

2018 FLYSET FTC Workshop

- Two Wheeled Chain Drive (with VexPro Gearboxes)

(9/3/2018)



Jerry

- Programmer/CADder
- Started with team in FLL, total 8 years
- SSR in 16-18, Worlds in 17



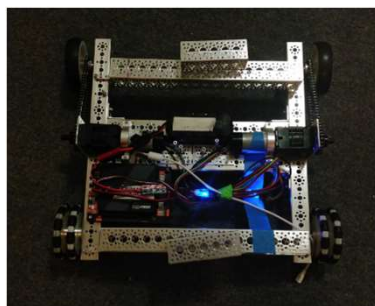
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Chassis Specification



Two Wheeled Chain Drive

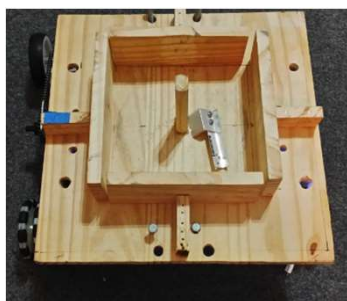


9.8 pounds



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Two Wheeled Chain Drive



14.8 lbs



29.8 lbs



44.8 lbs



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Two Wheel Chained Drive

- Tetrax
- Two NeveRest Bare Motors
- 2 Wheel chain drive
- Gear ratio from motor to wheel: 22:16 (~equiv. to Neverest 30:1)
- Uses 2 Tetrax wheels and 2 Tetrax omnis
- REV expansion hub is horizontally mounted on the robot chassis
- Base chassis weight: 9.8 lbs



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Chassis CAD Design



Two Wheel Chained Drive in Design Phase



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Two Wheel Chained Drive CAD Notes

- I mean not really. I just didn't think Cadding the right side of the robot was worth my time.



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Chassis Test Results

Two Wheel Chained Drive Build Notes

- Lots
- Obvious misjudgement of the time constraints of building a 8 wheel chassis that was custom
- Screwing things
- Use face mounts!
- Chaining struggles
- Tetrax being bad



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Test 1: Forward Speed Test

- It handled weight relatively well for linear speed

2-wheel Chained Drive	Raw Data		9/1/2018 Jerry		
	Reading 1	Reading 2	Reading 3	Average	Voltage
	5.12	5.17	5.15	5.146666667	13.49
	4.91	4.91	4.86	4.893333333	13.46
	4.62	4.65	4.59	4.62	13.41



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Test 2: Three Second Turn Test

- Was pretty weak with weights for turning (low torque)

2-wheel Chained Drive	Raw Data		8/25/2018	Jerry	
	Reading 1	Reading 2	Reading 3	Average	Voltage
	327	330	337	331.3333333	13.83
	171	194	197	187.3333333	13.45
	122	126	120.1	122.7	13.27



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Test 3: Driving up/down a ramp

- Omnis can't go up ramps! Also 2 motors have less torque! Also gearing up has less torque!

2-wheel Chained Drive	Raw Data		8/25/2018	Jerry	
	Reading 1	Reading 2	Reading 3	Average	Voltage
	0	0	0	0	13.2
	0	0	0	0	13.2
	0	0	0	0	13.2



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Test 4: Balance Stone Balancing Ability

- Chassis too close to the ground, where metal was hitting the stone

2-wheel Chained Drive	Raw Data		8/25/2018	Jerry	
	Reading 1	Reading 2	Reading 3	Average	Voltage
	0	0	0	0	13.2
	0	0	0	0	13.2
	0	0	0	0	13.2



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Test 6: Drift Test

It drifted way too much for the lower weights. But this doesn't make a lot of sense?

2-wheel Chained Drive	Raw Data		8/25/2018	Jerry	
	Reading 1	Reading 2	Reading 3	Average	Voltage
	16.2	20	17	17.73333333	13.3
	13	8	9	10	13.27
	1	1	3	1.666666667	13.19



Two Wheel Chained Drive Summary

- Tetrax sucks
- 30:1 not a good idea for most chassis applications (most teams should start with 40:1)
- 2 motor is usually not strong
- Chain is pretty difficult to use



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VexPro Gearboxes

Spur Gearbox vs Planetary Gearbox



Cheap
Compact

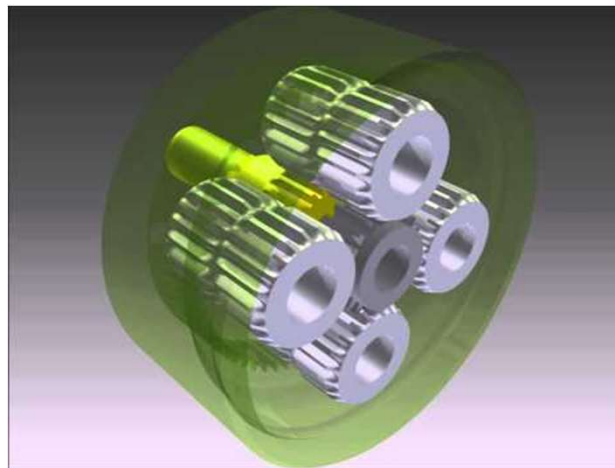


Compact
Efficient
Harder to break

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Animation of Planetary Gearboxes



Gear Ratio Calculation

Unfortunately you must do multiplication

Total gr = gr1*gr2*...

0	VersaPlanetary Ring Gear 217-2816	+\$9.99
0	VersaPlanetary 3:1 Gear Kit 217-2817 - Out of Stock	+\$10.99
0	VersaPlanetary 4:1 Gear Kit 217-2818 - Out of Stock	+\$10.99
0	VersaPlanetary 5:1 Gear Kit 217-2819	+\$10.99
0	VersaPlanetary 7:1 Gear Kit 217-3102	+\$10.99
0	VersaPlanetary 9:1 Gear Kit 217-3106 - Out of Stock	+\$10.99
0	VersaPlanetary 10:1 Gear Kit 217-2820	+\$10.99

