Multibeam AFS-16V «ZONT»

AFS-16V «Zont» is designed for beam reception of horizontally polarized radiofrequency signals in the bandwidth of 1.5 – 30 MHz.

AFS-16V «Zont» consists of sixteen inclined V-shaped antenna elements (AE) evenly arranged in a circle for providing beam reception of signals in any direction of azimuth plane.

Diagram of V-shaped antenna element is presented on figure 1.

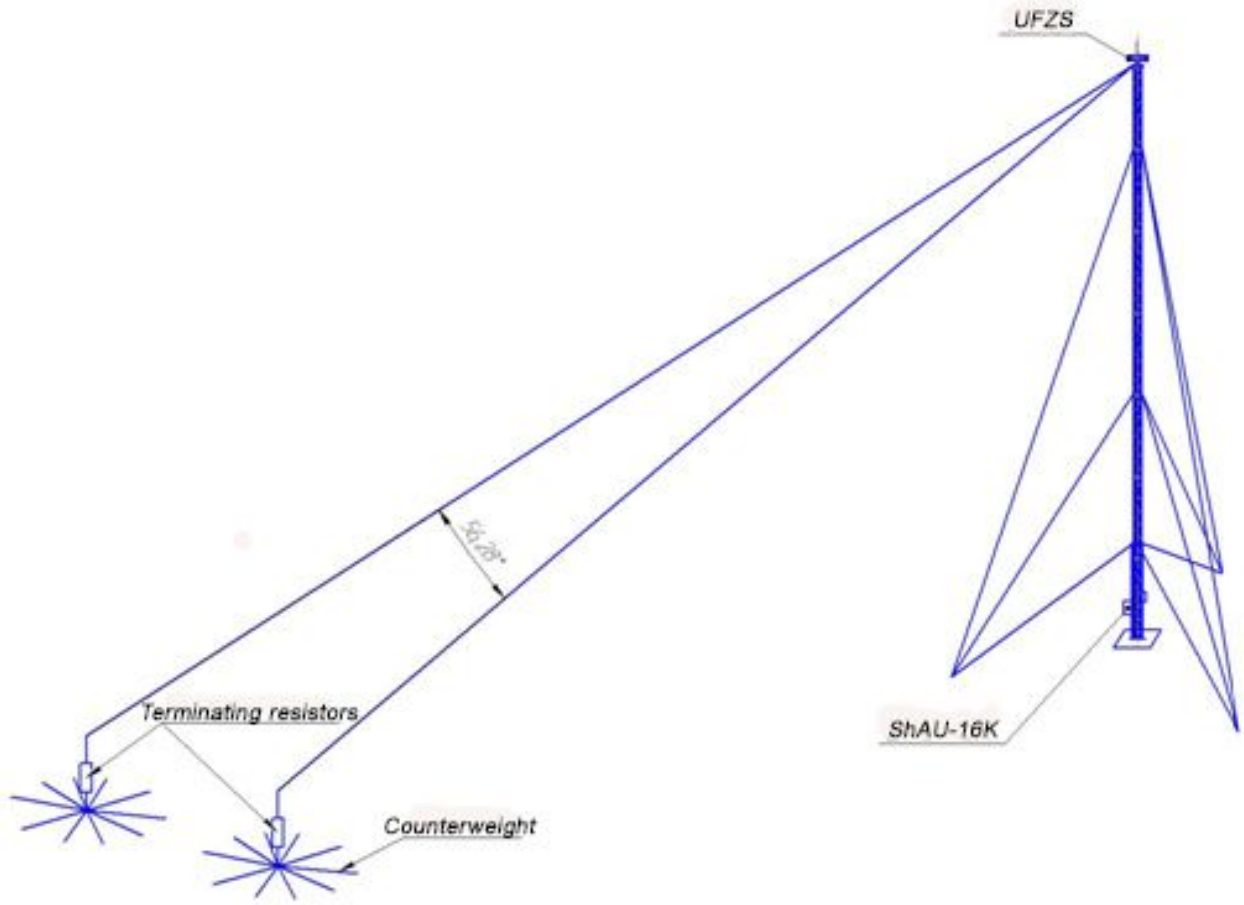


Figure 1 – V-shaped antenna element from the composition of AFS-16V «Zont»

V-shaped antenna element is progressive wave antenna with beam length of 63 m and terminating resistor 390 Ohm. Angle between beams comprises 56.25 degrees. Every antenna element contains unit UFZS (unit of forming, protection and balancing) purposed for matching output resistance with input resistance of ShAU-16K (wideband antenna amplifier). Also units UFZS contain lightning protection units realized on the base of gas-discharge devices.

Height for UFZS units' suspension is 19.5 m.

AFS-16V «Zont» and principle of antenna elements formation are presented on figure 2.

Divergent ends of AFS guys are connected to terminating resistors with rating 390 Ohm. Grounding of resistor is provided by connecting its pins to counterweight. Counterweight consists of ten five meter beams radially arranged in a circle and con-

nected in the center. Counterweight provides capacitive connection of antenna beam with ground.

Convergent ends of AFS guys are connected to corresponding inputs of UFZS units.

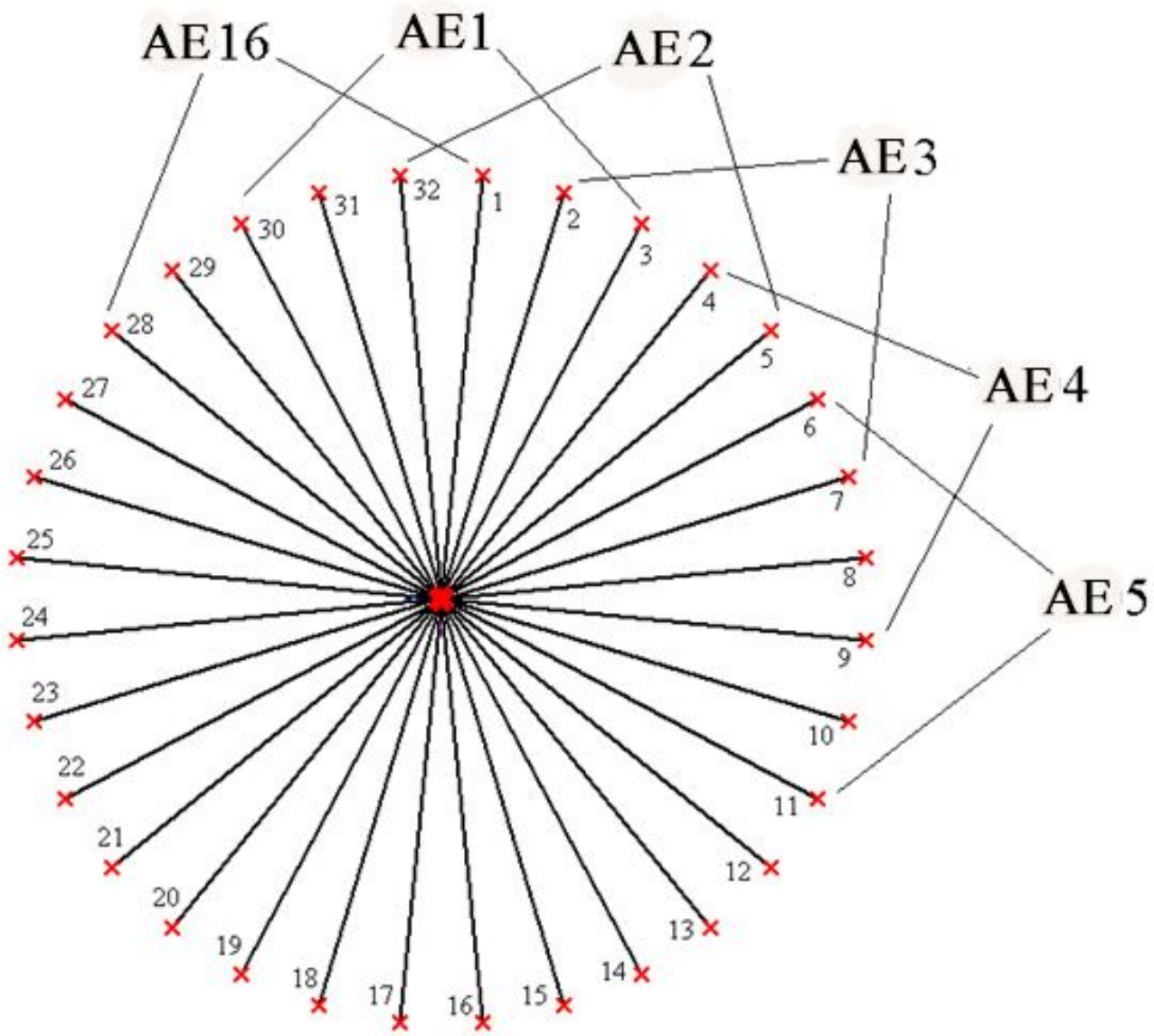


Figure 2 – Layout of AFS-16V «Zont» (plan view)

Computed patterns of antenna element of AFS -16V «Zont» in azimuth and elevation planes for horizontal polarization are presented of figure 3.

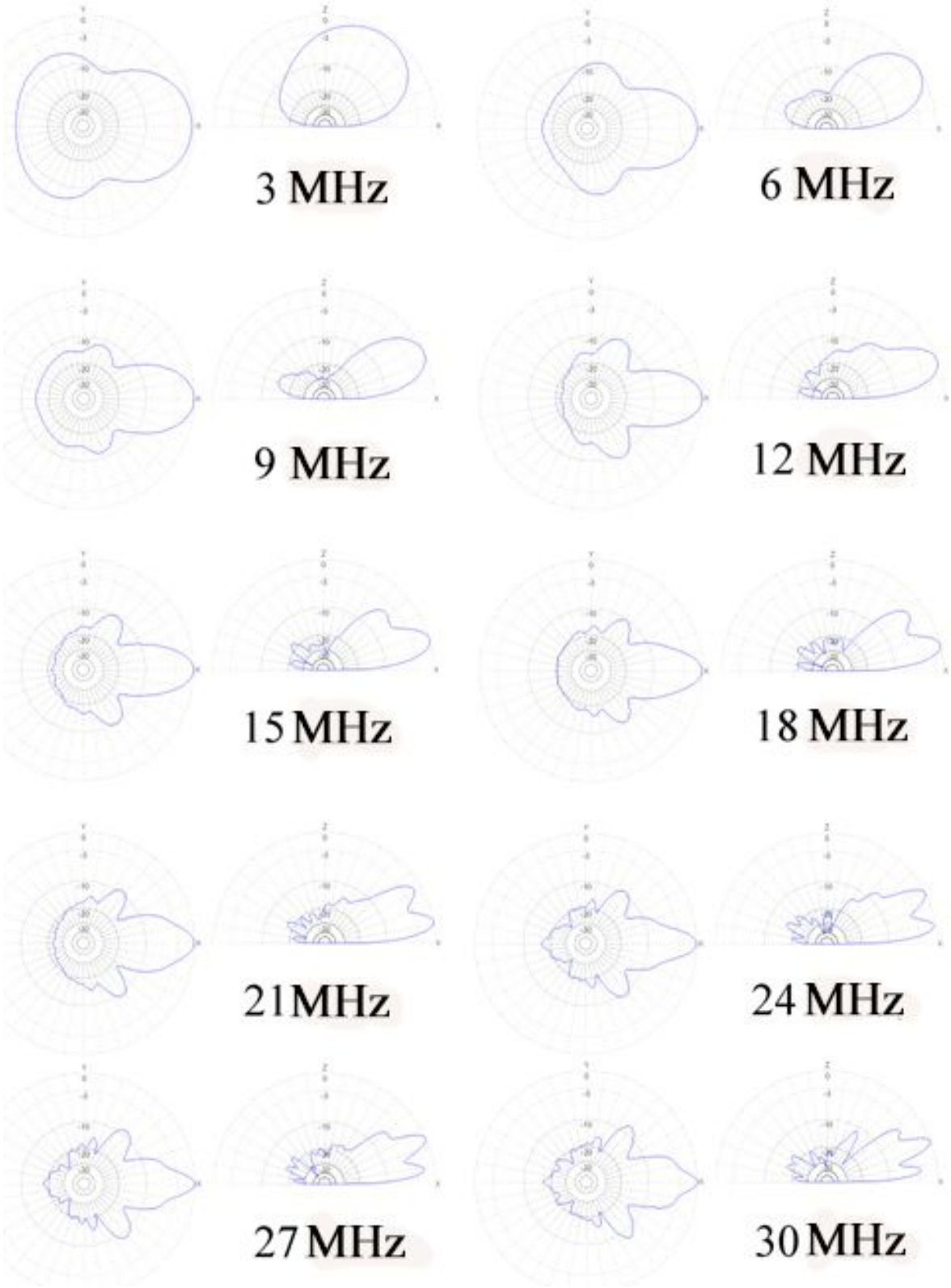


Figure 3 – Computed patterns of single AE in the composition of AFS-16V «Zont» for horizontal polarization

Also AFS-16V «Zont» contains unit ShAU-16K and sixteen trunk cables. Wideband antenna amplifier is designed for signals amplifying and loss compensation in cables transmitted from antenna-feeder system AFS-16V to switcher AK-24×24.

Unit ShAU-16K is a sixteen-channel amplifier consisting of separate 16 units ShAU.

Trunk cables transmitting received signals from antenna field to receiver also power ShAU-16K from switcher's racks with voltage +15 V.

Lightning protection in AFS-16V «Zont» is provided both by circuitry (elements of lightning protection in UFZS units) and by construction decision: on top of the mast is installed a lightning rod, connected with a help of a grounding bus with protective earthling loops, provided by the Customer.

Technical parameters of AFS-16V «Zont»:

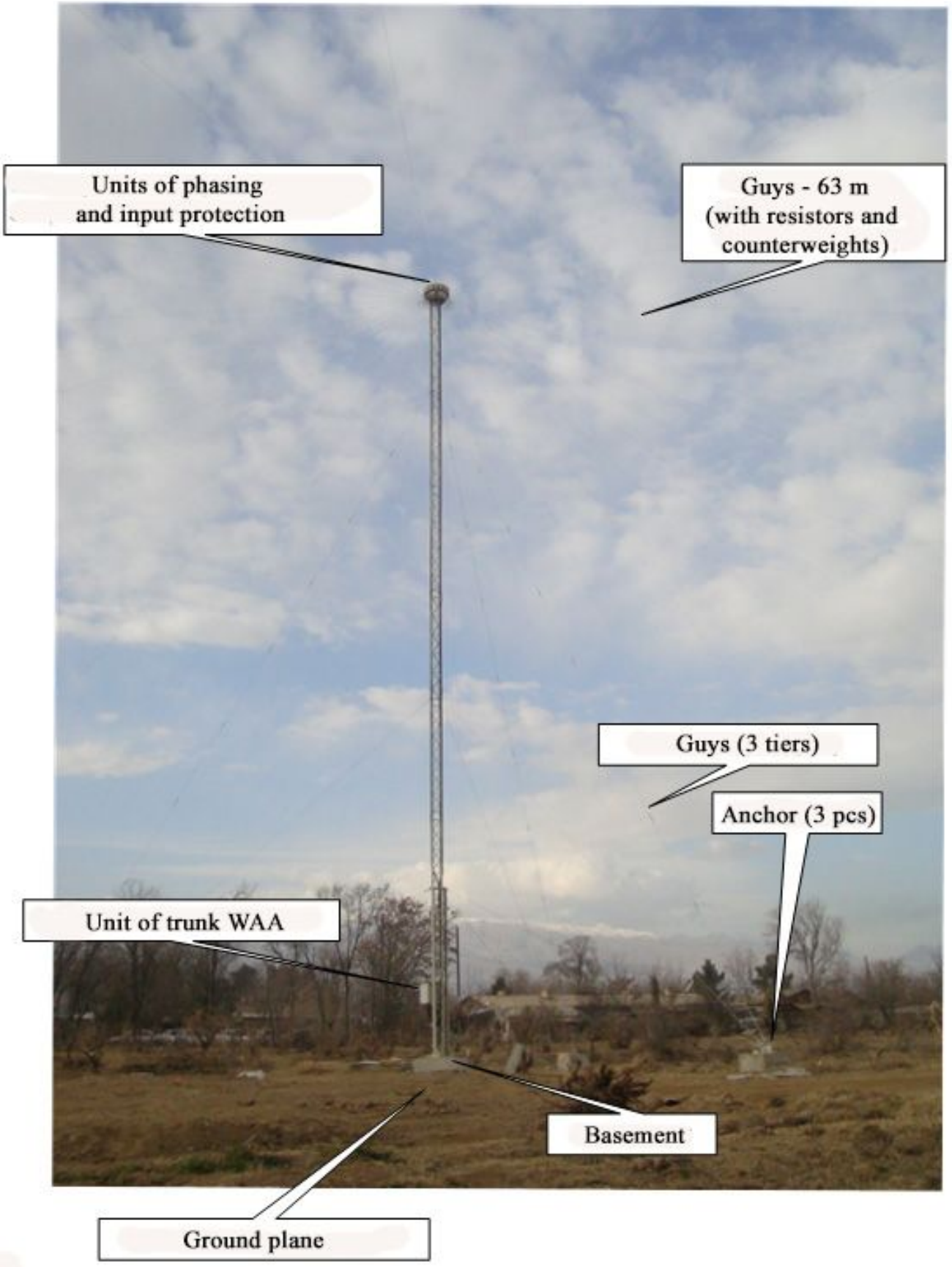
- frequency band – **from 1.5 MHz to 30 MHz;**
- polarization of received radiowaves – **horizontal;**
  (radiowaves with vertical polarization are also received, but parameters are not rated)
- impedance of V-shaped antennas: **50 Ohm;**
- directive gain in the frequency band 3 – 30 MHz: **from 5 dB to 20 dB;**
- gain factor of AE in the frequency band 3 – 30 MHz: **from –7 dB to 8 dB;**
- SWR of antenna elements: **≤ 2;**
- ShAU-16K input/output SWR: **≤ 2;**
- transmission gain of every amplifier of ShAU-16K: **+ 7 dB ± 0.5 dB;**
- noise factor of every amplifier of ShAU-16K: **≤ 5;**
- dynamic range by amplifier combinations $mf_1 \pm nf_2$ – **not less than 95 dB;**
- angle resolution of beam arrangement in AFS by azimuth – **22.5°;**
- number of AFS outputs for signal feeding to antenna switcher – **16**

Multibeam AFS-16V «Zont» on position

Multibeam AFS-16V «Zont»
(before raising)

Unit of trunk WAA of
Multibeam AFS-16V «Zont»

Picture of AFS "Zont" on the base of 16 V-shaped antennas



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