

# ANTENTOP

ANTENTOP 01 2005 # 007

ANTENTOP is **FREE** e-magazine devoted to **ANTENna's**  
**Theory,**

**1-2005**

**Operation, and**  
**Practice**

*Edited by hams for hams*

**In the Issue:**  
**Antennas Theory!**

**Practical design of HF Antennas!**

**Home brew Technique!**

**Propagation!**

**QRP!**

**And More....**

**SM0VPO Antenna**



**EDITORIAL:**

Well, my friends, new ANTENTOP – 01 -2005 come in! ANTENTOP is just authors' opinions in the world of amateur radio. I do not correct and re-edit yours articles, the articles are printed "as are". A little note, I am not a native English, so, of course, there are some sentence and grammatical mistakes there... Please, be indulgent!

ANTENTOP 01 –2005 contains antenna articles, and several historical articles. Hope, it will be interesting for you.

Our pages are opened for all amateurs, so, you are welcome always, both as a reader as a writer.

**73! Igor Grigorov, VA3ZNW**

**ex:** RK3ZK UA3-117-386,  
UA3ZNW, UA3ZNW/UA1N, UZ3ZK  
**op:** UK3ZAM, UK5LAP,  
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**ANTENTOP** is **FREE e- magazine**, made in **PDF**, devoted to antennas and amateur radio. Everyone may share his experience with others hams on the pages. Your opinions and articles are published without any changes, as I know, every your word has the mean.

Every issue of ANTENTOP is going to have 100 pages and this one will be paste in whole on the site. Preview's files will be removed in this case. I do not know what a term for one issue will need, may be 8- 10 month or so. A whole issue of ANTENTOP hold nearly 10 MB.

**A little note**, I am not a native English, so, of course, there are some sentence and grammatical mistakes there... Please, be indulgent!

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**Preview:** Some articles from "cooking" issue will be pasted for preview on this site, others no. Because, as I think, it must be something mysterious in every issue.

**Publishing:** If you have something for share with your friends, and if you want to do it **FREE**, just send me an email. Also, if you want to offer for publishing any stuff from your website, you are welcome!

**Your opinion is important for me, so, contact if you want to say something!**

I have a big collection of pictures, I have got the pictures and stuff in others ways, from **FREE websites**, from commercial CDs, intended for **FREE using**, and so on... I use to the pictures (and seldom, some stuff from closed websites) in ANTENTOP. **If the owners still are alive**, please, contact with me, I immediately remove any Copyright stuff, or, if it is necessary, all needed references will be made there.

and, they will do this work, and we will see lots interesting articles there.

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73! **Igor Grigorov**, VA3ZNW

ex: UA3-117-386, UA3ZNW, UA3ZNW/UA1N, UZ3ZK, RK3ZK

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Editorial

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### Antenna Theory

Page

#### **Fundamental Antenna Parameters:** by Prof. Natalia K.Nikolova

1 Dear friends, I would like to give to you an interesting and reliable antenna theory. Hours searching in the web gave me lots theoretical information about antennas. Really, at first I did not know what information to chose for ANTENTOP. 5- 31

Now I want to present to you one more very interesting Lecture - it is Fundamental Antenna Parameters (Radiation pattern. Pattern beamwidths. Radiation intensity. Directivity. Gain. Antenna efficiency and radiation efficiency. Frequency bandwidth. Input impedance and radiation resistance. Antenna equivalent area.). I believe, you cannot find such info anywhere for free! Very interesting and very useful info for every ham, for every radio-engineer.

### HF- Antenna Practice

#### **RW3XA's 9 Band HF Vertical Antenna:** by Serge V. Satyr, RW3XA (ex: UA3XBY)

2 As a rule, we need taking some steps to make any antenna to be resonant on several amateur bands. The body of the aerial needs some special constructive elements to tune it into a resonance within different amateur bands. These elements can be concentrated (LC, L, C) or distributed (loops, lines). I.e. the antenna is broken up into several parts in between which there are those adjusting elements providing a resonance of the aerial. The more such elements, the more difficulties with their optimum adjustment, and reliability of a design as a whole leaves much to be desired because it is cut by insulators. But a multiband vertical can be made upon the other constructive principals: the radiating part of the antenna through a switchable matching network to the feed line. In the other word, input impedance of a random wire is of a complex value, so the matching network transforms input impedance of it into feed line impedance. Naturally, for the reason of an accurate matching on each amateur band it is necessary to separate matching networks. 32-41

#### **Minimal Reactance Antenna:** by Ken, WB4ENE

3 I call this antenna the MRA (Minimal Reactance Antenna). It works on 160 through 10 Meters. 42

#### **Balcony Antenna:** by Harry Lythall - SM0VPO

4 Many amateurs are very restricted with the space they have available for HF antennas. I have documented a short antenna for the HF bands, but here is a simple method of mounting it, and a method of further reducing the physical length. I used to use an old CB (27 MHz) half-wave antenna which had a broken matching coil. this I used as a 1/4 - wave antenna for 14 MHz, after removing the matching coil. Today I find that CB antennas have increased in price, so I have found a cheap replacement that can be fitted to the balcony of apartment dwellers 43- 44

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	<b>Balcony Antenna Extension:</b> by Harry Lythall - SM0VPO	
<b>5</b>	You may have already seen my HF Balcony Antenna which was designed solely for 14MHz, then a coil was added to cover all the lower HF bands (10, 7 and 3.5MHz). Following an article in RadCom I have now extended this antenna to cover all bands from 3.5MHz through to 30MHz without any switching or tuning. The antenna functions using both Fractal and Meander principles.	<b>44- 45</b>
	<b>Building Antennas:</b> by Igor Grigorov, VA3ZNW	
<b>6</b>	<p>Almost all modern buildings contain lots metal parts inside. For example, any building has water pipes (as a rule copper), main wires, telephone wires, inner metal skeleton. Some building has a water (steam) heating system. The hidden metal parts can work as transmitting antenna. You only have to connect your transmitter to the metal in proper way.</p> <p>In this article we discuss antennas based on domestic water heater system. Let's name the antennas 'Water Heater Antenna System', or just WHAS. Certainly, diagram directivity and efficiency of WHAS often are far from desirable. Anyway such antennas allow ham to be on the Air.</p>	<b>46-48</b>
	<b>Window Dipole Antennas with Capacitive Loads for the 6 and 10 meters Band:</b> by Igor Grigorov, VA3ZNW	
<b>7</b>	It is possible to install a dipole antenna with capacitive loads for the 6 and 10 meters bands at a standard window with sizes 140x150 or 140x210 centimeters. The design of that window antenna for the bands can be simple as well as the antenna impedance can be easily matched with 50-Ohm coaxial cable. That dipole antenna with capacitive loads installed at upper floor of a high-rise building can provide DX- QSOs.	<b>49- 58</b>
	<b>Broadband Indoor Antenna:</b> by Igor Grigorov, VA3ZNW	
<b>8</b>	It was in winter 1994. In that time heavy winter winds destroyed my outdoor antennas. I could not do repairs of the antennas at cold winds and snowdrifts so I decided to try indoor antennas. I tried several antennas at the times. The article describes one of them, a very simple antenna that can work at all amateur bands.	<b>59- 63</b> <b>101- 106</b>
 <b>QRP</b>  		
	<b>Simple QRP CW TX for the 40 meters:</b> Credit Line: "U- QRP- C. Reference Book- #3"	
<b>9</b>	<p>At QRP rubric at Antentop 01- 2005 I use stuff from old Soviet QRP magazine published by the U- QRP- C at 1991. It was named "U- QRP- C. Reference Book- #3," you can see its cover at the right. The schematics, which were published there, are very interesting till now.</p> <p>The simple QRP TX used two FETs was published at "U- QRP- C. Reference Book- #3," page 4. I have done the TX, it worked pretty well!</p>	<b>64</b>

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	<b>Simple Regenerative Receivers:</b>	
10	Credit Line: "U- QRP- C. Reference Book- #3.'  The simple regenerative receivers were published at "U- QRP- C. Reference Book- #3," page 6. I have done the receivers, they work pretty well! 73/72! I. G.	65
	<b>QRP PA for the 10 meters:</b> Credit Line: "U- QRP- C. Reference Book- #3.'	
11	The QRP PA was published at "U- QRP- C Reference Book- #3," page 3. I have done the PA as well as for 10 meters as well as for others high (20-12 meters) amateurs bands. It works well! It gives near 1 watts to 50(75) Ohm load. 73/72! I. G.	66
	<b>Simple QRP CW Transceiver for the 20 meters:</b> by Igor Grigorov, VA3ZNW	
12	It was... Well, when it was... I guess, it was at the end 80s and in the beginning of the 90s. Perestrojka. Gorbachev. Eltcin stand on a tank... Well, it has no matter to our transceiver. At the times I was the director of the cooperative "Vibrissa." Well, it was one- man cooperative, so, I was as the director as the main worker. I did equipment for radio amateurs.  The transceiver was one of my products. I have done near 50 samples of the transceiver. It worked very well. At 1991 I sent the description of the transceiver to the magazine of the "U- QRP- C." The article is used copies of the original schematics published by "U- QRP- C. Reference Book- #3," pages 9- 10.	67- 69
	<b>Home Made Key for FT- 817:</b> by Yuri Murashev, RX3AEW	
13	Very simple and effective design of a key for the FT- 817.	70
	<b><i>Free Program and Utility</i></b>	
	<b>MMANA</b> (designed by by JE3HHT - Makoto Mori, DL1PBD - Alex Schewelew . DL2KQ - Igor Gontcharenko.)	
	<i>Just description of the useful FREE program...</i>	
14	MMANA is an antenna-analyzing tool based on the moment method, which was introduced in MININEC. MMANA version 2.03 provides ability to change the language of signs and messages for the program. There are three languages provided for the version 2.03 by default: English, Russian and Bulgarian. Users can easily write a file in their own language by editing the English one. This means, MMANA will be able to communicate with an user in ANY language, actually in the language of his operation system, and that users will be able to write language files themselves.	71

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	<b>NEC - 2 for MMANA</b> (designed by by Dimitry Fedorov, UA3AVR)	
	<i>Just description of the usfull FREE utility...</i>	
<b>15</b>	NEC-2 for MMANA is useful utility for MMANA. It is intended for calculation of *.maa files and for simulation of antenna models using input language NEC-2 and based on MMANA models.	<b>72</b>
 <b><i>Propagation</i></b>  		
	<b>The Ham and the Weather Forecast:</b> by Peter P. Grytsay, US1REO	
<b>16</b>	The weather accompanies us all our life. We are interested in the weather health and mood. I am sure that every Radio amateur can forecast the weather. For it it's necessary to have PC, simple HamComm modem, RX, computer software JVFX v.7.0 and etc. (author DK8JV), and without doubt a wish.	<b>73</b>
<b>17</b>	<b>Nonlinear Propagation of Radio- Wave in Ionosphere:</b> by Igor Grigorov, VA3ZNW	
	There are a lot of interesting phenomena at ionosphere propagation of radio-wave (for example, remember LDE!). One of such phenomenon is nonlinear propagation of radio- wave in ionosphere. What is it this effect? A very exactly description of the phenomenon was given by Vladislav, RX3ALL, at a message sent by him in the RU- QRP- C forum on December 19, 2005.	<b>74- 75</b>
<b>18</b>	<b>Einstein Wave or just LDE:</b> by Igor Grigorov, RK3ZK	
	Talking on an origin and on just existence of LDE go till the recent times. Yes, even just about existence of the LDE. Some scientists persistently do not recognize the existence of LDE and deny obvious authentic facts of reception LDE by many people. I do not know, why these scientists deny the obvious facts, may be because they can not explain this phenomenon. For the scientist if while it is impossible to explain something, if the something is not in frames of the laws existing in the modern science, the something can not exist.	<b>76- 78</b>
 <b><i>Homebrew Equipment</i></b>  		
<b>19</b>	<b>80/40 meter CW Transmitter with 6BM8/ECL82:</b> by Jan, SM5GNN	
	This is my own variation of the triode/pentode family of glowbug transmitters. It features a Pierce oscillator which runs continuously during transmit to avoid chirp. The PA is grid block keyed and since the negative is there, fixed bias.	<b>79- 80</b>
<b>20</b>	<b>Regenerative Receiver with 6SN7GT:</b> by Jan, SM5GNN	
	This is my October regenny as it looks right now. It works but more adjustments must be done before I'm happy with it. It's based on the 1950 ARRL handbook design.	<b>81</b>

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	<b>The hAmTX Power Supply:</b> by Paulo Ferreira CT2ILQ	
21	When a ham buys (or makes) a radio he usually needs a power supply for it. A cheap alternative to buy one is to adapt a computer power supply. I just said the magic word, cheap. Hams like cheap things because that way they can buy more radios, or wire for antennas, or CW keys, or any other things they like. And a computer power supply can be bought in many places of the world, where one cannot find other radio related items. But a computer power supply is very different from a radio power supply, so we need to check the differences and see what can be done.	82- 84
 <b>Free e- book</b> 		
	<b>CQ RAEM:</b> by Ernst Krenkel	
22	If you can read in Russian you can download a free 235-pages e- book "CQ RAEM" by Ernst Krenkel, RAEM. For ex-USSR radioamateurs Ernst Krenkel is a person like Hiram Persy Maxim, W1AW, is for US's radioamateurs. Ernst Krenkel had took participant in several North and South Pole expeditions, he, being at North Pole, and Richard Evely Byrd, being at South Pole, did the first radio contact North- South Pole at January 12, 1930. Well, I hope, me, or may be another person, will do translating the book in English. But for now I have only Russian text... Below you can see some photos from Ernst Krenkel life.	85
	<b>Transmitting magnetic loop antennas:</b> by Igor Grigorov, RK3ZK	
23	If you can read in Russian you can download a free 73- pages e- book "Transmitting Magnetic Loop Antennas" by Igor Grigorov, RK3ZK. The book is e- variant of a chapter from a paper book "Antennas for Radioamateurs printed in Russia". Some fragment of the book was translated in the English and was published (and, as I hope, will be published) at ANTENTOP. Other fragments of the book also going to translated in the English. Below you can see the Contents of the book and path to load the Russian variant.	86- 87
 <b>HISTORY</b> 		
	<b>Russian Far and Nesr Space Antennas</b>	
24	It is a new version of article that was published at AntenTop -02- 2003. All pictures of the antennas were taken at summer 2005. Added several new photos. I.G.	88- 90
	<b>Ham Radio Magazine: Alive for Hams:</b> by Craig Clark, K1QX	
25	Like any business, there is a life-cycle. W0UN is right in that the death of Jim Fisk did hurt the magazine but the "technical torch" was picked up by some pretty competent technical folks (W1SL, W1MD, K2RR, WA1TKH to name just a few) and HR did survive another ten years after Jim's death. One of the reasons HR survived was we paid our authors which QST did not at the time and that gave us a leg up on the competition	91- 92

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26                    Just data for mostly used Russian power tubes for HF/VHF/UHF	<b>93- 98</b>
<b>Color Code for Resistors and Capacitors</b>	
27                    Just the Color Code for the parts.	<b>99- 100</b>

