

ISO Geodetic Registry

| | | |
|---------------------------|---|---|
| <i>Item class</i> | ProjectedCRS | |
| <i>Name</i> | KSA-GRF17 / UTM zone 37N | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 956 | |
| <i>Information source</i> | <i>Title</i> | Technical Summary for Saudi Arabia National Spatial Reference System (SANSRS). |
| | <i>Author</i> | General Directorate of Geodesy |
| | <i>Publisher</i> | General Directorate of Geodesy, General Authority for Survey and Geospatial Information, Kingdom of Saudi Arabia |
| | <i>Revision date</i> | 2021-02 |
| | <i>Other citation details</i> | https://www.gasgi.gov.sa/En/Products/Products_v1/Geodesy/Documents/Technical_Summary_for_SANSRS_v1.1.pdf (accessed 2021-11-28) |
| <i>Data source</i> | ISO Geodetic Registry | |
| <i>Remarks</i> | Unified national system replacing Ain el Abd / UTM zone 37N and MTRF-2000 / UTM zone 37N from 2018. | |
| <i>Scope</i> | Spatial referencing | |
| <i>Datum</i> | Kingdom of Saudi Arabia Geodetic Reference Frame 2017 | |
| <i>Coordinate System</i> | Cartesian 2D CS. Axes: easting, northing (E,N). Orientations: east, north. UoM: m. | |
| <i>Base CRS</i> | KSA-GRF17 - LatLon | |

Extent

| | | |
|--------------------------------|---|-------|
| <i>Description</i> | Saudi Arabia - onshore and offshore - between 36°E and 42°E. | |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | 36.0 |
| | <i>North-bound latitude</i> | 31.15 |
| | <i>East-bound longitude</i> | 42.0 |
| | <i>South-bound latitude</i> | 16.35 |

ISO Geodetic Registry

| | | |
|-----------------------------------|--|---|
| <i>Item class</i> | GeodeticDatum | |
| <i>Name</i> | Kingdom of Saudi Arabia Geodetic Reference Frame 2017 | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 775 | |
| <i>Alias</i> | KSA-GRF17 | |
| <i>Information source</i> | <i>Title</i> | Technical Summary for Saudi Arabia National Spatial Reference System (SANSRS). |
| | <i>Author</i> | General Directorate of Geodesy |
| | <i>Publisher</i> | General Directorate of Geodesy, General Authority for Survey and Geospatial Information, Kingdom of Saudi Arabia |
| | <i>Publication date</i> | 2019-06 |
| | <i>Revision date</i> | 2021-02 |
| | <i>Other citation details</i> | https://www.gasgi.gov.sa/En/Products/Products_v1/Geodesy/Documents/Technical_Summary_for_SANSRS_v1.1.pdf (accessed 2021-06-07) |
| <i>Data source</i> | ISO Geodetic Registry | |
| <i>Remarks</i> | KSA-GRF17 replaces all previous geodetic datums including Ain el Abd, MOMRA Terrestrial Reference Frame 2000 and GDMS. | |
| <i>Anchor definition</i> | Aligned with ITRF2014 at epoch 2017.0 using 51 IGS primary stations and 16 additional IGS stations within 2500 km of Riyadh, and fixed to (co-moving with) the stable part of the Arabian tectonic plate as defined by 3 rotation rate parameters estimated from 41 IGS and GASGI GNSS stations. The reference frame is realized by 333 GNSS stations in Saudi Arabia. | |
| <i>Release date</i> | 2019-07 | |
| <i>Coordinate Reference Epoch</i> | 2017.0 | |
| <i>Scope</i> | Spatial referencing | |
| <i>Ellipsoid</i> | GRS 1980 | |
| <i>Prime Meridian</i> | Greenwich | |

Extent

| | | |
|--------------------------------|---|-------|
| <i>Description</i> | Saudi Arabia - onshore and offshore. | |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | 34.44 |
| | <i>North-bound latitude</i> | 32.16 |
| | <i>East-bound longitude</i> | 55.67 |
| | <i>South-bound latitude</i> | 16.29 |

ISO Geodetic Registry

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|-----------------------------|--|--------------|--------------------------------|---------------|-----------|------------------|--------------------------------------|-------------------------|---------|----------------------------|---------------------|-----------------------------|------------------|-------------|---------|
| <i>Item class</i> | Ellipsoid | | | | | | | | | | | | | | |
| <i>Name</i> | GRS 1980 | | | | | | | | | | | | | | |
| <i>Item status</i> | VALID | | | | | | | | | | | | | | |
| <i>Identifier</i> | 27 | | | | | | | | | | | | | | |
| <i>Alias</i> | Geodetic Reference System 1980 | | | | | | | | | | | | | | |
| <i>Alias</i> | GRS1980 | | | | | | | | | | | | | | |
| <i>Alias</i> | IAG GRS80 | | | | | | | | | | | | | | |
| <i>Alias</i> | International 1979 | | | | | | | | | | | | | | |
| <i>Alias</i> | GRS80 | | | | | | | | | | | | | | |
| <i>Information source</i> | <table> <tr> <td><i>Title</i></td><td>Geodetic Reference System 1980</td></tr> <tr> <td><i>Author</i></td><td>H. Moritz</td></tr> <tr> <td><i>Publisher</i></td><td>Springer International Publishing</td></tr> <tr> <td><i>Publication date</i></td><td>2003-03</td></tr> <tr> <td><i>Series/Journal name</i></td><td>Journal of Geodesy</td></tr> <tr> <td><i>Issue identification</i></td><td>Volume 74, No. 1</td></tr> <tr> <td><i>Page</i></td><td>128–162</td></tr> </table> | <i>Title</i> | Geodetic Reference System 1980 | <i>Author</i> | H. Moritz | <i>Publisher</i> | Springer International Publishing | <i>Publication date</i> | 2003-03 | <i>Series/Journal name</i> | Journal of Geodesy | <i>Issue identification</i> | Volume 74, No. 1 | <i>Page</i> | 128–162 |
| <i>Title</i> | Geodetic Reference System 1980 | | | | | | | | | | | | | | |
| <i>Author</i> | H. Moritz | | | | | | | | | | | | | | |
| <i>Publisher</i> | Springer International Publishing | | | | | | | | | | | | | | |
| <i>Publication date</i> | 2003-03 | | | | | | | | | | | | | | |
| <i>Series/Journal name</i> | Journal of Geodesy | | | | | | | | | | | | | | |
| <i>Issue identification</i> | Volume 74, No. 1 | | | | | | | | | | | | | | |
| <i>Page</i> | 128–162 | | | | | | | | | | | | | | |
| <i>Information source</i> | <table> <tr> <td><i>Title</i></td><td>Geodetic Reference System 1980</td></tr> <tr> <td><i>Author</i></td><td>H. Moritz</td></tr> <tr> <td><i>Publisher</i></td><td>International Association of Geodesy</td></tr> <tr> <td><i>Publication date</i></td><td>1984</td></tr> <tr> <td><i>Series/Journal name</i></td><td>Bulletin Geodesique</td></tr> <tr> <td><i>Issue identification</i></td><td>Volume 58, No. 3</td></tr> <tr> <td><i>Page</i></td><td>395-405</td></tr> </table> | <i>Title</i> | Geodetic Reference System 1980 | <i>Author</i> | H. Moritz | <i>Publisher</i> | International Association of Geodesy | <i>Publication date</i> | 1984 | <i>Series/Journal name</i> | Bulletin Geodesique | <i>Issue identification</i> | Volume 58, No. 3 | <i>Page</i> | 395-405 |
| <i>Title</i> | Geodetic Reference System 1980 | | | | | | | | | | | | | | |
| <i>Author</i> | H. Moritz | | | | | | | | | | | | | | |
| <i>Publisher</i> | International Association of Geodesy | | | | | | | | | | | | | | |
| <i>Publication date</i> | 1984 | | | | | | | | | | | | | | |
| <i>Series/Journal name</i> | Bulletin Geodesique | | | | | | | | | | | | | | |
| <i>Issue identification</i> | Volume 58, No. 3 | | | | | | | | | | | | | | |
| <i>Page</i> | 395-405 | | | | | | | | | | | | | | |
| <i>Data source</i> | ISO Geodetic Registry | | | | | | | | | | | | | | |
| <i>Remarks</i> | Adopted by IUGG 1979 Canberra. Inverse flattening is derived from geocentric gravitational constant $GM = 3986005e8 \text{ m}^3/\text{s}^2$, dynamic form factor $J_2 = 108263e-8$ and Earth's angular velocity = $7292115e-11 \text{ rad/s}$. | | | | | | | | | | | | | | |
| <i>Semi-major axis</i> | 6378137.0 m | | | | | | | | | | | | | | |
| <i>Inverse flattening</i> | 298.257222101 m | | | | | | | | | | | | | | |

ISO Geodetic Registry

| | | |
|----------------------------|-------------------------------|---|
| <i>Item class</i> | PrimeMeridian | |
| <i>Name</i> | Greenwich | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 25 | |
| <i>Alias</i> | Zero meridian | |
| <i>Information source</i> | <i>Title</i> | Why the Greenwich meridian moved |
| | <i>Author</i> | S. Malys, J.H. Seago, N.K. Pavlis, P.K. Seidelmann, G.H. Kaplan |
| | <i>Publisher</i> | Springer International Publishing |
| | <i>Publication date</i> | 2015-12 |
| | <i>Series/Journal name</i> | Journal of Geodesy |
| | <i>Issue identification</i> | Volume 89, No. 12 |
| | <i>Page</i> | 1263–1272 |
| <i>Information source</i> | <i>Title</i> | IERS Conventions (2010) |
| | <i>Author</i> | G. Petit, B.J. Luzum (eds) |
| | <i>Publisher</i> | Verlag des Bundesamts fur Kartographie und Geodasie |
| | <i>Publication date</i> | 2010 |
| | <i>Edition date</i> | |
| | <i>Series/Journal name</i> | IERS Technical Notes |
| | <i>Issue identification</i> | 36.0 |
| <i>Data source</i> | <i>Other citation details</i> | ISSN: 1019-4568 |
| | ISO Geodetic Registry | |
| <i>Greenwich longitude</i> | 0.0 ° | |

ISO Geodetic Registry

| | |
|--------------------|--|
| <i>Item class</i> | CartesianCS |
| <i>Name</i> | Cartesian 2D CS. Axes: easting, northing (E,N). Orientations: east, north. UoM: m. |
| <i>Item status</i> | VALID |
| <i>Identifier</i> | 828 |
| <i>Alias</i> | 2D coordinate system, consisting of 2 orthogonal axes (E,N) on a projection surface with E-axis pointing east and N-axis pointing north. UoM: m. |
| <i>Data source</i> | ISO Geodetic Registry |
| <i>Remarks</i> | Used in projected and engineering coordinate reference systems. |

Axes

| | |
|---------------------|-----------------------|
| <i>Item class</i> | CoordinateSystemAxis |
| <i>Name</i> | Easting |
| <i>Item status</i> | VALID |
| <i>Identifier</i> | 827 |
| <i>Data source</i> | ISO Geodetic Registry |
| <i>Abbreviation</i> | E |
| <i>Direction</i> | east |
| <i>Unit</i> | metre |

| | |
|---------------------|-----------------------|
| <i>Item class</i> | CoordinateSystemAxis |
| <i>Name</i> | Northing |
| <i>Item status</i> | VALID |
| <i>Identifier</i> | 826 |
| <i>Data source</i> | ISO Geodetic Registry |
| <i>Abbreviation</i> | N |
| <i>Direction</i> | north |
| <i>Unit</i> | metre |

ISO Geodetic Registry

| | |
|--------------------------|---|
| <i>Item class</i> | GeodeticCRS |
| <i>Name</i> | KSA-GRF17 - LatLon |
| <i>Item status</i> | VALID |
| <i>Identifier</i> | 779 |
| <i>Alias</i> | Kingdom of Saudi Arabia Geodetic Reference Frame 2017 |
| <i>Data source</i> | ISO Geodetic Registry |
| <i>Scope</i> | Spatial referencing. |
| <i>Datum</i> | Kingdom of Saudi Arabia Geodetic Reference Frame 2017 |
| <i>Coordinate System</i> | Ellipsoidal 2D CS. Axes: latitude, longitude. Orientations: north, east. UoM: degree |

Extent

| | | |
|--------------------------------|---|-------|
| <i>Description</i> | Saudi Arabia - onshore and offshore. | |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | 34.44 |
| | <i>North-bound latitude</i> | 32.16 |
| | <i>East-bound longitude</i> | 55.67 |
| | <i>South-bound latitude</i> | 16.29 |

ISO Geodetic Registry

| | |
|-----------------------------------|--|
| <i>Item class</i> | GeodeticDatum |
| <i>Name</i> | Kingdom of Saudi Arabia Geodetic Reference Frame 2017 |
| <i>Item status</i> | VALID |
| <i>Identifier</i> | 775 |
| <i>Alias</i> | KSA-GRF17 |
| <i>Data source</i> | ISO Geodetic Registry |
| <i>Remarks</i> | KSA-GRF17 replaces all previous geodetic datums including Ain el Abd, MOMRA Terrestrial Reference Frame 2000 and GDMS. |
| <i>Anchor definition</i> | Aligned with ITRF2014 at epoch 2017.0 using 51 IGS primary stations and 16 additional IGS stations within 2500 km of Riyadh, and fixed to (co-moving with) the stable part of the Arabian tectonic plate as defined by 3 rotation rate parameters estimated from 41 IGS and GASGI GNSS stations. The reference frame is realized by 333 GNSS stations in Saudi Arabia. |
| <i>Release date</i> | 2019-07 |
| <i>Coordinate Reference Epoch</i> | 2017.0 |
| <i>Scope</i> | Spatial referencing |
| <i>Ellipsoid</i> | GRS 1980 |
| <i>Prime Meridian</i> | Greenwich |

Extent

| | | |
|--------------------------------|---|-------|
| <i>Description</i> | Saudi Arabia - onshore and offshore. | |
| <i>Geographic Bounding Box</i> | <i>West-bound longitude</i> | 34.44 |
| | <i>North-bound latitude</i> | 32.16 |
| | <i>East-bound longitude</i> | 55.67 |
| | <i>South-bound latitude</i> | 16.29 |

ISO Geodetic Registry

| | | | | | | | | | | | | | | | |
|-----------------------------|--|--------------|--------------------------------|---------------|-----------|------------------|--------------------------------------|-------------------------|---------|----------------------------|---------------------|-----------------------------|------------------|-------------|---------|
| <i>Item class</i> | Ellipsoid | | | | | | | | | | | | | | |
| <i>Name</i> | GRS 1980 | | | | | | | | | | | | | | |
| <i>Item status</i> | VALID | | | | | | | | | | | | | | |
| <i>Identifier</i> | 27 | | | | | | | | | | | | | | |
| <i>Alias</i> | Geodetic Reference System 1980 | | | | | | | | | | | | | | |
| <i>Alias</i> | GRS1980 | | | | | | | | | | | | | | |
| <i>Alias</i> | IAG GRS80 | | | | | | | | | | | | | | |
| <i>Alias</i> | International 1979 | | | | | | | | | | | | | | |
| <i>Alias</i> | GRS80 | | | | | | | | | | | | | | |
| <i>Information source</i> | <table> <tr> <td><i>Title</i></td><td>Geodetic Reference System 1980</td></tr> <tr> <td><i>Author</i></td><td>H. Moritz</td></tr> <tr> <td><i>Publisher</i></td><td>Springer International Publishing</td></tr> <tr> <td><i>Publication date</i></td><td>2003-03</td></tr> <tr> <td><i>Series/Journal name</i></td><td>Journal of Geodesy</td></tr> <tr> <td><i>Issue identification</i></td><td>Volume 74, No. 1</td></tr> <tr> <td><i>Page</i></td><td>128–162</td></tr> </table> | <i>Title</i> | Geodetic Reference System 1980 | <i>Author</i> | H. Moritz | <i>Publisher</i> | Springer International Publishing | <i>Publication date</i> | 2003-03 | <i>Series/Journal name</i> | Journal of Geodesy | <i>Issue identification</i> | Volume 74, No. 1 | <i>Page</i> | 128–162 |
| <i>Title</i> | Geodetic Reference System 1980 | | | | | | | | | | | | | | |
| <i>Author</i> | H. Moritz | | | | | | | | | | | | | | |
| <i>Publisher</i> | Springer International Publishing | | | | | | | | | | | | | | |
| <i>Publication date</i> | 2003-03 | | | | | | | | | | | | | | |
| <i>Series/Journal name</i> | Journal of Geodesy | | | | | | | | | | | | | | |
| <i>Issue identification</i> | Volume 74, No. 1 | | | | | | | | | | | | | | |
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| <i>Title</i> | Geodetic Reference System 1980 | | | | | | | | | | | | | | |
| <i>Author</i> | H. Moritz | | | | | | | | | | | | | | |
| <i>Publisher</i> | International Association of Geodesy | | | | | | | | | | | | | | |
| <i>Publication date</i> | 1984 | | | | | | | | | | | | | | |
| <i>Series/Journal name</i> | Bulletin Geodesique | | | | | | | | | | | | | | |
| <i>Issue identification</i> | Volume 58, No. 3 | | | | | | | | | | | | | | |
| <i>Page</i> | 395-405 | | | | | | | | | | | | | | |
| <i>Data source</i> | ISO Geodetic Registry | | | | | | | | | | | | | | |
| <i>Remarks</i> | Adopted by IUGG 1979 Canberra. Inverse flattening is derived from geocentric gravitational constant $GM = 3986005e8 \text{ m}^3/\text{s}^2$, dynamic form factor $J_2 = 108263e-8$ and Earth's angular velocity = $7292115e-11 \text{ rad/s}$. | | | | | | | | | | | | | | |
| <i>Semi-major axis</i> | 6378137.0 m | | | | | | | | | | | | | | |
| <i>Inverse flattening</i> | 298.257222101 m | | | | | | | | | | | | | | |

ISO Geodetic Registry

| | | |
|----------------------------|-------------------------------|---|
| <i>Item class</i> | PrimeMeridian | |
| <i>Name</i> | Greenwich | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 25 | |
| <i>Alias</i> | Zero meridian | |
| <i>Information source</i> | <i>Title</i> | Why the Greenwich meridian moved |
| | <i>Author</i> | S. Malys, J.H. Seago, N.K. Pavlis, P.K. Seidelmann, G.H. Kaplan |
| | <i>Publisher</i> | Springer International Publishing |
| | <i>Publication date</i> | 2015-12 |
| | <i>Series/Journal name</i> | Journal of Geodesy |
| | <i>Issue identification</i> | Volume 89, No. 12 |
| | <i>Page</i> | 1263–1272 |
| <i>Information source</i> | <i>Title</i> | IERS Conventions (2010) |
| | <i>Author</i> | G. Petit, B.J. Luzum (eds) |
| | <i>Publisher</i> | Verlag des Bundesamts fur Kartographie und Geodasie |
| | <i>Publication date</i> | 2010 |
| | <i>Edition date</i> | |
| | <i>Series/Journal name</i> | IERS Technical Notes |
| | <i>Issue identification</i> | 36.0 |
| <i>Data source</i> | <i>Other citation details</i> | ISSN: 1019-4568 |
| | ISO Geodetic Registry | |
| <i>Greenwich longitude</i> | 0.0 ° | |

ISO Geodetic Registry

| | | |
|---------------------------|---|---|
| <i>Item class</i> | EllipsoidalCS | |
| <i>Name</i> | Ellipsoidal 2D CS. Axes: latitude, longitude. Orientations: north, east. UoM: degree | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 43 | |
| <i>Information source</i> | <i>Title</i> | ISO 19111 Geographical information - Spatial referencing by coordinates |
| | <i>Author</i> | International Organization for Standardization (ISO) |
| | <i>Publisher</i> | International Organization for Standardization (ISO) |
| | <i>Publication date</i> | 2007-07-01 |
| | <i>Edition</i> | Second Edition |
| | <i>Series/Journal name</i> | International Standard |
| | <i>Issue identification</i> | ISO 19111:2007 |
| <i>Data source</i> | ISO Geodetic Registry | |
| <i>Remarks</i> | Used in geographic 2D coordinate reference systems. Coordinates referenced to this CS are in degrees. Any degree representation (e.g. DMSH, decimal, etc.) may be used but that used must be declared for the user by the supplier of data. | |

Axes

| | | |
|---------------------------|---|---|
| <i>Item class</i> | CoordinateSystemAxis | |
| <i>Name</i> | Geodetic latitude | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 38 | |
| <i>Information source</i> | <i>Title</i> | ISO 19111 Geographical information - Spatial referencing by coordinates |
| | <i>Author</i> | International Organization for Standardization (ISO) |
| | <i>Publisher</i> | International Organization for Standardization (ISO) |
| | <i>Publication date</i> | 2007-07-01 |
| | <i>Edition</i> | Second Edition |
| | <i>Series/Journal name</i> | International Standard |
| | <i>Issue identification</i> | ISO 19111:2007 |
| <i>Data source</i> | ISO Geodetic Registry | |
| <i>Remarks</i> | Used in geographic 2D and geographic 3D coordinate reference systems. | |
| <i>Abbreviation</i> | Lat | |
| <i>Direction</i> | north | |
| <i>Unit</i> | degree (supplier to define representation) | |

| | | |
|---------------------------|---------------------------|---|
| <i>Item class</i> | CoordinateSystemAxis | |
| <i>Name</i> | Geodetic longitude | |
| <i>Item status</i> | VALID | |
| <i>Identifier</i> | 34 | |
| <i>Information source</i> | <i>Title</i> | ISO 19111 Geographical information - Spatial referencing by coordinates |
| | <i>Author</i> | International Organization for Standardization (ISO) |

| | | |
|---------------------|-----------------------------|---|
| | <i>Publisher</i> | International Organization for Standardization (ISO) |
| | <i>Publication date</i> | 2007-07-01 |
| | <i>Edition</i> | Second Edition |
| | <i>Series/Journal name</i> | International Standard |
| | <i>Issue identification</i> | ISO 19111:2007 |
| <i>Data source</i> | | ISO Geodetic Registry |
| <i>Remarks</i> | | Used in geographic 2D and geographic 3D coordinate reference systems. |
| <i>Abbreviation</i> | | Lon |
| <i>Direction</i> | | east |
| <i>Unit</i> | | degree (supplier to define representation) |