

**NAME**

**mbauvloglist** – Lists table data from an MBARI AUV mission log file.

**VERSION**

Version 5.0

**SYNOPSIS**

**mbauvloglist** **-I***file* [ **-C** **-F***printformat* **-L***lonflip* **-M***mode* **-N***navfile* **-O***list* **-P** **-R***id* **-S** **-X***scale* **-V** **-H** ]

**DESCRIPTION**

MBauvloglist reads an MBARI AUV mission log file and lists specified fields in tab-delimited text output. MBARI AUV mission logs are binary files with an ascii header describing the units, name, and binary size of each value in a single record. An example of a log file header is:

```
# binary fastcatlog
# timeTag time %8.8e ,time ,UNKNOWN
# double conductivity %8.8e ,Calculated conductivity ,Siemens/meter
# double temperature %8.8e ,Calculated temperature ,Celsius
# double pressure %8.8e ,Calculated pressure ,Decibars
# double calculated_salinity %8.8e ,Calculated salinity ,Volts
# double cond_frequency %8.8e ,Raw Conductivity frequency ,Hertz
# double temp_counts %8.8e ,Raw Pressure A/D counts ,Unitless
# double pressure_counts %8.8e ,pressure_counts ,Unitless
# double pressure_temp_comp_voltage_reading %8.8e ,Raw pressure temp compensation voltage reading
,Volts
# double calculated_sound_velocity %8.8e ,Calculated sound velocity ,M/s
# begin
```

Users can extract arbitrary text lists of values in the AUV log files by using the **-O** option repeatedly to specify fields by name (e.g. `calculated_sound_velocity`) in the order desired. The print formatting statements (e.g. `%8.8e`) included in the log header is used by default. However, users can use the **-F** option to specify optional formatting for fields specified in following **-O** commands.

To find out the values contained in any particular log file, use the **-P** option alone to print out a list of the contents. Then run **mbauvloglist** again using the **-O** option to specify each of the desired values in the desired order of columns. The **-F** option can be used to set the printing format. Otherwise, the default format specified in the log header will be used.

The **-M***mode* option sets the output mode. By default, the output will be ASCII text with tab characters between fields, which is equivalent to **-M0**. If *mode* = 1, then the output will be ASCII text with comma delimiters. If *mode* = 1, then the output will binary values (8-btye double or 4-byte int values) with nothing between the desired fields.

For log files that do not include navigation, an external navigation file in the "fnv" format may be specified using the **-N** option.

As of August 2009, the contents of the MBARI Mapping AUV missions logs are:

DropWeight.log Contents:  
 timeTag time %8.8e ,time ,UNKNOWN  
 short WDTimer %d ,Count Down Timer ,Seconds  
 short BWTimer %d ,Burn Wire Timer ,Seconds  
 short WDClear %d ,Watch Dog Clear ,Unitless

short AcommsDN %d ,Acoustic Comms Drop Now ,Unitless  
 short WDStatus %d ,Watch Dog Status ,Unknown  
 short DWout %d ,Drop Weight Active ,Unitless  
 short GulperProxIn %d ,Gulper Proximity Sensor ,Unitless

adam6017.log Contents:

timeTag time %8.8e ,time ,UNKNOWN  
 double chan0 %8.8e ,chan0 ,UNKNOWN  
 double chan1 %8.8e ,chan1 ,UNKNOWN  
 double chan2 %8.8e ,chan2 ,UNKNOWN  
 double chan3 %8.8e ,chan3 ,UNKNOWN  
 double chan4 %8.8e ,chan4 ,UNKNOWN  
 double chan5 %8.8e ,chan5 ,UNKNOWN  
 double chan6 %8.8e ,chan6 ,UNKNOWN  
 double chan7 %8.8e ,chan7 ,UNKNOWN

ats.log Contents:

timeTag time %8.8e ,time ,UNKNOWN  
 double AtsDelta %8.8e ,Last ms drift bt Reson and Auv clocks: drift = delta0 – (tReson-tAuv) ,seconds  
 double AtsDrift %8.8e ,AtsDrift ,seconds

dvl.log Contents:

timeTag time %8.8e ,time ,UNKNOWN  
 double dvlBotVelx %8.8e ,dvlBotVelx ,UNKNOWN  
 double dvlBotVely %8.8e ,dvlBotVely ,UNKNOWN  
 double dvlBotVelz %8.8e ,dvlBotVelz ,UNKNOWN  
 double dvlBotVele %8.8e ,dvlBotVele ,UNKNOWN  
 short dvlBotVelStat %d ,dvlBotVelStat ,UNKNOWN  
 double dvlWatVelx %8.8e ,dvlWatVelx ,UNKNOWN  
 double dvlWatVely %8.8e ,dvlWatVely ,UNKNOWN  
 double dvlWatVelz %8.8e ,dvlWatVelz ,UNKNOWN  
 double dvlWatVele %8.8e ,dvlWatVele ,UNKNOWN  
 short dvlWatVelStat %d ,dvlWatVelStat ,UNKNOWN  
 double dvlTemp %8.8e ,dvlTemp ,UNKNOWN  
 double dvlPitch %8.8e ,dvlPitch ,UNKNOWN  
 double dvlRoll %8.8e ,dvlRoll ,UNKNOWN  
 double dvlHeading %8.8e ,dvlHeading ,UNKNOWN  
 double dvlBeam1 %4.6f ,dvlBeam1 ,UNKNOWN  
 double dvlBeam2 %4.6f ,dvlBeam2 ,UNKNOWN  
 double dvlBeam3 %4.6f ,dvlBeam3 ,UNKNOWN  
 double dvlBeam4 %8.8e ,dvlBeam4 ,UNKNOWN  
 double dvlRange %8.8e ,dvlRange ,UNKNOWN  
 double dvlToping %20.4f ,dvlToping ,UNKNOWN  
 double dvlSpdSnd %12.4f ,dvlSpdSnd ,UNKNOWN

dynamicControl.log Contents:

timeTag time %8.8e ,time ,UNKNOWN  
 double myTime %.2f ,myTime ,UNKNOWN  
 double xTrackError %8.8e ,xTrackError ,UNKNOWN  
 double cPsi %8.8e ,cPsi ,UNKNOWN  
 double cDeltaR %8.8e ,cDeltaR ,UNKNOWN  
 double tPsi %8.8e ,tPsi ,UNKNOWN  
 double psiProp %8.8e ,psiProp ,UNKNOWN  
 double psiInt %8.8e ,psiInt ,UNKNOWN

```

double psiRate %8.8e ,psiRate ,UNKNOWN
double xteIntegral %8.8e ,xteIntegral ,UNKNOWN
double kxte %8.8e ,kxte ,UNKNOWN
double dPsi %8.8e ,dPsi ,UNKNOWN
double speedCmd %8.8e ,speedCmd ,UNKNOWN
double omegaCmd %8.8e ,omegaCmd ,UNKNOWN
double cDepth %8.8e ,cDepth ,UNKNOWN
double tDepth %8.8e ,tDepth ,UNKNOWN
double DepthError %8.8e ,DepthError ,UNKNOWN
double dIntegral %8.8e ,dIntegral ,UNKNOWN
double mDepthRateTerm %8.8e ,mDepthRateTerm ,UNKNOWN
double cTheta %8.8e ,cTheta ,UNKNOWN
double pitchProp %8.8e ,pitchProp ,UNKNOWN
double pitchInt %8.8e ,pitchInt ,UNKNOWN
double pitchRate %8.8e ,pitchRate ,UNKNOWN
double pitchIntInp %8.8e ,pitchIntInp ,UNKNOWN
double cDeltaEBL %8.8e ,cDeltaEBL ,UNKNOWN
double cDeltaE %8.8e ,cDeltaE ,UNKNOWN
double targetNorthing %13.2f ,targetNorthing ,UNKNOWN
double targetEasting %13.2f ,targetEasting ,UNKNOWN
double newBearing %8.8e ,newBearing ,UNKNOWN
double newNorthing %13.2f ,newNorthing ,UNKNOWN
double newEasting %13.2f ,newEasting ,UNKNOWN
short first %d ,first ,UNKNOWN

```

fastcatlog.log Contents:

```

timeTag time %8.8e ,time ,UNKNOWN
double conductivity %8.8e ,Calculated conductivity ,Siemens/meter
double temperature %8.8e ,Calculated temperature ,Celsius
double pressure %8.8e ,Calculated pressure ,Decibars
double calculated_salinity %8.8e ,Calculated salinity ,Volts
double cond_frequency %8.8e ,Raw Conductivity frequency ,Hertz
double temp_counts %8.8e ,Raw Pressure A/D counts ,Unitless
double pressure_counts %8.8e ,pressure_counts ,Unitless
double pressure_temp_comp_voltage_reading %8.8e ,Raw pressure temp compensation voltage reading
,Volts
double calculated_sound_velocity %8.8e ,Calculated sound velocity ,M/s

```

gps.log Contents:

```

timeTag time %8.8e ,time ,UNKNOWN
integer hours %d ,Hours ,Hours
integer minutes %d ,Minutes ,Minutes
integer seconds %d ,Seconds ,Seconds
integer centiSeconds %d ,CentiSeconds ,CentiSeconds
angle latitude %8.8e ,Vehicle latitude ,Degrees
angle longitude %8.8e ,Vehicle longitude ,Degrees
short quality %d ,GPS quality code ,Unitless
short numberOfSatellites %d ,Number of satellites visible ,Unitless
double hdop %8.8e ,Horizontal dilution of precision ,Unitless
double antennaHeight %8.8e ,Altitude of GPS antenna above mean sea level ,meters
double geoHeight %8.8e ,Geoidal separation ,meters
short dgpsDataAge %d ,Age of differential GPS correction ,seconds
short dgpsRSID %d ,Differential reference station ID ,Unitless

```

kearfott.log Contents:

```
timeTag time %8.8e ,time ,UNKNOWN
integer mCyclesK %d ,mCyclesK ,UNKNOWN
integer mModeK %d ,mModeK ,UNKNOWN
integer mMonK %d ,mMonK ,UNKNOWN
double mLatK %3.8f ,mLatK ,UNKNOWN
double mLonK %3.8f ,mLonK ,UNKNOWN
double mNorthK %13.2f ,mNorthK ,UNKNOWN
double mEastK %13.2f ,mEastK ,UNKNOWN
double mDepthK %8.8e ,mDepthK ,UNKNOWN
double mRollK %8.8e ,mRollK ,UNKNOWN
double mPitchK %8.8e ,mPitchK ,UNKNOWN
double mHeadK %8.8e ,mHeadK ,UNKNOWN
double mVbodyxK %8.8e ,mVbodyxK ,UNKNOWN
double mVbodyyK %8.8e ,mVbodyyK ,UNKNOWN
double mVbodyzK %8.8e ,mVbodyzK ,UNKNOWN
double mAccelxK %8.8e ,mAccelxK ,UNKNOWN
double mAccelyK %8.8e ,mAccelyK ,UNKNOWN
double mAccelzK %8.8e ,mAccelzK ,UNKNOWN
double mPrateK %8.8e ,mPrateK ,UNKNOWN
double mQrateK %8.8e ,mQrateK ,UNKNOWN
double mRrateK %8.8e ,mRrateK ,UNKNOWN
double utcTime %8.8e ,utcTime ,UNKNOWN
```

m3dmgx1.log Contents:

```
timeTag time %8.8e ,time ,UNKNOWN
angle mRollCB %8.8e ,Roll ,Degrees
angle mOmega_xCB %8.8e ,Roll rate ,Degrees/second
angle mPitchCB %8.8e ,Pitch ,Degrees
angle mOmega_yCB %8.8e ,Pitch rate ,Degrees/second
angle mYawCB %8.8e ,Yaw ,Degrees
angle mOmega_zCB %8.8e ,Yaw rate ,Degrees/second
double mAccel_xCB %8.8e ,Acceleration along vehicle x-axis ,G
double mAccel_yCB %8.8e ,Acceleration along vehicle y-axis ,G
double mAccel_zCB %8.8e ,Acceleration along vehicle z-axis ,G
double mMag_xCB %8.8e ,Magnetic field along vehicle x-axis ,Gauss
double mMag_yCB %8.8e ,Magnetic field along vehicle y-axis ,Gauss
double mMag_zCB %8.8e ,Magnetic field along vehicle z-axis ,Gauss
double mTempCB %8.8e ,Crossbow internal temperature ,Celsius
```

navigation.log Contents:

```
timeTag time %8.8e ,time ,UNKNOWN
double mPos_x %13.2f ,Vehicle Northing (WGS 84 Zone 10S) ,Meters
double mPos_y %13.2f ,Vehicle Easting (WGS 84 Zone 10S) ,Meters
double mDepth %8.8e ,Vehicle Depth ,Meters
double mGpsNorth %13.2f ,Northing (WGS 84 Zone 10S) based upon GPS fix ,Meters
double mGpsEast %13.2f ,Easting (WGS 84 Zone 10S) based upon GPS fix ,Meters
integer mGpsValid %d ,GPS fix Status code ,Unitless
double mPhi %8.8e ,Vehicle roll ,Degrees
double mTheta %8.8e ,Vehicle pitch ,Degrees
double mPsi %8.8e ,Vehicle yaw ,Degrees
double mOmega_x %8.8e ,Vehicle roll rate ,Degrees/second
double mOmega_y %8.8e ,Vehicle pitch rate ,Degrees/second
double mOmega_z %8.8e ,Vehicle yaw rate ,Degrees/second
```

```

double mPsaRange %8.8e ,Altimeter range ,Meters
double mAltitude %8.8e ,Vehicle altitude above bottom ,Meters
double mDvlAltitude %8.8e ,mDvlAltitude ,UNKNOWN
double mWaterSpeed %8.8e ,Current speed based upon DVL data ,Meters/second
integer mDvlValid %d ,Dvl valid flag in Navigation ,UNKNOWN
integer mDvlNewData %d ,Navigation thinks the Dvl has new data ,UNKNOWN
double mDeltaT %8.8e ,Time between Dvl updates ,Seconds
double nfix %13.2f ,Northing (WGS 84 Zone 10S) based upon baseline fix ,Meters
double efix %13.2f ,Easting (WGS 84 Zone 10S) based upon baseline fix ,Meters
double filter_north %13.2f ,Kalman filter northing (WGS 84 Zone 10S) ,Meters
double filter_east %13.2f ,Kalman filter easting (WGS 84 Zone 10S) ,Meters
double filter_depth %8.8e ,Kalman filter depth ,Meters
double north_current %8.8e ,Northward flowing current estimate ,Meters/second
double east_current %8.8e ,Eastward flowing current estimate ,Meters/second
double speed_bias %8.8e ,Speed bias based upon long baseline fixes ,Meters/second
double heading_bias %8.8e ,Heading bias based upon long baseline fixes ,Degrees
double latitude %5.8f ,latitude ,UNKNOWN
double longitude %5.8f ,longitude ,UNKNOWN

```

#### parosci.log Contents:

```

timeTag time %8.8e ,time ,UNKNOWN
double depth %8.3lf ,Depth ,Meters
double temp %8.8e ,Pressure Sensor Internal Temp ,Celsius
double pressure %8.8lf ,Pressure ,Bars
double temp_period %8.8lf ,Temperature Period ,Microseconds
double pres_period %8.8lf ,Pressure Period ,Microseconds

```

#### tailCone.log Contents:

```

timeTag time %8.8e ,time ,UNKNOWN
integer status %d ,status ,UNKNOWN
integer elevatorCurrent %d ,elevatorCurrent ,UNKNOWN
integer rudderCurrent %d ,rudderCurrent ,UNKNOWN
float propCurrent1 %f ,propCurrent1 ,UNKNOWN
integer propCurrent2 %d ,propCurrent2 ,UNKNOWN
integer propRpm %d ,propRpm ,UNKNOWN
float elevatorAngle %f ,elevatorAngle ,UNKNOWN
float rudderAngle %f ,rudderAngle ,UNKNOWN
integer propPwm %d ,propPwm ,UNKNOWN
integer propTemp %d ,propTemp ,UNKNOWN

```

## MB-SYSTEM AUTHORSHIP

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## OPTIONS

- H** This "help" flag cause the program to print out a description of its operation and then exit immediately.

**-C**

If merging with external navigation has been specified with the **-N** option, then the **-C** option causes input records with times before the beginning or after the end of the external navigation to not be output by **mbauvloglist**. The default behavior is to output all records, and for the values merged from the external navigation to be zero when outside the navigation time bounds.

**-F***printfmat*

Sets the printing format (in `fprintf()` style) of the next value specified using the **-O** option. By default, **mbauvloglist** uses the print format specified in the log file header. If the **-F** option has been used, using it again with *printfmat* equal to "default" will reset the print format to that specified in the log file header.

**-I***ifile*

Sets the input MBARI AUV mission log filename.

**-L***lonflip*

Sets the range of the longitude values output. If *lonflip*=−1 then the longitude values will be in the range from −360 to 0 degrees. If *lonflip*=0 then the longitude values will be in the range from −180 to 180 degrees. If *lonflip*=1 then the longitude values will be in the range from 0 to 360 degrees.

Default: **mbauvloglist** uses the user default *lonflip* set using **mbdefaults**.

**-M***mode*

Specifies the output mode. If *mode* = 0, then the output is ASCII text with tab delimiters between fields. If *mode* = 1, then the output is ASCII text with comma delimiters between fields. If *mode* = 2, then the output is binary with no values or breaks between fields. Default: ASCII text with tab delimiters.

**-N***nayfile*

Specifies a navigation file in the "fnv" format that contains position, heading, sensor depth, and attitude data. Values merged (interpolated) from these data can be specified for output using the

- mergeLon
- mergeLat
- mergeHeading
- mergeSpeed
- mergeDraft
- mergeSensordepth
- mergeRoll
- mergePitch
- mergeHeave

valuenames in the **-O** option. The merged values will be zero when the primary output data timestamp is from before the beginning or after the end of the navigation data. The **-C** option can be used to suppress output of records with timestamps outside the start and end bounds of the navigation.

**-O***valuename*

Causes **mbauvloglist** to output the specified value. This option can be given multiple times, and the values will be output in the order specified. The valid valuename strings consist of those defined in the header of the log file being parsed, plus the following:

- zero
- timeTag
- timeInterval
- mergeLon
- mergeLat
- mergeHeading
- mergeSpeed
- mergeDraft
- mergeSensordepth
- mergeRoll

```

mergePitch
mergeHeave
calcConductivity
calcTemperature
calcPressure
calcSalinity
calcSoundspeed
calcPotentialTemperature
calcDensity
calcKTime
calcKSpeed

```

The timeTag value corresponds to the record time tag reformatted as specified with **-Ftime\_i** as:

year,month,day,hour,minute,second,microsecond

or with **-Ftime\_j** options as:

year,julien\_day,hour,minute,second,microsecond

All of the other special values are double values. The timeInterval is the time interval between the current record and the prior record. The values beginning with "merge" derive from interpolation of data from an external navigation file specified using the **-N** option. Those beginning with "calc" are defined only when the input file is fastcatlog.log, which contains both raw conductivity, temperature, and pressure values from a SeaBird SBE49 Fastcat CTD and temperature, pressure, and salinity values derived from the raw values. If the **-Rid** option is used, then the temperature, conductivity, salinity, and pressure values will be recalculated using the calibration coefficients referenced by the *id* value. Those beginning with "calcK" are defined only when the input file is kearfott.log, which contains the output of the Kerafott inertial navigation system. The calcKtime value is a timestamp calculated by adding the Kerafott second-of-day value (utcTime) to the start of day (in seconds) from the overall timestamp (time). The calcKspeed is the lateral (x-y) speed calculated from the x and y rate values (mVbodyxK and mVbodyyK) in the kearfott.log file.

#### **-P**

Prints out the log file header.

#### **-R**

*id*

This option is meaningful only when the input file is fastcatlog.log, which contains both raw conductivity, temperature, and pressure values from a SeaBird SBE49 Fastcat CTD and temperature, pressure, and salinity values derived from the raw values. If the **-Rid** option is used, then the temperature, conductivity, salinity, and pressure values will be recalculated using the calibration coefficients referenced by the *id* value. As of July 2017, the only calibration coefficients defined are referenced by *id*=1, for the SeaBird SBE49 Fastcat CTD used on MBARI Mapping AUV 1 during 2016 and 2017.

#### **-S**

Scales angular values to be in degrees instead of radians.

#### **-X**

*scale*

Sets the output scaling factor multiplied by any following floating point values specified using the **-O** option. Initially this value is 1.0 so that by default no scaling occurs. If the **-X** option has been used, using it again with *scale* equal to 1.0 will restore no scaling for any following **-O** invocations. Default: *scale*=1.0

#### **-V**

The **-V** option causes the program to be verbose.

### EXAMPLE

To extract a list of pressure and water sound speed from the CTD log of an AUV mission, use:

```

mbauvloglist -I mvc_logs/2006.224.00/fastcatlog.log \
-F%f -O pressure -O calculated_sound_velocity

```

This simple list is ordered as the data were collected, following the ups and downs of the AUV mission. In order to construct a model of the water sound speed as a function of depth, one can sort the output of **mbauvloglist** (using the program **sort**) to be ordered with increasing pressure (depth), and then resampled

into uniform increments of pressure using the **GMT** program **sample1d**.

```
mbauvloglist -I mvc_logs/2006.224.00/fastcatlog.log \
    -F%f -O pressure -O calculated_sound_velocity \
    | sort -n -u > auv_ssv.txt
sample1d auv_ssv.txt -Fl -H1 -S0.0 -I10.0 > auv_ssv_bin.txt
```

## SEE ALSO

**mbsystem(1)**, **sample1d**, **sort**.

## BUGS

Indubitably.