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NATIONAL CLIMATIC DATA CENTER

TD-9665
WDC-A TOGA IMMT
MARINE DATA

Documentation Manual

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

NOSMR.

TD 9665

(Marine Data Section)
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Our Ref: MET/OP/21/5/62

Date: 21 April 1994

Synoptic marine data for the TOGA project area.

Dear Sir.

Herewith the latest editions of the TOGA project area marine datasets for 1985 to 1993. All previous editions are now superceded.

As intimated by Mr Fullagar last year, there have been further corrections made to the datasets. Further near-duplicate reports have been removed; causing report numbers for '85, '86 and '87 to fall; and many reports previously attributed to Australia are now "country of origin unknown".

As before, the datasets are in IMMT format (annex Part B- International exchange format)(Recommendation 8(CMMVIII)).
Specification of the magnetic cartridges :-

Number of tracks.....18
Density.....38000 bpi
Conversion code.....ASCII
Record length.....124 ch
Blocking factor.....200
Block length.....24800
Tape Labels.....No Label

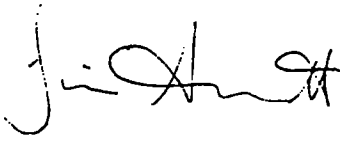
Contents of the cartridges are :-

TGAUS1 File 1	711540 reports for 1985
TGAUS1 File 2	741998 reports for 1986
TGAUS2 File 1	682514 reports for 1988

TGAUS2	File 2	605064 reports for 1989
TGAUS3	File 1	518353 reports for 1991
TGAUS3	File 2	480610 reports for 1992
TGAUS3	File 3	383696 reports for 1993
TGAUS4	File 1	756913 reports for 1987
TGAUS4	File 2	585609 reports for 1990

Acknowledgement of safe receipt of the cartridges would be appreciated.

Yours faithfully



J Arnott
for Head of Met O (OP) 3

OBSERVATION COUNTS PER COUNTRY PER YEAR FOR THE TOGA PROJECT AREA (30N-30S)

	COUNTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	ALL YEARS
0	NETHERLANDS	51203	50491	42969	45104	41010	45240	40456	14440	0	0	330913
1	NORWAY	2037	3271	717	141	11	3	0	0	0	0	6180
2	U.S.A.	90487	109170	103728	67843	84510	76024	43128	63690	16035	0	654612
3	U.K.	93009	95314	92295	93941	83419	77665	75978	74167	16964	0	702752
4	FRANCE	19955	18921	27620	24275	20345	23706	15392	5815	0	0	156029
5	DENMARK	0	0	0	0	0	0	0	0	0	0	0
6	ITALY	0	0	0	0	0	0	0	0	0	0	0
7	INDIA	69	0	4582	526	0	0	0	0	0	0	5177
8	HONG KONG	8728	12945	14432	13090	10645	10070	1613	0	0	0	71523
9	NEW ZEALAND	5117	6041	6519	5959	4373	5972	1372	0	0	0	35353
10	IRELAND	40	0	0	0	0	0	0	0	0	0	40
11	PHILIPPINES	24	0	0	0	0	0	0	0	0	0	24
12	U.A.R.	0	0	0	0	0	0	0	0	0	0	0
13	CANADA	18948	19235	16960	17540	12164	4634	0	0	0	0	89481
14	BELGIUM	0	0	0	0	0	0	0	0	0	0	0
15	SOUTH AFRICA	0	0	0	0	0	0	0	0	0	0	0
16	AUSTRALIA	0	0	0	0	0	0	0	0	0	0	0
17	JAPAN	80723	76068	64891	50301	49191	48346	46974	0	0	0	416494
18	PAKISTAN	0	0	0	279	1520	0	0	0	0	0	1799
19	ARGENTINA	0	0	0	0	0	0	0	0	0	0	0
20	SWEDEN	1040	862	974	677	223	387	680	0	0	0	4843
21	F.R.G.	77435	73333	73484	79035	90177	91960	89444	75400	26642	0	676910
22	ICELAND	26	0	0	1	0	0	0	0	0	0	27
23	ISRAEL	1729	1758	1863	4543	4315	78	5363	5112	0	0	24761
24	FED.OF MALAYA	4755	3612	7209	13065	2845	5454	5420	0	0	0	42364
25	U.S.S.R.	71609	107605	130745	64261	1931	0	0	0	0	0	376151
26	FINLAND	0	0	0	0	0	0	0	0	0	0	0
27	KOREA	0	0	0	0	0	0	0	0	0	0	0
28	NEW CALEDONIA	0	0	409	477	720	646	873	690	262	0	4077
29	PORTUGAL	745	366	295	0	0	0	0	0	0	0	1406
30	SPAIN	0	1	0	0	0	0	0	0	0	0	1
31	THAILAND	512	1	0	0	0	0	0	0	0	0	513
32	YUGOSLAVIA	1	0	0	0	0	0	0	0	0	0	1
33	POLAND	2394	2316	2019	2270	2408	2544	1548	528	0	0	16027
34	BRAZIL	19420	13327	9206	5850	8	0	2207	0	0	0	50018
35	SINGAPORE	0	16	7583	6368	7043	2884	2137	0	0	0	26031
36	KENYA	0	0	0	0	0	0	0	0	0	0	0
37	TANZANIA	0	0	0	0	0	0	0	0	0	0	0
38	UGANDA	0	0	0	0	0	0	0	0	0	0	0
39	MEXICO	0	0	0	0	0	0	0	0	0	0	0
40	C.O.R	7203	9126	6737	7007	2901	0	0	0	0	0	32974
41	GREECE	0	0	0	0	0	0	0	0	0	0	0
	UNKNOWN	154327	138219	141676	179964	185305	189996	185768	240768	323793	0	1739816
	TOTAL	711540	741998	756913	682514	605064	595609	518353	480610	383696	0	5466297

TOTAL OBS READ - 5466297
OBS WITH OCTANT ERRORS - 0

NORMAL EXIT TAKEN

Ch #

1 – temp Indicator

2-3 – year

4 5 – month

6 7 – day

8 9 – Time of OBS

RECORD FORMAT
5-4-94

APPENDIX I.13
LAYOUT FOR THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE (IMMT)

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
1	1	i_T	Format/temperature indicator	3=IMMT format with temperatures in tenths of °C 4=IMMT format with temperatures in halves of °C 5=IMMT format with temperatures in whole °C
2	2-3	AA	Year UTC	Last two digits
3	4-5	MM	Month UTC	01 - 12 January to December
4	6-7	YY	Day UTC	01 - 31
5	8-9	GG	Time of observation	Nearest whole hour UTC, WMO specifications
6	10	i_w	Indicator for wind speed	WMO code table 1855
7	11	Q	Octant of the globe	WMO code table 3300; quadrant converted into octant
8	12-14	$L_aL_aL_a$	Latitude	Tenths of degrees, WMO specifications
9	15-17	$L_oL_oL_o$	Longitude	Tenths of degrees; four digit longitude converted to three digits by removal of first digit; e.g. longitude 160.0° coded 1600 as four digits becomes 600 as three digits; longitude 40.0° coded 0400 as four digits becomes 400 as three digits.
10	18		Cloud height (h) and visibility (VV) measuring indicator	0 - h and VV estimated 1 - h measured, VV estimated 2 - h and VV measured 3 - h estimated, VV measured
11	19	h	Height of clouds	WMO code table 1600
12	20-21	VV	Visibility	WMO code table 4377
13	22	N	Cloud amount	Oktas, WMO code table 2700; show 9 where applicable
14	23-24	dd	True wind direction	Tens of degrees, WMO code table 0877; show 00 or 99 where applicable
15	25-26	ff	Wind speed	Tens and units of knots or metres per second, hundreds omitted; values in excess of 99 knots are to be indicated in units of metres per second and i_w encoded accordingly; the method of estimation or measurement and the units used (knots or metres per second) are indicated in element 6
16	27	s_n	Sign of temperature	WMO code table 3845
17	28-30	TTT	Air temperature	Tenths of degrees Celsius
18	31		Sign of wet bulb or dew-point temperature	0 - positive dew-point temperature 1 - negative dew-point temperature 5 - positive wet bulb temperature 6 - negative wet bulb temperature 7 - used if ice-bulb temperature reported
19	32–34		Wet-bulb dew-point temperature	Tenths of degrees Celsius
20	35–38	PPPP	Air pressure	Tenths of hectopascals
21	39-40	WW	Present weather	WMO code table 4677
22	41	W_1	Past weather	WMO code table 4561
23	42	W_2	Past weather	WMO code table 4561

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
24	43	N_h	Amount of lowest clouds	As reported for C_L or, if no C_L cloud is present, for C_M, in oktas; WMO code table 2700
25	44	C_L	Genus of C_L clouds	WMO code table 0513
26	45	C_M	Genus of C_M clouds	WMO code table 0515
27	46	C_H	Genus of C_H clouds	WMO code table 0509
28	47	s_n	Sign of sea-surface temperature	WMO code table 3845
29	48–50	$T_wT_wT_w$	Sea surface temperature	Tenth of degrees Celsius
30	51		Indicator for sea-surface temperature measurement	0 - Bucket thermometer 1 - Condenser inlet 2 - Trailing thermistor 3 - Hull contact sensor 4 - "Through hull" sensor 5 - Radiation thermometer 6 - Bait tanks thermometer 7 - Others
31	52		Indicator for wave measurement	Shipborne wave recorder: 0 - Wind sea and swell estimated; 1 - Wind sea and swell measured; 2 - Mixed wave measured, swell estimated; 3 - Other combinations measured and estimated Buoy: 4 - Wind sea and swell measured; 5 - Mixed wave measured, swell estimated; 6 - Other combinations measured and estimated Other measurement system: 7 - Wind sea and swell measured; 8 - Mixed wave measured, swell estimated; 9 - Other combinations measured and estimated
32	53–54	P_wP_w	Period of wind waves or of measured waves	Whole seconds; show 99 where applicable in accordance with Note (3) under specification of P_wP_w in the *Manual on Codes*
33	55–56	H_wH_w	Height of wind waves or of measured waves	Half-metre values. Examples: Calm or less than $^1/_4$m to be encoded 00; $3^1/_2$m to be encoded 07; 7m to be encoded 14; $11^1/_2$m to be encoded 23
34	57-58	$d_{w1}d_{w1}$	Direction of predominant swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks = No observation of waves attempted
35	59-60	$P_{w1}P_{w1}$	Period of predominant swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
36	61-62	$H_{w1}H_{w1}$	Height of predominant swell waves	Half-metre values (see under element 33)
37	63	I_s	Ice accretion on ships	WMO code table 1751
38	64–65	E_sE_s	Thickness of ice accretion	In centimetres
39	66	R_s	Rate of ice accretion	WMO code table 3551
40	67		Source of observation	0 - Unknown 1 - Logbook 2 - Telecommunication channels 3 - Publications (National) 4 - Logbook 5 - Telecommunication channels 6 - Publications (International data exchange)

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
41	68		Observation platform	0 - unknown 1 - Selected ship 2 - Supplementary ship 3 - Auxiliary ship 4 - Automated station/data buoy 5 - Fixed sea station 6 - Coastal station 7 - Aircraft 8 - Satellite 9 - Others
42	69-75		Ship identifier	Ship's call sign or other identifier encoded as follows: 7 characters call sign Columns 69-75 6 characters call sign Columns 70–75 5 characters call sign Columns 71–75 4 characters call sign Columns 72–75
43	76-77		Country which has recruited the ship	According to numbers assigned by WMO
44	78		Quality control indicator	0 - No quality control (QC) 1 - Manual QC only 2 - Automated QC only (no time-sequence checks) 3 - Automated QC only (including time sequence checks) 4 - Manual and automated QC (superficial; no automated time-sequence checks) 5 - Manual and automated QC (superficial; including time-sequence checks) 6 - Manual and automated QC (intensive, including automated time-sequence checks) 7 - Not used 8 - Not used 9 - National system of QC (information to be furnished to WMO)
45	79	i_x	Weather data indicator	WMO code table 1860
46	80		National use	
47	81	i_R	Indicator for inclusion or omission of precipitation data	WMO code table 1819
48	82–84	RRR	Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by t_R	WMO code table 3590
49	85	t_R	Duration of period of reference for amount of precipitation, ending at the time of the report	WMO code table 4019
50	86		Sign of computed wet-bulb or dew-point temperature	0 - positive dew-point 1 - negative dew-point 5 - positive wet-point 6 - negative wet-point
51	87-89	$T_dT_dT_d$	Computed dew-point or wet-bulb temperature	In tenths of degree Celsius, sign given by element 50
52	90	a	Characteristic of pressure tendency during the three hours preceding the time of observation	WMO code table 0200
53	91-93	ppp	Amount of pressure tendency at station level during the three hours preceding the time of observation	In tenths of hectopascal
54	94	D_s	True direction of resultant displacement of the ship during three hours preceding the time of observation	WMO code table 0700

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
55	95	v_s	Ship's average speed made good during the three hours preceding the time of observation	WMO code table 4451
56	96-97	$d_{w2}d_{w2}$	Direction of secondary swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks = No observation of waves attempted
57	98-99	$P_{w2}P_{w2}$	Period of secondary swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
58	100-101	$H_{w2}H_{w2}$	Height of secondary swell waves	Half-metre values (see under element 33)
59	102	c_i	Concentration or arrangement of sea ice	WMO code table 0639
60	103	S_i	Stage of development	WMO code table 3739
61	104	b_i	Ice of land origin	WMO code table 0439
62	105	D_i	True bearing of principal ice edge	WMO code table 0739
63	106	z_i	Present ice situation and trend of conditions over preceding three hours	WMO code table 5239
64	107	Q_1	Quality control indicator for (h)	0 - No quality control (QC) has been performed in this element 1 - QC has been performed; element appears to be correct 2 - QC has been performed; element appears to be inconsistent with other elements 3 - QC has been performed; element appears to be doubtful 4 - QC has been performed; element appears to be erroneous 5 - The value has been changed as a result of QC 6 - 8 Reserve 9 - The value of the element missing
65	108	Q_2	QC indicator for (VV)	- idem -
66	109	Q_3	QC indicator for (clouds: elements 13, 24–27)	- idem -
67	110	Q_4	QC indicator for (dd)	- idem -
68	111	Q_5	QC indicator for (ff)	- idem -
69	112	Q_6	QC indicator for (TTT)	- idem -
70	113	Q_7	QC indicator for (wet bulb/dew point)	- idem -
71	114	Q_8	QC indicator for (PPPP)	- idem -
72	115	Q_9	QC indicator for (weather: elements 21-23)	- idem -
73	116	Q_{10}	QC indicator for ($T_wT_wT_w$)	- idem -
74	117	Q_{11}	QC indicator for (P_wP_w)	- idem -
75	118	Q_{12}	QC indicator for (H_wH_w)	- idem -
76	119	Q_{13}	QC indicator for (swell: elements 34-36, 56-58)	- idem -
77	120	Q_{14}	QC indicator for (i_RRRRt_R)	- idem -
78	121	Q_{15}	QC indicator for (a)	- idem -
79	122	Q_{16}	QC indicator for (ppp)	- idem -
80	123	Q_{17}	QC indicator for (D_s)	- idem -
81	124	Q_{18}	QC indicator for (V_s)	- idem -

TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	1

INTRODUCTION

SOURCE

Input was TD-5600, rawinsonde standard and significant levels. Winds by constant height (CD-535) were used when available for the wind calculations. Computations were made for both inversion and non-inversion soundings. Inversion bases and tops were determined as follows: An inversion base was defined as the base of the lowest inversion or isothermal layer below 3000 meters above ground level. An inversion top is the height of maximum temperature below 4501 meters above ground level that is associated with an inversion. If the maximum temperature is an isothermal layer the inversion top is the top of the isothermal layer. For an inversion or isothermal layer extending upward through 4500 meters, the top is assumed at 4500 meters.

QUALITY CONTROL

Source observations were subjected to computer hydrostatic check prior to use in the inversion computations. Suspect values were manually edited and the files updated as necessary. Since the creation of this file a few observations that passed the set hydrostatic limits have been found to be error. These are usually quite evident when looking closely at the inversion characteristics.

MANUAL AND TAPE NOTATIONS

FORMAT

Each logical record contains information for one rawinsonde flight and is 173 bytes long. Although archive tapes are blocked 20 logical records per physical record (3460 bytes) customers may specify different blocking factors.

TAPE

The following notations are used throughout the manual:

X = Any numeric digit or alpha numeric character

\- = an "11" punch in the card or the equivalent tape configuration. This may appear by itself or in combination with a numeric digit to indicate an over punch.

9 = Any field with all 9's is missing data

TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	1.9665.1

STN NO	YR	MO	DA	HR	INVER BASE	INVER TOP	INVER THICK NESS	BASE TMP	TOP TMP	BASE-TOP TMP DIFF	INVER LAPSE	RH INVR SION	RH BELW INVR	RH 300M ABOVE INVR	SFC DIR	SFC SPD	150M DIR	150M SPD
XXXXX	XX	XX	XX	XX	XXXXX	XXXXX	XXXXX	XXXX	XXXX	XXXX	XXXXX	XXXX	XXXX	XXXX	XXX	XXXX	XXX	XXXX
001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019

300M DIR	300M SPD	600M DIR	600M SPD	900M DIR	900M SPD	1200M DIR	1200M SPD	TEMP 1-100M	TEMP 101-250M	TEMP 251-500M	TEMP 501-750M	TEMP 751-1000M	TEMP 1001-1500
XXX	XXXX	XXX	XXXX	XXX	XXXX	XXX	XXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
020	021	022	023	024	025	026	027	028	029	030	031	032	033

RH 1-100M	RH 101-250M	RH 251-500M	RH 501-750M	RH 751-1000M	RH 1001-1500M	RMKS	C D	SFC TMP	SFC TO BSE LPS	SFC-BSE TMP DIFF	S N
XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXXX	X	XXXX	XXXXX	XXXX	X
034	035	036	037	038	039	040	041	042	043	044	045

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT
001	01-05	STATION NUMBER
002	06-07	YEAR
003	08-09	MONTH
004	10-11	DAY
005	12-13	HOUR
006	14-18	INVERSION BASE HEIGHT
007	19-23	INVERSION TOP HEIGHT
008	24-28	INVERSION THICKNESS
009	29-32	INVERSION BASE TEMPERATURE
010	33-36	INVERSION TOP TEMPERATURE
011	37-40	INVERSION BASE-TOP TEMPERATURE DIFFERENCE
012	41-45	INVERSION LAPSE RATE
013	46-49	INVERSION AVERAGE RELATIVE HUMIDITY
014	50-53	AVERAGE RELATIVE HUMIDITY BELOW INVERSION
015	54-57	AVERAGE RELATIVE HUMIDITY TOP PLUS 300 METERS
016	58-60	SURFACE WIND DIRECTION
017	61-64	SURFACE WIND SPEED
018	65-67	150 METER WIND DIRECTION
019	68-71	150 METER WIND SPEED
020	72-74	300 METER WIND DIRECTION
021	75-78	300 METER WIND SPEED
022	79-81	600 METER WIND DIRECTION
023	82-85	600 METER WIND SPEED
024	86-88	900 METER WIND DIRECTION
025	89-92	900 METER WIND SPEED
026	93-95	1200 METER WIND DIRECTION
027	96-99	1200 METER WIND SPEED
028	100-104	NO INVERSION-LAPSE RATE (1-100 METERS)
029	105-109	NO INVERSION-LAPSE RATE (101-250 METERS)
030	110-114	NO INVERSION-LAPSE RATE (251-500 METERS)
031	115-119	NO INVERSION-LAPSE RATE (501-750 METERS)
032	120-124	NO INVERSION-LAPSE RATE (751-1000 METERS)
033	125-129	NO INVERSION-LAPSE RATE (1001-1500 METERS)
034	130-133	NO INVERSION-AVERAGE RELATIVE HUMIDITY (1-100 METERS)
035	134-137	NO INVERSION-AVERAGE RELATIVE HUMIDITY (101-250 METERS)
036	138-141	NO INVERSION-AVERAGE RELATIVE HUMIDITY (251-500 METERS)
037	142-145	NO INVERSION-AVERAGE RELATIVE HUMIDITY (501-750 METERS)
038	146-149	NO INVERSION-AVERAGE RELATIVE HUMIDITY (751-1000 METERS)

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TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	1.9665.2

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT
039	150-153	NO INVERSION-AVERAGE RELATIVE HUMIDITY (1001-1500 METERS)
040	154-158	REMARKS
041	159	CODE
042	160-163	SURFACE TEMPERATURE
043	164-168	SURFACE TO BASE TEMPERATURE LAPSE RATE
044	169-172	SURFACE TO BASE TEMPERATURE DIFFERENCE
045	173	SEASON

TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	2.9665.1

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITIONS AND REMARKS
001	001 - 005	STATION NUMBER	00000 - 99999	Station number was assigned according to alphabetical listing in the Rand McNally Atlas. Master copy of this station list is on file at NCC.
002	006 - 007	YEAR	00 - 99	Last two digits of year. 00 = 1900 48 = 1948 Etc.
003	008 - 009	MONTH	01 - 12	01 = January 02 = February Etc.
004	010 - 011	DAY	01 - 31	Days of the month.
005	012 - 013	HOUR	00 or 12	0000GMT or 1200GMT
006	014 - 018	INVERSION BASE HEIGHT	00000 - 03000	Height of lowest inversion base or isothermal layer below 3000 meters above ground level.
007	019 - 023	INVERSION TOP HEIGHT	00001 - 04500	Height of maximum temperature below 4501 meters above ground level that is associated with an inversion or isothermal layer. The top is assumed at 4500 meters if the inversion or isothermal layer continues above 4500 meters.
008	024 - 028	INVERSION THICKNESS	00001 - 04500	Difference in meters between the base and the top of the inversion.
009	029 - 032	INVERSION BASE TEMPERATURE	0000 - 0999 000$\bar{1}$ - 099$\bar{9}$	Degrees celsius to tenths. 000.0 - 099.9 = Positive temp 000.$\bar{1}$ - 099.$\bar{9}$ = Negative temp
010	033 - 036	INVERSION TOP TEMPERATURE	0000 - 0999 000$\bar{1}$ - 099$\bar{9}$	Degrees celsius to tenths. 000.0 - 099.9 = Positive temp 000.$\bar{0}$ - 099.$\bar{9}$ = Negative temp
011	037 - 040	INVERSION BASE-TOP TEMPERATURE DIFFERENCE	0000 - 1998	Degrees celsius to tenths. 0000 - 1998 = 000.0 - 199.8
012	041 - 045	INVERSION LAPSE RATE	00000 - 99998	Degrees celsius per meter. 00000 - 99998 = 0.0000 - 9.9998C/M
013	046 - 049	INVERSION AVERAGE RELATIVE HUMIDITY	0000 - 1000	Relative humidity in per cent. 0000 - 1000 = 000.0 - 100.0%
014	050 - 053	AVERAGE RELATIVE HUMIDITY BELOW INVERSION	0000 - 1000	Relative humidity in per cent. 0000 - 1000 = 000.0 - 100.0% Note: Not computed for inversion base at surface.

TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	2.9665.2

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITIONS AND REMARKS
015	054 - 057	AVERAGE RELATIVE HUMIDITY TOP PLUS 300 METERS	0000 - 1000	Relative humidity in per cent. 0000 - 1000 = 000.0 - 100.0% Note: Computed only for inversion base at surface.
016	058 - 060	SURFACE WIND DIRECTION	000 - 360	000 = Calm 001 - 360 = Direction from which wind comes in degrees at surface.
017	061 - 064	SURFACE WIND SPEED	0000 - 0999	000.0 = Calm 000.1 - 099.9 = Surface wind speed in meters per second.
018	065 - 067	150 METER WIND DIRECTION	000 - 360	150 meters above ground level otherwise same as field number 16 and 17.
019	068 - 071	150 METER WIND SPEED	0000 - 0999	150 meters above ground level otherwise same as field number 16 and 17.
020	072 - 074	300 METER WIND DIRECTION	000 - 360	300 meters above ground level otherwise same as field number 16 and 17.
021	075 - 078	300 METER WIND SPEED	0000 - 0999	300 meters above ground level otherwise same as field number 16 and 17.
022	079 - 081	600 METER WIND DIRECTION	000 - 360	600 meters above ground level otherwise same as field number 16 and 17.
023	082 - 085	600 METER WIND SPEED	0000 - 0999	600 meters above ground level otherwise same as field number 16 and 17.
024	086 - 088	900 METER WIND DIRECTION	000 - 360	900 meters above ground level otherwise same as field number 16 and 17.
025	089 - 092	900 METER WIND SPEED	0000 - 0999	900 meters above ground level otherwise same as field number 16 and 17.
026	093 - 095	1200 METER WIND DIRECTION	000 - 360	1200 meters above ground level otherwise same as field number 16 and 17.
027	096 - 099	1200 METER WIND SPEED	0000 - 0999	1200 meters above ground level otherwise same as field number 16 and 17.
028	100 - 104	NO INVERSION LAPSE RATE (1-100M)	0000Ī - 9999$\bar{8}$	-0.0001 - -9.9998 degrees celsius per meter (layer 1-100 Meters)
029	105 - 109	NO INVERSION LAPSE RATE (101--250M)	0000Ī - 9999$\bar{8}$	-0.0001 - -9.9998 degrees celsius per meter (layer 101-250 Meters)

TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	2.9665.3

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITIONS AND REMARKS
030	110 - 114	NO INVERSION LAPSE RATE (251-500M)	0000$\bar{1}$ - 9999$\bar{8}$	-0.0001 - -9.9998 degrees celsius per meter (layer 251-500 Meters)
031	115 - 119	NO INVERSION LAPSE RATE (501-750M)	0000$\bar{1}$ - 9999$\bar{8}$	-0.0001 - -9.9998 degrees celsius per meter (layer 501-750 Meters)
032	120 - 124	NO INVERSION LAPSE RATE (751-1000M)	0000$\bar{1}$ - 9999$\bar{8}$	-0.0001 - -9.9998 degrees celsius per meter (layer 751-1000 Meters)
033	125 - 129	NO INVERSION LAPSE RATE (1001-1500M)	0000$\bar{1}$ - 9999$\bar{8}$	-0.0001 - -9.9998 degrees celsius per meter (layer 1001-1500 Meters)
034	130 - 133	NO INVERSION AVERAGE RELATIVE HUMIDITY (1-100M)	0000 - 1000	000.0 - 100.0% relative humidity in per cent (layer 1-100 Meters)
035	134 - 137	NO INVERSION AVERAGE RELATIVE HUMIDITY (101-250M)	0000 - 1000	000.0 - 100.0% relative humidity in per cent (layer 101-250 Meters)
036	138 - 141	NO INVERSION AVERAGE RELATIVE HUMIDITY (251-500M)	0000 - 1000	000.0 - 100.0% relative humidity in per cent (layer 251-500 Meters)
037	142 - 145	NO INVERSION AVERAGE RELATIVE HUMIDITY (501-750M)	0000 - 1000	000.0 - 100.0% relative humidity in per cent (layer 501-750 Meters)
038	146 - 149	NO INVERSION AVERAGE RELATIVE HUMIDITY (751-1000M)	0000 - 1000	000.0 - 100.0% relative humidity in per cent (layer 751-1000 Meters)
039	150 - 153	NO INVERSION AVERAGE RELATIVE HUMIDITY (1001-1500M)	0000 - 1000	000.0 - 100.0% relative humidity in per cent (layer 1001-1500 Meters)
040	154 - 158	REMARKS	NONE $\underline{\Delta\Delta\Delta\Delta\Delta}$ MISSG	None = No inversion sounding $\underline{\Delta\Delta\Delta\Delta\Delta}$ = Inversion sounding Missg = Insufficient data to determine type of sounding
041	159	CODE	1,2,3	1 = Inversion sounding 2 = No inversion sounding 3 = Insufficient data, sounding counted as missing
042	160 - 163	SURFACE TEMPERATURE	0000 - 0999 000$\bar{1}$ - 099$\bar{9}$	000.0 - 099.9 = Positive temp 000.$\bar{1}$ - 099.$\bar{9}$ = Negative temp
043	164 - 168	SURFACE TO BASE TEMPERATURE LAPSE RATE	000$\bar{1}$ - 099$\bar{9}$	0.000$\bar{1}$ - 099.$\bar{9}$ = Degrees celsius per meter

TAPE FORMAT DOCUMENTATION

TAPE DECK		PAGE NO.
9665	INVERSION TAPES (ENVIRONMENTAL PROTECTION AGENCY)	2.9665.4

TAPE FIELD NUMBER	TAPE POSITIONS	ELEMENT	TAPE CONFIGURATION	CODE DEFINITIONS AND REMARKS
044	169 - 172	SURFACE TO BASE TEMPERATURE DIFFERENCE	000$\bar{1}$ - 019$\bar{9}$	000.$\bar{1}$ - 019.$\bar{9}$ = Degrees celsius to tenths
045	173	SEASON	1,2,3,4	1 = December, January, February 2 = March, April, May 3 = June, July, August 4 = September, October, November

TD-9660
35 REELS
9665

P0IC61 (OUTPUT) P03CØ1 (INPUT - MUST BE SORTED)

BLOCKED 60

COLS			
1-5	STATION		A4, A1
6-7	HOUR	00 OR 12	A2
8-9	CODE	{1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 17, 18, 19}	I2
10	SEASON	1, 2, 3, 4, 5	A1
11-14	QV	{20, 110, 200 / 110, 270, 430 / 470, 680, 830 / 940, 1220, 1500 / 1700, 2000, 2300}	I4
15-17	TS	{393, 445, 497 / 395, 430, 465 / 399, 416, 433 / 405, 411, 417 / 408, 410, 412}	I3
18-19	YEAR		A2
20-21	MONTH		A2
22-23	DAY		A2
24-28	STATION HEIGHT		A4, A1
29-32	MIXING DEPTH		A4
33-35	MIXING SPEED		A3
36-39	QH		I4
40-43	EQUILIBRIUM HEIGHT (METERS)		I4
44-46	WIND DIRECTION AT EQUILIBRIUM HEIGHT		I3
47-50	WIND SPEED AT EQUILIBRIUM HEIGHT		I4
51	IN INVERSION LAYER (EQUILIBRIUM HGT IN LAYER)		I1
52	BELOW INVERSION LAYER		I1
53	ABOVE INVERSION LAYER		I1
54	NO INVERSION		I1
55	UNKNOWN		I1
56	MISSING		I1

ONLY 1 WILL HAVE A CODE 1, REST ARE Ø

TD-9665

Met.O.(OP)3 (Marine Data Section)
Meteorological Office
London Road
Bracknell Berks
RG12 2SZ

Our Ref: MET/OP/21/5/6

Date: 31 March 1993

The Directors
TOGA data centres

World Data Centre-A, USA
World Data Centre-B, USSR

International TOGA Project Office

Synoptic marine data for the TOGA project area.

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As before the datasets are issued in the IMMT format (annex Part B - International exchange format)(Recommendation 8(CMMVIII)).
Specifications of the magnetic cartridges :-

Number of tracks	18
Density	38000 bpi
Conversion code	ASCII
Record length	124 ch –
Blocking factor	100
Block length	12400
Tape labels	NO Label

Contents of the tapes are :-

TOGA01	File 1	722544 records for 1985
TOGA01	File 2	753395 records for 1986
TOGA02	File 1	760154 records for 1987
TOGA02	File 2	686867 records for 1988
TOGA03	File 1	601161 records for 1989
TOGA03	File 2	571915 records for 1990
TOGA04	File 1	492137 records for 1991
TOGA04	File 2	406747 records for 1992

Tables and sample output are provided with each tape and acknowledgement of safe receipt of the tapes/cartridges would be appreciated.

Yours faithfully,

B.S.Fullagar
for Head of Met.O.(OP)3

OBSERVATION COUNTS PER COUNTRY PER YEAR FOR THE TOGA PROJECT AREA (30N-30S)

	COUNTRY	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	ALL YEARS
0	NETHERLANDS	51203	50491	42970	45104	41010	45085	32732	0	0	0	308595
1	NORWAY	2037	3271	717	141	11	3	0	0	0	0	6180
2	U.S.A.	90487	109170	103761	67840	84511	76028	43128	30459	0	0	605384
3	U.K.	93009	95314	92296	93860	83275	77358	73269	30361	0	0	638742
4	FRANCE	19956	18921	27613	23178	7395	0	0	0	0	0	97063
5	DENMARK	0	0	0	0	0	0	0	0	0	0	0
6	ITALY	0	0	0	0	0	0	0	0	0	0	0
7	INDIA	0	0	1798	0	0	0	0	0	0	0	1798
8	HONG KONG	8728	12945	14432	13000	9443	2715	0	0	0	0	61263
9	NEW ZEALAND	5117	6041	6519	5959	4373	5972	1372	0	0	0	35353
10	IRELAND	40	0	0	0	0	0	0	0	0	0	40
11	PHILIPPINES	24	0	0	0	0	0	0	0	0	0	24
12	U.A.R.	0	0	0	0	0	0	0	0	0	0	0
13	CANADA	18948	19235	16960	17540	12164	4634	0	0	0	0	89481
14	BELGIUM	0	0	0	0	0	0	0	0	0	0	0
15	SOUTH AFRICA	0	0	0	0	0	0	0	0	0	0	0
16	AUSTRALIA	72176	69075	80032	95422	106184	116894	129530	0	0	0	669313
17	JAPAN	80723	76068	64891	50301	49191	48347	36462	0	0	0	405983
18	PAKISTAN	0	0	0	279	1520	0	0	0	0	0	1799
19	ARGENTINA	0	0	0	0	0	0	0	0	0	0	0
20	SWEDEN	1037	862	952	673	0	0	0	0	0	0	3524
21	F.R.G.	77435	73333	73485	78871	90472	92086	88686	45068	0	0	619436
22	ICELAND	26	0	0	1	0	0	0	0	0	0	27
23	ISRAEL	1729	1758	1863	4543	4315	78	5359	0	0	0	19645
24	FED.OF MALAYA	4759	3612	7209	13065	2845	5454	0	0	0	0	36944
25	U.S.S.R.	71609	107605	130748	64262	1932	0	0	0	0	0	376156
26	FINLAND	0	0	0	0	0	0	0	0	0	0	0
27	KOREA	0	0	0	0	0	0	0	0	0	0	0
28	NEW CALEDONIA	0	0	409	477	805	917	1071	626	0	0	4305
29	PORTUGAL	745	366	295	0	0	0	0	0	0	0	1406
30	SPAIN	0	1	0	0	0	0	0	0	0	0	1
31	THAILAND	512	1	0	0	0	0	0	0	0	0	513
32	YUGOSLAVIA	1	0	0	0	0	0	0	0	0	0	1
33	POLAND	2394	2315	2019	2270	2231	2287	809	0	0	0	14325
34	BRAZIL	19420	13327	9206	5850	8	0	0	0	0	0	47811
35	SINGAPORE	0	16	7583	6368	7043	2884	2137	0	0	0	26031
36	KENYA	0	0	0	0	0	0	0	0	0	0	0
37	TANZANIA	0	0	0	0	0	0	0	0	0	0	0
38	UGANDA	0	0	0	0	0	0	0	0	0	0	0
39	MEXICO	0	0	0	0	0	0	0	0	0	0	0
40	G.D.R	7203	9126	6738	7007	2901	0	0	0	0	0	32975
41	GREECE	0	0	0	0	0	0	0	0	0	0	0
	UNKNOWN	93226	80542	67658	90856	89532	91173	77582	300233	0	0	890802
	TOTAL	722544	753395	760154	686867	601161	571915	492137	406747	0	0	4994920

TOTAL OBS READ = 4994920
OBS WITH OCTANT ERRORS = 0

NORMAL EXIT TAKEN

TD-9665

Met.O.(OP)3 (Marine Data Section)
Meteorological Office
London Road
Bracknell Berks
RG12 2SZ

Our Ref: MET/OP/21/5/6

Date: 31 March 1993

The Directors
TOGA data centres

World Data Centre-A, USA
World Data Centre-B, USSR

International TOGA Project Office

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for Head of Met.O.(OP)3

TD-9665

Met.O.(OP)3 (Marine Data Section)
Meteorological Office
London Road
Bracknell Berks
RG12 2SZ

Our Ref: MET/OP/21/5/6

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for Head of Met.O.(OP)3

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1992
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	35	58	56	4605	307	2353	1637	18	19	5	21	2911	9607	7180	3342	1416	1632	1904	
N 20	39	56	32	1054	7307	6750	3516	1841	382	71	688	10920	3782	3438	3682	1619	728	622	
N 10	1717	59	43	27	659	2097	3571	6207	6719	5451	8047	1607	2091	1346	2021	1617	416	345	
00	926	301	111	36	1540	430	433	1400	1114	484	1440	2113	1865	825	1820	2596	477	193	
S 10	2329	1298	16	279	1414	669	797	381	767	1471	1572	2013	3053	1806	14182	3553	957	568	
S 20	2382	3622	31	1979	1113	784	264	295	287	553	1666	3108	21	27	220	4091	2289	1356	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1992
(WESTERN HEMISPHERE)

	W 180	W 170	W 160	W 150	W 140	W 130	W 120	W 110	W 100	W 90	W 80	W 70	W 60	W 50	W 40	W 30	W 20	W 10	W 0
N 30	1972	1981	3503	3092	1951	1339	3413	1136	4320	10543	10298	8624	7815	5383	2779	2647	10621	70	
N 20	690	936	754	930	1005	674	818	2936	4010	4071	9757	8139	4355	1844	1013	3828	7470	61	
N 10	219	572	664	740	405	294	254	601	1312	3840	649	22	2232	3424	1318	2947	5966	3211	
00	364	648	453	308	200	310	389	580	813	1278	101	4	60	472	4507	1098	693	2886	
S 10	882	656	531	703	318	311	634	450	101	245	866	12	7	11	3495	646	936	1321	
S 20	778	464	378	494	518	460	267	116	85	139	636	12	15	2126	1170	502	361	751	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1990
(WESTERN HEMISPHERE)

	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
N 30	3739	2763	3943	3645	2541	2307	5120	1704	6064	15723	15635	14252	11090	7321	4032	4202	15665	15	
N 20	862	1096	1684	1700	1730	1422	1493	4703	5118	5951	11425	11090	4968	1909	1025	5116	8369	0	
N 10	431	954	1091	1011	694	356	452	579	2283	6409	1046	9	2595	4052	1783	4195	7049	3984	
00	480	1147	564	595	208	392	598	896	941	3295	238	1	21	457	6180	1391	765	3169	
S 10	1561	1058	863	1115	524	374	606	525	156	1084	2027	0	0	3	5272	842	990	1276	
S 20	1385	777	574	575	634	491	194	101	103	363	1728	0	0	3524	1765	684	443	784	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1990
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	0	11	7970	205	3398	2608	37	64	22	75	4929	17541	14427	5175	2478	2645	2725	
N 20	0	0	0	1723	12179	10266	4749	2703	1280	251	1213	21301	6337	6177	6304	1760	763	839	
N 10	2510	4	0	0	1078	2753	5458	8965	10056	8344	13456	4019	3245	1647	3582	2024	435	793	
00	1168	421	0	32	1971	744	778	2222	1465	639	2158	2767	1966	1388	1723	2110	597	353	
S 10	2552	763	0	353	1582	757	1113	524	1017	1565	1640	1612	2264	1640	5262	3408	887	864	
S 20	2480	4522	0	2281	1381	1260	602	531	423	772	1784	3935	4	0	239	4150	2557	2018	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1991
(WESTERN HEMISPHERE)

	W 180	W 170	W 160	W 150	W 140	W 130	W 120	W 110	W 100	W 90	W 80	W 70	W 60	W 50	W 40	W 30	W 20	W 10	W 0
N 30	3730	2572	3642	3269	2052	1834	4846	1522	5238	12693	11797	11123	9041	5498	2845	3434	12830	1	
N 20	1002	1069	1395	1110	1313	945	1071	4599	4431	4875	10458	8232	3937	1494	971	4661	7984	0	
N 10	272	721	850	787	495	252	378	568	1551	5106	701	8	2143	3835	1918	3641	5945	3402	
00	396	653	492	422	245	333	471	689	750	2095	201	0	8	564	5851	1292	959	3233	
S 10	1100	665	663	688	425	343	638	513	168	504	1311	0	0	2	5055	773	1042	1375	
S 20	1132	587	444	484	488	488	277	125	98	172	1071	0	1	3288	1616	609	444	777	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1991
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	1	0	7256	47	3537	1925	24	43	6	13	4017	13702	11984	5201	2186	2161	2066
N 20	0	0	0	1486	11121	9674	3918	2206	972	209	957	17048	5674	5391	5647	1977	696	653
N 10	1325	1	0	0	807	2269	4651	7843	8555	6645	11515	2805	2679	1167	3145	1837	545	1239
00	1000	232	0	34	1743	558	636	1432	1282	551	1652	2225	1809	998	1690	2356	692	236
S 10	2536	849	0	287	1464	553	1013	429	833	1315	1527	1818	2750	1176	8960	3497	1142	891
S 20	2309	4455	0	2194	1375	1106	457	419	285	556	1519	3718	1	0	188	3776	2809	1827
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1989
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	21	0	8342	169	4134	2958	341	371	231	401	5600	19567	13534	5236	2469	2987	2885	
N 20	0	01	0	1828	12723	10470	4994	3368	1929	444	1349	21773	6132	6255	7168	2234	769	787	
N 10	2075	71	0	01	1142	2538	5364	9176	10361	9038	13692	3162	3553	1731	4026	2239	679	530	
00	1917	1146	0	48	2084	1024	801	2438	1723	655	1831	2185	2130	1214	1763	3036	826	371	
S 10	2899	2251	0	377	1905	775	1198	651	1046	1981	1847	1559	2885	1482	2815	4526	1593	1204	
S 20	2516	7576	1	2419	1710	1464	581	554	449	827	2165	3447	3	0	187	4063	2808	1531	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1989
(WESTERN HEMISPHERE)

	W 180	W 170	W 160	W 150	W 140	W 130	W 120	W 110	W 100	W 90	W 80	W 70	W 60	W 50	W 40	W 30	W 20	W 10	W 0
N 30	3141	3239	4374	3914	2882	2718	6580	2122	5521	17553	16321	14767	11063	6904	4001	4386	18114	8	
N 20	800	1109	1501	1771	2026	2335	1949	5494	5586	7014	11160	10640	4979	2211	1383	5223	10359	0	
N 10	346	599	1235	880	661	506	570	732	1787	5916	1026	5	2317	3922	2101	4051	8899	4452	
00	393	1076	464	424	195	463	709	856	798	2277	162	0	21	421	6015	1163	989	3739	
S 10	1379	1050	1021	1458	493	351	568	512	123	456	1280	0	0	1	4911	702	953	1355	
S 20	1254	699	539	652	633	515	221	152	131	313	1351	1	4	3462	1356	658	431	791	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1988
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	4	0	9617	793	5447	3489	65	75	18	40	6227	19417	12833	5632	2437	2863	3309
N 20	0	0	0	2121	14516	12355	5491	3201	1430	322	1683	23917	5747	5455	7006	2012	790	642
N 10	2235	16	0	0	1235	3722	5960	9532	10132	8989	16075	10738	3772	1480	3603	2447	679	186
CO	2377	1173	0	36	2660	1311	1323	3075	2307	733	1919	2310	2318	1490	1649	3071	843	378
S 10	3894	6505	0	540	2496	1203	1704	692	1296	2533	1760	1860	3200	1319	2174	4738	1505	1009
S 20	2928	10840	0	4123	2242	1932	764	674	576	957	2661	3135	31	0	275	4729	2412	1808
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1988
(WESTERN HEMISPHERE)

	W 180	W 170	W 160	W 150	W 140	W 130	W 120	W 110	W 100	W 90	W 80	W 70	W 60	W 50	W 40	W 30	W 20	W 10	W 0
N 30	3529	3556	5424	3882	2912	2907	6837	2191	4489	16861	17732	15604	12470	8650	4731	5533	28183		5
N 20	545	1073	1329	1713	2096	2160	2230	6375	6572	7154	13275	11382	5243	2337	1494	6434	12254		0
N 10	332	667	1014	870	710	531	546	828	2312	6942	859	19	2092	4080	2195	5470	12143		4963
00	517	865	557	387	187	495	690	1049	909	2388	75	0	60	666	7480	1757	1092		5200
S 10	1298	981	804	1420	575	410	684	508	242	1244	1017	1	0	4	7547	1024	1213		1549
S 20	1336	656	506	672	771	616	419	122	201	915	1126	0	0	6168	2771	1011	654		1050
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1987
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	0	0	9574	793	4453	3152	65	66	32	146	5885	19391	13951	6529	2933	3607	3805	
N 20	0	0	0	2178	14685	12118	5281	4067	1895	501	2906	24842	6891	6228	9128	1980	874	679	
N 10	2429	4	0	0	1163	4058	6296	9847	10576	9386	17768	6276	3863	1771	4346	3295	881	368	
00	2838	2025	0	57	2546	1915	1491	3760	2348	1069	2275	2120	2525	1621	1954	4012	1150	293	
S 10	4435	10942	0	469	2329	1556	2165	719	1376	2323	1911	1820	3038	1465	2013	5605	1853	1153	
S 20	3466	10993	0	3218	2170	2101	975	766	594	976	2431	2893	2	0	205	4641	2913	2301	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1987
(WESTERN HEMISPHERE)

	W 180	W 170	W 160	W 150	W 140	W 130	W 120	W 110	W 100	W 90	W 80	W 70	W 60	W 50	W 40	W 30	W 20	W 10	W 0
N 30	3985	3635	5711	4669	3698	3413	8255	2631	4495	16461	19511	17718	14646	10059	5746	6150	3589	4	
N 20	1114	1280	1852	2401	3198	2077	2530	7862	8238	7830	13339	13206	5828	2248	1675	7070	1351	0	
N 10	400	909	1390	1018	759	445	552	629	2752	7754	1199	88	2191	4314	2791	5898	1259	5679	
00	539	1274	700	532	293	689	994	1142	870	3022	104	1	54	643	7718	2271	1690	5785	
S 10	1785	1362	1116	1557	765	571	747	587	258	1409	1376	0	0	2	7279	1245	1589	1830	
S 20	1509	842	633	762	726	543	582	149	269	886	1523	0	1	8919	3530	1135	872	1330	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1986
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	0	1	9564	2061	4411	2692	103	74	24	30	5308	18306	14534	7205	2674	3347	3579	
N 20	0	0	0	2014	13462	11442	4764	3357	2014	295	1783	21801	7068	6929	9363	1673	976	739	
N 10	2684	6	0	0	1175	3002	5393	9094	9955	7678	13837	6071	3924	2297	5275	3305	614	1359	
00	25131	1917	0	37	1868	1108	1290	4604	2159	974	3419	2597	2824	1361	2200	4773	834	465	
S 10	4314	6753	0	454	1873	1197	1724	871	1870	2532	2265	2006	3347	1418	2705	6360	1519	1032	
S 20	3829	9783	0	3072	2499	2555	1311	1132	783	1085	2423	3878	0	0	274	5612	3153	2201	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR T ;A AREA FOR 1986
(WESTERN HEMISPHERE)

	W 180	W 170	W 160	W 150	W 140	W 130	W 120	W 110	W 100	W 90	W 80	W 70	W 60	W 50	W 40	W 30	W 20	W 10	W 0
N 30	4867	3829	5179	4690	3711	3285	9602	3186	4399	16535	20362	16904	13451	10129	5384	6118	38130	17	
N 20	1297	1116	1831	2110	2533	1824	2361	8646	9156	8032	13960	11466	5631	2302	1591	7779	12419	0	
N 10	556	918	1196	301	620	408	522	590	2205	7905	1078	58	2401	4605	2907	6416	11742	5766	
00	1088	1116	463	234	179	406	587	878	987	3720	91	3	32	769	9311	2503	1834	5648	
S 10	1680	906	707	990	438	424	658	645	322	1608	1314	0	0	3	9201	1289	1454	2069	
S 20	1346	870	413	633	614	533	224	78	284	927	2655	0	2	10110	5408	1156	629	1368	
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1985
(EASTERN HEMISPHERE)

	W 0	E 10	E 20	E 30	E 40	E 50	E 60	E 70	E 80	E 90	E 100	E 110	E 120	E 130	E 140	E 150	E 160	E 170	E 180
N 30	0	7	0	9596	1762	4500	2937	163	107	31	35	4534	18326	16203	7770	2566	3085	3379
N 20	0	0	0	2053	13305	11629	4395	3411	1950	406	1062	20176	6968	7310	10934	1808	876	834
N 10	2389	5	0	0	1277	3292	5835	8995	10123	7831	13351	6124	4299	2108	5852	3539	487	1325
00	1898	928	0	45	2030	1174	1268	3438	1936	971	2161	2546	2740	1510	1628	5362	813	340
S 10	4219	6270	0	431	1896	1309	1482	726	2307	2721	1823	2177	2359	1236	2900	6759	1549	960
S 20	3863	8379	0	3288	2417	2522	1223	1171	914	1356	2601	4175	2	0	320	5627	3217	2210
S 30																			

OBSERVATION COUNTS PER TEN DEGREE SQUARE FOR TOGA AREA FOR 1985
(WESTERN HEMISPHERE)

	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
N 30	4867	3532	4793	4165	3090	3485	9879	3223	4305	14705	15976	14735	11246	9866	5490	6624	32318	12	
N 20	1275	1121	1140	1695	1809	1223	1636	7611	8612	9849	12275	10561	5246	2044	1452	6440	10683	0	
N 10	487	637	1098	650	478	388	372	748	1832	7320	852	156	2000	4830	2622	5739	9876	5408	
00	414	883	445	279	264	510	723	875	781	5600	133	6	90	873	10236	2312	2531	5181	
S 10	1151	983	883	1049	521	520	700	580	278	1267	1311	0	0	13	10173	1579	1334	2175	
S 20	1046	806	436	806	765	519	241	146	291	956	2889	1	3	11902	3601	1441	1024	1678	
S 30																			