

ANTENNA RECEIVING COMPLEX OF HF BAND “KALINA”

PURPOSE

Antenna receiving complex (ARC) “Kalina” is designed for directional reception of HF band signals (1.5-30 MHz), remote to the distance of up to 100-2000 km and more, received from the systems of long-haul radio communication and also for radio and radio-technical monitoring of radio emission sources (RES) including weak and noisy with ionosphere interference.

ARC “Kalina” is purposed for operation in the composition of state-of-the-art HF band radio receiving centers.

MAIN FUNCTIONS

ARC “Kalina” is designed for multichannel directional reception and processing of radio signals within the frequency band of 1.5 – 30 MHz and provides the following:

- 1) Amplification and splitting of signals to operators’ workplaces of the complex;
- 2) Automatic searching and identification of signals of messages in data networks;
- 3) Demodulation and decoding of messages of asynchronous and synchronous data transmission;
- 4) Automated recording of received signals in digital form;
- 5) Switch control of directional receiving channels;
- 6) Automatic processing and data documenting in undercontrolled receiving channels.

In the complex the following functions are provided: control of directional receiving channels, tasking for searching, configuring of system of demodulation and message decoding, observing of spectral shape, audio control and multichannel recording of signals in receiving channels.

In ARC “Kalina” additional option for connecting to its antenna field of multichannel receiving-indicating unit for providing direction finding with spatial-correlation processing of signal (variants 1,2) can be provided on Customer’s request.

External view of elements of antenna receiving complex “Kalina”



Loop antenna element of the second band



Antenna System of V-shaped antenna beams



Operators' working places with two receivers “Galaktika-M” and demodulators W-CODE

BRIEF INFORMATION

ARC “Kalina” (variant 1,2) provides generating of 32 identical directional patterns in azimuth plane with step 11.25° and elevation angle 20° .

ARC “Kalina” provides a possibility of connecting 32 receivers. At every output of ARC independent control of receiving direction is provided.

Antenna-feeder system of ARC “Kalina” in the first variant is based on two circular antenna arrays (CAA) with diameters of 120 and 60 m, wideband active loops able to receive radio waves with vertical and circular polarization are used as antenna elements of these arrays.

ARC “Kalina” has frequency stable by direction shape of pattern of beams in entire azimuth circle $0^\circ \dots 360^\circ$ (see Attachment A and B).

Equipment of complex “Kalina” is placed inside equipped premises and can be supplied in three following modifications of AFS:

- 1) with AFS on the base of two CAA (diameters 60 and 120m);
- 2) with AFS on the base of single CAA (diameter 60 m);
- 3) with AFS on the base of 6 V-shaped antennas

COMPOSITION

Variant 1 (two antenna arrays):

- antenna element of the first band	– 32 pcs.
- antenna element of the second band	– 32 pcs.
- beam-forming rack	– 2 pcs.
- rack of switching, amplifying and dividing	– 2 pcs.
- rack for band switching	– 1 pcs.
- control unit	– 1 pcs.
- complete set of connecting cables	– 1 set
- main HF-feeders	– 64 pcs.
- complete set of mounting parts	– 1 set
- complete set of operational and maintenance documentation	– 1 set
- equipment of posts	– 2...16 sets

(each post consisting of: receiver “Galaktika-M” - 2 pcs.,
computer with base software demodulator of signals W-CODE - 1 pcs.)

Variant 2 (one antenna array):

- antenna element	– 32 pcs.
- beam-forming rack	– 1 pcs.
- rack of switching, amplifying and dividing	– 1 pcs.
- control unit	– 1 pcs.
- complete set of connecting cables	– 1 set
- main HF-feeders	– 32 pcs.
- complete set of operational and maintenance documentation	– 1 set
- complete set of mounting parts	– 1 set
- equipment of posts	– 2...16 sets

(each post consisting of: receiver “Galaktika-M” - 2 pcs.,
computer with base software demodulator of signals W-CODE - 1 pcs.)

Variant 3 (V-shaped antennas):

- V-shaped beam antenna element with counterweights L= 50 m (antenna diameter 120 m) – 6 pcs.
 - rack of antenna elements switch 6×8 (6 inputs 8 outputs) – 1 pcs.
 - control unit – 1 pcs.
 - complete set of connecting cables – 1 set
 - main HF-feeders – 6 pcs.
 - complete set of mounting parts – 1 set
 - complete set of operational and maintenance documentation – 1 set
 - equipment of posts – 2...16 sets
- (each post consisting of: receiver “Galaktika-M” - 2 pcs.,
computer with base software demodulator of signals W-CODE - 1 pcs.)

TECHNICAL PARAMETERS

	Variant 1	Variant 2	Variant 3
Frequency band	1.5-30 MHz		
Sensitivity	0.5-3 μV/m	1-9 μV/m	3-15 μV/m
Third order intermodulation dynamic range	> 90 dB		
Number of beams of AFS	32	32	6
Width of patterns of AFS beams	10°...75°	10°...150°	60°...90° in the band 5-30 MHz)
Analyzed frequency bandwidth	0.1 - 12 kHz		
Automatic demodulation, decoding, signal registration using W-CODE software	available (from 2 to 16 posts)		
Lightning and surge protection	available		
Supply voltage	220 V (±15%), 50 Hz		
Minimal number of independently switched receiver channels connected to outputs of AFS with a possibility of increasing to N×8 (N=1...4)	8		
Temperature range : - in attended premises - in unattended premises - in the open air	<ul style="list-style-type: none"> - from plus10° to plus 40° C - from 0° to plus 50° C - from minus 40° to plus 65° C 		

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