Pro and contra offset dish

+ no (or less) blocking by the feed,

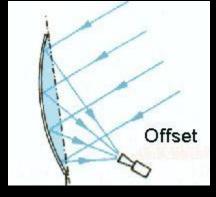
less interaction between feed and reflector, less diffused radiation

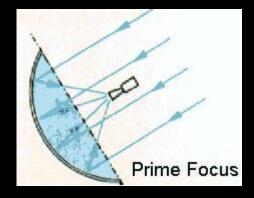
+ feed tilted upwards

→less ground noise pickup from spillover

+ easy access to the feed

- reflector construction more difficult
- 5% to 10% more reflector surface





Pro and contra offset dish

Small offset dish (up to 3m)

- + less blocking by the feed
- + less ground noise

Large offset dish

+ less ground noise

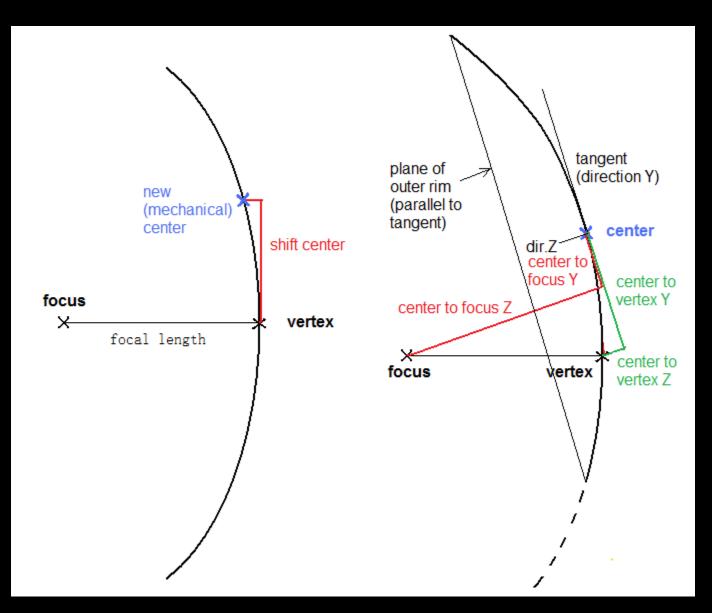
up to 10K less system temperature, depending on spillover (5%...10%), around 1dB improvement on receive

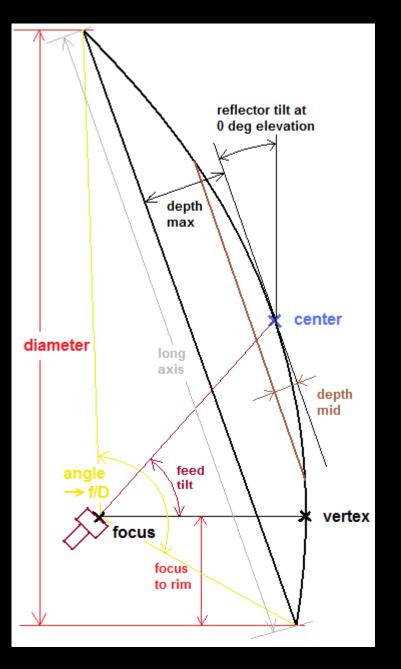
+ easy access to the feed

Extra + for me: challenge ,because nobody has tried it before (?)

- constructions more difficult \rightarrow subject of this lecture
- 5% to 10% more reflector surface (.... not that much)

From prime focus dish to offset dish





Only pairs of ribs are indentical program: Ofs_calc_jfl

Inputs:

Number of ribs Focal length Maximum depth of reflector, Shift of mechanical center up from vertex, (depth for middle ring, radius steps)

Outputs:

Dimension chart for ribs

Dish diameter (and long axis) f/D (and angle) Feed tilt and reflector tilt (for 0 deg elevation) Distance focus to (low end of) rim Focus and vertex position (relative to mechanical center)

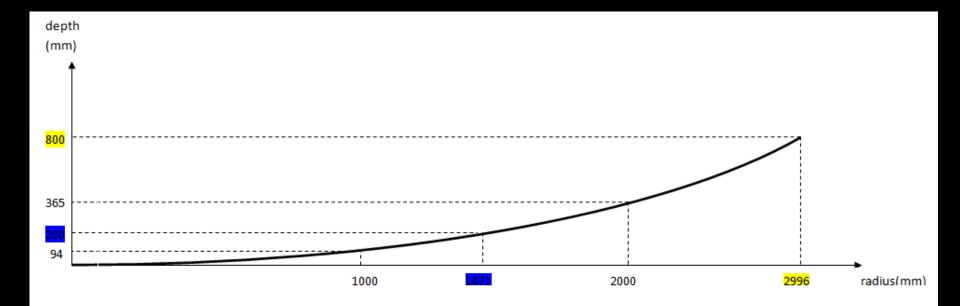
Chart with rib dimensions

number ribs		focal length shift center		depth max f/D (0,457		Statistics of the local division in which the local division in which the local division is not the local division in the local divi	summer passion and provide the		feed tilt 36,9	iong asie 5,998		diameter 5,691		
center to vertex Y 1,60 center to vertex Z 0,25 center to focus Y 0,84 center to focus Z 2,53	0	15	30	45	60	75	90	105	120	135	150	165	180	
	4	4	4	4	4	4	4	4	4	4	4	4	4	200
	14	14	14	15	15	16	16	16	16	15	15	15	15	400
	31	31	32	33	34	35	36	36	35	35	34	33	33	600
	54	55	56	58	60	62	63	64	63	62	61	60	60	800
	84	85	87	90	94	97	99	100	99	98	97	95	95	1000
	120	121	124	129	134	139	143	144	144	143	141	139	138	1200
	161	163	167	174	182	189	194	197	197	196	193	191	190	1400
	208	211	217	226	236	246	254	258	260	258	256	253	252	1600
	261	264	272	284	297	310	321	328	331	330	327	325	324	1800
	319	322	333	348	365	382	397	407	411	412	409	407	405	2000
	382	386	399	418	440	462	481	494	502	503	502	499	498	2200
	450	456	471	493	521	548	572	591	601	605	605	603	601	2400
	523	530	548	575	608	642	673	696	711	718	719	718	717	2600
focus to rim atitude (0 deg elev) 1.25	601	609	630	663	702	743	781	1411	1409	1415	1423	1430	1433	2800
	683	692	717	756	1471	1442	1422	2782	2750	2735	2731	2732	2733	3000
	770	780	1535	1504	2996	2907	2834	0	0	0	0	0	0	3200
	1567	1558	3180	3092	0	0	0	0	0	0	0	0	0	3400
	3266	3243	0	0	0	0	0	0	0	0	0	0	0	0

Example for using the chart

2.4m focal length, 800mm max. depth, 1.6m center shift Result: 5.69m dish diameter with f/D=0.46, the focal point is 1.25m up from the rim of the dish

Some dimensions for the rib at 60deg (same at 300deg): Length of the rib: 2996mm, depth at 1m radius: 94mm, depth at 2m: 365mm, radius for 200mm depth: 1471mm





Here you can see an example for the different length and shape of the ribs for my 7.3m dish. The template must be modified after building a pair of ribs every time. Those extra hours of work were only a small fraction of the time I spent for realizing the whole project.

Some photos of the building process....

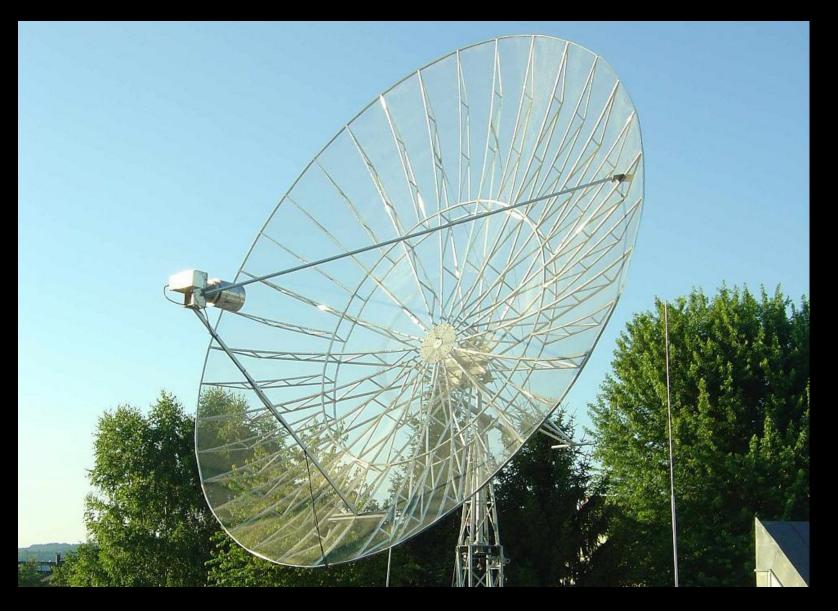




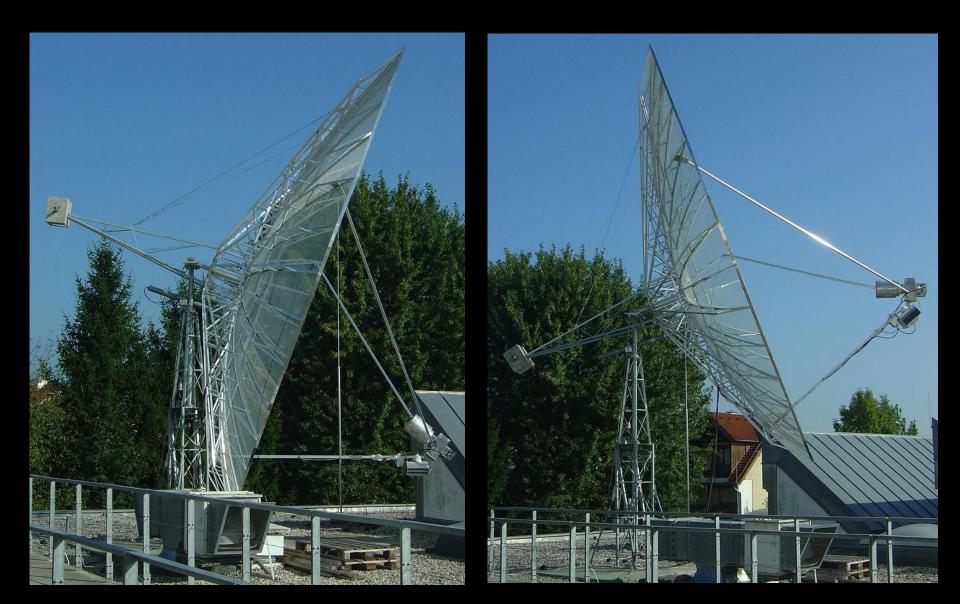
The mast is also a special construction



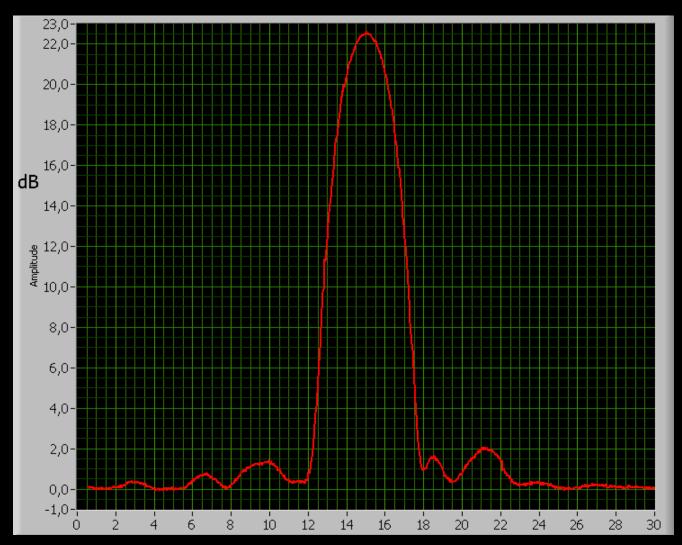
et voilà



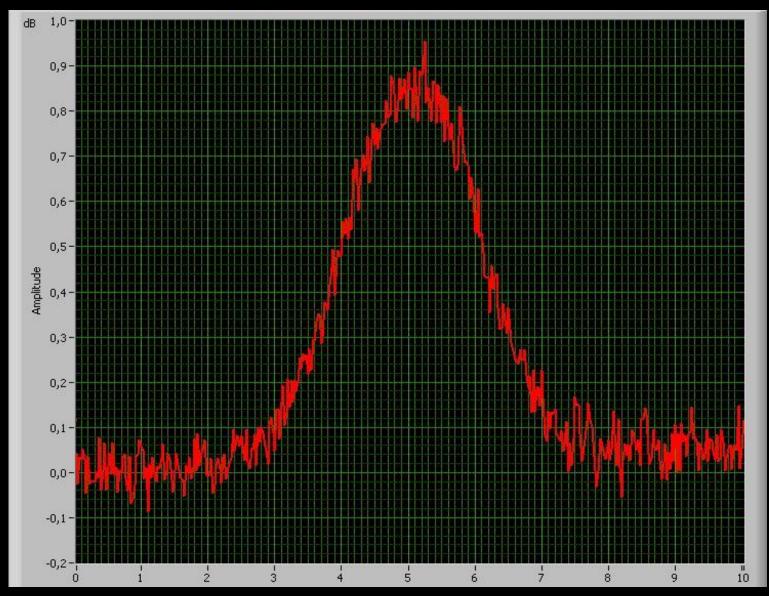
Dish at 0 deg elevation and 40 deg elevation

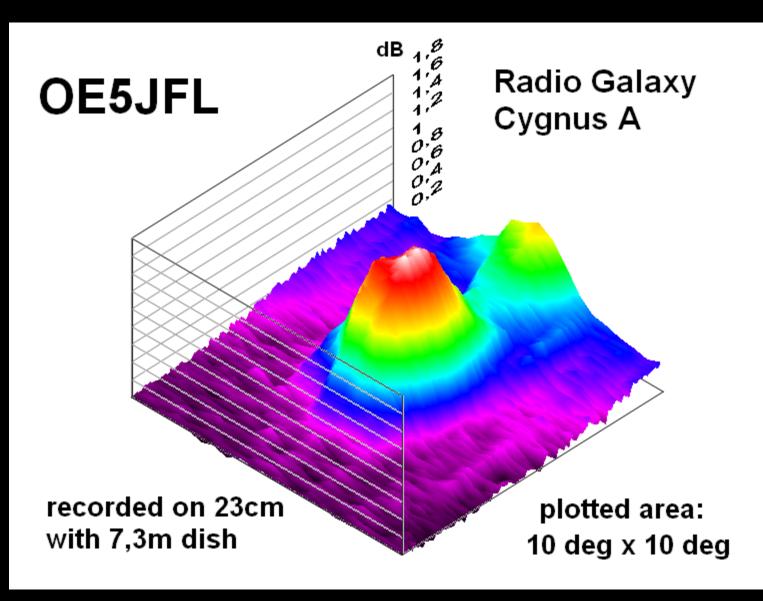


Measurements on 23cm (with RA3AQ feed) Sun noise: 22.5 dB @ SFI 107 (1 dB better than with a prime focus dish)

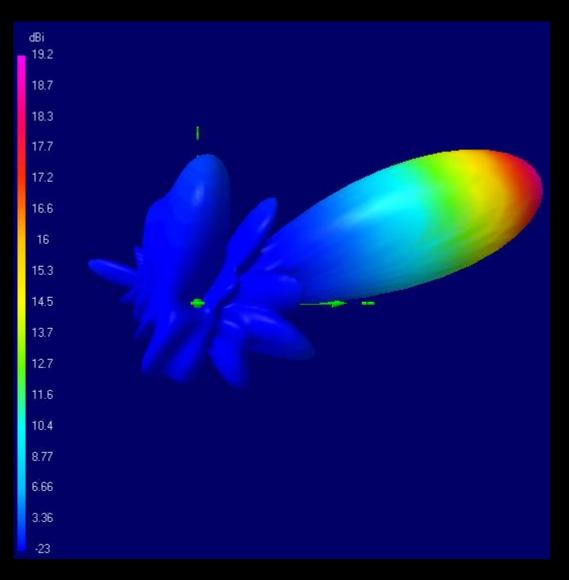


Moon noise on 23cm





Results on 144MHz (feed: 3 el quad)



Ratio diameter/wavelength=3.5 (!)

Comparisons by averaging the difference between MAP65 outputs and the reports from LiveCQ

Difference to my 13 element yagi (NEC 16dBi): +3.5dB

Difference to my old 11m dish (prime focus) : - 2.5dB

About the same receiving results as stations with 4x8 elements or 4x9 elements

CONCLUSION

If you want to build a dish larger than 3m diameter, it is worth to choose an offset dish.

The additional work because of the more complicated construction is less than 5%

Although the improvement of G/T is only around 1dB, the big advantage is the easy access to the feed!