

Browncoats

FTC Robotics
Team 7842

Huntsville, AL

Engineering Notebook 2018-2019



**ROVER
RUCKUS**





Browncoats Team 7842 Engineering Notebook

Table of Contents

	Page
<hr/>	
Team	
Getting to know the Browncoats	
Team Summary.	1 - 2
Member Introductions.	3- 5
Mentor Introductions.	6 - 10
Outreach	
Informational Meeting-Huntsville Library.	11 - 12
Informational Meeting-Madison Library.	13 - 14
Rover Challenge.	15 - 16
Take Your Child To Work Day.	17 - 18
Rocket City FTC Invitational.	19 - 20
Brick-a-Palooza.	21 - 22
Ian’s Programming Class.	23 - 24
Space & Missile Defense Symposium.	25 - 26
Huntsville STEAMWorks <i>FIRST</i> Open House	27 - 28
Huntsville Hamfest.	29 - 30
AUVSI Pathfinder’s Symposium.	31 - 32
Rocket City Nerdcon.	33 - 34
Garage Sale Fundraiser.	35 - 36
<i>FIRST</i> Lego League Qualifier (Columbia High School).	37 - 38
<i>FIRST</i> Lego League Qualifier (Randolph Middle School).	39 - 40
December Scrimmage.	41 - 42
<i>FIRST</i> Lego League State Championship demonstration.	43 - 44
 2018-2019 Business Plan.	 1 - 10
 Engineering	
Off Season	
Reflection.	1
Proof of Principle: 6-wheel shifting drive train.	2 - 3
Proof of Principle: One Speed 6-wheel shifting drive train.	4 - 6
Proof of Principle: Mecanum drive train.	7 - 12
Fundraiser - Building a Swing Set.	13



Browncoats Team 7842 Engineering Notebook

Table of Contents

	Page
<hr/>	
Engineering (continued)	
Programming Class.	14 - 32
Lessons Learned.. . . .	33 - 34
Engineering Process.	35 - 42
Toastmaster’s Presentation.	43 - 44
Soldering Class.. . . .	45
Engineering Notebook and Photography Guidelines.. . . .	46 - 50
Week 1:	
9/8/18: Design Process, Engineering Notebook Process.	51 - 72
Week 2:	
9/14/18: Discuss Brainstorming Ideas, Continue assembly of drive train.	73 - 74
9/15-17/18: Work on designing latch in CAD.	75 - 76
Week 3:	
9/21/18: Drive Train assembly, Proof of Principles and Prototypes.	77 - 78
9/22/18: Drive Train assembly, Proof of Principles and Prototypes.	79 - 80
Week 4:	
9/24-27/18: Drive Train assembly.	81 - 82
9/28/18: Score 1 point, Begin Building Landing/Latching Lift.	83 - 84
Week 5:	
10/5/18: Ian’s drive train presentation, Work on lift, Test latch prototype.	85 - 86
10/6/18: Stringing the belts on the lift, Version 2.0 of the latch prototype.	87 - 88
Week 6:	
10/8-11/18: Begin robot navigation tuning.	89 - 90
10/12/18: Continue to build telescoping lift, Work on display boards.	91 - 92
10/13/18: Practice driver controls, Finish display boards.	93 - 94
Week 7:	
10/19/18: Collector Intake Prototype, Work on lift, Picture Day.	95 - 96
10/20/18: Work on Collector Intake and marker dispenser, Discuss Judging.	97 - 98
Week 8:	
10/25/18: Finalize drive train hardware, Wire routing.	99 - 100
10/26/18: Work on Autonomous, Put latch on lift and test.	101-102
10/27/18: Debug Autonomous, Hardware assembly, Collector POP.	103-104
10/28/18: Assemble all hardware.	105-108



Browncoats Team 7842 Engineering Notebook

Table of Contents

	Page
<hr/>	
Engineering (continued)	
Week 9:	
11/2/18: Printed out photos of Vera for display board, Judging practice	109-110
11/3/18: Get robot ready, Re-pinned picture boards, Get ready for Nerdcon.	111-112
11/4/18: Continue working on autonomous	113-114
Week 10:	
11/8/18: Finish autonomous, Practice judging, Pack for Springdale qualifier	115-116
11/10/18: Springdale, Arkansas qualifier	117-120
Week 11:	
11/16/18: Discussed needed improvements, Reviewed competition videos	121-122
Week 12:	
11/20/18: Testing Intake concepts.	123-124
Week 13:	
11/30/18: Testing single actuating arm, Set up Pit.	125-126
Week 14:	
12/7/18: Worked on Intake designs, Edited photos and write-ups.	127-128
12/8/18: Worked on Intake concepts.	129-130
Week 15:	
12/9-11/18: Design arm actuator.	131-134
12/12/18: Begin Prototype of telescoping arm design, Begin crater-side Autonomous..	135-136
12/14/18: Continue work on telescoping arms, Intake design, and Autonomous.	137-138
Week 16:	
12/17/18: Continue working on arms, Diagnose and repair Drive Train problems.	139-140
12/18/18: Continue working on arms, Diagnosing and debugging Drive Train.	141-142
12/20/18: Continue work on telescoping arms, Testing drive motors.	143-144
12/21/18: Continue working on arms, Intake designs, and actuator.	145-146
12/22/18: Continue working on arms, Intake designs, and actuator.	147-148
Week 17:	
12/23/18: Continue working on actuator.	149-150
12/26/18: Work on actuator and Intake design.	151-152
12/27/18: Work on actuator and arms, design new marker dispenser.	153-154
12/28/18: Work on actuator and arms.	155-156
12/29/18: Continue working on arms and actuator.	157-158



Browncoats Team 7842 Engineering Notebook

Table of Contents

	Page
<hr/>	
Engineering (continued)	
Week 18:	
12/30/18: Worked on the robot, Practiced judging.	159-160
1/02/19: Work on telescoping arms..	161-162
1/03/19: Work on telescoping arms..	163-164
1/04/19: Work on telescoping arms, Team discussion of problems.	165-168
1/05/19: Work on telescoping arms and intake, Birthdayz Spectacular..	169-172
Week 19:	
1/06/19: Install marker dispenser, wiring.	173-174
1/07/19: Teleop Software-arm actuator, Team decision..	175-176
1/11/19: Work on arm actuator, intake/collector, and teleop software.	177-178
1/12/19: Work on arm actuator, teleop software, Judging Practice.	179-180
Week 20:	
1/13/19: Work on autonomous software..	181-182
1/14/19: Work on autonomous software..	183-184
1/15-16/19: Work on autonomous software.	185-186
1/18/19: Attach new drive plates.	187-188
1/19/19: Replace cracked drive plate, worked on telescoping arms.	189-190
Week 21:	
1/20/19: Work on telescoping arms and intake.	191-192
1/21/19: Driving practice.	193-194
1/22/19: Driving practice.	195-196
1/23/19: Driving practice cut short due to sheared 3D printed pulley..	197-198
1/24/19: Replace broken part in arm actuator, continue driving practice..	199-200
1/25/19: Getting ready for Alabama State Championship.	201-202
1/26/19: Alabama State Championship.	203-206
Week 22:	
1/29/19: Static-Proofing Vera.	207-208
2/01/19: Getting Ready for Tennessee State Championship, Ice Cream!..	209-210
2/02/19: Tennessee State Championship.	211-214
Week 23:	
2/07/19: Getting Ready for Arkansas State Championship..	215-216
2/09/17: Arkansas State Championship.	217-218



Browncoats Team 7842 Engineering Notebook

Table of Contents

	Page
<hr/>	
Week 24:	
2/15/19: Team Discussion.	219-220
Week 25:	
2/22/19: Brainstorming new intake design.	221-224
2/23/19: Worked on prototype of intake/collector.	225-228
Week 26:	
3/01/19: Worked on intake/collector prototype, Visit from Mr. Terry Abel.	229-230
3/02/19: Testing cardboard intake prototype.	231-232
Week 27:	
3/08/19: Work on potentiometer control for arm.	233-234
3/09/19: Rebuilding and testing intake/collector prototype.	235-236
Week 28:	
3/15/19: Assembling and testing intake/collector.	237-238
3/16/19: Building intake/collector, Making hand-outs, Analysis from Michael Stewart.	239-244
Week 29:	
3/17/19: Assembling intake, Work on display boards and alliance flyer.	245-246
3/18/19: Continue working on intake/collector.	247-248
3/19/19: Continue working on intake/collector.	249-250
3/20/19: Continue working on intake/collector.	251-252
3/22/19: Install intake/collector, Work on slideshows, team discussion.	253-254
3/23/19: Install intake/collector, Continued work on slideshows.	255-256
Week 30:	
3/29/19: Continued work in intake/collector, continued work in hand-outs.	257-258
3/30/19: Driving practice, continued work on slideshows.	259-260
 Software	
Sampling Vision Software.	1
Driver Enhancements.	2
Hardware Superstructure.	3
Autonomous Navigation.	4
Sensors Used.	5



Browncoats Team 7842 Engineering Notebook

Table of Contents

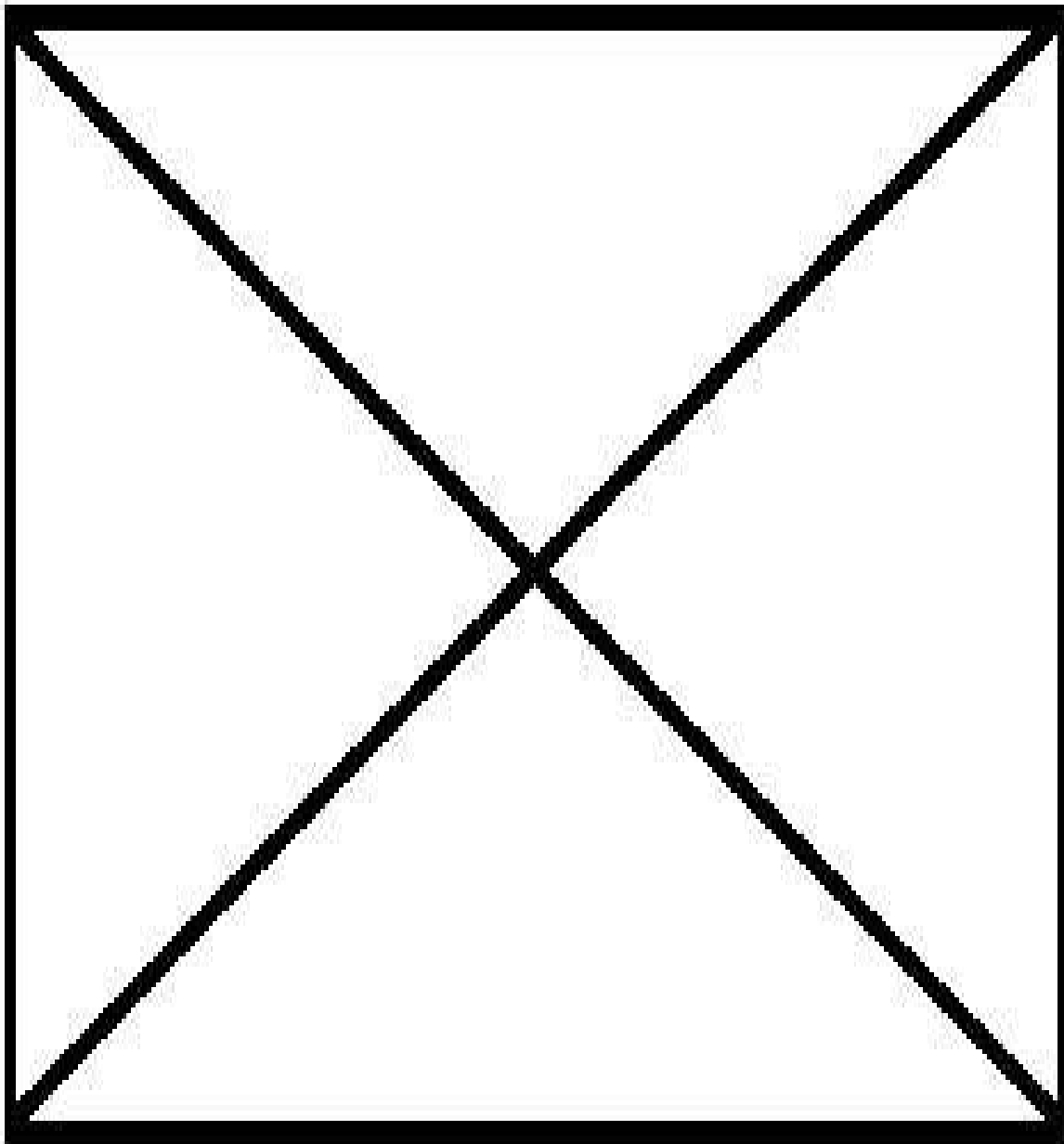
	Page
<hr/>	
CAD Design	
Mecanum Drive Train.	1 - 4
Mecanum Drive Train (version 2).	5 - 8
Latching Mechanism.	9 - 10
Vertical Lift.	11 - 15
Team Marker.	16 - 17
Telescoping Arm.	18 - 19
Intake	20 - 22
Strategy	
Initial Strategy.	1-2
Springdale, Arkansas Qualifier.	3
Hot Springs, Arkansas Qualifier.	4
Alabama State Championship.	5
Tennessee State Championship.	6
Arkansas State Championship.	7
World Championship.	8
Design Schedule.	1 - 112



Browncoats
Team 7842
Engineering Notebook

Table of Contents

Page





Browncoats
Team 7842
Engineering Notebook

Table of Contents

Page
