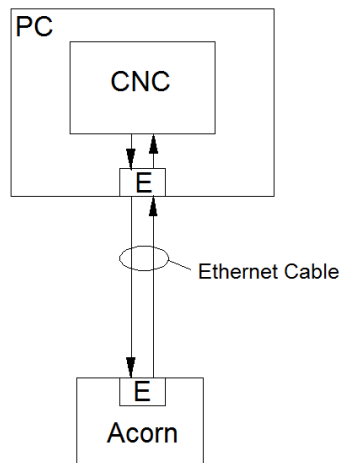# When the Centroid CNC Software Loses its Acorn, Version 2.1

By R. G. Sparber

Full disclosure: I am a customer of Centroid and do not represent them. I do not receive any money or goods from Centroid although I am a beta tester. The following was written with great technical support from them.

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There are two computers in the Centroid Acorn System. One is a Windows PC and the other is semi-custom hardware called Acorn[2]. They are linked by an Ethernet cable.


If this cable or its related functionality fails to operate correctly, the system is down. Thankfully, there are both software and hardware indicators that help the user locate the problem.

First, let's look at the system.

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[2] The Acorn contains a Beagle Bone Green central processing unit. It plugs into a custom hardware board.

The PC runs a program developed by Centroid called CNC. The Acorn, also a Centroid product, runs a program that comes preloaded with the hardware.
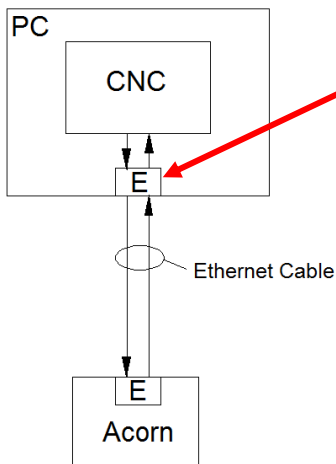
The CNC software sends messages to hardware in the PC which drives the Ethernet cable. These messages travel down the cable and are received by Ethernet hardware inside the Acorn. It passes the information along to the Acorn's software. Conversely, messages from the Acorn travel up the cable and are received by Ethernet hardware in the PC. It passes the information along to the CNC software.

It is essential that the Acorn be up and running before the CNC software is up[3]. If CNC tries to communicate with Acorn before it is stable, you will see this error message:

MPU11 has timed out.

Right after becoming stable, CNC sends a message to Acorn to verify it is present. Acorn then acknowledges by sending a message back.
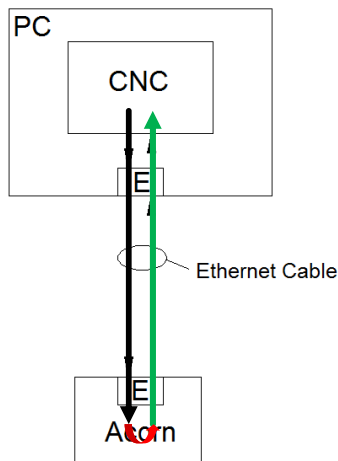
If CNC prompts the user to Home the machine, it means this message exchange was successful and all players in this round trip transaction worked as expected. Acorn found.

I am going to assume that your system worked in the past and that the failure occurs every time you power up the system. Installation problems and intermittent failures require a more complex strategy than can be presented here.

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[3] This can be accomplished by powering both the PC and the Acorn at the same time. The Acorn will come up first.

If you see the **MPU11 has timed out** message, try the following checks and tests.
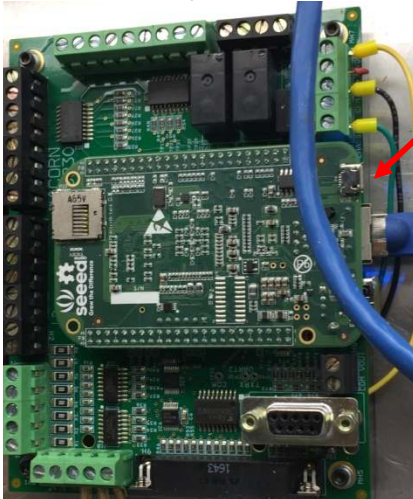
1. Check the Acorn's heartbeat LED is flashing on and off. This LED is attached to the smaller board that plugs into the larger board. You will likely see the reflection of this blue light and not be able to see it directly. This video will show you what to look for: https://youtu.be/MeB2hWXB7bg. If you do not see the flashing blue light, see Acorn, Section 4.

2. In the PC, see if any of these are true
   a. One or more anti-virus programs is running
   b. A firewall program is active
   c. The driver for the Ethernet hardware is out of date

Follow the CNC software installation video found on the Centroidcnc.com site to cover items a and b. For item c, you must know what Windows Ethernet hardware you own. Then search the Internet with that name plus "windows Ethernet driver".

3. In the Ethernet Cable[4]:
    a. it could be a plug that was pushed off center or is not seated.
    b. It could have failed
        1) Do you see any sharp bends or dents in the cable?
        2) If cable ties have been used, they should be easy to slide. If too tight, they can damage the cable.
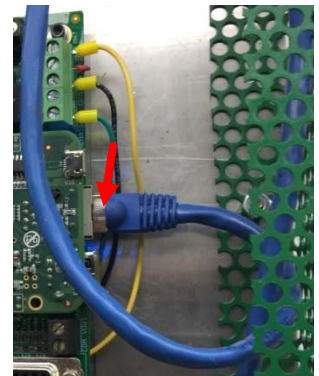
Since it is relatively easy to do, first power down the system. Then unplug each end of the cable and plug it back in. There is a catch (red arrow) that must be released before you can slide the plug out. When sliding the plug back in, listen for the click as the catch engages.

Power up and see if CNC finds Acorn. As a last resort, install a known good Shielded Ethernet cable and see if it fixes the problem.

4. In the Acorn we might have
    a. No power
    b. An internal software failure
    c. An internal hardware failure
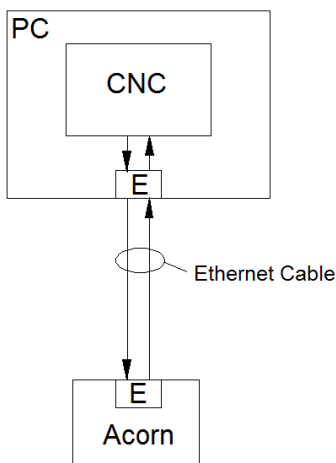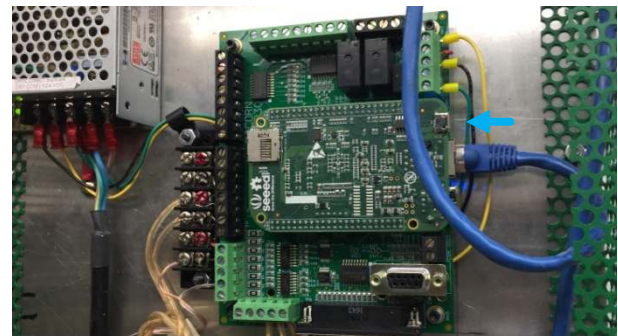
The flashing blue light (blue arrow) should be visible inside the Acorn. If the Acorn software is running and ready to accept messages from the PC, this light will cycle on and off once a second. If you see other lights on but the blue light is not cycling on and off, something is wrong with the hardware or software of the Acorn[5].

If you don't see any lights on, move on to the next section.

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[4] Always use the Ethernet cable supplied with the Acorn.

[5] The Acorn software can be corrupted if power is removed while CNC is updating it. Contact Centroid forum for how to reinstall the software.

5. If the green power supply light is on but the Acorn board is completely dark, a power or ground wire may have broken or come off.

If you have a voltmeter, measure the voltage at the Acorn's H9 terminal block.
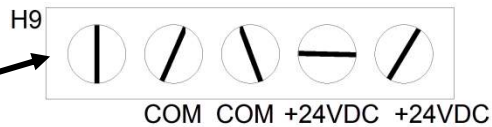
Touch the + voltmeter probe to either +24VDC screw and the - voltmeter probe to either COM screw. The meter should read between 22V DC and 27.6V DC.

Consult with the Centroid forum if your reading is outside of these limits.

Acknowledgments

Thanks to Keith McCulloch of Centroid for helping me understand the Ethernet interface plus create the YouTube video.

I welcome your comments and questions.

If you wish to be contacted each time I publish an article, email me with just "Article Alias" in the subject line.

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