2018 Kansas BEST

Robot Kits
John Matthew

September 8, 2018
**ROBOT KITS**

- What’s New for 2018
  - Consumable Parts Changes
  - Optional Parts – Team can Provide
- Kit Hardware Overview
- Spare Parts
- Kit Assignments
- Words of Wisdom
**CONSUMABLE PART CHANGES**

- **Added:**
  - 2 x 3/8” steel flat angle brackets
  - ¼” thick polypropylene sheet 12” x 24”
  - 0.50” diameter 6061-T6 aluminum round, 24” long

- **Deleted:**
  - ¼” polypropylene covered shock cord
  - Deleted 0.063” diameter, 2’ long piano wire
Optional Items

Hub provided Optional items from the returnable parts list:

Vex Programming Hardware Kit –

- Wichita Hub has 10 kits – available on first come / first serve basis
- Teams may request and pick up these as they collect their kits today
OPTIONAL ITEMS

Team Optional items from the returnable parts list are:

- Rubber Grommets (16) - Tower Hobbies (FUTM2310)
- Brass Spacers (16) - Tower Hobbies (FUTM3650)
- Servo Mounting Screws (16) - Tower Hobbies (FUTM2250)
**OPTIONAL ITEMS**  
*(CAN BE PROVIDED BY TEAM)*

- Hub provided optional parts are not included in our kits
- Optional parts that teams can use are:
  - Wooden spring clothes pins (10)
  - Corrugated cardboard - ¼” max thickness (2400 sq in)
  - Empty food/ beverage PEET containers – 2 liter max (2)
  - Wire coat hangers – 1/8” diameter max (3)
  - 5 minute epoxy (.85 oz)
  - 10 oz metal cans with top removed (3)
  - Solid core golf balls (3)
  - Pennies (24 lbs max)
  - PVC primer (8 oz)
  - Popsicle sticks (36)
  - Aluminum paint grid (1)
  - CD or DVD disc (4)
  - Deck or drywall screws (25)
  - Wire management clips, ties, wraps (25)
  - Team custom part (2)

Quantities shown in parentheses
Kit Hardware Overview

- Returnable Hardware
  - Included Parts Summary
  - Returnable Kit Issues
  - Kit Return Policy

- igus Donated Parts
RETURNABLE EQUIPMENT
INCLUDED PARTS SUMMARY

- VEX Control System
  - Joystick
  - CORTEX Microcontroller
  - VEXnet Keys
  - USB A-A Cable
  - VEX Programming Cable
  - Motor Controls
  - Interface Cables
  - Screw Terminal I/F Cables

- Battery Sets
  - 7.2 Volt Batteries
  - Large Battery Charger
  - Joystick AAA Batteries
  - Joystick Battery Charger
  - Cortex Battery Adaptor

- Servo Set
  - Servos
  - Servo Horns, Arms
  - 24”, 40” Extension Wires
  - Servo Power Adapter Cables

- VEX Motor Set
  - Large Motors
  - Small Motors

- Drive Component Set
  - Pulleys
  - Belts
  - Ball Bearings
  - Shoulder Bolt
  - 76mm Roller Blade & Axle
  - Window Alarm Sensors
  - Steel Couplers
RETURNABLE PARTS

Servo & Arms

The servos and arms are returnable parts.

The arms may be modified as necessary. However, all arms must be returned.
CONSUMABLE ITEMS
IGUS DONATED PARTS

10 matching black nylon hex nuts are in hardware sack
**RETURNABLE KIT ISSUES**

**IMPORTANT**

Leave the adapter connected to the cortex – to preclude wear on this connection.
VEX PROGRAMMING HARDWARE KIT

Not included in kits – 10 kits available on request

- Provides a connection between PC and Cortex
- Allows programming and debugging without using the wireless connection
RETURNABLE KIT ISSUES

• Decoration of your robot is encouraged, but do not get paint on any returnable component.

• Do not put Velcro on any returnable equipment.

• Do not open CORTEX or Joystick (except to charge/replace batteries).
RETURNABLE KIT ISSUES (CONT.)

• Teams – requested to clean solder from motor terminals
  • Recommend NOT tying the wires through holes in the motor terminals as this makes de-soldering very difficult.
  • Please return them as you got them!

• Please note:
  If motor cases get loose (on small or large electric motors) – please use appropriate Allen wrench to tighten the screws to preclude gear damage
**Kit Return Policy**

- Teams may return the kit to Kansas BEST at the end of Game Day in the large plastic box.

- Use picture summary included in Returnable kit to inventory all parts prior to returning. Provide this picture summary with check marks indicating the specific part is in the returned box.
Kit Return Policy (Cont’d)

• Teams not returning kits on game day must return them by April 1.
• Return dates beyond April 1 must be coordinated with Jason Bilberry (jason.bilberry@wichita.edu)
• Teams may be charged for missing parts
• Packaging, boxes, etc. for (new) individual parts does not need to be returned
Kit Return Policy (Cont’d)

- Expectations for returned kit parts
  - Inventory picture sheet filled out
  - Motor Terminals cleaned (soldered wire connections)
  - AAA Batteries removed from Joystick
  - Tape or decorations removed
  - Plastic Box returned with parts
Kit Return Policy (Cont’d)

• Teams are expected to take responsibility to return kits on time

• We have had significant problems with late and incomplete kit in recent years

Please take the time – before your team disbands - to return complete kits on time!
KIT ASSIGNMENTS

• Our goal is to assign teams the same kits they received in 2017 (there are a few instances where this did not happen – sorry!)

• Cortex, Joystick, motors, Vex keys and servos are numbered to the kits
Spare Parts

Returnable Equipment
- Limited number of spares
- No guarantee of spare equipment
- First review technical data and try to troubleshoot the problem.
- Document your problem. Attach a note to the item to assist with warranty.
- You must arrange to exchange and pickup spares. Contact Jason Bilberry, jason.bilberry@wichita.edu

Consumable Items
- BEST does not provide spares
- You may replace with like items (see rules)
## Kit Assignments

<table>
<thead>
<tr>
<th>Kit No.</th>
<th>Team</th>
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<tbody>
<tr>
<td>1</td>
<td>Salina South HS</td>
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<tr>
<td>2</td>
<td>Wichita Collegiate US</td>
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<tr>
<td>3</td>
<td>Kansas City Christian School</td>
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<td>Garden City HS</td>
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<td>Wichita Southeast HS</td>
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<tr>
<td>31</td>
<td>Andover Central HS</td>
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SOME WORDS OF WISDOM

- You are responsible for “returnable equipment”
  - Accurately inventory returned parts using provided picture summary.
  - Return parts on game day or on approved return date.
  - Secure equipment to your robot.
  - Leave the Battery Adapter attached to the Cortex
  - Do not over tighten Cortex mounting screws
  - Keep electric motor case screws tight using allen wrench
  - Do Not disassemble components (except to install batteries))
  - Do Not get paint on it!

- Be creative!
- Have Fun!
- Good luck!
MORE WORDS OF WISDOM

Read the Rules
And
Technical Data again!