

Grids & Datums

REPUBLIC OF NIGER

by Clifford J. Mugnier, C.P., C.M.S.

“Considerable evidence indicates that about 600,000 years ago, humans inhabited what has since become the desolate Sahara of northern Niger. Long before the arrival of French influence and control in the area, Niger was an important economic crossroads and the empires of Songhai, Mali, Gao, Kanem, and Bornu, as well as a number of Hausa states claimed control over portions of the area. During recent centuries, the nomadic Tuareg formed large confederations, pushed southward, and siding with various Hausa states, clashed with the Fulani Empire of Sokoto, which had gained control of much of the Hausa territory in the late 18th century. In the 19th century, contact with the West began when the first European explorers – notably Mungo Park (British) and Heinrich Barth (German) – explored the area searching for the mouth of the Niger River. Although French efforts at pacification began before 1900, dissident ethnic groups, especially the desert Tuareg, were not subdued until 1922, when Niger became a French colony” (*Niger – Country Studies, U.S. Dept. of State, 2011*).

“Before the Sahara started swallowing Niger around 2500 BC, it supported verdant grasslands, abundant wildlife and populations thriving on hunting and herding. Long after the desert pushed those populations south, Niger became a fixture on the trans-Saharan trade route. Between the 10th and 18th centuries, West African empires, such as the Kanem-Borno, Mali and Songhai flourished here, trafficking gold, salt, and slaves. The French strolled in late in the 1800s, meeting stronger-than-expected resistance. Decidedly un-amused, they dispatched the punitive Voulet-Chanoine expedition, destroying much of southern Niger in 1898–99. Although Tuareg revolts continued, culminating in Agadez’s siege in 1916–17; the French had control.

French rule wasn’t kind. They cultivated traditional chiefs’ power, whose abuses were encouraged as a means of control, and the enforced shift from subsistence farming to high-density cash crops compounded the Sahara’s ongoing migration. In 1958 France offered its West African colonies self-government in a French union or immediate independence. Countless votes conveniently disappeared, enabling France to claim that Niger wished to remain within its sphere of influence. Maintaining close French ties, Niger’s first president, Hamani Diori, ran a repressive one-party state. After surviving several coups, he was overthrown by Lieutenant Colonel Seyni Kountché after food stocks were discovered in ministerial homes during the Sahel drought of 1968–74. Kountché established a military ruling council. Kountché hit the jackpot in 1968 when uranium was discovered near Arlit. Mining incomes soon ballooned, leading to ambitious projects, including the ‘uranium highway’ to Agadez and Arlit. By the 1990s, Nigerians were aware of political changes sweeping West Africa and mass demonstrations erupted, eventually forcing the government into multiparty elections in 1993. However, a military junta overthrew the elected president, Mahamane Ousmane, in 1996. In 1999, during

widespread strikes and economic stagnation, president Mainassara (1996 coup leader) was assassinated and democracy re-established. Peaceful elections in 1999 and 2004 witnessed victory for Mamadou Tandja” (*Niger – Lonely Planet, 2011*).

Bordered by Algeria (956 km) (*PE&RS, October 2001*), Benin (266 km) (*PE&RS, July 2003*), Burkina Faso (628 km) (*PE&RS, January 2005*), Chad (1,175 km), Libya (354 km) (*PE&RS, June 2006*), Mali (821 km) (*PE&RS, October 2010*), and Nigeria (1,497 km) (*PE&RS, February 2009*); Niger has predominately desert plains and sand dunes, flat to rolling plains in the south and hills in the north. The lowest point is the Niger River (200 m), and the highest point is Idoùkâl-n-Taghès (2,022 m).

“Burkina Faso and Mali have jointly submitted a boundary dispute to the International Court of Justice (ICJ) for binding adjudication. The two states had signed an agreement to send their dispute to the ICJ on 24 February 2009 (entering into force on 20 November 2009) but the application was filed into the Court’s Registry on 20 July 2010. Burkina Faso and Niger have asked the ICJ to determine the course of their boundary between two identified endpoints, the survey pillar at Tong Tong (14° 25′ 04″ N, 00° 12′ 47″ E) in the north to the Boutou curve in the south (12° 36′ 18″ N, 01° 52′ 07″ E). This constitutes the vast majority of the central section of their boundary and the two parties made clear that the northern and southern extremities of the boundary (from Tong Tong to the tripoint with Mali, and Boutou to the tripoint with Benin) have already been demarcated by a Joint Technical Commission” (*International Boundaries Research Unit, Durham Univ., 22 July 2010*).

During WWII, the Niger Zone was established as a “British Grid” where: the Latitude of Origin (ϕ_0) = 13° N, Central Meridian (λ_0) = 0° (Equator), Scale Factor at Origin (m_0) = 0.99932, False Easting = 1,800 km, False Northing = 500 Km. The limits of the Grid were: North, 16° N.; East, 1° 30′ East; South: 10° N; and West, 14° West. The ellipsoid of reference was the Clarke 1880; the datum: ersatz (*Lambert Conical Orthomorphic Projection Tables, Niger Zone, RESTRICTED, Office of the Chief of Engineers, Washington, D.C., 1943*). (Later declassified – Ed.)

In December of 1945, the Institut Géographique National (IGN), issued SGC 1312 in which *I/A.E.F.* and *I/A.O.F.* (French East and West Africa) would employ a series of Gauss-Krüger Belts that included Niger. By 20 September 1950, that was rescinded in favor of the UTM Grid proposed by the U.S. Army Map Service.

The Chad-Niger Boundary is 1,175 km in length. In the south the Nigeria tripoint is situated in Lake Chad at about 13° 42′ 53″ N, 13° 38′ 20″ E, and in the north the Libya tripoint is situated northwest of the Tibesti at 23° N and 15° E. Northward the boundary traverses Lake Chad, crosses typical sandy and gravelly surfaces, and continues through a region of rocky ridges and steep-sided hills. There are

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no known pillars demarcating the boundary (*Chad-Niger Boundary, International Boundary Study No. 73 – August 1, 1966, Bureau of Intelligence and Research, Department of State, USA*).

The Niger-Nigeria Boundary is 1,497 km in length. From the tripoint with Dahomey on the median line of the Niger River, it extends northward and then eastward to the Republic of Chad tripoint at 13° 42' 29" N, and approximately 13° 38' E. In the extreme eastern sector, the boundary follows the thalweg of the eastward flowing Komadugu Yobe for more than 272 km and then continues for about 25.6 km in Lake Chad to the Chad tripoint. The boundary is demarcated by pillars and the Komadugu Yobe (*Niger-Nigeria Boundary, International Boundary Study No. 93 – December 15, 1969, Bureau of Intelligence and Research, Department of State, USA*).

Located in the Sahara, the Algeria-Niger boundary is about 956 km in length. Northeastward from the tripoint with Mali, it consists of three straight-line sectors of 174.4 km, 227.2, and 548.8 km, respectively. The boundary is un-demarcated and traverses sparsely populated areas (*Algeria-Niger Boundary, International Boundary Study No. 99 – May 1, 1970, Bureau of Intelligence and Research, Department of State, USA*).

The Mali-Niger boundary extends for approximately 816 km between the Upper Volta and Algeria tripoints. The line is not demarcated by pillars. Although it follows several valleys, more than two-thirds of the boundary consists of straight-line segments (*Mali-Niger Boundary, International Boundary Study No. 150 – January 13, 1975, Bureau of Intelligence and Research, Department of State, USA*).

The only datum known for Niger has its origin at Point 58 east of the town of Dosso and near the border with Nigeria where: $\Phi_o = 12^\circ 52' 44.045''$ N, $\Lambda_o = 3^\circ 58' 37.040''$ E of Greenwich. Thanks to John W. Hager, "Azimuth is 97° 30' 04.237" to C. F. L. 1 from north. Elevation = 266.71. Astro observed by IGN in 1968. This was used as a temporary datum pending the adjustment of the 12th Parallel to Adindan. It was for the section of the 12th Parallel in Niger and Upper Volta. Reference is *Final Report of the 12th Parallel Survey in the Republic of Niger*." Surveyed in 1969 by the French IGN, the ellipsoid of reference is the Clarke 1880 where: $a = 6,378,249.145$ m., $f/f_e = 293.465$. This was used as the basis for computation of the 12th Parallel traverse conducted 1966–70 from Senegal to Chad and connecting to the Adindan triangulation in Sudan. Remarkably, references to this datum origin point appear to have interchanged the values for Latitude and Longitude, incorrectly placing the point somewhere in Cameroon! According to TR 8350.2, the datum shift **from** Point 58 Datum **to** WGS84 Datum is: $\Delta X = -106$ m ± 25 m, $\Delta Y = -129$ m ± 25 m, and $\Delta Z = +169$ m ± 25 m, and is based on two points collocated in 1991.



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