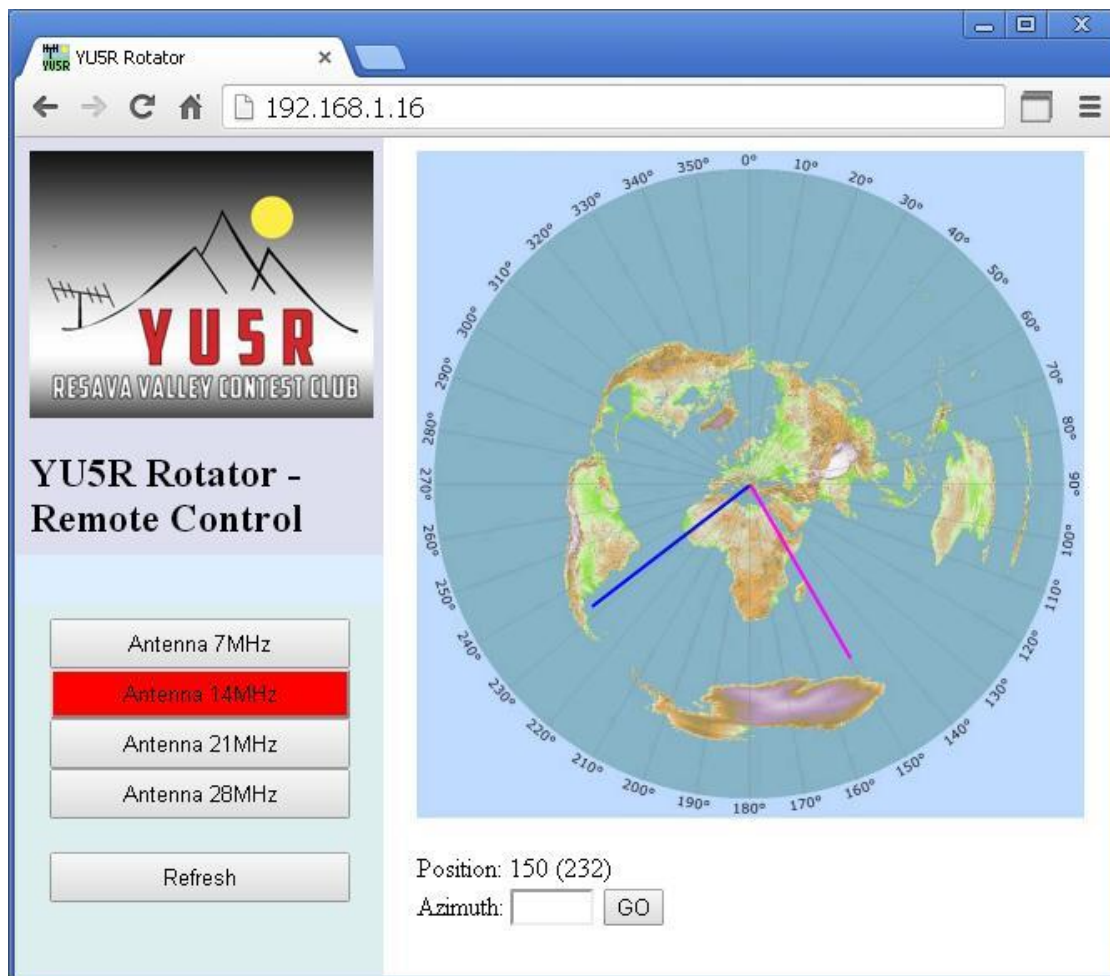


YU5R Rotator

by Goran Stankovic dipl.ing.el. – YT2FSG – Date: 06.10.2013.

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Add to the Personal Computer: PCI card with four or more RS232 ports or add four USB-RS232 converters.

Add Apache server and PHP to Windows Operating System.
Download xampp from this site and install it:

<https://www.apachefriends.org/index.html>

Download php serial driver (php_ser++.dll) for your xampp version from this site and install it:

<http://www.easyvitools.com/phpserial/>

Unpack files htdocs_yu5r.zip to directory c:\xampp\htdocs

index.php	head.php	navi.php	start.php
open_port.php	open_port1.php	open_port2.php	open_port3.php
open_port4.php	antena.txt	azimut.txt	readme.txt
yu5r_360.jpg	yu5r.ico	yu5r_1.jpg	

File: index.php

```
<html>
<head>
<meta http-equiv="cache-control" content="no-cache">
<title>YU5R Rotator</title>
<link rel="icon" href="yu5r.ico" type="image/ico" />
<frameset cols="220,*" marginwidth="0" marginheight="0" frameborder="0" border="0" borderwidth="0">
  <frame rows="250,30,*" marginwidth="0" marginheight="0" frameborder="0" border="0" borderwidth="0">
    <frame name="head" src="head.php" scrolling=no>
    <frame name="info" src="open_port.php" marginwidth=20 scrolling=no>
    <frame name="navi" src="navi.php" marginwidth=20 scrolling=no>
  </frameset>
  <frame name="content" src="start.php" marginwidth=20>
</frameset>
</head>
<body bgcolor=#ffffff>
</body>
</html>
```

File: head.php

```
<html>
<body bgcolor=#dddeee>

<h2>YU5R Rotator - Remote Control</h2>
</body>
</html>
```

File: navi.php

```
<html>
<head>
<style type="text/css"><!--
#b_r {
background-color:red;
height:30px;
width:180px;
}
#b_w {
height:30px;
width:180px;
}
//-->
</style>
</head>

<body bgcolor=#ddeeee>
<?php
$filename = "antena.txt";
$handle = fopen($filename, "r");
$antena = fread($handle, filesize($filename));
fclose($handle);
?>

<table border="0" cellpadding="0" cellspacing="0">
  <tr valign="top">
    <td align="center">

<a target="info" href="open_port1.php" >
<?php
if ($antena=="1") { echo '<button id="b_r">';}
else { echo '<button id="b_w">';}
?>
Antenna 7MHz </button></a><br>
```

```

<a target="info" href="open_port2.php" >
<?php
if ($antena=="2") { echo '<button id="b_r">';}
else { echo '<button id="b_w">';}
?>
Antenna 14MHz </button></a><br>

<a target="info" href="open_port3.php" >
<?php
if ($antena=="3") { echo '<button id="b_r">';}
else { echo '<button id="b_w">';}
?>
Antenna 21MHz </button></a><br>

<a target="info" href="open_port4.php" >
<?php
if ($antena=="4") { echo '<button id="b_r">';}
else { echo '<button id="b_w">';}
?>
Antenna 28MHz </button></a><br>
<br>
<a target="content" href="start.php"><button id="b_w"> Refresh </button></a><br>

        </td>
</tr>
</table>
</body>
</html>

```

File: open_port.php

```

<html>
<body bgcolor=#ddeeef>
<?php
$filename = "antena.txt";
$handle = fopen($filename, "r");
$antena = fread($handle, filesize($filename));
fclose($handle);

$module = 'win_serial';

if (extension_loaded($module)) {
    $str = "Module loaded, ";
} else {
    $str = "Module $module is not compiled into PHP";
    die("Module $module is not compiled into PHP");
}
//echo "$str";

ser_close();

if ($antena=="1")
{
ser_open( "COM1", 9600, 8, "None", "1", "None" );
if (ser_isopen())
echo "COM1 - Antenna 7MHz";
}
elseif ($antena=="2")
{
ser_open( "COM2", 9600, 8, "None", "1", "None" );
if (ser_isopen())
echo "COM2 - Antenna 14MHz";
}
elseif ($antena=="3")
{
ser_open( "COM3", 9600, 8, "None", "1", "None" );
if (ser_isopen())
echo "COM3 - Antenna 21MHz";
}
elseif ($antena=="4")

```

```

{
ser_open( "COM4", 9600, 8, "None", "1", "None" );
if (ser_isopen())
echo "COM4 - Antenna 28MHz";
}
else
{
echo "COM? - Antenna ?";
}

?>
</body>
</html>

```

File: open_port1.php

```

<html>
<body bgcolor=#ddeeef>
<?php
$module = 'win_serial';

if (extension_loaded($module)) {
    $str = "Module loaded, ";
} else {
    $str = "Module $module is not compiled into PHP";
    die("Module $module is not compiled into PHP");
}
ser_close();

ser_open( "COM1", 9600, 8, "None", "1", "None" );
if (ser_isopen())
{
echo "COM1 - Antenna 7MHz";
}
else
{
echo "COM? - Antenna ?";
}

$filename = "antena.txt";
$handle = fopen($filename, "w");
fwrite($handle, "1");
fclose($handle);

echo '
<script type="text/javascript">
parent.navi.location.reload();
</script>';
?>
</body>
</html>

```

File: open_port2.php

```

<html>
<body bgcolor=#ddeeef>
<?php
$module = 'win_serial';

if (extension_loaded($module)) {
    $str = "Module loaded, ";
} else {
    $str = "Module $module is not compiled into PHP";
    die("Module $module is not compiled into PHP");
}
ser_close();

ser_open( "COM2", 9600, 8, "None", "1", "None" );
if (ser_isopen())
{
echo "COM2 - Antenna 14MHz";
}
else

```

```

{
echo "COM? - Antenna ?";
}

$filename = "antena.txt";
$handle = fopen($filename, "w");
fwrite($handle, "2");
fclose($handle);

echo '
<script type="text/javascript">
parent.navi.location.reload();
</script>';
?>
</body>
</html>

```

File: open_port3.php

```

<html>
<body bgcolor=#ddeeef>
<?php
$module = 'win_serial';

if (extension_loaded($module)) {
    $str = "Module loaded, ";
} else {
    $str = "Module $module is not compiled into PHP";
    die("Module $module is not compiled into PHP");
}
ser_close();

ser_open( "COM3", 9600, 8, "None", "1", "None" );
if (ser_isopen())
{
echo "COM3 - Antenna 21MHz";
}
else
{
echo "COM? - Antenna ?";
}

$filename = "antena.txt";
$handle = fopen($filename, "w");
fwrite($handle, "3");
fclose($handle);

echo '
<script type="text/javascript">
parent.navi.location.reload();
</script>';
?>
</body>
</html>

```

File: open_port4.php

```

<html>
<body bgcolor=#ddeeef>
<?php
$module = 'win_serial';

if (extension_loaded($module)) {
    $str = "Module loaded, ";
} else {
    $str = "Module $module is not compiled into PHP";
    die("Module $module is not compiled into PHP");
}
ser_close();

ser_open( "COM4", 9600, 8, "None", "1", "None" );
if (ser_isopen())
{

```

```

echo "COM4 - Antenna 28MHz";
}
else
{
echo "COM? - Antenna ?";
}

$filename = "antena.txt";
$handle = fopen($filename, "w");
fwrite($handle, "4");
fclose($handle);

echo '
<script type="text/javascript">
parent.navi.location.reload();
</script>';
?>
</body>
</html>

```

File: start.php

```

<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<title></title>

<script language="JavaScript">
function getDetails(obj)
{
    var clickX = window.event.x-obj.offsetLeft;
    var clickY = window.event.y-obj.offsetTop;
    clickX=200-clickX;
    clickY=clickY-200;
    var azi = clickY / clickX;
    azi = Math.atan(azi);
    azi=parseInt(90-57.29*azi);
    if (clickX>=0)
    {
        azi=180+azi;
    }
    document.getElementById("p_az").value = azi;
}

function draw()
{
    var canvas = document.getElementById('cav1');

    if (canvas.getContext)
    {
        var ctx = canvas.getContext('2d');

        ctx.drawImage(krug, 0, 0);
        ctx.beginPath();
        ctx.moveTo(200, 200);
        ctx.lineTo(azi_x, azi_y);
        ctx.strokeStyle = '#0000FF';
        ctx.lineWidth = 2;
        ctx.stroke();
        ctx.beginPath();
        ctx.moveTo(200, 200);
        ctx.lineTo(pos_x, pos_y);
        ctx.strokeStyle = '#FF00FF';
        ctx.lineWidth = 2;
        ctx.stroke();
    }
    else
    {
        // make the element with the no-canvas message visible
        document.getElementById('no_cav').style.display = 'block';
    }
}

```

```

</script>
</head>
<body onload="draw()">

<canvas width="400" height="400" id="cav1" onclick="getDetails(this)">
  
</canvas>
<p id="no_cav" style="display:none;">You need a Canvas-compatible browser to view canvas area.</p>

<?php

echo "<br>";

$filename = "azimut.txt";
$handle = fopen($filename, "r");
$azim_f = fread($handle, filesize($filename));
fclose($handle);
$azim_xy=(180-$azim_f)*0.01744;
$azim_x=120*(sin($azim_xy))+200;
$azim_y=120*(cos($azim_xy))+200;
$azim_x=(int)$azim_x;
$azim_y=(int)$azim_y;
echo '
<script type="text/javascript">
// <![CDATA[
    azi_x = '' . $azim_x . '';
    azi_y = '' . $azim_y . '';
// ]]>
</script>';
//print(" $azim_x $azim_y");
echo "<br>";

ser_write("C\r\n");
$str = ser_read();
$str = substr($str, 2, 3);
//$str = 150;
echo "Position: $str ($azim_f)";
echo "<br>";

echo '
<script type="text/javascript">
// <![CDATA[
    var pos = '' . $str . '';
// ]]>
pos=(180-pos)*0.01744;
var pos_x=120*(Math.sin(pos))+200;
var pos_y=120*(Math.cos(pos))+200;
</script>';

if(!isset($_REQUEST['p_az']))
{
  ?>
  <form method="get" name="input">
    Azimuth: <input id="p_az" name="p_az" value="" style="width: 50px;" maxlength="3">
    <input id="GO" value="GO" type="submit">
  </form>
  <?php
  exit();
}
$azim = $_REQUEST['p_az'];
print("Azimuth = $azim");

if (strlen($azim)<1)
{
  $azim="0";
}

echo "<br>";
$filename = "azimut.txt";
$handle = fopen($filename, "w");
fwrite($handle, $azim);
fclose($handle);

```

```
ser_write("M$azim\r\n");
echo "<br>";
?>
<meta http-equiv="refresh" content="1;url=start.php">
</body>
</html>
```

File: readme.txt

```
Rottator Antenna Controller:
-----
C      - read azimuth
C2     - read azimuth elevation
Maaa   - write azimuth and go
S      - stop
Waaa   - write azimuth and go
Waaa eee - write azimuth elevation and go
```

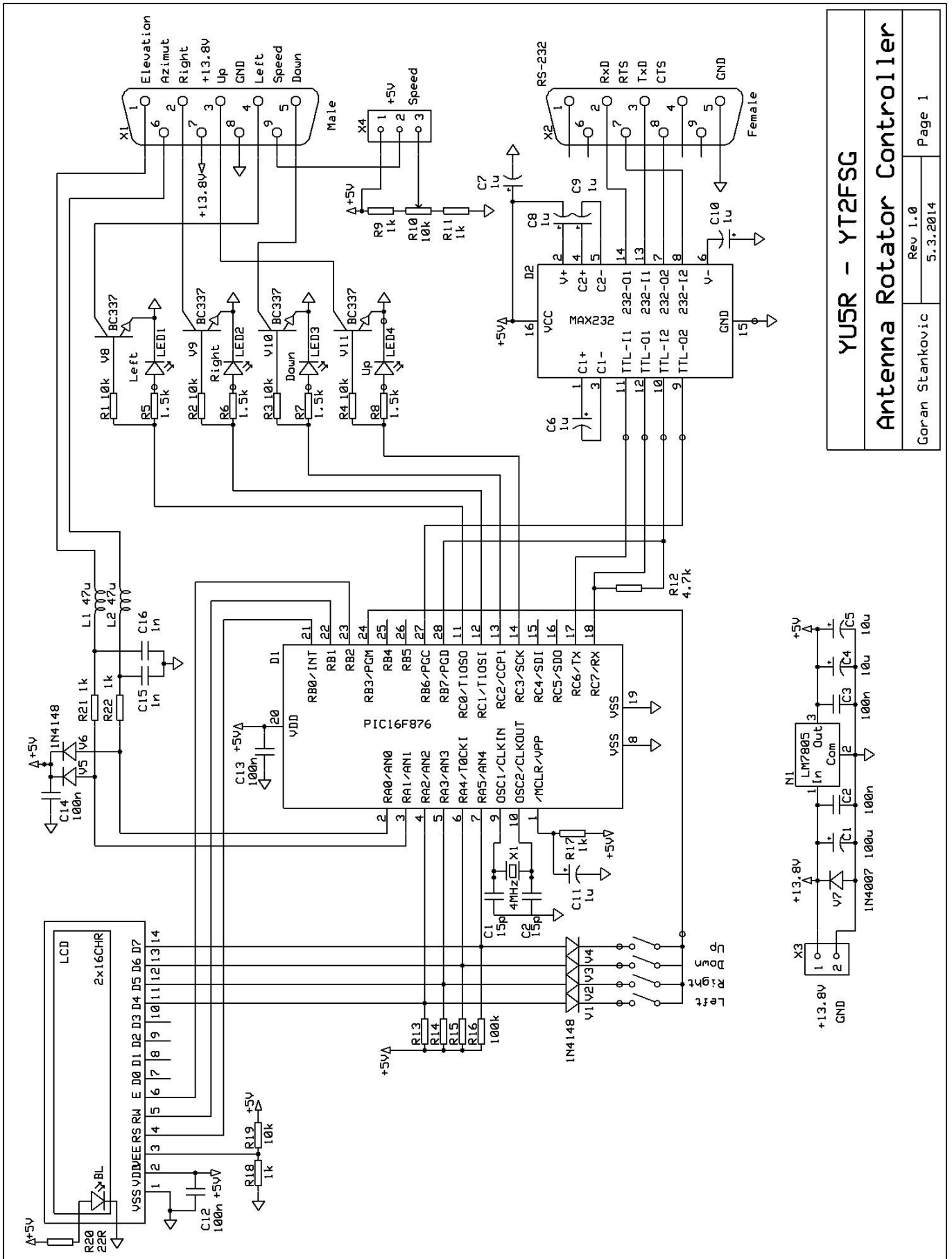
File: antena.txt

```
1
```

File: azimuth.txt

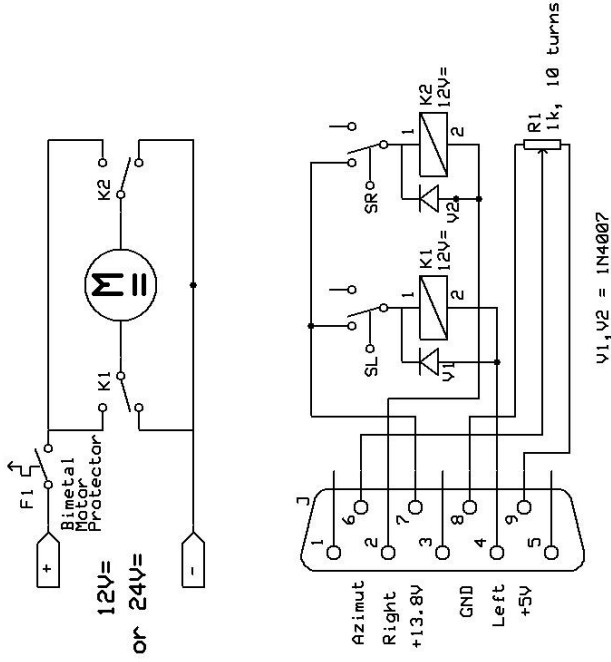
```
256
```


Schematic Antenna Rotator Controller

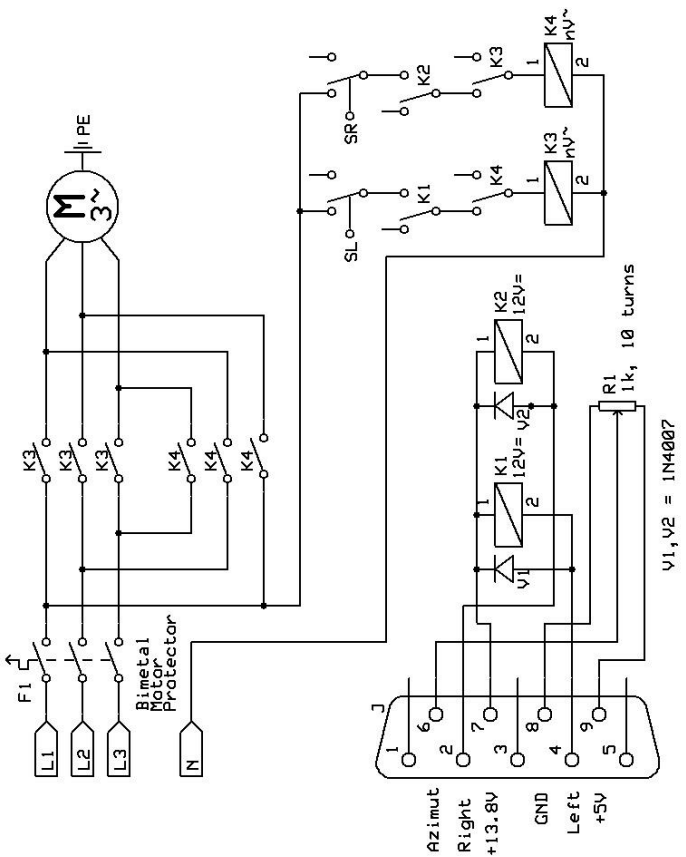


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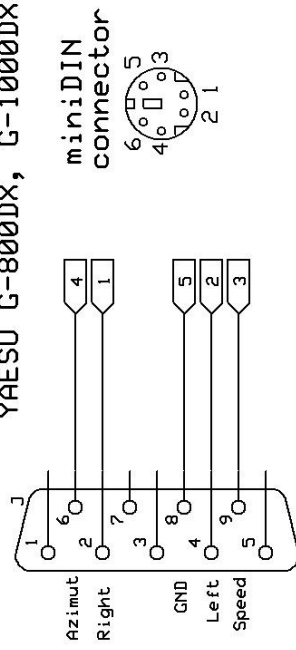
Homemade Antenna Rotator - Motor DC



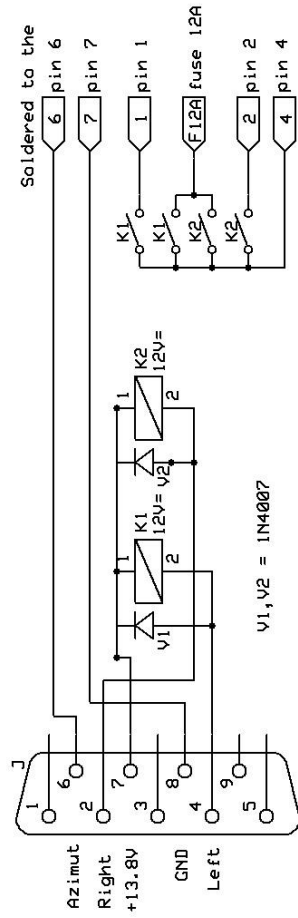
Homemade Antenna Rotator - Motor AC 3~



YAESU G-800DX, G-1000DX



HY-GAIN HRD-300A Modification



YU5R - YT2FSG Rotators

You can connect various antenna rotator controllers such as the Yaesu GS-232, LVB Tracker <http://www.g6lvb.com/articles/lvbtracker/>, Fox Delta ST2 – Satelite Tracking Interface <http://www.foxdelta.com/products/st2-rs232.htm>, ... or make one according to the scheme YU5R Antenna Rotator Controller.

You need 4 pcs antenna rotator controllers, one for each antenna: 7MHz, 14MHz, 21MHz, 28MHz.

Some antenna rotator can be connected over mini DIN, such as: YAESU G-800DX, YAESU G-1000DX, YAESU G-2800DX, some need the modification by adding the relays, such as: HY-GAIN HAM-IV, HY-GAIN HAM-V, HY-GAIN HDR-300A, YAESU G-450A, YAESU G-800SA, YAESU G-1000SA ...



Calibration Antenna Rotator Controller

After the unit is first programmed, it knows little about the voltages representing the rotator's maximum and minimum settings. You can set these either from your computer (using the serial connection) or from the front panel buttons.

Calibration from the serial connection

- (1) Connect to the unit using a terminal emulator at 9600 bps, 1 stop bit, no parity and no handshake.
- (2) Check for communication by typing the 'C' key followed by the enter key. Note that there is no echo of your keystrokes. Commands are also not case sensitive. The azimuth should be returned, although it will be the uncalibrated value.
- (3) Using either the rotator control box switches or the optional front panel switches, move the rotator to its counter-clockwise end stop (zero degrees), which should be due North or due South depending on your rotator.
- (4) Move the elevation to zero degrees.
- (5) To set the left-most azimuth, type these four keys in sequence: 'F', 'A', 'S', Enter. You will receive a reponse like: **Az Offset=0099**
- (6) To set zero degrees elevation, type the four keys in sequence: 'F', 'E', 'S', Enter. You will receive a response like: **El Offset=0326**
- (7) Using either the rotator control box switches or the optional front panel switches, move the rotator clockwise 360 degrees for both (a) 360 degree maximum azimuth rotators and (b) 450 degree South CCW stop rotators. For 450 degree North CCW stop rotators, move the rotator clockwise to 450 degrees.
- (8) Move the elevation to either 90 degrees, or 180 degrees, depending on the end stop of your rotator.
- (9) To set the right-most azimuth for both (a) 360 degree maximum azimuth rotators and (b) 450 degree South CCW stop rotators, type these four keys in sequence: 'F', 'A', 'E', Enter. For 450 degree North CCW stop rotators, type the four keys in sequence: 'F', 'A', 'F', Enter. In either case, you will receive a reponse like: **Az mul=0.897**
- (10) For 90 degree elevation rotators only: to set 90 degrees elevation, type the four keys in sequence: 'F', 'E', 'N', Enter. For 180 degree elevation rotators only: to set 180 degrees elevation, type the four keys in sequence: 'F', 'E', 'E', Enter. In either case, you will receive a response like: **El mul=1.234**
- (11) If you have a South CCW stopping rotator, you should key in the three key sequence 'F', 'S', Enter. For a North CCW stopping rotator (default), key in the three key sequence 'F', 'N', Enter.
- (12) To commit this to EEPROM, type the three keys in sequence: 'F', 'W', Enter.
- (13) When you reset or switch the unit on and off, the calibration parameters should be remembered.

Calibration from the front panel buttons

You must have an LCD connected for this to work. To enter calibration mode, hold down one of the four front panel buttons as the unit is switched on. After the welcome screen (and potentially the Bad EEPROM message), you then enter the calibration mode.

The four buttons (from LSB to MSB) are Left, Right, Down, Up. On the LCD, these are referred to as L, R, D, U.

- (1) **Set Az=min & press D (U=esc)** Using the L button, move the rotator to its counter-clockwise stop. The R button also operates to move the rotator right, although normally would not be required at this point. Press D to accept, or U to abort the calibration completely.
- (2) **Set El=min & press L (R=esc)** Using the D button, move the rotator to the zero elevation stop. The U button also operates to move the rotator up, although normally would not be required at this point. Press L to accept, or R to abort the calibration completely.

- (3) **Set Az=max & press D (U=esc)** Using the R button, move the rotator to its clockwise stop. If you are using a 450 degree azimuth rotator with a South CCW stop, you should move the rotator to be at the South position 360 degrees clockwise of the CCW stop. The L button also operates to move the rotator left, although normally would not be required at this point. Press D to accept, or U to abort the calibration completely.
- (4) **Set El=max & press L (R=esc)** Using the U button, move the rotator to the maximum elevation stop (90 or 180 degrees). The D button also operates to move the rotator down, although normally would not be required at this point. Press L to accept, or R to abort the calibration completely.
- (5) **Az range: 450 U 360 D (R=esc)** For North CCW stop 450 degree rotators, press U. For 360 degree or South CCW stop rotators, press D. Press R to abort the calibration completely.
- (6) **El range: 0-90 U 0-180 D (R=esc)** For elevation rotators with a maximum elevation of 90 degrees, press U. For 'flipping' elevation rotators, press D. Press R to abort the calibration completely.
- (7) **CCW stop North=U South=D (R=esc)** For North CCW stop rotators, press U, for South CCW stop rotators press D. Press R to abort the calibration completely.
- (8) **EE Write: U (R=esc)** To commit the settings to EEPROM, press U. Press R to abort the calibration completely.
- (9) **EEPROM write OK Push btn to exit** Push any front panel button to return to normal mode.

Quick configuration

If you know the calibration values for Az and El off and mul, you can set them directly using the following commands:

Az Off: FAOnnn
Az Mul: FAMn.nn
El Off: FEOnnn
El Mul: FEMn.nn

REFERENCE:

<https://www.apachefriends.org/index.html>
<http://www.easyvitools.com/phpserial/>
<https://www.microchip.com/>
<http://www.g6lvb.com/articles/lvtracker/>
<http://www.foxdelta.com/products/st2-rs232.htm>