

# OrbitalElementsModel

5.0

Generated by Doxygen 1.8.14



# Contents

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

<b>7 Data Structure Documentation</b>	<b>15</b>
7.1 jeod::OrbitalElements Class Reference	15
7.1.1 Detailed Description	17
7.1.2 Constructor & Destructor Documentation	17
7.1.2.1 OrbitalElements() [1/2]	17
7.1.2.2 OrbitalElements() [2/2]	17
7.1.2.3 ~OrbitalElements()	17
7.1.3 Member Function Documentation	17
7.1.3.1 from_cartesian()	18
7.1.3.2 get_object_name()	18
7.1.3.3 get_planet_name()	18
7.1.3.4 KepEqtnB()	19
7.1.3.5 KepEqtnE()	19
7.1.3.6 KepEqtnH()	19
7.1.3.7 mean_anom_to_nu()	19
7.1.3.8 nu_to_anomalies()	20
7.1.3.9 operator=()	20
7.1.3.10 set_object_name()	20
7.1.3.11 set_planet_name()	20
7.1.3.12 to_cartesian()	21
7.1.4 Friends And Related Function Documentation	21
7.1.4.1 init_attrjeod__OrbitalElements	21
7.1.4.2 InputProcessor	21
7.1.5 Field Documentation	21
7.1.5.1 arg_periapsis	21
7.1.5.2 cos_v	22
7.1.5.3 e_mag	22
7.1.5.4 inclination	22
7.1.5.5 long_asc_node	22
7.1.5.6 mean_anom	23

7.1.5.7	<a href="#">mean_motion</a>	23
7.1.5.8	<a href="#">object_name</a>	23
7.1.5.9	<a href="#">orb_ang_momentum</a>	23
7.1.5.10	<a href="#">orb_energy</a>	24
7.1.5.11	<a href="#">orbital_anom</a>	24
7.1.5.12	<a href="#">planet_name</a>	24
7.1.5.13	<a href="#">r_mag</a>	24
7.1.5.14	<a href="#">semi_major_axis</a>	25
7.1.5.15	<a href="#">semiparam</a>	25
7.1.5.16	<a href="#">sin_v</a>	25
7.1.5.17	<a href="#">true_anom</a>	25
7.1.5.18	<a href="#">vel_mag</a>	26
7.2	<a href="#">jeod::OrbitalElementsMessages Class Reference</a>	26
7.2.1	<a href="#">Detailed Description</a>	26
7.2.2	<a href="#">Constructor &amp; Destructor Documentation</a>	27
7.2.2.1	<a href="#">OrbitalElementsMessages() [1/2]</a>	27
7.2.2.2	<a href="#">OrbitalElementsMessages() [2/2]</a>	27
7.2.3	<a href="#">Member Function Documentation</a>	27
7.2.3.1	<a href="#">operator=()</a>	27
7.2.4	<a href="#">Friends And Related Function Documentation</a>	27
7.2.4.1	<a href="#">init_attrjeod__OrbitalElementsMessages</a>	27
7.2.4.2	<a href="#">InputProcessor</a>	27
7.2.5	<a href="#">Field Documentation</a>	27
7.2.5.1	<a href="#">convergence_error</a>	28
7.2.5.2	<a href="#">domain_error</a>	28
<b>8</b>	<b><a href="#">File Documentation</a></b>	<b>29</b>
8.1	<a href="#">orbital_elements.cc File Reference</a>	29
8.1.1	<a href="#">Detailed Description</a>	29
8.2	<a href="#">orbital_elements.hh File Reference</a>	29
8.2.1	<a href="#">Detailed Description</a>	30
8.3	<a href="#">orbital_elements_messages.cc File Reference</a>	30
8.3.1	<a href="#">Detailed Description</a>	30
8.4	<a href="#">orbital_elements_messages.hh File Reference</a>	30
8.4.1	<a href="#">Detailed Description</a>	31
	<b><a href="#">Index</a></b>	<b>33</b>



# Chapter 1

## Module Index

### 1.1 Modules

Here is a list of all modules:

Models . . . . .	9
Utils . . . . .	10
OrbitalElements . . . . .	11





## Chapter 2

# Namespace Index

### 2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

<a href="#">jeod</a>	Namespace jeod . . . . .	<a href="#">13</a>
----------------------	--------------------------	--------------------



## Chapter 3

# Data Structure Index

### 3.1 Data Structures

Here are the data structures with brief descriptions:

<a href="#">jeod::OrbitalElements</a>	
Represents state in terms of Keplerian orbital elements . . . . .	15
<a href="#">jeod::OrbitalElementsMessages</a>	
Specifies the message IDs used in the orbital elements model . . . . .	26



## Chapter 4

# File Index

### 4.1 File List

Here is a list of all files with brief descriptions:

<a href="#">orbital_elements.cc</a>	Define methods for the OrbitalElements class . . . . .	29
<a href="#">orbital_elements.hh</a>	Orbital elements class definition . . . . .	29
<a href="#">orbital_elements_messages.cc</a>	Implement the class OrbitalElementsMessages . . . . .	30
<a href="#">orbital_elements_messages.hh</a>	Define the class OrbitalElementsMessages, the class that specifies the message IDs used in the orbital elements model . . . . .	30



## Chapter 5

# Module Documentation

### 5.1 Models

#### Modules

- [Utils](#)

#### 5.1.1 Detailed Description

## 5.2 Utils

### Modules

- [OrbitalElements](#)

### 5.2.1 Detailed Description



## 5.3 OrbitalElements

### Files

- file [orbital\\_elements.hh](#)  
*Orbital elements class definition.*
- file [orbital\\_elements\\_messages.hh](#)  
*Define the class OrbitalElementsMessages, the class that specifies the message IDs used in the orbital elements model.*
- file [orbital\\_elements.cc](#)  
*Define methods for the OrbitalElements class.*
- file [orbital\\_elements\\_messages.cc](#)  
*Implement the class OrbitalElementsMessages.*

### Namespaces

- [jeod](#)  
*Namespace jeod.*

### Macros

- `#define PATH "utils/orbital_elements/"`

#### 5.3.1 Detailed Description

#### 5.3.2 Macro Definition Documentation

##### 5.3.2.1 PATH

```
#define PATH "utils/orbital_elements/"
```

Definition at line 37 of file orbital\_elements\_messages.cc.



## Chapter 6

# Namespace Documentation

### 6.1 jeod Namespace Reference

Namespace jeod.

#### Data Structures

- class [OrbitalElements](#)  
*Represents state in terms of Keplerian orbital elements.*
- class [OrbitalElementsMessages](#)  
*Specifies the message IDs used in the orbital elements model.*

#### 6.1.1 Detailed Description

Namespace jeod.



## Chapter 7

# Data Structure Documentation

### 7.1 jeod::OrbitalElements Class Reference

Represents state in terms of Keplerian orbital elements.

```
#include <orbital_elements.hh>
```

#### Public Member Functions

- [OrbitalElements](#) ()  
*Construct a [OrbitalElements](#) object.*
- virtual [~OrbitalElements](#) ()  
*Destroy a [OrbitalElements](#) object.*
- const char \* [get\\_object\\_name](#) (void) const  
*Return the object name.*
- const char \* [get\\_planet\\_name](#) (void) const  
*Return the planet name.*
- void [set\\_object\\_name](#) (const char \*name)  
*Set the object name.*
- void [set\\_planet\\_name](#) (const char \*name)  
*Set the planet name.*
- int [from\\_cartesian](#) (double mu, const double pos[3], const double vel[3])
- int [to\\_cartesian](#) (double mu, double pos[3], double vel[3])
- int [nu\\_to\\_anomalies](#) ()
- int [mean\\_anom\\_to\\_nu](#) ()

#### Data Fields

- double [semi\\_major\\_axis](#)  
*Semi-major-axis ( $a$ )*
- double [semiparam](#)  
*Semiparameter ( $p$ )*
- double [e\\_mag](#)  
*Magnitude of eccentricity ( $e$ )*
- double [inclination](#)

- *Orbit inclination (i)*
- double [arg\\_periapsis](#)  
*Argument of periapsis (w)*
- double [long\\_asc\\_node](#)  
*Longitude of ascending node (Omega)*
- double [r\\_mag](#)  
*Magnitude of orbital radius.*
- double [vel\\_mag](#)  
*Magnitude of orbital velocity.*
- double [true\\_anom](#)  
*True Anomaly (v)*
- double [mean\\_anom](#)  
*Mean Anomaly (M)*
- double [mean\\_motion](#)  
*Mean motion of orbit (n)*
- double [orbital\\_anom](#)  
*Eccentric (E), Hyperbolic (H), or Parabolic (B) anomaly.*
- double [sin\\_v](#)  
*Sine of the true anomaly.*
- double [cos\\_v](#)  
*Cosine of the true anomaly.*
- double [orb\\_energy](#)  
*Specific orbital energy.*
- double [orb\\_ang\\_momentum](#)  
*Specific orbital angular momentum.*

## Protected Member Functions

- int [KepEqtnE](#) (double M, double e, double \*E)
- int [KepEqtnH](#) (double M, double e, double \*H)
- int [KepEqtnB](#) (double M, double \*B)

## Protected Attributes

- std::string [object\\_name](#)  
*Name of orbital object.*
- std::string [planet\\_name](#)  
*Name of planet about which the object orbits.*

## Private Member Functions

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

## Friends

- class [InputProcessor](#)
- void [init\\_attrjeod\\_\\_OrbitalElements](#) ()

### 7.1.1 Detailed Description

Represents state in terms of Keplerian orbital elements.

Definition at line 81 of file orbital\_elements.hh.

### 7.1.2 Constructor & Destructor Documentation

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

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

#### 7.1.2.2 OrbitalElements() [2/2]

```
jeod::OrbitalElements::OrbitalElements (
    void )
```

Construct a [OrbitalElements](#) object.

Definition at line 61 of file orbital\_elements.cc.

References [arg\\_periapsis](#), [cos\\_v](#), [e\\_mag](#), [inclination](#), [long\\_asc\\_node](#), [mean\\_anom](#), [mean\\_motion](#), [orb\\_ang\\_](#)  
[momentum](#), [orb\\_energy](#), [orbital\\_anom](#), [r\\_mag](#), [semi\\_major\\_axis](#), [semiparam](#), [sin\\_v](#), [true\\_anom](#), and [vel\\_mag](#).

#### 7.1.2.3 ~OrbitalElements()

```
jeod::OrbitalElements::~~OrbitalElements (
    void ) [virtual]
```

Destroy a [OrbitalElements](#) object.

Definition at line 93 of file orbital\_elements.cc.

### 7.1.3 Member Function Documentation

#### 7.1.3.1 from\_cartesian()

```
int jeod::OrbitalElements::from_cartesian (
    double mu,
    const double pos[3],
    const double vel[3] )
```

Definition at line 184 of file orbital\_elements.cc.

References `arg_periapsis`, `e_mag`, `inclination`, `long_asc_node`, `mean_motion`, `nu_to_anomalies()`, `orb_ang_`↔`momentum`, `orb_energy`, `r_mag`, `semi_major_axis`, `semiparam`, `true_anom`, and `vel_mag`.

#### 7.1.3.2 get\_object\_name()

```
const char * jeod::OrbitalElements::get_object_name (
    void ) const
```

Return the object name.

##### Returns

Const pointer to name

Definition at line 141 of file orbital\_elements.cc.

References `object_name`.

#### 7.1.3.3 get\_planet\_name()

```
const char * jeod::OrbitalElements::get_planet_name (
    void ) const
```

Return the planet name.

##### Returns

Const pointer to name

Definition at line 154 of file orbital\_elements.cc.

References `planet_name`.



#### 7.1.3.4 KepEqtnB()

```
int jeod::OrbitalElements::KepEqtnB (
    double M,
    double * B ) [protected]
```

Definition at line 906 of file orbital\_elements.cc.

Referenced by mean\_anom\_to\_nu().

#### 7.1.3.5 KepEqtnE()

```
int jeod::OrbitalElements::KepEqtnE (
    double M,
    double e,
    double * E ) [protected]
```

Definition at line 781 of file orbital\_elements.cc.

Referenced by mean\_anom\_to\_nu().

#### 7.1.3.6 KepEqtnH()

```
int jeod::OrbitalElements::KepEqtnH (
    double M,
    double e,
    double * H ) [protected]
```

Definition at line 838 of file orbital\_elements.cc.

Referenced by mean\_anom\_to\_nu().

#### 7.1.3.7 mean\_anom\_to\_nu()

```
int jeod::OrbitalElements::mean_anom_to_nu ( )
```

Definition at line 655 of file orbital\_elements.cc.

References jeod::OrbitalElementsMessages::convergence\_error, cos\_v, e\_mag, KepEqtnB(), KepEqtnE(), KepEqtnH(), mean\_anom, orbital\_anom, sin\_v, and true\_anom.

#### 7.1.3.8 nu\_to\_anomalies()

```
int jeod::OrbitalElements::nu_to_anomalies ( )
```

Definition at line 582 of file orbital\_elements.cc.

References `cos_v`, `e_mag`, `mean_anom`, `orbital_anom`, `sin_v`, and `true_anom`.

Referenced by `from_cartesian()`.

#### 7.1.3.9 operator=()

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

#### 7.1.3.10 set\_object\_name()

```
void jeod::OrbitalElements::set_object_name (
    const char * name )
```

Set the object name.

##### Parameters

in	<i>name</i>	Orbital object name
----	-------------	---------------------

Definition at line 104 of file orbital\_elements.cc.

References `object_name`.

#### 7.1.3.11 set\_planet\_name()

```
void jeod::OrbitalElements::set_planet_name (
    const char * name )
```

Set the planet name.

##### Parameters

in	<i>name</i>	Name of planet about which the object orbits
----	-------------	--

Definition at line 122 of file orbital\_elements.cc.

References planet\_name.

#### 7.1.3.12 to\_cartesian()

```
int jeod::OrbitalElements::to_cartesian (
    double mu,
    double pos[3],
    double vel[3] )
```

Definition at line 431 of file orbital\_elements.cc.

References arg\_periapsis, cos\_v, jeod::OrbitalElementsMessages::domain\_error, e\_mag, inclination, long\_asc\_↵, node, semiparam, and sin\_v.

### 7.1.4 Friends And Related Function Documentation

#### 7.1.4.1 init\_attrjeod\_\_OrbitalElements

```
void init_attrjeod__OrbitalElements ( ) [friend]
```

#### 7.1.4.2 InputProcessor

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

Definition at line 83 of file orbital\_elements.hh.

### 7.1.5 Field Documentation

#### 7.1.5.1 arg\_periapsis

```
double jeod::OrbitalElements::arg_periapsis
```

Argument of periapsis (w)

trick\_units(rad)

Definition at line 108 of file orbital\_elements.hh.

Referenced by from\_cartesian(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.2 cos\_v

```
double jeod::OrbitalElements::cos_v
```

Cosine of the true anomaly.

trick\_units(-)

Definition at line 147 of file orbital\_elements.hh.

Referenced by mean\_anom\_to\_nu(), nu\_to\_anomalies(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.3 e\_mag

```
double jeod::OrbitalElements::e_mag
```

Magnitude of eccentricity (e)

trick\_units(-)

Definition at line 100 of file orbital\_elements.hh.

Referenced by from\_cartesian(), mean\_anom\_to\_nu(), nu\_to\_anomalies(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.4 inclination

```
double jeod::OrbitalElements::inclination
```

Orbit inclination (i)

trick\_units(rad)

Definition at line 104 of file orbital\_elements.hh.

Referenced by from\_cartesian(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.5 long\_asc\_node

```
double jeod::OrbitalElements::long_asc_node
```

Longitude of ascending node (Omega)

trick\_units(rad)

Definition at line 112 of file orbital\_elements.hh.

Referenced by from\_cartesian(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.6 mean\_anom

```
double jeod::OrbitalElements::mean_anom
```

Mean Anomaly (M)

trick\_units(rad)

Definition at line 130 of file orbital\_elements.hh.

Referenced by mean\_anom\_to\_nu(), nu\_to\_anomalies(), and OrbitalElements().

#### 7.1.5.7 mean\_motion

```
double jeod::OrbitalElements::mean_motion
```

Mean motion of orbit (n)

trick\_units(rad/s)

Definition at line 134 of file orbital\_elements.hh.

Referenced by from\_cartesian(), and OrbitalElements().

#### 7.1.5.8 object\_name

```
std::string jeod::OrbitalElements::object_name [protected]
```

Name of orbital object.

trick\_units(-)

Definition at line 161 of file orbital\_elements.hh.

Referenced by get\_object\_name(), and set\_object\_name().

#### 7.1.5.9 orb\_ang\_momentum

```
double jeod::OrbitalElements::orb_ang_momentum
```

Specific orbital angular momentum.

trick\_units(m2/s)

Definition at line 155 of file orbital\_elements.hh.

Referenced by from\_cartesian(), and OrbitalElements().

#### 7.1.5.10 orb\_energy

```
double jeod::OrbitalElements::orb_energy
```

Specific orbital energy.

trick\_units(m2/s2)

Definition at line 151 of file orbital\_elements.hh.

Referenced by from\_cartesian(), and OrbitalElements().

#### 7.1.5.11 orbital\_anom

```
double jeod::OrbitalElements::orbital_anom
```

Eccentric (E), Hyperbolic (H), or Parabolic (B) anomaly.

trick\_units(rad)

Definition at line 138 of file orbital\_elements.hh.

Referenced by mean\_anom\_to\_nu(), nu\_to\_anomalies(), and OrbitalElements().

#### 7.1.5.12 planet\_name

```
std::string jeod::OrbitalElements::planet_name [protected]
```

Name of planet about which the object orbits.

trick\_units(-)

Definition at line 165 of file orbital\_elements.hh.

Referenced by get\_planet\_name(), and set\_planet\_name().

#### 7.1.5.13 r\_mag

```
double jeod::OrbitalElements::r_mag
```

Magnitude of orbital radius.

trick\_units(m)

Definition at line 118 of file orbital\_elements.hh.

Referenced by from\_cartesian(), and OrbitalElements().

#### 7.1.5.14 semi\_major\_axis

```
double jeod::OrbitalElements::semi_major_axis
```

Semi-major-axis (a)

trick\_units(m)

Definition at line 92 of file orbital\_elements.hh.

Referenced by from\_cartesian(), and OrbitalElements().

#### 7.1.5.15 semiparam

```
double jeod::OrbitalElements::semiparam
```

Semiparameter (p)

trick\_units(m)

Definition at line 96 of file orbital\_elements.hh.

Referenced by from\_cartesian(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.16 sin\_v

```
double jeod::OrbitalElements::sin_v
```

Sine of the true anomaly.

trick\_units(-)

Definition at line 143 of file orbital\_elements.hh.

Referenced by mean\_anom\_to\_nu(), nu\_to\_anomalies(), OrbitalElements(), and to\_cartesian().

#### 7.1.5.17 true\_anom

```
double jeod::OrbitalElements::true_anom
```

True Anomaly (v)

trick\_units(rad)

Definition at line 126 of file orbital\_elements.hh.

Referenced by from\_cartesian(), mean\_anom\_to\_nu(), nu\_to\_anomalies(), and OrbitalElements().

### 7.1.5.18 vel\_mag

```
double jeod::OrbitalElements::vel_mag
```

Magnitude of orbital velocity.

trick\_units(m/s)

Definition at line 122 of file orbital\_elements.hh.

Referenced by from\_cartesian(), and OrbitalElements().

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

- [orbital\\_elements.hh](#)
- [orbital\\_elements.cc](#)

## 7.2 jeod::OrbitalElementsMessages Class Reference

Specifies the message IDs used in the orbital elements model.

```
#include <orbital_elements_messages.hh>
```

### Static Public Attributes

- static char const \* [domain\\_error](#)  
*Issued when a value / set of values is invalid.*
- static char const \* [convergence\\_error](#)  
*Issued when a numeric search fails to converge.*

### Private Member Functions

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

### Friends

- class [InputProcessor](#)
- void [init\\_attrjeod\\_\\_OrbitalElementsMessages](#) ()

### 7.2.1 Detailed Description

Specifies the message IDs used in the orbital elements model.

Definition at line 83 of file orbital\_elements\_messages.hh.



## 7.2.2 Constructor & Destructor Documentation

### 7.2.2.1 OrbitalElementsMessages() [1/2]

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

### 7.2.2.2 OrbitalElementsMessages() [2/2]

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

## 7.2.3 Member Function Documentation

### 7.2.3.1 operator=()

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

## 7.2.4 Friends And Related Function Documentation

### 7.2.4.1 init\_attrjeod\_\_OrbitalElementsMessages

```
void init_attrjeod__OrbitalElementsMessages ( ) [friend]
```

### 7.2.4.2 InputProcessor

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

Definition at line 86 of file orbital\_elements\_messages.hh.

## 7.2.5 Field Documentation

### 7.2.5.1 convergence\_error

```
char const * jeod::OrbitalElementsMessages::convergence_error [static]
```

#### Initial value:

```
=  
    "utils/orbital_elements/" "convergence_error"
```

Issued when a numeric search fails to converge.

trick\_units(-)

Definition at line 100 of file orbital\_elements\_messages.hh.

Referenced by jeod::OrbitalElements::mean\_anom\_to\_nu().

### 7.2.5.2 domain\_error

```
char const * jeod::OrbitalElementsMessages::domain_error [static]
```

#### Initial value:

```
=  
    "utils/orbital_elements/" "domain_error"
```

Issued when a value / set of values is invalid.

trick\_units(-)

Definition at line 95 of file orbital\_elements\_messages.hh.

Referenced by jeod::OrbitalElements::to\_cartesian().

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

- [orbital\\_elements\\_messages.hh](#)
- [orbital\\_elements\\_messages.cc](#)

## Chapter 8

# File Documentation

### 8.1 orbital\_elements.cc File Reference

Define methods for the OrbitalElements class.

```
#include <cmath>
#include <cstdlib>
#include "utils/math/include/vector3.hh"
#include "utils/memory/include/jeod_alloc.hh"
#include "utils/message/include/message_handler.hh"
#include "../include/orbital_elements.hh"
#include "../include/orbital_elements_messages.hh"
```

#### Namespaces

- [jeod](#)

*Namespace jeod.*

#### 8.1.1 Detailed Description

Define methods for the OrbitalElements class.

### 8.2 orbital\_elements.hh File Reference

Orbital elements class definition.

```
#include <string>
#include "utils/sim_interface/include/jeod_class.hh"
```

## Data Structures

- class [jeod::OrbitalElements](#)  
*Represents state in terms of Keplerian orbital elements.*

## Namespaces

- [jeod](#)  
*Namespace jeod.*

### 8.2.1 Detailed Description

Orbital elements class definition.

## 8.3 orbital\_elements\_messages.cc File Reference

Implement the class OrbitalElementsMessages.

```
#include "../include/orbital_elements_messages.hh"
```

## Namespaces

- [jeod](#)  
*Namespace jeod.*

## Macros

- `#define` [PATH](#) "utils/orbital\_elements/"

### 8.3.1 Detailed Description

Implement the class OrbitalElementsMessages.

## 8.4 orbital\_elements\_messages.hh File Reference

Define the class OrbitalElementsMessages, the class that specifies the message IDs used in the orbital elements model.

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

## Data Structures

- class [jeod::OrbitalElementsMessages](#)  
*Specifies the message IDs used in the orbital elements model.*

## Namespaces

- [jeod](#)  
*Namespace jeod.*

### 8.4.1 Detailed Description

Define the class `OrbitalElementsMessages`, the class that specifies the message IDs used in the orbital elements model.



# Index

- ~OrbitalElements
  - jeod::OrbitalElements, [17](#)
- arg\_periapsis
  - jeod::OrbitalElements, [21](#)
- convergence\_error
  - jeod::OrbitalElementsMessages, [27](#)
- cos\_v
  - jeod::OrbitalElements, [21](#)
- domain\_error
  - jeod::OrbitalElementsMessages, [28](#)
- e\_mag
  - jeod::OrbitalElements, [22](#)
- from\_cartesian
  - jeod::OrbitalElements, [17](#)
- get\_object\_name
  - jeod::OrbitalElements, [18](#)
- get\_planet\_name
  - jeod::OrbitalElements, [18](#)
- inclination
  - jeod::OrbitalElements, [22](#)
- init\_attrjeod\_\_OrbitalElements
  - jeod::OrbitalElements, [21](#)
- init\_attrjeod\_\_OrbitalElementsMessages
  - jeod::OrbitalElementsMessages, [27](#)
- InputProcessor
  - jeod::OrbitalElements, [21](#)
  - jeod::OrbitalElementsMessages, [27](#)
- jeod, [13](#)
- jeod::OrbitalElements, [15](#)
  - ~OrbitalElements, [17](#)
  - arg\_periapsis, [21](#)
  - cos\_v, [21](#)
  - e\_mag, [22](#)
  - from\_cartesian, [17](#)
  - get\_object\_name, [18](#)
  - get\_planet\_name, [18](#)
  - inclination, [22](#)
  - init\_attrjeod\_\_OrbitalElements, [21](#)
  - InputProcessor, [21](#)
  - KepEqtnB, [18](#)
  - KepEqtnE, [19](#)
  - KepEqtnH, [19](#)
  - long\_asc\_node, [22](#)
  - mean\_anom, [22](#)
  - mean\_anom\_to\_nu, [19](#)
  - mean\_motion, [23](#)
  - nu\_to\_anomalies, [19](#)
  - object\_name, [23](#)
  - operator=, [20](#)
  - orb\_ang\_momentum, [23](#)
  - orb\_energy, [23](#)
  - orbital\_anom, [24](#)
  - OrbitalElements, [17](#)
  - planet\_name, [24](#)
  - r\_mag, [24](#)
  - semi\_major\_axis, [24](#)
  - semiparam, [25](#)
  - set\_object\_name, [20](#)
  - set\_planet\_name, [20](#)
  - sin\_v, [25](#)
  - to\_cartesian, [21](#)
  - true\_anom, [25](#)
  - vel\_mag, [25](#)
- jeod::OrbitalElementsMessages, [26](#)
  - convergence\_error, [27](#)
  - domain\_error, [28](#)
  - init\_attrjeod\_\_OrbitalElementsMessages, [27](#)
  - InputProcessor, [27](#)
  - operator=, [27](#)
  - OrbitalElementsMessages, [27](#)
- KepEqtnB
  - jeod::OrbitalElements, [18](#)
- KepEqtnE
  - jeod::OrbitalElements, [19](#)
- KepEqtnH
  - jeod::OrbitalElements, [19](#)
- long\_asc\_node
  - jeod::OrbitalElements, [22](#)
- mean\_anom
  - jeod::OrbitalElements, [22](#)
- mean\_anom\_to\_nu
  - jeod::OrbitalElements, [19](#)
- mean\_motion
  - jeod::OrbitalElements, [23](#)
- Models, [9](#)
- nu\_to\_anomalies
  - jeod::OrbitalElements, [19](#)
- object\_name
  - jeod::OrbitalElements, [23](#)

- operator=
  - jeod::OrbitalElements, [20](#)
  - jeod::OrbitalElementsMessages, [27](#)
- orb\_ang\_momentum
  - jeod::OrbitalElements, [23](#)
- orb\_energy
  - jeod::OrbitalElements, [23](#)
- orbital\_anom
  - jeod::OrbitalElements, [24](#)
- orbital\_elements.cc, [29](#)
- orbital\_elements.hh, [29](#)
- orbital\_elements\_messages.cc, [30](#)
- orbital\_elements\_messages.hh, [30](#)
- OrbitalElements, [11](#)
  - jeod::OrbitalElements, [17](#)
  - PATH, [11](#)
- OrbitalElementsMessages
  - jeod::OrbitalElementsMessages, [27](#)
- PATH
  - OrbitalElements, [11](#)
- planet\_name
  - jeod::OrbitalElements, [24](#)
- r\_mag
  - jeod::OrbitalElements, [24](#)
- semi\_major\_axis
  - jeod::OrbitalElements, [24](#)
- semiparam
  - jeod::OrbitalElements, [25](#)
- set\_object\_name
  - jeod::OrbitalElements, [20](#)
- set\_planet\_name
  - jeod::OrbitalElements, [20](#)
- sin\_v
  - jeod::OrbitalElements, [25](#)
- to\_cartesian
  - jeod::OrbitalElements, [21](#)
- true\_anom
  - jeod::OrbitalElements, [25](#)
- Utils, [10](#)
- vel\_mag
  - jeod::OrbitalElements, [25](#)