



The added roll cage with the old Gator roof and dump-box, complete the look of Campbell's repowered Gator.

E-Gator Repowered By Cub Cadet

Don Campbell repowered an electric Gator by driving a Cub Cadet into it. The TE 4x2 Gator had been submerged overnight in Lake Michigan, ruining the electronic drive system. The Cub Cadet was a good fit.

"I bought the ruined Gator for \$150 and decided to strip it down and repower it," says Campbell. "I cut the rear frame off the Gator and drove a Cub Cadet 1811 into the middle of the Gator frame. I redesigned the dash to fit between the Gator seats."

Campbell did have to do some trimming of both machines. After removing all the electric components from the Gator, he cut out the old inside rear frame braces. He also removed the thin roof supports and added a 6-in. lift kit to level the Gator to the Cub's rear axle.

"The Cub Cadet had to be stripped down, and I shortened it 14 in. to fit inside the Gator frame," says Campbell. "I wanted everything to look the same without stretching the Gator frame."

He also built axle extensions to match the width of the front Gator tires and installed cross braces to tie the 2 frames together. The Cub 1811 had power steering that Campbell repurposed. While adding a dump box to the back end of the Gator/Cub combo, he



Campbell shortened the Gator frame and added a lift kit and axle extensions to match the frame to the Cub.

used the power steering assembly to provide hydraulic lift.

Campbell also added a roll cage and bolted the old plastic Gator roof to it. "I hand fabricated bumpers for it and added mudflaps and lights front and rear for a finished look," says Campbell. "With the hydrostatic lever mounted between the seats, my 9-year-old grandson can easily drive it."

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Simple Raised Garden Beds

Mark Schultz says he spent several years building and rebuilding raised beds before he arrived at what he considers his "ultimate" design. "It's lightweight, strong, inexpensive to build, attractive, and virtually decay resistant," Schultz says.

He uses corrugated metal for the sides so there isn't any wood in contact with the soil to rot and deteriorate. The wood top framing is western red cedar, which also resists decay, although treated lumber also works well. Either is strong enough to walk on, yet light enough to pick up and move.

"I can make an 8-in. high 4 by 8-ft. raised bed using just one 8-ft. sheet of 24-in. wide corrugated metal," Schultz says. The beds are easy to reach across, easy to cover with hoops for frost protection, and allow excellent control over soil quality. That leads to less watering, less fertilizing, less weeding, and more intensive planting."

The raised beds he designed are ideal for what Schultz calls the Living Soil method of gardening. That concept includes fertility and mulch provided by chopped leaves, which also produces a thriving home for earthworms.

Schultz says his garden beds can be built for less than \$50, depending on current



These 4 by 8-ft. raised beds are made using just one 8-ft. sheet of 24-in. wide corrugated metal, Schultz says. Beds are moveable, easy to reach across, and easy to cover with hoops for frost protection.

material prices. He offers low-cost plans for the garden beds at his website. He's adding an innovation in 2021 called "Bed Caps", which can be clamped to or hinged onto the beds. Covered with 2 by 4-in. wire fencing, they provide deer and rodent protection and can also allow covering for insect control or extending a growing season.

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Ranchers Noam Azran and Dvir Cohen use drones to herd their livestock. Onboard cameras provide a live video stream to a mobile device.

They Use Drones To Herd Cattle

By Lorn Manthey, Contributing Editor

Cattle in the Galilee Heights of Israel graze on rugged land with rocks, hills, and crevices that are difficult to navigate with anything other than horses. Ranchers Noam Azran and Dvir Cohen have found an additional method by pioneering the use of drones to herd their stock after testing the concept since 2014. "We experienced a 50 percent savings in labor costs, reduced our need for horses, and saved wear and tear on our vehicles," the ranchers say. "More importantly, we're spending more time with our families."

Azran and Cohen developed a software app they've named "Joe" as a herding device after using a drone for several years to check fences and water troughs. The drone is successful because the ranchers say livestock don't see a difference between a drone, a dog, a horse or a man on foot guiding them to new pasture.

"Cattle instinctively move away from all of those objects," Azran says. "They respond to the drone's movement and not the sound, although sometimes we've added the sound of a barking dog to the drone to make it more effective."

Azran and Cohen point out that they named their product Joe after their favorite shepherd dog. Says Azran, "Joe displays all the characteristics of our very best herding pal. He's intelligent, loyal, follows orders, and he's fast."

Azran and Cohen showed fellow ranchers a prototype of Joe and received a favorable response, so they moved the concept forward. A successful fundraising effort and a grant from the Israel Innovation Authority provided the seed money to develop Joe as an app to control drones. "We were cowboys, not

IT specialists, and we soon learned that we needed an autonomous system if Joe was going to a commercial market," Azran says.

Joe software controls a drone to observe or move cattle over large expanses of land with limited human intervention. The drone's onboard cameras provide a live video stream to a mobile device so the operator/rancher knows what's happening in real time. Cattle in the herd have GPS tags so the drone and app system can track movement. Azran says, "If there's abnormal behavior in a herd like a predator or if they're moving where they shouldn't be, the rancher will be notified and the drone can be sent to track them."

Azran and Cohen founded BeeFree Agro to produce the software, which operates with off-the-shelf drone hardware. A drone can fly up to 8 miles and move up to 1,000 head of cattle, but it won't replace cowboys.

"Joe gives a rancher the capability of moving animals with fewer cowboys, horses and dogs. We're not trying to disconnect the rancher from his land," Cohen says.

Azran says a herd can typically be moved in 1 to 3 hrs., depending on the herd size and topography. After launching its system in Israel, BeeFree hopes to have 10 to 20 pilot systems running in other parts of the world in 2021, including several in Texas. They've also had interest from the Emirates, where camels cross roadways creating hazards for drivers. "With a few adjustments we think Joe can be used to herd camels, too," Azran says.

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Simple Trailer Backup Guides

"I sometimes have to back a trailer that's too small to see when it's directly behind my truck. So I made these backup guides that are easy to use and solve the problem," says Steve Faber, Tiffin, Ohio.

"I made them from a pair of wood dowels and round magnets that I bought at Harbor Freight for \$5 (www.harborfreight.com). They have a tapered hole at the center. I fitted one end of each dowel to the hole, glued it in place, and then screwed into it from the bottom.

"I put pinch-style hose clamps around the base of the dowel to keep it from splitting when I put in the screws and to add strength.

"I carry them in the truck so they're always ready to use."

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A pair of wood dowels and round magnets serve as simple trailer backup guides for Steve Faber.

