SIO REFERENCE SERIES

72-7

DEEP MOORED INSTRUMENT STATION CRUISE REPORT

NORTH PACIFIC STUDY
Cruise 2
U.S.C.G.C. ACUSHNET
November 19 to December 19, 1968

University of California Scripps Institution of Oceanography

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13 ABSTRACT

The primary objectives of North Pacific Study, Cruise 2, were to moor Convair buoy ALPHA at 42°N, 172°W, and service all S.I.O. catamaran buoys.

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72-7

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NORTH PACIFIC STUDY

Cruise 2

U.S.C.G.C. ACUSHNET

November 19 to December 19, 1968

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DEEP MOORED INSTRUMENT STATION CRUISE REPORT
NORTH PACIFIC STUDY CRUISE 2
U.S.C.G.C. ACUSHNET
November 19, 1968 - December 19, 1968

The primary objectives of North Pacific Study, Cruise 2, were to moor Convair buoy ALPHA at 42°N, 172°W, and service all S.I.O. catamaran buoys. Secondary objectives are listed below:

1. Marine meteorological observations every 6 hours.
2. Upper air sounding by Weather Bureau personnel every 12 hours.
3. XBT at each buoy and every 6 hours while underway.
4. STD lowering at each buoy.
5. Hydrographic cast to 500 m at the ALPHA and BRAVO moorings. Additional casts at the discretion of the scientist in charge.
6. Assist personnel from Convair in servicing and mooring procedures, as needed.
7. Record pelagic observations as per instructions.
8. Report information from first three items in standard format by radio to Fleet Numerical Weather Central, Monterey, California.

The U.S.C.G.C. ACUSHNET departed San Diego on November 19, 1968 with the ALPHA buoy in tow. On November 23 the ALPHA buoy lost the upper section of its mast. ACUSHNET returned to San Diego, arriving on November 27. The ship topped off on fuel and water, and repairs were made on the Navigation Satellite System, radar and GDR.

The ACUSHNET departed San Diego on November 29, 1968 to service the S.I.O. buoys (p. 5). Buoy 45 (41°00.0'N, 148°02.0'W) was serviced on December 4. Both the radar reflector and the instrument mast had been

ripped out of the superstructure, leaving gaping holes. The superstructure was repaired and the instrument module serviced (p. 6, p. 7). The ship proceeded to the position of Buoy 44 (43°00.7'N, 157°20.9'W) where two expanding square search patterns were run with negative results. The ship then proceeded to Buoy 41 (42°55.1'N, 157°46.8'W) (p. 8) which was found moored, but mortally damaged. No instrumentation remained and the buoy itself was not salvagable. Photographs were taken of the damage.

It was also noted at this time that Buoy BRAVO was not on station. Buoy 39 (42°55.7'N, 158°20'W) and Buoy 42 (43°35.6'N, 157°48.6'W) were serviced on December 7. Both buoys were in generally good condition with the exception that the anemometers were not functioning. The anemometers were replaced and the instrument modules serviced. Since the weather was detereorating rapidly it was decided to proceed to Buoy 38 (42°00.0'N, 164°00.1'W). After standing by overnight waiting for the weather to moderate, this buoy was serviced on December 9. Buoy 38 was in excellent condition. The ACUSHNET returned to the cluster and serviced Buoy 40 (42°27.7'N, 158°02.0'W) on December 10. This buoy had the radar reflector missing and apparently had just run out of power. Everything except the 300 meter sensors were operational after the servicing. Since a visual sighting of buoy BRAVO had not yet been obtained, the ship proceeded to Buoys 39 and 42 so that the anemometers could be replaced. The ship then returned to the original BRAVO mooring position and began a search on course 090°T.

Buoy BRAVO was sighted visually at 43°02.9'N, 154°56.8'W approximately 130 miles east of its original position on December 11 (p. 9). The ACUSHNET remained on station near the buoy for 51 hours taking a series of navigation satellite fixes and recording 20 hourly

weather observations for intercomparison with data being telemetered by the buoy. Visual observation of buoy BRAVO showed that it was in very good condition, externally. The only damage noted was that one of the two air-sea temperature outriggers was missing. The ACANET departed the BRAVO area on December 13, and arrived in San Diego on December 19.

The objectives of the cruise were met with the following exceptions:

1. Convair buoy ALPHA was not moored.
2. Buoy 43 was not serviced since it was located too far from the planned cruise pattern and the extra time available was consumed during the unscheduled buoy BRAVO search and monitoring operation. Buoy 43 was reported on station and in good condition by a passing freighter in the middle of December, 1968.
3. No STD or hydrographic casts were made. It was decided to service the buoys as rapidly as possible while the good weather held. The nature of the winches available made these tasks very laborious and time-consuming.

Specific details and information concerning the cruise make up the remainder of the report. The reader is requested to consult the Table of Contents to locate the items of interest to him.

RECOMMENDATIONS

1. The buoy anemometers have had a high failure. Unit should be ruggedized or replaced with a tougher unit.

2. Wind velocity indicator has maximum scale of 70 knots. Suggest increasing maximum scale to 100 knots.

3. Wind direction now indicated in relative bearing. If feasible, electronically, the wind direction should be readout in True wind direction.

4. Investigate a radio transponder for the S.I.O. buoys which could be worked with the ship's ADF or some other compatible system.

5. Data camera magazine transport not sufficiently positive. Extra frames and slippage noticed. Suggest a more positive film drive mechanism be investigated.

6. Nav. Sat. problems indicate a need for replacing the punch tape programmer with an optical reader. Another desirable addition would be a "program protector" unit.

7. On several of the S.I.O. buoys it was found that nuts had loosened on instrument hold-downs in spite of lock washers. Recommend that all bolt fastenings be secured by torque wrench and further use of a product, such as, Loctite.

8. Radio transponder battery holder failed. This installation needs to be redesigned.

9. Instrument module dessicant containers are rather minimal. Suggest increasing amount of dessicant for inside the module.

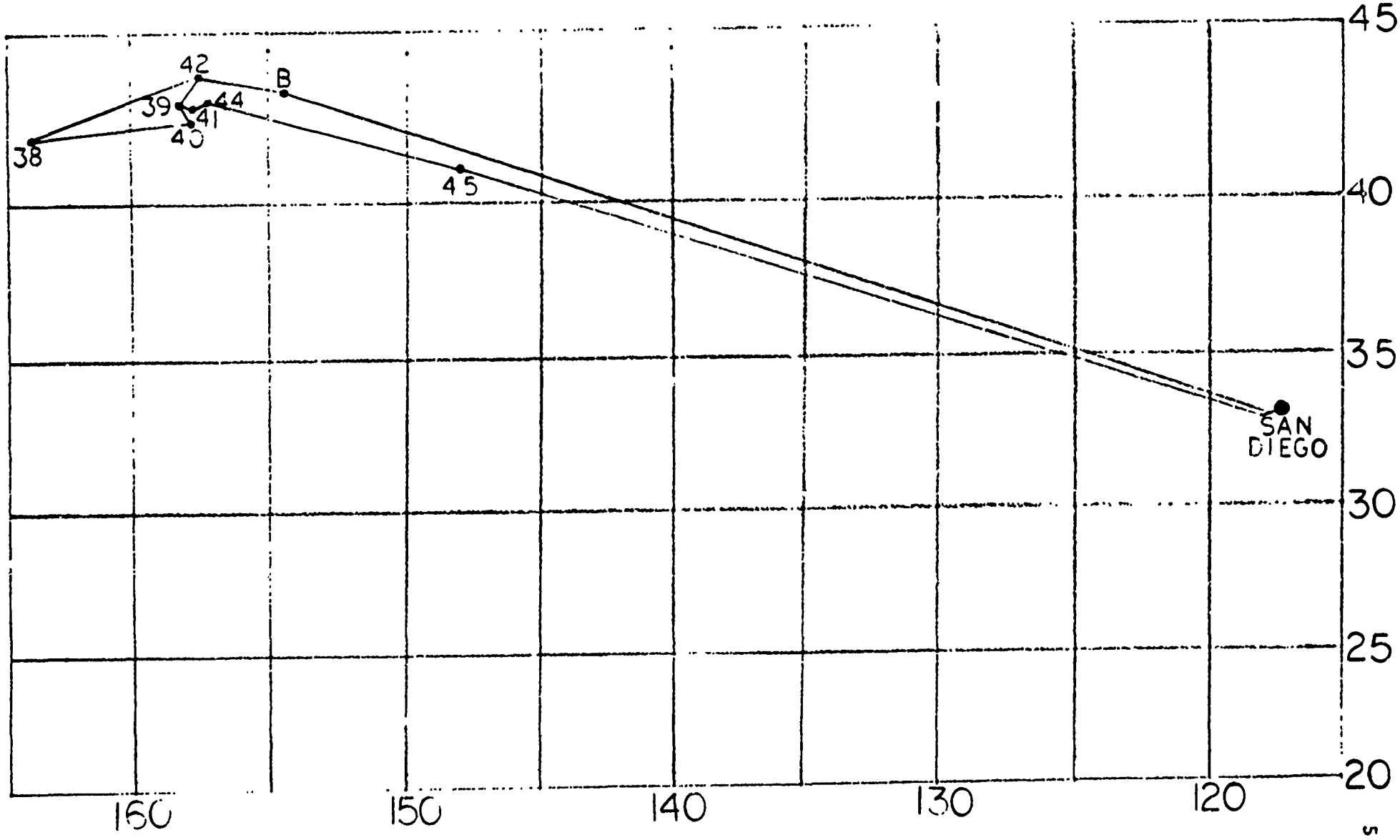
10. Patching of skin damage to S.I.O. buoys extremely difficult. Suggest carrying a thin (1/8") marine plywood and a heavy duty staple gun to make these repairs. Small tubes of RTV for a seam sealer would be useful.

11. S.I.O. buoy radar reflectors have not been demonstrably useful; further, the radar reflector on #45 is suspect in damaging the instrument mast. Recommend that radar reflectors be left off.

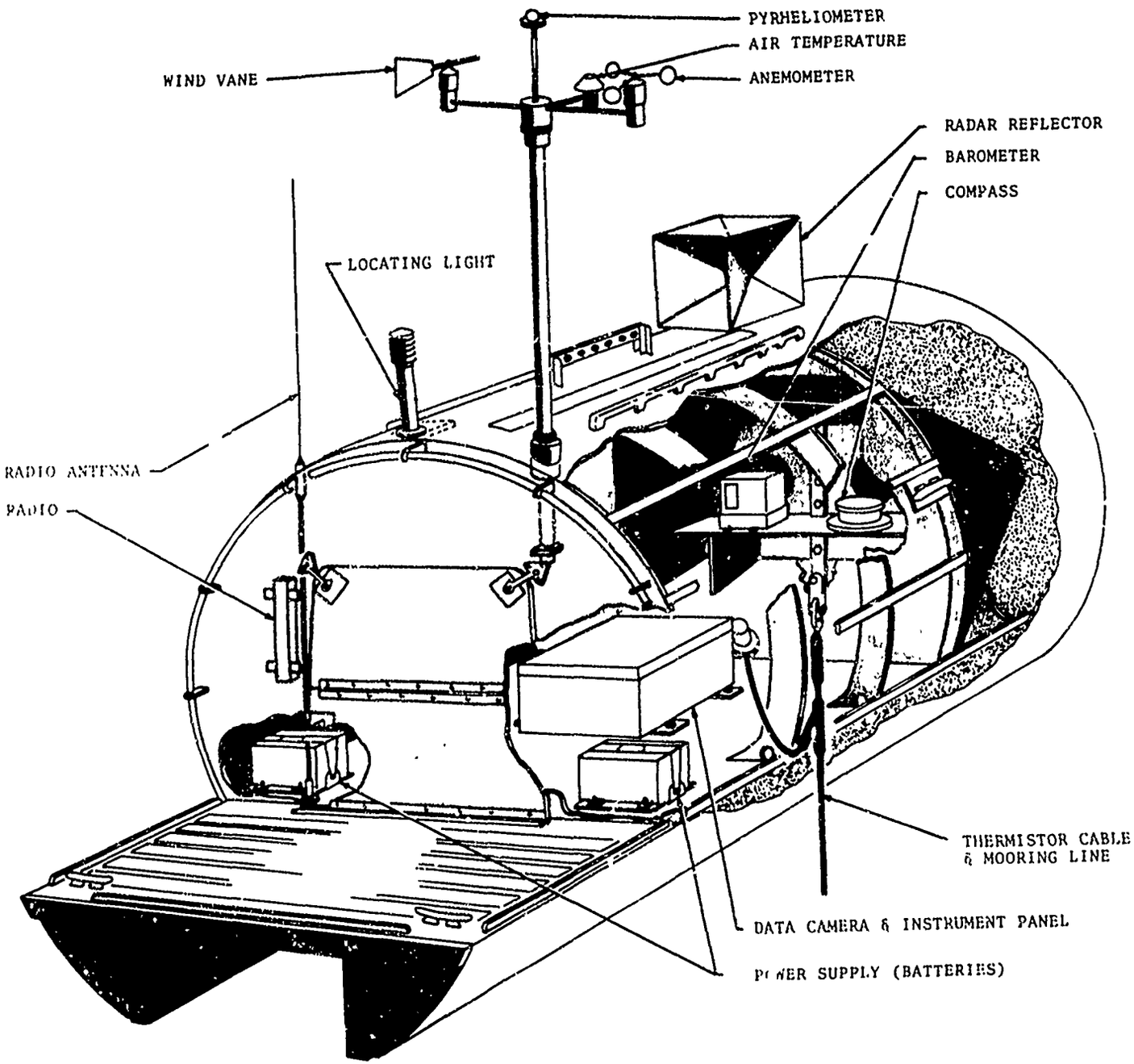
12. This cruise again demonstrated the urgent need for high speed boat davits to handle the MSB.

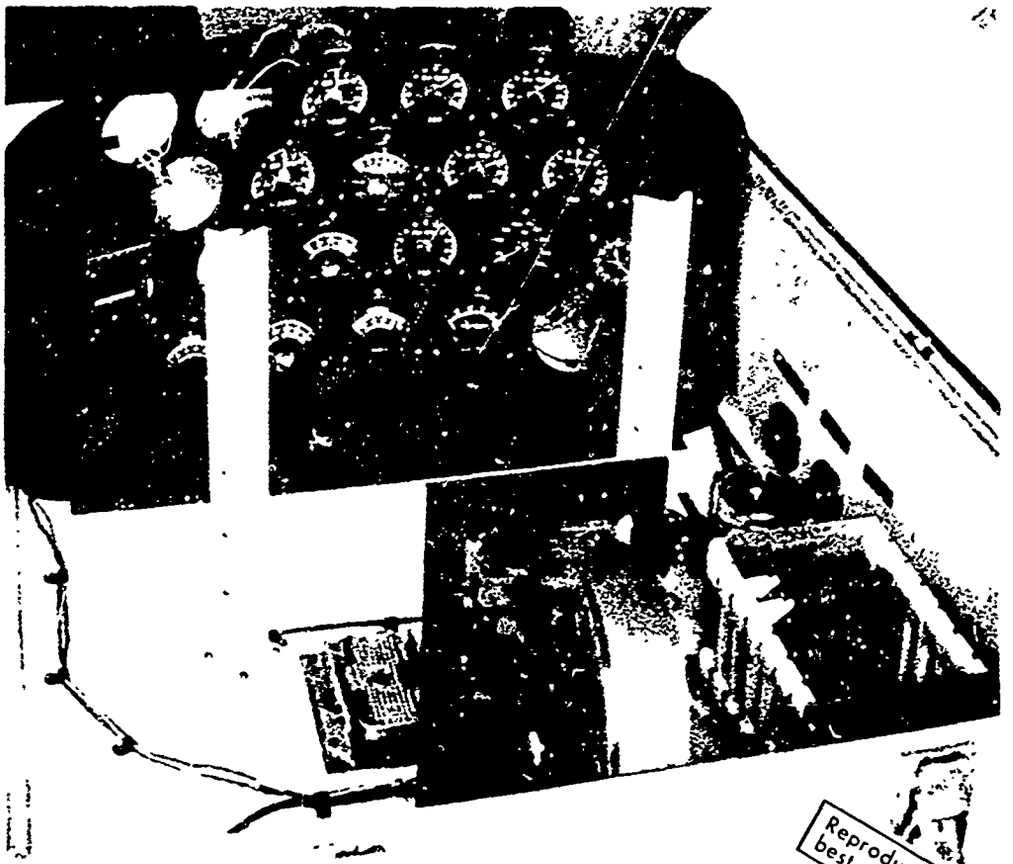
13. Anemometer now located on port side of foremast. Recommend it be relocated on starboard side to give best results while ship is on station. (Starboard is weather side on station.)

14. Radar still a problem. Suggest complete overhaul or a new radar installation.

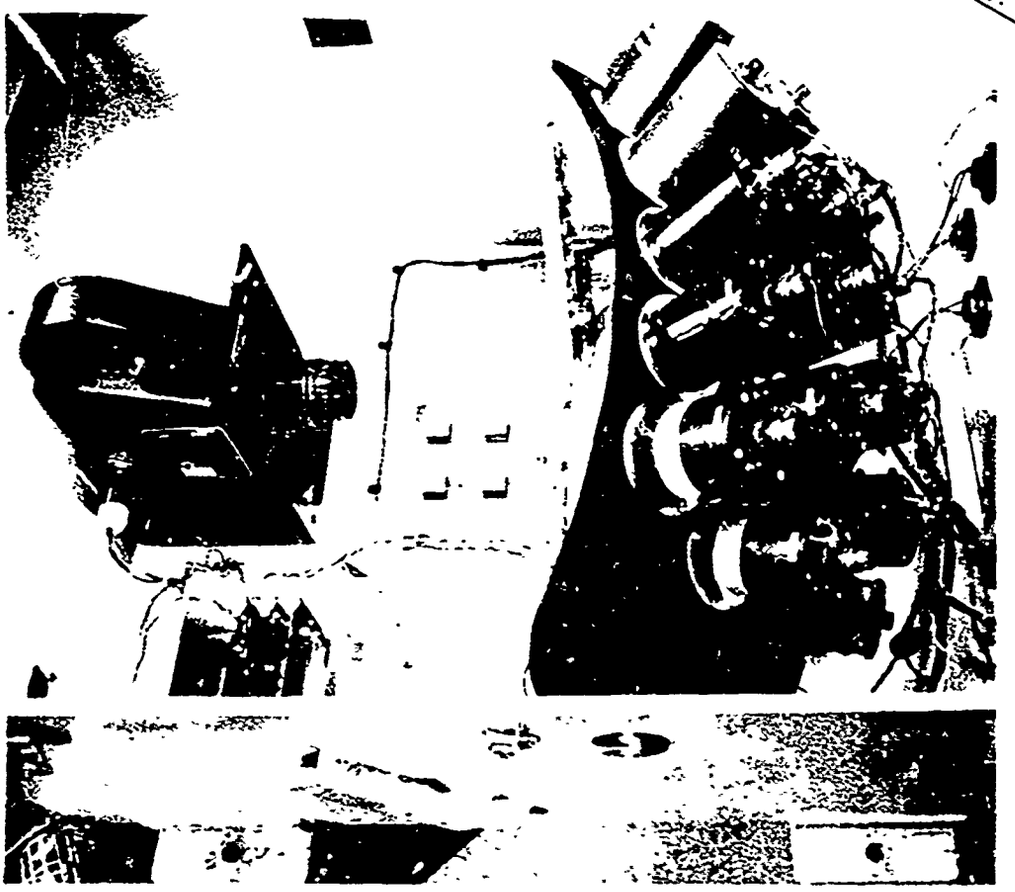


Ship's Track during NPS Cruise 2
U.S.C.G.C. ACUSHNET Nov. 19--Dec. 19, 1968

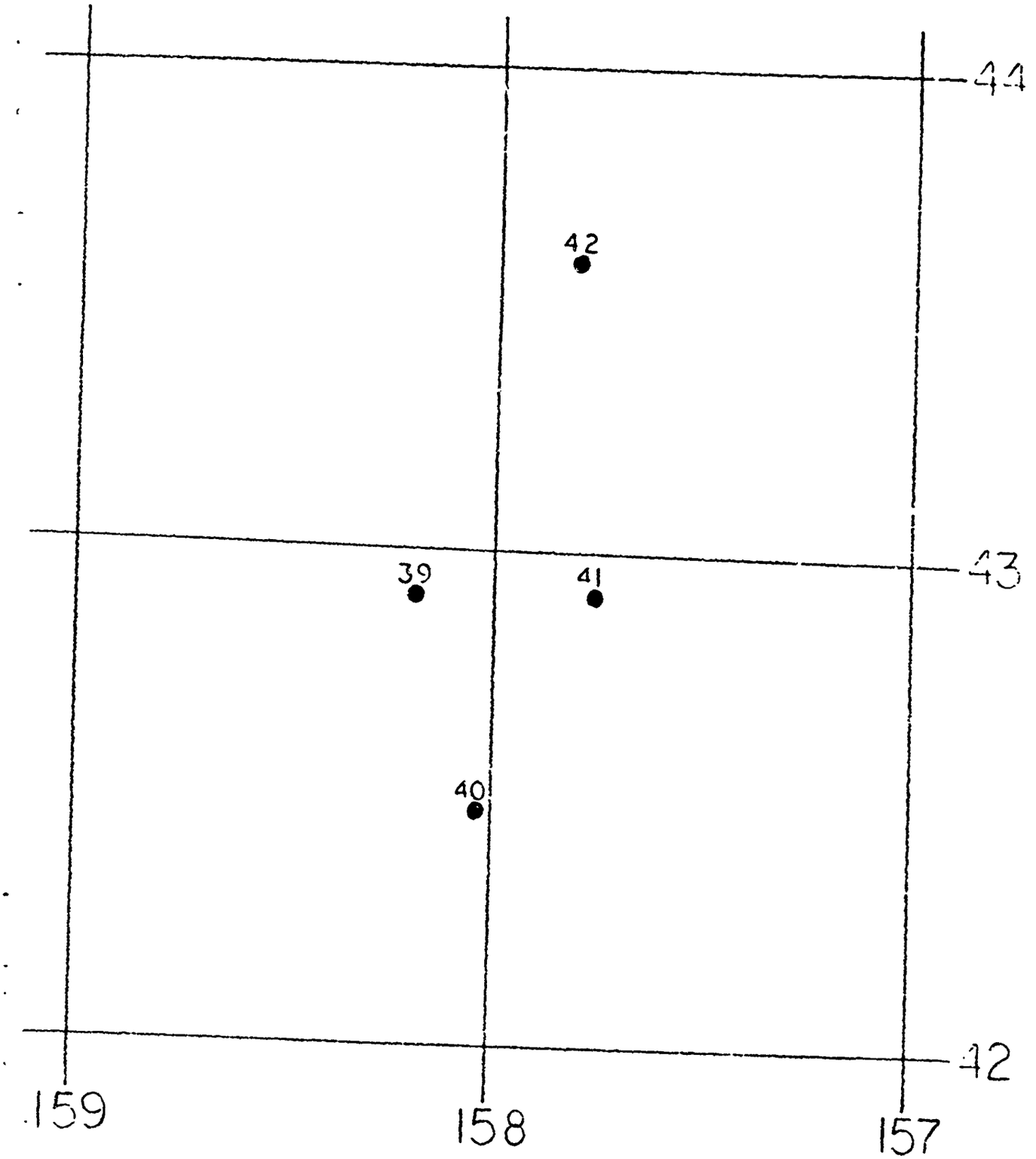

PYRHELIOMETER
AIR TEMPERATURE
WIND VANE
ANEMOMETER
RADAR REFLECTOR
BAROMETER
COMPASS
LOCATING LIGHT
RADIO ANTENNA
RADIO
THERMISTOR CABLE
& MOORING LINE
DATA CAMERA & INSTRUMENT PANEL
POWER SUPPLY (BATTERIES)



Opened instrument box showing instrument panel and panel light frames.

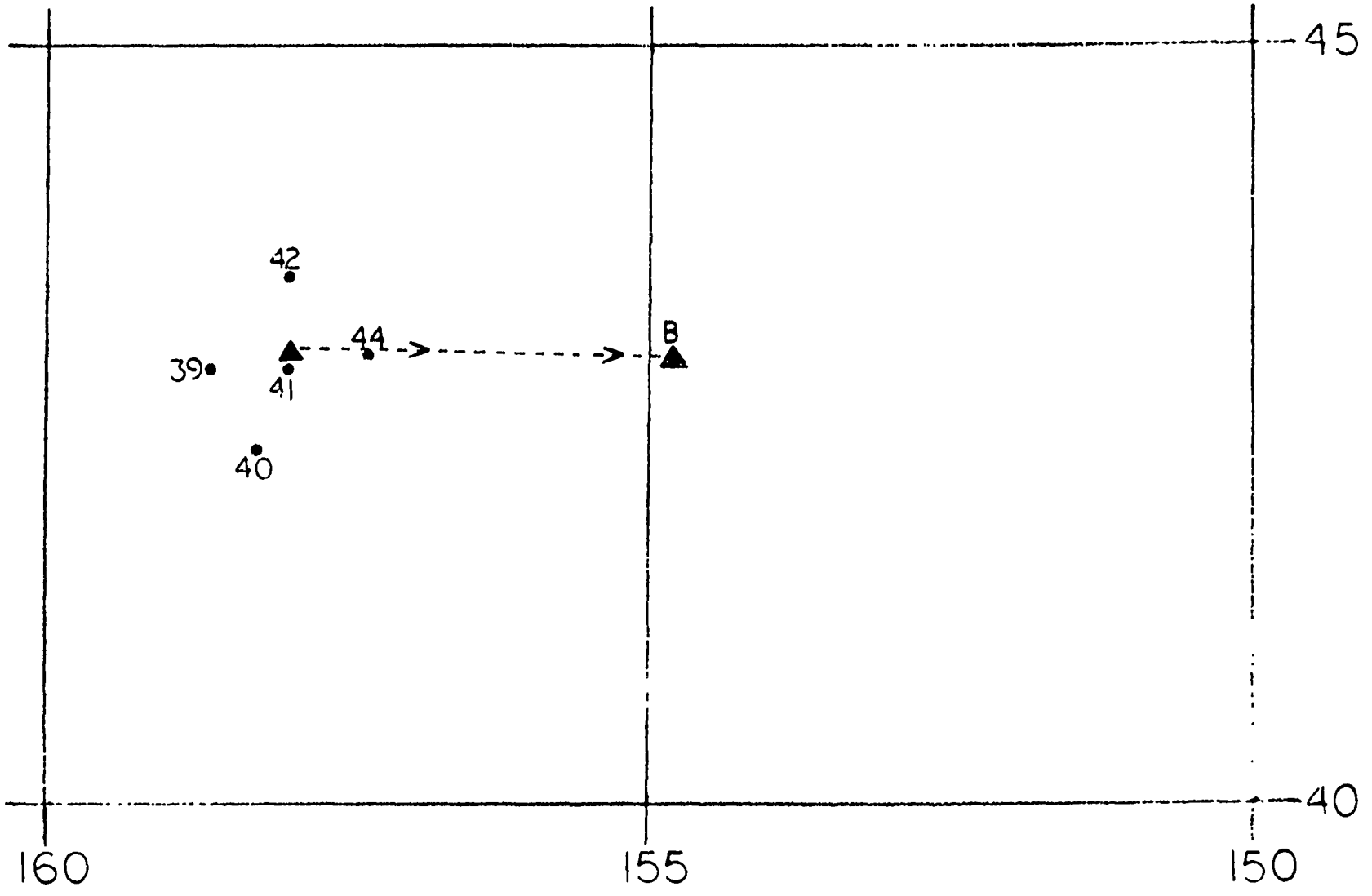


Instrument box showing camera with instrument panel tipped forward for servicing.



Locations of Buoys Within the Cluster

NPS Cruise 2



Displacement of Buoy Bravo from its Original Position During the Period
16 October 1968--11 December 1968

Mooring Position Summary

Position	Buoy No.	Installation Date	Service Date
43°35.6N 157°48.6W	42	19 Sept. 1968	07 Dec. 1968 11 Dec. 1968
43°00.7N 157°20.9W	44	20 Sept. 1968	Gone as of 06 Dec. 1968
42°27.7N 158°02.0W	40	21 Sept. 1968	14 Oct. 1968 10 Dec. 1968
35°05.0N 157°49.0W	43	27 Sept. 1968	**
42°00.0N 164°00.1W	38	09 Oct. 1968	09 Dec. 1968
42°55.7N 158°12.0W	39	11 Oct. 1968	07 Dec. 1968 10 Dec. 1968
42°55.1N 157°46.8W	41	11 Oct. 1968	07 Dec. 1968 Damaged. No instrumentation
41°00.0N 148°02.0W	45	19 Oct. 1968	05 Dec. 1968
42°58.3N 157°45.7W	BRAVO	11 Aug. 1968	24 Sept. 1968
43°02.9N* 154°56.8W	BRAVO		11 Dec. 1968 Not boarded

All positions obtained by Nav Sat except Buoy No. 43.
Buoy No. 43 position established by star fix.

*BRAVO not on original mooring site. Search located BRAVO at new position and it appears to have remoored.

**Buoy No. 43 was not scheduled for servicing during North Pacific Study Cruise No. 2.

SUMMARY OF DATA COLLECTED

1. Buoy data film retrieved:

Buoy No.	Frames of Data	Date
42	1368	12-7-68 (p. 12)
44	Buoy presumed lost	12-6-68 (p. 14)
40	1280	12-10-68 (p. 15)
43	Not serviced	
38	1488	12-9-68 (p. 18)
39	1434	12-7-68 (p. 20)
41	Instrument module missing	12-7-68 (p. 22)
45	1744	12-4-68 (p. 25)

2. Marine meteorological observations--110 (p. 29)

3. Upper air sounding--42 (p. 29)

4. XBT drops--67 (p. 30)

5. STD casts--none

6. Hydrographic casts--none

7. Pelagic observations (p. 31)
A very heavy concentration of silver dollar-sized Vellela lata was observed several times during the cruise.

8. Special observations: (p. 32)
20 marine meteorological observations were taken hourly while standing by buoy BRAVO for intercomparison with data being telemetered by the buoy.

BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 42

POSITION	INST. CASE #	DATE GMT	LAST SERVICE DATE
43° 35.1'N 157° 48.5'W	15	12-7-68 16.01 12-11-68 03.11	9-19-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
	1176	1368	GOOD	GOOD

SEA TEMP INDICATORS				
DEPTH	°C	CAL	XBT	TDS
1M	9.4		9.5	
5M	9.4		9.5	
10M	10.4		9.5	
30M	9.4		9.5	
50M	9.2		9.5	
75M	11.5		9.4	
100M	-		8.8	
150M	8.0		8.3	
300M	7.5		7.2	

SURFACE TEMP °C 9.5

SYSTEM BATTERIES PORT Ser.# STBD Ser.#

SPECIFIC GRAVITY Pos 1255 1265
Cen 1240 1268
Neg 1245 1260

ACCUTRON CLOCK
DAY 341 ERROR MIN 1- SEC 17
FAST ☑ SLOW ☐

INDICATOR	READING	LAB INDI.
WIND TRANSPORT	93182	
AIR TEMP °C	6.0	
COMPASS mag	270°	
WIND DIRECTION rel	180°	
WIND SPEED krts	INOPERATIVE	
BAROMETER mbs	1005	
150M PRESSURE psia	OPEN CIRCUIT	
LINE TENSION lbs	500	
BATTERY VOLTS load / noload	11.4	
300M PRESSURE psia	OPEN CIRCUIT	
PYRHELIOMETER	045806	Ser.# 35061
BAROMETER SENSOR	1005	
RADIO TRANSPONDER	INOPERATIVE	
TRANSPONDER BATTERY VOLTAGE	BATTERY MISSING	
LIGHT BEACON	OPERATING	
SERVICED BY:	GOULD & KELLOGG	

Instruments and components changed and serial nos. REPLACED WIND SPEED TRANSDUCER.

Sensor checks or test performed (Describe) RESERVICED BUOY ON 12-11-68

Overall condition of plugs, cables and hardware (internal & external:

Servicing notes: Buoy 42 December 7 & 10, 1968

This buoy was in good condition and the patch on the hole, caused by the ship's scuppers during launching, is strong.

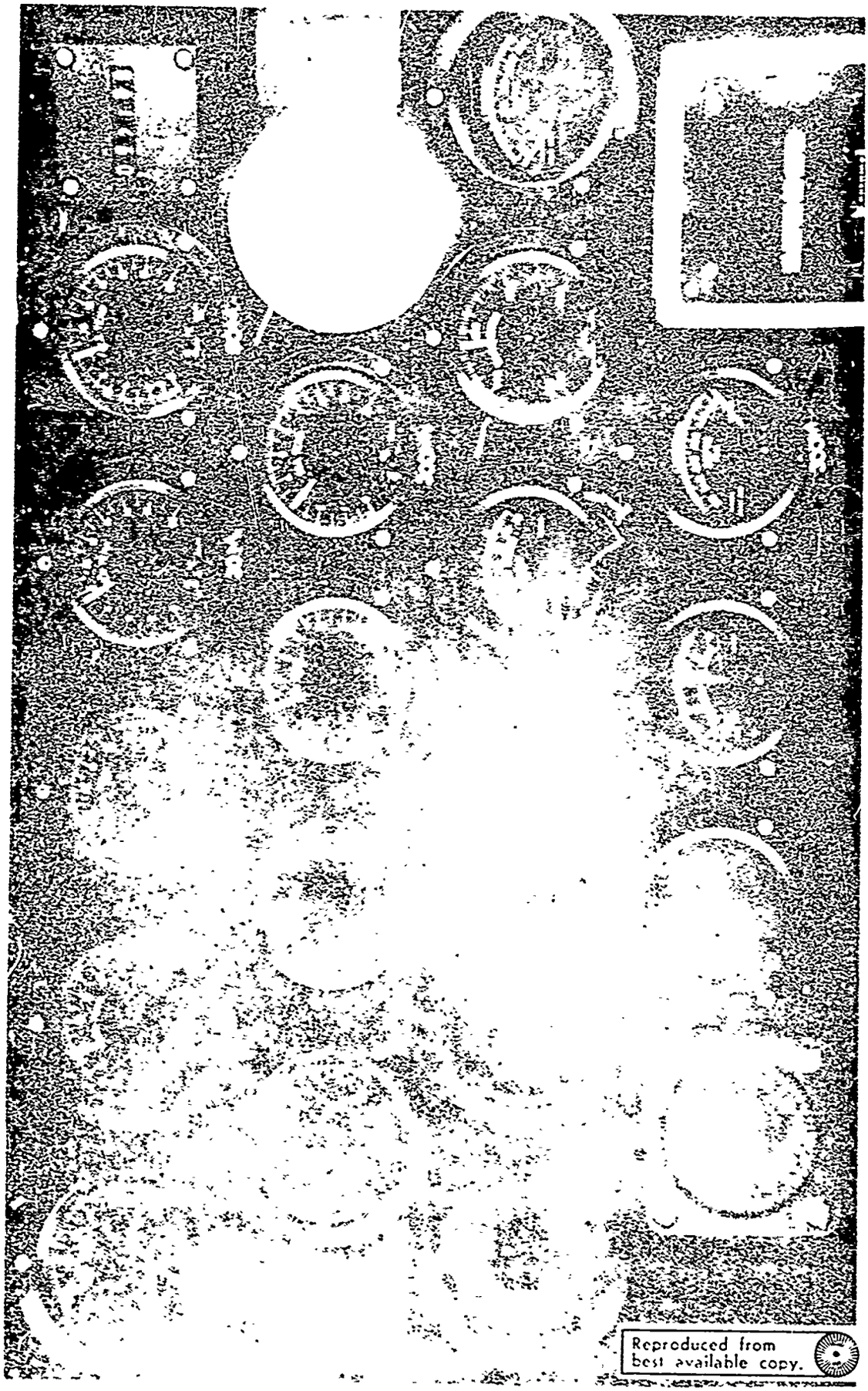
Installed new label showing position and date launched, etc.

The DF radio battery was found forward of its secured bracket and starboard of the instrument box.

During the December 7 servicing, a hail and slush storm left ice on the buoy rear deck making battery transfer more dangerous.

The wind speed and totalizer indicators were not working. Since it was found that the threads had been stripped on the weather mast set screw socket, it was impossible to install a new weather mast assembly. A new anemometer was installed on the existing weather mast assembly. The wind speed indicators were then operational.

The circuits to the 150 and 300m pressure depth transducers are open.



BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 44

POSITION	INST. CASE #	DATE GMT	LAST SERVICE DATE
43°00.7'N 157°20.9W		12-6-68 2305	9-20-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
Unable to locate after 7 hour search. Presumed lost.				

SEA TEMP INDICATORS					INDICATOR	READING	LAB INDI.
DEPTH	°C	CAL	XBT	TDS			
1M					WIND TRANSPORT		
5M					AIR TEMP °C		
10M					COMPASS mag		
30M					WIND DIRECTION rel		
50M					WIND SPEED knts		
75M					BAROMETER mbs		
100M					150M PRESSURE psia		
150M					LINE TENSION lbs		
300M					BATTERY VOLTS load / noload		
SURFACE TEMP °C					300M PRESSURE psia		
SYSTEM BATTERIES PORT Ser.# STBD Ser.#					PYRHELIOMETER		Ser.#
SPECIFIC GRAVITY Pos					BAROMETER SENSOR		
Cen					RADIO TRANSPONDER		
Neg					TRANSPONDER BATTERY VOLTAGE		
ACCUTRON CLOCK DAY ERROR MIN SEC					LIGHT BEACON		
FAST ☐ SLOW ☐					SERVICED BY:		

Instruments and components changed and serial nos. _____

Sensor checks or test performed (Describe) _____

Overall condition of plugs, cables and hardware (internal & external:

BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 40

POSITION	INST. CASE #	DATE GMT	LAST SERVICE DATE
42° 27.7' N 158° 02.0' W	10	12-10-68 1747	10-13-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
	1392	1280	SMALL 2"x3" HOLE IN HULL REPAIRED	GOOD

SEA TEMP INDICATORS					INDICATOR	READING	LAB INDI.
DEPTH	°C	CAL	BT	TDS			
1M	9.5		9.6		WIND TRANSPORT	141185	
5M	9.7		9.6		AIR TEMP °C	6.8	
10M	9.9		9.6		COMPASS . mag	090	
30M	9.3		9.6		WIND DIRECTION rel	090	
50M	9.3		9.6		WIND SPEED knts	4	
75M	9.5		9.6		BAROMETER : mbs	0 *	
100M	8.9		9.1		150M PRESSURE psia	230	
150M	4.1		8.1		LINE TENSION lbs	400	
300M	OPEN CIRCUIT		6.6		BATTERY VOLTS load noload	11.8	
SURFACE TEMP °C			9.6		300M PRESSURE psia	SHORTED XCDR	
SYSTEM BATTERIES		PORT Ser.#	STBD Ser.#		PYRHELIOMETER	070436	Ser.# 35060
SPECIFIC GRAVITY	Pos	1240	1238		BAROMETER SENSOR	1025	
	Cen	1240	1238		RADIO TRANSPONDER	INOPERATIVE	
	Neg	1237	1243		TRANSPONDER BATTERY VOLTAGE	BATTERY REMOVED	
ACCUTRON CLOCK DAY 344 ERROR MIN 6 SEC 30					LIGHT BEACON	OPERATING	
FAST [X] SLOW [ ]					SERVICED BY:	GOULD & KELLOGG	

Instruments and components changed and serial nos. REMOVED CBIC SN# 006 REPLACED WITH SN# 007

Sensor checks or test performed (Describe) POTENTIOMETER IN BAROMETER XDCR LINKAGE BROKEN. NO SPARES ON SHIP

Overall condition of plugs, cables and hardware (internal & external:

Servicing notes: Buoy 40 December 10, 1968

This buoy was found by radar before dawn even though its radar reflector was gone. The DF radio blue battery was found forward of its secured clamp with its cables still connected. It was removed. There was a small hole in the hull between Bulkheads 2 and 3 on the port side about 4 inches above the deck which was temporarily patched with a rag and black R.T.V.

This buoy was dead on our arrival but the camera frame count indicated that the power had run out only about a week before. There is a short in its circuitry somewhere, perhaps behind the panel jumper plug. This buoy at one time was set to take six minute pictures and also contains an additional indicator on the panel to check the effect of buoy motion on the other instrument meters. The power supply batteries which were removed showed a low gravity of approximately 1.238. It is suggested that a whole new instrument module be installed here.

The 300m sea temperature had an open circuit and the 300m pressure meter was pinned. The load cell indicated approximately correct but erratic line tension values.

BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 43

POSITION	INST. CASE #	DAT GMT	LAST SERVICE DATE
35° 05' N 157° 49' W	18		9-27-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
Buoy #43 NOT SCHEDULED FOR SERVICING DURING NPS Cruise #2				

SEA TEMP INDICATORS				
DEPTH	°C	CAL	XBT	TDS
1M				
5M				
10M				
30M				
50M				
75M				
100M				
150M				
300M				
SURFACE TEMP °C				

INDICATOR	READING	LAB INDI.
WIND TRANSPORT		
AIR TEMP °C		
COMPASS mag		
WIND DIRECTION rel		
WIND SPEED knts		
BAROMETER mbs		
150M PRESSURE psia		
LINE TENSION lbs		
BATTERY VOLTS load noload		
300M PRESSURE psia		
PYRHELIOMETER		Ser.#
BAROMETER SENSOR		
RADIO TRANSPONDER		
TRANSPONDER BATTERY VOLTAGE		
LIGHT BEACON		
SERVICED BY:		

SYSTEM BATTERIES PORT Ser.# STBD Ser.#

SPECIFIC GRAVITY Pos

Cen

Neg

ACCUTRON CLOCK
DAY ERROR MIN SEC

FAST ☐ SLOW ☐

Instruments and components changed and serial nos. _____

Sensor checks or test performed (Describe) _____

Overall condition of plugs, cables and hardware (internal & external:

BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 38

POSITION	INST. CASE #	DATE	GMT	LAST SERVICE DATE
42° 00.0' N 164° 00.0' W	14	12-9-68	1800	10-9-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
	1464	1488	GOOD	GOOD

SEA TEMP INDICATORS					INDICATOR	READING	LAB INDI.
DEPTH	°C	CAL	XBT	TDS			
1M	10.6		10.8		WIND TRANSPORT	303224	
5M	10.4		10.8		AIR TEMP °C	5.9	
10M	10.6		10.8		COMPASS . mag	300°	
30M	10.5		10.8		WIND DIRECTION rel	000°	
50M	10.6		10.8		WIND SPEED knts	10	
75M	10.5		10.8		BAROMETER : mbs	1024	
100M	10.6		10.5		150M PRESSURE psia	240	
150M	8.9		9.0		LINE TENSION lbs	ERRATIC	
300M	7.7		7.6		BATTERY VOLTS load / no load	11.5	
SURFACE TEMP °C			10.8		300M PRESSURE psia	456	
SYSTEM BATTERIES		PORT Ser.#	STBD Ser.#		PYRANOMETER	56152	Ser.# 35055
SPECIFIC GRAVITY	Pos	1262	1280		BAROMETER SENSOR	1024	
	Cen	1270	1275		RADIO TRANSPONDER	INOPERATIVE	
	Neg	1264	1275		TRANSPONDER BATTERY VOLTAGE	REMOVED BATTERY	
ACCUTRON CLOCK DAY 3.1.3 ERROR MIN 16 SEC 3					LIGHT BEACON	OPERATING	
FAST ☒ SLOW ☐					SERVICED BY:	GOULD – KELLOGG	

Instruments changed and components changed and serial nos. NONE

Sensor checks or test performed (Describe) VISUAL INSPECTION OF PANEL INDICATORS

Overall condition of plugs, cables and hardware (internal & external:

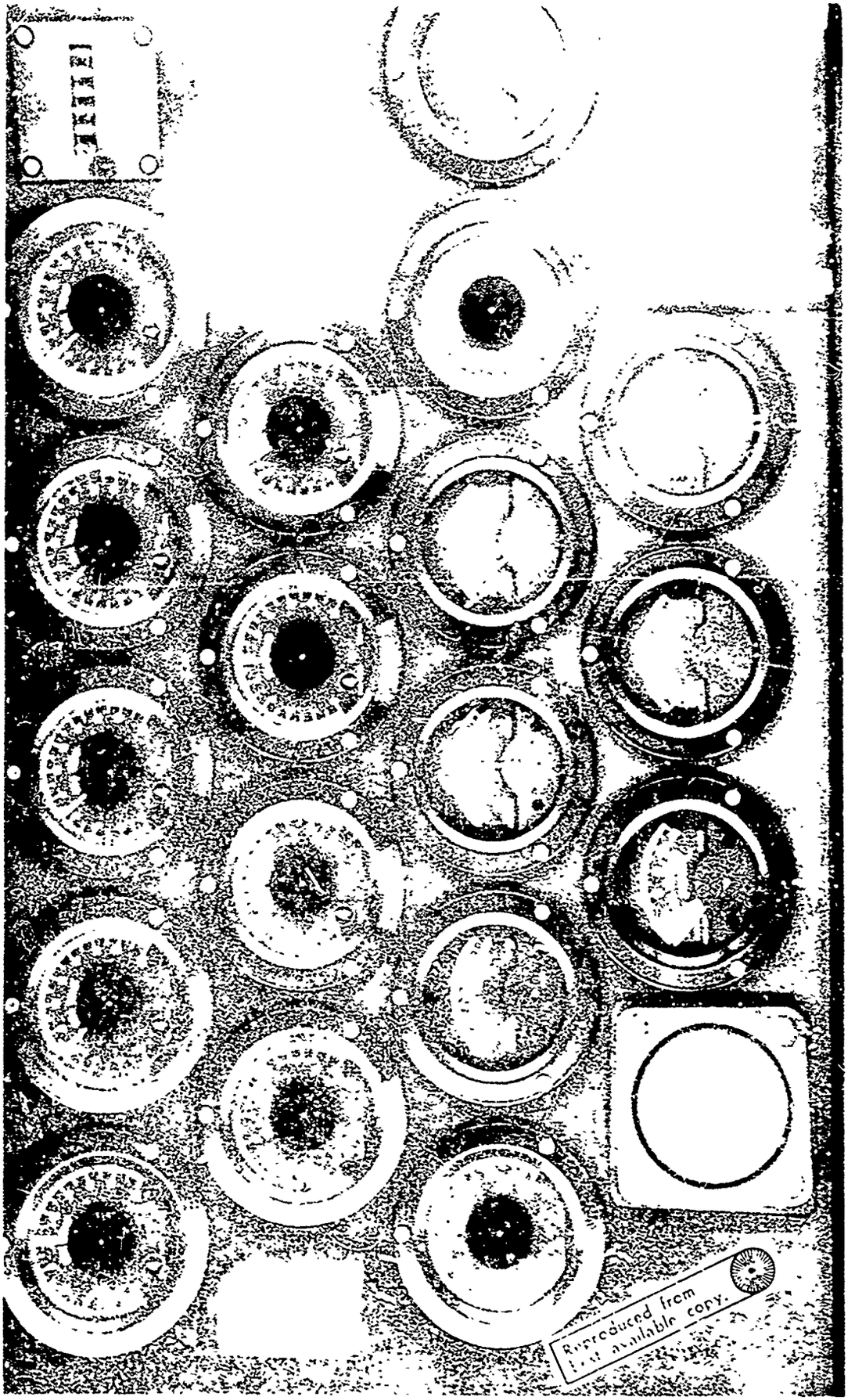
Servicing notes: Buoy 38 December 9, 1968

This buoy was in the best condition of all.

The light module was questionable and was changed. Ship's personnel reported that it did not work well during the night. The line tension readings were erratic, jumping from high to low readings. The DF radio battery was found forward of its secured bracket and on the port side of the instrument module. It was removed.

The cable clamps on the instrument lines through the bulkheads were corroded. Evidently the clips are not stainless steel.

All instrumentation with the possible exception of the load cell was operational and no meters were removed.



BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 39

POSITION	INST. CASE #	DATE GMT	LAST SERVICE DATE
42°54.5' N 158° 16.9' W	16	12-7-68 0253 12-10-68 2313	10-11-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
	1368	1434	GOOD	GOOD

SEA TEMP INDICATORS				
DEPTH	°C	CAL	XBT	TDS
1M	9.6		9.2	
5M	8.4		9.2	
10M	8.8		9.2	
30M	11.8		9.2	
50M	9.6		9.2	
75M	9.7		9.2	
100M	8.7		8.9	
150M	8.4		8.4	
300M	6.7		6.9	

SURFACE TEMP °C 9.2

SYSTEM BATTERIES PORT Ser.# STBD Ser.#

SPECIFIC GRAVITY Pos 1260 1270
Cen 1260 1270
Neg 1260 1270

ACCUTRON CLOCK
DAY ERROR MIN SEC
FAST ☐ SLOW ☐

INDICATOR	READING	LAB INDI.
WIND TRANSPORT	3669.3	
AIR TEMP °C	7.2	
COMPASS mag	120°	
WIND DIRECTION rel	310°	
WIND SPEED knts	10	
BAROMETER mbs	1014	
150M PRESSURE psia		
LINE TENSION lbs	FULL SCALE	
BATTERY VOLTS load / noload	11.8	
300M PRESSURE psia	400	
PYRHELIOMETER	136915	Ser.# 35052
BAROMETER SENSOR	1014	
RADIO TRANSPONDER	INOPERATIVE	
TRANSPONDER BATTERY VOLTAGE	BATTERY REMOVED	
LIGHT BEACON	OPERATING	
SERVICED BY:	GOULD & KELLOGG	

Instruments and components changed and seria nos. REPLACED WEATHER MAST ASSEMBLY SN# 35058 WITH MAST ASSEMBLY # 35052 BECAUSE WIND SPEED NOT OPERATING

Sensor checks or test performed (Describe) _____

Overall condition of plugs, cables and hardware (internal & external:

Servicing notes: Buoy 39 December 7 & 10, 1968

The anenometer cups and top bolt were gone, but the threads were alright. The cups were replaced, but the wind speed indicator and totalizer still did not work. On December 10, this buoy was reboarded, a new weather mast assembly was installed and these parameters are now operative. Installed instrument mast head 35052 and removed instrument mast head 35058.

The line tension meter read full scale.

The bolts on the instrument module, barometer and compass were all loose.

The DF radio battery was forward of its secured bracket with its electrolight gone.

The 1 x 1 on the rear of the deck was missing.

All cable clamps on the starboard side cables through the bulkheads were corroded.

When the new data camera was installed, its microswitch would not shut off the instrument box. Another camera had to be sent for and installed.

BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 41

POSITION	INST. CASE #	DATE GMT	LAST SERVICE DATE
42° 35' 1"N 157° 46.8' W	—	12-7-68 0110	10-11-1968

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
			BADLY DAMAGED	NONE

SEA TEMP INDICATORS					INDICATOR	READING	LAB INDI.
DEPTH	°C	CAL	XBT	TDS			
1M					WIND TRANSPORT		
5M					AIR TEMP °C		
10M					COMPASS mag		
30M					WIND DIRECTION rel		
50M					WIND SPEED Knts		
75M					BAROMETER mbs		
100M					150M PRESSURE psia		
150M					LINE TENSION lbs		
300M					BATTERY VOLTS load / noload		
SURFACE TEMP °C					300M PRESSURE psia		
SYSTEM BATTERIES PORT Ser.# STBD Ser.#					PYRHELIOMETER		Ser.#
SPECIFIC GRAVITY Pos					BAROMETER SENSOR		
Cen					RADIO TRANSPONDER		
Neg					TRANSPONDER BATTERY VOLTAGE		
ACCUTRON CLOCK DAY ERROR MIN SEC					LIGHT BEACON		
FAST ☐ SLOW ☐					SERVICED BY:	KELLOGG & HUFFEL	

Instruments and components changed and serial nos. _____

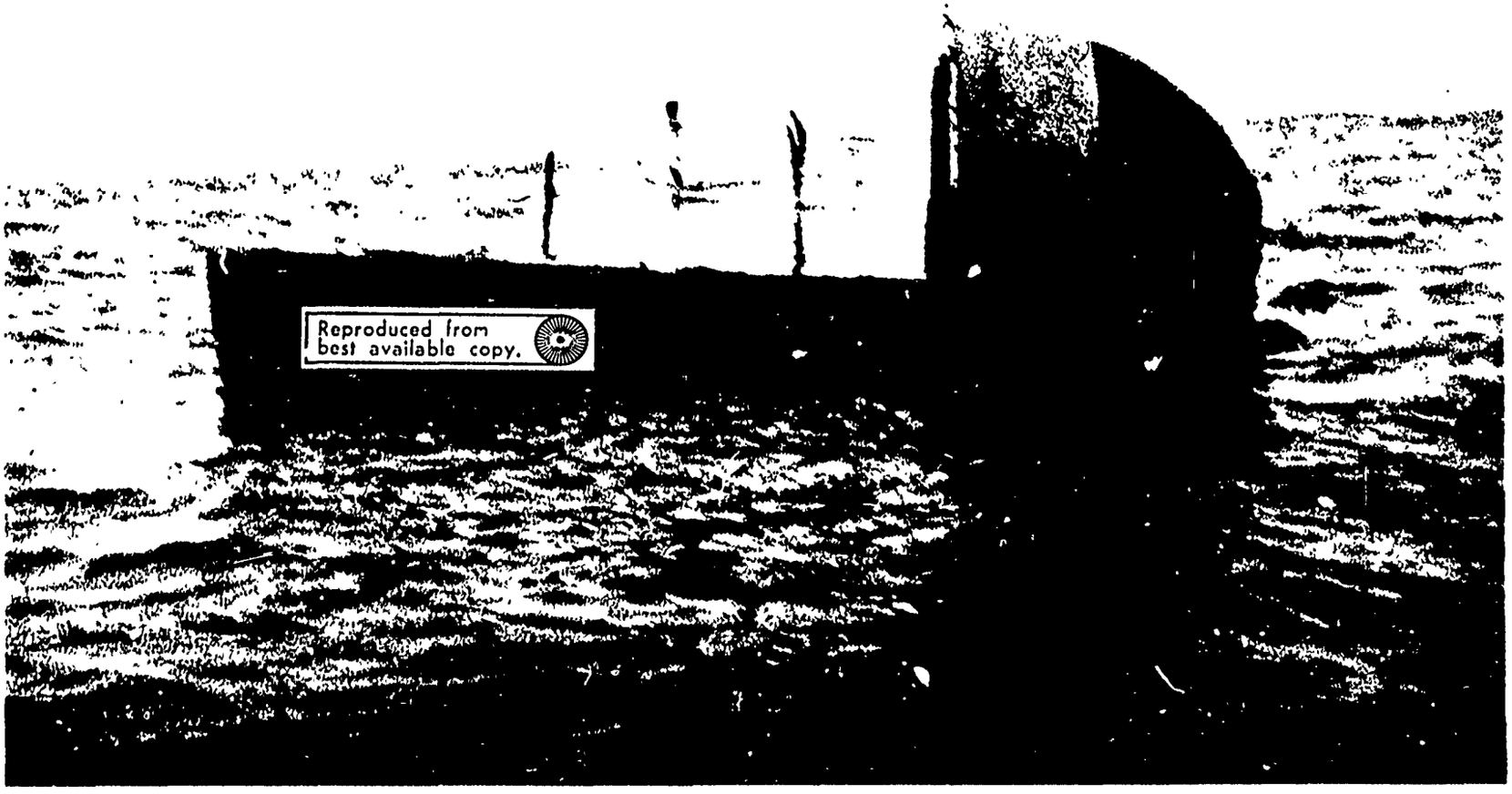
Sensor checks or test performed (Describe) _____

Overall condition of plugs, cables and hardware (internal & external:

Servicing notes: Buoy 41 December 6, 1968 (0100 Z 12/7/68)

All skin and framing around Bulkheads 2, 3, 4, and 5 were gone except port side where frame and skin sticks up about 1-1/2 feet. On the starboard side the skin was off below the water line. The complete hatch (door) was lying flat on the deck. The bow was all right with the towing eye and member in place. The portside vertical and horizontal 2 x 4's around the rear deck were gone. The 1 x 1 on the rear deck was in place on the port and starboard side but missing along the rear. The rear deck cleats were in place. On the port side, the grab rail was broken off at the butt plate and on the starboard side it was broken off clean. The instrument mast, yellow instrument mast cable and the black battery cable bitter ends were held at Bulkhead 2 on the starboard side and dangled in the water. The screw connector plug was still on the instrument line, but all other screw plugs were gone. The instrument shelf, compass transducer and barometer transducer on Bulkhead 1 were completely gone with the outward shelf brackets in place. The midship shelf bracket was missing, having been pulled from the deck. The instrument module was completely gone but the four mounting studs were in place, unbent with the threads undamaged. The nuts were gone. There was a great deal of deck abrasion where the instrument box should have been. The blue radio beacon battery bracket was smashed flat. Both main power supply battery plates were undamaged. The portside strap was intact but the starboard inboard snap was broken. The lower section of the DF radio antenna was still in place and attached to the deck. The antenna was broken at the through-hull screw connection but the threads were alright. The through-hull instrument line was intact and held by the tight friction fitting and RTV. The instrument line was still on deck.

There are about 25 Ektachrome color slides of this buoy hulk.



Station No. 41 float showing heavy damage.

BUOY SERVICE RECORD

NORTH PACIFIC STUDY

CRUISE # 2 BUOY # 45

POSITION	INST. CASE #	DATE	GMT	LAST SERVICE DATE
41° 00.0'N 148° 02.0'W	13	12-5-68	0025	10-19-68

FILM MAGAZINE FRAME COUNT	CALCULATED	ACTUAL	BUOY CONDITION	INST. CASE CONDITION
	1728	1744	WEATHER MAST-RADAR REFLECTOR STNG: SKIN DAMAGE	GOOD

SEA TEMP INDICATORS				
DEPTH	°C	CAL	XRT	TDS
1M	15 8	6		
5M	13 4	6		
10M	OPEN *			
30M	13 6	6		
50M	12.0	6		
75M	12.2	6		
100M	OPEN *			
150M	OPEN *			
300M	OPEN *			

SURFACE TEMP °C

SYSTEM BATTERIES PORT Ser.# STBD Ser.#

SPECIFIC GRAVITY Pos 1260 1275
Cen 1260 1275
Neg 1260 1075

ACCUTRON CLOCK
DAY 339 ERROR MIN 00 SEC 45
FAST ☐ SLOW ☒

INDICATOR	READING	LAB INDI.
WIND TRANSPORT	* (SEE NOTE)	
AIR TEMP °C	*	
COMPASS mag	320°	
WIND DIRECTION rel	*	
WIND SPEED knts	*	
BAROMETER : mbs	1028	
150M PRESSURE psia	*	
LINE TENSION lbs	*	
BATTERY VOLTS load / no load	11.4	
300M PRESSURE psia	*	
PYRHELIOMETER	*	Ser.#
BAROMETER SENSOR	1029	
RADIO TRANSPONDER	NON-OPERATIONAL	
TRANSPONDER BATTERY VOLTAGE	BATTERY ADRIFT	
LIGHT BEACON	NON-OPERATIONAL	REPLACED
SERVICED BY:	GOULD, KELLOGG & HUFFER	

Instruments and components changed and serial nos. * REMOVED. SEA TEMP INDICATORS OPEN CIRCUIT. METEOROLOGICAL SENSORS DESTROYED 150M/300M PRESSURE XCDR OPEN CIRCUIT LINE TENSION OPEN CIRCUIT. CB10 SN#010 FOR SN#005

Sensor checks or test performed (Describe) SEA TEMP INDICATORS CHECKED BY COMPARING OPERATIONAL THERMISTOR WITH DOUBTED INDICATOR

Overall condition of plugs, cables and hardware (internal & external:

Servicing notes: Buoy 45 December 4, 1968 (0025 Z 12/5/68)

The upper half of the door was open and the upper dogs were in the open position. There was a 9 x 20 inch hole through the forward part of the buoy roof where the radar reflector and mount had ripped away. The weather mast and bulkhead bracket had pulled out through the roof leaving a 3 x 5 inch hole from which the fibreglass mat had peeled. The yellow instrument mast line came out through this hole and trailed into the water across the rear deck starboard side. There were 2 inches of water forward in the buoy at the base of the instrument shelf at Bulkhead 2. The blue radio beacon battery was found portside rear with the 2 end electrolyte caps off and the fluid drained away. The steel battery bracket was still in the locked position and the battery had moved out from under the bracket by going forward. There were blue marks on the inside of the roof and other locations within the buoy from the flying radio battery, which had holed the slanted overhead above the barometer compass instrument shelf.

A new light beacon module was installed and the light now works. Temporary repairs were made on the roof holes using plywood, finishing nails and R.T.V. The circuit board for the pyroheliometer was removed.

There were many Vellela lata in the water around the buoy--small ones about the size of a silver dollar.

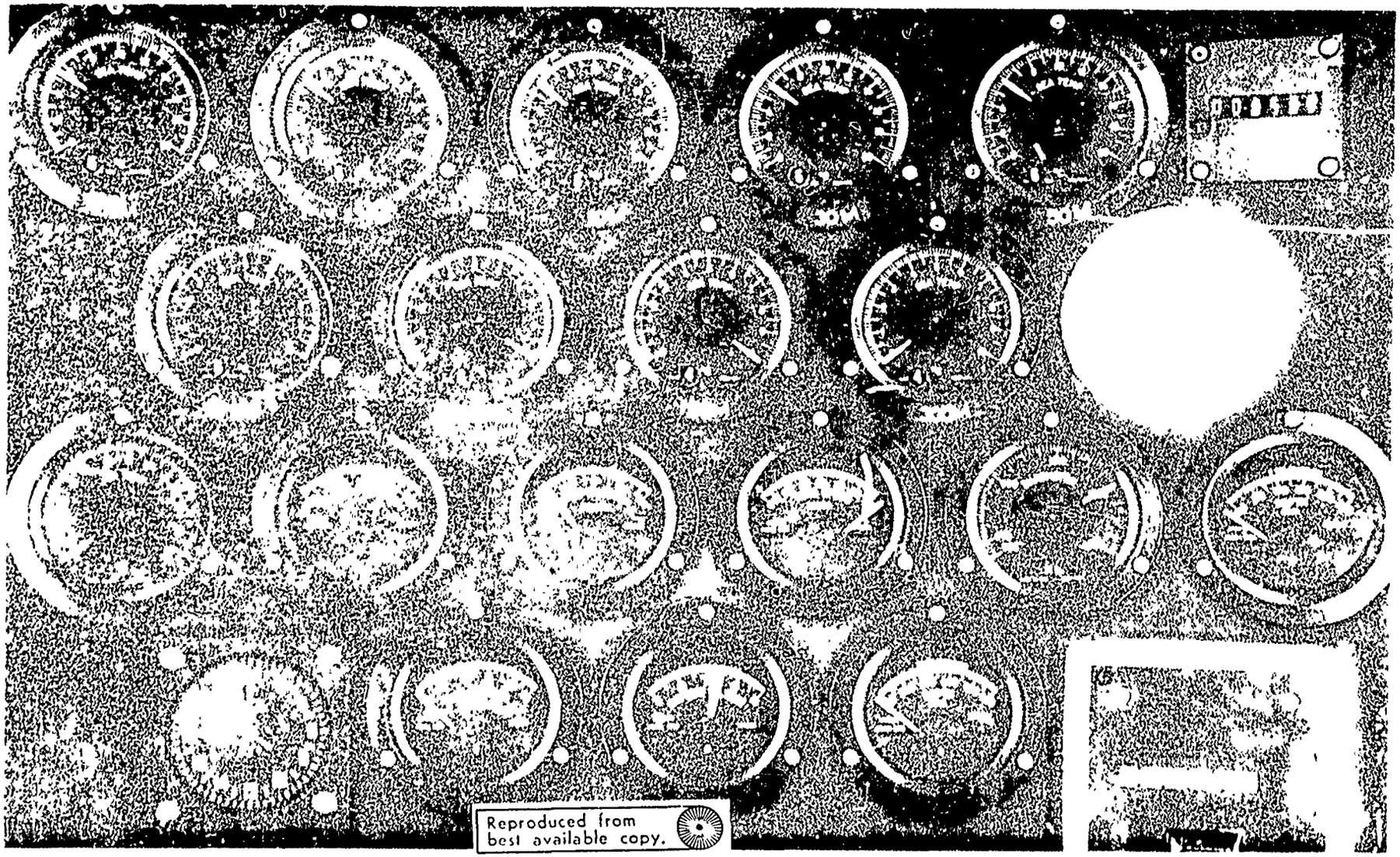
Buoy 45. Instrumentation

10, 100, 150, and 300m sea temperature indicators were removed as the circuits to the thermistors were open.

All weather mast indicators were removed because the weather mast was completely gone and could not be repaired.

The 150 and 300m pressure indicators were removed as the pressure transducer circuits were open.

The line tension indicator was removed as it was inoperative.



Carbonless paper - no carbon paper required

WB FORM 512-1A (11-66) U.S. DEPARTMENT OF COMMERCE ESSA WEATHER BUREAU

MOVING SHIP VOYAGE REPORT

1. NAME OF SHIP: USCGC Acushnet

2. HOME PORT OF SHIP: San Diego, California

TO:
Weather Bureau, W13 (Original)
Copy: Regional Headquarters
Project Supervisor
Port Supervisor
NWRC, Asheville, N.C. 28801

3. DEPARTURE

a. PORT	b. TIME	c. DATE
San Diego, Calif.	2pm	11/19/68

4. RETURN

a. PORT	b. TIME	c. DATE
San Diego, Calif.	9am	12/19/68

I. ITINERARY

AR. DATE	OTHER PORTS OF CALL	DP. DATE	AR. DATE	OTHER PORTS OF CALL	DP. DATE
11/27	San Diego, California	11/29			

II. SURFACE OBSERVATIONS

5. NUMBER OF SCHEDULED OBS. TAKEN	110	8. NUMBER OF SCHEDULED OBS. NOT TAKEN	0
6. NUMBER OF SPECIAL OBSERVATIONS TAKEN	0	a. LIST REASONS	
7. NUMBER OF OBSERVATIONS FILED LATE	0		
a. LIST REASONS			

III. RADIOSONDE

9. NUMPER OF SCHEDULED OBSERVATIONS TAKEN*	42	16. REASONS FOR TERMINATED OBSERVATIONS	NUMBER EACH
10. AVERAGE HEIGHT (m)	24301	Balloon Burst	29
11. NUMBER OF OBSERVATIONS TO BALLOON BURST	29	Fading Signal	8
12. AVERAGE BURSTING HEIGHT (m)	26370	Radiosonde Failure	3
13. NUMBER OF SPECIAL OBSERVATIONS TAKEN	0	Leaking Balloon	1
a. LIST REASONS		Chart Limitation	1
14. NUMBER OF SCHEDULED OBS. NOT TAKEN	4	17. REASONS FOR UNSUCCESSFUL RELEASES	NUMBER EACH
a. LIST REASONS Ship unable to maneuver while towing the Convair Buoy			0
15. NUMBER OF OBSERVATIONS FILED LATE	0		
a. LIST REASONS			

*Scheduled observations omitted because of proximity of ship to another observation point should not be counted as scheduled observations.

IV. REMARKS (If more space is required, use separate sheets)

18. PERFORMANCE OF BALLOONS, INSTRUMENTS, BATTERIES AND EQUIPMENT

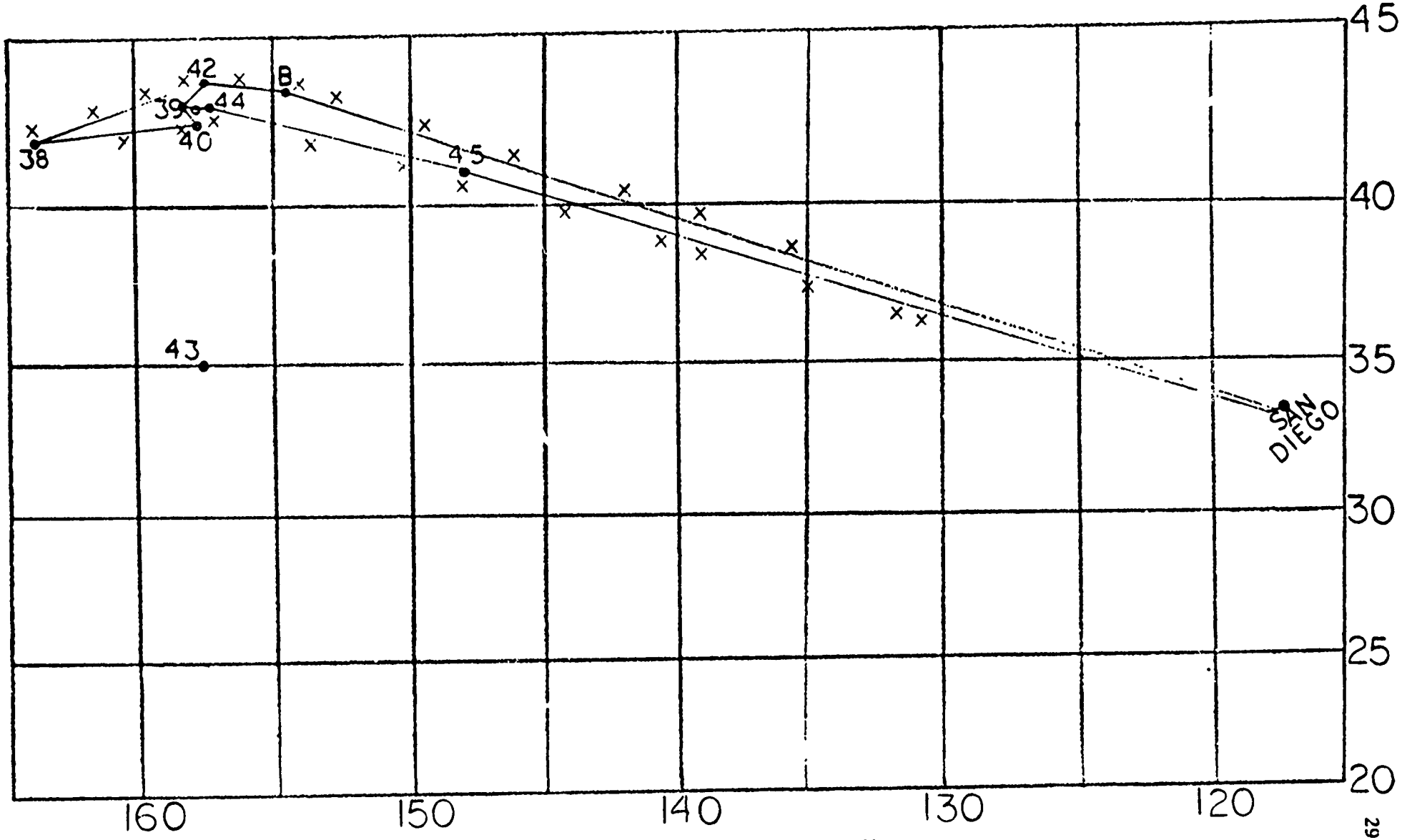
Balloons good.
Series B 403mc Instruments good, series A poor.
Batteries and ground equipment good.

19. IF ANY WEATHER BUREAU EMPLOYEE WAS INJURED, DESCRIBE BRIEFLY NATURE OF INJURY

V. OBSERVERS ABOARD SHIP

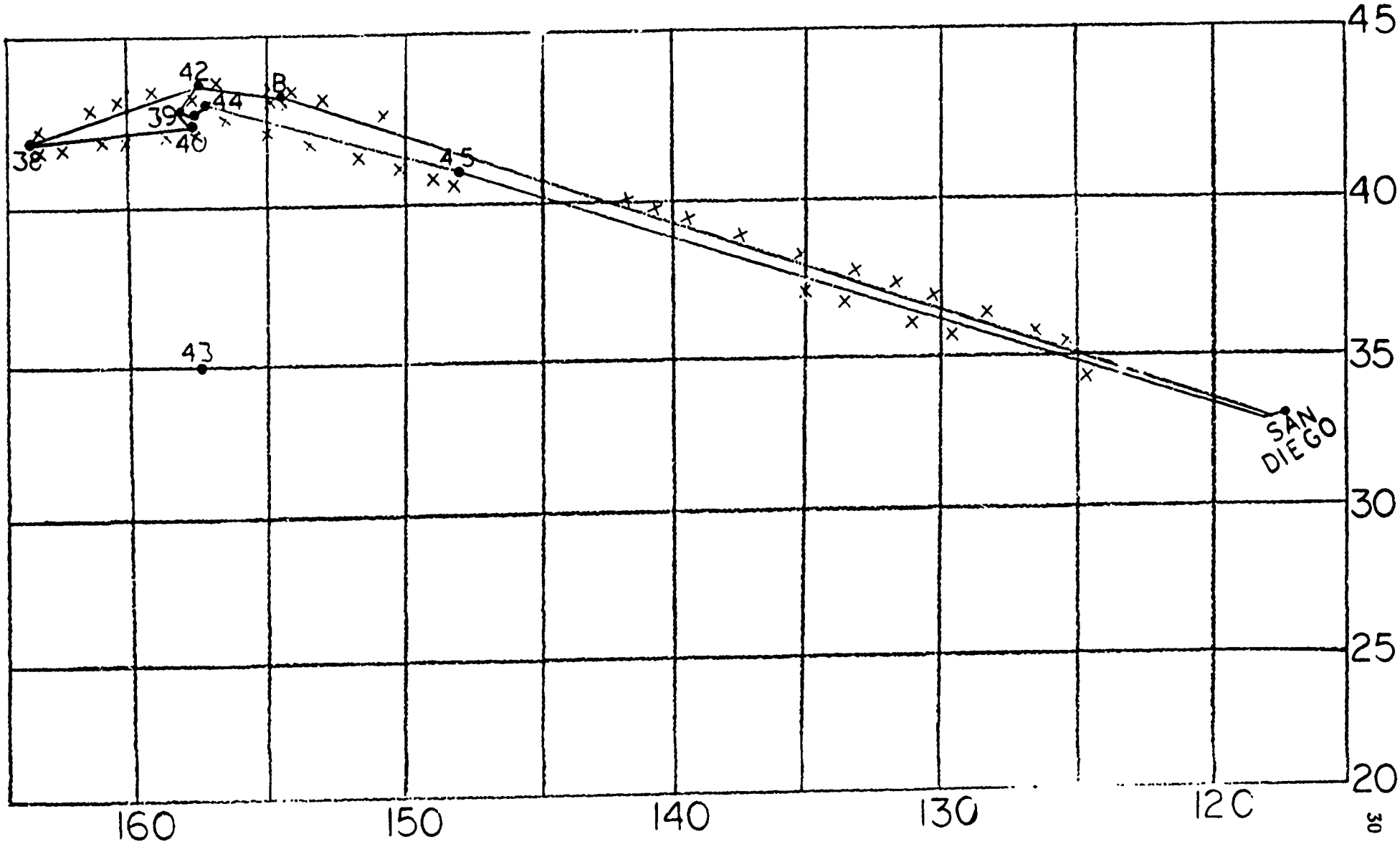
NAME	NO. OF C/T HOURS WORKED	NO. OF HOURS SICK LEAVE TAKEN
H.D. Shawley C.P. Johnson*		0
D.E. Harmon		0

20. SIGNATURE OF SHIPBOARD OFFICIAL IN CHARGE	21. DATE PREPARED	22. SIGNATURE OF PORT SUPERVISOR
	12/19/68	



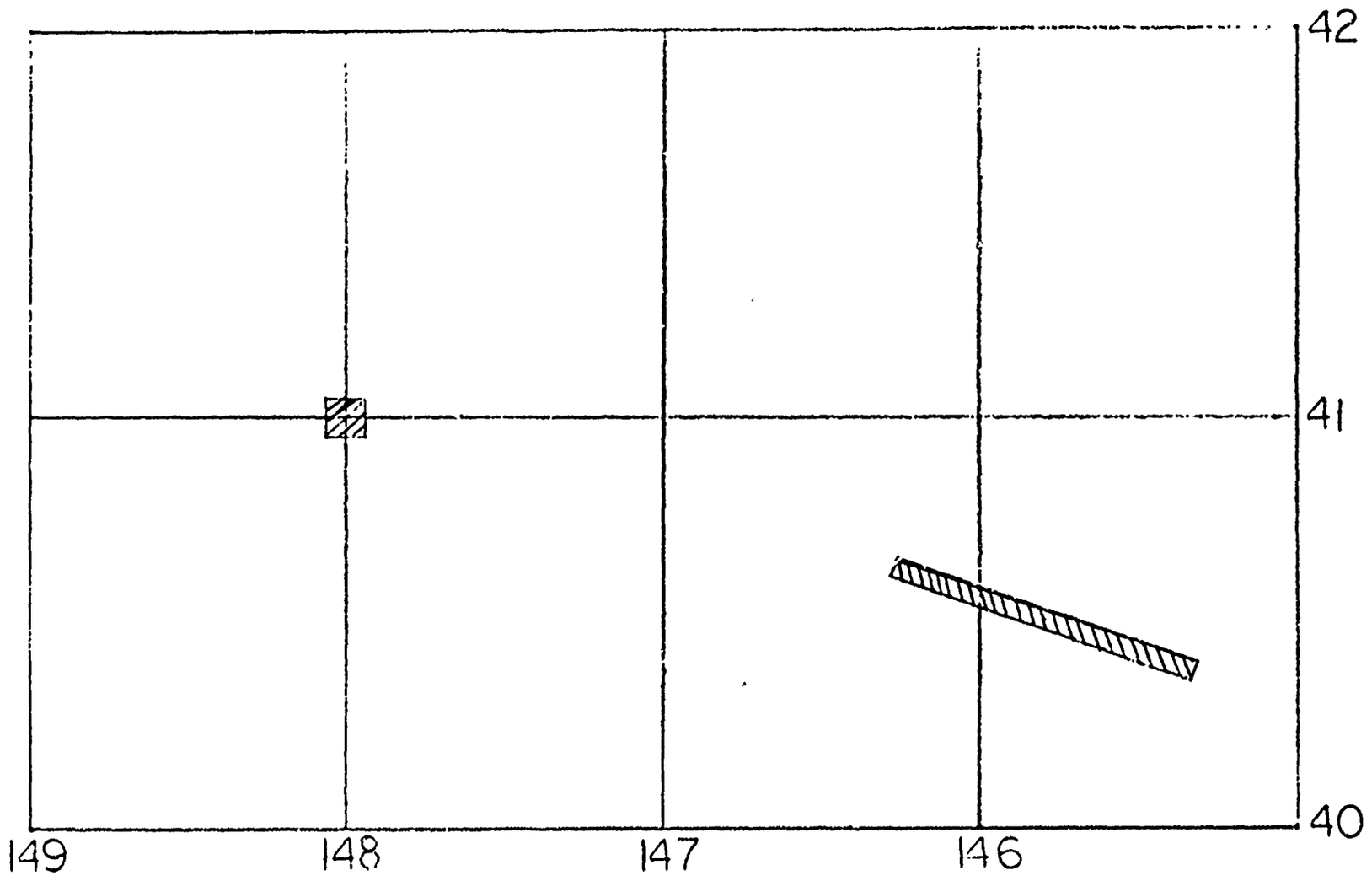
Positions of Upper Air Soundings

NPS Cruise 2



Positions of XBT and Marine Weather Observations

NPS Cruise 2



Observed Areas of Very High Concentrations of Vellela lata

NPS Cruise 2

Date	11 December 1968				12 December 1968			
Time (Z)	2000	2100	2200	2300	0000	0100	0200	0300
Wind speed kts	26	23	26	30	33	28	30	28
Wind direction °T	350	340	350	340	350	340	340	340
Wave height ft.	6	7	7	8	8	8	8	8
Cloud cover tenths	7	5	4	4	8	7	5	10
Barometric pressure mbs	1019.4	1019.2	1019.5	1020.2	1020.5	1021.5	1021.6	1022.8
Dry bulb °C	6.7	7.5	7.4	7.6	7.5	6.5	6.5	6.5
Wet bulb °C	4.8	5.8	5.5	4.3	5.0	4.1	3.6	3.9
Sea surface temperature °C	9.3	9.0	9.3	9.4	9.3	9.3	9.2	9.3

HOURLY WEATHER OBSERVATIONS TAKEN WHILE STANDING BY BRAVO

Date	12 December 1968				
Time (Z)	1900	2000	2100	2200	2300
Wind speed kts	30	30	32	29	29
Wind direction °T	310	310	310	310	310
Wave height ft.	10	10	10	10	10
Cloud cover tenths	10	10	10	10	10
Barometric pressure mbs	1023.4	1023.7	1023.4	1022.3	1021.9
Dry bulb °C	8.7	8.2	8.1	8.5	8.0
Wet bulb °C	6.4	7.0	6.8	7.1	7.0
Sea surface temperature °C	9.4	9.4	9.4	9.4	9.3
Beaufort sea scale	7	7	7	7	7

HOURLY WEATHER OBSERVATIONS TAKEN WHILE STANDING BY BRAVO

Date	13 December 1968						
Time (Z)	0000	0100	0200	0300	0400	0500	0600
Wind speed kts	31	31	30	30	29	29	30
Wind direction °T	300	300	290	290	290	290	280
Wave height ft.	11	11	11	12	X	X	X
Cloud cover tenths	10	10	8	8	4	2	2
Barometric pressure mbs	1021.4	1020.8	1020.5	1020.5	1020.7	1020.4	1020.5
Dry bulb °C	8.9	8.5	9.0	9.1	9.1	9.0	8.6
Wet bulb °C	7.4	7.5	7.5	7.6	6.8	6.7	6.4
Sea surface temperature °C	9.3	9.4	9.4	9.4	9.4	9.3	9.4
Beaufort sea scale	7	7	7	7	7	7	7

HOURLY WEATHER OBSERVATIONS TAKEN WHILE STANDING BY BRAVO

NORTH PACIFIC STUDY

CRUISE 2

SCIENTIFIC PERSONNEL

	Leg 1	Leg 2
Scripps Institution of Oceanography		
	R. P. Huffer - Scientist in Charge	R. P. Huffer
	D. Kellogg	D. Kellogg
	J. P. Costello	J. P. Costello
		R. J. Gould
United States Coast Guard		
	CDR Arthur G. Morrison, Captain U.S.C.G.C. ACUSHNET	
	Ensign Roger F. Wells, N.D.B.S., Washington, D. C.	
Convair Division General Dynamics		
	K. N. Jones	
	J. Winters	S. T. Uyeda
	G. Brickson	
	G. Barlow	
United States Weather Bureau		
	H. D. Shawley	H. D. Shawley
	C. P. Johnson	D. E. Harmon

NORTH PACIFIC STUDY

CRUISE 2

Chronology of Events:

	Greenwich Time	
19 Nov.	2158	C.G.C. ACUSHNET depart N.E.L. docks, San Diego, with Convair's Alpha buoy in tow.
20 Nov.	0027	Convair's "Wild Pigeon" sea tender and ST-908 away from Alpha as ACUSHNET cleared sea buoy. Began lengthening tow to 1200 feet. Speed 4 kts.
	1830	RM 1 Shipman ill. Changing course north toward San Nicholas Island for rendezvous with Coast Guard ASR helicopter.
	2000	Coast Guard helicopter picked up sick crew member. Changed course to 180°T to clear U.S.N. missile range. Speed 9 kts.
	2305	Cleared missile range. Changed course to 276°T. Proceeding now on assigned mission.
	2340	Established radio contact with Scripps Radio Station WWD on SSB frequency 12 Mlz. Schedule set for daily traffic at 1730Z and 2300Z.
21 Nov.	0045	Flooding lights on Alpha buoy flashing. Ship slowed and ship's motor surf boat (MSB) launched for Convair personnel to board buoy for inspection.

		0125	MSB returned to ship with inspection team. Requested Convair mobile data center (MDC) La Jolla to interrogate buoy to determine which compartment has water.
		0500	Secured Sperry Auto-pilot. Unit not operating properly. Using manual/electric steering.
		1530	Checked specific gravity and labeled 4 buoy batteries and 2 spares. Put batteries for Buoy 44 on chargers.
		1615	Started G.D.R.--no trace.
		1730	Tried WWD on 12 and 16 MHz. Received them very poorly and no traffic transmitted.
		1750	XBT not working Electrical short in lead to Launcher.
		2300	No contact WWD either freq.
22 Nov.		0000	XBT repaired by resplicing the lead.
		0500	Pump running on Alpha. Reduced speed to 7 kts.
		1200	XBT.
		1635	Convair personnel to Alpha on Cal 20 workboat.
		1730	Bathy, weather and position transmitted to MDC on 12 MHz.
	1800	1000	XBT-
		1916	Convair personnel returned. Underway at 5 kts, course 276°T while sealant dried on compartment #1 hatch.
		2235	Getting upper air humidity and temperature from first radiosonde balloon--beautiful afternoon.
		2300	WWD--No response on radio check.

23 Nov.	0000	XBT. Ship's clocks reset to + 9 zone.
	0300	Sealant on hatch dry. Increased speed to 7 kts. Course 275°T.
	0030	Increased speed to 9 kts--cse 275°T.
	0600	XBT.
	1300	XBT.
	1500	Speed 9 kts--cse 275°T.
	1730	Gave WWD position, weather and information on boarding Alpha yesterday and use of Cal 20 sea tender. New schedule 2300Z and 0300Z on 12 MHZ.
	1800	XBT.
	2150	Satellite antenna disc (upper half of HF antenna) on Alpha's mast observed missing. Position 33°03'N 131°28'W.
	2207	Ship began search of area.
	2300	Weather. Wind 280°T at 19 kts. dry bulb 20.5°C, wet bulb 18.4°C barometer 1024.3 and falling clouds 5/8 cumulus, stratocumulus and altocumulus bucket surface temperature 18.8°C sea 2 ft. at 280°T, swell 2 ft. at 280°T
	2320	Search secured. Results were negative.
24 Nov.	0000	XBT.
	0300	NDC and WWD-- ACUSHNET returning to San Diego.

		R/V OCONOSTOTA will rendezvous and return Alpha to San Diego. CGC ACUSHNET could then proceed to service S.I.O. Buoys. Schedule to be confirmed by radio.
	0600	XBT
	2100	XBT
	1200	XBT
	1530	Position and status report sent to WWD.
	1705	Speed 9 kts, cse 092°T
	1800	XBT
	2200	Problems with Nav Sat. Required reprogramming 3 times this morning.
	2300	Reached WWD but very heavy traffic.
	2330	Position and weather to WWD
25 Nov.	0000	XBT
	0140	Nav Sat teletype still not taking program.
	0200	Speed 7 kts cse 092°T
	0300	Unable to establish voice link with WWD.
	0600	Speed 6 kts.--cse 092°T Towing cable chafing on roller foundation and buoy riding poorly. Alpha skating from side to side in 22 kt cross wind. XBT
	1200	XBT
	1600	Speed 6 kts--cse 092°T--wind 23 kts at 020°T. Nav Sat out. Teletype will not accept program tape.
	1800	Contacted WWD and discussed Nav Sat.
	1807	Received OCONOSTOTA on 12403.5 KHz ship A S.S.B frequency. He is south of San Clemente awaiting better weather--gave him our weather and ETA his position 1700Z 27 Nov.

	2200	Speed 8 kts cse 084°T
	2300	MDC--arrangements to be made for:
		a) ACUSHNET to take on fuel and water
		b) Nav Sat representative to repair our unit
		c) Representative Sperry to make adjustments on new auto-pilot installation.
		d) S.I.O. E.T. to check out the GDR
		It is planned for ACUSHNET to depart San Dieto 29 November 1968 and service S.I.O. buoys.
		R/V OCONOSTOTA released to return San Diego.
	2330	Gave WWD position, speed, course, and weather
		WWD advises elimination of radio schedule as they will be guarding 12 MHz ship A frequency.
26 Nov.	0000	XBT Ship's clocks reset to + 8 zone.
	0600	XBT
	1500	Speed 7 kts cse 090°T
	1530	Cal 20 stainless steel shoe on keel and keel ripped out during night. Boat secured to deck by keel and gripped down over gunwales. Boat moved about 15 inches sideways. Port gunwale holed forward where 1/2 inch nylon line passed over it to the tie down pad-eye. Boat not repairable for 29 Nov. sailing. Battery barge ripped out brass snaps and lost 3 of 4 eye screws set in epoxy.
	1800	Tried WWD but he faded.

	1900	MDC. We requested 3/8 inch galvanized stock for through fittings on battery barge and removal of Cal 20 buoy tender on arrival San Diego. Lt. John talked to R. Fong about block loader of Nav Sat computer.
27 Nov.	0520	Cse 090°T--speed since noon slightly more than 8 kts. Ship's E.T. working on radar.
	1740	MDC. We requested full reel 9/16 nylon for cruise.
	1900	ACUSHNET E.T. working on radar variable range selector. Photographed damage to Cal 20 and battery barge.
	2250	Dropped Alpha to Convair Motor Vessel "Wild Pigeon" and S.I.O. ST-908 slightly south of channel marker buoy SD6.
	2323	Docked at N.E.L.
29 Nov.	2233	ACUSHNET departed N.E.L.--Nav Sat rep[illegible] adjustments made to GDR as transducer at 1% for shallow work. Received galvanized steel eyebolt threaded rods for battery barge and daily report forms.
30 Nov.	1910	MDC--Daily report, position, speed and weather given. Making turns for 14.5 kts but S.O.A. about 12 kts. Cse 290°T wind 28 kts at 340°T E. T. working on radar scanner. Sperry autopilot not being used. Adjustments still not satisfactory.
01 Dec.	0900	Reset ship's clocks to + 9 zone.
	1057	Radiosonde balloon away (Raob)
	1830	Cse 294°T--wind 26 kts at 340°T--ship making turns for 13.5 kts but S.O.A. 11.3 kts. Radar gain not working as well as it should.

	1915	MDC--position and weather, daily report transmitted. Requested WWD to call us ship A 12 MHz but barely received him--ship CW not reaching CG radio Long Beach.
	2256	Raob
02 Dec.	0020	Repaired XBT and launched first XBT of this leg to coincide with 0000Z balloon.
	0600	Raob XBT
	1108	Raob
	1730	Ship's CW not reaching any CG shore stations. Tried WWD but no response--E.T.'s working on tuning radar.
	1742	Ship's traffic to WWD
	1800	XBT
	1823	Daily report to WWD--Set new radio schedule of 1830 and 0030 with them. Repaired chart drive on XBT.
	2140	Installed the thru-hull galvanized battery barge.
	2150	Radio check on Purple 3, Orange 4, and 5 watter o.k. on Channel 15 or B.
	2245	Raob
03 Dec.	0000	WWD took weather observation and Raob. Ship's CW not reaching shore stations.
	0005	XBT out--obtained trace by twisting splice but reading about 1.90°C high in mixed layer.
	0600	XBT--same as above.
	1046	Raob
	1630	XBT's at 0000Z and 0600Z taken; however, they exhibit a high but normally contoured trace.

Trace at 1200Z shows ziz-zags all over chart--XBT shorted out. Radar bearing marker drifts and set will not stay in tune.

1730 Convair's instrument (geodyne sensors) rack on fantail port side broken up by sea--put below.

1755 Tried WWD but no answer.

1800 XBT out.

1825 Still trying WWD on 1830Z schedule.

1841 WWD received us but poorly--gave ship's traffic plus daily report. Ship's CW not reaching shore stations.

1945 Welding rack of high pressure acetylene bottles fell turning over 2 buoy batteries and spilling sulfuric acid electrolyte.

223° Raob

04 Dec. 0000 Ship's CW reached NMC San Francisco with traffic, 0000Z weather and raob.

0030 Radio check WWD--no contact.

0330 Respliced old connector on XBT electrical line. Soldered, taped and then covered with R.T.V. and allowed to cure overnight.

0345 ACUSHNET E.T. working on radar which is practically non-operational.

1000 Reset ship's clocks to + 10 zone.

1043 Raob

1830 Ship's CW being received by shore stations NMC San Francisco and Kodiak Alaska--Received R/V AGASSIZ on SSB--also (WLMN) U. S. SCRIPPS and ST-908.

	1923	WWD very busy so gave daily report to MDC. MDC passed on BRAVO reports air temperature 6°C, 1m sea 10°C at 1700Z. Beach will check to see if R/V AGASSIZ coming through area where S.I.O. November buoy may be drifting.
	1950	Installed low range 8°C-bucket thermometer. XBT trace off to left of chart.
	2300	Loaded 5 buoy data cameras. Only 2 frame counters work properly and 3 have defective microswitches. Checked defective cameras twice. XBT operating. Tried calling Buoy 45 Channel 7 but no response at 13 miles. Changed course to 277°T.
	2340	Raob
	2341	Sighted Buoy 45 bearing 315°T 2 miles off starboard bow.
05 Dec.	0000	XBT
	0025	MSB away to Buoy 45.
	0125	MSB back for instrument pick-up.
	0130	Radar secured for more work.
	0200	Personnel aboard Buoy 45 report heavy concentration of small Vellela lata.
	0240	MSB secured.
	0255	Underway to Buoy 44 east point of cluster.
	0600	XBT
	1042	Raob
	1200	XBT
	1800	XBT
	1830	Calling WWD--heard and relayed by WEMN E. B. SCRIPPS on SSB.

	1915	NWD still busy. MDC given brief report on Buoy 45 status. Informed Monterey computer rejecting Bathy messages as some confusion about our not giving surface temperatures data block 4 and chart surface temperatures data block 5. Will correct message blocks to be compatible.
	2301	Raob
06 Dec.	0020	Course 286°T speed 11 kts. winds 35 kt at 220°T
	0030	NWD suggests we reschedule 1830Z radio schedule to 1600Z because of heavy traffic. Maintain 0300Z schedule.
	0600	XBT
	1047	Raob
	1200	XBT
	1520	Change course to 257°T speed 10.5 kts
	1600	Daily report to NWD.
	1610	All engines stop. On position for Buoy 44 with no visual contact.
	1645	Trying buoy call up system Channel 9 for 44 and all other buoys in cluster. Negative results on call up system. Call up system may have failed in all buoys as a result of power source failure; similar to Bucy 45 where the transponder battery was adrift.
	1655	Nav Sat position 45°59.41'N 157°19.55'W
	1745	Began running expanding square search for Buoy 44.
	1800	Radar range diminishing. XBT taken.
	1852	Passing eastbound freighter Pacific Far East Lines' THAILAND BEAR 1.8 miles our starboard side.

	1915	MDC R. Schwartzlose asks for 2115Z schedule for us to receive weather forecast from Dr. Glenn Flittner at B.C.F., La Jolla.
	2010	Nav Sat position 42°56.4'N 157°25.7'W
	2030	Started second expanding square search pattern based on new Nav Sat position.
	2115	MDC R. Schwartzlose reports weather forecast now available WWD at 0030Z.
	2145	XBT
	2247	Raob
	2305	End of expanding square search. Results negative for Buoy 44. Proceeding to Buoy 41, located next to BRAVO.
07 Dec	0000	XBT
	0100	Sighted Buoy 41. Badly damaged. Position 42°55'N 157°46.8'W. No sighting at BRAVO.
	0110	MSB away to inspect Buoy 41.
	0140	Completed inspection and recording of damage on Buoy 41 MSB returned.
	0200	Received weather forecast from WWD. XBT taken.
	0253	Sighted Buoy 39 dead ahead at 4 miles. Course 260°T.
	0308	WWD requests we transmit bathy data taken at Buoy 41.
	0330	MSB away to service Buoy 39.
	0445	MSB back to ship for another data camera. Camera would not shut off. Camera's checkout o.k. in test mode on ship but failed when installed in buoy.
	0538	MSB secured.
	0600	Radar watch set for Buoy BRAVO during night.

	1143	Raob
	1200	XBT
	1455	Sighted Buoy 42. Light beacon is bearing 290°T range 4 miles.
	1607	MSB away to Buoy 42. Informed WWD of its apparent good condition.
	1728	MSB back from Buoy 42. Nav Sat position 43°35.6'N 157°48.6'W.
	1800	XBT
	1930	Called MDC. Advised of completion on service of Buoy 42.
	2303	Raob
08 Dec.	0000	XBT
	0015	Wind 30 knots and increasing. Weather now too rough to service buoys in cluster. Proceeding to Buoy 38 at 164°W. MDC called. They requested that ACUSHNET confirm that BRAVO is no longer at her mooring site by radio message to Com West Area. Com West Area will initiate information to ship's area.
	1102	Raob
	1200	XBT
	1600	Tried WWD and MDC; could not reach either.
	1800	XBT
	1845	Batteries from Buoy 39 off charger. S.G. 1.30. Batteries from Buoy 42 placed on charger. Head in port socket of steering cable fitting broke and repairs will take 4-5 hours. Ship hove-to for repair of steering cable.
	1913	Wind down to 12 knots.

	1915	MDC. Daily status report transmitted. Requested an overflight to establish present position of the BRAVO buoy no later than Tuesday 10 December. MDC personnel believe ACUSHNET can find BRAVO before plane; however, Captain Morrison wants a definite visual sighting and position. The ACUSHNET is limited in search capability with her radar out. Present search area is too poorly defined at this time.
	2124	Repairs completed on steering cable; ship underway.
	2300	Raob
	2310	Sighted Buoy 38 42°00'N 164°00'W dead ahead.
	2347	Readied all MSB personnel and then secured due to increasing wind and sea state.
09 Dec.	0030	Tried NWD--no response.
	0040	XBT
	0115	MDC. No change in BRAVO situation. Gave Bathy and weather call again 0715 09 Dec. and abandon next NWD schedule.
	0240	MSB readied for another try at buoy. Winds increased quickly and this attempt aborted.
	0600	XBT
	0109	Raob
	1200	XBT
	0425	Radar out
	0715	MDC. Gave daily status report.
	1800	XBT
	1807	MSB away to Buoy 38.
	1853	MSB back and secured.

	1930	MDC--reported status of Buoy 38. La Jolla reports new position calculated for BRAVO. Location now believed to be 44°N 152°W.
	2118	Loaded camera serial number 5318 from Buoy 38.
	2301	Raob
10 Dec.	0000	XBT Cse 084°T speed 14 knots.
	0015	MDC. Convair requests that we attempt RDF procedures at the BRAVO interrogation tomorrow 1705Z. Advised available equipment ancient and very marginal; however, will try for RDF bearings on BRAVO. Advised of possible overflight. MDC will put BRAVO on 8 MHz and will communicate with ACUSHNET on 16 MHz.
	0100	KWD indistinct--try tomorrow.
	0600	XBT
	0110	Raob
	1200	XBT
	1640	Sighted Buoy 40 on radar bearing 050°T at 1/2 mile. Radar reflector on this buoy gone. Mounting base for reflector intact. Strobe light beacon non-operational.
	1747	MSB away to service Buoy 40.
	1800	XBT
	2025	MSB back and secured.
	2030	Via KMI Oakland. R. Schwartzlose advises FCC obtained class D RDF position on BRAVO as 43°N 150°W. Overflight to locate BRAVO still pending. Work on repair of wind sensors on S.I.O. Buoys 39 and 42 will proceed pending the aircraft's confirmation of BRAVO position.

	2100	Underway to Buoy 39, west side of cluster
	2120	BRAVO putting out signal on 12 MHz but Scripps RDF not receiving. No equipment on ACUSHNET capable of obtaining any bearings on BRAVO signal.
	2207	Course 338°T speed 14.5 knots.
	2230	Scheduled aircraft search for BRAVO 43°N 150°W No reports received from aircraft or La Jolla reference this overflight.
	2250	Raob
	2305	Sighted Buoy 39. Position 42°54.7'N 158°120'W.
	2312	MSB away to Buoy 39. Installed weather mast instrument head #35052 and removed #35058. Wind speed totalizer and indicator now operational.
	2352	MSB secured.
11 Dec.	0000	XBT
	0250	Sighted Buoy 42.
	0311	MSB away to Buoy 42. Attempted to install new weather sensor head; however, threads stripped on bolt hole securing it to mast. Sensor head consequently was not changed. The anemometer unit was changed. Wind speed indication and totalizer now operating.
	0415	MSB secured. Proceeding course 150°T to original BRAVO site.
	0600	XBT
	0709	Arrived original BRAVO site. Changing course 090°T to search for BRAVO.
	1046	Raob
	1200	XBT

	1402	Visually spotted BRAVO by its light 12.5 miles relative bearing 040°. S. Uyeda reports BRAVO working fine except for location now determined as 43°02.9'N 154°56.8'W.
	1719	MDC Relayed to Convair preliminary report on BRAVO.
	1750	MDC Transmitted daily status report. Note weather is picking up and present conditions prohibit boarding of BRAVO.
	1800	XBT
	2000	MDC. Convair requests that we make hourly weather observations.
	2255	Raob
12 Dec.	0000	XBT
	0200	Total so far 9 Nav Sat fixes on BRAVO. Wind 30 kts. plus.
	0600	XBT
	0810	Radar out.
	1037	Raob
	1200	XBT
	1800	XBT
	1816	Have 19 Nav Sat fixes on BRAVO--appears moored--XBT giving erratic trace--Radar problem found to be windings on motor generator. GDR not operating.
	1840	MDC. Convair advises do not put line on BRAVO to determine if moored. Also do not interrogate sonic release to see if intact. Suggest we stand by another 24 hours continuing all observations.
	1915	Checked S.G. on batteries from Buoys 38 and 40. Those from 40 very ϕ low.

1920 Began GDR trace on BRAVO site 326°T speed 6.6 kts Receiving intermittent signal return on northerly leg into swell. GDR blowing fuses.

2020 Via KMI Oakland. Schwartzlose advises a 3 to 4 millibar discrepancy between Weather Bureau barometer and BRAVO data. Requests we continue hourly weather observations and include Beaufort sea state scale. Prof. Isaacs requests opinion on present BRAVO mooring status. Advised BRAVO believed moored on present information; however, would need bottom survey to estimate reliability of this mooring. Present weather and G.D.R. problems have prevented bottom survey. Attempts will continue to rectify this situation.

2115 MDC. Gave hourly weather including Beaufort wind sea scale 7.

2120 Stopped bottom survey as ship very close to BRAVO for upcoming Nav Sat fix. Noticed outrigger on orange side broken at point where it goes over hull edge. Changed circuit boards on GDR but it is still blowing fuses.

2232 Raob

2300 XBT repaired--dropped one close by BRAVO.

13 Dec. 0000 XBT

0300 KMI Oakland phone to R. Schwartzlose who tells us BRAVO giving wind speeds 2/3 or less than ACUSHNET hourly data. Arrangements to be made for recalibration of barometer and calibration of anemometer immediately on our return.

	0506	Reprogramming Nav Sat. GDR out.
	0600	XBT
	0105	Raob
	1200	XBT
	1700	Nav Sat teletype will not take program, but got 3 more fixes during the night. Total of 28 Nav Sat fixes on BRAVO. Conditions very rough today. Beaufort scale of 8.
	1705	Course 110°T speed 12 kts 17 ft following swell. ACUSHNET underway for San Diego.
	1720	MDC. Gave hourly weather and daily report to R. Born.
	1800	XBT
	2218	Nav Sat repaired.
	2246	Raob
14 Dec.	0000	XBT
	0030	WWD no answer. MDC took request to set up calibration of Weather Bureau's barometer and ACUSHNET'S anenometer. Also they will relay request for N.M.F. berthing, our preference.
	0100	Nav Sat o.k.
	0200	Beaufort wind sea scale 8. 16 foot sea and swell.
	0600	XBT
	1035	Raob
	1200	No XBT. Fantail secured due to weather.
	1600	Making good 15.5 kts on turns for 14.5--csc 110°T Nav Sat not taking program. Weather astern Beaufort scale 8.
	1910	MDC--Daily report transmitted.
	1915	Edo taking continuous trace.

	2250	Raob--Heavy concentration of small (silver dollar) size Vellela lata in about same position as before Buoy 45.
15 Dec.	0145	Nav Sat working.
	0900	Reset ship's clocks to + 9 time zone
	1104	Raob
	1200	XBT
	1800	XBT first probe bad--second broke wire--third o.k.
	1805	NWD taking ship's traffic--12 MHz ship A.
	1940	NWD daily report.
	2245	Raob
16 Dec.	0000	XBT
	0600	XBT
	0825	Gyro compass out.
	1155	Raob
	1200	XBT
	1800	XBT
	1833	NWD--no response--radio check E. B. SCRIPPS reports he had no roger on earlier NWD message--position at 24°N off Baja.
	1846	MDC wants to wait until 1915Z so will not interfere with 1905Z BRAVO interrogation.
	1910	MDC. Daily report transmitted and air reservations of ACUSHNET personnel going on leave being confirmed.
17 Dec.	0000	XBT
	0015	MDC advises berthing reserved for ACUSHNET at N.E.L. outboard Alpha pier all the way forward. Barometer calibration by both Convair and Weather Bureau arranged.

		0423	No. 3 diesel off the line. Cracked piston.
	0530	2030	XBT
		0800	Reset ship's clocks to + 8 zone.
		1045	Raob
		1200	XBT
		1730	WWD phone patch to R. A. Schwartzlose. Status report.
		1800	WWD daily report. XBT
		2245	Raob
18 Dec.	0000	1600	XBT
		1640	WWD no response. ACUSINET voice AM radio to Nav Fleet Command because of ADIZ missile range.
		1745	MDC no response.
19 Dec.		0030	MDC--Forecast no fog problem at San Diego.
		1600	Arrived San Diego N.E.L. docks.