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**ORIGINS AND DEVELOPMENT OF OBSERVATION AND  
RADIOLOCATION SURVEILLANCE SUBSYSTEM OF THE BORDER  
PROTECTION FORCES ON THE POLISH PEOPLE'S REPUBLIC  
BORDER IN THE YEARS 1960-1965**

**Abstract**

*Content outline:* The article describes the genesis and organisational development of the observation and radiolocation surveillance subsystem of the Polish People's Republic Border Protection Forces and its use in the protection of the Polish maritime border in the years 1960-1965. The following issues were discussed: origins, formation and development of observation and radiolocation of the BPF, its organisation, methods of service, occurring technical problems, as well as military significance of such subsystem in the protection of the Polish People's Republic's Coast.

*Key words:* protection of the Polish People's Republic's Coast, observation and radiolocation surveillance system of the Polish People's Republic Border Protection Forces, the BPF soldiers' service on the Polish Coast.

**Introduction**

The Border Protection Forces of the Polish People's Republic were created on the 13th September 1945 and functioned until 15<sup>th</sup> May 1991. In this period the formation changed its structures on multiple occasions, adjusting them to the needs of the system of national protection functioning at the time. On the Coast, in the system of protection and defence of the maritime border, at the beginning

of the 1960s, the implementation of a new subsystem of this formation began, i.e. the service of observation and radiolocation surveillance of this formation.

In this time, within a framework of the BPF, three coastal units of this formation were responsible for the protection of maritime border. They were three brigades of the BPF (BPF Pomeranian Brigade with the headquarters in Szczecin, BPF Baltic Brigade in Koszalin and BPF Kaszubska Brigade in Gdańsk). Moreover, the naval tactical association of the Navy – the Maritime Brigade of Border Ships (MBBS) cooperated with these units in the protection of the maritime border.<sup>17</sup>. The subsystem of observation and radiolocation surveillance of the BPF functioned until the Border Guard was established in 1991 and within its structures it was further developed and perfected.

During the entire period of functioning of the BPF on the Coast (1945-1991) in the protection of the Polish maritime border, the decisive role was played by, inter alia, such components of the border protection system as: the service of battalion (port) soldiers of this formation in the sea ports, operational and reconnaissance service of the BPF Intelligence, aircraft and helicopters of the BPF Independent Recon Aviation Squadron, as well as units sailing under the green flag. At the beginning of the 1960s organisational works began to implement and use on the Coast another protection subsystem, i.e. observation and radiolocation surveillance of the BPF.

The significance of this formation that was already attributed to it in the previous years (1950s) in terms of sea and airspace observation is confirmed by numerous documents regulating these issues. They already appeared at the

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<sup>17</sup>I. Bieniecki, *Border Protection Forces in the system of protection and defence of the maritime border of Poland in the years 1965-1991*, Scientific Publishing House of the Pomeranian Academy in Słupsk 2015, pp. 1-480; and I. Bieniecki, Maritime Brigade of Border Ships (1966-1991), "Maritime Review", 2002, Issue. 7-8, pp. 39-52; see also: J. W. Prochwicz, *Border Protection Forces 1945-1965. Selected Problems*, Piotrkowskie Scientific Publishing House, Piotrków Trybunalski 2001; and H. Łach, *The system of protection of the Polish national border in the years 1989-2004*, Warmińsko-Mazurski University Publishing House in Olsztyn, Olsztyn 2013; and also: Z. Jackiewicz, *Border Protection Forces 1945-1991. Short historical information book*, CSSG Publishing House in Kętrzyn, Kętrzyn 1998, pp.1-209.

beginning of that decade. To the surveillance of the sea applied, inter alia, the order no. 043 of 23<sup>rd</sup> May 1952 on the observation of the floating vessels and the order no. 087 of 25<sup>th</sup> May 1957 on reporting on the traffic in the Polish ports of the foreign fishing vessels.

Also, the principles of airspace surveillance by the soldiers of the BPF were regulated in the first half of the 1950s decade. At the beginning of 1953 a letter was published (no. 01097) on the matter of recording the “*Journal of Air Alert*” and “*Airspace Surveillance Instruction with the Aircraft Types Examples*”. In the later 1950s a directive was issued by the Minister of the Interior (Ministry of Interior – no. 0178/56) dated 10<sup>th</sup> August 1956 on reporting the flights of propaganda balloons.

In the subsequent year (1957) further orders were issued:

- on the conduct of the BPF soldiers in relation to the radiosondes found (no. 42 dated 4<sup>th</sup> March 1957),
- on the remuneration of the finders of balloons of foreign origin (no. 054/57 Ministry of Interior dated 4<sup>th</sup> April 1957),
- on the notification of the Air Force Command about the Air Conduct Violators (no. 091 dated 5<sup>th</sup> June 1957)<sup>18</sup>.

Created at the beginning of the 1960s system of observation and radiolocation surveillance of the BPF was not the only one that functioned on the Polish Coast. As the first in this area, the Navy’s observation and radiolocation surveillance system was created. As early as in the mid-1950s, among many undertakings serving the expansion of the Navy, there were also the ones aiming to modernise the observation posts (OPs) of this formation. Their implementation was started in the years 1954-1955, initiated with the construction of the new, reinforced

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<sup>18</sup>Archives of the Border Guards in Szczecin, CBPF Files, ref. no. 1350, Vol. 1, List of mandatory orders and directives issued by the CBPF in the years from 1945 until 15<sup>th</sup> November 1957 dated 22<sup>nd</sup> November 1957, pp. 1-29.

Visual and Technical Observation Posts (VTOP) in Międzyzdroje, Rozewie and Hel.

In May 1955 in Gąski the first LOT type radiolocating station was installed for the purpose of surface observation, which was commissioned after several months (in September).

In the years 1956-1957 equipping the OPs of the Navy with the radiolocating stations was completed, as well as creation of the coastal observation system of this formation, which at first included: 3-Visual Observation Posts, 2-Technical Observation Posts and 15- VTOPs<sup>19</sup>.

Only at the end of the 1950s on the coast 31 observation posts (OPs) of the BPF were created, which were used for defence of the maritime border. OPs of the BPF functioned on the existing in that area wooden towers. In 1958, after they were appropriately adapted and equipped with the tripods, the long-range telescopes with 40x magnification and the 25° view were introduced into their inventory. In this way the conditions were met for moving onto the regular observation service along the entire Coast.

Thanks to the network of the BPF OPs, a continuous – in time and space – observation covered both coastal line, border airspace, and territorial waters. From dawn to dusk the service of the BPF OPs was tasked with preventing the illegal maritime border crossings by the border violators. Also, the effective notification and reporting system was ensured, to pass information on the identified targets in the individual zones of responsibility, as well as cooperation within the BPF OPs network, between the observation points and seaside watchtowers, and through the headquarters with the squadrons of the border ships and planes.

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<sup>19</sup>P. Dygas, *The place of reconnaissance bodies and units of the Navy in the defence policy of the country in the years 1945-1989*, [In:] *Armed Forces-Politics. The Studies dedicated to Professor Jerzy Przybylski on the 70<sup>th</sup> anniversary of his birth*, ed. P. Kurlenda, J. Romanowicz, A. Rossa and B. Zalewski, Adam Marszałek Publishing House, Toruń 2005, p. 83.

Whilst this system worked well during the day, it nonetheless turned out to be useless at night and under unfavourable visibility. Thus, further works were undertaken to perfect it, through introducing new technical devices on the maritime border<sup>20</sup>.

In 1959 the Ministry of National Defence (MND) issued the “*Instruction of cooperation between the Navy and BPF*” in the border protection and carrying out the visual and technical observation. In accordance with this document, the 12th Pomeranian Brigade (PB) of the BPF cooperated with the Base Headquarters of the Navy in Świnoujście on the section: Świnoujście-Rogowo, and the 15<sup>th</sup> Baltic Brigade (BB) of the BPF in Koszalin on the section: Ustronie Morskie-Jezioro Kopań. Whilst the 16<sup>th</sup> Kashubian Brigade (KB) of the BPF in Gdańsk cooperated with the Command of the Brigade of the Water Region Defence of the Main Base of the Navy in Gdynia, on the section of Eastern border: USSR-Ustka.

The collaboration of the BPF and the Navy included mutual informing about the situation at sea, help in case of search or pursuit of the vessels, and launching the radiolocating station at VTOP, in order to guide the BPF’s ships to the specific targets. On the other hand, within the scope of communication, the observation points of the Navy were to pass the data relating to the detected enemy ships within the distance of 20NM and all units present within the distance of 3NM from the shore. Their tasks also included reporting the disclosed flights of aircraft, sea or airborne landing flights, watercraft and aircraft failures, and detected signals calling for help.

During that time the coastal watchtowers of the BPF implemented the following tasks for the observation points of the Navy:

- notified about the detection of own and foreign ships present near the shore,
- border violations,

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<sup>20</sup>Central Military Archive in Warsaw, *Work II*, ref. no. 1902/00, Vol. 15, pp. 34-35.

-noticing the submarine periscope,

-they also informed of floating or thrown to the shore mines and torpedoes.

In March 1959 a communication system of collaboration was organised between the units of the Navy and subdivisions of the BPF, which allowed to significantly shorten the time of mutual passing of information about events<sup>21</sup>.

The significant changes in the observation and radiolocation system on the Coast took place in the mid-1960s. In that time, in the system of maritime border security of the BPF, several important elements were present, the effectiveness of which determined the impenetrability of the border. These included: visual observation and radiolocation surveillance of the coastal waters, service of coastal ships and fishing boats, operational activity of the BPF reconnaissance bodies, control of border traffic and security through the linear service in ports of the ships under the flags of the so-called capitalist (Western) countries<sup>22</sup>.

The need to search and then practical application of further methods of the maritime border protection in the 1960s was determined by the new socio-economic, political and operational conditions on the Coast.

The experiences and conclusions obtained from the analysis of functioning of the current border protection system have also led to the introduction of new solutions within the scope of more effective maritime border protection by the BPF. For it was acknowledged that used until then in this system traditional forces and means did not allow impenetrable protection of the border. Existing maintenance of the control belt and its monitoring on the beaches engaged significant forces and resources of the BPF units. For raking the control belt on the Coast, the horses had to be present as inventory of these subdivisions in the watchtowers. Also, the night time inspections of the belt were onerous for soldiers

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<sup>21</sup>P. Dygas, *The recognition (...)*, p. 40.

<sup>22</sup>Archives of the Border Guards, CBPF Files, ref. no. 2087, vol. 4, Current system of organisation of the national borders protection of the Polish People's Republic and their structure, and the tasks of Border Protection Forces under threat and during the war dated 12<sup>th</sup> April 1976, p. 6.

on duty. This type of activity could not be carried out for longer due to progressing mass development of tourism on the Coast. Therefore, the uniform radiolocating system was organised and implemented in the units of the BPF on this section, which was aimed at:

- Reducing the number of coastal watchtowers and their staff,
- Making the entire Coast available to tourists and holidaymakers and departing from many regulatory provisions restricting the citizens,
- Allowing free practice of sports and water tourism on the coastal waters,
- Ensuring high effectiveness of maritime border protection through the 24-hour activity of the observation service,
- Covering vast areas of the sea with the continuous observation when the border was moved to the distance of 12NM from the shore,
- Reducing physical effort of soldiers of the recruit service thanks to the use of modern technology<sup>23</sup>.

Works on the implementation within the framework of the maritime border protection system of the new component, i.e. the radiolocating devices, started in this formation at the beginning of the 1960s. According to the former deputy head of the communications department for radiolocation of the KBBPF, lieutenant colonel MSc Eng. Jarosław Dobrowolski, in April 1960 the first prototype of the RLM-230 (Maritime Radio-Location) type radar intended for the BPF was created. After carrying out the factory tests, first three RLM-231 type devices were delivered to the Coast, for further testing. First experiments with the radiolocating devices were carried out by the Command of the BPF (CBPF) in 1961 on the section of the central Coast protected by the BBBPF. They were aimed at exploring the possibility of their use for the maritime border protection. The devices were tested on the arranged for this purpose two technical

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<sup>23</sup>Archives of the Border Guards, CBPF Files, ref. no. 2884, Vol. 251, The concept of perspective changes in the system of maritime national border protection, p. 5 (undated document).

watchtowers, where for two years technical working conditions, operating range and the usefulness to the station were examined. At the same time, the projects were implemented related to the development of new methods of border protection and organisational assumptions for the radiolocating system on the entire Coast.

The building of VTOP equipped with the radiolocating stations was commenced in 1961 – at first experimentally on the section of Mielno watchtower of the BBBPF (5 VTOPs), and in the subsequent year in the Ustronie Morskie and Dźwirzyno watchtower (8 VTOPs)<sup>24</sup>.

In 1963, after testing the radiolocating devices and introducing in them the solutions suggested by the users, the serial production of the type RO-231 radars was started. In the same year the experimental works with the radiolocating system on the Coast were completed and organisation of the security of the maritime border with the help of VTOPs was begun; VTOPs were equipped with the radiolocating stations and optical equipment for daytime observation. For that purpose, on the entire coastal belt, along the coastline, watchtowers were constructed using steel-concrete structure<sup>25</sup>.

In mid-1964 on the section of the service responsibility of the PBBPF (Western section of the Polish Coast) the results obtained thanks to the introduction of this new element in the maritime border protection were evaluated as follows:

*„(...) The transition in the border protection to the system of radar/observation posts allowed removing two coastal watchtowers and significant reduction in the service of floating vessels, which brought serious savings. Introduction of new technical resources to the border protection on the one hand influenced the*

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<sup>24</sup>Archives of the Border Guards, CBPF Files, ref. no. 2372, Vol. 5, Operational analysis of the use in the maritime border protection of the radiolocating station developed by the commander lieutenant M. Andrzejuk dated 27<sup>th</sup> February 1972, p. 1.

<sup>25</sup>S. Łuczyński, *The effectiveness of the maritime border protection using the radiolocating system*, “Border Protection Forces Bulletin”, CBPF Publishing House, Warsaw 1963, pp. 3-17; and the Report by J. Dobrowolski dated 7<sup>th</sup> April 2004 (owned by the author).



*reduction of the staffing levels of the brigade, and on the other hand – serious decrease in the physical effort of the soldiers serving on the border (...)*<sup>26</sup>.

At the latest, in the end of 1964 (in mid-November) the construction was completed of the VTOP on the section of KBBPF (Eastern section of the Polish Coast), on which the radiolocating stations were installed. From the beginning of 1964 the individual watchtowers were assigned on average from 1 to 4 VTOPs:

- the BPF Jastarnia watchtower -3 VTOPs,
- the BPF Władysławowo watchtower -3 VTOPs,
- the BPF Karwia watchtower -2 VTOPs,
- the BPF Białogóra watchtower -3 VTOPs,
- the BPF Łeba watchtower -4 VTOPs,
- the BPF Jantar watchtower -1 VTOP.

Altogether, on the KBBPF section 16 VTOPs functioned at that time.

Moreover, the further watchtowers were under construction in the following border subdivisions of this BPF Brigade:

- the BPF Łeba watchtower -1 VTOP,
- the BPF Karwia watchtower -1 VTOP,
- the BPF Jantar watchtower -2 VTOPs,
- the BPF Krynica Morska watchtower -4 VTOPs.

After the completion of their construction, equipping with appropriate technical gear and start-up of the observation and radiolocating system within the section, the KBBPF was to consist of 24 VTOPs. The deadline for completion of these works was estimated for the end of December 1964.<sup>27</sup>

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<sup>26</sup>Archives of the Border Guards, CBPF Files, ref. no. 1613, Vol. 12, Information on the state of security of the Polish People's Republic border on the section of PBBPF in the period from 1<sup>st</sup> January 1963 to 30<sup>th</sup> June 1964, p. 4.

<sup>27</sup> Archives of the Border Guards in Szczecin, KBBPF Files, ref. no. 1627, Vol. 140, The report of the Commander of the 16<sup>th</sup> KBBPF col. M. Dębicki to the Commander of the BPF on the tasks of the BPF for the years 1964-1965 in the scope of operational and technical security dated 14<sup>th</sup> November 1964, p. 2.

The above activities were implemented in stages on the individual, coastal Brigades of the BPF. The KBBPF section was the last on which the radiolocating system was implemented into the service. On the Eastern section of the Polish Coast, the new system of securing the maritime border by the coastal watchtowers was introduced in the autumn-winter season 1964/1965. The radiolocating and detection system was implemented in the service first in the watchtowers of the left, then the right section of this brigade. This took place in the following months:

- the BPF Łeba watchtower – December 1964,
- the BPF Białogóra watchtower – December 1964,
- the BPF Karwia watchtower – November/December 1964,
- the BPF Władysławowo watchtower – November 1964,
- the BPF Jastarnia watchtower – October 1964,
- the BPF Jantar watchtower – January 1965,
- the BPF Krynica Morska watchtower – January 1965,
- roadsteads of the Gdynia port – January 1965.<sup>28</sup>

The radiolocating system was implemented on the section of the entire brigade from January 1965. By April 1965 all radiolocating stations on the KBBPF section worked 18 446 hours altogether. In this period the apparatus did not function due to damages for 4 460 hours, which constituted 24,2% of the total operating time of these devices. The most frequent causes of the equipment failures were the rapid wear of transceiver tubes and inducing elements in the form of impulse transformers and cable connectors produced by WZR-T1<sup>29</sup>.

With the launch for operation activity of the new technical devices, organisation and performance of border service according to new principles begun, following the instruction for the technical watchtowers. Equipping of the so-called command of the KBBPF Headquarters in Gdańsk New Port (Oliwska Street 35)

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<sup>28</sup>Ibidem, The assessment of the operational situation and the project of guidelines for the organisation of the border service at the KBBPF for the spring-summer period of 1965 dated 21<sup>st</sup> April 1965, pp. 1-2.

<sup>29</sup>Ibidem, pp. 1-2.

and the operating rooms in the watchtowers, as well as the BPF's VTOP was commenced.

Eventually, in the mid-January 1965 at KBBPF, on the sections of six watchtowers, the observation and radiolocating system functioned, which at first consisted of 16 VTOPs. The BPF outposts on this section were assigned the following observation towers (VTOPs): Jastarnia-3, Władysławowo-3, Karwia-2, Białogóra-3, Łeba-4, Jantar-1.

Furthermore, 8 VTOPs were under construction (Łeba watchtower-1, Karwia watchtower-1, Jantar watchtower-2, Krynica Morska watchtower-4)<sup>30</sup>.

The basic tasks implemented by the BPF soldiers serving at a VTOP included:

- continuous observation of the designated sections of the shore and sea using the available resources of technical and optical observation,
  - detection on the territorial sea waters of the undefined floating targets,
  - disclosure of offences and crime on the territorial sea within the scope of carried out observation,
  - disclosing and reporting the flights of planes and other aircraft at low altitudes (up to 500 m),
- reporting to the neighbouring VTOP the data about the movement of the passing floating units and the observations carried out within their range,
  - reporting to the duty operational officers of the watchtowers about the confirmed events on the VTOP<sup>31</sup>.

By the end of 1965 the construction of the radiolocating system was completed on the entire Polish Coast (62 VTOPs). In the subsequent years additional 4 VTOPs were constructed in the areas requiring special security (port roadsteads, river estuaries).

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<sup>30</sup>Archives of the Border Guards in Szczecin, KBBPF Files, ref. no. 1627, Vol. 140, The report of the Commander of the KBBPF col. M. Dębicki to the Commander of the BPF on the tasks of the BPF for the years 1964-1965 in the scope of operational and technical security dated 14th November 1964, p. 2.

<sup>31</sup>Archives of the Border Guards, CBPF Files, ref. no. 1613, Vol. 13, Collective work of the CBPF team of 25<sup>th</sup> September 1990, pp. 2-3.

The general idea behind the construction of this system was to make the entire Coast widely available for the dynamically growing tourist, holiday and sport movement, while maintaining the strict but not restricting the freedom of movement supervision of this movement, and ensuring full protection of the maritime border, which could be achieved only through the use of radiolocating system.

The appropriate dislocation of VTOP and installation of the radiolocating system of high for those times technical and operational parameters (type RO-231 and later RN-231) allowed revealing all floating subjects on the Polish territorial sea, from a kayak to pontoon inclusive<sup>32</sup>.

From the first months of operation in the border protection, the radiolocating devices were exploited very intensively. The type RLM-231 devices in the number of 3 pieces functioned at the Brigade of the BPF in Gdańsk until 1967<sup>33</sup>. Taking into account the large significance of the observation and radiolocation in the system of maritime border protection, and the necessity of correct preparation of soldiers to serve at VTOP, in the mid-1960s in the shoreline Brigades of the BPF panel tests were introduced to monitor their preparation and service. The assessment of service of the soldiers at the observation towers was implemented within the framework of the competition for the best VTOP. For instance, the KBBPF panel from 17<sup>th</sup> May to 3<sup>rd</sup> June 1965 carried out a detailed inspection of all subordinate VTOPs. Out of 24 VTOPs whose crews entered into the competition only seven met the requirements provided by the regulations. In the general score the highest points were achieved by:

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<sup>32</sup>Archives of the Border Guards, CBPF Files, ref. no. 2372, Vol. 5, Operational analysis of the use in the maritime border protection of the radiolocating station developed by the commander lieutenant M. Andrzejuk dated 27th February 1972, p. 1.

<sup>33</sup>Archives of the Border Guards in Szczecin, KBBPF Files, ref. no. 1627, Vol. 140, The assessment of operational situation and the project of guidelines for the organisation of border forces at KBBPF for the spring-summer period in 1965 dated 21<sup>st</sup> April 1965, pp. 1-2.; and the Report by J. Dobrowolski dated 7<sup>th</sup> April 2004 (owned by the author).

- 1<sup>st</sup> place –VTOP - 45 (commander of the platoon, overtime conscript military service Waldemar Lepke),
- 2<sup>nd</sup> place – VTOP - 47 (commander of the platoon, overtime conscript military service Kazimierz Polanowski),
- 3<sup>rd</sup> place –VTOP - 35 (commander corporal Jerzy Żera) and VTOP - 43 (commander corporal Paweł Bławat).

For gaining the top positions the commanders of the above VTOPs received awards in the form of cash prizes, while operators were awarded leave<sup>34</sup>.

Since the very beginning of functioning of the new radiolocating system its effectiveness was being checked, inter alia, during testing exercises, organised by individual Brigades of the BPF. For example, in the 24-hour period between 10-11 August 1965 such exercise was carried out on the Hel-Jantar “straight line”, and its goal was to secure that “straight line” section by VTOP Hel and the squadron of the border ships in Gdańsk. During the exercise it was intended to simulate the crossing of the “straight line” within the reach of the radiolocating station of VTOP Hel, using the watercraft imitating an illegal border crossing<sup>35</sup>.

In the first half of the 1960s the equipment of VTOPs+ of the BPF included radiolocating stations of the Polish construction (at first type RO-231 and later RN-231), as well as telescopes and wired communication means. The assumption of the creators of the radiolocating system for the border protection was

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<sup>34</sup>Archives of the Border Guards in Szczecin, KBBPF Files, ref. no. 1627, Vol. 138, The order of the commander of the KBBPF, colonel M. Dębicki on the results of the competition for the best VTOP of the KBBPF in 1965, dated 9<sup>th</sup> June 1965.

<sup>35</sup>Archives of the Border Guards in Szczecin, KBBPF Files, ref. no. 1627, Vol. 141, Staff memo of Z. Majewski from the exercise carried out in order to secure the Hel-Jantar section on 10-11<sup>th</sup> August 1965 dated 16<sup>th</sup> August 1965, p. 1.

In the exercise the “ATOL” yacht was used from the LOK sailing centre in Jastarnia with the crew and officers of the operational division of KBBPF. The yacht sailed on 10<sup>th</sup> August 1965 at 22:20 from Jastarnia port. At approx. 0:30 at the distance of 2NM from the line the yacht was spotted on the screen of the Hel VTOP’s radiolocating station and was guided by the VTOP crew until the end of the exercise. At approx. 0:30 the yacht was illuminated by the headlight switched on following the order of the commander of the element of border forces from Hel VTOP and remained lit until the moment of approach of the KP-120 ship serving on the so-called “straight line”. At 0:50 the KP-120 ship, at the command of the Hel VTOP soldiers, stopped the above-mentioned yacht in order to recognise whether it crossed the “straight line”. Based on the carried-out exercise it was assessed that the action of Hel VTOP forces and the ship was appropriate.

impenetrable security of the entire Coast through observation of the small floating vessels, the so-called targets (e.g. pneumatic mattress or a kayak). However, the initial location of VTOPs of this formation on the coastal belt did not guarantee it in 100%, because between the neighbouring towers the so-called blind spots (not under monitoring) occurred<sup>36</sup>.

The experiences gained with the use of radiolocating devices at BBBPF and a positive assessment of the utilised system allowed the development in the subsequent years of two basic types of observation towers, which were used on the Coast:

- with steel structure (used on the section from Dziwnów to Ustka),
- and with strand-concrete structure (used on the remaining section of the maritime border)<sup>37</sup>.

Functioning from the mid-1960s systems consisting of 66 VTOPs substantially improved the effectiveness of border protection. Thanks to it, the constant and uninterrupted observation of the Coast and territorial waters was ensured, both in night conditions and in poor visibility. This allowed exposing the following: foreign floating vessels violating Polish territorial waters, in a manner violating the existing regulations, floating objects approaching and leaving the shores outside of ports and fishing harbours, aircraft and balloons passing over the border and all signals at the sea about the ships failures, catastrophes and other events. The imperfection of this system in the initial period of its functioning was lack in the seashore watchtowers of suitable watercraft, intended for intervention and investigating unrecognised targets on the territorial sea. Engaging to these tasks

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<sup>36</sup> H. Dominiczak, *Kaszubska Brigade of the Border Protection Forces in the years 1945-1988*, Warsaw 1996, pp. 90-91 (copy in the author's collection); and Branch of the Maritime Division of the Border Guards (MDBG) in Gdańsk, *The Chronicle of the Kaszubska Brigade of the BPF*.

<sup>37</sup>Branch of the Maritime Division of the Border Guards (MDBG) in Gdańsk, *The History of the Kaszubska Brigade of the BPF for the year 1962* (copy in the author's collection), p. 5.

the ships of the Maritime Brigade of Border Ships (MBBS), located in large ports, was deemed as uneconomical and not always effective<sup>38</sup>.

Already in these years, at the beginning of each summer season, when the temperature of sea water allowed, the checks of radiolocating station were performed for all VTOPs on the sections of the Brigades of the BPF, within the scope of detection of lightweight objects, such as a kayak, pontoon or a fishing boat. Night controls were also often organised, checking the alertness and effectiveness of detecting such objects by the on-duty crew of a VTOP. Similar actions were undertaken in all coastal Brigades of the BPF.

In the spring-summer period work regime was established for the radiolocating station for detectability of lightweight floating objects within the distance of 3 NM. Such regime covered with the technical observation the entire section of maritime border at night. During the day the observers from the towers, equipped with long-range telescopes, also monitored the entire section of this border.

In the autumn-winter period the scope of technical observation was extended, and even the system of alternating work was introduced. The staff of radiolocating station who did not carry out observation in a given time were in constant readiness to participate in the system of continuous observation. The system of work for an individual VTOP for each 24-hour period, depending on the occurring weather conditions, was established by each watchtower commander on their section<sup>39</sup>.

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<sup>38</sup>Central Military Archive in Warsaw, Work II, ref. no. 1902/00, Vol. 15, pp. 35-36.

<sup>39</sup>J. Nikiforow, *In the border kaleidoscope 1945-2005 - memories*, DJ Printers Publishing House, Gdańsk 2007, p. 57.

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