

Antenna Project

COMMUNICATIONS TECHNOLOGIES 00304

TX station: *WMYM FM TRANSLATOR*

Locality: *HOTEL 4 EL. YAGIS*

Frequency: *98.7 MHz*

Date: *07.06.2018*

Exhibit 13-3 Elevation Pattern Data For Free Space Calculations

General data of antenna System

TX station	WMYM FM TRANSLATOR
Locality	HOTEL 2 4 EL YAGI
System of coordinates	WGS84
Longitude	-80°11'30.4"
Latitude	25°45'32.4"
Ground level a.s.l. (m)	1.5
Antenna system height (m)	244.0
Transmitter power(Watt)	37.600
Carrier wave frequency (MHz)	98.70
Antenna system central frequency (MHz)	95.000
Antenna base diagrams type 1	ALDENA-AST.04.02.335 - tuned Yagi 4 el. band FM
Polarization (H/V/C/X)	V
Transmitting cable attenuation (dB)	0.0
Additional attenuations(dB)	0.0
Base diagrams sectors (T = All, F = Front)	T
Velocity factor of cables to Antennas (0÷1)	1.00
Coordinate System(C = cartesian, P = polar)	P
Mast side / diameter(cm)	10.5
Mast cross section (T/Q/C)	C
Structure rotation w.r.t. North (°)	0.0
Mast rotation w.r.t. North (°)	0.0

Information about antennas used in the System

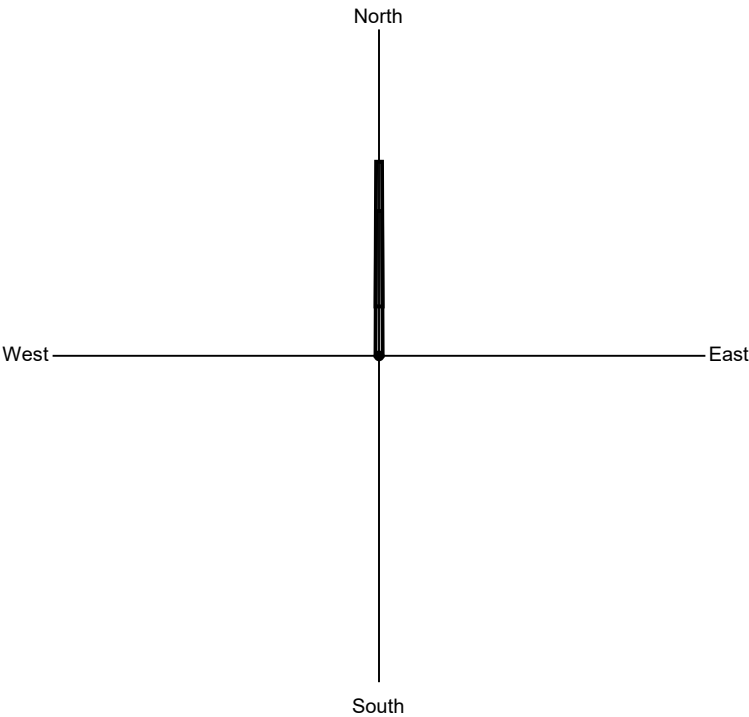
	Antenna type 1
Manufacturer	ALDENA
Antenna model	AST.04.02.335 - tune
Band start(MHz)	87.5
Band stop(MHz)	108
diagrams Frequency(MHz)	95
Polariz (H/V/C/X)	V
Vertical dist (cm)	270
Height (cm)	160
Width (cm)	11
Thickness (cm)	220
Weight (Kg)	11
Maximum power (KW)	0.6
Gain (dBd)	7.8
North E.C. (cm)	0
East E.C. (cm)	0
Return loss (dB)	-21.22
R.C.Phase (°)	90.3

Geometr. and electrical data of antenna System

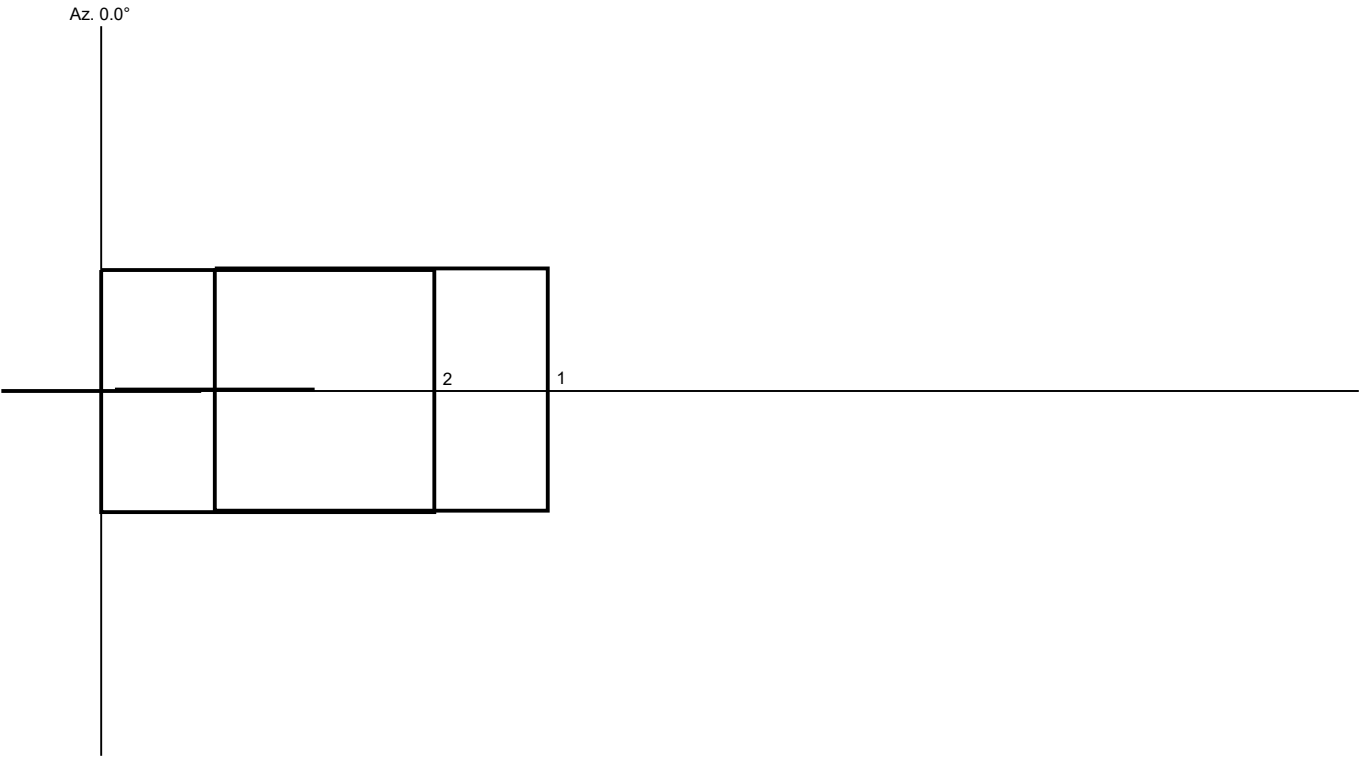
	<i>Power</i> (%)	<i>Tilt</i> (°)	<i>Az.</i> (°/N)	<i>Phase</i> (°)	<i>V dist.</i> (m)	<i>Scr-d</i> (cm)	<i>Scr-Az</i> (°/N)	<i>Rot.</i> (1÷4)	<i>Type</i> (1÷2)	<i>L cables</i> (cm)	<i>Car. phase</i> (°)
1	50.000	0	0	0 +0.0	0.01	75.0	0.0	1	1	0.0	0.0
2	50.000	0	0	0 +110.0	0.00	0.0	0.0	1	1	-96.5	110.0

NOTE: ANTENNA MEASURED DATA AT 95 MHz. FOR WMYM TRANSLATOR ANTENNA DIMENSIONS TO BE SCALED FOR OPERATION ON 98.7 MHz

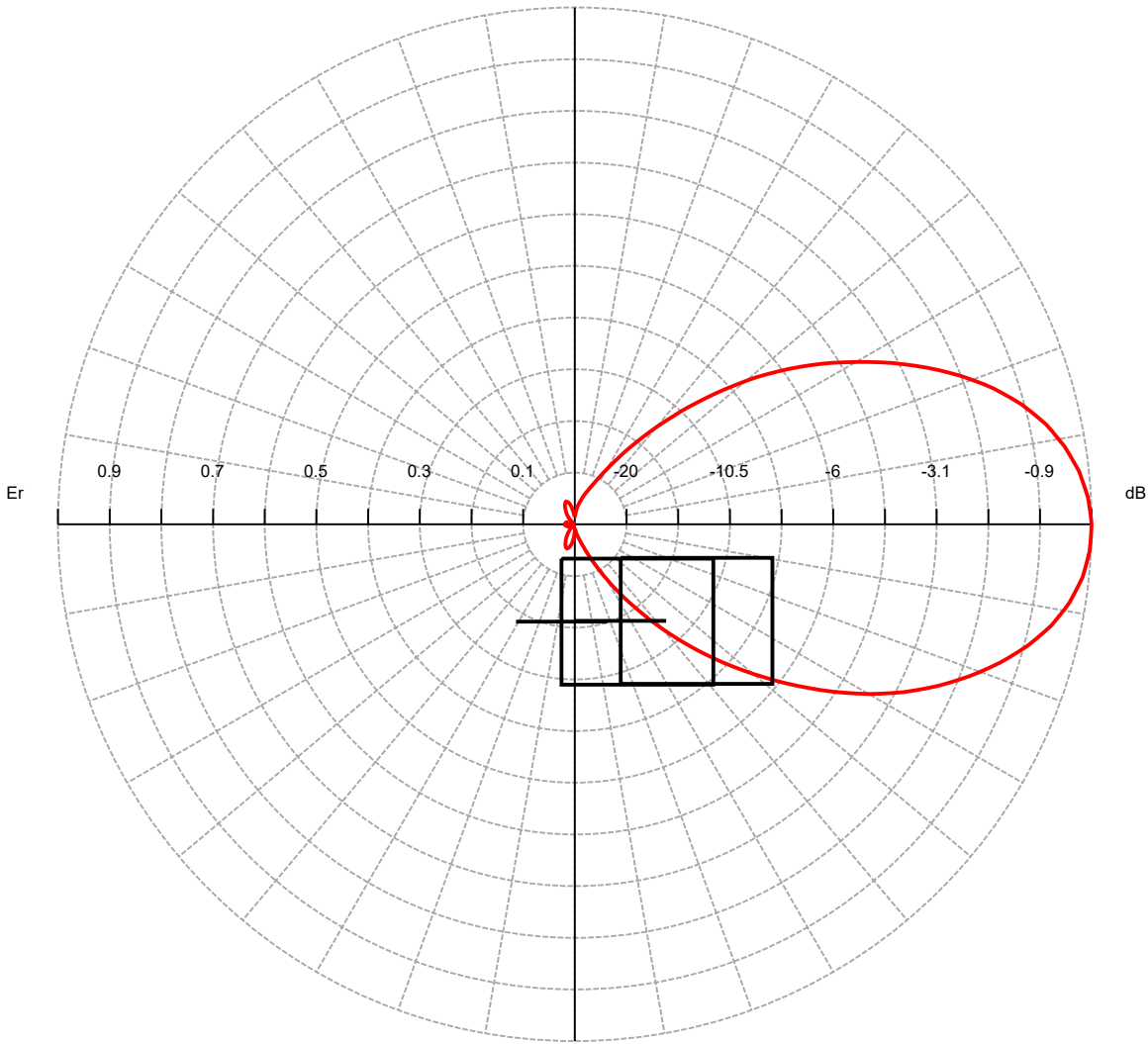
Plan of antenna system



Side of antenna system



Vertical diagram at an azimuth of 0.0° degrees



0.0° Az. (Total Antenna), Gain (dBd): 8.34

ERP T.Max(KW): 0.257 ERP E.Max(KW): 0.257

Vertical diagram at an azimuth of 0.0° degrees

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
0.0	100.0	256.5	60.0	12.1	3.8	120.0	3.5	0.3
1.0	99.9	256.1	61.0	11.0	3.1	121.0	3.3	0.3
2.0	99.8	255.6	62.0	10.0	2.6	122.0	3.2	0.3
3.0	99.7	255.1	63.0	9.0	2.1	123.0	3.0	0.2
4.0	99.4	253.5	64.0	8.1	1.7	124.0	2.8	0.2
5.0	99.1	251.8	65.0	7.3	1.4	125.0	2.7	0.2
6.0	98.7	250.1	66.0	6.5	1.1	126.0	2.5	0.2
7.0	98.1	247.0	67.0	5.9	0.9	127.0	2.3	0.1
8.0	97.5	243.9	68.0	5.3	0.7	128.0	2.2	0.1
9.0	96.9	240.8	69.0	4.7	0.6	129.0	2.0	0.1
10.0	96.0	236.4	70.0	4.3	0.5	130.0	1.9	0.1
11.0	95.1	232.1	71.0	3.9	0.4	131.0	1.7	0.1
12.0	94.2	227.7	72.0	3.5	0.3	132.0	1.5	0.1
13.0	93.1	222.1	73.0	3.2	0.3	133.0	1.4	0.1
14.0	91.9	216.6	74.0	2.9	0.2	134.0	1.3	0.0
15.0	90.7	211.1	75.0	2.7	0.2	135.0	1.1	0.0
16.0	89.3	204.6	76.0	2.5	0.2	136.0	1.0	0.0
17.0	87.9	198.3	77.0	2.3	0.1	137.0	0.8	0.0
18.0	86.5	192.1	78.0	2.1	0.1	138.0	0.7	0.0
19.0	85.0	185.3	79.0	1.9	0.1	139.0	0.6	0.0
20.0	83.4	178.6	80.0	1.7	0.1	140.0	0.5	0.0
21.0	81.9	172.0	81.0	1.6	0.1	141.0	0.3	0.0
22.0	80.2	165.1	82.0	1.4	0.1	142.0	0.2	0.0
23.0	78.5	158.3	83.0	1.3	0.0	143.0	0.1	0.0
24.0	76.9	151.6	84.0	1.2	0.0	144.0	0.0	0.0
25.0	75.1	144.6	85.0	1.1	0.0	145.0	0.1	0.0
26.0	73.3	137.7	86.0	1.1	0.0	146.0	0.2	0.0
27.0	71.5	131.0	87.0	1.0	0.0	147.0	0.3	0.0
28.0	69.5	124.0	88.0	1.1	0.0	148.0	0.4	0.0
29.0	67.6	117.2	89.0	1.2	0.0	149.0	0.4	0.0
30.0	65.6	110.5	90.0	1.2	0.0	150.0	0.5	0.0
31.0	63.6	103.7	91.0	1.5	0.1	151.0	0.6	0.0
32.0	61.5	97.0	92.0	1.8	0.1	152.0	0.7	0.0
33.0	59.4	90.6	93.0	2.0	0.1	153.0	0.8	0.0
34.0	57.3	84.3	94.0	2.3	0.1	154.0	0.8	0.0
35.0	55.2	78.2	95.0	2.6	0.2	155.0	0.9	0.0
36.0	53.1	72.4	96.0	2.9	0.2	156.0	1.0	0.0
37.0	51.1	66.9	97.0	3.2	0.3	157.0	1.0	0.0
38.0	49.0	61.7	98.0	3.5	0.3	158.0	1.1	0.0
39.0	47.0	56.6	99.0	3.7	0.4	159.0	1.1	0.0
40.0	45.0	52.0	100.0	3.9	0.4	160.0	1.2	0.0
41.0	43.1	47.6	101.0	4.1	0.4	161.0	1.3	0.0
42.0	41.1	43.3	102.0	4.3	0.5	162.0	1.3	0.0
43.0	39.2	39.4	103.0	4.5	0.5	163.0	1.4	0.0
44.0	37.3	35.7	104.0	4.6	0.5	164.0	1.4	0.1
45.0	35.4	32.2	105.0	4.7	0.6	165.0	1.5	0.1
46.0	33.6	28.9	106.0	4.8	0.6	166.0	1.5	0.1
47.0	31.7	25.8	107.0	4.9	0.6	167.0	1.6	0.1
48.0	29.9	22.9	108.0	4.9	0.6	168.0	1.6	0.1
49.0	28.2	20.3	109.0	4.9	0.6	169.0	1.7	0.1
50.0	26.4	17.9	110.0	4.9	0.6	170.0	1.7	0.1
51.0	24.7	15.7	111.0	4.8	0.6	171.0	1.7	0.1
52.0	23.1	13.7	112.0	4.7	0.6	172.0	1.8	0.1
53.0	21.6	11.9	113.0	4.6	0.5	173.0	1.8	0.1
54.0	20.0	10.3	114.0	4.4	0.5	174.0	1.8	0.1
55.0	18.6	8.9	115.0	4.3	0.5	175.0	1.9	0.1
56.0	17.2	7.6	116.0	4.1	0.4	176.0	1.9	0.1
57.0	15.8	6.4	117.0	4.0	0.4	177.0	1.9	0.1
58.0	14.6	5.4	118.0	3.8	0.4	178.0	1.9	0.1
59.0	13.3	4.6	119.0	3.7	0.3	179.0	1.9	0.1

Vertical diagram at an azimuth of 0.0° degrees

Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)	Dep (°)	Er (%)	ERP (W)
180.0	1.9	0.1	240.0	3.8	0.4	300.0	12.2	3.8
181.0	1.9	0.1	241.0	3.9	0.4	301.0	13.2	4.4
182.0	1.9	0.1	242.0	4.1	0.4	302.0	14.1	5.1
183.0	1.9	0.1	243.0	4.2	0.5	303.0	15.1	5.9
184.0	1.9	0.1	244.0	4.3	0.5	304.0	16.3	6.8
185.0	1.9	0.1	245.0	4.5	0.5	305.0	17.5	7.9
186.0	1.8	0.1	246.0	4.6	0.5	306.0	18.7	9.0
187.0	1.8	0.1	247.0	4.6	0.6	307.0	20.1	10.4
188.0	1.8	0.1	248.0	4.7	0.6	308.0	21.6	11.9
189.0	1.8	0.1	249.0	4.7	0.6	309.0	23.0	13.6
190.0	1.7	0.1	250.0	4.7	0.6	310.0	24.6	15.5
191.0	1.7	0.1	251.0	4.6	0.6	311.0	26.2	17.6
192.0	1.7	0.1	252.0	4.6	0.5	312.0	27.8	19.8
193.0	1.6	0.1	253.0	4.5	0.5	313.0	29.6	22.4
194.0	1.6	0.1	254.0	4.3	0.5	314.0	31.4	25.3
195.0	1.5	0.1	255.0	4.2	0.5	315.0	33.2	28.3
196.0	1.5	0.1	256.0	4.0	0.4	316.0	35.1	31.7
197.0	1.4	0.1	257.0	3.9	0.4	317.0	37.1	35.3
198.0	1.4	0.0	258.0	3.6	0.3	318.0	39.0	39.1
199.0	1.3	0.0	259.0	3.4	0.3	319.0	41.1	43.3
200.0	1.3	0.0	260.0	3.2	0.3	320.0	43.2	47.8
201.0	1.2	0.0	261.0	2.9	0.2	321.0	45.2	52.5
202.0	1.1	0.0	262.0	2.7	0.2	322.0	47.2	57.1
203.0	1.0	0.0	263.0	2.4	0.2	323.0	49.2	62.0
204.0	1.0	0.0	264.0	2.1	0.1	324.0	51.2	67.1
205.0	0.9	0.0	265.0	2.0	0.1	325.0	53.1	72.4
206.0	0.8	0.0	266.0	1.8	0.1	326.0	55.1	77.9
207.0	0.7	0.0	267.0	1.6	0.1	327.0	57.1	83.6
208.0	0.6	0.0	268.0	1.6	0.1	328.0	59.0	89.3
209.0	0.5	0.0	269.0	1.5	0.1	329.0	60.9	95.1
210.0	0.5	0.0	270.0	1.5	0.1	330.0	62.8	101.2
211.0	0.4	0.0	271.0	1.6	0.1	331.0	64.8	107.7
212.0	0.2	0.0	272.0	1.8	0.1	332.0	66.8	114.4
213.0	0.1	0.0	273.0	2.0	0.1	333.0	68.8	121.3
214.0	0.0	0.0	274.0	2.3	0.1	334.0	70.7	128.2
215.0	0.1	0.0	275.0	2.5	0.2	335.0	72.6	135.3
216.0	0.2	0.0	276.0	2.8	0.2	336.0	74.6	142.6
217.0	0.3	0.0	277.0	3.0	0.2	337.0	76.4	149.7
218.0	0.4	0.0	278.0	3.3	0.3	338.0	78.2	157.0
219.0	0.6	0.0	279.0	3.6	0.3	339.0	80.1	164.5
220.0	0.7	0.0	280.0	3.8	0.4	340.0	81.8	171.5
221.0	0.8	0.0	281.0	4.1	0.4	341.0	83.5	178.7
222.0	1.0	0.0	282.0	4.3	0.5	342.0	85.2	186.0
223.0	1.1	0.0	283.0	4.6	0.5	343.0	86.6	192.5
224.0	1.3	0.0	284.0	4.8	0.6	344.0	88.1	199.0
225.0	1.4	0.1	285.0	5.1	0.7	345.0	89.5	205.6
226.0	1.6	0.1	286.0	5.4	0.7	346.0	90.7	211.2
227.0	1.7	0.1	287.0	5.7	0.8	347.0	92.0	216.9
228.0	1.9	0.1	288.0	6.0	0.9	348.0	93.2	222.7
229.0	2.0	0.1	289.0	6.4	1.0	349.0	94.1	227.2
230.0	2.2	0.1	290.0	6.7	1.1	350.0	95.0	231.7
231.0	2.4	0.1	291.0	7.0	1.3	351.0	96.0	236.2
232.0	2.5	0.2	292.0	7.4	1.4	352.0	96.7	239.8
233.0	2.7	0.2	293.0	7.9	1.6	353.0	97.4	243.3
234.0	2.8	0.2	294.0	8.3	1.8	354.0	98.1	246.8
235.0	3.0	0.2	295.0	8.9	2.0	355.0	98.5	249.1
236.0	3.1	0.3	296.0	9.4	2.3	356.0	99.0	251.3
237.0	3.3	0.3	297.0	9.9	2.5	357.0	99.4	253.5
238.0	3.5	0.3	298.0	10.7	2.9	358.0	99.6	254.5
239.0	3.6	0.3	299.0	11.4	3.4	359.0	99.8	255.5