Control System Advisor

Certification Test

Important: All volunteers supporting events in the United States and Canada must be screened and assigned using the Volunteer Management System and are required to complete their certification test using the online volunteer certification system.

This test is provided publicly for team use and volunteer certification at events outside of the United States and Canada.

Revision History	
Revision	**Description**
V25-26.1	Initial 2025-26 Season Release

Questions

Q1. Which of these duties would you expect to see a CSA perform? (select all that apply)

A. Provide assistance to teams in the on-deck queue for a playing field
B. Answer rule questions relating to game-related on-field actions
C. Help a team with general software issues, where applicable
D. Queue teams onto the correct fields once their matches load

Q2. Which of these would you ***not*** expect a CSA to have or have access to? (select all that apply)

A. Safety Glasses
B. Multifunction Voltmeter/Ammeter/Ohmmeter with probes
C. A hard or electronic copy of the CSA manual
D. A laptop with necessary software tools to diagnose a robot installed
E. Transcripts of CSA calls to use as a source of daily affirmation

Q3. Which of these resources provides links or instructions for installing and updating software on control system components? (select all that apply)

A. Competition Manual (specifically rule R713)
B. Inspection Quick Reference
C. Robot Wiring Guide
D. ftc-docs website

Q4. Which of these are reasons why a DRIVER STATION Android device may lose Wi-Fi connection with a ROBOT CONTROLLER Android device? (select all that apply)
- A. Low battery level on either device
- B. ESD shock that causes the ROBOT CONTROLLER Android device to reboot
- C. Plugging an unsupported gamepad into the DRIVER STATION Android device
- D. Navigating away from the main screen of the DRIVER STATION app

Q5. Which of the following can impact 2.4GHz Wi-Fi connectivity between ROBOT CONTROLLER and DRIVER STATION Android devices?
- A. Walkie-Talkies (900MHz)
- B. Bluetooth Earbuds
- C. AM Radio
- D. RFID tags and readers

Q6. Which IP Address is used to access the management interface on an Android Smartphone running the ROBOT CONTROLLER app?
- A. 192.168.43.1:8080
- B. 10.0.100.5
- C. 127.0.0.1
- D. 192.168.49.1:8080

Q7. Per the Robot Wiring Guide, which of these are recommended to use to secure wires on a robot? (select all that apply)
- A. Cable Ties
- B. Staples
- C. Wire Sheaths
- D. Aluminum Foil

Q8. True or False: A team may use any method to ground electronics to their robot frame as long as a 470 Ohm resistor is placed in-line between the robot electronics and the robot frame.
- A. True
- B. False

Q9. A team approaches you and claims their DRIVER STATION will not stay connected to their ROBOT CONTROLLER for any length of time, even without their ROBOT running an OpMode. Which of the following are ***unlikely*** causes of this per the Robot Troubleshooting Guide?
- A. Electrostatic Discharge (ESD) events rebooting the ROBOT CONTROLLER Android device
- B. Wi-Fi Rogue Access Point protocols or other Wi-Fi Hotspot Suppressors in the Venue
- C. Poor wiring causing intermittent power loss on the ROBOT CONTROLLER Android device
- D. External interference causing Wi-Fi disruptions (Microwave ovens, Drones, etc.)

Q10. An FTA approaches you and comments that teams have been reporting abnormally high ping on their robots. Which of the following ranges represents the beginning of abnormally high ping?
- A. 100-150ms
- B. 150-200ms
- C. 250-300ms
- D. 350-400ms

Q11. When approached for help with a robot issue, which of these should the CSA get permission from the team before performing?
- A. Visually inspecting the robot, the robot controller, and the driver station
- B. Checking the status of the robot by viewing log files on the robot controller
- C. Checking the voltage level of the robot controller, driver station, and main robot battery
- D. Checking the wiring of the electronic modules on the robot

Q12. A team claims that their motors are receiving commands to move without the gamepad controls being touched. Which are ***not*** likely causes of this? (select all that apply)
- A. Gamepad analog sticks were not in a neutral position when initially plugged in.
- B. Gamepad analog inputs are suffering from drift effects of the internal electronics
- C. Team code may be reading the gamepad values incorrectly
- D. Incorrect gamepad may be configured as the driving gamepad
- E. ESD may be affecting the gamepad

Q13. A CSA may be consulted by an FTA if a match replay is being considered. Which of the following issues are reasonable for CSA investigate in order to help determine if a match replay will be granted?
- A. Processor sleep time-outs that might have contributed to a robot malfunction
- B. Communication failures on the Driver Station Android device
- C. Verifiable excessive wireless interference in the venue
- D. Electrical issues between the robot and the field, including ESD effects

Q14. Which of these is not considered a core Control System component? (select all that apply)
- A. REV Control Hub
- B. USB Flash Drive
- C. Android Smartphone
- D. I2C Color Sensor

Q15. True or False: A battery is a powerful energy source that can be dangerous if not handled properly. Keeping batteries secured to the robot and away from sharp edges and puncture risks (like screws and jagged metal) is paramount.

A. True
B. False

Q16. A team shows up to the event with really cool LEDs on the robot. You determine that the LEDs plug into the USB port for power. Which of these statements are okay to advise a team with? (select all that apply)

A. The LEDs draw a minimum amount of current, it'll be fine.
B. The team should be warned that the LEDs could cause issues if plugged into the USB 2.0 ports on the Control Hub, and should instead use the USB 3.0 port.
C. This use-case is illegal, nothing but vision devices and USB hubs are allowed to plug into USB ports.
D. As long as the LEDs aren't being controlled via the robot I/O, the team could instead plug the LEDs into a USB Battery Pack securely fastened to the robot.

Answer Key

Question	Correct Response	Explanation	Rule
Q1	A, C	The CSA provides critical general technical support for teams during an event on most aspects of the control system and robot systems. The CSA should refrain from answering any game-related questions (other than directing teams to the question box) or performing other duties unless specifically directed by the FTA.	
Q2	E	While regularly attending CSA volunteer calls prior to events is highly recommended, keeping transcripts is not required	
Q3	A, D	The competition manual provides links for instructions on how to update all typical software for control system components. Almost all of those links use ftc-docs as a resource.	R713
Q4	A, B	Low battery and brownout situations can cause either device to lose Wi-Fi communication. Any time the ROBOT CONTROLLER device reboots, Wi-Fi will be interrupted. Unsupported gamepads will not affect Wi-Fi connections. Navigating away from the main screen of the DRIVER STATION app aborts the OpMode, but does not impact the Wi-Fi connection.	
Q5	B	Bluetooth operates in the 2.4GHz range, which overlaps the frequencies used by 2.4GHz Wi-Fi. All other options operate on frequencies below 1GHz.	
Q6	D	Option A is the management interface for a Control Hub. Option D is the management interface for an Android smartphone.	
Q7	A, C	Staples and Aluminum Foil are not recommended because they are conductive materials.	
Q8	B	False. Only approved grounding straps are allowed to be used to ground robot electronics to the frame of the robot, as specified in R611 in the Competition Manual.	R611
Q9	A	It is unlikely that ESD will affect a robot Wi-Fi connection repeatedly while it is not in motion or actively discharging to an object of significantly different potential.	
Q10	C	Ping times over 250ms signify that the driver station is having extreme difficulty sending and receiving data to/from the robot. Sources of interference and/or congestion should be investigated.	
Q11	B	The CSA should get permission from the team before connecting any Android devices (Control Hub, Smartphone, Driver Hub) to a laptop.	

Q12	E	Option A mostly affects F310 gamepads, Option B affects PS4 and PS5 style gamepads most significantly, Option C is always something a CSA should check anyway, Option D could be a contributing issue if the gamepad that IS selected is suffering from options A through C. ESD effects in a gamepad will often cause the gamepad to no longer be recognized by the driver station device (until it is unplugged and replugged) but not cause unexpected motion.	
Q13	C	From a technical perspective (ignoring gameplay conditions) the only justification for replaying a match is absolutely verifiable excessive wireless interference. Issues caused by the team's robot are not considered when discussing match replays.	
Q14	B, D	While there's no FTC-specific definition for "Control System", this term is generally used to describe devices that provide control signals to the rest of the robot (and the systems that support them) and is loosely defined by R712. The REV Control Hub, REV Expansion Hub, and Android SmartPhones are among the core Control System components.	R712
Q15	A	True.	R606
Q16	C, D	Option A violates R714. Option B might seem like a good statement since the USB 2.0 port shares a USB root hub with the onboard Wi-Fi on a Control Hub, this is not a valid statement because any USB port on the Control Hub is illegal to plug USB LEDs into per R714. Option C is correct per R714. Option D is correct per R602.	R714, R602