```
2dirlist --help


2dirlist ver. 0.2  Walter Brisken <wbrisken@nrao.edu>  2016 Nov 07

Usage: /swc/difx/difx-root-18Sep10/bin/2dirlist [options] <inputFile> <outputFil
e>

Options can include:

  --help
  -h      print this useful help information and quit

Currently input files can be from Mark5 .dir file or a file list
output file from vsum or mk5bsum.
```

```
adump −h

adump: You must specify a data type (2 or 3) when using adump
adump: in a pipe (i.e. reading from stdin).  Use the −t option
adump: Fatal error interpreting command line
adump:
adump: SYNTAX:  adump [−f type] [−h] [−i inputfile] [−o outputfile] [−t type]
adump:          field1 field2 ... fieldn
adump:          The −i and −o flags are optional, and default to
adump:          stdin and stdout respectively.  The −f flag generates a
adump:          list of supported fields for type 2 and type 3 A−file
adump:          data, depending on "type".  The −t flag causes adump to
adump:          treat the input data as "type" 2 or 3 data.  The −h flag
adump:          suppresses the header lines in the output.  All flags
adump:          must precede the field specifications.
adump:

================================================

adump −−help

/swc/difx/difx−root−18Sep10/bin/adump: invalid option −− '−'
adump: Bad command−line flag
adump: Fatal error interpreting command line
adump:
adump: SYNTAX:  adump [−f type] [−h] [−i inputfile] [−o outputfile] [−t type]
adump:          field1 field2 ... fieldn
adump:          The −i and −o flags are optional, and default to
adump:          stdin and stdout respectively.  The −f flag generates a
adump:          list of supported fields for type 2 and type 3 A−file
adump:          data, depending on "type".  The −t flag causes adump to
adump:          treat the input data as "type" 2 or 3 data.  The −h flag
adump:          suppresses the header lines in the output.  All flags
adump:          must precede the field specifications.
adump:
```

```
aedit --help

/swc/difx/difx-root-18Sep10/bin/aedit: invalid option -- '-'
aedit: Unrecognized command-line flag '-?'
aedit:
aedit: SYNTAX:  aedit [-b "command string"] [-r runfile] [-x] [-f data file list
]
aedit:          Where all arguments are optional
aedit:          Note: if the -f flag appears, it must appear LAST
aedit:                if the -b flag appears, it must be the ONLY flag
aedit:
aedit: Problem parsing command line, abort
```

```
alist --help

/swc/difx/difx-root-18Sep10/bin/alist: invalid option -- '-'
alist: Bad command-line flag
alist: Fatal error interpreting command line
alist:
alist: SYNTAX:  alist [-ff] [-fr] [-o output file] [-v version] [data file list]
alist:           Where all arguments except the data file list are optional.
alist:           Note: all option flags must appear before the data file list
alist:
```

```
avgDiFX --help


avgDiFX 0.2  Walter Brisken <wbrisken@nrao.edu>  20171020

A program to average visibility data from two difx filesets

Usage: <Difx Fileset 1> <Difx Fileset 2> <Output Difx Fileset>

A file set is specified either by its .input file, or by the
portion of the .input file before ".input".

The first two filesets must exist, have identical parameters,
and should overlap in time.  The files from the first of these
will be duplicated to form the scaffold for the output fileset
```

```
bbsum --help


bbsum ver. 1.0   Walter Brisken  20111008

A program to summarize the contents of a baseband file.

Usage : /swc/difx/difx-root-18Sep10/bin/bbsum <file> <dataformat> <n> [<offset>]

  <file> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2

  <n> is the number of samples per channel to decode

  <offset> is number of bytes into file to start decoding
```

```
calcderiv --help

calcderiv  ver. 2  Walter Brisken <wbrisken@lbo.us>  20170122

Usage : calcderiv [options]  <inputfilebase1> [ <inputfilebase2> [ ... ] ]

options can include:
--verbose
-v         be a bit more verbose

--help
-h         print help information and quit

--deltaLM=<deltaLM>
           compute numeric angular derivatives using interval of <deltaLM> radia
ns
--deltaXYZ=<deltaXYZ>
           compute numeric linear derivatives using interval of <deltaXYZ> meter
s
<inputfilebaseN> is the base name of a difx fileset.
```

```
calcif2 --help

calcif2 ver. 2.5.0  Walter Brisken <wbrisken@nrao.edu>  20160226

A program to calculate a model for DiFX using a calc server.

Usage : calcif2 [options] { <calc file> | -a }

<calc file> should be a '.calc' file as generated by vex2difx.

options can include:
  --help
  -h                      Print this help and quit

  --verbose
  -v                      Be more verbose in operation

  --quiet
  -q                      Be less verbose in operation

  --force
  -f                      Force recalc

  --noaber
  -n                      Don't do aberration, etc, corrections

  --noatmos
  -A                      Don't include atmosphere in UVW calculations

  --all
  -a                      Do all calc files found

  --allow-neg-delay
  -z                      Don't zero negative delays

  --order <n>
  -o      <n>             Use <n>th order polynomial [5]

  --oversamp <m>
  -O         <m>          Oversample polynomial by factor <m> [1]

  --interval <int>
  -i         <int>        New delay poly every <int> sec. [120]

  --fit
  -F                      Fit oversampled polynomials

  --override-version      Ignore difx versions

  --server <servername>
  -s       <servername>   Use <servername> as calcserver

      By default 'localhost' will be the calcserver.  An environment
      variable CALC_SERVER can be used to override that.  The command line
      overrides all.
```

```
calcifMixed --help

usage: calcifMixed [options]
  Version $Id$

This script is intended as a replacement for calcif2 or difxcalc as invoked
via the DIFX_CALC_PROGRAM environment variable in startdifx. It will turn
adjust atmospheric corrections for stations in the noatmos list and use the
default atmosphere for the others. The resulting .im file will be labelled as
a MIXED correction. You can specify the calc files to process with either the
-j argument (job name or job.calc) or as files listed on the commandline.
Defaults are given in parentheses.

positional arguments:
  nargs

optional arguments:
  -h, --help            show this help message and exit
  -a COMMASEPLIST, --noatmos COMMASEPLIST
                        List of stations (Aa) which should have no atmospheric
                        delay
  -d COMMASEPLIST, --dry COMMASEPLIST
                        Dry component adjustment factor list, one per station
                        (1.0)
  -w COMMASEPLIST, --wet COMMASEPLIST
                        Wet component adjustment factor list, one per station
                        (1.0)
  -c STRING, --calc STRING
                        Name of the calc executable (calcif2)
  -o STRING, --options STRING
                        List of the options to pass to calc program specified
                        by -c (-v --override-version)
  -j STRING, --job STRING
                        Job name (use $job.calc) or empty for all .calc files
  -v, --verb            be chatty in our work
  -O, --override-version
                        ignored, present for compatibility only

Assuming this is in the path, "export DIFX_CALC_PROGRAM=calcifMixed.py" and
"export DIFX_CALC_OPTIONS=-v" would be sufficient to get the normal startdifx
to use this machinery on ALMA data (Aa). The -d and -w options adjust the
correction factor for the dry and wet components. Note that there are no
detailed corrections for U,V and W.
```

```
captureUDPVDIF --help


captureUDPVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20100319

A program to capture VDIF frames encapsulated in UDP frames from a network strea
m
A pure VDIF stream of packets is dumped to disk - optionally data is sniffed and
 written also.

Usage: captureUDPVDIF <VDIF input port> <VDIF output file> [skipbytesfront] [ski
pbytesback]

<VDIF input port> is the port on which the frames will be coming in over (use 12
002 for EVLA)

<VDIF output file> is the name of the VDIF file to write

[skipbytesfront=0] is the number of bytes to skip over before each frame

[skipbytesback=0] is the number of bytes to skip over after each frame

Not sure if by default the skipbytesfront/back should be zeroed?
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
checkmpifxcorr −h

[gefera −1]    INFO Initialized
[gefera −1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /−1
  hostname = gefera
  identifier = libmark6sg / −1
Usage: /swc/difx/difx−root−18Sep10/bin/checkmpifxcorr [options] <inputfilename>
...

Options can be:
  −h : print help info
  −f : print messages with level FATAL and worse
  −s : print messages with level SEVERE and worse
  −e : print messages with level ERROR and worse
  −w : print messages with level WARNING and worse [default]
  −i : print messages with level INFO and worse
  −v : print messages with level VERBOSE and worse
  −d : print messages with level DEBUG and worse

==================================================

checkmpifxcorr −−help

[gefera −1]   FATAL Cannot open file −−help − aborting!!!
[gefera −1]    INFO Initialized
[gefera −1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /−1
  hostname = gefera
  identifier = libmark6sg / −1
Config encountered inconsistent setup in config file − please check setup
```

```
cleanVDIF --help


cleanVDIF ver. 0.2  Adam Deller <adeller@nrao.edu>  20151122

A program to read a VDIF file containing excess junk and write a cleaned up repl
acement.

Usage: cleanVDIF <VDIF input file> <VDIF output file> <Mbps> [-v]

<VDIF input file> is the name of the VDIF file to read and clean

<VDIF output file> is the name of the VDIF file to write

<Mbps> is the data rate in Mbps expected for this file

[-v] verbose mode on
The input file must at least start with one valid packet
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
codifsum --help

Usage: codifsum [options] <codiffile> [<codiffile> ...]
  -s <N>                    Skip N bytes at start of file
  -v                        Summary of codiffile
  -h                        This list
```

```
compare-baselines-v6.pl -h

Unknown option: h
Uncaught exception from user code:
        Must specify alist with -a option

================================================

compare-baselines-v6.pl --help

Usage: /swc/difx/difx-root-18Sep10/bin/compare-baselines-v6.pl [options]

where the options are

  -a  input alist 1       [REQUIRED]
  -b  input alist 2       [default: alist 1]

  -x  baseline 1          [in alist 1, RECOMMENDED]
  -y  baseline 2          [in alist 2, default: baseline 1]

  -m  minimum snr cutoff  [default: 0]
  -n  maximum snr cutoff  [default: 1000000, tip: set this to remove autocorrs]

  -p  polarization 1
  -q  polarization 2

  -s  target source                           [default: all]

  -r  reverse sense of second baseline        [default: NO]
  -w  alias mbd difference into ambig window  [default: NO]

  -f  flag but display if length is different [default: NO]
  -d  skip entirely if length is different    [default: NO]

This code no longer assumes that the scan directories are named DDD-HHMM_BAND .

The flag option -f appends . if scans are equal length
                           1 if scan 1 is longer
                           2 if scan 2 is longer.

Version: 0.02
```

```
computetotals --help

computetotals  ver. 0.1  Walter Brisken <wbrisken@lbo.us>  20170413

Usage : computetotals [options] <residualdelayfile> <inputfilebase1> [ <inputfil
ebase2> [...] ]

options can include:
--help
-h         print help information and quit

<residualdelayfile> is the base name of the residual delay.

<inputfilebaseN> is the base name of a difx fileset.

All normal program output goes to stdout.

This program reads through one or more difx datasets and
evaluates delay polynomials in the .im files at times in the
residualdelafile and adds the model.

The residuals file should be a text file with N+1 columns of numbers:
Column 1 should be the MJD (including fraction) of the residual
Cols 2 to N+1 should be redidual for each antenna
```

```
CorAsc2 --help

CorAsc2 Typical usage:
    CorAsc2  xxx [...] <  $TMP/cortest  |  more
    where xxx is the record type to be printed
    (that is one of 000, 100, 101, 120, 130, etc.),
    and $TMP/cortest is an example of a correlator
    data file to be read.  Multiple types can be
    requested, and the first one can be "dbg" to
    turn on additional debugging or "xxx" to just
    get the summary of record counts.
```

```
countVDIFPackets --help


countVDIFpackets ver. 0.2  Adam Deller <adeller@nrao.edu>  20151122

A program to count the number of missing packets for a given thread

Usage: countVDIFpackets <VDIF input file> <Mbps> <theadId>

<VDIF input file> is the name of the VDIF file to read

<Mbps> is the data rate in Mbps expected for this file

<threadId> is the threadId to check for
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
cpumon --help

cpumon ver. 0.4  Walter Brisken  20150811

Usage: /swc/difx/difx-root-18Sep10/bin/cpumon [options]

options can include:
  --help
  -h         print help information and quit
```

```
diffDiFX.py --help

Usage: diffDiFX.py [options] <difx file 1> <difx file 2>

prints an error message if mean difference ever exceeds THRESHOLD, or every PRIN
TINTERVAL records if PRINTINTERVAL>0

Options:
  -h, --help            show this help message and exit
  -f FREQ, --freq=FREQ  Only look at visibilities from this FREQ index
  -b BASELINE, --baseline=BASELINE
                        Only look at visibilities from this BASELINE num
  -t THRESHOLD, --threshold=THRESHOLD
                        Display any difference that exceeds THRESHOLD percent
  -e EPSILON, --epsilon=EPSILON
                        Display any difference that exceeds allowed numerical
                        error EPSILON
  -s SKIPRECORDS, --skiprecords=SKIPRECORDS
                        Skip SKIPRECORDS records before starting comparison
  -m MAXRECORDS, --maxrecords=MAXRECORDS
                        Stop after comparing MAXRECORDS (if >0) records
  -p PRINTINTERVAL, --printinterval=PRINTINTERVAL
                        Print a summary every PRINTINTERVAL records
  -c MAXCHANNELS, --maxchannels=MAXCHANNELS
                        The length of the array that will be allocated to hold
                        vis results
  --matchheaders        On seeing a header mismatch, skip through file 2
                        looking for match
  -v, --verbose         Turn verbose printing on
  -i INPUTFILE, --inputfile=INPUTFILE
                        An input file to use as guide for number of channels
                        for each freq
```

```
difx2fits --help


difx2fits ver. 3.6.0   Walter Brisken <wbrisken@nrao.edu>

A program to convert DiFX format data to FITS-IDI

Usage : difx2fits [options] <baseFilename1> [<baseFilename2> ... ] [<outfile>]

It assumed that SWIN format visibility file(s) to be converted live
in directory <baseFilename>.difx/
It is also assumed that at least 3 additional files exist:
  <baseFilename>.input    DiFX input file
  <baseFilename>.calc     Base file for calcif
  <baseFilename>.im       Polynomial UVW and model
One other files is optionally read:
  <baseFilename>.flag     Antenna-based flagging

VLBA calibration transfer will produce 4 files:
  flag, tsys, pcal, weather
If these are present in the current directory, they will be used to
form the FL, TS, PH and WR tables

If env variable GAIN_CURVE_PATH is set, gain curves will be looked for
and turned into a GN table

The output file <outfile> will be written in FITS-IDI format nearly
identical to that made at the VLBA HW correlator.  The first two optional
files are required for full model accountability.

options can include:
  --help
  -h                  Print this help message

  --bin        <bin>
  -B           <bin>  Select on this pulsar bin number

  --difx
  -d                  Run on all .difx files in directory

  --no-model
  -n                  Don't write model (ML) table

  --dont-combine
  -1                  Don't combine jobs

  --scale <scale>
  -s      <scale>     Scale visibility data by <scale>

  --deltat <deltat>
  -t       <deltat>   Set interval (sec) in printing job matrix (default 20.0)

  --difx-tsys-interval
  -i       <interval> Set the Difx-derived tsys interval (sec) (default 30.0)

  --difx-pcal-interval
           <interval> Set the Difx-derived pcal interval (sec) (default 30.0)

  --phaseCentre <p>
  --phasecenter <p>   Create a fits file for all the <p>th phase centres (defaul
t 0)
```

```
  --keep-order
  -k                    Keep antenna order

  --ac-always
  -a                    Write standard autocorrelations into every output file

  --profilemode         Don't discard autocorrelations for pulsar bins other than
bin 0

  --skip-extra-autocorrs
                        Ignore e.g. LL autocorrs in a job with only RR cross-corrs

  --history <file>
  -H <file>             Read file <file> and populate FITS History

  --sniff-all
  -S                    Sniff all bins and centers

  --dont-sniff
  -x                    Don't produce sniffer output

  --sniff-time <t>
  -T           <t>      Sniff output on a <t> second timescale (default 30.0)

  --union
  -u                    Form union of frequency setups

  --max-jobs <max>
  -m <max>              Set maximum number of jobs to merge into one FITS file to
<max>

  --eop-merge-mode      Set the mode for merging differerent EOPs. Legal modes are
 strict (default), drop, relaxed.

  --verbose
  -v                    Be verbose.  -v -v for more!

  --override-version    Ignore difx versions

  --zero
  -0                    Don't put visibility data in FITS file

  --primary-band <pb> Add PRIBAND keyword with value <pb> to FITS file

PLEASE file all bug reports at http://svn.atnf.csiro.au/trac/difx .
Include at a minimum the output of difx2fits with extra verbosity
(that is with -v -v).  The .input, .im & .calc files may help too.
```

```
difx2mark4 --help


difx2mark4 ver. 1.5   Roger Cappallo <rjc@haystack.mit.edu>

A program to convert DiFX format data to mark4

Usage : difx2mark4 [options] <baseFilename1> [<baseFilename2> ... ]

It assumed that SWIN format visibility file(s) to be converted live
in directory <baseFilename>.difx/

It is also assumed that the following 3 additional files exist:
  <baseFilename>.input    DiFX input file
  <baseFilename>.im       Polynomial model and UVW
  <expFilename>.vex       Vex file for this expt.
where <expFilename> is <baseFilename w/o _<#> suffix

The output fileset <outfile> will be written in mark4 format similar
to that created by mark4 HW correlators.

Available options are:
  -h or --help              Print this help message

  -v or --verbose           Be verbose.  -v -v for more!

  -d or --difx              Run on all .difx files in directory

  --override-version        Ignore difx versions

  -e or --experiment-number Set the experiment number (default 1234)
                            Must be a four-digit number

  -k or --keep-order        don't sort antenna order

  -r or --raw               use raw mode - suppresses normalization

  -p or --pretend           dry run

  -b <code> <flo> <fhi>     Override freq band codes
                            (can have multiple triplets)
  -s or --scode <file>      Specify new VEX to mk4 station code mappings
                            via a file with lines of the form:   X Xx
```

```
difxcalc --help


 Program difxcalc: Calc 11 for the difx correlator.
 Send comments, suggestions, requests, etc to David.Gordon-1@nasa.gov.
 ************** 2016 July 07 Version *************

 Usage: difxcalc [options] <file1>
 or:    difxcalc [options] <file1> <file2> <file3> ...
 or:    difxcalc [options]  --all
 or:    difxcalc [options]  all
 <file1> <file2>, etc. should be .calc files.

 all or --all processes all .calc files in the working directory (2000 max).


 If the .calc file contains a spacecraft ephemeris, then difxcalc will
  switch to the near-field model.

 Options can include:
  --help
  -h                  Print this help and quit.

  -v                  Verbose: Small printout.

  -dry                DO NOT ADD dry atm delays.
                      (Default is to ADD dry atm.)

  -wet                DO NOT ADD wet atm delays.
                      (Default is to ADD wet atm.)

  -f                  Force execution, overwrite existing .im files.

  -uncorr             U,V,W: non-relativistic geometry.

  -approx             U,V,W: n-r geometry with aberration.

  -exact              U,V,W: partial derivatives (default).

  -noatmo             U,V,W: exact but no atmosphere.

  -S                  Use modified Sekido near-field model.
  -D                  Use Duev near-field model. (default)
  -R                  Use satellite ranging near-field model.

  -lt                 Solve for light travel time.
                      (Near-field mode only)

  -t <offset>         Near-field ephemeris epoch offset.
                      (in seconds, Real or Integer)
```

```
difxcalculator --help


difxcalculator ver. 0.3  Walter Brisken <wbrisken@nrao.edu>  20130508

A program to calculate software correlator resource usage.
This is based on Adam Deller's difx_calculator.xls .

Usage: difxcalculator [options] <input file base name> [<speedUp factor>]

<input file base name> is the prefix of the difx .input file
        to study.  Files ending in .input and .calc are needed.

<speedUp factor> is a floating point number which is the ratio
        of correlation speed to observation speed.

options can include:
  --help
  -h        print help info and quit.
```

```
difxcopy --help


difxcopy ver. 0.4  Walter Brisken 20150126

A program to copy DiFX input (and other) files to a different directory,
properly modifying the path of references to other files in the process.
This program is typically run by difxqueue.

Usage: /swc/difx/difx-root-18Sep10/bin/difxcopy [options] <jobPrefix1> [<jobPref
ix2> [ ... ] ] <destDirectory>

options can include

  --help
  -h         print this help information and quit

  --verbose
  -v         be more verbose in operation

jobPrefixN is the prefix of a job name, e.g., mt911_03 would be
  the prefix for files mt911_03.input and mt911_03.calc.

destDir is the destination directory for the copy.


Files with the following suffixes will be copied:
  input calc flag
```

```
difxdiagnosticmon --help


difxdiagnosticmon ver 0.4  20151122

Program to print multicast diagnostic data from mpifxcorr.

Usage: /swc/difx/difx-root-18Sep10/bin/difxdiagnosticmon [options]

options can include:
  --help
  -h        print help information and quit
```

```
difxlog --help


difxlog ver. 0.6  Walter Brisken 20111227

A program to collect multi-cast alert messages for a particular job and
write them to a file.

Usage: /swc/difx/difx-root-18Sep10/bin/difxlog <identity> <outfile> [<logLevel>
[<pidWatch>] ]

<identity> is the identifier for a job -- usually the job prefix.
Specifically, this is compared to the identity field of the DifxMessage
that is received.

<outfile> is the name of the output file containing the log info.

<logLevel> specifies how much data to collect [default is 4]. Messages
with severity less than or equal to this are saved.  See the list of severity
levels below.

<pidWatch> specifies the pid of the mpifxcorr process to watch.  This
program will quit automatically when this pid is no longer running.

Alert severity levels are as follows:
  0 = Fatal
  1 = Severe
  2 = Error
  3 = Warning
  4 = Informative
  5 = Verbose
  6 = Debug
```

```
difxspeed --help


difxspeed ver. 0.5  Walter Brisken <wbrisken@nrao.edu>  20180908

Usage: /swc/difx/difx-root-18Sep10/bin/difxspeed <benchmarkFile> [<numIterations
>]

Where:
  <benchmarkFile> describes the series of benchmarks to run.
                  (must end in .difxspeed)

  <numIterations> is the number of times to run the test.

See https://www.atnf.csiro.au/vlbi/dokuwiki/doku.php/difx/difxspeed for
more information.
```

```
difxwatch --help

Usage: difxwatch   $Revision: 8421 $  Helge Rottmann <rottmann@mpifr-bonn.mpg.de
> (last changes by $Author: WalterBrisken $)
A watchdog program to monitor progress of difx jobs and to automatically kill ha
nging jobs.
A job that has not made any progress for more than 300s (default can be override
n; see -i option below)
is assumed to be hanging and will be ended. In addition any associated difxlog
will also be stopped. Difxwatch parses multicast state messages to determine sta
rt
and progress of difx jobs.
Output is written to /tmp/difxwatch.log

Usage: difxwatch [options]

NOTE: difxwatch requires DIFXMESSAGE_GROUP and DIFXMESSAGE_PORT environment vari
ables to be defined

Options:
  --version             show program's version number and exit
  -h, --help            show this help message and exit
  -i MAXIDLESEC, --idle-time=MAXIDLESEC
                        Maximum number of seconds a job is allowed to be idle
                        before it will be killed.
```

```
directory2filelist --help


directory2filelist ver. 1.4   Helge Rottmann  2015 May 21

Creates a filelist to be used by vex2difx using all the files present in the giv
en directory
Can handle VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : /swc/difx/difx-root-18Sep10/bin/directory2filelist <directory> <dataform
at> [<refMJD>]

  <directory> is the name of the input directory

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2

  [<refMJD>]  changes the reference MJD (default is 58373)
```

```
drivepolconvert.py --help

usage: drivepolconvert.py [options] [input_file [...]]
  Version$Id: drivepolconvert.py 8403 2018-08-24 17:54:50Z GeoffreyCrew $

Normally CASA is intended to be run interactively, and that requires the user
to be familiar with its quirks. This script generates the appropriate (Python)
commands that could be typed into an interactive session, or for the more
likely use case, piped into CASA for the desired work. If CASA is not found in
your path, you must supply it via the environment variable DIFXCASAPATH (which
is used to build these tools and hence is probably set in your DiFX setup).

positional arguments:
  nargs                 List of DiFX input job files

optional arguments:
  -h, --help            show this help message and exit
  -v, --verbose         be chatty about the work
  -p, --prep            run prepolconvert.py on the same joblist--generally
                        not a good idea unless you are certain it will work
  -r, --run             execute CASA with the generated input
  -l STRING, --label STRING
                        prefix to the QA2 polconvert calibration directories.
                        The exact names despend on the QA2 version (see -q
                        option).
  -P INT, --parallel INT
                        Number of CASA jobs to run in parallel. The best value
                        depends on the number of physical cores and the memory
                        available. 0 reverts to the non-parallel execution
                        logic; 1 should provide similar results, >1 should
                        simply be that much faster.
  -i FILE, --input FILE
                        name of input file that will be created for CASA.
  -o FILE, --output FILE
                        name of output file to collect CASA output chatter.
  -e STRING, --exp STRING
                        VEX experiment name, prefix of job input files; it
                        will be derived from the list of jobs if not supplied
  -a INT, --ant INT     1-based index of linear (ALMA) antenna (normally 1)
  -x STRING, --xyadd STRING
                        user supplied XY angle adjustment or empty for
                        defaults, normally 180.0 or 0.0
  -q STRING, --qa2 STRING
                        table naming scheme for the QA2 tables; there should
                        be eight tables for antennas, appphase, dterms,
                        bandpass, ampgains, phasegains and xy phase and xy
                        gains. Options are "v0" .. "v11" or a comma-sep list
                        in an environment variable QA2TABLES. In versions
                        prior to v4, ".concatenated.ms" was part of the label.
                        For v4-v11 and subsequent the label is just the uid
                        name (and/or other identifiers). The default is "v8".
                        Examine the script for the details....
  -E FLOAT, --avgtime FLOAT
                        If >0 this will time-average the gains to reduce noise
  -y CHAR, --gainmeth CHAR
                        Specify the gain method to use on all calibration
                        tables except ones with "XY0", "bandpass" or "Gxyamp"
                        in name; "T" combines the gains, "G" retains
                        separation of X and Y.
  -d, --noDterm         disable use of Dterm calibration tables
  -A AMPNRM, --ampNorm AMPNRM
                        set the DPFU in ANTAB or <=0 to apply it (0)
```

```
  -G LIST, --gainDel LIST
                        comma-sep list of gain tables to delete:
                        del(gains[x])will be applied for every x in the list
                        AFTER checks forexistence of tables has been carried
                        out
  -s INT, --spw INT     Index of SPW for PolConvert to use: 0,1,2,3 for the
                        four basebands, or -1 (default) for PolConvert to
                        select
  -f INT, --fringe INT  Activate plotting diagnostics during conversion with
                        the number of IFs (channels) to produce fringe
                        diagnostics on. The default is 4. Sensible values are
                        1 (a middle channel), N for that many channels spread
                        through the IF range, or 0 for off.
  -m INT, --remote INT  Index of remote antenna on baseline to converted
                        antenna. The default is -1 (disabled). The vex file
                        will be searchedfor the appropriate indices based on
                        the site list, see -S.This value may be used only if
                        there are issues...
  -S LIST, --sites LIST
                        comma-sep list of 2-letter station codes to try (in
                        order) to use for plot diagnostics
  -X INT, --npix INT    The number of pixels to show in the fringe plots (50)
  -T, --test            Turns off processing of files, just does plotting
  -z, --zmchk           the default (False) assumes that a PolConvert fix (to
                        not crash if the IFs mentioned cannot be converted);
                        set this to recover the original behavior which
                        protects PolConvert.
```

In the typical use case, you would first unpack the QA2 tarball and then process some number of similar jobs first with prepolconvert.py, then with drivepolconvert.py, and finally difx2mark4 and/or difx2fits. If you want to adjust the CASA invocation beyond what the script provides, edit the output file and then run it manually using the instructions provided. In normal usage, you only need to supply the list of jobs and the label (-l). Diagnostic plots of per-IF fringes is controlled with the -f option; if used -m, -S, -X and -T become relevant. In particular, with -T, no conversion is written to disk, but all of the diagnostic plots are made and saved. Parallelization is possible with the -P option. In the event of problematic jobs, remove them from your list and deal with them individually.

```
errormon --help

errormon ver. 0.8  Walter Brisken  20150811

Usage: /swc/difx/difx-root-18Sep10/bin/errormon [options] [<maxlevel>]

options can include:
  --help
  -h        print help information and quit

<maxlevel>  is the max alert error level to print.  The levels are:
    0 = FATAL
    1 = SEVERE
    2 = ERROR
    3 = WARNING
    4 = INFO
    5 = VERBOSE
    6 = DEBUG
    7 = IGNORE
```

```
errormon2 --help

errormon2 ver. 0.7  Walter Brisken + ?  20150811

Usage: /swc/difx/difx-root-18Sep10/bin/errormon2 [options] [<maxlevel>]

options can include:
  --help
  -h        print help information and quit

  --split
  -s        split messages into separate log files
            based on the ID/experiment code

<maxlevel>  is the max alert error level to print

Levels are: 0=fatal, 1=severe, 2=error, 3=warning, 4=info, 5=verbose, 6=debug
```

```
est_manual_phases.py --help

usage: est_manual_phases.py [options]
  Version $Id: est_manual_phases.py.in 1940 2017-08-03 15:13:11Z gbc $

This script is designed to create a fourfit control file from one bright
fringe. The defaults are appropriate for the EHT mixed-pol ALMA case where
there are strong XL and XR fringes which allow the phase offset for the
reference station to be measured. The script is intended to be adaptable to
other applications.

optional arguments:
  -h, --help            show this help message and exit

required options:
  -c FILE, --control FILE
                        Name of fourfit control file to create/update.
                        Variations of the name will be used and created in the
                        process; see the --tidy option
  -r FILE, --rootfile FILE
                        Fourfit root file for fringe-finder scan to work with

flag options:
  -v, --verbose         Provide more verbosity about activities
  -n, --nuke            Nuke existing control file and start from scratch
  -X, --mixed           Fall back on the LMT/ALMA mixed first strategy

debugging options:
  -d, --dry             Dry run mode: show the commands, but do no work.
  -p, --prune           Just prune an existing control file that was created
                        by a similar process
  -x, --defaults        Print out the defaults and exit.

tuning options:
  -s LIST, --sites LIST
                        Comma separated list of stations to process
  -q LIST, --sequence LIST
                        Sequence of est_pc_manual directives
  -m INT, --max INT     Maximum number of iterations of -q sequence
  -t FLOAT, --tolerance FLOAT
                        Continue until sbd/mbd are smaller than this
  -a, --additional      If set, just do the phase/delay on the site list.
  arguments             Any remaining command-line arguments are treated as
                        control file global directives. Comments may be
                        included: * starts a comment and @ is translated into
                        a newline

Typical usage requires just the name of the control file to build and the root
file to use: est_manual_phases.py -r 3597/No0049/3C279.zlwmcz -c sample.conf
```

```
extractSingleVDIFThread --help


extractSingleVDIFThead ver. 0.1  Adam Deller <adeller@nrao.edu>  20100217

A program to insert dummy packets for any missing VDIF packets

Usage: extractSingleVDIFThead <VDIF input file> <VDIF output file> <Mbps> <threa
dId>

<VDIF input file> is the name of the VDIF file to read

<VDIF output file> is the name of the VDIF file to write

<Mbps> is the data rate in Mbps expected for this file

<threadId> is the threadId to extract and write
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
fakemultiVDIF --help


fakemultiVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20120102

A program to turn a single thread VDIF file into a fake multithread file

Usage: fakemultiVDIF <VDIF input file> <VDIF output file> <Mbps> [-v]

<VDIF input file> is the name of the single thread VDIF file to read

<VDIF output file> is the name of the fake multithread VDIF file to write

<Mbps> is the data rate in Mbps expected for this input file

[-v] verbose mode on
The input file must at least start with one valid packet
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
REMEMBER! The input file must be single thread!
```

```
filterDifx2Fits --help

Usage: filterDifx2Fits [options] <outname> <baseFilename1> [<baseFilename2> ...
]


A program to allow filtering of scans to be used for running difx2fits.
Scans can be filtered by: timerange, source and mode (see below).
Addtional difx2fits options can be passed with -d (see below)

 This program produces a bash script (<outname>.difx2fits) to execute difx2fits.
 The fits file produced by the script will be named <outname>.fits

<outname> : base name for the output files <outname>.difx2fits and <outname>.fit
s)
<baseFileNameN> : name of the .difx output directories to consider.
        Can contain wildcards (e.g. r1111_*)


Options:
  --version             show program's version number and exit
  -h, --help            show this help message and exit
  -m MODE, --mode=MODE  select mode to be included in FITS file. Must match
                        vex mode.
  -t TIMERANGE, --timerange=TIMERANGE
                        select timerange (start-stop) in the vex-format, e.g.
                        2014y293d17h00m00s-2014y293d18h45m00s. Multiple
                        timeranges can be separated by comma.
  -s SOURCE, --source=SOURCE
                        select sources to be included in the fits file.
                        Multiple sources can be separated by comma
  -d D2FOPTIONS, --difx2fits=D2FOPTIONS
                        specify extra options to be passed to difx2fits. Note:
                        when supplying multiple options these must be
                        surrounded with quotes, e.g. -d "--zero -v" .
```

```
filterVDIF --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
filterVDIF ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  20150709

A utility to extract specfied threads from a VDIF file.

Usage: /swc/difx/difx-root-18Sep10/bin/filterVDIF <VDIF input file> <VDIF output
 file> <threadids>

<VDIF input file> is the name of the VDIF file to read

<VDIF output file> is the name of the VDIF file to write

<threadids> is a comma separated list of thread ids to copy

Note: this currently assumes no interloper bytes and that all frames are the sam
e size
```

```
fixmark5b --help

Usage: fixmark5b <m5b file> <frames per second> <read size> <output file> [<star
t frame>]
```

```
fourfit --help

/swc/difx/difx-root-18Sep10/bin/fourfit: invalid option -- '-'
fourfit:
fourfit: SYNTAX:  fourfit [-a] [-b BB:F] [-c controlfile] [-d display device]
fourfit:             [-f value] [-m value] [-n value] [-p] [-r afile] [-s naps]
fourfit:             [-tux] [-P polar_pair] [-T trefoffs] [-X] data file list
fourfit:             [set <control file syntax statements>]
fourfit:          Where all arguments except the data file list are optional.
fourfit:          The [-r afile] option replaces the data file list, however.
fourfit:          The "set" argument and the commands which follow it must
fourfit:          come last.  All option flags must appear before the data file
fourfit:          list.  Option flags can come in any order.
fourfit:
fourfit:     Here are examples of command-line invocations of fourfit, with
fourfit:     an explanation of what they do:
fourfit:
fourfit: fourfit -pt -c control 101-0620/3C279.051V4B
fourfit:          Test mode, steps through all baselines polarizations for
fourfit:          this scan.  Without the -pt, the fringes would just be
fourfit:          written in individual files in 101-0620, with one file
fourfit:          per baseline-pol-frequencygroup type.
fourfit:
fourfit: fourfit -txas -m 1 -c control 018-234505 set mb_win -0.0034 .004 freqs
a b
fourfit:          Test mode, xwindow display, accounting switched on, cross
fourfit:          power spectrum plot switched on, moderately verbose, use
fourfit:          control file named "control" in current working directory,
fourfit:          process all data in scan directory 018-234505, override
fourfit:          multiband delay search window and select channels 'a' and
fourfit:          'b' only.
fourfit:
fourfit: fourfit -r refr_list -c control -d hardcopy -b AT:S
fourfit:          Process all data referenced by type 2 lines in the A-file
fourfit:          named "refr_list", use control file "control", print the
fourfit:          fringe plot on the default printer, process only baseline
fourfit:          AT frequency subgroup S.
fourfit:
fourfit: Fatal error interpreting command line arguments
```

```
fourmer --help

Usage: /swc/difx/difx-root-18Sep10/bin/fourmer <file A> <file B>
 or    /swc/difx/difx-root-18Sep10/bin/fourmer <file A> <file B> <msglev>
```

```
fourphase_original --help

Usage:
 fourphase [options] <stations> <root_filename>
 e.g.: fourphase GKE -c ../cf_3419 3C279.xyzzys

Options:
  -h, --help            show this help message and exit
  -c CFILE, --controlfile=CFILE
                        control-file name
  -o OFILE, --outputfile=OFILE
                        output-file name, overrides default of I appended to
                        control-file name
  -p, --plot            display ff plots (false)
  -t, --test            test mode with pre-existing file (false)
  -v, --verbose         verbose mode (false)
  -i, --ion_original    use original cf iono. model (false)
```

```
fplot −h

fplot: No valid type−2 files found/specified
fplot:
fplot: SYNTAX:    fplot [−x] [−d template] [−h] [−l] [−m level] [data file list]
fplot:                All option flags must appear before the data file list.
fplot:                The −x, −d, −h and −l flags are mutually exclusive, and
fplot:                enable xwindow display, diskfile, and hardcopy and
fplot:                line printer display mechinisms respectively.  The default
fplot:                is to display the plots with gs according to the GS_DEVICE
fplot:                environment variable.
fplot:

==================================================

fplot −−help

/swc/difx/difx−root−18Sep10/bin/fplot: invalid option −− '−'
/swc/difx/difx−root−18Sep10/bin/fplot: invalid option −− 'e'
/swc/difx/difx−root−18Sep10/bin/fplot: invalid option −− 'p'
fplot: Fatal error interpreting command line
fplot:
fplot: SYNTAX:    fplot [−x] [−d template] [−h] [−l] [−m level] [data file list]
fplot:                All option flags must appear before the data file list.
fplot:                The −x, −d, −h and −l flags are mutually exclusive, and
fplot:                enable xwindow display, diskfile, and hardcopy and
fplot:                line printer display mechinisms respectively.  The default
fplot:                is to display the plots with gs according to the GS_DEVICE
fplot:                environment variable.
fplot:
```

```
fringeFindDiFX.py --help

Usage: fringeFindDiFX.py [options] <difx file 1>

Searches for fringes in DiFX output files

Options:
  -h, --help            show this help message and exit
  -f targetfreq, --freq=targetfreq
                        Only display visibilities from this frequency index
  -b targetbaseline, --baseline=targetbaseline
                        Only display visibilities from this baseline num
  -c MAXCHANNELS, --maxchannels=MAXCHANNELS
                        The length of the array that will be allocated to hold
                        vis results
  -v, --verbose         Turn verbose printing on
  -i INPUTFILE, --inputfile=INPUTFILE
                        An input file to use as guide for number of channels
                        for each freq
  -Z, --nozero          Do not show visibilities on zero-baselines (e.g.,
                        exclude cross-pol autocorrs)
  -z, --zero            Show only visibilities on zero-baselines (e.g., cross-
                        pol autocorrs)
  --minsnr=MINSNR       Minimum S/N to print detection
```

```
fringex -h

/swc/difx/difx-root-18Sep10/bin/fringex: invalid option -- 'h'
fringex:
fringex: SYNTAX: fringex [-abcoqv] [-i iarg] [-f freq] [-d rdarg]
fringex:                 [-p ra,dec] [r afile] data file list
fringex:        where all option flags are optional, and the data file
fringex:        list is mandatory in the absence of the -r flag
fringex:
fringex:        -a switches on execution time accounting
fringex:        -b specifies binary output mode (use only with "average -b")
fringex:        -c mode makes rate,delay,ra,dec offsets relative
fringex:           to corel - rather than relative to the fourfit peak
fringex:        -o includes segments shifted by half segment duration
fringex:        -q nsecs is in millisecs (special mode - times are fictitious)
fringex:        -i specifies segmentation time(s) (see detailed description)
fringex:        -f freq (MHz) redefines the frequency
fringex:           freq=-1 for reference frequency equal to channel nearest mean
fringex:           freq=-2 for reference frequency equal to mean
fringex:        -p ra,dec in arcsec are position offsets in all modes
fringex:        -d specifies rate/delay value(s) to be used (see detailed
fringex:           description
fringex:        -r afile specifies a data list in A-file format
fringex:         -v allows one to specify an output version different from the i
nput
fringex:
fringex: Fatal error interpreting command line

================================================

fringex --help

/swc/difx/difx-root-18Sep10/bin/fringex: invalid option -- '-'
/swc/difx/difx-root-18Sep10/bin/fringex: invalid option -- 'h'
/swc/difx/difx-root-18Sep10/bin/fringex: invalid option -- 'e'
/swc/difx/difx-root-18Sep10/bin/fringex: invalid option -- 'l'
/swc/difx/difx-root-18Sep10/bin/fringex: option requires an argument -- 'p'
fringex:
fringex: SYNTAX: fringex [-abcoqv] [-i iarg] [-f freq] [-d rdarg]
fringex:                 [-p ra,dec] [r afile] data file list
fringex:        where all option flags are optional, and the data file
fringex:        list is mandatory in the absence of the -r flag
fringex:
fringex:        -a switches on execution time accounting
fringex:        -b specifies binary output mode (use only with "average -b")
fringex:        -c mode makes rate,delay,ra,dec offsets relative
fringex:           to corel - rather than relative to the fourfit peak
fringex:        -o includes segments shifted by half segment duration
fringex:        -q nsecs is in millisecs (special mode - times are fictitious)
fringex:        -i specifies segmentation time(s) (see detailed description)
fringex:        -f freq (MHz) redefines the frequency
fringex:           freq=-1 for reference frequency equal to channel nearest mean
fringex:           freq=-2 for reference frequency equal to mean
fringex:        -p ra,dec in arcsec are position offsets in all modes
fringex:        -d specifies rate/delay value(s) to be used (see detailed
fringex:           description
fringex:        -r afile specifies a data list in A-file format
fringex:         -v allows one to specify an output version different from the i
nput
fringex:
fringex: Fatal error interpreting command line
```

```
fslog2difx.pl --help

^[[34m
PURPOSE
fslog2difx.pl parses field system log files to extract information needed for th
e DiFX correlator.
1) extract the modules used by the station and write them out in a format
required for the vex  section.
2) extract the filenames written on the module with their start/stop times
in MJD. These filelists can be used by vex2difx (see files parameter in the vex2
difs documentation)



USAGE:
  fslog2difx.pl logfile (process one logfile)
or
  fslog2difx.pl -a (process all logfiles in this directory)
^[[30m
```

```
fuseDBBC3 -h

fuseDBBC3 compiled for 4 VDIF input streams with 8224-byte framesize, producing
8224-byte output VDIF frames

DEBUG mode -- assuming module 0 data are under ./0/[0-15]/!
DEBUG mode -- assuming module 1 data are under ./1/[0-15]/!
DEBUG mode -- assuming module 2 data are under ./2/[0-15]/!
DEBUG mode -- assuming module 3 data are under ./3/[0-15]/!
Mark6 SG file list assembly: glob() error: ./0: No such file or directory
Mark6 SG file list assembly: './0/[0-15]//*': no match of pattern
Mark6 SG file list assembly: glob() error: ./1: No such file or directory
Mark6 SG file list assembly: './1/[0-15]//*': no match of pattern
Mark6 SG file list assembly: glob() error: ./2: No such file or directory
Mark6 SG file list assembly: './2/[0-15]//*': no match of pattern
Mark6 SG file list assembly: glob() error: ./3: No such file or directory
Mark6 SG file list assembly: './3/[0-15]//*': no match of pattern
extra fuse args: /swc/difx/difx-root-18Sep10/bin/fuseDBBC3
extra fuse args: -f
extra fuse args: -s
extra fuse args: -odirect_io
extra fuse args: -ofsname=dbbc3fs6
extra fuse args: -h
usage: /swc/difx/difx-root-18Sep10/bin/fuseDBBC3 mountpoint [options]

general options:
    -o opt,[opt...]        mount options
    -h   --help            print help
    -V   --version         print version

FUSE options:
    -d   -o debug          enable debug output (implies -f)
    -f                     foreground operation
    -s                     disable multi-threaded operation

    -o allow_other         allow access to other users
    -o allow_root          allow access to root
    -o auto_unmount        auto unmount on process termination
    -o nonempty            allow mounts over non-empty file/dir
    -o default_permissions enable permission checking by kernel
    -o fsname=NAME         set filesystem name
    -o subtype=NAME        set filesystem type
    -o large_read          issue large read requests (2.4 only)
    -o max_read=N          set maximum size of read requests

    -o hard_remove         immediate removal (don't hide files)
    -o use_ino             let filesystem set inode numbers
    -o readdir_ino         try to fill in d_ino in readdir
    -o direct_io           use direct I/O
    -o kernel_cache        cache files in kernel
    -o [no]auto_cache      enable caching based on modification times (off)
    -o umask=M             set file permissions (octal)
    -o uid=N               set file owner
    -o gid=N               set file group
    -o entry_timeout=T     cache timeout for names (1.0s)
    -o negative_timeout=T  cache timeout for deleted names (0.0s)
    -o attr_timeout=T      cache timeout for attributes (1.0s)
    -o ac_attr_timeout=T   auto cache timeout for attributes (attr_timeout)
    -o noforget            never forget cached inodes
    -o remember=T          remember cached inodes for T seconds (0s)
    -o nopath              don't supply path if not necessary
    -o intr                allow requests to be interrupted
```

```
    -o intr_signal=NUM     signal to send on interrupt (10)
    -o modules=M1[:M2...]  names of modules to push onto filesystem stack

    -o max_write=N         set maximum size of write requests
    -o max_readahead=N     set maximum readahead
    -o max_background=N    set number of maximum background requests
    -o congestion_threshold=N  set kernel's congestion threshold
    -o async_read          perform reads asynchronously (default)
    -o sync_read           perform reads synchronously
    -o atomic_o_trunc      enable atomic open+truncate support
    -o big_writes          enable larger than 4kB writes
    -o no_remote_lock      disable remote file locking
    -o no_remote_flock     disable remote file locking (BSD)
    -o no_remote_posix_lock disable remove file locking (POSIX)
    -o [no_]splice_write   use splice to write to the fuse device
    -o [no_]splice_move    move data while splicing to the fuse device
    -o [no_]splice_read    use splice to read from the fuse device

Module options:

[iconv]
    -o from_code=CHARSET   original encoding of file names (default: UTF-8)
    -o to_code=CHARSET      new encoding of the file names (default: UTF-8)

[subdir]
    -o subdir=DIR           prepend this directory to all paths (mandatory)
    -o [no]rellinks         transform absolute symlinks to relative
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1

================================================

fuseDBBC3 --help

fuseDBBC3 compiled for 4 VDIF input streams with 8224-byte framesize, producing
8224-byte output VDIF frames

DEBUG mode -- assuming module 0 data are under ./0/[0-15]/!
DEBUG mode -- assuming module 1 data are under ./1/[0-15]/!
DEBUG mode -- assuming module 2 data are under ./2/[0-15]/!
DEBUG mode -- assuming module 3 data are under ./3/[0-15]/!
Mark6 SG file list assembly: glob() error: ./0: No such file or directory
Mark6 SG file list assembly: './0/[0-15]//*': no match of pattern
Mark6 SG file list assembly: glob() error: ./1: No such file or directory
Mark6 SG file list assembly: './1/[0-15]//*': no match of pattern
Mark6 SG file list assembly: glob() error: ./2: No such file or directory
Mark6 SG file list assembly: './2/[0-15]//*': no match of pattern
Mark6 SG file list assembly: glob() error: ./3: No such file or directory
Mark6 SG file list assembly: './3/[0-15]//*': no match of pattern
extra fuse args: /swc/difx/difx-root-18Sep10/bin/fuseDBBC3
extra fuse args: -f
extra fuse args: -s
extra fuse args: -odirect_io
extra fuse args: -ofsname=dbbc3fs6
extra fuse args: --help
usage: /swc/difx/difx-root-18Sep10/bin/fuseDBBC3 mountpoint [options]

general options:
```

```
    -o opt,[opt...]        mount options
    -h   --help            print help
    -V   --version         print version

FUSE options:
    -d   -o debug          enable debug output (implies -f)
    -f                     foreground operation
    -s                     disable multi-threaded operation

    -o allow_other         allow access to other users
    -o allow_root          allow access to root
    -o auto_unmount        auto unmount on process termination
    -o nonempty            allow mounts over non-empty file/dir
    -o default_permissions enable permission checking by kernel
    -o fsname=NAME         set filesystem name
    -o subtype=NAME        set filesystem type
    -o large_read          issue large read requests (2.4 only)
    -o max_read=N          set maximum size of read requests

    -o hard_remove         immediate removal (don't hide files)
    -o use_ino             let filesystem set inode numbers
    -o readdir_ino         try to fill in d_ino in readdir
    -o direct_io           use direct I/O
    -o kernel_cache        cache files in kernel
    -o [no]auto_cache      enable caching based on modification times (off)
    -o umask=M             set file permissions (octal)
    -o uid=N               set file owner
    -o gid=N               set file group
    -o entry_timeout=T     cache timeout for names (1.0s)
    -o negative_timeout=T  cache timeout for deleted names (0.0s)
    -o attr_timeout=T      cache timeout for attributes (1.0s)
    -o ac_attr_timeout=T   auto cache timeout for attributes (attr_timeout)
    -o noforget            never forget cached inodes
    -o remember=T          remember cached inodes for T seconds (0s)
    -o nopath              don't supply path if not necessary
    -o intr                allow requests to be interrupted
    -o intr_signal=NUM     signal to send on interrupt (10)
    -o modules=M1[:M2...]  names of modules to push onto filesystem stack

    -o max_write=N         set maximum size of write requests
    -o max_readahead=N     set maximum readahead
    -o max_background=N    set number of maximum background requests
    -o congestion_threshold=N  set kernel's congestion threshold
    -o async_read          perform reads asynchronously (default)
    -o sync_read           perform reads synchronously
    -o atomic_o_trunc      enable atomic open+truncate support
    -o big_writes          enable larger than 4kB writes
    -o no_remote_lock      disable remote file locking
    -o no_remote_flock     disable remote file locking (BSD)
    -o no_remote_posix_lock disable remove file locking (POSIX)
    -o [no_]splice_write   use splice to write to the fuse device
    -o [no_]splice_move    move data while splicing to the fuse device
    -o [no_]splice_read    use splice to read from the fuse device

Module options:

[iconv]
    -o from_code=CHARSET   original encoding of file names (default: UTF-8)
    -o to_code=CHARSET      new encoding of the file names (default: UTF-8)

[subdir]
    -o subdir=DIR           prepend this directory to all paths (mandatory)
```

```
    -o [no]rellinks         transform absolute symlinks to relative
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
fuseMk6 --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1

Mark6 Scatter-Gather data interpretation layer   v1.13  Jan Wagner 15032016

Usage: fuseMk6 [-v] [-r "pattern"] <mountpoint>

Presents Mark6 scatter-gather mode (SG) recordings as single files.
The SG disks are assumed to be already mounted (/mnt/disks/[1-4]/[0-7]/)

The Mark6 SG recording mode stripes data of a VLBI recording across multiple
files, each of them generally placed on its own disk or file system.
These SG files contain metadata and the actual VLBI data striped out in a
somewhat random time order. The fuseMk6 layer uses the 'libmark6sg' library
to hide the SG striping and metadata.

Options:
   -v    verbose mode (puts fuseMk6 into 'foreground' mode),
         repeat to increase verbosity
   -r    set root pattern (default: "/mnt/disks/[1-4]/[0-7]/")
```

```
genmachines --help

Usage: genmachines [options] [<input1> [<input2>] ...]

<input> is a DiFX .input file.
A program to find required Mark5 modules and write the machines file
appropriate for a particular DiFX job.

Note: genmachines respects the following environment variables:
DIFX_MACHINES: required, unless -m option is given. -m overrides DIFX_MACHINES.
DIFX_GROUP: if not defined a default of 224.2.2.1 will be used.
DIFX_PORT: if not defined a default of 50200 will be used.
See http://cira.ivec.org/dokuwiki/doku.php/difx/clusterdef for documentation on
the machines file format

Options:
  --version             show program's version number and exit
  -h, --help            show this help message and exit
  -v, --verbose         increase verbosity level
  -m MACHINESFILE, --machines=MACHINESFILE
                        use MACHINESFILE instead of $DIFX_MACHINES
  -n, --nothreads       don't write a .threads file
  -d, --difxdb          use difxdb to obtain data location
  --ignore-incomplete-module
                        Proceed even when Mark6 modules are found to be
                        incomplete.
```

```
geteop.pl --help

------------------------------------------------------------------------
 Script to obtain EOP values from this URL:
 http://gemini.gsfc.nasa.gov/solve_save/usno_finals.erp
 The EOPS are reformated to a format that can be used in the vex file
------------------------------------------------------------------------

Usage: /swc/difx/difx-root-18Sep10/bin/geteop.pl yyyy-doy numEOP [EOPsuffix]

yyyy-doy: the year and day-of-year of the first EOP value to obtain
numEOP:  the number of EOPs to get
if provided, EOPsuffix will be appended to the EOP def name.
output will be written to EOP.txt

------------------------------------------------------------------------
```

```
getsmart --help


getsmart ver. 0.1  20110723  Walter Brisken

A program to request mk5daemon to send smart data from a Mark5 unit.

Usage: getsmart [options] <unit>

options can include:

  -h or --help
          print this usage info and exit

  -v or --verbose
          be more verbose

  -q or --quiet
          be quieter

<unit> is the name or number of the mark5 unit to probe

Environment variables DIFX_MESSAGE_GROUP and DIFX_MESSAGE_PORT
can be used to override the default group/port of 224.2.2.1/50200
```

```
hops.bash --help

Usage: . /swc/difx/difx-root-18Sep10/bin/hops.bash

will set up your HOPS environment by modifying the following variables:

    PATH            executable search path
    INFOPATH        info file search path
    LD_LIBRARY_PATH adds dynamic linkage to PGPLOT_DIR
    PYTHONPATH      for a few useful python tools

    HOPS_ROOT       root of the HOPS package
    HOPS_VERS       version number of this package
    HOPS_ARCH       installation architecture
    HOPS_DOCS       program documentation support
    HOPS_SETUP      is set true after invocation
    HOPS_QUIET      controls setup diagnostics
    HOPS_PREFIX     directory where hops was installed

    PGPLOT_DIR      sets this appropriately if not otherwise defined
    PGPLOT_TYPE     sets this to /xw if not defined
    PGPLOT_DEV      sets this to /xw if not defined
    PROGDOC         used by HOPS vhelp to find help texts
    TEXT            used by HOPS for text configuration files
    AHELP           used by aedit for help texts
    DEF_CONTROL     used by fourfit
    GS_DEVICE       used by ghostscript
    DATADIR         parent of experiment data directory
    TESTDATADIR     directory for hops test data

    SCHEDDIR, AFILEDIR, SYSVEX, TASK, BIN, TMP
                    heritage variables that are
                    assigned but perhaps not used

    MK4_PRINTER     can be pointed to your preferred printer

Set HOPS_QUIET (to anything) if you do not want the chatter.
Once setup, HOPS_SETUP is defined to be "true".  You can set this
to "false" to reinitialize with a different version of the software,
e.g. something like one of these (depending on which hops.bash)

    HOPS_SETUP=false . ~/bin/hops.bash
    HOPS_SETUP=false . /swc/difx/difx-root-18Sep10/hops.bash

Otherwise, reinvocation will merely tell you what you are using.
To purge HOPS from your environment, set HOPS_SETUP to "purge".
```

```
hops_data_links.pl -h

Unknown option: h
Uncaught exception from user code:
        Required alist is missing:
                        (alist.out)

==================================================

hops_data_links.pl --help

Usage: /swc/difx/difx-root-18Sep10/bin/hops_data_links.pl [options]

where the options are

    -a <file>   to specify an alist file for the data to be linked
    -l <file>   is the script file to be created to make the links
    -d <dir>    destination data directory
    -s <dir>    source data directory
    -f          link only the root and fringe files
    -c          link only the root and correlation files

The alist file (-a) defaults to "alist.out"; and the source (-s) and
destination (-d) directories should not be the same.  These may be given
relative to the current directory and are automatically converted to
absolute paths for the linkages.  The current directory (.) is the default
for both, so you need to specify one of them.  "data directory" in
both cases refers to the parent of the numbered experiment directories.

If the -l option is omitted, a temporary file is used and deleted
after the links are made.  If present, a script file is created which
you can review and then run yourself.  (Use this if you are chicken.)
With the -f option the links to the correlator data and station files
are omitted.

In any case the script creates a directory hierarchy starting with
the experiment number in the destination directory with symbolic links
to files of the same name in the source data directory heirarchy.

The -f flag is useful for follow-up processing on the fringe files;
the -c flag is useful for to start over with fringe fitting.
```

```
hops_vex2ovex.py --help

usage: hops_vex2ovex.py [-h] [-k] [-c CODES] [-v] [--version] vexfile ovexfile

A script to convert a vex file to an ovex file to be used by the HOPS suite of
programs (e.g. aedit)

positional arguments:
  vexfile               the vex file to be converted to ovex
  ovexfile              the name of the output ovex file

optional arguments:
  -h, --help            show this help message and exit
  -k, --clobber         overwrite outputfile without complaint
  -c CODES, --codes CODES
                        the name of the file containing the mappings of one
                        letter to two letter station codes. For format of the
                        mapping file see below.
  -v, --verbose         chatter some more
  --version             show program's version number and exit

If no file for mapping one letter to two letter station codes is supplied (via
the -c option) random one letter codes will be created. The mapping file
should list in the first column the one letter code and in the second column
the two letter code. it must contain all two letter codes found in the vex
file
```

```
jobdisks --help


jobdisks ver. 1.1   20080114 Walter Brisken

A program to list all the modules used in a project

Usage: /swc/difx/difx-root-18Sep10/bin/jobdisks [options] [<file 1> [<file 2> ..
. ] ] ]

<file X> is either a .fx correlator job script file or a .input DiFX input
          file.  Any number of files can be listed.  If no files are listed,
          all .input files in the current directory are used.  If still no
          files are found, all the .fx files in the directory are used.

Options can include:

    -h or --help     Print this help info

    -c or --changes  Print module changes only

Example:  jobdisks

Example:  jobdisks job1420.*.input

Example:  jobdisks *.fx
```

```
joblist --help


joblist ver. 1.5   20130508 Walter Brisken

A program to list information about DiFX job files

Usage: [options] [<dir 1> [<dir 2> [ ... ] ] ]

<dir> is a directory containing .input files.  Many directories can be
      listed.  If no directory is listed, the current directory is assumed.

options can include:
   -h or --help  : print this usage information


The characters printed within [ ] indicated the following:
  c  .calc       model parameters and others
  m  .machines   MPI input file -- cluster configuration
  t  .threads    how many processing threads per core node
  i  .im         polynomials for delay, u,v,w, and atmosphere
  v  .difx/      visibilities produced by mpifxcorr
```

```
jobstatus --help


jobstatus ver. 1.1   20091204 Walter Brisken

A program to list the status of DiFX job files

Usage: [options] [<dir 1> [<dir 2> [ ... ] ] ]

<dir> is a directory containing .input files.  Many directories can be
      listed.  If no directory is listed, the current directory is assumed.

options can include:
   -h or --help  : print this usage information
```

```
killjob --help
Usage: /swc/difx/difx-root-18Sep10/bin/killjob <jobId1> [<jobId2> ... ]
<jobId#> is a DiFX job name, such as bb344a_34
```

```
listcpus --help


listcpus ver. 0.1  Walter Brisken 20160727

A program to list CPU info for SW corr machines

Usage : /swc/difx/difx-root-18Sep10/bin/listcpus [options]

options can include:

  -h or --help
         print this usage info and exit

  -v or --verbose
         increase verbosity of output

  -m <machinesfile> or --machines <machinesfile>
         use <machinesfile> instead of $DIFX_MACHINES

This program responds to the following environment variables:

DIFX_MACHINES must point to the machines file if no <machinesfile> is specifided
.
```

```
listmodules --help


listmodules ver. 0.1  Walter Brisken 20160727

A program to find required Mark5 modules and write the machines file
appropriate for a particular DiFX job.

Usage : /swc/difx/difx-root-18Sep10/bin/listmodules [options]

options can include:

  -h or --help
         print this usage info and exit

  -m <machinesfile> or --machines <machinesfile>
         use <machinesfile> instead of $DIFX_MACHINES

This program responds to the following environment variables:

DIFX_MACHINES must point to the machines file if no <machinesfile> is specifided
.
```

```
m5bstate --help


m5bstate ver. 1.3   Alessandra Bertarini  2015 May 21

A Mark5 state counter.  Can use VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : m5bstate <infile> <dataformat> <nframes> [<offset>]

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <nframes> is the number of frames to bstate-erize

  <offset> is number of bytes into file to start decoding
```

```
m5bsum --help


m5bsum ver. 0.1   Walter Brisken <wbrisken@nrao.edu>  20130817

A program to summarize contents of Mark5B files

Usage : /swc/difx/difx-root-18Sep10/bin/m5bsum [<options>] <file1> [<file2> ...]

  <fileX> is the name of the input file

  <options> can include:
    -h or --help                print this usage information and quit
    -f or --fixmjd              use today's date to resolve MJD ambiguity (defa
ult behavior)
    -r <mjd> or --refmjd <mjd>  use a specific reference date to resolve MJD am
biguity
    -s or --shortsum            print a short summary, also usable for input to
 vex2difx
```

```
m5d --help


m5d ver. 1.4   Walter Brisken  20151029

A Mark5 decoder.  Can decode VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : /swc/difx/difx-root-18Sep10/bin/m5d <file> <dataformat> <n> [<offset>]

  <file> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <n> is the number of samples per channel to decode

  <offset> is number of bytes into file to start decoding

The following options are supported

    --double    Double sideband (complex) data
                If using VDIF, specify VDIFC (complex VDIF) under dataformat

    --format=%f Format specifier for sample printout (default: %2.0f)

    --help      This list
```

```
m5fb --help


m5fb ver. 1.2   Richard Dodson  20170426

A Mark5 filterbank.  Can use VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : m5fb <infile> <dataformat> <nchan> <dint> <outfile> [<offset>]

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <nchan> is the number of channels to make per IF

  <dint> is the integration time in microseconds

  <outfile> is the name of the output file

  <offset> is number of bytes into file to start decoding



The following options are supported

    -dbbc      Assume dBBC polarisation order (all Rcp then all Lcp)

    -nopol     Do not compute cross pol terms

    -I         Compute intensity correlation

    -a         Write ascii output

    -p         String for pol terms. RLRL etc

    -i         String for IF terms. ULUL etc

    -help      This list
```

```
m5fold --help


m5fold ver. 1.6   Walter Brisken  20170422

A Mark5 power folder.  Can use VLBA, Mark3/4, Mark5B and VDIF formats using the
mark5access library.

Usage: m5fold <infile> <dataformat> <nbin> <nint> <freq> <outfile> [<offset>]

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <nbin> is the number of bins per if across 1 period
         if negative, the conversion to true power is not performed

  <nint> is the number of 10000 sample chunks to work on

  <freq> [Hz] -- the inverse of the period to be folded

  <outfile> is the name of the output file

  <offset> is number of bytes into file to start decoding

Example: look for the 80 Hz switched power:

  m5fold 2bit.data.vlba VLBA1_1-128-8-2 128 10000 80 switched_power.out

Output: A file with <nchan>+1 columns.  First column is time [s].
  Each remaining column is folded power for that baseband channel.
  If nbin is positive, the scaling is such that <v^2> = 1 yields a
  power reading of 1.0.  Optimal S/N occurs for power ~= 1.03

Note: This program is useless on 1-bit quantized data
```

```
m5pcal --help


m5pcal ver. 0.9   Walter Brisken  20170426

An offline pulse cal extractor.  Can use VLBA, Mark3/4, and Mark5B formats using
 the
mark5access library.

Usage: m5pcal [options] <infile> <dataformat> <freq1> [<freq2> ... ] <outfile>

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <freq1> ... is/are the frequencies (in MHz) relative to baseband of the first
      tone to detect; there should be one specified per baseband channel (IF)

  <outfile> is the name of the output file

Options can include:

  --verbose
  -v           Be more verbose in operation

  --quiet
  -q           Be quieter

  --help
  -h           Print this help info and quit

  --chunksize <number>
  -c <number>  Use a fixed rather than automatic chunk size (6400 in version 0.5
).

  -n <number>  Integrate over <number> chunks of data [1000]

  -N <number>  Number of outer loops to perform

  --offset <number>
  -o <number>  Jump <number> bytes into the file [0]

  --interval <number>
  -i <number>  Assume a pulse cal comb interval of <number> MHz [1]

  --edge <number>
  -e <number>  Don't use channels closer than <number> MHz to the edge in delay
calc.

Notes:

   The position of the first tone in a baseband channel (<freq1> for baseband 1,
 and so on)
   must not be larger than the tone interval (-i <number>). All tones are extrac
ted from
   each baseband channel. The tone interval is allowed to exceed the bandwidth o
f a baseband
   channel in which case <freqN> will effectively select just a single tone from
```

the baseband.

```
m5slice --help


m5slice ver. 0.2   Chris Phillips  20150312

A Mark5 slicer.  Can slice VLBA, Mark3/4, Mark5B and VDIFformats using the mark5
access library.

Usage : /swc/difx/difx-root-18Sep10/bin/m5slice <file> <dataformat> <offset> <le
ngth>

  <file> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <offset> is the offset into the file in seconds

  <length> size (in seconds) of the slice to make
```

```
m5spec --help


m5spec ver. 1.4   Walter Brisken, Chris Phillips  20170426

A Mark5 spectrometer.  Can use VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : m5spec <infile> <dataformat> <nchan> <nint> <outfile> [<offset>]

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <nchan> is the number of spectral points to make per baseband channel

  <nint> is the number of FFT frames to spectrometize

  <outfile> is the name of the output file

  <offset> is number of bytes into file to start decoding


The following options are supported

    -dbbc      Assume dBBC polarisation order (all Rcp then all Lcp)

    -nopol     Do not compute cross pol terms

    -double    Double sideband (complex) data

    -help      This list
```

```
m5subband --help


m5subband ver. 1.2   Jan Wagner  20170426

A Mark5 time domain filter. Extracts a narrow subband from a wideband recording.

Can use VLBA, Mark3/4, and Mark5B formats using the mark5access library.

Usage : m5subband [--refmjd=<n>] [--wf=Hann|cos|box] [--npts=<n>] [--trunc]
                  [--no-leading|--leading] [--no-tailing|--tailing]
                  <infile> <dataformat> <outfile> <if_nr> <qf> <f0> <f1> [<offse
t>]

Optional parameters:

  --refmjd=<n> resolve ambiguity of 3-digit MJD of Mark5B (default: 57000)
  --wf=<n> choose pre- and post-filtering window function (default: cos)
  --npts=<n> to choose number of DFT points across extractable subband (default:
 128)
  --trunc to discard incomplete frame when output file is closed, zero-pad other
wise
  --[no-]leading to discard/keep leading part of filter response, valid for qf>1
  --[no-]tailing to discard/keep tailing part of filter response, valid for qf>1

Arguments:

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <outfile> is the output VDIF file for the extracted subband

  <if_nr> is the IF to process (1 is the first recorded IF)

  <qf> is the quality factor (1 default, >=2 to reduce spectral leakage)

  <f0> is the low edge (in MHz) of the subband to filter out

  <f1> is the high edge (in MHz) of the subband to filter out

  <offset> is number of bytes into file to start decoding
```

```
m5test --help


m5test ver. 1.3   Walter Brisken  20170426

A Mark5 tester.  Can verify VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : /swc/difx/difx-root-18Sep10/bin/m5test <file> <dataformat> [<offset>] [<
report>]

  <file> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <offset> is number of bytes into file to start decoding

  <report> use 0 to report all timestamps, 1 to report once a second
```

```
m5time --help


m5time ver. 0.1   Chris Phillips  20120330

A Mark5 time decoder.  Can decode VLBA, Mark3/4, Mark5B and VDIFformats using th
e
mark5access library.

Usage : /swc/difx/difx-root-18Sep10/bin/m5time <file> <dataformat> <offset>

  <file> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <offset> is number of bytes into file to return time for
```

```
m5timeseries --help


m5timeseries ver. 0.2   Chris Phillips  20170426

A Mark5 power averager.  Can use VLBA, Mark3/4, Mark5B and VDIFformats using the
mark5access library.

Usage: m5timeseries <infile> <dataformat> <tint> <time> <outfile> [<offset>]

  <infile> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <tint> is the integration time, in millisec. Fractions allowed
  <time> The number of samples, in seconds to process

  <outfile> is the name of the output file

  <offset> is number of bytes into file to start decoding

Example: look for the 80 Hz switched power:

  m5timeseries 2bit.data.vlba VLBA1_1-128-8-2 4 2 power.out

Output: A file with <nchan>+2 columns.  First column is output line
  number (starting at 0).  Second column is time [s].
  Each remaining column is folded power for that baseband channel.
  If nbin is positive, the scaling is such that <v^2> = 1 yields a
  power reading of 1.0.  Optimal S/N occurs for power ~= 1.03

Note: This program is useless on 1-bit quantized data
```

```
m5tsys --help


m5states ver. 0.2   Walter Brisken  2011 Mar 15

A Mark5 switched power generator for VLBA, Mark3/4, and Mark5B formats using the
mark5access library.

Usage : /swc/difx/difx-root-18Sep10/bin/m5tsys <file> <dataformat> [<n>] [<offse
t>]

  <file> is the name of the input file

  <dataformat> should be of the form: <FORMAT>-<Mbps>-<nchan>-<nbit>, e.g.:
    VLBA1_2-256-8-2
    MKIV1_4-128-2-1
    Mark5B-512-16-2
    VDIF_1000-64-1-2 (here 1000 is payload size in bytes)

  <n> is the number of samples per channel to count

  <offset> is number of bytes into file to start count

If <n> is not provided or is < 0, then the whole file is processed.
```

```
m6sg_gather --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1

Mark6 SG library utility  m6sg_gather v1.0.1   Jan Wagner 20141121

Copies a single VLBI scan into a file by gathering together all the
piecewise files from several disks associated with scatter-gather
mode VLBI recording in Mark6 software.

Usage: m6sg_gather  [ --list | <scanname> <destination | - > ]

   --list         show a list of available scan names on the disks

   <scanname>     is the name of the scan on the disks, without paths
   <destination>  is the output directory or full output file name and path

The scanname will be used as the name of the output file if the specified
destination is a directory. The destination '-' outputs to stdout for piping.
```

```
m6sg_mount --help


Mark6 utility   m6sg_mount v2.1

Usage:  m6sg_mount [-u]

With the '-u' option all scatter-gather disks are unmounted.
With no options specified, all "diskpack" disks are mounted.
The main purpose of this script is to avoid having to start cplane,
then dplane, and then send the necessary da-client commands.
```

```
make_empty_binconfig.py --help

Usage: make_empty_binconfig.py [-p|--polyco <infile>] [-n|--numbins <N>]

Produces a DiFX .binconfig file with equal-weighted bins across the
entire pulse period. This is largely equivalent to running profile2binconfig.py
without specifying a profile file.

Options:
  -h, --help            show this help message and exit
  -p POLYCO, --polyco=POLYCO
                        Filename of the polyco file (a single file)
  -n NUMBINS, --numbins=NUMBINS
                        Number of bins in the output binconfig file
```

```
mjd2day -h

Traceback (most recent call last):
  File "/swc/difx/difx-root-18Sep10/bin/mjd2day", line 35, in <module>
    mjd = float(d)
ValueError: could not convert string to float: -h

==================================================

mjd2day --help

Traceback (most recent call last):
  File "/swc/difx/difx-root-18Sep10/bin/mjd2day", line 35, in <module>
    mjd = float(d)
ValueError: could not convert string to float: --help
```

```
mk5bheader.pl --help

Usage: m5bheader.pl [options] <vdiffile>

Options:
   -once           Print only the first header
   -check          Do check frames increase monotonically with no gaps
   -skip <bytes>   Skip <bytes> bytes at the start of each file
```

```
mk5control --help

mk5control ver. 0.6  Walter Brisken <wbrisken@nrao.edu> 20170819

A program that talks to the mk5daemon programs running on the
software correlator computers, including the mark5s.

usage : /swc/difx/difx-root-18Sep10/bin/mk5control <command> <machines>

<command> can be one of the following (case insensitive):
  GetVSN -- tell Mark5 unit to report is modules
  ResetMark5 -- runs SSReset followed by ssopen on Mark5
  StartMark5A -- starts the Mark5A program
  StopMark5A -- stops the Mark5A program
  Reboot -- reboots the machine
  Poweroff -- powers off the machine
  Clear -- used to clear errant "busy" state
  stopmk5daemon -- tell the mk5daemon program to quit
  killmpifxcorr -- kill -9 mpifxcorr and mpirin
  getdirA, getdirB -- get directory of module in A or B
  getdir -- get directory of all loaded modules
  stopdir -- stop a getdir in progress
  condition, conditionR, conditionW -- condition module A
  stopcondition -- stop a conditioning process
  copy -- copy data from module to file; see below
  stopcopy -- stop a copy in progress
  getver -- tell machine to report its version info
  mountXX -- mount /dev/sdXX /mnt/usb
  mountLABEL -- mount /dev/disk/by-label/LABEL /mnt/usb
  umount -- umount /mnt/usb
  listfs -- list filesystems with labels
  startfuseMk5A, startfuseMk5B -- start a fuse mount of module in A or B on /mnt
/diskpack
  stopfuseMk5 -- stop fuse mount on /mnt/diskpack

<machines> is a list of cluster members to receive the message;
  the format is as follows:
    general: the explicit computer hostname, or "all" for all
    mark5 units:  01 through 24, or "mark5" for all
    processor node:  000 though 999, or "swc" for all
    ranges are allowed:  12-18 or 001-010

Data copying requires additional parameters corresponding to the
parameters needed by program mk5cp.

Example: mk5control "copy A 12-14 /mnt/usb/bb269a/BR" 03
```

```
mk5daemon --help


mk5daemon ver. 2.6.0   Walter Brisken <wbrisken@nrao.edu>

A program to control Mark5A, handle Mark5 allocation manage VSNs, and
log all of the above.  Root permissions required.

Usage : /swc/difx/difx-root-18Sep10/bin/mk5daemon [options]

options can include:
  --help
  -h             Print this help message

  --headnode
  -H             Give head node capabilities

  --quiet
  -q             Don't multicast any status

  --log-path <path>
  -l <path>      Put log files in <path>

  --user <user>
  -u <user>      Use <user> when executing remote commands (default is 'difx')

  --hostname <name>
  -N <name>      Set hostname to <name> in messages (default is canonical hostna
me)

  --nosu
  -n             Don't use su when executing su commands

  --isMk5
  -m             Force mk5daemon on this host to act as Mark5 regardless of host
name

  --isMk6
  -6             Force mk5daemon on this host to act as Mark6 regardless of host
name

  --embedded
  -e             Configure for running within a pipe and with messages to stdout

Note: This program responds to the following environment variables:
  DIFX_LOG_DIR : change log path from default [/tmp]
  DIFX_MESSAGE_GROUP : change multicast group from default [224.2.2.1]
  DIFX_MESSAGE_PORT : change multicast port from default [50200]
  STREAMSTOR_BIB_PATH : change streamstor firmware path from default
  DIFX_USER_ID : change user account for executing remote commands from default
[difx]

IPv6 compliance: VSIS TCP port: likely
                 DiFX multicast: yes, vis difxmessage
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
mk5mon --help

Usage: A program to monitor the mark5 machines

Options:
  --version             show program's version number and exit
  -h, --help            show this help message and exit
  -d, --difxdb          use difxdb to obtain station codes
  -p PORT, --port=PORT  set the multicast message port (overrides
                        DIX_MESSAGE_PORT environment)
  -g GROUP, --group=GROUP
                        set the multicast message group (overrides
                        DIX_MESSAGE_GROUP environment)
```

```
mk6copy --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1

mk6copy [-s] <Mark6 scan name> <destination>

Copies the Mark6 scatter-gather data of a given scan via the
libmark6sg library (not FUSE) into a single output file. A scan
name of test.vdif for example collects the scatter-gather file
fragments '/mnt/disks/[1-4]/[0-7]//test.vdif'.

Specify -s to show copy progress.
```

```
mk6gather --help
Usage: /swc/difx/difx-root-18Sep10/bin/mk6gather <fileset template>
fileset template is a glob expression selecting all Mark 6 files.
```

```
mk6ls --help


mk6ls ver. 0.3  Walter Brisken <wbrisken@nrao.edu>  20180905

Usage: /swc/difx/difx-root-18Sep10/bin/mk6ls [options]

Options can include:
  --help
  -h        Print this help info and quit

  --short
  -s        Print short form output [default]

  --long
  -l        Print long form output

  --full
  -f        Print full information for each file

The following environment variables are used:
  MARK6_ROOT : Where to look for Mark 6 datasets
               Default is /mnt/disks/*/*/data
```

```
mk6mon --help

mk6mon ver. 0.1  Helge Rottmann  20151111

Usage: /swc/difx/difx-root-18Sep10/bin/mk6mon [options]

options can include:
  --help
  -h         print help information and quit
```

```
mk6state --help


mk6state ver 0.1  Mark Wainright  20180423
A program to change the state of a mark6 module
Module state can be played, erased, recorded, or cataloged.
Module state is stored in the metadata state file on each
disk in the module.

Usage: /swc/difx/difx-root-18Sep10/bin/mk6state [options] <desired state> <slot
number, MSN, scan file>

Options can include:

  --verbose
  -v         Send more output to the screen  (use -v -v for extra info)

  --quiet
  -q         Be quieter in operation

  --erase
  -e         Option to confirm erase state change

  --help
  -h         Print this help information and quit

This program should be run locally on a mark6 unit.

A module can be selected for state change by slot number, module serial number (
MSN),
or by the name of a scan file on the module.

This script can be used to erase a module and change state to erased.  The -e op
tion
and desired state erased must be used together to confirm erasure.

Examples:

  mk6state -v cataloged 1               # change state of module in slot 1 to ca
taloged

  mk6state -v played LBO%0001           # change state of module with MSN LBO%00
01 to played

  mk6state -v recorded AB123_KP_No0001  # change state of module with scan file
AB123_KP_No0001 to recorded

  mk6state -v -e erased 2               # change state of module in slot 2 to er
ased and erase module
```

```
mk6vmux --help


mk6vmux ver. 0.2  Walter Brisken <wbrisken@nrao.edu>  20180905

Usage: /swc/difx/difx-root-18Sep10/bin/mk6vmux <inputFile> <inputFrameSize> <fra
mesPerSecond> <threadList>
    <outputFile> [<offset> [ [<chunkSize>] ] }

A program to take a multi-thread VDIF file and multiplex into
a multi-channel, single thread file.  <thread list> should be
comma-separated without space.  Setting <input file> to - will take
take input from stdin.  Likewise setting output file to - will
send output to stdout.  <offset> can be set to seek into the file.

<inputFile> is the input multi-thread VDIF file, or - for stdin

<inputFrameSize> is the size of one thread's data frame, including
    header (for RDBE VDIF data this is 5032)

<framesPerSecond> is the number of frames per second in the input
    file for each thread (and is thus the number of output frames per
    second as well)

<threadList> is a comma-separated list of integers in range 0 to 1023;
    the order of the numbers is significant and dictates the order of
    channels in the output data

<outputFile> is the name of the output, single-thread VDIF file,
    or - for stdout

<offset> is an optional offset into the input file (in bytes)

<chunkSize> is (roughly) how many bytes to operate on at a time
    [default=2000000]

Note: as of version 0.5 this program supports multi-channel multi-thread input d
ata

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
mpispeed --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
Processor = gefera
Rank = 0/1
Sorry, must run with even number of processes
This program should be invoked in a manner similar to:
mpirun -H host1,host2,...,hostN /swc/difx/difx-root-18Sep10/bin/mpispeed [<numSe
nds>|<timeSend>s] [<sendSizeMByte>]
  where
    numSends : number of blocks to send (e.g., 256), or
    timeSend : duration in seconds to send (e.g., 100s)
```

```
multi2singlethreadVDIF --help


multi2singlethreadVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20120102

A program to translate multiple thread VDIF format to single thread
Must be one datastream in and one datastream out

Usage: multi2singlethreadVDIF <VDIF input file> <VDIF output file> <Num input th
reads> <Num output threads> <input Mbps/thread> <threadId0> <threadId1> ... <thr
eadIdN> [-v]

<VDIF input file> is the name of the multiple thread VDIF file to read

<VDIF output file> is the name of the single thread VDIF file to write

<Num input threads> is the number of threads to start with (must be a power of 2
)

<Number output threads> Number of threads in the output multichannel VDIF file (
must be power of 2)

<input Mbps/thread> is the data rate in Mbps expected per input thread

<threadIdN> is the threadId to put in the Nth output channel

[-v] verbose mode on
The input file must at least start with one valid packet
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
mvdifxhere --help

Repositioning files to /home/gbc/Desktop/difx-help/

mvdifxhere  ver. 0.1  wbrisken@lbo.us  20170220

Changes paths inside .input and .calc files to the current directory.
Note: this does not actually move the files.

Usage: mvdifxhere [options] [ <file1> [ <file2> ... ] ]

options can be:
  --help
  -h     print this help info and quit
```

```
oms2v2d --help

oms2v2d ver. 1.6  Walter Brisken  20171116

Program to take sched's .oms file and produce a skeleton .v2d file

Usage: /swc/difx/difx-root-18Sep10/bin/oms2v2d [options] <oms file>

options can include

  --help
  -h       print this help info and quit

  --force
  -f       force operation, even if output file exits

  --verbose
  -v       be more verbose in execution (use -v -v for even more!)

  --nrt
  -n       use near-real-time options: .preobs and filelists

  --datacopy
  -d       look for files in /home/datacopy-* (VLBA only, assumes VDIF)

  --datacopy5b
           look for files in /home/datacopy-* (VLBA only, assumes Mark5B)

  --file
  -F       make .v2d file for file-based correlation

  --quiet
  -q       be less verbose

<oms file> is a .oms file produced by sched
```

```
padVDIF --help


padVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20100217

A program to insert dummy packets for any missing VDIF packets

Usage: padVDIF <VDIF input file> <VDIF output file> <Mbps> [new start MJD]

<VDIF input file> is the name of the VDIF file to read

<VDIF output file> is the name of the VDIF file to write

<Mbps> is the data rate in Mbps expected for this file

[new start MJD] is the MJD (with fractional component) to overwrite the times wi
th
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
pbgen --help

pbgen  ver. 0.1  John Morgan <john.morgan@icrar.org>  20120927

NB proof of concept only!!
Offset of one source in primary beam is calculated at 30 second intervals
Selected phase centre can only be set at compile time
Usage : pbgen <inputfilebase> ...
```

```
pcList.pl --help

--------------------------------------------------------------------------------
PURPOSE
--------------------------------------------------------------------------------
Script to compare the contents of a FITS-file created by vex2difx
to what has been specified in the vexfile.

--------------------------------------------------------------------------------
USAGE
--------------------------------------------------------------------------------
 pcList.pl -v vexfile -j jobmatrixfile [-m mode] [-e station1 [,stationN]]

-m {mode}:                          process only scans having the selected mode
-e station1 [,stationN]]:           exclude listed antennas from processing
-s :                                exclude vex scans from the output list that hav
e no associated job


--------------------------------------------------------------------------------
OUTPUT
--------------------------------------------------------------------------------
 Output-Files :   vexfilename.pclist
         vexfilename.pclist     correlation summary (identical to sceen output)
         recor.joblist          recorrelation list

Legend:
o:              station is included in the FITS-file (data is complete)
x:              expected station is missing in the FITS-file
number:         percentage of job time in the FITS-file compared to expected tim
e.
```

```
pcplot --help

Usage:
 pcplot [options] <baseline> <root_filename>
 e.g.: pcplot  -p XY TV:X 3C279.xyzzys

Options:
  -h, --help            show this help message and exit
  -P POLPROD, --polarization=POLPROD
                        polarization product (1)
  -t PLOT_TYPE, --type=PLOT_TYPE
                        type <1:amp&ph vs tone  2:amp vs ph 3:phasors
                        4:stacked> (1)
  -v, --verbose         verbose mode (false)
```

```
plotDiFXPCal.py --help


plotDiFXPCal.py version 1.2  Jan Wagner  20151006

Usage: plotDiFXPCal.py [--pdf] [--txt]
           [--dly=<band>,<tone>,<band>,<tone>,...]
           <output_1.difx> <station>
           [<band>,<tone>[,<tone>,...]] [<band>,<tone>[...]]

Plots the contents of the PCAL file of the given station,
showing amplitude and phase against time for all tones.
Currently supports the DiFX 2.4 format of PCAL files.

Options:
  --pdf      to generate PDF file of plot
  --txt      to store phases and amplitudes into a text file,
             discarding details about frequency and polarization
  --dly=...  to combine specific tones (at least two) of arbitrary
             bands in a calculation of a best-fit delay, given by
                'delay[s] = - delta phi[rad] / 2pi delta nu[Hz]'
             and later plotted in a separate window

Arguments:
  <output_1.difx>  the DiFX output to read
  <station>        the two-letter station name

Optional arguments:
  band,tone  to select specific rather than all tone(s) of all bands,
             1,1 is the first tone in the first band

Has some similarity to 'plotpcal' from vex2difx: plotDiFXPCal.py
has no automatic tone selection, no x/y plots, but is faster (x25),
and produces optional PDF and ASCII output files. The delay
calculation allows tones from multiple subbands to be combined,
useful for subbands produced by a wideband digital filterbank.
```

```
plotDiFX.py --help

Usage: plotDiFX.py [options] <difx file 1> <difx file 2> ... [difx file N]

Flashes bandpasses of selected bands overlaid

Options:
  -h, --help            show this help message and exit
  -f targetfreq, --freq=targetfreq
                        Only display visibilities from this frequency index
  -b targetbaseline, --baseline=targetbaseline
                        Only display visibilities from this baseline num
  -c MAXCHANNELS, --maxchannels=MAXCHANNELS
                        The length of the array that will be allocated to hold
                        vis results
  -p POLLIST, --pols=POLLIST
                        Only display polarization pairs from this comma-
                        separated list
  -v, --verbose         Turn verbose printing on
  -i INPUTFILE, --inputfile=INPUTFILE
                        An input file to use as guide for number of channels
                        for each freq
  -x, --toscreen        Plot to the screen, otherwise to png files
  --singlevis           Stop plotting as soon as there is a time change
  --firstpermatch       For each baseline plot only the first matching entry
  -1, --singleplot      Plot everything on one axis
  --unwrap              Unwrap the phase
  --noauto              Exclude autocorrelation data
  --amprange=AMPRANGE   Range for the y axis for amplitude subplot in form
                        min,max
```

```
plotDynamicSpectrum.py --help

Usage: plotDynamicSpectrum.py [options] <difx file 1>

Makes a dynamic spectrum from visibility output, either a single baseline or sca
lar averaged

Options:
  -h, --help            show this help message and exit
  -f targetfreq, --freq=targetfreq
                        Only display visibilities from this frequency index
  -b targetbaseline, --baseline=targetbaseline
                        Only display visibilities from this baseline num
  -p POLPAIR, --polpair=POLPAIR
                        Plot this polarisations only e.g. RR, LL, RL, LR,
                        default [RR,LL,RL,LR]
  -c MAXCHANNELS, --maxchannels=MAXCHANNELS
                        The length of the array that will be allocated to hold
                        vis results
  -v, --verbose         Turn verbose printing on
  -i INPUTFILE, --inputfile=INPUTFILE
                        An input file to use as guide for number of channels
                        for each freq
  --toscreen            Plot to the screen, otherwise to png files
  --logamp              Take the log of amplitudes, for a flatter scaling
  --maxtimestep=MAXTIMESTEP
                        Max timestep number, if you want to limit the range
  --chanrange=CHANRANGE
                        Channel range to plot, in form min,max (-1,-1 for all)
  --secondswindow=SECONDSWINDOW
                        Time range to plot, in form min,max (-1,-1 for all)
  --scrunchbaselines    Scalar add all baseline amplitudes
  --scrunchautocorrs    Scalar add all autocorrelation amplitudes
  --showlegend          Show a legend on the plot
```

```
plotpcal --help


plotpcal ver. 0.1  Walter Brisken <wbrisken@nrao.edu>

Usage: /swc/difx/difx-root-18Sep10/bin/plotpcal [options] operation toneSelectio
ns dataFiles
```

```
plotpcal2 --help


plotpcal2 ver. 0.3  Walter Brisken <wbrisken@nrao.edu>

Usage: /swc/difx/difx-root-18Sep10/bin/plotpcal2 [options] operation toneSelecti
ons dataFiles

Some more details are at: https://www.atnf.csiro.au/vlbi/dokuwiki/doku.php/difx/
plotpcal

or by running   /swc/difx/difx-root-18Sep10/bin/plotpcal2 --doc
```

```
polswapDiFX.py --help

Usage: polswapDiFX.py <station[,station,station,...]> <difx basename>

Swaps the polarization labels for the given station.

Output:
  <difx basename>_swapped/DIFX_*
```

```
pplot_print --help

pplot_print: Define MK4_PRINTER (or PRINTER) as a valid printer
pplot_print: in your environment if you wish to print the plot.
```

```
prepolconvert.py --help

usage: prepolconvert.py [options] [input_file] [...]
  Version $Id: prepolconvert.py 8230 2018-03-29 14:47:53Z JanWagner $

This script is intended to be run after the DiFX correlation concludes, but
prior to running post-processing scripts such as difx2fits or difx2mark4. It
saves the files from the original correlation and provides new versions with
polarizations such as would be converted by PolConvert (i.e. X->R and Y->L).
Optionally, the required files may be relocated to a new directory.

positional arguments:
  nargs

optional arguments:
  -h, --help            show this help message and exit
  -l LIST, --suffices LIST
                        comma-separated list of file/dir sufficesto process,
                        default is "input,calc,flag,im,difx,save"
  -s DIR, --srcdir DIR  source directory with DiFX output (.)
  -d DIR, --dstdir DIR  destination directory for PolConvert inputs (.)
  -j LIST, --jobs LIST  list of job numbers to process; a comma-sep list of
                        numbers or ranges from:to (inclusive)
  -e STRING, --exp STRING
                        DiFX experiment name
  -o STRING, --orig STRING
                        suffix to be appended to original names
  -k, --clobber         clobber destination files/dirs found
  -v, --verbose         be chatty about the work

Both -j and -e need to be supplied, (not yet supported) or alternatively a
list of input files may be provided as positional on the command line. You may
need the *.vex.obs file if you wish to run difx2mark4 and have the root be
correct.
```

```
prep-one-scan.sh -h

fusermount: entry for /home/gbc/difx/data/mnt12 not found in /etc/mtab
creating mod-12--h
vdifuse -t -a mod-12--h -xm6sg -xrate=125000 \
-xinclpatt=-h -o async_read -o allow_other ./mnt12 /mnt/disks/[12]/?/data
No Abspath for /mnt/disks/[12]/?/data
Unable to build cache with the 1 directories provided (38)
Problem creating cache
vdifuse -m mod-12--h -xlist=/home/gbc/difx/data/mnt12 > mod-12--h.flist
VDIFuse metadata cache mod-12--h is missing.
ls: cannot access mod-12--h: No such file or directory
-rw-rw-r--. 1 gbc gbc 0 Sep 12 15:36 mod-12--h.flist
fusermount: entry for /home/gbc/difx/data/mnt34 not found in /etc/mtab
creating mod-34--h
vdifuse -t -a mod-34--h -xm6sg -xrate=125000 \
-xinclpatt=-h -o async_read -o allow_other ./mnt34 /mnt/disks/[34]/?/data
No Abspath for /mnt/disks/[34]/?/data
Unable to build cache with the 1 directories provided (38)
Problem creating cache
vdifuse -m mod-34--h -xlist=/home/gbc/difx/data/mnt34 > mod-34--h.flist
VDIFuse metadata cache mod-34--h is missing.
ls: cannot access mod-34--h: No such file or directory
-rw-rw-r--. 1 gbc gbc 0 Sep 12 15:36 mod-34--h.flist
ls: cannot access ./mnt??/se*/*/??/*.vdif: No such file or directory
-rw-rw-r--. 1 gbc gbc 0 Sep 12 15:36 mod-12--h.flist
-rw-rw-r--. 1 gbc gbc 0 Sep 12 15:36 mod-34--h.flist

==================================================

prep-one-scan.sh --help

/swc/difx/difx-root-18Sep10/bin/prep-one-scan.sh expression [rate [true|false [t
rue|false [vdifuseoptions]]]]

This script populates mount points for one scan in $home
(which if not supplied in the environment defaults to $HOME/difx/data)
and it assumes a pair of module subgroups (12 and 34) with data
to be found in /mnt/disks/$s/?/$data, where $s is taken from
an environment variable $sm (defaults to '12 34') and $data
defaults to 'data'.  If you've copied the data elsewhere set
$mount as a replacement for '/mnt/disks'.

Here the expression is some character sequence (RE) that matches
the scan(s) of interest.  The packet rate is assumed 125000 pkts/sec
unless specified in the second argument.  The 3rd argument (true|false)
controls whether to re-use an existing cache (mod-??-expression).  A
fourth argument (true|false) specifies whether a tracelog should be
retained.  (The default is false, which deletes the tracefiles written
to /tmp after vdifuse exits.)

Any additional arguments are passed directly to vdifuse, to do this
you will need to specify the initial 4 arguments fully.  Use

    vdifuse --help

for more information about that.  To recap on the environment variables:
    home    where to work ($HOME/difx/data)
    sm      the list of sub-module groups ('12 34')
    data    an alternate scatter-gather dir name ('data')
    mount   alternate mount points ('/mnt/disks')
```

A filelist for use with vex2difx is generated in <something>.flist.

```
printDiFX --help

Usage: printDiFX <difx data file> <config file>
```

```
printdirlist --help

printdirlist ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  2015 Dec 25

Usage: /swc/difx/difx-root-18Sep10/bin/printdirlist [options] <VSN>

Options can include:

  --help
  -h      print this useful help information and quit

.dir or .dirlist files must be in $MARK5_DIR_PATH
```

```
printVDIF --help


printVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20100217

A program to dump some basic info about VDIF packets to the screen

Usage: printVDIF <VDIF input file> <Mbps>

<VDIF input file> is the name of the VDIF file to read

<Mbps> is the data rate in Mbps expected for this file
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
printVDIFgaps --help

printVDIFgaps ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  20140620

A program to look for missing VDIF packets

Usage: printVDIFgaps <VDIF input file> <framesize> <framespersec> <nthread>

<VDIF input file> is the name of the VDIF file to read

<framesize> VDIF frame size, including header (5032 for VLBA)

<framespersec> is number of frames per thread per second

<nthread> is the number of threads to expect

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
printVDIFheader -h

Cannot open input file -h
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1

=====================================================

printVDIFheader --help

Cannot open input file --help
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
profile2binconfig.py --help

Usage: profile2binconfig.py -f <file> [options]

Options:
  -h, --help            show this help message and exit
  --profile=PROFILE     Filename of the pulsar profile file
  --polyco=POLYCO       Filename(s) (comma separated) of the polyco file(s)
  -n NUMBINS, --numbins=NUMBINS
                        Number of bins in the output binconfig file
  -s, --scrunch         Turn scrunching on in binconfig file
  --binconfigfile=BINCONFIGFILE
                        Filename of the output binconfig file
  --nonormalise         Don't re-calculate zero phase
  --zeroranges=ZERORANGES
                        colon separated start,end pairs of ranges to zero
  --hannwidth=HANNWIDTH
                        Width of hanning filter to apply, default -1/off
  --profilecolumn=PROFILECOLUMN
                        Column in the profile file with the important number
  --lineskip=LINESKIP   Number of lines to skip from start of profile file
  --dontzeronoise       Don't try to zero 'noisy' sections
```

```
psrflag --help

psrflag  ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  20140211

Usage : psrflag [options] <inputfilebase1> [ <inputfilebase2> [...] ]

options can include:
--verbose
-v         be a bit more verbose

--help
-h         print help information and quit

<inputfilebaseN> is the base name of a difx fileset.

The output is a text file that can be read by AIPS UVFLG called <exp>.<psr>.flag
```

```
reducepoly --help

reducepoly  ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  20150708

A program to reduce the polynomial order of the delay model

Usage : reducepoly [options] <inputfilebase1> [ <inputfilebase2> [...] ]

options can include:
--help
-h          print help information and quit

-2
-3
-4
-5          reduce polynomial to 2, 3, 4, or 5 terms

Note: This overwrites the original .im file(s)
```

```
removeZerovalAutoDiFX.py --help

Usage: removeZerovalAutoDiFX.py <station[,station,station,...]> <difx basename>

Removes all zero-valued autopower spectra detected for the given station(s)

Output:
  <difx basename>_swapped/DIFX_*
```

```
replaceAntennaDiFX.py --help


Usage: replaceAntennaDiFX.py <antennaslist> <difx basename dst> <difx basename s
rc>

Replaces visibilities on baselines to antenna(s) by visibilities from a second D
iFX file.

The result of the visibility-replacement is written into a new output .difx file
. This
new output file is a copy of DiFX file 'dst' where visibilities associated with
antennas
of 'antennasList' have been replaced by the respective visibilities from DiFX fi
le 'src'.
If no matching visibility record exists in 'src' the visibility from 'dst' is di
scarded.

Options:
    <antennaslist>      a comma separated list of antenna names in upper case, e
.g., EB,PV,MH
    <difx basename dst> difx data to be 'patched' by new visibility data on base
lines to <antennaslist>
    <difx basename src> difx data from which to take visibility data for baselin
es to <antennaslist>

Output:
  <difx basename>_antreplaced/DIFX_*
```

```
scan_check −h

/swc/difx/difx−root−18Sep10/bin/scan_check: invalid option −− 'h'

================================================

scan_check −−help

Usage: /swc/difx/difx−root−18Sep10/bin/scan_check [options] action

where the options are:

  −v            verbose, may be repeated for more
  −c <string>   configure the checker

/swc/difx/difx−root−18Sep10/bin/scan_check will check files and return nonzero i
f something
is amiss.  Increasing verbosity will provide more details.
Use −c"help" for options on configuring the checker;
however the defaults are intended to be sensible.
```

```
searchVDIF --help


searchVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20120103

A program to dump some basic info about VDIF packets to the screen

Usage: searchVDIF <VDIF input file> <bitshift> [expected framebytes]

  <VDIF input file> is the name of the VDIF file to read

  <byteshift> is number of bytes to move along at a time while searching

  [expected framebytes] is the expected header-inclusive frame sizen

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
sendsmart --help

nSmart must be in [1..32] inclusive.
```

```
sendtransient --help


Usage: /swc/difx/difx-root-18Sep10/bin/sendtransient startMJD stopMJD priority i
dentifier [outputDir]
```

```
showcal --help

showcal ver. 0.1  Walter Brisken  20131119

Usage: /swc/difx/difx-root-18Sep10/bin/showcal [options] <vexFile> [<passName>]


options can include:

  -h or --help     print this help information and quit

<vexFile> is the vex file associated with the project

<passName> is the correlator pass name (.v2d file previx)


There are two modes of operation.  In the first, only a
vex file is provided.  In this case this program cannot look
into the DiFX output directories where pulse cal or Tsys data
may be found.  Without the information about the correlator
setup, this mode cannot determine which antennas were actually
to be correlated.  In the second mode, the correlator pass is
also specified so the DiFX output can be found.  Note that
in this mode only antennas specified for correlation are
listed.  It is most useful to run this mode only after
correlation has completed.
```

```
smartmon --help

DIFX_MESSAGE_PORT needs to be defined
```

```
snipDiFX.py --help

Usage: snipDiFX.py [options] <input difx file> <output difx file>



Options:
  -h, --help            show this help message and exit
  -t TIMERANGE, --timerange=TIMERANGE
                        starttime,stoptime where times are fractional days
                        from corr start day
  -c MAXCHANNELS, --maxchannels=MAXCHANNELS
                        The length of the array that will be allocated to hold
                        vis results
  -v, --verbose         Turn verbose printing on
  -i INPUTFILE, --inputfile=INPUTFILE
                        The input file used for the correlation
```

```
snratio --help

No alist!
   enter:  snratio <snrs> <alist>
```

```
startdifx --help

Usage:
startdifx ver. 2.5.3  20180907  Walter Brisken and Helge Rottmann
A program to simplify the launching of mpifxcorr.
It can also cause model and FITS to be made.

Usage: startdifx [options] [<start delay>] <input1> [<input2> [ ... ] ]
or:    startdifx [options] [<start delay>] <joblist>

<start delay> is an optional delay (seconds) to add to the job start time
<inputN> is the file prefix for a DiFX input file (possibly including .input)
<joblist> as created by vex2difx (.joblist extension required)

This program responds to the following environment variables:
DIFX_MESSAGE_GROUP and DIFX_MESSAGE_PORT can be used to override
the default group/port of 224.2.2.1/50200
DIFX_HEAD_NODE must name the correlation head node (only with the -m option).
DIFX_MPIRUNOPTIONS can be used to pass options to the mpirun command.
DIFX_CALC_PROGRAM can be used to change the delay model program
(the default is calcif2, but difxcalc can be used).
DIFX_CALC_OPTIONS can be used to override options to the delay model program.


Options:
  --version             show program's version number and exit
  -h, --help            show this help message and exit
  -A AGENT, --agent=AGENT
                        call mpirun through this agent with filebase as only
                        argument
  -g, --genmachines     will run genmachines even if not needed [default]
  -a, --automachines    will run genmachines if needed
  -n, --nomachines      will not run genmachines, even if needed
  -M MACHINESFILE, --machines-file=MACHINESFILE
                        start difx via DifxStartMessage
  -m, --message         start difx via DifxStartMessage
  -f, --force           force running even if output file exists
  -d, --dont-calc       will not calculate delay model, even if needed
  -D, --difxdb          make use of difxdb to obtain module location
  -F, --fits            generate 1 fits file per job at end of each job
  -v, --verbose         send more output to the screen and difxlog file (use
                        -v -v for extra info)
  -q, --quiet           be quieter
  -l, --localhead       use the current host as the head node. Overrides
                        DIFX_HEAD_NODE.
  --override-version    ignore difx version differences
```

```
statemon --help

statemon ver. 0.5  Walter Brisken  20150811

Usage: /swc/difx/difx-root-18Sep10/bin/statemon [options]

options can include:
  --help
  -h         print help information and quit
```

```
statsplot.py --help

usage: statsplot.py [options] [input_file [...]]

This script reduces scan check bit statistics output for postprocessing.

positional arguments:
  nargs              List of scan check output files to process

optional arguments:
  -h, --help         show this help message and exit
  -v, --verbose      be chatty about the work
  -n MIN, --min MIN  minimum time or 0.0 for all
  -x MAX, --max MAX  maximum time or 86400.0 for all

This script is designed to ingest scan check stats and reduce it suitable for
further processing (e.g. gnuplot). Presumably you did something like this:
(for v in ....vdif ; do scan_check -v -cloops=0 -cruns=0 -csdelta=1250
-cchans=31 $v > ${v/vdif/data} ; done ) and are applying this program to the
data files to reduce them. The -n/-x min/max arguments are to cull for an
interesting period.
```

```
stripantennaDiFX.py −h

Keeping [] and removing []
Traceback (most recent call last):
  File "/swc/difx/difx−root−18Sep10/bin/stripantennaDiFX.py", line 131, in <modu
le>
    mergeDiFX(basename, antRemove, antKeep)
  File "/swc/difx/difx−root−18Sep10/bin/stripantennaDiFX.py", line 41, in mergeD
iFX
    difxfilename = glob.glob(basename + '.difx/DIFX_*.s*.b*')[0]
IndexError: list index out of range

=====================================================

stripantennaDiFX.py −−help


Usage: stripantennaDiFX.py [−r|−−remove <antennaslist>] [−k|−−keep <antennaslist
>] <difx basename> [<difx basename> ...]

Copies visibility data from DiFX .difx datasets to new output dataset(s), while
removing or keeping
visibility data on baselines to certain antennas during the copying process.

Options:
    −−remove <antennas>  all visibilities are copied, except for visibilities on
 baseline(s) to certain antennas
    −−keep <antennas>    no visibilities are copied, except for visibilities on
baseline(s) to certain antennas
    <antennas>           a comma separated list of antenna names in upper case,
e.g., EB,PV,MH

Output:
  <difx basename>_stripped/DIFX_*
```

```
stripVDIF --help


stripVDIF ver. 0.1  Adam Deller <adeller@nrao.edu>  20100217

A program to strip network headers from a VDIF format basebad data
file (e.g. captured from wireshark) and dump a pure VDIF stream.

Usage: stripVDIF <VDIF input file> <VDIF output file> [skipbytesfront] [skipbyte
sback] [skipbytesinitial]

<VDIF input file> is the name of the VDIF file to read

<VDIF output file> is the name of the VDIF file to read

[skipbytesfront=54] is the number of bytes to skip over before each frame

[skipbytesback=4] is the number of bytes to skip over after each frame

[skipbytesinitial=28] is the number of bytes to skip over only once after openin
g the file
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
sukill --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1

sukill ver. 0.1   Walter Brisken 20111126

A program to kill rampant su processes


Usage : sukill [<options>] [<dt>]

options can include:
  --help
  -h             Print this help message

  --verbose
  -v             Be more verbose

  --quiet
  -q             Be less verbose

<dt> is an option parameter specifying interval in seconds between attempts.
     If not provided, the program will try once and terminate.
```

```
summarizeDifxlogs.py --help


Usage: summarizeDifxlogs.py [--help|-h] [--color|-c]

Produces a summary of a DiFX correlation run in the current working directory.
Inspects the *.difxlog and associated *.input files and reports average
station (datastream) weights, run times, and (non)clean DiFX completion.
```

```
summarizePolconvertLogs.py --help

usage:
summarizePolconvertLogs.py [options]

Inspects the output of EHT drivepolconvert.py (that invokes CASA
polconvert) and its logfiles in the current working directory.
Reports the fringe SNRs found in the logfiles. Optionally checks
the polarizations present in each output .difx associated with each
polconvert log.  You can adjust the characterizations with the
threshold adjustments.

optional arguments:
  -h, --help            show this help message and exit
  -c, --color           enable use of terminal color codes
  -p, --pols            inspect polarizations in visibility data
  -s, --short           condense the report
  -e, --errors          print out any ERRORs when found
  -g FLOAT, --goodTh FLOAT
                        ratio threshold of max-cross-hands/min-parallel-hands
                        for good rating (0.3)
  -b FLOAT, --badTh FLOAT
                        ratio threshold of max-cross-hands/min-parallel-hands
                        for poor rating (0.6)
  -v file, --vex file   vex file to parse for EHTC project codes
  -V, --version         show program's version number and exit
```

```
tabulatedelays --help


tabulatedelays  ver. 0.3  Walter Brisken <wbrisken@lbo.us>  20180908

Usage : tabulatedelays [options] <inputfilebase1> [ <inputfilebase2> [...] ]

options can include:
--help
-h         print help information and quit

--az       print azimuth [deg], rate [deg/s] instead of delay, rate

--el       print elevation [deg], rate [deg/s] instead of delay, rate

--dry      print dry atmosphere delay [us]

--wet      print wet atmosphere delay [us]

--uvw      print antenna u,v,w [m] instead of delay, rate

--clock    print clock offset and rate instead of delay, rate

--perint   print values at the center of every integration rather than every 8s

--addclock include clock offset/rate in delay/rate values

<inputfilebaseN> is the base name of a difx fileset.

All normal program output goes to stdout.

This program reads through one or more difx datasets and evaluates
delay polynomials in the .im files on a regular time grid (every
8 seconds).  Delays and rates are both calculated.  Output should
be self explanatory.  Plotting utilities such as gnuplot can be used
directly on the output.

When operating without --perint, the entirety of the delay polynomials
are plotted, even exceeding the time range of the scans to which they
belong.  Comments in the output separate scans cleanly.  When --perint
is used, only the time covered by the scans is output.

Sign conventions:
  Delay: a positive delay indicates wavefront arrival at the station
        before wavefront arrival at earth center.  The delay includes
        contribution from wet and dry atmosphere components.
  Rate: simply the time derivative of Delay.
  Clock Offset: sign convention is opposite that of .vex "clock_early"
        parameter; a positive clock offset indicates slow station clock.
        The sum of Clock Offset and Delay is the total correlator delay.
  Clock Rate: simply the time derivative of Clock Offset.
```

```
testdifxinput --help

testdifxinput  ver. 1.4  Walter Brisken <wbrisken@nrao.edu>  20180906

Usage : testdifxinput [options] <inputfilebase1> [ <inputfilebase2> [...] ]

options can include:
--verbose
-v         be a bit more verbose

--help
-h         print help information and quit

--union
-u         merge even incompatible frequency setups

--eop-strict
           don't allow merging of jobs with different EOP days

--eop-loose
           drop EOPs to prevent incompatibility

--eop-relaxed
           allow different EOPs per file as long as they re consistent (default)

<inputfilebaseN> is the base name of a difx fileset.
```

```
testdifxmessagereceive --help


testdifxmessagereceive ver. 1.1  Walter Brisken 20110409

Usage:  /swc/difx/difx-root-18Sep10/bin/testdifxmessagereceive [options]  [type]

Options can be:

  -h or --help   : Print this help info

  -b or --binary : Write binary records to file binary.out

  -l or --length : Print lengths, not dots

Type is a number from 1 to 26 and refers to the following message types

   1 : DifxLoadMessage
   2 : DifxAlertMessage
   3 : Mark6StatusMessage
   4 : Mark5StatusMessage
   5 : DifxStatusMessage
   6 : DifxInfoMessage
   7 : DifxDatastreamMessage
   8 : DifxCommand
   9 : DifxParameter
  10 : DifxStart
  11 : DifxStop
  12 : Mark5VersionMessage
  13 : Mark5ConditionMessage
  14 : DifxTransientMessage
  15 : DifxSmartMessage
  16 : Mark5DriveStatsMessage
  17 : DifxDiagnosticMessage
  18 : DifxFileTransfer
  19 : DifxFileOperation
  20 : DifxVex2DifxRun
  21 : DifxMachinesDefinition
  22 : DifxGetDirectory
  23 : DifxMk5Control
  24 : DifxMark5Copy
  25 : DifxVsis
  26 : Mark6ActivityMessage

If no type is listed, all message types will be printed
```

```
testephem --help

testephem  ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  20130416

Usage: /swc/difx/difx-root-18Sep10/bin/testephem <mjd0> <deltat> <n> <obj> <naif
 file> <ephem file>
```

```
test_mark5_stream --help

Usage : /swc/difx/difx-root-18Sep10/bin/test_mark5_stream <infile> <formatname>
[<offset>]
```

```
testparsevis --help

difxfringe ver. 0.1   Walter Brisken 20111129

usage : /swc/difx/difx-root-18Sep10/bin/testparsevis <difx file> <nchan> [<basel
ine>]
```

```
testseqnumbers --help


testseqnumbers ver. 1.1  Walter Brisken <wbrisken@nrao.edu>  20130509

A utility to listen for DiFX multicast messages and identify any that
come with a sequence number that is not sequential.  This is a good
way to identify possible packet loss or duplication on a DiFX cluster
network.

Usage: /swc/difx/difx-root-18Sep10/bin/testseqnumbers [options]

options can include:
--verbose
-v          increase output verbosity

--help
-h          print help information and quite

If run without the '-v' option, only unexpected packets will be noted.
If run with one '-v' flag, each received packet will be identified with a
period being written to the screen.  If run with 2 '-v' flags, each
packet received will have its source and sequence number printed.
```

```
vdif2to8 --help


vdif2to8 ver. 0.1  Walter Brisken <wbrisken@nrao.edu>  20131206

Usage: /swc/difx/difx-root-18Sep10/bin/vdif2to8 <inputFile> <inputFrameBytes> <o
utputFile>

A program to take a VDIF file containing 2-bit samples and
convert it to 8-bit samples.

<inputFile> is the input 2-bit VDIF file, or - for stdin

<inputFrameBytes> is the size of one thread's data frame, including
    header (for RDBE VDIF data this is 5032)

<outputFile> is the name of the output, 8-bit VDIF file,
    or - for stdout

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
vdifbstate --help


vdifbstate ver. 0.2  Walter Brisken  20160610

A VDIF state counter for multi-thread VDIF data.  Uses vmux
and m5bstate to do the heavy lifting.

Usage : vdifbstate <infile> <frame size> <data rate> <threadlist> <nframes> [<of
fset>]

  <infile> is the name of the VDIF file

  <frame size> is the size of each input VDIF frame, inc. header (e.g., 5032)

  <data rate> is the stream data rate (Mbps)

  <nframes> is the number of frames to bstate-erize

  <offset> is number of bytes into file to start decoding

Note: Only works on 2-bit real data for now...
```

```
vdifChanSelect --help


vdifChanSelect ver. 0.1  Chris Phillips <Chris.Phillips@csiro.au>  20150305

A program select a subset of channels from a VDIF file. Assumes all threads have
 the same # channels

Usage: vdifChanSelect -o <Output directory> <VDIF input file> [<VDIF output file
> ...]

<VDIF input file> is the name of the VDIF file to read

<Output directory> is the name of a directory to write all the files to

Options:

-skip <bytes>    Skip <bytes> bytes a the start of each file
[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
vdifd --help


vdifd ver. 0.3  Walter Brisken  20160610

A VDIF decoder for multi-thread, single channel VDIF data.  Uses vmux
and m5d to do the heavy lifting.

Usage : vdifd <infile> <frame size> <data rate> <threadlist> <n> [<offset> [<nbi
t>] ]

  <infile> is the name of the VDIF file

  <frame size> is the size of each input VDIF frame, inc. header (e.g., 5032)

  <data rate> is the stream data rate (Mbps)

  <n> is the number of samples per channel to decode

  <offset> optionally jump into input file by this many bytes

  <nbit> is number of bits per sample (default is 2)

Note: Only works on 2-bit real data for now...
```

```
vdiffold --help


vdiffold ver. 0.3  Walter Brisken  20160610

A VDIF decoder for multi-thread VDIF data.  Uses vmux
and m5d to do the heavy lifting.

Usage : vdiffold <infile> <frame size> <data rate> <threadlist> <nbin> <nint> <f
req> <outfile> [<offset> [<nbit>] ]

  <infile> is the name of the VDIF file

  <frame size> is the size of each input VDIF frame, inc. header (e.g., 5032)

  <data rate> is the stream data rate (Mbps)

  <nbin> is the number of bins per if across 1 period
       if negative, the conversion to true power is not performed

  <nint> is the number of 10000 sample chunks to work on

  <freq> [Hz] -- the inverse of the period to be folded

  <outfile> is the name of the output file

  <offset> optionally jump into input file by this many bytes

  <nbit> is number of bits per sample (default is 2)

Note: Only works on 2-bit real data for now...
```

```
vdifheader.pl --help

Usage: vdifheader.pl [options] <vdiffile>

Options:
   -once          Print only the first header
   -check         Do check frames increase monotonically with no gaps (single th
read only?)
   -skip <bytes>  Skip <bytes> bytes at the start of each file
```

```
vdifspec --help


vdifspec ver. 0.4  Walter Brisken  20180906

A VDIF spectrometer for multi-thread VDIF data.  Uses vmux
and m5spec to do the heavy lifting.

Usage : vdifspec <infile> <frame size> <data rate> <threadlist> <nchan> <nint> <
outfile> [nbit] [<offset>]

  <infile> is the name of the VDIF file

  <frame size> is the size of each input VDIF frame, inc. header (e.g., 5032)

  <data rate> is the stream data rate (Mbps)

  <threadlist> is a comma-separated list of threads to process

  <nchan> is the number of spectral channels to make per baseband channel

  <nint> is the number of FFT frames to spectrometize

  <outfile> is the name of the output file

  <nbit> is number of bits per sample (default is 2)

  <offset> optionally jump into input file by this many bytes

Note: Only works on 2-bit real data for now...
```

```
vdif_time -h

/swc/difx/difx-root-18Sep10/bin/vdif_time: invalid option -- 'h'

================================================

vdif_time --help

Usage: /swc/difx/difx-root-18Sep10/bin/vdif_time [options] time[s]
where the options are:
  -v            verbose, may be repeated for more
  -q string     type of time response requested
  -E int        epoch to use for Vdif times
  -e            echos the query time and ==
  -t            imprecision treated as truncation
  -r            imprecision treated as rounding
  -p int        specify ns precision (9) of output

The -q and -E arguments allow vdif_time to be configured
to parse the remaining arguments as times to print
out their interpretation.  The supported types are:

  Clock   -- UNIX clock seconds SS[.ss]
  Now     -- +/- seconds (within a week) from now
  DOT     -- [YY]YYMMDDHHMMSS[.ss]
  ISO     -- YYYY-MM-DDTHH:MM:SS[.ss]
  MJD     -- ddddd.dddddddddd
  Vex     -- [YY]YYyDOYdHHhMMmSS[.ss]
  Vdif    -- XX@SS.ss XX in 0..63

Times are treated as calendar times, so leap seconds
will probably not appear unless supported by libc.
Since - is interpreted as options, you will need to
preceed negative relative times with, e.g., a space (' ')
If time is incompletely specified -t and -r affect the
unspecified parts.
```

```
vdifuse --help

usage: vdifuse [options] [fuse-options] mount-point <directories>

  -h           this help
  --HELP       help and additional FUSE mounting options
  -xhelp       help on processing parameters

  -c <file>    create cache <file> for metadata (and exit)
  -r <file>    check & report on cache <file> (and exit)
  -u <file>    use cache <file> and go into background
  -a <file>    all of the above with cache <file>

  -m <file>    generate DiFX v2d-style filelist from cache <file>

  -v           verbose commentary, repeatable for more
  -l <logfile> log commentary to the specified log file
  -t           provide a trace log in /tmp/vdifuse.<pid>
  -x <key=val> set various processing parameters

vdifuse is expecting to scan a set of <directories> for valid VDIF
files (-xfiles, -xm6raid) or valid Mark6 scatter-gather files (-xm6sg),
to build a cache (-c, -a) of what it finds, and to prepare to supply a FUSE
filesystem filled with "fragments" (what it found) and "sequences" (what
it assembles into virtual files).

Normal usage is to create and use a new cache in one step:

  vdifuse -a cache-file -xm6sg mount-point <directories>

and when finished unmount it with

  fusermount -u mount-point

The FUSE option -f keeps vdifuse in the foreground, and if combined
with processing parm -xdebug=N is the best way to debug issues.
For convenience -v (repeated N) is equivalent to -xdebug=N.

The -l/-t options are for debugging problematic files.

For usage examples, use "-xexamples".
For details on additional processing parameters, use "-xhelp".
For details on a variety of known issues, use "-xissues".
```

```
vex2difx --help


vex2difx version 2.6.0  Walter Brisken/Adam Deller 20160226

Usage:  /swc/difx/difx-root-18Sep10/bin/vex2difx [<options>] <v2d file>

  <options> can include:
     -h
     --help        display this information and quit.

     -v
     --verbose     increase the verbosity of the output; -v -v for more.

     -o
     --output      create a v2d file with all defaults populated.

     -d
     --delete-old  delete all job(s) in this series before running.

     -f
     --force       continue desipte warnings.

     -s
     --strict      treat some warnings as errors and quit [default].

     -6
     --mk6         call mk62v2d utility to generate mark6 related files

  <v2d file> is the vex2difx configuration file to process.

When running vex2difx you will likely see some output to the screen.
Some messages may be important.  Most messages are categorized
with one of three qualifiers:
  * Note    This may be normal but usually indicates vex2difx is changing
            something automatically and that may not be what you want.
  * Warning This is something that does not prevent vex2difx from running
            but has a high likelihood of doing something different than
            you intend.
  * Error   vex2difx could not complete due to this problem.

See http://cira.ivec.org/dokuwiki/doku.php/difx/vex2difx for more information
```

```
vexpeek --help


vexpeek ver. 0.8  Walter Brisken 20180304

A program to print essential information from a vex file.

Usage: /swc/difx/difx-root-18Sep10/bin/vexpeek <vex filename> [options]

options can include:
  -h or --help : print help info and quit
  -v or --verbose : print entire vextables structure of vexfile
  -f or --format : add data format to output
  -b or --bands : print list of band codes
  -s or --scans : print list of scans and their stations
  -u or --diskusage : print disk usage (GB)
  -m or --modules : print disk modules used (from TAPELOG_OBS)
```

```
vlog --help


vlog ver. 1.1   20160727 Walter Brisken

A program to preprocess the cal files to simiplfy difx2fits.

Usage: /swc/difx/difx-root-18Sep10/bin/vlog [options] <TSM file> [<antenna list>
]

  options can include:

    --help
    -h          print this help info and quit

    --mjd
    -m          use mjd rather than doy timestamps

    --mark5a
    -a          force to run in Mark5A mode

    --mark5c
    -c          force to run in Mark5C mode

    --exper <exp>
    -e <exp>    name the output files by <exp>.<ant>.<file>

  <TSM file> is <project>cal.vlba or <project>cal.vlba.gz

  <antenna list> is a comma separated list of antennas with
          no spaces, e.g., FD,GB,Y.  Default -- all ants.

Output files will be placed in a subdirectory called jobs
which will be created if it does not already exist.

Note: this program is essentially obsolete.
```

```
vmux --help


vmux ver. 0.9  Walter Brisken <wbrisken@nrao.edu>  20170621

Usage: /swc/difx/difx-root-18Sep10/bin/vmux [options] <inputFile> <inputFrameSiz
e> <framesPerSecond>
   <threadList> <outputFile> [<offset> [<chunkSize>] ]

A program to take a multi-thread VDIF file and multiplex into
a multi-channel, single thread file.  <thread list> should be
comma-separated without space.  Setting <input file> to - will take
take input from stdin.  Likewise setting output file to - will
send output to stdout.  <offset> can be set to seek into the file.

<inputFile> is the input multi-thread VDIF file, or - for stdin

<inputFrameSize> is the size of one thread's data frame, including
    header (for RDBE VDIF data this is 5032)

<framesPerSecond> is the number of frames per second in the input
    file for each thread (and is thus the number of output frames per
    second as well)

<threadList> is a comma-separated list of integers in range 0 to 1023;
    the order of the numbers is significant and dictates the order of
    channels in the output data

<outputFile> is the name of the output, single-thread VDIF file,
    or - for stdout

<offset> is an optional offset into the input file (in bytes)

<chunkSize> is (roughly) how many bytes to operate on at a time
    [default=10000000]

Options can include:
  --help
  -h        Print this help info and quit

  --verbose
  -v        Increase verbosity

  --quiet
  -q        Decrease verbosity

  --noEDV4
  -n        Don't make use of EDV4 (per-thread validity) in output

  --EDV4
  -e        Use of EDV4 (per-thread validity) in output [default]

  --fanout <f>
  -f <f>    Set fanout factor to <f> (used for some DBBC3 data) [default = 1]

  --gap <g>
  -g <g>    Set the max gap in frames to <g> [default = 100]

  --sort <s>
  -s <s>    Set the max sort horizon in frames to <s> [default = 5]

  --zero
```

```
  -z        Set nGap and nSort to 0 (same as '-g 0 -s 0')

Note: as of version 0.5 this program supports multi-channel multi-thread input d
ata.

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
```

```
vsum --help

[gefera -1]    INFO Initialized
[gefera -1]    INFO libmark6sg started
difxMessage: libmark6sg
  group/port = /-1
  hostname = gefera
  identifier = libmark6sg / -1
vsum ver. 0.7  Walter Brisken <wbrisken@nrao.edu>, Mark Wainright <mwainrig@nrao
.edu>  20180905

A utility to summarize the contents of VDIF data files

Usage: /swc/difx/difx-root-18Sep10/bin/vsum [<options>] <file1> [<file2> [ ... ]
 ]

  <fileX> is the name of a VDIF data file

  <options> can include:
    -h or --help          print this usage information and quit
    -s or --shortsum      print a short summary, also usable for input to vex2di
fx
    -6 or --mark6         operate directly on Mark6 module data
    --allmark6            operate directly on all Mark6 scans found on mounted m
odules
    --mark6slot <slot>    operate directly on all Mark6 scans found on module in
 <slot>
```

```
zerocorr --help


zerocorr ver. 0.4   Walter Brisken  20170426

A zero baseline cross correlator

Usage: /swc/difx/difx-root-18Sep10/bin/zerocorr [ <options> ] <conf file>

options can include:

  --help
  -h         Print this help information and quit

  --verbose
  -v         Increase the output verbosity

The conf file should have 17 lines as follows:

For the first datastream:
   1  Input baseband data file name
   2  Input format (e.g., Mark5B-2048-16-2)
   3  Input sub-band to process (0-based index)
   4  Offset into the file (bytes)
   5  Size of FFT to perform over the original bandwidth
   6  First channel (spectral point) to correlate
   7  Number of channels to correlate (negative for LSB)
For the second datastream:
   8  Input baseband data file name
   9  Input format (e.g., Mark5B-2048-16-2)
  10  Input sub-band to process (0-based index)
  11  Offset into the file (bytes)
  12  Size of FFT to perform over the original bandwidth
  13  First channel to correlate
  14  Number of channels to correlate (negative for LSB)
Other general parameters:
  15  Name of output visibility file
  16  Name of output lag file
  17  Number of FFTs to process (if -1, run on entire input files)

The visibility output file (specified in line 15 above) has 8 columns:
   1  Channel (spectral point) number
   2  Frequency relative to first spectral channel (Hz)
   3  Real value of the visibility
   4  Imaginary value of the visibility
   5  Amplitude
   6  Phase (rad)
   7  Autocorrelation of the first datastream (real only)
   8  Autocorrelation of the second datastream (real only)

The lags output file (specified in line 16 above) has 7 columns:
   1  Channel (spectral point) number
   2  Time lag (sec)
   3  Real value of the lag function
   4  Imaginary value of the lag function
   5  Amplitude
   6  Phase (rad)
   7  Window function

Control-C will stop this program after the next FFT is completed and
will write the partial results to the output files.
```

```
zerocorr_makeconfig --help

usage: zerocorr_makeconfig [-h] [-i2 INFILE2] [-f2 FORMAT2] [-b2 BAND2]
                           [-o OFFSET] [-o2 OFFSET2] [-fs FFTSIZE]
                           [-fs2 FFTSIZE2] [-fc FIRSTCHAN] [-fc2 FIRSTCHAN2]
                           [-n NUMCHAN] [-n2 NUMCHAN2] [--numFFT NUMFFT]
                           infile format band basename outfile

A script for creating a configuration file for the zerocorr program. For
details see the help of zerocorr. If options for the second input file are
ommited the seetings of the first file are duplicated.

positional arguments:
  infile                the data file. Use --datafile2 option to supply a
                        second data file.
  format                The DiFX format descriptor for the data file (e.g.
                        VDIF_5032-2048-16-2)
  band                  The number of the band to process (starts at 0)
  basename              the base name of the visibility (.vis) and lag (.lag)
                        output files.
  outfile               name of the output .conf file

optional arguments:
  -h, --help            show this help message and exit
  -i2 INFILE2, --infile2 INFILE2
                        The second data file to process. [default: the first
                        data file]
  -f2 FORMAT2, --format2 FORMAT2
                        The format specifier for the second data file.
                        [default: format of the first data file]
  -b2 BAND2, --band2 BAND2
                        The number of the band to process of the second data
                        file(starts at 0) [default: the band selected for the
                        first file]
  -o OFFSET, --offset OFFSET
                        Offset into the first file (bytes). [default: 0]")
  -o2 OFFSET2, --offset2 OFFSET2
                        Offset into the second file (bytes). [default: 0]")
  -fs FFTSIZE, --fftsize FFTSIZE
                        Size of the FFT to perform over the original bandwidth
                        of first data file. [default: 512]")
  -fs2 FFTSIZE2, --fftsize2 FFTSIZE2
                        Size of the FFT to perform over the original bandwidth
                        of second data file. [default: 512]")
  -fc FIRSTCHAN, --firstchan FIRSTCHAN
                        First channel to correlate for the first data file
                        [default: 0]")
  -fc2 FIRSTCHAN2, --firstchan2 FIRSTCHAN2
                        First channel to correlate for the second data file.
                        [default: 0]")
  -n NUMCHAN, --numchan NUMCHAN
                        Number of channels to correlate (negative for LSB) of
                        first data file. [default: 256]")
  -n2 NUMCHAN2, --numchan2 NUMCHAN2
                        Number of channels to correlate (negative for LSB) of
                        second data file. [default: 256]")
  --numFFT NUMFFT       number of FFTs to process [default = all]
```