

Annex E (normative)

ORM specifications

E.1 Introduction

This annex presents the specification of the standardized ORM s and associated RTs. If two or more object-fixed ORM s for the same object are specified then one of the ORM s is designated as the reference ORM for that object. [Table E.1](#) in [E.2.1](#) lists the reference ORM s specified in this International Standard, 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.

E.2 ORM s

E.2.1 Reference ORM s

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_1988
Belinda	Satellite	BELINDA_1988
Bianca	Satellite	BIANCA_1988
Callisto	Satellite	CALLISTO_2000
Calypso	Satellite	CALYPSO_1988
Charon	Satellite	CHARON_1991
Cordelia	Satellite	CORDELIA_1988

Object name	Type	Reference ORM label
Cressida	Satellite	CRESSIDA_1988
Deimos	Satellite	DEIMOS_1988
Desdemona	Satellite	DESDEMONA_1988
Despina	Satellite	DESPINA_1991
Dione	Satellite	DIONE_1982
Earth	Earth	WGS_1984
Enceladus	Satellite	ENCELADUS_1994
Epimetheus	Satellite	EPIMETHEUS_1988
Eros (asteroid 433)	Planet	EROS_2000
Europa	Satellite	EUROPA_2000
Galatea	Satellite	GALATEA_1991
Ganymede	Satellite	GANYMEDE_2000
Gaspra (asteroid 951)	Planet	GASPRA_1991
Helene	Satellite	HELENE_1992
Iapetus	Satellite	IAPETUS_1988
Ida (asteroid 243)	Planet	IDA_1991
Io	Satellite	IO_2000
Janus	Satellite	JANUS_1988
Juliet	Satellite	JULIET_1988
Jupiter	Planet	JUPITER_1988
Larissa	Satellite	LARISSA_1991
Mars	Planet	MARS_2000
Mercury	Planet	MERCURY_1988
Metis	Satellite	METIS_2000
Mimas	Satellite	MIMAS_1994
Miranda	Satellite	MIRANDA_1988
Moon	Satellite	MOON_1991

Object name	Type	Reference ORM label
Naiad	Satellite	NAIAD_1991
Neptune	Planet	NEPTUNE_1991
Oberon	Satellite	OBERON_1988
Ophelia	Satellite	OPHELIA_1988
Pan	Satellite	PAN_1991
Pandora	Satellite	PANDORA_1988
Phobos	Satellite	PHOBOS_1988
Phoebe	Satellite	PHOEBE_1988
Pluto	Planet	PLUTO_1994
Portia	Satellite	PORTIA_1988
Prometheus	Satellite	PROMETHEUS_1988
Proteus	Satellite	PROTEUS_1991
Puck	Satellite	PUCK_1988
Rhea	Satellite	RHEA_1988
Rosalind	Satellite	ROSALIND_1988
Saturn	Planet	SATURN_1988
Sun	Sun	SUN_1992
Telesto	Satellite	TELESTO_1988
Tethys	Satellite	TETHYS_1991
Thalassa	Satellite	THALASSA_1991
Thebe	Satellite	THEBE_2000
Titan	Satellite	TITAN_1982
Titania	Satellite	TITANIA_1988
Triton	Satellite	TRITON_1991
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 7.10](#). [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. The deprecated ORMs are specified in [Annex J](#). 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](#).

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
Stellar ORM specifications	Table E.19	Table E.20
Dynamic stellar ORM specifications	Table E.21	n/a
Time-fixed instances of dynamic stellar ORM specifications	Table E.22	Table E.23

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	RT parameters	Date published	References
ABSTRACT_2D	ABSTRACT_2D_IDENTITY	1	Universal	n/a (reference ORM)	n/a	none
ABSTRACT_3D	ABSTRACT_3D_IDENTITY	2	Universal	n/a (reference ORM)	n/a	none

Table E.5 — Object-fixed ERM specifications

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
ADINDAN_1991	3	Adindan	WGS_1984	1991	Burkina Faso, Cameroon, Ethiopia, Mali, Senegal, and Sudan	OBLATE_ELLIPSOID	CLARKE_1880	[83502T , App. B.2, "ADI"]
AFGOOYE_1987	5	Afgooye (Somalia)	WGS_1984	1987	Somalia	OBLATE_ELLIPSOID	KRASSOVSKY-1940	[83502T , App. B.2, "AFG"]
AIN_EL_ABD_1970	6	Ain el Abd	WGS_1984	1970	Bahrain and Saudi Arabia	OBLATE_ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.3, "AIN"]
AMERICAN_SAMOA-1962	8	American Samoa	WGS_1984	1962	American Samoa Islands	OBLATE_ELLIPSOID	CLARKE_1866	[83502T , App. B.10, "AMA"]
ANNA_1_1965	9	Anna 1 (astronomic)	WGS_1984	1965	Cocos Islands	OBLATE_ELLIPSOID	AUSTRALIAN-NATIONAL_1966	[83502T , App. B.9, "ANO"]
ANTIGUA_1943	10	Antigua (astronomic)	WGS_1984	1943	Antigua and Leeward Islands	OBLATE_ELLIPSOID	CLARKE_1880	[83502T , App. B.8, "AIA"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
ARC 1950	11	Arc	WGS 1984	1950	Botswana, Burundi, Lesotho, Malawi, Swaziland, Zaire, Zambia, and Zimbabwe	OBLATE ELLIPSOID	CLARKE 1880	[83502T, App. B.2, "ARF"]
ARC 1960	12	Arc	WGS 1984	1960	Kenya and Tanzania	OBLATE ELLIPSOID	CLARKE 1880	[83502T, App. B.2, "ARS"]
ASCENSION 1958	14	Ascension	WGS 1984	1958	Ascension Island	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T, App. B.8, "ASC"]
AUSTRALIAN GEOD-1966	16	Australian Geodetic	WGS 1984	1966	Australia and Tasmania	OBLATE ELLIPSOID	AUSTRALIAN-NATIONAL-1966	[83502T, App. B.4, "AUA"]
AUSTRALIAN GEOD-1984	17	Australian Geodetic	WGS 1984	1984	Australia and Tasmania	OBLATE ELLIPSOID	AUSTRALIAN-NATIONAL-1966	[83502T, App. B.4, "AUG"]
AYABELLE-LIGHTHOUSE 1991	18	Ayabelle Lighthouse (Djibouti)	WGS 1984	1991	Djibouti	OBLATE ELLIPSOID	CLARKE 1880	[83502T, App. B.2, "PHA"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
BEACON E 1945	19	Beacon E (Iwo-jima; astronomic)	WGS 1984	1945	Iwo Jima Island	OBLATE ELLIPSOID	INTERNATIONAL- 1924	[83502T] , App. B.10, "ATF"]
BELLEVUE IGN 1987	21	Bellevue (IGN)	WGS 1984	1987	Efate and Erromango Islands (Vanuatu)	OBLATE ELLIPSOID	INTERNATIONAL- 1924	[83502T] , App. B.10, "IBE"]
BERMUDA 1957	22	Bermuda	WGS 1984	1957	Bermuda	OBLATE ELLIPSOID	CLARKE 1866	[83502T] , App. B.8, "BER"]
BISSAU 1991	24	Bissau	WGS 1984	1991	Guinea- Bissau	OBLATE ELLIPSOID	INTERNATIONAL- 1924	[83502T] , App. B.2, "BID"]
BOGOTA OBS 1987	25	Bogota Observatory	WGS 1984	1987	Colombia	OBLATE ELLIPSOID	INTERNATIONAL- 1924	[83502T] , App. B.7, "BOO"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
BOGOTA_OBS_1987_PM-BOGOTA	26	Bogota Observatory (with the Prime Meridian at Bogota)	WGS_1984	1987 The x -positive xz -half-plane contains Bogota, Colombia (Instituto Geografico Augustin Cadazzi (IGAC) determination).	Colombia	OBLATE_ELLIPSOID	INTERNATIONAL-1924	[83502T, App. B.7, "BOO"]
BUKIT_RIMPAH_1987	27	Bukit Rimpah	WGS_1984	1987	Bangka and Belitung Islands (Indonesia)	OBLATE_ELLIPSOID	BESSEL_1841-ETHIOPIA	[83502T, App. C.2, "BUR"]
CAMP_AREA_1987	30	Camp Area (astronomic)	WGS_1984	1987	McMurdo Camp Area (Antarctica)	OBLATE_ELLIPSOID	INTERNATIONAL-1924	[83502T, App. C.2, "CAZ"]
CAMPO_INCHAUSPE-1969	31	Campo Inchauspe	WGS_1984	1969	Argentina	OBLATE_ELLIPSOID	INTERNATIONAL-1924	[83502T, App. B.7, "CAI"]
CANTON_1966	32	Canton (astronomic)	WGS_1984	1966	Phoenix Islands	OBLATE_ELLIPSOID	INTERNATIONAL-1924	[83502T, App. B.10, "CAO"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
CAPE_1987	33	Cape	WGS_1984	1987	South Africa	OBLATE ELLIPSOID	CLARKE_1880	[83502T] , App. B.2, "CAP"]
CAPE_CANAVERAL_1991	34	Cape Canaveral	WGS_1984	1991	Bahamas and Florida	OBLATE ELLIPSOID	CLARKE_1866	[83502T] , App. B.6, "CAC"]
CARTHAGE_1987	35	Carthage	WGS_1984	1987	Tunisia	OBLATE ELLIPSOID	CLARKE_1880	[83502T] , App. B.2, "CGE"]
CHATHAM_1971	37	Chatam (astronomic)	WGS_1984	1971	Chatham Islands (New Zealand)	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T] , App. B.10, "CHI"]
CHUA_1987	38	Chua (astronomic)	WGS_1984	1987	Paraguay	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T] , App. B.7, "CHU"]
COAMPS_1998	39	Coupled Ocean/ Atmospheric Mesoscale Prediction System (COAMPS™)	WGS_1984	1998	Earth, Global	SPHERE ORIGIN	COAMPS_1998	[ERNWM] , Table 1, "COAMPS"]
CORREGO_ALEGRE-1987	41	Corrego Alegre	WGS_1984	1987	Brazil	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T] , App. B.7, "COA"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
DABOLA 1991	43	Dabola	WGS 1984	1991	Guinea	OBLATE ELLIPSOID	CLARKE 1880	[83502T] , App. B.2, "DAL"]
DECEPTION 1993	44	Deception	WGS 1984	1993	Deception Island (Antarctica)	OBLATE ELLIPSOID	CLARKE 1880	[83502T] , App. B.8, "DID"]
DJAKARTA 1987	49	Djakarta (also known as Batavia)	WGS 1984	1987	Sumatra (Indonesia)	OBLATE ELLIPSOID	BESSEL 1841-ETHIOPIA	[83502T] , App. B.3, "BAT"]
DJAKARTA 1987_PM-DJAKARTA	50	Djakarta (also known as Batavia; with the Prime Meridian at Djakarta)	WGS 1984	1987 The x-positive xz-half-plane contains Djarkata, Indonesia.	Sumatra (Indonesia)	OBLATE ELLIPSOID	BESSEL 1841-ETHIOPIA	[83502T] , App. B.3, "BAT"]
DOS 1968	51	DOS	WGS 1984	1968	Gizo Island (New Georgia Islands)	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T] , App. B.10, "GIZ"]
DOS 71 4 1987	52	DOS 71/4 (St. Helena Island; astronomic)	WGS 1984	1987	St. Helena Island	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T] , App. B.8, "SHB"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
EASTER 1967	60	Easter	WGS 1984	1967	Easter Island	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.10, "EAS"]
ESTONIA 1937	64	Estonia	WGS 1984	1937	Estonia	OBLATE ELLIPSOID	BESSEL 1841-ETHIOPIA	[83502T , App. B.5, "EST"]
ETRS 1989	65	European Terrestrial Reference System (ETRS)	WGS 1984	1989	Europe	OBLATE-ELLIPSOID-ORIGIN	GRS 1980	[HELM , "EUT"]
EUROPE 1950	67	European	WGS 1984	1950	Europe	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.5, "EUR"]
EUROPE 1979	68	European	WGS 1984	1979	Europe	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.5, "EUS"]
FAHUD 1987	69	Fahud	WGS 1984	1987	Oman	OBLATE ELLIPSOID	CLARKE 1880	[83502T , App. B.3, "FAH"]
FORT THOMAS 1955	70	Fort Thomas	WGS 1984	1955	St. Kitts, Nevis and Leeward Islands	OBLATE ELLIPSOID	CLARKE 1880	[83502T , App. B.8, "FOT"]

ORM label	ORM code	Published name	Reference ORM	Binding information	Region	ORMT label	RD parameterization	References
GAN 1970	72	Gan	WGS 1984	1970	Republic of Maldives	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.9, "GAA"]
GDA 1994	75	Geocentric Datum of Australia (GDA)	WGS 1984	1994	Australia	OBLATE-ELLIPSOID-ORIGIN	GRS 1980	[HELM , "GDS"]
GEODETIC DATUM 1949	76	Geodetic Datum	WGS 1984	1949	New Zealand	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.10, "GEO"]
GRACIOSA BASE SW-1948	89	Graciosa Base SW	WGS 1984	1948	Central Azores (Faial, Graciosa, Pico, Sao Jorge and Terceira Islands)	OBLATE ELLIPSOID	INTERNATIONAL-1924	[83502T , App. B.8, "GRA"]
GUAM 1963	90	Guam	WGS 1984	1963	Guam	OBLATE ELLIPSOID	CLARKE 1866	[83502T , App. B.10, "GUA"]
GUNONG SEGARA 1987	91	Gunung Segara	WGS 1984	1987	Kalimantan Island (Indonesia)	OBLATE ELLIPSOID	BESSEL 1841-ETHIOPIA	[83502T , App. C.2, "GSE"]