

Renewal of feed-back circuit in STS-1 broadband seismometer system

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STS-1 broadband seismometer is one of most popular broadband seismometers. The high performance with low instrument noise, high sensitivity and wide dynamic range supplied huge valuable data to seismologists. The production of STS-1 sensor and spare parts had been terminated, however many broadband networks are still using as main seismometer.

OHP seismic network also operates STS-1 sensor in the Western Pacific region. Usage period of the sensors have already been over 20 years. Mechanical body part that is kept in vacuumed and dry condition is still stable and intact status. However the characteristics of electric parts in feed-back and amplification circuit varied due to their life time. Practically some unstable and artificial signal is recorded in low background noise and stable stations.

Recently new feedback circuit box (STS1-E300) is developed and some seismic networks have started to use it. Our network is considering installation of new feed-back circuit to avoid problems by parts' aging. In this presentation, we will report the

New feed-back circuit box includes three components of outer electricity part in one body. It has serial communication port for command to the box for setting measurement mode (normal/maintenance), mass position control and calibration. In trial operation, all functions of the box are checked and operation procedure in our network is produced.

For the installation on site, stable power supply, re-structure of cable wires and interface to PC are required as accessory equipment. We designed and produced new control unit for new feed-back circuit box which is enables to be improved at OHP stations even in the case of unstable power condition.

Test measurement was performed with sensor mechanical part in room and at some our station to evaluate the control unit performance and stability. After test measurement, we installed new feed-back circuit box and control unit at OGS (Ogasawara) station officially this year. In early monitoring, artificial signal that was recorded in original configuration is erased and new system is recording stable signal. By common feed-back circuit, each sensitivity of output changes from original one, which is estimated by electric device constant. Evaluation of exact coefficient is required by other procedures.

Keywords: STS-1 seismometer, feed-back circuit, broadband seismometer, OHP network