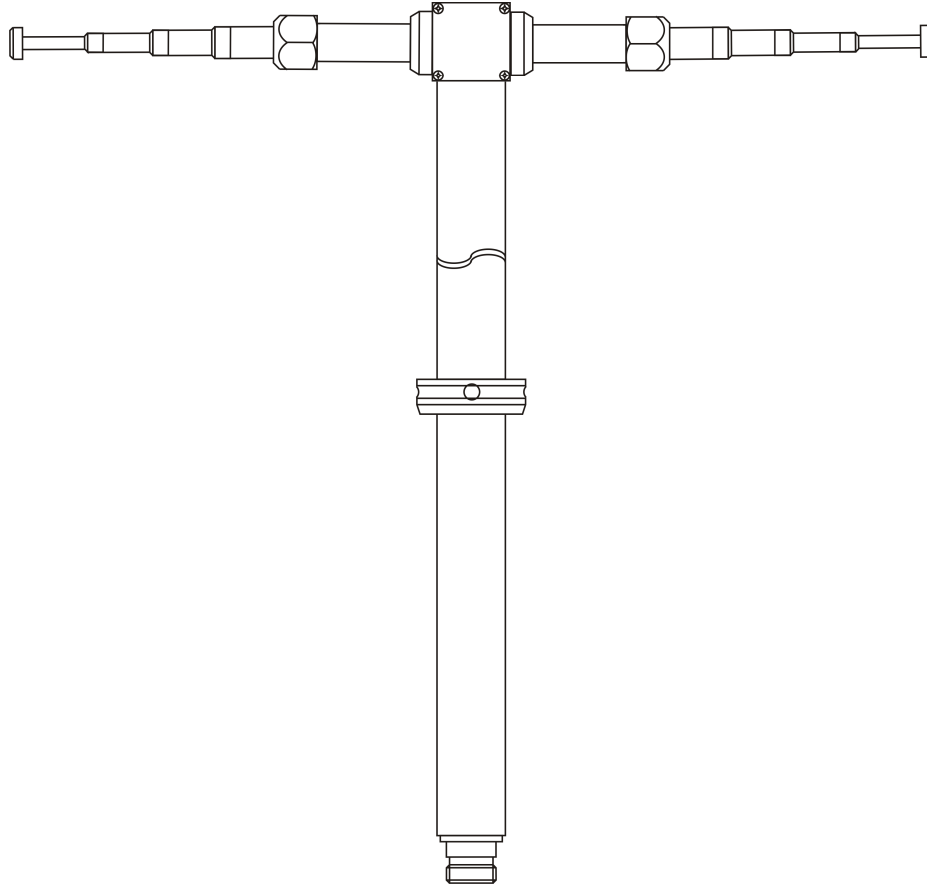




Abstimmbarer UHF-Halbwellendipol
Half - Wave Tuned Dipole Antenna



Beschreibung:

Eine abgestimmte Halbwellen-Dipolantenne gilt als Referenz für die Messung von Feldstärken und die Erzeugung definierter UHF-Felder.

Die Meßantenne UHA 9105 besteht aus dem Antennenkopf mit einem Teflonkabel Symmetrierübertrager bis 1 GHz, zwei kurzen Elementrohren mit Spannzangen für einsetzbare Teleskop-Ausziehelemente.

Ohne die Teleskopeinsätze ist die Rohrdipollänge 120 mm, mit den Einsätzen wird der Auszugs-Längenbereich 174 mm bis 520 mm überstrichen. Die Bandbreite ist durch die relativ dicken Elemente ab 800 MHz sehr groß, so dass die Längeneinstellung unkritisch ist.

Description:

A tuned Half-Wave Dipole Antenna is considered as a reference for the measurement of field strength and for the generation of defined UHF electromagnetic fields (up to 10 watts erp).

The model UHA 9105 Antenna consists of the aerial head with a teflon coax BALUN that provides symmetry up to 1 GHz and two tubes, slotted at their ends and tightened by hexagonal nuts.

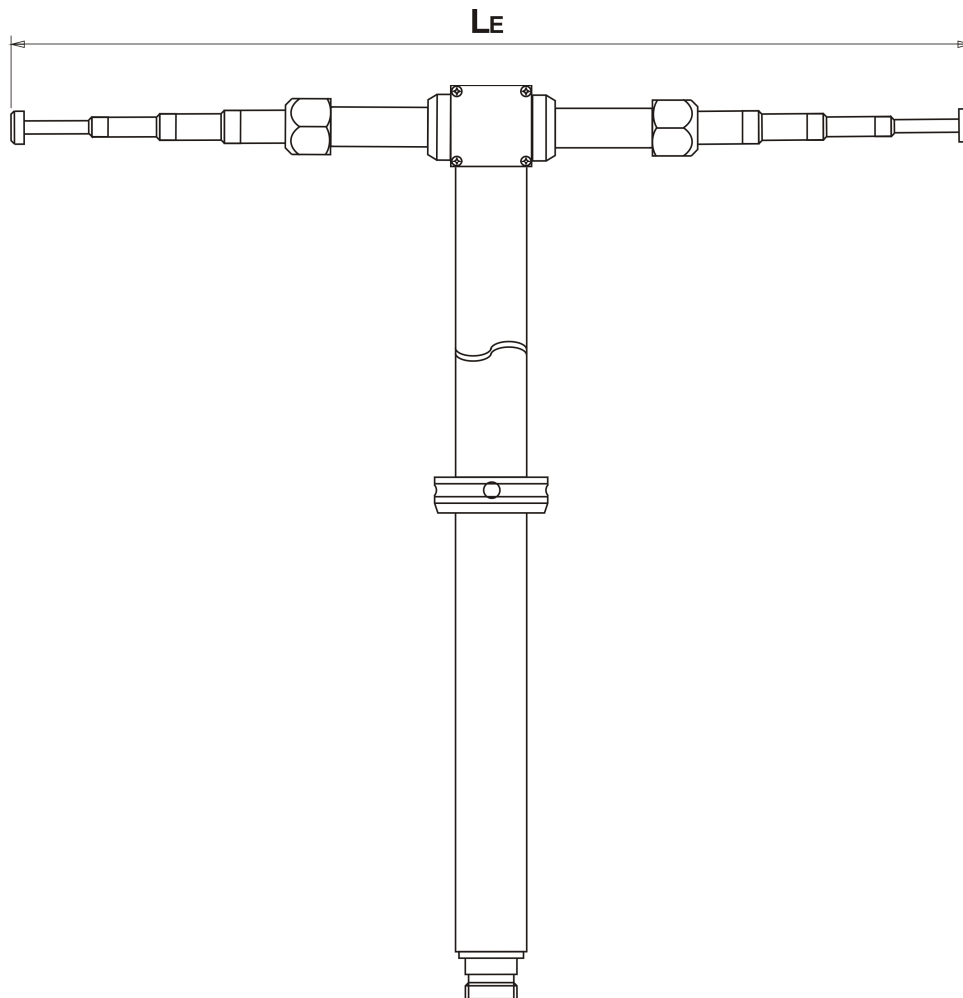
Without the telescopic inserts the total tube-element length is 120 mm. With the telescopic elements a total length range is 173 mm to 520 mm. Generally the bandwidth is high due to the large diameter/length-ratio, particularly from 800 MHz up.



Vom Antennenkopf aus dient ein 475 mm langes Rohr mit 22 mm Durchmesser und einem verschiebbaren Rastring (fixiert mit M3-Inbus-Gewindestiften) als Halterung. Diese passt in den Isolierstoff-Antennenwagen der zerlegbaren Antennen-Mastanlage Typ AM 9104. Der Rastring ermöglicht das Einrasten in vertikaler und horizontaler Dipollage.

The Antenna Holder is a 475 mm tube with a diameter of 22 mm with an indexing ring, fixed with 3 mm screws to provide a fixed position with the elements in a vertical or horizontal plane when inserted in the movable antenna holding box of the detachable mast system model AM 9104 for antenna heights from 0.4 m to 4 m.

Technische Daten:		Specifications:
Frequenzbereich:	300 - 1000 (1100) MHz	<i>Frequency Range:</i>
Bereich der Element-Auszugslängen:	120 / 174 - 500 mm	<i>Dipole Element Extension range:</i>
Dämpfung der Halterung mit Sy.-Übertrager:	0.4 - 1.5 dB	<i>Holder and Balun Attenuation:</i>
Antennenfaktoren an 50 Ω	18 - 31 dB/m	<i>Antenna Factors</i>
Antennengewinn über Isotropstrahler:	+ 1 dBi ... +1.8 dBi	<i>Antenna Gain over Isotropic :</i>
Max. Belastbarkeit (Senden):	10 W	<i>Power handling capability</i>
3-dB-Öffnungswinkel in E-Ebene:	78 °	<i>Half Power Beamwidth, E-Plane</i>
Länge:	520 mm	<i>Length</i>
Gewicht:	800 g	<i>Weight</i>
Anschluß:	N - female	<i>Connector</i>



Einstellung der Dipollänge:

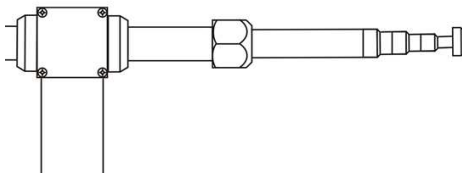
Die Einstellung der Dipollänge ist, aufgrund der hohen Bandbreite der „dicken“ Teleskopelemente (großes Durchmesser zu Längen Verhältnis), nicht kritisch. Im Gegensatz zu dünnen Elementen sind einige Millimeter Abweichung tragbar (siehe Tab 1).

Daher empfiehlt es sich zuerst die Elementabschnitte mit dickerem Durchmesser ausziehen. Auf diese Weise erhält man ein besseres Durchmesser zu Längen Verhältnis und größere Bandbreite.

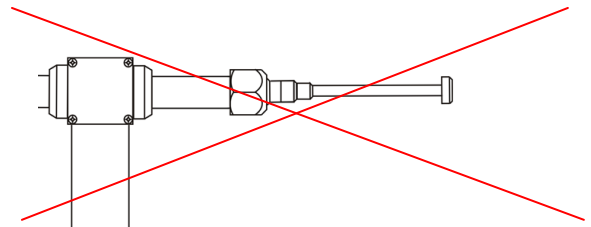
Adjustment of Dipole length:

The dipole length adjustment is not critical due to the large bandwidth of the elements with a high diameter to length ratio. In contrast to slim elements, the length may differ a few millimeters (show Tab 1).

It is recommended to extend first the element sections with a thicker diameter. In that way the dipole-elements gets a better diameter to length ratio and a major bandwidth. See the picture below.



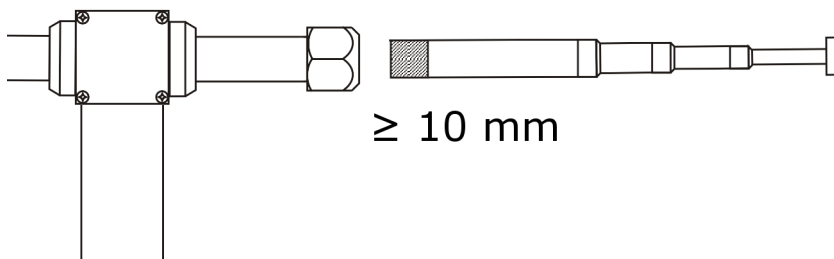
Richtiger Auszug der Teleskopelemente
Correct adjustment of the dipole elements



Falscher Auszug der Teleskopelemente
Wrong adjustment of the dipole elements

Für eine ausreichende Befestigung der Teleskopelemente müssen diese mindestens 10 mm in dem Halterohren stecken.

For a good mounting, the telescopic elements have to be inserted minimum 10 mm into the mounting tube.



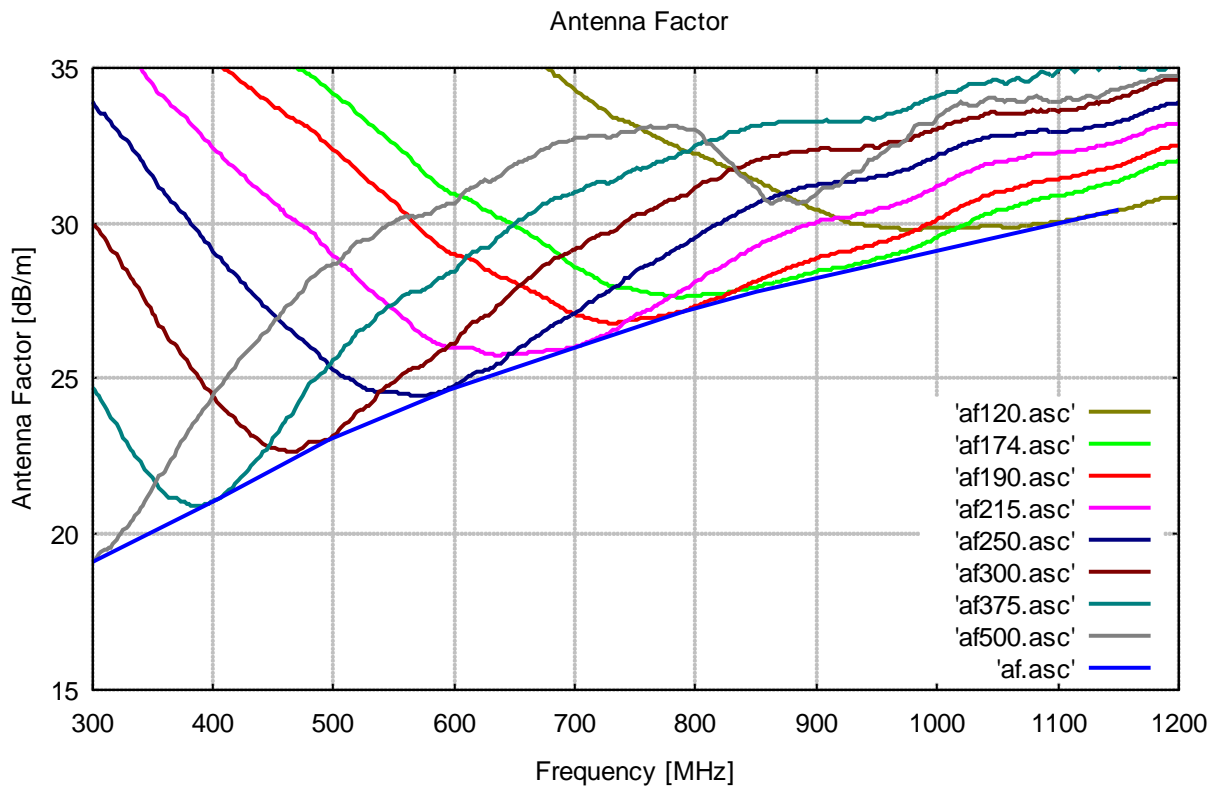
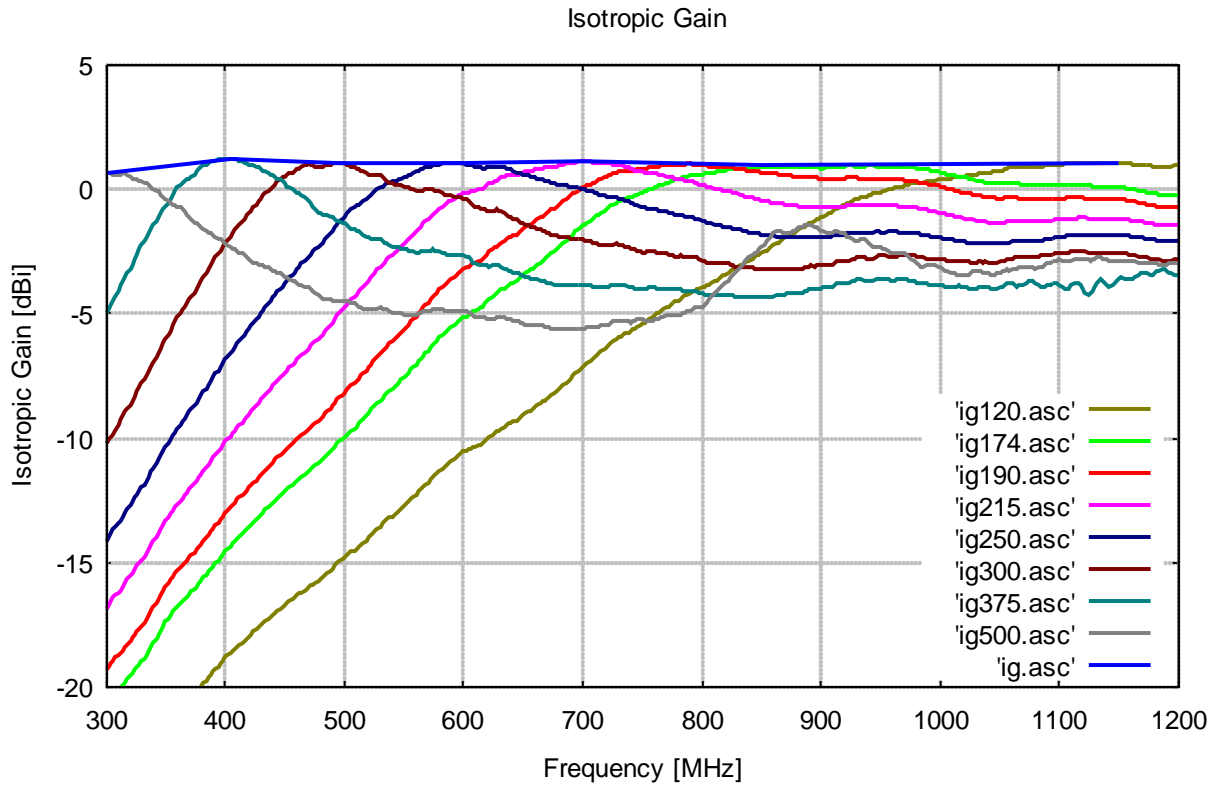


Tab 1: Technische Daten in Abhängigkeit der Elementlänge LE
Technical data depending on the element length LE

Elementlänge	Halbwellenresonanz	Frequenz des maximalen Gewinns	Isotropgewinn	Antennenfaktor	Bandbreite bei 0.5 dB Gewinnreduktion	Bandbreite bei 1 dB Gewinnreduktion
<i>Element Length</i>	<i>Half-wave resonance</i>	<i>Frequency of maximum gain</i>	<i>Isotropic Gain</i>	<i>Antenna Factor</i>	<i>Bandwidth with 0.5 dB gain decay</i>	<i>Bandwidth with 1 dB gain decay</i>
LE	$f\lambda/2$	$f g_{i_{max}}$	g_i	AF	B[-0.5 dB]	B[-1 dB]
[mm]	[MHz]	[MHz]	[dBi]	[dB/m]	[MHz]	[MHz]
500	300	300	0.68	19.09	287 - 334	278 - 348
375	400	404	1.24	21.11	376 - 432	364 - 450
300	500	496	1.07	23.06	452 - 528	440 - 554
250	600	594	1.05	24.65	554 - 654	530 - 697
215	698	700	1.12	26.01	646 - 762	620 - 800
190	789	788	1.02	27.13	722 - 878	700 - 1000
174	862	942	0.95	28.75	782 - 1024	740 - >1150
Telescopic El. Removed = 120 mm	1250	1150	1.04	30.40	1022 - >1200	961 - >1200

Da bei praktischen Messungen stets mit unerwünschten Reflexionen zu rechnen ist, wurden die Tabellenwerte durch mehrfache Mittelwertbildung (verschiedene Abstände, verschiedene Winkel im Richtdiagramm der H-Ebene, Höhenvariation) ermittelt. Für optimale Ergebnisse sollte insbesondere ein möglichst kleiner, reflexionsarmer Mastadapter / Mast verwendet werden

Since unwanted reflections are apparent in all practical applications, the tabular values have been determined using a multiple averaging technique (different distances, different angles of the H-plane pattern, height variation). To obtain best measurement results the mast / adapter should be as small as possible



Total Element Length: 50 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
250.00	-2.83	21.01
252.00	-2.60	20.85
254.00	-2.35	20.67
256.00	-2.11	20.50
258.00	-1.87	20.33
260.00	-1.63	20.15
262.00	-1.42	20.01
264.00	-1.25	19.90
266.00	-1.09	19.81
268.00	-0.95	19.74
270.00	-0.82	19.66
272.00	-0.68	19.59
274.00	-0.54	19.52
276.00	-0.40	19.44
278.00	-0.27	19.37
280.00	-0.16	19.33
282.00	-0.04	19.26
284.00	0.06	19.22
286.00	0.15	19.20
288.00	0.23	19.18
290.00	0.30	19.17
292.00	0.37	19.16
294.00	0.46	19.13
296.00	0.55	19.10
298.00	0.64	19.07
300.00	0.68	19.09
302.00	0.67	19.15
304.00	0.63	19.25
306.00	0.58	19.35
308.00	0.54	19.45
310.00	0.56	19.48
312.00	0.60	19.51
314.00	0.63	19.53
316.00	0.63	19.59
318.00	0.58	19.69
320.00	0.51	19.81
322.00	0.45	19.93
324.00	0.40	20.03
326.00	0.38	20.11
328.00	0.35	20.19
330.00	0.32	20.27
332.00	0.28	20.37
334.00	0.22	20.48
336.00	0.15	20.60
338.00	0.09	20.71
340.00	0.03	20.82
342.00	-0.04	20.94
344.00	-0.10	21.05
346.00	-0.20	21.20
348.00	-0.29	21.34
350.00	-0.38	21.48
352.00	-0.48	21.63

Total Element Length: 50 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
354.00	-0.56	21.76
356.00	-0.60	21.85
358.00	-0.65	21.95
360.00	-0.69	22.03
362.00	-0.74	22.14
364.00	-0.81	22.25
366.00	-0.90	22.39
368.00	-1.01	22.55
370.00	-1.13	22.72
372.00	-1.23	22.87
374.00	-1.33	23.00
376.00	-1.39	23.11
378.00	-1.45	23.22
380.00	-1.51	23.33
382.00	-1.58	23.44
384.00	-1.66	23.57
386.00	-1.73	23.68
388.00	-1.79	23.78
390.00	-1.85	23.89
392.00	-1.90	23.99
394.00	-1.96	24.09
396.00	-2.03	24.21
398.00	-2.11	24.33
400.00	-2.19	24.45
402.00	-2.27	24.57
404.00	-2.32	24.67
406.00	-2.38	24.77
408.00	-2.42	24.86
410.00	-2.48	24.95
412.00	-2.54	25.05
414.00	-2.60	25.16
416.00	-2.67	25.27
418.00	-2.74	25.38
420.00	-2.80	25.48
422.00	-2.86	25.59
424.00	-2.93	25.69
426.00	-2.97	25.78
428.00	-3.02	25.87
430.00	-3.04	25.93
432.00	-3.07	26.00
434.00	-3.11	26.08
436.00	-3.16	26.17
438.00	-3.22	26.27
440.00	-3.27	26.36
442.00	-3.31	26.43
444.00	-3.35	26.52
446.00	-3.38	26.59
448.00	-3.43	26.68
450.00	-3.51	26.79

Total Element Length: 37.5 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
350.00	-0.68	21.78
352.00	-0.54	21.69
354.00	-0.39	21.59
356.00	-0.24	21.49
358.00	-0.09	21.39
360.00	0.05	21.30
362.00	0.15	21.24
364.00	0.25	21.20
366.00	0.32	21.17
368.00	0.38	21.16
370.00	0.44	21.14
372.00	0.52	21.11
374.00	0.60	21.07
376.00	0.70	21.02
378.00	0.79	20.98
380.00	0.87	20.95
382.00	0.94	20.92
384.00	1.00	20.91
386.00	1.05	20.90
388.00	1.10	20.90
390.00	1.13	20.91
392.00	1.16	20.92
394.00	1.18	20.95
396.00	1.19	20.98
398.00	1.20	21.02
400.00	1.22	21.05
402.00	1.22	21.08
404.00	1.24	21.11
406.00	1.24	21.15
408.00	1.22	21.21
410.00	1.19	21.28
412.00	1.16	21.36
414.00	1.11	21.45
416.00	1.08	21.52
418.00	1.05	21.60
420.00	1.01	21.67
422.00	0.98	21.74
424.00	0.94	21.83
426.00	0.90	21.91
428.00	0.86	21.99
430.00	0.82	22.07
432.00	0.76	22.17
434.00	0.70	22.27
436.00	0.64	22.37
438.00	0.59	22.46
440.00	0.55	22.54
442.00	0.51	22.62
444.00	0.45	22.72
446.00	0.39	22.82
448.00	0.31	22.93
450.00	0.22	23.07
452.00	0.13	23.19

Total Element Length: 37.5 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
454.00	0.07	23.30
456.00	-0.01	23.41
458.00	-0.08	23.52
460.00	-0.14	23.62
462.00	-0.19	23.71
464.00	-0.24	23.79
466.00	-0.30	23.88
468.00	-0.36	23.98
470.00	-0.45	24.11
472.00	-0.58	24.28
474.00	-0.71	24.45
476.00	-0.83	24.60
478.00	-0.92	24.73
480.00	-0.97	24.82
482.00	-1.01	24.90
484.00	-1.03	24.95
486.00	-1.06	25.01
488.00	-1.10	25.09
490.00	-1.14	25.16
492.00	-1.18	25.24
494.00	-1.25	25.34
496.00	-1.28	25.41
498.00	-1.34	25.50
500.00	-1.39	25.59
502.00	-1.43	25.67
504.00	-1.49	25.76
506.00	-1.56	25.86
508.00	-1.59	25.93
510.00	-1.66	26.04
512.00	-1.71	26.12
514.00	-1.76	26.20
516.00	-1.83	26.31
518.00	-1.89	26.40
520.00	-1.95	26.49
522.00	-1.99	26.57
524.00	-2.00	26.60
526.00	-2.01	26.65
528.00	-2.02	26.69
530.00	-2.02	26.73
532.00	-2.08	26.82
534.00	-2.14	26.92
536.00	-2.19	27.00
538.00	-2.27	27.11
540.00	-2.31	27.17
542.00	-2.33	27.23
544.00	-2.35	27.28
546.00	-2.36	27.32
548.00	-2.37	27.37
550.00	-2.40	27.43

Total Element Length: 30 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
420.00	-0.96	23.64
422.00	-0.85	23.57
424.00	-0.74	23.50
426.00	-0.62	23.43
428.00	-0.50	23.35
430.00	-0.37	23.26
432.00	-0.26	23.19
434.00	-0.16	23.13
436.00	-0.08	23.09
438.00	0.01	23.04
440.00	0.11	22.98
442.00	0.21	22.92
444.00	0.31	22.86
446.00	0.40	22.81
448.00	0.47	22.78
450.00	0.52	22.76
452.00	0.58	22.75
454.00	0.63	22.73
456.00	0.69	22.71
458.00	0.73	22.70
460.00	0.78	22.70
462.00	0.84	22.67
464.00	0.89	22.66
466.00	0.95	22.64
468.00	1.01	22.62
470.00	1.03	22.63
472.00	1.01	22.68
474.00	0.97	22.76
476.00	0.92	22.85
478.00	0.89	22.92
480.00	0.89	22.96
482.00	0.90	22.99
484.00	0.94	22.98
486.00	0.98	22.97
488.00	1.01	22.98
490.00	1.03	22.99
492.00	1.05	23.01
494.00	1.05	23.04
496.00	1.07	23.06
498.00	1.05	23.12
500.00	1.02	23.18
502.00	0.99	23.24
504.00	0.94	23.33
506.00	0.89	23.41
508.00	0.87	23.47
510.00	0.82	23.55
512.00	0.79	23.62
514.00	0.75	23.69
516.00	0.70	23.77
518.00	0.65	23.85
520.00	0.61	23.93
522.00	0.58	23.99
524.00	0.58	24.03

Total Element Length: 30 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
526.00	0.58	24.06
528.00	0.57	24.10
530.00	0.56	24.14
532.00	0.50	24.24
534.00	0.43	24.34
536.00	0.37	24.44
538.00	0.29	24.55
540.00	0.23	24.64
542.00	0.21	24.69
544.00	0.18	24.75
546.00	0.17	24.79
548.00	0.16	24.84
550.00	0.13	24.90
552.00	0.11	24.95
554.00	0.07	25.02
556.00	0.03	25.09
558.00	-0.00	25.16
560.00	-0.04	25.22
562.00	-0.05	25.26
564.00	-0.04	25.29
566.00	-0.04	25.32
568.00	-0.03	25.34
570.00	-0.03	25.36
572.00	-0.03	25.40
574.00	-0.03	25.43
576.00	-0.06	25.49
578.00	-0.08	25.53
580.00	-0.10	25.59
582.00	-0.16	25.68
584.00	-0.21	25.76
586.00	-0.23	25.81
588.00	-0.25	25.86
590.00	-0.27	25.91
592.00	-0.28	25.95
594.00	-0.30	26.00
596.00	-0.32	26.04
598.00	-0.34	26.10
600.00	-0.36	26.14
602.00	-0.40	26.21
604.00	-0.47	26.31
606.00	-0.55	26.42
608.00	-0.63	26.53
610.00	-0.71	26.64
612.00	-0.74	26.70
614.00	-0.78	26.76
616.00	-0.80	26.82
618.00	-0.82	26.86
620.00	-0.85	26.92
622.00	-0.86	26.96
624.00	-0.85	26.97
626.00	-0.84	26.99
628.00	-0.83	27.01
630.00	-0.86	27.06

Total Element Length: 25 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
520.00	-0.30	24.84
522.00	-0.21	24.78
524.00	-0.12	24.73
526.00	-0.05	24.69
528.00	0.01	24.67
530.00	0.07	24.64
532.00	0.12	24.62
534.00	0.17	24.60
536.00	0.23	24.58
538.00	0.27	24.57
540.00	0.30	24.56
542.00	0.33	24.57
544.00	0.36	24.57
546.00	0.39	24.57
548.00	0.43	24.57
550.00	0.47	24.55
552.00	0.51	24.55
554.00	0.56	24.53
556.00	0.60	24.52
558.00	0.65	24.50
560.00	0.70	24.49
562.00	0.74	24.48
564.00	0.78	24.47
566.00	0.82	24.46
568.00	0.86	24.45
570.00	0.90	24.44
572.00	0.93	24.44
574.00	0.96	24.44
576.00	0.98	24.45
578.00	0.99	24.47
580.00	1.00	24.48
582.00	1.02	24.50
584.00	1.03	24.52
586.00	1.04	24.54
588.00	1.04	24.57
590.00	1.04	24.60
592.00	1.04	24.62
594.00	1.05	24.65
596.00	1.05	24.68
598.00	1.04	24.71
600.00	1.03	24.75
602.00	1.01	24.81
604.00	0.98	24.86
606.00	0.96	24.91
608.00	0.94	24.96
610.00	0.92	25.01
612.00	0.90	25.06
614.00	0.87	25.11
616.00	0.85	25.16
618.00	0.85	25.19
620.00	0.86	25.20
622.00	0.88	25.21
624.00	0.89	25.23

Total Element Length: 25 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
626.00	0.89	25.26
628.00	0.88	25.30
630.00	0.87	25.33
632.00	0.86	25.37
634.00	0.86	25.40
636.00	0.84	25.45
638.00	0.82	25.50
640.00	0.78	25.56
642.00	0.74	25.63
644.00	0.69	25.70
646.00	0.66	25.77
648.00	0.63	25.82
650.00	0.61	25.87
652.00	0.58	25.92
654.00	0.56	25.97
656.00	0.53	26.03
658.00	0.50	26.08
660.00	0.48	26.13
662.00	0.45	26.18
664.00	0.43	26.24
666.00	0.40	26.29
668.00	0.37	26.35
670.00	0.34	26.40
672.00	0.31	26.46
674.00	0.27	26.52
676.00	0.24	26.58
678.00	0.21	26.63
680.00	0.20	26.67
682.00	0.18	26.72
684.00	0.16	26.76
686.00	0.14	26.80
688.00	0.12	26.85
690.00	0.10	26.89
692.00	0.09	26.93
694.00	0.08	26.97
696.00	0.06	27.01
698.00	0.04	27.06
700.00	0.02	27.11
702.00	-0.02	27.16
704.00	-0.04	27.21
706.00	-0.08	27.27
708.00	-0.11	27.33
710.00	-0.14	27.38
712.00	-0.17	27.44
714.00	-0.20	27.49
716.00	-0.23	27.55
718.00	-0.26	27.60
720.00	-0.28	27.64
722.00	-0.30	27.69
724.00	-0.32	27.73
726.00	-0.33	27.77
728.00	-0.35	27.82
730.00	-0.37	27.86

Total Element Length: 21.5 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
600.00	-0.19	25.98
602.00	-0.17	25.98
604.00	-0.14	25.98
606.00	-0.11	25.98
608.00	-0.08	25.98
610.00	-0.05	25.98
612.00	-0.03	25.99
614.00	-0.01	25.99
616.00	0.03	25.98
618.00	0.09	25.95
620.00	0.16	25.91
622.00	0.23	25.87
624.00	0.29	25.84
626.00	0.33	25.82
628.00	0.37	25.81
630.00	0.42	25.79
632.00	0.46	25.77
634.00	0.51	25.76
636.00	0.54	25.75
638.00	0.56	25.76
640.00	0.57	25.77
642.00	0.58	25.79
644.00	0.59	25.81
646.00	0.61	25.81
648.00	0.64	25.81
650.00	0.67	25.81
652.00	0.70	25.81
654.00	0.72	25.81
656.00	0.74	25.81
658.00	0.76	25.82
660.00	0.78	25.83
662.00	0.80	25.84
664.00	0.82	25.84
666.00	0.84	25.85
668.00	0.86	25.86
670.00	0.87	25.87
672.00	0.89	25.88
674.00	0.90	25.89
676.00	0.91	25.91
678.00	0.93	25.91
680.00	0.96	25.91
682.00	0.98	25.91
684.00	1.00	25.92
686.00	1.02	25.92
688.00	1.04	25.94
690.00	1.05	25.95
692.00	1.07	25.95
694.00	1.09	25.96
696.00	1.10	25.97
698.00	1.11	25.99
700.00	1.12	26.01
702.00	1.11	26.04

Total Element Length: 21.5 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
704.00	1.11	26.07
706.00	1.10	26.10
708.00	1.09	26.13
710.00	1.08	26.17
712.00	1.07	26.20
714.00	1.05	26.24
716.00	1.04	26.28
718.00	1.03	26.31
720.00	1.03	26.34
722.00	1.02	26.37
724.00	1.02	26.40
726.00	1.01	26.43
728.00	0.99	26.47
730.00	0.98	26.51
732.00	0.97	26.54
734.00	0.94	26.59
736.00	0.92	26.64
738.00	0.89	26.70
740.00	0.84	26.76
742.00	0.80	26.83
744.00	0.77	26.89
746.00	0.74	26.93
748.00	0.72	26.98
750.00	0.70	27.02
752.00	0.68	27.07
754.00	0.65	27.11
756.00	0.64	27.15
758.00	0.63	27.18
760.00	0.62	27.21
762.00	0.62	27.24
764.00	0.60	27.28
766.00	0.58	27.32
768.00	0.56	27.37
770.00	0.53	27.42
772.00	0.51	27.47
774.00	0.49	27.51
776.00	0.47	27.55
778.00	0.44	27.60
780.00	0.42	27.64
782.00	0.40	27.69
784.00	0.38	27.73
786.00	0.37	27.76
788.00	0.36	27.79
790.00	0.34	27.84
792.00	0.31	27.89
794.00	0.27	27.95
796.00	0.24	28.00
798.00	0.21	28.05
800.00	0.19	28.10

Total Element Length: 19 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
700.00	0.06	27.06
702.00	0.11	27.04
704.00	0.16	27.02
706.00	0.20	26.99
708.00	0.25	26.97
710.00	0.29	26.96
712.00	0.33	26.94
714.00	0.38	26.92
716.00	0.42	26.90
718.00	0.46	26.88
720.00	0.51	26.86
722.00	0.55	26.84
724.00	0.60	26.82
726.00	0.64	26.80
728.00	0.67	26.79
730.00	0.70	26.78
732.00	0.73	26.78
734.00	0.74	26.79
736.00	0.76	26.80
738.00	0.77	26.82
740.00	0.77	26.84
742.00	0.77	26.86
744.00	0.77	26.88
746.00	0.78	26.89
748.00	0.80	26.90
750.00	0.81	26.91
752.00	0.82	26.92
754.00	0.84	26.93
756.00	0.86	26.93
758.00	0.88	26.93
760.00	0.90	26.93
762.00	0.92	26.94
764.00	0.93	26.95
766.00	0.94	26.97
768.00	0.94	26.98
770.00	0.95	27.00
772.00	0.96	27.02
774.00	0.96	27.03
776.00	0.97	27.05
778.00	0.97	27.07
780.00	0.97	27.09
782.00	0.98	27.11
784.00	0.99	27.12
786.00	1.00	27.13
788.00	1.02	27.13
790.00	1.02	27.16
792.00	1.00	27.19
794.00	0.98	27.23
796.00	0.97	27.27
798.00	0.97	27.29
800.00	0.96	27.32
802.00	0.95	27.35
804.00	0.94	27.39

Total Element Length: 19 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
806.00	0.93	27.42
808.00	0.92	27.45
810.00	0.91	27.48
812.00	0.90	27.51
814.00	0.90	27.53
816.00	0.91	27.55
818.00	0.90	27.58
820.00	0.89	27.61
822.00	0.88	27.63
824.00	0.87	27.67
826.00	0.86	27.70
828.00	0.84	27.74
830.00	0.83	27.77
832.00	0.82	27.81
834.00	0.80	27.84
836.00	0.78	27.88
838.00	0.76	27.92
840.00	0.75	27.96
842.00	0.74	27.99
844.00	0.72	28.02
846.00	0.71	28.05
848.00	0.70	28.09
850.00	0.68	28.13
852.00	0.66	28.17
854.00	0.65	28.20
856.00	0.64	28.23
858.00	0.63	28.26
860.00	0.63	28.28
862.00	0.62	28.31
864.00	0.60	28.35
866.00	0.59	28.38
868.00	0.58	28.41
870.00	0.57	28.44
872.00	0.56	28.47
874.00	0.54	28.51
876.00	0.53	28.54
878.00	0.52	28.57
880.00	0.50	28.61
882.00	0.49	28.64
884.00	0.49	28.66
886.00	0.48	28.69
888.00	0.47	28.72
890.00	0.46	28.75
892.00	0.46	28.76
894.00	0.46	28.78
896.00	0.46	28.81
898.00	0.45	28.84
900.00	0.43	28.88
902.00	0.42	28.91
904.00	0.41	28.93
906.00	0.42	28.95
908.00	0.42	28.96
910.00	0.43	28.97

Total Element Length: 19 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
912.00	0.43	28.99
914.00	0.43	29.01
916.00	0.42	29.04
918.00	0.43	29.05
920.00	0.44	29.06
922.00	0.46	29.06
924.00	0.47	29.06
926.00	0.47	29.08
928.00	0.47	29.10
930.00	0.46	29.13
932.00	0.45	29.16
934.00	0.44	29.19
936.00	0.44	29.21
938.00	0.43	29.23
940.00	0.44	29.25
942.00	0.44	29.26
944.00	0.44	29.28
946.00	0.43	29.30
948.00	0.42	29.33
950.00	0.41	29.36
952.00	0.40	29.39
954.00	0.41	29.40
956.00	0.42	29.41

Total Element Length: 19 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
958.00	0.42	29.43
960.00	0.41	29.45
962.00	0.40	29.48
964.00	0.39	29.51
966.00	0.38	29.54
968.00	0.38	29.56
970.00	0.37	29.58
972.00	0.37	29.60
974.00	0.36	29.63
976.00	0.34	29.66
978.00	0.32	29.70
980.00	0.31	29.73
982.00	0.29	29.77
984.00	0.27	29.81
986.00	0.25	29.85
988.00	0.23	29.89
990.00	0.20	29.93
992.00	0.19	29.96
994.00	0.17	29.99
996.00	0.15	30.03
998.00	0.14	30.07
1000.00	0.11	30.11

Total Element Length: 17.4 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
750.00	-0.12	27.84
752.00	-0.09	27.83
754.00	-0.05	27.82
756.00	-0.01	27.80
758.00	0.03	27.78
760.00	0.07	27.76
762.00	0.11	27.75
764.00	0.14	27.74
766.00	0.17	27.73
768.00	0.20	27.72
770.00	0.24	27.71
772.00	0.28	27.70
774.00	0.31	27.68
776.00	0.34	27.67
778.00	0.38	27.66
780.00	0.41	27.65
782.00	0.44	27.64
784.00	0.47	27.63
786.00	0.51	27.62
788.00	0.53	27.62
790.00	0.55	27.62
792.00	0.55	27.64
794.00	0.56	27.66
796.00	0.57	27.67
798.00	0.59	27.67
800.00	0.60	27.68
802.00	0.62	27.69
804.00	0.63	27.69
806.00	0.65	27.70
808.00	0.66	27.70
810.00	0.69	27.70
812.00	0.71	27.70
814.00	0.74	27.70
816.00	0.75	27.70
818.00	0.76	27.71
820.00	0.77	27.73
822.00	0.78	27.74
824.00	0.80	27.74
826.00	0.81	27.75
828.00	0.81	27.77
830.00	0.81	27.79
832.00	0.81	27.81
834.00	0.82	27.83
836.00	0.82	27.84
838.00	0.83	27.85
840.00	0.84	27.86
842.00	0.85	27.88
844.00	0.85	27.89
846.00	0.85	27.91
848.00	0.86	27.93
850.00	0.86	27.95
852.00	0.86	27.97
854.00	0.87	27.98

Total Element Length: 17.4 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
856.00	0.86	28.01
858.00	0.86	28.03
860.00	0.87	28.04
862.00	0.87	28.06
864.00	0.87	28.08
866.00	0.88	28.09
868.00	0.88	28.11
870.00	0.88	28.13
872.00	0.88	28.15
874.00	0.87	28.18
876.00	0.87	28.20
878.00	0.88	28.21
880.00	0.88	28.23
882.00	0.88	28.25
884.00	0.88	28.27
886.00	0.88	28.29
888.00	0.87	28.31
890.00	0.87	28.34
892.00	0.87	28.35
894.00	0.87	28.37
896.00	0.87	28.40
898.00	0.86	28.43
900.00	0.85	28.45
902.00	0.85	28.47
904.00	0.86	28.49
906.00	0.87	28.49
908.00	0.88	28.50
910.00	0.88	28.52
912.00	0.89	28.53
914.00	0.89	28.55
916.00	0.90	28.56
918.00	0.91	28.57
920.00	0.92	28.57
922.00	0.94	28.58
924.00	0.94	28.59
926.00	0.95	28.61
928.00	0.93	28.64
930.00	0.93	28.66
932.00	0.92	28.69
934.00	0.92	28.71
936.00	0.93	28.72
938.00	0.94	28.73
940.00	0.94	28.74
942.00	0.95	28.75
944.00	0.94	28.78
946.00	0.93	28.81
948.00	0.92	28.84
950.00	0.92	28.86
952.00	0.92	28.87
954.00	0.93	28.88
956.00	0.93	28.90
958.00	0.93	28.92
960.00	0.92	28.94

Total Element Length: 17.4 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
962.00	0.92	28.97
964.00	0.91	28.99
966.00	0.91	29.01
968.00	0.91	29.03
970.00	0.91	29.05
972.00	0.90	29.07
974.00	0.89	29.10
976.00	0.88	29.13
978.00	0.87	29.16
980.00	0.85	29.19
982.00	0.84	29.22
984.00	0.82	29.26
986.00	0.80	29.29
988.00	0.79	29.32
990.00	0.78	29.36
992.00	0.77	29.38
994.00	0.75	29.42
996.00	0.73	29.46
998.00	0.70	29.50
1000.00	0.68	29.54
1002.00	0.65	29.59
1004.00	0.63	29.63
1006.00	0.61	29.66

Total Element Length: 17.4 cm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
1008.00	0.59	29.70
1010.00	0.57	29.73
1012.00	0.55	29.77
1014.00	0.53	29.81
1016.00	0.51	29.85
1018.00	0.49	29.88
1020.00	0.48	29.91
1022.00	0.47	29.94
1024.00	0.45	29.98
1026.00	0.43	30.01
1028.00	0.40	30.06
1030.00	0.37	30.11
1032.00	0.34	30.15
1034.00	0.32	30.19
1036.00	0.30	30.23
1038.00	0.28	30.26
1040.00	0.27	30.29
1042.00	0.26	30.31
1044.00	0.26	30.33
1046.00	0.26	30.36
1048.00	0.25	30.38
1050.00	0.25	30.40

Total Element Length: Minimum (Elements removed) 120 mm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
950.00	-0.13	29.90
952.00	-0.10	29.89
954.00	-0.07	29.88
956.00	-0.03	29.86
958.00	0.00	29.85
960.00	0.03	29.84
962.00	0.05	29.83
964.00	0.07	29.83
966.00	0.10	29.82
968.00	0.12	29.82
970.00	0.15	29.81
972.00	0.18	29.80
974.00	0.20	29.79
976.00	0.22	29.79
978.00	0.24	29.79
980.00	0.25	29.79
982.00	0.27	29.80
984.00	0.27	29.81
986.00	0.29	29.81
988.00	0.30	29.82
990.00	0.31	29.82
992.00	0.33	29.82
994.00	0.35	29.82
996.00	0.37	29.82
998.00	0.39	29.82
1000.00	0.40	29.82
1002.00	0.42	29.82
1004.00	0.43	29.83
1006.00	0.44	29.83
1008.00	0.45	29.84
1010.00	0.46	29.84
1012.00	0.48	29.85
1014.00	0.49	29.85
1016.00	0.50	29.86
1018.00	0.51	29.86
1020.00	0.53	29.87
1022.00	0.54	29.87
1024.00	0.56	29.87
1026.00	0.58	29.86
1028.00	0.60	29.86
1030.00	0.61	29.86
1032.00	0.62	29.87
1034.00	0.63	29.88
1036.00	0.64	29.89
1038.00	0.65	29.89
1040.00	0.66	29.90
1042.00	0.68	29.90
1044.00	0.70	29.89
1046.00	0.71	29.90
1048.00	0.72	29.90
1050.00	0.74	29.90
1052.00	0.77	29.89

Total Element Length: Minimum (Elements removed) 120 mm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
1054.00	0.80	29.87
1056.00	0.84	29.86
1058.00	0.87	29.84
1060.00	0.89	29.83
1062.00	0.91	29.83
1064.00	0.91	29.85
1066.00	0.91	29.87
1068.00	0.91	29.88
1070.00	0.92	29.89
1072.00	0.93	29.89
1074.00	0.93	29.91
1076.00	0.93	29.92
1078.00	0.93	29.94
1080.00	0.93	29.96
1082.00	0.92	29.99
1084.00	0.92	30.00
1086.00	0.93	30.00
1088.00	0.95	30.00
1090.00	0.97	30.00
1092.00	0.97	30.01
1094.00	0.98	30.02
1096.00	0.99	30.03
1098.00	0.99	30.04
1100.00	1.00	30.05
1102.00	1.00	30.06
1104.00	1.02	30.06
1106.00	1.03	30.07
1108.00	1.03	30.08
1110.00	1.03	30.09
1112.00	1.04	30.11
1114.00	1.04	30.12
1116.00	1.04	30.14
1118.00	1.03	30.15
1120.00	1.03	30.17
1122.00	1.03	30.19
1124.00	1.03	30.21
1126.00	1.02	30.23
1128.00	1.02	30.25
1130.00	1.02	30.26
1132.00	1.02	30.28
1134.00	1.02	30.29
1136.00	1.02	30.31
1138.00	1.03	30.32
1140.00	1.03	30.33
1142.00	1.03	30.35
1144.00	1.03	30.36
1146.00	1.03	30.37
1148.00	1.03	30.39
1150.00	1.04	30.40
1152.00	1.04	30.41
1154.00	1.03	30.43
1156.00	1.03	30.45

Total Element Length: Minimum (Elements removed) 120 mm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
1158.00	1.02	30.47
1160.00	1.02	30.49
1162.00	1.01	30.51
1164.00	1.00	30.54
1166.00	1.00	30.56
1168.00	0.99	30.58
1170.00	0.98	30.60
1172.00	0.96	30.63
1174.00	0.95	30.66
1176.00	0.94	30.69
1178.00	0.93	30.71

Total Element Length: Minimum (Elements removed) 120 mm		
Frequency	Gain(Isotr.)	Ant.-Factor
MHz	dBi	dB/m
1180.00	0.92	30.74
1182.00	0.91	30.76
1184.00	0.91	30.78
1186.00	0.91	30.79
1188.00	0.91	30.80
1190.00	0.92	30.81
1192.00	0.93	30.82
1194.00	0.93	30.83
1196.00	0.94	30.84
1198.00	0.95	30.84
1200.00	0.96	30.85

Bandwidth with 0.5 dB gain decay

