

CRUISE REPORT

FAY 003

H.J.W. FAY Cruise 3
October 2, 1975
to
October 17, 1975

SCHLEE, CHIEF SCIENTIST

75022

Introduction

As a part of USGS program to evaluate the subsea resources and the environment of the Atlantic OCS, a two week cruise was made to Georges Bank and Nantucket Shoals during the first half of October. The main purposes of the cruise were to (1) investigate the shallow structure of the area (as a key to spot potential geologic hazards), (2) study of the deeper crustal structure through measurement of gravity and magnetics, and through seismic reflection profiles, (3) to collect shallow seismic reflection profiles over areas where vibracores were taken on the first cruise of the FAY.

The cruise completed a survey with a 20 km line spacing (N-S) over the Bank with 3 tie lines along the central northern and southern part of the Bank. Lines were extended into the deep ocean (1800 m) to assure coverage over the continental slope.

FAY 003
SCHLEE

Participants

Ship:	John Ostensen	Captain
	John Lero	First Mate
	Jim Biller	Third Mate
Scientific:	John Schlee	Chief Scientist-USGS
	Paul Cousins	USGS
	Ellen Davie	USGS
	Dennis Edwards	USGS
	Peter Gleba	"
	Prescott Heald	"
	Frank Jennings	"
	Mike Kerkmann	"
	Stanley Locker	"
	Felicity Oram	"
	Perry Parks	"
	Douglas Peeler	"
	Fran Scarver	"
	Dick Sylwester	"
	Lyle McGinnis	University of N. Illinois

Equipment

We towed four sensors behind the ship, a 3.5 khz ORE fish (suspended on the starboard aft side of the ship, approximately 30 feet below the sea surface), a single channel minisparker, towed from a boom off the starboard side near the stern, a single channel air gun system (towed astern), and a magnetometer-gradiometer probe (also towed astern). A four air-gun array was towed in two groups behind the ship; a 160 cu. in. air gun was towed by itself, to the port side astern, and a 3-gun array on a "fish" (80,40,20 cu. in.) was towed directly astern. Navigation was by two Internav 101 receivers, with fixes taken every 15 minutes; Loran C readings were also fed onto paper punch tape every 10 minutes. For graphic display of seismic data, two UGR Raytheon recorders and two EPC Curley recorders were used. Filtered and unfiltered air gun, 3.5 khz and minisparker data were recorded on a 7 channel Honeywell tape recorder for later editing and analysis.

A fifth system to measure gravity was installed in a separate van on the 01 deck. Gravity was measured using a vibrating string accelarometer sensor mounted on a gyrostabilized platform.

Of all the systems, the gravity and magnetics proved to be the most free of breakdowns. The malfunctions of all systems are covered chronologically in the cruise narrative.

Cruise Narration

Julian date

- October 2, 1975 (275 J.D)

Depart Woods Hole at 1225(GMT or z) and motored down Vineyard Sound to Gayhead; seas calm, skies cloudy, wind from northwest 20-25 knots, course 236⁰T, speed 9.9 kts. By 1445 (z) Captain had decided to hold for the weather (passage of Hurricane Gladys); gentle swells, 1-2 m. Deployed 3.5 khz fish at 1514(z). The remainder of the day we motored in a triangular course southwest of the Elizabeth Islands, and in Vineyard Sound.

- October 3, 1975 (276)

At 0710 (z) we left Vineyard Sound for Georges Bank. At 1230 (z) we began to deploy gear for beginning of Line A. 1445 (z) came to course 90⁰T to begin Line A; speed 6 kts. Minisparker not functioning for much of Line A. Completed Line A at 2345; began Line B.

- October 4, 1975 (277)

Skies clear, sea spotted with whitecaps and a brisk wind. FAY had difficulty supplying adequate amount of salt water for cooling gravity van (temperature rose 5⁰C above normal value in hut), and flushing toilets. Ran Line B and part of Line C; began Line C at 1410 (z). Three airgun fish out of operation from 1434 to 2030; operated on 160 cu. in gun alone. SEI streamer out of action for the slope part of Line C; switched to a new streamer.

- October 5, 1975 (278)

Seas were calm, and skies clear and sunny. We completed Lines C, D and part of E. Perry Parks rigged up a new thermostat arrangement for the air conditioners in the gravity hut, and used the alternate unit to do most of the air conditioning. Both airgun units were pulled between 2002 and 2336 for servicing. Even with this attention, 40 cu. in. air gun continued to bleed between firings (5 sec.).

- October 6, 1975 (279)

Seas were calm, weather cool and skies cloudy. We completed Line E and part of Line F. We experienced power surges in ship's electric current which altered the time on the main clock used to mark the records. This clock was out several hours until a voltage stabilizer was put in between the digital clock and the electrical outlet, to protect against the surges. Corrosion in the connector at the winch for the SEI streamer, caused it to be down from 1656-1910 (z); we used 100 Element Minisparker streamer over this time. Three airgun "fish" out for repair, 1321-1514.

- October 7, 1975 (280)

Seas were choppy with a mild swell early in the day, deteriorating to 8-10 ft. waves and 40 kt. winds. Weather was cloudy and became sunny and clear as the day progressed. We completed Line F and started Line G. All systems operational except 20 cu. in and 40 cu. in. air guns.

- October 8, 1975 (281)

Seas calm and weather partly cloudy to clear and sunny. We complete Lines G and H and part of I. Three airgun fish out of water for repair 1224-1830; 160 cu. in. gun down from 0133 to 1224; air lines were replaced on two compressors.

- October 9, 1975 (282)

Weather was clear and sunny. Seas were rough at night, moderating toward morning. We completed Line I and started Line J. Minisparker out because of erratically firing source and hydrophone malfunction from 0900-1240 (z), 1309-1330, 1555-1918; a new amplifier-filter combination was set up. Loran C values were slewed because of a momentary power failure; both receivers stabilized in a manner similar to the digital clock: 160 cu. in. gun out from 0750-1524; three gun fish array out from 1210-1557.

- October 10, 1975 (283)

Seas were calm and the weather partly cloudy. We completed Line J and part of Line K. Three air gun array retrieved at 0435 (20 and 40 cu. in. guns not firing). Fish bent at a welded point of repair. 80 cu. in. fish deployed separately at 1505. Fish (with 40" and 20" guns) abandoned.

- October 11, 1975 (284)

Seas were calm. Weather sunny to partly cloudy. Lines K, L, were completed and Line M started. We experienced much ship traffic at the end of Line K, northern flank of Georges Bank. All systems operational except 40 and 20 cu. in. airguns.

- October 12, 1975 (285)

Seas were calm in the early morning but as the day lengthened, seas became rough (10-12 ft. waves); weather changed from cloudy to rain with fog. We completed Line M and N; pulled gear after completion of Line N (1505z) and motored slowly southeast of line into heavy seas. Only gravity was measured during this time of waiting for seas to moderate.

and fog to lift. Seas moderated in the evening (2000-2100 z) and we motored northeast toward the beginning of Line O. We had one close call while pulling gear, the "Cape Morrow", out of Halifax, passed within 50 yds. of the FAY's port side. She was approached undetected on the FAY's radar because of "hash" on the radar screen, caused by the agitated sea state. 160 cu. in. air gun out from 0222 to end of Line N (1505 z).

- October 13, 1975 (286)

Cloudy weather, strong northwest wind (45 kts) came up in middle part of the day; 6-8 ft. waves. Sea state moderated toward latter part of the day. We commenced Line O at 0215 z. Gravity and magnetometer data were noisy because of the choppy seas. All systems go except 20, 40, and 160 cu. in. airguns.

- October 14, 1975 (287)

Seas were smooth with a gentle swell. Weather was warm, sunny and clear. We completed Line O, P and part of Q. 160 cu. in. airgun substituted for 80" gun at 0250; by 0610 (z) a 40" gun was also in the water. Upper Loran C unit malfunctioned and was repaired.

- October 15, 1975 (288)

Seas were extremely calm and weather clear in the early morning. We spent the 1200-1600 (z) watch maneuvering on Line R in the fog to avoid fishing vessels. Lines Q and R were completed, and Line S was begun. All systems go except 20 and 80" air guns.

- October 16, 1975 (289)

Seas were calm in the early morning, becoming slightly rough as the day proceeded. Skies were sunny with a high cloudiness and haze. We completed Lines S, T, U, V and W. Because of a malfunctioning of Channel 7 on the tape recorder, we switched the minisparker input from this channel over to Channel 3. All systems operated normally except the 20" and 80" airguns. We completed survey at 2330 (z) and haul in all gear.

- October 17, 1975 (289)

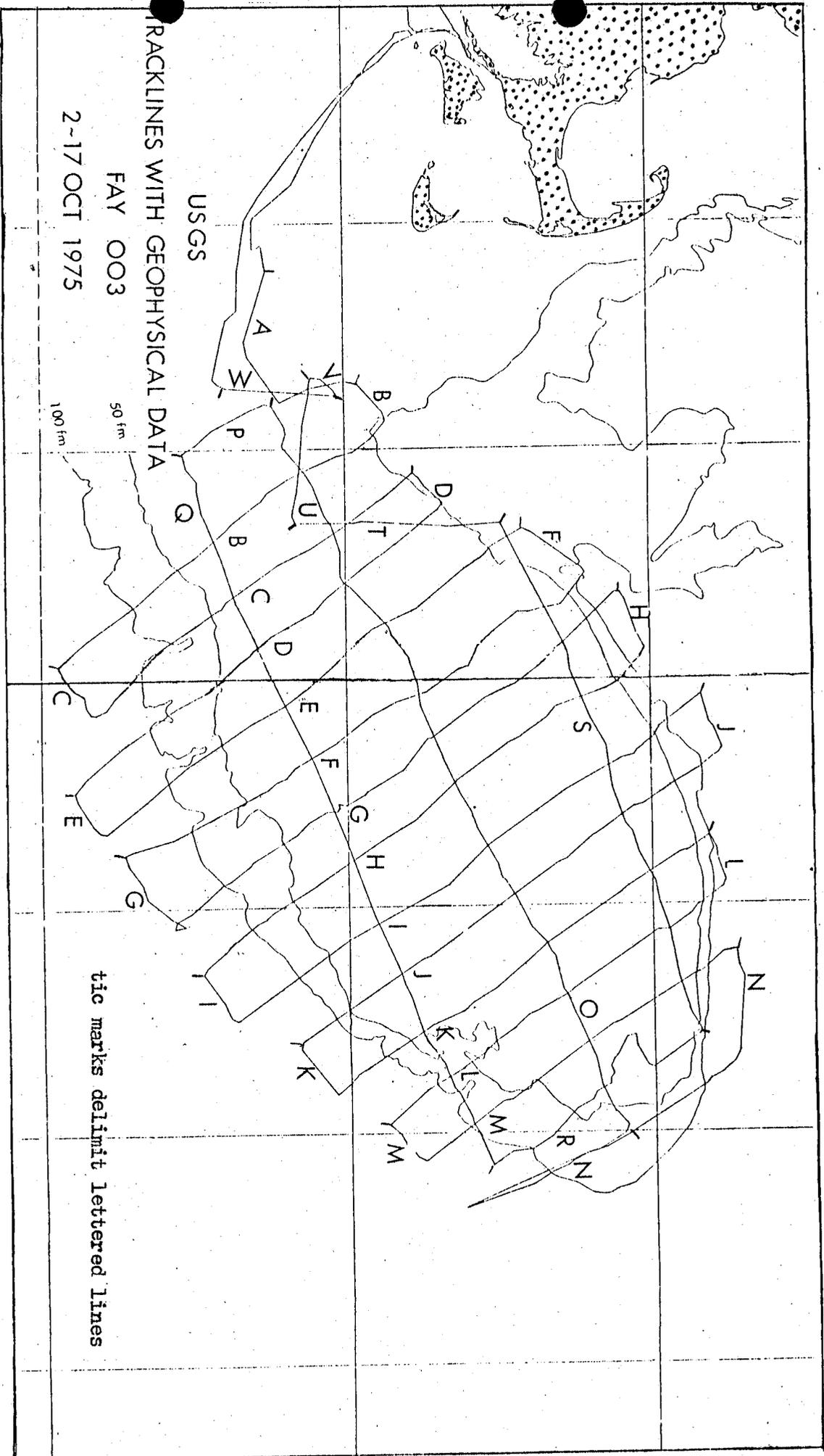
Seas were calm. Pulled 3.5 khz fish so FAY's clutch-drive train could be tested. Redeployed fish at 0054, but pulled it at 0106 because the 10 kt. speed was too fast to tow it. Arrived in Woods Hole at 1110 z.

Table - Total track, kilometers by day and by system

OCTOBER

DAY	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
System															
3.5 khz	203	259	240	304	222	259	259	209	265	167	259	287	259	294	3486
Minisparker	0	231	224	296	196	259	241	209	265	167	259	287	259	294	3187
Airgun	83	268	277	277	261	309	259	256	309	167	259	287	302	294	3608
Gravity	203	287	292	304	264	309	278	265	309	232+	259	287	302	306	3897+
Magnetics (Gradiometer)	83	287	292	304	264	309	278	265	309	167	259	287	302	294	3700
Daily Totals (in km)	572+	1332	1325	1485	1207	1445	1315	1204	1457	900+	1295	1435	1424	1482	

Mc Mi.
1882
1721
1948
2104
1998



TRACKLINES WITH GEOPHYSICAL DATA

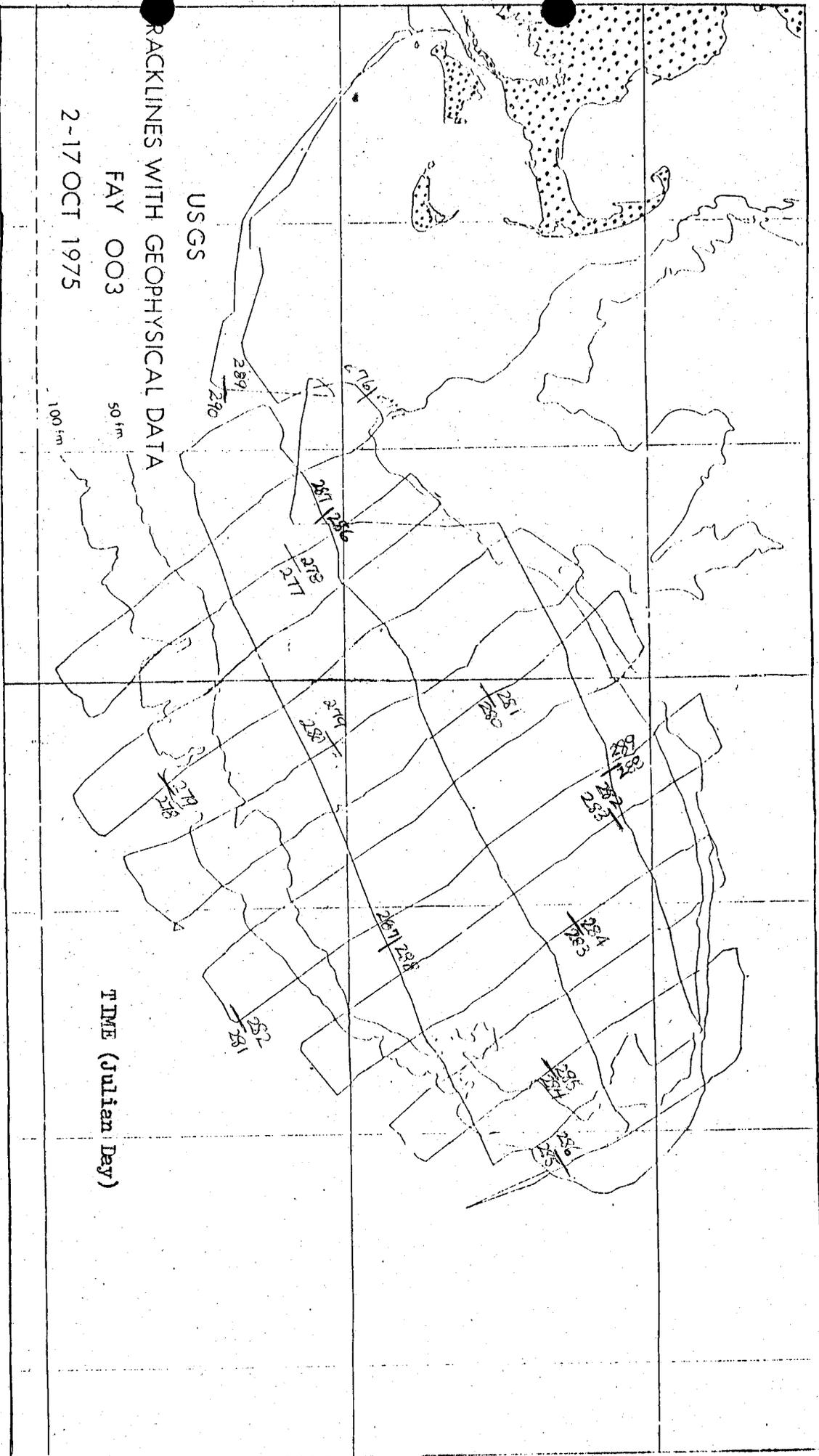
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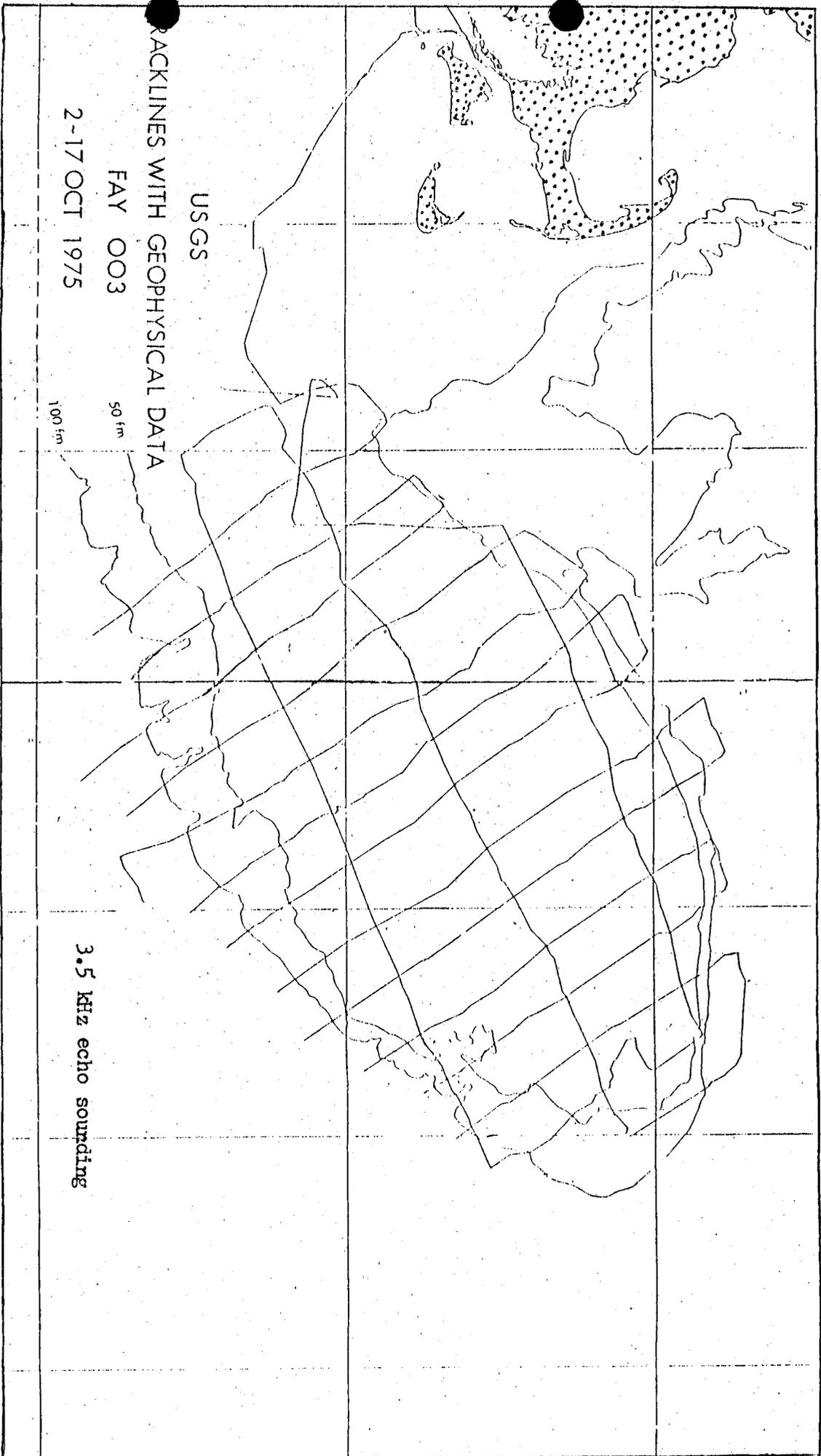
2-17 OCT 1975

USGS

50 fm
100 fm

tic marks delimit lettered lines





TRACKLINES WITH GEOPHYSICAL DATA

FAY 003

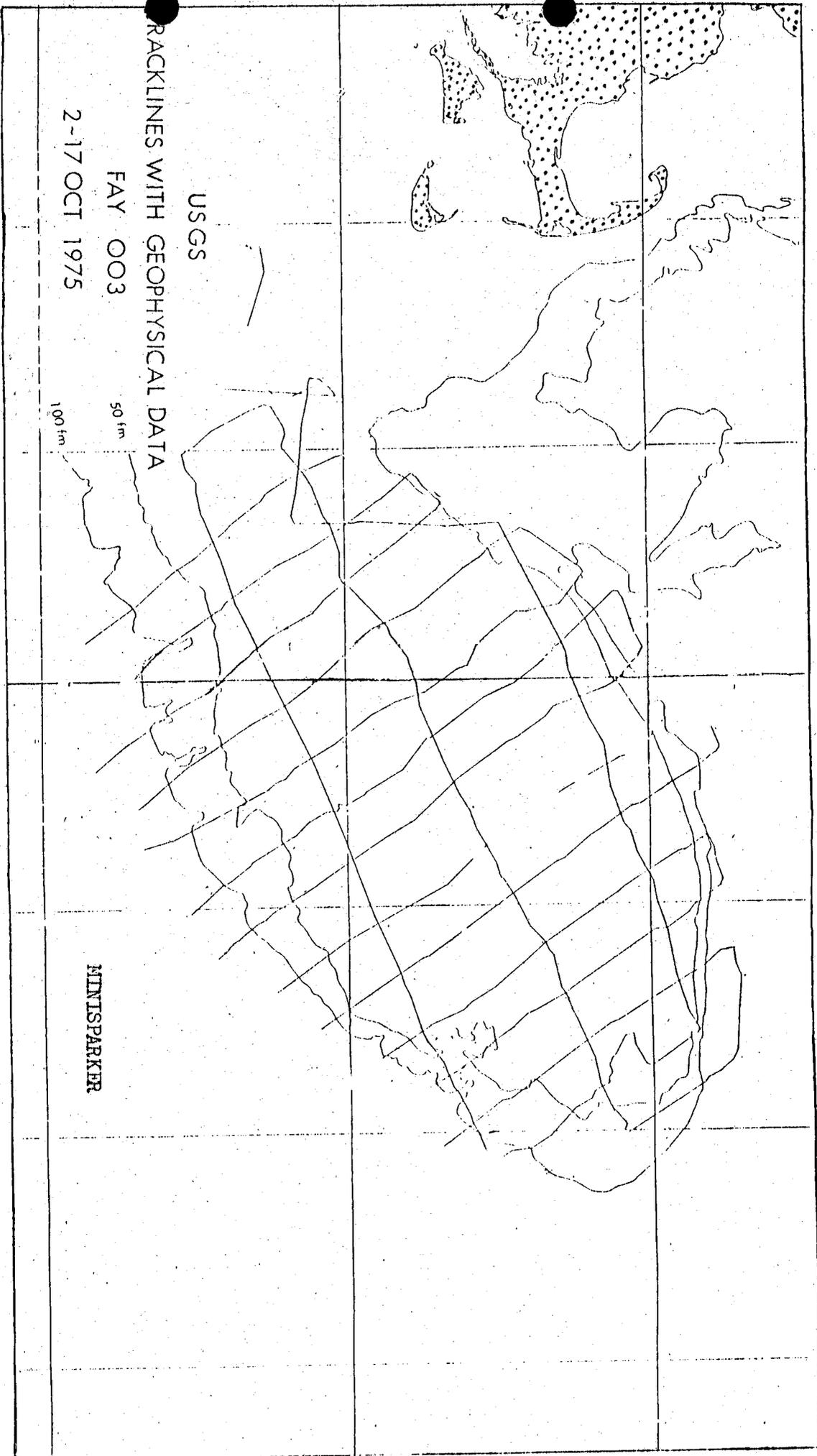
2-17 OCT 1975

USGS

50 fm

100 fm

3.5 kHz echo sounding



USGS

TRACKLINES WITH GEOPHYSICAL DATA

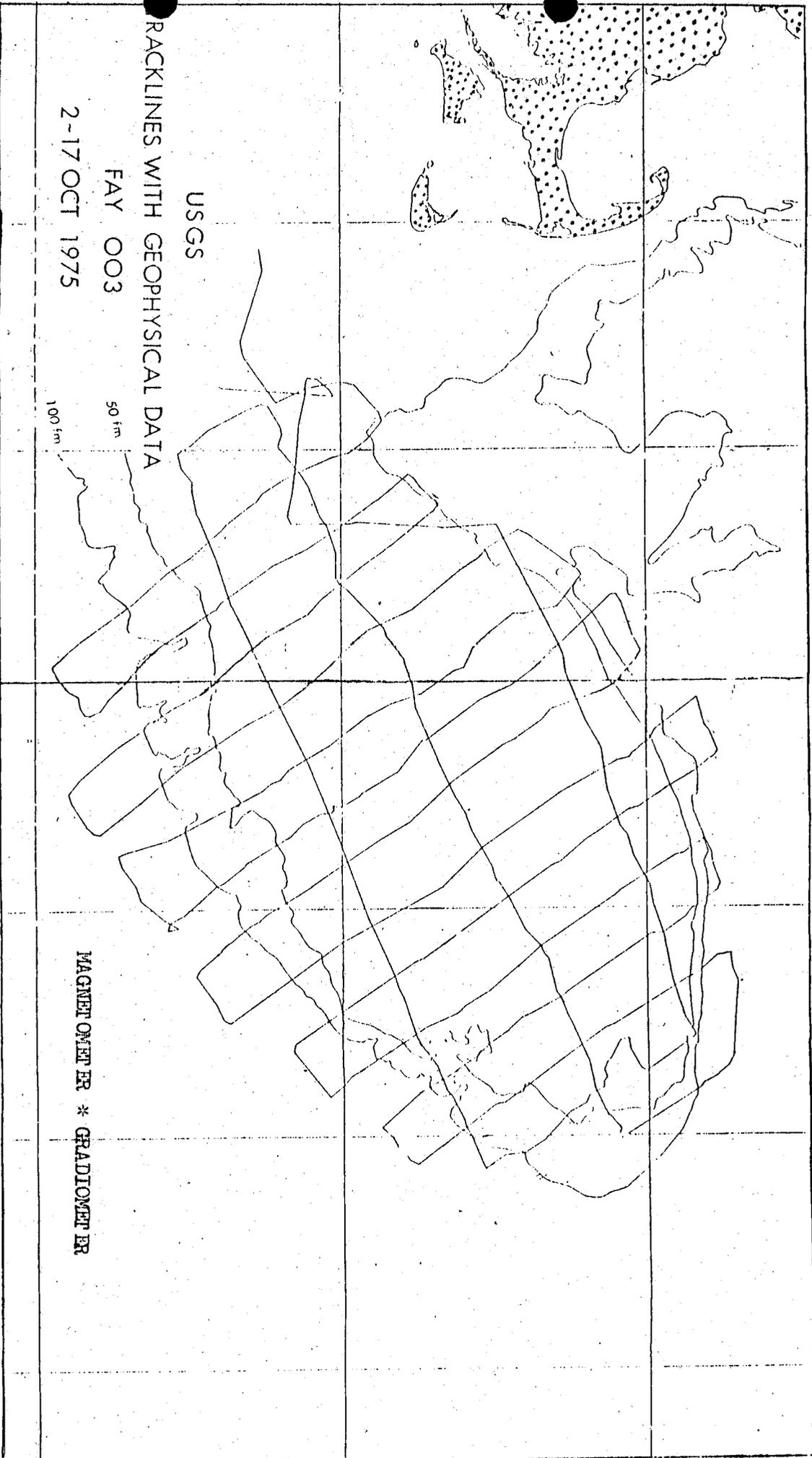
FAY 003

2-17 OCT 1975

50 fm

100 fm

MINISPARKER



USGS

TRACKLINES WITH GEOPHYSICAL DATA

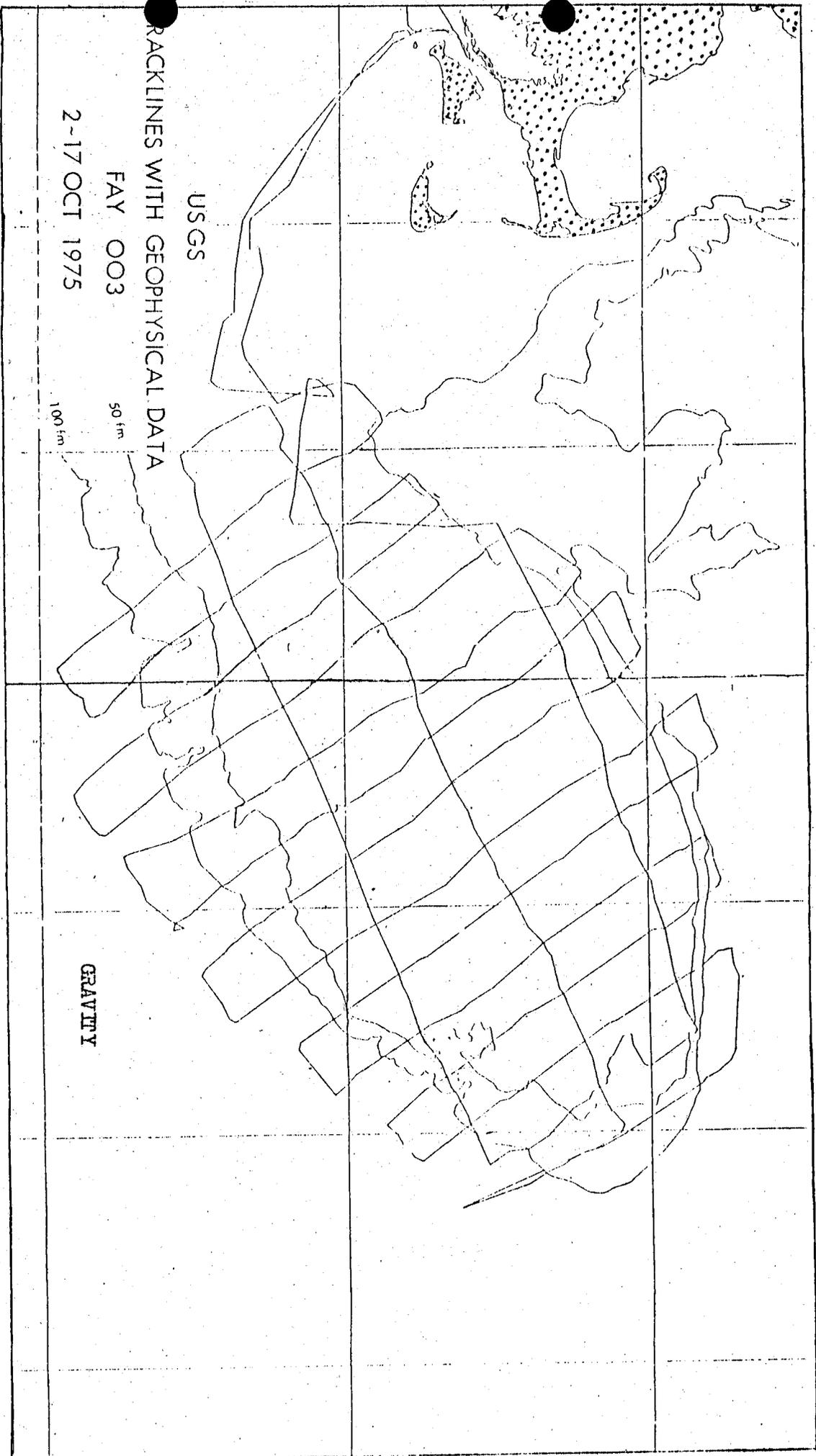
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2-17 OCT 1975

50 fm

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MAGNETOMETER * GRAVIMETER



USGS

TRACKLINES WITH GEOPHYSICAL DATA

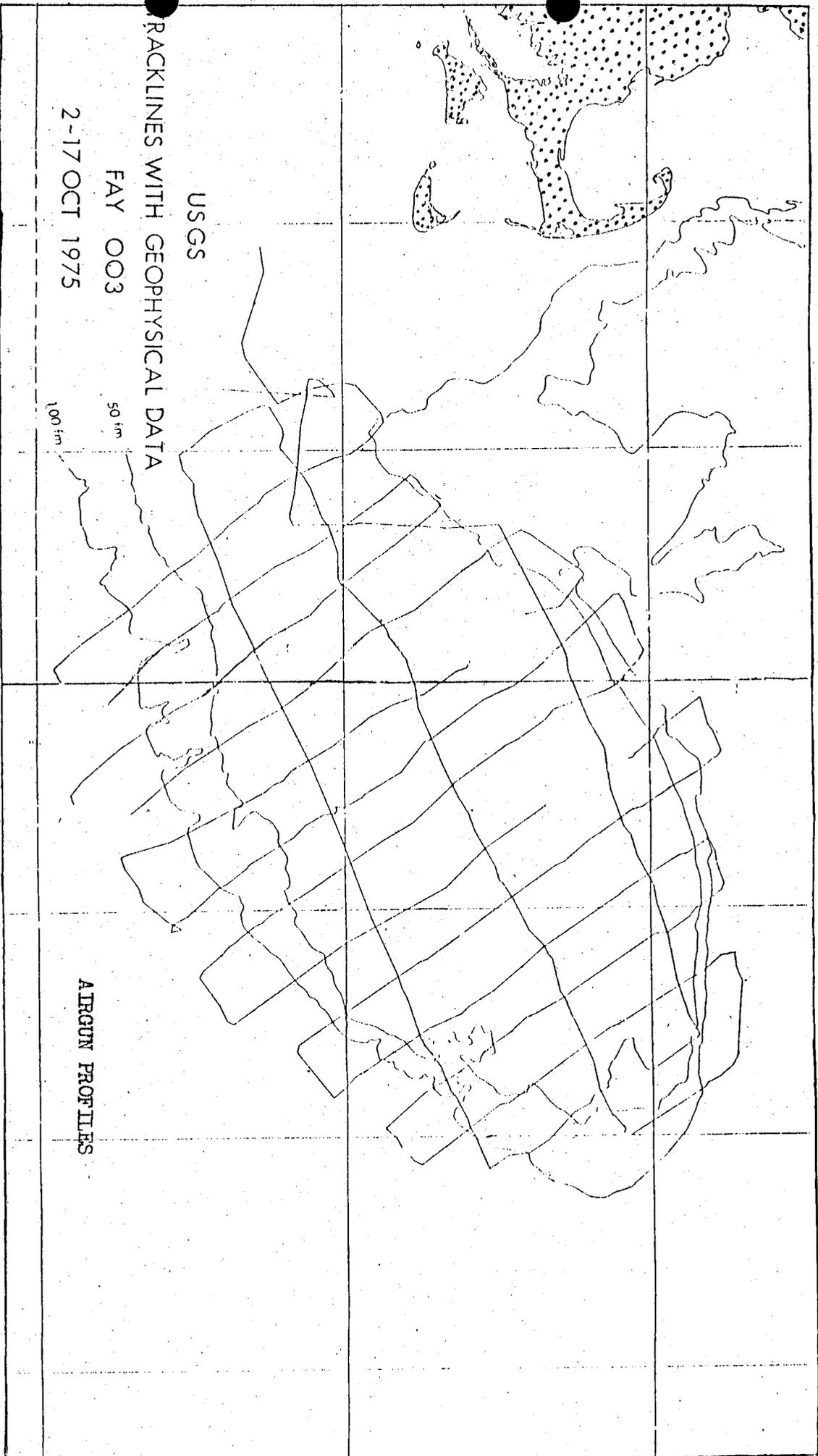
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2-17 OCT 1975

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GRAVITY



USGS

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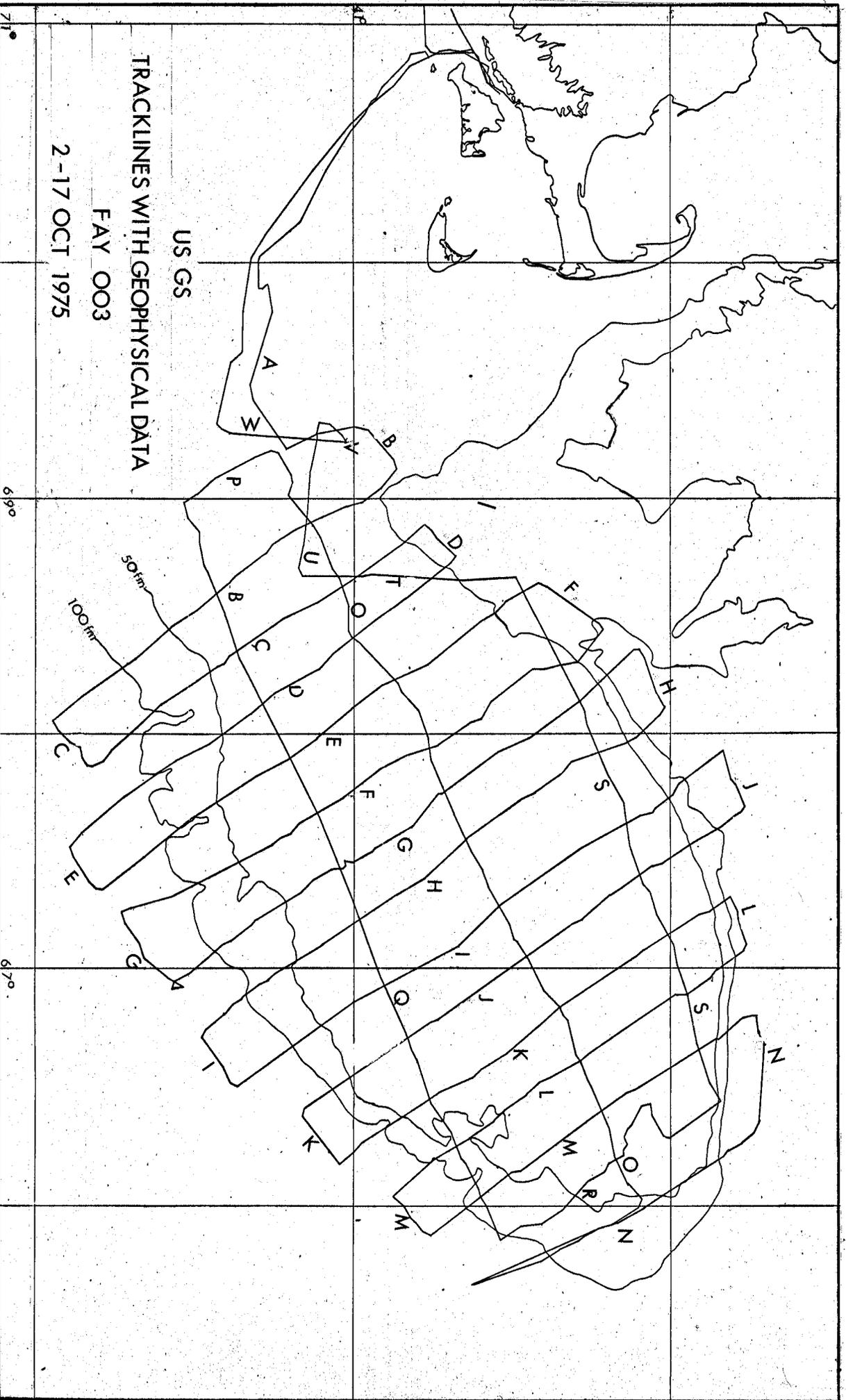
FAY 003

2-17 OCT 1975

50 fm

100 fm

AIRGUN PROFILES



US GS
TRACKLINES WITH GEOPHYSICAL DATA

FAY 003

2-17 OCT 1975

69°

67°

50 fm

100 fm

71