

## Balcony magnetic loop, home-made, especially for CB radio (11m or 27 MHz)



Today, in gloriously sunny and windless November weather, my inner bastard forced me to get up from the sofa and go for one last ride on my e-bike in 10 degree temperatures. Of course, as always, my CB radio equipment was in the basket at the back, but this time not with a 10m GRP mast + EasyFed, no, this time with my primitive (433 MHz radio-controlled) magnetic loop (home-made, diameter 84cm, cost EUR 60). As you can see in the video, this loop, which weighs just 1.5 kg, not only works on my balcony, but also outdoors on a park bench in the meadow. The standing wave fit (after strapping it to the park bench) right away (i.e. SWR = 1.11 ... could have optimized the SWR even further towards 1.00 - by changing the shape of the coupling loop - but then left it as it was, a standing wave of 1.11 also fits)

Despite massively interfering overreaches (DX-QRM), I was able to reach some local stations. But the chaos is no fun in the long run and after 2 hours I packed up, hung the loop back around my neck\*\*\* and cycled home again.

Thanks guys for the nice local QSO's, you can always be relied on, despite HF garbage via DX.

On that note, have a nice Sunday evening :-)

27 Andreas (Vespa\_300 or Krampfader)

- Photos: [https://ibb.co/album/ScGMQZ?sort=name\\_asc](https://ibb.co/album/ScGMQZ?sort=name_asc)
- Video: <https://www.youtube.com/watch?v=yFamCOBBiFM>
- Facebook: <https://www.facebook.com/groups/24261462196834662>
- Self-made loop (EUR 60,--): <https://antennenbau.dxfreun.de/krampfader/Balkon-Loop>
- It doesn't get any cheaper than this (loop for EUR 20,--):  
<https://antennenbau.dxfreun.de/krampfader/Askari-Loop>
- English (Self-build loop, US-\$ 64,--): [https://antennenbau-dxfreun-de.translate.goog/krampfader/Balkon-Loop? x tr sl=de& x tr tl=en& x tr hl=de& x tr\\_pto=wapp](https://antennenbau-dxfreun-de.translate.goog/krampfader/Balkon-Loop? x tr sl=de& x tr tl=en& x tr hl=de& x tr_pto=wapp)
- Cable (H155): <https://antennenbau.dxfreun.de/krampfader/Kabellaenge>
- Battery: <https://www.erevit.de/p/12v-18ah-lifepo4-mit-bms>
- Charger: <https://www.erevit.de/p/12v-1a-lifepo4-ladegeraet>
- Plug (50/100A): <https://www.lindinger.at/de/RC-Elektronik/Kabel-Stecker-Buchsen/Steckverbindungen-fuer-Hochstromanwendungen/MULTIPLEX-Hochstromstecker-M6-50-50-100-A-3Stk.-Original-Multiplex/13197>
- Channel change with analyzer: <https://youtu.be/yFamCOBBiFM?si=-mwqd3eIWWWnJA2G&t=848>
- Channel change with SWR meter: <https://www.youtube.com/watch?v=M4rkKGNjFSk>
- Music carrier via DX: <https://youtu.be/yFamCOBBiFM?si=NrjUJYFWth2UNpOe&t=1154>
- Pack size 57cm: <https://i.ibb.co/ThLDpJf/Packmass-Loop.jpg>
- Sofa spark with loop: <https://youtu.be/f8ldliRLnI0>
- Loop construction: <https://youtu.be/MRPyv3Lm4DY>
- Interesting facts about MagLoop + prices:  
<https://www.wimo.com/de/antennen/kurzwellenantennen/mag-loop-antennen>
- Opposite of "Sofa-Funken": <https://youtu.be/Uc329uW65AA>
- Feedback tuned rubber sausage: <https://picr.eu/images/2023/11/11/lmwgK.png>
- Location: <https://w3w.co/schaufel.buch.rolle>
- Motschger/Matsch: Interfering overreaches (DX-QRM or DX garbage):  
<https://de.wikipedia.org/wiki/%C3%9Cberreichweite>
- Definition dilettante (experts are others): <https://i.ibb.co/Tc9QCbT/Definition-Dilettant.jpg>

=====

\*\*\*Neck: Of course people look at you when you cycle around with a loop around your neck (and of course they think their part) ... but I don't really care what others think about me, a whole new feeling of freedom, wonderful

=====

NOTE: Again and again I hear statements about building a loop myself: "I don't have time", "I can't do it", "I have two links", etc., to which I reply the following, on the subject of "time": For each of us the day has exactly 24 hours, no more, but also no less. If I say to someone "I don't have time for this" then I honestly and secretly mean "it's not important enough for me" ... and on the subject of "I can't do it, I have two left hands": Each of you can bend a flat aluminum profile round, each of you can saw off a wooden strip and drill two holes, and each of you can remove the sheathing from a piece of coaxial cable, so please don't give me that . ... the only excuse I will accept is: "I'm just too lazy to do it", because it can't be the cost, from EUR 20,-- you're in, see:  
<https://antennenbau.dxfreun.de/krampfader/Askari-Loop> ... PS: And please don't make any requests or offers to "sell": I'm not selling my loop, my contributions are intended to encourage people to build their own Magnetic-Loop from EUR 20,-- ... As an antenna-impaired CB radio operator, you don't have to dig deep into your pocket to take part in the local CB house round. Or make worldwide connections using JS8Call. Here is the construction plan of my simple CB-MagLoop, which consists of easily obtainable and inexpensive materials. Such a primitive and dismountable MagLoop can be put together in an afternoon at the kitchen table, basically with a Leatherman and a cordless drill. But above all you need the will to do it, see the construction plan at: <https://i.ibb.co/LnqPwDg/Bauplan-Askari-Loop.jpg>

You can download more high-resolution detailed photos here:

<https://antennenbau.dxfreun.de/krampfader/Askari-Loop> The only important thing is to remove the electrically insulating anodized layer from the three flat aluminium profiles at the respective contact points by sanding with a file. I also use spring steel toothed washers for the screw connection with M6 screws. The hard toothed washers dig deep into the soft aluminum, penetrate the oxide layer and thus ensure a low-resistance screw connection. This is important for the loop to function properly, see image: <https://i.ibb.co/CzJWyNB/IMG-8908.jpg> If you don't have the confidence to build such a cheap magnetic loop (despite the simplest construction + materials) (i.e. if you have two left hands or are simply too lazy to do so), you can also buy one of the commercially available MagLoops, WiMo has a large selection of them, see: <https://www.wimo.com/de/antennen/kurzwellenantennen/mag-loop-antennen> ... even at the risk that the commercial AFU loop is then not optimally designed for the CB band, be it in terms of diameter and/or measured values, see only the following example, using the "Baby-Loop", although labeled as "Baby" this (in itself very good) loop has a diameter far too large for CB radio (namely 1.0m). Although this increases the efficiency slightly, the loop no longer radiates purely magnetically but already has a large electrical component. That's not what we want. For example, my commercial Schubert loop with a diameter of 90 cm repeatedly caused my digital SAT receiver to crash, keyword TVI & BCI. Only after I reduced the diameter of the Schubert loop from 90cm down to 80cm was there no more interference. Various loop calculators also recommend smaller diameters for 27 MHz, CB radio is not amateur radio, see picture: <https://i.ibb.co/yRtBHSn/Baby-Loop.jpg> Critics always come up with the argument that the quality of such a simple capacitor made from a scrap piece of coaxial cable cannot be particularly high: As a self-taught CB radio operator, I am not the only one who uses a stub of coaxial cable as a capacitor. Klaus Finkenzeller (DL5MCC), a qualified communications engineer, radio amateur and assessor for the Federal Network Agency (for AFU examinations), also does so. Klaus uses normal, cheap 5mm RG-58 as a capacitor in his newly developed special MagLoop, see picture. I, on the other hand, use voltage-resistant, high-quality and yet inexpensive 7mm cable with foamed dielectric, see: <https://kabel-kusch.de/Koaxkabel/HIGHFLEXX7/highflexx7.htm> ... Conclusion: If even an experienced communications engineer, radio amateur and examiner prefers this type of capacitor, then we CB radio operators should also consider it to be perfectly usable, see picture: <https://i.ibb.co/85fTkbK/DL5MCC.jpg>, source: article by DL5MCC: <https://oe5.oevsv.at/export/sites/oe5/informationen/vortragsunterlagen/2020-05-07/MLA-DL5MCC-CQDL-Jan-Feb-2020.pdf> On the subject of SWR and resonance of an antenna: By definition, a CB antenna (or MagLoop) is resonant when the reactive component "X" at the target frequency has the value zero ("0"), regardless of where the SWR minimum is located. Only in the ideal case are both (SWR minimum and resonance point of the antenna) exactly at one and the same frequency, in the case below on our CB house channel FM11 (or 27.205 MHz, center of the band for 40 channels). The complex impedance "Z" then becomes purely real ("R") at X=0 and is the desired 50 ohms. It couldn't be better, the antenna is perfectly tuned. Commercial, expensive MagLoops developed for amateur radio rarely deliver these measured values on the CB band, see: <https://i.ibb.co/gLHKcrd/Messwerte-Eigenbau-Mag-Loop.jpg>

Due to the inherent narrowband nature of a MagLoop, these antennas are not only very selective when receiving (RX) (i.e. less RF junk or less QRM) but also when transmitting (TX). This effectively suppresses the transmission of harmonics, side waves and/or harmonics, or at least greatly attenuates them, meaning that less (or no) interference is to be expected, keyword TVI & BCI (the ambitious CB radio operator does not have to expect to disturb the neighbor). With regard to DX-QRM (i.e. overreach), however, there are also limits to a MagLoop, unfortunately, see or listen to my example: <https://www.youtube.com/watch?v=yFamCOBBiFM&t=1154s> ... DX overreaches exactly on the frequency (sometimes strong) push local QSO's away, local calls are then no longer possible (via strongly attenuated ground wave), but one is heard at a distance of 1,000km, depending on propagation conditions or solar activity, mostly during the day (via the then hardly attenuated space wave). With this kind of overreach, Europe-wide radio connections fall into your lap without much effort, often even with "suboptimal" antennas or even just a handheld CB radio. This gives you the

"pleasure" that radio amateurs enjoy almost all year round. The licensed colleague will almost always find a band "where something works", due to the extraordinarily good propagation conditions of various AFU bands, see the frequencies highlighted in green at:

<https://www.fading.de/funkwetter/das-aktuelle-funkwetter> ... Otherwise you can find general information about MagLoops here: [https://www.wimo.com/media/manuals/WiMo\\_/11255\\_AMA-Prospekt\\_AMA-Broschure.pdf](https://www.wimo.com/media/manuals/WiMo_/11255_AMA-Prospekt_AMA-Broschure.pdf) and here: <https://sil0.tips/download/magnetische-antennen>

In the following short video, radio amateur Michael (DL2MR) shows us how tricky it is to tune a magnetic loop if the variable capacitor is much too large, i.e. covers a much too large range (several bands), see: <https://www.youtube.com/watch?v=RWQ29iYQAqY&t=407s> ... DL2MR is therefore unable to tune the MagLoop exactly to the desired target frequency. But it doesn't matter, if you as a radio amateur don't manage to set the desired frequency on the loop exactly, then you just make it easy for yourself and set your AFU transceiver to that "crooked" frequency, and that's that. We CB radio operators can't afford to do that, AFU is not CB, we CB radio operators have specified precise frequencies to which we have to guide our MagLoop exactly to the Hz (i.e. to one of our 40 or 80 CB channels, e.g. to channel 25 or 27.245 MHz for JS8Call). The easiest way to do this is to use the cheapest coaxial capacitor, a very sensitive motor drive and 433 MHz radio remote control, see my precise channel change compared to the video by DL2MR at: <https://www.youtube.com/watch?v=yFamCOBBiFM&t=848s>

