

A Compilation of Data from the 1978-1979 Rhenish Massif Seismic Refraction Experiment

James Mechie¹, Claus Prodehl², Werner Kaminski^{2,†} and Karl Fuchs²

1. (corresponding author) GFZ German Research Centre for Geosciences, Potsdam, Germany
2. Geophysical Institute, Karlsruhe Institute for Technology, Karlsruhe, Germany

Abstract

During 1978-79, a seismic refraction experiment was carried out in the Rhenish Massif, West Germany, and adjacent areas, extending through Belgium and Luxembourg into the Paris Basin in France. The experiment was designed to investigate the structure of the crust and uppermost mantle beneath the massif and thus help in a multidisciplinary study, sponsored by the Deutsche Forschungsgemeinschaft DFG, into the causes and mechanisms of uplift of the massif. This report is a catalogue of the seismic data obtained.

A map of the Rhenish Massif and adjacent areas, showing a simplified geology and the location of the seismic profiles completed in 1978-79 (double lines) together with those completed in 1958-74 (single lines) (Mooney & Prodehl, 1978), is presented in Fig. 1.

The Aachen-Baumholder (LI/L2-MI/M2) profile was completed in May and August, 1978. Details of shot-points and recording stations are presented in Tables 1 and 2 respectively, while P-wave record sections, plotted with a reduction velocity of 6km/ sec, of vertical components are shown in Figs. 2-17. The 600 km long, main profile and the cross profiles, B-K and K-F, were completed in May 1979. Details of shot-points and recording stations for these profiles are presented in Tables 3 and 4 respectively, while record sections are shown in Figs. 18-105.

The original report is preceded by the "Amendment to the data report", a technical description describing the file structure of today's raw, info and segy directories that is superseding the original description in the report from 1983. The data are archived at the GIPP Experiment and Data Archive (GIPP, Haberland and Ritter, 2016: <http://dx.doi.org/10.17815/jlsrf-2-128>).

Coordinates: 48.5-52°N; 4-11°E

Keywords: Rhenish Massif, seismic refraction, geophysics, plateau uplift, 1978-79 Rhenish Massif seismic refraction experiment

Licence: Creative Commons Attribution 4.0 International (CC BY 4.0)

Citation: Mechie, J.; Prodehl, C.; Kaminski, W.; Fuchs, K. (2020): Data from the 1978-79 Rhenish Massif seismic refraction experiment. GFZ Data Services. <http://doi.org/10.5880/GIPP.197901.1>

Amendment to data report „A compilation of data from the 1978-79 Rhenish Massif seismic refraction experiment“ by Mechie, Prodehl, Kaminski and Fuchs

James Mechie – 28/3/2020

The following is a description of the files in the raw, info and segy directories.

raw directory

The raw data for this experiment are in Karlsruhe University's binary format. File names end in *.rds or *.rdo and one needs a *.rds file and the corresponding *.rdo file (e.g. trex79-a.rds & trex79-a.rdo) to convert the raw data to segy data. For a description of the format see the files kabintap.txt and karlsruhe_rds_binary_data. The files *.lst provide listings of the seismograms in the raw data archive. For example, the first file - trex79-a.rds - in the listing trex79_fa-fd.lst contains 734 seismograms.

info directory

RhenishMassif78-79_DataReport.pdf - data report
amendment_to... - this file

The following files provide information regarding the raw data format.

kabintap.txt - see paragraph above

karlsruhe_rds_binary_data - see paragraph above

*.lst files - see paragraph above

The following files are needed for the conversion from the raw data format to segy format.

- _rdst.c
- _rdst.o
- copenhagen.f
- copenhagen.o
- helsinki.f
- helsinki.o
- plotsn.f
- plotsn.dat
- plotsn
- refx2seggy.c
- refx2seggy
- seggy.h

The data have been converted from the raw format to segy using the programs plotsn and refx2seggy. In the case that one should wish to convert different time windows with, eventually, different reduction velocities, the programs plotsn and refx2seggy are provided. plotsn and refx2seggy have been compiled to run on a Unix system (not Linux). plotsn requires _rdst.c (compile using gcc), copenhagen.f and helsinki.f. The present command to compile plotsn is

```
f77 -O1 -o plotsn plotsn.f _rdst.o helsinki.o copenhagen.o
```

Presently, the program is compiled under SunOS 4, but it is probably not difficult to compile it under later Unix systems. The program also executes on SunOS 5.9 systems. The execution call is plotsn The program requires as input the data sets plotsn.dat and the raw data in infile.rds and infile.rdo. The program outputs an intermediate format file plotsn.refx

and an output file `plotsn.out`. `plotsn.dat` contains the input which was used to convert the raw data to an intermediate format. When running `plotsn` it is necessary to delete the one or two blank lines and the line of text at the start of the file. In the file `plotsn.dat`, the bandpass filters which were used when creating the raw data sets have been indicated. If not indicated then it was at least 1-33 Hz, which was the standard bandpass filter applied to all the raw data.

In the case that the maximum distance is greater than 250 km, then the vertical (Z) component data have been converted with a reduction velocity of 8 km/s and a time window from 0 to 20 secs i.e. 20 secs long.

In the case that the maximum distance is less than 250 km, then the vertical (Z) component data have been converted with a reduction velocity of 6 km/s and a time window from -5 to 6 secs i.e. 11 secs long.

In the case that the maximum distance is greater than 250 km, the radial (X) and transverse (Y) data have been converted with a reduction velocity of 4.619 km/s and a time window from 0 to 35 secs i.e. 35 secs long.

In the case that the maximum distance is less than 250 km, then the radial (X) and transverse (Y) data have been converted with a reduction velocity of 3.464 km/s and a time window from -8 to 10 secs i.e. 18 secs long.

Due to the fact that the sampling interval in the raw data is not exactly 0.01 secs, the data have been re-interpolated if the sampling rate was less than 99.5 Hz or greater than 100.5 Hz.

As some traces still had their original sampling interval of 400 Hz, these traces were anti-alias filtered at 40 Hz and then re-sampled at 100 Hz.

The program `refx2segy` converts from the intermediate format to `segy` format. The execution call is

`refx2segy n plotsn.refx outfile.sgy` - where `n = 1` for the vertical (Z) component, `2` for the radial (X) component and `3` for the transverse (Y) component.

To compile `refx2segy` use `cc refx2segy.c -lm`. Presently, the program is compiled under SunOS 5.9

segy directory

The naming convention for the `segy` files is e.g. `dne_z.sgy` where `d` is the shot point name, `ne` = northeast and `z` = vertical component (`x` = radial, `y` = transverse). `filt` or `filt2` describe files which may have had other filters applied (see also above).

James Mechie - 24/4/2020

GEOPHYSIKALISCHES
INSTITUT
UNIVERSITÄT KARLSRUHE

A COMPILATION OF DATA
FROM THE 1978-79
RHENISH MASSIF
SEISMIC REFRACTION EXPERIMENT

by
JAMES MECHIE, CLAUS PRODEHL,
WERNER KAMINSKI and KARL FUCHS.

GEOPHYSICAL INSTITUTE
OPEN-FILE REPORT 83-1
KARLSRUHE
FEBRUARY 1983

CONTENTS

	Page
Report	1
Acknowledgments	4
References and Literature	4
Tables	
1 Shot details for Aachen-Baumholder Profile	6
2 Recording station details for Aachen-Baumholder Profile	7
3 Shot details for Rhenish Massif Seismic Experiment, May 1979	12
4 Recording station details for Rhenish Massif Seismic Experiment, May 1979	13
Figures	
1 Map of Rhenish Massif and adjacent areas	31
2-17 Record sections for Aachen-Baumholder Profile	32
18-19 Full range record sections, shots A and I _{SW}	55
20-44 Normalized P-wave record sections	65
45 True amplitude P-wave record section, shot D _{NE}	122
46-75 S-wave record sections, vertical components	125
76-105 S-wave record sections, radial components	164

REPORT

During 1978-79, a seismic refraction experiment was carried out in the Rhenish Massif, West Germany, and adjacent areas, extending through Belgium and Luxembourg into the Paris Basin in France. The experiment was designed to investigate the structure of the crust and uppermost mantle beneath the massif and thus help in a multidisciplinary study, sponsored by the Deutsche Forschungsgemeinschaft, into the causes and mechanisms of uplift of the massif. This report is a catalogue of the seismic data obtained.

A map of the Rhenish Massif and adjacent areas, showing a simplified geology and the location of the seismic profiles completed in 1978-79 (double lines) together with those completed in 1958-74 (single lines) (Mooney & Prodehl, 1978), is presented in Fig. 1.

The Aachen-Baumholder (L1/L2-M1/M2) profile was completed in May and August, 1978. Details of shot-points and recording stations are presented in Tables 1 and 2 respectively, while P-wave record sections, plotted with a reduction velocity of 6km/sec, of vertical components are shown in Figs.2-17.

The 600km long, main profile and the cross profiles, B-K and K-F, were completed in May 1979. Details of shot-points and recording stations are presented in Tables 3 and 4 respectively. Locations and heights of shot-points and recording stations were read from the 1:25000 Ordnance Survey maps of West Germany, Belgium, Luxembourg, and France. Full range P-wave record sections, plotted with a reduction velocity of 8km/sec, of vertical components are shown for shots A and I_{SW} (Figs. 18-19). Normalized P-wave record sections, plotted with a reduction velocity of 6km/sec, of vertical components are shown in Figs. 20-44, and an example of a true amplitude P-wave record section of vertical components is shown for shot D_{NE} (Fig. 45). S-wave

record sections, plotted with a reduction velocity of 3.46km/sec, are shown in Figs. 46-75 (vertical components) and Figs. 76-105 (radial components).

No elevation corrections have been applied in the record sections. For each record section is shown:

Date of plot Component of ground motion Band-pass filter settings

and beneath the distance axis - the reduction velocity. Beside each seismogram in the record sections the following information is shown, for the Aachen-Baumholder profile:

Shot No. (Table 1) - Station No. (Table 2) - Equipment No. (Files 4-7)

for the 1979 profiles:

Station No. (Table 4) - Shot No. (Table 3) - Equipment No. (Files 11-18).

A description of the contents of the files and computer tapes pertaining to the experiment now follows. Files 1-3 contain general background to and details of (including planning) the experiment.

File 4 contains the details of the Baumholder shots in May, 1978, including field protocols, and details of analogue to digital (A-D) conversion and filtering from A-D tapes to E tapes. Files 5-9 contain details of the Aachen and Henau shots in August 1978, including field protocols (Files 5-7), and details of A-D conversion (File 8) and filtering from A-D tapes to E tapes (File 9). Details of plotting of record sections, further filtering, and some interpretation for the Aachen-Baumholder profile are contained in File 10.

For the Aachen-Baumholder profile, computer tapes TABEX

(Tapes of Aachen-Baumholder EXperiment) AD1-15 relate to the A-D conversion, tapes TABEX B1-4, C1-4, D1-3, and E1-3 relate to filtering of the data, and tapes TABEX F1-9 relate to ordering and further filtering of the data for record section plotting.

During the main experiment in May 1979, 137 recording units of the MARS type (Berckhemer, 1970) from various European countries participated. 20 shots were fired in 1979 and thus a total of 2740 three-component recordings were made. From shot-points A, B, C, D, F, G, H, and I, recordings were obtained all along the main profile with an average station spacing of about 2km, while from shot-point W recordings were obtained along the northeastern half of the main profile with an average station spacing of about 1km. Along profile B-K, recordings were obtained from shot-points B, K, and F, while along profile K-F, recordings were obtained from shot-points K and F. The average station spacing along profiles B-K and K-F was about 3km.

Field protocols are contained in Files 11-18. All data were digitized from the analogue tapes at 400samples/sec. Files 19-25 and computer tapes TREX (Tapes of Rhenish Massif EXperiment) AD1-74 relate to the A-D conversion. Files 26-35 and tapes TREX B1-23, C1-16, D1-7, E1-8, and E1AUX-E9AUX relate to the filtering and re-sampling eventually at 100samples/sec, and spike and time-signal deletion. Files 36-46 and tapes TREX F(A), F(B), F(C), F(D), F(F), F(G), F(H), F(W), F(I), F(K), F11, and F12 relate to ordering of seismograms according to shot-point and distance, and further filtering for plotting of record sections. Some details of interpretation are contained in Files 47-50 (one-dimensional travel time) and File 51 (time-term, ray-tracing, and synthetic seismograms).

Files 52-59 contain correspondence, contracts, permissions and other details necessary for preparation and organisation of the total project. In Files 60-61 the reports are collected which were written on behalf of the seismic project. Files 62-63 contain details of the first preliminary interpretation.

In addition, the computer tape TRADCARDS contains a listing of the A-D conversion "header" cards and Table 4.

ACKNOWLEDGMENTS

The financial support of the Deutsche Forschungsgemeinschaft for this seismic refraction project is first and foremost acknowledged. Additional financial support and organisation was provided by the IPG Paris (Dr. A. Hirn), Messieurs Flick and Feidt-Mahowald at Luxembourg, the III Korps of the German Army (Mr. Goos), N.E.R.C. (Britain) and ETH Zürich. The help of the following authorities is acknowledged: Oberbergamt Clausthal-Zellerfeld; Bergämter Aachen, Goslar, Kassel, and Koblenz; the State Forestry Commission of Hessen, Niedersachsen, Nordrhein-Westfalen, and Rheinland-Pfalz. A full list of participants in the field experiments and data processing is given in Mechie et al. (1982). In particular, personnel and instruments were provided from all German geophysical university institutes and state agencies, as well as from the ETH Zürich, IPG Paris, the Universities of Birmingham, East Anglia, Leicester, Swansea, Vienna, and Uppsala, and the Serviço Meteorológico Nacional of Portugal. The record sections were plotted on the RAYTHEON Computer at the Geophysical Institute, Karlsruhe University. G. Bartman typed the manuscript, and Gaby Koptschalitsch, Birgit Clauss and Robert Koenig helped in preparing the report.

REFERENCES AND LITERATURE

- Berckhemer, H., 1970. MARS 66 - a magnetic tape recording equipment for deep seismic sounding. *J. Geophys.* 36: 501-18.
- Mooney, W.R. & Prodehl, C., 1978. Crustal structure of the Rhenish Massif and adjacent areas; a reinterpretation of existing seismic-refraction data. *J. Geophys.* 44: 573-601.
- Prodehl, C., Fuchs, K. & Bamford, D., 1979. Explosionsseismische Untersuchungen anomaler Eigenschaften der Lithosphäre des Rheinischen Schildes im Hinblick auf Vertikalbewegungen und ihre Ursachen. In: Protokoll über das 4.Kolloquium im Schwerpunktprogramm "Vertikalbewegungen und ihre Ursachen am Beispiel des Rheinischen Schildes", Neustadt a.d. Weinstr., 16.-17.11.1979.

- Prodehl, C. & Fuchs, K., 1980. Explosionsseismische Untersuchungen anomaler Eigenschaften der Lithosphäre des Rheinischen Schildes im Hinblick auf Vertikalbewegungen und ihre Ursachen. In: Protokoll über das 5. Kolloquium im Schwerpunktprogramm "Vertikalbewegungen und ihre Ursachen am Beispiel des Rheinischen Schildes", Neustadt a.d. Weinstr., 7.-8.11.1980.
- Mechie, J., Prodehl, C. & Fuchs, K., 1981. Crustal structure of the Rhenish Massif based on the 1978-79 seismic refraction experiments. In: Protokoll über das 6. Kolloquium im Schwerpunktprogramm "Vertikalbewegungen und ihre Ursachen am Beispiel des Rheinischen Schildes". Neustadt a.d. Weinstr., 3.-4.12.1981.
- Mechie, J., Prodehl, C. Fuchs, K., Kaminski, W., Flick, J., Hirn, A., Ansorge, J. & King, R., 1982. Progress report on Rhenish Massif seismic experiment. Tectonophysics, 90:215-30.
- Mechie, J., Prodehl, C. & Fuchs, K., 1983. The long-range seismic refraction experiment in the Rhenish Massif. In: Fuchs, K., v. Gehlen, K., Mälzer, H. & Murwaski, H. (eds.) Plateau Uplift - The Rhenish Massif A Case History. Springer Verlag, Heidelberg.

Table 1. Shot details for Aachen-Baumholder Profile.

Shot	Date	Time (MEZ) ¹ h m s	Gauss Krüger Coordinates		Weight ² (metric tons)	Elevation (metres)
BM1/M1	30.05.78	08 40 04.34	2596238	5503930	1.5	480
BM2/M1	30.05.78	14 49 49.18	2596225	5504120	1.8	475
AHE1/M2	09.08.78	16 07 40.70	2606660	5527320	2.68	480
AO25/L1	09.08.78	11 15 16.81	2509718	5633338	0.075	178
AO53/L1	09.08.78	12 01 17.86	2511515	5629278	0.05	197
AO76/L1	09.08.78	12 15 16.94	2513210	5626058	0.075	228
AO99	09.08.78	13 00 17.07	2515180	5622915	0.032	260
A118	09.08.78	13 30 17.43	2516902	5620440	0.075	316
A136	09.08.78	13 45 17.53	2518673	5618140	0.4	344
A146	09.08.78	14 30 17.35	2519742	5616927	0.025	390
A170	09.08.78	14 45 17.54	2521526	5613555	0.075	525
A192	09.08.78	15 15 17.22	2522938	5610320	0.075	513
A207	09.08.78	15 30 17.50	2524430	5608435	0.075	488
A216	09.08.78	16 30 17.37	2524910	5607012	0.075	495
A239/L2	09.08.78	16 45 17.12	2526810	5603860	0.075	305
A261/L2	09.08.78	19 00 17.18	2529925	5601910	0.22	523
A270/L2	09.08.78	19 30 17.44	2530680	5600608	0.2	528

¹ MEZ = Middle European Zone.

² 1 metric ton = 1000 kg.

Table 2. Recording station details for Aachen-Baumholder Profile.

Station No.		Gauss Krüger Coordinates		Height
A.XX	K1	2605295	5525622	459
A.XX	K2	2605272	5525610	460
A.XX	K3	2605242	5525600	461
A.02		2591318	5511220	500
A.04		2590182	5513600	480
A.06		2588158	5515508	410
A.09	K1	2583580	5519570	620
A.09	K2	2583570	5519520	620
A.09	K3	2583640	5519510	620
A.12		2582760	5524180	553
A.14		2580960	5526250	517
A.16		2579008	5528980	385
A.17	K1	2579565	5529870	370
A.17	K2	2579590	5530190	401
A.17	K3	2579335	5530440	390
A.19	K1	2577420	5533040	265
A.19	K2	2577360	5532640	260
A.19	K3	2577400	5532510	260
A.20	K1	2577060	5533570	310
A.20	K2	2576840	5534060	340
A.20	K3	2576640	5534340	350
A.21	K1	2575965	5534907	345
A.21	K2	2575600	5535080	335
A.21	K3	2575290	5535180	300
A.23	K2	2574090	5537710	170
A.23	K3	2574300	5537450	195
A.25	K3	2571740	5540510	170
A.27	K1,K2	2569830	5542485	245
A.27	K3	2569730	5542615	240
A.29	K1,K2	2568798	5545080	310
A.29	K3	2568607	5545150	310
A.30	K1,K2	2567302	5546700	360
A.30	K3	2567060	5546860	340
A.30B	K1,K2	2566400	5547145	300
A.30B	K3	2566408	5547180	300
A.31A	K1,K2	2564572	5548805	370
A.31A	K3	2564507	5548765	370
A.32A		2564457	5550367	280
A.33	K1	2563610	5552040	438
A.33	K2,K3	2563610	5551990	437
A.35		2561770	5554580	447
A.37	K1	2560661	5556300	473
A.37	K2	2560666	5556292	473
A.37	K3	2560676	5556277	473
A.39	K1,K3	2559397	5557980	425
A.39	K2	2559407	5557990	425
A.41		2557400	5560500	432
A.44		2555630	5564040	480
A.46		2554180	5566340	610
A.52	K2	2547225	5574880	491
A.53	K2	2547351	5575635	467
A.55	K1	2544515	5579492	510
A.55	K2,K3	2544755	5579190	504

Table 2: continued

Station No.		Gauss Krüger Coordinates		Height
A.57	K1	2542225	5583070	547
A.57	K2, K3	2542000	5583285	568
A.59	K1	2540450	5585335	570
A.59	K2	2540600	5585065	568
A.59	K3	2540545	5585045	562
A.61	K1	2537615	5589760	571
A.61	K2	2537745	5589395	582
A.61	K3	2538005	5589111	564
A.63	K1	2534745	5593105	523
A.63	K2	2534840	5593100	521
A.63	K3	2534955	5592925	542
A.66	K1	2532103	5597560	483
A.66	K2	2532191	5597340	481
A.66	K3	2532210	5597310	489
A.68	K1	2531052	5601195	521
A.68	K2	2530945	5601623	531
A.68	K3	2531232	5601064	526

Table 2: continued

Station No.	Gauss Krüger Coordinates		Height
BM.01	2591878	5510000	340
BM.02	2591388	5511285	527
BM.03	2590365	5511638	505
BM.04	2590178	5513590	480
BM.05	2589000	5514545	490
BM.06	2588330	5515728	420
BM.07	2587570	5516965	495
BM.08	2586558	5517950	590
BM.9	2583648	5519473	620
BM.9L	2583575	5519538	620
BM.10	2583890	5521170	510
BM.10L	2583650	5521375	490
BM.11	2582430	5521815	520
BM.11L	2582620	5521925	510
BM.12	2582763	5524150	560
BM.12L	2582855	5524040	560
BM.13	2582108	5525093	545
BM.13L	2581975	5524723	555
BM.14	2580950	5526250	515
BM.14L	2581275	5526105	530
BM.15	2580125	5527763	470
BM.16	2579000	5528978	380
BM.16L	2579380	5528813	380
BM.17	2579595	5530195	400
BM.17L	2579308	5530570	385
BM.18	2578205	5532000	280
BM.18L	2578480	5531830	330
BM.19	2577383	5532500	260
BM.19L	2577405	5533045	270
BM.20	2576578	5534453	360
BM.20L	2576845	5534055	340
BM.21	2575683	5535070	340
BM.21L	2576073	5534825	350
BM.22	2573825	5535655	280
BM.22L	2574213	5535573	300
BM.23	2574298	5537438	200
BM.23L	2574088	5537700	190
BM.24	2572425	5539530	200
BM.24L	2572700	5539263	260
BM.25	2571770	5540563	177
BM.25L	2571450	5540858	165
BM.26	2570303	5541688	225
BM.26L	2570508	5541370	180
BM.27	2569788	5542455	250
BM.27L	2569662	5542693	267
BM.28	2569095	5543575	220
BM.28L	2568950	5543795	260
BM.29	2568813	5545125	310
BM.29L	2568375	5545250	320
BM.29A	2567625	5546020	364
BM.29AL	2567500	5546283	350
BM.30	2567288	5546725	350
BM.30L	2567075	5546900	350

Table 2: continued

Station No.	Gauss Krüger Coordinates		Height
BM.30A	2566370	5547045	310
BM.30AL	2566300	5547330	320
BM.30B	2566138	5547575	330
BM.3OBL	2566325	5547450	320
BM.31	2565738	5548300	340
BM.31L	2565438	5548420	330
BM.31A	2565075	5549038	340
BM.31AL	2564895	5549150	340
BM.32	2564275	5549430	360
BM.32L	2564175	5549505	370
BM.32A	2564210	5550705	380
BM.32AL	2564025	5550750	380
BM.33	2563605	5552000	437
BM.33L	2563525	5552185	420
BM.34	2562395	5553313	447
BM.34L	2562325	5553500	447
BM.35	2561775	5554575	450
BM.35L	2561625	5554788	450
BM.36	2560688	5554910	440
BM.36L	2560625	5555075	420
BM.37	2560668	5556288	475
BM.37L	2560625	5556438	475
BM.38	2559713	5557323	450
BM.38L	2559650	5557500	420
BM.39	2559405	5558000	430
BM.39L	2559450	5558300	480
BM.41	2557580	5560348	430
BM.41L	2557425	5560570	430
BM.42	2557025	5561795	420
BM.42L	2556895	5562000	460
BM.44	2555625	5564040	500
BM.45	2554258	5564880	640 - x-pt v. diff.
BM.46	2554175	5566338	600
BM.47	2553168	5567513	570
BM.48	2551200	5568598	470
BM.48L	2551375	5568303	540
BM.49	2550450	5569698	530
BM.49L	2550280	5569730	520
BM.50	2550130	5570700	520
BM.50L	2549980	5570785	520
BM.51	2549375	5573320	460
BM.51L	2549705	5573175	552
BM.52	2547850	5574203	450
BM.52L	2547675	5574525	470
BM.53	2547145	5575875	435
BM.53L	2547008	5576170	425
BM.54	2545550	5577970	480
BM.54L	2545290	5578270	517
BM.55	2544775	5579200	505
BM.55L	2544520	5579490	510
BM.56	2543620	5581950	510
BM.56L	2543758	5581763	540
BM.57	2542025	5583280	560

Table 2: continued

Station No.	Gauss Krüger Coordinates		Height
BM.57L	2542263	5583075	545
BM.59	2541008	5585643	580
BM.59L	2541155	5585363	560
BM.60	2538538	5588173	567
BM.60L	2538720	5587918	563
BM.61	25 7300	5589455	585
BM.61L	2537150	5589625	565
BM.62	2536380	5592313	560
BM.62L	2536475	5592500	525
BM.63	2534838	5593113	520
BM.63L	2534950	5592925	540
BM.64	2534025	5594850	520
BM.64L	2534240	5594680	505
BM.65	2533180	5596500	450
BM.65L	2533375	5596300	460
BM.66	2532698	5597615	460
BM.66L	2532675	5597475	480
BM.67	2530850	5599500	440
BM.67L	2530615	5599863	450
BM.68	2531050	5601200	522
BM.68L	2530873	5601775	532

Table 3. Shot details for Rhenish Massif Seismic Experiment, May 1979.

Shot	Date	Time (MEZ) ¹			Lat.	Long.	Weight ² (metric tons)	Elevation (metres)
		h	m	s				
F1	14.05.79	12	05	02.20	50° 41.88' N	7° 58.98' E	1.0	573
W1	14.05.79	19	03	35.60	51° 19.55' N	9° 77.42' E	0.4	300
A1	16.05.79	12	00	09.40	48° 36.49' N	3° 58.59' E	2.4	113
C1	16.05.79	12	07	00.90	49° 44.59' N	6° 3.22' E	1.2	390
D1	16.05.79	12	13	59.88	50° 17.99' N	6° 53.19' E	1.0	562
I1	16.05.79	12	21	01.64	51° 32.62' N	9° 40.28' E	1.0	334
B1	17.05.79	12	00	06.20	49° 17.23' N	5° 21.20' E	1.5	220
G1	17.05.79	12	08	15.84	51° 3.45' N	8° 33.95' E	0.5	496
H1	17.05.79	12	14	00.57	51° 16.10' N	9° 2.00' E	0.5	464
W2	17.05.79	12	21	01.03	51° 19.57' N	9° 7.46' E	0.4	300
K1	18.05.79	18	59	59.36	50° 41.14' N	6° 16.26' E	1.0	380
F2	18.05.79	19	07	46.42	50° 41.86' N	7° 59.04' E	1.5	571
B2	19.05.79	19	01	03.23	49° 17.23' N	5° 21.12' E	0.5	225
D2	21.05.79	18	59	59.59	50° 17.94' N	6° 53.22' E	1.0	566
C2	21.05.79	19	07	01.12	49° 44.60' N	6° 3.28' E	0.5	390
G2	21.05.79	19	14	00.10	51° 3.57' N	8° 33.90' E	1.5	496
A2	21.05.79	19	21	10.60	48° 36.51' N	3° 58.67' E	0.5	113
F3	22.07.79	19	00	01.03	50° 41.84' N	7° 59.12' E	2.0	567
I2	22.05.79	19	07	02.03	51° 32.63' N	9° 40.26' E	3.0	335
H2	22.05.79	19	14	00.83	51° 16.12' N	9° 1.89' E	1.5	463

¹ MEZ = Middle European Zone.

² 1 metric ton = 1000 kg.

Table 4. Recording station details for Rhenish Massif Seismic

STATION NO.	Experiment, May 1979.		GEOGRAPHIC		HEIGHT metres	
	GAUSS-KRUEGER		COORDINATES			
	COORDINATES		Long East	Lat. North		
0/1	4406967	5751971	10 38.900	51 53.721	240	
0/2	4406393	5752031	10 38.399	51 53.747	275	
1	4405422	5751534	10 37.560	51 53.469	335	
4	4402945	5750259	10 35.424	51 52.757	440	
5	4401942	5749744	10 34.559	51 52.468	400	
8	4399138	5748030	10 32.146	51 51.514	540	
9	4398002	5747491	10 31.167	51 51.211	603	
12	3602436	5745935	10 29.187	51 50.368	460	
13	3601632	5745893	10 28.487	51 50.354	525	
16/1	3599126	5743674	10 26.267	51 49.184	480	
16/2	3598641	5744207	10 25.854	51 49.477	500	
17	3597854	5743153	10 25.152	51 48.917	500	
20/1	3595594	5742191	10 23.170	51 48.422	580	
20/2	3595796	5742060	10 23.343	51 48.349	560	
21	3594828	5742094	10 22.502	51 48.377	580	
24	3592907	5740324	10 20.803	51 47.442	580	
25	3590944	5739203	10 19.078	51 46.857	582	
28	3589103	5737964	10 17.459	51 46.207	420	
29	3587977	5736834	10 16.463	51 45.608	405	
32	3586299	5736021	10 14.993	51 45.186	240	
33	3585406	5735630	10 14.212	51 44.983	240	
34	3582942	5733587	10 12.042	51 43.904	257	
35	3581421	5732369	10 10.704	51 43.260	230	
40	3578775	5731562	10 8.396	51 42.848	170	
41	3577459	5729923	10 7.232	51 41.975	165	
44	3575335	5729683	10 5.385	51 41.863	134	
45	3573996	5728310	10 4.206	51 41.133	180	
48/1	3571740	5726976	10 2.232	51 40.431	200	
48/2	3571907	5726822	10 2.375	51 40.347	165	
49	3570582	5726326	10 1.220	51 40.090	219	
50	3569487	5725888	10 .265	51 39.862	300	
52/1	3568569	5724922	9 59.458	51 39.347	220	
52/2	3568522	5724919	9 59.417	51 39.346	210	
53	3566913	5724924	9 58.022	51 39.360	155	
56	3564630	5724778	9 56.041	51 39.298	130	
57	3563220	5723272	9 54.802	51 38.495	151	
60	K1	3561598	5721637	9 53.379	51 37.624	154
60	K2	3561280	5721430	9 53.102	51 37.515	159
60	K3	3561184	5721170	9 53.016	51 37.375	160
61	K1	3560737	5720875	9 52.625	51 37.219	155
61	K2	3560469	5720710	9 52.391	51 37.132	151
61	K3	3560119	5720567	9 52.087	51 37.057	144
64	K1	3558269	5719276	9 50.471	51 36.372	220
64	K2	3558036	5719153	9 50.268	51 36.307	205
64	K3	3557703	5719070	9 49.979	51 36.265	205
65	K1	3557324	5719199	9 49.652	51 36.337	210
65	K2	3557037	5719033	9 49.402	51 36.249	230
65	K3	3556801	5718842	9 49.196	51 36.147	250
68	K1	3554857	5717205	9 47.497	51 35.276	220
68	K2	3554491	5717496	9 47.183	51 35.435	210
68	K3	3554367	5717146	9 47.072	51 35.247	210
69	K1	3553925	5716775	9 46.686	51 35.050	210
69	K2	3553615	5716784	9 46.418	51 35.056	215
69	K3	3553263	5716585	9 46.111	51 34.951	205
72	K1	3551051	5714725	9 44.180	51 33.960	212

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
				Long East	Lat. North	
72	K2	3551051	5714725	9 44. 180	51 33. 960	212
72	K3	3550856	5714540	9 44. 010	51 33. 861	225
73		3550426	5714359	9 43. 636	51 33. 766	274
75	K1	3548308	5713368	9 41. 795	51 33. 243	320
75	K2	3548443	5713418	9 41. 912	51 33. 269	302
75	K3	3548443	5713418	9 41. 912	51 33. 269	302
76/1	K1	3547883	5712976	9 41. 424	51 33. 033	365
76/1	K2	3547737	5712891	9 41. 297	51 32. 988	360
76/1	K3	3547737	5712891	9 41. 297	51 32. 988	360
76/2	K1	3547973	5713030	9 41. 503	51 33. 062	362
76/2	K2	3547737	5712894	9 41. 297	51 32. 990	362
76/2	K3	3547737	5712894	9 41. 297	51 32. 990	362
80	K1	3544292	5710726	9 38. 301	51 31. 838	330
80	K2	3544213	5710610	9 38. 232	51 31. 775	347
80	K3	3544213	5710610	9 38. 232	51 31. 775	347
81	K1	3543275	5709993	9 37. 416	51 31. 447	220
81	K2	3543168	5709992	9 37. 324	51 31. 447	205
81	K3	3543168	5709992	9 37. 324	51 31. 447	205
82	K1	3542900	5709675	9 37. 090	51 31. 277	240
82	K2	3542667	5709483	9 36. 887	51 31. 175	250
82	K3	3542398	5709296	9 36. 653	51 31. 075	250
84	K1	3540549	5708274	9 35. 048	51 30. 532	132
84	K2	3540384	5708160	9 34. 904	51 30. 471	155
84	K3	3540213	5708058	9 34. 756	51 30. 417	172
85	K1	3539779	5707574	9 34. 377	51 30. 158	350
85	K2	3539658	5707579	9 34. 273	51 30. 161	370
85	K3	3539547	5707727	9 34. 178	51 30. 241	380
86/1		3538904	5706942	9 33. 617	51 29. 821	335
86/2		3538785	5706982	9 33. 514	51 29. 843	345
87		3537745	5706775	9 32. 614	51 29. 735	345
88	K2	3537054	5705846	9 32. 012	51 29. 237	379
89	K2	3536599	5705700	9 31. 618	51 29. 160	332
90	K1	3536188	5705113	9 31. 259	51 28. 845	335
90	K2	3535973	5704915	9 31. 072	51 28. 739	357
90	K3	3535973	5704915	9 31. 072	51 28. 739	357
91	K1	3534964	5704085	9 30. 196	51 28. 295	320
91	K2	3534811	5704088	9 30. 063	51 28. 297	300
91	K3	3534811	5704088	9 30. 063	51 28. 297	300
92	K1	3534671	5703794	9 29. 941	51 28. 139	305
92	K2	3534417	5703665	9 29. 721	51 28. 071	335
92	K3	3534417	5703665	9 29. 721	51 28. 071	335
93	K1	3533341	5703141	9 28. 789	51 27. 792	290
93	K2	3533173	5703118	9 28. 643	51 27. 780	295
93	K3	3533173	5703118	9 28. 643	51 27. 780	295
94	K1	3532755	5702691	9 28. 280	51 27. 551	295
94	K2	3532572	5702652	9 28. 122	51 27. 531	293
94	K3	3532572	5702652	9 28. 122	51 27. 531	293
95	K1	3531641	5702044	9 27. 315	51 27. 206	260
95	K3	3531641	5702044	9 27. 315	51 27. 206	260
96	K1	3531240	5701676	9 26. 967	51 27. 009	253
96	K2	3530962	5701563	9 26. 726	51 26. 949	255
96	K3	3530962	5701563	9 26. 726	51 26. 949	255
97	K1	3530416	5701276	9 26. 254	51 26. 796	240
97	K2	3530261	5701120	9 26. 119	51 26. 712	230
97	K3	3530261	5701120	9 26. 119	51 26. 712	230

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres		
		Long. East	Lat. North			
98		3528857	5699684	9 24. 900	51 25. 942	235
99		3528219	5699428	9 24. 348	51 25. 806	245
100	K1	3527725	5698961	9 23. 920	51 25. 556	238
100	K2	3527480	5698826	9 23. 708	51 25. 484	241
100	K3	3527480	5698826	9 23. 708	51 25. 484	241
101	K1	3527028	5698538	9 23. 317	51 25. 330	256
101	K2	3526653	5698300	9 22. 992	51 25. 202	261
101	K3	3526653	5698300	9 22. 992	51 25. 202	261
102	K1	3525598	5697779	9 22. 080	51 24. 924	285
102	K2	3526012	5698010	9 22. 438	51 25. 048	276
102	K3	3526012	5698010	9 22. 438	51 25. 048	276
104		3523624	5697431	9 20. 376	51 24. 742	260
105	K1	3523260	5697032	9 20. 060	51 24. 527	275
105	K2	3523139	5696839	9 19. 955	51 24. 423	275
105	K3	3523139	5696839	9 19. 955	51 24. 423	275
106	K1	3523029	5695278	9 19. 854	51 23. 582	294
106	K2	3522780	5695168	9 19. 639	51 23. 523	310
106	K3	3522780	5695168	9 19. 639	51 23. 523	310
107	K1	3522365	5695068	9 19. 281	51 23. 470	340
107	K2	3521933	5694950	9 18. 908	51 23. 408	380
107	K3	3521933	5694950	9 18. 908	51 23. 408	380
108	K1	3521585	5694180	9 18. 605	51 22. 993	350
108	K2	3521276	5694075	9 18. 339	51 22. 937	310
108	K3	3521276	5694075	9 18. 339	51 22. 937	310
109		3520186	5693667	9 17. 398	51 22. 719	300
110/1	K1	3518512	5693291	9 15. 954	51 22. 520	410
110/1	K2	3518395	5693192	9 15. 853	51 22. 467	410
110/1	K3	3518395	5693192	9 15. 853	51 22. 467	410
110/2	K1	3518647	5693232	9 16. 070	51 22. 488	410
110/2	K2	3518457	5693178	9 15. 906	51 22. 459	410
110/2	K3	3518457	5693178	9 15. 906	51 22. 459	410
110/3	K1	3518625	5693139	9 16. 051	51 22. 438	420
110/3	K2	3518460	5693183	9 15. 909	51 22. 462	410
110/3	K3	3518460	5693183	9 15. 909	51 22. 462	410
111	K1	3518308	5692865	9 15. 777	51 22. 291	400
111	K2	3518196	5692660	9 15. 679	51 22. 180	390
111	K3	3518196	5692660	9 15. 679	51 22. 180	390
112/1	K1	3517693	5691905	9 15. 244	51 21. 774	380
112/1	K2	3517878	5692196	9 15. 404	51 21. 931	390
112/1	K3	3517878	5692196	9 15. 404	51 21. 931	390
112/2	K1	3517233	5692035	9 14. 848	51 21. 845	335
112/2	K2	3517339	5692143	9 14. 940	51 21. 903	350
112/2	K3	3517339	5692143	9 14. 940	51 21. 903	350
113	K1	3517267	5691893	9 14. 877	51 21. 768	340
113	K2	3517092	5691614	9 14. 725	51 21. 618	327
113	K3	3517092	5691614	9 14. 725	51 21. 618	327
114	K1	3515067	5691991	9 12. 982	51 21. 825	397
114	K2	3515192	5691984	9 13. 089	51 21. 821	394
114	K3	3515225	5691990	9 13. 118	51 21. 824	393
115	K1	3514995	5691735	9 12. 919	51 21. 687	390
115	K2	3514860	5691548	9 12. 802	51 21. 586	340
115	K3	3514860	5691548	9 12. 802	51 21. 586	340
116		3514170	5691083	9 12. 207	51 21. 337	345
117	K1	3513271	5690678	9 11. 431	51 21. 120	
117	K2	3513271	5690678	9 11. 431	51 21. 120	

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
				Long. East	Lat. North	
117	K3	3513271	5690678	9 11.431	51 21.120	
118	K1	3512341	5690018	9 10.629	51 20.765	240
118	K2	3512484	5690053	9 10.752	51 20.783	240
118	K3	3512484	5690053	9 10.752	51 20.783	240
119	K1	3511194	5688817	9 9.639	51 20.118	260
119	K2	3510991	5688825	9 9.464	51 20.123	270
119	K3	3510991	5688825	9 9.464	51 20.123	270
120	K1	3509866	5687247	9 8.493	51 19.273	325
120	K2	3510183	5687310	9 8.766	51 19.307	305
120	K3	3510183	5687310	9 8.766	51 19.307	305
121	K1	3509526	5686867	9 8.199	51 19.069	295
121	K2	3509611	5686945	9 8.273	51 19.110	335
121	K3	3509611	5686945	9 8.273	51 19.110	335
122	K1	3508757	5686317	9 7.537	51 18.773	320
122	K2	3509025	5686406	9 7.767	51 18.820	320
122	K3	3509025	5686406	9 7.767	51 18.820	320
123		3508532	5685851	9 7.342	51 18.521	350
124	K1	3508250	5685217	9 7.099	51 18.180	382
124	K2	3507997	5685078	9 6.881	51 18.105	400
124	K3	3507997	5685078	9 6.881	51 18.105	400
125	K1	3507311	5684611	9 6.290	51 17.854	380
125	K2	3506889	5684409	9 5.927	51 17.745	380
125	K3	3506889	5684409	9 5.927	51 17.745	380
126	K1	3504927	5683915	9 4.238	51 17.480	410
126	K2	3505183	5684083	9 4.459	51 17.570	395
126	K3	3505183	5684083	9 4.459	51 17.570	395
127		3505079	5683842	9 4.369	51 17.440	395
128		3504397	5683473	9 3.782	51 17.242	411
129	K1	3503535	5682669	9 3.040	51 16.808	450
129	K2	3503714	5682879	9 3.194	51 16.922	452
129	K3	3503714	5682879	9 3.194	51 16.922	452
131		3501866	5681229	9 1.604	51 16.032	420
132		3501113	5680301	9 .957	51 15.532	420
133		3500187	5679824	9 .161	51 15.275	385
134	K1	3499087	5679524	8 59.215	51 15.113	392
134	K2	3498813	5679307	8 58.980	51 14.996	362
134	K3	3498813	5679307	8 58.980	51 14.996	362
135	K1	3498610	5679062	8 58.805	51 14.863	370
135	K2	3498400	5678925	8 58.625	51 14.789	350
135	K3	3498400	5678925	8 58.625	51 14.789	350
136	K1	3497078	5678135	8 57.489	51 14.363	350
136	K2	3497406	5678230	8 57.771	51 14.414	330
136	K3	3497406	5678230	8 57.771	51 14.414	330
137	K1	3496569	5677550	8 57.052	51 14.047	360
137	K2	3496844	5677750	8 57.288	51 14.155	361
137	K3	3496844	5677750	8 57.288	51 14.155	361
138	K1	3495492	5676848	8 56.127	51 13.668	355
138	K2	3495684	5676878	8 56.292	51 13.685	352
138	K3	3495684	5676878	8 56.292	51 13.685	352
139	K1	3495021	5676465	8 55.723	51 13.461	364
139	K2	3495073	5676490	8 55.768	51 13.475	365
139	K3	3495073	5676490	8 55.768	51 13.475	365
140	K1	3493641	5676113	8 54.538	51 13.271	420
140	K2	3493779	5676254	8 54.656	51 13.347	428
140	K3	3493779	5676254	8 54.656	51 13.347	428

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
				Long. East	Lat. North	
141	K1	3493109	5675618	8 54.082	51 13.003	370
141	K2	3493304	5675781	8 54.249	51 13.091	405
141	K3	3493304	5675781	8 54.249	51 13.091	405
142	K1	3491798	5674780	8 52.957	51 12.550	390
142	K2	3492055	5675083	8 53.177	51 12.714	400
142	K3	3492149	5675263	8 53.258	51 12.811	398
143	K1	3491799	5674476	8 52.958	51 12.386	385
143	K2	3491725	5674283	8 52.895	51 12.282	380
143	K3	3491540	5673935	8 52.737	51 12.094	390
144	K1	3490710	5673384	8 52.025	51 11.796	340
144	K2	3490800	5673554	8 52.102	51 11.888	375
144	K3	3490965	5673742	8 52.243	51 11.990	355
145	K1	3489780	5672621	8 51.228	51 11.384	440
145	K2	3489954	5672837	8 51.377	51 11.501	433
145	K3	3490225	5673121	8 51.609	51 11.654	380
146	K1	3488972	5672226	8 50.535	51 11.170	480
146	K2	3489038	5672275	8 50.592	51 11.196	490
146	K3	3489389	5672534	8 50.892	51 11.337	470
147	K1	3488387	5671556	8 50.034	51 10.808	440
147	K2	3488559	5671695	8 50.182	51 10.883	470
147	K3	3488814	5671824	8 50.400	51 10.953	470
148	K1	3487905	5671098	8 49.621	51 10.560	420
148	K2	3488305	5671275	8 49.964	51 10.656	435
148	K3	3488366	5671290	8 50.017	51 10.664	420
149	K1	3486918	5670662	8 48.775	51 10.324	406
149	K2	3487050	5670797	8 48.888	51 10.397	395
149	K3	3487282	5671008	8 49.087	51 10.511	370
150	K1	3486694	5670386	8 48.584	51 10.175	405
150	K2	3486916	5670660	8 48.774	51 10.323	407
150	K3	3486916	5670660	8 48.774	51 10.323	407
151	K1	3485185	5669546	8 47.291	51 9.719	395
151	K2	3484972	5669270	8 47.109	51 9.570	390
151	K3	3484972	5669270	8 47.109	51 9.570	390
152	K1	3484585	5669022	8 46.778	51 9.436	350
152	K2	3484974	5669273	8 47.111	51 9.572	390
152	K3	3484974	5669273	8 47.111	51 9.572	390
153	K1	3483670	5668065	8 45.996	51 8.918	400
153	K2	3484012	5668323	8 46.288	51 9.058	350
153	K3	3484012	5668323	8 46.288	51 9.058	350
154/1	K1	3482849	5667456	8 45.293	51 8.588	360
154/1	K2	3482861	5667366	8 45.304	51 8.540	360
154/1	K3	3482861	5667366	8 45.304	51 8.540	360
154/2	K1	3483034	5667540	8 45.452	51 8.634	400
154/2	K2	3482811	5667403	8 45.261	51 8.559	350
154/2	K3	3482811	5667403	8 45.261	51 8.559	350
155	K1	3482252	5666856	8 44.783	51 8.263	355
155	K2	3482252	5666856	8 44.783	51 8.263	355
155	K3	3481994	5666732	8 44.562	51 8.196	370
156/1		3481274	5666191	8 43.947	51 7.903	333
156/2	K1	3481081	5666092	8 43.782	51 7.849	345
156/2	K2	3481392	5666283	8 44.048	51 7.953	330
156/2	K3	3481392	5666283	8 44.048	51 7.953	330
157	K1	3480358	5664898	8 43.166	51 7.204	335
157	K2	3480699	5665224	8 43.457	51 7.380	340
157	K3	3480699	5665224	8 43.457	51 7.380	340

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
				Long. East	Lat. North	
158/1	K1	3479978	5664561	8 42. 841	51 7. 021	350
158/1	K2	3479843	5664481	8 42. 726	51 6. 978	350
158/1	K3	3479843	5664481	8 42. 726	51 6. 978	350
158/2	K1	3479638	5664398	8 42. 550	51 6. 932	360
158/2	K2	3479818	5664538	8 42. 704	51 7. 008	350
158/2	K3	3479818	5664538	8 42. 704	51 7. 008	350
158/3	K1	3479590	5664428	8 42. 509	51 6. 948	355
158/3	K2	3479820	5664540	8 42. 706	51 7. 009	350
158/3	K3	3479820	5664540	8 42. 706	51 7. 009	350
159	K1	3479106	5664229	8 42. 095	51 6. 840	380
159	K2	3478768	5664002	8 41. 806	51 6. 717	370
159	K3	3478768	5664002	8 41. 806	51 6. 717	370
160		3477086	5663697	8 40. 366	51 6. 548	395
161		3476999	5663336	8 40. 293	51 6. 354	380
162		3476309	5663067	8 39. 703	51 6. 207	420
163		3475534	5662689	8 39. 041	51 6. 001	375
164		3474728	5661406	8 38. 355	51 5. 307	450
165		3474082	5661460	8 37. 802	51 5. 334	470
166		3473212	5660576	8 37. 061	51 4. 855	400
167		3472236	5659769	8 36. 229	51 4. 417	520
168	K1	3471839	5659302	8 35. 891	51 4. 164	512
168	K2	3471529	5658991	8 35. 627	51 3. 995	564
168	K3	3471529	5658991	8 35. 627	51 3. 995	564
169		3470823	5658759	8 35. 024	51 3. 868	400
172/1		3468198	5656640	8 32. 788	51 2. 717	425
172/2		3467840	5656825	8 32. 481	51 2. 815	490
173		3466929	5655684	8 31. 707	51 2. 197	540
174		3466690	5655572	8 31. 504	51 2. 136	540
175		3466090	5654972	8 30. 994	51 1. 810	450
176	K1	3464635	5654360	8 29. 753	51 1. 474	480
176	K2	3464218	5654144	8 29. 397	51 1. 356	590
176	K3	3464218	5654144	8 29. 397	51 1. 356	590
177	K1	3463889	5653893	8 29. 118	51 1. 220	480
177	K2	3464218	5654144	8 29. 397	51 1. 356	590
177	K3	3464218	5654144	8 29. 397	51 1. 356	590
178	K1	3462468	5652772	8 27. 909	51 . 610	520
178	K2	3462135	5652637	8 27. 625	51 . 536	542
178	K3	3462135	5652637	8 27. 625	51 . 536	542
179	K1	3461931	5652516	8 27. 452	51 . 469	540
179	K2	3462140	5652635	8 27. 630	51 . 534	542
179	K3	3462140	5652635	8 27. 630	51 . 534	542
180		3462362	5650982	8 27. 830	50 59. 644	490
181		3461156	5650342	8 26. 803	50 59. 294	490
182	K1	3460561	5649997	8 26. 297	50 59. 105	500
182	K2	3460326	5649748	8 26. 098	50 58. 970	505
182	K3	3460326	5649748	8 26. 098	50 58. 970	505
183	K1	3459655	5648789	8 25. 531	50 58. 450	585
183	K2	3459874	5648985	8 25. 717	50 58. 557	583
183	K3	3459874	5648985	8 25. 717	50 58. 557	583
184	K1	3458822	5648014	8 24. 824	50 58. 028	573
184	K2	3458435	5647789	8 24. 495	50 57. 905	500
184	K3	3458435	5647789	8 24. 495	50 57. 905	500
185	K1	3458144	5647549	8 24. 248	50 57. 775	480
185	K2	3458435	5647792	8 24. 495	50 57. 907	500
185	K3	3458435	5647792	8 24. 495	50 57. 907	500

STATION NO.	GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
			Long East	Lat. North	
186		3457875 5646699	8 24. 025	50 57. 315	395
187		3457286 5646300	8 23. 524	50 57. 097	465
188		3456397 5645591	8 22. 770	50 56. 711	360
189		3455721 5644797	8 22. 199	50 56. 279	500
190		3455142 5644002	8 21. 711	50 55. 848	480
191		3454026 5643231	8 20. 764	50 55. 427	460
192		3453515 5642381	8 20. 334	50 54. 966	430
193		3452962 5641836	8 19. 867	50 54. 669	460
194		3452228 5641377	8 19. 244	50 54. 418	500
195/1		3452267 5639893	8 19. 289	50 53. 618	540
195/2		3451360 5640490	8 18. 511	50 53. 935	580
196		3450514 5639878	8 17. 794	50 53. 601	670
197		3449991 5639353	8 17. 352	50 53. 315	640
198/1		3449910 5639007	8 17. 286	50 53. 128	680
198/2		3449395 5638388	8 16. 852	50 52. 791	621
199		3447906 5638576	8 15. 581	50 52. 885	550
200/1		3447984 5637180	8 15. 660	50 52. 132	580
200/2		3448014 5637145	8 15. 685	50 52. 114	580
201		3447308 5637024	8 15. 085	50 52. 045	570
202	K1	3446333 5635384	8 14. 268	50 51. 155	540
202	K2	3446305 5635342	8 14. 245	50 51. 132	540
202	K3	3446305 5635342	8 14. 245	50 51. 132	540
203		3445714 5634685	8 13. 747	50 50. 774	530
204	K1	3444999 5634247	8 13. 142	50 50. 534	550
204	K2	3444956 5634232	8 13. 105	50 50. 526	560
204	K3	3444956 5634232	8 13. 105	50 50. 526	560
205		3444492 5633575	8 12. 716	50 50. 169	580
206	K1	3443868 5632819	8 12. 191	50 49. 757	450
206	K2	3443833 5632777	8 12. 162	50 49. 734	450
206	K3	3443833 5632777	8 12. 162	50 49. 734	450
207	K1	3443092 5632287	8 11. 535	50 49. 466	420
207	K2	3443071 5632277	8 11. 518	50 49. 460	420
207	K3	3443071 5632277	8 11. 518	50 49. 460	420
208	K1	3442178 5631122	8 10. 768	50 48. 832	430
208	K2	3442299 5631169	8 10. 871	50 48. 858	420
208	K3	3442299 5631169	8 10. 871	50 48. 858	420
209		3441389 5630707	8 10. 100	50 48. 603	520
210		3440895 5629935	8 9. 687	50 48. 184	535
211		3439952 5629331	8 8. 891	50 47. 852	552
212		3439314 5628539	8 8. 356	50 47. 421	488
213		3438714 5627747	8 7. 853	50 46. 990	510
214		3438015 5626802	8 7. 268	50 46. 476	525
215		3437268 5626329	8 6. 637	50 46. 216	505
216/1		3436707 5625652	8 6. 167	50 45. 847	470
216/2		3436295 5625870	8 5. 814	50 45. 962	492
217		3435951 5625236	8 5. 529	50 45. 618	502
218		3434264 5623176	8 4. 116	50 44. 496	540
219		3433709 5623002	8 3. 646	50 44. 398	500
220		3433339 5622809	8 3. 334	50 44. 291	420
221		3432799 5622160	8 2. 882	50 43. 938	520
222/1		3432358 5621292	8 2. 517	50 43. 466	610
222/2		3432137 5621146	8 2. 330	50 43. 386	610
223		3431816 5620700	8 2. 063	50 43. 143	535
224/1		3430647 5620079	8 1. 077	50 42. 800	545
224/2		3430925 5620552	8 1. 307	50 43. 057	540

STATION NO.	GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
			Long East	Lat. North	
225	3429625	5619765	8 . 212	50 42. 623	510
228	3427200	5618161	7 58. 171	50 41. 740	570
229	3426324	5617113	7 57. 440	50 41. 169	478
230	3425282	5616934	7 56. 557	50 41. 064	470
231	3424869	5616744	7 56. 209	50 40. 958	502
232	3424821	5616114	7 56. 176	50 40. 618	495
233	3423827	5615485	7 55. 340	50 40. 271	475
234	3423035	5614432	7 54. 681	50 39. 697	460
235	3422519	5613416	7 54. 256	50 39. 145	340
236	3420940	5613983	7 52. 909	50 39. 438	370
237	3419164	5613512	7 51. 408	50 39. 169	445
238	3418636	5613039	7 50. 967	50 38. 910	435
239	3417860	5612721	7 50. 313	50 38. 732	432
240/1	3416786	5612174	7 49. 409	50 38. 428	393
240/2	3416756	5611572	7 49. 392	50 38. 103	440
241	3416197	5611466	7 48. 919	50 38. 041	438
242/1	3415319	5611080	7 48. 180	50 37. 825	482
242/2	3415381	5611582	7 48. 226	50 38. 096	468
243	3414529	5610718	7 47. 515	50 37. 623	465
244	3413358	5610572	7 46. 524	50 37. 534	335
245/CH	3412413	5610499	7 45. 724	50 37. 486	412
245/F	3412111	5609861	7 45. 477	50 37. 139	420
246	3411744	5609571	7 45. 170	50 36. 979	402
247	3411035	5608635	7 44. 583	50 36. 468	358
248	3409450	5608255	7 43. 245	50 36. 249	305
249	3408550	5608185	7 42. 483	50 36. 202	306
250	3408095	5607596	7 42. 106	50 35. 881	304
251	3406954	5606971	7 41. 149	50 35. 533	285
252	3406244	5606561	7 40. 554	50 35. 305	278
253	3405110	5606134	7 39. 600	50 35. 063	305
254/1	3404304	5605743	7 38. 923	50 34. 845	308
254/2	3404396	5605537	7 39. 004	50 34. 735	302
255	3403432	5605459	7 38. 189	50 34. 683	290
256	3403000	5604307	7 37. 841	50 34. 057	255
258	3401288	5603191	7 36. 409	50 33. 438	330
260/1	3398774	5602611	7 34. 290	50 33. 100	320
260/2	3398708	5602607	7 34. 234	50 33. 097	322
262/1	3397765	5601480	7 33. 455	50 32. 479	330
262/2	3397751	5601525	7 33. 442	50 32. 503	320
264	3395584	5600988	7 31. 617	50 32. 191	310
265/CH	3395093	5600796	7 31. 205	50 32. 082	290
265/F	3394897	5600531	7 31. 044	50 31. 937	310
266	3394105	5600086	7 30. 381	50 31. 689	350
267	3393285	5599501	7 29. 698	50 31. 364	310
268/1	3392397	5599395	7 28. 948	50 31. 297	340
268/2	3392191	5599475	7 28. 773	50 31. 338	330
269	3390879	5599356	7 27. 665	50 31. 259	350
270	2602769	5598269	7 26. 944	50 30. 742	310
271/CH	2601636	5597374	7 25. 971	50 30. 271	140
271/F	2602157	5597323	7 26. 411	50 30. 238	140
272	2600912	5596689	7 25. 348	50 29. 909	190
273	2600376	5596220	7 24. 887	50 29. 662	167
274	2599470	5595825	7 24. 115	50 29. 458	330
275	2598320	5595852	7 23. 143	50 29. 485	330
276	2597857	5595542	7 22. 747	50 29. 322	350

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres
		Long East	Lat. North	
277	2597386 5595108	7 22. 342	50 29. 093	340
278	2596636 5594858	7 21. 704	50 28. 965	280
279	2596089 5594654	7 21. 239	50 28. 861	180
280/CH	2594250 5593194	7 19. 662	50 28. 091	295
280/GB	2594325 5593120	7 19. 724	50 28. 051	297
281	2593701 5592853	7 19. 193	50 27. 913	188
282	2592822 5592011	7 18. 438	50 27. 467	262
283	2591789 5591479	7 17. 557	50 27. 190	246
284	2591010 5590783	7 16. 889	50 26. 822	260
285/CH	2589613 5590174	7 15. 701	50 26. 506	261
285/GB	2589968 5590660	7 16. 007	50 26. 765	220
286	2588994 5589950	7 15. 175	50 26. 391	250
287/CH	2587608 5589963	7 14. 004	50 26. 410	290
287/GB	2588186 5589502	7 14. 486	50 26. 157	275
288	2587554 5588919	7 13. 944	50 25. 848	370
289	2586671 5588512	7 13. 193	50 25. 636	287
290	K1 2585318 5588073	7 12. 045	50 25. 411	
290	K2 2585293 5588050	7 12. 023	50 25. 399	350
290	K3 2585293 5588050	7 12. 023	50 25. 399	350
291	2584669 5587678	7 11. 491	50 25. 204	460
292	2583688 5586824	7 10. 652	50 24. 752	550
293	2583194 5586563	7 10. 231	50 24. 615	480
294	2582038 5585953	7 9. 248	50 24. 296	480
295	2581355 5585671	7 8. 668	50 24. 150	430
296	2580274 5585019	7 7. 747	50 23. 807	430
297	2579497 5584441	7 7. 084	50 23. 501	410
298	2578832 5583779	7 6. 515	50 23. 150	510
299	2578057 5583364	7 5. 856	50 22. 932	480
300/1	2577282 5582992	7 5. 197	50 22. 738	520
300/2	2577291 5583003	7 5. 205	50 22. 743	520
301	2576387 5582303	7 4. 434	50 22. 373	480
302	2575120 5581787	7 3. 359	50 22. 104	500
304	K1 2573644 5580768	7 2. 103	50 21. 566	500
304	K2 2573322 5580557	7 1. 829	50 21. 455	510
304	K3 2573109 5580450	7 1. 648	50 21. 399	495
306	2572513 5579502	7 1. 135	50 20. 892	525
308	K1 2570326 5578068	6 59. 275	50 20. 134	490
308	K2 2570566 5578265	6 59. 479	50 20. 239	475
308	K3 2570566 5578265	6 59. 479	50 20. 239	475
310	2568477 5577543	6 57. 711	50 19. 864	547
312	K1 2567866 5576400	6 57. 184	50 19. 252	565
312	K2 2567549 5576153	6 56. 914	50 19. 121	580
312	K3 2567261 5575980	6 56. 670	50 19. 029	603
314	2565556 5575096	6 55. 224	50 18. 564	530
320	2559897 5570839	6 50. 417	50 16. 304	582
322	2559064 5569485	6 49. 703	50 15. 579	584
324	2557911 5567793	6 48. 718	50 14. 673	500
326	2555892 5566277	6 47. 006	50 13. 867	566
328	2555202 5565099	6 46. 415	50 13. 235	550
330	2553618 5563779	6 45. 073	50 12. 532	600
332	K1 2552015 5562309	6 43. 713	50 11. 747	600
332	K2 2551971 5562272	6 43. 676	50 11. 728	600
332	K3 2551971 5562272	6 43. 676	50 11. 728	600
334	2550786 5560932	6 42. 669	50 11. 011	630
336	2549092 5559239	6 41. 233	50 10. 106	590

exp. with 1950

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres		
		Long East	Lat. North			
338	K1	2548356	5557337	6 40. 600	50 9. 084	575
338	K2	2548329	5557532	6 40. 579	50 9. 189	575
338	K3	2548329	5557532	6 40. 579	50 9. 189	575
340		2546327	5556698	6 38. 892	50 8. 749	520
342		2545186	5554570	6 37. 919	50 7. 606	450
344		2544162	5553540	6 37. 053	50 7. 055	469
346		2542141	5552370	6 35. 350	50 6. 433	510
348		2540354	5550256	6 33. 837	50 5. 300	502
350		2538125	5548450	6 31. 958	50 4. 335	475
352		2539550	5549346	6 33. 158	50 4. 812	470
354		2536660	5546715	6 30. 720	50 3. 404	405
356		2534798	5545325	6 29. 152	50 2. 661	385
358		2533501	5543693	6 28. 057	50 1. 785	350
360		2531644	5542649	6 26. 496	50 1. 228	360
362		2530913	5541219	6 25. 877	50 . 459	430
364/1	K1	2529858	5539961	6 24. 988	49 59. 783	300
364/1	K2	2529540	5540039	6 24. 723	49 59. 826	385
364/1	K3	2529540	5540039	6 24. 723	49 59. 826	385
364/2	K1	2529856	5540130	6 24. 988	49 59. 874	300
364/2	K2	2529540	5540037	6 24. 723	49 59. 825	385
364/2	K3	2529540	5540037	6 24. 723	49 59. 825	385
364/3		2529816	5539424	6 24. 951	49 59. 494	320
366		2527800	5538584	6 23. 260	49 59. 046	340
368	K1	2526831	5536753	6 22. 442	49 58. 061	375
368	K2	2526601	5536663	6 22. 249	49 58. 013	425
368	K3	2526601	5536663	6 22. 249	49 58. 013	425
370	K1	2524717	5535954	6 20. 671	49 57. 636	390
370	K2	2524695	5535937	6 20. 652	49 57. 627	390
370	K3	2524695	5535937	6 20. 652	49 57. 627	390
372		2522783	5534363	6 19. 048	49 56. 782	330
374	K1	2522268	5532724	6 18. 611	49 55. 899	363
374	K2	2522288	5532751	6 18. 628	49 55. 913	363
374	K3	2522288	5532751	6 18. 628	49 55. 913	363
376	K1	2520392	5531146	6 17. 038	49 55. 052	325
376	K2	2520282	5530948	6 16. 946	49 54. 945	325
376	K3	2520282	5530948	6 16. 946	49 54. 945	325
378	K1	2518921	5529543	6 15. 805	49 54. 190	317
378	K2	2518901	5529515	6 15. 788	49 54. 175	317
378	K3	2518901	5529515	6 15. 788	49 54. 175	317
380/1	K1	2517583	5528174	6 14. 683	49 53. 454	250
380/1	K2	2517638	5528212	6 14. 729	49 53. 474	250
380/1	K3	2517638	5528212	6 14. 729	49 53. 474	250
380/2	K1	2517404	5528062	6 14. 533	49 53. 394	300
380/2	K2	2517473	5528172	6 14. 591	49 53. 453	280
380/2	K3	2517473	5528172	6 14. 591	49 53. 453	280
382	K1			6 13. 492	49 52. 761	200
382	K2			6 13. 719	49 52. 912	225
382	K3			6 13. 962	49 53. 026	275
384	K1	2514776	5525133	6 12. 332	49 51. 818	310
384	K2	2514867	5525252	6 12. 408	49 51. 882	305
384	K3	2514867	5525252	6 12. 408	49 51. 882	305
386/1	K1	2513424	5524295	6 11. 202	49 51. 367	320
386/1	K2	2513358	5524442	6 11. 147	49 51. 447	320
386/1	K3	2513358	5524442	6 11. 147	49 51. 447	320
386/2	K1	2513672	5524662	6 11. 410	49 51. 565	330

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres	
				Long East	Lat. North		
386/2	K2	2513360	5524439	6 11. 149	49 51. 445	320	
386/2	K3	2513360	5524439	6 11. 149	49 51. 445	320	
386	K1			6 12. 296	49 51. 800	315	
386	K2			6 12. 469	49 51. 905	300	
386	K3			6 12. 688	49 52. 060	235	
388				6 10. 794	49 50. 923	322	
390	K1			6 9. 845	49 50. 050	305	
390	K2			6 10. 097	49 50. 066	305	
390	K3			6 10. 335	49 50. 198	310	
392				6 8. 723	49 49. 422	321	
394	K1			6 8. 204	49 48. 361	260	
394	K2			6 8. 277	49 48. 479	380	
394	K3			6 8. 430	49 48. 701	398	
396				6 6. 619	49 47. 306	280	
398	K1			6 6. 049	49 46. 770	270	
398	K2			6 5. 813	49 46. 657	275	
398	K3			6 5. 813	49 46. 657	275	
400				6 4. 753	49 45. 643	260	
404				6 2. 638	49 44. 094	280	
406	K1			6 1. 840	49 43. 251	365	
406	K2			6 1. 723	49 43. 209	365	
406	K3			6 1. 723	49 43. 209	365	
408/1	K1			6 . 661	49 42. 423	335	
408/1	K2			6 . 826	49 42. 478	340	
408/1	K3			6 . 826	49 42. 478	340	
408/2				6 . 827	49 42. 479	340	
410	K1			5 59. 549	49 41. 612	300	
410	K2			5 59. 552	49 41. 668	390	
410	K3			5 59. 552	49 41. 668	390	
412	K1			5 58. 905	49 40. 860	365	
412	K2			5 58. 778	49 40. 789	362	
412	K3			5 58. 778	49 40. 789	362	
414	K1			5 57. 534	49 39. 870	323	
414	K2			5 57. 627	49 39. 948	327	
414	K3			5 57. 627	49 39. 948	327	
416	K1			5 53. 890	49 39. 853	320	
416	K2			5 53. 689	49 39. 704	325	
416	K3			5 53. 689	49 39. 704	325	
418	K1			5 54. 178	49 38. 574	325	
418	K2			5 54. 011	49 38. 597	325	
418	K3			5 54. 011	49 38. 597	325	
420	K1			5 53. 065	49 38. 170	325	
420	K2			5 53. 231	49 38. 231	425	
420	K3			5 53. 231	49 38. 231	425	
422	K1			5 52. 123	49 37. 073	340	
422	K2			5 51. 976	49 37. 018	345	
422	K3			5 51. 976	49 37. 018	345	
424				5 51. 493	49 36. 306	375	
426	K1			5 50. 473	49 35. 709	350	
426	K2			5 50. 365	49 35. 671	350	
426	K3			5 50. 365	49 35. 671	350	
428				5 48. 148	49 35. 587	358	
430	K1			5 48. 369	49 34. 776	315	
430	K2			5 48. 309	49 34. 726	313	
430	K3			5 48. 309	49 34. 726	313	

Table 4: continued

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres
		Long. East	Lat. North	
431		5 46. 989	49 33. 670	298
432		5 47. 643	49 33. 239	283
434/1	K1	5 45. 130	49 32. 295	360
434/1	K2	5 44. 944	49 32. 193	350
434/1	K3	5 44. 944	49 32. 193	350
434/2	K1	5 45. 143	49 32. 319	360
434/2	K2	5 44. 942	49 32. 193	350
434/2	K3	5 44. 942	49 32. 193	350
436	K1	5 44. 353	49 31. 949	380
436	K2	5 44. 034	49 31. 945	380
436	K3	5 44. 034	49 31. 945	380
438/1		5 43. 071	49 30. 838	373
438/2		5 43. 048	49 30. 889	375
440	K1	5 41. 752	49 30. 713	370
440	K2	5 41. 470	49 30. 598	370
440	K3	5 41. 470	49 30. 598	370
442	K1	5 40. 647	49 29. 696	315
442	K2	5 40. 412	49 29. 648	330
442	K3	5 40. 412	49 29. 648	330
444		5 39. 434	49 29. 111	350
446		5 37. 636	49 28. 285	265
448		5 37. 122	49 27. 391	324
450/1		5 35. 254	49 27. 060	275
450/2		5 35. 543	49 27. 430	300
452/1		5 34. 062	49 32. 613	270
452/2		5 32. 847	49 29. 667	250
453		5 34. 073	49 25. 872	267
454	K1	5 32. 885	49 25. 399	297
454	K2	5 33. 138	49 25. 494	305
454	K3	5 33. 138	49 25. 494	305
456		5 31. 923	49 22. 330	225
458		5 30. 723	49 23. 631	240
460		5 29. 724	49 23. 112	203
462		5 28. 101	49 22. 463	220
464		5 27. 392	49 21. 554	207
466		5 25. 963	49 20. 713	220
468		5 22. 751	49 18. 884	290
469		5 25. 038	49 19. 363	230
470		5 24. 411	49 19. 653	210
473		5 21. 232	49 17. 254	224
476		5 18. 576	49 16. 679	235
480		5 16. 056	49 15. 665	237
484		5 12. 085	49 14. 303	215
488		5 10. 219	49 13. 125	275
492		5 7. 571	56 1. 984	240
496		5 4. 852	53 21. 600	213
500		5 1. 639	49 8. 998	225
504/1		4 59. 513	49 7. 488	185
504/2		4 59. 809	49 7. 513	190
508		4 57. 360	49 6. 213	220
512		4 54. 828	49 4. 955	167
516		4 52. 115	49 3. 940	177
520		4 49. 036	49 2. 451	155
524/1		4 46. 616	49 1. 130	191
524/2		4 46. 749	49 . 865	183

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres
		Long. East	Lat. North	
526		4 44. 425	49 . 464	185
528		4 42. 815	48 59. 293	185
532		4 41. 021	48 58. 783	201
536	K1	4 38. 937	48 57. 278	210
536	K2	4 38. 648	48 57. 269	203
536	K3	4 38. 364	48 57. 216	192
540	K1	4 36. 159	48 56. 153	157
540	K2	4 36. 013	48 55. 909	175
540	K3	4 35. 676	48 55. 738	187
544	K1	4 33. 683	48 54. 856	170
544	K2	4 33. 406	48 54. 754	170
544	K3	4 33. 197	48 54. 567	165
548	K1	4 31. 296	48 53. 681	130
548	K2	4 31. 515	48 53. 799	135
548	K3	4 31. 515	48 53. 799	135
552/1	K1	4 27. 519	48 51. 945	85
552/1	K2	4 27. 376	48 51. 875	85
552/1	K3	4 27. 376	48 51. 875	85
552/2	K1	4 27. 517	48 51. 946	85
552/2	K2	4 27. 517	48 51. 946	85
552/2	K3	4 27. 378	48 51. 873	85
556	K1	4 25. 459	48 50. 662	120
556	K2	4 25. 839	48 50. 820	112
556	K3	4 25. 839	48 50. 820	112
560/1	K1	4 23. 130	48 49. 544	160
560/1	K2	4 22. 991	48 49. 489	160
560/1	K3	4 22. 638	48 49. 371	155
560/2	K1	4 23. 053	48 49. 624	155
560/2	K2	4 22. 928	48 49. 574	155
560/2	K3	4 22. 724	48 49. 503	155
564	K1	4 20. 512	48 48. 395	155
564	K2	4 20. 281	48 48. 293	145
564	K3	4 20. 054	48 48. 201	150
568/1		4 18. 556	48 46. 479	175
568/2		4 18. 046	48 46. 985	170
572	K2	4 15. 235	48 45. 385	184
576	K1	4 14. 149	48 44. 457	176
576	K2	4 13. 907	48 44. 464	172
576	K3	4 13. 907	48 44. 464	172
580	K1	4 9. 784	48 43. 245	186
580	K2	4 9. 437	48 43. 351	176
580	K3	4 9. 437	48 43. 351	176
584		4 6. 976	48 41. 952	165
588	K1	4 4. 740	48 40. 150	155
588	K2	4 4. 587	48 39. 966	143
588	K3	4 4. 587	48 39. 966	143
592	K1	4 2. 928	48 39. 118	126
592	K2	4 2. 674	48 39. 052	118
592	K3	4 2. 674	48 39. 052	118
596		3 59. 440	48 37. 898	120
605		3474100 5618125	8 38. 002 50 41. 960	210
608		3472319 5618944	8 36. 485 50 42. 396	250
610		3470219 5618767	8 34. 702 50 42. 295	265
611		3468683 5618965	8 33. 397 50 42. 397	325
614	K1	3466375 5618559	8 31. 438 50 42. 170	340

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
				Long East	Lat. North	
614	K2	3466097	5618675	8 31. 201	50 42. 232	350
614	K3	3465781	5618690	8 30. 933	50 42. 239	360
617	K1	3461796	5619092	8 27. 546	50 42. 441	313
617	K2	3462155	5619311	8 27. 849	50 42. 560	310
617	K3	3462436	5619500	8 28. 087	50 42. 663	320
620	K1	3459536	5618771	8 25. 628	50 42. 258	320
620	K2	3459325	5618602	8 25. 450	50 42. 166	330
620	K3	3459014	5618681	8 25. 185	50 42. 207	330
623	K1	3456562	5618699	8 23. 102	50 42. 207	320
623	K2	3456677	5618699	8 23. 200	50 42. 207	320
623	K3	3456677	5618699	8 23. 200	50 42. 207	320
626	K1	3454988	5618559	8 21. 766	50 42. 124	320
626	K2	3454988	5618559	8 21. 766	50 42. 124	320
626	K3	3454797	5618613	8 21. 604	50 42. 152	320
629	K1	3451973	5619010	8 19. 202	50 42. 353	290
629	K2	3451865	5619016	8 19. 110	50 42. 355	275
629	K3	3451865	5619016	8 19. 110	50 42. 355	275
632	K1	3447939	5618933	8 15. 776	50 42. 290	340
632	K2	3447731	5619000	8 15. 599	50 42. 325	360
632	K3	3447299	5618933	8 15. 233	50 42. 287	380
635	K1	3445011	5618782	8 13. 291	50 42. 193	360
635	K2	3444586	5618795	8 12. 930	50 42. 197	380
635	K3	3444126	5618763	8 12. 539	50 42. 177	390
638	K2	3440874	5618724	8 9. 777	50 42. 137	498
641		3437958	5618545	8 7. 303	50 42. 022	485
644	K1	3435053	5618898	8 4. 832	50 42. 194	582
644	K2	3434930	5618887	8 4. 728	50 42. 187	584
644	K3	3434930	5618887	8 4. 728	50 42. 187	584
647	K1	3433346	5619027	8 3. 381	50 42. 252	580
647	K2	3433230	5618993	8 3. 283	50 42. 232	580
647	K3	3433230	5618993	8 3. 283	50 42. 232	580
652	K1	3425271	5617766	7 56. 538	50 41. 513	455
652	K2	3425023	5617912	7 56. 325	50 41. 589	453
652	K3	3425023	5617912	7 56. 325	50 41. 589	453
654	K1	3423723	5618266	7 55. 217	50 41. 770	445
654	K2	3423971	5618187	7 55. 429	50 41. 730	448
654	K3	3423971	5618187	7 55. 429	50 41. 730	448
656	K1	3423605	5618309	7 55. 117	50 41. 793	445
656	K2	3423380	5618230	7 54. 926	50 41. 748	445
656	K3	3423380	5618230	7 54. 926	50 41. 748	445
658		3421691	5617364	7 53. 503	50 41. 268	432
660		3418766	5617835	7 51. 014	50 41. 498	345
662	K1	3417107	5617637	7 49. 608	50 41. 377	330
662	K2	3416864	5617683	7 49. 401	50 41. 399	307
662	K3	3416864	5617683	7 49. 401	50 41. 399	307
664		3415591	5618090	7 48. 315	50 41. 608	305
666	K1	3413136	5618261	7 46. 228	50 41. 679	260
666	K2	3412892	5618301	7 46. 020	50 41. 698	250
666	K3	3412892	5618301	7 46. 020	50 41. 698	250
668	K1	3411768	5618490	7 45. 063	50 41. 790	240
668	K2	3411630	5618352	7 44. 948	50 41. 714	260
668	K3	3411630	5618352	7 44. 948	50 41. 714	260
670		3409343	5618766	7 43. 000	50 41. 916	330
672		3407796	5618558	7 41. 689	50 41. 789	275
674		3406298	5618879	7 40. 413	50 41. 948	250

STATION NO.	GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
			Long East	Lat. North	
676		3403287 5618420	7 37. 860	50 41. 779	235
678		3401056 5618784	7 35. 963	50 41. 845	280
680		3398581 5618552	7 33. 866	50 41. 694	287
682		3396708 5618852	7 32. 270	50 41. 836	282
684		3394548 5618760	7 30. 438	50 41. 763	283
686		3392965 5618479	7 29. 099	50 41. 594	280
687		3392043 5618607	7 28. 314	50 41. 653	320
688	K1	3390682 5618512	7 27. 160	50 41. 587	270
688	K2	3390730 5618523	7 27. 201	50 41. 593	270
688	K3	3390730 5618523	7 27. 201	50 41. 593	270
690		2600822 5618294	7 25. 623	50 41. 561	267
692		2598428 5618804	7 23. 599	50 41. 861	190
694	K1	2597428 5618586	7 22. 747	50 41. 753	190
694	K2	2597432 5618516	7 22. 749	50 41. 716	190
694	K3	2597432 5618516	7 22. 749	50 41. 716	190
696		2596513 5618288	7 21. 965	50 41. 602	190
698		2593402 5618017	7 19. 320	50 41. 486	305
700		2591119 5617540	7 17. 374	50 41. 251	222
702		2589971 5615585	7 16. 371	50 40. 207	260
704		2588855 5615029	7 15. 416	50 39. 917	320
706		2588233 5614601	7 14. 882	50 39. 692	300
708		2587315 5614078	7 14. 096	50 39. 419	150
710		2580962 5613305	7 8. 696	50 39. 057	175
712		2580095 5613480	7 7. 963	50 39. 158	182
714		2576937 5613698	7 5. 286	50 39. 301	176
716		2575264 5613322	7 3. 862	50 39. 112	176
718		2573460 5616340	7 2. 368	50 40. 753	168
720		2571108 5617298	7 . 382	50 41. 287	164
722		2569448 5617909	6 58. 980	50 41. 629	170
724		2567127 5617979	6 57. 010	50 41. 683	142
726		2565277 5618179	6 55. 441	50 41. 804	136
728		2563205 5618315	6 53. 683	50 41. 891	142
730		2561610 5617440	6 52. 319	50 41. 429	146
732		2559542 5618067	6 50. 569	50 41. 780	151
734		2557350 5618064	6 48. 708	50 41. 792	142
736		2555523 5617844	6 47. 154	50 41. 684	158
738	K1	2553120 5617895	6 45. 114	50 41. 725	157
738	K2	2552954 5617874	6 44. 973	50 41. 714	158
738	K3	2552954 5617874	6 44. 973	50 41. 714	158
740	K1	2551527 5618008	6 43. 762	50 41. 794	152
740	K2	2551288 5618115	6 43. 560	50 41. 853	152
740	K3	2551288 5618115	6 43. 560	50 41. 853	152
742	K1	2549792 5617545	6 42. 285	50 41. 554	157
742	K2	2549550 5617699	6 42. 081	50 41. 638	152
742	K3	2549550 5617699	6 42. 081	50 41. 638	152
744		2547359 5617055	6 40. 215	50 41. 301	162
746	K1	2544680 5617778	6 37. 946	50 41. 704	161
746	K2	2544883 5617719	6 38. 118	50 41. 671	161
746	K3	2544883 5617719	6 38. 118	50 41. 671	161
748	K1	2542856 5617753	6 36. 397	50 41. 699	156
748	K2	2542769 5617722	6 36. 323	50 41. 682	157
748	K3	2542769 5617722	6 36. 323	50 41. 682	157
750		2541465 5617773	6 35. 216	50 41. 716	169
752		2539806 5617387	6 33. 804	50 41. 514	211
753		2538297 5617647	6 32. 524	50 41. 661	231

Table 4: continued

STATION NO.		GAUSS-KRUEGER COORDINATES		GEOGRAPHIC COORDINATES		HEIGHT metres
				Long East	Lat. North	
754	K1	2536430	5617344	6 30. 937	50 41. 504	288
754	K2	2536732	5617274	6 31. 193	50 41. 466	
754	K3	2536732	5617274	6 31. 193	50 41. 466	
756	K1	2536718	5617499	6 31. 183	50 41. 587	280
756	K2	2536383	5617480	6 30. 898	50 41. 578	295
756	K3	2536383	5617480	6 30. 898	50 41. 578	295
759	K1	2531960	5616700	6 27. 138	50 41. 173	305
759	K2	2531762	5616548	6 26. 969	50 41. 092	310
759	K3	2531762	5616548	6 26. 969	50 41. 092	310
762		2529036	5617343	6 24. 658	50 41. 529	325
764	K1	2526956	5615772	6 22. 885	50 40. 687	400
764	K2	2526754	5615751	6 22. 713	50 40. 677	400
764	K3	2526754	5615751	6 22. 713	50 40. 677	400
767		2523827	5616564	6 20. 232	50 41. 123	380
770	K1	2520705	5616153	6 17. 579	50 40. 908	460
770	K2	2521109	5616190	6 17. 923	50 40. 927	472
770	K3	2521109	5616190	6 17. 923	50 40. 927	472
803	K1	2518645	5614044	6 15. 824	50 39. 775	500
803	K2	2518750	5614535	6 15. 915	50 40. 040	485
803	K3	2518941	5614348	6 16. 076	50 39. 938	500
806	K1	2517720	5611208	6 15. 031	50 38. 247	540
806	K2	2517681	5610853	6 14. 997	50 38. 055	557
806	K3	2517681	5610853	6 14. 997	50 38. 055	557
809	K1	2516729	5607656	6 14. 181	50 36. 333	565
809	K2	2516910	5608075	6 14. 335	50 36. 558	565
809	K3	2516910	5608075	6 14. 335	50 36. 558	565
812	K1	2515828	5605152	6 13. 410	50 34. 983	631
812	K2	2516002	5605532	6 13. 559	50 35. 188	610
812	K3	2516002	5605532	6 13. 559	50 35. 188	610
815	K1	2512966	5602878	6 10. 981	50 33. 761	705
815	K2	2513237	5603132	6 11. 211	50 33. 898	710
815	K3	2513237	5603132	6 11. 211	50 33. 898	710
818				6 10. 443	50 32. 061	635
821				6 8. 934	50 30. 358	615
824				6 8. 720	50 28. 901	555
827	K1			6 6. 684	50 26. 678	540
827	K2			6 6. 707	50 26. 910	520
827	K3			6 6. 707	50 26. 910	520
830				6 6. 253	50 25. 693	560
833	K1			6 5. 081	50 24. 428	545
833	K2			6 5. 311	50 24. 587	565
833	K3			6 5. 311	50 24. 587	565
836	K1			6 4. 632	50 23. 353	460
836	K2			6 4. 424	50 23. 198	460
836	K3			6 4. 424	50 23. 198	460
839	K1			6 3. 429	50 22. 006	425
839	K2			6 3. 465	50 21. 923	420
839	K3			6 3. 465	50 21. 923	420
842	K1			6 1. 925	50 19. 869	410
842	K2			6 2. 000	50 19. 946	410
842	K3			6 2. 000	50 19. 946	410
845/1	K1			6 1. 163	50 18. 409	495
845/1	K2			6 1. 134	50 18. 475	490
845/1	K3			6 1. 134	50 18. 475	490
845/2	K1			6 1. 121	50 18. 343	500

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres
		Long. East	Lat. North	
845/2	K2	6 1.161	50 18.409	495
845/2	K3	6 1.161	50 18.409	495
848	K1	5 59.949	50 16.828	560
848	K2	6 .053	50 17.000	572
848	K3	6 .071	50 17.112	562
851	K1	5 58.893	50 15.338	532
851	K2	5 58.971	50 15.545	545
851	K3	5 59.033	50 15.712	545
854	K1	5 57.762	50 13.569	485
854	K2	5 57.874	50 13.801	490
854	K3	5 57.736	50 14.035	505
857	K1	5 56.814	50 12.466	485
857	K2	5 57.031	50 12.660	480
857	K3	5 57.205	50 12.797	480
860	K1	5 55.777	50 11.017	470
860	K2	5 55.734	50 10.995	470
860	K3	5 55.734	50 10.995	470
863	K1	5 55.031	50 9.568	480
863	K2	5 54.943	50 9.599	480
863	K3	5 54.943	50 9.599	480
866	K1	5 53.946	50 8.260	515
866	K2	5 54.045	50 8.283	515
866	K3	5 54.045	50 8.283	515
869		5 52.934	50 6.291	460
872		5 51.513	50 5.234	480
875		5 52.485	50 3.782	450
878		5 50.002	50 2.357	505
881		5 48.947	50 .761	470
884		5 48.225	49 59.267	520
887		5 46.768	49 57.796	520
890		5 46.091	49 56.371	440
893	K1	5 44.989	49 54.899	430
893	K2	5 44.981	49 54.879	430
893	K3	5 44.981	49 54.879	430
896	K1	5 44.039	49 53.223	475
896	K2	5 44.032	49 53.203	473
896	K3	5 44.032	49 53.203	473
899	K1	5 43.291	49 51.684	470
899	K2	5 43.296	49 51.708	470
899	K3	5 43.296	49 51.708	470
902		5 42.300	49 50.196	460
905		5 40.724	49 48.649	480
908		5 40.332	49 47.340	440
911		5 39.164	49 45.770	400
914		5 38.228	49 44.339	420
917		5 37.704	49 42.992	380
920		5 36.327	49 41.361	345
923		5 35.270	49 39.813	340
926		5 34.374	49 38.013	330
928		5 33.722	49 36.731	290
932		5 31.968	49 36.291	260
935		5 33.639	49 34.268	255
938		5 30.738	49 31.898	290
941		5 28.966	49 30.645	300
944		5 28.422	49 29.114	290

STATION NO.	GAUSS-KRUEGER COORDINATES	GEOGRAPHIC COORDINATES		HEIGHT metres
		Long. East	Lat. North	
946		5 27. 189	49 28. 471	260
950		5 26. 591	49 56. 447	257
953		5 25. 253	49 24. 517	230
956		5 24. 418	49 23. 516	195
959		5 24. 390	49 21. 894	200
962/1		5 22. 536	49 20. 314	240
962/2		5 22. 558	49 20. 312	240
965		5 21. 573	49 18. 840	360

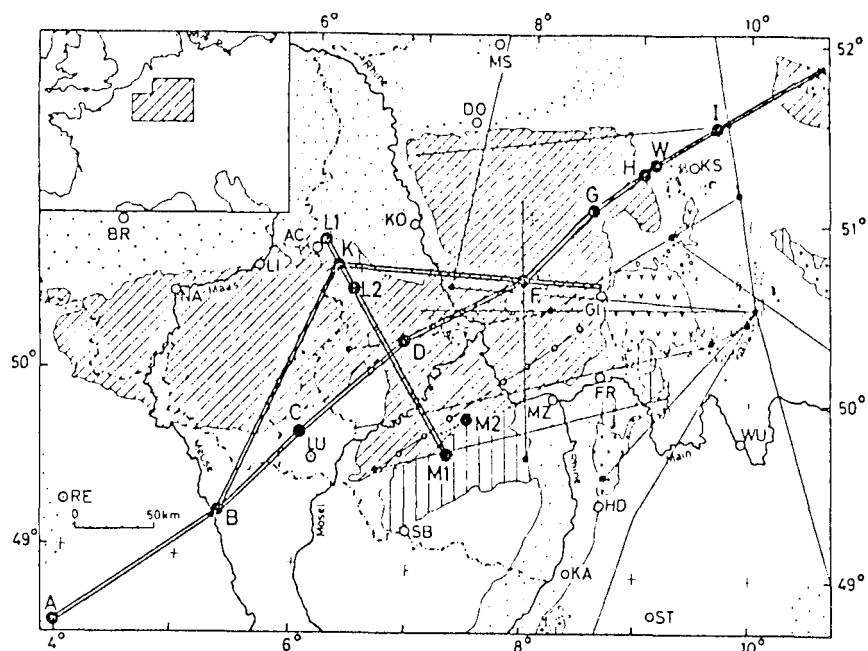


Fig. 1 Map of Rhenish Massif and adjacent areas, showing location of seismic profiles and simplified geology.

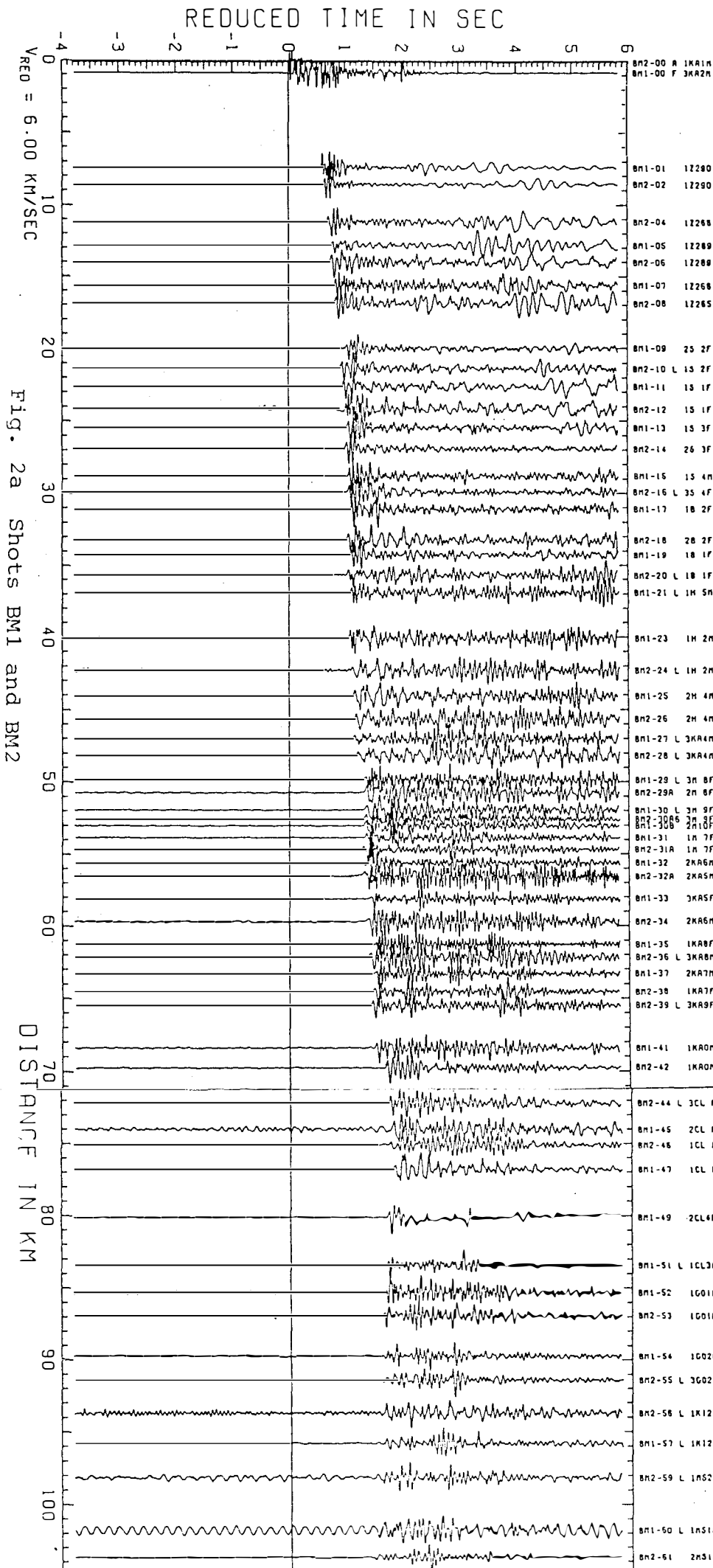
Key: Quaternary and Tertiary, Mesozoic, Permian, Carboniferous and Devonian, mainly Quaternary trachytes and phonolites, Tertiary volcanics, Plutonic rocks.

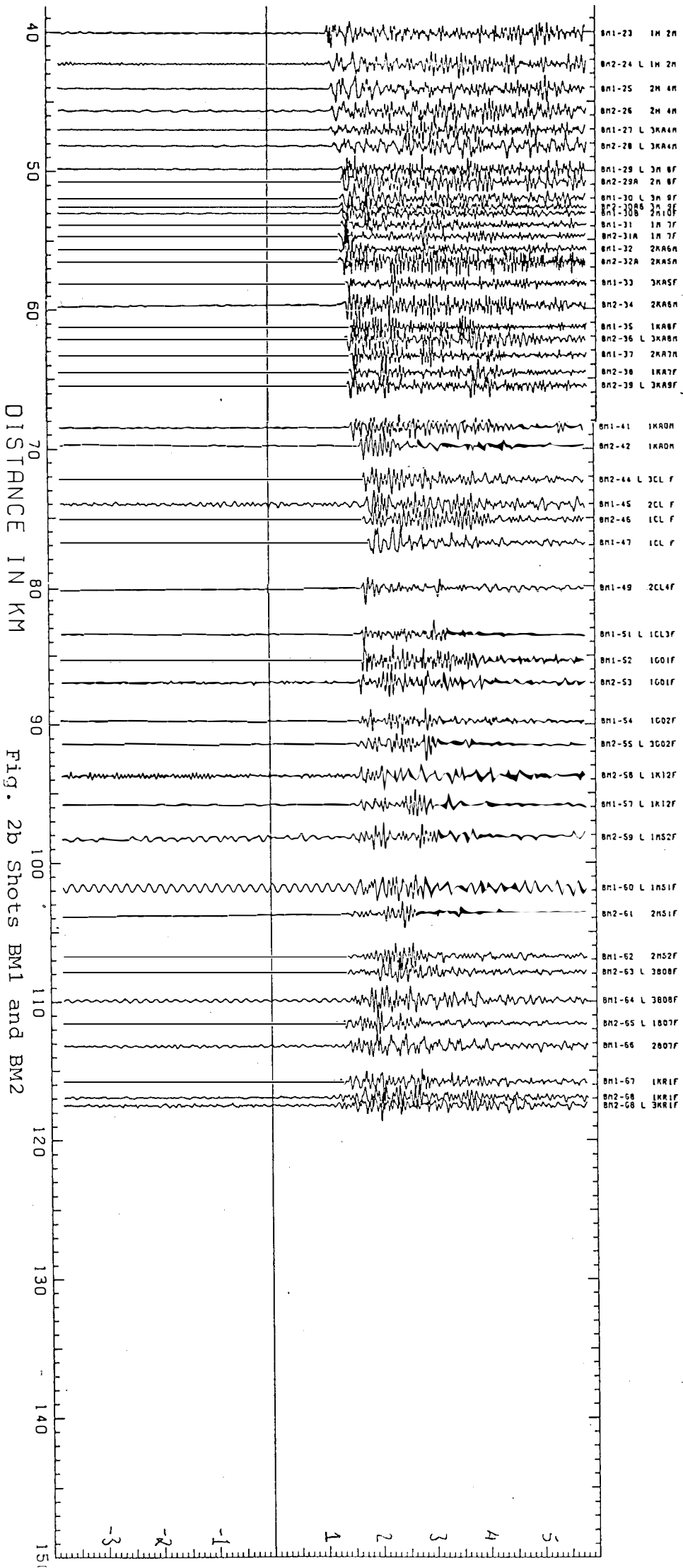
Shot-points and recording lines completed before 1978.

Common-depth point profile completed before 1978.

Shot-points and recording lines completed during 1978-79.

⊙ Cities: AC Aachen, BR Brussels, DO Dortmund, FR Frankfurt, GI Giessen, HD Heidelberg, KA Karlsruhe, KÜ Cologne, KS Kassel, LI Liège, LU Luxembourg, MS Münster, MZ Mainz, NA Namur, RE Rheims, SB Saarbrücken, ST Stuttgart, WÜ Würzburg.





REDUCED TIME IN SEC

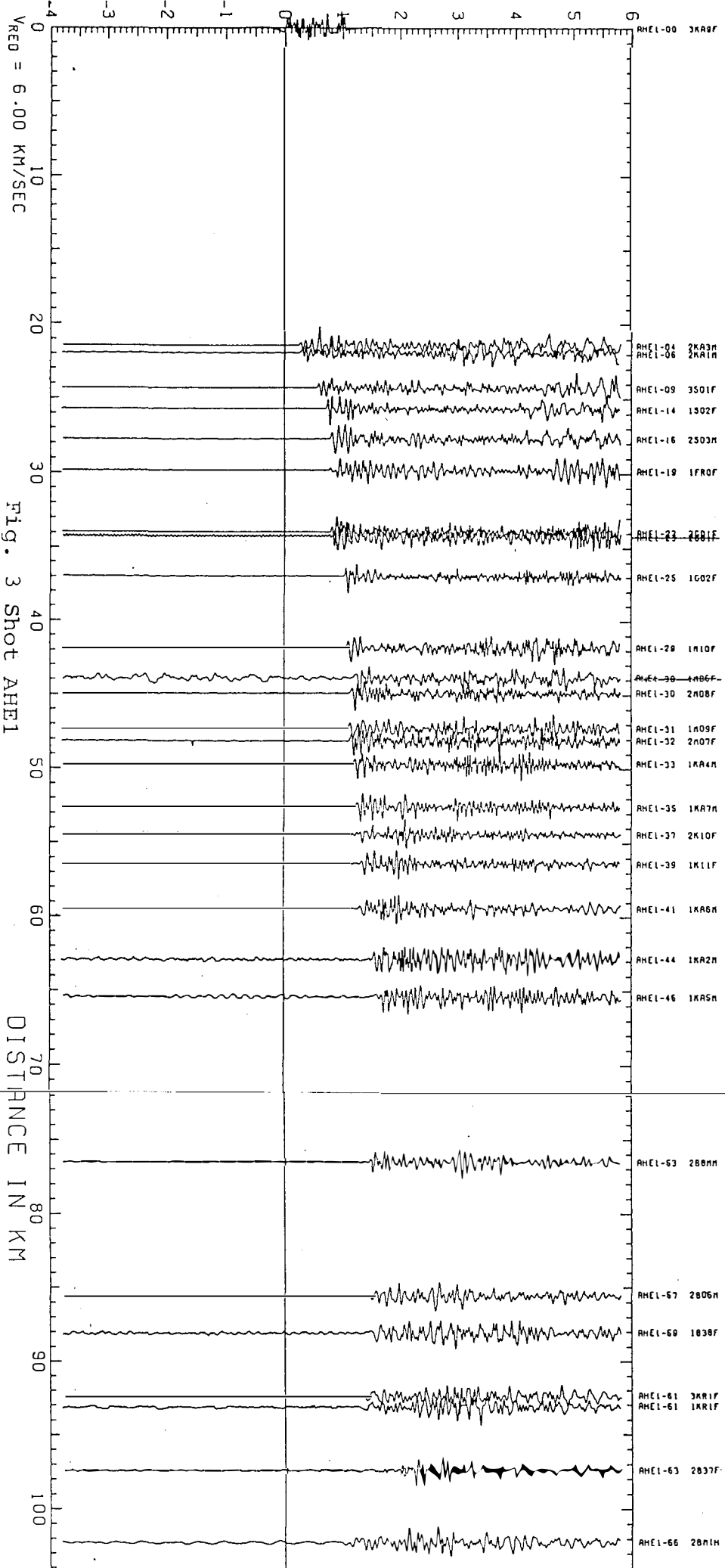
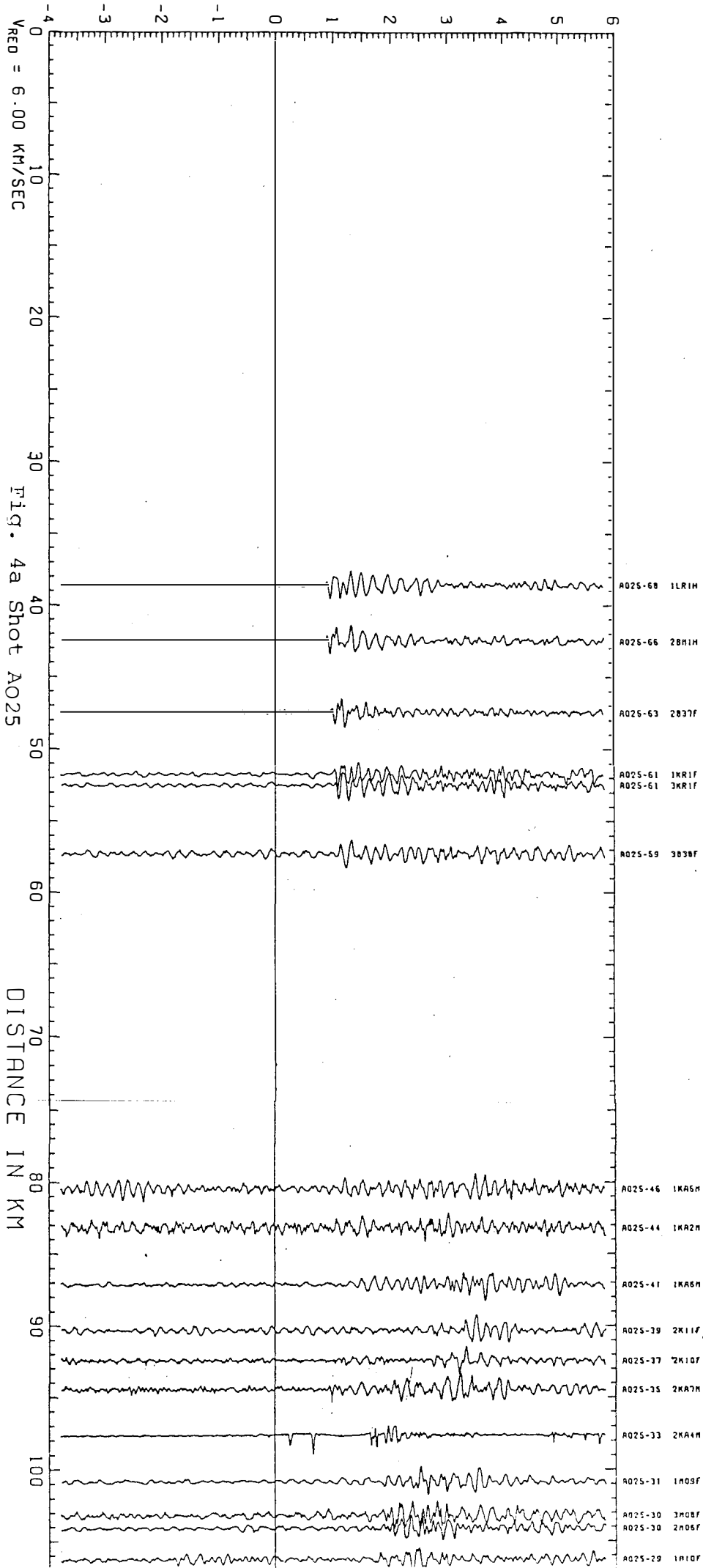


Fig. 3 Shot AHE1

REDUCED TIME IN SEC



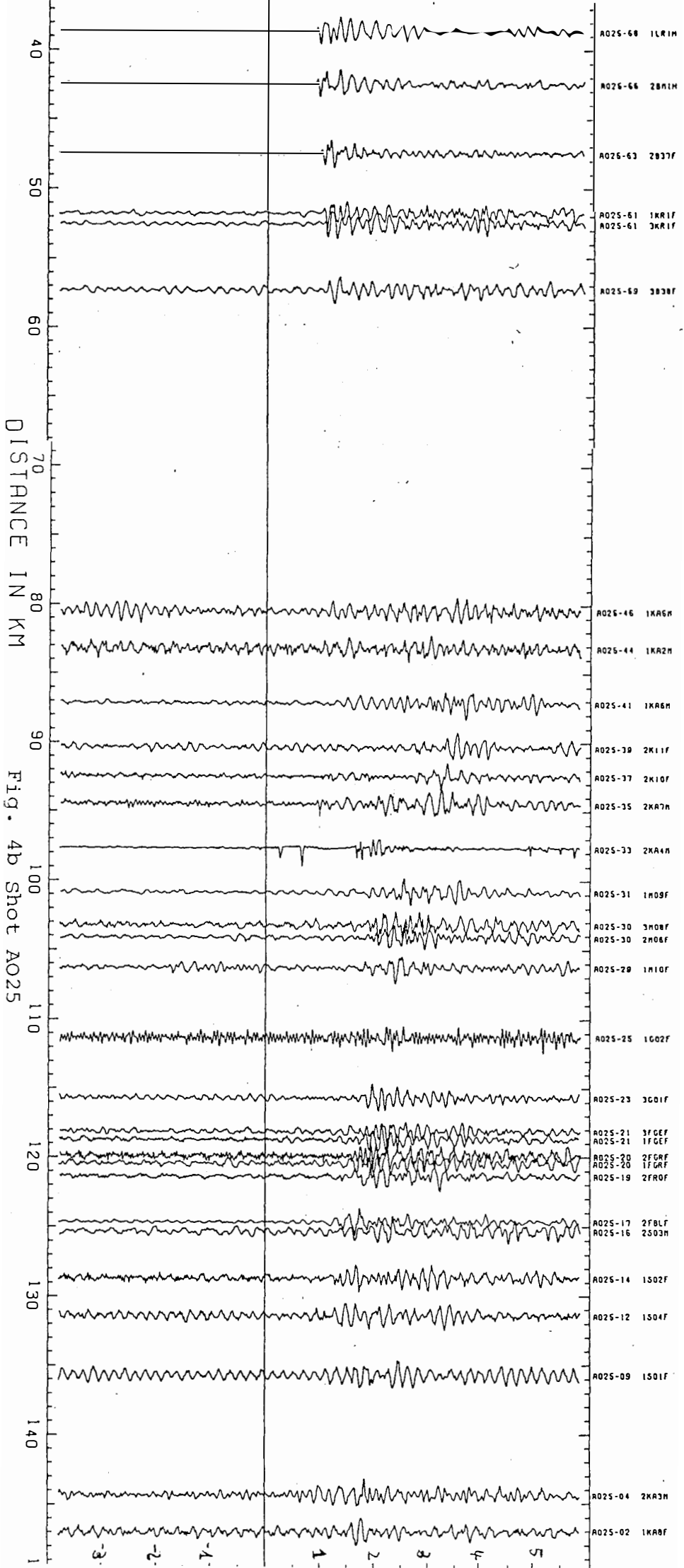
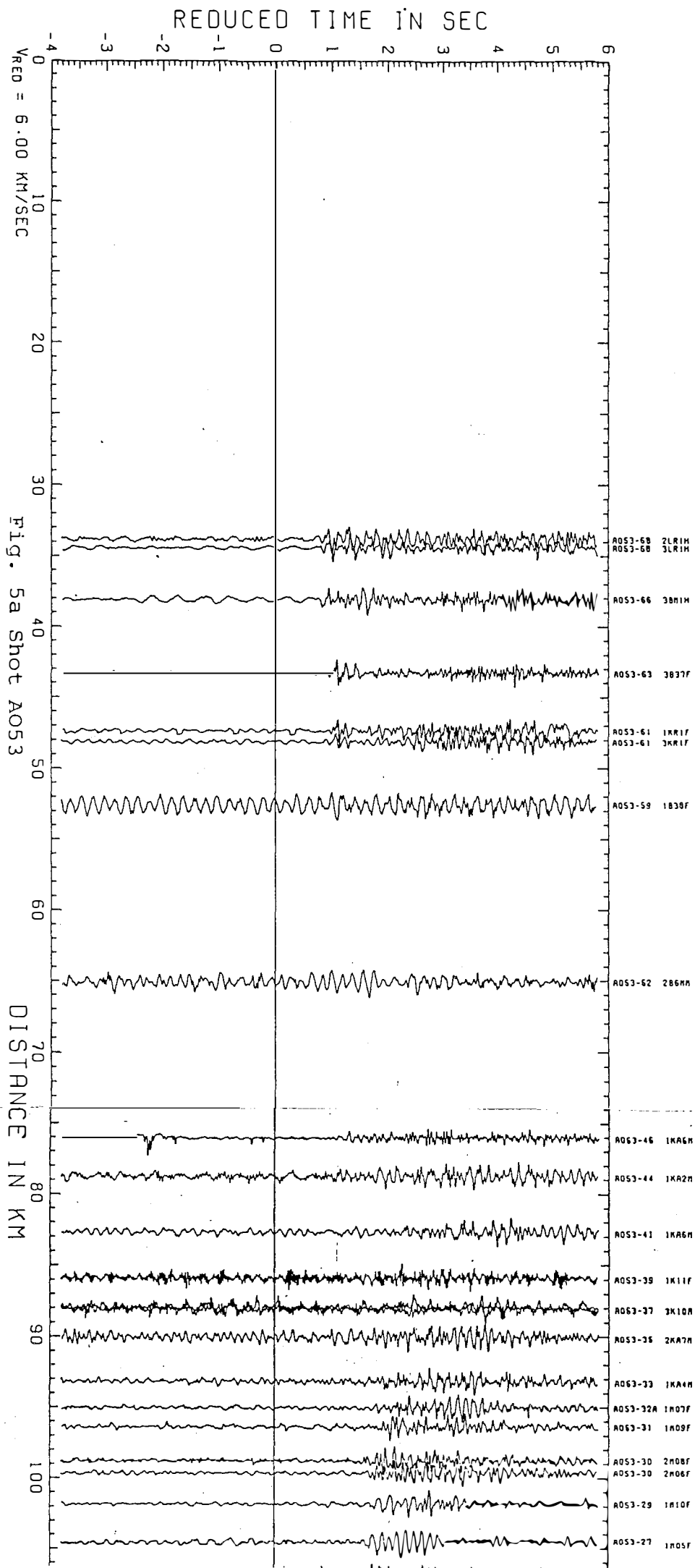


Fig. 4b Shot A025



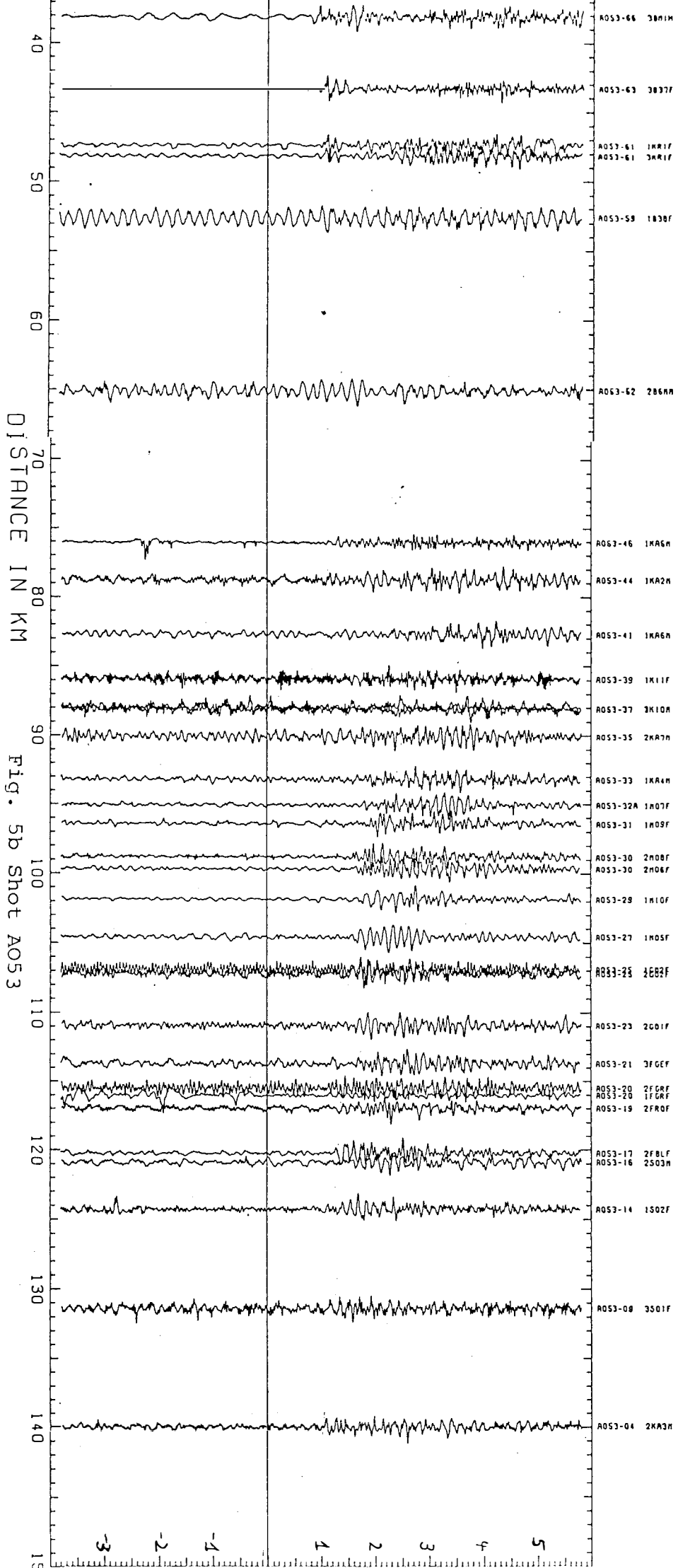
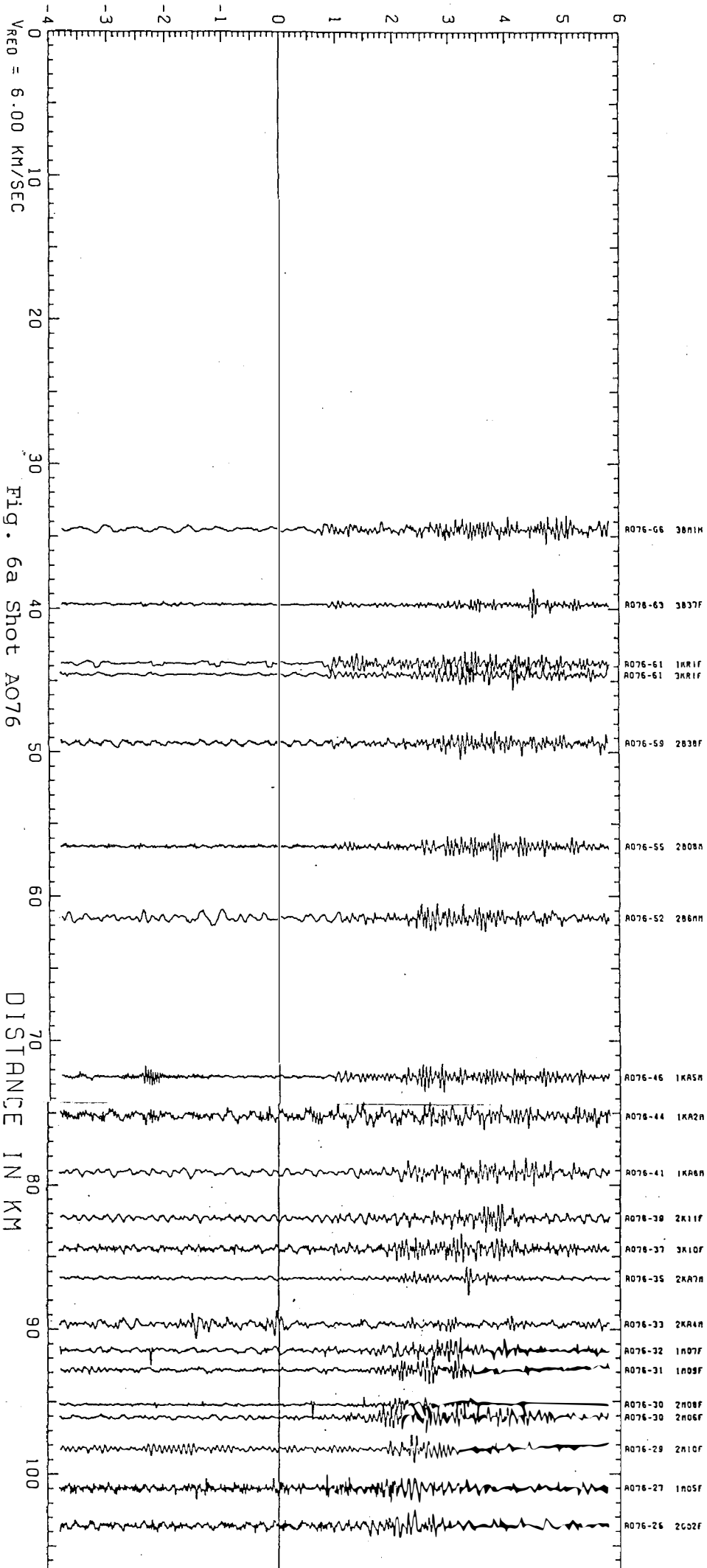
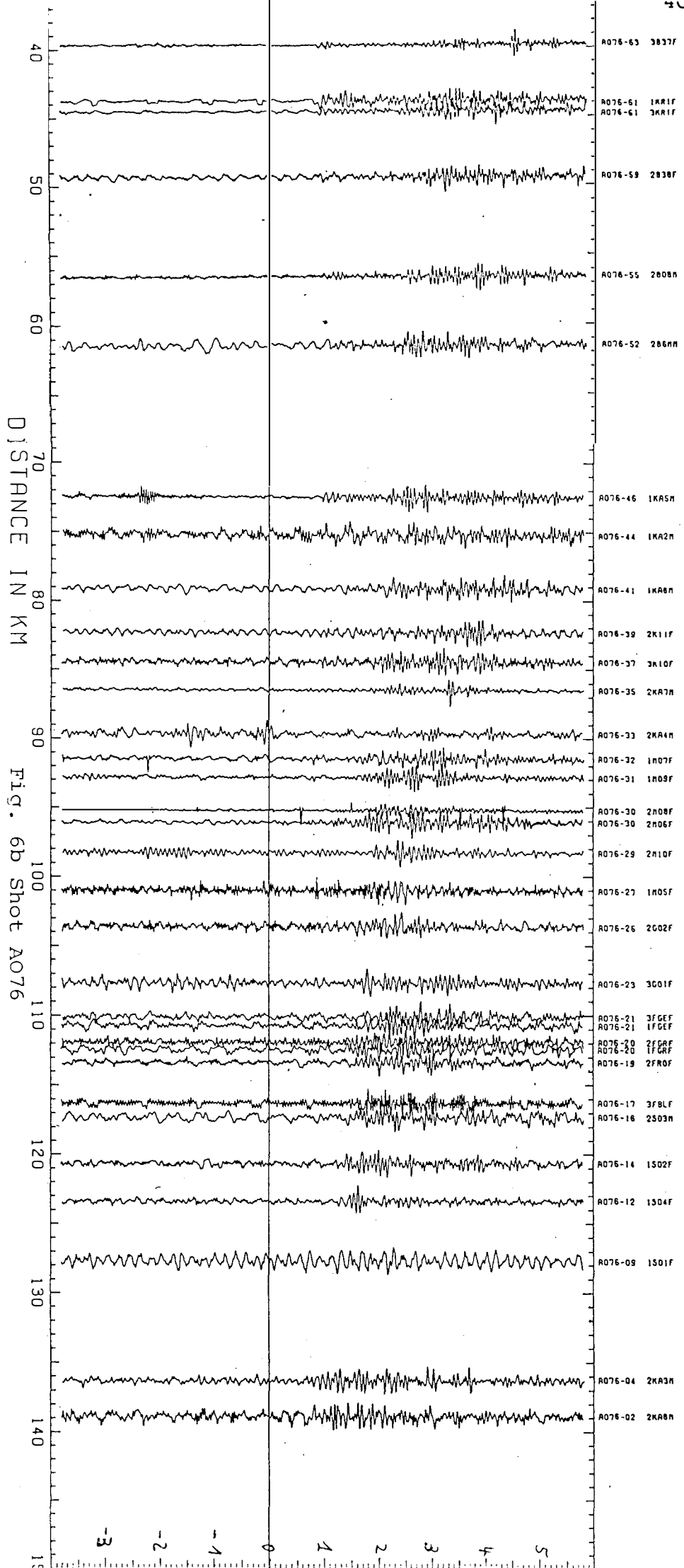


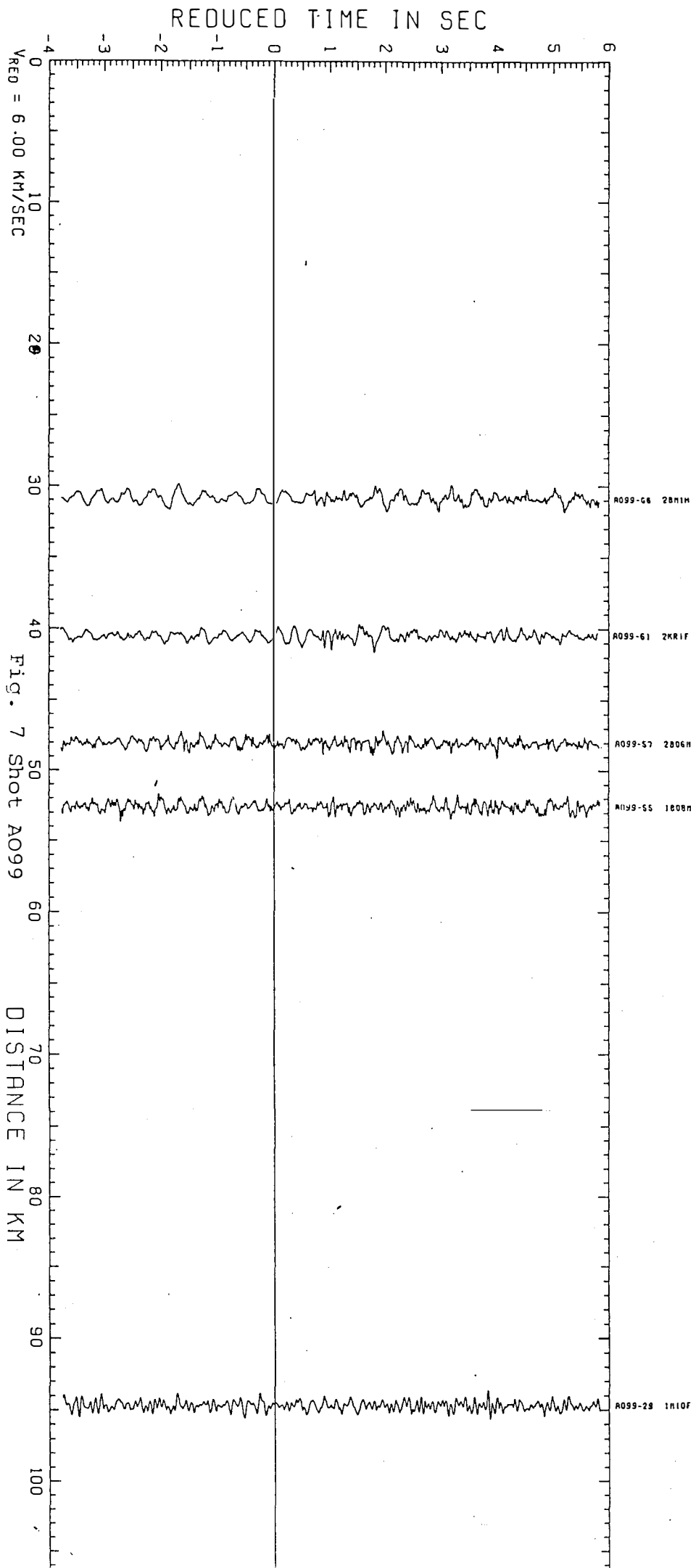
Fig. 5b Shot A053

0 1 2 3 4 5

REDUCED TIME IN SEC







04.08.81 VERTICAL 1.3 HZ TO 33.0 HZ (80.13/2)

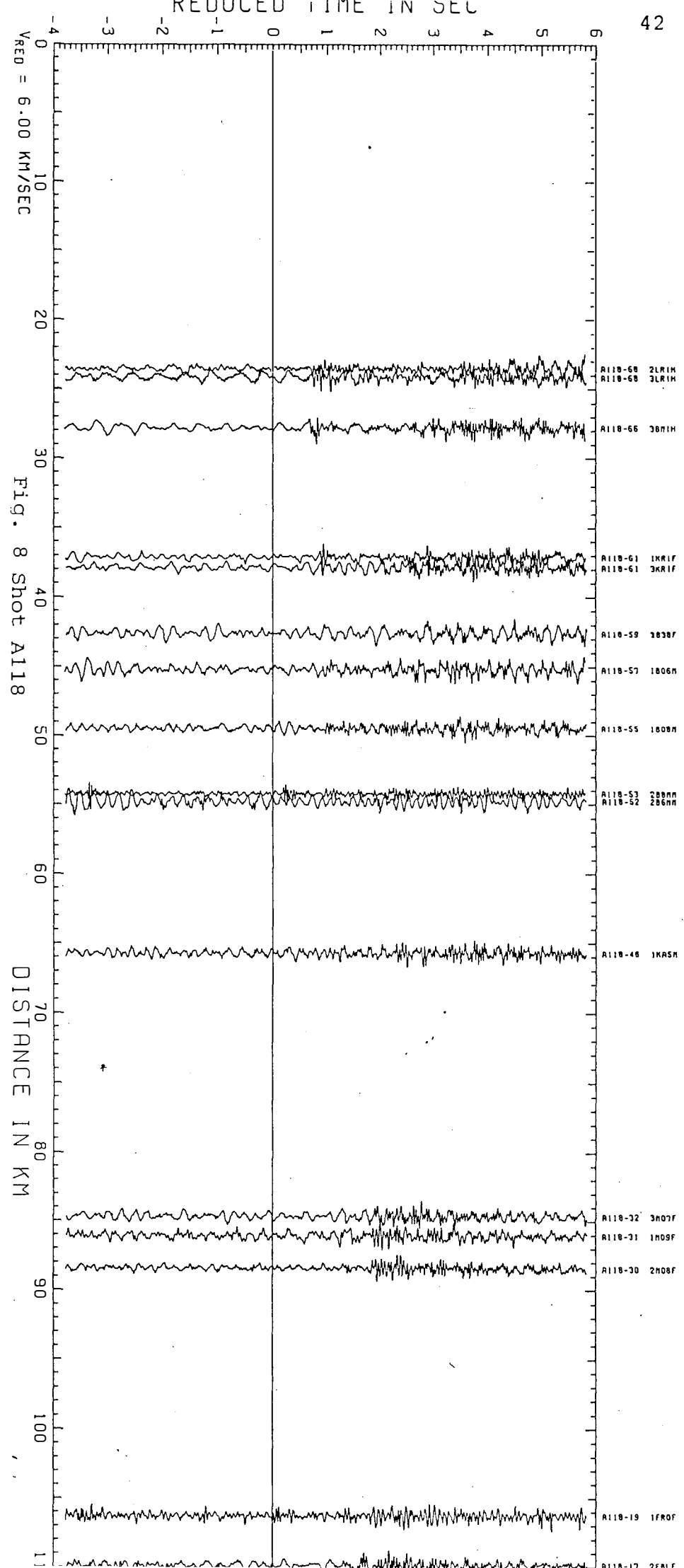
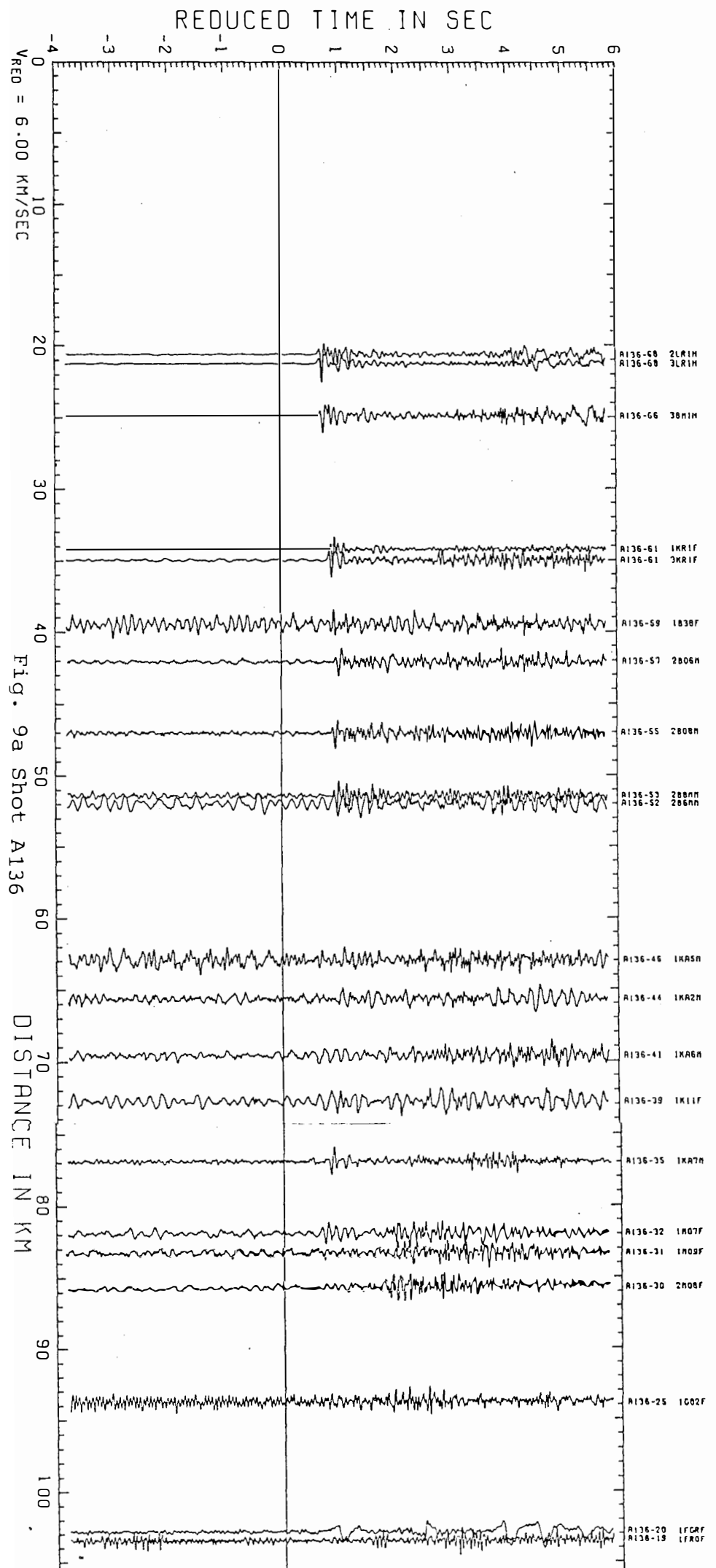


Fig. 8 Shot A118



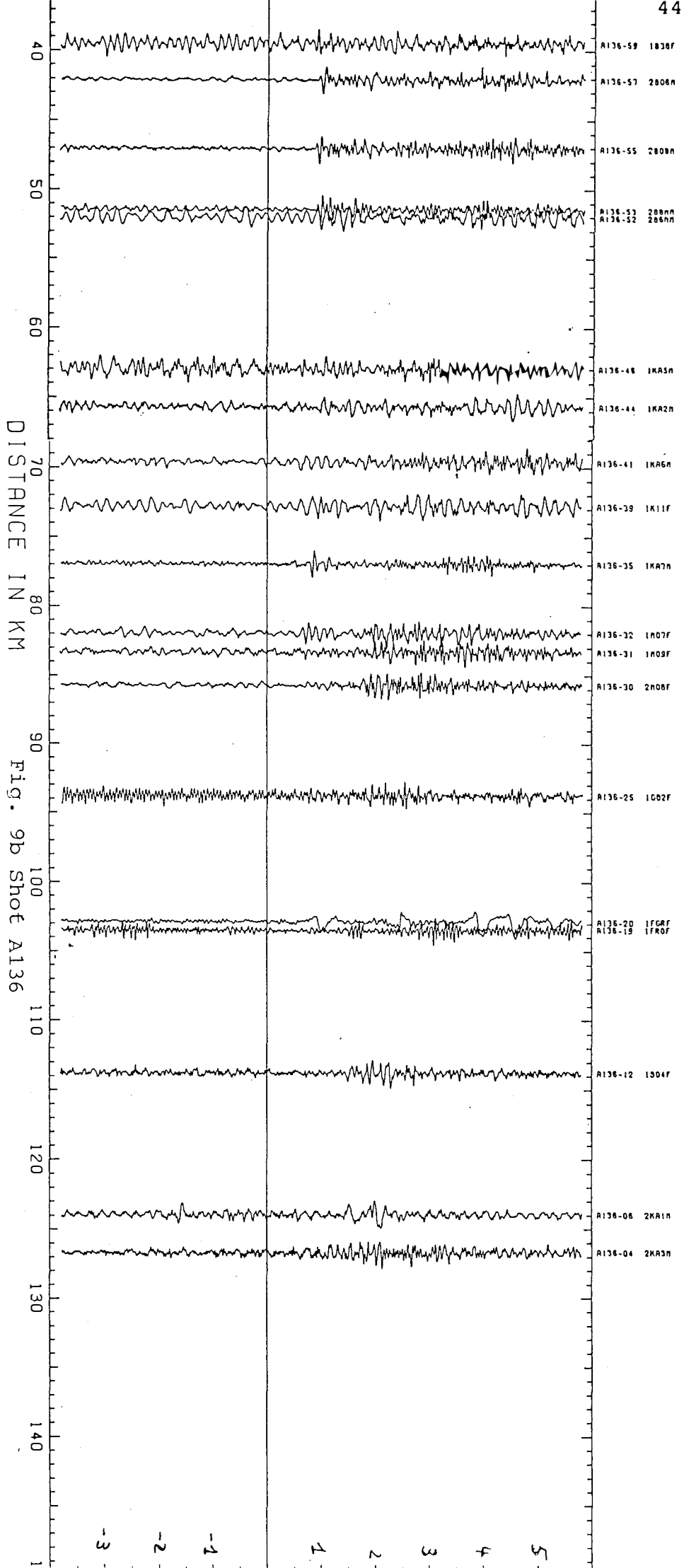


Fig. 9b Shot A136

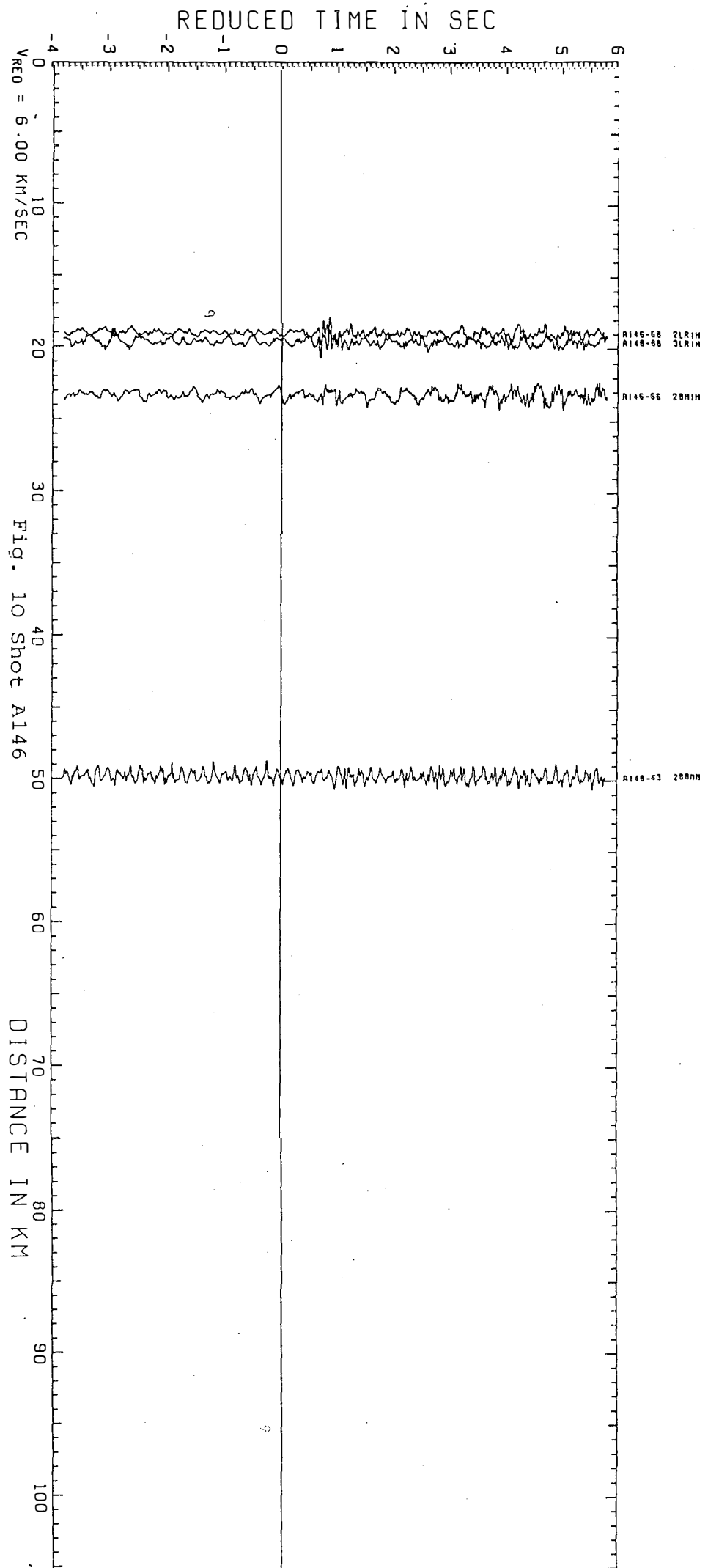
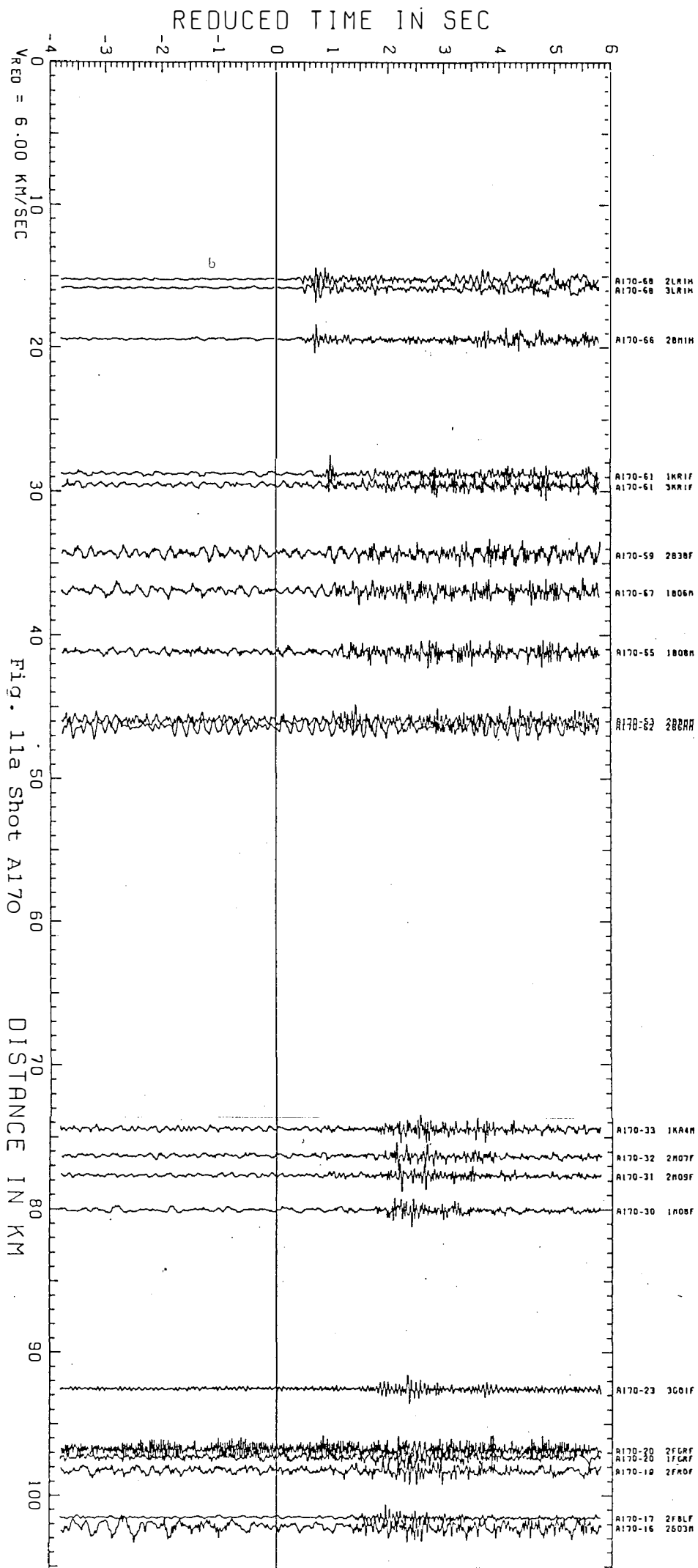


Fig. 10 Shot A146



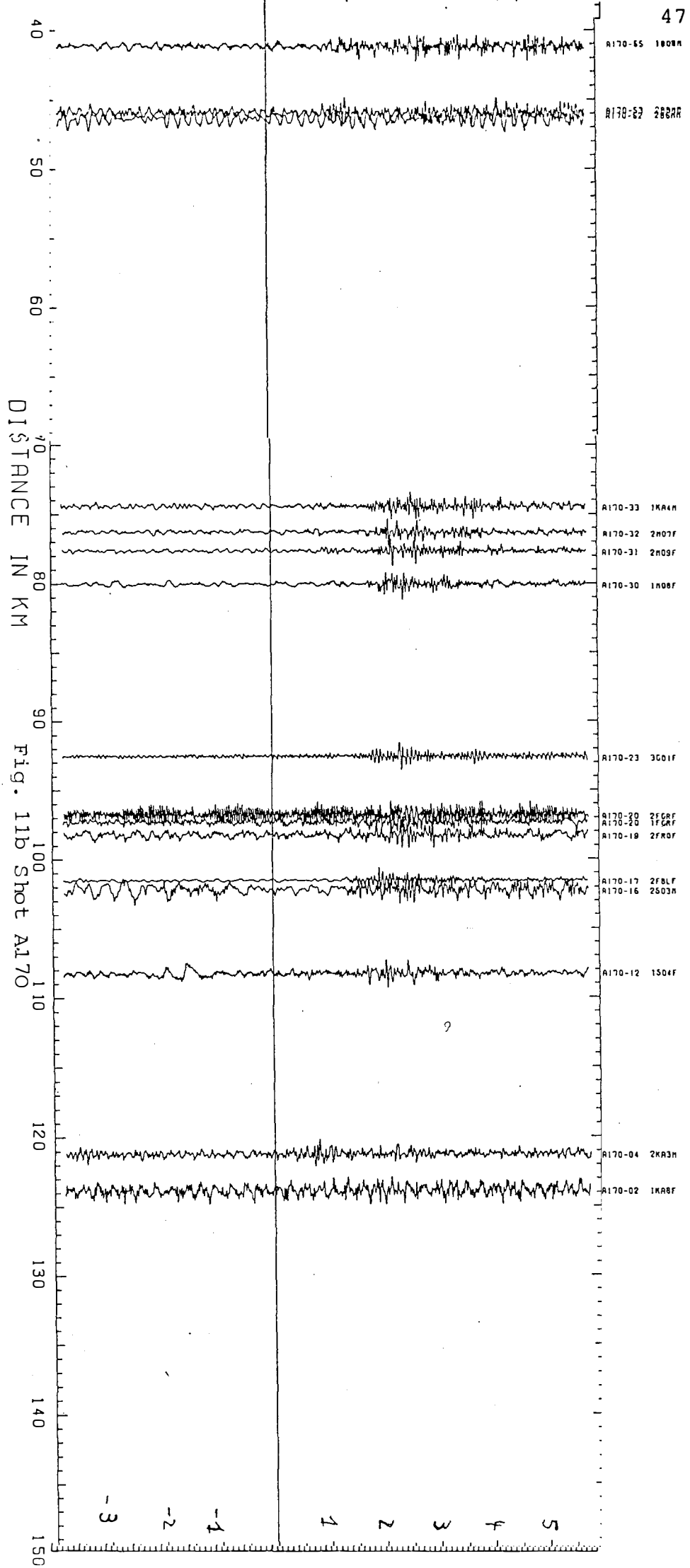
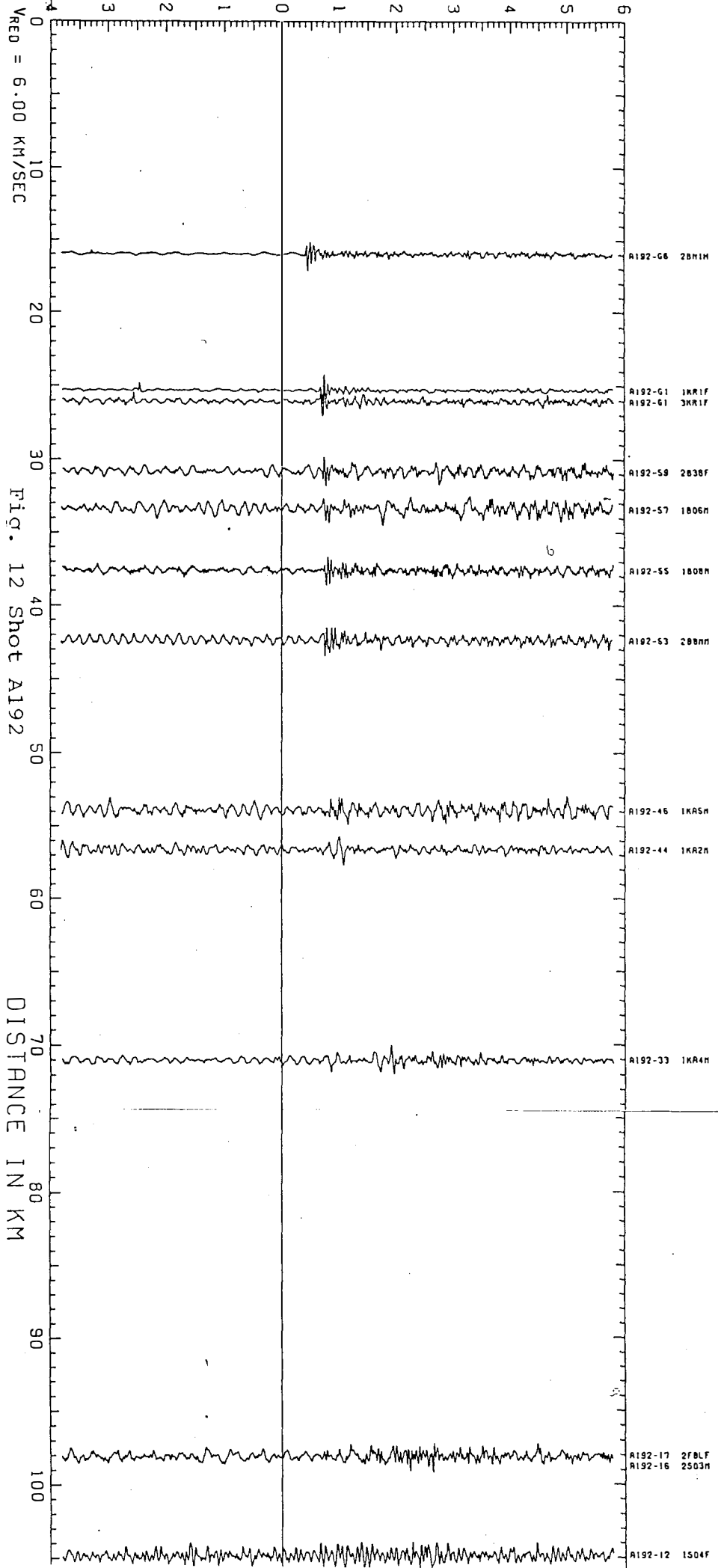
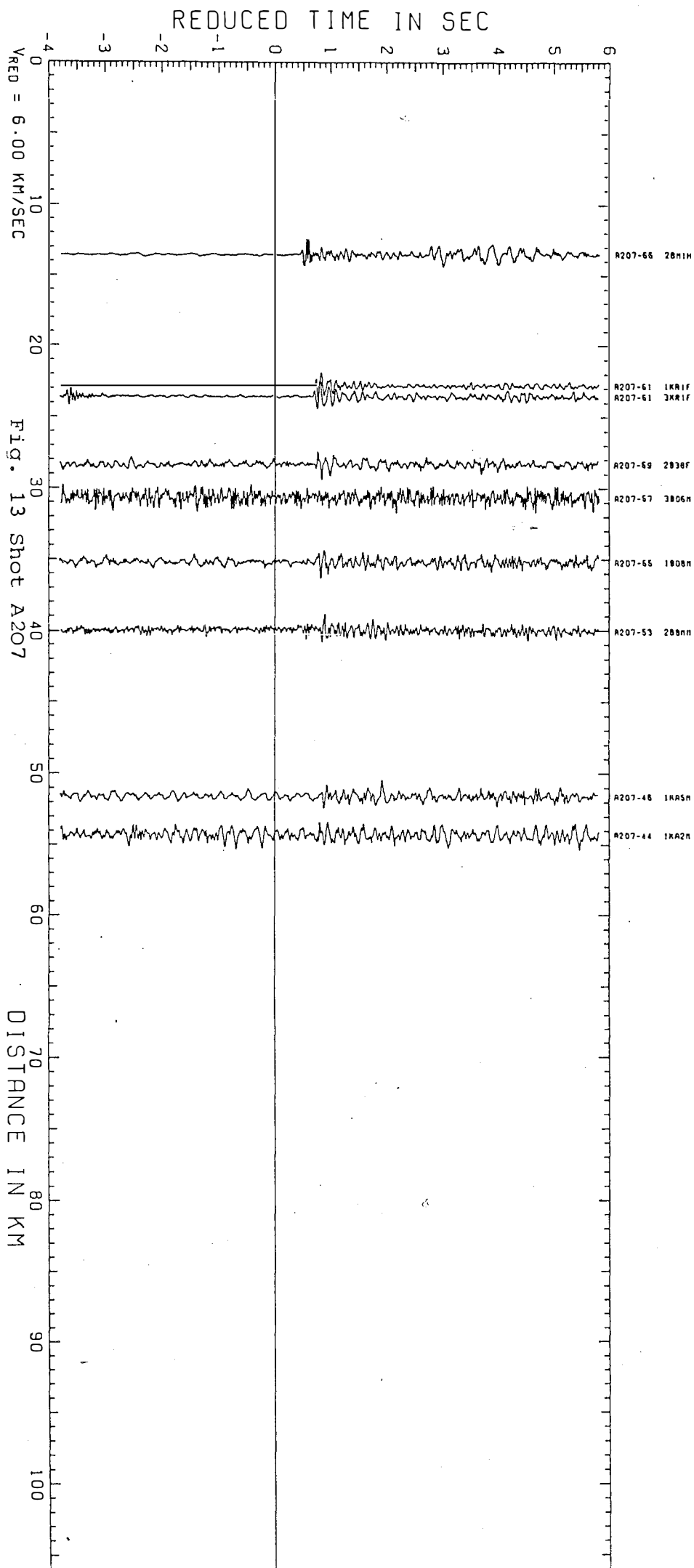


Fig. 11b Shot A170

5 4 3 2 1
-1 -2 -3

REDUCED TIME IN SEC





10.08.81 VERTICAL 1.3 HZ TO 33.0 HZ (80, 13/2)

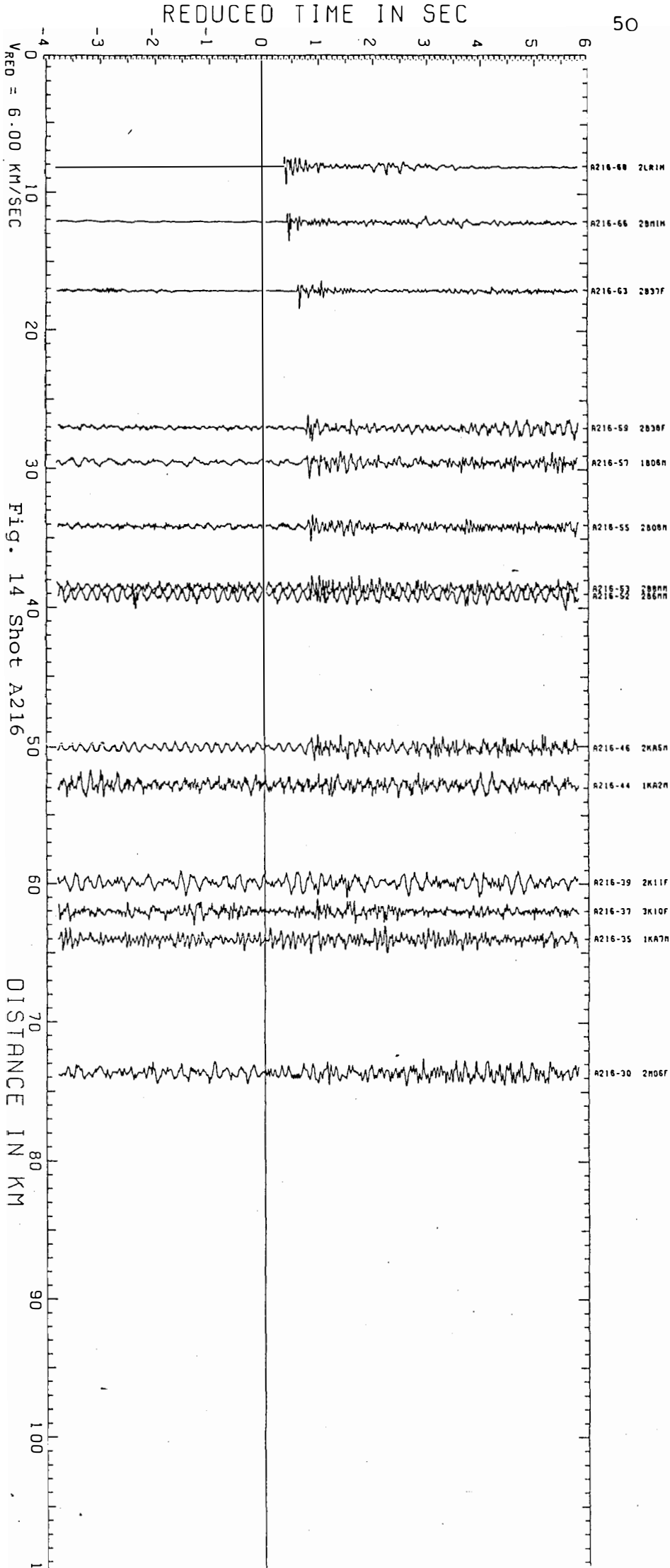


Fig. 14 Shot A216

VRED = 6.00 KM/SEC

REDUCED TIME IN SEC

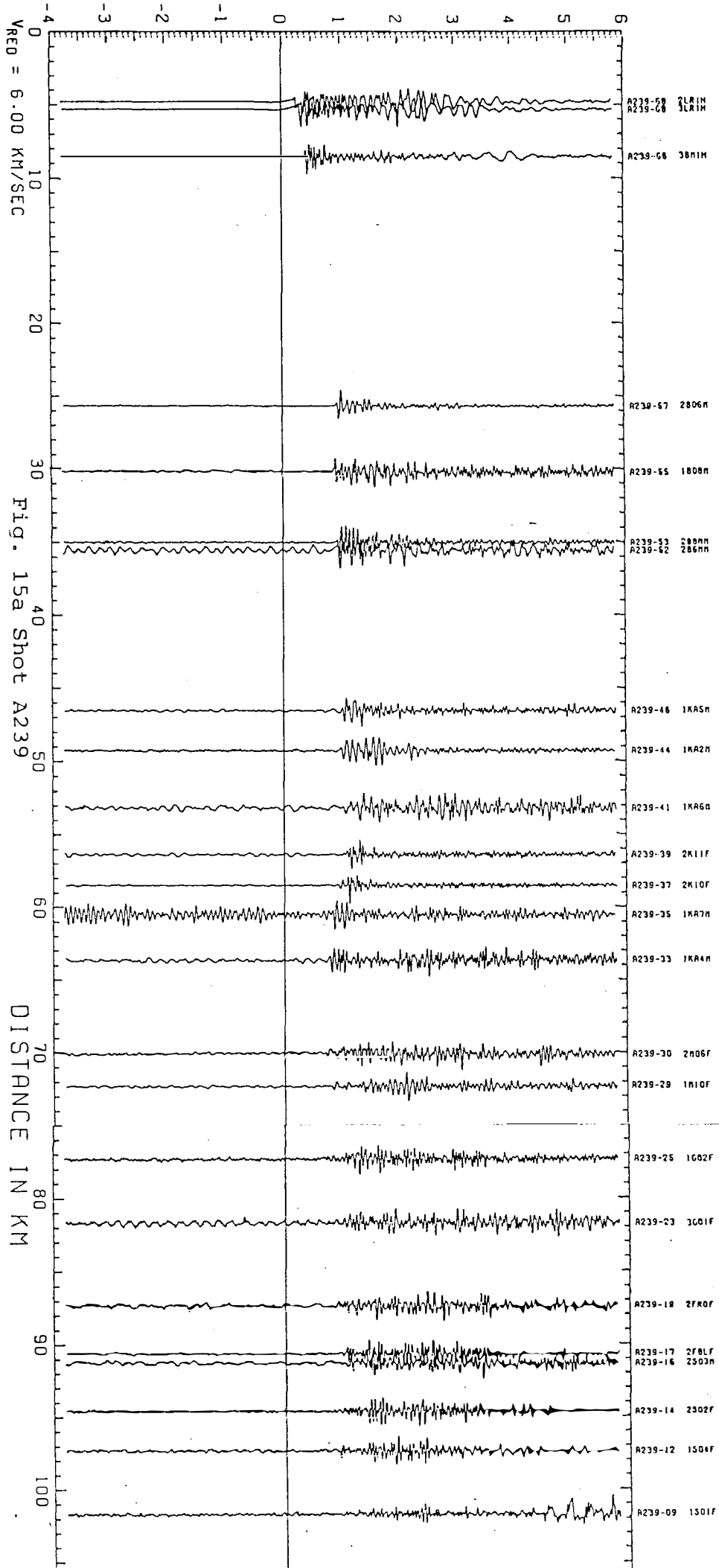


Fig. 15a Shot A239

DISTANCE IN KM

V_{RED} = 6.00 KM/SEC

12.08.81 VERTICAL 1.5 HZ TO 33.0 HZ (60.15/2)

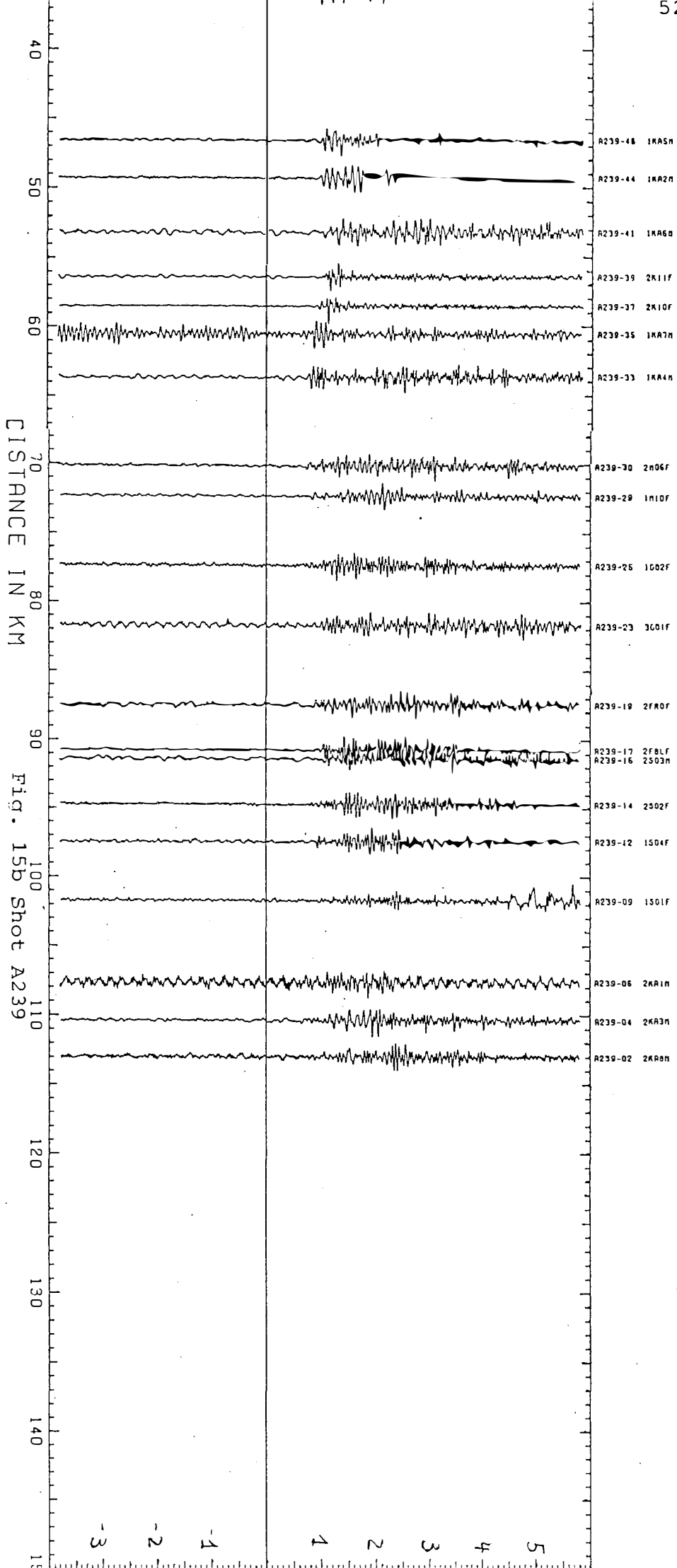
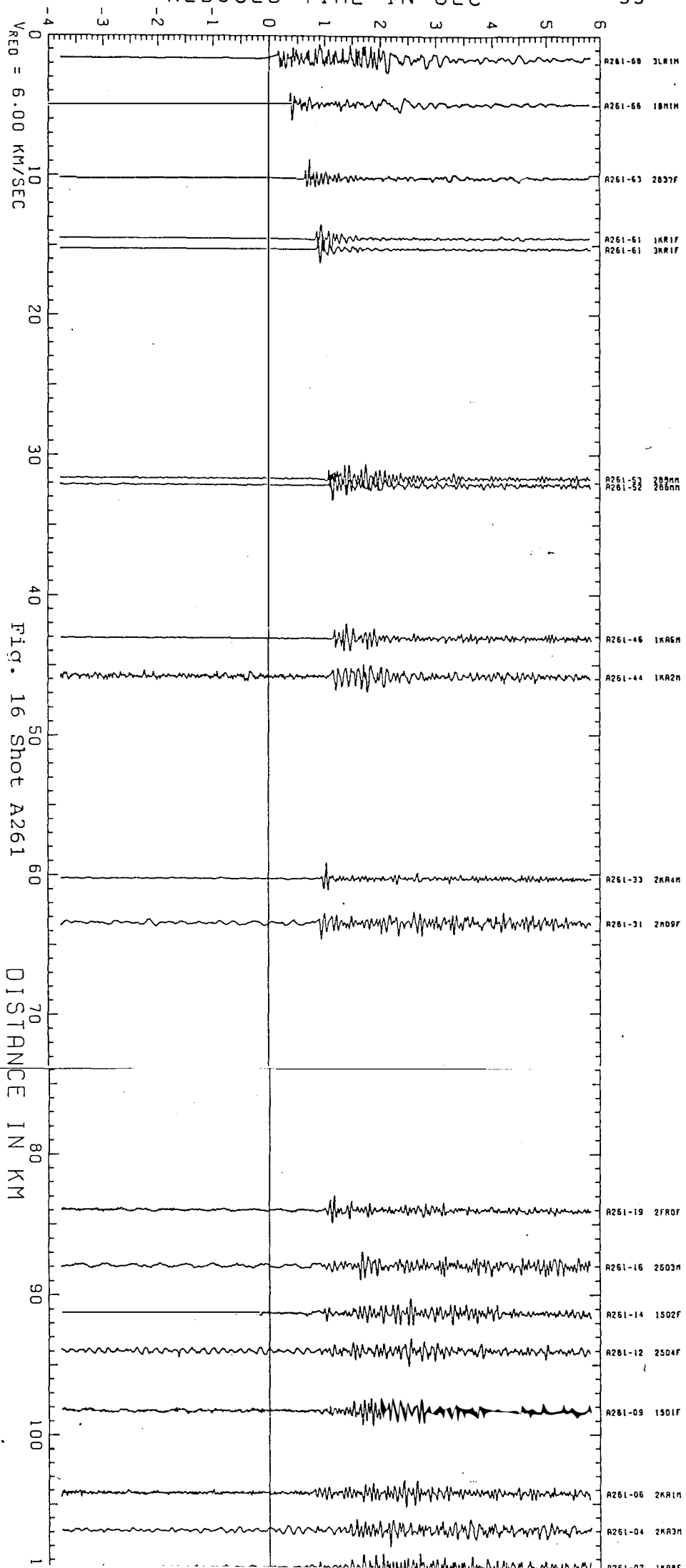


Fig. 15b Shot A239

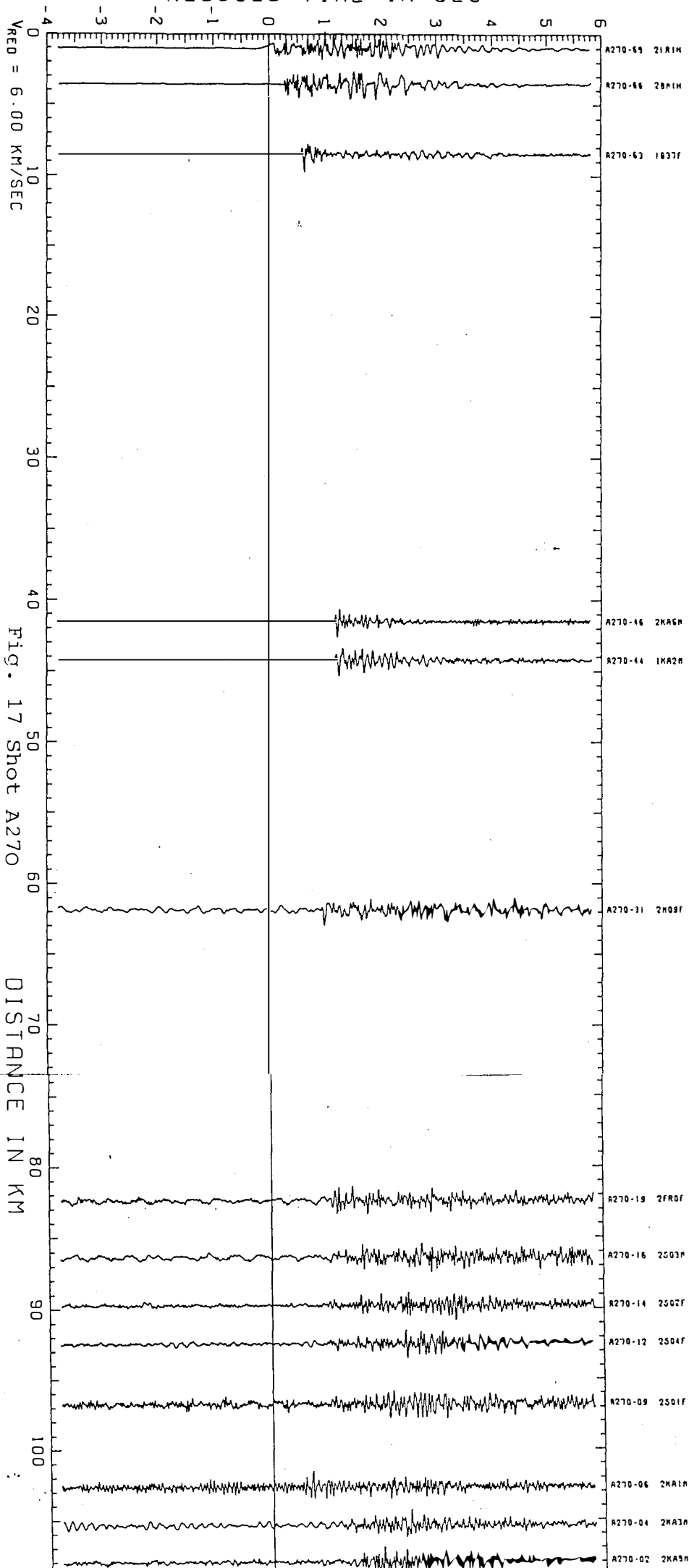
5
4
3
2
1
-1
-2
-3



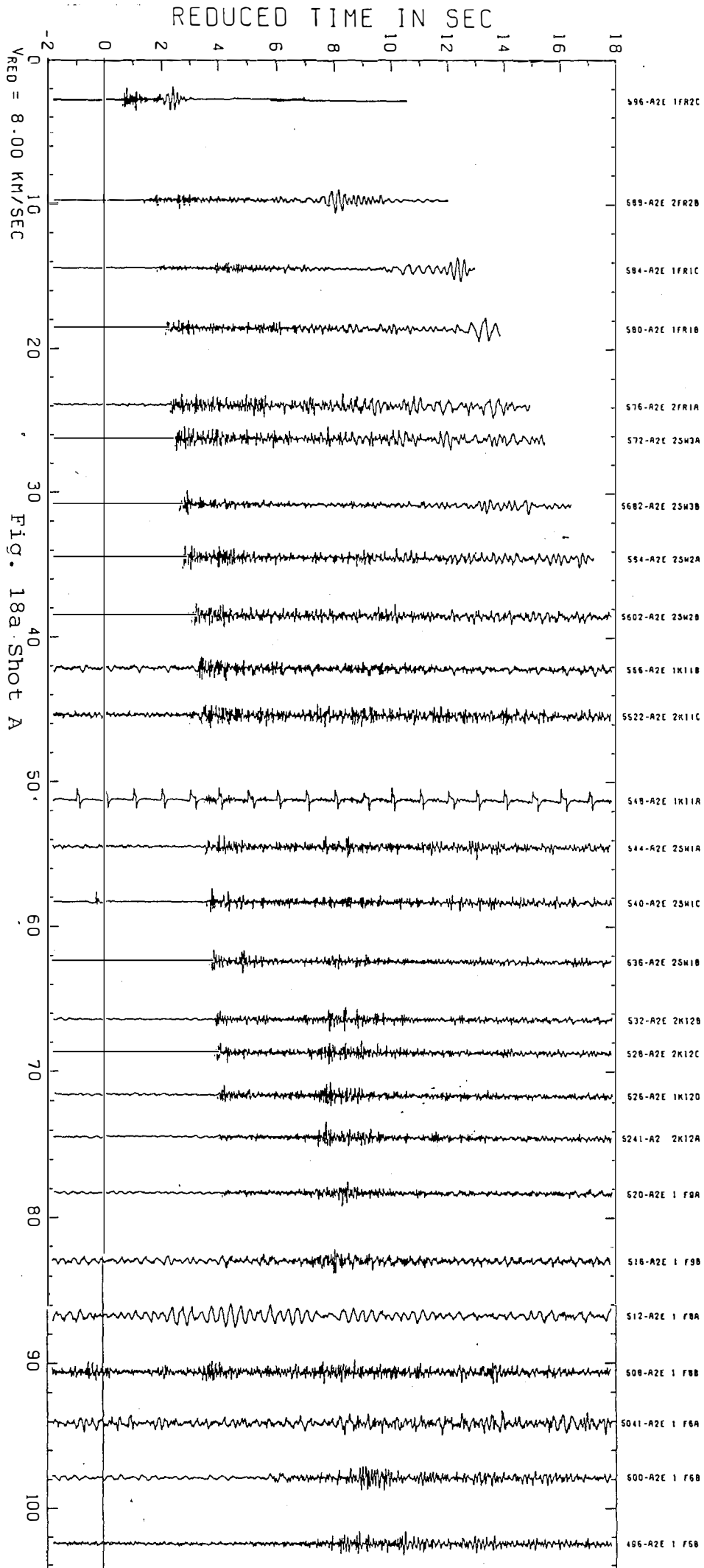
VRED = 6.00 KM/SEC

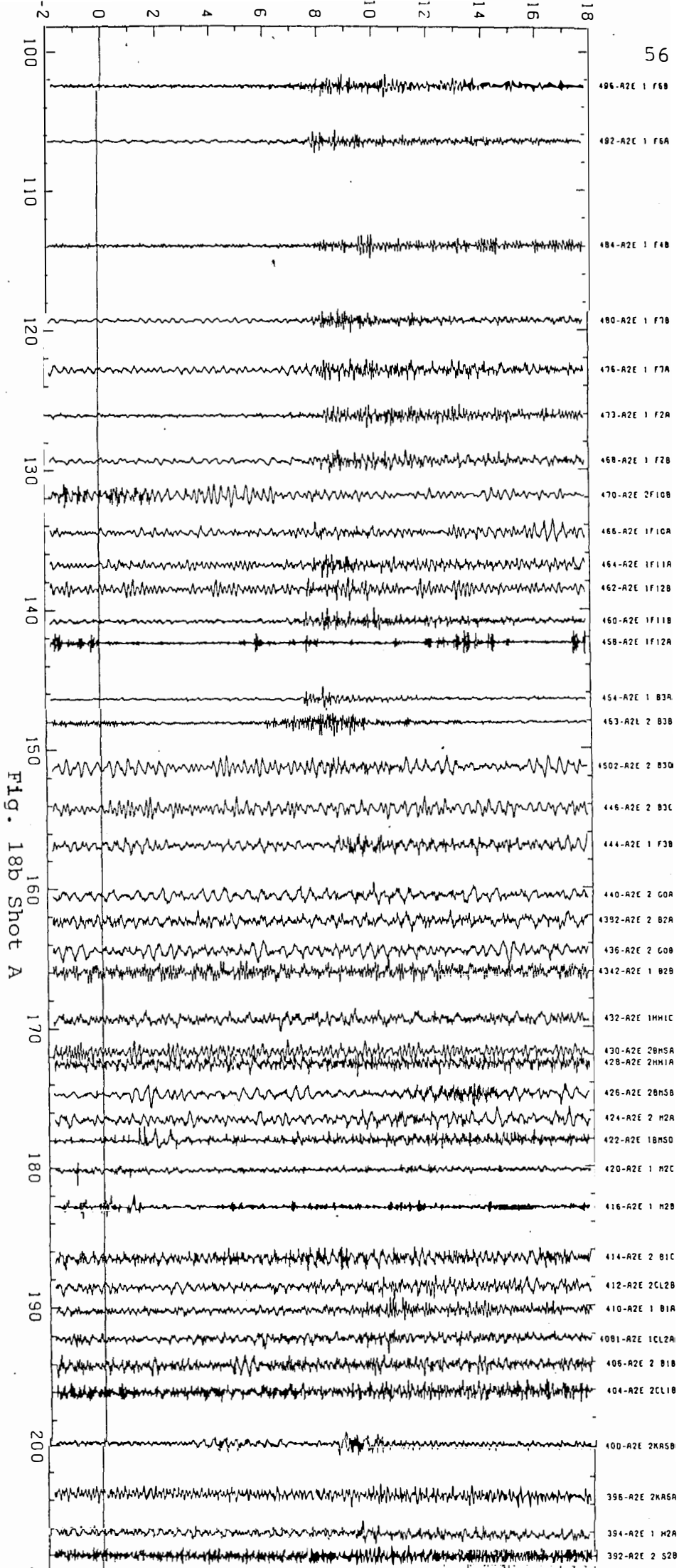
Fig. 16 Shot A261

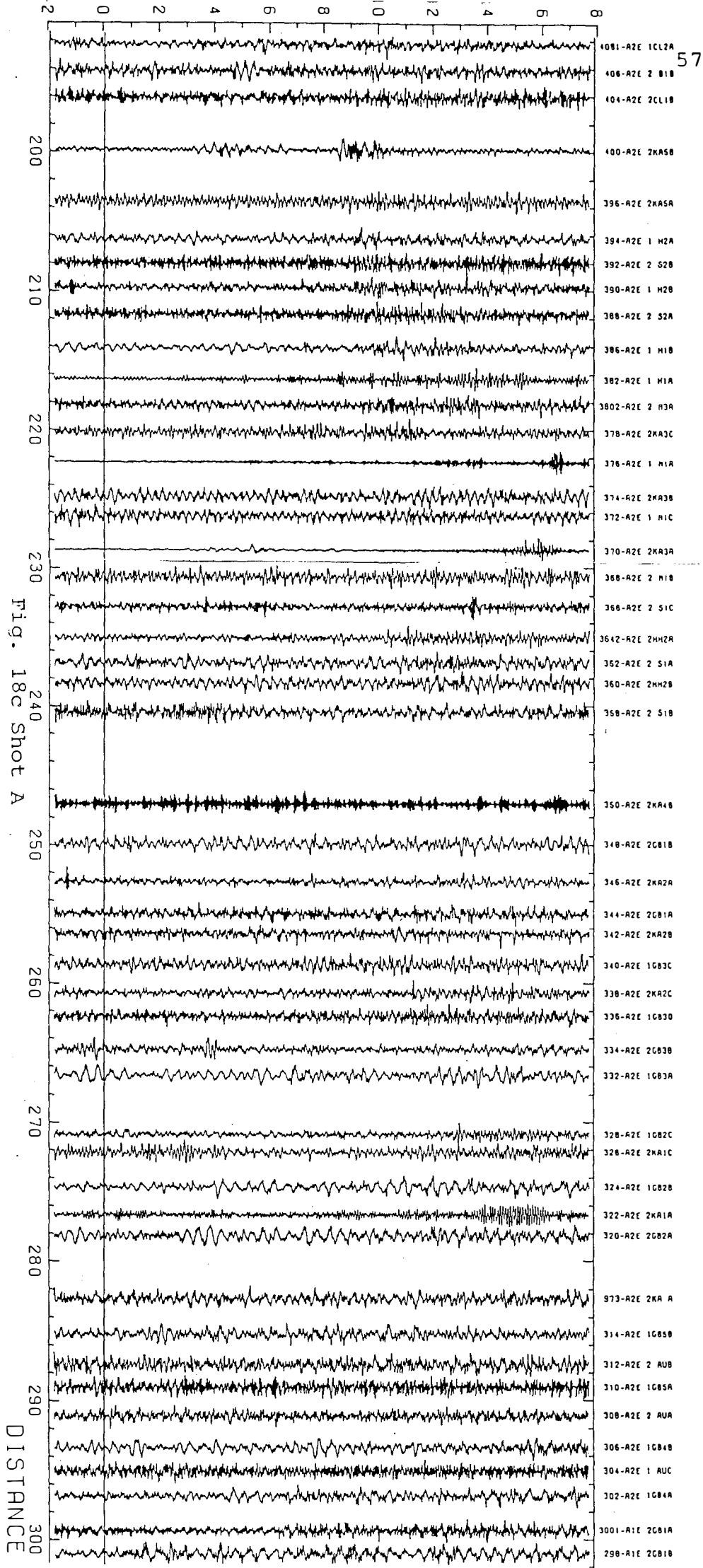
14.08.81 VERTICAL 1.3 HZ TO 33.0 HZ (80.13/2)

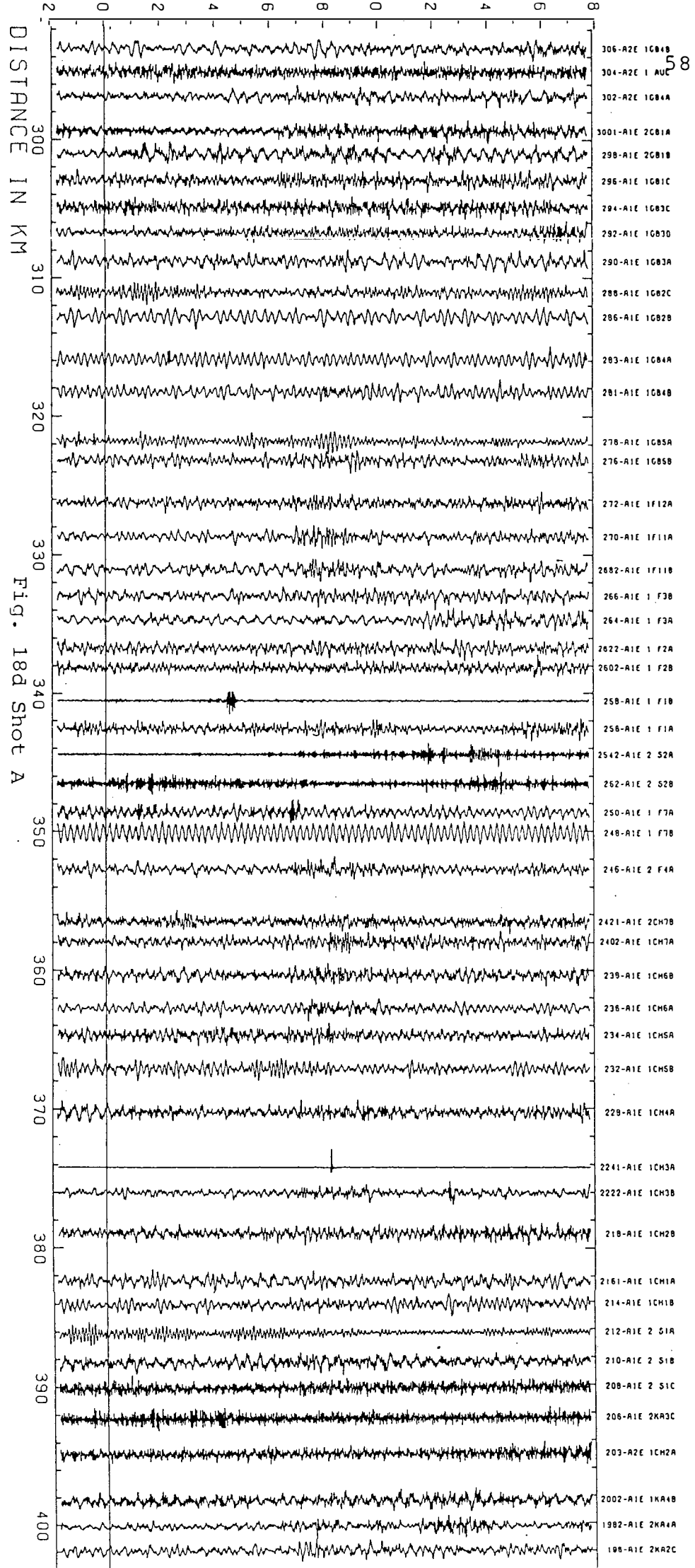


VERTICAL 1.3 HZ TO 33.0 HZ (80.13/2)









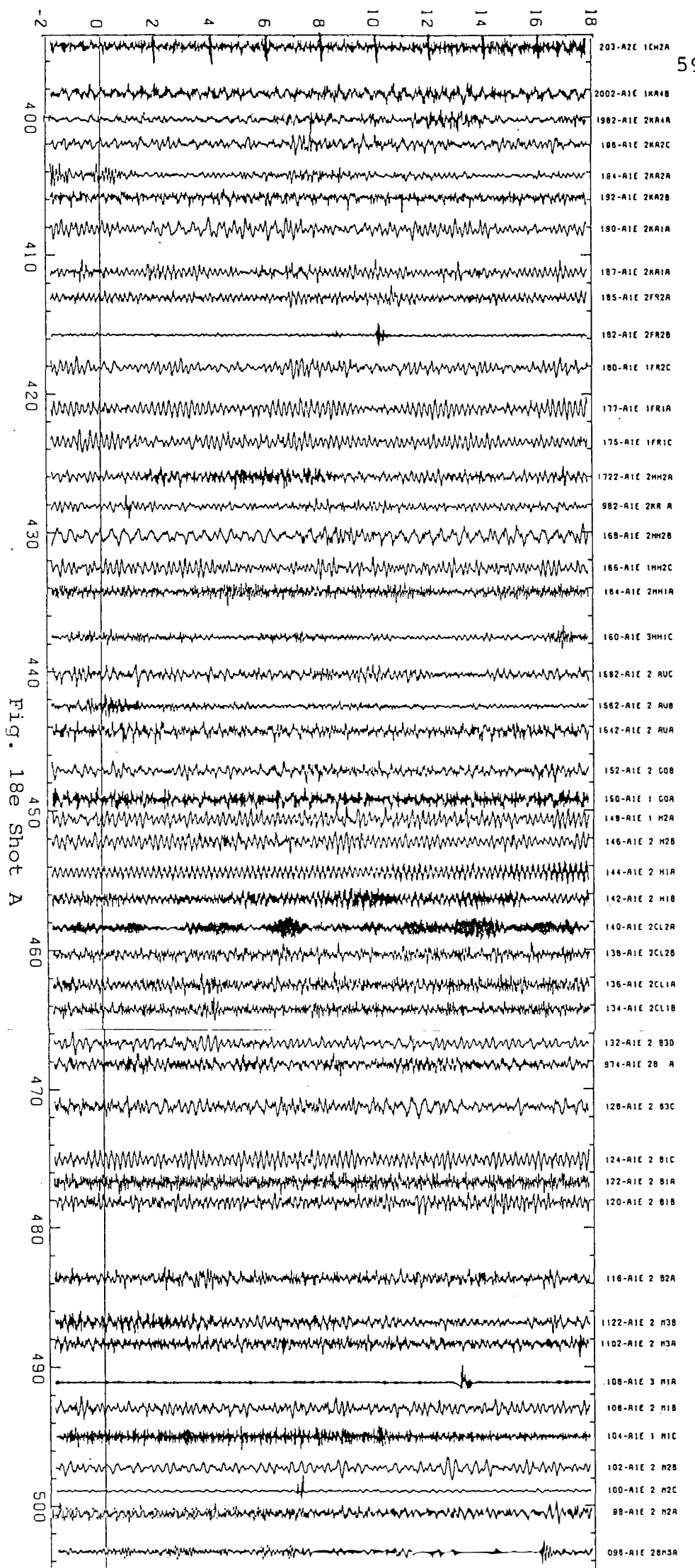
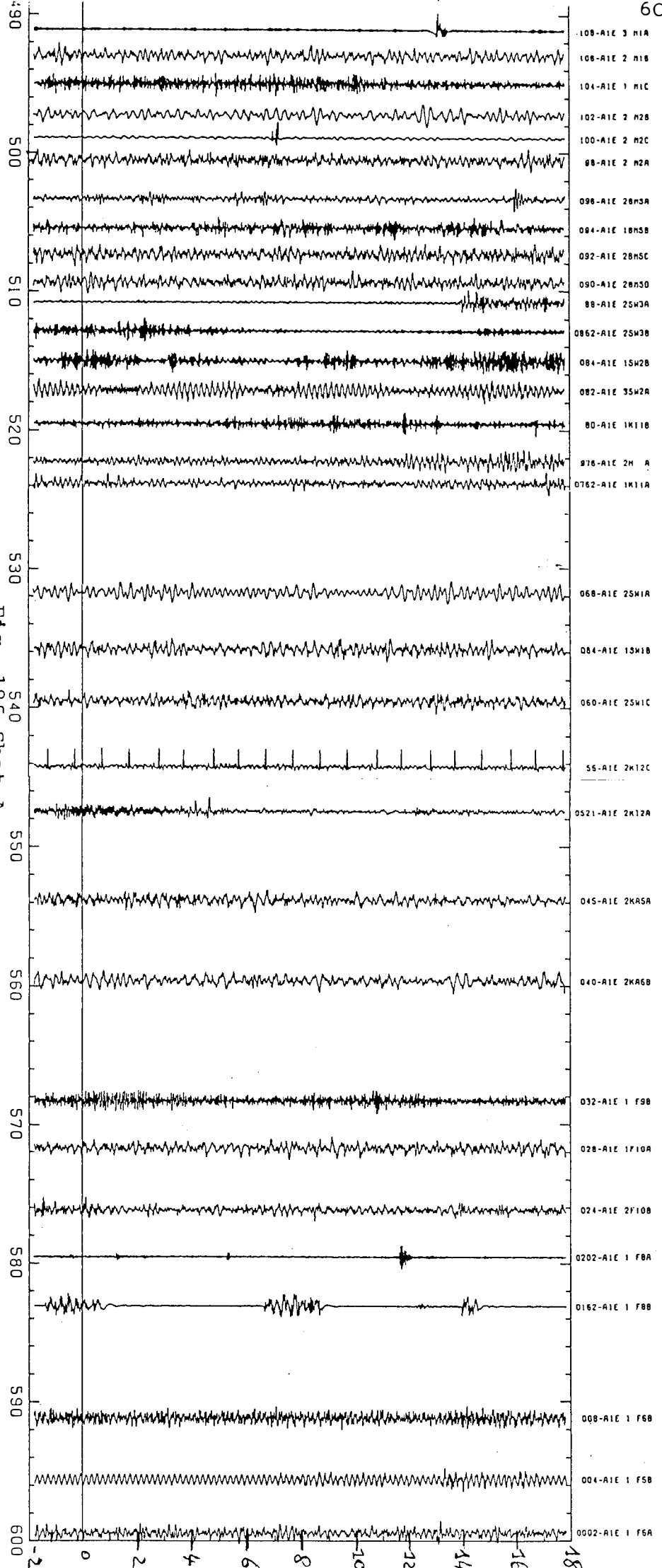
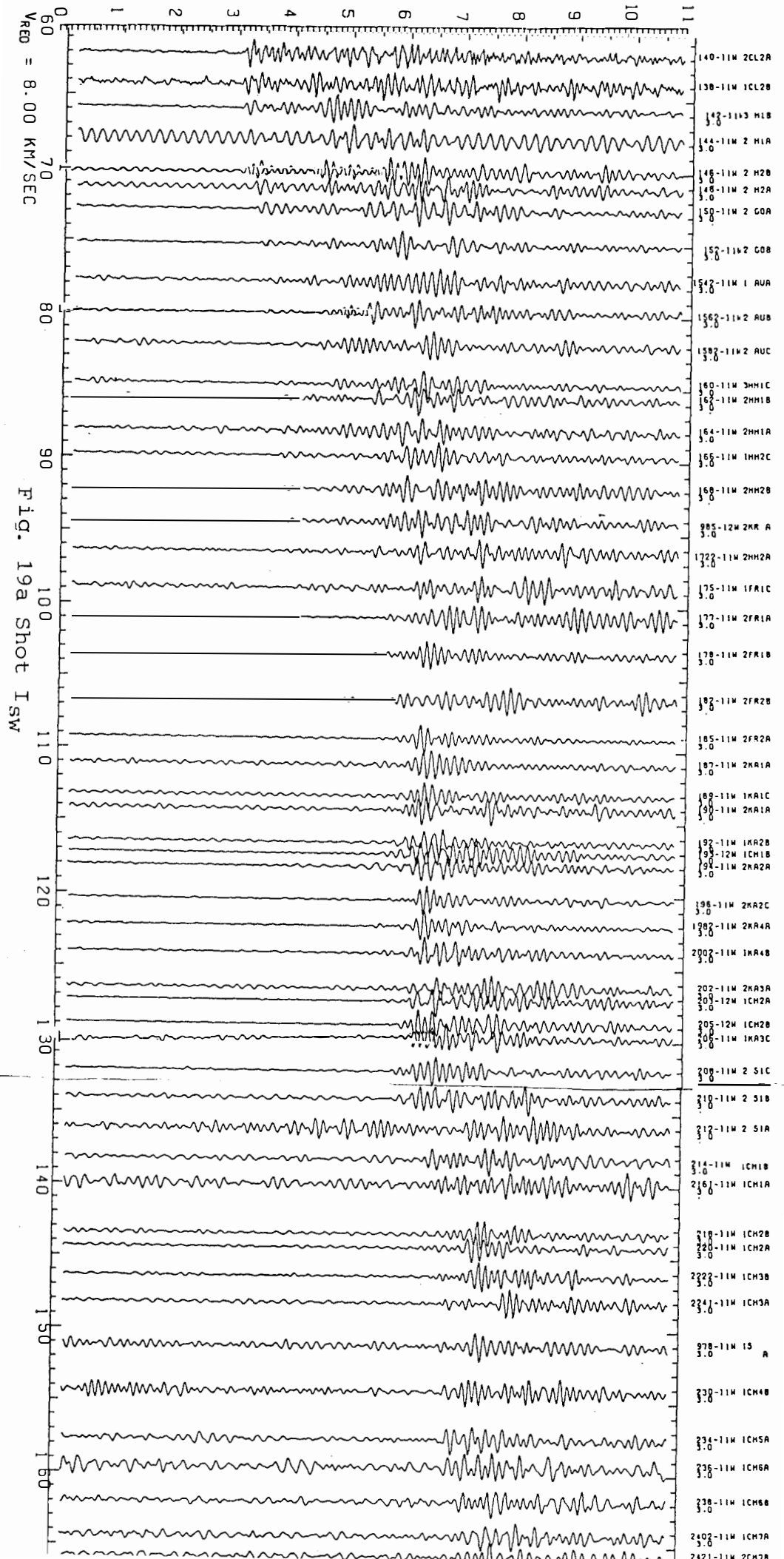


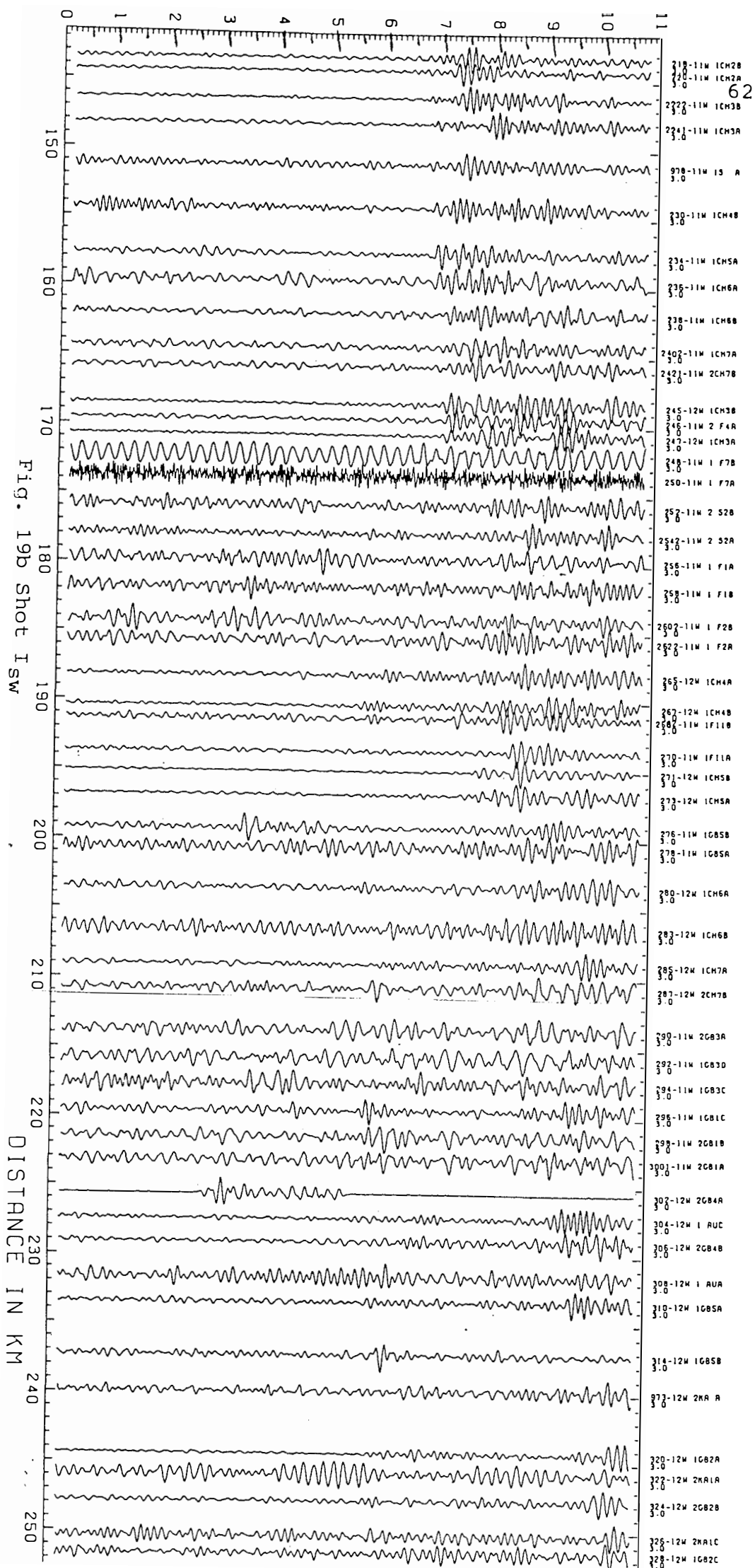
Fig. 18e Shot A

Fig. 18F Shot A



REDUCED TIME IN SEC





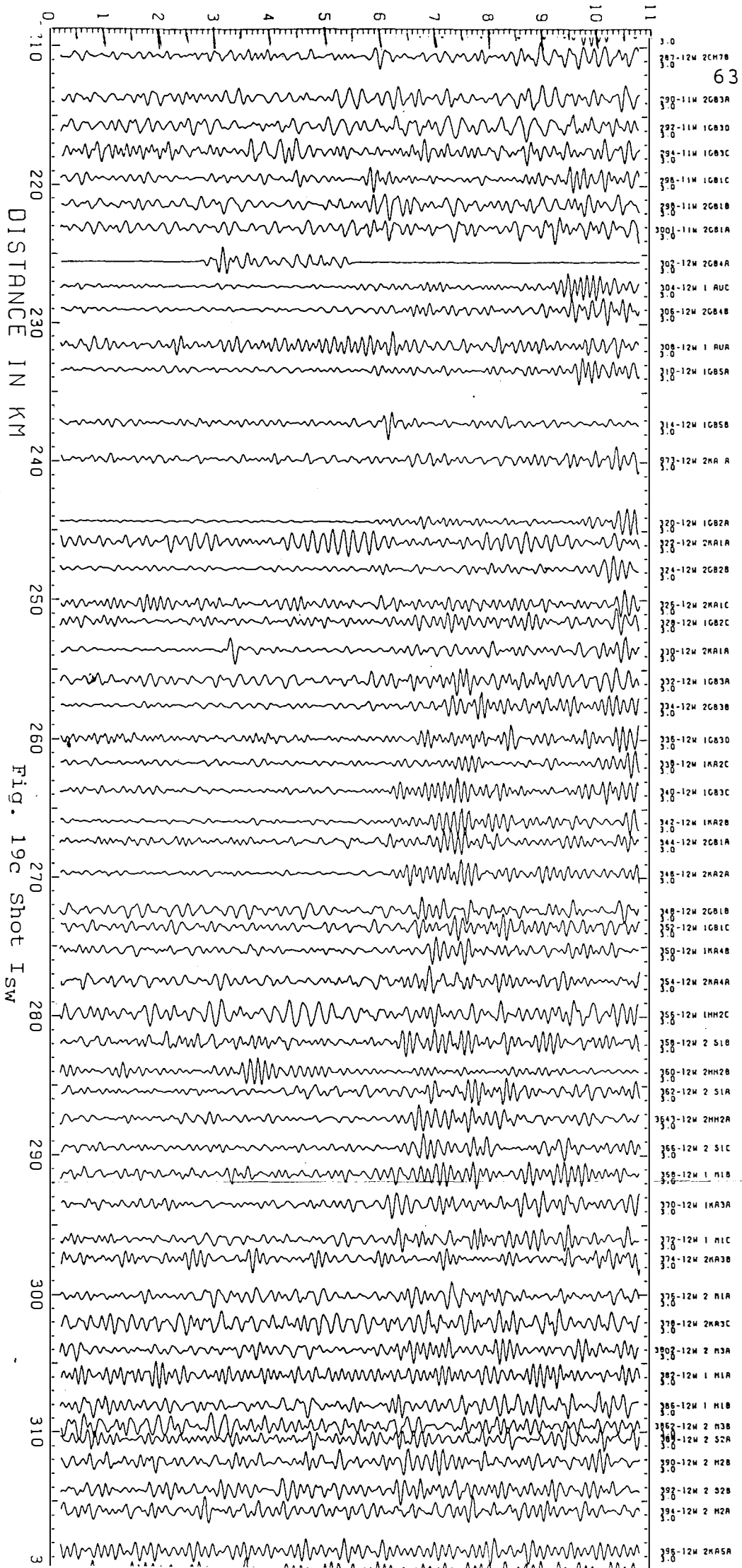
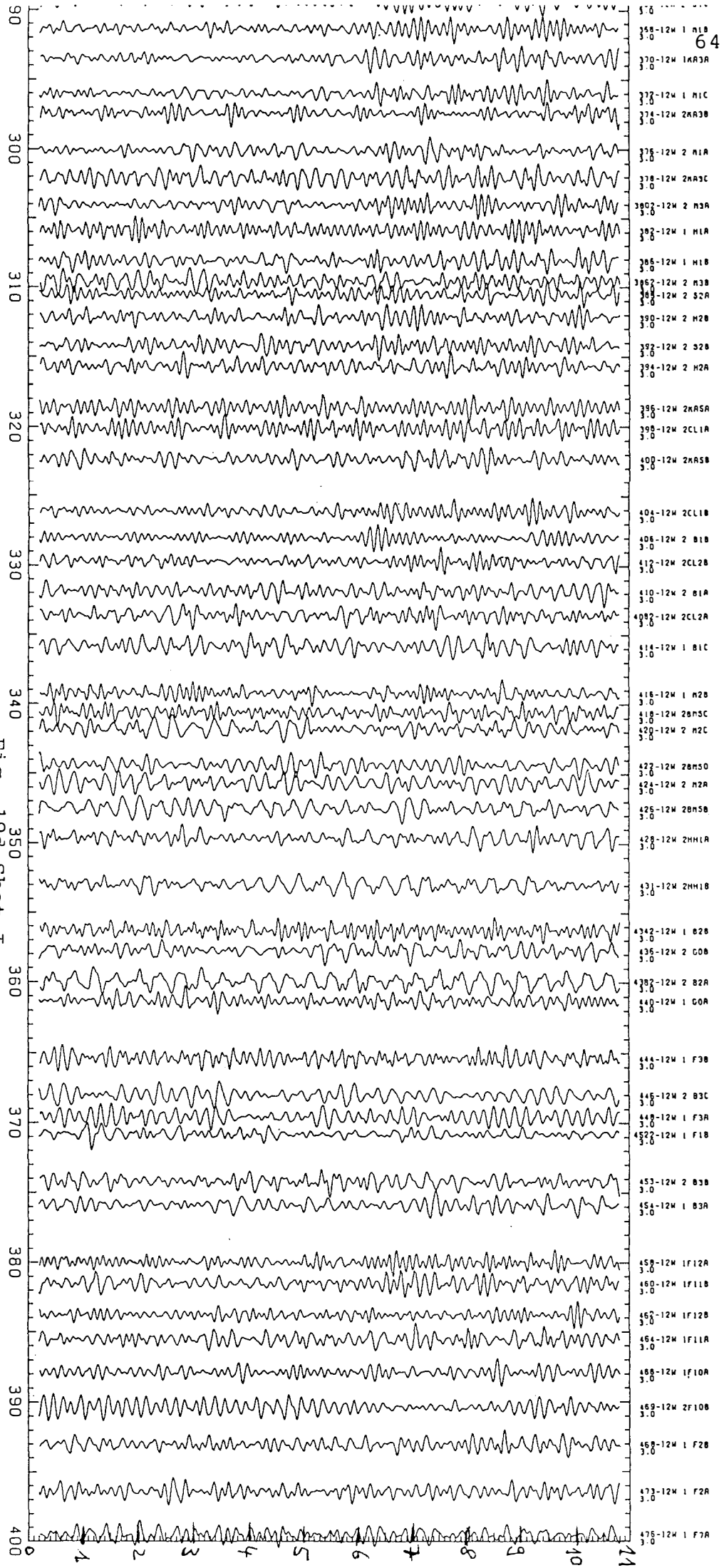
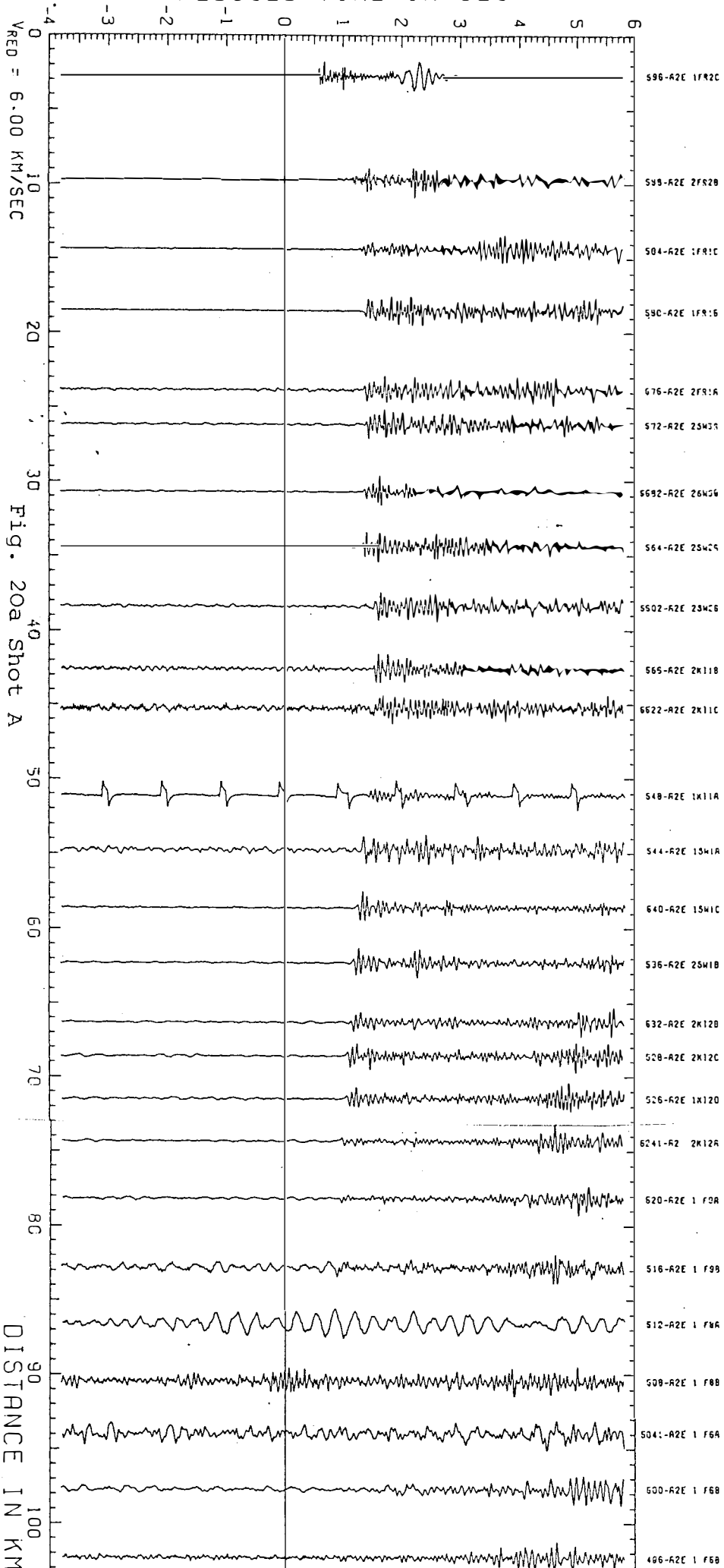
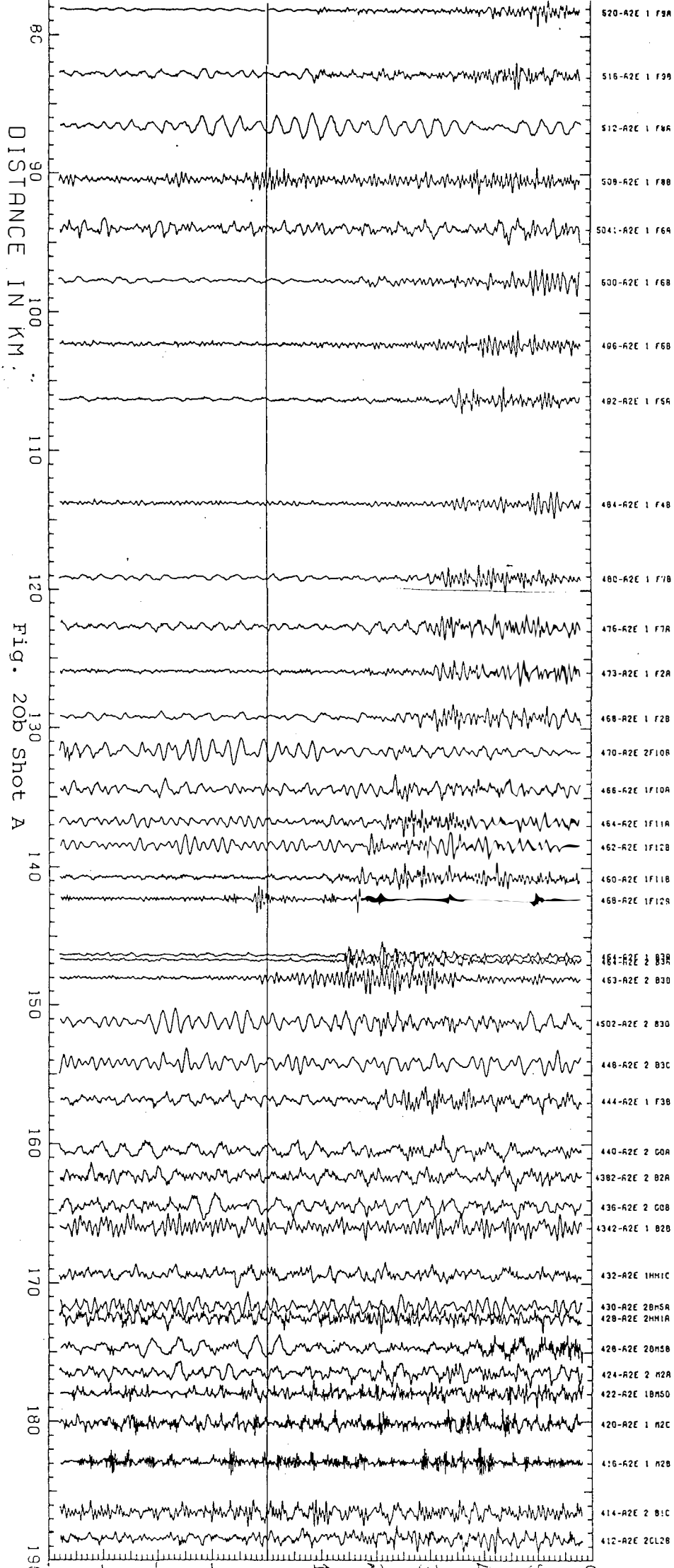


Fig. 19d Shot I sw

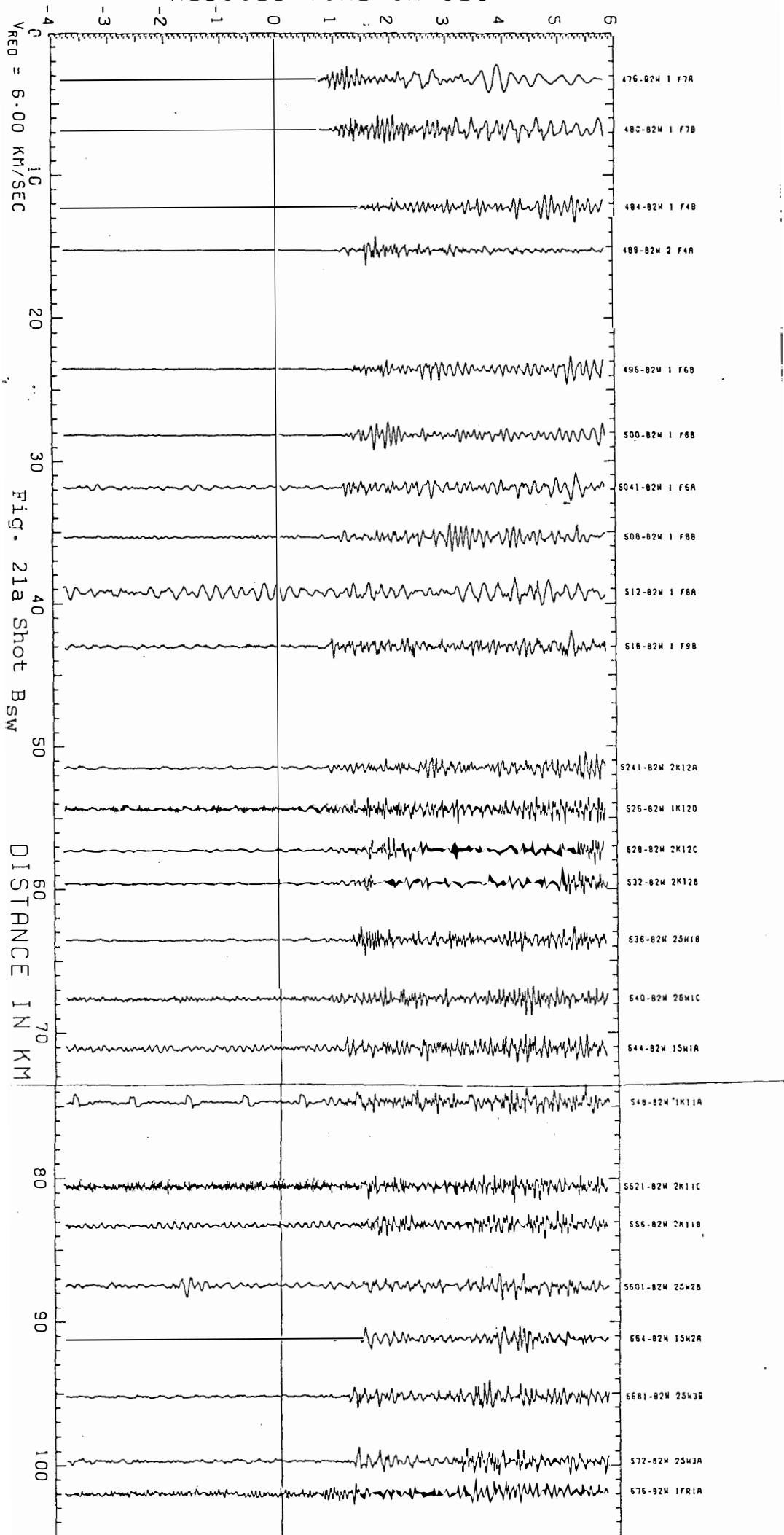


REDUCED TIME IN SEC





REDUCED TIME IN SEC



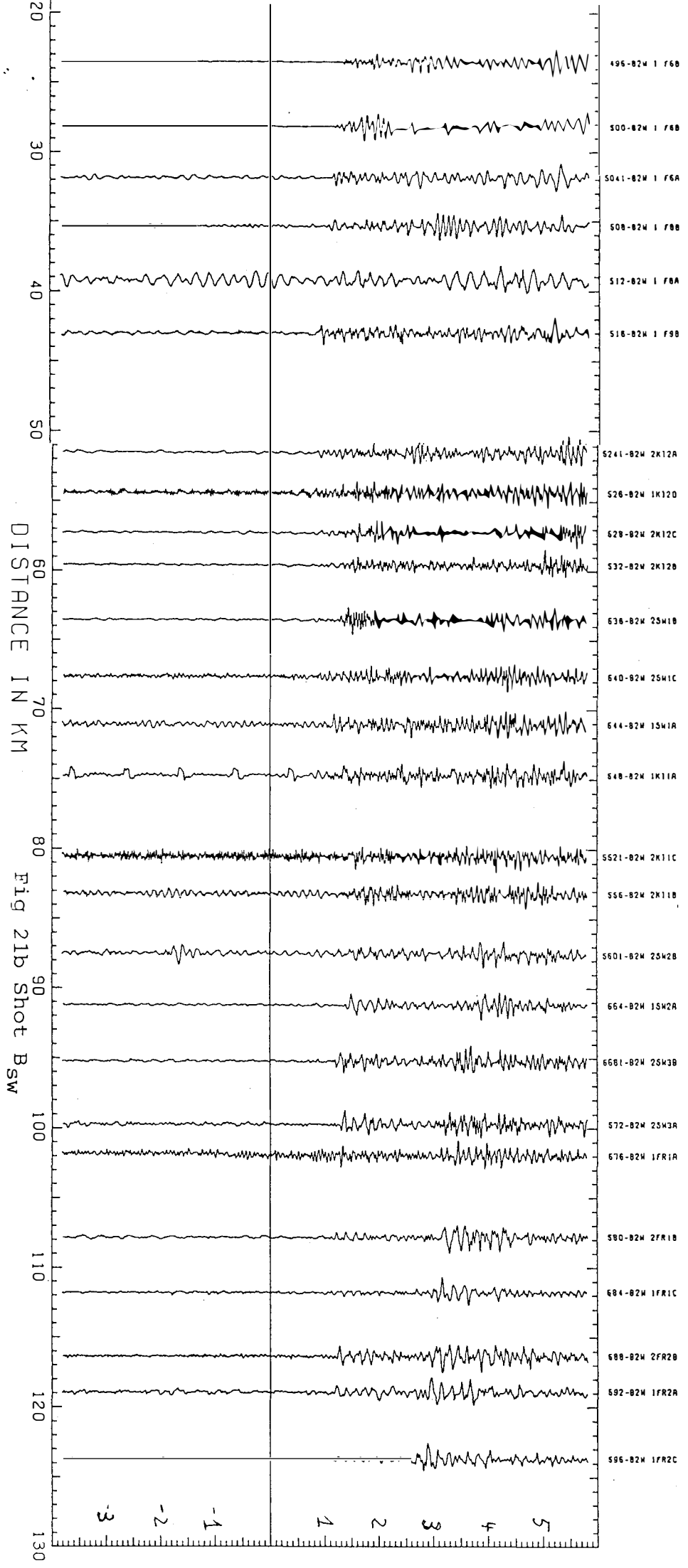
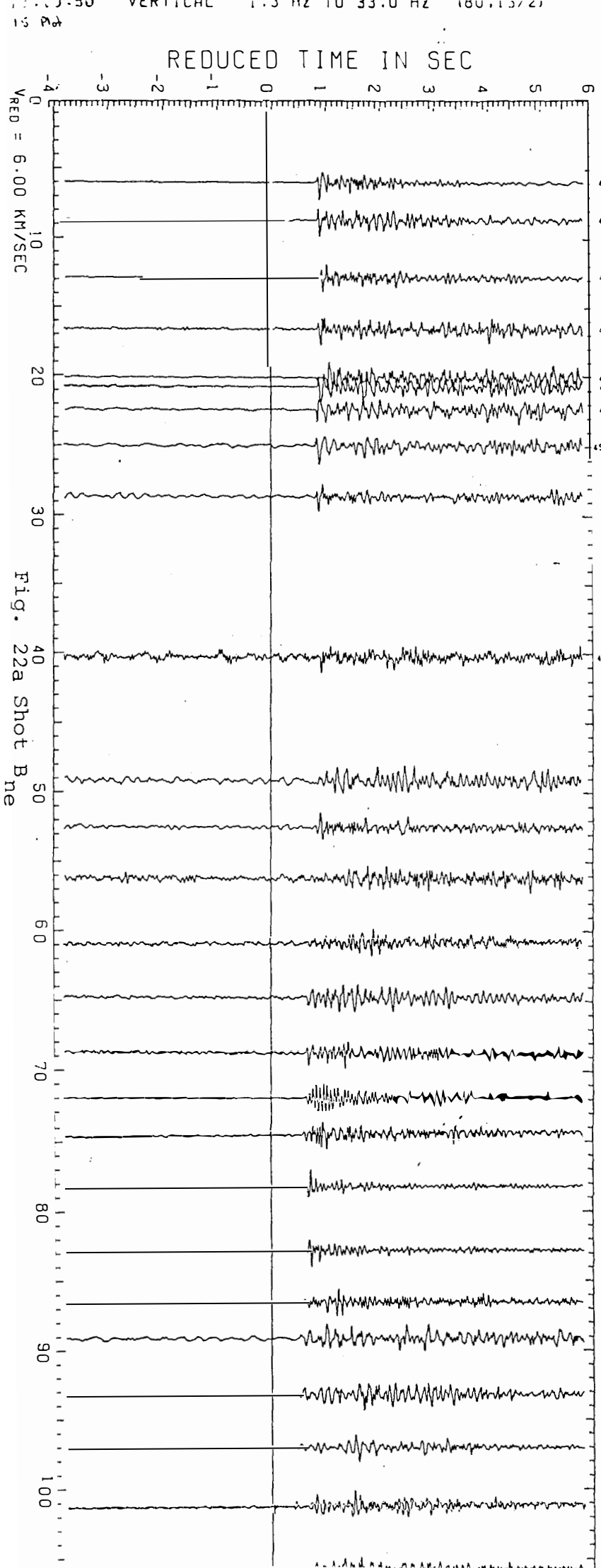


Fig 21b Shot Bw



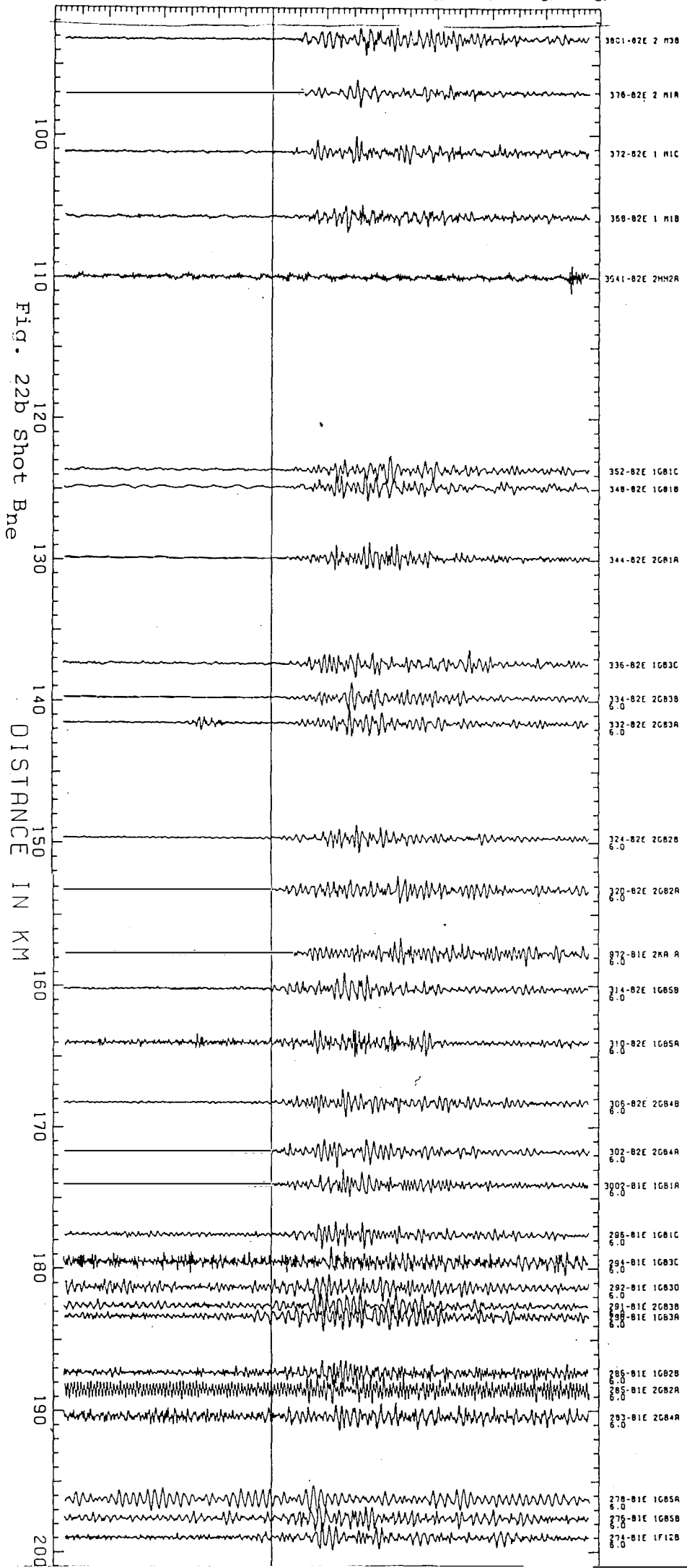
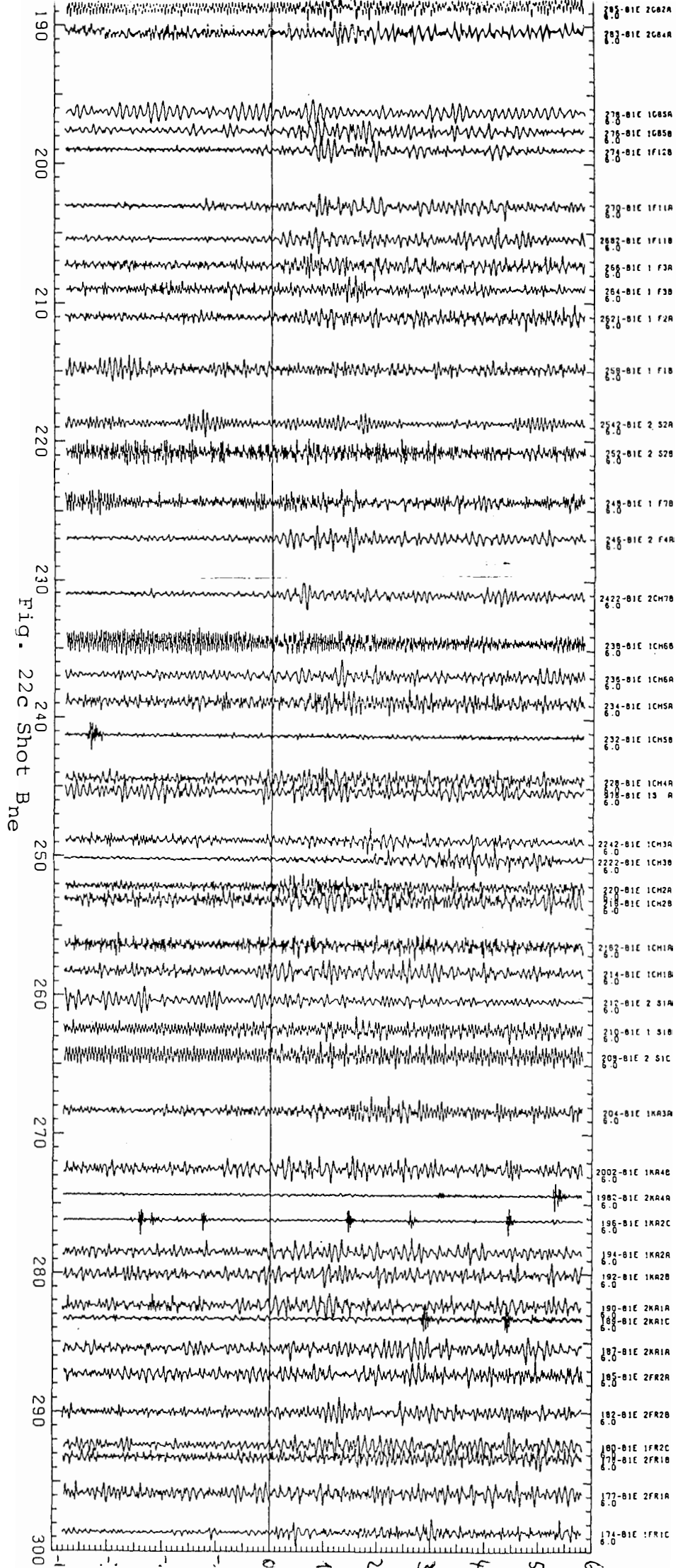
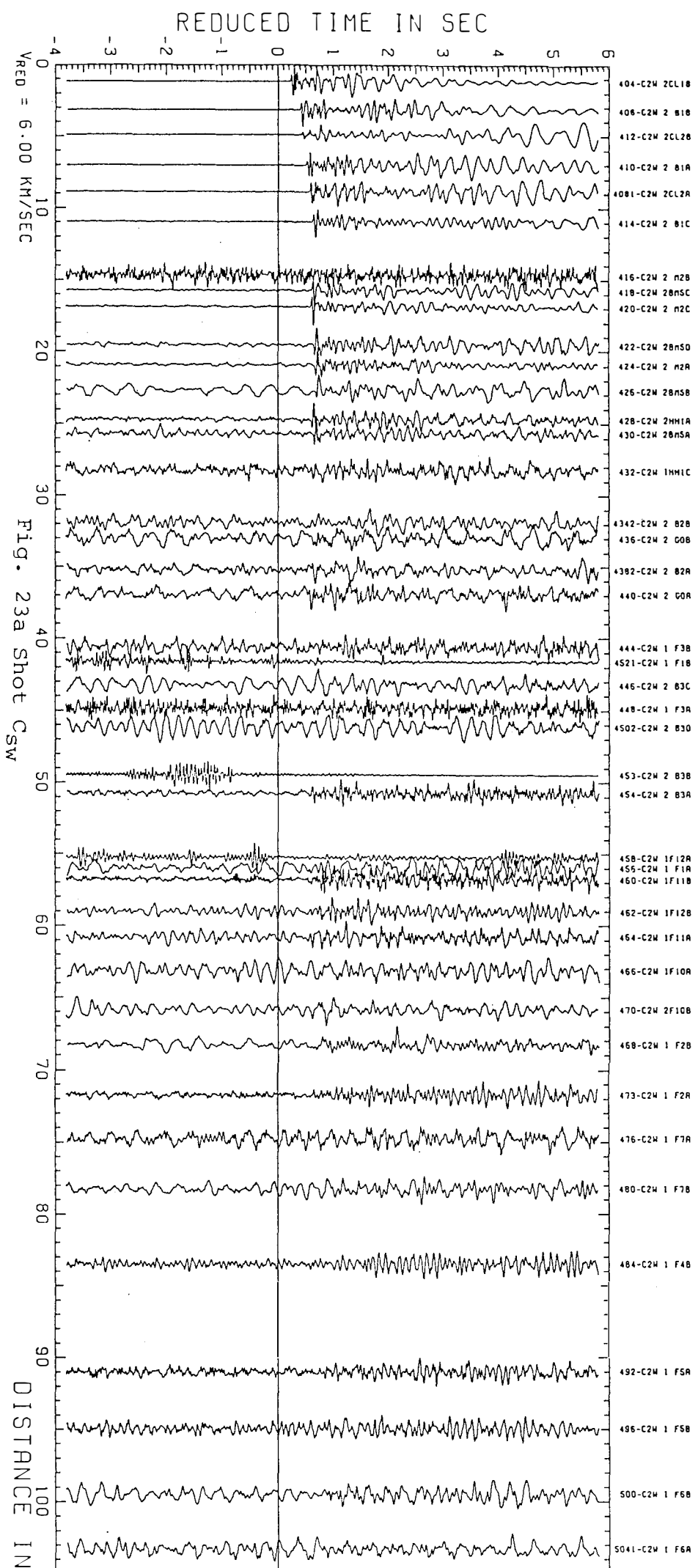
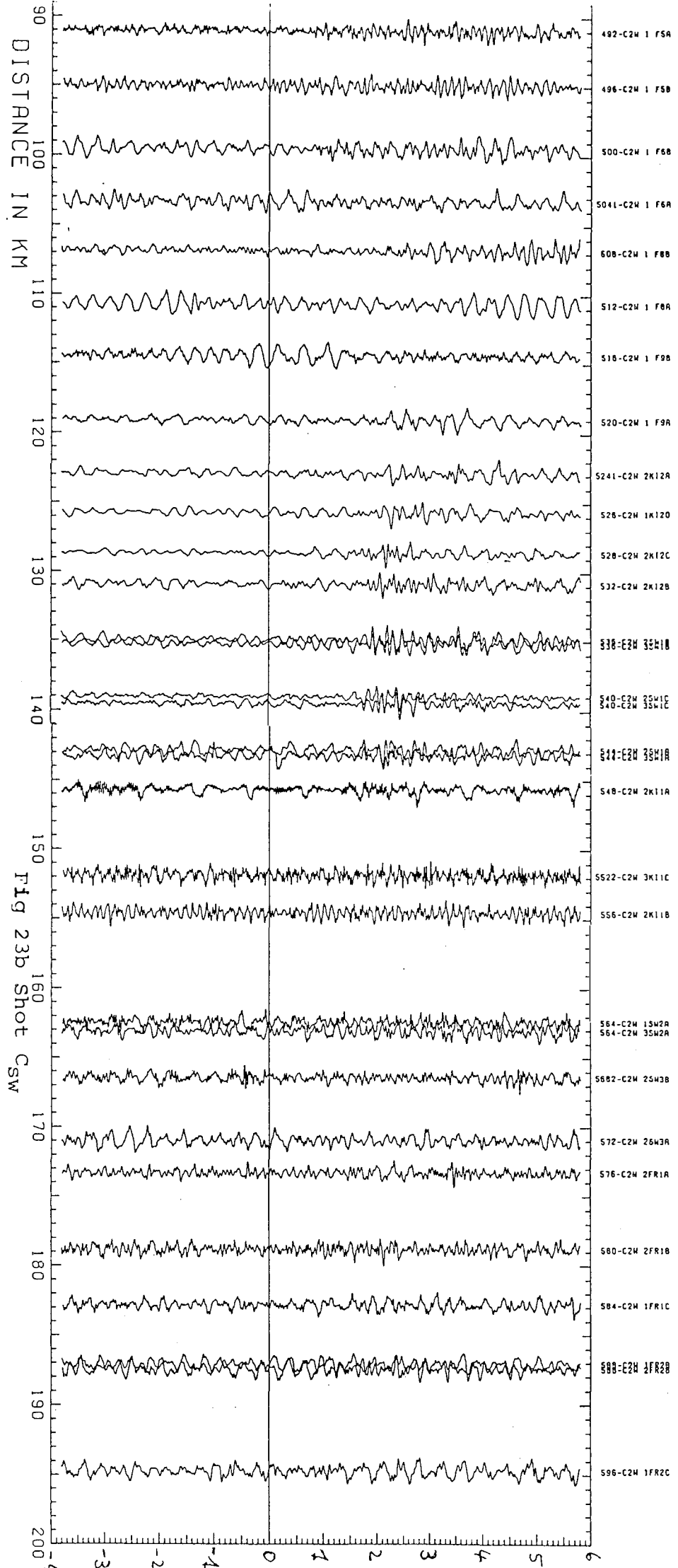
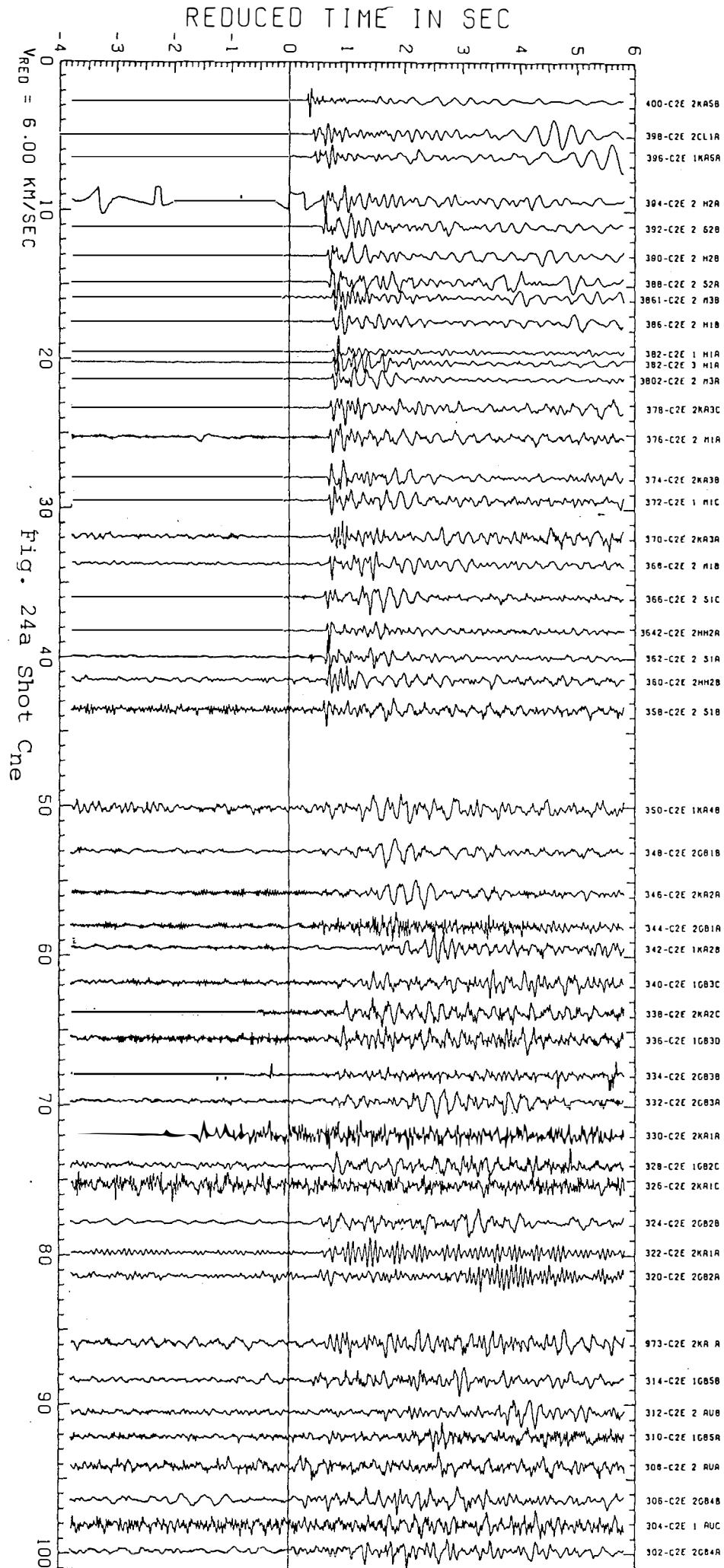


Fig. 22b Shot Bne
DISTANCE IN KM









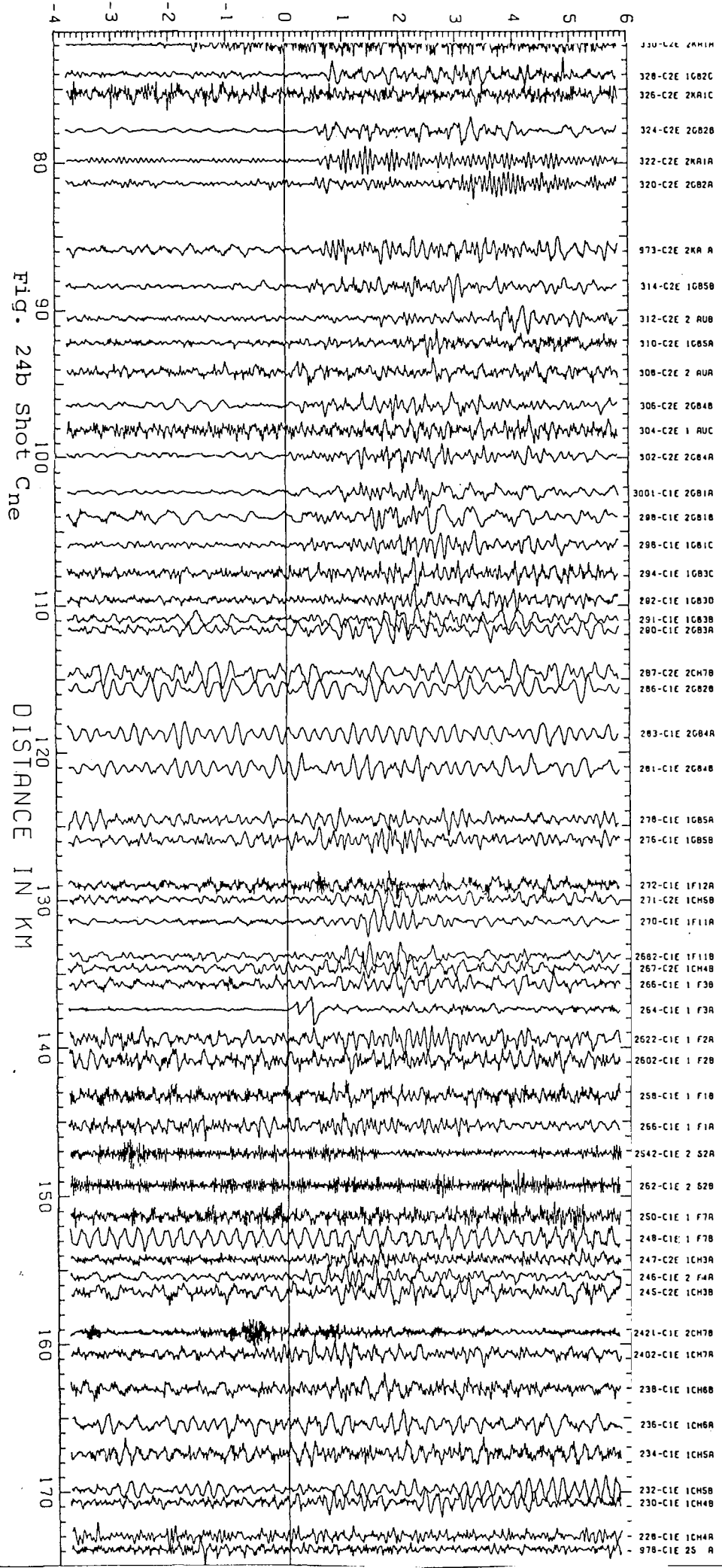
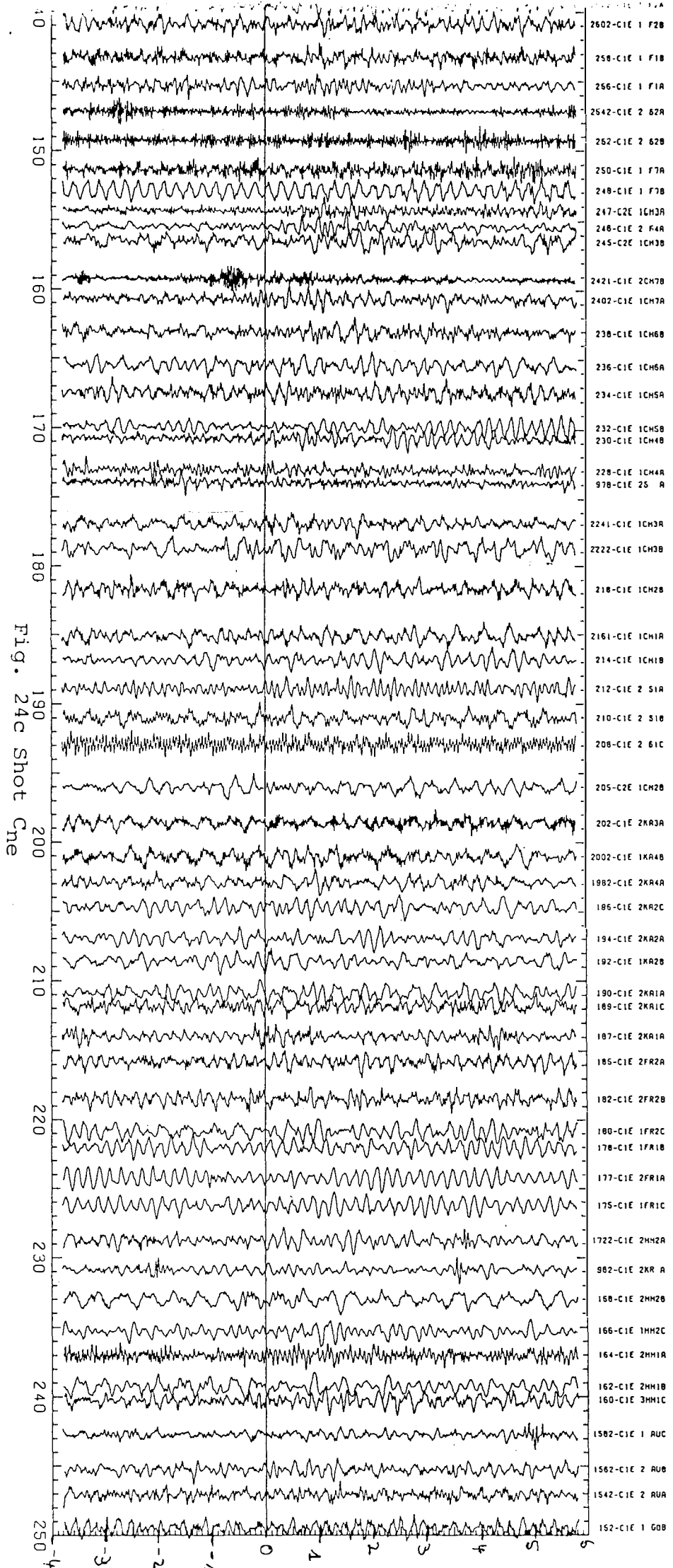


Fig. 24b Shot Cme

DISTANCE IN KM



REDUCED TIME IN SEC

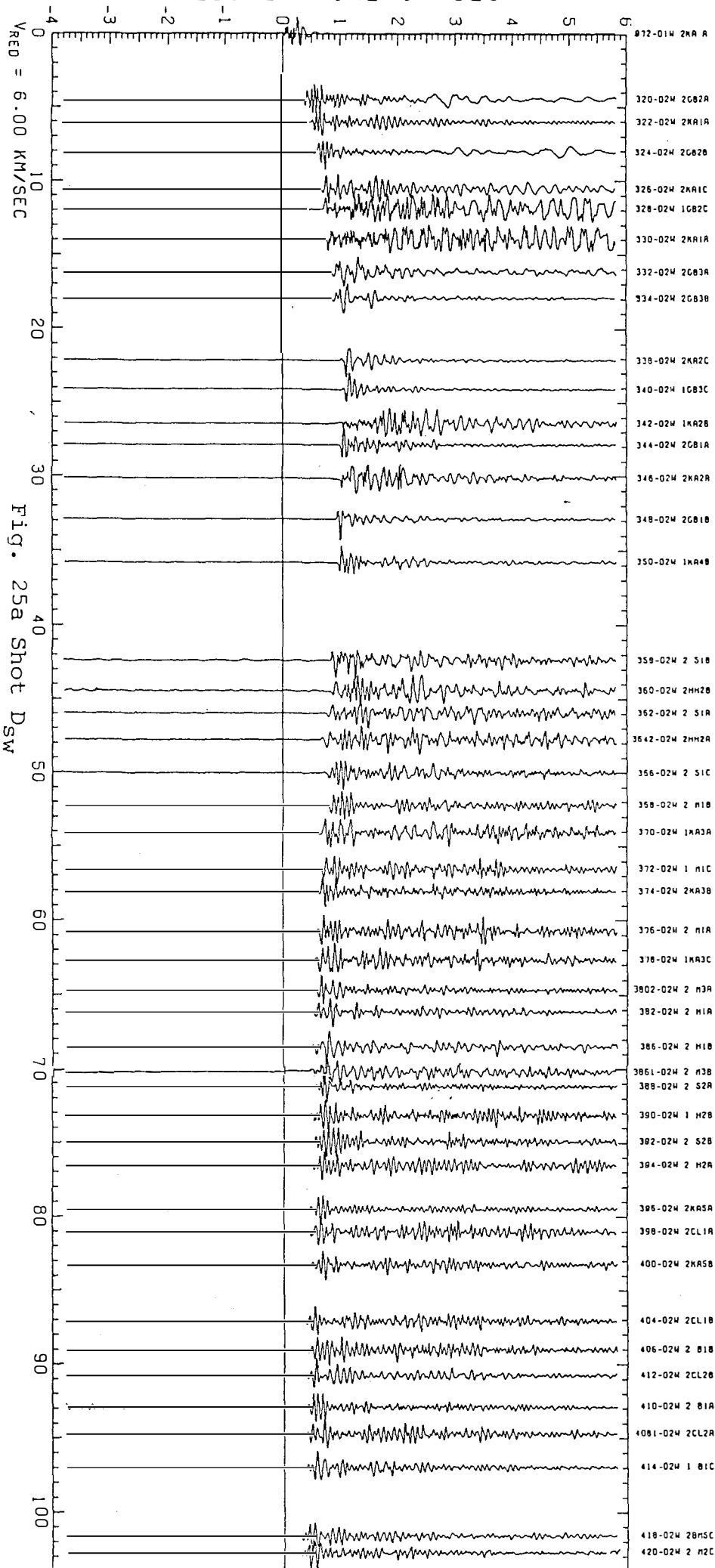
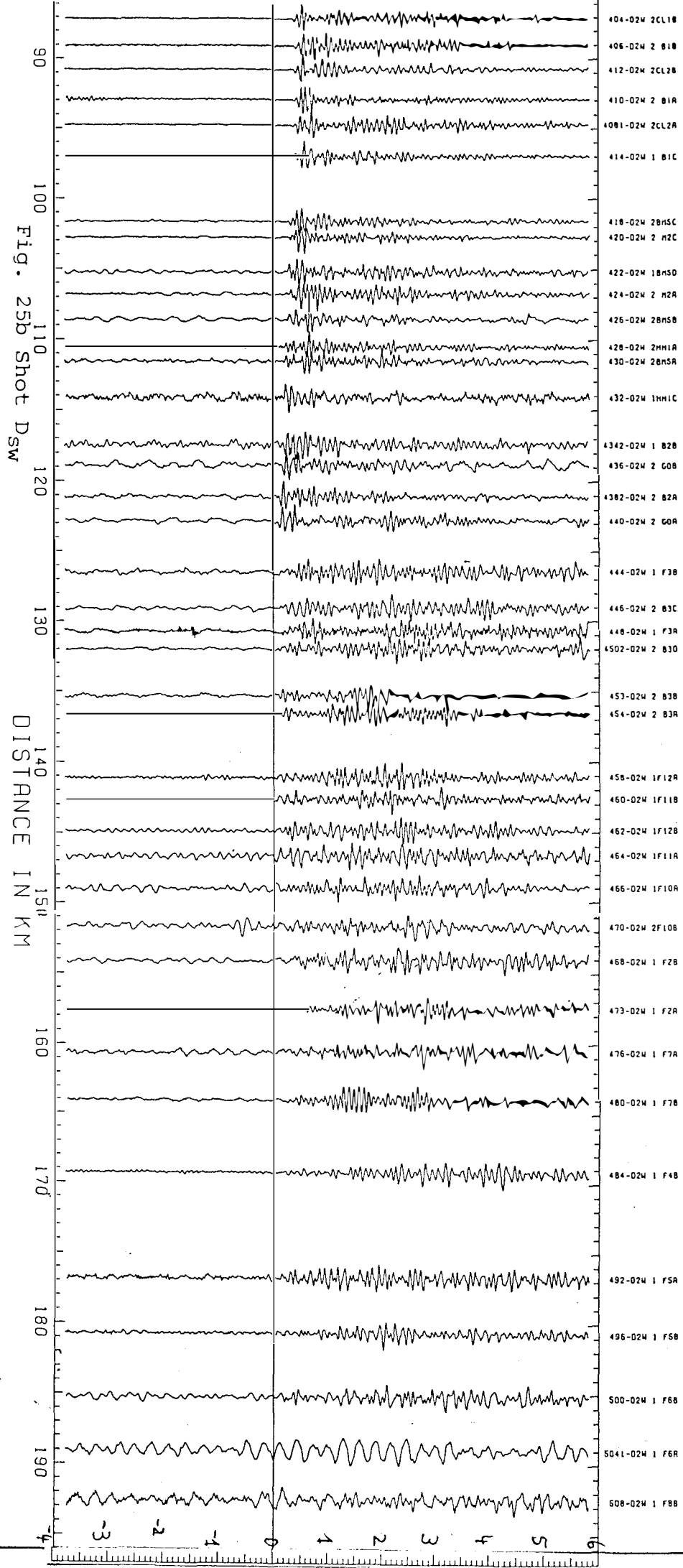


Fig. 25a Shot Dsw



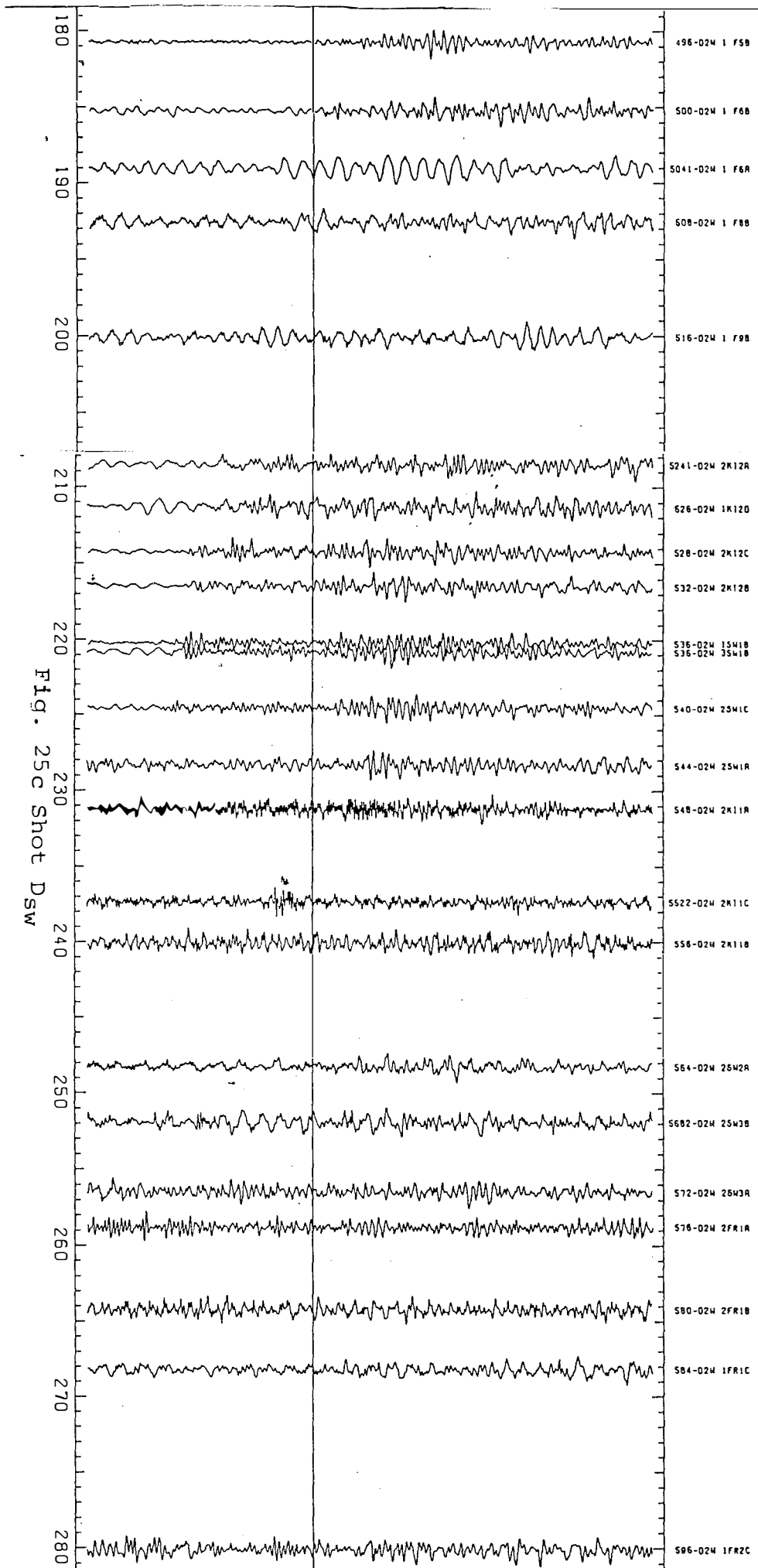


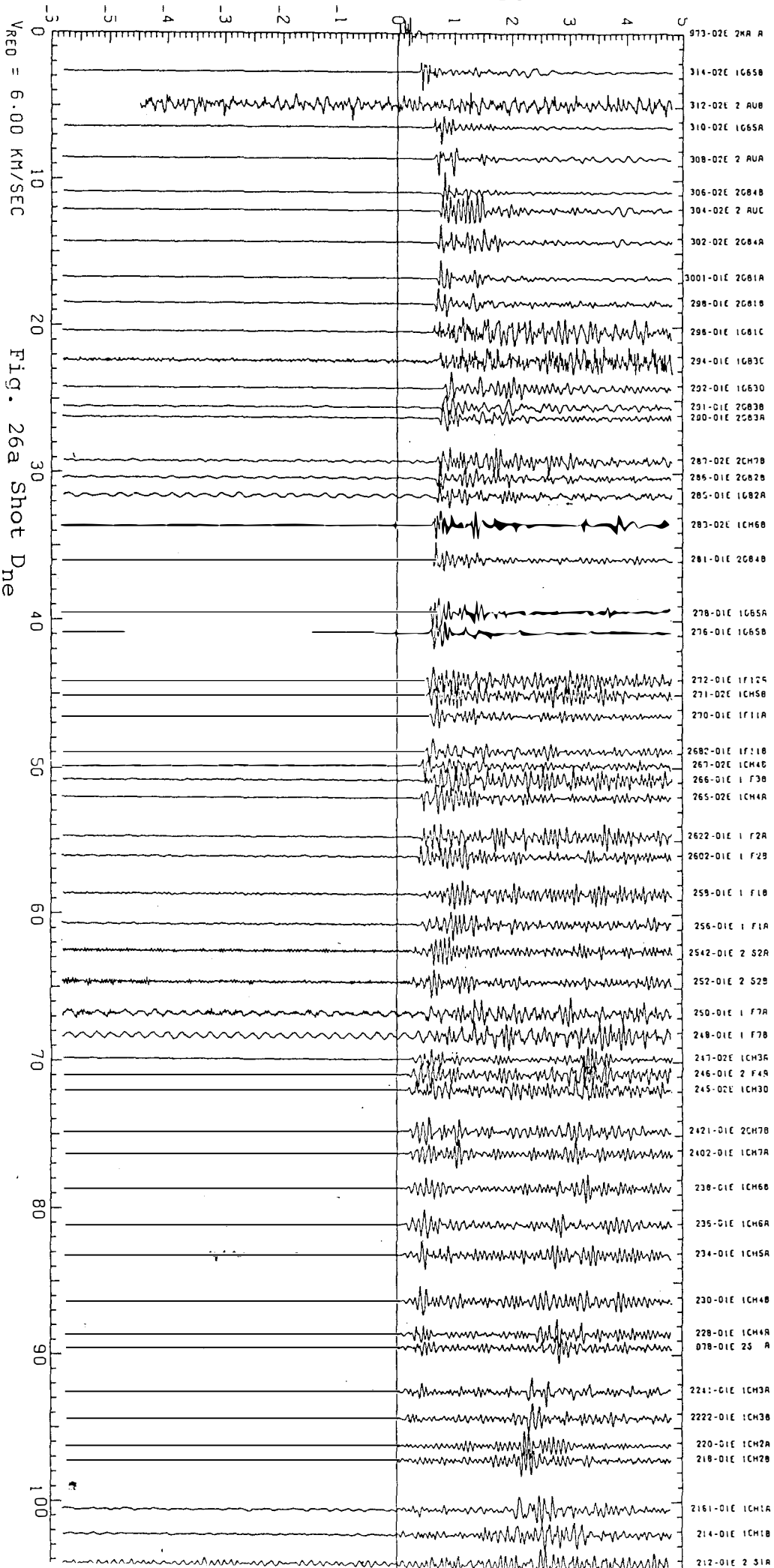
Fig. 25c Shot DSW

180
190
200
210
220
230
240
250
260
270
280

496-02M 1 F5B
500-02M 1 F6B
5041-02M 1 F6A
508-02M 1 F8B
516-02M 1 F9B
5241-02M 2K12A
526-02M 1K120
528-02M 2K12C
532-02M 2K12B
536-02M 1S41B
536-02M 3S41B
540-02M 2S41C
544-02M 2S41A
548-02M 2K11A
5522-02M 2K11C
558-02M 2K11B
564-02M 2S42A
5682-02M 2S43B
572-02M 2S43A
578-02M 2FR1A
580-02M 2FR1B
584-02M 1FR1C
586-02M 1FR2C

1 2 3 4 5 6 7 8 9

REDUCED TIME IN SEC



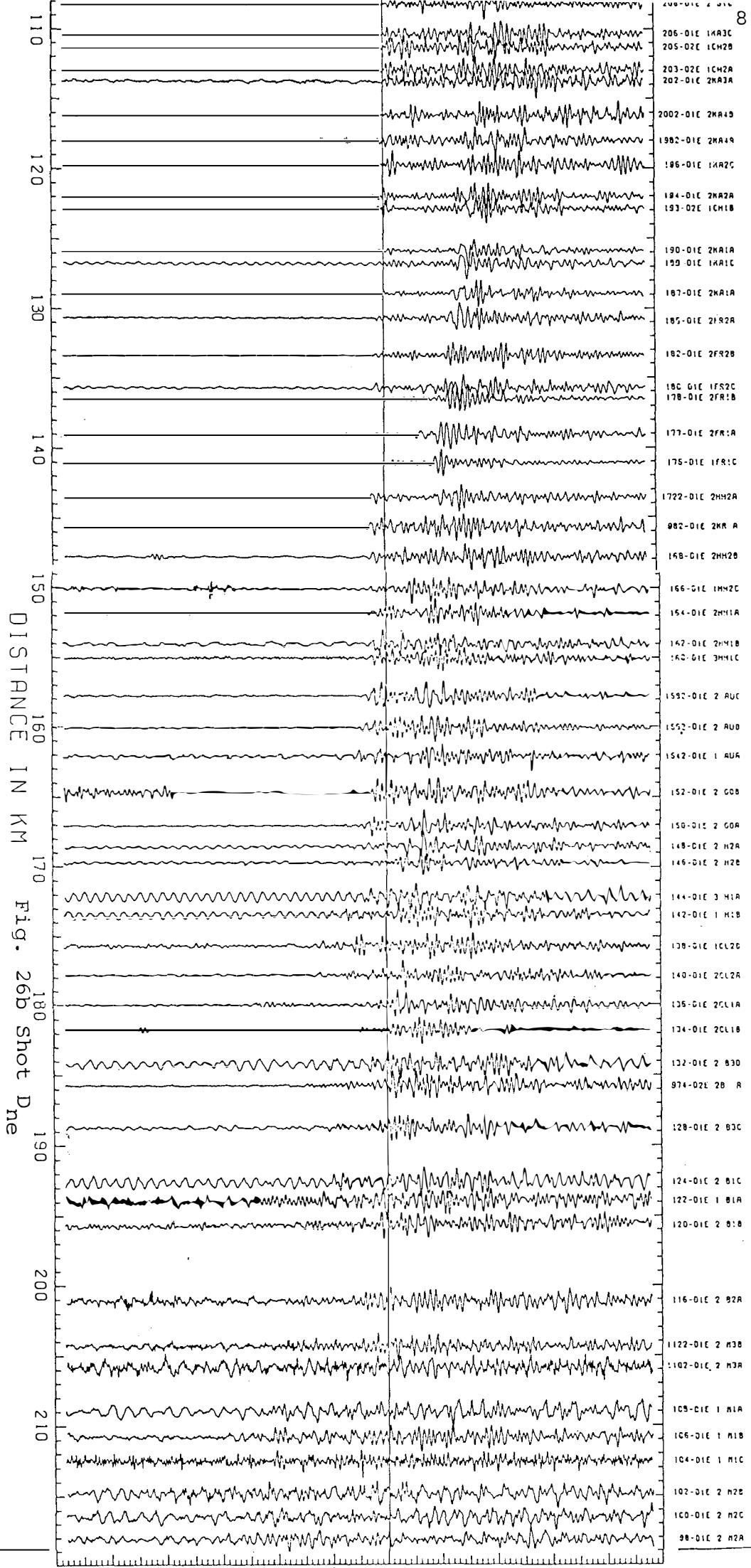
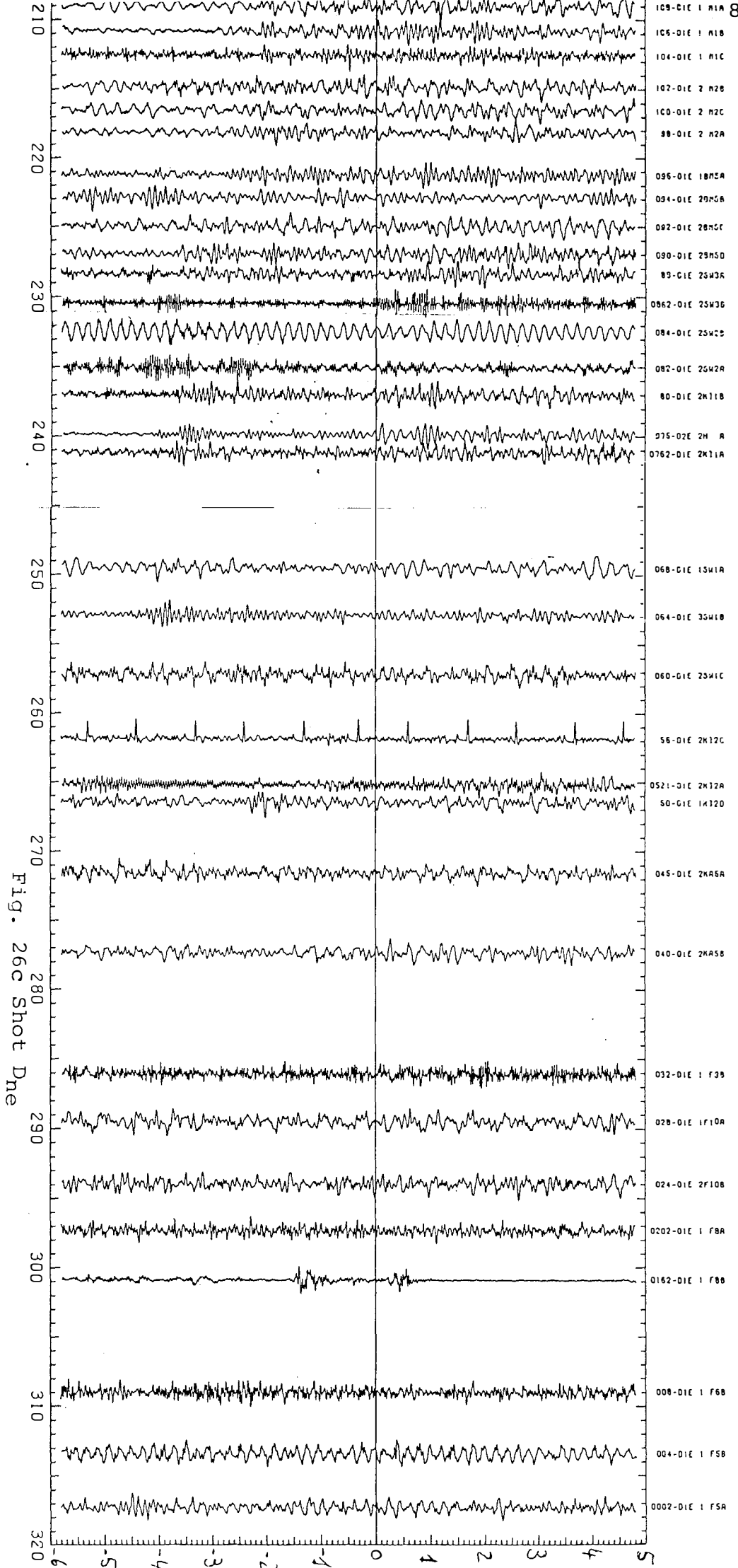


Fig. 26b Shot Dne



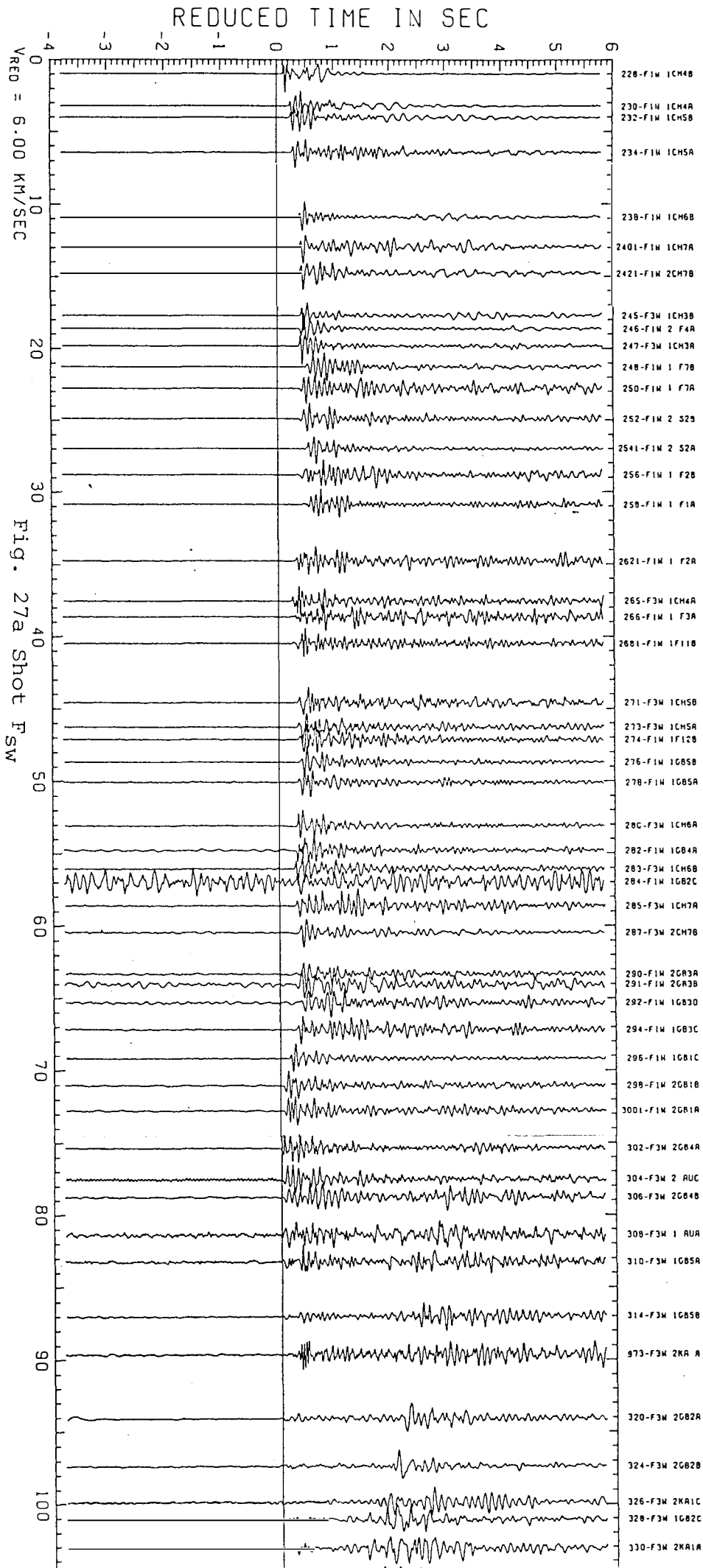


Fig. 27b Shot F_{sw}

DISTANCE IN KM

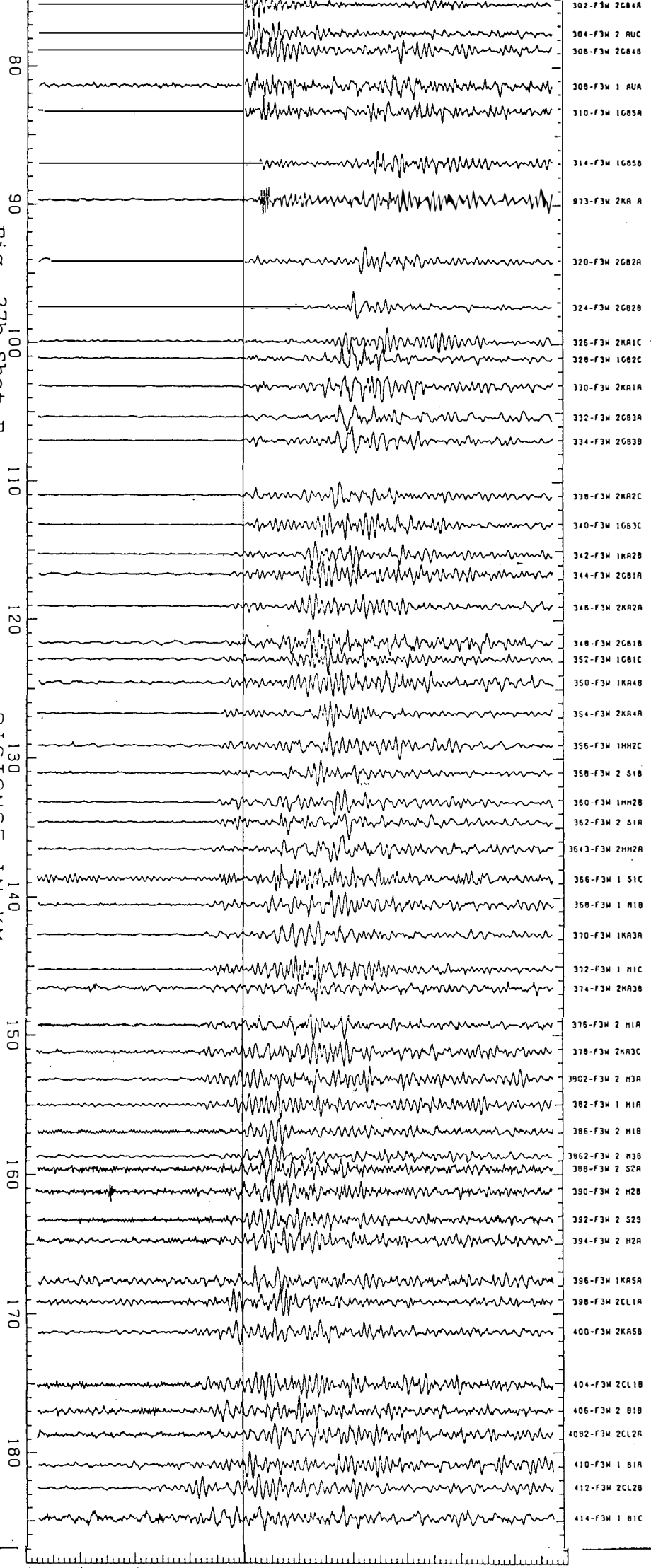
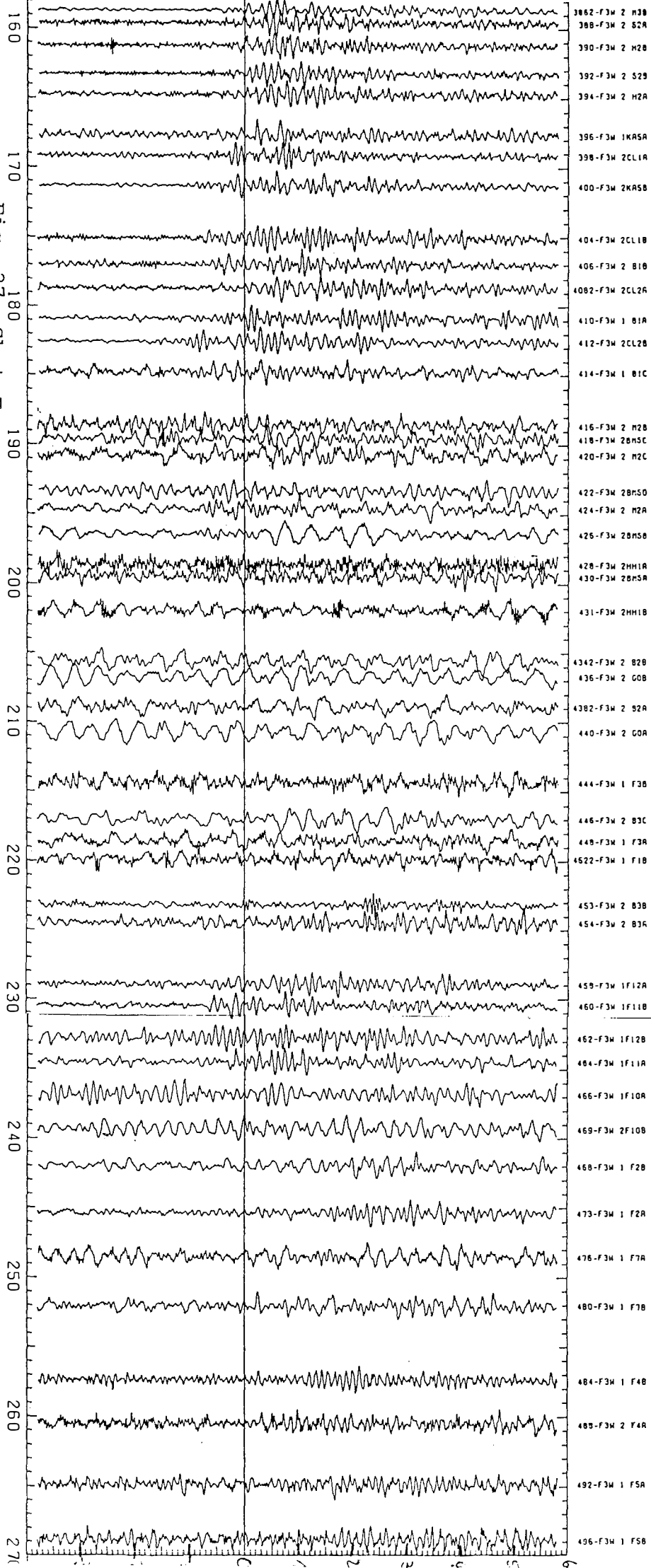
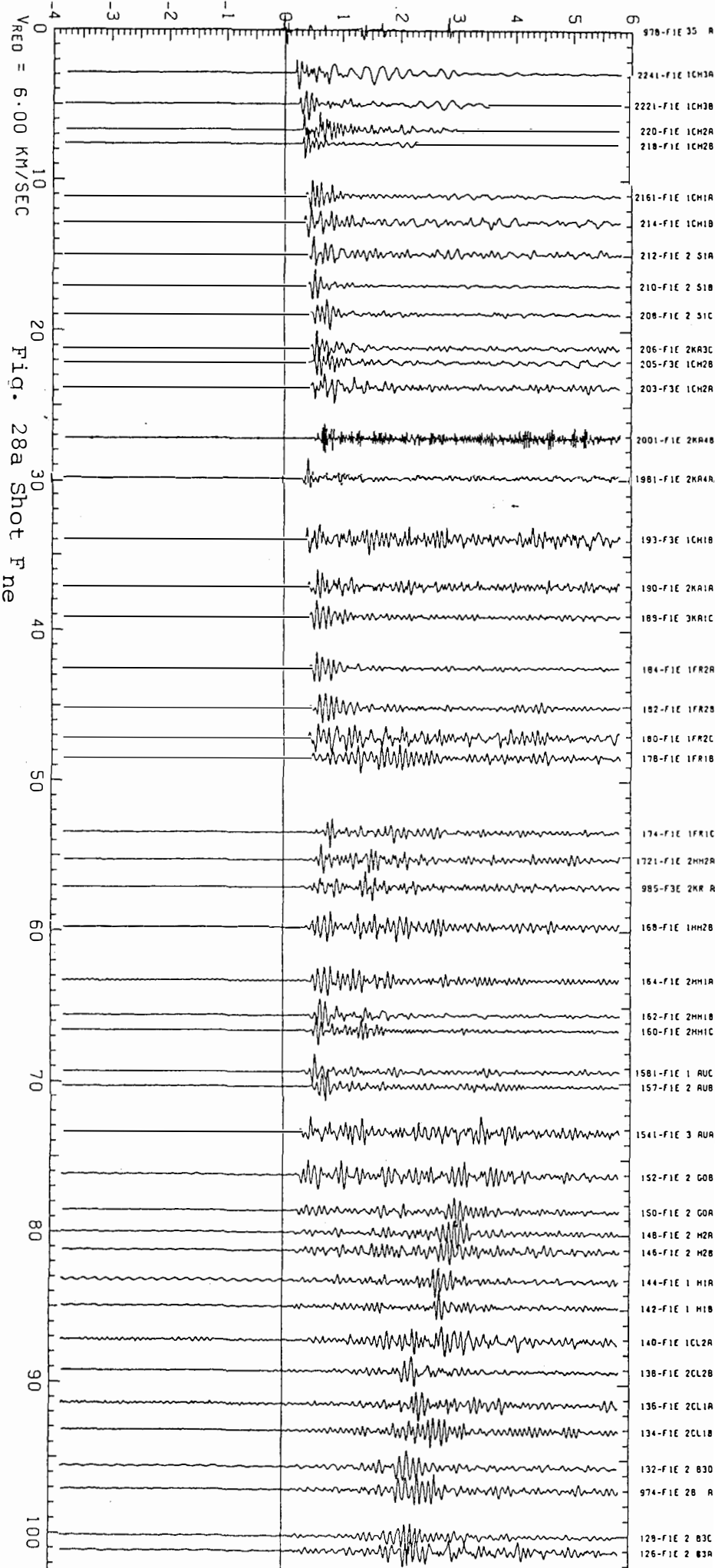
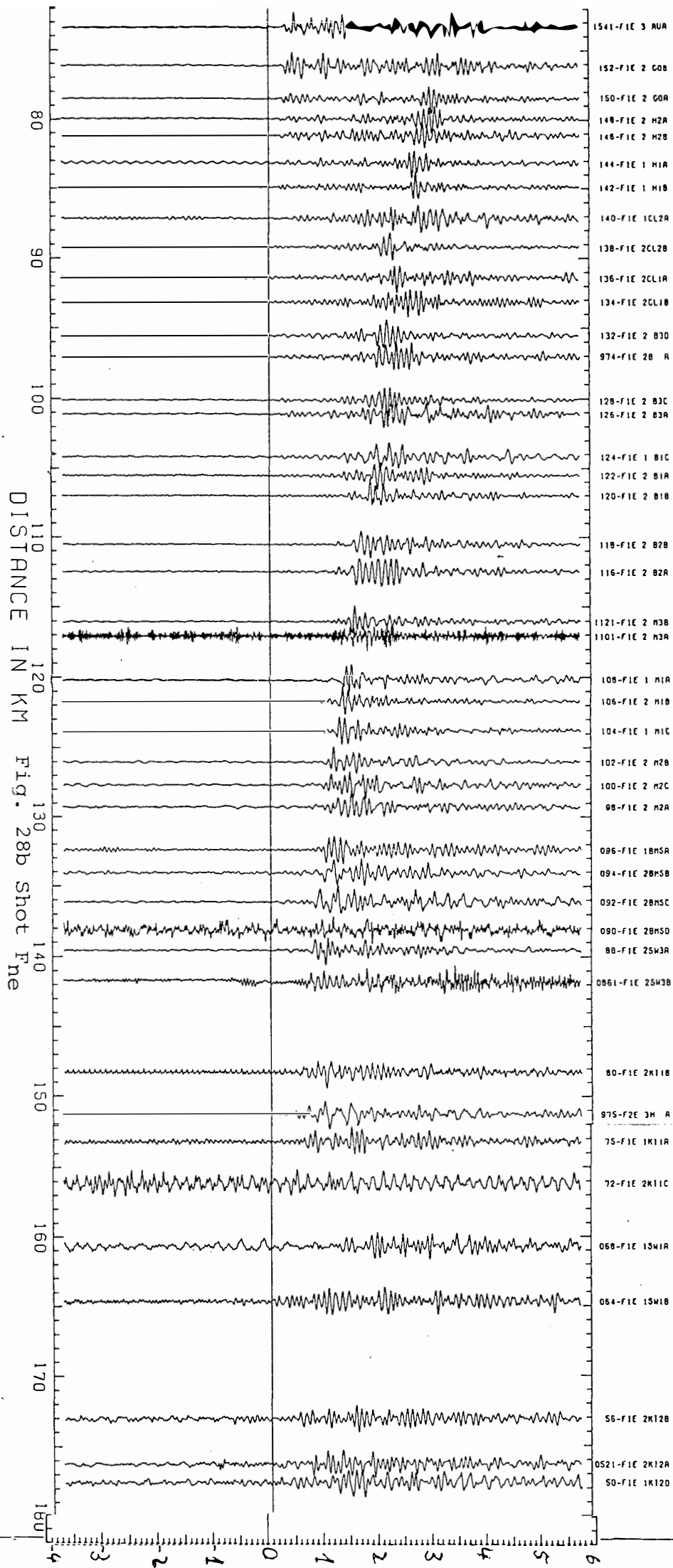


Fig. 27c Shot F_{sw}



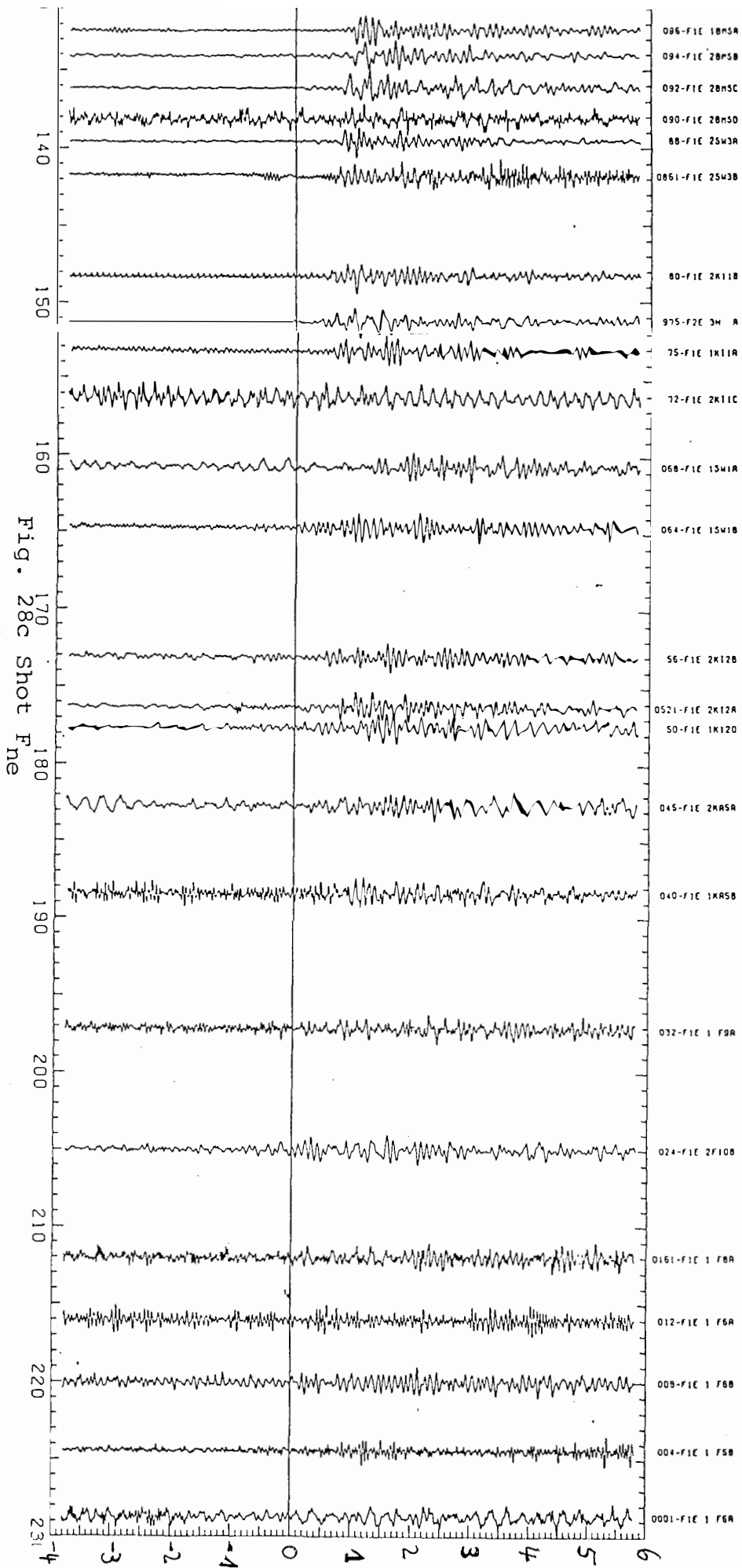
REDUCED TIME IN SEC

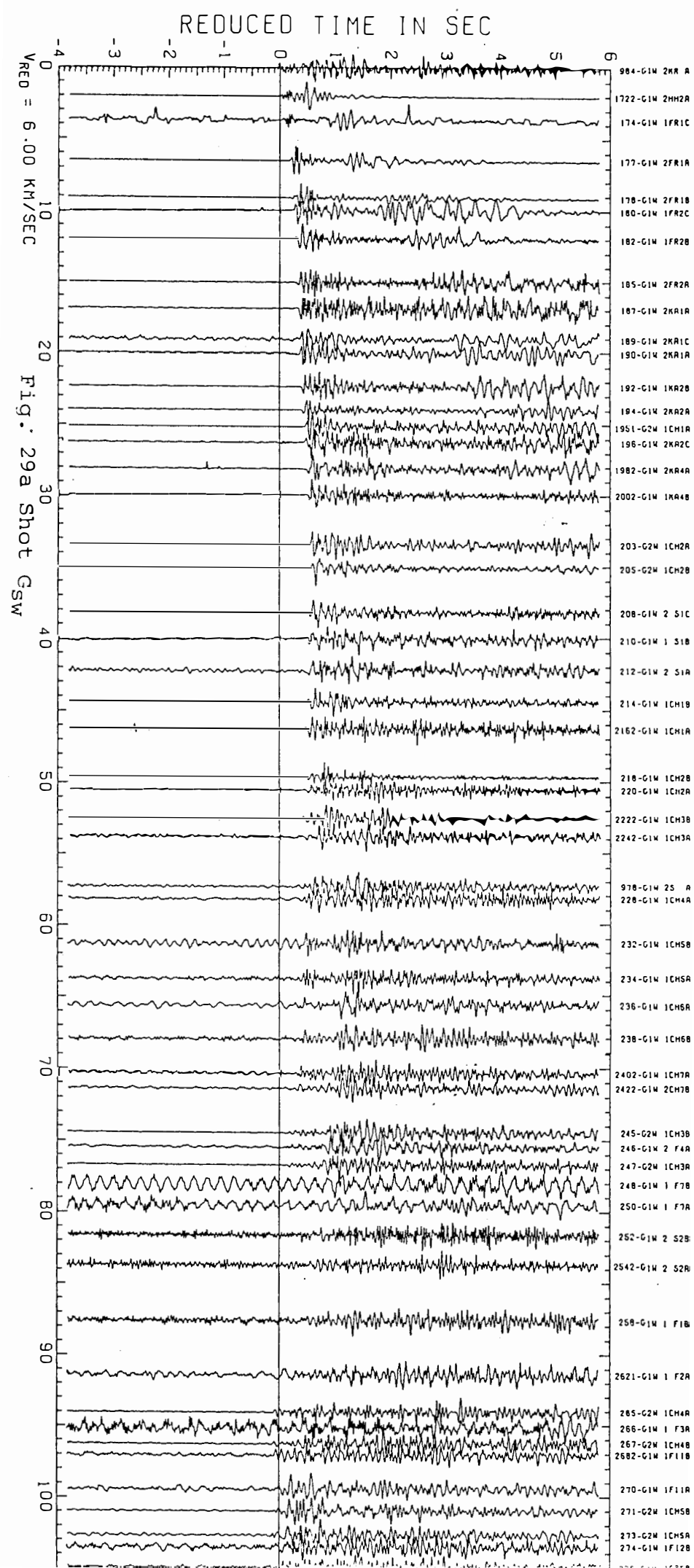




DISTANCE IN KM Fig. 28b Shot Fne

4 3 2 1 0 1 2 3 4 5 6





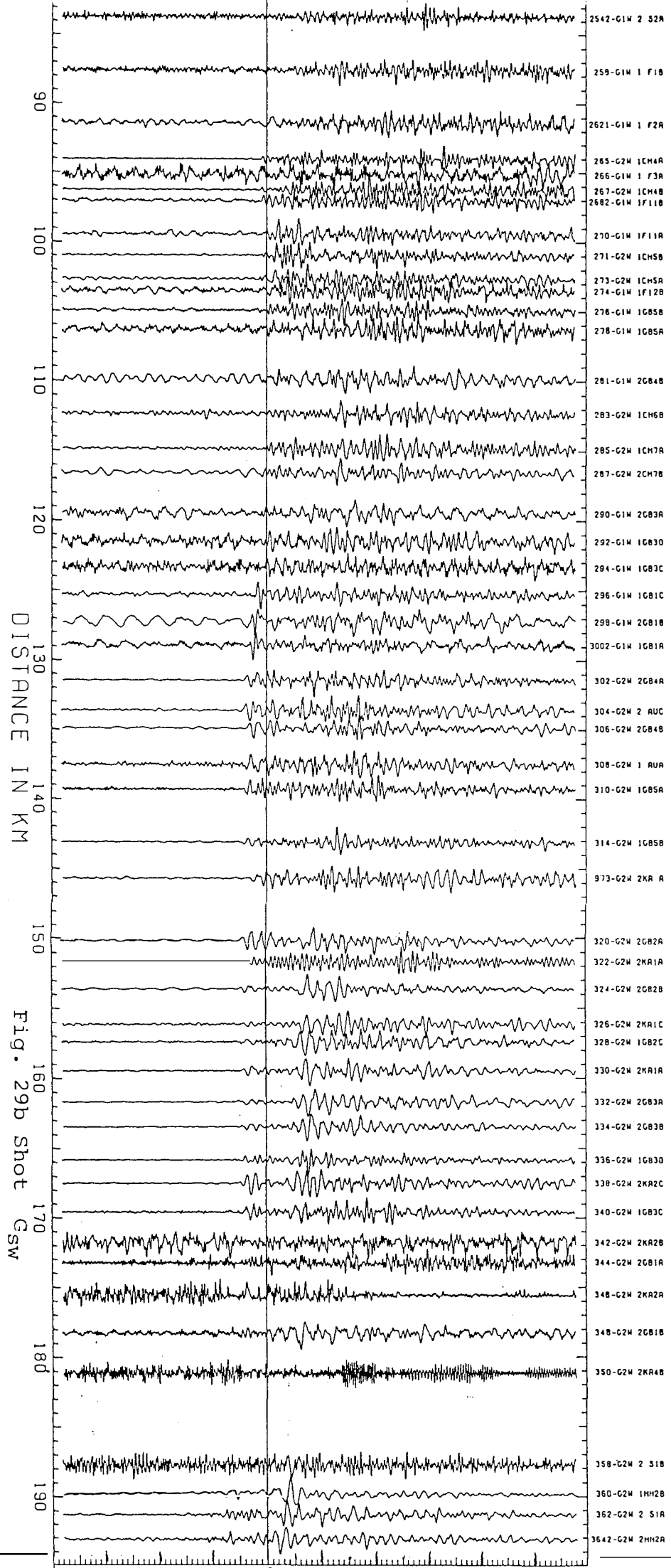
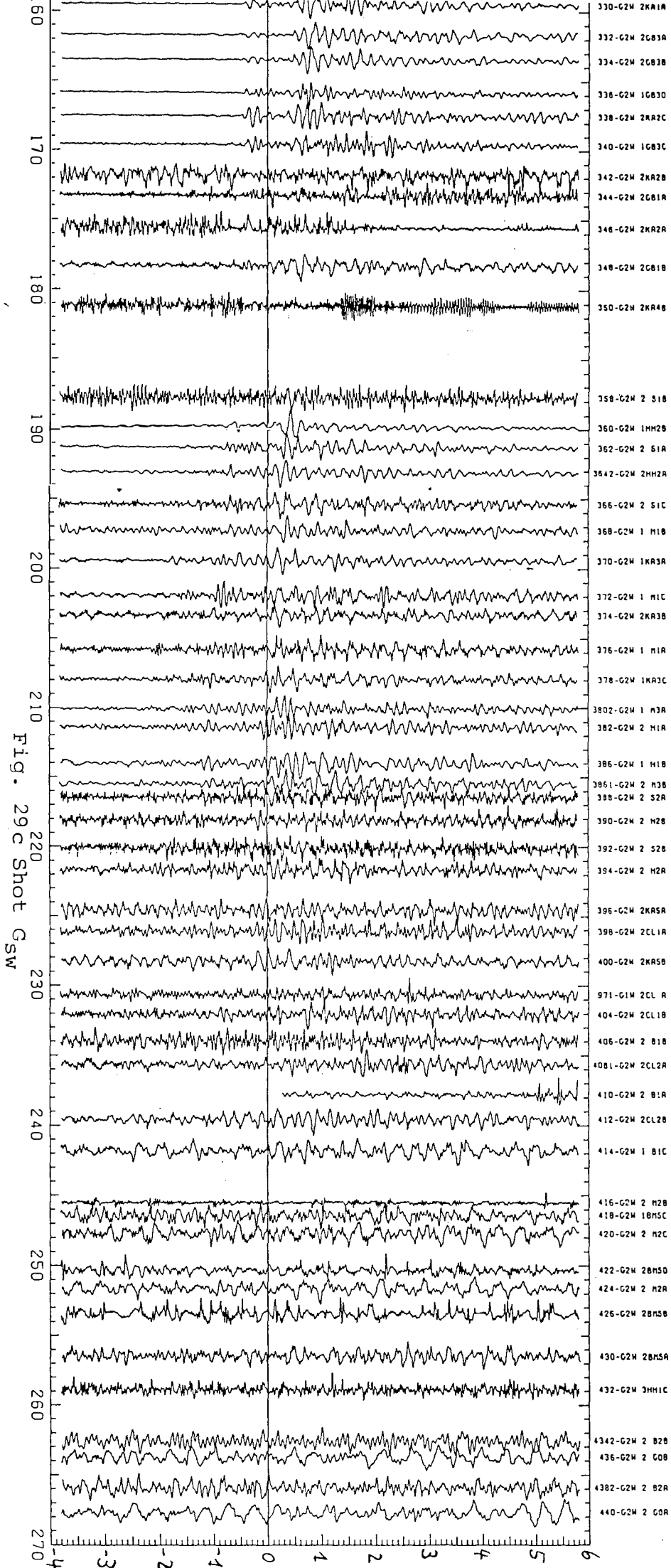
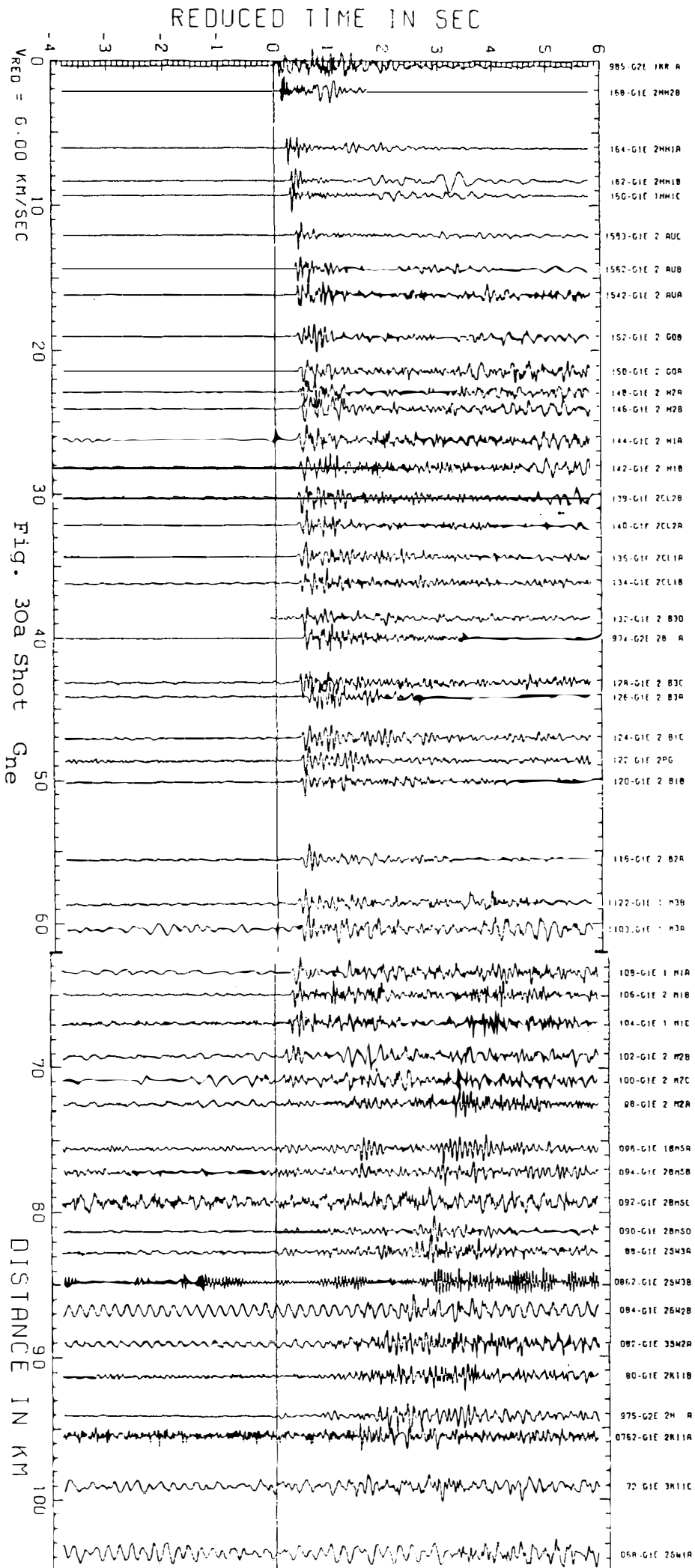
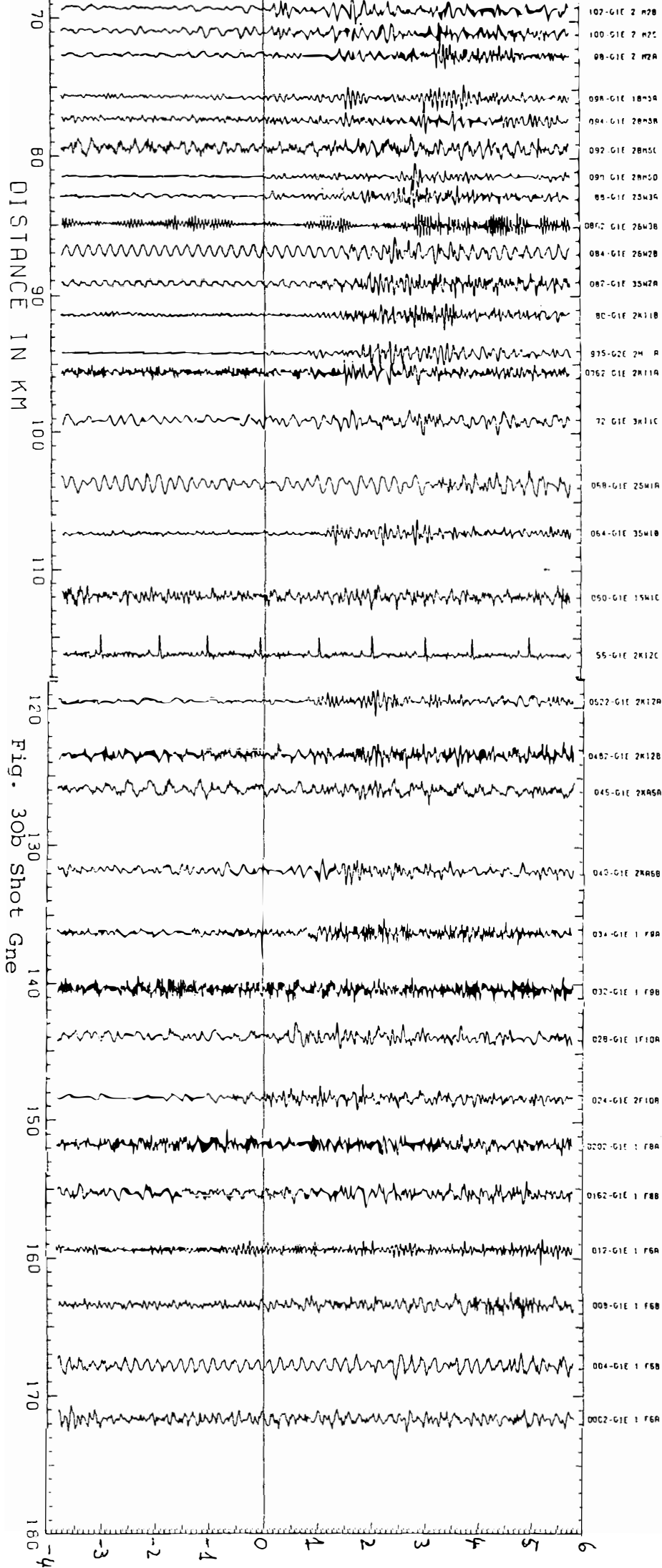


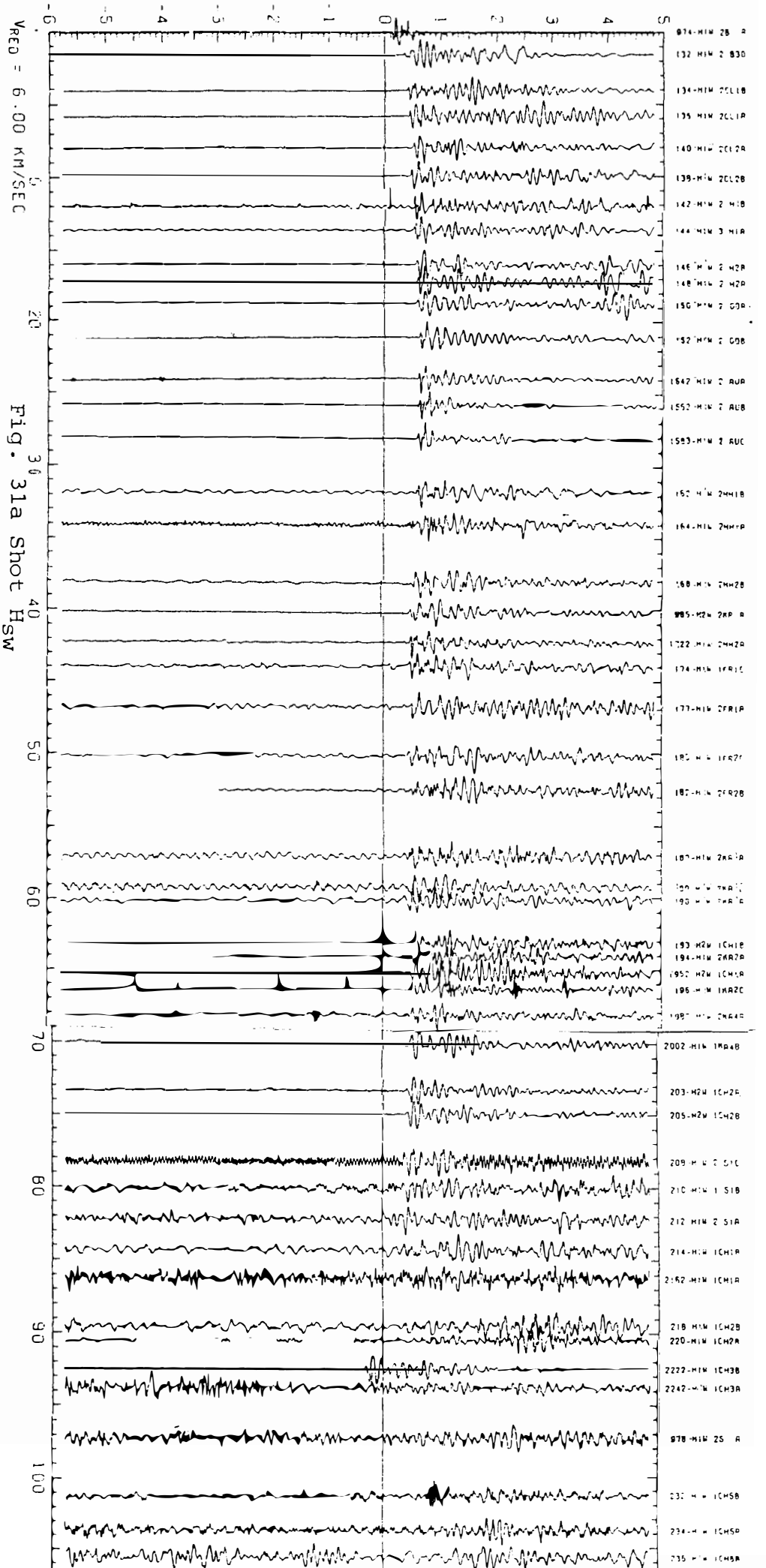
Fig. 29b Shot Gsw

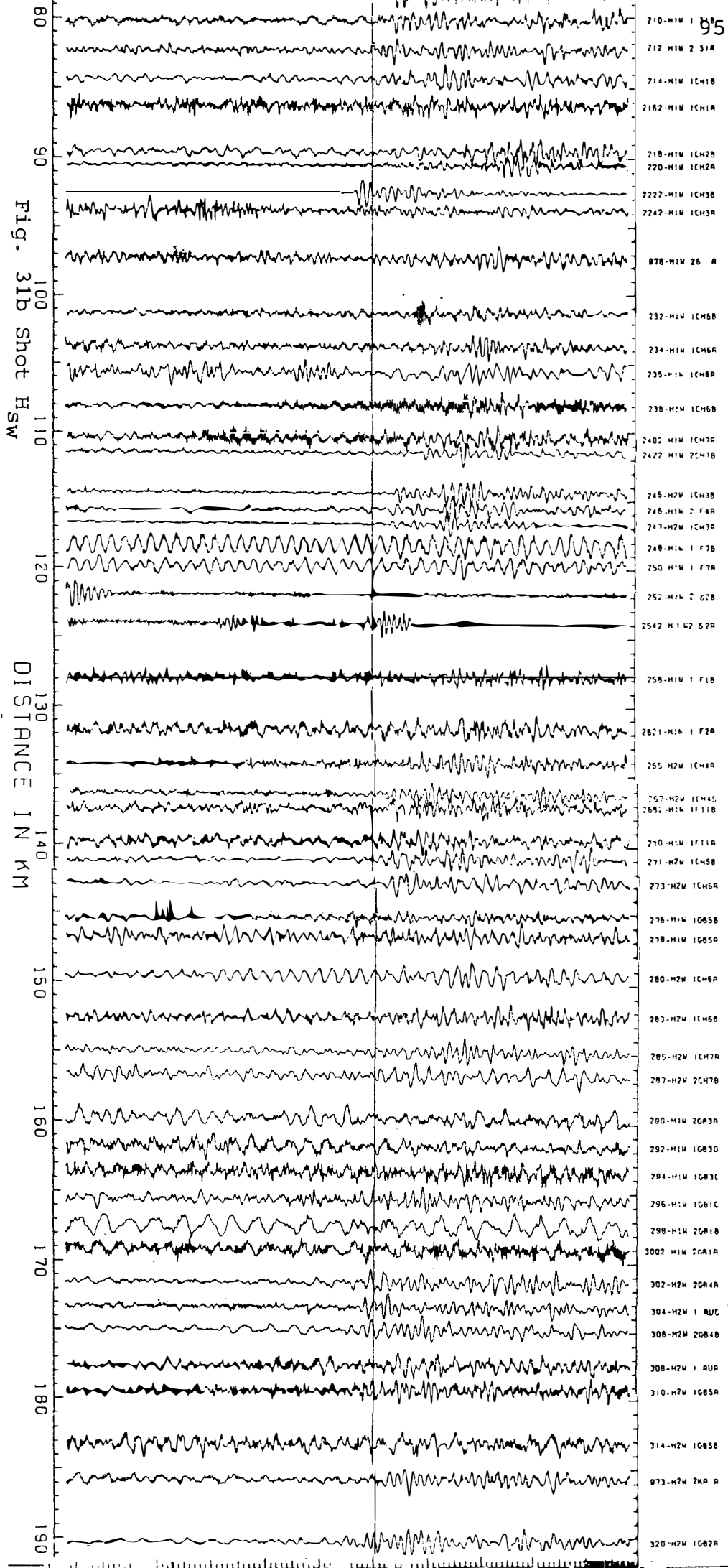






REDUCED TIME IN SEC





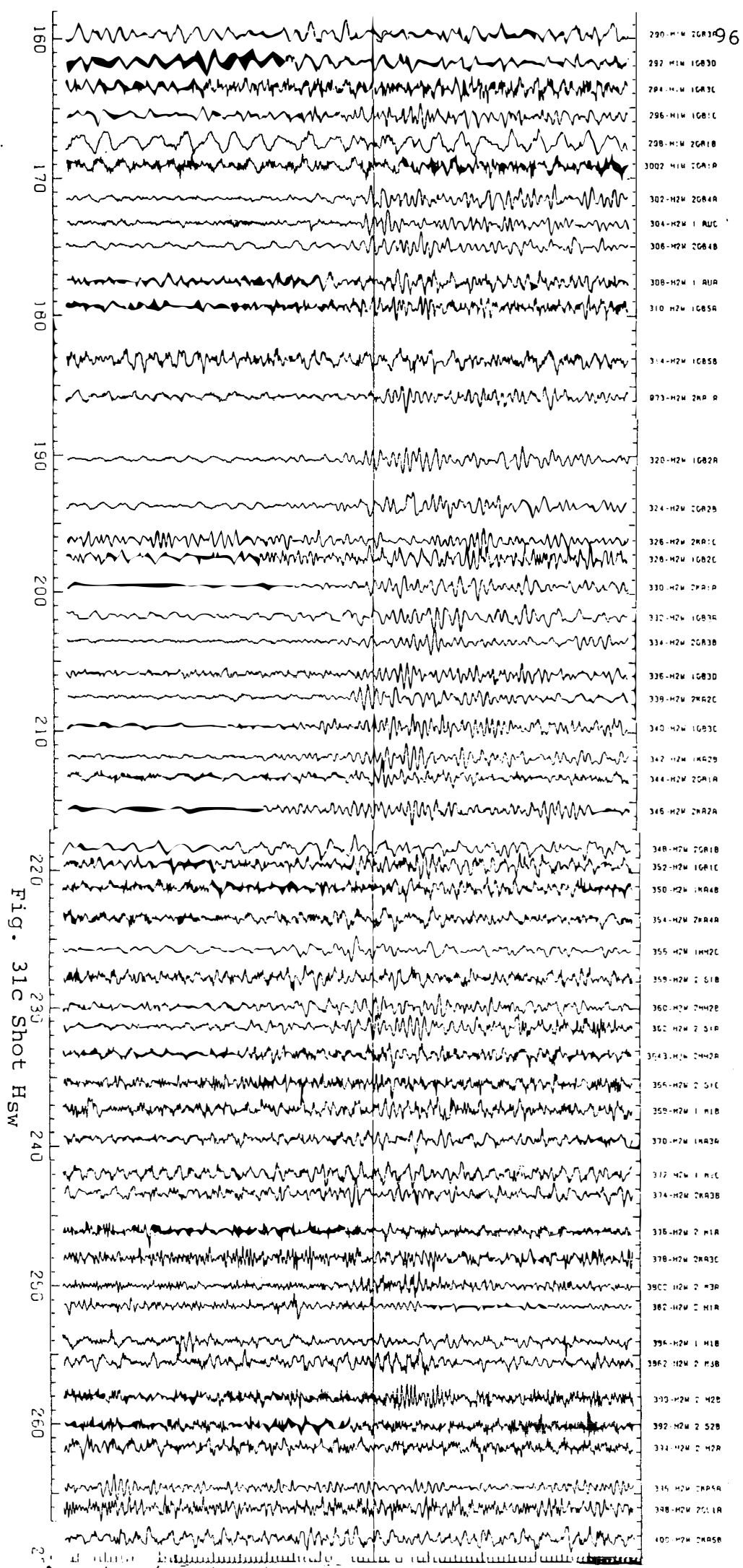


Fig. 31c Shot HSW

REDUCED TIME IN SEC

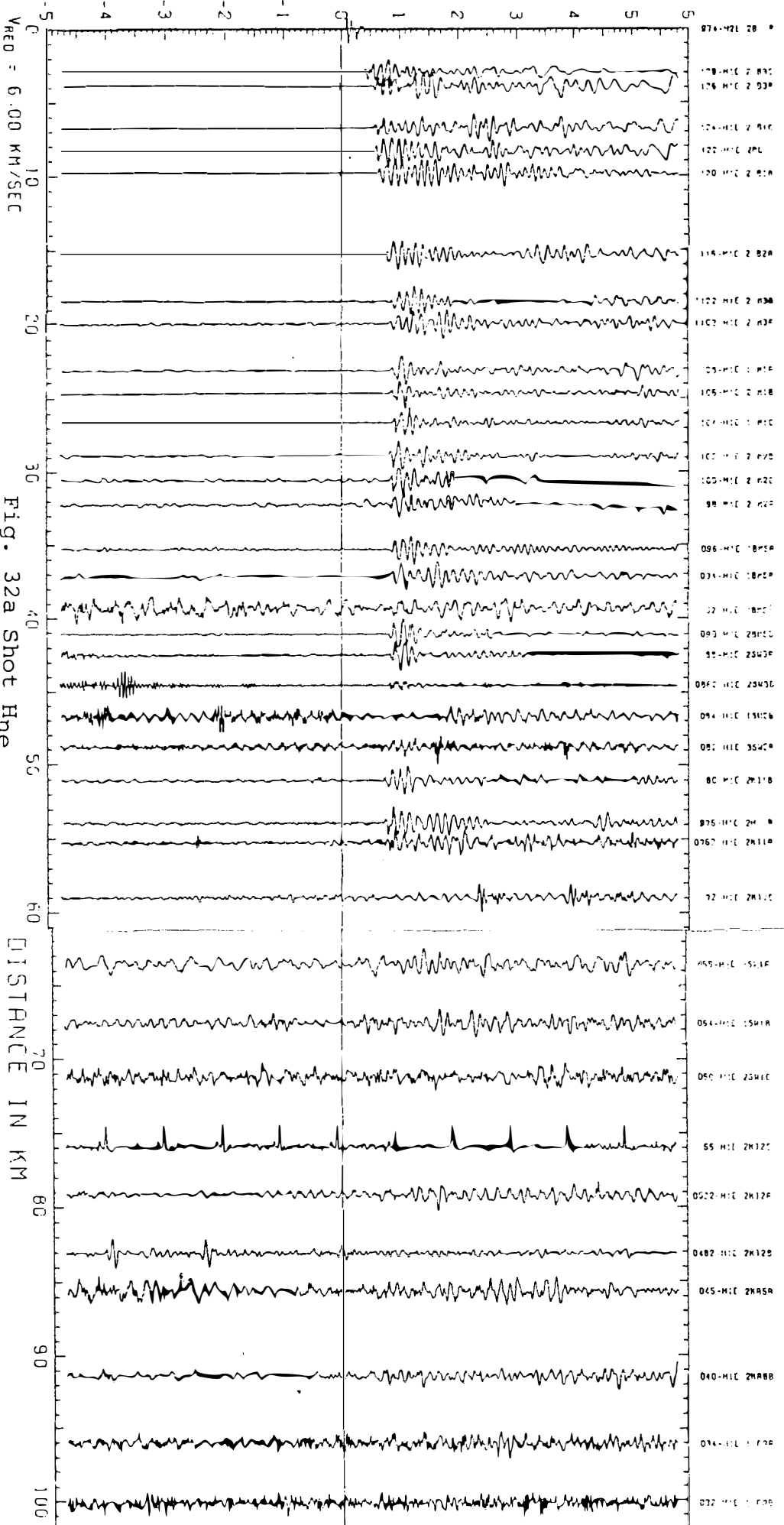
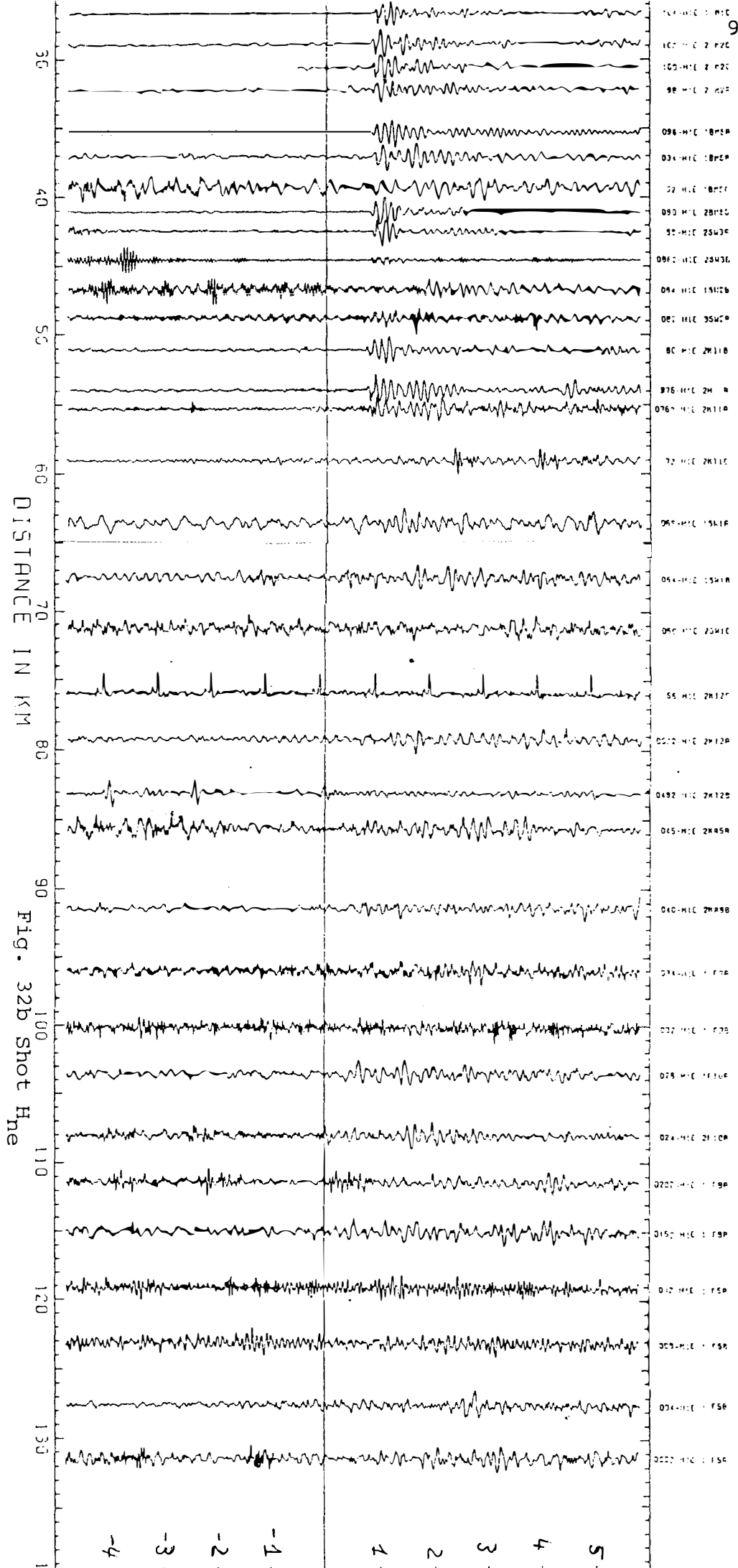
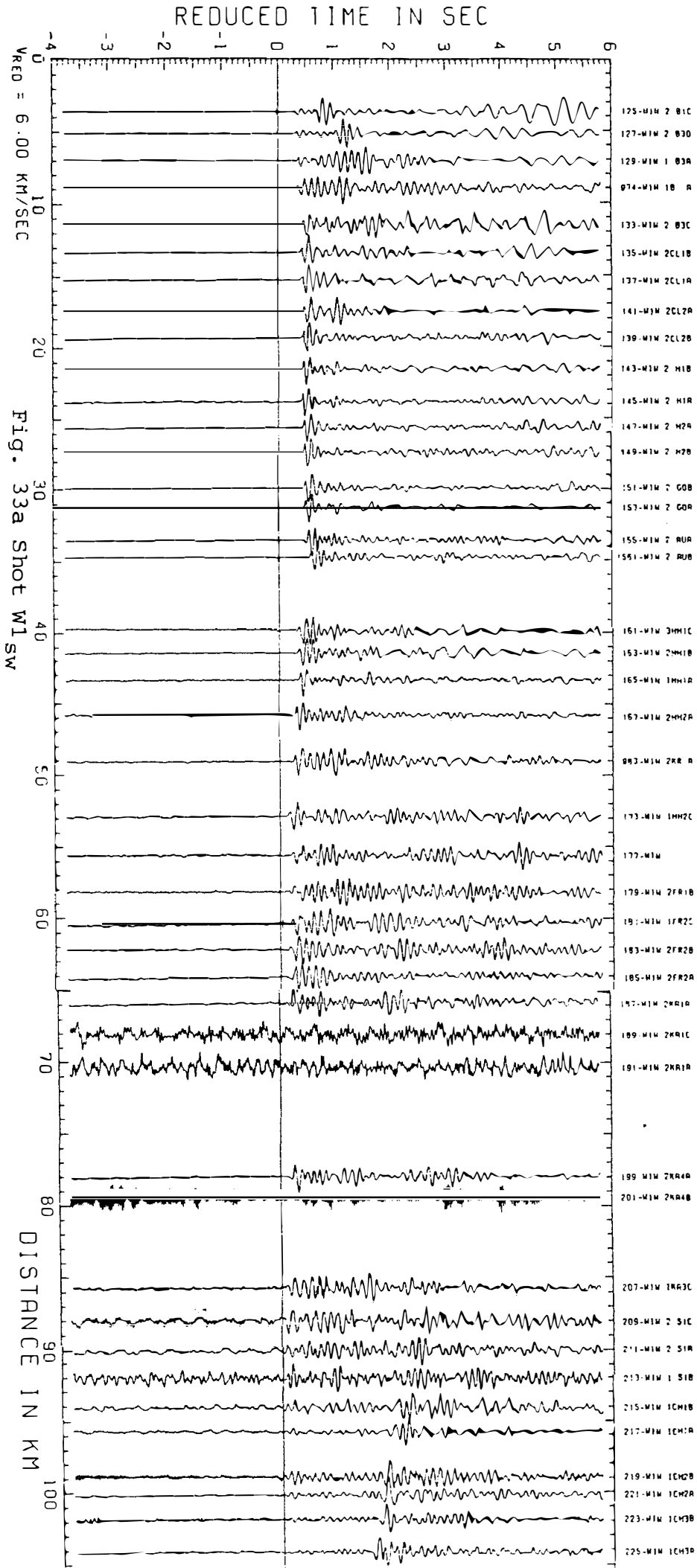
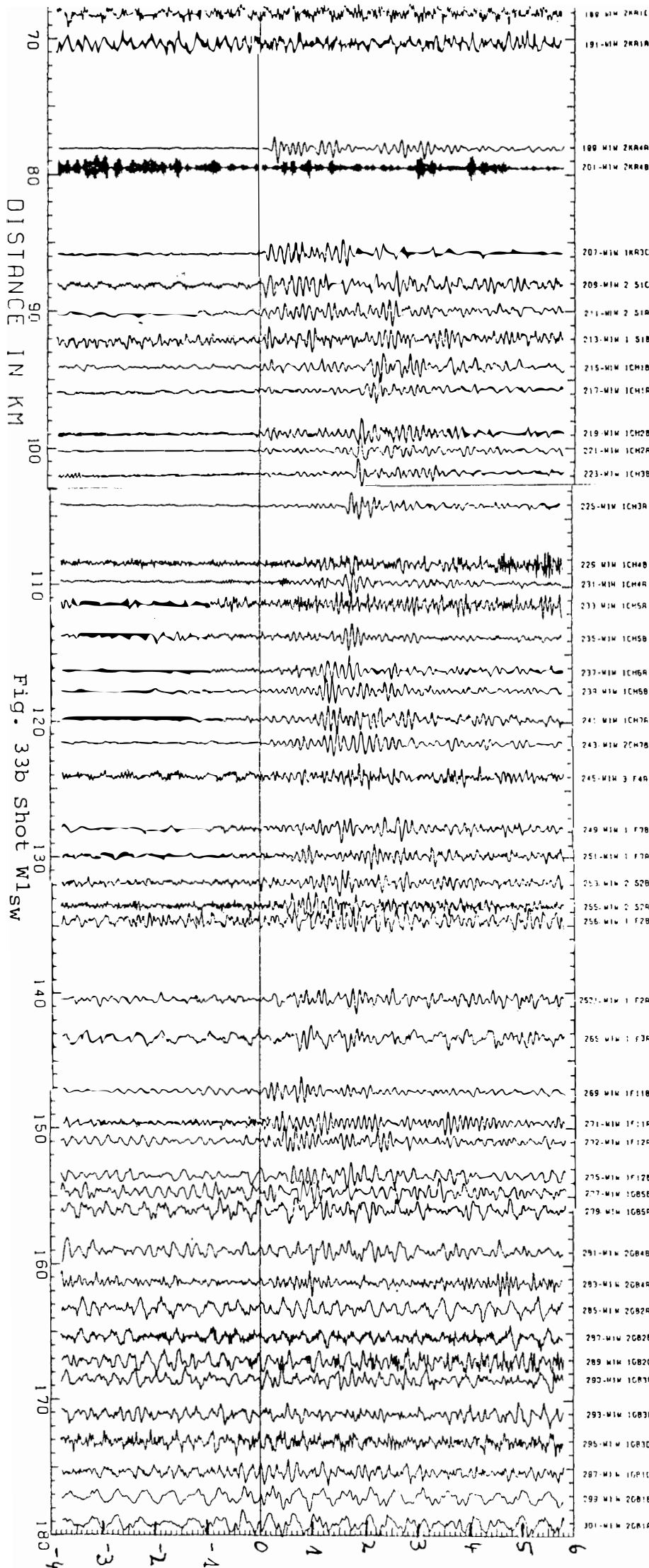


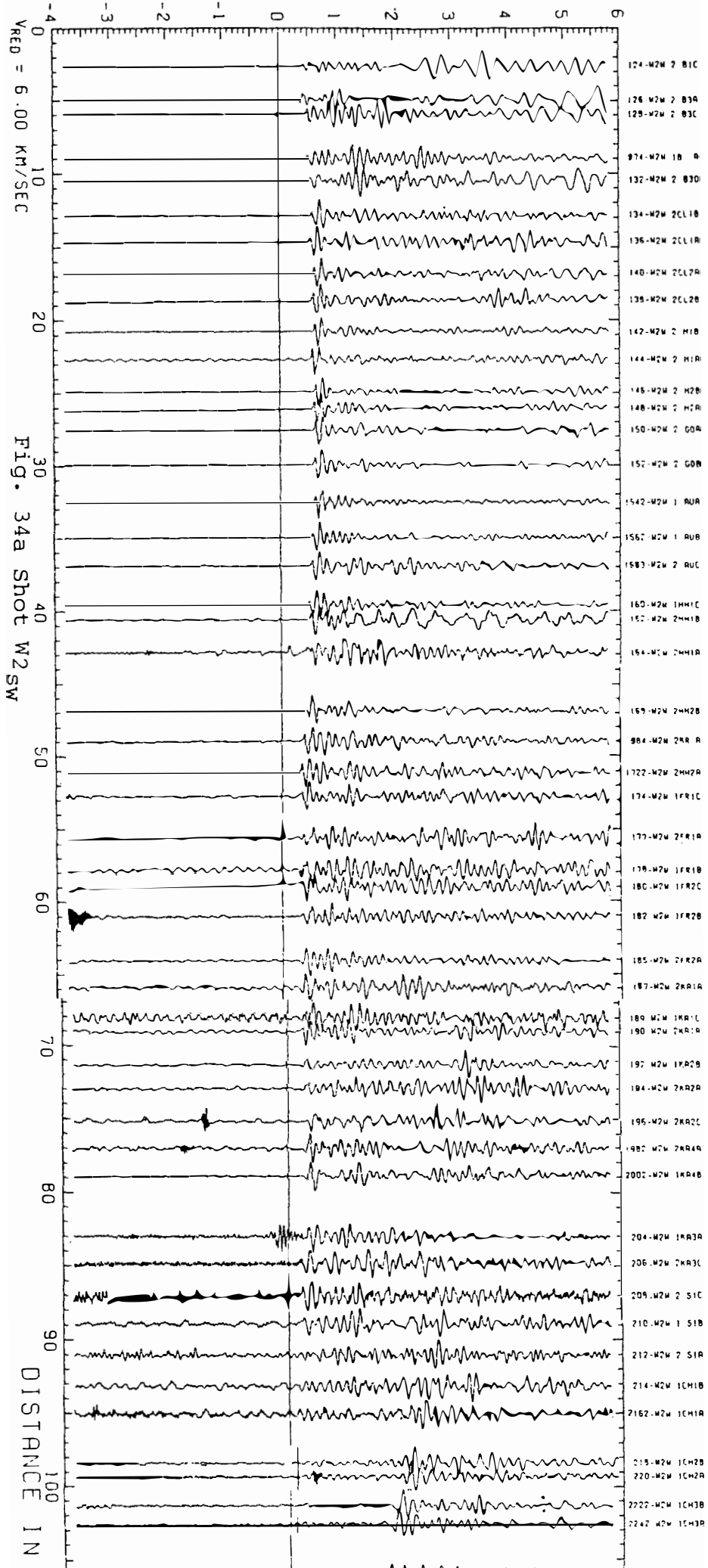
Fig. 32a Shot Line







REDUCED TIME IN SEC



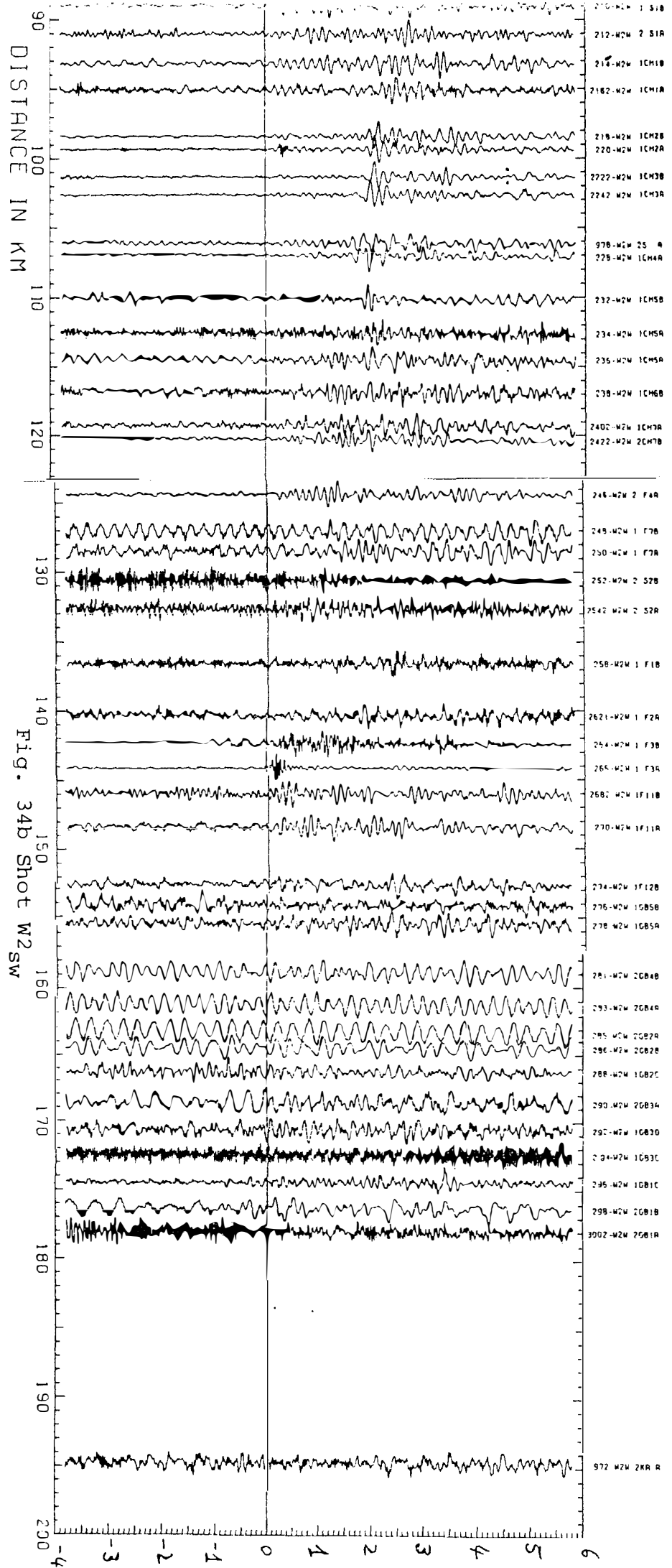


Fig. 34b Shot W2 SW

REDUCED TIME IN SEC

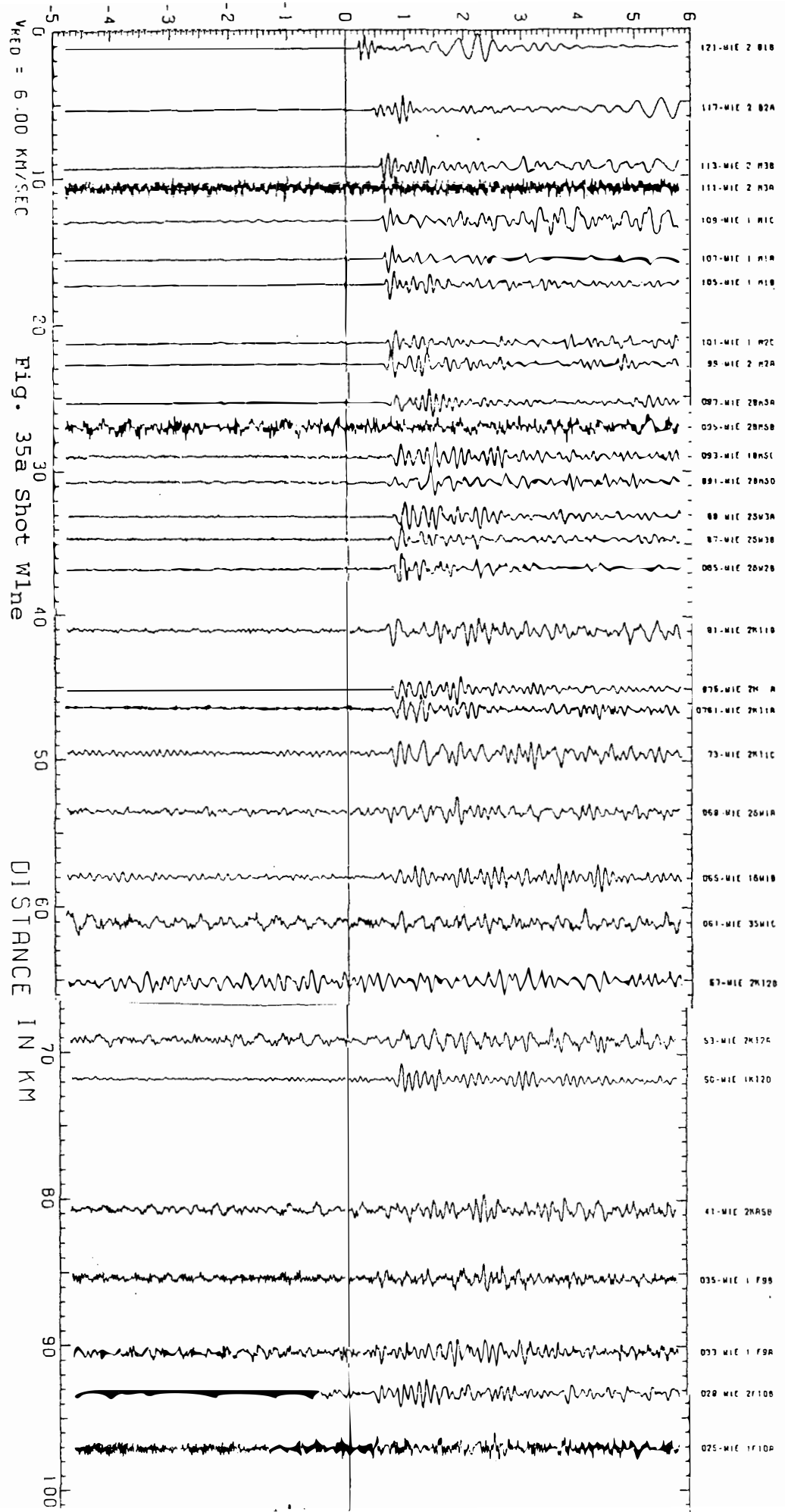


Fig. 35a Shot wine

WIND = 6.00 KM/SEC

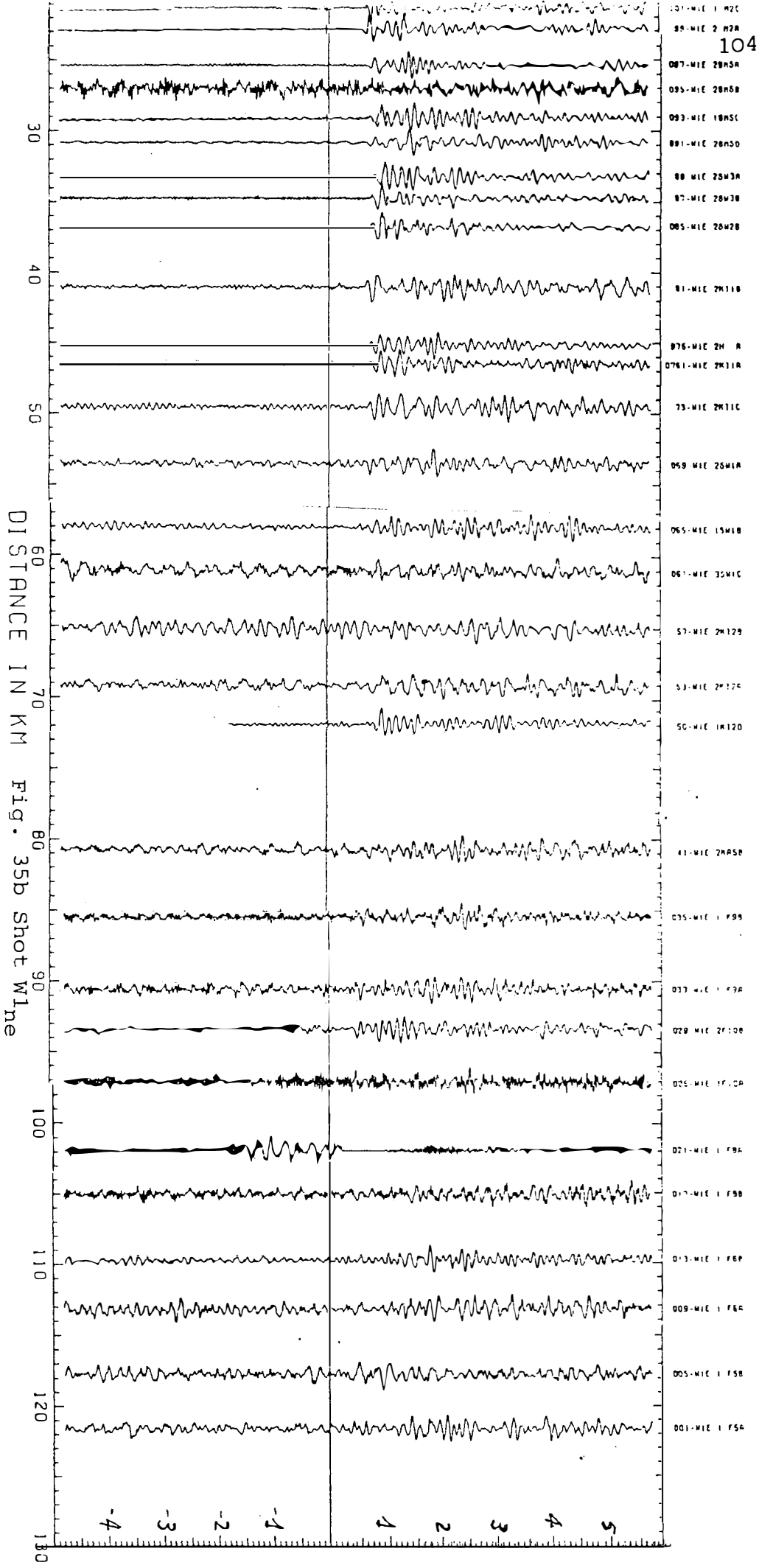
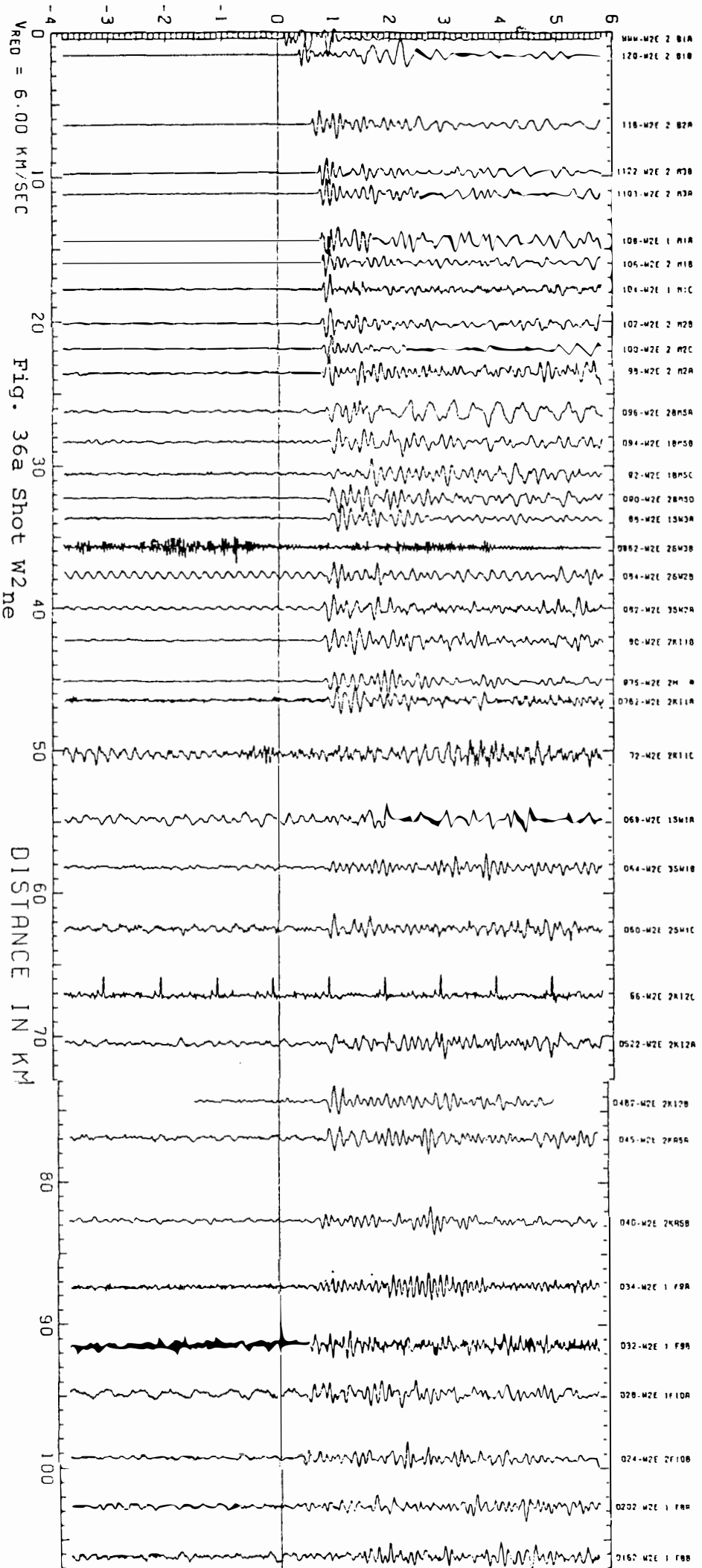
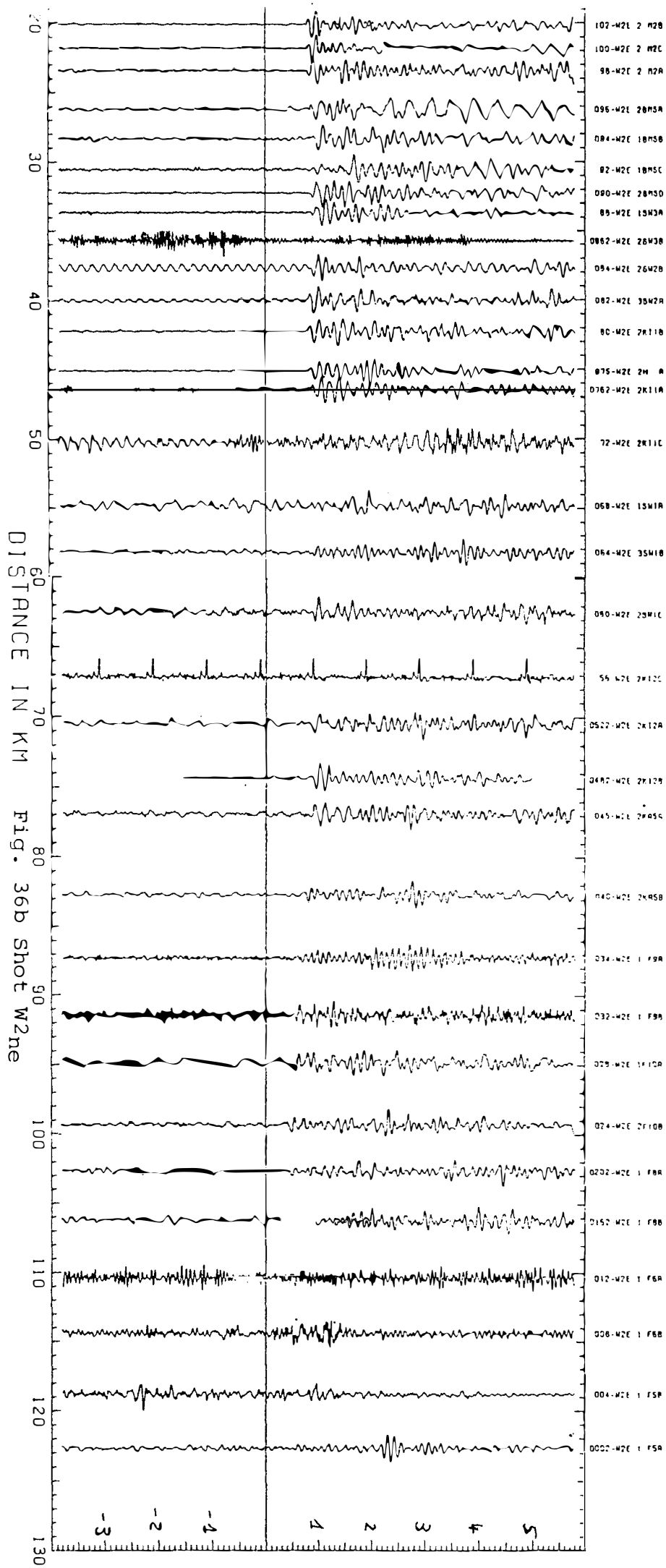


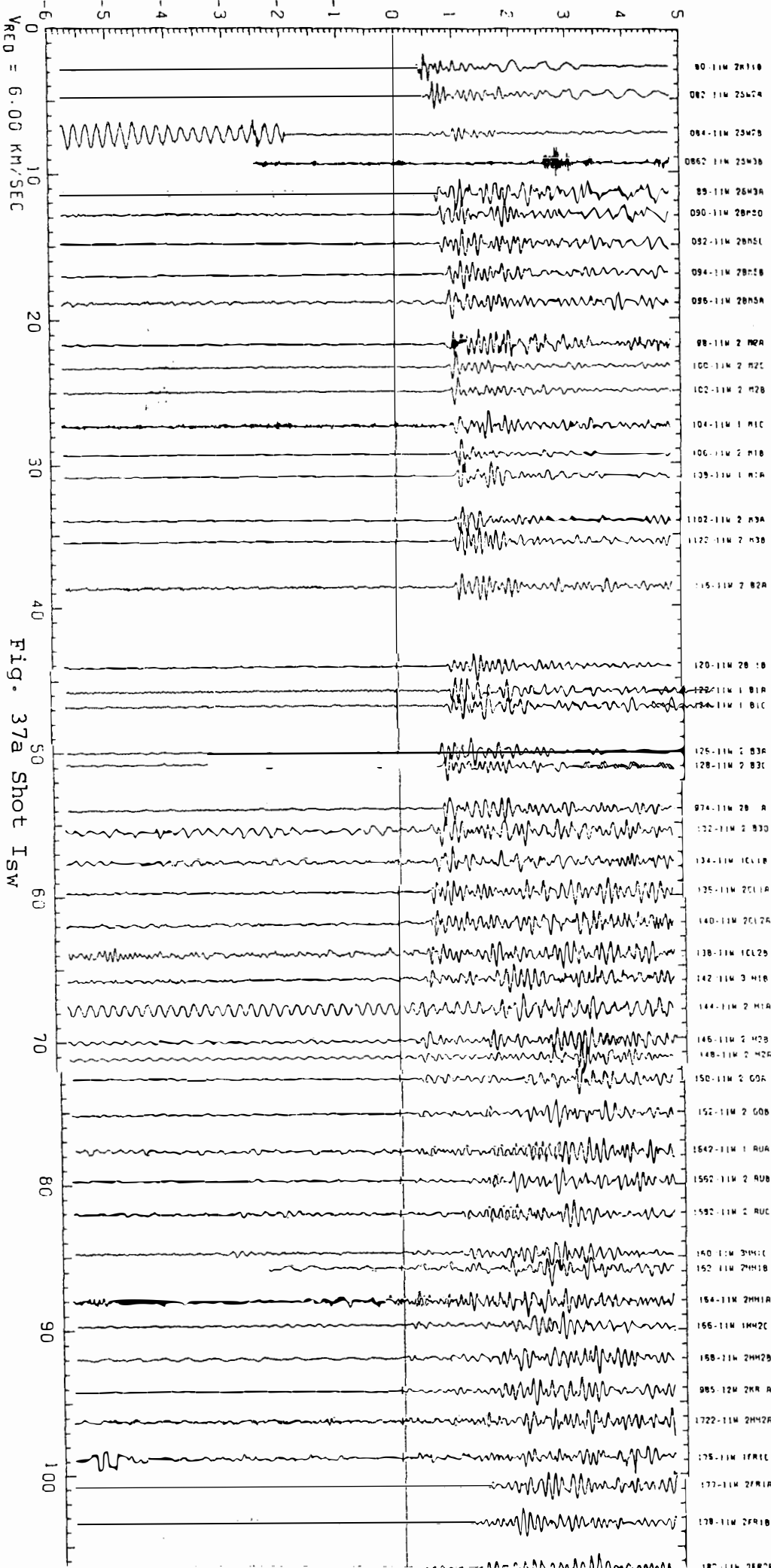
Fig. 35b Shot W1ne

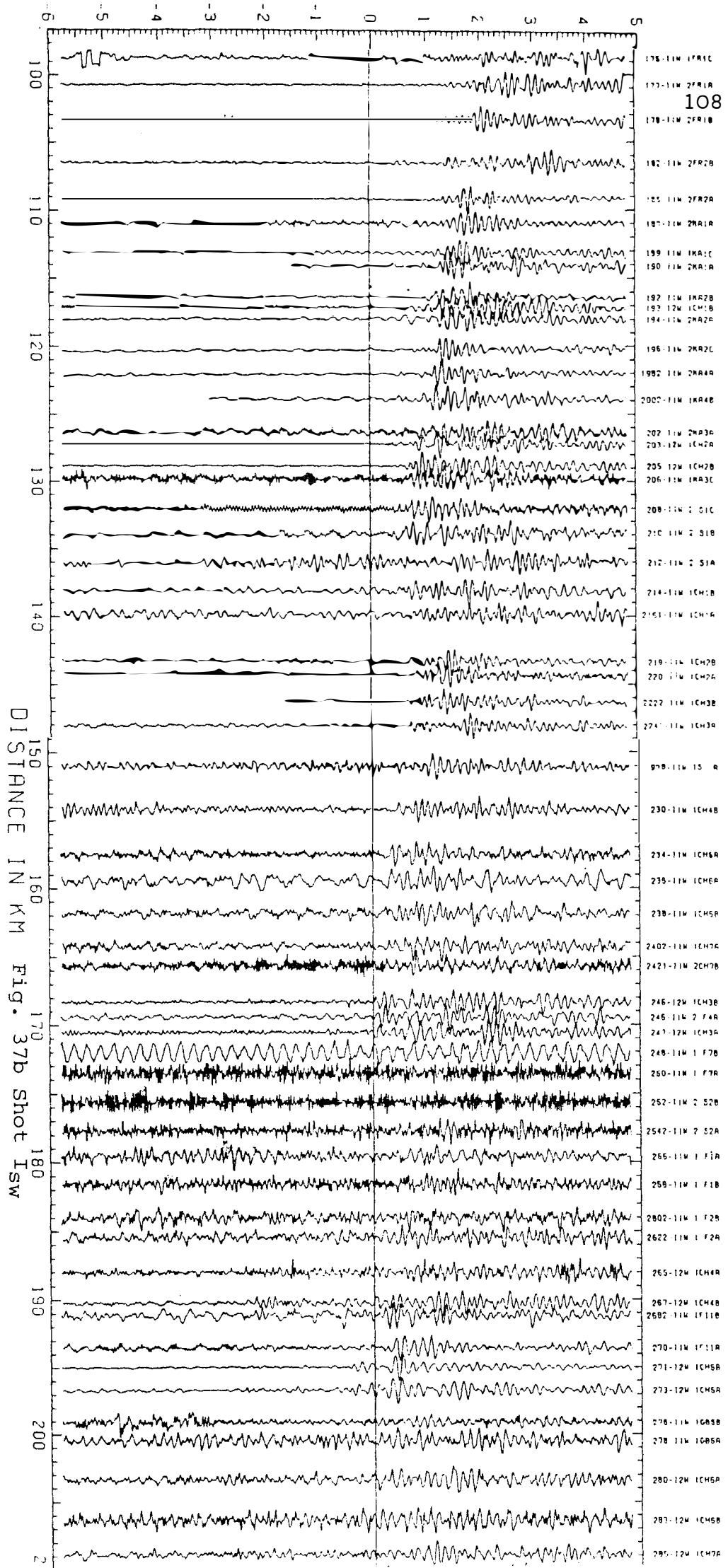
REDUCED TIME IN SEC

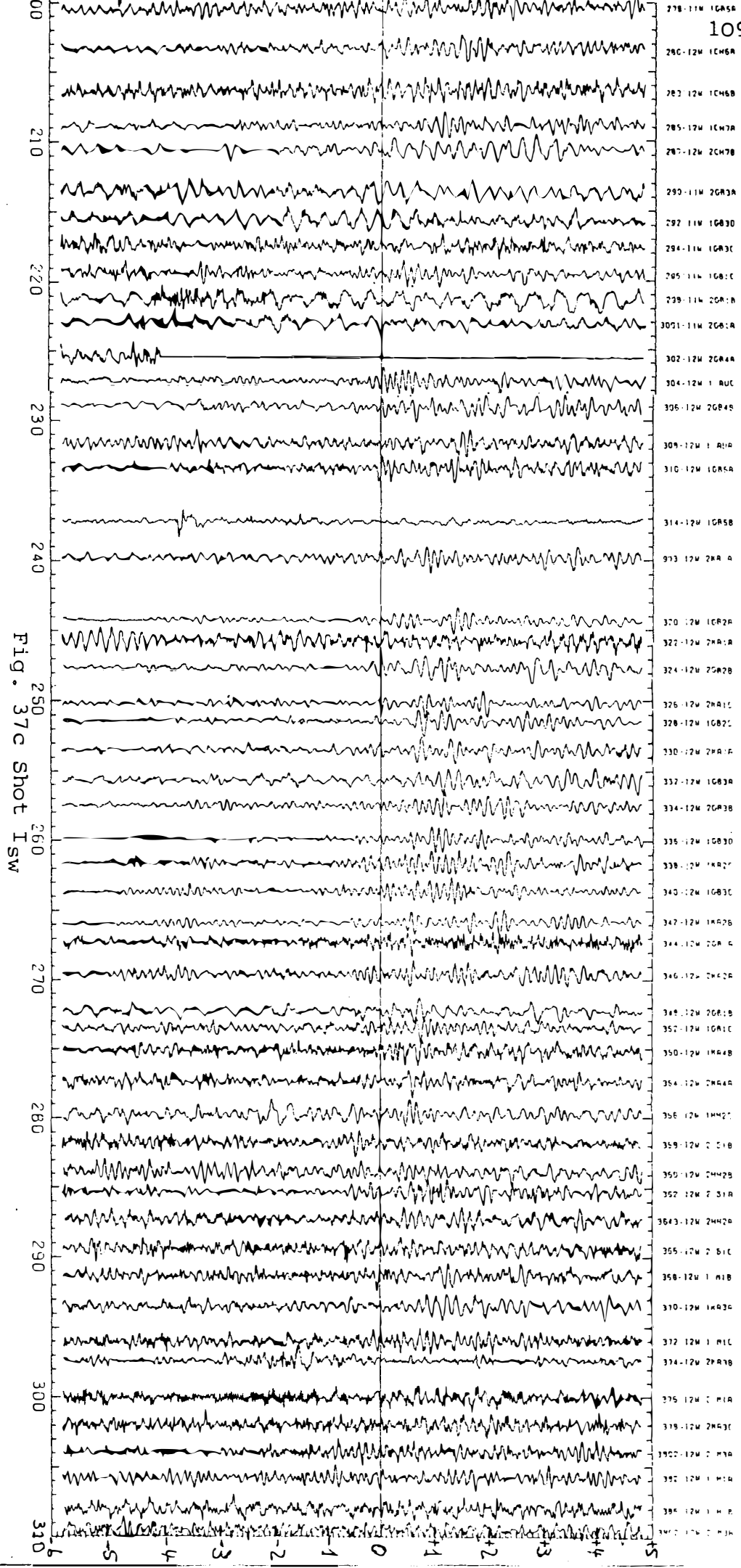




REDUCED TIME IN SEC







6 5 4 3 2 1 0 1 2 3 4 5

M 27 .10.80 VERTICAL 1.3 HZ TO 33.0 HZ (50.13/2)

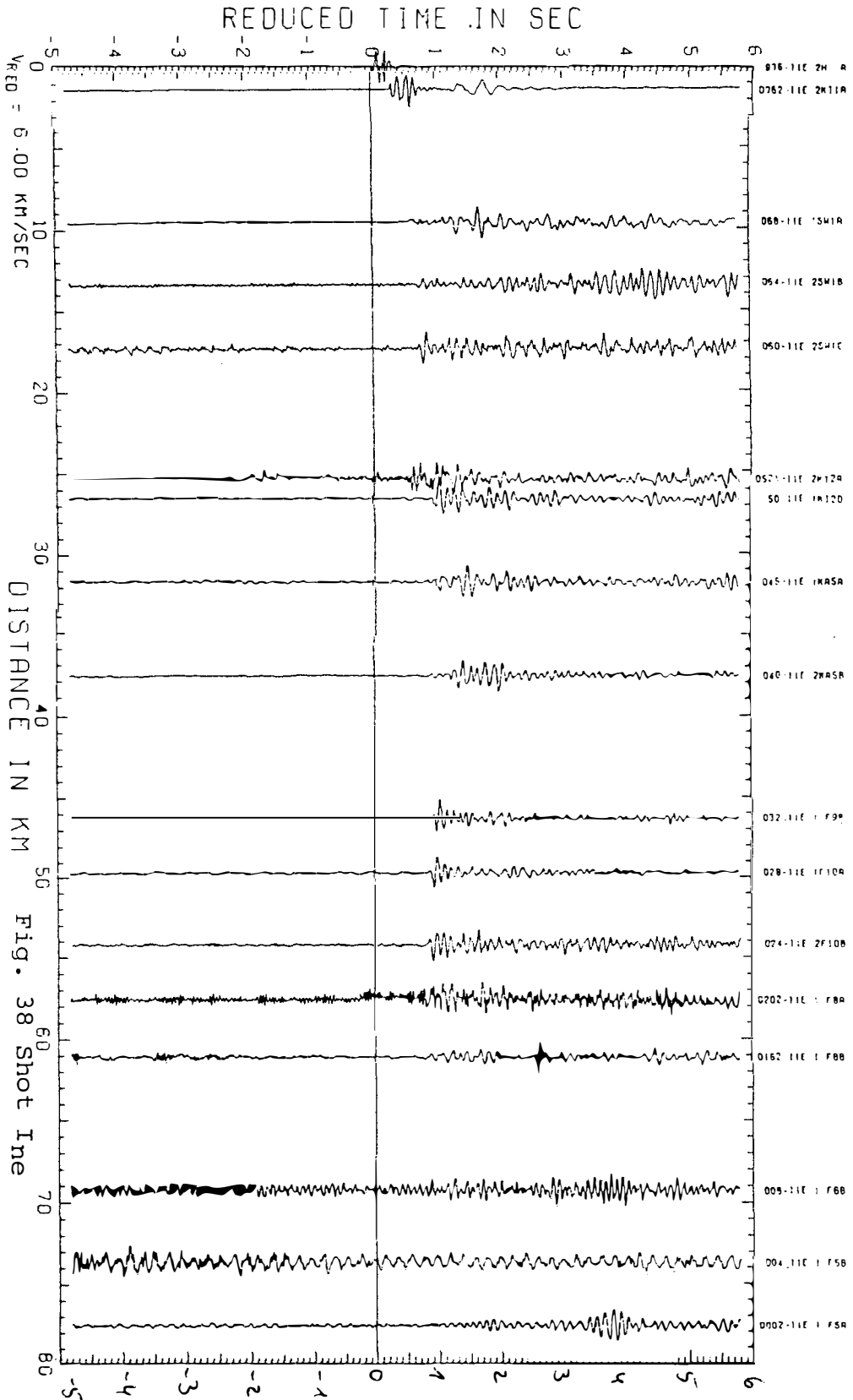


Fig. 38 Shot Ine

REDUCED TIME IN SEC

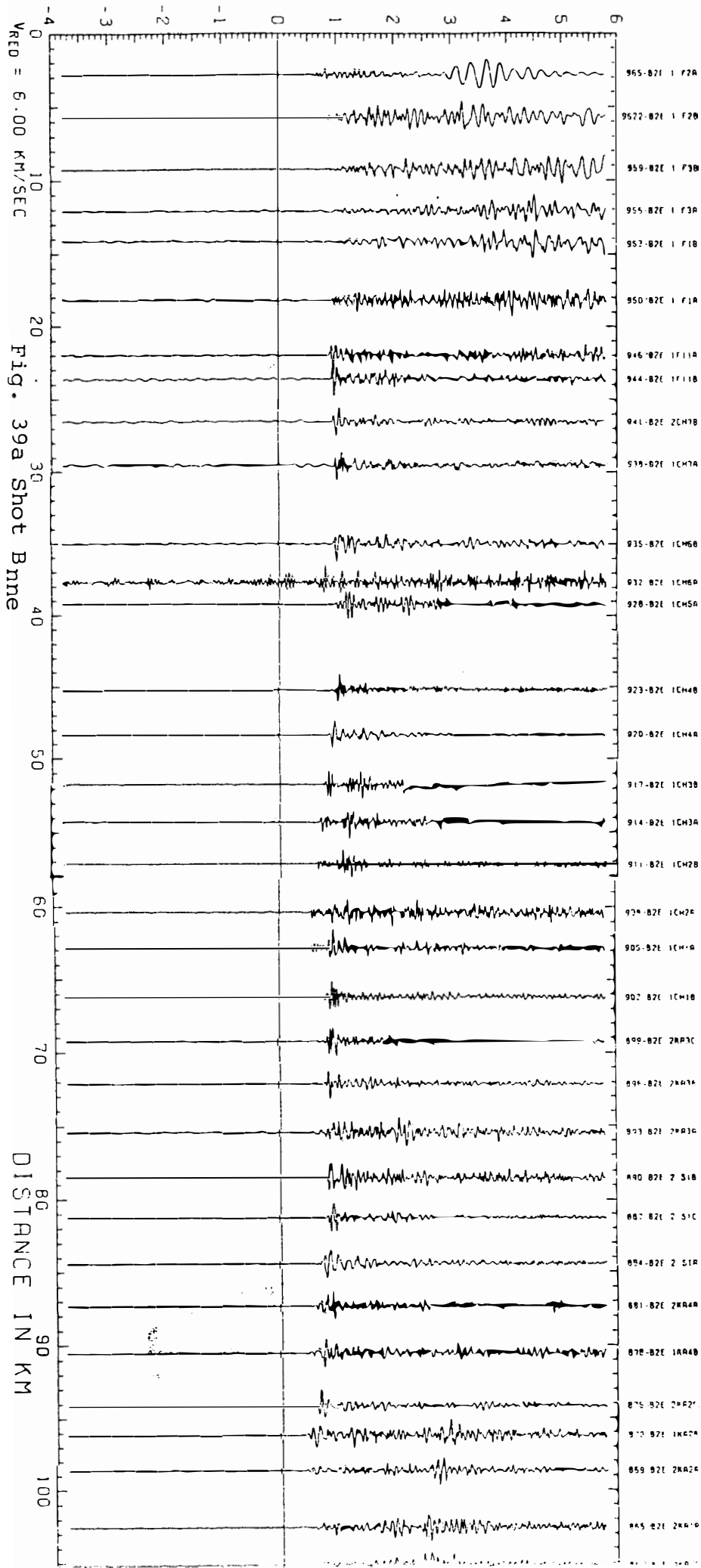
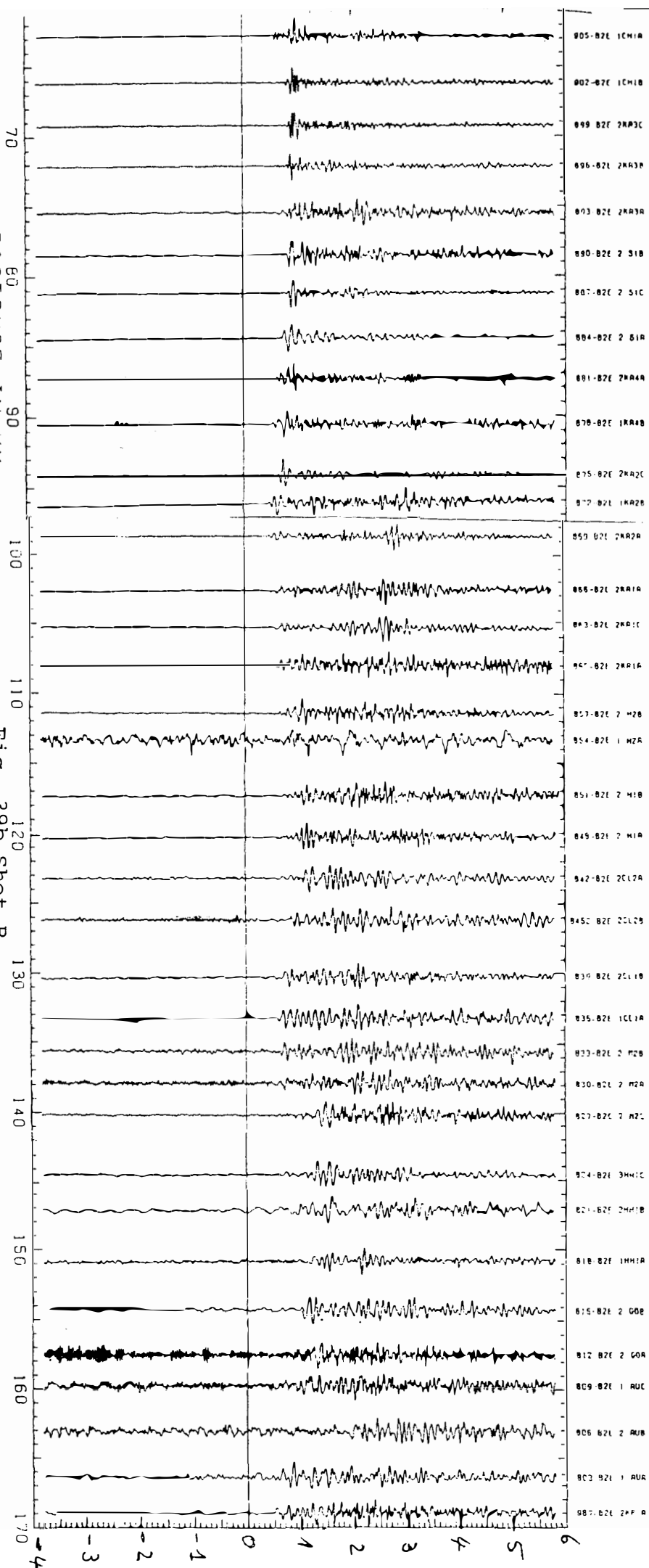


Fig. 39a Shot Bme

DISTANCE IN KM

Fig. 39b Shot Bme



24 Ach
25 Plot

REDUCED TIME IN SEC

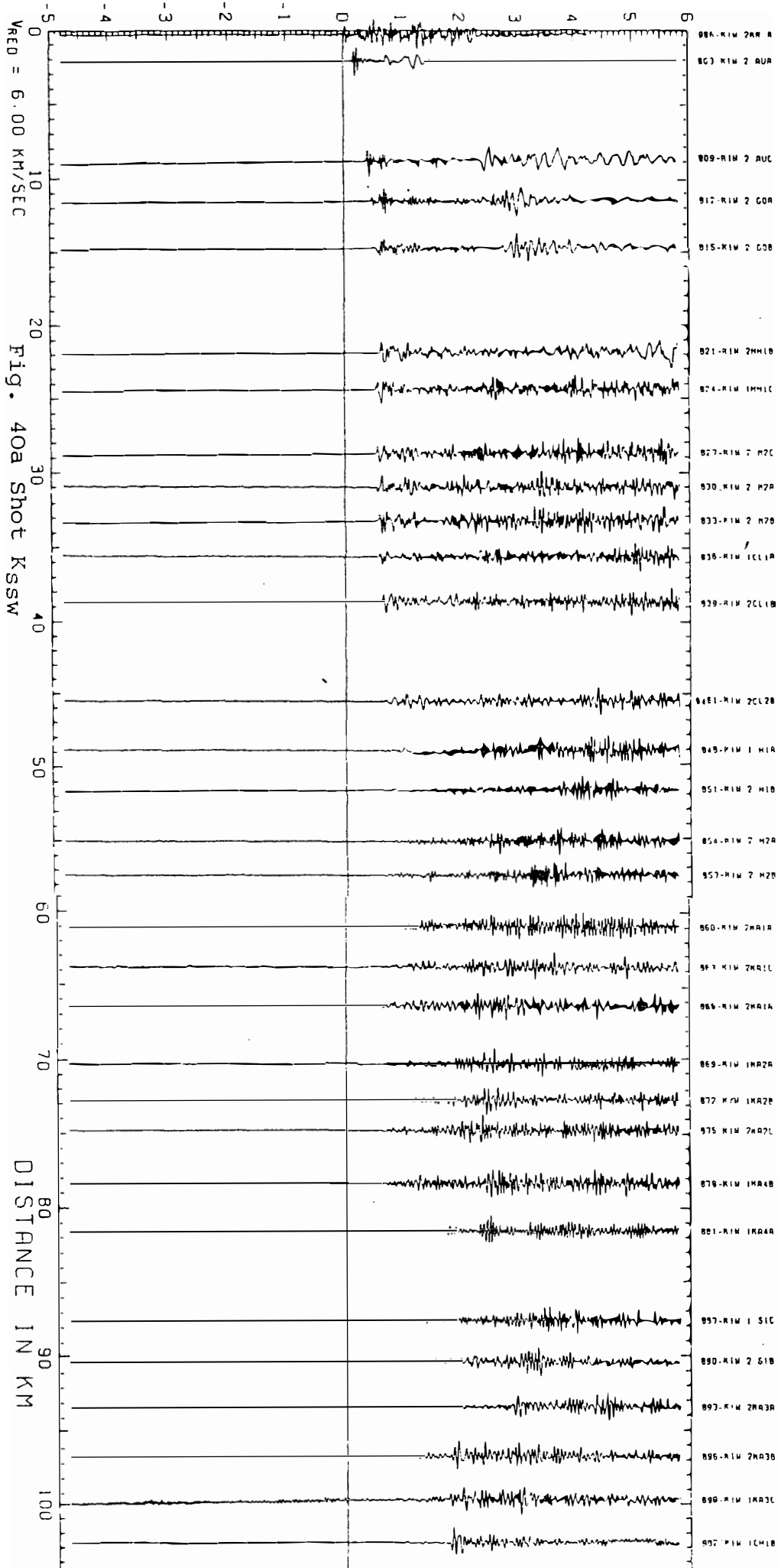


Fig. 40a Shot KSSW

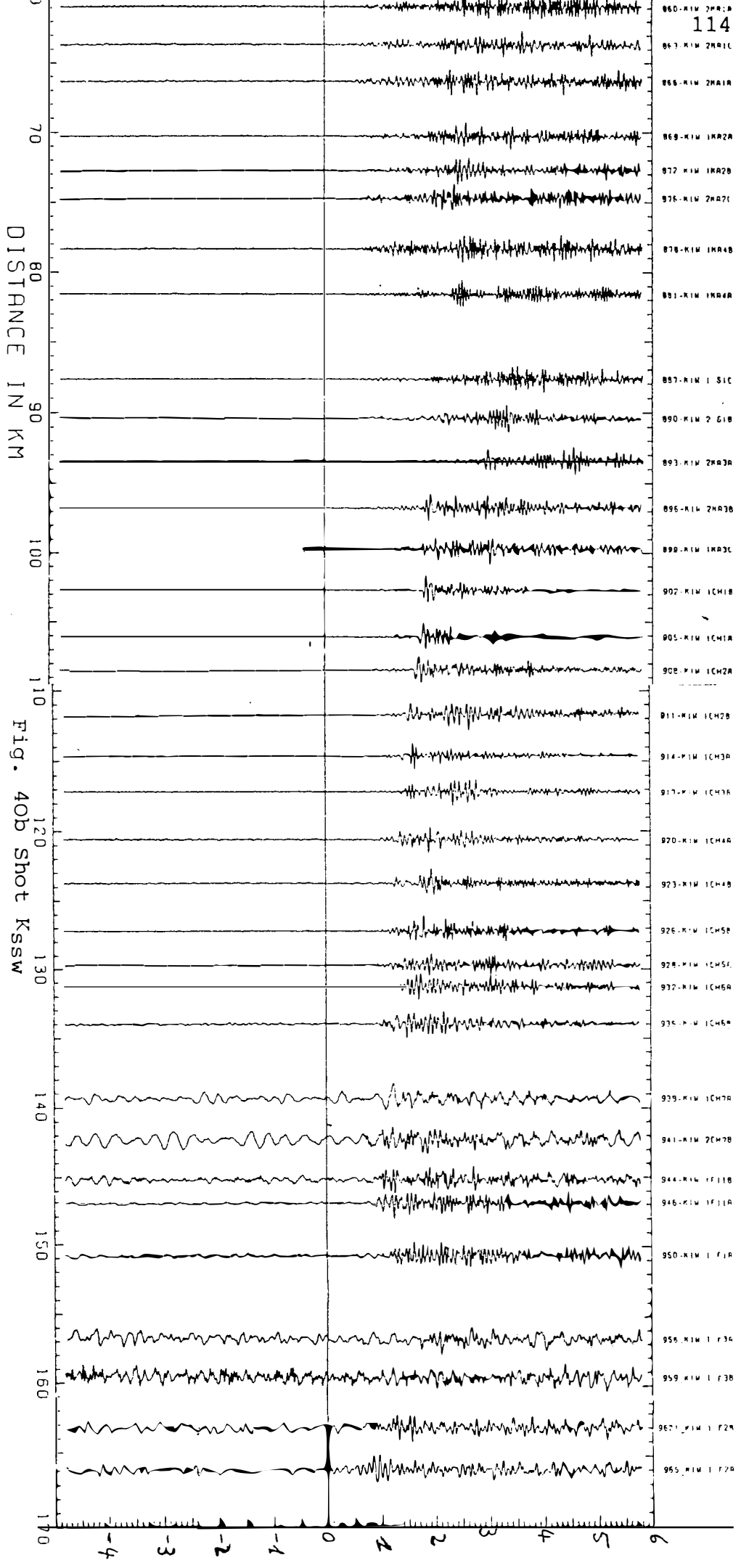
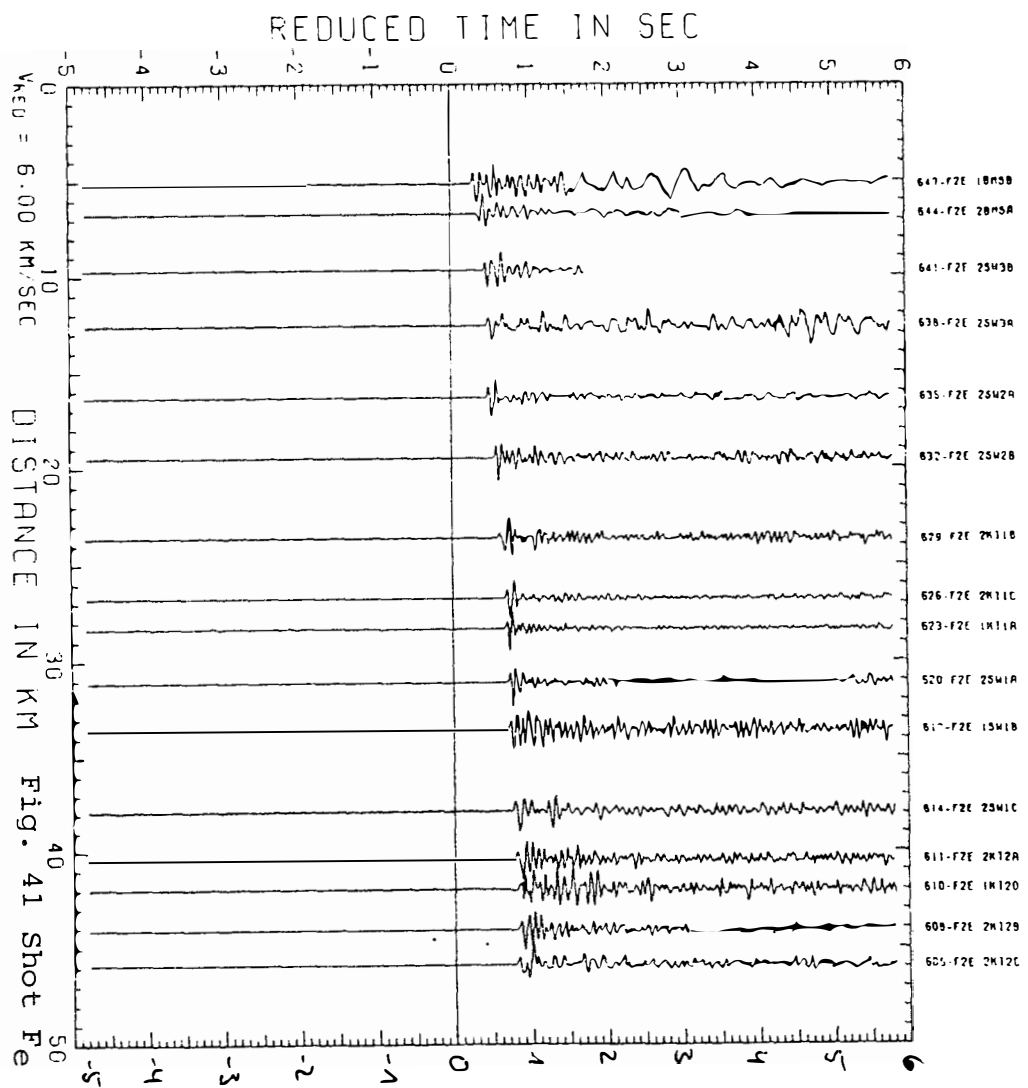
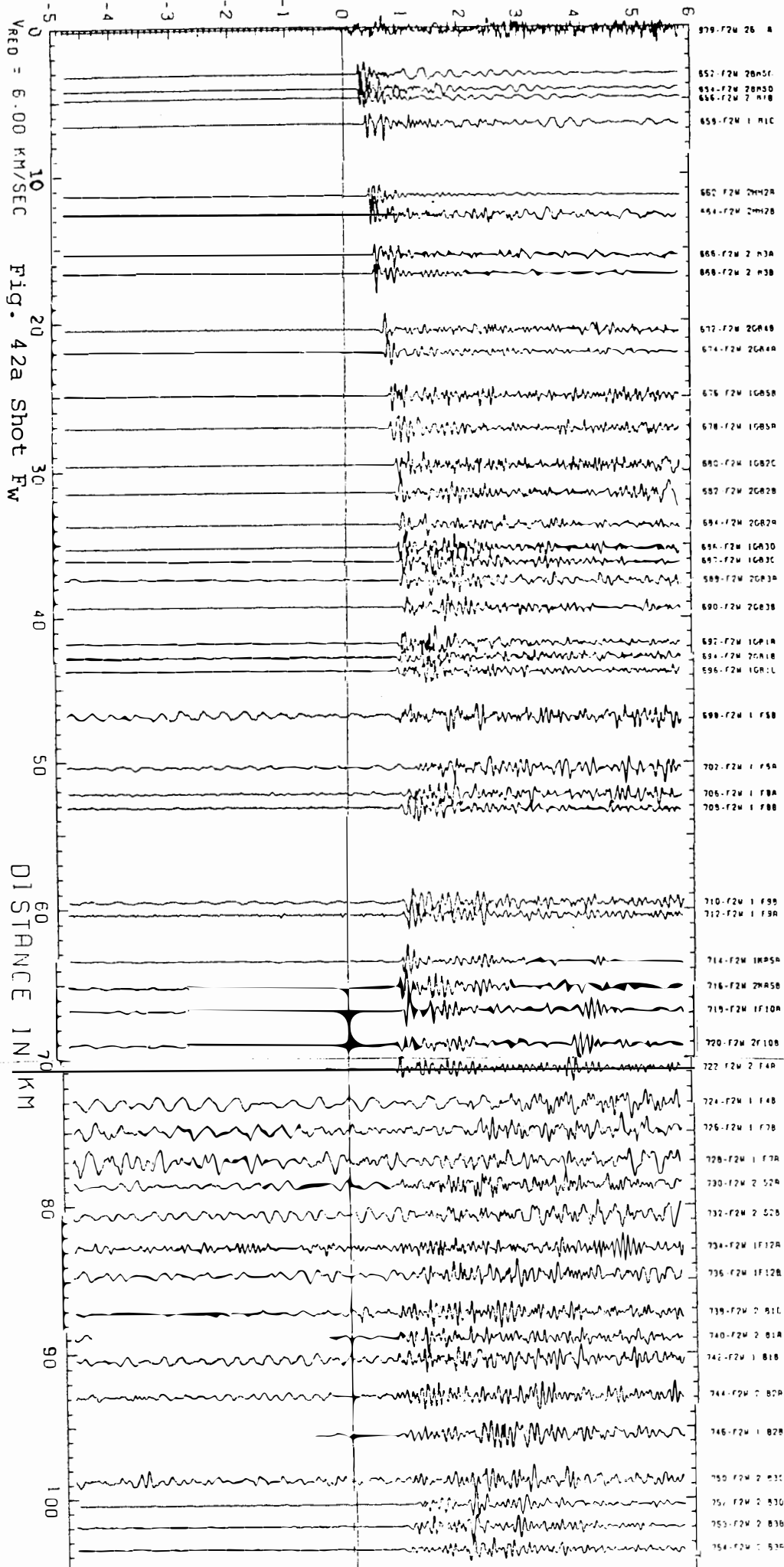


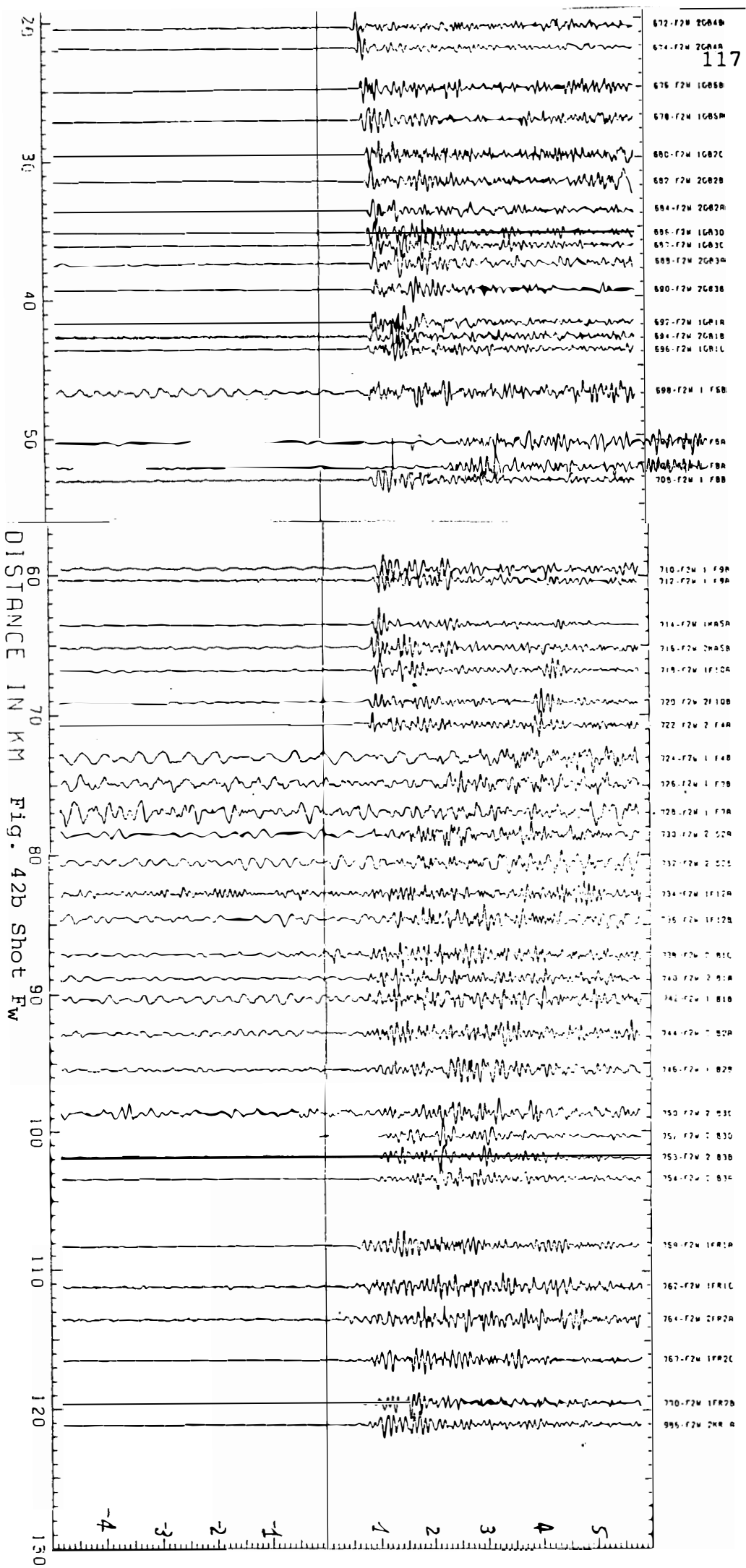
Fig. 40b Shot Kssw

10.80 VERTICAL 1.3 HZ TO 33.0 HZ (80.13/2)

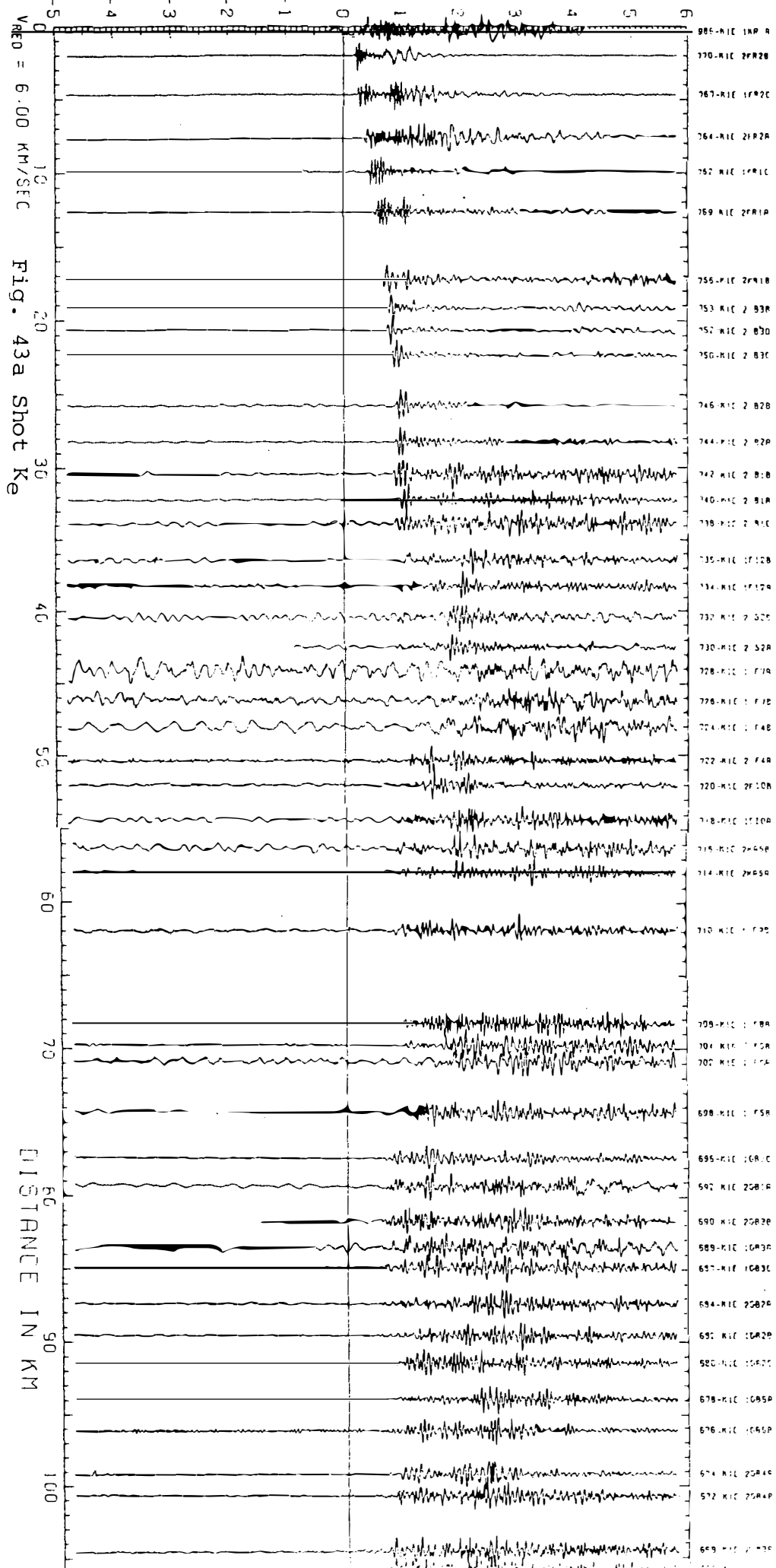


REDUCED TIME IN SEC





REDUCED TIME IN SEC



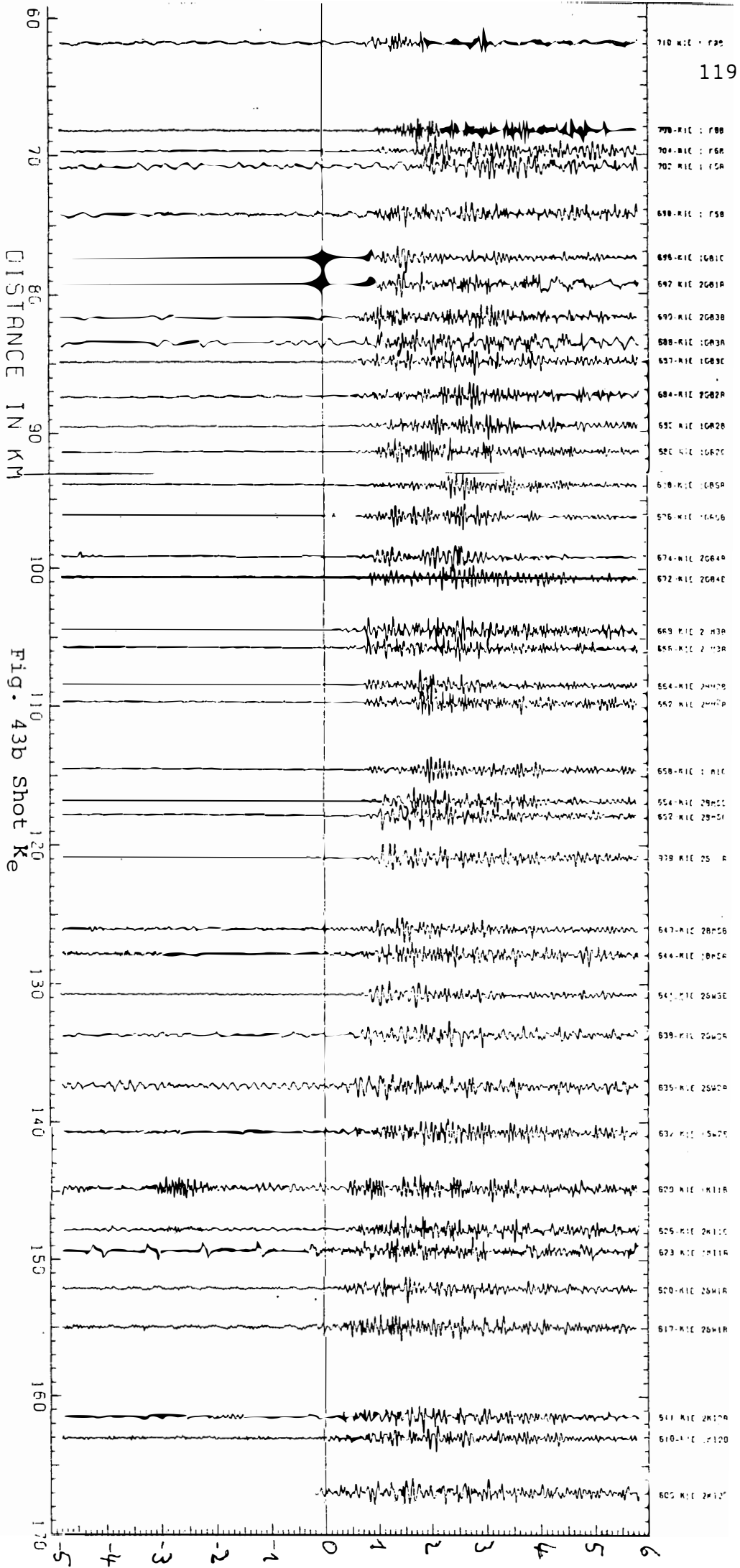


Fig. 43b Shot Ke

REDUCED TIME IN SEC

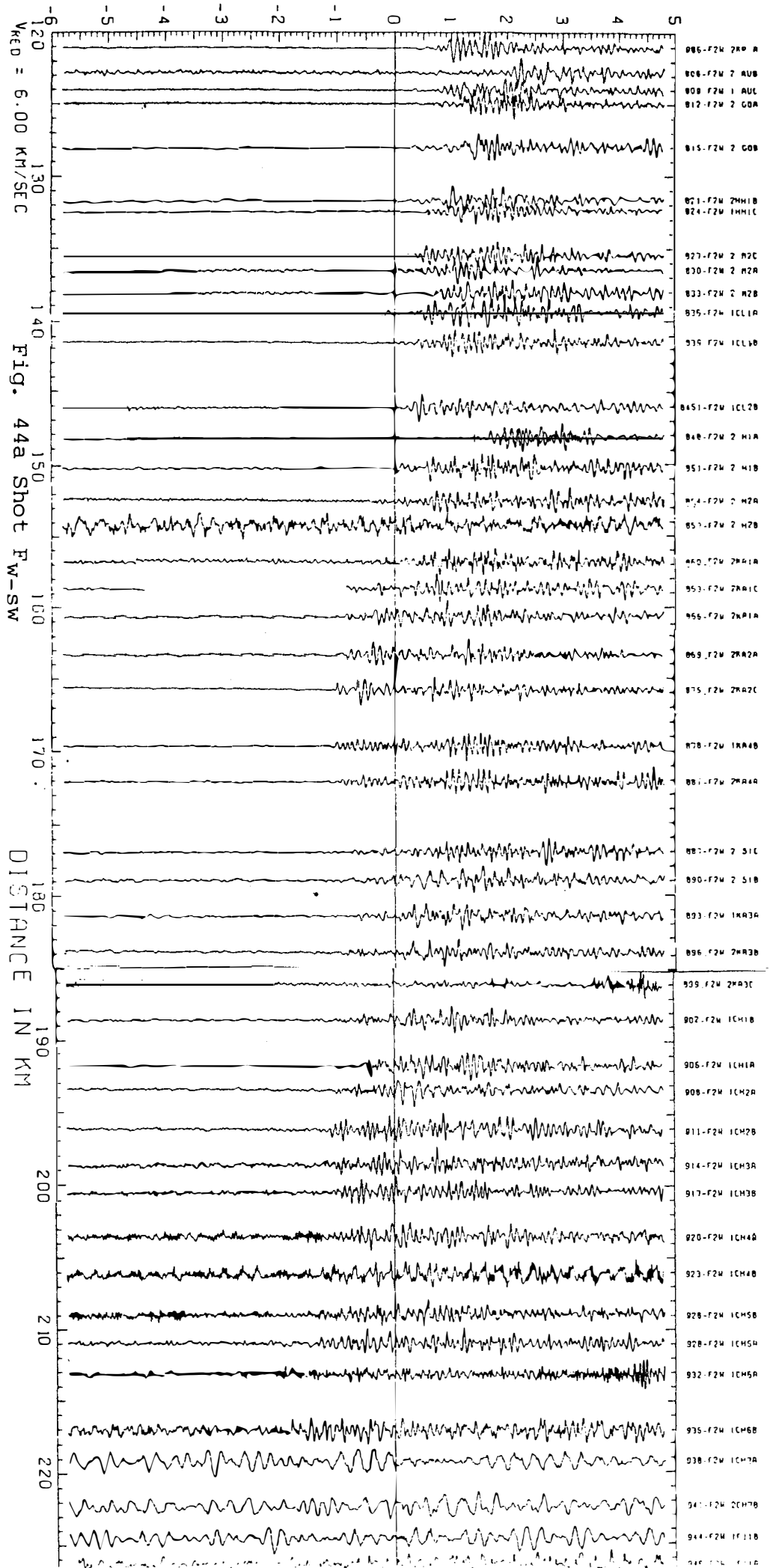
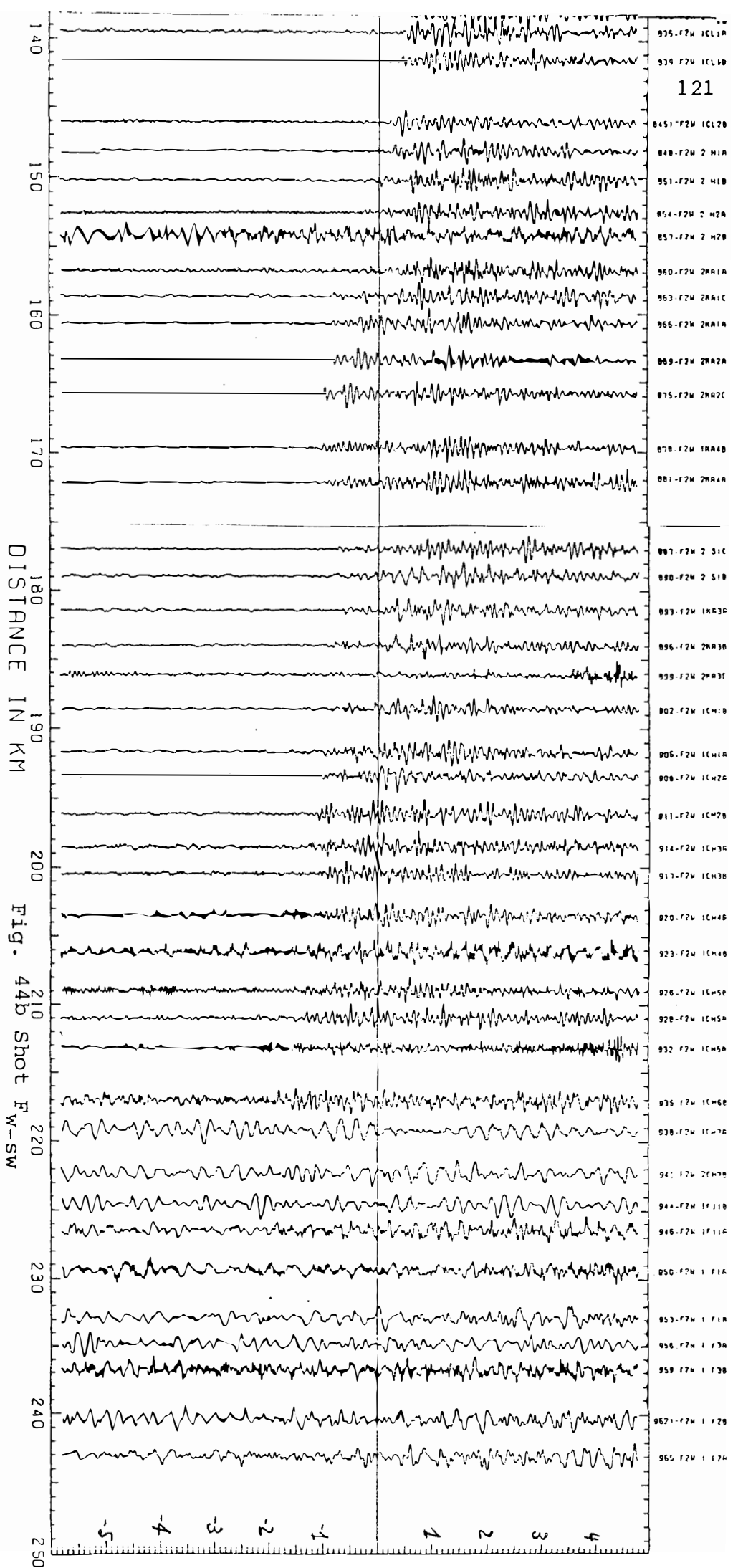
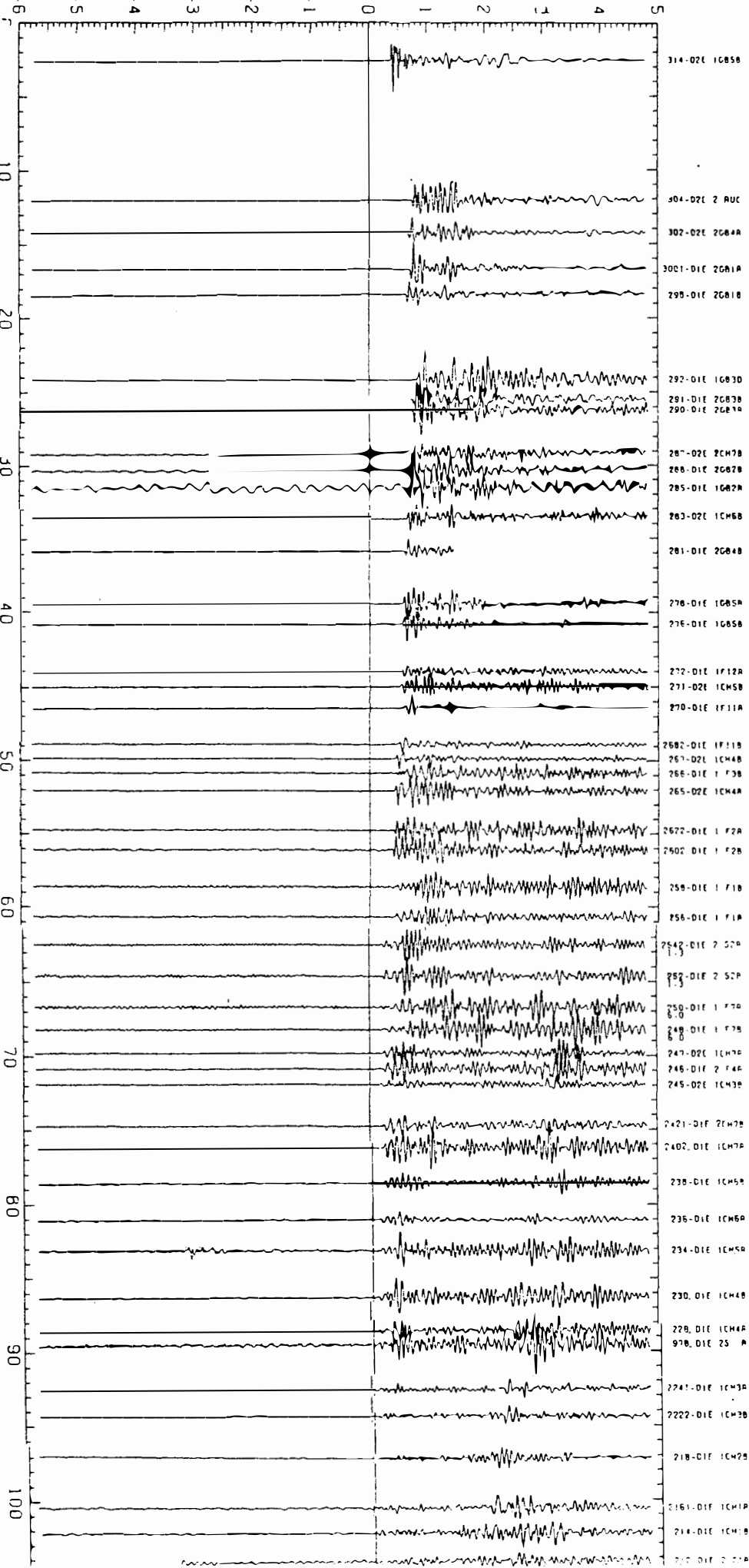


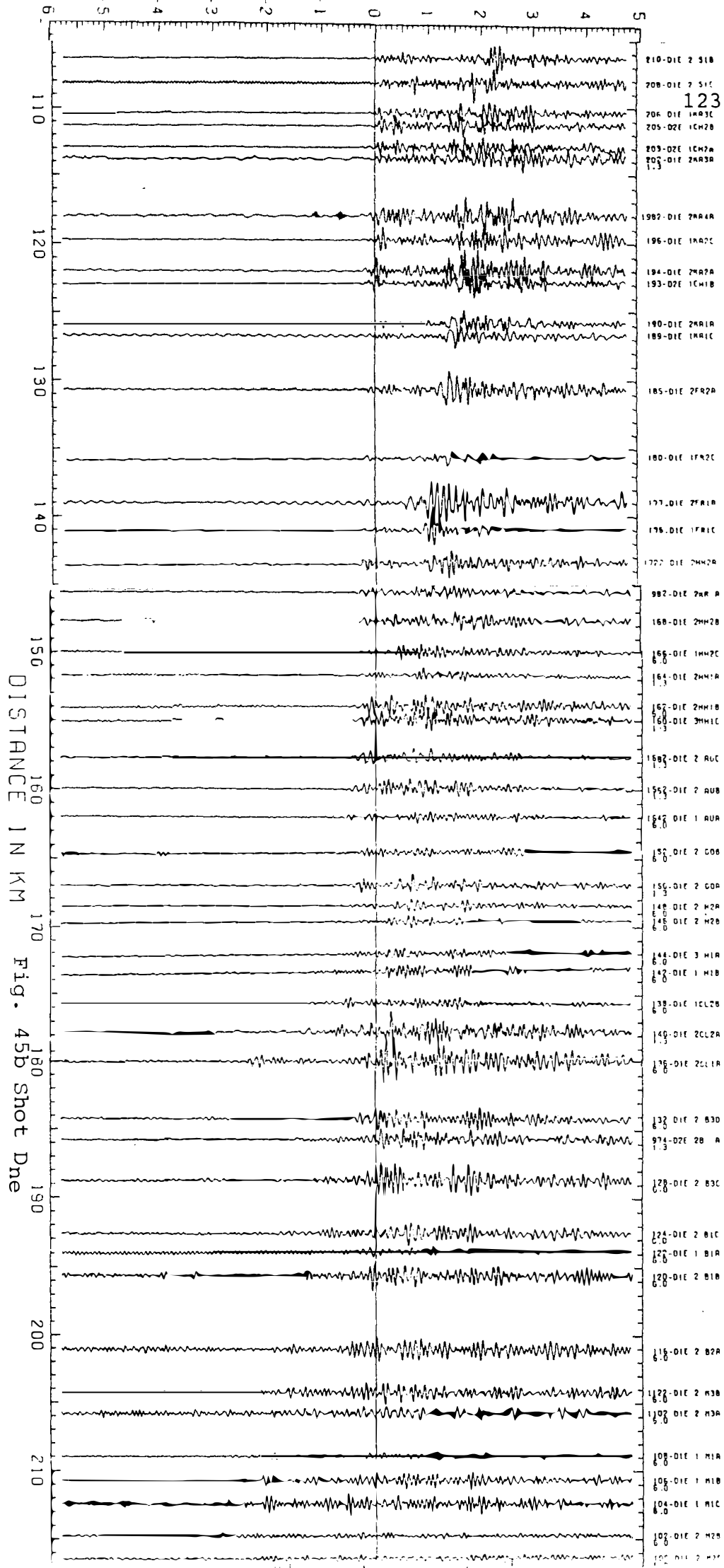
Fig. 44a Shot F-w-sw



REDUCED TIME IN SEC

VEDO = 6.00 KM/SEC
Fig. 45a Shot Dne





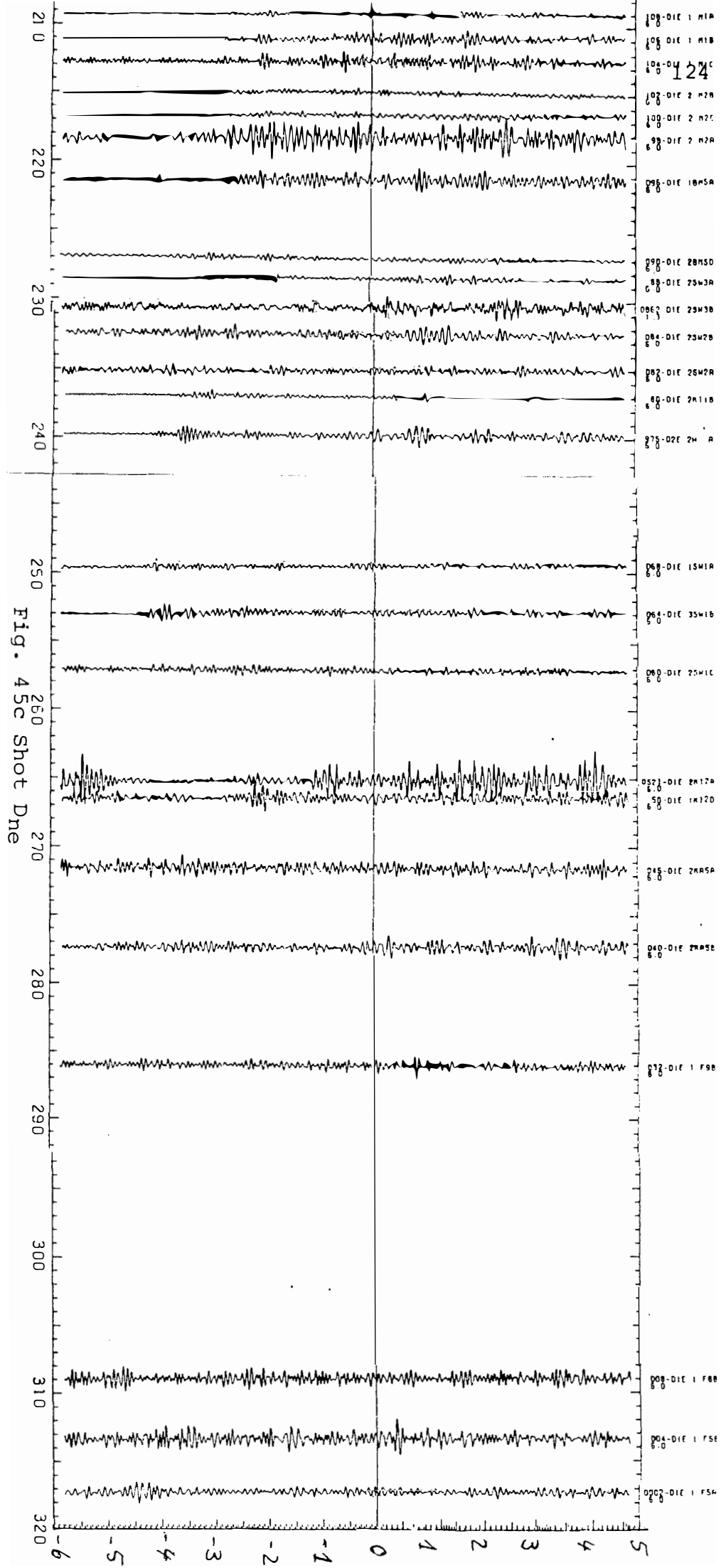


Fig. 45c Shot Dne

REDUCED TIME IN SEC

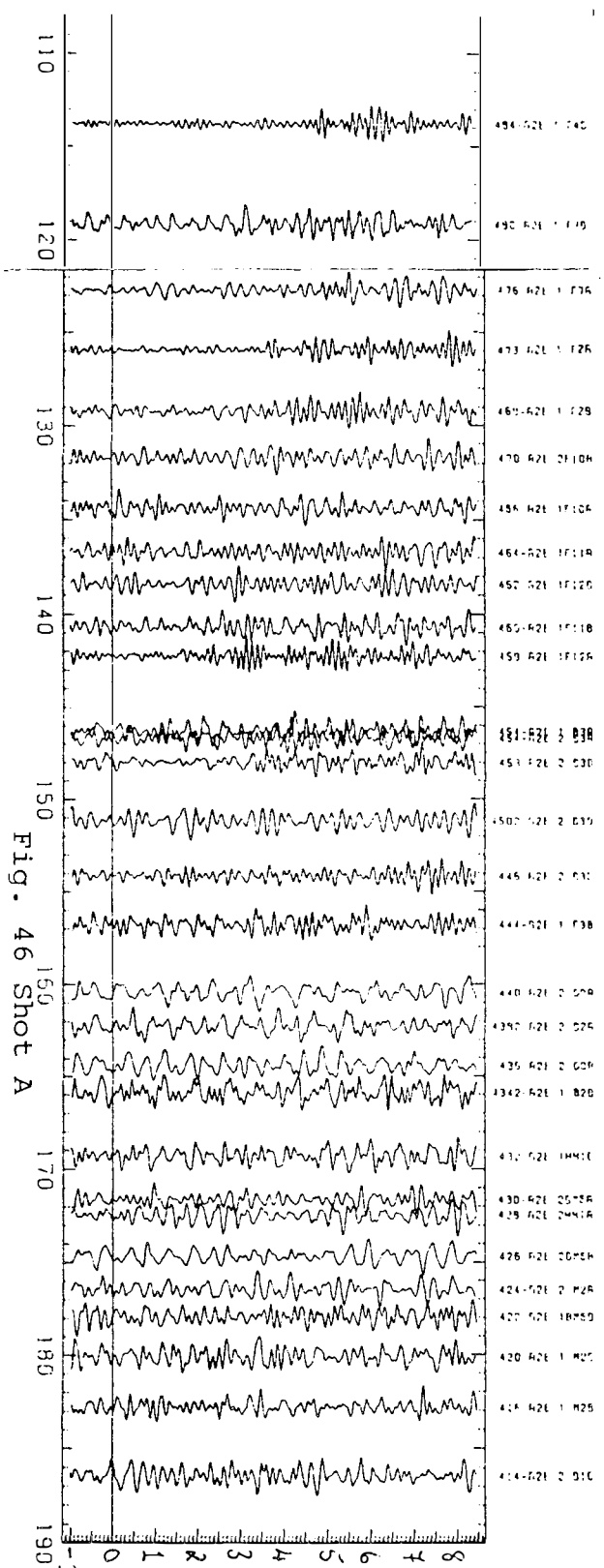
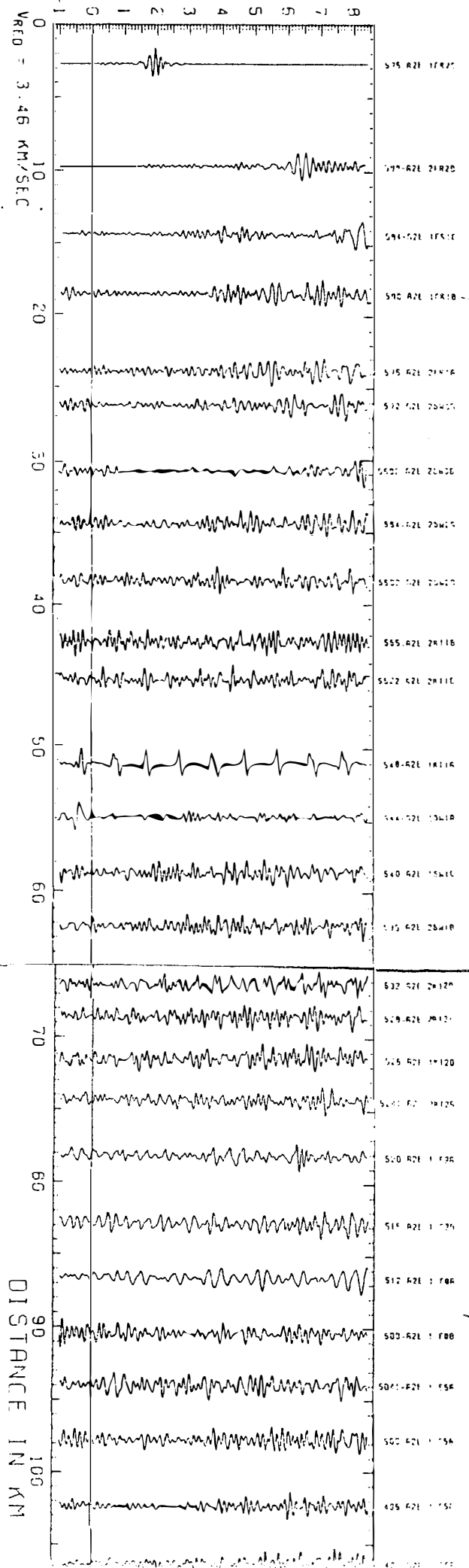
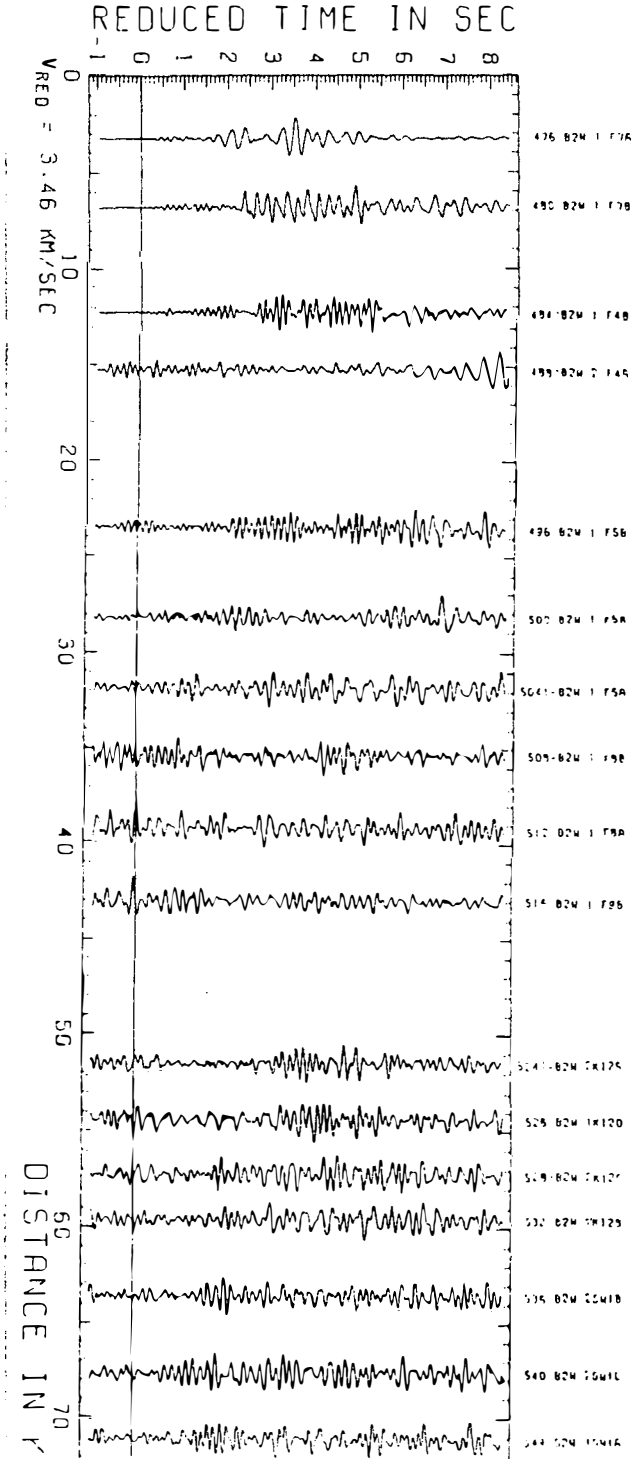
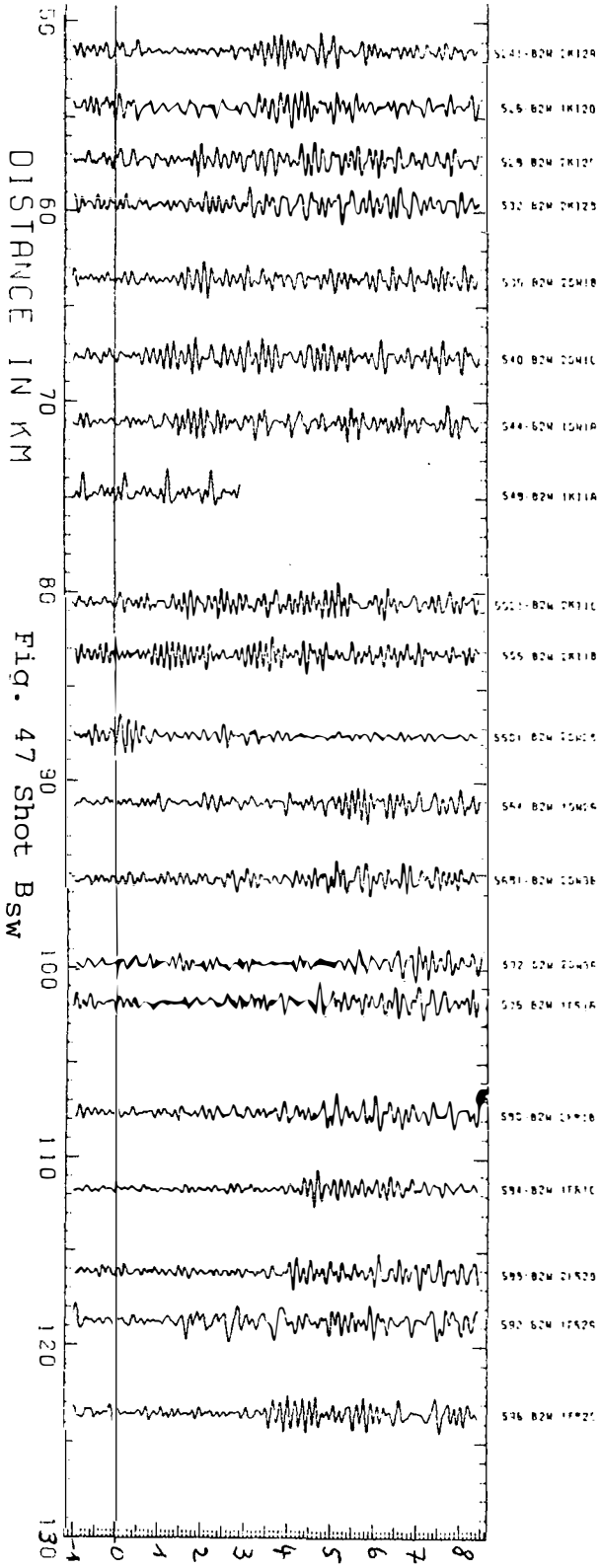
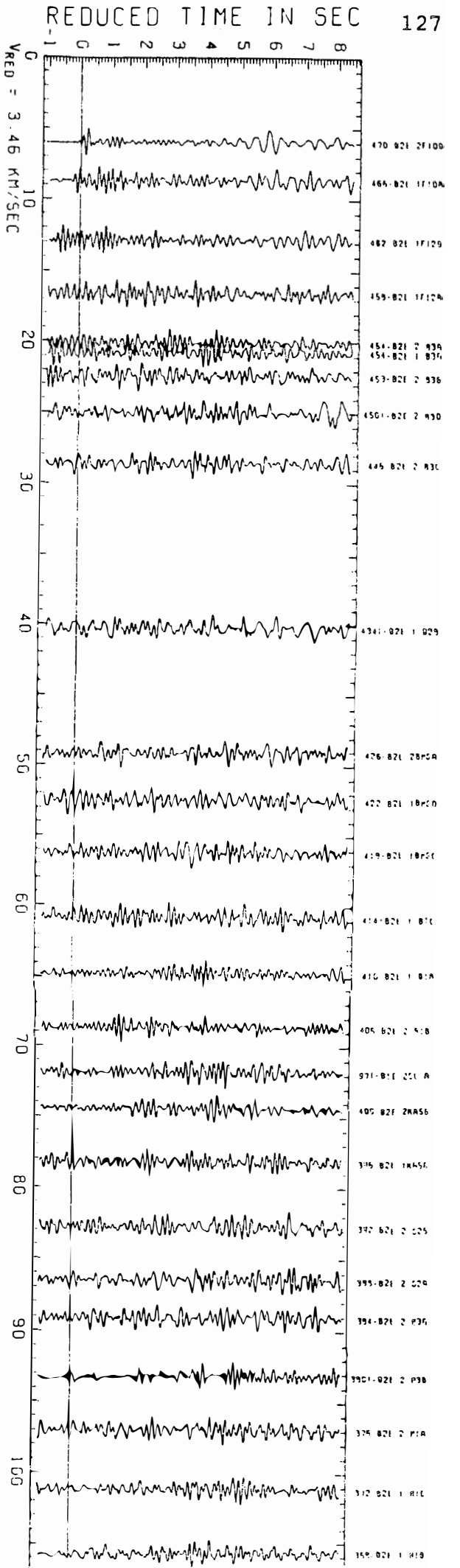
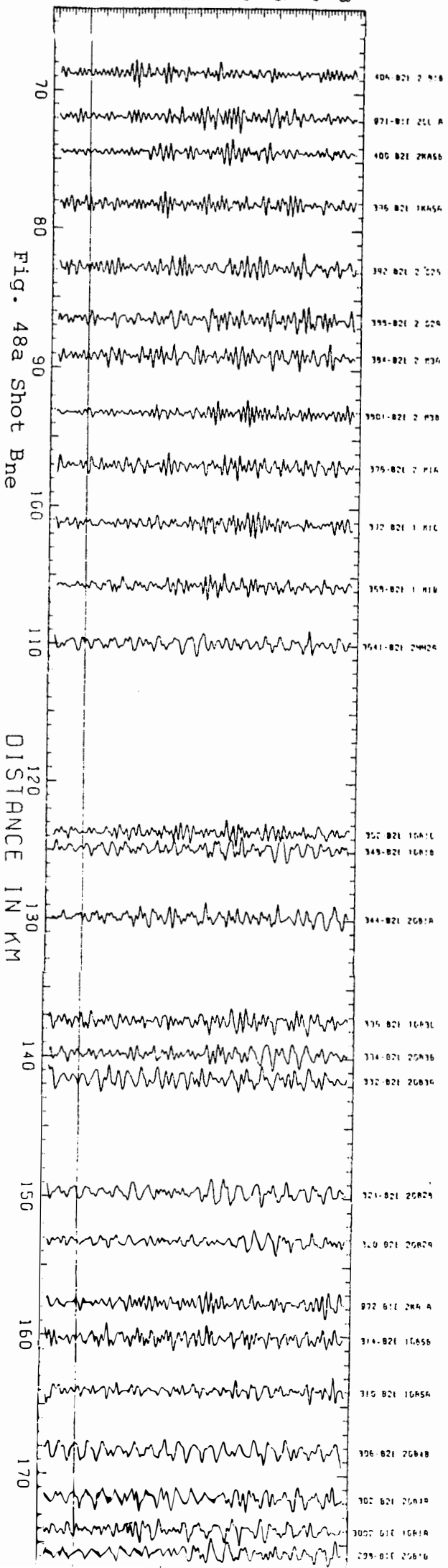
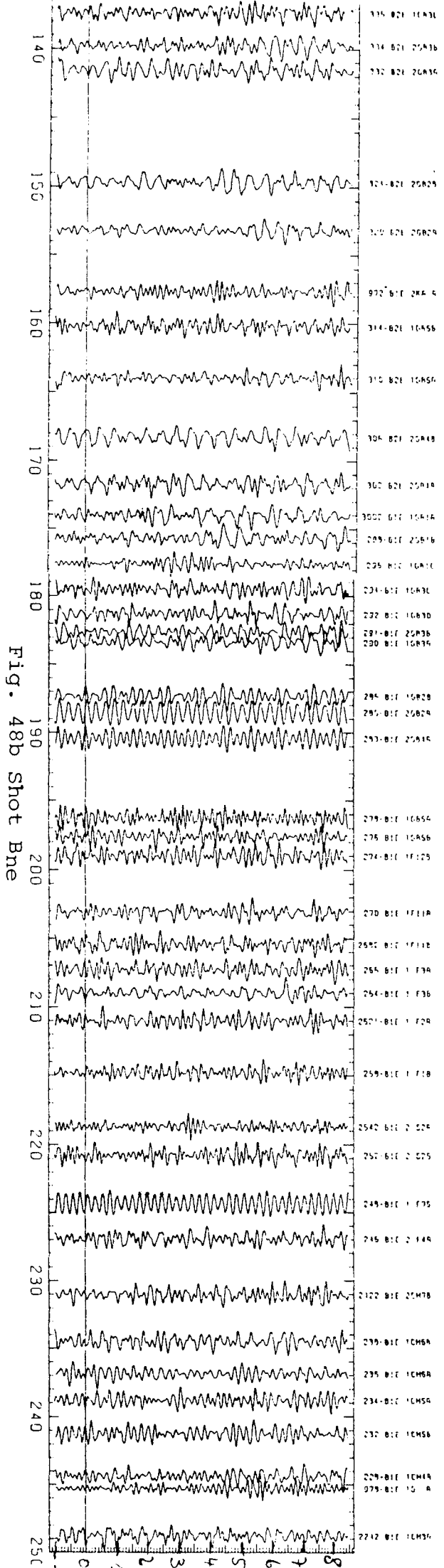


Fig. 46 Shot A

07.12.62 VERTICAL 1.3 HZ TO 8.0 HZ (80,AD)



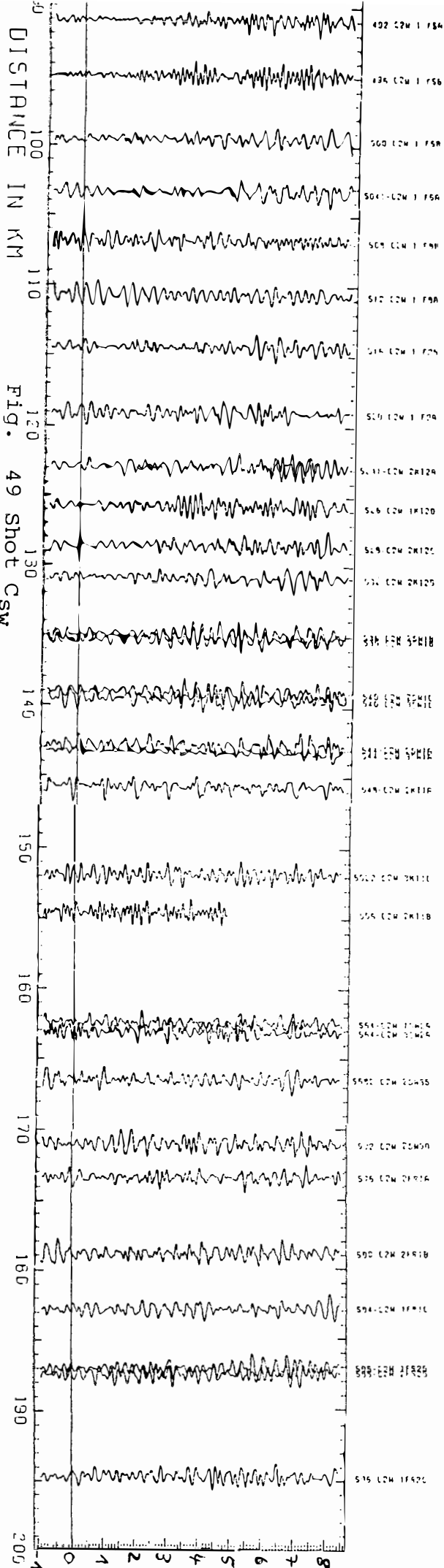
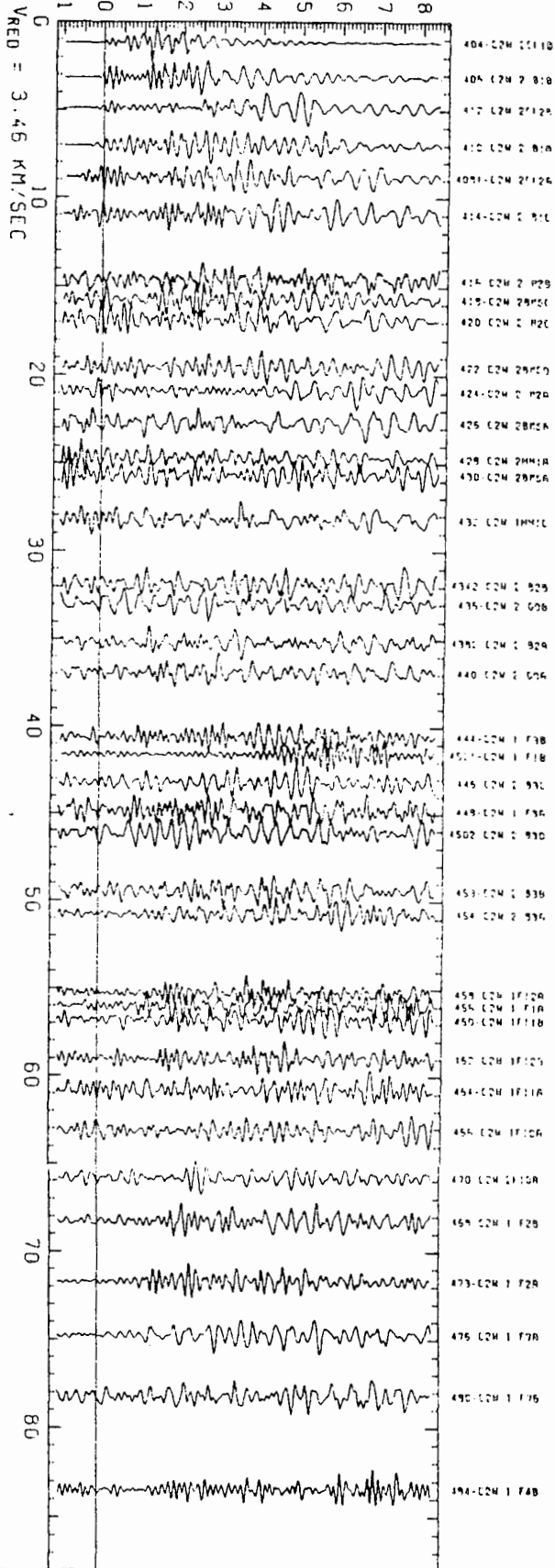


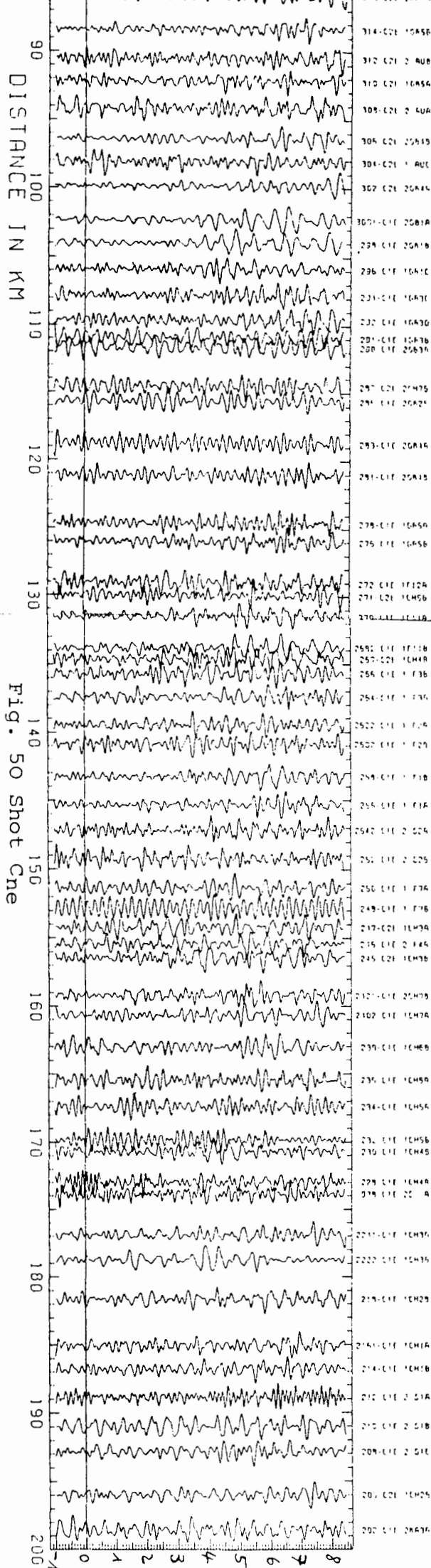


(07 02) 24 0 8 2L FHSI 7D(L)M 28 21 50

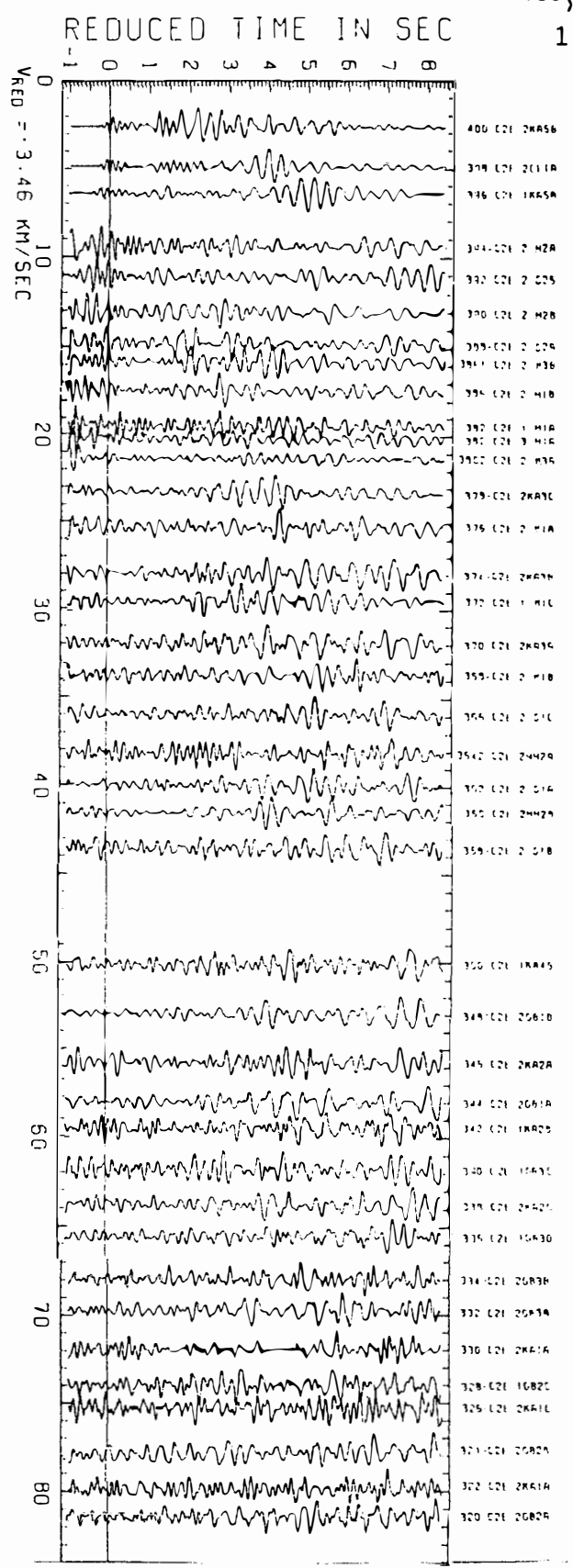
REDUCED TIME IN SEC

VRSD = 3.46 KM/SEC



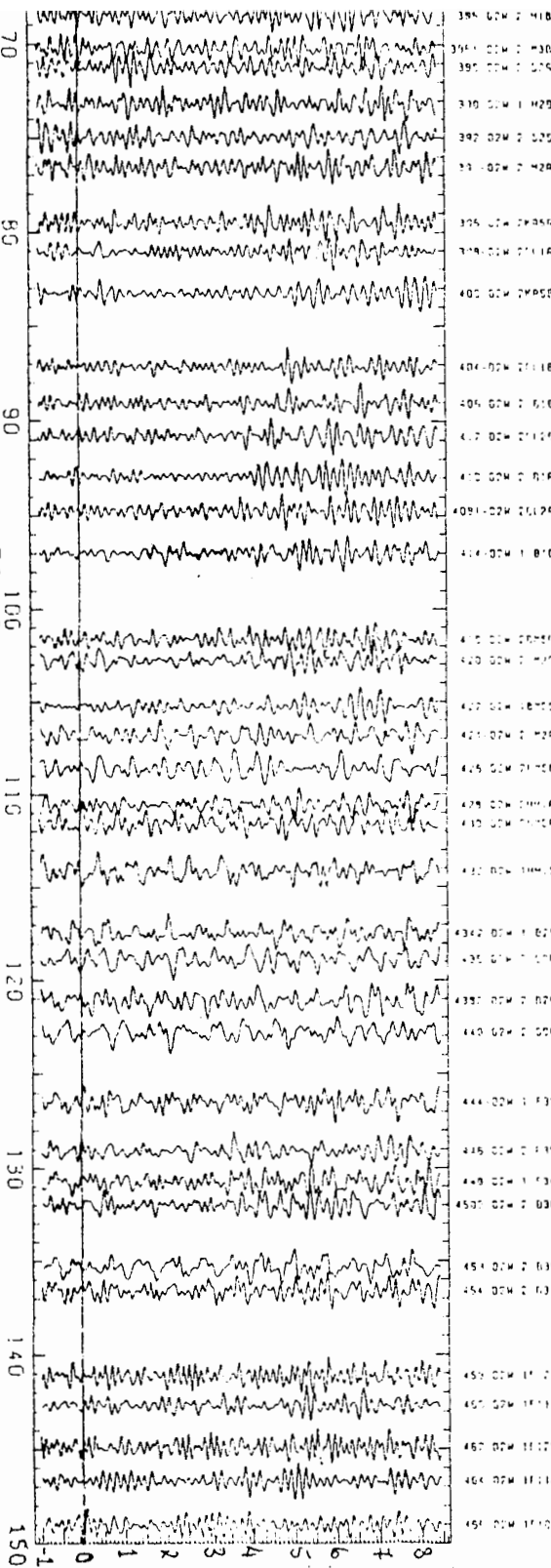


07.12.82 VERTICAL 1.3 HZ TO 8.0 HZ (80, 40) 130



150
140
130
120
110
100
90
85
80
70
DISTANCE IN KM

Fig. 51 Shot DSW

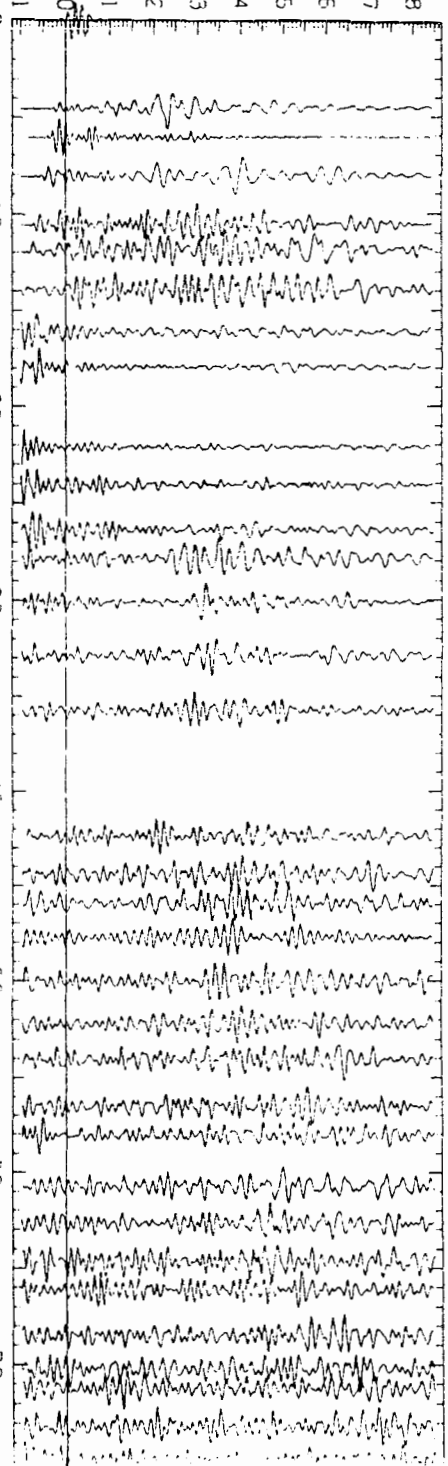


22.07.82 VERTICAL 1.3 Hz to 8.0 Hz
22.07.82 (80,40)

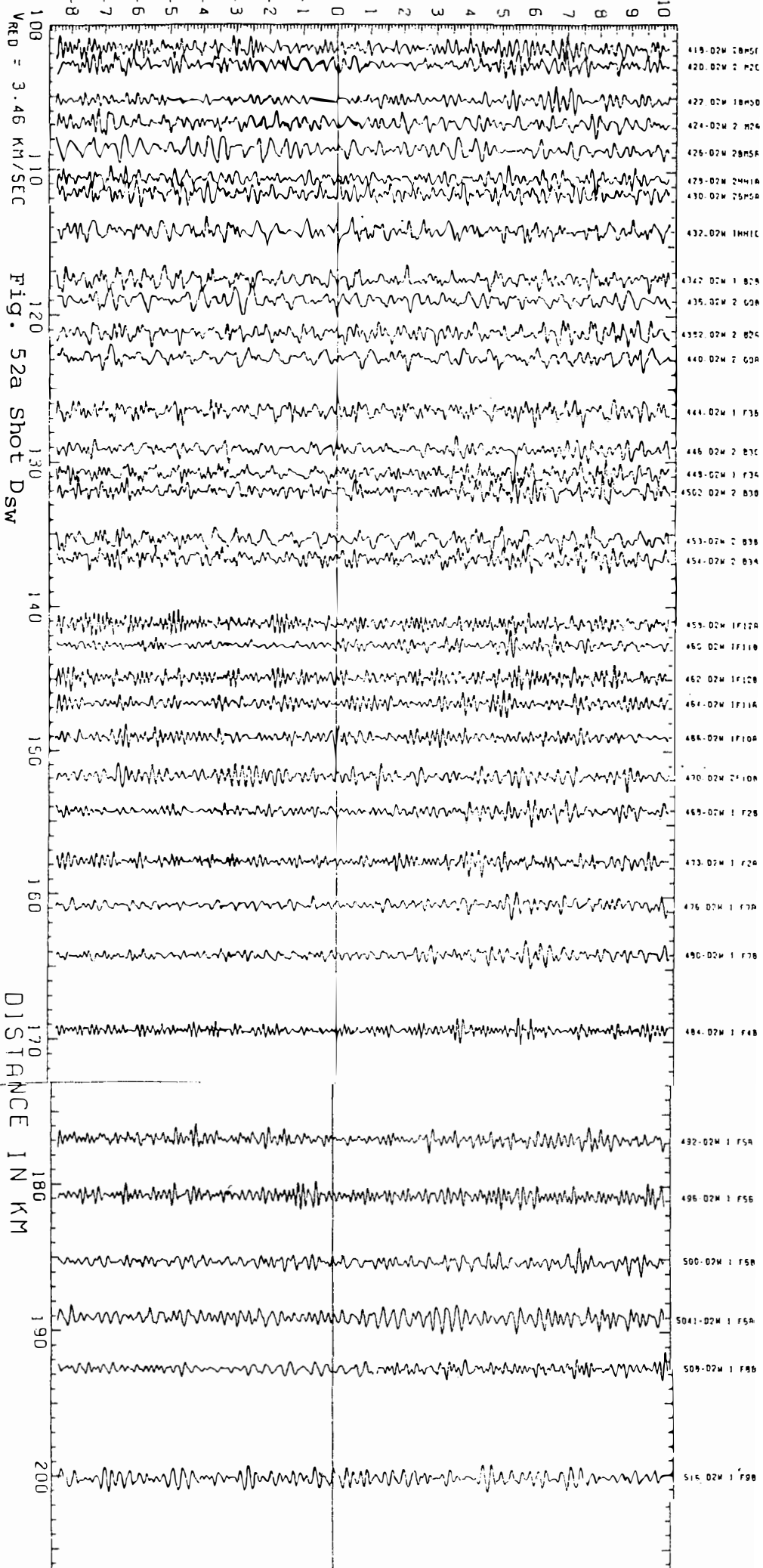
REDUCED TIME IN SEC 131

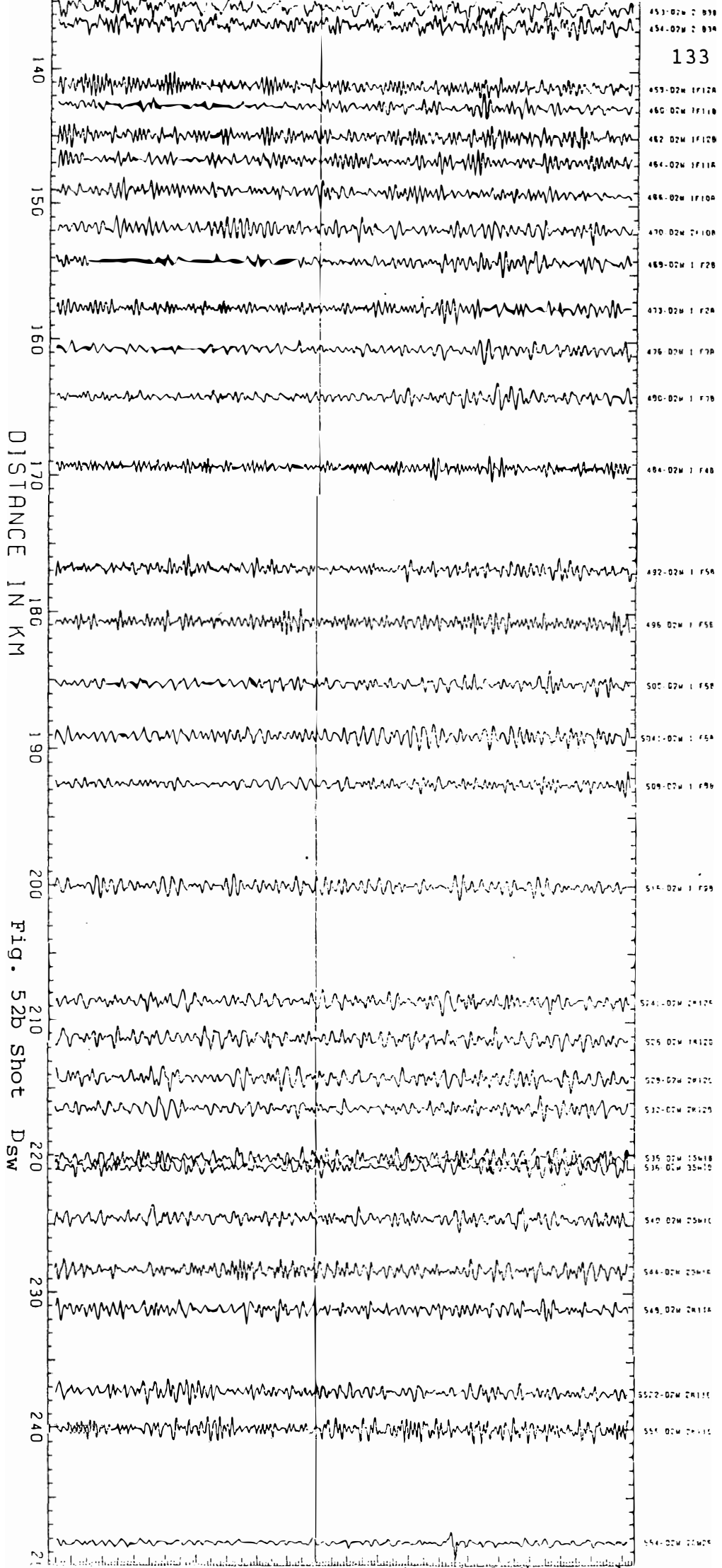
0
10
20
30
40
50
60
70
DISTANCE

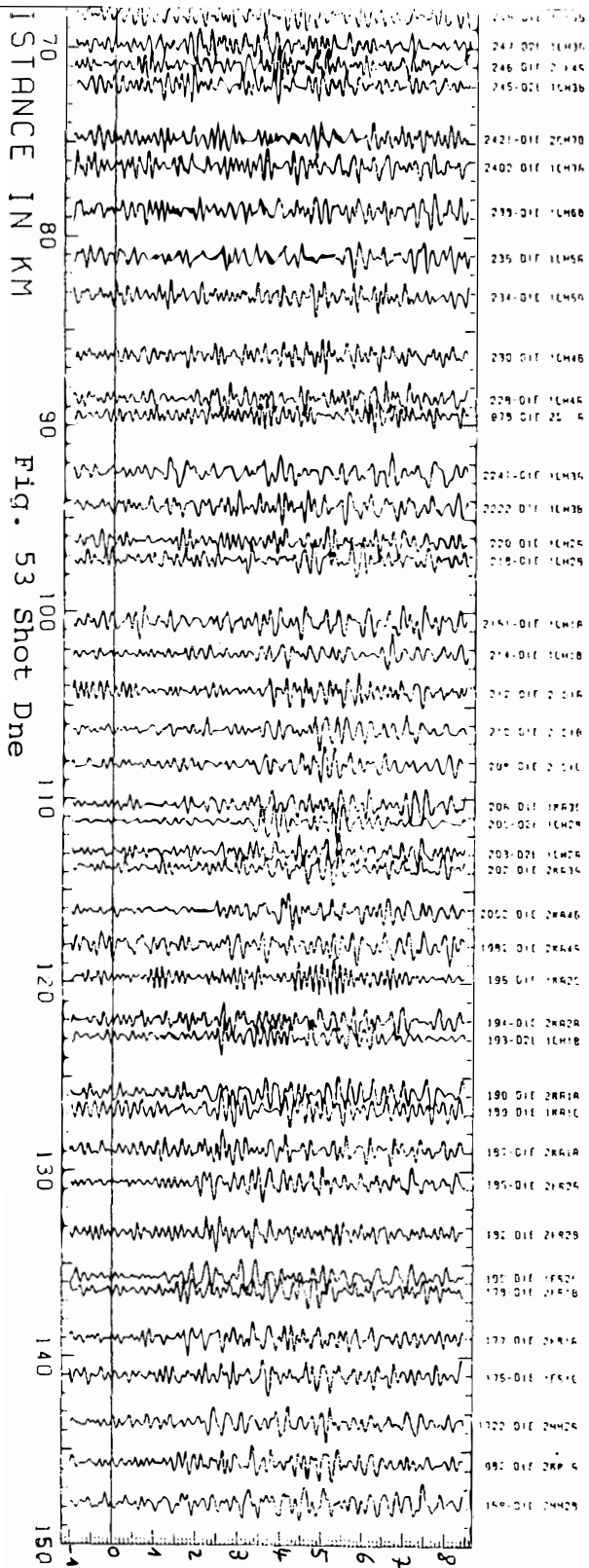
372 02W 2 416
320 02W 2 428
371 02W 2 418
324 02W 2 428
325 02W 2 416
328 02W 1 425
332 02W 2 436
314 02W 2 430
319 02W 2 427
340 02W 1 433
342 02W 1 428
344 02W 2 416
345 02W 2 428
348 02W 2 418
350 02W 1 425
359 02W 2 418
351 02W 2 442
357 02W 2 418
354 02W 2 442
356 02W 2 416
353 02W 2 418
370 02W 1 436
372 02W 1 416
374 02W 2 430
378 02W 2 418
378 02W 1 433
380 02W 2 425
397 02W 2 414
384 02W 2 418
394 02W 2 430
395 02W 2 525
310 02W 1 420



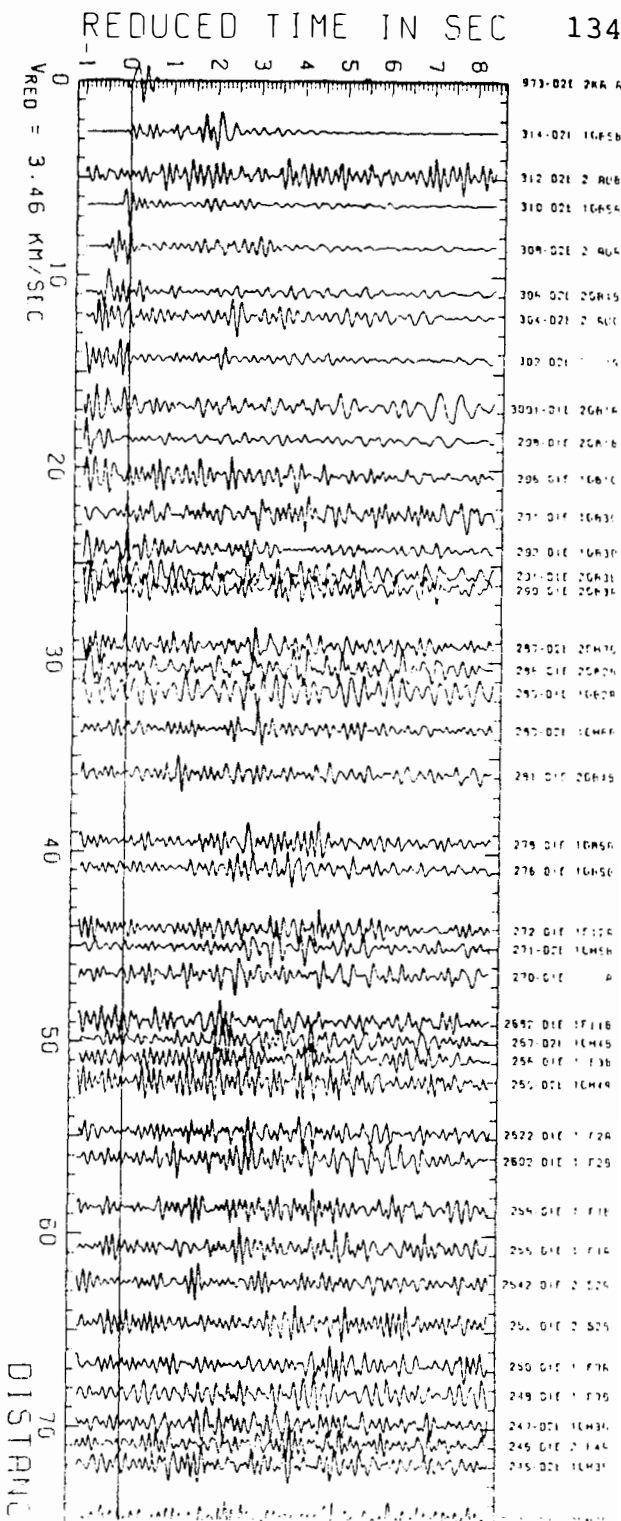
REDUCED TIME IN SEC



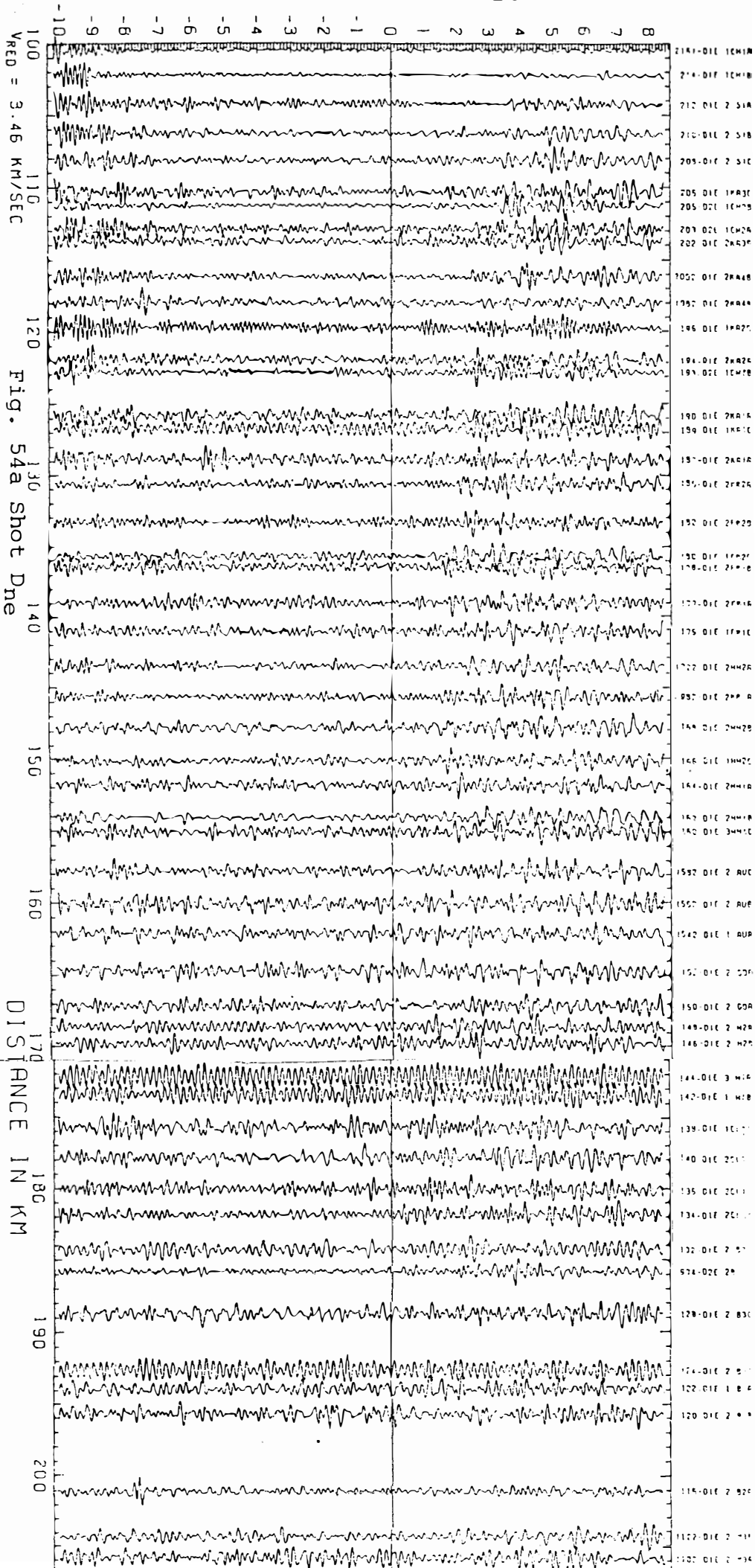


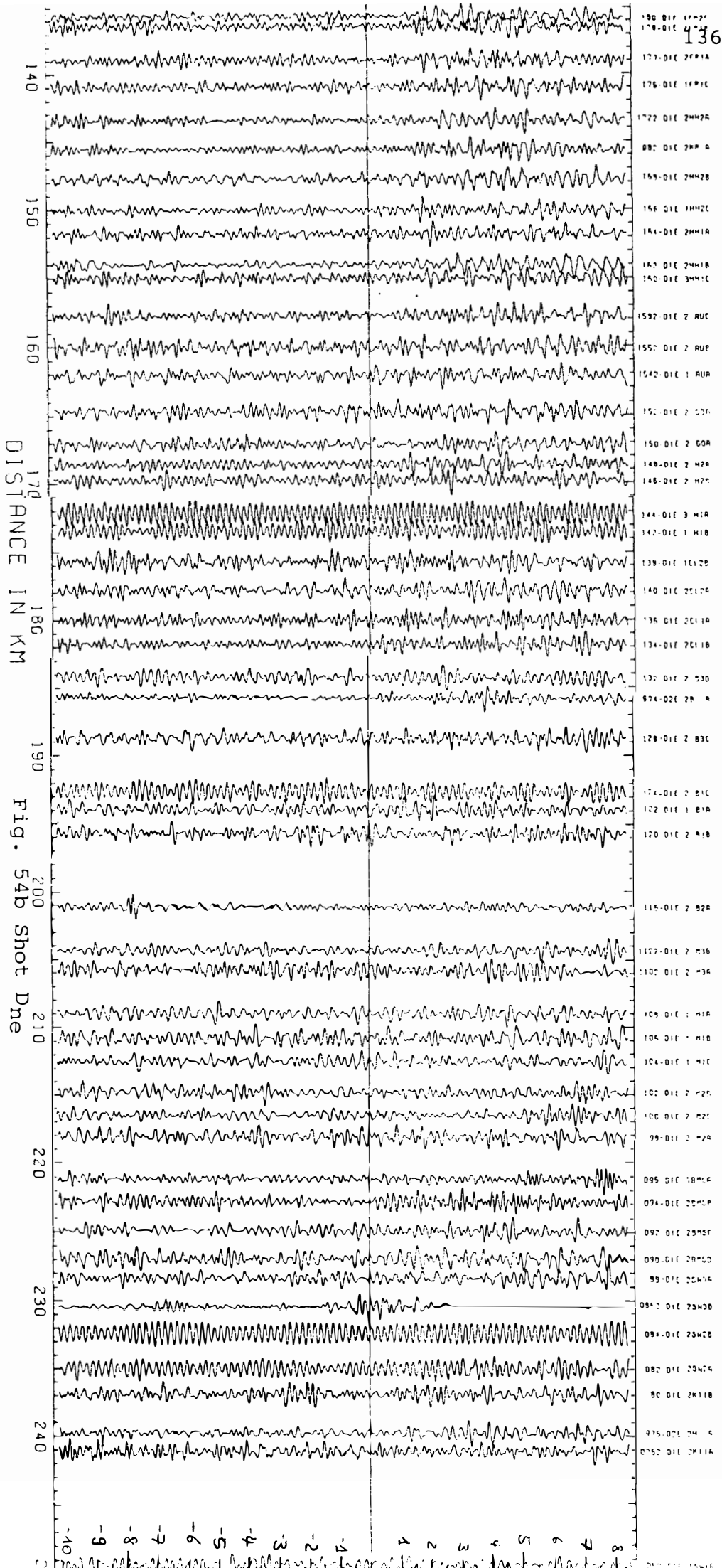


21.07.62 VERTICAL 1.3 HZ TO 8.0 HZ (80,40)



REDUCED TIME IN SEC

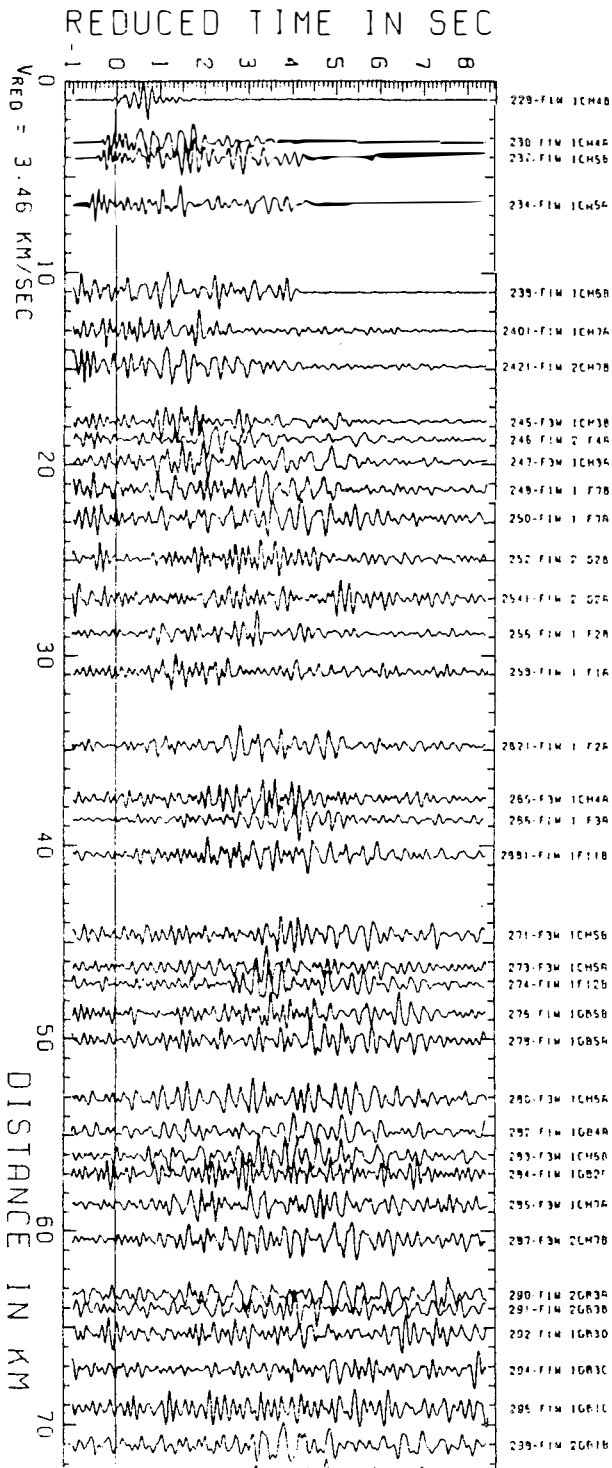
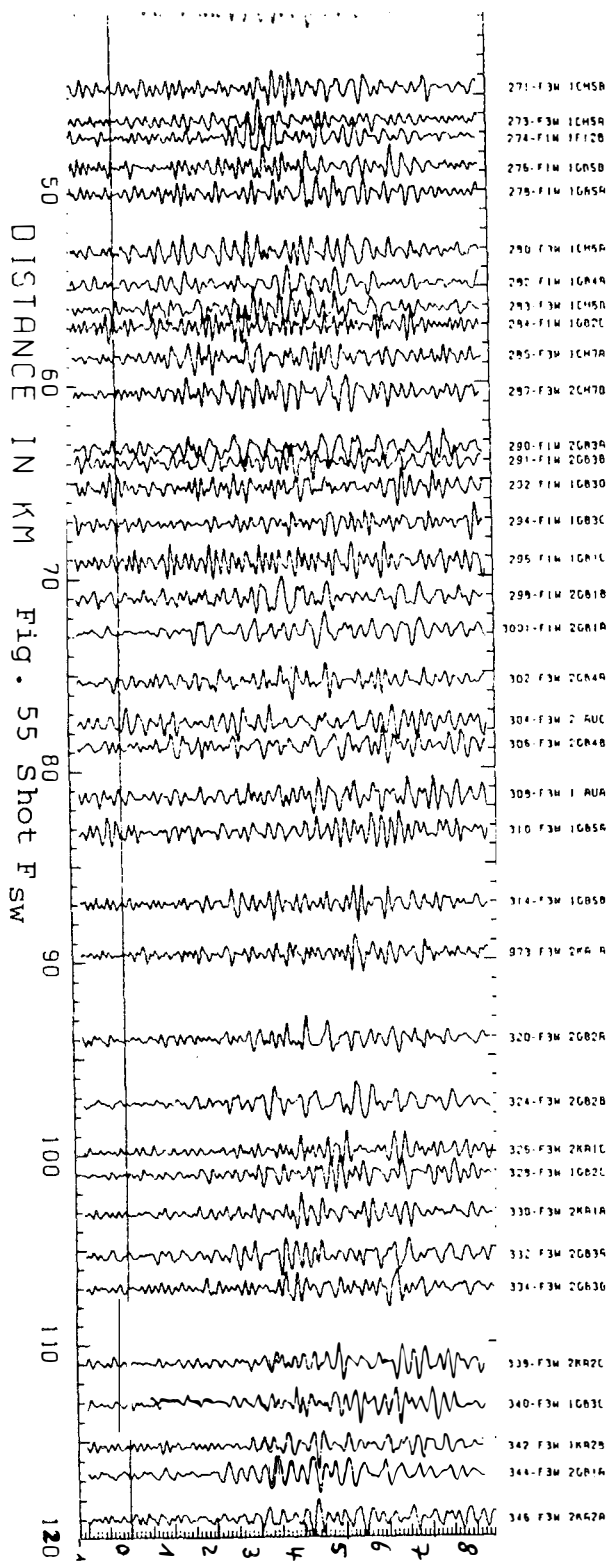




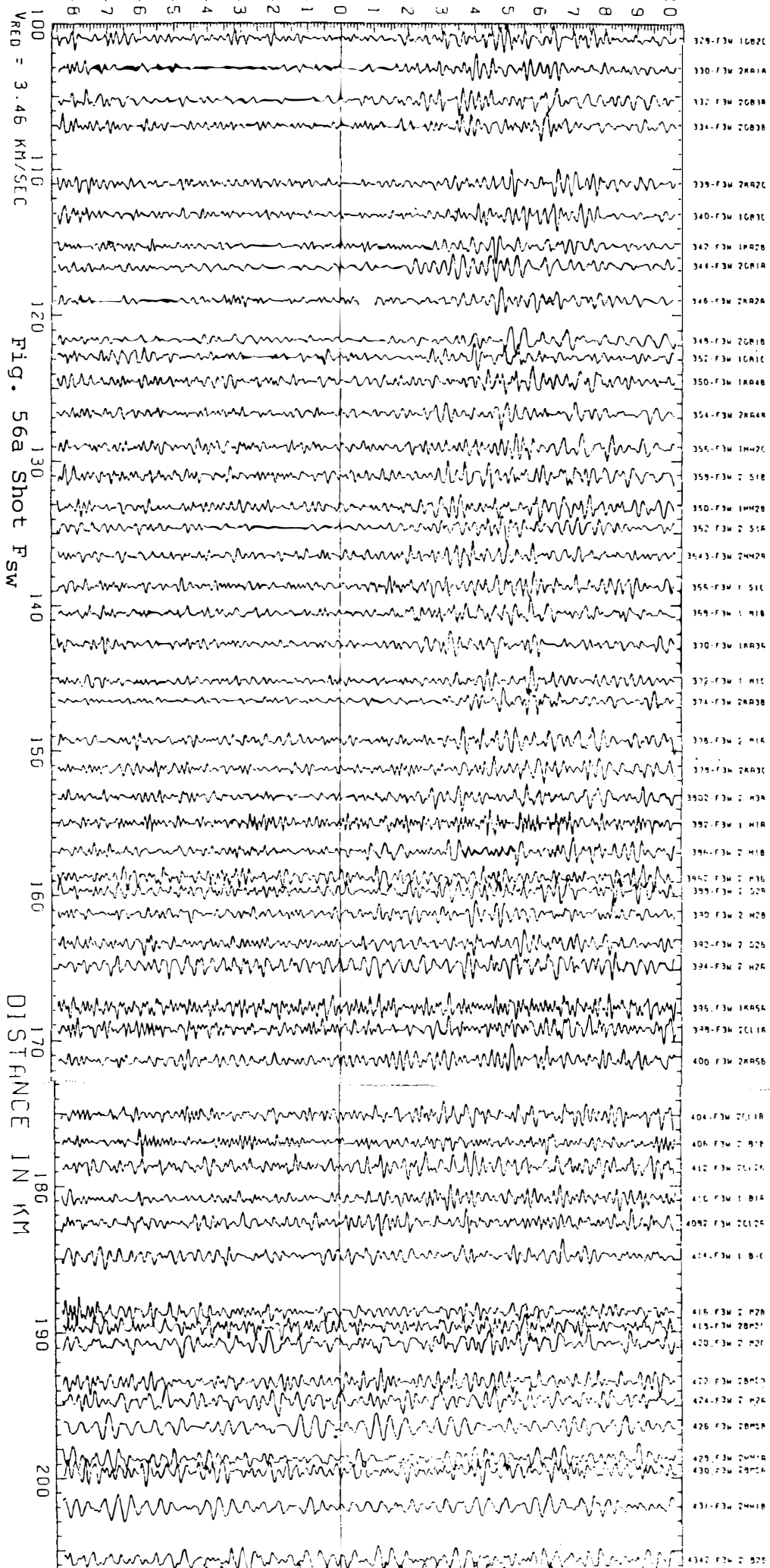
436

10 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 10

12-12-82 VERTICAL 1.3 HZ TO 8.0 HZ (80,40)

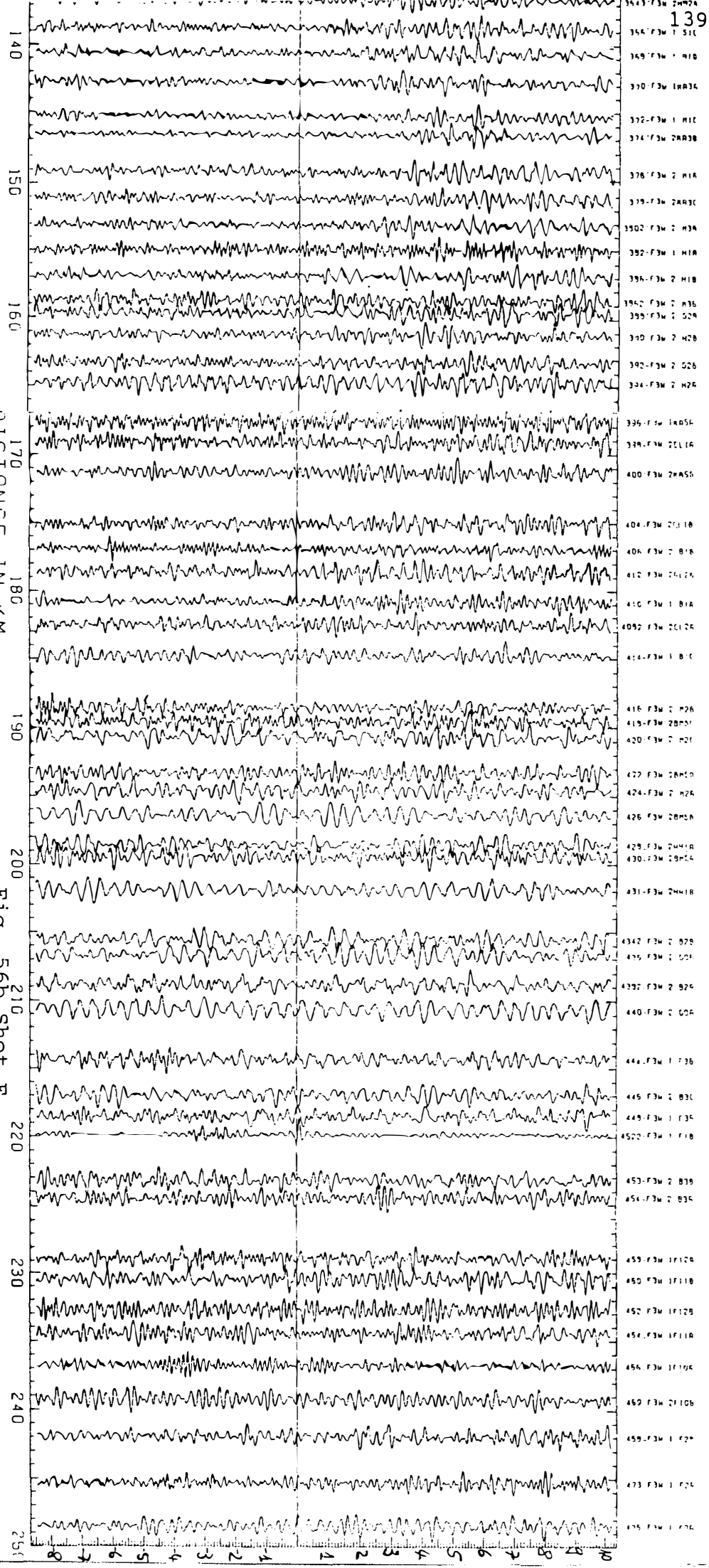


REDUCED TIME IN SEC



DISTANCE IN KM

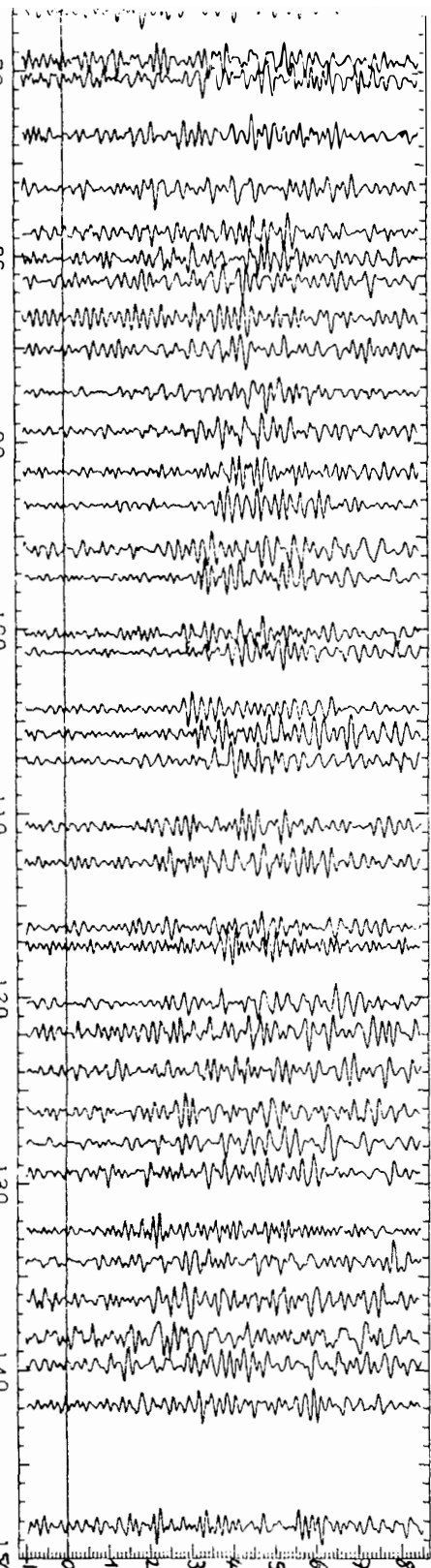
Fig. 56b Shot FSW



DISTANCE IN KM

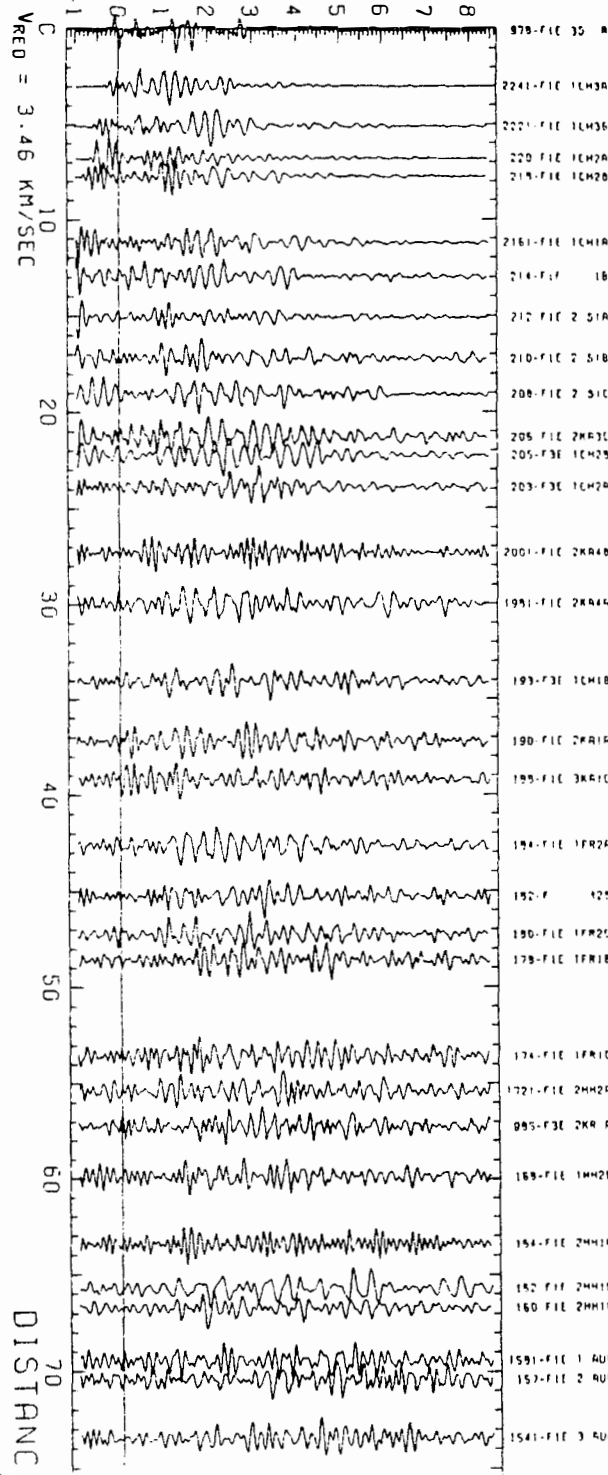
Fig. 57 Shot Fne

70
80
90
100
110
120
130
140
150



11.12.82 VERTICAL 1.3 HZ TO 8.0 HZ (80,40)

REDUCED TIME IN SEC 140



REDUCED TIME IN SEC

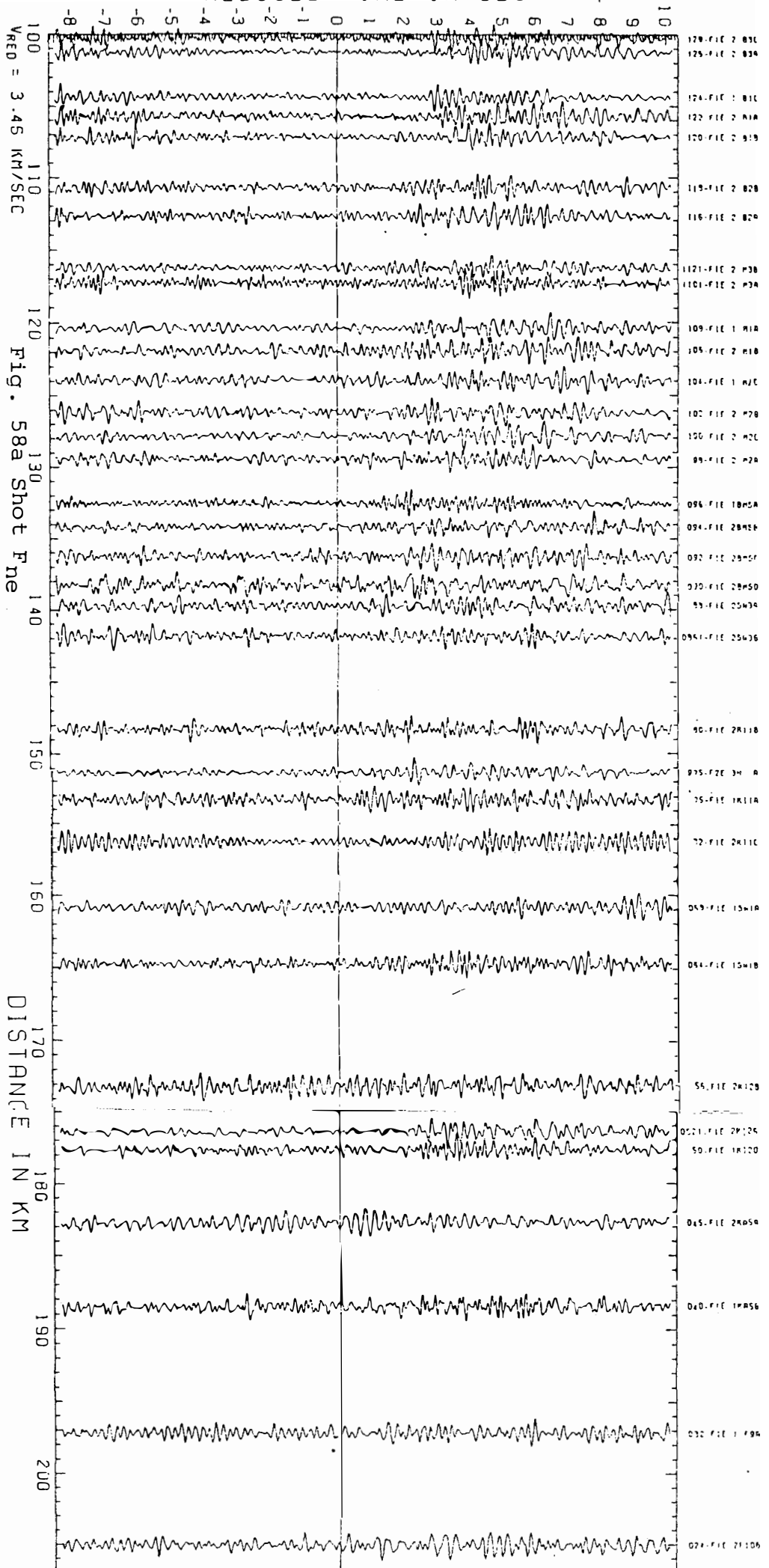
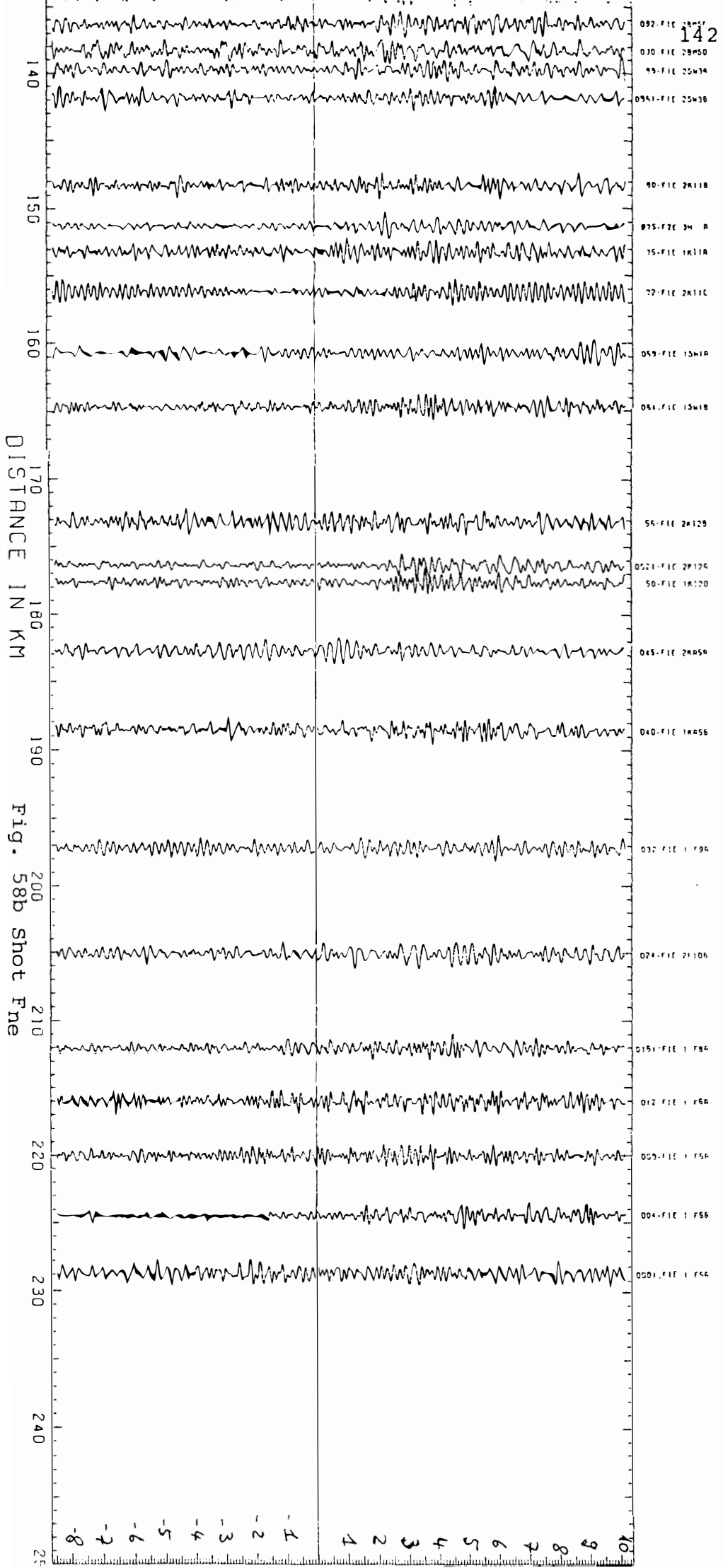


Fig. 58a Shot Fne

DISTANCE IN KM

VED = 3.45 KM/SEC



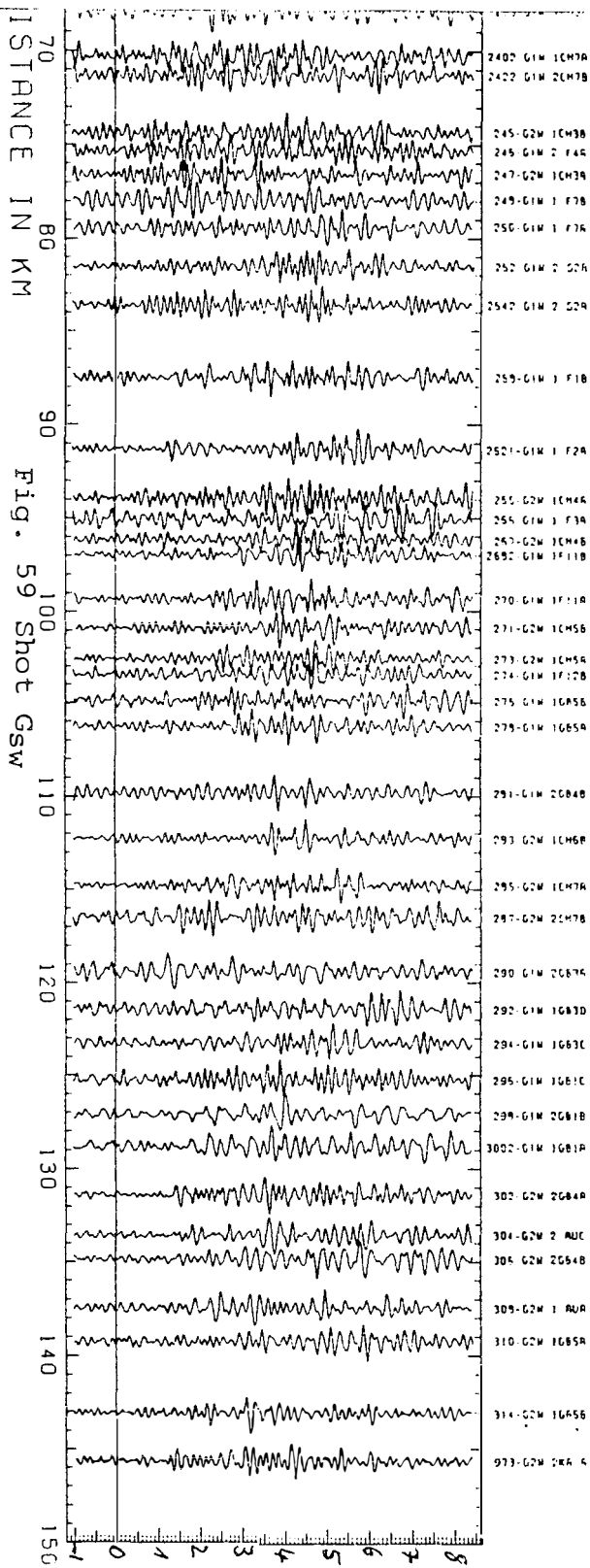
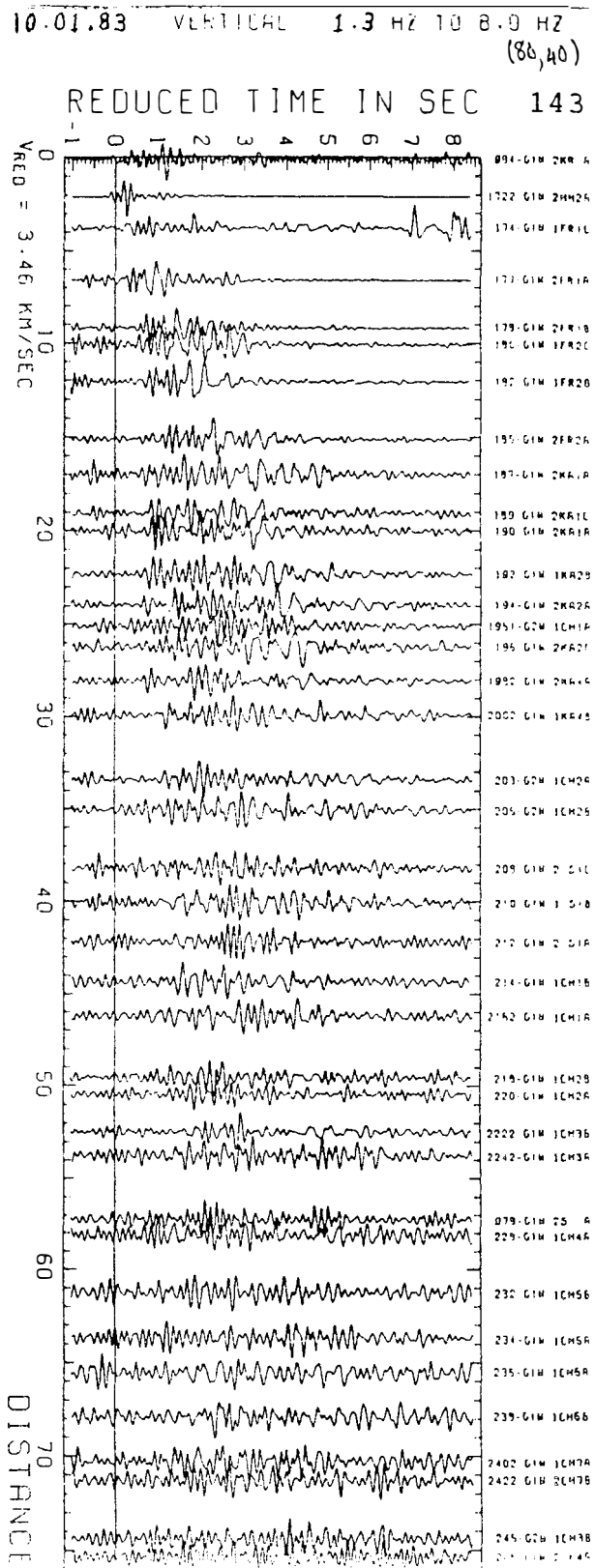
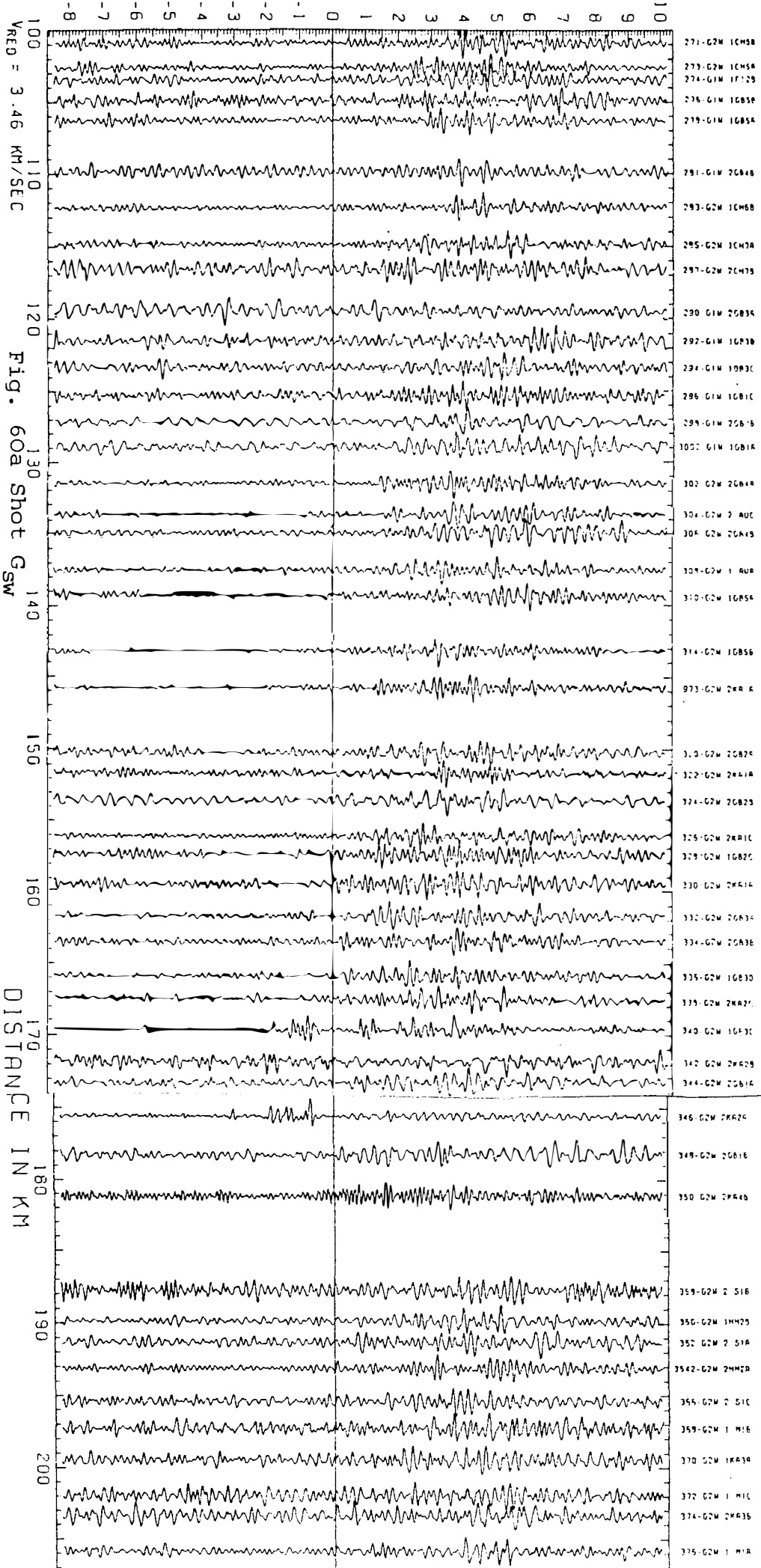


Fig. 59 Shot Gsw



REDUCED TIME IN SEC



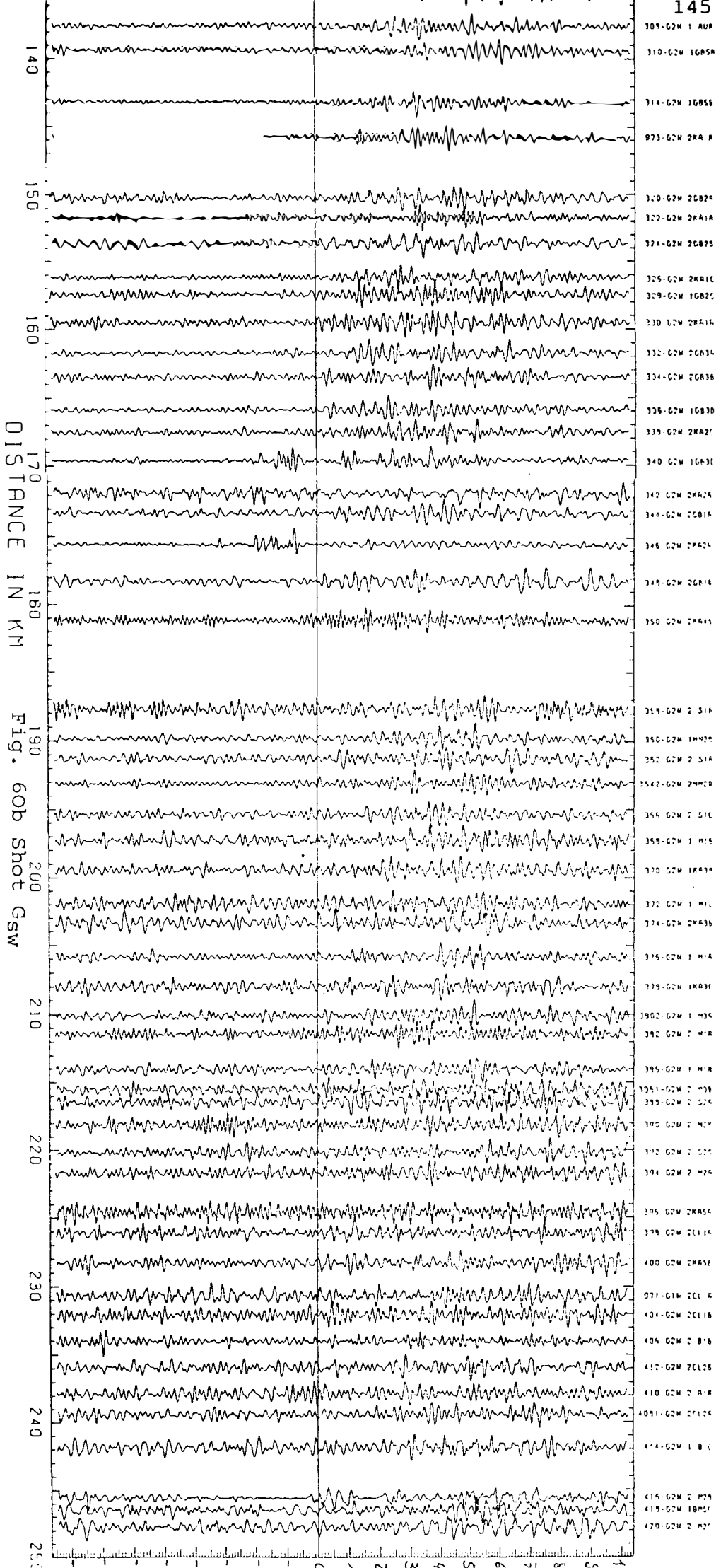
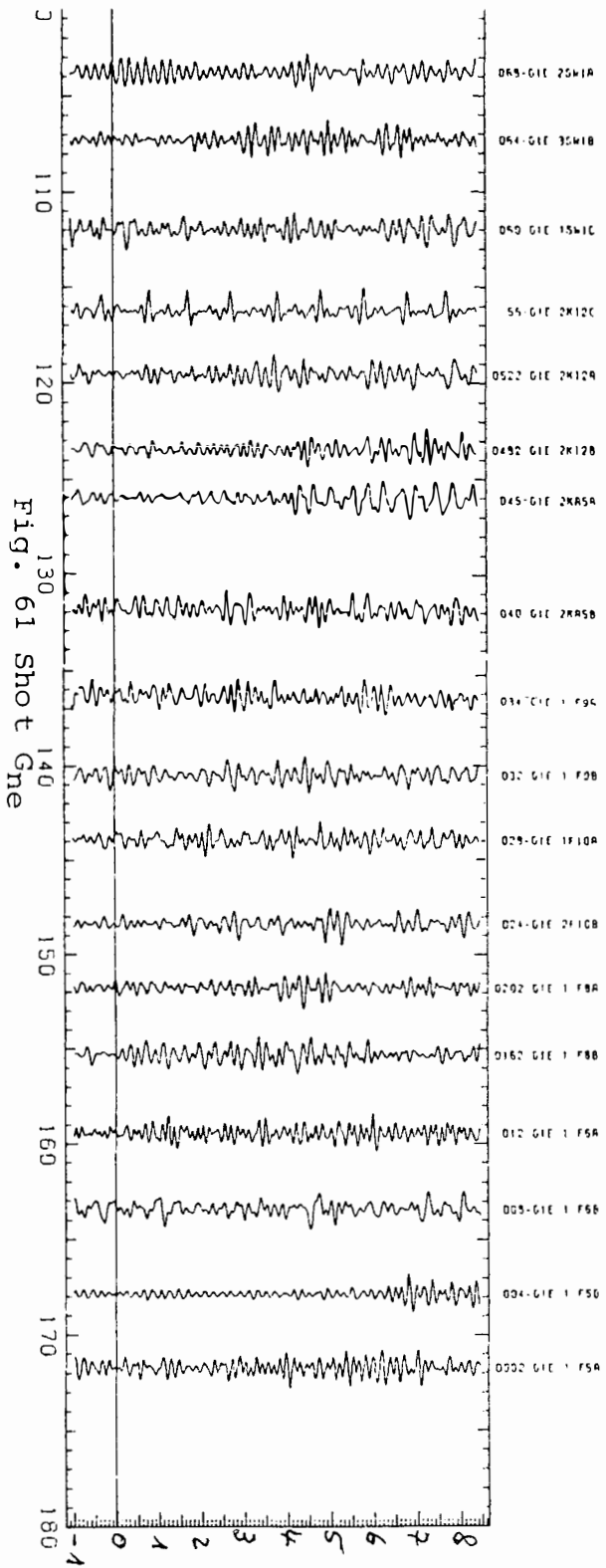
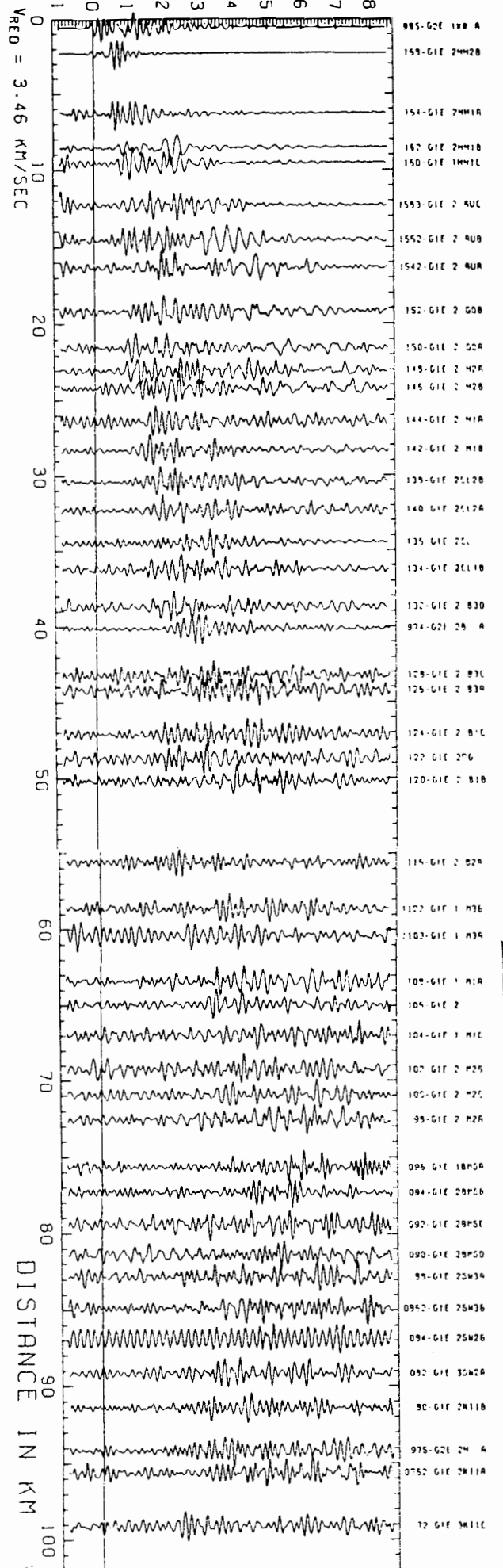
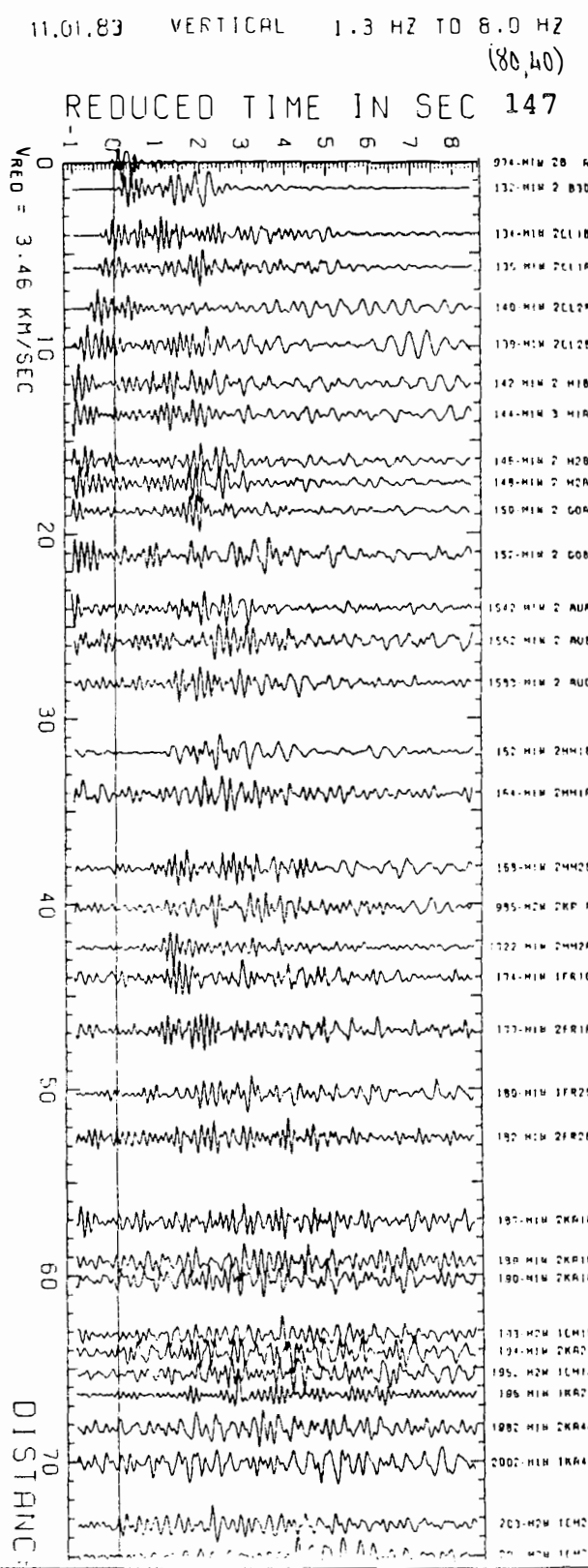
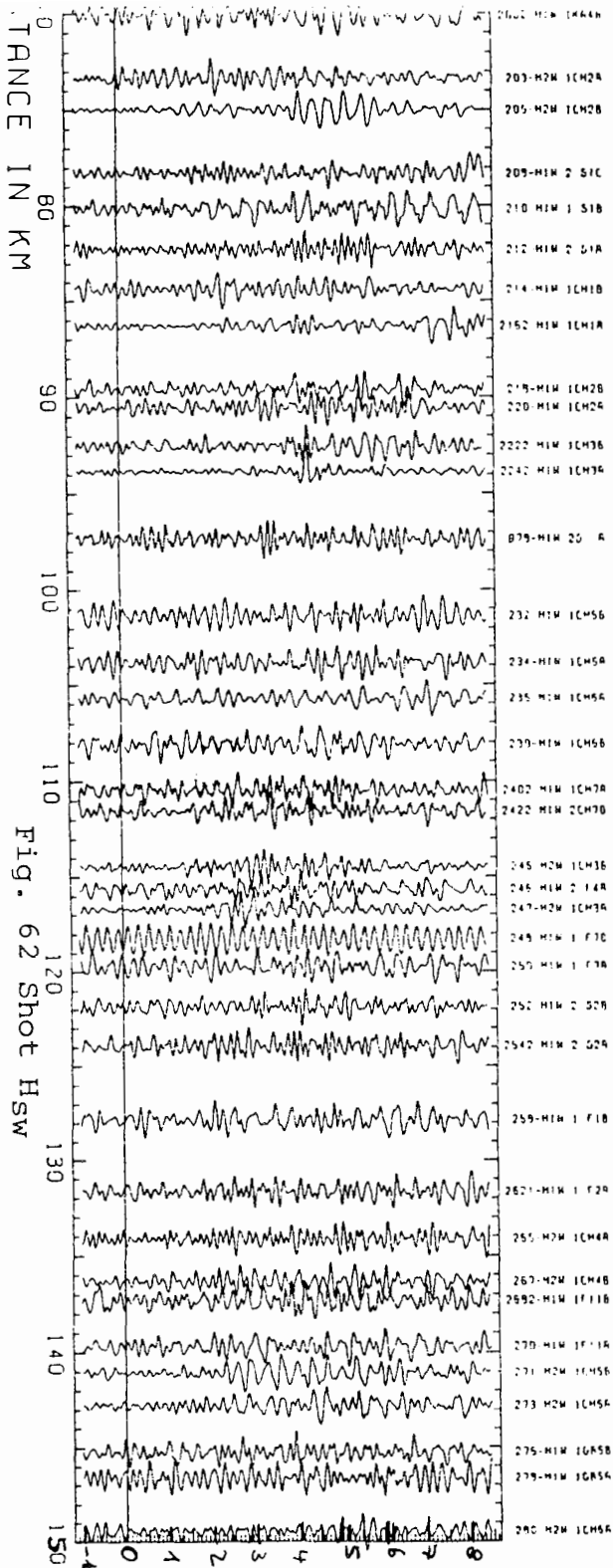


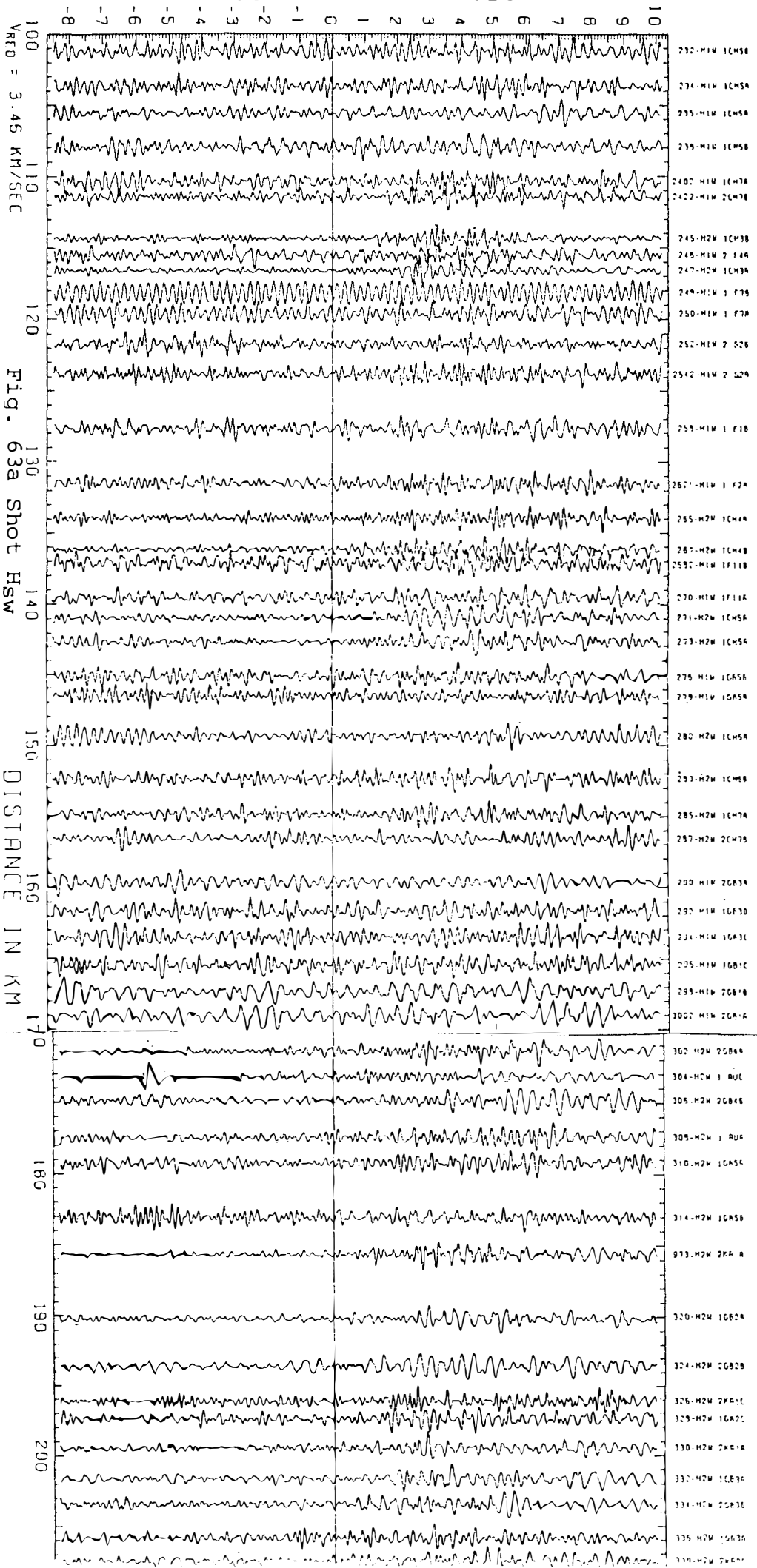
Fig. 60b Shot GSW

REDUCED TIME IN SEC





REDUCED TIME IN SEC



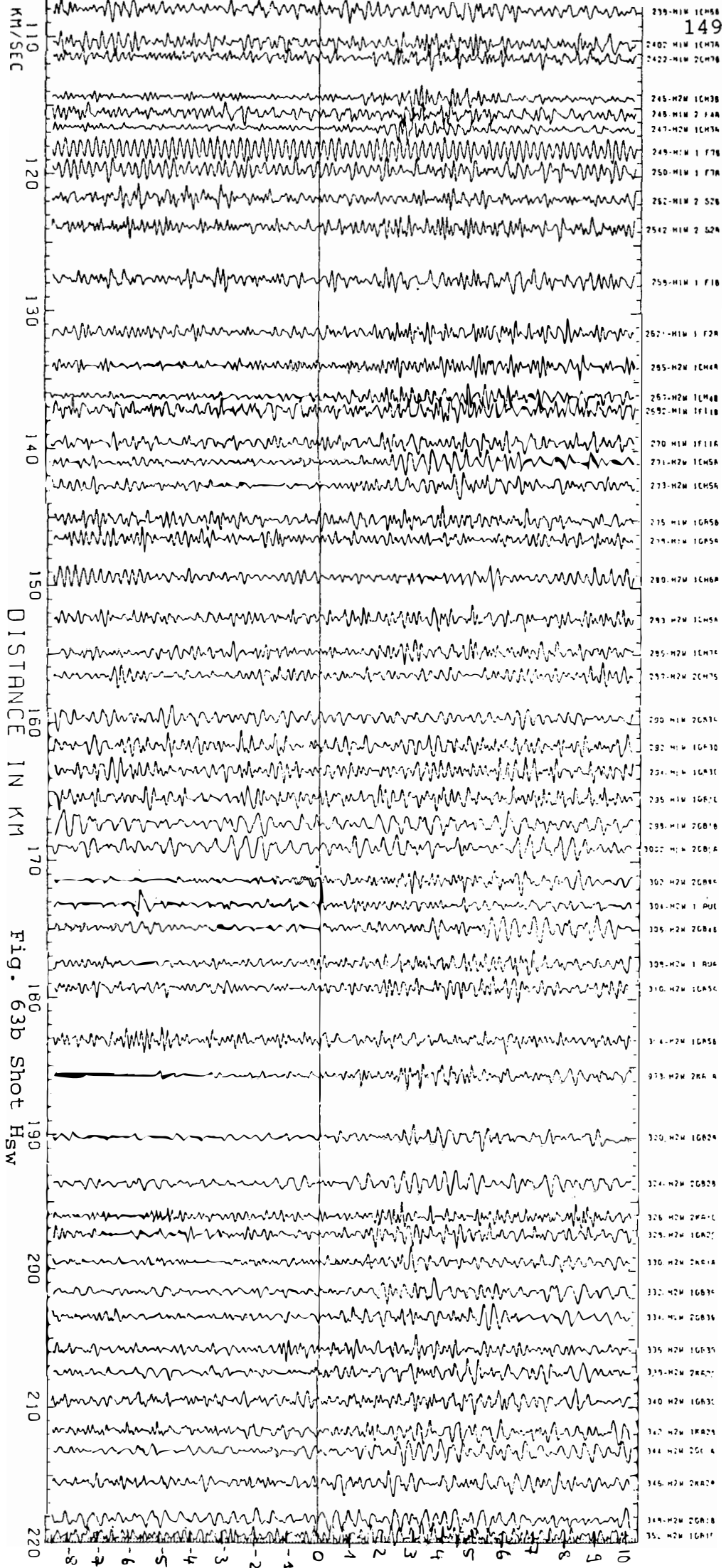
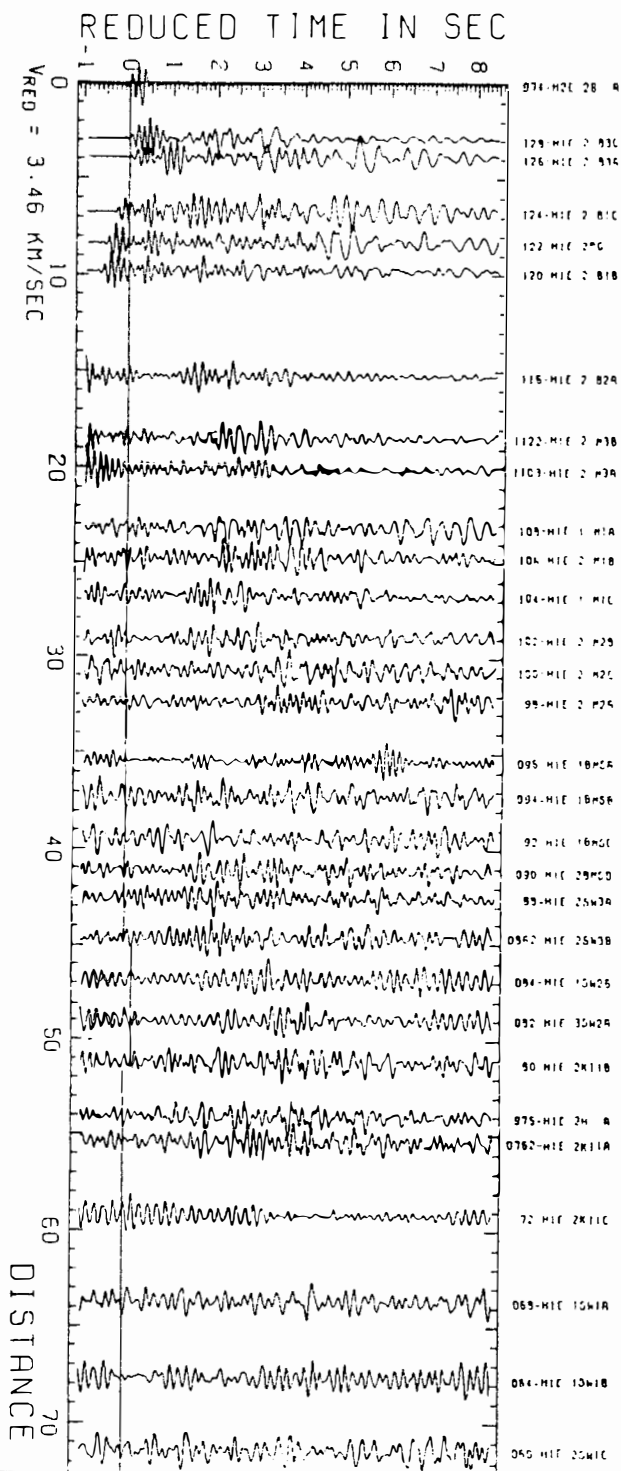
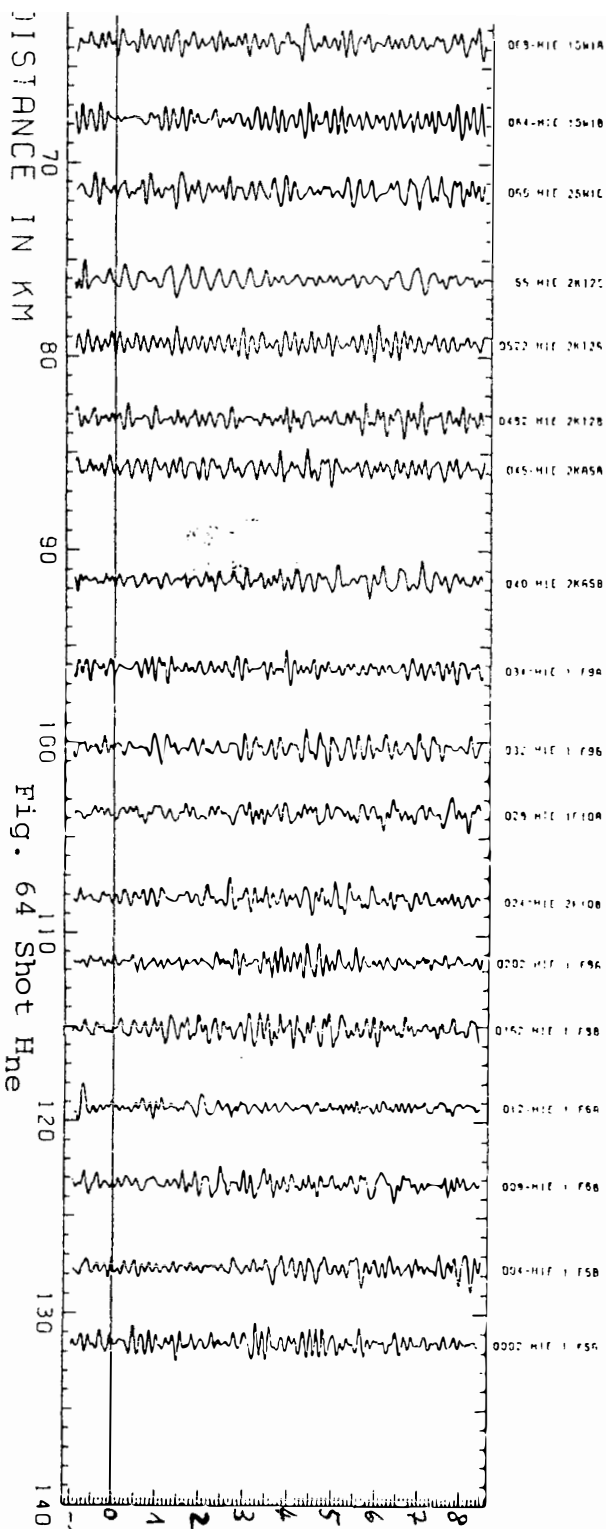


Fig. 63b Shot H_{sw}

11.01.83 VERTICAL 1.3 HZ TO 8.0 HZ (80.40)



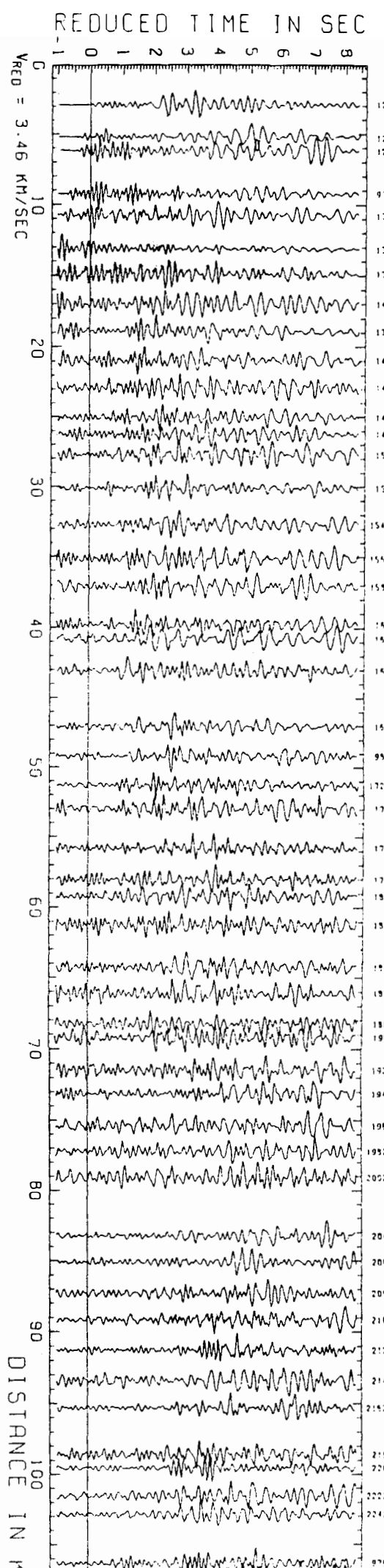
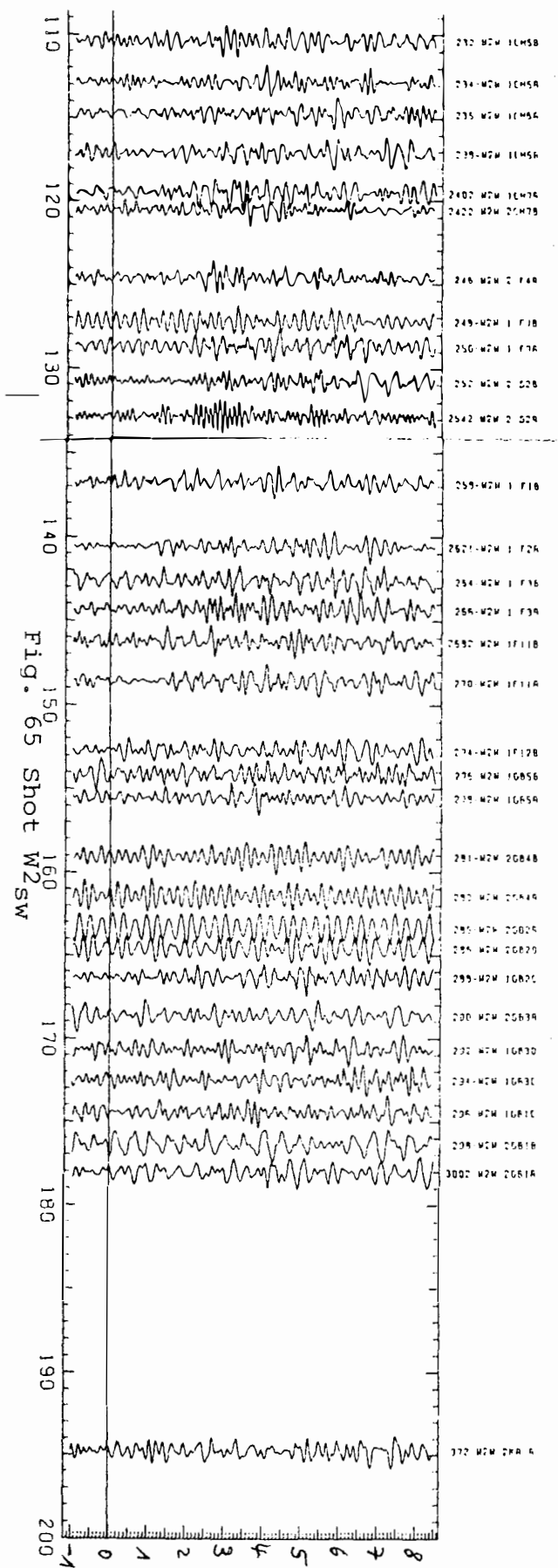
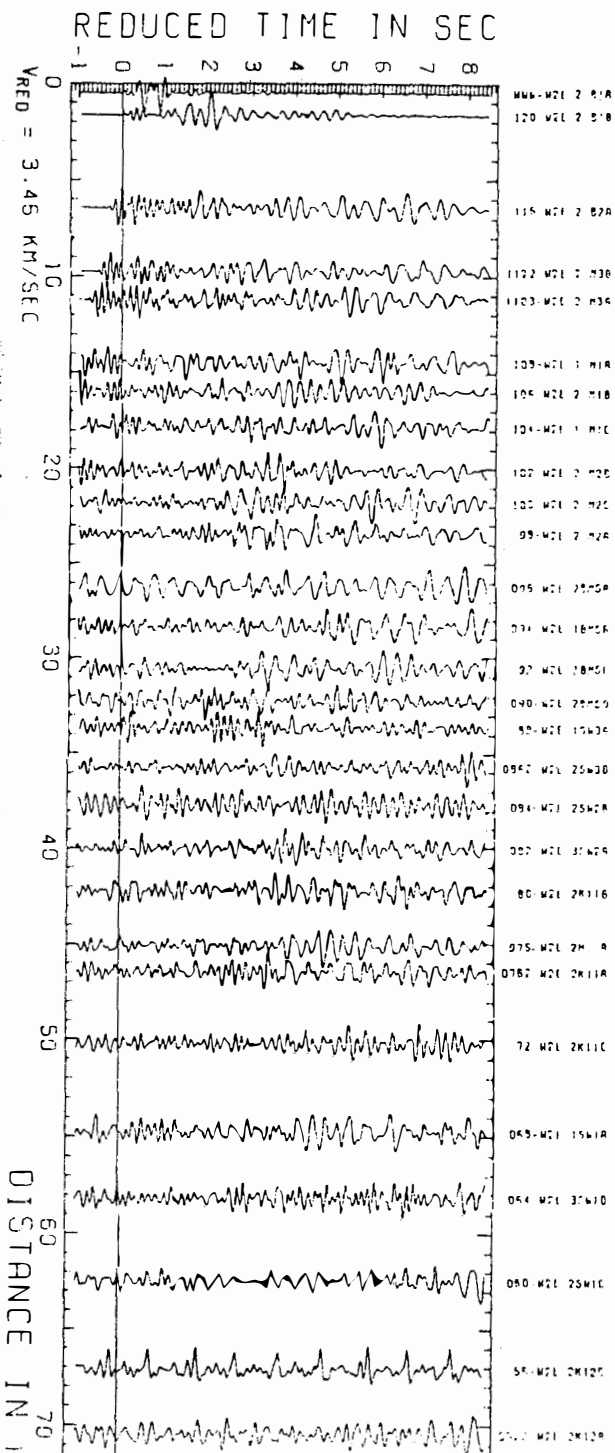
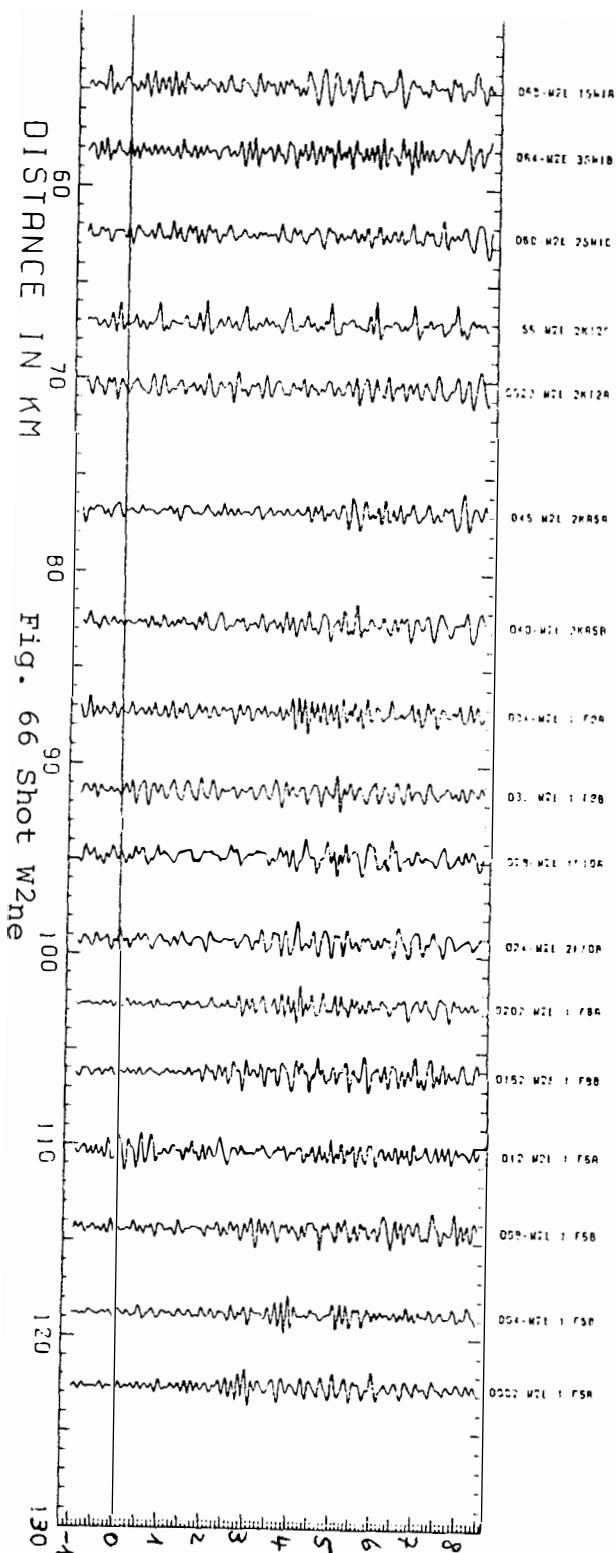


Fig. 65 Shot W2 SW

12.01.83 VERTICAL 1.3 HZ TO 8.0 HZ (80.40)



DISTANCE IN KM

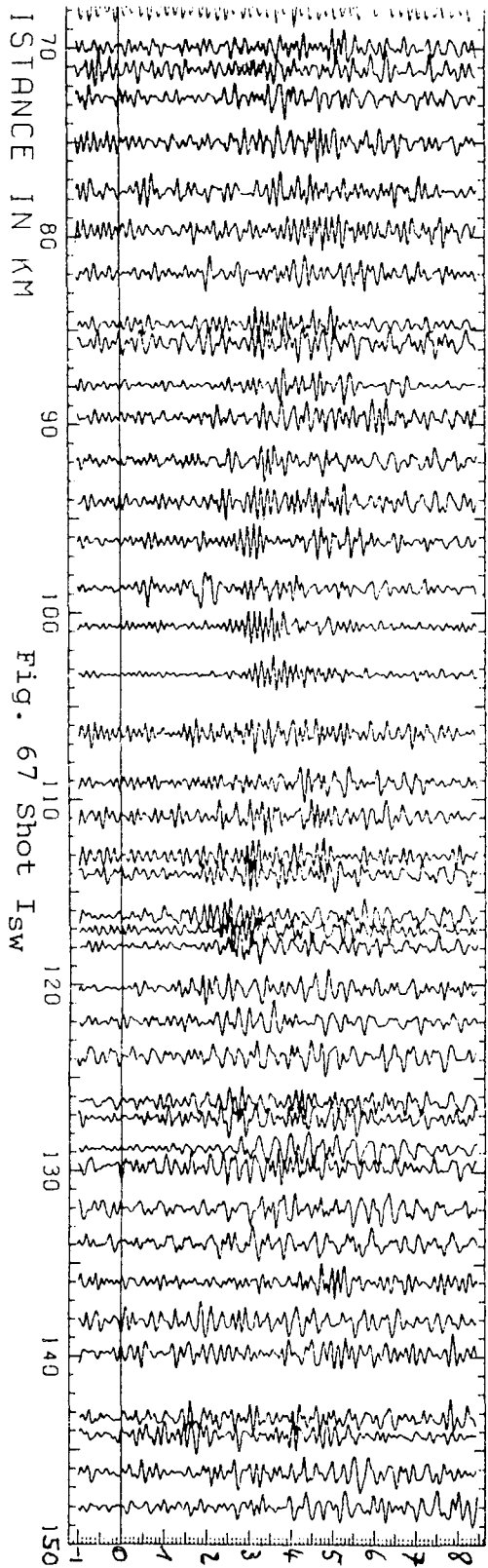
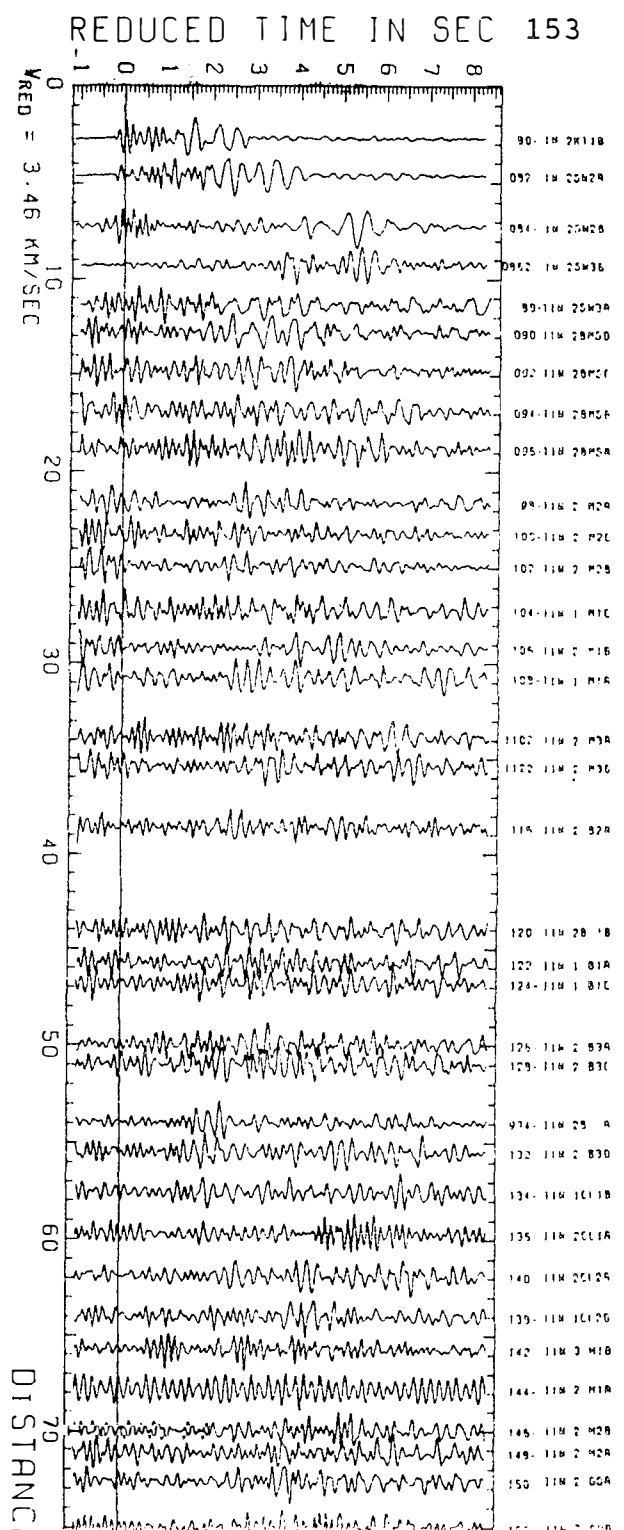
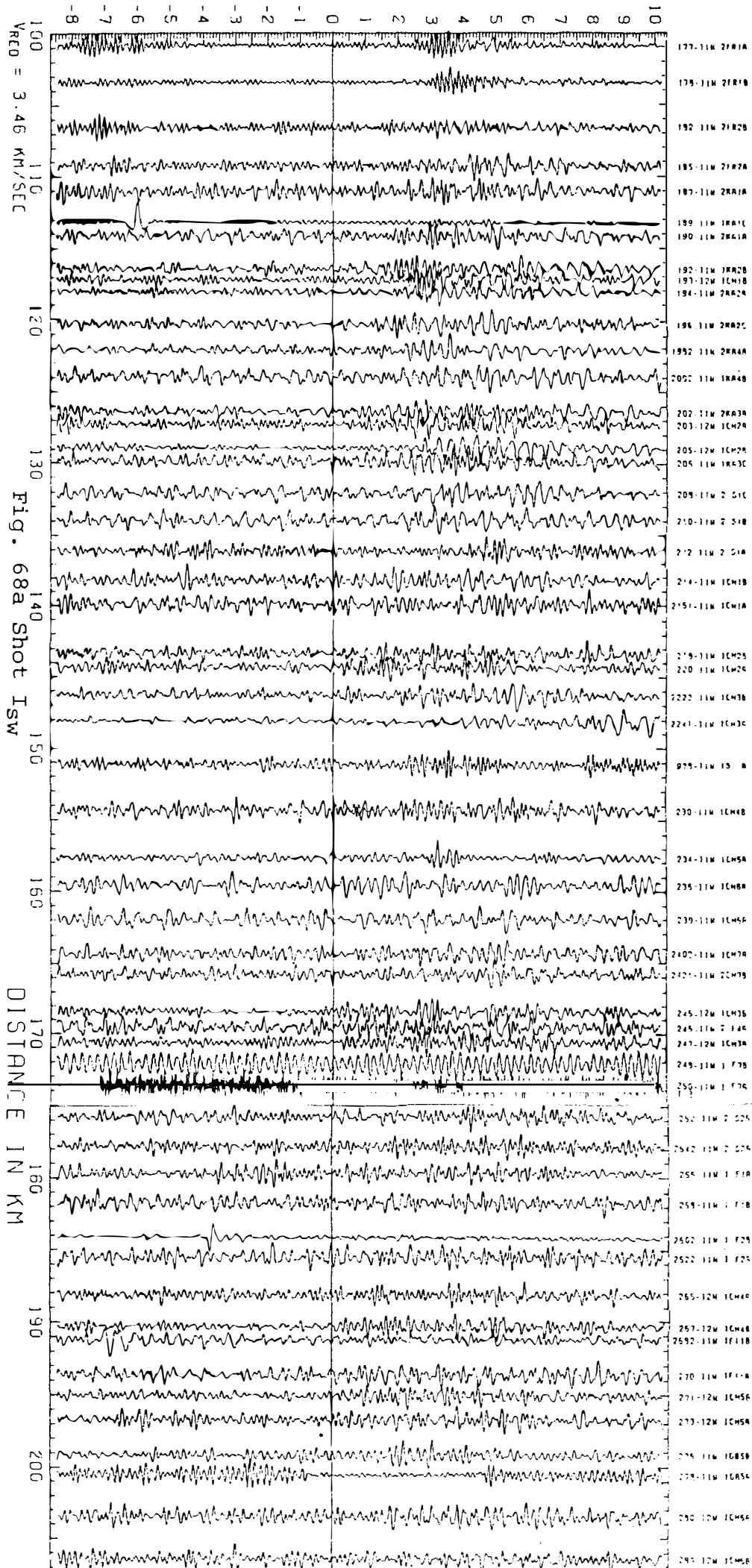


Fig. 67 Shot Isw

12.01.83 VERTICAL 1.3 HZ TO 8.0 HZ (80,40)



REDUCED TIME IN SEC



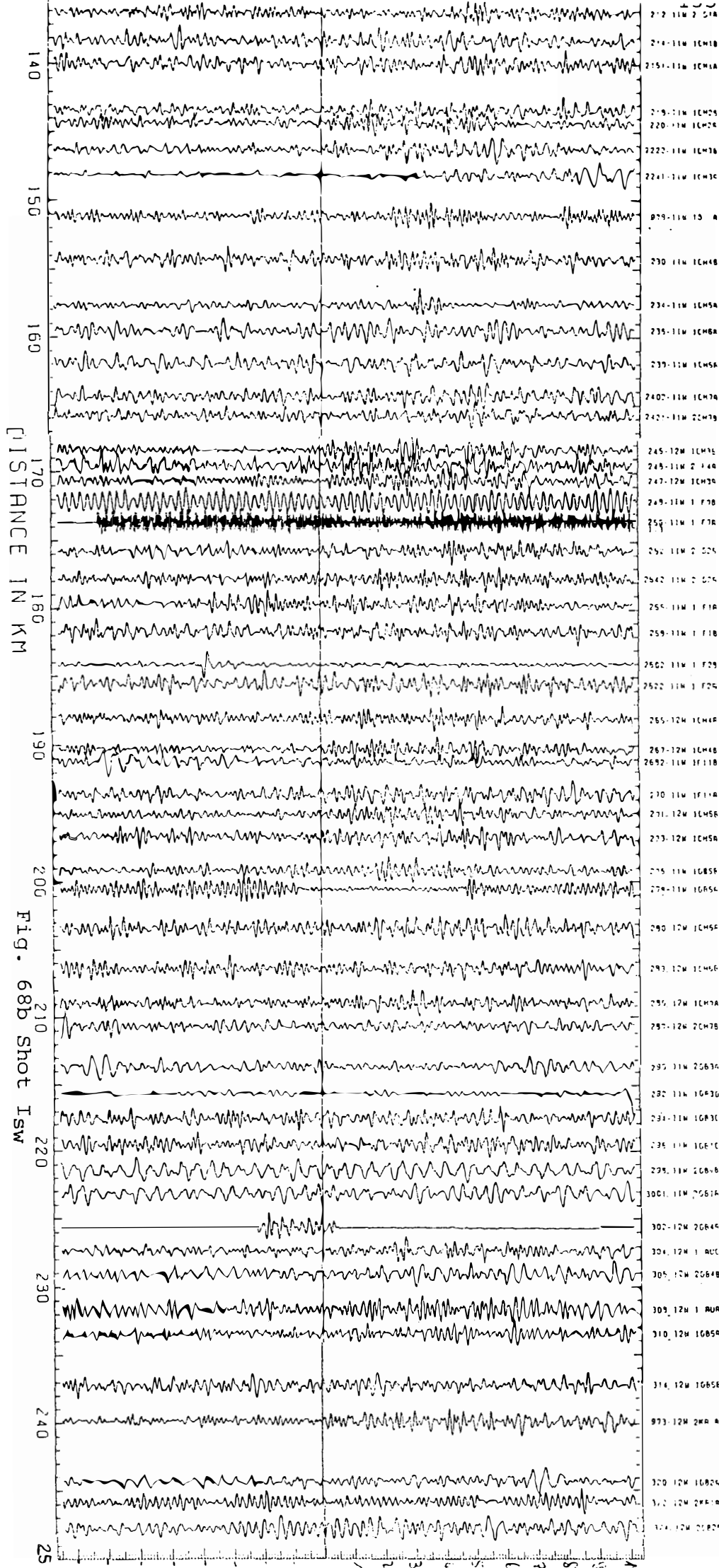
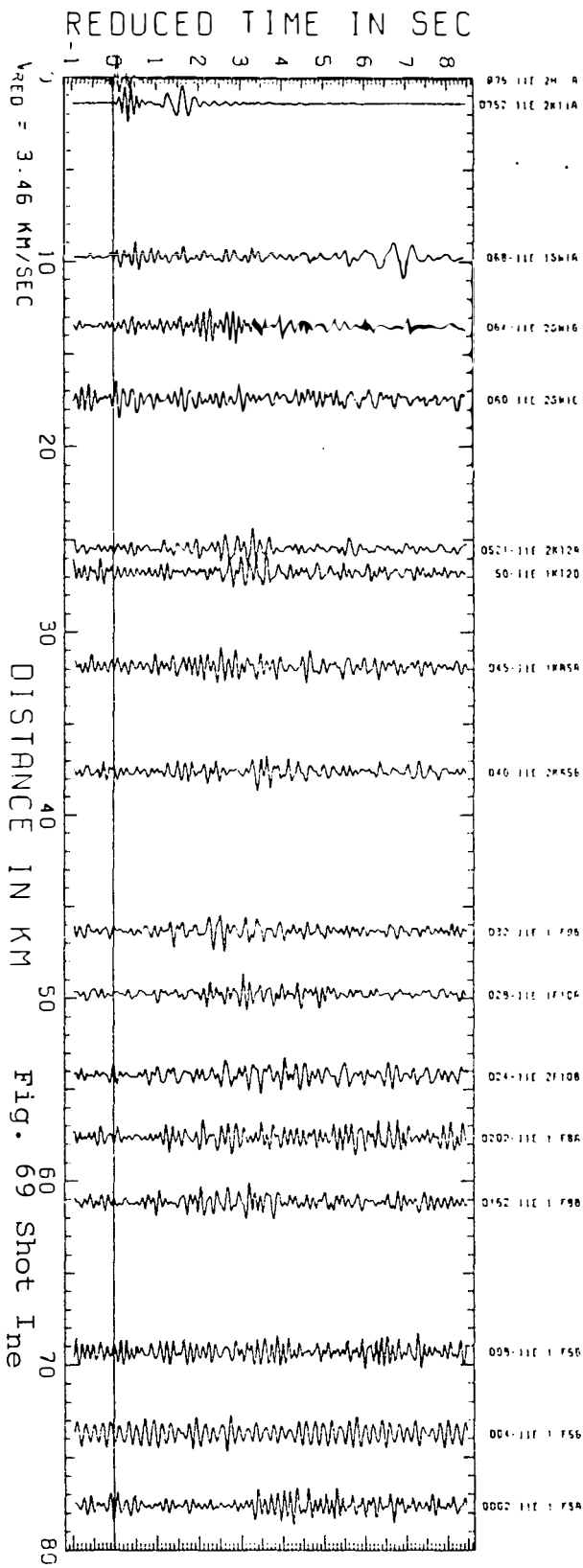
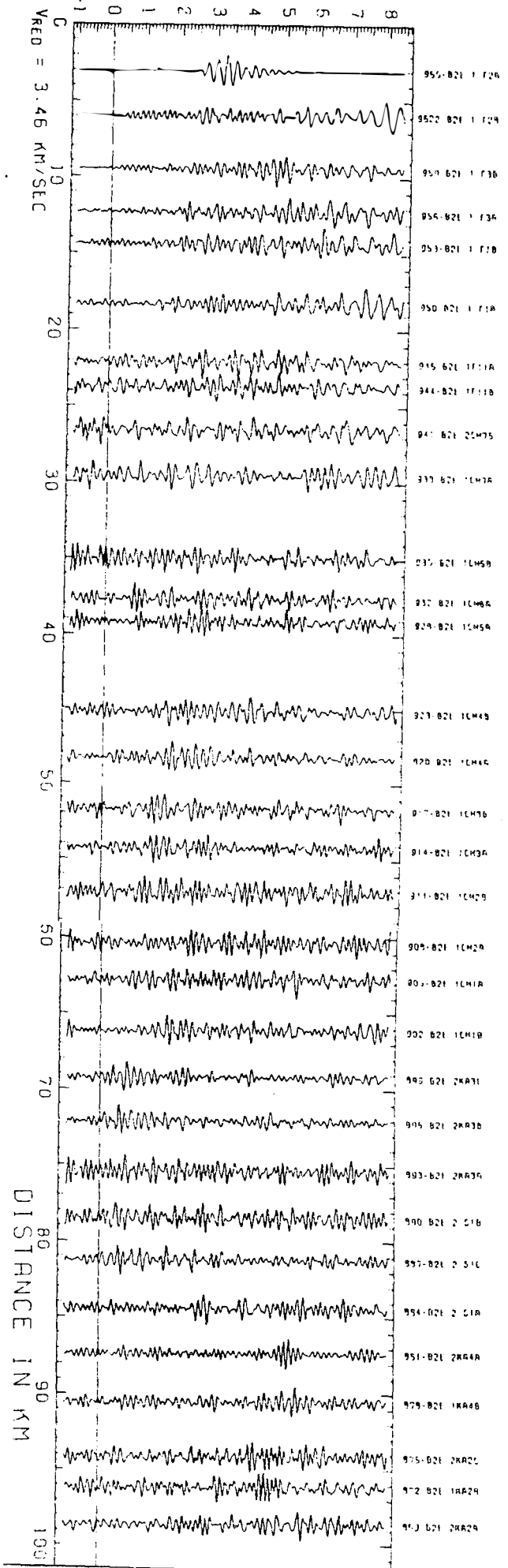
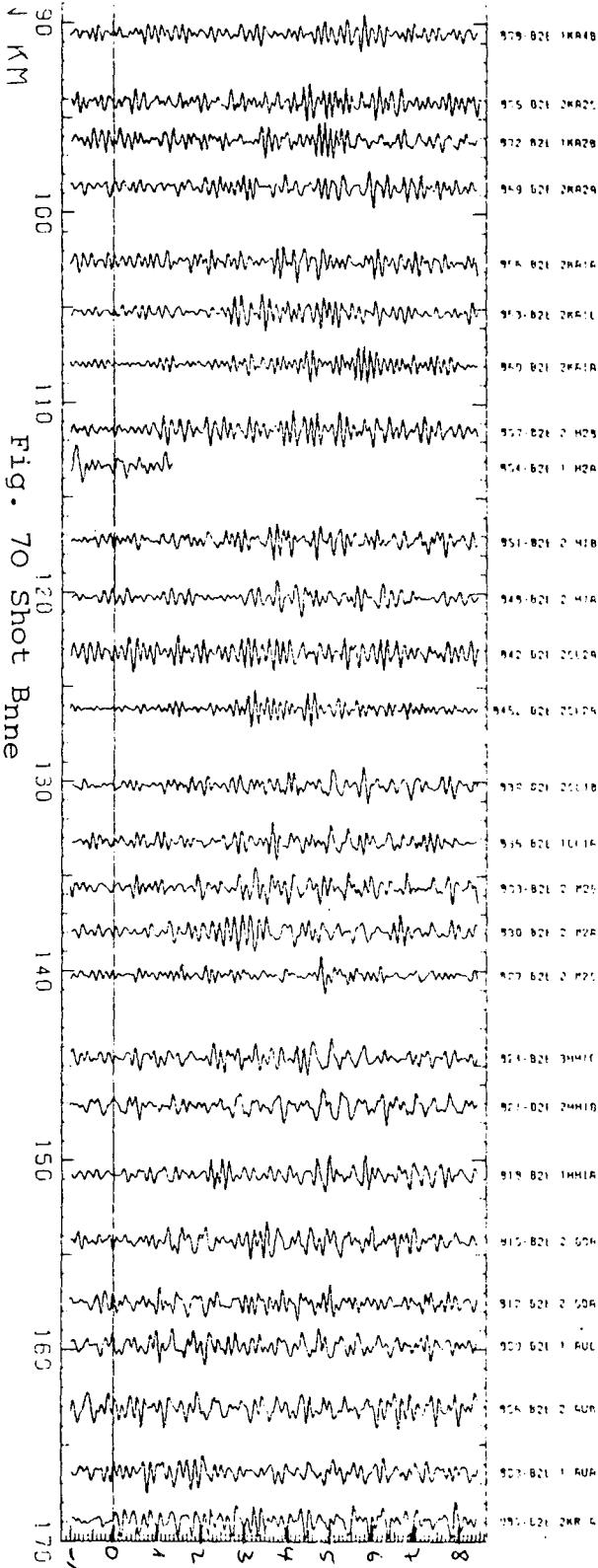


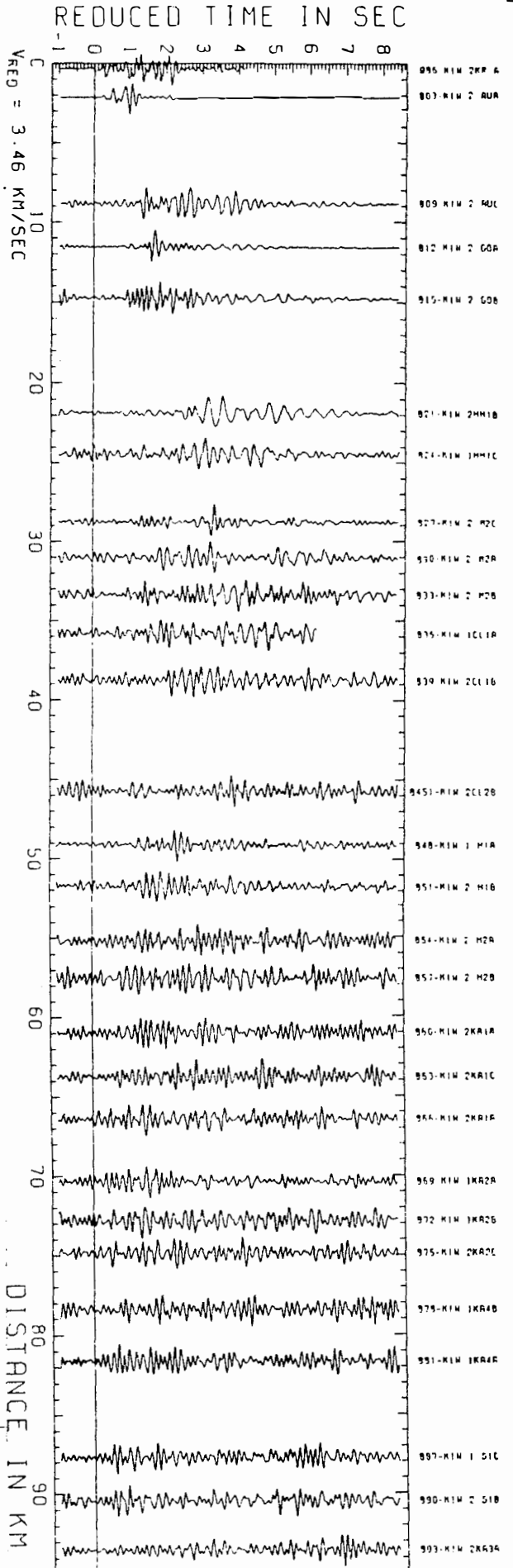
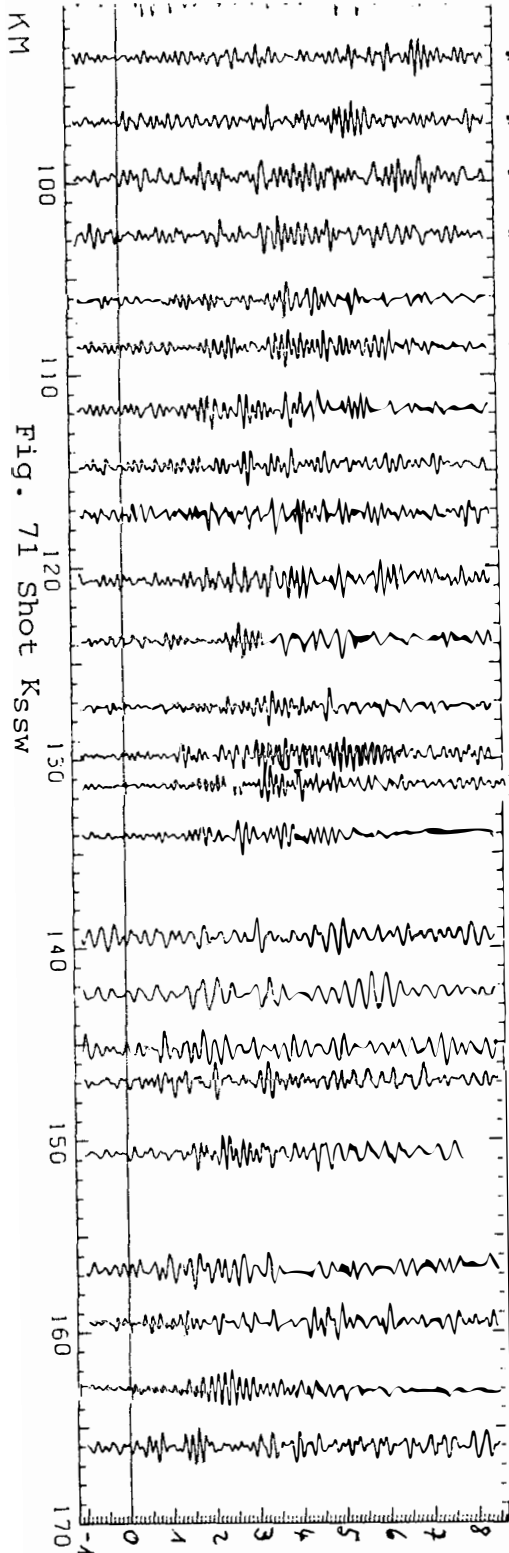
Fig. 68b Shot TSW



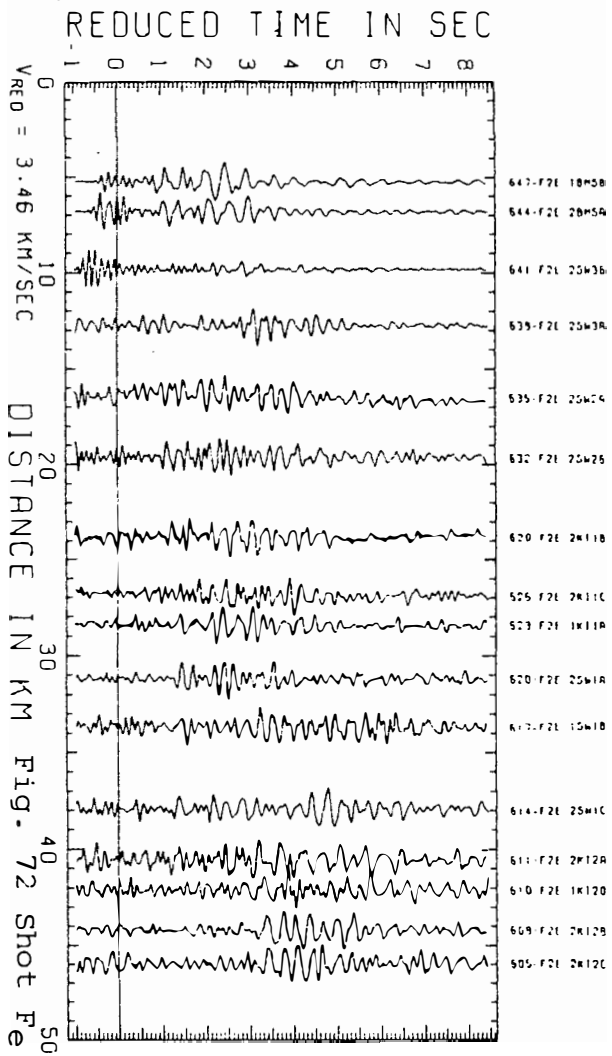
REDUCED TIME IN SEC 157



DISTANCE IN KM

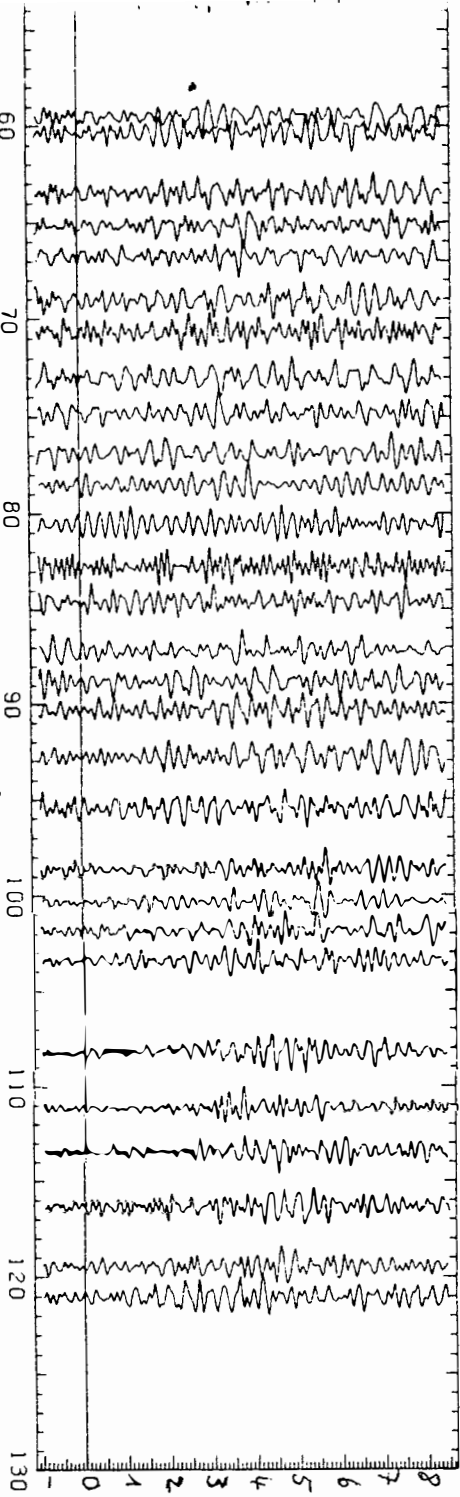


07.01.83 VERTICAL 1.3 HZ TO 8.0 HZ (80.40)



DISTANCE IN KM

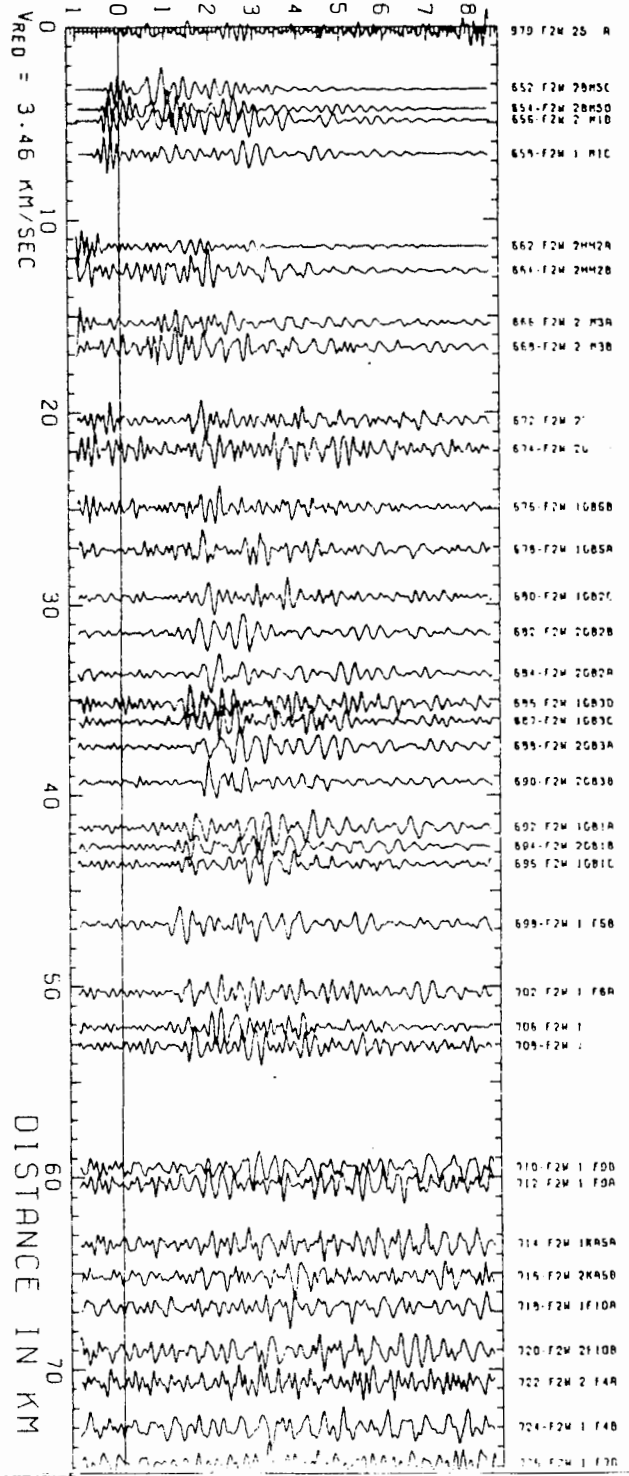
Fig. 73 Shot Fw



- 710-F2M 1 F0B
- 712-F2M 1 F0A
- 714-F2M 1KASA
- 715-F2M 2KASB
- 719-F2M 1F10A
- 720-F2M 2F10B
- 722-F2M 2 F4A
- 724-F2M 1 F4B
- 725-F2M 1 F7B
- 729-F2M 1 F7A
- 730-F2M 2 S0A
- 732-F2M 2 S2B
- 734-F2M 1F12A
- 735-F2M 1F12B
- 738-F2M 2 B1C
- 740-F2M 2 B1A
- 742-F2M 1 B1B
- 744-F2M 2 B2A
- 745-F2M 1 B2B
- 750-F2M 2 B3C
- 752-F2M 2 B3D
- 753-F2M 2 B3B
- 754-F2M 2 B3A
- 759-F2M 1FR1A
- 752-F2M 1FR1C
- 764-F2M 2FR2A
- 767-F2M 1FR2C
- 770-F2M 1FR2D
- 395-F2M 2KR A

07.01.83 VERTICAL 1.3 HZ TO 8.0 HZ (80,40)

REDUCED TIME IN SEC 160



- 879-F2M 25 A
- 852-F2M 2BMS0
- 854-F2M 2BMS0
- 855-F2M 2 P1B
- 859-F2M 1 P1C
- 862-F2M 2M42A
- 861-F2M 2M42B
- 865-F2M 2 M3A
- 869-F2M 2 M3B
- 872-F2M 2
- 874-F2M 2L
- 875-F2M 1GB5B
- 878-F2M 1GB5A
- 880-F2M 1GB2C
- 892-F2M 2GB2B
- 884-F2M 2GB2A
- 885-F2M 1GB3D
- 887-F2M 1GB3C
- 895-F2M 2GB3A
- 890-F2M 2GB3B
- 892-F2M 1GB1A
- 894-F2M 2GB1B
- 895-F2M 1GB1C
- 899-F2M 1 F5B
- 702-F2M 1 F6A
- 705-F2M 1
- 709-F2M 1
- 710-F2M 1 F0B
- 712-F2M 1 F0A
- 714-F2M 1KASA
- 715-F2M 2KASB
- 719-F2M 1F10A
- 720-F2M 2F10B
- 722-F2M 2 F4A
- 724-F2M 1 F4B
- 725-F2M 1 F7B

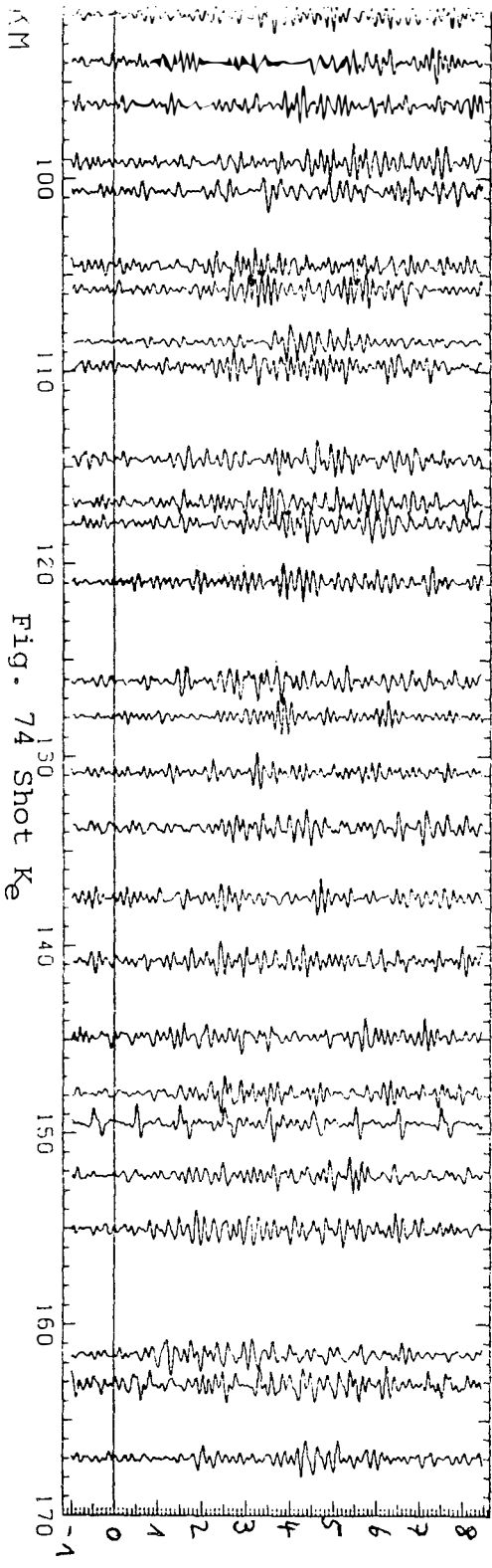
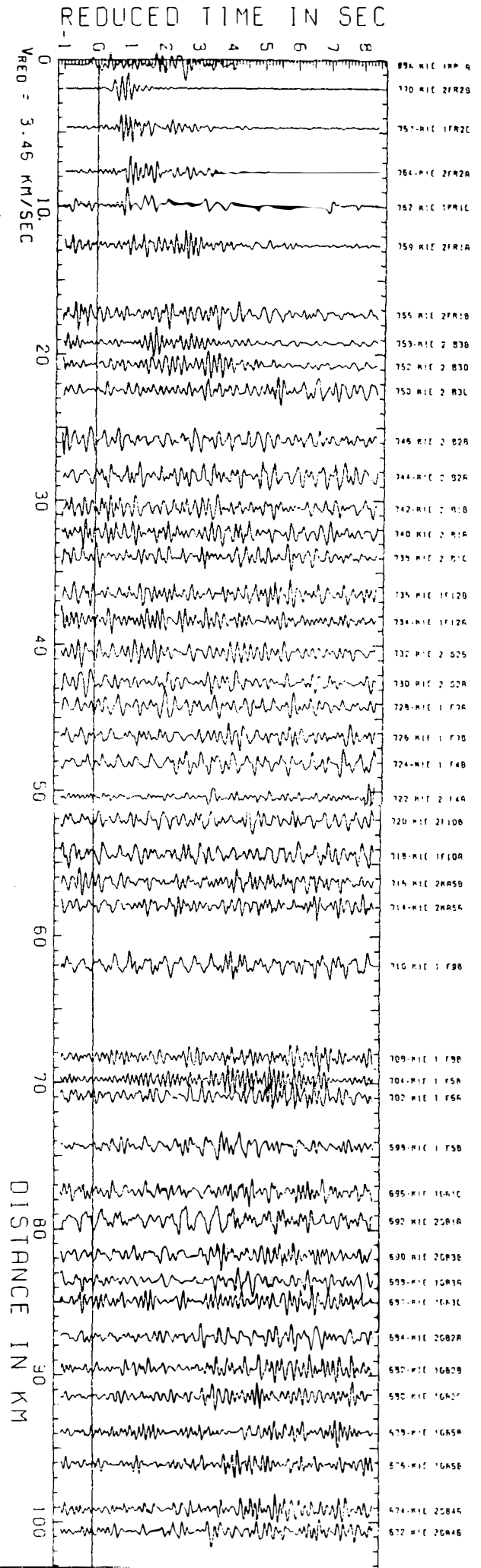
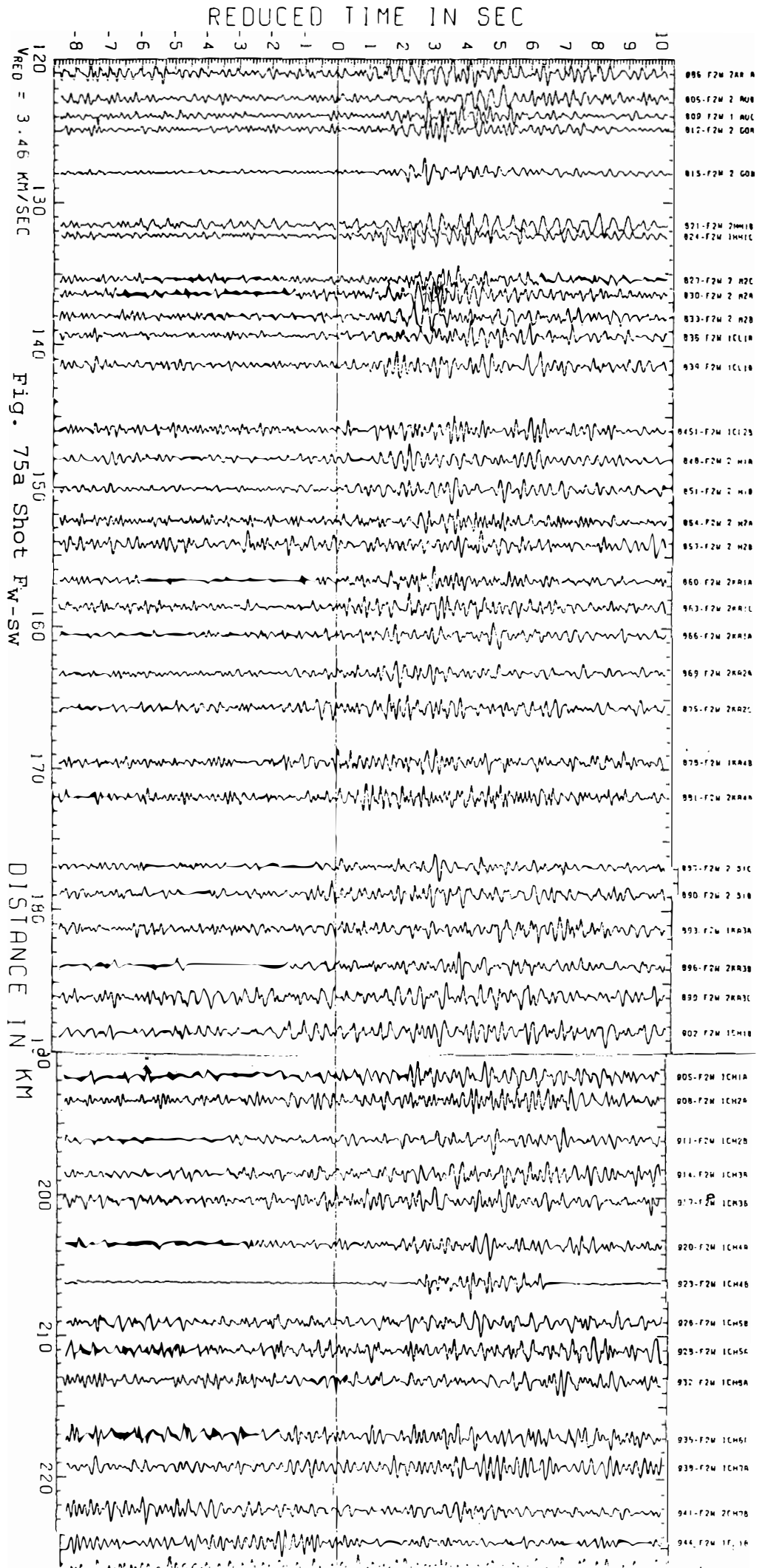


Fig. 74 Shot K_e



DISTANCE IN KM



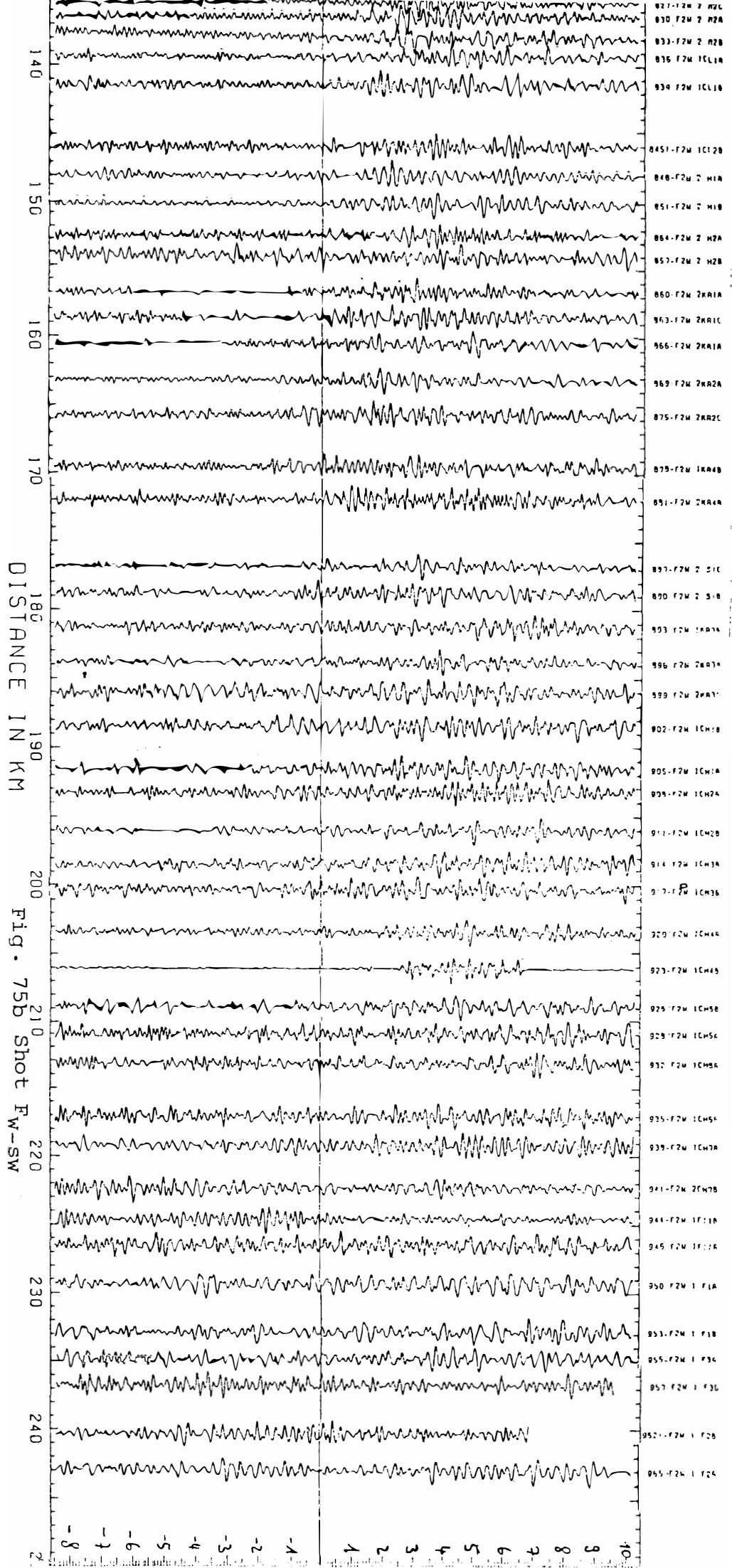
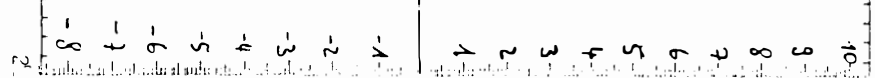


Fig. 75b Shot F_w-SW



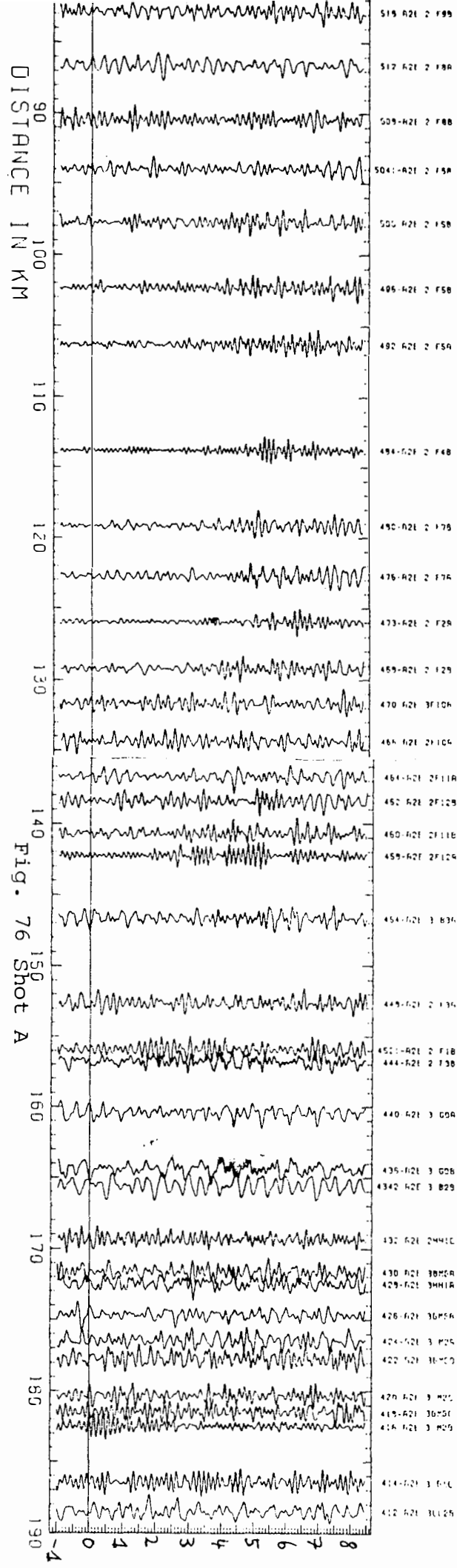
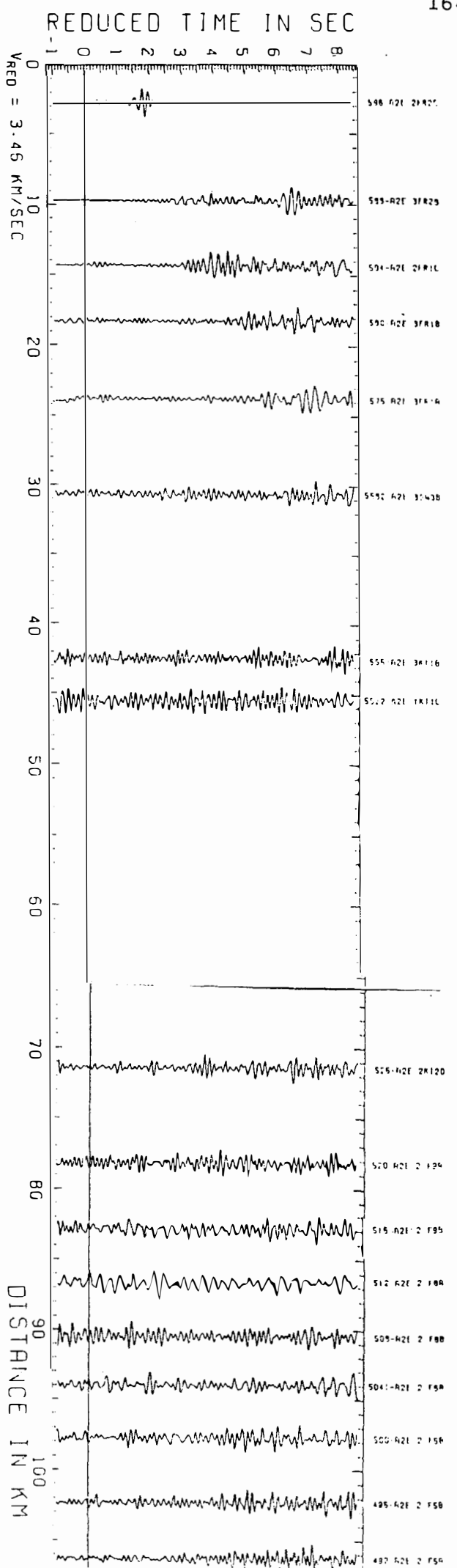
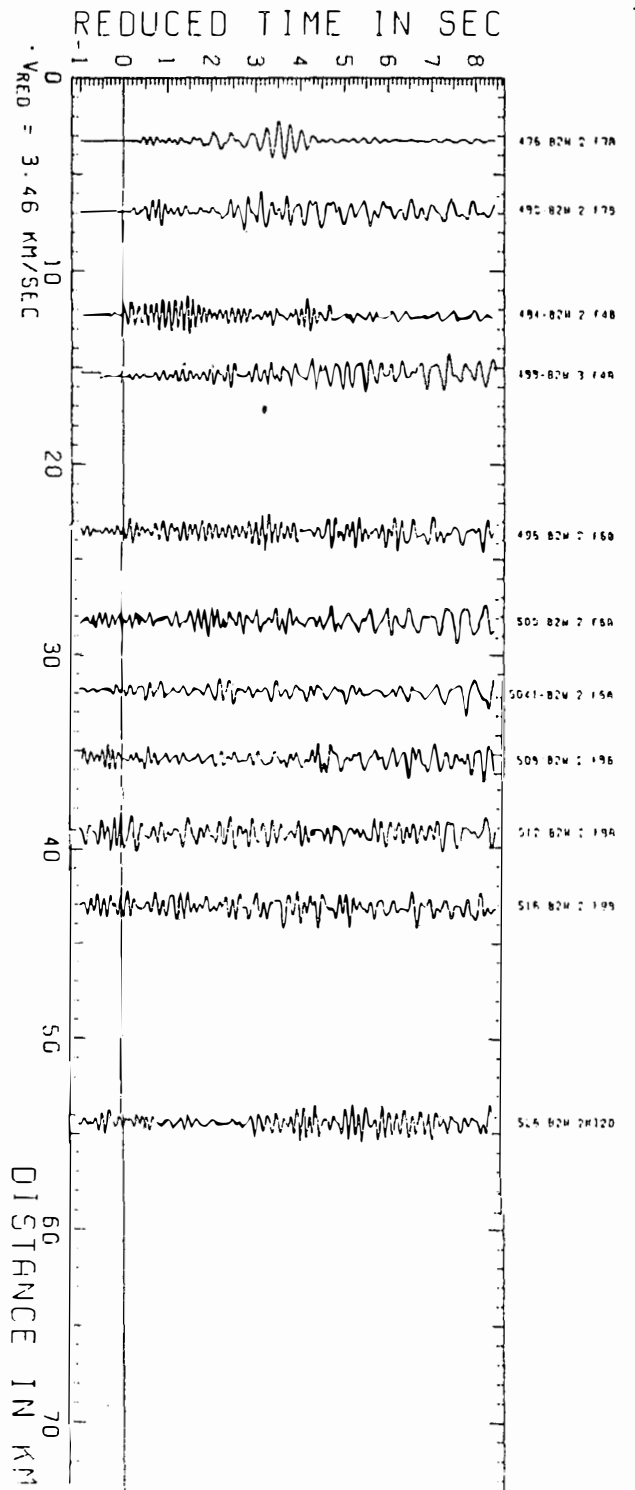
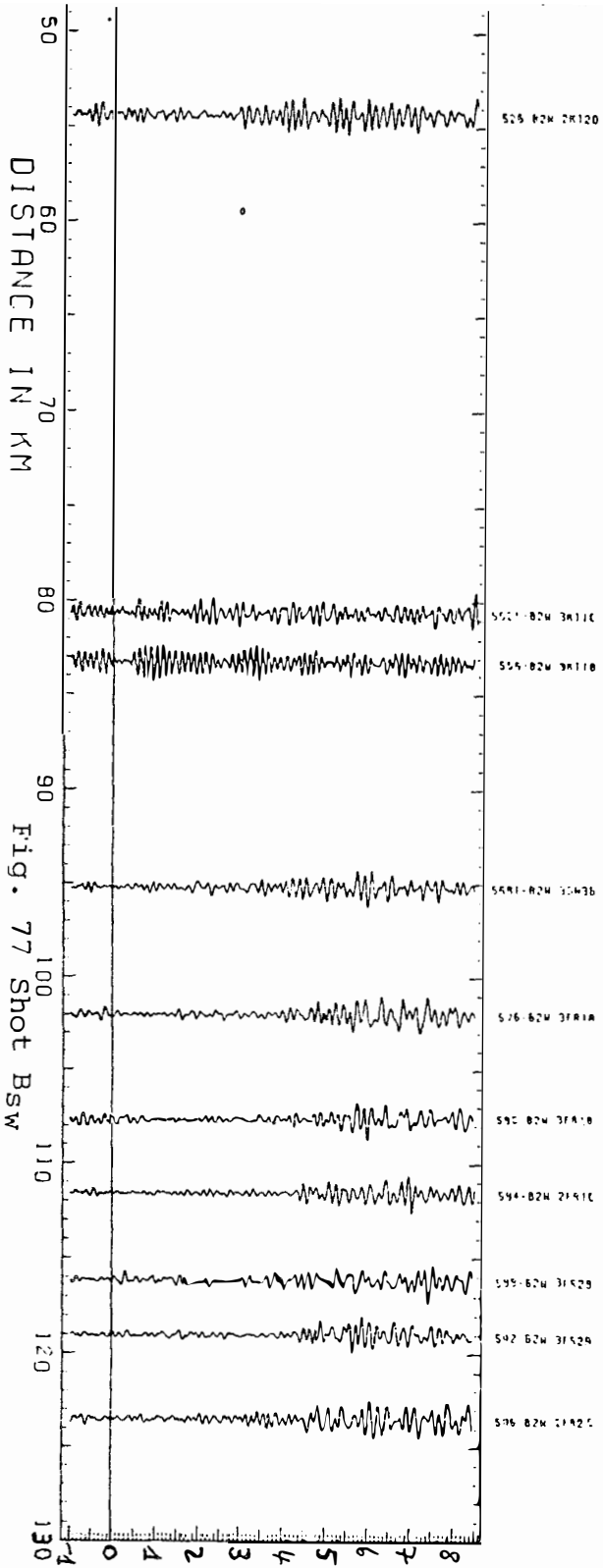
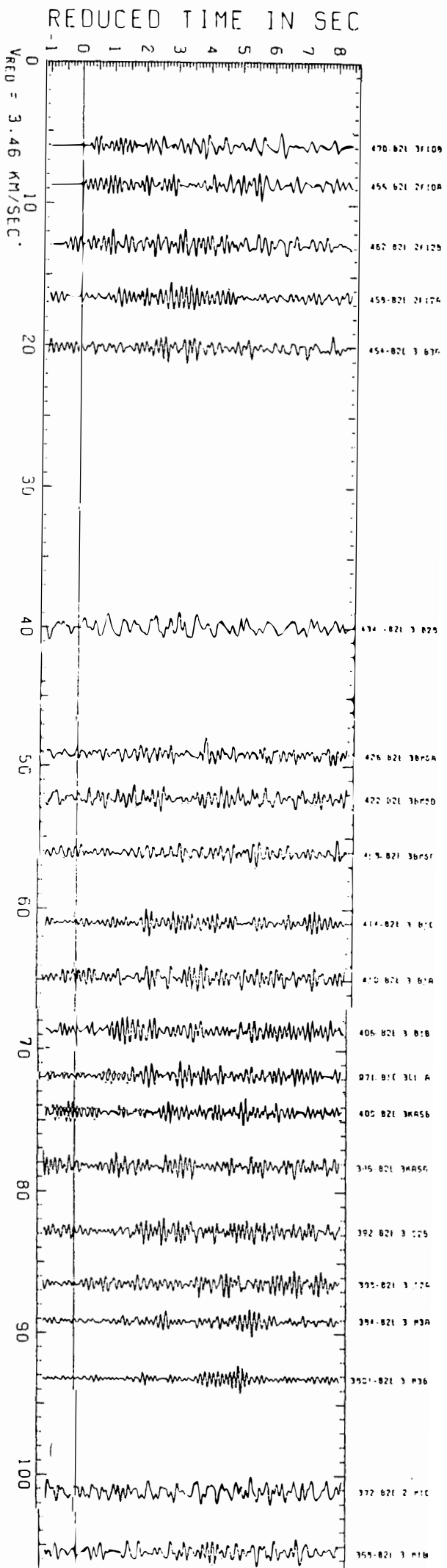
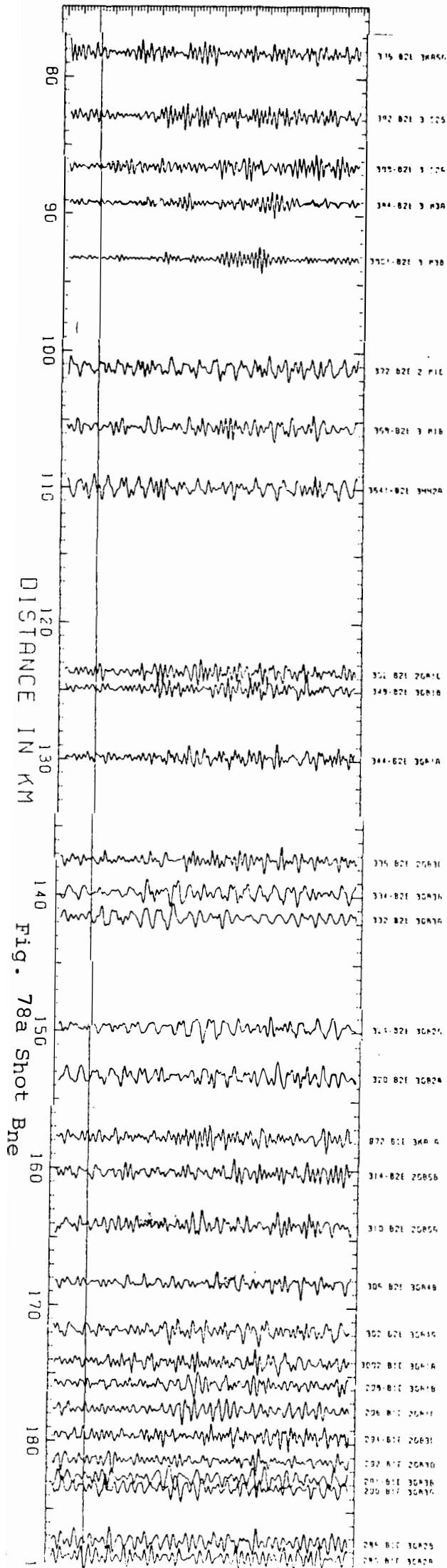
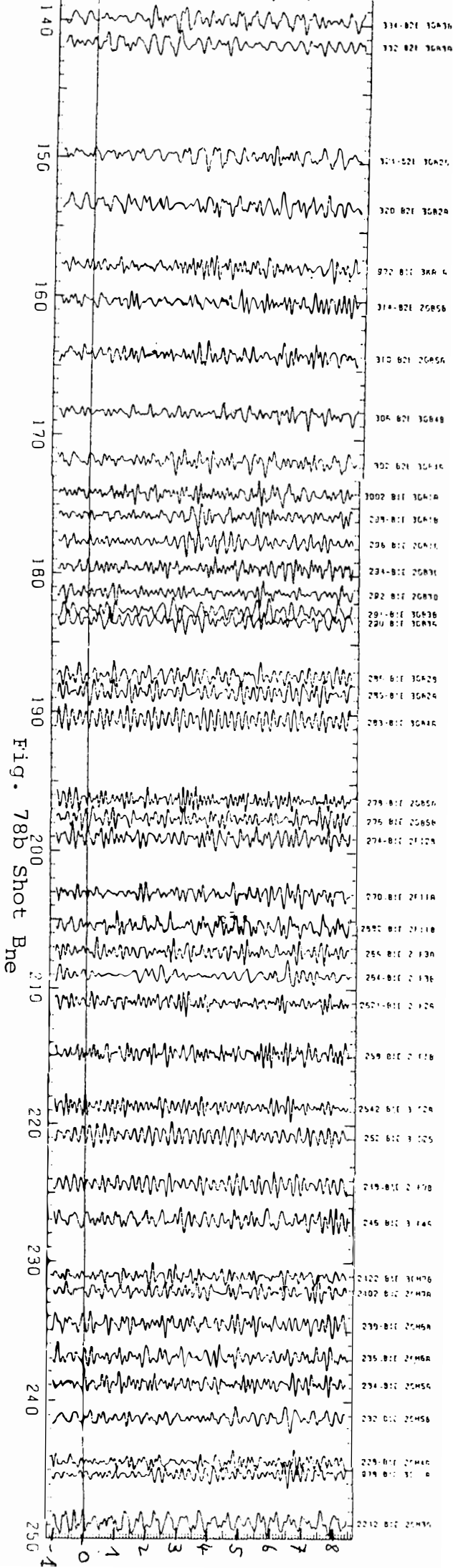


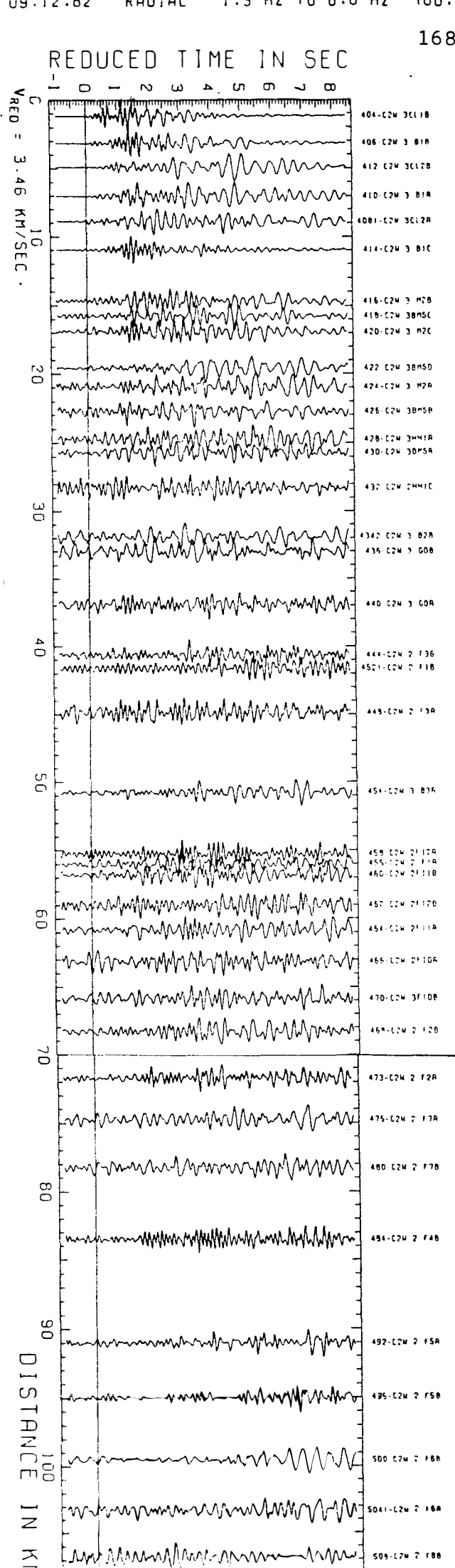
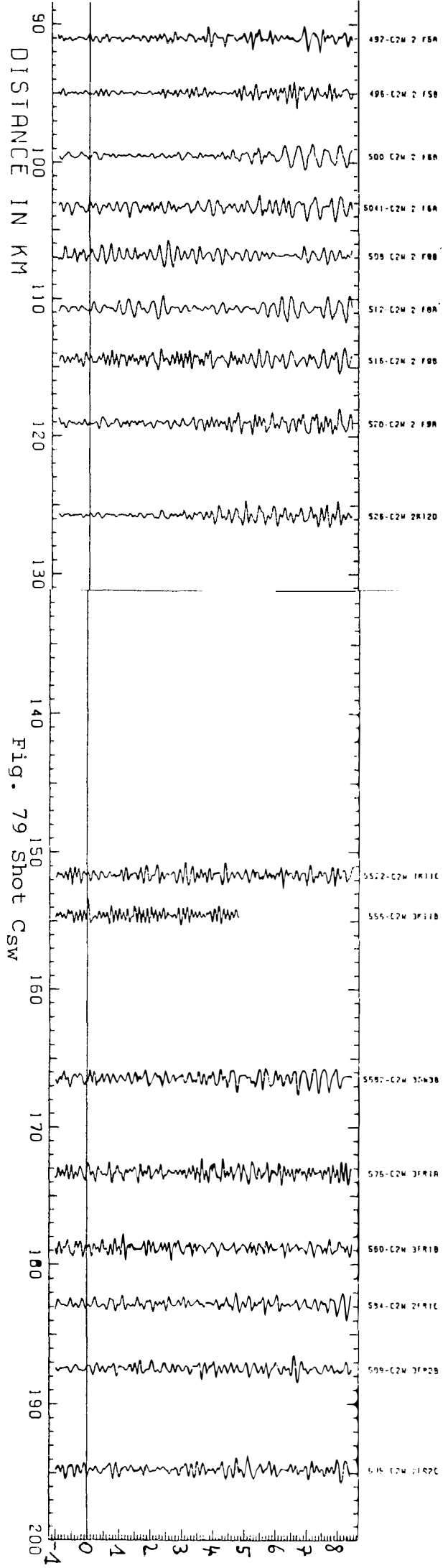
Fig. 76 Shot A

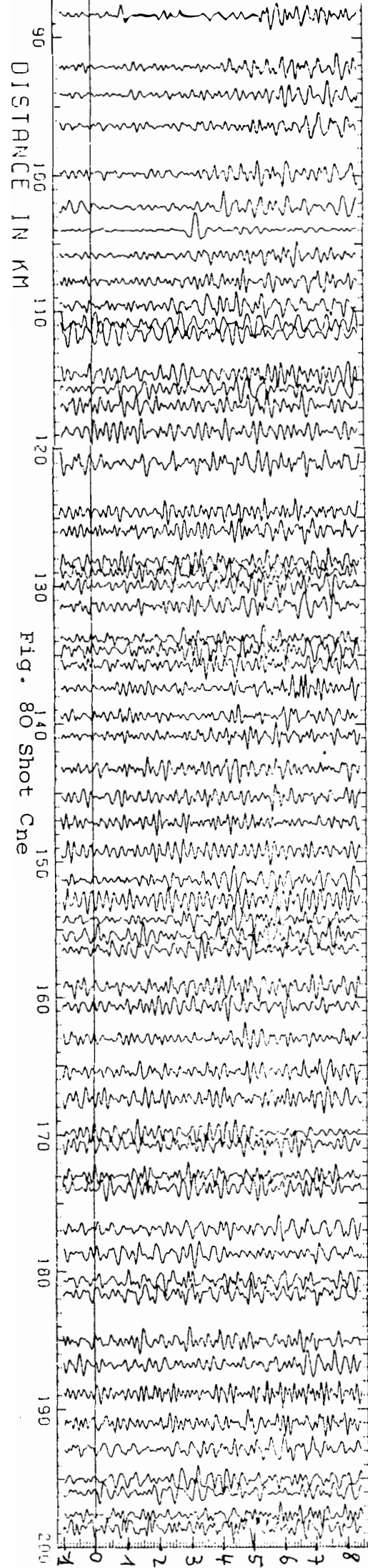






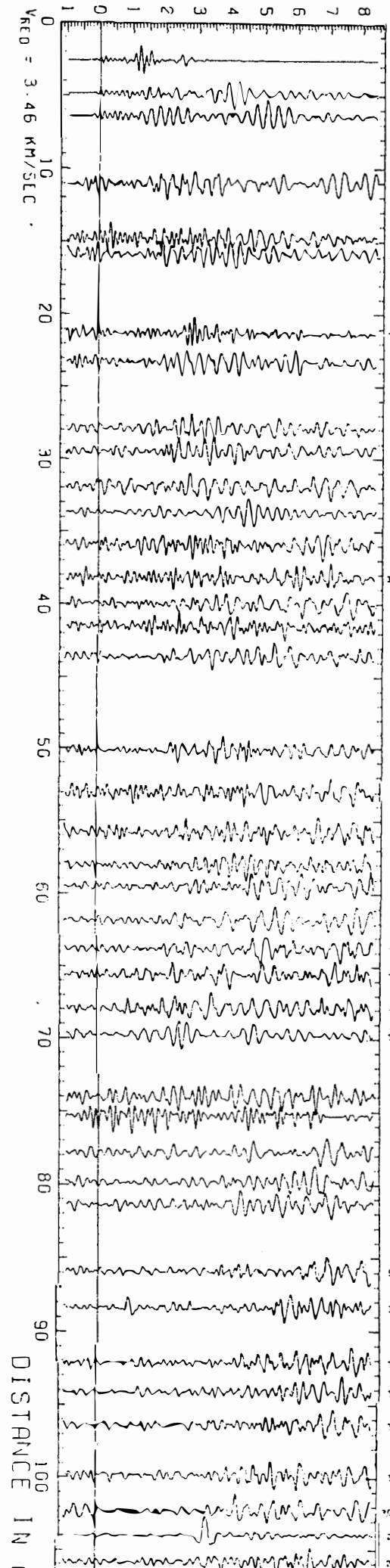






314-C21 20956
310-C21 20954
309-C21 3 RUP
316-C21 30948
307-C21 30946
300-C21 30944
229-C21 30942
226-C21 20940
221-C21 20938
232-C21 20930
231-C21 30934
230-C21 30934
247-C21 30928
294-C21 30928
285-C21 30925
283-C21 30916
291-C21 30915
278-C21 20854
276-C21 20854
273-C21 20854
272-C21 20854
271-C21 20854
270-C21 20816
259-C21 20818
257-C21 20815
254-C21 2 136
254-C21 2 136
262-C21 2 124
260-C21 2 125
259-C21 2 118
256-C21 2 114
254-C21 3 529
251-C21 3 126
250-C21 2 179
218-C21 2 175
217-C21 20834
216-C21 3 145
215-C21 20834
247-C21 30978
240-C21 20979
239-C21 20968
236-C21 20968
234-C21 20954
231-C21 20956
230-C21 20948
228-C21 20948
227-C21 30948
227-C21 20938
220-C21 20926
219-C21 20924
214-C21 20918
214-C21 30918
212-C21 3 110
211-C21 3 118
209-C21 3 110
204-C21 30916
202-C21 20916
203-C21 20908
202-C21 20908

REDUCED TIME IN SEC



90
100

DISTANCE IN KM

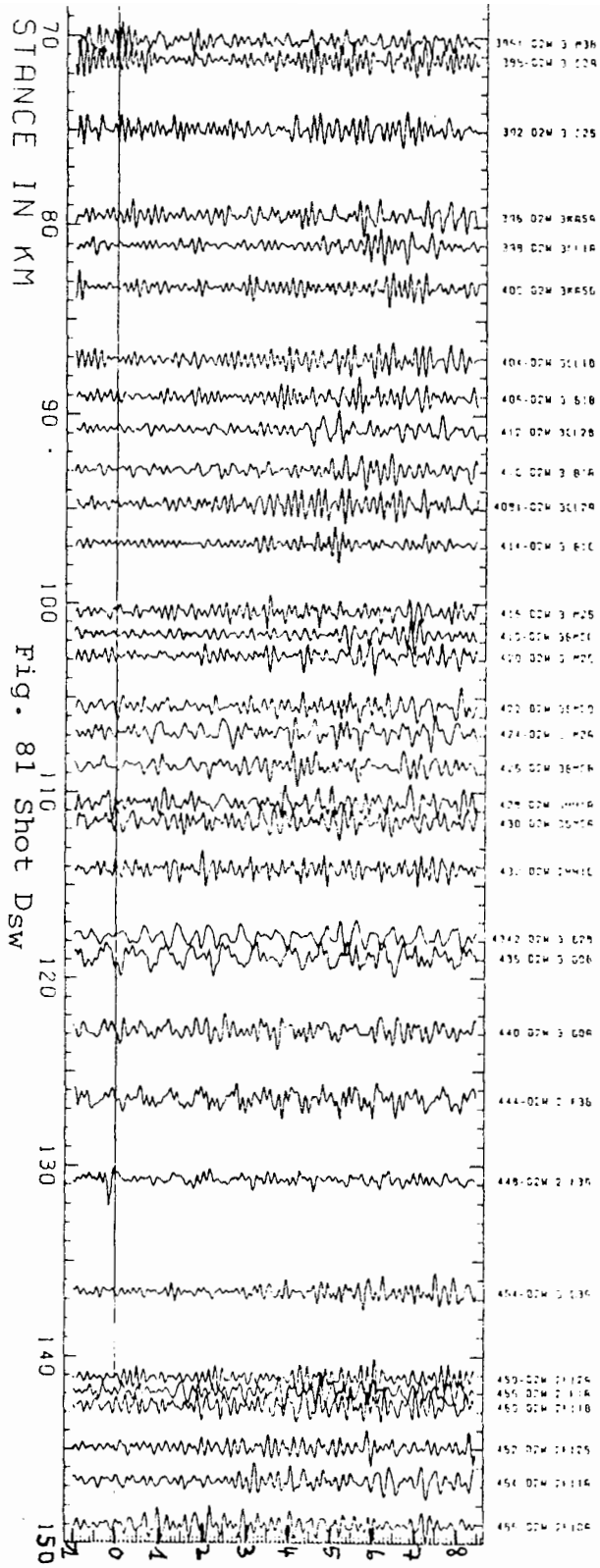
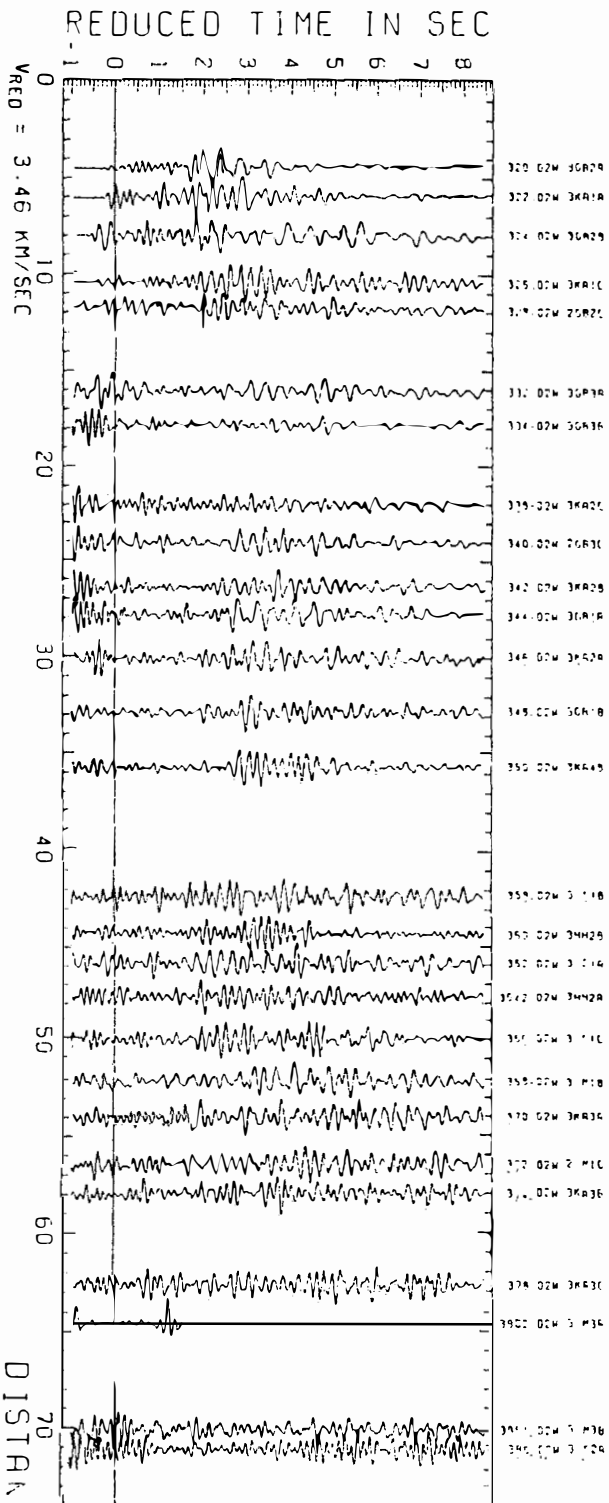
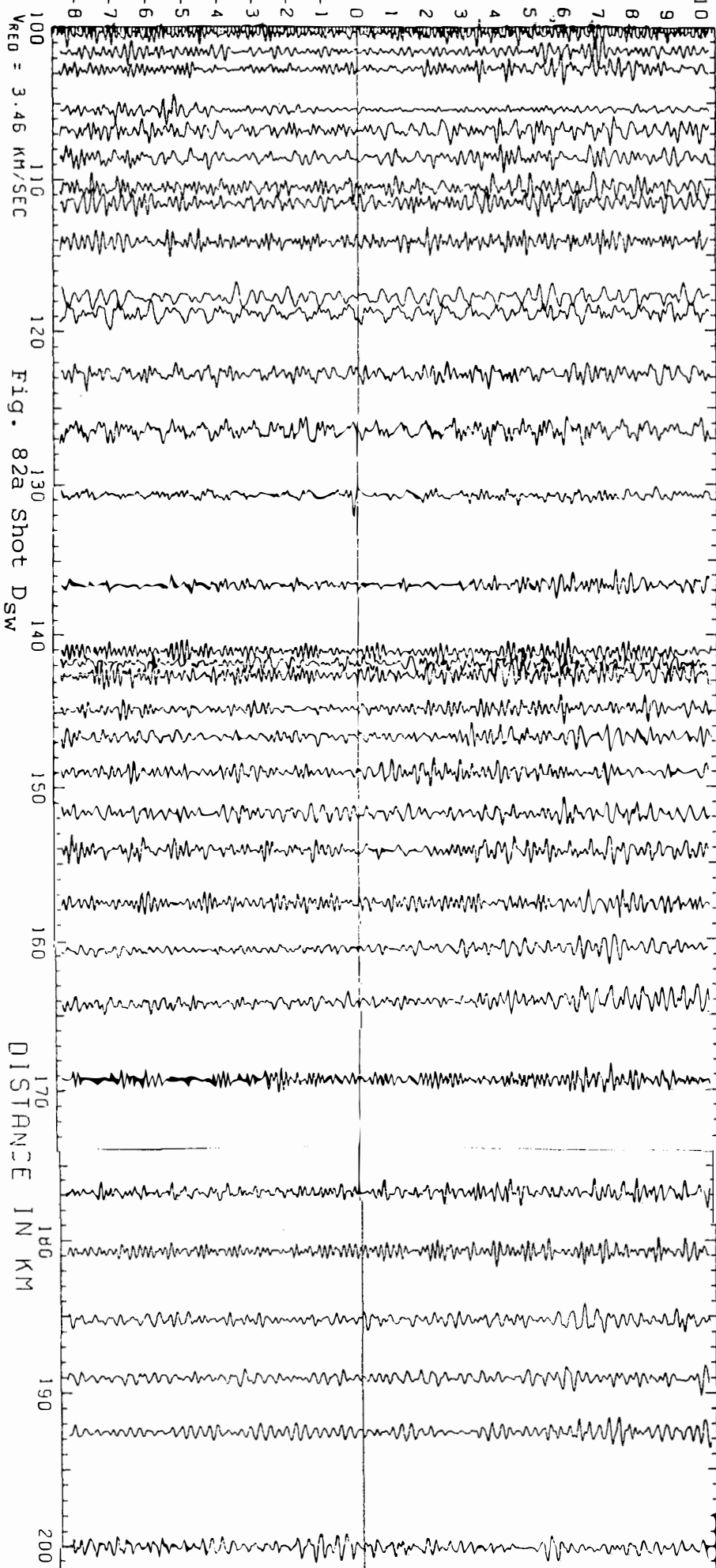


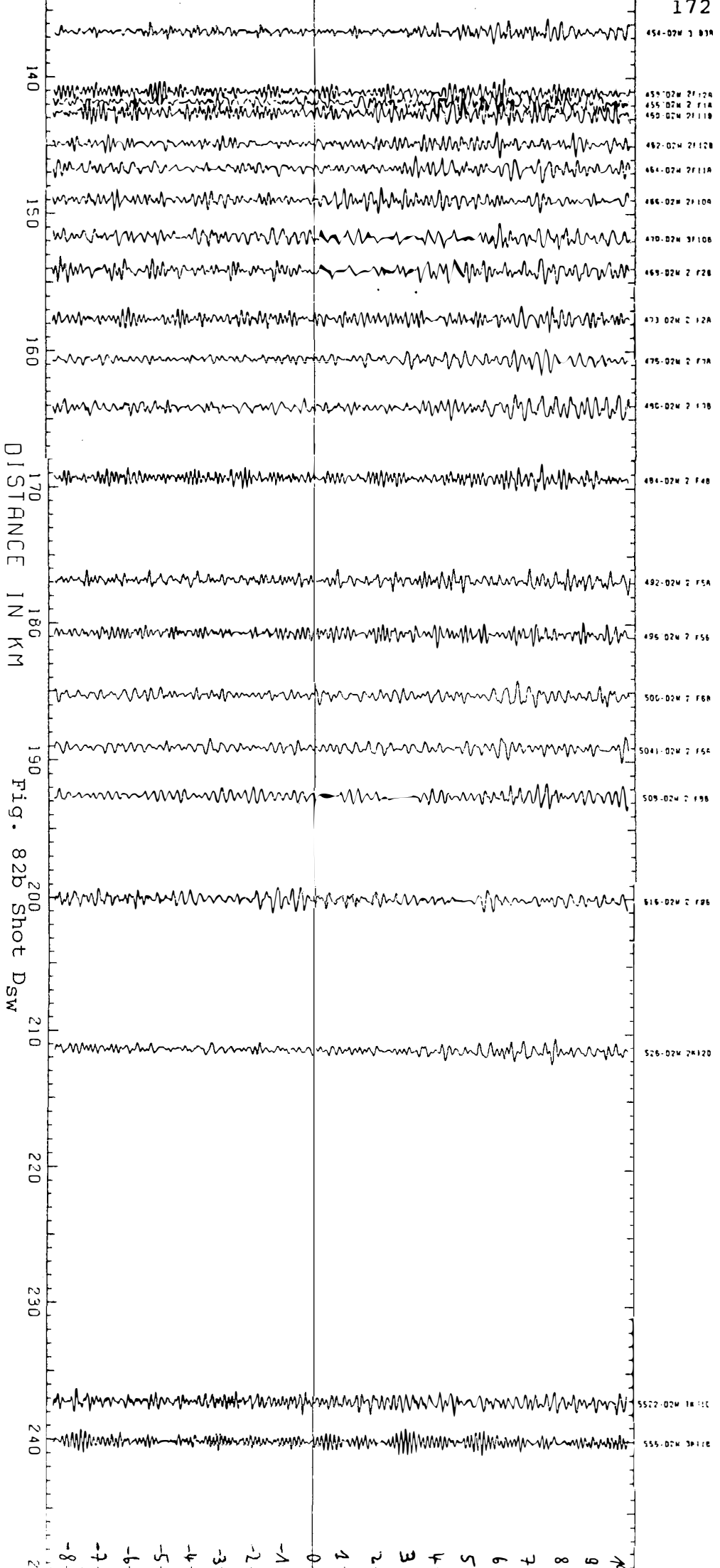
Fig. 81 Shot Dsw

22-07-82 RADIAL 1.3 HZ TO 8.0 HZ (80,40)



REDUCED TIME IN SEC





STANCE IN KM

Fig. 83 Shot Dne

76

80

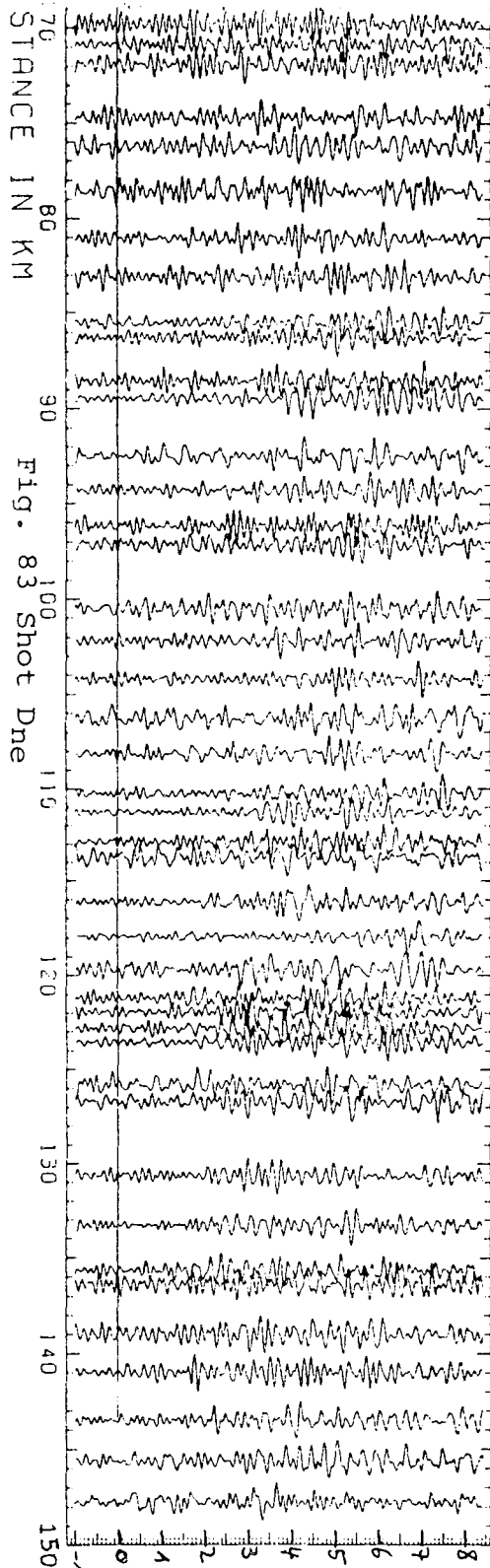
90

100

110

120

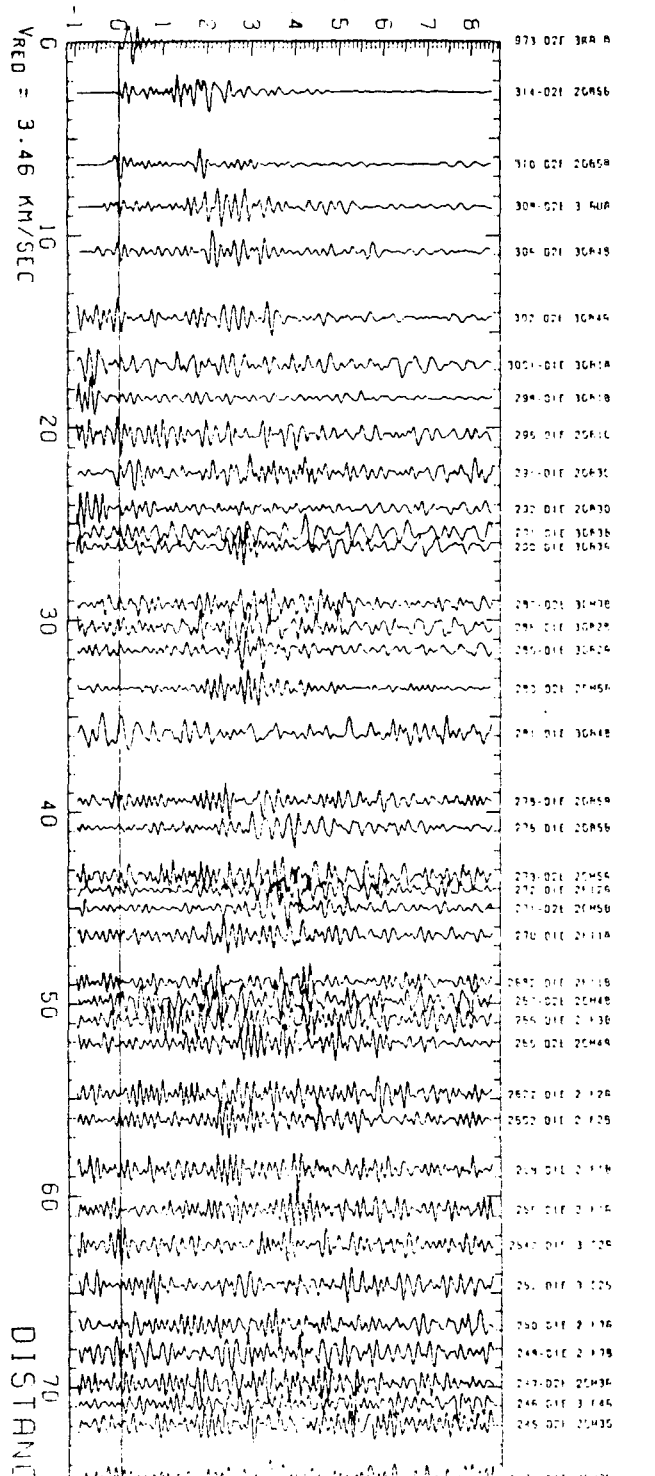
130



247-021 24438
 248-011 24438
 249-021 24438
 242-011 24478
 243-011 24478
 239-011 24458
 235-011 24458
 234-011 24458
 231-011 24458
 230-011 24458
 229-011 24458
 228-011 24458
 224-011 24438
 222-011 24438
 220-011 24428
 218-011 24428
 216-011 24418
 214-011 24418
 212-011 24418
 210-011 24418
 209-011 24418
 204-011 36431
 203-011 36431
 202-011 36431
 200-011 36445
 198-011 36445
 195-011 36427
 194-011 36427
 193-011 36427
 192-011 36427
 190-011 36418
 189-011 36418
 188-011 36426
 187-011 36426
 186-011 36426
 185-011 36426
 184-011 36426
 183-011 36426
 182-011 36426
 181-011 36426
 180-011 36426
 179-011 36426
 178-011 36426
 177-011 36426
 176-011 36426
 175-011 36426
 174-011 36426
 173-011 36426
 172-011 36426
 171-011 36426
 170-011 36426
 169-011 36426
 168-011 36426

22.07.82 RAGIAL 1.3 HZ TO 8.0 HZ (80,40)

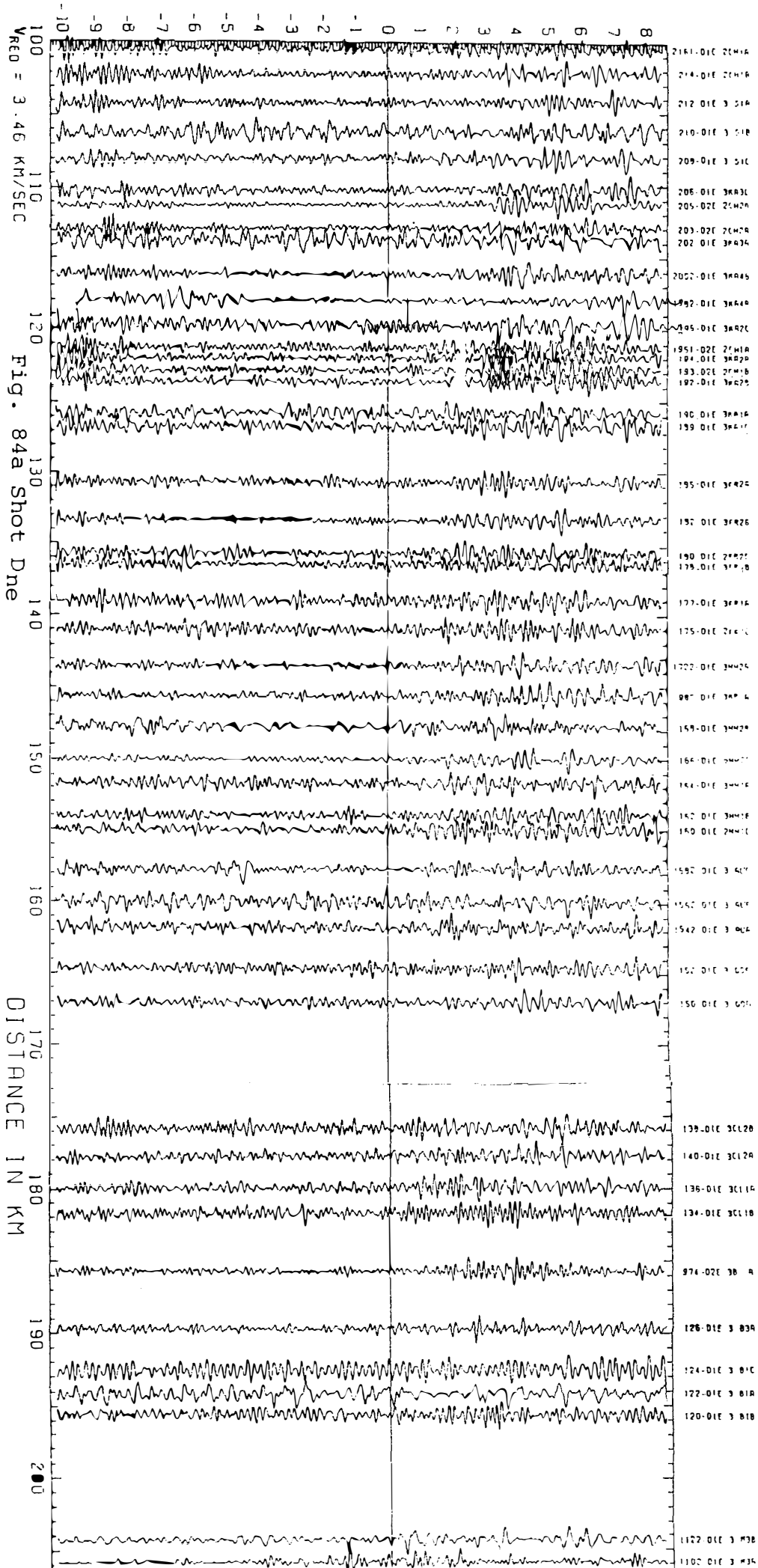
REDUCED TIME IN SEC



VRED = 3.46 KM/SEC

873-021 36418
 314-021 26456
 710-021 26458
 304-021 36418
 305-021 36418
 307-021 36445
 1021-011 36418
 294-011 36418
 295-011 26418
 293-011 26431
 292-011 26430
 291-011 36436
 290-011 36436
 288-021 36436
 284-011 36426
 285-011 36426
 283-021 24458
 281-011 36448
 279-011 26458
 278-011 26456
 273-021 24458
 272-011 24474
 271-021 24458
 270-011 24418
 269-011 24418
 267-021 24418
 267-011 24418
 265-021 24448
 262-011 24426
 262-011 24426
 262-011 24418
 261-011 24418
 257-021 24418
 257-011 24418
 254-011 24426
 254-011 24426
 253-011 24426
 250-011 24418
 249-011 24418
 247-021 24438
 246-011 24438
 245-021 24438

REDUCED TIME IN SEC



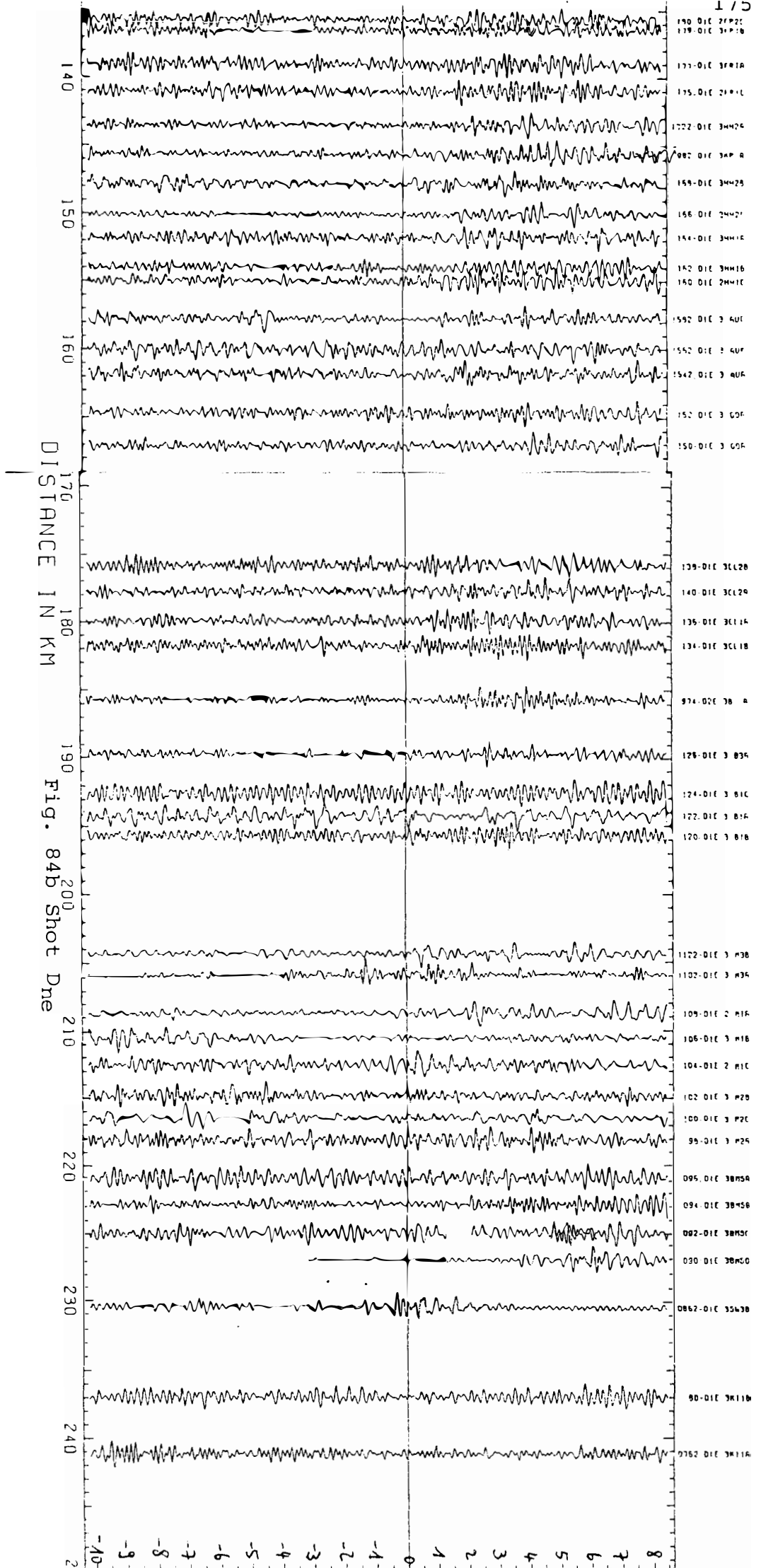
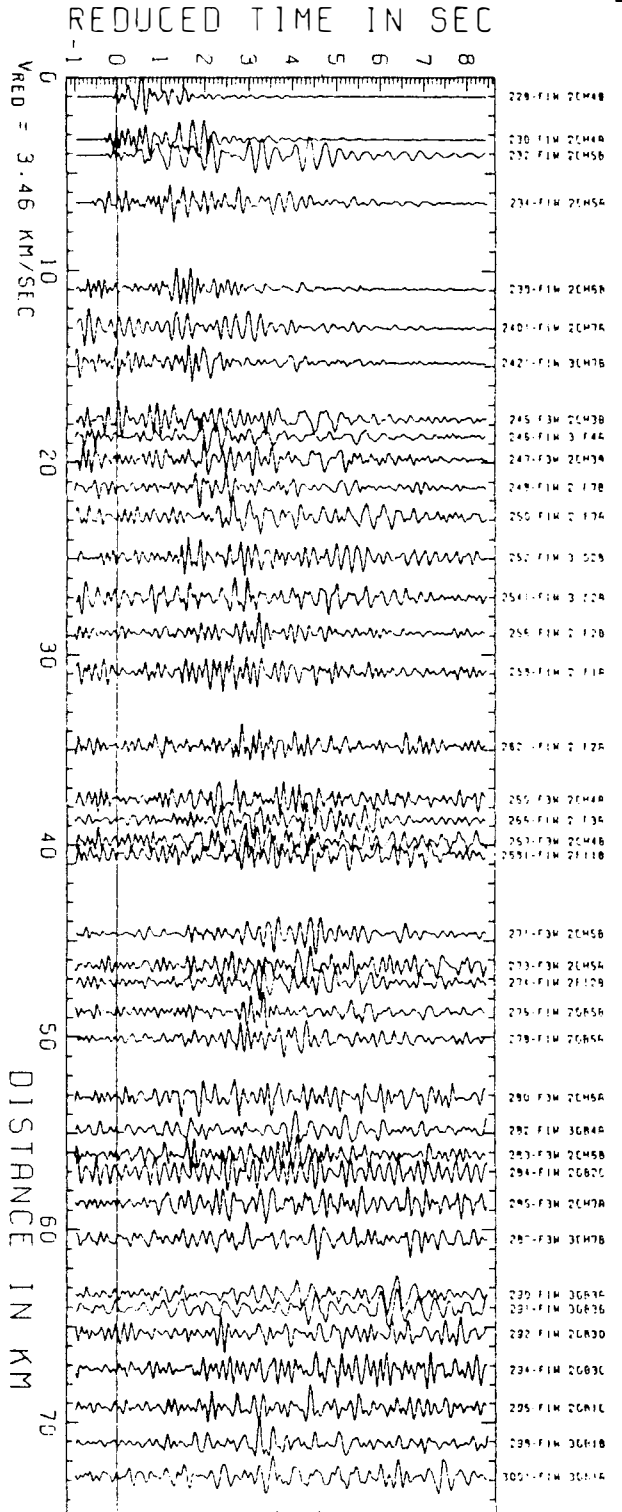
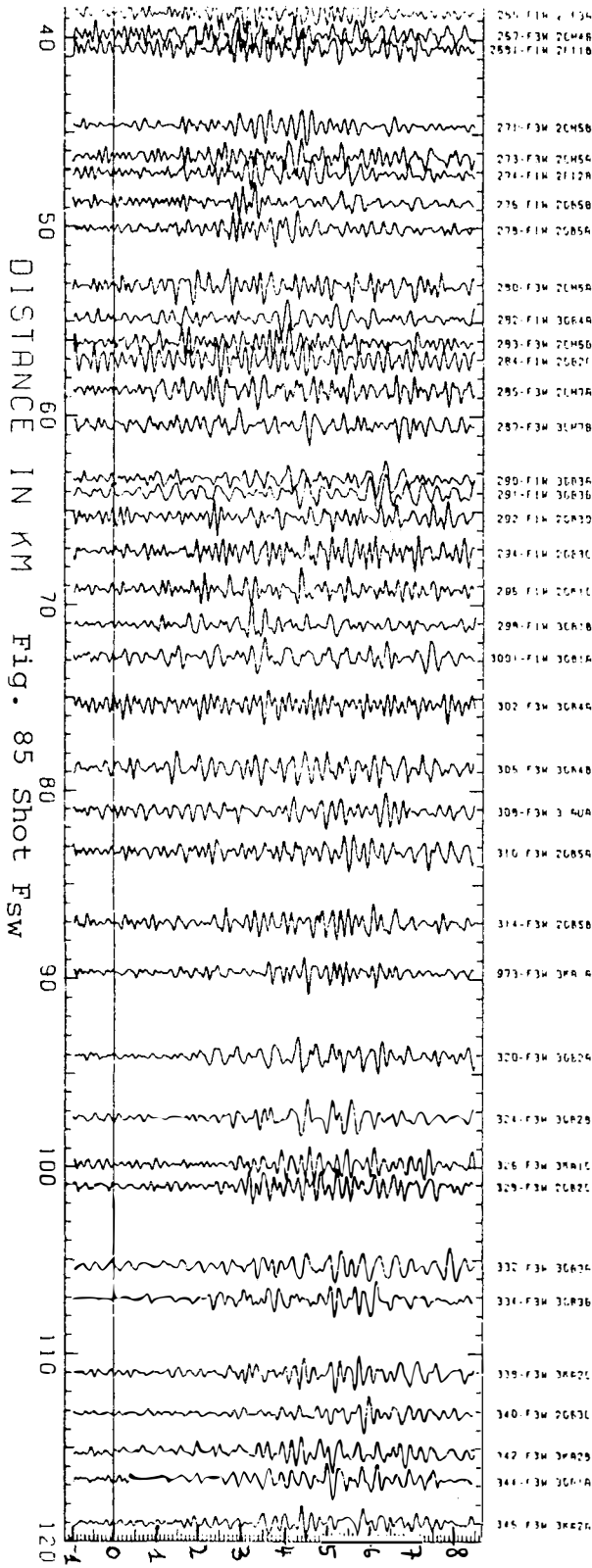
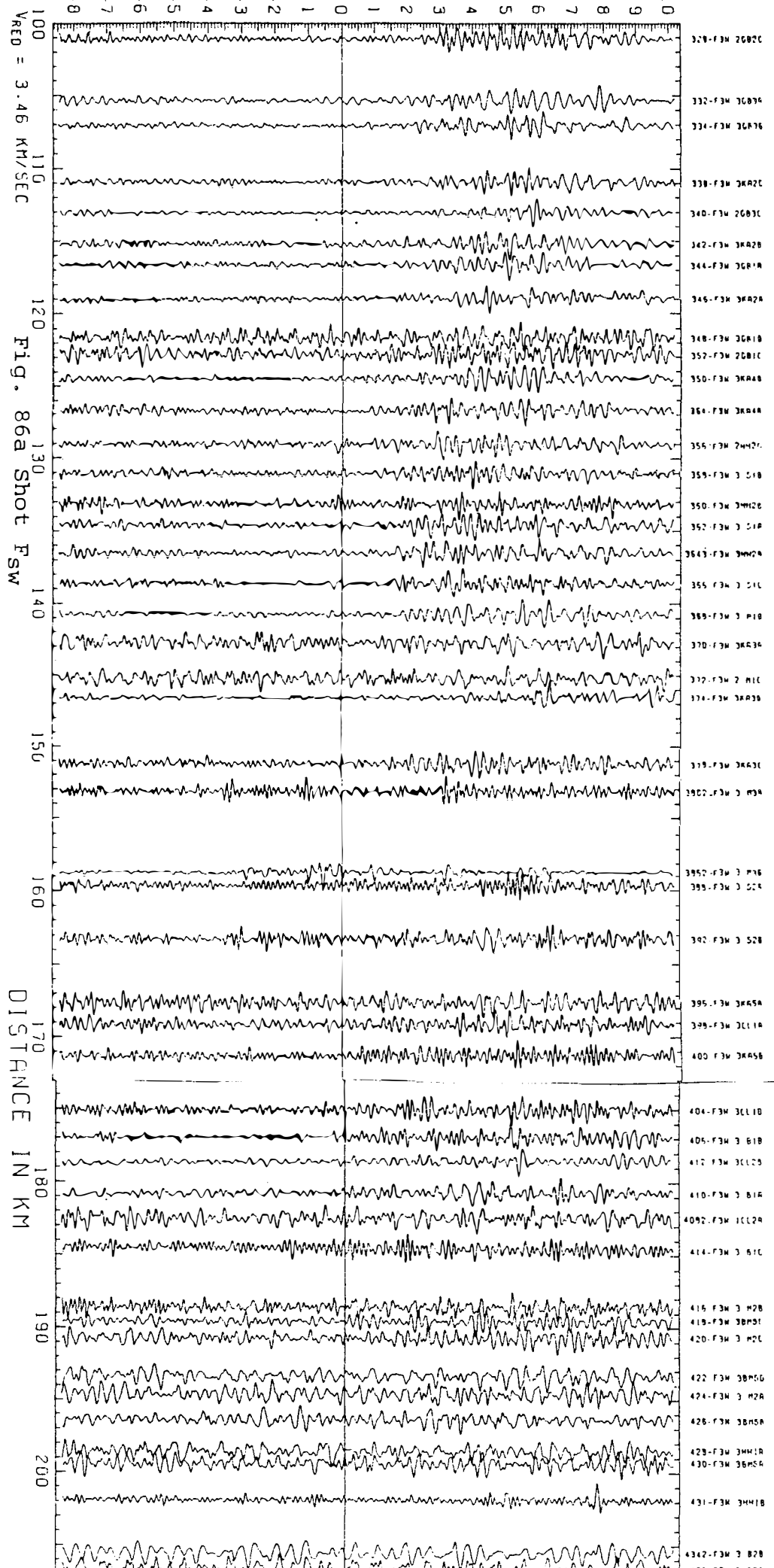


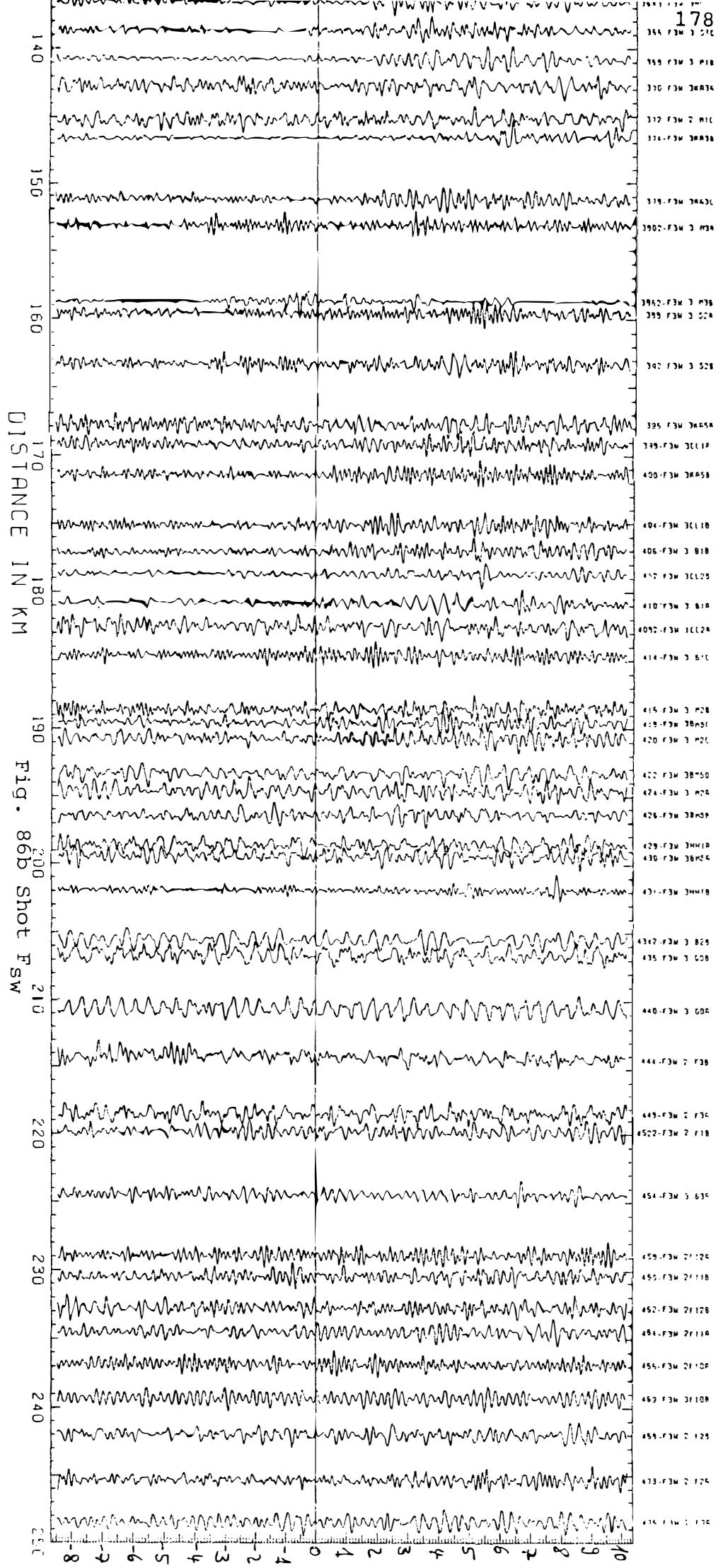
Fig. 84b Shot Dne

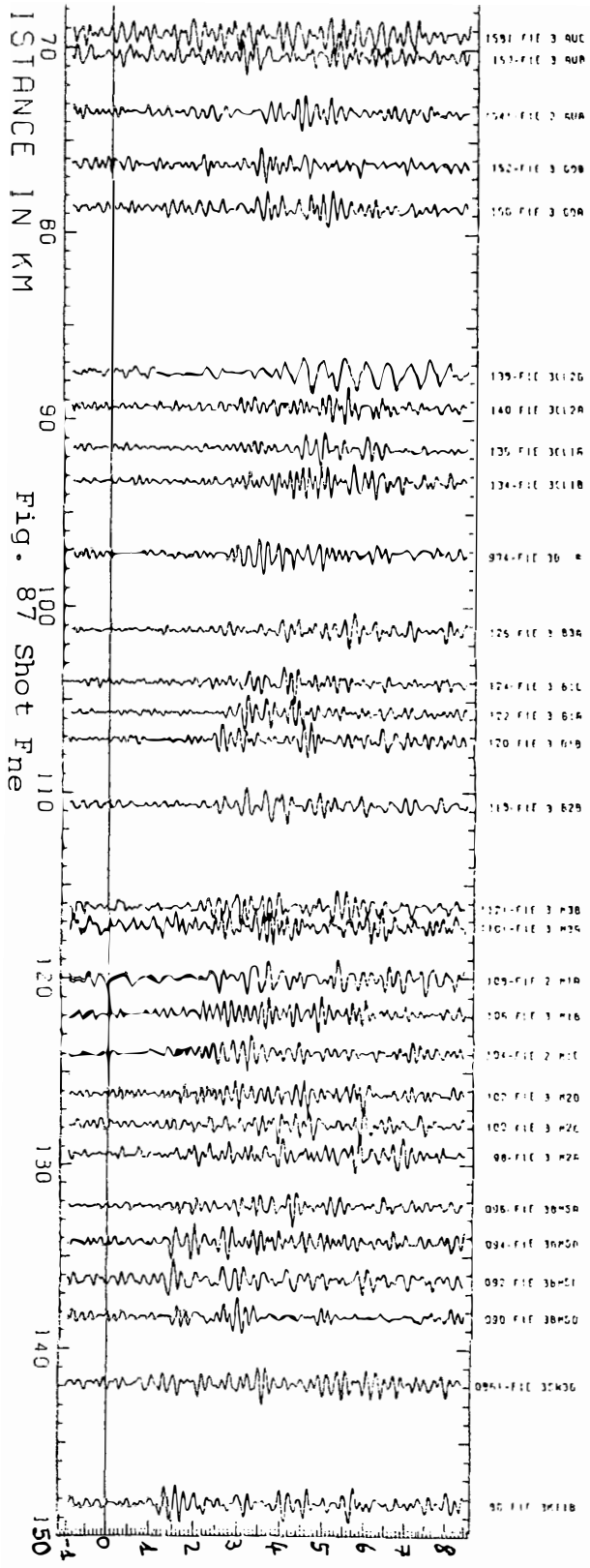
12.12.82 RADIAL 1.3 HZ TO 8.0 HZ (80,40)



REDUCED TIME IN SEC







REDUCED TIME IN SEC

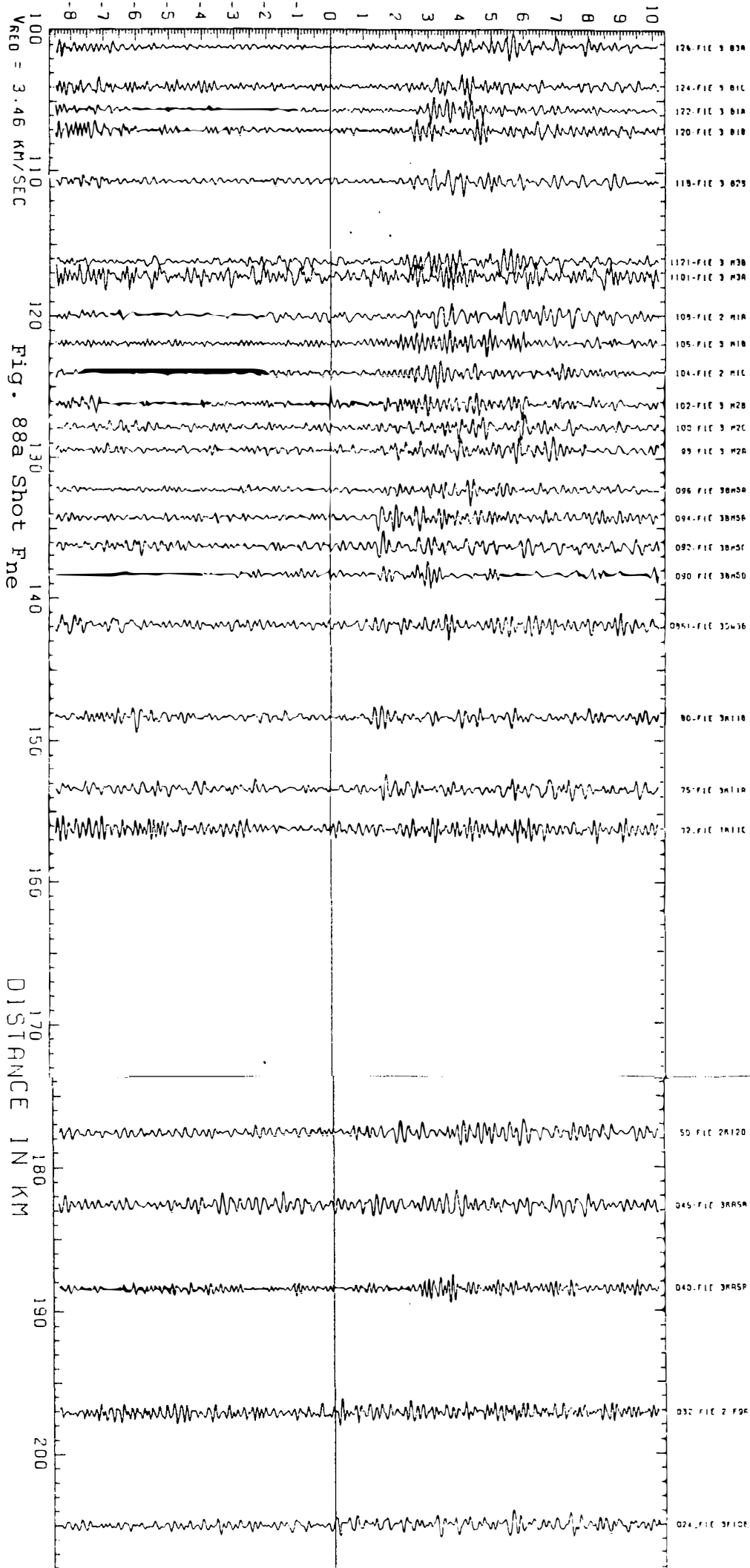


Fig. 88a Shot Fne

VRED = 3.46 KM/SEC

DISTANCE IN KM

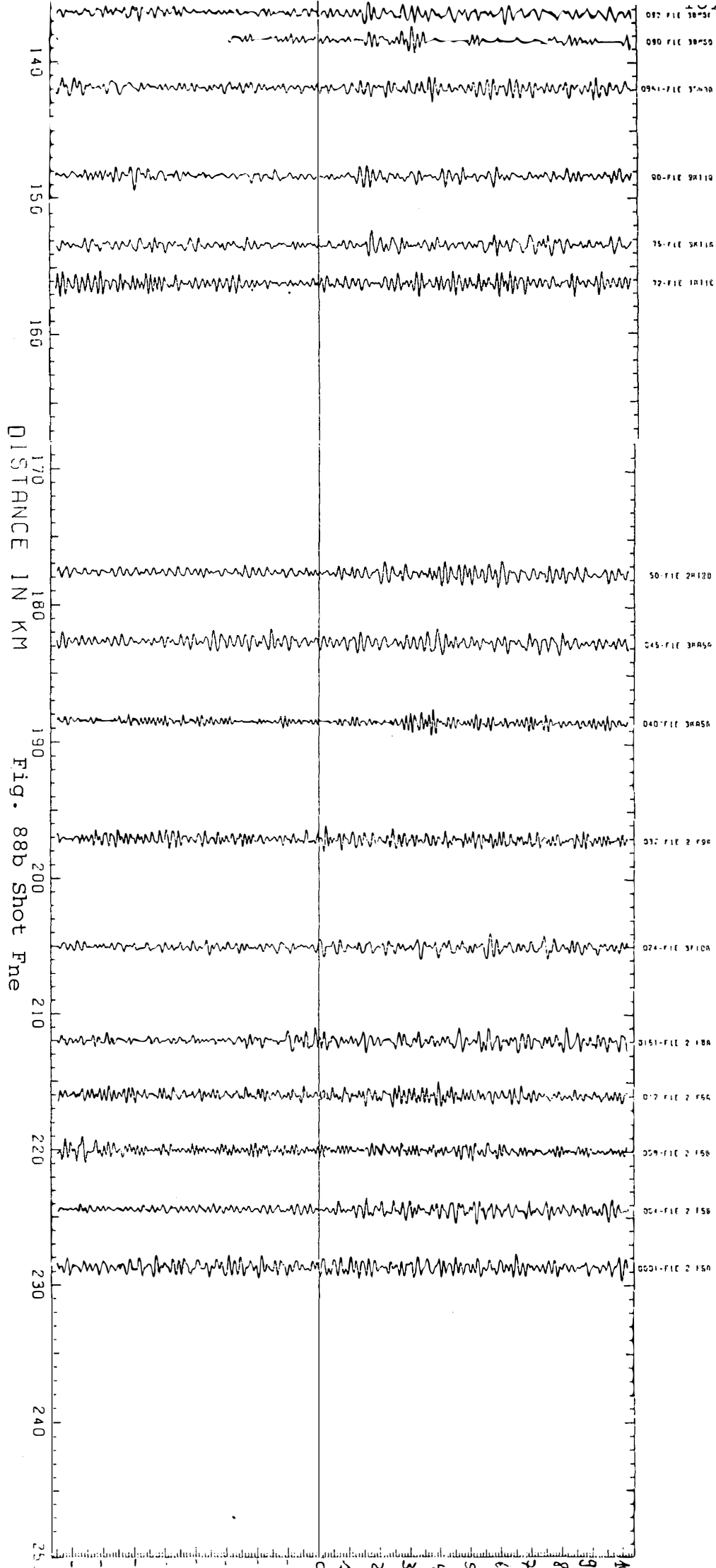
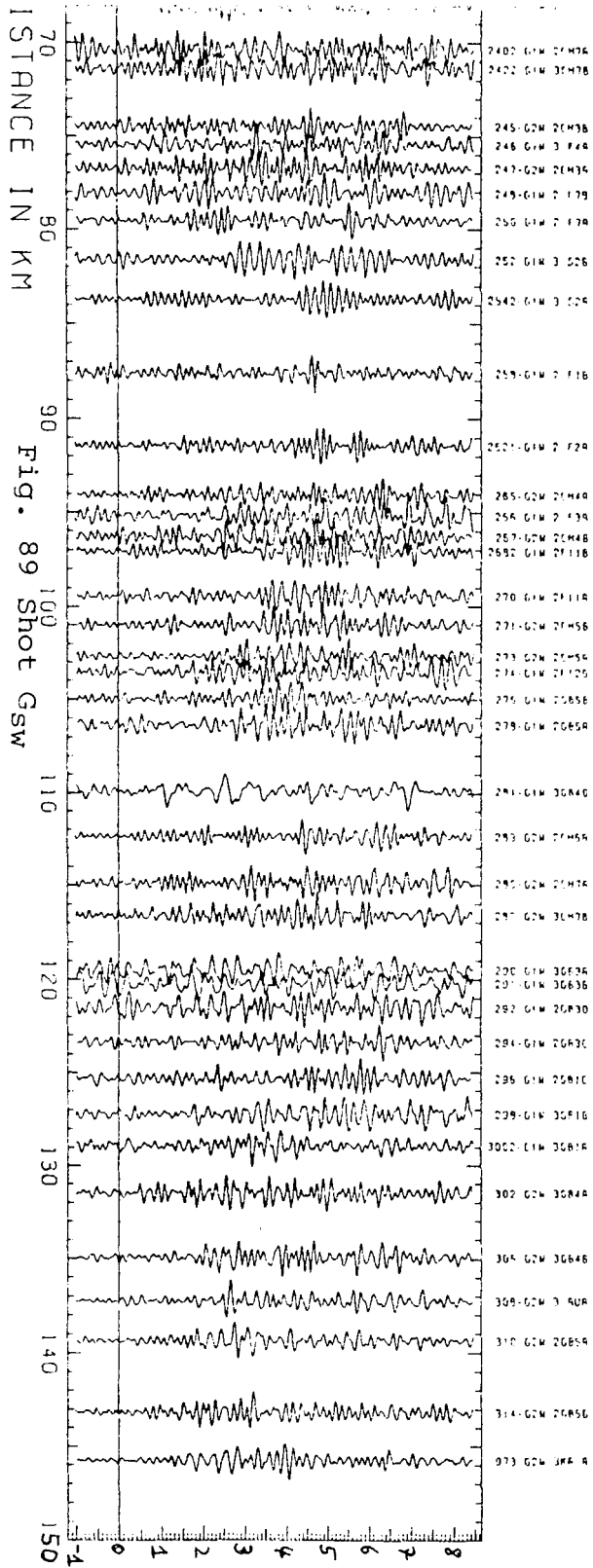
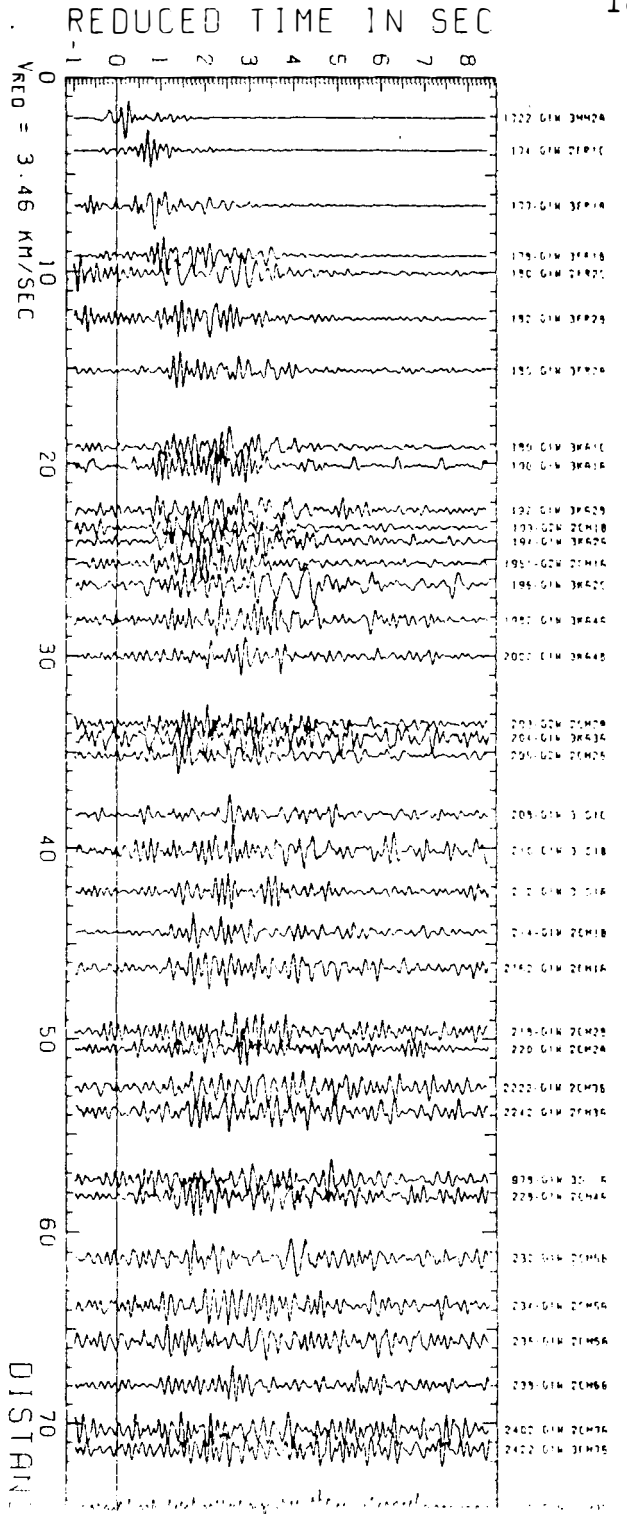


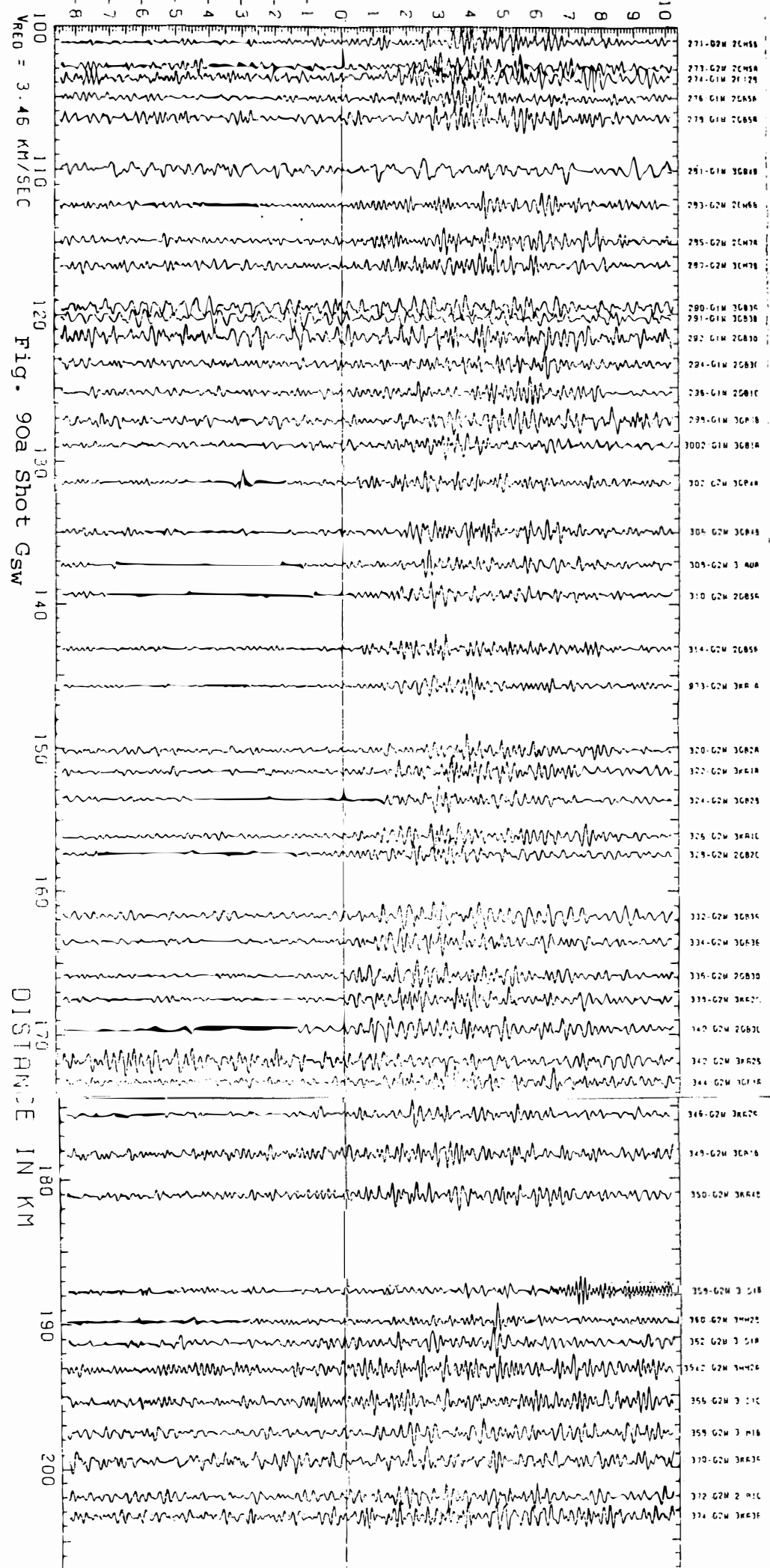
Fig. 88b Shot Fne

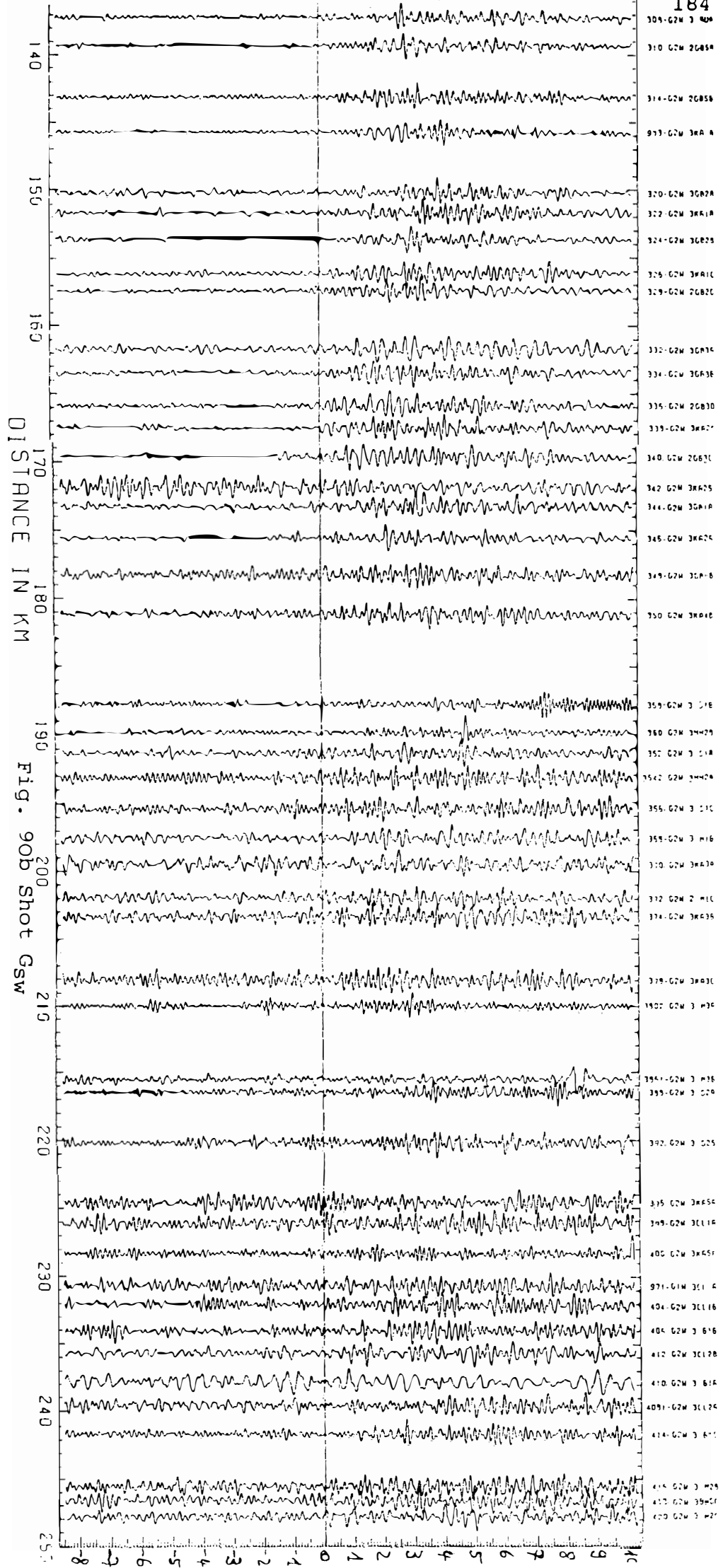


10.01.83 R401A1 1.3 HZ TO 8.0 HZ (80.40)



REDUCED TIME IN SEC





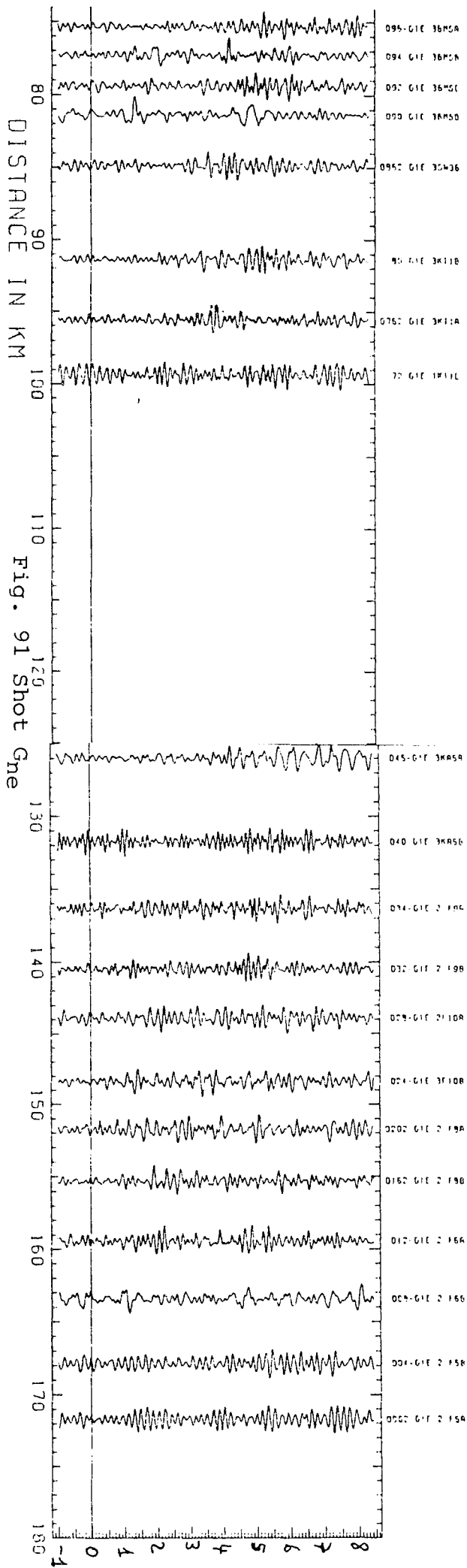
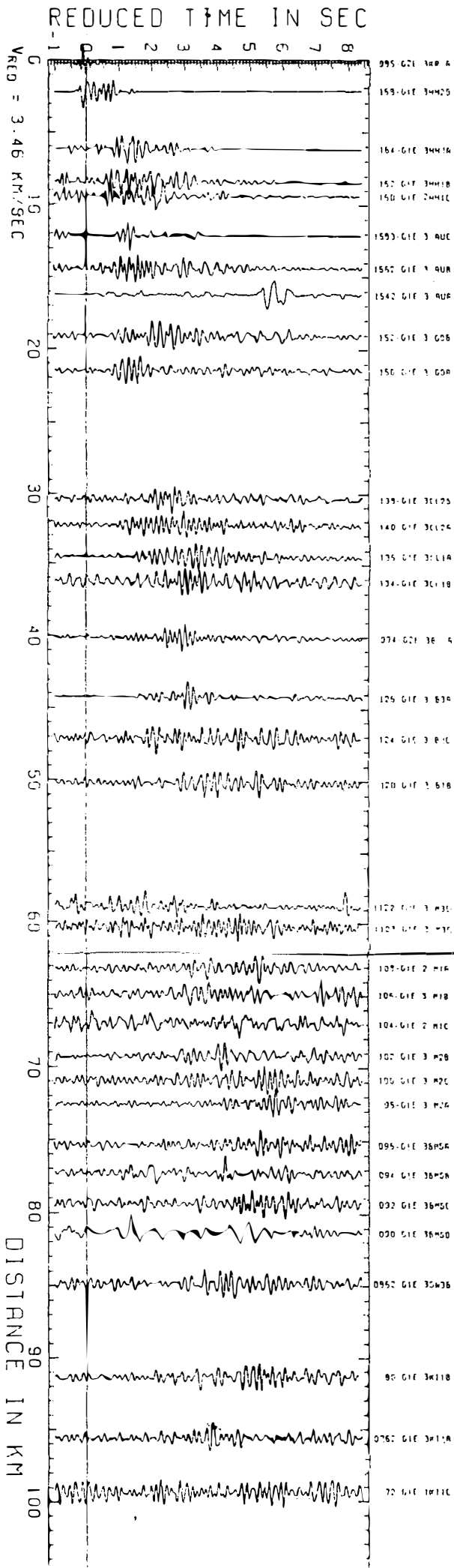
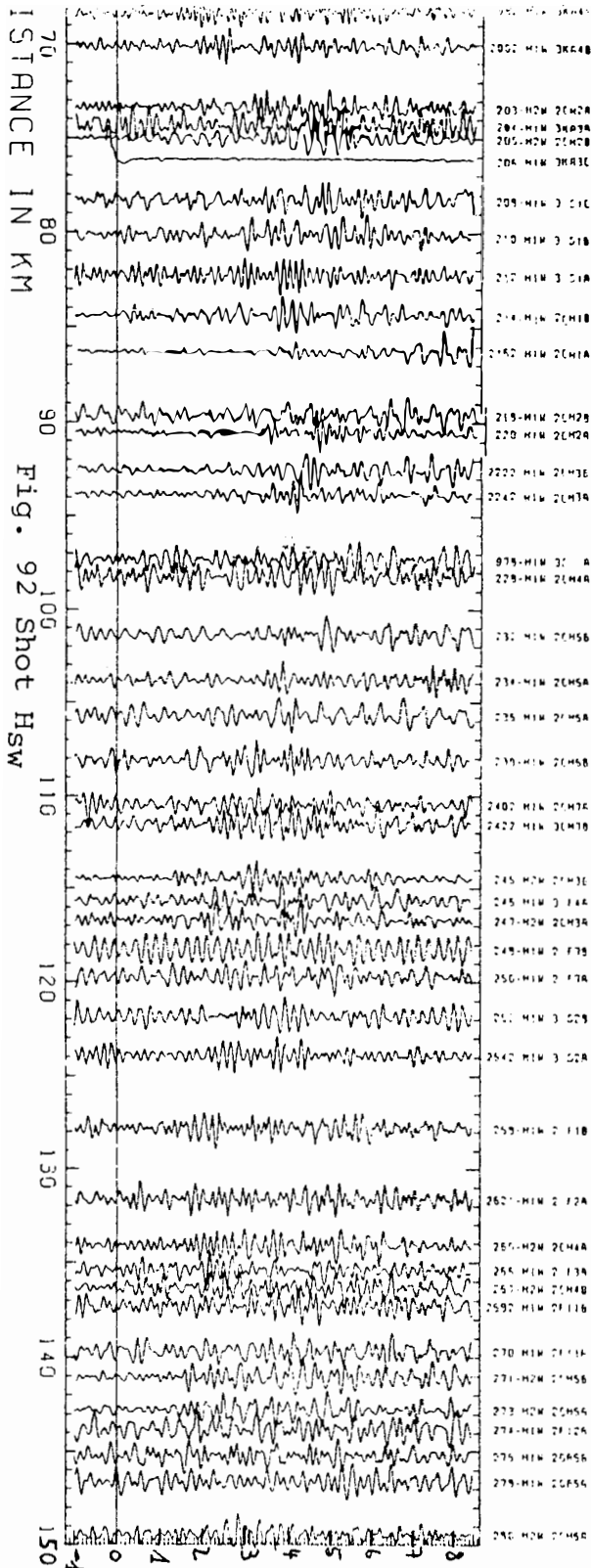


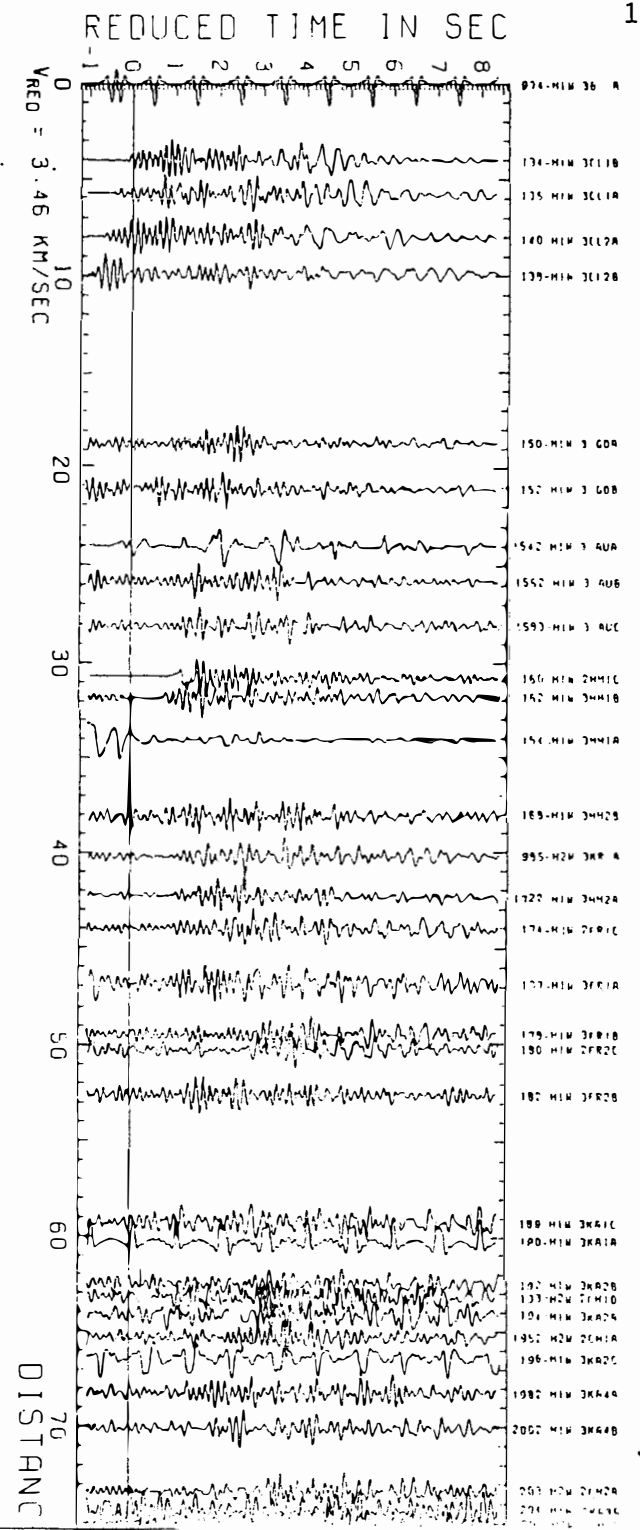
Fig. 91 Shot Gne



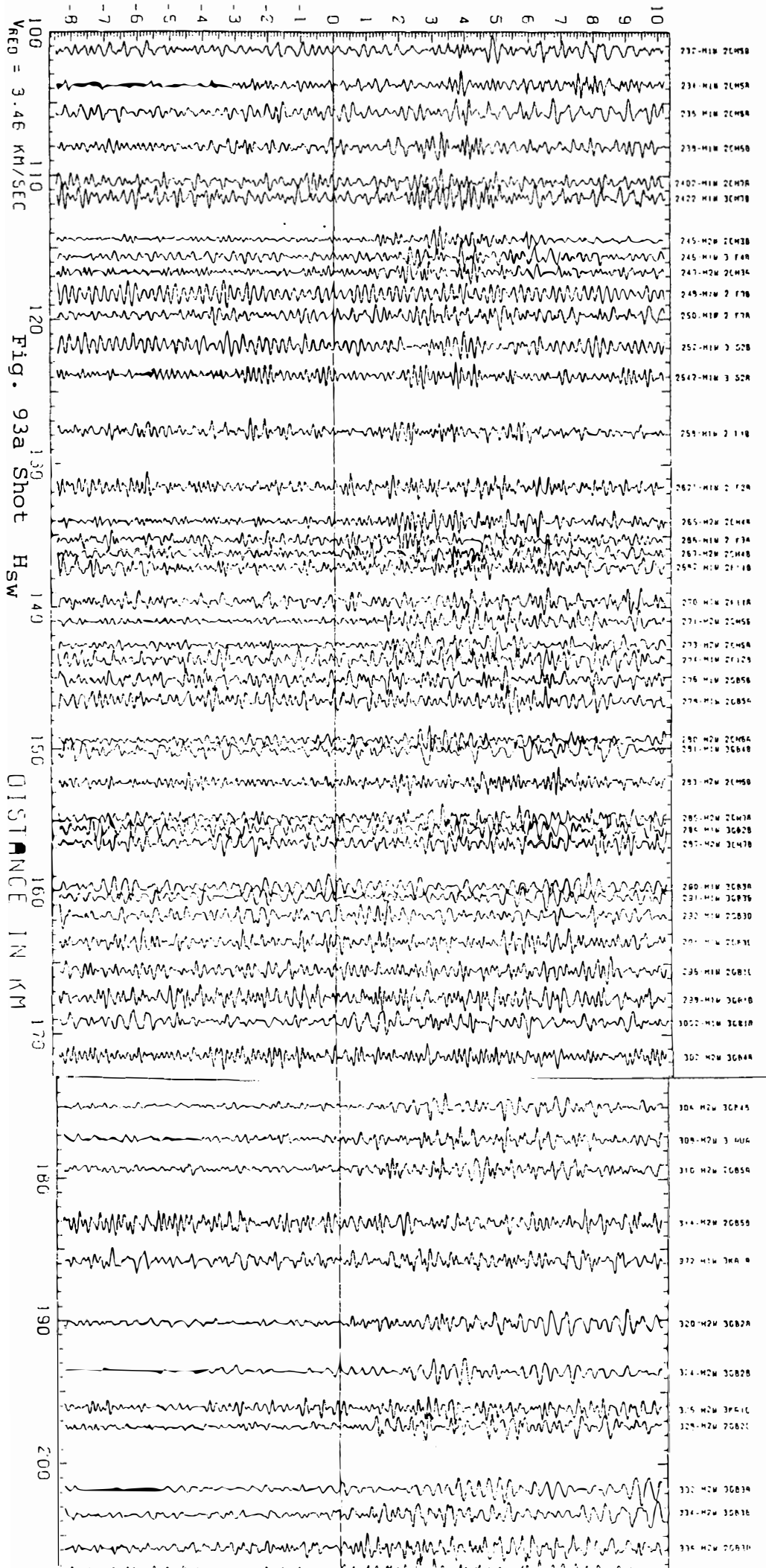
DISTANCE IN KM



11.01.93 RADIAL 1.3 HZ TO 8.0 HZ (80.40)



REDUCED TIME IN SEC



100
110
120
130
140
150
160
170
180
190
200

Fig. 93a Shot Hsw

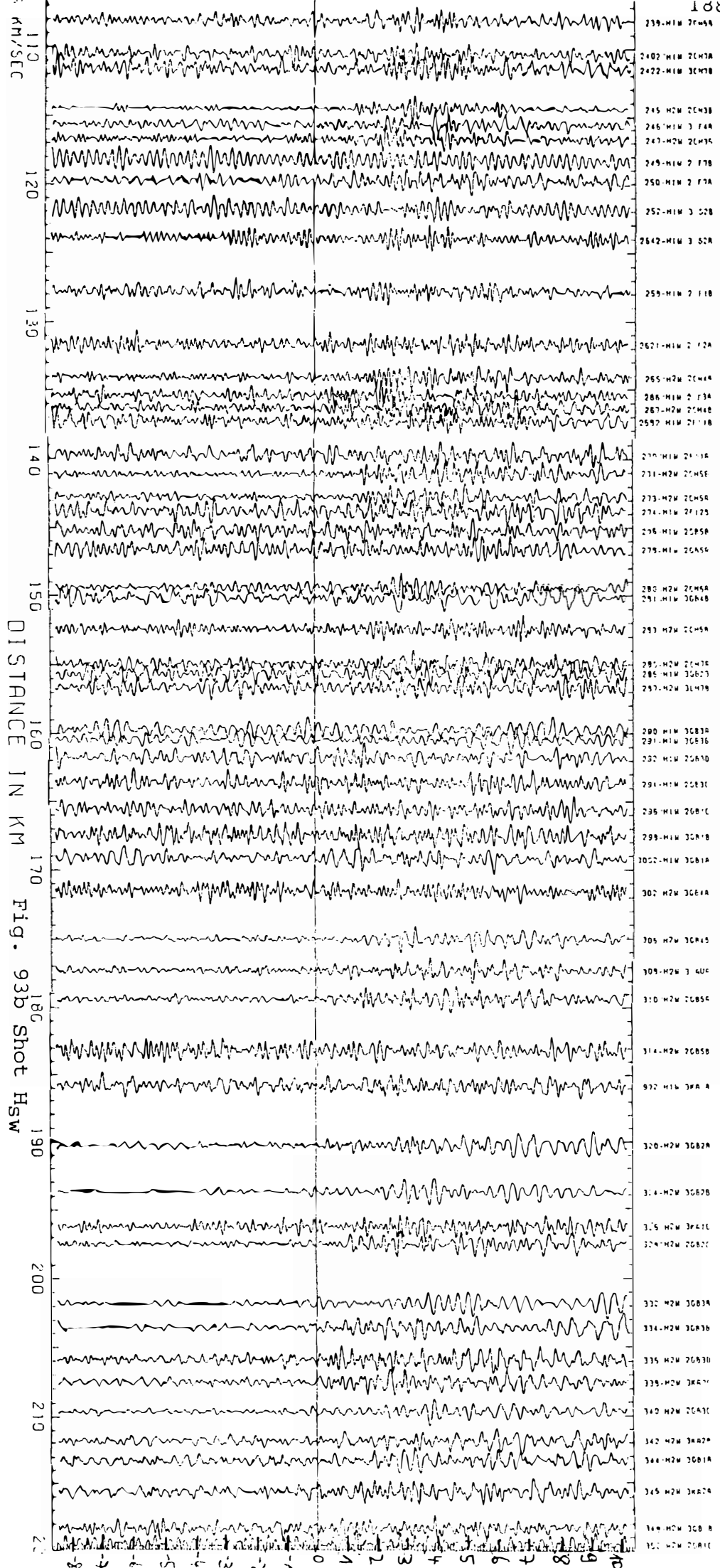
DISTANCE IN KM

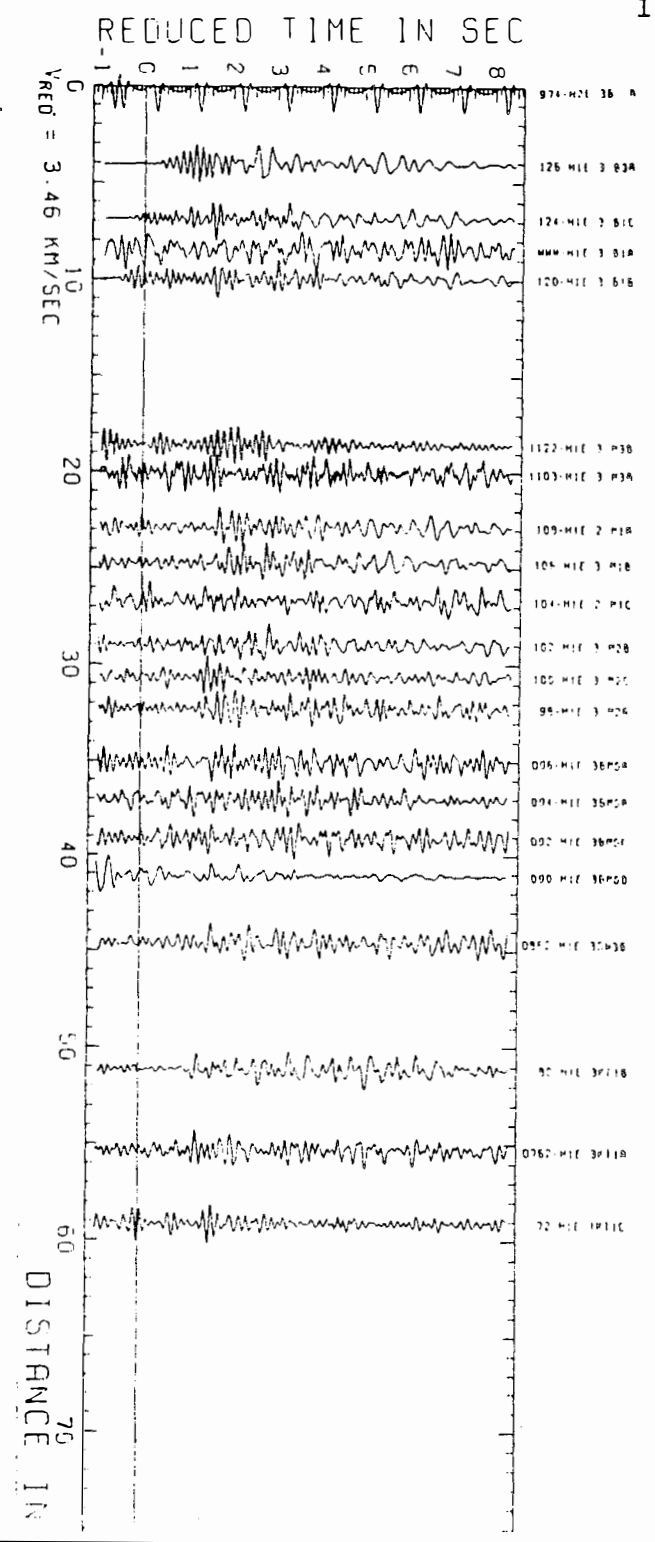
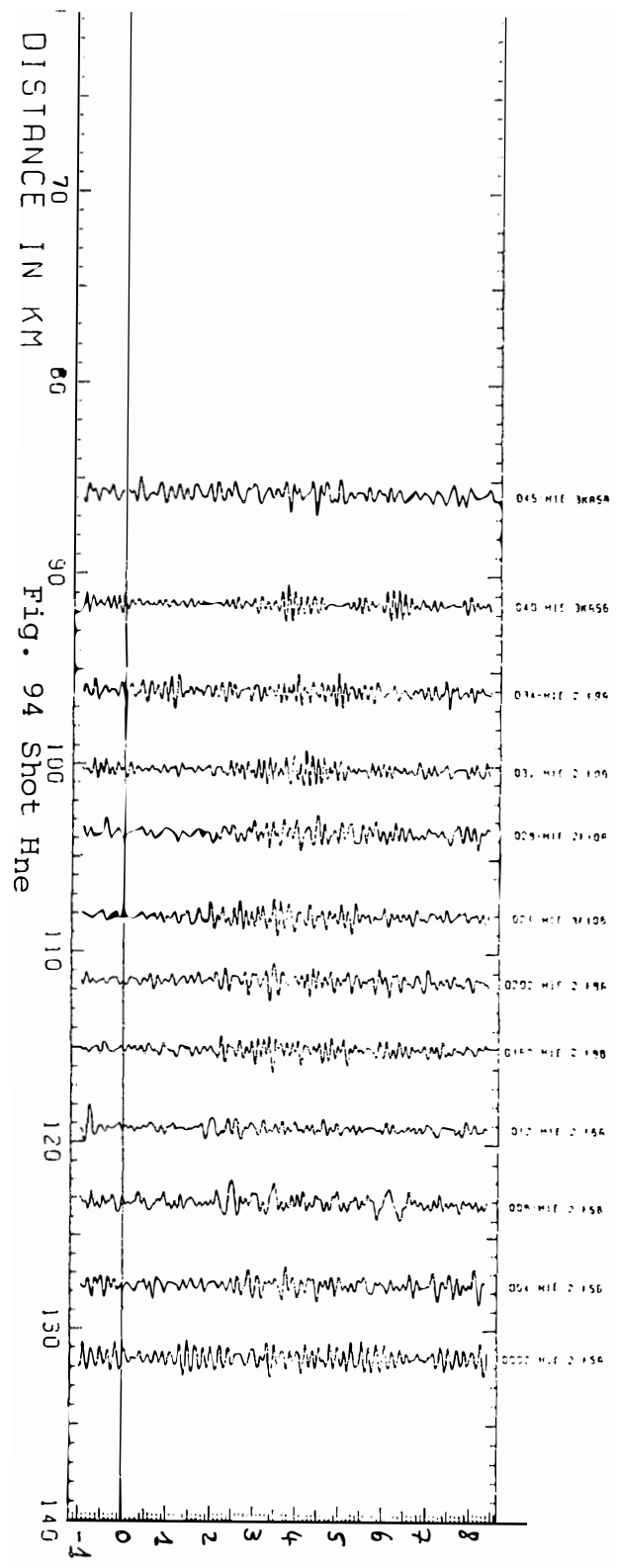
180

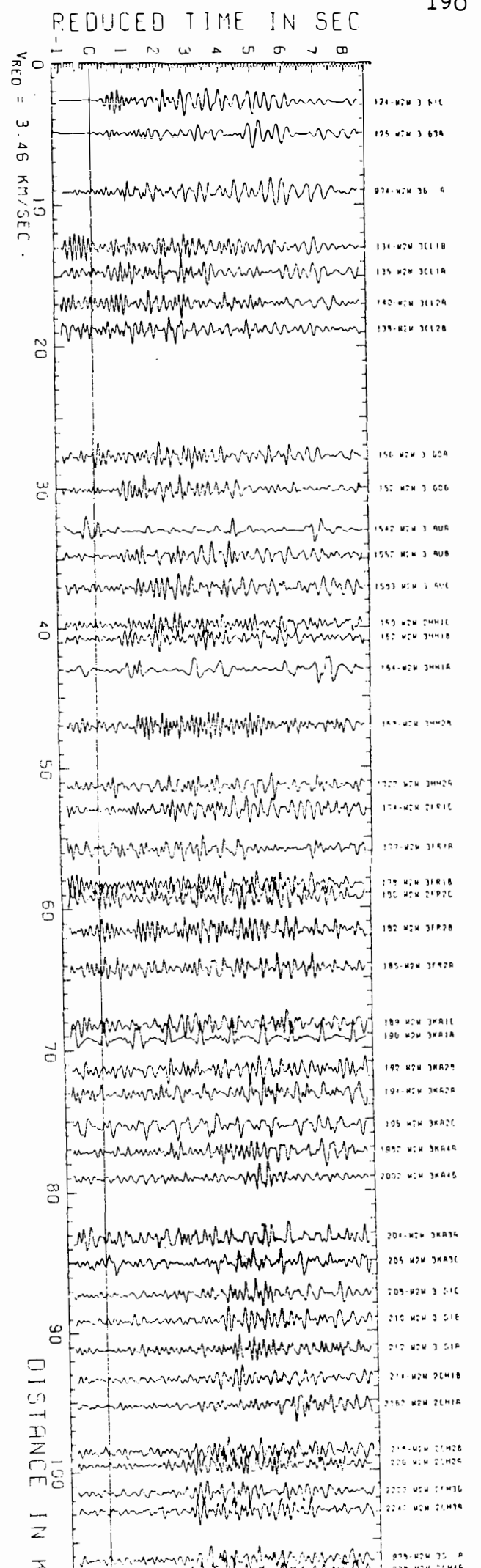
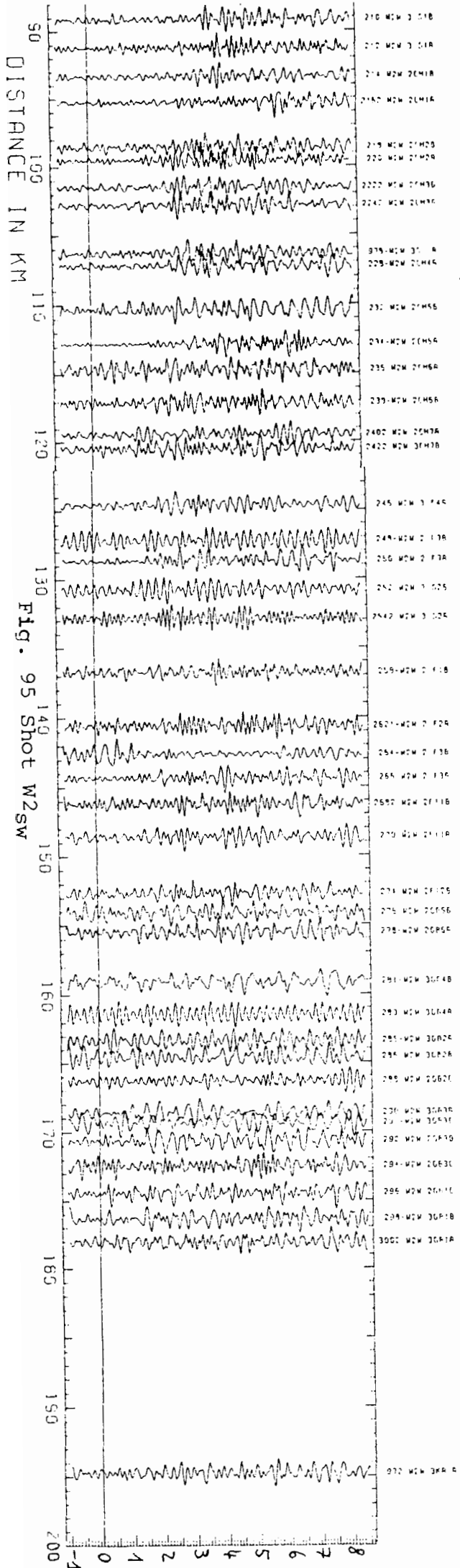
190

200

10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10

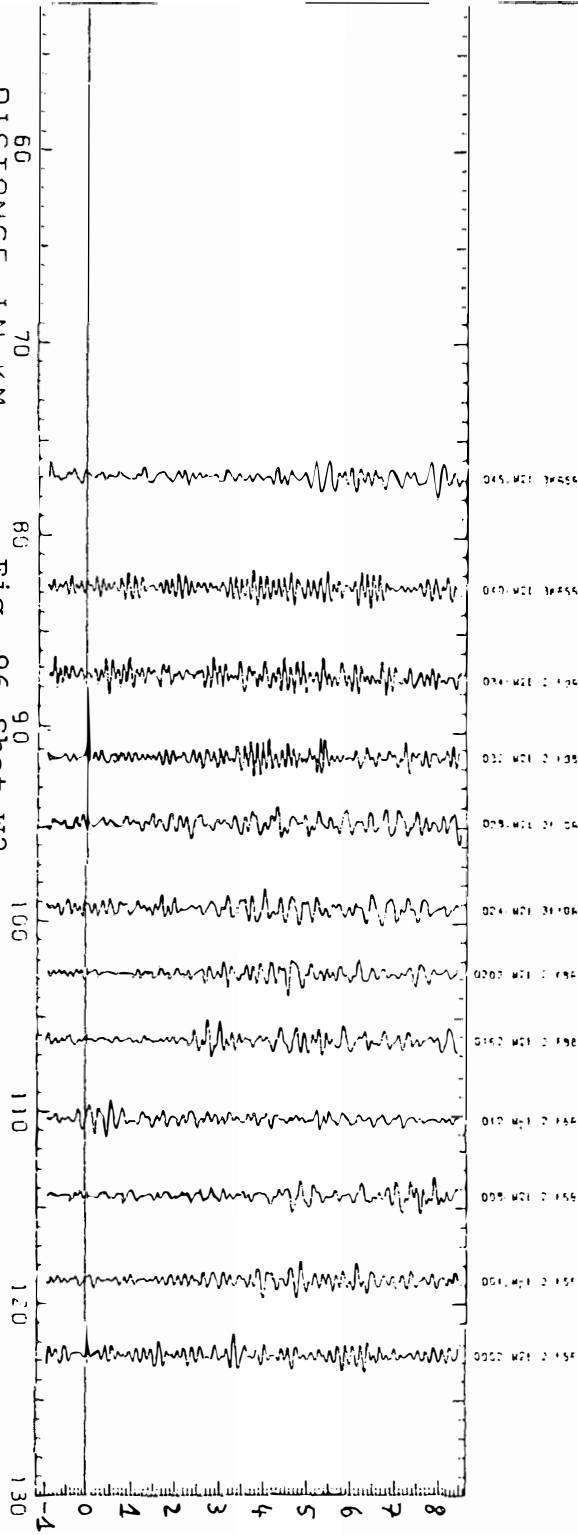






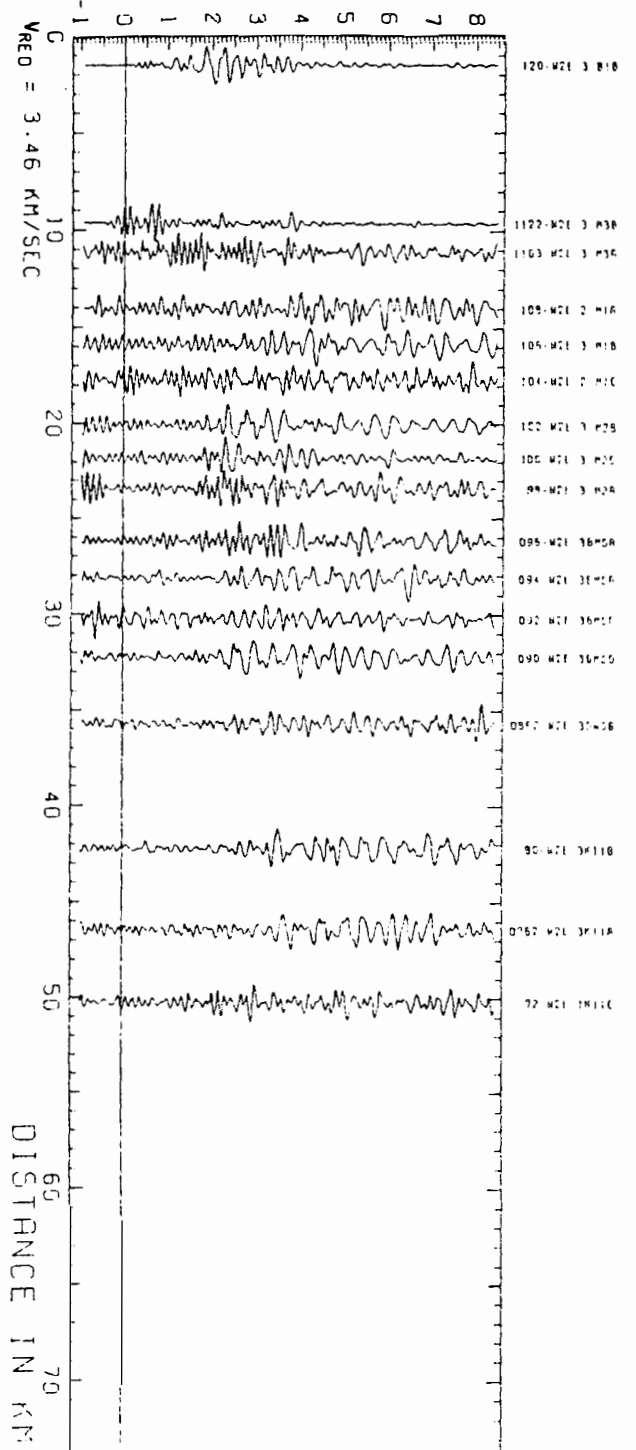
DISTANCE IN KM

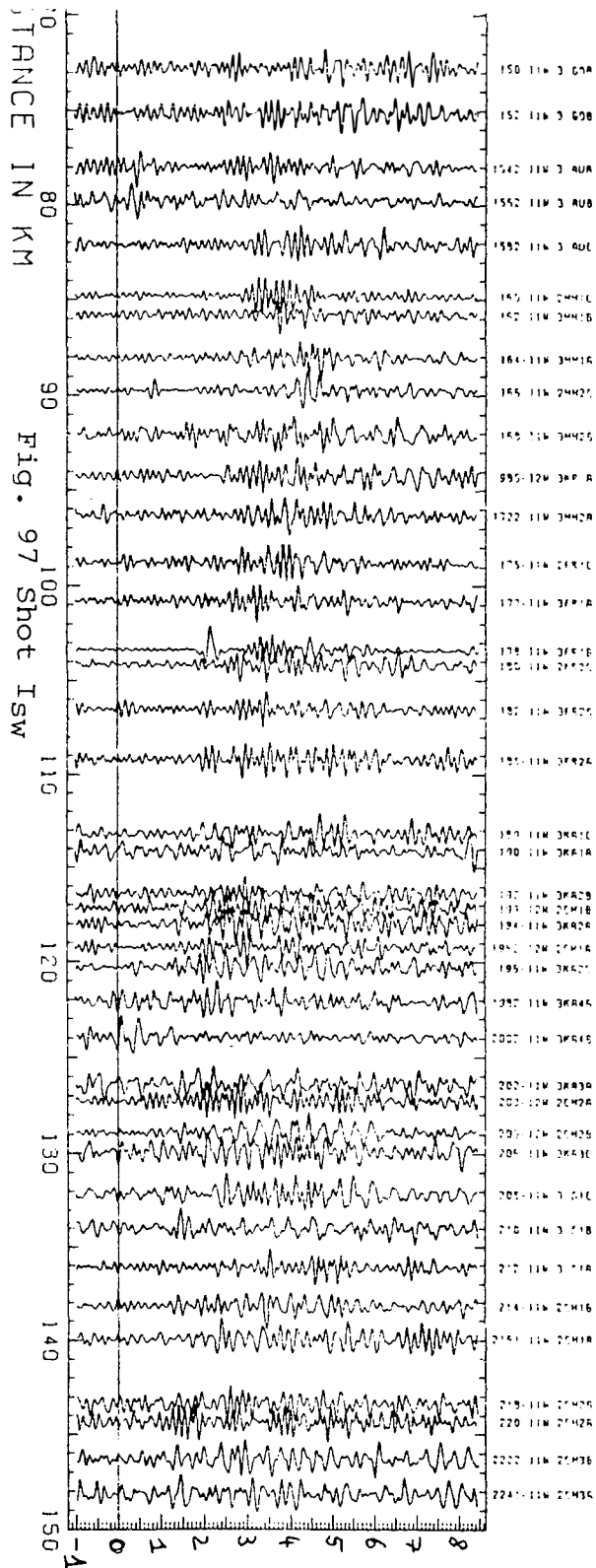
Fig. 96 Shot W2ne



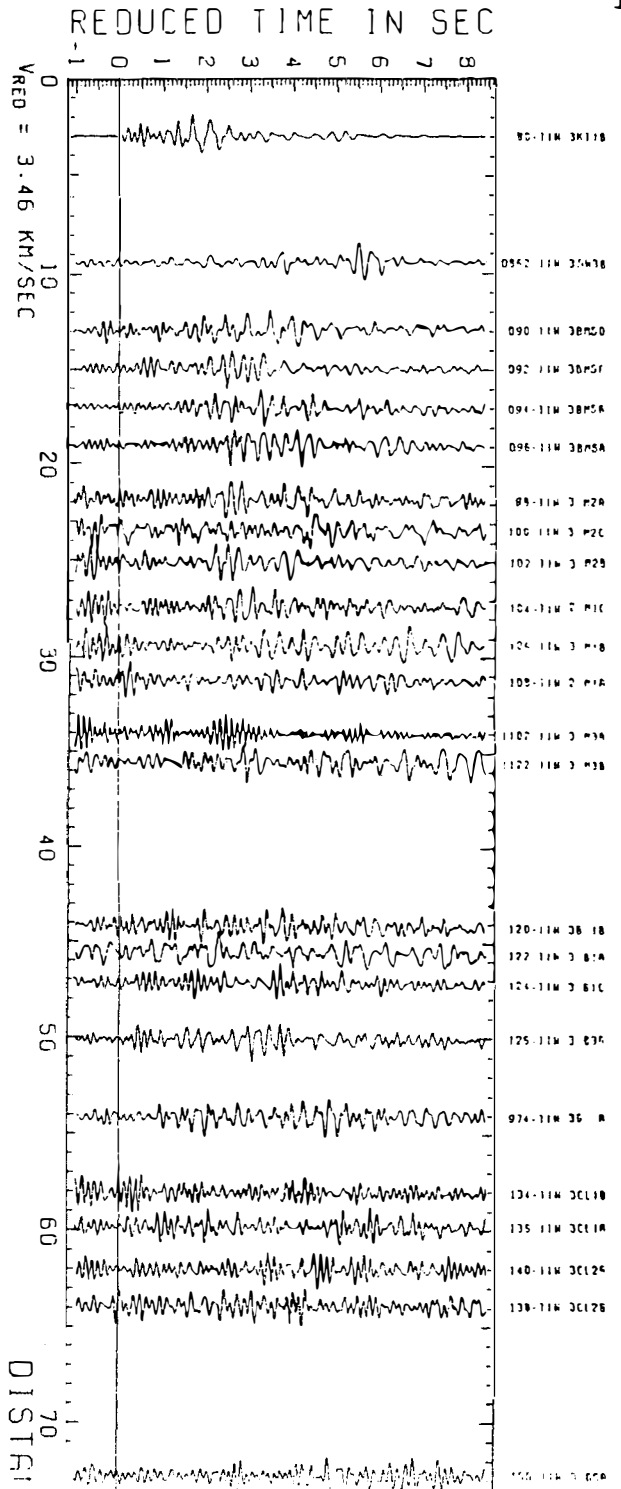
REDUCED TIME IN SEC

VRED = 3.46 KM/SEC

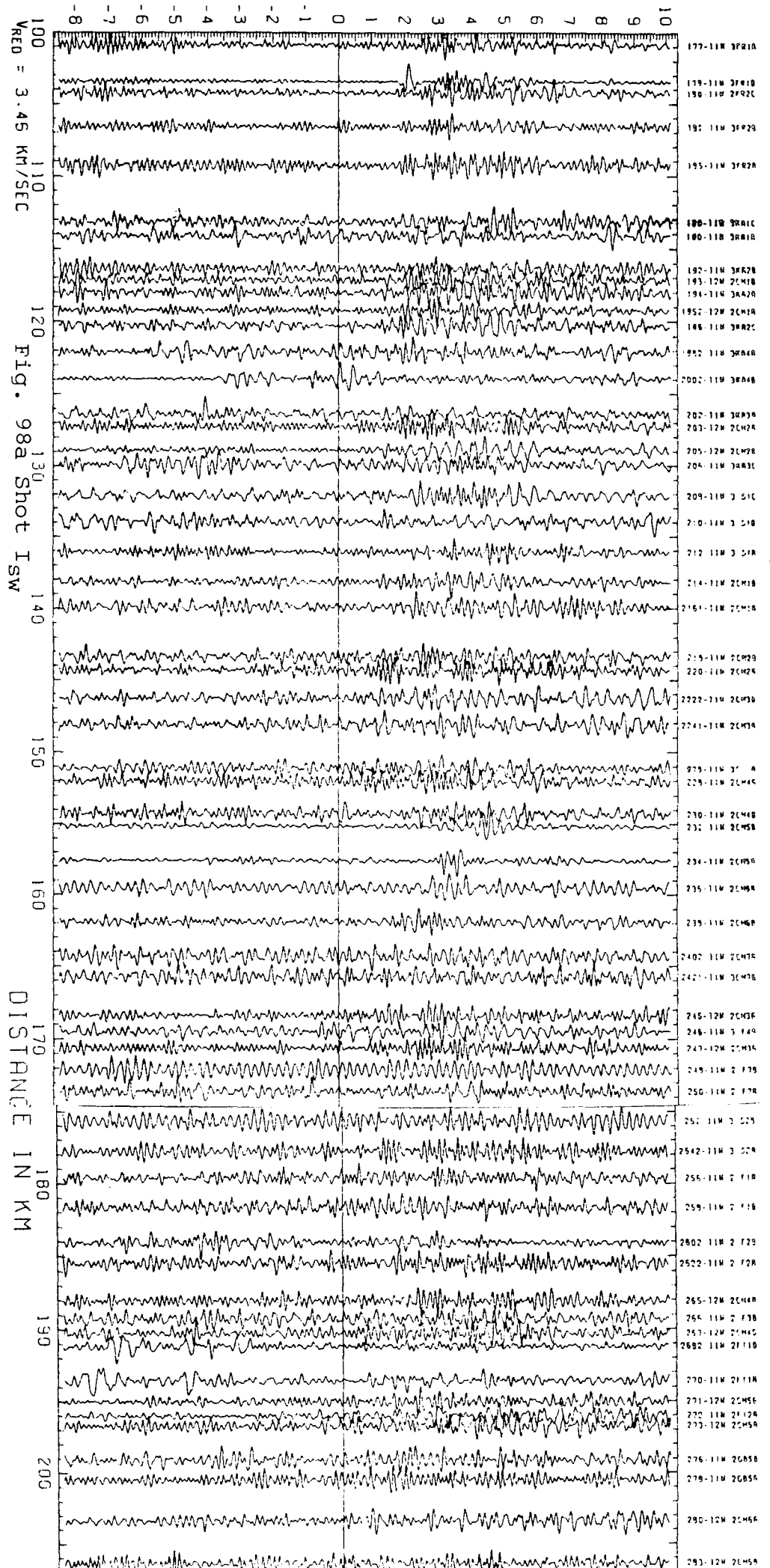


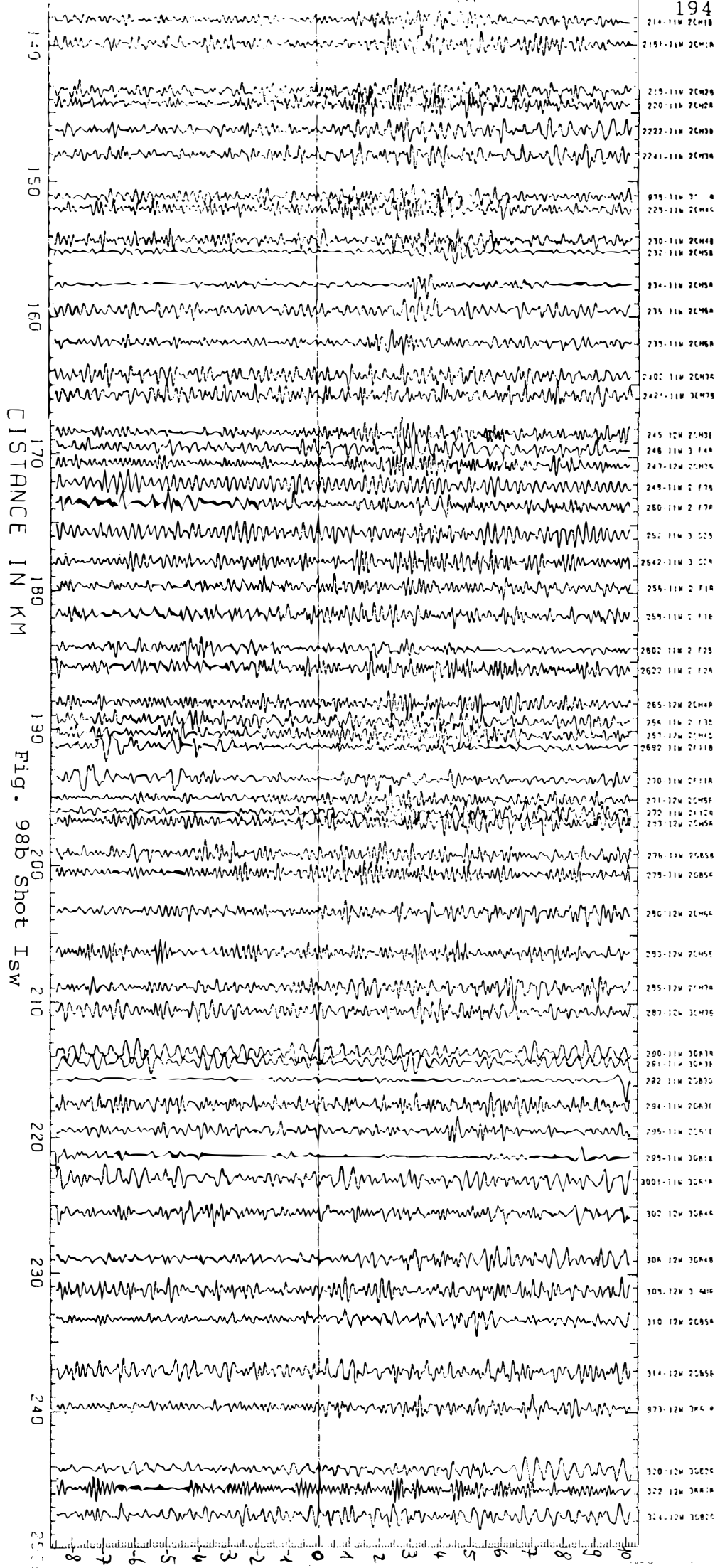


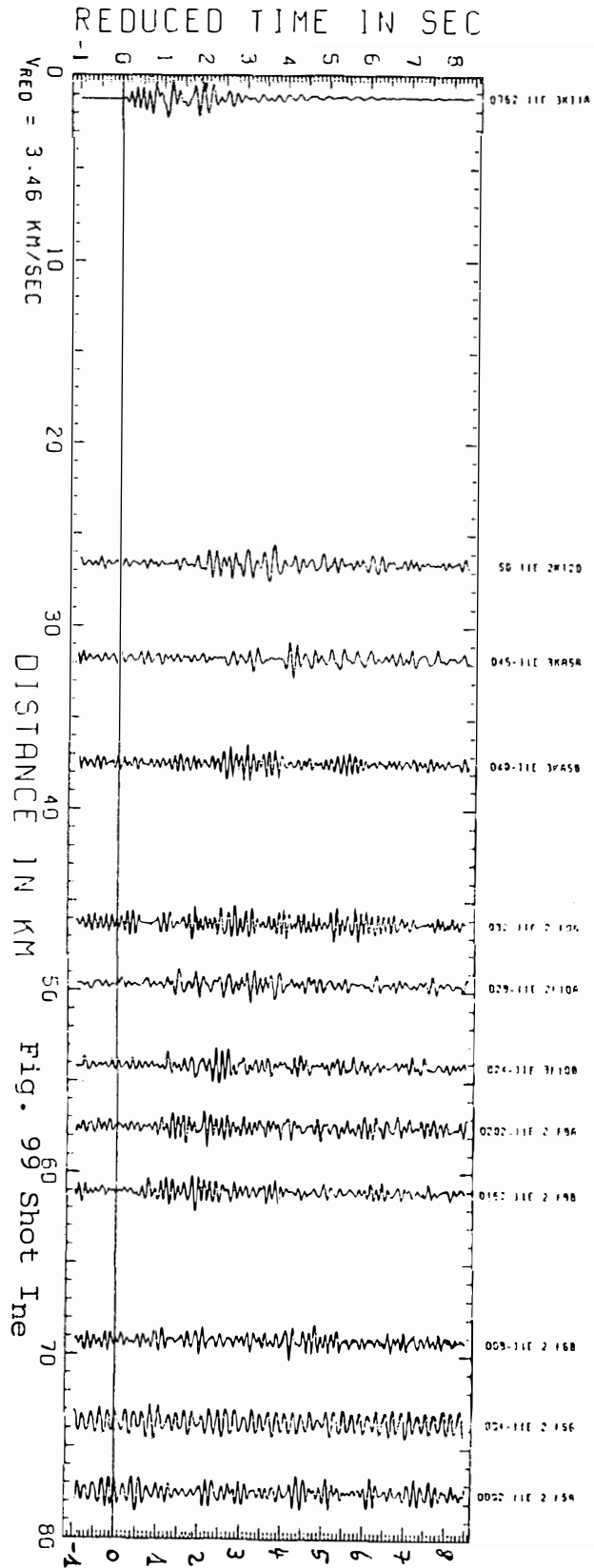
13.01.83 RADIAL 1.3 HZ TO 8.0 HZ 180.40

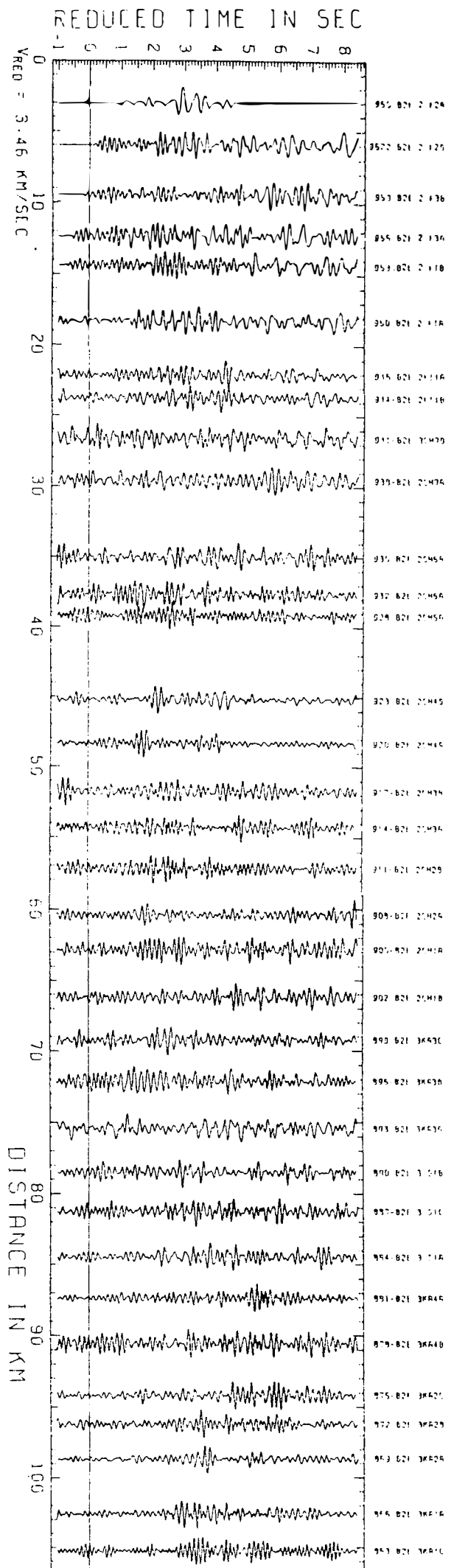
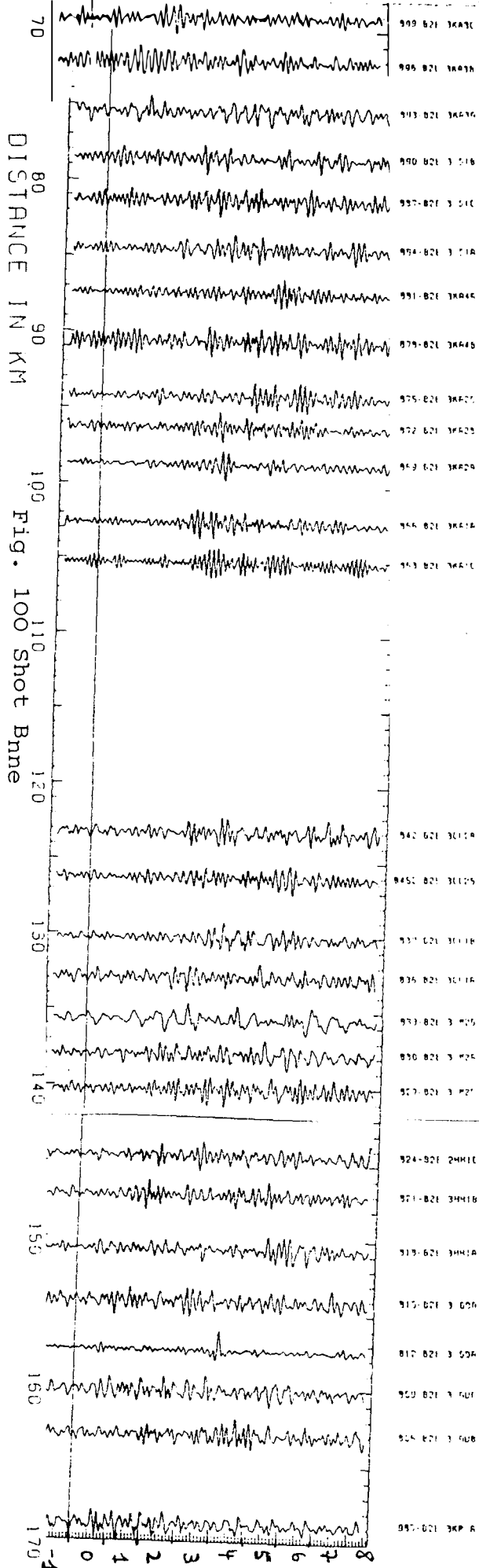


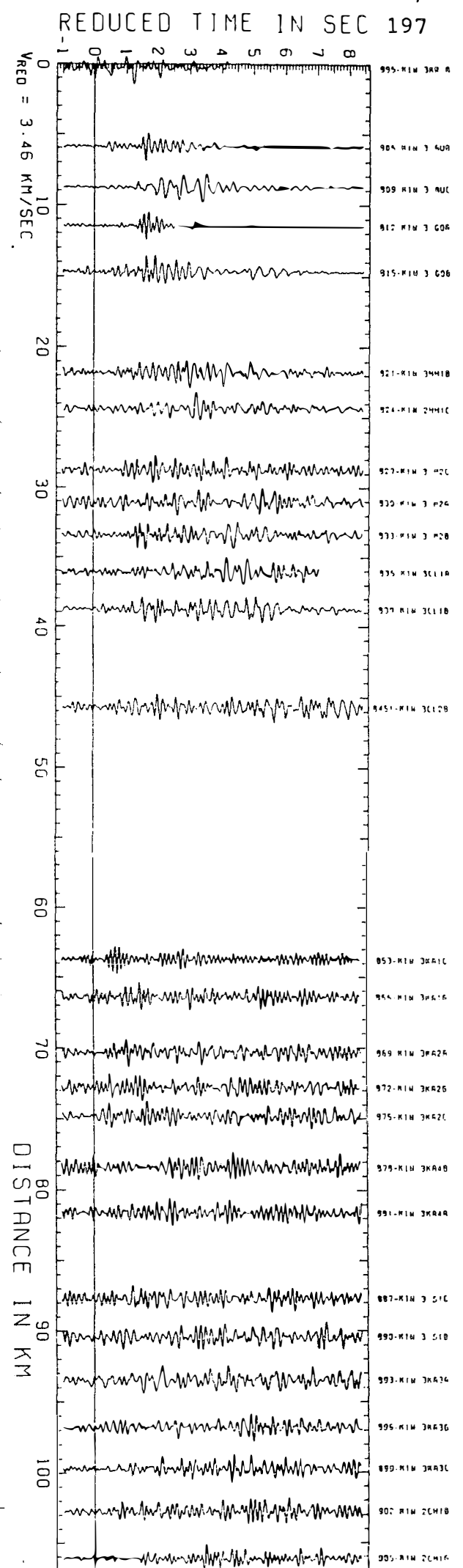
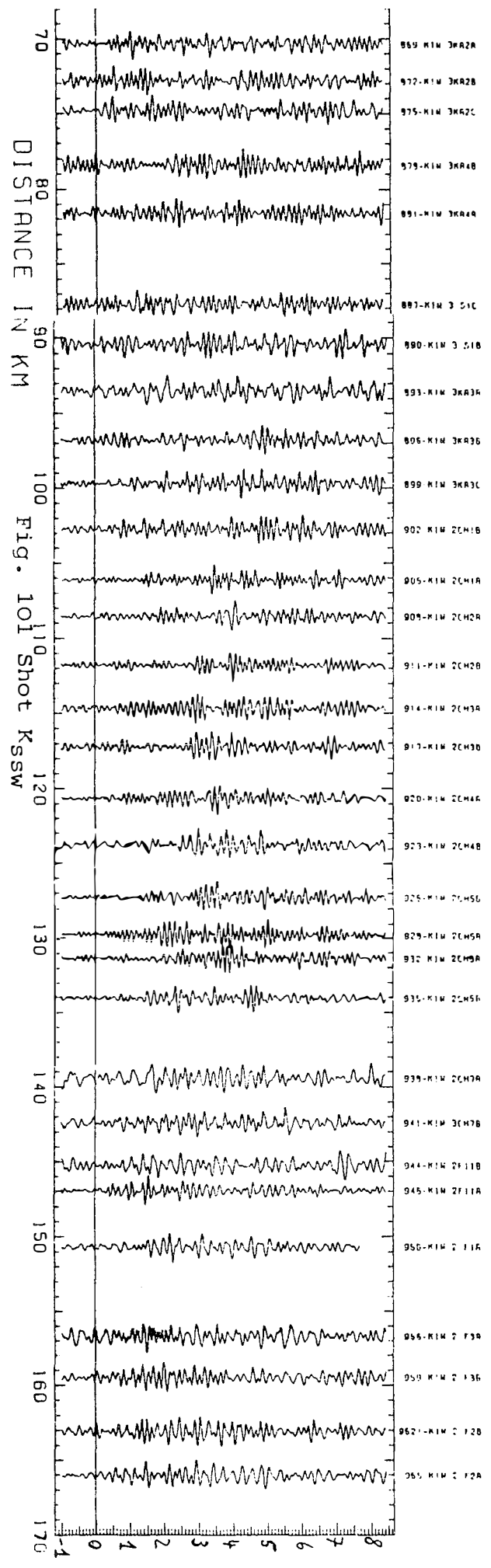
REDUCED TIME IN SEC

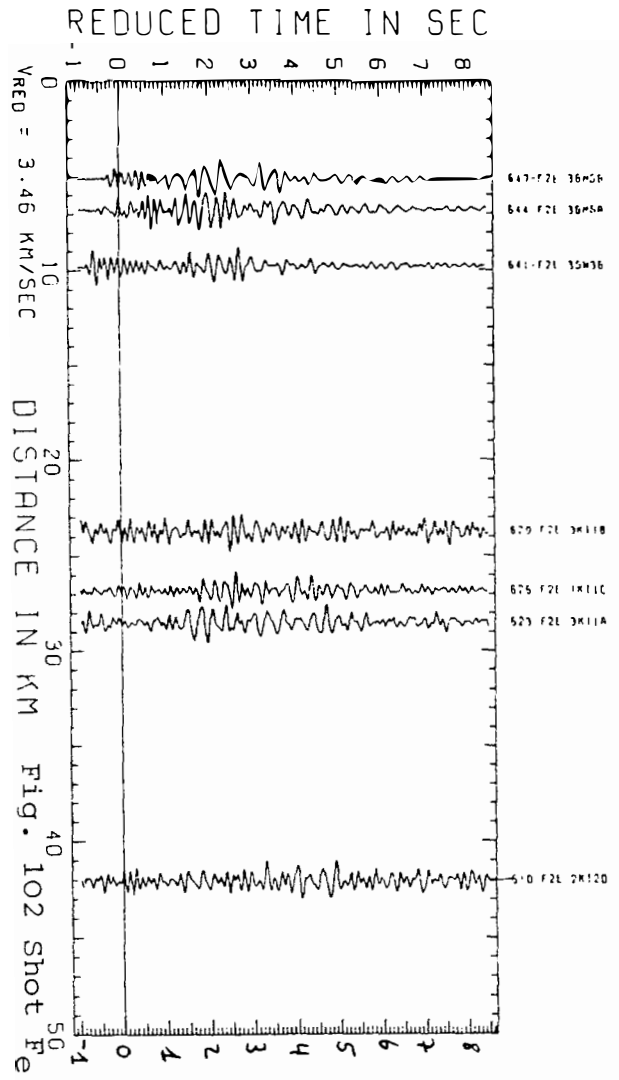


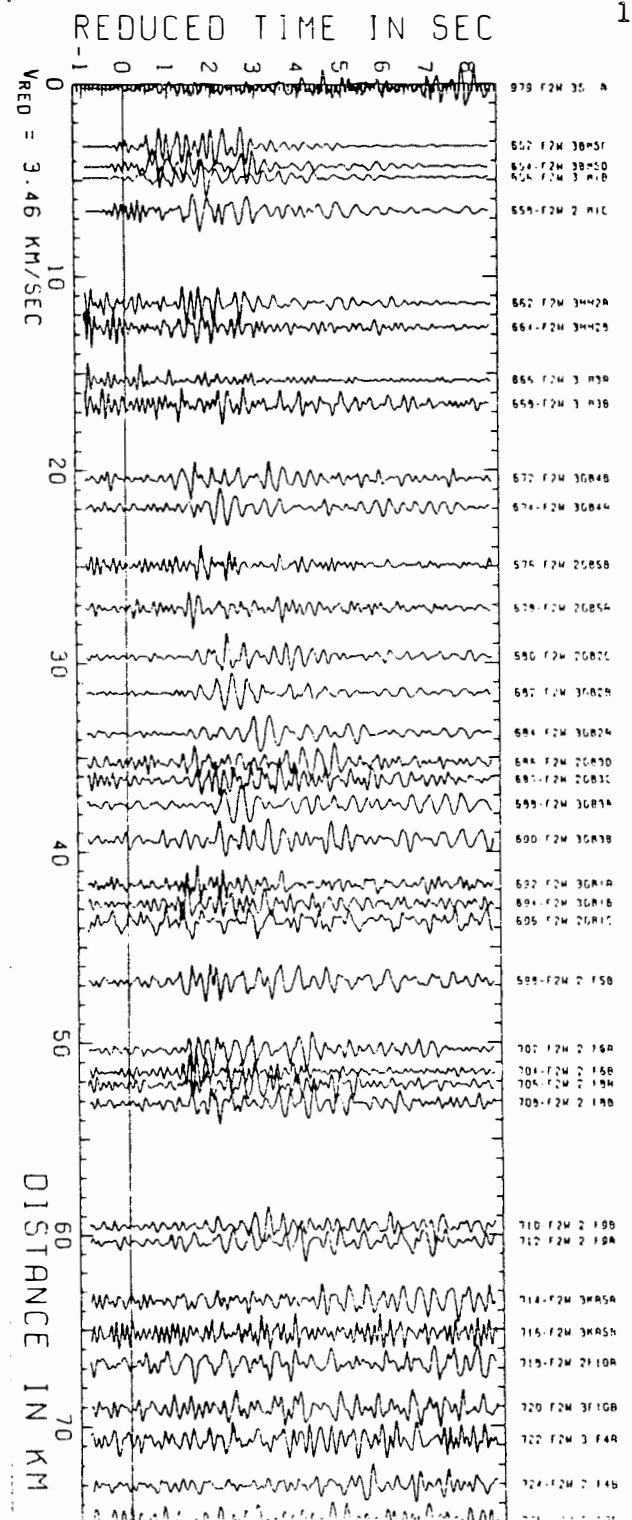
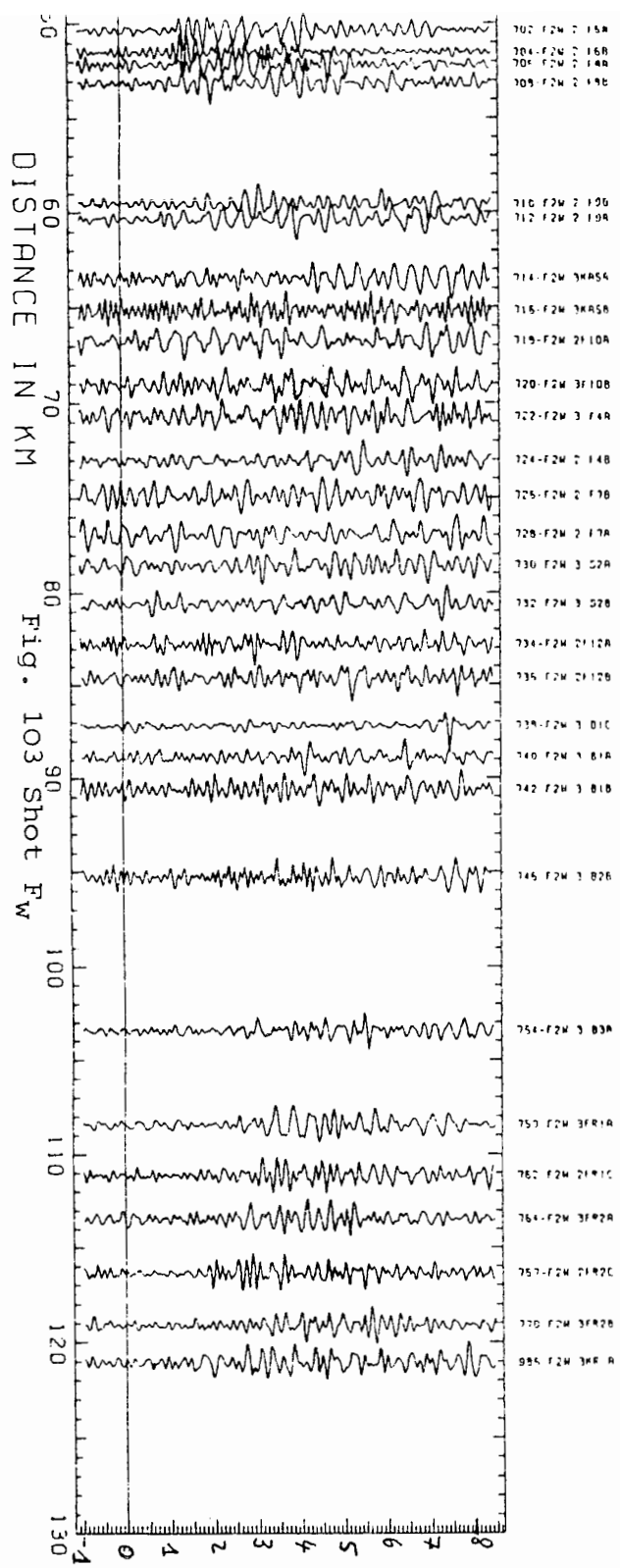












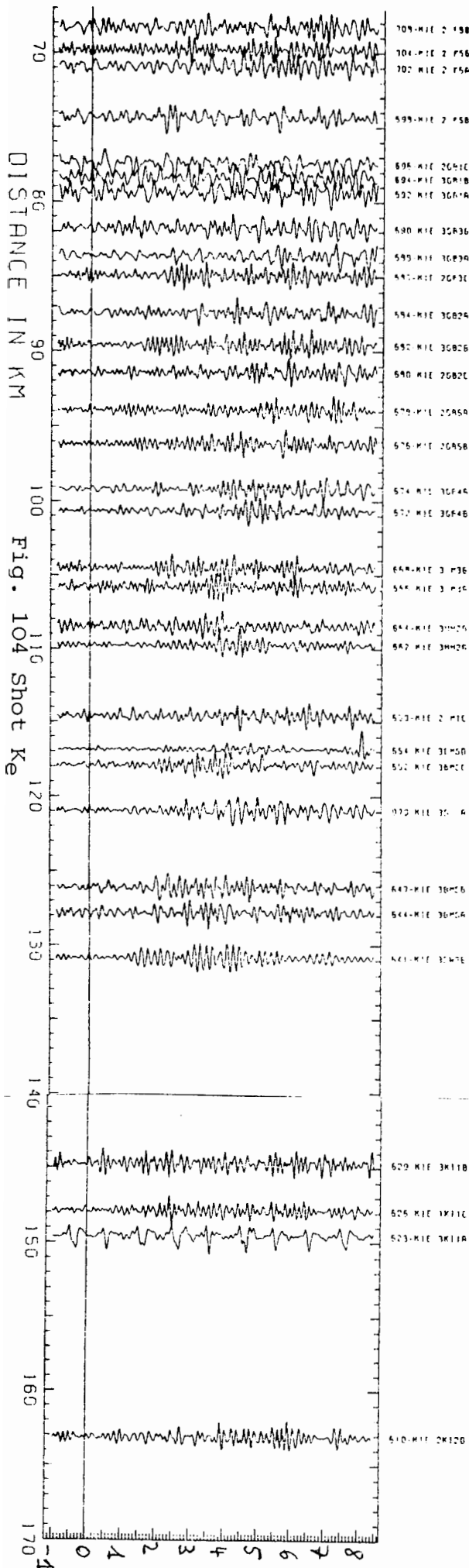
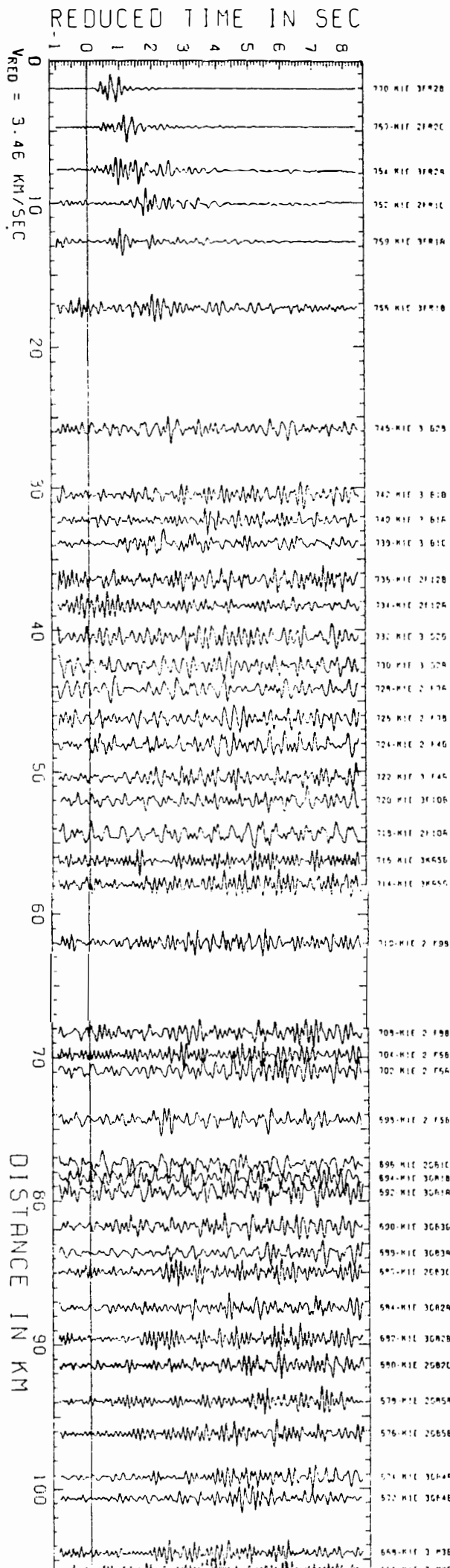


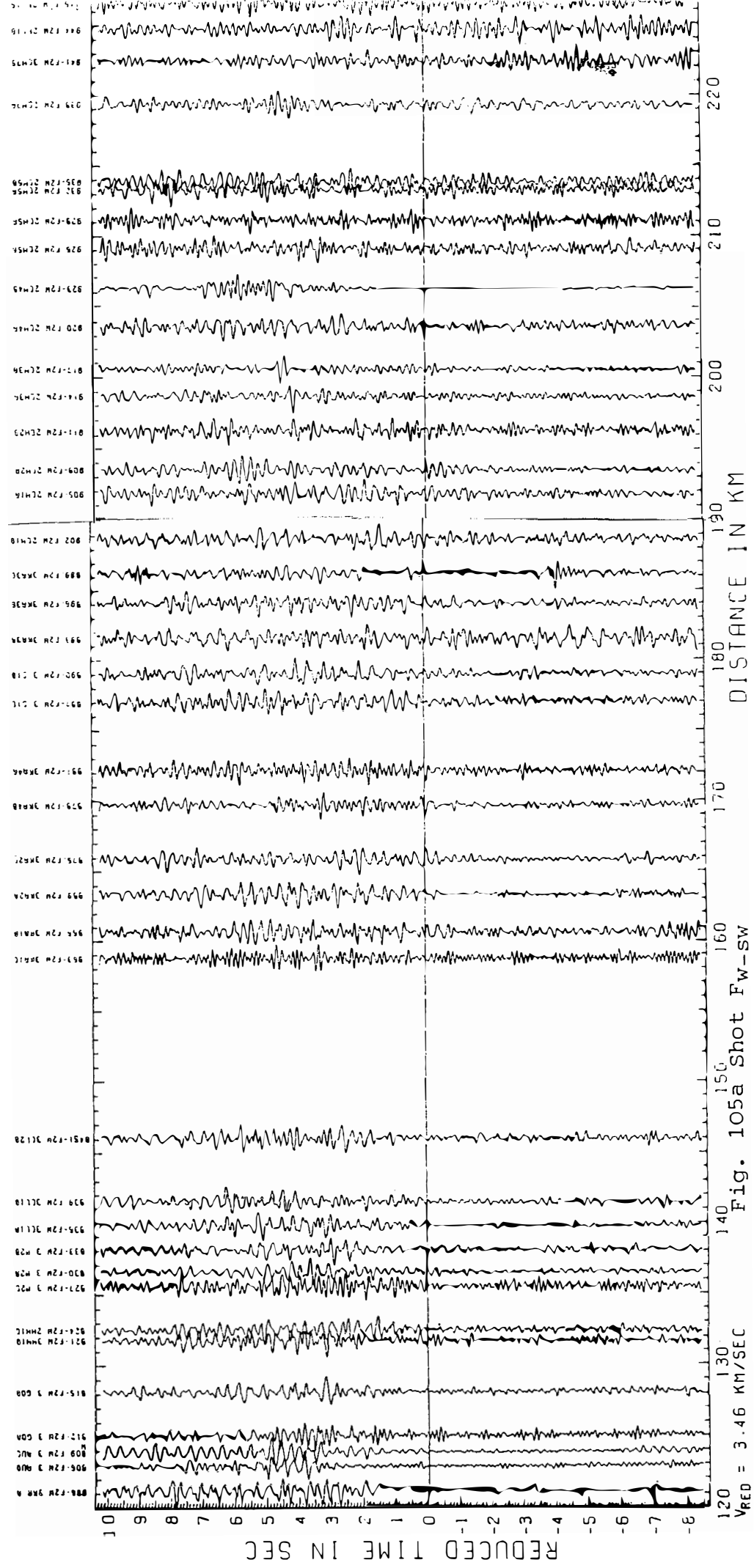
Fig. 104 Shot Kε



VRCD = 3.46 KM/SEC

DISTANCE IN KM

REDUCED TIME IN SEC



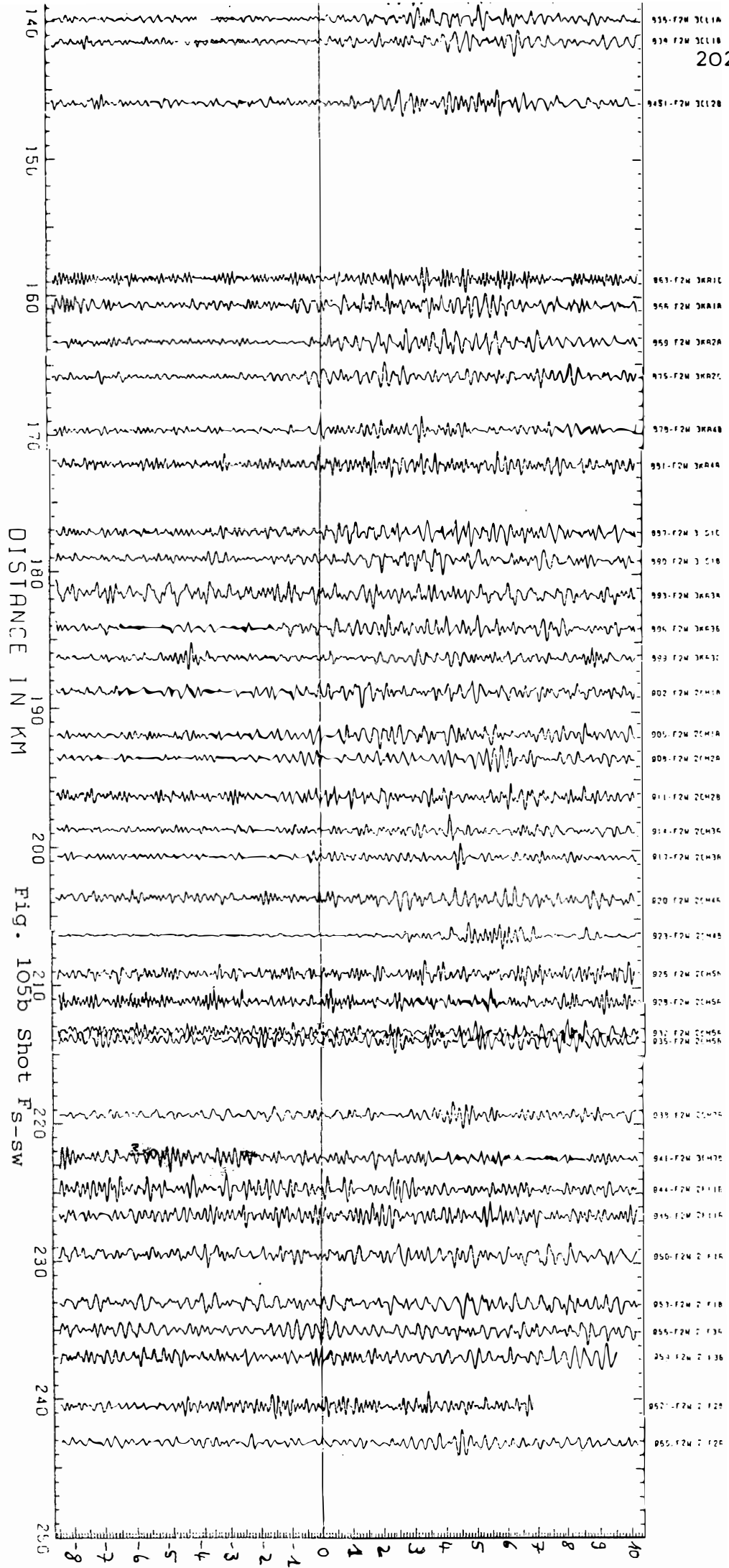


Fig. 105b Shot F-S-sw

DISTANCE IN KM

80 4 0 4 8 12 16 20 24 28 32 36 40