

LVLHFrameModel

5.0

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Contents

1	Module Index	1
1.1	Modules	1
2	Namespace Index	3
2.1	Namespace List	3
3	Data Structure Index	5
3.1	Data Structures	5
4	File Index	7
4.1	File List	7
5	Module Documentation	9
5.1	Models	9
5.1.1	Detailed Description	9
5.2	Utils	10
5.2.1	Detailed Description	10
5.3	LvlhFrame	11
5.3.1	Detailed Description	11
5.3.2	Macro Definition Documentation	11
5.3.2.1	PATH	11
6	Namespace Documentation	13
6.1	jeod Namespace Reference	13
6.1.1	Detailed Description	13

7 Data Structure Documentation	15
7.1 jeod::LvlhFrame Class Reference	15
7.1.1 Detailed Description	16
7.1.2 Constructor & Destructor Documentation	16
7.1.2.1 LvlhFrame() [1/2]	16
7.1.2.2 ~LvlhFrame()	17
7.1.2.3 LvlhFrame() [2/2]	17
7.1.3 Member Function Documentation	17
7.1.3.1 compute_lvlh_frame()	17
7.1.3.2 initialize()	17
7.1.3.3 operator=()	18
7.1.3.4 set_planet()	18
7.1.3.5 set_planet_name()	18
7.1.3.6 set_subject_frame()	19
7.1.3.7 set_subject_name()	19
7.1.3.8 update()	19
7.1.4 Friends And Related Function Documentation	19
7.1.4.1 init_attrjeod__LvlhFrame	20
7.1.4.2 InputProcessor	20
7.1.5 Field Documentation	20
7.1.5.1 frame	20
7.1.5.2 local_dm	20
7.1.5.3 planet_centered_inertial	21
7.1.5.4 planet_name	21
7.1.5.5 subject_frame	21
7.1.5.6 subject_name	21
7.2 jeod::LvlhFrameMessages Class Reference	22
7.2.1 Detailed Description	22
7.2.2 Constructor & Destructor Documentation	22
7.2.2.1 LvlhFrameMessages() [1/2]	23

7.2.2.2	LvlhFrameMessages() [2/2]	23
7.2.3	Member Function Documentation	23
7.2.3.1	operator=()	23
7.2.4	Friends And Related Function Documentation	23
7.2.4.1	init_attrjeod__LvlhFrameMessages	23
7.2.4.2	InputProcessor	23
7.2.5	Field Documentation	23
7.2.5.1	divide_by_zero	24
7.2.5.2	fatal_error	24
7.2.5.3	illegal_value	24
7.2.5.4	invalid_configuration	25
7.2.5.5	invalid_name	25
7.2.5.6	invalid_object	25
7.2.5.7	null_pointer	26
7.2.5.8	trace	26
7.3	jeod::LvlhType Class Reference	26
7.3.1	Detailed Description	27
7.3.2	Member Enumeration Documentation	27
7.3.2.1	Type	27
7.3.3	Constructor & Destructor Documentation	27
7.3.3.1	LvlhType()	28
7.3.4	Friends And Related Function Documentation	28
7.3.4.1	init_attrjeod__LvlhType	28
7.3.4.2	InputProcessor	28
7.3.5	Field Documentation	28
7.3.5.1	value	28
8	File Documentation	29
8.1	lvlh_frame.cc File Reference	29
8.1.1	Detailed Description	29
8.2	lvlh_frame.hh File Reference	29
8.2.1	Detailed Description	30
8.3	lvlh_frame_messages.cc File Reference	30
8.3.1	Detailed Description	30
8.4	lvlh_frame_messages.hh File Reference	30
8.4.1	Detailed Description	31
8.5	lvlh_type.hh File Reference	31
8.5.1	Detailed Description	31
	Index	33

Chapter 1

Module Index

1.1 Modules

Here is a list of all modules:

Models	9
Utils	10
LvlhFrame	11

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

jeod	Namespace jeod	13
----------------------	--------------------------	--------------------

Chapter 3

Data Structure Index

3.1 Data Structures

Here are the data structures with brief descriptions:

jeod::LvlhFrame	The class used to represent an LVLH reference frame associated with a subject DynBody . . .	15
jeod::LvlhFrameMessages	The class that specifies the message IDs used in the LvlhFrame model	22
jeod::LvlhType	The class used to identify the type of LVLH desired	26

Chapter 4

File Index

4.1 File List

Here is a list of all files with brief descriptions:

lvlh_frame.cc	Define methods for the LVLH reference frame class	29
lvlh_frame.hh	Define the class LvlhFrame, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject DynBody	29
lvlh_frame_messages.cc	Implement the class LvlhFrameMessages	30
lvlh_frame_messages.hh	Define the class LvlhFrameMessages, the class that specifies the message IDs used in the LvlhFrame model	30
lvlh_type.hh	Define the class LvlhType, which identifies the type of LVLH desired to be calculated	31

Chapter 5

Module Documentation

5.1 Models

Modules

- [Utils](#)

5.1.1 Detailed Description

5.2 Utils

Modules

- [Lv1hFrame](#)

5.2.1 Detailed Description

5.3 LvlhFrame

Files

- file [lvlh_frame.hh](#)
Define the class LvlhFrame, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject DynBody.
- file [lvlh_frame_messages.hh](#)
Define the class LvlhFrameMessages, the class that specifies the message IDs used in the LvlhFrame model.
- file [lvlh_type.hh](#)
Define the class LvlhType, which identifies the type of LVLH desired to be calculated.
- file [lvlh_frame.cc](#)
Define methods for the LVLH reference frame class.
- file [lvlh_frame_messages.cc](#)
Implement the class LvlhFrameMessages.

Namespaces

- [jeod](#)
Namespace jeod.

Macros

- `#define` [PATH](#) "utils/lvlh_frame/"

5.3.1 Detailed Description

5.3.2 Macro Definition Documentation

5.3.2.1 PATH

```
#define PATH "utils/lvlh_frame/"
```

Definition at line 31 of file `lvlh_frame_messages.cc`.

Chapter 6

Namespace Documentation

6.1 jeod Namespace Reference

Namespace jeod.

Data Structures

- class [LvlhFrame](#)
The class used to represent an LVLH reference frame associated with a subject DynBody.
- class [LvlhFrameMessages](#)
The class that specifies the message IDs used in the [LvlhFrame](#) model.
- class [LvlhType](#)
The class used to identify the type of LVLH desired.

6.1.1 Detailed Description

Namespace jeod.

Chapter 7

Data Structure Documentation

7.1 jeod::LvlhFrame Class Reference

The class used to represent an LVLH reference frame associated with a subject DynBody.

```
#include <lvlh_frame.hh>
```

Public Member Functions

- [LvlhFrame](#) ()
Construct an [LvlhFrame](#) object.
- [~LvlhFrame](#) ()
Destruct an [LvlhFrame](#) object.
- void [initialize](#) (DynManager &dyn_manager)
Begin initialization of an [LvlhFrame](#).
- void [update](#) ()
Update the state.
- void [set_subject_name](#) (const std::string new_name)
Set the `subject_name` to the supplied value.
- void [set_planet_name](#) (const std::string new_name)
Set the `planet_name` to the supplied value.
- void [set_subject_frame](#) (RefFrame &new_frame)
Set the `subject_frame` to the supplied value.
- void [set_planet](#) (BasePlanet &new_planet)
Set the planet whose PCI frame will be the reference for LVLH.

Data Fields

- RefFrame [frame](#)
The LVLH frame defined by the subject frame's motion with respect to the reference planet.
- std::string [subject_name](#)
The frame whose motion defines LVLH.
- std::string [planet_name](#)
The planet used as reference for the LVLH frame.

Protected Member Functions

- void [compute_lvlh_frame](#) (const RefFrameTrans &rel_trans)
Update the state of the LVLH frame wrt its parent.

Protected Attributes

- RefFrame * [subject_frame](#)
The (moving) frame specified with subject_name.
- RefFrame * [planet_centered_inertial](#)
The inertial frame with origin at the center of the specified planet.

Private Member Functions

- [LvlhFrame](#) (const [LvlhFrame](#) &)
- [LvlhFrame](#) & [operator=](#) (const [LvlhFrame](#) &)

Private Attributes

- DynManager * [local_dm](#)
A local pointer to the dynamics manager needed for clean-up.

Friends

- class [InputProcessor](#)
- void [init_attrjeod__LvlhFrame](#) ()

7.1.1 Detailed Description

The class used to represent an LVLH reference frame associated with a subject DynBody.

Definition at line 84 of file [lvlh_frame.hh](#).

7.1.2 Constructor & Destructor Documentation

7.1.2.1 [LvlhFrame](#)() [1/2]

```
jeod::LvlhFrame::LvlhFrame (
    void )
```

Construct an [LvlhFrame](#) object.

Definition at line 51 of file [lvlh_frame.cc](#).

7.1.2.2 ~LvlhFrame()

```
jeod::LvlhFrame::~~LvlhFrame (
    void )
```

Destruct an [LvlhFrame](#) object.

Definition at line 69 of file `lvlh_frame.cc`.

References `frame`, `local_dm`, `planet_centered_inertial`, and `subject_frame`.

7.1.2.3 LvlhFrame() [2/2]

```
jeod::LvlhFrame::LvlhFrame (
    const LvlhFrame & ) [private]
```

7.1.3 Member Function Documentation

7.1.3.1 compute_lvlh_frame()

```
void jeod::LvlhFrame::compute_lvlh_frame (
    const RefFrameTrans & rel_trans ) [protected]
```

Update the state of the LVLH frame wrt its parent.

Parameters

in	<i>rel_trans</i>	Planet relative state
----	------------------	-----------------------

Definition at line 267 of file `lvlh_frame.cc`.

References `frame`.

Referenced by `update()`.

7.1.3.2 initialize()

```
void jeod::LvlhFrame::initialize (
    DynManager & dyn_manager )
```

Begin initialization of an [LvlhFrame](#).

Parameters

<i>in, out</i>	<i>dyn_manager</i>	Dynamics manager
----------------	--------------------	------------------

Definition at line 96 of file `lvlh_frame.cc`.

References `frame`, `jeod::LvlhFrameMessages::invalid_configuration`, `jeod::LvlhFrameMessages::invalid_name`, `local_dm`, `planet_centered_inertial`, `planet_name`, `subject_frame`, and `subject_name`.

7.1.3.3 operator=()

```
LvlhFrame& jeod::LvlhFrame::operator= (
    const LvlhFrame & ) [private]
```

7.1.3.4 set_planet()

```
void jeod::LvlhFrame::set_planet (
    BasePlanet & new_planet )
```

Set the planet whose PCI frame will be the reference for LVLH.

Parameters

<i>in</i>	<i>new_planet</i>	new planet.
-----------	-------------------	-------------

Definition at line 255 of file `lvlh_frame.cc`.

References `planet_centered_inertial`.

7.1.3.5 set_planet_name()

```
void jeod::LvlhFrame::set_planet_name (
    const std::string new_name )
```

Set the `planet_name` to the supplied value.

Parameters

<i>in</i>	<i>new_name</i>	new name.
-----------	-----------------	-----------

Definition at line 243 of file `lvlh_frame.cc`.

References `planet_name`.

7.1.3.6 set_subject_frame()

```
void jeod::LvlhFrame::set_subject_frame (
    RefFrame & new_frame )
```

Set the subject_frame to the supplied value.

Parameters

in	<i>new_frame</i>	new frame.
----	------------------	------------

Definition at line 231 of file lvlh_frame.cc.

References subject_frame.

7.1.3.7 set_subject_name()

```
void jeod::LvlhFrame::set_subject_name (
    const std::string new_name )
```

Set the subject_name to the supplied value.

Parameters

in	<i>new_name</i>	new name.
----	-----------------	-----------

Definition at line 220 of file lvlh_frame.cc.

References subject_name.

7.1.3.8 update()

```
void jeod::LvlhFrame::update (
    void )
```

Update the state.

Definition at line 190 of file lvlh_frame.cc.

References compute_lvlh_frame(), frame, planet_centered_inertial, and subject_frame.

7.1.4 Friends And Related Function Documentation

7.1.4.1 init_attrjeod__LvlhFrame

```
void init_attrjeod__LvlhFrame ( ) [friend]
```

7.1.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 86 of file lvlh_frame.hh.

7.1.5 Field Documentation

7.1.5.1 frame

```
RefFrame jeod::LvlhFrame::frame
```

The LVLH frame defined by the subject frame's motion with respect to the reference planet.

trick_units(-)

Definition at line 95 of file lvlh_frame.hh.

Referenced by compute_lvlh_frame(), initialize(), update(), and ~LvlhFrame().

7.1.5.2 local_dm

```
DynManager* jeod::LvlhFrame::local_dm [private]
```

A local pointer to the dynamics manager needed for clean-up.

trick_units(-)

Definition at line 124 of file lvlh_frame.hh.

Referenced by initialize(), and ~LvlhFrame().

7.1.5.3 planet_centered_inertial

```
RefFrame* jeod::LvlhFrame::planet_centered_inertial [protected]
```

The inertial frame with origin at the center of the specified planet.

trick_units(–)

Definition at line 117 of file lvlh_frame.hh.

Referenced by initialize(), set_planet(), update(), and ~LvlhFrame().

7.1.5.4 planet_name

```
std::string jeod::LvlhFrame::planet_name
```

The planet used as reference for the LVLH frame.

trick_units(–)

Definition at line 105 of file lvlh_frame.hh.

Referenced by initialize(), and set_planet_name().

7.1.5.5 subject_frame

```
RefFrame* jeod::LvlhFrame::subject_frame [protected]
```

The (moving) frame specified with subject_name.

trick_units(–)

Definition at line 112 of file lvlh_frame.hh.

Referenced by initialize(), set_subject_frame(), update(), and ~LvlhFrame().

7.1.5.6 subject_name

```
std::string jeod::LvlhFrame::subject_name
```

The frame whose motion defines LVLH.

Can be on a vehicle or not.trick_units(–)

Definition at line 100 of file lvlh_frame.hh.

Referenced by initialize(), and set_subject_name().

The documentation for this class was generated from the following files:

- [lvlh_frame.hh](#)
- [lvlh_frame.cc](#)

7.2 jeod::LvlhFrameMessages Class Reference

The class that specifies the message IDs used in the [LvlhFrame](#) model.

```
#include <lvlh_frame_messages.hh>
```

Static Public Attributes

- static char const * [fatal_error](#)
Issued when performing an action results in an error return from the method performing the action.
- static char const * [illegal_value](#)
Issued when a simple type (e.g.
- static char const * [invalid_name](#)
Issued when a name is invalid (NULL, empty, or does not name an object of the specified type).
- static char const * [invalid_configuration](#)
Issued when insufficient information has been specified prior to initialization.
- static char const * [invalid_object](#)
Issued when a pointer points to an object of the wrong type.
- static char const * [null_pointer](#)
Error issued when a pointer is required but was not provided.
- static char const * [trace](#)
Debug message issued to trace [LvlhFrame](#) actions.
- static char const * [divide_by_zero](#)
Fatal message when a divide by zero is encountered.

Private Member Functions

- [LvlhFrameMessages](#) (void)
- [LvlhFrameMessages](#) (const [LvlhFrameMessages](#) &)
- [LvlhFrameMessages](#) & [operator=](#) (const [LvlhFrameMessages](#) &)

Friends

- class [InputProcessor](#)
- void [init_attrjeod__LvlhFrameMessages](#) ()

7.2.1 Detailed Description

The class that specifies the message IDs used in the [LvlhFrame](#) model.

Definition at line 82 of file [lvlh_frame_messages.hh](#).

7.2.2 Constructor & Destructor Documentation

7.2.2.1 LvlhFrameMessages() [1/2]

```
jeod::LvlhFrameMessages::LvlhFrameMessages (
    void ) [private]
```

7.2.2.2 LvlhFrameMessages() [2/2]

```
jeod::LvlhFrameMessages::LvlhFrameMessages (
    const LvlhFrameMessages & ) [private]
```

7.2.3 Member Function Documentation

7.2.3.1 operator=()

```
LvlhFrameMessages& jeod::LvlhFrameMessages::operator= (
    const LvlhFrameMessages & ) [private]
```

7.2.4 Friends And Related Function Documentation

7.2.4.1 init_attrjeod__LvlhFrameMessages

```
void init_attrjeod__LvlhFrameMessages ( ) [friend]
```

7.2.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 85 of file lvlh_frame_messages.hh.

7.2.5 Field Documentation

7.2.5.1 divide_by_zero

```
char const * jeod::LvlhFrameMessages::divide_by_zero [static]
```

Initial value:

```
=  
    "utils/lvlh_frame/" "divide_by_zero"
```

Fatal message when a divide by zero is encountered.

trick_units(—)

Definition at line 131 of file lvlh_frame_messages.hh.

7.2.5.2 fatal_error

```
char const * jeod::LvlhFrameMessages::fatal_error [static]
```

Initial value:

```
=  
    "utils/lvlh_frame/" "fatal_error"
```

Issued when performing an action results in an error return from the method performing the action.

trick_units(—)

Definition at line 94 of file lvlh_frame_messages.hh.

7.2.5.3 illegal_value

```
char const * jeod::LvlhFrameMessages::illegal_value [static]
```

Initial value:

```
=  
    "utils/lvlh_frame/" "illegal_value"
```

Issued when a simple type (e.g.

an enum) has an illegal value.trick_units(—)

Definition at line 99 of file lvlh_frame_messages.hh.

7.2.5.4 invalid_configuration

```
char const * jeod::LvlhFrameMessages::invalid_configuration [static]
```

Initial value:

```
=  
    "utils/lvlh_frame/" "invalid_configuration"
```

Issued when insufficient information has been specified prior to initialization.

trick_units(—)

Definition at line 111 of file lvlh_frame_messages.hh.

Referenced by jeod::LvlhFrame::initialize().

7.2.5.5 invalid_name

```
char const * jeod::LvlhFrameMessages::invalid_name [static]
```

Initial value:

```
=  
    "utils/lvlh_frame/" "invalid_name"
```

Issued when a name is invalid (NULL, empty, or does not name an object of the specified type).

trick_units(—)

Definition at line 105 of file lvlh_frame_messages.hh.

Referenced by jeod::LvlhFrame::initialize().

7.2.5.6 invalid_object

```
char const * jeod::LvlhFrameMessages::invalid_object [static]
```

Initial value:

```
=  
    "utils/lvlh_frame/" "invalid_object"
```

Issued when a pointer points to an object of the wrong type.

trick_units(—)

Definition at line 116 of file lvlh_frame_messages.hh.

7.2.5.7 null_pointer

```
char const * jeod::LvlhFrameMessages::null_pointer [static]
```

Initial value:

```
=
    "utils/lvlh_frame/" "null_pointer"
```

Error issued when a pointer is required but was not provided.

trick_units(−)

Definition at line 121 of file lvlh_frame_messages.hh.

7.2.5.8 trace

```
char const * jeod::LvlhFrameMessages::trace [static]
```

Initial value:

```
=
    "utils/lvlh_frame/" "trace"
```

Debug message issued to trace [LvlhFrame](#) actions.

trick_units(−)

Definition at line 126 of file lvlh_frame_messages.hh.

The documentation for this class was generated from the following files:

- [lvlh_frame_messages.hh](#)
- [lvlh_frame_messages.cc](#)

7.3 jeod::LvlhType Class Reference

The class used to identify the type of LVLH desired.

```
#include <lvlh_type.hh>
```

Public Types

- enum [Type](#) { [Rectilinear](#) = 0, [CircularCurvilinear](#) = 1, [EllipticalCurvilinear](#) = 2 }

An enumeration to specify the type of LVLH coordinates to use, whether rectilinear, circular curvilinear, or elliptical curvilinear.

Public Member Functions

- [LvlhType](#) (void)
Default constructor.

Data Fields

- [Type](#) value
Indicates type of LVLH coordinates desired.

Friends

- class [InputProcessor](#)
- void [init_attrjeod__LvlhType](#) ()

7.3.1 Detailed Description

The class used to identify the type of LVLH desired.

Definition at line 79 of file `lvlh_type.hh`.

7.3.2 Member Enumeration Documentation

7.3.2.1 Type

```
enum jeod::LvlhType::Type
```

An enumeration to specify the type of LVLH coordinates to use, whether rectilinear, circular curvilinear, or elliptical curvilinear.

As of March 2015, elliptical is not implemented.

Enumerator

Rectilinear	
CircularCurvilinear	
EllipticalCurvilinear	

Definition at line 92 of file `lvlh_type.hh`.

7.3.3 Constructor & Destructor Documentation

7.3.3.1 LvlhType()

```
jeod::LvlhType::LvlhType (
    void ) [inline]
```

Default constructor.

Definition at line 120 of file lvlh_type.hh.

References Rectilinear, and value.

7.3.4 Friends And Related Function Documentation

7.3.4.1 init_attrjeod__LvlhType

```
void init_attrjeod__LvlhType ( ) [friend]
```

7.3.4.2 InputProcessor

```
friend class InputProcessor [friend]
```

Definition at line 81 of file lvlh_type.hh.

7.3.5 Field Documentation

7.3.5.1 value

Type jeod::LvlhType::value

Indicates type of LVLH coordinates desired.

Default is rectilinear.trick_units(–)

Definition at line 111 of file lvlh_type.hh.

Referenced by LvlhType().

The documentation for this class was generated from the following file:

- [lvlh_type.hh](#)

Chapter 8

File Documentation

8.1 `lvlh_frame.cc` File Reference

Define methods for the LVLH reference frame class.

```
#include <cstdint>
#include "dynamics/dyn_manager/include/dyn_manager.hh"
#include "environment/planet/include/base_planet.hh"
#include "utils/math/include/vector3.hh"
#include "utils/message/include/message_handler.hh"
#include "utils/named_item/include/named_item.hh"
#include "../include/lvlh_frame.hh"
#include "../include/lvlh_frame_messages.hh"
```

Namespaces

- [jeod](#)
Namespace jeod.

8.1.1 Detailed Description

Define methods for the LVLH reference frame class.

8.2 `lvlh_frame.hh` File Reference

Define the class `LvlhFrame`, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject `DynBody`.

```
#include <string>
#include "dynamics/dyn_manager/include/class_declarations.hh"
#include "environment/planet/include/class_declarations.hh"
#include "utils/ref_frames/include/ref_frame.hh"
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::LvHFrame](#)

The class used to represent an LVLH reference frame associated with a subject DynBody.

Namespaces

- [jeod](#)

Namespace jeod.

8.2.1 Detailed Description

Define the class LvHFrame, the class used to represent a local-vertical, local-horizontal reference frame associated with a subject DynBody.

8.3 lvh_frame_messages.cc File Reference

Implement the class LvHFrameMessages.

```
#include "../include/lvlh_frame_messages.hh"
```

Namespaces

- [jeod](#)

Namespace jeod.

Macros

- #define [PATH](#) "utils/lvh_frame/"

8.3.1 Detailed Description

Implement the class LvHFrameMessages.

8.4 lvh_frame_messages.hh File Reference

Define the class LvHFrameMessages, the class that specifies the message IDs used in the LvHFrame model.

```
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::LvlhFrameMessages](#)

The class that specifies the message IDs used in the [LvlhFrame](#) model.

Namespaces

- [jeod](#)

Namespace jeod.

8.4.1 Detailed Description

Define the class `LvlhFrameMessages`, the class that specifies the message IDs used in the `LvlhFrame` model.

8.5 lvlh_type.hh File Reference

Define the class `LvlhType`, which identifies the type of LVLH desired to be calculated.

```
#include "utils/sim_interface/include/jeod_class.hh"
```

Data Structures

- class [jeod::LvlhType](#)

The class used to identify the type of LVLH desired.

Namespaces

- [jeod](#)

Namespace jeod.

8.5.1 Detailed Description

Define the class `LvlhType`, which identifies the type of LVLH desired to be calculated.

Index

- ~LvlhFrame
 - jeod::LvlhFrame, [16](#)
- compute_lvlh_frame
 - jeod::LvlhFrame, [17](#)
- divide_by_zero
 - jeod::LvlhFrameMessages, [23](#)
- fatal_error
 - jeod::LvlhFrameMessages, [24](#)
- frame
 - jeod::LvlhFrame, [20](#)
- illegal_value
 - jeod::LvlhFrameMessages, [24](#)
- init_attrjeod__LvlhFrame
 - jeod::LvlhFrame, [19](#)
- init_attrjeod__LvlhFrameMessages
 - jeod::LvlhFrameMessages, [23](#)
- init_attrjeod__LvlhType
 - jeod::LvlhType, [28](#)
- initialize
 - jeod::LvlhFrame, [17](#)
- InputProcessor
 - jeod::LvlhFrame, [20](#)
 - jeod::LvlhFrameMessages, [23](#)
 - jeod::LvlhType, [28](#)
- invalid_configuration
 - jeod::LvlhFrameMessages, [24](#)
- invalid_name
 - jeod::LvlhFrameMessages, [25](#)
- invalid_object
 - jeod::LvlhFrameMessages, [25](#)
- jeod, [13](#)
- jeod::LvlhFrame, [15](#)
 - ~LvlhFrame, [16](#)
 - compute_lvlh_frame, [17](#)
 - frame, [20](#)
 - init_attrjeod__LvlhFrame, [19](#)
 - initialize, [17](#)
 - InputProcessor, [20](#)
 - local_dm, [20](#)
 - LvlhFrame, [16](#), [17](#)
 - operator=, [18](#)
 - planet_centered_inertial, [20](#)
 - planet_name, [21](#)
 - set_planet, [18](#)
 - set_planet_name, [18](#)
 - set_subject_frame, [19](#)
 - set_subject_name, [19](#)
 - subject_frame, [21](#)
 - subject_name, [21](#)
 - update, [19](#)
- jeod::LvlhFrameMessages, [22](#)
 - divide_by_zero, [23](#)
 - fatal_error, [24](#)
 - illegal_value, [24](#)
 - init_attrjeod__LvlhFrameMessages, [23](#)
 - InputProcessor, [23](#)
 - invalid_configuration, [24](#)
 - invalid_name, [25](#)
 - invalid_object, [25](#)
 - LvlhFrameMessages, [22](#), [23](#)
 - null_pointer, [25](#)
 - operator=, [23](#)
 - trace, [26](#)
- jeod::LvlhType, [26](#)
 - init_attrjeod__LvlhType, [28](#)
 - InputProcessor, [28](#)
 - LvlhType, [27](#)
 - Type, [27](#)
 - value, [28](#)
- local_dm
 - jeod::LvlhFrame, [20](#)
- lvlh_frame.cc, [29](#)
- lvlh_frame.hh, [29](#)
- lvlh_frame_messages.cc, [30](#)
- lvlh_frame_messages.hh, [30](#)
- lvlh_type.hh, [31](#)
- LvlhFrame, [11](#)
 - jeod::LvlhFrame, [16](#), [17](#)
 - PATH, [11](#)
- LvlhFrameMessages
 - jeod::LvlhFrameMessages, [22](#), [23](#)
- LvlhType
 - jeod::LvlhType, [27](#)
- Models, [9](#)
- null_pointer
 - jeod::LvlhFrameMessages, [25](#)
- operator=
 - jeod::LvlhFrame, [18](#)
 - jeod::LvlhFrameMessages, [23](#)
- PATH
 - LvlhFrame, [11](#)
- planet_centered_inertial

- jeod::LvlhFrame, [20](#)
- planet_name
 - jeod::LvlhFrame, [21](#)
- set_planet
 - jeod::LvlhFrame, [18](#)
- set_planet_name
 - jeod::LvlhFrame, [18](#)
- set_subject_frame
 - jeod::LvlhFrame, [19](#)
- set_subject_name
 - jeod::LvlhFrame, [19](#)
- subject_frame
 - jeod::LvlhFrame, [21](#)
- subject_name
 - jeod::LvlhFrame, [21](#)
- trace
 - jeod::LvlhFrameMessages, [26](#)
- Type
 - jeod::LvlhType, [27](#)
- update
 - jeod::LvlhFrame, [19](#)
- Utils, [10](#)
- value
 - jeod::LvlhType, [28](#)