

Gins

CRUISE REPORT

FM30 - Student Cruise VII

Chronological Narrative

20 May Departed Austin 8:30 am in UTIG van; arrived Galveston 2 pm with eight students. Assigned cabins. Gave the students a tour of the ship emphasizing functioning of deck equipment and safety features. Held a general meeting with students and Capt. Collins reviewing ship's operating procedures, regulations, and the cruise plan and objectives. Began watches with instructions on detailed watch-standing procedures including DEMUXR tutorial and practice. Had various difficulties with tape drives (e.g., not loading and/or running off the end of the spool).

21 May 5:30 am: DEMUXR crashed on attempt to change drives (C to D). Typical crash - SOH, HDR, & EOH lights stay on while new tape spins continuously followed by complete shutdown of the program. A small screen corruption was common: the sampling rate display commonly showed one more millisecond than was the real sampling rate (i.e., 2ms commonly showed as 3 ms and 4ms commonly showed as 5 ms).

22 May Switched to ship's power at 9am. I was advised by Capt. Collins about 10:30am that a generator part had broken and obtaining a replacement would take at least a couple of hours; therefore there would be a corresponding departure delay. 4:55pm - an increase in engine RPM suggested that we were getting underway. Indeed, we left the dock at 4:37pm. Emergency drills after supper went smoothly. Full scientific watches began at 7pm (0000z 23 May 1985). Seas predicted: 3-5', encountered: 2-4'.

23 May 1am stopped to check wind & drift; reset course to aim streamer party course toward start of first line. 4:30 - 9:30am - streamer party: added 56 lbs lead, 10 birds (repositioned 2), no leaks. The EG&G depressor was placed between ropes that connected the tailbuoy to the terminal stretch section. Checked length of one streamer section (= 100'3/8" [30.01m]). 10:25am deployed magnetometer. Shot about 60 shots (with two airguns) when we had to shut down for compressor problem (bleedoff partially clogged). Resumed shooting after lunch but at only 1800 psi, because the below-deck compressor was overheating. The first line was southsoutheasterly. A strong westerly current required crabbing to the extent that the streamer was extending almost 30 degrees from dead astern. Although it was apparently over the port gun, the streamer did not foul on the gun. The streamer was a little heavy (sank at speeds under 4 knots), and apparently rode well under the gun. The lower data logger tape drive would take data at only 800 bpi. 11/34 drives were having various difficulties.

24 May Arose to the sounds of silence. Guns were off, because compressors were off, because there was no AC power to (?) oil coolers. Alternate (repaired) generator (the cause of the initial delay) broke (same part) almost immediately after it was

brought on line (I was told later). Generator failure was apparently due to overload. Up and running between 9 & 10 am. Changed line designation from 67A to 67B, and changed record length from 8 to 12 seconds continuing with a 21 second repetition rate. Also DEMUXR channels were increased from 24 to 28 to record blast phones (27 & 28) and sonobuoys (25 & 26). Deployed sonobuoys about 9:40 & 9:50pm. The first apparently hung on the tailbuoy or maggie. The next line (SC68) was begun after supper and was our first use of the new watergun. We were in deep water below the Sigsbee Escarpment (>2 sec). The firing was: watergun, 2 sec delay, airgun; thus recording 2 sec of pure watergun records. The strength of the record indicated that significantly more than two seconds of watergun record could have been obtained. The rep rate was reduced to 18 sec (with 12 sec records). DEMUXR attempted to crash (automatic drive change [D to A]) when end of tape was reached before max shots. An increase in sampling rate from 4 to 2 ms (for all watergun data) increased record lengths (on tape). The crash was averted with the STOP, YES, ..., CANCEL routine with only 5 shots lost. On the next line (SC69), the watergun and one airgun were fired together. Lines 69 & 70 were shortened several miles each to make up for the departure delay and to keep on the pre-cruise OBS deployment schedule.

25 May We returned to using two airguns about 4am (on line SC70). Turned on to next line (SC71) about 1pm. Ship's generator cycled on and off repeatedly. That is, the lights cycled on and off repeatedly (sometimes circuits were manually deleted as the overall load bogged the generator down). Sonobuoy deployed at 10:08pm on line SC71. Weather: light northeasterly breeze, seas calm, unbelievably delightful.

26 May Shot lines 72, 73, 74, & 75. I replanned the last day of the cruise to conform precisely to the precruise OBS schedule.

27 May Deployed OBSs at 0453 and 0455 (about 150 meters apart) stopping ever so briefly with the streamer out. We were on a due north course and reoriented slightly downwind (NNW although there was hardly any wind) for deployment). I stood at the streamer winch controls in case an unexpected delay or backdown occurred, in which case I could bring in the streamer rather than allow it to sink too deeply or run under the ship. This was not necessary; as the operation went very smoothly. The next two lines (SC77 & 78) were shot with one airgun; and the last line (SC79) over the OBSs with two airguns. A sonobuoy was deployed ahead of the OBSs so that reflection points would cross the OBS site. Stopped firing about 7:20pm; made a 180 degree turn (to downwind - what there was of it). 8:00 to 8:55pm - streamer party went smoothly. Despite the calm seas, the radar mast had broken off the tailbuoy. The first OBS surfaced during the streamer party, the second's radio signal was first heard at 9:05pm - right on schedule. We homed in on the signals from an initial distance of 10 - 11 n.mi. Capt. Collins maneuvered for two smooth pickups in about one hour. The OBSs were located in an intraslope bathymetric and sedimentary basin in about 830m of water at 27 36.7N and 94 07.1W. Apparently two complete sets of three component data were retrieved. A course was set for a shelfbreak crossing

in between other lines of data and, then a course was set for Galveston.

28 May Arrived at the UTIG dock about 9am.

Review and Discussion

With one small exception that took us slightly off a course directly over the OBSs, the ship's and scientific personnel performed with their usual, superb skills, cooperation, and dedication which produce the superb marine data for which the Institute is famous. Unfortunately, the same can not be said for some of the machinery. Three items, in particular, need attention: the below-deck compressor, the ship's AC power system, and the lab's tape drives.

Compressor At first, air was "demanded" at a maximum rate - two guns firing at a 21 second intervals. Due, reportedly, to overheating of the below-deck compressor, pressure above 1800 psi could not be maintained. However, later, firing at much less demanding rates (e.g., with one airgun and one watergun at 18 seconds), the pressure was sometimes turned farther down to 1500 or 1600 psi. I have no analysis of this problem; but we apparently do not have available, the full 2000 psi that the deck (Gardner-Denver) compressors can deliver.

Generators Except on the first line, the only real data gap was due to loss of AC power. Losses might have been numerous but for the efforts (approaching heroic) of the ship's engineers to keep power on. One generator is not available, because one part breaks every time it is replaced. More problematic seems to be the situation that one generator cannot handle a full, daytime load without periodically bogging down. The engineers are fully and acutely aware of these problems and need full support to pursue solutions to them.

Tape Drives With annoying frequency, tapes would either not load or would run off the end of a reel (or both) as though the drives were not seeing the load point and/or end of tape marks. DEMUXR drive C was not usable at all; and at one point none of the 11/34 drives were fully operational. Much drive monitoring and maintenance was done by Eddy Nicol. It would seem that Stirling's departure, perhaps along with chronic disuse, has lead to a condition that requires a general maintenance overhaul of all tape drives aboard the FRED H. MOORE.

The repositioning of two birds on the streamer was primarily to even their distribution. One bird was moved from section 24 to the shipward stretch section to reduce bird noise (roughly 20 Hz vibration or strumming) on that section. One bird collar was removed from section 1 for the same reason. Bird noise continues to be a problem that has not been fully addressed. Channel 6 (with a bird) became totally noise by the end of the cruise.

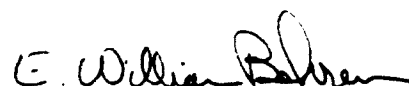
DEMUXR did its usual, wonderful job. Tape drive changes through the max shots feature were not always accomplished, because of several changes in record length and sampling rate;

but the students seemed unusually adept at recovering from crashes and even preventing them when they started to occur. This was done by pushing STOP, YES, ..., and CANCEL when DEMUXR hung in the header entry stage (SOH, HDR, & EOH lights remain on while a new tape spins continuously). Two recommendations: Printers (both DEMUXR and data logger) are sometimes turned off-line accidentally when adjusting paper or retrieving it to look up some data entry. Experienced watch-standers quickly notice an absence of the printer's clickity-clack, but inexperienced watch-standers do not. For them, a short but loud warning buzzer when the offline button is pushed would avert undo loss of printed logs. Second, a couple of items displayed on screen by DEMUXR would be handy to have also on the printed log (probably as part of the page header). These are record length and sampling rate.

Completing the transition from discussion of problematic equipment to praiseworthy equipment, I must mention the airguns. Of my ten multi-channel cruises, I have never seen fewer airgun problems than on this cruise. The watergun also worked flawlessly. Since guns don't take care of themselves, credit for this performance is obviously due to the gunman.

In summary, 14 new lines of 8 to 12 fold multi-channel data were collected (SC67 - SC79), four with our new watergun source (SC68, 69, 74, & 75), one over two three-component OBSs. These extended from the shelfbreak to the continental rise below the Sigsbee Escarpment and totalled about 430 n.mi. All lines include 3.5 kHz and magnetometer data. Student interest is indicated by the facts that I had 35 applications for the 18 student berths (usually 15) that were filled; 14 applications are already on file for the January 1986 cruise; and 61% of the students taking the last two cruises are doing or have done follow-up research projects.

Respectfully,



E. William Behrens
Chief Scientist