



International Boundary Study

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Malawi – Mozambique Boundary

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INTERNATIONAL BOUNDARY STUDY

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MALAWI - MOZAMBIQUE BOUNDARY

I. BOUNDARY BRIEF

The Malawi–Mozambique boundary is approximately 975 miles in length and is demarcated. It traverses Lake Nyasa for about 205 miles including lines around Likoma Island and Chisumulu Island, which are part of Malawi. Southward from Lake Nyasa to the Malosa river, the boundary extends along straight-line segments for 195 miles passing through both Lake Chiuta and Lake Chilwa. It follows consecutively the thalwegs of the Malosa, Ruo, and Shire downstream for 150 miles. The boundary then continues northwestward to the Zambia tripoint utilizing features along the Shire–Zambezi and the Lake Nyasa–Zambezi drainage divides for most of the remainder of the distance.

II. HISTORICAL BACKGROUND

The first Portuguese explorer to arrive in Mozambique was Pero de Covilha who was dispatched in 1487 to find a route to India, which he reached via Egypt and Aden. On his return trip in 1489, he visited several places on the east coast of Africa, including the ancient port of Sofala within the present-day boundaries of Mozambique. The second explorer was Vasco da Gama whose voyage of 1498, following the rounding of the Cape of Good Hope the previous year by Bartholomeu Dias, took him to Inhambane, Quelimane, and the island of Mocambique before continuing to his ultimate destination of India.

In 1505 a Portuguese trading post was established on the island of Mocambique, and shortly thereafter several ports were fortified. With the formation of the office of viceroy of India, a subordinate captaincy was created with headquarters first at Sofala and then at Mocambique. Concerted efforts were made to penetrate inland along the Zambezi during the middle of the sixteenth century, at which time the river ports of Sena and Tete were taken from Arab and African traders. Difficulties in maintaining bases led to the suppression of the captain-generalship, and the East African territory was administered directly from India until 1752 when it was placed under a governor general. Except for the period from 1930 to 1951 when it was referred to as Mozambique colony, the East African territory was defined officially as an overseas province from 1822 until the present.

A dispute between Portugal and the United Kingdom relative to territorial claims in Delagoa Bay south of Lourenco Marques was submitted to President Marshal MacMahon of France for arbitration. His award in 1875 supported most of the Portuguese claims giving to Portugal the bay and adjacent land to the south. An Anglo–Portuguese treaty (the Congo treaty) was signed on February 26, 1884, which stated in Article III, "The claims of Portugal on the Shire shall not extend beyond the confluence of the river Ruo with that river." The treaty was never ratified and a conference was convened later the same year in Berlin to discuss the territorial problems of Central Africa.

In 1886 Portugal signed treaties with both France and Germany, which in effect recognized Portuguese claims to a continuous strip of territory across Africa between Mozambique and Angola. In response the United Kingdom indicated it would recognize only claims based on effective occupation because the General Act of the Berlin Conference stated that the possession of territory must be effective to have validity.

Between 1888 and 1893, three concessionary companies, the Mocambique, Niassa, and Zambezia, were formed to provide the necessary financial resources for economic growth in Mozambique. The companies were given responsibility over more than two-thirds of Mozambique including administrative control in the Mocambique and Niassa companies. The system of granting administrative responsibility to private Companies was abolished when the Niassa Company concession expired in 1929 and that of the Mocambique Company was not renewed in 1941. The capital was moved officially from Mocambique to Lourenco Marques in 1907.

In the meantime British interests were focused on south-central Africa by the exploration and missionary work of Dr. David Livingstone after 1853. He first sighted Lake Nyasa¹ in 1859, and two years later mission work was started in the lake area supported by churches from the United Kingdom. In 1878 the African Lakes Corporation was founded by an association of Scottish merchants for trade in the area, which was to a large extent merged with the British South Africa Company in 1893. On October 1, 1883, a British Consul was appointed for the districts adjacent to Lake Nyasa.

On September 21, 1889, a British Protectorate was declared over the Makololo, Yao, and Machinga territories of the Lake Nyasa area. A British Foreign Office paper delimited the western boundary of the Nyasaland territory on February 13, 1891, and a second Foreign Office paper declared a British Protectorate over the Nyasaland Districts and delimited its boundaries on May 14, 1891. The name of the entity was changed to the British Central African Protectorate by a Foreign Office note on February 22, 1893, and an Order in Council of July 6, 1907 made an additional name change to the Nyasaland Protectorate. Between August 1, 1953 and December 31, 1963, the Nyasaland Protectorate was a member of the Federation of Rhodesia and Nyasaland.

An attempt by the United Kingdom and Portugal to delimit their respective territories in East Africa by treaty on August 20, 1890, was unsuccessful when it failed ratification. Later the same year on November 14th, an Anglo-Portuguese agreement was reached on their general spheres of action in Africa and navigation on the Zambezi and Shire.

An Anglo-Portuguese treaty of June 11, 1891, delimited a boundary between Nyasaland (British Central African Protectorate) and Mozambique (Portuguese East Africa) as follows:

¹ The present Government of Malawi refers to Lake Nyasa as Lake Malawi.

To the west [of Mozambique] by a line which, starting from the above mentioned frontier [German East Africa (Tanganyika)—Mozambique boundary] on Lake Nyasa, follows the eastern shore of the lake southwards as far as the parallel of latitude 13°30' south; thence it runs in a south-easterly direction to the eastern shore of Lake Chiuta, which it follows. Thence it runs in a direct line to the eastern shore of Lake Chilwa or Shirwa, which it follows to its south-easternmost point; thence in a direct line to the easternmost affluent of the River Ruo, and thence follows that affluent, and, subsequently, the centre of the channel of the Ruo to its confluence with the River Shire.

From the confluence of the Ruo and Shire the boundary will follow the centre of the channel of the latter river to a point just below Chiwanga.

Thence it runs due westward until it reaches the watershed between the Zambezi and the Shire, and follows the watershed between those rivers and afterwards between the former river and Lake Nyassa until it reaches parallel 14° of south latitude.

It was agreed in an annex to the treaty of June 11, 1891, that Portugal would lease land on the Chinde mouth of the Zambezi to the United Kingdom for purposes of landing, storage, and transshipment of goods. Likewise, it was agreed that the United Kingdom would lease land along the shore of Lake Nyasa to Portugal for similar purposes. The leases were signed on May 7, 1892. The British concession at Chinde was expanded in 1898, and the Portuguese exchanged their concession on Leopard Bay for Chipole, Rhoades Bay on Lake Nyasa in 1901. Both concessions were cancelled by an exchange of notes between the United Kingdom and Portugal on May 19, 1925.

An Anglo-Portuguese agreement of May 31-June 5, 1893, recorded the understanding arrived at for a modus vivendi pending the demarcation of the boundaries of the United Kingdom and Portugal north of the Zambezi, in accordance with the treaty of June 11, 1891. Pending actual demarcation, the agreement specified that natural lines of demarcation such as lake shores, rivers, and drainage divides were to be utilized. Also, the agreement specifically recognized that Chisumulu Island and Likoma Island in Lake Nyasa were in the British sphere of influence. An agreement of January 20, 1896, prolonged the modus vivendi for an additional two years until July 1, 1898. Agreements were signed by British and Portuguese commissioners for the demarcation of the boundary between Mozambique and Nyasaland on July 31-November 21, 1899 and December 8, 1900. An exchange of notes on September 15, 1906, between the United Kingdom and Portugal gave provisional confirmation, with certain rectifications, to the demarcation of the joint boundary commission of 1899-1900.

Numerous changes were made in the alignment and demarcation of the Mozambique-Nyasaland boundary following the initial delimitation of 1891 and the demarcation agreement of 1906. An Anglo-Portuguese agreement of November 6-30, 1911, established the boundary in the Malosa², Ruo, and Shire rivers along their respective

² The Malosa was referred to as the easternmost affluent of the Ruo in the Anglo-Portuguese treaty of

thalwegs. It also assigned ownership to specific islands in these rivers. Between the Malosa and Lake Nyasa, boundary rectifications and rebeaconings in 1911 and 1923 were approved by an agreement on May 6, 1920. Additional beacons in this boundary sector were erected in the vicinity of Lake Chilwa during 1952.

An Anglo-Portuguese agreement of November 18, 1954, made various changes in the alignment of the Mozambique-Nyasaland boundary, which resulted in a net territorial gain of 2,496 square miles of land and water surface for the Portuguese overseas province. In Lake Nyasa the boundary was shifted from the eastern shore to overseas province. In Lake Nyasa the boundary was shifted from the eastern shore to the median line annexing 2,471 square miles of water surface to Mozambique, and an additional water area of 23 square miles was included in the entity by redemarcating the line westward in Lake Chiuta. Approximately two square miles of land also was given to Mozambique in the vicinity of Nsanje. Nyasaland received about eight square miles of Portuguese territory in the Angonia area of the Tete District of Mozambique.

The agreement of 1954 also provided for a redemarcation of the boundary eastward from the Lake Nyasa-Zambezi drainage divide to the Shire. The demarcation was completed in 1956, and it was stipulated that the report of the boundary commission would be regarded as constituting an annex to the 1954 agreement by an exchange of notes between Portugal and the United Kingdom on November 29, 1963.

At the present time, the Portuguese Government considers the overseas province of Mozambique to be legally a part of Portugal. Nyasaland achieved independence on July 6, 1964 and formally adopted the name of Malawi at that time. Malawi became a republic on July 6, 1966.

III. ALIGNMENT

The alignment of the Malawi-Mozambique boundary is determined by a number of different treaties and demarcations in various sectors. For purposes of this study, the boundary is discussed in five sectors from the Tanzania tripoint to the Zambia tripoint as follows: (1) Lake Nyasa, (2) the Malosa river to Lake Nyasa, (3) the Malosa to Beacon 52E on the Shire river, (4) Beacon 2 on the Zambezi-Lake Nyasa drainage divide to the Shire, and (5) Beacon 2 to the Zambia tripoint.

In 1886 a German-Portuguese declaration delimited a boundary between their respective possessions from the mouth of the Ruvuma on the Indian Ocean westward to the shore of Lake Nyasa. An Anglo-German agreement of 1890 stated that "the boundary from the Mozambique tripoint on the eastern shore of Lake Nyasa strikes northward and follows the eastern, northern, and western shores of the Lake. In 1907 a joint German-Portuguese boundary commission moved the Malawi-Mozambique-Tanzania tripoint a short distance

June 11, 1891.

southward to its present location at the mouth of the Txuinde or Kwinde on the median line of the river (about 11°34'30" S.).

Article 1 of the Anglo–Portuguese agreement of November 18, 1954³ established the Lake Nyasa sector of the Malawi–Mozambique boundary. The line extends westward into Lake Nyasa from the Tanzania tripoint and then turns southward to Beacon 17 (13°28'57.99" S., 34°52'49.29" E.) also on the eastern shore for a total of 205 miles.

1. In execution of the preliminary agreement concluded between the Government of the United Kingdom and the Portuguese Government by an Exchange of Notes dated the 21st January, 1953, the frontier on Lake Nyasa shall run due west from the point where the frontier of Mozambique and Tanganyika meets the shore of the Lake to the median line of the waters of the same Lake and shall then follow the median line to its point of intersection with the geographical parallel of Beacon 17 as described in the Exchange of Notes of the 6th of May, 1920, which shall constitute the southern frontier.

2. The Government of the United Kingdom shall retain sovereignty over the islands of Chisamulo [Chisumulu] and Likoma, together with the exercise of all rights flowing from such sovereignty, including full, unrestricted and unconditional rights of access. The Government of the United Kingdom shall also retain sovereignty over a belt of water two sea miles in width surrounding each of these islands, except that where the distance between Likoma and the mainland is less than 4 miles the waters shall be equally divided between the two Governments. These belts of water shall be drawn as shown in the map annexed to the present Agreement.

The 195-mile boundary sector between Beacon 1 (15°56'06.77" S., 35°49'36.74" E.) on the left bank of the Malosa river and Beacon 17 on the shore of Lake Nyasa initially was demarcated during 1899 in accordance with the Anglo–Portuguese treaty of June 11, 1891. Boundary rectifications in 1911 and 1913 accompanied by a rebeaconing of the entire sector were approved by an Anglo–Portuguese agreement in the form of an exchange of notes on May 6, 1920.⁴ Additional beacons were erected between Beacons 7 and 8 by a joint boundary commission in 1952, and the Anglo–Portuguese agreement of November 18, 1954, redelimited the boundary in Lake Chiuta between Beacons 10 and 11.

Annex 1 of the Anglo–Portuguese boundary rectification of 1911 affords the following description of the line.⁵ Where subsequent alterations have been made to the 1911 alignment, the changes are noted to maintain the continuity of the boundary. The bearings given in the rectifications are from true north.

³ Great Britain Treaty Series No. 64 (1962), Cmd. 1866.

⁴ Great Britain Treaty Series No. 16 (1920), Cmd. 1000.

⁵ For the exact locations of the beacons see Part III of the Appendix.

The above frontier line, separating the territories of Great Britain and Portugal, shall commence at Beacon No. 1, situated on the left bank of the Malosa River, Mlanje [Mulanje], and described in attachment No. 2.

From Beacon No. 1 the frontier shall run in a direct line on an initial bearing of 3°33'00" for a distance of 16 miles 446 yards, or until it reaches Beacon No. 4, situated on the western peak of Mount Mauze; thence it shall run in a direct line on an initial bearing of 5°7'46" for a distance of 15 miles 1,702 yards, or until it reaches Beacon No. 7, at the south-east corner of Lake Shirwa;...

Annex 1 of the Anglo-Portuguese boundary rectification of 1913 describes the line between Beacons 7 and 8 left undecided by the rectification of 1911. Beacons 7A to 7F were added,⁶ and the position of Beacon 8 was shifted 6,545 feet south of its prior location.

From Beacon No. 7 the frontier shall be carried in a direct line on an initial bearing of 3°05'09" for a distance of 18,036 feet, or until it reaches Beacon No. 7B; thence it shall be carried in a direct line on an initial bearing of 348°13'55" for a distance of 17,996 feet, or until it reaches Beacon No. 7C; thence it shall be carried in a direct line on an initial bearing of 345°45'14" for a distance of 74,948 feet, or until it reaches Beacon No. 7F, situated at the embouchure of the Chimadzi River; from Beacon No. 7F the frontier shall be carried in a direct line on an initial bearing of 24°28'27" for a distance of 75,048 feet, or until it reaches Beacon No. 9, situated on the north side of the main footpath leading from Madziabango into Portuguese territory, and 1 mile or thereabouts east of Madziabango.

From Beacon 7F the boundary extends in a straight line to Beacon 8 forming a prolongation of the line previously delimited from Beacon 8 to Beacon 10. Thus, the boundary between Beacon 7F and Beacon 10, located at the southeast corner of Lake Chiuta, consists of a single straight line. In accordance with the 1911 rectification, the boundary from Beacon 10 followed the eastern shore of Lake Chiuta until it reached Beacon 11 at the eastern edge of the marsh between Lake Chiuta and Lake Amaramba. Article 4 of the Anglo-Portuguese Agreement of November 18, 1954, redelimited the boundaries in Lake Chiuta between Beacons 10 and 11.

The frontier on Lake Chiuta shall be a straight line drawn from Beacon 11 running due south to its intersection with the prolongation westwards of a line drawn along the geographical parallel of Beacon 10, as described in Exchange of Notes of May 6, 1920.

⁶ In 1952 a joint boundary commission determined that Beacons 7, 7C, 7E, and 7F were either covered by water or obscured by reeds and no useful purpose would be served to reestablish them. Therefore, the boundary was redemarcated for a distance of about 4 kilometers in the vicinity of Chisoni (north and south of Beacon 7B) and about 10 kilometers in the vicinity of Usingu, Mpambiche, Namibire, and Chinguma (north and south of Beacon 7D).

The description of the boundary from Annex 1 of the rectification of 1911 continues from Beacon 11 to Beacon 17 as follows:

From Beacon No. 11 the frontier shall run in a direct line on an initial bearing of 320°32'8" for a distance of 37 miles 156 yards, or until it reaches Beacon No. 13, situated on the left bank of the River Luchimwa, and from Beacon No. 13 it shall run in a direct line on an initial bearing of 339°30'45" for a distance of 6 miles 831 yards, or until it reaches Beacon No. 14, on the right bank of the Mlindi Stream [Melinde] to the west of Lisyete Hill.

From Beacon No. 14 the frontier shall run in a direct line on an initial bearing of 318°50'40" for a distance of 26 miles 835 yards, or until it reaches Beacon No. 15, on the summit of Chekopo Hill; thence a direct line on an initial bearing of 323°25'33" for a distance of 15 miles 958 yards, or until it reaches Beacon No. 15A, on the summit of Tukani Hill; thence a direct line on an initial bearing of 313°56'38" for a distance of 15 miles 268 yards, or until it reaches Beacon No. 16, near the River Msinje, and from Beacon No. 16 a direct line on an initial bearing of 316°41'13" for a distance of 5 miles 1,640 yards to Beacon No. 17, at Lipuchi, on the shore of Lake Nyasa.

The boundary sector between Beacon 1 on the left (east) bank of the Malosa and Beacon 52E (17°07'44.0" S., 35°17'42.2" E.) on the right (west) bank of the Shire follows downstream successively for 150 miles the thalwegs of the Malosa, Ruo, and Shire rivers. In the Anglo–Portuguese treaty of June 11, 1891 (also in the Anglo–Portuguese agreement of 1893) the boundary is demarcated as follows:

...thence [from the eastern shore of Lake Chilwa] in a direct line to the easternmost affluent [determined to be the Malosa] of the River Ruo, and thence follows that affluent, and, subsequently, the centre of the channel of the Ruo to its confluence with the River Shire.

From the confluence of the Ruo and Shire the boundary will follow the centre of the channel of the latter river to a point just below Chiwanga. Thence it runs due westward [to Beacon 52E]...

An Anglo–Portuguese agreement of November 6–30, 1911⁷ declared that the boundary in the Malosa, Ruo, and Shire followed the thalwegs of the rivers, and it also assigned ownership to specific islands.

His Britannic Majesty's Government and the Government of the Portuguese Republic having resolved to demarcate their territories in East Africa along the Rivers Ruo and Shire between the points on those rivers mentioned in the Treaty of the 11th June, 1891, it has been decided by common accord between the two

⁷ Great Britain Treaty Series No. 10 (1912), Cd. 6147.

Governments to accept the line of the thalweg of those rivers as the frontier-line, and the islands situated between the left bank of the said rivers and the lines of their thalweg to belong to Portugal, and those situated between those lines of thalweg and the right bank of the said Rivers Ruo and Shire to belong to Great Britain, these lines being determined according to the condition of the two rivers in 1908. In this manner the islands belonging to Portugal will be:

Sankalani, and the adjacent islands, Masekodoso, which is downstream from the village of Mlolo, those at the mouth of the Ruo, Ngoma, Msamvu No. 1, Dumba, Chakao, Nyamula, Kalumbe, Kalikovani, and Chezuka, as shown on the attached map of the Ruo and Shire Rivers.

And to Great Britain:

Malo, Nyantambwe, Nyapembere, Nyafunzi, Msamvu No. 2, Tengana, Panga, Temba, and the two islands of Kutamo, as shown on the attached map of the Ruo and Shire Rivers.

In the sector between Beacon 2 (14°28'48.3" S., 33°56'22.9" E.) on the Lake Nyasa–Zambezi drainage divide and Beacon 52E on the west bank of the Shire, the boundary follows the Lake Nyasa–Zambezi, Shire–Zambezi, and Mecoleche–Shire drainage divides for most of the distance. The Anglo–Portuguese treaty of June 11, 1891, delimited the boundary, and it was demarcated initially by a joint commission in 1899–1900, as provisionally confirmed by or as rectified under, the exchange of notes of September 15, 1906.

Following the Anglo–Portuguese agreement of November 18, 1954, a joint commission completed the work of redemarcating parts of the boundary and repairing or inspecting the beacons for the remainder of the sector. The commission issued a detailed report on the 340-mile sector on August 27, 1956. In an exchange of notes between Portugal and the United Kingdom on November 29, 1963,⁸ it was agreed that the report was to be regarded as constituting an annex to the agreement of November 18, 1954. The report of the commission affords the alignment of the boundary in accordance with the terms of the agreement of 1954 as follows:⁹

Demarcation of the Frontier Between Mozambique
And Nyasaland in Accordance With the Agreement
Of the 18th November, 1954

1. The Mozambique–Nyasaland boundary between beacon 2 Kapiriuta Hill and Beacon 41 Salambidwe Hill is defined as follows:

⁸ Great Britain Treaty Series No. 5 (1965), Cmd 2501.

⁹ For the geographical coordinates of the beacons see Part IV of the Appendix. True azimuths given in the boundary description are measured clockwise from the south pole.

(a) From Beacon No. 2 (Kapiriuta Hill) on a bearing of 274°01'22" for a distance of 15,877 metres to Beacon 3 (Mpati Hill);

(b) Thence on a bearing of 176°20'44" for a distance of 3,431 metres to Beacon 4 (Kalumba Hill);

(c) Thence on a bearing of 255°59'51" for a distance of 3,090 metres to Beacon 5 near Ngoma village, and thence on a bearing of 259°19'16" for a distance of 8,020 metres to Beacon 6 erected beside the Maonde-Dedza road near Mwalawamadzi hillock;

(d) Thence by the Maonde-Dedza road inclusive to Nyasaland to Beacon 6A at a place called Pangalala for a distance of 3.05 kilometres measured along the road, thence by the said road, inclusive to Nyasaland, for a distance of 3.60 kilometres measured along the road to Beacon 7 at the junction of this road with the main road at the foot of Ncheneka Hill;

(e) Thence by the main Lilongwe-Ncheu road, inclusive to Nyasaland to Beacon 11 erected at the road junction at the southern end of Lizulu trading centre, demarcated by the following beacons:

No.	Location beacon measured along the road	Approx. distance from previous
7A	place called Chimomwe	Near a store at a 3.75 km.
8	At the road junction leading to Dedza near Lower Chalomwe	5.30 km.
9	At the road junction leading to Dedza near Upper Chalomwe	5.00 km.
10	At a place called Mwalawancondo near the road leading to Bembeke Mission	6.70 km.
10A	Massasa opposite the Golomoti road junction	At a village called 5.80 km.
10B	At the Mlanda Mission road junction	6.55 km.
11	At the road junction south of Lizulu Trading Centre	5.00 km.

(f) Thence by the eastern loop (Lake View Road), inclusive to Nyasaland, to Beacon 15 erected at the junction of this road with the main Dedza-Ncheu road approximately 1 kilometre west of Fort Mlangeni, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the road
12	At the foot of Mapanda Hill, S.E. of the summit	2.85 km.
13	At the foot of Panda Hill	8.20 km.
14	At the foot of Matanda Hill	5.45 km.
15	At the road junction 1 kilometre west of Fort Mlangeni	9.00 km.

(g) Thence by the main Dedza-Ncheu road, inclusive to Nyasaland to Beacon 17 erected at the road junction 1.5 kilometres south of Biriwiri trading centre, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the road
16	Near the Vasco-da-Gama pillar at the junction of the Matengo Balama road	9.70 km.
17	Road junction 1.5 kilometres south of Biriwiri trading centre	3.55 km.

(h) Thence by the road, inclusive to Nyasaland leading along the general line of the Zambezi–Shire watershed as far as Beacon 24 erected about 1.5 kilometres north of Mbia Hill (Beacon 25) demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the road
18	Near Chipuzilo village	4.80 km.
18A	Between Chansoma Hill and Mvai Hill	4.00 km.
19	At the foot of Mvai Hill S.W. of the summit	4.20 km.
20	At the Matengo Balama road junction	3.05 km.
21	700 metres south of Kambira Hill, where the watershed leaves the road	8.55 km.
22	Near Nepiridimba Village, where the watershed joins the road	3.60 km.
22A	Near Musso Village, at the foot of Zualange Hill	3.85 km.
23	At the Jordan road junction in Viriato village	3.00 km.
23A	At the Gwelo road junction	6.65 km.
24	Near Davico Village, 1.5 kilometres north of Mbia Hill	3.90 km.

(i) Thence by the watershed to Beacon 27 erected at the point where the watershed meets the road about 3 kilometres south of Sangano Hill, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the road
25	Summit of Mbia Hill	1.90 km.
25A	Summit of Nkwenkwe Hill	2.10 km.
25B	Summit of Malope Hill	3.60 km.
26	Summit of Sangano Hill	2.40 km.
27	500 metres south of Chitende Hill where the watershed joins the road	3.85 km.

(j) Thence by the road inclusive to Nyasaland to the new Beacon 28 erected about 2.5 kilometres south of Mpenchera Hill at the point where the Neno road leaves the watershed, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the road
27A	At Masamba Village	5.75 km.
28	At the Neno road junction	5.55 km.

(k) Thence by the watershed to the point where it is intersected by the main Blantyre-Tete road near the Vasco-da-Gama pillar and thence by the watershed to Beacon 36B erected near the point where the watershed intersects the Blantyre-Tete road, approximately 1,700 metres north of the Zobwe customs house, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the watershed
29	Summit of Mwalawakuda Hill	3.00 km.
30	Summit of Mwanjeti Hill	3.85 km.
31	Summit of Mpata Hill	6.10 km.
31A	Summit of Pacondjeza Hill	6.60 km.
32	300 metres S.W. of Ndola Hill	2.30 km.
32A	Summit of Tasi Hill	4.50 km.
33	Summit of Kamalire Hill	5.60 km.
34	On Consosole Hill	6.60 km.
35	Summit of Kandema Hill	5.70 km.
36	Summit of Tembe Hill	6.75 km.
36A	Summit of Cadole Hill	5.10 km.
36B	At Kupussa Village where the watershed joins the main road	1.20 km.

(l) Thence by the said road inclusive to Mozambique for a distance of 300 metres to Beacon 36C where the watershed leaves the road:

(m) Thence by the watershed to Beacon 39A erected at the point of intersection of the watershed with the main Blantyre-Tete road about 2,300 metres west of Ngowo Hill demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the watershed
36D	At Dzama Village	1.10 km.
36E	Summit of Casusore Hill	1.40 km.
37	On Zobwe Hill	1.50 km.
37A	At Pantawira Village	1.90 km.
37B	At Chimulango Village	5.20 km.
38	On Tambani Hill	1.10 km.
38A	At Chikuleka Village	1.70 km.
38B	Summit of Kapwantora Hill	1.10 km.
38C	1.5 kilometres S.W. of Kapwantora Hill in an area called Dadza	2.00 km.
38D	2.5 kilometres S.W. of Kapwantora Hill in an area called Dadza	1.30 km.
38E	In a place called Lizia	5.20 km.
39	Summit of Ngowo Hill	3.60 km.
39A	2.0 kilometres west of Ngowo Hill where the watershed joints the main road	2.50 km.

(n) Thence by the main Blantyre-Tete road inclusive to Mozambique to Beacon 40 at the point near Nambulo Hill where the watershed leaves the road, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the road
39B	At foot of small hill named Kapwantora	4.80 km.
40	400 metres N.E. of Nambulo Hill where the watershed leaves the road	2.90 km.

(o) Thence by the watershed to Beacon 41 on the highest point of Salambidwe Hill which is the primary triangulation point, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measure along the watershed
40A	Summit of Nambulo Hill	0.40 km.
40B	1.6 kilometres S.W. of Nambulo Hill near Sixpence Village	1.60 km.
40C	At eastern end of ridge called Fumazi Hill	6.30 km.
40D	At the highest point of the western end of the Fulancoma Hills	5.00 km.
40E	At foot of Salambidwe Hills 2.5 kilometres north of Mcponsi Hill	2.00 km.
41	Summit of Salambidwe Hill	4.70 km.

2. (a) The boundary between Beacon 41 (Salambidwe Hill) and Beacon 51A (erected on the Shire–Mcoletche watershed about 4,500 metres S.W. of Lulwe Mission) follows the Zambesi–Shire watershed and is demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the watershed
41A	Between the Tembo river in Nyasaland and the Nyamitarara river in Mozambique	20.50 km.
41B	Summit of Mwanangoli Hill	5.70 km.
41C	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	9.80 km.
41D	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	1.80 km.
41E	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	1.60 km.
41F	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	3.20 km.
41G	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	2.00 km.
41H	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	3.80 km.
41I	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	1.10 km.
41J	Between the Nicondezi river in Mozambique and	

	the Mcombezi-wa-Fodia in Nyasaland	1.40 km.
41K	Between the Nicondezi river in Mozambique and the Mcombezi-wa-Fodia in Nyasaland	1.80 km.
42	The summit of Mwanda Hill	2.40 km.
42A	At the S.W. end of the ridge forming Mwanda Hill	2.90 km.
42B	Between Malica river in Mozambique and Pwadzi river in Nyasaland	10.40 km.
42C	Between the Msaunde river in Mozambique and Kalimbwete river in Nyasaland	4.20 km.
43	A point 4.8 kilometres N.N.E. of Nyatande Hill	2.80 km.
43A	On a ridge 1.8 kilometres N.E. of Nyatande Hill	3.50 km.
43B	Between Pembeza river in Mozambique and Nyatambala river in Nyasaland	9.60 km.
43C	On isolated rock 6.4 kilometres west of Banga Hill	6.30 km.
43D	On the summit of a hill 2 kilometres north of Folha village	8.50 km.
44	On the highest point at the northern end of the Nyangopo Hills	6.20 km.
44A	In Kuninga village	2.80 km.
44B	Near Loli village on a track leading from Doa to the main Chikwawa road	7.90 km.
44C	At a point 1.5 kilometres N.W. of Sanseteca Hill	4.70 km.
44D	Between the Conjovo river in Mozambique & the Nyakamba river in Nyasaland	5.20 km.
45	On the highest point of the southern end of the Murukanyama Hills	6.50 km.
45A	Between the Cachere river in Mozambique and the Lilanje river in Nyasaland	4.00 km.
45B	1 kilometre west of the village named Tendo	4.70 km.
46	On the summit of Chirunda Hill	5.50 km.
46A	Between the Membo river in Mozambique and the Kasuku river in Nyasaland	5.30 km.
47	At a point 500 metres S.W. of Melanga Hill	2.40 km.
47A	On a small hill 1.5 kilometres S.W. of Nyantoko Hill	6.90 km.
47B	On the highest point of the ridge 3.7 kilometres south of Nyantoko Hill	3.20 km.
47C	Between the Nacali river in Mozambique and the Mwabvi river in Nyasaland	4.20 km.
47D	Between the Nacali river in Mozambique and the Mwabvi river in Nyasaland	2.10 km.
47E	Between the Nacali river in Mozambique and the Mwabvi river in Nyasaland	2.70 km.
47F	Between the Nacali river in Mozambique and the Mwabvi river in Nyasaland	5.40 km.
48	On the summit of Mulaka Hill	6.60 km.
49	On the summit of Mwanabidzi Hill	7.00 km.
50	On the summit of Chafuta Hill	24.10 km.
51	On the summit of Kafalatenga Hill	3.80 km.
51A	On the summit of Kancire Hill	23.30 km.

(b) Thence by the Shire-Mcoletche watershed to the original site of Beacon 52:

No.	Location	Approx. distance from previous beacon measured along the watershed
52	Between the Mcoletche river in Mozambique and the Ntundu river in Nyasaland	2.70 km.

(c) Thence in a straight line on a bearing of 269°12'53" to Beacon 52C erected about 23 metres north of the base of the Vasco-da-Gama pillar near Marka-Nyatandu trading centre, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the straight line
52A	Near Conho village	1,339 metres
52B	On the east side of railway line 850 metres south of Border station	8,976 metres
52C	In Marka Nyatandu trading centre	3,814 metres

(d) Thence by a straight line on a bearing of 270°60'26" to a point near the junction of the Nyamalikombe and Shire rivers which is presumed to be the site of the original Beacon 53, demarcated by the following beacons:

No.	Location	Approx. distance from previous beacon measured along the straight line
52D	On the Shire marsh	1,714 metres
52E	In Marka Gombe near junction of Nyamalikombe and Shire rivers, 20 metres west of the Shire river	5,216 metres

The sector between Beacon 2 and the Zambia tripoint follows the Lake Nyasa–Zambezi drainage divide northward for 85 miles to the 14th parallel in accordance with the Anglo–Portuguese treaty of June 11, 1891. The boundary was demarcated initially by the joint commission of 1899–1900 or as rectified by an exchange of notes of September 15, 1906. Westward from Beacon 2, the beacons are numbered 1, X through A, and 38.¹⁰

The site of the present Zambia tripoint was determined initially by two actions. The first was the issuance of a paper by the British Foreign Office on February 13, 1891, excluding Nyasaland from the field north of the Zambezi.¹¹ The second action was the signing on June 11, 1891, of the agreement between Portugal and the United Kingdom, which established a boundary between their respective spheres of influence.

The Foreign Office paper delimited a boundary between Nyasaland and the adjacent territory (later Northern Rhodesia and then Zambia) of the British South Africa Company stating that "starting on the south from a point where the boundary between the British and Portuguese spheres is intersected by the boundary of the Conventional [Free Trade Zone] line of the Berlin Act [1885]." The Convention line followed the Shire–Zambezi and the Lake Nyasa–Zambezi drainage divides as did the Anglo–Portuguese boundary of June 11, 1891. Thus with the termination point of the northward extension of the Anglo–Portuguese boundary along the Lake Nyasa–Zambezi drainage divide at the 14th parallel in

¹⁰ Located on the Zambia tripoint, Beacon 38 was the final beacon of a line demarcated eastward from the Luangwa river by an Anglo–Portuguese commission which signed proces verbaux on November 21, 1904. The United Kingdom and Portugal reached an agreement on the boundary which is part of the present Mozambique–Zambia boundary by an exchange of notes dated October 21–November 20, 1911.

¹¹ The conditions of the paper were accepted by the British South Africa Company on March 5, 1891, and the British Secretary of State sanctioned the agreement on April 2, 1891.

accordance with the agreement of June 11, 1891, the tripoint was determined to be located at 14°00'00" S. and 33°14'32"E. by a joint boundary commission in 1904.

APPENDIX

I. Documents

1. Notes on the Nyasaland Protectorate. 1883–1908. Edward Hertslet, The Map of Africa by Treaty, 3 vols., 3rd Edition (London: Harrison and Sons, 1909). Vol. 1, pp. 286–8.
2. General Act of the Conference of Berlin, relative to the Development of Trade and Civilization in Africa; the free Navigation of the Rivers Congo, Niger, & c; the Suppression of the Slave Trade by Sea and Land; the occupation of Territory on the African Coasts, & c. Signed at Berlin, February 26, 1885. *Ibid.*, Vol. 2, pp. 468–86.
3. Declaration between Germany and Portugal respecting the Limits of their respective Possessions and Spheres of Influence in South-West and South-East Africa. Lisbon, December 30, 1886. *Ibid.*, Vol. 2, pp. 703–5.
4. Agreement between the British and German Governments, respecting Africa and Heligoland; Berlin, July 1, 1890. *Ibid.*, Vol. 3, pp. 899–906.
5. Agreement between Great Britain and Portugal, recording a modus vivendi respecting the Spheres of Action of the two Countries in Africa. Navigation of the Zambesi and Shire Rivers, & c. London, November 14, 1890. *Ibid.*, Vol. 3, pp. 1014–6.
6. Conditions on extending the Field of the Operations of the British South Africa Company to the North of the Zambezi, February 13, 1891. *Ibid.*, Vol. 1, pp. 277–9.
7. Treaty between Her Britannic Majesty and His Majesty the King of Portugal, defining their respective Spheres of Influence in Africa, Lisbon, June 11, 1891. *Ibid.*, Vol. 3, pp. 1016–26. Also see Great Britain Treaty Series, Portugal No. 1 (1891), C. 6375.
8. Agreement between Great Britain and Portugal relative to Spheres of Influence north of the Zambezi. May 31–June 5, 1893. *Ibid.*, Vol. 3, pp. 1027–30.
9. Agreement between Great Britain and Portugal prolonging the "Modus Vivendi" of 1893, respecting the Boundaries of their respective Spheres of Influence to the North of the Zambezi. Signed at London, January 20, 1896. *Ibid.*, Vol. 3, pp. 1034–5.

10. Articles of Agreement respecting the Delimitation of the Boundary between the British Central Africa (Nyasaland) Protectorate and adjoining Portuguese Territory. July 31 to November 21, 1899, and December 8, 1900. Ibid., Vol. 3, p. 1070.
11. Exchange of Notes between the British and Portuguese Governments for the provisional confirmation, with certain exceptions, of the recommendations of the Joint Commissioners for the Delimitation of the Boundary between the British Central Africa Protectorate and Portuguese East Africa. Lisbon, September 15, 1906. Ibid., Vol. 3, p. 1077.
12. Schlobach, M. "Allgemeiner Bericht über den Verlauf der deutsch-portugiesischen Grenzexpedition Zwischen dem Knie des Rowuma-Flusses und dem Ostufer des Niassa," Mitteilungen aus den deutschen Schutzgebieten, Band XXIII (1910), pp. 49–54.
13. Agreement between the United Kingdom and Portugal respecting the Boundary between British and Portuguese Possessions on the Ruo and Shire Rivers. Lisbon, November 6–30, 1911 [with map]. Great Britain Treaty Series, No. 10 (1912), Cd. 6147.
14. Agreement between the United Kingdom and Portugal respecting the Boundary between British and Portuguese Possessions north and south of the Zambesi. London, October 21–November 20, 1911 [with map]. Great Britain Treaty Series, No. 16 (1912), Cd. 6265.
15. Agreement between the United Kingdom and Portugal, respecting Boundaries in South-east Africa [from Beacon No. 1 on the left bank of the Malosa river to Beacon No. 17 on the shore of Lake Nyasa]. London, May 6, 1920 [with map]. Great Britain Treaty Series, No. 16 (1920), Cmd. 1000.
16. Exchange of Notes between Her Majesty's Government in the United Kingdom of Great Britain and Northern Ireland and the Portuguese Government providing for Portuguese participation in the Shire Valley Project. Lisbon, January 21, 1953. Great Britain Treaty Series, No. 35 (1953), Cmd. 8855.
17. Fronteira "Mocambique–Niassalandia," Acordo de 18 de Novembro de 1954 ("Mozambique–Nyasaland" Frontier, Agreement of 18th November 1954) [with maps]. Published by Empresa Moderna, Lourenco Marques.
18. Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland (acting on their own behalf and on behalf of the Government of the Federation of Rhodesia and Nyasaland) and the Government of Portugal regarding the Nyasaland–Mozambique Frontier [together with Exchange of Notes

and maps]. Lisbon, November 18, 1954 [Ratifications were exchanged at London on October 26, 1955. This paper replaces that issued as "Treaty Series No. 40 (1958)", Cmnd. 528]. Great Britain Treaty Series, No. 64 (1962), Cmnd. 1866.

19. Exchange of Notes between the Government of the United Kingdom of Great Britain and Northern Ireland (acting on their own behalf and on behalf of the Government of the Federation of Rhodesia and Nyasaland) and the Government of the Portuguese Republic accepting the Report of the Nyasaland–Mozambique Boundary Commission of the 27th of August, 1956. Lisbon, November 29, 1963 [with maps]. Great Britain Treaty Series, No. 5 (1965), Cmnd. 2501.
20. No. 4706. Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland (acting on their behalf and on behalf of the government of the Federation of Rhodesia and Nyasaland) and the Government of Portugal regarding the Nyasaland–Mozambique Frontier. Signed at Lisbon, November 18, 1954 [Exchange of Notes accepting the Report of the Nyasaland–Mozambique Boundary Commission of August 27, 1956 (with annexed Report of the Commission and maps). Lisbon, November 29, 1963]. United Nations Treaty Series, Vol. 534 (1965), pp. 441–67.

**II. DESCRIPTIONS AND GEOGRAPHICAL COORDINATES
OF BEACONS BETWEEN MALOSA AND LAKE NYASA**

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and close to a very large Mbawa tree, which marked the position of the old Beacon No. I

The new beacon is built of masonry, and consists of a base 5' x 5' x 2'6" high above ground-level, surmounted by a masonry pillar 2' x 2' x 3' high, making a total height above ground-level of 5'6".

No. 2	Situated 1,200 yards or thereabouts north-east of Napimba village and close to a footpath leading from that village to Portuguese territory. Built of masonry similar to Beacon No. 1.	15 50 32.15	35 49 58.18
No. 3	Situated at the south of Limbe marsh, to the south of Mauze Mountain, 6,075 yards from the highest point (Beacon No. 4), and close to a footpath leading from Nazombe village, in British territory, to Bwanaula, in Portuguese territory. Built of masonry similar to Beacon No. 1.	15 44 57.78	35 50 19.61
No. 3A	At Mangwazi's village, on the south side of Mauze Mountain, 3,459 yards from the highest point (Beacon No. 4). Built of masonry similar to No. 1.	15 43 40.09	35 50 24.58
No. 4	The highest point of Mauze Mountain. The beacon consists of a masonry pillar 2' x 2' x 3'6" high.	15 41 57.38	35 50 31.16
No. 5	On the north side of Mauze Mountain, 2,937 yards from the highest point (Beacon No. 4). Built of masonry similar to No. 1.	15 40 30.36	35 50 39.23
No. 6	In the same position as the old Beacon No. 6, at the point where the boundary crosses a main footpath which passes to the north of Malambala Hill running in a north-easterly direction to the east side of Shirwa, in Portuguese territory. Built of masonry similar to Beacon No. 1.	15 31 35.34	35 51 28.83

No. 7	At the south-eastermost corner of Lake Shirwa. Built of masonry consisting of a base 5' x 5' x 2'6" high above ground-level, surmounted by a masonry pillar 2' x 2' x 3' high, making a total height above ground level of 5'6".	15 28 04.69	35 51 48.22
No. 7A	The beacon is in the form of a post consisting of a pair of steel rails riveted together and set in masonry, and having an iron plate at the top, the height being 9 feet or thereabouts above ground-level. The beacon is in line between Beacon No. 7 and Beacon No. 7B, and at a distance of 9,502 feet from No. 7.	• • •	• • •
No. 7B	Constructed similarly to Beacon No. 7A...	15 25 05.90	35 51 58.41
No. 7C	Constructed similarly to Beacon No. 7A...	15 22 11.11	35 51 20.85
No. 7D	Constructed similarly to Beacon No. 7A... Situated on the right bank of the River Mmembo and in line between Beacons Nos. 7C and 7F.	• • •	• • •
No. 7E	Constructed similarly to No. 7A... In line between Beacons Nos. 7C and 7F.	• • •	• • •
No. 7F	Constructed similarly to Beacon No. 7A... Situated at the south side of the embouchure of the Chimadzi River.	15 10 10.67	35 48 12.54
No. 7G	Constructed similarly to Beacon No. 7A... In line between Beacons Nos. 7F and 9, and at a distance of 40,606 feet from No. 7F.	• • •	• • •
No. 8	The old position of Beacon No. 8 (as fixed in 1911) has been abandoned, and the beacon re-erected in its present position, distant 6,545 feet south from its old position, or 7,904 feet from No. 9 and in line between No. 9 and No. 7F.	• • •	• • •
No. 9	At the point where the boundary crosses the main footpath leading from Madziabango into Portuguese territory, 453 yards from Beacon No. 8. Constructed similarly to Beacon No. 8.	14 58 53.21	35 53 29.71

No. 10	Near the south-east corner of Lake Chiuta, at the edge of the dambo which borders the lake. Constructed similarly to Beacon No. 8.	14 53 42.06	35 55 55.20
No. 11	At the eastern edge of the marsh between Lake Chiuta and Lake Amaramba. Constructed similarly to Beacon No. 8.	14 40 31.04	35 53 07.96
No. 12	At the western edge of the marsh between Lake Chiuta and Lake Amaramba. Constructed similarly to Beacon No. 8	14 39 34.76	35 52 20.57
No. 13	On the left bank of the Luchimwa River, 1,783 yards from the summit of Chesulo Hill. The beacon is of masonry, consisting of a base 6' x 6' x 2' high above ground-level, surmounted by a masonry pillar 2'3" x 2'3" x 4' high.	14 15 30.66	35 32 02.36
No. 14	Situated to the west of Lisyete Hill on the right bank of the Mlindi stream near its junction with the Namaunya stream. Built in a similar manner to Beacon No. 13.	14 10 13.16	35 30 00.79
No. 15	A masonry pillar 2' x 2' x 3'9" high, standing on a large rock on the summit of Chekopo Hill. The rock is the highest point of the hill.	13 52 48.79	35 14 26.96
No. 15A	A masonry pillar similar to No. 15, standing on the summit of Tukani Hill.	13 41 54.90	35 06 10.93
No. 16	Situated 1/2 mile or thereabouts south-east of the Msinje River in the same position as the old Beacon No. 16. Constructed of masonry similar to Beacon No. 13.	13 32 44.05	34 56 27.01
No. 16A	On the summit of the high ground immediately to the north of the Msinje River between that river and Pamba stream, a tributary of the Msinje. The beacon stands on the south side of a main footpath leading from Msinje on the shore of Lake Nyasa to Ntonya, in Portuguese territory. (This path has taken the place of the old route which previously passed		

close to Beacon No. 16, but is not now in existence.)
The beacon is built of masonry similar to Beacon No. 13.

No. 16B Situated on the high ground immediately to the south of the Gome stream, and 3,517 yards from Beacon No. 17 on the shore of Lake Nyasa.
The beacon consists of a masonry pillar 2'6" x 2'6" x 4' high built on a projecting rock.

No. 17 Situated on the shore of Lake Nyasa 13 28 57.99 34 52 49.29
immediately to the south of the mouth of the Lipuchi stream, and built on a rocky point at a height of 22'6" above the lake.
The beacon consists of a bock 7' x 7' x 4' high, surmounted by a masonry pillar 2'3" x 2'3" x 4' high.

III. GEOGRAPHICAL COORDINATES OF BEACONS BETWEEN ZAMBEZI- LAKE NYASA DRAINAGE DIVIDE AND SHIRE

(in accordance with the Anglo-Portuguese Agreement of November 18, 1954)

N. °	Latitude			Longitude		
	(South)			(East)		
	°	'	"	°	'	"
2	14	28	48.3	33	56	22.9
3	14	29	24.4	34	05	11.8
4	14	27	32.9	34	05	04.5
5	14	27	04.5	34	06	44.8
6	14	26	16.1	34	11	07.9
6A	14	26	32.5	34	12	42.9
7	14	25	31.9	34	14	02.4
7A	14	25	49.9	34	16	02.4
8	14	23	56.7	34	18	05.0
9	14	23	57.2	34	20	34.4
10	14	23	46.5	34	23	19.8
10A	14	25	59.3	34	25	09.5
10B	14	28	45.7	34	26	48.8
11	14	31	10.5	34	27	50.3
12	14	32	09.8	34	28	53.3
13	14	34	40.5	34	31	34.9
14	14	37	07.4	34	32	34.1
15	14	40	53.2	34	31	26.9
16	14	45	12.6	34	32	49.2
17	14	46	35.1	34	34	04.1
18	14	48	42.9	34	35	01.5
18A	14	50	28.1	34	34	30.6
19	14	52	40.6	34	34	34.3

20	14 54 00.6	34 33 57.7
21	14 57 43.3	34 35 42.3
22	14 58 46.9	34 36 57.9
22A	15 00 30.4	34 37 16.2
23	15 01 39.6	34 36 19.4
23A	15 04 01.9	34 34 23.3
24	15 05 14.3	34 35 06.8
25	15 06 02.2	34 35 23.8
25A	15 06 44.1	34 34 36.0
25B	15 08 18.1	34 34 37.4
26	15 09 22.7	34 34 38.0
27	15 11 03.3	34 35 04.1
27A	15 13 34.2	34 35 33.8
28	15 15 56.1	34 36 10.0
29	15 17 17.6	34 35 40.7
30	15 18 36.1	34 34 13.3
31	15 20 07.2	34 32 51.1
31A	15 22 04.6	34 31 07.8
32	15 23 12.5	34 31 16.4
32A	15 24 34.8	34 30 53.3
33	15 25 27.2	34 28 21.3
34	15 26 17.2	34 26 22.1
35	15 28 32.6	34 25 29.6
36	15 31 58.1	34 26 16.0
36A	15 34 26.5	34 26 31.5
36B	15 34 59.2	34 26 17.1
36C	15 35 08.2	34 26 18.7
36D	15 35 25.5	34 26 45.0
36E	15 35 57.6	34 27 12.5
37	15 36 29.4	34 27 25.1
37A	15 36 48.0	34 26 26.9
37B	15 39 12.0	34 25 52.6
38	15 39 45.1	34 26 06.6
38A	15 39 50.8	34 25 32.2
38B	15 40 26.0	34 24 50.0
38C	15 41 00.5	34 24 14.0
38D	15 41 05.2	34 23 46.0
38E	15 43 19.6	34 22 34.0
39	15 44 36.2	34 21 12.2
39A	15 44 36.5	34 19 56.0
39B	15 45 53.4	34 17 53.8
40	15 47 14.3	34 17 11.4
40A	15 47 16.6	34 16 53.8
40B	15 47 51.4	34 16 17.5
40C	15 50 03.8	34 15 18.9
40D	15 52 16.4	34 15 17.5
40E	15 53 05.8	34 15 17.2
41	15 54 25.0	34 15 30.6
41A	16 00 56.5	34 22 49.3
41B	16 02 35.1	34 25 32.6
41F	16 09 47.2	34 24 16.4
42	16 15 23.1	34 25 28.3
42A	16 16 24.3	34 26 37.7
42B	16 16 55.1	34 31 29.0

42C	16 18 20.9	34 32 54.7
43	16 19 02.0	34 34 15.7
43A	16 20 43.5	34 34 02.2
43B	16 24 51.8	34 35 29.4
43C	16 26 21.1	34 38 15.6
43D	16 27 52.4	34 41 00.1
44	16 30 22.6	34 41 55.6
44A	16 30 05.5	34 43 15.5
44B	16 32 42.8	34 46 28.1
44C	16 35 02.6	34 46 16.1
44D	16 36 03.5	34 48 47.1
45	16 37 16.3	34 50 57.3
45A	16 39 14.9	34 51 10.2
45B	16 40 56.7	34 52 25.8
46	16 42 01.5	34 54 58.1
46A	16 44 32.6	34 55 08.8
47	16 44 58.4	34 56 01.0
47A	16 45 09.2	34 58 58.4
47B	16 46 36.5	34 59 37.5
47C	16 48 16.6	35 00 23.5
47D	16 48 26.6	35 01 22.5
47E	16 49 33.1	35 02 06.0
47F	16 49 24.3	35 04 33.6
48	16 49 08.8	35 08 07.5
49	16 51 52.8	35 09 29.1
50	16 59 18.7	35 05 35.7
51	16 59 43.4	35 03 44.3
51A	17 06 46.9	35 04 43.6
52	17 07 50.1	35 05 49.8
52A	17 07 49.5	35 06 35.1
52B	17 07 45.3	35 11 38.7
52C	17 07 43.6	35 13 47.8
52D	17 07 43.8	35 14 45.7
52E	17 07 44.0	35 17 42.2

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