

February 15, 2008

TEAM UPDATE #10

GENERAL NOTICES

Modifications to rules are highlighted in **yellow**.

FIRST IR Board:

A small quantity (<25) of the *FIRST* IR boards have worked well, but then stopped working. These particular boards stopped working because the PIC code was corrupted. The cause of the corrupted code is unconfirmed, however Bob Grieb, the designer, has a hypothesis as to the cause, and suggestions for preventative measures.

Please note, this is breaking information, and we have not had a chance to validate either the hypothesis or solution that is presented. We cannot, at this time, guarantee the efficacy of the solution and merely present it as a suggestion from the board's designer. Teams that alter their designs to accommodate this solution do so at their own risk.

If you have reason to believe that your PIC code has been corrupted, and you have the capability program PICs, you can use the code that Mr. Grieb has graciously provided.

Some teams have experienced a problem with the *FIRST* IR board where it suddenly stopped working, after operating properly for days or weeks. Several boards have been returned to me for repair and it seemed that the program in the PIC MCU was corrupted. I was able to reprogram the PIC chip on these boards and restore proper operation. After trying to figure out how this could possibly happen, I may have come up with an explanation:

Right at the time the robot is shutting off, any filter capacitors in its power supply may take some time to discharge. This could be several seconds or more. During this time, the voltages are gradually decreasing from their "on" level, say 12 volts, to the "off" level, probably 0 volts. During the time that the voltage applied to the *FIRST* IR 5V regulator input is around 3V or less, the regulator output will be too low for the PIC to operate reliably. If this in-between voltage is applied for a long enough time, the PIC could possibly crash and write to internal memory, erasing or corrupting the program itself.

A good way to prevent this from possibly happening is to insure that power is removed from the PIC very quickly, and is applied very quickly as well. A small toggle switch in series with the *FIRST* IR board power leads (pins 1

and 2 of J1) should accomplish this.

Radio Shack carries several small toggle switches that should work fine for this application. Part numbers are 275-663, 275-636, and 275-626. Some may be double-pole switches, as these are more common. You can just use one pole of the switch.

The correct sequence for powering up the *FIRST* IR board would be:
Power up/turn on the robot, and then turn on the new switch to power up the *FIRST* IR board.

To power down the robot,
Always turn off the switch that powers the *FIRST* IR board first, and then power down/turn off the robot.

This sequence should isolate the *FIRST* IR board from any long capacitor discharge times that the robot may have, and will hopefully prevent any more teams from having this problem.

I have been using this same exact code for several years, and have never had any problem, but as Murphy's Law states "If anything can go wrong, it will". Sorry for any inconvenience this may have caused.

- Bob Grieb

.....

Section 0 – Introduction

No changes.

Section 1 - Communication

No changes.

Section 2 – Team Organization

No changes.

Section 3 – At the Events

Spares Case Contents:

FIRST recognizes that there may be issues at your event in which you may require replacement parts of which you do not have extras. For this reason, we offer a Spares Case at each event (reference Section 3.9.5 of the Manual). The case is stocked with various items that your team may need in case of an emergency. Some of the items are consumables, but others will not be given out unless you exchange your damaged part for the new part.

Other parts are loaned parts and must be returned after the event (notated in **bold**

text). Teams must have written approval from the event's Innovation First representative in order to borrow Innovation First items. *If these are not returned, FIRST will charge the credit card submitted upon the loan.*

The following components may be available at the Spares Case at your event. Please remember that there are limited quantities, and that they are distributed on a first come first serve basis. While *FIRST* will make every effort to keep the Space Case as fully stocked as possible, we cannot guarantee that every item will always be available. It is incumbent upon each team to obtain and bring any spare/replacement parts that may be critical to the operation of their robot, and only rely upon the Spares Case as a resource of last resort.

Air tank, Clippard

Battery connector

Battery Connector Plug

Battery, backup

Bearings, R8 (wheel)

Chain, #35, (feet)

Circuit Breaker, 120A

Circuit Breakers (20, 30 & 40A)

Compact Fan (large and mini)

Couplers (6, 9, & 12 tooth)

Cylinders, Parker

Fuse Block, gold plated

Fuse Panels (6 & 12 position)

Gearbox, FisherPrice

Lead Screw w/ nut

Microswitch

Motor, CIM

Motor, Denso window

Motor, FisherPrice

Motor, Globe

Motor, Keyang window (-1023, -60, & -61)

Motor, Mabuchi

Operator Interface Units

Pivot/bracket set

Pneumatic fittings, brass, Parker

Pneumatic fittings, SMC

PowerGrip belting

Pressure Gauge, Norgren

Pressure Gauge, WIKA

Pressure Switch, Nason

Radio Modem for Robot Controller

Regulator & bracket, Monnier

Regulator mounting kit, Norgren

Regulator, Norgren

Relay Module (Spike)

Relief Valve, Norgren

Robot Controller Unit

Rod/clevis kit

Rotary limit switch

Serial cable, 9-pin

Solenoid valve, FESTO

Speed Controller (Victor 884)

Sprockets, Gates

Sprocket, output & wheel

Tape, teflon

Terminal Block, black & red

Terminal block, center jumper

Terminal block, end anchors & barriers

Terminal strips

Terminals (Tyco, Delphi, & FCI BURNDY)

Tie wraps (4" & 8")

Transmission kits

Tubing, latex (handful)

Tubing, pneumatic, roll

Vibration isolators, handful

Wheel, grey

Wire, 6AWG, Black & Red

Section 4 – Robot Transportation

No changes.

Section 5 - The Awards

No changes.

Section 6 – The Arena

No changes.

Section 7 – The Game

No changes.

Section 8 – The Robot

No changes.

Section 9 – The Tournament

No changes.

Section 10 – The Kit of Parts

No changes.

***FIRST* Guidelines, Tips and Good Practices**

No changes.