

FIELD UNIVERSAL HF ANTENNA RV3DA

In Russia summer traditionally is the season for radio expeditions. So, the question about a field antenna stands before hundreds radio amateurs. Certainly, it is impossible to give one answer to this question. A design of an antenna for fields depends on many factors. There are frequencies bands used by radio expedition, local factors for antenna installation, time and money and so on. Igor, RV3DA, has developed universal wire antenna. This one with ATU works well on all amateurs short-wave ranges, including WARC. factors. There are frequencies bands used by radio expedition, local factors for antenna installation, time and money and so on. Igor, RV3DA, has developed universal wire antenna. This one with ATU works well on all amateurs short-wave ranges, including WARC.

Igor Grigor'ev, RV3DA

RK3DZD@falcon.ru
[http:// www.qsl.net/rk3dzd](http://www.qsl.net/rk3dzd)

The antenna has a triangular shape, one of the ends of the triangular is grounded. **Figure 1** shows the circuit of the antenna. A good grounding is necessary for successful work of the antenna. However, the antenna provides good work without good grounding also.

The antenna was tested by team of collective radio station RK3DZD in field conditions.

On Eastern Sunday April 11 we have been going to RDA- pedition. About RDA program you can see [page 86, ANTENTOP# 2- 2004](#). Our team (RD3DT, UA3DUS, RZ3DT and RV3DA) and buys settled down at picturesque surroundings of the edge of Tsna river, Egor'evskoe area [MO-62](#) at Moscow oblast.

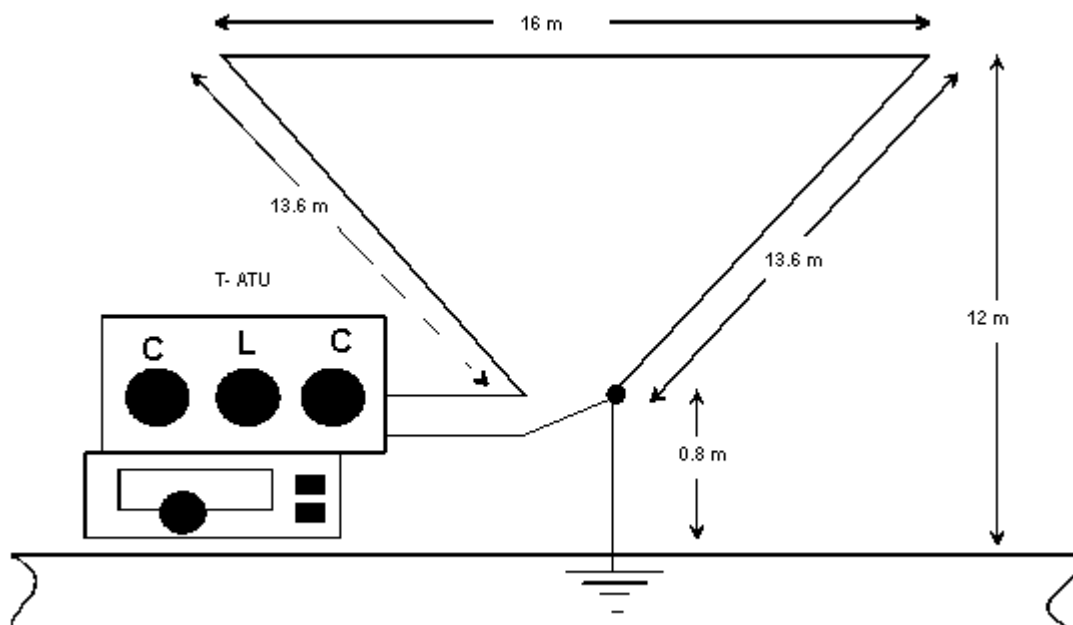


Figure 1

Yuri, RA3DUF, hanged our antenna on the nearest pines. TNX to Yuri, RK3DUF for steeplejack works! You can see a photo of the antenna (antenna colored by red). The antenna had no feeder and was connected directly to a transceiver FT-847 through a home- made T- ATU that was placed at the table. We used an automobile accumulator 55-A/h and gas-generator Honda for feeding our equipment.

Grounding was very bad - a pipe in diameter of 1/2" and in length of 1 meter. The ground was very damp, ten meters father from the antenna a river was. The antenna was hanged between two high pines.

What we have had:

1. 40 meters - is higher than any praises. Really, we ruled by pile- up from tens calling stations. Simultaneously we received as local as DX- stations.
2. 20 meters – the directivity of the antenna did bad effect for us. The antenna was directed to the North - South, that it was not good for us. Southern radio stations simply rattled in the Air!

3. 15 meters- Japanese called us very loudly.
4. On 10 meters was dead (no propagation).
5. 80 meters – we received very loudly many radio station from Siberia (2000- 3000 kms from us) but our sign was received poor in Siberia because, as we think, of poor grounding.

Below given diagram directivity for the antenna obtained with help of free antenna program MMANA (MININEC based). Left diagram is a section of the volumetric diagram directivity of plane X-Y at a zenith corner of the maximum radiation. The right diagram is section of the volumetric diagram directivity of plane X-Z. Also at the right down corner of the pictures is a table with antenna impedance. Please, take attention to the data, you can do decision how you ATU does match of the

73!
Igor Grigor'ev, RV3DA

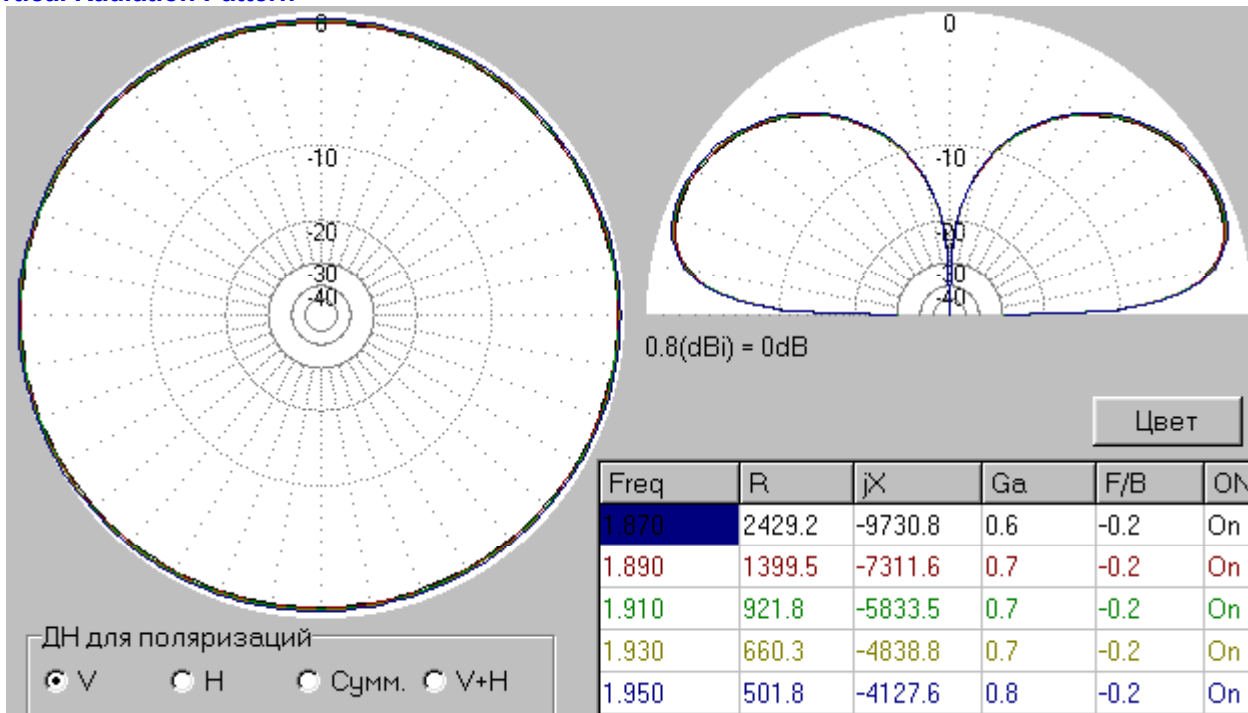


So our first workplace looked. As usual, we had too little time for preparing before our pedition, so, we

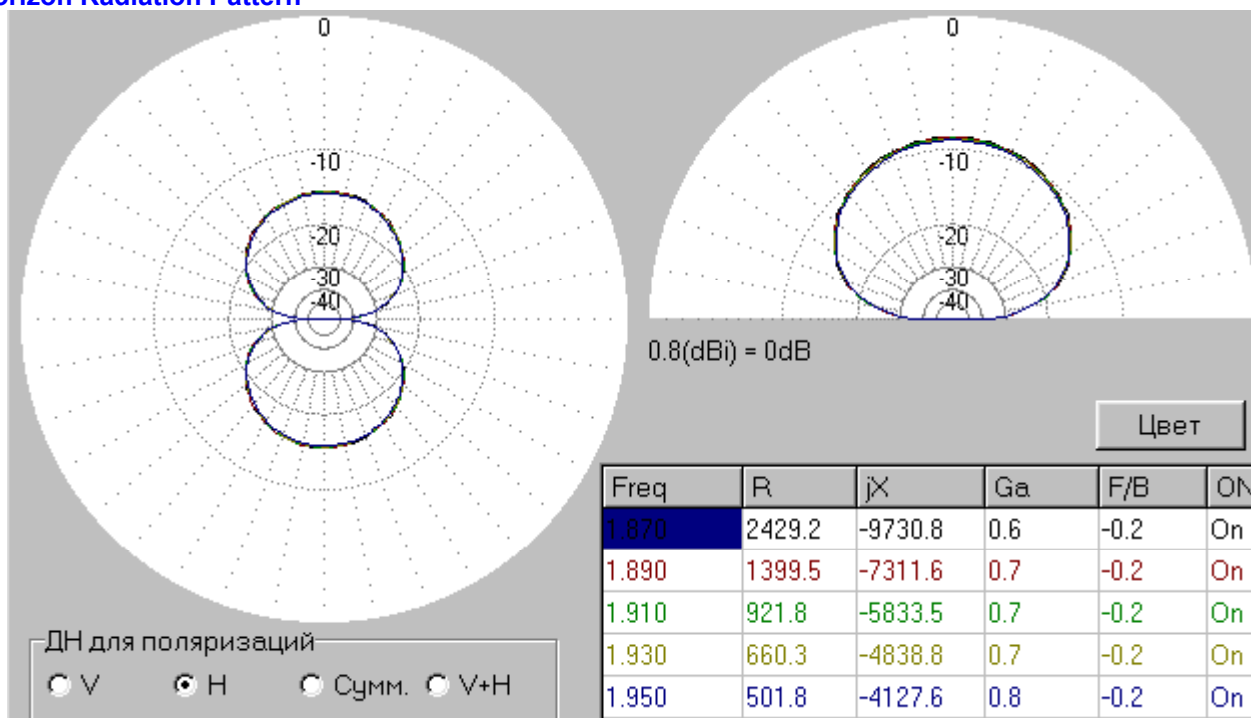
have used "table" T-ATU. Two air variable capacitors and a variable inductor placed on the table without any case. Yury, RK3DUF, did DX- QSO.

Antenna RV3DA at 160-m

Vertical Radiation Pattern



Horizon Radiation Pattern

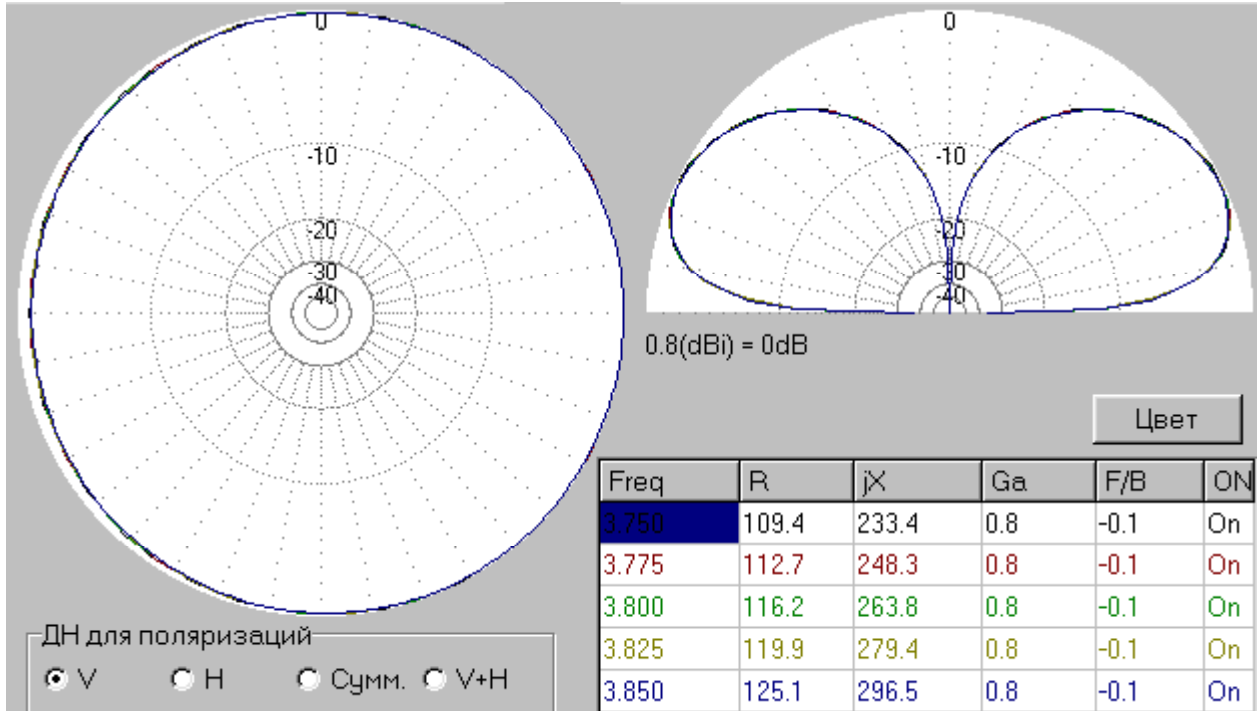


Comments: Antenna radiates mainly radio waves with vertical polarization. A very good pattern with low lobes in the vertical plane. Circular pattern in horizontal plane. It is fine for DX- QSO. But antenna has Z= 921-j5833-Ohms at 1910-kHz. Not all ATUs do good matching for such load.

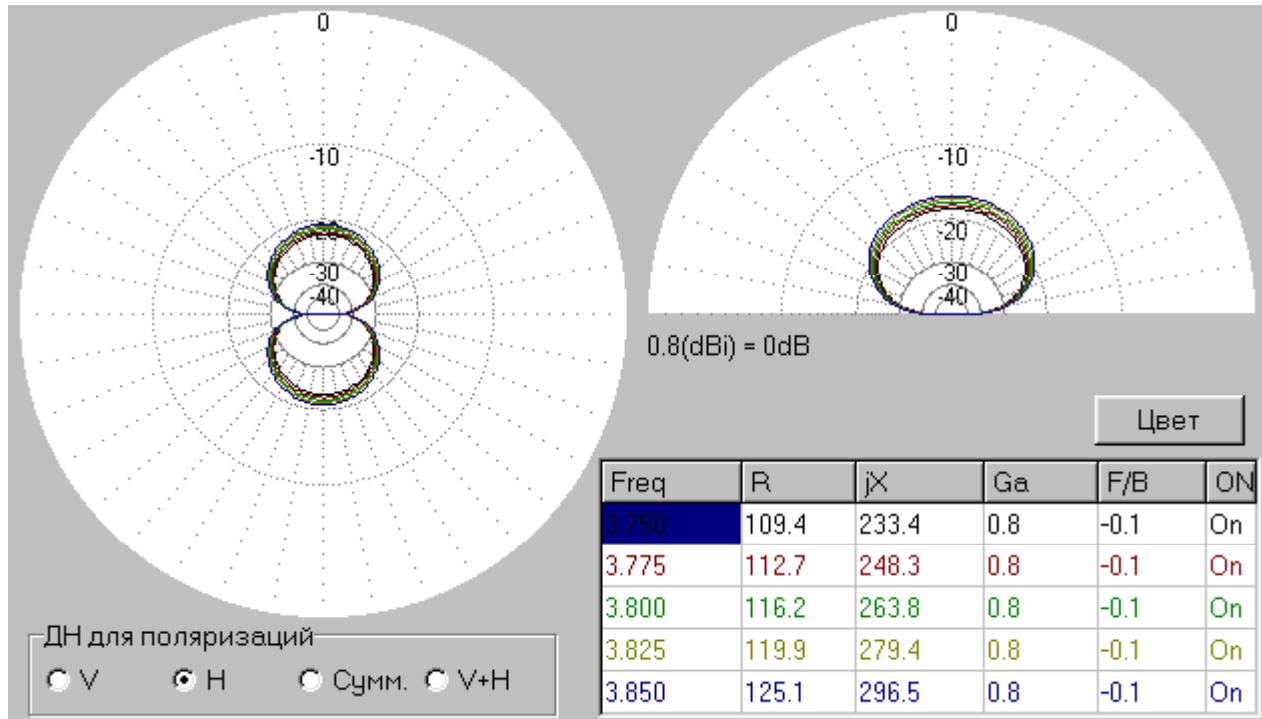


Antenna RV3DA at 80-m

Vertical Radiation Pattern



Horizon Radiation Pattern

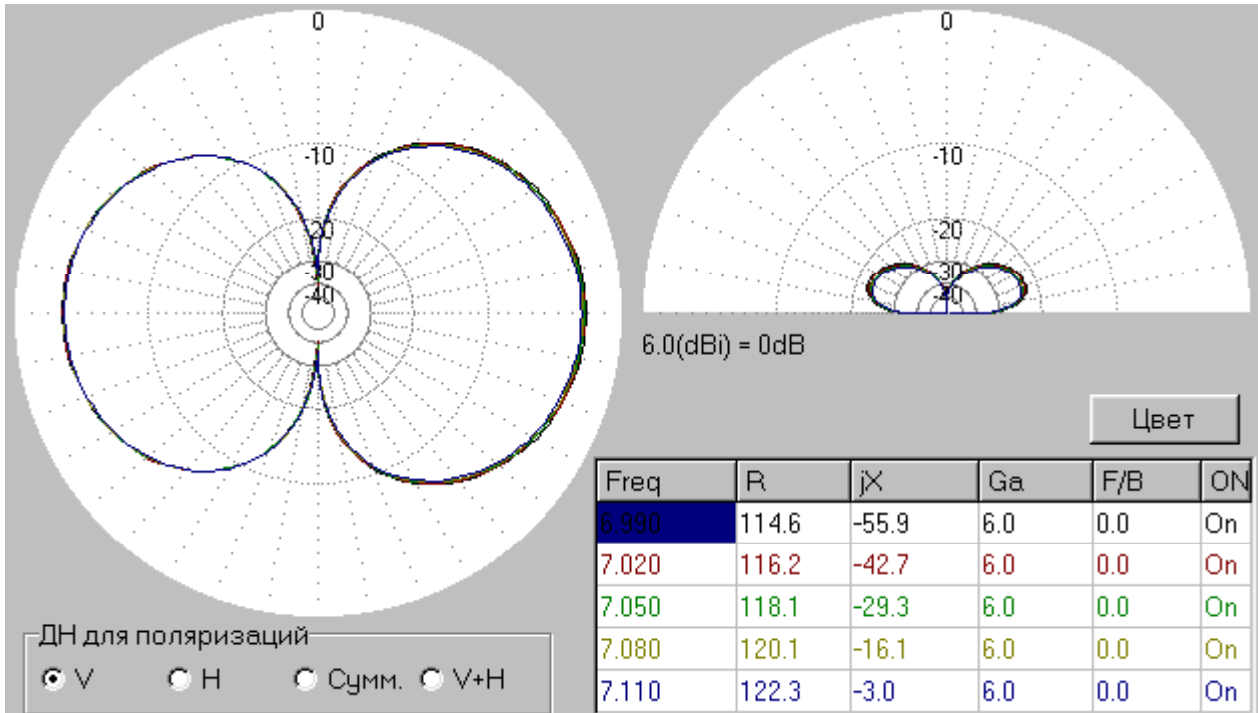


Comments: Antenna radiates mainly radio waves with vertical polarization. A very good pattern with low lobes in the vertical plane. Circular pattern in horizontal plane. It is fine for DX- QSO. Antenna has $Z = 116 + j263$ -Ohms at 3800-kHz. Almost any ATU does good matching for such load.

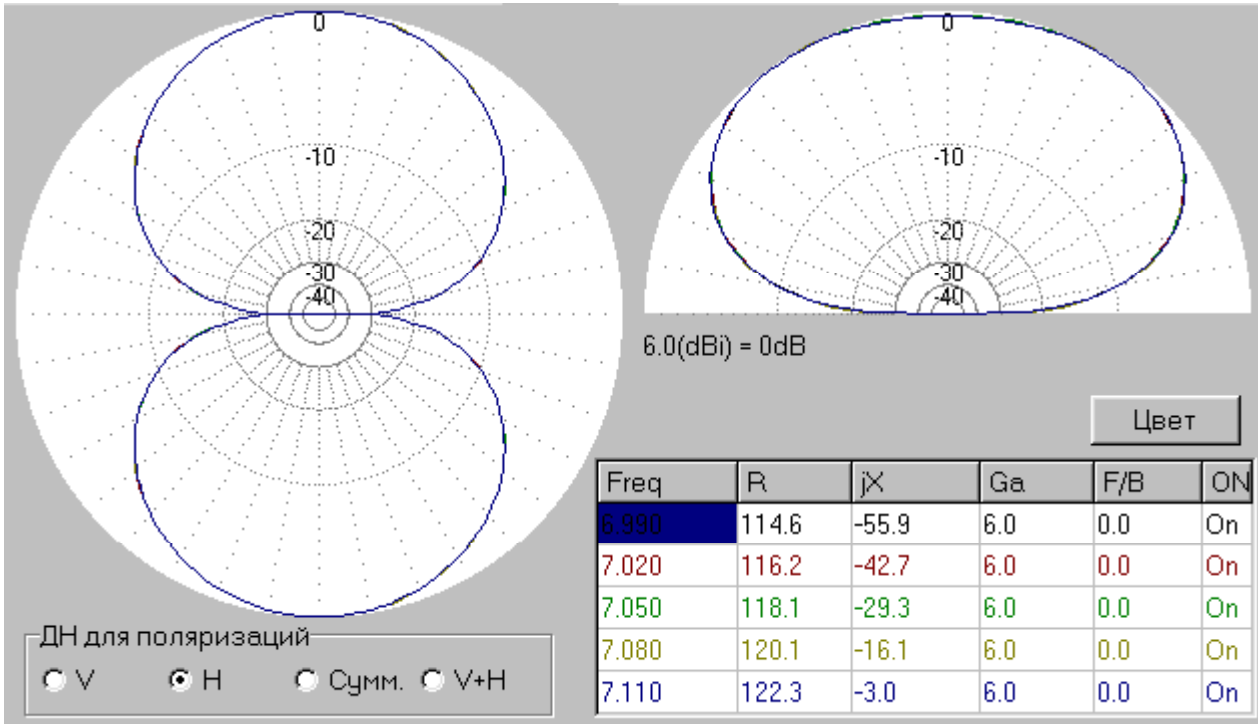


Antenna RV3DA at 40-m

Vertical Radiation Pattern



Horizon Radiation Pattern

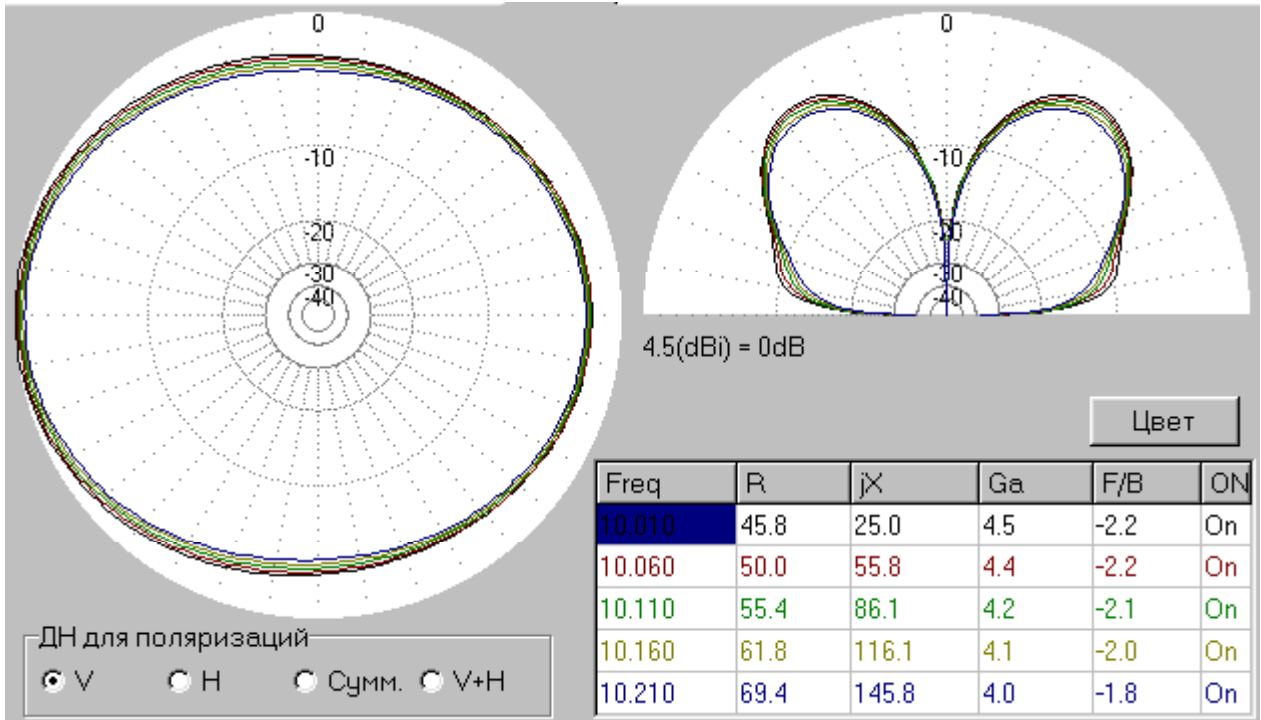


Comments: Antenna radiates mainly radio waves with horizontal polarization. A good pattern in the vertical plane. Antenna has strong zenith radiation that allows to do local QSOs. "Eight-figure" pattern in horizontal plane, so, it demands to choose a proper direction before an installation of the antenna. Antenna is fine for DX and local QSOs. Antenna has Z= 116+ j263-Ohms at 3800-kHz. Almost any ATU does good matching for such load.

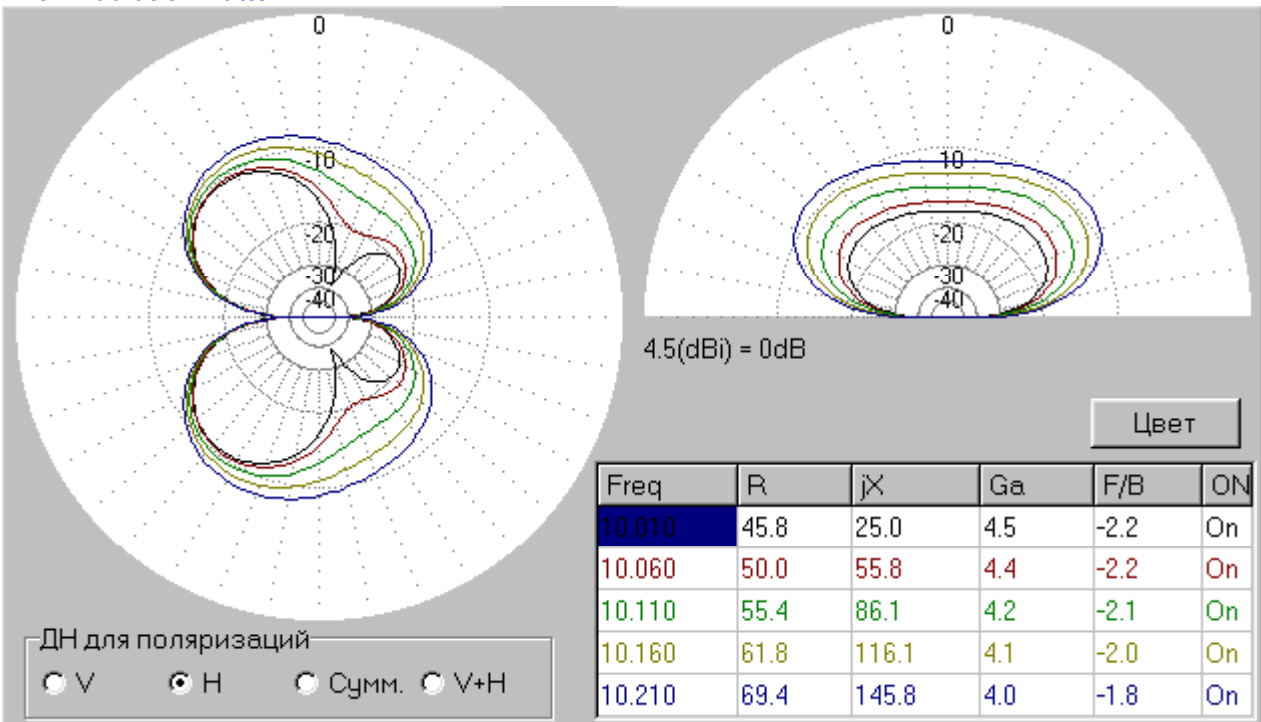


Antenna RV3DA at 30-m

Vertical Radiation Pattern



Horizon Radiation Pattern

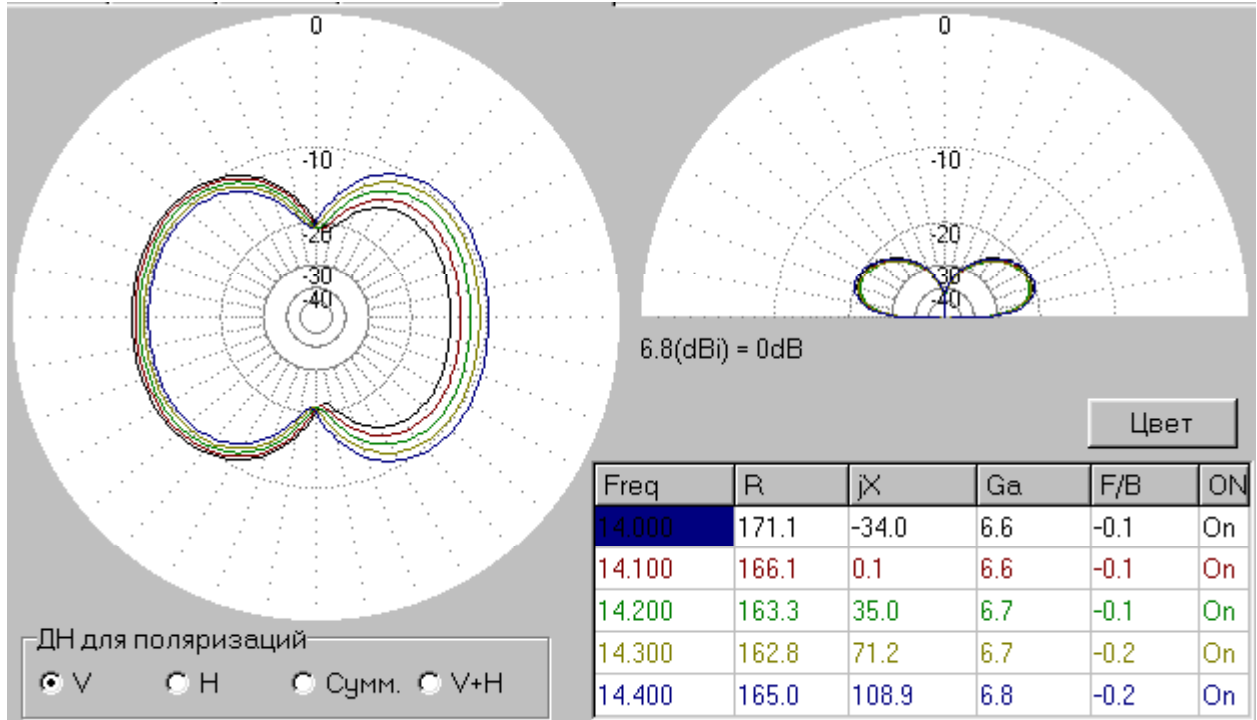


Comments: Antenna has strong vertical radiation. Not bad pattern in the vertical plane. Antenna has strong radiation at high corners that allows to do local QSOs. Antenna has almost circular pattern in horizontal plane. Antenna provides DX and local QSOs. Antenna has $Z = 55 + j86$ -Ohms at 1010-kHz. Any ATU does good matching for such load.

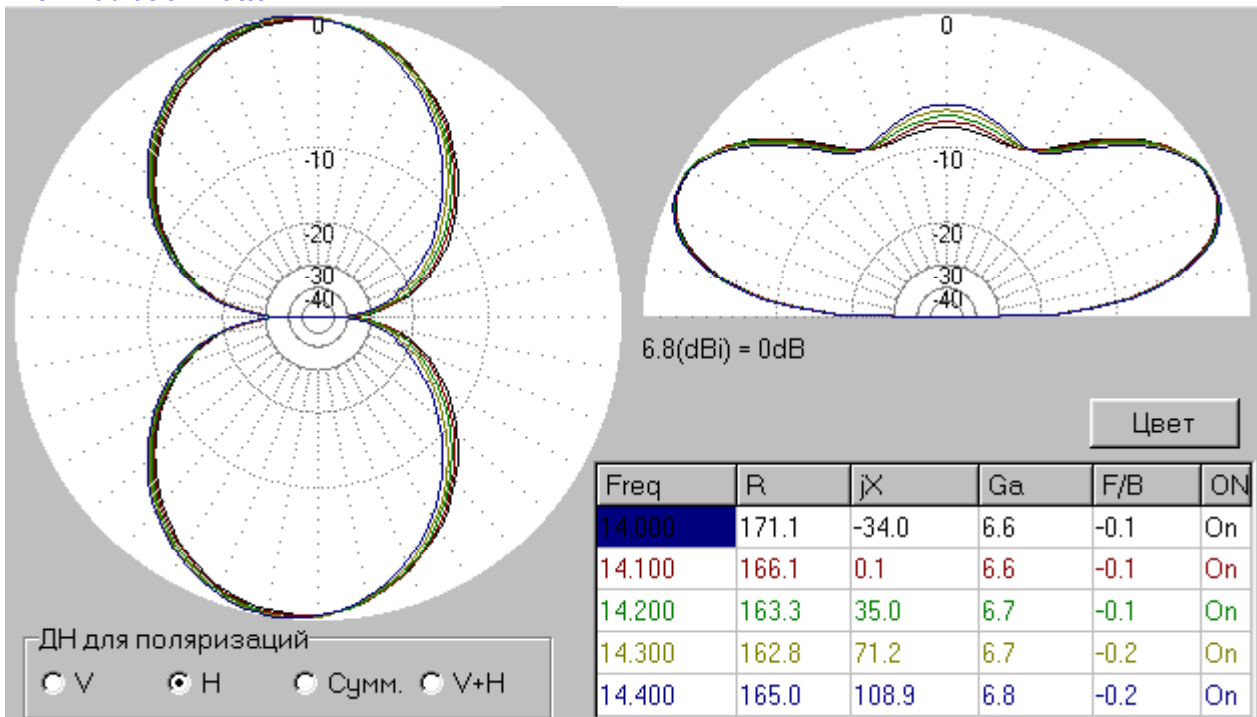


Antenna RV3DA at 20-m

Vertical Radiation Pattern



Horizon Radiation Pattern

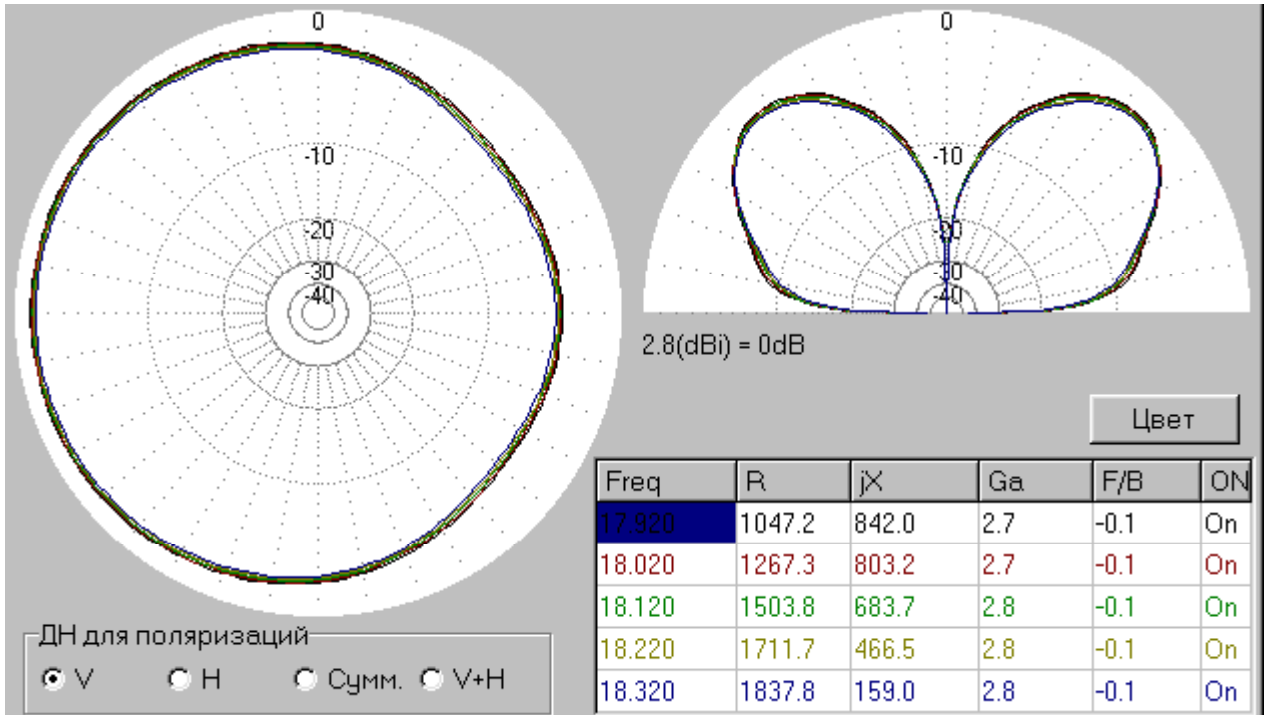


Comments: Antenna has strong horizon radiation. A good pattern in the vertical plane. Antenna has a strong radiation at low corners that allows to do DX QSOs. Antenna has almost “eight- figure” pattern in horizontal plane, so, it demands to choose a proper direction before an installation of the antenna. Antenna provides DX QSOs. Antenna has the resonance at 14100-kHz at 166 Ohms. Any ATU does good matching for the antenna.

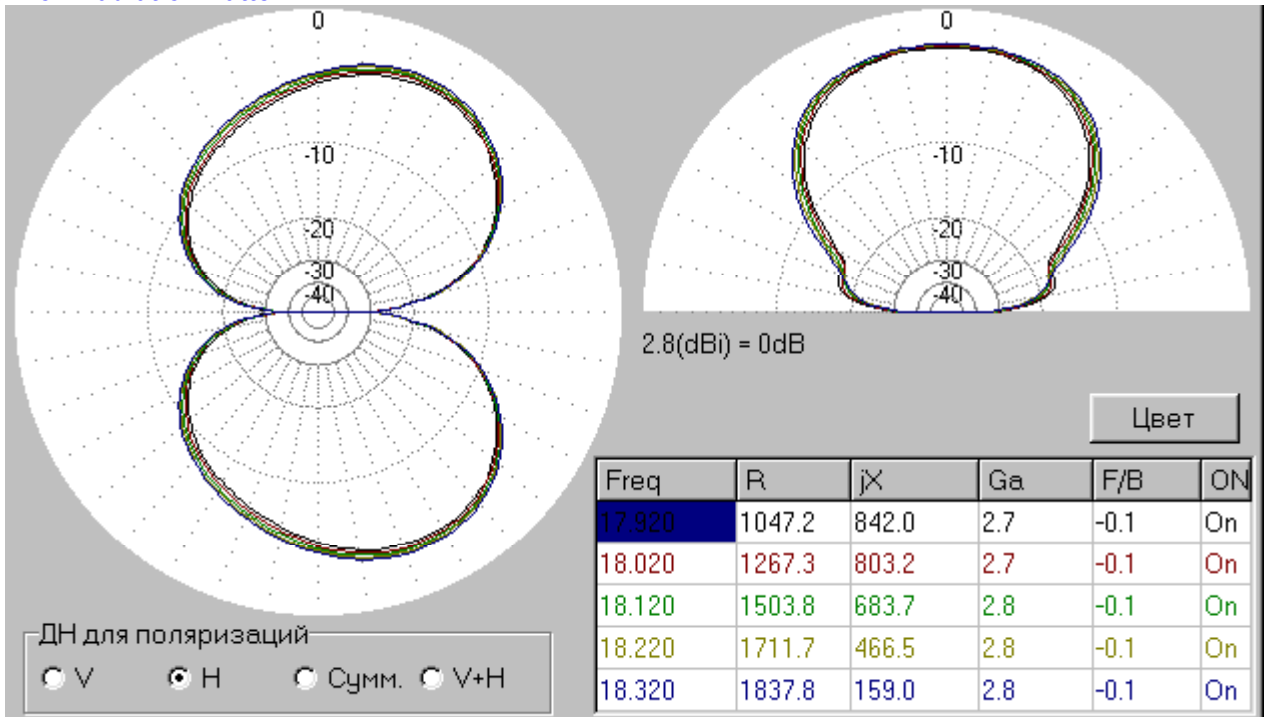


Antenna RV3DA at 17-m

Vertical Radiation Pattern



Horizon Radiation Pattern

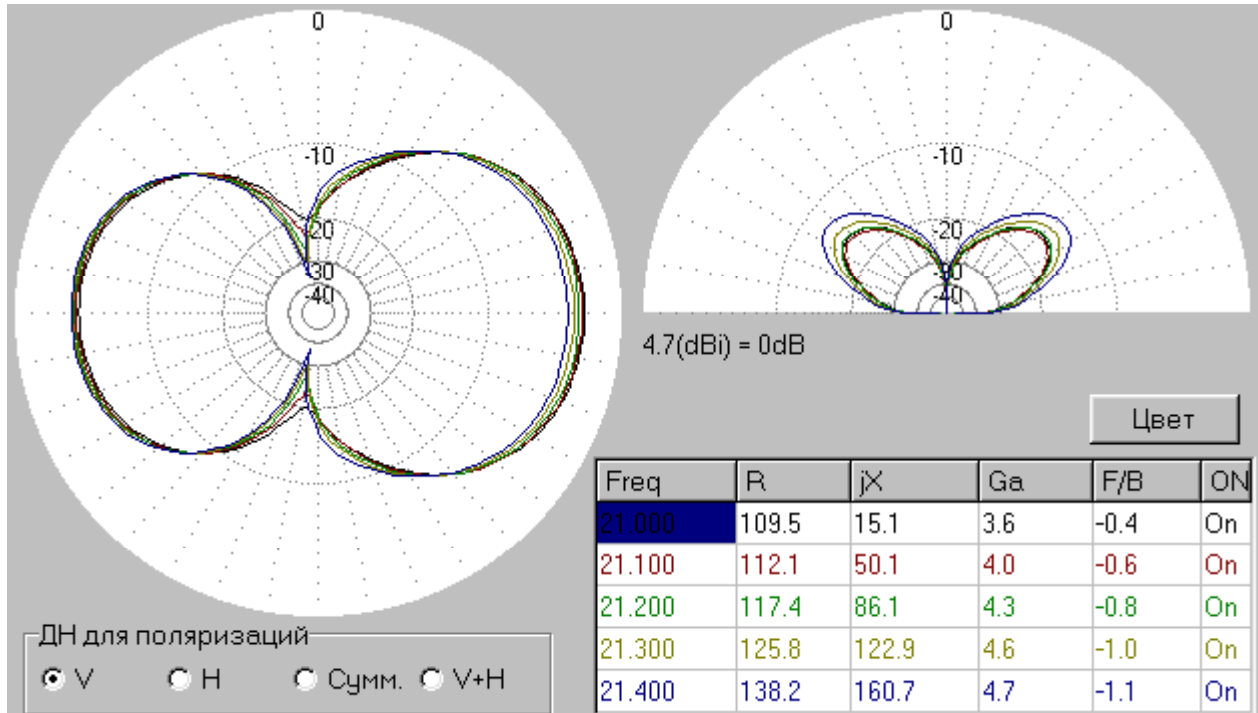


Comments: Antenna has both, a strong vertical and strong horizon radiation. For the vertical radiation antenna has a good pattern in the vertical plane, and almost circular pattern in the horizon plane. Pattern for horizon radiation is not so good as to vertical polarization. Antenna can provide DX QSOs at vertical and horizon radiation. Antenna has impedance 1711+j466-Ohms at 18220-kHz. Not all ATUs do good matching for such load.

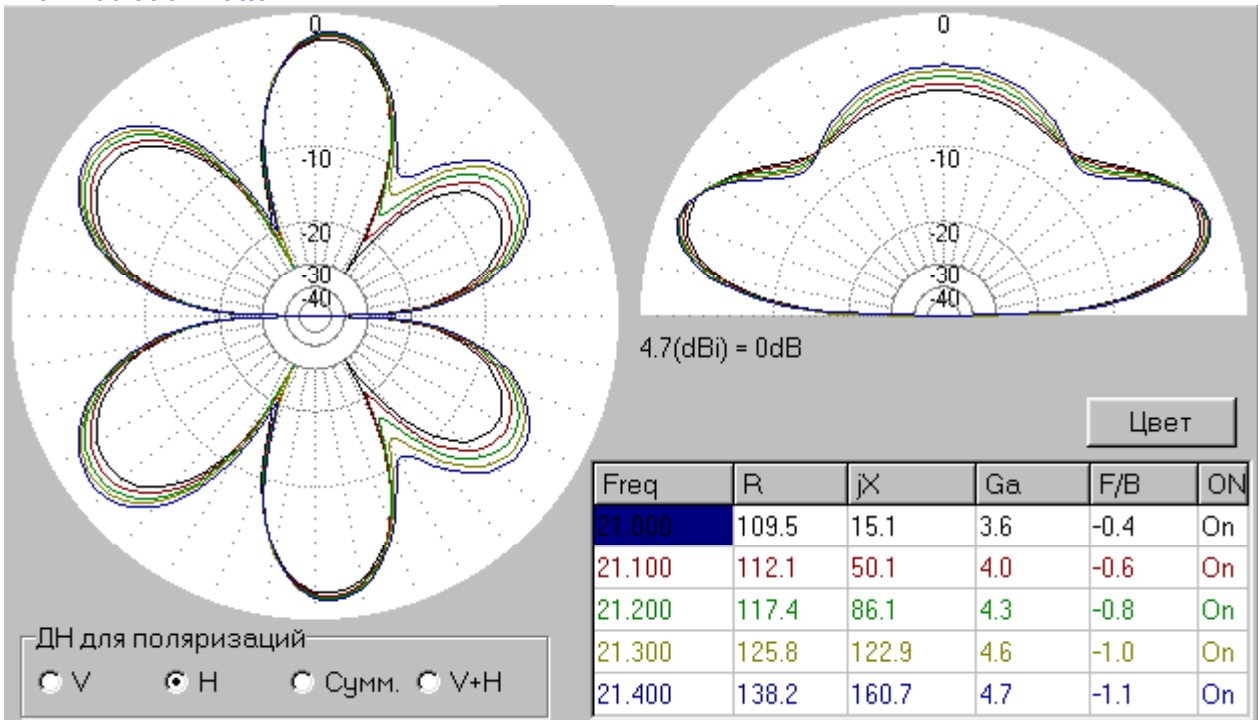


Antenna RV3DA at 15-m

Vertical Radiation Pattern



Horizon Radiation Pattern

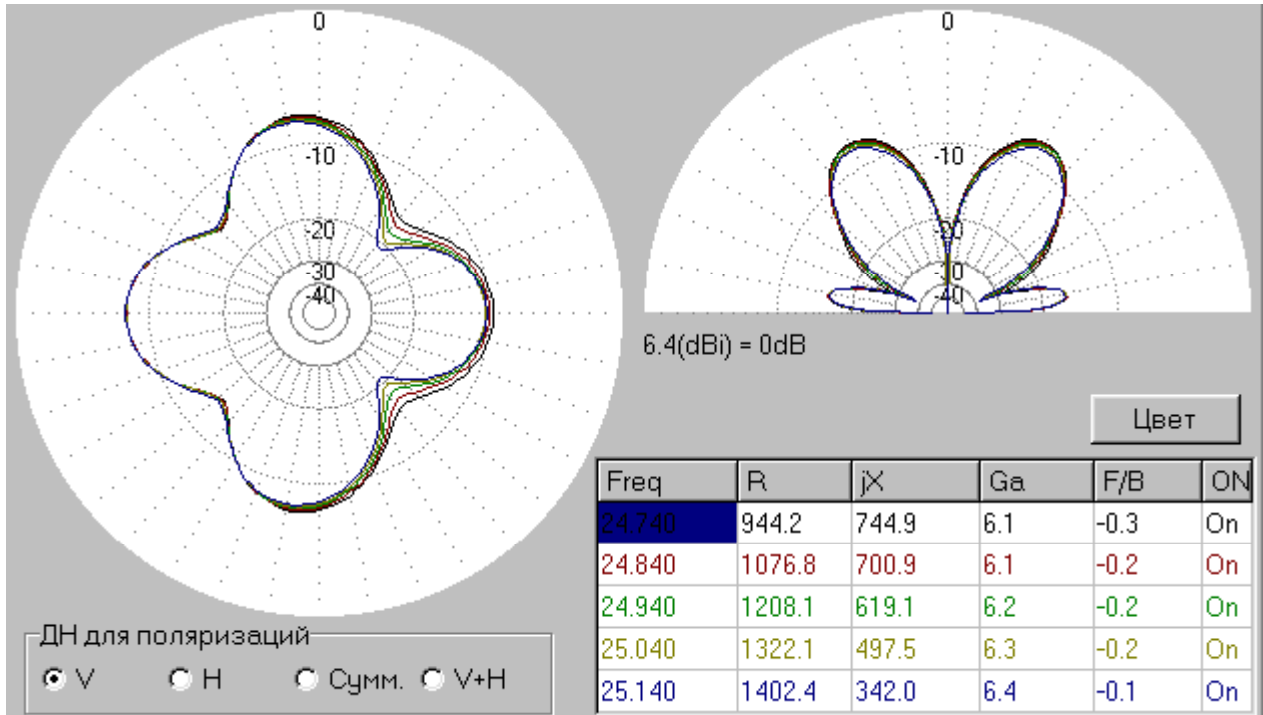


Comments: Antenna has both, a strong vertical and strong horizon radiation. For the horizon radiation antenna has a good pattern in the vertical plane with low lobes, and six-lobes pattern in the horizon plane. Pattern for the horizon radiation is not so good as to vertical polarization. Antenna can provide DX QSOs at vertical radiation. Antenna has impedance 117+j86-Ohms at 21200-kHz. Any ATU makes good matching for such load.

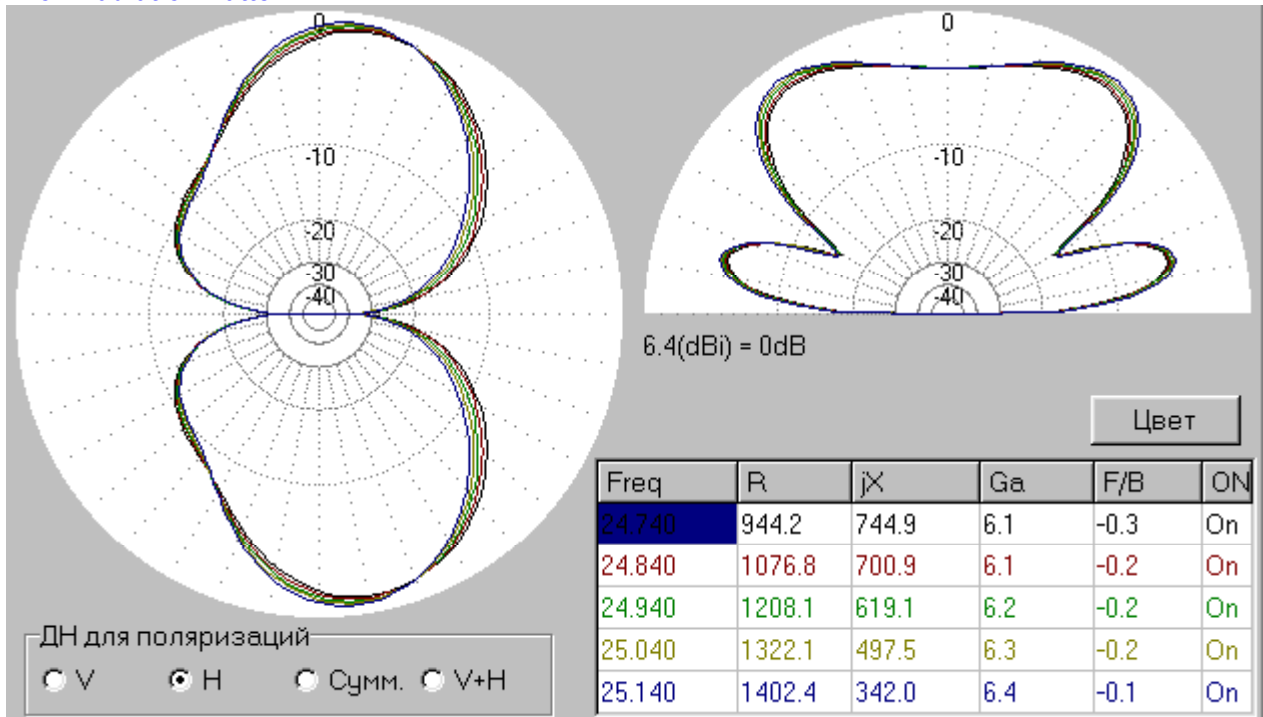


Antenna RV3DA at 12-m

Vertical Radiation Pattern



Horizon Radiation Pattern

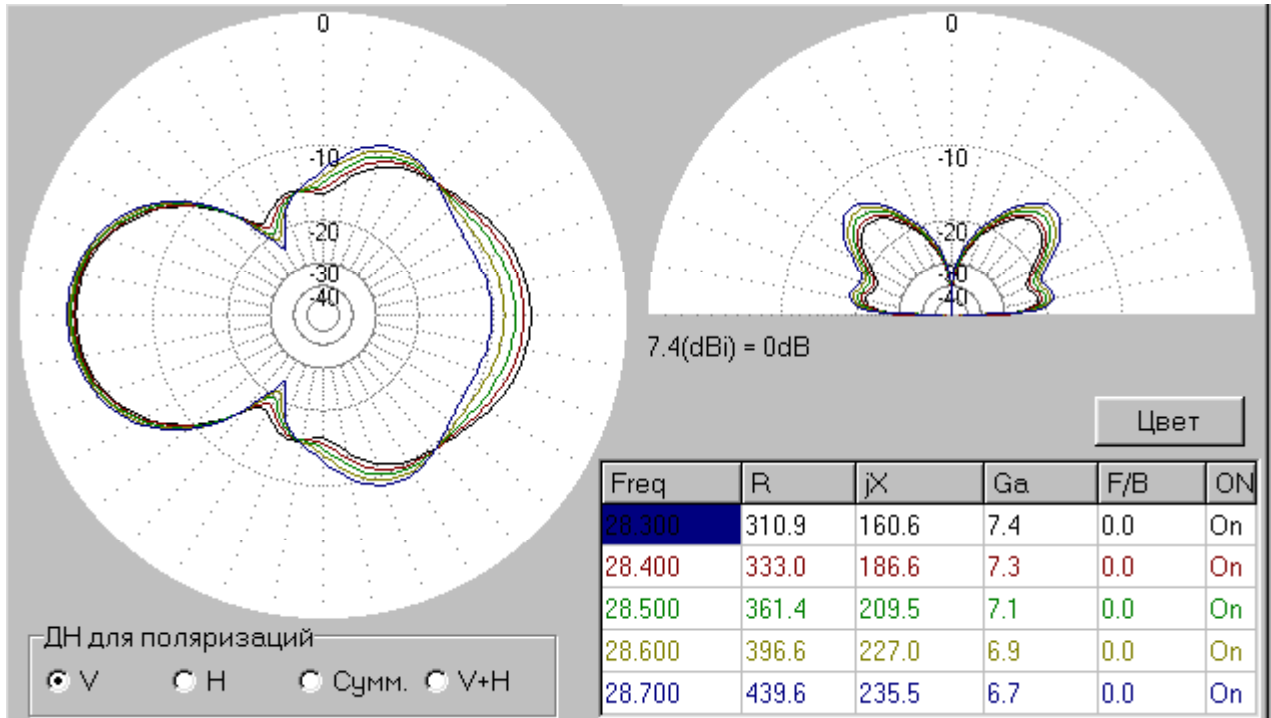


Comments: Antenna has strong horizon radiation. For the horizon radiation antenna has a not bad pattern in the vertical plane, and “eight- figure” pattern in the horizon plane. Antenna can provide DX QSOs at horizon radiation. Antenna has impedance 1208+j619-Ohms at 21200-kHz. Not all ATUs do good matching for such load.

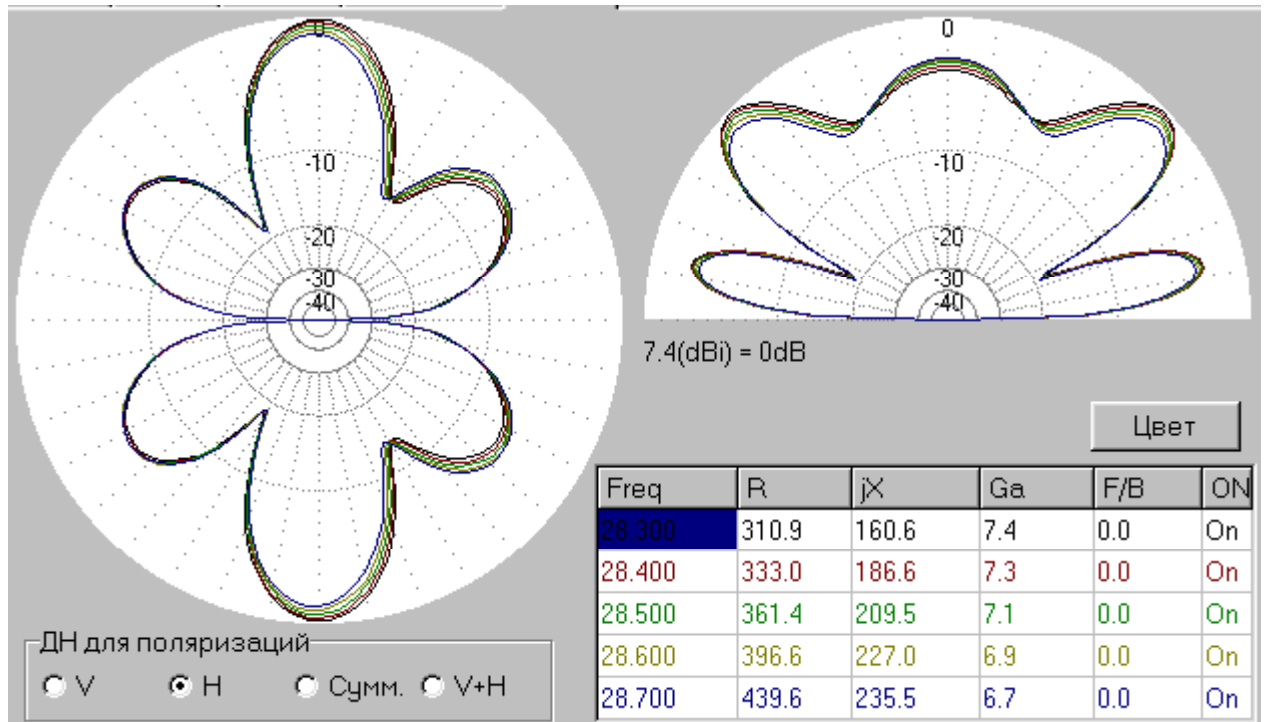


Antenna RV3DA at 10-m

Vertical Radiation Pattern



Horizon Radiation Pattern

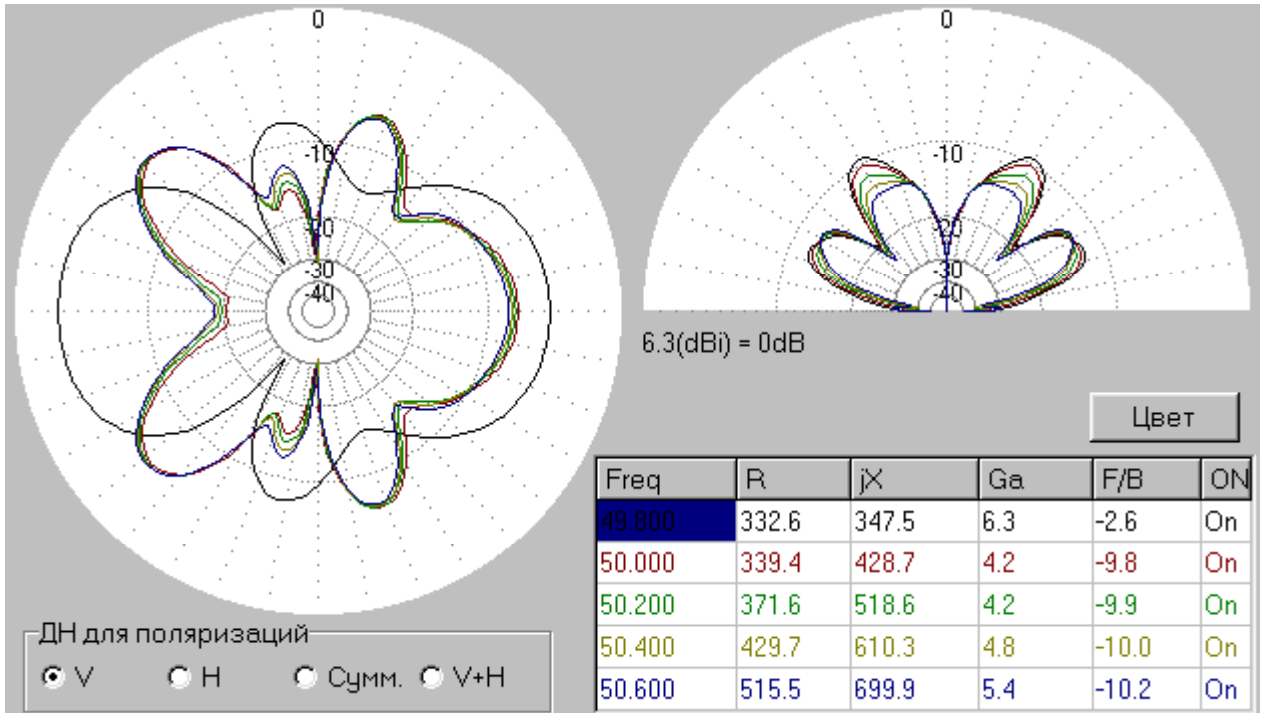


Comments: Antenna has strong horizon radiation. For the horizon radiation antenna has a not bad pattern in the vertical plane, and "eight-figure" pattern dropped to lobes in the horizon plane. Antenna can provide DX QSOs at the horizon radiation. Antenna has impedance 396+j227-Ohms at 28600-kHz. Not all ATUs do good matching for such load.

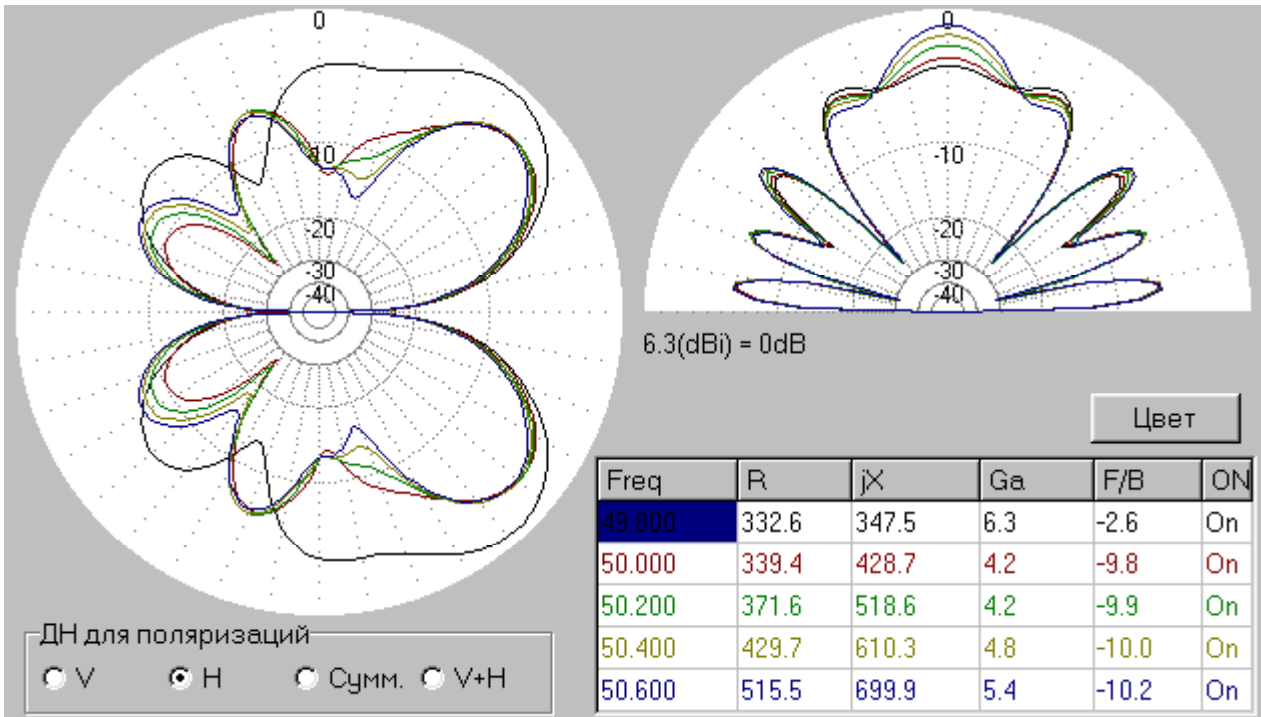


Antenna RV3DA at 6-m

Vertical Radiation Pattern



Horizon Radiation Pattern



Comments: Antenna has horizon and vertical radiation. For the horizon radiation antenna has a not bad pattern in the vertical plane, and “eight-figure” pattern dropped to lobes in the horizon plane. Antenna can provide DX QSOs at horizon radiation. Antenna has impedance 429+j599-Ohms at 50600-kHz. Not all ATUs do good matching for such load.

