U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

THE SOUTHERN CALIFORNIA NETWORK BULLETIN JANUARY - DECEMBER 1994

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Open-File Report 95-204

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Corrections to 1993 Network Bulletin

In Appendix C (page C1) the final units for the two equations for station gains were omitted. The units for the short-period stations are counts/cm/sec, and the units for the FBA's are counts/cm/sec^2.

Code	Site Name	Lat. (deg)	Long. (deg)	Elev. (m)	Date Installed	Instr.	Orientation
SYL VHZ	Sylmar	34.35360 N	118.45098 W	928	01/20/94	L4	vertical high-gain
SYL VLZ	"	"	"	"	"	L4	vertical low-gain
SYL VLN	"	"	"	"	"	L4	North low-gain
SYL VLE	"	"	"	"	"	L4	East low-gain
SYL ASZ	"	"	"	"	"	FBA	vertical
SYL ASN	"	"	"	"	"	FBA	North
SYL ASE	"	"	"	"	"	FBA	East
VRD VHZ	Verdugo Hills	34.21459 N	118.27964 W	897	01/18/94	L4	vertical high-gain
VRD VLZ	"	"	"	"	"	L4	vertical low-gain
VRD VLN	"	"	"	"	"	L4	North low-gain
VRD VLE	"	"	"	"	"	L4	East low-gain
VRD ASZ	"	"	"	"	"	FBA	vertical
VRD ASN	"	"	"	"	"	FBA	North
VRD ASE	"	"	"	"	"	FBA	East
VVD VHZ	Val Verde	34.44350 N	118.66332 W	451	01/29/94	L4	vertical high-gain

Note: The * in front of some station codes indicate that the locations for these sites were determined by a topo map or a hand-held GPS. The topo sites are in NAD-27; all other sites are in NAD-83.

Addendum

Some of the station locations in Table 1 in the text still indicated the topo or hand-held GPS location, and were labeled as such, even though the GPS location was available. The corrected Table 1 below has the most current locationsfor all the stations, including those that were located using GPS in 1994.

Table 1. New Stations

Code	Site Name	Lat. (deg)	Long. (deg)	Elev. (m)	Date Installed	Instr.	Orientation
BAL VHZ	Balcom Canyon Rd	34.30764 N	118.96713 W	258	02/03/94	L4	vertical high-gain
BLC VHZ	Black Canyon	34.24356 N	118.67312 W	607	02/01/94	L4	vertical high-gain
*BR2 VLZ	Brawley	32.97899 N	115.54936 W	-67	07/20/94	L4	vertical low-gain
*BR2 ASZ	"	"	"	"	"	FBA	vertical
*BR2 ASN	"	"	"	"	"	FBA	North
*BR2 ASE	"	"	"	"	"	FBA	East
CDY VHZ	Cady Mountains	34.83007 N	116.33717	934	04/20/94	L4	vertical high-gain
DGR ASZ	Domenigoni Res.	33.64996 N	117.00948 W	609	08/22/94	FBA	vertical
DGR ASN	"	"	"	"	"	FBA	North
DGR ASE	"	"	"	"	"	FBA	East
GRH VHZ	Granada Hills	34.30803 N	118.55954 W	723	01/18/94	L4	vertical high-gain
GRH VLZ	"	"	"	"	"	L4	vertical low-gain
GRH VLN	"	"	"	"	"	L4	North low-gain
GRH VLE	"	"	"	"	"	L4	East low-gain
GRH ASZ	"	"	"	"	"	FBA	vertical
GRH ASN	"	"	"	"	"	FBA	North
GRH ASE	"	"	"	"	"	FBA	East
HCM VHZ	Holy Cross Mausoleum	33.99404 N	118.38406 W	19	01/12/94	L4	high-gain vertical
*MNT VHZ	Mint Canyon	34.4569 N	118.4444 W	701	01/30/94	L4	vertical high-gain
MWC ASZ	Mount Wilson	34.22368 N	118.05827 W	1696	05/10/94	FBA	vertical
MWC ASN	"	"	"			FBA	North
MWC ASE	"	"	"			FBA	East
NHL VHZ	Newhall	34.39148 N	118.59946 W	542	01/20/94	L4	vertical high-gain
NHL VLZ	"	"	"	"	"	L4	vertical low-gain
NHL VLN	"	"	"	"	"	L4	North high-gain
NHL VLE	"	"	"	"	"	L4	East low-gain
NHL ASZ	"	"	"	"	"	FBA	vertical
NHL ASN	"	"	"	"	"	FBA	North
NHL ASE	"	"	"	"	"	FBA	East
OAK VHZ	Oakridge	34.36363 N	118.78439 W	832	01/22/94	L4	vertical high-gain
OAK VHN							North high-gain
OAK VHE							East high-gain
RMM VHZ	Rodman Mountain	34.64384 N	116.62438 W	1777	04/08/94	L4	high-gain vertical
RMM VLZ	"	"	"	"	"	L4	low-gain vertical
RMM VLN	"	"	"	"	05/12/94	L4	North low-gain
RMM VLE	"	"	"	"	"	L4	East low-gain
SIP VLN	Simi Peak	34.20453 N	118.78073 W	694	01/22/94	L4	North high-gain
SIP VLE	"	"	"	"	"	L4	East high-gain
*SLD VHZ	San Luis Dam	37.077 N	121.221 W	400	04/21/94	L4	vertical high-gain
SMF VHZ	Santa Monica Field	34.02159 N	118.44675 W	19	01/13/94	L4	vertical high-gain
SMF VLZ	"	"	"	"	"	L4	vertical low-gain
SMF VLN	"	"	"	"	"	L4	North low-gain
SMF VLE	"	"	"	"	"	L4	East low-gain
SMF ASZ	"	"	"	"	"	FBA	vertical
SMF ASN	"	"	"	"	"	FBA	North
SMF ASE	"	"	"	"	"	FBA	East
*SXT VHZ	Sexton Canyon	34.3379 N	119.2148 W	488	02/02/94	L4	vertical high-gain

INTRODUCTION

The Pasadena Office of the U.S. Geological Survey together with the California Institute of Technology Seismology Laboratory (Caltech Seismo Lab) operates a network of more than 300 remote seismometers in southern California called the Southern California Seismic Network (SCSN). Signals from these sites are telemetered to the central processing site at the Caltech Seismo Lab in Pasadena. These signals are continuously monitored by computers that detect and record thousands of earthquakes each year. Phase arrival times for these events are picked by analysts and archived along with digital seismograms. Data acquisition, processing and archiving is achieved using the CUSP system (*Dollar, 1989*). These data are used to compile the SCSN Catalog of Earthquakes, a list beginning in 1932 that currently contains more than 258,000 events. This data set is critical to the evaluation of earthquake hazards in California and to the advancement of geoscience as a whole.

This and previous Network Bulletins are intended to serve several purposes. The most important goal is to make Network data more accessible to current and potential users. It is also important to document the details of Network operation, because only with a full understanding of the process by which the data are produced can researchers use the data responsibly.

NETWORK CONFIGURATION

New Stations

Many of the new sites added in 1994 were a result of the M6.7 Northridge earthquake on January 17, 1994, and most of them were already posted in the 1993 Network Bulletin (*Wald et al., 1994*). All new stations through December 31, 1994 are included in this list and Table 1. An explanation for the addition of each station is provided, followed by Table 1 which contains information about each station. Figure 1 is a current SCSN station map showing the locations of the stations and the telemetry.

BAL

This vertical station was added at Balcom Canyon Road after the Northridge earthquake.

BLC

This vertical station was added in Black Canyon after the Northridge earthquake.

BR2

This station was relocated in this location after being moved from a nearby site.

CDY

This station was "turned on" again after the telemetry was reinstalled. It went off the air when the telemetry site at Crystal Creek was moved to support the Northridge earthquake.

DGR

This site was installed in cooperation with the Metropolitan Water District for a project to study the site in preparation for building a dam.

GRH

A seven-channel network portable station (*Wald et al., 1991*) was moved to Granada Hills after the Northridge earthquake.

HCM

This is a USC site that is received on a phone line with a number of other USC stations.

MNT

This vertical station was added in Mint Canyon after the Northridge earthquake.

MWC

A three-component FBA was added to this already-existing site.

NHL

A network portable station was installed in Newhall after the Northridge earthquake.

OAK

A three-component station was installed in Oakridge after the Northridge earthquake.

RMM

This site was reinstalled as a permanent station after the network portable station was moved to support the Northridge earthquake. It is a four-channel station with a high and low-gain vertical and two horizontal components.

SIP

Two horizontal components were added to this pre-existing high-gain vertical site at Simi Peak after the Northridge earthquake.

SLD

This is a Department of Water Resources site that is received on a phone line with a number of other USC stations. We do not have information on the elevation.

SMF

A network portable station was installed at Santa Monica Field just before the Northridge earthquake after a series of small earthquakes were located in this area. (Correction from the 1993 Network Bulletin.*Wald et al., 1994*)

SXT

A vertical station was installed in Sexton Canyon after the Northridge earthquake.

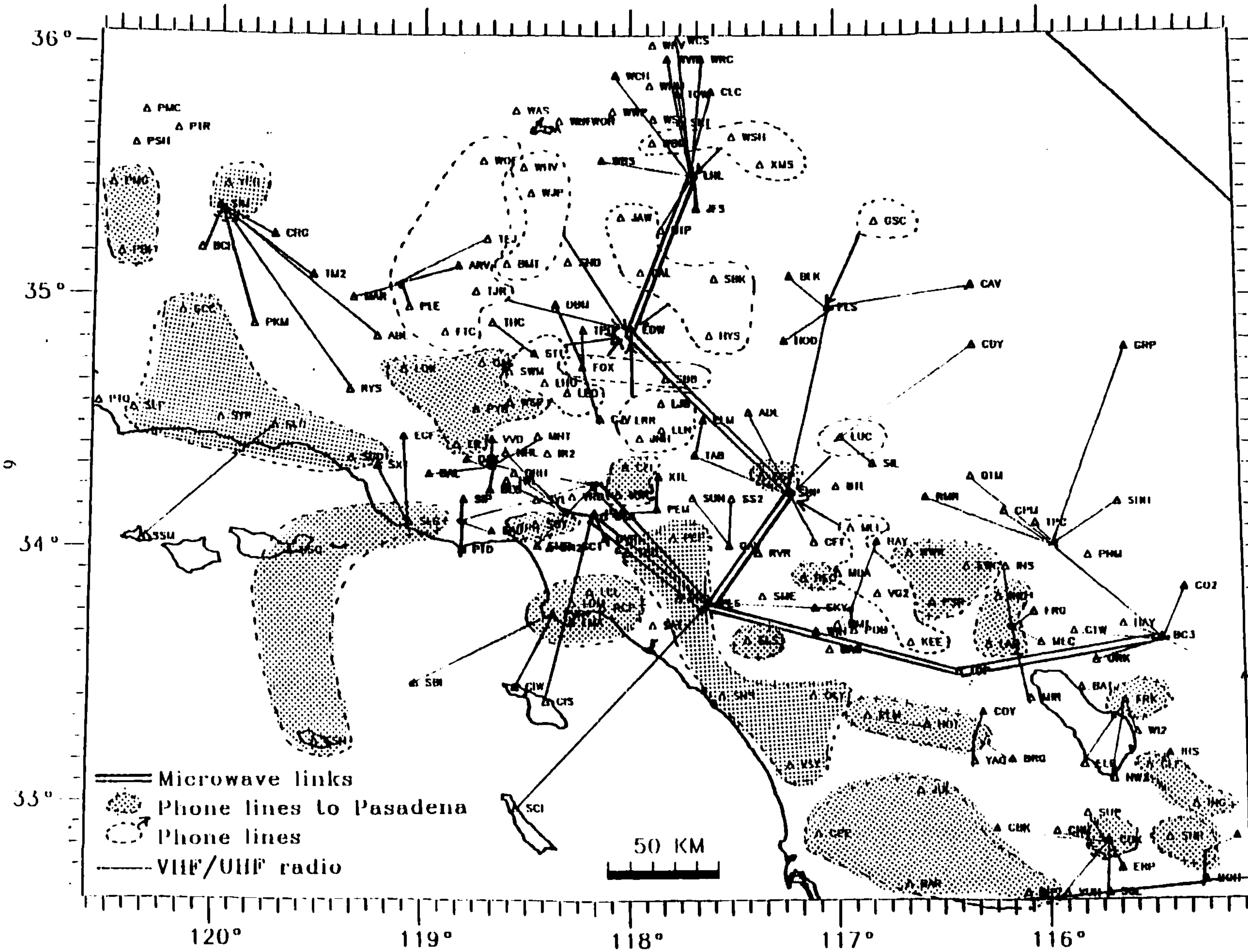


Figure 1. Southern California Seismic Network and telemetry. Map of all stations operated and maintained by the Pasadena Field Office as well as several stations operated by other agencies that are also digitally recorded, and the telemetry network. (courtesy of Jim Mori)

SYL

A network portable station was installed in Sylmar after the Northridge earthquake.

VRD

A network portable station was installed in Verdugo Hills after the Northridge earthquake.

VVD

A vertical station was installed at Val Verde after the Northridge earthquake.

Table 1. New Stations

Code	Site Name	Lat. (deg)	Long. (deg)	Elev. (m)	Date Installed	Instr.	Orientation
*BAL VHZ	Balcom Canyon Rd	34.3067 N	118.9673 W	299	02/03/94	L4	vertical high-gain
*BLC VHZ	Black Canyon	34.2433 N	118.6734 W	671	02/01/94	L4	vertical high-gain
*BR2 VLZ	Brawley	32.97899 N	115.54936 W	-67	07/20/94	L4	vertical low-gain
*BR2 ASZ	"	"	"	"	"	FBA	vertical
*BR2 ASN	"	"	"	"	"	FBA	North
*BR2 ASE	"	"	"	"	"	FBA	East
*CDY VHZ	Cady Mountains	34.83007 N	116.33717	934	04/20/94	L4	vertical high-gain
*DGR ASZ	Domenigoni Res.	33.64996 N	117.00948 W	609	08/22/94	FBA	vertical
*DGR ASN	"	"	"	"	"	FBA	North
*DGR ASE	"	"	"	"	"	FBA	East
*GRH VHZ	Granada Hills	34.3088 N	118.5588 W	748	01/18/94	L4	vertical high-gain
*GRH VLZ	"	"	"	"	"	L4	vertical low-gain
*GRH VLN	"	"	"	"	"	L4	North low-gain
*GRH VLE	"	"	"	"	"	L4	East low-gain
*GRH ASZ	"	"	"	"	"	FBA	vertical
*GRH ASN	"	"	"	"	"	FBA	North
*GRH ASE	"	"	"	"	"	FBA	East
*HCM VHZ	Holy Cross Mausoleum	33.99404 N	118.38406 W	19	01/12/94	L4	high-gain vertical
*MNT VHZ	Mint Canyon	34.4569 N	118.4444 W	701	01/30/94	L4	vertical high-gain
MWC ASZ	Mount Wilson	34.22368 N	118.05827 W	1696	05/10/94	FBA	vertical
MWC ASN	"	"	"			FBA	North
MWC ASE	"	"	"			FBA	East
*NHL VHZ	Newhall	34.3918 N	118.5987 W	544	01/20/94	L4	vertical high-gain
*NHL VLZ	"	"	"	"	"	L4	vertical low-gain
*NHL VLN	"	"	"	"	"	L4	North high-gain
*NHL VLE	"	"	"	"	"	L4	East low-gain
*NHL ASZ	"	"	"	"	"	FBA	vertical
*NHL ASN	"	"	"	"	"	FBA	North
*NHL ASE	"	"	"	"	"	FBA	East
*OAK VHZ	Oakridge	34.3640 N	118.7830 W	822	01/22/94	L4	vertical high-gain
*OAK VHN							North high-gain
*OAK VHE							East high-gain
RMM VHZ	Rodman Mountain	34.64384 N	116.62438 W	1777	04/08/94	L4	high-gain vertical
RMM VLZ	"	"	"	"	"	L4	low-gain vertical
RMM VLN	"	"	"	"	05/12/94	L4	North low-gain
RMM VLE	"	"	"	"	"	L4	East low-gain
SIP VLN	Simi Peak	34.20453 N	118.78073 W	700	01/22/94	L4	North high-gain
SIP VLE	"	"	"	"	"	L4	East high-gain
*SLD VHZ	San Luis Dam	37.07700 N	121.22100 W	?	04/21/94	L4	vertical high-gain
*SMF VHZ	Santa Monica Field	34.0300 N	118.4465 W	14	01/13/94	L4	vertical high-gain
*SMF VLZ	"	"	"	"	"	L4	vertical low-gain
*SMF VLN	"	"	"	"	"	L4	North low-gain
*SMF VLE	"	"	"	"	"	L4	East low-gain
*SMF ASZ	"	"	"	"	"	FBA	vertical
*SMF ASN	"	"	"	"	"	FBA	North
*SMF ASE	"	"	"	"	"	FBA	East
*SXT VHZ	Sexton Canyon	34.3379 N	119.2148 W	488	02/02/94	L4	vertical high-gain

Code	Site Name	Lat. (deg)	Long. (deg)	Elev. (m)	Date Installed	Instr.	Orientation
*SYL VHZ	Sylmar	34.2035 N	118.4497 W	1026	01/20/94	L4	vertical high-gain
*SYL VLZ	"	"	"	"	"	L4	vertical low-gain
*SYL VLN	"	"	"	"	"	L4	North low-gain
*SYL VLE	"	"	"	"	"	L4	East low-gain
*SYL ASZ	"	"	"	"	"	FBA	vertical
*SYL ASN	"	"	"	"	"	FBA	North
*SYL ASE	"	"	"	"	"	FBA	East
*VRD VHZ	Verdugo Hills	34.2152 N	118.2788 W	902	01/18/94	L4	vertical high-gain
*VRD VLZ	"	"	"	"	"	L4	vertical low-gain
*VRD VLN	"	"	"	"	"	L4	North low-gain
*VRD VLE	"	"	"	"	"	L4	East low-gain
*VRD ASZ	"	"	"	"	"	FBA	vertical
*VRD ASN	"	"	"	"	"	FBA	North
*VRD ASE	"	"	"	"	"	FBA	East
*VVD VHZ	Val Verde	34.4443 N	118.6633 W	625	01/29/94	L4	vertical high-gain

Note: The * in front of some station codes indicate that the locations for these sites were determined by a topo map or a hand-held GPS. These sites will be located using differential GPS in the future.

Discontinued Stations

Ten stations were removed in 1994. The removal dates are shown below. The network portable stations BRS (Banning Ranger Station), CCR (Crystal Creek), RMM (Rodman Mountain), and STO (Stoddard Mountain) were moved to new sites after the Northridge earthquake. CDY (Cady Mountain) was temporarily off the air after the telemetry site CCR was moved. CMB is owned and maintained by Berkeley and the reason for the removal is unknown. HOT (Hot Springs Mountain) was removed due to inaccessibility. The low-gain component of POB (Polly Butte) was removed, leaving only the high-gain vertical at this site, after the DGR (Domenigoni) site was established since it covered the area well. TOP (Toro Peak) was removed due to a new inaccessibility problem. VG2 (Vista Grande) was also moved when the owner of the property required payment in order to continue operating on his property. These removals are summarized in Table 2.

Table 2. Discontinued Stations

Station Code	Date Discontinued
BRS	01/19/94
CCR	01/17/94
CDY	01/19/94
CMB	04/21/94
HOT	06/28/94
POB	04/19/94
RMM	01/19/94
STO	01/17/94
TOP	03/10/94
VG2	06/07/94

Northridge Portable Stations

Table 3, compiled by Adam Edelman at University of California at San Diego, lists the Southern California Earthquake Center's (SCEC) portable seismograms that were installed following the Northridge earthquake on January 17. This list and additional information can be found on the SCEC Data Center (scec.gps.caltech. edu).

Table 3. Northridge Portables

Site	Latitude	Longitude	Elevation
LA00	34.1062	-118.4542	275
LA01	34.1317	-118.4394	380
LA02	34.0630	-118.4180	80
LA03	34.0900	-118.3390	80
LA04	34.0700	-118.1500	135
BAHA	34.2337	-118.5455	815
BCCP	34.2024	-118.6986	480
BEAR	34.3580	-118.3959	830
BRCY	34.3074	-118.6037	610
CHIM	34.2347	-118.5280	260
CPCP	34.2114	-118.6081	250
CSBB	34.24461	-118.53300	270
CSNR	34.2431	-118.5314	270
CWHP	34.2589	-118.5730	290
DILL	34.3482	-118.3570	670
DOSK	34.2409	-118.5198	270
EFRN	34.2314	-118.5590	250
ETHY	34.1657	-118.4175	200
FIRE	34.3089	-118.4468	385
FLMR	34.4123	-118.9323	275
GRTT	34.18962	-118.61060	245
HERK	34.3259	-118.4283	470
JFPP	34.3120	-118.4960	385
KEST	34.21002	-118.45693	235
KLVC	33.83537	-118.15897	20
KSRG	34.05958	-118.47364	120
LDSC	33.89900	-118.19600	20
LAUR	34.2239	-118.5321	250

MGUY	34.2488	-118.5187	280	SFPW	34.2990	-118.4380	360
MKDR	34.2173	-118.5235	240	SFYP	34.2369	-118.4391	260
MONT	34.27306	-118.48276	300	SMGC	34.4221	-118.6708	400
MPKP	34.2871	-118.8816	30	SMIP	34.2632	-118.6673	330
NFCN	34.2412	-118.5547	265	SSAP	34.2309	-118.7135	380
NFCS	34.2367	-118.5558	260	TNVC	33.92365	-118.19766	25
NHFS	34.19898	-118.39774	225	WVES	34.00500	-118.27900	50
NWHP	34.3880	-118.5332	380	VANA	34.2461	-118.5482	267
PDAM	34.33413	-118.39796	600	YOLY	34.2368	-118.5393	255
PIRU	34.4127	-118.7963	210	YOLZ	34.2335	-118.5393	250
PWGB	34.33222	-118.71712	520	OVHS	34.3285	-118.4460	457
RESB	34.2968	-118.5507	520	NMHP	34.2315	-118.5507	251
SCFS	34.38573	-118.41365	535	OVHI	34.3290	-118.4460	500
SFMI	34.2708	-118.4612	300				

TERRAscope Stations

In 1994 three broadband stations were added to the TERRAscope network: GLA was installed at Glamis, SNCC was installed on San Nicholas Island, and SMTC was installed at Superstition Mountain. Figure 2 shows the locations of all the stations. Table 4 below contains the installation dates and locations of all currently operating TERRAscope stations. Instrument response parameters can be found on the SCEC Data Center (scec.gps.caltech.edu).

Table 4. TERRAscope Stations

Station	Station Name	Installation Date	Latitude (N)	Longitude (W)	Elevation (meters)
BAR	Barrett Dam	10/01/92	32.68005	116.67215	496
*CALB	Calabasas	01/17/94	34.14302	118.62792	276
DGR	Domenegoni Reservoir	06/22/93	33.64996	117.00948	609
GLA	Glamis	04/28/94	33.05107	114.82779	514
GSC	Goldstone	08/08/90	35.30176	116.80572	954
ISA	Isabella	02/07/91	35.66278	118.47403	817
MLAC	Mammoth	11/04/92	37.63014	118.83611	2134
NEE	Needles	04/14/93	34.82482	114.59942	139
PAS	Pasadena	12/87	34.14844	118.17113	257
PFO	Pinyon Flat	10/31/91	33.61151	116.45935	1245
RPV	Rancho Palos Verdes	05/12/93	33.74329	118.40426	64
SBC	Santa Barbara Channel	12/20/90	34.44076	119.71492	61
SNCC	San Nicholas Island	05/27/94	33.24800	119.71492	227
SMTC	Superstition Mountain	**11/94	32.94892	115.72031	3
SVD	Seven Oaks Dam	12/04/90	34.10645	117.09825	574
USC	Univ. of Southern California	02/17/93	34.01916	118.28597	17
VTV	Victorville	04/14/93	34.56058	117.32961	812

Notes: Locations are in NAD-83 coordinate system.
* Previously CALA
** Installed 07/07/93, but data not logged until 11/94

TERRAscope STATIONS JULY 1994

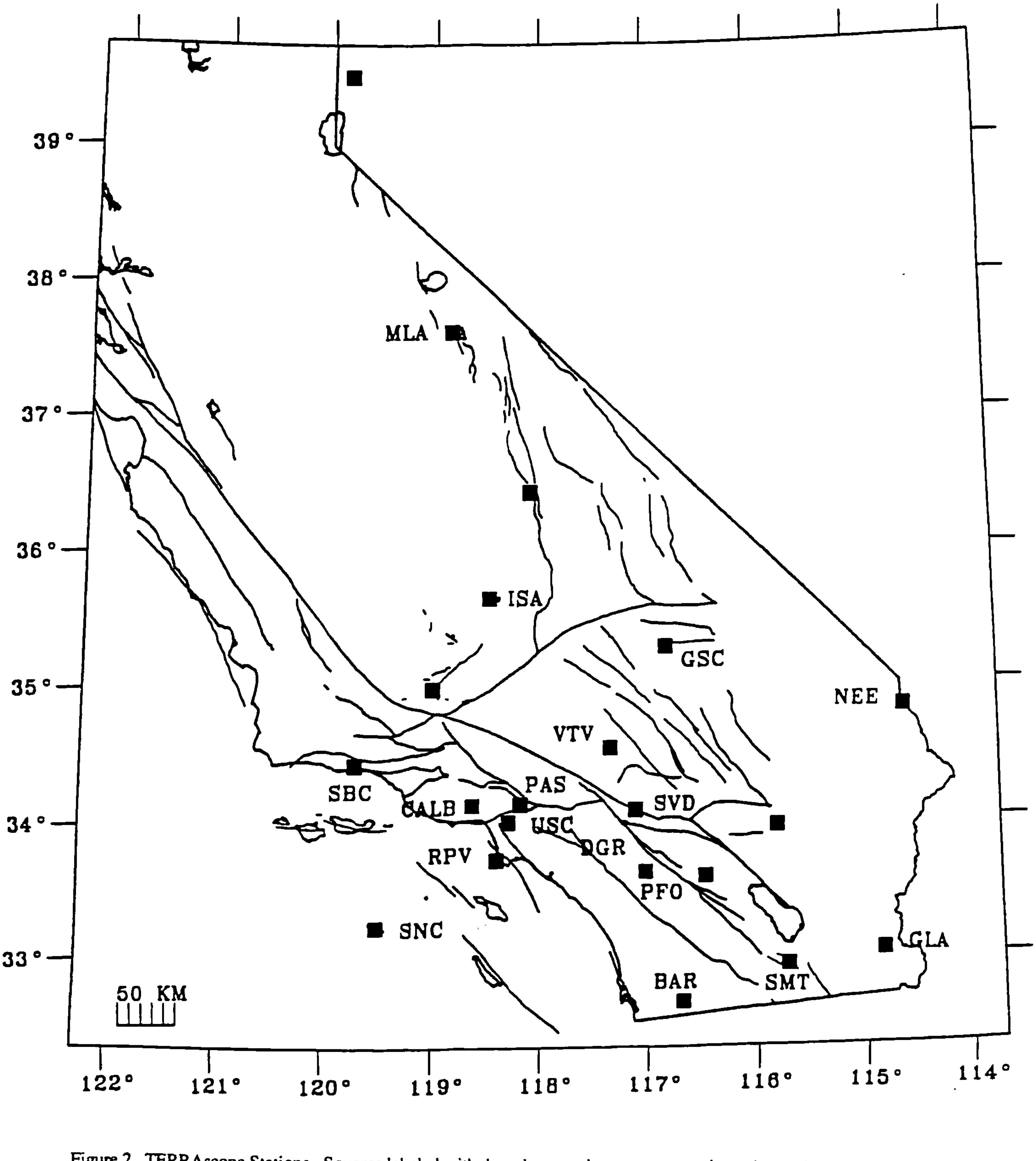


Figure 2. TERRAscope Stations. Squares labeled with three-letter codes represent stations already in operation, squares that are not labeled represent stations to be installed in 1995. (courtesy of Egill Hauksson)

NETWORK OPERATIONS

Status of Processing

The status of each month of the catalog data since the advent of digital recording is described in Table 5. Events for months marked preliminary (**P**) have been timed but have not yet run the gauntlet of quality checking, addition of helicorder amplitudes and rearchiving necessary to become final (**F** with shading). For months marked "pinked" (**PNK**), larger events (~3.0) have only been timed crudely on a few stations and smaller events are absent. A period in 1980-1981 has actually been timed and digital seismograms are available, but the "pinked" version is still used for any purpose requiring good magnitudes or completeness for large earthquakes; some events and magnitudes are missing otherwise. An increased effort has been made in the last couple of years to finalize the backlog of incomplete data . The last three quarters of 1981 are now finalized except for missing magnitude calibrations in the months marked with a "**P**". All of the 1975-76 data has been finalized. The months marked "**P**" in 1993-94 are finalized except for missing magnitude calibrations.

In addition to triggered events, an archive of other interesting seismic time periods and teleseisms are kept on continuously-recorded DAT tapes. See Appendix B for a list of these times and/or events for 1994.

Table 5. Processing Status of Network Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1932-1974	PRE-DIGITAL RECORDING - COMPLETE FOR M≥3.0											
1975	F	F	F	F	F	F	F	F	F	F	F	F
1976	F	F	F	F	F	F	F	F	F	F	F	F
1977	P	P	P	P	P	P	P	P	P	P	P	P
1978	F	F	F	F	F	F	F	F	F	F	F	F
1979	P	P	P	P	P	P	P	P	P	P	P	P
1980	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK
1981	PNK	PNK	P	P	P	P	F	F	F	F	F	F
1982	F	F	F	F	F	F	F	F	F	F	F	F
1983	P	PNK	PNK	PNK	PNK	PNK	PNK	F	F	F	F	F
1984	F	F	F	F	F	F	F	F	F	F	F	F
1985	F	F	F	F	F	F	F	F	F	F	F	F
1986	F	F	F	F	F	F	F	F	F	F	F	F
1987	F	F	F	F	F	F	F	F	F	F	F	F
1988	F	F	F	F	F	F	F	F	F	F	F	F
1989	F	F	F	F	F	F	F	F	F	F	F	F
1990	F	F	F	F	F	F	F	F	F	F	F	F
1991	F	F	F	F	F	F	F	F	F	F	F	F
1992	F	F	F	P	P	P	P	P	P	P	P	P
1993	F	F	F	F	F	F	P	P	P	P	P	P
1994	F	P	P	P	P	P	P	P	P	P	P	P

Figure 3 is a flowchart showing the flow of CUSP data starting from the instrument and ending with the SCEC archives.

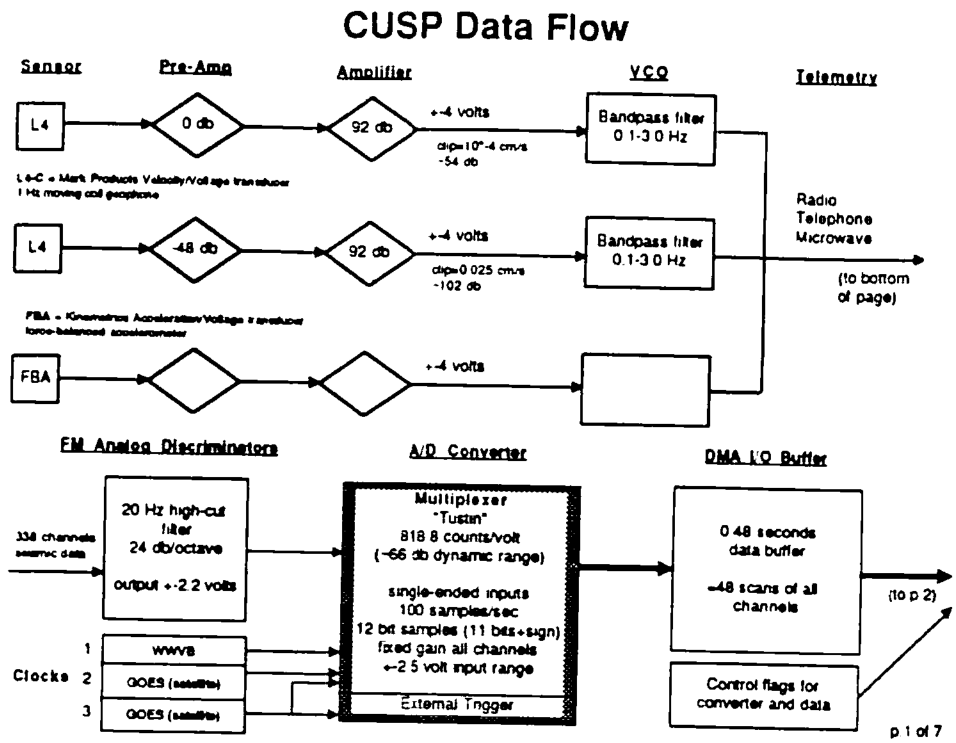
Pasadena USGS Office WWW Home Page

The Pasadena Office now has a home page on the World Wide Web. It is in the early stages of development, but it currently includes information (or links to information) about staff, seismicity, seismic stations, USGS public information, the most recent Network Bulletin, and lots more. The www address is:

http://aladdin.gps.caltech.edu/usgs-pas.html

Public Brochure about Southern California Earthquakes

Lucy Jones of the Pasadena USGS has been heading an effort to produce and distribute a public information brochure with basic earthquake information, and information specific to southern California. The brochure is being prepared by the Pasadena USGS in cooperation with SCEC, the Federal Emergency Management Agency (FEMA) and the California Office of Emergency Services (OES). It is being sponsored



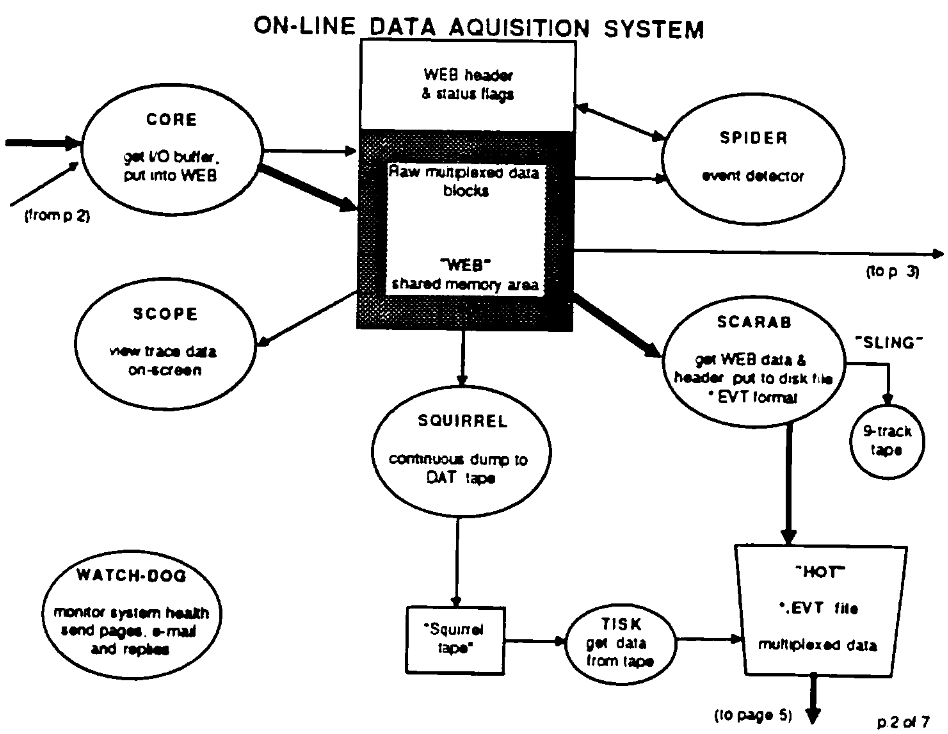
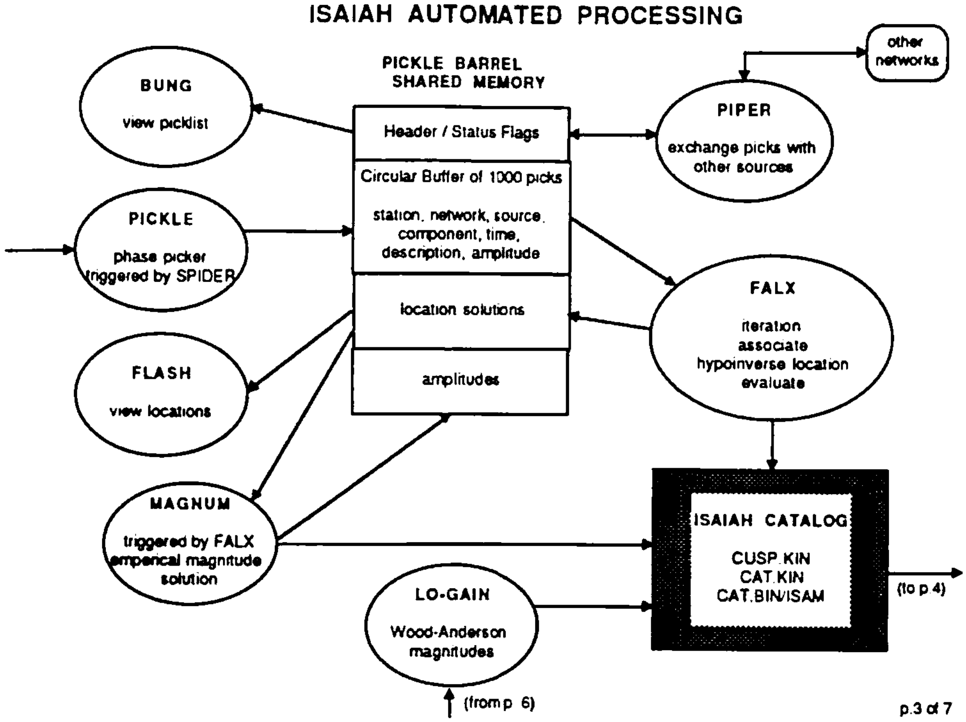
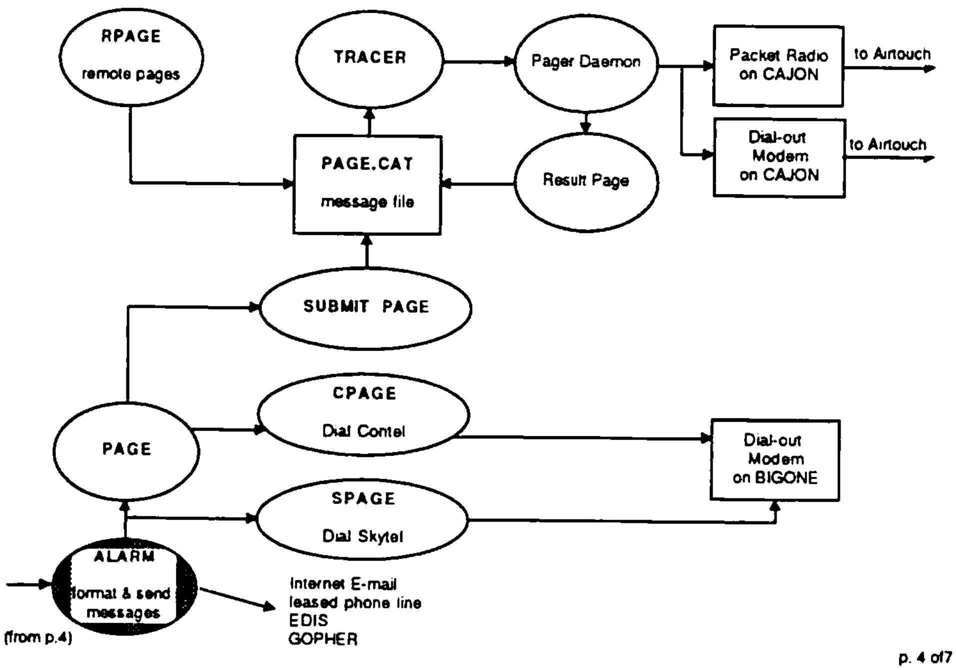


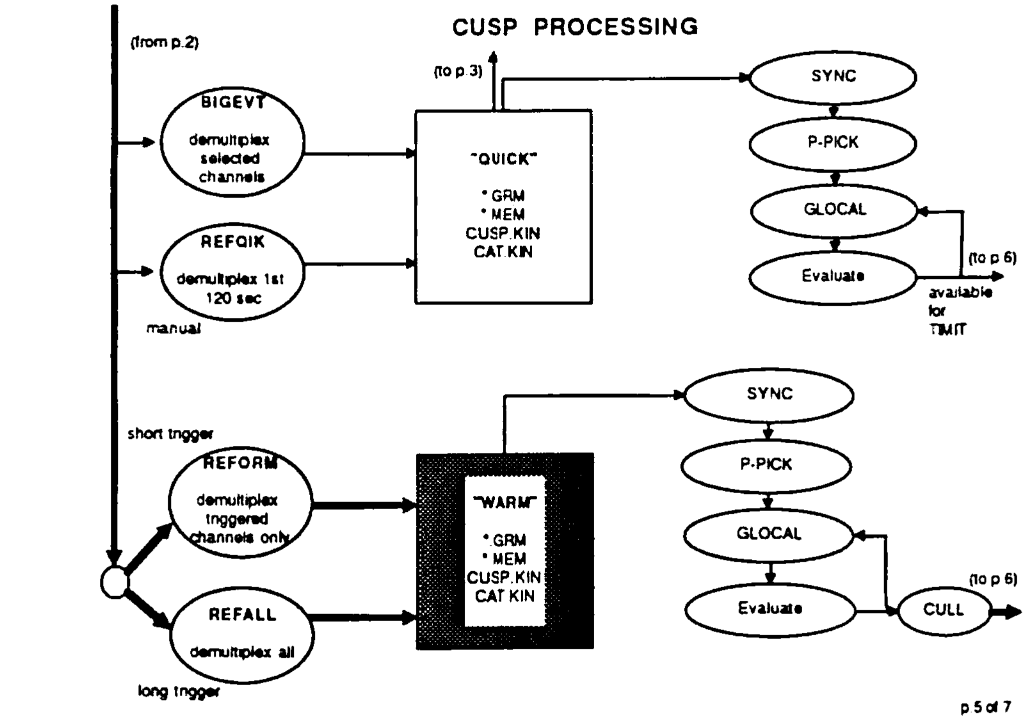
Figure 3. CUSP Data Flow. Flow chart showing the flow of data from the instrument in the field through the CUSP processing system and finally into the SCEC archives (4 pages).

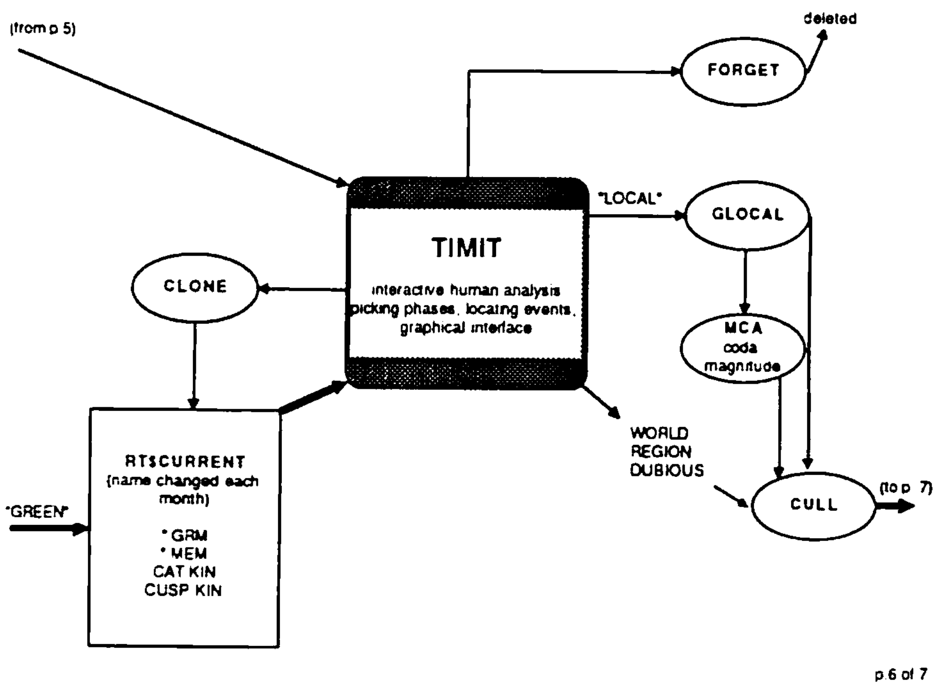
ISAIAH AUTOMATED PROCESSING

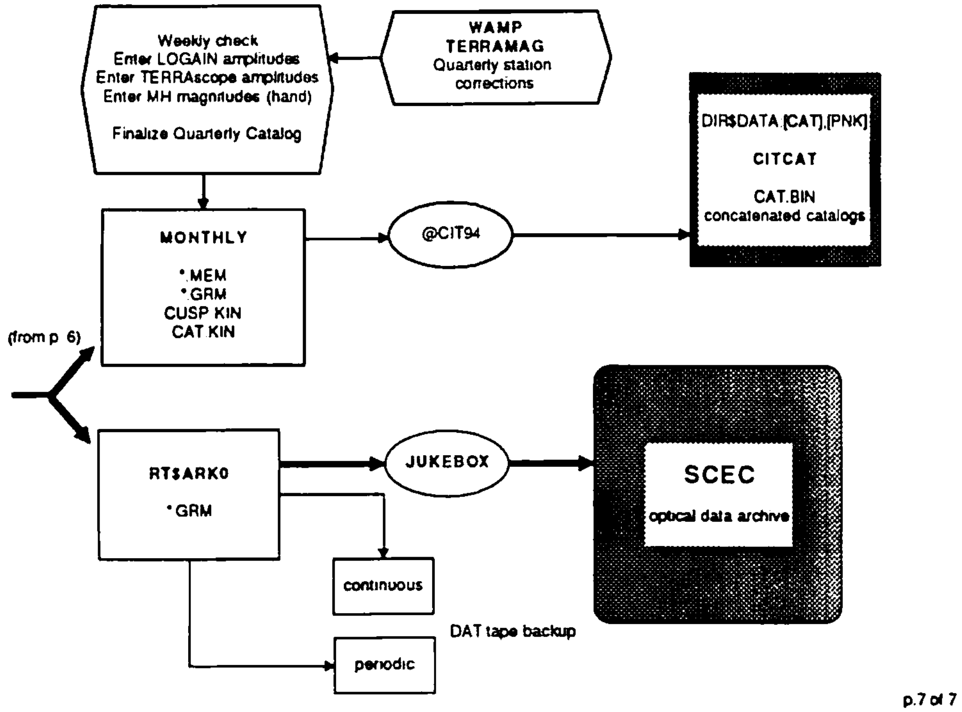


MESSAGE BROADCAST SYSTEM




CUSP PROCESSING
(from p.2)
(to p.3)
BIGEVT
demultiplex selected channels
REFQIK
demultiplex 1st 120 sec
manual
"QUICK"
* GRM
* MEM
CUSP.KIN
CAT.KIN
SYNC
P-PICK
GLOCAL
Evaluate
(to p 6)
available for TIMIT
short trigger
REFORM
demultiplex triggered channels only
REFALL
demultiplex all
long trigger
"WARM"
* GRM
* MEM
CUSP.KIN
CAT.KIN
SYNC
P-PICK
GLOCAL
Evaluate
CULL
(to p 6)
p 5 of 7


(from p 5)
deleted
FORGET
"LOCAL"
GLOCAL
TIMIT
interactive human analysis picking phases, locating events, graphical interface
CLONE
MCA
coda magnitude
RTSCURRENT
(name changed each month)
* GRM
* MEM
CAT.KIN
CUSP.KIN
"GREEN"
WORLD
REGION
DUBIOUS
CULL
(to p 7)
p.6 of 7


Weekly check
Enter LOGAIN amplitudes
Enter TERRAscope amplitudes
Enter MH magnitudes (hand)
Finalize Quarterly Catalog
WAMP
TERRAMAG
Quarterly station corrections
DIR$DATA.[CAT].[PNK]
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concatenated catalogs
MONTHLY
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@CIT94
(from p. 6)
RT$ARK0
*.GRM
JUKEBOX
SCEC
optical data archive
continuous
periodic
DAT tape backup
p.7 of 7

by many different private companies and will be distributed inside newspapers in southern California during Earthquake Preparedness Month, April 1995.

The brochure, entitled *Putting Down Roots in Earthquake Country*, will include information about the basics of earthquake science, new advances in hazard assessment in southern California, and what the individual can do to help make their home and office safer in case of an earthquake. It is filled with eye-catching graphics and easy-to-understand text.

LARSE Experiment

After a year delay spent seeking permits from various agencies, an important experiment took place to enhance our understanding of the earthquake hazard potential in the southern California area. In October of 1994, the USGS and SCEC conducted a seismic imaging survey of the Los Angeles region as part of the National Earthquake Hazards Reduction Program (NEHRP), calling it the LARSE (Los Angeles Regional Seismic Experiment. The goal of the project is to create a subsurface map of geologic structures, including faults, sediment thicknesses, and subcrustal velocities.

The first part of the experiment consisted of firing airguns offshore and recording with 200 on-shore portable seismographs installed along three linear arrays (Figure 4): Seal Beach to Barstow, Topanga Canyon to the Mojave Desert, and Redondo Beach to San Bernardino. These linear arrays were extended out into the Pacific Ocean using sensors in a 3 km streamer towed by the R.V. Ewing research ship, which was operating the airgun array. Also, several ocean bottom seismographs (OBS) were deployed. Beginning October 12 the Ewing sailed along the three lines for six days firing bursts of compressed air every 20-60 seconds (Figure 5).

For the second part of the experimental study on October 26, the original 200 seismographs and an additional 300 more instruments were deployed on the single line from Seal Beach to Barstow. A series of 60 explosions were set off along the line during the nights of October 26, 27 and 28. Each blast used 50 to 4000 lbs. of ammonium nitrate, which produced the maximum equivalent of a magnitude 2.5 earthquake.

It will take up to three years to fully process and analyze the data which will give us a detailed look at the area under southern California. The results will help future planning for earthquake hazards in many different sectors.

The CalREN Project

Currently, about 95% of the seismic data recorded by the SCSN is transmitted from remote sites as analog FM modulated data on analog phone lines. The data are then digitized at a central site. Although this is adequate for smaller seismic signals, this type of transmission during a large earthquake is inadequate because of the distortion of the large earthquake signals by the analog equipment. The objective of the CalREN project is the demonstrate the increased speed and accuracy of earthquake information that can be provided with a fully digital network.

The participants in the CalREN project include the USGS office in Pasadena, Caltech, PacBell, Kinemetrics Inc. in Pasadena, Quanterra Inc., in Harvard, MA, and GTE. The project sponsors include the L.K. Whittier Foundation, CUBE, USGS, and SCEC. CalREN was initiated by a PacBell request for proposals to stimulate the development of new applications for high-speed data communications services. Caltech and USGS responded to the request and were successful in getting the project funded. The project is called "Pilot Study for Use of Digital Data Communications for Real-Time Earthquake Monitoring". The acronym CalREN stands for California Research and Education Network.

The project utilizes a state-of-the-art communication called Frame Relay Service (FRS). FRS is a method of transmitting and receiving digital data over commercially available telephone lines that allows telemetry of real-time seismic data. The packet technology provides a permanent virtual circuit (PVC) that operates at speeds from 56 kbits/sec (bps) to 1.5 M bps and appears to the user as a point to point communications link. It is part of something called Wide Area Networking (WAN) technology that can carry a wide variety of digital formats such as asynchronous, TCP/IP, HDLC, and SDLC. The digital signal is encapsulated and then carried within the Frame Relay packets.

The Frame Relay System is attractive for telemetry of digital seismic signals because it meets all the requirements of our present data communications and software, and it offers the following additional benefits. The high-speed technology means faster and more accurate data. The service is available from most phone companies and the cost is not based on distance. The cost is further reduced since many station data lines can be carried on a single high-speed data line. The Frame Relay Access Devices (FRAD's) can encapsulate IP packets which will allow us to use TCP/IP when our instruments support it in the future.

This pilot study is intended to be a precursor to an extensive upgrade of the present analog network to a digital network. See **http://www.gps.caltech.edu/calren** for further information.

CUBE Update

In the past six months a number of enhancements have been made to the CUBE system. Most of the improvements have resulted from the work of Doug Given of the Pasadena USGS. The major areas of improvement have been in accuracy and performance of ISAIAH (Information on Seismic Activity In A Hurry). Much of the effort has been focused on reducing the number of earthquakes that are split; resulting in two or more events being broadcast for only one real earthquake. At this time, on average, only 2 to 3 percent of events result in multiple broadcasts for the same event.

Magnitude determination for larger events has taken a step forward with the introduction of real-time synthetic Wood-Anderson M_L magnitude determination using a program developed by Jim Mori of the Pasadena USGS. This allows for rapid determination of magnitudes for larger events using data from the SCSN low gain instruments and force balance

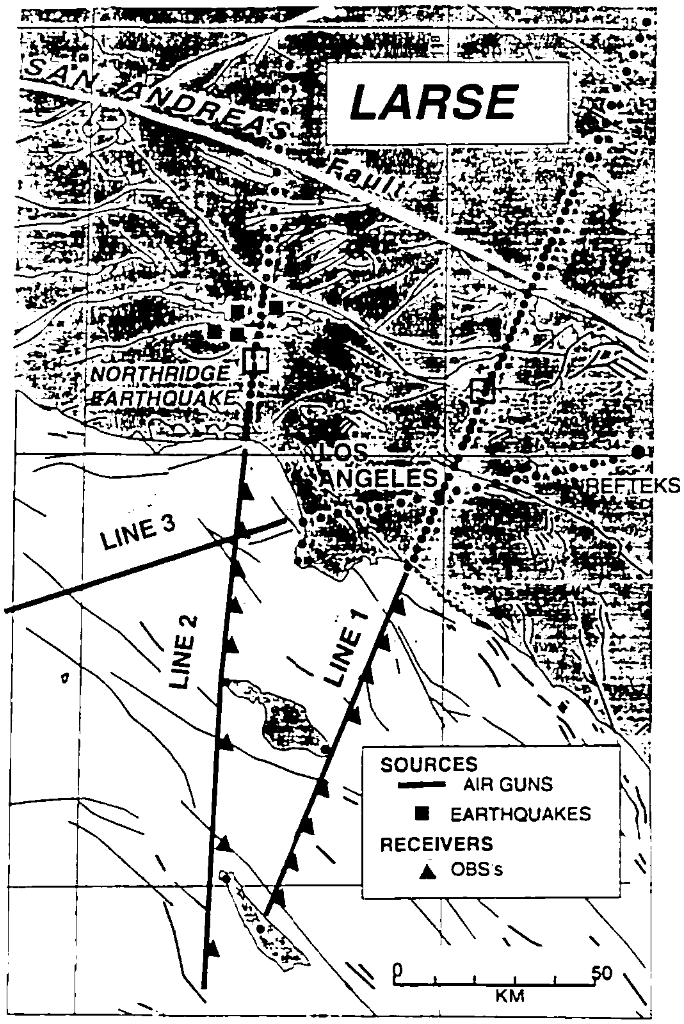

Figure 4. Los Angeles Regional Seismic Experiment (LARSE). Map showing the linear arrays during LARSE to image the Los Angeles Basin. (courtesy of Gary Fuis)

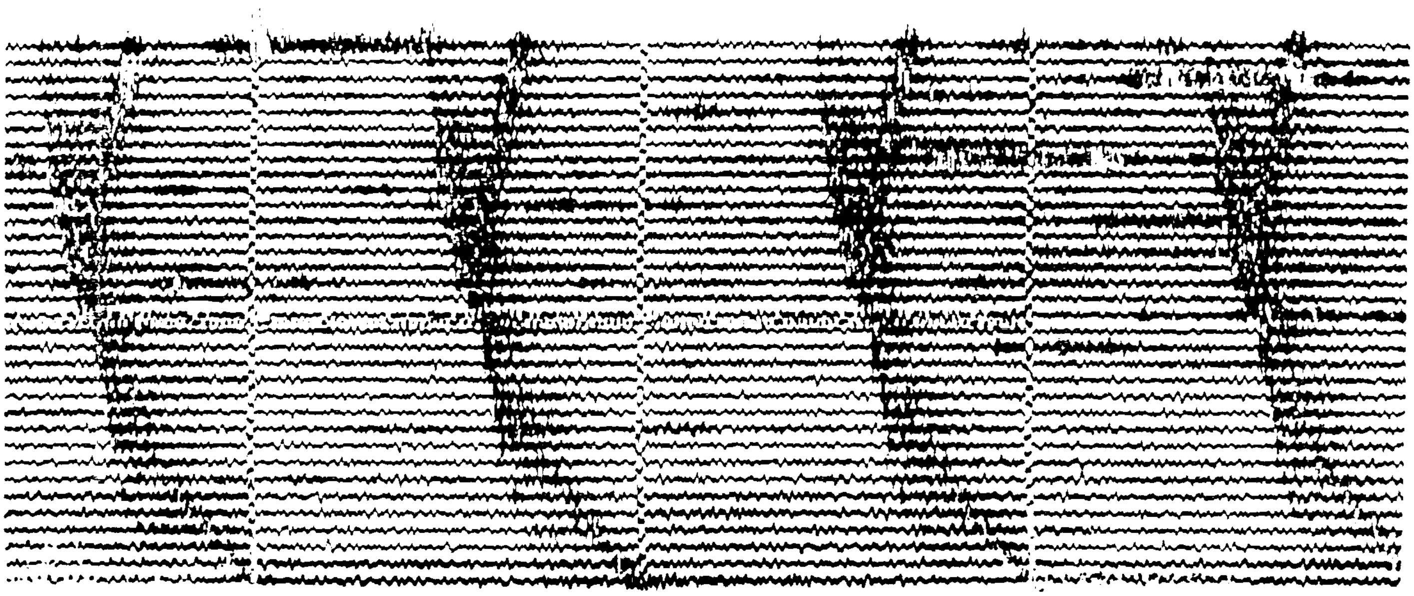

Figure 5. Recording of air gun shots at station CIS (Catalina Island) on October 13, 1994.

accelerometers (FBA's). In conjunction with this work, PhilMaechling of Caltech has developed programs to automatically analyze data from the TERRAscope stations to calculate M_L magnitudes for events above 4.0, and energy magnitudes for events greater than 6.0. This is based on the work of Hiroo Kanamori of the Caltech Seismo Lab. This work is performed on a Sun workstation and the data is automatically incorporated into the real-time data stream.

Another area of work is the speed at which notification is made to interested parties. This has resulted in an average notification send time of just 18 seconds for all users. Also, in an effort to speed up receipt of earthquake data to end users, Steve Bryant of Caltech has rewritten the software used to send pages to Airtouch paging. This rewrite resulted in a 10 to 15 second reduction in the time messages are received by the users. The average time from origin to reception is now 143 seconds.

Another improvement has been with software to quickly review earthquake information following a significant event. Doug Given has been instrumental in this area also. Using data recorded by the CUSP system, Doug designed a graphical review program to examine waveform data on any Tektronics compatible screen. In addition, Doug designed and wrote a screen-oriented catalog editor. These two tools in combination give duty personnel a quick and easy way to review and update information disseminated to users.

SCEC Data Center Update

The main activities of the SCEC Data Center (SCEC_DC) during 1994 were focused on: 1) expanding online data storage capacity, 2) increasing the accessibility of seismological data to users (including those outside of the immediate research community), and 3) designing and implementing a relational database which allows users to extract a variety of seismological data types correlated to a particular earthquake.

As of March 23rd, a second mass storage device was added to the Data Center's exiting one-jukebox system. This included an upgrade of the operating system, the front-end machine, and the archival data management software. The online storage capacity has now doubled to 600 Gbytes. This new configuration has been completely transparent to users accustomed to the previous one-Jukebox system.

Means of Accessing Data

Accessibility to seismological data at the SCEC_DC has been expanded beyond individual user accounts (currently totaling 318) to include anonymous ftp, a bulletin board system, a mosaic interface and a "finger quake" utility (Figure 6):

"scec.gps.caltech.edu"

1) Bulletin Board System (username "bulletin")
2) Individual Research Accounts (requested via the Bulletin Board)
3) Anonymous FTP (username "anonymous")
4) Mosaic Interface (http://scec.gps.caltech.edu)
5) finger quake.scec.gps.caltech.edu (or e-mail quake)

The "bulletin board" system, implemented in April of 1994, allows users to request accounts, and obtain information regarding data stored at the SCEC_DC, as well as the availability and methods of accessing GPS and Strong Motion Data. Weekly earthquake reports, catalog data, and specially compiled data sets (e.g. data from Northridge aftershocks > M4.0) have been made available via anonymous ftp. A World Wide Web interface to the SCEC_DC was implemented in June. In addition to information regarding SCEC and data types stored at the various core institutions, weekly earthquake reports and information regarding current seismic activity are available through this interface.

SCEC_DC Database

The SCEC_DC recently developed and implemented a relational database system, which allows users with individual user accounts to sort and access archived triggered seismological waveform data. All data are associated with an earthquake (i.e. an event) recorded by the SCSN. The "indexes" into the database are the event ID's associated with individual earthquakes. A binary version of the database was developed from ASCII files which store earthquake and seismogram attributes, as well as indices into the waveform archives. The format of these ASCII files is identical to the system used at the Northern California Data Center. Triggered TERRAscope and portable data (Joshua Tree and Landers earthquake sequences) have been associated with the events recorded by the SCSN and merged into this binary database (Figure 7). Users can now retrieve and sort parametric data (e.g. hypocenters, magnitudes and phase information) via a database searching program DBSORT, and waveform data can be retrieved and converted from the archived format to such formats as SAC, SEGY and AH via the program SCECGRAM (Figure 8).

Current Archive

The *online* SCEC_DC archive currently consists of approximately 350 Gbytes of seismological and geodetic data. SCSN hypocenter, phase and waveform data is available for May 1981 through January 1983, and August 1983 to the present. Since the Northridge earthquake, the SCSN is now routinely archiving waveforms directly onto the SCEC_DC jukebox system, thereby making SCSN data available within a day or so of data collection. The remainder of the archive consists of GPS data, triggered TERRAscope data for local and regional events since September of 1990, and portable instrument data for selected events in the Joshua Tree and Landers earthquake sequences.

Processing of aftershocks (except for magnitude calibrations) from the January 17th Northridge earthquake was completed as of the middle of October. Work is now resuming on processing the approximately 10,000 events still backlogged from the Joshua Tree-Landers-Big Bear earthquake sequence (Figure 9).

Further Information

Further information regarding the SCEC_DC is available by contacting Katrin Hafner at the Seismological Laboratory, Mail Code 252-21, Caltech, Pasadena, CA 91125, (katrin@scec.gps.caltech.edu) or (818)395-2106.

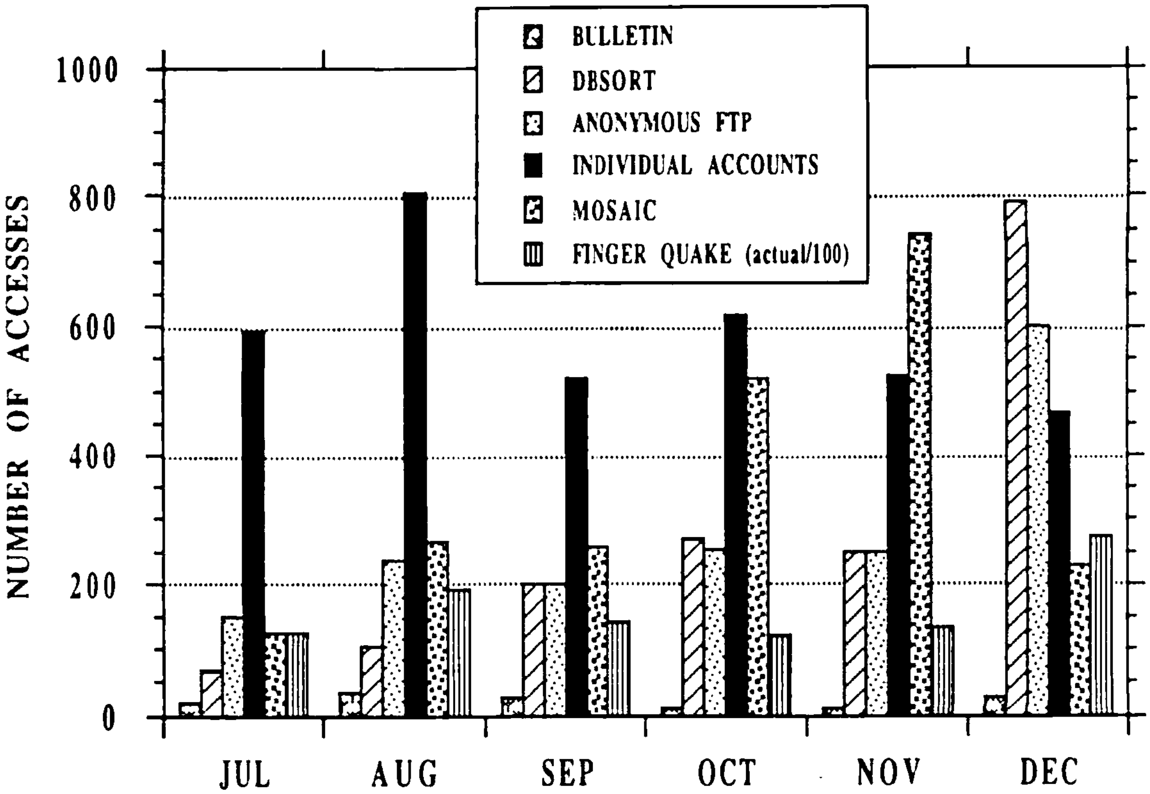

Figure 6. Distribution and number of accesses to the SCEC_DC via various user interfaces between July and December of 1994. Note that the finger quake utility is divided by one hundred.

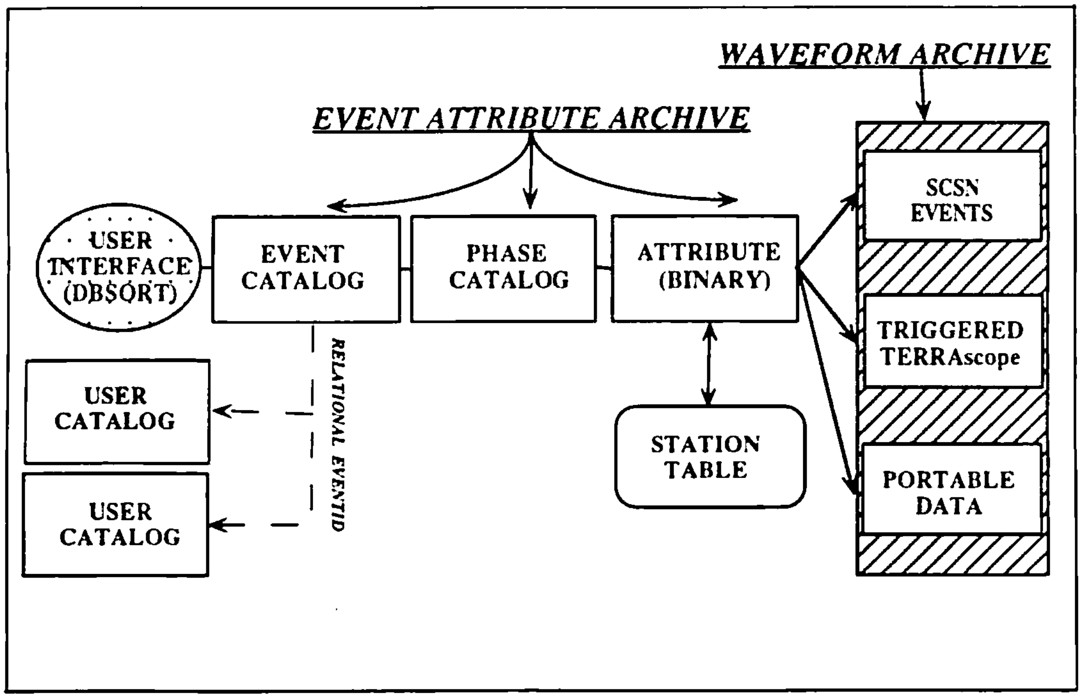

Figure 7. Schematic diagram of the SCEC_DC database, illustrating the connections from the user interface into various portions of the archive.

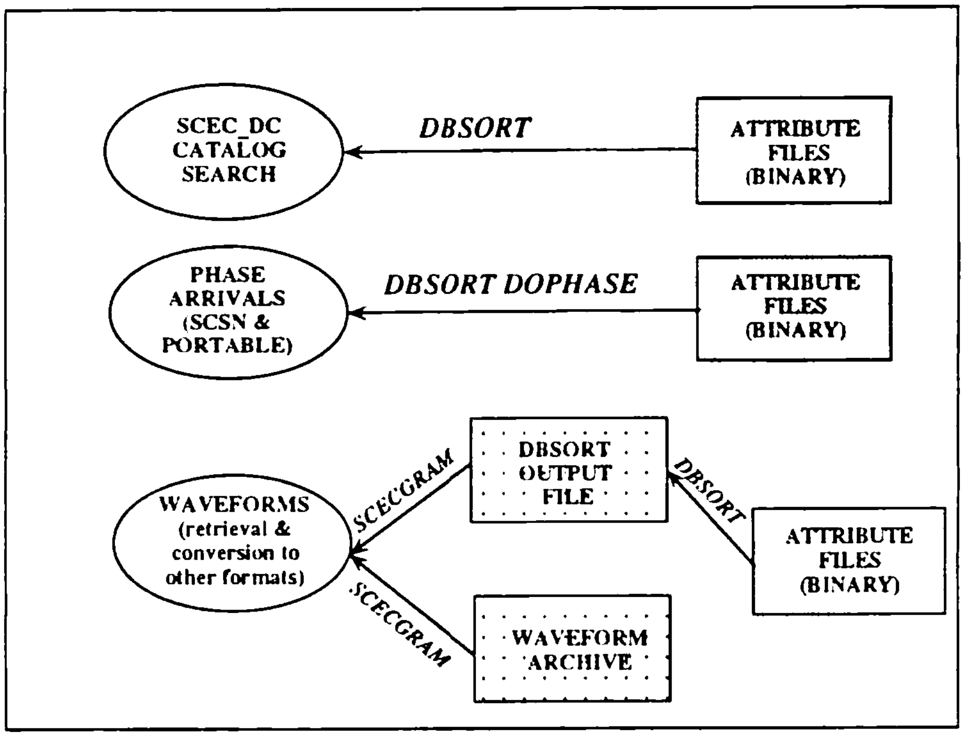

Figure 8. Schematic diagram illustrating the methods for retrieving hypocentral, phase and waveform data from the SCEC_DC archive using "dbsort" and "scecgram".

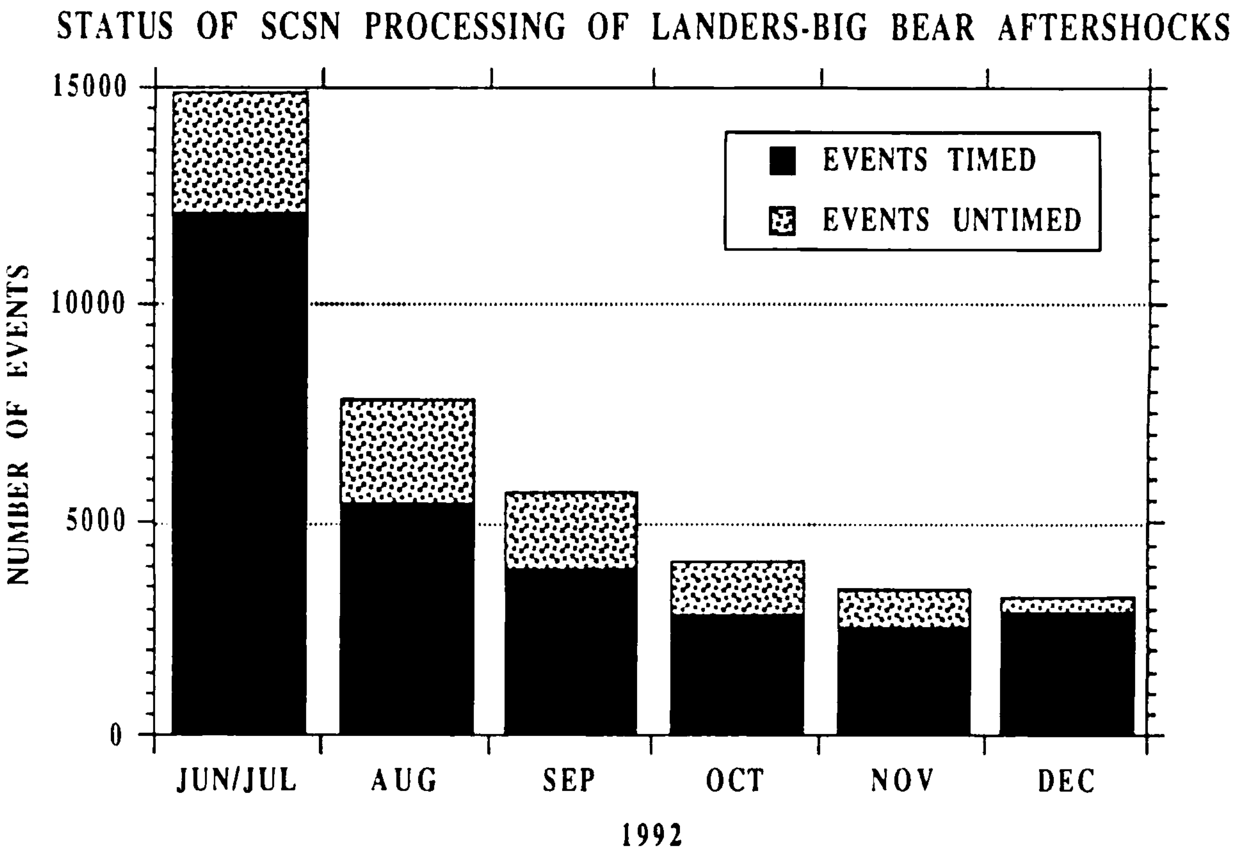

Figure 9. Status of SCSN processing of earthquakes since the June 28th, Landers earthquake sequence. The bar graph show the number of events that triggered the network versus the number of those triggered events that have been processed.

RESEARCH NOTES

The January 17, 1994 Northridge Earthquake

(This is a copy of a report that was written by Jim Mori and Lisa Wald for the 1994 USGS Yearbook.)

On the morning of January 17 at 04:30 (PST) a magnitude 6.7 earthquake severely shook the San Fernando Valley and other regions of Los Angeles area in southern California. The Northridge earthquake was the most costly earthquake in U.S. history causing estimated losses of $20 billion. There were 57 deaths and over 9000 injuries to people in the region attributed to the earthquake, as well as 20,000 people displaced from their homes. It was a moderate earthquake in size, but since it occurred directly under the populated San Fernando Valley, it had an immense impact on the people and structures of the Los Angeles area. There was significant damage to thousands of buildings, with over 1600 "red-tagged" as unsafe to enter. Another 7300 buildings were restricted to limited entry (yellow-tagged) and minor damage was incurred on many thousands of other structures. The 10 to 20 seconds of strong shaking collapsed buildings, brought down freeway interchanges, and ruptured gas lines that exploded into fires. But the early morning occurrence was a fortuitous life saver, because there were only a few people in many of the large buildings and parking structures that collapsed and traffic was very light on the freeway overpasses that fell.

Scientists of the USGS responded quickly to the Northridge earthquake, investigating and reporting on the geological and societal effects. The work of USGS personnel during the month following the earthquake focused on efforts to:

•Monitor the current seismic activity and provide information about seismic hazards to local government, media, and the public.

•Collect data to study the problem of seismic hazards in southern California leading to information that will mitigate damage from future earthquakes.

Early on January 17 the USGS/Caltech offices in Pasadena became the center for seismic information. The large seismic network that monitors the earthquakes in southern California is operated from this location, and within minutes of the Northridge earthquake scientists began analyzing data from the network and broadcasting the location and magnitude to the public. USGS and Caltech scientists kept a steady flow of information to the public over the next few days as details about the earthquake and its damaging effects were inferred from seismic data and observed by the field crews. To maintain good communications with emergency response groups, a USGS liaison was stationed at the FEMA headquarters a few miles away in Pasadena and a California Office of Emergency Services liaison was stationed at the USGS operations in Pasadena. These efforts to provide information about earthquakes continued throughout the next few months as the Los Angeles area was rocked by hundreds of felt aftershocks.

Seismological Observations

Thousands of aftershocks occurred during the following months including 5 magnitude 5, 44 magnitude 4 and 287 magnitude 3 events. The locations of the aftershocks are distributed across an area about 30 x 20 km (Figure 10) and map out the extent and orientation of the fault plane. These locations clearly show a plane dipping toward the southwest, which is interpreted to be the rupture surface of the thrust fault that produced the earthquake. This plane extends from the mainshock hypocenter at 18 km upward toward (but not reaching) the surface. Preliminary analyses indicate that most of the slip on the fault plane occurred at depths below 5 km and there was relatively little slip on the shallow portions of the fault.

The location of the fault plane as inferred from the aftershock distribution does not correspond to any mapped geologic fault. The earthquake did occur, however, within a system of known thrust faults that extends along the northern edge of the San Fernando Valley. Like the fault that produced the Northridge earthquake, many of these faults are "blind thrusts" which do not extend to the surface and, therefore, are difficult to recognize prior to large earthquakes.

The extensive damage from the earthquakes was mainly a result of the intense shaking produced by earthquake. The large amplitude motions from the Northridge earthquake were recorded on many strong-motion instruments within the Los Angles area, producing one of the best data sets of strong ground motions. The recordings showed peak accelerations of 0.5 to 1.0 g in the aftershock area and decreasing to 0.1 g at distances of about 50 km. Several sites close to the epicenter area recorded accelerations over 1 g. These high levels of ground motion and the resultant wide-spread damage emphasized the need for a better understanding of how the local geology effects the levels of ground shaking. A coordinated effort of USGS and university seismologists deployed more than 75 portable seismographs to record aftershocks and study the complicated wave propagation and local site effects that are controlled by the local geology. Instruments placed in many severely damaged areas of Northridge, Sherman Oaks, and Santa Monica, as well as the collapsed freeway sites at the I5-highway 14 interchange, highway 118 near Woodley, and I10 near La Cienega.

Real-time information about the mainshock and aftershocks was broadcast to 15 members of the Caltech-USGS Broadcast of Earthquakes (CUBE) program. This project is a cooperative effort to develop a system of quick earthquake information in southern California. Contributing members that make immediate use of this information include governmental emergency response agencies, water and power utilities, railroads, and other private companies. Earthquake locations and magnitudes are sent to pagers and computer displays throughout southern California and other parts of the country. Generally, information is sent within about 5 minutes of the earthquake occurrence. Because of various problems encountered at the time of the Northridge earthquake, actual information about the mainshock was relatively slow in getting out, however messages about the

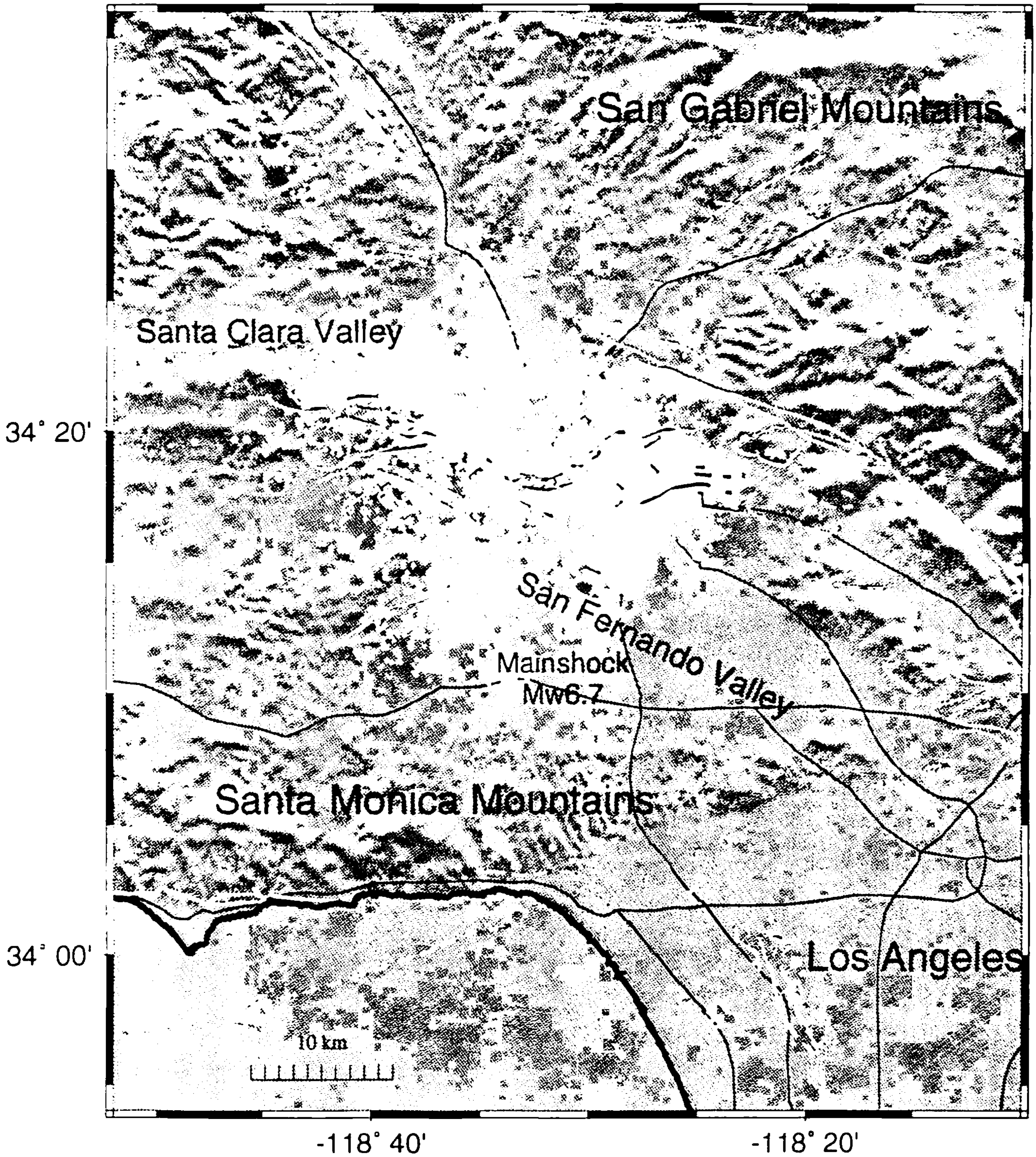

Figure 10. Northridge aftershock zone and faults in the area overlayed on a relief map. (courtesy of Egill Hauksson)

first aftershocks were being sent within about 15 minutes after the mainshock.

Geological Observations

There was no evidence of tectonic surface ruptures suggesting that the Northridge fault did not appear to extend to the surface. This is consistent with the seismologic and geodetic data indicating that all slip occurred at depths below 5 km. However, there were regions of surface cracking and deformations that were thought to be the result of strong shaking rather than direct fault ruptures. The most extensive area of ground deformation was in Portrero Canyon on the north side of the Santa Susana mountains where a series of discontinuous tension cracks and normal faults had displacements of up to 60 cm. None of the deformation was associated with any previously mapped surface fault Another system of small cracks was studied in Granada Hills, where ground deformations caused numerous water and gas main rupture at the time of the earthquake. These features were also caused by ground shaking rather than tectonic faulting.

Extensive landslides occurred in the younger sediments of the western Santa Susana Mountains, Oak Ridge and Big Mountain areas. Over 1000 landslides Rock falls have choked the ravine bottoms of many canyons in the Santa Susana Mountains. Had heavy rains fallen, they have could saturate the material, causing it to mobilize into debris flows that threaten structures near the mouths of the canyons.

The extent of liquefaction caused by this earthquake was much less than expected, given the historical ground water levels and the strong levels of ground shaking that occurred. The reason was probably the lower than average water table levels in the San Fernando valley. There were localized instances of liquefaction and lateral spreading in the San Fernando Valley (primarily settling basins along the Los Angeles River) and other areas in Simi Valley, Santa Monica, and Redondo Beach.

Conclusions

Scientists have often warned about seismic hazards in the western U.S., and this earthquake tested the preparedness of southern California. There were successes that had been learned from past experiences and failures that need to be corrected. On the positive side, information gained from scientific efforts of the National Earthquake Hazard Reduction Program (NEHRP), combined with some of the better seismic building practices in the US, helped to limit the loss of life. In other parts of the world where these types of programs do not exist, similar sized earthquakes, for example in India (1993) and Armenia (1988), have caused thousands of deaths. On the negative side, poorer building construction was not adequate to prevent wide-spread structural failures in many communities, such as Northridge, Simi Valley, Sherman Oaks, North Hollywood and Santa Monica. The famous Los Angeles freeways suffered collapses at 7 sites and another 170 bridges had varying amounts of observable damage. Road construction to repair the bridges caused traffic problems for many months following the earthquake.

The large amount of damage that was caused by the Northridge earthquake is a consequence of an active geologic structure within an urban environment. The type of fault that produced the Northridge earthquake is not unique to the San Fernando valley. Similar structures exist throughout the area and there is geologic evidence for several blind thrusts in the Los Angles basin that are capable of producing events even larger than Northridge. Large earthquakes on these faults could present serious problems for densely populated areas, including the high rise buildings in downtown Los Angeles. Furthermore, the problem of populated areas in close proximity to earthquakes is not limited to Los Angeles. Portions of the San Andreas fault are adjacent to San Bernardino and San Francisco. The Hayward fault passes through densely populated areas of Oakland and East Bay communities. Portland, Seattle, and Memphis all are located in earthquake prone areas. The lessons learned from the Northridge earthquake about the levels of strong ground shaking produced by a moderate earthquake and the subsequent damage to populated areas, should be applied to the practices in building construction and earthquake preparedness in all of these cities.

Re-surveys of benchmarks, using the Global Positioning System (GPS), showed there were significant static displacements due to the earthquake. In the aftershock region, there were vertical uplifts of 40 to 50 cm and horizontal movements of 2 to 20 cm. These movements are consistent with the fault geometry derived from the seismological observations. Preliminary modeling of the data indicate that there was slip of 2.5 to 3.5 meters on a 10 x 10 km patch of the fault. The motion was primarily thrust faulting, and most of the slip occurred at depths greater than 6 km. Following the Northridge earthquake, GPS receivers were permanently installed to provide continuous monitoring of deformations in the San Fernando valley and Los Angeles basin.

(This report was compiled from information gathered by many scientists from the U.S. Geological Survey, (Pasadena CA, Menlo Park CA, Golden CO offices) California Institute of Technology, Southern California Earthquake Center, and the Jet Propulsion Laboratory.)

SYNOPSIS OF SEISMICITY

A total of 27,996 earthquakes and 1607 blasts were cataloged for 1994 (Figure 11) at the time of this writing. Of the cataloged events, 526 were greater than or equal to $M_L3.0$ (Appendix A, Figure 12). The largest earthquake within the SCSN network in 1994 had an magnitude of 6.7 and was located in Northridge. Focal mechanisms for 16 events ($M_L \geq 4.0$) are shown in Figure 13.

For the following discussion southern California has been divided into eleven sub-regions (Figure 14). These regions are arbitrary, but useful for discussing characteristics of seismicity in a manageable context. Figure 15 summarizes the activity of each sub-region over the past ten years. A separate discussion section follows for those regions with notable activity. The dates mentioned in the text are based on Pacific time, however those in Appendix A are based on GMT, thus the discrepancy in a few dates.

Imperial Valley - Region 1

Obsidian Butte experienced several swarms throughout the year, as is normal for this area. This area is very seismically active because it is the transition zone between the East Pacific Rise spreading ridge and the south end of the San Andreas fault. The first swarm started on March 6 and lasted about two weeks with a maximum magnitude of M3.0. The second one occurred in mid-July and included an M3.2. On December 12 an M3.6 was the largest event in the last swarm of the year.

Several earthquakes were felt in this region that actually occurred in Mexico. On Feb. 11 and M3.3 south of the border was felt in the El Centro area. An M4.6 in northern Baja shook the area on August 11 (Figure 13, No.13), and two months later on October 4 an M4.6 in northern Baja was also felt in the Imperial Valley area.

South San Jacinto - Region 2

The only seismic activity in this region included two earthquakes in the vicinity of Borrego Springs. The first on February 9 was an M3.4 on the Anza segment of the San Jacinto fault. The second was an M3.9 in the Ocotillo Wells area south of Borrego Springs that was felt in the area.

South Elsinore - Region 3

This region experienced no significant seismic activity in 1994.

San Diego - Region 4

The only notable event in this region was an M3.8 in August just south of San Clemente Island.

Los Angeles Coast - Region 5

The Los Angeles and South Coast areas experienced quite a few small earthquakes in 1994, perhaps as a result of the nearby M6.7 Northridge earthquake on January 17. An M3.7 offshore of Venice Beach on January 9 (before the Northridge earthquake) was widely felt in west Los Angeles and the San Fernando Valley. It was accompanied by one foreshock and a few small aftershocks.

On February 3-9 there were several wide-spread small events in Malibu, the Los Angeles Basin, and in the Monrovia/Baldwin Park area. None were felt. They were probably due to crustal readjustment after the Northridge earthquake. These small events throughout the Los Angeles area continued throughout the year. An M2.9 in the Watts/Lynwood area was felt on March 3, and a small M2.7 was felt later on March 31 in Monterey Park.

April 7-13 there were a few small events that went unnoticed by the public; an M2.0 near Mt. Wilson, an M2.0 near the La Brea Tar Pits, and an M1.5 in South Pasadena. Then south of Los Angeles offshore between Dockweiler and Manhattan Beaches there was a cluster of events on May 13. The largest two, an M2.5 and M3.2, were felt. On June 7 one person called in response to an M2.5 near Loma Linda. The Lakewood area had a small cluster of earthquakes on June 21 (except for one on June 20), including an M2.5 and M2.6 that were felt in the epicentral area. Lastly, Marina del Rey residents felt an M3.4 earthquake on December 11.

North Elsinore - Region 6

The Palomar Observatory was the epicentral location of an M3.2 that was felt on April 3. A large swarm of earthquakes occurred in the Fontana area beginning in mid-July and tapering off in mid-August. The largest event in the swarm was an M3.5.

San Bernardino - Region 7

This region was very seismically active, as usual. Landers/Big Bear aftershocks continued throughout the year, many being felt. They included an M5.0 strike-slip event on June 15 in the Landers area (Figure 13, No.11), an M4.9 on August 1 (Figure 13, No.12), an M4.2 on November 20 (Figure 13, No.15), and a swarm of 27 events on August 15 at the south end of the Landers aftershock zone just 2 miles from the San Andreas fault. The largest was an M3.8 that was felt in Palm Desert. The mechanisms were mostly normal faulting.

In the southernmost tip of the region near Bombay Beach, there were four small earthquakes (largest M2.0) February 24 - March 2. Earthquakes in this area cause a little concern since it is the south end of the locked section of the San Andreas fault were it connects to the active Brawley Seismic Zone.

An M4.8 oblique thrust earthquake occurred on April 6 in the Lake Arrowhead area Figure 13, No.10). It was widely felt.

On May 26 an unusually deep (18km) M3.3 was felt on the San Jacinto fault near San Bernardino. One focal plane was almost horizontal; this type of mechanism has been seen in this area in the past. An M3.5 event on September 11 on the north San Jacinto fault was felt in Hemet. An M2.8 was felt on October 11 near Idyllwild, and then on November 7 and 8 there were an M3.8 and an M3.7, respectively, near Idyllwild on the San Jacinto fault that were both felt in the Palm Springs area. Residents in the Redlands area felt an M3.2 earthquake on November 15.

North Mojave - Region 8

Seismic activity was experienced in the usual areas within this region in 1994. An M3.5 occurred near Barstow on June 27. An M3.5 was also the largest of a cluster of events (several >M3.0) outside of Baker (northeast of the Landers aftershock zone) that began in late August and continued into September.

On October 18 southeast of Ridgecrest on the Garlock fault on M4.3 (Figure 13, No.14), followed later by an M3.5, shook the area. It was part of a swarm of earthquakes that began in mid-October and continued through almost the end of the month. Both the larger events were strike-slip, which is consistent with the left-lateral Garlock fault. The Garlock fault is not considered to be an active fault, but it does experience such events occasionally.

South Sierra Nevada - Region 9

The Furnace Creek area of Death Valley was the location of an M4.0 on February 3 (Figure 13, No.7). Later in the year on October 23 there was a cluster of events in Death Valley, M3.4 being the largest.

In the vicinity of Ridgecrest there was an M3.7 on July 25 (in Trona) and an M3.6 on December 12.

Kern County - Region 10

This area had some seismic activity late in the year starting with an M3.4 on October 21 in the south San Joaquin Valley. Then on November 10 an M3.0 was felt near Bakersfield. About two weeks later on November 23 just west of Bakersfield, along the east edge of the Coast Ranges near Taft, an M3.5 was also felt.

Santa Barbara - Region 11

The largest earthquake of 1994, and M6.7, occurred in Northridge on January 17 (Figures 8 & 13; Nos.1-6,8). This earthquake caused widespread damage in the San Fernando Valley and parts of the Los Angeles Basin, and produced many aftershocks that were felt throughout the year. On December 5 there was an M4.5 aftershock, the largest since an M5.2 on March 20 (and an M4.4 on May 25). See the article entitled "the January 17 Northridge Earthquake" in the *Research Notes* section for details.

An unusual sequence of 22 earthquakes occurred in Ventura County that began on February 17 and continued through March 2. These events (all <M2.0 with normal 2-16km depths) were located along a 50km-long lineation parallel to the east-striking Ventura Basin.

An M3.6 thrust event happened near Fillmore (northwest of the Northridge aftershock zone) on April 8 that may have been on the San Cayatano fault. Offshore near Santa Barbara Island on August 13 there was an M3.4. An M3.6 was felt on December 9 near Ojai.

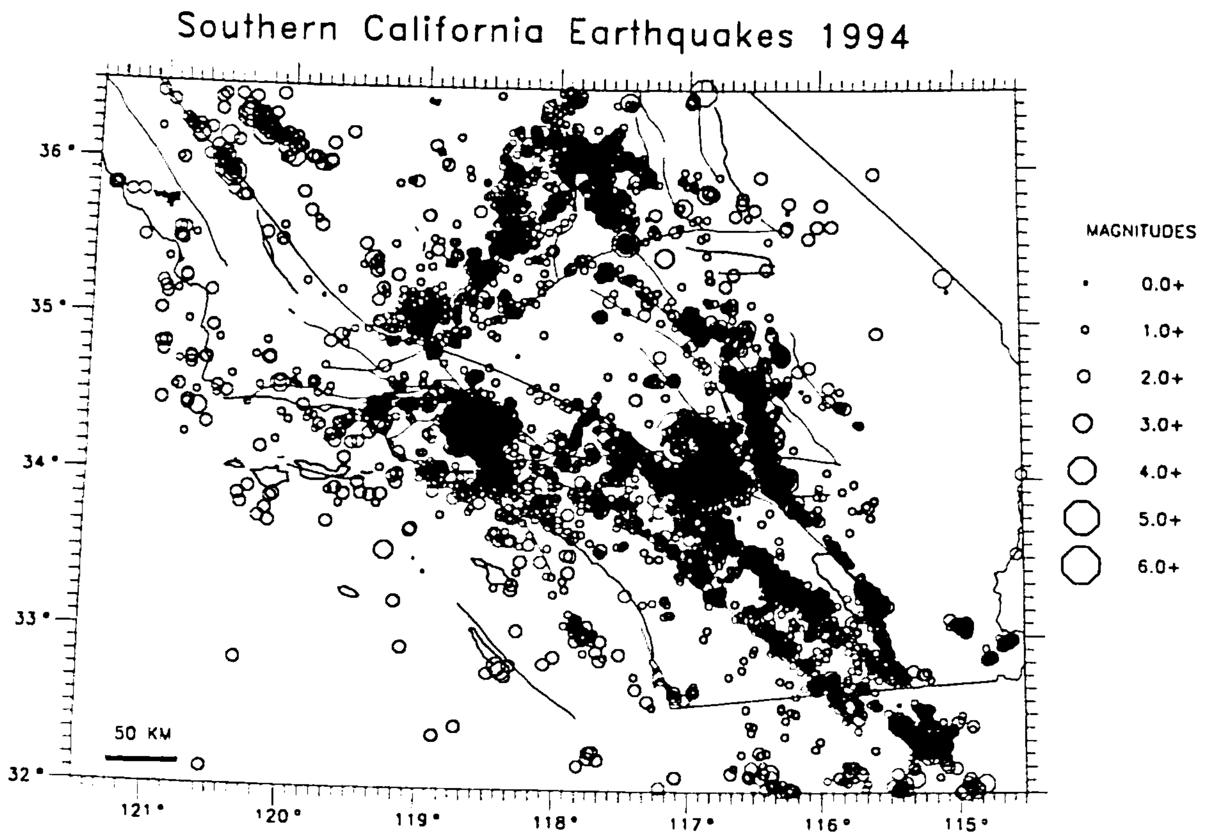

Figure 11. Map of all located earthquakes in southern California for the period of January through December 1994.

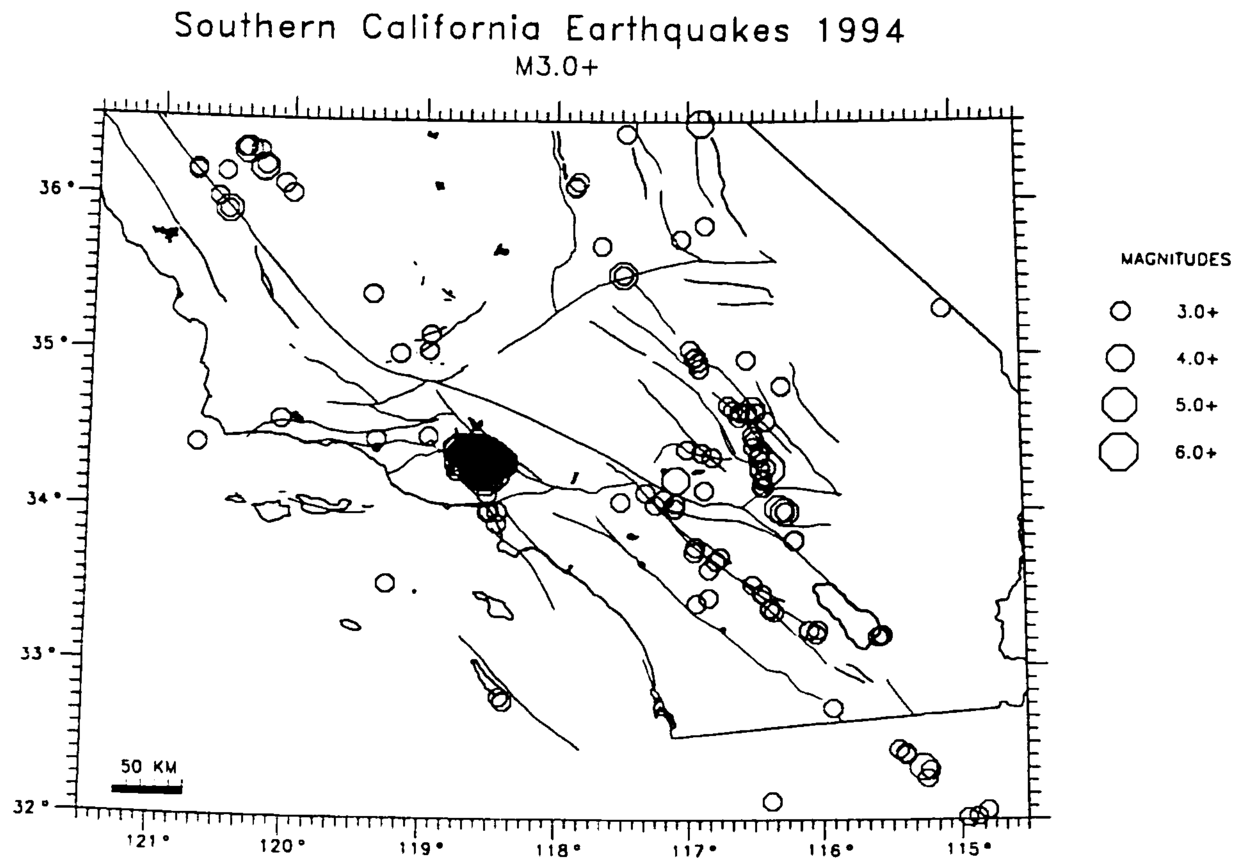

Figure 12. Map of located earthquakes of magnitude 3.0 and larger in southern California for the period of January through December 1994.

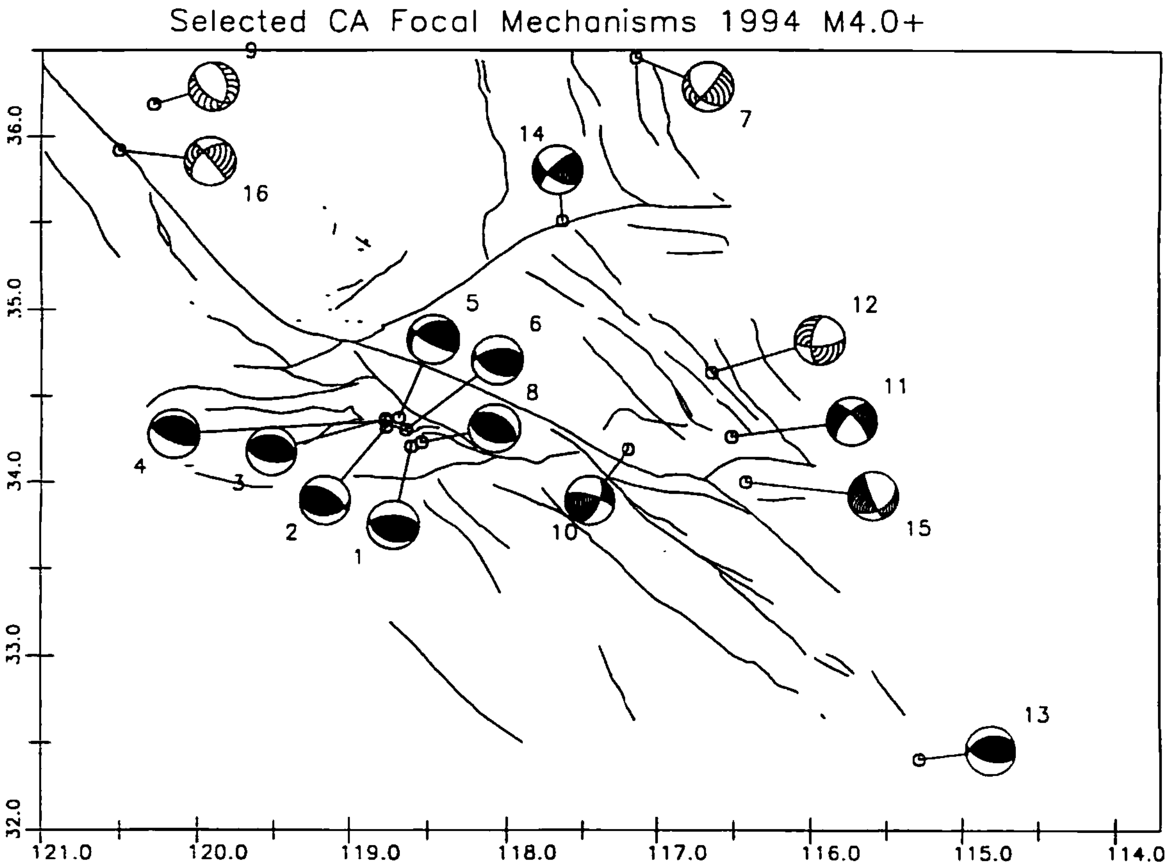

Figure 13. Lower hemisphere focal mechanisms for selected events for the period January through December 1994. Event numbers correspond to numbers in FM column of Appendix A.

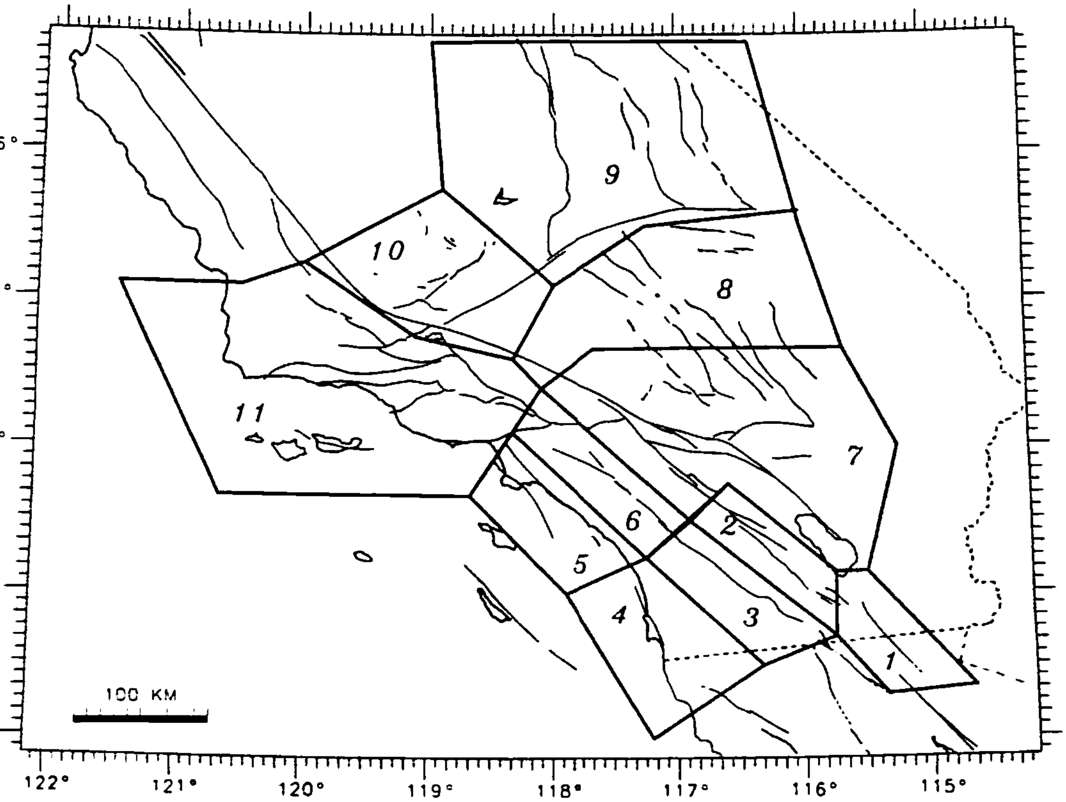

Figure 14. Map of sub-regions used in Figure 15. The geographic name of each sub-region, as used in the text, can be found in the headings of Figure 15.

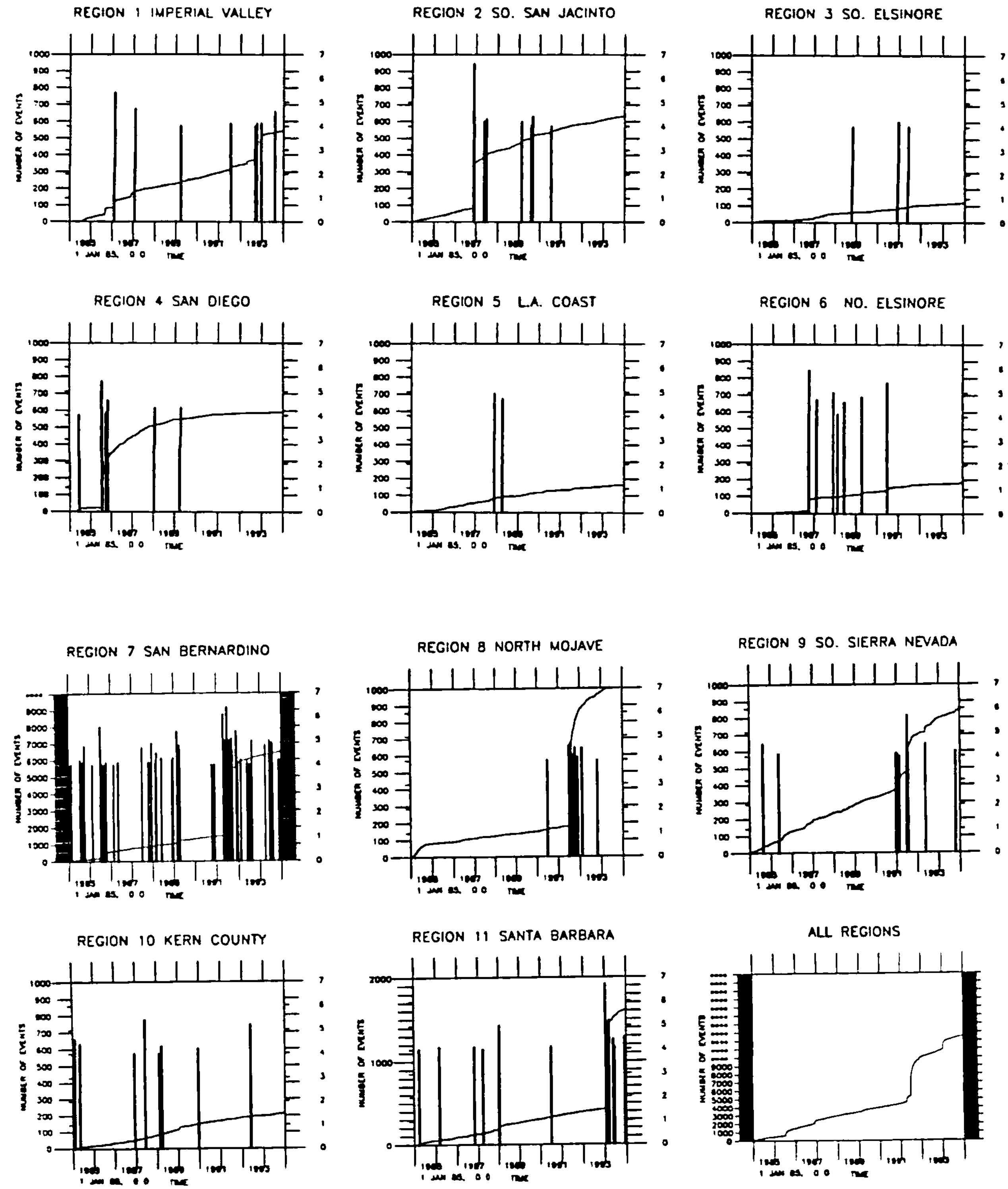

Figure 15. Cumulative number of events ($M_L \geq 2.5$) in all sub-regions over the ten year period ending December 1994. The boundaries of the sub-regions are shown in Figure 14. Vertical bars represent time and magnitude (scale on right) of large events ($M_L \geq 4.0$). Note that the vertical scales of the plots may not be the same.

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Acknowledgements

We would like the thank Egill Hauksson for providing information on the CalREN project, the Northridge aftershocks figure, the TERRAscope stations figure, and the rough draft of Peter German's CUSP data flowchart. Thanks to Jim Mori for the SCSN stations and telemetry figure. Thanks to Tom Brocher for supplying the LARSE figure. Nick Scheckel compiled the DAT tape list for Appendix B. Adam Edelman, at UCSD compiled the Northridge portables list. The Summary of Seismicity section was written using information in the Weekly Earthquake Reports. Thanks to Tom Heaton for the review.

Appendix A

Significant Southern California Earthquakes

All events of $M_L \geq 3.0$ for the period January to December 1994. Times are GMT, Q is the overall quality of the location, M is the magnitude, Z is the depth in km, PH is the number of phases picked, RMS is the root mean square of the location error, ID is the unique number assigned to the event by the CUSP system, and F denotes the number of the accompanying focal mechanism in Figure 13. Note that these events have not been finalized, therefore their magnitudes may not be correct. In most cases, if the magnitude is incorrect, it is really larger than indicated.

DATE			TIME			LOCATION				Q	M	Z	PH	RMS	ID	F
1994	1	1	17	47	31.54	34	23.28	-117	0.98	A	3.5	8.67	99	0.15	3138805	
1994	1	3	23	39	16.89	36	5.08	-120	3.63	C	3.2	6.00	17	0.38	3139101	
1994	1	7	3	53	17.82	36	1.31	-120	0.04	C	3.4	6.00	25	0.36	3139325	
1994	1	8	7	6	54.37	34	40.29	-116	42.02	A	3.7	4.16	115	0.19	3139468	
1994	1	9	23	0	58.93	33	59.27	-118	30.21	B	3.7	2.62	129	0.30	3139684	
1994	1	10	6	12	3.81	33	59.62	-118	29.65	A	3.1	2.73	84	0.26	3139708	
1994	1	12	7	27	34.98	33	59.04	-118	30.24	A	3.6	11.00	96	0.30	3139979	
1994	1	12	19	28	5.32	33	59.12	-118	30.44	A	3.2	11.72	71	0.30	3140049	
1994	1	13	11	6	37.92	34	58.47	-116	57.61	A	3.4	0.01	105	0.21	3140165	
1994	1	13	11	51	44.21	33	13.89	-116	2.22	A	3.1	2.66	27	0.22	3140226	
1994	1	14	10	35	53.16	34	2.52	-117	5.82	A	3.1	16.72	107	0.19	3140330	
1994	1	17	12	30	55.39	34	12.80	-118	32.22	A	6.7	18.40	147	0.31	3144585	1
1994	1	17	12	31	57.82	34	16.76	-118	28.43	A	5.9	0.00	40	0.46	3149646	
1994	1	17	12	32	54.53	34	21.08	-118	29.98	C	3.3	10.00	20	0.29	3144587	
1994	1	17	12	33	50.63	34	22.50	-118	28.18	A	3.6	15.21	24	0.29	2153163	
1994	1	17	12	34	18.03	34	18.00	-118	30.00	D	4.4	10.00	11	0.32	3144599	
1994	1	17	12	36	22.62	34	20.40	-118	29.66	C	3.7	7.27	18	0.35	3144620	
1994	1	17	12	37	0.21	34	20.79	-118	26.66	A	3.8	0.01	53	0.24	3144631	
1994	1	17	12	39	39.80	34	15.66	-118	32.03	A	4.9	14.77	119	0.27	3144652	
1994	1	17	12	40	9.40	34	19.19	-118	30.22	C	4.8	3.90	28	0.29	3144673	
1994	1	17	12	40	35.71	34	20.49	-118	36.10	C	5.2	0.01	18	0.30	3144694	
1994	1	17	12	41	21.11	34	21.99	-118	26.36	A	3.3	15.18	21	0.27	3144715	
1994	1	17	12	42	16.43	34	21.47	-118	27.27	A	3.8	1.16	18	0.31	3144736	
1994	1	17	12	43	35.22	34	21.37	-118	37.54	B	3.6	0.41	18	0.58	3144757	
1994	1	17	12	44	16.30	34	16.56	-118	28.30	C	3.6	15.18	18	0.30	3159141	
1994	1	17	12	45	56.96	34	17.76	-118	26.50	C	3.6	2.79	36	0.21	3157609	
1994	1	17	12	46	1.63	34	19.48	-118	26.69	A	3.6	0.01	42	0.24	3144768	
1994	1	17	12	46	28.37	34	16.55	-118	27.93	A	3.2	14.48	26	0.20	3157617	
1994	1	17	12	49	38.00	34	18.53	-118	26.79	A	3.8	1.79	78	0.26	3140672	
1994	1	17	12	50	11.96	34	19.66	-118	27.48	A	3.2	0.00	27	0.24	3158433	
1994	1	17	12	51	4.89	34	19.05	-118	28.67	A	3.8	0.00	77	0.28	3141055	
1994	1	17	12	54	7.73	34	20.91	-118	38.22	C	3.6	6.00	24	0.22	2150625	
1994	1	17	12	54	33.37	34	18.64	-118	27.25	A	4.0	0.98	56	0.26	2150608	
1994	1	17	12	55	46.82	34	16.14	-118	34.58	B	4.1	16.50	104	0.31	3140674	
1994	1	17	12	57	56.74	34	21.32	-118	25.49	C	3.7	6.00	66	0.41	3140675	
1994	1	17	12	59	29.10	34	19.86	-118	28.69	B	3.8	0.02	27	0.20	3140722	
1994	1	17	13	1	1.20	34	21.32	-118	37.35	C	3.6	6.00	55	0.28	3140677	
1994	1	17	13	1	32.00	34	22.65	-118	33.27	C	3.0	6.00	22	0.38	3140715	
1994	1	17	13	6	27.89	34	15.26	-118	32.70	A	4.6	0.00	103	0.35	3140678	
1994	1	17	13	8	34.93	34	17.79	-118	27.26	A	3.6	1.31	73	0.24	3140780	
1994	1	17	13	17	42.65	34	23.34	-118	32.75	C	3.7	6.00	14	0.42	3140679	
1994	1	17	13	22	49.64	34	21.86	-118	37.11	C	3.9	6.00	52	0.35	3140681	
1994	1	17	13	23	42.83	34	20.00	-118	25.23	A	3.2	0.60	28	0.23	3140789	
1994	1	17	13	25	10.63	34	20.02	-118	30.45	C	3.6	3.35	57	0.27	3140726	
1994	1	17	13	26	36.71	34	17.08	-118	27.03	B	3.0	3.06	32	0.35	2148088	
1994	1	17	13	26	44.72	34	19.03	-118	27.29	C	4.7	2.30	112	0.32	3140684	
1994	1	17	13	28	10.16	34	21.26	-118	42.07	C	3.0	6.00	37	0.31	2148111	
1994	1	17	13	28	13.13	34	16.32	-118	34.52	B	4.0	0.01	63	0.26	2148104	
1994	1	17	13	29	15.41	34	21.07	-118	27.17	A	3.9	0.01	65	0.38	2148666	
1994	1	17	13	30	8.16	34	21.67	-118	30.62	B	3.0	1.72	49	0.36	2148720	
1994	1	17	13	32	20.33	34	19.02	-118	25.84	A	3.8	0.01	80	0.20	3140685	
1994	1	17	13	32	59.74	34	22.82	-118	37.25	B	3.3	0.02	25	0.26	3140746	
1994	1	17	13	37	48.16	34	21.07	-118	36.36	C	3.9	5.54	41	0.29	3140756	

DATE			TIME				LOCATION				Q	M	Z	PH	RMS	ID	F
1994	1	17	13	44	33.57		34	20.68	-118	32.68	B	3.8	1.32	79	0.35	3140689	
1994	1	17	13	45	12.80		34	22.62	-118	37.18	B	3.9	0.00	48	0.29	3140765	
1994	1	17	13	46	48.89		34	19.27	-118	24.20	A	3.6	0.01	69	0.23	3140771	
1994	1	17	13	56	2.42		34	17.09	-118	37.43	A	4.4	19.42	123	0.32	3140691	
1994	1	17	13	58	26.18		34	21.37	-118	28.25	A	3.0	0.01	47	0.24	2151895	
1994	1	17	14	0	42.86		34	15.20	-118	37.32	C	3.3	6.00	13	0.29	3140694	
1994	1	17	14	3	59.39		34	21.86	-118	37.77	C	3.7	1.34	87	0.33	3140695	
1994	1	17	14	4	25.72		34	15.63	-118	29.92	B	3.3	11.37	27	0.31	3158617	
1994	1	17	14	6	56.16		34	18.86	-118	31.93	B	3.5	6.66	84	0.29	3140697	
1994	1	17	14	8	7.50		34	19.55	-118	24.81	A	3.8	0.35	90	0.24	3140862	
1994	1	17	14	14	30.31		34	19.88	-118	26.52	A	4.5	1.93	109	0.25	3140870	
1994	1	17	14	26	51.81		34	22.68	-118	27.97	A	3.8	0.92	56	0.32	3140704	
1994	1	17	14	28	3.78		34	11.55	-118	31.74	A	3.9	16.87	77	0.31	3140892	
1994	1	17	14	33	42.10		34	18.50	-118	28.70	A	3.3	2.06	111	0.26	3140709	
1994	1	17	14	45	54.42		34	17.65	-118	38.64	A	3.1	0.33	41	0.29	3140716	
1994	1	17	14	50	24.77		34	17.14	-118	29.86	A	3.1	1.59	74	0.27	3158783	
1994	1	17	14	50	38.29		34	18.55	-118	28.43	B	3.8	2.47	128	0.25	3140719	
1994	1	17	15	3	48.58		34	18.07	-118	32.66	A	3.2	0.26	64	0.30	3140902	
1994	1	17	15	7	3.17		34	18.26	-118	28.43	A	4.2	2.58	158	0.34	3140728	
1994	1	17	15	7	35.46		34	18.39	-118	28.01	A	4.1	1.64	80	0.33	2138698	
1994	1	17	15	9	41.24		34	17.43	-118	26.24	A	3.1	2.20	79	0.26	2138715	
1994	1	17	15	10	11.62		34	18.71	-118	27.81	A	3.9	1.55	97	0.23	2138723	
1994	1	17	15	14	26.72		34	21.13	-118	27.54	A	3.9	0.89	134	0.23	3140736	
1994	1	17	15	15	20.82		34	17.40	-118	33.65	A	3.3	11.43	64	0.33	2180516	
1994	1	17	15	16	4.69		34	18.87	-118	23.25	A	3.2	0.01	90	0.24	2138764	
1994	1	17	15	20	50.80		34	22.13	-118	36.78	A	3.4	11.99	66	0.31	3140742	
1994	1	17	15	24	5.18		34	22.22	-118	36.92	A	3.5	0.13	115	0.31	3140745	
1994	1	17	15	42	12.42		34	18.80	-118	25.20	A	3.9	2.13	128	0.25	3140749	
1994	1	17	15	43	4.73		34	10.99	-118	30.43	A	3.0	18.29	37	0.30	2138793	
1994	1	17	15	44	38.74		34	17.24	-118	28.05	A	3.2	2.62	63	0.28	3140753	
1994	1	17	15	45	11.75		34	22.15	-118	37.13	C	3.8	6.00	55	0.30	2138815	
1994	1	17	15	45	58.08		34	25.29	-118	37.19	C	3.8	6.00	30	0.32	2138827	
1994	1	17	15	49	52.91		34	21.56	-118	28.55	A	3.1	0.60	54	0.24	3140760	
1994	1	17	15	50	45.40		34	21.00	-118	36.18	B	3.2	11.05	31	0.22	3140762	
1994	1	17	15	54	10.76		34	22.54	-118	37.62	A	4.8	13.02	141	0.35	3140766	
1994	1	17	15	57	26.54		34	17.89	-118	29.32	A	3.7	10.06	114	0.32	2177255	
1994	1	17	16	16	1.71		34	17.16	-118	28.92	A	3.8	2.99	107	0.33	3140775	
1994	1	17	16	19	24.09		34	20.79	-118	26.96	A	3.6	0.76	111	0.24	3140777	
1994	1	17	16	22	47.18		34	19.72	-118	25.97	A	3.4	0.95	103	0.23	3140787	
1994	1	17	16	26	3.38		34	17.29	-118	29.00	A	3.2	2.50	97	0.27	3140790	
1994	1	17	16	27	7.46		34	21.60	-118	37.73	A	3.3	10.70	85	0.28	2156095	
1994	1	17	16	44	15.43		34	19.76	-118	27.14	A	3.2	0.39	48	0.21	3140805	
1994	1	17	16	45	45.01		34	16.53	-118	28.26	A	3.1	3.25	66	0.30	3140807	
1994	1	17	16	49	15.64		34	19.45	-118	26.00	A	3.2	0.16	95	0.24	3140809	
1994	1	17	17	9	25.88		34	19.77	-118	26.29	A	3.0	0.01	38	0.29	3140819	
1994	1	17	17	21	54.52		34	19.05	-118	25.11	A	3.4	0.46	74	0.23	3140822	
1994	1	17	17	56	8.21		34	13.66	-118	34.35	A	4.6	19.24	148	0.33	3140853	
1994	1	17	18	20	23.69		34	16.73	-118	27.94	A	3.5	11.42	98	0.28	3140861	
1994	1	17	18	22	55.08		34	22.12	-118	38.15	A	3.2	12.09	91	0.27	3140863	
1994	1	17	18	32	8.47		34	17.10	-118	30.27	A	3.8	2.95	82	0.27	3140868	
1994	1	17	18	39	58.18		34	20.17	-118	27.68	A	3.1	0.00	43	0.22	3140869	
1994	1	17	18	51	8.23		34	20.22	-118	25.54	A	3.5	0.01	45	0.25	3140876	
1994	1	17	19	7	28.40		34	20.14	-118	36.85	A	3.3	1.04	76	0.30	3140885	
1994	1	17	19	21	10.69		34	21.06	-118	26.71	A	3.2	0.46	54	0.20	3141198	
1994	1	17	19	23	53.60		34	16.84	-118	34.80	A	3.6	14.79	82	0.34	3141202	
1994	1	17	19	35	34.28		34	18.63	-118	27.33	A	4.0	2.11	120	0.30	3140898	
1994	1	17	19	43	53.38		34	22.05	-118	38.21	A	4.1	13.91	118	0.28	3141205	
1994	1	17	19	46	21.38		34	22.40	-118	38.22	A	3.5	0.01	76	0.29	3141210	
1994	1	17	19	47	43.35		34	20.29	-118	35.45	A	3.1	1.18	49	0.34	3185796	
1994	1	17	19	56	41.14		34	19.78	-118	32.18	A	3.5	1.74	67	0.26	3140912	
1994	1	17	19	57	10.24		34	19.49	-118	25.92	A	3.1	1.37	21	0.22	3161123	
1994	1	17	19	58	48.76		34	22.18	-118	37.93	A	3.6	11.64	99	0.27	3140915	
1994	1	17	20	2	5.40		34	24.48	-118	33.56	A	3.9	0.00	129	0.24	3140926	
1994	1	17	20	5	27.47		34	19.69	-118	31.01	A	3.8	1.87	56	0.27	3140929	
1994	1	17	20	8	8.98		34	15.67	-118	27.49	B	3.2	22.87	28	0.30	3161138	
1994	1	17	20	11	49.35		34	19.09	-118	29.95	A	3.7	2.19	59	0.31	3140938	

DATE			TIME			LOCATION				Q	M	Z	PH	RMS	ID	F
1994	1	17	20	17	38.45	34	19.92	-118	30.88	A	3.2	1.97	85	0.27	3140939	
1994	1	17	20	17	50.02	34	17.67	-118	25.69	A	3.6	2.06	56	0.27	2156602	
1994	1	17	20	24	37.83	34	20.70	-118	25.60	A	3.1	0.01	46	0.19	3140943	
1994	1	17	20	31	59.16	34	19.40	-118	26.40	C	3.0	1.48	9	0.19	3140945	
1994	1	17	20	38	24.34	34	18.57	-118	27.49	A	3.6	2.47	75	0.20	3141214	
1994	1	17	20	39	12.40	34	17.83	-118	35.44	B	3.1	0.00	31	0.27	3162658	
1994	1	17	20	39	38.69	34	17.48	-118	28.92	A	3.7	2.87	72	0.33	3141216	
1994	1	17	20	44	46.98	34	19.73	-118	26.08	A	3.1	1.21	68	0.21	3140964	
1994	1	17	20	46	2.39	34	18.08	-118	33.92	A	4.9	9.46	150	0.33	3141219	
1994	1	17	20	50	23.05	34	20.79	-118	29.41	A	3.7	1.01	62	0.28	3141226	
1994	1	17	21	2	23.34	34	17.00	-118	27.13	C	3.1	8.42	45	0.25	3140971	
1994	1	17	21	34	52.97	34	17.86	-118	28.71	A	3.1	9.23	109	0.24	3140990	
1994	1	17	22	7	42.47	34	20.67	-118	28.70	A	3.5	0.67	61	0.29	3141230	
1994	1	17	22	9	16.36	34	17.19	-118	33.13	A	3.2	10.41	67	0.28	3141231	
1994	1	17	22	11	5.95	34	15.56	-118	36.18	A	3.5	0.01	72	0.28	3141007	
1994	1	17	22	19	23.95	34	21.91	-118	37.23	A	3.9	11.70	97	0.30	3141233	
1994	1	17	22	21	44.85	34	20.33	-118	27.78	A	3.6	0.00	55	0.28	3141238	
1994	1	17	22	24	33.00	34	20.31	-118	32.45	A	3.5	0.87	106	0.26	3141012	
1994	1	17	22	31	36.57	34	18.74	-118	27.64	B	3.7	6.23	102	0.26	3186668	
1994	1	17	22	31	53.29	34	20.42	-118	26.49	A	4.1	0.01	96	0.29	3141242	
1994	1	17	22	33	6.01	34	21.78	-118	37.28	A	3.1	1.00	32	0.32	3141248	
1994	1	17	22	50	35.42	34	18.62	-118	28.37	A	3.5	4.86	73	0.30	3141023	
1994	1	17	22	57	14.02	34	20.84	-118	36.66	A	3.5	9.51	119	0.26	3141031	
1994	1	17	23	9	22.34	34	19.73	-118	26.61	A	3.1	8.32	95	0.23	3141033	
1994	1	17	23	33	30.69	34	19.58	-118	41.90	A	5.6	9.83	134	0.32	3141273	2
1994	1	17	23	36	55.84	34	20.74	-118	39.76	A	3.7	3.15	35	0.37	3141350	
1994	1	17	23	37	24.22	34	19.34	-118	41.20	B	3.3	13.88	16	0.23	3183139	
1994	1	17	23	38	9.71	34	22.52	-118	31.42	A	3.5	1.04	44	0.23	3141353	
1994	1	17	23	49	25.36	34	20.55	-118	39.93	A	4.0	8.21	107	0.34	3141062	
1994	1	17	23	50	7.57	34	21.92	-118	36.63	A	3.0	2.55	39	0.29	2150833	
1994	1	18	0	1	27.82	34	20.35	-118	41.00	A	3.5	0.01	58	0.31	3141072	
1994	1	18	0	22	20.02	34	21.12	-118	37.44	A	3.0	0.24	55	0.27	3141278	
1994	1	18	0	23	38.25	34	14.79	-118	34.40	A	3.3	2.53	62	0.36	3141279	
1994	1	18	0	36	20.72	34	16.06	-118	28.94	A	3.9	12.74	112	0.28	3141107	
1994	1	18	0	39	35.02	34	22.77	-118	33.82	A	4.4	7.19	111	0.28	3141108	
1994	1	18	0	40	4.09	34	23.63	-118	32.61	A	4.2	0.00	45	0.33	2150850	
1994	1	18	0	43	8.89	34	22.59	-118	41.89	A	5.2	11.34	139	0.31	3141286	3
1994	1	18	0	44	17.66	34	23.79	-118	41.70	A	3.6	14.56	31	0.33	2152199	
1994	1	18	0	44	51.58	34	23.96	-118	41.70	B	3.2	0.02	17	0.31	2152224	
1994	1	18	0	45	34.20	34	22.63	-118	43.38	C	3.4	2.14	23	0.32	3141288	
1994	1	18	0	46	40.72	34	22.91	-118	41.92	B	3.0	1.30	39	0.44	3186805	
1994	1	18	0	47	58.77	34	22.99	-118	42.64	A	3.1	1.57	14	0.36	3141292	
1994	1	18	1	0	23.93	34	14.81	-118	36.80	B	3.4	19.27	35	0.31	3141111	
1994	1	18	1	17	51.43	34	22.85	-118	42.28	A	3.6	12.34	92	0.30	3141112	
1994	1	18	1	43	13.20	34	14.68	-118	36.89	A	3.0	20.70	44	0.28	3141116	
1994	1	18	1	47	10.60	34	21.31	-118	39.43	A	3.0	2.86	60	0.21	3141295	
1994	1	18	2	6	4.08	34	16.88	-118	28.16	A	3.0	9.25	97	0.24	3141401	
1994	1	18	2	15	42.94	34	22.69	-118	30.31	A	3.0	0.60	105	0.25	3141128	
1994	1	18	2	53	51.86	34	18.07	-118	30.34	A	3.1	10.96	64	0.28	3141139	
1994	1	18	3	31	1.47	34	17.30	-118	27.67	A	3.4	11.00	95	0.32	3141158	
1994	1	18	3	34	11.63	34	22.12	-118	38.77	A	3.5	11.26	80	0.31	3141161	
1994	1	18	3	56	37.52	34	17.41	-118	28.28	A	3.0	3.07	64	0.28	3141172	
1994	1	18	4	1	26.72	34	21.46	-118	37.36	A	4.3	0.93	117	0.32	3141180	
1994	1	18	4	31	19.72	34	21.84	-118	26.98	A	3.8	4.94	96	0.27	3141207	
1994	1	18	4	31	45.33	34	22.52	-118	25.86	B	3.6	0.00	15	0.25	3162645	
1994	1	18	4	43	27.60	34	18.06	-118	28.46	A	3.6	9.79	128	0.31	3141208	
1994	1	18	5	19	2.55	34	21.12	-118	40.13	A	3.8	9.38	133	0.27	3141258	
1994	1	18	5	31	32.92	34	20.58	-118	27.93	A	3.0	1.20	51	0.27	3141261	
1994	1	18	5	49	43.44	34	18.03	-118	26.84	B	3.9	6.73	70	0.19	2158412	
1994	1	18	6	29	2.20	34	17.86	-118	26.81	A	3.7	8.06	85	0.29	3141294	
1994	1	18	6	42	44.23	34	15.81	-118	34.19	A	3.4	15.47	91	0.30	3141315	
1994	1	18	6	45	32.78	34	17.29	-118	28.17	A	3.3	10.07	63	0.30	3141316	
1994	1	18	7	11	2.87	34	19.23	-118	26.88	A	3.4	2.65	125	0.28	3141337	
1994	1	18	7	23	56.02	34	19.99	-118	37.40	A	4.0	14.81	126	0.27	3141341	
1994	1	18	7	49	7.88	34	20.09	-118	36.00	A	3.3	13.42	111	0.28	3141355	
1994	1	18	7	53	25.23	34	21.27	-118	35.91	A	3.4	2.67	89	0.27	3141357	

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1994	1	18	8	12	50.01	34	19.82	-118	37.23	A	3.0	13.80	83	0.28	3141368	
1994	1	18	8	19	3.93	34	22.28	-118	29.51	A	3.1	1.19	77	0.22	3141376	
1994	1	18	9	41	48.64	34	13.46	-118	30.32	A	3.7	18.18	139	0.23	3141408	
1994	1	18	9	44	32.81	34	20.63	-118	33.19	A	3.3	1.00	110	0.27	3141410	
1994	1	18	10	9	29.37	34	22.09	-118	42.78	B	3.1	8.98	54	0.31	3141429	
1994	1	18	10	49	33.39	34	19.07	-118	26.28	B	3.1	5.53	110	0.25	3141453	
1994	1	18	11	13	0.66	34	18.19	-118	38.31	B	3.2	8.93	65	0.30	3141460	
1994	1	18	11	35	9.90	34	13.06	-118	36.39	A	4.2	12.10	89	0.37	3141570	
1994	1	18	12	42	3.30	34	18.46	-118	34.78	A	3.4	2.02	40	0.34	3141579	
1994	1	18	12	42	55.02	34	18.63	-118	35.04	A	3.2	1.92	32	0.27	3141581	
1994	1	18	13	23	15.11	34	19.97	-118	26.29	A	3.0	7.12	77	0.25	3141582	
1994	1	18	13	24	44.13	34	19.16	-118	33.49	A	4.3	1.73	118	0.26	3141584	
1994	1	18	13	33	33.33	34	18.29	-118	35.08	A	3.0	2.05	54	0.33	3141590	
1994	1	18	13	34	20.40	34	18.72	-118	33.93	A	3.3	2.01	55	0.35	3141592	
1994	1	18	13	34	42.79	34	20.67	-118	37.20	A	3.2	1.39	27	0.25	3164741	
1994	1	18	14	5	8.30	34	15.83	-118	27.84	A	3.2	9.76	93	0.27	3141612	
1994	1	18	14	12	59.91	34	19.01	-118	26.78	A	3.1	1.16	66	0.26	3141554	
1994	1	18	14	17	29.87	34	17.73	-118	29.46	A	3.5	11.71	123	0.36	3141616	
1994	1	18	14	27	24.22	34	18.48	-118	27.73	A	3.2	7.36	79	0.28	3141621	
1994	1	18	14	47	56.21	34	17.45	-118	28.20	A	3.5	9.61	101	0.32	3141568	
1994	1	18	15	1	52.27	34	22.14	-118	26.50	A	3.5	5.03	110	0.25	3141587	
1994	1	18	15	9	26.43	34	17.52	-118	33.51	A	3.2	10.81	76	0.28	3141589	
1994	1	18	15	19	54.28	34	12.51	-118	36.27	A	3.9	8.71	88	0.34	3141594	
1994	1	18	15	21	3.36	34	17.14	-118	29.56	A	3.5	3.24	62	0.29	3164750	
1994	1	18	15	21	36.82	34	18.15	-118	27.58	B	3.0	9.24	22	0.20	3164756	
1994	1	18	15	23	46.89	34	22.72	-118	33.64	A	4.8	7.70	134	0.28	3141597	
1994	1	18	15	42	57.08	34	18.54	-118	34.60	A	3.4	0.79	68	0.28	3141605	
1994	1	18	15	51	44.87	34	14.71	-118	28.27	A	3.9	12.51	144	0.30	3141615	
1994	1	18	16	23	34.67	34	21.94	-118	34.38	A	3.9	1.30	118	0.31	3141640	
1994	1	18	16	56	13.53	34	12.25	-118	36.59	A	3.0	11.72	71	0.32	3141653	
1994	1	18	18	3	55.67	34	20.03	-118	26.79	A	3.6	6.09	123	0.27	3141679	
1994	1	18	18	35	13.22	34	13.79	-118	30.49	A	3.3	15.99	120	0.25	3141691	
1994	1	18	18	35	54.24	34	19.53	-118	26.35	A	3.4	3.27	71	0.23	3143129	
1994	1	18	19	24	7.33	34	19.35	-118	26.69	A	3.0	1.17	65	0.23	2139486	
1994	1	18	19	28	2.83	34	22.36	-118	39.04	A	3.1	12.27	87	0.27	3141736	
1994	1	18	19	59	6.12	34	21.67	-118	36.18	A	3.2	11.98	117	0.27	3141743	
1994	1	18	21	14	14.62	34	23.99	-118	37.86	A	3.0	14.53	55	0.27	3141795	
1994	1	19	0	3	17.69	34	16.31	-118	27.64	B	3.2	6.62	91	0.26	3141872	
1994	1	19	1	17	54.77	34	16.94	-118	33.18	A	3.0	9.44	115	0.28	3141903	
1994	1	19	1	26	54.11	34	18.44	-118	23.24	A	3.5	2.85	106	0.23	3141906	
1994	1	19	3	23	53.98	34	19.12	-118	27.52	A	3.2	11.21	86	0.23	3141953	
1994	1	19	3	57	51.53	34	21.41	-118	35.29	A	3.2	0.00	80	0.24	3141964	
1994	1	19	4	40	48.00	34	21.69	-118	34.28	A	4.3	2.59	145	0.34	3142081	
1994	1	19	4	43	14.52	34	21.95	-118	42.53	A	4.0	12.67	124	0.33	3142082	
1994	1	19	4	44	14.93	34	21.29	-118	44.00	A	3.2	0.01	21	0.39	3183233	
1994	1	19	5	14	58.57	34	17.60	-118	27.52	A	3.5	9.37	109	0.29	3142007	
1994	1	19	6	23	41.57	34	16.97	-118	27.29	A	3.2	10.07	92	0.31	3142066	
1994	1	19	7	14	6.19	34	17.20	-118	27.94	A	3.9	11.60	127	0.30	3142074	
1994	1	19	7	58	34.41	34	14.35	-118	31.97	A	3.2	15.18	83	0.27	3142053	
1994	1	19	8	24	11.71	34	21.85	-118	38.70	A	3.2	12.60	96	0.28	3142063	
1994	1	19	9	13	10.90	34	18.24	-118	44.22	A	4.1	13.02	125	0.28	3142087	
1994	1	19	10	42	24.96	34	18.37	-118	44.07	A	3.3	2.95	57	0.23	3142190	
1994	1	19	10	51	9.72	34	17.15	-118	33.10	A	3.1	10.69	106	0.28	3142129	
1994	1	19	11	6	3.83	34	17.10	-118	27.81	A	3.1	10.00	71	0.29	3142134	
1994	1	19	12	9	10.03	34	20.89	-118	29.06	A	3.4	6.51	67	0.24	3142192	
1994	1	19	12	38	44.76	34	19.83	-118	25.45	A	3.5	4.96	110	0.28	3142165	
1994	1	19	14	9	14.83	34	12.90	-118	30.62	A	4.5	17.47	158	0.30	3142198	
1994	1	19	14	46	35.20	34	17.54	-118	27.94	B	3.9	6.09	120	0.26	3142230	
1994	1	19	15	3	47.55	34	17.70	-118	27.59	A	3.6	8.46	124	0.30	3142210	
1994	1	19	17	46	52.53	34	20.51	-118	27.10	A	3.1	4.62	72	0.27	3142271	
1994	1	19	19	50	8.96	34	16.85	-118	27.00	A	3.7	9.96	75	0.21	3142322	
1994	1	19	20	17	51.65	34	21.65	-118	42.31	A	3.3	13.17	71	0.28	3142328	
1994	1	19	21	9	28.61	34	22.72	-118	42.70	A	5.1	14.44	142	0.54	3142595	4
1994	1	19	21	11	44.90	34	22.67	-118	37.17	A	5.1	11.35	104	0.35	3142597	5
1994	1	19	21	17	59.23	34	21.38	-118	42.35	A	3.0	12.57	41	0.25	3142362	
1994	1	19	21	34	21.91	34	21.77	-118	38.56	A	3.3	13.62	40	0.26	3167734	

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1994	1	19	21	34	39.81	34	20.81	-118	42.79	B	3.4	3.06	41	0.27	3142372	
1994	1	19	21	42	3.84	34	17.69	-118	29.14	A	3.4	8.72	83	0.23	3142379	
1994	1	19	22	59	6.77	34	22.55	-118	41.25	B	3.2	9.60	42	0.26	3142418	
1994	1	19	23	59	53.57	34	21.85	-118	41.98	A	3.2	11.50	79	0.26	3142460	
1994	1	20	4	24	17.28	34	21.80	-118	43.67	A	3.0	12.14	73	0.29	3142607	
1994	1	20	5	58	24.59	34	22.97	-118	41.95	A	3.6	10.92	91	0.26	3142819	
1994	1	20	6	3	54.96	34	59.91	-119	10.50	A	3.1	11.93	51	0.26	3142646	
1994	1	20	6	58	27.14	34	21.59	-118	42.51	A	3.9	13.11	118	0.29	3142821	
1994	1	20	7	0	37.75	34	21.46	-118	43.22	A	3.2	11.07	102	0.26	3142822	
1994	1	20	7	22	40.48	34	19.70	-118	31.67	A	3.8	1.37	115	0.30	3142823	
1994	1	20	8	58	7.77	34	18.65	-118	30.07	A	3.4	1.37	120	0.26	2140450	
1994	1	20	11	6	20.08	34	22.56	-118	30.56	A	3.1	0.55	84	0.35	3142757	
1994	1	20	11	37	18.03	34	18.90	-118	25.62	A	3.2	3.74	91	0.22	3142833	
1994	1	20	12	26	22.81	34	18.34	-118	26.37	A	3.2	7.22	96	0.22	3142838	
1994	1	20	13	56	45.68	34	21.90	-118	42.47	A	3.2	10.17	67	0.24	3142824	
1994	1	20	14	19	14.24	34	21.76	-118	32.06	A	3.4	2.96	113	0.28	3142842	
1994	1	20	18	48	7.40	34	22.53	-118	30.61	A	3.2	0.27	77	0.27	3142940	
1994	1	20	22	4	44.52	34	15.34	-118	27.87	A	3.4	12.08	129	0.28	3143020	
1994	1	21	0	7	29.27	34	22.08	-118	32.06	A	3.3	0.33	70	0.26	3143239	
1994	1	21	0	9	6.06	34	17.84	-118	27.51	A	3.1	9.30	70	0.28	3143240	
1994	1	21	3	35	48.08	34	19.34	-118	30.74	A	3.0	2.78	62	0.27	3143122	
1994	1	21	5	56	4.66	34	16.19	-118	39.18	A	3.4	14.41	100	0.26	3143181	
1994	1	21	18	39	15.26	34	18.06	-118	27.97	A	4.5	10.61	159	0.34	3145627	
1994	1	21	18	39	47.08	34	17.81	-118	28.76	A	4.0	11.94	32	0.28	3159009	
1994	1	21	18	42	24.40	34	18.90	-118	28.23	A	3.1	5.10	34	0.20	3145631	
1994	1	21	18	42	24.40	34	19.01	-118	27.77	A	3.0	3.08	44	0.31	3183923	
1994	1	21	18	42	28.77	34	18.58	-118	28.47	A	4.2	7.93	93	0.34	3143541	
1994	1	21	18	52	44.23	34	18.12	-118	27.15	A	4.3	7.59	146	0.35	3143546	
1994	1	21	18	53	44.57	34	17.88	-118	27.51	A	4.3	7.65	83	0.29	3143547	
1994	1	21	18	54	56.52	34	18.17	-118	27.75	A	3.3	8.95	41	0.26	3143548	
1994	1	21	18	57	19.35	34	17.55	-118	28.45	A	3.5	8.85	115	0.27	3143556	
1994	1	21	19	14	20.89	34	20.12	-118	38.26	A	3.3	14.51	99	0.25	3143487	
1994	1	21	21	2	54.56	34	19.90	-118	38.03	A	3.0	4.82	84	0.31	3143561	
1994	1	21	21	26	27.80	34	17.18	-118	25.02	A	3.2	5.24	81	0.30	3143567	
1994	1	22	3	34	10.32	34	21.00	-118	29.49	A	3.1	1.87	49	0.30	3143686	
1994	1	22	9	3	49.78	34	21.69	-118	33.28	A	3.1	4.15	126	0.30	3143816	
1994	1	22	23	14	54.87	34	18.82	-118	24.73	A	3.2	5.35	56	0.30	3144125	
1994	1	23	2	48	46.86	34	20.25	-118	30.62	A	3.0	4.91	72	0.29	3144206	
1994	1	23	4	0	55.31	34	18.20	-118	27.59	A	3.0	6.71	73	0.27	3144221	
1994	1	23	6	57	41.50	34	23.30	-118	41.79	A	3.1	8.57	106	0.22	3144273	
1994	1	23	8	41	41.78	34	17.55	-118	27.59	A	3.7	8.18	115	0.31	3144539	
1994	1	23	8	55	8.66	34	18.02	-118	25.65	A	4.1	5.98	139	0.34	3144303	
1994	1	23	14	5	31.90	34	19.32	-118	31.50	A	3.1	2.00	116	0.28	3144428	
1994	1	23	14	52	37.58	34	17.16	-118	31.28	A	3.2	8.53	86	0.29	3144459	
1994	1	23	14	52	57.31	34	23.82	-118	41.63	A	3.2	10.89	63	0.32	3144558	
1994	1	23	15	59	4.26	34	15.50	-118	35.92	A	3.2	1.38	80	0.29	3144561	
1994	1	24	2	41	2.68	34	15.19	-118	28.44	A	3.6	13.00	141	0.34	3145129	
1994	1	24	4	15	18.82	34	20.80	-118	33.09	A	4.6	6.53	173	0.31	3145150	
1994	1	24	5	50	24.34	34	21.63	-118	37.68	A	4.3	12.12	156	0.31	3145168	
1994	1	24	5	54	21.07	34	21.86	-118	37.60	A	4.2	10.88	145	0.29	3145171	
1994	1	24	10	48	27.79	34	20.86	-118	33.66	A	3.1	14.10	76	0.22	3145284	
1994	1	24	10	48	48.70	34	21.01	-118	33.64	A	3.1	13.92	31	0.27	3174345	
1994	1	24	17	52	51.41	34	22.09	-118	39.32	A	3.2	12.58	103	0.24	3145393	
1994	1	24	18	5	59.95	34	22.03	-118	39.26	A	3.4	12.82	74	0.20	3145396	
1994	1	24	18	16	29.69	34	21.59	-118	33.31	A	3.2	0.73	73	0.33	3145401	
1994	1	25	10	21	58.10	34	18.31	-118	33.27	A	3.2	11.19	96	0.32	3145747	
1994	1	25	17	17	29.61	34	19.11	-118	30.34	A	3.5	1.74	67	0.34	3146011	
1994	1	25	18	42	43.80	34	19.14	-118	26.29	A	3.3	6.00	98	0.29	3145851	
1994	1	26	12	28	47.22	34	18.20	-118	28.18	A	3.7	10.00	126	0.37	3146149	
1994	1	26	17	9	22.84	34	22.40	-118	31.03	A	3.5	1.14	67	0.30	3146233	
1994	1	26	17	59	41.19	34	12.75	-118	36.51	A	3.0	2.61	57	0.34	3146242	
1994	1	27	4	43	52.72	34	21.92	-118	28.89	A	3.4	1.00	107	0.34	3146427	
1994	1	27	14	31	10.64	34	15.33	-118	34.99	A	3.3	15.62	83	0.30	3146657	
1994	1	27	17	19	58.83	34	16.41	-118	33.75	A	4.6	14.92	146	0.33	3146628	
1994	1	27	18	57	10.88	34	24.35	-116	30.53	A	3.4	1.80	70	0.14	3146645	
1994	1	28	4	58	34.07	34	18.51	-118	27.06	A	3.3	6.10	85	0.28	3146789	

DATE			TIME			LOCATION				Q	M	Z	PH	RMS	ID	F
1994	1	28	5	47	51.86	34	21.47	-118	37.79	A	3.2	11.02	68	0.21	3146791	
1994	1	28	7	44	46.29	34	13.99	-118	36.90	A	3.4	20.88	111	0.29	3146815	
1994	1	28	12	48	42.11	34	22.37	-118	29.36	A	3.1	0.96	76	0.31	3146868	
1994	1	28	20	9	53.43	34	22.52	-118	29.66	A	4.2	0.70	81	0.32	3146983	
1994	1	28	20	11	5.15	34	22.44	-118	30.05	A	3.9	0.21	102	0.34	3147036	
1994	1	29	11	13	18.18	34	18.35	-118	24.59	A	3.4	6.58	109	0.31	3147539	
1994	1	29	11	20	35.97	34	18.36	-118	34.72	A	5.1	1.10	134	0.34	3147406	6
1994	1	29	11	37	32.27	34	21.91	-118	38.45	A	3.3	12.48	53	0.29	3147246	
1994	1	29	12	47	36.22	34	20.89	-118	36.41	A	3.3	13.04	88	0.24	3147272	
1994	1	29	12	59	43.71	34	18.95	-118	33.54	A	3.1	2.35	59	0.32	3147277	
1994	1	29	14	3	6.95	34	17.87	-118	33.88	A	3.4	2.36	68	0.28	3147344	
1994	1	29	15	0	59.12	34	38.41	-116	39.66	A	3.1	0.30	59	0.15	3147325	
1994	1	30	4	22	55.64	34	57.86	-116	33.66	C	3.3	6.00	67	0.28	3147601	
1994	1	30	9	19	56.48	34	19.08	-118	33.27	A	3.3	1.20	89	0.33	3147655	
1994	1	30	10	44	40.46	34	22.84	-118	33.88	A	3.3	2.53	94	0.36	3147842	
1994	1	31	4	55	50.25	34	17.62	-118	37.12	A	3.3	2.37	81	0.31	3148020	
1994	2	1	7	40	19.99	34	14.03	-118	36.94	A	3.6	3.69	91	0.30	3148411	
1994	2	1	9	59	10.96	34	19.89	-118	41.66	A	3.2	4.23	80	0.31	3148450	
1994	2	2	11	24	37.88	34	17.57	-118	36.63	A	3.8	0.89	88	0.26	3148720	
1994	2	3	9	16	27.41	34	19.70	-118	26.07	B	3.0	13.13	12	0.31	3186791	
1994	2	3	16	23	35.37	34	17.98	-118	26.38	A	4.0	8.96	115	0.27	3149105	
1994	2	4	0	10	8.56	36	29.16	-116	54.19	D	4.0	6.00	50	0.34	3149235	7
1994	2	4	6	33	39.50	34	16.63	-118	37.24	A	3.5	2.36	104	0.25	3149315	
1994	2	4	8	52	22.80	34	18.44	-118	29.75	C	3.5	15.90	8	0.13	3149354	
1994	2	4	14	26	6.00	34	16.37	-118	24.08	A	3.2	4.10	85	0.33	3149474	
1994	2	5	8	51	6.64	34	22.43	-118	37.81	A	3.5	13.21	101	0.25	3149688	
1994	2	5	8	51	29.83	34	22.29	-118	38.78	A	3.3	15.38	27	0.26	3149858	
1994	2	5	8	51	39.25	34	24.78	-118	40.78	A	3.7	11.46	34	0.54	3149924	
1994	2	5	10	49	2.34	34	22.77	-118	35.32	B	3.5	16.12	10	0.18	3186542	
1994	2	6	3	15	54.05	34	34.11	-116	24.72	C	3.2	6.00	76	0.21	3149968	
1994	2	6	10	0	21.12	34	22.62	-118	39.74	A	3.1	11.27	91	0.29	3150067	
1994	2	6	13	19	27.02	34	17.53	-118	28.55	A	4.1	9.30	154	0.35	3150210	
1994	2	6	13	21	45.79	34	17.44	-118	28.57	A	3.6	8.24	116	0.37	3150211	
1994	2	9	15	47	47.99	33	28.04	-116	27.04	B	3.5	6.28	94	0.26	3150798	
1994	2	10	7	43	7.08	34	22.05	-118	30.15	A	3.3	2.91	82	0.32	3150980	
1994	2	10	11	16	12.27	34	22.57	-118	29.64	A	3.5	1.39	89	0.32	3151009	
1994	2	11	6	12	5.59	32	26.01	-115	24.09	C	3.2	6.00	19	0.30	3151196	
1994	2	11	14	7	53.07	34	20.07	-118	29.06	A	3.7	4.98	128	0.30	3151277	
1994	2	11	15	52	49.18	34	24.06	-118	46.53	A	3.1	10.66	69	0.26	3151303	
1994	2	11	23	25	27.68	32	26.03	-115	24.33	C	3.2	6.00	27	0.45	3151384	
1994	2	13	17	9	16.26	32	25.20	-115	24.14	C	3.3	6.00	22	0.30	3151700	
1994	2	14	20	32	57.55	34	12.50	-118	33.39	A	3.2	16.88	124	0.29	3152209	
1994	2	15	3	21	36.73	32	7.20	-116	22.73	C	3.4	6.00	43	0.36	3152382	
1994	2	15	12	31	55.33	34	17.59	-118	27.07	A	3.1	6.92	129	0.30	3152592	
1994	2	16	7	58	42.21	34	5.85	-118	30.58	A	3.2	5.52	118	0.40	3152649	
1994	2	18	9	13	28.36	34	14.19	-118	34.54	A	3.7	16.26	143	0.31	3153233	
1994	2	18	15	44	23.40	34	18.21	-118	27.25	A	3.1	7.35	95	0.28	3153329	
1994	2	19	0	33	38.53	34	59.08	-116	56.75	A	3.2	5.12	58	0.18	3153564	
1994	2	23	6	58	9.14	36	17.51	-120	15.27	C	3.8	6.00	36	0.31	3154551	
1994	2	25	12	59	12.59	34	21.42	-118	28.79	A	4.0	1.18	154	0.32	3155150	
1994	2	25	13	11	43.09	34	21.57	-118	28.80	A	3.1	1.16	92	0.33	3155152	
1994	2	25	13	56	13.77	34	19.29	-118	25.30	A	3.7	3.33	115	0.29	3155156	
1994	2	28	5	40	7.61	34	12.17	-116	26.23	A	3.4	3.51	67	0.18	3155943	
1994	3	2	3	35	37.94	34	11.58	-116	26.43	A	3.4	0.18	63	0.18	3155989	
1994	3	2	20	6	3.66	34	12.11	-118	36.77	A	3.1	2.63	58	0.37	2151869	
1994	3	3	17	27	58.26	32	16.14	-115	14.96	C	3.6	6.00	15	0.37	3156224	
1994	3	5	14	23	12.09	34	18.63	-118	28.49	A	3.1	3.11	65	0.32	3156773	
1994	3	5	23	37	56.15	34	18.45	-118	28.69	A	3.1	3.73	69	0.32	3156844	
1994	3	6	22	53	0.57	33	11.84	-115	34.13	A	3.0	4.83	46	0.33	3157038	
1994	3	7	9	11	36.39	34	37.35	-116	36.37	C	3.7	6.00	78	0.21	3157117	
1994	3	8	12	53	1.43	34	14.70	-118	27.49	A	3.3	11.35	129	0.32	3157314	
1994	3	10	12	44	14.75	34	19.75	-118	34.66	A	3.5	3.72	126	0.28	3157755	
1994	3	11	5	38	46.90	34	19.22	-118	35.06	A	3.0	4.72	100	0.28	3157906	
1994	3	11	13	55	59.51	34	18.84	-118	33.08	A	3.0	2.20	97	0.27	3157952	
1994	3	11	16	46	0.91	33	11.77	-115	34.23	A	3.4	6.61	57	0.34	3157979	
1994	3	14	22	22	9.18	34	1.98	-117	15.06	A	3.0	15.14	69	0.18	3158448	

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1994	3	15	10	44	21.79	34	19.65	-118	28.37	A	3.0	4.14	58	0.30	3158543	
1994	3	20	21	20	12.26	34	13.88	-118	28.50	A	5.2	13.09	174	0.33	3159411	8
1994	3	23	17	0	44.64	34	17.39	-118	27.57	A	3.2	10.42	111	0.31	3160056	
1994	3	28	6	18	38.39	33	21.02	-116	21.48	A	3.3	11.66	58	0.26	3160727	
1994	3	31	20	0	0.08	36	10.95	-120	13.15	C	4.4	6.00	28	0.33	3161292	9
1994	3	31	20	2	30.06	36	11.17	-120	13.16	C	4.2	6.00	30	0.30	3161293	
1994	4	1	7	36	38.73	36	11.96	-120	12.33	C	3.4	6.00	46	0.28	3161336	
1994	4	2	14	10	47.93	34	21.97	-118	39.27	A	3.3	12.84	130	0.24	3161512	
1994	4	4	3	25	44.41	33	26.46	-116	51.16	A	3.3	13.69	79	0.24	3161717	
1994	4	5	15	17	50.66	34	0.68	-117	6.31	A	3.0	9.07	102	0.15	3161935	
1994	4	6	7	26	1.23	34	28.61	-116	30.89	A	3.7	8.57	99	0.19	3162056	
1994	4	6	7	27	36.47	34	28.66	-116	30.97	C	3.0	6.00	70	0.19	3162117	
1994	4	6	19	1	4.06	34	11.49	-117	5.72	A	4.8	7.28	189	0.20	3162132	10
1994	4	7	4	19	28.63	34	19.99	-118	27.95	A	3.5	4.39	72	0.29	3162175	
1994	4	8	17	53	31.62	34	27.91	-118	57.28	A	3.6	3.66	119	0.34	3162465	
1994	4	13	1	57	31.89	34	20.02	-118	35.58	A	3.2	12.32	103	0.26	3163096	
1994	4	15	23	49	11.20	34	16.28	-118	26.95	A	3.0	10.96	116	0.29	3163503	
1994	4	18	3	38	53.41	34	15.92	-116	27.28	B	3.3	0.02	12	0.08	3163889	
1994	4	21	16	37	15.97	36	17.55	-120	20.77	C	4.5	6.00	95	0.31	3164331	
1994	4	21	18	5	10.56	36	18.42	-120	20.99	C	3.6	6.00	42	0.29	3164337	
1994	4	27	9	39	23.91	34	18.47	-118	36.87	A	3.1	13.83	93	0.27	3165125	
1994	4	27	12	33	10.10	34	14.88	-118	44.68	A	3.5	15.53	59	0.25	3165177	
1994	5	3	0	30	46.31	34	10.84	-118	33.95	A	3.2	6.50	115	0.34	3165919	
1994	5	4	4	9	12.44	34	19.58	-118	27.72	A	3.7	5.28	142	0.29	3166049	
1994	5	9	23	45	59.86	34	19.79	-118	27.50	A	3.2	4.82	96	0.33	3166867	
1994	5	14	2	35	30.42	33	54.76	-118	26.30	A	3.2	13.24	97	0.32	3167466	
1994	5	16	8	40	46.79	34	19.82	-118	37.11	A	3.8	14.44	162	0.26	3167759	
1994	5	19	6	12	44.47	34	19.38	-118	26.21	A	3.6	8.10	121	0.32	3168172	
1994	5	24	15	41	45.64	34	37.44	-116	33.22	A	3.0	8.03	63	0.16	3168927	
1994	5	24	20	56	1.66	34	15.69	-118	28.13	A	3.2	10.64	76	0.30	3168979	
1994	5	25	12	56	57.05	34	18.72	-118	23.57	A	4.4	6.99	155	0.29	3169078	
1994	5	26	22	26	59.14	34	6.57	-117	19.38	A	3.4	17.81	138	0.18	3169324	
1994	5	28	14	48	51.89	34	21.25	-118	41.24	A	3.0	13.03	61	0.26	3169540	
1994	5	28	17	14	4.39	34	21.33	-118	40.98	A	3.2	13.17	89	0.25	3169562	
1994	5	28	17	15	12.33	34	21.28	-118	40.91	A	3.6	12.44	81	0.27	3169586	
1994	5	30	3	22	25.20	36	4.45	-117	51.66	A	3.4	0.33	54	0.23	3169750	
1994	5	31	3	3	34.43	33	12.14	-116	2.97	A	3.4	3.49	72	0.27	3169866	
1994	6	2	3	27	14.44	34	16.61	-118	27.42	A	3.7	11.30	154	0.30	3170087	
1994	6	6	5	14	1.92	34	16.33	-118	35.79	A	3.1	9.22	90	0.28	3170976	
1994	6	7	19	13	46.33	35	17.33	-115	5.07	D	3.3	0.00	5	0.47	3171415	
1994	6	14	1	21	19.11	36	4.95	-117	52.02	A	3.2	0.00	52	0.20	3172227	
1994	6	15	5	59	48.63	34	18.63	-118	23.86	A	4.1	7.38	156	0.35	3172383	
1994	6	15	14	13	52.51	34	20.24	-116	28.16	A	3.1	4.91	79	0.16	3172420	
1994	6	15	17	8	58.49	34	24.29	-120	40.54	D	3.0	6.00	17	0.34	3172429	
1994	6	16	16	24	27.52	34	16.07	-116	24.09	A	5.0	3.43	99	0.18	3172554	11
1994	6	24	19	13	41.72	34	27.29	-118	35.19	A	3.0	1.03	60	0.29	3173695	
1994	6	24	20	20	59.72	34	22.08	-116	54.07	A	3.1	3.05	87	0.19	3173702	
1994	6	27	10	53	4.32	35	1.86	-116	59.38	A	3.4	7.59	89	0.18	3173927	
1994	6	28	22	3	9.61	33	22.05	-116	23.60	A	3.2	7.76	76	0.26	3174102	
1994	6	29	7	34	35.21	34	16.40	-116	24.66	A	3.5	0.98	90	0.20	3174154	
1994	7	3	2	13	48.02	34	17.42	-118	27.39	A	3.3	9.41	117	0.29	3174590	
1994	7	7	13	21	51.03	34	57.08	-116	55.53	A	3.1	0.01	68	0.22	3175093	
1994	7	7	15	19	21.60	34	17.12	-118	27.14	A	3.2	9.52	117	0.29	3175117	
1994	7	7	15	46	8.74	34	57.02	-116	55.57	A	3.0	0.00	80	0.25	3175119	
1994	7	9	22	56	11.20	34	17.42	-118	27.03	A	3.0	7.12	79	0.29	3175378	
1994	7	11	6	49	15.58	34	15.37	-118	41.54	A	3.8	15.70	98	0.28	3175511	
1994	7	11	6	50	49.69	34	15.57	-118	41.52	A	3.7	15.84	119	0.29	3175686	
1994	7	11	9	30	11.49	32	0.69	-114	57.39	D	3.1	6.00	20	0.53	3175522	
1994	7	11	14	34	10.58	34	37.85	-116	36.58	A	3.2	4.47	80	0.24	3175602	
1994	7	16	10	21	33.35	32	27.48	-115	27.12	C	3.0	6.00	26	0.44	3176237	
1994	7	16	10	22	35.73	32	27.35	-115	27.26	C	3.1	6.00	20	0.35	3176405	
1994	7	17	15	29	9.76	34	14.05	-118	35.43	A	3.5	18.28	78	0.31	3176380	
1994	7	19	0	34	59.28	33	11.20	-115	36.03	A	3.2	8.36	54	0.29	3176569	
1994	7	23	5	12	7.89	34	47.46	-116	17.62	A	3.2	4.38	42	0.17	3177182	
1994	7	25	23	18	21.33	35	44.55	-117	3.21	C	3.6	6.00	69	0.22	3177642	
1994	7	27	2	24	49.88	34	3.11	-117	30.76	A	3.5	3.57	136	0.24	3177863	

DATE			TIME			LOCATION				Q	M	Z	PH	RMS	ID	F
1994	7	28	10	52	2.51	33	24.18	-116	56.62	A	3.3	5.11	95	0.26	3178069	
1994	7	31	4	35	20.26	34	17.74	-118	27.60	A	3.1	7.85	92	0.30	3178447	
1994	8	1	21	34	31.12	34	38.37	-116	31.04	A	4.9	9.15	128	0.23	3178681	12
1994	8	1	21	35	17.97	34	37.56	-116	29.60	B	3.0	4.92	13	0.26	3178698	
1994	8	3	12	40	13.69	34	19.73	-118	27.60	A	3.5	7.44	129	0.26	3178912	
1994	8	7	15	10	25.96	33	59.53	-116	16.46	A	4.0	7.03	80	0.16	3179522	
1994	8	7	23	43	32.88	33	59.53	-116	16.47	A	3.6	7.67	128	0.20	3179575	
1994	8	8	21	17	30.92	32	3.65	-114	48.49	D	3.4	6.00	10	1.10	3179669	
1994	8	11	2	22	53.52	32	20.49	-115	16.83	C	4.6	6.00	59	0.69	3180000	13
1994	8	11	16	49	51.11	34	8.99	-116	26.82	A	3.0	8.81	84	0.17	3180075	
1994	8	13	11	43	21.87	33	59.53	-116	16.15	A	3.0	8.53	76	0.19	3180365	
1994	8	13	19	51	3.49	32	47.53	-118	24.50	C	3.7	6.00	88	0.45	3180400	
1994	8	14	4	16	32.06	33	31.47	-119	15.60	C	3.2	6.00	40	0.35	3180439	
1994	8	14	6	19	30.63	36	25.19	-117	28.42	C	3.1	6.00	30	0.20	3180444	
1994	8	14	12	27	13.55	34	21.58	-118	39.29	A	3.0	12.20	101	0.26	3180464	
1994	8	15	8	7	32.86	33	48.70	-116	12.08	A	3.9	6.98	111	0.21	3180612	
1994	8	15	8	8	24.44	33	48.48	-116	12.32	A	3.1	7.28	54	0.22	3180677	
1994	8	19	4	41	20.76	34	13.00	-118	39.02	A	3.2	4.08	119	0.31	3181152	
1994	8	19	6	56	10.13	34	14.57	-118	44.86	A	3.5	14.12	135	0.28	3181174	
1994	8	20	16	20	35.19	32	1.12	-114	52.98	D	3.1	6.00	15	0.55	3181384	
1994	8	20	20	22	55.19	33	22.63	-116	23.10	A	3.2	9.87	72	0.26	3181408	
1994	8	21	12	52	40.73	34	35.54	-116	37.03	A	3.7	3.97	61	0.17	3181488	
1994	8	26	17	42	34.02	34	54.44	-116	55.22	A	3.1	0.90	104	0.20	3182221	
1994	8	27	4	12	20.73	34	13.04	-118	38.02	A	3.3	3.80	115	0.34	3182267	
1994	8	27	11	3	46.47	34	12.76	-118	38.58	A	3.2	4.24	73	0.26	3182296	
1994	8	28	12	20	44.23	34	47.47	-116	17.78	A	3.7	4.71	47	0.18	3182414	
1994	8	30	15	59	57.77	34	9.00	-116	25.69	C	3.1	6.00	75	0.17	3182675	
1994	9	6	14	51	4.87	32	45.74	-118	23.01	C	3.1	6.00	43	0.41	3183525	
1994	9	6	15	29	51.59	36	9.23	-120	30.23	B	3.1	2.39	28	0.28	3183529	
1994	9	7	22	34	31.50	35	59.46	-120	33.48	B	3.0	1.96	44	0.24	3183673	
1994	9	8	9	57	52.71	34	18.93	-118	27.22	A	3.1	5.97	115	0.26	3183715	
1994	9	12	0	16	59.61	33	45.82	-116	57.10	A	3.6	14.84	129	0.24	3184085	
1994	9	16	11	39	56.31	34	47.93	-116	17.88	A	3.3	5.77	80	0.24	3184799	
1994	9	21	22	15	6.39	33	31.61	-116	31.20	A	3.1	13.52	70	0.21	3185616	
1994	9	26	8	58	9.48	34	47.75	-116	17.81	A	3.4	4.82	90	0.27	3186234	
1994	10	3	8	28	49.78	34	34.12	-120	3.14	A	3.3	12.85	85	0.33	3186994	
1994	10	9	4	10	7.45	33	13.84	-116	6.02	A	3.9	11.52	57	0.25	3187666	
1994	10	9	19	20	58.87	32	19.38	-115	13.75	C	3.4	6.00	24	0.55	3187756	
1994	10	19	0	49	58.80	35	30.71	-117	29.62	A	4.2	3.43	78	0.16	3188805	14
1994	10	19	3	34	22.40	35	30.73	-117	29.49	A	3.5	3.49	60	0.16	3188828	
1994	10	19	20	4	50.91	34	26.96	-116	29.94	A	3.1	2.96	85	0.17	3188924	
1994	10	20	2	56	39.27	32	43.44	-115	55.73	A	3.3	2.99	47	0.34	3188952	
1994	10	21	11	42	8.31	35	1.05	-118	57.45	A	3.3	7.85	66	0.25	3189106	
1994	10	23	18	5	7.12	35	49.90	-116	52.43	C	3.1	0.01	34	0.20	3189685	
1994	10	24	2	52	37.69	35	49.86	-116	52.19	B	3.4	6.97	63	0.21	3189743	
1994	10	24	3	17	2.95	35	30.80	-117	29.61	A	3.0	3.38	70	0.18	3189746	
1994	10	24	15	17	56.08	34	15.89	-116	27.50	A	3.4	0.01	76	0.17	3189808	
1994	10	24	21	20	24.37	35	30.71	-117	29.68	A	3.0	3.22	49	0.17	3189848	
1994	10	31	0	45	23.97	34	22.43	-116	27.32	A	3.4	2.98	74	0.17	3190827	
1994	11	7	18	4	42.64	34	20.35	-116	49.39	A	3.1	7.07	100	0.16	3191682	
1994	11	7	18	32	20.61	33	42.06	-116	45.83	A	3.8	14.98	134	0.20	3191683	
1994	11	9	2	29	4.32	33	40.78	-116	47.84	A	3.7	17.17	147	0.24	3191862	
1994	11	11	21	30	1.91	35	7.31	-118	56.88	A	3.0	10.13	78	0.30	3192204	
1994	11	12	11	50	28.53	34	21.66	-116	27.53	A	3.4	1.47	56	0.13	3192274	
1994	11	16	2	52	42.32	34	4.29	-117	11.22	A	3.2	11.09	132	0.14	3192849	
1994	11	20	4	31	43.45	34	0.74	-116	19.14	A	4.2	6.30	168	0.24	3193347	15
1994	11	24	6	43	32.15	35	22.89	-119	23.13	A	3.5	18.90	96	0.32	3194399	
1994	11	27	12	36	57.74	33	43.92	-116	57.66	C	3.0	0.00	10	0.31	3194774	
1994	12	2	10	50	21.51	36	10.16	-120	43.80	B	3.3	9.70	32	0.23	3195263	
1994	12	2	10	51	6.07	36	9.31	-120	44.08	C	3.1	8.06	13	0.19	3195323	
1994	12	6	3	36	24.33	34	17.61	-118	23.41	A	3.6	8.28	144	0.29	3195726	
1994	12	6	3	48	34.49	34	17.56	-118	23.36	A	4.5	8.97	166	0.33	3195727	
1994	12	10	2	34	22.70	34	26.65	-119	20.58	A	3.6	14.12	96	0.45	3196147	
1994	12	10	17	54	24.72	34	58.83	-116	57.09	A	3.3	0.02	73	0.20	3196206	
1994	12	11	10	48	26.17	33	59.36	-118	26.07	A	3.4	14.12	84	0.31	3196283	
1994	12	12	13	5	31.04	33	11.66	-115	34.60	A	3.6	4.64	68	0.33	3196439	

DATE			TIME			LOCATION				Q	M	Z	PH	RMS	ID	F
1994	12	12	19	48	30.80	35	41.93	-117	39.52	A	3.4	11.82	103	0.18	3196479	
1994	12	13	17	51	44.41	34	7.57	-116	52.99	A	3.2	10.60	99	0.16	3196638	
1994	12	20	10	27	47.79	35	54.70	-120	28.55	B	4.8	14.00	98	0.35	3197468	16
1994	12	20	12	55	7.26	35	54.56	-120	28.72	B	3.3	12.95	82	0.30	3197475	
1994	12	25	7	59	38.74	36	6.82	-117	50.40	A	3.4	3.11	63	0.24	3198017	
1994	12	28	12	49	5.54	36	18.43	-120	22.24	C	3.3	0.00	58	0.31	3198348	
1994	12	30	10	3	24.52	34	19.08	-118	24.30	A	3.3	5.34	84	0.28	3198585	
1994	12	30	16	22	56.45	36	7.64	-117	50.30	A	3.0	3.44	28	0.21	3198611	
1994	12	31	0	7	23.09	32	21.93	-115	21.63	C	3.6	6.00	27	0.44	3198651	

Appendix B

DAT Tape Archives

All telemetered network data - 330 channels digitized at 100 samples per second - are continuously recorded on 4mm DAT tapes. Three 2-Gbyte tapes are used each day. These tapes provide on-line system backup and capture signals that do not trigger the local network detection system. The tapes have been useful for recording data that normally would not have been saved, such as teleseismic body and surface waves, and late arrivals from local earthquakes.

All tapes are saved for about one month and then at the end of the month, time periods containing significant earthquakes, important periods of seismicity (such as the Landers earthquake sequence), and other noteworthy events (i.e. space shuttle landings and NTS blasts) are identified and the appropriate tapes are archived. The criteria for saving tapes are given below. Tapes that do not contain significant data are re-used. The archived tapes are boxed and stored chronologically in a cabinet in the SCSN data analysis room at the Caltech Seismological Laboratory.

Tapes are saved if they contain earthquakes meeting any of these broad criteria:

local events, mag >= 4.0
regional events, mag >= 4.5
teleseisms, mag >= 6.0
deep events, >= 100 km, mag >= 5.5
someone has requested the tape be saved.

To request that a tape be pulled and saved from the last month's batch of recordings, or for more information about these tapes, contact Nick Scheckel, 818-395-6955, nick@bombay.gps.caltech.edu. Instructions on reading the DAT tapes at our facilities can be found in any of the red binders - the emergency and important procedures manuals.

Below is a list of events through 1994 that have been saved on 4mm DAT tapes.

Teleseismic & Regional Events

DATE	TIME	LAT.	LONG.	DEPTH	MB	MSZ	ML	LOCATION
03JAN94	01:26.11	49.7 N	126.7 W	21	5.3	5.4		VANCOUVER
03JAN94	05:52.29	36.3 N	100.1 E	10	5.9			QINGHAICHINA
03JAN94	13:24.16	49.3 S	164.2 E	33	6.0	6.1		AUCKLAND IS REG
04JAN94	19:32.03	5.1 S	138.3 E	10		6.1		IRIAN JAYA
05JAN94	04:24.07	16.6 N	145.6 E	592	5.3			MARIANA ISL
05JAN94	13:24.11	39.1 N	15.1 E	290	5.9			SOUTHERN ITALY
07JAN94	09:39.37	42.3 N	121.9 W	7			4.1	OREGON
07JAN94	11:05.14	4.9 N	96.5 E	180	5.3			SUMATERA
09JAN94	19:03.02	42.2 N	121.9 W	5			4.2	OREGON
09JAN94	21:29.02	48.5 N	154.5 E	66	5.9			KURIL ISL
10JAN94	15:53.50	13.1 S	69.2 W	600	6.4			PERU/BOLIVIA
11JAN94	00:51.59	25.2 N	97.3 E	33	6.0			MYANMAR-CHINA
11JAN94	10:53.51	36.9 N	121.7 W	13			4.3	CENTRAL CA
16JAN94	00:42.00	40.3 N	76.0 W	5	4.2			PENNSYLVANIA
16JAN94	01:49.01	40.3 N	76.0 W	5	4.6			PENNSYLVANIA
17JAN94	14:46.12	38.8 N	122.4 W	11			4.0	NORTHERN CA
19JAN94	01:13.26	43.6 N	127.5 W	10	4.5			OFF COAST OREGON
19JAN94	01:53.34	3.0 S	135.3 E	33	6.0	6.9		IRIAN JAYA
19JAN94	22:27.31	42.3 N	121.9 W	7	4.2		4.4	OREGON
20JAN94	09:06.52	6.0 S	77.0 W	120	5.8			NORTHERN PERU
20JAN94	15:41.33	40.4 N	124.8 W	23			4.2	OFF COAST N CA
21JAN94	02:24.31	1.3 N	128.0 E	33	7.2			HALMAHERA
21JAN94	18:00.17	4.8 S	103.7 E	89	6.0			S SUMATERA
01FEB94	08:01.51	37.2 N	118.3 W	10			4.3	CAL/NEV BORDER
01FEB94	10:01.53	19.2 N	155.3 W	10	5.1			HAWAII
02FEB94	11:04.25	42.7 N	111.1 W	5			4.0	EASTERN IDAHO
03FEB94	07:14.51	42.7 N	111.0 W	5			4.5	EASTERN IDAHO
03FEB94	09:05.03	42.7 N	110.9 W	5			5.8	WYOMING
03FEB94	09:12.28	42.8 N	111.0 W	5			4.4	EASTERN IDAHO
03FEB94	09:47.36	42.7 N	111.0 W	5			4.0	EASTERN IDAHO
03FEB94	09:58.40	42.7 N	111.0 W	5			4.2	EASTERN IDAHO

03FEB94	10:25.51	42.8 N	111.1 W	5			4.0	EASTERN IDAHO
03FEB94	11:19.07	42.7 N	111.0 W	5			4.7	EASTERN IDAHO
03FEB94	11:46.50	42.8 N	111.1 W	5			4.0	EASTERN IDAHO
03FEB94	12:04.57	42.7 N	111.1 W	5			4.4	EASTERN IDAHO
03FEB94	19:13.40	42.8 N	111.1 W	5			3.9	EASTERN IDAHO
04FEB94	00:10.09	36.4 N	116.9 W	10			3.9	CAL/NEV BORDER
04FEB94	02:42.12	42.7 N	111.0 W	5			5.2	EASTERN IDAHO
04FEB94	03:10.08	42.8 N	111.0 W	5			4.0	EASTERN IDAHO
04FEB94	16:50.34	42.7 N	111.0 W	5			3.9	EASTERN IDAHO
04FEB94	21:49.10	42.6 N	111.1 W	5			4.0	EASTERN IDAHO
05FEB94	07:06.02	42.6 N	110.9 W	5			4.2	WYOMING
05FEB94	09:09.43	42.7 N	111.0 W	5			4.2	EASTERN IDAHO
05FEB94	10:38.48	42.7 N	111.0 W	5			4.1	EASTERN IDAHO
05FEB94	14:55.37	37.3 N	89.1 W	5	4.2	(MD)		MISSOURI REGION
05FEB94	23:34.09	0.6 N	30.1 E	10		6.2		UGANDA
07FEB94	06:35.47	42.6 N	111.0 W	5			4.8	EASTERN IDAHO
07FEB94	12:15.45	42.6 N	111.0 W	5			4.5	EASTERN IDAHO
10FEB94	00:56.12	42.7 N	111.0 W	5			4.3	EASTERN IDAHO
11FEB94	04:24.30	42.7 N	111.1 W	5			4.0	EASTERN IDAHO
11FEB94	14:59.50	42.7 N	111.0 W	5			5.3	EASTERN IDAHO
11FEB94	21:17.31	18.8 S	169.1 E	204	6.3			VANUATU ISL
12FEB94	04:16.26	10.7 S	128.8 W	10	6.3	6.5		S PACIFIC OCEAN
12FEB94	17:58.25	20.5 S	169.3 E	33	6.3	7.2		VANUATU ISL
14FEB94	09:06.12	30.7 N	115.3 W	5			4.2	BAJA CAMEX
14FEB94	16:55.35	42.7 N	111.0 W	5			4.0	EASTERN IDAHO
15FEB94	15:08.18	20.6 S	169.3 E	39	5.7	5.7		VANUATU ISL
15FEB94	17:07.42	5.0 S	104.2 E	39	6.0	7.0		INDONESIA
15FEB94	21:11.58	20.3 S	168.8 E	33	5.6	6.5		LOYALTY ISL
16FEB94	06:47.00	20.0 S	168.8 E	33	5.8			LOYALTY ISL
16FEB94	06:48.58	20.0 S	168.8 E	33	5.9	6.5		LOYALTY ISL
16FEB94	22:03.12	20.2 S	168.8 E	33	5.6	5.8		LOYALTY ISL
20FEB94	21:48.13	13.8 N	120.8 E	219	5.5	6.2		PHILIPPINE ISL
21FEB94	13:40.04	40.2 N	125.3 W	10			4.1	OFF COAST N CA.
23FEB94	08:02.05	30.8 N	60.6 E	10	6.0	6.1		NORTHERN IRAN
24FEB94	15:25.35	17.3 S	174.3 S	124	5.6			TONGA ISLANDS
25FEB94	00:40.29	17.3 S	174.3 S	124	5.4			TONGA ISLANDS
26FEB94	02:31.11	30.9 N	60.5 E	12	5.8	5.9		NORTHERN IRAN
28FEB94	21:45.43	44.7 N	130.2 W	10	4.0			OFF COAST OREGON
28FEB94	21:51.39	44.7 N	130.2 W	10	5.0			OFF COAST OREGON
28FEB94	21:52.55	44.6 N	130.2 W	10	4.9			OFF COAST OREGON
28FEB94	22:24.35	44.6 N	129.8 W	10	4.5			OFF COAST OREGON
01MAR94	03:48.59	29.0 N	52.7 E	10		6.0		SOUTHERN IRAN
01MAR94	03:59.59	29.5 N	52.0 E	10	4.5	6.3		SOUTHERN IRAN
01MAR94	17:49.24	44.5 N	129.6 W	10	4.0			OFF COAST OREGON
03MAR94	07:13.17	42.7 N	111.0 W	5			4.1	EASTERN IDAHO
07MAR94	16:49.12	38.8 N	119.7 W	3			4.0	CAL/NEV BORDER
09MAR94	23:28.07	17.7 S	178.6 W	570	6.6			FIJI ISLANDS
13MAR94	16:59.01	40.3 N	125.1 W	23	4.6		4.4	OFF COAST N CA
14MAR94	04:30.07	1.4 N	24.0 W	10	6.1	6.4		MID-ATLANTIC RIDGE
14MAR94	20:51.23	15.7 N	92.4 W	160	5.9	6.2		MEXICO/GUATEMALA
26MAR94	20:41.01	44.8 N	110.8 W	5			3.8	WYOMING
31MAR94	22:40.53	21.9 S	179.5 W	591	5.9			FIJI ISLANDS
02APR94	15:34.44	15.1 S	177.5 W	354	5.5			FIJI ISL REG
05APR94	09:35.46	51.3 N	178.1 W	33	5.8	5.9		ANDREANOF ISL
06APR94	12:13.45	17.7 S	168.1 E	33		6.0		VANUATU ISLANDS
07APR94	16:16.44	42.5 N	111.0 W	5			4.8	IDAHO
07APR94	18:32.11	34.9 N	166.9 W	5			4.1	BAJA CALIFORNIA
08APR94	01:10.40	40.7 N	143.8 E	10	6.0	6.2		HONSHUJAPAN
08APR94	07:26.21	42.6 N	111.0 W	5			4.1	E IDAHO
10APR94	20:04.09	42.6 N	111.1 W	5	4.4		4.6	E IDAHO
10APR94	23:45.55	23.7 N	126.8 E	10	5.9			SE RYUKYU ISL
13APR94	22:22.29	3.0 S	135.3 E	33	6.0			IRIAN JAYA
14APR94	03:28.26	6.5 S	129.6 E	170	5.8			BANDA SEA
17APR94	13:37.00	23.4 S	179.9 W	500	5.5			S OF FIJI ISL
18APR94	17:29.54	6.5 S	154.7 E	33	6.6			SOLOMON ISL
18APR94	21:39.43	21.3 S	178.8 W	541	5.5			FIJI ISL
21APR94	03:51.45	5.7 S	154.0 E	33		6.6		SOLOMON ISLANDS
23APR94	15:00.54	14.2 S	167.1 E	33	6.0			VANUATU ISLANDS

27APR94	09:23.27	21.4 S	173.8 W	30	6.2			TONGA ISLANDS
27APR94	14:11.48	13.0 N	119.5 E	33	5.8			PHILIPPINE IS
29APR94	07:11.29	28.5 S	63.2 W	573	6.4			ARGENTINA
01MAY94	12:00.37	37.0 N	67.0 E	10		6.3		HINDU HUSH REG
02MAY94	17:14.04	1.1 S	97.4 E	40	6.1			SW OF SUMATERA
04MAY94	06:37.37	17.1 S	168.3 E	220	5.7			VANUATU ISLANDS
10MAY94	01:49.04	19.5 S	69.6 W	53	5.8			NORTHERN CHILE
10MAY94	06:36.27	28.5 S	62.9 W	605	6.4			ARGENTINA
11MAY94	08:18.18	2.0 S	99.8 E	33	6.0			SUMATERA
11MAY94	12:54.07	44.6 N	129.9 W	10	4.0			OFF COAST OREGON
11MAY94	21:14.38	2.1 S	99.7 E	60	5.8			SUMATERA
12MAY94	00:22.21	24.9 N	109.2 W	10	4.6	4.9		GULF OF CALIFORNIA
12MAY94	01:14.02	24.6 N	109.2 W	10	4.2			GULF OF CALIFORNIA
18MAY94	03:54.02	44.6 N	149.4 E	46	5.8			KURIL ISL
23MAY94	01:41.46	18.3 N	100.5 W	86	5.8			GUERREROMEX
23MAY94	05:36.04	24.4 N	122.4 E	33		6.0		TAIWAN REGION
23MAY94	06:46.16	35.5 N	24.8 E	77	6.0			CRETE
23MAY94	15:16.58	24.0 N	122.5 E	33				TAIWAN REGION
24MAY94	04:00.44	24.0 N	122.3 E	33	6.0	6.6		TAIWAN REGION
24MAY94	21:13.18	56.2 N	161.3 E	91	5.9			KAMCHATKA
25MAY94	04:03.44	3.7 S	136.1 E	33	5.9	6.5		IRIAN JAYA
29MAY94	14:11.51	20.9 N	94.2 E	33	6.2			MYANMAR
31MAY94	17:41.58	7.4 N	72.1 W	33	6.3	5.6		NORTHERN COLOMBIA
02JUN94	18:17.37	10.2 S	113.2 E	33	5.5	7.2		JAWAINDONESIA
03JUN94	21:07.01	10.5 S	113.5 E	33	5.9	6.4		JAWAINDONESIA
04JUN94	00:57.05	10.7 S	113.4 E	33	5.8	6.2		JAWAINDONESIA
05JUN94	01:09.30	24.5 N	121.9 E	10	6.0	6.5		TAIWAN
05JUN94	10:45.06	10.4 S	113.4 E	33	5.5	6.2		JAWAINDONESIA
06JUN94	20:47.43	3.0 N	76.2 W	33		6.4		COLOMBIA
07JUN94	13:30.03	44.6 N	113.9 W	10			5.0	EASTERN IDAHO
07JUN94	14:26.14	44.5 N	113.9 W	10			4.3	EASTERN IDAHO
07JUN94	18:36.07	44.5 N	113.9 W	10			4.5	EASTERN IDAHO
09JUN94	00:33.13	13.7 S	67.3 W	637	6.8	8.2	(Mw)	N BOLIVIA
09JUN94	16:22.22	13.2 N	124.3 E	80	5.8			PHILIPPINE IS
13JUN94	21:15.05	5.3 S	151.8 E	33		6.0		NEW BRITAIN REG
14JUN94	02:04.11	43.8 N	127.9 W	10	4.2			OFF COAST OF OREGON
15JUN94	08:22.19	47.4 N	123.1 W	44			4.0	WASHINGTON
15JUN94	09:23.01	10.0 S	114.2 E	33		6.1		BALIINDONESIA
15JUN94	10:28.51	10.1 S	114.4 E	33		6.0		BALIINDONESIA
16JUN94	10:12.45	7.4 S	128.1 E	100	5.8			BANDA SEA
16JUN94	18:41.32	14.8 S	70.0 W	225	5.6			CENTRAL PERU
18JUN94	03:25.18	42.8 S	171.7 E	33	6.2	7.1		NEW ZEALAND
19JUN94	10:39.32	40.3 N	124.4 W	19			4.9	COAST OF N CALIF
19JUN94	13:43.51	43.1 S	171.5 E	10		5.9		NEW ZEALAND
20JUN94	09:09.04	29.2 N	52.5 E	10	6.0			SOUTHERN IRAN
25JUN94	13:54.58	56.0 S	27.6 W	110	5.7			S SANDWICH IS
26JUN94	08:42.50	37.9 N	122.2 W	7			4.2	BERKELEY CALIF
30JUN94	01:08.24	27.9 N	90.1 W	10	4.2			GULF OF MEXICO
30JUN94	07:30.37	43.7 N	128.0 W	10	4.2			OFF COAST OF OREGON
30JUN94	09:23.22	36.4 N	71.1 E	233	6.1			AFGHAN/TAJIKISTAN
01JUL94	10:12.41	40.2 N	53.3 E	44	5.9			TURKMENISTAN
04JUL94	21:36.44	15.0 N	97.2 W	33	6.1			OAXACAMEXICO
05JUL94	02:59.42	16.3 S	177.5 W	413	5.4			FIJI ISLAND REG.
06JUL94	09:13.10	6.0 N	126.1 E	164	5.7			MINDANAOPHILIPPINE
13JUL94	02:35.59	16.1 S	167.4 E	33	6.3	7.3		VANUATU ISLANDS
13JUL94	11:45.26	7.0 S	127.2 E	180	6.4			BANDA SEA
14JUL94	00:09.27	16.1 S	167.2 E	33	5.4	6.0		VANUATU ISLANDS
14JUL94	13:25.01	24.8 N	108.8 W	10	4.6			GULF OF CALIFORNIA
16JUL94	18:05.07	4.6 S	125.6 E	461	5.8			BANDA SEA
21JUL94	18:36.32	42.3 N	133.0 E	480	6.5			SE COAST OF RUSSIA
21JUL94	18:55.57	41.2 N	132.3 E	500	5.7			SEA OF JAPAN
22JUL94	16:57.54	6.7 S	158.5 E	30	5.7	6.0		SOLOMON ISLANDS
24JUL94	17:55.40	17.3 S	167.7 E	33	5.6	6.6		VANUATU ISLANDS
28JUL94	08:03.30	47.3 S	100.3 E	10	5.2	5.7		SE INDIAN RIDGE
29JUL94	00:17.48	52.3 N	168.2 W	33	5.9			ALEUTIAN ISLANDS
29JUL94	07:53.31	16.6 S	167.4 E	33		5.9		VANUATU ISLANDS
02AUG94	14:17.54	52.5 N	158.1 E	170	5.8			E COAST OF KAMCHATKA
08AUG94	07:55.39	13.8 S	68.4 W	602	5.4			PERU/BOLIVIA BORDER

08AUG94	21:08.31	24.8 N	95.3 E	127	6.0			MYANMAR
11AUG94	02:22.53	32.3 N	115.2 W	15			4.5	CALEXICOMEXICO
11AUG94	19:32.52	21.7 S	176.7 W	180	5.5			FIJI ISLAND REGION
14AUG94	00:46.22	44.6 N	15.01 E	33	5.9			E OF KURIL ISLANDS
14AUG94	01:31.15	44.8 N	150.1 E	33	6.1			E OF KURIL ISLANDS
16AUG94	11:03.41	48.4 N	111.3 W	5			4.1	MONTANA
18AUG94	00:45.48	7.3 S	31.7 E	29	6.0			LAKE TANGANYIKA REG
18AUG94	01:13.06	35.5 N	0.1 W	9		5.9		NORTHERN ALGERIA
18AUG94	04:42.59	44.6 N	150.2 E	33	6.1			E OF KURIL ISLANDS
18AUG94	04:45.22	44.7 N	150.1 E	33	5.9			E OF KURIL ISLANDS
19AUG94	10:02.51	26.6 N	63.3 W	565	6.4			SANTIAGO DEL ESTERO
20AUG94	04:38.51	44.8 N	148.8 E	33	6.1			KURIL ISLANDS
21AUG94	15:56.01	56.6 N	117.8 E	33	5.7			E OF L. BAYKAL RUS.
22AUG94	17:26.37	11.5 S	166.3 E	148	6.1			SANTA CRUZ ISLANDS
28AUG94	18:37.19	44.9 N	150.1 E	14	6.0	6.5		E OF KURIL ISLANDS
30AUG94	06:13.36	44.6 N	150.1 E	54	6.1			E OF KURIL ISLANDS
30AUG94	19:42.48	6.9 S	123.9 E	618	5.8			BANDA SEA
31AUG94	09:07.26	43.7 N	146.0 E	80	5.9			HOKKAIDOJAPAN
01SEP94	15:15.52	40.3 N	125.8 W	10	6.6	7.1		OFF COAST OF N CAL
01SEP94	15:38.55	10.8 S	166.1 E	154	5.7			SANTA CRUZ ISLAND
01SEP94	19:48.31	40.4 N	125.7 W	10	4.4	(MD)		OFF COAST OF N CAL
03SEP94	17:46.41	20.8 S	173.2 E	33		6.2		VANUATU ISL REG
05SEP94	22:13.51	46.7 N	155.2 E	33	5.9			E OF KURIL ISL
06SEP94	03:46.37	38.0 N	122.3 W	5			4.3	UTAH
08SEP94	09:49.34	40.8 N	127.0 W	10	4.3			OFF COAST OF N CAL
08SEP94	09:52.20	40.7 N	127.4 W	10	4.6			OFF COAST OF N CAL
10SEP94	07:43.11	47.1 N	121.9 W	18			4.1	WASHINGTON (STATE)
12SEP94	12:23.43	38.8 N	119.6 W	14	5.3	5.7		CAL-NEV BORDER REG
12SEP94	12:37.24	38.7 N	119.6 W	1			3.9	CAL-NEV BORDER REG
12SEP94	12:40.35	38.7 N	119.6 W	6			3.9	CAL-NEV BORDER REG
12SEP94	14:24.22	38.7 N	119.6 W	0			3.6	CAL-NEV BORDER REG
12SEP94	17:14.02	38.8 N	119.7 W	8			4.0	CAL-NEV BORDER REG
12SEP94	23:57.09	38.7 N	119.7 W	1			5.3	CAL-NEV BORDER REG
13SEP94	04:28.01	29.2 N	129.8 E	37	5.8	6.3		RYUKYU ISLANDS
13SEP94	06:01.23	38.1 N	107.9 W	10			4.6	COLORADO
13SEP94	06:15.44	38.7 N	119.7 W	0			4.3	CAL-NEV BORDER REG
13SEP94	21:22.38	38.7 N	119.8 W	0			4.4	CAL-NEV BORDER REG
15SEP94	00:45.27	38.7 N	119.7 W	8			4.0	CAL-NEV BORDER REG
16SEP94	06:20.24	22.5 N	119.2 E	33		6.7		TAIWAN REGION
20SEP94	03:17.47	38.7 N	119.5 W	0			3.9	CAL-NEV BORDER REG
20SEP94	05:17.19	38.7 N	119.6 W	1			4.6	CAL-NEV BORDER REG
20SEP94	15:38.36	38.7 N	119.6 W	2			4.5	CAL-NEV BORDER REG
20SEP94	15:40.55	38.8 N	119.5 W	5			4.5	CAL-NEV BORDER REG
21SEP94	02:09.01	40.4 N	124.6 W	21			4.3	NEAR COAST OF N CAL
23SEP94	07:59.39	3.1 S	148.6 E	33		6.0		BISMARCK SEA
25SEP94	00:53.28	28.0 N	69.9 W	18			4.3	GASPE PENCANADA
28SEP94	16:39.52	5.5 S	110.2 E	643	5.7			JAVA SEA
28SEP94	17:33.59	5.3 S	110.1 E	630	5.4			JAVA SEA
01OCT94	14:53.59	18.7 S	176.9 W	391	5.6			FIJI ISL REGION
01OCT94	16:35.22	17.7 S	167.6 E	33	5.7	6.5		VANUATU ISLANDS
01OCT94	17:46.37	17.8 S	167.8 E	33	5.6	6.3		VANUATU ISLANDS
03OCT94	14:00.47	32.0 N	114.9 W	5	4.6	4.9		W ARIZONA/SONORA
04OCT94	13:22.58	43.7 N	147.3 E	33	7.4	8.2		KURIL ISLANDS
04OCT94	13:42.49	43.8 N	147.2 E	33	6.1			KURIL ISLANDS
04OCT94	13:52.46	43.9 N	147.8 E	33	5.9			KURIL ISLANDS
04OCT94	15:24.17	43.4 N	147.9 E	33	6.2			KURIL ISLANDS
04OCT94	16:01.04	43.7 N	147.9 E	33	6.3			KURIL ISLANDS
04OCT94	16:06.22	43.9 N	147.8 E	33	5.9			KURIL ISLANDS
04OCT94	16:43.40	43.6 N	147.6 E	27	5.1	6.1		KURIL ISLANDS
04OCT94	19:16.28	43.7 N	147.4 E	33	5.9			KURIL ISLANDS
05OCT94	20:37.31	43.5 N	147.4 E	33		5.9		KURIL ISLANDS
05OCT94	20:39.47	43.8 N	147.4 E	33	6.2	5.6		KURIL ISLANDS
07OCT94	02:36.10	43.7 N	147.3 E	33	6.1			KURIL ISLANDS
07OCT94	03:25.58	41.7 N	88.8 E	0	5.9	(nuk	)	S XINJIANGCHINA
07OCT94	15:24.04	43.0 N	146.1 E	33	5.9			OFF COAST HOKKAIDO
08OCT94	09:54.37	43.8 N	148.1 E	29	5.9	4.9		E OF KURIL ISLANDS
08OCT94	21:44.09	1.2 S	128.0 E	31	6.3	6.8		HALMAHERAINDONESIA
09OCT94	07:55.38	43.9 N	147.9 E	23	6.5	7.0		KURIL ISLANDS

09OCT94	08:07.04	43.7 N	148.0 E	42	5.9			E OF KURIL ISLANDS
10OCT94	03:07.07	38.7 N	199.6 W	1	4.3	4.4	4.8	CAL/NEV BORD. TAHOE
12OCT94	06:43.41	13.8 N	124.5 E	33	5.8	6.1		LUZONPHILIP. ISL
13OCT94	05:04.28	1.2 S	128.0 E	33	6.0	6.4		HALMAHERAINDONESIA
14OCT94	00:57.25	40.3 N	124.6 W	19			4.2	NEAR COAST OF N CA
15OCT94	00:39.27	3.8 S	152.1 E	33		6.1		NEW IRELAND REG
16OCT94	00:06.48	9.2 S	75.7 W	131	5.4			CENTRAL PERU
16OCT94	05:10.03	45.7 N	149.3 E	139	6.3			KURIL ISLANDS
17OCT94	19:25.54	5.6 S	154.6 E	146	5.4			SOLOMON ISLANDS
18OCT94	17:12.51	43.6 N	147.1 E	66	6.1			KURIL ISLANDS
20OCT94	01:15.16	39.1 S	70.8 W	164	5.7			S ARGENTINA
25OCT94	00:54.35	36.3 N	70.9 E	244	5.9			HINDU KUSH REG
25OCT94	15:56.06	44.7 N	129.2 W	10	4.2			OFF COAST OF OREGON
25OCT94	15:59.43	44.6 N	130.0 W	10	4.3			OFF COAST OF OREGON
27OCT94	09:14.34	25.6 N	109.6 W	10	4.9			GULF OF CALIFORNIA
27OCT94	17:45.56	43.6 N	127.3 W	10		6.0		OFF COAST OF OREGON
27OCT94	22:20.31	25.6 S	179.1 E	550	5.9			S OF FIJI ISLANDS
30OCT94	08:11.29	6.1 S	129.4 E	263	5.6			BANDA SEA
31OCT94	11:48.14	3.0 N	96.4 E	33	5.6	6.1		N SUMATERAINDO
02NOV94	20:48.27	43.7 N	128.0 W	10			4.5	OFF COAST OF OREGON
03NOV94	03:07.22	10.9 S	166.2 E	165	5.3			SANTA CRUZ ISLAND
04NOV94	01:13.20	9.2 S	71.2 W	598	5.8			PERU/BRAZIL BORDER
05NOV94	02:15.59	57.2 S	158.2 E	10	6.2			MACQUARIE ISLREGION
05NOV94	12:05.28	9.1 S	71.2 W	597	5.6			PERU/BRAZIL BORDER
09NOV94	18:21.04	43.5 N	147.2 E	62	6.1			KURIL ISLANDS
11NOV94	08:48.30	15.5 S	72.4 W	121	5.6			SOUTHERN PERU
14NOV94	01:28.23	40.3 N	124.4 W	18			4.3	NEAR COAST OF N CA
14NOV94	19:15.30	13.4 N	121.1 E	33	6.1	7.1		MINDOROPHILIPPINE
15NOV94	20:18.11	5.6 S	110.1 E	559	6.2			JAVA SEA
15NOV94	20:39.38	47.2 N	155.1 E	33		6.0		E OF KURIL ISLANDS
17NOV94	20:29.49	42.3 N	12.0 W	7			4.4	OREGON
18NOV94	20:50.59	39.1 N	119.7 W	6			4.4	NEVADA
20NOV94	16:59.08	2.0 S	135.9 E	24	6.3			IRIAN JAYA REGINDO
20NOV94	18:34.35	4.2 N	97.6 E	167	5.7			N SUMATERAINDO
21NOV94	02:21.38	15.0 S	167.2 E	201	5.6			VANUATU
22NOV94	21:23.30	43.5 N	127.1 W	10	4.7			OFF COAST OF OREGON
24NOV94	13:21.15	5.3 S	150.5 E	142	5.5			NEW BRITAIN REGION
07DEC94	03:37.58	22.6 S	66.4 W	243	5.6			JUJUY PROVARGENTINA
10DEC94	16:17.35	18.0 N	101.2 W	33	6.5			GUERREROMEXICO
11DEC94	09:29.01	24.7 S	179.4 W	391	5.5			S OF FIJI ISLANDS
12DEC94	07:41.58	17.0 S	69.4 W	151	5.8			PERU/BOLIVIA REGION
13DEC94	18:42.50	29.7 N	114.3 W	10			4.1	BAJA CALIFORNIA
14DEC94	07:28.55	9.4 S	159.1 E	33	5.7	5.9		SOLOMON ISLANDS
15DEC94	11:20.22	37.3 S	177.5 E	33	5.7	6.4		OFF E COAST OF N.Z.
15DEC94	23:56.10	3.2 S	139.8 E	110	5.5			IRIAN JAYAINDONESIA
16DEC94	03:03.38	40.7 N	125.2 W	8	4.1		4.2	OFF COAST N CALIF
18DEC94	20:38.32	17.7 S	179.0 W	551	5.6			FIJI ISLANDS REGION
20DEC94	10:27.47	35.9 N	120.4 W	9	4.4		5.0	PARKFIELDCALIFORNIA
20DEC94	22:14.10	38.7 N	119.7 W	3			4.0	CA/NEV BORDER REGION
21DEC94	05:50.11	38.7 N	119.7 W	0			4.2	CA/NEV BORDER REGION
25DEC94	19:06.07	39.3 N	104.8 W	10			4.0	COLORADO
26DEC94	14:10.29	40.7 N	124.3 W	23	5.1		5.3	NEAR COAST OF N CAL
27DEC94	17:32.52	31.9 S	179.5 E	229	6.0			S OF KERMADEC ISLAND
28DEC94	12:19.24	40.2 N	144.0 E	33	6.4	7.4		OFF COAST OF HONSHU
28DEC94	20:52.28	40.2 N	142.7 E	33		5.8		E COAST HONSHUJAPAN
28DEC94	22:23.57	30.4 S	179.1 E	33	5.6	6.1		S OF KERMADEC ISLAND
28DEC94	22:36.06	40.3 N	142.4 E	33	5.2	6.5		E COAST HONSHUJAPAN
28DEC94	22:37.49	40.2 N	143.6 E	33	5.8	5.9		E COAST HONSHUJAPAN
30DEC94	15:12.27	18.6 N	145.4 E	235	5.6			MARIANA ISLANDS

Local Events

DATE	TIME	LAT.	LONG.	DEPTH	MB	MSZ	ML	LOCATION
09JAN94	23:00.58	33.9N	118.5W	3			3.7	SANTAMONICA CA
10JAN94	06:12.03	33.9N	118.4W	3			3.1	SANTAMONICA CA

12JAN94	07:27.34	33.9N	118.5W	11			3.5	SANTAMONICA CA
17JAN94	12:30.51	34.0N	118.7W	10			6.7	NORTHRIDGE CA
17JAN94	12:39.39	34.2N	118.5W	17			5.0	NORTHRIDGE CA
17JAN94	13:06.27	34.2N	118.5W	0			4.5	NORTHRIDGE CA
17JAN94	13:22.49	34.3N	118.6W	6			4.0	NORTHRIDGE CA
17JAN94	13:26.44	34.3N	118.4W	6			4.6	NORTHRIDGE CA
17JAN94	13:37.48	34.3N	118.6W	6			4.2	NORTHRIDGE CA
17JAN94	13:45.13	34.3N	118.6W	6			4.1	NORTHRIDGE CA
17JAN94	13:56.02	34.3N	118.6W	25			4.6	NORTHRIDGE CA
17JAN94	14:08.07	34.3N	118.4W	0			4.1	NORTHRIDGE CA
17JAN94	14:14.14	34.3N	118.4W	0			4.5	NORTHRIDGE CA
17JAN94	14:46.12	38.8N	122.4W	11			4.0	NORTHERN CA
17JAN94	14:50.38	34.3N	118.4W	0			4.1	NORTHRIDGE CA
17JAN94	15:07.02	34.3N	118.4W	2			4.0	NORTHRIDGE CA
17JAN94	15:10.11	34.3N	118.4W	0			4.0	NORTHRIDGE CA
17JAN94	15:54.10	34.3N	118.6W	12			4.8	NORTHRIDGE CA
17JAN94	15:56.08	34.2N	118.5W	20			4.3	NORTHRIDGE CA
17JAN94	19:35.34	34.3N	118.4W	0			4.2	NORTHRIDGE CA
17JAN94	19:43.53	34.3N	118.6W	15			4.0	NORTHRIDGE CA
17JAN94	20:02.05	34.4N	118.5W	0			4.0	NORTHRIDGE CA
17JAN94	20:46.01	34.3N	118.5W	0			5.1	NORTHRIDGE CA
17JAN94	23:33.30	34.3N	118.7W	0	5.6	6.0		NORTHRIDGE CA
17JAN94	23:49.25	34.3N	118.6W	2			4.2	NORTHRIDGE CA
18JAN94	00:36.20	34.3N	118.4W	12			4.0	NORTHRIDGE CA
18JAN94	00:39.34	34.3N	118.5W	3			4.4	NORTHRIDGE CA
18JAN94	00:43.08	34.3N	118.6W	3	5.3	5.0		NORTHRIDGE CA
18JAN94	04:01.26	34.3N	118.6W	2			4.6	NORTHRIDGE CA
18JAN94	07:23.56	34.3N	118.6W	12			4.2	NORTHRIDGE CA
18JAN94	11:35.09	34.2N	118.6W	15			4.2	NORTHRIDGE CA
18JAN94	13:24.43	34.3N	118.5W	2			4.4	NORTHRIDGE CA
18JAN94	15:23.46	34.3N	118.5W	8			4.8	NORTHRIDGE CA
19JAN94	04:40.47	34.3N	118.5W	3			4.5	NORTHRIDGE CA
19JAN94	04:43.14	34.3N	118.7W	12			4.1	NORTHRIDGE CA
19JAN94	09:13.10	34.3N	118.7W	1			4.2	NORTHRIDGE CA
19JAN94	14:09.14	34.2N	118.5W	17			4.5	NORTHRIDGE CA
19JAN94	14:46.35	34.2N	118.4W	6			4.1	NORTHRIDGE CA
19JAN94	21:09.28	34.3N	118.7W	14	5.0			NORTHRIDGE CA
19JAN94	21:11.44	34.3N	118.6W	11			4.8	NORTHRIDGE CA
20JAN94	05:58.27	34.3N	118.7W	11			4.0	NORTHRIDGE CA
21JAN94	18:39.15	34.3N	118.4W	11			4.7	NORTHRIDGE CA
21JAN94	18:42.28	34.3N	118.4W	8			4.3	NORTHRIDGE CA
21JAN94	18:52.44	34.3N	118.4W	8			4.3	NORTHRIDGE CA
21JAN94	18:53.44	34.3N	118.4W	8			4.3	NORTHRIDGE CA
23JAN94	08:41.41	34.3N	118.4W	8			4.0	NORTHRIDGE CA
23JAN94	08:55.08	34.3N	118.4W	6			4.2	NORTHRIDGE CA
24JAN94	04:15.18	34.3N	118.5W	7			4.7	NORTHRIDGE CA
24JAN94	05:50.24	34.3N	118.6W	12			4.3	NORTHRIDGE CA
24JAN94	05:54.21	34.3N	118.6W	11			4.4	NORTHRIDGE CA
27JAN94	17:19.58	34.3N	118.5W	15			4.4	NORTHRIDGE CA
28JAN94	20:09.53	34.3N	118.5W	1			4.1	NORTHRIDGE CA
28JAN94	20:11.05	34.3N	118.5W	0			4.0	NORTHRIDGE CA
29JAN94	11:20.35	34.1N	118.7W	10			5.4	NORTHRIDGE CA
29JAN94	12:16.56	34.2N	118.6W	3			4.3	NORTHRIDGE CA
01FEB94	07:40.19	34.2N	118.6W	3			3.8	NORTHRIDGE CA
02FEB94	11:24.37	34.2N	118.6W	1			3.9	NORTHRIDGE CA
03FEB94	16:23.35	34.3N	118.4W	9			4.2	NORTHRIDGE CA
05FEB94	08:21.06	34.3N	118.6W	13			3.9	NORTHRIDGE CA
06FEB94	13:19.27	34.3N	118.4W	9			4.1	NORTHRIDGE CA
20MAR94	21:20.12	34.2N	118.4W	13	5.1	4.8	5.3	NORTHRIDGE CA
31MAR94	19:59.59	36.1N	120.2W	10			4.3	COALINGA CA
31MAR94	20:02.29	36.1N	120.2W	10			4.2	COALINGA CA
06APR94	19:01.03	34.2N	117.1W	10			5.0	LAKE ARROWHEAD CA
08APR94	17:53.30	34.4N	118.9W	5			4.0	NORTHRIDGE CA
21APR94	16:37.15	36.3N	120.4W	11			4.5	COALINGA CA
04MAY94	04:09.12	34.3N	118.4W	5			3.9	NORTHRIDGE CA
25MAY94	12:56.57	34.3N	118.3W	7			4.2	NORTHRIDGE CA
15JUN94	05:59.48	34.3N	118.9W	7			4.0	NORTHRIDGE CA
16JUN94	16:24.26	34.3N	116.4W	3			5.0	YUCCA VALLEY CA

11JUL94	06:49.15	34.2N	118.6W	16	3.2	SIMI VALLEY CA
11JUL94	06:50.49	34.2N	118.6W	16	3.7	SIMI VALLEY CA
01AUG94	21:34.31	34.6N	116.5W	9	4.9	LUCERNE VALLEY CA
07AUG94	15:10.26	34.0N	166.3E	7	4.0	YUCCA VALLEY CA
19OCT94	00:49.58	35.5N	117.4W	3	4.3	RIDGECREST
20NOV94	04:31.43	34.0N	116.3W	6	4.2	YUCCA VALLEY CA
06DEC94	03:36.24	34.3N	118.4W	8	3.6	SAN FERNANDO CA
06DEC94	03:48.34	34.3N	118.4W	9	4.5	SAN FERNANDO CA

Saved Time Periods for Local Sequences

DATE	TIMESPAN		DESCRIPTION
09JAN94	12:19-01:38	15JAN94	NORTHRIDGE
15JAN94	01:56-17:42	15JAN94	NORTHRIDGE
15JAN94	17:49-17:43	17JAN94	NORTHRIDGE
17JAN94	17:48-17:58	17JAN94	NORTHRIDGE
17JAN94	18:09-18:26	17JAN94	NORTHRIDGE
17JAN94	18:27-23:53	18JAN94	NORTHRIDGE
18JAN94	23:56-04:06	20JAN94	NORTHRIDGE
20JAN94	04:24-21:04	20JAN94	NORTHRIDGE
20JAN94	21:08-21:12	20JAN94	NORTHRIDGE
20JAN94	21:17-03:03	28JAN94	NORTHRIDGE
28JAN94	03:06-18:42	29JAN94	NORTHRIDGE
26JAN94	18:49-20:11	29JAN94	NORTHRIDGE
29JAN94	20:14-15:50	31JAN94	NORTHRIDGE
31JAN94	15:50-00:10	01FEB94	NORTHRIDGE
01FEB94	00:10-20:14	01FEB94	NORTHRIDGE
01FEB94	20:22-23:14	01FEB94	NORTHRIDGE
01FEB94	23:23-17:07	02FEB94	NORTHRIDGE
02FEB94	17:13-19:40	02FEB94	NORTHRIDGE
02FEB94	20:10-22:03	03FEB94	NORTHRIDGE
03FEB94	22:30-22:37	03FEB94	NORTHRIDGE
03FEB94	22:47-05:19	04FEB94	NORTHRIDGE
04FEB94	05:42-16:47	04FEB94	NORTHRIDGE
04FEB94	16:51-17:45	05FEB94	NORTHRIDGE
05FEB94	17:49-18:33	05FEB94	NORTHRIDGE
05FEB94	19:36-15:33	08FEB94	NORTHRIDGE
08FEB94	15:35-16:56	08FEB94	NORTHRIDGE
08FEB94	17:00-19:27	08FEB94	NORTHRIDGE
08FEB94	19:33-20:46	08FEB94	NORTHRIDGE
08FEB94	20:50-18:59	12FEB94	NORTHRIDGE
12FEB94	19:00-17:37	13FEB94	NORTHRIDGE (POSSIBLE GAPS)
13FEB94	17:42-21:02	14FEB94	NORTHRIDGE
15FEB94	04:27-21:26	15FEB94	NORTHRIDGE
15FEB94	21:33-15:41	16FEB94	NORTHRIDGE
16FEB94	15:44-16:51	17FEB94	NORTHRIDGE
17FEB94	16:57-23:22	17FEB94	NORTHRIDGE
18FEB94	07:01-14:26	18FEB94	NORTHRIDGE (POSSIBLE GAPS)
18FEB94	14:30-17:24	18FEB94	NORTHRIDGE
18FEB94	17:29-00:54	19FEB94	NORTHRIDGE
19FEB94	02:09-18:57	19FEB94	NORTHRIDGE
19FEB94	19:05-02:30	20FEB94	NORTHRIDGE
20FEB94	09:55-16:42	21FEB94	NORTHRIDGE
21FEB94	16:51-23:16	21FEB94	NORTHRIDGE
21FEB94	23:20-23:34	22FEB94	NORTHRIDGE (POSSIBLE GAPS)
22FEB94	23:34-19:59	23FEB94	NORTHRIDGE
23FEB94	22:57-23:54	23FEB94	NORTHRIDGE
24FEB94	01:03-03:18	24FEB94	NORTHRIDGE
24FEB94	10:43-15:02	24FEB94	NORTHRIDGE
24FEB94	15:06-08:04	28FEB94	NORTHRIDGE
28FEB94	08:09-17:52	01MAR94	NORTHRIDGE
01MAR94	18:22-09:13	02MAR94	NORTHRIDGE

02MAR94	16:38-22:58	02MAR94	NORTHRIDGE
02MAR94	23:01-23:04	02MAR94	NORTHRIDGE
02MAR94	23:31-10:24	03MAR94	NORTHRIDGE
03MAR94	23:32-18:05	04MAR94	NORTHRIDGE
04MAR94	18:12-18:44	05MAR94	NORTHRIDGE
06MAR94	02:09-16:20	07MAR94	NORTHRIDGE
07MAR94	16:24-22:36	07MAR94	NORTHRIDGE
07MAR94	22:39-18:13	08MAR94	NORTHRIDGE
08MAR94	19:44-22:56	08MAR94	NORTHRIDGE
08MAR94	23:23-08:29	09MAR94	NORTHRIDGE (POSSIBLE GAPS)
09MAR94	19:16-17:26	10MAR94	NORTHRIDGE
10MAR94	17:32-01:56	13MAR94	NORTHRIDGE
13MAR94	02:20-22:04	15MAR94	NORTHRIDGE
15MAR94	22:07-05:03	16MAR94	NORTHRIDGE
16MAR94	05:33-03:14	17MAR94	NORTHRIDGE
17MAR94	03:17-23:56	17MAR94	NORTHRIDGE

Miscellaneous Events

DATE	TIME OF EVENT OR TAPE			DESCRIPTION
12MAY94	00:00.??			QUESTIONABLE SONIC
13MAY94	00:00.??			SONIC
18MAY94	07:00.09	33.5N	114.6W	ARIZONA (EXPLOSION) M3.5
09JUN94	18:45.09	32.5N	120.3W	OFFSHOREPALOSVERDE 2.5 MC (BLAST)
10JUN94	06:25.00	14.5N	88.7E	XINJIANGCHINA 5.7 (EXPLOSION)
27JUN94	18:33.10	32.1N	120.3W	OFFSHORE PALOS VERDES 2.8MC (BLAST)
07JUL94	14:55.??			SR-71 SONIC BOOM
20SEP94	22:08.??			SPACE SHUTTLE SONIC
07OCT94	03:25.58	41.7N	88.8E	S. XINJIANG, CHINA M5.9 (NUCLEAR)
13OCT94	00:00-18:53 14OCT94			LARSE EXPERIMENT
15OCT92	00:55-00:34 28OCT94			LARSE EXPERIMENT (POSSIBLE GAPS)
29OCT94	00:51-05:06 31OCT94			LARSE EXPERIMENT
14NOV94	15:30.??			SPACE SHUTTLE SONIC

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