U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Digital Recordings of Aftershocks of the April 25 and 26, 1992, Cape Mendocino, California, earthquakes

by

David Carver[1]

Open-File Report 93-219

[1]Denver, CO

1993

CONTENTS

ILLUSTRATIONS

TABLES

Digital Recordings of Aftershocks of the April 25 and 26, 1992, Cape Mendocino, California, earthquakes

by David Carver

INTRODUCTION

On April 25 and 26, 1992, three large earthquakes occurred near Cape Mendocino, Calif. The mainshock occurred on April 25 with M_S = 7.1, the next day followed by two powerful aftershocks of M_S = 6.6 and M_S = 6.7. The permanent seismographic network operated by the U.S. Geological Survey located 197 aftershocks, greater than magnitude 3 during the following 3 weeks (Andrew Michael, personal commun., 1992). Most of them were located offshore (Michael, 1992, fig. 1).

On April 27, 1992, the author began operation of five portable digital seismographs located in a rough semi-circle approximately 50–90 km from the aftershock (fig. 1). The seismographs were operated for 12 days. The primary research goal was to contribute to aftershock locations with P- and S-arrival times and to record data to improve focal mechanism studies of the aftershocks. These goals were particularly important because the earthquakes originated in an especially complex, poorly understood tectonic regime.

This report is intended to facilitate the use of the digital seismograms by other researchers. Tables 1A and B give the location and sensor specifications for each recording station. Appendix A is a narrative of road directions to the recording stations should they need to be reoccupied. Appendix B lists all of the trigger times of seismograms recorded by the network. Appendix C contains plots of the seismograms of earthquakes recorded by three or more seismographs. Appendix D is an example data file showing the format (DR-100). The data set is available directly from the author on 9-track tape.

INSTRUMENTATION AND FIELD PROCEDURE

Each seismograph station consisted of a Sprengnether DR-200 (any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS) portable, self-triggering, digital recorder equipped with a triaxial seismometer. The operating characteristics of the DR-200 seismograph are described in detail by Carver and others (1986).

The velocity transducers used were Sprengnether S-6000, Mark Products L-22, and L-4 sensors. Table 1A shows the instrumentation and other operation parameters for each recording

site. The record headers in the data set reflect the response characteristics of the seismometer in use at that station. Calibration of the transducers was performed each time recording tapes were changed. The DR-200 internal calibration routine consists of a positive and a negative 0.05 v constant current pulse followed by a positive and a negative 2.5 v constant current pulse. These pulses are sent by the DR-200 to the calibration coils inside the sensors. The DR-200 records the resulting motion of the sensor mass. The record headers in the data set reflect the instrumental constants specified by the manufacturer corresponding to each seismometer component.

The DR-200 recording parameters were set up the same way for almost all installations. The recording parameters of the seismograph at the time of an event are written in the event header. Signals were high pass filtered at 0.2 Hz and low pass filtered (anti-alias) at 25 Hz with a 7-pole Butterworth filter. Sampling was done at 100 samples per second per channel. The 12-bit gain-ranged A/D has four gain levels (three steps) with a magnification of four (2 bits) per step and has an ideal dynamic range of 18 bits (however, because of the limitations of DR-100 format, we have processed only the most significant 16 bits). The gains were X10 at all stations.

The trigger algorithm was a simple short-term average versus long-term average (STA/LTA). Before an event was recorded, both of the horizontal channels were required to exceed a 6-dB signal-to-noise ratio. The pre-event memory was set at 13.6 s, and total duration of recording varied from 20 to 60 s.

Most seismometer placements were buried with the top of the case being visible, allowing for frequent checks to insure that the seismometer was level. The L-4 sensors at SHO were epoxied directly to an outcrop. The horizontal components were first glued to their cradles, the cradle legs glued to the outcrop, and then the case of the vertical sensor was glued directly to the outcrop. Seismometers were always oriented with channel 2, (the North-South component) aligned with magnetic North. Table 1B lists sensor specifications including their orientation with respect to the conventional (up, north, and east motion yields positive output). The correct orientations are included in the headers of the data files. Please note, however, that the plots in Appendix C are not corrected for orientation, therefore, some components are reversed.

A portable master clock was used to determine seismograph clock corrections. The seismograph clocks were compared at least every other day with the master clock. Careful notes were kept of clock corrections for both the seismograph clocks relative to the master clock and the master clock relative to the Rubidium standard at the USGS, Menlo Park, Calif.

Final clock corrections to the event trigger times were made in the event headers by first correcting the seismograph clock corrections for master-clock drift (less than 10 ms during the entire program). The appropriate seismograph clock correction was then derived by linear interpolation between the two clock corrections closest to the trigger time. This procedure yielded corrected event trigger times that are believed, based upon experience, to be accurate to within $\pm$10 ms of UTC. The typical operation procedure was to install a station and start the

internal clock automatically with a pulse from the master clock. Thus, the clocks started with a time correction of 0. The stations were visited at least every 2 days to change recording tape (if necessary), check the system operation, and determine the seismograph's clock drift. Notes were taken in the field and later entered into the computer so that the time corrections could be computed.

FIELD OPERATIONS

Deployment of 5 portable digital seismographs began 2 days after the mainshock. Table 1A shows the installation dates and times for each of the sites. Stations, FRE, SHO, DIN, and SEW were installed on the first day, April 27, 1992. These sites were revisited the next day to make certain that they were operating correctly. The East–West component at DIN was dead so the sensor was replaced with an L–22 and the station was renamed DI2. On April 29, 1992, the three L–4s at FRE were replaced with an L–22 because the L–22 is easier to keep level. FRE was renamed FR2 because of the sensor change. The fifth instrument was deployed at SHE on April 29th. Directions to the recording sites are given in Appendix A.

After the initial deployment, the recording sites were visited every other day, tapes changed, and clock drift determined. No other changes were made to the seismographs until the network was removed on May 5, 1992. All seismometers remained level throughout the recording period. Clocks were generally allowed to run continuously; however, they were reset if the clock correction exceeded 100 ms.

DATA SET DESCRIPTION

A total of 575 three–component digital seismograms was recorded beginning April 29 through May 8, 1992. All seismograph triggers (listed in Appendix B) have been included in the data set, regardless of whether or not they could be associated with a located earthquake. Earthquake seismograms recorded by three or more seismographs are shown in Appendix C. Appendix C also includes the output of a computer program that associates trigger times that occur at three or more stations using a sliding time window. The program also attempts to associate these times with aftershock origin time, location, and magnitude.

The seismograph at SHO malfunctioned starting on day 126 at 23:06 hrs. Apparently, the seismograph recorded both the aftershock ground motion and a calibration pulse each time the seismograph was triggered. We are investigating the source of the problem further. The compromised SHO data is included in the data set, because the data may be useful for some studies.

The original data cassettes recorded by the seismographs were played into an IBM–compatible PC using software called OL–V200 (Leland Bond, University of Washington, 1987). The data on the PC were then transferred to a micro–Vax computer via Pathworks, then

converted to DR–100 format, a compact block–binary format. In DR–100 format each single–component file consists of a 512 byte header followed by data blocks. There is one integer leader record (256 2–byte integer) and one real header block (128 four–byte real), followed by one or more integer data blocks (256 two–byte integer).

Appendix D is a complete description of the DR–100 format used for the data. Each seismic record is stored as a separate file whose name is a unique 13–character string constructed from the trigger time (UTC), component, and station name. Characters 1–3 represent day of year (001–366), characters 4–5 = hour (00–23), characters 6–7 = minute (00–59), character 8 = second code (A–T, where A = 0.000 – 2.999, B = 3.000 – 5.999, ... T = 57.000 – 59.999), character 9 is the component code (4 is vertical–component velocity, 5 and 6 are North–South and East–West horizontal component velocity, character 10 is ".", and characters 11–13 are the three–letter station names.

Copies of the entire data set in DR–100 format on 9–track tape are available from the author:

David Carver
U.S. Geological Survey, MS 966
Denver Federal Center
Denver, CO 80225
Phone – (303) 273–8552

ACKNOWLEDGMENTS

This work could not have been accomplished without the cooperation of the people on whose land the recording sites were located. Mr. and Mrs. Art Cave, Mr. and Mrs. Lee Rice, Mr. and Mrs. Gino Rovai, Mr. and Mrs. Ken Willison, and Mr. and Mrs. B.V. Williams gave their permission for the seismograph sites. One of the greatest pleasures of this work was meeting these fine people.

Thanks to Tom Bice and Dee Overturf who worked overtime in support of the field operations. Ken King and Kaye Shedlock provided guidance and encouragement; thanks to them.

REFERENCES

Carver, D.L., Cunningham, D.R., and King, K.W., 1986, Calibration and acceptance testing of the DR–200 digital seismograph: U.S. Geological Survey Open–File Report 86–430, 2 p.

Michael, Andrew, 1992, Three's a crowd in California: Nature, v. 357, 14 May 1992, p. 111–112.

TABLE 1A. Recording station parameters

Station	Latitude(°N)	Longitude(°W)	Elevation(m)	Date Installed	Date Removed	Sensor	Placement
FRE	40:45.83	124:04.31	0040	4/27/92@18:10	4/29/92@17:38	L-4	Buried
FR2	40:45.83	124:04.31	0040	4/29/92@18:22	5/08/92@14:28	L-22	Buried
DIN	40:29.27	123:37.59	0744	4/27/92@23:46	4/28/92@20:28	S-6000	Buried
DI2	40:29.27	123:37.59	0744	4/28/92@20:29	5/08/92@18:05	L-22	Buried
SEW	40:14.28	123:37.57	0373	4/28/92@01:56	5/08/92@19:42	S-6000	Buried
SHE	40:02.10	124:03.49	0293	4/29/92@22:33	5/08/92@21:49	L-22	Buried
SHO	40:35.88	123:44.93	1128	4/27/92@20:34	5/08/92@16:23	L-4	Epoxied to outcrop

TABLE 1B. Sensor specifications

Sensor	Natural frequency (Hz)	Damping ratio	Effective generator constant (v/cm/sec)	Orientation Z	Orientation Radial (N–S)	Orientation Transverse (E–W)	Manufacturer
S–6000	1.7	0.6	1.20	000	180	090	Sprengnether
L–22	2.0	0.66	0.93	180	180	270	Mark Products
L–4	1.0	0.69	1.66	180	180	270	Mark Products

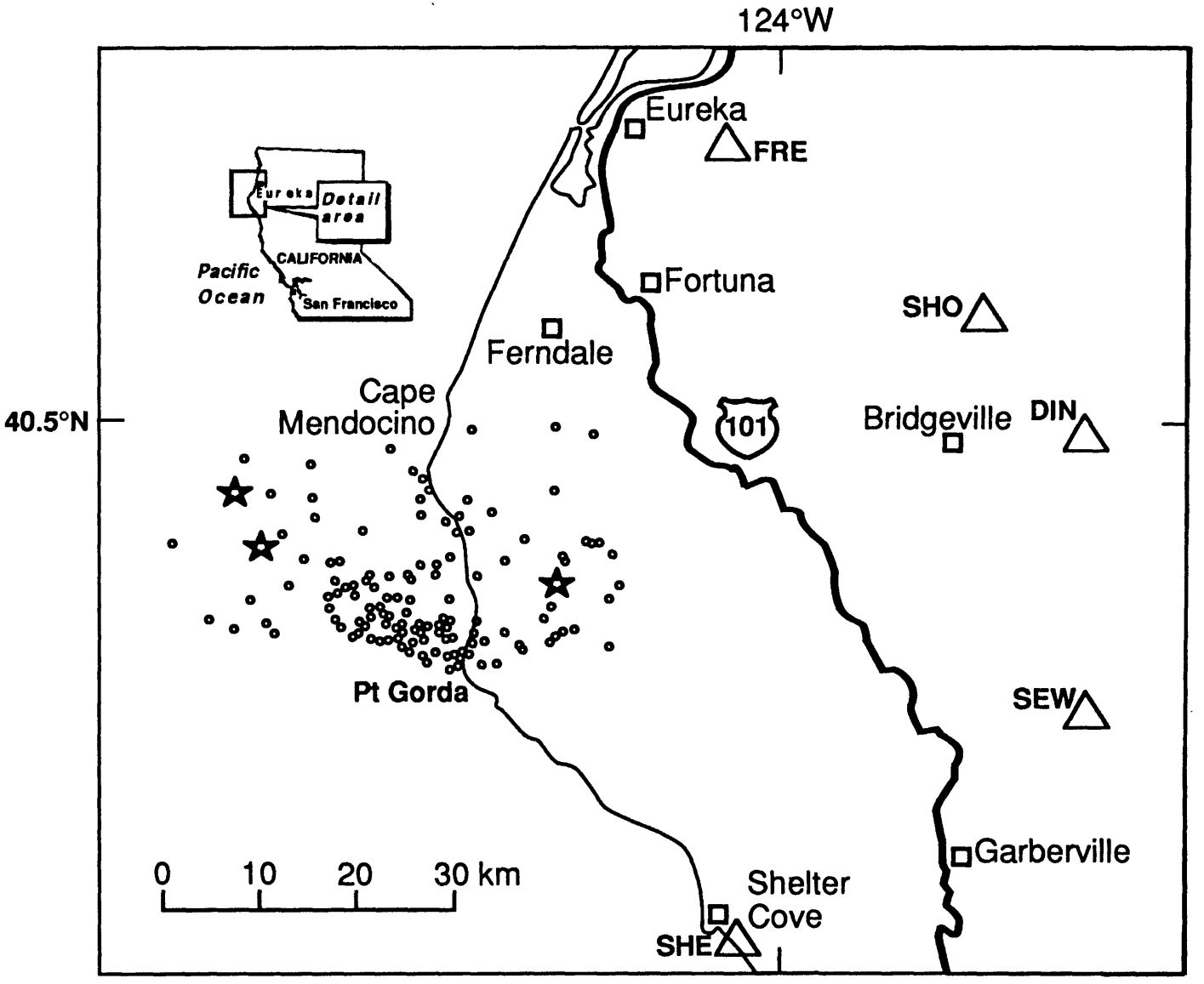


Figure 1. Map showing the Cape Mendocino, Calif., area. Small circles represent aftershock locations made using the permanent seismograph network (A. Michael, personal commun., 1992), stars show the epicenters of the three largest earthquakes with $M_S > 6.5$. Triangles indicate the location of the digital seismographs discussed in this report.

APPENDIX A.
Directions to seismograph stations

Directions to Seismograph Stations

NOTE: Color photographs showing approaches to the recording sites the exact location of sites are available from the author.

FRE – On northbound 101, take Myrtle Street to the south and east approximately 4 miles to Freshwater Road (right) to Howard Heights Road (right) (photo 1), follow paved lane to the south then west to the end. Turn left up a paved drive (photo 2) to the Art Cave residence (phone (707) 443–3492). The seismometer was buried behind the white house on the East fence line.

SHO – Back on Freshwater Road, go east to Kneeland Road through Kneeland, past Kneeland Airport on Mountain View Road. Past Jack Shaw Road, past Butte Creek Road, keep left and don't take the cutoff to Bridgeville. On Showers Pass Road, go past Gorden Road. Take Stapp Road (photo 3) 0.2 miles to outcrop on right. The seismometers were epoxied to the outcrop shown in photo 4. John Rice owns the Ft. Baker Ranch and permission is required before installation. His phone number is (707) 777–3240. Evenings are best.

DIN – From SHO, continue on Showers Pass Road to Bridgeville. Go across the bridge and turn east almost to Dinsmore 16.6 miles. Just before the Van Duzen River Bridge, turn right (photo 5) and double back up the hill to the Genio Rovai residence (phone (707) 5524–6520 (photo 6). The seismometer was buried behind the garage, up the hill, in the woodlot.

SEW – Go back to Bridgeville and turn south on Alderpoint Road through Blocksburg, go southwest on Ft. Seward Road. The Ken Willison residence is 22.8 miles from Bridgeville on the right as you switch back down the hill. The seismometer was buried approximately 100' west of the garage in an open yard.

SHE – Take either Ft. Seward Road or Alderpoint Road from SEW to Garberville. Drive through Redway and follow the signs to Shelter Cove. Start down the final grade to Shelter Cove and pass the General Store on the left. Turn left at 0.7 miles past the General Store onto Hillside Road (photo 7), go up the hill to the residence of B.V. Williams at 530 Hillside Road (phone (707) 986–7266. The instrument was buried behind and below the house near a small fenced–in garden (photo 8).

APPENDIX B.
Complete list of trigger times

Complete List of
Trigger Times

PATH	DAYHRMNS	STA	LENGTH
NCA:	[FRE.A]	1181858LA.FRE;1	10263514
NCA:	[FRE.A]	1181915RA.FRE;1	10264551
NCA:	[FRE.A]	1181917KA.FRE;1	10264650
NCA:	[FRE.A]	1182027HA.FRE;1	10268841
NCA:	[FRE.A]	1182030KA.FRE;1	10269031
NCA:	[SHO.A]	1182044PA.SHO;1	10269887
NCA:	[SHO.A]	1182047FA.SHO;1	10270037
NCA:	[FRE.A]	1182214MA.FRE;1	10275277
NCA:	[FRE.A]	1182243CA.FRE;1	10276987
NCA:	[FRE.A]	1182248AA.FRE;1	10277281
NCA:	[FRE.A]	1182302PA.FRE;1	10278165
NCA:	[SHO.A]	1182302QA.SHO;1	10278170
NCA:	[FRE.A]	1190032DA.FRE;1	10283530
NCA:	[FRE.A]	1190047DA.FRE;1	10284430
NCA:	[FRE.A]	1190139TA.FRE;1	10287597
NCA:	[FRE.A]	1190146MA.FRE;1	10287996
NCA:	[FRE.A]	1190210OA.FRE;1	10289443
NCA:	[FRE.A]	1190422AA.FRE;1	10297321
NCA:	[SHO.A]	1190422EA.SHO;1	10297332
NCA:	[SEW.A]	1190422EA.SEW;1	10297333
NCA:	[FRE.A]	1190542HA.FRE;1	10302141
NCA:	[FRE.A]	1190556SA.FRE;1	10303016
NCA:	[SHO.A]	1190556TA.SHO;1	10303019
NCA:	[DIN.A]	1190944QA.DIN;1	10316690
NCA:	[FRE.A]	1191027SA.FRE;1	10319275
NCA:	[FRE.A]	1191356BA.FRE;1	10331763
NCA:	[DIN.A]	1191356CA.DIN;1	10331767
NCA:	[SHO.A]	1191356DA.SHO;1	10331771
NCA:	[SEW.A]	1191356EA.SEW;1	10331773
NCA:	[DIN.A]	1191453RA.DIN;1	10335231
NCA:	[SHO.A]	1191454AA.SHO;1	10335240
NCA:	[SEW.A]	1191454AA.SEW;1	10335241
NCA:	[FRE.B]	1191701RA.FRE;1	10342911
NCA:	[FRE.B]	1191742QA.FRE;1	10345368
NCA:	[DIN.A]	1191749IA.DIN;1	10345764
NCA:	[SEW.A]	1191749IA.SEW;1	10345764
NCA:	[FRE.B]	1191749NA.FRE;1	10345780
NCA:	[FRE.B]	1191838HA.FRE;1	10348703
NCA:	[DIN.A]	1191838IA.DIN;1	10348706
NCA:	[SHO.B]	1191838LA.SHO;1	10348715
NCA:	[SEW.A]	1191838MA.SEW;1	10348716
NCA:	[DI2.B]	1192050SA.DI2;1	10356654
NCA:	[DI2.B]	1192106LA.DI2;1	10357595
NCA:	[DI2.B]	1192123JA.DI2;1	10358608
NCA:	[FRE.B]	1192201EA.FRE;1	10360872
NCA:	[FRE.B]	1192206GA.FRE;1	10361179
NCA:	[FRE.B]	1192259AA.FRE;1	10364341
NCA:	[DI2.B]	1192348BA.DI2;1	10367283
NCA:	[DI2.B]	1200030FA.DI2;1	10369815
NCA:	[FRE.B]	1200035EA.FRE;1	10370112
NCA:	[DI2.B]	1200035GA.DI2;1	10370119
NCA:	[FRE.B]	1200110OA.FRE;1	10372242
NCA:	[DI2.B]	1200220JA.DI2;1	10376427
NCA:	[FRE.B]	1200438NA.FRE;1	10384720
NCA:	[FRE.B]	1200532GA.FRE;1	10387940
NCA:	[FRE.B]	1200533IA.FRE;1	10388005
NCA:	[FRE.B]	1200607TA.FRE;1	10390079
NCA:	[FRE.B]	1200612PA.FRE;1	10390365
NCA:	[FRE.B]	1200702DA.FRE;1	10393329
NCA:	[DI2.B]	1200702EA.DI2;1	10393334
NCA:	[FRE.B]	1200828TA.FRE;1	10398537
NCA:	[FRE.B]	1200927OA.FRE;1	10402063
NCA:	[SEW.B]	1200953LA.SEW;1	10403615
NCA:	[FRE.B]	1201042GA.FRE;1	10406539
NCA:	[SHO.B]	1201042IA.SHO;1	10406544
NCA:	[DI2.B]	1201403LA.DI2;1	10418615
NCA:	[DI2.B]	1201602QA.DI2;1	10425768
NCA:	[DI2.B]	1201607EA.DI2;1	10426034
NCA:	[DI2.B]	1201609RA.DI2;1	10426193
NCA:	[DI2.B]	1201636DA.DI2;1	10427769
NCA:	[DI2.B]	1201653EA.DI2;1	10428793
NCA:	[DI2.B]	1201719TA.DI2;1	10430397
NCA:	[DI2.B]	1201817LA.DI2;1	10433853
NCA:	[DI2.B]	1201824DA.DI2;1	10434251
NCA:	[DI2.B]	1201936AA.DI2;1	10438562
NCA:	[DI2.B]	1202012QA.DI2;1	10440769
NCA:	[DI2.B]	1202024HA.DI2;1	10441462
NCA:	[DI2.B]	1202040GA.DI2;1	10442420
NCA:	[DI2.B]	1202104RA.DI2;1	10443892
NCA:	[DI2.B]	1202107NA.DI2;1	10444060
NCA:	[DI2.B]	1202121MA.DI2;1	10444896
NCA:	[DI2.B]	1202147GA.DI2;1	10446440
NCA:	[DI2.B]	1202200FA.DI2;1	10447217
NCA:	[DI2.B]	1202214QA.DI2;1	10448089
NCA:	[SHE.A]	1210203LA.SHE;1	10461813
NCA:	[DI2.B]	1210219DA.DI2;1	10462750
NCA:	[SHE.A]	1210219DA.SHE;1	10462751
NCA:	[FR2.C]	1210219FA.FR2;1	10462756
NCA:	[SHO.B]	1210219GA.SHO;1	10462759
NCA:	[SHE.A]	1210516DA.SHE;1	10473370
NCA:	[SHE.A]	1210549GA.SHE;1	10475358
NCA:	[SHE.A]	1210555TA.SHE;1	10475757
NCA:	[SHE.A]	1210635DA.SHE;1	10478110
NCA:	[FR2.C]	1210840GA.FR2;1	10485618
NCA:	[DI2.B]	1210840HA.DI2;1	10485621
NCA:	[SHE.A]	1210840IA.SHE;1	10485624
NCA:	[SHO.B]	1210840JA.SHO;1	10485629
NCA:	[SHE.A]	1210849OA.SHE;1	10486183
NCA:	[FR2.C]	1210856TA.FR2;1	10486617
NCA:	[SHE.A]	1210953GA.SHE;1	10490000
NCA:	[FR2.C]	1210953HA.FR2;1	10490003
NCA:	[SHO.B]	1210953IA.SHO;1	10490004
NCA:	[DI2.B]	1210953IA.DI2;1	10490005
NCA:	[SHE.A]	1211029PA.SHE;1	10492185
NCA:	[FR2.C]	1211029SA.FR2;1	10492195
NCA:	[DI2.B]	1211030BA.DI2;1	10492203
NCA:	[SHE.A]	1211114OA.SHE;1	10494882
NCA:	[FR2.C]	1211140KA.FR2;1	10496432
NCA:	[SHE.A]	1211357HA.SHE;1	10504642
NCA:	[DI2.B]	1211548KA.DI2;1	10511310
NCA:	[DI2.B]	1211619DA.DI2;1	10513149
NCA:	[SHE.A]	1211652DA.SHE;1	10515131
NCA:	[SHE.A]	1211702MA.SHE;1	10515756
NCA:	[FR2.D]	1211702NA.FR2;1	10515760
NCA:	[SHE.A]	1211910OA.SHE;1	10523444
NCA:	[SHE.A]	1212009IA.SHE;1	10526964
NCA:	[SEW.C]	1212042LA.SEW;1	10528954
NCA:	[SHE.A]	1220053EA.SHE;1	10543993
NCA:	[SHE.A]	1220230PA.SHE;1	10549845
NCA:	[SHE.A]	1220403PA.SHE;1	10555426
NCA:	[FR2.D]	1220403QA.FR2;1	10555430
NCA:	[SHO.C]	1220403RA.SHO;1	10555433
NCA:	[SEW.C]	1220403SA.SEW;1	10555435
NCA:	[FR2.D]	1220409PA.FR2;1	10555786
NCA:	[SEW.C]	1220409PA.SEW;1	10555786
NCA:	[SHO.C]	1220409QA.SHO;1	10555788
NCA:	[SHE.A]	1220411FA.SHE;1	10555877
NCA:	[FR2.D]	1220411HA.FR2;1	10555882
NCA:	[SHE.A]	1220415LA.SHE;1	10556133
NCA:	[FR2.D]	1220415OA.FR2;1	10556144
NCA:	[SEW.C]	1220415QA.SEW;1	10556148
NCA:	[SHO.C]	1220415QA.SHO;1	10556148
NCA:	[SHE.A]	1220418GA.SHE;1	10556298
NCA:	[SHE.A]	1220419JA.SHE;1	10556368
NCA:	[SHE.A]	1220822SA.SHE;1	10570975
NCA:	[SHE.A]	1221028LA.SHE;1	10578514
NCA:	[FR2.D]	1221028MA.FR2;1	10578517
NCA:	[SHE.A]	1221132NA.SHE;1	10582361
NCA:	[SHE.A]	1221423KA.SHE;1	10592611
NCA:	[SHE.A]	1221542RA.SHE;1	10597373
NCA:	[FR2.D]	1221542SA.FR2;1	10597374
NCA:	[SHO.C]	1221543BA.SHO;1	10597385
NCA:	[SEW.C]	1221543CA.SEW;1	10597388
NCA:	[SHE.A]	1221544HA.SHE;1	10597463
NCA:	[SHE.A]	1221839RA.SHE;1	10607993
NCA:	[SHE.A]	1221951LA.SHE;1	10612293
NCA:	[SHE.A]	1222241QA.SHE;1	10622510
NCA:	[FR2.E]	1222241RA.FR2;1	10622512
NCA:	[SHO.C]	1222241SA.SHO;1	10622514
NCA:	[SHE.A]	1222259PA.SHE;1	10623586
NCA:	[FR2.E]	1222259PA.FR2;1	10623587
NCA:	[SHE.B]	1230153SA.SHE;1	10634034
NCA:	[SHE.B]	1230941NA.SHE;1	10662100
NCA:	[FR2.E]	1230941NA.FR2;1	10662101

```
NCA:[SHO.C]1230941OA.SHO;1      10662102
NCA:[DI2.C]1230941RA.DI2;1      10662111
NCA:[SHE.B]1231033OA.SHE;1      10665223
NCA:[SHE.B]1231130IA.SHE;1      10668626
NCA:[FR2.E]1231130JA.FR2;1      10668629
NCA:[SHO.C]1231130LA.SHO;1      10668635
NCA:[DI2.C]1231130OA.DI2;1      10668642
NCA:[SEW.C]1231130OA.SEW;1      10668642
NCA:[FR2.E]1231203DA.FR2;1      10670590
NCA:[SHE.B]1231208FA.SHE;1      10670897
NCA:[FR2.E]1231208GA.FR2;1      10670899
NCA:[SHO.C]1231208HA.SHO;1      10670902
NCA:[SHE.B]1231329HA.SHE;1      10675761
NCA:[SHE.B]1231347KA.SHE;1      10676852
NCA:[SHE.B]1231412KA.SHE;1      10678350
NCA:[SHE.B]1231518KA.SHE;1      10682312
NCA:[FR2.E]1231518NA.FR2;1      10682320
NCA:[SHO.C]1231518OA.SHO;1      10682322
NCA:[SHE.B]1231520QA.SHE;1      10682448
NCA:[SHE.B]1231708QA.SHE;1      10688929
NCA:[SHO.D]1231757QA.SHO;1      10691870
NCA:[SHO.D]1231759PA.SHO;1      10691987
NCA:[SHE.B]1231831AA.SHE;1      10693862
NCA:[FR2.F]1232104LA.FR2;1      10703075
NCA:[SHO.D]1232104NA.SHO;1      10703080
NCA:[SEW.D]1240403PA.SEW;1      10728226
NCA:[FR2.F]1240934TA.FR2;1      10748099
NCA:[FR2.F]1240955OA.FR2;1      10749343
NCA:[SHO.D]1240955PA.SHO;1      10749347
NCA:[SEW.D]1241324NA.SEW;1      10761881
NCA:[FR2.G]1241447PA.FR2;1      10766866
NCA:[FR2.G]1241506CA.FR2;1      10767966
NCA:[FR2.G]1241700MA.FR2;1      10774836
NCA:[FR2.G]1241728FA.FR2;1      10776495
NCA:[SHO.E]1241728JA.SHO;1      10776507
NCA:[FR2.G]1241740IA.FR2;1      10777226
NCA:[FR2.G]1241806MA.FR2;1      10778797
NCA:[SHO.E]1241806QA.SHO;1      10778808
NCA:[FR2.G]1241837CA.FR2;1      10780627
NCA:[FR2.G]1241901RA.FR2;1      10782112
NCA:[FR2.G]1241933EA.FR2;1      10783994
NCA:[FR2.G]1241943QA.FR2;1      10784628
NCA:[FR2.G]1241946FA.FR2;1      10784777
NCA:[FR2.G]1242003DA.FR2;1      10785790
NCA:[SHO.E]1242003DA.SHO;1      10785791
NCA:[DI2.E]1242003IA.DI2;1      10785806
NCA:[FR2.G]1242013PA.FR2;1      10786425
NCA:[FR2.G]1242015BA.FR2;1      10786504
NCA:[FR2.G]1242039IA.FR2;1      10787966
NCA:[FR2.G]1242046CA.FR2;1      10788368
NCA:[SHO.E]1242046TA.SHO;1      10788418
NCA:[FR2.G]1242107NA.FR2;1      10789661
NCA:[FR2.G]1242126QA.FR2;1      10790810
NCA:[FR2.G]1242213EA.FR2;1      10793594
NCA:[FR2.G]1242249QA.FR2;1      10795789
NCA:[FR2.G]1242253QA.FR2;1      10796028
NCA:[FR2.G]1242308OA.FR2;1      10796924
NCA:[FR2.G]1242354RA.FR2;1      10799693
NCA:[FR2.G]1242357EA.FR2;1      10799833
NCA:[FR2.G]1250002OA.FR2;1      10800163
NCA:[SHO.E]1250002PA.SHO;1      10800165
NCA:[DI2.E]1250002TA.DI2;1      10800178
NCA:[FR2.G]1250013IA.FR2;1      10800805
NCA:[SHO.E]1250013JA.SHO;1      10800807
NCA:[DI2.E]1250013KA.DI2;1      10800812
NCA:[FR2.G]1250033RA.FR2;1      10802031
NCA:[DI2.E]1250033SA.DI2;1      10802034
NCA:[SHO.E]1250033SA.SHO;1      10802035
NCA:[FR2.G]1250035PA.FR2;1      10802147
NCA:[SHO.E]1250035QA.SHO;1      10802149
NCA:[DI2.E]1250035RA.DI2;1      10802151
NCA:[FR2.G]1250044GA.FR2;1      10802659
NCA:[SHO.E]1250044KA.SHO;1      10802670
NCA:[FR2.G]1250115NA.FR2;1      10804540
NCA:[FR2.G]1250159FA.FR2;1      10807156
NCA:[SHO.E]1250159FA.SHO;1      10807157
NCA:[DI2.E]1250159GA.DI2;1      10807159
NCA:[FR2.G]1250211FA.FR2;1      10807875
NCA:[FR2.G]1250218MA.FR2;1      10808316
NCA:[FR2.G]1250226CA.FR2;1      10808766
NCA:[FR2.G]1250251AA.FR2;1      10810262
NCA:[FR2.G]1250254DA.FR2;1      10810450
NCA:[FR2.G]1250257NA.FR2;1      10810659
NCA:[FR2.G]1250345NA.FR2;1      10813541
NCA:[FR2.G]1250411IA.FR2;1      10815085
NCA:[FR2.G]1250435EA.FR2;1      10816514
NCA:[FR2.G]1250504IA.FR2;1      10818265
NCA:[FR2.G]1250506FA.FR2;1      10818376
NCA:[SHO.E]1250506GA.SHO;1      10818379
NCA:[DI2.E]1250506GA.DI2;1      10818380
NCA:[FR2.G]1250606KA.FR2;1      10821992
NCA:[FR2.G]1250708FA.FR2;1      10825696
NCA:[SHO.E]1250708FA.SHO;1      10825697
NCA:[DI2.E]1250708GA.DI2;1      10825698
NCA:[SEW.E]1250708JA.SEW;1      10825707
NCA:[FR2.G]1250718BA.FR2;1      10826284
NCA:[SHO.E]1250718KA.SHO;1      10826311
NCA:[FR2.G]1250744NA.FR2;1      10827879
NCA:[SHO.E]1250744NA.SHO;1      10827880
NCA:[DI2.E]1250744NA.DI2;1      10827881
NCA:[SEW.E]1250744QA.SEW;1      10827890
NCA:[FR2.G]1250748HA.FR2;1      10828101
NCA:[FR2.G]1250824JA.FR2;1      10830267
NCA:[SHO.E]1250824KA.SHO;1      10830270
NCA:[FR2.G]1250835HA.FR2;1      10830921
NCA:[FR2.G]1250859KA.FR2;1      10832372
NCA:[SHO.E]1250859MA.SHO;1      10832376
NCA:[FR2.G]1250932FA.FR2;1      10834336
NCA:[SHO.E]1250932GA.SHO;1      10834338
NCA:[DI2.E]1250932GA.DI2;1      10834340
NCA:[FR2.G]1251009EA.FR2;1      10836552
NCA:[SHO.E]1251009FA.SHO;1      10836556
NCA:[DI2.E]1251009NA.DI2;1      10836580
NCA:[FR2.G]1251011MA.FR2;1      10836698
NCA:[SHO.E]1251011OA.SHO;1      10836703
NCA:[FR2.G]1251017GA.FR2;1      10837039
NCA:[SHO.E]1251017HA.SHO;1      10837041
NCA:[FR2.G]1251026MA.FR2;1      10837597
NCA:[DI2.E]1251236MA.DI2;1      10845397
NCA:[FR2.G]1251239PA.FR2;1      10845585
NCA:[DI2.E]1251313PA.DI2;1      10847626
NCA:[FR2.G]1251314NA.FR2;1      10847681
NCA:[SHO.E]1251314OA.SHO;1      10847684
NCA:[DI2.E]1251352RA.DI2;1      10849972
NCA:[FR2.G]1251432EA.FR2;1      10852332
NCA:[DI2.E]1251516BA.DI2;1      10854963
NCA:[FR2.G]1251531CA.FR2;1      10855866
NCA:[SHO.E]1251531EA.SHO;1      10855874
NCA:[FR2.G]1251538KA.FR2;1      10856310
NCA:[DI2.E]1251547JA.DI2;1      10856848
NCA:[DI2.E]1251556HA.DI2;1      10857383
NCA:[FR2.G]1251557JA.FR2;1      10857449
NCA:[DI2.E]1251609MA.DI2;1      10858176
NCA:[DI2.E]1251624HA.DI2;1      10859061
NCA:[FR2.G]1251628IA.FR2;1      10859305
NCA:[DI2.E]1251703CA.DI2;1      10861387
NCA:[FR2.G]1251734AA.FR2;1      10863241
NCA:[FR2.G]1251734TA.FR2;1      10863298
NCA:[DI2.E]1251821PA.DI2;1      10866107
NCA:[FR2.G]1251833CA.FR2;1      10866786
NCA:[FR2.G]1251907OA.FR2;1      10868862
NCA:[SHO.E]1251907PA.SHO;1      10868865
NCA:[DI2.E]1251936OA.DI2;1      10870604
NCA:[FR2.G]1251938MA.FR2;1      10870717
NCA:[SHE.C]1251946SA.SHE;1      10871215
NCA:[SHE.C]1251953EA.SHE;1      10871592
NCA:[FR2.G]1251953GA.FR2;1      10871598
NCA:[SHO.E]1251953HA.SHO;1      10871602
NCA:[FR2.G]1251959MA.FR2;1      10871976
NCA:[DI2.E]1251959NA.DI2;1      10871981
NCA:[SHE.C]1252009MA.SHE;1      10872577
NCA:[DI2.E]1252014HA.DI2;1      10872862
NCA:[SHE.C]1252015PA.SHE;1      10872945
NCA:[SHO.E]1252015RA.SHO;1      10872951
NCA:[SHE.C]1252022RA.SHE;1      10873371
NCA:[FR2.G]1252023BA.FR2;1      10873383
NCA:[SHE.C]1252037MA.SHE;1      10874256
NCA:[SHE.C]1252112GA.SHE;1      10876338
NCA:[FR2.G]1252112IA.FR2;1      10876344
NCA:[SHO.E]1252112LA.SHO;1      10876353
```

NCA:[DI2.E]1252131AA.DI2;1 10877460
NCA:[SHE.C]1252133NA.SHE;1 10877621
NCA:[SHE.C]1252142PA.SHE;1 10878167
NCA:[SHE.C]1252150HA.SHE;1 10878621
NCA:[DI2.E]1252155OA.DI2;1 10878942
NCA:[SHE.C]1252209FA.SHE;1 10879756
NCA:[SHE.C]1252217QA.SHE;1 10880270
NCA:[SHO.E]1252218BA.SHO;1 10880284
NCA:[DI2.E]1252246JA.DI2;1 10881989
NCA:[SHE.C]1252259RA.SHE;1 10882793
NCA:[DI2.E]1252329HA.DI2;1 10884562
NCA:[DI2.E]1252344HA.DI2;1 10885461
NCA:[DI2.E]1252356TA.DI2;1 10886219
NCA:[DI2.E]1260000IA.DI2;1 10886426
NCA:[SHO.E]1260012DA.SHO;1 10887129
NCA:[DI2.E]1260018FA.DI2;1 10887497
NCA:[DI2.E]1260047FA.DI2;1 10889237
NCA:[DI2.E]1260207EA.DI2;1 10894033
NCA:[SEW.E]1260254EA.SEW;1 10896854
NCA:[SEW.E]1260255PA.SEW;1 10896945
NCA:[DI2.E]1260437PA.DI2;1 10903067
NCA:[DI2.E]1260442AA.DI2;1 10903320
NCA:[SHO.E]1260537AA.SHO;1 10906622
NCA:[SHE.C]1260537SA.SHE;1 10906675
NCA:[SHE.C]1260630QA.SHE;1 10909848
NCA:[SHE.C]1260724CA.SHE;1 10913046
NCA:[SHE.C]1260848RA.SHE;1 10918133
NCA:[SHO.E]1260849BA.SHO;1 10918143
NCA:[SHE.C]1260852QA.SHE;1 10918369
NCA:[SHE.C]1260953BA.SHE;1 10921985
NCA:[SHE.C]1260958NA.SHE;1 10922319
NCA:[SHE.C]1261046DA.SHE;1 10925170
NCA:[SEW.E]1261046FA.SEW;1 10925176
NCA:[SHO.E]1261046FA.SHO;1 10925176
NCA:[DI2.E]1261046FA.DI2;1 10925177
NCA:[SHE.C]1261051PA.SHE;1 10925506
NCA:[SHO.E]1261051TA.SHO;1 10925517
NCA:[SHE.C]1261054AA.SHE;1 10925641
NCA:[SHE.C]1261109FA.SHE;1 10926555
NCA:[SHE.C]1261147EA.SHE;1 10928834
NCA:[SHO.E]1261147IA.SHO;1 10928844
NCA:[SHE.C]1261201EA.SHE;1 10929674
NCA:[SHE.C]1261214RA.SHE;1 10930492
NCA:[SHO.E]1261218JA.SHO;1 10930709
NCA:[DI2.E]1261252SA.DI2;1 10932775
NCA:[DI2.E]1261332IA.DI2;1 10935145
NCA:[DI2.E]1261357HA.DI2;1 10936643
NCA:[SHE.C]1261413LA.SHE;1 10937614
NCA:[SHE.C]1261418FA.SHE;1 10937896
NCA:[SHE.C]1261421CA.SHE;1 10938066
NCA:[DI2.E]1261426EA.DI2;1 10938372
NCA:[SHO.E]1261435RA.SHO;1 10938952
NCA:[DI2.E]1261459HA.DI2;1 10940363
NCA:[SHE.C]1261505JA.SHE;1 10940727
NCA:[SHO.E]1261505OA.SHO;1 10940742
NCA:[SHE.C]1261506KA.SHE;1 10940791
NCA:[SHE.C]1261519FA.SHE;1 10941555
NCA:[SEW.E]1261535LA.SEW;1 10942535
NCA:[SEW.E]1261557CA.SEW;1 10943827
NCA:[SEW.E]1261602TA.SEW;1 10944177
NCA:[SEW.E]1261608KA.SEW;1 10944512
NCA:[SHE.C]1261620CA.SHE;1 10945208
NCA:[SEW.E]1261625PA.SEW;1 10945547
NCA:[SEW.E]1261632HA.SEW;1 10945943
NCA:[SEW.E]1261635EA.SEW;1 10946114
NCA:[SHE.C]1261637NA.SHE;1 10946259
NCA:[SHO.E]1261637SA.SHO;1 10946274
NCA:[SHE.C]1261639KA.SHE;1 10946372
NCA:[DI2.E]1261640HA.DI2;1 10946423
NCA:[SHE.C]1261642IA.SHE;1 10946546
NCA:[SHE.C]1261706QA.SHE;1 10948009
NCA:[SHE.C]1261711LA.SHE;1 10948295
NCA:[DI2.E]1261736IA.DI2;1 10949786
NCA:[SEW.E]1261746FA.SEW;1 10950375
NCA:[SHE.C]1261747HA.SHE;1 10950441
NCA:[SEW.E]1261750EA.SEW;1 10950613
NCA:[SEW.E]1261759JA.SEW;1 10951168
NCA:[SEW.E]1261800PA.SEW;1 10951246
NCA:[SHE.C]1261807AA.SHE;1 10951621
NCA:[SHE.C]1261808GA.SHE;1 10951700

NCA:[DI2.E]1261823IA.DI2;1 10952604
NCA:[DI2.E]1261833TA.DI2;1 10953238
NCA:[SHE.C]1261902TA.SHE;1 10954978
NCA:[DI2.E]1261905AA.DI2;1 10955100
NCA:[DI2.E]1261934IA.DI2;1 10956865
NCA:[SHE.C]1261944DA.SHE;1 10957449
NCA:[SHE.C]1262021NA.SHE;1 10959700
NCA:[SHE.C]1262057EA.SHE;1 10961832
NCA:[SHE.C]1262104DA.SHE;1 10962250
NCA:[SHE.C]1262108QA.SHE;1 10962528
NCA:[DI2.F]1262131QA.DI2;1 10963908
NCA:[DI2.F]1262138BA.DI2;1 10964285
NCA:[SHE.C]1262204AA.SHE;1 10965842
NCA:[DI2.F]1262225FA.DI2;1 10967116
NCA:[SHE.C]1262228FA.SHE;1 10967295
NCA:[SHE.C]1262229JA.SHE;1 10967369
NCA:[DI2.F]1262250PA.DI2;1 10968647
NCA:[DI2.F]1262304GA.DI2;1 10969458
NCA:[DI2.F]1262305DA.DI2;1 10969509
NCA:[SHE.C]1262306OA.SHE;1 10969604
NCA:[FR2.H]1262306PA.FR2;1 10969605
NCA:[SHO.F]1262306PA.SHO;1 10969607
NCA:[DI2.F]1262306SA.DI2;1 10969616
NCA:[SHE.C]1262311KA.SHE;1 10969890
NCA:[DI2.F]1262316MA.DI2;1 10970197
NCA:[SHE.C]1262336TA.SHE;1 10971417
NCA:[DI2.F]1262347PA.DI2;1 10972066
NCA:[DI2.F]1262351CA.DI2;1 10972267
NCA:[SHO.F]1262358SA.SHO;1 10972735
NCA:[DI2.F]1270025HA.DI2;1 10974323
NCA:[FR2.H]1270025SA.FR2;1 10974354
NCA:[SHO.F]1270025SA.SHO;1 10974356
NCA:[SEW.F]1270028IA.SEW;1 10974506
NCA:[DI2.F]1270311QA.DI2;1 10984310
NCA:[FR2.H]1270311QA.FR2;1 10984310
NCA:[SHO.F]1270311QA.SHO;1 10984310
NCA:[FR2.H]1270450JA.FR2;1 10990229
NCA:[FR2.H]1270551DA.FR2;1 10993871
NCA:[FR2.H]1270646RA.FR2;1 10997211
NCA:[FR2.H]1270659LA.FR2;1 10997975
NCA:[SHO.F]1270722DA.SHO;1 10999329
NCA:[FR2.H]1270733CA.FR2;1 10999987
NCA:[SHO.F]1270733FA.SHO;1 10999996
NCA:[DI2.F]1270733GA.DI2;1 10999998
NCA:[FR2.H]1270951CA.FR2;1 11008266
NCA:[FR2.H]1271027DA.FR2;1 11010429
NCA:[FR2.H]1271045CA.FR2;1 11011507
NCA:[SHO.F]1271045DA.SHO;1 11011510
NCA:[DI2.F]1271045GA.DI2;1 11011519
NCA:[DI2.F]1271113RA.DI2;1 11013233
NCA:[FR2.H]1271148GA.FR2;1 11015298
NCA:[SHO.F]1271148HA.SHO;1 11015303
NCA:[FR2.H]1271151GA.FR2;1 11015479
NCA:[DI2.F]1271201QA.DI2;1 11016110
NCA:[FR2.H]1271209JA.FR2;1 11016567
NCA:[SHO.F]1271209MA.SHO;1 11016577
NCA:[FR2.H]1271237GA.FR2;1 11018239
NCA:[FR2.H]1271423RA.FR2;1 11024631
NCA:[SHO.F]1271423SA.SHO;1 11024635
NCA:[DI2.F]1271510IA.DI2;1 11027425
NCA:[DI2.F]1271542IA.DI2;1 11029345
NCA:[DI2.F]1271557OA.DI2;1 11030264
NCA:[DI2.F]1271621KA.DI2;1 11031692
NCA:[FR2.H]1271702NA.FR2;1 11034159
NCA:[SHO.F]1271702OA.SHO;1 11034162
NCA:[DI2.F]1271746HA.DI2;1 11036783
NCA:[FR2.H]1271747CA.FR2;1 11036826
NCA:[SHO.F]1271747DA.SHO;1 11036830
NCA:[DI2.F]1271747EA.DI2;1 11036833
NCA:[DI2.F]1271829AA.DI2;1 11039341
NCA:[FR2.H]1271844RA.FR2;1 11040292
NCA:[FR2.H]1271851CA.FR2;1 11040667
NCA:[SHO.F]1271851DA.SHO;1 11040670
NCA:[SHE.D]1271900AA.SHE;1 11041200
NCA:[SHO.F]1271900CA.SHO;1 11041207
NCA:[DI2.F]1271915JA.DI2;1 11042129
NCA:[SHE.D]1271926TA.SHE;1 11042817
NCA:[FR2.H]1271927CA.FR2;1 11042827
NCA:[SHO.F]1271927DA.SHO;1 11042831
NCA:[SHO.F]1271935QA.SHO;1 11043349

```
NCA:[DI2.F]1272021TA.DI2;1      11046118
NCA:[DI2.F]1272023EA.DI2;1      11046192
NCA:[DI2.F]1272036GA.DI2;1      11046980
NCA:[DI2.F]1272051GA.DI2;1      11047878
NCA:[DI2.F]1272131TA.DI2;1      11050319
NCA:[DI2.F]1272147AA.DI2;1      11051221
NCA:[DI2.F]1272215JA.DI2;1      11052929
NCA:[SHE.D]1272228JA.SHE;1      11053708
NCA:[DI2.F]1272229SA.DI2;1      11053795
NCA:[DI2.F]1272231BA.DI2;1      11053865
NCA:[DI2.F]1272249CA.DI2;1      11054948
NCA:[DI2.F]1272303LA.DI2;1      11055813
NCA:[SHE.D]1272316KA.SHE;1      11056591
NCA:[DI2.F]1272319BA.DI2;1      11056744
NCA:[DI2.F]1272344BA.DI2;1      11058243
NCA:[DI2.F]1272346QA.DI2;1      11058409
NCA:[SHE.D]1280325SA.SHE;1      11071555
NCA:[SHE.D]1280645OA.SHE;1      11083544
NCA:[SHO.F]1280645RA.SHO;1      11083552
NCA:[DI2.F]1280814SA.DI2;1      11088896
NCA:[SHE.D]1280816BA.SHE;1      11088964
NCA:[SHO.F]1280816CA.SHO;1      11088966
NCA:[SHE.D]1281011FA.SHE;1      11095877
NCA:[SHE.D]1281318LA.SHE;1      11107113
NCA:[SHO.F]1281318MA.SHO;1      11107118
NCA:[DI2.F]1281348JA.DI2;1      11108908
NCA:[DI2.F]1281430AA.DI2;1      11111400
NCA:[DI2.F]1281459OA.DI2;1      11113183
NCA:[SHE.D]1281509JA.SHE;1      11113769
NCA:[SHE.D]1281511EA.SHE;1      11113872
NCA:[DI2.F]1281515FA.DI2;1      11114117
NCA:[DI2.F]1281528RA.DI2;1      11114933
NCA:[DI2.F]1281558JA.DI2;1      11116707
NCA:[DI2.F]1281611DA.DI2;1      11117470
NCA:[SHE.D]1281651DA.SHE;1      11119870
NCA:[FR2.I]1281651FA.FR2;1      11119875
NCA:[SHO.F]1281651IA.SHO;1      11119886
NCA:[DI2.F]1281653MA.DI2;1      11120016
NCA:[SHE.D]1281716LA.SHE;1      11121394
NCA:[FR2.I]1281716LA.FR2;1      11121395
NCA:[DI2.F]1281805CA.DI2;1      11124307
NCA:[FR2.I]1281819MA.FR2;1      11125176
NCA:[SHE.D]1281819MA.SHE;1      11125178
NCA:[DI2.F]1281829BA.DI2;1      11125745
NCA:[DI2.F]1281838DA.DI2;1      11126290
NCA:[FR2.I]1281846SA.FR2;1      11126816
NCA:[SHE.D]1281938LA.SHE;1      11129914
NCA:[DI2.F]1281948PA.DI2;1      11130527
NCA:[DI2.F]1282010SA.DI2;1      11131856
NCA:[DI2.F]1282036LA.DI2;1      11133393
NCA:[FR2.I]1282038AA.FR2;1      11133481
NCA:[SHE.D]1282038GA.SHE;1      11133500
NCA:[DI2.F]1282050MA.DI2;1      11134237
NCA:[DI2.F]1282104GA.DI2;1      11135060
NCA:[DI2.F]1282130FA.DI2;1      11136617
NCA:[SHE.D]1282142LA.SHE;1      11137353
NCA:[FR2.I]1282142MA.FR2;1      11137356
NCA:[SHO.G]1282142NA.SHO;1      11137359
NCA:[DI2.F]1282144GA.DI2;1      11137458
NCA:[FR2.I]1282218FA.FR2;1      11139496
NCA:[SHO.G]1282218GA.SHO;1      11139499
NCA:[DI2.F]1282226AA.DI2;1      11139961
NCA:[DI2.F]1282256FA.DI2;1      11141775
NCA:[SHE.D]1282257TA.SHE;1      11141877
NCA:[FR2.I]1282258CA.FR2;1      11141886
NCA:[SHE.D]1282308DA.SHE;1      11142491
NCA:[FR2.I]1282308FA.FR2;1      11142496
NCA:[SHO.G]1282308HA.SHO;1      11142502
NCA:[SHE.D]1290026DA.SHE;1      11147169
NCA:[SHE.D]1290031FA.SHE;1      11147476
NCA:[FR2.I]1290106BA.FR2;1      11149563
NCA:[FR2.I]1290354SA.FR2;1      11159695
NCA:[FR2.I]1290442SA.FR2;1      11162575
NCA:[SHE.D]1290513QA.SHE;1      11164428
NCA:[FR2.I]1290513SA.FR2;1      11164436
NCA:[SHO.G]1290513TA.SHO;1      11164439
NCA:[SHE.D]1290528NA.SHE;1      11165319
NCA:[FR2.I]1290528OA.FR2;1      11165324
NCA:[SHO.G]1290651KA.SHO;1      11170291
NCA:[SHE.D]1290656EA.SHE;1      11170573
NCA:[SHE.D]1290733MA.SHE;1      11172817
NCA:[FR2.I]1290809PA.FR2;1      11174987
NCA:[SHE.D]1291035AA.SHE;1      11183700
NCA:[FR2.I]1291035BA.FR2;1      11183704
NCA:[SHO.G]1291035FA.SHO;1      11183715
NCA:[SHO.G]1291154TA.SHO;1      11188499
NCA:[FR2.I]1291304KA.FR2;1      11192671
NCA:[SHE.D]1291304KA.SHE;1      11192671
NCA:[SHO.G]1291304MA.SHO;1      11192676
NCA:[SHE.D]1291330QA.SHE;1      11194248
NCA:[SHO.G]1291332QA.SHO;1      11194369
NCA:[FR2.I]1291332SA.FR2;1      11194374
NCA:[SHO.G]1291421RA.SHO;1      11197311
NCA:[SHE.D]1291433LA.SHE;1      11198014
NCA:[SHE.D]1291452TA.SHE;1      11199178
NCA:[SHO.G]1291453AA.SHO;1      11199180
NCA:[SHE.D]1291720BA.SHE;1      11208005
NCA:[SHE.D]1291841FA.SHE;1      11212876
NCA:[SHE.D]1291929KA.SHE;1      11215772
NCA:[SHE.D]1291958PA.SHE;1      11217527
NCA:[SHE.D]1292002CA.SHE;1      11217727
NCA:[SHE.D]1292017NA.SHE;1      11218660
```

APPENDIX C.
Wave forms of earthquakes recorded at three or more stations

APPENDIX C. Waveforms of earthquakes recorded at three or more stations.

List of aftershocks recorded at three or more seismograph stations in the Cape Mendocino, California area. Seismic records were identified by a computer algorithm that found multiple triggers in a 20–s sliding–time window. Earthquakes are listed by the start time of the earliest associated record (Julian day, hour, minute are characters one through seven in the filename). Records (for a given three–letter station code) are indicated by the corresponding second–bin character, i.e., character eight in the filename – A = 0.000 – 2.999, B = 3.000 – 5.999, ...T = 57.000 – 59.999.

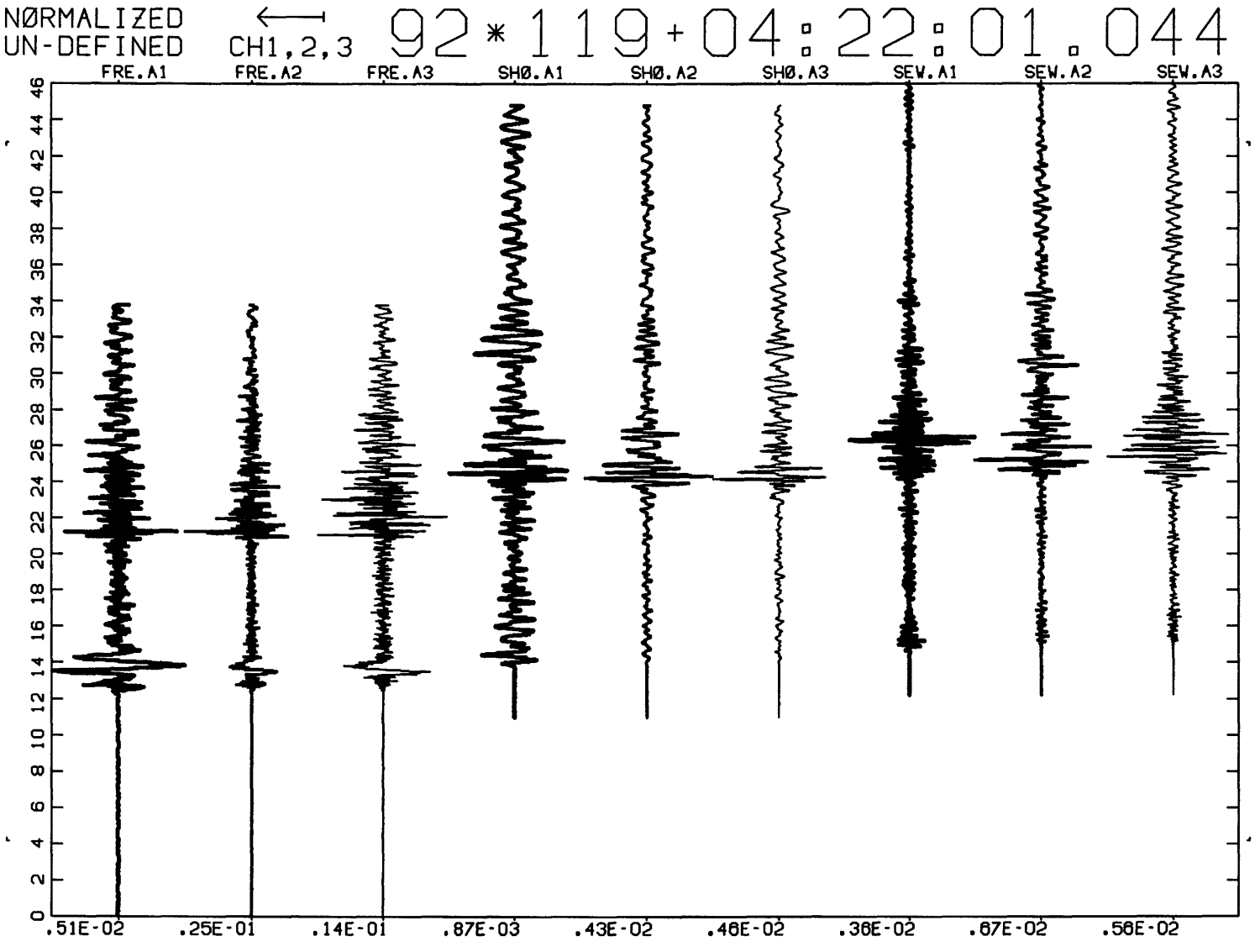
The computer algorithm also extracted hypocenter information for associated earthquakes from U.S. Geological Survey, Menlo Park summary files. The hypocenter data were provided by Andrew Michael and are listed in a modified HYPOINVERSE format. We used versions of the summary files that were current at the time of writing this report in August 1992. These hypocenters will be refined during the lifetime of this report and are provided here only to help readers make preliminary correlations between earthquakes and seismograph recordings.

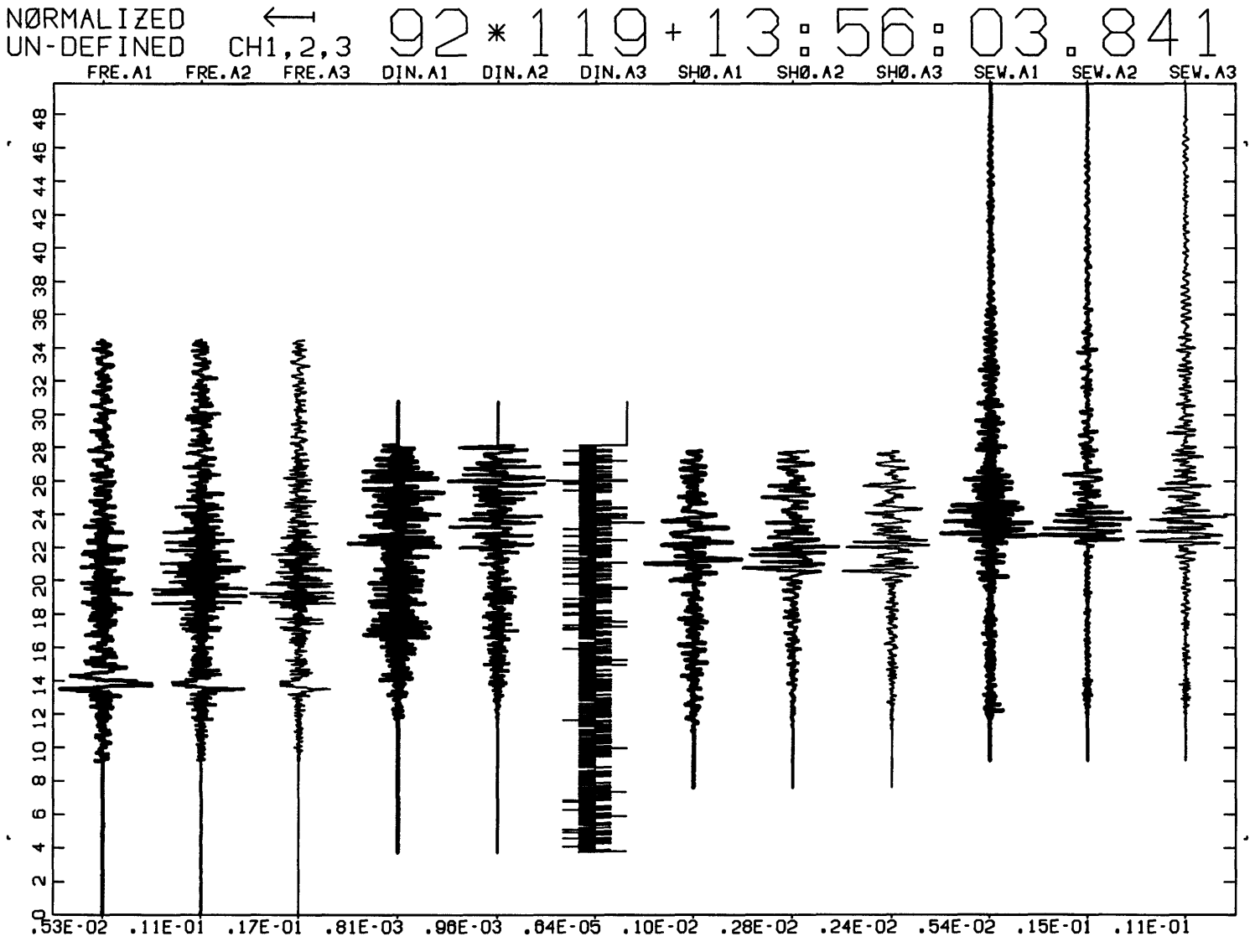
Three components are plotted for each station that recorded the aftershock. The traces are identified on the right by station name and component. A1 is the vertically oriented component, A2 is horizontally oriented North; A3 is horizontally oriented East. The peak velocity (expressed in cm/s) of the trace is shown in the left margin. All traces for each event are plotted at the same scale. Time proceeds from left to right and the numbers indicated below are seconds from the time of the first sample of the record.

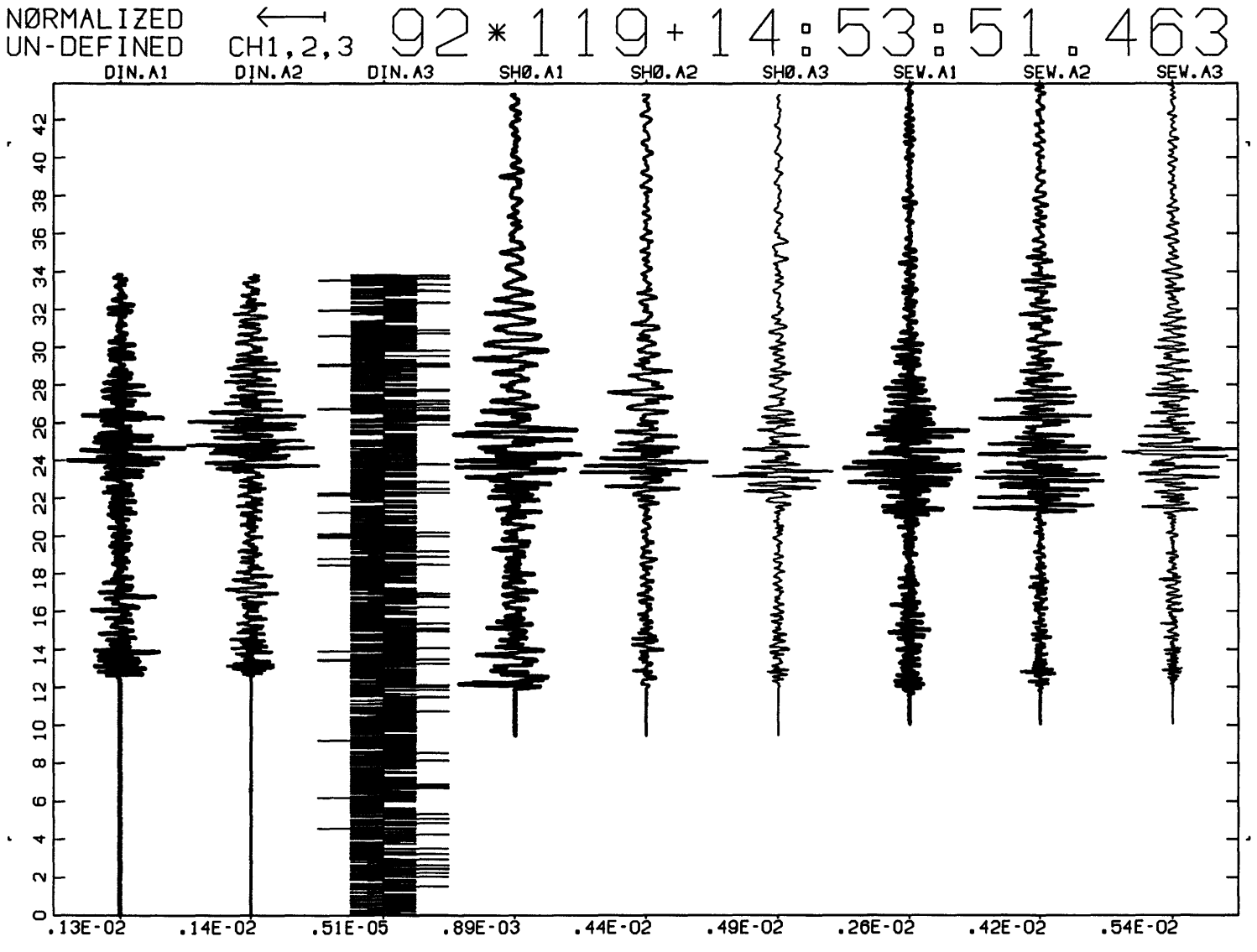
List of associated earthquakes (recorded at three or more stations)

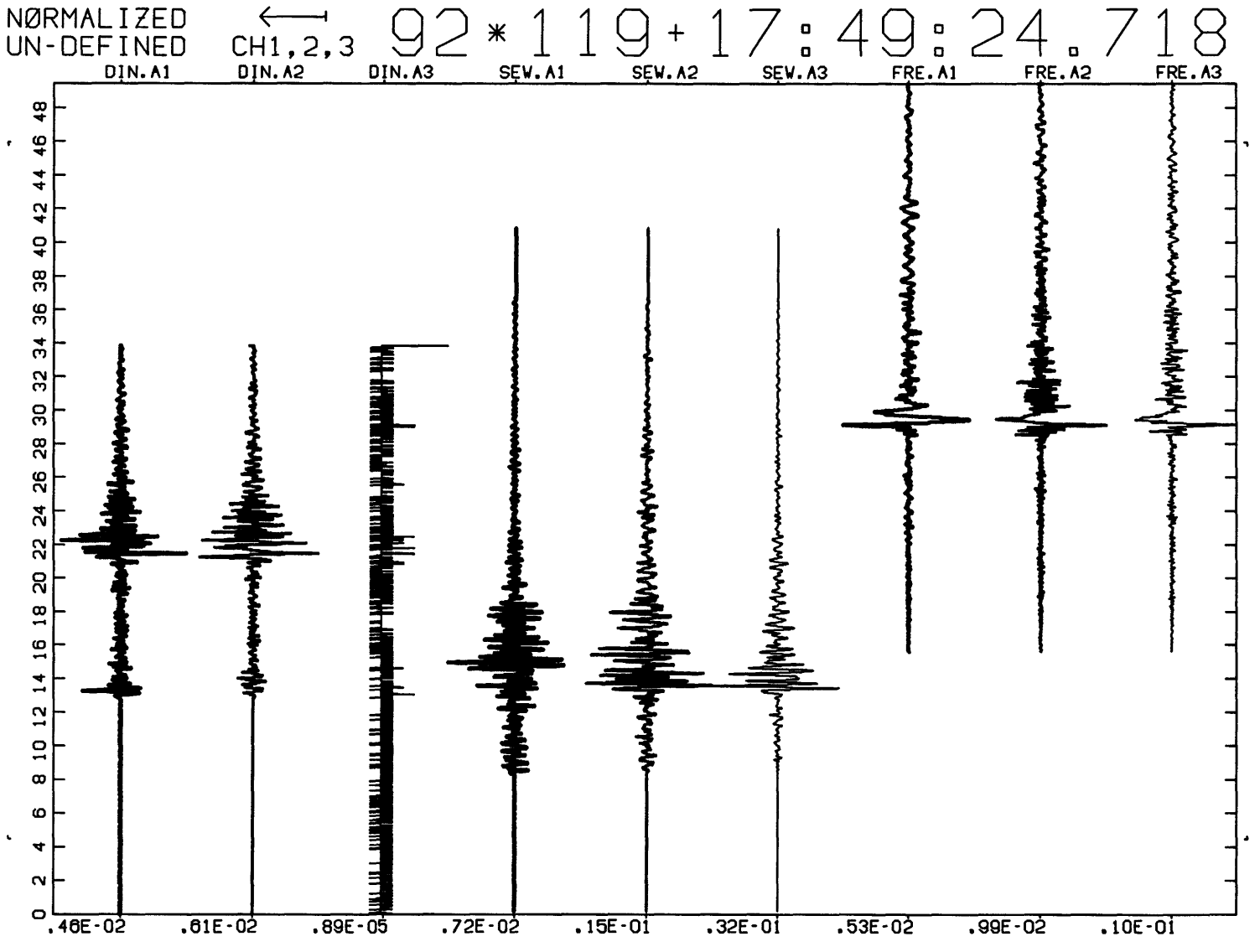
EVENT	MAG	DI2	DIN	FR2	FRE	SEW	SHE	SHO
1190422					A	E		E
1191356			C		B	E		D
1191453			R			A		A
1191749			I		N	I		
1191838			I		H	M		L
1210219	3.1	D		F			D	G
1210840		H		G			I	J
1210953		I		H			G	I
1211029		B		S			P	
1220403	3.1			Q		S	P	R
1220409	2.9			P		P		Q
1220415				O		Q	L	Q
1221542				S		C	R	B
1222241				R			Q	S
1230941		R		N			N	O
1231130		O		J		O	I	L
1231208	3.1			G			F	H
1231518				N			K	O
1242003		I		D				D
1250002		T		O				P
1250013		K		I				J
1250033		S		R				S
1250035		R		P				Q
1250159		G		F				F
1250506		G		F				G
1250708		G		F		J		F
1250744		N		N		Q		N
1250932		G		F				G
1251953				G			E	H
1252112				I			G	L
1261046		F				F	D	F
1262306		S		P			O	P
1270311		Q		Q				Q
1270733		G		C				F
1271045		G		C				D
1271747		E		C				D
1271926				C			T	D
1281651				F			D	I
1282142	2.8			M			L	N
1282308				F			D	H
1290513				S			Q	T
1291035				B			A	F
1291304	2.0			K			K	M

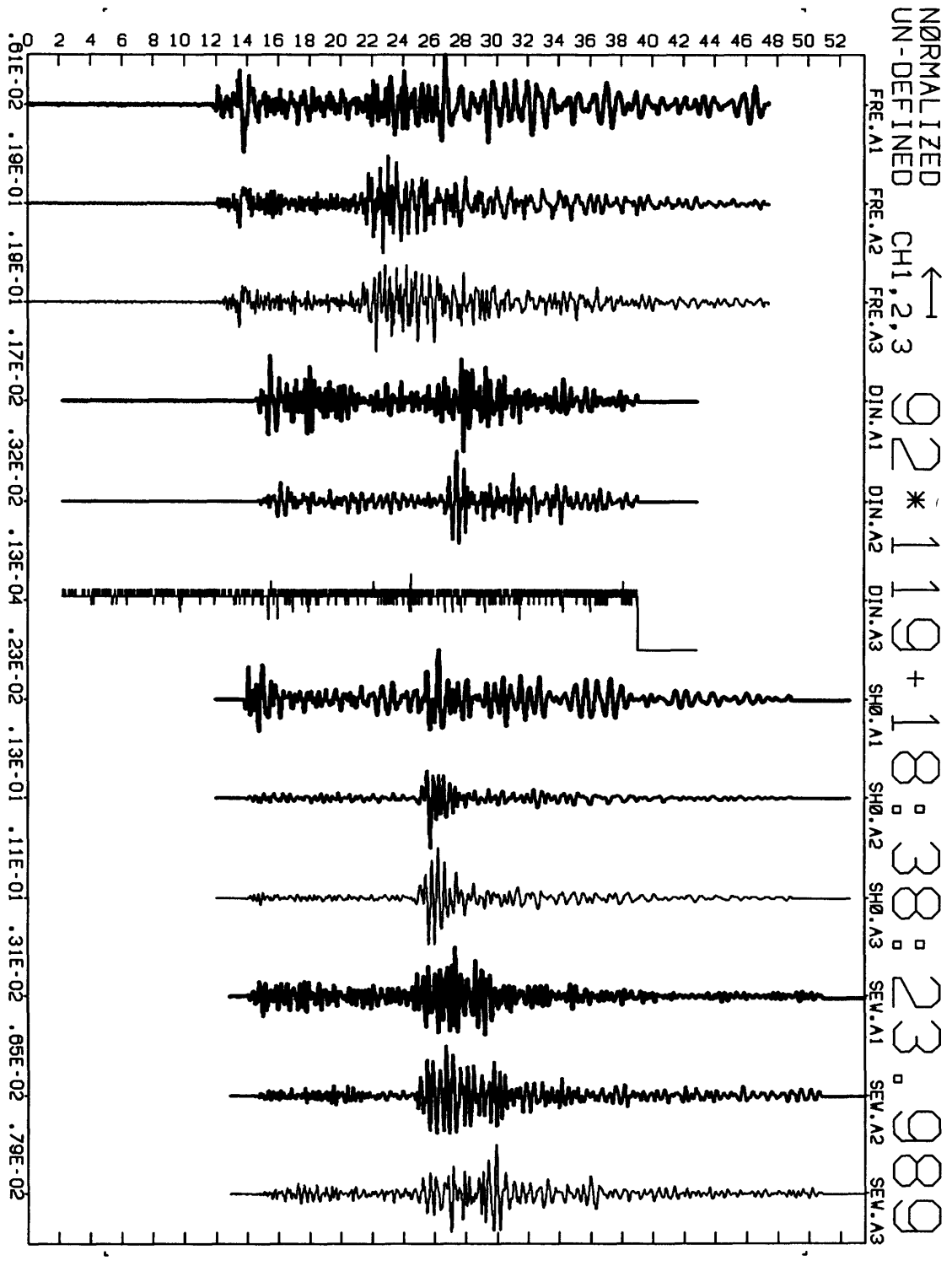
	DI2	DIN	FR2	FRE	SEW	SHE	SHO
9204300219089840	1959124–2722	766	0	13261	15	11 9120	16521253	6731MEN	37	0
9205010403452140	1887124–2570	2049	0	14249	13	7257 9	14416231	4331MEN	35	0
9205010409405840	1851124–1587	854	0	13133	8	1925229	95 6860	6429MEN	42	0
9205021208157840	2153124–2225	1543	0	22216	13	1926515	9914363	4331MEN	38	0
9205072142307540	1847124–3090	3092	0	9268	19	625134	31111446	11028MEN	58	0
9205081304278340	2569124–2297	840	0	8245	21	1110734	19425651	11220MEN	50	0

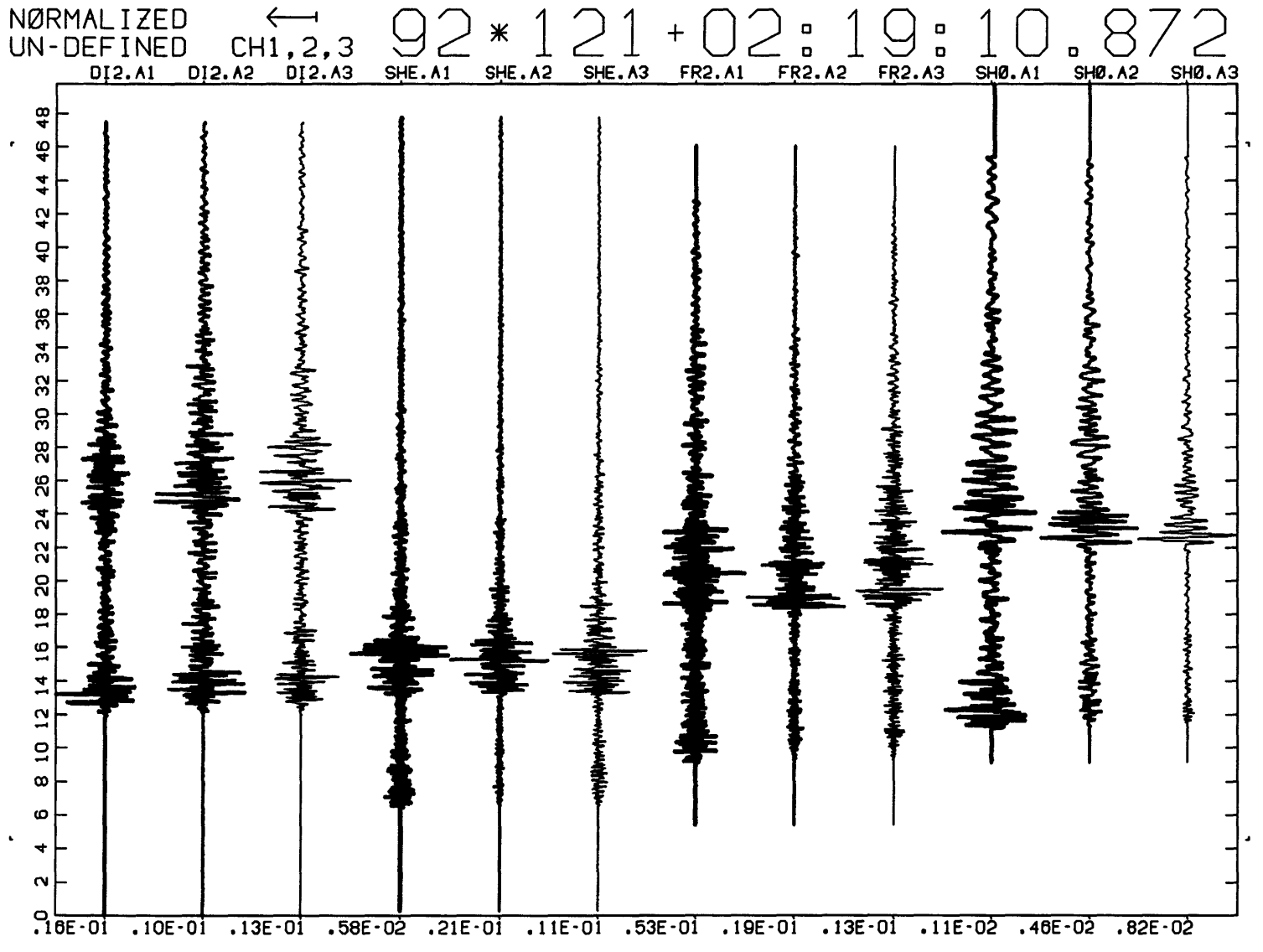

NØRMALIZED
UN-DEFINED
CH1,2,3
92*119+04:22:01.044
FRE.A1
FRE.A2
FRE.A3
SHØ.A1
SHØ.A2
SHØ.A3
SEW.A1
SEW.A2
SEW.A3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
.51E-02
.25E-01
.14E-01
.87E-03
.43E-02
.46E-02
.36E-02
.67E-02
.56E-02

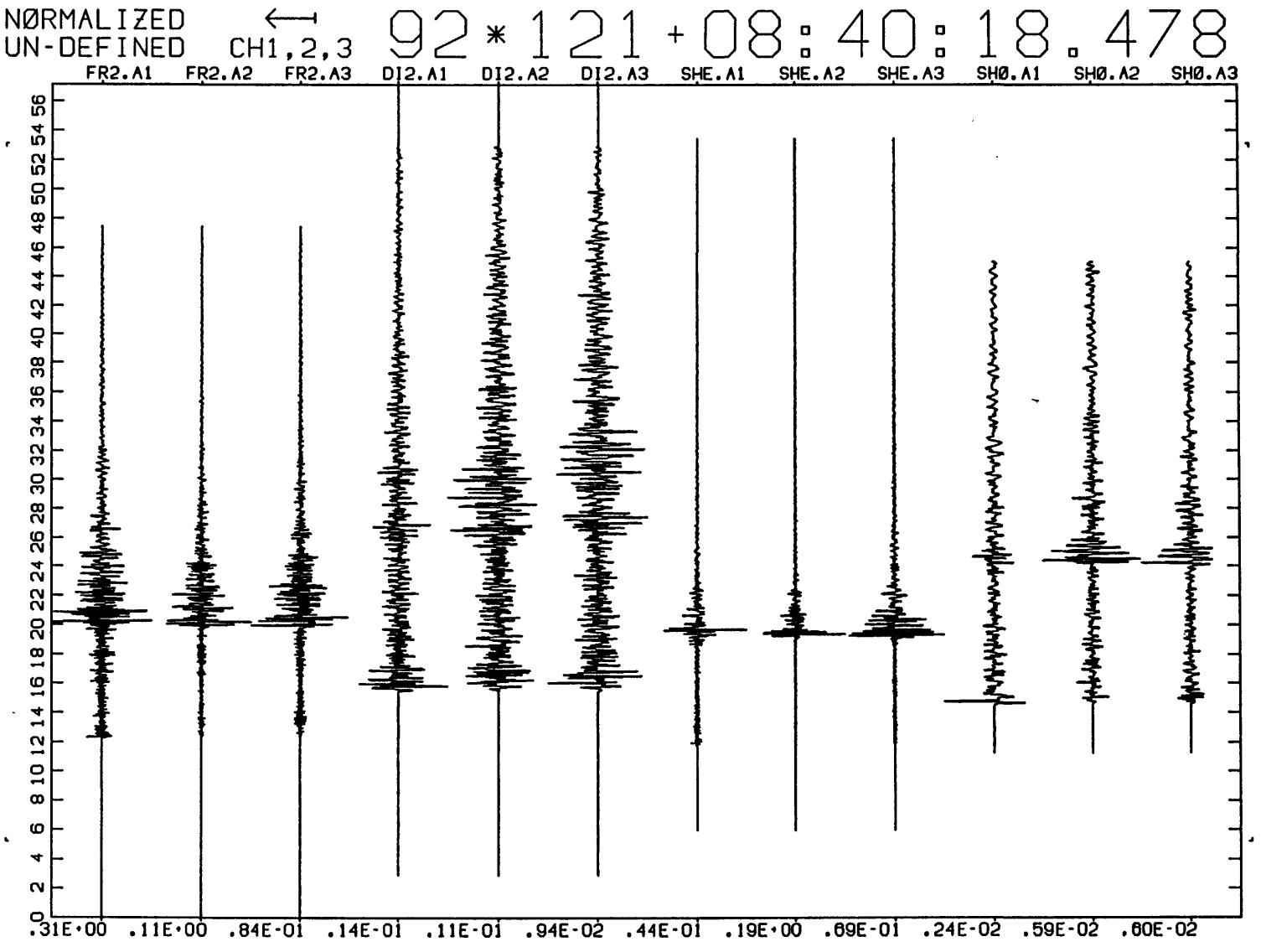

NØRMALIZED
UN-DEFINED
CH1,2,3
92*119+13:56:03.841
FRE.A1
FRE.A2
FRE.A3
DIN.A1
DIN.A2
DIN.A3
SHØ.A1
SHØ.A2
SHØ.A3
SEW.A1
SEW.A2
SEW.A3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
.53E-02
.11E-01
.17E-01
.81E-03
.96E-03
.64E-05
.10E-02
.28E-02
.24E-02
.54E-02
.15E-01
.11E-01

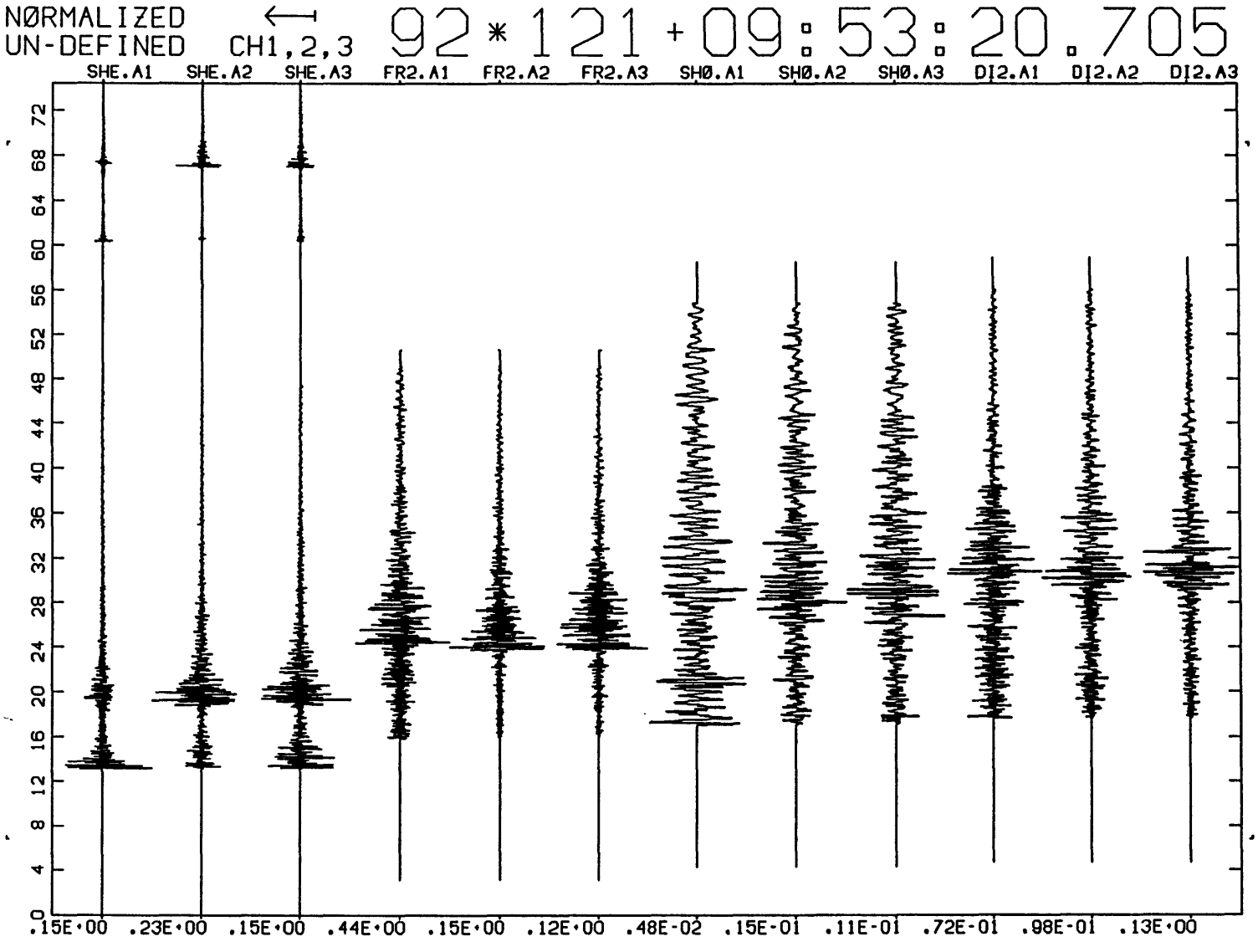

NORMALIZED
UN-DEFINED
CH1,2,3
92*119+14:53:51.463
DIN.A1
DIN.A2
DIN.A3
SH0.A1
SH0.A2
SH0.A3
SEW.A1
SEW.A2
SEW.A3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
.13E-02
.14E-02
.51E-05
.89E-03
.44E-02
.49E-02
.26E-02
.42E-02
.54E-02

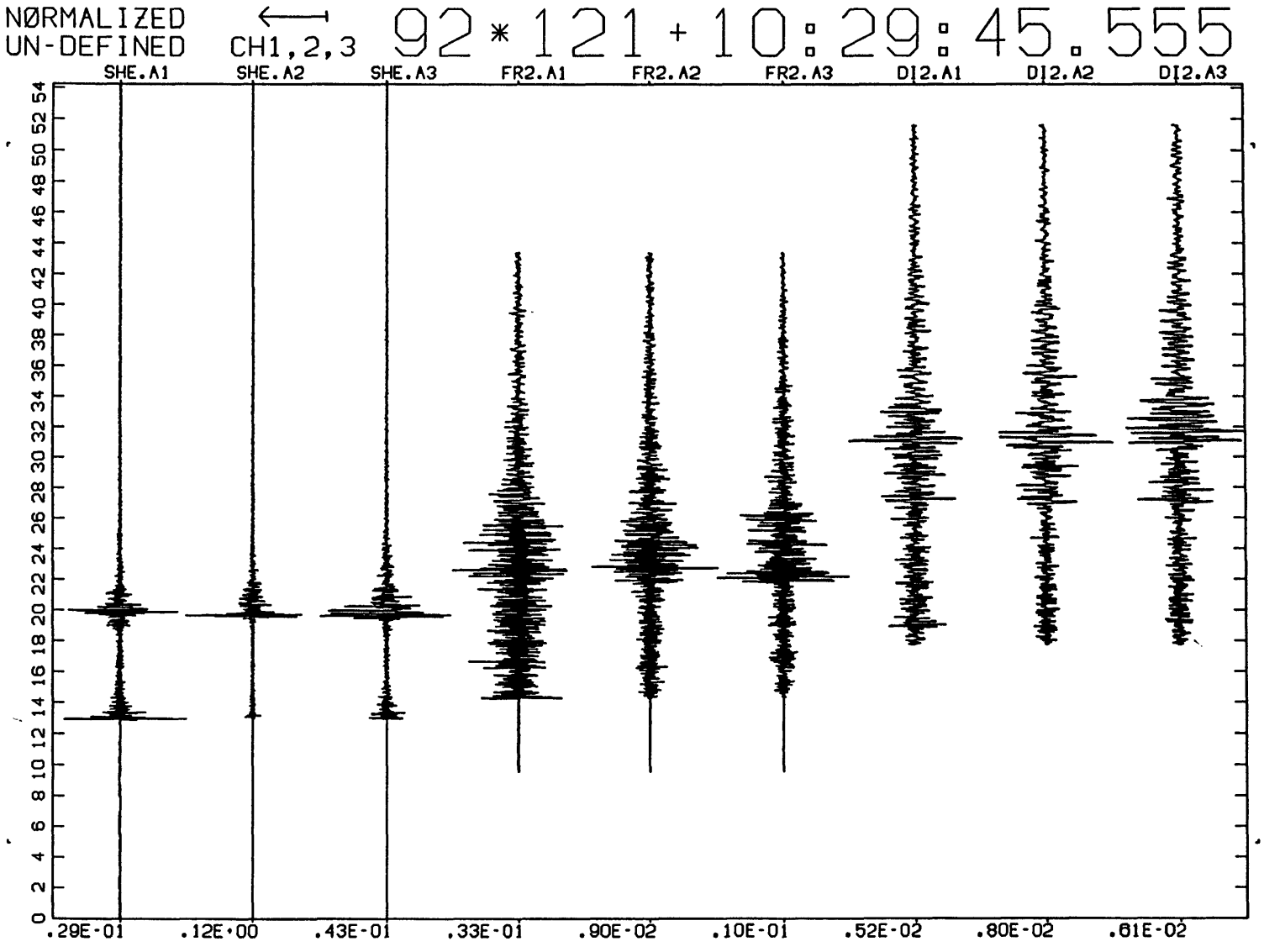

NORMALIZED
UN-DEFINED
CH1,2,3
92*119+17:49:24.718
DIN.A1
DIN.A2
DIN.A3
SEW.A1
SEW.A2
SEW.A3
FRE.A1
FRE.A2
FRE.A3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
.46E-02
.61E-02
.89E-05
.72E-02
.15E-01
.32E-01
.53E-02
.99E-02
.10E-01

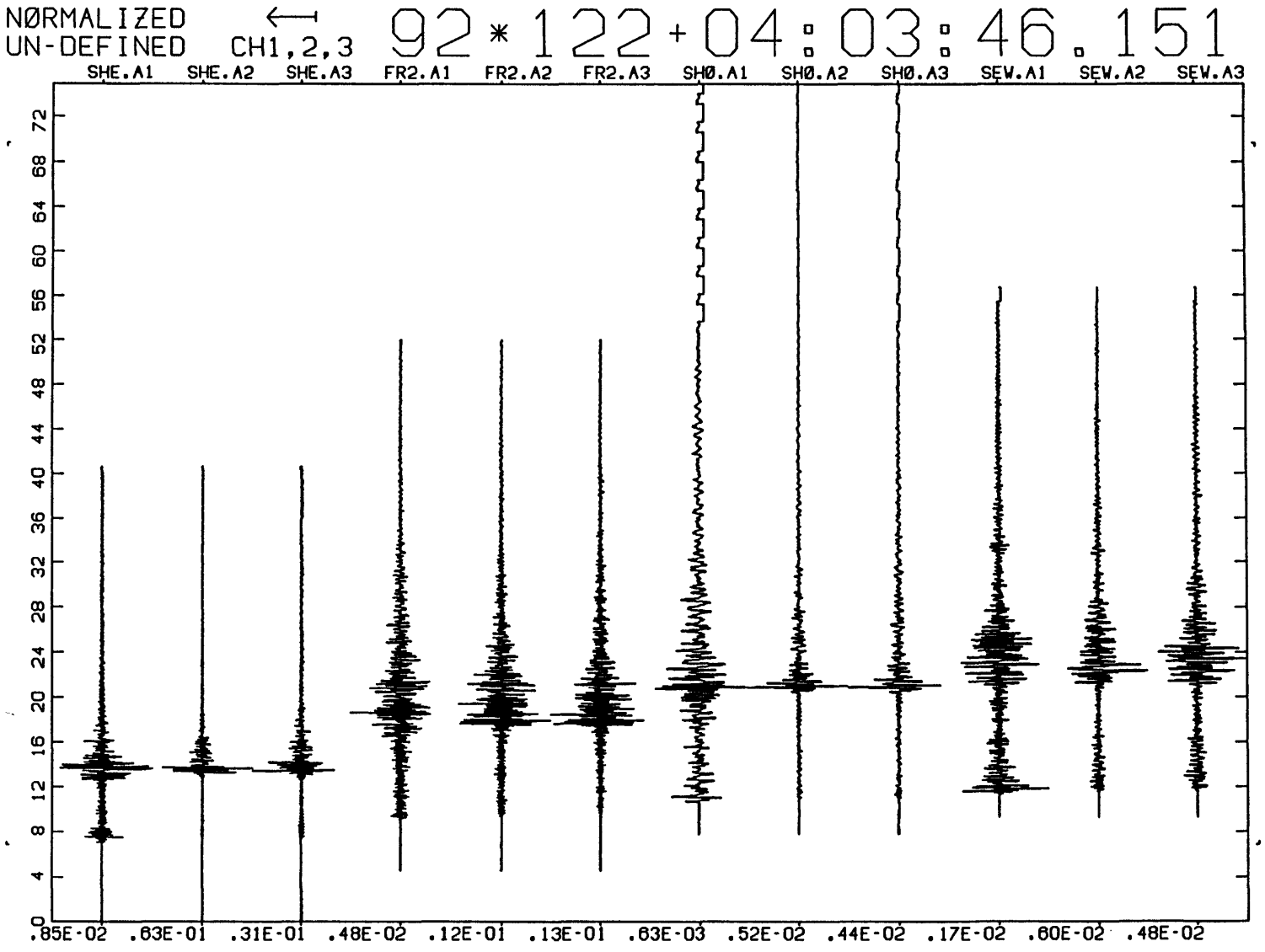

NORMALIZED
UN-DEFINED
CH1,2,3
92*119+18.38.23.989
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52
.61E-02
.19E-01
.19E-01
.17E-02
.32E-02
.13E-04
.23E-02
.13E-01
.11E-01
.31E-02
.65E-02
.79E-02
FRE.A1
FRE.A2
FRE.A3
DIN.A1
DIN.A2
DIN.A3
SH0.A1
SH0.A2
SH0.A3
SEW.A1
SEW.A2
SEW.A3

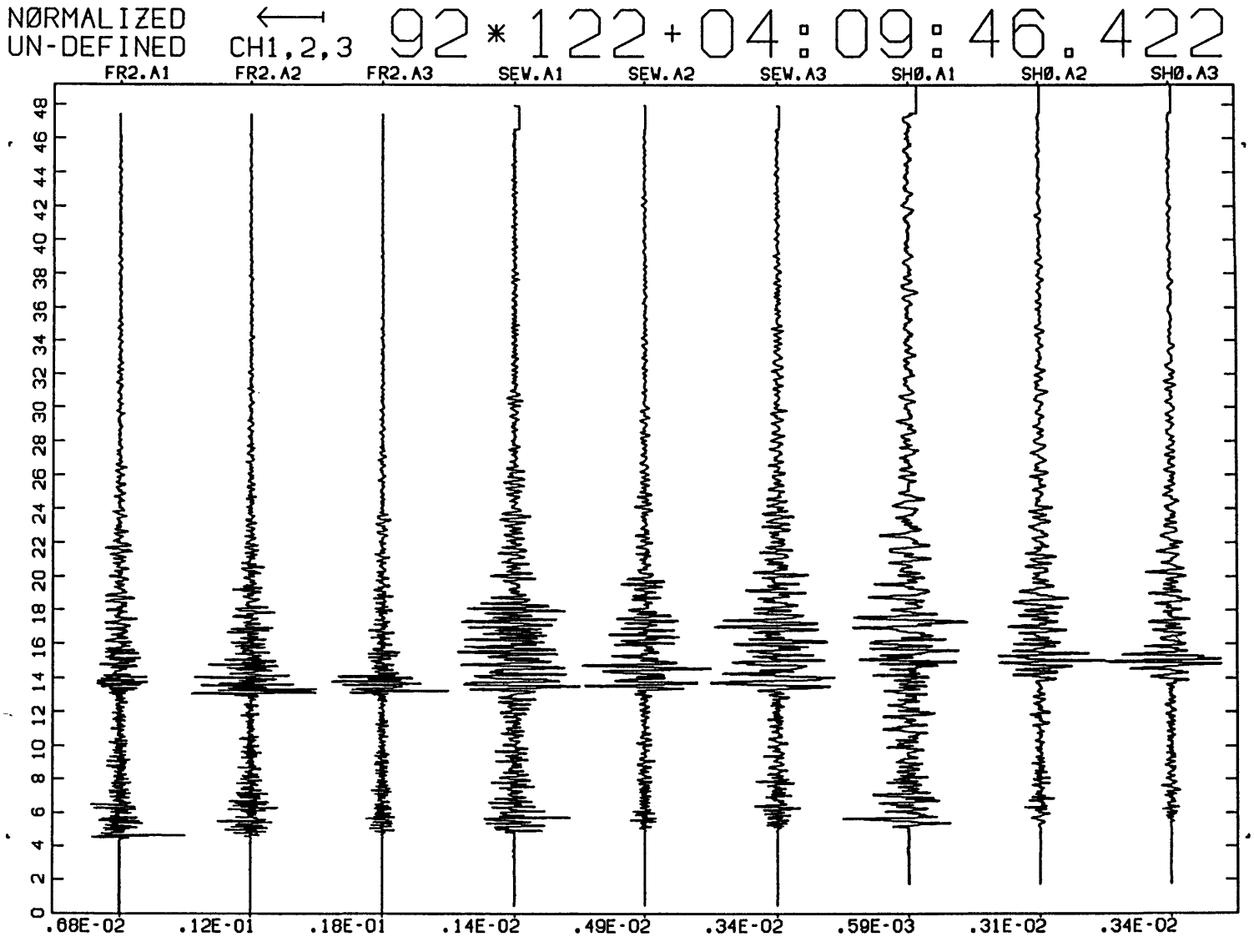

NØRMALIZED
UN-DEFINED
CH1,2,3
92*121+02:19:10.872
DI2.A1
DI2.A2
DI2.A3
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
.16E-01
.10E-01
.13E-01
.58E-02
.21E-01
.11E-01
.53E-01
.19E-01
.13E-01
.11E-02
.46E-02
.82E-02

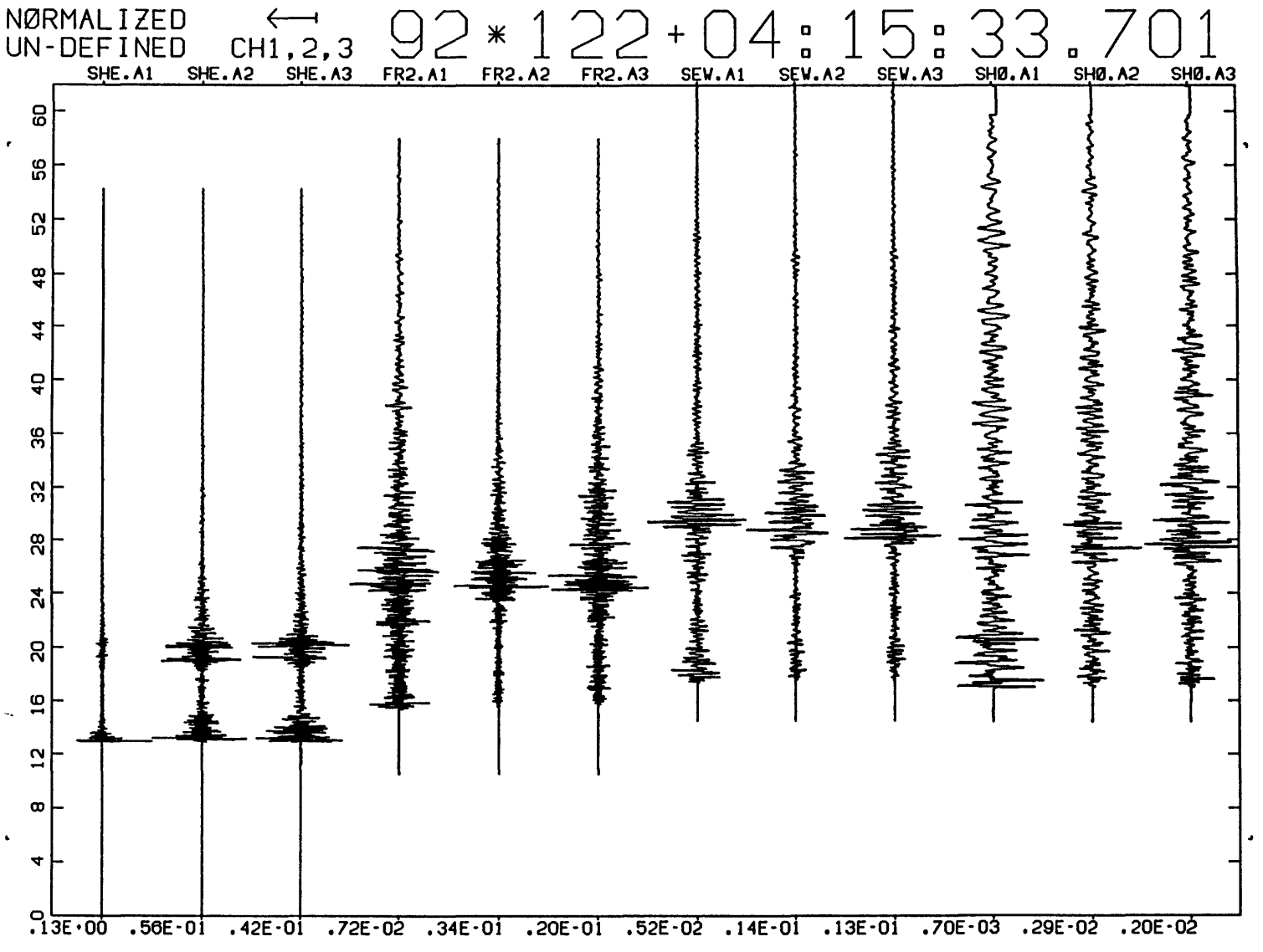

NORMALIZED
UN-DEFINED
CH1,2,3
92*121+08:40:18.478
FR2.A1
FR2.A2
FR2.A3
DI2.A1
DI2.A2
DI2.A3
SHE.A1
SHE.A2
SHE.A3
SH0.A1
SH0.A2
SH0.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56
.31E+00
.11E+00
.84E-01
.14E-01
.11E-01
.94E-02
.44E-01
.19E+00
.69E-01
.24E-02
.59E-02
.60E-02

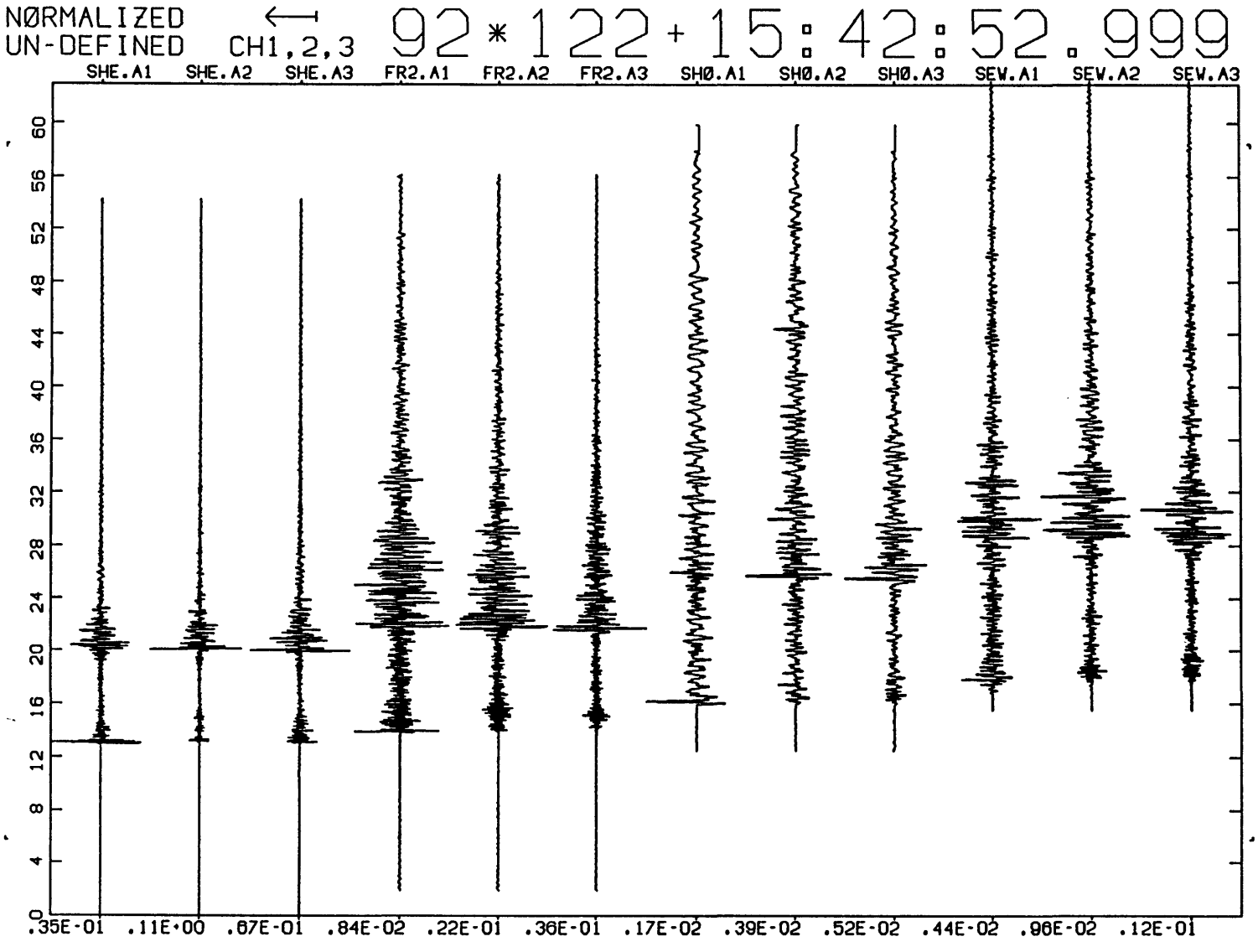

NØRMALIZED
UN-DEFINED
CH1,2,3
92*121+09:53:20.705
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
72
.15E+00
.23E+00
.15E+00
.44E+00
.15E+00
.12E+00
.48E-02
.15E-01
.11E-01
.72E-01
.98E-01
.13E+00

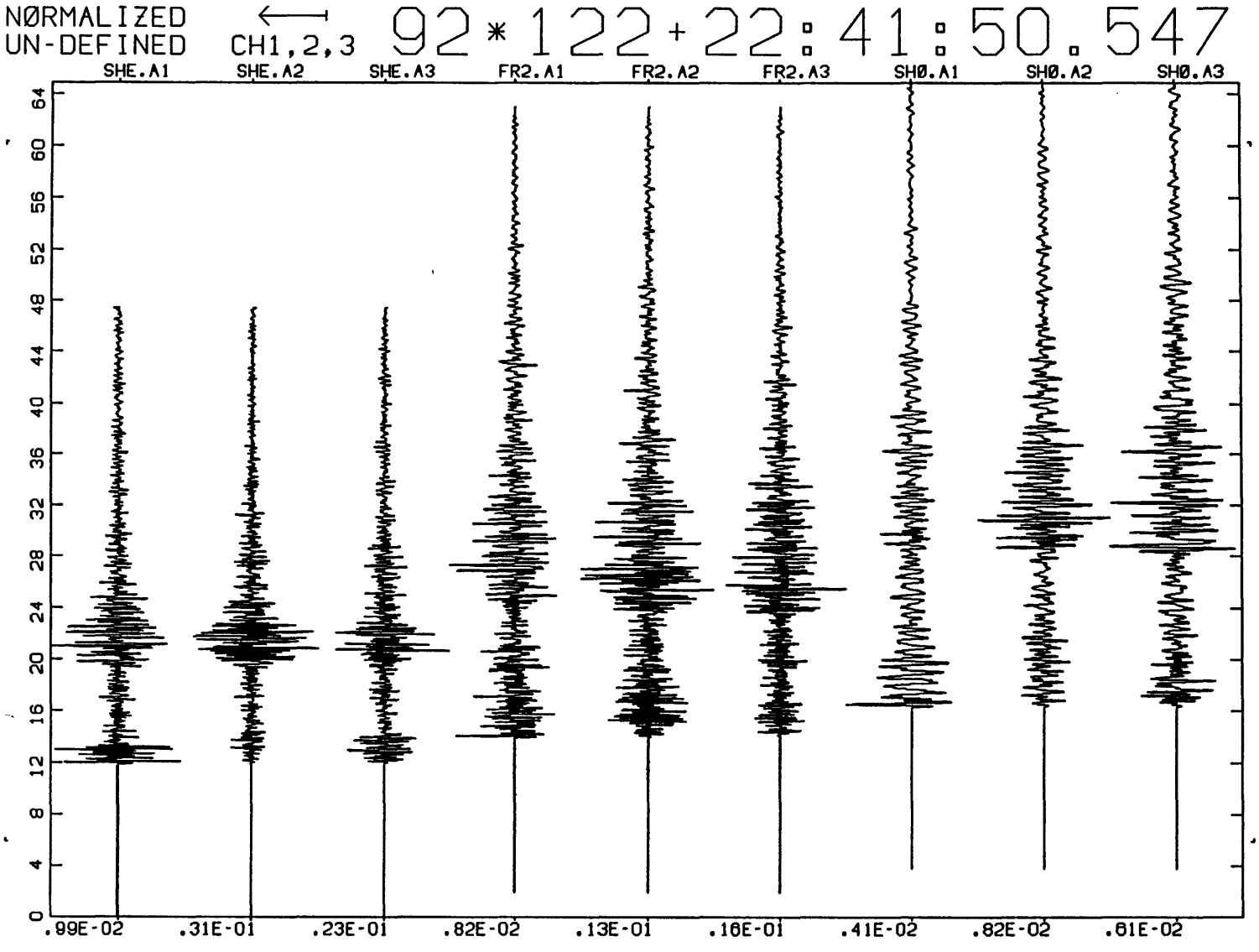

NORMALIZED
UN-DEFINED
CH1,2,3
92*121+10:29:45.555
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
DI2.A1
DI2.A2
DI2.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54
.29E-01
.12E+00
.43E-01
.33E-01
.90E-02
.10E-01
.52E-02
.80E-02
.61E-02

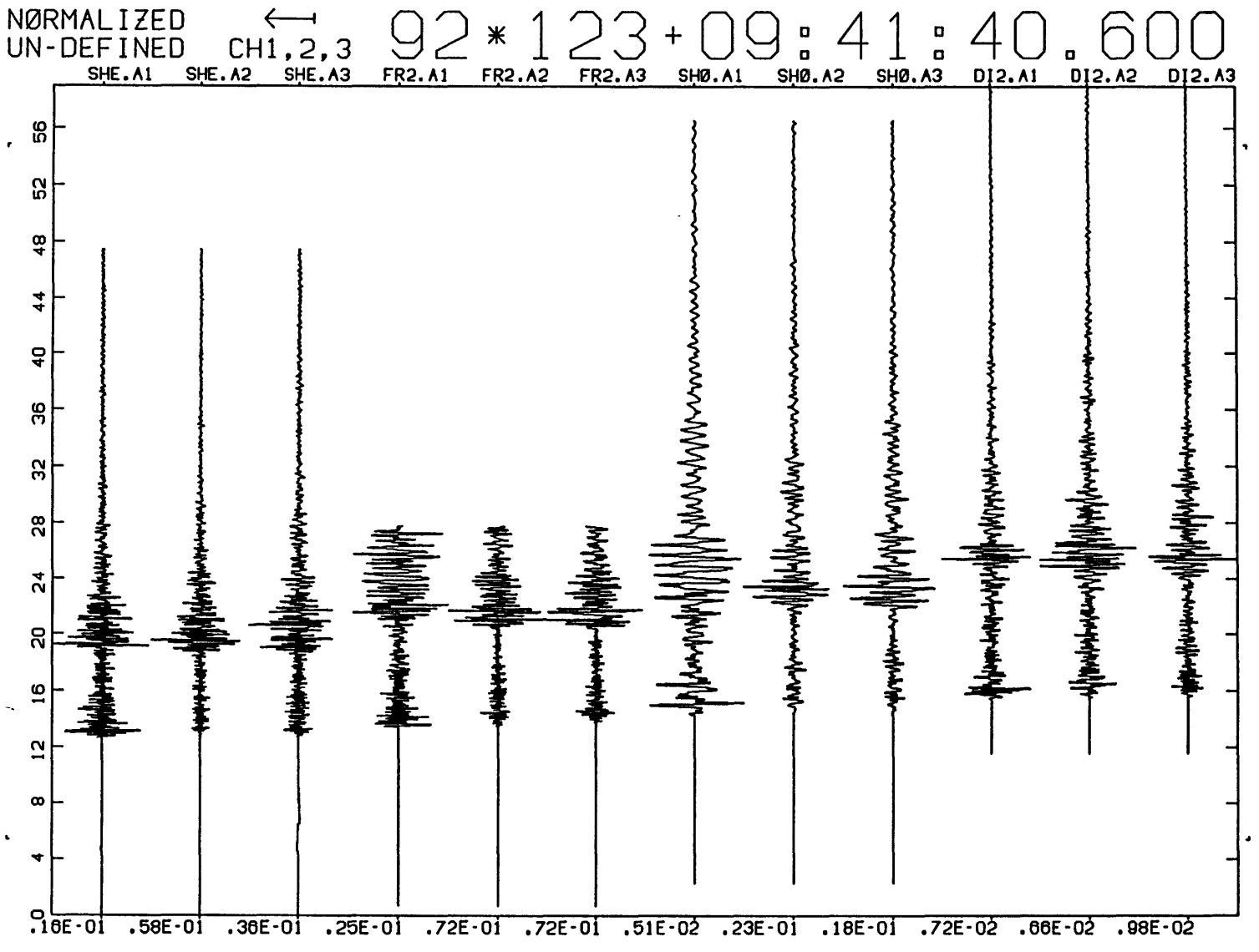

NORMALIZED
UN-DEFINED
CH1,2,3
92*122+04:03:46.151
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
SEW.A1
SEW.A2
SEW.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
72
.85E-02
.63E-01
.31E-01
.48E-02
.12E-01
.13E-01
.63E-03
.52E-02
.44E-02
.17E-02
.60E-02
.48E-02

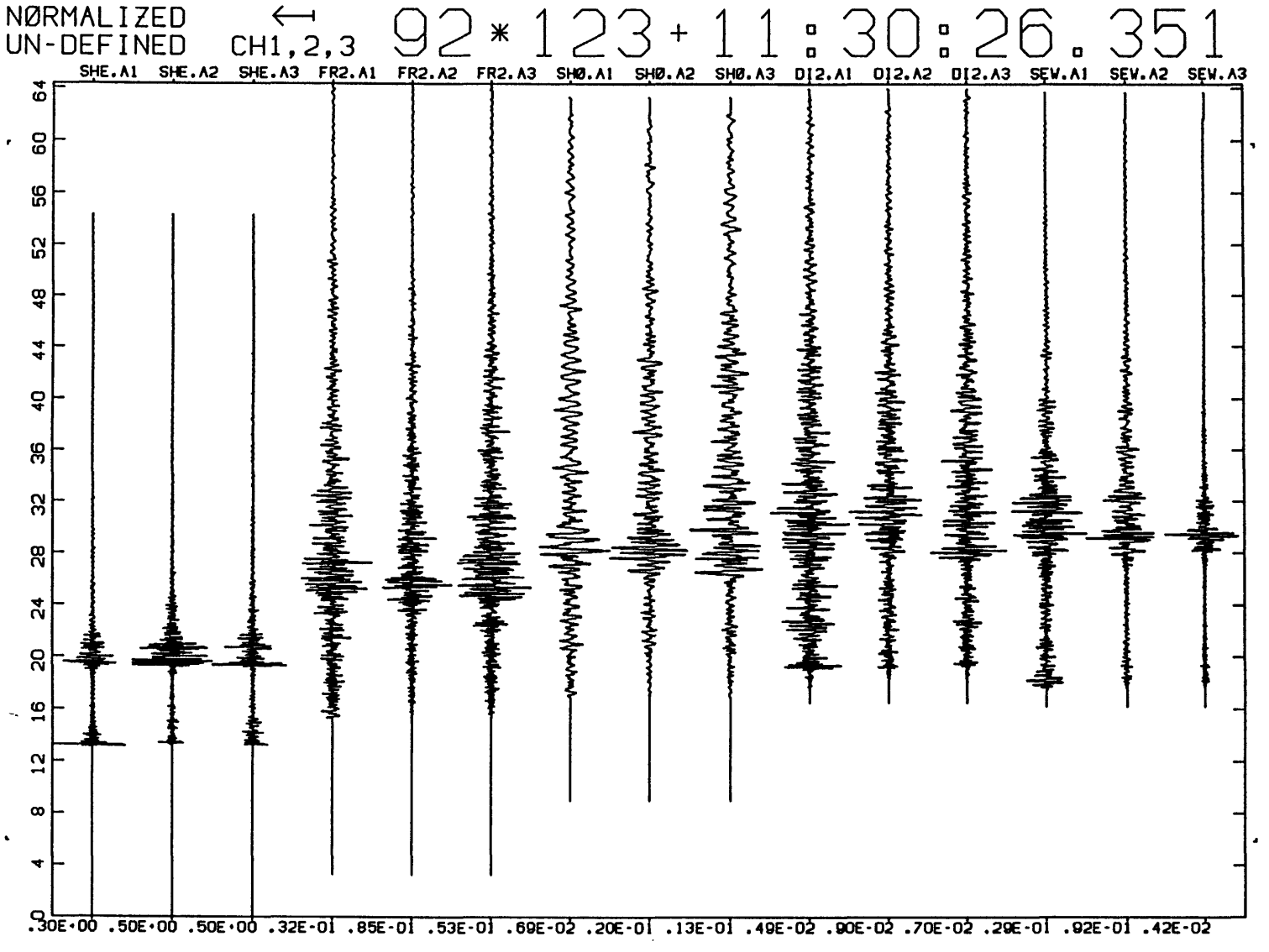

NØRMALIZED
UN-DEFINED
CH1,2,3
92*122+04:09:46.422
FR2.A1
FR2.A2
FR2.A3
SEW.A1
SEW.A2
SEW.A3
SHØ.A1
SHØ.A2
SHØ.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
.68E-02
.12E-01
.18E-01
.14E-02
.49E-02
.34E-02
.59E-03
.31E-02
.34E-02

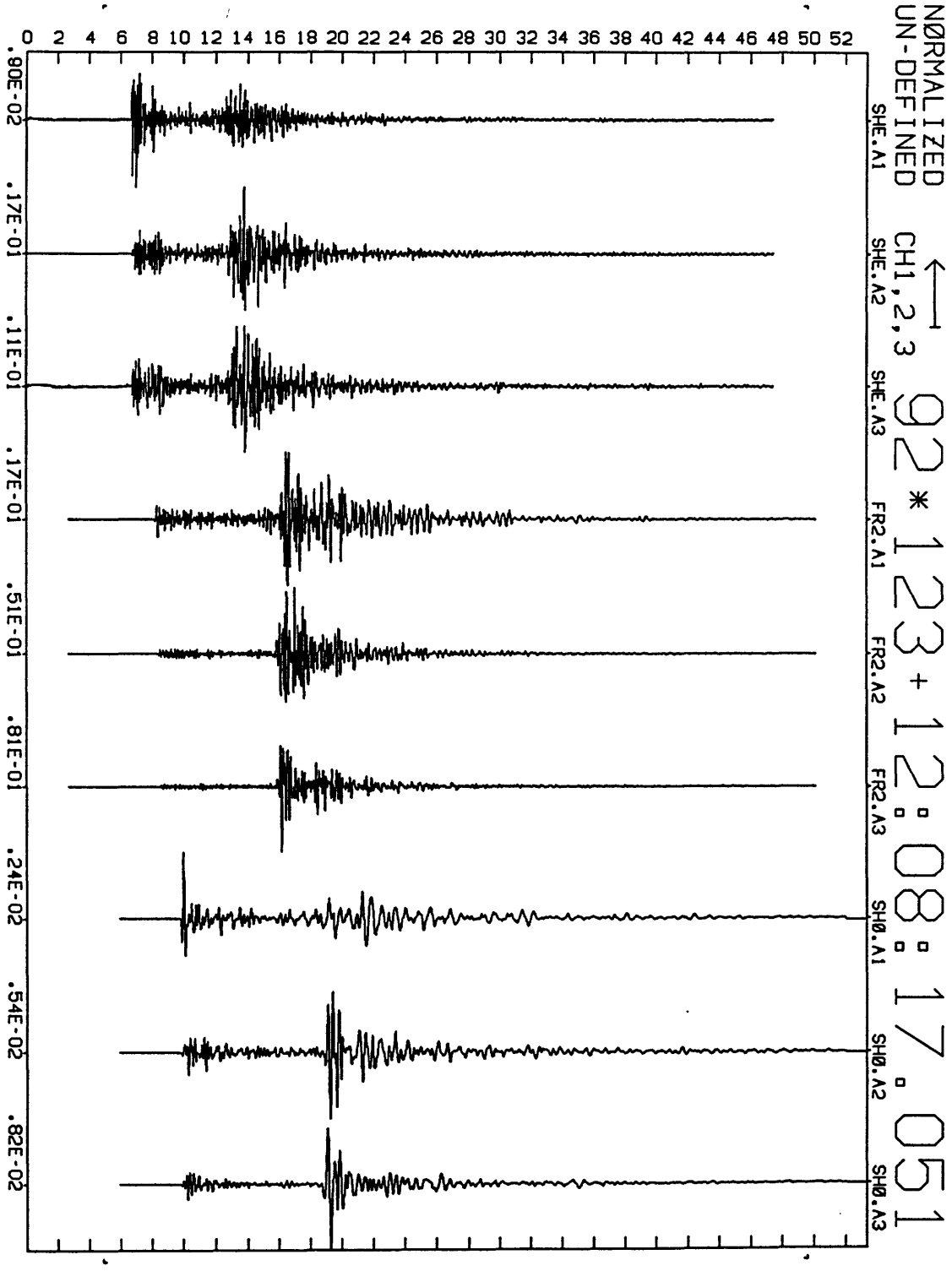

NORMALIZED
UN-DEFINED
CH1,2,3
92*122+04:15:33.701
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SEW.A1
SEW.A2
SEW.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.13E+00
.56E-01
.42E-01
.72E-02
.34E-01
.20E-01
.52E-02
.14E-01
.13E-01
.70E-03
.29E-02
.20E-02

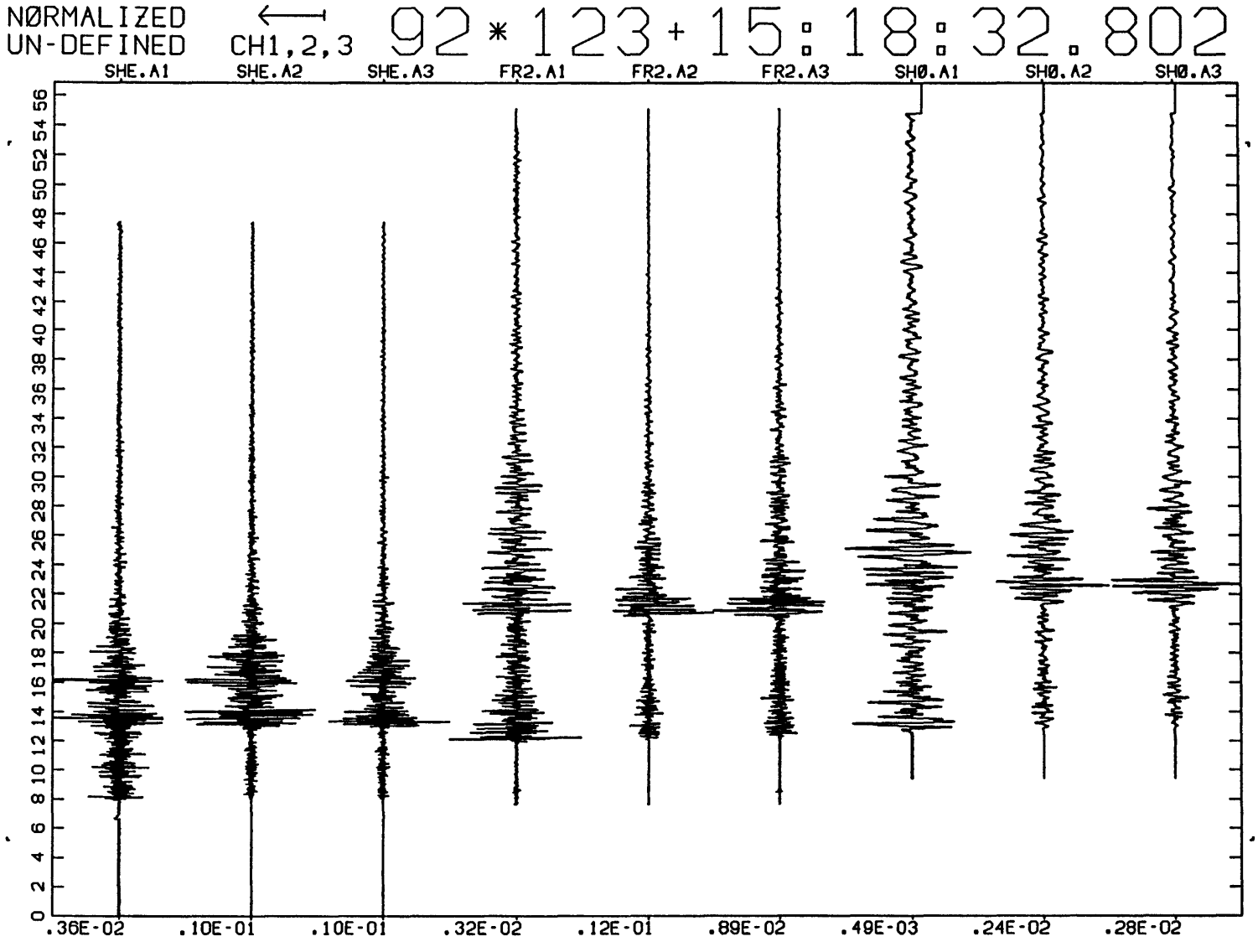

NORMALIZED
UN-DEFINED
CH1,2,3
92*122+15:42:52.999
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
SEW.A1
SEW.A2
SEW.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.35E-01
.11E+00
.67E-01
.84E-02
.22E-01
.36E-01
.17E-02
.39E-02
.52E-02
.44E-02
.96E-02
.12E-01

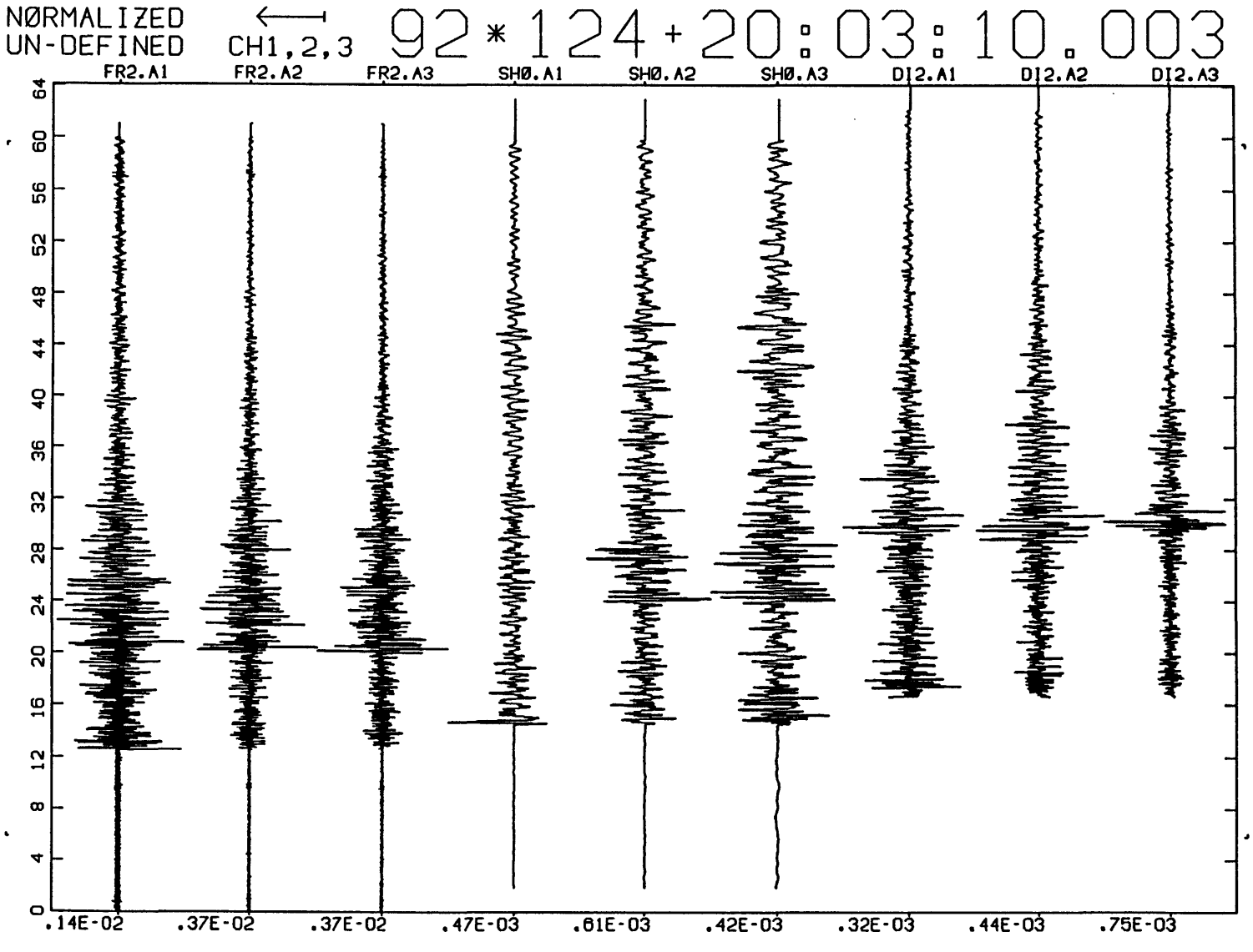

NORMALIZED
UN-DEFINED
CH1,2,3
92*122+22:41:50.547
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
.99E-02
.31E-01
.23E-01
.82E-02
.13E-01
.16E-01
.41E-02
.82E-02
.61E-02

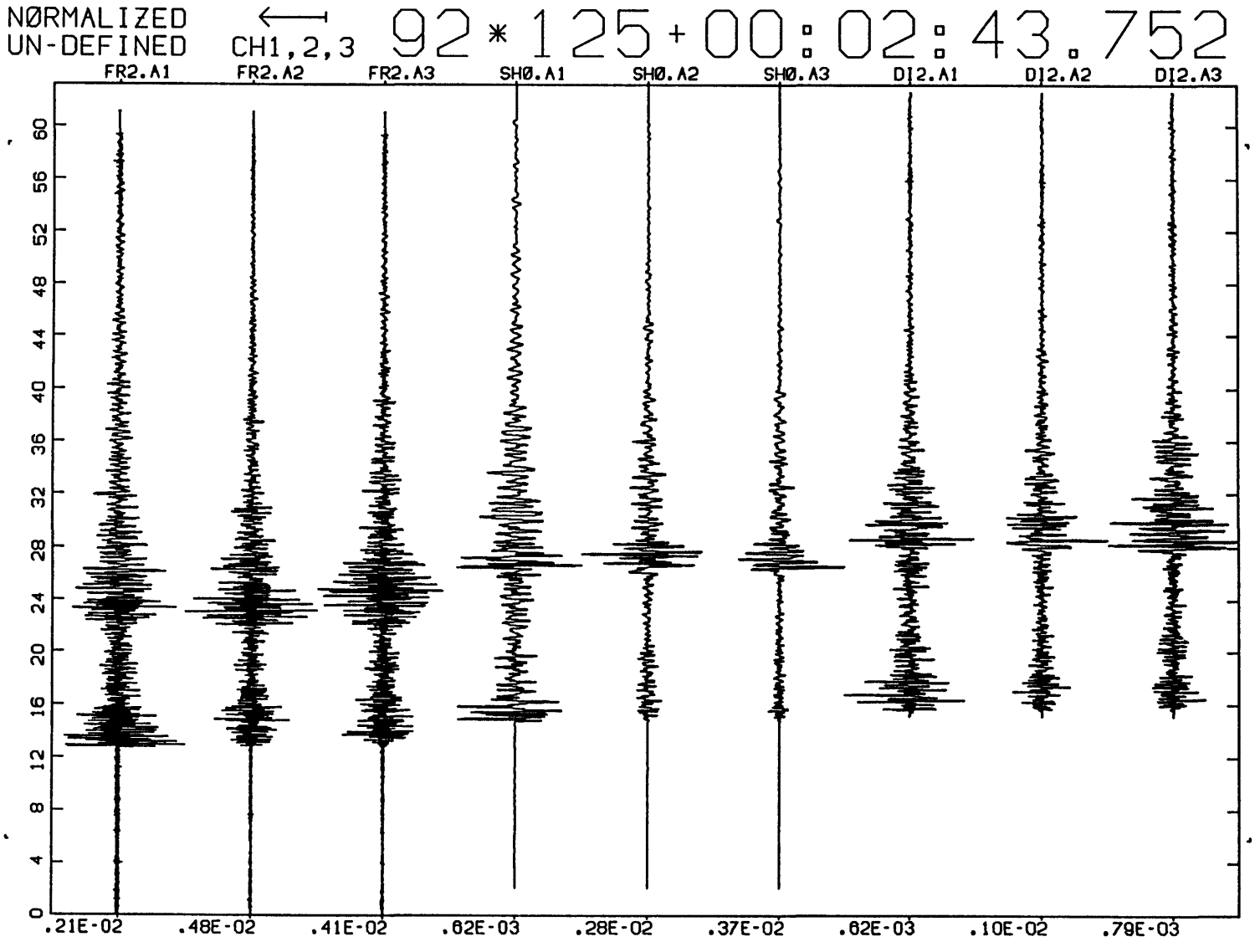

NORMALIZED
UN-DEFINED
CH1,2,3
92*123+09:41:40.600
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
.16E-01
.58E-01
.36E-01
.25E-01
.72E-01
.72E-01
.51E-02
.23E-01
.18E-01
.72E-02
.66E-02
.98E-02

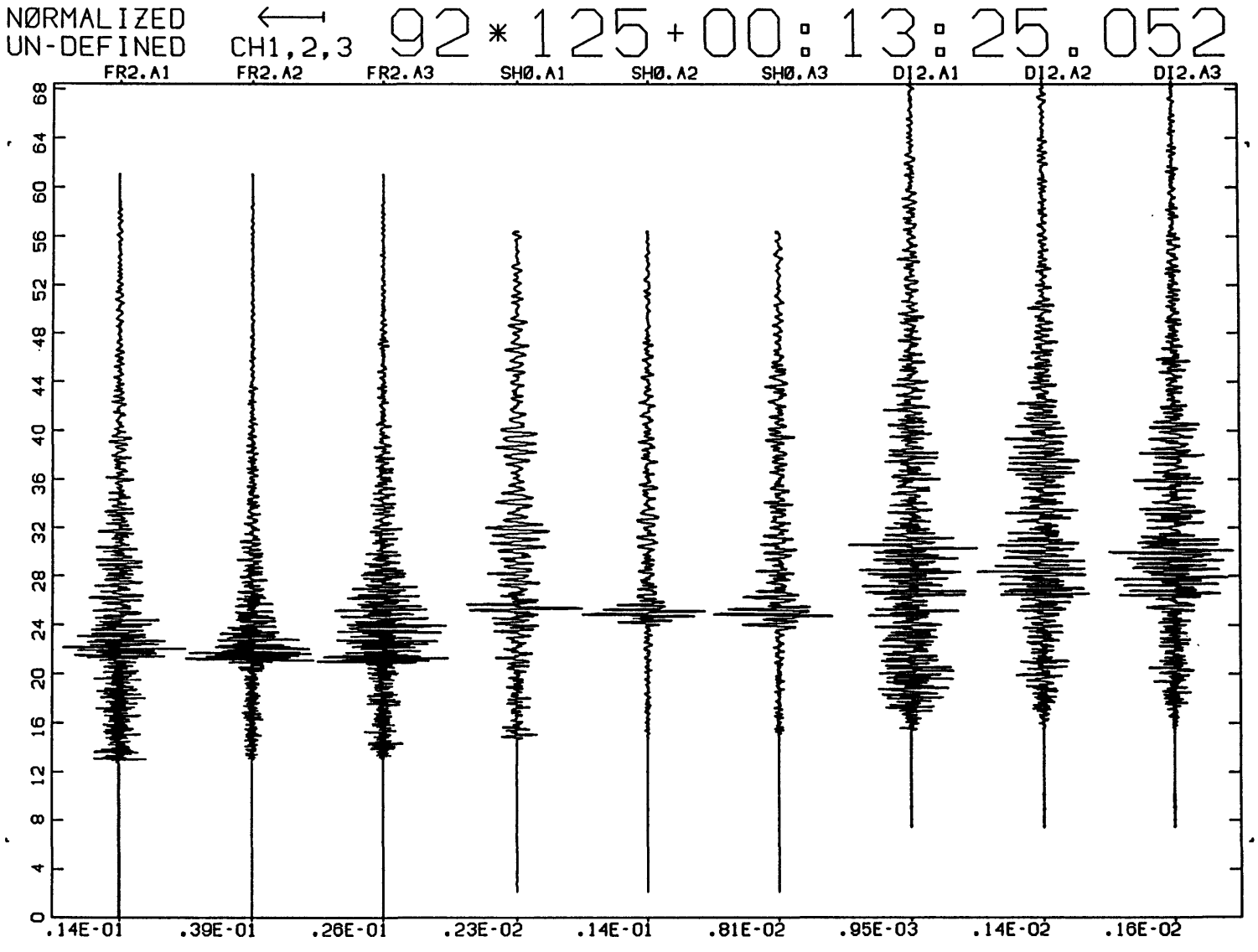

NØRMALIZED
UN-DEFINED
CH1,2,3
92*123+11:30:26.351
SHE.A1 SHE.A2 SHE.A3 FR2.A1 FR2.A2 FR2.A3 SHØ.A1 SHØ.A2 SHØ.A3 DI2.A1 DI2.A2 DI2.A3 SEV.A1 SEV.A2 SEV.A3
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64
.30E+00 .50E+00 .50E+00 .32E-01 .85E-01 .53E-01 .69E-02 .20E-01 .13E-01 .49E-02 .90E-02 .70E-02 .29E-01 .92E-01 .42E-02

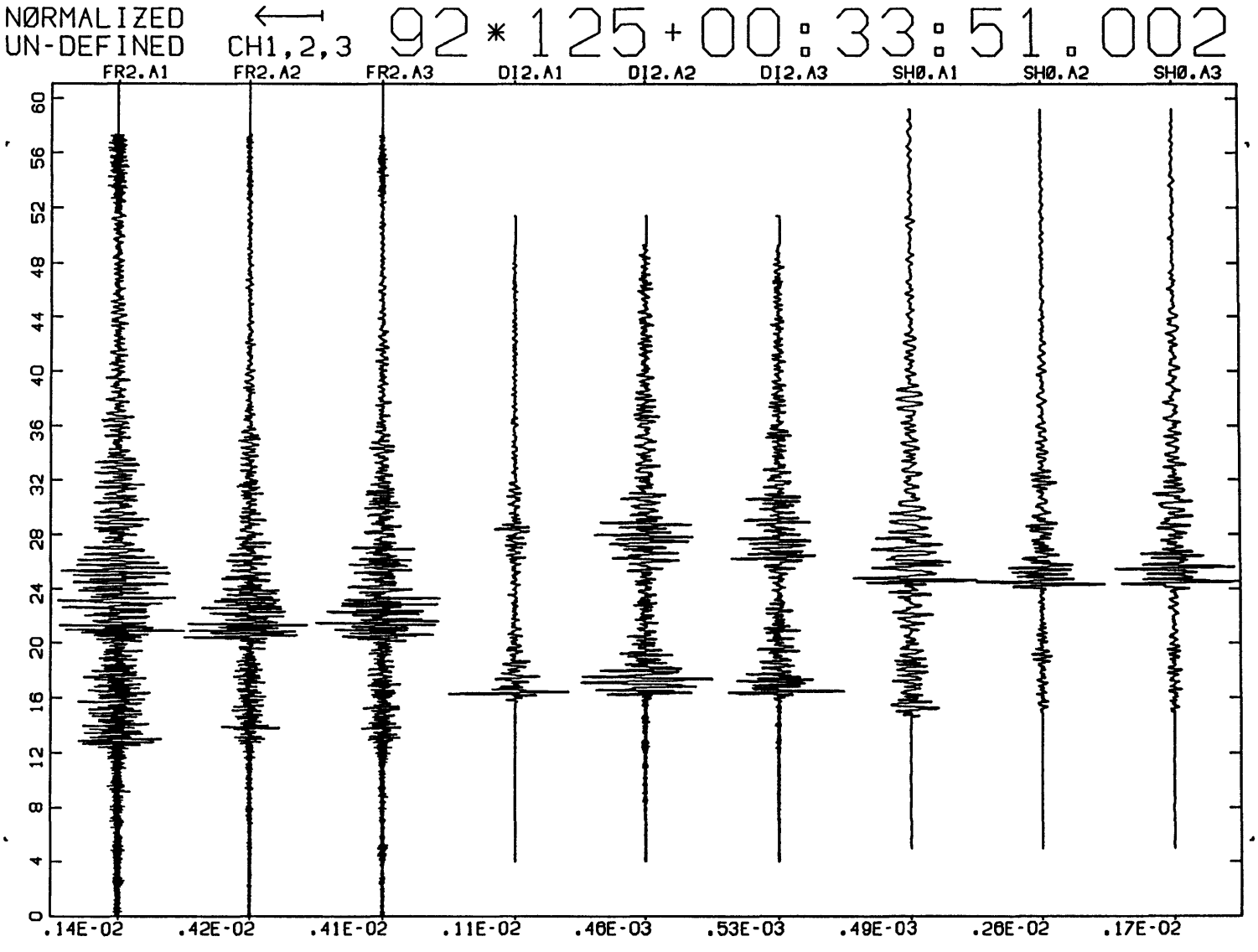

NORMALIZED
UN-DEFINED
CH1,2,3
92 * 123 + 12:08:17.051
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52
.90E-02
.17E-01
.11E-01
.17E-01
.51E-01
.81E-01
.24E-02
.54E-02
.82E-02
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3

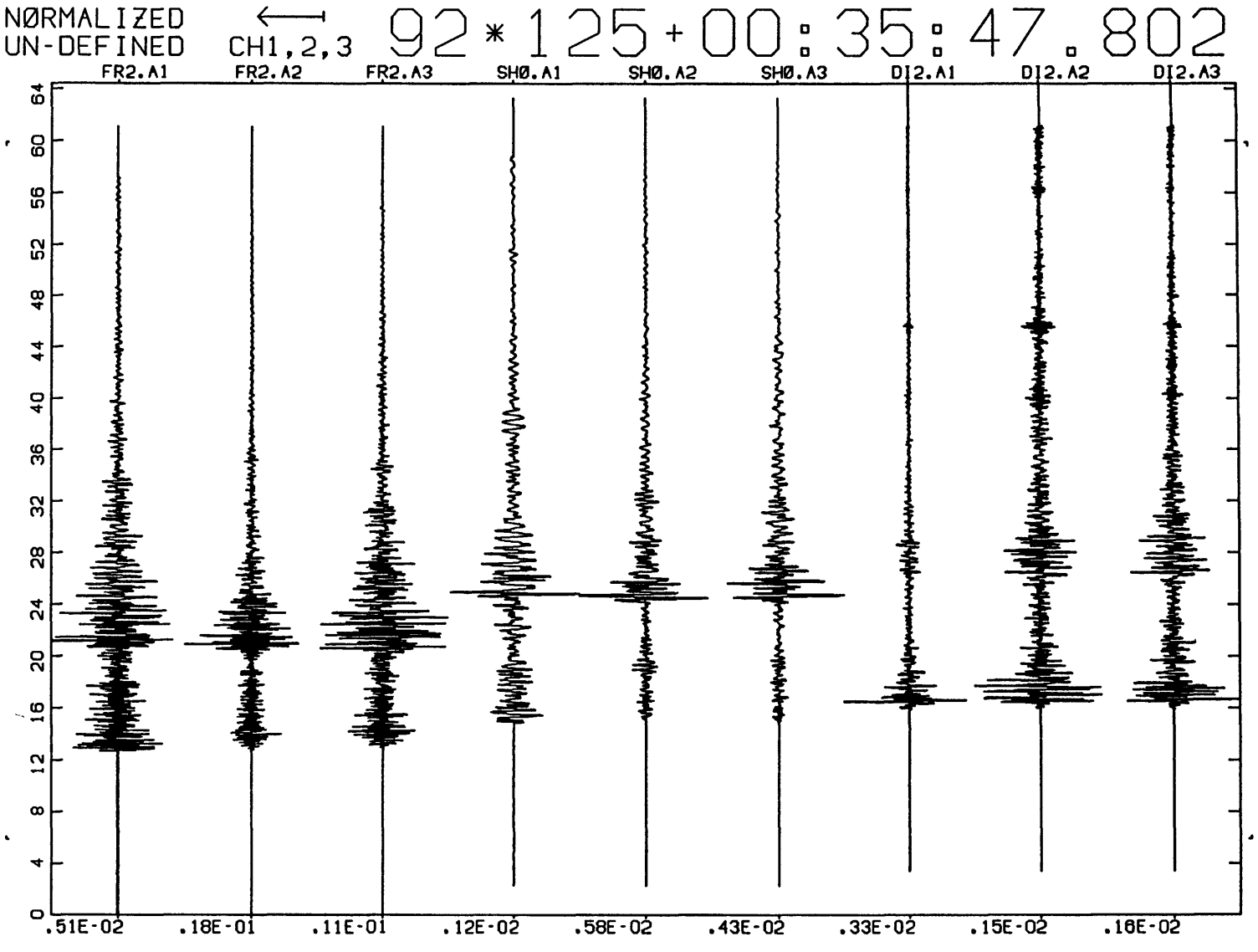

NORMALIZED
UN-DEFINED
CH1,2,3
92*123+15:18:32.802
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56
.36E-02
.10E-01
.10E-01
.32E-02
.12E-01
.89E-02
.49E-03
.24E-02
.28E-02

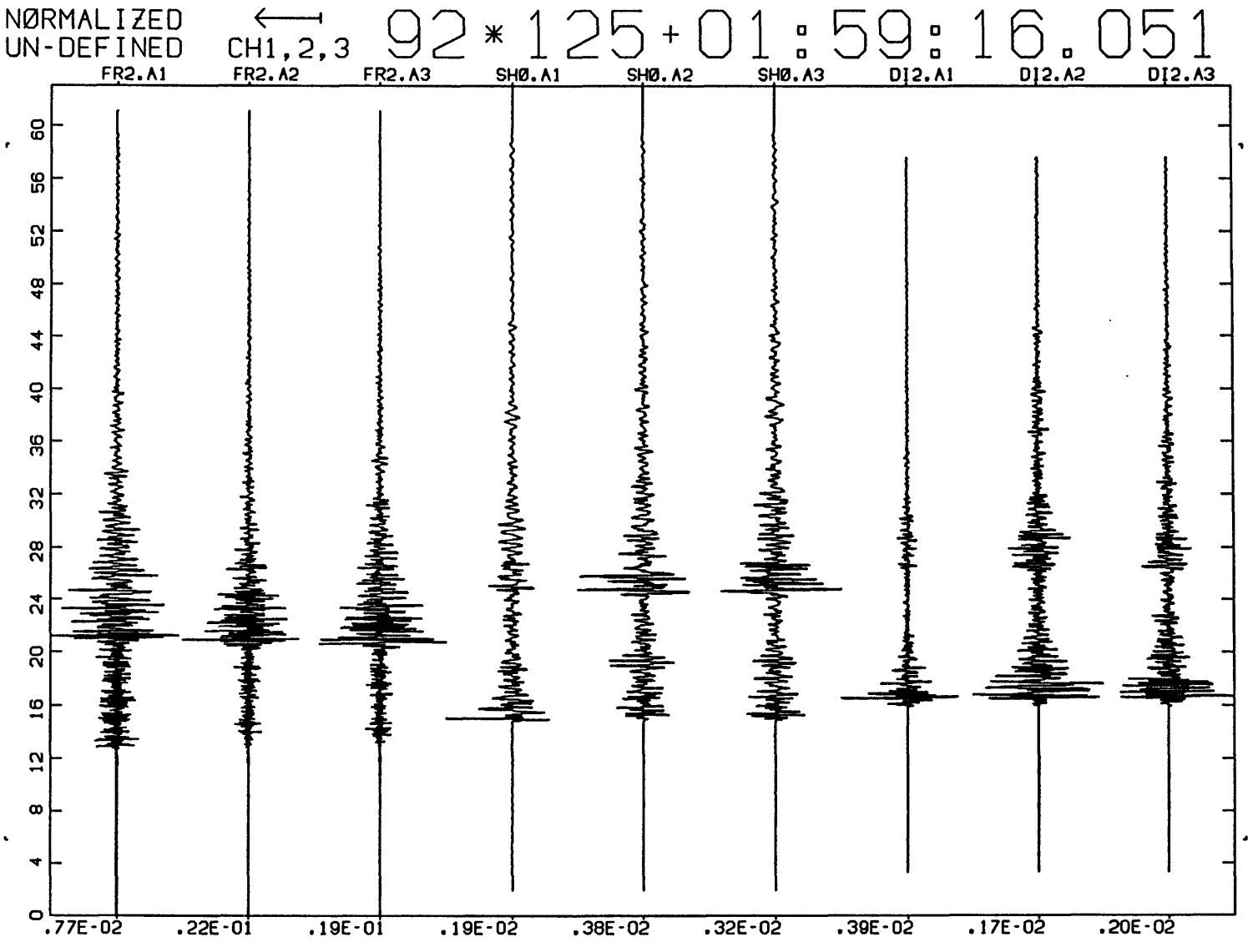

NORMALIZED
UN-DEFINED
CH1,2,3
92*124+20:03:10.003
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
.14E-02
.37E-02
.37E-02
.47E-03
.61E-03
.42E-03
.32E-03
.44E-03
.75E-03

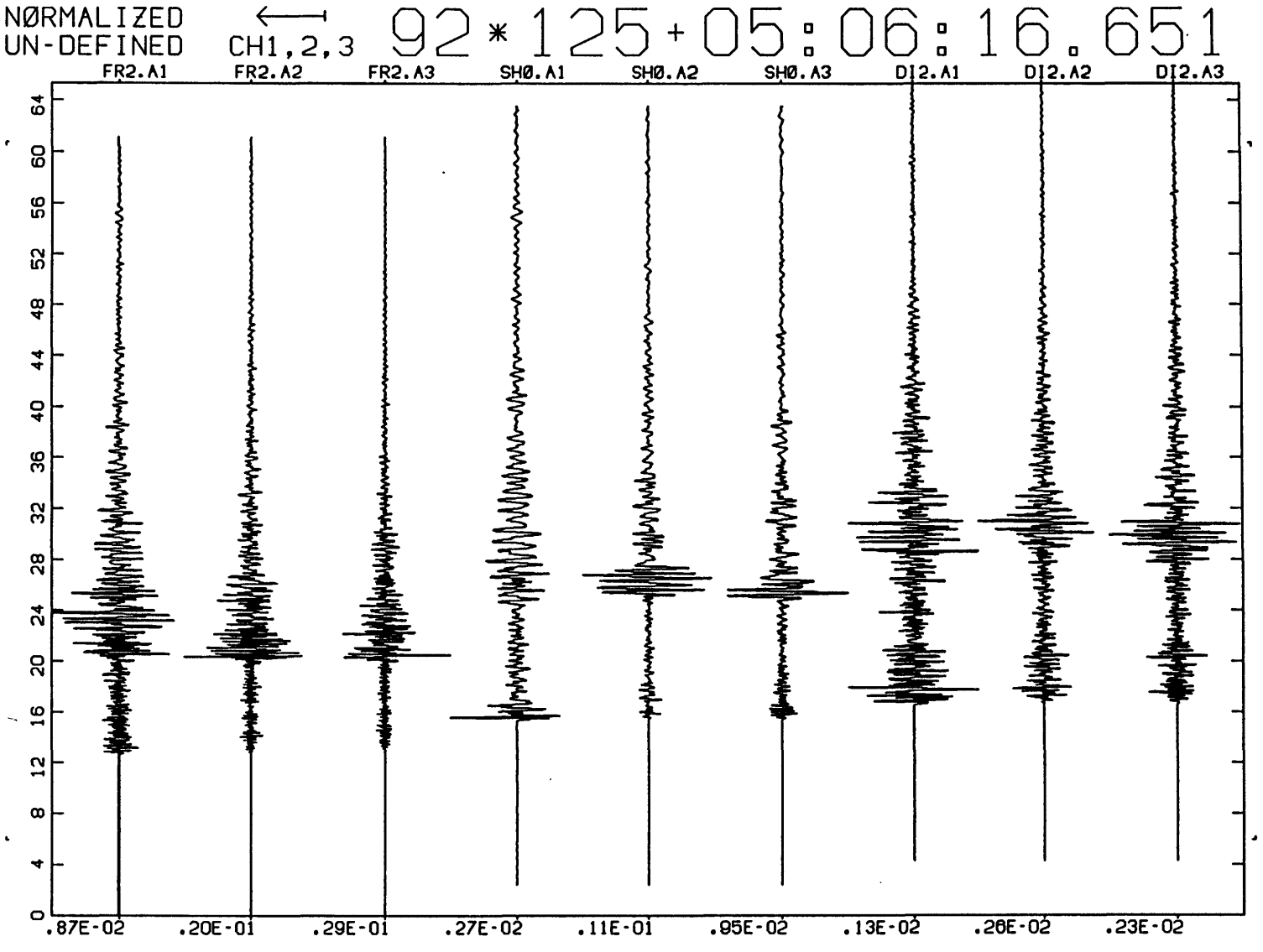

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+00:02:43.752
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.21E-02
.48E-02
.41E-02
.62E-03
.28E-02
.37E-02
.62E-03
.10E-02
.79E-03

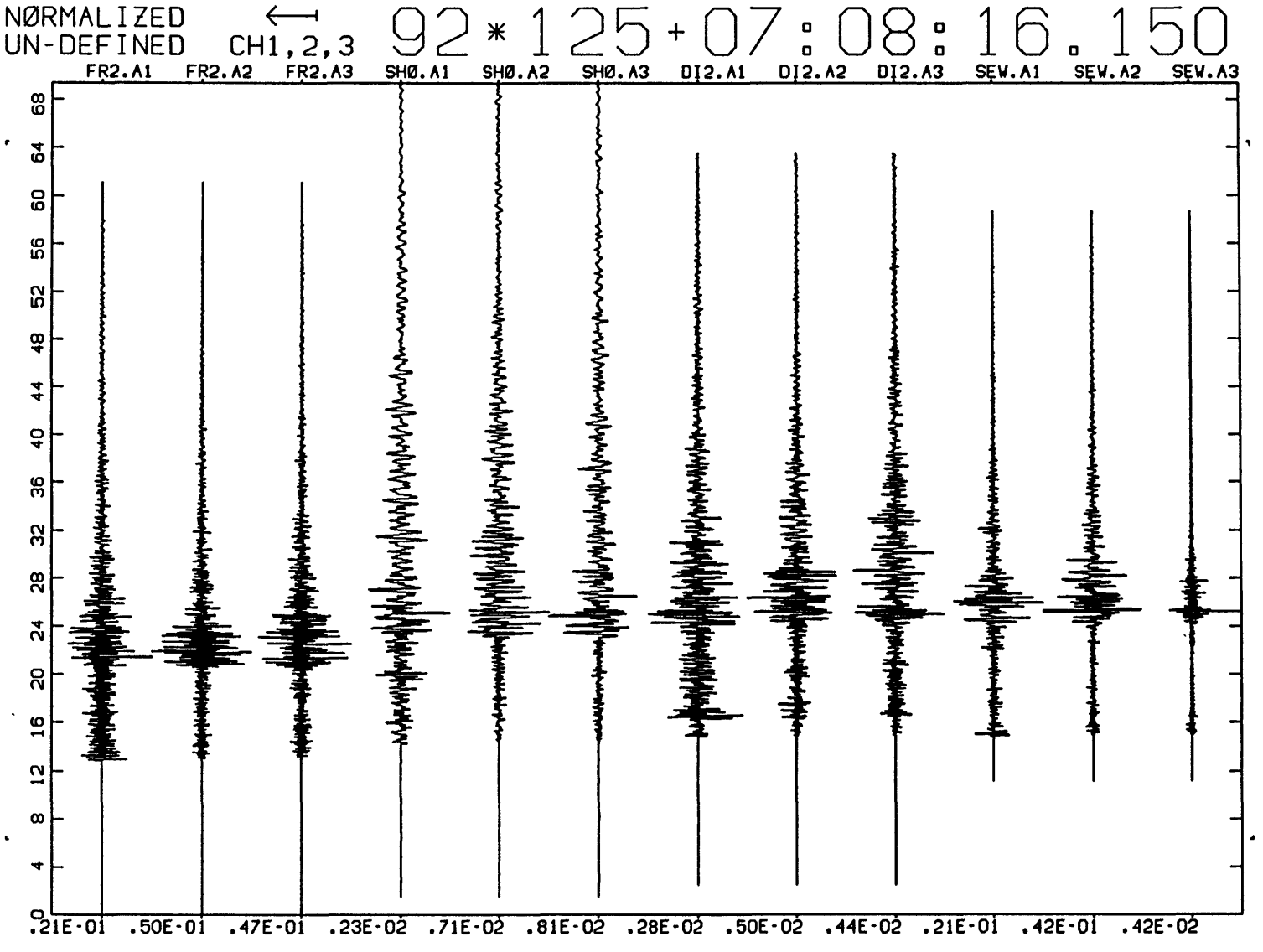

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+00:13:25.052
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
.14E-01
.39E-01
.26E-01
.23E-02
.14E-01
.81E-02
.95E-03
.14E-02
.16E-02

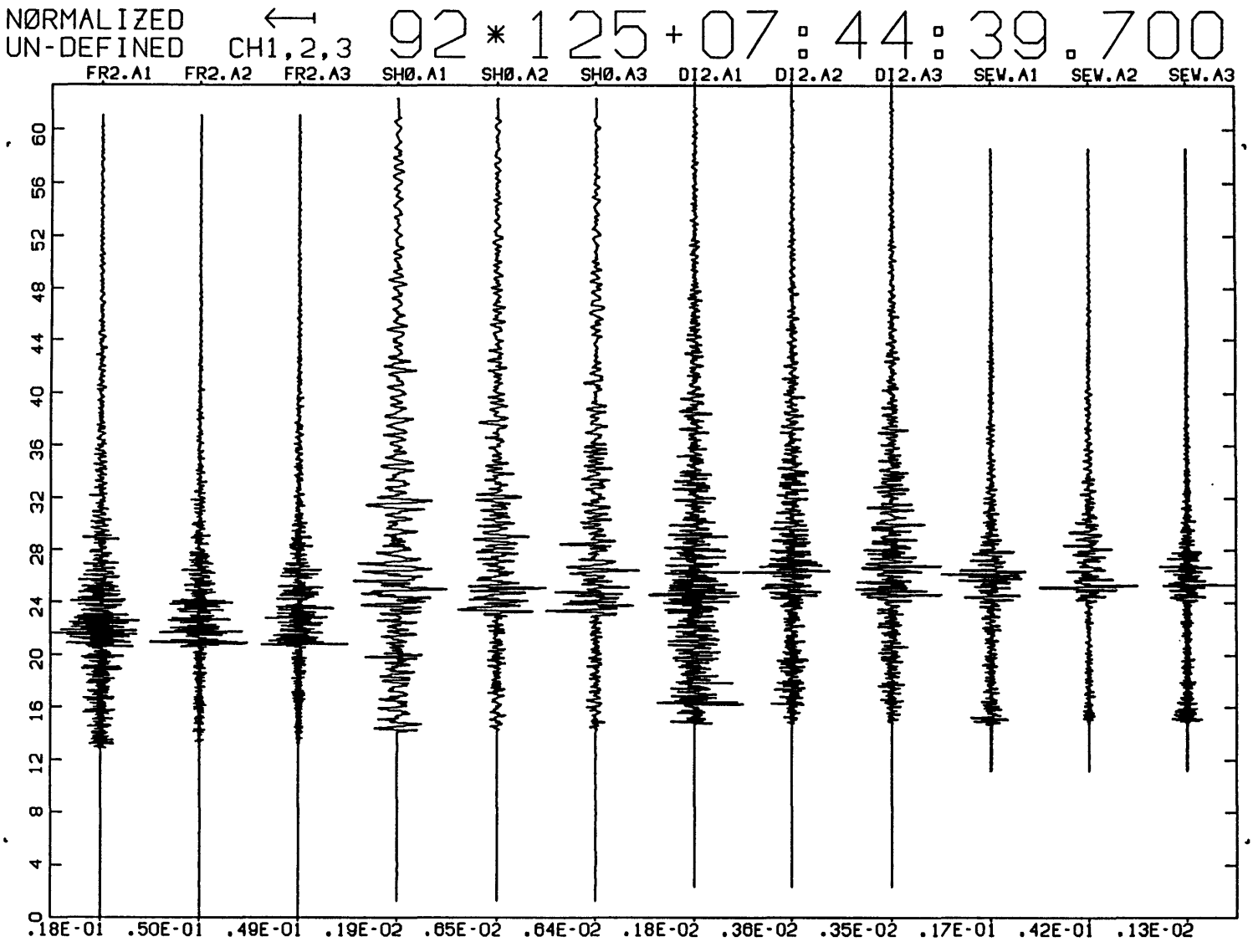

NØRMALIZED
UN-DEFINED
CH1,2,3
92*125+00:33:51.002
FR2.A1
FR2.A2
FR2.A3
DI2.A1
DI2.A2
DI2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.14E-02
.42E-02
.41E-02
.11E-02
.46E-03
.53E-03
.49E-03
.26E-02
.17E-02

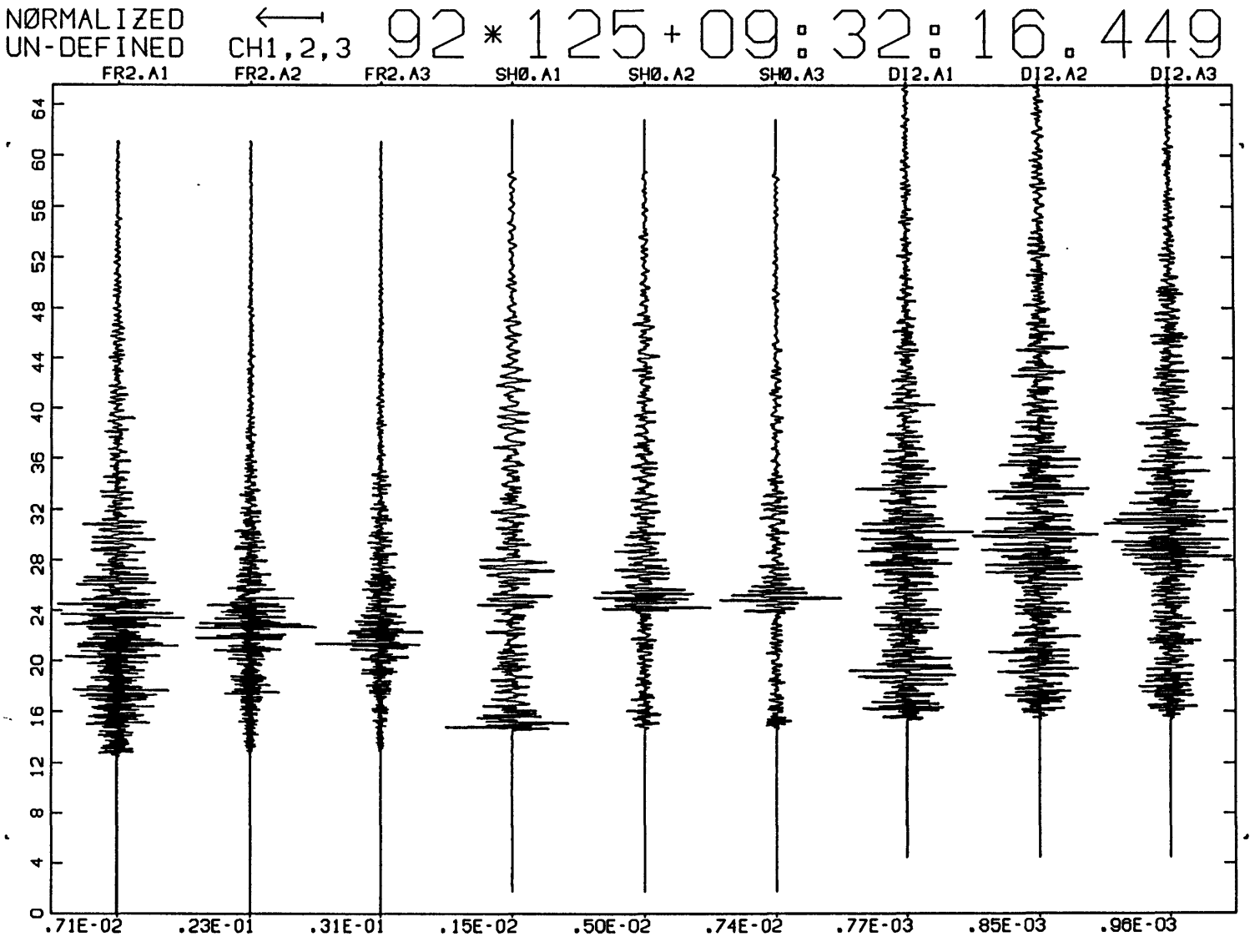

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+00:35:47.802
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
.51E-02
.18E-01
.11E-01
.12E-02
.58E-02
.43E-02
.33E-02
.15E-02
.16E-02

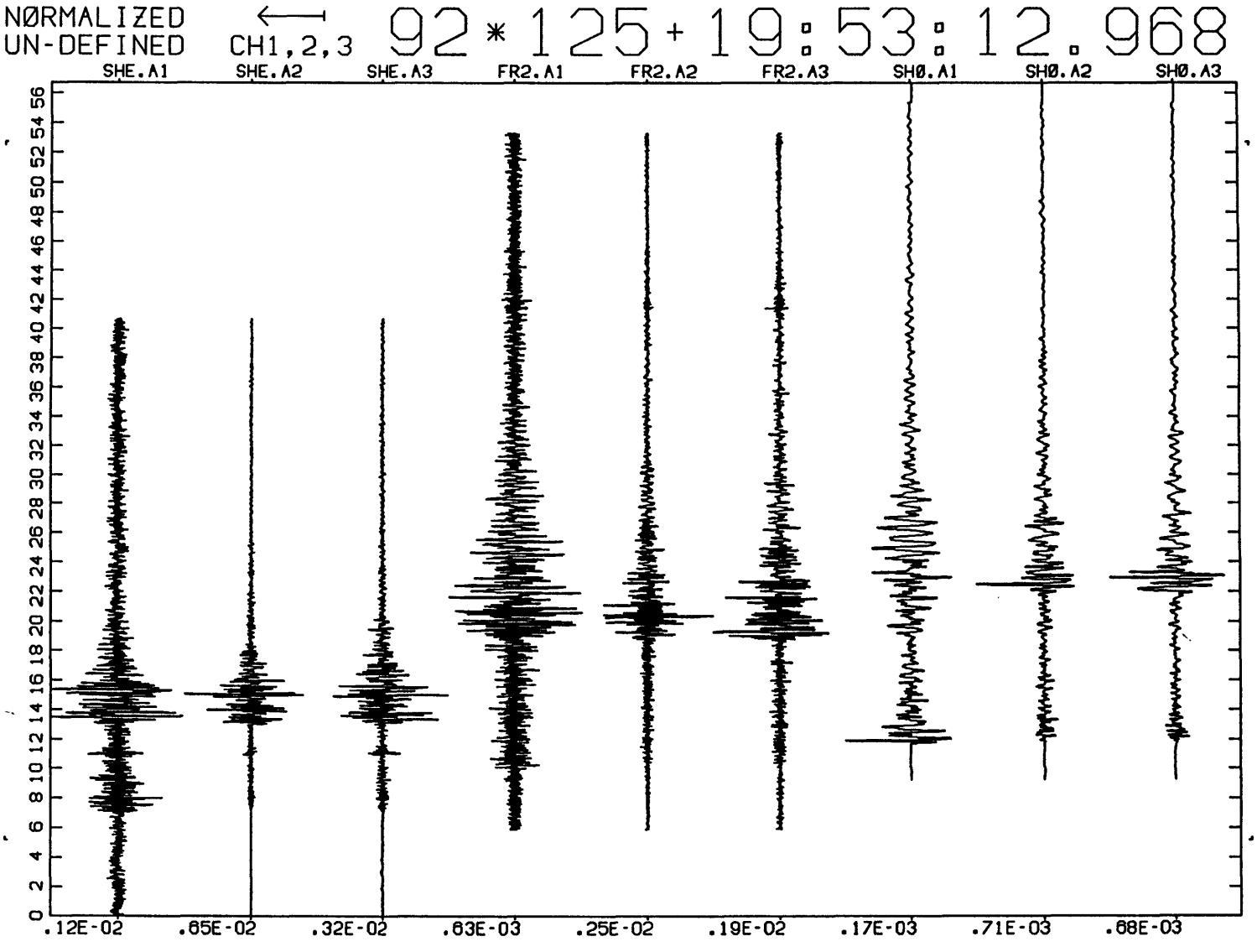

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+01:59:16.051
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.77E-02
.22E-01
.19E-01
.19E-02
.38E-02
.32E-02
.39E-02
.17E-02
.20E-02

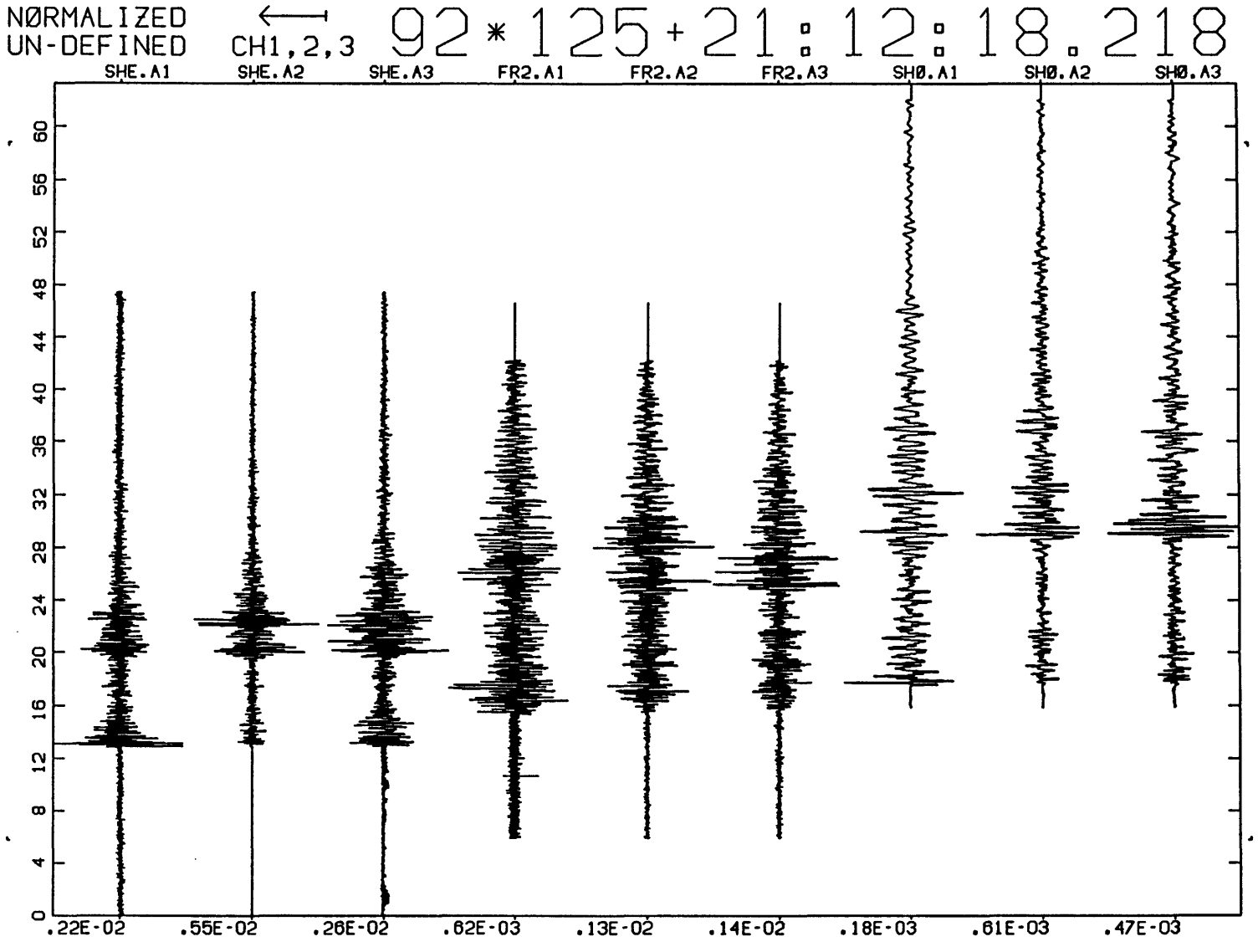

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+05:06:16.651
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
.87E-02
.20E-01
.29E-01
.27E-02
.11E-01
.95E-02
.13E-02
.26E-02
.23E-02

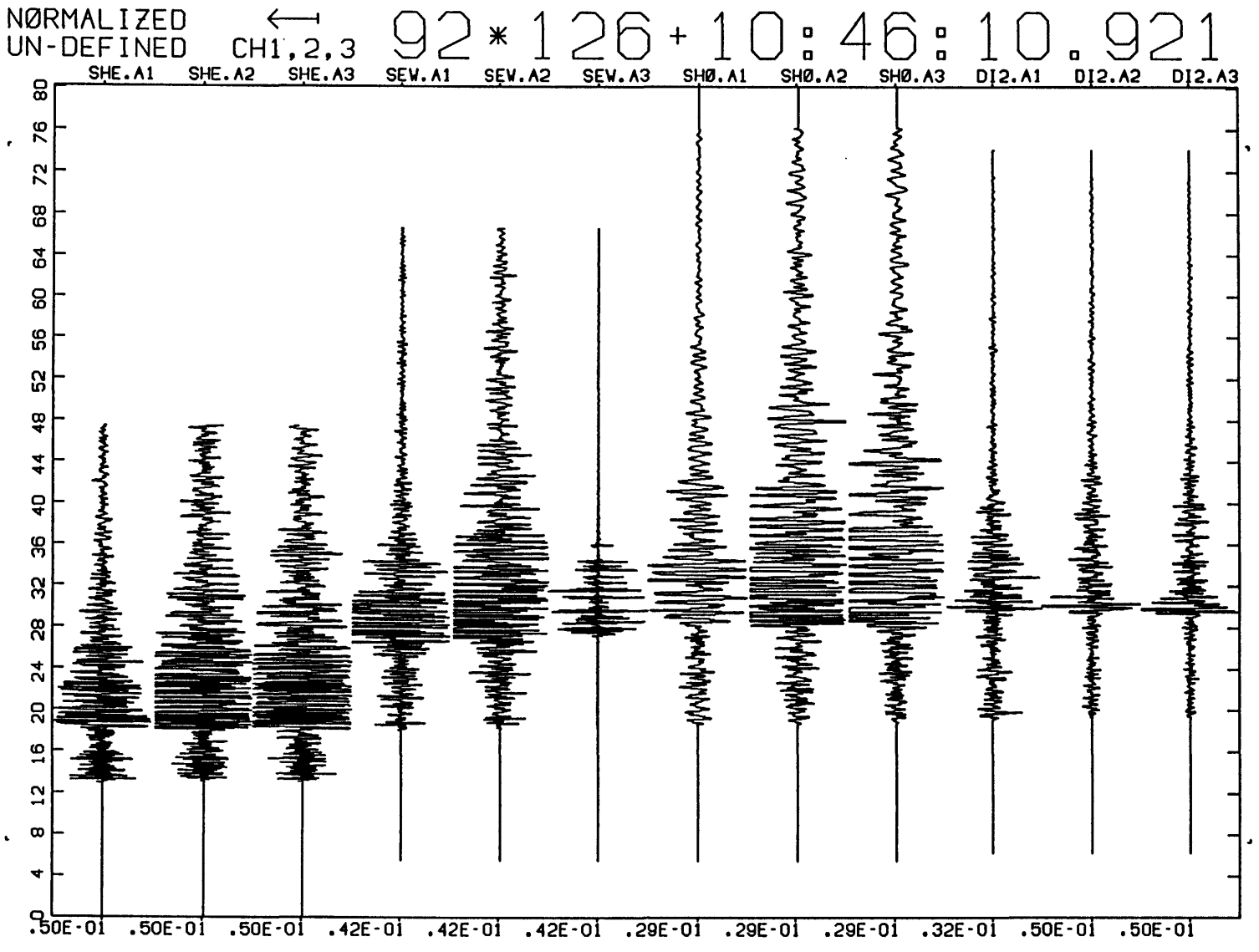

NØRMALIZED
UN-DEFINED
CH1,2,3
92*125+07:08:16.150
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
SEW.A1
SEW.A2
SEW.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
.21E-01
.50E-01
.47E-01
.23E-02
.71E-02
.81E-02
.28E-02
.50E-02
.44E-02
.21E-01
.42E-01
.42E-02

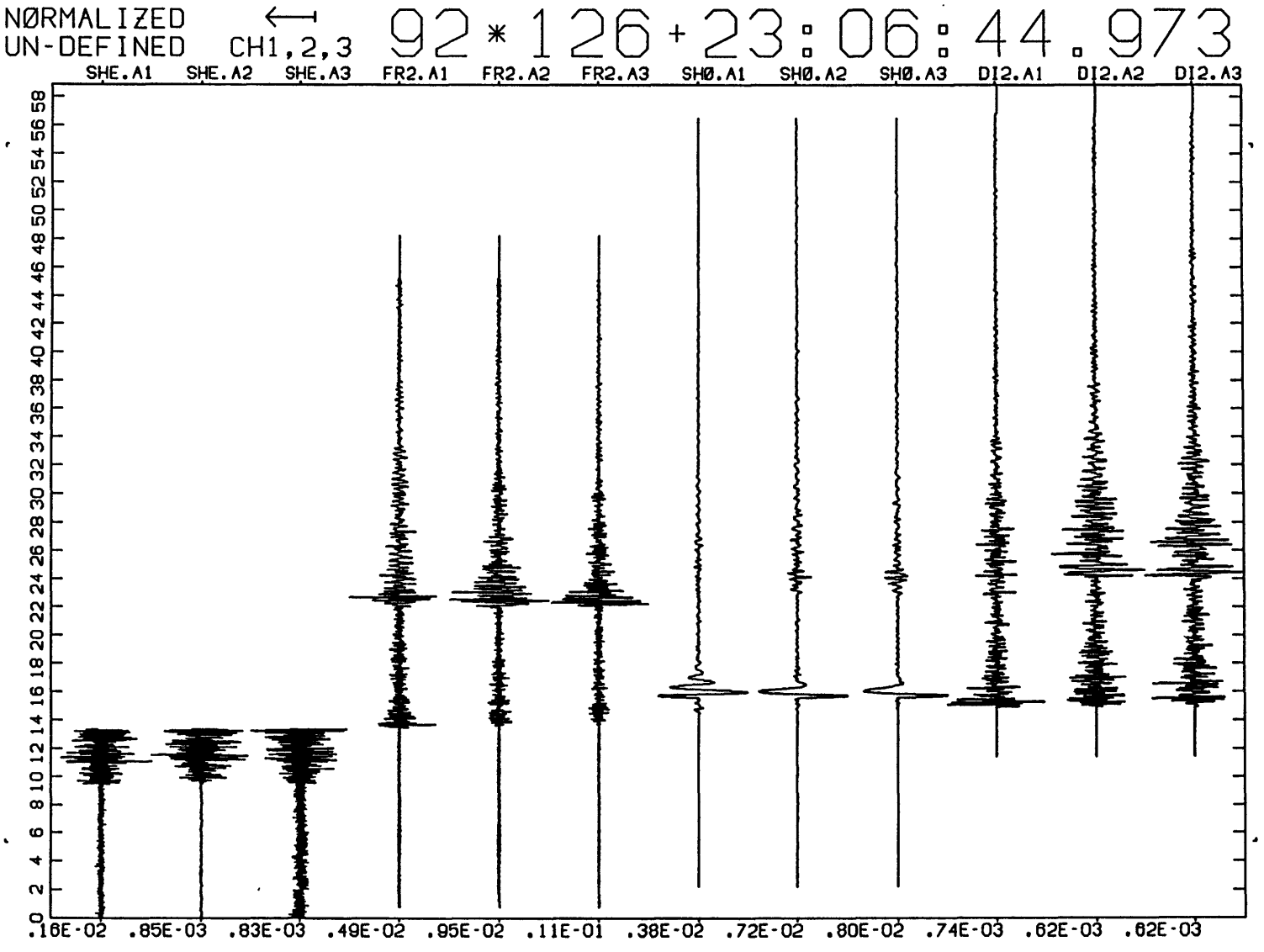

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+07:44:39.700
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
SEV.A1
SEV.A2
SEV.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.18E-01
.50E-01
.49E-01
.19E-02
.65E-02
.64E-02
.18E-02
.30E-02
.35E-02
.17E-01
.42E-01
.13E-02

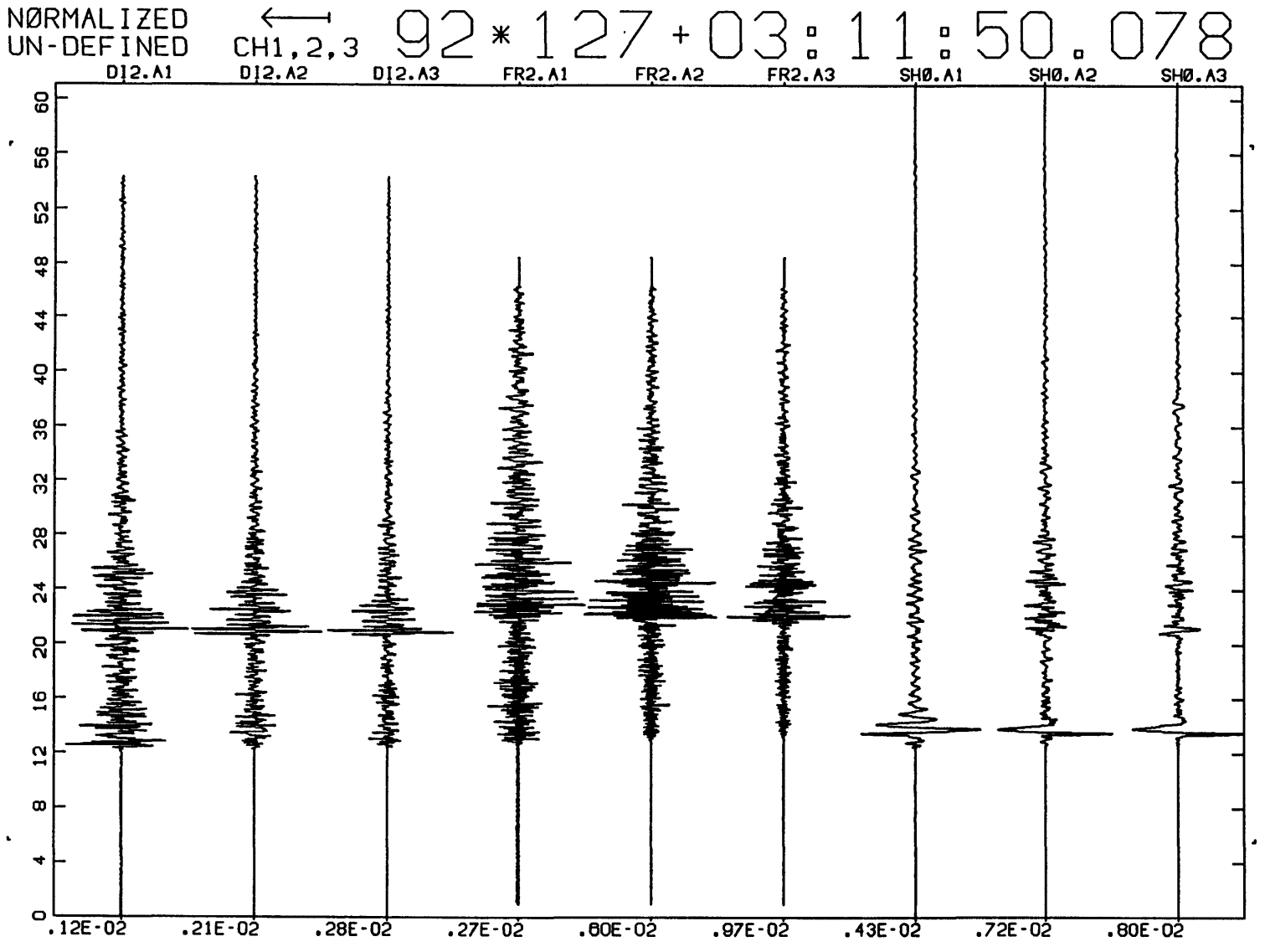

NORMALIZED
UN-DEFINED
CH1,2,3
92*125+09:32:16.449
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
.71E-02
.23E-01
.31E-01
.15E-02
.50E-02
.74E-02
.77E-03
.85E-03
.96E-03

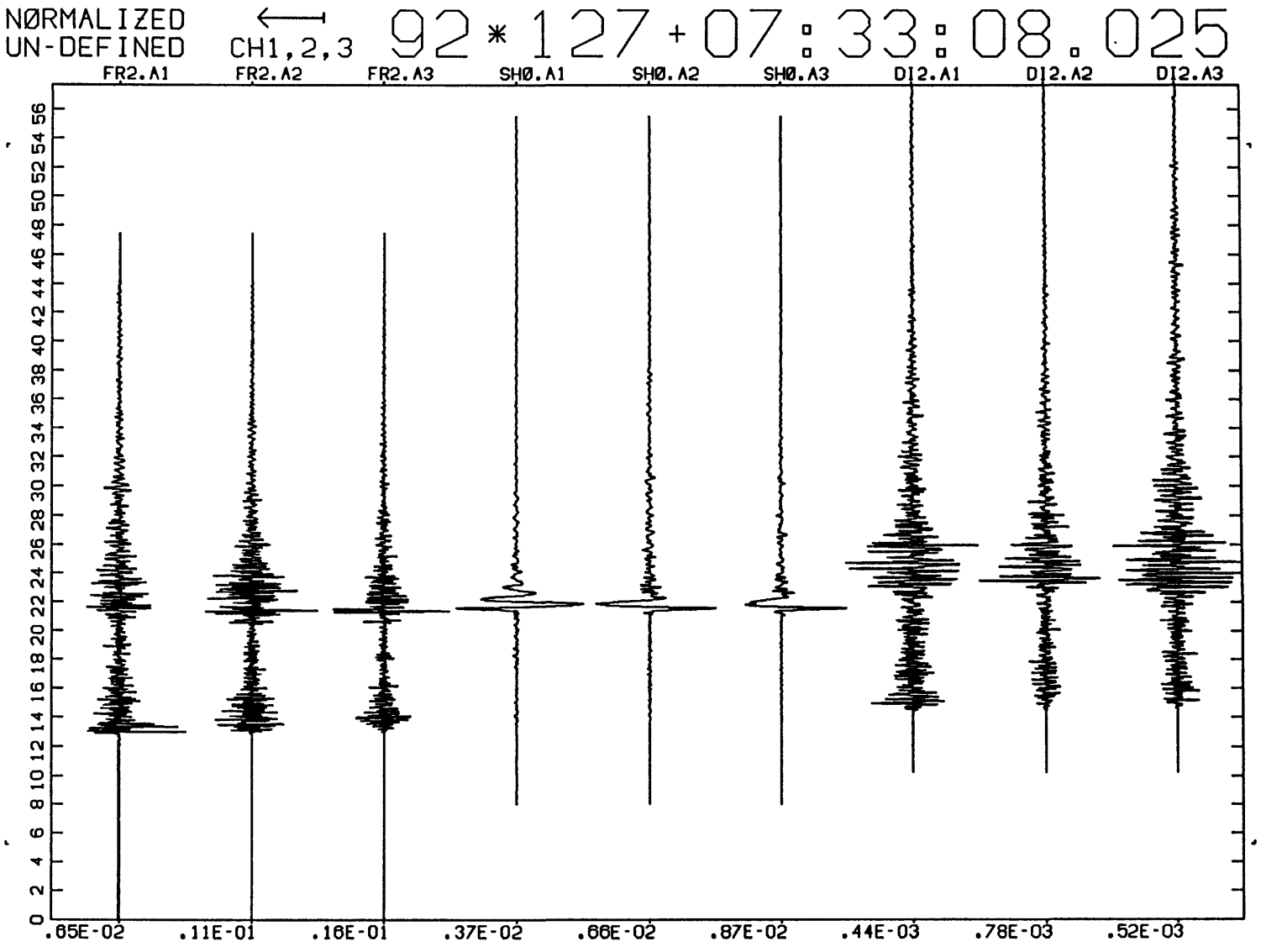

NØRMALIZED
UN-DEFINED
CH1,2,3
92*125+19:53:12.968
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56
.12E-02
.65E-02
.32E-02
.63E-03
.25E-02
.19E-02
.17E-03
.71E-03
.68E-03

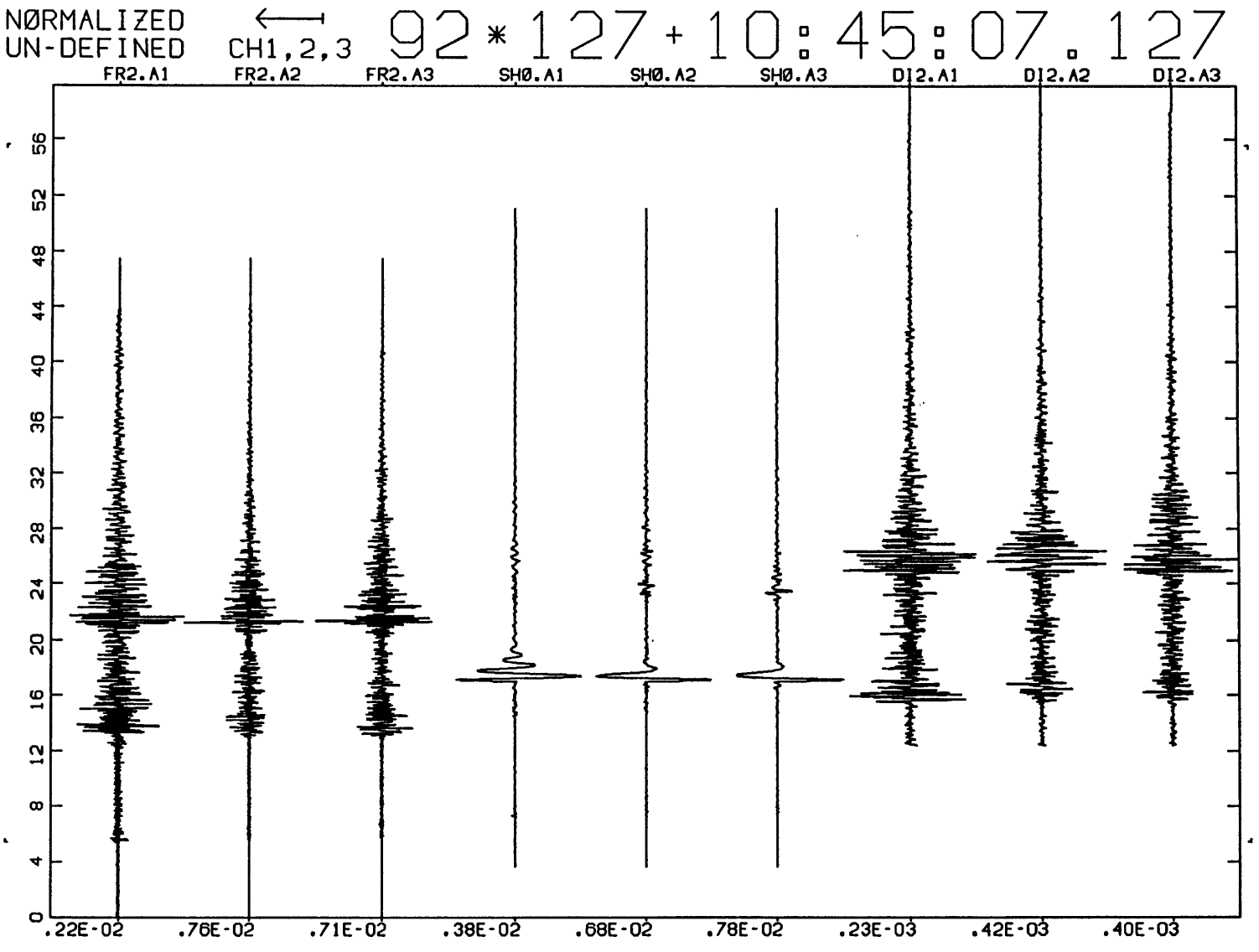

NØRMALIZED
UN-DEFINED
CH1,2,3
92*125+21:12:18.218
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.22E-02
.55E-02
.26E-02
.62E-03
.13E-02
.14E-02
.18E-03
.61E-03
.47E-03

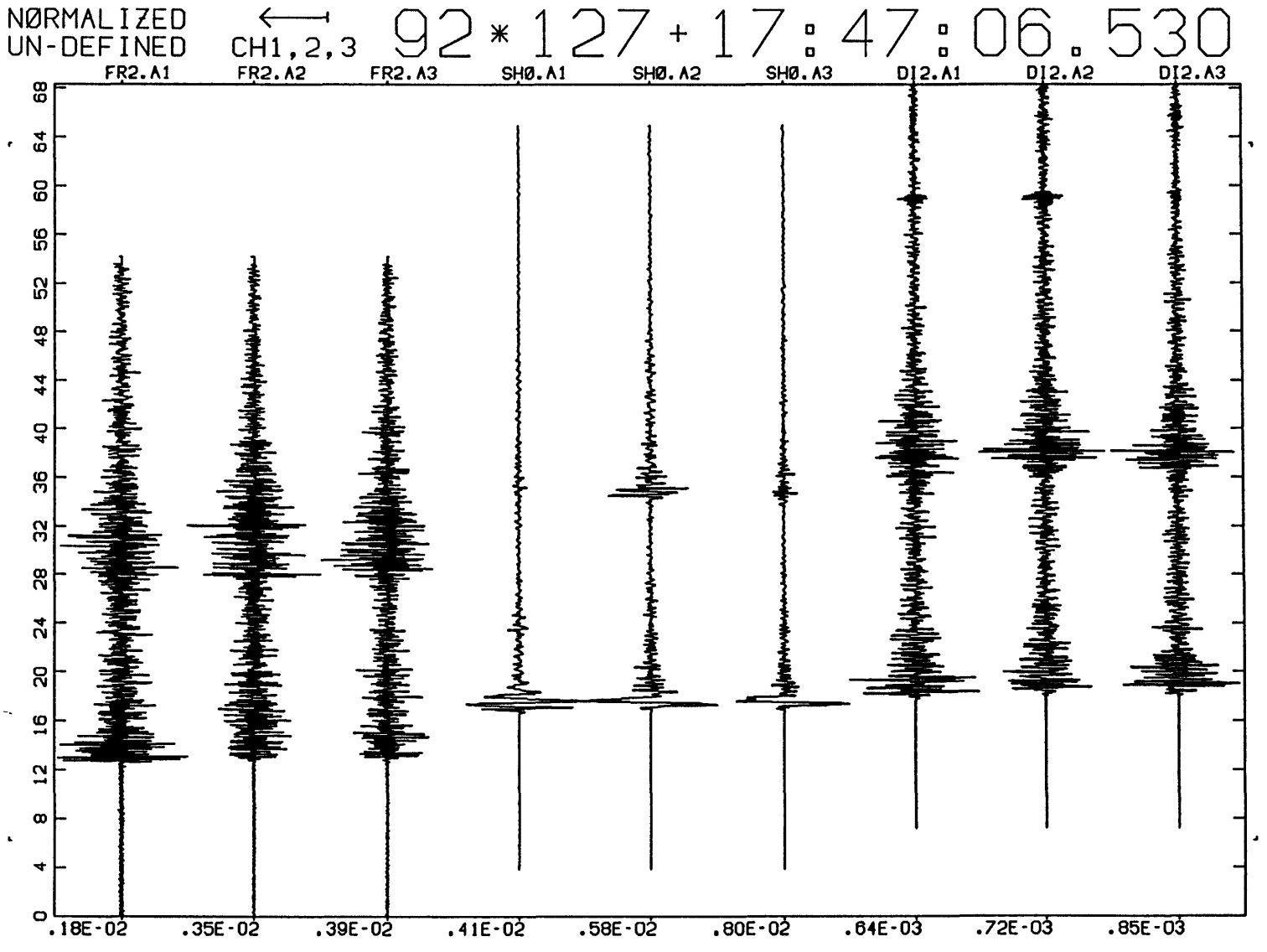

NORMALIZED
UN-DEFINED
CH1,2,3
92*126+10:46:10.921
SHE.A1
SHE.A2
SHE.A3
SEW.A1
SEW.A2
SEW.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
72
76
80
.50E-01
.50E-01
.50E-01
.42E-01
.42E-01
.42E-01
.29E-01
.29E-01
.29E-01
.32E-01
.50E-01
.50E-01

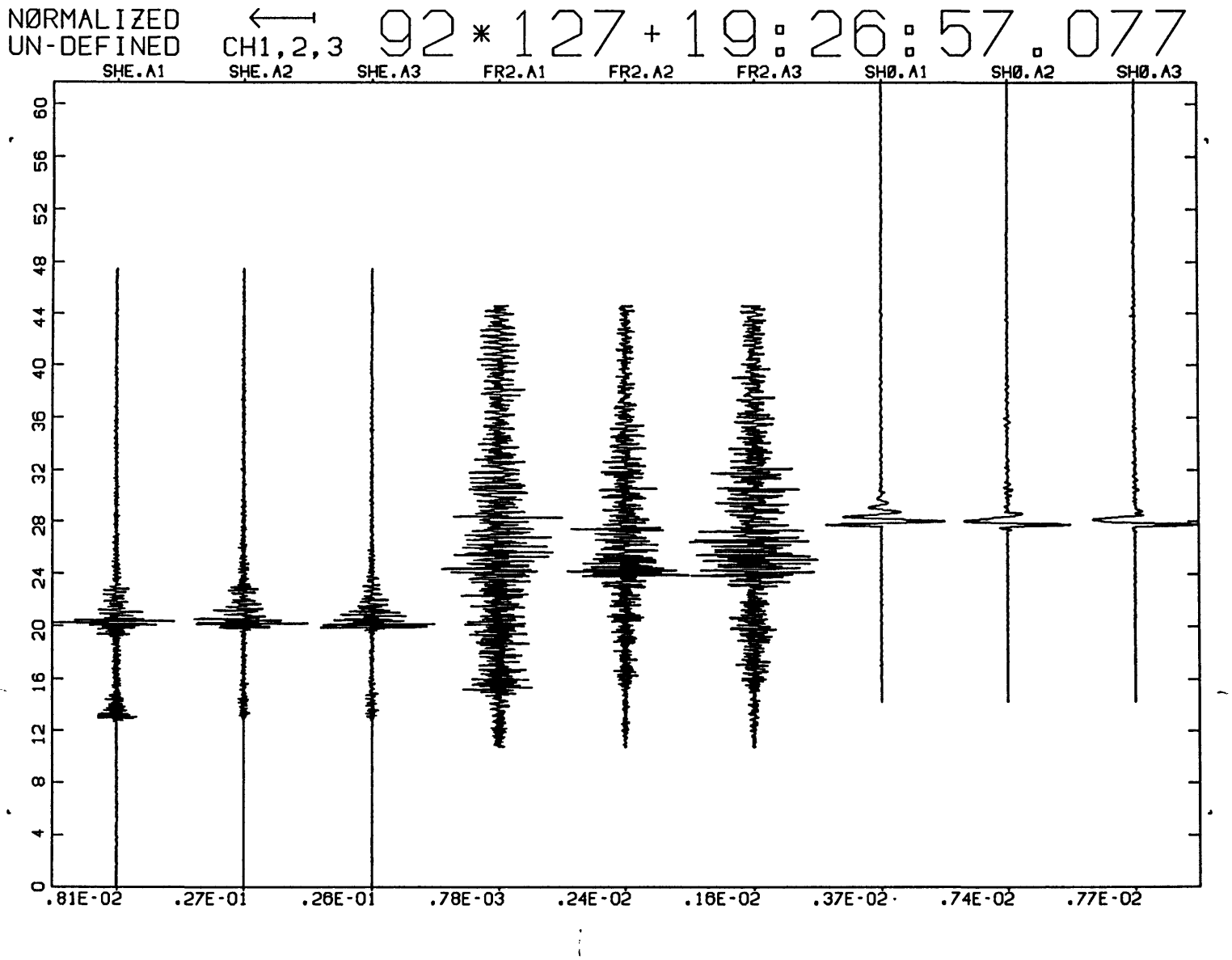

NORMALIZED
UN-DEFINED
CH1,2,3
92*126+23:06:44.973
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58
.16E-02
.85E-03
.83E-03
.49E-02
.95E-02
.11E-01
.38E-02
.72E-02
.80E-02
.74E-03
.62E-03
.62E-03

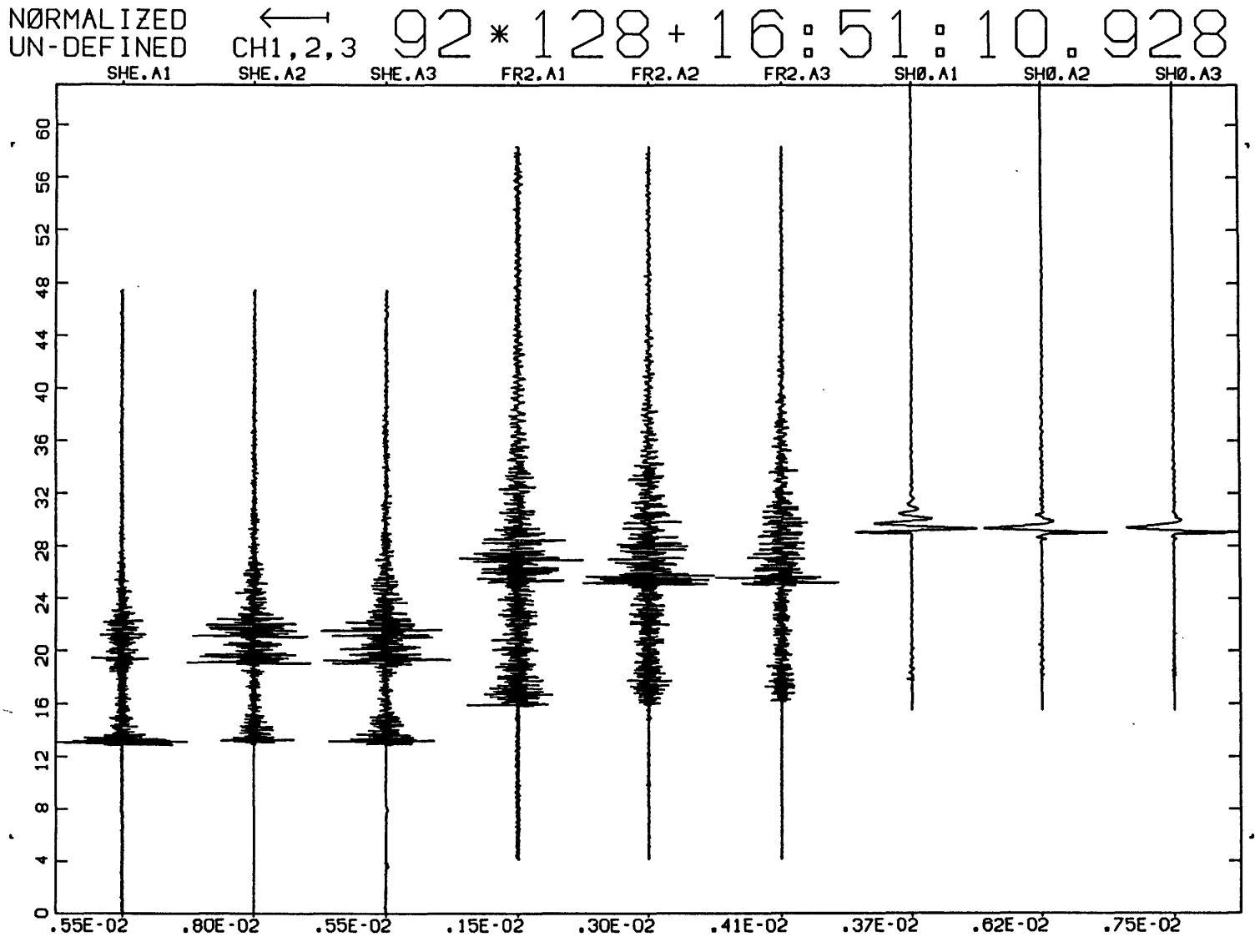

NØRMALIZED
UN-DEFINED
CH1,2,3
92*127+03:11:50.078
DI2.A1
DI2.A2
DI2.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.12E-02
.21E-02
.28E-02
.27E-02
.60E-02
.97E-02
.43E-02
.72E-02
.80E-02

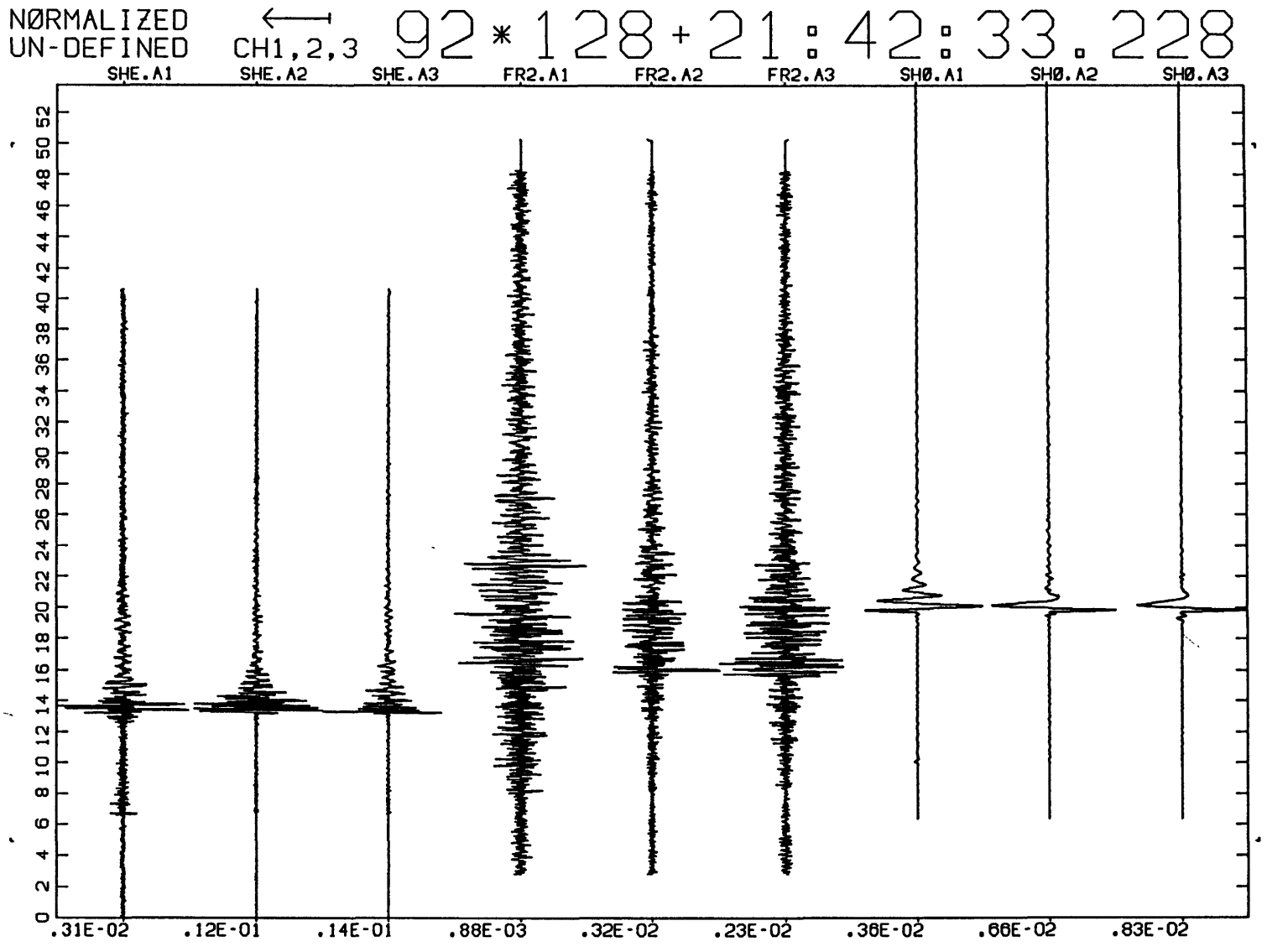

NORMALIZED
UN-DEFINED
CH1,2,3
92*127+07:33:08.025
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56
.65E-02
.11E-01
.16E-01
.37E-02
.66E-02
.87E-02
.44E-03
.78E-03
.52E-03

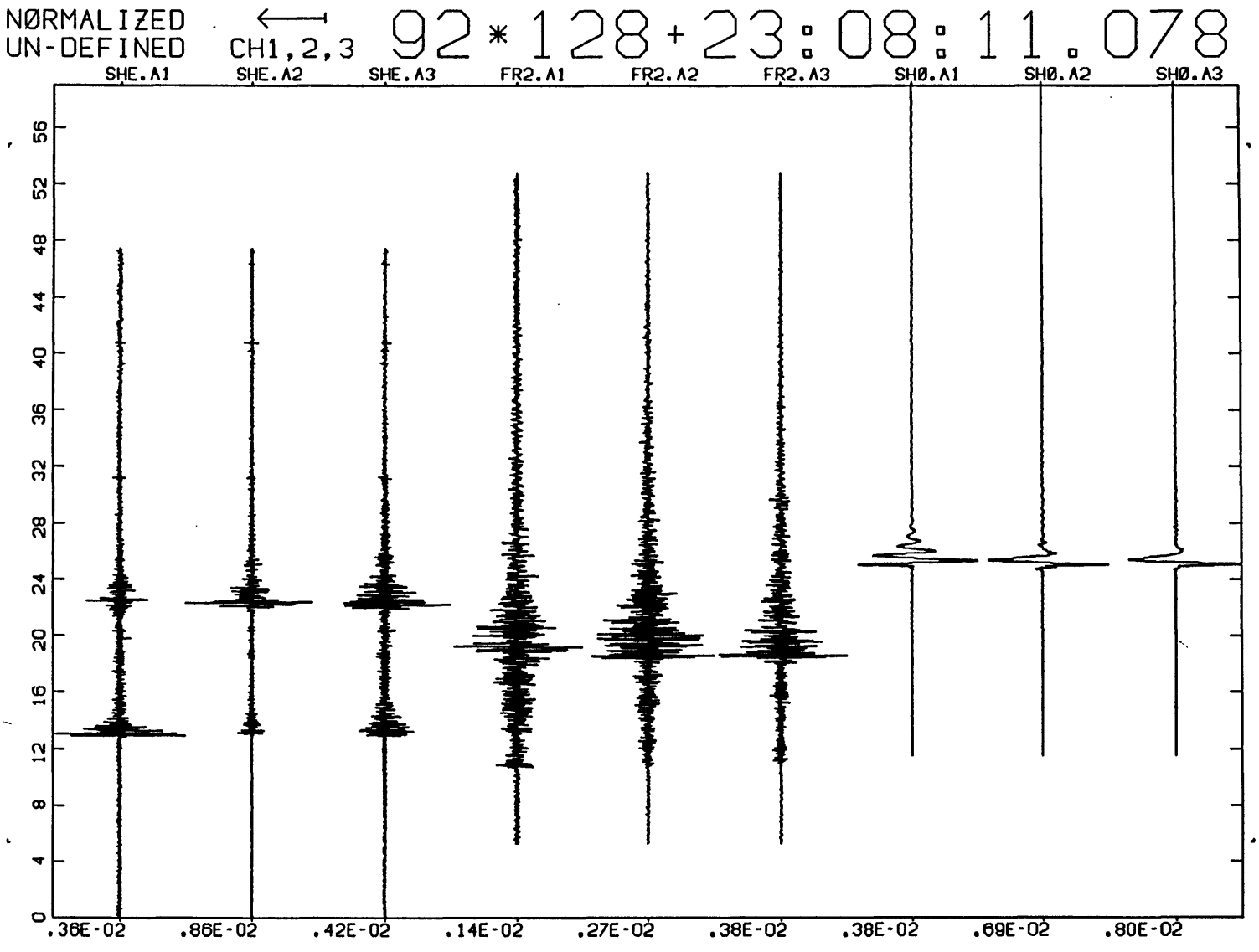

NORMALIZED
UN-DEFINED
CH1,2,3
92*127+10:45:07.127
FR2.A1
FR2.A2
FR2.A3
SH0.A1
SH0.A2
SH0.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
.22E-02
.76E-02
.71E-02
.38E-02
.68E-02
.78E-02
.23E-03
.42E-03
.40E-03

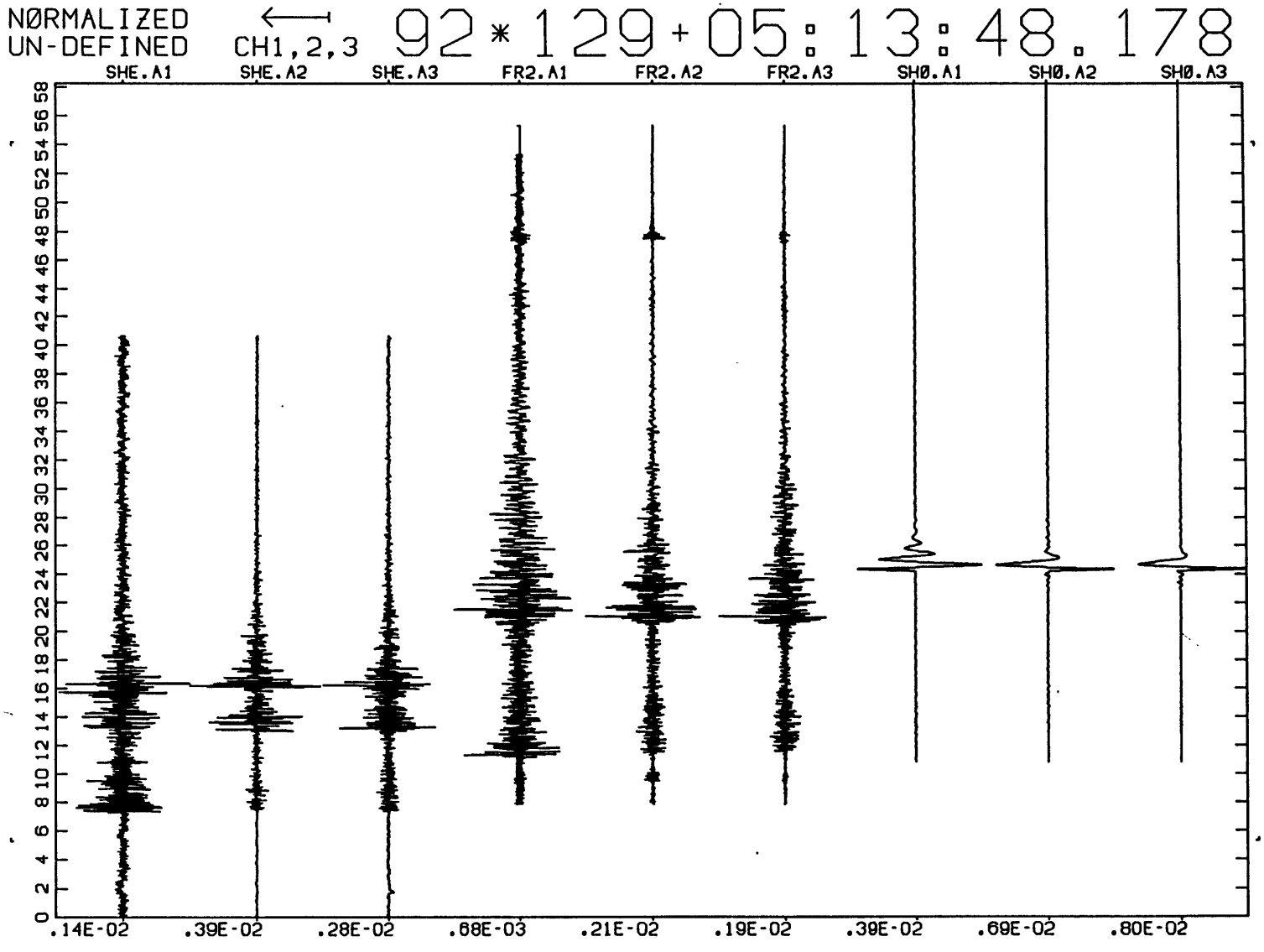

NØRMALIZED
UN-DEFINED
CH1,2,3
92*127+17:47:06.530
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
DI2.A1
DI2.A2
DI2.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
64
68
.18E-02
.35E-02
.39E-02
.41E-02
.58E-02
.80E-02
.64E-03
.72E-03
.85E-03

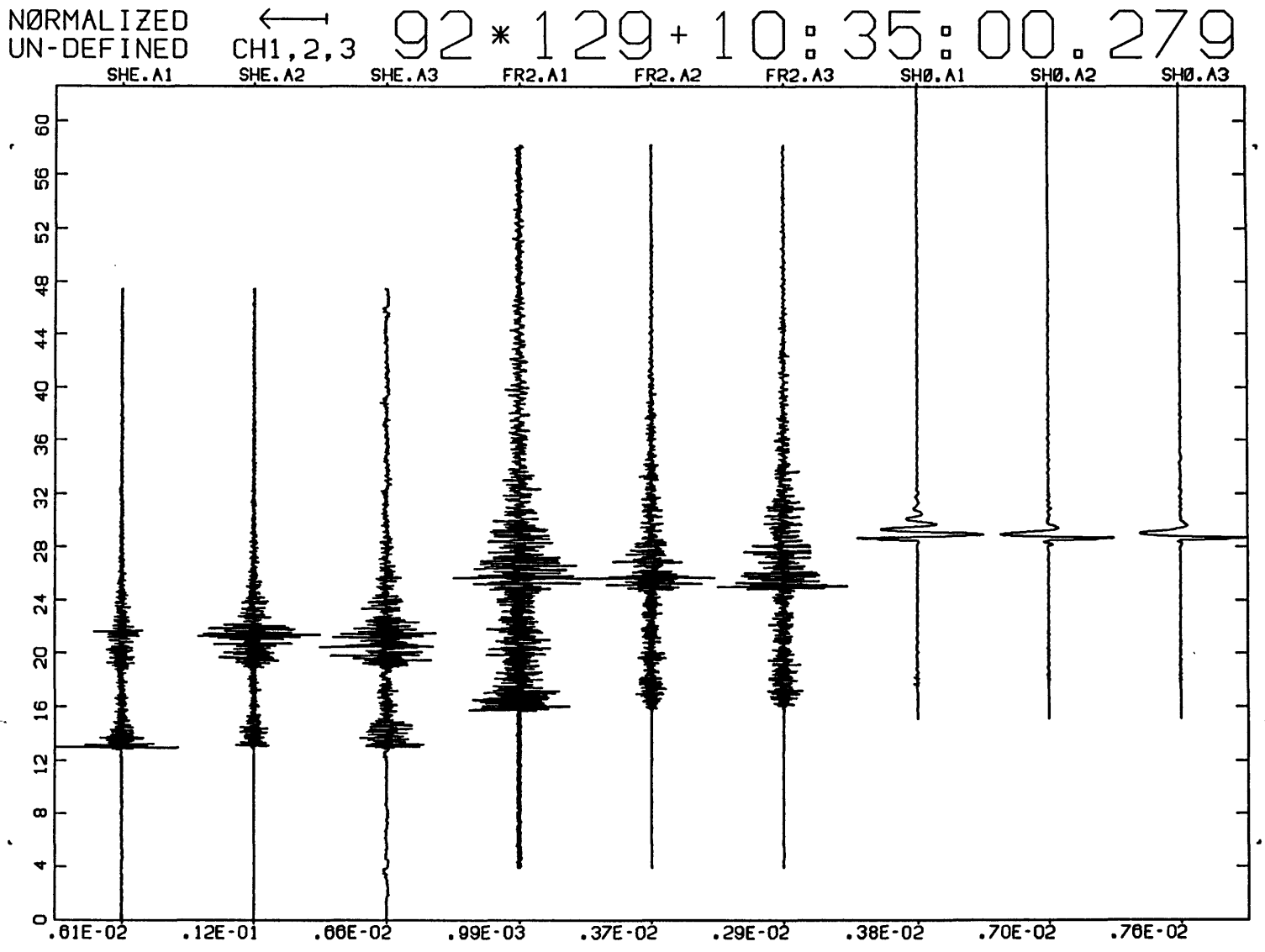

NØRMALIZED
UN-DEFINED
CH1,2,3
92*127+19:26:57.077
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.81E-02
.27E-01
.26E-01
.78E-03
.24E-02
.16E-02
.37E-02
.74E-02
.77E-02

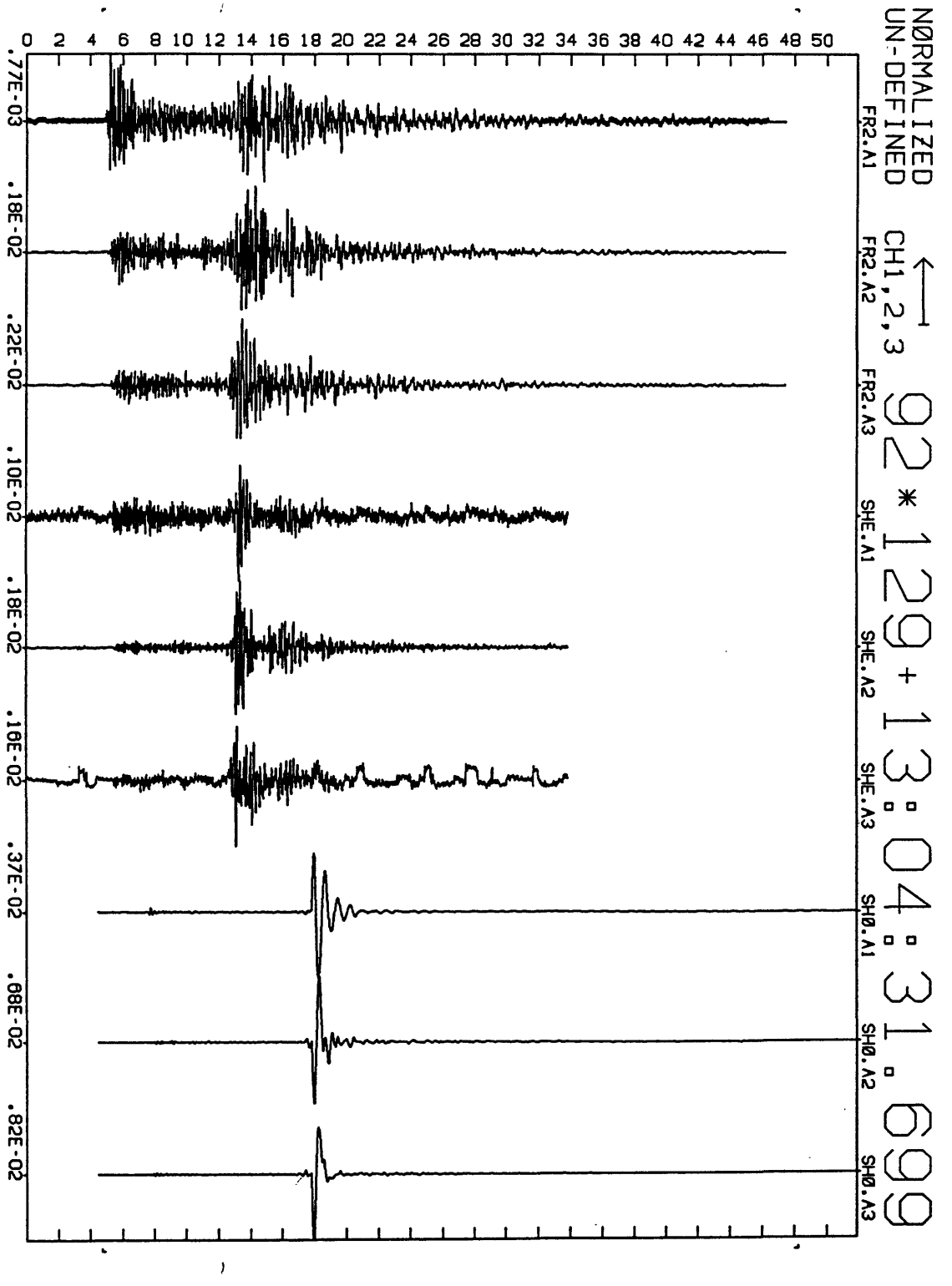

NORMALIZED
UN-DEFINED
CH1,2,3
92*128+16:51:10.928
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.55E-02
.80E-02
.55E-02
.15E-02
.30E-02
.41E-02
.37E-02
.62E-02
.75E-02


NØRMALIZED
UN-DEFINED
CH1,2,3
92*128+21:42:33.228
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52
.31E-02
.12E-01
.14E-01
.88E-03
.32E-02
.23E-02
.36E-02
.66E-02
.83E-02


NORMALIZED
UN-DEFINED
CH1,2,3
92*128+23:08:11.078
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
.36E-02
.86E-02
.42E-02
.14E-02
.27E-02
.38E-02
.38E-02
.69E-02
.80E-02


NØRMALIZED
UN-DEFINED
CH1,2,3
92*129+05:13:48.178
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58
.14E-02
.39E-02
.28E-02
.68E-03
.21E-02
.19E-02
.39E-02
.69E-02
.80E-02


NØRMALIZED
UN-DEFINED
CH1,2,3
92*129+10:35:00.279
SHE.A1
SHE.A2
SHE.A3
FR2.A1
FR2.A2
FR2.A3
SHØ.A1
SHØ.A2
SHØ.A3
0
4
8
12
16
20
24
28
32
36
40
44
48
52
56
60
.61E-02
.12E-01
.66E-02
.99E-03
.37E-02
.29E-02
.38E-02
.70E-02
.76E-02


NORMALIZED
UN-DEFINED
92*129+13.04.31.699
CH1,2,3
FR2.A1
FR2.A2
FR2.A3
SHE.A1
SHE.A2
SHE.A3
SH0.A1
SH0.A2
SH0.A3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
.77E-03
.18E-02
.22E-02
.10E-02
.18E-02
.10E-02
.37E-02
.08E-02
.82E-02

APPENDIX D.
DR-100 File Specification

APPENDIX D. Example data file.

Use of hour code (A = 00,B = 01,...X = 23) shortens export filenames by one character and makes them PC–compatible. For example: 3471126I1.LP6 = 347L26I1.LP6

Headers:
I010 = Year
I011 = Day (0–365)
I012 = Hour (0–23)
I013 = Minute (0–59)
I014 = Second (0–59)
I015 = Millisecond (0–999)
I020 = DR–200 serial number
I027 = not used
I028 = not used
I029 = not used
I031 = Number of data blocks
I032 = Index of last sample in last data block
I040 = not used
I041 = Vertical orientation (degree, measured down from 0 = up)
I042 = Horizontal orientation (degree, measured clockwise from 0 = north)
I254 = Recorded motion type (1 = acceleration, 2 = velocity)
R005 = Sample rate (sample/second)
R006 = Component sample lag (second)
R040 = Station latitude (degree)
R042 = Station longitude (degree)
R044 = Station elevation (meter, above sea level)
R046 = Digitizing constant (count/volt)
R047 = Anti–alias filter corner frequency (hertz)
R048 = Anti–alias filter rolloff (poles, 6 dB/octave per pole)
R049 = Sensor natural frequency (hertz)
R050 = Sensor damping (fraction of critical)
R051 = Sensor sensitivity (volt/ground–motion–unit)
R052 = Amplifier gain (dB)
R060 = Clock correction (ms)
Notes:
I010 through I015 specify the time of the first sample in the file
Total samples in file = (I031 – 1) x 256 + I032
Ground motion = COUNTS/(R046xR051xG) where G = 10(R052/20)