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INCORPORATED RESEARCH INSTITUTIONS FOR SEISMOLOGY

CONTENTS

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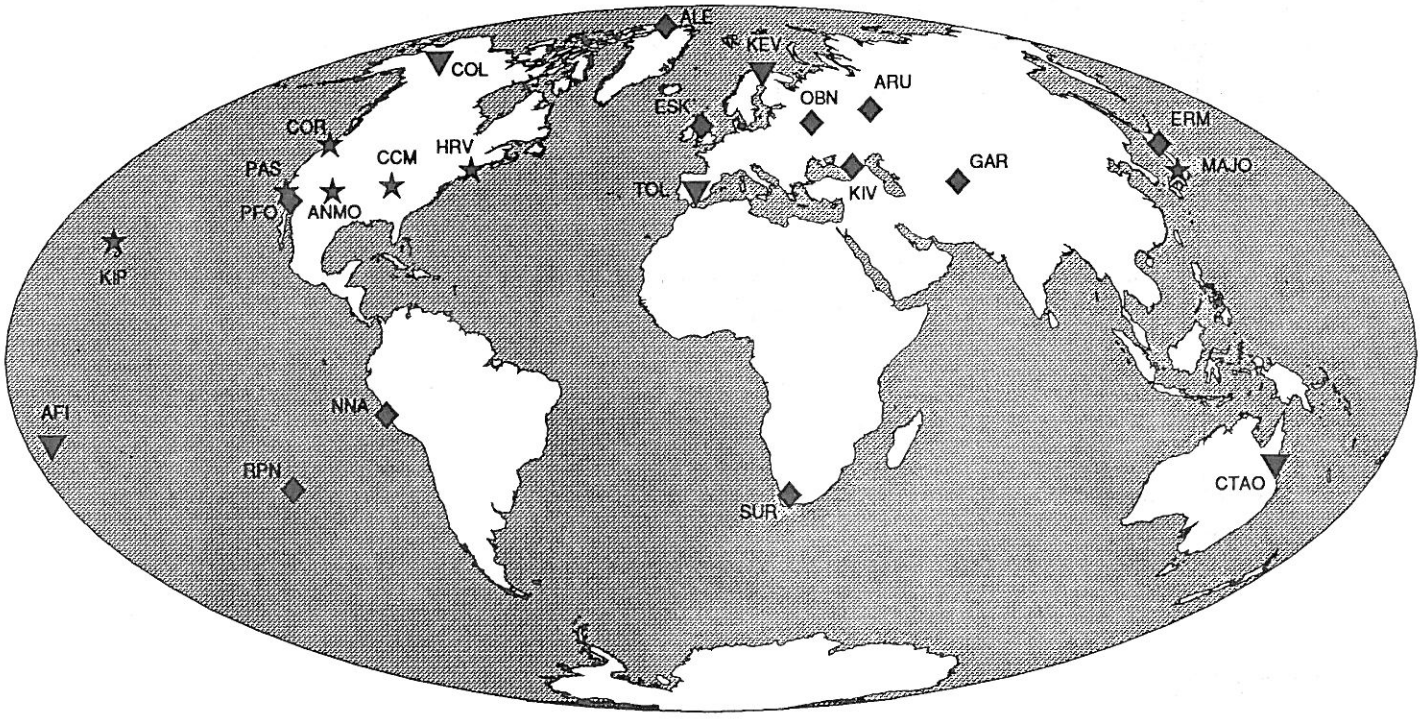
IRIS

Global Seismographic Network

August, 1990



★ Broadband Seismometer + 24-bit IRIS-1 or IRIS-2 • dial-up access	◆ Broadband Seismometer + 16-bit dual-gain IRIS-3	▼ Broadband Seismometer + DWWSSN or ASRO data logger

The 1990 Pinyon Flat Tight Grid Passive Source Experiment
An IRIS Eurasian Seismic Studies Program Project

Thomas J. Owens, Gary L. Pavlis, and Frank L. Vernon

Project Goals

The IRIS Eurasian Seismic Studies Program is planning two passive-source seismic experiments in the area of Pinyon Flat Observatory, California (Figure 1) in 1990 and 1991. These experiments have dual goals. First, to allow detailed characterization of high-frequency seismic wavefields from local and regional events and, second, to prepare equipment and personnel for future similar deployments in the Soviet Union. Scientific questions include:

Wave Propagation

- What is the nature of the complex, scattered wavefield that seems to characterize P and S codas of local and regional events?
- How do the complex set of heterogeneities in rocks and soil near the earth's surface shape seismograms?
- Can we use 3-component, areal arrays to image the subsurface beneath such an array?
- What is the role of anisotropy of crustal rocks in shaping observed seismograms?

Source Properties

- Can we reduce the ambiguity in our ability to discriminate different types of explosion sources from earthquakes of comparable energy release?
- What are the spectral properties of the small events detectable only by the array compared to larger events analyzed by the Anza network?

Spring 1990 Tight Grid Experiment

With these goals in mind, we deployed a tight grid of 3 component 2 Hz L-22 sensors at Pinyon Flat during April and May 1990. The array consisted on 28 PASSCAL recorders each recording 12 channels. This array consisted of a grid and two orthogonal arms (Figure 2). The primary purpose of this array was to characterize the small scale variabilities in recorded waveforms and to identify the source of these variabilities using

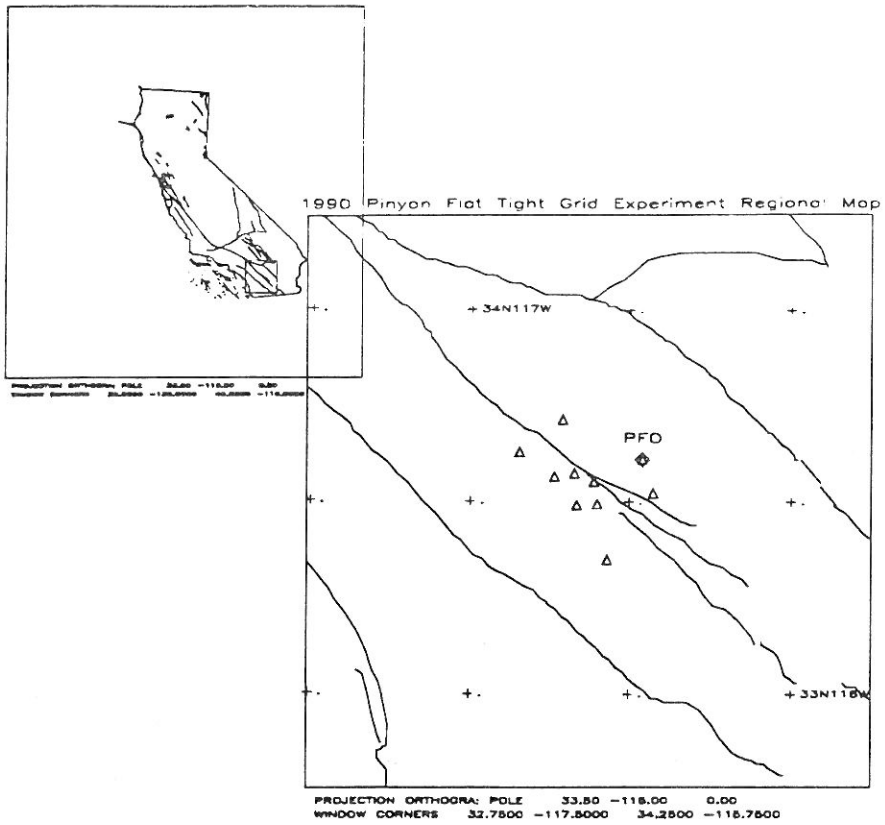


FIGURE 1: Regional basemap for 1990 Pinyon Grid Experiment, Grid was located at PFO and operated from Julian Day 108 until 148

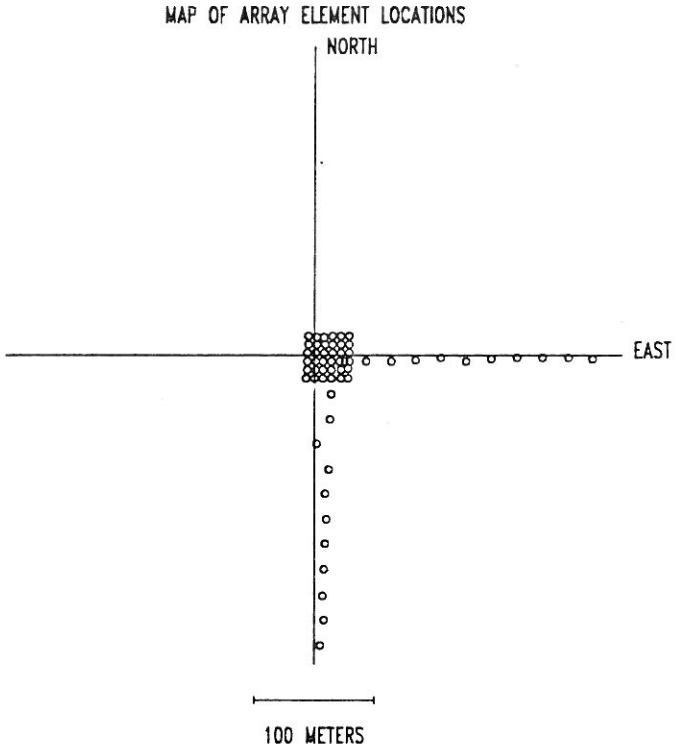


FIGURE 2: Map of Array Elements, nominal spacing was 7 meters for grid, 21 meters on arms

array analysis. The sensor spacings of 7 meters in the grid and 21 meters on the arms were chosen to aid the identification of body to surface wave conversions at high wavenumbers. Sensors were buried between 1.5 and 4 meters depth to isolate them from the soft sandy surface layer at Pinyon Flat.

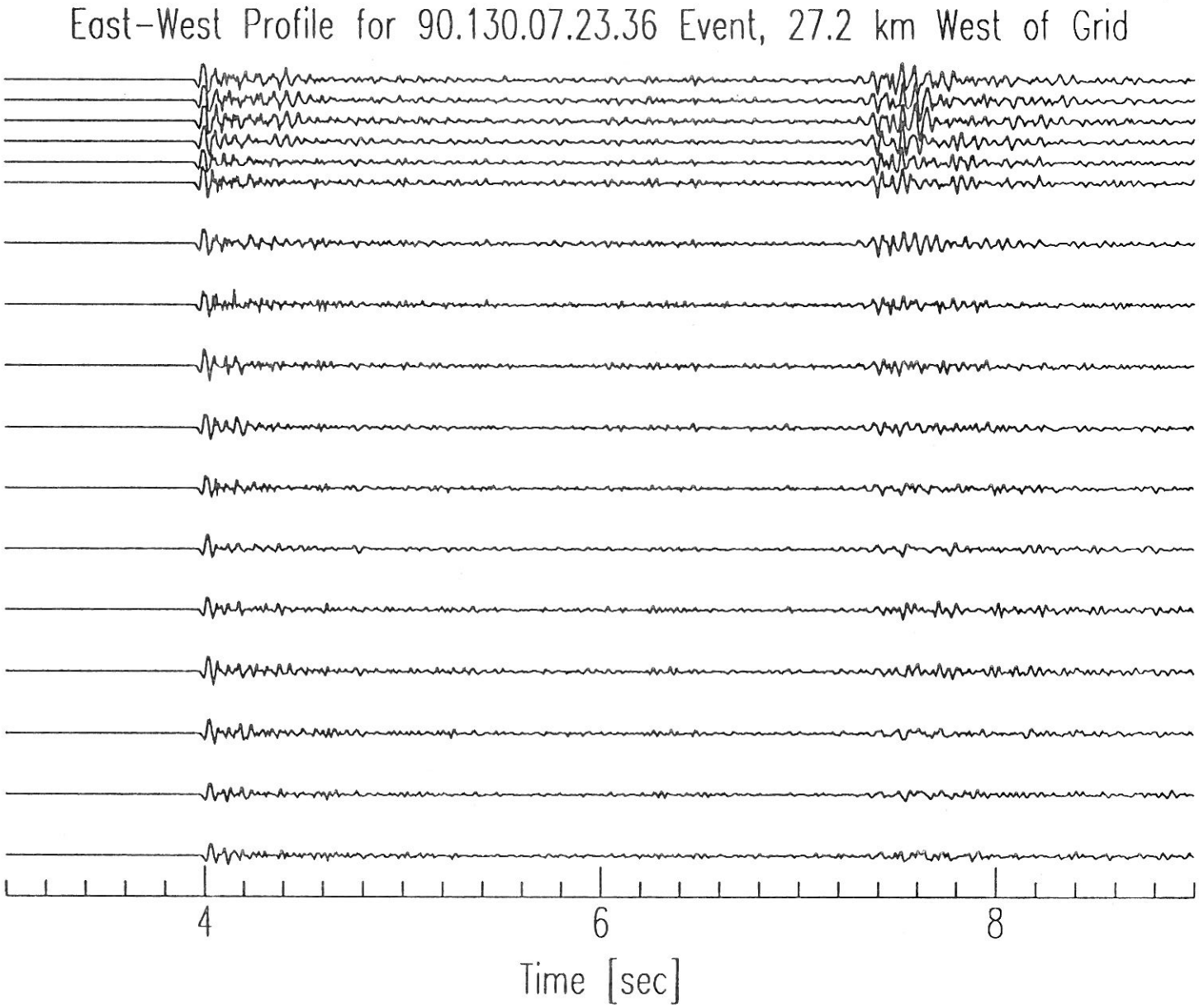
The array operated in a master/slave mode with all array elements configured as slaves to 2 borehole sensors located beneath the array. These borehole sensors were located at depths of 150 and 275 meters and have been operating at PFO for several years by the USGS. Using the borehole sensors as masters in trigger decisions effectively eliminated false triggers. This array also was fed a common time signal from a single OMEGA time clock to ensure that precise timing measurements could be made over short distances. This was the first PASSCAL experiment to use these features of the PASSCAL recorders. We did not have any problem with either feature.

The array recorded for about 40 days and triggered on 370 seismic events during 33 days of this period. An additional 7 days of data have not been extracted from tape due to a rare bug in the Reftek instrument (which has subsequently been fixed). Software has been written to extract this data and we anticpate that the entire data set will be more than 450 events. At this point we have correlated 96 of these events for the first 25 days with events located by the ANZA network. Correlation over the entire recording period and with the CALTECH network continue and we expect to have many more located events to analyze. Overall, when the master borehole sensors triggered, and average of 88.3% of the slaves also triggered. A large percentage of this data loss was due to problems with our central power distribution system early in the project; very little data was lost due to instrument failure. We recorded 15 seconds pretrigger and 75 seconds post-trigger signals at 250 samples per second. Thus, a single trigger of the entire array generated about 8 Mb of data in SEGY format.

A sample event (Figure 3) illustrates the variability of the signals along one arm of the array. This event was located 27.2 km nearly due west of the array, so the east-west arm has been plotted in Figure 3. The seismograms have not yet been corrected for variations in gain, but are plotted as raw uncorrected amplitudes. It is obvious that the direct P-wave does not vary significantly across the array, but the S-wave and the P-wave coda do vary even over these small distances. Analysis of this data will continue with a PASSCAL Data Report expected in early 1991.

The 1991 Pinyon Flat Array Experiment

The second phase of the ESSP Pinyon Flat array program will begin in January of 1991. In this phase, US and Soviet scientists will install and operate an array with a geometry similar to NORESS at PFO. The major differences between the planned array and NORESS will be that all elements of the Phase II array will be 3-component broadband instruments. This phase of the project will extend the observations of local events at the


East-West Profile for 90.130.07.23.36 Event, 27.2 km West of Grid
4
6
8
Time [sec]

tight grid to regional and teleseismic events over a broad frequency band. The experiment will operate for about 3 months.

Experiment Team Members

Members of the Experiment Field Crew for the 1990 Pinyon Flat Tight Grid Array include:

Paul Anderson	Indiana University
Jeff Babcock	University of California, San Diego
James Battie	University of California, San Diego
Dan McNamara	University of South Carolina
Glen Offield	University of California, San Diego
Tom Owens	University of South Carolina
Gary Pavlis	Indiana University
Frank Vernon	University of California, San Diego

Richard Boaz of the PASSCAL Instrument Center provided significant software support for this project.

Brooks Range 1990 Seismic Study
"Quick Look" Data Report

G.S. Fuis (USGS) co-P.I.
A.R. Levander (Rice) co-P.I.
E.E. Criley (USGS) Field Party Chief

The Brooks Range Seismic Study was conducted from July 12-27, 1990. The goal of the experiment was to produce a high resolution image of the crust of the Brooks Range and flanking geologic provinces (Figure 1).

Seven hundred portable seismographs and 64 shots, fired at 42 separate shot points, were used during the study. The 700 instruments were deployed five times in abutting and overlapping arrays, for a total profile length of 315 km. Instrument spacing was nominally 100 m. Both small shots (100- 600 lbs) and large shots (1500-4000 lbs) were fired to produce a vertical-incidence to wide-angle seismic reflection/refraction data set with continuous offset coverage from 0 to 200 km

Scientifically, the project goal is to define the structure of the Mesozoic to Cenozoic Brooks Range fold and thrust belt. The Brooks Range project is also an essential part of the USGS Trans Alaska Crustal Transect Program (TACT), which spans the entire continental crust and flanking margins of Alaska. The study was designed to provide both a low fold seismic-reflection image of the Brooks Range and adjacent terranes, and a vertical-incidence to wide-angle reflection/refraction data set amenable to automated processing and inverse methods .

Funding for the Brooks Range experiment was provided by the USGS Deep Continental Studies (DCS) Program (2/3rds funding) and the NSF's Seismology and PASSCAL/IRIS Programs (1/3rd funding).

Participants in the study included: the USGS, Rice University, the Geological Survey of Canada, the Air Force Geophysics Laboratory, the University of Alaska-Fairbanks Geophysical Institute, Purdue University, and the University of Wyoming.

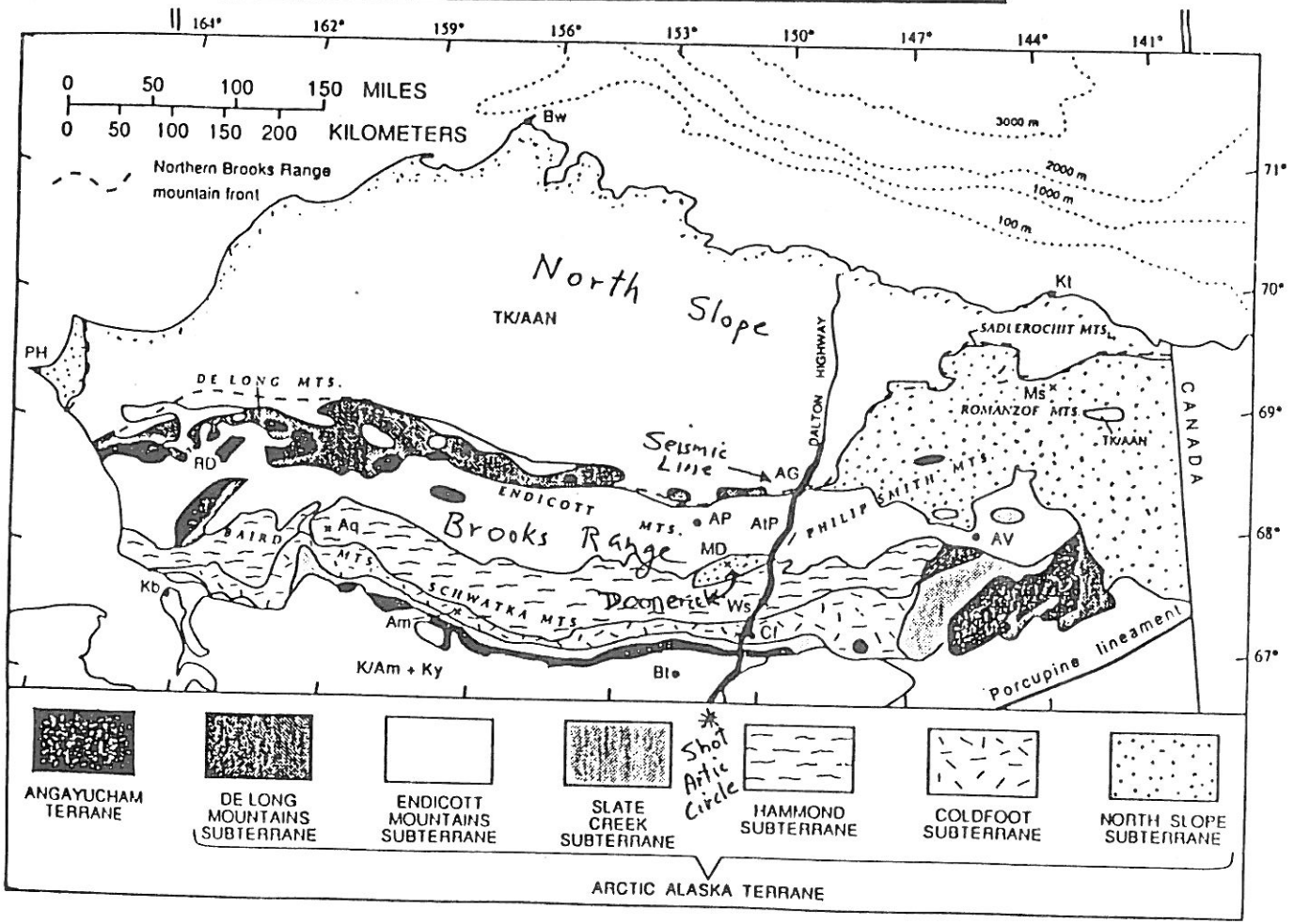
Examples of the data collected follow.

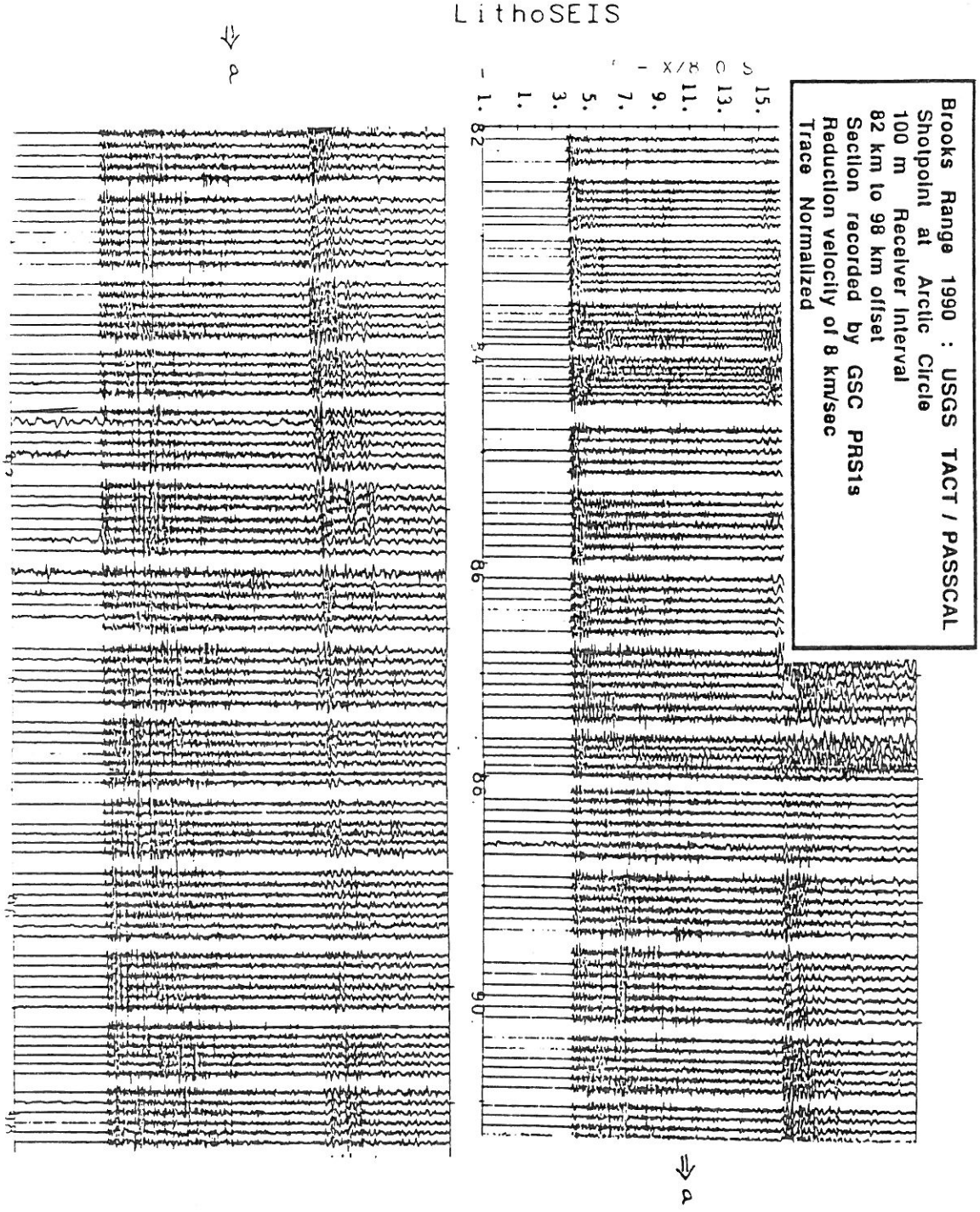
Coldfoot, Alaska 26 July 1990

Brooks Range 1990 Seismic Experiment

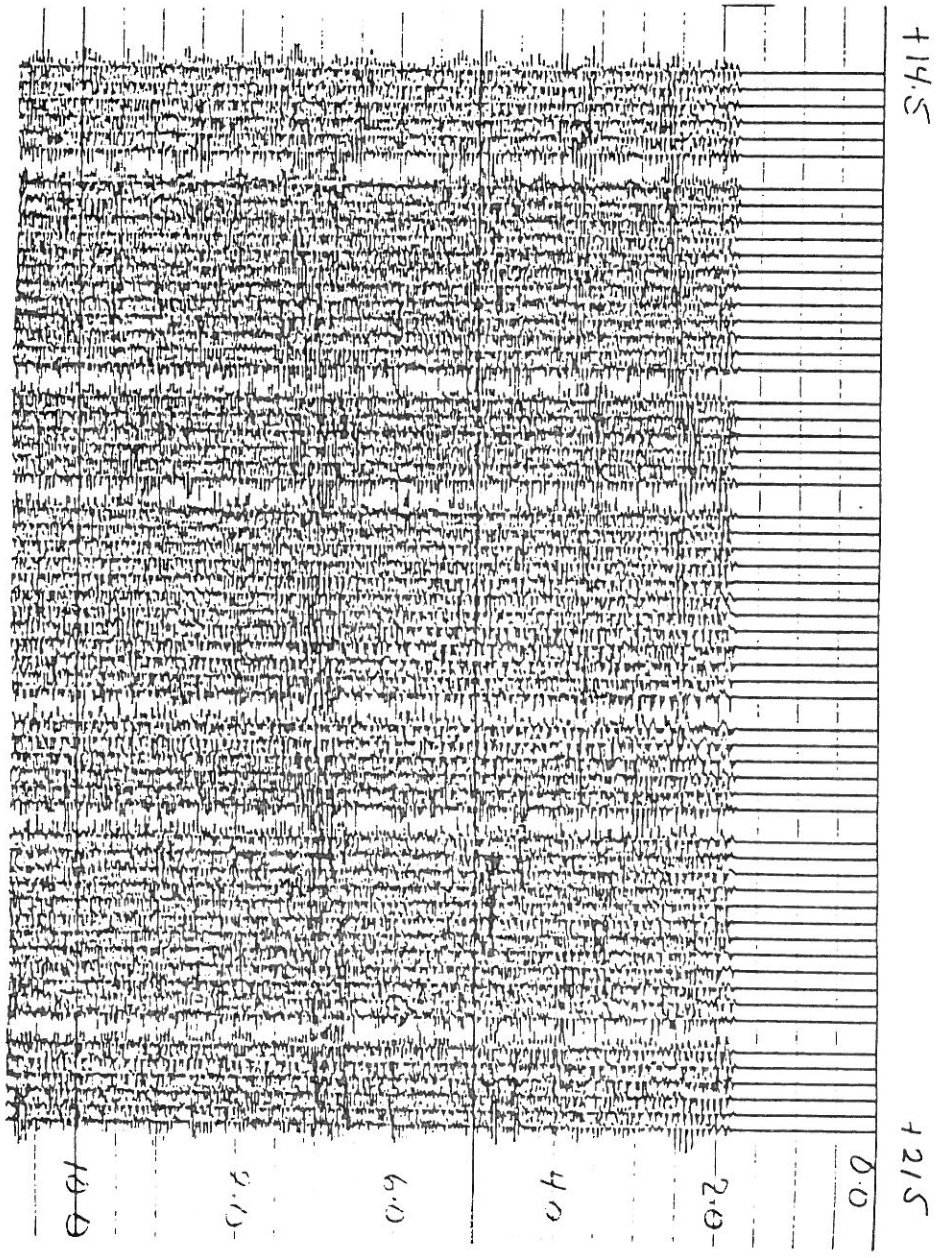
USGS - TACT & Rice University - PASSCAL

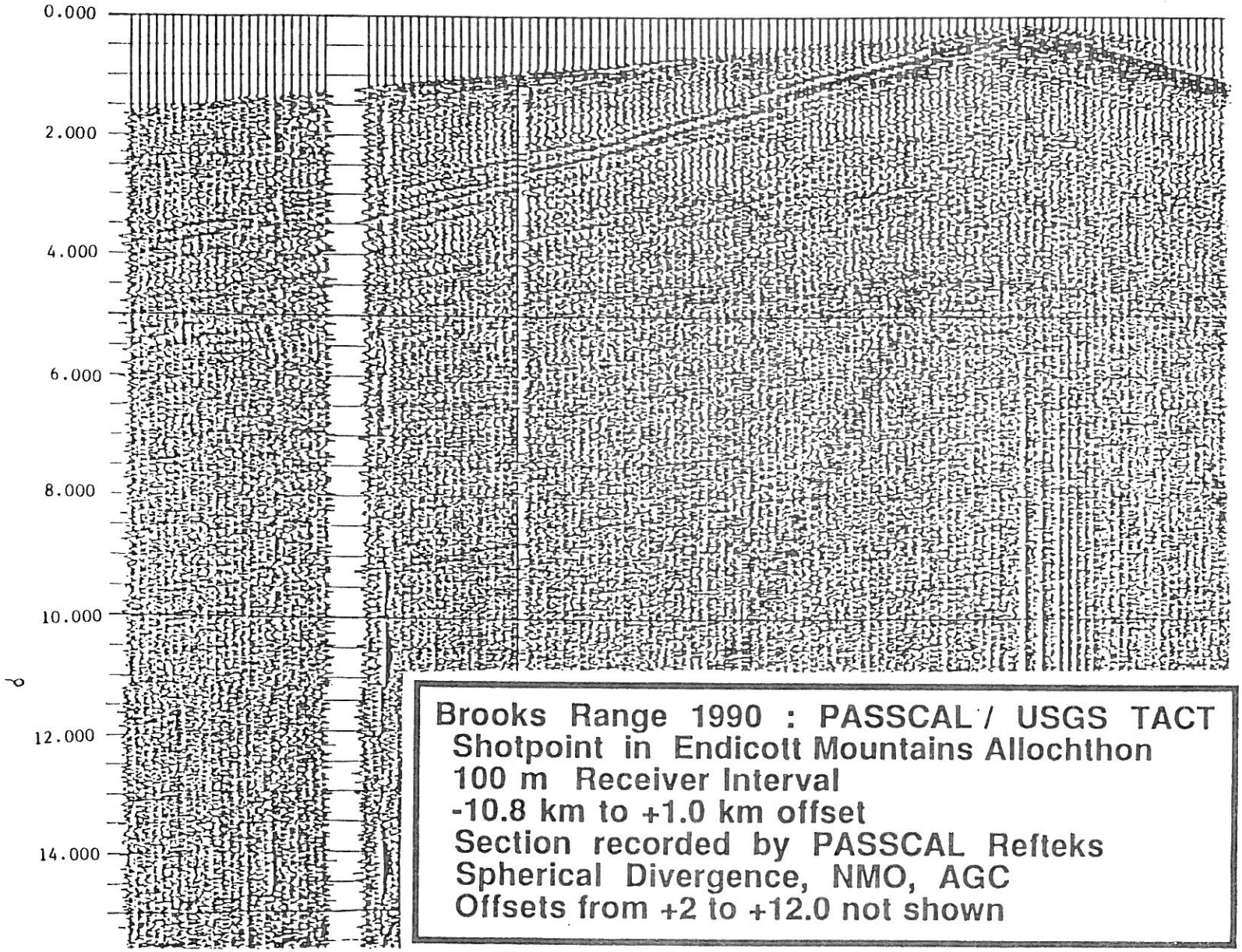
Geological Survey of Canada
Univ. of Alaska-Fairbanks Geophysical Institute
Air Force Geophysics Laboratory
University of Wyoming, Purdue University

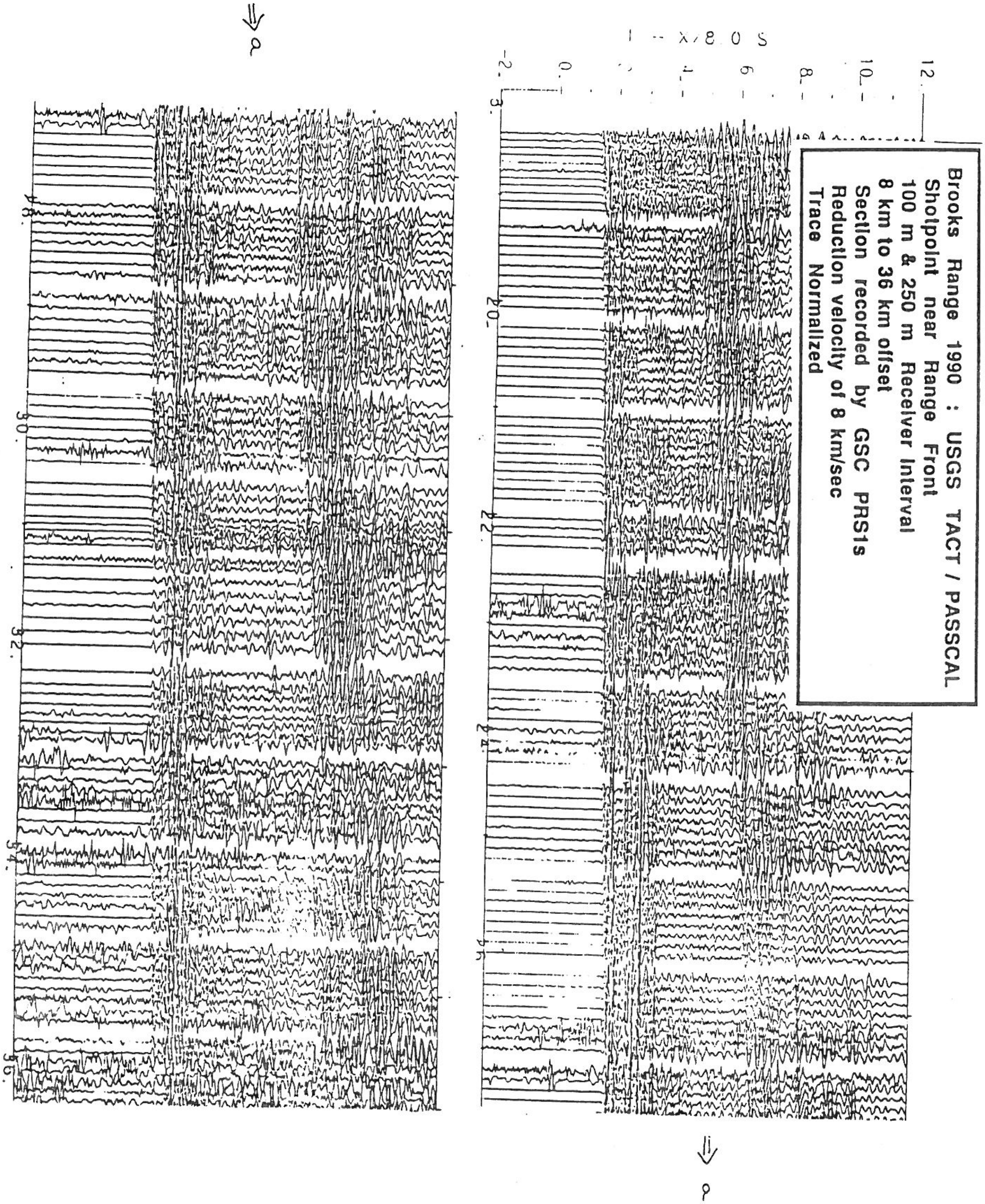



LithoSEIS
Brooks Range 1990 : USGS TACT / PASSCAL
Shotpoint at Arctic Circle
100 m Receiver Interval
82 km to 98 km offset
Section recorded by GSC PRS1s
Reduction velocity of 8 km/sec
Trace Normalized
- X/8 0 S
15.
13.
11.
9.
7.
5.
3.
1.
- 1.
82
84
86
88
90
P
P

Brooks Range 1990 : PASSCAL / USGS TACT
Shotpoint near Doonerak Window
100 m Receiver Interval
+14.5 km to +21.5 km offset
Section recorded by PASSCAL Refteks
Spherical Divergence, NMO, AGC
Offsets from -8 to +14.5 and +21.5 to +35 km not shown




0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
sec
Brooks Range 1990 : PASSCAL / USGS TACT
Shotpoint in Endicott Mountains Allochthon
100 m Receiver Interval
-10.8 km to +1.0 km offset
Section recorded by PASSCAL Refteks
Spherical Divergence, NMO, AGC
Offsets from +2 to +12.0 not shown


Brooks Range 1990 : USGS TACT / PASSCAL
Shotpoint near Range Front
100 m & 250 m Receiver Interval
8 km to 36 km offset
Section recorded by GSC PRS1s
Reduction velocity of 8 km/sec
Trace Normalized

PASSCAL Experiment on Hawaii - Project ALOHA

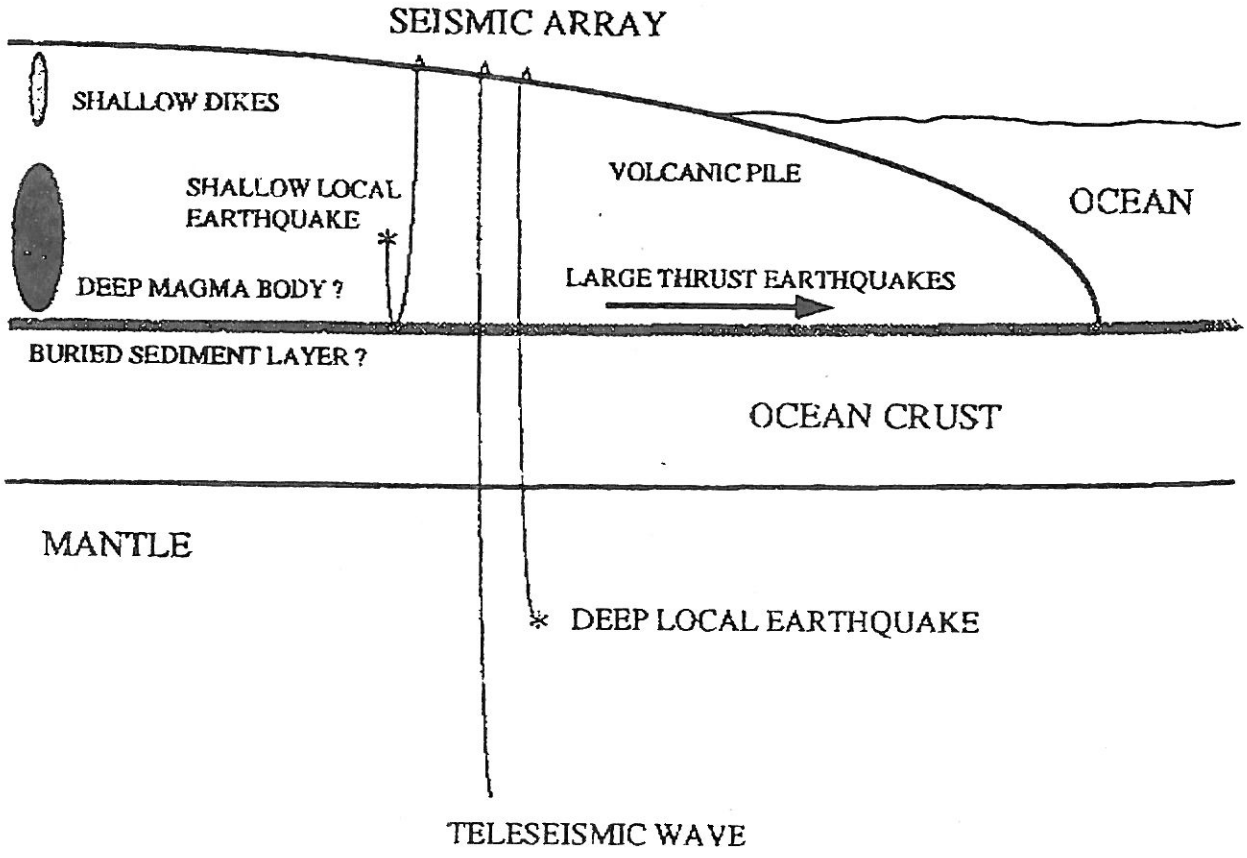
Submitted by Cliff Thurber

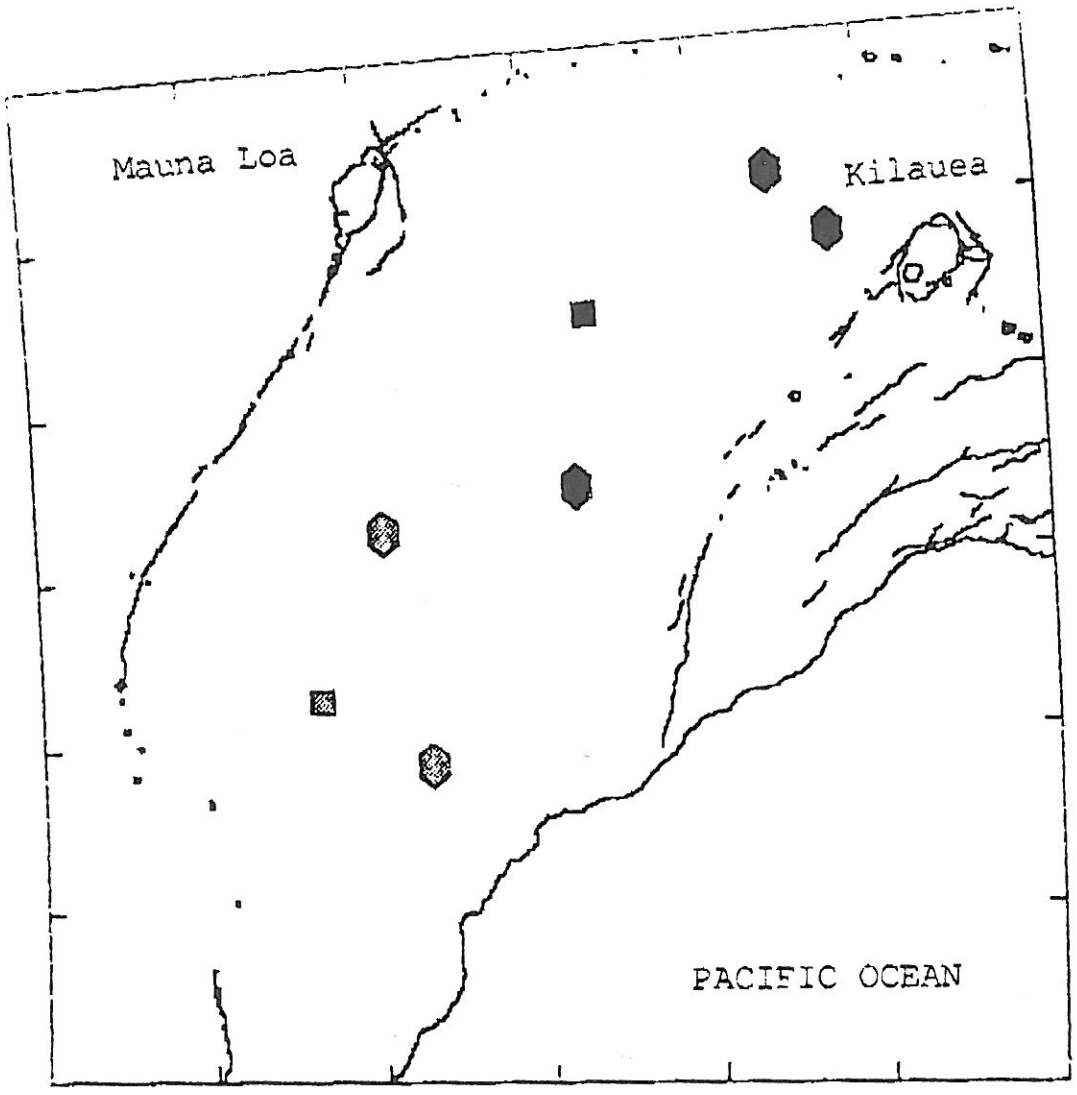
Project ALOHA (Arrays for Lithosphere Observations in HAwaii) began in early July, with the deployment of 16 RefTek and 6 UCSB recorders on the southeast flank of Mauna Loa volcano, Hawaii. Participating institutions are the University of Wisconsin-Madison (Cliff Thurber, Cliff Munson), UC Santa Barbara (Bill Prothero, Lydia Deems, Maryann Short), and SUNY-Stony Brook (Yingping Li), aided by logistical support from the Hawaiian Volcano Observatory. Larry Shengold of the PASSCAL Instrument Center provided superb assistance in set-up and installation of the arrays.

The instruments are deployed in 4 to 6 station arrays with apertures of one to a few kilometers. Sensors include 1 Hz S-13's and L-4's and two Guralp CMG-3's (all 3-component). The Guralps are recorded in continuous and triggered modes, while the others are all triggered only. Our scientific objective is to map the volcano-ocean crust and Moho interfaces using microearthquake reflected and teleseismic converted waves.

The arrays are recording 10 or more local earthquakes per day, mostly nearby events of magnitude 1.0 to 2.5. Two moderate earthquakes have also been recorded already, a magnitude 5.5 event on Kilauea's south flank and an unusual magnitude 4.8 event beneath Mauna Kea. A number of Pacific-rim teleseisms have also been recorded. The experiment will continue until mid-December, although with gradually reduced numbers of instruments.

STRATEGY FOR ARRAY DEPLOYMENT ON MAUNA LOA'S FLANK





PASSCAL and UCSB array deployments on the southeast flank of Mauna Loa.
Hexagons are 6-station arrays, squares are 4-station arrays.
Solid symbols - current, shaded symbols - planned.

Status of the PASSCAL Program

JC Fowler

Instrumentation

PASSCAL now has a total of 90 basic recording systems. Where each system is equipped with an Omega clock, 2.5 MBytes of memory and a 160 MByte disk. The enclosed chart gives a break down of the systems along with the ancillary types of equipment that are now available through the PASSCAL program.

We have received at least one of each of the four candidate broadband sensors, a Guralp CMG-3T, a Guralp CMG-3ESP, Kinemetrics WR-1, and a Streckeisen STS-2 for testing. Preliminary testing has begun at Lamont and will be continued throughout the summer. We will be receiving additional units during the next few months, these will be taken to the field to be used during the Hawaii, New Mexico and Carolina field experiments. The goal of the testing and evaluation program is not only to determine which broadband sensor to purchase in the future, but also to develop field installation techniques which can produce good high quality data.

Finally as part of the Loma Prieta program we have just finished calibrating all of the L-22 sensors. These data will be made available to the membership with the release of the Loma Prieta data set. These calibrations will also be used as part of the historical records to allow to look at changes in the seismometers with time.

Software

The development of a comprehensive software package for the field computers is now being started at the Instrument Center. The initial development will center around a quick-look capability. This will enable the field operator to quickly look through the data to perform a preliminary quality control operation.

The next major development will be the addition of a data base capability to allow the field computer to perform all of the functions of the typical Data Collection Center. This includes the generation of tapes not only for the investigators, but also for the Data Management Center. The development will start toward the end of the summer and take about a year. All of the programs developed in this project will be designed so that they can be effectively run by operators with a minimum of training on the system. The processing framework will utilize standard interfaces so that IRIS members can port it to their systems if they desire.

Field Experiments

PASSCAL Instruments have been involved in several major experiments and many smaller ones since the beginning of the year. The experiments utilizing more than 10 PASSCAL units include the Eurasian Seismic Studies Program experiment at Pinon Flats, the Rice University/USGS/GSC experiment in the Brooks Range, the Lamont Refraction Experiment in Iceland and the U of Wisconsin/UCSB experiment in Hawaii. Most of these are discussed elsewhere in this newsletter.

A schedule for fully supported field experiments is included with this report. This schedule indicates that we will have over 60 instruments in the field for most of the year. This is essentially 100% utilization of the field capability. The high demand for instruments is

very encouraging we could effectively use another 40 to 50 instruments now, and we should continue to build our instrument capability as rapidly as possible.

Simple Instrument

We received proposals from six different companies for simple instruments. A proposal evaluation committee met during the IRIS Workshop to consider the proposals and make recommendations to the PASSCAL Standing Committee. The recommendation was made to accept the proposal from Refraction Technology. The proposed Simple instrument is a modified version of the PASSCAL Instrument. Except for the Analog to Digital converter, it will utilize the same parts as the standard instrument. It will have the ability to upload data via the SCSI port, and it will be able to have an OMEGA clock. The committee felt that this hardware compatibility along with the advantages of using the same set-up controllers, download devices and field computer software made this the most cost effective option for the Simple Instrument.

The PASSCAL Standing Committee accepted the recommendation of the evaluation committee and voted to proceed with the Simple Instrument procurement. Refraction Technology will deliver five prototype instruments for evaluation before the end of the year.

PASSCAL INSTRUMENTATION Summer 1990		
Recording Equipment		
	Data Loggers	90
	Disk Units	90
	Exabyte Recorders	14
Sensors		
	L-22 2 Hz Sensor Sets	100
	L-4 1 Hz Sensor Sets	5
	S-13 1 Hz Sensor Sets	10
	Broadband Sensor Sets	3
Field Computers		
	SUN 3/180	2
	SUN 3/50	2
	SUN SparcStation	2
Misc		
	3-Channel Cables	100
	Trimble Pathfinder GPS Receivers	2
	Kinemetrics Portable GOES Receiver	1
	Nanometrics Portable Clocks	4

Instrument use 1990

PASSCAL Instruments												
1990												
	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec
Wisc/UCLA Kenya	6	6	6	6								
Utah Yellowstone	4	4	4	4	4							
NMSU/NMIT Rio Grande Rift	4	4	4	4	4	4	4	4	4	4	4	4
U of Wash Beaufort Sea			4	4								
ESSP Pinon Flats				20	20							
USC/Berkeley Edge					5							
Rice Brooks Range				1	1	1	40					
Lamont Iceland							15	15				
Wisc/UCSB Hawaii							18	18	12	12	12	12
Wyoming Minnesota								40	40			
WHOI/Wyo Edge									10			
Texas A&M/UTEP Edge									6	6		
Oregon State ONR										35	35	35
Stanford Antarctic											30	30
Total	14	14	18	39	34	5	77	77	72	57	81	81
Available	45	45	45	60	60	90	90	90	90	90	90	90

CURRENT STATUS OF IRIS DATA MANAGEMENT CENTER

August 14, 1990

Tim Ahern
Becky Wofford
IRIS
Data Management Systems

The IRIS Data Management Center has been in operation for nearly one year. At the present time users can make requests for data from the archive interactively through the Electronic Bulletin Board, and many users are doing just that.

The system being used is the INTERIM system and is designed around a relatively simple flat file system. It is not a true data base management system. Access is limited to requests for data through station-channel-time windows. A description of how to use this system can be found in the RETRIEVE manual reproduced in this newsletter.

The PROTOTYPE data base management system has now been released in an alpha test mode. We anticipate a wider release of the system this fall. This system is built upon a commercial data base management system which is a combination of a relational and network data base management system. At the present time access to this prototype system is through a standard data base access language called Structured Query Language (SQL). A more user friendly interface using menu driven commands is being developed and IRIS DMS personnel have the first version of this interface. The prototype system presently allows a researcher to select data from the data base using any fields stored in the system. The data in this data base comes from SEED volumes sent to the DMC in Austin from either the Albuquerque Seismic Lab of the USGS or the IRIS/IDA Data Collection Center at Scripps Institute. Additionally we have received SEED volumes from some members of the Federation of Digital Broadband Seismographic Networks (FDSN) and anticipate archiving data from non-US operated networks in the near future. At the present time, the prototype system contains all information that is contained within the SEED volumes the DMC receives. The PROTOTYPE system is being expanded to include data coming from the NEIC Earthquake Data Report and the ISC catalogue. This information includes both the normal event information as well as Moment Tensor solutions and phase information. The event portion of the PROTOTYPE data base management system will allow a seismologist to easily generate event oriented requests for data.

CURRENT STATISTICS

The following tables present a summary of the status of the DMC archive as well as statistics related to data that have been distributed this year. We hope this information is useful to you.

Customized (RETRIEVE) Requests
January, 1990 - August 15, 1990

Month	Number of Requests	Average # of Seismograms	Average Size (MB)
January	12	91	*
February	16	341	*
March	3	517	*
April	10	327	12.7
May	6	189	21.9
June	18	538	37.2
July	11	298	19.1
August 15	9	128	21.2
1990 Total	85	313	*
May-Aug 15	44	347	27.3

* Figures not available

ASSEMBLED DATA SETS

Dataset	Description	Distribution Total	2/1/90-8/15/90
JVE1	US JVE	16	11
JVE2	Soviet JVE	16	11
ARM	Armenian	97	6
MCQ	Macquarie	96	6
LPP	Loma Prieta PASSCAL	14	8
LPR	Loma Prieta GSN	25	20
BRE	Basin & Range 88-89	1	1
NEV	Basin & Range 86	1	1

Electronic Bulletin Board Access

Month	# of Accesses
1990 total	1076
January	49
February	59
March	68
April	76
May	152
June	168
July	245
Aug (1-15)	99

MISC. STATISTICS

Archive size	36.616 Gigabytes
Number of Seismograms	138719
Size of Holdings File	24.137 Megabytes
# of Stations	49
# of Station-Channels	813
# of Station-Days	17307
# of days stored	757
Archive Completion	(17307)/(757*49)= 47%
Megabytes/day	48.37

GOPHER Accesses

Month	Number
1990 total	1537
January	70
February	69
March	212
April	209
May	305
June	268
July	220
August 15	42

Programs Distributed by DMC

Program	Total	May-Aug 15
RDSEED	130	17
SEEDSNIFF	4	0
SAC	21	11
SierraSEIS	24	4
Format Conv	4	2
ZPLOT	16	16

Summary of Station Days
Tue Aug 14 11:16:09 CDT 1990

IRIS/USGS	# of Days	CDSN	# of Days	IRIS/IDA	# of Days
AFI	395	BJI	540	ARU	51
ANMO	533	ENH	15	ESK	463
ANTO	443	HIA	461	GAR	12
BCAO	401	KMI	529	KIV	17
BDF	275	LZH	537	NNA	408
BGIO	4	MDJ	184	OBN	117
CCM	156	SSE	15	PFO	314
CHTO	373	WMQ	522	RPN	275
CMB	531				
COL	515				
COR	183				
CTAO	500				
GAC	292				
GDH	453				
GRFO	522				
GUMO	489				
HON	484				
HRV	524				
KEV	504				
KIP	236				
KONO	340				
LEM	14				
LON	540				
MAJO	401				
NWAO	481				
PAS	511				
SCP	375				
SLR	426				
SNZO	403				
TATO	287				
TAU	468				
TOL	497				
ZOBO	287				

In summary, the IRIS DMC has delivered more than 5 gigabytes of data to our users since the beginning of 1990 in the form of customized requests for data. Additionally the DMC has delivered 267 Data Products since November 1989 until present. The DMC has also distributed 199 Program tapes since November of 1989. The total number of customized data sets, data products and programs distributed by the DMC since November, 1989 is 551. This is an average of more than two shipments per day since we became operational, of which 1.3 shipments per day are of data.

CURRENT HOLDINGS

The IRIS DMC Electronic Bulletin Board allows you to determine the present status of data availability through the IRIS DMC. Simply select the "c" option from the main menu of the bulletin board to "Check the Current Status of the Archive".

Individual station information will not be presented here. However to give you some idea of data availability the following description may be useful. The IRIS DMC archive presently has some data for 1988 as early as March 29, has data from most stations for every day of 1989, and has data from most stations through June 7, 1990.

NEAR TERM DATA FLOW

Oversight of data flow was just recently transferred to the IRIS DMS program from the GSN program. Presently the most significant problem we have in the area of data flow is related to the data from the IRIS stations in the Soviet Union. At the present time data from the Soviet Stations normally arrive at the IRIS/USGS DCC in Albuquerque too late to make the 60 day cutoff for the assembly of the Network Volume. Data missing the cutoff are simply sent on a late volume. This has resulted in a significant amount of Soviet data not being archived at the IRIS DMC.

At the present time the following schedule exists for receipt of the late data at the DMC.

1. Late Soviet data from the beginning of 1989 will begin being shipped to the IRIS DMC by the last week of August, 1990.

2. The sixty day cutoff for assembling the network volume, will be removed from the IRIS DMC data flow path by September 15, 1990. All data quality controlled at ASL during a given week will be routinely shipped to the DMC within one week. Since the Soviet data are QC'd at San Diego, they will be delayed no more than one week after QC by San Diego.

3. Data from the GDSN dataset for 1988 should begin shipment by October 1, 1990 and completed by the end of November.

4. Data prior to 1988 should start being received by the DMC before the end of 1990. This includes data from 1980-1987.

This schedule is tentative and may change due to unforeseen difficulties at the IRIS/IDA DCC, the IRIS/USGS DCC or the IRIS DMC.

Prototype Data Base Management System Provides Improved Station Information

by Tim Ahern
Program Manager
IRIS Data Management Systems
August 8, 1990

The Prototype Database Management System being developed by Sue Schoch of the IRIS staff is now capable of producing an excellent summary of stations that have archived data at the IRIS DMC.

Some examples of the type of station and channel information that the system is capable of producing are reproduced below. These displays were generated by the prototype DBMS system and are routinely transferred to the DMC Electronic Bulletin Board as needed. To access this type of information select the "s" option within the bulletin board.

These examples are for stations from different networks and include

Network	Station(s)
DWWSSN	AFI
CDSN	BJI
IRIS/USGS GSN	CCM
IRIS/IDA GSN	NNA and OBN
IRIS1 Prototype	PAS

If you wish to see information for a station that is not presented below login to the DMC electronic bulletin board and select the "s" option. Do this by

rlogin irisdmc.ig.utexas.edu -l bulletin (password is board)

or

telnet 128.83.149.25

and login as user bulletin password board. Consult the November, 1989 IRIS newsletter for more information on using the bulletin board.

The entries in the following tables represent the station name, latitude in degrees where + is north and - is south, longitude in degrees where + is degrees east and - is degrees west, elevation is in meters. The Channel names use the SEED naming convention where the first is the band code (such as L for long period) the second letter is the source code (such as H for high), and the third letter is the orientation code (such as N for north/south). See the correct section of the RETRIEVE manual in this newsletter for a more complete description of the SEED channel naming convention, or consult Appendix A of the SEED Reference Manual available through the IRIS DMC.

These tables should serve to provide a good example of the new types of data streams that are available on IRIS GSN stations. The example for CCM indicates that there are 36 channels of information for that station. Other IRIS stations such as ANMO have many of these same channels and also have weather information available.

AFI Lat: -13.909300 Lon: -171.777300 Elev: +0706.0

Site: Afiamalu, Western Samoa
Network: (DWWSSN) World-Wide Seismic Network Upgrade

Chan	Sam Rate	Cont/Trig	Instrument
LHE	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHN	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHZ	1.00	Continuous	Streckeisen STS-1V/VBB Seismometer
BHE	20.00	Triggered	Streckeisen STS-1H/VBB Seismometer
BHN	20.00	Triggered	Streckeisen STS-1H/VBB Seismometer
BHZ	20.00	Triggered	Streckeisen STS-1V/VBB Seismometer
SHZ	20.00	Triggered	Streckeisen STS-1V/VBB Seismometer

BJI Lat: +40.040300 Lon: +116.175000 Elev: +0043.0

Site: Baijatuan, Beijing, China
Network: (CDSN) China Digital Seismograph Network

Chan	Sam Rate	Cont/Trig	Instrument
VHE	0.10	Continuous	Streckeisen STS-1H Seismometer
VHN	0.10	Continuous	Streckeisen STS-1H Seismometer
VHZ	0.10	Continuous	Streckeisen STS-1V Seismometer
LHE	1.00	Continuous	Streckeisen STS-1H Seismometer
LHN	1.00	Continuous	Streckeisen STS-1H Seismometer
LHZ	1.00	Continuous	Streckeisen STS-1V Seismometer
BHE	20.00	Triggered	Streckeisen STS-1H Seismometer
BHN	20.00	Triggered	Streckeisen STS-1H Seismometer
BHZ	20.00	Triggered	Streckeisen STS-1V Seismometer
SHE	40.00	Triggered	China Institute of Geophysics DJ-1 Boreho
SHN	40.00	Triggered	China Institute of Geophysics DJ-1 Boreho
SHZ	40.00	Triggered	China Institute of Geophysics DJ-1 Boreho

OBN Lat: +55.100000 Lon: +036.600000 Elev: +0160.0

Site: Obninsk, Kaluzhskaya Oblast, USSR
Network: (GSN) IRIS/IDA - IGPP - SIO - UCSD

Chan	Sam Rate	Cont/Trig	Instrument
LOG	0.00	H	Console/Error Log
BHE	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHN	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHZ	20.00	Continuous	Streckeisen STS-1V/VBB Seismometer
BLE	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BLN	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BLZ	20.00	Continuous	Streckeisen STS-1V/VBB Seismometer

CCM Lat: +38.055700 Lon: -091.244600 Elev: +0222.5

Site: Cathedral Cave, Missouri, USA
Network: (GSN) Global Seismograph Network (IRIS/USGS)

Chan	Sam Rate	Cont/Trig	Instrument
LME	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
LMN	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
LMZ	0.01	Continuous	Streckeisen STS-1V/VBB Seismometer
UHE	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UHN	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UHZ	0.01	Continuous	Streckeisen STS-1V/VBB Seismometer
UME	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UMN	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UMZ	0.01	Continuous	Streckeisen STS-1V/VBB Seismometer
VHE	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHN	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHZ	0.10	Continuous	Streckeisen STS-1V/VBB Seismometer
LHE	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHN	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHZ	1.0	Continuous	Streckeisen STS-1V/VBB Seismometer
BHE	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHN	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHZ	20.00	Continuous	Streckeisen STS-1V/VBB Seismometer
EHE	1e+02	Triggered	Streckeisen STS-1H/VBB Seismometer
EHN	1e+02	Triggered	Streckeisen STS-1H/VBB Seismometer
EHZ	1e+02	Triggered	Streckeisen STS-1V/VBB Seismometer
VME	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
VMN	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
VMZ	0.01	Continuous	Streckeisen STS-1V/VBB Seismometer
VHE	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHN	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHZ	0.10	Continuous	Streckeisen STS-1V/VBB Seismometer
LHE	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHN	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHZ	1.00	Continuous	Streckeisen STS-1V/VBB Seismometer
BHE	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHN	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHZ	20.00	Continuous	Streckeisen STS-1V/VBB Seismometer
EHE	1e+02	Triggered	Geotech S-13 Seismometer
EHN	1e+02	Triggered	Geotech S-13 Seismometer
EHZ	1e+02	Triggered	Geotech S-13 Seismometer

NNA Lat: -11.980000 Lon: -076.842200 Elev: +0575.0

Site: Nana, Peru
Network: (GSN) IRIS/IDA - IGPP - SIO - UCSD

Chan	Sam Rate	Cont/Trig	Instrument
LOG	0.00	H	Console/Error Log
UGZ	0.02	Continuous	La Coste-Romberg Gravimeter
UME	0.02	Continuous	Streckeisen STS-1H/VBB Seismometer
UMN	0.02	Continuous	Streckeisen STS-1H/VBB Seismometer
UMZ	0.02	Continuous	Streckeisen STS-1V/VBB Seismometer
VGZ	0.10	Continuous	La Coste-Romberg Gravimeter
VHE	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHN	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHZ	0.10	Continuous	Streckeisen STS-1V/VBB Seismometer
MHE	5.00	Continuous	Streckeisen STS-1H/VBB Seismometer
MHN	5.00	Continuous	Streckeisen STS-1H/VBB Seismometer
MHZ	5.00	Continuous	Streckeisen STS-1V/VBB Seismometer
MLE	5.00	Continuous	Streckeisen STS-1H/VBB Seismometer
MLN	5.00	Continuous	Streckeisen STS-1H/VBB Seismometer
MLZ	5.00	Continuous	Streckeisen STS-1V/VBB Seismometer
BHE	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHN	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHZ	20.00	Continuous	Streckeisen STS-1V/VBB Seismometer
BLE	20.00	Triggered	Streckeisen STS-1H/VBB Seismometer
BLN	20.00	Triggered	Streckeisen STS-1H/VBB Seismometer
BLZ	20.00	Triggered	Streckeisen STS-1V/VBB Seismometer

PAS Lat: +34.48300 Lon: -118.171700 Elev: +0295.0

Site: Pasadena, California, USA
Network: IRIS-1 Prototype

Chan	Sam Rate	Cont/Trig	Instrument
UHE	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UHN	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UHZ	0.01	Continuous	Streckeisen STS-1V/VBB Seismometer
UME	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UMN	0.01	Continuous	Streckeisen STS-1H/VBB Seismometer
UMZ	0.01	Continuous	Streckeisen STS-1V/VBB Seismometer
VHE	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHN	0.10	Continuous	Streckeisen STS-1H/VBB Seismometer
VHZ	0.10	Continuous	Streckeisen STS-1V/VBB Seismometer
LHE	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHN	1.00	Continuous	Streckeisen STS-1H/VBB Seismometer
LHZ	1.00	Continuous	Streckeisen STS-1V/VBB Seismometer
BHE	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHN	20.00	Continuous	Streckeisen STS-1H/VBB Seismometer
BHZ	20.00	Continuous	Streckeisen STS-1V/VBB Seismometer
ELE	1e+02	Triggered	Kinemetrics FBA-23 Low-Gain Sensor
ELN	1e+02	Triggered	Kinemetrics FBA-23 Low-Gain Sensor
ELZ	1e+02	Triggered	Kinemetrics FBA-23 Low-Gain Sensor

User Comments Added to Electronic Bulletin Board

by Tim Ahern
Program Manager
IRIS Data Management Systems
August 8, 1990

The Electronic Bulletin Board has been functioning for over a year at the IRIS Data Management Center in Austin, Texas. On the average the bulletin board is being accessed about 200 times per month both by IRIS members and seismologists around the world.

As a result of the IRIS Workshop held in March, 1990, it became clear that a mechanism was needed to provide data users a way in which data problems could be reported. It was decided to use the IRIS DMC Electronic Bulletin Board as this mechanism.

As such the Electronic Bulletin Board (EBB) was enhanced by adding the "USER COMMENT" feature in the main menu. The main menu presently includes the following options.

```
Welcome to the IRIS DATA MANAGEMENT CENTER Electronic Bulletin Board

      Enter 'a'    for ASSEMBLED data sets
            'b'    for special BULLETINS with important new information
            'c'    for CURRENT data holdings
            'g'    for GENERAL information
            'h'    for HELP information
            'i'    for IRIS telephone numbers and addresses
            'm'    to  consult on-line MANUALS
            'n'    for NOTE writing to DMC staff
            'p'    for PROGRAMS available
          'ret'    for RETRIEVING data from the archive - beta test
            's'    for a list of Stations and channels available
            'u'    for USER comments (data problems, etc)
        'vt100'    set TERMINAL for VT100 users
            'q'    to  QUIT
```

It is the "u" option that allows a person to view any reported problems with data quality.

Selecting the option presents the following display:

```
        Information on the following subjects is available

Enter 'd'    --- Data problems that have been reported
      's'    --- SierraSEIS user comments
      'h'    --- for HELP
      'q'    to QUIT

(Enter your selection)
```

Selecting the "d" option will place you into a UNIX mail utility by which the various reported problems can be viewed as Summary Comments.

```
Mail version SMI 4.0 Mon Apr 24 17:29:13 PDT 1989  Type ? for help.
"+ dp": 12 messages 11 new [Read only]
 1 ASL!JPH      Tue Mar 13 14:33    34/1441   COR OBN PAS
 2 tim          Mon Mar 19 16:30    26/1087   ARU KIV GAR OB N
 3 ASL!JPH      Thu Apr 26 12:17    24/997    Data Problems:  PAS
 4 tim          Mon Apr 30 17:09    44/1810   Data Problem - HRV
 5 ASL!JPH      Thu May 17 12:37    21/785    KONO
 6 ASL!JPH      Thu May 17 12:37    21/762    CCM
 7 ASL!JPH      Fri Jun 29 15:16    24/973    ANMO data
 8 SNOKE        Mon Jul  2 08:27    53/3075
 9 ASL!JPH      Thu Jul  5 11:57    23/915    ANMO sensitivity
10 chavez       Sat Jul 14 17:19    31/1385   Data Problem
11 kenji        Wed Jul 18 11:31    31/1417   PAS and HRV polar ity
12 comments     Tue Jul 24 16:27    48/1832   Data Problem, COR station
```

From this menu you simply view selected items in the same manner you use UNIX mail. For instance if you wanted to view the data problem related to the CCM data problem on May 17, 1990 you would simply enter a "6" followed by a carriage return at the & prompt.

The display you would see is:

```
Message  6:
From irisaq!ASL!JPH Thu May 17 12:37:33 1990
Received: from iris.edu (iris.iris.edu) by irisdmc.ig.utexas.edu (4.0/4.22)
        id AA08757; Thu, 17 May 90 12:37:31 CDT
Received: by iris.edu (4.1/SMI-DDN)
        id AA04860; Thu, 17 May 90 13:37:27 EDT
From: irisaq!ASL!JPH
Received: by irisaq.uucp (3.2/SMI-3.2)
        id AA02306; Thu, 17 May 90 11:29:56 MDT
Date: Thu, 17 May 90 11:29:56 MDT
Message-Id: <9005171729.AA02306@ irisaq.uucp>
Received: by DnaMail (v1.1); Thu May 17 11:27:02 1990 MDT
To: irisaq!:"comments@ irisdmc.ig.utexas.edu"
Subject: CCM
Status: R

The polarities for all VBB channels (Z,N,E) at CCM have been reversed since
initial installation on Sep 11, 1989 until March 9, 1990.


---John Hoffman - Albuquerque Seismo Lab - USGS <jph%irisaq.uucp@ iris.CSS.GOV>
```

You should consult the UNIX manual for "mail" to determine all of the options available to you when in this utility. Two key items that can be selected at the & prompt are the "h" command which redisplays the the header information for all the comments, and the "quit" command which exits the mail program and returns you to the EBB main menu.

If you wish to report a data problem you have found in IRIS data, simply send electronic mail to

comments@ irisdmc.ig.utexas.edu (128.83.149.25)

Make the subject of the email message identify the station to which the data problem relates if at all possible.

We hope that this facility helps you identify data problems more quickly. The system will only work if you the data users both send reports of the data problems to comments@ irisdmc.ig.utexas.edu and consult the posted comments frequently.

When the IRIS DMC receives reports of data problems, the appropriate Data Collection Center is contacted and a solution to the problem is intitated.

NAME

retrieve -- interactive access to the IRIS Data Management Center Archive

SYNOPSIS

retrieve

DESCRIPTION

The IRIS Data Management Systems Program in conjunction with Lamont Doherty Geological Observatory has developed RETRIEVE to make the generation of data requests easy for you. Users can simply specify station, channel, starting times and ending times within the RETRIEVE program and interactively determine which time windows are available in the archive. The archive grows continuously as data from the IRIS network is received and so identical responses to the RETRIEVE program do not necessarily result in the same amount of data being requested.

DATA FORMAT

All media and electronic files are written in the Standard for Exchange of Earthquake Data (SEED) format. The IRIS DMS program has developed and distributes the RDSEED program that converts the SEED data into Seismic Analysis Code (SAC) format supported by Lawrence Livermore National Lab (LLNL). Other conversion routines exist that can translate SAC format into other trace data formats.

DEFAULTS

When the RETRIEVE program first executes, you are prompted for your name. Your name should be entered with your first name connected to your last name with an underscore character such as

John_Doe

If the program can not find default information for that name, you will be prompted to enter several lines of information identifying you and the institution you are with. You can also specify your preference for output medium on which to receive your SEED data volumes.

Don't be concerned if you wish to change any of the default values for the current session. You can always modify this session's parameters while in the Address Parameters menu.

Once you have created your default file you can not change the permanent default values without the assistance of someone from the IRIS DMC. You can however always modify the name you are using and reenter a new set of parameters.

MENU OPTIONS

The Main Menu

The main menu contains the following entries

Iris Interim Data Management Center
[main menu]

1. Enter Address Parameters
2. Enter Search Parameters
3. Search DMC Holding File
4. View Request File
5. Mail Request File to DMC Staff
6. Help

7. Quit

Enter your selection:

ESC-select ^X-exit ^U-up <RETURN>-down ?-help

Options **MUST** be selected in order, that is first issue option 1, then 2, 3, 4, and 5. Issuing the options in other orders can produce unpredictable results.

Enter Address Parameters

The user is asked for address information and medium preferences. Information in square brackets ([]) is optional. The default medium preference is Exabyte Cartridge.

An example of the screen in which you specify your address information is given below:

Iris Interim Data Management Center
[Enter Address Parameters]

User Name	:	Tim Ahern
Institution	:	IRIS
Mail Address	:	8701 Mopac Blvd. Austin, TX 78759
E-mail Address	:	tim@iris.edu
(Area Code) Phone No	:	(512) 471-0404
[(Fax Code) Phone No]	:	(512) 471-8844
[Ftp Guest Host Name]	:	dmc3 (128.95.16.157)
[Ftp Guest User Name]	:	guest
[Ftp Guest Password]	:	xxxxxx
[Directory Pathname]	:	/usr/users/tim/
[Comments]	:	none
[Output Medium]	:	0

type 0 - Exabyte Cartridge Tape (default)
type 1 - 1/2" 9-track Tape, 6250 bpi
type 2 - 1/2" 9-track Tape, 1600 bpi
type 3 - 1/4" cartridge
type 4 - electronic transmission

^X-main menu ^U-up <RETURN>-down

Most of the above fields are self explanatory. The FTP fields are only required if you wish to have the IRIS DMC ftp files back to your home institution electronically. These fields are normally left blank. Do not provide your own password for your own account on your local machine. Remember that this information could be viewed by anyone using RETRIEVE if they entered your name as the default.

If you select electronic transmission, DMC staff will first verify that your output file is sufficiently small (<5 Megabytes) to transfer via ftp. The DMC will place your output SEED volume in the anonymous ftp directory, notify you by email that your request is ready, and leave it to you to transfer the file to your home computer system. The files will remain in the anonymous ftp directory for one week. See the section titled

"Electronic Transfer of SEED Volumes" for more information on transferring the files.

If you wish to have the SEED volume written on another medium, simply specify the desired medium in the Comments field.

Even if you do not wish to modify any of your default address information you **must** still select option 1 and leave the menu using the ^X option. This performs certain argument checking operations that are required later in the program.

Enter Search Parameters

The second menu option "Enter Search Parameters" is where specific station-channel-time_windows are specified. An example of this menu is shown below.

```
Iris Interim Data Management Center
[Enter Search Parameters]

Station (str 5)          : + CDSN ANMO
Channel (str 3)          : B LH?

Start year (int 4)       : 1989
Start month (int 2)      : 10
Start day (int 2)        : 18
Start hour (int 2)       : 0
Start minute (int 2)     : 4
Start second (float )    : 0
End year (int 4)         : 1989
End month (int 2)        : 10
End day (int 2)          : 19
End hour (int 2)         : 12
End minute (int 2)       : 4
End second (float )      : 0

^L-load search set ^X-main menu ^U-up <RETURN>-down ^F-Flush search buf
```

The Station entries can contain both "ALIASES" and wildcard characters. See the section on ALIASES and WILDCARDING later in this manual. In the above example the "+ CDSN" is an alias for all the stations in the China Digital Seismographic Network (CDSN). A later section identifies the existing aliases. Users can not add to the ALIAS list. This list is maintained by the IRIS DMC staff. You can make requests that additional aliases be added by sending electronic mail to

comments@ irisdmc.ig.utexas.edu

Both the station and channel fields can contain multiple entries as shown above. For instance "PAS HRV COR" in the station field would request data from the three designated stations.

Station names can also contain the "?" wildcard character. The "?" means match any single character. For instance ???O would match any station that had an "O" as the fourth character in its name, as do all of the SRO/ASRO stations. Entering just the

character "B" would match all stations that begin with the letter B. In other words, the number of characters of the actual channel names that are compared to your entry is equal to the number of characters you enter in the station and/or channel field entries.

The channel field uses the same aliasing and wildcarding that the station field uses. Some examples of channel names are

+ BC	meaning all broadband channels
BH?	meaning all components of broadband high-gain channels
B? Z	meaning all broadband vertical channels
B	meaning all channels beginning with the letter B (broadband) , etc.

If you wish to request data from all stations in the DMC archive, you can enter a "?" in the station field. Similarly entering a "?" in the channel field would request data for all channels for the stations identified in the station field.

The starting and ending time fields are self-explanatory. Please note that the entire year must be entered, 89 is not the same thing as 1989. Leading zeroes are not necessary. In other words month 8 is the same as month 08.

After defining one panel (station-channel-time window), you must type control-L (^L). This type checks this panel and insures that errors have not been made. If you wish to enter another panel, move the cursor with the RETURN or ^U keys to the field you wish to change and use the backspace or delete keys to remove the existing entry and replace it with a new one. The definition of the new panel must also be ended with a ^L.

Enter as many panels as you wish up to a maximum of 50. When you have no more panels to define select the ^X key to return to the main menu.

Be careful, the ^F key to flush the buffer, completely erases all panels you have defined, not just the panel you are presently defining. In general the ^F option should be avoided.

Search DMC Holdings

The information in each of the panels that have been defined in the previous option can be sent to the main DMC computer with this option. The intersection between the panel and the actual DMC archive is determined and the result returned to the computer running the RETRIEVE program.

If you have incorrectly defined some panels and you wish to not perform the intersection, simply press the return key to bypass the panel being displayed and move to the next panel you defined. When a panel is being displayed for which you wish to query the DMC archive, simply press ^E to begin the computation of the intersection.

The length of time it takes for the main DMC computer to return control to the RETRIEVE program varies. For requests containing only a few stations and a few channels the delay is measured in seconds. For requests for all stations and all channels, each intersection can take a few minutes but typically less than 4 minutes.

You can return to the main menu after any search by selecting ^X.

Iris Interim Data Management Center
[Search DMC Holding File (Create Request File)]

User Name	:Tim Ahern
Institution Name	:IRIS
Mail Address	:8701 Mopac Blvd., Austin, TX 78759
E-mail Address	:tim@iris.edu
Station(str 5)	:+ CDSN ANMO
Channel(str 3)	:B?? LH?
Start year (int 4)	:1989
Start month (int 2)	:10
Start day (int 2)	:18
Start hour (int 2)	:0
Start minute (int 2)	:4
Start second (float)	:0
End year (int 4)	:1989
End month (int 2)	:10
End day (int 2)	:19
End hour (int 2)	:12
End minute (int 2)	:4
End second (float)	:0

Enter ^E to begin search, CR to skip request, or ^X to main menu:

>> Total 84 records matched. Request File 90_0725_2358_14 created

The above shows the result of performing a search of the DMC archive for one such panel. The number of seismograms (files) matching your request is clearly indicated.

The intersection is actually performed by the main DMC computer in Austin, TX. A connection is made between the computer upon which RETRIEVE is being executed and the main DMC computer. A command line is passed to the DMC computer which causes a program to begin execution. When the program has completed another connection is made back to your computer and summary lines identifying the seismograms that match your request are sent to the computer running RETRIEVE.

These summary lines can be viewed using the next option.

View Request File

This option displays information about each of the seismograms that resulted from the search of the DMC archive. It **must** be executed for correct operation of the RETRIEVE program.

An example of the display is given below.

Iris Interim Data Management Center
[View Request File]

```
Station                 :HIA
Channel                 :BHZ
Sample Rate             :2.0000E+ 01
Recording Mode          :T
Requested Start Time    :1989,291,00:04:00.0000
Requested End Time      :1989,292,12:04:00.0000
Archive Start Time      :1989,291,00:15:51.2700
Archive End Time        :1989,291,19:00:32.9200
Max File Length (KB)    :00308

Enter [n]ext, [p]revious, [1-0] to skip forward,
     shift-[1-0] to skip back, ^X to main menu:
     Total: 84, Current: 11
```

The fields being displayed include the station, channel, sample rate, whether the channel is continuous (C) or triggered (T) and the starting and ending times you requested. The Archive start and end times indicate what is actually in the mass storage system for this seismogram. For triggered channels these times are the starting time of the first trigger and the ending time of the last trigger for that 24 hour period, that is to say for triggered channels you can not really be sure that the data you want is available. This information can not be determined until the data files are recovered from the mass storage system and actual starting and ending times found. The Max File Length field indicates the total size of the file in the mass storage system. If you only request a portion of the day's data, the resulting SEED volume you receive will contain less data than this number indicates.

Several control keys allow you to move through the file quickly. The "n" option moves you to the next record, the "p" option to the previous record. The numeric keys move you forward through the file from one (1) to ten (0) records. Holding the shift key down and pressing a numeric key moves you back in the file the indicated number of records.

Leave this menu option using the ^X key.

The display at the bottom of the menu indicates the total number of records in your request and which record is presently being displayed.

Mail Request File

This option transfers the request file into a special queue on the machine running the RETRIEVE software. This option first displays the MAXIMUM size of the SEED volume that will be generated from this request. If you are selecting less than a full day's worth of data, the SEED volume may be significantly smaller than the number indicated.

To issue the data request simply type ^E. To cancel the request type ^X to return to the main menu.

Requests for data are normally processed within one day of the time received. A SEED volume containing the data you have requested will be sent to you as indicated in your address information.

Help

Accesses on-line help texts for various menu items.

Quit

Leave the RETRIEVE program and return to the shell.

ELECTRONIC TRANSFER OF OUTPUT SEED VOLUMES

If you wish to have the SEED volume generated by your request transferred to your host institution electronically, you can designate your wish by selecting the output medium in the address menu accordingly.

At the present time the IRIS DMC limits the size of the volume that can be transferred electronically to 5 Megabytes. If you select this option the output SEED volume will be placed in the anonymous ftp directory on the irisdmc computer. You will be notified by email when it is ready to transfer to your home institution. The data will stay resident in the anonymous ftp directory for one week.

To perform an anonymous ftp to the IRIS computer do the following:

Type

ftp irisdmc.ig.utexas.edu or ftp 128.83.149.25

at the prompt for a name enter

ftp

at the Password prompt enter the name of your computer

computer@university.edu

you should then see the ftp> prompt. Your data will be in the "pub/userdata" directory so you should next type

cd pub
cd userdata

followed by an

ls

This list will show all the files in the userdata directory. One or more of these will correspond to your SEED data volume(s). Because these are binary files, not ascii files, you should next change to the ftp binary mode by typing

binary

You then transfer the file to your host computer by issuing the following command

get filename

where filename is the name of the file you wish to transfer. To exit the anonymous ftp type

quit

ALIASES FOR STATION AND CHANNEL NAMES

RETRIEVE makes use of an aliasing feature to simplify the definition of the station-channel-time windows. In main menu option 2, Enter Search Parameters, the Station and Channel fields contain multiple strings of characters to identify stations or channels. For instance a user could specify

BJI ENH HIA KMI LZH MDJ SSE WMQ

to recover data from all stations in the China Digital Seismographic Network (CDSN). RETRIEVE eliminates the need to remember the individual station names however. If an entry in the Station or Channel fields is preceded with a "+ " symbol, the entry is interpreted as an ALIAS and expanded accordingly. For instance entering

+ CDSN

is identical to the previous line specifying the stations individually.

At the present time the following aliases are defined.

ASRO	----->	CTAO KONO MAJO
WWSSN	----->	AFI BDF CMB COL GDH HON KEV LEM LON SCP SLR TAU TOL
CDSN	----->	BJI ENH HIA KMI LZH MDJ SSE WMQ
IRIS	----->	ANMO ARU CCM COR ESK GAR HRV KIP KIV NNA OBN PAS PFO RPN
UNIV	----->	CCM COR HRV PAS IPAS IHRV
USGS	----->	ANMO CCM COR HRV KIP PAS
SIO	----->	ARU ESK GAR KIV NNA OBN PFO RPN
IDA	----->	ESK NNA PFO RPN
SOV	----->	ARU GAR KIV OBN
SRO	----->	ANTO BCAO BGIO CHTO GRFO GUMO NWAO SNZO TATO ZOBO
GSC	----->	GAC
BBS	----->	AFI ARU ANMO BJI CCM COL COR ESK GAR HIA HRV IHRV IPAS KIV KEV KIP KMI LZH MDJ NNA OBN PAS PFO RPN TOL WMQ
BC	----->	BBE BBN BBZ BHE BHN BHZ BLE BLN BLZ

The aliases are as follows:

ASRO	Abbreviated Seismic Research Observatories,
WWSSN	Digital Worldwide Seismographic Station Network,
CDSN	China Digital Seismographic Network,
IRIS	stations meeting full IRIS GSN specification,
UNIV	Stations at IRIS Universities,
USGS	IRIS GSN stations maintained by USGS,
SIO	IRIS GSN stations maintained by Scripps,
IDA	IRIS stations in the IDA network,
SOV	IRIS GSN stations in the Soviet Union,
SRO	Seismic Research Observatories,
GSC	Geological Survey of Canada,
BBS	broadband stations, and
BC	broadband channels.

At the present time the user can not define his own aliases. If you have a particular suite of

stations or channels that you often request data for, you can request that the DMC staff add the alias to the supported list.

WILDCARDING IN STATION AND CHANNEL NAMES

The Station and Channel fields of main menu option 2 support limited wildcarding. It is similar to but not the equivalent of UNIX filename wildcarding. Only the "?" wildcard character is supported. It means match any single character. For instance "BH?" means match any Broadband High Gain Channel when entered into the Channel field.

The Station and Channel fields can contain multiple entries such as

LHZ BH? S??.

The field can also contain ALIASES in addition to non-aliased entries such as

ANMO +CDSN L??.

The above line would request data from station ANMO, the entire CDSN network and all stations beginning with the letter "L".

The number of characters matched in the station and channel names is the same as the number of characters you enter in those fields. For instance if you enter

L??

in the channel field, three characters in each of the channel names in the DMC archive are compared with L??. Since the "?" means match any character it should be clear that "L??" is the same as "L".

If you wish data for all stations or all channels in the archive simply enter a single "?" in the respective fields.

CHANNEL NAMING CONVENTIONS

The DMC archive stores data for channels using the SEED channel naming convention documented in the SEED Reference Manual, appendix A.

Briefly the channel names are three characters in length. The first character is the Band Code, the second the Source code and the third the Orientation Code. Band Codes are currently defined as

Band Code	Band Type	Sample Rate	Corner Frequency
E	Extr Short Period	>=80 hz	< 10 s
S	Short Period	>=10<80	< 10
H	High Broad Band	>=80	>= 10
B	Broad Band	>=10<80	>= 10
M	Mid Period	>1<10	
L	Long Period	=1	
V	Very Long Period	~0.1	
U	Ultra Long Period	~0.01	
R	Extr Long Period	~0.001	
A	Administrative		
W	Weather		

X	Experimental

The Source Code indicates the type of sensor.

Source Code	Source
H	High Gain Seismometer
L	Low Gain/Strong Motion Seismometer
G	Gravimeter
T	Tidal Meter
A	Tilt Meter
B	Creep Meter
S	Linear Strain
M	Mass Position
X	Experimental
V	Volumetric Strain
F	Magnetic Field
P	Geophone

The Orientation Code is as follows

Orientation Code	Orientation
Z,N,E	Traditional vertical, N/S, E/W
A,B,C	Triaxial
T	Transverse
R	Radial
I	Scalar Calibrations
1,2,3	Miscellaneous
X	Experimental

During the very early period of 1989, some data with alternate channel naming conventions were inserted into the mass storage system of the DMC archive. Therefore some stations do have channels with names such as BBZ instead of the current BHZ. By consulting the Display Station Information option of the Electronic Bulletin Board you can determine which channels exist for which stations. Stations with BBZ type channel names are identified using that option. Note that some aliases that have been specified previously, address this problem.

ENVIRONMENT

RETRIEVE must be accessed through the main user interface computer at the IRIS Data Management Center. This computer is

irisdmc.ig.utexas.edu (128.83.149.25)

Either connect to it with

rlogin irisdmc.ig.utexas.edu

or

telnet 128.83.149.25

Logon as user "bulletin" with password "board". The RETRIEVE program is accessed via the obvious menu option.

Since RETRIEVE uses CURSES to generate the various displays, you must previously set your

TERM environment variable properly. If your display is erratic you can try issuing the following command before connecting to the DMC computer. From a UNIX system type

setenv TERM vt100

and then issue the rlogin or telnet.

FILES

defaults_file (see above)

DIAGNOSTICS

User supplied with various entry and status diagnostics

BUGS

The user must issue the main menu requests in order. The only order that is guaranteed to function properly is option 1, option 2, option 3, option 4, and then if necessary option, 5.

Typechecking only checks for proper alphanumerics.

No default file for search sets

Limitations in the CURSES program cause the following problems:

- if the window from which you are running is too large the program can crash, hanging the terminal. Try pressing "line feed", then type "reset", followed by another "line feed" to reset the terminal.
- if you use inverted video, the cursor can disappear, try changing the window size.

AUTHOR

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with contributions from Lynn Liu and Art Lerner-Lam of LDGO.

IRIS E-mail Directory
by Rick Williams

Last modified 20 August 1990

Send an E-mail message to "rick@rockytop.gg.utk.edu" or try "finger rick@128.169.201.176" to see the current version on this list.

An astrisk (*) preceeding a name means that I was unable to send mail to the address given, but others may be able to use it. A carat (^) before a name means that individual is a member of the anisotropy interest group assembled by Joe Dellinger; contact Joe for details. The letter (j) before a name indicates a Japanese seismologist from the list compiled by Kiyoshi Suyehiro with additions by Kazuki Koketsu.

The letter (o) before a name means the address is old, and did not work the last time I tried it. Users are requested to let me know when they find an old or invalid address in this list, particularly when it is their own.

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