

As of 1 May 2026, Estonia has 1,674 public aids to navigation, comprising 55 lighthouses, 245 lighted beacons, 25 daymarks and 1,349 floating aids to navigation. There are nearly 15,000 operational lighthouses worldwide. About 250 are located in the Baltic Sea, including 11 in Latvia, 5 in Lithuania and 13 in Finland.

Kõpu Lighthouse

Geographical coordinates: 58°54.9579'N 22°11.9787'E.

The world's oldest continuously operating aid to navigation of lighthouse type is the Tower of Hercules in Spain (Spanish: *La Torre de Hércules*, built in the 2nd century). The second oldest is Hook Lighthouse in Ireland, built in 1245. Both *La Torre de Hércules* and Hook have been rebuilt several times, and only their original inner walls survive.

Kõpu (*Dagerort* in historical documents) ranks a distinguished **third** among the world's continuously operating fixed aids to navigation (lighthouses).

The world's fourth-oldest lighthouse still in operation is *La Lanterna* in Genoa, Italy, built in 1543; the fifth is *Cordouan* Lighthouse in *Gironde*, France, completed in 1611.

Among the world's three oldest lighthouses, *Kõpu* is unique in retaining its original main structure: a four-sided tower with supporting buttresses.

For half a millennium, the *Kõpu* aid to navigation has warned mariners of the shoals around the *Kõpu* Peninsula on *Hiiumaa*, particularly *Suurrahu* Shoal (*Näckmansgrund* in historical documents) north of the peninsula.

Kõpu Lighthouse is architectural monument no. 23453 under state protection. "Lighthouses of the World", published by IALA (the International Organization for Marine Aids to Navigation) in 1998 to present the heritage of 100 outstanding lighthouses worldwide, includes six from Estonia: *Kõpu*, *Ruhnu*, *Tahkuna*, *Keri*, *Pakri* and *Suurupi*.

Lighthouse History and Information

Coastal beacon fires were used around the Baltic Sea as early as the Viking Age (c. **800–1050**) to guide vessels that remained at sea after dark back to their home shores. A beacon fire was also used on *Tornimägi*, the later site of *Kõpu* Lighthouse, before the need for the *Kõpu* seamark arose (*Laevandus, Shipping, 1920/3–4*).

As early as the **1480s**, German merchants of the Hanseatic League unsuccessfully sought permission from the Bishopric of *Ösel-Wiek* to mark the *Kõpu* Peninsula on *Hiiumaa* with a seamark.

On **20 April 1500**, the Bishopric of *Ösel-Wiek* granted the *Tallinn* Town Council (Low German: "*de Rät van Reval*") a building permit.

Translation of the document: "*Johannes Orges*, Bishop of *Ösel-Wiek*, authorises the burghmaster and council of *Tallinn*, who had already approached his predecessor *Petrus von Wetberg* in this matter on behalf of the merchants of the Hanseatic League, to erect and maintain a sea mark on *Hiiumaa* (Low German: "*Dagheden*"), on church lands, under the conditions specified and with the consent of his cathedral chapter, for the benefit of navigation and trade." The phrase "*kenninghe edder pyle*" in the letter means "landmark or pillar" in Low German.

The covering letter to the document stated:

- All construction work was to be carried out at the builder's expense without harming the interests of peasants on the bishopric's lands.
- The pillar was to be filled internally with stones and lime and could be repaired and enlarged as necessary.
- The bishopric's coat of arms was to be placed on the pillar, and the builder would acquire no rights to the land.

Although the site of the future structure had been selected in 1499, warfare between the Livonian Order and the Grand Duchy of Moscow in 1501–1503 delayed the start of construction.

In the spring of **1504**, building materials began to be collected for the sea mark. However, an outbreak of plague on the island later that year again halted the work.

Intensive construction took place at the tower from 1514 to 1519. The master builder in charge was *Clawes Duker*, a council servant sent by the *Tallinn* Town Council.

In **1519**, the **principal construction work was completed on the four-sided tower with supporting buttresses, whose external form remains unchanged to this day**. A 12 kg bronze plate (Low German: "*Schine*") was fixed to each face to reflect sunlight. A total of 2,860 *Tallinn* barrels of lime (~363 m³) was used for the masonry and whitewashing. About **5,000 cubic metres of stone** went into the structure.

In **1529**, Bishop *Jürgen Tiesenhausen* of *Ösel-Wiek* confirmed his consent for the *Tallinn* Town Council to repair and raise the tower by several metres. In addition to the conditions imposed by the building permit, the bishop demanded two barrels (~300 litres) of wine each year as rent for the tower.

In February **1532**, the Livonian Diet met at *Wolmar* (present-day *Valmiera*, Latvia), where it was reported that *Kõpu* Tower (*Dagerort* bake) had been completed in the latter half of the previous summer, probably in August. Accordingly, **1531 is regarded as the year in which Kõpu Tower, the aid to navigation, was completed**. Built of glacial erratic boulders and limestone, the four-sided, buttressed tower had the form of a truncated pyramid. It stood ~25 m above the foot of the hill, ~19 m above its own base and ~90 m above sea level, and could be sighted at 24 nautical miles (~44 km) in good weather.

In 1538, Bishop *Reinolt von Buxhoeveden* of *Ösel-Wiek* concluded an agreement with the City of *Tallinn* under which the *Tallinn* Town Council could raise and repair the existing tower. In return, through his representative the bishopric could each year exchange 16 lasts of salt from salt ships arriving in *Tallinn* for rye.

Between 1538 and 1557, the four-sided section of the tower was repaired and raised. The tower then stood ~35 m above the foot of the hill, ~29 m above its own base and ~100 m above sea level, and could be sighted at 25 nautical miles (~46 km) in good weather. After the Livonian War of 1558–1583, *Hiiumaa* and *Kõpu* Tower came under the rule of the Kingdom of Sweden.

1639: on 15 May, the *Tallinn* Town Council considered exhibiting a light from *Kõpu* Tower by lighting an open fire on its summit, but the proposal was not implemented.

1648: prompted by frequent shipwrecks in the area, the Governor of Estonia, *Erik Axelsson Oxenstierna*, proposed to the Swedish government that a lighthouse be established on the *Kõpu* Peninsula on *Hiiumaa* – **in effect, converting the existing Kõpu Tower into a lighted tower, or lighthouse**. The proposal was approved in August.

1649: on 13 June, an employment contract was signed between the governor and the future inspector of *Kõpu* Lighthouse, *Eberhard Dellinghausen*, with an annual salary of 200 *riks-dalers* plus 60 *riksdalers* for the upkeep of two servants. In September that year, a wooden external staircase was built on the tower, the top of the tower was levelled, and a fire grate and hoist were installed to raise fuel to the top. A small house was also built beside the tower as the lighthouse inspector's residence.

1649, 3 October: the lighthouse inspector informed the governor that six lasts of coal (approximately 12–15 metric tons) had been purchased for *Kõpu* Lighthouse from the reserves of the *Sörve* lever light. Coal burning then began at *Kõpu*. **Kõpu Tower became a lighthouse**.

An open fire burned in the brazier according to winter conditions; in milder winters the light was exhibited from March until the end of the year, with a pause during the bright summer nights. Regulations required a flame one fathom high (~2 metres), and the light keeper had to remain on watch at the summit whenever the fire was burning. Because the island of *Hiiumaa* had extensive forests, logs were used as fuel starting the following year (1650), as they were cheaper to procure.

The first fixed aids with lights on the Estonian coast were built at *Sörve* and *Ruhnu* in 1646. They consisted of a counterweighted wooden lever that could be raised, with a metal basket hanging from its end, and coal or wood was burned to produce the light. They were known as lever lights (Danish: *vipp-fyr*, invented in Denmark in 1626).

1688: six men were permanently employed at *Kõpu* Lighthouse to hoist firewood to the top with a winch and maintain the fire. **Annual consumption was 1,000–1,200 fathoms (~4,400–5,300 m³ / ~7,000–8,400 stacked cubic metres) of firewood. In stormy weather, seven fathoms (~17.6 m³ / ~25.2 stacked cubic metres) of wood were consumed in a single night!**

In 1710, after ten years of fighting in the Great Northern War between the Kingdom of Sweden and the Russian Empire, the Capitulation of *Harku* was signed, as a result of which all of Estonia, including *Hiiumaa*, was incorporated into Russia.

1810: the lighthouse passed from the private administration of *Kõrgessaare* Manor to the Russian Admiralty (Ministry of Naval Forces), and reconstruction began that year. A room was carved into the lower part of the tower for a six-man watchkeeping crew, and a new 69-step internal staircase, existing today, led upwards. Two rooms, one above the other, were carved into the upper tower, and a lantern room was built on the roof. A catoptric light apparatus was installed: polished brass reflectors were arranged in a circle, with 25 oil lamps set in front of them so that the light was exhibited seaward through three sides and, in clear weather, had a range of 31 nautical miles (~57 km). Annual hemp-oil consumption was about 200 poods (~3.3 tonnes)! The lighthouse staff consisted of a non-commissioned officer and six men. **Thus, 1810 may be regarded as the first year in which Kõpu Lighthouse was fitted with a lantern room and a proper light system was brought into service**.

In 1845, a large crack appeared in the upper part of the structure as a result of the poor reconstruction carried out in 1810. The lighthouse underwent a complete overhaul, during which c. 10 m of the upper part of the tower was demolished and then rebuilt. A new wooden lantern room with glass windows was also constructed.

In 1860, the worn light apparatus was replaced by a first-order *Fresnel* optical system with reflectors, purchased in *Paris*, giving a maximum visibility range of 27 nautical miles (~50 km). The optic completed one rotation every four minutes, driven by a weight-powered clockwork mechanism. The apparatus used a four-concentric-wick *Carsel* kerosene lamp. The lighthouse was attended by a seven-person crew, one of whom had to remain in the lantern room at all times.

In 1883, a telegraph station was established at the lighthouse station for communication with *Saint Petersburg*. The lighthouse had a direct telegraph connection with *Saint Petersburg* by Morse code, while ships and the lighthouse communicated by signal flags. A lifeboat station with two rescue units was located nearby.

1898: the telegraph was decommissioned and replaced by a **telephone connection**.

In **1901**, a **new revolving dioptric optical apparatus and lantern room, acquired at the Paris Exposition the previous year, were installed in the lighthouse**. The clockwork-driven optic, carried by the cast-iron structure of the apparatus, revolved in a mercury bath. The resulting low friction minimised bearing wear, and the system never required lubrication. A kerosene mantle burner produced two revolving beams with a range of 21 nautical miles (~39 km). **The lantern room, dome and lantern were manufactured in Paris by Sautter, Harle & Co under a patent by Gustave Eiffel. The same lantern room remains in service today**.

In 1918, the Republic of Estonia was established, and the lighthouse came under the Lighthouse and Sea Marks Administration.

In 1920, an AGA acetylene light ordered from Sweden was installed in the lighthouse.

1940: the Soviet Union occupied the Republic of Estonia, the **lighthouse was electrified**, and a radio beacon began operating the following year.

1941: Germany in turn occupied Estonia from the Soviet Union. During the German advance, the lighthouse's lantern room and its lighting system were heavily damaged. The superintendent's residence was also hit by a bomb. The German Navy repaired the structure, and during the war the lighthouse used a mantle kerosene lamp.

In 1944, the Soviet Union reoccupied Estonia, and the lighthouse came under the authority of the Hydrographic Service of the Soviet Union.

In 1946–1947, a new direct-current light apparatus (*Gorky Glassworks*) was brought into service, replacing the former revolving beams with a flashing light.

In 1963, a Soviet-made alternating-current light apparatus, EMV-3 (*Fresnel* lens), was brought into service, restoring the use of revolving beams.

In **1981**, a **Soviet-made Fresnel-lens light apparatus, EMV-930M, was brought into service. This unusually large-diameter experimental apparatus was one of only two made: one was installed on the Soviet Union's eastern boundary. And the other on its western boundary - at Kõpu, to compare reliability under different meteorological conditions**. Its light source was a 1,000 W halogen lamp, giving a range of 27–30 nautical miles (~50–55 km). **The same lens remains in service today**.

In September 1988, during construction work, the tower's southern corner collapsed together with the scaffolding, followed in October by part of the western buttress. An investigation found that repair work carried out in 1982 had covered the lighthouse with paint that prevented the lime plaster from breathing. Water entered the resulting cracks and, as temperatures fell, froze and expanded, damaging the lighthouse structure. During repairs in 1989–1990, the massive body of the lighthouse was encased in a reinforced-concrete shell to prevent further collapses.

In August 1991, the Republic of Estonia restored its independence, and *Kõpu* Lighthouse came under the administration of the Estonian Maritime Administration.

2001: the lighthouse lantern system was **connected to a remote-monitoring system**, and the last superintendent of *Kõpu* Lighthouse, *Ants Päll*, ended his service there, (superintendent 1997–2001). Before him, during the period of the Estonian Maritime Administration, *Jaan Puusepp* was superintendent of *Kõpu* Lighthouse (1994–1996); before that, during the Soviet era, he had served for many years as head keeper of *Ristna* Lighthouse (1980–1994). Before *Jaan Puusepp*, the legendary *Lembit Sepp* served as head keeper of *Kõpu* Lighthouse for a very long period, from approximately the 1960s to the early 1990s.

2020: on 31 January, the 1,000 W halogen lamp inside the EMV-930M apparatus was replaced by a Sabik E8201 LED light source rated at 98 W, with a luminous intensity of **2,100,000 candelas (cd)** and a night-time range of 26 nautical miles (~47 km). At the time of installation, it was believed to be the most powerful LED light system in the world. **The luminous intensity of the Kõpu light is comparable to switching on 21,000 formerly common 100 W incandescent lamps at once, or lighting 2.1 million candles simultaneously in the same room!**

The standby light at *Kõpu* Lighthouse was also modernised in 2020. Two Sabik E8278 W.180 semicircular LED lanterns were brought into service, with a combined power of 200 W, a luminous intensity of 110,000 cd and a night-time range of 19 nautical miles (~35 km).

In 2021, the Estonian Maritime Administration, the Estonian Civil Aviation Administration and the Road Administration were merged into a single government authority, the Estonian Transport Administration, which assumed responsibility for managing *Kõpu* Lighthouse.

In **2023**, the Estonian State Fleet was established by consolidating vessels previously operated by several government authorities into a single organisation. The Aids to Navigation Department, including responsibility for navigational lights, floating aids to navigation and buoy-laying vessels, was transferred from the Estonian Transport Administration to the new agency. Responsibility for *Kõpu* Lighthouse and other lighthouses was likewise divided: the Estonian Transport Administration remains responsible for structural maintenance and reconstruction, while the Estonian State Fleet is responsible for the operation and maintenance of the navigational light.

Whereas other lighted aids to navigation in Estonia exhibit a flashing all-round light, **uniquely in Estonia, Kõpu Lighthouse still produces its flash character by means of a revolving optic**. The beam sweeps through 360°. **The light at Kõpu Lighthouse is the most powerful LED light on any fixed aid to navigation in the Baltic States and Scandinavia. At 103.6 metres above sea level, it is also the highest-elevation light in the Baltic Sea!**

Today, the lighthouse light operates automatically, and specialists maintain both the tower and its aids-to-navigation equipment in accordance with a maintenance plan.

In 2031, *Kõpu* Lighthouse will celebrate its 500th anniversary!

Sources:

Peeter Peetsalu, *Merekultuurilugu (Maritime Cultural History), 2013*.

Jaan Vali, *Eesti tuletornide ajalugu (History of Estonian Lighthouses), 2011*.

Igor Alekseejev, *Eesti tuletornid (Estonian Lighthouses), 2003*.

Estonian National Heritage Board, *historical report*

Restoration of Kõpu Lighthouse, 1989.

Johann Mey, *Eesti loots (The Estonian Pilot), 1927*.

Tiit Einberg, *Kõpu tuletorni lugu (The Story of Kõpu Lighthouse), 2007*.

Estonian Transport Administration, *Aids to Navigation in Estonian Waters*.

Tallinn City Archives.



Soviet postage stamp featuring Kõpu Lighthouse, issued in 1983. Designed by Y. Bronfenbrener.



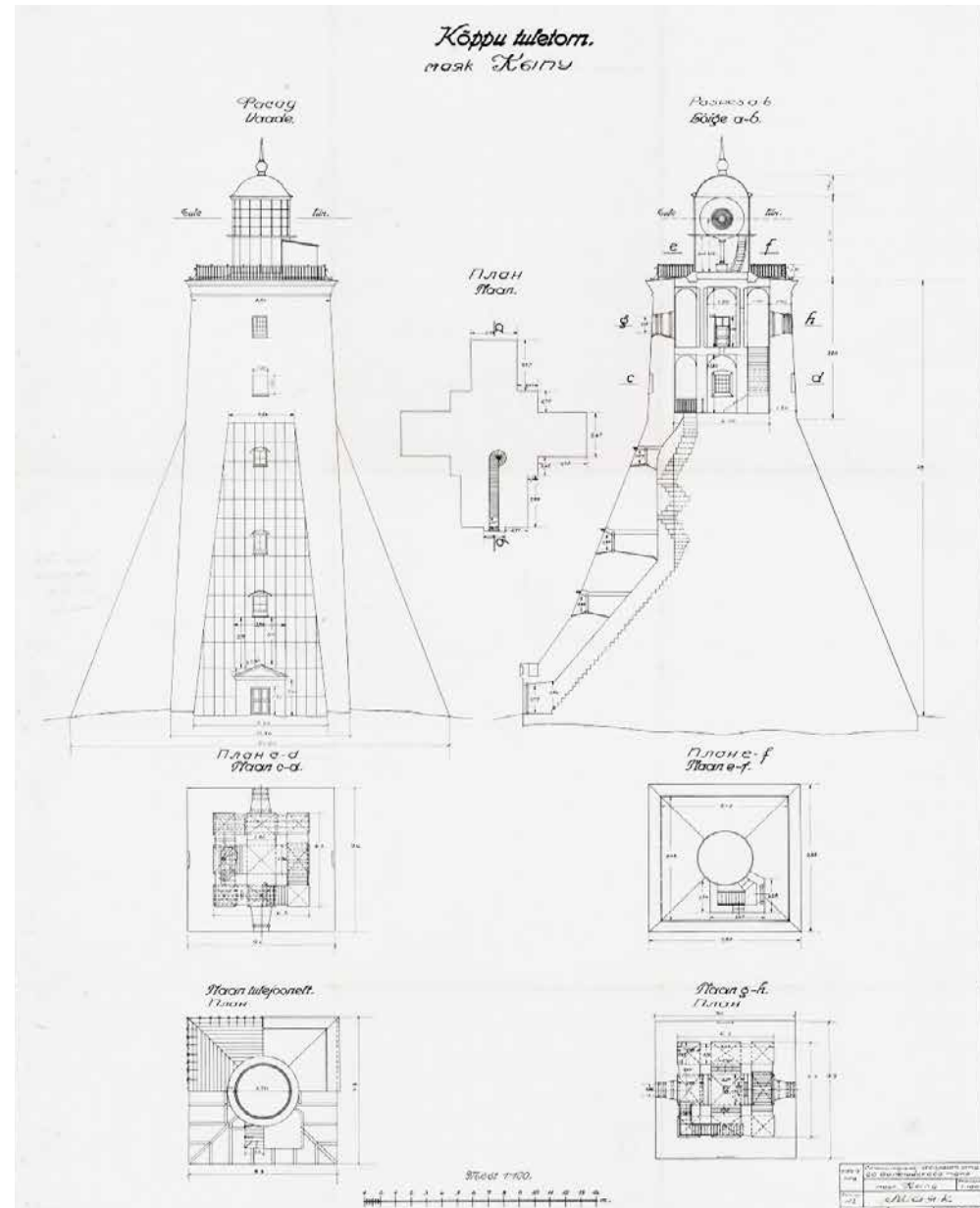
Postage stamp issued by Eesti Post in 2000, designed by R. Matkiewicz.



Sabik E8278 standby lanterns, photograph by T. Rosenberg.



In 2020, a Sabik E8201 LED lantern fitted with heat sinks was installed inside the Fresnel lens of the existing optical apparatus, photograph by T. Rosenberg.



Drawing of Kõpu Lighthouse from 1949, Estonian Maritime Museum Foundation.

Aid to Navigation Characteristics

Aid to navigation number: 668

Site elevation above sea level: 68.8 m

Height of the structure above ground level: 37.7 m

Focal height above sea level: 103.6 m

Light character: FI(2) W 10 s

FI  Plinktuli - Flashing light

Character composition: 0.2+2.3+0.2+7.3=10 s

Characteristics of the fixed aid in the Aids to Navigation Database:

https://nma.transpordiamet.ee/aton/2684



EST



ENG



RUS



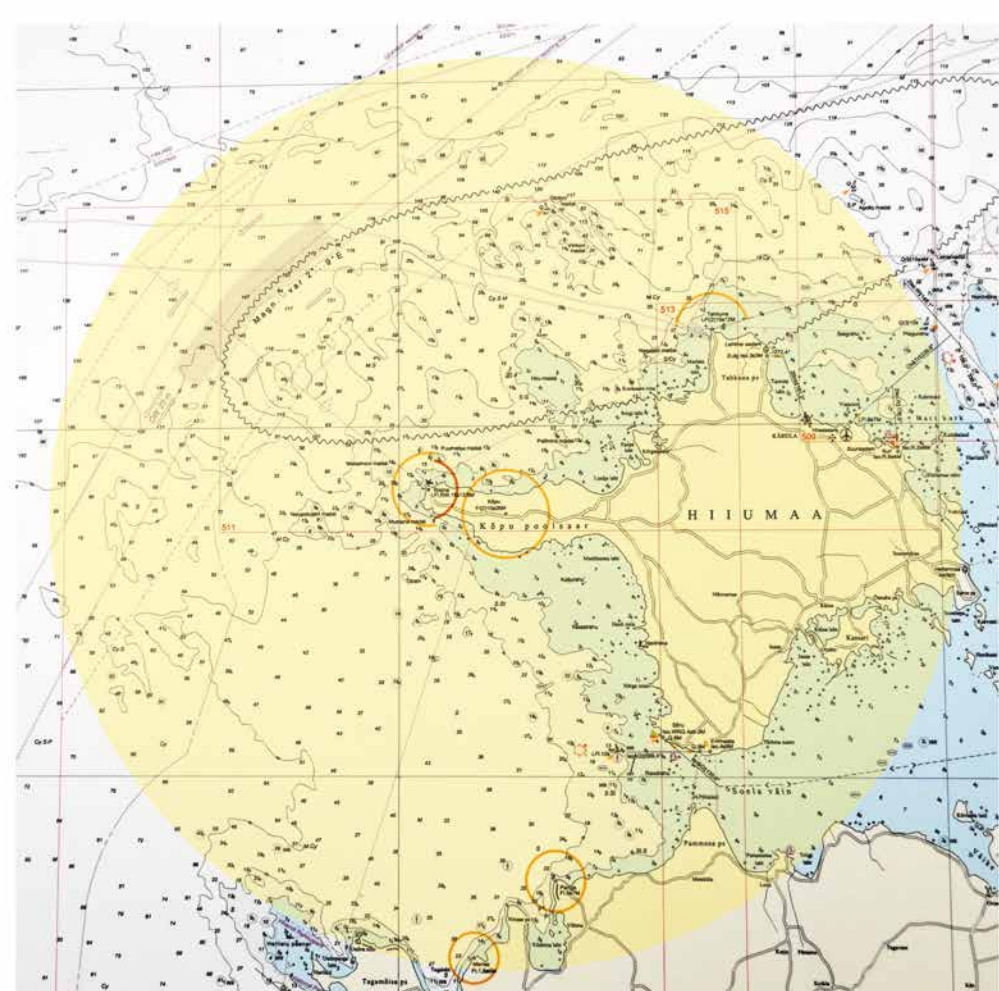
Lever lights (Danish: *vipp-fyr*) were invented in Denmark in 1626, drawing by R. Matkiewicz.



Manufacturer's nameplate on the lantern room purchased at the 1900 Paris World's Fair (Exposition Universelle de 1900).



Kõpu Lighthouse in 2021, photograph by T. Vilu.



Extract from the 2014 chart atlas *Eesti merekaardid* (Estonian Nautical Charts), showing the lighthouse light sector.



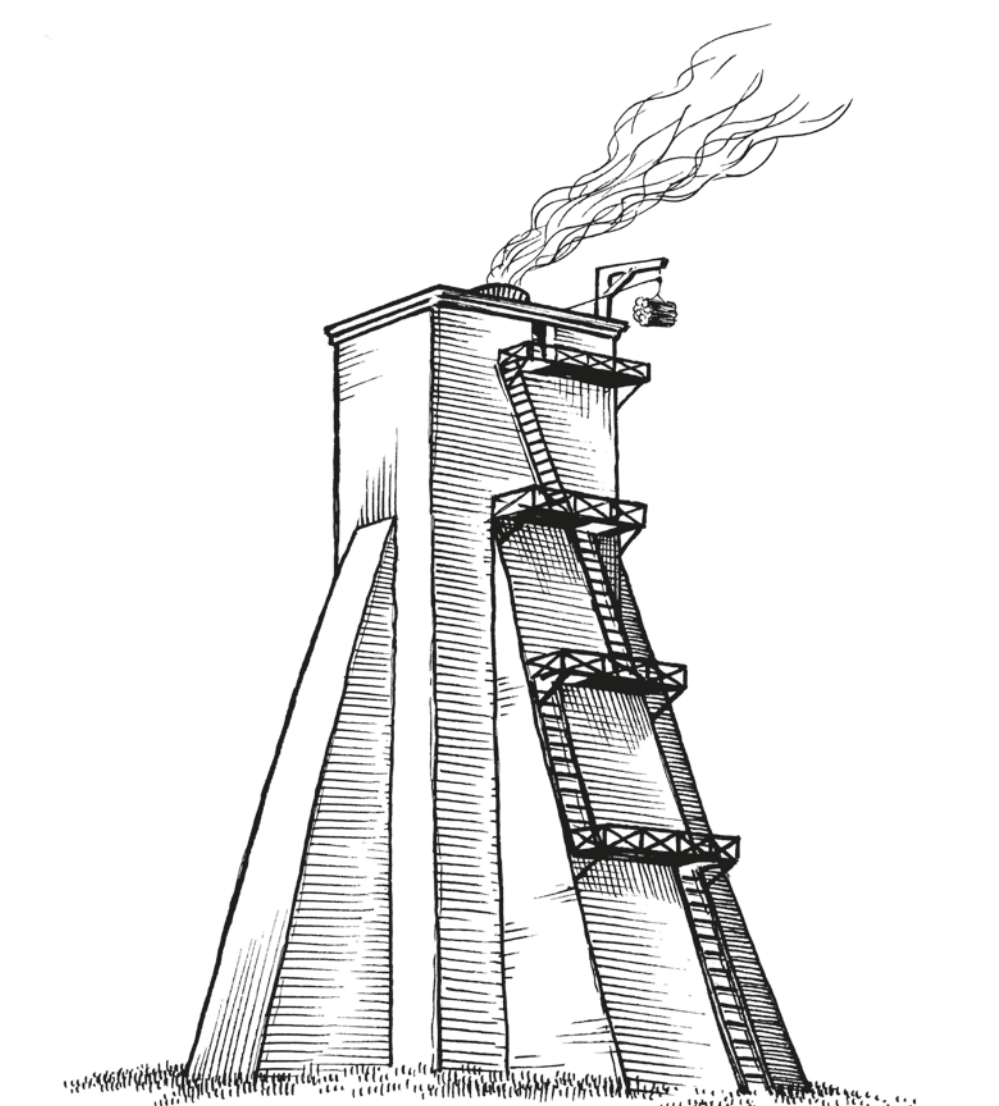
Charter issued on 20 April 1500 by Johannes, Bishop of *Ösel-Wiek*, granting permission to construct the sea-mark pillar. National Archives of Estonia, reference TLA.230.1-1871.



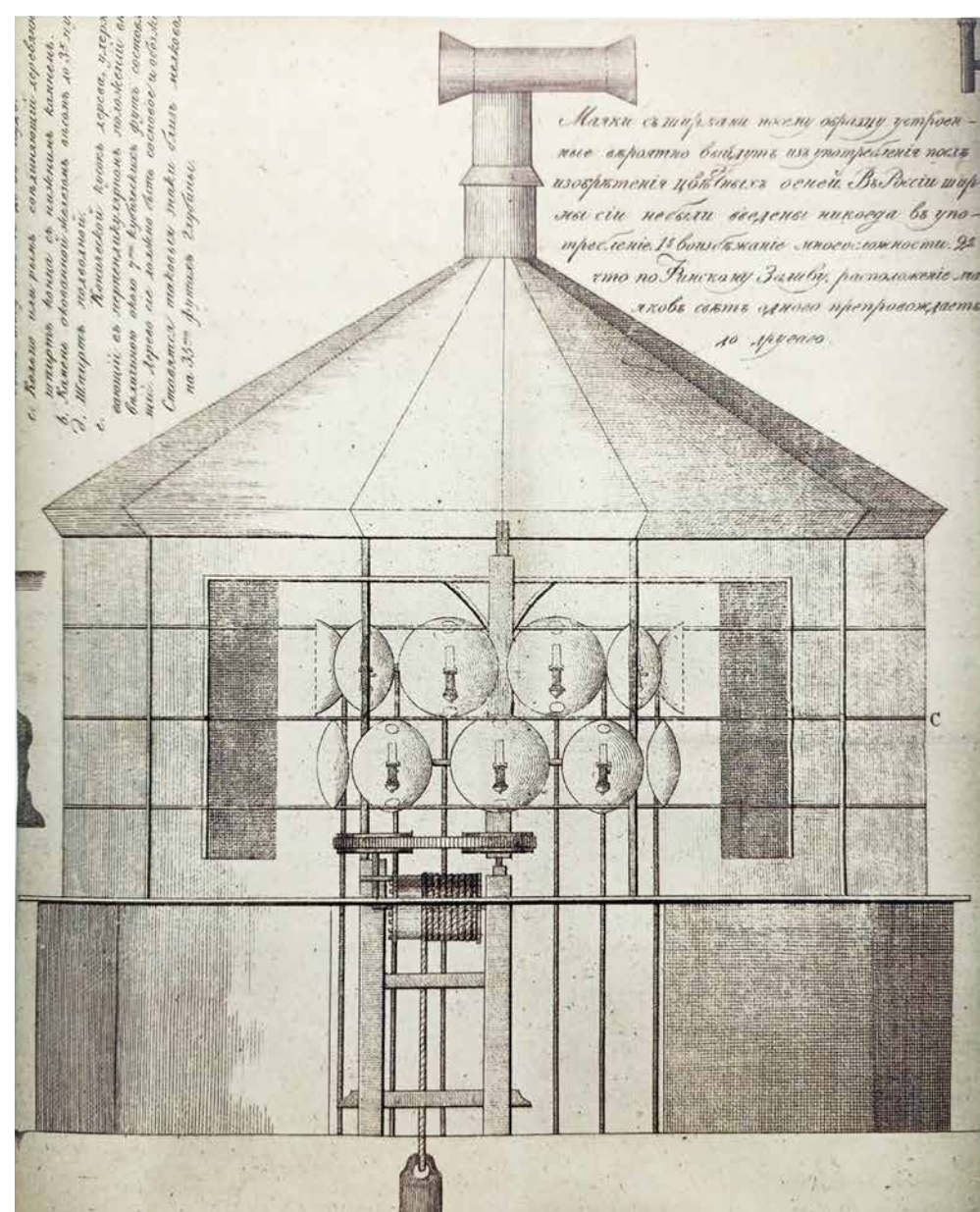
Extract from A. Nagaev's atlas *Атлас всего Балтийского моря* (Atlas of the Entire Baltic Sea), 1757. This is the earliest known chart on which the *Kõpu* aid to navigation is depicted.



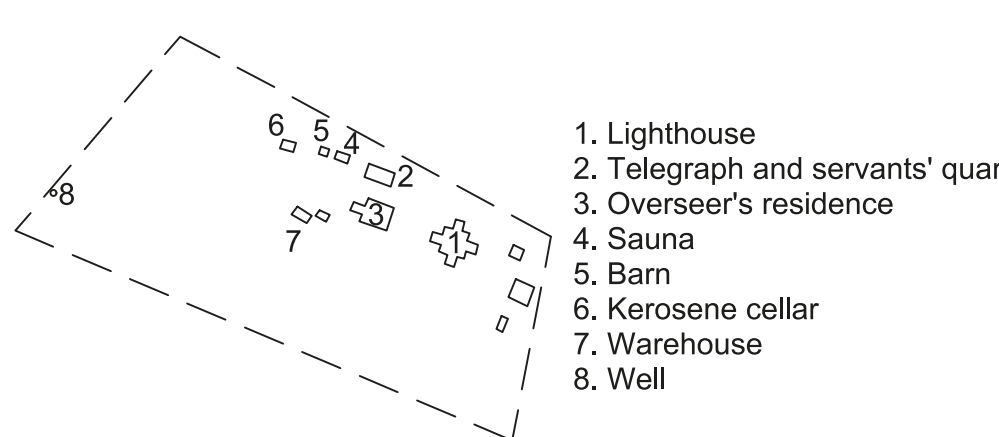
Extract from L. A. Mellin's *Atlas von Liefland* (Atlas of Livonia), 1791–1810, National Archives of Estonia.



Maintaining an open fire at Kõpu Lighthouse from 1649 to 1810, drawing by R. Matkiewicz.



The lantern room of *Kõpu* Lighthouse with its catoptric lighting apparatus as it appeared from 1810 to 1860, Spafaryev, 1820.



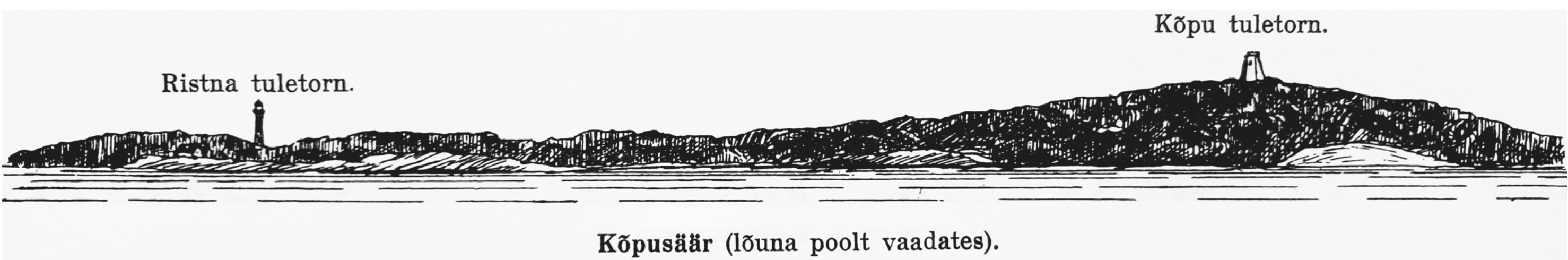
Kõpu Lighthouse Station in 1912.



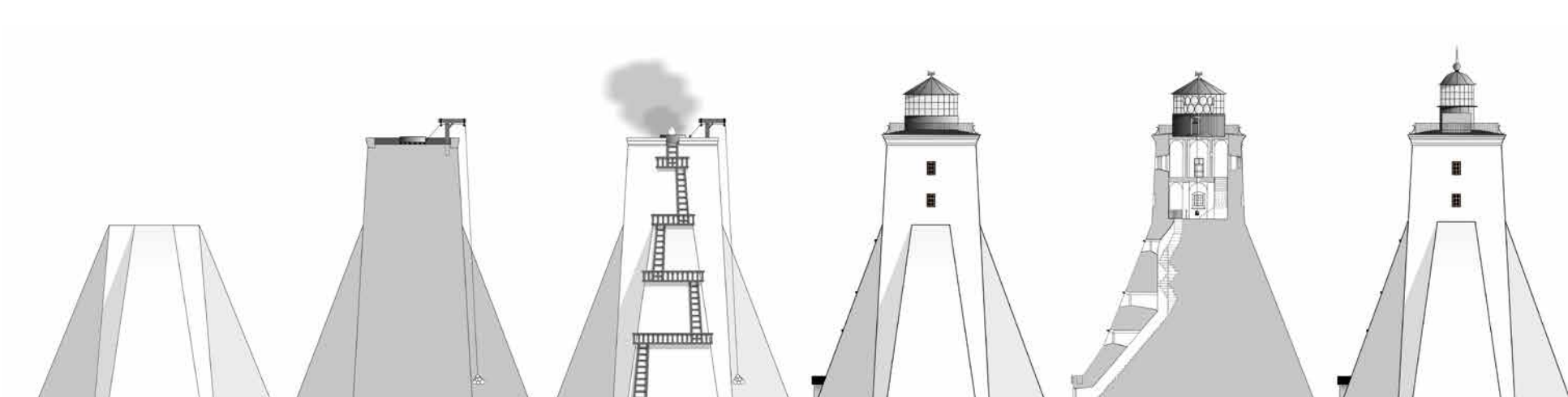
The powerful Soviet-manufactured EMV-930 lighting apparatus with a rotating Fresnel lens, in operation from 1981 to 2020, photograph by T. Rosenberg.



The damaged *Kõpu* Lighthouse surrounded by scaffolding in 1988, *Hiiumaa* Museums Foundation.



Silhouette of the *Kõpu* Peninsula, *Eesti loots*, 1927.



Timeline showing the development of *Kõpu* Lighthouse, drawing by R. Matkiewicz.