Copy of Manufacturer's Directional Antenna Pattern Data
(Actual Pattern Rotated to 140.0°T)

MUNN-REESE, INC.
Broadcast Engineering Consultants
Coldwater, MI 49036
1(517)278-7339

KATHREIN
SCALA DIVISION

CA2-FM
FM DIPOLE REFLECTOR ANTENNA
4 dBd gain
88 to 108 MHz

The Scala CA2-FM is a ruggedly built dipole reflector antenna, designed for professional FM transmit and receive applications.

Like all Scala antennas, the CA2-FM is made of the finest materials resulting in superior performance and long service life.

The CA2-FM may be used stand-alone or in stacked arrays for higher gain, increased side-lobe suppression, or custom azimuth patterns.

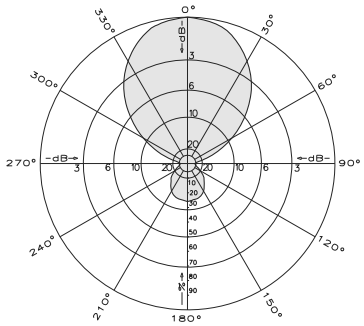
Specifications:

Frequency range	Any specified FM channel 88 to 108 MHz
Gain	4 dBd
Impedance	50 or 75 ohms
VSWR	< 1.5:1
Polarization	Horizontal or Vertical
Front-to-back ratio	>11 dB
Maximum input power	250 watts
Azimuth pattern	72 degrees (half-power)
Elevation pattern	80 degrees (half-power)
Connector	50Ω or 75Ω N female
Weight	5.7 lb (2.6 kg)
Dimensions	35.3 x 68.9 inches maximum (897 x 1750 mm)
Equivalent flat plate area	1.19 ft^2 (0.11 m^2) maximum
Wind survival rating*	120 mph (194 kph)
Shipping dimensions	70 x 6 x 5 inches maximum (1778 x 152 x 127mm)
Shipping weight	10 lb (4.5 kg) maximum
Mounting	For masts of 2.375 inches (60 mm) OD.

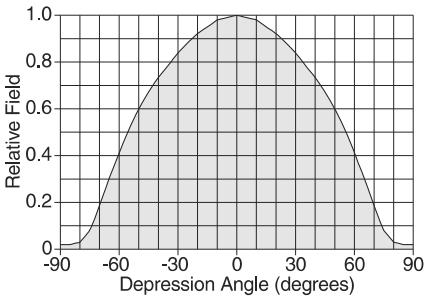
* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Order Information:

Contact Scala Customer Service for detailed order information.



Azimuth pattern (E-plane - typical)



Elevation pattern (H-plane)

TÜV ISO 9001

10747-A

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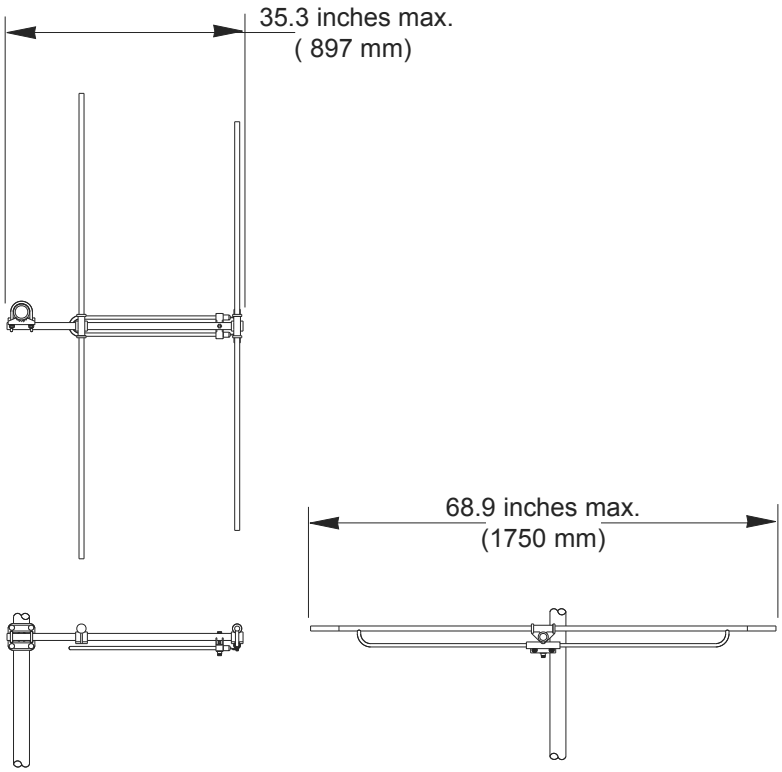

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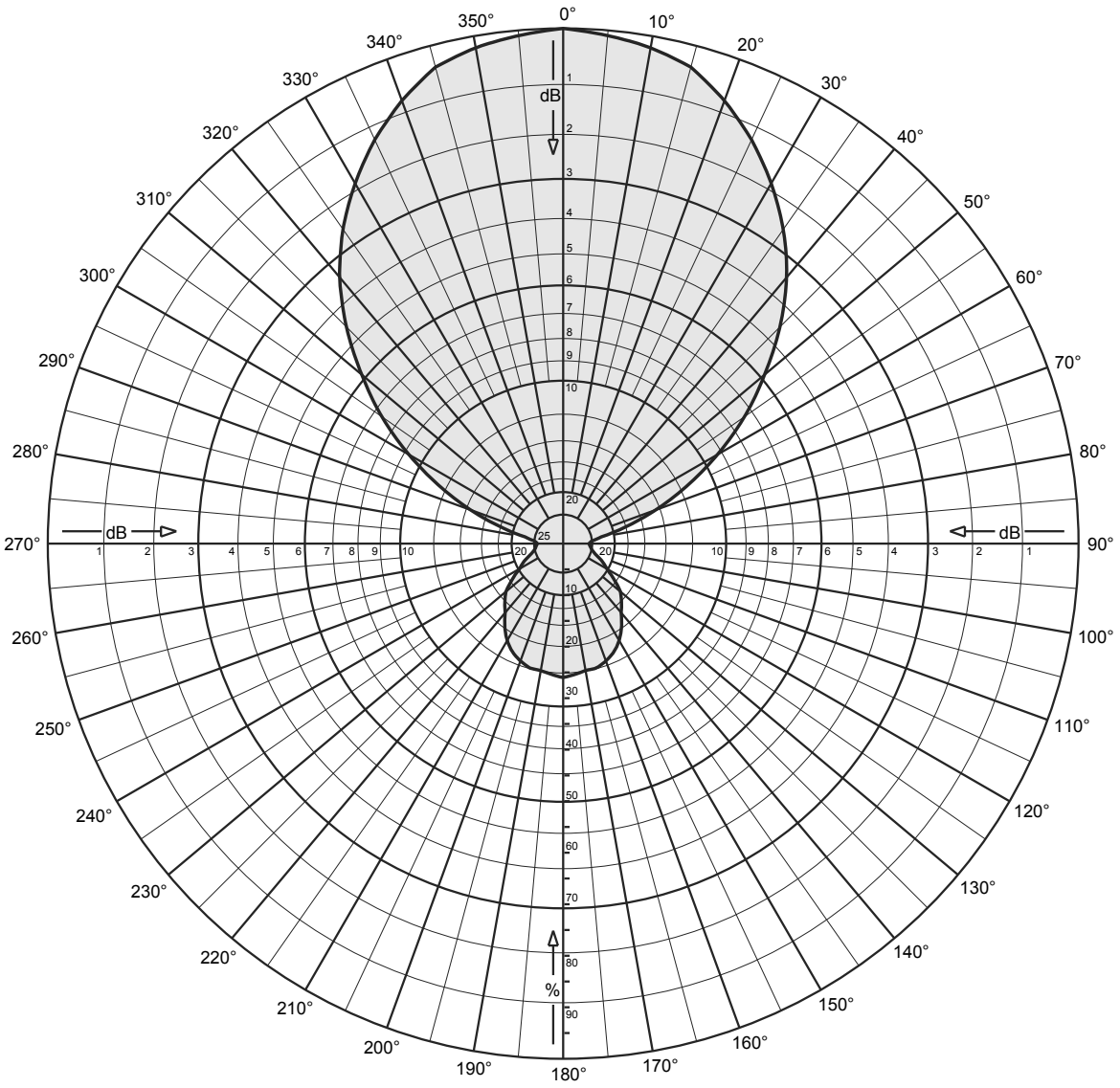

CA2-FM Dipole/Reflector
FM
Maximum gain: 4.0 dBd
Horizontal or Vertical Polarization
Horizontal radiation pattern
0 degree electrical downtilt

KATHREIN
SCALA DIVISION
Post Office Box 4580
Medford, OR 97501 (USA)
Phone:(541)779-6500
Fax:(541)779-3991
http://www.kathrein-scala.com

18-Sep-2008

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SCALA DIVISION

CA2-FM Dipole/Reflector radiation pattern
FM 0 degree electrical downtilt
Maximum gain: 4.0 dBd
Horizontal or Vertical Polarization

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	4.00	2.51	45	0.595	-4.51	-0.51	0.89
1	0.998	-0.02	3.98	2.50	46	0.578	-4.76	-0.76	0.84
2	0.996	-0.03	3.97	2.49	47	0.561	-5.02	-1.02	0.79
3	0.994	-0.05	3.95	2.48	48	0.544	-5.29	-1.29	0.74
4	0.992	-0.07	3.93	2.47	49	0.527	-5.56	-1.56	0.70
5	0.990	-0.09	3.91	2.46	50	0.510	-5.85	-1.85	0.65
6	0.988	-0.11	3.89	2.45	51	0.494	-6.13	-2.13	0.61
7	0.985	-0.13	3.87	2.44	52	0.478	-6.41	-2.41	0.57
8	0.982	-0.15	3.85	2.42	53	0.462	-6.71	-2.71	0.54
9	0.980	-0.18	3.82	2.41	54	0.446	-7.01	-3.01	0.50
10	0.978	-0.20	3.80	2.40	55	0.430	-7.33	-3.33	0.46
11	0.974	-0.23	3.77	2.38	56	0.413	-7.68	-3.68	0.43
12	0.970	-0.27	3.73	2.36	57	0.396	-8.05	-4.05	0.39
13	0.965	-0.30	3.70	2.34	58	0.379	-8.43	-4.43	0.36
14	0.961	-0.34	3.66	2.32	59	0.362	-8.83	-4.83	0.33
15	0.957	-0.38	3.62	2.30	60	0.345	-9.24	-5.24	0.30
16	0.949	-0.45	3.55	2.26	61	0.329	-9.66	-5.66	0.27
17	0.940	-0.53	3.47	2.22	62	0.313	-10.09	-6.09	0.25
18	0.932	-0.61	3.39	2.18	63	0.297	-10.54	-6.54	0.22
19	0.924	-0.69	3.31	2.14	64	0.281	-11.03	-7.03	0.20
20	0.915	-0.77	3.23	2.10	65	0.265	-11.54	-7.54	0.18
21	0.905	-0.87	3.13	2.06	66	0.250	-12.04	-8.04	0.16
22	0.895	-0.96	3.04	2.01	67	0.235	-12.58	-8.58	0.14
23	0.885	-1.06	2.94	1.97	68	0.220	-13.15	-9.15	0.12
24	0.875	-1.16	2.84	1.92	69	0.205	-13.76	-9.76	0.11
25	0.865	-1.26	2.74	1.88	70	0.190	-14.42	-10.42	0.09
26	0.854	-1.38	2.62	1.83	71	0.177	-15.04	-11.04	0.08
27	0.842	-1.49	2.51	1.78	72	0.164	-15.70	-11.70	0.07
28	0.831	-1.61	2.39	1.73	73	0.151	-16.42	-12.42	0.06
29	0.819	-1.73	2.27	1.68	74	0.138	-17.20	-13.20	0.05
30	0.808	-1.86	2.14	1.64	75	0.125	-18.06	-14.06	0.04
31	0.795	-1.99	2.01	1.59	76	0.115	-18.79	-14.79	0.03
32	0.783	-2.13	1.87	1.54	77	0.105	-19.58	-15.58	0.03
33	0.770	-2.27	1.73	1.49	78	0.095	-20.45	-16.45	0.02
34	0.757	-2.41	1.59	1.44	79	0.085	-21.41	-17.41	0.02
35	0.745	-2.56	1.44	1.39	80	0.075	-22.50	-18.50	0.01
36	0.731	-2.72	1.28	1.34	81	0.071	-22.97	-18.97	0.01
37	0.717	-2.89	1.11	1.29	82	0.067	-23.48	-19.48	0.01
38	0.703	-3.06	0.94	1.24	83	0.063	-24.01	-20.01	0.01
39	0.689	-3.24	0.76	1.19	84	0.059	-24.58	-20.58	0.01
40	0.675	-3.41	0.59	1.14	85	0.055	-25.19	-21.19	0.01
41	0.659	-3.62	0.38	1.09	86	0.054	-25.35	-21.35	0.01
42	0.643	-3.84	0.16	1.04	87	0.053	-25.51	-21.51	0.01
43	0.627	-4.05	-0.05	0.99	88	0.052	-25.68	-21.68	0.01
44	0.611	-4.28	-0.28	0.94	89	0.051	-25.85	-21.85	0.01

18-Sep-2008

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KATHREIN
SCALA DIVISION

CA2-FM Dipole/Reflector
FM
Maximum gain: 4.0 dBd
Horizontal or Vertical Polarization

radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
90	0.050	-26.02	-22.02	0.01	135	0.160	-15.92	-11.92	0.06
91	0.051	-25.93	-21.93	0.01	136	0.163	-15.76	-11.76	0.07
92	0.051	-25.85	-21.85	0.01	137	0.166	-15.60	-11.60	0.07
93	0.052	-25.76	-21.76	0.01	138	0.169	-15.44	-11.44	0.07
94	0.052	-25.68	-21.68	0.01	139	0.172	-15.29	-11.29	0.07
95	0.053	-25.60	-21.60	0.01	140	0.175	-15.14	-11.14	0.08
96	0.053	-25.51	-21.51	0.01	141	0.179	-14.92	-10.92	0.08
97	0.054	-25.43	-21.43	0.01	142	0.184	-14.70	-10.70	0.09
98	0.054	-25.35	-21.35	0.01	143	0.188	-14.49	-10.49	0.09
99	0.055	-25.27	-21.27	0.01	144	0.193	-14.29	-10.29	0.09
100	0.055	-25.19	-21.19	0.01	145	0.197	-14.09	-10.09	0.10
101	0.056	-25.04	-21.04	0.01	146	0.201	-13.91	-9.91	0.10
102	0.057	-24.88	-20.88	0.01	147	0.205	-13.74	-9.74	0.11
103	0.058	-24.73	-20.73	0.01	148	0.209	-13.58	-9.58	0.11
104	0.059	-24.58	-20.58	0.01	149	0.213	-13.41	-9.41	0.11
105	0.060	-24.44	-20.44	0.01	150	0.218	-13.25	-9.25	0.12
106	0.062	-24.15	-20.15	0.01	151	0.220	-13.13	-9.13	0.12
107	0.064	-23.88	-19.88	0.01	152	0.224	-13.01	-9.01	0.13
108	0.066	-23.61	-19.61	0.01	153	0.226	-12.90	-8.90	0.13
109	0.068	-23.35	-19.35	0.01	154	0.230	-12.78	-8.78	0.13
110	0.070	-23.10	-19.10	0.01	155	0.233	-12.67	-8.67	0.14
111	0.073	-22.73	-18.73	0.01	156	0.235	-12.60	-8.60	0.14
112	0.076	-22.38	-18.38	0.01	157	0.236	-12.52	-8.52	0.14
113	0.079	-22.05	-18.05	0.02	158	0.238	-12.45	-8.45	0.14
114	0.082	-21.72	-17.72	0.02	159	0.241	-12.38	-8.38	0.15
115	0.085	-21.41	-17.41	0.02	160	0.242	-12.31	-8.31	0.15
116	0.087	-21.16	-17.16	0.02	161	0.244	-12.25	-8.25	0.15
117	0.090	-20.92	-16.92	0.02	162	0.246	-12.20	-8.20	0.15
118	0.093	-20.68	-16.68	0.02	163	0.247	-12.15	-8.15	0.15
119	0.095	-20.45	-16.45	0.02	164	0.248	-12.09	-8.09	0.16
120	0.097	-20.22	-16.22	0.02	165	0.250	-12.04	-8.04	0.16
121	0.102	-19.83	-15.83	0.03	166	0.250	-12.04	-8.04	0.16
122	0.107	-19.45	-15.45	0.03	167	0.250	-12.04	-8.04	0.16
123	0.111	-19.09	-15.09	0.03	168	0.250	-12.04	-8.04	0.16
124	0.115	-18.75	-14.75	0.03	169	0.250	-12.04	-8.04	0.16
125	0.120	-18.42	-14.42	0.04	170	0.250	-12.04	-8.04	0.16
126	0.125	-18.06	-14.06	0.04	171	0.251	-12.01	-8.01	0.16
127	0.130	-17.72	-13.72	0.04	172	0.252	-11.97	-7.97	0.16
128	0.135	-17.39	-13.39	0.05	173	0.253	-11.94	-7.94	0.16
129	0.140	-17.08	-13.08	0.05	174	0.254	-11.90	-7.90	0.16
130	0.145	-16.77	-12.77	0.05	175	0.255	-11.87	-7.87	0.16
131	0.148	-16.59	-12.59	0.06	176	0.256	-11.84	-7.84	0.16
132	0.151	-16.42	-12.42	0.06	177	0.257	-11.80	-7.80	0.17
133	0.154	-16.25	-12.25	0.06	178	0.258	-11.77	-7.77	0.17
134	0.157	-16.08	-12.08	0.06	179	0.259	-11.73	-7.73	0.17

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SCALA DIVISION

CA2-FM Dipole/Reflector
FM
Maximum gain: 4.0 dBd
Horizontal or Vertical Polarization

radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
180	0.260	-11.70	-7.70	0.17	225	0.160	-15.92	-11.92	0.06
181	0.259	-11.73	-7.73	0.17	226	0.157	-16.08	-12.08	0.06
182	0.258	-11.77	-7.77	0.17	227	0.154	-16.25	-12.25	0.06
183	0.257	-11.80	-7.80	0.17	228	0.151	-16.42	-12.42	0.06
184	0.256	-11.84	-7.84	0.16	229	0.148	-16.59	-12.59	0.06
185	0.255	-11.87	-7.87	0.16	230	0.145	-16.77	-12.77	0.05
186	0.254	-11.90	-7.90	0.16	231	0.140	-17.08	-13.08	0.05
187	0.253	-11.94	-7.94	0.16	232	0.135	-17.39	-13.39	0.05
188	0.252	-11.97	-7.97	0.16	233	0.130	-17.72	-13.72	0.04
189	0.251	-12.01	-8.01	0.16	234	0.125	-18.06	-14.06	0.04
190	0.250	-12.04	-8.04	0.16	235	0.120	-18.42	-14.42	0.04
191	0.250	-12.04	-8.04	0.16	236	0.115	-18.75	-14.75	0.03
192	0.250	-12.04	-8.04	0.16	237	0.111	-19.09	-15.09	0.03
193	0.250	-12.04	-8.04	0.16	238	0.107	-19.45	-15.45	0.03
194	0.250	-12.04	-8.04	0.16	239	0.102	-19.83	-15.83	0.03
195	0.250	-12.04	-8.04	0.16	240	0.097	-20.22	-16.22	0.02
196	0.248	-12.09	-8.09	0.16	241	0.095	-20.45	-16.45	0.02
197	0.247	-12.15	-8.15	0.15	242	0.093	-20.68	-16.68	0.02
198	0.246	-12.20	-8.20	0.15	243	0.090	-20.92	-16.92	0.02
199	0.244	-12.25	-8.25	0.15	244	0.087	-21.16	-17.16	0.02
200	0.242	-12.31	-8.31	0.15	245	0.085	-21.41	-17.41	0.02
201	0.241	-12.38	-8.38	0.15	246	0.082	-21.72	-17.72	0.02
202	0.238	-12.45	-8.45	0.14	247	0.079	-22.05	-18.05	0.02
203	0.236	-12.52	-8.52	0.14	248	0.076	-22.38	-18.38	0.01
204	0.235	-12.60	-8.60	0.14	249	0.073	-22.73	-18.73	0.01
205	0.233	-12.67	-8.67	0.14	250	0.070	-23.10	-19.10	0.01
206	0.230	-12.78	-8.78	0.13	251	0.068	-23.35	-19.35	0.01
207	0.226	-12.90	-8.90	0.13	252	0.066	-23.61	-19.61	0.01
208	0.224	-13.01	-9.01	0.13	253	0.064	-23.88	-19.88	0.01
209	0.220	-13.13	-9.13	0.12	254	0.062	-24.15	-20.15	0.01
210	0.218	-13.25	-9.25	0.12	255	0.060	-24.44	-20.44	0.01
211	0.213	-13.41	-9.41	0.11	256	0.059	-24.58	-20.58	0.01
212	0.209	-13.58	-9.58	0.11	257	0.058	-24.73	-20.73	0.01
213	0.205	-13.74	-9.74	0.11	258	0.057	-24.88	-20.88	0.01
214	0.201	-13.91	-9.91	0.10	259	0.056	-25.04	-21.04	0.01
215	0.197	-14.09	-10.09	0.10	260	0.055	-25.19	-21.19	0.01
216	0.193	-14.29	-10.29	0.09	261	0.055	-25.27	-21.27	0.01
217	0.188	-14.49	-10.49	0.09	262	0.054	-25.35	-21.35	0.01
218	0.184	-14.70	-10.70	0.09	263	0.054	-25.43	-21.43	0.01
219	0.179	-14.92	-10.92	0.08	264	0.053	-25.51	-21.51	0.01
220	0.175	-15.14	-11.14	0.08	265	0.053	-25.60	-21.60	0.01
221	0.172	-15.29	-11.29	0.07	266	0.052	-25.68	-21.68	0.01
222	0.169	-15.44	-11.44	0.07	267	0.052	-25.76	-21.76	0.01
223	0.166	-15.60	-11.60	0.07	268	0.051	-25.85	-21.85	0.01
224	0.163	-15.76	-11.76	0.07	269	0.051	-25.93	-21.93	0.01

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Maximum gain: 4.0 dBd
Horizontal or Vertical Polarization

radiation pattern
0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
270	0.050	-26.02	-22.02	0.01	315	0.595	-4.51	-0.51	0.89
271	0.051	-25.85	-21.85	0.01	316	0.611	-4.28	-0.28	0.94
272	0.052	-25.68	-21.68	0.01	317	0.627	-4.05	-0.05	0.99
273	0.053	-25.51	-21.51	0.01	318	0.643	-3.84	0.16	1.04
274	0.054	-25.35	-21.35	0.01	319	0.659	-3.62	0.38	1.09
275	0.055	-25.19	-21.19	0.01	320	0.675	-3.41	0.59	1.14
276	0.059	-24.58	-20.58	0.01	321	0.689	-3.24	0.76	1.19
277	0.063	-24.01	-20.01	0.01	322	0.703	-3.06	0.94	1.24
278	0.067	-23.48	-19.48	0.01	323	0.717	-2.89	1.11	1.29
279	0.071	-22.97	-18.97	0.01	324	0.731	-2.72	1.28	1.34
280	0.075	-22.50	-18.50	0.01	325	0.745	-2.56	1.44	1.39
281	0.085	-21.41	-17.41	0.02	326	0.757	-2.41	1.59	1.44
282	0.095	-20.45	-16.45	0.02	327	0.770	-2.27	1.73	1.49
283	0.105	-19.58	-15.58	0.03	328	0.783	-2.13	1.87	1.54
284	0.115	-18.79	-14.79	0.03	329	0.795	-1.99	2.01	1.59
285	0.125	-18.06	-14.06	0.04	330	0.808	-1.86	2.14	1.64
286	0.138	-17.20	-13.20	0.05	331	0.819	-1.73	2.27	1.68
287	0.151	-16.42	-12.42	0.06	332	0.831	-1.61	2.39	1.73
288	0.164	-15.70	-11.70	0.07	333	0.842	-1.49	2.51	1.78
289	0.177	-15.04	-11.04	0.08	334	0.854	-1.38	2.62	1.83
290	0.190	-14.42	-10.42	0.09	335	0.865	-1.26	2.74	1.88
291	0.205	-13.76	-9.76	0.11	336	0.875	-1.16	2.84	1.92
292	0.220	-13.15	-9.15	0.12	337	0.885	-1.06	2.94	1.97
293	0.235	-12.58	-8.58	0.14	338	0.895	-0.96	3.04	2.01
294	0.250	-12.04	-8.04	0.16	339	0.905	-0.87	3.13	2.06
295	0.265	-11.54	-7.54	0.18	340	0.915	-0.77	3.23	2.10
296	0.281	-11.03	-7.03	0.20	341	0.924	-0.69	3.31	2.14
297	0.297	-10.54	-6.54	0.22	342	0.932	-0.61	3.39	2.18
298	0.313	-10.09	-6.09	0.25	343	0.940	-0.53	3.47	2.22
299	0.329	-9.66	-5.66	0.27	344	0.949	-0.45	3.55	2.26
300	0.345	-9.24	-5.24	0.30	345	0.957	-0.38	3.62	2.30
301	0.362	-8.83	-4.83	0.33	346	0.961	-0.34	3.66	2.32
302	0.379	-8.43	-4.43	0.36	347	0.965	-0.30	3.70	2.34
303	0.396	-8.05	-4.05	0.39	348	0.970	-0.27	3.73	2.36
304	0.413	-7.68	-3.68	0.43	349	0.974	-0.23	3.77	2.38
305	0.430	-7.33	-3.33	0.46	350	0.978	-0.20	3.80	2.40
306	0.446	-7.01	-3.01	0.50	351	0.980	-0.18	3.82	2.41
307	0.462	-6.71	-2.71	0.54	352	0.982	-0.15	3.85	2.42
308	0.478	-6.41	-2.41	0.57	353	0.985	-0.13	3.87	2.44
309	0.494	-6.13	-2.13	0.61	354	0.988	-0.11	3.89	2.45
310	0.510	-5.85	-1.85	0.65	355	0.990	-0.09	3.91	2.46
311	0.527	-5.56	-1.56	0.70	356	0.992	-0.07	3.93	2.47
312	0.544	-5.29	-1.29	0.74	357	0.994	-0.05	3.95	2.48
313	0.561	-5.02	-1.02	0.79	358	0.996	-0.03	3.97	2.49
314	0.578	-4.76	-0.76	0.84	359	0.998	-0.02	3.98	2.50