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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
NATIONAL METEOROLOGICAL CENTER

OFFICE NOTE 211

BATHY/TESAC Data Transmission and Monitoring Program

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Introduction

The Ocean Services Group (OSG) at the National Meteorological Center (NMC) near Washington, DC is actively participating in the Integrated Global Ocean Station System (IGOSS) to exchange radio BATHY/TESAC data in "real time" with the international community via the Global Telecommunications System (GTS). NMC participates by (1) entering data received from U.S. coastal radio stations on the GTS and (2) monitoring all data received from U.S. coastal radio stations and international GTS centers. The monitoring program summarizes the data by originating station or center and by ship. Also, OSG participates in the semi-annual World Meteorological Organization (WMO) monitoring exercise for evaluation of meteorological and oceanographic "data flow" on the GTS.

GTS Transmissions

BATHY/TESAC data received at NMC have several sources. Most international data are received directly through the GTS, whereas the majority of U.S. data are received indirectly through Fleet Numerical Oceanographic Center (FNOC), Monterey, California from U.S. coastal radio stations. Some data is addressed directly to NMC through coastal radio stations. The U.S. BATHY/TESAC data are entered onto the GTS four times daily; the times vary, but approximately at 09Z, 11Z, 21Z amd 23Z. Because the bulk of data transmitted from FNOC are received only twice daily after 00Z and 12Z, the NMC transmissions following at 09Z and 21Z tend to be quite large. The 11Z and 23Z transmissions, 2 hours later, may contain no data.

At transmission time, each bulletin received since last transmission is checked to determine its origin. Data already on the GTS are allowed to continue on the circuit. However, data from U.S. coastal radio stations are placed on the GTS provided that the message passes a set of minimal data error checks.

The OSG philosophy has been to check data primarily for gross errors, making as few decisions as possible concerning a BATHY/TESAC message. Recommendations concerning error checking and correcting will be proposed later.

An incoming bulletin is stripped of its header and each BATHY/TESAC report is scanned in the following manner:

1. The time group is checked to insure a / is present in last position.

2. Identify 5 digit 7's or 8's group for BATHY; or 7's or 8's with 1, 2, 3 possible in last digit for TESAC.

3. Ship call letters are identified, if any, at the end of the message.

4. Between the time group and call letters, only numbers are valid, anything else is replace by blanks.

5. The message is compressed by removing excess blanks.

6. Each of the data groups is checked for 5 digits. If more than 3 groups contain other than 5 digits, the message is considered in error and will not be transmitted.

7. A new report is checked against reports already transmitted to avoid duplicate reports. A duplicate report is one whose latitude, longitude and time is the same as a report that has been transmitted during the last 24 hours.

The header of BATHY/TESAC bulletins transmitted from NMC follow the standard WMO format as follows:

SOVD1 KWBC 251820

The first 5 digit group identifies the following data as BATHY reports.

The WMO format is as follows:

S	—	identifies the data type, in this case, surface or sub-
O		surface sea temperature, salinity or current data.
V	-	moble ships (Note, however, that BATHY bulletins contain data received from fixed buoys)
D	-	WMO region 4, Western North Atlantic Gulf of Mexico and Eastern North Pacific.
1	-	bulletin number identifier.

SOVD1 through SOVD5 are used to transmit BATHY data and SOVD6 through SOVD9 are used to transmit TESAC data. Using this format, BATHY and TESAC data are transmitted in separate bulletins. If more bulletins are required than there are bulletin identifiers, the last identifier is repeated and flagged with RTD. (See last bulletin header in figure 1). The second group of the header contains 4 letters (KWBC) identifying the originating center (WASHINGTON) of the bulletin. The third group contains 6 digits that gives the day, hour and minute of bulletin transmission.

The reports within a bulletin follow the standard FM63-V (BATHY data) or FM64-V (TESAC data) format of WMO. At present a 1280 character limit per bulletin allows about 6 BATHY reports per bulletin. A sample transmission is presented in Figure 1.

If no BATHY or TESAC data are transmitted, a "NIL" bulletin transmission is made. The NIL bulletin makes it evident that no data was transmitted, rather than questioning whether data is missing.

SOVD1 KWBC 261215
NIL

SOVD6 KWBC 261215
NIL

Data Monitoring

The quantity of all BATHY/TESAC data received at NMC are monitored on a weekly basis. These data are edited manually to correct errors in call

signs of bulletins and call signs of ship reports. The data are summarized for the number of BATHY's, TESAC's and BUOYS received by U.S. coastal stations and the GTS; and by ship (Figure 2). Master lists are maintained to identify 1) the call sign of a station or center with its city and country and 2) the call sign of a ship with its name and country of registry. An unknown ship name is identified by xxx. The weekly summaries are merged to produce monthly semi-annual and annual summaries. An annual ship participation list is published in the Gulfstream (Kundrat, 1980) which is presented in Figures 3a and 3b.

NMC uses the summaries to monitor the amount of data it receives from various ships and centers through the GTS, as well as the amount of data it is entering on the GTS. NMC forwards the IGOSS statistical evaluation sheet (Figure 4) to the Intergovernmental Oceanographic Commission (IOC), where comparisons are made with similar reports from other GTS centers, to monitor each countries participation, as well as to identify problems with the data exchange system.

Twice yearly, in June and December, the WMO itself conducts an exercise monitoring meteorological and oceanographic data transmitted and received on the GTS by various countries. OSG supports the overall NMC exercise by monitoring BATHY/TESAC data during the special test.

Other NMC BATHY/TESAC Services

A number of other services are provided at NMC concerning BATHY/TESAC data. A weekly listing of the radio reports are produced (Figure 5), with and without duplicates, and is distributed upon request for both global and selected limited areas. Also, the BATHY/TESAC reports are put on tape weekly and sent to the Regional National Oceanographic Data Center (RNODC), Washington, D.C., where the data are retained and are available upon request.

OSG itself processes BATHY data in real time to use sea surface temperatures and subsurface temperatures in analyses prepared at NMC. During POLYMODE, for example, NMC acted as a real time center in preparing subsurface maps (NOAA, 1978). BATHY/TESAC data services prepared at NMC are listed in Table 1.

1. Daily real time use of surface and subsurface measurements.
2. Four times daily GTS transmissions.
3. Center and ship monitoring statistical summary.
4. Weekly global listing of all received bulletins and reports
   a. with duplicates removed
   b. no duplicates removed
5. Weekly selected limited area listing of reports.
6. Weekly data tape sent to RNODC for distribution.
7. Annual ship participation list.

Table 1. BATHY/TESAC Data Services

Recommendations

IGOSS has devoted a number of years to monitoring and improving the quantity of BATHY/TESAC being exchanged over the GTS. IGOSS should now emphasize the role of monitoring and improving the quality of that data. A first step suggested is to monitor and document the frequency of various types of errors found in radio messages. Huber (1979) reported the Specialized Oceanographic Data Center, Federal Republic of Germany, has been applying quality control procedures to correct BATHY/TESAC data during FGGE. The next step would be to establish a set of IGOSS approved quality control procedures that would be used to correct "certain" types of errors at the appropriate GTS centers prior to transmission.

The utility of these real time radio data lie in their ability to adequately describe the real ocean. A detailed study is needed to compare radio messages to the strip chart recorded aboard ship, showing discrepancies and errors between the reports. The credibility of the BATHY/TESAC real time program could improve provided the loss of accuracy and detail of the radio messages could be documented.

References

Huber, Klaus, 1979: "Quality Control Procedures Applied to IGOSS Data at the Specialized Oceanographic Data Center, Federal Republic, Germany," IOC Workshop Report No. 7 (Supplement), Intergovernmental Oceanographic Commission, Paris, pp. 227-243.

Kundrat, John, 1980: "Gulfstream V(2), U.S. Dept. of Commerce, National Weather Service, Washington, DC, pp. 6-7.

National Oceanic and Atmospheric Administration (NOAA), 1978: IGOSS/POLYMODE Experiment Final Report: Ocean Services Branch, NWS, Washington, DC, 15 pp.

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SOVO1 KWBC 030834
JJXX C2040 11006/ 52954 03826 88888 00252 41252 50227 63207 81193
99901 10178 20177 27171 73157 89156 99902 27146 99903 42130
61130 99904 50112 WNCU
JJXX 02040 11907/ 72653 08555 88888 00228 09223 56222 66207 77207
90202 93195 99901 10193 50168 99902 32140 54132 88126 99903
2 3 55106 98100 99904 12094 60088 NNH
JJXX 02040 11205/ 70001 12003 88888 00259 05257 10248 31230 43200
63173 70173 99901 11150 36135 99902 67116 99903 84085 99904
50082
JJXX 01040 23387/ 70002 11810 88888 00267 09253 19252 37248 42220
48209 52208 65180 70184 83155 95143 99901 12142 53130 80130
99902 97111 99904 WTEP
JJXX C2040 18307/ 70003 12029 88888 00262 18258 25257 39225 55203
62198 73172 81175 96158 99901 01158 11153 20152 21148 39140
49139 52134 70134 99902 28123 70120 99904 50083 WTEP
JJXX C2040 23457/ 70800 12141 88888 00280 05261 25257 31253 45250
55220 70190 80183 95184 99901 05155 09157 70134 99902 79124
99904 50083
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SOVO5 KWBC 030834
JJXX 02040 19247/ 13919 16505 88888 00095 50095 99901 10093 15092
90090 70080 85078 92071 99902 08070 35057 60055 69058 71056
99903 02056 02055 45050 75050 82046 99904 25049 37047 40048
45045 50045 JJLL
JJXX 03040 00007/ 73459 17618 88888 00148 50146 90146 99901 01143
10140 50138 90136 99902 10135 40135 50134 60133 70132 80131
85130 86128 90127 99903 00125 18120 30117 40116 50115 55115
60113 70112 80112 82109 90109 95108 99904 00108 10107 26107
35105 50103 DHPV
JJXX 01040 18027/ 52530 17918 88888 00250 32249 50233 52220 57219
77197 99901 70170 93169 99902 39157 50156 85142 99903 10138
11135 45126 65125 99904 05114 40101 60098 DHCW
JJXX C2040 17587/ 51850 17605 88888 00280 50280 70245 99901 55220
57218 71217 90210 99902 22195 32193 70175 82170 95170 99903
28149 99904 02127 12118 20117 60102 DHCW
JJXX 02040 05507/ 52226 17148 88888 00260 50253 50236 67235 77225
99901 11214 42206 55204 99902 50177 99903 10165 18160 30159
51154 98135 99904 12135 60103 DHCW
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SOVO5 KWBC 030834 RTD
JJXX 02040 22407/ 50400 15630 88888 00279 55277 99901 14271 99902
10148 20145 50120 99903 70100 99904 50086 KRSF
JJXX 03040 00007/ 52601 11118 88888 00264 05268410262
JJXX C3040 00007/ 75743 17402 88888 00080 03050 06033 10031 18031
26028 82026 83027 99901 19027 20028 28029 00000 NMMJ
JJXX 03040 00007/ 71016 15700 88888 00274 50274 99901 00138 50117
99902 00110 50105 99903 00100 50097 99904 00094 50090 A8SL
JJXX C3040 00017/ 72045 10815 88888 00242 18240 43239 46211 55183
61167 67161 99901 10142 46131 83125 99902 07122 44114 99903
66097 NPFS
JJXX C2040 23457/ 70800 12141 88888 00280 05261 25257 31253 45250
55220 70190 80183 95184 99901 05155 09157 70134 99902 79124
99904 50083
JJXX 03040 00007/ 71111 09859 88888 00292 46282 65266 74236 81226
95196 99901 00179 18152 31140 99903 07110 58101 99904 60087
NRUO
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Figure 1. Sample of part of XBT bulletin transmission generated at NMC.

DATA FOR 15-22 DECEMBER 1979

CALL SIGN	TOTAL	BATHY	TESAC	BUOY	SHIP NAME	COUNTRY
CWPF	14	14	0	0	ESQUIMALT,BRITISH COLUMBIA	CANADA
EDZW	5	5	0	0	OFFENBACH	GERMANY
EGRR	28	28	0	0	BRACKNELL	ENGLAND
KNMF	8	8	0	0	COAST GUARD BOSTON,MA.	USA
KNWC	353	352	1	0	MONTEREY,CA.	USA
KSAN	8	8	0	0	SAN DIEGO,CA.	USA
KWBC	1	1	0	0	WASHINGTON,D.C.	USA
RJTD	20	20	0	0	TOKYO	JAPAN
RUHB	13	12	1	0	KHABAROVSK	USSR
RUML	7	7	0	0	***	USSR ?
RUMS	12	12	0	0	MOSCOW	USSR
TOTL	469	467	2	0	TOTAL BATHYS & TESACS REC'D	
A8VI	9	9	0	0	PACOUCHESS	USA
A8WW	1	1	0	0	KOREAN FIR	USA
A8YI	1	1	0	0	PACBARON	USA
CGBR	7	7	0	0	VANCOUVER	CANADA
C7L	10	10	0	0	OCEAN STATION LIMA	UK
C7P	13	13	0	0	OCEAN STATION PAPA	CANADA
C7R	10	10	0	0	OCEAN STATION ROMEO	FRANCE
DCL	5	5	0	0	FEHMARNBELT-FEUERSCHIFF	FRG
DGSR	2	2	0	0	COLUMBUS TASMANIA	FRG
DGVK	3	3	0	0	COLUMBIA VICTORIA	FRG
DGZV	10	10	0	0	COLUMBUS VIRGINIA	FRG
DHCW	9	9	0	0	COLUMBUS WELLINGTON	FRG
DHFC	4	4	0	0	SEATRAIN LEXINGTON	FRG
DHPV	4	4	0	0	PLUVIUS	FRG
ELEC	8	8	0	0	MARCONA EXPORTER	USA-MARCONA CORP.
ELXF	4	4	0	0	KOREAN PRIDE	USA
EREB	1	1	0	0	VOLNA	USSR
EREH	10	10	0	0	PRIBOI	USSR
ERET	2	2	0	0	GEORGE OUSHAKOV	USSR
EREU	1	1	0	0	ERNST KRENKEL	USSR
EWVW	3	3	0	0	KARA-DAG	USSR
FNEL	2	2	0	0	FRANCE II	FRANCE
FPERL	2	2	0	0	FANNING ISLAND	USA
JBES	6	6	0	0	YAMASHIN MARU	USA
JCFU	3	3	0	0	GOLDEN ARROW	JAPAN
JDOC	2	2	0	0	HIEI MARU	JAPAN
JDRP	1	1	0	0	TAKUYO	JAPAN
JEMM	4	4	0	0	ASIA MARU	JAPAN
JHJE	2	2	0	0	QUEENS WAY BRIDGE	JAPAN
JJKQ	12	12	0	0	HARUNA MARU	JAPAN
JJLL	13	13	0	0	KASHU MARU	JAPAN
JKFS	4	4	0	0	JAPAN ACE	JAPAN
JKIC	1	1	0	0	HAHONE MARU	JAPAN
JNXV	14	14	0	0	AMERICA MARU	JAPAN
JPZO	7	7	0	0	GOLDEN GATE BRIDGE	JAPAN
JQXW	6	6	0	0	HIERO MARU	JAPAN
KCNX	3	3	0	0	AFRICAN METEOR	USA-FARRELL
KNBD	1	1	0	0	DELAWARE II	USA-NOAA
KRSF	8	8	0	0	WECOMA	USA
MDBE	2	2	0	0	WEATHER ADVISER	UK
MEDD	4	4	0	0	WEATHER MONITOR	UK
NAAG	22	22	0	0	GLACIER	USA-USCG
NCFX	1	1	0	0	***	USA ?
NDIT	14	13	1	0	MELLON	USA-USCG
NHNU	1	1	0	0	HUDSON	USA
NIZX	29	29	0	0	MARSHFIELD	USA
NLGA	7	7	0	0	***	USA ?
NLVS	6	6	0	0	RUSH	USA-USCG
NLWA	10	10	0	0	PVT LEONARD C BRASTROM	USA-USNS
NNUD	20	20	0	0	SILAS BENT	USA-NAVOCEANO
NRDL	11	11	0	0	INGHAM	USA-USCG
NRFJ	6	6	0	0	NORTHWIND	USA-USCG
NRUN	2	2	0	0	DURABLE	USA
NTJZ	1	1	0	0	***	USA ?
NTRI	1	1	0	0	WILKES	USA-NAVOCEANO
NYCQ	5	5	0	0	BOUTHELL	USA-USCG
NZSK	1	1	0	0	E.KANE	USA-NAVOCEANO
PACM	6	6	0	0	***	USA ?
UNAC	2	1	1	0	SHOKALSKEY	USSR
UPUI	9	9	0	0	***	USSR ?
UVMM	1	1	0	0	***	USSR ?
UZGH	3	3	0	0	PASSAT	USSR
VP415	1	1	0	0	AIRCRAFT SQUADRON	CANADA
WMRJ	7	7	0	0	MORMAC VEGA	USA-MOORE MCCORMACK
WMRU	2	2	0	0	MORMAC LYNX	USA-MOORE MCCORMACK
WMVF	3	3	0	0	ALBATROSS IV	USA-NOAA
WNCU	7	7	0	0	GLOMAR CHALLENGER	USA-SCRIPPS
WTEF	4	4	0	0	RAINIER	USA-NOAA
WWPI	12	12	0	0	PRESIDENT VAN BUREN	USA-AMERICAN PRESIDENT
5MCB	3	3	0	0	PACMERCHANT	USA
6ZFW	1	1	0	0	PACSTAR	USA
BATHYS	467	0	0	0	TOTAL BATHYS REC'D	
IGBATHY	467	0	0	0	TOTAL IGOSS BATHYS REC'D	
ITESAC	2	0	0	0	TOTAL IGOSS TESACS REC'D	
TESACS	2	0	0	0	TOTAL TESACS REC'D	
TOTALS	469	0	0	0	TOTAL OF ALL REPORTS REC'D	
CWPFXX	1	1	0	0	SENT FROM CWPF * NO CALL SIGN	
KNWCXX	35	35	0	0	SENT FROM KNWC * NO CALL SIGN	
KSANXX	1	1	0	0	SENT FROM KSAN * NO CALL SIGN	
KWBCXX	1	1	0	0	SENT FROM KWBC * NO CALL SIGN	
RJTDXX	19	19	0	0	SENT FROM RJTD * NO CALL SIGN	
XXXX	57	57	0	0	NO SHIP CALL SIGN REC'D	

Figure 2. Edited weekly summary.

BATHYTHERMOGRAPH (BATHY) AND TEMPERATURE/SALINITY (TESAC) REPORTS RECEIVED BY THE NATIONAL WEATHER SERVICE IN 1979

Compiled by John J. Kundrat, Jr.

The National Weather Service wishes to acknowledge the following ships for providing BATHY and TESAC observations from the world oceans to the National Meteorological Center (NMC). The number of observations received from each ship, from January through December 1979, is listed below.

It is requested that any discrepancies between the number of BATHY's or TESAC's listed (received at NMC) and the number transmitted by a ship be reported to:

Chief, Oceanographic Services Branch (W161)
8060 13th Street
Silver Spring, MD 20910
(301) 427-7278

Anyone wishing information on the BATHY/TESAC program, in terms of participation or data availability, may contact the same address.

Ship Call Sign	Ship Name	Country	Bathy's Recvd. by NMC	Tesac's Recvd. by NMC
AAAA	USCG Oceanographic Unit	USA	40	
A8SL	Pacduke	USA	5	
A8VI	Pacduchess	USA	98	
A8WW	Korean Fir	USA	15	
A8YI	Pacbaron	USA	28	
CGBR	Vancouver	Canada	955	
CGBV	Dawson	Canada	6	72
CGDG	Hudson	Canada		44
CGDN	Quadra	Canada	757	
CYQD	Quappelle	Canada	2	
C7L	Ocean Station Lima	UK	306	
C7M	Ocean Station Mike	Netherlands	120	
C7P	Ocean Station Papa	Canada	168	
C7R	Ocean Station Romeo	France	322	
DBBH	Meteor	FRG	207	
DBFB	Gauss	FRG	59	
DBFK	Heincke	FRG	4	
DBFP	Walther Herwig	FRG	40	
DBFR	Anton Dohrn	FRG	282	
DCL	Fehmarnbelt-Feuerschiff	FRG	232	
DECC	Carib	FRG	1	
DGHR	Seefalke	FRG	1	
DGSR	Columbus Tasmania	FRG	43	
DGVK	Columbus Victoria	FRG	202	
DGZV	Columbus Virginia	FRG	68	
DHCW	Columbus Wellington	FRG	185	
DHFC	Seatrain Lexington	FRG	154	
DHPV	Pluvius	FRG	157	
DSCZ	Planet	FRG	2	
ELCE	Esso Carribean	USA	6	
ELEC	Marcona Explorer	USA	151	
ELXF	Korean Pride	USA	46	
EREA	Monsoon	USSR	280	53
EREB	Volna	USSR	159	118
EREC	Prylyv	USSR	231	182
EREH	Priboi	USSR	183	119
EREI	Ocean	USSR	172	110
ERES	Bugaev	USSR	313	205
ERET	George Oushakov	USSR	387	93
EREU	Ernst Krenkel	USSR	353	296
ESGU	Percy 3	USSR		22
EWVW	Kara-Dag	USSR	3	
FNBA	Cryos	France	35	
FNBG	Capricorne	France	3	47
FNCW	Rousseau	France	35	
FNDF	Cezanne	France	4	
FNEJ	France I	France	144	
FNEL	France II	France	128	
FNIB	Thalassa	France	11	
FNOY	Jean Charcot	France	27	
FNRZ	Nickel I	France	1	
FNXE	Rodin	France	30	
FPERL	Fanning Island	USA	38	
GLNE	Discovery	UK	288	
GNAM	Cirolana	UK	33	
GOOB	Dart America	UK	3	
GOVM	Dilkara	UK	10	
GULL	Miranda	UK	34	
JBES	Yamashin Maru	Japan	328	
JBOA	Keifu Maru	Japan	43	
JCFU	Golden Arrow	Japan	81	
JCZF	Hotaka Maru	Japan	74	
JDBD	Beishu Maru	Japan	32	
JDOC	Hiei Maru	Japan	126	
JDRP	Takuyo	Japan	28	
JEMM	Asia Maru	Japan	220	
JFZG	Hakusan Maru	Japan	289	
JGFM	Pacific Arrow	Japan	312	
JGZK	Ryofu Maru	Japan	181	
JHJE	Queens Way Bridge	Japan	220	
JJKQ	Haruna Maru	Japan	281	
JJLL	Kashu Maru	Japan	319	
JKFS	Japan Ace	Japan	328	
JKIC	Hahone Maru	Japan	160	
JNEJ	Japan Teak	Japan	1	
JNXV	America Maru	Japan	238	
JPVB	Seifu Maru	Japan	55	
JPZD	Golden Gate Bridge	Japan	237	
JQXW	Hieru Maru	Japan	274	
KCMV	African Comet	USA	2	
KCNX	African Meteor	USA	27	
KGKV	Texaco New York	USA	5	
KHPV	Seatrain Princeton	USA	1	
KJCL	Gyre	USA	68	
KNBD	Delaware II	USA	77	
KPZK	Californian	USA	51	
KRDH	President Fillmore	USA	4	
KRSF	Wecoma	USA	269	
KSBG	Arco Juneau	USA	11	
KSVE	Hawaiian Queen	USA	128	
LOIO	Islas Orcadas	Argentina	29	9
LOPP	Bahia Aguirre	Argentina	14	
MDBE	Weather Advisor	UK	220	
MEDD	Weather Monitor	UK	219	
NAAO	Glacier	USA	255	
NAQD	Jarvis	USA	76	
NBAD	Bartlett	USA	19	
NBLM	Potomac	USA	1	
NBTM	Polar Star	USA	105	
NDIS	Neches	USA	9	

Figure 3a.

Ship Call Sign	Ship Name	Country	Bathy's Recvd. by NMC	Tesac's Recvd. by NMC
NDIT	Mellon	USA	91	2
NDWA	Morgenthau	USA	48	
NENC	Sealift Pacific	USA	5	
NFKQ	Sealift Arabian Sea	USA	58	
NGDF	Munro	USA	104	
NHNU	Hudson	USA	101	
NHOP	Navasota	USA	35	
NHWR	Midgett	USA	153	
NIKA	Sealift Atlantic	USA	182	
NIZX	Marshfield	USA	63	
NJOR	Gallatin	USA	76	
NJPJ	Reliance	USA	2	
NJTH	Shoshone	USA	33	
NLKL	Westwind	USA	79	
NLPM	Chase	USA	3	
NLVS	Rush	USA	9	
NLWA	Bradstrom	USA	159	
NMAG	Hamilton	USA	68	
NMMJ	Sherman	USA	19	
NNHA	Acushnet	USA	149	
NNUD	Silas Bent	USA	123	
NOSP	Vigorous	USA	16	
NRDC	Campbell	USA	102	
NRDL	Ingham	USA	155	
NRDT	Taney	USA	79	
NRFJ	Northwind	USA	48	
NRUN	Durable	USA	2	
NRUO	Polar Star	USA	52	
NRXD	Evergreen	USA	96	34
NSNF	Maumee	USA	6	
NSTF	Steadfast	USA	1	
NTRI	Wilkes	USA	565	
NTUG	American Explorer	USA	44	
NUOP	Yukon	USA	19	
NYCQ	Boutwell	USA	65	
NYGG	Chauvenet	USA	62	
NZSK	Kane	USA	156	
ORXA	Recteur Du Buission	France	3	
PBVQ	Cumulus	Netherlands	127	
SNSP	Wieczno	Poland	17	
TFEA	Bjarni Saemundsson	Iceland	54	
TFJA	Arni Fridriksson	Iceland	4	
UBLF	Kurchatov	USSR	16	28
UEGV	Prof. Derugyn	USSR	53	
UHMO	Aliot	USSR	47	
UHQS	Academic Korolev	USSR	141	160
ULYN	Vernadsky	USSR	57	41
UMAY	Academic Shirshov	USSR	239	232
UMFW	Prof. Zubov	USSR	239	61
UMWZ	Mirny	USSR	2	2
UNAC	Shokalskey	USSR	351	339
UQIH	Lomonosov	USSR	113	92
UREU	Ossipenko	USSR		1
UYWH	Belogorsk	USSR	55	
UZGH	Passat	USSR	402	182
VJZJ	Yarra	Australia	15	
VKLB	Hobart	Australia	75	
VKLC	Brisbane	Australia	47	
VLAA	Allunga	Australia	3	
VLNB	Torrens	Australia	118	
VPO1	Aircraft Squadron	USA	20	
VPO6	Aircraft Squadron	USA	10	
VP19	Aircraft Squadron	USA	2	
VP26	Aircraft Squadron	USA	1	
VP31	Aircraft Squadron	USA	3	
VP40	Aircraft Squadron	USA	2	
VP415	Aircraft Squadron	Canada	9	
VP44	Aircraft Squadron	USA	2	
VP46	Aircraft Squadron	USA	16	
VP47	Aircraft Squadron	USA	10	
VP48	Aircraft Squadron	USA	1	
VP50	Aircraft Squadron	USA	2	
VP69	Aircraft Squadron	USA	1	
VP91	Aircraft Squadron	USA	1	
VWNK	Darshak	India	57	
VXN	Aircraft	USA	332	
WCGN	Chevron California	USA	81	
WCIO	Arco Anchorage	USA	20	
WEZA	Austral Lighting	USA	82	
WEZP	Austral Rainbow	USA	140	
WEZT	Austral Moon	USA	46	
WLRL	President Truman	USA	1	
WMRG	Mormac Argo	USA	3	
WMRJ	Mormac Vega	USA	15	
WMRU	Mormac Lynx	USA	37	
WMSD	Mormac Draco	USA	58	
WMSF	Mormac Rigel	USA	1	
WMSM	Mormac Altair	USA	47	
WMVF	Albatross IV	USA	147	
WNCU	Glomar Challenger	USA	103	
WNKP	Manuawili	USA	257	
WTDF	Cromwell	USA	424	
WTDK	David Star Jordan	USA	32	
WTDM	Miller Freeman	USA	24	
WTEA	Discoverer	USA	164	
WTEB	Fairweather	USA	9	
WTEF	Rainier	USA	4	
WTEG	Mount Mitchell	USA	59	
WTEP	Oceanographer	USA	222	
WTER	Researcher	USA	693	
WTES	Surveyor	USA	10	
WVFQ	Endeavor	USA	26	
WVFZ	President McKinley	USA	34	
WWPI	President Van Buren	USA	56	
WXBR	Chevron Mississippi	USA	55	
WY4621	Cabrillo	USA	1	
WZY9373	Prospector	USA	1	
XCWU	Dragaminas	Mexico	80	
XCYT	Mariano Matamoroz	Mexico	2	
5LFX	Pacbaroness	USA	14	
5MCB	Pacmerchant	USA	29	
6ZDG	Marina	USA	1	
6ZFW	Pacstar	USA	39	
6ZKG	Lake Berryessa	USA	68	
8JNZ	Kofu Maru	Japan	108	
9VAJ	Seatrain Trenton	USA	118	

UNIDENTIFIED SOURCES

Argentina	14	
Australia	2	7
Canada	109	194
UK	66	1
France	13	
FRG	89	
Japan	1500	
South Africa	42	
USSR	1989	1696
USA	1663	42

DATA TOTALS—1979

BATHY	TESAC	TOTAL
27,457	4,484	31,941

Figure 3b.

IGOSS STATISTICAL EVALUATION SHEET

NATIONAL CENTRE: KWBC Washington

MONTH: December

COUNTRY: USA

YEAR: 1979

INPUT

Data input consists of all data collected from coastal radio stations and entered on to the GTS.

GTS Centre	BATHY	TESAC	BUOY
KWBC	1393	2	0

OUTPUT

Data output consists of all data received by the telecommunication centre from other GTS centres.

GTS Centre	BATHY	TESAC	BUOY
CWPF	28		
EDZW	25		
EGRR	153		
RJTD	61		
RUHB	71	3	
RUML	13		
RUMS	109		
SABM	3		
Total Output	463	3	0

Figure 4.

SLIP

Document Begin - BB

Primary	Secondary
clear folder	

SLIP-BB-CACI

```
SOVJ10 RLML 201600 1904
*JJXX 20129 1600/ 33026 03938 02004 40220 88888 00247 40242 60231 90218 99901 20203 50186 80176 99902 00172-UPUI
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SOVJ10 RLML 201200 1907
*JJXX 20129 1200/ 32925 03806 01802 40242 88888 00253 50248 80230 99901 00224 50209 99902 00190-UPUI
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SOVJ10 RLML 200600 1911
*JJXX 20129 0600/ 32828 03645 01302 40248 88888 00248 40245 60043 80232 99901 00228 30219 60210 80205 99902 00200-UPUI
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SOVF1  EGRR 202300 2340
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*JJXX 20129 2100/ 75621 01418 12516 20083 88888 00103 10102 50101 99901 99902 10100 99903 10099 20098 30097 50096 60095
99094 99904 50093 60092-MEDD
*JJXX 20129 0200/ 75617 01344 13214 20083 88888 00103 63102 99901 99902 00101 20100 70099 99903 00098 90097 99904 00096
80095 60094-MDBE
*JJXX 20129 0900/ 75631 01501 12715 20079 88888 70095-MDBE
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00097 10096 30095 50094 60092-C7L
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*JJXX 20129 2210/ 74700 01700 88888 00129 99901 20129 40121 99902 40119 99903 00114-C7R
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SOXX1  KNWC 210000 0306
*JJXX 21129 0000/ 73014 15446 88888 00193 08191 63190 70188 80179 95167 99167 99902 01163 08163 25153 33152 40145 70135
72123 87130 99128 99126 99903 02125 10125 15123 22120 80110 97109 99107 99904 15104 27103 52100-DHPV
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99093 99904 50076-JJLL
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90029-CCCC
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99903 00101 27097 50093 99904 20085 60078-JJKQ
*JJXX 21129 0000/ 13217 16120 88888 00205 50200 99901 00200 50180 99902 20170 70165 99903 00160 50150 99904 00140 50120-
A8VI
```

Figure 5. Sample of weekly XBT listing.