Inhabited since Paleolithic times, the beginning of Vietnamese civilization dates back to the late Neolithic or early Bronze Age. Vietnam is tropical in the south and subject to monsoons in the north. The country is low, comprised of the Mekong Delta in the south, the Red River Delta in the north, central highlands, hilly, mountainous in the far north and northwest. The lowest point in Vietnam is the South China Sea; the highest is Ngoc Linh at 3,143 meters. The area of Vietnam is slightly more than 1,060,000 km² with a coastline of about 3,420 km. The ...
were published as $\phi = 21^\circ 01' 58.415''$ N and $\lambda = 103^\circ 29' 52.120''$ East of Paris.

In the annual report of A. Gougenheim for his hydrographic mission to French Indochina from June 1930 to June 1931, he listed a projection summary that enumerated all of the Hatt Azimuthal Equidistant projections he used that year in his mission, including the calculating machine coefficients for both the direct and the inverse for Origin Grand Mirador de Doson, Origine Hon Nieu, Origine Cana, and Origine Nui Chauvien. Each pair of formulae for direct and inverse also included a version for units of sexagesimal seconds (degress) as well as centesimal seconds (grads). Of course, everything was truncated at the cubic! Gougenheim later presented his own machine calculation for the ellipsoidal geodesic that was recast and presented by Paul D. Thomas of the U.S. Naval Hydrographic Office during the 1970s.

After the Second World War, three Hatt Azimuthal Grids were devised by the French in Vietnam. The Signal Haiphuc (1933) origin was at $\phi = 13^\circ 26' 04.693''$ N and $\lambda = 109^\circ 17' 44.322''$ East of Greenwich. The Borne (monument) de Bac Lieu (1933) origin was at $\phi = 9^\circ 15' 42.02''$ and $\lambda = 105^\circ 43' 14.48''$ East of Greenwich. The last grid established by the French was at Cal Ranh Bay in 1949 where the origin was published as $\phi = 11^\circ 55' 55.85''$ N and $\lambda = 100^\circ 49' 58.60''$ East of Paris rather than East of Greenwich!

John W. Hager tells me that “in 1954, the triangulation of Thailand was adjusted to Indian 1916 (Datum) based on 10 stations on the Burma border. In 1960, the triangulation of Cambodia and Vietnam was adjusted holding fixed two Cambodian stations connected to the Thailand adjustment of stations from the Cambodian-Vietnam adjustment. North Vietnam was also adjusted to this system but with lower standards. The details are that of the Indian Datum as defined in 1900 and labeled as Indian 1916: origin at Kalianpur Hill Station, $\phi = 24^\circ 07' 11.26''$ N, $\lambda = 77^\circ 39' 17.57''$ East of Greenwich, the initial azimuth to Surantal from south is: $\alpha_0 = 190^\circ 27' 05.10''$. The ellipsoid of reference is the Everest 1830 where $a = 6,377,276.345$ m and $1/f = 300.8017$.

I was assigned to Army Map Service (later TOPOCOM) during the Vietnam War, and for a short period was a Company Commander. Some of “my” personnel were at a SECOR satellite tracking station in Thailand while establishing a precise location for a SHORAN transmitter for navigation control of airplanes. The South Asia Datum was used for that application, and was referenced to the Modified Fisher 1960 ellipsoid where $a = 6,378,155$ m and $1/f = 298.3$. I do not think that that Datum was ever used (at that time) for unclassified applications. NIMA lists two transformations for Vietnam. For Vietnam near $16^\circ$ N, from the Indian 1960 Datum to the WGS 84 Datum: $\Delta X = +198m \pm 25m$, $\Delta Y = +881m \pm 25m$, and $\Delta Z = +317m \pm 25m$, and the solution is based on one station. For Vietnam near $16^\circ$ N, from the WGS 84 Datum to the Indian (Vietnam) Datum, $\Delta X = -199m$, $\Delta Y = -931m$, and $\Delta Z = -321m$. According to “Vietsovpetro,” further details and accuracy are unknown. However, this is suspiciously close to the VT78 parameters for the WGS 72 Datum that I received from Robert Holloway of Mt. Lawley, West Australia back in 1998. The current geodetic and mapping authority is the General Department of Land Administration in Hanoi. Vietnam continues to be an enigma, and I believe that it is due to the Campbells of the last couple of centuries.

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