

Portable Broadband Instrument Center (PBIC) 1994 Annual Report

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Earthquake response

The January 17, 1994 Northridge Earthquake and its subsequent aftershock sequence occupied the attention of the PBIC for the first part of 1994. The PBIC worked closely with other SCEC member institutions in a rapid response to this significant event, collecting 3-5 gigabytes of data from the 30 or so portable data acquisition systems deployed. The data was transferred to UCSD for initial processing and conversion into a format suitable for the Data Center's database. A preliminary release of the data was available within a few months.

Equipment Usage

The following table summarizes the projects that utilized PBIC equipment in 1994. The vast majority of equipment remained up and in the field the entire year (table below and figure 1).

Dates	Institution	PI(s)	Experiment
01/17/94-03/11/94	SCEC	Martin/Steidl	Northridge response
01/21/94-03/23/94	UCLA	Davis/Gao	Northridge response
02/23/94-07/26/94	CSUN	Simila	Northridge response
03/24/94-04/20/94	UCLA	Davis/Benthien	NEAR94
03/24/94-09/24/94	UCSB	Archuleta/Steidl	Keenwyld & Anza
03/24/94-09/26/94	UCSB/USC	Steidl/Chin	LA Microzonation
04/05/94-06/14/94	USC	Li	LA Basin
06/15/94-08/10/94	USC	Li	San Andreas Fault Zone
07/24/94-09/20/94	USC	Abercrombie	Cajon Pass
08/11/94-09/24/94	USC	Li	LA Basin
09/26/94-current	Caltech	Hauksson/Kedar	Yellowstone seismic exp
10/01/94-10/31/94	SCEC/USGS	Okaya/Fuis	LARSE 94
10/30/94-11/04/94	USC	Li	Landers array

All of the PBIC equipment was made available to the LARSE experiment as well as the two most recent acquisitions that arrived just prior to the experiment. In addition the PBIC support workstation was taken to the Glendora command center and used in the sensor calibration and data dumping phases of the experiment. PBIC personnel assisted in the deployment and maintenance of portions of the LARSE experiment as well as providing logistical, computer and instrumentation support.

Hardware

Purchases with this years equipment funds consisted of two more portable recorders, passive sensors and I/O devices. The recorders have increased dynamic range (24 bits) in response to PBICC recommendations. All new DASs are equipped with GPS timing subsystems. The present DAS inventory includes: 9 – 16 bit recorders and 7 – 24 bit (3ch@24bits, 3ch@16bits) recorders for a total of 16 DASs. In addition we have an L4C3D and FBA-23 sensor pair for each DAS. The remainder of the 1994 budget is being spent on support equipment for the portable instruments.

Sensor Calibration

The sensor calibration process developed last year continues to be refined through use. A paper on this process, produced by PBIC employees, was recently accepted by the BSSA. PBIC sensors will undergo periodic recalibration using these methods to track any changes in sensor response over time. SCEC researchers have started utilizing results from last year's LARSE 93 calibration, but have had problems using the analytic form of the output due to database restrictions. In response to this, work is currently underway to produce an alternative form of the calibration in terms of poles and zeroes along with the analytic form.

This sensor calibration process was used during the LARSE 94 experiment to calibrate the sensors used during that large deployment. New interface and calibration boxes significantly sped up the recording process allowing LARSE volunteers to record calibration pulses on over 500 components within a two day period.

Software

The PBIC continues development on several software packages and its interaction with the PASSCAL programming group as well as the PASSCAL Instrument Center. SCEC software continues to be included in the standard PASSCAL software release. In addition, modifications to PASSCAL software made by the PBIC have been integrated into the standard software. Some new shells were added to the response package to make the processing of the response data more streamlined.

The anonymous ftp account at quake.crustal.ucsb.edu has been reorganized. SCEC supported software is now in its own directory (/scec). Subdirectories exist for information and files for three different machine architectures. The PBIC maintains a copy of the most current PASSCAL software release at this site.

Publications

Rodgers, P., Martin, A., Robertson, M., Hsu, M., Harris, D., "Signal Coil Calibration of Electro-Magnetic Seismometers," accepted for publication in the *Bulletin of the Seismological Society of America*.