83009

Cruise Report
R/V/ Gyre
8313
October 11-15, 1983

Mahlon M. Ball
Debbie Hutchinson-Gove

U.S. Geological Survey
Woods Hole, MA 02543

December 13, 1983

Vessel:	R/V Gyre, Texas A&M Department of Oceanography College Station, TX 77843
Cruise No:	83-G-13
Project:	Regional Structure and Stratigraphy of the Western Florida Shelf, Eastern Gulf of Mexico. MAFLA Area 9840-01798
Area of Operations:	Western Florida Shelf
Date of Start and End of cruise:	Oct. 11, 1983 Miami, FL Oct. 15, 1983 Pensacola, FL

Names and Affiliations of Scientific Crew and ships Captain:

A. Scientific Party:

	Name	Title	Affiliation
1.	Mahlon M. Ball	Chief Scientist, Geophysist	U.S.G.S. (WH)
2.	Dave Nichols	Geophysicist	U.S.G.S. (WH)
3.	Jack Connell	Geophysicist	U.S.G.S. (WH)
4.	Jim Dodd	Geophysicist	U.S.G.S. (WH)
5.	Barry Irwin	Geophysicist	U.S.G.S. (WH)
6.	Gus Lamarre	Geophysicist	U.S.G.S. (WH)
7.	Debbie Gove	Watch Stander	U.S.G.S. (WH)
8.	Ann Swift	Watch Stander	U.S.G.S. (WH)
9.	Betsy Miller	Watch Stander	U.S.G.S. (WH)
10.	Jim Leinbach	Watch Stander	U.S.G.S. (Den.)
11.	Bill Patterson	Watch Stander	U.S.G.S. (Den.)
12.	Dick Wise	Watch Stander	U.S.G.S. (Den.)
13.	Nick Zihlmam	Watch Stander	U.S.G.S. (Den.)
14.	Jim Hedger	Water Gun Tech	Consultant

B. Ship's Captain: Don Armand

Purpose of Cruise: Make geophysical measurements (CDP seismic, 3.5 bc, gravity and magnetic) to be used in regional structural and stratigraphic framework studies. The loss of a ships main engine caused a cessation of this cruise following the completion of signature tests but before any work could be done.*

Navigation System:

The United States Geological Survey's Integrated Navigation/Gravity System is built around a Western Geophysical Survey and Data Management System. The Western system uses a Hewlett-Packard 2112 minicomputer and Western designed interface circuitry to take data from six navigation sensors and output the accurate position of the vessel. The sensors are of two types: 1) Velocity output--range-range loran, bottom lock (pulsed) sonar, doppler (continuous) sonar, gyroscope and 2) Position output -- Navy Navigation Satellite receiver, hyperbolic loran. The two usual methods of navigation are: 1) Dead reckoning between satellite fixes using one of the velocity sensors (the recommended mode, with range-range loran the recommended sensor) and 2) Using the continuous data from hyperbolic loran.

List of Scientific Equipment Employed:

A. Gravity System

A Bell Aerospace BGM-3 gravimeter is integrated with the navigation system. Roll and pitch signals from the gyroscope (Sperry MK-29) are used to keep a stable platform (designed by J. Dean of Woods Hole Oceanographic Institute) parallel to the earth's surface. The gravimeter is mounted on this platform and sends raw gravity data to a Hewlett-Packard 9825A calculator. A navigation/gravity interface unit (designed by P. Parks, formerly of U.S.G.S.) transfers navigation data to the HP 9825A.

B. Multichannel reflection seismic system with U.S.G.S. 1200m streamer and two 408 in^3 waterguns. The guns were 15m off the stern and the near phone was 230m astern. Shot point interval was 25m. The steamer is composed of alternating active and inactive segments 25m long. Twenty-four fold data were using a DSFV recorder.

C. High resolution reflection seismic system: 3.5 Hz.

D. Varian magnetometer

Tabulated Information

A. Number of days at sea - 5

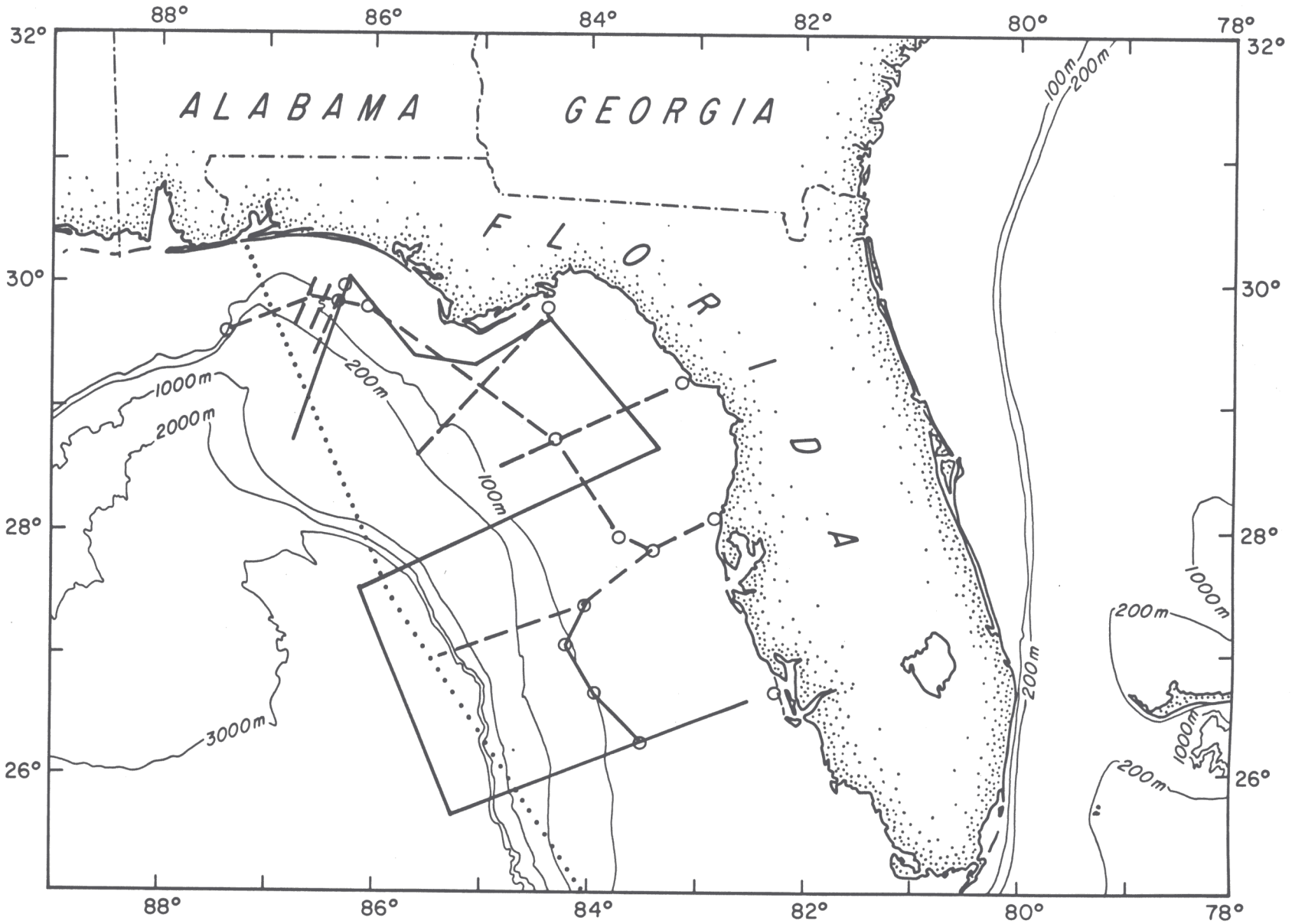
B. Number of Km

*Signature test summary attached

1. Gravity Data = 0
2. Magnetic Data = 0
3. Reflection Seismic Data = 0

Track Chart Caption

Dotted line is track for 83-G-13. Solid line is track for 82-G-12. Dashed line is track for 1979 Seismic explorer cruise. Circles are locations of key wells.


88°
86°
84°
82°
80°
78°
32°
30°
28°
26°
ALABAMA
GEORGIA
FLORIDA
1000m
2000m
200m
100m
3000m

Cruise Report 83-G-13
Attachment 1

SIGNATURE TEST SUMMARY

83-G-13

by Deborah R. Hutchinson

VESSEL: R/V GYRE

CRUISE: 83-G-13

LOCATION: 1700 fathoms of water south of Pensacola, Fla.

DATES: 13 Oct., 1983 0830-1630 CDT

SCIENTIFIC EQUIPMENT:

Aquatronics STR 70-2F Sonobuoy Receiver
Ref-Tek 18 SN 001 Sonobuoy
Ref-Tek 17 SN 134 Hydrophone (10 volts/bar)

DFS V Recording System

Waterguns (Seismic Systems, Inc)
P400 SN 19832 (stbd)
P400 SN 19833 (port)

Airguns (Bolt, Inc)
1500C SN 891 (port)
1500C SN ? (stbd)

RECORDING PARAMETERS:

Sonobuoy: Seismic Monitor o/p (1 volt)

DFS V: Sampling - 2 ms
Filters - out-128 Hz and 8-128 Hz
notch-out

IFP
Internal gain switch - 6
Camera reproduce - defloat
(Data recorded on channel 24)

Guns: Rep rate - 10 sec
Pressure - 1500-2000 PSI
Depth - 5.0 m
Distance behind fantail - 17 m

GUNS RECORDED IN SIGNATURE TESTS:

400 in^3 Watergun:	2 guns
	Port gun
	Stbd gun
540 in^3 Airgun:	2 guns
	Port gun
	Stbd gun

SHOOTING PATTERN:

After launching the sonobuoy, the ship made passes as close as possible to the buoy. The bridge alerted the lab when the buoy was 200 yds, 100 yds (when DFS V turned on to record) and "buoy abeam" (when several camera records were recorded). Then we shot past the buoy until the signal deteriorated (~1/2 km), and put the DFS V in standby while turning around for the next pass. The antennae location behind the bridge prevented our recording shots steaming towards the buoy.

COMMENTS:

(I) Overall: The signature tests basically went smoothly and produced good results. There were no obvious equipment failures. These signatures should produce excellent comparisons of the amplitude, shape, and frequency characteristics between the 400 in^3 watergun and the 540 in^3 airgun. Because of the gain and 60 Hz noise problems described below, the signatures may be of dubious use for signature or wavelet deconvolution applications. The attached figure of traces copied from the camera record for the 400 in^3 watergun show the sharp-spike nature of its pulse (Figure 1).

(II) Gain Problem: With the DFS V set to maximum gain, the signal was not of an impressively large amplitude, which it should have been shooting 2 large guns at 500 foot gun-phone offset. This may be due to (a) too large a gain resistor in the sonobuoy (b) a tired sonobuoy (flooded last year) or (c) having to use the seismic monitor output rather than the seismic signal output to get a broad band recording.

(III) 60 Hz Noise: The seismic monitor signal has considerable 60 Hz noise on it. This was recorded without the DFS V notch filter out, and shows visible 60 Hz noise on the camera monitor. This was done since much of the seismic energy probably occurs near 60 Hz.

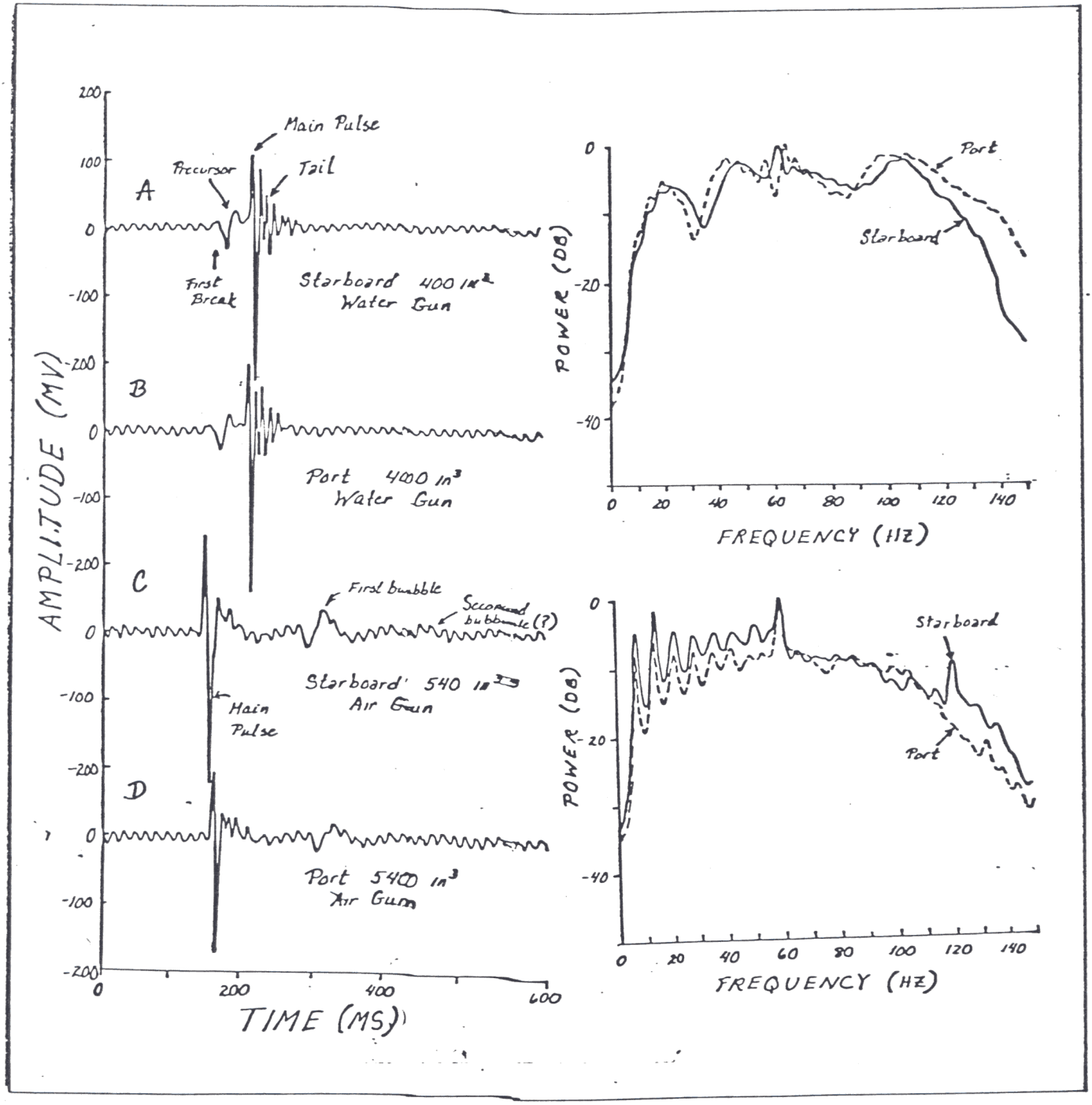
(IV) Recomendations: A larger polyform tether in any sea state would make it easier for the bridge to keep track of the sonobuoy while making passes. (See Figure 2, Shooting Configuration).

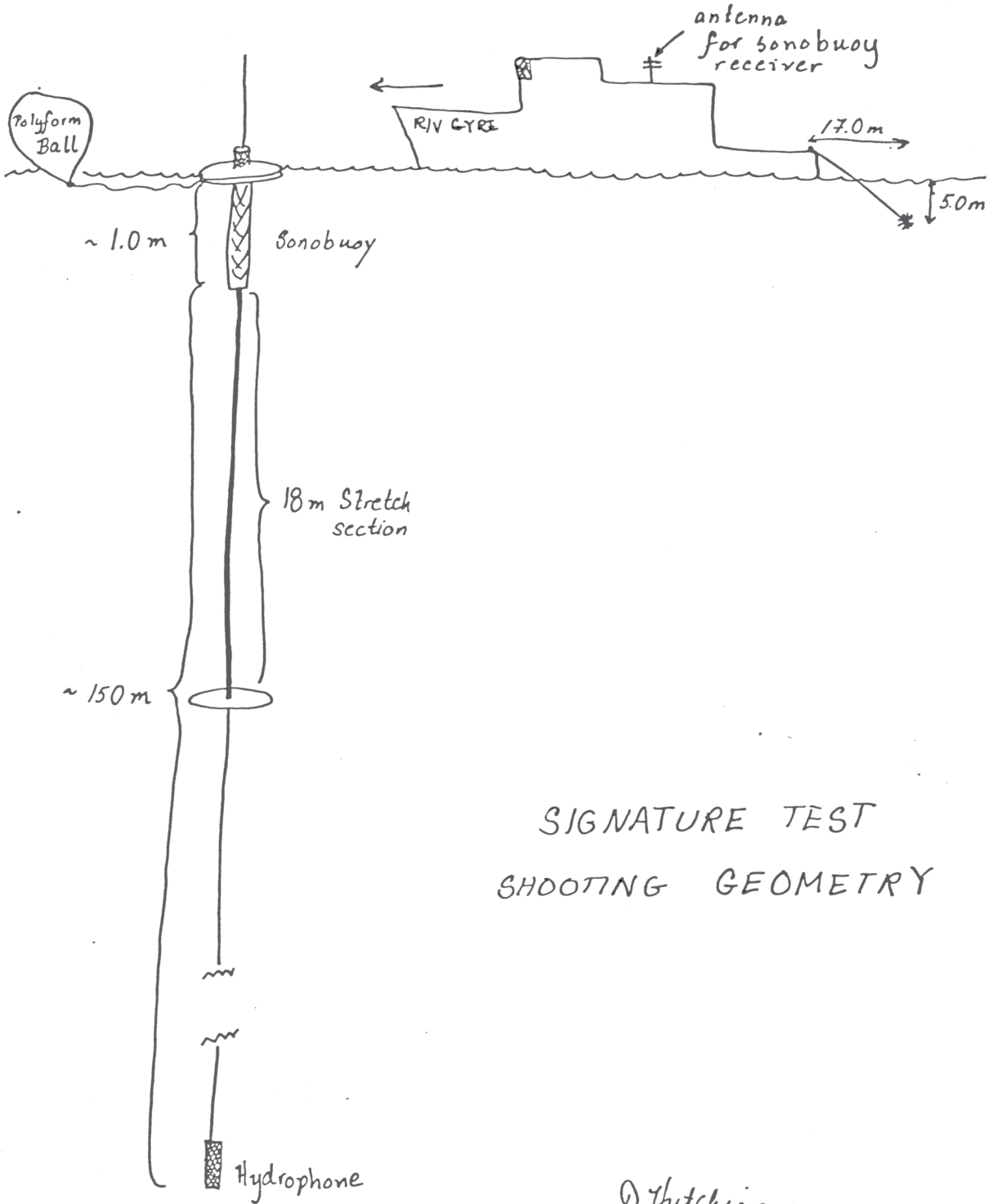
FIGURES:

1: 400 in3 Watergun and 540 in3 Airgun signatures.

2: Sonobuoy shooting configuration for signature tests.

3: Gun towing geometry for 400 in3 Watergun.

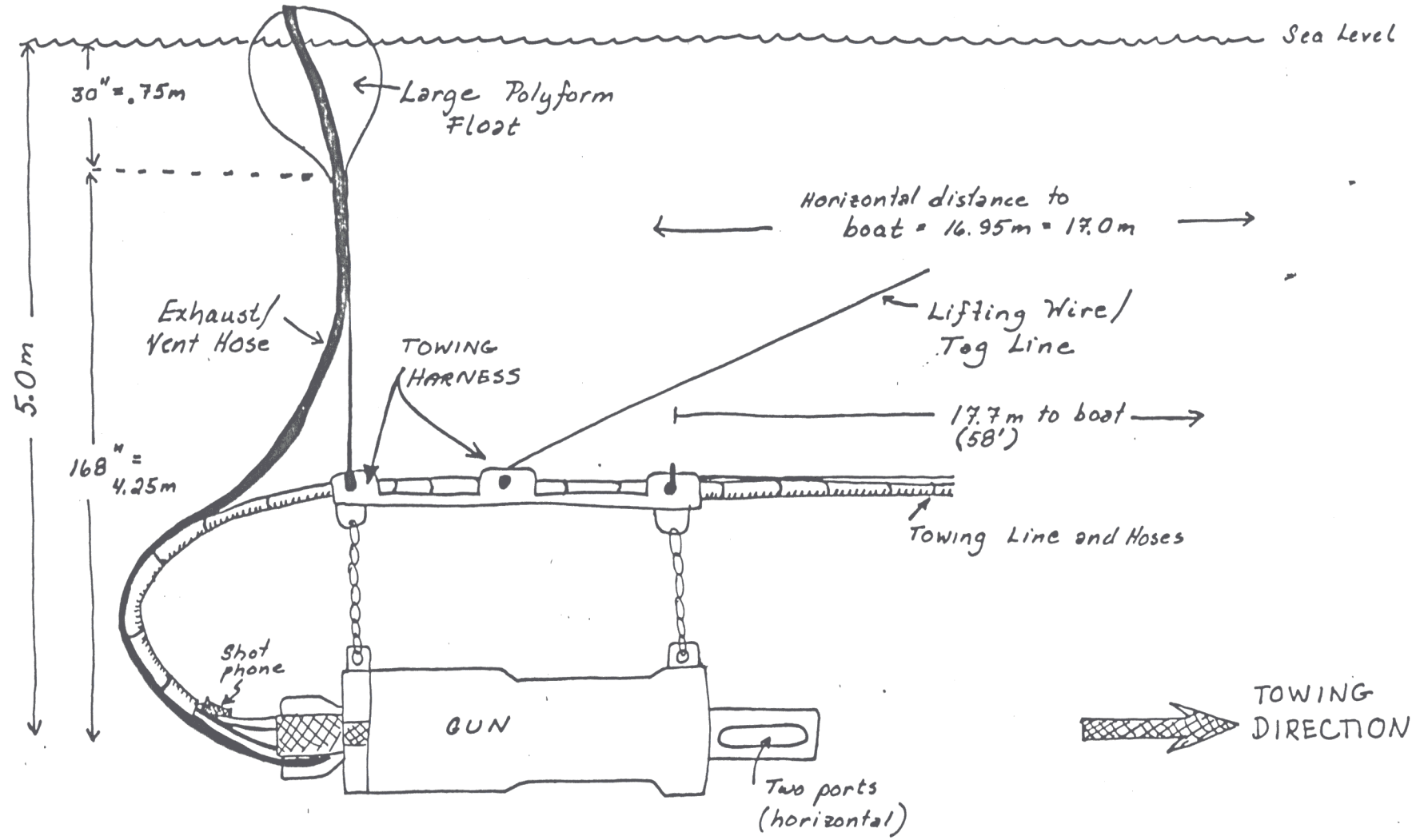

Main Pulse
Precursor
Tail
A
First Break
Starboard 400 in³ Water Gun
B
Port 400 in³ Water Gun
C
First bubble
Secondary bubble (?)
Starboard 540 in³ Air Gun
Main Pulse
D
Port 5400 in³ Air Gun
AMPLITUDE (MV)
TIME (MS)
POWER (DB)
FREQUENCY (HZ)
Port
Starboard
Starboard
Port



SIGNATURE TEST

SHOOTING GEOMETRY

D. Hutchinson
October 1983



GUN TOWING CONFIGURATION

83-G-13

D. Hutchinson
October 1983