VEX TEAM 3547: VIRUS TRAINING KIT

The purpose of the V5 Training kit (also called the "Clawbot Trainer") is to teach you the basics of building with the VEX EDR components for VRC competition. You might be building because you're completely new to robotics, or you might be making the transition from VEX IQ to VRC.   (If you've been in VEXIQ, then VRC is what the young IQ students call "metal").

The Clawbot trainer is sometimes built for competition or for use at demonstrations like the Monroe County Fair.   If this is the case, you will use multiple screws with locknuts instead of the nylon hex-nut retainers, and lock nuts throughout the build. Also, you'll substitute steel clamping shaft collars for the rubber shaft collars throughout (clamping shaft collars are not part of the trainer: get them from the Team stores).

Getting Started:
To get up and running as quickly as possible, build the Clawbot according to the instructions up to step 22.   This will give you a fully functional "drive base."   Take the controller, pair it up if needed, and you can start driving.

Here's a link to the Clawbot build instructions:
https://content.vexrobotics.com/docs/V5-Clawbot-BuildInstructions.pdf

Here's how to pair the controller to the V5 Brain:
https://help.vex.com/article/11-pairing-wireless-controller-to-the-brain

Here's a link to the VEX online help documents:
https://help.vex.com/

Building and Programming:
There is a lot to learn, and VEX has an entire year's worth of learning in the STEM-LABS curriculum.   If you have time, look through it all!   But here's the minimum you should do:

First, you'll want to go to the STEM-LABS link and bookmark it:
https://education.vex.com/eduvex/edr/stem-labs/

Next, for programming training, you'll need to install VEX Coding studio.   Go here and download/install the VEX Coding Studio:
https://www.vexrobotics.com/vexedr/products/programming
If you need some help, go here:
https://help.vex.com/article/60-how-to-install-vex-coding-studio-for-windows

STEM-LABS Lessons

If you're not going to do all the STEM-LABS lessons right away, then work through this for the quick version:

First, Unit 2-Programming.   You'll use just the basic drive base, which you've already built and are driving around.   Now it's time to learn about programming.   There are two options, "Modkit" and "VEX C++" to choose from. You don't need to do both, but VEX C++ is probably the better choice.
> https://education.vex.com/parent-wrapper.php?id=medbot

Next, Unit 4-Programming (Loops).   In this module, you'll build the rest of the Clawbot trainer.   When you have it build, take some time to drive it around, learn to operate the arm and claw.   If the practice field is set up, you can even try the current game.   On page 8 is a whole bunch of programming training you'll need to complete!   Don't skip it, do either the Modkit or the VEX C++.
> https://education.vex.com/parent-wrapper.php?id=loop-there-it-is

Unit 4-Programming (Decisions).   More programming skills.
> https://education.vex.com/parent-wrapper.php?id=to-do-or-not-to-do

Unit 4-Programming.   Programming the Claw to do stuff.
> https://education.vex.com/parent-wrapper.php?id=secret-message

Unit 4-Programming. Moving things around.
> https://education.vex.com/parent-wrapper.php?id=speedy-delivery

Got more time, the Unit 5-Vision sensor.   The vision sensor is not part of the trainer. You'll need to check one out from the Team's stores.
> https://education.vex.com/parent-wrapper.php?id=vision-quest

If you were a Graphical C programmer in IQ, then look at Unit 6, making the transition from Graphical C to VEX C++:
> https://education.vex.com/parent-wrapper.php?id=robotc-vcs

More Building (optional)

If you want some more building practice with pre-designed V5 systems before you design and build your own, you can look at this link of some pre-designed robots:
https://www.vexrobotics.com/vexedr/support/robot-builds

IMPORTANT: You won't have all the parts you need in the Clawbot Trainer kit. Disassemble the trainer and put it away, so the parts don't get mixed up.   For these more advanced builds, you'll have to dig into the Team parts to get what you need. Ask any mentor or veteran team member to help you find all the parts you'll need.

The builds presented (like Flip and Super Flip) were designed as basic usable bots for the games (Flip and Super Flip were for 2018-19 "Turning Point")

PARTS INCLUDED WITH THE V5 TRAINER

PLASTIC VEX TUB CONTAINING:

ELECTRONICS

	(1) V5 Robot Brain
	(1) V5 Controller
	(1) V5 Robot Radio
	(1) V5 Robot Battery
	(1) V5 Robot Battery Cable
	(1) V5 Robot Battery Charger
	(4) V5 Smart Motors
	(2) Bumper Switch v2
	(3) 300mm Smart Cables
	(1) 600mm Smart Cable
	(1) 900mm Smart Cable
	(1) USB A to Micro Cable

WHEELS

	(2) 4" Omni Wheels
	(2) 4" Wheels

STRUCTURE

	(3) 2x2x2x20 Steel U-Channels
	(2) 1x2x1x15 Steel C-Channels
	(2) 1x2x1x25 Steel C-Channels
	(2) 2x2x14x20 Steel Angles
	(2) V5 Battery Clips
	(1) V5 Claw Assembly

SMALL PARTS (REMOVABLE TRAY):

	(2) 2" Shafts
	(2) 3" Shafts
	(1) 3.5" Shaft
	(3) 4" Shafts
	(1) 12T Metal Pinion Gear
	(1) 12T Metal Pinion Gear Insert
	(1) 84T High Strength Spur Gear
	(10) High Strength Gear Inserts
	(15) 1-Post Hex Nut Retainer w/ Flat Bearing

	(5) 1-Post Hex Nut Retainer
	(7) 4-Post Hex Nut Retainer
	(5) Flat Bearing
	(23) Rubber Shaft Collar
	(8) 1/8" Nylon Spacer
	(4) 3/8" Nylon Spacer
	(3) 1/2" Nylon Spacer
	(2) 7/8" Nylon Spacer

SCREWS, NUTS, AND MISC:

	(100) #8-32 x 3/8" Star Drive Screw
	(4) #8-32 x 1/2" Star Drive Screw
	(2) #8-32 x 1.000" Star Drive Screw
	(4) #8-32 x 1.500" Star Drive Screw
	(30) #8-32 Hex Nut
	(100) #8-32 NyLock Nut
	(6) 0x2 Connector Pin
	(50) 4" Zip Ties
	(2) #32 Rubber Bands

TOOLS:

T-15 "L" key
T-15 Driver
Open-end wrench