From Random Reboots to Reliable Starlink on 12V

July 19, 2026 / Gavin Jackson

electronics starlink caravan 12v soldering fnirsi maker learning

This was a relatively simple project that I had been putting off for months.

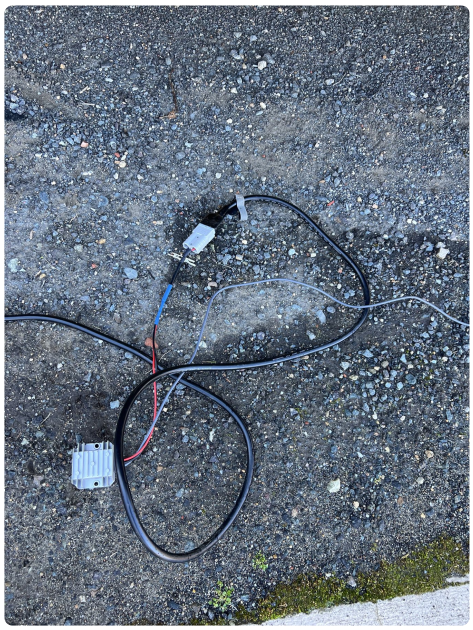
We use a Starlink Mini with the caravan. The dish is small, quick to set up and extremely useful when a campsite's idea of Wi-Fi is one struggling access point attached to the office. Powering it neatly from the caravan, however, had become one of those jobs I kept promising to fix before the next trip.

I had bought a cheap cable intended to run the Mini directly from 12 V. It almost worked. The Starlink would power up, broadcast its Wi-Fi network and sometimes even get online. Then it would randomly reboot. Other times my devices could connect to the Starlink access point, but the dish never established an Internet link.

On our previous trip, I gave up and used the normal Starlink power supply. That meant running a cable into the caravan, switching on the 240 V inverter and converting the battery's DC power to AC, only for the Starlink adapter to convert it back to DC again.

It worked, but it was inefficient, untidy and involved exactly the sort of cable arrangement someone eventually trips over while carrying a cup of tea.

The proper solution was to keep the whole setup on DC and give the Starlink a more stable voltage. I needed a boost converter, a usable connection to the caravan battery and enough confidence to finally do the soldering.



The finished assembly. An old plastic container gives the converter and cable joints some protection from weather, dirt and knocks.

Why The 12 V Cable Almost Worked

The random reboots were the useful clue. The Starlink Mini could receive enough power to start, but not enough to remain stable once the dish began doing real work.

Starlink rates the Mini for a 12-48 V DC input at up to 60 W. At the lower end of that range, a 60 W load represents about 5 A. Sending that current through a long, relatively thin cable creates voltage drop: some of the supply voltage is lost in the resistance of the wire before it reaches the dish.

That explains why a cable can appear to work until the load changes. The Mini's Wi-Fi access point may be alive, but the available voltage at the far end of the cable can still fall low enough to prevent a reliable satellite link or trigger a reboot.

The fix was a 12 V-to-30 V DC-DC boost converter made for the Starlink Mini. It takes the caravan's nominal 12 V supply and raises it to 30 V before the power enters the long Starlink cable.

The basic numbers show why that helps:

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Power = Voltage x Current

60 W at 12 V = 5 A
60 W at 30 V = 2 A
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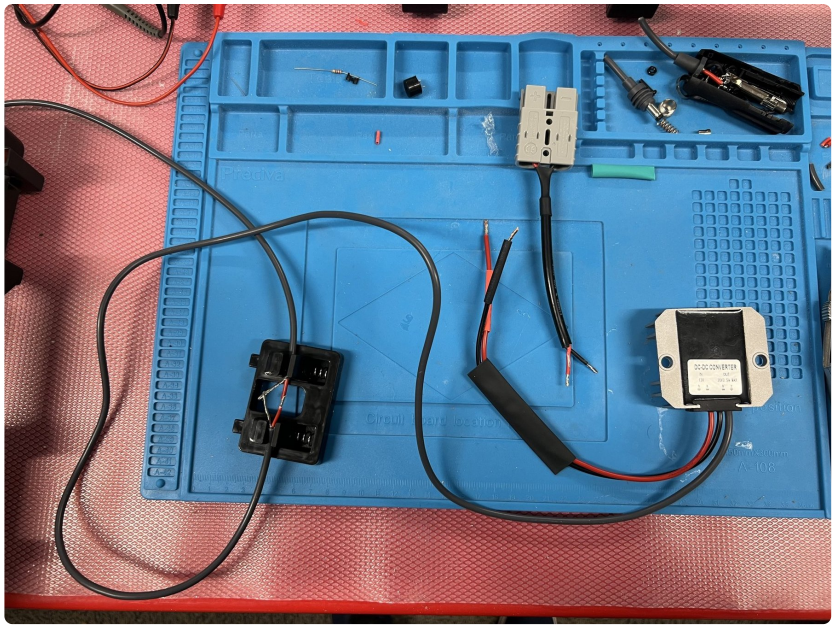
The converter is not perfectly efficient, so the battery side will draw a little more than the ideal calculation suggests. The important part is that the long run to the dish now carries much less current. Less current means less voltage lost in the cable and a much better chance of the Mini receiving a stable supply.

Starlink only guarantees performance with its own power supply and cable, so this remains a third-party arrangement. It is, however, a much more sensible arrangement than asking a marginal 12 V cable to carry several amps all the way to the dish.



The job laid out on the bench: boost converter, Starlink power lead, Anderson-style connector and rather more loose wire than the finished version would require.

Finding A Useful 12 V Connection

My first idea was to use the Anderson connector at the end of the caravan drawbar. It had originally been installed so the tow vehicle's alternator could charge the caravan battery while we were driving.

Our car does not have the matching Anderson connection, so that cable was not doing anything. Repurposing it for the Starlink seemed like a tidy way to make use of something already installed. An Anderson connector is simply a sturdy two-pole DC connector; whether it is an input or an output depends on what is wired behind it.

Unfortunately, once I investigated the cable route properly, the idea fell apart. The existing lead was not long enough to reach the battery system's output connection.

While tracing the wiring, I found a second Anderson lead installed by the caravan's original owner. This one had been used to connect a portable solar blanket for extra power generation. More importantly, it was long enough to route internally to the battery output.

That became the new plan. I rerouted the unused solar-blanket lead inside the caravan, connected it to the 12 V output and used the multimeter at the external Anderson connector to confirm that I had approximately 12 V and the expected polarity.

That small test felt important. A year ago I probably would have trusted the wire colours, plugged everything in and hoped for the best. This time I could prove what the connector was doing before attaching the converter or the Starlink.

The final power path looked like this:

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Caravan battery system
 -> repurposed solar-blanket lead
 -> external Anderson connector
 -> DC-DC boost converter
 -> existing Starlink power cable
 -> Starlink Mini
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Making The Converter Cable

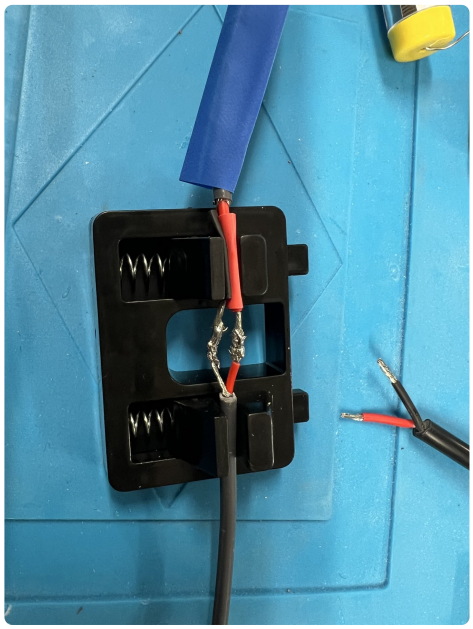
The converter came with bare input and output wires, so the next step was turning it into something usable.

I fitted an Anderson-style plug to the 12 V input side and soldered the output to the dish end of my existing Starlink cable. Before making the joints permanent, I checked the converter markings, traced the positive and negative conductors and used the multimeter to verify continuity. Wire colours are helpful, but they are not evidence once several third-party cables and connectors are involved.

For the soldering I used an adjustable wire and PCB holder. Calling it a third hand is probably the clearest description. It kept the conductors aligned and stopped the joint moving while I held the iron in one hand and fed solder with the other.

This was hardly precision aerospace work, but it made an enormous difference. Instead of chasing two loose wires around the bench with a hot soldering iron, I could concentrate on heating the joint properly.

I protected each conductor with its own piece of heat-shrink tubing, then added a larger second layer around the completed cable. The inner layer provides the electrical insulation; the outer layer keeps the pair together and adds some protection and strain relief.



The joint in progress: individual insulation over each conductor, followed by a larger outer sleeve.

I also repurposed an old plastic container as an enclosure for the converter. It is not a certified waterproof electrical box, and I would not leave it sitting in a puddle, but it provides a useful barrier against splashes, dirt and accidental knocks. I can also position the cable openings away from the weather while leaving enough space around the converter for heat to escape.

The 12 V side of this setup can supply substantial current, so the circuit needs suitable fuse protection near the battery or distribution point. The cable and connectors also need to be rated for the expected load. I checked the polarity one final time before connecting the Mini because reverse polarity would have made this article much shorter and considerably less cheerful.

> ### *Mini-review: FNIRSI SAG-55 hot-air gun*
>
> *This project was my first proper excuse to use the FNIRSI SAG-55 hot-air gun I bought from AliExpress, and I loved it.*
>
> *My previous heat gun was a much larger general-purpose tool. It could shrink tubing, but it always felt like using a leaf blower to dry a postage stamp. The SAG-55 is small enough for the electronics bench and much easier to aim at one section of cable without heating everything nearby.*
>
> *The controls and colour display are built into the handle, while the separate power adapter is compact enough to move or put away easily. That matters on my increasingly crowded workbench, where every new electronics tool seems to arrive with territorial ambitions.*
>
> *Temperature and airflow can both be adjusted from the handle. FNIRSI specifies a temperature range of 100-450 C, 20 airflow levels, up to 80 litres per minute of airflow, three presets and a maximum heating power of 550 W. For this job I set it to 300 C, selected a modest airflow and watched the tubing close around the cable.*

The SAG-55 at 300 C. Much smaller and easier to control than my old full-sized heat gun.

The temperature is easy to dial in, the display makes the current setting obvious and the tool heats quickly. The cold-air function also helps cool it down when the work is finished. The Pro kit's magnetic stand can trigger cooling and standby when the handle is returned to it, although the included stand and behaviour depend on which version is purchased.

This is still a powerful hot-air tool. Too much heat or airflow can soften connectors, damage nearby insulation or send small components across the bench. Starting gently and keeping the nozzle moving worked well.

I have not yet used it for demanding surface-mount rework, so this is not a scientific test of temperature calibration or long-term durability. For heat-shrink work, though, the SAG-55 is compact, easy to control and far more precise than my old heat gun. It is exactly the sort of tool that makes a small job feel less awkward.

The Final Setup

The Starlink Mini now sits above the caravan on a BBQARM Telescopic Starlink RV Pole. BBQARM lists the aluminium pole at 3.5 kg, with a collapsed length of 1.5 metres and an extended length of approximately 2.6 metres, or about 3 metres with the dish fitted. The Mini also requires the appropriate pole adapter.

The final setup: Starlink Mini on the telescopic pole, powered from the caravan's 12 V system through the boost converter.

The result is considerably neater than our previous arrangement. There is no power cable running through a door or window, no 240 V inverter humming away purely to feed the Starlink adapter and no unnecessary DC-to-AC-to-DC conversion chain.

Most importantly, the Mini no longer randomly reboots. It powers up, establishes an Internet connection and stays connected.

A Small Job That Had Become A Big One In My Head

This was not advanced electronics. I did not design the converter, build a circuit board or diagnose a component-level fault. I found a suitable 12 V connection, verified it with a multimeter, joined the correct wires and insulated everything properly.

Six months ago, that list would have been enough for me to put the project back in the cupboard.

The recent multimeter and soldering lessons have not turned me into an electronics technician. They have given me enough knowledge to break a job like this into manageable pieces. Find the power source. Measure it. Check the polarity. Understand what the converter is doing. Make one joint at a time. Test before connecting the expensive part.

The tools helped, particularly the wire holder and the SAG-55, but the biggest improvement was confidence. I no longer had to treat every exposed wire as forbidden magic.

The Starlink works, the caravan setup is tidier, and an unused solar-blanket connection has found a new purpose. More importantly, I have now completed one of the smaller jobs I kept avoiding because it sat just beyond what I thought I knew how to do.

Hopefully the next confidence-building exercise also stops short of making a soldering iron glow orange.

Parts Used

- Starlink Mini 12 V-to-30 V DC-DC boost converter
- Adjustable wire and PCB soldering holder
- FNIRSI SAG-55 hot-air gun
- BBQARM Telescopic Starlink RV Pole
- Anderson-style connector, solder and assorted heat-shrink tubing

Related

- The $50 Lesson That Made My Soldering Iron Glow Orange
- Phase Zero, Lesson One: Multimeter Mastery
- Phase Zero, Lesson Two: Soldering the Amulet of Entry