

Book #2
LABORATORY RESEARCH NOTE BOOK

Department of IG - 24 - 7

Subject Chief Scientist's Log

Name 24 July 77 -

Address _____



43-649

Made in U.S.A.

24 July 1977

IG - 24-7 continued

After much travail Will Featherston got a 3rd gun going about 0130 A.M. Two problems with guns #2 & #4.

a) New crimping connectors have a sharp edge which tends to cut the wires after crimping.

b) Wire in harness became fatigued & broke - opens only under towing strain, but tests out ok on deck.

Will removed Dr. Worgel's latest - designed coil (that gave only 320 psi max pressure) from #2 gun & replaced the coil with the old style coil. Gun now fires at a maximum pressure of 320 psi.

Finished NIC-1 dip line off Niagara. This line ties our shelf line MMS-2 & our trench line GCR-1. Transit to line off Panama.

Tai Shih has been seasick ever since he joined the boat in Pantarenas. He did help with the wiring & took care of the wire latching & log keeping. Since then he has not made any motion & has been out of his bunk just long enough to sprain his ankle. He has spoken to me & said that "in view of his physical condition he would like to leave the ship in Panama." Will talk to Galveston about this at next contact.

25 July 1977

Steaming to beginning of Panama DP line.

Will Featherston repaired 4th gun - spliced out bad section of wire. George Perry repaired the dead section that we removed several days ago. He replaced defective O-rings in the filler caps; found no salt water in the section.

26 July 1977

Put out streamer and guns for Panama Line PN-2N, PN-2W, & PN-2E. Finished at 0400 L. & started shooting with 4 guns. #2 took a gelic after several hours, but was back on line after a speedy repair.

#2 gun will now take 340 psi. without free running, but 4 compressors @ 1250-1300 RPM can give us only 320 psi for 4 guns. With our past problems of brashed mounts, & broken bearing seals, don't want to run them up to their max RPM of 1400.

Removed 5/16" wire rope from manipulator to use as a replacement tug line for one of the guns. Only suitable wire on board since need 50 feet & other pieces in store room & layette are too short.

Advised Dr. Wozel of our BSA in Panama (early 29th) & of Shih's request. Dr. Wozel suggested that a Doctor (MD) examine Tai's ankle & that we act on his professional opinion; chronic seasickness is not a valid excuse.

While putting out streamer noticed a small leak in line #21 (probably caused by a sharp lead weight). Wrapped tape around it & will repair later. Line #24 ~~also~~ appeared to have salt water in it. Found leakage of 50-60 K/L in about 1/2 the tracer. Decided to go ahead & shoot anyway. Only O-K L leakage in #1 & #13 appears to adversely affect the records. Will patch #21 and swap out #24 later in the cruise.

I was informed by Otis that as of noon yesterday we have 24" of water in the 48" main water tank. Showers have been on ever since we started raining.

27 July 1977

Finished lines PN-2N, PN-2W, + PN-2E @ 1619Z.
Data looks interesting; some evidence for a "reflector" which may be caused by methane hydrates.

Pulled in streamer + swapped out line #24 and line #21 with the two replacement sections we had. George Penny repaired the gash in #24 (that we removed) + will drain the saltwater out + refill it ready-to-go. Old #21 will also be repaired + stored for further use. Finished up + started for Balboa @ 1500 local.

Oster has informed me our ETA Balboa is 0530 on the 28th. (if we can maintain 10 kts.).

28 July 1977

Steaming toward Balboa.

Found reason for breakdown of depth sensors 2, 4, + 6. Wires which patch the signal from the cable to the slave range are broken. These jumper wires which are exposed on the starboard side of the winch were pulled out, possibly when someone forgot to disconnect the wire to #1, 3, + 5.

Looks like we can easily repair 2 sensors, but may have trouble with the third - broken wire leading into the ^{drum} is too short. We might be able to run another wire to the lab for this sensor.

Dropped anchor in Merchant Ship Anchorage @ 1915 L.

Earlier, as we pulled the mags, the starboard engine developed what Oster called "a fuel thump" or "piston slap". Didn't know exactly what the problem was, but would have a mechanic look at it when we dock.

CDP Summary for Leg 24-7

Nicaragua Dip Line: (NIO-1)

BeginningEnd

Time: 1829Z 23 VII 77

SP: 1

RN: 1

Reels: 247001

Lat: $11^{\circ} 47.8' N$ (1900Z)Long: $-86^{\circ} 54.8' W$

1236Z 24 VII 77

3262

6174

247025

 $10^{\circ} 48.7' N$ (1508Z) $-87^{\circ} 52.0' W$

Panama Pacific Lines:

BeginningEndPN-2N

Time: 0950Z 26 VII 77

SP: 1

RN: 1

Reels: 247026

Lat: $06^{\circ} 57.0' N$ Long: $-82^{\circ} 52.7' W$

2117Z 26 VII 77

2071

3752

247044

 $07^{\circ} 46.1' N$ $-82^{\circ} 18.8' W$ PN-2W

Time: 2117Z 26 VII 77

SP: 2072

RN: 3753

Reels: 247044

Lat: $07^{\circ} 46.1' N$ Long: $-82^{\circ} 18.8' W$

0542Z 27 VII

3575

6654

247057

 $07^{\circ} 42.1' N$ $-82^{\circ} 55.1' W$ PN-2E

Time: 0543Z 27 VII 77

SP: 3580

RN: 6661

Reels: 247058

Lat: $07^{\circ} 42.1' N$ Long: $-82^{\circ} 55.1' W$

1619Z 27 VII 77

5487

12420

247074

 $07^{\circ} 13.8' N$ $-82^{\circ} 25.6' W$

29 July 1977

Docked at Canal Zone Pier 18 at 0200 ship's time. Agent aboard at this time & has arranged for a mechanic to look at the starboard engine & an electronics tech. to check & repair the VHF radio.

Board for VHF radio arrived at 1330 L. Tech from Belton Electronics installed new board & found a new (another? original?) problem in the Seawatch - Audio Board.

Otto has informed me that major repairs need to be made to the starboard engine. Estimate that this will take at least 2 days, or more depending on what they find. Advanced ship's time 1 hr to coincide with Canal & Galveston time.

30 July 1977

Otto has persuaded mechanics to work late & to work on the weekend. They will try to finish up tomorrow. Called Dr. Wenzel & Capt. Bering and advised them of our status. Replied list of personnel who must leave the ship in Santa Domingo: Lindquist, Boucher, Fitzwater (or sooner), & Harrington.

31 July 1977

Pouring down rain & still at dock in Belton. Mechanic found a broken valve lifter & will have to wait til Monday to get parts. Means additional delay.

Cause of engine breakdown, in the opinion of the mechanic, is that the "lash" was set at 300 instead of 105 as the book calls for. Don't really understand, but Otto does & agrees that this could be the root of our problem.

I have a high opinion of Otto's mechanical knowledge & confidence in these Interpinner mechanics. They are fast, efficient, & great in their work; seem to know what they're doing.

They will set the rack to specs & then change the port engine; we'll just have to suffer the loss in speed. Otto claims that overall problem is that the propellers are too big for the boat.

1 August 1977

Still at Balboa dock. Engine repairs should be ~~finished~~ finished this evening. We are scheduled to transit the canal tomorrow morning.

2 August 1977

Pilot on board & left Balboa docks at 0950 L. Topped off with water this morning.

Then Gatun locks @ 1725 L. Thunderstorms & showers in the area.

Begin leg IG 24-8

Scientific Party:

Houston

Shanb

Lindquist

Boucher

Eapen

Featherston

Pearcy

Peebles

Shih

3 August 1977

Steamed toward beginning of Nicaragua River line making at most 8 1/2 kts. Bucking seas has slowed us down, though don't think that we can now make an honest 10 kts.

Started streaming cable @ 0430 L; decided not to calibrate depth transducer, seas too rough. While we were paying out the cable Otis shut down 1 engine to change a seal in the starboard engine. Began shooting @ 0741 L.

3 August (continued)

Advised Galveston @ 1000 L that we would continue working line NR-1 and then would head for Santa Domingo @ 9 P.M. This puts us in Santa Domingo about 0600 L on the 8th of August.

Oliver has shut down both port and starboard engines alternately. Have an air leak in the after cooler (of turbocharger?) that "sucks" the too high pressure air down. He's tried double-gasketing in the starboard engine, but leak seems worse. The port engine which has only 20 lbs oil pressure may have ~~some~~ oil leaking into its oil supply. The oil broke pump. This is due to the engine that we did not overhaul, & it too most likely has cracks in the fuel pump.

4 August '77

Tried several sonobuoys at the north end of NR-1, 1st over @ 1604 L, recorded on DFS channel #25. Data looked ok. Reversed course after ran out of signal on 1st sonobuoy & tried to shoot a pseudo-reversed pair. 2nd and 3rd sonobuoys tangled in the streamer. (We recovered #3 wrapped around the bird near line #12). 4th sonobuoy was ok. Overboard @ 1318 Z. Did not retrace original path, topography rough. Cannot use these as a reversed pair.

Ended the line NR-1 @ 1440 Z.

Started pulling the cable @ 1000 L & tried to calibrate the depth sensors with the aluminum pressure sleeve. Tried to calibrate #6, #5 & #4 with no luck. Could zero the meter, but could not set the meters with the calibration screw. Had this problem with three different sensors. Gave up until we get advice from Galveston.

See p. 19+ for Summary

4 August (continued)

While pulling in cable saw a pin hole leak in a dead section just forward of line #22. Since the section was already covered with later sections, left it to be repaired later. Tried to mark the area with a black magic marker - not very successful.

After cable was in, steamed maggie + set a course for Santa Domingo.

2300 L - only making 6 1/4 kts. the last 8 hrs.

5 August 77

Still steaming toward Santa Domingo. Seas rough. Making only 6 kts.

6 August 77

Transiting the S.D. Seas rough; making 7 kts. (Otis opened the track up).

7 August 77

Ditto. Today Otis informed me that we will have to port immediately when we arrive at Santa Domingo. All six fuel pumps for the port engine will have to be opened & cleaned.

8 August 77

Ditto. Our ETA Santa Domingo is now 2100

9 Aug.

9 Aug. 77

Seas abated. Docked Santa Domingo 1030 L.

9 Aug 77 continued

Mechanics examined port engine fuel pumps - all to bad. Will have to wait 3 days for parts to be flown in from Miami. No parts available on the island. Apparently word & parts now did not get passed from Galveston.

Set sailing time for 0600 L tomorrow. Capt. decided to run easy on the port engine & change out pumps when we return to S.D.

I reset sailing time to 1000 L to accommodate a visit by Mr Carlos Salinas, a high monkey-munch Economic Minister without Portfolio, Chief Science Advisor to the President of the Dominican Republic.

10 August 77

Mr Salinas's visit went well. Postponed sailing time to 0000 11 Aug. to wait for crew members flying down from Galveston. @ 1100 one crew member still missing from shore. Missing crew member finally showed up about 1500.

Received a delegation (on board the Ida Green) from the oil company Las Mercedes; this company has oil development rights onshore & offshore in the area of Santo Domingo. A Mr. Lester W. Lander M. discussed with us our proposed truck line. The Dominican Republic is of course anxious for Mercedes to find commercial oil reserves.

11 August 77

Ida Green sailed from Santo Domingo @ 0000 L on the 2nd part of 14 24-8

Scientific Crew - U.S.

Houston	Eapen Oomen
Ladd	Shih
Sharb	Peebles
Fetherston	Pearcy

Visiting Dominican Sci.

Narciso Almonte C.
Francisco Xavier Angermann

11 Aug (continued)

Sailed for nearest beginning point of Dominican Republic Project. Began to stream gear @ 0530 L.

1) Since air bellows calibrator for the depth sensor didn't work, calibrated the sensor with the dip n dunk method. Calibrated #2, 4, 5, & 6. #2 was calibrated by attaching a 60-lb weight to the depth sensor cable section & connecting the cable to a depth of 40' as measured by an attached rope. Since some rope angle was present, the lat readout was set to 30' when the 40' mark was even with the ocean surface.

4, 5, & 6 were calibrated with the modified method, the dip n dunk with float method. Here, the 40' line was attached to the depth sensor & an extra steel bar, & the cable was unwound with the ship at dead stop. With the float upright, the lat readouts were set to 35'.

2) The dead section inboard of line #22 was changed out. George Perry will fix & drain the salt water out, & return to storage reel.

3) Additional leakage has developed in the leads. We now have O.K. leakage in #1 and #13 and additionally 80K.L. leakage in #23. The leakage remains with the shifting gaskets installed at the head of the stated sections.

Started line SD-1 @ 2009Z with 3 guns. Broken splice in #4 gun repaired by Will Featherston & back in operation with 4 guns by about 2100Z.

Since Otis is short-handed (his ~~staff~~ crew member for whom we waited & postponed sailing failed to show) I have agreed to let Will Featherston stand a 6 hr engineers' watch in the engine room whenever I don't need him for streamer work or to work on the airplanes.

12 Aug 77

John Ladd noticed rising traces 14, 15 & 16, so decided to pull the cable & add lead since from the depth gauge & the noise detector looked like the cable was running shallower.

Began pulling the cable at 0530 L. Added lead in the following amounts:

① 1 lead piece ^{on} every dead section between line #12 and line #17

② 1 lead piece per live section from line #17 to line #23 inclusive.

Lead in forward part of cable looks like: (after adding lead)			
12	+ 4 ^{1/2} lead pieces	18	4
d	5 6	d	4 5
d	4 5	d	3
13	3	19	4
d	5 6	d	4 X
d	4 5	d	4
14	4	20	3 4
d	5 6	d	4
d	4 5	d	3 4
15	3	21	4
d	4 5	d	5 X
d	4 5	d	2 3
16	3 4	22	3
d	5 6	d	3 4
d	4	d	3 4
17	4	23	4
d	2 3	d	4
d	3	d	5
8/12	8/13	24	2 3
		stretch	15
		8/12	8/13

During this work, developed a problem in the D.F.S. The Seischeck read 100 to 120 Ω for all traces. When switched into their mode, the warning light did not light. Turned out to be a blown fuse in the LEDEX. Note must use SLO-BLOW 1 A fuse for this. Regular fuses keep blowing from the initial current surge.

12 Aug (continued)

Broke a hydraulic line to the stored gas winch, but was able to fix it during streamer work. Finished up work, gunn out, & began recheck of part of line #2 (SD-2B) @ 1530 L.

Because of time lost, will shoot this line @ 12 CPP - 6 kts.

Traces #13 - 16 (~~presently~~) still noisy. Depth gauge for 15-16 reads 0. May have to pull the cable again & add still more lead. Will also check bird operation.

13 Aug 77

Started pulling gunn @ 0830 L & pulling the cable shortly thereafter. Decided to add 1 lead wt. for every dead section between 11 & 17, and 1 lead wt. for every live section from 17 thru 24 inclusive. See 12 Aug for updated table.

Found a small amount of saltwater in the dead section just inboard of line #15. Broke it at the head & checked leakage - no problem.

We did find a new problem during the reeling. Developed bad leakage on traces 20 & 6, and what looked like a salt-water short on trace #6. Seesheck for #6 showed a resistance of $\approx 120 \Omega$.

Broke the cable at the head of line #20 with shorting delays in leakage & short still there.

At this point I suspected the leader, which has given us trouble before, but couldn't immediately assume this was true.

Also broke the streamer at the head of a dead section just outboard of #22. (This dead section has some salt water). Leakage inboard.

Broke it at the aft end of #23 - still forward & additional leakage on #19.

As we prepared to break it at the end of the leader, everything that was new (for today) cleared up.

Only 8 fathoms in the streamer & found several bad discharges.

13 Aug 77 continued

Ran the streamer out, deployed the gun, & fired up the compressor. Turned onto the line SD-3 & started profiling @ 2150Z.

Guns #3 & #4 immediately went down. Gun #3 had a mechanical problem; the gate jammed shut & wouldn't open. Will brought it up in deck, cranked it several times with a hammer, lowered it over again, & it worked. #4 burned a coil & will be back on line ASAP.

Took Will Featherston off the engine room watch since I need him to work on the guns.

Otha has gone back to standing 6 in 6 with Jesse in the engine room.

Otha turned the showers off today.

14 Aug 77

Streamer & 4 guns working well. Streamer in quiet & running between 40 & 70 fathoms.

Steaming along SD-4 (SE) can only make 4 1/2 kts at best with 1050 on starboard engine & 700 on the port.

Port engine still leaking diesel oil into the engine oil. Otha must change the oil twice a day.

15 Aug '77

Made the turn to SD-5 about 0700L. Gun #3 went down early this morning with a broken air hose.

Will fixed it; gun back in operation by early afternoon.

Found that we cannot make another gun harness - no more 1/2" wire rope for the streamer.

Otha found fresh water pouring out of starboard manifold when we cut starboard engine from 1050 rpm to 6700 rpm. May mean additional engine repairs in Santa Domingo.

16 Aug 77

Continued juggling. Gun #2 broke \approx 1300 L, broken wire in the harness. Will replace the whole wire with new wire recently sent out from Gibraltar. Went to launch gun after repair & the winch wouldn't work. Appeared to be water in the system, though how it got there neither Oton nor I could figure. George drained the old fluid out & since we didn't have any of the regular fluid, we filled the system with \approx 30 gal. of light compressor oil. System worked OK after Oton adjusted the pressure relief valves (valves now screwed all the way in). May need to change & flush the system if we can get the proper oil.

Finished fixing the winch \approx 2000 L & put the repaired gun in the water. No luck, another break in the cable, though the continuity checked out OK on deck. Will work on it till 0700 the next morning; he found 3 separate breaks, replaced the "new" wire with the last piece of "old" wire on board. Will claim that the new wire is not the same as the old wire, & that the new wire is giving us problems because of vibration fatigue of the internal copper strands.

17 Aug 77

0900 L turned north for the last 2 Dominican lines. Should finish work about 0500 L tomorrow & be in Santo Domingo by noon.

18 Aug 77

Finished D.R. work & started pulling cable about 0530 L. Finished at 0845 L & started for S.D.

Docked at the same dock as previously in Santo Domingo @ 1115 L.

Oton will get mechanics to work on ~~port~~ engine fuel pumps, & investigate water leak in starboard engine.

John Ladd & I are scheduled to visit INDOTEC at 1500 L today to show them the single channel monitors of our work.

See p. 19+ for Summary

18 Aug 77 (continued)

Mechanics replaced fuel pump in port engine & started work on manifold of starboard engine. Our "new" manifold is not the right kind (its for a 243 & we need a 353?) but Otis thinks it will fit. We have all the gaskets, etc. & won't have to wait for parts.

John & I visited INDOTEC in the afternoon & Ramon Albuquerque gave a small gathering for us in the evening.

19 Aug 77

John and I went back to INDOTEC in the morning. I photographed the 5-sec monitor records for them (B&W film) & also photographed some tapes & geo-maps for John with part of a roll of slide film.

We returned to the plaza in the afternoon & found that the mechanics had finished up, fuel on board, & provisions ok. Will take on water 0800 tomorrow & sail as soon as possible.

20 Aug 77

After some difficulty getting water finally sailed from Santo Domingo @ 1530 h.

We had been steaming barely 2 hours when Otis noticed a large water leak in the port engine manifold. The new manifold was cracked - apparently from faulty installation and was leaking badly. Nothing to do but return the boat to Santo Domingo for repairs.
Arrived back in Santo Domingo @ 1100 h.

21 Aug 77 - Sunday

Otis has managed a temporary fix for our manifold problem. He salvaged the gaskets from the latipolter batch & will use them on the old manifold. Since the old manifold leaked only when we slowed down we should be able to make it back to Galveston. This means that we probably will not be able to shoot the Gulf Tectonic Line in the Yucatan Straits.

The alternative is to wait until Monday to contact Tom Kining to order parts out of Miami & then wait two or three more days until a new manifold arrives, plus one more day to install & test it. (We tried calling Bob Koring at home several times today & could not reach him). It's my judgment that waiting in a foreign port 4-5 days waiting for parts is not the best course under the present circumstances. Otis has stated that if no new leaks have developed in the old manifold, the safety of the ship will not be altered by remaining with the old manifold. It's either steam for Galveston on the old manifold or sit in port & wait for a new one.

We sailed from Santo Domingo, once again, @ 1810 L (Galveston time)

22 Aug 77

Steaming toward Yucatan. Manifold not leaking water (starboard engine), but later in the day developed a leak in the exhaust gaskets. Exhaust gases are blowing by one of the old - reused gaskets. The leak can only get worse & may not last till Galveston. We'll see.

23 Aug 77

Continued steaming toward Yucatan. Highlight of the day was receiving a good FM radio station from Jamaica - in English.

24 Aug 77

Steaming toward Yucatan Straits. Passed Grand Cayman Island about 2000 L; could see airport searchlight.

25 Aug 77

Steaming toward Yucatan Straits. Several small problems with starboard engine, which nevertheless still runs.

26 Aug 77

Passed through the Straits & into the Gulf of Mexico. Making 9 1/2 - 10 kts. with current. One stopped a leak in the starboard shaft stuffing box.

27 Aug 77

Steaming for Galveston.

28 Aug 77

Ditto. ETA Galveston early tomorrow morning. Palled Mappie & shot down lat @ 1020 L.

29 Aug 77

Arrived MSE dock @ 0700 L.

IG 24-8 Multichannel Summary

Nicaragua Rise - Line NR-1

1241 Z 3 <u>VIII</u> 77	to	1440 Z 4 <u>VIII</u> 77	10° 43.3' N	to	12° 11.9' N
SP 1	to	SP 4677	-80° 32.8' W		-81° 37.1' W
RN 1	to	RN 10760			
Reel 248001	to	248037			

Dominican Republic (J. Ladd - P.I.)

Line SD-1

2009 Z 11 <u>VIII</u> 77	to	0816 Z 12 <u>VIII</u> 77	18° 12.2' N	18° 14.5' N
SP 108	to	SP 2344	-69° 59.4' W	-71° 00.0' W
RN 1	to	RN 4262		
Reel 248038	to	248050		

Line SD-2A

0857 Z 12 <u>VIII</u> 77	to	1113 Z 12 <u>VIII</u> 77	18° 14.5' N	18° 05.0' N
SP 5	to	SP 413	-71° 00.0' W	-70° 52.6' W
RN 3	to	RN 621		
Reel 248051	to	248053		

Line SD-2B

2228 Z 12 <u>VIII</u> 77	to	1128 Z 13 <u>VIII</u> 77	18° 06.1' N	17° 23.0' N
SP 81	to	SP 2418	-70° 55.8' W	-70° 25.7' W
RN 32	to	RN 4442		
Reel 248054	to	248070		

Line SD-3

2151 Z 13 <u>VIII</u> 77	to	0942 Z 14 <u>VIII</u> 77	17° 28.2' N	17° 23.9' N
SP 4	to	SP 2133	-70° 24.5' W	-71° 40.0' W
RN 2	to	RN 4045		
Reel 248071	to	248086		

Line SD-4

1003 Z 14 <u>VIII</u> 77	to	1148 Z 15 <u>VIII</u> 77	17° 23.0' N	16° 39.0' N
SP 8	to	SP 4643	-71° 37.5' W	-69° 59.1' W
RN 4	to	RN 10716		
Reel 248087	to	248120		

Log 24-8 Multichannel Summary (continued)

Line SD-5

1214 Z	15 VIII 77	to	1150 Z	16 VIII 77	16° 39.0' N	18° 24.5' N
SP 5	to	SP 4253			-69° 59.1' W	-69° 46.8' W
RN 4	to	RN 10160				
Reel 248121	to	248153				

Line SD-6

1203 Z	16 VIII 77	to	2129 Z	16 VIII 77	18° 24.5' N	17° 50.1' N
SP 2	to	SP 1699			-69° 46.8' W	-69° 28.0' W
RN 3	to	RN 3236				
Reel 248153	to	248163				

Line SD-7

2132 Z	16 VIII 77	to	0623 Z	17 VIII 77	17° 50.1' N	18° 16.8' N
SP 6	to	SP 1601			-69° 28.0' W	-68° 58.6' W
RN 5	to	RN 3066				
Reel 248164	to	248173				

Line SD-8

0624 Z	17 VIII 77	to	1427 Z	17 VIII 77	18° 16.8' N	17° 44.5' N
SP 1604	to	SP 3050			-68° 58.6' W	-68° 47.8' W
RN 3071	to	RN 5722				
Reel 248174	to	248182				

Line SD-9

1427 Z	17 VIII 77	to	1022 Z	18 VIII 77	17° 44.5' N	18° 11.2' N
SP 3051	to	SP 6635			-68° 47.8' W	-70° 05.8' W
RN 5723	to	RN 14660				
Reel 248182	to	248205				