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 **–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

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OPTIONS

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

–F   *printformat*
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 *printformat* 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   *navfile*
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 **-F***time_i* as:
                    year,month,day,hour,minute,second,microsecond
              or with **-F***time_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, tem-
              perature, and pressure values from a SeaBird SBE49 Fastcat CTD and temperature, pressure, and
              salinity values derived from the raw values. If the **–R***id* option is used, then the temperature, con-
              ductivity, salinity, and pressure values will be recalculated using the calibration coefficients refer-
              enced by the *id* value. Those beginning with "calcK" are defined only when the input file is kear-
              fott.log, which contains the output of the Kearfott inertial navigation system. The calcKtime value
              is a timestamp calculated by adding the Kearfott 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 calcu-
              lated 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 con-
              ductivity, temperature, and pressure values from a SeaBird SBE49 Fastcat CTD and temperature,
              pressure, and salinity values derived from the raw values. If the **–R***id* option is used, then the tem-
              perature, conductivity, salinity, and pressure values will be recalculated using the calibration coef-
              ficients 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.

       –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.

       –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.