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# Third Workshop on 3D Modelling of Seismic Waves Generation Propagation and their Inversion

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## *Recent Development in Inocoporated Research Institutions in Seismology (IRIS)*

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**Recent Development in**
**Inocoporated Research Institutions in Seismology (IRIS)**

In the early 1960's the World Wide Standard Seismograph Network was installed. It was one the most important milestones in seismology. Much of the important advances in seismological observations came as a consequence, with the concommitant development in seismological theory. But by early 1980 the network was outdated in the sense that maintenance of old instruments become difficult, the digitization of the film or paper records was labor-intensive and inaccurate, the distribution of stations around the globe was heavily biased toward land based ones, and the lack of dynamic range hampered studies of the whole range of earthquakes. Along another front, the classical refraction crustal studies and temporary network deployment were considered highly unsatisfactory. In 1983, seismological groups engaged in these research in the United States began to consider the problem of a successor to WWSSN and the design and acquisition of field equipment. IRIS was incorporated as a non-profit organization in 1985 with about 50 member institutions in the US. Under it there were three major programs: the Global Seismograph Network (GSN), the Program for Array Seismic Studies of Continental Lithosphere (PASSCAL) and the Data Management System (DMS). In a nutshell, GSN was to deploy 100 broadband wide-dynamic range stations world-wide, PASSCAL was to acquire 1000 channel of seismic recording equipment and the DMS will managnIt obtained funds from National Science Foundation. By 1988, the designs of new broadband stations and portable digital instruments were ready and prototypes made. Beginning in 1989 new stations were deployed and a data management center was organized; PASSCAL's "REF TEK" recorders began to be used. The 1989 Loma Prieta earthquake in northern California provided a shakedown for the very rudimentary system in existence at that time. It was very exciting that within a few hours DMC was able to provide data on the internet. Within the same day portable instruments were deployed in the epicentral region of the earthquake. Since then, in addition to the timely organization of the unit to push the use of advanced and reliable electronic designs in their instrumentation programs, also several world-wide events enable IRIS to carry out most of its original goals. Not least among these are the breakdown of political barriers and the maturation of the internet. The uniform seismic station coverage of the globe is not possible with the former and distribution of seismic data from IRIS/DMC cound not have been done with the latter. The US National Science Foundation has just granted its third five year plan and now IRIS is ready to fine tune its operations. Also, in a significant way, because of nuclear test ban treaty monitor purposes, the US Congress twice made direct appropriations through the Air Force to support the accelerated deployment of GSN.

The IRIS program changed academic seismological research in a most significant way. GSN data are now easily available for seismologists to test ideas. The PASSCAL instruments made recording seismic signals in remote and scientifically interesting parts of the world possible. The DMC operations ensure the integrity of data for years to come.

From the initial developmental stage of IRIS, the long fruitful tradition of international cooperation in seismology is recognized. It is through the relentless pursuit

of this view that made possible the effective globalization of seismology. Evidently the establishment of world-wide stations requires in-country support, from site selection to acquisition to construction, to maintenance and finally to in-country research programs in seismology. Also the carrying out of the PASSCAL field experiments cannot be conducted without in-country interests in the program. Significantly, while IRIS continued its attempt to establish as uniform a world-wide seismic network as it can manage, other very powerful networks were launched nearly at the same time. These networks in many ways are complementary to the IRIS network. In the past few years, GEOSCOPE, MEDNET, and many other networks are contributing data to IRIS/DMC under the eagis of the Federation of Digital Seismic Networks (FDSN). In fact, IRIS/DMC became the first FDSN data center. Even before this happened, IRIS/DMC has steadily supplied data to requests emanating from any research organization in the world. Many foreign seismological research instutes became foreign associates of IRIS and foreign seismologists regularly serves on IRIS committees.

In the following I will first describe briefly how IRIS is organized and then the notes will give some detail how a seismologist would go about getting data from IRIS/DMC.

IRIS now has nearly 90 US members. Each institute has one person designated as a member of the board of directors. This body has to approve the by-law and its changes. It also elects members of the executive committee. The committee, especially its chairman, works closely with the president of IRIS, who is responsible for the management of the day-to-day matters. The IRIS corporate office consists of a small office in Washington, DC, in the American Association for the Advancement of Science (AAAS) building. There are three main programs under IRIS, i.e., GSN, PASSCAL and DMS. GSN cooperates with USGS (Alburqueque)and UC San Diego to site, install and routinely maintain the GSN stations. PASSCAL has two Instrumentation Centers: broadband instruments are maintained at Lamont-Doherty Earth Observatory and three-channel recorders mainly used for active source Stanford University. The Data Management System (a broad umbrella) supports two data collection centers: USGS in Alburqueque and UC San Diego and the Data Management Center in Seattle. Each program has an oversight Standing Committee determining long term policy and development.

IRIS Headquarter - Washington DC, in AAAS building - President David Simpson

GSN - Rhett Butler, Program Manager
Cooperates with
USGS - Alburqueque
UCSD - San Diego

PASSCAL - Jim Fowler, Program Manager
LDEO - Palisades, Columbia University NY; broadband instrumentation
Standford U.; 3-channel short-period instruments

DMS - Tim Ahern, Program Manager
USGS - Alburqueque
UCSD - San Diego
DMC - Seattle

If your institution is interested in becoming an foreign associate member, you should write Dr. David Simpson; there is no membership fee. But you will receive the IRIS newsletter and other announcements regularly.

**Requesting data from DMC**

The DMC is where the data archive is located. The following data are available:

GSN continous and triggered and event-oriented data: A multiple terabyte storage device stores the continuous data from GSN in data sorting and station sorting. This is the deep archive where a general request may result in retrieve data from this source. However, since many requests are event-oriented, finite duration (one or more hours) data are retrieved from the archive and placed on hard disks (older data may be migrated off to another temporary storage, but its operation is transparent to an user).

PASSCAL experiments: These could result from broadband field experiment or from active source refraction/reflection studies or aftershock monitoring using either short period,

There are two main interfaces to approach DMC electronically. One is through the web-page at URL:

http://www.iris.washington.edu

and the other is by rlogin or telnet to

dmc.iris.washington.edu

with userid as "bulletin" and password as "board"

# Acronyms

[non-table version]

| Acronym | Definition |
|---|---|
| AFOSR | Air Force Office of Scientific Research |
| ASL | Albuquerque Seismological Laboratory |
| BREQ_FAST | Batch REQuests Fast |
| CMT | centroid moment tensor |
| CROP | Customized Reduction of Products |
| DCC | data collection center |
| DIRTS | Data and Information Related To Seismology |
| DMC | Data Management Center |
| DMS | Data Management System |
| EBB | Electronic Bulletin Board |
| ERI | Earthquake Research Institute |
| FARM | Fast Archive Recovery Method |
| FDSN | Federation of Digital Broad-Band Seismograph Networks |
| GEOFON | GeoForschungsZentrum |
| GSN | Global Seismic Network |
| HDF | hypocenter data format |
| IDA | International Deployment of Accelerometers (Scripps) |
| IGPP | Institute of Geophysics and Planetary Physics (Scripps)<?A> |
| IPGP | Institut de Physique du Globe, Paris |
| IRIS | Incorporated Research Institutions for Seismology |
| JSP | Joint Seismic Program |
| JSPC | Joint Seismic Program Center |
| MDC | Moscow Data Center |
| NEIC | National Earthquake Information Center (USGS) |
| NOC | Network Operations Center (Albuquerque & IDA) |

| | |
|---|---|
| NSF | National Science Foundation |
| PASSCAL | Program for Array Seismic Studies of the Continental Lithosphere |
| PIC | Passcal Instrument Center (see:LDEO and Stanford) |
| POD | Program to Output Data |
| QED | Quick Epicenter Determination |
| RELISH | Responses Evaluatied by Listing Information in SEED Headers |
| RUMBLE | Requests Users Make By Listing Events |
| SC | Standing Committee |
| SEED | Standard for the Exchange of Earthquake Data |
| SIO | Scripps Institute of Oceanography |
| SOD | Standing Order for Data |
| SPYDER | System to Provide You Data from Earthquakes Rapidly |
| SQL | Structured Query Language |
| Uof W | University of Washington |
| USGS | United States Geological Survey |
| UV-FARM | Ultra Long Period (.01 sam/sec ) FARM products |
| VLP | Very Long Period (0.1 sam/sec) FARM products |
| WEED | Windows Extracted from Earthquake Data |
| WQC | Waveform Quality Center (Harvard) |

[redacted]

BREQ_FAST requests
CROP
EVALRESP
RDSEED
RELISH
RUMBLE requests
SOD requests
WEED
XRETRIEVE [redacted]
Request methods tutorial (PostScript file, 130k, will download)

[redacted]

SEED (note: you can download just the updated pages including info on blockette 1001)
SPROUT
FDSN Station Book (12.5 MB)
BREQ_FAST
CROP
RDSEED
RUMBLE
SOD
WEED

What is [redacted]

[redacted]

| IRIS | DMS | DMC | GSN | PASSCAL | FDSN | DATA | [redacted] |
|---|---|---|---|---|---|---|---|

**1408 NE 45th St., Suite 201, Seattle, Wa. 98105**
**Phone: (206)547-0393**
**FAX: (206)547-1093**
**webmaster@dmc.iris.washington.edu**

# BREQ_FAST Request Manual Pages

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Jump to:



## NAME

BREQ_FAST - Batch REQuests, FAST

## AVAILABILITY


*Incorporated Research Institutions for Seismology*
*Data Management Center*
*1408 NE 45th Street, Seattle WA 98105*
*(206)547-0393, FAX:(206)547-1093*
*breq_fast@iris.washington.edu*


## DESCRIPTION

Batch access to the IRIS DMC archive can be obtained by electronically mailing a specially formatted file to the IRIS DMC in Seattle. These are BREQ_FAST files and provide a base level access to the DMC needed by any user. These requests are not interactive in that you simply send the file to the DMC and the DMC will return all data matching the request. For users that do not have access to electronic mail facilities, the IRIS DMC will process tapes containing images of BREQ_FAST files in simple ASCII format.

## FILE FORMAT

The format of the file is as follows:

```
.NAME
.INST
.MAIL
.EMAIL
.PHONE
.FAX
.MEDIA:
```

```
.ALTERNATE MEDIA:
.ALTERNATE MEDIA:
.LABEL
.SOURCE          ---
.HYPO              | optional
.MAGNITUDE       ---
.END
 request line-1
 request line-2
 .
 .
 .
 request line-n
```

The format of each line is as follows:

```
             STARTING TIME         ENDING TIME
STA NN YYYY MM DD HH MM SS.T  YYYY MM DD HH MM SS.T #_CH CH1 CH2 CHn
```

where:

```
STA  is the station
NN   is network code
YYYY is the year, 1900 is added to a year less than 100.
MM   is the month
DD   is the day
HH   is the hour
MM   is the minute
SS.T is the second and tenths of seconds
#_CH is the number of channel designators in the immediately following list
CHn  is a channel designator that can contain wildcards
```

Individual lines in the request can not exceed 100 characters.

Valid selections for media at the present time, in the order of preference are:

Electronic (FTP)
EXABYTE - 2 gigabyte
EXABYTE - 5 gigabyte
DAT (digital audio tape)
1/2" tape - 6250
1/2" tape - 1600
1/2" tape - 3200
1/2" tape - 800
1/4" Cartridge - QIC150
1/4" Cartridge - QIC24
1/4" Cartridge - QIC11

Please be sure to specify your first, second and third choices for the output media.

The LABEL entry will be used to name the files containing your SEED volumes whenever they are small enough to transfer with ftp. Your SEED volumes will alsO include this LABEL internally so they can be distinguished regardless of filename. This capability can help you distinguish data you receive for

different projects and aids communication with regard to a specific request.

**Hypocenter option**

You must add the three token fields .SOURCE, .HYPO, and .MAGNITUDE to the standard BREQ_FAST file to request hypocenter data. The fields are defined as follows:

**Cited Source Info:**
(All referenced entries marked "# n" below refer to field numbers in blockette 32 of the SEED volume. See the SEED manual for details about blockette 32).

```
.SOURCE ~NEIC PDE~Jan 1990 PDE~National Earthquake Information Center~USGS DOI~
  |          |           |                                 |
  |          |           |                                 Publisher Name (# 6)
  |          |          Date Published/Cataloged (# 5)
  |         Name of Publication - Author (# 4)
 Token name
```

**Event Info:**
(All referenced entries marked "# n" below refer to field numbers in blockette 71 of the SEED volume.)

```
.HYPO ~1990 01 02 20 21 32.62~13.408~144.439~135.0~18~216~Mariana Islands~
  |               |             |       |       |     |  |        |
  |               |             |       |       |     |  |  Region Name (# 14)
  |               |             |       |       |     | Seismic Loc (# 13)
  |               |             |       |       |   Seismic region (# 12)
  |               |             |       |      Depth (# 7)
  |               |             |      Longitude  (# 6)
  |               |            Latitude (# 5)
  |              Origin Time (# 3)
 Token name
```

**Magnitudes:**

```
.MAGNITUDE ~5.7~mb~
    |        |   |
    |        |   Magnitude Type (Blk 71 - field 10)
    |       Magnitude  (blk 71 - field 9)
   Token name
```

You can have as many MAGNITUDE entries as you need, just repeat the token.

Also note, you can have optional source entries for each magnitude. If the cited source is different than the SOURCE line entered above, just add the references here, i.e:

```
.MAGNITUDE ~5.7~mb~Publication/Author~Date Published~Publisher Name~
     |        |   |            |              |                  |
     |        |   |            |              |                  Blk 32 - field 6
     |        |   |            |              Blk 32 - field 5
     |        |   |           Blk 32 - field 4
     |        |   Same as above
     |       Same as above
    Token name
```

NOTE: The "~" works as a field delimeter and must appear at the beginning of each line (after the token and after each field as shown in the above examples.

# EXAMPLE

An example of a valid short BREQ_FAST file:

```
.NAME Joe Seismologist
.INST Podunk University
.MAIL 101 Fast Lane, Middletown, KS  89432
.EMAIL joe@podunk.edu
.PHONE 555 555-1212
.FAX   555 555-1213
.MEDIA DAT
.ALTERNATE MEDIA 1/2" tape - 6250
.ALTERNATE MEDIA EXABYTE
.LABEL Joe's FIRST Request
.SOURCE ~NEIC PDE~Jan 1990 PDE~National Earthquake Information Center - USGS DOI~
.HYPO ~1990 01 02 20 21 32.62~ 13.408~ 144.439~135.0~18~216~Mariana Islands~
.MAGNITUDE ~5.7~mb~
.END

GRFO IU 1995 01 02 00 18 10.4 1995 01 02 00 20 10.4  1 SHZ
ANTO IU 1995 01 02 02 10 36.6 1995 01 02 02 12 36.6  1 SH?
GRFO IU 1995 01 02 02 10 37.1 1995 01 02 02 12 37.1  1 SH?
SEE  CD 1995 01 02 14 45 08.9 1995 01 02 14 47 08.9  1 SHZ
BDF  IU 1995 01 04 02 42 13.4 1995 01 04 02 44 13.4  1 SHZ
NNA  II 1995 01 04 02 41 57.5 1995 01 04 02 43 57.5  1 BHZ
PFO  TS   95 01 04 02 41 57.5   95 01 04 02 43 57.5  1 BHZ
PFO  II   95 01 04 02 41 57.5   95 01 04 02 43 57.5  1 BHZ
KMI  CD   95 01 04 02 41 57.5   95 01 04 02 43 57.5  1 BHZ
SSE  CD   95 01 04 02 18 25.4   95 01 04 02 20 25.4  2 B?? SHZ
PAS  TS   95  1  4  2 10 49     95  1  4  2 12 49    3 BH? SHZ L??
```

# WILDCARDING

The Channel list in the batch file supports limited wild carding. It is similar to but not the equivalent of UNIX filename wild carding. Only the "?" wild card character is supported. It means match any single character. For instance "BH?" means match any Broad band High Gain Channel when entered into the Channel field.

The Channel list can contain multiple entries such as

3 LHZ BH? S??

As an example a #_ch of 1 and a channel list of L?? (1 L??) would result in three characters in each of the channel names in the DMC archive being compared to L??. Since the "?" means match any character it should be clear that "L??" is the same as entering "L". The channel names are matched for the same number of characters as the number in the input channel designator field. NOTE: The '*' symbol is interchangable with the '?' but is not accepted for wildcarding when making a request using the Web form.

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. Refer to the SEED reference manual for a more complete description of the SEED channel naming convention.

One of the major benefits of the BREQ_FAST method is that you can specify time windows for various stations that have travel time corrections applied to the windows.

# SUBMITTING YOUR REQUESTS

Once you have generated your BREQ_FAST file you can simply mail it via email to

BREQ_FAST@dmc.iris.washington.edu (128.95.166.2)

When the IRIS DMC receives your request, programs will be run that will compare what you requested with what data are actually in the IRIS archive, recover the data from the mass storage system, generate the output SEED volume, and send it to you in the manner you requested. The only exception to this is that if you request electronic transfer and the file is too large, an alternate media will be used.

# SEE ALSO

***rumble*** **, sod**

# DIAGNOSTICS

Your request will be echo-ed back via email. Another message is sent when your SEED format data is available for pickup via FTP.

# BUGS AND LIMITATIONS

Not able to guess correct values for out of range data, such as minutes>59.

Each line expected to begin at the left margin.

The BREQ_FAST format specifically does not support wildcarding of the STATION name.

Wildcarding convention for CHANNEL names is not UNIX standard.

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# CROP Manual Pages

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Jump to:



# NAME

**CROP** - Customized Reduction of Output Products

# DESCRIPTION

CROP is a user interface currently available through the DMC bulletin board which allows the user to pare down the volume of data in a selected FARM product before ftp transfer.

Through a user-friendly interface a user is able to select specific FARM products and trim them down to specific stations, channels, networks, and a particular time window. The data is then made available to the user through anonymous ftp.

# FORMAT

The stations, channels, and networks are specified using IRIS-standard abbreviations. If more than one is listed on a given line, the user needs to separate the items by white space. Wildcards '*' and '?' are accepted. If all of a category is desired, the user can simply hit RETURN.

Time windows are generally specified using conventional rdseed format:

```
YYYY,DDD,HH:MM:SS.FFFF
```

Specification is made for the start time and the end time either by explicitly entering the time, by entering an event-relative time, or by hitting RETURN.

In the first case, absolute time is entered in the format shown above. More precise orders of time can be omitted if desired, but the higher order time parameters must still be included. As an example, you can shorten your absolute time entry from 1995,156,09:00:00.0000 to 1995,156,09 but *not* to 156,09 or 09:00, which omits the year in the first case and the year and day in the second case.

Event-relative time specification takes the form of:

```
MM:SS.FFFF (before|after);
```

in which the 'before' or 'after' keyword tells CROP to compute the number of minutes and seconds before or after the hypocenter event time. Note that this option cannot be used if the event time is not provided with the FARM product. If the event time is found, CROP will have displayed it for you. An example of specifying one minute and thirty seconds before the event occurring at 1995,156,09:02:03.4358 would be '01:30 before', which would yield the result of 1995,156,09:01:33.4358.

Finally, the user can simply accept the widest bound of time, whether it be the start time of the FARM product or the end time of the product, by simply hitting RETURN.

# Making your request

After the necessary parameters have been entered, CROP will display the user's entries and confirm with the user that his entry was acceptable. The user can accept or reject his entries at this point. If rejected, CROP will start at the beginning again. If accepted, CROP will start up a background process to begin working on the request. The user can exit CROP after selection is complete, or begin another request. When the background process is finished, the user will be notified by email. At this point, the user can retrieve the product through anonymous ftp at **dmc.iris.washington.edu**.

It is necessary for the user to have properly registered his/her name and email address with IRIS DMC through the Electronic Bulletin Board. CROP uses the email address to send mail notification to the user when his product has finished, or if an error has occurred with processing. Users should take care to enter their email address properly to prevent failed sends and bouncebacks to the DMC. If the user does not have a registered email address when CROP is started, an email address will be prompted for.

# 'OFFLINE' Requests

To conserve disk space at IRIS DMC, many of the FARM products are taken off the disk drives and held on archive tapes. If a FARM product is selected that is 'offline', CROP can fetch the FARM product back from the archives and process the request. This is performed in the background when the user okay's the archive retrieval.

# QUITTING

If a mistake is made at any point during request entry, the user can type 'quit' on the current line, which will terminate the request and restart CROP. This is a perfectly acceptable way to start over and can be used as a means of 'browsing' through the FARM products.

# FILES

select_crop - CROP request entry routine
harvest_crop - CROP request processing routine
cron_crop_migrate - CROP offline-product
retrievaldeltime_crop.awk - computes time relative to event
timerdseed - borrowed SEED processing engine

# AUTHOR

Robert Casey - IRIS DMC - May, 1995

# BUGS

A lot of interface robustness has been put in but the user still must be careful when entering the shearing parameters. If rdseed doesn't like it, well, that's the way the cookie crumbles.

rdseed doesn't always give good feedback when errors occur during CROP processing. The error files don't indicate, for instance, cases where no data is returned simply because the time windows were outside the data window or that a particular station doesn't exist for that product.

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George Yarnes

# evalresp Manual Pages

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Jump to:

- Filter Sequence
- How the program searches for responses
- Notes about usage
- Example

---

## NAME

**evalresp** - evaluate response information and output to ASCII files using **rdseed V4.1** response outputs.

## SYNOPSIS

```
evalresp STA_LIST CHA_LIST YYYY DAY MIN_FREQ MAX_FREQ NFREQS [-f file] [-u units]
     [-t time-of-day] [-s type-of-spacing] [-o type-of-output] [-n network-code] [-v
```

## DESCRIPTION

Evalresp (Version 3.0) will calculate the complex response of a specified station or set of stations, channel or channels, and network, for a specified date, time and frequency, all by using the SEED ascii response files produced by the program *'rdseed'*. *Evalresp* by itself returns the usage or 'help' lines useful for how to correctly input the options.

## FIR FILTERS

All FIR filters are considered as having a zero phase-shift, even if they are not symmetrical and the delay correction is null. In case there are 2 FIR filters in the same stage, the program assumes that both filters have the same input sample interval (in other words, the first filter has a decimation factor of 1).

## FILTER SEQUENCE

The program assumes that the response information consists of a series of filter stages arranged in a cascade. It is assumed that the first filter in a given stage is one of the following:

1. A Laplace Transform or Analog pole-zero filter
2. An IIR pole-zero filter
3. A FIR filter (either symmetric or asymmetric)
4. A stand-alone gain blockette that indicates the overall sensitivity of the filter sequence (valid only if the blockette has a stage sequence number of zero, i.e. it is a 'stage zero' filter).

George Yarner

It is further assumed that the Laplace Transform, Analog pole-zero filters, IIR or FIR filters will be followed by a gain blockette and (possibly) by a decimation blockette (if a decimation blockette is included, the order of these two blockettes does not matter). If an invalid filter sequence is found, then that response is discarded and the program moves on to the next response in the input file (or the response in the next RESP file if the '-f' option is not used) to try to match it up with one of the user's requests.

Other unexpected cases:

1. If a single stage filter (only a 'stage zero' filter) is specified as the response and the gain (sensitivity) for that stage is zero, then the response is discarded (because the filter sequence is not valid).
2. If the gain specified for any stage is zero, the response is discarded (because the filter sequence is not valid).
3. If a pole-zero filter is found and the the gain frequency for that stage is zero or the channel's overall sensitivity frequncy is zero then that response is discarded (because the filter specification is invalid).
4. stand alone FIR filters (i.e. those with no sample rate and gain specified) are discarded (Only that stage is discarded, the rest of the filter sequence is kept and used to calculate a response).
5. FIR filters which are not normalized to 1 at frequency 0 are normalized.

# HOW THE PROGRAM SEARCHES FOR RESPONSES

If the '-f' option is specified, a determination is made as to whether the filename that follows the '-f' flag is a directory.

1. If it is, then that directory (and only that directory) is searched for files with names like 'RESP.NETID.STA.CHA', where the NETID, STA, and CHA match the user supplied (or default) network-code, station names (from the STA_LIST), and channel names (from the CHA_LIST).
2. If it is not, then a file with that name is used as input to the program. That file (and only that file), will be searched for response information that matches the user's request.
3. If the '-f' option is not specified, then both the current working directory and the directory pointed to by the 'SEEDRESP' environment variable (if it exists) are searched for response information that matches the user's request. As in the directory search (above), the filenames are constructed automatically. The files are searched starting with the local directory, so if a match is found in both the local and 'SEEDRESP' directories, the information from the local file will be used.
4. Because it is possible to use wildcards to specify the network-code, stations and channels that are of interest, when the '-f' flag is used to pass the name of a directory to search or when the '-f' option is not given and the local and 'SEEDRESP' directories are searched for matching files, all files whose names match the user's request are searched for responses that match the users request. This is necessary because there may be multiple, unique station-channel-network's that match a single input station- channel-network tuple from the user (if wildcards are used). A list of all of the files that match is constructed and each is searched in turn, however, only the first matching response in each file is calculated.

# NOTES ABOUT USAGE

1. First, you must create an ASCII file containing the response information for the SEED volume. For *evalresp V3.0, rdseed V4.1* or later must be used to create these files. To create the files, the 'R' option to rdseed can be specified (either on the command line or interactively), which places the response information in the SEED volume into ASCII files with names like RESP.NET.STA.CHA. Alternatively, the 'd' option can be specified and, by responding 'yes' to the query of whether you want response files written, these same files will be extracted only for the station-channel pairs for which data is extracted.
2. If the 'file' argument is a directory, that directory will be searched for RESP files of the form RESP.NET.STA.CHA.
3. If the 'file' argument is a file, that file is assumed to be a concatenated version of the output from a call to rdseed with the '-R' option. If this is the case, then only this file will be searched for matching response information
4. If the 'file' argument is missing, the current directory will be searched for RESP files of the form RESP.NET.STA.CHA (see above).
5. If the environment variable SEEDRESP exists and is the name of a directory, that directory will also be searched for the requested files (if the '-f' option is not used, see above).
   i.e. if typed 'setenv SEEDRESP /foo/resp_dir' and no file or directory is specified to search on the command line, then the current directory and the directory 'foo/resp_dir' will be searched for matching RESP files to calculate responses from.
6. The 'units' argument is either of DIS (displacement), VEL (velocity), or ACC (acceleration) and represents the units for which the output response should be calculated (regardless of the units that the RESP file gives the response in). The default value for this argument is VEL.
7. The 'time-of-day' argument is in HH:MM:SS format. This is used only in the case where there is more than one response in a given SEED volume for a given day. In that case, this argument can be used to choose one response over another according to the effective time of each. If this argument is not specified, then the first response that is found in the file that matches the requested year and day will be used. The default value for this argument is '00:00:00.0'.
8. The 'type-of-spacing' argument is either logarithmic or linear ('log' or 'lin' respectively). This governs whether the frequencies chosen are spaced evenly between the minimum frequency and the maximum frequency in a linear or logarithmic sense. This argument defaults to a value of 'log'.
9. The '-v' argument is the verbose argument. If this flag is given on the command line, diagnostic information will be sent to standard output showing summary information of the calculated response for each station-channel-network tuple that matches the user's request. If this option is not specified, only error output will occur in the program.
10. The '-r' argument indicates the response type the user desires. Available values are 'ap' for amplitude- phase output and 'cs' for complex-spectra output. If the 'cs' option is chosen, then the result is a set of files like 'STA.CHA.NET.SPECTRA' that contain the frequency, real response and imaginary response (in that order). If the 'ap' option is chosen, then a set of files like 'STA.CHA.NET.AMP' and 'STA.CHA.NET.PHASE' are created, containing the amplitude and phase response, respectively. This argument defaults to a value of 'ap'.
11. The use of wildcards is allowed in the specification of stations, channels, and networks to search for. The first response of each station-channel-network that matches the wildcard pattern will be calculated and saved. For example, if the user requested response information from PFO 'BH?' with a network flag of -n '*', then the first response that matches the specified date for each of the broadband, high-gain channels will be returned for all of the networks that report a response for PFO. The wildcarding scheme used here is a 'glob' style, rather than 'regular expression' style of pattern matching. The total length of the patterns used for the stations, channels, or networks is

restricted to 64 characters by the program, although multiple examples can be combined in a comma separated list for the station and channel lists.

# EXAMPLE

evalresp HRV,ANMO 'BHN,BHE,LH?' 1992 231 0.001 10 100 -f /home/RESP/NEW -t 12:31:04 -v

The quotes in this command are required to prevent the shell from expanding the '?'character before passing it into evalresp. If the RESP files for HRV and ANMO are contained in the directory '/home/RESP/NEW', then this example will output eight files, called:

HRV.BHE.IU.AMP, HRV.BHE.IU.PHASE, HRV.BHN.IU.AMP, HRV.BHN.IU.PHASE, HRV.BHE.IU.AMP, HRV.BHE.IU.PHASE, HRV.BHN.IU.AMP, and HRV.BHN.IU.PHASE

for the HRV BHE and BHN channels. A corresponding set of files would be output for the ANMO broadband channels and for all the HRV and ANMO long-period high-gain channels in '/home/RESP/NEW'. These files contain the amplitude and phase information, respectively. These output files can be used as input for graph or SAC. For example, take the amplitude file and try this:

graph < HRV.BHE.IU.AMP | xtek

# SEE ALSO

**rdseed(v4.1), relish(v3.0),** *graph*, and *SAC*.

---

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# *rdseed* Manual Pages

---

Jump to:



---

## NAME

*rdseed* - Read an FDSN SEED format volume

## SYNOPSIS

```
rdseed -{a | c  | l | s | S | r | R | t } [-f filename]  [v (n)]
```

## OPTIONS

The following options may be selected:

-a retrieve the abbreviation dictionaries.
-c retrieve volume table of contents.
-l list contents of each record in the volume.
-s retrieve all station and channel header information.
-S retrieve station summary information.
-r retrieve all response information.
-R retrieve all response information in the new format.
-t construct a list of all event start/stop times and starting record numbers.
-v specify the volume number [1-n] to process (default is 1).
-f specify the input filename (default is /dev/nrst0).

# DESCRIPTION

*rdseed* reads from the input tape (or other input file) in the format defined by the Federation of Digital Seismographic Networks (FDSN), popularly known as the Standard for Exchange of Earthquake Data (SEED). According to the command line function option specified by the user, *rdseed* will read the volume and recover the volume table of contents (-c option), the set of abbreviation dictionaries (-a option), or station and channel information and instrument response tables (-s option).

The desired volume on tape (or in a file) can be selected with the (-v option). The first volume is "1" , the second "2" and so forth. (Note: this option is only used when a physical volume contains more than one logical volume.

Two additional options allow access to detailed information concerning the actual contents of the volume (rather than reading files purporting to contain such information from the volume, for which one uses the -c option). The first of these options (-t) writes out a list of data start and stop times along with the starting records at which those data may be found. (For the purposes of this discussion, a record is defined as a set of station/channel/time continuous data records.) The other option (-l) is primarily a diagnostic tool; it writes a description of every record on the volume.

In order to extract data from the SEED volume for analysis by other packages, the user must run *rdseed* in User Prompt Mode which is discussed below. As data is extracted from the SEED volume, *rdseed* looks at the orientation and sensitivity of each channel and determines if channel polarity is reversed. Refer to the description of blockettes 52 and 58 in the SEED manual for a description of reversed polarity. A negative sensitivity in blockette 58 is indicative of a reversed polarity. The user can request that reversed channels be corrected. This correction is a simple multiplication by -1.0 . The output response file information is NOT adjusted for channels which *rdseed* inverts.

## Output Header Corrections

*rdseed* does correct the header information in the SAC, AH and CSS files as follows:

> SAC headers contain both scale factor and Dip/Azimuth information. If a Dip/Azimuth reversal has been corrected, *rdseed* will correct the Dip/Azimuth information in the SAC header. If a negative sensitivity is corrected, the header SCALE value is also made positive. If *rdseed* finds both types of reversals, NO corrections to the data or header are made.
>
> CSS headers are handled in the same way as SAC headers. The header information is found in CSS formatted relation files that are seperate from the data files. These files are named RDSEED.WFDISC, RDSEED.SITE and RDSEED.SITECHAN.
>
> The AH format presents a problem. There is no place for Dip/Azimuth information. Headers contain only a scale factor. Therefore when a Dip/Azimuth reversal occurs, there is no place in the header to indicate that occurrance. Therefore the following rules are followed. If the user has not requested dip/azimuth checking and one is detected, *rdseed* will invert the sign of the scale factor in the AH header. If the user has asked for inversion checking, the data will be inverted and NO change in the scale factor will occur. Negative sensitivity is handled the same way as in the SAC and CSS headers. Again, if *rdseed* finds both types of reversals,

NO corrections will be made.

# User Prompt Mode

When *rdseed* is run without any options, the user is prompted for all of the options as well as some additional options.

# Input Options

Input Device (/dev/nrst0) :
: the input device can be changed from the default of /dev/nrst0. Note that when a tape is being accessed, it is best to use the norewind device. This allows *rdseed* to search for multiple volumes on tape across tape file marks.

Output Device (stdout) :
: the output device can be changed from the default of stdout.

Volume # [(1)-N] :
: volume number can be changed from the default value of 1.

Options [acsSrRtde] :
: one of the options must be selected. All except "d" have the same meaning as the corresponding command line options.

**If the "d", "S" or "s" option is selected, further selection can be made.**

Station List (ALL) :
: a list of selected stations separated by spaces or commas. Wildcard substitution of characters "*" , "?" and "." is performed. A station name can be that of an alias whose name is defined in a file whose filename is specified by the environment variable SEEDALIAS. See details below.

Channel List (ALL) :
: a list of selected channels separated by spaces or commas. Wildcard substitution of characters "*", "?" and "." is performed.

**If the "d" option is selected, further selection can be made.**

Summary file (None) :
: Optional summary file processing. See documentation for *WEED*

Output Format [(1=SAC),2=AH,3=CSS, 4=miniseed, 5=seed] :
: select output format as SAC, AH, CSS 3.0 binary, mini seed or seed; default is SAC.

Check Reversal [(0=No), 1=Dip.Azimuth, 2=Gain, 3=Both]:
: select signal reversal checking; default is No.

Start Time(s) (FIRST) :
: a list of seismogram start times of the form YYYY.DDD.HH:MM:SS.FFFF or YYYY/MM/DD.HH:MM:SS.FFFF separated by spaces. YYYY may be YY i.e. "90" for "1990". Least significant parts may be omitted, in which case they become zero i.e. "90.270" is time 00:00:00.000 of the 270th day of 1990.

End Time(s) (LAST) :
: a list of seismogram end times of the same form as start times. Each start time (except the

last one) must have a corresponding end time. If the last start time does not have a corresponding end time, the end time is assumed to be the last time in the volume.

Sample Buffer Length [2000000]:

each seismogram is assembled in a sample buffer prior to output. The size of the buffer can be changed. This number is the number of samples. If the length is too small for the any of the requested seismograms an error message will inform the user that the waveform is being broken into pieces. The user may increase the size of the buffer to avoid this problem.

Extract Responses [Y/(N)] :

channel response extraction is selected via this prompt.

# Alternate Response Files

The user can specify that station configuration and responses be taken from another SEED volume. This will allow for two possible scenarios to be accomplished. First, if station information is found to be in error, the user can use the headers from another SEED volume that is known to be correct. Second, if the SEED volume is a "data-only" volume (MINI-SEED), the user can use a "data-less" SEED volume and the "data-only" SEED volume to extract the desired waveforms. So you say, "how do I do this?". The environment variable ALT_RESPONSE_FILE should be defined with its value being the path name of the SEED volume from which responses should be taken.

# The Alias File

An alias file can be defined which contains a list of station alias names. The first word in each line of the file is the alias. The following words are station names which will match the corresponding alias. The alias file name must be defined in the SEEDALIAS environment variable. For example, the file *rdseed*.alias contains the following:

CHINA BJI XIAN SHNG

All references to station CHINA will match station BJI, XIAN or SHNG.

The source code is written in such a way that it will run, with recompilation, on both big-endian (e.g., Sun) and little-endian machines (e.g., VAX) under UNIX. This program has not yet been tested under VAX VMS.

# Time Tear Tolerance

Normally, the tolerance for determining time tears is found in the station header information. Some stations may have clocks that wander excessively. This may cause time tears in the data. The drift tolerance can be adjusted by defining an environment variable called SEEDTOLERANCE. Its value is multipled by a drift tolerance that is contained in the SEED volume for each channel. Thus a value of 3.0 will increase the drift tolerance by a factor of three. Drift is defined in units of "seconds per sample" and is typically around .00005 sec/smp.

# Data Recovery

There are two necessary steps to recovering seismograms from a SEED tape.

The first step consists of finding out what is on the tape; one does this by using any of the command line options -c or -t, to list the station and channel names, starting times, and record numbers of the seismograms contained in the volume.

Seismic data are recovered from SEED tapes in the second step. Using the station, channel and time information, use User Prompt Mode to select start and stop times for individual seismograms.

Seismogram files are written to the current directory with names of the form
yyyy.ddd.hh.mm.ss.ffff.SSSSS.CCC for SAC Files
yyyy.ddd.hh.mm.ss.ffff.SSSSS.CCC.AH for AH Files
yy.ddd.hh.mm.ss.ffff/SSSSS.CCC.w for CSS Files

where yyyy is the year, ddd is the Julian day, hh.mm.ss.ffff is the time of day of the start of the first record, SSSSS is the station name, and CCC is the component name for the particular seismogram being recovered. This seismogram file naming convention was chosen to provide unique names to output files without user intervention; however, the large number of files which can be generated to a single directory might cause problems for some operating systems. Notice that CSS uses a slightly different format that puts channel data in subdirectories. This is due to a limitation in the filename field in the CSS database. For CSS there are three additional files created, RDSEED.WFDISC, RDSEED.SITE and RDSEED.SITECHAN. These files are used by the CSS database system.

# Recovering auxiliary data from an FDSN SEED volume.

One may also retrieve the set of abbreviation dictionaries or the set of station information tables from an FDSN SEED volume. The former is accomplished with the command
rdseed -af inputfile
while the latter results from
rdseed -sf inputfile
Output from these commands should be redirected to files, as in examples 6 and 7.

# DIAGNOSTICS

Various warnings and error messages are issued to the standard error device by the procedure. Typical response of the procedure to a warning condition is to write a message to the standard error device and then to continue execution. An error condition, on the other hand, will cause a message to be generated to the standard error device followed by immediate termination of the procedure.

# EXAMPLES

1. Reading the table of contents from a volume.

   rdseed -cf /dev/rmt8 > tape.contents & or *rdseed*
   Input Device (/dev/rst0) : /dev/rmt8

Output Device (stdout) : tape.contents
Volume # [(1)-N] :
Options [acstd] : c

reads the table of contents from the tape on device /dev/rmt8 into a file called tape.contents; the job is run in the background (command line example). Output directed to "stderr", such as error messages, comes to the terminal. Table-of-contents entries have the format

AFI LPZ 1988,228,00:00:00.68 1 147

where the columns represent station name, channel name, start time, location flag (here, a blank), subsequence number, and starting record number.

2. Determining event start/stop times on a volume.

rdseed -tvf 2 image > image.times & or *rdseed*
Input Device (/dev/rst0) : image
Output Device (stdout) : image.times
Volume # [(1)-N] : 2
Options [acstd] : t

reads a disk file called "image" and creates a table containing starting record numbers, station and channel names, start and stop times of events, nominal sample rate, calculated sample rate and numbers of samples for that file. Output is written to the file "image.times". The lines of the output table have the format

119 ANMO LPZ 1988,230,00:00:00.6800 1988,230,18:35:04.6800 1.00 66904

where the columns represent station name, channel name, start time, end time, sample rate in samples per second, number of samples, and starting record number for these data.

3. Creating a detailed list of the contents of a volume.

rdseed -lf /dev/rmt11 > tape.list &

reads a tape on drive mt11 and writes a list of the contents of each record to a file called tape.list. The job is run in the background.

4. Reading all data from a tape.

*rdseed*
Input Device (/dev/rst0) : /dev/rmt8
Output Device (stdout) : tape.extraction.list
Volume # [(1)-N] :
Options [acstd] : d
Station List (ALL) :
Channel List (ALL) :
Output format [(1-SAC),2-AH...]:

Start Time(s) (FIRST) :
End Time(s) (LAST) :
Sample Buffer Length [2000000] :
Extract Responses [Y/(N)] :

reads all seismograms from the tape on device /dev/rmt8 into the current directory, writes "stdout" output to a file.

5. Reading the abbreviation dictionaries.

rdseed -af tape.image > tape.abbreviation.dictionaries or *rdseed*
Input Device (/dev/rst0) : tape.image
Output Device (stdout) : tape.abbreviation.dictionaries
Volume # [(1)-N] : 1
Options [acstd] : a

extracts the abbreviation dictionaries from a tape image stored on disk, sends the result to a file, and runs in the foreground.

6. Reading station information.

rdseed -sf /dev/rmt8 > tape.station.information & or *rdseed*
Input Device (/dev/rst0) : /dev/rmt8
Output Device (stdout) : tape.station.information
Volume # [(1)-N] : 1
Options [acstd] : s

recovers station and channel location and response information from the tape on device /dev/rmt8, writes the information to a file, and in the command line form runs in the background.

7. Reading specific station/channel/time information.

*rdseed*
Input Device (/dev/rst0) : /dev/rmt8
Output Device (stdout) : tape.station.information
Volume # [(1)-N] : 2
Options [acstd] : d
Station List (ALL) : BJI YKW1
Channel List (ALL) : *Z
Output format [(1-SAC),2-AH] :
Start Time(s) (FIRST) : 1990,270,20:30
End Time(s) (LAST) : 1991/2/1
Sample Buffer Length [2000000]: 3000000
Extract Responses [Y/(N)] : Y

reads all seismograms from stations BJI and YKW1, all Z channels, from year 1900, julian day 270, hour 20, minute 30 to Febuaury 1, 1991. The buffer size was increased to 3 million samples and the channel response information will be output.

# FILES

yyyy,ddd,hh.mm.ss.ffff.SSSSS.CCC - seismogram files as described above

# SEE ALSO

Halbert, S. E., R. Buland, and C. R. Hutt (1988). Standard for the Exchange of Earthquake Data (SEED), Version V2.0, February 25, 1988. United States Geological Survey, Albuquerque Seismological Laboratory, Building 10002, Kirtland Air Force Base East, Albuquerque, New Mexico 87115. 82 pp.

O'Neill, D. (1987). IRIS Interim Data Distribution Format (SAC ASCII), Version 1.0 (12 November 1987). Incorporated Research Institutions for Seismology, 1616 North Fort Myer Drive, Suite 1440, Arlington, Virginia 22209. 11 pp.

Tull, J. (1987). SAC User's Manual, Version 10.2, October 7, 1987. Lawrence Livermore National Laboratory, L-205, Livermore, California 94550. ??? pp.

SEED Reference Manual, *WEED*

# BUGS

The -d option dumps all records .

Address bug reports to Chris Laughbon at IRIS DMC, 206-547-0393, or send ARPAnet mail to chris@iris.washington.edu . Please DO NOT "fix bugs" locally without telling the author about them. Please DO NOT redistribute this program. Address requests for the program to IRIS at the numbers given above.

# AUTHOR

Dennis O'Neill; Allen Nance, IRIS

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# RELISH Manual Pages

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Jump to:

- Usage
- How the program searches for responses
- Notes about usage
- System Requirements

## NAME

**relish** - Responses Evaluated by Listing Information in Seed Headers. Output phase and amplitude files (or complex response spectra) from *rdseed v4.1* response files.

## SYNOPSIS

```
relish.tcl
```

## DESCRIPTION

evalresp (Version 3.0) is used to calculate the complex response for a specified station or set of stations, channel or channels, date, time and set of frequencies, all by using the SEED ascii response files produced by the program rdseed (version 4.1 or later). This new version of *relish* is actually only a GUI that is used to drive the *evalresp (Version 3.0)* program, unlike the previous versions of *relish*, which were stand-alone '*Matlab® Executable*' (or '*mex*') programs. This version of *relish* is also very different from its predecessors in that a *Tcl/Tk* graphical interface is used, rather than *Matlab®*. The responses that are calculated by *evalresp* can be plotted by the *relish* 'front-end' using the graph widget from the Tk/Blt X-Windows interface.

*Relish (v3.0)* sets up a simple GUI to the *evalresp (v3.0)* program. This interface allows the user to interactively enter the command line inputs to the *evalresp* program and, at the same time, allows the resulting response curves to be plotted using a set of *Blt* graph widgets. The user can plot the amplitude response, phase response, or both, and the resulting graphs can be saved to *Postscript* files with names that look like 'STA.AMP.ps' and 'STA.PHS.ps' respectively. This functionality for plotting the response curves is intended to allow the user to plot a set of responses for all of the channels for a given station. Specifically, while wildcards (in the *UNIX* 'glob' style) are permitted in indicating which channels and networks should be included in the resulting response plots, no wildcards are permitted in specifying the station name (since it is assumed that only one station's responses will be shown on a given plot). In addition, the *relish* GUI provides a simple mechanism for trapping the output from *evalresp* by providing a '*relish log*' window, whose contents can be cleared, printed (utilizing the *UNIX enscript* utility) or saved to the file '*relish.logfile*'.

## USAGE

When the user types *relish.tcl* in a standard X-window, two *Tk* graphics widgets appear on the screen. The first is a dialog box that allows the user to enter the command line information for running *evalresp* (Station List, Channel List, Year, Julian Day, etc.), while the second contains a non-editable text widget that is used to capture the output from *evalresp* as a log, which can be cleared, printed, or saved. The user is required to enter the following arguments:

1. the 'Year' for the response (selects which 'effective time' to used in calculating the response)
2. the 'Julian Day' for the response (selects which 'effective time' to used in calculating the response)
3. the 'Minimum Frequency' for the response
4. the 'Maximum Frequency' for the response
5. the 'Number of Frequencies' for the response

In addition, there are a number of 'optional' inputs, many of which have default values. They are:

1. the 'Station List' for which responses are to be calculated. This comma separated list can contain wildcards (e.g. 'C*' or 'C??'). In many cases, because wildcards are allowed, it is not necessary to provide the *evalresp (v2.0 or earlier)* style 'list' (e.g. 'COL,CHTO,CTAO'), although it is available if the need should arise. If no 'Station List' is specified, it defaults to '*', meaning that responses should be calculated for all stations in the specified directory (or file). Note: an explicit limit on the 'length' of these 'stations' (the names specified between the commas in the list) of 64 characters is set by *evalresp*.
2. the 'Channel List' for which responses are to be calculated. As with the 'Station List', the 'Channel List' can contain a mix of wildcards in a comma separated list of channels. In all cases, if wildcards are used, no quoting is necessary (in fact, quotes will not hurt, they are just passed on to *evalresp*. Note: as with the 'Station List' the 'length' of these 'channels' must be 64 characters or less. If this field is not specified, it defaults to '*', meaning that responses should be calculated for all channels with matching stations and networks.
3. the 'Network' for which responses are to be calculated. As with the 'Station List' and 'Channel List', a 'glob' style pattern with as many as 64 characters may be provided as a value to this field (although fixed values like 'SR' are allowed). The user should be aware, however, that the 'Network' values provided by *rdseed (v4.1)* are restricted to two letters or less. If this field is not specified, it defaults to '*', indicating that responses should be calculated for all matching station-channel pairs, regardless of their network affiliation.
4. the 'Time' for which responses are to be calculated. This field can be used to restrict the 'effective time' for which the response should be calculated in the case that there has been more than one response determined for a given station-channel-network on the same day. It should have the form 'HR:MM:SS.######', although the number of decimal points in the seconds specification can be less
5. the 'Directory (Filename)' which should be searched for matching responses (see discussion below on how this argument is used to determine which, if any, responses match the user's request)

Finally, there are a number of radiobuttons that are used to set the 'Units', the 'Spacing', the 'Response Type' and the 'Verbose' inputs to *evalresp*. Since these represent optional inputs to *evalresp*, default values are set which are consistent with those utilized by the *evalresp* program. See the *evalresp* documentation for further information on how these parameters are used

The *relish* GUI is completed by the specification of three pushbuttons that represent 'actions' that can be

taken by the user:

1. The user can use the parameters that have been specified by the inputs in the GUI and 'Run Evalresp'. This will cause *evalresp* to begin executing, with its output being redirected to the '*Relish Log*' window. The output response files will be created in the directory that the GUI was started in (assuming that the user can create files there).
2. The user can choose to 'Quit'. If this option is chosen, then the *relish* session ends.
3. The user can choose to 'Plot Responses'. This will bring up a second dialog box in which the user can specify the 'Station', 'Channel', 'Network ID' and 'Directory' to plot responses for. These parameters are defined in a manner that is consistent with the definitions in the *relish* GUI. Two sets of checkboxes are also provided to allow the user to specify what should be plotted (either amplitude or phase or both may be plotted in the resulting graphics window) and what 'Response Type' should be used (either amplitude/phase spectra or complex spectra may be used as inputs).
    1. If the user presses 'OK' in this window, then graphs will be created for the requested station's channels in a new graphics window. If the user presses 'Cancel', then control is returned to the main *relish* GUI window. In any event, the options set in this window will be saved for the duration of the session, so the next time this window is opened, the options will be the same.
    2. Once the plots are generated, there are three options available if both amplitude and phase have been specified. The user can print the phase, print the amplitude, or quit. If either of the first two options are chosen, then files with names like 'COL.PHS.ps' and 'COL.AMP.ps' are created in the directory where the *relish* GUI was started. If the user chooses to 'Quit', then control is returned to the main window.

# HOW THE PROGRAM SEARCHES FOR RESPONSES

If the 'Directory (Filename)' option is specified, a determination is made as to whether the name given by the 'Directory (Filename)' is a directory.

1. If it is, then that directory (and only that directory) is searched for files with names like 'RESP.NETID.STA.CHA', where the NETID, STA, and CHA match the user supplied (or default) network code, station names (from the STA_LIST), and channel names (from the CHA_LIST).
2. If it is not, then a file with that name is used as input to the program. That file (and only that file), will be searched for response information that matches the user's request.
3. If the 'Directory (Filename)' option is not specified, then both the current working directory and the directory pointed to by the 'SEEDRESP' environment variable (if it exists) are searched for response information that matches the user's request. As in the directory search (above), the filenames are constructed automatically. The files are searched starting with the local directory, so if a match is found in both the local and 'SEEDRESP' directories, the information from the local file will be used.
4. Because it is possible to use wildcards to specify the network-code, stations and channels that are of interest, when the 'Directory (Filename)' is used to pass the name of a directory to search or when the 'Directory (Filename)' option is not given and the local and 'SEEDRESP' directories are searched for matching files, all files whose names match the user's request are searched for responses that match the users request. This is necessary because there may be multiple, unique station-channel-network's that match a single input station-channel-network tuple from the user (if wildcards are used). A list of all of the files that match is constructed and each is searched in turn, and a response is calculated for the first matching response in each of those files.

# NOTES ABOUT USAGE

1. First, you must create an ASCII file containing the response information for the SEED volume. For *evalresp V3.0, rdseed v4.1* or later must be used to create these files. To create the files, the 'R' option to rdseed can be specified (either on the command line or interactively), which places the response information in the SEED volume into ASCII files with names like RESP.NET.STA.CHA. Alternatively, the 'd' option can be specified and, by responding 'yes' to the query of whether you want response files written, these same files will be extracted only for the station-channel pairs for which data is extracted.
2. If the 'Directory (Filename)' argument is a directory, that directory will be searched for RESP files of the form RESP.NET.STA.CHA.
3. If the 'Directory (Filename)' argument is a file, that file is assumed to be a (concatenated) version of the output from a call to rdseed with the '-R' option. If this is the case, then only this file will be searched for matching response information
4. If the 'Directory (Filename)' argument is missing, the current directory will be searched for RESP files of the form RESP.NET.STA.CHA (see above).
5. If the environment variable SEEDRESP exists and is the name of a directory, that directory will also be searched for the requested files (if the 'Directory (Filename)' option is not used, see above).
   i.e. if typed 'setenv SEEDRESP /foo/resp_dir' and no file or directory is specified to search on the command line, then the current directory and the directory '/foo/resp_dir' will be searched for matching RESP files to calculate responses from.
6. The 'Units' buttons indicate the units that the response should be returned to the user in. They are either DIS (displacement), VEL (velocity), or ACC (acceleration). The response will be given in the response to one of these three types of ground motion (the default is VEL). The actual units of the response will be in terms of output units per DIS, VEL or ACC, where the units used for the DIS, VEL, or ACC are the 'equivalent' of the input units, regardless of the units that the RESP file gives the response in (e.g. if the input units if the input units are given as 'nm/sec' and the output units are given as counts, then the response to displacement will be returned as 'counts/nm', where 'nm' represents nanometers). The default value for this argument is VEL,.
7. The 'time-of-day' argument is in HH:MM:SS.S format. If there is more than one response in a given SEED volume for a given day, this argument can be used to choose one response over another according to the effective time of each. If this argument is not specified, then the first response that is found in the file that matches the requested year and day will be used. The default value is '00:00:00.0'.
8. The 'type-of-spacing' argument is either logarithmic or linear ('log' or 'lin' respectively). This governs whether the frequencies chosen are spaced evenly between the minimum frequency and the maximum frequency in a linear or logarithmic sense. This argument defaults to a value of 'log'.
9. Toggling the 'verbose' button causes diagnostic output to be sent to the '*Relish Log*' window showing summary information of the calculated response for each station-channel-network tuple that matches the user's request. If this option is not specified, only error output will appear in the log window.
10. The 'Response Type' argument indicates the type of output the user desires. Available values are 'Amplitude/Phase' and 'Complex Response Spectra'. If the 'Complex Spectra' option is chosen, then the result is a set of files like 'STA.CHA.NET.SPECTRA' that contain the frequency, real response and imaginary response (in that order). If the 'Amplitude/Phase' option is chosen, then a

set of files like 'STA.CHA.NET.AMP' and 'STA.CHA.NET.PHASE' are created, containing the amplitude and phase response, respectively. This argument defaults to a value of 'Amplitude/Phase'.

11. The use of wildcards is allowed in the specification of stations, channels, and networks. The first response of each station-channel-network that matches the wildcard pattern will be calculated and saved. For example, if the user requested response information from PFO 'BH?' with a network flag of '*', then the first response that matches the specified date for each of the broadband, high-gain channels will be returned for all of the networks that report a response for PFO. The wildcarding scheme used here is a 'glob' style, rather than 'regular expression' style of pattern matching.

# SYSTEM REQUIREMENTS

To run this package properly, two easily accessible extensions are needed (in addition to compiled versions of *rdseed (v4.1 or later)* and *evalresp (v3.0)*. First, the *Tcl/Tk* package must be installed on the system that is running the *relish (v3.0)* program. This package is easily accessible via anonymous ftp (e.g. from ftp.cs.berkeley.edu in the '/ucb/tcl' directory). This package recently underwent a major revision, so we have utilized to 'latest' versions of the *Tcl/Tk* package, i.e. *Tcl (v7.4)* and *Tk (v4.0)*. Second, the *Blt (v1.8)* extension to *Tk (v4.0)* must also be installed. This extension provides the graph widget that is used by the *relish* GUI to plot the response curves. This extension is also available via anonymous ftp (e.g. from ftp.cs.uoregon.edu in the directory '/pub/jhobbs'). Care must be exercised to make sure the version numbers of these extensions are current, since the latest revisions that have been made to the *Tk/Blt* extensions are incompatible with previous releases.

# SEE ALSO

**rdseed(v4.1), evalresp(v3.0), Tcl(v7.4)/Tk(v4.0), Blt(v1.8)**

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[return to top]

# *WEED* Manual Pages (Version 1.0)

---

Jump to:



## Name

*WEED* - Windows Extracted from Event Data (download now)

## Description

*WEED* is an X-windows program which presents the user with an easy-to-use interface for selecting events and stations and then computes travel times from events to stations. The resulting travel times can be used to generate BREQ_FAST requests for data and extracting the waveforms from SEED volumes. The user can specify events based on criteria such as magnitude size and type, depth, seismic region and code, and event location and time. The user can select stations based on azimuth, distance, back azimuth from these events or latitude longitude boundaries. In this manner you can generate a summary file which holds the travel times from the event(s) to each station(s). *WEED* then calls upon *rdseed* to extract the data from the SEED volume.

NOTE: WEED can be used with data other than DMC data as long as the files are in the same format as described below.

## Installation

*WEED* comes in a tar file with executable, IASP91 tables, station and even files. As of this version it is

written for X-windows for use on Sun computers. *Openlook* is the window manager it is written for but it should work with *Motif*. Future versions will support both.

When you extract the tar file you will get a directory called *DIST* which will hold an executable, sources and libraries, plus all the event and station catalogs already compiled for use by *WEED* . Event catalogs will be in DIST/events/YYYY/month, and station catalogs will be in DIST/stations. **Be sure to read the README file for important information!!**

## Help

The help file is called *weed.info*. You need to place this file in a directory which the environment variable "HELPPATH" points to. If you are using Openlook the variable should be active. Copy the weed.info file to the location indicated by HELPPATH or add the directory where it resides to the HELPPATH. If HELPPATH doesn't exist then set it to the directory where weed.info lies (probably the /DIST directory).

To activate the help mechanism, place the mouse over the gui object and press either the Help key for F1. If you get an error message about no help available for a gui object the HELPPATH isn't setup properly.

## WEED_HOME

A *WEED* environment variable has been created for versions 1.5 and higher. This variable, *WEED* _HOME, should be set to point to the DIST directory. *WEED* will use this variable to search for the event, station and Data Window Definition files, and also the IASPI91 tables. If this variable isn't set, *WEED* will use the current directory to search.

## *WEED* FILES

There are five main files (and one auxillary) created or used by *WEED* . The event file, station file, Data Window Definition file, the summary file and the BREQ_FAST request file. The first three are used by *WEED* in the generation of the summary file. The summary file is used in the generation of the BREQ_FAST request file.

Although *WEED* uses the event, station and DWD file as input in the generation of the summary file, *WEED* can also create these files from existing SEED volumes, in the case of event and station files, or from user entered information in the case of Data Window Definition file.There is a 6th user entered *WEED* file called the Email Header File. This file is used to fill in the information necessary to email the BREQ_FAST file to the DMC.

## Station Files

A station file is an ascii file which contains the stations network code, latitude/longitude, elevation, site description, and the most recent list of channels available.

You can generate station files from existing SEED volumes using *WEED* , or you can ftp the "catalogs" from the DMC. We keep all stations in the directory: ~ftp/pub/weed/stations. Each network has its own

station file. Also, the distribution tar file comes with the station files.

## Event Files

Event files are also ascii text. Each event file can have one or more event holding the event's source, time, latitude, longitude, depth, Flinn Engdahl region and seismic codes, magnitude type and size which repeats as needed.

You can generate the event file from an existing SEED volume using *WEED* or you can ftp the "catalogs" from our ftp site. They are located in ~ftp/pub/weed/events. Each year has its own directory and within the year are catalogs grouped by month. These event files also come with the tar file distribution.

NOTE: You can create your own station or event files by "cat"-ing station or event files. This will allow you to select multiple networks or event dates from single, large files instead of several smaller ones.

## Data Window Definition (DWD) Files

DWD files are created using *WEED* . You specify a starting phase and an ending phase. These two phases define the time window to use when computing travel times from events to stations. For instance, if you specify, in the DWD file, a starting phase of First P and an ending phase of First S, *WEED* will, for every station and event, compute travel times of the 1st P and the 1st S. These two times will define your window for data extraction from the SEED volume. The bias field refers to a time factor which is added to or subtracted from the computed phase arrival. For example, to start windowing 5 secs before the initial P wave, select a starting phase of first P and then enter a value of -5 in the bias field for the starting phase. Conversely, to end windowing 10 seconds after the first S arrival, select First S for the ending phase, then enter a value of 10 into the einding phase bias field. Some other features of the DWD window include setting surface wave parameters, specifying channels of interest and the IASP91 Path field - this refers to the directory where you placed the iasp91 travel time tables, iaps91.tbl and iasp91.hed. As they arrive from the distribution, they are placed in the directory /DIST.

## Summary Files

Summary files are the result of *WEED* computing travel times of phases to stations from events. *WEED* then hands this file to *rdseed* for the actual extraction of data from an existing SEED volume. Alternatively you can generate a BREQ_FAST file which you mail to the DMC for processing. When you receive your SEED volume you can then use *WEED* in conjunction with this summary file to extract the data.

## File Extensions

All *WEED* files except the BREQ_FAST request file use a default extension. *WEED* will scan the directories for files with matching extensions and use them accordingly.

```
Station files uses .stations
Event files uses .events
Data Window Definition files uses .phases
Summary files uses .summary
BREQ_FAST email header file uses .bfast_header
```

## File Formats

**Station Files:** Fields are delimited by spaces. Some fields have spaces in them which necessitates wrapping the fields in double quotes (").

**Here is the file format description:**

```
  station nc st_lat st_lon st_elev "site" "channel_list"
```

Where

| | |
|---|---|
| station | is the station call letters. |
| nc | is the network code. |
| st_lat | is the latitude of station |
| st_lon | is the longitude of station |
| st_elev | is the elevation of the station |
| site | is the site information |
| channel_list | is a list of available channels for this station |

Actual lines from a station file:

```
AFI   IU  -13.90930 -171.777300 706.0 "Afiamalu, Western Samoa" "LHE LHN LHZ"
BJI   IU  40.04030 116.175000 43.0  "Baijiatuan, Beijing, China" "BHE BHN BHZ L
COL   IU  64.90000 -147.793300 320.0 "College Outpost, Alaska, USA" "LHE LHN LH
```

**Event files:** Fields are delimited with commas.

**Here is the event file format:**

```
ev_src,ev_time,ev_lat,ev_lon,ev_depth,reg,code,mag_type1,mag1_size...
```

Where

| | |
|---|---|
| ev_src | is hypocenter source |
| ev_time | is the event time with a format: YYYY/MM/DD HH:MM:SS.FFFF |
| ev_lat | is the latitude of event |
| ev_lon | is the longitude of event |
| ev_depth | is the depth of event in Km |
| reg | is the Flinn Engdahl region |
| code | is the Flinn Engdahl seismic code |

mag_type1 is the magnitude type

mag1_size is the magnitude of event

mag_type2 is the magnitude type

mag2_size is the magnitude of event

mag_typeN is the magnitude type

magn_size is the magnitude of event

Actual lines from an event file:

NEIC PDE, 1990/01/02 20:21:32.62, 13.408000, 144.4390000, 135.0, 18, 216, mb,

NEIC PDE,1994/04/17 06:23:39,63.5,-150.75,15.0,1,1,MB,3.1,ML,3.5

NEIC PDE,1994/04/17 08:23:27,63.2,-151.2, 12,1,1,MB,3.5,ML,3.7

NEIC PDE,1994/04/18 15:48:49,63.8,-148.31,106.00,1,1,MB,3.0

**Data Window Definition File [DWD] This file has space delimited fields.**

**Here is the DWD file format:**

```
starting_phase:name start_bias start_surf_wave start_surf_index
ending_phase:name end_bias end_surf_wave end_surf_index extract_channel
tt_model
```

Where

starting_phase:name
is a combination of a number representing the *WEED* menu item of the selected starting phase, plus the english name from the menu item. A colon separates them.

start_bias is an integer used to subtract seconds from the computed travel time of the starting phase.

start_surf_wave is the speed of the surface wave in Km/sec.

start_surf_index
is the number of times around the globe you wish to add to the computed time of the surface wave.

ending_phase:name
is a combination of a number representing the *WEED* menu item of the selected ending phase, plus the english name from that menu item. A colon separates the them.

end_bias is an integer used to add seconds from the computed travel time of the ending phase.

end_surf_wave is the speed of the surface wave for the

```
                ending phase.

end_surf_index  is the number of times around the globe  you
                wish to add to the computed time of the sur-
                face wave.

extract_channel a list of channels you for extraction.

IASP91 path     the path to the directory which holds the IASPI
                tables. This field will hold the start-up direc-
                tory or the directory specified in WEED_HOME.


Actual lines from a Data Window Definition file:


2:First_P 100 0 1 3:First_S 500 0 1 BH* LH*  /<path to iasp91 tables>
```

**Summary Files:** The summary file, being a combination of the event, station and DWD files, holds lines from each. For every event processed, there are station lines. And for every station line there are the necessary data definition lines. The event lines are delimited with commas, the station and DWD lines with spaces. Each event line is prefaced by the token EVENT, the station lines by STATION and the DWD lines, for historical reasons, are delimited by the word PHASE.

Here are the field names of the summary file:

```
EVENT:ev_src, ev_time, ev_lat, ev_depth, FE_reg, FE_code, mag1_type, mag1_size,
STATION:stn nc st_lat stlon st_elev mp_lat mp_lon distance azimuth back_azimuth
PHASE:phase_start_name phase_start_tt phase_start_bias phase_end_name phase_end
```

Where

```
EVENT: label indicating an event line follows
ev_src: source of the event information
ev_time: time of the event
ev_lat, ev_lon: latitude and longitude
ev_depth: depth
FE_reg: Flinn Engdalh region
FE_code: seismic code
mag1_type: the type of the folowing magnitude
magn1_size: the size of the magnitude
...
magn_type: repeats as needed
magn_size: repeats as needed
```

Here is an example of a summary file. This example shows an event taken from the first line of the event file example (see above), the stations from the station file example (see above), and the phases used from the above DWD file example.

```
EVENT: NEIC PDE, 1990/01/02 20:21:32.62, 13.408000, 144.4390000, 135.0,  18,  2
    STATION: AFI   IU  -13.90930 -171.777300 706.0 -13.909 -171.777  51.25 120.
      PHASE: First_P 100 First_S 500 "BH*,LH*," 1990,002,20:30:36.62  1990,002,
    STATION: BJI   IU  40.04030 116.175000 43.0  40.043 116.175  36.38 322.3215
      PHASE: First_P 100 First_S 500 "BH*,LH*," 1990,002,20:28:37.62  1990,002,
    STATION: COL   IU  64.90000 -147.793300 320.0 64.900 -147.793  68.52 24.958
      PHASE: First_P 100 First_S 500 "BH*,LH*," 1990,002,20:32:35.62  1990,002,
```

## Extraction Parameter Screen

The Extraction Parameters screen is where you enter delimiting parameters. Remember that the event files which come with *WEED* hold thousands of events. This, in combination with a large list of stations, can result in a HUGE summary file. You are advised to keep this in mind when generating a suumary file with the default parameters. For instance, you may only want those events with a magnitude > 6 in which case you must edit the parameters in the Extration Parameter screen before generating the summary file.

## *WEED* Output

*WEED* always outputs to the current working directory, the directory in which it has been started. All output goes here, by default. *WEED* will request a file name for the various files listed above and at that time you can enter in a pathname if you wish the files saved somewhere else. But in general *WEED* will save files to the local directory. Data extracted from a SEED volume using *WEED* will always go to the current working directory.

## Example

The steps in this example are taken with the assumption that you have downloaded the WEED executable and set the WEED_HOME variable properly. Let's generate a BREQ_FAST request for data from the stations/networks ANMO/IRIS, ATD/ GEOSCOPE and KEG/MEDNET; for events in January 1993 that are of a magnitude 5.5 or greater at a depth of 100 Km or less.

**Step 1**: Run WEED. When you start WEED you will get a large window with several sections defined. If you have your WEED_HOME set up properly you should see your WEED_HOME directory's contents in each section's file window.

**Step 2**: Create a station file. The three stations we have selected for this example are from three different networks so we will need to make 3 files for our request. To do this we need to cd to the stations directory in the Station Files section (double click) and then select our first station's network file - for ANMO it will be IRIS.stations. We need to save the information about ANMO to a new file. Select the line about ANMO and choose SAVE AS from the bottom of the screen and name this file ANMO (the .stations extension is added automatically). (Notice that the EDIT button is not highlighted if more than one file is selected.) Do the same for ATD from G.stations (GEOSCOPE) and KEG from MN.stations (MEDNET). If you don't know what the network abbreviations are you can check the file: `http://www.iris.washington.edu/FDSN/networks.txt` You should now have three files saved to your stations directory: ANMO.stations, ATD.stations and KEG.stations.

**Step 3**: Choose an events file. In the Event Files section, cd to the events directory and then to the events.1993 directory and select the 1993.Jan.events file. We could edit this file if we wanted but we don't need to because we will set some extraction parameters later on. We could also select more than one events file.

**Step 4**: Create a phases file. Under the Data Window Definition Files section there is a button for Create/Edit Phases. When you click this a new window comes up and asks for input. For our request we

are going to define a bias for our time window that is -30 seconds before the first P-wave and 120 seconds after the first S-wave (use the right mouse button to bring up pop-up menus). We want all broadband (you can use wildcards) and one long period channel. Save this file as TUTORIAL (the .phases extension will be added automatically).

**Step 5**: Set extraction parameters. Click the Extraction Parameters button (below Create/Edit Phases) and change the magnitude minimum to 5.5 and the maximum depth to 7000 Km. There are many more parameters that can be set or you could make no changes at all (in which case you run into the problem of the possibility of HUGE summary files). There is no file to save with this step - just close the window when you are done.

**Step 6**: Make a summary file. You must have all 3 stations files, the events file, and the TUTORIAL.phases file selected (a box appears around selected files) and your parameters set before you click the Make Summary File button. Name this file TUTORIAL (the .summary extension will be added automatically) You can view this file by clicking the EDIT button next to the Summary Files section.

**Step 7**: Make a BREQ_FAST file. Select your TUTORIAL.summary file and then click the Make BREQ_FAST File button. Call this file TUTORIAL.request and hit OK. Be sure to fill in your BREQ_FAST header information accurately. You can save this info for future requests and just load it each time you are using WEED (your file will have the extension .bfast_header). Click the Generate BREQ_FAST file button and then View the results. If everything looks okay, click Mail to IRIS-DMC, Quit and Exit WEED.

You will be notified by the DMC when your request has been received and again when your data is ready. If you selected to get your data via FTP you will be notified about where and how to pick it up. Once you receive the data you are ready to take the next step:

**Step 8**: Extracting waveforms. The data volume you receive will have more data than you requested; this is because SEED volumes are blocked and your time parameters will most likely not match the exact start and end of a data block. WEED calls upon rdseed to extract the travel times. Simply select your SEED volume in the Seed Volumes section and your .summary file (the one you used to make your request) in the Summary Files section and click the Extract Data button. Select a file output format and click Extract Data. The output file will be saved to your start-up directory.

## Caveats, bugs and gotchas

It is important when creating summary files that you are aware that the combination of many events plus many stations can create a huge summary file. The event catalogs supplied with *WEED* and available via ftp from the DMC hold thousands of events. Similiarily, the station catalogs for each network can be quite large. The mechanism needs to be improved to allow the user to preview their request size.

You must have a version of *rdseed* which is compatible with *WEED* . A *rdseed* version >= 4.0 is required. *WEED* will complain if there is another version in the path.

## See Also

BREQ_FAST, *rdseed*, *evalresp*, *relish*, SEED Reference Manual

[redacted]

**Short Courses:**

- Synthetic Seismograms Using the Direct Solution Method by Phil Cummins (sponsored by IRIS DMS)
- High Resolution Seismic Reflection Techniques by Don Steeples (sponsored by PASSCAL)

**IRIS Software** (such as rdseed, pod, etc...)

**PASSCAL Software**

**Seismic Software Library** (contributed seismic tools)

**Visiting the DMC - Travel Tips**

**Acronyms Glossary**

**DMC Staff Info**

**Job Listings**

**Odds and Ends:**

- World map of **user request totals**
- Graphic of **DMC hardware configuration**
- Short list of seismololgical **terms** (ie. what do the letters in a phase name stand for and other small mysteries to the non-seismologist)

[redacted]

| IRIS | DMS | DMC | GSN | PASSCAL | FDSN | DATA | [redacted] |
|---|---|---|---|---|---|---|---|

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**webmaster@dmc.iris.washington.edu**

## FARM, the Fast Archive Recovery Method

- [Skip the intro, take me straight to the FARM Product options, please!]

The **IRIS** DMC recognizes the fact that the most interesting data, and most frequently requested, are data from Earthquakes. Most of these interesting events are larger than a magnitude of 5.5. For this reason, the **IRIS** DMC routinely pre-assembles data from earthquakes that are larger than 5.7, unless the event depth is greater than 100 km, in which case we include those down to 5.5.

A fairly thorough description of the FARM can be found in a reprint of an **IRIS** Newsletter article.

This is a very large undertaking (see below for years available). The FARM will always be six months behind real time to allow for shipment of the maximum amount of data from the Data Collection Centers.

Recoginizing the fact that most interesting seismic phases occur within 60 minutes of the P arrival, we do use a 60 minute window for the Broadband (20 samples/s) continuous, Mid, Intermediate,and Short Period (typically 80 samples/s) data which is generally triggered. Long period windows are identical to that used by the USGS for the production of the NEIC Event CDROMs. The FARM products are typically 15 - 25 Megabytes in size and can be picked up using anonymous ftp to the machine

**dmc.iris.washington.edu**

There are at least four files attached to each FARM Product.

- The **.contents** file will show you a summary of the seismograms that are contained in the product.
- The **.gif** file is a graphics image file showing the long period vertical channels for all stations contained int he FARM product.
- The **.problems** file itemizes known problems in the SEED file. It will also contain the time when the SEED volume was last built.
- The final file is the **.seed** file itself.

Normally you will see filenames such as **940106_1602.seed**. However, there is not enough disk space to keep all of the FARM products on line. For this reason you will sometimes see filenames such as **940106_1602.seed_offline**. Such SEED files have been migrated to an 8.6 terabyte mass storage system. If you click on the offline file, this will cause a migration of the file from the mass storage system to the FARM directory. If you are doing this through your INTERNET browser you will eventually see the file **940106_1602.seed_offline** disappear from the directory and a file **940106_1602.seed** appear in its place. If you are using anonymous ftp, you must ask for the offline file to be transferred to your home machine and continue to do dir or ls commands. When you see the **_offline** file disappear and the **.seed** file appear, you may then request the FARM volume.

---

**Please be aware! Some browsers require that you set your FTP option to binary transfer mode before selecting data to download. You may also have to toggle this option back to continue.**

---

You will find FARM volumes listed in directories such as:

- FARM Products 1977
- FARM Products 1978
- FARM Products 1979
- FARM Products 1980
- FARM Products 1981
- FARM Products 1982
- FARM Products 1988
- FARM Products 1989
- FARM Products 1990
- FARM Products 1991
- FARM Products 1992
- FARM Products 1993
- FARM Products 1994
- FARM Products 1995

---

## We are pleased to announce the UVFARM!!

The **Ultra and Very Long Period Data** is now accessible from the ftp directory where normal 'event-gathered' farm volumes are located. You can get directly there from the menu below. Presently (4/25/94) only files during 1992 have been produced. The generation of these is continuing.

- UVFARM Products 1992
- UVFARM Products 1993
- UVFARM Products 1994

■

[redacted] options

[redacted]

- What is [redacted]?
- View information about the 10 most recent earthquakes around the world
- Access [redacted] via the Electronic Bulletin Board.

[redacted]

| IRIS | DMS | DMC | GSN | PASSCAL | FDSN | DATA | [redacted] |
|---|---|---|---|---|---|---|---|

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[redacted]

[redacted]

IRIS DMC users have the freedom to make requests for data using a variety of tools. These include:

| (selections link to manuals) | Requests based on Station, Channel, Time | Requests based on Events | General Info |
|---|---|---|---|
| **Graphic Interface** | ***xretrieve #*** **WEB Request Form** | ***WEED*** xtract | xtract |
| **Batch / E-mail** | ***BREQ_FAST #*** | **RUMBLE** | [redacted] |
| **Text / Keyboard** | **sprout** | **sprout** | ***sprout*** |

*Italicized* words represent the recommended tool for that type of request.

# The tool of choice in this case depends on the size of your request. xretrieve is good for requesting a smaller number of stations or time windows but many users have utilities that will generate more complex requests suitable for a BREQ_FAST mailing.

Here is diagram showing the various request tools and their interaction with the database (click to enlarge). The FARM products are available through anonymous ftp to **dmc.iris.washington.edu** or through our FARM web page.

[redacted]

Most data distributed by the **IRIS** DMC is in **SEED** format.

A que of current user requests is available for easy monitoring of request status.

[redacted]

| IRIS | DMS | DMC | GSN | PASSCAL | FDSN | DATA | [redacted] |
|---|---|---|---|---|---|---|---|

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## Author

Chris Laughbon - IRIS DMC - February, 1996

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[redacted]

[redacted]

Educational links

•

Other Earth Science WWW Servers

•

The University of Washington seismo Internet surfing link

•

Federation of Digital Broad-Band Seismograph Networks (FDSN)

•

National Earthquake Information Center

•

SavvySearch, a Parallel Internet Query Engine.

•

[redacted] Magellan Search Engine

[redacted]

| IRIS | DMS | DMC | PASSCAL | GSN | FDSN | DATA | [redacted] |
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