C-Band Reception in Europe With a 120cm Antenna

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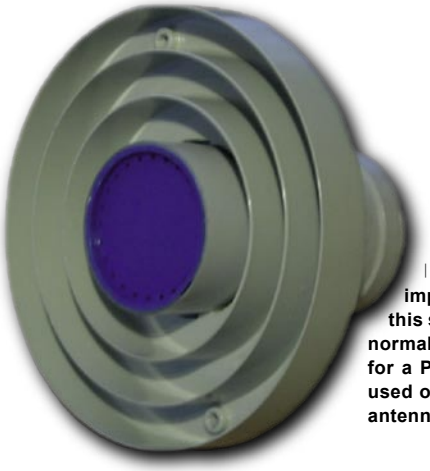
Thomas Haring adjusts a C-band feed on a 1.2-meter offset antenna while checking his progress with the help of the Prodig-5 signal analyzer also introduced in this issue

In the last issue of TELE-satellite magazine Sylvain Oscul, from the TELE-satellite test center in France, had a look to see what kind of C-band reception was possible with a 180cm dish. The results were impressive.

Not to be outdone, I decided to take this a step further and see what could be done with a slightly smaller antenna. If you don't have your own backyard and have no choice but to mount your dishes on a steep rooftop or on a balcony, installing large-diameter satellite dishes may not be the most practical thing to do.

Thanks to modern Ku-band satellites with their high output power, a large dish is not really necessary since you should have no trouble getting several thousand channels from a variety of countries. Despite all the variety available on Ku-band, the more exotic programming (like North Korean State TV) or other foreign language programming is usually only available in C-band. So, the question then is, "what can we do in C-band with a 120cm dish?"

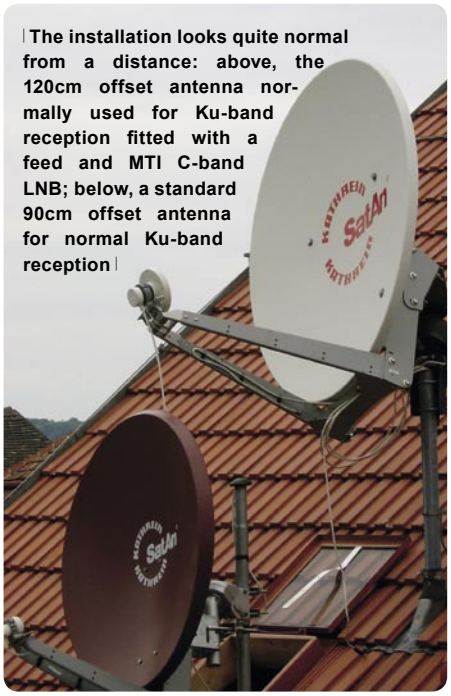
Naturally the first step would be to put together the required antenna assembly. I ran into my first little setback here: I could not find any manufacturer or dealer that could scrape together a special feed for an offset antenna. Ebay wasn't able to help either; only a funnel-type feed was available which we later found out was totally incompatible. This really left me with no choice but to use a feed meant for a parabolic dish and found the MTI AC21-C2B. It is a C-band LNB with standard grooved feed that switches between polarizations through 14/18V control signals. The matching dielectric is already available.



With a little improvisation this scalar feed, normallydesigned for a PFA, can be used on an Offset antenna too.

Finally, after all of the parts had been organized, delivered and assembled, a missing feed holder for the Kathrein CAS-120 antenna I was using threatened to put everything on hold. I managed to find an old 60mm feed holder gathering dust in the basement but, as expected, it was not the right size. After some improvising using a 75mm cable conduit I was able to move to the next step. It isn't exactly professional, but it is an effective and inexpensive alternative. It required some skill to install, but after several attempts the feed was ultimately installed in the correct position.

The entire assembly including motor was



The installation looks quite normal from a distance: above, the 120cm offset antenna normally used for Ku-band reception fitted with a feed and MTI C-band LNB; below, a standard 90cm offset antenna for normal Ku-band reception

initially aligned to Ku-band satellites so that the less-sensitive C-band should not present a problem. Just like my colleague in France, I also used a good-old D-box1 with DVB2000 software as well as the Prodig-5 signal analyzer from Promax. With full expectations and anticipation the antenna was turned to the relatively powerful Express A1R C-band satellite at 40° east. The first look at the analyzer display revealed that there was a very strong signal at 3675R. After entering this frequency in the DVB2000 software, numerous Russian channels with plenty of signal strength were found.

According to the frequency list at www.satcodx.com, there were also a number of South American transponders on NSS 806 at 40.5° west with relatively high power outputs. I was able to lock onto several MCPC and SCPC transponders with sufficient signal strength. Especially strong was Rede Gospel on 4108R and RCN TV on 4016R although these channels were unfortunately encrypted. Even the ImpSat package from Venezuela on 3879R was receivable albeit without any bad weather signal reserve. The tests on NSS7 at 22° west were not as successful. Here the only luck was with 3650R. The other transponders did not provide a strong enough signal even though the receiver was able to lock onto some of them on occasion.

RTV Podmoskove on 40° East

Rede Gospel on 40.5° West

TV5 Afrique on 22° West


RTP Afrika on 27.5° West


Kultura Telekanal on 40° East


Bangla Vision on 76.5° East

The transponder at 4158R on Atlantic Bird 3 at 5° west was handled without any problems. The remaining transponders just scratched the surface of the receiver's threshold level and despite clearly recognizable peaks on the analyzer display, the signals were simply not strong enough. The situation was somewhat better on Intelsat 907 at 27.5° west. Here three transponders could be received (3715R, 3830R and 4048R). Intelsat 801 at 31.5° west and Intelsat 903 at 34.5° west each yielded just one transponder that was strong enough. For all the other transponders the antenna was simply too small. Deutsche Welle TV on Intelsat 10-02 (3912R) could also be received without any problems. Express A3 at 11° west is considered a fairly strong C-band satellite yet the 120cm antenna could not pull in any signals; the peaks shown on the analyzer display were simply too weak.

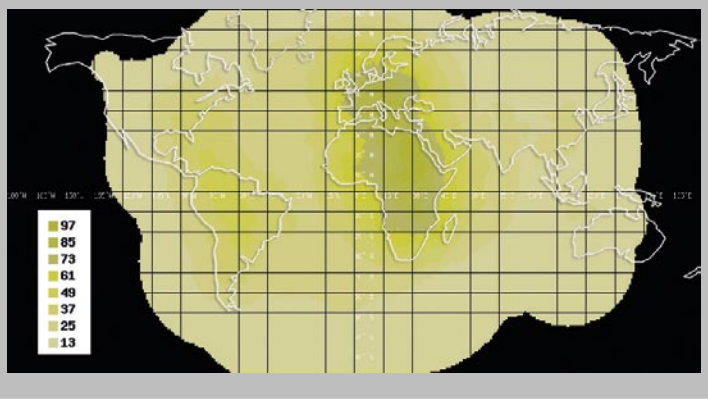
The next step involved taking a closer look at the eastern sky and here I stumbled across a number of surprises: On Intelsat 906 at 64° east the (unfortunately encrypted) AFN package on 4080L was more than strong enough. The Hope Channel on Pas7 (3516V) at 67.5° east was visible while Bangla Vision was receivable on Telstar 10 at 76.5° east (4049H). Express AM1 at 40° east delivered a number of Russian channels with sufficient bad weather reserve. Even a feed channel (3786V) and four radio channels (4026V) on BADRC at 26° east were receivable despite a missing polarizer. Most of the analog channels on these satellites were viewable after some threshold adjustments.

Compared to the previously used grooved feed, we wanted to see what a funnel-type feed could do on the Kathrein antenna such as the Precision PMJ-LNB C Gold. We obtained this feed from a UK seller through an Ebay auction. The LNB was contributed by Olbort Satellite Technologies. Unfortunately, this feed proved to be totally incompatible and should never work with an offset antenna despite what the seller had said. On the strongest C-band satellite position (Express A1R at 40° east), the signal that was identified on the analyzer (3675R) was far too weak to be received. The result was the same with all the other satellites: no reception.

And last but not least, a Ku-band LNB was added alongside the C-band LNB. Of course the C-band LNB had to be moved out of the antenna's focal point to make room for the Ku-band LNB. Though you had to squint a little, reception alongside the Ku-band LNB was still possible.

In general it is safe to say that C-band reception using a 120cm dish is also possible in Europe, just don't expect any miracles. The North Korean state TV channel was still not receivable. Nevertheless, this setup would make for an interesting toy for the satellite hobbyist and at the very least will let you somewhat expand the limits of your satellite system.

This table displays an overview of all European satellite positions that would be worth taking a shot at with a small offset antenna. It also shows the number of channels that we were able to identify with our system. The graphic gives an overall representation of the footprints of all the named satellites and also provides the number of FTA channels transmitted from these satellites. The number of channels that you will be able to receive will depend on your location.



Satellite	Number of channels
TELSTAR 10 76.5° East	1
PAS 7 67.5° East	1
INTELSAT 904 64° East	6
EXPRESS A1R 40° East	20
BADRC 26° East	5
INTELSAT 10-02 1° West	1
ATLANTIC BIRD 3 5° West	10
NSS7 22° West	7
INTELSAT 907 27.5° West	13
INTELSAT 801 31.5° West	1
INTELSAT 903 34.5° West	1
NSS 806 40.5° West	18