

**NAME**

**mbmakeplatform** – creates or modifies an MB-System platform file.

**VERSION**

Version 5.0

**SYNOPSIS**

```
mbmakeplatform
--output=plffile
[
--verbose
--help
--input=plffile
--swath=datalist
--swath=swathfile
--swath-format=value
--platform-type-surface-vessel
--platform-type-tow-body
--platform-type-rov
--platform-type-auv
--platform-type-aircraft
--platform-type-satellite
--platform-name=string
--platform-organization=string
--platform-documentation-url=string
--platform-start-time=yyyy/mm/dd/hh/mm/ss.ssssss
--platform-end-time=yyyy/mm/dd/hh/mm/ss.ssssss
--add-sensor-sonar-echosounder
--add-sensor-sonar-multiechosounder
--add-sensor-sonar-sidescan
--add-sensor-sonar-interferometry
--add-sensor-sonar-multibeam
--add-sensor-sonar-multibeam-twohead
--add-sensor-sonar-subbottom
--add-sensor-camera-mono
--add-sensor-camera-stereo
--add-sensor-camera-video
--add-sensor-lidar-scan
--add-sensor-lidar-swath
--add-sensor-position
--add-sensor-compass
--add-sensor-vru
--add-sensor-imu
--add-sensor-ins
--add-sensor-ins-with-pressure
--add-sensor-ctd
--add-sensor-pressure
--add-sensor-soundspeed
--modify-sensor=sensorid
--modify-sensor-bathymetry
--modify-sensor-bathymetry1
--modify-sensor-bathymetry2
--modify-sensor-bathymetry3
--modify-sensor-backscatter
```

```
--modify-sensor-backscatter1
--modify-sensor-backscatter2
--modify-sensor-backscatter3
--modify-sensor-subbottom
--modify-sensor-subbottom1
--modify-sensor-subbottom2
--modify-sensor-subbottom3
--modify-sensor-position
--modify-sensor-position1
--modify-sensor-position2
--modify-sensor-position3
--modify-sensor-depth
--modify-sensor-depth1
--modify-sensor-depth2
--modify-sensor-depth3
--modify-sensor-heading
--modify-sensor-heading1
--modify-sensor-heading2
--modify-sensor-heading3
--modify-sensor-rollpitch
--modify-sensor-rollpitch1
--modify-sensor-rollpitch2
--modify-sensor-rollpitch3
--modify-sensor-heave
--modify-sensor-heave1
--modify-sensor-heave2
--modify-sensor-heave3
--sensor-model=string
--sensor-manufacturer=string
--sensor-serialnumber=string
--sensor-capability-position
--sensor-capability-depth
--sensor-capability-altitude
--sensor-capability-velocity
--sensor-capability-acceleration
--sensor-capability-pressure
--sensor-capability-rollpitch
--sensor-capability-heading
--sensor-capability-magneticfield
--sensor-capability-temperature
--sensor-capability-conductivity
--sensor-capability-salinity
--sensor-capability-soundspeed
--sensor-capability-gravity
--sensor-capability-topography-echosounder
--sensor-capability-topography-interferometry
--sensor-capability-topography-sass
--sensor-capability-topography-multibeam
--sensor-capability-topography-photogrammetry
--sensor-capability-topography-structurefrommotion
--sensor-capability-topography-lidar
--sensor-capability-topography-structuredlight
--sensor-capability-topography-laserscanner
--sensor-capability-backscatter-echosounder
```

```
--sensor-capability-backscatter-sidescan
--sensor-capability-backscatter-interferometry
--sensor-capability-backscatter-sass
--sensor-capability-backscatter-multibeam
--sensor-capability-backscatter-lidar
--sensor-capability-backscatter-structuredlight
--sensor-capability-backscatter-laserscanner
--sensor-capability-photography
--sensor-capability-stereophotography
--sensor-capability-video
--sensor-capability-stereovideo
--sensor-capability1=value
--sensor-capability2=value
--sensor-offsets=x/y/z/azimuth/roll/pitch
--sensor-offset-positions=x/y/z
--sensor-offset-angles=azimuth/roll/pitch
--sensor-time-latency=value
--sensor-time-latency-model=file
--sensor-source-bathymetry
--sensor-source-bathymetry1
--sensor-source-bathymetry2
--sensor-source-bathymetry3
--sensor-source-backscatter
--sensor-source-backscatter1
--sensor-source-backscatter2
--sensor-source-backscatter3
--sensor-source-subbottom
--sensor-source-subbottom1
--sensor-source-subbottom2
--sensor-source-subbottom3
--sensor-source-position
--sensor-source-position1
--sensor-source-position2
--sensor-source-position3
--sensor-source-depth
--sensor-source-depth1
--sensor-source-depth2
--sensor-source-depth3
--sensor-source-heading
--sensor-source-heading1
--sensor-source-heading2
--sensor-source-heading3
--sensor-source-rollpitch
--sensor-source-rollpitch1
--sensor-source-rollpitch2
--sensor-source-rollpitch3
--sensor-source-heave
--sensor-source-heave1
--sensor-source-heave2
--sensor-source-heave3
--modify-offsets=ioff/x/y/z/azimuth/roll/pitch
--modify-offset-positions=ioff/x/y/z
--modify-offset-angles=ioff/azimuth/roll/pitch
--modify-time-latency=value
```

```
--modify-time-latency-model=file
--end-sensor
--set-source-bathymetry=sensorid
--set-source-bathymetry1=sensorid
--set-source-bathymetry2=sensorid
--set-source-bathymetry3=sensorid
--set-source-backscatter=sensorid
--set-source-backscatter1=sensorid
--set-source-backscatter2=sensorid
--set-source-backscatter3=sensorid
--set-source-subbottom=sensorid
--set-source-subbottom1=sensorid
--set-source-subbottom2=sensorid
--set-source-subbottom3=sensorid
--set-source-camera=sensorid
--set-source-camera1=sensorid
--set-source-camera2=sensorid
--set-source-camera3=sensorid
--set-source-position=sensorid
--set-source-position1=sensorid
--set-source-position2=sensorid
--set-source-position3=sensorid
--set-source-depth=sensorid
--set-source-depth1=sensorid
--set-source-depth2=sensorid
--set-source-depth3=sensorid
--set-source-heading=sensorid
--set-source-heading1=sensorid
--set-source-heading2=sensorid
--set-source-heading3=sensorid
--set-source-rollpitch=sensorid
--set-source-rollpitch1=sensorid
--set-source-rollpitch2=sensorid
--set-source-rollpitch3=sensorid
--set-source-heave=sensorid
--set-source-heave1=sensorid
--set-source-heave2=sensorid
--set-source-heave3=sensorid ]
```

## DESCRIPTION

**Mbmakeplatform** is used to create an **MB-System** platform file, which provides a complete description of the geometry of sensors on a survey platform, including the relative positional and angular offsets. Platform files are used by **mbpreprocess** to set up an **MB-System** processing structure for swath data. In many cases the preprocessing consists only of creating the ancillary files parallel to the raw files, but in others the data must be translated to different formats. The preprocessing step can also be used to merge navigation, attitude, sound speed, or other ancillary data with the survey data.

Platform files are needed for preprocessing only when survey data have been collected without integrating the asynchronous navigation and attitude data and when the positional and angular offsets between the survey sensor (e.g. multibeam sonar, lidar, stereo camera rig) have not been specified in the various data streams. Most often this situation is associated with custom survey systems on submerged platforms like autonomous underwater vehicles (AUVs) or remotely operated vehicles (ROVs). The few data formats supported with preprocessing functionality utilizing platform files include the Reson 7k format 88, the Teledyne 7k3 format 89, and the 3D at Depth lidar formats 232 and 233.

Generally platform files are created by a single execution of **Mbmakeplatform** with a long series of command line arguments that add sensors, set sensor capabilities, and set sensor positional and angular offsets. For some data formats **Mbmakeplatform** can initialize a platform structure by extracting the sensor offset values from swath data files. In most cases the source of position data is set as the platform origin with zero positional and angular offset values.

No platform file is needed for preprocessing when the logged datastream includes a full platform description. Specifically, all datasets collected using Kongsberg multibeam sonars do not require use of a platform file (the only exception to this would be if the positional offsets between sensors were incorrectly specified in the multibeam configuration).

Two examples are presented below, both of which are custom submerged survey platforms combining a number of both mapping and ancillary sensors, including an inertial navigation system producing navigation and attitude.

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## OPTIONS

**--output=plffile**

Specifies the path of the output platform file.

[

**--verbose**

By default **mbmakeplatform** outputs minimal information to the shell. This option causes the program to indicate it's progress as it runs.

**--help** Lists the available command options.

**--input=plffile**

Specify an existing platform file to read and then modify with subsequent commands.

**--swath=[datalist or swathfile]**

Specify a swath data input (a datalist file or an individual data file) from which **mbmakeplatform** will attempt to extract a starting platform structure, including the list of sensors and the sensor positional and angular offsets. If the input path name follows the **MB-System** convention (e.g. \*.mb59 for format 59) or is otherwise recognized as associated with a known format, then the format need not be specified separately with **--swath-format**. Only the first available definition of the platform structure will be parsed, typically from the beginning of the first file referenced. This option only works for recent Kongsberg or Teledyne data formats (e.g. Kongsberg formats 58 & 59 and Teledyne formats 88 & 89).

**--swath-format=value**

Specify the format of the swath file or datalist from which a starting platform structure should be extracted.

**--platform-type=surface-vessel**

Set the platform type to be a surface vessel.

**--platform-type-tow-body**

Set the platform type to be a towed body.

**--platform-type-rov**

Set the platform type to be an ROV (remotely operated vehicle).

**--platform-type-auv**

Set the platform type to be an AUV (autonomous underwater vehicle).

**--platform-type-aircraft**

Set the platform type to be an aircraft.

**--platform-type-satellite**

Set the platform type to be a satellite.

**--platform-name=*string***

Set the platform name.

**--platform-organization=*string***

Set the name of the platform operating organization.

**--platform-documentation-url=*string***

Set the name of the platform documentation website url.

**--platform-start-time=yyyy/mm/dd/hh/mm/ss.ssssss**

Set the starting time for the time interval that this platform description is valid.

**--platform-end-time=yyyy/mm/dd/hh/mm/ss.ssssss**

Set the ending time for the time interval that this platform description is valid.

**--add-sensor-sonar-echosounder**

Initiate adding a new sensor of type echosounder (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-sonar-multiechosounder**

Initiate adding a new sensor of type multiechosounder (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-sonar-sidescan**

Initiate adding a new sensor of type sidescan (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-sonar-interferometry**

Initiate adding a new sensor of type interferometry sidescan (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-sonar-multibeam**

Initiate adding a new sensor of type multibeam (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-sonar-multibeam-twohead**

Initiate adding a new sensor of type two-head multibeam (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-sonar-subbottom**

Initiate adding a new sensor of type subbottom (sonar). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-camera-mono**

Initiate adding a new sensor of type single still camera. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-camera-stereo**

Initiate adding a new sensor of type stereo still camera rig. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-camera-video**

Initiate adding a new sensor of type video camera. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-lidar-scan**

Initiate adding a new sensor of type 2D scanning lidar. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-lidar-swath**

Initiate adding a new sensor of type swath lidar. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-position**

Initiate adding a new sensor of type position. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-compass**

Initiate adding a new sensor of type compass. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-vru**

Initiate adding a new sensor of type vertical reference unit (VRU). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-imu**

Initiate adding a new sensor of type inertial motion unit (IMU). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-ins**

Initiate adding a new sensor of type inertial navigation system (INS). All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-ins-with-pressure**

Initiate adding a new sensor of type inertial navigation system (INS) with pressure. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-ctd**

Initiate adding a new sensor of type CTD. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-pressure**

Initiate adding a new sensor of type pressure. All commands will pertain to this sensor until the command **end-sensor** is given.

**--add-sensor-soundspeed**

Initiate adding a new sensor of type sound speed. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor=sensorid**

Initiate modifying the existing sensor *sensorid* (where sensors ids count from 0). All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-bathymetry**

Initiate modifying the existing sensor that is identified as the source for bathymetry. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-bathymetry1**

Initiate modifying the existing sensor that is identified as the source for bathymetry1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-bathymetry2**

Initiate modifying the existing sensor that is identified as the source for bathymetry2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-bathymetry3**

Initiate modifying the existing sensor that is identified as the source for bathymetry3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-backscatter**

Initiate modifying the existing sensor that is identified as the source for backscatter. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-backscatter1**

Initiate modifying the existing sensor that is identified as the source for backscatter1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-backscatter2**

Initiate modifying the existing sensor that is identified as the source for backscatter2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-backscatter3**

Initiate modifying the existing sensor that is identified as the source for backscatter3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-subbottom**

Initiate modifying the existing sensor that is identified as the source for subbottom. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-subbottom1**

Initiate modifying the existing sensor that is identified as the source for subbottom1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-subbottom2**

Initiate modifying the existing sensor that is identified as the source for subbottom2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-subbottom3**

Initiate modifying the existing sensor that is identified as the source for subbottom3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-position**

Initiate modifying the existing sensor that is identified as the source for position. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-position1**

Initiate modifying the existing sensor that is identified as the source for position1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-position2**

Initiate modifying the existing sensor that is identified as the source for position2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-position3**

Initiate modifying the existing sensor that is identified as the source for position3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-depth**

Initiate modifying the existing sensor that is identified as the source for depth. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-depth1**

Initiate modifying the existing sensor that is identified as the source for depth1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-depth2**

Initiate modifying the existing sensor that is identified as the source for depth2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-depth3**

Initiate modifying the existing sensor that is identified as the source for depth3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heading**

Initiate modifying the existing sensor that is identified as the source for heading. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heading1**

Initiate modifying the existing sensor that is identified as the source for heading1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heading2**

Initiate modifying the existing sensor that is identified as the source for heading2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heading3**

Initiate modifying the existing sensor that is identified as the source for heading3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-rollpitch**

Initiate modifying the existing sensor that is identified as the source for rollpitch. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-rollpitch1**

Initiate modifying the existing sensor that is identified as the source for rollpitch1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-rollpitch2**

Initiate modifying the existing sensor that is identified as the source for rollpitch2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-rollpitch3**

Initiate modifying the existing sensor that is identified as the source for rollpitch3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heave**

Initiate modifying the existing sensor that is identified as the source for heave. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heave1**

Initiate modifying the existing sensor that is identified as the source for heave1. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heave2**

Initiate modifying the existing sensor that is identified as the source for heave2. All commands will pertain to this sensor until the command **end-sensor** is given.

**--modify-sensor-heave3**

Initiate modifying the existing sensor that is identified as the source for heave3. All commands will pertain to this sensor until the command **end-sensor** is given.

**--sensor-model=string**

Set sensor model string.

**--sensor-manufacturer=string**

Set sensor manufacturer string.

**--sensor-serialnumber=string**

Set sensor serial number string.

**--sensor-capability-position**

Add position to list of sensor's measurement capabilities.

**--sensor-capability-depth**

Add depth (typically from pressure) to list of sensor's measurement capabilities.

**--sensor-capability-altitude**

Add altitude to list of sensor's measurement capabilities.

**--sensor-capability-velocity**

Add velocity of motion to list of sensor's measurement capabilities.

**--sensor-capability-acceleration**

Add acceleration of motion to list of sensor's measurement capabilities.

**--sensor-capability-pressure**

Add pressure to list of sensor's measurement capabilities.

**--sensor-capability-rollpitch**

Add roll and pitch to list of sensor's measurement capabilities.

**--sensor-capability-heading**

Add heading to list of sensor's measurement capabilities.

**--sensor-capability-magneticfield**

Add magnetic field to list of sensor's measurement capabilities.

**--sensor-capability-temperature**

Add temperature to list of sensor's measurement capabilities.

**--sensor-capability-conductivity**

Add conductivity to list of sensor's measurement capabilities.

**--sensor-capability-salinity**

Add salinity to list of sensor's measurement capabilities.

**--sensor-capability-soundspeed**

Add sound speed to list of sensor's measurement capabilities.

**--sensor-capability-gravity**

Add gravity to list of sensor's measurement capabilities.

**--sensor-capability-topography-echosounder**

Add topography from echosounder to list of sensor's measurement capabilities.

**--sensor-capability-topography-interferometry**

Add topography from interferometric sidescan sonar to list of sensor's measurement capabilities.

**--sensor-capability-topography-sass**

Add topography from synthetic aperture sidescan (SASS) sonar to list of sensor's measurement capabilities.

**--sensor-capability-topography-multibeam**

Add topography from multibeam sonar to list of sensor's measurement capabilities.

**--sensor-capability-topography-photogrammetry**

Add topography from photogrammetry to list of sensor's measurement capabilities.

**--sensor-capability-topography-structurefrommotion**

Add topography from structure from motion to list of sensor's measurement capabilities.

**--sensor-capability-topography-lidar**

Add topography from lidar to list of sensor's measurement capabilities.

**--sensor-capability-topography-structuredlight**

Add topography from structured light to list of sensor's measurement capabilities.

**--sensor-capability-topography-laserscanner**

Add topography from laser scanner to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-echosounder**

Add backscatter from echosounder to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-sidescan**

Add backscatter from sidescan sonar to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-interferometry**

Add backscatter from interferometric sidescan sonar to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-sass**

Add backscatter from synthetic aperture sidescan (SASS) sonar to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-multibeam**

Add backscatter from multibeam sonar to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-lidar**

Add backscatter from lidar to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-structuredlight**

Add backscatter from structured light to list of sensor's measurement capabilities.

**--sensor-capability-backscatter-laserscanner**

Add backscatter from laser scanner to list of sensor's measurement capabilities.

**--sensor-capability-photography**

Add single camera still photography to list of sensor's measurement capabilities.

**--sensor-capability-stereophotography**

Add stereo camera still photography to list of sensor's measurement capabilities.

**--sensor-capability-video**

Add video to list of sensor's measurement capabilities.

**--sensor-capability-stereovideo**

Add stereo video to list of sensor's measurement capabilities.

**--sensor-capability1=value**

Set the first of two sensor capability 4 byte bitmasks directly. The usage of the bits in this mask are:

MB_SENSOR_CAPABILITY1_NONE	0x00000000	All bits = 0
MB_SENSOR_CAPABILITY1_POSITION	0x00000001	Bit 0 = 1
MB_SENSOR_CAPABILITY1_DEPTH	0x00000002	Bit 1 = 2
MB_SENSOR_CAPABILITY1_ALTITUDE	0x00000004	Bit 2 = 4
MB_SENSOR_CAPABILITY1_VELOCITY	0x00000008	Bit 3 = 8
MB_SENSOR_CAPABILITY1_ACCELERATION	0x00000010	Bit 4 = 16
MB_SENSOR_CAPABILITY1_PRESSURE	0x00000020	Bit 5 = 32
MB_SENSOR_CAPABILITY1_ROLLPITCH	0x00000040	Bit 6 = 64
MB_SENSOR_CAPABILITY1_HEADING	0x00000080	Bit 7 = 128
MB_SENSOR_CAPABILITY1_HEAVE	0x00000100	Bit 8 = 256
MB_SENSOR_CAPABILITY1_UNUSED09	0x00000200	Bit 9 = 512

MB_SENSOR_CAPABILITY1_UNUSED10	0x00000400	Bit 10 = 1024
MB_SENSOR_CAPABILITY1_UNUSED11	0x00000800	Bit 11 = 2048
MB_SENSOR_CAPABILITY1_UNUSED12	0x00001000	Bit 12 = 4096
MB_SENSOR_CAPABILITY1_TEMPERATURE	0x00002000	Bit 13 = 8192
MB_SENSOR_CAPABILITY1_CONDUCTIVITY	0x00004000	Bit 14 = 16384
MB_SENSOR_CAPABILITY1_SALINITY	0x00008000	Bit 15 = 32768
MB_SENSOR_CAPABILITY1_SOUND SPEED	0x00010000	Bit 16 = 65536
MB_SENSOR_CAPABILITY1_UNUSED17	0x00020000	Bit 17 = 131072
MB_SENSOR_CAPABILITY1_UNUSED18	0x00040000	Bit 18 = 262144
MB_SENSOR_CAPABILITY1_UNUSED19	0x00080000	Bit 19 = 524288
MB_SENSOR_CAPABILITY1_GRAVITY	0x00100000	Bit 20 = 1048576
MB_SENSOR_CAPABILITY1_UNUSED21	0x00200000	Bit 21 = 2097152
MB_SENSOR_CAPABILITY1_UNUSED22	0x00400000	Bit 22 = 4194304
MB_SENSOR_CAPABILITY1_UNUSED23	0x00800000	Bit 23 = 8388608
MB_SENSOR_CAPABILITY1_MAGNETICFIELD	0x01000000	Bit 24 = 16777216
MB_SENSOR_CAPABILITY1_UNUSED25	0x02000000	Bit 25 = 33554432
MB_SENSOR_CAPABILITY1_UNUSED26	0x04000000	Bit 26 = 67108864
MB_SENSOR_CAPABILITY1_UNUSED27	0x08000000	Bit 27 = 134217728
MB_SENSOR_CAPABILITY1_UNUSED28	0x10000000	Bit 28 = 268435456
MB_SENSOR_CAPABILITY1_UNUSED29	0x20000000	Bit 29 = 536870912
MB_SENSOR_CAPABILITY1_UNUSED30	0x40000000	Bit 30 = 1073741824
MB_SENSOR_CAPABILITY1_UNUSED31	0x80000000	Bit 31 = 2147483648

**--sensor-capability2=value**

Set the second of two sensor capability 4 byte bitmasks directly. The usage of the bits in this mask are:

MB_SENSOR_CAPABILITY2_NONE	0x00000000	All bits = 0
MB_SENSOR_CAPABILITY2_TOPOGRAPHY_ECHOSOUNDER	0x00000001	Bit 0 = 1
MB_SENSOR_CAPABILITY2_TOPOGRAPHY_INTERFEROMETRY	0x00000002	Bit 1 = 2

```

    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_SASS
        0x00000004      Bit 2 = 4
    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_MULTIBEAM
        0x00000008      Bit 3 = 8
    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_PHOTOGRAMMETRY
        0x00000010      Bit 4 = 16
    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_STRUCTUREFROMMOTION
        0x00000020      Bit 5 = 32
    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_LIDAR
        0x00000040      Bit 6 = 64
    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_STRUCTUREDLIGHT
        0x00000080      Bit 7 = 128
    MB_SENSOR_CAPABILITY2_TOPOGRAPHY_LASERSCANNER
        0x00000100      Bit 8 = 256
    MB_SENSOR_CAPABILITY2_UNUSED09
        0x00000200      Bit 9 = 512
    MB_SENSOR_CAPABILITY2_UNUSED10
        0x00000400      Bit 10 = 1024
    MB_SENSOR_CAPABILITY2_UNUSED11
        0x00000800      Bit 11 = 2048
    MB_SENSOR_CAPABILITY2_BACKSCATTER_ECHOSOUNDER
        0x00001000      Bit 12 = 4096
    MB_SENSOR_CAPABILITY2_BACKSCATTER_SIDESCAN
        0x00002000      Bit 13 = 8192
    MB_SENSOR_CAPABILITY2_BACKSCATTER_INTERFEROMETRY
        0x00004000      Bit 14 = 16384
    MB_SENSOR_CAPABILITY2_BACKSCATTER_SASS
        0x00008000      Bit 15 = 32768
    MB_SENSOR_CAPABILITY2_BACKSCATTER_MULTIBEAM
        0x00010000      Bit 16 = 65536
    MB_SENSOR_CAPABILITY2_BACKSCATTER_LIDAR
        0x00020000      Bit 17 = 131072
    MB_SENSOR_CAPABILITY2_BACKSCATTER_STRUCTUREDLIGHT
        0x00040000      Bit 18 = 262144
    MB_SENSOR_CAPABILITY2_BACKSCATTER_LASERSCANNER
        0x00080000      Bit 19 = 524288
    MB_SENSOR_CAPABILITY2_UNUSED20
        0x00100000      Bit 20 = 1048576
    MB_SENSOR_CAPABILITY2_SUBBOTTOM_ECHOSOUNDER
        0x00200000      Bit 21 = 2097152
    MB_SENSOR_CAPABILITY2_SUBBOTTOM_CHIRP
        0x00400000      Bit 22 = 4194304
    MB_SENSOR_CAPABILITY2_UNUSED23
        0x00800000      Bit 23 = 8388608
    MB_SENSOR_CAPABILITY2_PHOTOGRAPHY
        0x01000000      Bit 24 = 16777216
    MB_SENSOR_CAPABILITY2_STEREOPHOTOGRAPHY
        0x02000000      Bit 25 = 33554432
    MB_SENSOR_CAPABILITY2_VIDEO
        0x04000000      Bit 26 = 67108864
    MB_SENSOR_CAPABILITY2_STEREOVIDEO
        0x08000000      Bit 27 = 134217728
    MB_SENSOR_CAPABILITY2_UNUSED28
        0x10000000      Bit 28 = 268435456

```

MB_SENSOR_CAPABILITY2_UNUSED29	0x20000000	Bit 29 = 536870912
MB_SENSOR_CAPABILITY2_UNUSED30	0x40000000	Bit 30 = 1073741824
MB_SENSOR_CAPABILITY2_UNUSED31	0x80000000	Bit 31 = 2147483648

**--sensor-offsets=x/y/z/azimuth/roll/pitch**

Used to set the positional (x, y, and z) and angular (azimuth, roll, and pitch) offsets for the sensor currently being added. To modify offsets of an existing sensor use **--modify-offsets**. Here x is positive to starboard, y is positive forward, and z is positive up. Roll is positive starboard up, pitch is positive forward up, and azimuth is positive clockwise from forward. Generally one sensor has zero offsets and thus serves as the platform origin. For sensors with two elements (e.g. bistatic multibeam sonars with separate transmit and receive arrays, or stereo camera rigs with two cameras), two **--sensor\_offsets** calls are made. In the case of a multibeam the first set of offsets is for the transmit array, and in the case of a stereo camera rig the first offsets are for the left camera.

**--sensor-offset-positions=x/y/z**

Used to set the positional (x, y, and z) offsets for the sensor currently being added. To modify positional offsets of an existing sensor use **--modify-offset-positions**. Here x is positive to starboard, y is positive forward, and z is positive up. Generally one sensor has zero offsets and thus serves as the platform origin. This command is used for sensors that do not make measurements dependent on orientation, and so do not have angular offsets (e.g. sound speed, pressure, or CTD sensors).

**--sensor-offset-angles=azimuth/roll/pitch**

Used to set the angular (azimuth, roll, and pitch) offsets for the sensor currently being added. To modify angular offsets of an existing sensor use **--modify-offset-angles**. Here roll is positive starboard up, pitch is positive forward up, and azimuth is positive clockwise from forward. Generally one sensor has zero offsets and thus serves as the platform origin. This command is used for sensors that do not make measurements dependent on position, and so do not have positional offsets (e.g. vertical reference units (VRUs) that measure orientation only).

**--sensor-time-latency=value**

Sets a static time latency in seconds for the sensor currently being added.

**--sensor-time-latency-model=file**

Specifies a file containing a time latency model time series for the sensor currently being added. The file is in the form of two white-space delimited columns with the first column being times in epoch seconds (seconds since the start of 1970) and the second being the time latency in seconds.

**--sensor-source-bathymetry**

Sets the sensor currently being either added or modified to be the source for bathymetry.

**--sensor-source-bathymetry1**

Sets the sensor currently being either added or modified to be the source for bathymetry1.

**--sensor-source-bathymetry2**

Sets the sensor currently being either added or modified to be the source for bathymetry2.

**--sensor-source-bathymetry3**

Sets the sensor currently being either added or modified to be the source for bathymetry3.

**--sensor-source-backscatter**

Sets the sensor currently being either added or modified to be the source for backscatter.

**--sensor-source-backscatter1**

Sets the sensor currently being either added or modified to be the source for backscatter1.

**--sensor-source-backscatter2**

Sets the sensor currently being either added or modified to be the source for backscatter2.

**--sensor-source-backscatter3**

Sets the sensor currently being either added or modified to be the source for backscatter3.

**--sensor-source-subbottom**

Sets the sensor currently being either added or modified to be the source for subbottom.

**--sensor-source-subbottom1**

Sets the sensor currently being either added or modified to be the source for subbottom1.

**--sensor-source-subbottom2**

Sets the sensor currently being either added or modified to be the source for subbottom2.

**--sensor-source-subbottom3**

Sets the sensor currently being either added or modified to be the source for subbottom3.

**--sensor-source-position**

Sets the sensor currently being either added or modified to be the source for position.

**--sensor-source-position1**

Sets the sensor currently being either added or modified to be the source for position1.

**--sensor-source-position2**

Sets the sensor currently being either added or modified to be the source for position2.

**--sensor-source-position3**

Sets the sensor currently being either added or modified to be the source for position3.

**--sensor-source-depth**

Sets the sensor currently being either added or modified to be the source for depth.

**--sensor-source-depth1**

Sets the sensor currently being either added or modified to be the source for depth1.

**--sensor-source-depth2**

Sets the sensor currently being either added or modified to be the source for depth2.

**--sensor-source-depth3**

Sets the sensor currently being either added or modified to be the source for depth3.

**--sensor-source-heading**

Sets the sensor currently being either added or modified to be the source for heading.

**--sensor-source-heading1**

Sets the sensor currently being either added or modified to be the source for heading1.

**--sensor-source-heading2**

Sets the sensor currently being either added or modified to be the source for heading2.

**--sensor-source-heading3**

Sets the sensor currently being either added or modified to be the source for heading3.

**--sensor-source-rollpitch**

Sets the sensor currently being either added or modified to be the source for rollpitch.

**--sensor-source-rollpitch1**

Sets the sensor currently being either added or modified to be the source for rollpitch1.

**--sensor-source-rollpitch2**

Sets the sensor currently being either added or modified to be the source for rollpitch2.

**--sensor-source-rollpitch3**

Sets the sensor currently being either added or modified to be the source for rollpitch3.

**--sensor-source-heave**

Sets the sensor currently being either added or modified to be the source for heave.

**--sensor-source-heave1**

Sets the sensor currently being either added or modified to be the source for heave1.

**--sensor-source-heave2**

Sets the sensor currently being either added or modified to be the source for heave2.

**--sensor-source-heave3**

Sets the sensor currently being either added or modified to be the source for heave3.

**--end-sensor**

Ends the commands for adding or modifying a sensor.

**--modify-offsets=*ioff/x/y/z/azimuth/roll/pitch***

Used to set the positional (x, y, and z) and angular (azimuth, roll, and pitch) offsets for the sensor currently being modified. To add offsets to a new sensor use **--sensor-offsets**. Here x is positive to starboard, y is positive forward, and z is positive up. Roll is positive starboard up, pitch is positive forward up, and azimuth is positive clockwise from forward. Generally one sensor has zero offsets and thus serves as the platform origin. For sensors with two elements (e.g. bistatic multibeam sonars with separate transmit and receive arrays, or stereo camera rigs with two cameras), two **--sensor\_offsets** calls are made. In the case of a multibeam the first set of offsets is for the transmit array, and in the case of a stereo camera rig the first offsets are for the left camera.

**--modify-offset-positions=*ioff/x/y/z***

Used to set the positional (x, y, and z) offsets for the sensor currently being modified. To add positional offsets to a new sensor use **--sensor-offset-positions**. Here x is positive to starboard, y is positive forward, and z is positive up. Generally one sensor has zero offsets and thus serves as the platform origin. This command is used for sensors that do not make measurements dependent on orientation, and so do not have angular offsets (e.g. sound speed, pressure, or CTD sensors).

**--modify-offset-angles=*ioff/azimuth/roll/pitch***

Used to set the angular (azimuth, roll, and pitch) offsets for the sensor currently being modified. To add angular offsets to a new sensor use **--sensor-offset-angles**. Here roll is positive starboard up, pitch is positive forward up, and azimuth is positive clockwise from forward. Generally one sensor has zero offsets and thus serves as the platform origin. This command is used for sensors that do not make measurements dependent on position, and so do not have positional offsets (e.g. vertical reference units (VRUs) that measure orientation only).

**--modify-time-latency=*value***

Sets a static time latency in seconds for the sensor currently being modified.

**--modify-time-latency-model=*file***

Specifies a file containing a time latency model time series for the sensor currently being modified. The file is in the form of two white-space delimited columns with the first column being times in epoch seconds (seconds since the start of 1970) and the second being the time latency in seconds.

**--set-source-bathymetry=*sensorid***

Set the specified sensor to be a source for bathymetry.

**--set-source-bathymetry1=*sensorid***

Set the specified sensor to be a source for bathymetry1.

**--set-source-bathymetry2=*sensorid***

Set the specified sensor to be a source for bathymetry2.

**--set-source-bathymetry3=*sensorid***

Set the specified sensor to be a source for bathymetry3.

**--set-source-backscatter=*sensorid***

Set the specified sensor to be a source for backscatter.

**--set-source-backscatter1=*sensorid***

Set the specified sensor to be a source for backscatter1.

--set-source-backscatter2=*sensorid*  
Set the specified sensor to be a source for backscatter2.

--set-source-backscatter3=*sensorid*  
Set the specified sensor to be a source for backscatter2.

--set-source-subbottom=*sensorid*  
Set the specified sensor to be a source for subbottom.

--set-source-subbottom1=*sensorid*  
Set the specified sensor to be a source for subbottom1.

--set-source-subbottom2=*sensorid*  
Set the specified sensor to be a source for subbottom2.

--set-source-subbottom3=*sensorid*  
Set the specified sensor to be a source for subbottom3.

--set-source-camera=*sensorid*  
Set the specified sensor to be a source for camera.

--set-source-camera1=*sensorid*  
Set the specified sensor to be a source for camera1.

--set-source-camera2=*sensorid*  
Set the specified sensor to be a source for camera2.

--set-source-camera3=*sensorid*  
Set the specified sensor to be a source for camera3.

--set-source-position=*sensorid*  
Set the specified sensor to be a source for position.

--set-source-position1=*sensorid*  
Set the specified sensor to be a source for position1.

--set-source-position2=*sensorid*  
Set the specified sensor to be a source for position2.

--set-source-position3=*sensorid*  
Set the specified sensor to be a source for position3.

--set-source-depth=*sensorid*  
Set the specified sensor to be a source for depth.

--set-source-depth1=*sensorid*  
Set the specified sensor to be a source for depth1.

--set-source-depth2=*sensorid*  
Set the specified sensor to be a source for depth2.

--set-source-depth3=*sensorid*  
Set the specified sensor to be a source for depth3.

--set-source-heading=*sensorid*  
Set the specified sensor to be a source for heading.

--set-source-heading1=*sensorid*  
Set the specified sensor to be a source for heading1.

--set-source-heading2=*sensorid*  
Set the specified sensor to be a source for heading2.

--set-source-heading3=*sensorid*  
Set the specified sensor to be a source for heading3.

```
--set-source-rollpitch=sensorid
    Set the specified sensor to be a source for rollpitch.

--set-source-rollpitch1=sensorid
    Set the specified sensor to be a source for rollpitch1.

--set-source-rollpitch2=sensorid
    Set the specified sensor to be a source for rollpitch2.

--set-source-rollpitch3=sensorid
    Set the specified sensor to be a source for rollpitch3.

--set-source-heave=sensorid
    Set the specified sensor to be a source for heave.

--set-source-heave1=sensorid
    Set the specified sensor to be a source for heave1.

--set-source-heave2=sensorid
    Set the specified sensor to be a source for heave2.

--set-source-heave3=sensorid
    Set the specified sensor to be a source for heave3.
```

]

## EXAMPLES

The Monterey Bay Aquarium Research Institute operates a Low Altitude Survey System (LASS) that is mounted on Remotely Operated Vehicles (ROVs) and used for 1-cm-scale surveys of the seafloor. The LASS combines the following sensors:

- Kearfott SeaDevil inertial navigation system (INS)
- Paroscientific Digiquartz pressure sensor
- Teledyne Reson T50 400 kHz multibeam sonar
- 3D at Depth Wide Swath Subsea Lidar (WiSSL)
- Stereo camera rig with two Allied Vision Prosilica GX1920 color cameras
- VectorNav VN100 inertial measurement unit (IMU) and attitude heading reference system (AHRS)

**MB-System** processing of the various datasets collected by the LASS depend upon the platform model for the LASS, which is created by the following set of commands to **mbmakeplatform**:

```
mbmakeplatform --output=20240829ROVVentana.plf \
    --platform-type-rov \
    --platform-name="Ventana" \
    --platform-organization="Monterey Bay Aquarium Research Institute" \
    --add-sensor-ins \
        --sensor-model="SeaDeViL" \
        --sensor-manufacturer="Kearfott" \
        --sensor-serialnumber="2" \
        --sensor-capability-position \
        --sensor-capability-heading \
        --sensor-capability-rollpitch \
        --sensor-offsets=0.0/0.0/0.0/0.0/0.0/0.0 \
        --sensor-time-latency=0.0 \
        --sensor-source-position \
        --sensor-source-heading \
        --sensor-source-rollpitch \
        --sensor-source-heave \
    --end-sensor \
```

```
--add-sensor-pressure \
--sensor-model="Digiquartz" \
--sensor-manufacturer="Paroscientific" \
--sensor-serialnumber="Unknown" \
--sensor-capability-depth \
--sensor-offset-positions=-0.2164694/-0.076170/-0.069085 \
--sensor-time-latency=0.0 \
--sensor-source-depth \
--end-sensor \
--add-sensor-sonar-multibeam \
--sensor-model="T50 400 kHz" \
--sensor-manufacturer="Reson" \
--sensor-serialnumber="Unknown" \
--sensor-capability-topography-multibeam \
--sensor-capability-backscatter-multibeam \
--sensor-offsets=-0.459100/0.246774/-0.180388/0.07/0.07/0.16 \
--sensor-offsets=-0.459100/0.442174/-0.211386/0.07/0.07/0.16 \
--sensor-source-bathymetry \
--sensor-source-bathymetry1 \
--sensor-source-backscatter \
--sensor-source-backscatter1 \
--end-sensor \
--add-sensor-lidar-swath \
--sensor-model="WiSSL" \
--sensor-manufacturer="3DatDepth" \
--sensor-serialnumber="1" \
--sensor-capability-topography-lidar \
--sensor-capability-backscatter-lidar \
--sensor-offsets=-0.4653/0.0160/-0.0952/0.0/0.0/0.0 \
--sensor-source-bathymetry2 \
--sensor-source-backscatter2 \
--end-sensor \
--add-sensor-camera-stereo \
--sensor-model="Prosilica GX1920" \
--sensor-manufacturer="Allied Vision" \
--sensor-serialnumber="Unknown" \
--sensor-capability-stereophotography \
--sensor-offsets=-0.559430/-0.106901/-0.136561/0.0/0.0/0.0 \
--sensor-offsets=-0.559430/-0.106901/-0.136561/0.0/0.0/0.0 \
--sensor-source-bathymetry3 \
--sensor-source-backscatter3 \
--end-sensor \
--add-sensor-ins \
--sensor-model="VN-100" \
--sensor-manufacturer="VectorNav" \
--sensor-serialnumber="Unknown" \
--sensor-capability-position \
--sensor-capability-heading \
--sensor-capability-rollpitch \
--sensor-offsets=-0.255900/0.231999/-0.004164/0.0/0.0/0.0 \
--sensor-time-latency=0.0 \
--sensor-source-position \
--sensor-source-heading \
--sensor-source-rollpitch \
```

```
--sensor-source-heave \
--end-sensor
```

Executing the above command produces a platform file named 20240829ROVVentana.plf, which has the following contents:

```
## MB-System Platform Definition File
MB-SYSTEM_VERSION      5.8.2beta13
FILE_VERSION            1.00
ORIGIN                 Generated by user <seafloor> on cpu <Morgan.local> at <Thu Aug 29
14:33:58 2024>
##
PLATFORM_TYPE          3 ## ROV
PLATFORM_NAME           Ventana
PLATFORM_ORGANIZATION   Monterey Bay Aquarium Research Institute
DOCUMENTATION_URL
##
START_TIME_D            0.000000 ## 0000/00/00 00:00:00.000000
END_TIME_D              0.000000 ## 0000/00/00 00:00:00.000000
##
PLATFORM_NUM_SENSORS    6
##
## Defined data source sensors:
SOURCE_BATHYMETRY      2
SOURCE_BATHYMETRY1       2
SOURCE_BATHYMETRY2       3
SOURCE_BATHYMETRY3       4
SOURCE_BACKSCATTER        2
SOURCE_BACKSCATTER1       2
SOURCE_BACKSCATTER2       3
SOURCE_BACKSCATTER3       4
SOURCE_POSITION          5
SOURCE_DEPTH              1
SOURCE_HEADING            5
SOURCE_ROLLPITCH          5
SOURCE_HEAVE                5
##
## Undefined data sources:
## SOURCE_SUBBOTTOM
## SOURCE_SUBBOTTOM1
## SOURCE_SUBBOTTOM2
## SOURCE_SUBBOTTOM3
## SOURCE_CAMERA
## SOURCE_CAMERA1
## SOURCE_CAMERA2
## SOURCE_CAMERA3
## SOURCE_POSITION1
## SOURCE_POSITION2
## SOURCE_POSITION3
## SOURCE_DEPTH1
## SOURCE_DEPTH2
## SOURCE_DEPTH3
## SOURCE_HEADING1
## SOURCE_HEADING2
```

```

## SOURCE_HEADING3
## SOURCE_ROLLPITCH1
## SOURCE_ROLLPITCH2
## SOURCE_ROLLPITCH3
## SOURCE_HEAVE1
## SOURCE_HEAVE2
## SOURCE_HEAVE3
##
## Sensor list:
##
SENSOR_TYPE      0 101 ## INS
SENSOR_MODEL     0 SeaDeViL
SENSOR_MANUFACTURER 0 Kearfott
SENSOR_SERIALNUMBER 0 2
SENSOR_CAPABILITY1 0    193 ## position rollpitch heading heading
SENSOR_CAPABILITY2 0    0 ##
SENSOR_NUM_OFFSETS 0 1
OFFSET_POSITION   0 0 0.000000 0.000000 0.000000 ## Starboard, Forward,
Up (meters)
OFFSET_ATTITUDE   0 0 0.000000 0.000000 0.000000 ## Heading, Roll, Pitch
(degrees)
SENSOR_TIME_LATENCY_STATIC 0    0.000000 ## Seconds
##
SENSOR_TYPE      1 111 ## Pressure
SENSOR_MODEL     1 Digiquartz
SENSOR_MANUFACTURER 1 Paroscientific
SENSOR_SERIALNUMBER 1 Unknown
SENSOR_CAPABILITY1 1    2 ## depth
SENSOR_CAPABILITY2 1    0 ##
SENSOR_NUM_OFFSETS 1 1
OFFSET_POSITION   1 0 -0.216469 -0.076170 -0.069085 ## Starboard, Forward,
Up (meters)
SENSOR_TIME_LATENCY_STATIC 1    0.000000 ## Seconds
##
SENSOR_TYPE      2 30 ## Sonar multibeam
SENSOR_MODEL     2 T50 400 kHz
SENSOR_MANUFACTURER 2 Reson
SENSOR_SERIALNUMBER 2 Unknown
SENSOR_CAPABILITY1 2    0 ##
SENSOR_CAPABILITY2 2    65544 ## topography_multibeam backscatter_multibeam
SENSOR_NUM_OFFSETS 2 2
OFFSET_POSITION   2 0 -0.459100 0.246774 -0.180388 ## Starboard, Forward,
Up (meters)
OFFSET_ATTITUDE   2 0 0.070000 0.070000 0.160000 ## Heading, Roll, Pitch
(degrees)
OFFSET_POSITION   2 1 -0.459100 0.442174 -0.211386 ## Starboard, Forward,
Up (meters)
OFFSET_ATTITUDE   2 1 0.070000 0.070000 0.160000 ## Heading, Roll, Pitch
(degrees)
##
SENSOR_TYPE      3 61 ## Lidar swath
SENSOR_MODEL     3 WiSSL
SENSOR_MANUFACTURER 3 3DatDepth
SENSOR_SERIALNUMBER 3 1

```

```
mbmakeplatform(1)
```

MB-System 5.0

```
mbmakeplatform(1)
```

```
    SENSOR_CAPABILITY1      3      0 ##
    SENSOR_CAPABILITY2      3    1311136 ## topography_lidar backscatter_lidar
    SENSOR_NUM_OFFSETS      3      1
    OFFSET_POSITION          3      0  -0.465300  0.016000  -0.095200 ## Starboard, Forward,
Up (meters)
    OFFSET_ATTITUDE          3      0  0.000000  0.000000  0.000000 ## Heading, Roll, Pitch
(degrees)
    ##
    SENSOR_TYPE              4  51 ## Camera stereo
    SENSOR_MODEL              4 Prosilica GX1920
    SENSOR_MANUFACTURER      4 Allied Vision
    SENSOR_SERIALNUMBER      4 Unknown
    SENSOR_CAPABILITY1      4      0 ##
    SENSOR_CAPABILITY2      4  33554432 ## stereophotography
    SENSOR_NUM_OFFSETS      4      2
    OFFSET_POSITION          4      0  -0.559430  -0.106901  -0.136561 ## Starboard, Forward,
Up (meters)
    OFFSET_ATTITUDE          4      0  0.000000  0.000000  0.000000 ## Heading, Roll, Pitch
(degrees)
    OFFSET_POSITION          4      1  -0.559430  -0.106901  -0.136561 ## Starboard, Forward,
Up (meters)
    OFFSET_ATTITUDE          4      1  0.000000  0.000000  0.000000 ## Heading, Roll, Pitch
(degrees)
    ##
    SENSOR_TYPE              5  101 ## INS
    SENSOR_MODEL              5 VN-100
    SENSOR_MANUFACTURER      5 VectorNav
    SENSOR_SERIALNUMBER      5 Unknown
    SENSOR_CAPABILITY1      5    193 ## position rollpitch heading heading
    SENSOR_CAPABILITY2      5      0 ##
    SENSOR_NUM_OFFSETS      5      1
    OFFSET_POSITION          5      0  0.000000  0.000000  0.000000 ## Starboard, Forward,
Up (meters)
    OFFSET_ATTITUDE          5      0  0.000000  0.000000  0.000000 ## Heading, Roll, Pitch
(degrees)
    SENSOR_TIME_LATENCY_STATIC 5    0.000000 ## Seconds
    ##
```

The Monterey Bay Aquarium Research Institute operates two Dorado class autonomous underwater vehicles (AUVs) optimized for seafloor mapping in the deep ocean. These Mapping AUVs field the following sensors:

- Kearfott SeaDevil inertial navigation system (INS)
- Paroscientific Digiquartz pressure sensor
- Teledyne Reson T50 400 kHz multibeam sonar
- Edgetech 110 kHz chirp sidescan sonar
- Edgetech 1-6 kHz chirp subbottom profiler

**MB-System** processing of the various datasets collected by the Mapping AUVs depend upon the platform models for these vehicles, which are created by the following set of commands to **mbmakeplatform**:

```
mbmakeplatform --output=20240510m1_MAUV2.plf \
--platform-type-auv \
--platform-name="MAUV2 MBARI Dorado Class Mapping AUV" \
--platform-organization="Monterey Bay Aquarium Research Institute" \
```

```
--add-sensor-ins \
--sensor-model="SeaDeViL" \
--sensor-manufacturer="Kearfott" \
--sensor-serialnumber="2" \
--sensor-capability-position \
--sensor-capability-heading \
--sensor-capability-rollpitch \
--sensor-offsets=0.0/0.0/0.0/0.0/0.0/0.0 \
--sensor-time-latency=0.0 \
--sensor-source-position \
--sensor-source-heading \
--sensor-source-rollpitch \
--sensor-source-heave \
--end-sensor \
--add-sensor-pressure \
--sensor-model="Digiquartz" \
--sensor-manufacturer="Paroscientific" \
--sensor-serialnumber="Unknown" \
--sensor-capability-depth \
--sensor-offset-positions=0.0/-0.6/0.0 \
--sensor-time-latency=0.0 \
--sensor-source-depth \
--end-sensor \
--add-sensor-sonar-multibeam \
--sensor-model="7125 400 kHz" \
--sensor-manufacturer="Reson" \
--sensor-serialnumber="Unknown" \
--sensor-capability-topography-multibeam \
--sensor-capability-backscatter-multibeam \
--sensor-offsets=0.0/0.353/-0.18/0.50/-0.16/+0.34 \
--sensor-offsets=0.0/0.153/+0.00/0.50/-0.16/+0.34 \
--sensor-source-bathymetry \
--sensor-source-bathymetry1 \
--sensor-source-backscatter \
--sensor-source-backscatter1 \
--end-sensor \
--add-sensor-sonar-sidescan \
--sensor-model="FSAU chirp 110 kHz" \
--sensor-manufacturer="Edgetech" \
--sensor-serialnumber="Unknown" \
--sensor-capability-backscatter-sidescan \
--sensor-offsets=0.0/1.353/-0.10/0.0/0.0/0.0 \
--sensor-source-backscatter2 \
--end-sensor \
--add-sensor-sonar-subbottom \
--sensor-model="FSAU chirp 1-6 kHz" \
--sensor-manufacturer="Edgetech" \
--sensor-serialnumber="Unknown" \
--sensor-capability-backscatter-sidescan \
--sensor-offsets=0.0/1.353/-0.10/0.0/0.0/0.0 \
--sensor-source-backscatter2 \
--end-sensor
```

Executing the above command produces a platform file named 20240510m1\_MAUV2.plf, which has the following contents:

```
## MB-System Platform Definition File
MB-SYSTEM_VERSION      5.8.2beta02
FILE_VERSION            1.00
ORIGIN                 Generated by user <caress> on cpu <auvrouter.rc.mbari.org> at <Sun May 12
20:48:01 2024>
##
PLATFORM_TYPE          4 ## AUV
PLATFORM_NAME           MAUV2 MBARI Dorado Class Mapping AUV
PLATFORM_ORGANIZATION   Monterey Bay Aquarium Research Institute
DOCUMENTATION_URL
##
START_TIME_D            0.000000 ## 0000/00/00 00:00:00.000000
END_TIME_D              0.000000 ## 0000/00/00 00:00:00.000000
##
PLATFORM_NUM_SENSORS    5
##
## Defined data source sensors:
SOURCE_BATHYMETRY      2
SOURCE_BATHYMETRY1       2
SOURCE_BACKSCATTER        2
SOURCE_BACKSCATTER1       2
SOURCE_BACKSCATTER2       4
SOURCE_POSITION          0
SOURCE_DEPTH             1
SOURCE_HEADING            0
SOURCE_ROLLPITCH          0
SOURCE_HEAVE              0
##
## Undefined data sources:
## SOURCE_BATHYMETRY2
## SOURCE_BATHYMETRY3
## SOURCE_BACKSCATTER3
## SOURCE_SUBBOTTOM
## SOURCE_SUBBOTTOM1
## SOURCE_SUBBOTTOM2
## SOURCE_SUBBOTTOM3
## SOURCE_CAMERA
## SOURCE_CAMERA1
## SOURCE_CAMERA2
## SOURCE_CAMERA3
## SOURCE_POSITION1
## SOURCE_POSITION2
## SOURCE_POSITION3
## SOURCE_DEPTH1
## SOURCE_DEPTH2
## SOURCE_DEPTH3
## SOURCE_HEADING1
## SOURCE_HEADING2
## SOURCE_HEADING3
## SOURCE_ROLLPITCH1
## SOURCE_ROLLPITCH2
```

```

## SOURCE_ROLLPITCH3
## SOURCE_HEAVE1
## SOURCE_HEAVE2
## SOURCE_HEAVE3
##
## Sensor list:
##
SENSOR_TYPE      0 101 ## INS
SENSOR_MODEL     0 SeaDeViL
SENSOR_MANUFACTURER 0 Kearfott
SENSOR_SERIALNUMBER 0 2
SENSOR_CAPABILITY1 0    193 ## position rollpitch heading heading
SENSOR_CAPABILITY2 0    0 ##
SENSOR_NUM_OFFSETS 0 1
OFFSET_POSITION   0 0 0.000000 0.000000 0.000000 ## Starboard, Forward,
Up (meters)
OFFSET_ATTITUDE   0 0 0.000000 0.000000 0.000000 ## Heading, Roll, Pitch
(degrees)
SENSOR_TIME_LATENCY_STATIC 0    0.000000 ## Seconds
##
SENSOR_TYPE      1 111 ## Pressure
SENSOR_MODEL     1 Digiquartz
SENSOR_MANUFACTURER 1 Paroscientific
SENSOR_SERIALNUMBER 1 Unknown
SENSOR_CAPABILITY1 1    2 ## depth
SENSOR_CAPABILITY2 1    0 ##
SENSOR_NUM_OFFSETS 1 1
OFFSET_POSITION   1 0 0.000000 -0.600000 0.000000 ## Starboard, Forward,
Up (meters)
SENSOR_TIME_LATENCY_STATIC 1    0.000000 ## Seconds
##
SENSOR_TYPE      2 30 ## Sonar multibeam
SENSOR_MODEL     2 7125 400 kHz
SENSOR_MANUFACTURER 2 Reson
SENSOR_SERIALNUMBER 2 Unknown
SENSOR_CAPABILITY1 2    0 ##
SENSOR_CAPABILITY2 2    65544 ## topography_multibeam backscatter_multibeam
SENSOR_NUM_OFFSETS 2 2
OFFSET_POSITION   2 0 0.000000 0.353000 -0.180000 ## Starboard, Forward,
Up (meters)
OFFSET_ATTITUDE   2 0 0.500000 -0.160000 0.340000 ## Heading, Roll, Pitch
(degrees)
OFFSET_POSITION   2 1 0.000000 0.153000 0.000000 ## Starboard, Forward,
Up (meters)
OFFSET_ATTITUDE   2 1 0.500000 -0.160000 0.340000 ## Heading, Roll, Pitch
(degrees)
##
SENSOR_TYPE      3 20 ## Sonar sidescan
SENSOR_MODEL     3 FSAU chirp 110 kHz
SENSOR_MANUFACTURER 3 Edgetech
SENSOR_SERIALNUMBER 3 Unknown
SENSOR_CAPABILITY1 3    0 ##
SENSOR_CAPABILITY2 3    8192 ## backscatter_sidescan
SENSOR_NUM_OFFSETS 3 1

```

*mbmakeplatform(1)*

MB-System 5.0

*mbmakeplatform(1)*

```
OFFSET_POSITION      3   0  0.000000  1.353000 -0.100000 ## Starboard, Forward,  
Up (meters)  
OFFSET_ATTITUDE     3   0  0.000000  0.000000  0.000000 ## Heading, Roll, Pitch  
(degrees)  
##  
SENSOR_TYPE         4  40 ## Sonar subbottom  
SENSOR_MODEL        4 FSAU chirp 1-6 kHz  
SENSOR_MANUFACTURER 4 Edgetech  
SENSOR_SERIALNUMBER 4 Unknown  
SENSOR_CAPABILITY1  4    0 ##  
SENSOR_CAPABILITY2  4    8192 ## backscatter_sidescan  
SENSOR_NUM_OFFSETS  4  1  
OFFSET_POSITION     4   0  0.000000  1.353000 -0.100000 ## Starboard, Forward,  
Up (meters)  
OFFSET_ATTITUDE     4   0  0.000000  0.000000  0.000000 ## Heading, Roll, Pitch  
(degrees)  
##
```

## SEE ALSO

**mbsystem(1), mbpreprocess(1), mbprocess(1)**

## BUGS

Platform files are complicated, yet inscrutable.