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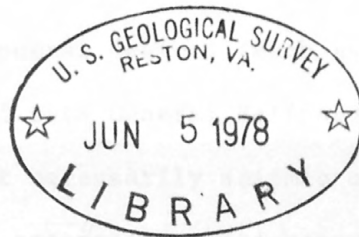
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UNITED STATES
(DEPARTMENT OF INTERIOR)
GEOLOGICAL SURVEY, [Reports-Open file series]

NOTES ON AVAILABILITY OF
MULTI CHANNEL SEISMIC PROCESSING PROGRAMS

by

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OPEN FILE REPORT

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U.S. Geological Survey
OPEN FILE REPORT

This report is preliminary and has not
been edited or reviewed for conformity with
Geological Survey standards.

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A copy of the complete report is on file in the Menlo Park Library.

Layman's Summary
Open File Report
Multi Channel Seismic Processing Programs

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During the past two years, a seismic processing system has been developed within Western Region offices of the U.S. Geological Survey (Pacific-Arctic Branch of Marine Geology). This brief report describes some of the programs within this system that may be of value to others. We process seismic reflection data taken onboard ship to yield a pseudo cross section of the earth as revealed by echoes returned off rock layers within the earth.

Included are programs to attach various peripheral devices (such as tape drives and disk drives) to the operating system of Data General Eclipse computers. These may be of value to other users (not necessarily seismic oriented) of these computers. Most of the programs are for processing multichannel seismic data. These data have high redundancy and are statistically processed to yield not only a pseudo cross section of the earth but also to give the velocity of acoustic waves within various rock layers. The final product is used in offshore oil and gas exploration and environmental assessment.

This summary describes a collection of program listings that are a part of the multi-channel seismic processing system developed within the Pacific-Arctic Branch of Marine Geology during the last 2 years and that are available for consultation at the Menlo Park library of the U.S. Geological Survey. These listings include several driver programs to attach peripheral devices such as tapes or disks to the operating system of Data General Eclipse computers and other programs (primarily concerned with acoustic velocity and filter design) that are useful in seismic processing irrespective of computer brand. Understanding any of the routines listed necessarily requires a basic understanding of conventional multi-channel seismic processing as practiced in the last decade.

The first four sections deal with driver programs to attach peripheral devices to the operating system. The nine-track tape drives and fixed head disks are the standard storage devices for our seismic data. The GUS HDDR tape drive is used to read field tapes.

The fifth section deals with the log listing, demultiplexing, and editing of the GUS HDDR tapes. These processes are the most time-consuming aspect of the processing of our seismic data, both in terms of manpower and computer time.

The programs in the sixth section are used to process velocity picks made from velocity spectra. Interval velocities and NMO corrected gathers are typically used in velocity analysis.

A suite of seismic diagnostic routines in the seventh section are used in filter analysis and design, gain/amplitude studies, and deconvolution analysis and design. They have been used in seismic source and streamer studies. The eighth and last section includes a few miscellaneous routines including generation of CMP gathers for use in checkout of processing programs.

All of the routines are in current usage. Some, such as test programs, are run infrequently. Others, such as demux and some drivers, are in use many dozens of hours per week. The correctness of any of these programs cannot be guaranteed.

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