



Joint Stock Company
CONCERN "RADIOTECHNICAL AND INFORMATION SYSTEMS"
(CONCERN "RTI SYSTEMS")

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October 04, 2011

№2561/PTUC

His Excellency Ambassador
of the Republic of Indonesia,
Mr. prof. Hamid Awaluddin

Your Excellency!

Taking an opportunity we would like to express our respect to You and Your country. Thank You for the interest to our company and our production and giving us an opportunity to conduct negotiations with Your representatives.

As a result of negotiations held by our representatives Mr. Evgeny Hromov and Vladimir Yudin with Mr. Dian Wirengjurit we offer for the beginning to start cooperation in the field of over-the-horizon radio location on the basis of over-the-horizon radar "Laguna".

"Laguna" is the modern, highly efficient, civil used OTH surface-wave radar specially designed for ensuring of law and order, as well as economic security in the 200-miles exclusive economic zone of coastal states.

We suggest discussing of different versions of cooperation including joint development and production of "Laguna" radar's necessary parts and equipment.

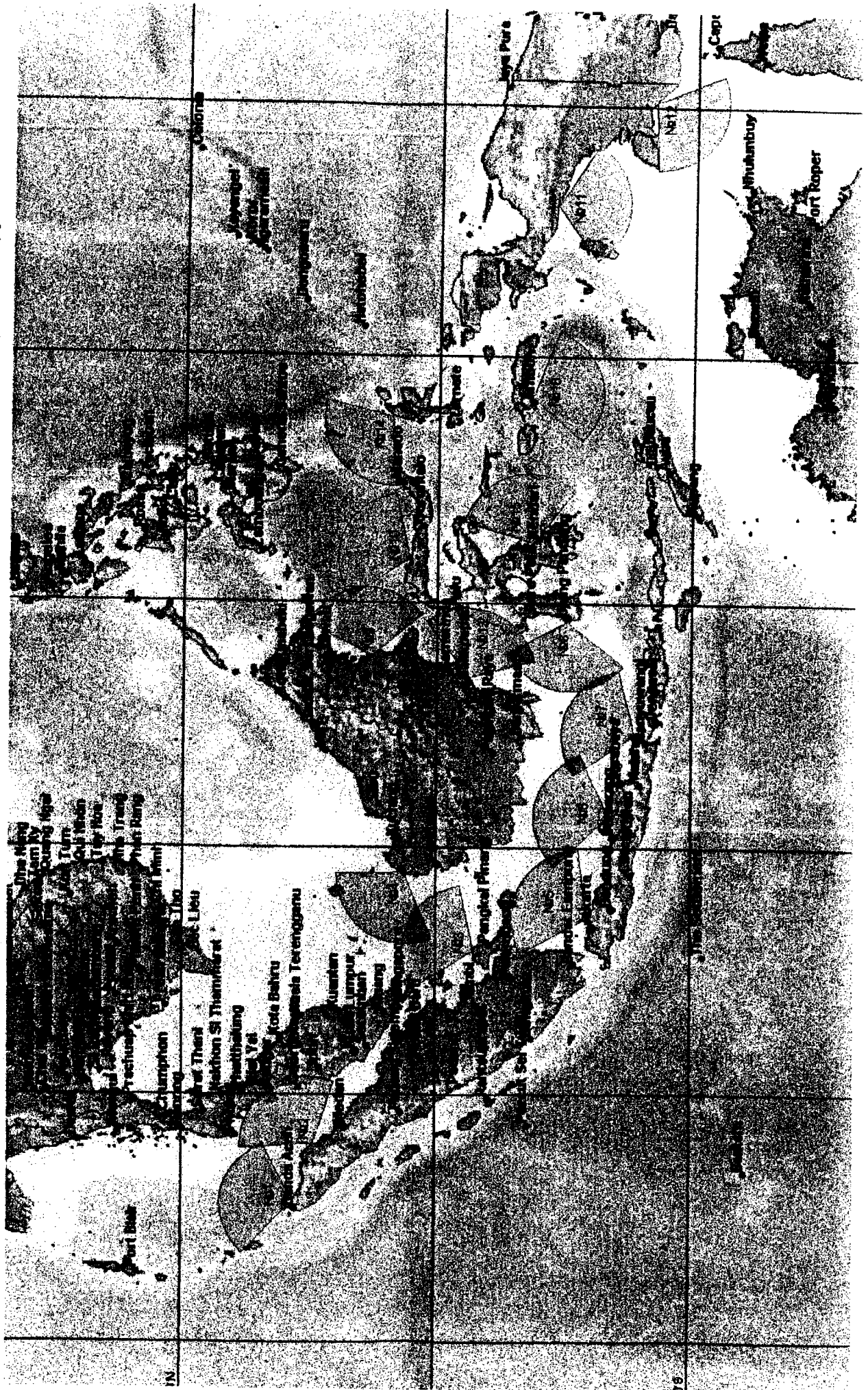
In case of interest of Indonesian authorities or private companies in this cooperation we are ready to start negotiations both in Indonesia and in Russia at any appropriate time for You.

Yours respectfully,

Sergei O. Tishenko

CEO

Размещение 3Г РЛС "Лагуна" для контроля морской обстановки в акваториях Индонезии

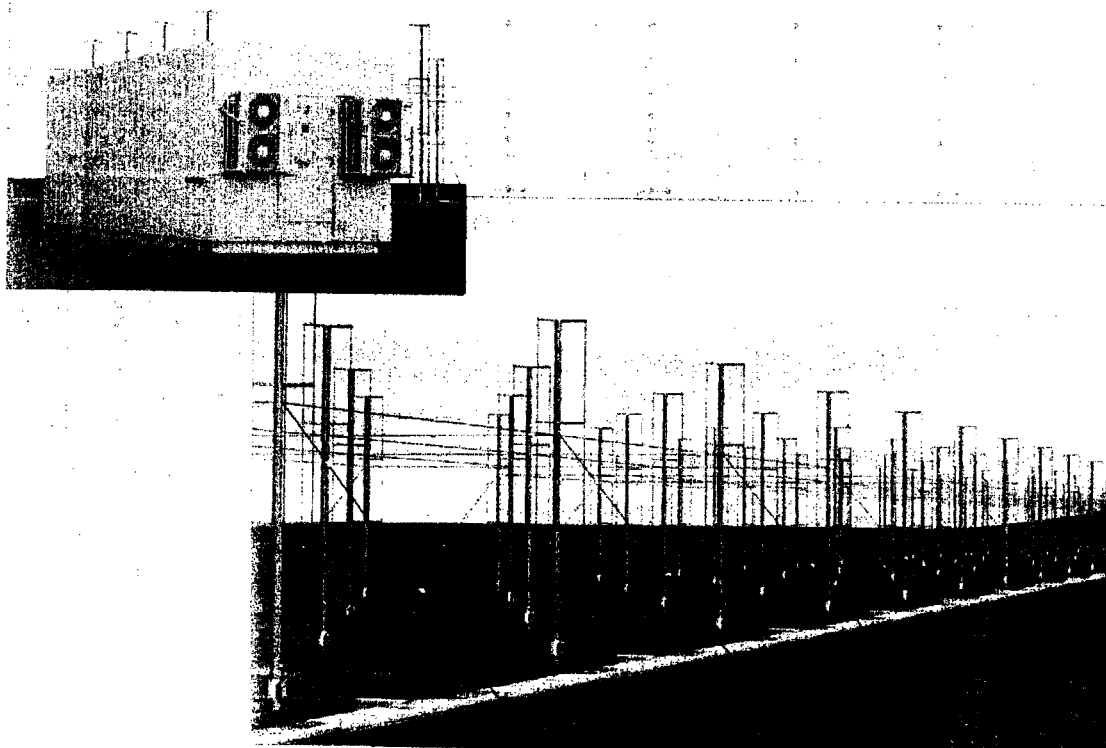


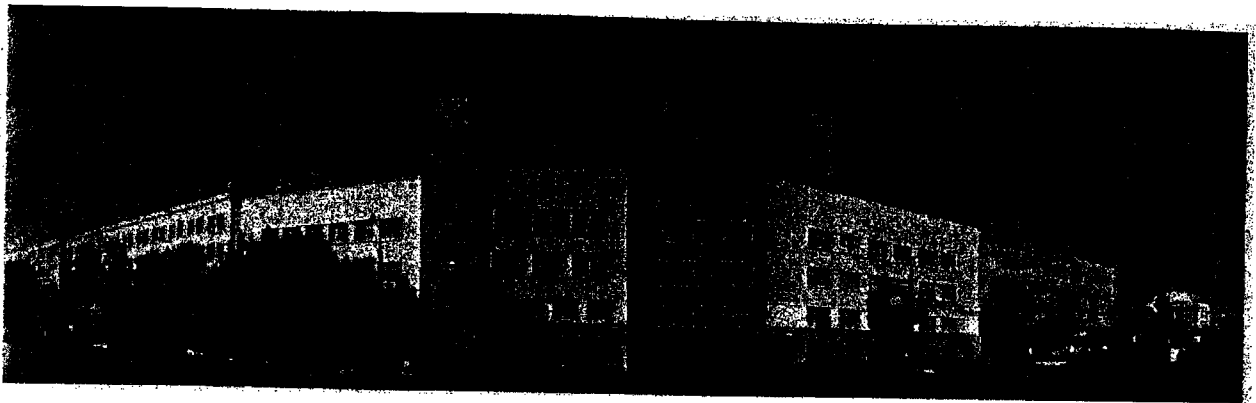


OPEN-STOCK COMPANY
«SCIENTIFIC AND PRODUCTION COMPLEX
«SCIENTIFIC RESEARCH INSTITUTE OF LONG-RANGE RADIO-COMMUNICATION»

«LAGUNA»

OVER-THE-HORIZON SURFACE WAVE RADAR





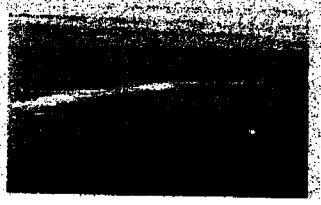
OAO NPK NIIDAR is one of the oldest companies in Russia in the field of creating and exploiting of extra complicated radio systems, development and production of scientific and technical products and software.

The main trends of scientific and technical activities are: development and production of high-grade and high informative radar systems, electronic equipment, science intensive technologies in information, telecommunications and control systems executing the mission of detecting, tracking, classification and delivering information on the sea-surface, aerodynamic and space objects.

The company possesses the scientific, technological and infrastructure capacities enable to perform the order of constructing the competitive products conforming to international scientific and technical levels, meeting the most exacting customer requirements.

The company employs highly qualified specialists, among them Doctors of Technical Sciences and dozens of technical sciences candidates. Company scientists involves in the work of some industry-science academies. All the developed company products have the high factory readiness, with a minimum volume of capital construction, and modular structure with the use of maximum standardized components.

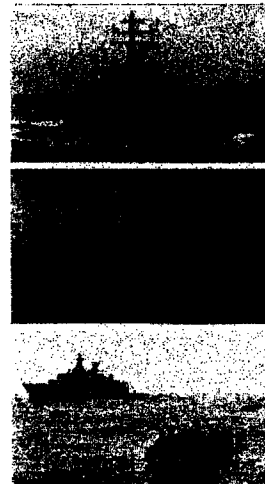
The available research, design and production bases allow to ensure a full cycle of manufacturing, testing, customer delivery, maintenance of the products and their modernization during operation.





In accordance with the international agreements, the coastal States have a legal responsibility to ensure law and order in the 200-mile exclusive economic zone and to solve the following tasks:

- border control
- guarantee of navigational safety
- counteraction against terrorism and sea piracy
- preventing illegal fishing
- suppression of drugs traffic
- suppression of smuggling traffic
- current state and prediction of the weather



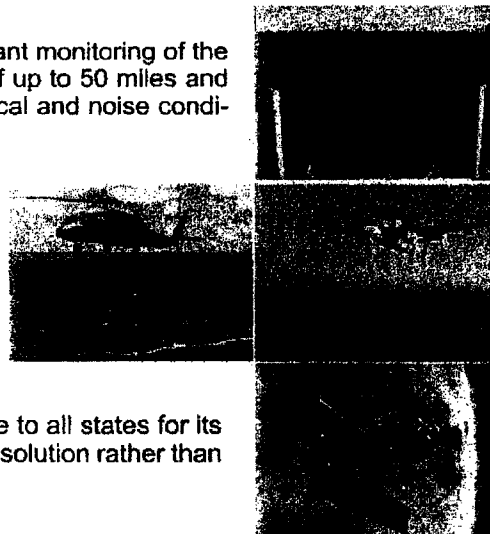
Currently, surface and air situation in the 200-mile zone is controlled by means of shore and ship radars, surveillance airplanes, and satellite intelligence.

Longstanding experience of using these traditional means of monitoring revealed a number of shortcomings:

- Coastal microwave radars are not able to carry constant monitoring of the 200-mile zone, as well as can detect targets at the ranges of up to 50 miles and have limitations of uninterrupted operation time, meteorological and noise conditions.

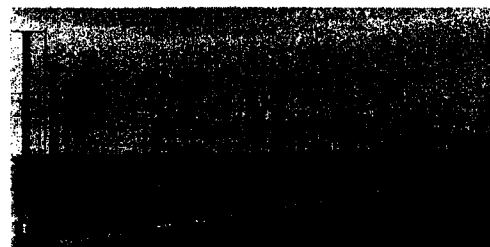
- The use of patrol aircrafts and coastguard ships is more effective, but continuous monitoring throughout the maritime domain awareness is extremely expensive.

- Satellite observing of the coastal zone is not available to all states for its exclusivity and high cost and often used to possess strategic solution rather than to solve tasks of the local nature.



To meet the challenges of economic security of coastal state the Open-stock company «Scientific and production complex Scientific research institute of long-range radio-communication» («OAO NPK NIIDAR») proposed

**highly efficient over-the-horizon surface wave radar
«LAGUNA»**

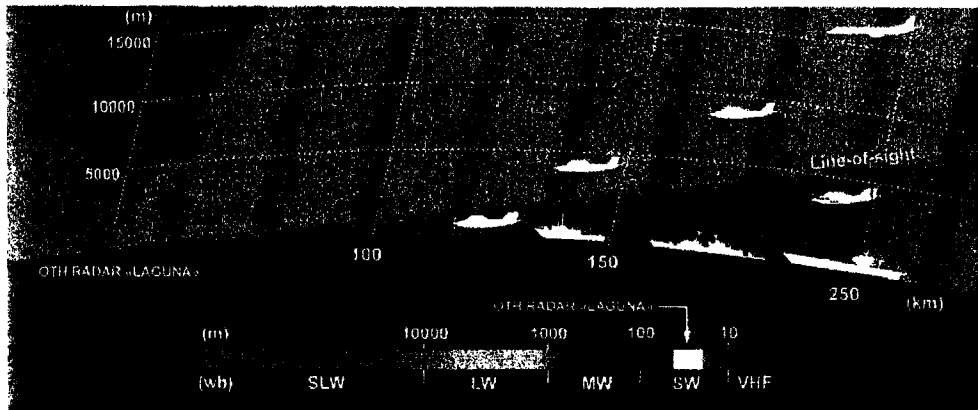




RADAR OPERATION PRINCIPLES

Functioning of OTH SW radar is based on the ability of short-range radio waves to spread beyond horizon along the sea surface by using diffraction effect.

It makes enable to detect targets, placed at a considerable distance over the horizon and in direct field of vision.



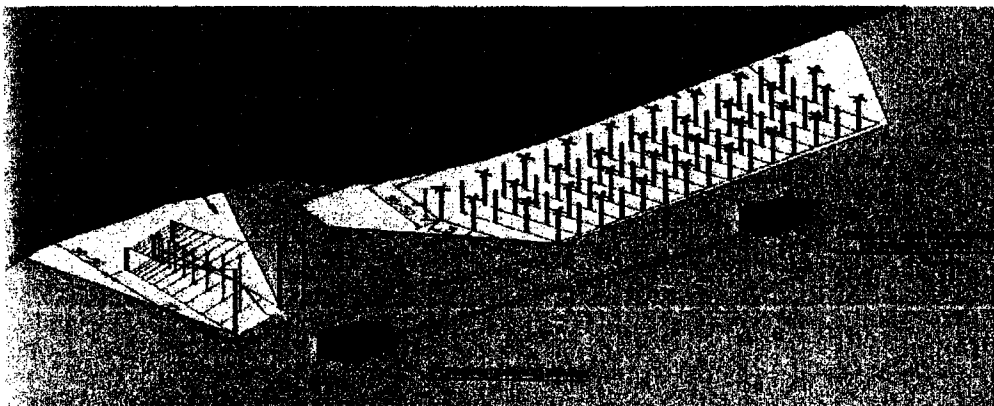
RADAR MAIN MISSIONS:

- detection and tracking of ships and aircrafts in the zone of control;
- automated measurement movement coordinates and parameters of detected ships and aircrafts;
- classification of detected ships and aircraft on the basis of "small"--"big", "maritime"-air";
- ships and planes tracking information transfer to the external control posts for collection and processing of information to make operational decisions;
- analysis and estimation of the HF signals level distribution to ensure electromagnetic compatibility of radar "Laguna" with other radio assets;
- analysis of meteorological conditions of the sea surface in the zone of control.

RADAR "LAGUNA" STRUCTURE

SW radar "Laguna" is located on the coast. The radar composition comprises transmitter and receiving antenna-feeder devices placed at two sites, power amplifying device, and device for receiving and processing information.

All radar electronic equipment is placed in two transportable containers.

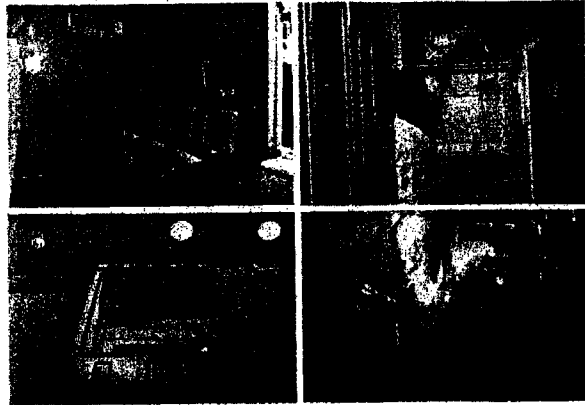




EQUIPMENT AND OPERATORS'S WORKBENCHES OF RADAR "LAGUNA"

The radar electronic equipment produced using modern Russian and foreign electronic components are located in the autonomous modules (containers), appointed by the conditioning, automatic fire alarm and fire-fighting systems. Upon request of the Customer radar equipment can be placed in the pre-arranged indoors.

Digital interfaces of radar make possible to couple various consumes and to supply compatible systems and control units with coordinate and tracking information. Information consumers attachment is performed by communication channels available at the Customer's.



Information consumers attachment is performed by communication channels available at the Customer. If necessary, communication and data radio transmission means can be provided with the station.

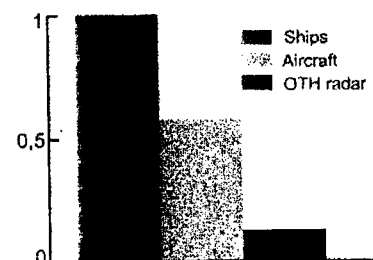
The functional management, data processing and detected objects display information of the radar "Laguna" is carried out by specialized computing complex.



RADAR'S ECONOMIC EFFICIENCY

The use of the surface-wave radar «Laguna» ensures substantial savings in manpower, material-technical and financial resources and also significantly reduces the overall specific cost of monitoring the surface and air situation. At the same time the continuity of control is ensured throughout the 200-mile economic zone.

Specific cost of monitoring the surface and air situation by different means





PERFORMANCE OF RADAR «LAGUNA»

Wave band:	decametric
Zone observation throughout:	
- range, km	15-250
- azimuth, deg	110
- elevation, deg	0-20
Zone observation type:	Paralell
Detection range of the objects, km:	
- large ship (tanker)	250
- average trawler	200
- speedboat	150
- helicopter	150
- aircraft	150
- transport aircraft	250
Mean-root-square error of parameters and coordinates measurements of the objects movement throughout:	
- range, km	1,5
- bearing, deg	1,5
- speed of:	
- sea surface objects, km/h	2,8
- air objects, km/h	20
- assessment of direction of accompanied object, deg	10
Resolving capacity:	
- of the range, km	2
- azimuth, deg	4
- of the radial velocity, m/s	1
Number of simultaneously accompanied objects (at least):	
- sea surface objects	50
- air objects	10
Power consumption of primary electrical power network, kW	≤ 100
Mean running time to failure, h	≥ 1000
Mean recovery time, min	30
Service life, years	10
Operating squad (one shift), pers.	3
Time for deployment radar on prepared sites and communications engineering, days	10
Environmental operating conditions :	
- ambient air temperature, ° C	from -15 to +50
- relative air humidity at a temperature of +25°C, %	95
- wind speed, max, m/s	45