SEISMIC TESTING REPORT

Placer Bench Claim

Mikin P30237

NTS ~~11603~~-03a
116B-03a

Prepared for:

Owner: Eva Kindl
Box 692
Dawson City, Yukon
YOB 1GO
and
Fieldsman: Scott Cone
Box 964
Dawson City, Yukon
YOB 1GO

~~~

Prepared by
Ted Sandor
RR1 Site 20 Comp 121
Whitehorse, Yukon
Y1A 4Z6
(Phone/Fax 667-6193 [403])

June 2, 1991
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This report has been examined by the Geological Evaluation Unit under Section 41 Yukon Placer Mining Act and is recommended as allowable representation work in the amount of $ 1,000.00.

Robert Deklerk

for. Chief Geologist, Exploration and Geological Services Division, Northern Affairs Program for Commissioner of Yukon Territory.

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ASSESSMENT REPORT

on June 2, 1991

Seismic Survey

on Placer Bench

Mikin P30237

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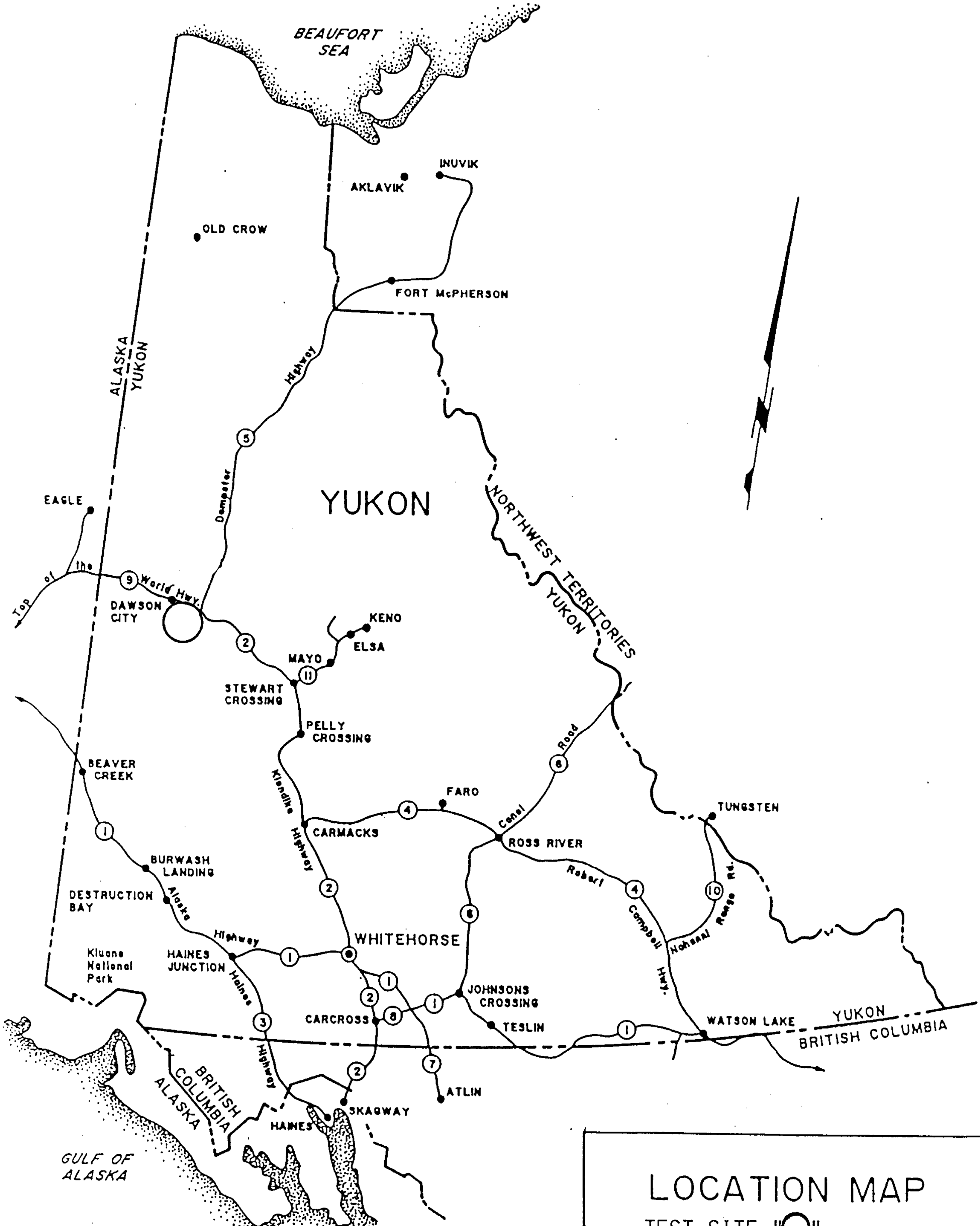
1. INTRODUCTION

On June 2, 1991 a seismic survey was conducted on Placer Bench P30237 for the owner Eva Kindl by Fieldsman, Scott Cone.

Scott Cone, using a compass and hip chain, located four (4) test sites on the Placer Bench Claim P30237. Shots are spaced 100 feet from each other. Test location was marked with flagging and labelled (See Fig.C).

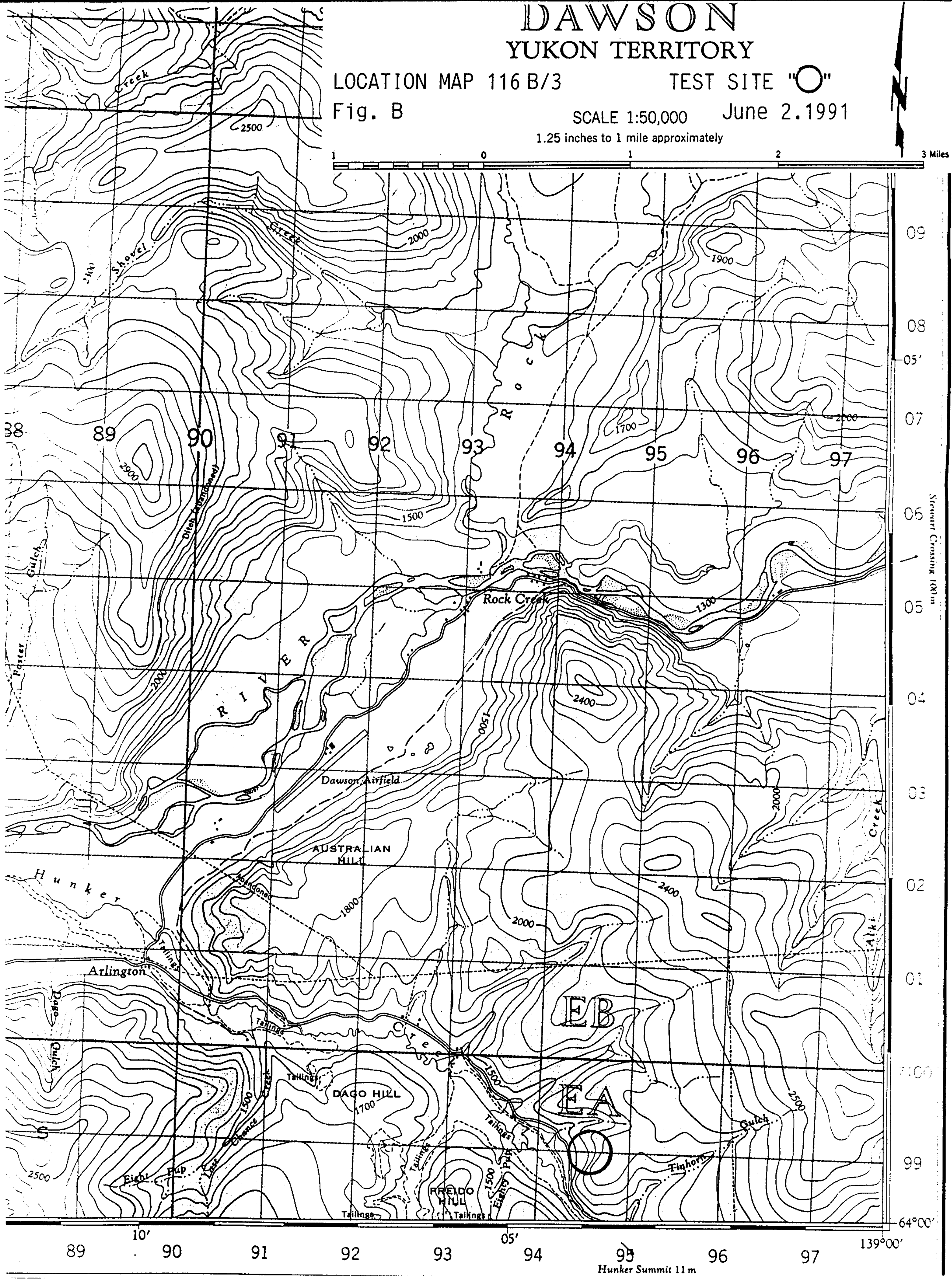
The seismic consultant, Ted Sandor, processed field recordings and interpreted the data received.

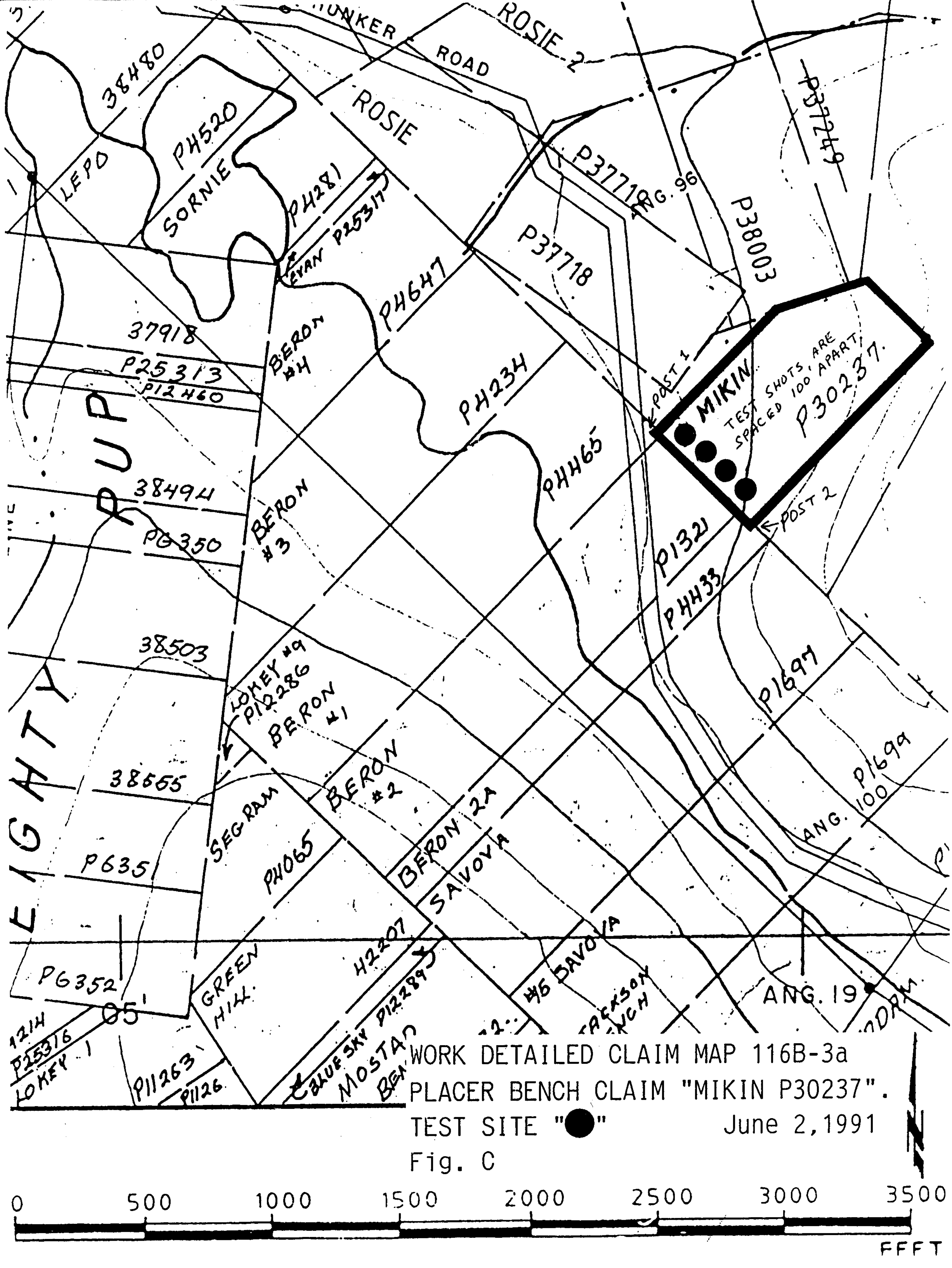


LOCATION MAP

TEST SITE "◯"

N.T.S.: 116 B/3	TECH:	DATE: JUNE 2/91
SCALE: 1"=112.5ml.	DRAFTING: HANDESIGN	FIGURE: A


DAWSON
YUKON TERRITORY
LOCATION MAP 116 B/3
TEST SITE "O"
Fig. B
SCALE 1:50,000
June 2.1991
1.25 inches to 1 mile approximately
1 0 1 2 3 Miles
Rock Creek
Dawson Airfield
AUSTRALIAN HILL
DAGO HILL
PREIDO HILL
Arlington
Hunker
Shovel Creek
Foster Gulch
Dago Gulch
Eighty Pup
Last Chance Creek
Tinhorn Gulch
Alki Creek
RIVER
Ditch (abandoned)
Tailings
EB
EA
Stewart Crossing 100 m
Hunker Summit 11 m
64°00′
139°00′
10′
05′



WORK DETAILED CLAIM MAP 116B-3a
PLACER BENCH CLAIM "MIKIN P30237".
TEST SITE "●" June 2,1991
Fig. C

2. SURVEY

2.1 Location and Access

Placer Bench Claim #P30237 is located 13 miles southeast of Dawson.

Access to the test site was by 4x4 pickup on road. Testing was done on foot. (See Access Map Fig B)

2.2 Claim Information

Name	Placer Claim Number	Owner
Mikin	P30237	Eva Kindl

3. PERSONNEL

Scott Cone surveyed, marked, measured, expedited and carried out the field work.

Ted Sandor supervised the quality, directed the data processing and prepared the report.

4. GEOLOGY

Unconsolidated glacial and alluvial deposits. No visible outcrop. The Hunker Creek does have a history of being gold bearing. The creek in the past has been extensively worked. There are still good prospects in many places in this area. Further investigation could be worthwhile.

5. INSTRUMENTATION

Directional Electret Microphone
800 OHMS 30 - 18,000 Hz Response

Panasonic Magnetic Tape Recorder Model #RQ-L335
Frequency Range: 180 - 7,000 Hz
Tape Speed: 4.8 cm/s (1-7/8 I.P.S.)
Track System: 2-track monaural, recording and playback
16 ga. shotgun, 1-1/8 oz. shot, #7-1/2 shot

Software:
Sound Filler St. Visual Sample Editor
Requires TOS in ROM
This manual and the software described herein were copyrighted in 1987 by Drumware Inc., Los Angeles, California, with all rights reserved.

Akai Professional S700 Digital Sampler
12-Bit Sampling
Sampling Frequency: 4KHZ - 40 KHZ
Sampling Time: 8 Sec. - 08 Sec.
Frequency Response: 25 Hz - 16 KHz
Atari 520 St. Computer
Processor: MC6800, 32 Bit Internal,
16-Bit External Architecture
8 MHz clock frequency.
Memory: 524,288 Bytes of RAM; 196,608 Bytes of ROM
Keyboard: 94-key Intelligent keyboard, using 6301 Microprocessor
Storage Medium: 3-1/2 inch, Microfloppy disk;
Single-Side, Double Density;
135 Tracks per inch
Data Transfer
Speed: 250 Kilobits per second
Atari Sc. 1224 RGB Colour Monitor
Seikosha SP-1600 Dot Matrix Printer
Printing Method:Impact Dot Matrix Bidirectional Logic
Seeking Printing
Print Head: 9 Pins

6. THEORY

This report is intended as a guide to the application of seismic refraction and reflection techniques to shallow, subsurface exploration of engineering sites. Many civil engineers and geologists have some acquaintance with this basic geophysical tool, but few apply it frequently. The primary purpose of the report is to provide the reader with a working knowledge of the method, with a convenient reference, and further, with a basis to judge the applicability of the method and the results to his particular exploration problem.

Solid state electronics have improved the portability of engineering-type refraction and reflection instruments, but they operate fundamentally in the same way they did 50 years ago. The basic field practices and methods of interpreting the data have not changed with time, although specialized interpretational techniques have been proposed and developed for some difficult cases.

The conduct of refraction and reflection surveys and the interpretation of the data are well-established and reasonably straight forward, although they are not invariant. The user can change the field layout of his equipment and apply judgement and imagination in his handling of the raw data. In common with other indirect methods of subsurface exploration, there are no rigid inflexible approaches to making sense of the data, nor are there any handbooks that infallibly direct the engineer, geologist or geophysicist to the correct answer. The general case will require thought and care: ambiguities and uncertainties are not uncommon. Some foreknowledge of the site conditions and an understanding of what is geologically plausible will always assist in resolving the raw data into meaningful information.

Figure 1 shows a refraction survey. This method could be quite costly and require complicated data processing should multiple layers of soil and gravels be encountered.

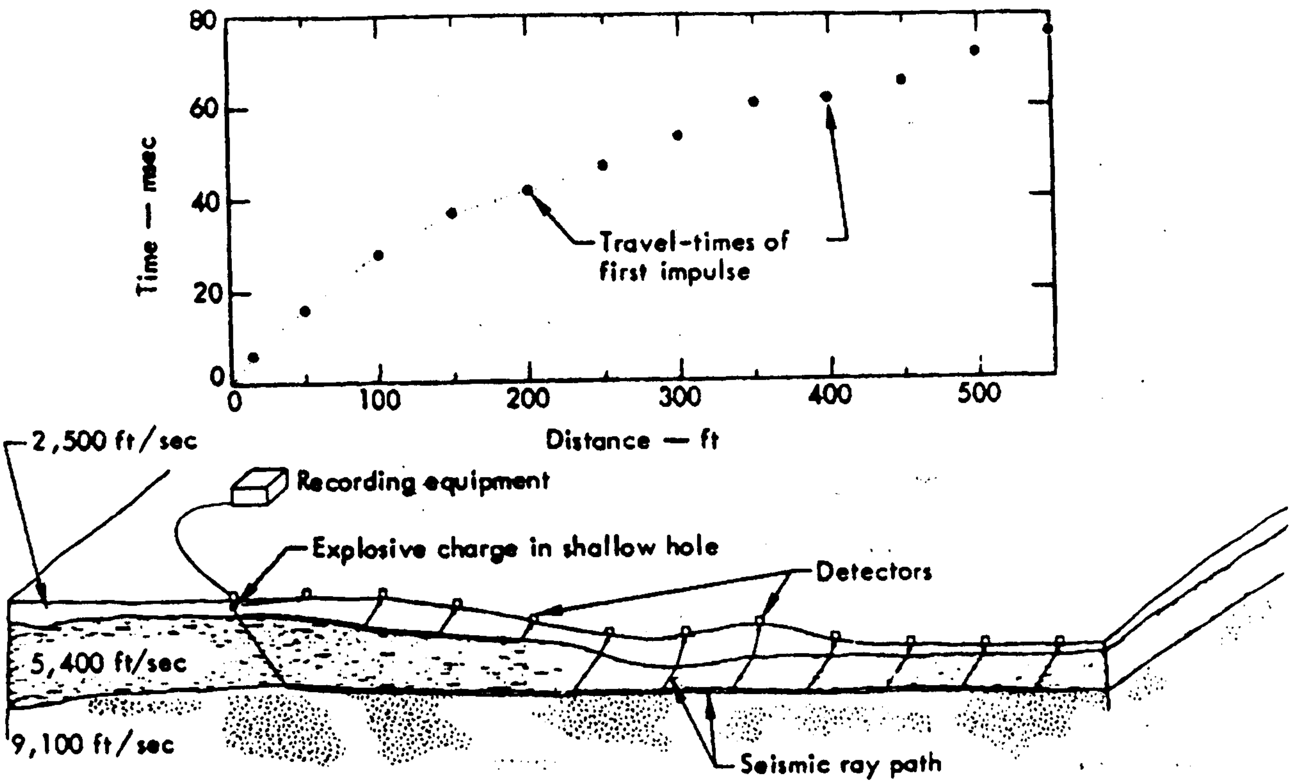


Figure 1. Schematic of Seismic Refraction Survey

There is a definite relation between reflected and refracted energy which could be observed in Figure 2B. Using this principle and Tables A1 and A2 calculation is simplified, for the sound in a reflected survey only has to go down, turn around at point of geophone or microphone without going along the higher velocity layers and then back up. Seismic waves will bounce off of most surface with a lot of amplitude but not necessarily with a wide range of frequencies. The reflected seismic waves returning to the geophone with the strongest amplitude and frequencies should come from the layer with the highest velocity change which, in most cases, should be bedrock (solid rock) or from a gravel layer directly beneath an organic surface cover.

6. THEORY CONTINUED

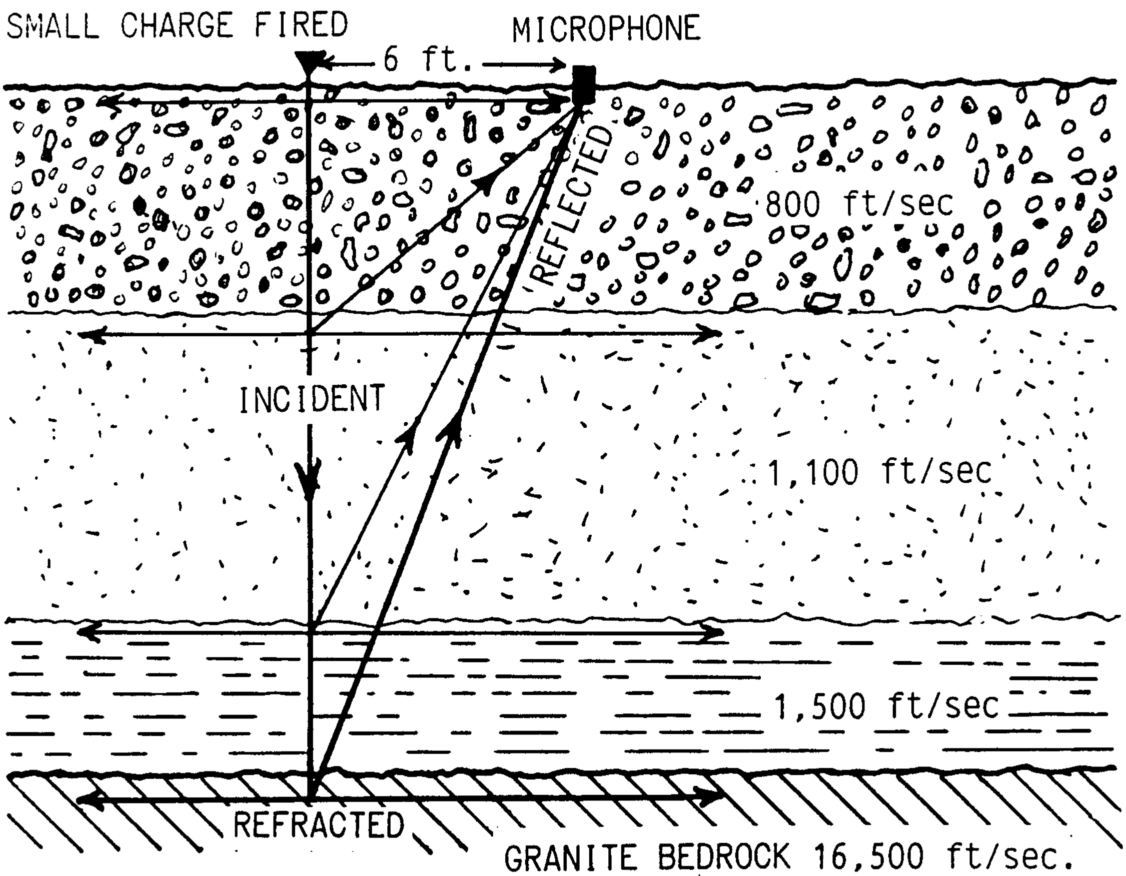


Figure 2. Schematic of Seismic Reflection Survey

The thicker line representing the reflected seismic wave from the bedrock to the microphone should be the wave with the highest amplitudes and the widest range of frequencies in Figure 2. The six foot distance from microphone to charge is to prevent damage to the delicate recording equipment. The error of this footage can usually be made up by averaging the total of the velocities a little higher to simplify interpretation. In this case "1,200 ft/sec." will be close enough.

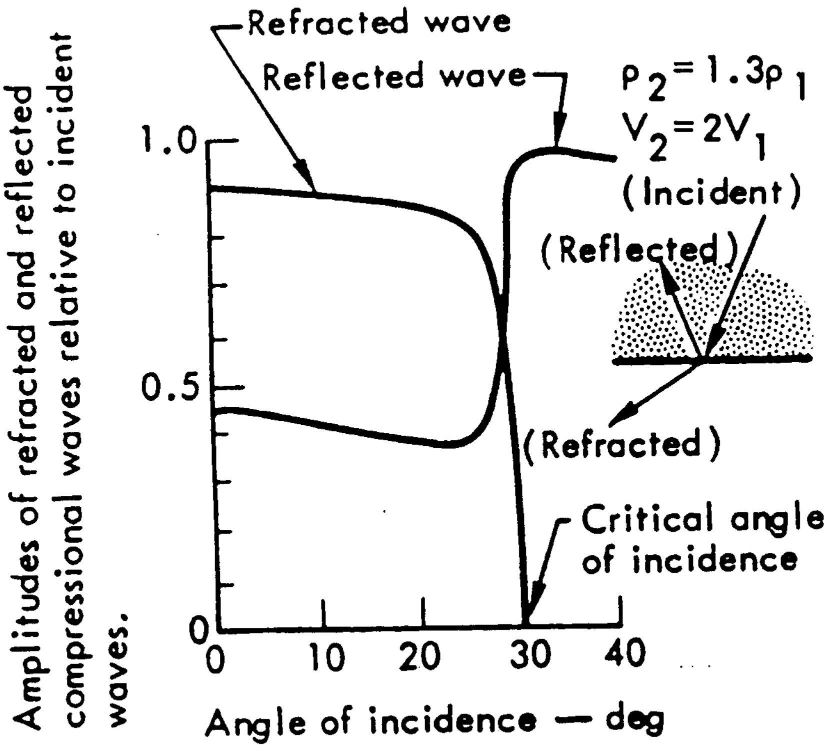


Fig. 2b. Amplitudes of reflected and refracted compressional waves relative to incident waves as a function of angle of incidence.

Figure 2b Amplitudes of Reflected/ Refracted Compressional Waves

It may seem anomalous in Figure 2b that the sum of the amplitudes of the reflected and refracted pulses is greater than that of the incident wave (i.e., greater than 1.0). However, the **energy** of a pulse is proportional to the square of its amplitude, and the sum of the energies of the reflected and refracted waves is equal to the energy of the incident wave.

Table A1. Speed of propagation of seismic waves in subsurface materials.

MATERIALS	FEET PER SECOND
TOP SOILS:	
LIGHT AND DRY	600 TO 900
MOIST, LOAMY OR SILTY	1,000 TO 1,300
CLAYEY	1,300 TO 2,000
RED CLAY IN COLORADO [A]	1,630
SEMI-CONSOLIDATED SANDY CLAY [B]	1,250 TO 2,150
WET LOAM [B]	2,500
CLAY, DENSE AND WET - DEPENDING ON DEPTH	3,000 TO 5,900
RUBBLE, OR GRAVEL [B]	1,970 TO 2,600
CEMENTED SAND [B]	2,800 TO 3,200
SAND CLAY [B]	3,200 TO 3,800
CEMENTED SAND CLAY [B]	3,800 TO 4,200
WATER SATURATED SAND [B]	4,600
SAND [B]	4,600 TO 8,400
CLAY, CLAYEY SANDSTONE [B]	5,900
GLACIAL TILL UPPER SUSQUEHANNA [C]	5,600 TO 7,400
GLACIAL MORAINE DEPOSIT, DRY-CALIFORNIA [A]	2,500 TO 5,000
GLACIAL MORAINE DEPOSIT, SATURATED-CALIFORNIA	5,000 TO 7,000
CEMENTED LAVA AGGLOMERATE, CALIFORNIA [A]	5,000 TO 6,000
LOOSE ROCK-TALUS	1,250 TO 2,500
WEATHERED AND FRACTURED ROCK	1,500 TO 10,000
SHALE:	
OLENTANGY RIVER, OHIO	9,000 TO 11,000
UPPER SUSQUEHANNA [C]	10,200 TO 12,800
PANAMA CANAL ZONE	7,000 TO 8,000
MANCOS, COLORADO [A]	2,600 TO 2,900
ROMNEY SHALE-SHENNANDOAH RIVER - WEATHERED	4,000 TO 6,500
ROMNEY SHALE-SHENNANDOAH RIVER - GOOD	12,000
JOHN MARSHALL DAM SITE	2,900 TO 4,250
PHYLLITE-YORK, PA. [D]	10,000 TO 11,000
SANDSTONE: [B]	7,200 TO 7,900
DEVONIAN-UPPER SUSQUEHANNA [C]	14,000
CANAL ZONE, PACIFIC END	7,000 TO 9,000
COLORADO, DENSE, HARD, AND CONTINUOUS WITH FEW SEAMS [A]	7,250
COLORADO, CONTAINING WEATHERED SEAMS AND SOFT AREAS. [A]	4,725
SMOKY HILL RIVER KANSAS	6,000 TO 7,500
SANDSTONE CONGLOMERATE [B]	8,000
CHALK:	
FORT RANDALL DAMSITE - ABOVE WATER TABLE	6,300 TO 7,000
FORT RANDALL DAMSITE - BELOW WATER TABLE	8,000

MATERIALS	FEET PER SECOND
GRANITE:	
SIERRA NEVADA RANGE, CALIFORNIA (IN ROAD CUTS)	
FRIABLE AND HIGHLY DECOMPOSED	1,540
BADLY FRACTURED AND PARTLY DECOMPOSED	2,200
SOFTENED AND PARTLY DE-COMPOSED BUT SLIGHTLY SEAMED	10,530
SOLID AND MONOLITHIC 70 FEET DEEP	18,500
NEW HAMPSHIRE [C] (COMPARISON OF VELOCITIES WITH DRILLING LOGS)	
BADLY BROKEN AND WEATHERED; FREQUENTLY ONLY CHIPS AND FRAGMENTS RECOVERED. SEGMENTS OF CORE LONGER, BUT WEATHERING HAD PENETRATED ABOUT 1/4 INCH ON EACH SIDE OF THE JOINT PLANES ON WHICH A FILM OF RESIDUAL CLAY HAD FORMED	3,000 TO 8,000
JOINT PLANES SHOW BUT LITTLE SIGN OF WEATHERING, EVEN THOUGH THEY ARE OPEN	10,000 TO 13,000
ENTIRELY UNWEATHERED AND UNSEAMED	16,000 TO 20,000
GRANODIORITE [B]	15,000
BASALT-CANAL ZONE-WEATHERED AND FRACTURED	9,000 TO 14,000
LIMESTONE, DOLOMITE, METAMORPHIC ROCKS, MASSIVE ROCKS [B]	16,400 TO 20,200
DIABASE, IN BED OF BROAD RIVER, SOUTH CAROLINA	19,700
GREENSTONE, TIGHT SEAMED-CALIFORNIA [A]	16,100
GREENSTONE, SLIGHTLY SEAMED-CALIFORNIA	13,300

NOTE:

[A] *Reported by G. H. Williams, U. S. Bureau of Public Roads*

[B] *From Report of Imperial Geophysical Experimental Survey in Australia*

[C] *Reported by A. E. Wood, Corps of Engineers*

[D] *Reported by L. T. Abele, Corps of Engineers*

Table A2. Approximate range of velocities of longitudinal waves for representative materials found in the earth's crust.[a]

A. *Classification According to Material*

Material	Velocity* Ft./Sec.	Velocity* M./Sec.
Weathered surface material	1,000— 2,000	305— 610
Gravel, rubble, or sand (dry)	1,500— 3,000	468— 915
Sand (wet)	2,000— 6,000	610— 1,830
Clay	3,000— 9,000	915— 2,750
Water (depending on temperature and salt content)	4,700— 5,500	1,430— 1,680
Sea water	4,800— 5,000	1,460— 1,530
Sandstone	6,000—13,000	1,830— 3,970
Shale	9,000—14,000	2,750— 4,270
Chalk	6,000—13,000	1,830— 3,970
Limestone	7,000—20,000	2,140— 6,100
Salt	14,000—17,000	4,270— 5,190
Granite	15,000—19,000	4,580— 5,800
Metamorphic rocks	10,000—23,000	3,050— 7,020
Ice	12,050	

B. *Classification According to Geologic Age*

Age	Type of Rock	Velocity Ft./Sec.	Velocity M./Sec.
Quaternary	Sediments (various degrees of consolidation)	1,000— 7,500	305— 2,290
Tertiary	Consolidated Sediments	5,000—14,000	1,530— 4,270
Mesozoic	Consolidated Sediments	6,000—19,500	1,830— 5,950
Paleozoic	Consolidated Sediments	6,500—19,500	1,980— 5,950
Archeozoic	Various	12,500—23,000	3,810— 7,020

C. *Classification According to Depth* †

	0—2000 ft. (0—600 M.) Ft./Sec.	2000—3000 ft. (600—900 M.) Ft./Sec.	3000—4000 ft (900—1200 M.) Ft./Sec.
Devonian	13,300	13,400	13,500
Pennsylvanian	9,500	11,200	11,700
Permian	8,500	10,000	.....
Cretaceous	7,400	9,300	10,700
Eocene	7,100	9,000	10,100
Pleistocene-to-Oligocene	6,500	7,200	8,100

* The higher values in a given range are usually obtained at depth.

† Data from B. B. Weatherby and L. Y. Faust, *Bull. Amer. Assoc. Petrol. Geologists*, 19 (1935) 1.

[a]Reprinted from pg. 660 of Jakosky[2].

7. METHOD

After the grid pattern is established on a given claim by the owner or party in charge, we mark each test with flagging. We clean loose debris to allow firm soil contact with the microphone. We then cover the microphone to lessen the surface noise. A small charge is fired (usually a 16 gauge shotgun) to generate a seismic wave six feet from the microphone. The wave going into the ground and the reflected signal coming out is recorded on a magnetic tape recorder. We also do a field test on a nearby area with similar conditions where bedrock depth is known by drilling or excavation to determine the velocity of the gravels.

8. DATA PROCESSING AND PRESENTATION

The recording is sent back to base camp and is transferred into the Akai S700 Digital Sampler by means of a coaxal cable with 6.3 mm phone plug jack. The Akai is coupled with the Atari 520 St. computer with Midi Interface. Other peripherals are connected with various other interface connections.

The seismic recording is now analyzed in various formats and then the best choice is printed out on a Seikosha SP-1600 Dot Matrix Printer. A report on the testing and the interpretation of the data is made out to finalize the survey, along with copies of the original Fourier Transform for 3-D wave form analysis.

9. INTERPRETATION

In tests conducted in the past on Hunker Creek and the Klondike River, we determined that those frozen gravels had a velocity of 1500 ft/sec. (l.5 ft/ms). Based on this calculation the following formula is used:

> Reflected milliseconds x 1.5 divided by 2 = feet to bedrock or the layer of interest.

<u>TEST 1</u>

42 milliseconds indicate Bedrock at 32 feet.

<u>TEST 2</u>

39 milliseconds indicate Bedrock at 29 feet.

<u>TEST 3</u>

37 milliseconds indicate Bedrock at 28 feet.

<u>TEST 4</u>

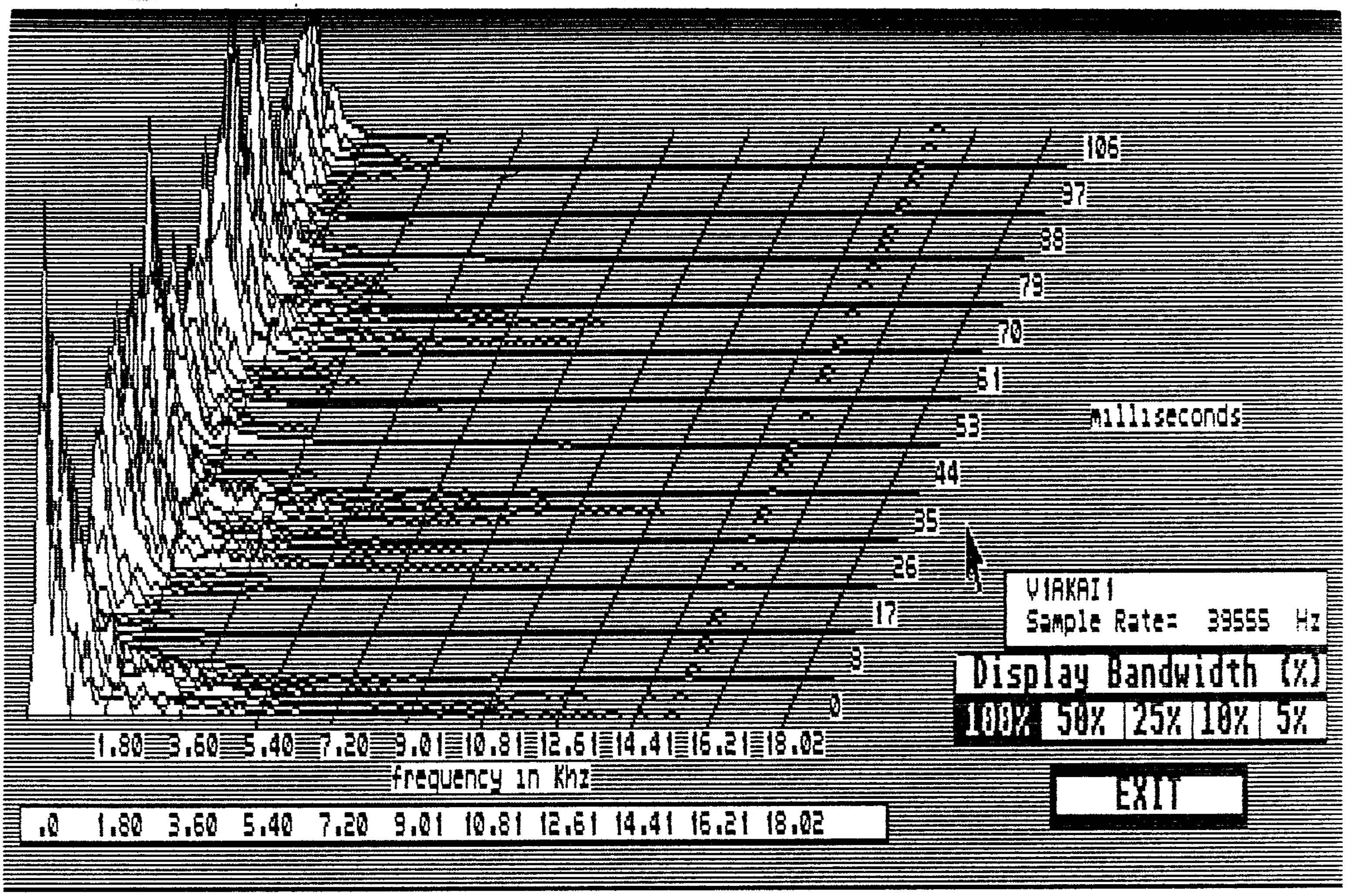
32 milliseconds indicate Bedrock at 24 feet.

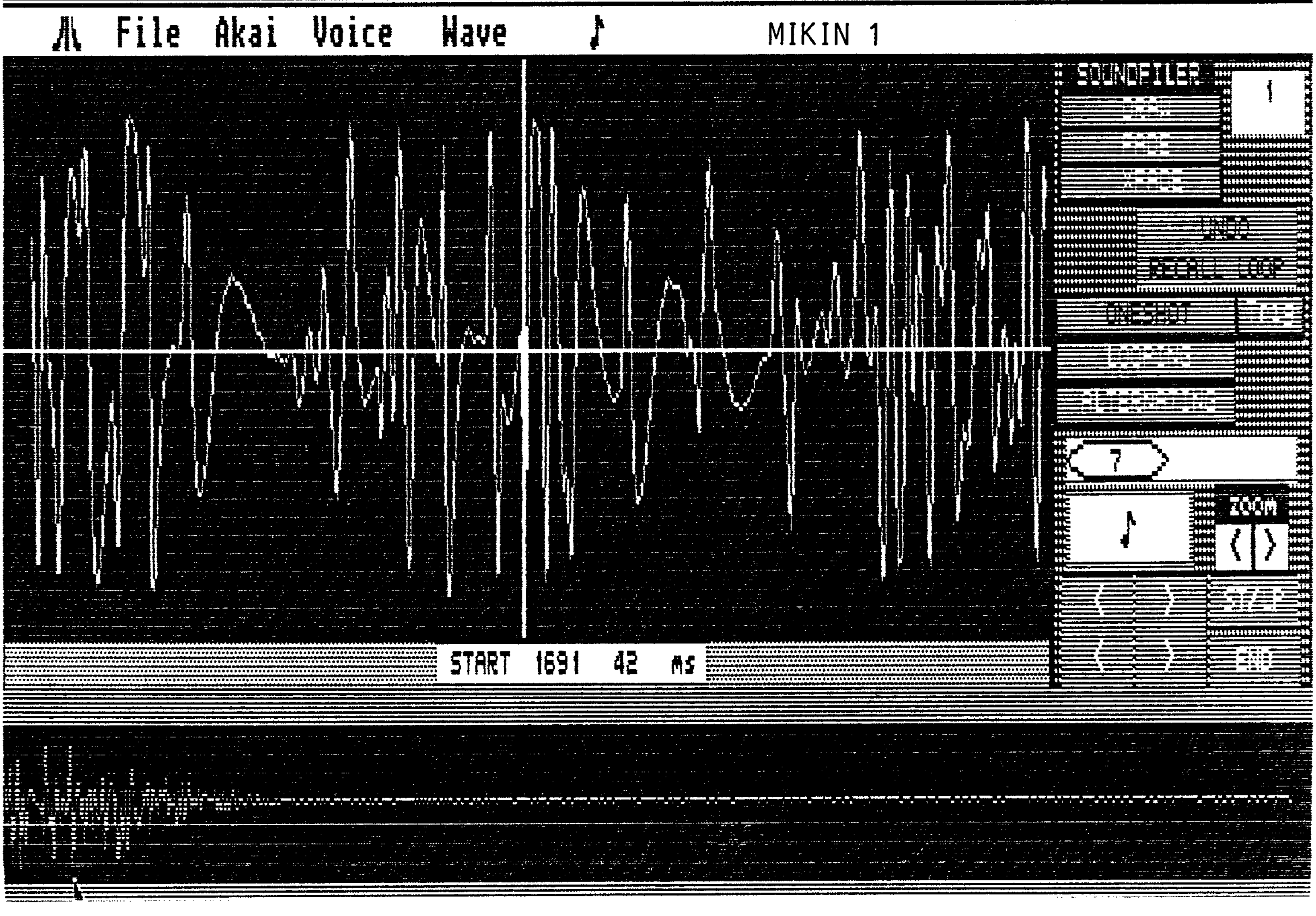
10. CONCLUSION

For the many varying soil conditions in different geographical locations could alter the final results. For this fact, an actual excavation on one of the test sites is strongly recommended. The most shallow reading test site is the best suited for this purpose. More accurate results can be achieved in this manner.

11. RECOMMENDATION

This type of reflected seismic testing is ideal in shallow placer ground. Without drilling or excavating near the test sites to establish velocity, the contour of the subsurface profile could still be charted in a cross test of a given valley. Old stream beds are possible to locate this way, giving a target area for a drill. A re-analysis of the seismic data after a drill log can make these tests surprisingly accurate. A tighter grid pattern in the future may be of great value in a drilling or mining strategy program.


106
97
88
79
70
61
53
44
35
26
17
8
0
milliseconds
V1AKAI1
Sample Rate= 39555 Hz
Display Bandwidth (%)
100% 50% 25% 10% 5%
1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
frequency in Khz
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
EXIT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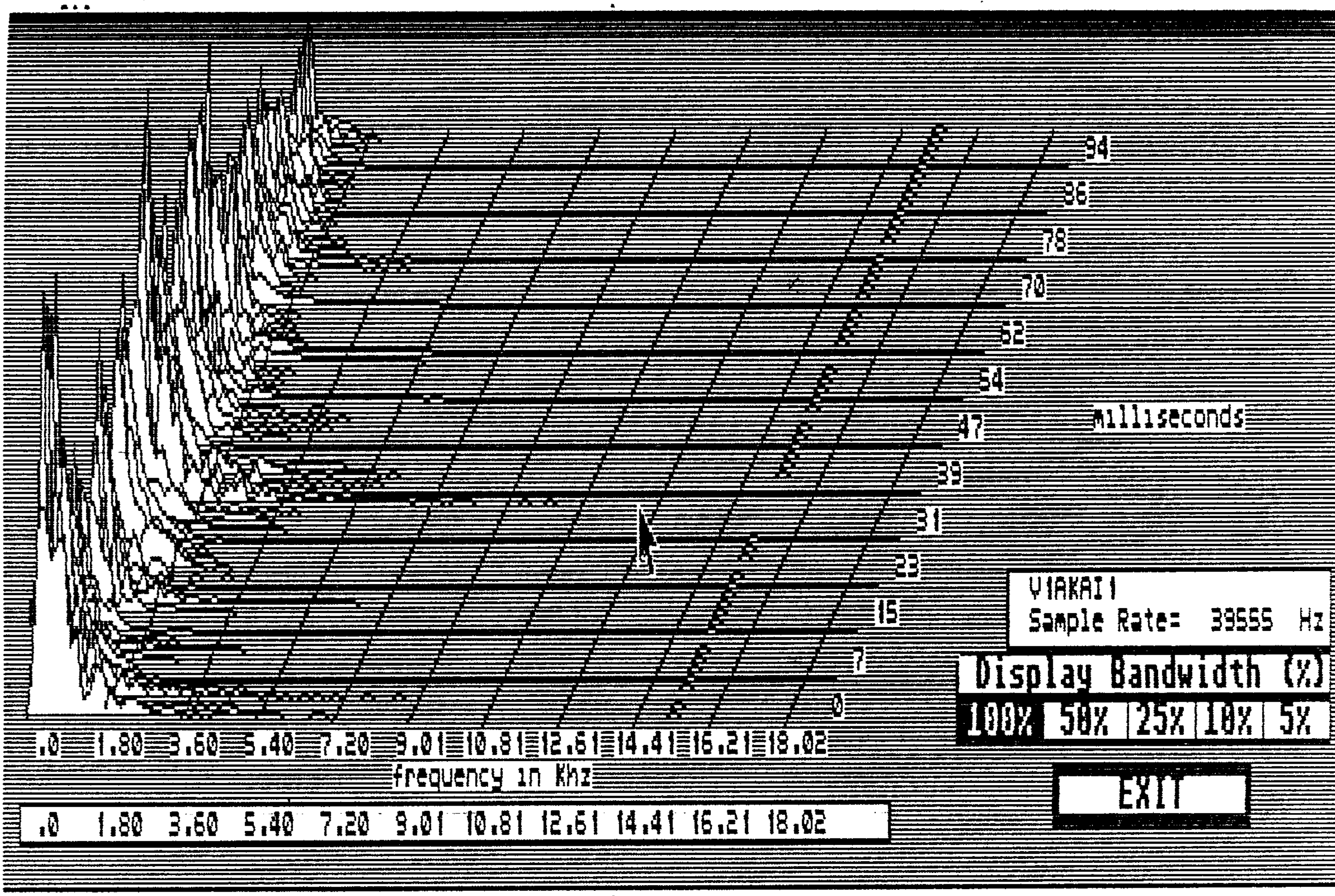
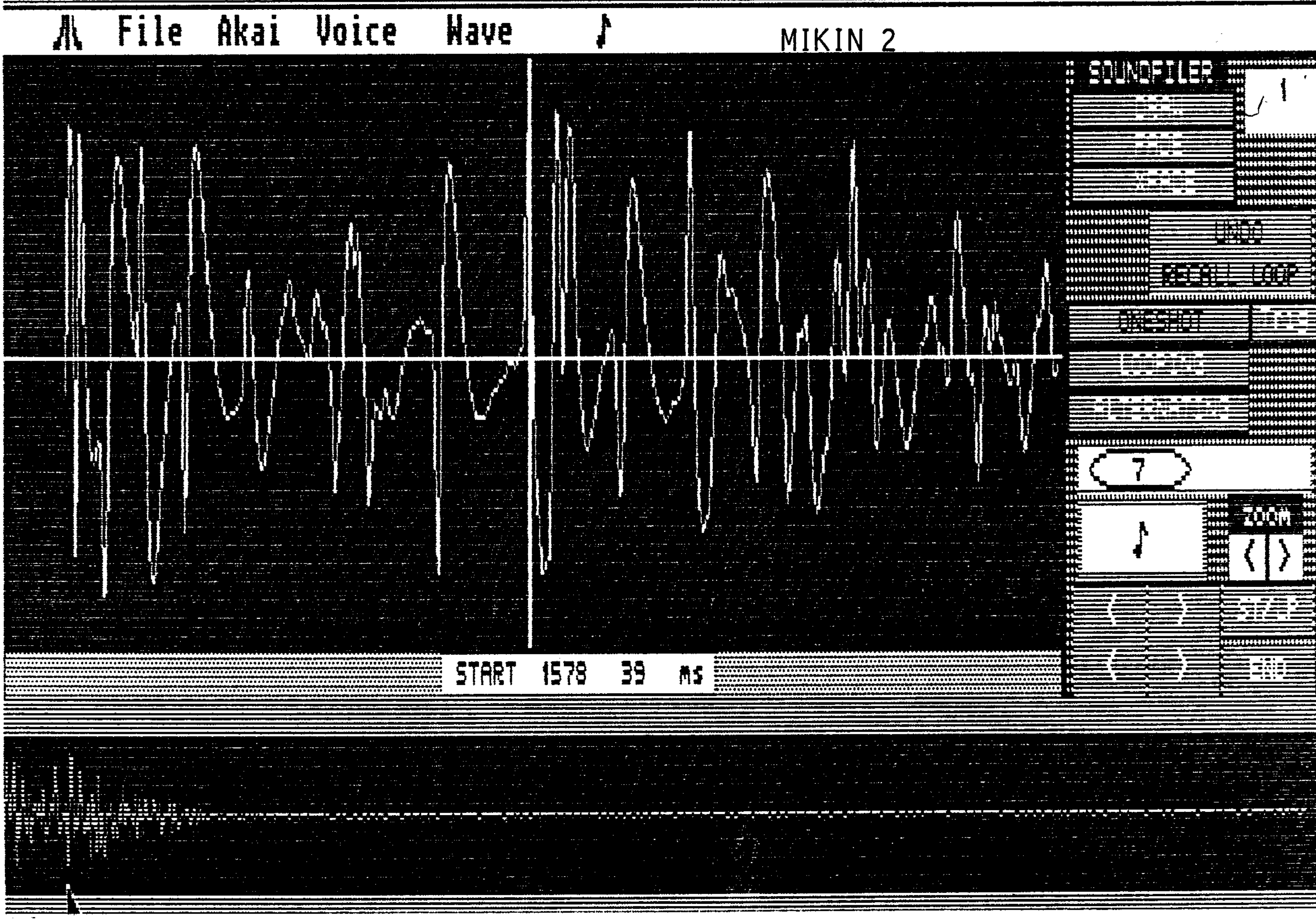
MIKIN 1
SOUNDFILES
1
UNDO
RECALL LOOP
ONESHOT
7
ZOOM
START 1691 42 ms


94
86
78
70
62
54
47
39
31
23
15
7
0
milliseconds
V1AKAI1
Sample Rate= 39555 Hz
Display Bandwidth (%)
100% 50% 25% 10% 5%
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
frequency in Khz
EXIT
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02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SOUNDFILER
UNDO
RECALL LOOP
ONESHOT
7
ZOOM
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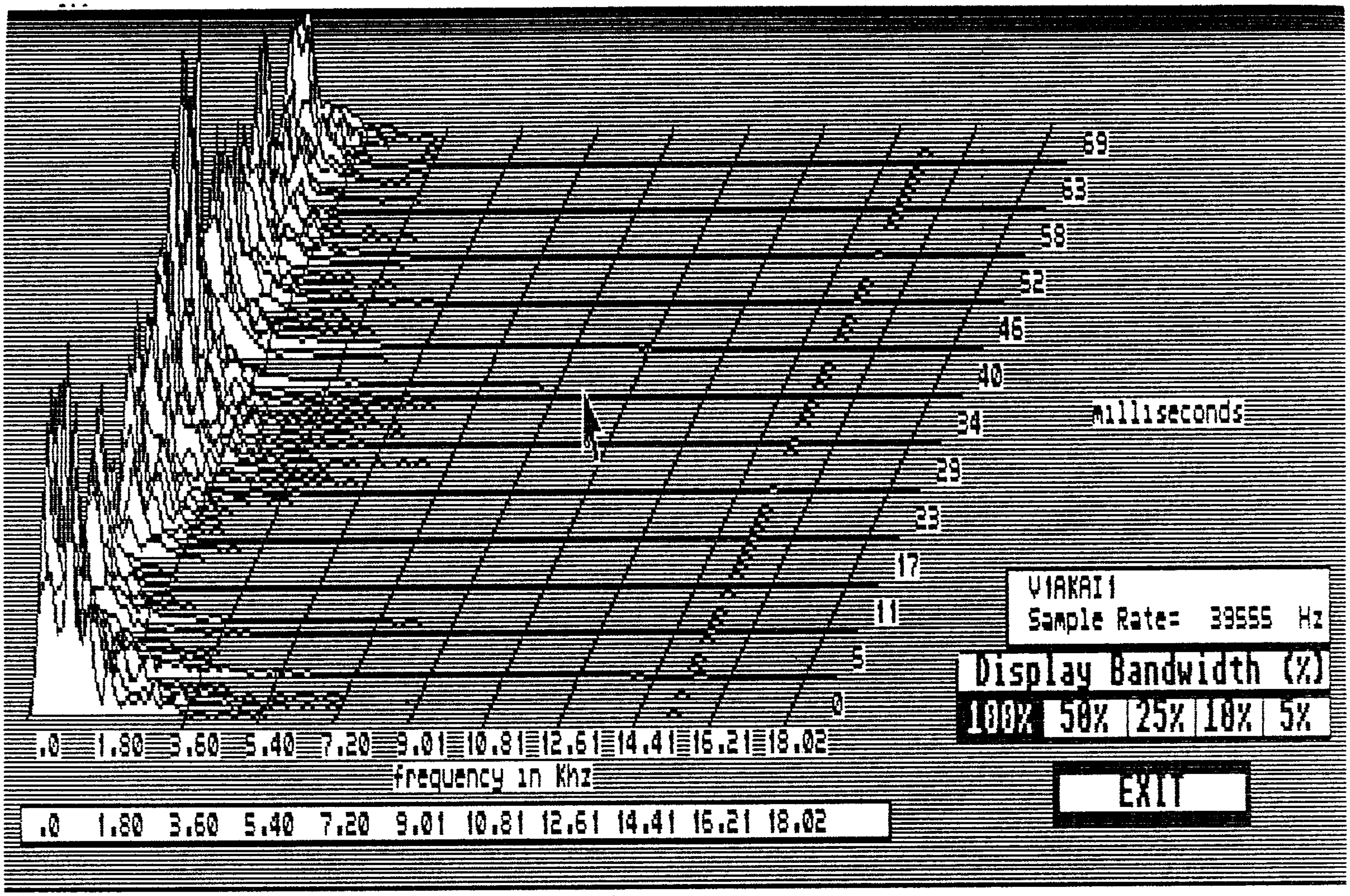
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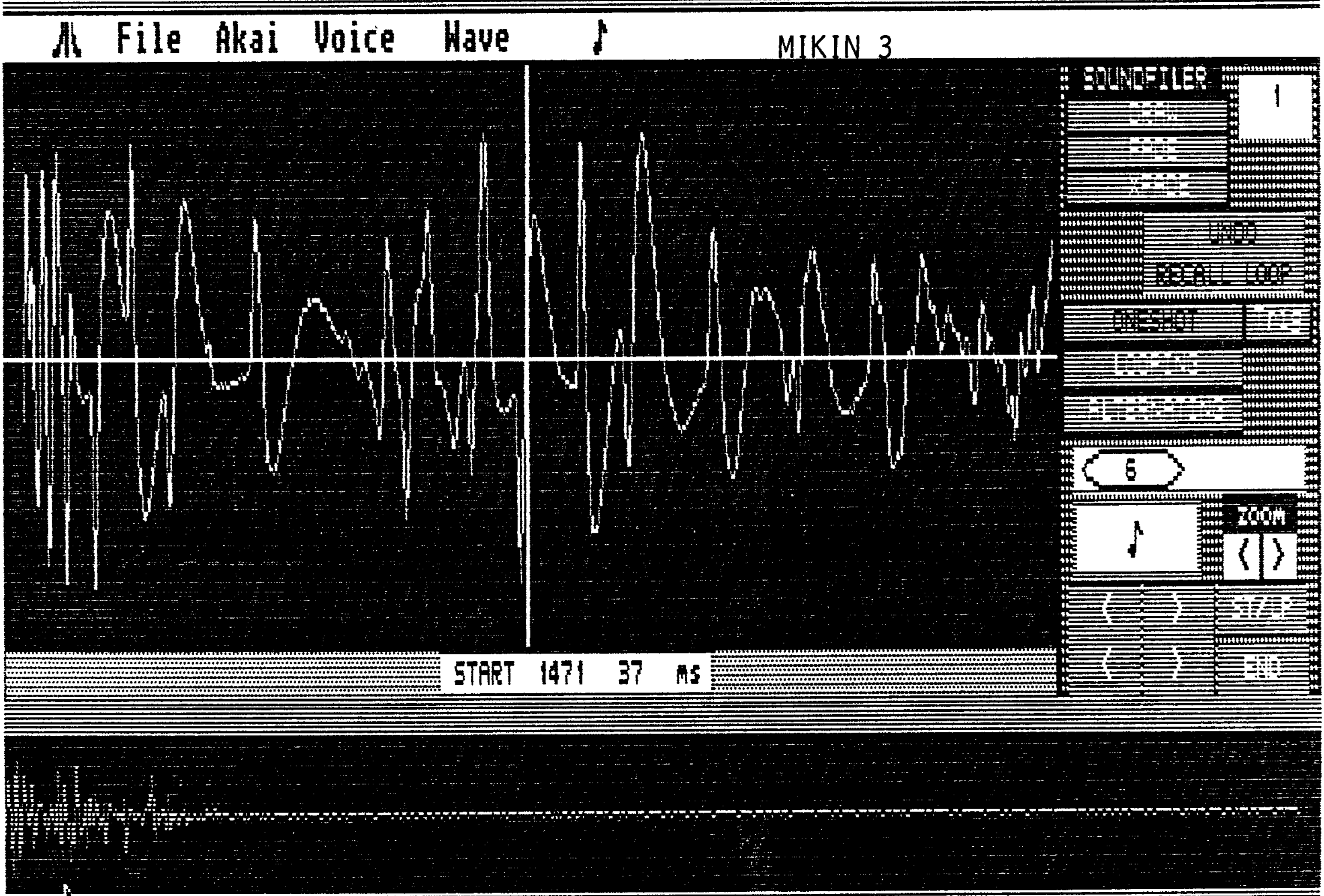
63
58
52
46
40
34
29
23
17
11
5
0
milliseconds
V1AKAI1
Sample Rate= 39555 Hz
Display Bandwidth (%)
100% 50% 25% 10% 5%
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
frequency in Khz
EXIT
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02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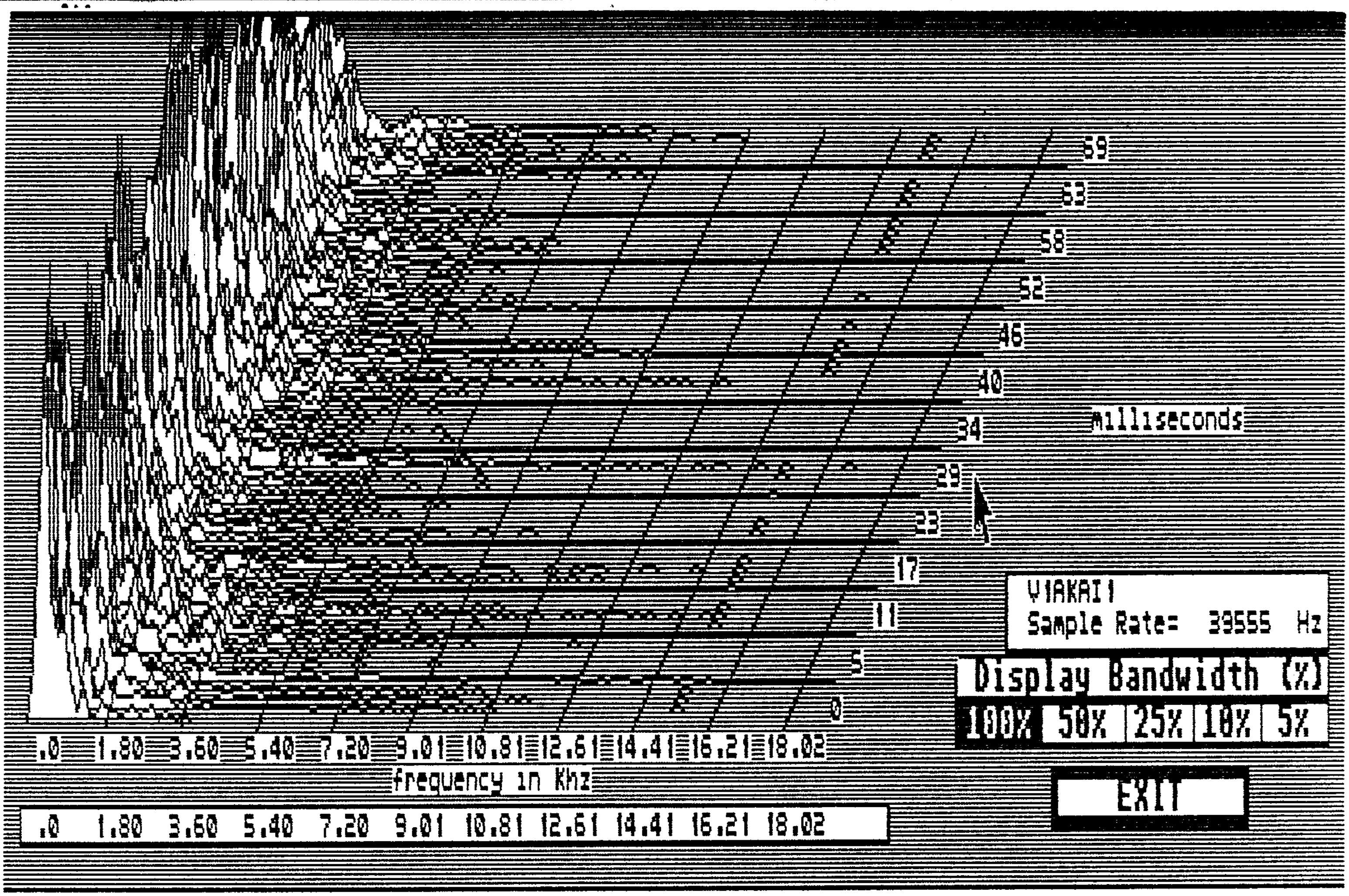
MIKIN 3
SOUNDFILER
1
UNDO
RECALL LOOP
ONESHOT
6
ZOOM
START 1471 37 ms
END


69
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23
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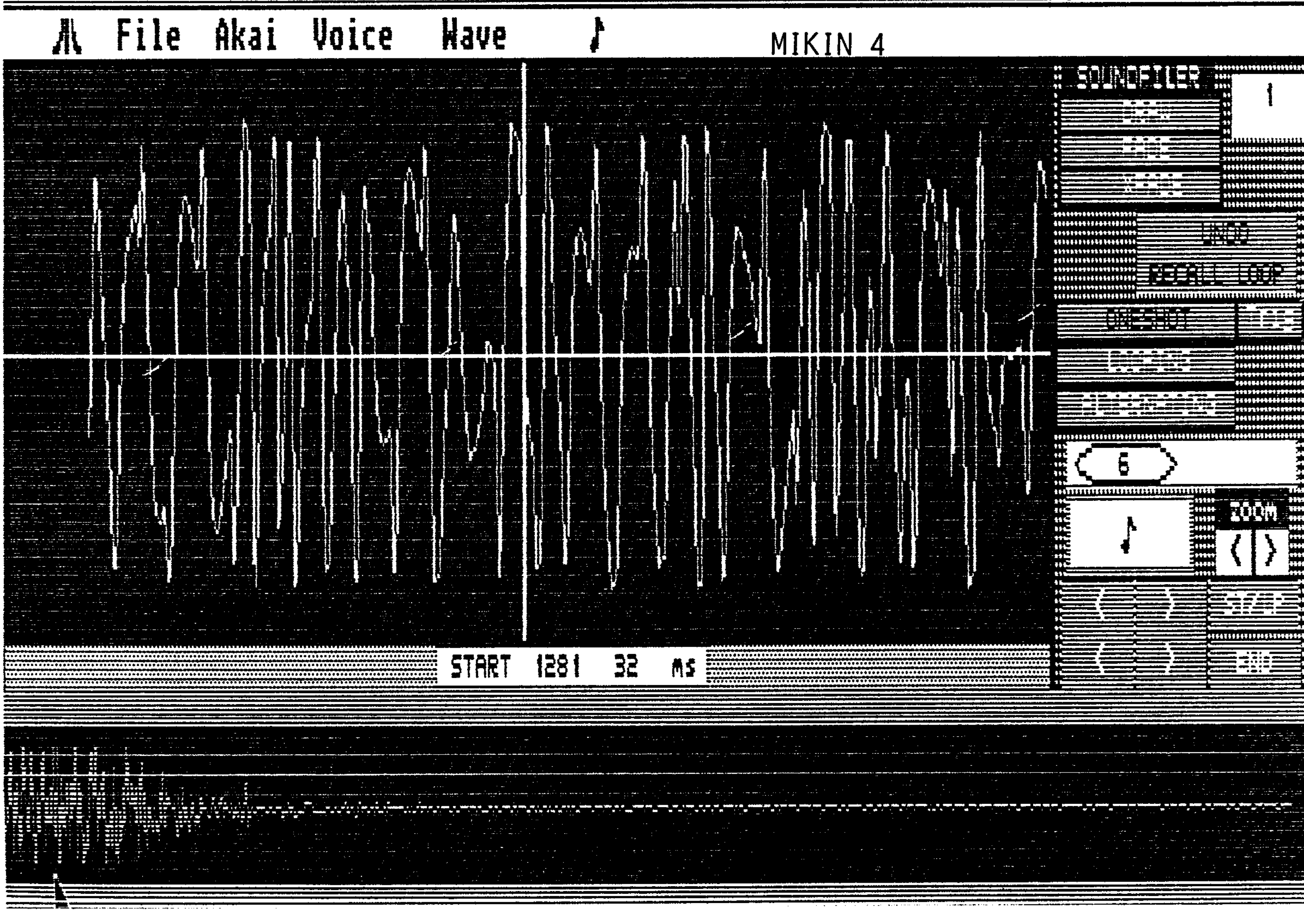
milliseconds
V1AKAI1
Sample Rate= 39555 Hz
Display Bandwidth (%)
100% 50% 25% 10% 5%
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
frequency in Khz
EXIT
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02


File Akai Voice Wave
MIKIN 4
SOUNDFILER
1
UNDO
RECALL LOOP
ONESHOT
6
ZOOM
START 1281 32 ms
END

12. STATEMENT OF ASSESSMENT COSTS

For seismic survey conducted on Placer Claim #P30237.

<u>Seismic Test</u>

$250 per test x 4 shots	= $1,000

Includes:

Seismic consultant
Assistant for field and expediting
Computer and printer time
Computer and program time
Computer down-loading (off-loading/data dumping)
Seismic interpretation
Equipment - ATV, axe, hip chain with thread, flagging tape, marker etc.
Transportation
Food and camping supplies
Accommodations (hotel, tent or camper)
Test shots where applicable (for calibration)

<u>Report Preparation</u>

Report writing, drafting, map and figure preparation, photocopying and binding	= 400
Total Cost	=$1,400

CERTIFICATION

I, Ted Sandor, of Whitehorse, Yukon Territory certify that:

1. I hold a Gas and Arc Welding diploma from Northern Alberta Institute of Technology, Edmonton, Alberta, and have been practising continuously since mid seventies in Ardco Industries on oil field and seismic related equipment.

2. I am a journeyman welder, licensed to practise in Alberta. The geophysical technology came from extensive field work in the oil patch, and the very need to satisfy my own mining strategy since 1978.

3. The geophysical field work was conducted with assistance that may change from test to test. The report preparation and interpretation is done by me personally to keep up the highest quality of this report.

4. I have based conclusions and recommendations contained in this report on my knowledge of geophysics, my previous experience and the results of the field work conducted on the property.

5. Directly or indirectly I hold no interest in this property other than professional fees, nor do I expect any interest in the property or any other of the owner's holdings.

6. The accuracy of the final results depends more on the calibration of the recording device and the computers then on the qualification of the operator.

Whitehorse, Yukon Territory

T. Sandor.

Ted Sandor, Seismic Consultant

13. REFERENCES

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2. J.J. Jakosky, Exploration Geophysics. (Trija Publishing Co., Newport Beach, California. 1957)

3. Technical Report E-73-4 Seismic Refraction Exploration for Engineering Site Investigations. Bruce B. Redpath (May, 1973)

4. 1984 Open File, R.L. Debicki, Bedrock Geology and Mineralization of the Klondike Area (West), 1150/14,15 and 116B/2,3.

5. J.K. Mortensen, Geochemistry of the Klondike District, West Central Revised, 1990.