

ACCESSION NO. 8700121 FILETYPE INIT.

TRACK NO.

PROJECT IDENTIFICATION

U. Rhode Island
SOFAR Float Deployments

STEP	DATE	INIT.	TAPE OR DISK DSN	NO. FILES	LRECL	BLK SIZE	NO. RECORD
ORIG. TAPE	04/24/87	INIT	A00500, A00501	each tape 1 file	120	120	
DUPLICATE TAPE	04/27/87	INIT	W11883	1	120	120	
REFORMATTED TAPE Duplicate	04/27/87	INIT	W11883	1	120	120	
REFORMATTED DISK							
FIRST MULCHER							
FINAL MULCHER							
PD75 OR F022							
DATA SET FINALIZED							

ERRORS REPORTED TO PRINCIPAL INVESTIGATOR:

ADDITIONAL ERRORS/CORRECTIONS (NOT REPORTED TO P.I.)

COMMENTS (TRACKS DELETED, FIELDS DELETED, ETC.)

TRANSMITTAL AND RECEIPT RECORD

(Please sign and return carbon copy acknowledging receipt)

TO: National Oceanographic Data Ctr.
1825 Connecticut Ave., NW
Washington, D.C. 20235

REFER TO

ATTENTION Dr. Tony Picciolo

THE ITEM(S) LISTED BELOW WERE FORWARDED TO YOU BY

☒ ORDINARY
MAIL☐ REGISTERED
MAIL☐ AIR
MAIL☐ CERTIFIED
MAIL☐ GOVERNMENT
TRUCK☐ BY HAND☐ OTHER

The enclosed two reels of magnetic tape contain the SOFAR Float data collected by Dr. Thomas Rossby, Univ. of Rhode Island. This data set consists of 65 SOFAR Float deployments and contains data collected over the period 1975 thru 1981.

- a..Originator supplied documentation
- b..Other supporting documentation
- c..Sample tape dump
- d..Two tapes (9 track, 800 bpi, ASCII, 120 char record, unblocked)

cc: Thomas Rossby

8700121

A00500
A00501

FORWARDED BY (Signature) G. Heimerdinger	TITLE	DATE FORWARDED Mar. 12, 87
RECEIVED BY (Signature) F. Mitchell	TITLE	DATE RECEIVED 3/16/87

INPUT TO BE USED AND FUNCTION TO BE PERFORMED
 Copy to a W'tape -
 Scan W'tape
 09/24/87 11:01 07
 Bin
 04

INPUT MEDIUM TAPE #/DISKETTE CARD DISKETTE DISK OTHER(SPECIFY)	OUTPUT MEDIUM CARD DISKETTE DISK PRINT TAPE PLOT OTHER(SPECIFY)
---	--

TAPE #/DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE	
A00500		9	800		NL	UB	120	120	1	
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME				PUR DATE
TAPE #/DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE	
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME				PUR DATE
TAPE #/DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE	
W11883		9	1600	ODD	SL	FB	120	120	1	
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME				PUR DATE
						DNOXX 8700-121-01				

INSTRUCTIONS Please send W'tape to Asheville, N.C.	ESTIMATED EXECUTION TIME
--	--------------------------

USE ONLY				
DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTED, DISKETTES USED, CARDS PUNCHED, CARDS KEYVERIFIED
			C	Completed by PC

Bin 09

scan tape

INPUT MEDIUM PER CARD DISK <u>TAPE</u> KETTE OTHER(SPECIFY)	OUTPUT MEDIUM CARD DISK <u>PRINT</u> TAPE PLOT DISKETTE OTHER(SPECIFY)
---	--

DISKETTE INFORMATION

TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
A00500		9			NL				
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DAT
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE

AL INSTRUCTIONS

Please return tape A00500 to Bin 09	ESTIMATED EXECUTION TIME
--	--------------------------------

USE ONLY

DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTED DISKETTES USED, CARDS PUNCHED, CARDS KEY VERIFIED
			C	COMPLETED BY FL

INPUT MEDIUM: PAPER, CARD, DISK, TAPE, SKLETTE, OTHER(SPECIFY)
 OUTPUT MEDIUM: CARD, DISK, PRINT, TAPE, PLOT, DISKETTE, OTHER(SPECIFY)

DISKETTE INFORMATION

TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURGE DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
17-541		9	500	odd	NL	FBX	120	4000	1
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURGE DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURGE DATE

ADDITIONAL INSTRUCTIONS

ESTIMATED
EXECUTION
TIME

FOR USER ONLY

DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTED, DISKETTES USED, CARDS PUNCHED, CARDS KEY VERIFIED
2/14/57	1540	1957	C	COMPLETED BY TEL

PROJECT IDENTIFICATION

ACCESSION NO. 8/00.121 FILETYPE INIT. TRACK NO. 120

LL Rhode. Island.
SCKRR Fleet Deployments

TEP	DATE	INIT.	TAPE OR DISK DSN	NO. FILES	LRECL	BLK SIZE	RECORD NO.
RIG. TAPE	09/29/87	INIT	A00500 A00501	1 1	120	120	
UPPLICATE TAPE	09/27/87	INIT	W12109	1	120	120	
EFORMATTED TAPE <i>Duplicate</i>	04/27/87	INIT	W12109	1	120	120	
EFORMATTED DISK							
IRST MULCHEK							
IRAL MULCHEK							
075 OR F022							
ATA SET FINALIZED							

ERRORS REPORTED TO PRINCIPAL INVESTIGATOR:

COITIONAL ERRORS/CORRECTIONS (NOT REPORTED TO P.I.)

OMMENTS (TRACKS DELETED, FIELDS DELETED, ETC.)

TRANSMITTAL AND RECEIPT RECORD

(Please sign and return carbon copy acknowledging receipt)

#579 101-16-87

TO: National Oceanographic Data Ctr.
1825 Connecticut Ave., NW
Washington, D.C. 20235

REFER TO

ATTENTION Dr. Tony Picciolo

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TRUCK☐ BY HAND☐ OTHER

The enclosed two reels of magnetic tape contain the SOFAR Float data collected by Dr. Thomas Rossby, Univ. of Rhode Island. This data set consists of 65 SOFAR Float deployments and contains data collected over the period 1975 thru 1981.

- a..Originator supplied documentation
- b..Other supporting documentation
- c..Sample tape dump
- d..Two tapes (9 track, 800 bpi, ASCII, 120 char record, unblocked)

cc: Thomas Rossby

8700121

A00500
A00501

AWARDED BY (Signature) G. Heimerdinger	TITLE	DATE FORWARDED Mar. 12, 87
RECEIVED BY (Signature) F. M. [unclear]	TITLE	DATE RECEIVED 3/16/87

Copy to a 'u' tape
 scan 'u' tape
 09/24/51 1501 09

INPUT MEDIUM PER CARD DISK <u>TAPE</u> KETTE OTHER(SPECIFY)	OUTPUT MEDIUM CARD DISK <u>PRINT</u> <u>TAPE</u> PLOT DISKETTE OTHER(SPECIFY)
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DISKETTE INFORMATION										
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FIL	
AD501		9	800		N/2	UB	120	120	7	
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME				PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FIL	
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME				PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FIL	
W12149		9	1600	ADD	S2	FB	120	120	1	
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME DNOBC * 8200121-02				PUR DATE

INSTRUCTIONS Please send 'u' tape to Asheville, N.C.	ESTIMATED EXECUTION TIME
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USE ONLY					DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTED DISKETTES USED, CARDS PUNCHED, CARDS KEY VERIFIED
DATE JOB COMPLETED	START TIME	END TIME	PRIORITY		
09/24/51			C		

Scan tape

13.11.09

INPUT MEDIUM TAPE <input checked="" type="checkbox"/> CARD <input type="checkbox"/> DISK <input type="checkbox"/> OTHER(SPECIFY) <input type="checkbox"/>	OUTPUT MEDIUM PRINT <input checked="" type="checkbox"/> TAPE <input type="checkbox"/> PLOT <input type="checkbox"/> DISK <input type="checkbox"/> DISKETTE <input type="checkbox"/> OTHER(SPECIFY) <input type="checkbox"/>
---	---

TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
ADD501		9			NZ				
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PUR DATE

AL INSTRUCTIONS

Please return tape ~~A0050~~
to Bin 09 A00501

ESTIMATED
EXECUTION
TIME 3.3

USE ONLY

DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTED, DISKETTES USED, CARDS PUNCHED, CARDS KEY VERIFIED
04/27/81	1:41	05:00	C	COMPLETED 10/1/81

INPUT MEDIUM
 TAPE CARD DISK TAPE
 SKETTE OTHER(SPECIFY)

OUTPUT MEDIUM
 CARD DISK PRINT TAPE PLOT
 DISKETTE OTHER(SPECIFY)

5 1/2 DISKETTE INFORMATION

TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURGE DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
812342		9	800	odd	NIL	FB	120	4080	1
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURGE DATE
TAPE #/ DISKETTE	SLOT #	TRK	DENSITY	PARITY	LABEL TYPE	RECORD TYPE	RECORD LENGTH	MAX. BLOCK SIZE	# OF FILE
SECTOR SIZE	EXCHANGE TYPE	CODE: ASCII EBCDIC BCD SDF OTHER(SPECIFY)				DATA SET NAME			PURGE DATE

ESTIMATED
EXECUTION
TIME

USE ONLY

DATE JOB COMPLETED	START TIME	END TIME	PRIORITY	DEVICES USED, NUMBER OF TAPE MOUNTS, LINES PRINTED DISKETTES USED, CARDS PUNCHED, CARDS KEY VERIFIED
4/3/87	09:05	09:17	C	COMPLETED by FL

GRADUATE SCHOOL OF OCEANOGRAPHY
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND

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SOFAR Float Pilot Studies
in the Western North Atlantic 1975-1981
Data Report

by

Renee M. O'Gara
H. Thomas Rossby
Diane L. Spain

Woods Hole Oceanographic Institution
ATLAS - GAZETTEER COLLECTION

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INSTITUTION DATA LIBRARY
MCLEAN

Technical Report

Ref. No. 82-3

MODE Contribution No. 39 T

May 1982

Approved for Distribution

[Signature]

This research program has been funded by the International Decade
of Ocean Exploration Office of the National Science Foundation under
grants IDO75-18930, OCE-7818662, and OCE-79-26187. The Office of Naval
Research also supported the program under contract # NOO14-76-C-0226.

Introduction

The period 1975 - 1977 was one of geographical exploration of the Western North Atlantic with small clusters of SOFAR floats. These floats, being of a new design, were developed for the Polymode program. The design and performance characteristics of this new float has been discussed in detail elsewhere (Spain, O'Gara and Rossby, 1980) and will not be repeated here.

The exploratory studies comprise six cruises:

- Chain - 127, October 1975
- Gilliss 76 - 02, March 1976
- Oceanus - 15, October 1976
- Oceanus - 21, January 1977
- Endeavor - 07, April 1977
- Endeavor - 13, September 1977

The Chain cruise was the very first field trial of the new float design. One of the floats launched at this time lasted more than three years (float #1). The Gilliss cruise to the Nares Abyssal Plains (24°N, 62°W) was very successful, with two floats set at 700 meters and three at 2000 meters. Some of the scientific results of this study have been reported by Riser and Rossby (1982) and Rossby, Riser and Mariano (1982). One of the floats (#9) lasted almost five years.

The Oceanus cruise in October, 1976 launched six 700 meter floats in the vicinity of a large eddy, which subsequently was shown to be of eastern Atlantic origin (McDowell and Rossby, 1978).

The January, 1977 Oceanus cruise was designed originally to explore further the waters of the South Hatteras Abyssal Plains and the hydrography of the deep waters along the Blake Escarpment. Due to a variety of difficulties (including weather) only two floats (#21, #22) were successfully launched.

The April 1977 Endeavor cruise was a combined operation of float deployment and a density survey along 70 W. Four floats were successfully launched (#25, #26, #27, #29).

The last Endeavor cruise was primarily an operational test of the new float command recovery system prior to the Local Dynamics Experiment in May 1978. One float was recovered, #24, and reset as #30. A cold ring SOFAR float that had been set three years earlier (Cheney et al., 1976) was also recovered.

We do not provide a discussion of tracking accuracy in this report. The reasons are twofold. First, we are concerned with wide area geographical properties of Lagrangian motion

where high spatial accuracy is not crucial. Second, and more importantly, there are many trajectories where it was almost impossible to know what the probable errors were. This was particularly true in 1975-1976 when the complete network of receiving stations was not yet operational and for floats that were off to the southeast (floats #6-10) or near the Bahama-Caribbean Islands. For floats that are approximately centered within the tracking network, the tracking accuracy approaches that of the LDE floats (Spain et al, 1980). The data are presented as follows:

- 1) Float Statistics (Table 1)
- 2) Individual float trajectory plots with bottom topography
- 3) Temperature and Pressure plots
- 4) Stick plots of velocity
- 5) Spaghetti plot of all 700 meter floats
- 6) Spaghetti plots of all 2000 meter floats.

Remarks on Individual Float Tracks

- Float #1 - Telemetry was offscale for the first 549 days due to a shallow launch.
- Floats #1, #6 - #10 - These early trajectories are gappy due to an incomplete tracking network.
- Float #11 - The first fourteen days of the trajectory are not included due to a very erratic float clock which made tracking impossible.
- Float #12 - This float was ballasted for 900 meters in an attempt to set it in the vicinity of a remarkable eddy that subsequently proved to be of Eastern Atlantic origin (the "Meddy").
- Float #21 - Due to ballasting problems this float went too deep (>925 meters), and took approximately one year to equilibrate.
- Float #26 - This float could not be tracked reliably after day 3420. With the setting of an ALS for the Local Dynamics Experiment, it was relocated and tracked effectively starting day 3638. Between the above mentioned dates, only a few positions were obtained. These fixes have been connected by a dashed line to approximate the float's path during this period.

Float Statistics Table

The float statistics table is a brief summary of all the Pre - Local Dynamics Experiment Floats. In it is contained each float number with its corresponding julian launch day, launch position, julian fail day (that is, its last trackable day) and the total number of days of data. Also included is the range of temperature and pressure in degrees Centigrade and the maximum velocity in centimeters per second.

Julian Calendar

To shorten the representation of the date, a truncated Julian day was chosen instead of the traditional day, month and year. In true Julian time, the day starts at 12:00 noon instead of 12:00 midnight. The Julian day used here starts at midnight and uses only the four least significant digits. The calendars on the following pages show year-days, and month-days for 1975 through 1981.

Plots

The float tracks are plotted on a Mercator projection; superimposed on this is bottom topography. Three positions per day are plotted. The first position of the day is marked with a large dot and the second and third are marked with a smaller dot. Every tenth day, an arrow head with its corresponding Julian day label, indicates the direction of the drift. The "D" or "S" in the lower right hand corner signifies a deep (2000 dbar) or a shallow (700 dbar) float respectively.

During the history of float 26 was a period from approximately 3420 through 3638 where only a few positions were obtained. These fixes have been connected by a dashed line, thus indicating the float's path during that time.

Temperature and Pressure Plots

Temperature and pressure, when available was plotted for all floats. Pressure (Δ) in decibars is scaled on the left margin, temperature (+) in degrees Centigrade is scaled on the right margin, and the corresponding Julian day is printed at the base of the plot.

It is worth pointing out that the telemetry subsystem on the whole, has been very successful. Of the 20 floats in this report there were only four with no temperature telemetry and three without pressure telemetry. Included in the above mentioned telemetry failures is float #24, which only lasted eleven days and had neither temperature nor pressure telemetry.

Table 1. Float Statistics

Float	Launch Day	Launch Position	Fall Day	Total Days	Temperature Range (Centigrade)	Pressure Range (Decibars)	Maximum Velocity (cm/sec)
1	2680	30.770N 62.472W	3858	1047	3.60- 3.90	No Data	20.8
6	2840	23.985N 62.022W	3115	266	10.49-12.21	693- 732	17.7
7	2843	24.135N 61.963W	3637	770	3.46- 3.73	1997-2048	16.1
8	2843	24.180N 62.067W	3856	932	3.43- 4.00	1993-2120	15.4
9	2839	24.052N 62.052W	4517	1170	9.21-12.52	694- 764	23.7
10	2841	24.010N 62.025W	3612	517	No Data	1995-2053	14.5
11	3051	25.003N 70.022W	3808	669	No Data	789- 858	24.2
12	3054	24.412N 69.132W	4799	570	5.44-11.16	No Data	21.7
13	3052	25.235N 69.207W	3233	169	11.30-12.15	695- 712	14.6
14	3052	24.763N 69.535W	3404	351	9.36-13.50	665- 701	37.2
15	3051	25.495N 69.988W	3066	16	11.81-11.89	696- 715	10.1
16	3056	24.702N 70.590W	3085	30	No Data	697- 729	14.3
21	3166	27.235N 75.645W	4815	1018	5.24-13.74	661- 901	72.9
22	3170	26.466N 72.918W	3414	244	10.66-12.93	692- 724	13.7
24	3239	30.017N 70.000W	3250	10	No Data	No Data	31.3
25	3251	26.000N 70.033W	3972	717	11.06-13.93	673- 714	34.9
26	3249	29.500N 70.000W	3909	379	12.50-15.98	614- 763	76.0
27	3239	30.017N 70.000W	3816	577	3.49- 3.87	1995-2100	46.0
29	3248	29.500N 70.000W	4163	917	3.53- 3.73	1997-2101	15.0
30	3410	29.063N 70.007W	3873	456	12.93-14.83	637- 677	25.6

1975

MAR

FEB

JAN

S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
5	6	7	8	9	10	11	2	3	4	5	6	7	8	2	3	4	5	6	7	1
2417	2418	2419	2420	2421	2422	2423	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428
12	13	14	15	16	17	18	9	10	11	12	13	14	15	16	17	18	19	20	21	22
2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444
19	20	21	22	23	24	25	16	17	18	19	20	21	22	23	24	25	26	27	28	29
2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451
26	27	28	29	30	31		23	24	25	26	27	28	29	30	31		32	33	34	35
2438	2439	2440	2441	2442	2443		2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479
							2494	2495	2496	2497	2498	2499	2500	2501	2502					

JUN

MAY

APR

S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
6	7	8	9	10	11	12	4	5	6	7	8	9	10	1	2	3	4	5	6	7
2508	2509	2510	2511	2512	2513	2514	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519
13	14	15	16	17	18	19	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542
20	21	22	23	24	25	26	18	19	20	21	22	23	24	25	26	27	28	29	30	31
110	111	112	113	114	115	116	138	139	140	141	142	143	144	145	146	147	148	149	150	151
2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549
							2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584
							2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607

JUL							AUG							SEP						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
6	7	8	9	10	11	12	3	4	5	6	7	8	9	7	8	9	10	11	12	13
187	188	189	190	191	192	193	215	216	217	218	219	220	221	250	251	252	253	254	255	256
2599	2600	2601	2602	2603	2604	2605	2627	2628	2629	2630	2631	2632	2633	2662	2663	2664	2665	2666	2667	2668
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20
194	195	196	197	198	199	200	222	223	224	225	226	227	228	257	258	259	260	261	262	263
2606	2607	2608	2609	2610	2611	2612	2634	2635	2636	2637	2638	2639	2640	2669	2670	2671	2672	2673	2674	2675
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27
201	202	203	204	205	206	207	229	230	231	232	233	234	235	264	265	266	267	268	269	270
2613	2614	2615	2616	2617	2618	2619	2641	2642	2643	2644	2645	2646	2647	2676	2677	2678	2679	2680	2681	2682
27	28	29	30	31			24	25	26	27	28	29	30	20	29	30				
208	209	210	211	212			236	237	238	239	240	241	242	271	272	273				
2620	2621	2622	2623	2624			2648	2649	2650	2651	2652	2653	2654	2683	2684	2685				

80

OCT							NOV							DEC						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13
278	279	280	281	282	283	284	306	307	308	309	310	311	312	341	342	343	344	345	346	347
2690	2691	2692	2693	2694	2695	2696	2718	2719	2720	2721	2722	2723	2724	2753	2754	2755	2756	2757	2758	2759
12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20
205	206	207	208	209	290	291	313	314	315	316	317	318	319	348	349	350	351	352	353	354
2697	2698	2699	2700	2701	2702	2703	2725	2726	2727	2728	2729	2730	2731	2760	2761	2762	2763	2764	2765	2766
19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27
292	293	294	295	296	297	298	320	321	322	323	324	325	326	355	356	357	358	359	360	361
2704	2705	2706	2707	2708	2709	2710	2732	2733	2734	2735	2736	2737	2738	2767	2768	2769	2770	2771	2772	2773
26	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31			
299	300	301	302	303	304		327	328	329	330	331	332	333	362	363	364	365			
2711	2712	2713	2714	2715	2716		2739	2740	2741	2742	2743	2744	2745	2774	2775	2776	2777			
							30													
							334													
							2746													

The third number of each day is a truncated Julian date. Add 2440000.5 for true Julian or add 2440000.0 for modified Julian.

1976

JAN

FEB

MAR

S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
4	5	6	7	8	9	10	1	2	3	4	5	6	7	7	8	9	10	11	12	13
2781	2782	2783	2784	2785	2786	2787	2809	2810	2811	2812	2813	2814	2815	2844	2838	2839	2840	2841	2842	2843
11	12	13	14	15	16	17	15	16	17	18	19	20	21	14	15	16	17	18	19	20
2788	2789	2790	2791	2792	2793	2794	2823	2824	2825	2826	2827	2828	2829	2851	2852	2853	2854	2855	2856	2857
18	19	20	21	22	23	24	22	23	24	25	26	27	28	21	22	23	24	25	26	27
2795	2796	2797	2798	2799	2800	2801	2830	2831	2832	2833	2834	2835	2836	2850	2859	2860	2861	2862	2863	2864
25	26	27	28	29	30	31	29	30	31					28	29	30	31			
2802	2803	2804	2805	2806	2807	2808	2837							2865	2866	2867	2868			

APR

MAY

JUN

S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
2872	2873	2874	2875	2876	2877	2878	2900	2901	2902	2903	2904	2905	2906	2935	2936	2937	2938	2939	2940	2941
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
2879	2880	2881	2882	2883	2884	2885	2907	2908	2909	2910	2911	2912	2913	2942	2943	2944	2945	2946	2947	2948
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
2886	2887	2888	2889	2890	2891	2892	2914	2915	2916	2917	2918	2919	2920	2949	2950	2951	2952	2953	2954	2955
25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30			
2893	2894	2895	2896	2897	2898		144	145	146	147	148	149	150	172	173	174	175	176	177	178
							2921	2922	2923	2924	2925	2926	2927	2949	2950	2951	2952	2953	2954	2955
							30	31												
							151	152												
							2920	2929												

JUL							AUG							SEP						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
4	5	6	7	8	9	10	1	2	3	4	5	6	7	1	6	7	8	9	10	11
106	107	108	109	110	111	112	214	215	216	217	218	219	220	245	250	251	252	253	254	255
2963	2964	2965	2966	2967	2968	2969	2991	2992	2993	2994	2995	2996	2997	3022	3027	3028	3029	3030	3031	3032
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
193	194	195	196	197	198	199	228	229	230	231	232	233	234	256	257	258	259	260	261	262
2970	2971	2972	2973	2974	2975	2976	3005	3006	3007	3008	3009	3010	3011	3033	3034	3035	3036	3037	3038	3039
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25
200	201	202	203	204	205	206	235	236	237	238	239	240	241	263	264	265	266	267	268	269
2977	2978	2979	2980	2981	2982	2983	3012	3013	3014	3015	3016	3017	3018	3040	3041	3042	3043	3044	3045	3046
25	26	27	28	29	30	31	29	30	31					26	27	28	29	30		
207	208	209	210	211	212	213	242	243	244					270	271	272	273	274		
2984	2985	2986	2987	2988	2989	2990	3019	3020	3021					3047	3048	3049	3050	3051		

OCT							NOV							DEC						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
3	4	5	6	7	8	9	1	2	3	4	5	6	1	1	6	7	8	9	10	11
277	278	279	280	281	282	283	306	307	308	309	310	311	312	336	341	342	343	344	345	346
3054	3055	3056	3057	3058	3059	3060	3083	3084	3085	3086	3087	3088	3089	3113	3118	3119	3120	3121	3122	3123
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18
204	205	206	207	208	209	210	319	320	321	322	323	324	325	347	348	349	350	351	352	353
3061	3062	3063	3064	3065	3066	3067	3096	3097	3098	3099	3100	3101	3102	3124	3125	3126	3127	3128	3129	3130
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25
291	292	293	294	295	296	297	326	327	328	329	330	331	332	354	355	356	357	358	359	360
3068	3069	3070	3071	3072	3073	3074	3103	3104	3105	3106	3107	3108	3109	3131	3132	3133	3134	3135	3136	3137
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	
298	299	300	301	302	303	304	333	334	335					361	362	363	364	365	366	
3075	3076	3077	3078	3079	3080	3081	3110	3111	3112					3138	3139	3140	3141	3142	3143	
31																				
305																				
3082																				

The third number of each day is a truncated Julian date. Add 2440000.5 for true Julian or add 2440000.0 for modified Julian.

1977

JAN							FEB							MAR						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
2	3	4	5	6	7	8	1	7	8	9	10	11	12	1	7	8	9	10	11	12
2	3	4	5	6	7	8	32	38	39	40	41	42	43	60	66	67	68	69	70	71
3145	3146	3147	3148	3149	3150	3151	3175	3181	3182	3183	3184	3185	3186	3203	3209	3210	3211	3212	3213	3214
9	10	11	12	13	14	15	15	14	15	16	17	18	19	13	14	15	16	17	18	19
9	10	11	12	13	14	15	44	45	46	47	48	49	50	72	73	74	75	76	77	78
3152	3153	3154	3155	3156	3157	3158	3107	3188	3189	3190	3191	3192	3193	3215	3216	3217	3218	3219	3220	3221
16	17	18	19	20	21	22	20	21	22	23	24	25	26	20	21	22	23	24	25	26
16	17	18	19	20	21	22	51	52	53	54	55	56	57	79	80	81	82	83	84	85
3159	3160	3161	3162	3163	3164	3165	3194	3195	3196	3197	3198	3199	3200	3222	3223	3224	3225	3226	3227	3228
23	24	25	26	27	28	29	27	28						27	28	29	30	31		
23	24	25	26	27	28	29	58	59						86	87	88	89	90		
3166	3167	3168	3169	3170	3171	3172	3201	3202						3229	3230	3231	3232	3233		
30	31																			
30	31																			
3173	3174																			

11

APR							MAY							JUN						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
3	4	5	6	7	8	9	1	2	3	4	5	6	7	1	6	7	8	9	10	11
93	94	95	96	97	98	99	121	122	123	124	125	126	127	152	157	158	159	160	161	162
3236	3237	3238	3239	3240	3241	3242	3264	3265	3266	3267	3268	3269	3270	3295	3300	3301	3302	3303	3304	3305
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
103	101	102	103	104	105	106	135	136	137	138	139	140	141	163	164	165	166	167	168	169
3243	3244	3245	3246	3247	3248	3249	3278	3279	3280	3281	3282	3283	3284	3306	3307	3308	3309	3310	3311	3312
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
107	108	109	110	111	112	113	142	143	144	145	146	147	148	170	171	172	173	174	175	176
3250	3251	3252	3253	3254	3255	3256	3285	3286	3287	3288	3289	3290	3291	3313	3314	3315	3316	3317	3318	3319
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30		
114	115	116	117	118	119	120	149	150	151					177	178	179	180	181		
3257	3258	3259	3260	3261	3262	3263	3292	3293	3294					3320	3321	3322	3323	3324		

JUL							AUG							SEP						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
3	4	5	6	7	8	9	7	8	9	10	11	12	13	4	5	6	7	8	9	10
184	185	186	187	188	189	190	219	220	221	222	223	224	225	247	248	249	250	251	252	253
3327	3328	3329	3330	3331	3332	3333	3362	3363	3364	3365	3366	3367	3368	3390	3391	3392	3393	3394	3395	3396
10	11	12	13	14	15	16	14	15	16	17	18	19	20	11	12	13	14	15	16	17
191	192	193	194	195	196	197	226	227	228	229	230	231	232	254	255	256	257	258	259	260
3334	3335	3336	3337	3338	3339	3340	3369	3370	3371	3372	3373	3374	3375	3397	3398	3399	3400	3401	3402	3403
17	18	19	20	21	22	23	21	22	23	24	25	26	27	18	19	20	21	22	23	24
198	199	200	201	202	203	204	233	234	235	236	237	238	239	261	262	263	264	265	266	267
3341	3342	3343	3344	3345	3346	3347	3376	3377	3378	3379	3380	3381	3382	3404	3405	3406	3407	3408	3409	3410
24	25	26	27	28	29	30	28	29	30	31				25	26	27	28	29	30	
205	206	207	208	209	210	211	240	241	242	243				268	269	270	271	272	273	
3348	3349	3350	3351	3352	3353	3354	3383	3384	3385	3386				3411	3412	3413	3414	3415	3416	
31																				
212																				
3353																				
12																				
OCT							NOV							DEC						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10
275	276	277	278	279	280	281	310	311	312	313	314	315	316	338	339	340	341	342	343	344
3418	3419	3420	3421	3422	3423	3424	3453	3454	3455	3456	3457	3458	3459	3481	3482	3483	3484	3485	3486	3487
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17
282	283	284	285	286	287	288	317	318	319	320	321	322	323	345	346	347	348	349	350	351
3425	3426	3427	3428	3429	3430	3431	3460	3461	3462	3463	3464	3465	3466	3488	3489	3490	3491	3492	3493	3494
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24
289	290	291	292	293	294	295	324	325	326	327	328	329	330	352	353	354	355	356	357	358
3432	3433	3434	3435	3436	3437	3438	3467	3468	3469	3470	3471	3472	3473	3495	3496	3497	3498	3499	3500	3501
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31
296	297	298	299	300	301	302	331	332	333	334				359	360	361	362	363	364	365
3439	3440	3441	3442	3443	3444	3445	3474	3475	3476	3477				3502	3503	3504	3505	3506	3507	3508
30	31																			
303	304																			
3446	3447																			

The third number of each day is a truncated Julian date. Add 2440000.5 for true Julian or add 2440000.0 for modified Julian.

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UNIVERSITY OF RHODE ISLAND

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SOFAR Float Data Report
of the POLYMODE Local Dynamics Experiment

Technical Report

Ref. No. 80-1

MODE Contribution No. 34-T

by

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INTRODUCTION

This is the final report of all SOFAR float data collected during the POLYMODE Local Dynamics Experiment (LDE) and the post-LDE period. POLYMODE was a co-operative experiment conducted by the United States and the Union of Soviet Socialist Republics. It was an outgrowth of the United States' Mid-Ocean Dynamics Experiment (MODE) and the Soviet experiment POLYGON. As part of POLYMODE, the LDE was to explore the dynamics of the mesoscale eddy field in a region more energetic than the MODE area. A secondary goal was to look at the interaction between mesoscale eddies and the mean flow. While these objectives were similar to those of MODE, the LDE was a more intensive study designed to produce more accurate results.

Forty SOFAR floats, which telemetered temperature and pressure, were deployed for the LDE. Twenty of these were ballasted to float at a depth of 1300 dbars, and twenty were ballasted for 700 dbars. The floats were launched approximately 500 kilometers southwest of Bermuda in a $2^{\circ} \times 2^{\circ}$ area centered at $31^{\circ} 00' N$ $69^{\circ} 30' W$. They were acoustically tracked by four shore based receivers and four Autonomous Listening Stations (ALS) from May 10, 1978 until Nov. 17, 1978 for the LDE and from Nov. 17, 1978 until Oct. 18, 1979 for the post-LDE.

This data report discusses the new acoustic signalling and receiving systems used in POLYMODE, the data reduction, and data accuracy. The data are presented as:

- 1) Individual float trajectory plots with bottom topography
- 2) Temperature and pressure plots
- 3) Stick plots of velocity
- 4) Five day trajectory plots of all floats in the central LDE area
- 5) Spaghetti plot overlay of 700 dbar and 1300 dbar levels
- 6) Spaghetti plot with bottom topography

SIGNAL TRANSMISSION

POLYMODE SOFAR floats used a new signalling system in which an 80 second, swept frequency, acoustic signal was transmitted every eight hours. An additional signal, representing alternately temperature and pressure, was telemetered every 24 hours. Two swept carrier frequencies, having starting frequencies of 250 and 259.375 Hz, were monitored. These frequencies were increased linearly every two seconds to produce a total sweep of 1.523 Hz in 80 seconds.

All floats on the same frequency transmitted identical signals. Floats were identified by using their scheduled transmission times and their approximate distance from the receiver to estimate the signal

time of arrival. The temperature and pressure signals, which followed the first, second, or third signal of the day, provided a redundancy check on float identification.

Float transmission schedules were arranged to allow a maximal separation in time between the transmission of different floats. This was extremely important since signals which overlap (arrived within 80 seconds of each other) interfere with each other so that neither can be identified, and signals which cross slowly (arrive at approximately the same time for several days) are difficult to correctly identify once they do separate. A minimum of 10 minutes between signals was the largest time separation that could be allocated on the 250 Hz channel since several of the pre-LDE floats were still being recorded on that frequency. The 259 Hz frequency was used only for the more rapidly dispersing 700 dbar LDE floats, and a separation of 25-30 minutes was maintained in the transmission schedule on that frequency.

SIGNAL RECEPTION

Eight receiving stations recorded the float signals (Figure 1). Shore based stations were located on Bermuda, Eleuthera, Grand Turk, and Puerto Rico. Autonomous Listening Stations (ALS) (Bradley, 1977) were deployed at various times on the Blake Spur, east of Sable Island, north of Bermuda, and southwest of Bermuda. For the LDE, all shore based stations and two ALSs were in operation (Table 1). But, during the post-LDE period, the Grand Turk hydrophone failed, and the stations housing the Eleuthera and Puerto Rico receivers were shut down. The ALS situation was better; one ALS was deployed at the beginning of the post-LDE, and two more were deployed when the first was recovered, however, no ALSs were available for subsequent post-LDE use.

A dual conversion, hardlimiting system was used for the receivers. Each receiver system consisted of a hydrophone, preamplifier, narrow bandpass filter at the carrier frequency, and a mixer stage that heterodyned the input to 23 Hz, (the center frequency of the bandpass filter). The output was again heterodyned to approximately 1.5 Hz and hardlimited to produce an output of 0 v for negative voltages and +12 v DC for positive voltages. Each channel was sampled 10 times per second and recorded on a cassette tape (Figure 2). The data was recorded in binary form 0 v was recorded as "zero", and +12 v was recorded as "one". Walden (1976) provided a detailed description of the receiver hardware used on the shore based station. This processing procedure records no amplitude information. The 1-bit phase digitization is a tremendous compression of the incoming information. Despite this compression, at the recording rate of 10 bits per second, each LDE shore based receiver produced a data bit string over 164×10^6 bits long, for each frequency during the 190 days of the LDE.

TEMPERATURE AND PRESSURE

METHOD

A 48 hour average of temperature or pressure was telemetered once a day. It was encoded in the form of a variable delay signal which followed 120-600 seconds after one of the eight hour signals. For example, a float could telemeter temperature on odd Julian days and pressure on even Julian days after the third signal of the day. The actual temperature is then calculated as:

$$T = T_0 + S \cdot \Delta T$$

where T_0 is the base temperature, S is seconds of delay from the main signal, and ΔT is the temperature rate of change per second of delay. Actual pressure is calculated by the same method using a base pressure and a pressure rate of change per second of delay. The scheme provides temperature ranges of 6-16°C for shallow floats and 4-7°C for deep floats and pressure ranges of 500 db- 900 db for shallow floats and 1100 db - 1500 db for deep floats.

TEMPERATURE ACCURACY

During the R/V Gyre cruise (78-G-6), 51 STD casts were taken within the dispersing float array. For 11 floats, three STD casts were taken at intervals in the vicinity of each float for eight floats, two STD casts were taken; and for the remaining floats, one cast was taken. We have compared the STD temperatures at the telemetered float depth to the corresponding float temperatures. Since the telemetered data is a series of 48 hour averages, a weighted average of the two transmissions bracketing the time of the cast was used for the comparison.

A frequency distribution of the difference between float temperature and STD as a function of float depth is shown in Figure 14. The temperature differences are much greater for the 700 dbar floats than for the 1300 dbar floats. The 11 shallow floats had a mean difference of .09°C and a standard deviation of .25°C. The 10 deep floats had a mean of .034°C and a standard deviation of .03°C. When the mean differences are divided by their corresponding vertical gradients, they become equivalent to four and 10 meters offsets, at 700 and 1300 db respectively. These results show that temperature differences between STD and the same float showed less variation than temperature differences between STD and different floats. This implies that errors are primarily due to variations in float calibration not the small scale processes in the ocean between the float and the STD. The discrepancies are probably due to drift in the pressure sensor due to the large sustained pressure after launch. The temperature sensors, on the other hand, are not subject to this kind of mechanical stress.

Table 4. Recovery/Failure Table

Float	Comments
32	Recovered on 3718. Too shallow, telemetry off scale.
33	Not recovered. Failed on 3650.
34	Recovered on 3715.
35	Recovered on 3715.
36	Not recovered. Too weak to track after 3780. Telemetry off scale.
37	Recovered on 3814.
38	Not recovered. Release command acknowledged, but did not surface. Insufficient data to track after 4159.
39	Not recovered. Would not reply to any command. Insufficient data to track after 3856.
40	Recovered on 3806.
41	Not recovered. Float stops transmitting on 3959.
42	Recovered on 3804.
43	Recovered on 3791. Pressure off scale after 3706, probably due to sinking because of loss of tag line.
44	Recovered on 3806.
45	Recovered on 3815.
46	Recovered on 3719.
47	Recovered on 3804.
48	Not recovered. Float stops transmitting on 4012.
49	Not recovered. Insufficient data to track.
50	Recovered on 3718.
51	Recovered on 3714.
52	Recovered on 3716.
53	Recovered on 3716.
54	Not recovered. Would not reply to any command. Cap in track at 3995 due to crossing of baseline. Moves out of receiver range after 4118.
55	Not recovered. Insufficient data to track after 4062.
56	Recovered on 3719. All signals stop at 3709.
57	Recovered on 3824.
58	Recovered on 3828. Too deep, telemetry off scale.
59	Not recovered. Cap in track during 4090-4112 due to crossing baseline. Moves out of receiver range after 4153.
60	Not recovered. Failed on 3817.
61	Recovered on 3719.
62	Not recovered. Would not reply to any command. Insufficient data to track after 3956.
63	Not recovered. Would not reply to any command.
64	Not recovered. Release would not work. Caps in data during 4018-4050 due to baseline crossing. Insufficient data to track after 4164.
65	Recovered on 3823.
66	Recovered on 3823. No temperature signal.
67	Recovered on 3821.
68	Not recovered. Acoustically shadowed after 3828.
69	Recovered on 3819.
71	Not recovered. Insufficient data to track. Extremely weak signal.
84	Recovered on 3827.
85	Not recovered. Insufficient data to track after 3817.
	Release command acknowledged, but did not surface.
86	Not recovered. Too weak to track after 3825.
87	Not recovered. Insufficient data to track after 3817.
88	Recovered on 3814. Temperature and pressure off scale.
89	Not recovered. Failed on 3799.
90	Recovered on 3826.
91	Not recovered. Lost on surface on 3814.

Table 5. Float Statistics

Float	Launch Day	Launch Position	Recovery /Fail Day	Recovery /Fail Position	Total Days	Temperature Range (Centigrade)	Pressure Range (Decibars)	Maximum Velocity (Cm/Sec)
32	3643	30.972N 69.357W	3717	29.696N 70.597W	75	N/A	1461-1461	21.3
33	3643	31.083N 68.661W	3650	31.179N 68.384W	3	4.17-4.50	1454-1439	7.9
34	3643	30.703N 68.902W	3715	28.852N 73.361W	73	4.52-4.83	1376-1429	21.3
35	3643	30.352N 69.149W	3715	28.860N 72.693W	73	4.51-4.64	1364-1440	15.2
36	3643	30.345N 69.350W	3750	31.899N 70.389W	138	N/A	1499-1501	15.4
37	3639	31.072N 70.253W	3814	29.974N 73.794W	176	4.70-5.25	1297-1373	17.7
38	3639	31.430N 70.102N	4162	28.305N 61.392W	324	3.85-5.75	1287-1417	36.3
39	3639	31.768N 69.837W	3856	37.742N 71.391W	218	5.02-5.65	1278-1362	29.3
40	3639	31.767N 69.141W	3806	32.283N 70.863W	168	4.87-5.19	1295-1325	15.4
41	3640	31.461N 69.503W	3959	31.283N 70.531W	320	4.66-5.04	1313-1391	16.6
42	3640	31.214N 69.676W	3804	32.529N 72.071W	163	4.71-5.52	1268-1306	17.5
43	3640	31.071N 69.953W	3791	31.880N 70.886W	152	4.16-5.92	1304-1301	17.5
44	3640	30.695N 70.097W	3806	32.418N 71.434W	167	4.72-5.18	1298-1323	16.2
45	3641	30.922N 69.663W	3815	30.852N 72.095W	173	4.45-5.19	1298-1424	19.5
46	3640	31.083N 69.493W	3719	31.294N 69.937W	63	4.64-4.93	1297-1333	18.9
47	3641	31.223N 69.275W	3804	32.806N 72.014W	164	4.70-5.43	1293-1353	16.4
48	3641	31.433N 68.901W	4012	28.431N 71.219W	372	4.80-5.42	1280-1336	16.7
50	3641	30.927N 69.326W	3718	29.674N 72.517W	78	4.63-4.87	1297-1301	43.7
51	3643	30.696N 69.501W	3714	28.947N 72.642W	72	4.75-5.09	1241-1270	22.5
52	3641	31.084N 69.501W	3716	28.033N 72.670W	76	11.36-12.89	736-739	34.6
53	3640	30.917N 69.670W	3714	27.997N 73.592W	75	10.16-12.23	747-841	25.6
54	3640	31.082N 69.920W	4118	32.271N 60.208W	479	11.64-15.96	665-769	34.4
55	3640	31.204N 69.689W	4062	34.936N 69.190W	423	11.10-15.56	677-738	53.6
56	3640	31.457N 69.499W	3707	31.474N 74.485W	68	12.69-14.86	690-729	28.5
57	3713	31.345N 69.083W	3824	34.010N 67.870W	112	12.21-13.99	672-702	32.7
58	3642	30.935N 69.338W	3828	32.073N 72.321W	187	N/A	899-901	27.0
59	3642	30.719N 69.495W	4153	36.892N 49.087W	492	5.17-14.57	590-724	83.0
60	3641	31.077N 69.055W	3817	27.339N 70.503W	172	12.09-13.05	688-768	19.5
61	3641	31.222N 69.333W	3719	30.931N 73.923W	79	13.57-15.93	668-723	58.2
62	3713	31.373N 69.370W	3956	30.111N 76.344W	250	11.41-12.95	699-727	19.4
63	3713	31.333N 69.666W	3850	29.691N 77.037W	118	11.63-13.83	692-766	24.7
64	3713	31.632N 69.331W	4164	31.856N 71.305W	452	12.38-14.72	670-720	18.1
65	3714	31.050N 69.333W	3823	34.354N 65.105W	110	12.56-13.44	679-714	19.3
66	3722	30.917N 69.502W	3823	33.865N 67.487W	102	N/A	683-737	25.6
67	3723	31.070N 68.962W	3821	32.559N 62.183W	99	12.22-13.88	670-709	21.0
68	3722	30.993N 69.740W	3807	32.785N 66.013W	86	12.19-14.68	694-716	19.7
69	3723	31.250N 69.662W	3819	31.294N 64.753W	97	12.27-14.03	668-710	19.1
84	3721	31.607N 69.825W	3827	34.549N 73.903W	102	11.56-14.11	689-712	41.7
85	3721	31.605N 69.825W	3825	32.280N 71.664W	99	4.75-6.09	1291-1304	17.0
86	3721	31.575N 69.398W	3825	30.518N 69.390W	95	4.82-5.31	1264-1301	6.8
87	3721	31.575N 69.397W	3825	33.274N 75.376W	103	13.12-14.98	642-672	27.8
88	3722	31.062N 69.285W	3814	30.282N 70.689W	93	N/A	N/A	7.9
89	3721	31.065N 69.282W	3799	30.680N 62.012W	79	12.92-14.05	665-679	20.6
90	3722	30.943N 69.517W	3826	32.086N 71.028W	105	4.84-5.07	1298-1328	18.2
91	3722	30.970N 69.717W	3814	30.388N 73.505W	93	4.84-5.31	1293-1302	15.4

JULIAN CALENDAR

The use of truncated Julian days was chosen instead of the traditional month, day, and year to shorten the representation of the date. This speeds computing and simplifies programming. In true Julian time, the day starts at 12:00 noon instead of 12:00 midnight. The Julian day used here starts at midnight and uses only the four least significant digits. For example, Oct. 18, 1978, 12:00 PM is the start of true Julian day 2443799. However, in our notation, Oct. 18, 1978, 12:00 AM is the start of day 3799. Tables 2 and 3 show the Julian days, year-days, and month-days of 1978 and 1979 for comparison.

PLOTS

INDIVIDUAL FLOAT TRAJECTORY PLOTS

The float tracks are plotted on a Mercator projection. Superimposed on this is bottom topography contoured at 100 meter intervals (Pratt, 1968). Three positions per day are plotted. The first position of the day is marked with a large dot, and the second and third positions are marked with smaller dots. Every fifth day, an arrow head, accompanied by a Julian day label, marks the direction of drift. The "D" or "S" in the lower right hand corner signifies a deep (1300 dbar) or shallow (700 dbar) float respectively.

TEMPERATURE AND PRESSURE PLOTS

Temperature and pressure plots are included for most floats. The dates of telemetry failure are noted in Table 4 for those floats not plotted. Pressure (Δ) in decibars is scaled on the left margin, temperature (+) in degrees Centigrade is scaled on the right margin, and the corresponding Julian days are printed at the base of the plot.

It is evident that temperature averaging over 48 hours was inadequate to show the fine structure of rapid temperature fluctuations at 700 dbars. Floats 52, 54, 67, and 84 are good examples of the need for more frequent temperature reporting at shallow depths. Temperature averaged over 12 or 24 hours would have greatly improved the quality of this information. However, temperatures recorded by the 1300 dbar floats were more stable, and the 48 hour average was certainly acceptable.

3/4/87

Dear George,

Sorry about the confusion with regard to the Sofar float data we sent earlier. Somehow the original binary data tapes were sent rather than the Ascii listing output tapes. We are now sending the Ascii tapes which you should be able to read no problem.

Here are the specs. on the two tapes you've received:

Density: 800 BPI

Blocking: Unblocked, 120 Byte Records

Format: USASCII, 1 File/Tape

The record format of the data is as follows: There are 3, 120 Byte records for each day of data for all the floats contained in the file on each tape. The logical data fields have the following meaning (some of which you won't care about):

Record 1/3: Format (12F10.3)

- 1: Lat 0000Z
- 2: Long 0000Z
- 3: Lat 0800Z
- 4: Long 0800Z
- 5: Lat 1600Z
- 6: Long 1600Z
- 7: U 0000Z
- 8: V 0000Z
- 9: U 0800Z
- 10: V 0800Z
- 11: U 1600Z
- 12: V 1600Z

Record 2/3: Format (9F10.3,29X,1H0)

- 1: Temp. 0000Z
- 2: Pres. 0000Z
- 3: Temp. 0800Z
- 4: Pres. 0800Z
- 5: Temp. 1600Z
- 6: Pres. 1600Z
- 7: Actual Temp
- 8: Actual Pres
- 9: Telemetry Transmission Time

Record 3/3: Format (8I6,6F10.3,2I6)

- 1: Float #
- 2: Julian day
- 3: Security Code of Tracker
- 4: Julian day when float tracked
- 5: Clock correction (0=None)
- 6: Doppler indicator (1=used,0=not)
- 7: # Points smoothing for position
- 8: # Points smoothing for telemetry
- 9: Temp. rate of change 0000Z
- 10: Pres. rate of change 0000Z
- 11: Temp. rate of change 0800Z
- 12: Pres. rate of change 0800Z
- 13: Temp. rate of change 1600Z
- 14: Pres. rate of change 1600Z
- 15: Not Used
- 16: Interpolated Data Flag

Note that for Record 1/3 a missing position or velocity will be flagged by 999. For Record 2/3 a missing temp. or pres. will be flagged by -1.0. And for Record 3/3 a missing rate of change of temp. or pres. will be flagged by 999.

Lastly, the file on the first tape contains all data for Sofar floats 1,6-16,21,22,24-27,29,30 and covers a span of julian days from day 2686-4815. The file on the second tape contains all data for Sofar floats 32-48,50-69,84-91 and covers days 3639-4164. Floats are not seperated from one another by any special records or by end-of-files (thus one file/tape). However the end of the data, within the file, is signalled by the last three records having no data flags (-999 or -1) and the very last record will have a float # of -1 in the first data field.

Hope you have no trouble decoding all this. Give me a call at (401)792-6520 if you have any further questions.

Sincerely,

John Lillibridge
John Lillibridge

10
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46
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66

1
11
1
4
2
20

Record No. 1 RECORD (12F10.3)

1. Latitude at 0000Z
2. Longitude at 0000Z
3. Latitude at 0800Z
4. Longitude at 0800Z
5. Latitude at 1600Z
6. Longitude at 1600Z
7. U at 0000Z
8. V at 0000Z
9. U at 0800Z
10. V at 0800Z
11. U at 1600Z
12. V at 1600Z

Latitude and longitude are given in degrees and decimal degrees. North and east are positive, and south and west are negative. Velocity is in centimeters per second. Missing data is assigned 999.0.

Record No. 2 FORMAT(9F10.3)

1. Temperature at 0000Z
2. Pressure at 0000Z
3. Temperature at 0000Z
4. Pressure at 0000Z
5. Temperature at 0000Z
6. Pressure at 0000Z
7. Actual temperature (on temperature days only)
8. Actual pressure (on pressure days only)
9. Telemetry transmission time

Temperature is given in degrees Centigrade. Pressure is given in decibars. Missing data is assigned -1.0. Transmission time is in seconds.

Record No. 3 FORMAT(8I6,6F10.3,2I6)

1. Float number
2. Julian day
3. Security code of operator who prepared the track
4. Julian day float was tracked
5. Record No. of clock correction in TCKT file (used only since 4520)
6. Doppler flag (1=Doppler correction used, 0=not used (used only since 4520))
7. Number of points used to smooth for positions (used only since 4520)
8. Number of points used to smooth for telemetry (used only since 4520)
9. Temperature rate of change at 0000Z
10. Pressure rate of change at 0000Z
11. Temperature rate of change at 0800Z
12. Pressure rate of change at 0800Z
13. Temperature rate of change at 1600Z
14. Pressure rate of change at 1600Z
15. Not used
16. Interpolated signal time of arrival flag

Rates of change are per day. Missing data for rates of change is assigned 999.0. If signal time of arrival was interpolated, bit 3=1 for 0000Z, bit 2=1 for 0800Z, and bit 1=1 for 1600Z. End of file is indicated by a float number of -1 (first variable of record No. 3), followed by an EOF mark.

PRE-LIDE FLOATS																						
START	STOP	TOTAL	NORTH		SOUTH		WEST		EAST		MAXIMUM		MINIMUM		MAXIMUM		MINIMUM		MAXIMUM		MINIMUM	
DAYS											TEMP	TEMP	TEMP	TEMP	PRESS	PRESS	PRESS	PRESS	VELOCITY	VELOCITY	VELOCITY	VELOCITY
1	2686	3850	1847	23.818	26.713	-74.882	-62.703	12.21	3.90	3.60	742.	1597.	1597.	1597.	1597.	1597.	1597.	1597.	17.7	20.8	1.1	1.1
6	2841	3115	266	25.038	22.135	-62.165	-49.538	3.73	3.73	3.45	2048.	1597.	1597.	1597.	1597.	1597.	1597.	1597.	16.1	16.1	1.1	1.1
7	2844	3637	770	24.250	22.447	-64.793	-59.427	4.07	3.73	3.45	2128.	1597.	1597.	1597.	1597.	1597.	1597.	1597.	15.7	15.7	1.1	1.1
8	2844	3856	932	24.200	21.453	-69.734	-59.727	3.43	3.43	3.21	764.	1595.	1595.	1595.	1595.	1595.	1595.	1595.	23.7	23.7	1.1	1.1
9	2848	4517	1170	25.013	17.584	-69.655	-57.493	12.52	3.18	2.18	2055.	1595.	1595.	1595.	1595.	1595.	1595.	1595.	14.5	14.5	1.1	1.1
10	2844	3611	517	24.343	22.657	-65.569	-59.577	3.18	3.18	2.18	358.	789.	789.	789.	789.	789.	789.	789.	27.5	27.5	1.1	1.1
11	3065	3808	669	24.512	20.393	-71.853	-59.643	11.16	3.44	3.44	712.	665.	665.	665.	665.	665.	665.	665.	14.6	14.6	1.1	1.1
12	3065	4799	570	24.923	19.291	-74.473	-65.162	11.16	3.44	3.44	712.	665.	665.	665.	665.	665.	665.	665.	37.2	37.2	1.1	1.1
13	3065	4033	177	24.267	22.791	-69.778	-62.765	12.16	11.30	9.36	715.	696.	696.	696.	696.	696.	696.	696.	10.1	10.1	1.1	1.1
14	3064	3404	351	24.714	21.930	-73.950	-68.720	11.50	11.50	11.81	715.	696.	696.	696.	696.	696.	696.	696.	14.5	14.5	1.1	1.1
15	3061	3066	16	25.503	24.956	-69.596	-69.107	11.89	11.89	11.81	715.	696.	696.	696.	696.	696.	696.	696.	10.1	10.1	1.1	1.1
16	3056	3085	30	24.756	23.547	-70.518	-69.575	11.89	11.89	11.81	715.	696.	696.	696.	696.	696.	696.	696.	14.5	14.5	1.1	1.1
21	3168	4815	1019	29.782	22.786	-77.187	-68.946	12.74	12.74	12.74	729.	661.	661.	661.	661.	661.	661.	661.	72.5	72.5	1.1	1.1
22	3171	3414	244	27.061	24.267	-73.152	-68.946	12.93	12.93	12.65	724.	692.	692.	692.	692.	692.	692.	692.	13.7	13.7	1.1	1.1
24	3241	3256	10	29.834	22.224	-70.101	-68.271	13.53	13.53	11.06	714.	673.	673.	673.	673.	673.	673.	673.	34.8	34.8	1.1	1.1
25	3252	3972	717	28.550	22.086	-75.791	-68.271	13.53	13.53	12.50	712.	614.	614.	614.	614.	614.	614.	614.	76.1	76.1	1.1	1.1
26	3251	3905	379	28.581	20.190	-76.148	-63.142	15.98	15.98	3.49	2160.	1995.	1995.	1995.	1995.	1995.	1995.	1995.	46.1	46.1	1.1	1.1
27	3240	3816	577	31.784	24.440	-76.990	-69.984	3.87	3.87	3.53	2101.	1997.	1997.	1997.	1997.	1997.	1997.	1997.	15.4	15.4	1.1	1.1
29	3249	4166	917	29.495	24.347	-71.445	-66.067	3.73	3.73	3.53	677.	637.	637.	637.	637.	637.	637.	637.	25.6	25.6	1.1	1.1
30	3418	3872	456	32.059	26.529	-76.530	-67.203	14.83	14.83	12.93	677.	637.	637.	637.	637.	637.	637.	637.	25.6	25.6	1.1	1.1

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03-23-64 02:02:35 PM

TABLE IXA

545

JULIAN DAY NUMBER, 1900-2019

DAYS ELAPSED AT GREENWICH MEAN NOON

Year	Jan. 0	Feb. 0	Mar. 0	Apr. 0	May 0	June 0	July 0	Aug. 0	Sept. 0	Oct. 0	Nov. 0	Dec. 0
1960	243 6934	6965	6994	7025	7055	7086	7116	7147	7178	7208	7239	7269
1961	7300	7331	7359	7390	7420	7451	7481	7512	7543	7573	7604	7634
1962	7665	7696	7724	7755	7785	7816	7846	7877	7908	7938	7969	7999
1963	8030	8061	8089	8120	8150	8181	8211	8242	8273	8303	8334	8364
1964	8395	8426	8455	8486	8516	8547	8577	8608	8639	8669	8700	8730
1965	243 8761	8792	8820	8851	8881	8912	8942	8973	9004	9034	9065	9095
1966	9126	9157	9185	9216	9246	9277	9307	9338	9369	9399	9430	9460
1967	9491	9522	9550	9581	9611	9642	9672	9703	9734	9764	9795	9825
1968	9856	9887	9916	9947	9977	0008	0038	0069	0100	0130	0161	0191
1969	244 0222	0253	0281	0312	0342	0373	0403	0434	0465	0495	0526	0556
1970	244 0587	0618	0646	0677	0707	0738	0768	0799	0830	0860	0891	0921
1971	0952	0983	1011	1042	1072	1103	1133	1164	1195	1225	1256	1286
1972	1317	1348	1377	1408	1438	1469	1499	1530	1561	1591	1622	1652
1973	1683	1714	1742	1773	1803	1834	1864	1895	1926	1956	1987	2017
1974	2048	2079	2107	2138	2168	2199	2229	2260	2291	2321	2352	2382
1975	244 2413	2444	2472	2503	2533	2564	2594	2625	2656	2686	2717	2747
1976	2778	2809	2838	2869	2899	2930	2960	2991	3022	3052	3083	3113
1977	3144	3175	3203	3234	3264	3295	3325	3356	3387	3417	3448	3478
1978	3509	3540	3568	3599	3629	3660	3690	3721	3752	3782	3813	3843
1979	3874	3905	3933	3964	3994	4025	4055	4086	4117	4147	4178	4208
1980	244 4239	4270	4299	4330	4360	4391	4421	4452	4483	4513	4544	4574
1981	4605	4636	4664	4695	4725	4756	4786	4817	4848	4878	4909	4939
1982	4970	5001	5029	5060	5090	5121	5151	5182	5213	5243	5274	5304
1983	5335	5366	5394	5425	5455	5486	5516	5547	5578	5608	5639	5669
1984	5700	5731	5760	5791	5821	5852	5882	5913	5944	5974	6005	6035
1985	244 6066	6097	6125	6156	6186	6217	6247	6278	6309	6339	6370	6400
1986	6431	6462	6490	6521	6551	6582	6612	6643	6674	6704	6735	6765
1987	6796	6827	6855	6886	6916	6947	6977	7008	7039	7069	7100	7130
1988	7161	7192	7221	7252	7282	7313	7343	7374	7405	7435	7466	7496
1989	7527	7558	7586	7617	7647	7678	7708	7739	7770	7800	7831	7861
1990	244 7892	7923	7951	7982	8012	8043	8073	8104	8135	8165	8196	8226
1991	8257	8288	8316	8347	8377	8408	8438	8469	8500	8530	8561	8591
1992	8622	8653	8682	8713	8743	8774	8804	8835	8866	8896	8927	8957
1993	8988	9019	9047	9078	9108	9139	9169	9200	9231	9261	9292	9322
1994	9353	9384	9412	9443	9473	9504	9534	9565	9596	9626	9657	9687
1995	244 9718	9749	9777	9808	9838	9869	9899	9930	9961	9991	*0022	0052
1996	245 0083	0114	0143	0174	0204	0235	0265	0296	0327	0357	0388	0418
1997	0449	0480	0508	0539	0569	0600	0630	0661	0692	0722	0753	0783
1998	0814	0845	0873	0904	0934	0965	0995	1026	1057	1087	1118	1148
1999	1179	1210	1238	1269	1299	1330	1360	1391	1422	1452	1483	1513
2000	245 1544	1575	1604	1635	1665	1696	1726	1757	1788	1818	1849	1879
2001	1910	1941	1969	2000	2030	2061	2091	2122	2153	2183	2214	2244
2002	2275	2306	2334	2365	2395	2426	2456	2487	2518	2548	2579	2609
2003	2640	2671	2699	2730	2760	2791	2821	2852	2883	2913	2944	2974
2004	3005	3036	3065	3096	3126	3157	3187	3218	3249	3279	3310	3340
2005	245 3371	3402	3430	3461	3491	3522	3552	3583	3614	3644	3675	3705
2006	3736	3767	3795	3826	3856	3887	3917	3948	3979	4009	4040	4070
2007	4101	4132	4160	4191	4221	4252	4282	4313	4344	4374	4405	4435
2008	4466	4497	4526	4557	4587	4618	4648	4679	4710	4740	4771	4801
2009	4832	4863	4891	4922	4952	4983	5013	5044	5075	5105	5136	5166
2010	245 5197	5228	5256	5287	5317	5348	5378	5409	5440	5470	5501	5531
2011	5562	5593	5621	5652	5682	5713	5743	5774	5805	5835	5866	5896
2012	5927	5958	5987	6018	6048	6079	6109	6140	6171	6201	6232	6262
2013	6293	6324	6352	6383	6413	6444	6474	6505	6536	6566	6597	6627
2014	6658	6689	6717	6748	6778	6809	6839	6870	6901	6931	6962	6992
2015	245 7023	7054	7082	7113	7143	7174	7204	7235	7266	7296	7327	7357
2016	7388	7419	7448	7479	7509	7540	7570	7601	7632	7662	7693	7723
2017	7754	7785	7813	7844	7874	7905	7935	7966	7997	8027	8058	8088
2018	8119	8150	8178	8209	8239	8270	8300	8331	8362	8392	8423	8453
2019	8484	8515	8543	8574	8604	8635	8665	8696	8727	8757	8788	8818

1959 243 6567 6600 6628 6657 6687 6720 6750 6781 6812 6842 6873 6903

Feb

Apr

June

Aug

Oct

Dec