

Annex E (normative)

ORM specifications

E.1 Overview

This annex presents the specification of the standardized ORM and associated RTs. If two or more object-fixed ORMs for the same object are specified, then one of the ORMs is designated as the reference ORM for that object. [Table E.1](#) in [E.2.1](#) lists the reference ORMs specified in this document, ordered alphabetically by their label. ORM specifications are listed in tables in [E.2.2](#) according to object categories (abstract, Earth, other planet, satellites, and Sun) and binding type (object-fixed or dynamic). [Table E.2](#) provides a directory of these tables. Parameter values in the tables are specified by value or by reference. Parameters specified by reference use the terminology in the cited references. Those terms are enclosed in brackets ({ }). Referenced values in length units other than metres are converted to metres to specify the corresponding RT parameter. Angular values are generally expressed in the units of radian. However, to avoid a loss of precision, some angular values are expressed in the units of arc second (") or arc degree (°), as indicated.

Abbreviated forms used in labels in this annex are defined in [Annex F](#).

E.2 ORMs

E.2.1 Reference ORMs

Table E.1 — Reference ORM directory

Object name	Type	Reference ORM label
2D modelling space	Abstract	ABSTRACT_2D
3D modelling space	Abstract	ABSTRACT_3D
Adrastea	Satellite	ADRASTEIA_2000
Amalthea	Satellite	AMALTHEA_2000
Ariel	Satellite	ARIEL_1988
Atlas	Satellite	ATLAS_2013
Belinda	Satellite	BELINDA_1988
Bianca	Satellite	BIANCA_1988
Callisto	Satellite	CALLISTO_2001
Calypso	Satellite	CALYPSO_2013
Charon	Satellite	CHARON_2017

Object name	Type	Reference ORM label
Cordelia	Satellite	CORDELIA 1988
Cressida	Satellite	CRESSIDA 1988
Deimos	Satellite	DEIMOS 1993
Desdemona	Satellite	DESDEMONA 1988
Despina	Satellite	DESPINA 1991
Dione	Satellite	DIONE 2010
Earth	Earth	WGS 1984
Enceladus	Satellite	ENCELADUS 2016
Epimetheus	Satellite	EPIMETHEUS 2013
Eros (asteroid 433)	Planet	EROS 2002
Europa	Satellite	EUROPA 2007
Galatea	Satellite	GALATEA 1991
Ganymede	Satellite	GANYMEDE 2007
Gaspra (asteroid 951)	Planet	GASPRA 1991
Helene	Satellite	HELENE 2013
Iapetus	Satellite	IAPETUS 2010
Ida (asteroid 243)	Planet	IDA 1991
Io	Satellite	IO 1998
Janus	Satellite	JANUS 2013
Juliet	Satellite	JULIET 1988
Jupiter	Planet	JUPITER 2006
Larissa	Satellite	LARISSA 1991
Mars	Planet	MARS 2000
Mercury	Planet	MERCURY 2015
Metis	Satellite	METIS 2000
Mimas	Satellite	MIMAS 2010

Object name	Type	Reference ORM label
Miranda	Satellite	MIRANDA_1988
Moon	Satellite	MOON_1991
Naiad	Satellite	NAIAD_1991
Neptune	Planet	NEPTUNE_1991
Oberon	Satellite	OBERON_1988
Ophelia	Satellite	OPHELIA_1988
Pan	Satellite	PAN_2013
Pandora	Satellite	PANDORA_2013
Phobos	Satellite	PHOBOS_2010
Phoebe	Satellite	PHOEBE_2010
Pluto	Planet	PLUTO_2017
Portia	Satellite	PORTIA_1988
Prometheus	Satellite	PROMETHEUS_2013
Proteus	Satellite	PROTEUS_1991
Puck	Satellite	PUCK_1988
Rhea	Satellite	RHEA_2010
Rosalind	Satellite	ROSALIND_1988
Saturn	Planet	SATURN_1988
Sun	Sun	SUN_2008
Telesto	Satellite	TELESTO_2013
Tethys	Satellite	TETHYS_2010
Thalassa	Satellite	THALASSA_1991
Thebe	Satellite	THEBE_2000
Titan	Satellite	TITAN_2010
Titania	Satellite	TITANIA_1988
Triton	Satellite	TRITON_1991

Object name	Type	Reference ORM label
Umbriel	Satellite	UMBRIEL_1988
Uranus	Planet	URANUS_1988
Venus	Planet	VENUS_1991

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E.2.2 Standardized ORMs

The elements of an ORM specification are defined in [Table 7.33](#), and RT specification elements are defined in [Table 7.34](#). [Table E.2](#) is a directory of standardized ORMs organized by category of ORM and type of object. The ORM entries in each table are ordered alphabetically by their label. ORM specifications may include one or more RT specifications. The RT specifications associated with an ORM are specified in a corresponding table as shown in [Table E.2](#). Deprecated ORMs and their associated RTs are specified in [Annex J](#).

Table E.2 — ORM specification directory

ORM and RT specification tables	ORM table	RT table
Abstract ORM specifications	Table E.3	Table E.4
Object-fixed ERM specifications	Table E.5	Table E.6
Dynamic ERM specifications	Table E.7	n/a
Time-fixed instances of dynamic ERM specifications	Table E.8	Table E.9
Object-fixed planet (non-Earth) ORM specifications	Table E.10	Table E.11
Dynamic planet (non-Earth) ORM specifications	Table E.12	n/a
Time-fixed instances of dynamic planet (non-Earth) ORM specifications	Table E.13	Table E.14
Object-fixed satellite ORM specifications	Table E.15	Table E.16
Time-fixed instances of dynamic satellite ORM specifications	Table E.17	Table E.18
Object-fixed stellar ORM specifications	Table E.19	Table E.20
Dynamic stellar ORM specifications	Table E.21	n/a

ORM and RT specification tables	ORM table	RT table
Time-fixed instances of dynamic stellar ORM specifications	Table E.22	Table E.23

E.2.2.1 Abstract ORMs

Table E.3 — Abstract ORM specifications

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
ABSTRACT_2D	1	2D modelling space	This is the reference ORM for abstract 2D object-space.	none	Universal	BI_AXIS_ORIGIN_2D	n/a	none
ABSTRACT_3D	2	3D modelling space	This is the reference ORM for abstract 3D object-space.	none	Universal	TRI_PLANE	n/a	none

Table E.4 — Abstract ORM reference transformation specifications

ORM label	RT label	RT code	RT region	STT label and parameter values	Date published	References
ABSTRACT_2D	ABSTRACT_2D_IDENTITY	1	Universal	IDENTITY n/a (reference ORM)	n/a	none
ABSTRACT_3D	ABSTRACT_3D_IDENTITY	2	Universal	IDENTITY n/a (reference ORM)	n/a	none

E.2.2.2 Object-fixed ERMs

Table E.5 — Object-fixed ERM specifications

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
ACCRA	266	Accra	WGS 1984	1929	Ghana	OBLATE ELLIPSOID	WAR OFFICE-1924	[NGA36 , App. D.2, "ACC"]
ADEN 1925	300	Aden	WGS 1984	1925	Yemen	OBLATE ELLIPSOID	CLARKE 1880	[NGA36 , App. E.2, "ADN"]
ADINDAN 1991	3	Adindan	WGS 1984	1991	Burkina Faso, Cameroon, Ethiopia, Mali, Senegal, and Sudan	OBLATE ELLIPSOID	CLARKE 1880	[NGA36 , App. D.2, "ADI"]
AFGOOYE 1987	5	Afgooye	WGS 1984	1987	Somalia	OBLATE ELLIPSOID	KRASSOVSKY-1940	[NGA36 , App. D.2, "AFG"]
AIN EL ABD 1970	6	Ain el Abd	WGS 1984	1970	Bahrain and Saudi Arabia	OBLATE ELLIPSOID	INTERNATIONAL-1924	[NGA36 , App. D.3, "AIN"]
AMERICAN SAMOA-1962	8	American Samoa	WGS 1984	1962	American Samoa Islands	OBLATE ELLIPSOID	CLARKE 1866	[NGA36 , App. D.10, "AMA"]
AMERSFOORT	267	Amersfoort 1885/1903	WGS 1984	1903	Netherlands	OBLATE ELLIPSOID	BESSEL 1841-ETHIOPIA	[DIGEST , Table 6.2, "AME"]