

Grid Bearings and Astronomic Azimuths

Introduction

This fact sheet discusses Grid Bearings and Astronomic Azimuths and their representation on Alberta Survey Control Marker ID cards.

Derivation of Grid Bearings and Astronomic Azimuths for ASCMs

A grid bearing is derived by inverting between the published Transverse Mercator coordinates of two ASCMs. An Astronomic Azimuth is derived by adding a set of corrective terms to the calculated geodetic (ellipsoidal) azimuth. The ellipsoidal azimuth is computed directly from the published geographic coordinates of two ASCMs. The corrective terms account for the deflections of the vertical and the geometry of a geodesic line on the ellipsoid.

Grid Bearings and Astronomic Azimuths shown on ASCM ID Cards

Grid bearings and astronomic azimuths appear in the ADJACENT MARKERS (calculated) data on ASCM ID cards. A grid bearing is shown if the originating marker (the "from" ASCM) is included in an urban index map (an URBAN ASCM). An astronomic azimuth is shown if the from ASCM is included in a rural index map (a RURAL ASCM). For further details on grid bearings/astronomic azimuths and other data shown on the ID cards, please refer to the Alberta Survey Control Products Manual at: [Geodetic Control Unit](#)

Grid Bearings and Mapping Planes used for ASCMs

Grid bearings are based on either the 3-degree Transverse Mercator (3TM) mapping plane or the Universal Transverse Mercator (UTM) mapping plane. Users should be aware of the mapping plane selected when they are required to be consistent with the Provincial mapping system, particularly for plans of survey. When generating ASCM ID card information via the Spatial Information (SPIN) System, users can select either the 3TM or UTM mapping plane.

ASCMs and 3TM/UTM Mapping Planes

There are two mapping planes used for ASCMs: 3-degree Transverse Mercator (3TM) and Universal Transverse Mercator (UTM). The 3TM mapping plane is typically used for all municipalities that previously comprised the 73 Municipal Integrated Surveying and Mapping (MISAM) areas, referred to as the urban cadastral map areas. Conversely, the UTM mapping plane is typically used for all other municipalities and non-urban areas, referred to as rural cadastral map areas. For further information on the mapping planes used for Alberta Survey Control, please see Fact Sheet 10 - Mapping Planes in Alberta at: [Geodetic Control Unit](#)

Grid Bearings and Plans of Survey

All plans of survey in Alberta necessary to be integrated or tie to survey control are required to use 3TM grid bearings for Urban mapping areas and UTM grid bearings for everywhere else. For a listing of the urban cadastral map areas (73 Urban former MISAM municipalities), please see Fact Sheet 10 - Mapping Planes in Alberta at: [Geodetic Control Unit](#)

More Information

This fact sheet is one of a series published by Lands Division, Geodetic Control Unit. For more information, please visit our web site at [Geodetic Control Unit](#) or contact us at (780) 422-1291 or fax (780) 427-1493.