0
1979	9	0	0	0	0	0	0	0
1980	14	0	0	0	0	0	0	0
1981	14	0	0	0	0	0	0	0
1982	19	0	0	0	0	0	0	0
1983	19	0	0	0	0	0	0	0
1984	19	0	0	0	0	0	0	0
1985	20	0	0	0	0	0	0	0
1986	20	0	0	0	0	0	0	0
1987	20	0	0	0	0	0	0	0
1988	22	0	0	0	0	0	0	0
1989	22	0	0	0	0	0	0	0
1990	21	0	0	0	0	0	0	0
1991	21	0	0	0	57	0	0	1
1992	16	0	0	0	139	0	0	5
1993	14	0	0	0	190	0	0	5
1994	9	0	0	0	44	0	0	5

SHIP TYPE

YEAR	SELECTED
1973	1197
1974	1229
1975	1273
1976	1229
1977	1352
1978	1412
1979	1412
1980	1458
1981	1463
1982	1464
1983	1459
1984	1449
1985	1463
1986	1458
1987	1410
1988	1406
1989	1678
1990	1675
1991	1711
1992	1704
1993	1632
1994	1038

UK

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	356	0	190	0
1974	1	0	97	480
1975	1	0	56	428
1976	1	0	97	480
1977	0	0	14	550
1978	0	0	3	515
1979	0	0	3	515
1980	0	0	2	485
1981	0	0	1	469
1982	0	0	1	449
1983	0	0	0	413
1984	0	0	0	445
1985	1	0	0	451
1986	1	0	0	444
1987	1	0	0	433
1988	1	0	0	447
1989	1	0	0	450
1990	2	0	0	462
1991	1	0	0	471
1992	2	2	0	481
1993	7	8	0	493
1994	7	8	0	493

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	498	0
1974	0	530	0
1975	0	446	0
1976	0	530	0
1977	0	529	0
1978	0	489	0
1979	0	489	0
1980	0	463	0
1981	0	452	0
1982	0	435	0
1983	0	406	0
1984	0	436	0
1985	0	441	0
1986	0	435	0
1987	0	426	0
1988	0	440	0
1989	0	445	0
1990	0	459	0
1991	0	468	0
1992	0	481	0
1993	0	508	0
1994	0	508	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	496	2
1974	529	1
1975	446	0
1976	529	1
1977	525	0
1978	488	0
1979	488	0
1980	462	0
1981	452	0
1982	435	0
1983	406	0
1984	438	0
1985	442	0
1986	432	0
1987	424	0
1988	440	0
1989	443	1
1990	456	1
1991	467	1
1992	474	3
1993	487	13
1994	487	13

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	532	13	0
1974	560	18	0
1975	465	20	0
1976	560	18	0
1977	545	19	0
1978	495	23	0
1979	495	23	0
1980	470	17	0
1981	450	20	0
1982	429	21	0
1983	391	22	0
1984	426	19	0
1985	432	20	0
1986	424	21	0
1987	406	28	0
1988	418	30	0
1989	417	34	0
1990	425	39	0
1991	431	41	0
1992	438	44	0
1993	449	59	0
1994	449	59	0

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	475	22	0	12	0	0	0	0
1974	502	27	0	17	0	0	0	0
1975	415	24	0	20	0	0	0	0
1976	502	27	0	17	0	0	0	0
1977	501	29	0	19	0	0	0	0
1978	448	32	0	23	0	0	0	0
1979	448	32	0	23	0	0	0	0
1980	430	29	0	17	0	0	0	0
1981	416	30	0	20	0	0	0	0
1982	404	25	0	21	0	0	0	0
1983	369	22	0	22	0	0	0	0
1984	401	21	0	19	0	0	0	0
1985	397	18	0	21	0	0	0	0
1986	385	19	0	23	0	0	0	0
1987	371	16	0	30	0	0	0	0
1988	376	16	0	32	0	0	0	0
1989	383	14	0	35	0	0	0	0
1990	389	15	0	41	0	0	0	0
1991	393	16	0	43	0	0	0	0
1992	387	22	1	50	0	0	0	0
1993	373	47	0	51	2	0	0	1
1994	373	47	0	51	2	0	0	1

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	545	0	0	0	0	0	0	0
1974	578	0	0	0	0	0	0	0
1975	485	0	0	0	0	0	0	0
1976	578	0	0	0	0	0	0	0
1977	564	0	0	0	0	0	0	0
1978	518	0	0	0	0	0	0	0
1979	518	0	0	0	0	0	0	0
1980	487	0	0	0	0	0	0	0
1981	470	0	0	0	0	0	0	0
1982	450	0	0	0	0	0	0	0
1983	413	0	0	0	0	0	0	0
1984	445	0	0	0	0	0	0	0
1985	452	0	0	0	0	0	0	0
1986	445	0	0	0	0	0	0	0
1987	434	0	0	0	0	0	0	0
1988	447	0	0	0	0	0	0	0
1989	450	0	0	0	1	0	0	0
1990	463	0	0	0	1	0	0	0
1991	471	0	0	0	1	0	0	0
1992	480	0	0	0	1	0	0	0
1993	495	0	0	2	0	3	3	5
1994	495	0	0	2	0	3	3	5

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	498	0	0	0	0	0	0	0
1974	530	0	0	0	0	0	0	0
1975	446	0	0	0	0	0	0	0
1976	530	0	0	0	0	0	0	0
1977	529	0	0	0	0	0	0	0
1978	489	0	0	0	0	0	0	0
1979	489	0	0	0	0	0	0	0
1980	451	0	0	0	0	0	0	0
1981	451	0	0	0	0	0	0	0
1982	434	0	0	0	0	0	0	0
1983	406	0	0	0	0	0	0	0
1984	436	0	0	0	0	0	0	0
1985	441	0	0	0	0	0	0	0
1986	432	0	0	0	0	0	0	0
1987	424	0	0	0	0	0	0	0
1988	439	0	0	0	0	0	0	0
1989	444	0	0	0	1	0	0	0
1990	458	0	0	0	1	0	0	0
1991	467	0	0	0	1	0	0	0
1992	480	0	0	0	1	0	0	0
1993	495	0	0	2	0	3	3	5
1994	495	0	0	2	0	3	3	5

SHIP TYPE

YEAR	SELECTED	SELECTED SPECIAL	SELECTED MERCHANT	SELECTED TRAWLER	SUPPLEMEN-TARY	AUXILLARY TRAWLER	SUPP MERCHANT	SUPP TRAWLER	AUXILLARY	AUXILLARY OCCASIONAL
1973	498	0	0	0	48	24	0	0	21	0
1974	530	0	0	0	48	10	0	0	16	0
1975	0	26	418	2	3	5	21	15	16	0
1976	530	0	0	0	48	10	0	0	16	0
1977	0	25	491	9	4	12	27	9	6	0
1978	0	26	458	5	3	1	22	5	7	0
1979	0	26	458	5	3	1	22	5	7	0
1980	0	29	430	4	4	1	17	4	5	0
1981	0	30	420	2	3	1	13	2	5	0
1982	0	29	407	4	3	0	11	1	5	0
1983	0	24	381	1	0	0	9	1	6	0
1984	0	23	412	1	0	0	9	2	6	0
1985	0	19	425	0	0	0	8	1	3	0
1986	0	17	415	0	0	0	12	1	4	0
1987	0	32	392	0	0	0	9	1	4	0
1988	0	42	396	3	0	0	7	1	3	0
1989	0	43	396	6	0	0	5	1	1	0
1990	0	41	416	2	0	0	4	1	0	0
1991	0	40	422	3	0	0	6	1	0	0
1992	0	89	388	2	0	0	2	1	0	3
1993	0	100	395	4	0	0	1	0	0	8
1994	0	100	395	4	0	0	1	0	0	8

USA

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	1563	0	5	0
1974	1500	0	5	0
1975	1554	0	2	0
1976	1500	0	5	0
1977	1565	0	2	0
1978	1086	0	1	0
1979	1086	0	1	0
1980	1122	0	2	0
1981	1146	0	2	0
1982	1020	0	2	0
1983	934	0	2	0
1984	934	0	2	0
1985	811	0	2	0
1986	769	0	1	0
1987	737	0	1	0
1988	749	0	1	0
1989	750	0	1	0
1990	743	0	1	0
1991	741	0	1	0
1992	706	0	1	0
1993	743	0	1	0
1994	791	0	2	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	4	1544	0
1974	3	1484	0
1975	2	1536	0
1976	3	1484	0
1977	2	1548	0
1978	0	1077	0
1979	0	1077	0
1980	0	1113	0
1981	0	1136	0
1982	0	1010	0
1983	0	901	0
1984	0	901	0
1985	0	684	0
1986	0	564	0
1987	0	483	0
1988	0	463	0
1989	0	434	0
1990	1	392	0
1991	1	410	0
1992	1	390	0
1993	1	434	0
1994	3	438	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	502	83
1974	474	87
1975	505	99
1976	474	87
1977	522	95
1978	514	71
1979	514	71
1980	513	75
1981	529	83
1982	494	71
1983	472	60
1984	472	60
1985	477	49
1986	457	40
1987	445	35
1988	460	33
1989	454	32
1990	457	26
1991	481	23
1992	461	20
1993	470	19
1994	477	13

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	1429	2	137
1974	1342	1	162
1975	1372	2	181
1976	1342	1	162
1977	1353	2	210
1978	939	3	145
1979	939	3	145
1980	974	3	147
1981	1010	4	134
1982	902	2	115
1983	826	1	106
1984	826	1	106
1985	725	4	83
1986	673	3	83
1987	662	3	75
1988	669	3	81
1989	666	5	85
1990	688	6	79
1991	698	5	70
1992	668	6	66
1993	692	7	65
1994	743	7	48

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	30	1534	0	1	0	0	0	0
1974	20	1482	0	1	0	0	0	0
1975	16	1535	0	1	0	0	0	0
1976	20	1482	0	1	0	0	0	0
1977	16	1545	0	1	0	0	0	0
1978	18	1050	0	8	0	0	0	4
1979	18	1050	0	8	0	0	0	4
1980	19	1084	0	10	0	0	0	4
1981	18	1110	0	10	0	0	0	4
1982	16	986	0	7	0	0	0	4
1983	15	902	0	6	0	0	0	4
1984	15	902	0	6	0	0	0	4
1985	15	774	0	6	0	0	0	5
1986	19	714	0	9	0	0	0	3
1987	16	694	0	12	0	0	0	3
1988	15	706	0	12	0	0	0	4
1989	18	708	0	11	0	0	0	4
1990	24	710	0	12	0	0	0	5
1991	25	703	0	12	0	0	0	4
1992	24	670	0	13	0	0	0	3
1993	28	660	0	14	0	0	0	4
1994	32	631	0	11	0	0	2	4

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	207	5	1103	0	221	32	0	0
1974	236	5	1049	0	179	36	0	0
1975	262	4	1091	0	166	32	0	0
1976	236	5	1049	0	179	36	0	0
1977	310	3	1065	0	161	26	0	0
1978	230	1	694	0	150	12	0	0
1979	230	1	694	0	150	12	0	0
1980	241	1	721	0	147	14	0	0
1981	241	1	744	0	146	16	0	0
1982	206	0	663	0	138	12	0	0
1983	194	0	598	0	130	10	0	0
1984	194	0	598	0	130	10	0	0
1985	186	0	509	0	97	10	0	0
1986	185	0	472	0	81	7	0	0
1987	175	0	471	0	76	6	0	0
1988	190	0	467	0	75	7	0	0
1989	213	1	446	0	71	8	0	0
1990	210	2	472	0	61	9	0	0
1991	203	2	485	0	60	7	0	0
1992	196	2	464	0	55	7	0	0
1993	203	2	457	0	57	23	0	0
1994	186	4	462	0	56	71	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	199	5	1104	0	222	18	0	0
1974	230	5	1049	0	180	23	0	0
1975	255	4	1092	0	166	21	0	0
1976	230	5	1049	0	180	23	0	0
1977	303	3	1065	0	162	17	0	0
1978	222	1	693	0	151	10	0	0
1979	222	1	693	0	151	10	0	0
1980	233	1	719	0	148	12	0	0
1981	234	1	741	0	147	13	0	0
1982	201	0	660	0	139	10	0	0
1983	181	0	584	0	126	9	0	0
1984	181	0	584	0	126	9	0	0
1985	131	0	455	0	91	5	0	0
1986	107	0	386	0	69	2	0	0
1987	84	0	339	0	58	2	0	0
1988	83	0	321	0	57	2	0	0
1989	82	1	296	0	53	2	0	0
1990	68	2	275	0	46	2	0	0
1991	66	2	298	0	44	1	0	0
1992	62	2	287	0	39	1	0	0
1993	78	2	294	0	41	19	0	0
1994	64	2	274	0	36	65	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY	AUXILLARY	SELECTED not US	SUPP not US	AUXILLARY not US
1973	468	226	3	77	798	0
1974	443	189	3	67	808	0
1975	455	182	33	74	846	0
1976	443	189	3	67	808	0
1977	453	170	75	91	854	0
1978	457	130	52	90	410	0
1979	457	130	52	90	410	0
1980	455	144	57	102	423	0
1981	470	153	63	101	425	0
1982	446	151	66	82	345	0
1983	425	132	77	78	303	0
1984	425	132	77	78	303	0
1985	364	114	62	79	264	0
1986	352	111	64	77	236	0
1987	347	115	61	69	226	0
1988	358	123	68	72	219	0
1989	349	127	74	78	227	0
1990	336	136	99	99	242	0
1991	350	139	121	120	233	0
1992	328	132	110	118	240	0
1993	320	141	113	114	291	0
1994	312	136	78	140	311	0

YUGOSLAVIA

BAROMETER

YEAR	ANEROID	SHIPS ANEROID	MERCURY	DIGITAL ANEROID
1973	95	0	0	0
1974	94	0	0	0
1975	100	0	3	0
1976	94	0	0	0
1977	106	0	3	0
1978	110	0	3	0
1979	110	0	3	0
1980	211	0	2	0
1981	215	0	2	0
1982	221	0	1	0
1983	245	0	1	0
1984	235	0	0	0
1985	199	0	0	0
1986	207	0	0	0
1987	207	0	0	0
1988	178	0	0	0
1989	178	0	0	0
1990	178	0	0	0
1991	178	0	0	0
1992	178	0	0	0
1993	126	0	0	0
1994	126	0	0	0

HUMIDITY TYPE

YEAR	HAIR	PSYCHRO-METER	ELECTRIC
1973	0	59	0
1974	0	59	0
1975	0	79	0
1976	0	59	0
1977	0	94	0
1978	0	99	0
1979	0	99	0
1980	0	178	0
1981	0	182	0
1982	0	184	0
1983	0	197	0
1984	0	180	0
1985	0	149	0
1986	0	143	0
1987	0	143	0
1988	0	125	0
1989	0	125	0
1990	0	125	0
1991	0	125	0
1992	0	125	0
1993	0	85	0
1994	0	85	0

BAROGRAPH

YEAR	OPEN SCALE	SMALL SCALE
1973	0	1
1974	0	1
1975	6	0
1976	0	1
1977	9	0
1978	9	0
1979	9	0
1980	10	0
1981	12	0
1982	12	0
1983	17	15
1984	12	25
1985	4	28
1986	4	27
1987	4	27
1988	4	27
1989	4	27
1990	4	27
1991	4	27
1992	4	27
1993	4	20
1994	4	20

THERMOMETER

YEAR	MERCURY	ELECTRIC	ALCOHOL
1973	95	0	0
1974	94	0	0
1975	68	11	24
1976	94	0	0
1977	83	11	15
1978	88	11	14
1979	88	11	14
1980	186	11	16
1981	190	11	16
1982	199	7	16
1983	231	0	15
1984	212	0	23
1985	187	0	12
1986	197	0	10
1987	197	0	10
1988	170	0	8
1989	170	0	8
1990	170	0	8
1991	170	0	8
1992	170	0	8
1993	120	0	6
1994	120	0	6

SST METHOD

YEAR	BUCKET	ENGINE INTAKE	TRAILING	HULL CONTACT	THROUGH HULL	RADIATION	BAIT TANK	OTHER
1973	0	95	0	0	0	0	0	0
1974	0	94	0	0	0	0	0	0
1975	0	101	0	0	2	0	0	0
1976	0	94	0	0	0	0	0	0
1977	0	107	0	0	2	0	0	0
1978	0	111	0	0	2	0	0	0
1979	0	111	0	0	2	0	0	0
1980	0	211	0	0	2	0	0	0
1981	0	215	0	0	2	0	0	0
1982	0	218	0	0	2	0	0	0
1983	0	243	0	0	2	0	0	0
1984	1	233	0	0	0	0	0	0
1985	1	197	0	0	0	0	0	1
1986	0	207	0	0	0	0	0	0
1987	0	207	0	0	0	0	0	0
1988	0	178	0	0	0	0	0	0
1989	0	178	0	0	0	0	0	0
1990	0	178	0	0	0	0	0	0
1991	0	178	0	0	0	0	0	0
1992	0	178	0	0	0	0	0	0
1993	0	126	0	0	0	0	0	0
1994	0	126	0	0	0	0	0	0

TEMPERATURE HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	45	0	0	0	18	32	0	0
1974	44	0	0	0	20	30	0	0
1975	32	0	0	7	35	29	0	0
1976	44	0	0	0	20	30	0	0
1977	22	0	0	5	63	19	0	0
1978	27	0	0	5	63	18	0	0
1979	27	0	0	5	63	18	0	0
1980	54	0	0	11	106	42	0	0
1981	55	0	0	12	108	42	0	0
1982	57	0	0	12	111	42	0	0
1983	49	0	0	8	139	49	0	0
1984	45	0	5	2	131	52	0	0
1985	45	0	4	1	118	31	0	0
1986	50	0	4	1	122	30	0	0
1987	50	0	4	1	122	30	0	0
1988	45	0	3	1	104	25	0	0
1989	45	0	3	1	104	25	0	0
1990	45	0	3	1	104	25	0	0
1991	45	0	3	1	104	25	0	0
1992	45	0	3	1	104	25	0	0
1993	33	0	2	1	69	21	0	0
1994	33	0	2	1	69	21	0	0

HUMIDITY HOUSING

YEAR	SCREEN	VENT'D SCREEN	SLING	WHIRL	ASSMAN	UNSCR-EENED	SHIPS SLING	SHIPS SCREEN
1973	41	0	0	0	18	0	0	0
1974	39	0	0	0	20	0	0	0
1975	30	0	0	7	35	7	0	0
1976	39	0	0	0	20	0	0	0
1977	20	0	0	5	63	6	0	0
1978	25	0	0	5	63	6	0	0
1979	25	0	0	5	63	6	0	0
1980	48	0	0	11	106	13	0	0
1981	49	0	0	12	108	13	0	0
1982	49	0	0	12	111	12	0	0
1983	36	0	0	8	139	14	0	0
1984	31	0	5	2	129	12	0	0
1985	22	0	4	1	118	4	0	0
1986	18	0	4	1	116	4	0	0
1987	18	0	4	1	116	4	0	0
1988	19	0	3	1	98	4	0	0
1989	19	0	3	1	98	4	0	0
1990	19	0	3	1	98	4	0	0
1991	19	0	3	1	98	4	0	0
1992	19	0	3	1	98	4	0	0
1993	15	0	2	1	65	2	0	0
1994	15	0	2	1	65	2	0	0

SHIP TYPE

YEAR	SELECTED	SUPPLEMEN-TARY
1973	60	35
1974	59	35
1975	66	37
1976	59	35
1977	71	38
1978	74	39
1979	74	39
1980	121	92
1981	124	93
1982	126	96
1983	130	116
1984	180	55
1985	123	76
1986	110	97
1987	110	97
1988	95	83
1989	95	83
1990	95	83
1991	95	83
1992	95	83
1993	59	67
1994	59	67

Figure 1 - Types of instruments used by Voluntary Observing Ships by Year from 1973 to 1994

Type of barometer

black - aneroid
red - ships aneroid
green - mercury
purple - digital aneroid

Type of thermometer

black - mercury
red - electric resistance
green - alcohol

Housing of thermometer

black - screen (unventilated)
red - screen (ventilated)
green - sling
purple - whirling
turquoise - aspirated (Assman)
pink - unscreened
yellow -ships sling
orange - ships screen

Type of hygrometer

black - hair hygrometer
red - psychrometer
green - electric

Housing of hygrometer

black - screen (unventilated)
red - screen (ventilated)
green - sling
purple - whirling
turquoise - aspirated (Assman)
pink - unscreened
yellow -ships sling
orange - ships screen

Type of 2nd barometer

black - aneroid
red - ships aneroid
green - mercury
purple - digital aneroid

Type of 2nd thermometer

black - mercury
red - electric resistance
green - alcohol

Housing of 2nd thermometer

black - screen (unventilated)
red - screen (ventilated)
green - sling
purple - whirling
turquoise - aspirated (Assman)
pink - unscreened
yellow -ships sling
orange - ships screen

Type of 2nd hygrometer

black - hair hygrometer
red - psychrometer
green - electric

Housing of 2nd hygrometer

black - screen (unventilated)
red - screen (ventilated)
green - sling
purple - whirling
turquoise - aspirated (Assman)
pink - unscreened
yellow -ships sling
orange - ships screen

SST method

black - bucket
red - engine intake
green - trailing thermistor
purple - hull contact sensor
turquoise - through hull sensor
pink - radiation thermometer
yellow - bait tank thermometer
orange - other

SST method 2

black - bucket
red - engine intake
green - trailing thermistor
purple - hull contact sensor
turquoise - through hull sensor
pink - radiation thermometer
yellow - bait tank thermometer
orange - other

SST method 3

black - bucket
red - engine intake
green - trailing thermistor
purple - hull contact sensor
turquoise - through hull sensor
pink - radiation thermometer
yellow - bait tank thermometer
orange - other

Type of barograph

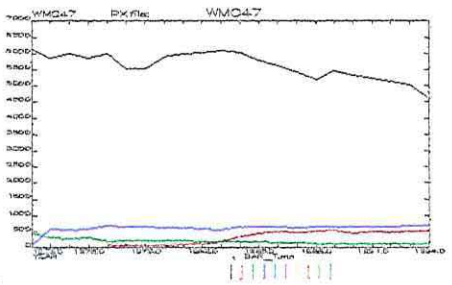
black - open scale
red - small scale

Type of 2nd barograph

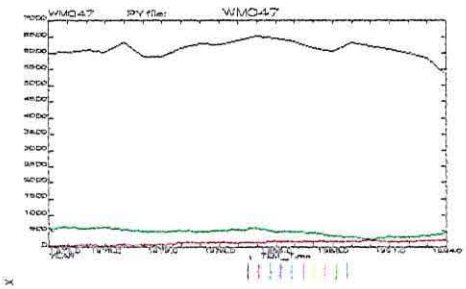
black - open scale
red - small scale

telecoms

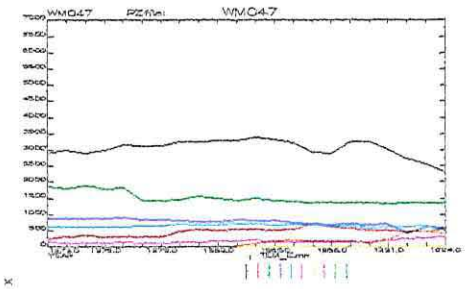
black - radio telephone, HF , MF
red - HF and MF radio telegraphy
green - radio telephone, HF
purple - radio telephone, MF
turquoise - HF radio telegraphy
pink - MF radio telegraphy
yellow - radio telephone



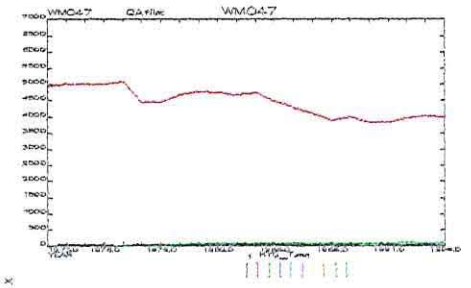
type of barometer



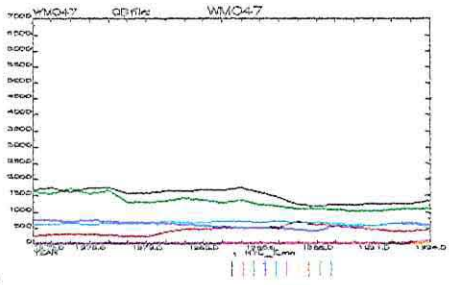
type of thermometer



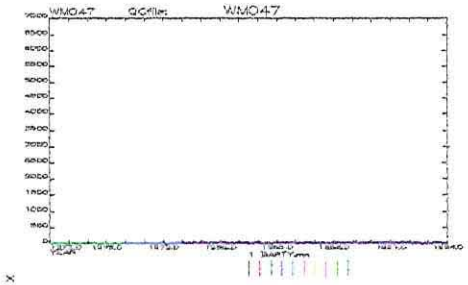
housing of thermometer



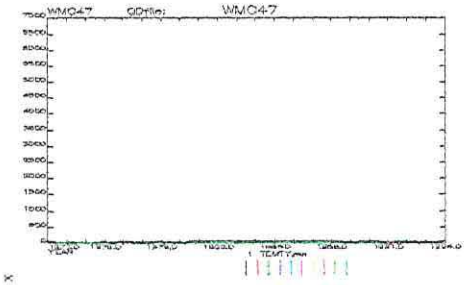
type of hygrometer



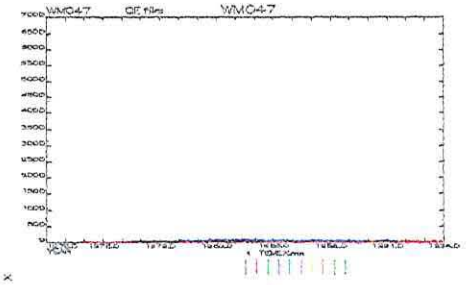
housing of hygrometer



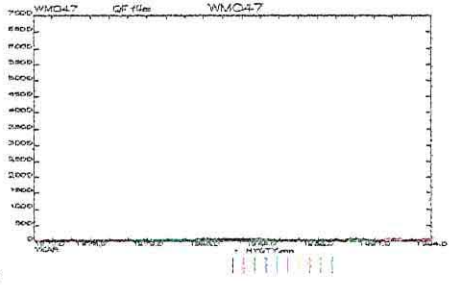
type of 2nd barometer



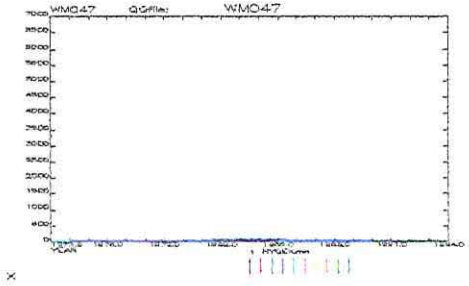
type of 2nd thermometer



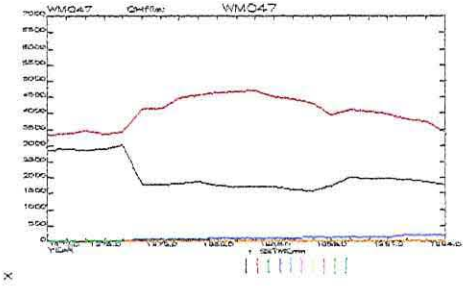
housing of 2nd thermometer



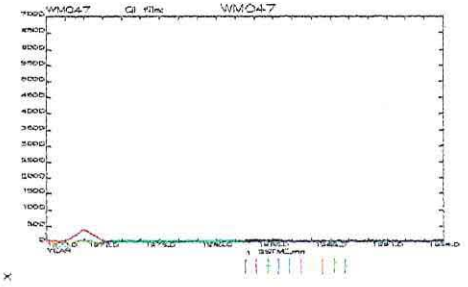
type of 2nd hygrometer



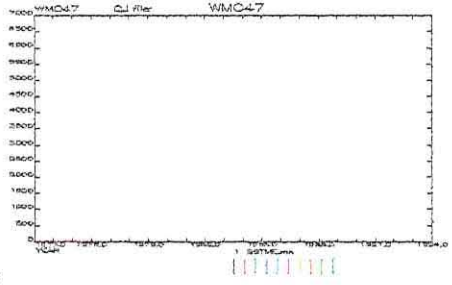
housing of 2nd hygrometer



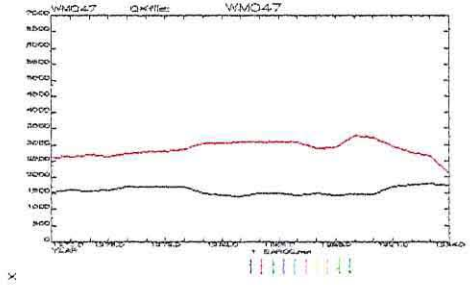
SST method 1



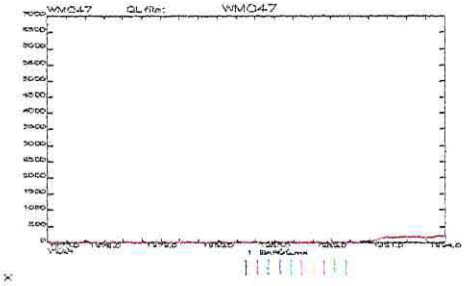
SST method 2



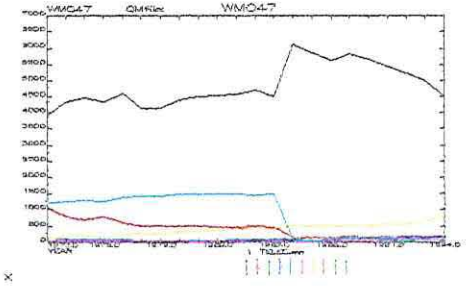
SST method 3



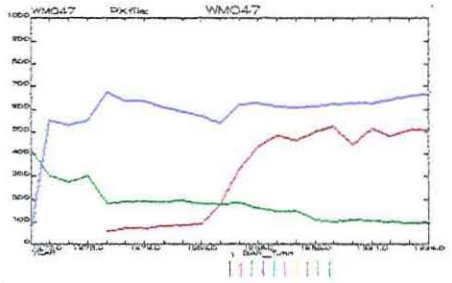
type of barograph



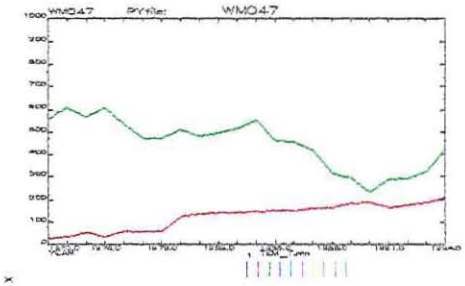
type of 2nd barograph



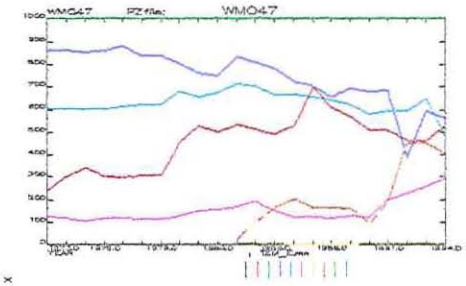
telecoms



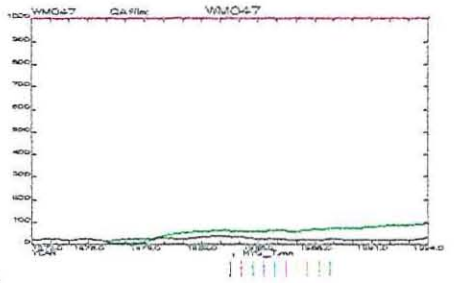
type of barometer



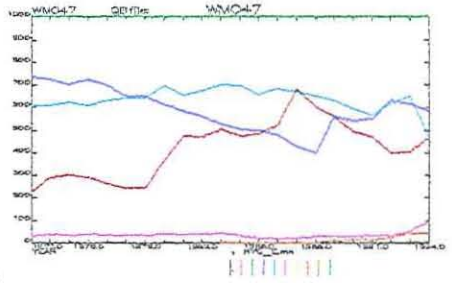
type of thermometer



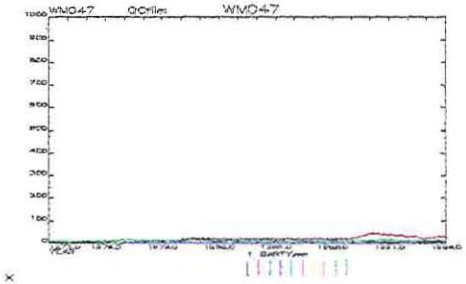
housing of thermometer



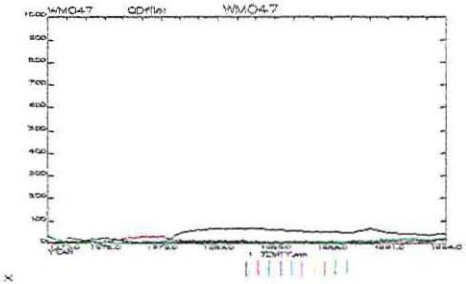
type of hygrometer



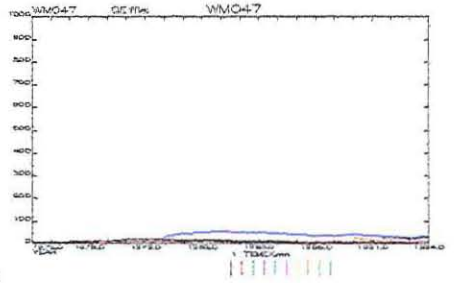
housing of hygrometer



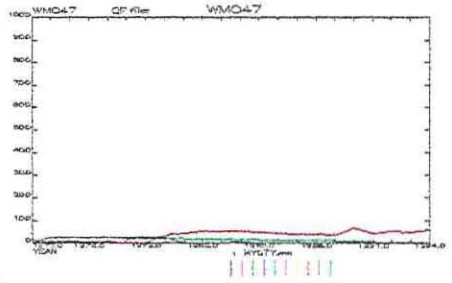
type of 2nd barometer



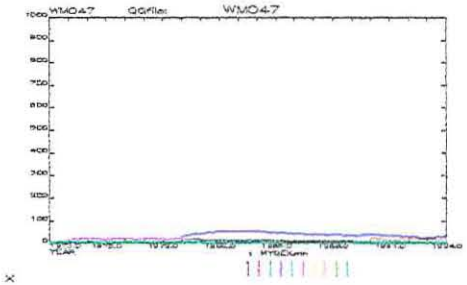
type of 2nd thermometer



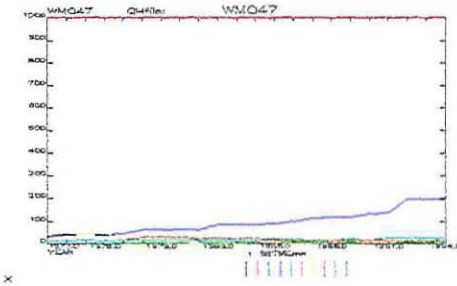
housing of 2nd thermometer



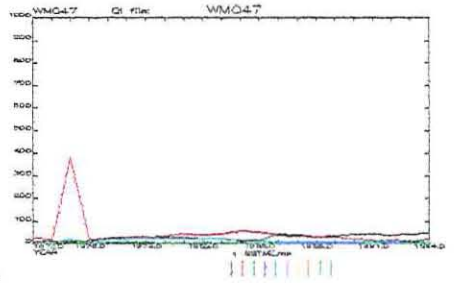
type of 2nd hygrometer



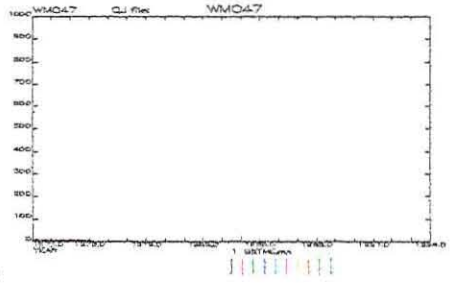
housing of 2nd hygrometer



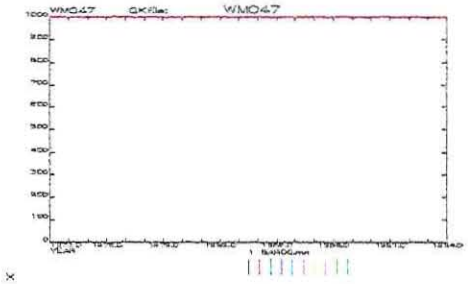
SST method 1



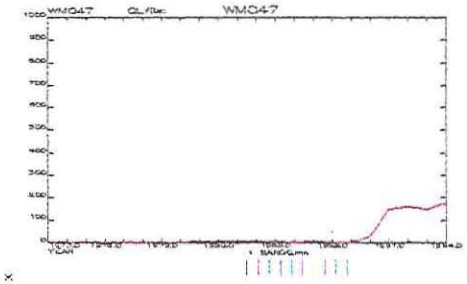
SST method 2



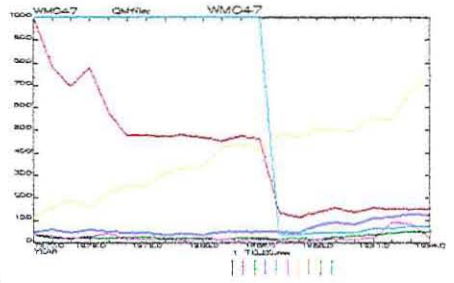
SST method 3



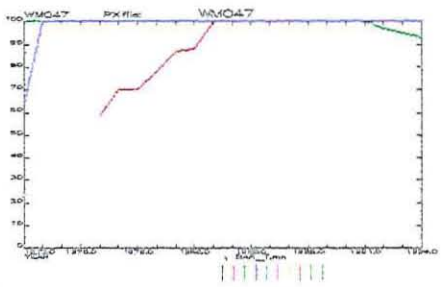
type of barograph



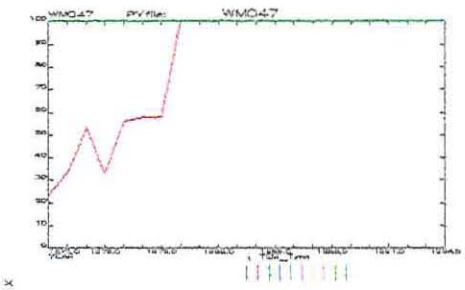
type of 2nd barograph



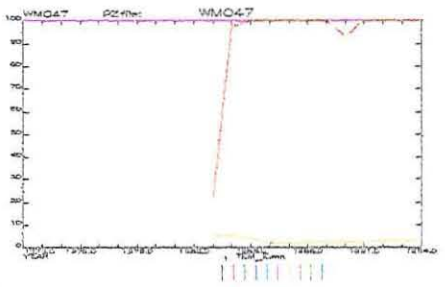
telecoms



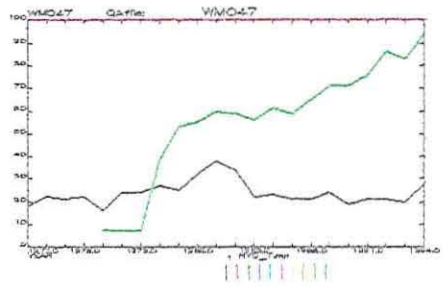
type of barometer



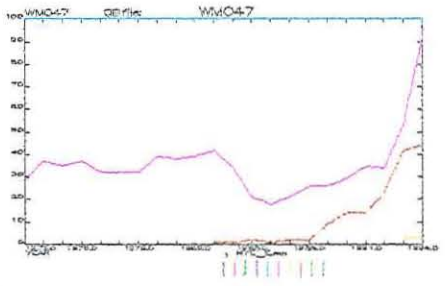
type of thermometer



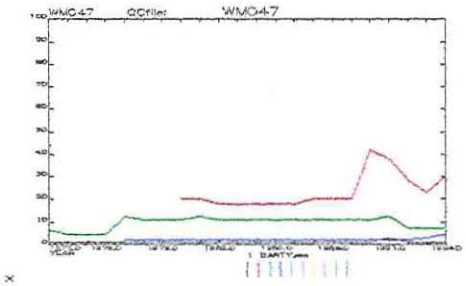
housing of thermometer



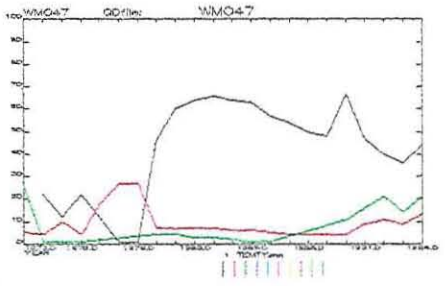
type of hygrometer



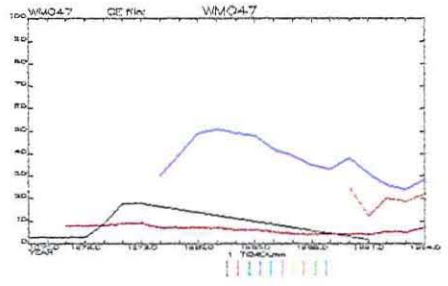
housing of hygrometer



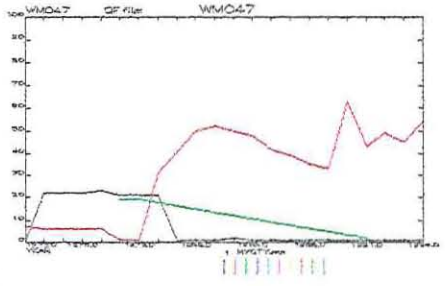
type of 2nd barometer



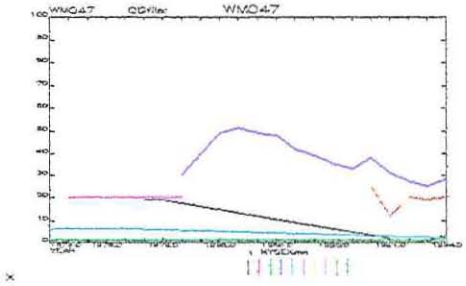
type of 2nd thermometer



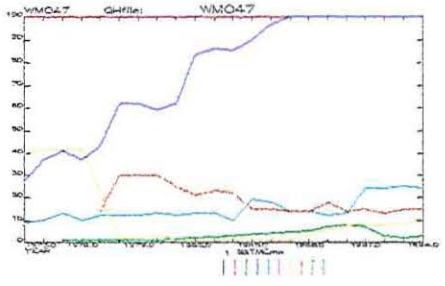
housing of 2nd thermometer



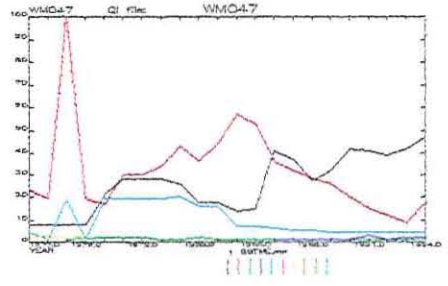
type of 2nd hygrometer



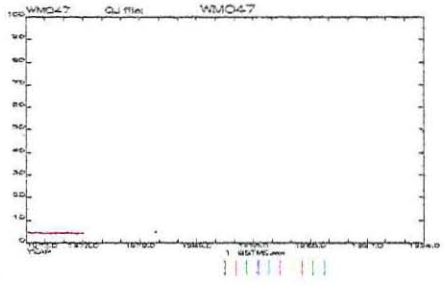
housing of 2nd hygrometer



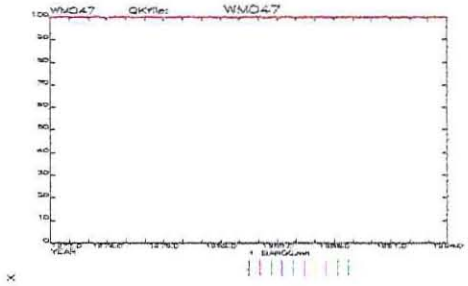
SST method 1



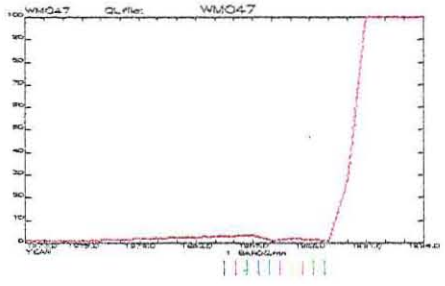
SST method 2



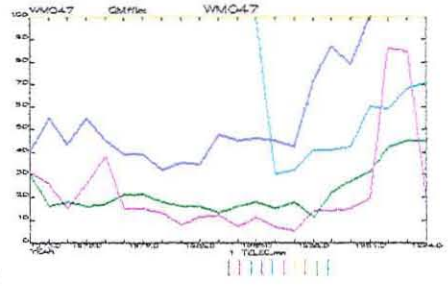
SST method 3



type of barograph



type of 2nd barograph



telecoms

Figure 2 - Numbers of Ships with Different Types of Other Instruments, by Year, 1973 to 1994.

Top Row, Left to Right

Maximum Thermometer, Minimum Thermometer, Reversing Thermometer, Temperature/Salinity/Depth Probe

Second Row, Left to Right

Bathythermometer, Bathythermograph (towed), Expendable Bathythermograph, Hand held anemometer

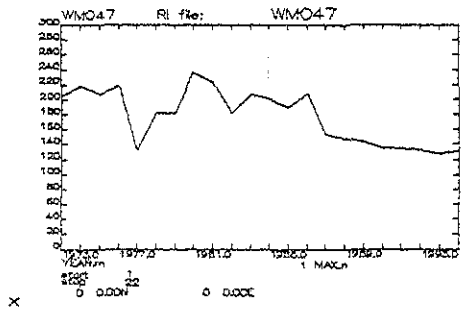
Third Row, Left to Right

Anemometer, Ships anemometer, Anemograph, Rain Gauge

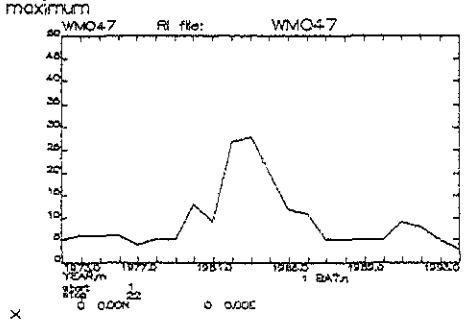
Fourth Row, Left to Right

Pilot Balloon Equipment, Radiosonde Equipment, Radarwind Equipment, Sea Thermograph and Radar Storm/Meteorological Phenomenon Detection (final two on one plot)

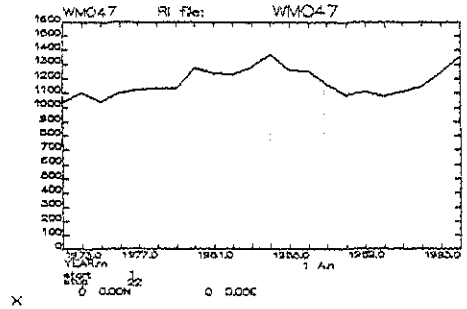
fig 2



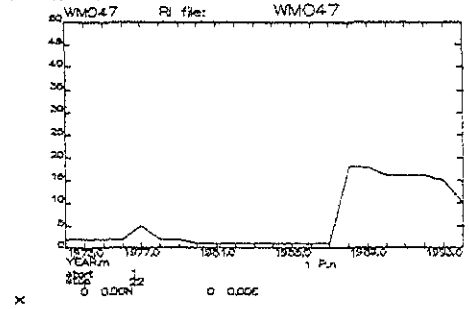
maximum



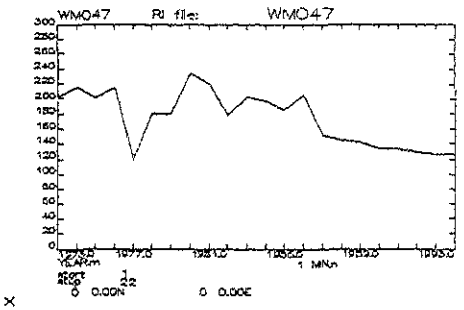
BAT



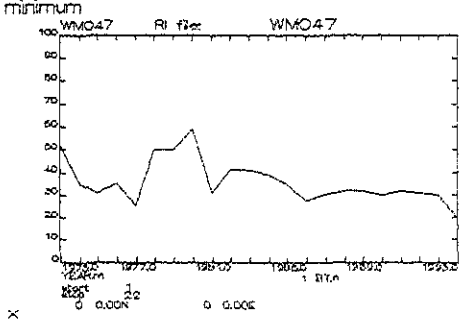
anemometer



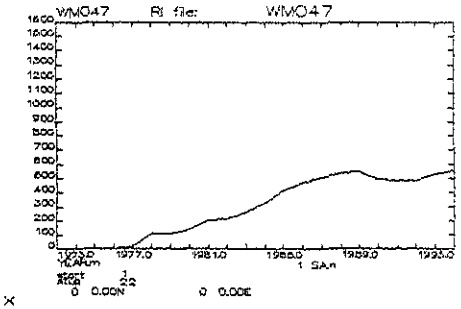
pilot balloon



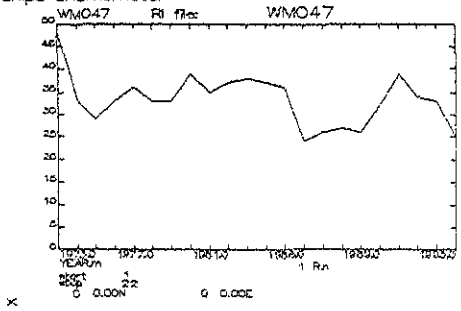
minimum



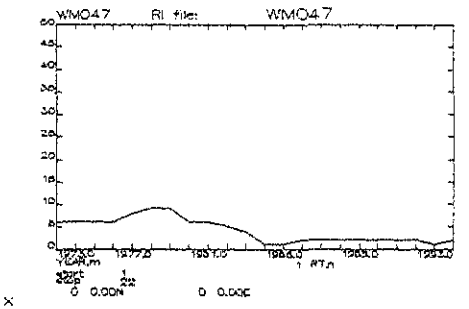
BT



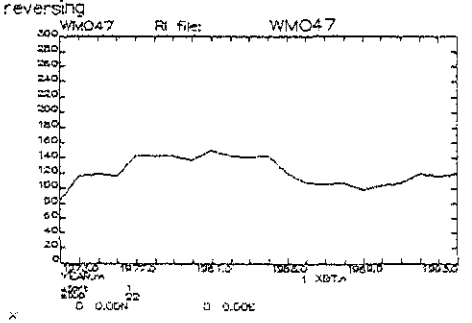
ships anemometer



radiosonde



reversing



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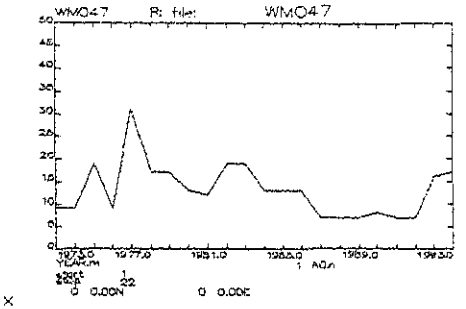
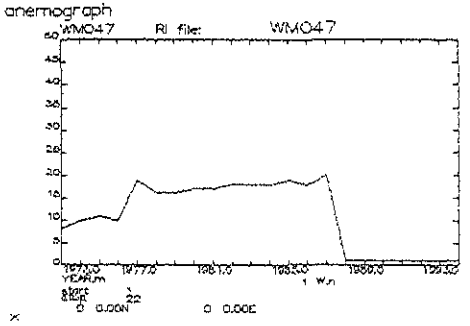
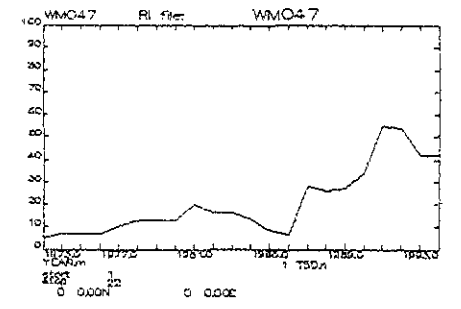


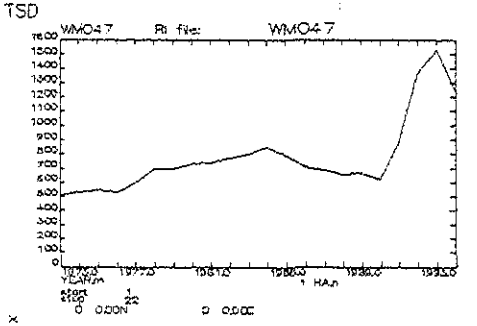
anemograph



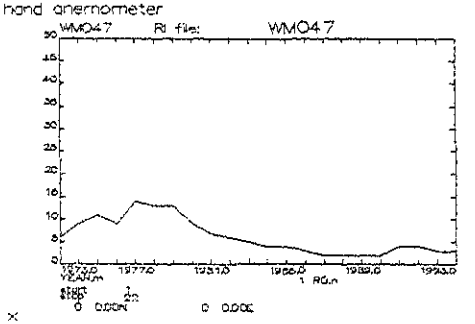
radar wind



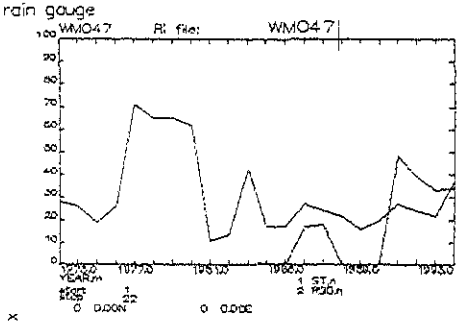
TSD



hand anemometer



rain gauge



sea therm & radar storm

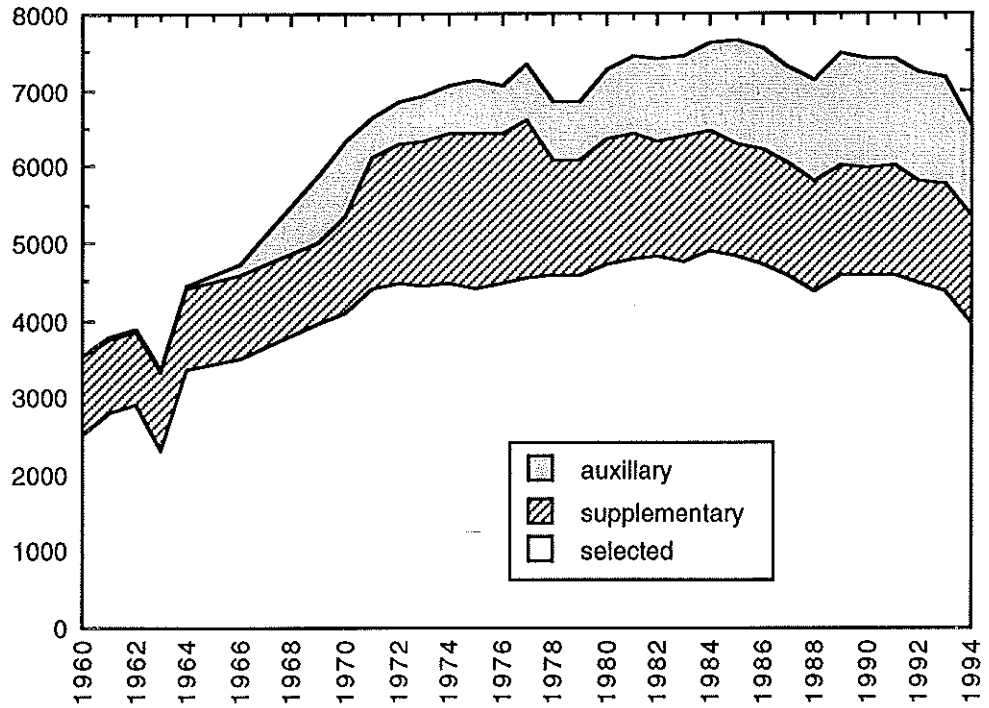


Figure 3a - Numbers of Selected, Supplementary and Auxiliary Ships by year (area plot, ie area between lines gives number of each type of ship).

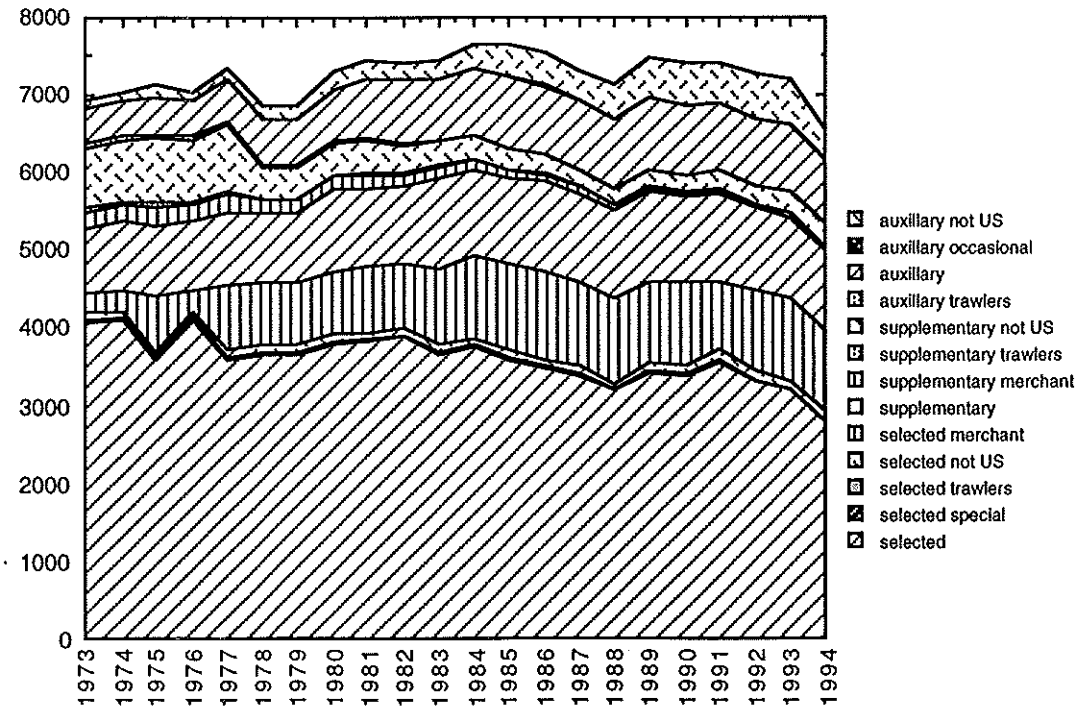
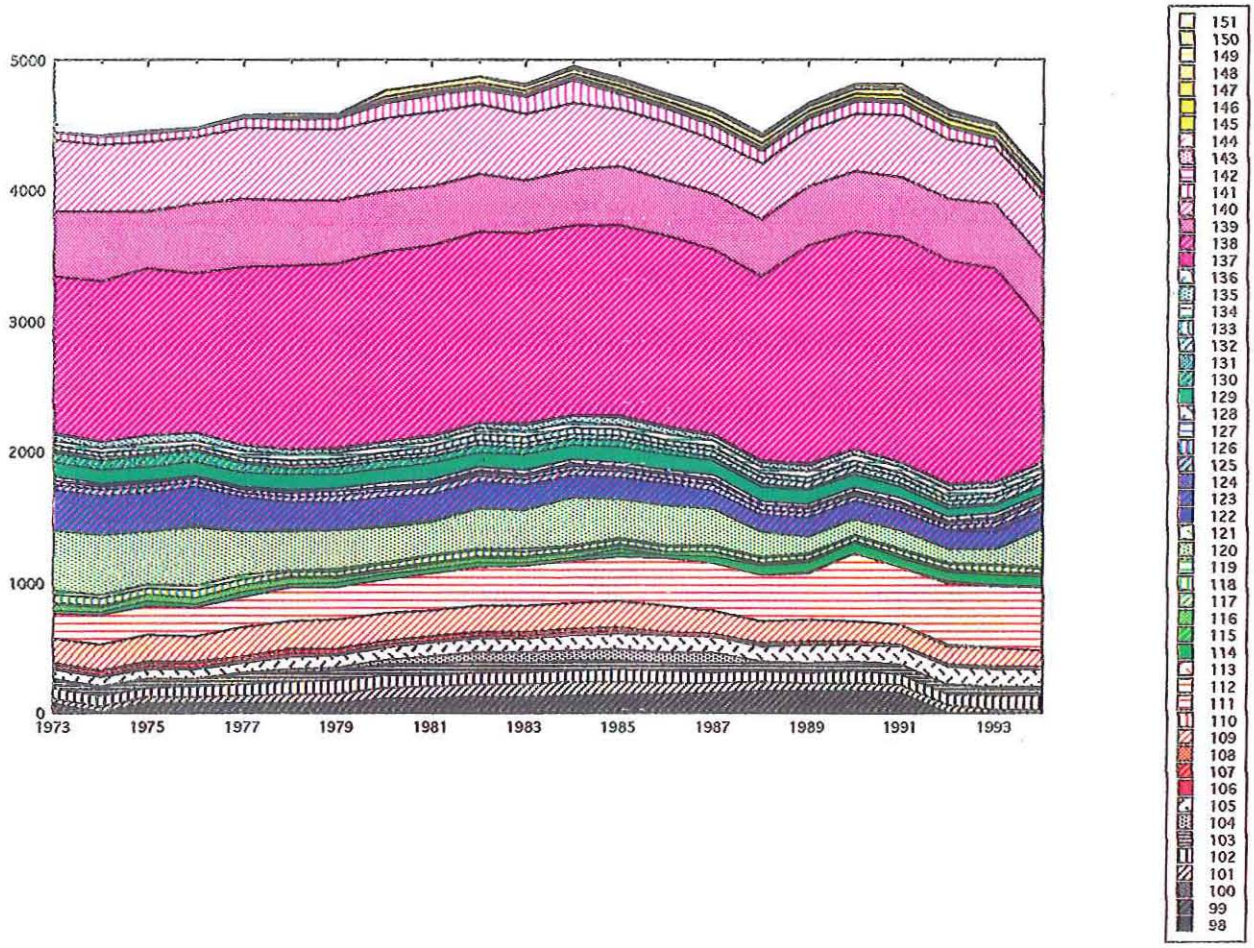


Figure 3b - As Figure 3a but using information from WMO47 to divide ships further by category (some countries differentiate between merchant ships and trawlers and other categories as in the legend)



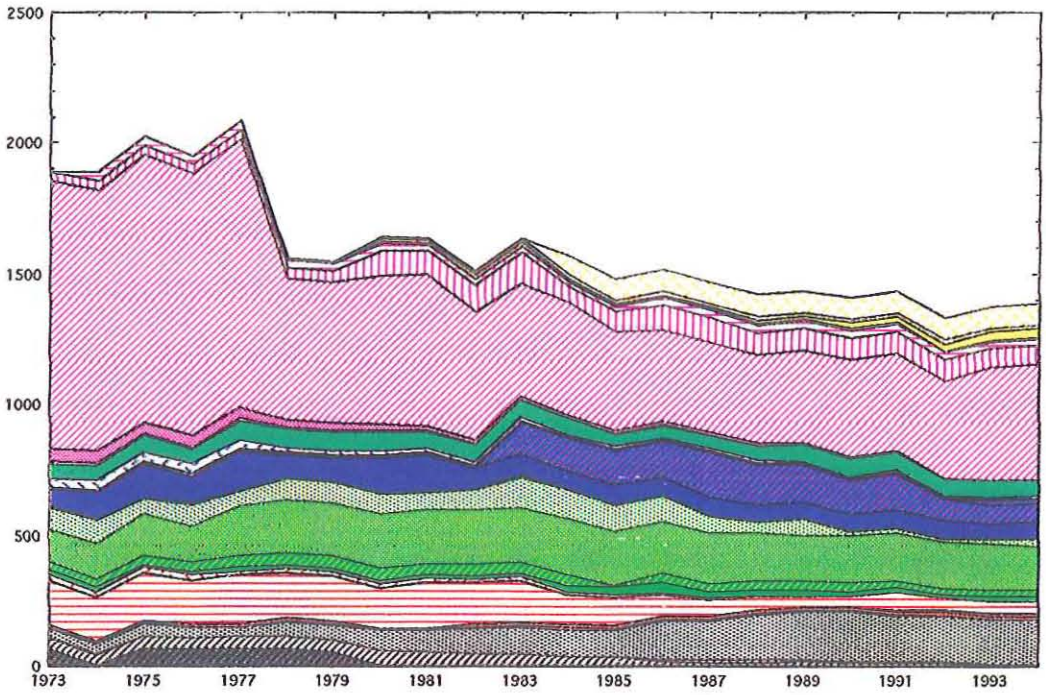


Figure 4a (top) - Number of Selected Ships by Country - See Table 1 for Country Codes

Figure 4b (bottom) - Number of Supplementary Ships by Country - See Table 1 for Country Codes

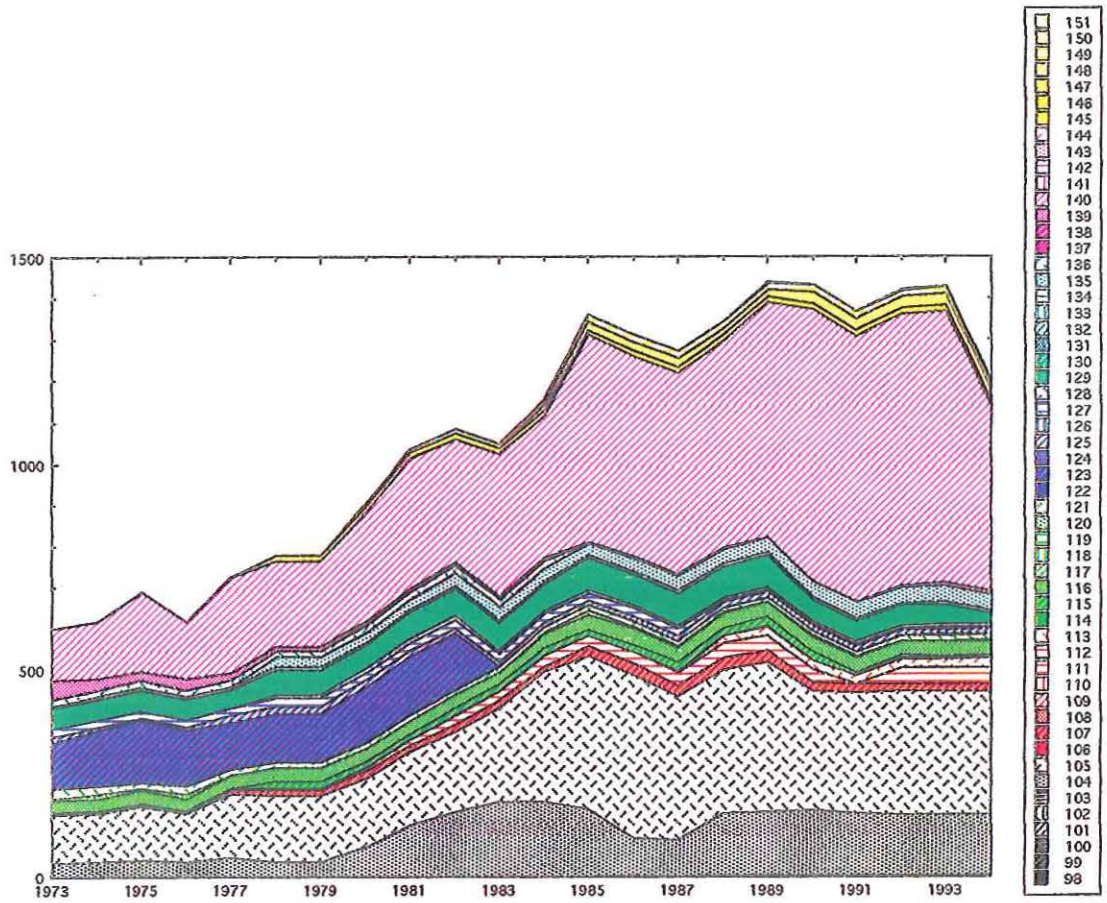


Figure 4c - Number of Auxiliary Ships by Country - See Table 1 for Country Codes

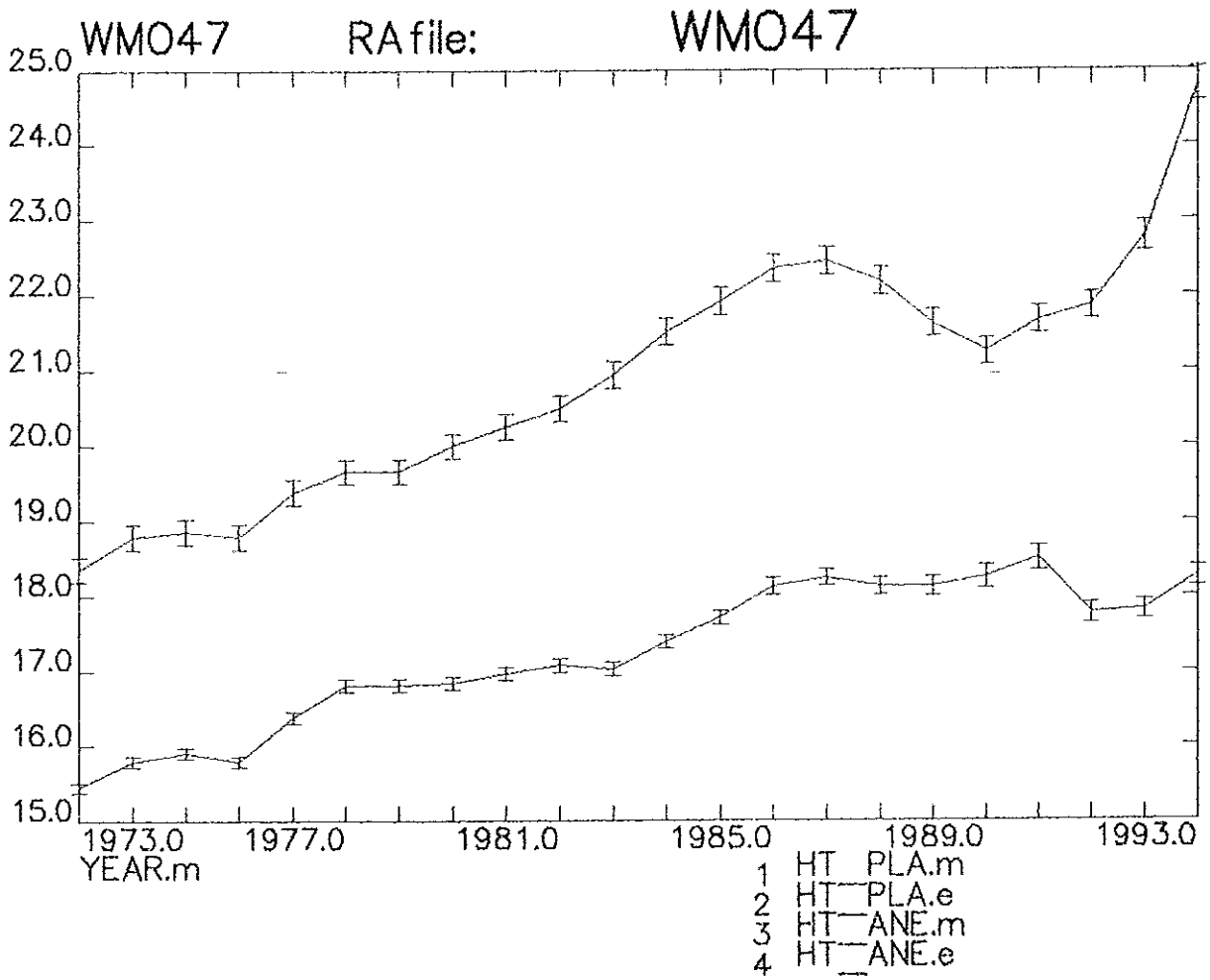
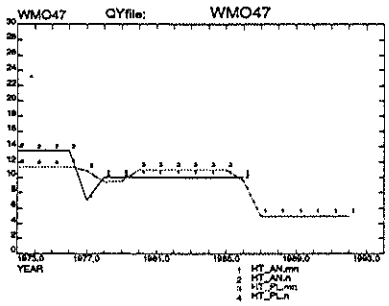
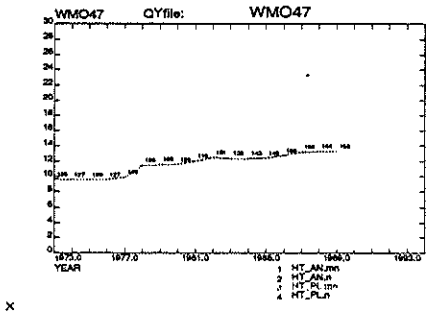


Figure 5 - Mean Anemometer (Upper Line) and Platform Heights (Lower Line) from WMO47 for 1973 to 1994. Error Bars Represent the Standard Error of the Mean.

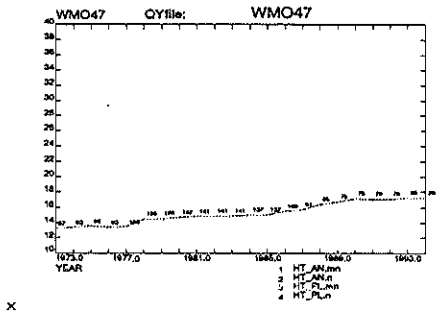
Figures 6 - Plots to show mean anemometer height (upper line) and platform height (lower, dotted line) by year from 1973 to 1994. Numbers above each point on the lines give the number of ships contributing to that mean. Heights are shown individually for each country (name of country below each plot).



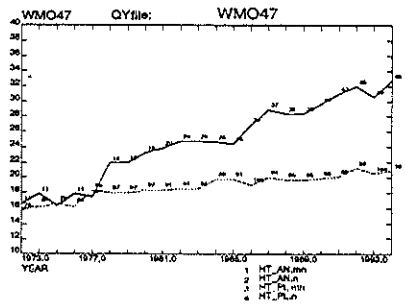
New Caledonia



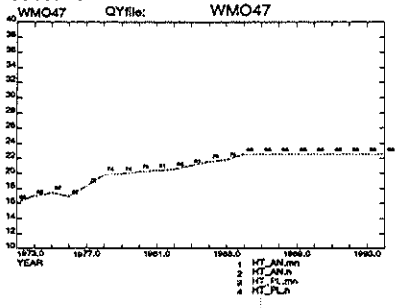
German Democratic Republic



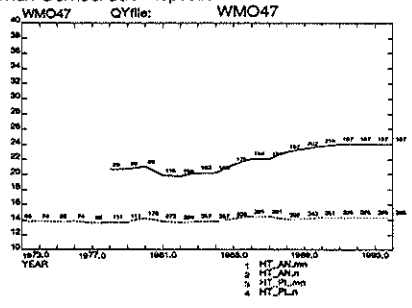
Argentina



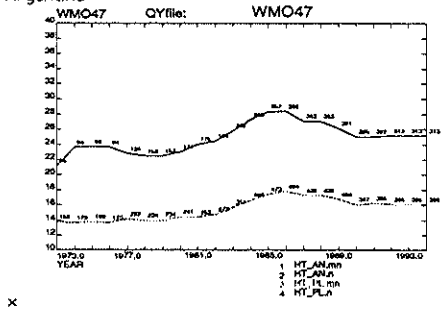
Australia



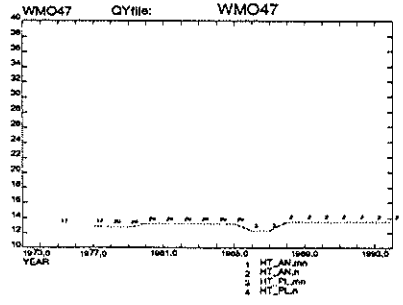
Belgium



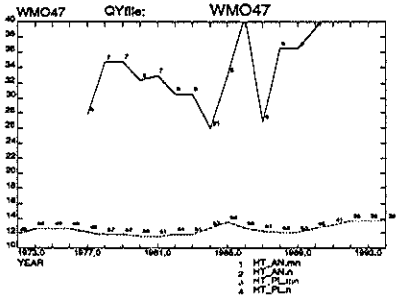
Brazil



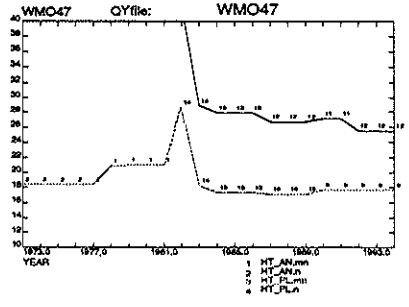
Canada



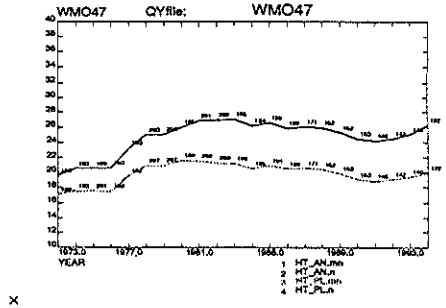
Chile



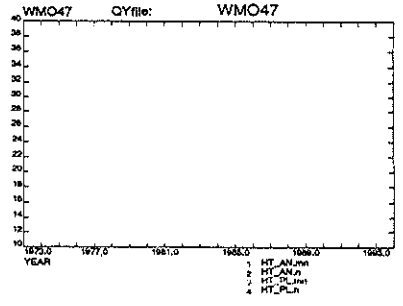
Denmark



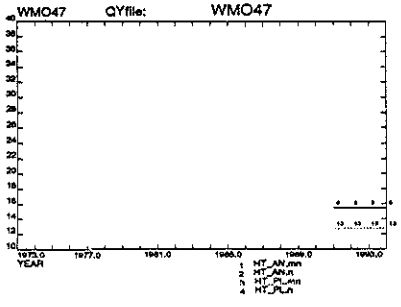
Finland



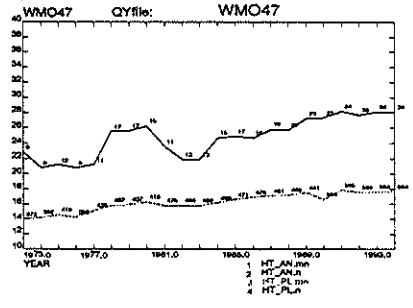
France



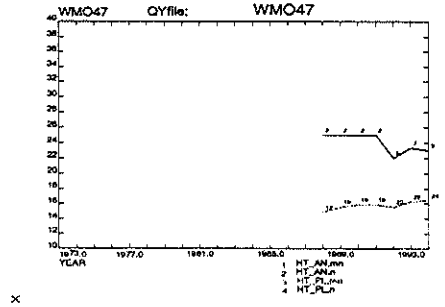
French Polynesia



PDR Korea



German Federal Republic



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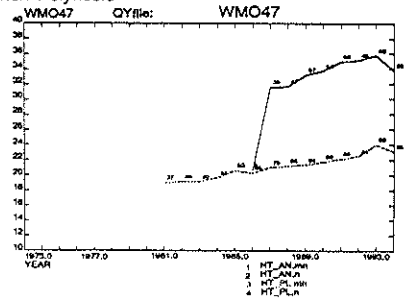
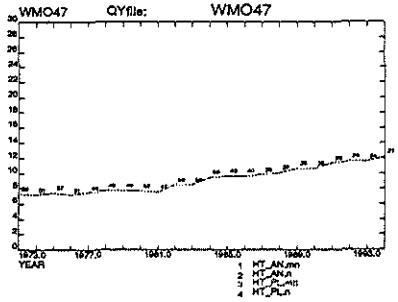


Hong Kong



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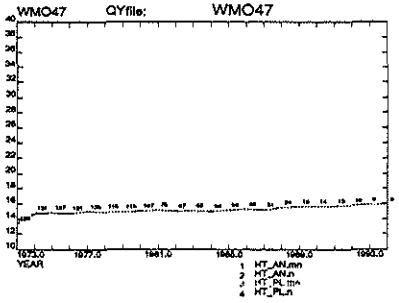

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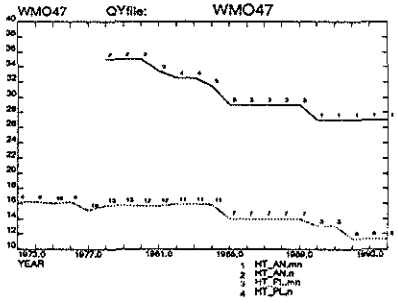

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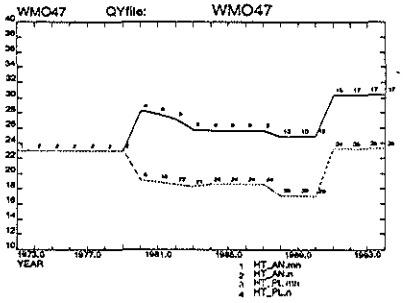

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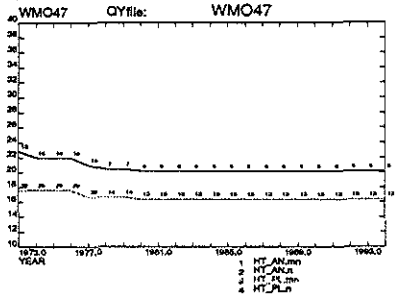
Iceland



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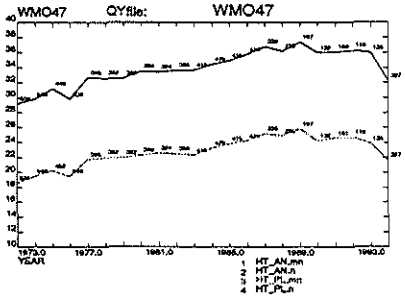

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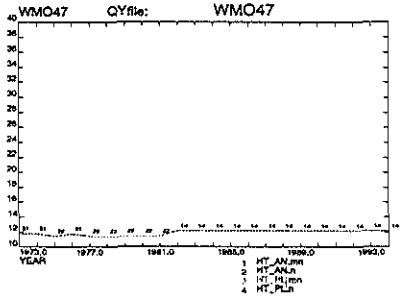

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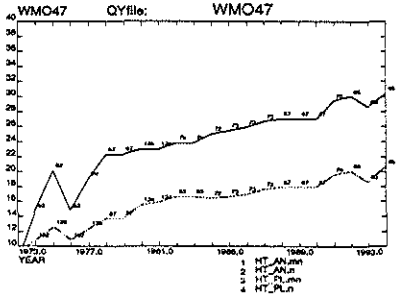

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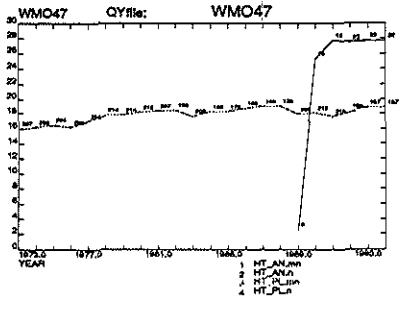
Italy



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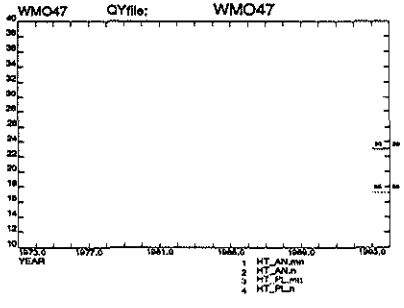

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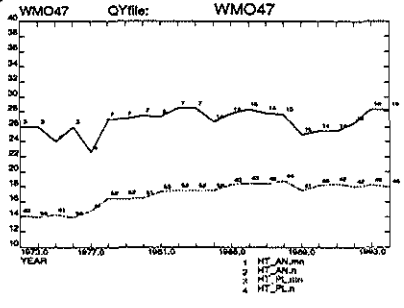
Kenya



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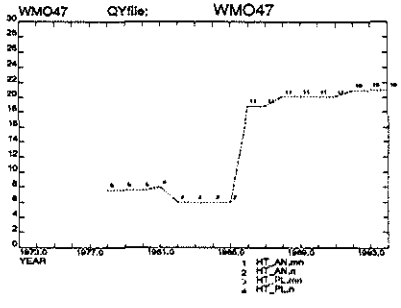
Korea



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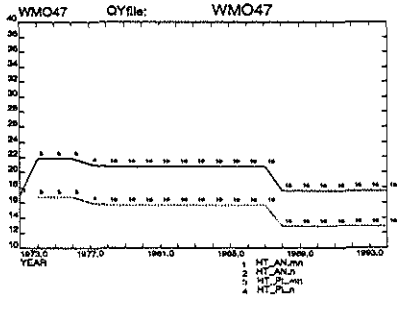
Netherlands



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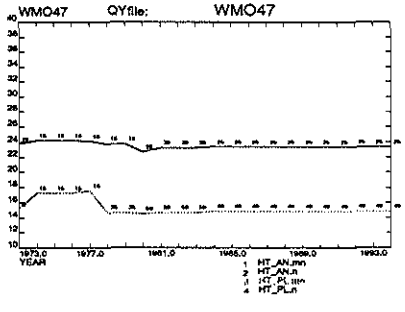

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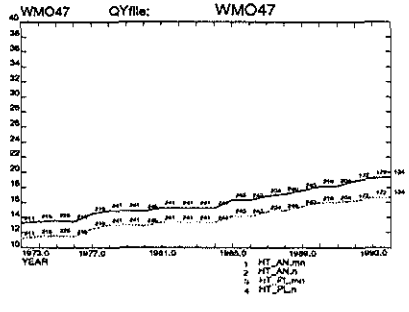
New Zealand



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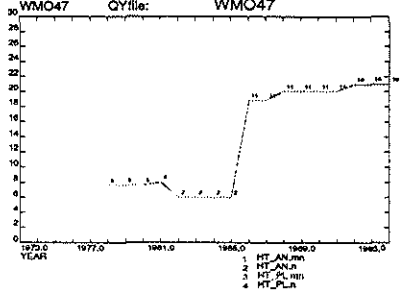
Norway



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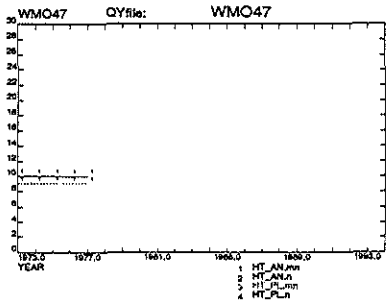

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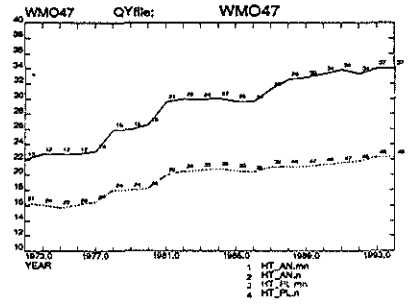

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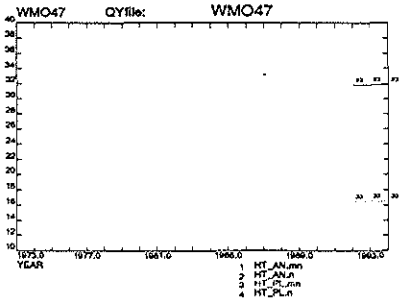

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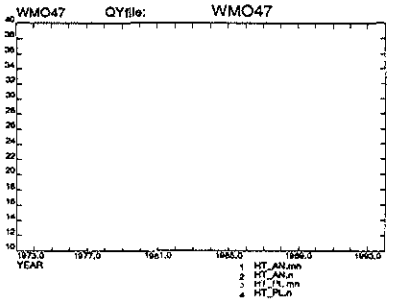

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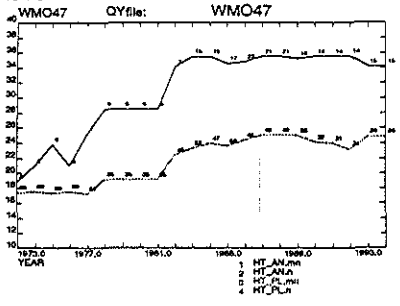
St Pierre



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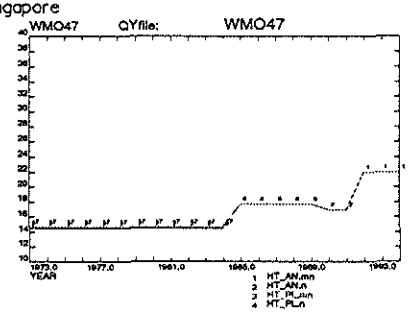
Singapore



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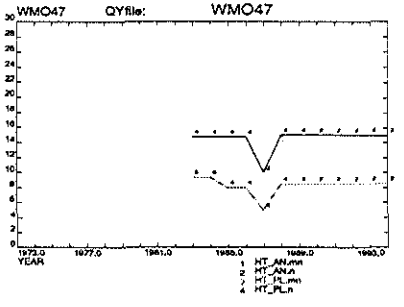
South Africa



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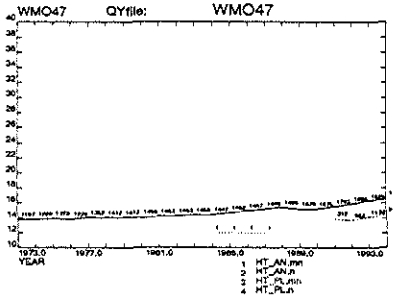
Spain



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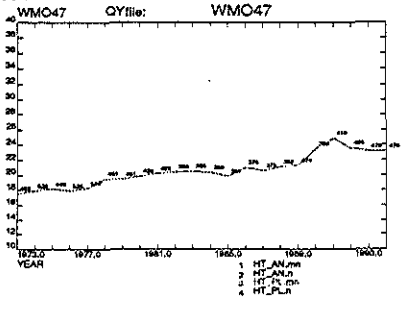
Sweden



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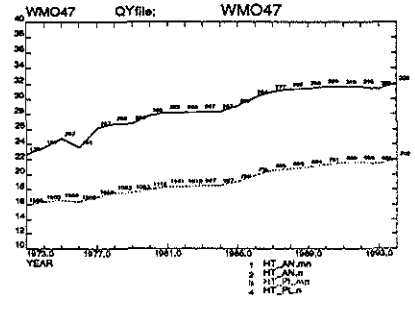
Switzerland



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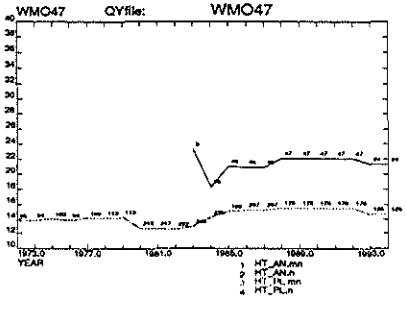
Thailand



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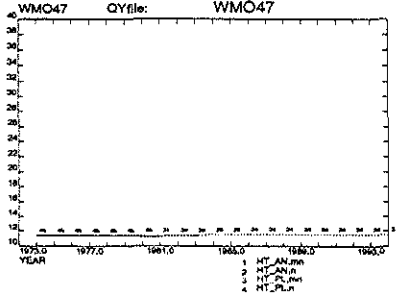
USSR/Russian Federation



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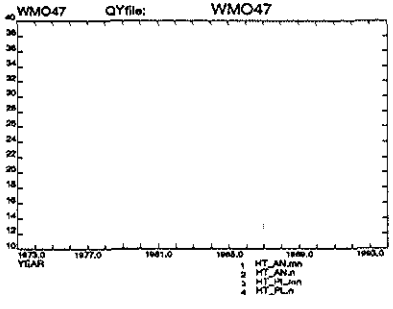
UK



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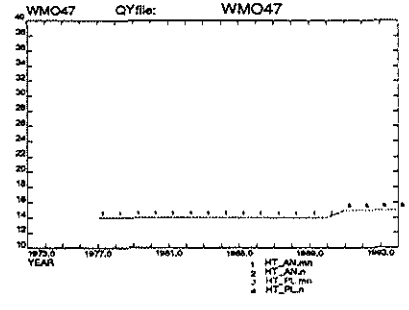
USA



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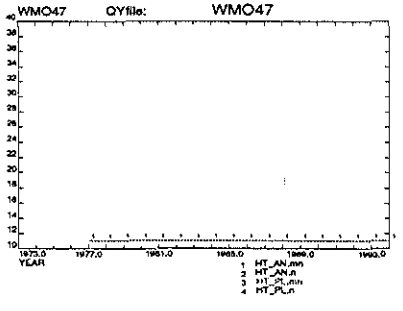
Yugoslavia



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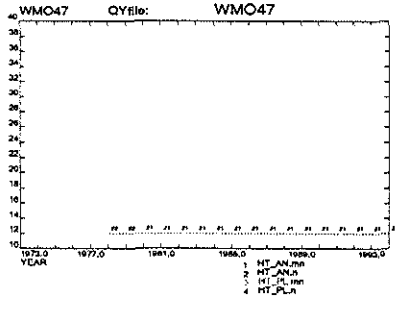
Bulgaria



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Bangladesh

×

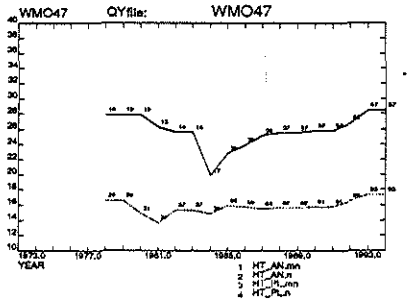
Cuba

×

Jamaica

×

Tanzania



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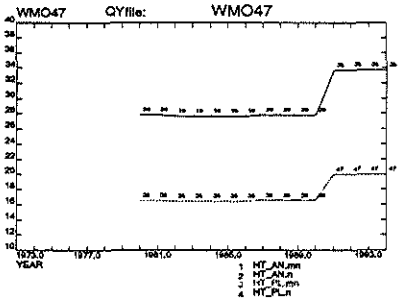
Malaysia



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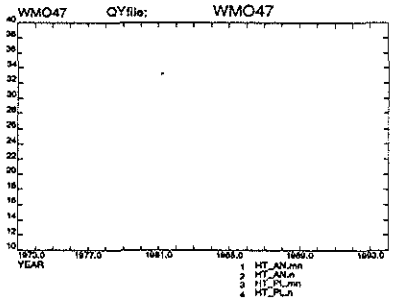
China



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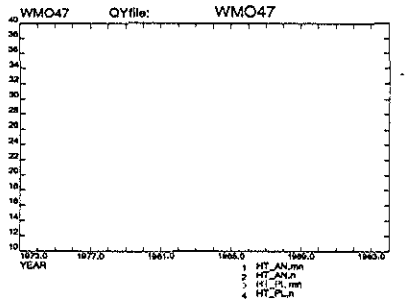
Indonesia



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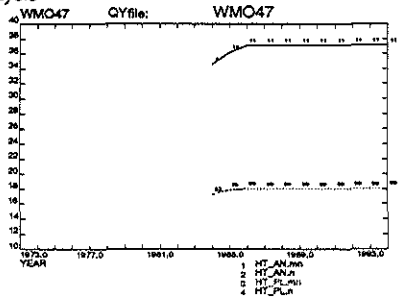
Sri Lanka



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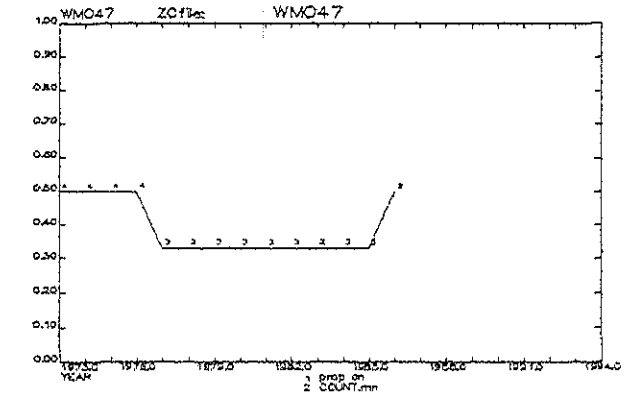
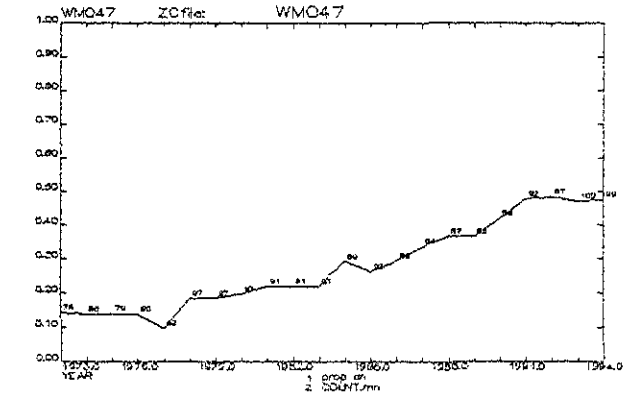
Saudi Arabia

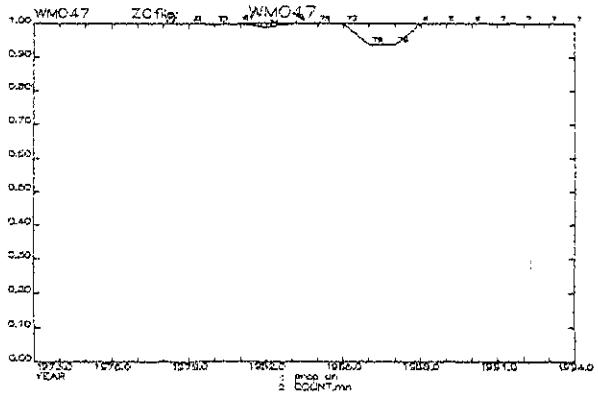
Figures 7 - Plots to show proportion of selected ships with anemometers by year from 1973 to 1994. Numbers above each point on the lines give the number of selected ships. Proportions and numbers of selected ships are shown individually for each country (name of country below each plot).



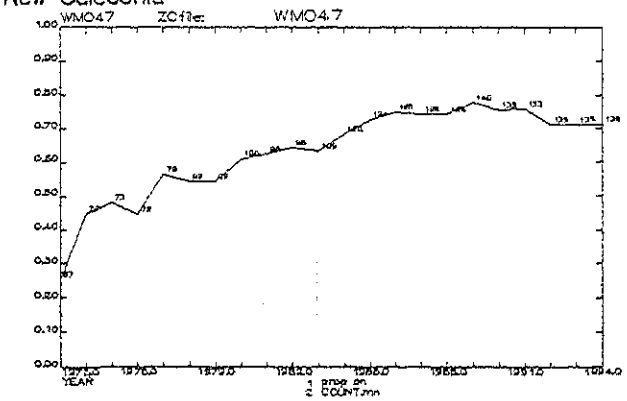
New Caledonia



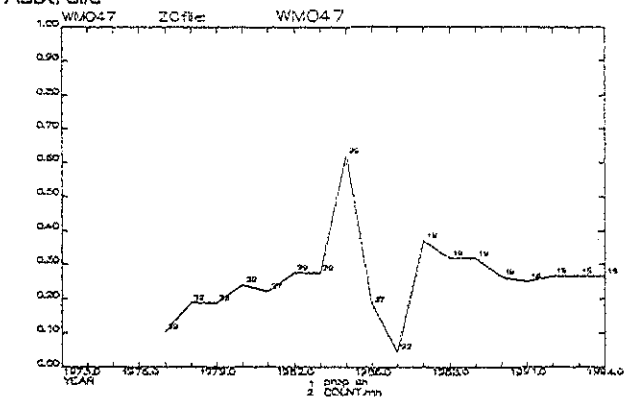
Australia



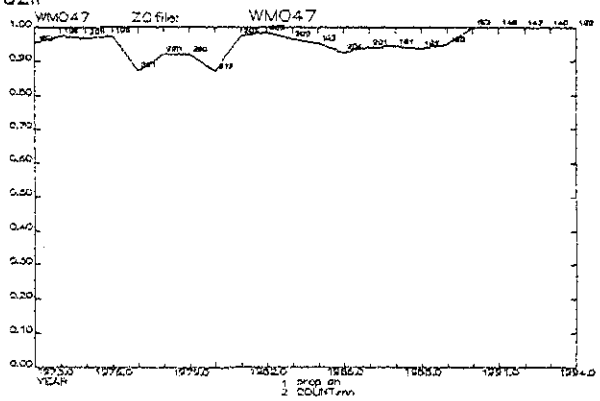
Brazil



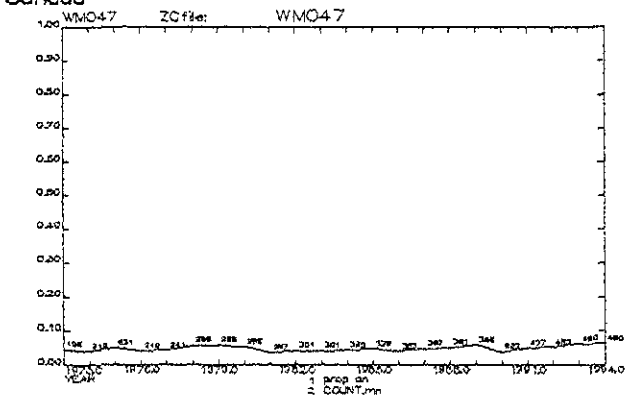
Canada



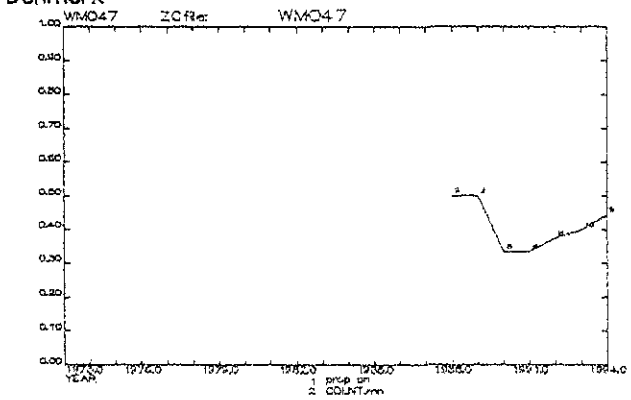
Denmark



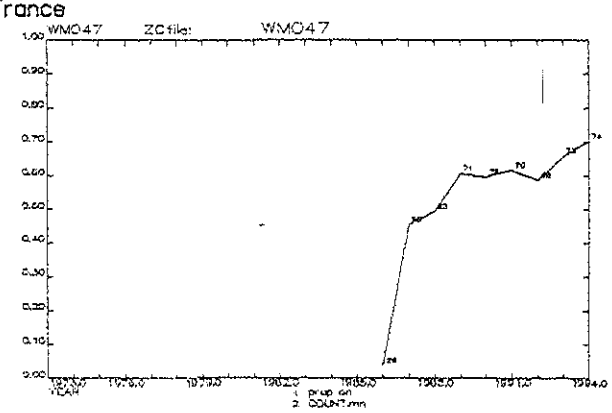
France



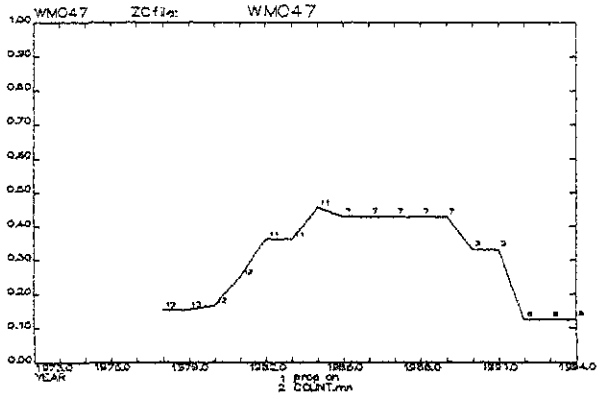
Germany



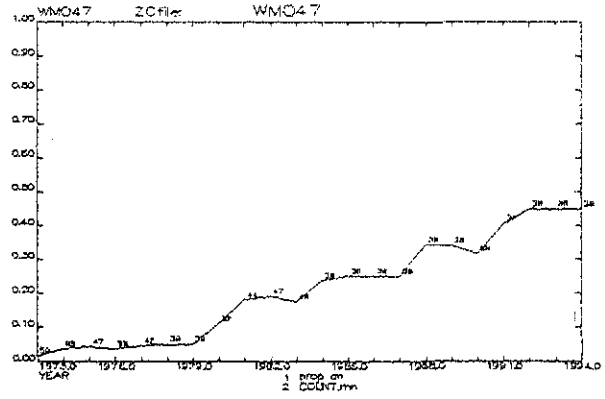
Greece



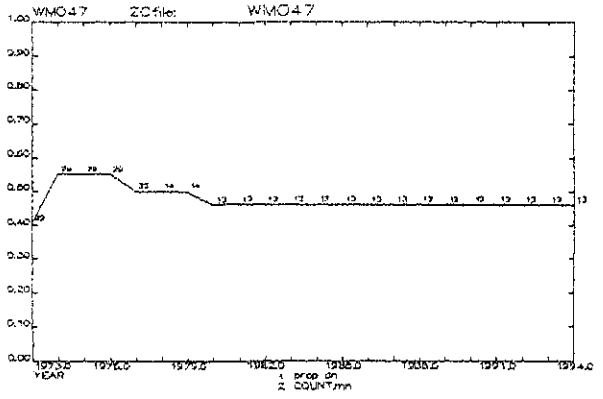
Hong Kong



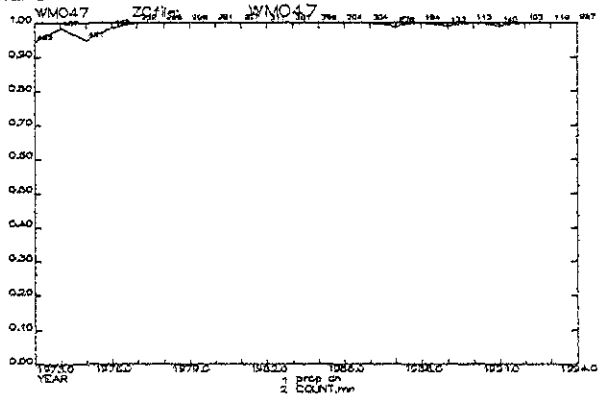
Ireland



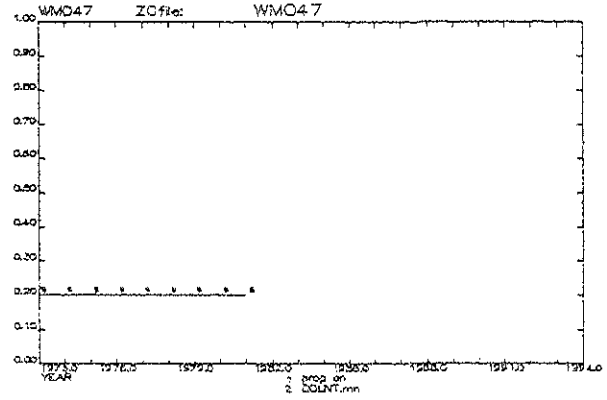
Israel



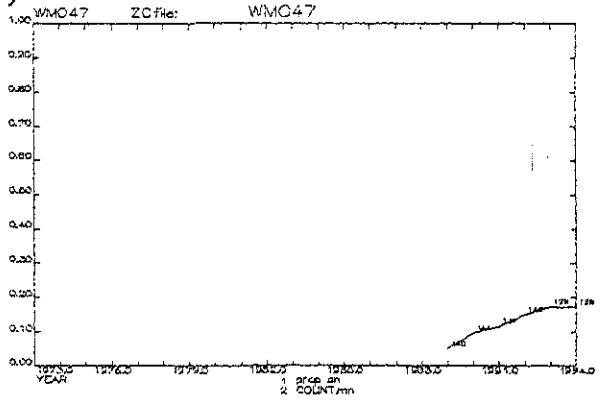
Italy



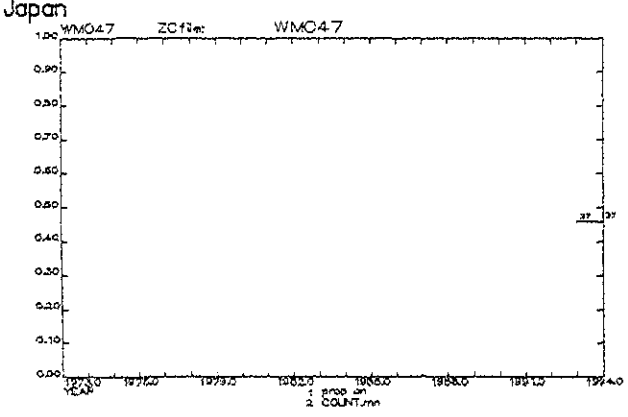
Japan



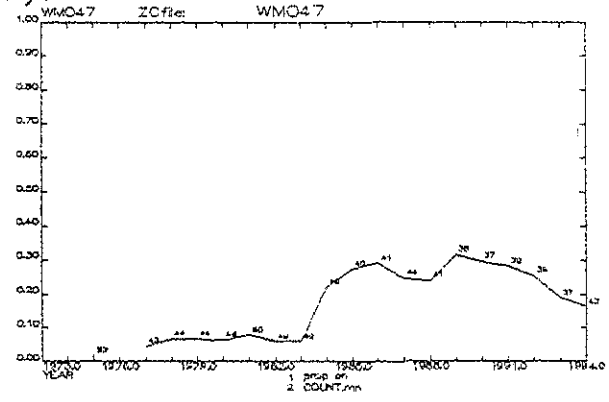
Kenya



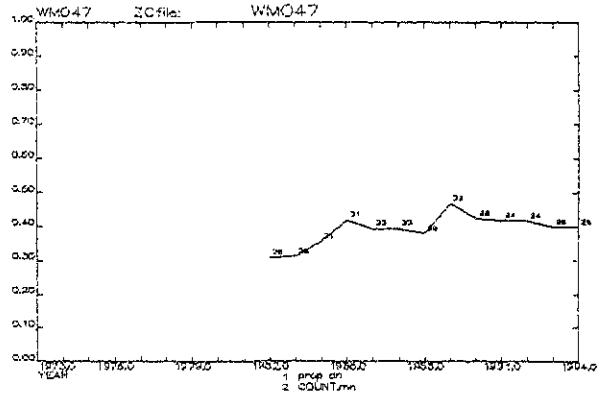
Netherlands



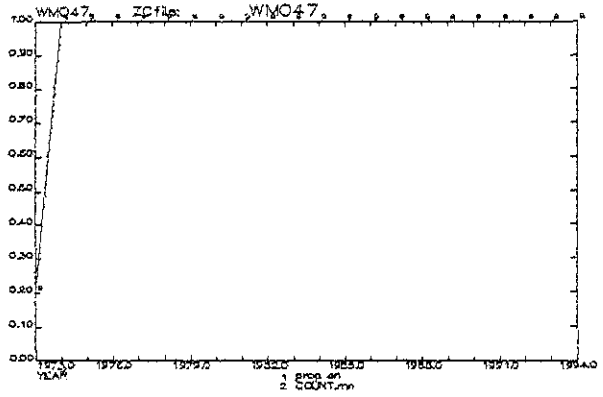
Croatia



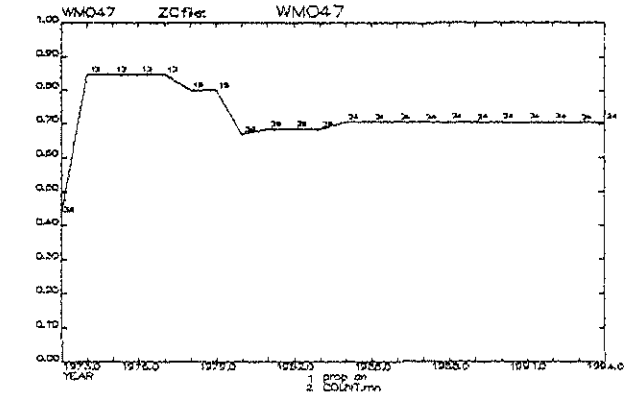
New Zealand



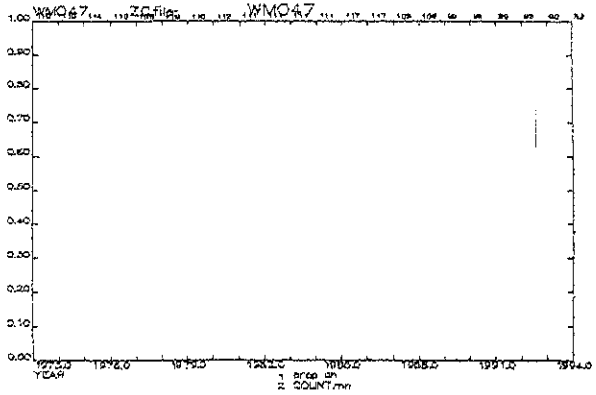
Norway



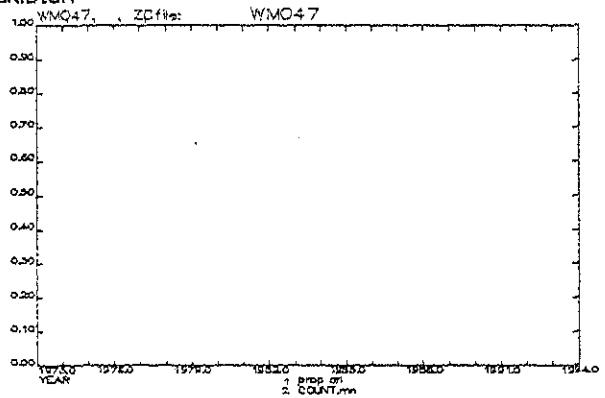
Pakistan



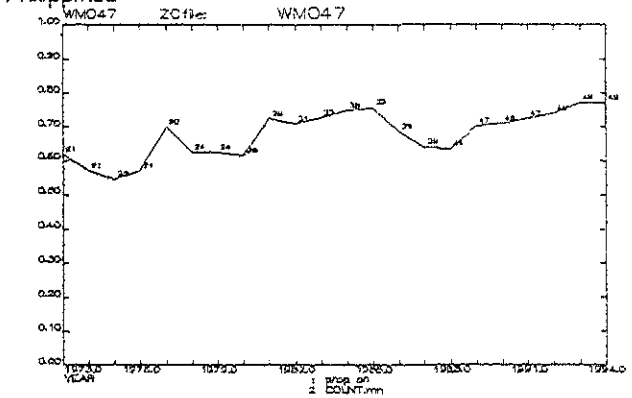
Philippines



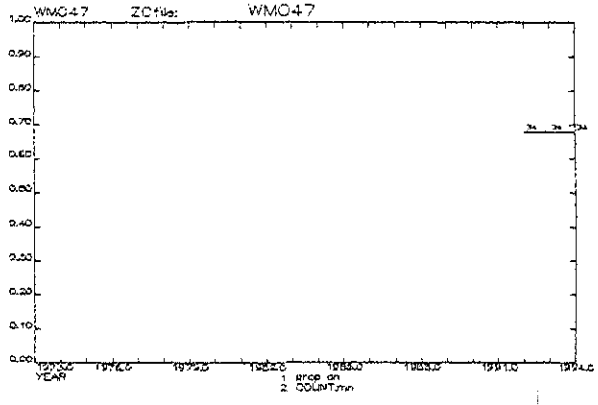
Poland



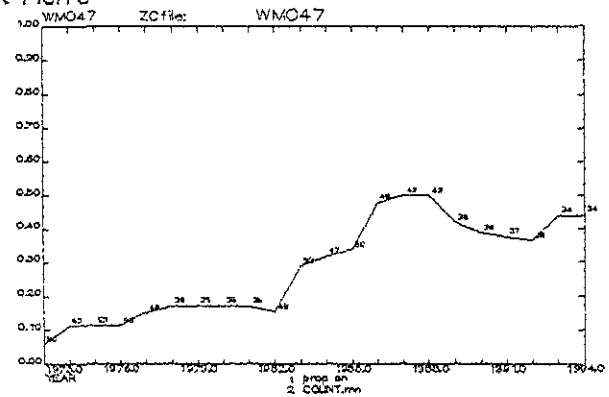
St Pierre



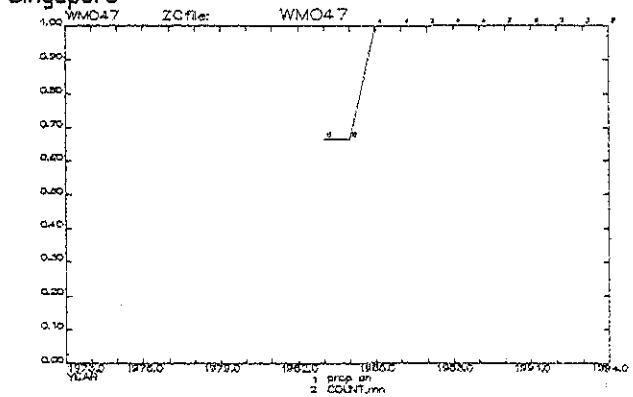
Singapore



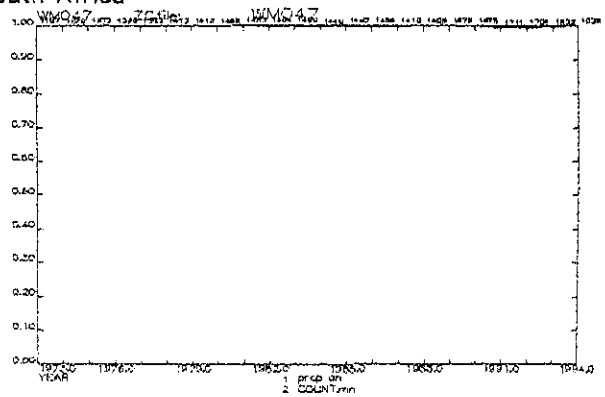
South Africa



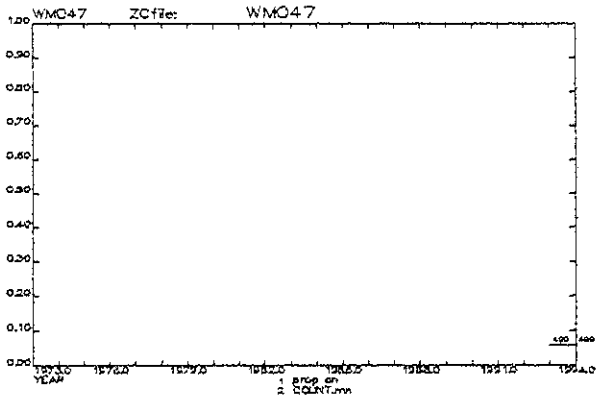
Sweden



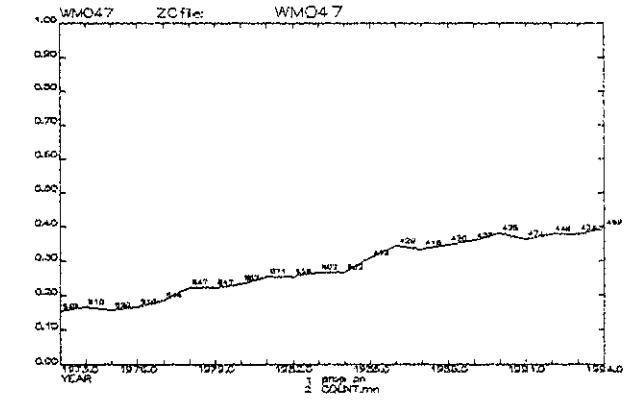
Thailand



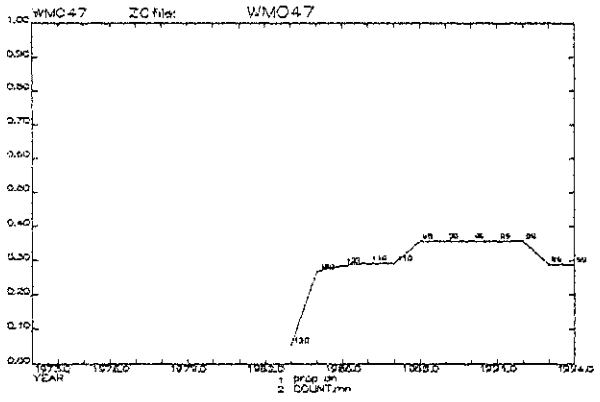
USSR/Russian Federation



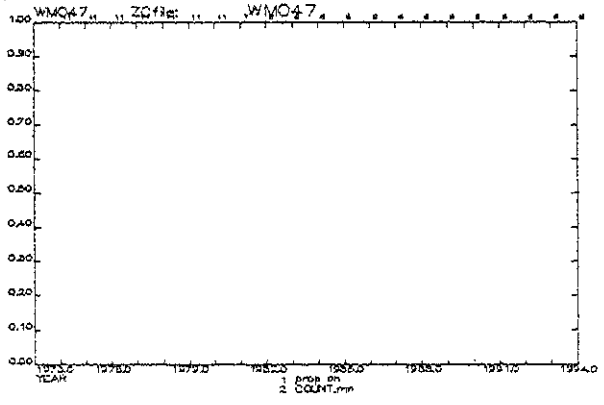
UK



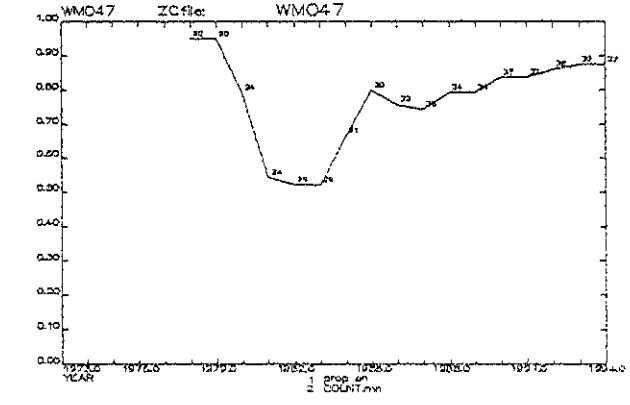
USA



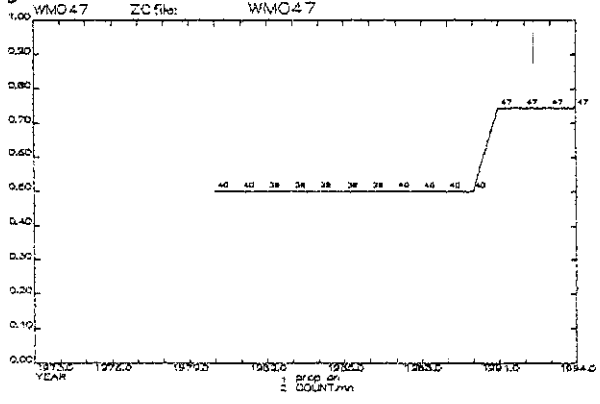
Yugoslavia



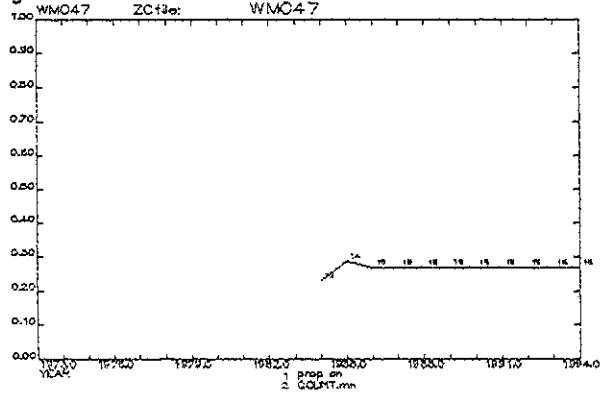
Bulgaria



Malaysia



China



Saudi Arabia

APPENDIX 1

DOCUMENTATION FOR ORIGINAL WMO47 ASCII FILES

NOTE : NOT ALL CODES APPLY TO DATA FILES PRODUCED BY ELIZABETH KENT AND DANIEL OAKLEY, JAMES RENNELL DIVISION OF SOUTHAMPTON OCEANOGRAPHY CENTRE

1984

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N

WMO PUBLICATION No. 47
INTERNATIONAL LIST OF SELECTED, SUPPLEMENTARY AND AUXILIARY SHIPS
RECORD LAYOUT

Record Positions	Field size	Field description
1	1	Record code = 'N'
2 - 3	2	Country code (see Code Table No. 1)
4 - 28	25	Ship's name (Column 1 in the List, first line of print)
29 - 35	7	Call sign (Column 2 in the List). The field is aligned to the left[1)]
36 - 37	2	Type of ship (see Code Table No. 2)
38 - 45	8	Routes (Column 3 in the List, first line of print). Should be in coded form and separated by commas.
46 - 48	3	Type of barometer (Column 4 in the List). The field is aligned to the right. Valid entries are given in Code Table No. 3.
49 - 51	3	Type of thermometer (Column 5 in the List). Valid entries are given in Code Table No. 3.
52 - 53	2	Condition of exposure of thermometer (Column 6 in the List). The field is aligned to the right. Valid entries are given in Code Table No. 3.
54	1	Type of hygrometer (Column 7 in the List). Valid entries are given in Code Table No. 3.
55 - 56	2	Condition of exposure of hygrometer. (Column 8 in the List). The field is aligned to the right. Valid entries are given in Code Table No. 3.
57 - 60	4	Method of obtaining sea surface temperature (Column 9 in the List). The field is aligned to the right. Valid entries are given in Code Table No. 3.
61 - 63	3	Type of barograph (Column 10 in the List). The field is aligned to the right. Valid entries are given in Code Table No. 3.

Record Positions	Field size	Field description
64 - 66	3	Other meteorological instruments (Column 11 in the List, first line of print). The field is aligned to the right. Valid entries are given in Code Table No. 3.
67 - 69	3	Telecommunication facilities (Column 12 in the List). Telephony and Telegraphy. The field is aligned to the right. Valid entries are given in Code Table No. 3. (See also record positions 105 - 106).
70	1	Number of radio-operators (Column 13 in the List). The actual number or blank if none.
71 - 72	2	Height, in metres, of the observing platform. (Column 14 in the List). Leading zero if one digit.
73	1	Blank (spare area for future applications).
74 - 75	2	Height, in metres, of the anemometer (Column 15 in the List). Leading zero if one digit.
76 - 77	2	Column in the List, to which the first footnote refers. Leading zero if one digit.
78 - 79	2	Code number of the first coded footnote (See Code Table No. 4)
80 - 83	4	Blank (Spare area for future applications)
84 - 86	3	Type of second barometer, if any (Column 4 in the List, second line of print). The field is aligned to the right. Valid entries are given in Code Table No. 3.
87 - 89	3	Type of second thermometer, if any (Column 5 in the List, second line of print). Valid entries are given in Code Table No. 3.
90 - 91	2	Condition of exposure of second thermometer, if any (Column 6 in the List, second line of print). The field is aligned to the right. Valid entries are given in Code Table No. 3.
92	1	Type of second hygrometer, if any. (Column 7 in the List, second line of print). Valid entries are given in Code Table No. 3.
93 - 94	2	Condition of exposure of second hygrometer, if any. (Column 8 in the List, second line of print). The field is aligned to the right. Valid entries are given in Code Table No. 3.

Record Positions	Field size	Field description
95 - 98	4	Other method of obtaining sea surface temperature, if any. Column 9 in the List, second line of print). The field is aligned to the right. Valid entries are given in Code Table No. 3.
99 - 101	3	Type of second barograph, if any. (Column 10 in the List, second line of print). The field is aligned to the right. Valid entries are given in Code Table No. 3.
102 - 104	3	Other meteorological instruments, if any. (Column 11 in the List, second line of print).
105 - 106	2	Telecommunication facilities (Column 12 in the List). Teleprinter and Satellite. The field is aligned to the right Valid entries are given in Code Table No. 3 (See also record positions 67 - 69)
107 - 115	9	Blank (Spare area for future applications)
116 - 118 119 - 121 122 - 124 125 - 127	3 3 3 3	(Other meteorological instruments, if any. (Column 11 in the List, third, fourth, fifth, (sixth line of print). The field is aligned to (the right. Valid entries are given in Code Table No. 3.
128 - 147	20	Ship's name (Column 1 in the List, second line of print).
148 - 151	4	Other routes, if any. (Column 3 in the List, second line of print). Should be in coded form and separated by commas.
152	1	Blank (Spare area for future applications)
153 - 154	2	Column in the List, to which the second footnote refers. Leading zero if one digit.
155 - 156	2	Code number of the second coded footnote (See Code Table No. 4)
157 - 158	2	Column in the List, to which the third footnote refers. Leading zero if one digit.
159 - 160	2	Code number of the third coded footnote (See Code Table No. 4)

Notes: 1) For ships where no call sign is given a dummy call sign is required. This consists of four asterisks and a unique three-digit number which is not printed in the List.

Routes (File 2 of tape)

Record Layout

Record Positions	Field Size	Description
1	1	Record code "3"
2 - 3	2	Country Code (Code table 1)
4 - 5	2	Route Number within country
6 - 79	74	Text of route
80	1	Reserved

COUNTRY CODES

Code Figure	Country
01	ARGENTINA / ARGENTINE
02	AUSTRALIA / AUSTRALIE
03	BELGIUM / BELGIQUE
04	BRAZIL / BRESIL
05	CANADA
06	CHILE / CHILI
07	DENMARK / DANEMARK
08	FINLAND / FINLANDE
09	FRANCE
10	FRENCH POLYNESIA / POLYNESIE FRANCAISE
11	GERMAN DEMOCRATIC REPUBLIC / REPUBLIQUE DEMOCRATIQUE ALLEMANDE
12	GERMANY, FEDERAL REPUBLIC OF / ALLEMAGNE, REPUBLIQUE FEDERALE D'
13	GREECE / GRECE
14	HONG KONG / HONG-KONG
15	ICELAND / ISLANDE
16	INDIA / INDE
17	IRELAND / IRLANDE
18	ISRAEL
19	ITALY / ITALIE
20	JAPAN / JAPON
21	KENYA
22	REPUBLIC OF KOREA / REPUBLIQUE DE COREE
23	NETHERLANDS / PAYS-BAS
24	NEW CALEDONIA / NOUVELLE-CALEDONIE
25	NEW ZEALAND / NOUVELLE-ZELANDE

COUNTRY CODES

Code Figure	Country
26	NORWAY / NORVEGE
27	PAKISTAN
28	PHILIPPINES
29	POLAND / POLOGNE
30	PORTUGAL
31	ST. PIERRE AND / ET MIQUELON
32	SINGAPORE / SINGAPOUR
33	SOUTH AFRICA / AFRIQUE DU SUD
34	SPAIN / ESPAGNE
35	SWEDEN / SUEDE
36	SWITZERLAND / SUISSE
37	THAILAND / THAILANDE
38	UNION OF SOVIET SOCIALIST REPUBLICS / UNION DES REPUBLIQUES SOCIALISTES SOVIETIQUES
39	UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND / ROYAUME-UNI DE GRANDE BRETAGNE ET D'IRLANDE DU NORD
40	UNITED STATES OF AMERICA / ETATS-UNIS D'AMERIQUE
41	YUGOSLAVIA / YOUGOSLAVIE
42	BULGARIA / BULGARIE
43	BANGLADESH
44	CUBA
45	JAMAICA / JAMAIQUE
46	TANZANIA (UNITED REPUBLIC OF) / TANZANIE (REPUBLIQUE UNIE DE)
47	MALAYSIA / MALAISIE
48	CHINA / CHINE
49	INDONESIA / INDONESIE
50	SRI LANKA
51	SAUDI ARABIA / ARABIE SAOUDITE

TYPE OF SHIP

Code Figure	Type of Ship Note: Standard entries are indicated in capitals
10	SELECTED SHIPS
20	Selected ships (special ships)
21	Selected ships (merchant ships)
22	Selected ships (trawlers)
31	Selected ships A) Merchant ships
32	B) Trawlers
40	SUPPLEMENTARY SHIPS
60	Supplementary ships (merchant ships)
61	Supplementary ships (trawlers)
70	AUXILIARY SHIPS
80	Auxiliary ships (occasional)[1]
45	Auxiliary ships (trawlers)
	1) Auxiliary ships recruited on a trip-to-trip or non-continuing basis
	Additional codes for ships recruited by the USA
88	Selected ships (not USA registry)
89	Supplementary ships (not USA registry)
90	Auxiliary ships (not USA registry)

INSTRUMENTS AND TELECOMMUNICATIONS FACILITIES

Valid entries	Specifications
	Type of barometer (Column 4 in the List)
AN	Aneroid barometer
MER	Mercury barometer
DA	Digital aneroid barometer
	Type of thermometer (Column 5 in the List)
MER	Dry bulb mercury thermometer
ELE	Electric (resistance) thermometer
ALC	Alcohol thermometer
	Conditions of exposure of the thermometer (Column 6 in the List)
S	Screen (not ventilated)
VS	Screen (ventilated)
SL	Sling
W	Whirling
A	Aspirated (Assmann type)
US	Unscreened
SG	Ship's sling
SN	Ship's screen
	Type of hygrometer (Column 7 in the List)
H	Hair hygrometer
P	Psychrometer

INSTRUMENTS AND TELECOMMUNICATIONS FACILITIES

Valid entries	Specifications
	Conditions of exposure of the hygrometer (Column 8 in the List)
S	Screen (not ventilated)
VS	Screen (ventilated)
SL	Sling
W	Whirling
A	Aspirated (Assmann type)
US	Unscreened
	Method of obtaining sea surface temperature (Column 9 in the List)
BU	Bucket thermometer
C	Thermometer in condenser intake on steam ships, or inlet of engine cooling system on motor ships
TT	Trailing thermistor
HC	Hull contact sensor
HT	"through hull" sensor
RAD	Radiation thermometer
BTT	Bait tanks thermometer
OT	Other
	Type of barograph (Column 10 in the List)
OS	Open scale barograph
SS	Small scale barograph
	If the barograph is not designed with a seven-day clock, the type of clock is indicated; e.g. OS3

INSTRUMENTS AND TELECOMMUNICATIONS FACILITIES

Valid entries	Specifications
	Other instruments (Column 11 in the List)
MAX	Maximum thermometer
MIN	Minimum thermometer
RT	Reversing thermometer
TSD	Temperature/salinity/depth probe
BAT	Bathythermometer
BT	Bathythermograph (towed)
XBT	Expendable bathythermograph
HA	Hand anemometer
A	Anemometer (normal pattern)
AG	Anemograph
RG	Rain-gauge
P	Pilot balloon sounding apparatus
R	Radiosounding apparatus
W	Radio or radarwind apparatus
ST	Sea thermograph
RSD	Radar storm and meteorological phenomena detection
	Telecommunication facilities (Column 12 in the List)
	a) Telephony and telegraphy (Record positions 67-69)
T	Radio telephone
M	MF radiotelegraphy
H	HF radiotelegraphy
(or a combination of the above)	
	b) Teleprinter and satellite (Record positions 105-106)
Y	Direct printing radiotelegraphy
I	INMARSAT communication facility
A	Argos communication facility
E	Environmental satellites communication facility
(or a combination of the above)	

CODE TABLE No. 4

TEXT OF CODED FOOTNOTES

Code Figure	Specifications
01	New type precision aneroid barometer
02	Ship's officer
06	HA: Spare / En réserve
07	Operates during the period November-May
08	Humidity measured by psychometric methods and dewpoint estimation
10	Fixed drilling rig (in North sea)
12	Research and special purposes only
13	Research and special purposes only, on duty Nov-May
	If others notes are needed, no attempt should be made to code them in the records, but a written notification, giving call sign of ship(s), column to which the note refers, and text of note, should be made.

APPENDIX 2

PROGRAM: READ47.F

TO READ IN WMO47 ASCII TEXT FILES INTO PSTAR FORMAT

```
C ****TO READ INFORMATION FROM WMO47
C
      PROGRAM LIST
      IMPLICIT REAL*8 (A-H,O-Z,a-h,o-z)
C
#include "datadf.h"
#include "psio.h"
C
      PARAMETER (OUTVARS=34)
      PARAMETER (NORECS=10000)
      CHARACTER*9 PROG
      CHARACTER*8 NAMES(OUTVARS),UNITS(OUTVARS)
      DIMENSION BUF(NORECS,OUTVARS)
      CHARACTER*7 CALLSIGN
      CHARACTER*3 BARTYPE,TEMPTYPE,BAROGRAPH1,OTSST,TELECOM
      CHARACTER*3 OTIST(7),BARTYPE2,TEMPTYPE2
      CHARACTER*3 STORE1,STORE2
      CHARACTER*2 TEMPEXP,HUMEXP,OTBARG,BAROGRAPH2,HTANEM
      CHARACTER*2 HTPLAT,TEMPEXP2,HUMEXP2,DUMMY
      CHARACTER*1 HUMTYPE,NORADOP,HUMTYPE2
      CHARACTER*4 COMMS,SSTME(3)
      REAL*8 NUMSTORE1,NUMSTORE2
      INTEGER COUNTRY,SHIPTYPE,IHTPLAT,ITEST,INORADOP,IHTANEM
      INTEGER ID1,ID2,YEAR,IFOOTNOTE1,IFOOTNOTE2
C
      DATA PROG/'READ_W47'/
      DATA COUNTRECS/0/
C
C......initialise header
C
      CALL PROGHD(PROG)
C
C......Open file
C
      CALL OPENOT(IODISK)
      IF(IODISK.EQ.-999) STOP 'No output file'
C......enter header information
C
C......initialise variable name array.  Units are all blank
C
      DATA NAMES/'COUNTRY ','ID1     ','ID2     ','SHIPTYPE','BAR_TYPE',
     &'TEM_TYPE','TEM_EXP ','HYG_TYPE','HYG_EXP ','BARTYPE2','TEMTYPE2',
     &'TEMEXP 2','HYGTYPE2','HYGEXP 2','SSTMETH1','SSTMETH2','SSTMETH3',
     &'BAROGRA1','BAROGRA2','TELECOM ','COMMS___','No_RADOP','HT_PLAT_',
     &'HT_ANE__','OTIST(1)','OTIST(2)','OTIST(3)','OTIST(4)','OTIST(5)',
     &'OTIST(6)','OTIST(7)','FOOT(1) ','FOOT(2) ','YEAR    '/
C
      DATA UNITS/34*'        '/
C
C     Information for pstar header
C
      DATA INSTMT/'WMO47 Info  '/,PLATYP/'SHIP    '/,
     &PLTNAM/'   VOS     '/,PLTNUM/'         '/
      DATA IC,ICENT/19,1900/,IYMD,IHMS/951001,000000/
      DATA DEPTHI,DEPTHW,ALAT,ALONG/4*0.0/
      DATA DATNAM/'WMO47 '/
      NOFLDS=OUTVARS
C
C......the year is not in the data file,  so we read it in at the
C......terminal
C
      write(IOITT,*)'ENTER YEAR'
      READ*,YEAR
C
C .. read data into variable name array
C
      DO 210 I=1,NOFLDS
      FLDNAM(I)=NAMES(I)
```

```
      FLDUNT(I)=UNITS(I)
  210 CONTINUE
C
C.....set absent data value to -999
      DO 50 I=1,NOFLDS
   50 ABSENT(I)=-999.0
C
      CALL OPENSQ(INDISK)
      IF(INDISK.EQ.-999) STOP 'No input file'
C
C ... format statement for read from file - not read in are the ship
C ... routes,  the ship name and the third footnote (there weren't any)
C
  500 FORMAT(I3,25X,A7,I2,8X,2A3,A2,A1,A2,A4,3A3,A1,A2,1x,A2,I4,4x,2A3,
     &       A2,A1,A2,A4,1x,A2,A3,A4,7x,4A3,25x,I4)
C
      NLEN=NORECS
      NUM=NLEN
      DO 40 N=1,NORECS
      IF((N+NUM-1).GT.NORECS)NUM=NORECS-N+1
C
      BUF(N,34)=YEAR
C
C ...  read the data from the text file
C
          READ(INDISK,500,end=45)COUNTRY,CALLSIGN,SHIPTYPE,BARTYPE,
     &TEMPTYPE,TEMPEXP,HUMTYPE,HUMEXP,SSTME(1),BAROGRAPH1,OTIST(1),
     &TELECOM,NORADOP,HTPLAT,HTANEM,IFOOTNOTE1,BARTYPE2,TEMPTYPE2,
     &TEMPEXP2,HUMTYPE2,HUMEXP2,SSTME(2),BAROGRAPH2,OTIST(2),COMMS,
     &OTIST(3),OTIST(4),OTIST(5),OTIST(6),IFOOTNOTE2
C
C ..  there are only 2 sst variables and 6 other instruments
C ..  the extra ones are needed as there are often 2 or more
C ..  instruments in each column,  this makes it hard to read!
C
      SSTME(3)='    '
      OTIST(7)='    '
C
C ..  codesub codes the character callsign into numbers
C ..  these are stored as ID1 and ID2.  Blank is coded as 99.
C
   30 format(A7,3X,A3)
   31 format(A7,3X,A4)
        call codesub2(ID1,ID2,CALLSIGN)
           BUF(N,1)=country
           BUF(N,2)=ID1
           BUF(N,3)=ID2
           BUF(N,4)=SHIPTYPE
   32 format(I2,2X,A1)
C
C****CHECK NUMBER OF RADIO OPERATORS IS NOT A CHARACTER,  IF IT
C****IS THEN WRITE OUT THE CALLSIGN AND THE VALUE TO A FILE
C
        IF(ICHAR(NORADOP).GE.48.and.ICHAR(NORADOP).LE.57)then
           READ(NORADOP,'(I1)')INORADOP
           BUF(N,22)=INORADOP
        ELSEIF(NORADOP.NE.' ')then
           IF(NORADOP(1:1).EQ.'(')then
           INORADOP2=10
           ELSE
           INORADOP2=(ICHAR(NORADOP(1:1)))
           INORADOP2=INORADOP2-54
           ENDIF
           WRITE(15,33)N,CALLSIGN,NORADOP,INORADOP2
           BUF(N,22)=INORADOP2
   33 format(I8,2X,A7,3X,A4,3X,I4)
        ELSE
           BUF(N,22)=-999.0
```

```
        ENDIF
C
C*****AS ABOVE FOR PLATFORM HEIGHT
C
        IF(ICHAR(HTPLAT).GE.48.and.ICHAR(HTPLAT).LE.57)then
           READ(HTPLAT,'(I2)')IHTPLAT
           BUF(N,23)=IHTPLAT
        ELSEIF(ICHAR(HTPLAT).eq.32)then
           READ(HTPLAT,'(I2)')IHTPLAT
           BUF(N,23)=IHTPLAT
        ELSEIF(HTPLAT.NE.'  ')then
           IF(HTPLAT(1:1).EQ.'{')then
           IHTPLAT2=100
           ELSE
           IHTPLAT2=(ICHAR(HTPLAT(1:1)))
           IHTPLAT2=(IHTPLAT2-54)*10
           ENDIF
           READ(HTPLAT(2:2),'(I1)')ITEMP
           IHTPLAT2=IHTPLAT2+ITEMP
           WRITE(15,33)N,CALLSIGN,HTPLAT,IHTPLAT2
           BUF(N,23)=IHTPLAT2
        ELSE
           BUF(N,23)=-999.0
        ENDIF
C
C****SAME AS NUMBER OF RADIO OPERATORS FOR ANEMOMETER HEIGHT
C
        IF(ICHAR(HTANEM).GE.48.and.ICHAR(HTANEM).LE.57)then
           READ(HTANEM,'(I2)')IHTANEM
           BUF(N,24)=IHTANEM
        ELSEIF(ICHAR(HTANEM).eq.32)then
           READ(HTANEM,'(I2)')IHTANEM
           BUF(N,24)=IHTANEM
        ELSEIF(HTANEM.NE.'  ')then
           IF(HTANEM(1:1).EQ.'{')then
           IHTANEM2=100
           ELSE
           IHTANEM2=(ICHAR(HTANEM(1:1)))
           IHTANEM2=(IHTANEM2-54)*10
           ENDIF
           READ(HTANEM(2:2),'(I1)')ITEMP
           IHTANEM2=IHTANEM2+ITEMP
           WRITE(15,33)N,CALLSIGN,HTANEM,IHTANEM2
           BUF(N,24)=IHTANEM2
        ELSE
           BUF(N,24)=-999.0
        ENDIF
C
C****TYPE OF PRESSURE SENSOR
C
        IF(BARTYPE.EQ.' AN')then
           BUF(N,5)=1
        ELSEIF(BARTYPE.EQ.'SAN')then
           BUF(N,5)=2
        ELSEIF(BARTYPE.EQ.'MER')then
           BUF(N,5)=3
        ELSEIF(BARTYPE.EQ.' DA')then
           BUF(N,5)=4
        ELSEIF(BARTYPE.EQ.'   ')then
           BUF(N,5)=-999.0
        ELSE
           write(16,*)'PRESSURE SENSOR UNKNOWN'
           write(16,30)CALLSIGN,BARTYPE
           BUF(N,5)=999.0
        ENDIF
C
C****TYPE OF TEMPERATURE SENSOR
C
```

```
        IF(TEMPTYPE.EQ.'MER')then
           BUF(N,6)=1
        ELSEIF(TEMPTYPE.EQ.'ELE')then
           BUF(N,6)=2
        ELSEIF(TEMPTYPE.EQ.'ALC')then
           BUF(N,6)=3
        ELSEIF(TEMPTYPE.EQ.'    ')then
           BUF(N,6)=-999.0
        ELSE
           write(16,*)'TEMPERATURE INTRUMENTATION UNKNOWN'
           write(16,30)CALLSIGN,TEMPTYPE
           BUF(N,6)=999.0
        ENDIF
C
C****WHAT THE TEMPERATURE SENSOR IS EXPOSED IN
C
        IF(TEMPEXP.EQ.' S')then
           BUF(N,7)=1
        ELSEIF(TEMPEXP.EQ.'VS')then
           BUF(N,7)=2
        ELSEIF(TEMPEXP.EQ.'SL')then
           BUF(N,7)=3
        ELSEIF(TEMPEXP.EQ.' W')then
           BUF(N,7)=4
        ELSEIF(TEMPEXP.EQ.' A')then
           BUF(N,7)=5
        ELSEIF(TEMPEXP.EQ.'US')then
           BUF(N,7)=6
        ELSEIF(TEMPEXP.EQ.'SG')then
           BUF(N,7)=7
        ELSEIF(TEMPEXP.EQ.'SN')then
           BUF(N,7)=8
        ELSEIF(TEMPEXP.EQ.'  ')then
           BUF(N,7)=-999.0
        ELSE
           write(16,*)'TEMPERATURE METHOD UNKNOWN'
           write(16,30)CALLSIGN,TEMPEXP
           BUF(N,7)=999.0
        ENDIF
C
C****TYPE OF HUMIDITY SENSOR
C
        IF(HUMTYPE.EQ.'H')then
           BUF(N,8)=1
        ELSEIF(HUMTYPE.EQ.'P')then
           BUF(N,8)=2
        ELSEIF(HUMTYPE.EQ.'E')then
           BUF(N,8)=3
        ELSEIF(HUMTYPE.EQ.' ')then
           BUF(N,8)=-999.0
        ELSE
           write(16,*)'HUMIDITY INSTRUMENTATION UNKNOWN'
           write(16,30)CALLSIGN,HUMTYPE
           BUF(N,8)=999.0
        ENDIF
C
C****WHAT THE HUMIDITY SENSOR IS EXPOSED IN
C
        IF(HUMEXP.EQ.' S')then
           BUF(N,9)=1
        ELSEIF(HUMEXP.EQ.'VS')then
           BUF(N,9)=2
        ELSEIF(HUMEXP.EQ.'SL')then
           BUF(N,9)=3
        ELSEIF(HUMEXP.EQ.' W')then
           BUF(N,9)=4
        ELSEIF(HUMEXP.EQ.' A')then
           BUF(N,9)=5
```

```
         ELSEIF(HUMEXP.EQ.'US')then
            BUF(N,9)=6
         ELSEIF(HUMEXP.EQ.'SG')then
            BUF(N,9)=7
         ELSEIF(HUMEXP.EQ.'SN')then
            BUF(N,9)=8
         ELSEIF(HUMEXP.EQ.'  ')then
            BUF(N,9)=-999.0
         ELSE
            write(16,*)'HUMIDITY INSTRUMENTATION UNKNOWN'
            write(16,30)CALLSIGN,HUMEXP
            BUF(N,9)=999.0
         ENDIF
C
C****TYPE OF SECOND PRESSURE SENSOR
C
         IF(BARTYPE2.EQ.' AN')then
            BUF(N,10)=1
         ELSEIF(BARTYPE2.EQ.'SAN')then
            BUF(N,10)=2.0
         ELSEIF(BARTYPE2.EQ.'MER')then
            BUF(N,10)=3.0
         ELSEIF(BARTYPE2.EQ.' DA')then
            BUF(N,10)=4.0
         ELSEIF(BARTYPE2.EQ.'   ')then
            BUF(N,10)=-999.0
         ELSE
            write(16,*)'PRESSURE SENSOR UNKNOWN'
            write(16,30)CALLSIGN,BARTYPE2
            BUF(N,10)=999
         ENDIF
C
C****TYPE OF SECOND TEMPERATURE SENSOR
C
        IF(TEMPTYPE2.EQ.'MER')then
           BUF(N,11)=1.0
        ELSEIF(TEMPTYPE2.EQ.'ELE')then
           BUF(N,11)=2.0
        ELSEIF(TEMPTYPE2.EQ.'ALC')then
           BUF(N,11)=3.0
        ELSEIF(TEMPTYPE2.EQ.'   ')then
           BUF(N,11)=-999
        ELSE
           write(16,*)'SECOND TEMPERATURE INSTUMENTATION UNKNOWN'
           write(16,30)CALLSIGN,TEMPTYPE2
           BUF(N,11)=999
        ENDIF
C
C****WHAT THE SECOND TEMPERATURE SENSOR IS EXPOSED IN
C
         IF(TEMPEXP2.EQ.' S')then
            BUF(N,12)=1
         ELSEIF(TEMPEXP2.EQ.'VS')then
            BUF(N,12)=2
         ELSEIF(TEMPEXP2.EQ.'SL')then
            BUF(N,12)=3
         ELSEIF(TEMPEXP2.EQ.' W')then
            BUF(N,12)=4
         ELSEIF(TEMPEXP2.EQ.' A')then
            BUF(N,12)=5
         ELSEIF(TEMPEXP2.EQ.'US')then
            BUF(N,12)=6
         ELSEIF(TEMPEXP2.EQ.'SG')then
            BUF(N,12)=7
         ELSEIF(TEMPEXP2.EQ.'SN')then
            BUF(N,12)=8
         ELSEIF(TEMPEXP2.EQ.'  ')then
            BUF(N,12)=-999.0
```

```
        ELSE
           write(16,*)'TEMPERATURE METHOD UNKNOWN'
           write(16,30)CALLSIGN,TEMPEXP2
           BUF(N,12)=999.0
        ENDIF
C
C****SECOND TYPE OF HUMIDITY SENSOR
C
        IF(HUMTYPE2.EQ.'H')then
           BUF(N,13)=1
        ELSEIF(HUMTYPE2.EQ.'P')then
           BUF(N,13)=2
        ELSEIF(HUMTYPE2.EQ.'E')then
           BUF(N,13)=3
        ELSEIF(HUMTYPE2.EQ.' ')then
           BUF(N,13)=-999.0
        ELSE
           write(16,*)'HUMIDITY INSTRUMENTATION UNKNOWN'
           write(16,30)CALLSIGN,HUMTYPE2
           BUF(N,13)=999.0
        ENDIF
C
C****WHAT THE SECOND HUMIDITY SENSOR IS EXPOSED IN
C
        IF(HUMEXP2.EQ.' S')then
           BUF(N,14)=1
        ELSEIF(HUMEXP2.EQ.'VS')then
           BUF(N,14)=2
        ELSEIF(HUMEXP2.EQ.'SL')then
           BUF(N,14)=3
        ELSEIF(HUMEXP2.EQ.' W')then
           BUF(N,14)=4
        ELSEIF(HUMEXP2.EQ.' A')then
           BUF(N,14)=5
        ELSEIF(HUMEXP2.EQ.'US')then
           BUF(N,14)=6
        ELSEIF(HUMEXP2.EQ.'SG')then
           BUF(N,14)=7
        ELSEIF(HUMEXP2.EQ.'SN')then
           BUF(N,14)=8
        ELSEIF(HUMEXP2.EQ.'  ')then
           BUF(N,14)=-999.0
        ELSE
           write(16,*)'HUMIDITY INSTRUMENTATION UNKNOWN'
           write(16,30)CALLSIGN,HUMEXP2
           BUF(N,14)=999.0
        ENDIF
C
C****METHODS OF SST MEASUREMENT
C .. extra coding is needed here as two methods are often in a
C .. single column.  If this is the case,  save one up and put
C .. in the next available variable.
C
           BUF(N,17)=-999.0
        DO 112 j=1,2,1
        IF(SSTME(j).EQ.'   C')then
           BUF(N,j+14)=2.0
        ELSEIF(SSTME(j).EQ.'  OT')then
           BUF(N,j+14)=8.0
        ELSEIF(SSTME(j).EQ.'  TT')then
           BUF(N,j+14)=3.0
        ELSEIF(SSTME(j).EQ.'  HC')then
           BUF(N,j+14)=4.0
        ELSEIF(SSTME(j).EQ.'  BU')then
           BUF(N,j+14)=1.0
        ELSEIF(SSTME(j).EQ.'  HT')then
           BUF(N,j+14)=5.0
        ELSEIF(SSTME(j).EQ.' RAD')then
```

```
            BUF(N,j+14)=6.0
          ELSEIF(SSTME(j).EQ.'RAD ')then
            write(*,*)'using new rad'
            BUF(N,j+14)=6.0
          ELSEIF(SSTME(j).EQ.' BTT')then
            BUF(N,j+14)=7.0
          ELSEIF(SSTME(j).EQ.'    ')then
            IF(BUF(N,j+14).LT.0.5)BUF(N,j+14)=-999
          ELSEIF(SSTME(j).EQ.'C,BU')then
            BUF(N,j+14)=2.

            IF(SSTME(j+1).EQ.'    ')then
            IF((j+1).GT.3)GOTO 117
            BUF(N,j+15)=1.0
            ENDIF

          ELSEIF(SSTME(j).EQ.'BU,C')then
            BUF(N,j+14)=1.0

            IF(SSTME(j+1).EQ.'    ')then
            IF((j+1).GT.3)GOTO 117
            BUF(N,j+15)=2.0
            ENDIF

          ELSEIF(SSTME(j).EQ.'C,TT')then
            BUF(N,j+14)=2.0

            IF(SSTME(j+1).EQ.'    ')then
            IF((j+1).GT.3)GOTO 117
            BUF(N,j+15)=3.0
            ENDIF

          ELSEIF(SSTME(j).EQ.'    ')then
            BUF(N,j+14)=-999
            BUF(N,j+15)=-999
C
            ELSE
C
            write(16,*)'SST INSTRUMENTATION UNKNOWN'
            write(16,31)CALLSIGN,SSTME(j)
            BUF(N,j+14)=999.0
C           BUF(N,j+15)=999.0

          ENDIF
          GOTO 112
  117       write(16,*)'TOO MANY SSTMETHODS'
            write(16,30)CALLSIGN,SSTME(j)

  112   CONTINUE
C
C****TYPE OF BAROGRAPH
C
        IF(BAROGRAPH1.EQ.' OS')then
            BUF(N,18)=1.0
        ELSEIF(BAROGRAPH1.EQ.' SS')then
            BUF(N,18)=2.0
        ELSEIF(BAROGRAPH1(1:2).EQ.'OS')then
            BUF(N,18)=1.0
        ELSEIF(BAROGRAPH1(1:2).EQ.'SS')then
            BUF(N,18)=2.0
        ELSEIF(BAROGRAPH1.EQ.'    ')then
            BUF(N,18)=-999.0
        ELSE
            write(16,*)'BAROGRAPH1 UNKNOWN'
            write(16,30)CALLSIGN,BAROGRAPH1
            BUF(N,18)=999.0
        ENDIF
C
```

```
C****OTHER INSTRUMENTS
C
C .. again need to store multiple types
C
      STORE1='    '
      STORE2='    '
      DO 111 ii=1,7,1
      IF(OTIST(ii).EQ.'MAX')then
          BUF(N,ii+24)=1.0
      ELSEIF(OTIST(ii).EQ.'MIN')then
          BUF(N,ii+24)=2.0
      ELSEIF(OTIST(ii).EQ.' RT')then
          BUF(N,ii+24)=3.0
      ELSEIF(OTIST(ii).EQ.'TSD')then
          BUF(N,ii+24)=4.0
      ELSEIF(OTIST(ii).EQ.'BAT')then
          BUF(N,ii+24)=5.0
      ELSEIF(OTIST(ii).EQ.' BT')then
          BUF(N,ii+24)=6.0
      ELSEIF(OTIST(ii).EQ.'XBT')then
          BUF(N,ii+24)=7.0
      ELSEIF(OTIST(ii).EQ.' HA')then
          BUF(N,ii+24)=8.0
      ELSEIF(OTIST(ii).EQ.'  A')then
          BUF(N,ii+24)=9.0
      ELSEIF(OTIST(ii).EQ.' SA')then
          BUF(N,ii+24)=10.0
      ELSEIF(OTIST(ii).EQ.' AG')then
          BUF(N,ii+24)=11.0
      ELSEIF(OTIST(ii).EQ.' RG')then
          BUF(N,ii+24)=12.0
      ELSEIF(OTIST(ii).EQ.'  P')then
          BUF(N,ii+24)=13.0
      ELSEIF(OTIST(ii).EQ.'  R')then
          BUF(N,ii+24)=14.0
      ELSEIF(OTIST(ii).EQ.'  W')then
          BUF(N,ii+24)=15.0
      ELSEIF(OTIST(ii).EQ.' ST')then
          BUF(N,ii+24)=16.0
      ELSEIF(OTIST(ii).EQ.'RSD')then
          BUF(N,ii+24)=17.0
      ELSEIF(OTIST(ii).EQ.'    ')then
          BUF(N,ii+24)=-999.0

      ELSEIF(OTIST(ii).EQ.'AHA')then
          BUF(N,ii+24)=9.0

          DO 69 M=1,6,1
          IF((ii+M).GT.7)GOTO 101
            IF(BUF(N,ii+M+24).EQ.-999)then
            BUF(N,ii+M+24)=8.0
            ELSE
                IF(STORE1.EQ.'    ')then
                STORE1=' HA'
                NUMSTORE1=8.0
47    FORMAT (A3)
                ELSEIF(STORE2.EQ.'    ')then
                STORE2=' HA'
                NUMSTORE2=8.0
                ELSE
                write(16,*)'more than two variables stored'
                write(16,30)CALLSIGN,OTIST(ii)
                ENDIF

          GOTO 111
          ENDIF

69    CONTINUE
```

```
      ELSEIF(OTIST(ii).EQ.' RW'.OR.OTIST(ii).EQ.'RW ')then
          BUF(N,ii+24)=14.0

          DO 70 M=1,6,1
          IF((ii+M).GT.7)GOTO 101
            IF(BUF(N,ii+M+24).EQ.-999)then
            BUF(N,ii+M+24)=15.0
           ELSE
                IF(STORE1.EQ.'    ')then
                STORE1='  W'
                NUMSTORE1=15.0
                ELSEIF(STORE2.EQ.'    ')then
                STORE2='  W'
                NUMSTORE2=15.0
                ELSE
                write(16,*)'more than two variables stored'
                write(16,30)CALLSIGN,OTIST(ii)
                ENDIF


          GOTO 111
          ENDIF

   70   CONTINUE

          ELSEIF(OTIST(ii).EQ.' PR')then
          BUF(N,ii+24)=13.0

          DO 81 M=1,6,1
          IF((ii+M).GT.7)GOTO 101
            IF(BUF(N,ii+M+24).EQ.-999)then
            BUF(N,ii+M+24)=14.0
          ELSE
              IF(STORE1.EQ.'    ')then
              STORE1='  R'
              NUMSTORE1=14.0
              ELSEIF(STORE2.EQ.'    ')then
              STORE2='  R'
              NUMSTORE2=14.0
              ELSE
              write(16,*)'MORE THAN TWO VARIALBES STORED'
              write(16,30)CALLSIGN,OTIST(ii)
              ENDIF


          GOTO 111
          ENDIF


   81   CONTINUE

          ELSEIF(OTIST(ii).EQ.'A,R')then
          BUF(N,ii+24)=9.0

          DO 82 M=1,6,1
          IF((ii+M).GT.7)GOTO 101
            IF(BUF(N,ii+M+24).EQ.-999)then
            BUF(N,ii+M+24)=14.0
          ELSE
              IF(STORE1.EQ.'    ')then
              STORE1='  R'
              NUMSTORE1=14.0
              ELSEIF(STORE2.EQ.'    ')then
              STORE2='  R'
              NUMSTORE2=14.0
              ELSE
              write(16,*)'MORE THAN TWO VARIABLES STORED'
```

```
            write(16,30)CALLSIGN,OTIST(ii)
            ENDIF


          GOTO 111
          ENDIF


   82   CONTINUE

       ELSEIF(OTIST(ii).EQ.'PRW')then
           BUF(N,ii+24)=13.0

           DO 83 M=1,6,1
           IF((ii+M).GT.7)GOTO 101
             IF(BUF(N,ii+M+24).EQ.-999)then
             BUF(N,ii+M+24)=14.0
           ELSE
               IF(STORE1.EQ.'    ')then
               STORE1=' R '
               NUMSTORE1=14.0
               ELSEIF(STORE2.EQ.'    ')then
               STORE2=' R '
               NUMSTORE2=14.0
               ELSE
               write(16,*)'MORE THAN TWO VARIALBES STORED'
               write(16,30)CALLSIGN,OTIST(ii)
               ENDIF


           GOTO 111
           ENDIF


   83   CONTINUE

          DO 84 M=2,6,1
           IF((ii+M).GT.7)GOTO 101
             IF(BUF(N,ii+M+24).EQ.-999)then
            BUF(N,ii+M+24)=15.0
           ELSE
               IF(STORE2.EQ.'    ')then
               STORE2='  W'
               NUMSTORE2=15.0
               ELSE
               write(16,*)'MORE THAN TWO VARIALBES STORED'
               write(16,30)CALLSIGN,OTIST(ii)
               ENDIF


           GOTO 111
          ENDIF


   84   CONTINUE

       ELSE
           write(16,*)'OTHER INSTRUMENT UNKNOWN'
           write(16,30)CALLSIGN,OTIST(ii)
           BUF(N,ii+24)=999
       ENDIF
           GOTO 111
   101  IF((ii+M).GT.7)then
           write(16,*)'MORE THAN SIX OTINST'
           write(16,30)CALLSIGN,OTIST(ii)
       ENDIF

   111 CONTINUE
```

```
      IF(STORE1.NE.'    ')then

        DO 85 ii=1,7,1
        IF(BUF(N,ii+24).EQ.-999.0)then
          BUF(N,ii+24)=NUMSTORE1
        GOTO 1112
        ENDIF
   85 CONTINUE
        write(16,*)'MORE THAN SEVEN OTISTS'
        write(16,30)CALLSIGN,STORE1
        ENDIF
 1112 CONTINUE

      IF(STORE2.NE.'    ')then
        DO 86 ii=1,7,1
          IF(BUF(N,ii+24).EQ.-999.0)then
          BUF(N,ii+24)=NUMSTORE2
          GOTO 1113
        ENDIF
   86 CONTINUE
        write(16,*)'MORE THAN SEVEN OTISTS'
        write(16,30)CALLSIGN,OTIST(ii)
        ENDIF
 1113 CONTINUE
C
C****TELECOM
C
      IF(TELECOM.EQ.'TMS'.OR.TELECOM.EQ.'TMH')then
          BUF(N,20)=1.0
      ELSEIF(TELECOM.EQ.' MS'.OR.TELECOM.EQ.' MH')then
          BUF(N,20)=2.0
      ELSEIF(TELECOM.EQ.' TS'.OR.TELECOM.EQ.' TH')then
          BUF(N,20)=3.0
      ELSEIF(TELECOM.EQ.' TM')then
          BUF(N,20)=4.0
      ELSEIF(TELECOM.EQ.'  S'.OR.TELECOM.EQ.'  H')then
          BUF(N,20)=5.0
      ELSEIF(TELECOM.EQ.'  M')then
          BUF(N,20)=6.0
      ELSEIF(TELECOM.EQ.'  T')then
          BUF(N,20)=7.0
      ELSEIF(TELECOM.EQ.'    ')then
          BUF(N,20)=-999.0
      ELSE
          write(16,*)'TELECOM UNKNOWN'
          write(16,30)CALLSIGN,TELECOM
          BUF(N,20)=999.0
      ENDIF
C
C****SECOND BAROGRAPH
C
       IF(BAROGRAPH2.EQ.'OS')then
          BUF(N,19)=1.0
       ELSEIF(BAROGRAPH2.EQ.'SS')then
          BUF(N,19)=2.0
       ELSEIF(BAROGRAPH2.EQ.'  ')then
          BUF(N,19)=-999.0
       ELSE
          write(16,*)'BAROGRAPH2 UNKNOWN'
          write(16,30)CALLSIGN,BAROGRAPH2
          BUF(N,19)=999.
       ENDIF
C
C****FOOTNOTES
C
C      READ(IFOOTNOTE1,'I4')
       IF(IFOOTNOTE1.NE.0)then
```

```
        BUF(N,32)=IFOOTNOTE1
        ELSE
        BUF(N,32)=-999
        ENDIF
C
C       READ(IFOOTNOTE2,'I4')
        IF(IFOOTNOTE2.NE.0)then
        BUF(N,33)=IFOOTNOTE2
        ELSE
        BUF(N,33)=-999
        ENDIF
C
C****COMMS
C
        IF(COMMS.EQ.'YIAE')then
           BUF(N,21)=1.0
        ELSEIF(COMMS.EQ.'YIA ')then
           BUF(N,21)=2.0
        ELSEIF(COMMS.EQ.'YI  '.OR.COMMS.EQ.'  YI')then
           BUF(N,21)=3.0
        ELSEIF(COMMS.EQ.'YE  ')then
           BUF(N,21)=4.0
        ELSEIF(COMMS.EQ.'YA  '.OR.COMMS.EQ.'  YA')then
           BUF(N,21)=5.0
        ELSEIF(COMMS.EQ.'IE  ')then
           BUF(N,21)=6.0
        ELSEIF(COMMS.EQ.'IA  '.OR.COMMS.EQ.'  IA')then
           BUF(N,21)=7.0
        ELSEIF(COMMS.EQ.' A  '.OR.COMMS.EQ.'   A')then
           BUF(N,21)=8.0
        ELSEIF(COMMS.EQ.' E  ')then
           BUF(N,21)=9.0
        ELSEIF(COMMS.EQ.' I  '.OR.COMMS.EQ.'   I')then
           BUF(N,21)=10.0
        ELSEIF(COMMS.EQ.' Y  ')then
           BUF(N,21)=11.0
        ELSEIF(COMMS.EQ.'AE  ')then
           BUF(N,21)=12.0
        ELSEIF(COMMS.EQ.' AE ')then
           BUF(N,21)=12.0
        ELSEIF(COMMS.EQ.'  AE')then
           BUF(N,21)=12.0
        ELSEIF(COMMS.EQ.'  YE'.OR.COMMS.EQ.' YE ')then
           BUF(N,21)=4.0
        ELSEIF(COMMS.EQ.'  IE')then
           BUF(N,21)=6.0
        ELSEIF(COMMS.EQ.' YIE'.OR.COMMS.EQ.'YIE ')then
           BUF(N,21)=13.0
        ELSEIF(COMMS.EQ.'   Y')then
           BUF(N,21)=11.0
        ELSEIF(COMMS.EQ.'Y   ')then
           BUF(N,21)=11.0
        ELSEIF(COMMS.EQ.'  Y ')then
           BUF(N,21)=11.0
        ELSEIF(COMMS.EQ.' IE ')then
           BUF(N,21)=6.0
        ELSEIF(COMMS.EQ.'    ')then
           BUF(N,21)=-999
        ELSE
           write(16,*)'COMMS UNKNOWN'
           write(16,30)CALLSIGN,COMMS
           BUF(N,21)=999.
        ENDIF
C
      COUNTRECS=COUNTRECS+1
   40 CONTINUE
   45 CONTINUE
      norec=countrecs
```

```
C
C .. write out data
C
        DO 35 I=1,NOFLDS
          CALL OTDATA(IODISK,I,1,NOREC,BUF(1,I),NOFLDS,NOREC)
   35   CONTINUE
C
      DO 15 I=1,NOFLDS
   15 CALL UPRLWR(IODISK,I,1,NOREC,ALRLIM(I),UPRLIM(I),ABSENT(I),
     &NOFLDS,NOREC)
C
      CALL PFINIS(IODISK,PROG,
     & MAGIC,NOFLDS,NOREC,NROWS,NPLANE,ICENT,IYMD,IHMS,
     & FLDNAM,FLDUNT,ALRLIM,UPRLIM,ABSENT,
     & ALAT,ALONG,DEPTHI,DEPTHW,OPWRIT,RAWDAT,PIPEFL,ARCHIV,VERS,
     & DATNAM,PREFIL,POSTFL,PLATYP,PLTNUM,RECINT,PLTNAM,INSTMT,COMENT)
C
      STOP
      END
C
C  ****************************************************************
C  **  subroutine to code up the character callsign into a number   **
C  **  coded as : ascii code *1000000 for 1st character of 4,       **
C  **  ascii code *10000 for the 2nd etc.  The seven character      **
C  **  callsign is coded in 2,  8 digit variables                   **
C  ****************************************************************
      subroutine codesub2(output,output2,input)
C
      IMPLICIT INTEGER(A-E,G-Z)
      character*7 input,input2
      real*8 number,number2
      integer output output2
C
      input2=input
C
C ..  this bit codes a blank as 99 (in fact 99 is equivalent
C ..  to a lower case "c"
C
      do 70 ii=1,7
      if(input(ii:ii).eq.'c')input(ii:ii)='C'
      if(input(ii:ii).eq.' ')input(ii:ii)='c'
   70 continue
C
C ..  code ID1
C
      output=ichar(input(4:4))
      output=output+100*ichar(input(3:3))
      output=output+100*100*ichar(input(2:2))
      output=output+100*100*100*ichar(input(1:1))
C
C ..  code ID2
C
      output2=99
      output2=output2+100*ichar(input(7:7))
      output2=output2+100*100*ichar(input(6:6))
      output2=output2+100*100*100*ichar(input(5:5))
C
      number=output
      number2=output2
C
      input=input2
      return
      end
```

APPENDIX 3

PROGRAM: PWRITEOUT.F

TO WRITE WMO47 DATA FROM PSTAR INTO FIXED TEXT FORMAT

```
C******Pwriteout
C
      PROGRAM Pwriteout
C
C.....Program to write out WMO47 pstar file in 'easy to read' format.
C
      IMPLICIT REAL*8 (A-H,O-Z,a-h,o-z)
#include "datadf2.h"
#include "psio.h"
      PARAMETER (INVARS=34)
      CHARACTER*8 PROG
      DIMENSION BUFA(IRECXX,INVARS)
      DIMENSION ABSUB(INVARS)
      INTEGER NPOSV(IFLDXX),NPOS(IFLDXX)
C
      DATA PROG/'Pwriteout'/
C
C.....Initialise
      CALL PROGHD(PROG)
C
C.....Open files
      CALL OPENIN(INDISK)
      if(indisk.eq.-999.) call pabort
C
      CALL READPR(INDISK,
     & MAGIC,NOFLDS,NORECS,NROWS,NPLANE,ICENT,IYMD,IHMS,
     & FLDNAM,FLDUNT,ALRLIM,UPRLIM,ABSENT,
     & ALAT,ALONG,DEPTHI,DEPTHW,OPWRIT,RAWDAT,PIPEFL,ARCHIV,VERS,
     & DATNAM,PREFIL,POSTFL,PLATYP,PLTNUM,RECINT,PLTNAM,INSTMT,COMENT)
C
C.....Which vars to offer to PFSUB ?
C
      WRITE(IOITT,501)INVARS
 501  FORMAT(' Which vars to be operated on (must be ',I3,') ?')
      CALL READVR(NPOSV,NVARS,NOFLDS)
      IF(NVARS.NE.INVARS)THEN
        WRITE(IOITT,*)' MUST OFFER ',INVARS,' VARS TO PFSUB - STOPPING'
        CALL PABORT
      ENDIF
C
C.....Now operate
      NLEN=IRECXX
      NUM=NLEN
      DO 50 N=1,NORECS,NLEN
      IF((N+NUM-1).GT.NORECS)NUM=NORECS-N+1
      DO 60 J=1,NVARS
      CALL INDATA(INDISK,NPOSV(J),N,NUM,BUFA(1,J),NOFLDS,NORECS)
      ABSUB(J)=ABSENT(NPOSV(J))
  60  CONTINUE
      CALL PFSUB(BUFA,NUM,ABSUB,INVARS,INVARS)
  50  CONTINUE
C
      STOP
      END
C
      SUBROUTINE PFSUB(BUF,NUM,ABS,INVARS,INVARS)
C
C      Subroutine to provide any desired function of input
C        variable. Use with PFUNC.
C
      IMPLICIT REAL*8 (A-H,O-Z,a-h,o-z)
      CHARACTER*8 CODE
      CHARACTER*15 COUNTRY,TYPE
      CHARACTER*3 BAROMETER(2)
      CHARACTER*3 THERMOMETER(2)
      CHARACTER*3 HOUSING(4)
      CHARACTER*3 HUMIDITY(2)
      CHARACTER*3 SST(3)
```

```
      CHARACTER*3 BARG(2)
      CHARACTER*3 TELECOM
      CHARACTER*4 COMMS
      CHARACTER*3 OT(7)
      INTEGER*4 NORADOP,HTPLAT,HTANEM,YEAR,FOOTNOTE1,FOOTNOTE2
#include "datadf2.h"
      DIMENSION BUF(IRECXX,INVARS),ABS(INVARS)
      DO 10 J=1,NUM
C***
C***   The following code writes out the instrumentation etc
C***   in reasonable (?) english
C
C **  YEAR
C
      YEAR=BUF(J,34)
C
C **  sort out country
C
      IF(BUF(J,1).EQ.101.0)then
      COUNTRY='ARGENTINA'
      ELSEIF(BUF(J,1).EQ.102.0)then
      COUNTRY='AUSTRALIA'
      ELSEIF(BUF(J,1).EQ.103.0)then
      COUNTRY='BELGIUM'
      ELSEIF(BUF(J,1).EQ.104.0)then
      COUNTRY='BRAZIL'
      ELSEIF(BUF(J,1).EQ.105.0)then
      COUNTRY='CANADA'
      ELSEIF(BUF(J,1).EQ.106.0)then
      COUNTRY='CHILE   '
      ELSEIF(BUF(J,1).EQ.107.0)then
      COUNTRY='DENMARK'
      ELSEIF(BUF(J,1).EQ.108.0)then
      COUNTRY='FINLAND'
      ELSEIF(BUF(J,1).EQ.109.0)then
      COUNTRY='FRANCE'
      ELSEIF(BUF(J,1).EQ.110.0)then
      COUNTRY='FR POLYNESIA'
      ELSEIF(BUF(J,1).EQ.111.0)then
         IF(YEAR.GT.1990) THEN
          COUNTRY='PDR KOREA'
         ELSE
          COUNTRY='GDR'
         ENDIF
      ELSEIF(BUF(J,1).EQ.112.0)then
      COUNTRY='GFR'
      ELSEIF(BUF(J,1).EQ.113.0)then
      COUNTRY='GREECE'
      ELSEIF(BUF(J,1).EQ.114.0)then
      COUNTRY='HONG KONG'
      ELSEIF(BUF(J,1).EQ.115.0)then
      COUNTRY='ICELAND'
      ELSEIF(BUF(J,1).EQ.116.0)then
      COUNTRY='INDIA'
      ELSEIF(BUF(J,1).EQ.117.0)then
      COUNTRY='IRELAND'
      ELSEIF(BUF(J,1).EQ.118.0)then
      COUNTRY='ISRAEL'
      ELSEIF(BUF(J,1).EQ.119.0)then
      COUNTRY='ITALY'
      ELSEIF(BUF(J,1).EQ.120.0)then
      COUNTRY='JAPAN'
      ELSEIF(BUF(J,1).EQ.121.0)then
      COUNTRY='KENYA'
      ELSEIF(BUF(J,1).EQ.122.0)then
      COUNTRY='KOREA'
      ELSEIF(BUF(J,1).EQ.123.0)then
      COUNTRY='NETHERLANDS'
```

```
      ELSEIF(BUF(J,1).EQ.124.0)then
         IF(YEAR.GT.1992) THEN
            COUNTRY='CROATIA  '
         ELSE
            COUNTRY='NEW CALENDONIA'
         ENDIF
      ELSEIF(BUF(J,1).EQ.125.0)then
      COUNTRY='NEW ZEALAND'
      ELSEIF(BUF(J,1).EQ.126.0)then
      COUNTRY='NORWAY'
      ELSEIF(BUF(J,1).EQ.127.0)then
      COUNTRY='PAKISTAN'
      ELSEIF(BUF(J,1).EQ.128.0)then
      COUNTRY='PHILIPPINES'
      ELSEIF(BUF(J,1).EQ.129.0)then
      COUNTRY='POLAND'
      ELSEIF(BUF(J,1).EQ.130.0)then
      COUNTRY='PORTUGAL'
      ELSEIF(BUF(J,1).EQ.131.0)then
      COUNTRY='ST PIERRE'
      ELSEIF(BUF(J,1).EQ.132.0)then
      COUNTRY='SINGAPORE'
      ELSEIF(BUF(J,1).EQ.133.0)then
      COUNTRY='SOUTH AFRICA'
      ELSEIF(BUF(J,1).EQ.134.0)then
      COUNTRY='SPAIN'
      ELSEIF(BUF(J,1).EQ.135.0)then
      COUNTRY='SWEDEN'
      ELSEIF(BUF(J,1).EQ.136.0)then
      COUNTRY='SWITZERLAND'
      ELSEIF(BUF(J,1).EQ.137.0)then
      COUNTRY='THAILAND'
      ELSEIF(BUF(J,1).EQ.138.0)then
      COUNTRY='USSR'
      ELSEIF(BUF(J,1).EQ.139.0)then
      COUNTRY='UK'
      ELSEIF(BUF(J,1).EQ.140.0)then
      COUNTRY='USA'
      ELSEIF(BUF(J,1).EQ.141.0)then
      COUNTRY='YUGOSLAVIA'
      ELSEIF(BUF(J,1).EQ.142.0)then
      COUNTRY='BULGARIA'
      ELSEIF(BUF(J,1).EQ.143.0)then
      COUNTRY='BANGLADESH'
      ELSEIF(BUF(J,1).EQ.144.0)then
      COUNTRY='CUBA'
      ELSEIF(BUF(J,1).EQ.145.0)then
      COUNTRY='JAMAICA'
      ELSEIF(BUF(J,1).EQ.146.0)then
      COUNTRY='TANZANIA'
      ELSEIF(BUF(J,1).EQ.147.0)then
      COUNTRY='MALAYSIA'
      ELSEIF(BUF(J,1).EQ.148.0)then
      COUNTRY='CHINA'
      ELSEIF(BUF(J,1).EQ.149.0)then
      COUNTRY='INDONESIA'
      ELSEIF(BUF(J,1).EQ.150.0)then
      COUNTRY='SRI LANKA'
      ELSEIF(BUF(J,1).EQ.151.0)then
      COUNTRY='SAUDI ARABIA'
      ELSE
      COUNTRY='UNKNOWN'
      ENDIF
C
C **   sort out callsign
C
      call letters(BUF(J,2),BUF(J,3),CODE)
C     write(*,43)CODE(1:1),CODE(2:2),CODE(3:3),CODE(4:4)
```

```
  43  format(4A1)
C
C **  Type of barometer
C
      do 100 II=1,2
      IF(II.EQ.1)JJ=5
      IF(II.EQ.2)JJ=10
      IF(BUF(J,JJ).EQ.-999.0)then
      BAROMETER(II)='    '
      ELSEIF(BUF(J,JJ).EQ.1.0)then
      BAROMETER(II)='AN  '
      ELSEIF(BUF(J,JJ).EQ.2.0)then
      BAROMETER(II)='SAN'
      ELSEIF(BUF(J,JJ).EQ.3.0)then
      BAROMETER(II)='MER'
      ELSEIF(BUF(J,JJ).EQ.4.0)then
      BAROMETER(II)='DA  '
      ELSE
      BAROMETER(II)='UNK'
      ENDIF
 100  CONTINUE
C
C-
C **  type of temperature sensor
C
      do 200 II=1,2
      IF(II.EQ.1)JJ=6
      IF(II.EQ.2)JJ=11
      IF(BUF(J,JJ).EQ.-999.0)then
      THERMOMETER(II)='    '
      ELSEIF(BUF(J,JJ).EQ.1.0)then
      THERMOMETER(II)='MER'
      ELSEIF(BUF(J,JJ).EQ.2.0)then
      THERMOMETER(II)='ELE'
      ELSEIF(BUF(J,JJ).EQ.3.0)then
      THERMOMETER(II)='ALC'
      ELSE
      THERMOMETER(II)='UNK'
      ENDIF
 200  CONTINUE
C
C **  type of housing, 1 and 2 are temp,  3 and 4 are humidity
C
      do 300 II=1,4
      IF(II.EQ.1)JJ=7
      IF(II.EQ.2)JJ=12
      IF(II.EQ.3)JJ=9
      IF(II.EQ.4)JJ=14
      IF(BUF(J,JJ).EQ.-999.0)then
      HOUSING(II)='    '
      ELSEIF(BUF(J,JJ).EQ.1.0)then
      HOUSING(II)='S   '
      ELSEIF(BUF(J,JJ).EQ.2.0)then
      HOUSING(II)='VS  '
      ELSEIF(BUF(J,JJ).EQ.3.0)then
      HOUSING(II)='SL  '
      ELSEIF(BUF(J,JJ).EQ.4.0)then
      HOUSING(II)='W   '
      ELSEIF(BUF(J,JJ).EQ.5.0)then
      HOUSING(II)='A   '
      ELSEIF(BUF(J,JJ).EQ.6.0)then
      HOUSING(II)='US  '
      ELSEIF(BUF(J,JJ).EQ.7.0)then
      HOUSING(II)='SG  '
      ELSEIF(BUF(J,JJ).EQ.8.0)then
      HOUSING(II)='SN  '
      ELSE
      HOUSING(II)='UNK'
```

```
      ENDIF
 300  CONTINUE
C
C
C **  type of humidity sensor
C
      do 400 II=1,2
      IF(II.EQ.1)JJ=8
      IF(II.EQ.2)JJ=13
      IF(BUF(J,JJ).EQ.-999.0)then
      HUMIDITY(II)='   '
      ELSEIF(BUF(J,JJ).EQ.1.0)then
      HUMIDITY(II)='H  '
      ELSEIF(BUF(J,JJ).EQ.2.0)then
      HUMIDITY(II)='P  '
      ELSEIF(BUF(J,JJ).EQ.3.0)then
      HUMIDITY(II)='E  '
      ELSE
      HUMIDITY(II)='UNK'
      ENDIF
 400  CONTINUE
C
C **  type of SST sensor
C
      do 500 II=1,3
      IF(II.EQ.1)JJ=15
      IF(II.EQ.2)JJ=16
      IF(II.EQ.3)JJ=17
      IF(BUF(J,JJ).EQ.-999.0)then
      SST(II)='   '
      ELSEIF(BUF(J,JJ).EQ.1.0)then
      SST(II)='BU '
      ELSEIF(BUF(J,JJ).EQ.2.0)then
      SST(II)='C  '
      ELSEIF(BUF(J,JJ).EQ.3.0)then
      SST(II)='TT '
      ELSEIF(BUF(J,JJ).EQ.4.0)then
      SST(II)='HC '
      ELSEIF(BUF(J,JJ).EQ.5.0)then
      SST(II)='HT '
      ELSEIF(BUF(J,JJ).EQ.6.0)then
      SST(II)='RAD'
      ELSEIF(BUF(J,JJ).EQ.7.0)then
      SST(II)='BTT'
      ELSEIF(BUF(J,JJ).EQ.8.0)then
      SST(II)='OT '
      ELSE
      SST(II)='UNK'
      ENDIF
 500  CONTINUE
C
C **  type of barograph
C
      do 600 II=1,2
      IF(II.EQ.1)JJ=18
      IF(II.EQ.2)JJ=19
      IF(BUF(J,JJ).EQ.-999.0)then
      BARG(II)='   '
      ELSEIF(BUF(J,JJ).EQ.1.0)then
      BARG(II)='OS '
      ELSEIF(BUF(J,JJ).EQ.2.0)then
      BARG(II)='SS '
      ELSE
      BARG(II)='UNK'
      ENDIF
 600  CONTINUE
C
C **  other instruments
```

```
C
      do 700 II=1,7
      IF(BUF(J,II+24).EQ.-999.0)then
      OT(II)='    '
      ELSEIF(BUF(J,II+24).EQ.1.0)then
      OT(II)='MAX'
      ELSEIF(BUF(J,II+24).EQ.2.0)then
      OT(II)='MIN'
      ELSEIF(BUF(J,II+24).EQ.3.0)then
      OT(II)='RT '
      ELSEIF(BUF(J,II+24).EQ.4.0)then
      OT(II)='TSD'
      ELSEIF(BUF(J,II+24).EQ.5.0)then
      OT(II)='BAT'
      ELSEIF(BUF(J,II+24).EQ.6.0)then
      OT(II)='BT '
      ELSEIF(BUF(J,II+24).EQ.7.0)then
      OT(II)='XBT'
      ELSEIF(BUF(J,II+24).EQ.8.0)then
      OT(II)='HA '
      ELSEIF(BUF(J,II+24).EQ.9.0)then
      OT(II)='A  '
      ELSEIF(BUF(J,II+24).EQ.10.0)then
      OT(II)='SA '
      ELSEIF(BUF(J,II+24).EQ.11.0)then
      OT(II)='AG '
      ELSEIF(BUF(J,II+24).EQ.12.0)then
      OT(II)='RG '
      ELSEIF(BUF(J,II+24).EQ.13.0)then
      OT(II)='P  '
      ELSEIF(BUF(J,II+24).EQ.14.0)then
      OT(II)='R  '
      ELSEIF(BUF(J,II+24).EQ.15.0)then
      OT(II)='W  '
      ELSEIF(BUF(J,II+24).EQ.16.0)then
      OT(II)='ST  '
      ELSEIF(BUF(J,II+24).EQ.17.0)then
      OT(II)='RSD'
      ELSE
      OT(II)='UNK'
      ENDIF
 700  CONTINUE
C
C **  number of radio operators
C
      if(BUF(J,22).EQ.-999.0)BUF(J,22)=-1.0
      noradop=BUF(J,22)
C
C **  height of observing platform
C
      if(BUF(J,23).EQ.-999.0)BUF(J,23)=-1.0
      if(BUF(J,23).EQ.0.0)BUF(J,23)=-1.0
      htplat=BUF(J,23)
C
C **  height of anemometer
C
      if(BUF(J,24).EQ.-999.0)BUF(J,24)=-1.0
      if(BUF(J,24).EQ.0.0)BUF(J,24)=-1.0
      htanem=BUF(J,24)
C
C **  telecom
C
      IF(BUF(J,20).EQ.-999.0)then
      TELECOM='    '
      ELSEIF(BUF(J,20).EQ.1.0)then
      TELECOM='TMH'
      ELSEIF(BUF(J,20).EQ.2.0)then
      TELECOM=' MH'
```

```
      ELSEIF(BUF(J,20).EQ.3.0)then
      TELECOM='T H'
      ELSEIF(BUF(J,20).EQ.4.0)then
      TELECOM='TM '
      ELSEIF(BUF(J,20).EQ.5.0)then
      TELECOM='  H'
      ELSEIF(BUF(J,20).EQ.6.0)then
      TELECOM=' M '
      ELSEIF(BUF(J,20).EQ.7.0)then
      TELECOM='T  '
      ELSE
      TELECOM='UNK'
      ENDIF
C
C **  communications
C
      IF(BUF(J,21).EQ.-999.0)then
      COMMS='   '
      ELSEIF(BUF(J,21).EQ.1.0)then
      COMMS='YIAE'
      ELSEIF(BUF(J,21).EQ.2.0)then
      COMMS='YIA '
      ELSEIF(BUF(J,21).EQ.3.0)then
      COMMS='YI  '
      ELSEIF(BUF(J,21).EQ.4.0)then
      COMMS='Y  E'
      ELSEIF(BUF(J,21).EQ.5.0)then
      COMMS='Y A '
      ELSEIF(BUF(J,21).EQ.6.0)then
      COMMS=' I E'
      ELSEIF(BUF(J,21).EQ.7.0)then
      COMMS=' IA '
      ELSEIF(BUF(J,21).EQ.8.0)then
      COMMS='  A '
      ELSEIF(BUF(J,21).EQ.9.0)then
      COMMS='   E'
      ELSEIF(BUF(J,21).EQ.10.0)then
      COMMS=' I  '
      ELSEIF(BUF(J,21).EQ.11.0)then
      COMMS='Y   '
      ELSE
      COMMS='UNK'
      ENDIF
C
C **  ship type
C
      IF(BUF(J,4).EQ.-999.0)then
      TYPE='       '
      ELSEIF(BUF(J,4).EQ.10.0)then
      TYPE='SEL    '
      ELSEIF(BUF(J,4).EQ.20.0)then
      TYPE='SEL SP '
      ELSEIF(BUF(J,4).EQ.21.0)then
      TYPE='SEL MER'
      ELSEIF(BUF(J,4).EQ.22.0)then
      TYPE='SEL TRW'
      ELSEIF(BUF(J,4).EQ.31.0)then
      TYPE='SEL MER'
      ELSEIF(BUF(J,4).EQ.32.0)then
      TYPE='SEL TRW'
      ELSEIF(BUF(J,4).EQ.40.0)then
      TYPE='SUP    '
      ELSEIF(BUF(J,4).EQ.60.0)then
      TYPE='SUP MER'
      ELSEIF(BUF(J,4).EQ.61.0)then
      TYPE='SUP TRW'
      ELSEIF(BUF(J,4).EQ.70.0)then
      TYPE='AUX    '
```

```
      ELSEIF(BUF(J,4).EQ.80.0)then
      TYPE='AUX OCC'
      ELSEIF(BUF(J,4).EQ.45.0)then
      TYPE='AUX TRW'
      ELSEIF(BUF(J,4).EQ.88.0)then
      TYPE='SEL NUS'
      ELSEIF(BUF(J,4).EQ.89.0)then
      TYPE='SUP NUS'
      ELSEIF(BUF(J,4).EQ.90.0)then
      TYPE='AUX NUS'
      ELSE
      TYPE='UNK     '
      ENDIF
C
C **  FOOTNOTES
C
      IF(BUF(J,32).EQ.-999.0)BUF(J,32)=-1.0
      FOOTNOTE1=BUF(J,32)
      IF(BUF(J,33).EQ.-999.0)BUF(J,33)=-1.0
      FOOTNOTE2=BUF(J,33)
C
C
      write(17,102) YEAR,COUNTRY,CODE,TYPE,
     &   BAROMETER(1),THERMOMETER(1),HOUSING(1),
     &   HUMIDITY(1),HOUSING(3),BAROMETER(2),THERMOMETER(2),
     &   HOUSING(2),
     &   HUMIDITY(2),HOUSING(4),SST(1),SST(2),SST(3),BARG(1),
     &   BARG(2),
     &   NORADOP,HTPLAT,HTANEM,OT(1),OT(2),OT(3),OT(4),OT(5),
     &   OT(6),OT(7),
     &   TELECOM,COMMS,FOOTNOTE1,FOOTNOTE2
 101  format(a8)
 102  format(I4,',',A15,',',A8,',',A7,15(',',A3),
     &3(',',I3),7(',',A3),',',
     &,A3,',',A4,',',I4,',',I4)

C***
  10  CONTINUE
      RETURN
      END
C*************************************************
      SUBROUTINE LETTERS(number1,number2,code)
C
      IMPLICIT INTEGER(A-E,G-Z)
      character*1 coutput(8)
      integer*2 ioutput(8)
      character*8 code
      real*8 number1,number2
C
      inum=int(number1)
      inum2=int(number2)
      ioutput(1)=inum/1000000
      inum=inum-ioutput(1)*1000000
      ioutput(2)=inum/10000
      inum=inum-ioutput(2)*10000
      ioutput(3)=inum/100
      inum=inum-ioutput(3)*100
      ioutput(4)=inum
C
      ioutput(5)=inum2/1000000
      inum2=inum2-ioutput(5)*1000000
      ioutput(6)=inum2/10000
      inum2=inum2-ioutput(6)*10000
      ioutput(7)=inum2/100
      inum2=inum2-ioutput(7)*100
      ioutput(8)=inum2
C
C
```

```
      do 77 ii=1,8
      if(ioutput(ii).eq.99)ioutput(ii)=32
      coutput(ii)=char(ioutput(ii))
   77 continue
      do 88 ii=1,8
      code(ii:ii)=coutput(ii)
   88 continue
      return
      end
```

APPENDIX 4

EXAMPLE OF NEW FORMAT WMO47 TEXT FILE AS PRODUCED BY ELIZABETH KENT AND DANIEL OAKLEY, JAMES RENNELL DIVISION OF SOUTHAMPTON OCEANOGRAPHY CENTRE

1973	ARGENTINA	LOAK	SUP	AN	MER	W	P	W	C	SS	1	8	-1		TMH	-1	-1	PUNTA DELGADA
1973	ARGENTINA	LOMY	SUP	AN	MER	W	P	W	C	SS	1	7	-1		TMH	-1	-1	CABO SAN GONZALO
1973	ARGENTINA	LONA	SUP	AN	MER	W	P	W	C	SS	1	9	-1		TMH	-1	-1	CABO SAN ISIDRO
1973	ARGENTINA	LONE	SUP	AN	MER	W	P	W	C	SS	1	10	-1		TMH	-1	-1	CABO SAN PIO
1973	ARGENTINA	LPAC	SEL	AN	MER	S	P	S	C	SS	2	18	-1		TMH	-1	-1	LIBERTAD
1973	ARGENTINA	LPKT	SEL	MER	MER	W	P	W	C	SS	1	14	-1		TMH	-1	-1	LA PLATA
1973	ARGENTINA	LQAT	SEL	AN	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	ALMIRANTE STEWART
1973	ARGENTINA	LQAY	SEL	AN	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	FLETERO
1973	ARGENTINA	LQBC	SUP	AN	MER	W	P	W	C	SS	1	13	-1		MH	-1	-1	HORNERO
1973	ARGENTINA	LQBN	SEL	AN	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	LAGO ARGENTINO
1973	ARGENTINA	LQBP	SUP	AN	MER	S	P	S	C	SS	1	16	-1		TMH	-1	-1	LAGO ALUMINE
1973	ARGENTINA	LQCG	SUP	AN	MER	W	P	W	C	SS	1	15	-1		MH	-1	-1	MARINERO
1973	ARGENTINA	LQCY	SUP	AN	MER	W	P	W	C	SS	1	12	-1		MH	-1	-1	NAVIERO
1973	ARGENTINA	LQER	SUP	AN	MER	W	P	W	C	SS	1	13	-1		MH	-1	-1	ENTRE RIOS
1973	ARGENTINA	LQFE	SUP	AN	MER	W	P	W	C	SS	1	13	-1		MH	-1	-1	SANTA FE
1973	ARGENTINA	LQGA	SUP	AN	MER	W	P	W	C	SS	1	16	-1		TMH	-1	-1	LAGO NAHUEL HUAPI
1973	ARGENTINA	LQGB	SEL	AN	MER	W	P	W	C	SS	1	16	-1		TMH	-1	-1	LAGO TRAFUL
1973	ARGENTINA	LQGC	SEL	AN	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	LAGO LACAR
1973	ARGENTINA	LQGL	SUP	AN	MER	S	P	S	C		1	14	-1		TMH	-1	-1	GAUCHO CRUZ
1973	ARGENTINA	LQGN	SEL	AN	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	GAUCHO LAGUNA
1973	ARGENTINA	LQGR	SUP	AN	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	RIO DULCE
1973	ARGENTINA	LQGS	SUP	AN	MER	S	P	S	C	SS	1	16	-1		TMH	-1	-1	RIO SALADO
1973	ARGENTINA	LQHC	SUP	AN	MER	W	P	W	C	SS	1	12	-1		TMH	-1	-1	CIPOLLETTI
1973	ARGENTINA	LQHR	SEL	AN	MER	W	P	W	C	SS	1	14	-1		TMH	-1	-1	MARBELLA
1973	ARGENTINA	LQLM	SEL	AN	MER	S	P	S	C	SS	1	10	-1		TMH	-1	-1	YAHAM
1973	ARGENTINA	LQLP	SUP	MER	MER	W	P	W	C	SS	1	19	-1		MH	-1	-1	PAMPA ARGENTINA
1973	ARGENTINA	LQMB	SUP	AN	MER	S	P	S	C	SS	1	12	-1		MH	-1	-1	MARBRAVA
1973	ARGENTINA	LQOM	SUP	AN	MER	S	P	S	C	SS	1	8	-1		TMH	-1	-1	MAR TIRRELO
1973	ARGENTINA	LQPA	SEL	AN	MER	S	P	S	C	SS	1	17	-1		TMH	-1	-1	PROGRESO ARGENTINO
1973	ARGENTINA	LQPH	SEL	AN	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	HARVELLA
1973	ARGENTINA	LQPM	SEL	AN	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	PETROMAR MENDOZA
1973	ARGENTINA	LQPR	SEL	AN	MER	W	P	W	C	SS	1	14	-1		TMH	-1	-1	RIO PARANA
1973	ARGENTINA	LQQA	SUP	AN	MER	S	P	S	C	SS	1	12	-1		TMH	-1	-1	ANTARTICO
1973	ARGENTINA	LQRC	SEL	AN	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	RIO CALCHAQUI
1973	ARGENTINA	LQRP	SUP	AN	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	RIO DE LA PLATA
1973	ARGENTINA	LQUC	SEL	AN	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	PETROMAR CAMPANA
1973	ARGENTINA	LQUD	SEL	AN	MER	S	P	S	C	SS	1	10	-1		TMH	-1	-1	MAR DULCE
1973	ARGENTINA	LQUE	SEL	AN	MER	W	P	W	C	SS	1	10	-1		TMH	-1	-1	BALLENITA
1973	ARGENTINA	LQUM	SUP	AN	MER	W	P	W	C		1	17	-1		TMH	-1	-1	MARDULCE
1973	ARGENTINA	LQUQ	SUP	AN	MER	S	P	S	C		1	14	-1		TMH	-1	-1	AREMAR
1973	ARGENTINA	LQUW	SEL	AN	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	ASTRASUR
1973	ARGENTINA	LQUY	SUP	AN	MER	S	P	S	C	SS	1	15	-1		MH	-1	-1	ESTRELLA ARGENTINA
1973	ARGENTINA	LQVC	SEL	AN	MER	W	P	W	C	SS	1	15	-1		TMH	-1	-1	PETROMAR CORDOBA
1973	ARGENTINA	LQVG	SEL	AN	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	SANTOS VEGA
1973	ARGENTINA	LQVI	SUP	AN	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	CAMINITO
1973	ARGENTINA	LQVP	SUP	AN	MER	S	P	S	C	SS	1	16	-1		TMH	-1	-1	PETROMAR BAHIA BLANCA
1973	ARGENTINA	LQYD	SUP	AN	MER	S	P	S	C		1	10	-1		TMH	-1	-1	BLAS DAVENIA
1973	ARGENTINA	LQYE	SEL	AN	MER	W	P	W	C	SS	1	11	-1		TMH	-1	-1	EARTHBANK
1973	ARGENTINA	LQYP	SEL	AN	MER	W	P	W	C	SS	1	14	-1		TMH	-1	-1	PECTEN
1973	ARGENTINA	LQYV	SEL	AN	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	ESTRELLA PATAGONICA
1973	ARGENTINA	LQYW	SEL	AN	MER	S	P	S	C	SS	1	16	-1		TMH	-1	-1	ASTRAPATAGONIA
1973	ARGENTINA	LQZD	SUP	AN	MER	S	P	S	C		1	10	-1		TMH	-1	-1	DESDEMONA
1973	ARGENTINA	LQZP	SUP	AN	MER	S	P	S	C		1	11	-1		TMH	-1	-1	CLAOPATRA
1973	ARGENTINA	LRAF	SEL	AN	MER	W	P	W	C	SS	1	11	-1		TMH	-1	-1	FLORENTINO AMEGHINO
1973	ARGENTINA	LRAG	SEL	MER	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	ISLAS GEORGIAS
1973	ARGENTINA	LRAH	SEL	MER	MER	S	P	S	C	SS	1	12	-1		TMH	-1	-1	INGENIERO HERMITTE
1973	ARGENTINA	LRAI	SEL	MER	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	PERITO MORENO
1973	ARGENTINA	LRBK	SEL	MER	MER	W	P	W	C	SS	1	14	-1		TMH	-1	-1	SAN LORENZO
1973	ARGENTINA	LRBP	SEL	MER	MER	S	P	S	C	SS	2	11	-1		TMH	-1	-1	COMODORO RIVADAVIA
1973	ARGENTINA	LRBU	SUP	AN	MER	S	P	S	C	SS	1	13	-1		TMH	-1	-1	ISLAS MALVINAS
1973	ARGENTINA	LRCH	SEL	MER	MER	S	P	S	C	SS	1	12	-1		TMH	-1	-1	GENERAL LAS HERAS
1973	ARGENTINA	LRCS	SEL	MER	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	SAN ANTONIO
1973	ARGENTINA	LRCV	SUP	AN	MER	W	P	W	C		1	13	-1		TMH	-1	-1	SAN CLEMENTE
1973	ARGENTINA	LRCY	SEL	AN	MER	W	P	W	C	SS	1	13	-1		TMH	-1	-1	SAN JOSE
1973	ARGENTINA	LRDD	SUP	MER	MER	W	P	W	C	SS	1	12	-1		MH	-1	-1	SAN SEBASTIAN
1973	ARGENTINA	LRDZ	SEL	AN	MER	S	P	S	C	SS	1	13	-1		TMH	-1	-1	SANTA CRUZ
1973	ARGENTINA	LRMG	SEL	AN	MER	S	P	S	C	SS	1	15	-1		TMH	-1	-1	GENERAL MARTIN GUEMES
1973	ARGENTINA	LRPC	SEL	AN	MER	W	P	W	C	SS	1	15	-1		TMH	-1	-1	RIO CARCARANA
1973	ARGENTINA	LRPD	SEL	AN	MER	W	P	W	C	SS	1	15	-1		TMH	-1	-1	RIO COLORADO
1973	ARGENTINA	LRPE	SUP	AN	MER	W	P	W	C	SS	1	16	-1		TMH	-1	-1	RIO CORRIENTES
1973	ARGENTINA	LRPS	SUP	AN	MER	W	P	W	C	SS	1	13	-1		MH	-1	-1	RIO ATUEL
1973	ARGENTINA	LRPV	SUP	AN	MER	S	P	S	C	SS	1	13	-1		MH	-1	-1	RIO BELEN
1973	ARGENTINA	LRPW	SUP	AN	MER	W	P	W	C	SS	1	15	-1		TMH	-1	-1	RIO BELGRANO
1973	ARGENTINA	LRPY	SUP	AN	MER	W	P	W	C	SS	1	15	-1		MH	-1	-1	RIO BERMEJO
1973	ARGENTINA	LRQL	SUP	AN	MER	W	P	W	C	SS	1	14	-1		TMH	-1	-1	RIO CUARTO
1973	ARGENTINA	LRQM	SUP	AN	MER	W	P	W	C	SS	1	16	-1		TMH	-1	-1	RIO MARAPA
1973	ARGENTINA	LRRB	SEL	AN	MER	W	P	W	C	SS	1	12	-1		TMH	-1	-1	RIO GALLEGOS
1973	ARGENTINA	LRRM	SUP	AN	MER	S	P	S	C		1	10	-1		TMH	-1	-1	MAR GRANDE
1973	ARGENTINA	LRSC	SEL	AN	MER	S	P	S	C	SS	1	12	-1		TMH	-1	-1	RIO LUJAN
1973	ARGENTINA	LRSH	SEL	AN	MER	W	P	W	C	SS	1	12	-1		TMH	-1	-1	RIO MENDOZA
1973	ARGENTINA	LRST	SEL	AN	MER	S	P	S	C	SS	1	13	-1		TMH	-1	-1	RIO PRIMERO
1973	ARGENTINA	LRSU	SEL	AN	MER	S	P	S	C	SS	1	13	-1		TMH	-1	-1	RIO QUEQUEN
1973	ARGENTINA	LRSW	SUP	AN	MER	S	P	S	C	SS	1	13	-1		MH	-1	-1	RIO QUINTO
1973	ARGENTINA	LRTA	SEL	AN	MER	W	P	W	C	SS	1	12	-1		TMH	-1	-1	RIO SAN JUAN
1973	ARGENTINA	LRTH	SEL	AN	MER	W	P	W	C	SS	1	12	-1		TMH	-1	-1	RIO SANTIAGO
1973	ARGENTINA	LRTI	SUP	AN	MER	W	P	W	C	SS	1	12	-1		MH	-1	-1	RIO SEGUNDO
1973	ARGENTINA	LRTK	SEL	AN	MER	S	P	S	C	SS	1	13	-1		TMH	-1	-1	RIO TERCERO
1973	AUSTRALIA	CLXI	SEL	DA	MER	S	P	S	C	OS	1	25	-1		TMH	-1	-1	CITOS (SWEDEN)
1973	AUSTRALIA	C2CR	SEL	DA	MER	S	P	S	C	OS	1	12	-1		TMH	-1	-1	CENPAC ROUNDER. (NAURU)
1973	AUSTRALIA	C2EM	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	EIGAMOIYA (NAURU)
1973	AUSTRALIA	C2GD	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	ENNA G (NAURU)
1973	AUSTRALIA	C2RD	SEL	DA	MER	S	P	S	C	OS	1	18	-1		T H	-1	-1	ROSIE D (NAURU)
1973	AUSTRALIA	DGUC	SEL	DA	MER	S	P	S	C	SS	1	14	-1		TMH	-1	-1	GUAVACORE (ISRAEL)
1973	AUSTRALIA	GBHQ	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	ISLAND CHIEF (U.K.)
1973	AUSTRALIA	GFSD	SEL	MER	MER	S	P	S	C	OS	1	15	-1		MH	-1	-1	CHAKRATA (U.K.)
1973	AUSTRALIA	GFSF	SEL	MER	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	CHAKDINA (U.K.)
1973	AUSTRALIA	GGHW	SEL	DA	MER	S	P	S	C	OS	1	14	-1		MH	-1	-1	NEW GUINEA CHIEF (U.K.)
1973	AUSTRALIA	GHNV	SEL	DA	MER	S	P	S	C	OS	2	20	-1		TMH	-1	-1	CATHAY (U.K.)
1973	AUSTRALIA	GHNX	SEL	DA	MER	S	P	S	C	OS	2	18	-1	MAX,MIN	TMH	-1	-1	CHITRAL (U.K.)
1973	AUSTRALIA	GHQA	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	PORT ST. LAWRENCE (U.K.)
1973	AUSTRALIA	GHRH	SEL	DA	MER	S	P	S	C	OS	1	15	-1		MH	-1	-1	FORRESBANK (U.K.)
1973	AUSTRALIA	GHRU	SEL	DA	MER	S	P	S	C		1	20	-1		TMH	-1	-1	IRON CAVALIER
1973	AUSTRALIA	GHWJ	SEL	DA	MER	S	P	S	C	OS	1	15	15	HA	MH	-1	-1	TAULOTO (TONGA)
1973	AUSTRALIA	GKPQ	SEL	MER	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	RHEXENOR (U.K.)
1973	AUSTRALIA	GLNM	SEL	MER	MER	S	P	S	C	OS	1	-1	-1		MH	-1	-1	TRIADIC
1973	AUSTRALIA	GLRU	SEL	MER	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	CENTAUR (U.K.)
1973	AUSTRALIA	GMHP	SEL	DA	MER	S	P	S	C	OS	1	17	17	A	TMH	-1	-1	WANBIRI
1973	AUSTRALIA	GMHQ	SEL	DA	MER	S	P	S	C	OS	1	17	-1		TMH	-1	-1	BEROONA
1973	AUSTRALIA	GMTC	SEL	MER	MER	S	P	S	C	OS	1	15	-1		MH	-1	-1	STENTOR (U.K.)
1973	AUSTRALIA	GNUS	SEL	DA	MER	S	P	S	C	OS	1	17	-1		TMH	-1	-1	NANCHANG (U.K.)
1973	AUSTRALIA	GOVF	SEL	DA	MER	S	P	S	C	OS	1	18	-1		TMH	-1	-1	TEMPLE HALL
1973	AUSTRALIA	GQLB	SEL	DA	MER	S	P	S	C	OS	1	15	-1		MH	-1	-1	CARPENTARIA (U.K.)
1973	AUSTRALIA	GUFX	SEL	DA	MER	S	P	S	C	OS	1	12	12	HA	MH	-1	-1	PAPUAN CHIEF (U.K.)
1973	AUSTRALIA	GVFM	SEL	MER	MER	S	P	S	C	OS	1	18	-1		TMH	-1	-1	TEESTA (U.K.)
1973	AUSTRALIA	GVRX	SEL	DA	MER	S	P	S	C	OS	1	15	-1		MH	-1	-1	MALAYSIA (SINGAPORE)
1973	AUSTRALIA	GXKF	SEL	DA	MER	S	P	S	C	OS	1	15	15	HA	TMH	-1	-1	CORAL CHIEF (U.K.)
1973	AUSTRALIA	GYYS	SEL	DA	MER	S	P	S	C	OS	1	14	-1		TMH	-1	-1	NIMOS (SWEDEN)
1973	AUSTRALIA	GZJU	SEL	DA	MER	S	P	S	C		1	18	-1		TMH	-1	-1	ORE REGENT (U.K.)
1973	AUSTRALIA	GZKK	SEL	DA	MER	S	P	S	C	OS	1	6	-1		MH	-1	-1	MANORA (U.K.)
1973	AUSTRALIA	GZKN	SEL	DA	MER	S	P	S	C	OS	1	6	-1		MH	-1	-1	MERKARA (U.K.)
1973	AUSTRALIA	GZKP	SEL	DA	MER	S	P	S	C	OS	1	23	-1		TMH	-1	-1	MORVADA (U.K.)
1973	AUSTRALIA	GZSE	SEL	DA	MER	S	P	S	C	OS	1	23	23	HA	TMH	-1	-1	ARAFURA (U.K.)
1973	AUSTRALIA	JWLM	SEL	DA	MER	S	P	S	C	OS	1	12	-1		TMH	-1	-1	WOOLGAR (NORWAY)
1973	AUSTRALIA	JZSH	SEL	DA	MER	S	P	S	C	OS	1	25	-1		TMH	-1	-1	ARIAKE (U.K.)
1973	AUSTRALIA	LAGQ	SEL	DA	MER	S	P	S	C	OS	1	12	-1		TMH	-1	-1	THORSORIENT (NORWAY)
1973	AUSTRALIA	SDSN	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	MILOS (SWEDEN)
1973	AUSTRALIA	SIDX	SEL	DA	MER	S	P	S	C	OS	1	17	-1		TMH	-1	-1	SAMOS (SWEDEN)
1973	AUSTRALIA	SIJM	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	ANDROS (SWEDEN)
1973	AUSTRALIA	SKOT	SEL	MER	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	LEMNOS (SWEDEN)
1973	AUSTRALIA	SMLN	SEL	DA	MER	S	P	S	C	OS	1	15	-1		TMH	-1	-1	TENOS (SWEDEN)
1973	AUSTRALIA	VJAE	SEL	DA	MER	S	P	S	C	OS	1	20	-1		TMH	-1	-1	AUSTRALIAN ENDEAVOUR
1973	AUSTRALIA	VJBA	SEL	DA	MER	S	P	S	C	OS	1	21	-1		TMH	-1	-1	BOGONG

APPENDIX 5

PROGRAM: PWRITENUM.F

TO WRITE WMO47 DATA FROM PSTAR INTO FIXED NUMBER ONLY FORMAT

```
C******Pwritenum
C
      PROGRAM Pwritenum
C
C......Program to write out WMO47 pstar file in 'easy to read' format.
C
      IMPLICIT REAL*8 (A-H,O-Z,a-h,o-z)
#include "datadf2.h"
#include "psio.h"
      PARAMETER (INVARS=34)
      CHARACTER*8 PROG
      CHARACTER*40 outfile
      DIMENSION BUFA(IRECXX,INVARS)
      DIMENSION ABSUB(INVARS)
      INTEGER NPOSV(IFLDXX),NPOS(IFLDXX)
C
      DATA PROG/'Pwritenum'/
C
C......Initialise
      CALL PROGHD(PROG)
C
C......Open files
      CALL OPENIN(INDISK)
      if(indisk.eq.-999.) call pabort
C
      WRITE(*,*)'name of output file?'
      READ(*,220)outfile
  220 FORMAT(A40)
C
      OPEN(UNIT=17,STATUS='NEW',FILE=OUTFILE)
C
      CALL READPR(INDISK,
     & MAGIC,NOFLDS,NORECS,NROWS,NPLANE,ICENT,IYMD,IHMS,
     & FLDNAM,FLDUNT,ALRLIM,UPRLIM,ABSENT,
     & ALAT,ALONG,DEPTHI,DEPTHW,OPWRIT,RAWDAT,PIPEFL,ARCHIV,VERS,
     & DATNAM,PREFIL,POSTFL,PLATYP,PLTNUM,RECINT,PLTNAM,INSTMT,COMENT)
C
C......Which vars to offer to PFSUB ?
C
      WRITE(IOITT,501)INVARS
 501  FORMAT(' Which vars to be operated on (must be ',I3,') ?')
      CALL READVR(NPOSV,NVARS,NOFLDS)
      IF(NVARS.NE.INVARS)THEN
        WRITE(IOITT,*)' MUST OFFER ',INVARS,' VARS TO PFSUB - STOPPING'
        CALL PABORT
      ENDIF
C
C......Now operate
      NLEN=IRECXX
      NUM=NLEN
      DO 50 N=1,NORECS,NLEN
      IF((N+NUM-1).GT.NORECS)NUM=NORECS-N+1
      DO 60 J=1,NVARS
      CALL INDATA(INDISK,NPOSV(J),N,NUM,BUFA(1,J),NOFLDS,NORECS)
      ABSUB(J)=ABSENT(NPOSV(J))
  60  CONTINUE
      CALL PFSUB(BUFA,NUM,ABSUB,INVARS,INVARS)
  50  CONTINUE
C
      STOP
      END
C
      SUBROUTINE PFSUB(BUF,NUM,ABS,INVARS,INVARS)
C
C      Subroutine to provide any desired function of input
C        variable. Use with PFUNC.
C
      IMPLICIT REAL*8 (A-H,O-Z,a-h,o-z)
```

```
      INTEGER IBUF(34)
#include "datadf2.h"
      DIMENSION BUF(IRECXX,INVARS),ABS(INVARS)
      DO 10 J=1,NUM
C***
C***   The following code writes out the instrumentation etc
C***   in numbers
C
      DO 20 I=1,34
      IBUF(I)=BUF(J,I)
  20  CONTINUE
C
      IF(IBUF(22).EQ.0)IBUF(22)=-999
      IF(IBUF(23).EQ.0)IBUF(23)=-999
      IF(IBUF(24).EQ.0)IBUF(24)=-999
C
      WRITE(17,100)IBUF(34),IBUF(1),IBUF(2),IBUF(3),IBUF(4),IBUF(5),
     &IBUF(6),IBUF(7),IBUF(8),IBUF(9),IBUF(10),IBUF(11),IBUF(12),
     &IBUF(13),IBUF(14),IBUF(15),IBUF(16),IBUF(17),IBUF(18),IBUF(19),
     &IBUF(22),IBUF(23),IBUF(24),IBUF(25),IBUF(26),IBUF(27),IBUF(28),
     &IBUF(29),IBUF(30),IBUF(31),IBUF(20),IBUF(21),IBUF(32),IBUF(33)
C
  100 FORMAT(2(I4,','),2(I8,','),29(I4,','),I4)
C
C***
  10  CONTINUE
      RETURN
      END
```

APPENDIX 6

ASCII DECIMAL CHARACTER SET USED TO CODE CALLSIGNS

0 nul	1 soh	2 stx	3 etx	4 eot	5 enq	6 ack	7 bel
8 bs	9 ht	10 nl	11 vt	12 np	13 cr	14 so	15 si
16 dle	17 dc1	18 dc2	19 dc3	20 dc4	21 nak	22 syn	23 etb
24 can	25 em	26 sub	27 esc	28 fs	29 gs	30 rs	31 us
32 sp	33 !	34 "	35 #	36 $	37 %	38 &	39 '
40 (	41)	42 *	43 +	44 ,	45 -	46 .	47 /
48 0	49 1	50 2	51 3	52 4	53 5	54 6	55 7
56 8	57 9	58 :	59 ;	60 <	61 =	62 >	63 ?
64 @	65 A	66 B	67 C	68 D	69 E	70 F	71 G
72 H	73 I	74 J	75 K	76 L	77 M	78 N	79 O
80 P	81 Q	82 R	83 S	84 T	85 U	86 V	87 W
88 X	89 Y	90 Z	91 [	92 \	93]	94 ^	95 _
96 `	97 a	98 b	99 c	100 d	101 e	102 f	103 g
104 h	105 i	106 j	107 k	108 l	109 m	110 n	111 o
112 p	113 q	114 r	115 s	116 t	117 u	118 v	119 w
120 x	121 y	122 z	123 {	124 |	125 }	126 ~	127 del