SCEC 1992 Progress Report

SCEC Portable Broadband Instrument Center (PBIC)

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PBIC recorders and sensors were deployed for the three principal earthquakes to strike southern California in 1992: 22 April Joshua Tree, 28 June Landers and 28 June Big Bear. In addition to these earthquakes the recorders/sensors were used by other SCEC investigators for ongoing SCEC experiments.

Five PBIC DAS's were initially deployed within 6.5 hours of the April 22 M6.1 Joshua Tree mainshock. The PBIC assisted in the deployment and maintenance of these sites. Six PASSCAL DAS's were added to the deployment in the following days. The array was maintained until early June and collected about 5-6 Gb of raw data. The PBIC is working on the timing corrections and event association of the 3-4 Gb of data remaining after reduction.

The Joshua Tree earthquake and subsequent data processing was overshadowed by the June 28 M_S 7.4 Landers and M_L 6.6 Big Bear earthquakes. Eight of the PBIC DAS's were deployed for this aftershock sequence, the ninth SCEC DAS being left deployed at the Cajon Pass Deep borehole. PASSCAL supplemented the SCEC array with 10 DAS's in the days following the mainshock. SCEC member institutions worked together to deploy and maintain the array which, once fully deployed, consisted of 18 sites (see figure 1) including 3 STS-2 and 2 CMG-3 broadband sensors. The 18-station array was maintained for about 3 weeks when it was reduced to 6 sites. The remainder of the array was pulled at the beginning of September. A prototype field computer was configured for the aftershock deployment. The computer was used to perform initial field quality control of the data and to make timing corrections necessary for later processing.

In addition to the field deployments the PBIC has continued to improve the use of the DAS systems. These improvements include:

- The PBIC has developed worksheets and forms to assist users during field deployments. The worksheets/forms are a direct result of the PBIC's experiences during the two aftershock deployments.
- The PBIC has examine the compatibility of the DAS characteristics with that of available sensors. This is shown in Figure 2 which shows the relationship between the dynamic range of sensors and the input characteristics of 16 and 24 bit Reftek DAS's. The figure is useful in illustrating the usable magnitude range of each of the sensors at different gains and suggest the limitations of different sensor/DAS combinations.
- The PBIC DAS's have been upgraded to version 2.47 of Refraction Technology's operating system. This upgrade corrects several timing problems from earlier versions and adds some new capabilities, such as detriggering, to the DAS's.
- The PBIC has provided SCEC member institutions with assistance in deployment planning, field data collection, software usage and data salvage.
- Reftek was able to diagnose and find a solution to the low level spiking problem discovered by the PBIC last year. All PBIC DAS's have been upgraded to correct

the problem. One omega board has failed and is in for evaluation. The vertical component of one of the L4C-3D's failed and has been repaired. Two disks that failed during the Joshua Tree deployment are being repaired or replaced.