

# SILICON TRANSISTOR 2SC5008

# NPN SILICON EPITAXIAL TRANSISTOR 3 PINS ULTRA SUPER MINI MOLD

#### **DESCRIPTION**

The 2SC5008 is an NPN epitaxial silicon transistor designed for use in low noise and small signal amplifiers from VHF band to L band. Low noise figure, high gain, and high current capability achieve a very wide dynamic range and excellent linearity. This is achieved by direct nitride passivated base surface, process (NEST2 process) which is an NEC proprietary fabrication technique.

#### **FEATURES**

- · Low Voltage Use.
- High ft: 8.0 GHz TYP. (@ VcE = 3 V, Ic = 5 mA, f = 2 GHz)
- Low Cre: 0.3 pF TYP. (@ Vce = 3 V, IE = 0, f = 1 MHz)
- Low NF: 1.9 dB TYP. (@ VcE = 3 V, Ic = 5 mA, f = 2 GHz)
- High  $|S_{21e}|^2$ : 7.5 dB TYP. (@ VcE = 3 V, Ic = 5 mA, f = 2 GHz)
- Ultra Super Mini Mold Package.

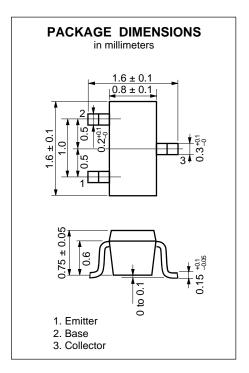
#### ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKING STYLE
2SC5008	50 pcs./Unit	Embossed tape 8 mm wide.
2SC5008-T1	3 kpcs./Reel	Pin3 (Collector) face to perforation side of the tape.

\* Please contact with responsible NEC person, if you require evaluation sample. Unit sample quantity shall be 50 pcs.

### ABSOLUTE MAXIMUM RATINGS (TA = 25 °C)

Collector to Base Voltage	Vсво	20	V
Collector to Emitter Voltage	Vceo	10	V
Emitter to Base Voltage	Vево	1.5	V
Collector Current	Ic	35	mA
Total Power Dissipation	Рт	125 mW	
Junction Temperature	$T_{j}$	150	° C
Storage Temperature	Tstg	-65 to + 150	° C



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# ELECTRICAL CHARACTERISTICS (TA = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	Ісво			1.0	μΑ	Vcb = 10 V, IE = 0
Emitter Cutoff Current	ІЕВО			1.0	μΑ	V <sub>EB</sub> = 1 V, I <sub>C</sub> = 0
DC Current Gain	hfe	80		160		VcE = 3 V, Ic = 5 mA*1
Gain Bandwidth Product	f⊤	5.5	8.0		GHz	VcE = 3 V, Ic = 5 mA
Feed-back Capacitance	Cre		0.3	0.7	pF	VcB = 3 V, IE = 0, f = 1 MHz*2
Insertion Power Gain	S <sub>21e</sub>   <sup>2</sup>	5.5	7.5		dB	VcE = 3 V, Ic = 5 mA, f = 2 GHz
Noise Figure	NF		1.9	3.2	dB	VcE = 3 V, Ic = 5 mA, f = 2 GHz

<sup>\*1</sup> Pulse Measurement PW  $\leq$  350  $\mu$ s, Duty Cycle  $\leq$  2 %

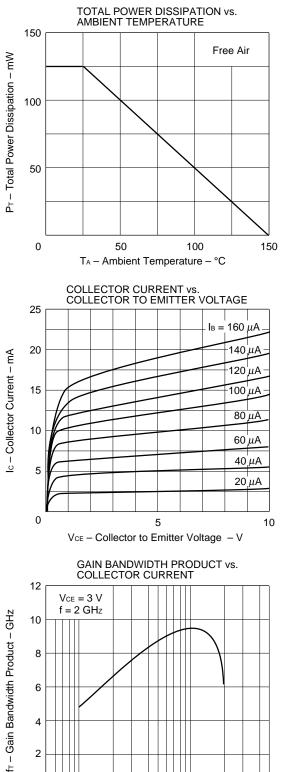
#### hFE Classification

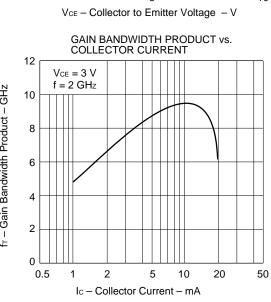
RANK	FB
Marking	44
hfe	80 to 160

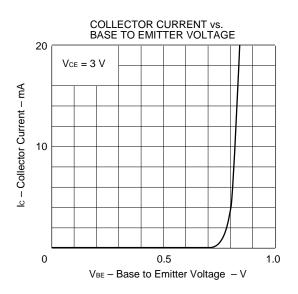
2

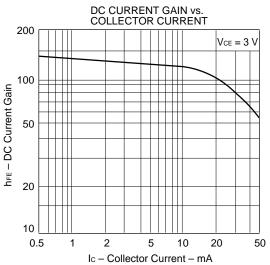
<sup>\*2</sup> The emitter terminal and the case shall be connected to the guard terminal of the three-terminal capacitance bridge.

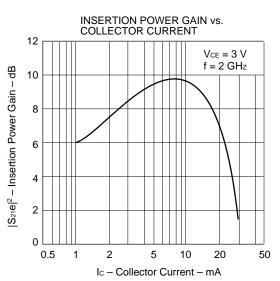
# TYPICAL CHARACTERISTICS (TA = 25 °C)

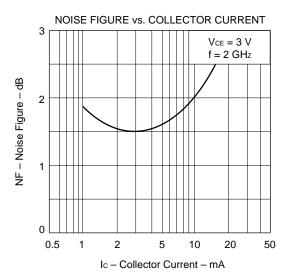


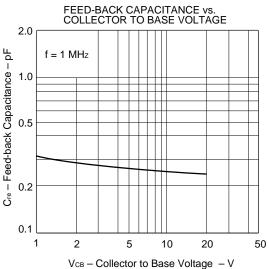


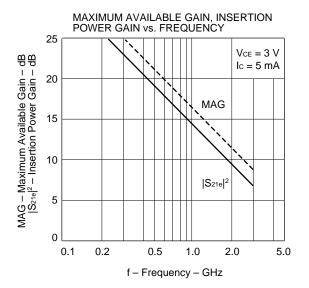














0-1 ANAMETER								
$V_{CE} = 3 \text{ V}, \text{ Ic} = 10 \text{ n}$	nA, Zo = 50	Ω						
FREQUENCY		311	S2	01	9	12	9	22
TREGGENOT	•	, , ,	02	- '	9		0.	
NAL I—	MAG	ANG	MAG	ANG	MAC	ANG	N4A C	ANG
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	.739	-23.1	15.190	151.5	.016	74.9	.922	-13.6
200.00	.617	-45.5	13.966	131.9	.027	63.0	.804	-22.2
300.00	.507	-64.6	12.474	115.9	.035	57.3	.699	-25.8
400.00	.414	-81.0	10.826	102.7	.042	51.8	.632	-27.3
500.00	.344	-94.7	9.421	91.8	.049	49.7	.583	-28.1
600.00	.296	-105.9	8.147	82.9	.055	47.0	.550	-28.1
700.00	.260	-116.6	7.211	74.9	.062	44.4	.525	-28.3
800.00	.236	-126.3	6.434	67.7	.068	41.8	.506	-28.7
900.00	.218	-136.2	5.806	60.9	.075	39.1	.490	-28.9
1000.00	.205	-144.8	5.288	54.6	.083	36.4	.477	-29.6
1100.00	.199	-153.1	4.864	48.6	.089	33.4	.466	-29.9
1200.00	.194	-161.6	4.500	42.7	.096	30.2	.457	-31.0
1300.00	.193	-168.9	4.191	37.0	.102	27.7	.449	-31.7
1400.00	.194	-175.6	3.908	31.4	.111	24.2	.441	-32.8
1500.00	.196	178.7	3.680	26.2	.118	21.0	.435	-33.9
1600.00	.202	173.5	3.489	20.7	.125	17.6	.429	-35.5
1700.00	.214	167.9	3.317	15.0	.133	12.6	.417	-37.2
	.222		3.154	9.6		9.4	.406	-37.2 -38.2
1800.00		161.7			.139			
1900.00	.229	156.3	2.994	4.2	.145	6.0	.397	-39.4
2000.00	.237	151.7	2.857	-1.0	.152	2.6	.390	-40.5
2100.00	.246	147.5	2.748	-6.1	.159	9	.381	-42.1
2200.00	.253	144.6	2.626	-11.1	.167	-4.6	.374	-43.6
2300.00	.263	140.9	2.539	-16.2	.174	-8.0	.366	-45.2
2400.00	.271	137.9	2.445	-21.3	.182	-11.6	.357	-46.8
2500.00	.283	134.8	2.363	-26.3	.190	-15.2	.347	-48.4
2600.00	.292	132.0	2.288	-31.4	.197	-19.2	.338	-50.6
2700.00	.303	129.7	2.218	-36.4	.204	-22.9	.328	-52.5
2800.00	.315	127.4	2.147	-41.4	.211	-26.7		-54.8
							.318	
2900.00 3000.00	.326 .339	125.0 122.7	2.085 2.032	-46.3 -51.2	.220 .227	-30.8 -34.2	.309 .299	-56.9 -59.5
Vce = 3 V, Ic = 7 m.	A, Zo = 50 Ω	2						
Vce = 3 V, Ic = 7 m. FREQUENCY		Ω 311	S2	21	S	12	S	22
FREQUENCY	S	311						
FREQUENCY MHz	S MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
FREQUENCY MHz 100.00	MAG .815	ANG –17.7	MAG 11.972	ANG 155.6	MAG .016	ANG 77.0	MAG .947	ANG -11.5
FREQUENCY MHz 100.00 200.00	MAG .815 .732	ANG -17.7 -34.0	MAG 11.972 11.228	ANG 155.6 138.4	MAG .016 .029	ANG 77.0 63.4	MAG .947 .855	ANG -11.5 -20.4
FREQUENCY  MHz 100.00 200.00 300.00	MAG .815 .732 .634	ANG -17.7 -34.0 -50.1	MAG 11.972 11.228 10.480	ANG 155.6 138.4 123.5	MAG .016 .029 .039	ANG 77.0 63.4 56.1	MAG .947 .855 .757	ANG -11.5 -20.4 -25.1
FREQUENCY  MHz 100.00 200.00 300.00 400.00	MAG .815 .732 .634 .539	ANG -17.7 -34.0 -50.1 -64.9	MAG 11.972 11.228 10.480 9.549	ANG 155.6 138.4 123.5 110.7	MAG .016 .029 .039 .047	ANG 77.0 63.4 56.1 51.8	MAG .947 .855 .757 .687	ANG -11.5 -20.4 -25.1 -27.9
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00	MAG .815 .732 .634 .539 .455	ANG -17.7 -34.0 -50.1 -64.9 -78.9	MAG 11.972 11.228 10.480 9.549 8.722	ANG 155.6 138.4 123.5 110.7 99.0	MAG .016 .029 .039 .047	ANG 77.0 63.4 56.1 51.8 47.4	MAG .947 .855 .757 .687	ANG -11.5 -20.4 -25.1 -27.9 -29.6
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00	MAG .815 .732 .634 .539 .455	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6	MAG 11.972 11.228 10.480 9.549 8.722 7.703	ANG 155.6 138.4 123.5 110.7 99.0 89.1	MAG .016 .029 .039 .047 .054	ANG 77.0 63.4 56.1 51.8 47.4 44.0	MAG .947 .855 .757 .687 .630	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00	MAG .815 .732 .634 .539 .455 .392	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3	MAG .016 .029 .039 .047 .054 .060	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4	MAG .947 .855 .757 .687 .630 .589	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	MAG .815 .732 .634 .539 .455 .392 .336 .297	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2	MAG .016 .029 .039 .047 .054 .060	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5	MAG .947 .855 .757 .687 .630 .589 .557	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	MAG .815 .732 .634 .539 .455 .392 .336 .297	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9	MAG .016 .029 .039 .047 .054 .060 .066 .073	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8	MAG .947 .855 .757 .687 .630 .589 .557 .532	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	MAG .815 .732 .634 .539 .455 .392 .336 .297	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9	MAG .016 .029 .039 .047 .054 .060 .066 .073	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8	MAG .947 .855 .757 .687 .630 .589 .557 .532	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 33.6 33.9 28.2 22.7	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .449	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00 1900.00 2000.00 2100.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 -7 -4.6 -9.6	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2100.00 2200.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7 -47.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 -7 -4.6 -9.6	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2100.00 2200.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7 -47.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00 2300.00 2400.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244 .219 .223 .236	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1 143.5	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548 2.453	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9 -20.0	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174 .181	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4 -13.8	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374 .365 .356	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7 -47.2 -49.0
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2100.00 2300.00 2400.00 2500.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1 143.5 140.2 137.1	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548 2.453 2.370 2.295	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9 -20.0 -25.0 -30.2	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174 .181 .189 .196	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4 -13.8 -17.4	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374 .365 .356 .346 .337	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7 -47.2 -49.0 -50.5 -52.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 1800.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .228 .216 .208 .202 .205 .214 .219 .223 .230 .236 .244 .258 .258 .268 .278	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1 143.5 140.2 137.1	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548 2.453 2.370 2.295 2.228	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9 -20.0 -25.0 -30.2 -35.2	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174 .181 .189 .196 .203	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4 -13.8 -17.4 -21.0 -24.9	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374 .365 .356 .346 .337 .328	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7 -47.2 -49.0 -50.5 -52.7 -54.6
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 1800.00 1200.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244 .254 .262 .273 .281 .293 .303	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1 143.5 140.2 137.1 134.1	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548 2.453 2.370 2.295 2.228 2.156	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9 -20.0 -25.0 -30.2 -35.2 -40.2	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174 .181 .189 .196 .203 .211	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4 -13.8 -17.4 -21.0 -24.9 -28.3	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374 .365 .356 .346 .337 .328	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -41.7 -43.0 -44.4 -45.7 -47.2 -49.0 -50.5 -52.7 -54.6 -56.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 1800.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .815 .732 .634 .539 .455 .392 .336 .297 .268 .244 .228 .216 .208 .203 .202 .205 .214 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .219 .223 .230 .236 .244 .228 .216 .208 .202 .205 .214 .219 .223 .230 .236 .244 .258 .258 .268 .278	ANG -17.7 -34.0 -50.1 -64.9 -78.9 -89.6 -100.4 -110.0 -119.5 -128.0 -136.6 -145.2 -153.4 -160.8 -167.7 -173.8 179.6 172.5 165.7 160.0 155.4 151.6 147.1 143.5 140.2 137.1	MAG 11.972 11.228 10.480 9.549 8.722 7.703 6.951 6.265 5.700 5.221 4.802 4.479 4.169 3.900 3.674 3.478 3.316 3.153 3.001 2.874 2.753 2.631 2.548 2.453 2.370 2.295 2.228	ANG 155.6 138.4 123.5 110.7 99.0 89.1 80.3 72.2 64.9 58.3 51.8 45.5 39.6 33.9 28.2 22.7 17.3 11.6 6.0 .7 -4.6 -9.6 -14.9 -20.0 -25.0 -30.2 -35.2	MAG .016 .029 .039 .047 .054 .060 .066 .073 .079 .086 .092 .098 .106 .113 .121 .128 .135 .141 .146 .153 .160 .167 .174 .181 .189 .196 .203	ANG 77.0 63.4 56.1 51.8 47.4 44.0 41.4 38.5 35.8 32.7 29.7 27.4 24.0 21.1 17.5 14.3 10.2 6.4 3.5 0.0 -3.2 -6.9 -10.4 -13.8 -17.4 -21.0 -24.9	MAG .947 .855 .757 .687 .630 .589 .557 .532 .511 .494 .480 .468 .459 .449 .440 .433 .421 .409 .399 .391 .382 .374 .365 .356 .346 .337 .328	ANG -11.5 -20.4 -25.1 -27.9 -29.6 -30.5 -30.9 -31.5 -31.9 -32.5 -32.9 -33.8 -34.4 -35.6 -36.6 -37.8 -39.7 -40.7 -41.7 -43.0 -44.4 -45.7 -47.2 -49.0 -50.5 -52.7 -54.6



O-I ANAMETER								
Vce = 3 V, Ic = 5 m	nA, Zo = 50 Ω	2						
FREQUENCY	S	S11	S2	21	S	12	S	22
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	.870	-13.9	9.067	158.8	.017	76.2	.964	-9.7
200.00	.809	-27.3	8.687	143.1	.031	65.8	.897	-17.8
300.00	.733	-40.3	8.368	129.3	.042	58.0	.814	-23.3
400.00	.661	-53.0	7.864	117.5	.052	51.2	.748	-27.0
500.00	.575	-66.1	7.479	106.3	.059	45.9	.687	-29.5
600.00	.510	-76.2	6.765	96.3	.066	41.4	.643	-31.2
700.00	.440	-87.2	6.297	86.6	.072	38.2	.604	-32.3
800.00	.387	-96.8	5.812	77.7	.078	34.7	.574	-33.3
900.00	.345	-106.1	5.365	69.7	.083	32.7	.547	-33.9
1000.00	.309	-114.9	4.964	62.4	.090	29.2	.527	-34.7
1100.00	.283 .261	-123.3 -131.9	4.616 4.298	55.4	.096	25.9 23.0	.509	-35.2 -36.1
1200.00 1300.00	.246	-131.9 -139.7	4.296	49.0 42.4	.101 .107	20.4	.493 .481	-36.7
1400.00	.234	-139.7 -147.4	3.784	36.7	.115	17.1	.471	-30.7 -37.8
1500.00	.227	-147.4 -154.7	3.568	30.8	.113	14.2	.460	-37.8 -38.9
1600.00	.227	-161.3	3.385	25.0	.122	11.2	.450	-30.9 -40.2
1700.00	.231	-168.9	3.230	19.1	.137	7.1	.438	-41.9
1800.00	.231	-176.7	3.069	13.5	.141	3.4	.425	-42.8
1900.00	.233	176.3	2.929	7.8	.148	.7	.413	-44.0
2000.00	.237	169.5	2.802	2.3	.153	-2.4	.405	-45.2
2100.00	.242	163.9	2.690	-3.0	.159	-6.1	.396	-46.5
2200.00	.247	159.4	2.583	-8.3	.166	<b>-</b> 9.3	.387	-48.0
2300.00	.256	154.3	2.495	-13.6	.173	-12.8	.377	-49.5
2400.00	.264	150.1	2.404	-18.8	.179	-16.2	.367	-51.1
2500.00	.274	146.2	2.324	-23.9	.187	-19.3	.358	-52.7
2600.00	.282	142.3	2.251	-29.2	.194	-23.3	.348	-54.8
2700.00	.292	139.2	2.188	-34.3	.200	-26.9	.339	-56.8
2800.00	.303	135.9	2.117	-39.4	.207	-30.2	.328	-59.0
2900.00	.313	132.9	2.056	-44.5	.215	-34.1	.319	-60.9
3000.00	.325	130.0	2.003	-49.5	.223	-37.5	.309	-63.5
Vce = 3 V, Ic = 3 m FREQUENCY		Ω 611	S2	21	S	12	s	22
FREQUENCY	S	S11						
FREQUENCY MHz	S MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
FREQUENCY MHz 100.00	MAG .936	ANG -10.5	MAG 5.612	ANG 163.6	MAG .017	ANG 79.6	MAG .981	ANG -7.1
FREQUENCY MHz 100.00 200.00	MAG .936 .892	ANG -10.5 -20.4	MAG 5.612 5.628	ANG 163.6 148.9	MAG .017 .034	ANG 79.6 69.7	MAG .981 .944	ANG -7.1 -14.0
FREQUENCY  MHz 100.00 200.00 300.00	MAG .936 .892 .842	ANG -10.5 -20.4 -30.5	MAG 5.612 5.628 5.602	ANG 163.6 148.9 136.8	MAG .017 .034 .048	ANG 79.6 69.7 60.6	MAG .981 .944 .887	ANG -7.1 -14.0 -19.3
FREQUENCY  MHz  100.00  200.00  300.00  400.00	MAG .936 .892 .842 .785	ANG -10.5 -20.4 -30.5 -41.2	MAG 5.612 5.628 5.602 5.393	ANG 163.6 148.9 136.8 126.0	MAG .017 .034 .048 .060	ANG 79.6 69.7 60.6 53.2	MAG .981 .944 .887 .837	ANG -7.1 -14.0 -19.3 -23.7
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00	MAG .936 .892 .842 .785	ANG -10.5 -20.4 -30.5 -41.2 -50.8	MAG 5.612 5.628 5.602 5.393 5.328	ANG 163.6 148.9 136.8 126.0 116.2	MAG .017 .034 .048 .060	ANG 79.6 69.7 60.6 53.2 46.4	MAG .981 .944 .887 .837	ANG -7.1 -14.0 -19.3 -23.7 -27.2
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00	MAG .936 .892 .842 .785 .732	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2	MAG 5.612 5.628 5.602 5.393 5.328 4.924	ANG 163.6 148.9 136.8 126.0 116.2 106.6	MAG .017 .034 .048 .060 .069	ANG 79.6 69.7 60.6 53.2 46.4 40.6	MAG .981 .944 .887 .837 .782 .740	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00	MAG .936 .892 .842 .785 .732 .681	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2	MAG .017 .034 .048 .060 .069 .077	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8	MAG .981 .944 .887 .837 .782 .740 .698	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	MAG .936 .892 .842 .785 .732 .681 .618	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0	MAG .017 .034 .048 .060 .069 .077 .084	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0	MAG .981 .944 .887 .837 .782 .740 .698 .663	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00	MAG .936 .892 .842 .785 .732 .681	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2	MAG .017 .034 .048 .060 .069 .077 .084 .090	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0	MAG .981 .944 .887 .837 .782 .740 .698 .663	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	MAG .936 .892 .842 .785 .732 .681 .618 .564	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4	MAG .017 .034 .048 .060 .069 .077 .084	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0	MAG .981 .944 .887 .837 .782 .740 .698 .663	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  900.00  1000.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  900.00  1100.00  1200.00  1300.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  900.00  1000.00  1100.00  1200.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .106 .110 .116	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  900.00  1000.00  1100.00  1200.00  1300.00  1400.00  1500.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .110 .116	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  900.00  1000.00  1100.00  1200.00  1300.00  1400.00  1500.00  1600.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.790 3.588 3.410 3.234 3.086	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .106 .110 .116 .121 .126 .134	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .106 .110 .116 .121 .126 .134	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8
FREQUENCY  MHz  100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .110 .116 .121 .126 .134 .140	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0
FREQUENCY  MHz  100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .110 .116 .121 .126 .134 .140 .143 .148	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  1000.00  1100.00  1200.00  1400.00  1500.00  1600.00  1700.00  1800.00  1900.00  1900.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 11.2 5.4	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .110 .116 .121 .126 .134 .140 .143 .148	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  1000.00  1100.00  1200.00  1300.00  1400.00  1500.00  1700.00  1800.00  1700.00  1800.00  2000.00  2100.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.4 3	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .110 .116 .121 .126 .134 .140 .143 .148 .153 .159	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1500.00 1600.00 1700.00 1800.00 1700.00 1800.00 2000.00 2100.00 2200.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -120.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.4 -3 -5.9	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .106 .110 .116 .121 .126 .134 .140 .143 .143 .153 .159	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00 2300.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273 .275	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0 167.8	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.43 -5.9 -11.5	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .106 .110 .116 .121 .126 .134 .140 .143 .148 .153 .159 .164	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00 2300.00 2400.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .275 .280 .284	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -158.6 -166.4 -174.1 179.6 174.0 167.8 162.6	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332 2.248	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.4 -3 -5.9 -11.5 -16.9	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .111 .126 .134 .140 .143 .148 .153 .159 .164 .170	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9 -20.9	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428 .417 .406	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7 -54.2
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00 2300.00 2400.00 2500.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273 .275 .280 .284	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0 167.8 162.6	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332 2.248 2.177	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.43 -5.9 -11.5 -16.9 -22.2	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .111 .126 .134 .140 .143 .148 .153 .159 .164 .170 .176 .182	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9 -20.9 -23.8	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428 .417 .406 .396	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7 -54.2 -55.9
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1500.00 1500.00 1600.00 1700.00 1800.00 1900.00 2100.00 2200.00 2300.00 2400.00 2500.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273 .273 .275 .280 .284 .292	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -120.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0 167.8 162.6 157.7	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332 2.248 2.177 2.109	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.43 -5.9 -11.5 -16.9 -22.2 -27.6	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .111 .126 .134 .140 .143 .148 .153 .159 .164 .170 .176 .182 .187	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9 -20.9 -23.8 -27.3	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428 .417 .406 .396 .386	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7 -54.2 -55.9 -57.9
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273 .275 .280 .284 .292 .298 .307	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0 167.8 162.6 157.7 152.8 148.7	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332 2.248 2.177 2.109 2.051	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.43 -5.9 -11.5 -16.9 -22.2 -27.6 -32.9	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .121 .126 .134 .140 .143 .148 .153 .159 .164 .170 .176 .182 .187 .194	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9 -20.9 -23.8 -27.3 -30.7	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428 .417 .406 .396 .386 .376	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7 -54.2 -55.9 -59.9
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00  700.00  800.00  1000.00  1100.00  1200.00  1300.00  1400.00  1500.00  1600.00  1700.00  1800.00  2000.00  2100.00  2200.00  2300.00  2400.00  2500.00  2600.00  2700.00  2800.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273 .275 .280 .284 .292 .298 .307	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0 167.8 162.6 157.7 152.8 148.7	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332 2.248 2.177 2.109 2.051 1.988	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.43 -5.9 -11.5 -16.9 -22.2 -27.6 -32.9 -38.1	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .121 .126 .134 .140 .143 .148 .153 .159 .164 .170 .176 .182 .187 .194	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9 -20.9 -23.8 -27.3 -30.7 -33.8	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428 .417 .406 .396 .386 .376	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -40.8 -41.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7 -54.2 -55.9 -57.9 -59.9 -61.8
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .936 .892 .842 .785 .732 .681 .618 .564 .510 .459 .413 .375 .350 .325 .307 .295 .289 .283 .276 .273 .273 .275 .280 .284 .292 .298 .307	ANG -10.5 -20.4 -30.5 -41.2 -50.8 -59.2 -68.7 -77.9 -86.9 -96.0 -104.8 -113.0 -120.8 -128.3 -135.8 -142.9 -150.9 -158.6 -166.4 -174.1 179.6 174.0 167.8 162.6 157.7 152.8 148.7	MAG 5.612 5.628 5.602 5.393 5.328 4.924 4.767 4.575 4.365 4.191 3.991 3.790 3.588 3.410 3.234 3.086 2.960 2.830 2.707 2.597 2.504 2.405 2.332 2.248 2.177 2.109 2.051	ANG 163.6 148.9 136.8 126.0 116.2 106.6 97.2 88.0 79.4 70.9 62.9 55.7 48.7 42.0 35.7 29.5 23.3 17.0 11.2 5.43 -5.9 -11.5 -16.9 -22.2 -27.6 -32.9	MAG .017 .034 .048 .060 .069 .077 .084 .090 .094 .100 .116 .121 .126 .134 .140 .143 .148 .153 .159 .164 .170 .176 .182 .187 .194	ANG 79.6 69.7 60.6 53.2 46.4 40.6 35.8 31.0 27.0 23.5 19.8 17.1 14.2 11.1 7.8 4.9 1.0 -2.7 -5.6 -8.5 -11.6 -14.4 -17.9 -20.9 -23.8 -27.3 -30.7	MAG .981 .944 .887 .837 .782 .740 .698 .663 .627 .599 .577 .558 .542 .525 .513 .499 .486 .471 .457 .448 .435 .428 .417 .406 .396 .386 .376	ANG -7.1 -14.0 -19.3 -23.7 -27.2 -29.9 -32.0 -33.9 -35.2 -36.5 -37.5 -38.5 -39.6 -40.8 -41.8 -43.2 -44.8 -46.0 -47.1 -48.4 -49.8 -51.3 -52.7 -54.2 -55.9 -59.9



S-PARAMETER								
$V_{CE} = 3 \text{ V, Ic} = 1 \text{ m/s}$	$A. Z_0 = 50 G$	2						
FREQUENCY	•	- 311	S2	01	9	12	9	22
TREGOLINGT	3	711	32	- 1	3	12	5.	22
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	.986	-6.4	1.963	167.5	.019	82.2	.996	-4.0
200.00	.971	-13.0	2.022	157.2	.036	73.4	.987	-8.1
300.00	.958	-19.5	2.075	147.4	.053	66.7	.966	-11.8
400.00	.936	-26.5	2.082	137.6	.070	58.7	.953	-15.4
500.00	.914	-32.8	2.114	129.5	.084	52.1	.929	-18.7
600.00	.890	-39.0	2.011	120.8	.098	45.0	.909	-22.0
700.00	.859	-45.3	1.993	112.4	.109	38.5	.883	-24.9
800.00	.833	-51.7	1.967	103.7	.120	32.1	.859	-27.7
900.00	.801	-58.0	1.916	95.7	.127	25.8	.830	-30.5
1000.00	.769	-65.2	1.952	88.0	.137	20.2	.803	-33.0
1100.00	.732	-72.5	1.972	79.8	.143	14.4	.776	-35.0
1200.00	.693	-80.0	1.987	72.4	.148	9.7	.754	-37.1
1300.00	.663	-86.7	1.945	64.6	.154	4.5	.734	-39.0
1400.00	.626	-93.9	1.936	57.2	.157	1	.712	-41.1
1500.00	.596	-100.5	1.893	49.6	.162	-4.4	.693	-42.9
1600.00	.570	-107.2	1.852	42.8	.165	-8.3	.676	-44.6
1700.00	.542	-114.9	1.845	35.3	.170	-12.9	.660	-46.5
1800.00	.523	-121.5	1.786	28.6	.172	-17.5	.640	-48.3
1900.00	.497	-129.1	1.766	21.5	.174	-21.5	.622	-49.9
2000.00	.471	-137.3	1.746	14.6	.174	-25.3	.610	-51.7
2100.00	.456	-144.2	1.707	8.2	.174	-28.5	.595	-53.3
2200.00	.443	-151.0	1.661	1.6	.176	-31.9	.583	-55.0
2300.00	.430	-158.3	1.648	-4.8	.177	-35.1	.567	-56.8
2400.00	.424	-164.8	1.598	-10.9	.178	-38.1	.557	-58.6
2500.00	.419	-171.3	1.565	-17.0	.180	-40.5	.545	-60.5
2600.00	.414	-177.8	1.534	-23.1	.182	-43.6	.534	-62.6
2700.00	.412	176.4	1.504	-29.1	.183	-46.5	.523	-64.6
2800.00	.413	170.5	1.466	-34.9	.186	-48.7	.515	-66.9
2900.00	.414	164.7	1.442	-40.6	.189	-51.4	.504	-69.2
3000.00	.419	159.5	1.413	-46.3	.191	-53.5	.495	-71.7
Voc = 1 V lo = 5 m/	70 - 50 0	)						
Vce = 1 V, Ic = 5 mA FREQUENCY		Ω 311	S2	21	S	12	s	22
FREQUENCY	S	311						
FREQUENCY MHz	S MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
FREQUENCY MHz 100.00	MAG .849	ANG –19.1	MAG 8.397	ANG 156.6	MAG .021	ANG 75.5	MAG .949	ANG -11.9
FREQUENCY MHz 100.00 200.00	MAG .849 .764	ANG -19.1 -34.1	MAG 8.397 8.259	ANG 156.6 139.2	MAG .021 .037	ANG 75.5 63.8	MAG .949 .866	ANG -11.9 -21.8
FREQUENCY  MHz 100.00 200.00 300.00	MAG .849 .764 .681	ANG -19.1 -34.1 -49.1	MAG 8.397 8.259 7.901	ANG 156.6 139.2 125.1	MAG .021 .037 .051	ANG 75.5 63.8 54.8	MAG .949 .866 .767	ANG -11.9 -21.8 -28.2
FREQUENCY  MHz 100.00 200.00 300.00 400.00	MAG .849 .764 .681 .612	ANG -19.1 -34.1 -49.1 -63.6	MAG 8.397 8.259 7.901 7.397	ANG 156.6 139.2 125.1 113.1	MAG .021 .037 .051 .060	ANG 75.5 63.8 54.8 48.4	MAG .949 .866 .767 .689	ANG -11.9 -21.8 -28.2 -32.3
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00	MAG .849 .764 .681 .612 .534	ANG -19.1 -34.1 -49.1 -63.6 -78.0	MAG 8.397 8.259 7.901 7.397 7.006	ANG 156.6 139.2 125.1 113.1 101.8	MAG .021 .037 .051 .060	ANG 75.5 63.8 54.8 48.4 42.2	MAG .949 .866 .767 .689	ANG -11.9 -21.8 -28.2 -32.3 -35.2
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00	MAG .849 .764 .681 .612 .534	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5	MAG 8.397 8.259 7.901 7.397 7.006 6.297	ANG 156.6 139.2 125.1 113.1 101.8 91.7	MAG .021 .037 .051 .060 .068	ANG 75.5 63.8 54.8 48.4 42.2 38.7	MAG .949 .866 .767 .689 .623	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00	MAG .849 .764 .681 .612 .534 .473	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2	MAG .021 .037 .051 .060 .068 .076	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3	MAG .949 .866 .767 .689 .623 .573	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	MAG .849 .764 .681 .612 .534 .473 .414	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6	MAG .021 .037 .051 .060 .068 .076 .082	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9	MAG .949 .866 .767 .689 .623 .573 .531	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	MAG .849 .764 .681 .612 .534 .473 .414 .371	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7	MAG .021 .037 .051 .060 .068 .076 .082 .089	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7	MAG .949 .866 .767 .689 .623 .573 .531 .499	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1100.00 1200.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1100.00 1200.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.9	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.9 1	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.9 1 -3.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00 1900.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.9 1 -3.8 -6.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00 1900.00 2000.00 2100.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2100.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00 2300.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6 147.3	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 2000.00 2200.00 2300.00 2400.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317 324	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6 147.3 143.6	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260 2.177	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8 -23.0	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192 .199	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2 -20.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284 .272	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0 -58.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 2000.00 2100.00 2200.00 2300.00 2400.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317 324 .334	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 155.4 155.6 147.3 143.6 140.2	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260 2.177 2.105	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8 -23.0 -28.2	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192 .199 .207	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2 -20.8 -23.9	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284 .272 .261	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0 -58.9 -60.8
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317 .317 .324 .334 .334	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6 147.3 143.6 140.2 137.0	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260 2.177 2.105 2.037	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8 -23.0 -28.2 -33.5	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192 .199 .207 .214	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2 -20.8 -23.9 -27.8	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284 .272 .261 .251	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0 -58.9 -60.8 -63.7
MHz 100.00 200.00 300.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1200.00 2200.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317 .324 .334 .345 .354	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6 147.3 143.6 140.2 137.0 134.0	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260 2.177 2.105 2.037 1.977	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8 -23.0 -28.2 -33.5 -38.6	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192 .199 .207 .214	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2 -20.8 -23.9 -27.8 -31.4	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284 .272 .261 .251 .241	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0 -58.9 -60.8 -63.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00 2800.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317 .324 .334 .354 .354 .354	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6 147.3 143.6 140.2 137.0 134.0 131.0	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260 2.177 2.105 2.037 1.977 1.913	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8 -23.0 -28.2 -33.5 -38.6 -43.8	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192 .199 .207 .214 .221 .228	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2 -20.8 -23.9 -27.8 -31.4 -35.3	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284 .272 .261 .251 .241 .230	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0 -58.9 -60.8 -63.7 -65.9 -68.6
MHz 100.00 200.00 300.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1200.00 2200.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .849 .764 .681 .612 .534 .473 .414 .371 .339 .314 .295 .283 .275 .270 .267 .268 .273 .280 .288 .294 .301 .307 .317 .324 .334 .345 .354	ANG -19.1 -34.1 -49.1 -63.6 -78.0 -89.5 -101.5 -112.1 -122.2 -131.4 -140.2 -148.3 -156.2 -163.3 -170.3 -176.4 177.8 172.2 165.8 160.1 155.4 151.6 147.3 143.6 140.2 137.0 134.0	MAG 8.397 8.259 7.901 7.397 7.006 6.297 5.833 5.352 4.924 4.557 4.219 3.935 3.672 3.448 3.242 3.081 2.927 2.783 2.663 2.540 2.445 2.347 2.260 2.177 2.105 2.037 1.977	ANG 156.6 139.2 125.1 113.1 101.8 91.7 82.2 73.6 65.7 58.5 51.6 45.2 38.8 32.9 26.9 21.1 15.4 9.6 3.9 -1.7 -7.0 -12.4 -17.8 -23.0 -28.2 -33.5 -38.6	MAG .021 .037 .051 .060 .068 .076 .082 .089 .095 .103 .109 .115 .122 .129 .136 .143 .153 .160 .165 .171 .177 .186 .192 .199 .207 .214	ANG 75.5 63.8 54.8 48.4 42.2 38.7 35.3 31.9 28.7 25.6 22.8 20.1 16.9 13.8 10.7 7.5 3.91 -3.8 -6.8 -10.1 -13.8 -17.2 -20.8 -23.9 -27.8 -31.4	MAG .949 .866 .767 .689 .623 .573 .531 .499 .472 .448 .429 .414 .398 .385 .374 .362 .353 .340 .326 .316 .304 .293 .284 .272 .261 .251 .241	ANG -11.9 -21.8 -28.2 -32.3 -35.2 -37.0 -38.1 -39.2 -39.9 -40.9 -41.2 -42.2 -42.8 -44.0 -45.0 -46.4 -47.9 -49.5 -51.1 -52.2 -53.7 -55.4 -57.0 -68.9 -60.8



O-I ANAMETER								
$V_{CE} = 1 \text{ V}, \text{ Ic} = 3 \text{ m/s}$	$A, Z_0 = 50 \Omega$	2						
FREQUENCY	S	311	S2	21	S	12	S	22
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.00	.928	-11.2	5.570	160.2	.022	78.7	.974	-8.7
200.00	.876	-22.9	5.562	146.9	.040	67.5	.928	-16.9
300.00	.821	-34.2	5.509	134.3	.057	57.4	.859	-23.0
400.00	.758	-45.7	5.289	123.2	.070	49.7	.798	-28.0
500.00	.705	-45.7 -56.7	5.198	113.1	.081	43.3	.738	-26.0 -32.0
600.00	.652	-66.1	4.787	103.2	.089	37.0	.689	-35.2
700.00	.588	-76.8	4.617	93.6	.097	31.9	.640	-37.5
800.00	.535	-87.1	4.406	84.1	.103	27.6	.601	-39.4
900.00	.484	-97.1	4.187	75.5	.108	23.9	.565	-41.0
1000.00	.438	-107.0	3.986	67.1	.115	20.3	.533	-42.6
1100.00	.401	-116.3	3.771	59.1	.120	16.5	.508	-43.6
1200.00	.371	-125.4	3.566	51.8	.125	13.4	.486	-44.7
1300.00	.350	-133.4	3.362	44.8	.131	10.3	.468	-45.7
1400.00	.333	-141.3	3.177	38.3	.137	7.0	.449	-47.2
1500.00	.320	-148.7	3.015	31.8	.143	4.1	.436	-48.3
1600.00	.312	-156.1	2.872	25.8	.149	1.1	.421	-49.7
1700.00	.310	-162.9	2.745	19.5	.157	-2.5	.408	-51.4
1800.00	.310	-170.2	2.623	13.4	.162	-6.5	.391	-52.9
1900.00	.309	-177.5	2.514	7.3	.165	-9.7	.377	-54.2
2000.00	.310	175.4	2.407	1.4	.171	-12.7	.366	-55.5
2100.00	.313	169.8	2.318	-4.2	.177	-16.1	.351	-57.2
2200.00	.317	164.9	2.227	-9.8	.182	-19.1	.343	-58.5
2300.00	.324	159.5	2.157	-15.4	.188	-22.3	.330	-60.4
2400.00	.331	155.0	2.137	-13.4 -20.8	.194	-22.3 -25.6	.319	-62.2
2500.00	.338	150.6	2.012	-26.2	.200	-28.8	.307	-64.1
2600.00	.346	146.5	1.947	-31.7	.207	-32.4	.296	-66.8
2700.00	.356	142.6	1.894	-36.9	.213	-35.6	.285	-69.0
2800.00	.365	139.0	1.833	-42.3	.220	-39.1	.274	-71.8
2900.00	.375	135.7	1.782	<b>−</b> 47.5	.226	-42.7	.265	-74.3
3000.00	.386	132.4	1.737	-52.7	.234	-46.1	.254	-77.2
Vce = 1 V, Ic = 1 mA		2 811	S2	21	S	:12	S	22
FREQUENCY	S	311						
FREQUENCY MHz	S MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
FREQUENCY MHz 100.00	MAG .983	ANG -6.8	MAG 1.986	ANG 166.5	MAG .022	ANG 83.1	MAG .993	ANG -4.6
FREQUENCY MHz 100.00 200.00	MAG .983 .968	ANG -6.8 -14.0	MAG 1.986 2.016	ANG 166.5 156.0	MAG .022 .044	ANG 83.1 73.1	MAG .993 .983	ANG -4.6 -9.3
FREQUENCY  MHz 100.00 200.00 300.00	MAG .983 .968 .952	ANG -6.8 -14.0 -21.0	MAG 1.986 2.016 2.067	ANG 166.5 156.0 145.7	MAG .022 .044 .064	ANG 83.1 73.1 65.2	MAG .993 .983 .959	ANG -4.6 -9.3 -13.6
FREQUENCY  MHz 100.00 200.00 300.00 400.00	MAG .983 .968 .952 .925	ANG -6.8 -14.0 -21.0 -28.5	MAG 1.986 2.016 2.067 2.064	ANG 166.5 156.0 145.7 135.9	MAG .022 .044 .064 .083	ANG 83.1 73.1 65.2 56.7	MAG .993 .983 .959	ANG -4.6 -9.3 -13.6 -17.7
FREQUENCY  MHz 100.00 200.00 300.00 400.00 500.00	MAG .983 .968 .952 .925 .904	ANG -6.8 -14.0 -21.0 -28.5 -35.3	MAG 1.986 2.016 2.067 2.064 2.096	ANG 166.5 156.0 145.7 135.9 127.1	MAG .022 .044 .064 .083 .100	ANG 83.1 73.1 65.2 56.7 49.8	MAG .993 .983 .959 .942 .913	ANG -4.6 -9.3 -13.6 -17.7 -21.6
FREQUENCY  MHz  100.00  200.00  300.00  400.00  500.00  600.00	MAG .983 .968 .952 .925 .904 .878	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992	ANG 166.5 156.0 145.7 135.9 127.1 118.1	MAG .022 .044 .064 .083 .100	ANG 83.1 73.1 65.2 56.7 49.8 42.7	MAG .993 .983 .959 .942 .913 .889	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00	MAG .983 .968 .952 .925 .904 .878 .844	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4	MAG .022 .044 .064 .083 .100 .116 .129	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5	MAG .993 .983 .959 .942 .913 .889	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	MAG .983 .968 .952 .925 .904 .878 .844	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6	MAG .022 .044 .064 .083 .100 .116 .129	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7	MAG .993 .983 .959 .942 .913 .889 .859	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	MAG .983 .968 .952 .925 .904 .878 .844 .816	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3	MAG .022 .044 .064 .083 .100 .116 .129 .141	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5	MAG .993 .983 .959 .942 .913 .889 .859 .829	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795 .765	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795 .765 .736	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795 .765 .736 .709	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 .8 -3.9	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795 .765 .736 .709 .686	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 .8 -3.9 -8.9	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795 .765 .736 .709 .686 .661	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8	MAG .993 .983 .959 .942 .913 .889 .859 .829 .795 .765 .736 .709 .686 .661	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .621 .603	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2 -54.4
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .196 .196	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2 -54.4 -56.1
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .196	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2 -52.4 -56.1 -57.9
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1800.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .196 .196	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2 -54.4 -56.1
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 17700.00 1800.00 1900.00 2000.00 2100.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .196 .198 .198 .198	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 .8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1900.00 1900.00 2000.00 2100.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .196 .198 .198	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2 -54.4 -57.9 -59.6
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 17700.00 1800.00 1900.00 2000.00 2100.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3 -172.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .196 .198 .198 .198	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 .8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 17700.00 1800.00 1900.00 2000.00 2200.00 2300.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454 .446	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590 1.571	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1 -9.5	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .196 .198 .198 .199 .200	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 .8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9 -40.5	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7 -63.5
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 17700.00 1800.00 1900.00 2000.00 2200.00 2300.00 2400.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454 .446 .437	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3 -172.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590 1.571	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1 -9.5 -15.7	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .198 .198 .198 .199 .200 .201	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 .8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9 -40.5 -43.8	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519 .502 .490	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7 -63.5 -65.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 2000.00 2100.00 2200.00 2300.00 2400.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454 .446 .437 .433	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3 -172.8 -179.0	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590 1.571 1.520 1.488	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1 -9.5 -15.7 -21.7	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .198 .198 .198 .199 .200 .201 .201	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9 -40.5 -43.8 -46.5	MAG .993 .983 .959 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519 .502	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7 -63.5 -65.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454 .446 .437 .433 .430	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -92.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3 -172.8 -179.0 174.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590 1.571 1.520 1.488 1.459	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1 -9.5 -15.7 -21.7 -27.8	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .198 .198 .199 .200 .201 .201 .203	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9 -40.5 -43.8 -46.5 -49.3	MAG .993 .983 .989 .942 .913 .889 .859 .829 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519 .502 .490 .477 .466	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7 -63.5 -65.7 -67.7
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1500.00 1600.00 1700.00 1800.00 1200.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454 .446 .437 .433 .430 .429	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3 -172.8 -179.0 174.8 169.2	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590 1.571 1.520 1.488 1.459 1.425	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1 -9.5 -15.7 -21.7 -27.8 -33.7	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .196 .196 .198 .199 .200 .201 .203 .204	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9 -40.5 -43.8 -46.5 -49.3 -52.3	MAG .993 .983 .989 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519 .502 .490 .477 .466 .453	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -46.3 -48.2 -50.2 -54.4 -56.1 -57.9 -59.6 -61.7 -63.5 -65.7 -70.0 -72.4
MHz 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1100.00 1200.00 1300.00 1400.00 1500.00 1600.00 1700.00 1800.00 1700.00 1800.00 2000.00 2100.00 2200.00 2300.00 2400.00 2500.00 2600.00 2700.00 2800.00	MAG .983 .968 .952 .925 .904 .878 .844 .816 .782 .749 .709 .673 .639 .606 .578 .551 .526 .509 .487 .466 .454 .446 .437 .433 .430 .429 .429	ANG -6.8 -14.0 -21.0 -28.5 -35.3 -41.8 -48.6 -55.6 -62.3 -69.9 -77.8 -85.8 -100.6 -107.5 -114.6 -122.6 -129.5 -137.3 -145.4 -152.5 -159.2 -166.3 -172.8 -179.0 174.8 169.2 163.8	MAG 1.986 2.016 2.067 2.064 2.096 1.992 1.971 1.945 1.900 1.926 1.940 1.952 1.904 1.889 1.837 1.801 1.782 1.727 1.702 1.674 1.637 1.590 1.571 1.520 1.488 1.459 1.425 1.390	ANG 166.5 156.0 145.7 135.9 127.1 118.1 109.4 100.6 92.3 84.3 76.0 68.2 60.4 52.8 45.2 38.0 30.7 23.8 16.9 9.8 3.4 -3.1 -9.5 -15.7 -21.7 -27.8 -33.7 -39.5	MAG .022 .044 .064 .083 .100 .116 .129 .141 .151 .159 .166 .172 .178 .182 .185 .189 .195 .196 .196 .198 .198 .199 .200 .201 .201 .201 .203 .204 .206	ANG 83.1 73.1 65.2 56.7 49.8 42.7 35.5 28.7 22.5 16.3 11.1 5.8 -3.9 -8.9 -12.8 -17.6 -22.3 -26.3 -30.1 -33.7 -36.9 -40.5 -43.8 -46.5 -49.3 -55.1	MAG .993 .983 .989 .942 .913 .889 .859 .795 .765 .736 .709 .686 .661 .641 .621 .603 .582 .562 .548 .530 .519 .502 .490 .477 .466 .453 .443	ANG -4.6 -9.3 -13.6 -17.7 -21.6 -25.2 -28.5 -31.7 -34.8 -37.4 -39.7 -42.0 -44.2 -46.3 -48.2 -50.2 -52.2 -54.4 -56.1 -57.9 -59.6 -61.7 -63.5 -65.7 -67.7 -70.0 -72.4 -75.1

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