

■ Unbelievable: this is DXer Daniel Rank's private satellite reception system. He installed everything himself and routed all of the cables in a highly professional manner.

The Perfect Satellite System

- Can switch between 12 fixed LNBs
- Utilizes a homemade PC as a satellite receiver
- Exceptionally careful wiring of every component
- Operates his system using only the PC mouse
- Capable of remote controlling the receiver via Smartphone

The Best Professionally Constructed Private Satellite System



Usually not much care is taken when setting up a private satellite system: as long as TV channels are received, everything is good. How all the cables are installed doesn't really matter. But there is one satellite DXer that is an exception to this rule. He professionally erected his exceptional satellite system according to the philosophy „Only the best is good enough“.

We paid him a visit in the small town of Blankenberg in the southern part of

Thuringen in Germany right along the river Saale. Daniel Rank became interested in anything electronic at a very early age: „When I was 12 years old I started helping friends and relatives with electric related installations.“ He is an electronics technician and works for a small company (STS Signal Technik Sprenger) that manufactures specialized communications products, such as, telephones that still work using a hand crank that would be used in times of emer-

gency when multiple electronic networks have failed. He works in the company's development laboratory.

He came in contact with satellite reception while in the military. „I was stationed in Kosovo twice, once in 2002 and again in 2003.“ To provide the soldiers with TV from home, the military installed a satellite system that provided only four TV channels. Daniel Rank was determined to improve that number. He installed his own satellite system and started to be-



■ The front side of Daniel Rank's house. There's nothing that can be seen here that would even hint at the highly professional satellite reception system that is installed on the other side of the home.



■ The three dishes are actually quite inconspicuous; the trees hide them very well.



come more and more involved with that subject.

„When I came back home, I acquired a Toroidal 90 antenna.“ This type of antenna can be used to receive multiple satellites all at the same time using as many LNBs as needed for each satellite without having to turn the antenna. The dish is shaped in such a way that the focal point is actually a focal line that stretches across a large orbital arc. „I started with four Quad LNBs for the satellites at 13 east, 19 east, 23 east and 28.2 east.“ And just like any other satellite DXer, it didn't take long before this was no longer good enough for Daniel. Over the years he continuously added LNBs until now he has a total of 12 LNBs on his antenna. „The eastern-most satellite that I can receive is at 33 east while the western-most is at 12.5 west.“ He also added two motorized antennas.

„Both of them are equipped with DiSEqC motors and Twin LNBs. One of the dishes is 120cm in diameter and the other

■ To set up his satellite system Daniel Rank used his Smartphone: he uses the Android applications on it to remotely control his homemade PC system through his own WLAN



one is 110cm wide. The range of the antennas reaches from 75 east to 34 west."

What makes Daniel Rank's satellite system so unique is how all of the components are connected together and how all the cables are routed: it's all highly professional! Thanks to his electrical installation experience, he knows exactly how to professionally install cable and also what to look out for. He doesn't use the standard white installation cable that is actually meant to be used indoors, instead he uses better-protected cable designed to be used outdoors. He even considered things like potential equalization; something that your average private antenna builder wouldn't even think about.

The highlight of his system is the homemade PC that he uses to control everything. „My Home Theater consists of six satellite tuners and eight 1.5 GB hard drives that are switched using RAID." The signals from all of his LNBs end up in his PC and he can use the PC's mouse to switch between channels. If, while I'm watching a TV channel, I decide I want to check my e-mails or surf the Internet, I can do that with a simple mouse click." Instead of a remote control that he now only needs to adjust the speaker volume on his 7.1 HiFi system, the only device he uses while watching satellite TV is the mouse.

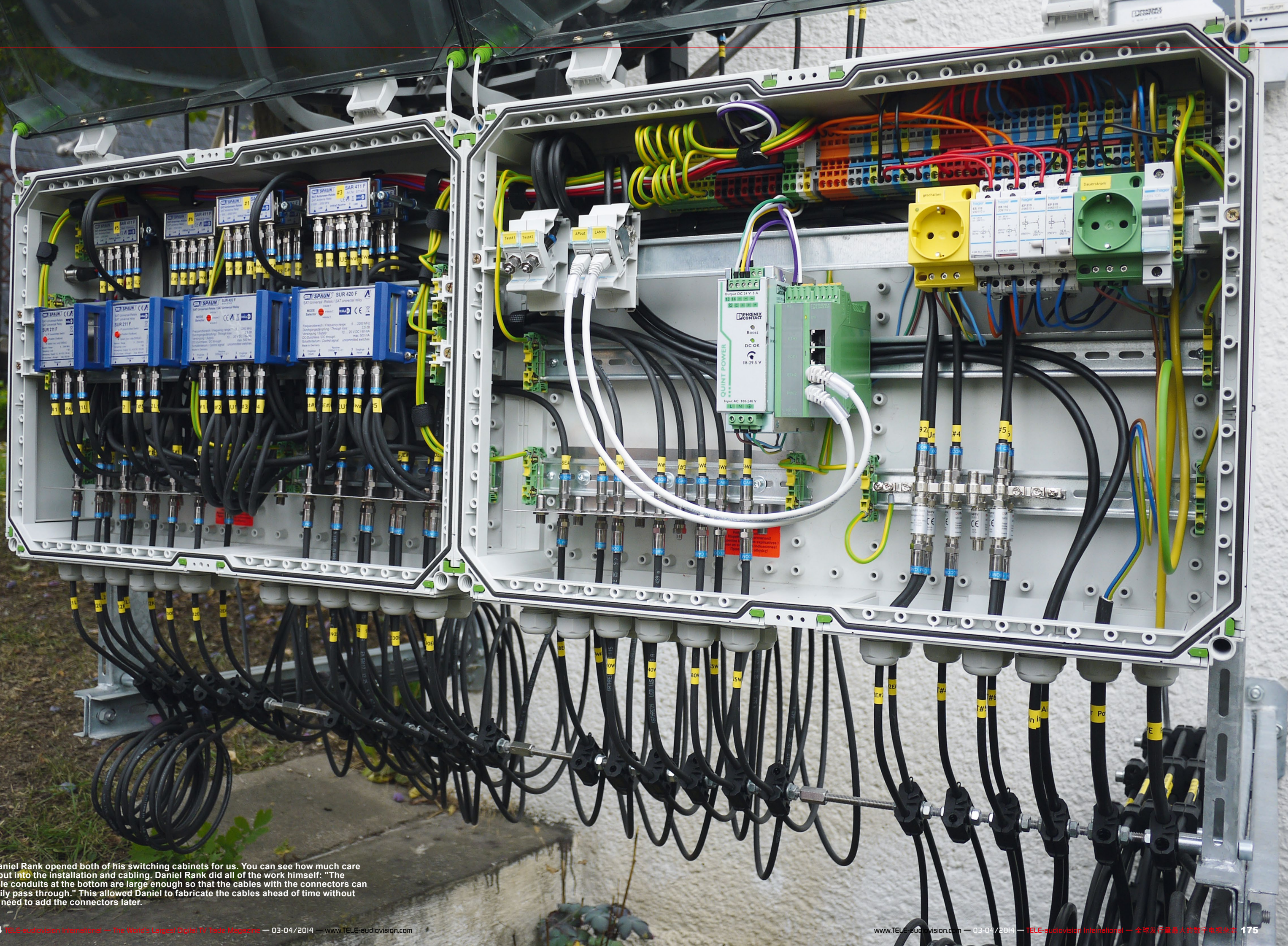
„When I want to adjust the settings on my system, I use the Android programs on my Smartphone to remotely control the DVB channels." Daniel Rank has optimally set up the available software and is already prepared for new technologies such as the Ka-band and SatIP. „My cabling is already prepared for it, I'm just waiting for less expensive hardware to become available."

Daniel Rank is not totally satisfied with his system: „I'm planning to reconstruct the Toroidal antenna's LNB mounting rail in order to be able to adjust the height of the LNB installation." Not all of the satellites sit perfectly on the orbital belt, some of them are in inclined orbits. Daniel Rank is a perfectionist; his philosophy mentioned at the beginning should not only be understood like this: that the hardware has to be the best, the installation itself has to be the best it could possibly be.

Daniel Rank managed to get it done: his satellite reception system is without a doubt the best private professionally installed system there is!



■ From the side you can see the 12 LNBs on his Toroidal antenna. This antenna is shaped in such a way that all of the 12 LNBs sit in the focal point of the antenna. All 12 satellites can therefore be equally received depending on the footprints. The box on the wall provides a WLAN signal. Why? "My WLAN signal is attenuated quite a bit when it goes through the wall, that's why I installed a WLAN repeater so that whenever I'm working on my system out in the yard, I'll have an excellent WLAN signal."



♦ Daniel Rank opened both of his switching cabinets for us. You can see how much care he put into the installation and cabling. Daniel Rank did all of the work himself: "The cable conduits at the bottom are large enough so that the cables with the connectors can easily pass through." This allowed Daniel to fabricate the cables ahead of time without the need to add the connectors later.

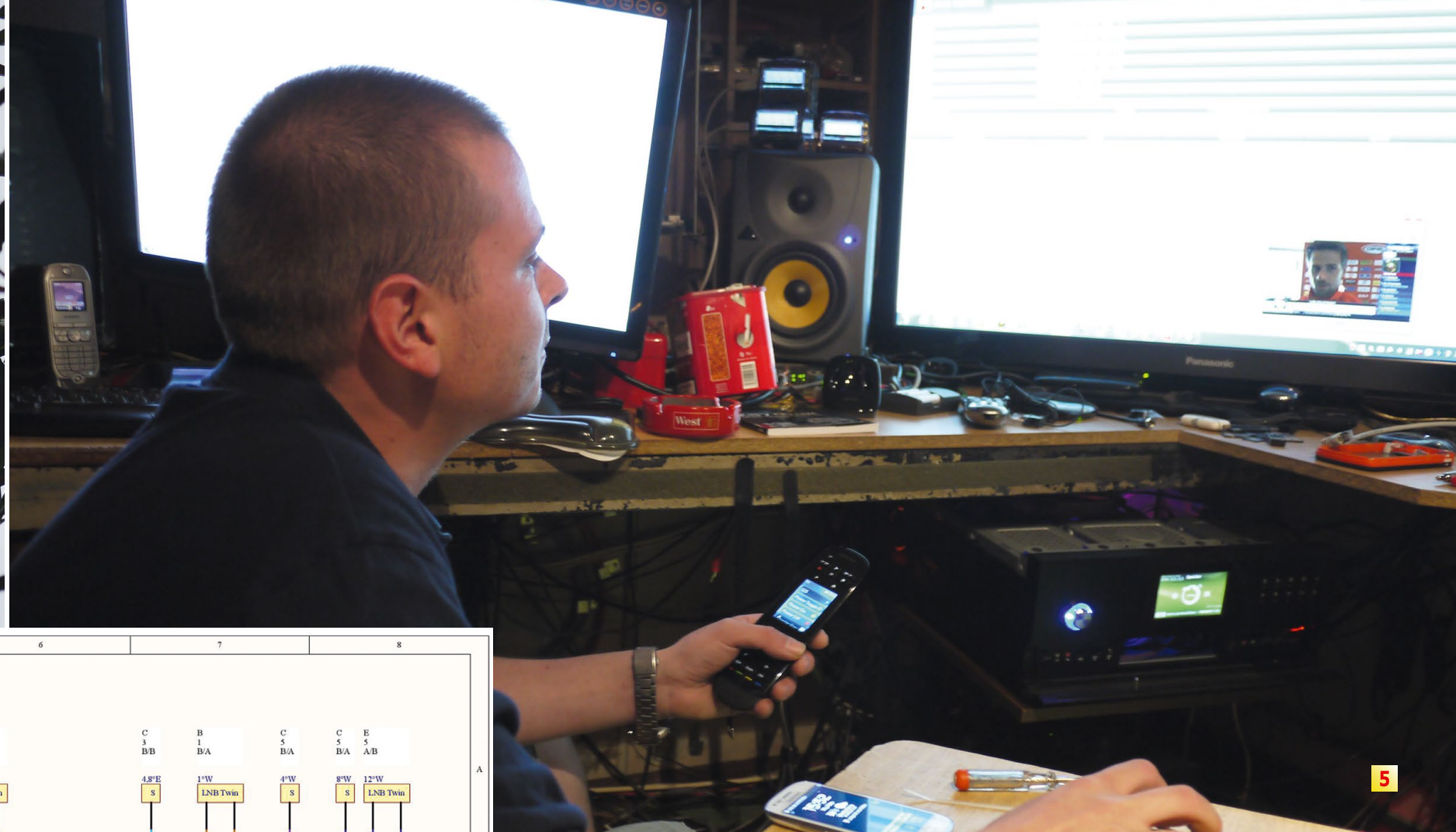


1. Another detail: Daniel drilled the potential equalization plate himself: "The holes are located precisely above the cable conduit openings. In this way not one cable needs to be bent; they can be routed straight through to the connector jacks."

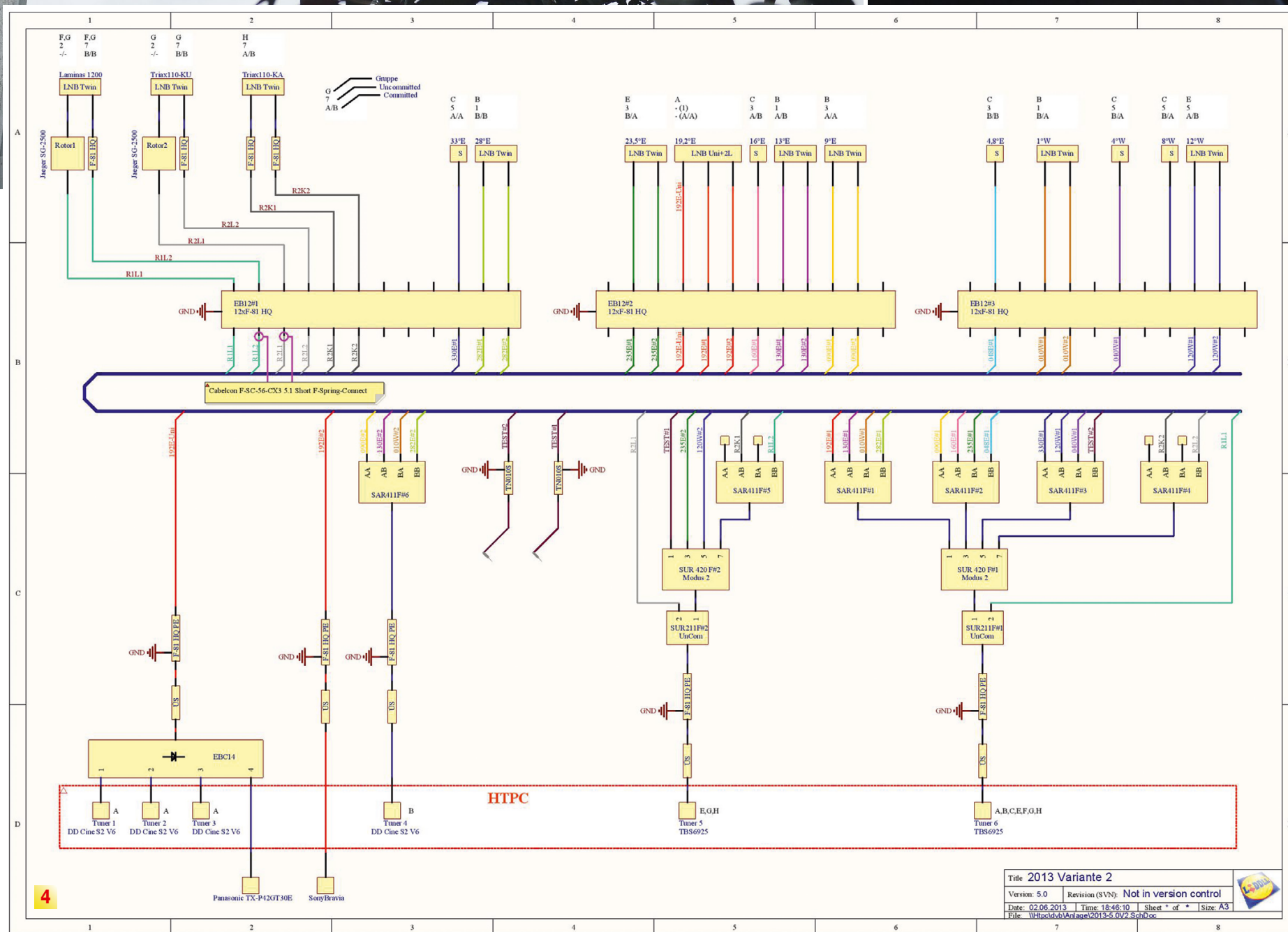
2. The 110cm motorized antenna. Even here the LNB cables were correctly and professionally fastened and routed into the house.



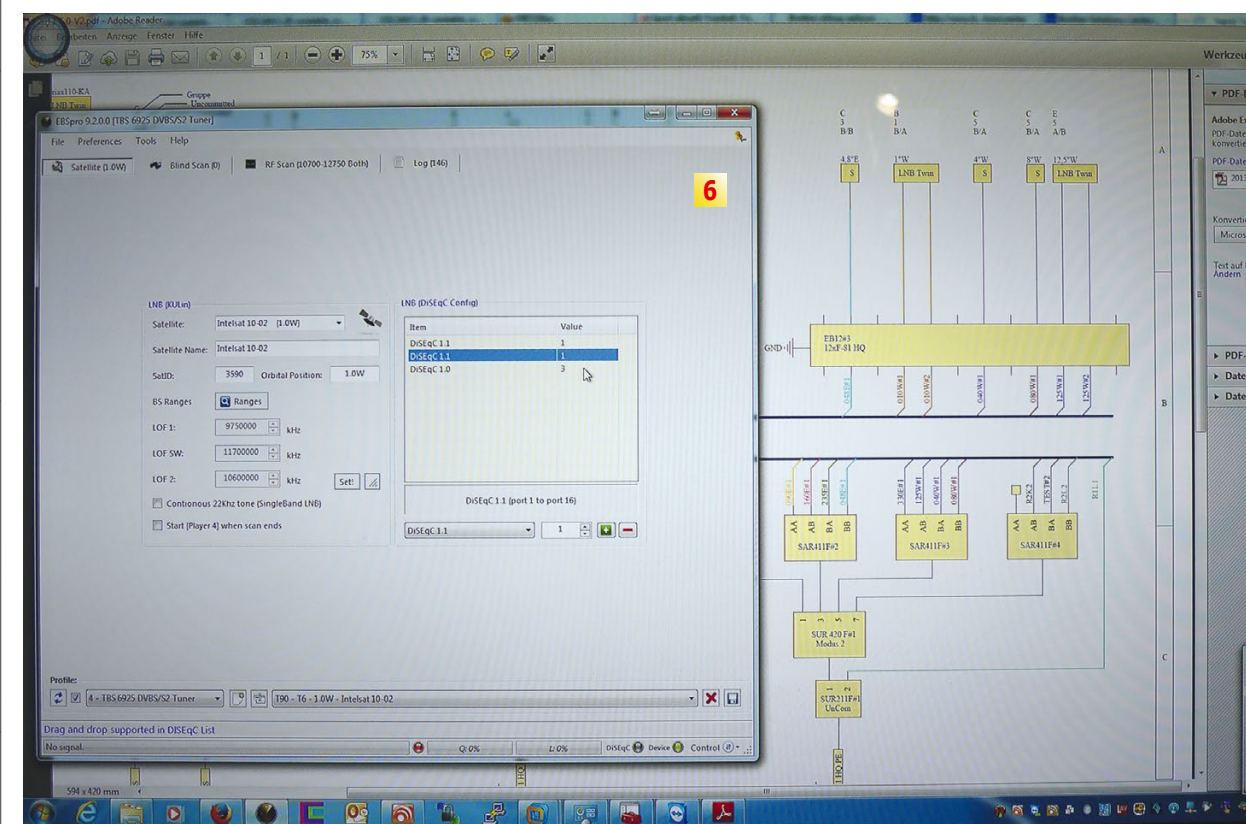
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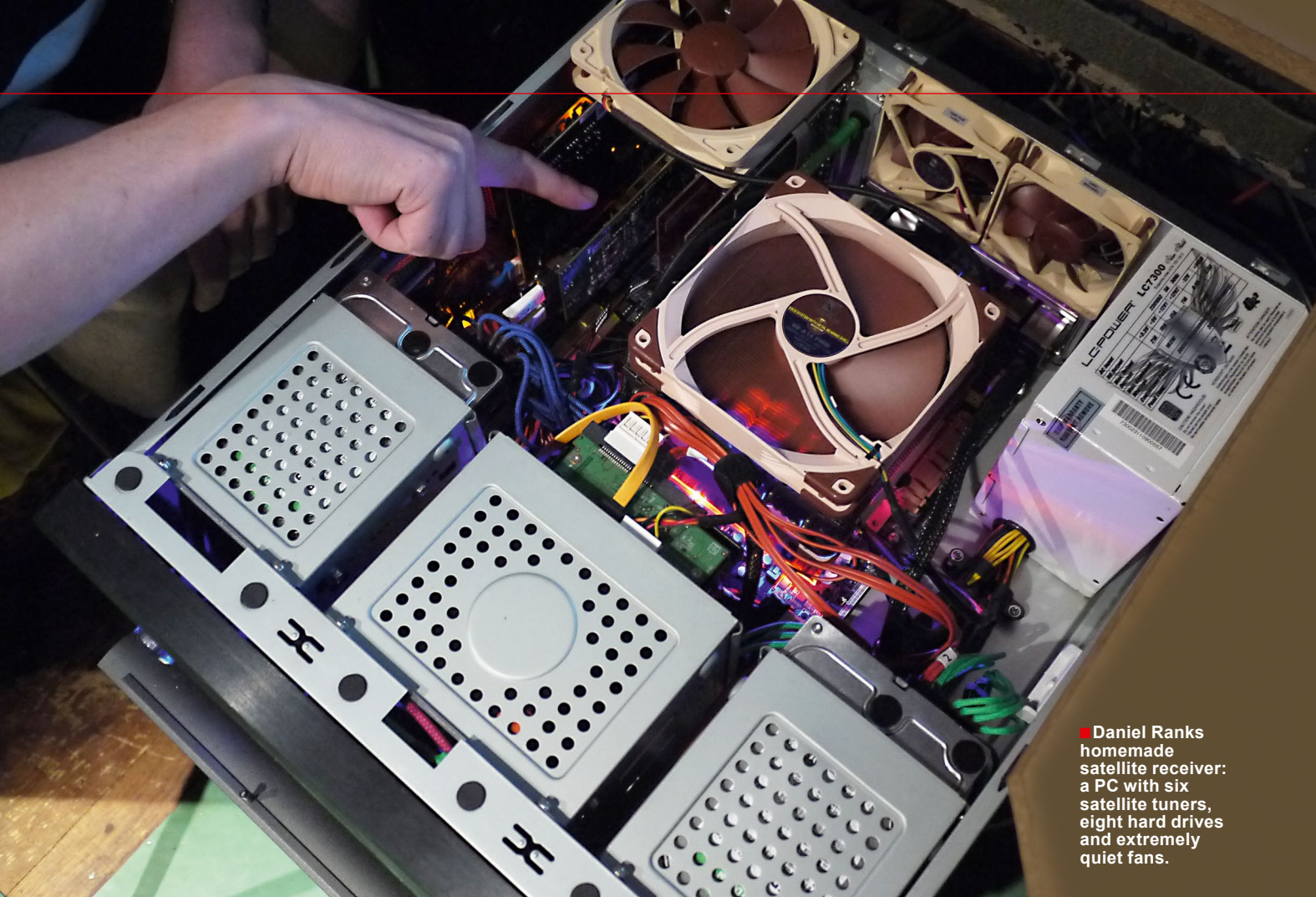
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3. The 120cm antenna. This one is already prepared for the connection of a Ka-band LNB.

4. Daniel Rank's satellite reception system block diagram.

5. Daniel Rank in his shack. He sits here in the evenings and enjoys all of the channels he can receive with his system. "I'm a football fan but I also like to watch documentaries." His favorite satellites are at 26 east for Dubai Sports and 1 west for the numerous documentaries. "I also like to switch over to the satellites at 23 east, 12 west and 24 west; there's always a sports feed there that I can easily find through a Blindscan."

6. Daniel demonstrates how he switches between the 16 LNBs. The various DiSeqC switches have to be correctly switched for each LNB.



Six-Tuner Receiver

Daniel Rank's Homemade Satellite Receiver

Tuner 1: ASTRA via SCR (1210 MHz)
Tuner 2: ASTRA via SCR (1420 MHz)
Tuner 3: ASTRA via SCR (1680 MHz)
Tuner 4: ASTRA via SCR (2040 MHz)
Tuner 5: Antenna motor 2 switched through the SPAUN SUR211F#2's uncommitted switch #2

(SPAUN SUR211F#2 - input 1) uncommitted switch #3
(SPAUN SUR420F#2 - input 2) committed switch #3
(without switching)

Tuner 6: All in one: Switching between antenna motors and fixed LNBS via SPAUN SUR211F#1. The antenna motors are switched in uncommitted switch #2 and USALS mode.

The fixed LNBS are connected via input



1 (uncommitted switch #1) of the SPAUN SUR211F#1 and SPAUN SUR420F#1 in mode 2. It's mode 2 because the command uncommitted switch #2 is always used by the SPAUN SUR211F#1, with the uncommitted switch #2 (or US4, 6, 8, 10, 12, 14, 16) it would always switched to the antenna motor. Mode 2 passes the uneven US 1, 3, 5, 7 through which then allows cascading. For example, to switch to the 4 west satellite, the correct path would be:

uncommitted switch #1
(SPAUN SUR211F#1 - Input 1)
uncommitted switch #5
(SPAUN SUR420F#1 - Input 3)
committed switch #3
(SPAUN SAR411F#3 - Input 3)

It would also work with this combination since the SPAUN SUR211F#1 will switch to Input 1 with all of the uneven ones:

uncommitted switch #5
(SPAUN SUR211F#1 - Input 1)
uncommitted switch #5
(SPAUN SUR420F#1 - Input 3)
committed switch #3
(SPAUN SAR411F#3 - Input 3)

Note: the uncommitted switch from the SPAUN SUR211F and the SUR420F can also be accessed using an alternate address:

normal: E0 10 39 Fx
(10 = all Switches)
alternative: E0 18 39 Fx