#78022

CRUISE REPORT

R/V STATE ARROW 78-3

Submersible "Diaphus"

South Atlantic Environmental

Program

August, 15-19 1978

CRUISE REPORT

VESSEL: STATE ARROW

MASTER: G.F. Ottmer

SUBMERSIBLE:"Diaphus", leased from Texas A & M by Martech International, Inc.

CRUISE NO: STATE ARROW 78, Leg 3

AREA of OPERATION: Southeast Georiga Embayment or Georgia Bight

START: 07:45 Aug. 15, 1978, Savannah,Georgia

END: 08:20 Aug. 19, 1978, Savannah,Georgia

CHIEF SCIENTIST: Dr. Mahlon Ball

SCIENTIFIC PARTY:

Popenoe, Peter	Geologist, U.S.G.S.,Woods Hole,MA
Henry, V.J.	Geologist, Skidway Institute of Oceanography, Savannah, Ga.
Paull, Charles	Geologist, U.S.G.S.,Wooods Hole, MA
Hunt, Jesse, Jr.	Oceanographer, BLM New Orleans OCS Office
Eskenasy, Diane	Geologist, U.S.G.S., Woods Hole, MA
Pfirman, Stephanie	Geologist, U.S.G.S., Woods Hole, MA
Noble, Marlene	Physical Oceanographer, U.S.G.S. Woods Hole,MA

SUBMERSIBLE PERSONNEL (MARTECH)

Bolstad, Don	Supervisor and Dive Master
Hickey, Pat	Submersible pilot
Barksdale, Gordon	Submersible pilot
Jackson, Bob	Diver
Barker, Dan	Diver
Beldon, Mark	Diver and winch operator

OBJECTIVE:

To study the reefs and hargrounds of the Georgia Bight in order to "ground truth" the seismic and side-scan sonar data, to investigate first hand the geologic origin and nature of the reefal features, and their use as a marine habitat. To inspect the bottom tripod instrument package on the shelf edge for evidence of scour, bottom conditions and composition, and to document the extent of the use of the tripods as an animal habitat. A mini-sparker line was planned to supplement existing data from the FY-75-76 FAY Cruises, and XBT observations are to be made in order to better define the water masses associated with the tripods.

SCIENTIFIC EQUIPMENT:

1. Submersible equipped with a Benthos 800 frame camera, video TV recorder, and Van Veen Grab.

2. Northstar 6000 Loran- C

3. Teledyne model 253, 800 Joule minisparker

4. XBT equipment

5. Salinity sample bottles

NAVIGATION TECHNIQUES:

Navigation was entirely by Loran-C with the Northstar - 6000 unit. Nav. Slaves used were the 9930 chain, chiefly stations W and Z.

Tabulated Information

Date	Dives	Diving	Total Time Underwater	XBT	Surface Salinity	Transitting	Sparking	Stand-by
15 Aug. '78	5	5 hrs. 40 min.	2 hrs. 47 min.	3	8	13 hrs. 28 min.	3 hrs. testing no data	____
16 Aug. '78	7	11 hrs. 10 min.	6 hrs. 17 min.	10	11	12 hrs. 50 min.	____	____
17 Aug. '78	6	9 hrs. 30 min.	4 hrs. 41 min.	7	7	14 hrs.30 min.	____	____
18 Aug. '78	4	8 hrs. 40 min.	5 hrs. 14 min.	13	13	12 hrs.20 min.	____	3 hrs.
19 Aug. '78		____	____	5	5	8 hrs.20 min.	____	____
Total	22	35 hrs.	19 hrs.	38	44	61 hrs. 28 min.		3 hrs.

Total time at sea 120 hrs, 35 minutes (5 days, 35 minutes).

Dive	Date	Down	Up	Total	Start	Finish	Depth (feet)	Course	Visibility	Pilot Observer	Remarks
1 (604)	15 Aug.	1336	1404	30	31°23.12 80°52.5	31°23.1 80°52.5	55	100°	10 - 15	Hickey Ball	To N.E. of Gray's reef Sand Bottom, 1.5 knots current at 090
2 (605)	15 Aug.	1435	1511	36	31°23.12 80°53.5	31°23.1 80°52.5	55	Search	10 - 15	Barksdale Henry	To N.E. of Gray's reef Sand bottom, .5 knots current at 20°
3 (606)	15 Aug.	1526	1611	45	31°23.92 80°53.29	31°24.38 80°55.01	60		10 - 15	Hickey Hunt	On Gray's reef, spectacular bottom, no current
4 (607)	15 Aug.	1627	1651	24	31°23.92 80°55.03	31°24.48 80°55.23	50	W N W	10 - 15	Barksdale Popenoe	Sand bottom, current 120° 1.5 knots, Missed reef,
5 (608)	15 Aug.	1757	1829	32	31°24.3 80°55.0	31°24.16 80°54.96	60		20	Hickey Paull	On Gray's reef
6 (609)	16 Aug.	0848	1048	120	30°25.36 80°22.65	30°24.35 80°20.99	130		20	Barksdale Henry	On hardgrounds traversing East across shelf toward shelf edge reef. current 3/4 knot at 270°
7 (610)	16 Aug.	1221	1300	39	30°24.75 80°14.81	30°24.83 80°15.02	150	Search	20	Hickey Ball	On shelf edge reef. No refal features seen, only sand bottom.
8 (611)	16 Aug.	1332	1406	34	30°24.75 80°14.81	30°24.75 80°14.81	170	120°	10 - 15	Barksdale Hunt	Current 130°
9 (612)	16 Aug.	1430	1525	55	30°24.75 80°14.81	30°24.37 80°12.85	170	090°	20	Hickey Paull	Current 120°, good reef seen
10 (613)	16 Aug.	1543	1633	50	30°24.87 80°12.85	30°24.87 80°12.85	175	270°	20	Barksdale Noble	
11 (614)	16 Aug.	1635	1722	47	30°24.87 80°12.85	30°24.87 80°12.85	160	170°	15	Hickey Eskenasy	

Dive	Date	Down	Up	Total	Start	Finish	Depth	Course	Visibility	Pilot Observer	Rema
12 (615)	16 Aug.	1748	1820	32	30°24.87 80°12.85	30°27.53 80°16.25	155	090°	15	Barksdale Pfirman	Strong current
13 (616)	17 Aug.	0900	0914	14	30°32.2 80°04.68		500		30	Hickey Ball	Dive on deep reefs on lower slope in area of Maganese and phosphate nodules. Dive aborted because of strong Gulf stream current.
14 (619)	17 Aug.	1134	1215	41	30°40.10 80°09.52	30°39.99 80°09.32	180	West	30	Barksdale Popenoe	current 340° at .5 knots Shelf edge reef N. of previous dives.spectacular live bottom.
15 (620)	17 Aug.	1240	1335	55	30°40.16 80°09.49	30°39.98 80°09.67	180	West East	30	Hickey Hunt	Traverse W. across reef to sand top, then E across reef again
16 (621)	17 Aug.	1345	1457	71	30°39.73 80°07.51	30°40.15 80°09.61	180	270°	20	Barksdale Henry	current 340°, weak, good reef seen
17 (622)	17 Aug.	1540	1645	65	30°40.14 80°09.62	30°40.14 80°09.38	165	120°	20	Hickey Paull	good reef seen
18 (623)	17 Aug.	1650	1725	35	30°39.88 80°07.69		165	090°	20	Barksdale Noble	missed reef
19 (624)	18 Aug.	1020	1211	111	32°33 78°39	Same	140	125° 295° 300° 200°	25 - 30	Hickey Pfirman	Dive in search of tripod at described distance and bearing. No tripod found
20 (625)	18 Aug.	1245	1434	109	32°32.5 78°37.5	Same	140	Search Pattern	20	Barksdale Noble	Move to exact loran location of tripod. No tripod found
21 (626)	18 Aug.	1654	1750	54	32°38.64 78°50.98	Same	125	320° 325°	40	Hickey Henry	reticulated bottom area Sandy with hardground and fish
22 (627)	18 Aug.	1805	1845	40	32°39.12 78°51.45	Same	120	325°	40	Barksdale Eskenasy	reticulated bottom area

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Sta #	Depth (m)	Latitude	Longitude	XBT	Surface Salinity	Date	Time
R- 1						8/15	0910
2		31 59.0	80 46.0		X		0936
3		31 49.4	80 44.9		X		1038
4		31 42.1	80 47.3		X		1120
5		31 26.4	80 53.8		X		1230
6	18	31 23.6	80 51.5		X		1940
7	25	31 17.2	80 38.3	X	X		2138
8	31	31 09.2	80 27.8	X	X		2305
9	36	30 56.2	80 24.3	X	X	8/16	0030
10	40	30 44.5	80 21.5		X		0200
11	40	30 34.7	80 23.2	X	X		0330
12	36	30 23.7	80 23.1	X	X		0520
13	73	30 24.0	80 13.8	X	X		1140
14	40	30 25.1	80 16.5	X	X		1151
15	340	30 24.6	80 03.5	X	X		2047
16	256	30 25.9	80 06.2	X	X		2110
17	148	30 24.9	80 11.0	X	X		2145
18	40	30 24.2	80 11.5	X	X		2220
19	33	30 23.7	80 25.0	X	X		2303
20	24	30 25.0	80 38.2	X	X	8/17	0020
21	22	30 24.4	80 49.3	X	X		0116
22	18	30 25.1	81 01.1	X	X		0210
23	60	30 41.9	80 08.5	X	X		1835
24	80	30 54.9	80 01.9	X	X		1945
25	40	31 01.0	80 04.0	X	X		2055
26	42	31 15.7	79 59.0	X	X		2235
27	146	31 25.4	79 43.9	X	X	8/18	0000
28	46	32 32.0	78 38.4	X	X		0500
29	47	32 34.3	78 37.7	X	X		1500
30	160	32 31.4	78 39.0	X	X		1530
31	60	32 33.0	78 39.6	X	X		1540
32	50			X	X		1555
33	40	32 36.2	78 46.1	X	X		1615
34	32	32 39.6	78 52.0	X	X		1850
35	30	32 42.5	78 55.8	X	X		1915
36	24	32 45.6	79 00.0	X	X		1945
37	22	32 48.9	79 03.4	X	X	8/18	2010
38	24	32 41.2	79 09.4	X	X		2110
39	26	32 31.0	79 20.8	X	X		2225
40	24	32 19.6	79 36.2	X	X	8/19	0020
41	26	32 08.7	79 47.4	X	X		0130
42	24	31 57.9	79 58.7	X	X		0230
43	20	31 56.9	80 17.1	X	X		0400
44	16	31 57.0	80 26.5	X	X		0535

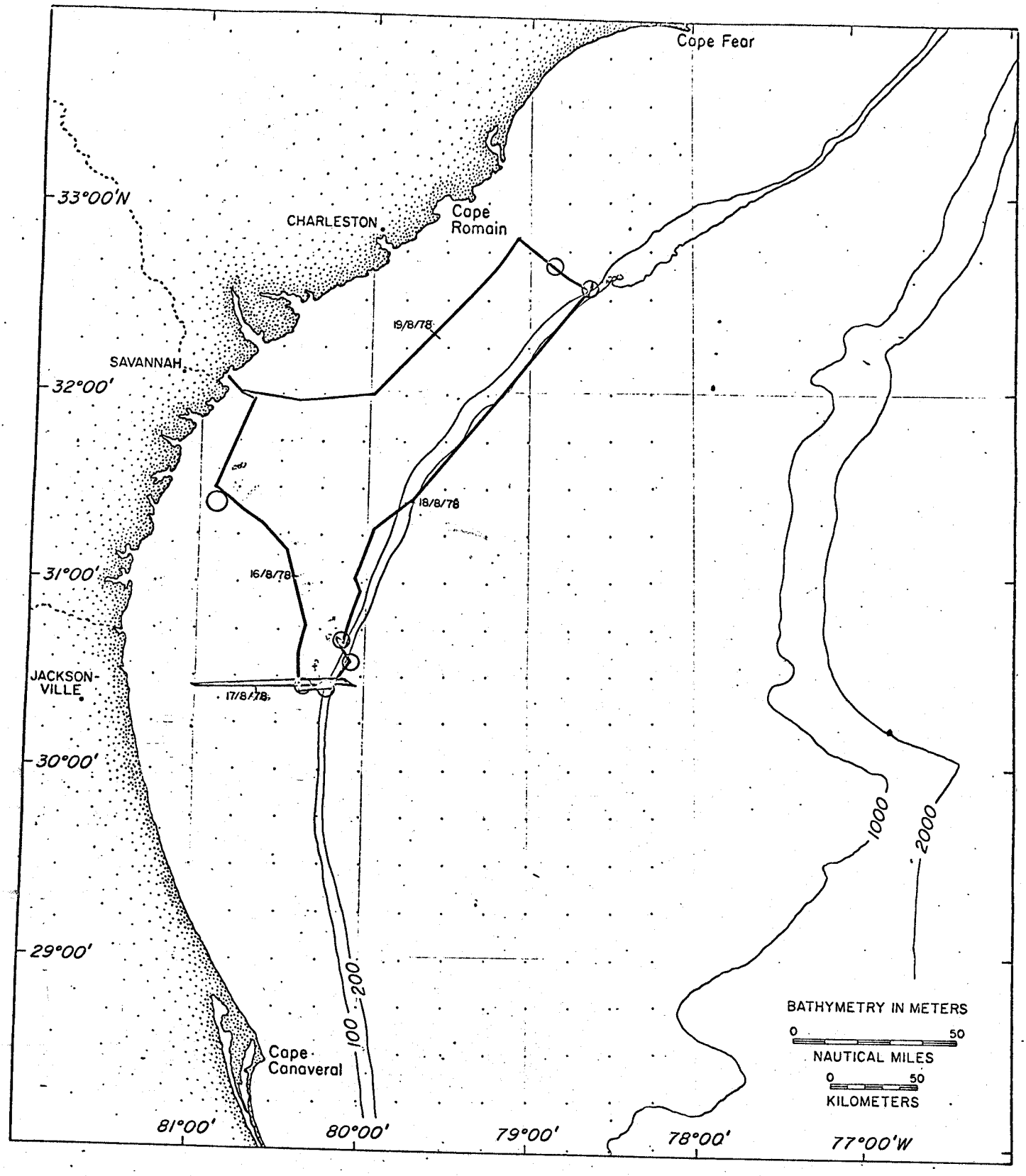

Figure 1: Cruise track chart - circles indicate dive areas.

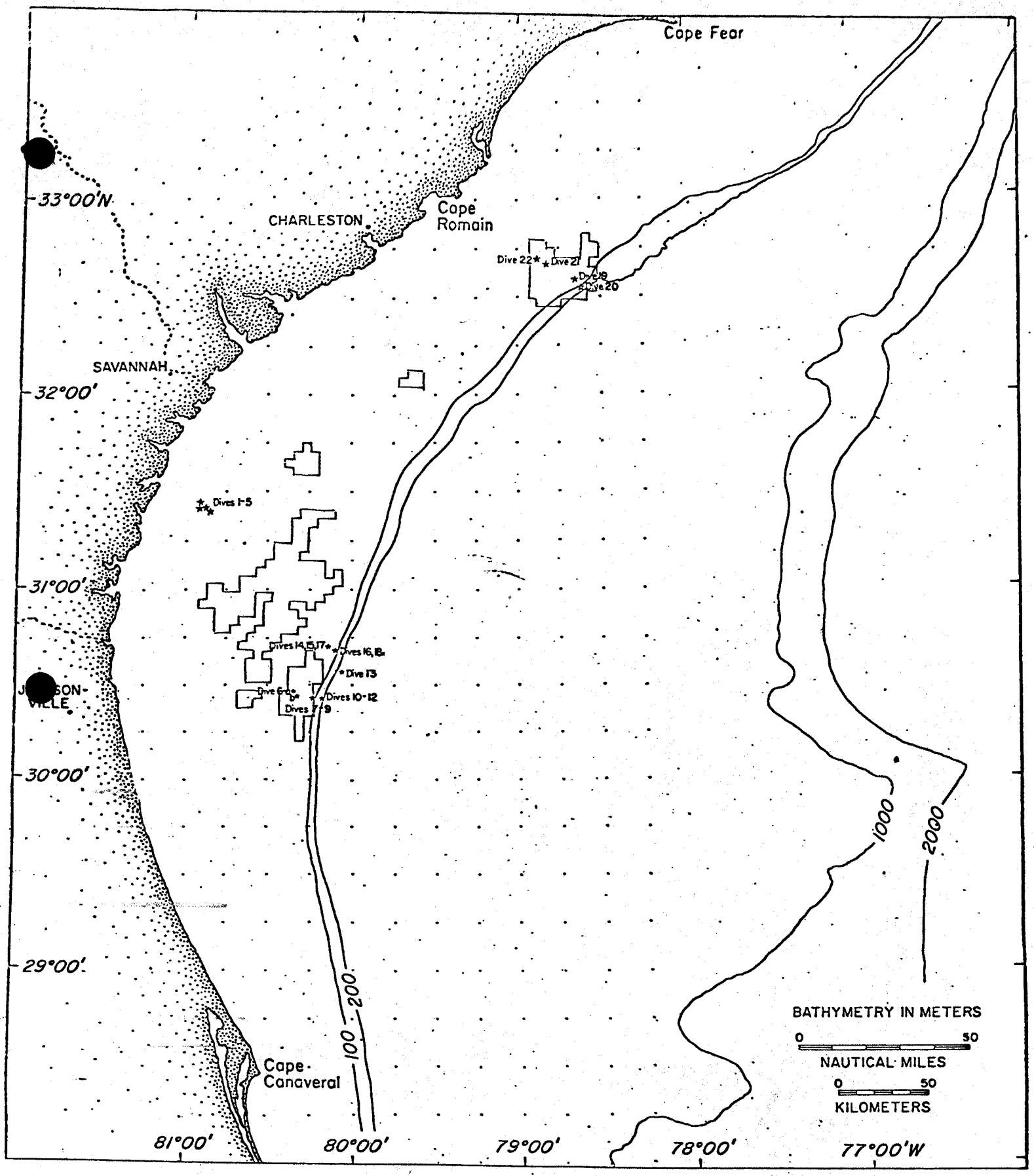

Figure 2: Dive sites, submersible DIAPHUS, STATE ARROW Leg 3, August, 1978

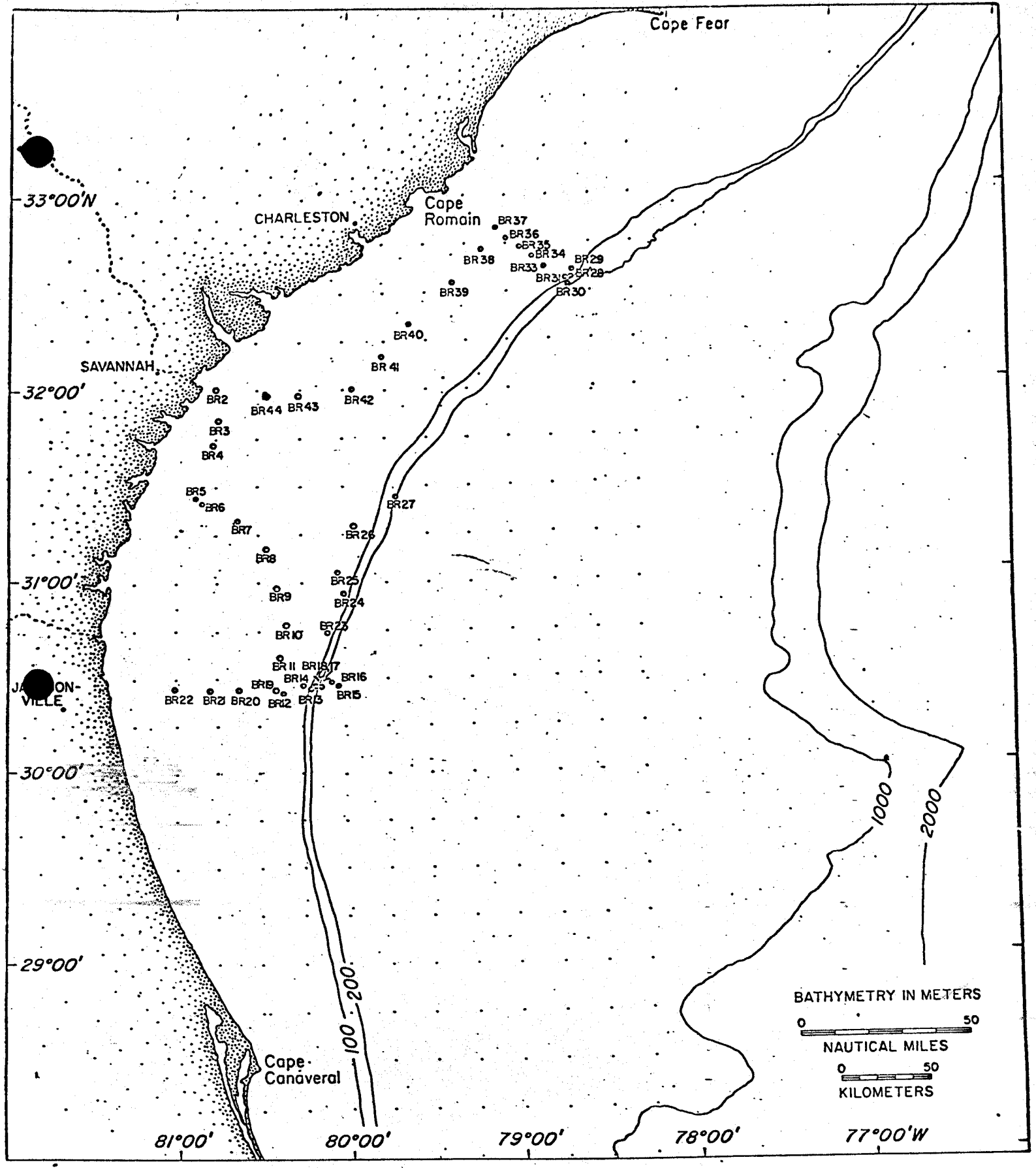

Figure 3: XBT and surface salinity stations, STATE ARROW Leg 3, August 1978

CHIEF SCIENTIST'S LOG

Mahlon Ball

NOTE: All times are recorded in Eastern Daylight Standard Time. The five digit numbers are Loran C coordinates.

The STATE ARROW experienced rudder problems on Legs 1 and 2 and did not make their planned departure for Leg 3 on 8/10/78. They started for Savannah, Georgia on 8/11/78, however additional rudder problems were encountered just offshore of Woods Hole and they returned to Woods Hole for repairs, finally leaving the morning of 8/12/78 and arriving in Savannah, Georgia in the afternoon of 8/14/78. In Savannah the starboard engine blower was out and was worked on overnight and finally repaired early on 8/15/78.

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0745 Depart Savannah, Georgia

0910 Surface salinity sample taken (BR-2) still in ship's channel
latitude 31°59.0′ longitude 80°46.0′

0912 Stream eel for sparker 14378.7, 70902.7

0930 Course 120, 10 knots
latitude 31°58.97′ longitude 80°45.96′

0936 Water sample taken (BR-1)
Weather: sea state 1, 2-3′ ground swell, wind SW at 6 knots beautiful day

0945 120° course, 11 knots 14360.6, 70946.7
Sparker recorder problems: signal coming, recorder not doing well no record yet

1035 Slow from 10 knots to 5 knots to see if we can get a useable record 14273.0, 70951.1

1038 Salinity sample (BR-3) 14268.1, 70950.6
latitude 31°49.38′ longitude 80°44.88′

1044 Slow to 0 to retrieve eels 14245.3, 70949.2

1049 Return to 10 knots speed (toward Gray's reef), sparker working at 5 knots speed, 10 knots is too fast

1055 10 knots, course 195 14231.2, 70947.1

1120 Surface salinity sample taken (BR-4) 14184.1, 70941.8
latitude 31°42.07′ longitude 80°47.29′

1230 Surface salinity sample taken (BR-5) 13998.5, 70913.6
latitude 31°26.37′ longitude 80°53.79′

1251 At buoy "R2S", change course to 156°

1300 Preparing for first dive on Gray's reef

1316 Mahlon Ball in sub preparing for dive #1. We are coming up on a flat-topped ridge (Gray's reef). Buoy "SLB" marks reef. 13968.1, 70923.9
latitude 31°23.12′ longitude 80°52.50′

1328 Mahlon in sub again, Pat Hickey pilot. Weather is nice and calm, blue sky, blue water.

1331 Zodiac over with J. Henry and Martech member.

1332 Swinging ship, we are SW of buoy.

1336 Sub lifted from deck.

1338 Sub in water 13966.9, 70923.0
latitude 31°23.07′ longitude 80°32.66′

1345 Have notified all shipping in area that sub is engaged in submersible operations.

1358 Sub ready to come up, standing by.

1414 Sub on surface.

1418 Zodiac hooked to sub.

1421 Sub back on board, only sand observed.

1435 Dive #2, Jim Henry observer, Gordon Barksdale, pilot.

1517 Sub aboard again, Gray's reef not found, some hard bottom.

1520 Change position of ship. Steam 210° for one mile 3 knots.

1528 Prepare for dive. 13973.2, 70918.6
latitude 31°23.82′ longitude 80°53.29′

1535 Dive #3. Sub in water, Jesse Hunt observer, Hickey pilot.

1603 Location of Gray's reef. 13974.3, 70907.2
latitude 31°24.38′ longitude 80°55.01′

1614 Retrieving sub. 13972.9, 70907.1

latitude 31°24.26′ longitude 80°55.01′

1618 Sub on deck, good dive, very live reef, Jesse took lots of pictures.

1625 Dive #4. Sub in water, Popenoe observer, Barksdale pilot.

1632 Current taking sub away from buoy 13972.6, 70907.6.

1700 Retrieve sub.

1705 Sub on board, drifted WNW of buoy 200 yards across bottom. Probably dove west of Gray's Reef.

1707 Dive report, no reef only sand with ripples.

1717 Return to reef 13973.2, 70909.0.

1721 Zodiac requires motor repair.

1755 Dive #5, Paull observer, Hickey pilot 13971.8, 70906.2.

1825 Sub up 13972.4, 70907.7.
latitude 31°24.16′ longitude 80°54.96′

1835 Sub on deck. Seal on hydraulic cylinder (stb) on "A" frame leaking badly, requiring repair.

1930 Sparker eels in water.

1940 XBT and salinity sample (BR-6) 13976.0, 70929.5
latitude 31°23.64′ longitude 80°51.54′

2005 Sparker operating 13972.3, 70945.9.
latitude 31°22.65′ longitude 80°49.04′

2011 Course 125°, speed 7 knots, depth 58′ begin sparker line 13971.8, 70948.2.
latitude 31°22.51′ longitude 80°48.64′

2030 Trigger on sparker kaput, eels recovered.

2138 XBT and salinity sample (BR-7) 71014.9, 13943.3.
latitude 31°17.22′ longitude 80°38.28′

2305 XBT and salinity sample (BR-8) 13884.6, 71080.3.
latitude 31°09.22′ longitude 80°27.77′

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0030 Salinity sample (BR-9) 13746.7, 71103.7.
latitude 30°56.17′ longitude 80°27.32′

0200 XBT and salinity sample (BR-10) 13626.4, 71120.0.
latitude 30°44.5′ longitude 80°21.5′

0330 XBT and salinity sample (BR-11) 13503.0, 71110.7.
latitude 30°34.7′ longitude 80°23.2′

0520 XBT and salinity sample (BR-12) 13377.4, 71111.0.
latitude 30°23.7′ longitude 80°23.1′

0814 Sub in water for Dive #6 on hardground to cross inner reef and move to shelf edge; observer V.J. Henry, pilot Barksdale.
latitude 30°23.36′ longitude 80°22.65′

0817 Notice to all shipping of submarine operation in progress.

1048 Sub progress too slow to accomplish objective, signal Henry to come up.

1056 Sub back on board 13390.4, 71123.1.
latitude 30°24.35′ longitude 80°20.99′

1100 Moving east to dive on shelf edge reef.

1140 XBT and salinity station (BR-13).
latitude 30°24.0′ longitude 80°13.8′

1151 XBT and salinity station (BR-14).
latitude 30°25.1′ longitude 80°16.8′

1206 Deployed buoy on shelf edge on eastern side of shelf edge reef.
13409.0, 71156.0
latitude 30°24.75′ longitude 80°14.66′

1220 Begin Dive #7 M. Ball observer, Hickey pilot at shelf edge, 150 feet of water, all calm, beautiful weather, flat sea, etc.
13409.0, 71155.5
latitude 30°24.75′ longitude 80°14.81′

1310 Sub up 13409.3, 71154.5.
latitude 30°24.83′ longitude 80°15.02′

1315 Mahlon reports no reef at buoy next dive should be to east.

1326 Begin Dive #8 observer Jesse Hunt, pilot Barksdale.

1415 Sub up.

1435 Begin Dive #9 observer C. Paull, pilot Hickey to head E over reef.

1510 Water so calm transfer of Paull to ship made by Zodiac, M. Noble transferred to sub. Paull reported bedded rock at 160 to 200′ depth, encrusted.

1535 Begin Dive #10, observer M. Noble, pilot Barksdale 13414.6, 71155.7.
latitude 30°24.87′ longitude 80°12.85′

1625 Sub up, surface transfer to begin Dive #11, observer D. Eskenasy, pilot Hickey.

1722 Sub up, surface transfer.

1730 Begin Dive #12, observer S. Pfirman, Pilot Barksdale.

1748 Surface transfer complete, sub on descent.

1820 Clear to come up.

1830 Sub aboard, end diving 13437.7, 71148.1.
latitude 30°27.53′ longitude 80°16.25′

2047 XBT and salinity sample (BR-15).
latitude 30°24.6′ longitude 80°03.5′

2110 XBT and salinity sample (BR-16).
latitude 30°25.9′ longitude 80°06.2′

2145 XBT and salinity sample (BR-17).
latitude 30°24.9′ longitude 80°11.0′

2220 XBT and salinity sample (BR-18).
latitude 30°24.2′ longitude 80°11.5′

2303 XBT and salinity sample (BR-19).
latitude 30°23.7′ longitude 80°25.0′

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0020 XBT and salinity sample (BR-20).
latitude 30°25.0′ longitude 80°38.2′

0116 XBT and salinity sample (BR-21).
latitude 30°24.4′ longitude 80°43.3′

0210 XBT and salinity sample (BR-22).
latitude 30°25.1′ longitude 80°01.1′

0900 Begin Dive #13 on deep reefal features on Blake Plateau. Water depth 822 ft, Gulf Stream current strong. Observer Ball, pilot Hickey.
13520.0, 71209.3
latitude 30°32.2′ longitude 80°04.68′

0925 Sub on surface, dive aborted. At 500 ft current from S pushed sub faster than buoy, 1,300 ft of buoy line out and current pulled it under. Sub was sideways to current and could not maintain heading.
13538.7, 71216.7 recovery
latitude 30°34.39′ longitude 80°03.35′

1000 Proceed to shelf edge reef, beautiful weather and calm sea.

1100 On reef N of previous dives, several passes made over reef and buoy dropped right on reef.

1121 Begin Dive #14. Observer Popenoe, pilot Barksdale.

1128 Sub has landed on top of reef: many fish, sandstone outcrops, etc.

1212 Sub standing by for retrieval position 13598.7, 71186.1.
latitude 30°39.99′ longitude 80°09.32′ Pete was on reef, reports slabs of rock, colorful fish, angelfish, lots of color in general. Rocks encrusted, everything living, basket sponges, visibility 15-20 ft, color only beneath lights.

1230 Begin Dive #15. Observer Jesse Hunt, pilot Hickey.
13600.3, 71185.2
latitude 30°40.16′ longitude 80°09.49′

1325 Jesse is sticking near buoy.

1333 Sub on surface.

1338 Sub aboard. Jesse saw large blocks and holes between them. Lobster in holes, Barracuda, Traverse went across top of reef to white sand bottom, turned around to E and went halfway down reef again. Recorded lots of video tape. Clean white sand with ripple marks on top of reef. Grouper and amberjack.
13597.8, 71184.3
latitude 30°39.98′ longitude 80°09.67′

1348 Begin Dive #16. Observer Henry, pilot Barksdale 13600.2, 71195.4.
latitude 30°39.73′ longitude 80°07.57′

1500 Sub at surface 13599.9, 71184.6.
latitude 30°40.15′ longitude 80°09.61′

1510 Sub aboard.

1535 Begin Dive #17. Observer C. Paull, pilot Hickey. 13599.7, 71184.5
latitude 30°40.14′ longitude 80°09.62′

1637 Sub on surface 13600.3, 71185.9.
latitude 30°40.14′ longitude 80°09.38′

1642 Sub aboard, hatch open.

1653 Sub in water, begin Dive #18 13601.7, 71194.8. Observer M. Noble, pilot Barksdale.
latitude 30°39.88′ longitude 80°07.69′

1734 Sub at surface.

1753 Sub retrieval, Marlene reports that dive missed the reef.

1800 Leave reef area to steam toward tripod area, heading 026°, speed 12.5 knots.

1835 XBT and salinity sample (BR-23) 13622.7, 71904.0.
latitude 30°41.9′ longitude 80°08.53′

1945 XBT and salinity sample (BR-24).
latitude 30°54.9′ longitude 80°01.9′

2055 XBT and salinity sample (BR-25).
latitude 31°01.0′ longitude 80°04.0′

2235 XBT and salinity sample (BR-26).
latitude 31°15.7′ longitude 79°59.0′

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0000 XBT and salinity sample (BR-27).
latitude 31°25.4′ longitude 79°43.9′

0500 XBT and salinity sample (BR-28).
latitude 32°32.0′ longitude 78°38.4′

0725 Weather is deteriorating, cloudy and windy, squall in distance, lightning.

0730 Arrive at tripod buoy, Buoy G. Waiting for bad weather to clear.
15177.7, 71748.1
latitude 32°31.01′ longitude 78°38.13′

0945 Begin Dive #19 in search for tripod. (We cannot search for tripod with pinger for fear of triggering the release mechanism. If this happens we cannot recover the tripod.) Tripod location at .25 nautical mile at 235° from Buoy "G". Observer Pfirman, pilot Hickey. 15180.1, 56059.3, 71749.3
latitude 32°32.5′ longitude 78°37.5′

1012 Launch sub, begin search pattern.

1220 End Dive #19, tripod not found.

1240 Begin Dive #20 at exact loran locations of tripod. Observer Noble, pilot Barksdale. Begin search pattern. Check buoy light on Buoy G.

1440 Sub on surface, end Dive #20.

1451 Sub recovered, tripod not found, good live bottom found.

1500 Underway to tripod J which was reported to not have a light.

1530 Light at tripod J found to be operating. Preceeding to reticulated bottom area to check on cause of reticulated signature on side-scan radar records.

1644 Prepare for Dive #21. Observer Henry, pilot Hickey 15211.0, 71681.7.
latitude 32°38.64′ longitude 78°50.98′

1649 Launch sub, begin Dive #21.

1740 Sub on surface.

1744 Sub recovered, end Dive #21. Nothing unusual seen in area to cause reticulated bottom. Probably results from density differences in the water column.

1800 Launch sub for Dive #22. Observer Eskenasy, pilot Barksdale. 71687.4, 15214.5
latitude 32°39.12′ longitude 78°51.45′

1838 Sub on surface.

1847 Sub recovered.

1850 XBT and salinity sample (BR-34). Steaming for Savannah, Georgia.
latitude 32°39.6′ longitude 78°52.0′

1915 XBT and salinity sample (BR-35).
latitude 32°42.5′ longitude 78°55.8′

1945 XBT and salinity sample (BR-36).
latitude 32°45.6′ longitude 79°00.0′

2010 XBT and salinity sample (BR-37).
latitude 32°48.9′ longitude 79°03.4′

2110 XBT and salinity sample (BR-38).
latitude 32°41.2′ longitude 79°09.4′

2225 XBT and salinity sample (BR-39).
latitude 32°31.0′ longitude 79°20.8′

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0020 XBT and salinity sample (BR-400.
latitude 32°19.6′ longitude 79°36.2′

0130 XBT and salinity sample (BR-41).
latitude 32°08.7′ longitude 79°47.4′

0230 XBT and salinity sample (BR-42).
latitude 31°57.9′ longitude 79°58.7′

0400 XBT and salinity sample (BR-43).
latitude 31°56.9′ longitude 80°17.1′

0535 XBT and salinity sample (BR-44).
latitude 31°27.0′ longitude 80°26.5′

0820 In port, Savannah, Georgia.

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

IN REPLY REFER TO:
1513.53(300)
AA551-MU8-13

TO : Files

Date: August 22, 1978

FROM : Jesse L.Hunt, Jr.,Oceanographer (Geology), E.A.D.

SUBJECT : Report on U.S.G.S. (Woods Hole) South Atlantic Submersible Cruise as Contract Inspector

The cruise was delayed for a couple of days due to mechanical problems with the main engines and rudder. The problems were taken care of and we departed Savannah at approximately 0800 on 8/15/78. Scientific crew included:

Mahlon Ball, U.S.G.S., Woods Hole (Chief Scientist)
Pete Poponoe, U.S.G.S. Woods Hole
Charles Paull, U.S.G.S. Woods Hole
Diane Eskenasy, U.S.G.S. Woods Hole
Stephanie Phirman, U.S.G.S. Woods Hole
Marlene Noble, U.S.G.S. Woods Hole
Jim Henry, Skidaway Institute of Oceanography
Jesse L. Hunt,Jr., BLM, New Orleans OCS (Contract Inspector)

The support vessel was the "State Arrow" under the command of Captain G. F. Ottmer. The submersible used was the "Diaphus", leased from Texas A & M by Martec International, Inc. The Martec Personnel included:

Don Bolstad, Submersible Supervisor and dive master
Pat Hickey, Submersible pilot
Gordon Barksdale, Submersible pilot
Bob Jackson, Diver
Dan Barker, Diver
Mark Beldon, Diver and winch operator

Prior to arrival at the Savannah Light Tower, the minisparker system was deployed and tested. A course was set for Grey's Reef. Little data was collected with the sparker due to the excessive noise on the hydrophone array caused by the profiling speed of 10 knots. We slowed the vessel and the records cleared up substantially. The gear was then recovered and we ran to Grey's Reef, arriving on station at approximately 13:30. Mahlon Ball made the first dive in the vicinity of the Ga. DNR Buoy "SLB" and nothing but sand was observed. A second dive was made in the same vicinity with Jim Henry as observer, and very little live-bottom was observed. We then replotted the reef area and ran approximately 3/4 mile from the buoy at 212° and came across good bottom. Third dive was made and we saw good "live-bottom". Two more were made in the vicinity and good video tapes and 35mm slides were taken.

We then set course for the shelf edge off Jacksonville via the 6002 U.S.G.S. core hole running the sparker at 7 knots. After a short while, the trigger circuit in the sparker went out, probably due to frequent power surges in the ship's power. En route to the shelf edge, several XBT's were run.

On 8/16/78, seven dives were made on the shelf edge reef in approximately 160 to 180 feet of water. We obtained good fathometer records over the reef and were able to correlate features observed during the dives with the fathometer records. We then ran shoreward taking XBT's and returned to the same area during the night.

On 8/17/78, an attempt was made to dive on a deeper feature (800 feet) in the phosphatic-manganese accretion area, but the dive was aborted at approximately 600 feet due to excessive current (Gulf Stream). Five more dives were made on a different section of the shelf-edge reef just north of the previous day's dive sites.

We departed that station and ran all night taking XBT's to the area "A" off of Charleston. On 8/18/78, two dives were made at the site of one of the tripods, but it was not found. We then checked the lights on both tripod buoys and ran inshore to an area that showed as "reticulated bottom" on Jim Henry's side scan records. Nothing unusual was observed, so Jim thought perhaps it was the result of density differences in the water column.

Live-bottom areas of the low-relief type were seen in the area of the tripod and shoreward.

En route to Savannah, XBT's were run along the way. Salinity samples (surface) were collected at the XBT sites during the entire cruise.

A total of 22 dives were made at depths from 55 feet to 190 feet.

I felt the submersible operation, and especially the launch and recovery operations and procedures, were very professional, safe and efficient. Back-up safety contingencies and procedures were well thought out and very professional.

A great deal of excellent data was collected which will enable us to better understand, and to even characterize, certain portions of the shelf-edge reef trend off Georgia and Florida. Many color slides were taken and much video footage was shot for future study and documentation.

CRUISE REPORT

VESSELS: M/V STATE ARROW
DSRV DIAPHUS

CRUISE NUMBER: STATE ARROW 78, Legs 1 and 2

AREA: Mid-Atlantic and North Atlantic Upper Continental Slope

DATE: 30 July - 9 August 1978

PERSONNEL:

U.S. Geological Survey

Slater, Rich	Chief Scientist - Geologist
Aaron, John	Geologist - North Atlantic
Bryden, Cindy	Biologist
Hampson, Jack	Geological Assistant
McCarthy, Jerry	Technician
Purdy, Sue	Secretary
Sylwester, Dick	Technician
Twichell, Dave	Geologist - Mid-Atlantic

Guests

Butler, Pam	Readers Digest
Phipps, Charles V.G.	Univ. of Sydney, Australia

Martek

Bolstad, Don	Supervisor, Diving Operation
Barksdale, Gordon	Pilot
Hickey, Pat	Pilot

State Arrow

Ottmer, Gerald	Captain

PURPOSE OF CRUISE: To make detailed observations of geologic hazards, especially slumping, along the Upper Continental Slope off Georges Bank near 40°20'N, 67°W, and off the Baltimore Canyon area 38°30'N to 39°30'N and 73°W to 73°30'W.

NAVIGATION TECHNIQUES: NORTHSTAR 6000 LORAN C

SCIENTIFIC EQUIPMENT

ORE 3.5 kHz profiler
BENTHOS Deep-sea camera
Van Veen Grab
Teledyne minisparker (800 toules)
SONY video tape recorder

Date	Dives	Diving	Total Time Underwater	Sampling	Transitting	Sparking	Stand-By
30 July	5	13 hrs	5 hrs 59 min	-	11 hrs	-	-
31 July	1	3 hrs	2 hrs 58 min	-	6 hrs 30 min	4 hrs 30 min	10 hrs
1 August	4	8 hrs	7 hrs 14 min	3 hrs	8 hrs	9 hrs	-
2 August	2	9 hrs	6 hrs 8 min	3 hrs	30 min	11 hrs 30 min	-
3 August	3	8 hrs 30 min	6 hrs 15 min	-	8 hrs	7 hrs 30 min	-
4 August	3	13 hrs 30 min	7 hrs 5 min	-	7 hrs 30 min	3 hrs	-
5 August	1	3 hrs 30 min	2 hrs 38 min	-	2 hrs 30 min	18 hrs	-
6 August	3	8 hrs 30 min	5 hrs 32 min	-	9 hrs 30 min	6 hrs	-
7 August	2	8 hrs	6 hrs 23 min	-	7 hrs	9 hrs	-
8 August	0	1 hr 30 min	-	1 hr 30 min	13 hrs 30 min	7 hrs 30 min	-
9 August	0	-	-		7 hrs 30 min	-	-
Total	24	76 hrs 30 min	50 hrs 12 min	7 hrs 30 min	75 hrs 30 min	76 hrs	10 hrs
AVE	2.7	7 hrs 39 min	5 hrs 35 min	18 min	6 hrs 50 min	7 hrs 36 min	-
MAX	5	13 hrs 30 min	7 hrs 5 min	3 hrs	13 hrs 30 min	18 hrs	-
MIN	1	1 hr 30 min	2 hrs 38 min	0	30 min	3 hrs	-

Total time at sea - 247 hrs. (10 days 7 hrs). Total Distance traveled - 1778 (162 km/day). Total distance of sparker surveys - 592 km (59 km/day)

DIVE	DATE	TIME Down	TIME Up	Total	Position Start	Position Finish	Depth	Course	Visibility	PILOT Observer	FILM	REMARKS
1	30 July	1004	1059	55	38°05 73°54	38°04 73°54	125 m	135°	5 m	Hickey Aaron		
2	30 July	1142	1250	68	38°03 73°51	38°03.43 73°51.88	216 m	260°	5 m	Barksdale Twichell		
3	30 July	1354	1510	76	38°06.3 73°53.4	38°06.35 73°53.45	125 m	040°	5 m	Hickey Bryden		
4	30 July	1554	1741	107	38°07.1 73°52'	38°06.80 73°51.67	366 m		4 m	Barksdale Phipps		
5	30 July	1835	1928	53	38°05.38 73°53.34	38°05.06 73°53.22	131 m	000°	6 m	Hickey Butler		
6	31 July	1059	1357	178	39°03.75 72°46.40	39°02.7 76°46.3	131 m to 366 m	090° to 225°	4 m	Barksdale Slater	(60) 35 mm T.V.	Head of South Tom's Canyon. Couple of steep drop-offs. Lots of trash at depth.
7	1 Aug.	0806	1040	156	39°02.89 72°45.13	39°02.58 72°45.81	366 m	165°	7 m	Hickey Twichell	(101) 35 mm T.V.	N.E. head of South Tom's Canyon Lots of trash at depth. No steep drop-offs.
8	1 Aug.	1127	1341	134	39°02.33 72°46.64	39°02.09 72°46.62	314 m		6 m	Barksdale Bryden	(124) 35 mm T.V.	Head of South Tom's Canyon. Biological Observation

9	1 Aug	1455	1638	104	39°01.87 72°47.55	39°01.80 72°47.56	299 m	135°	7 m	Hickey Hampson		
10	1 Aug	1730	1810	40	39°02.52 72°45.10	39°02.32 72°44.91	320 m		6 m	Barksdale Aaron		Batteries ran down
11	2 Aug	0816	1142	206	38°54.04 78°54.24	38°53.31 72°52.87	366 m	090°	7 m	Hickey Phipps		
12	2 Aug	1403	1645	162	38°55.27 72°54.82	38°54.4 72°54.8	332 m	145°	8 m	Barksdale Slater		
13	3 Aug	0816	1045	149	38°54.67 72°53.12	38°54.24 72°53.31	366 m	120°	10 m	Hickey Twichell		
14	3 Aug	1145	1415	150	38°56.93 72°50.76	38°56.34 72°51.35	341 m	150°	7 m	Barksdale Aaron		
15	3 Aug	1502	1618	76	38°59.96 72°49.32	38°58.91 72°49.78	197 m	110°	8 m	Hickey Hampson		
16	4 Aug	0810	1040	150	40°00.68 69°37.71	40°01.33 69°37.41	217 m	090°	8 m	Barksdale Slater		
17	4 Aug	1204	1434	150	40°00.83 69°37.66	40°00.27 69°37.40	207 m	180°	8 m	Hickey Aaron		Batteries ran down
18	4 Aug	1821	2026	125	40°00.46 69°37.54	40°00.24 69°37.24	207 m		8 m	Barksdale Twichell		
19	5 Aug	1428	1706	158	40°00.58 69°37.65	40°00.09 69°37.72	134 m	140°	9 m	Hickey Bryden		
20	6 Aug	0850	1040	110	40°25.16 67°39.10	40°25.5 67°39.8	366 m	270°	8 m	Barksdale Aaron		
21	6 Aug	1127	1349	142	40°24.68 67°42.82	40°24.62 67°43.05	156 m	090°	9 m	Hickey Phipps		

2	6 Aug	1505	1625	80	40°26.01 67°41.63	40°25.70 67°41.12	141 m	090	8 m	Barksdale Hampson		
3	7 Aug	0821	1105	164	40°50.77 67°23.74	40°50.86 67°24.27	85 m		3 m	Hickey Bryden		
4	7 Aug	1435	219	219	40°29.46 67°41.44	40°29.32 67°41.68	366		6 m	Barksdale Slater		

7 Aug.	2400 - 0500	Sparking	Fog Calm Cleared later in AM	Fog Steering Sub leaking
	0500 - 0800	Transit (Lydonia Canyon to tripod on shelf)		
	0800 - 1130	Diving (Tripod site)		
	1130 - 1430	Transit (Tripod site to Lydonia Canyon)		
	1430 - 1900	Diving (Lydonia Canyon		
	1900 - 2000	Transit		
	2000 - 2400	Sparking		
8 Aug.	0000 - 0730	Sparking	2-3' swell 10-15 knot wind	(Dive aborted on surface) Bad leak
	0730 - 0900	Diving		
	0900 - 1030	Sampling		
	1030 - 2400	Transit (Lydonia Canyon to Woods Hole)		
9 Aug.	0000 - 0730	Transit		

3 Aug.	0000 - 0730	Sparking	1-2' swell	Zodiac broke down
	0730 - 0800	Transit	Calm, sunny	
	0800 - 1630	Diving (Carteret Canyon)		
	1630 - 2400	Transit (Carteret Canyon to Veatch Canyon)		
4 Aug.	0000 - 0730	Transit (Carteret Canyon to Veatch Canyon)	Sunny Clear Calm	Zodiac problems Minisparker problems
	0730 - 2100	Diving (Veatch Canyon)		
	2100 - 2400	Sparking		
5 Aug.	2400 - 1400	Sparking (Too foggy to dive	Fog Calm	Fog Steering problem 3.5 kHz down Water contamination
	1400 - 1730	Diving (Veatch Canyon)		
	1730 - 1800	Transit		
	1800 - 2200	Sparking		
	2200 - 2400	Transit (Veatch Canyon to Lydonia Canyon)		
6 Aug.	0000 - 0830	Transit (Veatch Canyon to Lydonia Canyon)	Fog Calm	Fog Steering problems Water contamination
	0830 - 1700	Diving (Lydonia Canyon)		
	1700 - 1800	Transit		
	1800 - 2400	Sparking		

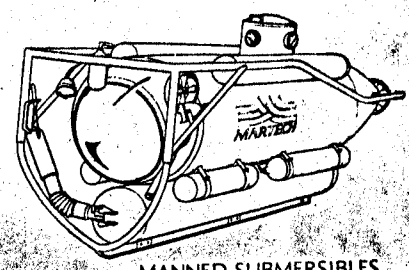
			Weather	Problems
30 July	0000 - 0700	Transit (Cape May to Baltimore Canyon)	Seas calm, 2-3' swell	Ships steering broke down
	0700 - 2000	Diving (Baltimore Canyon		
	2000 - 2400	Transit and adjusting sparker (Baltimore Canyon to South Tom's Canyon		
31 July	0000 - 0630	Transit (Baltimore Canyon to South Tom's Canyon)	20-25 knot SE wind 6-8' swell 1-2' chop	One engine down Trouble with location of sub
	0630 - 1100	Fixing ships engine		
	1100 - 1400	Diving (South Tom's Canyon)		
	1400 - 1930	Standing by (weather)		
	1930 - 2400	Sparking		
1 Aug.	2400 - 0600	Sparking	2-3' swell	
	0600 - 0800	Transit	Sunny	
	0800 - 1900	Diving (South Tom's Canyon)		
	1900 - 2100	Sparking		
	2100 - 2400	Sparking		
2 Aug.	0000 - 0730	Sparking	2-3' swell	
	0730 - 0800	Transit	Sunny	
	0800 - 1700	Diving (Carteret Canyon)		
	1700 - 2000	Sampling (3 samples)		

DIAPHUS

PRE/POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Customer NOAA (USGS) Date 8/15/78 Job# 392

Contract Dive No. 604

Job Location Vessel STATE ARROW Service Order No.

External	( )	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	( )
SW Detectors	( )	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	( )
Pod Covers	( )	Bow Plane/Rudder	(✓)	Antennas	(✓)		( )
Vent Plugs	( )	H.P. Bottles	(✓)	Propeller & Nut	(✓)		( )
Sonar Comp.	( )	Cables	(✓)	Hatch Dogs	(✓)		( )

Internal					
Soda Sorb	(✓)	H.P. Air P.S.I.	(✓)	V.H.F. Normal	(✓)
L10H x 5	(✓)	Battery State	(✓)	Emergency	(✓)
Oxygen In Use	(✓)	36V	(✓)	Timers	(✓)
Standby	(✓)	12V	(✓)	Scrubber	(✓)
Oxygen Monitor	(✓)	E12V	(✓)	Pinger Receiver	(✓)
Draeger CO_2 + O_2	(✓)	Internal Lights	(✓)	Sonar	(✓)
Fire Extinguisher	(✓)	External Lights	(✓)	Port Vent	(✓)
First Aid Kit	(✓)	Drop Weight Pinned	(✓)	Port Bow	(✓)
Emergency Rations	(✓)	U.W.T. Normal	(✓)	STBD Vent	(✓)
Flash Lights	(✓)	Emergency	(✓)	STBD Blow	(✓)
Clock	(✓)	U.W. Pinger Normal	(✓)	V.B.T.	(✓)
Barometer	(✓)	Emergency	(✓)	Thruster	(✓)
Temperature	(✓)	R.D.F.	( )		

Maintenance Done

REPEATED DIVING ON MAIN PORT

Equipment Fitted & WT. Pilot

Post-Dive						Equip. Removed	Wt.
Hatch Cleaned	☐	H.P. Air	☐	Garbage Removed	☐		
R.D.F. Off	☐	Batteries 36V	☐	Sanitary Bottle	☐		
Zenon Off	☐	12V	☐		☐		
Dehumidifier On	☐	E12V	☐		☐		

Maintenance Required

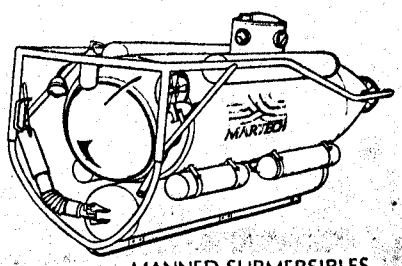
Pilot

DIAPHUS

P[illegible] & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Customer USGS Date 8/15/78 Job#

Contract Dive No.

Job Location Vessel STATE ARROW Service Order No.

External	(✓)	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	(✓)
SW Detectors	(✓)	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	(✓)
Pod Covers	(✓)	Bow Plane/Rudder	(✓)	Antennas	(✓)		( )
Vent Plugs	(✓)	H.P. Bottles	(✓)	Propeller & Nut	(✓)		( )
Sonar Comp.	(X)	Cables	(✓)	Hatch Dogs	(✓)		( )

Internal

Soda Sorb	(✓)	H.P. Air P.S.I.	(✓)	V.H.F. Normal	(✓)
L10H x 5	(✓)	Battery State	(✓)	Emergency	(✓)
[illegible]gen In Use	(✓)	36V	(✓)	Timers	(✓)
[illegible]Standby	(✓)	12V	(✓)	Scrubber	(✓)
Oxygen Monitor	(✓)	E12V	(✓)	Pinger Receiver	(✓)
Draeger CO_2 + O_2	(✓)	Internal Lights	(✓)	Sonar	(✓)
Fire Extinguisher	(✓)	External Lights	(✓)	Port Vent	(✓)
First Aid Kit	(✓)	Drop Weight Pinned	(✓)	Port Bow	(✓)
Emergency Rations	(✓)	U.W.T. Normal	(✓)	STBD Vent	(✓)
Flash Lights	(✓)	Emergency	(✓)	STBD Blow	(✓)
Clock	(✓)	U.W. Pinger Normal	(✓)	V.B.T.	(✓)
Barometer	(✓)	Emergency	(✓)	Thruster	(✓)
Temperature	(✓)	R.D.F.	(✓)		

Maintenance Done

Equipment Fitted & WT. Pilot

Post-Dive

						Equip. Removed	Wt.
Hatch Cleaned	☑	H.P. Air	☑	Garbage Removed	☑		
R.D.F. Off	☒	Batteries 36V	ON ☑	Sanitary Bottle	☑		
Zenon Off	☒	12V	ON ☑		☐		
[illegible] Humidifier On	☒	E12V	☐		☐		

Maintenance Required

Pilot

SUBMERSIBLE PILOTS LOG

Date 8/15/78

Dive# 604

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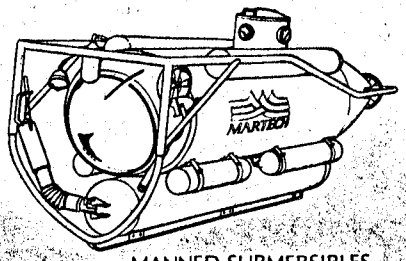
TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Pilot HICKEY Contract # 387 Operation USGS

Observer BALL Support Ship STATE ARROW

	Pre	Post		Pre	Post
O_2 Main	700	600	Barometer	30.15	
Reserve	1900x4	✓	Temperature	82	
Soda Sorb	NEW	4	Humidity	57	
Cans Reserve	15	✓	Ballast		
Air P.S.I.	2250x2	2000/2250	Post O_2 Off	Electrical	
Voltage 36	39	✓	Ballast	Bilge	
12	13	✓			
E12	✓	✓	Signed		

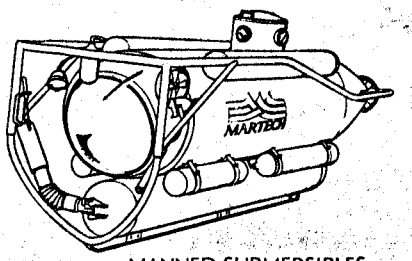
TIME	
1327	Gyrd
1328	Hatch Shut
1334	Launch
1336	Vents Open
1338	On Bottom 10 Vis 60 Depth FROM 0 Current 1½ KT
1355	STANDING BY TO COME UP
1403	Off Bottom
1404	On Surface
1407	Recovered
1418	Hatch Open

HUNT #606	PAULL #608
1526 LAUNCH	1755 LAUNCH
1530 ON BOTTOM	1800 ON BOTTOM 60'
1600 OFF BOTTOM 60'	1829 OFF BOTTOM
1611 ON DECK	1835 ON DECK

SUBMERSIBLE PILOTS LOG

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Date 8/15/78

Dive# 605
607

Pilot BARKSDALE Contract # _____ Operation USGS

Observer JIM HENRY
PETER DOLENOE Support Ship STATE ARROW

	Pre	Post		
O_2 Main	700	600	500	450
Reserve	1800	1800	1800	1800
Soda Sorb	/	/	/	/
Cans Reserve	5	5	5	5
Air P.S.I.	2000	1925	1775	1775
Voltage 36	38	37	37	37
12	12	12	12	12
E12	/	/	/	

	Pre	Post	
Barometer	30.35	30.35	30.30
Temperature	82	82	82
Humidity	60	60	60
Ballast	/	OK	/

O_2 Off / Electrical ON

Ballast / Bilge /

Signed Gordon Barksdale

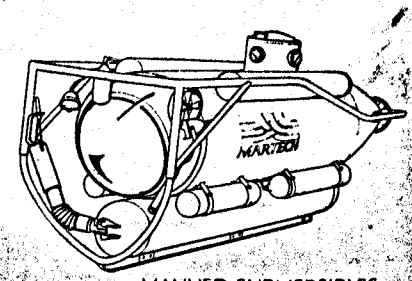
TIME			Vis	Depth	Current
1430	Gyrd ON	015°			
1432	Hatch Shut	1623			
1435	Launch	1625			
1440	Vents Open	1627			
	On Bottom	1630	10-15'	55	.5 120°
			10'	55	.5 KNT 120°
					30.30 30.30
					82 85
					60 64
1510	Off Bottom	1651			
1511	On Surface				
	Recovered				
	Hatch Open				

DIAPHUS

PRE & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Customer NOAA USGS Date 8/16/78 Job# 332

Contract Dive No. 610

Job Location Vessel STATE ALASKA Service Order No.

External	(/)	Ports Cleaned	(/)	Penitrators	(/)	RDF On	( )
SW Detectors	(/)	MBT Vent Clear	(/)	Transducers	(/)	Zenon On	(/)
Pod Covers	(/)	Bow Plane/Rudder	(/)	Antennas	(/)		( )
Vent Plugs	(/)	H.P. Bottles	(/)	Propeller & Nut	(/)		( )
Sonar Comp.	(X)	Cables	(/)	Hatch Dogs	(/)		( )

Internal

Soda Sorb	(/)	H.P. Air P.S.I.	(/)	V.H.F. Normal	(/)
L10H x 5	(/)	Battery State	(/)	Emergency	(/)
Oxygen In Use	(/)	36V	(/)	Timers	(/)
Standby	(/)	12V	(/)	Scrubber	(/)
Oxygen Monitor	(/)	E12V	(/)	Pinger Receiver	(X)
Draeger CO_2 + O_2	(/)	Internal Lights	(/)	Sonar	(X)
Fire Extinguisher	(/)	External Lights	(/)	Port Vent	(/)
First Aid Kit	(/)	Drop Weight Pinned	(/)	Port Bow	(/)
Emergency Rations	(/)	U.W.T. Normal	(/)	STBD Vent	(/)
Flash Lights	(/)	Emergency	(/)	STBD Blow	(/)
Clock	(/)	U.W. Pinger Normal	(/)	V.B.T.	(/)
Barometer	( )	Emergency	(/)	Thruster	(/)
Temperature	( )	R.D.F.	( )		

Maintenance Done

Equipment Fitted & WT

Pilot

Post-Dive

						Equip. Removed	Wt.
Hatch Cleaned	☐	H.P. Air	☐	Garbage Removed	☐		
R.D.F. Off	☐	Batteries 36V	☐	Sanitary Bottle	☐		
Zenon Off	☐	12V	☐		☐		
De Humidifier On	☐	E12V	☐		☐		

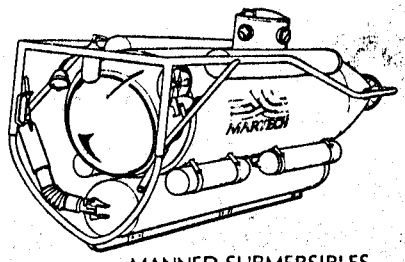
Maintenance Required

Pilot

DIAPHUS
PRE & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

4 DIVES

Customer USGS Date 8/16/78 Job#

Contract Dive No. 609 611 613 615

Job Location Vessel STATE ARROW Service Order No.

External	(✓)	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	(✓)
SW Detectors	(✓)	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	( )
Pod Covers	(✓)	Bow Plane/Rudder	(✓)	Antennas	(✓)		( )
Vent Plugs	(✓)	H.P. Bottles	(✓)	Propeller & Nut	(✓)		( )
Sonar Comp.	(X)	Cables	(✓)	Hatch Dogs	(✓)		( )

Internal

Soda Sorb	(✓)	H.P. Air P.S.I.	(✓)	V.H.F. Normal	(✓)
L10H x 5	(✓)	Battery State	(✓)	Emergency	(✓)
Oxygen In Use	(✓)	36V	(✓)	Timers	(✓)
Standby	(✓)	12V	(✓)	Scrubber	(✓)
Oxygen Monitor	(✓)	E12V	(✓)	Pinger Receiver	(✓)
Draeger CO_2 + O_2	(✓)	Internal Lights	(✓)	Sonar	(✓)
Fire Extinguisher	(✓)	External Lights	( )	Port Vent	(✓)
First Aid Kit	(✓)	Drop Weight Pinned	(✓)	Port Bow	(✓)
Emergency Rations	(✓)	U.W.T. Normal	(✓)	STBD Vent	(✓)
Flash Lights	(✓)	Emergency	(✓)	STBD Blow	(✓)
Clock	(✓)	U.W. Pinger Normal	(✓)	V.B.T.	(✓)
Barometer	(✓)	Emergency	(✓)	Thruster	(✓)
Temperature	(✓)	R.D.F.	(✓)		

Maintenance Done

Equipment Fitted & WT.

Pilot Gordon Barksdale

Post-Dive

						Equip. Removed	Wt.
Hatch Cleaned	☑	H.P. Air		☑	Garbage Removed	☑	
R.D.F. Off	☑	Batteries	36V	☑	Sanitary Bottle	☑	
Zenon Off	☑		12V	☑		☐	
De Humidifier On	☑		E12V	☑		☐	

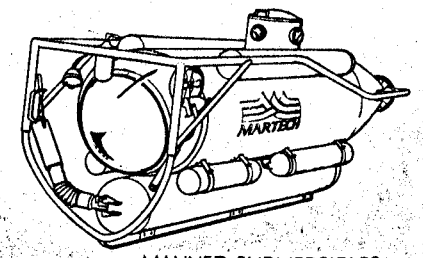
Maintenance Required

Pilot Gordon Barksdale

SUBMERSIBLE PILOTS LOG

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Date 8/16/78

Dive# 609
611
613
615

4 DIVES

Pilot BARKSDALE Contract # Operation USGS

Observer JIM HENRY Support Ship STATE ARROW

	Pre	Post					Pre	Post
O_2 Main	450	X	1500	30.15	29.55	Barometer	30.24	29.77
Reserve	1800 1800	1800 1800	1800 1800	78	75	Temperature	77	74
Soda Sorb	/	2.5 HR 4		58	58	Humidity	63	59
Cans Reserve	5	5	5	/		Ballast	/	/
Air P.S.I.	2250 2175	2025 2175	1850 2175	Post		O_2 Off	Electrical	
Voltage 36	38	37	37			Ballast	Bilge	
12	13	12	12					
E12	/	/	/	Signed Gordon Barksdale				

TIME		
	Gyrd	315° 090°
0842	Hatch Shut	1328
0845	Launch	1329
0848	Vents Open	1332
0849	On Bottom	1335

Vis	Depth	Current
10-15'	130'	3/4 KNOT 270°
10-15'	170	1/4 KNOT 120°

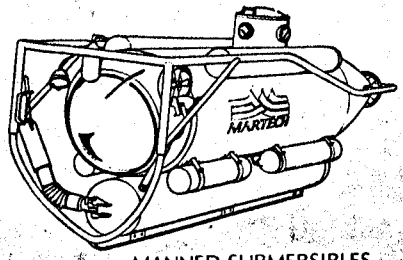
some trouble with VTR after hitting bottom, still think tapes have moisture on them
rudder is moving stiff
leak on manipulator at claw fitting
NEW O_2 bottle
spare flash light D' cells

1046	Off Bottom	1404
1048	On Surface	1406
1054	Recovered	1410
	Hatch Open	1415

SUBMERSIBLE PILOTS LOG

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Date 8/16/78

Dive# 1 10

Pilot Hickey Contract # 382 Operation NOAA USGS

Observer Hunt Bull Support Ship State Arrow

	Pre	Post
O_2 Main	11.22	
Reserve	40/950	
Soda Sorb	+3	
Cans Reserve	+5	
Air P.S.I.	2000/1700	
Voltage 36	37	
12	12	
E12	✓	

	Pre	Post
Barometer	30.2	
Temperature	78	
Humidity	61	
Ballast		

Post O_2 Off Electrical Ballast Bilge

Signed

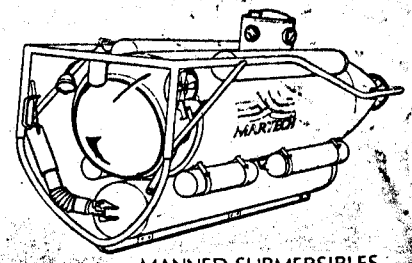
TIME	
	Gyrd
1215	Hatch Shut
1220	Launch
1221	Vents Open
1225	On Bottom 201 Vis 200' Depth F 240' Current
1254	Standing By To Come Up 170'
1300	Off Bottom
1311	Recovered

#612	Pauli	
1426	Launch	#614
1435	On Bottom 170'	1630
	Course 120 Cur 120	Surface
		Transfer
1507	Standing By	1640
	To Come Up	On Bottom
1516	Off Bottom 200	160'
1525	On Surface	1722
	Surface Transfer	Off Bottom
	Off Bottom	
	On Surface	
	Recovered	
	Hatch Open	

DIAPHUS
PRE & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Customer NOAA USGS Date 8/17/78 Job# 382

Contract _____ Dive No. 618

Job Location _____ Vessel STATE ARROW Service Order No. _____

External	(✓)	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	( )
SW Detectors	(✓)	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	(✓)
Pod Covers	(✓)	Bow Plane/Rudder	(✓)	Antennas	(✓)		( )
Vent Plugs	(✓)	H.P. Bottles	(✓)	Propeller & Nut	(✓)		( )
Sonar Comp.	(✓)	Cables	(✓)	Hatch Dogs	(✓)		( )

Internal

Soda Sorb	(✓)	H.P. Air P.S.I.	(✓)	V.H.F. Normal	(✓)
L10H x 5	(✓)	Battery State	(✓)	Emergency	(✓)
Oxygen In Use	(✓)	36V	(✓)	Timers	(✓)
Standby	(✓)	12V	(✓)	Scrubber	(✓)
Oxygen Monitor	(✓)	E12V	(✓)	Pinger Receiver	(x)
Draeger CO_2 + O_2	(✓)	Internal Lights	(✓)	Sonar	(✓)
Fire Extinguisher	(✓)	External Lights	(✓)	Port Vent	(✓)
First Aid Kit	(✓)	Drop Weight Pinned	(✓)	Port Bow	(✓)
Emergency Rations	(✓)	U.W.T. Normal	(✓)	STBD Vent	(✓)
Flash Lights	(✓)	Emergency	(✓)	STBD Blow	(✓)
Clock	(✓)	U.W. Pinger Normal	(✓)	V.B.T.	(✓)
Barometer	(✓)	Emergency	(✓)	Thruster	(✓)
Temperature	(✓)	R.D.F.	( )		

Maintenance Done

Equipment Fitted & WT.

Pilot [signature]

Post-Dive

						Equip. Removed	Wt.
Hatch Cleaned	☑	H.P. Air	☑	Garbage Removed	☐		
R.D.F. Off	☐	Batteries 36V	☐	Sanitary Bottle	☐		
Zenon Off	☑	12V	☑		☐		
De Humidifier On	☑	E12V	☑		☐		

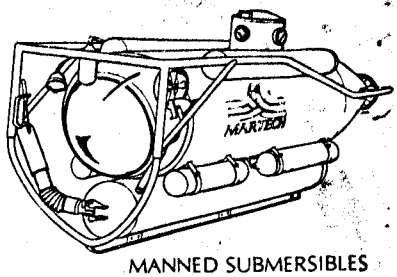
Maintenance Required

Pilot [signature]

DIAPHUS
PRE & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

3 DIVES

Customer USGS Date 8/17/78 Job#

Contract Dive No. 519 521 523

Job Location Vessel STATE HARDOW Service Order No.

External	(✓)	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	(✓)
SW Detectors	(✓)	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	(✓)
Pod Covers	(✓)	Bow Plane/Rudder	(✓)	Antennas	(✓)		( )
Vent Plugs	(✓)	H.P. Bottles	(✓)	Propeller & Nut	(✓)		( )
Sonar Comp.	(X)	Cables	(✓)	Hatch Dogs	(✓)		( )

Internal

Soda Sorb	(✓)	H.P. Air P.S.I.	(✓)	V.H.F. Normal	(✓)
L10H x 5	(✓)	Battery State	(✓)	Emergency	(✓)
Oxygen In Use	(✓)	36V	(✓)	Timers	(✓)
Standby	(✓)	12V	(✓)	Scrubber	(✓)
Oxygen Monitor	(✓)	E12V	(✓)	Pinger Receiver	(✓)
Draeger $CO_2 + O_2$	(✓)	Internal Lights	(✓)	Sonar	(X)
Fire Extinguisher	(✓)	External Lights	(✓)	Port Vent	(✓)
First Aid Kit	(✓)	Drop Weight Pinned	(✓)	Port Bow	(✓)
Emergency Rations	(✓)	U.W.T. Normal	(✓)	STBD Vent	(✓)
Flash Lights	(✓)	Emergency	(✓)	STBD Blow	(✓)
Clock	(✓)	U.W. Pinger Normal	(✓)	V.B.T.	(✓)
Barometer	(✓)	Emergency	(✓)	Thruster	(✓)
Temperature	(✓)	R.D.F.	(✓)		

Maintenance Done

Equipment Fitted & WT.

Pilot

Post-Dive

						Equip. Removed	Wt.
Hatch Cleaned	☐	H.P. Air		☐	Garbage Removed	☐	
R.D.F. Off	☐	Batteries	36V	☐	Sanitary Bottle	☐	
Zenon Off	☐		12V	☐		☐	
De Humidifier On	☐		E12V	☐		☐	

Maintenance Required

Pilot

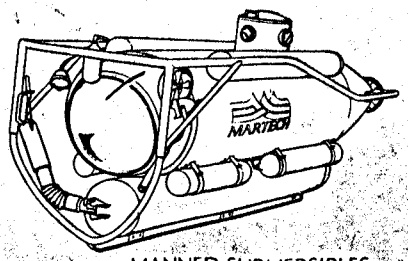
SUBMERSIBLE PILOTS LOG

Date 8/17/78

Dive# 618

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Pilot Hickey Contract # 382 Operation USGS

Observer Ball Support Ship State Arrow

	Pre	Post
O_2 Main	1200	
Reserve	1910x4	
Soda Sorb	New	
Cans Reserve	15	
Air P.S.I.	2.0/2700	
Voltage 36	38	
12	13	
E12	✓	

	Pre	Post
Barometer	30.15	
Temperature	76	
Humidity	65	
Ballast		

Post O_2 Off Electrical

Ballast Bilge

Signed [signature]

TIME	
0857	Gyrd
0856	Hatch Shut
0858	Launch
0900	Vents Open
	On Bottom Vis Depth Current
0912	AT 500 FT CURRENT FROM S AND PULLING BOAT TO N. 1300 FT BOLLY LINE OUT AND CURRENT PULLING IT UNDER ABORTING DIVE
0914	SURFACING

#620 HUNT.
1230 LAUNCH
1238 ON BOTTOM
270° - 300
1310 090°
1329 OFF BOTTOM
1345 RECOVERED

#622 PAULL
1530 LAUNCH
1535 ON BOTTOM
COURSE 090°
1628 OFF BOTTOM
1640 RECOVERED

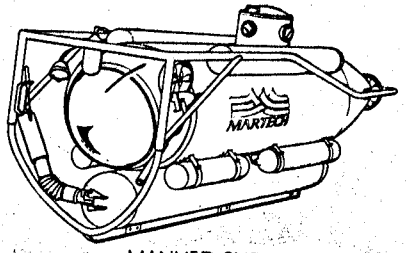
	Off Bottom
0925	On Surface
0937	Recovered
09.40	Hatch Open

17-4

SUBMERSIBLE PILOTS LOG

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Date 8/17/78

Dive# 519
521
523

3 DIVES

Pilot BARKSDALE Contract # Operation USGS

Observer PETE POTEBWOE Support Ship STATE ARROW

	Pre	Post				
O_2 Main	1150	975	800	600	30.15	29.35
Reserve	1800	1800	1800	1800	75	72
Soda Sorb	3 HR	5.5 HR	7	8	57	58
Cans Reserve	5	5	5	5		
Air P.S.I.	2175	2175	1525	1275		
Voltage 36	38	37	37	37		
12	12.5	12	12	12		
E12	/	/	/	/		

Post

	Pre	Post
Barometer	30.15	29.70
Temperature	80	74
Humidity	60	58
Ballast	/	OK
O_2 Off /	Electrical	OK
Ballast /	Bilge	/

Signed

TIME					
	Gyrd 239° - 245°			30.15	1100 PSI
1147	Hatch Shut	1347	1651	+ 78	500 O2
1132	Launch	1348		56	
1134	Vents Open	1354			
1131	On Bottom	270			

	Vis	Depth	Current
	30'	180'	340° .5 KNT.
	30'	175'	0

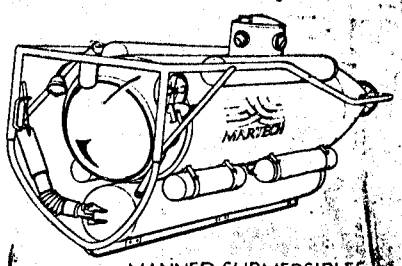
New O ring on aft battery pod.
Batteries for front internal light
No current on second dive after seeing strong current this morning from the NE.
Attempted bottom sample, claw broke

1215	Off Bottom	1459	1724
	On Surface	1510	
	Recovered		
	Hatch Open	1516	

DIAPHUS
PRE & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Customer USGS Date 8/18/78 Job#

Contract Dive No. 525 529

Job Location Vessel STATE ARROW Service Order No.

External	(✓)	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	(✓)
SW Detectors	(✓)	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	(✓)
Pod Covers	(✓)	Bow Plane/Rudder	(✓)	Antennas	(✓)		( )
Vent Plugs	(✓)	H.P. Bottles	(✓)	Propeller & Nut	(✓)		( )
Sonar Comp.	(✓)	Cables	(✓)	Hatch Dogs	(✓)		( )

Internal

Soda Sorb	(✓)	H.P. Air P.S.I.		(✓)	V.H.F. Normal		(✓)
L10H x 5	(✓)	Battery State		(✓)		Emergency	(✓)
Oxygen In Use	(✓)		36V	(✓)	Timers		(X)
Standby	(✓)		12V	(✓)	Scrubber		(✓)
Oxygen Monitor	(✓)		E12V	(✓)	Pinger Receiver		(✓)
Draeger $C0_2$ + 0_2	(✓)	Internal Lights		(✓)	Sonar		(X)
Fire Extinguisher	(✓)	External Lights		(✓)	Port Vent		(✓)
First Aid Kit	(✓)	Drop Weight Pinned		(✓)	Port Bow		(✓)
Emergency Rations	(✓)	U.W.T.	Normal	(✓)	STBD Vent		(✓)
Flash Lights	(✓)		Emergency	(✓)	STBD Blow		(✓)
Clock	(✓)	U.W. Pinger	Normal	(✓)	V.B.T.		(✓)
Barometer	(✓)		Emergency	(✓)	Thruster		(✓)
Temperature	(✓)	R.D.F.		(✓)			

Maintenance Done

Equipment Fitted & WT.

Pilot Gordon Barkedale

Post-Dive

					Equip. Removed	Wt.
Hatch Cleaned	☑	H.P. Air	☑	Garbage Removed	☐	
R.D.F. Off	☑	Batteries 36V	☑	Sanitary Bottle	☑	
Zenon Off	☑	12V	☑		☐	
De Humidifier On	☑	E12V	☑		☐	

Maintenance Required

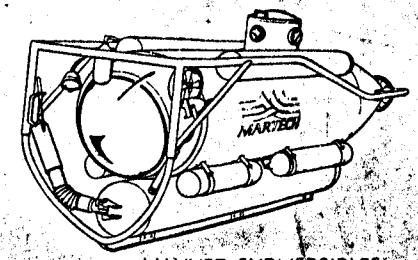
Pilot Gordon Barkedale

DIAPHUS

PRE & POST DIVE CHECK LIST

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Customer NOAA (USGS) Date 8/18/78 Job# 304

Contract / Dive No. 624

Job Location / Vessel STATE ARROW Service Order No.

External	(✓)	Ports Cleaned	(✓)	Penitrators	(✓)	RDF On	(✓)
SW Detectors	(✓)	MBT Vent Clear	(✓)	Transducers	(✓)	Zenon On	(✓)
Pod Covers	(✓)	Bow Plane/Rudder	(✓)	Antennas	(✓)		(✓)
Vent Plugs	(✓)	H.P. Bottles	(✓)	Propeller & Nut	(✓)		(✓)
Sonar Comp.	(✓)	Cables	(✓)	Hatch Dogs	(✓)		(✓)

Internal

Soda Sorb	(✓)	H.P. Air P.S.I.	(✓)	V.H.F. Normal	(✓)
L10H x 5	(✓)	Battery State	(✓)	Emergency	(✓)
Oxygen In Use	(✓)	36V	(✓)	Timers	(✓)
Standby	(✓)	12V	(✓)	Scrubber	(✓)
Oxygen Monitor	(✓)	E12V	(✓)	Pinger Receiver	(✓)
Draeger CO_2 + O_2	(✓)	Internal Lights	(✓)	Sonar	(✓)
Fire Extinguisher	(✓)	External Lights	(✓)	Port Vent	(✓)
First Aid Kit	(✓)	Drop Weight Pinned	(✓)	Port Bow	(✓)
Emergency Rations	(✓)	U.W.T. Normal	(✓)	STBD Vent	(✓)
Flash Lights	(✓)	Emergency	(✓)	STBD Blow	(✓)
Clock	(✓)	U.W. Pinger Normal	(✓)	V.B.T.	(✓)
Barometer	(✓)	Emergency	(✓)	Thruster	(✓)
Temperature	(✓)	R.D.F.	( )		

Maintenance Done

Equipment Fitted & WT.

Pilot

Post-Dive

						Equip. Removed	Wt.
Hatch Cleaned	☐	H.P. Air	☐	Garbage Removed	☐		
R.D.F. Off	☐	Batteries 36V	☐	Sanitary Bottle	☐		
Zenon Off	☐	12V	☐		☐		
De Humidifier On	☐	E12V	☐		☐		

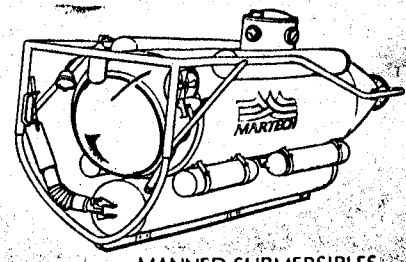
Maintenance Required

Pilot

SUBMERSIBLE PILOTS LOG

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Date 8/18/78

Dive# 624

Pilot HICKEY Contract # 382 Operation USGS

Observer PFIRMAN Support Ship STATE ARROW

	Pre	Post
O_2 Main	1700	
Reserve	UNKD	
Soda Sorb	NEW	
Cans Reserve 15	~~2x2200~~	
Air P.S.I.	2x2200	
Voltage 36	38	
12	12	
E12	12	

	Pre	Post
Barometer	30.10	
Temperature	78	
Humidity	65	
Ballast		
O_2 Off	Electrical	
Ballast	Bilge	

Post

Signed

HICKEY

	TIME	
626	0945	Gyrd
1644	0953	Hatch Shut
1009	1012	Launch
1050	1014	Vents Open
1653	1022	On Bottom

Course 325° ? #626

30.10 125

25-30' Vis 140 Depth F 170 Current

125° For 1000'

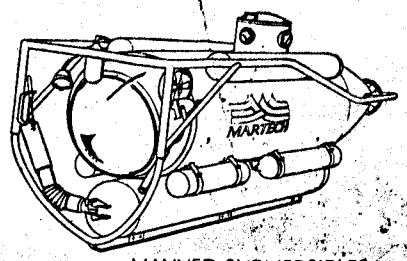
#626
1730 STANDING BY TO COME UP.
1731 OFF BOTTOM
1740 ON SURFACE
1744 RECOVERED

1205	Off Bottom
1209	On Surface
1213	Recovered
	Hatch Open

SUBMERSIBLE PILOTS LOG

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Date 8/18/78

Dive# 525
527 LAST ONE

Pilot BARKSDALE Contract # Operation USGS

Observer MARCEL NOBLE Support Ship STATE AKRON
DIANE ESKENASY

	Pre	Post				Pre	Post
O_2 Main	1400	1100	800	700	30.5 30.10 Barometer	30.15	30.10
Reserve	1800 1800	1800 1800	1800	1800	80 80 Temperature	78	78
Soda Sorb	3 HK	6 HK	9 HK	—	58 58 Humidity	58	57
Cans Reserve	5	5	5	5	Ballast	—	
Air P.S.I.	2025	1750	1600	1400 Post	O_2 Off	Electrical	
Voltage 36	37	36	36	35.5	Ballast	Bilge	
12	11.5	11.5	11.5	11.5			
E12	—	—	—		Signed Marlon Barksdale		

TIME

Gyrd 035

Hatch Shut	1239	1759
Launch	1241	1800
Vents Open	1245	1804
On Bottom	1248	1806

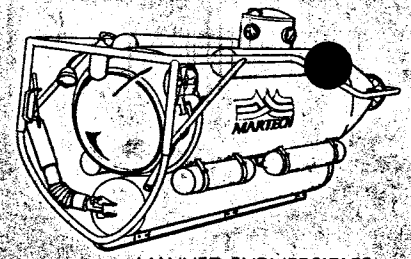
Vis	Depth	Current
60'	140'	slight 270°
40'	125'	NONE

Rudder is getting too stiff, will have to replace cable

1430	Off Bottom	1834
1444	On Surface	1838
1448	Recovered	1846
1451	Hatch Open	1847

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

Surface Officer: BOLSTAD

Pilot: HICKEY

Observer:

Communications: BARKSDALE

Diver: BAILER

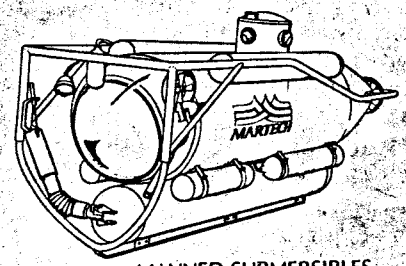
Recovery Team: BALDEN JACKSON

Ship's Master: OMTER

TIME	COMMENT
1336	LAUNCH
1344	30' comm. check
1345	50' ON BOTTOM. CURRENT FROM 120°
1346	COURSE 100°
1353	VIS 10'-12' BOTTOM SAND & SHELL HASH
1404	Standing by to come up
1406	CLEAR TO COME UP
1407	ON SURFACE

MARTECH

TECHNICAL SERVICES GROUP



MANNED SUBMERSIBLES

OPERATIONAL CREW

Surface Officer: Bolstad

Pilot: Barksdale

Observer:

Communications: Barker, Jack

Diver: Hickey

Recovery Team: Belden, Jackson

Ship's Master: Ottimer

TIME	COMMENT
1435	Launch #605 BARKSDALE
1437	Left surface
1438	25'
1440	On bottom 55', Sandy shell bottom, strong current
1505	clear to come up
1530	LAUNCH #606 HICKEY
1535	ON BOTTOM CURRENT 000 SANDY 10-15
1609	On coral reef, good bottom
1602	off bottom
1604	ON SURFACE
1620	LAUNCH #607 BARKSDALE
1626	ON BOTTOM CURRENT 120 SANDY 10-15'
1654	standing by to come up
1657	clear to surface
1658	on surface
1810	Launch #608 HICKEY
	on bottom 60', ~~current~~ 290°, sandy bottom 2½'
1825	clear to come up
1833	ON SURFACE

#611 8/16/78 PILOT BARKSDALE

13[illegible] LAUNCH

1328 Comm's LAC 120'

1331 On Bottom 170' Current Slight 130° Sandy

1343 sub told steer 120°

1406 comm check

1408 Standing by to surface

1411 Clear to come up

#612 8/16/78 HICKEY

1425 LAUNCH

1434 COMM CHECK 110'

1441 170' ON BOTTOM RIGHT ON BREAK COURSE ~~170~~ 090

15[illegible] Standing by to come up

1526 Clear to come up, off bottom

#613 8/16/78 Barksdale

1543 Sub leaving surface, comm check

1544 175' course 270° sandy bottom

1620 165' course 270°

1628 Clear to surface

1633 on surface

#614 8/16/78 HICKEY

1635 surface transfer complete open vents

1636 Comm check LAC

1650 160' vis 15', bottom sandy, strong current, heading 170°

1720 Clear to surface, off bottom 165'

1738 on surface

#615 8/16/78 Pilot Barksdale

1748 surface transfer complete, sub on descent
1750 20' comm's good
1756 155' on bottom, heading 090°, strong
1758 request course change 270°
1820 Crew To Come Up.

~~Time~~ Dive #619 Pilot Barksdale

1115 Launch
1118 Comm's LAC 45'
1126 180' 340° Current Course 270°
1155 Stand by.
1157 178' course 270°
1205 Standing By To Come Up
1210 Clear To Come Up.
1214 On Surface

Dive # 620 Pilot Hickey

1240 Launch
1246 comm's LAC
1248 180' on bottom, vis 20', strong current, heading NW
1309 advised sub to watch for buoy line
1318 course change 090°
1334 Standing By To Come Up
1331 Clear to come up
1335 On Surface

DIVE #621 BARKSDALE

1345 LAUNCH
1349 COMM'S LAC 20'
1352 170' ON BOTTOM COURSE 240
1406 COURSE 120°
1434 180' ~~240~~ 270°
1446 STANDBY TO COME UP
1457 ~~ON SURFACE~~

#622 HICKEY

1540 LAUNCH
1543 ON BOTTOM 165' 20' VIS 090° CURRENT
1625 Course 120°
1635 Standing By to Surface
1640 Clear to come up, off bottom 190°
1645 ON SURFACE

#623 BARKSDALE

1655 LAUNCH
1657 110' COMMS WEAK
1[illegible] 165' ON BOTTOM COURSE 090°
1[illegible] CLEAR TO COME UP & GOING TO TOW TO GPS LOCATION

#624 HICKLEY

1020 LAUNCH
1025 140' VIS 25-30' CURRENT 270°
course 125° for 1000', then begin search
1028 sub actual more good than position

[illegible]	advise sub position good, begin search
1052	C/C to 295
1100	advise sub to begin search
1101	C/C to 300' for 5 minutes
1115	5 min. up on 300' beginning search
1147	C/C 200' for 500'
1149	advise sub position good continue searching
1207	clear to come up
1211	ON SURFACE

Dive # 625 Pilot Barksdale

1245	launch
1255	140' on bottom, request course
1258	advise search in all directions
1300	120', sand bottom, 270° current.
1311	advise course 110°
1320	110° 200' no anchor line
1320	advise course 220°
1335	continue 220° for 50', start search
1346	turn 90° to port
1355	C/C 190° Zig Zag
1400	C/C 100°
1424	C/C 045°
1434	CLEAR TO COME UP

Field
HICKEY

326

1654 LAUNCH

1656 80'

1658 125' VIS 40' SANDY WITH CORAL & FISH

320'

1708 125' 305' Radio check.

1748 Clear to surface

1750 On Surface

~~[illegible] surface~~

#627 Barksdale

1805	Launch
1812	80'
1815	course 325°, 120', no current.
1840	Standby to come up
1845	On surface

Time figures to 2 hrs, 47 minutes underwater

MAX DEPTH 65' TOTAL WATER HRS. 2:15 NO. OF DIVES 5

EQUIPMENT	QTY	CONSUMABLES	QTY	THIRD PARTY EQUIPMENT	QTY
RCV - 225	( )	Video Tape R/R ½" x 60 min.	( )	Video Tape Recorder Hz.	( )
RCV - 150	( )	Video Tape R/R ½" x 30 min.	( )	Video Cassette Recorder Hz.	( )
Tethered Vehicle	( )	Video Tape, Cassette-¾" x 60 min.	( )	Video Monitor	( )
Manned Submersible	(/)	Video Tape, Cassette-¾" x 30 min.	( )	Frequency Stabilizer Hz.	( )
RS-7 System	( )	Buoy Material	( )	Generator 220V/440V Hz.	( )
Beacons,	( )	Buoy Weights	( )	Air Tugger	( )
Beacons,	( )	Buoy Flag Poles	( )	Topside Closed Circuit T.V.	( )
Beacons,	( )	Rope ¼" Poly-Manila	( )		( )
Pan & Tilt Camera	( )	Rope ½" Poly-Manila	( )		( )
Current Meter	( )		( )		( )
[illegible]					
[illegible]					

List of Damaged or Lost Equipment.

PERSONNEL	HRS.	PERSONNEL	HRS.	
[illegible]	12			Destination
[illegible]	12			Mileage
[illegible]	12			Subsistance
[illegible]	12			
[illegible]	12			Supervisor [illegible]
				Approved by [illegible]

Tel. (713) 462-0010

Telex 790163

MARTECH INTERNATIONAL, INC.
13550 Hempstead Hwy.
Houston, Texas 77040

DAILY TIME TICKET

NO. 1157

FIELD COPY

Description of work performed:

[illegible]

[illegible]

MAX DEPTH 210 TOTAL WATER HRS. 7:20 NO. OF DIVES 7

EQUIPMENT	QTY	CONSUMABLES	QTY	THIRD PARTY EQUIPMENT	QTY
RCV - 225	( )	Video Tape R/R ½" x 60 min.	( )	Video Tape Recorder Hz.	( )
RCV - 150	( )	Video Tape R/R ½" x 30 min.	( )	Video Cassette Recorder Hz.	( )
Tethered Vehicle	( )	Video Tape, Cassette-¾" x 60 min.	( )	Video Monitor	( )
Manned Submersible	(/)	Video Tape, Cassette-¾" x 30 min.	( )	Frequency Stabilizer Hz.	( )
RS-7 System	( )	Buoy Material	( )	Generator 220V/440V Hz.	( )
Beacons,	( )	Buoy Weights	( )	Air Tugger	( )
Beacons,	( )	Buoy Flag Poles	( )	Topside Closed Circuit T.V.	( )
Beacons,	( )	Rope ¼" Poly-Manila	( )		( )
Pan & Tilt Camera	( )	Rope ½" Poly-Manila	( )		( )
Current Meter	( )		( )		( )
35 [illegible]					
[illegible]					

List of Damaged or Lost Equipment.

PERSONNEL	HRS.	PERSONNEL	HRS.	Destination
Pat Hickey	12			Mileage
Gordon Barksdale	12			Subsistance
Mark Belden	12			
Dan Barker	12			Supervisor [illegible]
[illegible] Jackson	12			Approved by
				[illegible] M. Bell

Tel. (713) 462-0010

Telex 790163

MARTECH INTERNATIONAL, INC.
13550 Hempstead Hwy.
Houston, Texas 77040

DAILY TIME TICKET

No. 1156

FIELD COPY

Address _____ A.F.E. No. _____

Job Location _____ Vessel _____ Service Order No. _____

Description of work performed:

[illegible]

MAX DEPTH 50' TOTAL WATER HRS. 6 [illegible] NO. OF DIVES 5

EQUIPMENT	QTY	CONSUMABLES	QTY	THIRD PARTY EQUIPMENT	QTY
RCV - 225	( )	Video Tape R/R ½" x 60 min.	( )	Video Tape Recorder Hz.	( )
RCV - 150	( )	Video Tape R/R ½" x 30 min.	(10)	Video Cassette Recorder Hz.	( )
Tethered Vehicle	( )	Video Tape, Cassette-¾" x 60 min.	( )	Video Monitor	( )
Manned Submersible	(1)	Video Tape, Cassette-¾" x 30 min.	( )	Frequency Stabilizer Hz.	( )
RS-7 System	( )	Buoy Material	( )	Generator 220V/440V Hz.	( )
Beacons,	( )	Buoy Weights	( )	Air Tugger	( )
Beacons,	( )	Buoy Flag Poles	( )	Topside Closed Circuit T.V.	( )
Beacons,	( )	Rope ¼" Poly-Manila	(600)		( )
Pan & Tilt Camera	( )	Rope ½" Poly-Manila	( )		( )
Current Meter	( )		( )		( )
35 [illegible]					
[illegible]					

List of Damaged or Lost Equipment.

PERSONNEL	HRS.	PERSONNEL	HRS.	Destination
[illegible]	12			Mileage
[illegible]	2			Subsistance
[illegible]	12			
[illegible]	2			Supervisor [illegible]
[illegible]	12			Approved by
				[illegible] M. Bill

Description of work performed:

MAX DEPTH _____ TOTAL WATER HRS. _____ NO. OF DIVES _____

EQUIPMENT	QTY	CONSUMABLES	QTY	THIRD PARTY EQUIPMENT	QTY
RCV - 225	( )	Video Tape R/R ½" x 60 min.	( )	Video Tape Recorder Hz.	( )
RCV - 150	( )	Video Tape R/R ½" x 30 min.	( )	Video Cassette Recorder Hz.	( )
Tethered Vehicle	( )	Video Tape, Cassette-¾" x 60 min.	( )	Video Monitor	( )
Manned Submersible	(/)	Video Tape, Cassette-¾" x 30 min.	( )	Frequency Stabilizer Hz.	( )
RS-7 System	( )	Buoy Material	( )	Generator 220V/440V Hz.	( )
Beacons,	( )	Buoy Weights	( )	Air Tugger	( )
Beacons,	( )	Buoy Flag Poles	( )	Topside Closed Circuit T.V.	( )
Beacons,	( )	Rope ¼" Poly-Manila	( )		( )
Pan & Tilt Camera	( )	Rope ½" Poly-Manila	( )		( )
Current Meter	( )		( )		( )

List of Damaged or Lost Equipment.

PERSONNEL	HRS.	PERSONNEL	HRS.	
	2			Destination
	2			Mileage
	2			Subsistance
	2			Supervisor
	2			Approved by

Tel. (713) 462-0010

Telex 790163

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13550 Hempstead Hwy.
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DAILY TIME TICKET

No. 1155