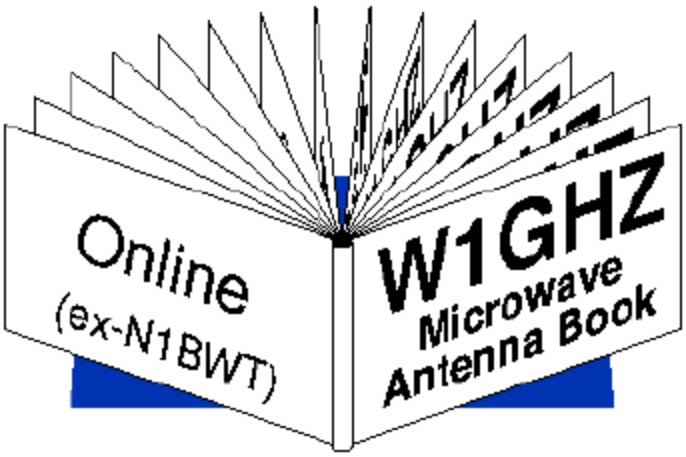

Chapter 5
Offset-fed Parabolic Dishes
Paul Wade W1GHZ ©1998,1999

Appendix 5A — Common offset dishes

I've accumulated a collection of small offset dishes over the past few years. Many of them came without any information or feed, while others came with a feed assembly. In order to characterize the dishes and find the focal point, I made measured points on the reflector surface and used the curve-fitting routines in the **HDL_ANT** program as described in Chapter 5. The following table is a summary which might be useful if you acquire a copy of one of these dishes:

Offset dishes

Description	**Diameter** (width) mm	**Long** dimension mm	**Focal** length mm	**Top string** length mm	**Tilt** angle degrees	**Feed** equiv ***f*/D**
Sony DSS	451	521	266	479	65.9	0.68
DSS metal	457	496	281	468	67.8	0.69
RCA DSS (SMC)	457	495	278	466	67.7	0.69
Dish Network	460	504	287	477	67.8	0.7
Metal - raised edge	600	636	387	615	69.0	0.72
Steel - small rim	600	640	403	626	69.6	0.75
Molded 24"	603	656	368	618	67.6	0.69
Metal	797	848	593	865	71.3	0.81
Molded plastic	850	927	505	866	67.1	0.67
Channel Master 1M	997	1083	604	1018	67.5	0.68

The "top string" length is the distance from the top center of the reflector to the focus.

I use a string to find the focus, as illustrated in Figures 5-4 and 5-5 — a knot in the string is located the "top string" distance from the top center of the reflector and the "bottom string" distance from the bottom center. When the string is stretched taut, the knot is at the focus, and the phase center of the feed should also be at the knot. All of the dishes listed above have the bottom center of the reflector at the vertex of the full parabola, so that the focus and bottom center are level when pointed on the horizon. Thus, the "bottom string" length is the same as the focal length.

Results have been quite good. For the dishes with feed assemblies, the calculated focal point is close to the actual feed. I've also measured sun noise on most of these, from the small DSS dishes to the largest, with high efficiency at 10 GHz. The only exception was the 850 mm plastic dish. Perhaps I should have left it at the junkyard where I found it.

One closing note: the 1-meter dish is *very* sharp — pointing it by hand, even using an extremely solid tripod, was difficult. The difficulty would not be so apparent on an ordinary S-meter, but the sun noise setup uses an HP-432 power meter as the indicator. Resolution is much better than 0.1 dB, so small errors are very apparent. I found that getting the last ¼ dB is very difficult. A dish this large is not recommended for field use unless you have a way to adjust it very precisely. For rover use, I've been very happy with the 18" (457 mm) DSS dishes.