

Grids & Datums

REPUBLIC OF THE GAMBIA

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

"The Gambia was once part of the Mali (*PE&RS*, October 2010) and Kaabu Empires. The first written accounts of the region come from records of Arab traders in the 9th and 10th centuries *A.D.* Arab traders established the trans-Saharan trade route for slaves, gold, and ivory. In the 15th century, the Portuguese took over this trade using maritime routes. At that time, The Gambia was part of the Kingdom of Mali. In 1588, the claimant to the Portuguese throne, Antonio, Prior of Crato, sold exclusive trade rights on The Gambia River to English merchants; this grant was confirmed by letters patent from Queen Elizabeth I. In 1618, King James I granted a charter to a British company for trade with The Gambia and the Gold Coast (now Ghana, *PE&RS*, June 2000). During the late 17th century and throughout the 18th, England and France struggled continuously for political and commercial supremacy in the regions of the Senegal and Gambia Rivers. The 1783 Treaty of Versailles gave Great Britain possession of The Gambia, but the French retained a tiny enclave at Albreda on the north bank of the river, which was ceded to the United Kingdom in 1857. As many as 3 million slaves may have been taken from the region during the 3 centuries that the transatlantic slave trade operated. It is not known

and a port of call for Allied naval convoys. U.S. President Franklin D. Roosevelt stopped overnight in Banjul en route to and from the Casablanca Conference in 1943, marking the first visit to the African Continent by an American president while in office. After World War II, the pace of constitutional reform quickened. Following general elections in 1962, full internal self-government was granted in 1963. The Gambia achieved independence on February 18, 1965, as a constitutional monarchy within the British Commonwealth. Shortly thereafter, the government proposed conversion from a monarchy to a republic with an elected president replacing the British monarch as chief of state. The proposal failed to receive the two-thirds majority required to amend the constitution, but the results won widespread attention abroad as testimony to The Gambia's observance of secret balloting, honest elections, and civil rights and liberties. On April 24, 1970, The Gambia became a republic following a referendum" (*Background Notes*, 11/15/11).

Slightly less than twice the size of Delaware, The Gambia is surrounded by Senegal (740 km) (*PE&RS*, May 2010), and is comprised of the flood plain of the Gambia River flanked by some low hills. The

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how many slaves were taken by Arab traders prior to and simultaneous with the transatlantic slave trade. Most of those taken were sold to Europeans by other Africans; some were prisoners of intertribal wars; some were sold because of unpaid debts, while others were kidnapped. Slaves were initially sent to Europe to work as servants until the market for labor expanded in the West Indies and North America in the 18th century. In 1807, slave trading was abolished throughout the British Empire, and the British tried unsuccessfully to end the slave traffic in The Gambia. They established the military post of Bathurst (now Banjul) in 1816. In the ensuing years, Banjul was at times under the jurisdiction of the British governor general in Sierra Leone. In 1888, The Gambia became a separate colonial entity. An 1889 agreement with France established the present boundaries, and The Gambia became a British Crown Colony, divided for administrative purposes into the colony (city of Banjul and the surrounding area) and the protectorate (remainder of the territory). The Gambia received its own executive and legislative councils in 1901 and gradually progressed toward self-government. A 1906 ordinance abolished slavery. During World War II, Gambian troops fought with the Allies in Burma. Banjul served as an air stop for the U.S. Army Air Corps

lowest point is the Atlantic Ocean (0 m), and the highest point is an unnamed elevation point (53 m). The Gambia has a coastline of 80 km, and the territorial sea it claims is 12 nautical miles; it is the smallest country in Africa (*World Factbook*, 2012).

"The Gambia Datum of 1941 (code GAI) located at East Base "O" where: $\Phi_o = 13^\circ 27' 20.035''$ N, $\Lambda_o = 16^\circ 34' 22.350''$ W, azimuth $\alpha_o = 34^\circ 55' 45''$ to "A" Barra from north, ellipsoid of reference is both Clarke 1858 and Clarke 1880 (Trig List is Clarke 1880). The Gambia Trig Lists 1, 2, and 3 were published by the Directorate of Military Survey, 1953. Source is Triangulation Data, West Africa, River Gambia, "H.M.S./ Challenger," 1941 (DI302A) with corrections from E6325 Press 31M, 1941. The station is a brass disc let into cement projecting a few inches above surface situated about 5 yards inshore of Highline at the N.W. corner of Bathurst. It is 358° 550 ft. from the light beacon.

"There is also a code DOC for the datum D.O.S. 415. I have no data. My guess on the ellipsoid is that the British Admiralty used Clarke 1858 (*where: $a = 6,378,235.6$ m, and $1/f = 294.26 - Ed.$). There are no UTM tables for 1858 so they used 1880 for the trig list. Clarke 1880 was also the IGGU ellipsoid for Africa. I never bothered to see*

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what the difference is but it most likely is insignificant. Grid. The Gambia Grid is Cassini-Soldner, Clarke 1858. Unit of measurement is the foot. Origin is the datum point, East Base. Scale Factor is unity. False northing and false easting are 0. The UK published tables; the limits are 13° N to 14° N. You have probably figured out the extent of the country so you can see that the very limited extent of the tables is more than adequate" (*Personal communication, John W. Hager, 08 November 2012*).

According to *Annals Hydrographique*, a 1965 geodetic survey in the vicinity of Senegal, *Travaux Géodésiques au Sénégal (Avril 1965-Juin 1965)* consisted of a series of triangulation points that included two points on the exterior boundaries of The Gambia: Djinnack (to the north) where: X = 333,289.86 m, Y = 1,504,202.99 m and Fanjara (to the south) where: X = 316,602.53 m, and Y = 1,490,293.33 m, and the coordinates are on UTM Zone 28, Clarke 1880 where: $a = 6,378,249.145$ m, and $1/f = 293.465$. The French Geodesists used a WILD T-3 theodolite, Tellurometer EDM, and used Bilby towers (USC&GS standard).

According to Russell Fox, International Library Manager of the Ordnance Survey, Southampton, UK, "We believe that the datum shift from HMS Challenger Astro to WGS84 is approximately: delta Latitude +1".385 North, delta Longitude +5".025 East; *i.e.*, WGS84 positions are roughly 150 m ENE of HMS Challenger Astro Datum positions. I doubt whether the data exists for the computation of reliable 3-parameter transformation parameters for Gambia. What is needed are quality GPS observations at a handful of existing trig stations" (17 November 1998).



The contents of this column reflect the views of the author, who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the American Society for Photogrammetry and Remote Sensing and/or the Louisiana State University Center for Geoinformatics (C²G).