



Focal Length 90 mm

Circle of Confusion 0.025 mm

T/No	2.2	2.5	2.8	3.2	3.5	4	4.5
Hyperfocal Distance (ft-inch)	479' 8.18"	427' 4.98"	380' 10.16"	339' 4.32"	302' 4.82"	269' 5.7"	240' 1.65"

T/No	2.2		2.5		2.8		3.2		3.5		4		4.5	
Focus Distance (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)
Infinity	479' 3.8"	Infinity	427' 0.75"	Infinity	380' 6.08"	Infinity	339' 0.36"	Infinity	302' 0.92"	Infinity	269' 1.86"	Infinity	239' 9.89"	Infinity
200' 0"	141' 3.7"	342' 4.59"	136' 4.91"	375' 1.3"	131' 3.61"	420' 2.37"	126' 0.06"	485' 8.97"	120' 6.59"	588' 10.6"	114' 11.55"	773' 2.38"	109' 3.35"	1192' 1.45"
100' 0"	82' 10.41"	126' 1.24"	81' 1.99"	130' 3.25"	79' 4.05"	135' 3.48"	77' 4.57"	141' 4.88"	75' 3.57"	148' 11.61"	73' 1.06"	158' 5.78"	70' 9.11"	170' 8.69"
75' 0"	64' 11.49"	88' 8.82"	63' 10.93"	90' 9.27"	62' 9.3"	93' 2.08"	61' 6.57"	96' 0.31"	60' 2.71"	99' 5.32"	58' 9.7"	103' 6.98"	57' 3.54"	108' 7.91"
50' 0"	45' 4.24"	55' 8.58"	44' 10.12"	56' 6.08"	44' 3.42"	57' 5.07"	43' 8.09"	58' 5.84"	43' 0.1"	59' 8.75"	42' 3.42"	61' 2.27"	41' 6.02"	62' 10.98"
40' 0"	36' 11.79"	43' 6.7"	36' 7.73"	44' 0.46"	36' 3.26"	44' 7.08"	35' 10.35"	45' 2.72"	35' 4.98"	45' 11.55"	34' 11.1"	46' 9.82"	34' 4.7"	47' 9.81"
30' 0"	28' 3.39"	31' 11.31"	28' 1.03"	32' 2.37"	27' 10.41"	32' 5.87"	27' 7.53"	32' 9.88"	27' 4.35"	33' 2.48"	27' 0.86"	33' 7.77"	26' 9.03"	34' 1.88"
25' 0"	23' 9.63"	26' 3.91"	23' 7.97"	26' 5.98"	23' 6.12"	26' 8.33"	23' 4.08"	26' 11.01"	23' 1.82"	27' 2.08"	22' 11.33"	27' 5.59"	22' 8.59"	27' 9.63"
20' 0"	19' 2.8"	20' 9.98"	19' 1.72"	20' 11.26"	19' 0.52"	21' 0.72"	18' 11.19"	21' 2.37"	18' 9.72"	21' 4.25"	18' 8.08"	21' 6.39"	18' 6.28"	21' 8.84"
17' 0"	16' 5.36"	17' 7.11"	16' 4.58"	17' 8.01"	16' 3.71"	17' 9.04"	16' 2.74"	17' 10.2"	16' 1.67"	17' 11.52"	16' 0.47"	18' 1.02"	15' 11.15"	18' 2.74"
15' 0"	14' 6.85"	15' 5.47"	14' 6.24"	15' 6.16"	14' 5.56"	15' 6.95"	14' 4.8"	15' 7.84"	14' 3.96"	15' 8.84"	14' 3.03"	15' 9.99"	14' 1.99"	15' 11.29"
14' 0"	13' 7.52"	14' 4.73"	13' 6.99"	14' 5.33"	13' 6.4"	14' 6.01"	13' 5.74"	14' 6.78"	13' 5.01"	14' 7.64"	13' 4.19"	14' 8.63"	13' 3.28"	14' 9.75"
13' 0"	12' 8.15"	13' 4.05"	12' 7.69"	13' 4.56"	12' 7.18"	13' 5.14"	12' 6.61"	13' 5.79"	12' 5.98"	13' 6.53"	12' 5.28"	13' 7.37"	12' 4.49"	13' 8.33"
12' 0"	11' 8.73"	12' 3.43"	11' 8.34"	12' 3.86"	11' 7.91"	12' 4.34"	11' 7.43"	12' 4.89"	11' 6.89"	12' 5.52"	11' 6.28"	12' 6.22"	11' 5.62"	12' 7.02"
11' 0"	10' 9.27"	11' 2.85"	10' 8.94"	11' 3.21"	10' 8.58"	11' 3.61"	10' 8.17"	11' 4.07"	10' 7.72"	11' 4.59"	10' 7.21"	11' 5.17"	10' 6.65"	11' 5.83"
10' 0"	9' 9.76"	10' 2.33"	9' 9.49"	10' 2.62"	9' 9.19"	10' 2.95"	9' 8.85"	10' 3.33"	9' 8.48"	10' 3.75"	9' 8.06"	10' 4.22"	9' 7.6"	10' 4.76"
9' 6"	9' 3.98"	9' 8.09"	9' 3.74"	9' 8.35"	9' 3.47"	9' 8.65"	9' 3.17"	9' 8.98"	9' 2.83"	9' 9.36"	9' 2.46"	9' 9.78"	9' 2.04"	9' 10.26"
9' 0"	8' 10.2"	9' 1.87"	8' 9.98"	9' 2.1"	8' 9.74"	9' 2.36"	8' 9.47"	9' 2.66"	8' 9.17"	9' 2.99"	8' 8.83"	9' 3.37"	8' 8.46"	9' 3.8"
8' 6"	8' 4.4"	8' 7.65"	8' 4.21"	8' 7.86"	8' 3.99"	8' 8.09"	8' 3.76"	8' 8.35"	8' 3.49"	8' 8.65"	8' 3.19"	8' 8.98"	8' 2.85"	8' 9.36"
8' 0"	7' 10.59"	8' 1.45"	7' 10.42"	8' 1.63"	7' 10.23"	8' 1.84"	7' 10.02"	8' 2.07"	7' 9.79"	8' 2.33"	7' 9.52"	8' 2.62"	7' 9.23"	8' 2.95"
7' 6"	7' 4.77"	7' 7.26"	7' 4.62"	7' 7.42"	7' 4.46"	7' 7.6"	7' 4.27"	7' 7.8"	7' 4.07"	7' 8.02"	7' 3.84"	7' 8.28"	7' 3.58"	7' 8.57"
7' 0"	6' 10.94"	7' 1.09"	6' 10.81"	7' 1.23"	6' 10.67"	7' 1.38"	6' 10.51"	7' 1.55"	6' 10.33"	7' 1.74"	6' 10.13"	7' 1.96"	6' 9.9"	7' 2.21"
6' 6"	6' 5.09"	6' 6.93"	6' 4.98"	6' 7.04"	6' 4.86"	6' 7.17"	6' 4.72"	6' 7.32"	6' 4.57"	6' 7.49"	6' 4.4"	6' 7.67"	6' 4.21"	6' 7.88"
6' 0"	5' 11.24"	6' 0.78"	5' 11.14"	6' 0.88"	5' 11.04"	6' 0.99"	5' 10.92"	6' 1.11"	5' 10.8"	6' 1.25"	5' 10.65"	6' 1.4"	5' 10.49"	6' 1.58"
5' 6"	5' 5.37"	5' 6.65"	5' 5.29"	5' 6.73"	5' 5.2"	5' 6.82"	5' 5.11"	5' 6.92"	5' 5"	5' 7.03"	5' 4.88"	5' 7.16"	5' 4.75"	5' 7.31"
5' 0"	4' 11.49"	5' 0.52"	4' 11.42"	5' 0.59"	4' 11.35"	5' 0.66"	4' 11.28"	5' 0.74"	4' 11.19"	5' 0.84"	4' 11.09"	5' 0.94"	4' 10.98"	5' 1.06"
4' 9"	4' 8.54"	4' 9.47"	4' 8.48"	4' 9.53"	4' 8.42"	4' 9.59"	4' 8.35"	4' 9.66"	4' 8.27"	4' 9.75"	4' 8.19"	4' 9.84"	4' 8.09"	4' 9.94"
4' 6"	4' 5.59"	4' 6.41"	4' 5.54"	4' 6.47"	4' 5.49"	4' 6.52"	4' 5.43"	4' 6.59"	4' 5.36"	4' 6.66"	4' 5.28"	4' 6.74"	4' 5.19"	4' 6.84"
4' 3"	4' 2.64"	4' 3.36"	4' 2.6"	4' 3.41"	4' 2.55"	4' 3.46"	4' 2.49"	4' 3.52"	4' 2.43"	4' 3.58"	4' 2.36"	4' 3.65"	4' 2.29"	4' 3.74"
4' 0"	3' 11.69"	4' 0.32"	3' 11.65"	4' 0.36"	3' 11.61"	4' 0.4"	3' 11.56"	4' 0.45"	3' 11.5"	4' 0.51"	3' 11.44"	4' 0.57"	3' 11.38"	4' 0.64"
3' 9"	3' 8.73"	3' 9.27"	3' 8.7"	3' 9.31"	3' 8.66"	3' 9.35"	3' 8.62"	3' 9.39"	3' 8.57"	3' 9.44"	3' 8.52"	3' 9.49"	3' 8.46"	3' 9.55"
3' 6"	3' 5.77"	3' 6.23"	3' 5.74"	3' 6.26"	3' 5.71"	3' 6.3"	3' 5.67"	3' 6.33"	3' 5.63"	3' 6.37"	3' 5.59"	3' 6.42"	3' 5.54"	3' 6.47"
3' 3"	3' 2.8"	3' 3.2"	3' 2.78"	3' 3.22"	3' 2.75"	3' 3.25"	3' 2.72"	3' 3.28"	3' 2.69"	3' 3.31"	3' 2.65"	3' 3.35"	3' 2.61"	3' 3.4"
3' 0"	2' 11.84"	3' 0.16"	2' 11.82"	3' 0.18"	2' 11.8"	3' 0.21"	2' 11.77"	3' 0.23"	2' 11.74"	3' 0.26"	2' 11.71"	3' 0.29"	2' 11.68"	3' 0.33"



5	5.6	6.3	7.1	8	9	10	11
214' 0.03"	190' 8.66"	169' 11.72"	151' 5.95"	135' 0.39"	120' 4.41"	107' 3.6"	95' 7.87"

5		5.6		6.3		7.1		8		9		10		11	
Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)
213' 8.32"	Infinity	190' 4.96"	Infinity	169' 8.07"	Infinity	151' 2.33"	Infinity	134' 8.78"	Infinity	120' 0.78"	Infinity	106' 11.99"	Infinity	95' 4.29"	Infinity
103' 6.43"	3043' 8.25"	97' 9.24"	Infinity	92' 0.24"	Infinity	86' 3.88"	Infinity	80' 8.61"	Infinity	75' 2.83"	Infinity	69' 10.92"	Infinity	64' 9.2"	Infinity
68' 3.8"	186' 11.24"	65' 9.22"	209' 2.99"	63' 1.52"	241' 7.6"	60' 4.86"	292' 5.51"	57' 7.4"	382' 10.85"	54' 9.37"	586' 7.84"	51' 10.97"	1457' 11.5"	49' 0.42"	Infinity
55' 8.25"	114' 11.85"	53' 11.86"	123' 0.4"	52' 2.4"	133' 6.28"	50' 3.96"	147' 7.94"	48' 4.62"	167' 7.06"	46' 4.5"	197' 6.28"	44' 3.72"	247' 1.13"	42' 2.42"	344' 0.98"
40' 7.88"	64' 11.68"	39' 8.98"	67' 5.41"	38' 9.31"	70' 5.61"	37' 8.89"	74' 2.33"	36' 7.72"	78' 10.54"	35' 5.82"	84' 10.78"	34' 3.24"	92' 10.29"	33' 0.03"	103' 9.42"
33' 9.74"	48' 11.9"	33' 2.21"	50' 4.57"	32' 6.08"	52' 0.45"	31' 9.35"	54' 0.39"	31'	56' 5.56"	30' 2.05"	59' 5.61"	29' 3.5"	63' 2.98"	28' 4.38"	68' 1.33"
26' 4.83"	34' 8.96"	26' 0.26"	35' 5.22"	25' 7.27"	36' 2.88"	25' 1.87"	37' 2.27"	24' 8.03"	38' 3.79"	24' 1.74"	39' 7.99"	23' 6.99"	41' 3.6"	22' 11.79"	43' 3.64"
22' 5.58"	28' 2.28"	22' 2.28"	28' 7.66"	21' 10.67"	29' 1.9"	21' 6.73"	29' 9.19"	21' 2.45"	30' 5.75"	20' 9.82"	31' 3.87"	20' 4.82"	32' 3.91"	19' 11.44"	33' 6.4"
18' 4.29"	21' 11.65"	18' 2.1"	22' 2.88"	17' 11.7"	22' 6.59"	17' 9.06"	22' 10.89"	17' 6.18"	23' 3.89"	17' 3.03"	23' 9.72"	16' 11.62"	24' 4.56"	16' 7.92"	25' 0.65"
15' 9.69"	18' 4.69"	15' 8.08"	18' 6.93"	15' 6.3"	18' 9.5"	15' 4.35"	19' 0.45"	15' 2.2"	19' 3.86"	14' 11.85"	19' 7.81"	14' 9.29"	20' 0.42"	14' 6.5"	20' 5.81"
14' 0.84"	16' 0.77"	13' 11.57"	16' 2.47"	13' 10.17"	16' 4.4"	13' 8.62"	16' 6.62"	13' 6.92"	16' 9.18"	13' 5.06"	17' 0.12"	13' 3.01"	17' 3.54"	13' 0.78"	17' 7.51"
13' 2.28"	14' 11.02"	13' 1.17"	15' 0.47"	12' 11.94"	15' 2.13"	12' 10.58"	15' 4.03"	12' 9.09"	15' 6.21"	12' 7.45"	15' 8.73"	12' 5.65"	15' 11.63"	12' 3.68"	16' 3"
12' 3.63"	13' 9.41"	12' 2.66"	13' 10.64"	12' 1.6"	14' 0.05"	12' 0.42"	14' 1.66"	11' 11.12"	14' 3.5"	11' 9.69"	14' 5.61"	11' 8.12"	14' 8.06"	11' 6.4"	14' 10.88"
11' 4.87"	12' 7.93"	11' 4.05"	12' 8.96"	11' 3.14"	12' 10.14"	11' 2.13"	12' 11.48"	11' 1.02"	13' 1.02"	10' 11.79"	13' 2.78"	10' 10.44"	13' 4.81"	10' 8.95"	13' 7.15"
10' 6.03"	11' 6.58"	10' 5.33"	11' 7.44"	10' 4.57"	11' 8.41"	10' 3.71"	11' 9.51"	10' 2.77"	11' 10.78"	10' 1.73"	12' 0.22"	10' 0.59"	12' 1.88"	9' 11.33"	12' 3.79"
9' 7.08"	10' 5.37"	9' 6.51"	10' 6.06"	9' 5.87"	10' 6.85"	9' 5.17"	10' 7.74"	9' 4.39"	10' 8.76"	9' 3.52"	10' 9.92"	9' 2.57"	10' 11.26"	9' 1.52"	11' 0.79"
9' 1.58"	9' 10.81"	9' 1.06"	9' 11.43"	9' 0.48"	10' 0.13"	8' 11.85"	10' 0.93"	8' 11.14"	10' 1.84"	8' 10.36"	10' 2.87"	8' 9.49"	10' 4.06"	8' 8.54"	10' 5.42"
8' 8.04"	9' 4.28"	8' 7.58"	9' 4.83"	8' 7.06"	9' 5.45"	8' 6.49"	9' 6.16"	8' 5.85"	9' 6.97"	8' 5.15"	9' 7.88"	8' 4.37"	9' 8.93"	8' 3.52"	9' 10.13"
8' 2.48"	8' 9.79"	8' 2.07"	8' 10.27"	8' 1.61"	8' 10.82"	8' 1.1"	8' 11.44"	8' 0.53"	9' 0.15"	7' 11.9"	9' 0.96"	7' 11.21"	9' 1.88"	7' 10.44"	9' 2.93"
7' 8.9"	8' 3.32"	7' 8.53"	8' 3.75"	7' 8.13"	8' 4.23"	7' 7.68"	8' 4.77"	7' 7.17"	8' 5.39"	7' 6.62"	8' 6.09"	7' 6"	8' 6.89"	7' 5.32"	8' 7.81"
7' 3.29"	7' 8.89"	7' 2.97"	7' 9.26"	7' 2.61"	7' 9.67"	7' 2.22"	7' 10.15"	7' 1.78"	7' 10.68"	7' 1.29"	7' 11.29"	7' 0.75"	7' 11.98"	7' 0.15"	8' 0.77"
6' 9.66"	7' 2.49"	6' 9.38"	7' 2.8"	6' 9.07"	7' 3.16"	6' 8.72"	7' 3.57"	6' 8.34"	7' 4.02"	6' 7.92"	7' 4.55"	6' 7.44"	7' 5.14"	6' 6.92"	7' 5.81"
6' 4"	6' 8.12"	6' 3.76"	6' 8.39"	6' 3.49"	6' 8.69"	6' 3.2"	6' 9.03"	6' 2.87"	6' 9.42"	6' 2.5"	6' 9.86"	6' 2.1"	6' 10.36"	6' 1.65"	6' 10.93"
5' 10.31"	6' 1.78"	5' 10.11"	6' 2"	5' 9.88"	6' 2.26"	5' 9.63"	6' 2.54"	5' 9.35"	6' 2.87"	5' 9.04"	6' 3.24"	5' 8.7"	6' 3.65"	5' 8.32"	6' 4.13"
5' 4.6"	5' 7.47"	5' 4.43"	5' 7.65"	5' 4.24"	5' 7.86"	5' 4.03"	5' 8.1"	5' 3.8"	5' 8.36"	5' 3.54"	5' 8.67"	5' 3.26"	5' 9.01"	5' 2.94"	5' 9.4"
4' 10.86"	5' 1.19"	4' 10.72"	5' 1.34"	4' 10.57"	5' 1.51"	4' 10.4"	5' 1.7"	4' 10.21"	5' 1.91"	4' 10"	5' 2.16"	4' 9.76"	5' 2.43"	4' 9.5"	5' 2.74"
4' 7.98"	4' 10.06"	4' 7.86"	4' 10.19"	4' 7.72"	4' 10.34"	4' 7.57"	4' 10.51"	4' 7.4"	4' 10.7"	4' 7.21"	4' 10.92"	4' 7"	4' 11.17"	4' 6.76"	4' 11.44"
4' 5.09"	4' 6.94"	4' 4.98"	4' 7.06"	4' 4.86"	4' 7.19"	4' 4.73"	4' 7.34"	4' 4.58"	4' 7.51"	4' 4.41"	4' 7.7"	4' 4.22"	4' 7.92"	4' 4.01"	4' 8.16"
4' 2.2"	4' 3.83"	4' 2.1"	4' 3.93"	4' 2"	4' 4.05"	4' 1.88"	4' 4.18"	4' 1.74"	4' 4.33"	4' 1.59"	4' 4.49"	4' 1.43"	4' 4.68"	4' 1.24"	4' 4.9"
3' 11.3"	4' 0.72"	3' 11.22"	4' 0.81"	3' 11.12"	4' 0.91"	3' 11.02"	4' 1.03"	3' 10.9"	4' 1.16"	3' 10.77"	4' 1.3"	3' 10.63"	4' 1.47"	3' 10.46"	4' 1.65"
3' 8.4"	3' 9.62"	3' 8.32"	3' 9.7"	3' 8.24"	3' 9.79"	3' 8.15"	3' 9.89"	3' 8.05"	3' 10"	3' 7.94"	3' 10.12"	3' 7.81"	3' 10.26"	3' 7.67"	3' 10.42"
3' 5.48"	3' 6.53"	3' 5.42"	3' 6.6"	3' 5.35"	3' 6.67"	3' 5.27"	3' 6.75"	3' 5.19"	3' 6.85"	3' 5.09"	3' 6.96"	3' 4.98"	3' 7.08"	3' 4.86"	3' 7.21"
3' 2.56"	3' 3.45"	3' 2.51"	3' 3.5"	3' 2.45"	3' 3.56"	3' 2.39"	3' 3.63"	3' 2.31"	3' 3.71"	3' 2.23"	3' 3.8"	3' 2.14"	3' 3.9"	3' 2.04"	3' 4.02"
2' 11.64"	3' 0.37"	2' 11.59"	3' 0.42"	2' 11.55"	3' 0.47"	2' 11.49"	3' 0.53"	2' 11.43"	3' 0.59"	2' 11.36"	3' 0.67"	2' 11.28"	3' 0.75"	2' 11.2"	3' 0.84"



13	14	16	18	20	22
85' 3.43"	76' 0.56"	67' 9.78"	60' 5.75"	53' 11.36"	48' 1.52"

13		14		16		18		20		22	
Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)	Short Focus (ft-inch)	Long Focus (ft-inch)
84' 11.84"	Infinity	75' 8.97"	Infinity	67' 6.19"	Infinity	60' 2.19"	Infinity	53' 7.79"	Infinity	47' 9.94"	Infinity
59' 9.96"	Infinity	55' 1.41"	Infinity	50' 7.74"	Infinity	46' 5.05"	Infinity	42' 5.41"	Infinity	38' 8.84"	Infinity
46' 1.97"	Infinity	43' 3.83"	Infinity	40' 6.23"	Infinity	37' 9.37"	Infinity	35' 1.43"	Infinity	32' 6.59"	Infinity
40' 0.76"	615' 5.02"	37' 10.91"	5392' 3.66"	35' 9.04"	Infinity	33' 7.32"	Infinity	31' 5.92"	Infinity	29' 5"	Infinity
31' 8.25"	119' 7.13"	30' 3.99"	144' 3.4"	28' 11.33"	187' 10.25"	27' 6.38"	284' 3.91"	26' 1.23"	672' 3.8"	24' 8.01"	Infinity
27' 4.71"	74' 6.59"	26' 4.54"	83' 4.86"	25' 3.92"	96' 3.02"	24' 2.92"	116' 4.75"	23' 1.6"	152' 2.24"	22' 0.05"	232' 6.69"
22' 4.14"	45' 9.59"	21' 8.04"	48' 11.63"	20' 11.53"	53' 1.19"	20' 2.62"	58' 7.89"	19' 5.35"	66' 5.72"	18' 7.77"	78' 2.29"
19' 5.68"	35' 0.01"	18' 11.55"	36' 9.74"	18' 5.04"	39' 0.99"	17' 10.17"	41' 11.92"	17' 2.96"	45' 9.95"	16' 7.43"	51' 0.86"
16' 3.92"	25' 10.28"	15' 11.63"	26' 9.87"	15' 7.03"	27' 11.96"	15' 2.13"	29' 5.35"	14' 8.94"	31' 3.17"	14' 3.45"	33' 7.14"
14' 3.47"	21' 0.16"	14' 0.2"	21' 7.69"	13' 8.68"	22' 4.72"	13' 4.9"	23' 3.63"	13' 0.86"	24' 5.01"	12' 8.57"	25' 9.65"
12' 10.35"	18' 0.16"	12' 7.71"	18' 5.64"	12' 4.86"	19' 0.13"	12' 1.79"	19' 7.89"	11' 10.49"	20' 5.27"	11' 6.96"	21' 4.73"
12' 1.53"	16' 6.93"	11' 11.19"	16' 11.53"	11' 8.66"	17' 4.97"	11' 5.92"	17' 11.43"	11' 2.98"	18' 7.19"	10' 11.82"	19' 4.6"
11' 4.52"	15' 2.16"	11' 2.47"	15' 6"	11' 0.25"	15' 10.5"	10' 9.84"	16' 3.83"	10' 7.24"	16' 10.19"	10' 4.45"	17' 5.84"
10' 7.33"	13' 9.86"	10' 5.56"	14' 1.01"	10' 3.63"	14' 4.7"	10' 1.53"	14' 9.04"	9' 11.26"	15' 2.19"	9' 8.82"	15' 8.34"
9' 9.95"	12' 5.99"	9' 8.43"	12' 8.55"	9' 6.78"	12' 11.53"	9' 4.99"	13' 3.01"	9' 3.04"	13' 7.12"	9' 0.93"	14'
9' 0.36"	11' 2.55"	8' 11.09"	11' 4.58"	8' 9.71"	11' 6.94"	8' 8.19"	11' 9.7"	8' 6.55"	12' 0.92"	8' 4.76"	12' 4.73"
8' 7.49"	10' 6.98"	8' 6.34"	10' 8.78"	8' 5.08"	10' 10.87"	8' 3.7"	11' 1.29"	8' 2.2"	11' 4.13"	8' 0.57"	11' 7.47"
8' 2.57"	9' 11.51"	8' 1.53"	10' 1.09"	8' 0.39"	10' 2.93"	7' 11.14"	10' 5.05"	7' 9.78"	10' 7.53"	7' 8.31"	10' 10.44"
7' 9.6"	9' 4.14"	7' 8.66"	9' 5.52"	7' 7.64"	9' 7.12"	7' 6.52"	9' 8.97"	7' 5.3"	9' 11.13"	7' 3.96"	10' 1.64"
7' 4.57"	8' 8.86"	7' 3.74"	8' 10.06"	7' 2.83"	8' 11.45"	7' 1.83"	9' 1.05"	7' 0.73"	9' 2.9"	6' 11.54"	9' 5.06"
6' 11.48"	8' 1.67"	6' 10.75"	8' 2.71"	6' 9.95"	8' 3.9"	6' 9.06"	8' 5.27"	6' 8.09"	8' 6.85"	6' 7.03"	8' 8.69"
6' 6.34"	7' 6.58"	6' 5.7"	7' 7.46"	6' 5"	7' 8.47"	6' 4.23"	7' 9.64"	6' 3.38"	7' 10.98"	6' 2.45"	8' 0.53"
6' 1.15"	6' 11.58"	6' 0.6"	7' 0.32"	5' 11.99"	7' 1.17"	5' 11.32"	7' 2.14"	5' 10.58"	7' 3.27"	5' 9.77"	7' 4.56"
5' 7.89"	6' 4.67"	5' 7.42"	6' 5.28"	5' 6.91"	6' 5.99"	5' 6.33"	6' 6.79"	5' 5.7"	6' 7.72"	5' 5.01"	6' 8.78"
5' 2.58"	5' 9.84"	5' 2.19"	5' 10.34"	5' 1.75"	5' 10.92"	5' 1.27"	5' 11.57"	5' 0.74"	6' 0.32"	5' 0.16"	6' 1.19"
4' 9.21"	5' 3.1"	4' 8.89"	5' 3.5"	4' 8.53"	5' 3.96"	4' 8.13"	5' 4.48"	4' 7.69"	5' 5.08"	4' 7.21"	5' 5.77"
4' 6.5"	4' 11.76"	4' 6.21"	5' 0.12"	4' 5.89"	5' 0.52"	4' 5.53"	5' 0.99"	4' 5.14"	5' 1.51"	4' 4.7"	5' 2.12"
4' 3.78"	4' 8.44"	4' 3.52"	4' 8.75"	4' 3.23"	4' 9.11"	4' 2.91"	4' 9.52"	4' 2.56"	4' 9.98"	4' 2.17"	4' 10.52"
4' 1.04"	4' 5.14"	4' 0.81"	4' 5.42"	4' 0.55"	4' 5.73"	4' 0.27"	4' 6.08"	3' 11.96"	4' 6.49"	3' 11.61"	4' 6.95"
3' 10.28"	4' 1.86"	3' 10.08"	4' 2.1"	3' 9.86"	4' 2.37"	3' 9.61"	4' 2.68"	3' 9.33"	4' 3.03"	3' 9.03"	4' 3.43"
3' 7.51"	3' 10.6"	3' 7.34"	3' 10.81"	3' 7.14"	3' 11.04"	3' 6.93"	3' 11.31"	3' 6.69"	3' 11.61"	3' 6.42"	3' 11.95"
3' 4.72"	3' 7.37"	3' 4.57"	3' 7.54"	3' 4.41"	3' 7.74"	3' 4.22"	3' 7.96"	3' 4.01"	3' 8.21"	3' 3.79"	3' 8.5"
3' 1.92"	3' 4.15"	3' 1.79"	3' 4.29"	3' 1.65"	3' 4.46"	3' 1.49"	3' 4.64"	3' 1.32"	3' 4.86"	3' 1.12"	3' 5.1"
2' 11.1"	3' 0.95"	2' 11"	3' 1.07"	2' 10.88"	3' 1.2"	2' 10.75"	3' 1.36"	2' 10.6"	3' 1.53"	2' 10.44"	3' 1.73"