

Tractor Converted To Remote Control

Brian Laine could think of lots of times when having a remote-controlled tractor would be useful, so he converted one himself. He used off-the-shelf parts where he could and created his own where necessary.

"I did the conversion on my Deere 4210," says Laine. "The hydrostatic drive and power steering helped keep the project manageable. It eliminated the need for throttle control, as the hydrostatic lets you control speed with a constant throttle setting. All I had to do was control fore and aft direction, speed and steering."

Laine used a standard RC controller from Futaba that's used on RC cars. The receiver that mounts to the tractor has a range of about 500 ft. and cost about \$70.

"I needed to convert signals from the RC receiver into outputs at the tractor," says Laine.

This required that he piggyback electrical controls to the hydrostat and mechanical controls to the steering column. Foot pedals on the 4210 are equipped with position sensors that feed signals to the engine control unit. Laine spliced into the wires for power, ground, and fore/aft signals.

The added wires were connected to an electronics control module Laine designed to read output signals from the transmitter. Unless the hand held transmitter is turned on, the tractor operates normally. When turned on, the electronics module uses its signals to imitate foot pedal-activated signals.

As the steering is hydraulically controlled, he needed a way to motorize the steering shaft for RC, but be able to disconnect the motor for manual control.

"I found a used 12V DC motor with electric clutch on eBay for \$35," recalls Laine. "The motor was too slow, but the clutch, which

normally sells for around \$200, could be repurposed."

Laine attached a stepper motor with gear reduction to the clutch, attaching it in turn to a chain drive. He made adapters for both to mount them to the tractor and mounted a sprocket on the steering shaft. A #25 roller chain connects the chain drive on the clutch with the shaft. Signals received by the module are directed to the motor and the clutch for either remote control of the shaft or to disengage the clutch for manual control.

"The microprocessor and stepper motor electronics driver module fit in a stout metal box for physical and electronic protection and are mounted under the instrument panel," says Laine. "I did have to give up the tilt-steering function to make room for the motor, but I hadn't used it in the previous 15 years that I had the tractor."

Laine admits that the process was filled with challenges, including just getting the steering wheel off. He ended up cutting it off and replacing it. The hydrostat control box had to be redone to be more mechanically and electrically robust.

"The steering mechanical was the biggest issue," says Laine. "I ended up making mounting pieces at least 3 times and had to try different gear ratios for the chain drive and even a different stepper motor with a different gear ratio. Issues were strength and flex, speed, clutch torque management and clearance under the instrument panel."

That said, Laine is more than satisfied. "It works great," he says. Check out a video of the RC 4210 at www.farmshow.com.

Contact: FARM SHOW Followup, Brian Laine, 7921 Wade Rd., Arlington, Wash. 98223 (ph 425 879-2890; brianlaine@aol.com; www.lainefamily.com).



Brian Laine used mostly off-the-shelf parts to convert his Deere 4210 to a remote-controlled tractor. A standard RC controller is used to operate the tractor.



Steering is hydraulically controlled with electrical controls that piggyback onto tractor's hydrostatic drive.



Photo at left shows motorized controls mounted on steering column. Photo at right shows steering control box.

Zero-Turn Mower Converted To Tracks

James Bassett, Berlin, Md., turned an early 1990's Yazoo zero-turn riding mower into a camouflaged marsh buggy that rides on tracks, and can motor through the marsh land on his property.

The tracks ride around 3 sets of wheels and axles. The mower's original rear wheels drive the machine, and the tracks ride around them and 2 more sets of axles in front. A wooden compartment just in front of the driver is used for storage and to haul dead deer.

"I live on a big farm that borders a bay with lots of marshland. We do a lot of deer hunting there, and it's always a battle getting dead deer off the marsh. My marsh buggy works excellent both on and off the marsh," says Bassett.

"I already had the zero-turn mower, and a friend gave me some old hard plastic tracks off an old Argo off-road vehicle."

The Yazoo mower was equipped with a 25 hp. Kohler engine and 60-in. deck. He removed the deck, then cut off the front part of the mower frame and used 2-in. square tubing to lengthen the mower frame by 18 in. He mounted 2 boat trailer axles on front.

The gas tanks were in the way of the tracks so he added 2 wooden side panels to the machine and bolted the gas tanks onto them.

"I built the machine 5 years ago and it has really changed the way I hunt. Now I want to shoot deer on the marsh just for a chance to use it," says Bassett. "The rear tires drive the machine without any slippage inside the tracks, and the side pieces keep water from splashing on me as I drive. I use the mower's original controls to steer and to go forward and backward. If I need to haul more than one deer I pull the second one on a rope behind



James Bassett converted a Yazoo zero-turn mower into this camouflaged marsh buggy, which rides on tracks that go around 3 sets of wheels and axles. Photo below shows original mower.



me."

Bassett also replaced the mower's original rear tires with lugged ATV tires. "The 4-wheeler tires have plenty of tread to pull the tracks," he notes.

Contact: FARM SHOW Followup, James Bassett, 9632 Goody Hill, Berlin, Md. 21811 (ph 443 366-2034; bassettpullingteam@yahoo.com).



Phil Murphy built this miniature tandem axle, 4-WD road grader out of 2 Cub Cadet rear ends.

"Cub Cadet" Road Grader

About 16 years ago Phil Murphy of Mansfield, Ohio, was in an accident and suffered a severe spinal injury. He now walks with a cane, but he still puts his mechanical skills to work building machines just for fun. He recently built this miniature 4-WD road grader out of 2 Cub Cadet rear ends. It's painted Allis Chalmers orange.

The tandem axle machine rides on six 12-in. tall, 10 1/2-in. wide garden tractor wheels. It's equipped with a 5-ft. wide blade that can be angled left or right, up and down, or tilted from side to side. Power is supplied by a Kohler 22 hp, 2-cyl. military cast iron engine mounted on back. The engine is coupled to one of the Cub Cadets' hydrostatic transmissions.

"It's modeled after a real Galion road grader and built mostly from scrap materials. I tell people that I already had the engine and decided to build something to put it on," says Murphy, who notes that he got a lot of help from a local machinist friend.

"I took photos of a real Galion as a

guide and built it as close to the real thing as possible. For example, the front wheels hubs off a Dodge minivan. "The Dodge hubs had the same bolt pattern as the wheels on the Cub Cadet rear ends," says Murphy.

He used 3 by 4-in. steel tubing to build the grader's frame. The 2 Cub Cadet rear ends are bolted together with a big steel plate that Murphy welded to the frame. A homemade driveshaft runs from the engine up to both rear ends.

The grader's front axle uses the rear wheel hubs off a Dodge minivan. "The Dodge hubs had the same bolt pattern as the wheels on the Cub Cadet rear ends," says Murphy.

The grader is equipped with 5 hydraulic cylinders. They're used to raise and lower the blade, to adjust the blade angle, to tilt the blade up or down, to control how far the blade's teeth dig into the ground, and to lean the front wheels in when turning. "All the cylinders operate off a hydraulic pump on one of the Cub Cadets," says Murphy.

Contact: FARM SHOW Followup, Phil Murphy, 1958 Ashland Rd., Mansfield, Ohio 44905 (ph 419 589-3524).