UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MULTICHANNEL SEISMIC REFLECTION DATA ACQUIRED ON THE M/V CECIL H. GREEN IN THE GULF OF ALASKA, JUNE - AUGUST 1975

By

Terry R. Bruns and Kenneth Bayer

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This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

Menlo Park, California
April 1977

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Introduction

During June - August, 1975, the U.S. Geological Survey contracted with Geophysical Service, Inc., party 2942 aboard the M/V CECIL H. GREEN, to acquire approximately 5500 km of 24- and 48-fold seismic reflection data in the Gulf of Alaska, roughly between Unimak Island at the end of the Alaska peninsula and Cross Sound east of Juneau, Alaska. Tracklines are shown in Figures 1 thru 5. Table 1 shows line numbers, shotpoint numbers, fold of coverage, field magnetic tape reel numbers, and final-stack magnetic tape reel numbers. In addition, high resolution records obtained with a Teledyne Model 405 mini-sparker system were acquired on some of the lines and are indicated in Table 2.

Seismic recording system

(1) Amplifier and Magnetic Recorder:

DFS IV digital instruments with a dynamic range of 81 db were used to record 48-trace, 24- and 48-fold seismic data on one inch 21-track magnetic tape at 712 bpi. The sample rate was 4 milliseconds. Field filters had a high cut of 62Hz with a 72 db/Oct slope, and a low cut of 8Hz with an 18db/Oct slope. Record length was primarily 6 sec; longer record times were used in deep water. System noise was less than 0.25 μv.

(2) Streamer:

The GSI 2400-m streamer used 48 live sections containing 30 acceleration-cancelling geophones per section. Streamer depth was maintained

at approximately 14 m except in shallow water. Depth was controlled by weighting the streamer to approximately neutral buoyancy, by use of nine depth-control birds strategically located along the streamer, and to a minor extent by ship speed and length of lead-in. Streamer geometry is shown in Figure 6. Geophone group geometry and hydrophone response are shown in Figure 7.

(3) Energy Source:

The energy source for the survey was a tuned 1200 cu. in. airgun array towed 26 m off the stern at a depth of 10 m. The distance from the satellite antenna to the center of the airgun array during this survey was 54 m. Air pressure was maintained at 1600-2000 psi by two compressors. Guns were fired at 25 m or 50 m intervals depending on fold of coverage. The airgun array geometry is shown in Figure 8. Figure 9 shows the approximate form and frequency spectrum of the resulting pulse.

Navigation

Shotpoints were located by an integrated 980A Geonav survey system utilizing doppler sonar dead-reckoning control with Loran C as a secondary system. Absolute satellite positions were taken on the average of every 1.5 hours. Between fixes, ship velocities were monitored continuously with a doppler sonar or a Loran C 980-A interface operated by Offshore Navigaton, Inc.

Processing

Data were processed by Petty-Ray Geophysical, Division of Geosource, Inc., in Houston, Texas. The processing sequence for each line is shown on the stacked sections; an example is shown in Figure 10. The stacked sections were filmed at 2 1/2"/sec and 20 traces/inch; an example of a final stacked section is shown in Figure 11.

Available Data

Final shotpoint maps are available at two scales: 1:250,000 and 1:96,000 (1 in = 8000 ft), and a map index is shown in Figure 12. Shotpoint locations on the maps are at the antenna position. For reference purposes, a cruise identifier code, EGAL-75-XB is annotated on all reports and logs associated with the data.

The data for this survey are available from:

Marine Technical Data Center
345 Middlefield Road
Menlo Park, CA 94205
Phone: (415) 323-8111, ext. 2074

and

National Geophysical and
Solar Terrestrial Data Center (NGSDC)
EDS/NOAA; Boulder, CO 80302

Data available from NGSDC only:

Sepia or paper print of full-scale final stack seismic sections.

Sepia or paper print of corrected velocity gathers.

Full-scale final shotpoint maps at scales of 1:250,000 and 1:96,000.

Magnetic tape of shotpoint locations.

Magnetic Tape of bathymetry.

Data available from Marine Technical Data Center:

Microfilm of final stack seismic sections.

Microfilm of the 1:250,000 shotpoint maps.

Data available from both NGSDC and Marine Technical Data Center:

Microfilm of observers logs.

Microfilm of velocity analyses.

Microfilm of single trace sections.

Microfilm of corrected velocity gathers.

Map Index Sheet.

Microfilm of high-resolution seismic reflection data.

Microfilm copies of final reports from GSI, ONI, and Petty Ray.

FIGURE CAPTIONS

Figure 1: Trackline Map 1: Cross Sound to Icy Bay, Eastern Gulf of Alaska

Figure 2: Trackline Map 2: Icy Bay to Kayak Island, Eastern Gulf of Alaska

Figure 3: Trackline Map 3: Kayak Island to Middleton Island, Eastern Gulf of Alaska

Figure 4: Trackline Map 4: Middleton Island to Chirikof Island, Kodiak Shelf, Western Gulf of Alaska

Figure 5: Trackline Map 5: Chirikof Island to Unimak Island, Shumagin Shelf Western Gulf of Alaska

Figure 6: Streamer Geometry

Figure 7: Geophone Group Geometry and Hydrophone Response.

Figure 8: Airgun Array Geometry

Figure 9: Airgun Pulse Form and Frequency Spectrum

Figure 10: Example of processing sequence for line 406 (See Fig. 11)

Figure 11: Part of the final stacked section for Line 406 near Icy Bay, Eastern Gulf of Alaska

Figure 12: Index map for 1:250,000 and 1:96,000 final shotpoint location map.

TABLE 1: Line and reel listing for multichannel seismic reflection data acquired on the M/V CECIL H. GREEN in the Gulf of Alaska, June-August 1975.

LINE	SHOTPOINTS	FOLD	STACK REC.	STACK REEL	FIELD REELS
400-1	0001 - 1310	24	1 - 112	20565	716162 - 716169
400-2	1453 - 2673	24	1 - 104	03419	716170 - 716178
401	0001 - 1345	24	1 - 114	06868	716155 - 716161
402	0001 - 0878	24	1 - 75	15835	716149 - 716154
403-1	0001 - 0363	24	1 - 33	22266	716179 - 716180
403-2	0364 - 2537	24	1 - 184	34229	716181 - 716193
404-1	0001 - 0740	48	1 - 33	15060	716001 - 716004
404-2	5003 - 6859	48	1 - 80	36022	716205 - 716218
404-3	0001 - 1398	24	1 - 119	04164	716194 - 716204
405	0001 - 1614	48	1 - 70	37257	716012 - 716020
406	0001 - 1865	48	1 - 80	32289	716031 - 716040
407-1	0001 - 0529	48	1 - 24	08796	715987 - 715989
407-2	0530 - 0770	48	1 - 12	18731	715990 - 715991
407-3	0771 - 2247	48	1 - 64	31463	716229 - 716236
408-1	0246 - 1444	48	1 - 52	04104	715994 - 716000
408-2	1445 - 2371	48	1 - 41	34474	716084 - 716088
409	0001 - 1980	48	1 - 85	19576	716073 - 716083
410-1	0001 - 0502	48	1 - 23	26169	716089 - 716091
410-2	0503 - 2275	48	1 - 76	22291	716117 - 716125
410-3	5011 - 5331	24	1 - 29	28876	716092 - 716093
411-1	0001 - 0337	24	1 - 30	16738	716094 - 716095
411-2	5003 - 7062	48	1 - 88	00124	716096 - 716106
412-1	0001 - 1247	48	1 - 55	07465	716107 - 716113
412-2	1282 - 1860	48	1 - 27	18048	716114 - 716116

LINE	SHOTPOINTS	FOLD	STACK REC.	STACK REEL	FIELD REELS
413-3	0001 - 0220	48	1 - 33	35652	715959 - 715960
413-1	0221 - 0960	48	1 - 45	38437	715961 - 715964
413-2	1361 - 2371	48	1 - 12	33158	716054 - 716059
414-1	1301 - 2767	48	1 - 64	30023	716060 - 716069
414-2	0001 - 0784	48	1 - 35	16393	715955 - 715958
415	0001 - 1180	48	1 - 52	09140	715889 - 715894
416	0001 - 0993	48	1 - 44	06359	715884 - 715888
417	0001 - 1852	48	1 - 80	37536	715874 - 715883
418	0001 - 0816	48	1 - 36	29683	716005 - 716009
419-1	0001 - 0169	48	1 - 9	21535	715645 - 715645
419-2	0162 - 1502	48	1 - 58	14462	715646 - 715652
420	0001 - 2275	48	1 - 97	18649	715633 - 715644
421-1	0191 - 0580	48	1 - 19	04656	715857 - 715858
421-2	1002 - 3457	48	1 - 105	37410	715861 - 715873
422	0001 - 3023	48	1 - 128	08143	715604 - 715619
423-1	0001 - 0202	48	1 - 11	13624	715586 - 715587
423-2	0405 - 3175	48	2 - 137	13624	715589 - 715603
424-1	0001 - 0551	48	1 - 119	38574	715571 - 715573
424-2	0771 - 2738	48	1 - 119	38574	715575 - 715584
425-1	0001 - 3655	48	1 - 155	23006	715825 - 715843
425-2	5001- 6561	24	1 - 132	31612	716280 - 716293
426	0001 - 2237	48	1 - 96	08668	715812 - 715824
427	0001 - 1666	48	1 - 72	31137	715735 - 715743
428-1	0200 - 0910	48	1 - 32	10562	715721 - 715724
428-2	0911 - 2036	48	1 - 49	07412	715758 - 715764
428-3	2037 - 2446	24	1 - 37	06215	716294 - 716297
429	0001 - 1749	48	1 - 75	02474	715706 - 715714

LINE	SHOTPOINTS	FOLD	STACK REC.	STACK REEL	FIELD REELS
430-1	0001 - 1068	48	1 - 47	34653	715700 - 715705
430-2	1445 - 1876	48	1 - 20	17914	715716 - 715718
431	0466 - 1173	24	1 - 61	18102	716259 - 716262
432	0001 - 1259	48	1 - 55	02576	716240 - 716246
450-1	0001 - 0479	48	1 - 22	32586	716041 - 716043
450-2	2016 - 3911	48	1 - 81	20446	716219 - 716228
451-1	0046 - 0722	48	1 - 31	35961	716021 - 716024
451-2	1856 - 2435	48	1 - 27	16821	716044 - 716046
451-4	3252 - 4025	48	1 - 35	32444	716251 - 716254
452-1	0001 - 0429	48	1 - 20	16829	715916 - 715918
452-2	1076 - 5363	48	1 - 181	38405	715922 - 715944
453-1	0001 - 0790	24	1 - 68	25327	716255 - 716258
453-2	0791 - 1441	24	1 - 57	34949	716263 - 716266
454	0001 - 2483	48	1 - 106	07672	716134 - 716148
455-1	0001 - 2500	48	1 - 107	01076	715620 - 715632
455-2	2506 - 4033	48	1 - 66	11844	715945 - 715953
455-3	4311 - 8285	48	1 - 168	09048	715967 - 715986
456	0001 - 4033	48	1 - 171	31919	715895 - 715915
457-1	0001 - 0334	48	1 - 16	30074	715725 - 715726
457-2	0545 - 1700	48	1 - 51	23528	715728 - 715733
457-3	1842 - 3991	48	1 - 92	34527	715845 - 715855
458	0001 - 2409	48	1 - 103	08186	715799 - 715811
459	0001 - 3279	48	1 - 139	06876	715672 - 715688
460	0001 - 4259	48	1 - 180	08471	715776 - 715798
461	0001 - 2109	48	1 - 90	05828	715689 - 715699
462-1	0001 - 0385	48	1 - 19	23221	715765 - 715766
462-2	0386 - 2031	48	1 - 71	00246	715767 - 715775

LINE	SHOTPOINTS	FOLD	STACK REC.	STACK REEL	FIELD REELS
463	0001 - 0803	48	1 - 36	30940	715744 - 715747
464	0001 - 1861	48	1 - 80	37308	715748 - 715757
465	0001 - 1777	48	1 - 76	09978	715662 - 715671
466	0001 - 1657	48	1 - 72	17049	715653 - 715661
467	0001 - 1788	24	1 - 151	19211	716267 - 716279
468	0001 - 0655	48	1 - 30	34868	716247 - 716250
500-1	0001 - 1104	24	1 - 94	04855	715490 - 715495
500-2	1471 - 1580	24	1 - 12	19588	715498 - 715498
500-3	1811 - 2310	24	1 - 44	15585	715500 - 715502
500-4	3415 - 4010	24	1 - 52	38673	715540 - 715543
500-5	4102 - 4672	24	1 - 50	31229	715545 - 715548
500-6	5170 - 6650	24	1 - 126	17936	715550 - 715557
500A-4	0001 - 0790	24	1 - 68	31301	716298 - 716301
500A-5	0791 - 2216	24	1 - 121	27838	716310 - 716316
500A-6	2217 - 2766	24	1 - 48	18096	716332 - 716334
500A-7	2767 - 3361	24	1 - 52	06565	716335 - 716339
501	0001 - 0110	24	1 - 11	15421	715428 - 715428
501-1	0115 - 1500	24	1 - 118	2377[illegible]	715430 - 715438
501-2	1501 - 2800	24	1 - 111	36151	715446 - 715452
501-3	2801 - 3900	24	1 - 94	27865	715462 - 715467
501-4	3901 - 4799	24	1 - 77	11310	715477 - 715481
502	0001 - 1401	24	1 - 119	32459	715405 - 715412
503-1	0001 - 0511	24	1 - 45	23053	716302 - 716304
503-2	0512 - 1405	24	1 - 77	12714	716305 - 716309
504-1	0970 - 1391	24	1 - 58	12509	715563 - 715566
504-2	2200 - 2498	24	1 - 27	00085	716318 - 716320
504-2CT	2508 - 2728	24	1 - 21	00085	716330 - 716331

LINE	SHOTPOINTS	FOLD	STACK REC.	STACK REEL	FIELD REELS
505	0693 - 2668	24	1 - 167	00046	715514 - 715526
505-1	0001 - 0120	24	1 - 12	01242	715509 - 715509
506-1	0001 - 1156	24	1 - 99	34555	715503 - 715508
506-2	1230 - 1856	24	1 - 55	32350	715528 - 715532
507	0001 - 1575	24	1 - 134	16992	715482 - 715489
508	0001 - 1750	24	1 - 148	25258	715468 - 715476
509	0001 - 1625	24	1 - 138	29958	715453 - 715461
510	0001 - 1002	24	1 - 86	05849	715439 - 715445
511	0001 - 2138	24	1 - 181	01213	715413 - 715426
512	0001 - 0609	24	1 - 53	02954	715383 - 715386
513	0001 - 1518	24	1 - 129	28816	715374 - 715382
514	0001 - 1109	24	1 - 95	14154	715393 - 715399
515	0004 - 0780	24	1 - 67	36424	715388 - 715392
516	0811 - 1442	24	1 - 55	03115	715400 - 715404
517	0001 - 1270	24	1 - 108	22403	716321 - 716329
521	0001 - 1836	24	1 - 155	23837	715350 - 715363
522	0001 - 1700	24	1 - 144	21152	715364 - 715373
530	0002 - 1057	24	1 - 90	30218	715330 - 715336
531	0001 - 1200	24	1 - 102	03870	715313 - 715320
532	0001 - 1428	24	1 - 121	34994	715321 - 715329
533	0001 - 2083	24	1 - 176	15434	715337 - 715349

Table 2 : Line and shotpoint listing for high resolution seismic reflection data acquired on the M/V Cecil H. Green in the Gulf of Alaska, June- August 1975.

Line	Shotpoints
400	0001-0940
400	0957-1400
401	0001-0140
401	0220-0403
401	0496-0552
401	0625-1345
402	0001-0878
404	0336-0740
405	0001-1614
406	0001-1865
407	0001-0529
407	0530-0770
408	0246-0460
408	0600-0840
408	0901-1100
408	1455-2371
409	0855-1980
410	0001-0600
410	5164-5331
410	0530-2275
411	0001-0337
411	5003-7062
412	0001-1281
412	1282-1860
413	0001-0220
413	0221-1360
413	1361-2235
415	0001-1180
416	0001-0993
417	0001-1852
418	0001-0816
419	0001-0161
420	0059-2275
421	0001-0190
421	0191-1001
421	2600-2935
421	3125-3457
422	0001-3023
423	1950-3175
424	0001-0770
424	0771-2650
425	0001-3655
426	0001-2237
427	0001-1666
428	0001-0910
428	0911-2036
429	0001-1749
430	0001-1069
450	0001-0479
450	0480-2015
450	2016-3911
451	1856-2436
452	1076-4000
452	4100-5363
454	0001-2483
455	0001-2500
455	2501-4034
455	4311-8285
456	0001-4033
457	0001-0541
457	0591-1555
457	1610-1775
457	1776-3991
458	0221-0740
458	1981-2409
459	0001-1240
459	1301-3279
460	0001-2080
460	3630-3836
461	0001-2109
462	0001-1700
463	0001-0803
464	0001-1861
465	0001-1200
465	1340-1777
466	0001-1658
500	4103-5190
500	5650-6650
504	0998-1391

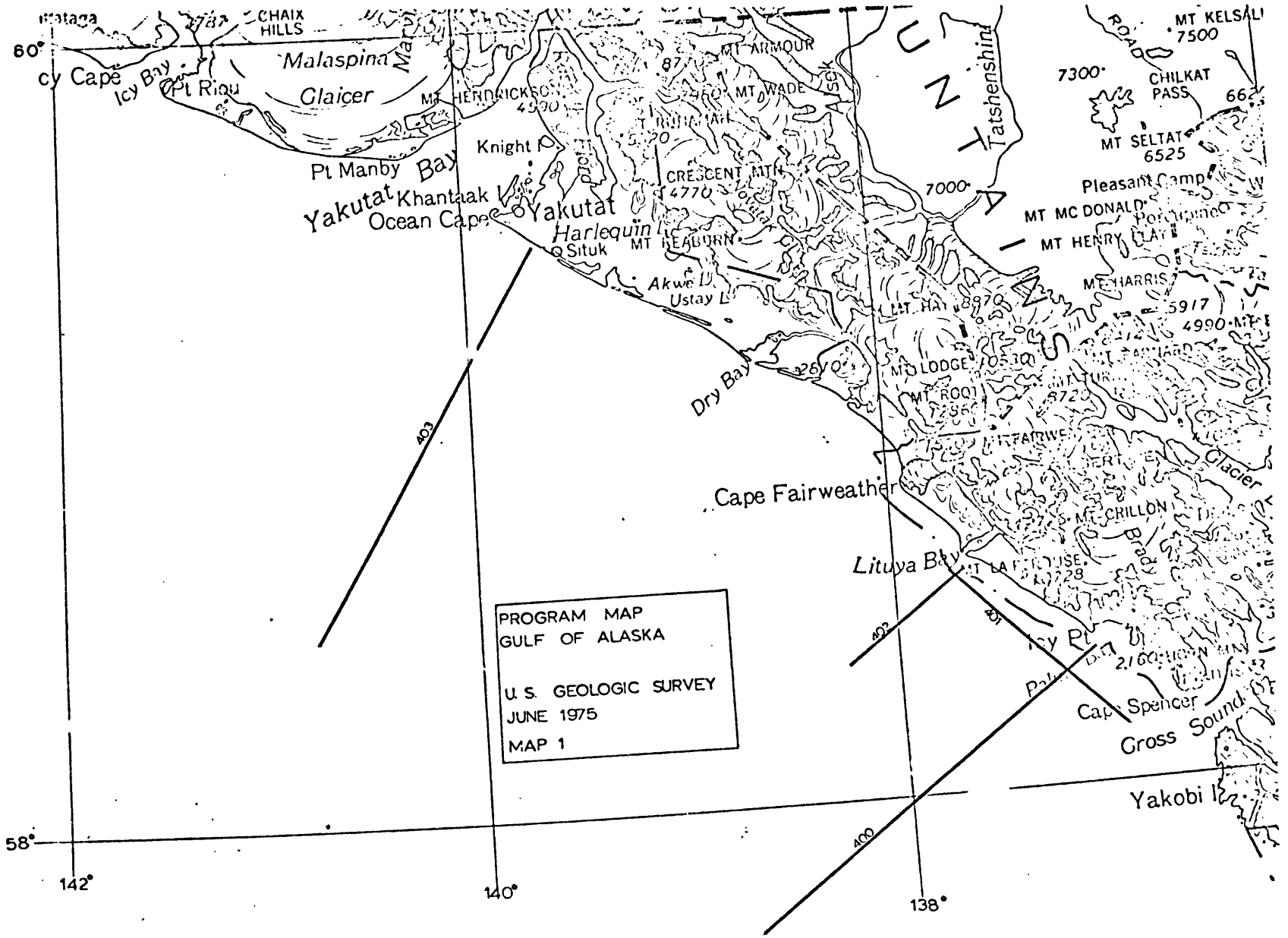


Figure 1: Trackline Map 1: Cross Sound to Icy Bay, Eastern Gulf of Alaska

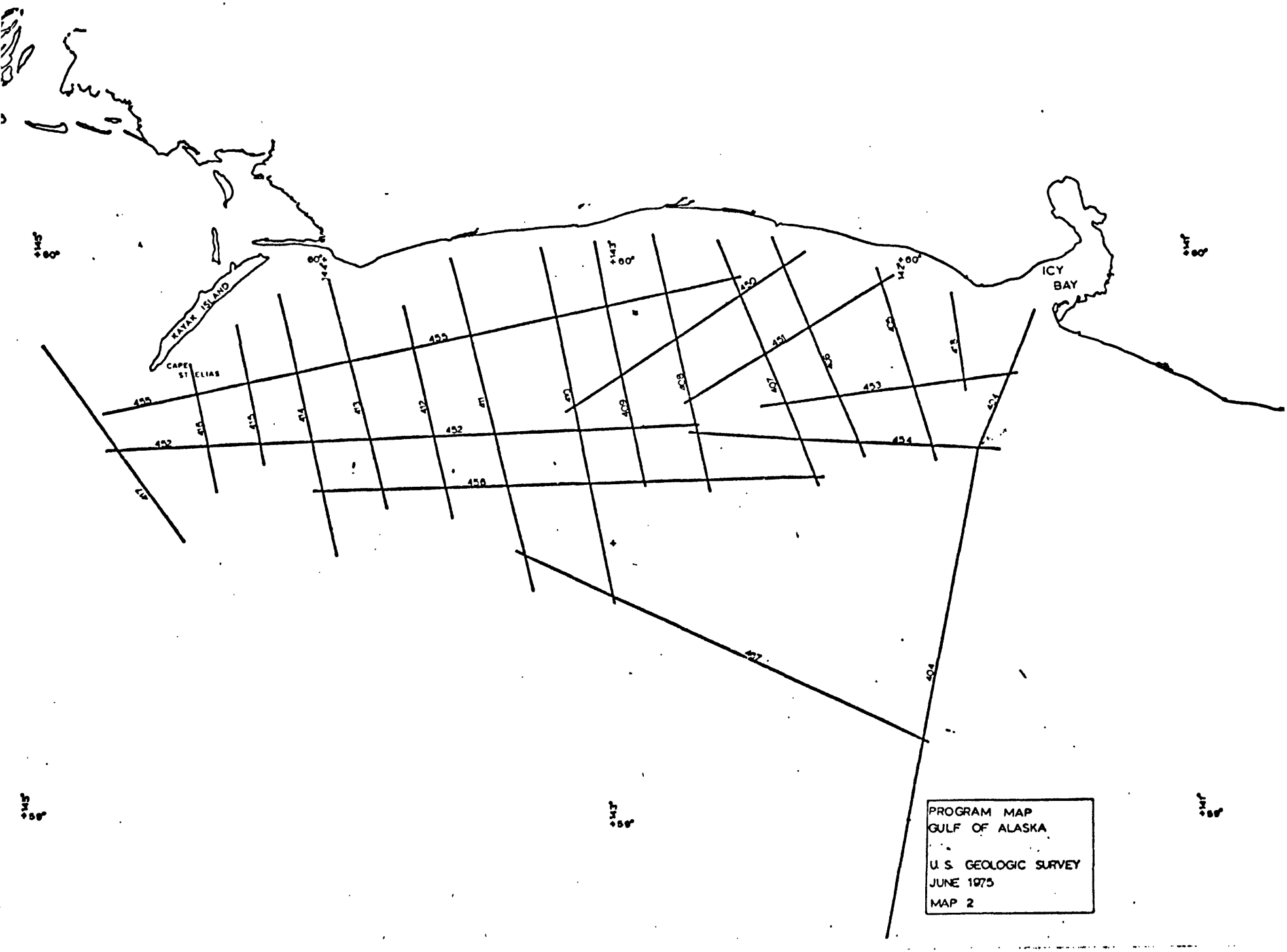


Figure 2: Trackline Map 2: Icy Bay to Kayak Island, Eastern Gulf of Alaska

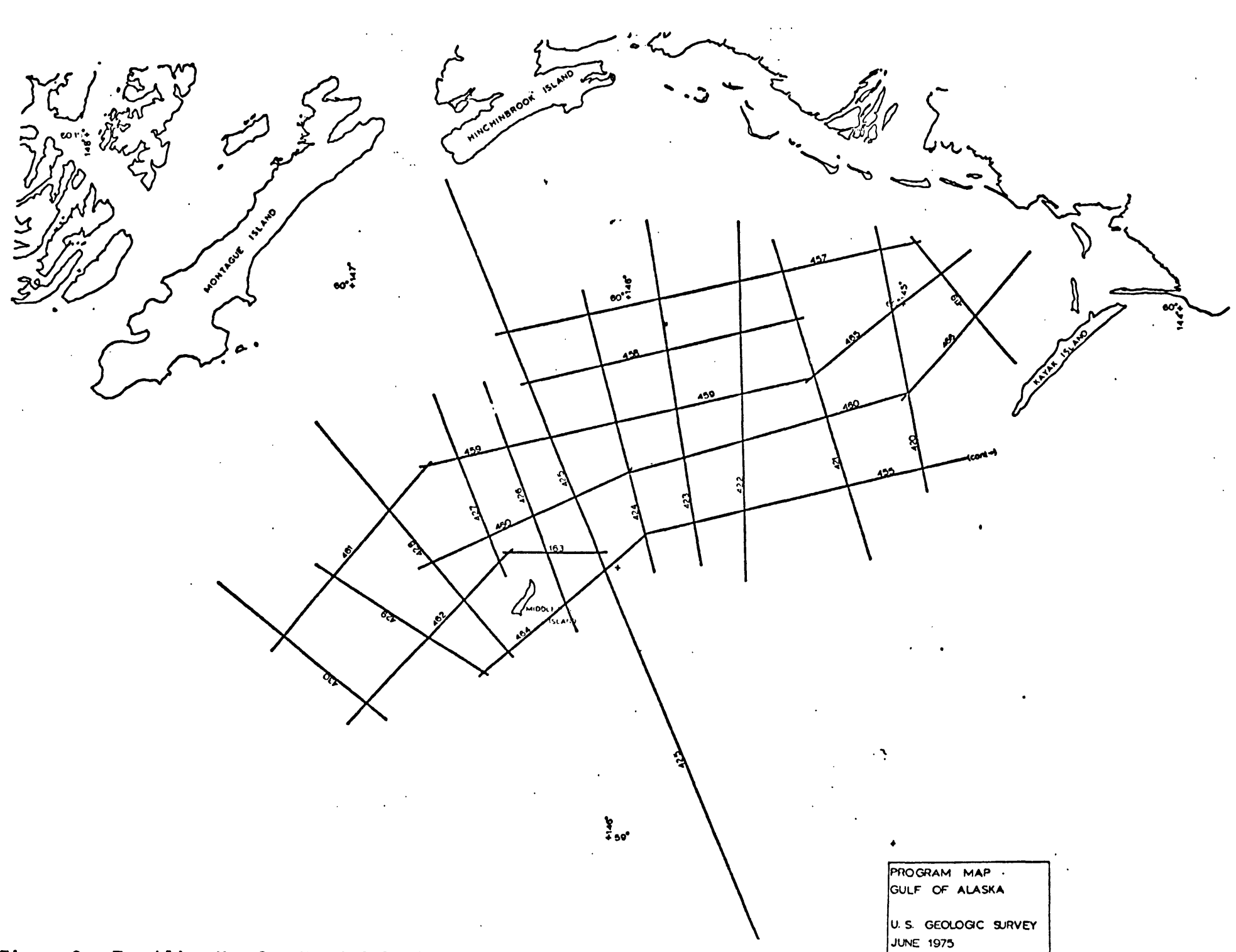


Figure 3: Trackline Map 3: Kayak Island to Middleton Island, Eastern Gulf of Alaska

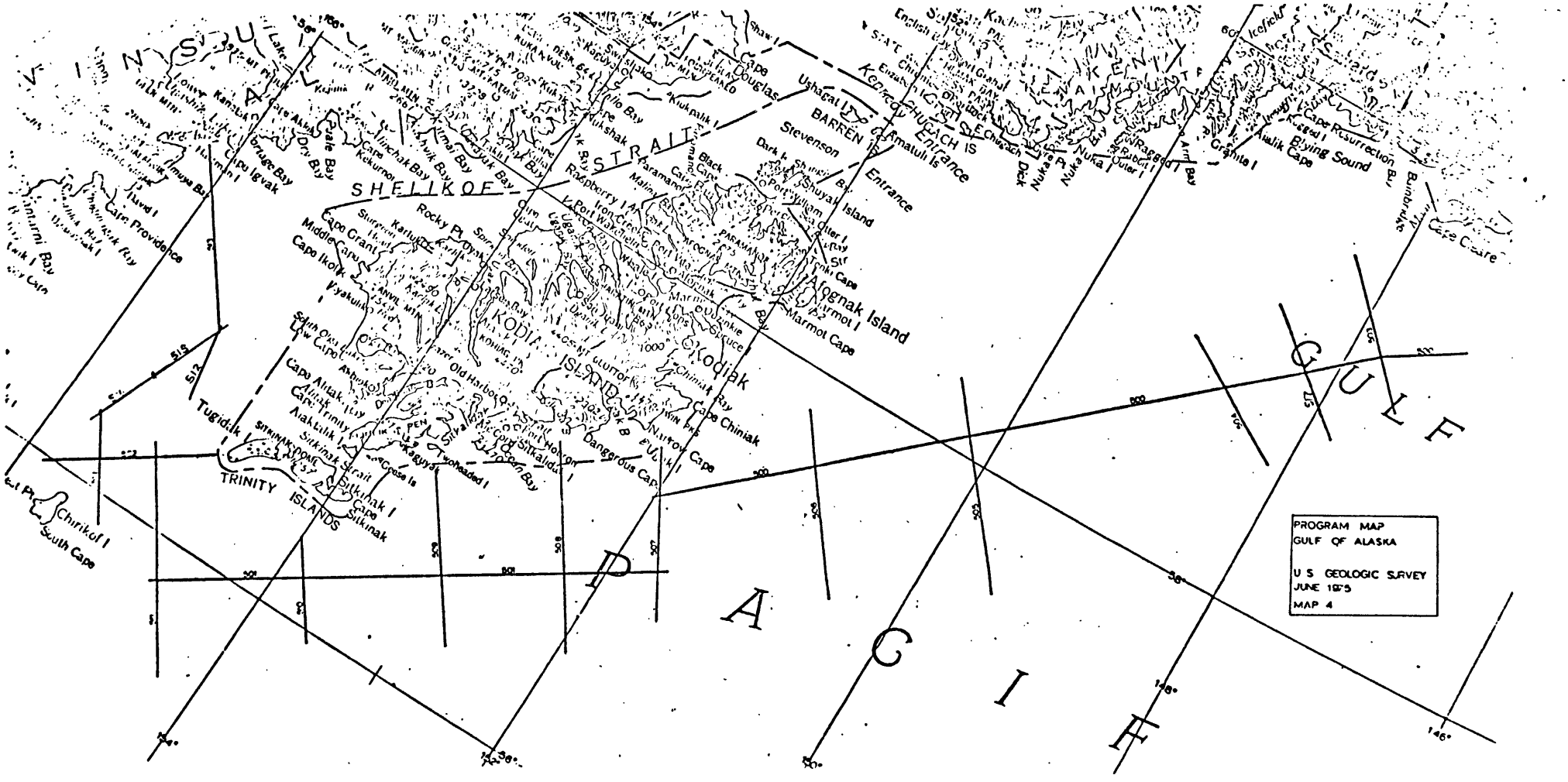


Figure 4: Trackline Map 4: Middleton Island to Chirikof Island, Kodiak Shelf, Western Gulf of Alaska

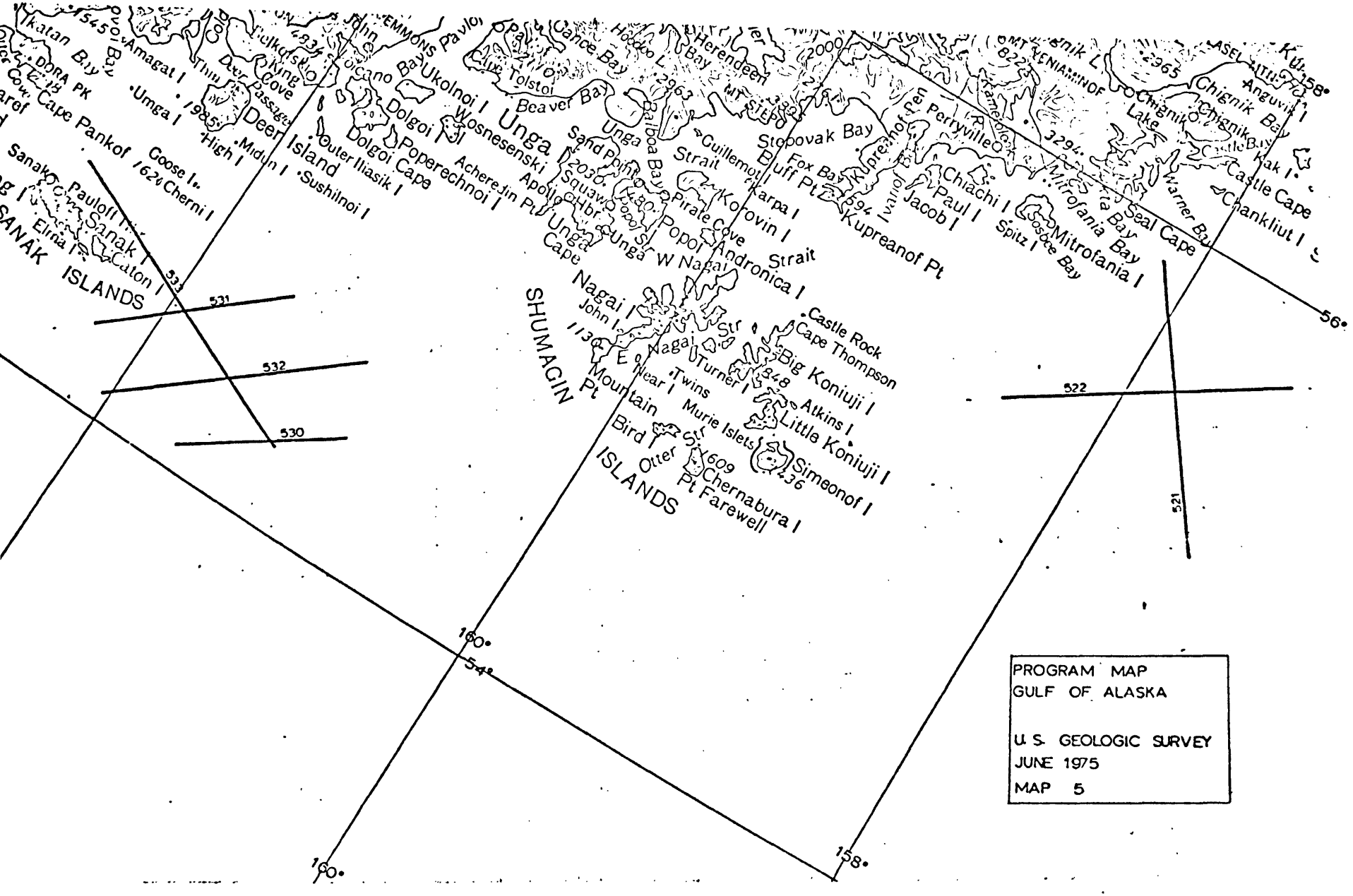


Figure 5: Trackline Map 5: Chirikof Island to Unimak Island, Shumagin Shelf

Western Gulf of Alaska

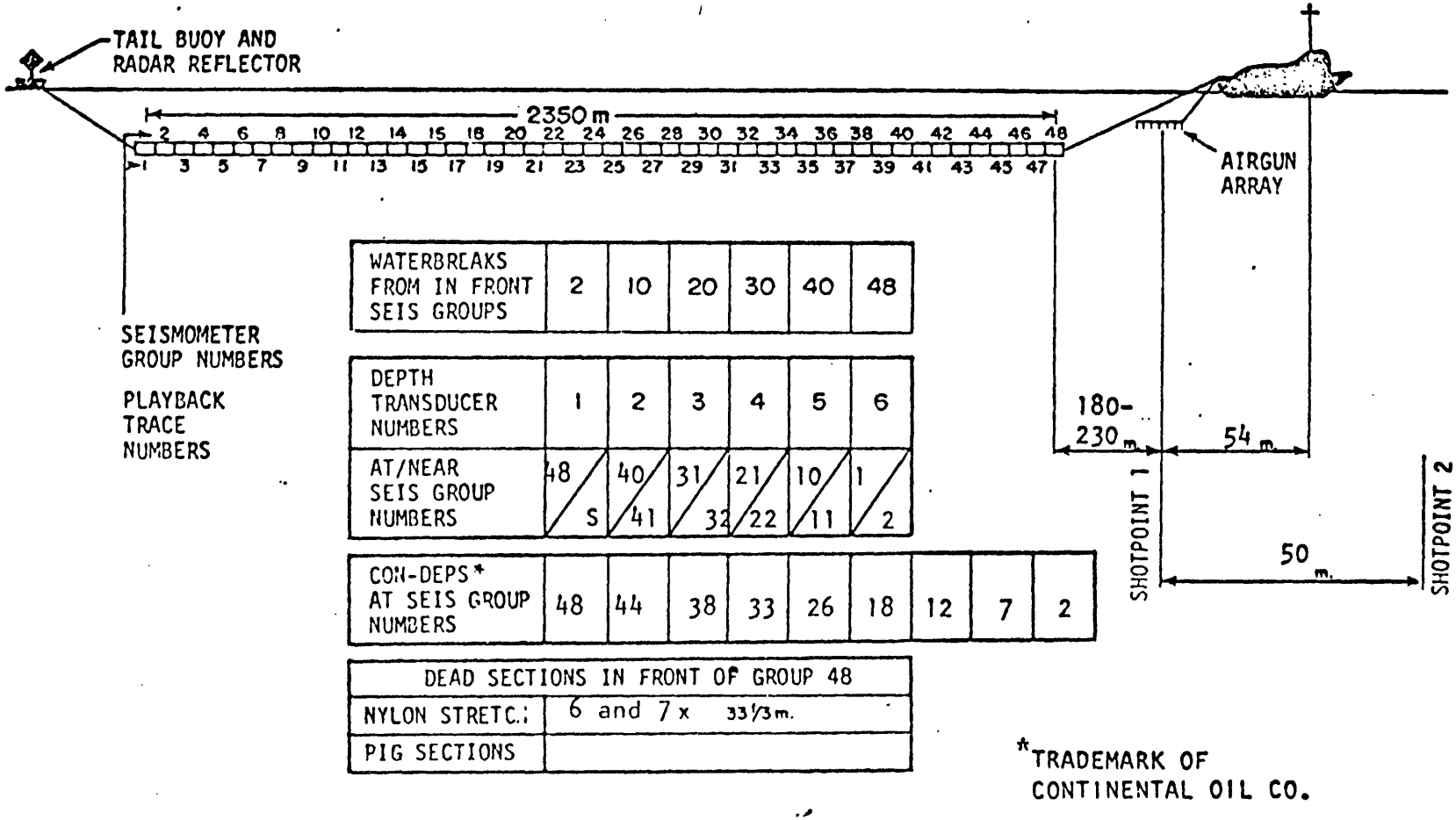
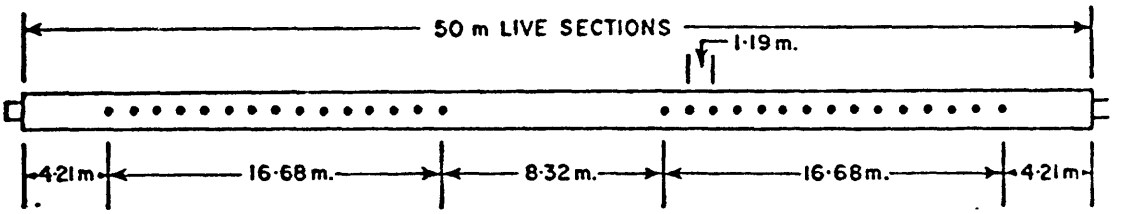


Figure 6: Streamer Geometry

STREAMER RESPONSE

ACCELERATION-CANCELLING HYDROPHONE



- o 30 ACCELERATION-CANCELLING HYDROPHONES PER 50-M SECTION
- o EACH HYDROPHONE CONTAINS TWO CRYSTAL TUBES (approx. 0.96-in. OD x 0.75-in. ID x 0.22-in. in length) WIRED IN PARALLEL

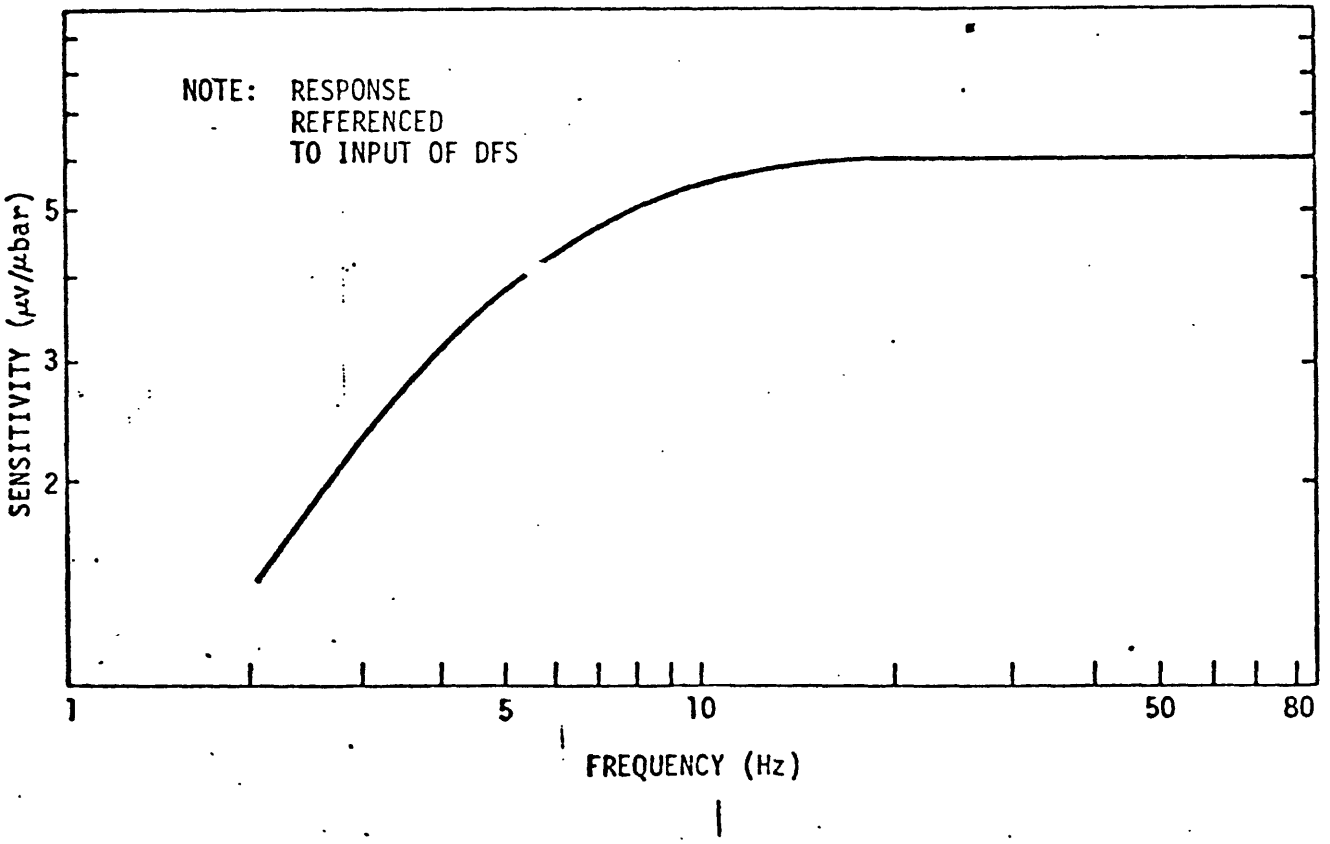


Figure 7: Geophone Group Geometry and Hydrophone Response.

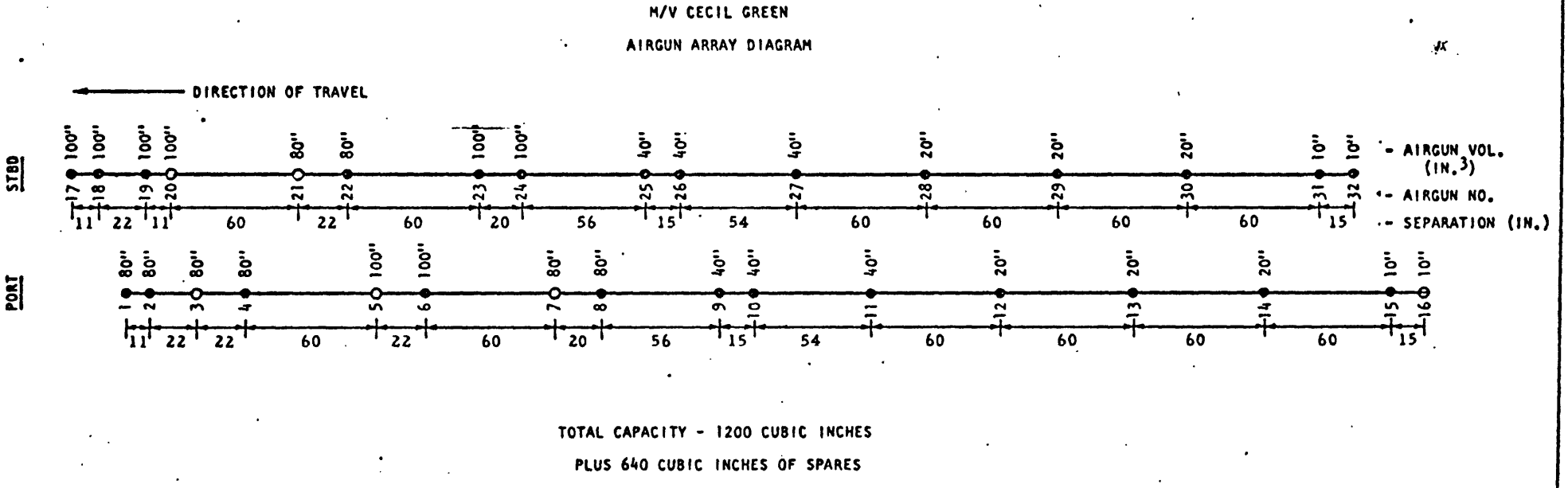
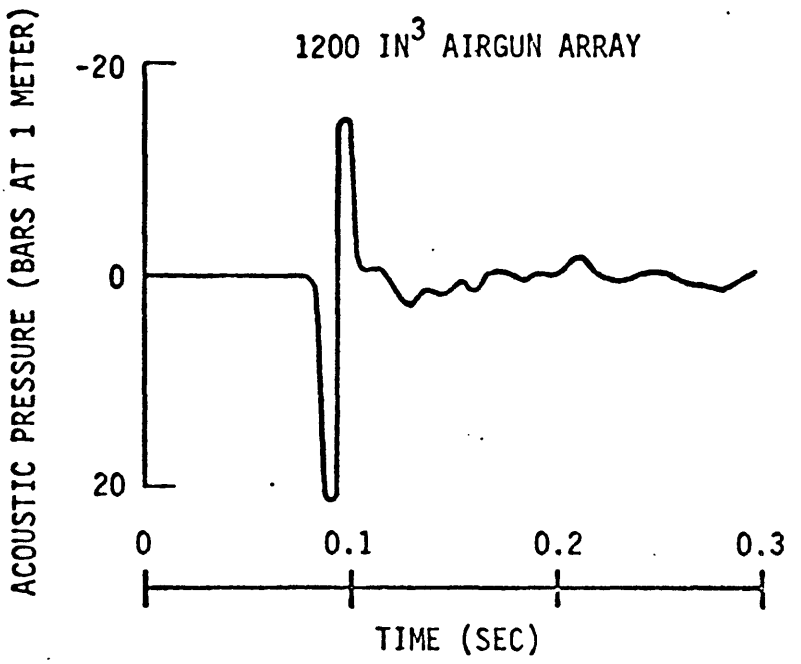
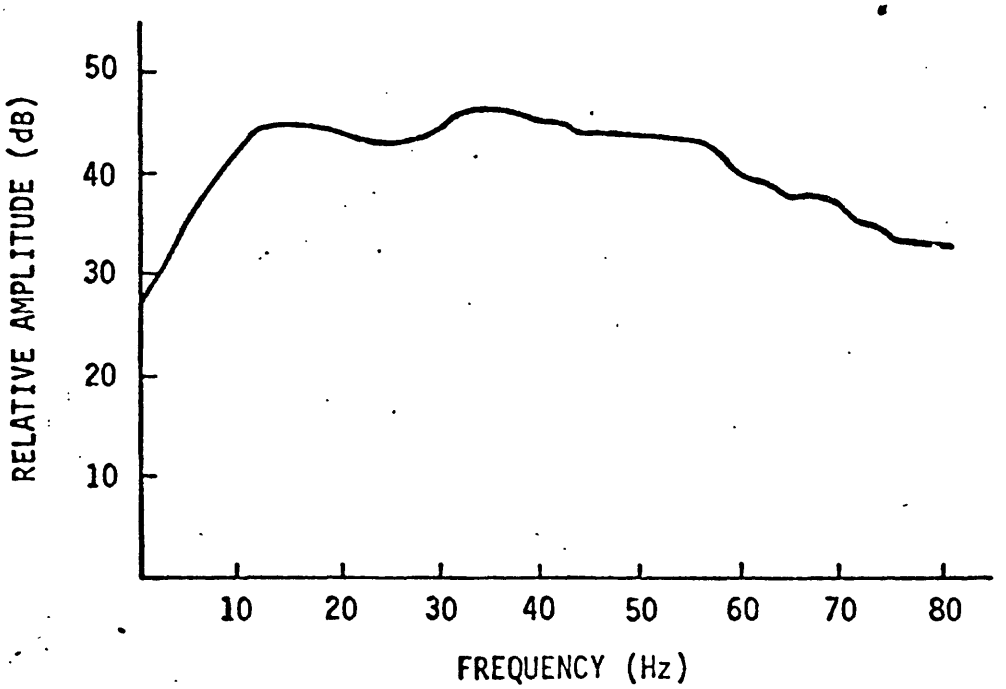


Figure 8: Airgun Array Geometry

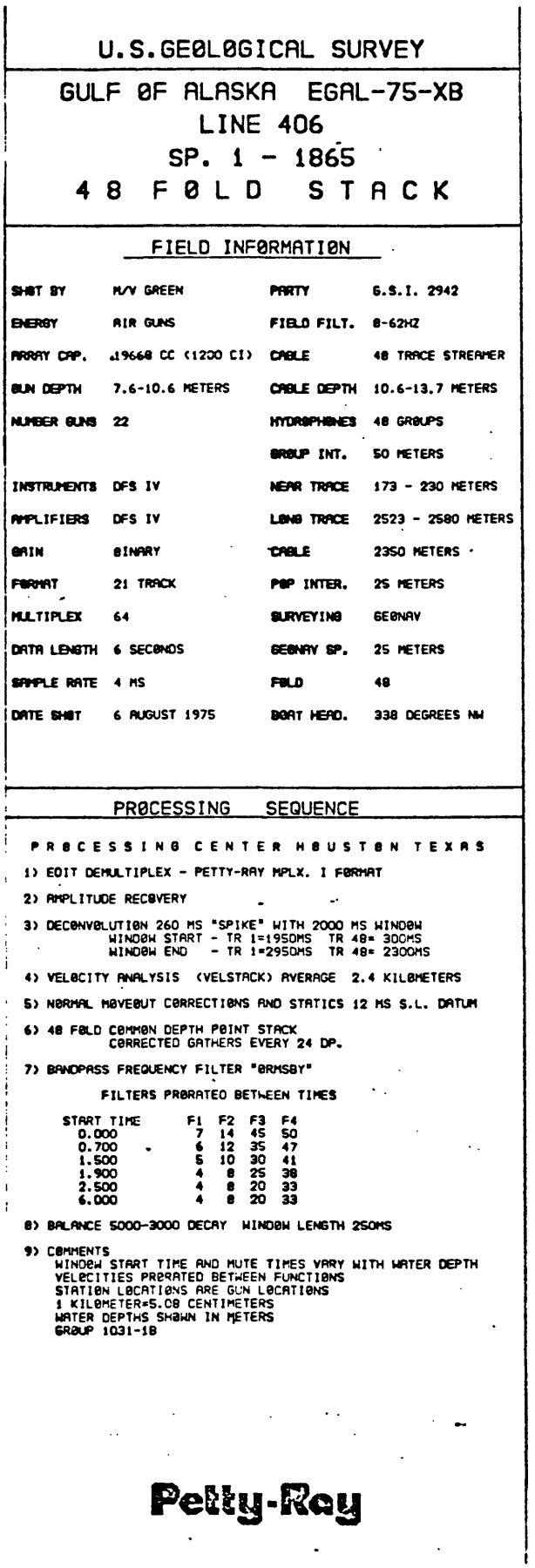


MEASURED PULSE FORM
FILTERED: OUT - 248 Hz



FREQUENCY SPECTRUM

Figure 9: Airgun Pulse Form and Frequency Spectrum



U.S.GE0L0GICAL SURVEY

GULF 0F ALASKA EGAL-75-XB
LINE 406
SP. 1 - 1865
4 8 F 0 L D S T A C K

FIELD INF0RMATI0N

SH0T BY	M/V GREEN	PARTY	G.S.I. 2942
ENERGY	AIR GUNS	FIELD FILT.	8-62HZ
ARRAY CAP.	19660 CC (1200 CI)	CABLE	48 TRACE STREAMER
GUN DEPTH	7.6-10.6 METERS	CABLE DEPTH	10.6-13.7 METERS
NUMBER GUNS	22	HYDR0PH0NES	48 GR0UPS
		GR0UP INT.	50 METERS
INSTRUMENTS	DFS IV	NEAR TRACE	173 - 230 METERS
AMPLIFIERS	DFS IV	L0NG TRACE	2523 - 2580 METERS
GAIN	BINARY	CABLE	2350 METERS
F0RMAT	21 TRACK	P0P INTER.	25 METERS
MULTIPLEX	64	SURVEYING	GE0NAV
DATA LENGTH	6 SEC0NDS	GE0NAV SP.	25 METERS
SAMPLE RATE	4 MS	F0LD	48
DATE SH0T	6 AUGUST 1975	B0AT HEAD.	338 DEGREES NW

PR0CESSING SEQUENCE

P R 0 C E S S I N G C E N T E R H 0 U S T 0 N T E X A S

1) E0IT DEMULTIPLEX - PETTY-RAY MPLX. I F0RMAT

2) AMPLITUDE REC0VERY

3) DEC0NV0LUTI0N 260 MS "SPIKE" WITH 2000 MS WIND0W
WIND0W START - TR 1=1950MS TR 48= 3000MS
WIND0W END - TR 1=2950MS TR 48= 2300MS

4) VEL0CITY ANALYSIS (VELSTACK) AVERAGE 2.4 KIL0METERS

5) N0RMAL M0VE0UT C0RRECTI0NS AND STATICS 12 MS S.L. DATUM

6) 48 F0LD C0MM0N DEPTH P0INT STACK
C0RRECTED GATHERS EVERY 24 DP.

7) BANDPASS FREQUENCY FILTER "0RMSBY"

FILTERS PR0RATED BETWEEN TIMES

START TIME	F1	F2	F3	F4
0.000	7	14	45	50
0.700	6	12	35	47
1.500	5	10	30	41
1.900	4	8	25	38
2.500	4	8	20	33
6.000	4	8	20	33

8) BALANCE 5000-3000 DECAY WIND0W LENGTH 250MS

9) C0MMENTS
WIND0W START TIME AND MUTE TIMES VARY WITH WATER DEPTH
VEL0CITIES PR0RATED BETWEEN FUNCTI0NS
STATI0N L0CATI0NS ARE GUN L0CATI0NS
1 KIL0METER=5.08 CENTIMETERS
WATER DEPTHS SH0WN IN METERS
GR0UP 1031-18

Petty-Ray

Figure 10: Example of processing sequence for line 406 (See Fig. 11)

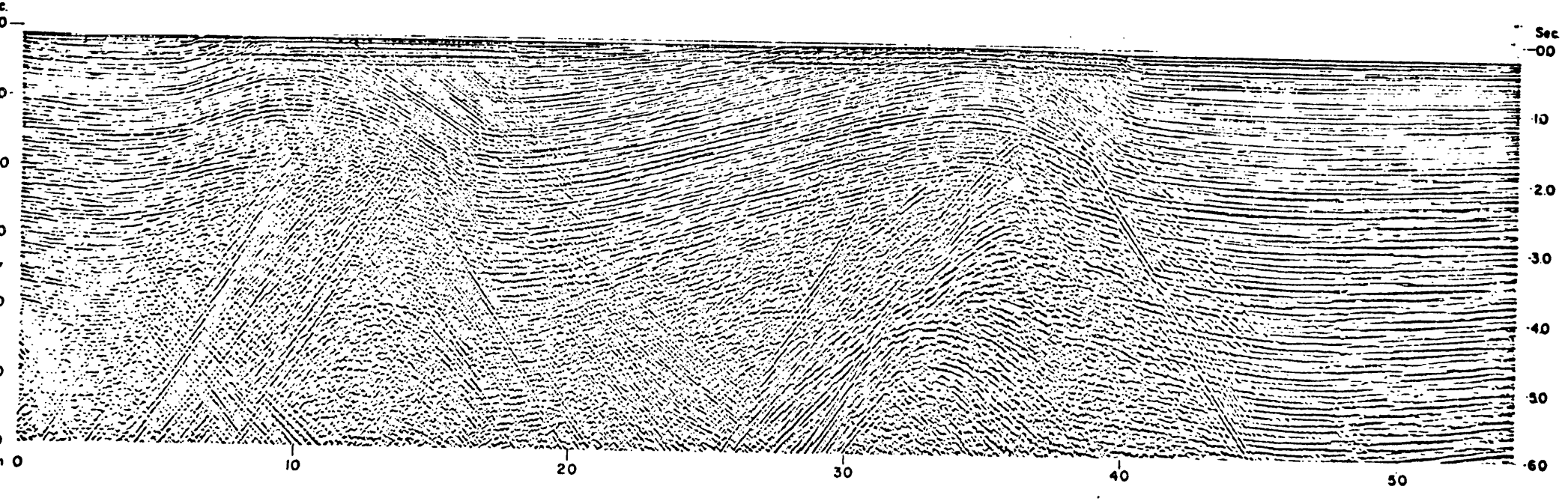


Figure 11: Part of the final stacked section for Line 406 near Icy Bay, Eastern Gulf of Alaska

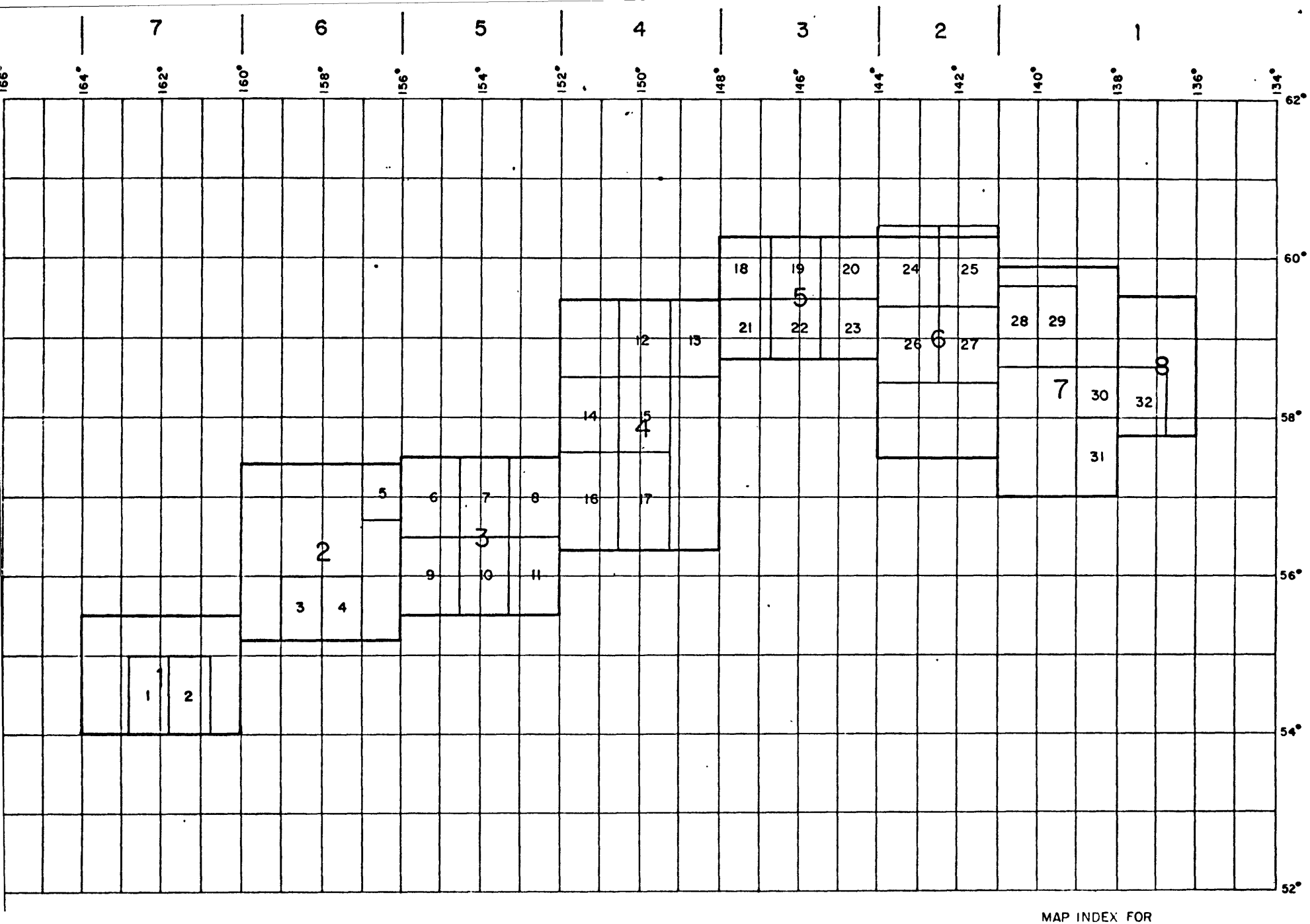


Figure 12: Index map for 1:250,000 and 1:96,000 final shotpoint location map.