

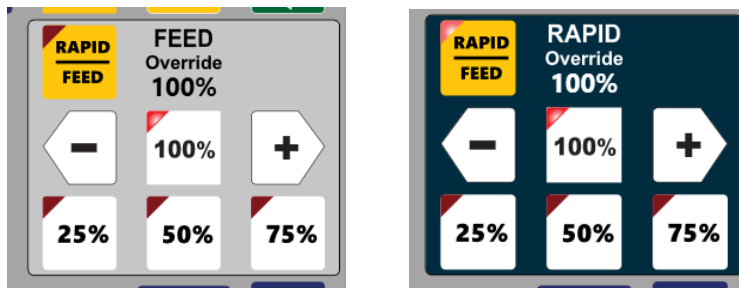
1. Acorn and AcornSix: Separate Rapid Override control functionality has been added Acorn and AcornSix. This feature is now by active by default on any CNC12 installation for Acorn and AcornSix. Rapid Override control is done with the VCP (virtual control panel) the v5.08 VCP has both controls for Feedrate and Rapid Rate override.

#### Rapid Override Notes:

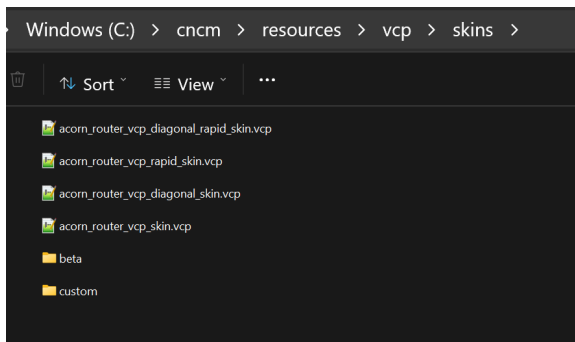
- Legacy functionality (having the Rapid and Feedrate override on the same control knob like it has been for many years) has been retained for those that do not want to use this new separate Rapid and Feed rate override control.

- This new separate rapid override control feature is will work with the Oak/Allin1DC/MPU11/Hickory platforms but requires PLC program and or VCP editing to enabled this feature. In a future release of CNC12 the included Centroid provided stock PLC programs and VCP will have this feature pre-programmed.

2. Acorn and AcornSix new VCP skins: Included with CNC12 are new Centroid 'stock' Rapid Override VCP skins which have the new separate Rapid Override control functionality ready to run in the VCP skins for Acorn and AcornSix.



These skins will have the word "rapid" in the file name.



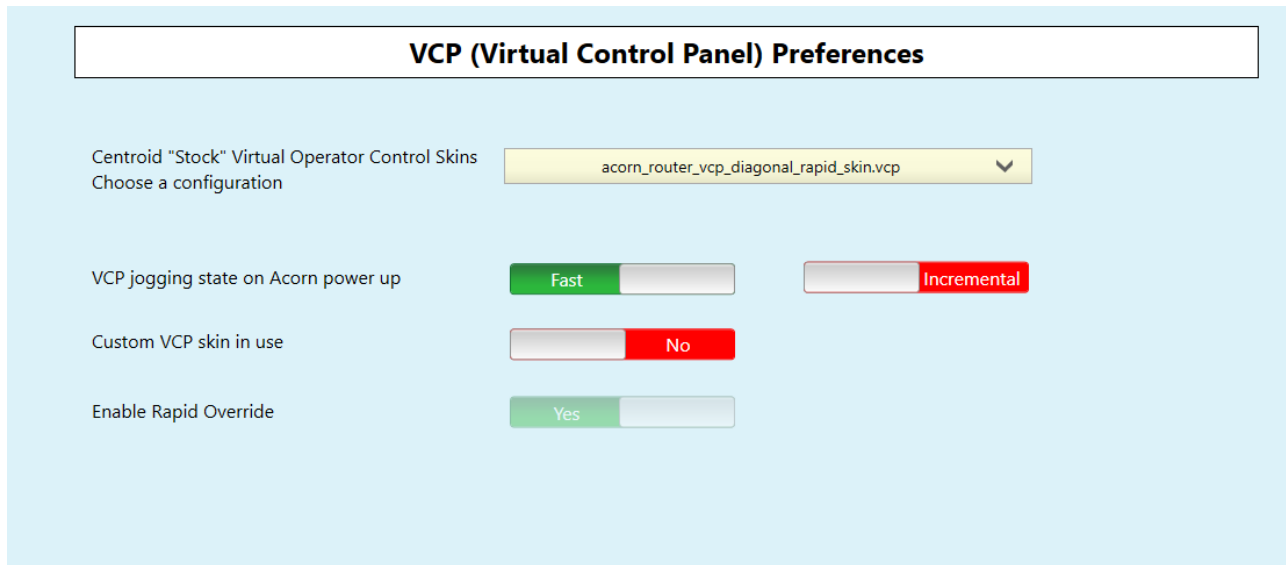
Stock VCP skins without this feature are also still included so users can use the old Centroid VCP skins if desired, these filenames do not have the word "rapid" in them.

#### Notes:

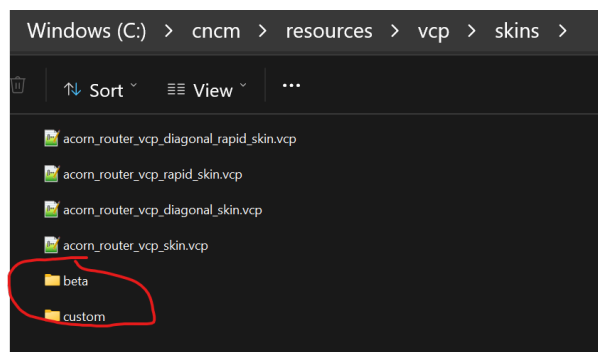
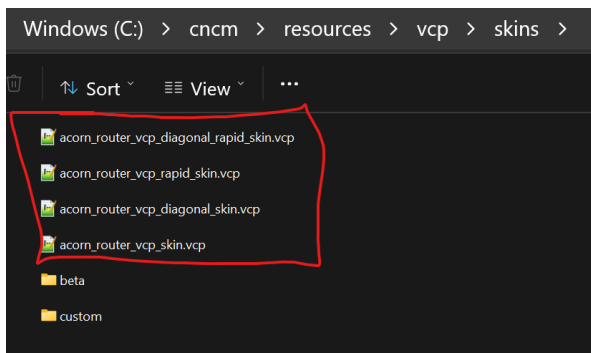
a.) Custom VCP's can be edited to include the new separate rapid override controls if desired. To do this, simply copy over the corresponding code from any of the Centroid stock VCP 'rapid' skins and corresponding button folders and set parameter 264 = 3 and it is required to add the corresponding PLC code to the PLC program if you are using a Custom PLC program.

b.) Any custom Acorn/AcornSix PLC programs will continue to work as they did before and will not separate the rapid and feedrate controls. Even if user sets Parameter 264 =1 or 3 without updating the custom PLC program CNC12 will run as normal and will not separate the rapid and feedrate controls aka the old way of doing things.

- Software implemented for Future USB Operator Control Panel products: such as operators physical knob control of Rapid Override, Feedrate Override, and Spindle Speed Override via USB as well as Cycle Start, Cycle Cancel, Tool Check, Feed Hold buttons and other future uses of USB input for CNC control use. This software and hardware technology frees up inputs on the control hardware and allows operator controls such as digital encoder knobs without requiring use of any analog inputs (like the old potentiometer type analog input) This new tech is designed to be compatible with all CNC controller hardware. (Acorn, AcornSix, Hickory, Allin1DC, Oak, and MPU11). Parameter 496 tells CNC12 which com port to look at for the new Centroid USB control panel. Simply enter the com port number (you can look it up with Windows Device manager) For example if windows device manager shows the new control panel connected to COM4 enter a "4" into Parameter 496 and reboot CNC12. Future version of CNC12 will auto recognize the USB port, for now you must set it manually to 'turn on' the USB control panel hardware.
- To make things easy for Wizard users, a Centroid 'stock' VCP skins selector has been added as a drop down box in VCP Preferences folder for Acorn and AcornSix.



Note: Any .vcp file located in the c:\cncm\resources\vcp\skins folder will appear in this Wizard drop down box. The Wizard reads the contents of this folder and displays any .vcp files in this location as a selection in the drop down box.



Two new folders also appear in the cncm\resources\vcp\skins folder. "beta" and "custom"

- Beta = new skins ready for beta testing
- Custom = a place holder for any skin that you don't want to show up in the Wizard Skin Selection drop down box.

5. VCP: Added a "Switching" functionality in the VCP code where buttons, borders, and images can be swapped out when user presses a button. This feature has the ability to have different buttons, borders, and images defined to occupy the same space. Each button, border, and image (referred to collectively henceforth as an 'object') requires a group to be defined, define the group in the .vcp xml file

Groups for borders and images are defined via a child node, example:

```
<border>  
  <group>group_name</group>  
</border>
```

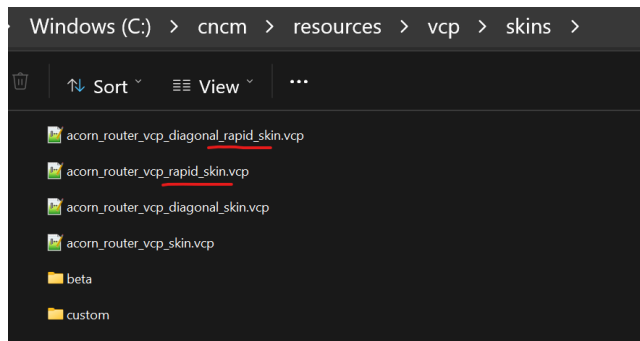
```
<image>  
  <group>group_name</group>  
</image>
```

Groups for buttons are defined via an attribute

```
<button row="Y" column="X" group="group_name"></button>
```

Any border, button or image can be defined as a group by simply adding the child node into the button/border/image node in the skin.VCP xml file.

Examples of proper use of these tools can be found in the new Centroid 'stock' (centroid provided) VCP skins with the word "rapid" in the name.



the sample code below is from acorn\_router\_vcp\_skin.vcp showing how to add a border to a group.

```
<border>  
  <column_span>3</column_span>  
  <column_start>4</column_start>  
  <fill>#012c3f</fill>  
  <row_span>3</row_span>  
  <row_start>11</row_start>  
  <outline_color>#000000</outline_color>  
  <outline_thickness>1</outline_thickness>  
  <group>rapid_group</group>  
</border>
```

Adding this child node within <border> and </border> adds this particular border to a group called "rapid\_group" this group can then be switched on/off along with the button press.

Multiple borders, images and buttons can be added to any given group.  
 acorn\_router\_vcp\_skin.vcp has examples of this as well, below you see the border for rapid override and the % value of the rapid override being included a the group call "rapid\_group".

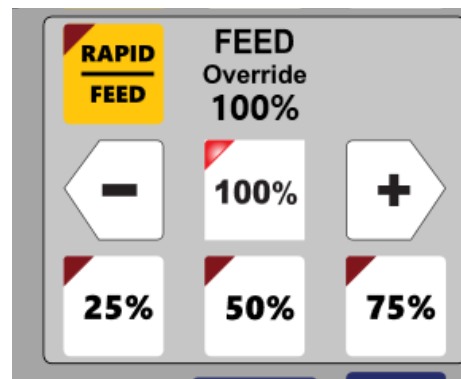
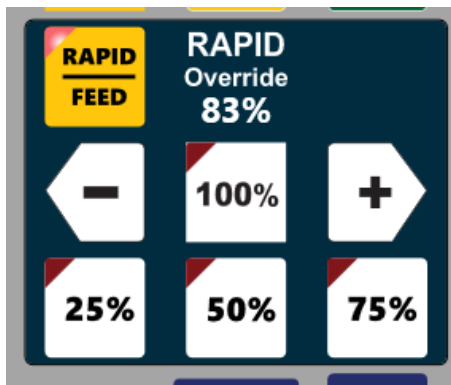
```

<border>
  <column_span>3</column_span>
  <column_start>4</column_start>
  <fill>#012c3f</fill>
  <row_span>3</row_span>
  <row_start>11</row_start>
  <outline_color>#000000</outline_color>
  <outline_thickness>1</outline_thickness>
  <group>rapid_group</group>
</border>
<border>
  <column_span>3</column_span>
  <column_start>4</column_start>
  <fill>Transparent</fill>
  <row_span>1</row_span>
  <row_start>11</row_start>
  <outline_color>Transparent</outline_color>
  <outline_thickness>1</outline_thickness>
  <plc_word>
    <number>58</number>
    <color>#ffffff</color>
    <fontsize>22</fontsize>
    <font>Sergio UI</font>
    <fontstyle>bold</fontstyle>
    <verticalalignment>bottom</verticalalignment>
    <horizontalalignment>center</horizontalalignment>
    <marginbottom>-5</marginbottom>
    <percentage>>true</percentage>
  </plc_word>
  <group>rapid_group</group>
</border>

```



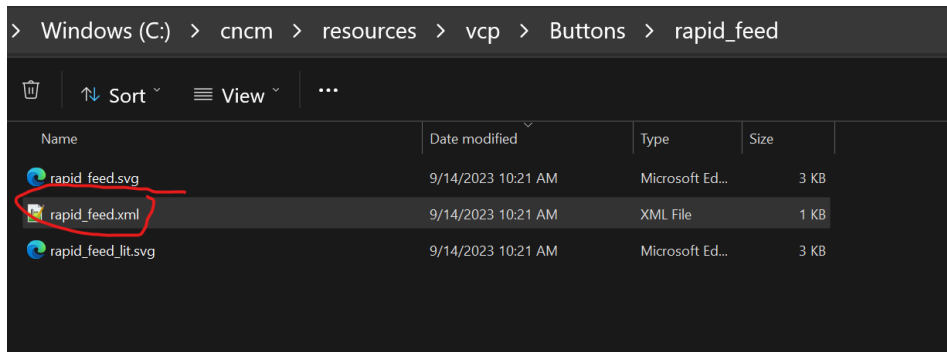
This way when the user presses the Rapid/Feed button on the VCP the VCP switches from Rapid to Feedrate Override controls, and vs verse. Notice the border,background and PLC words (the value the user has Feedrate and Rapid rate set to) switch.



Once groups are defined in the .VCP skin. What to do with those groups is defined in the button .XML itself.

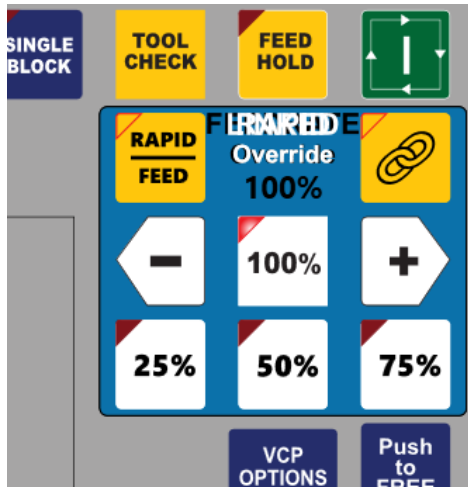
Example code from the new button called “rapid\_feed.xml” file that is using this feature:

```
<vcp_button>
  <switch>
    <switch_on>
      <remove>feed_group</remove>
      <remove>feed_button_group</remove>
      <add>rapid_group</add>
      <image_on>rapid_feed_lit.svg</image_on>
    </switch_on>
    <switch_off>
      <remove>rapid_group</remove>
      <add>feed_group</add>
      <add>feed_button_group</add>
      <image_off>rapid_feed.svg</image_off>
    </switch_off>
    <remove>linked_group</remove>
    <add>unlinked_group</add>
  </switch>
</vcp_button>
```



Note: For start up, a node must be inserted into the skin (.vcp file) to hide all of the groups that are unwanted at start up.

If this is not done, all objects will be visible from the beginning resulting in a mess as seen below.



Using our example file `acorn_router_vcp_skin.vcp` you can find an example of hiding the rapid group on start up beginning on line 121.

```
117         <opacity>100</opacity>
118         <outline_color>#ffffff</outline_color>
119     </on_hover>
120
121     <hide_group>
122         <group>rapid_group</group>
123     </hide_group>
124
125     <button row="1" column="1">spindle_plus</button>
126     <button row="1" column="2">spindle_auto_man</button>
```

The rapid group is being hidden on start up since the VCP defaults to Feedrate Override controls being displayed on startup so we don't want the Rapid Override value, border or background color to be displayed on startup.

Convention to hide on start up is simply:

```
<hideGroup>
    <group>group_name_1</group>
    <group>group_name_2</group>
</hideGroup>
```

The `hideGroup` node has no limit on how many groups can be hidden. While there is no limit on how many objects can be added to the VCP, it is important to note that performance may suffer as more objects are added. (We would estimate that decreased performance would start to become visible at approximately 1000 objects)

6. VCP Feature: Added the <run> ability to the VCP where a VCP button can now be set to run either a single line of G-code or a Macro immediately, without the need for cycle start..

run a line of g-code via <line>

or

run a macro via <macro>

Insert these commands directly into the button .xml file

To run run a line of g-code with a VCP button:

```
<run>  
  <line>G0 X0 Y0</line>  
</run>
```

To run a macro directly with a VCP button, Specify path and filename:

```
<run>  
  <macro>C:\cncm\ncfiles\myMacro.cnc</macro>  
</run>
```

Notes:

- a.) Button will only work when being run from the main menu of cnc12.
- b.) Both a macro and a g code line cannot be run at the same time.

**What not to do example**

```
<run>  
  <line>G0 X0 Y0</line>  
  <line>G1 X1 Y1</line>  
</run>
```

*When pressing the button the first line (G0X0Y0) would be run and the second line would be ignored. In this case, the two lines should be put into a macro and the macro option used.*

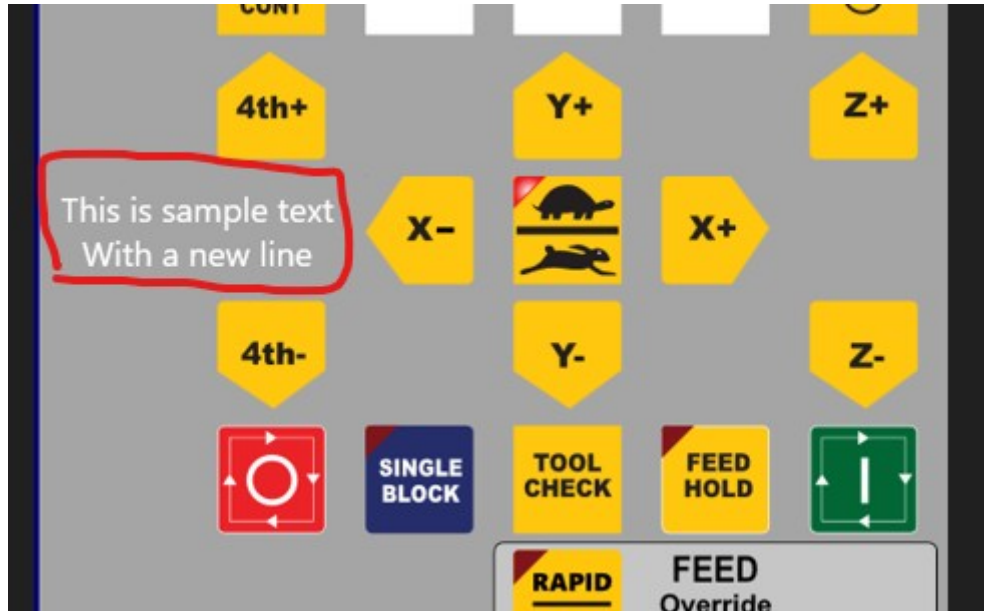
**What not to do 2<sup>nd</sup> example**

```
<run>  
  <line>G0 X0 Y0</line>  
  <macro>C:\cncm\ncfiles\myMacro.cnc</macro>  
</run>
```

*When pressing the button the first line (G0X0Y0) would be ignored completely and the macro would be run instead.*

**In this case, the first line should be included in the macro.**

7. VCP: We added the ability to draw text onto the VCP without the need of an image.



Example code from the skin.vcp file for the image above.

```
<border>
  <column_span>2</column_span>
  <column_start>1</column_start>
  <fill>Transparent</fill>
  <row_span>1</row_span>
  <row_start>8</row_start>
  <text>
    <content>This is sample text&#13;With a new line</content>
    <fontsize>20</fontsize>
    <color>#ffffff</color>
    <font>Segoe UI</font>
    <horizontalalignment>center</horizontalalignment>
    <verticalalignment>center</verticalalignment>
  </text>
</border>
```

Note:

- &#13; = Carriage Return (adds a new line)

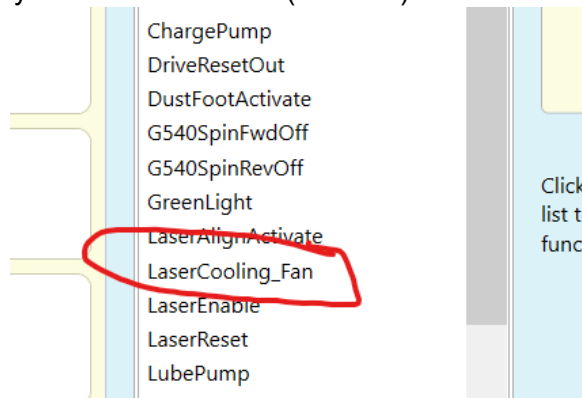
- This feature functions in a similar fashion to the VCP feature called plc\_word.

See v5.0 release notes for more details on page 13.

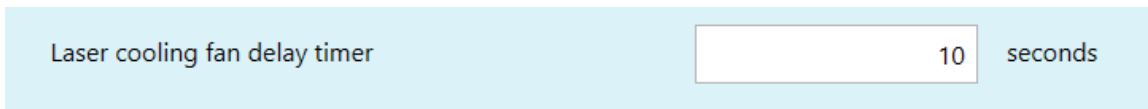
[https://www.centroidcnc.com/centroid\\_diy/downloads/centroid\\_cnc12\\_download/centroid\\_cnc12\\_v5.0\\_release\\_notes.pdf](https://www.centroidcnc.com/centroid_diy/downloads/centroid_cnc12_download/centroid_cnc12_v5.0_release_notes.pdf)



8. VCP image paths are now case inssensitive allowing a more 'forgiving' UX when creating custom VCP skins.
9. Wizard: Added "LaserCooling\_Fan" output to the Output Definitions menu. This Output will automatically turn on with a M37 (laser on) and turn off with a M38 (laser off)



10. Added Laser Cooling Fan OFF delay timer which keeps the fan running the after laser is turned off (M38), by a set mount of time specified by the user.



11. Updated the Acorn/AcornSix Wizard PLC logic for SpindleCoolingFan output. Now the spindle cooling fan output is automatically disabled when a M37 (laser on) is issued.  
Note: The user specified SpindleCoolingFan delay timer will still be active even after an M37. For example: if you have the spindle cooling fan delay time set to 10 seconds, when the M37 is executed by CNC12 the spindle cooling fan will still run for 10 seconds and then turn off.
12. Feature added to all Pro License: Added all 18 WCS positions to the Pro License software level for Mill, Router, Lathe, and Plasma.
13. Hickory: Added support for Leadshine EL7 and EL8 EtherCAT servo drives for Hickory CNC controller.
14. Installer will now rename the cncm/cnct directory to be the backup instead of making a copy of it. This results in faster install times and doesn't change the dates of the files contained in the cnct/cncm directories which makes updating easier. Along with this we added a self closing message box to the installer informing the user that a backup is being created during the install process.
15. Acorn/AcornSix: Fixed WMPG not moving the slaved axis after homing prior to jogging the paired axes through any other means.
16. Fixed graphics anomaly issue bug in probing menus where instructions would clip into the diagrams on lower resolutions
17. Added default load path to path.ini file for F2 – Load. This allows user to specify which folder to open by default when pressing F2 Load.
18. Fixed issue where the "Feedrate:" in the status window did not change to white text on a red background when rapid override is off.

19. Fixed issue where the display of PID output was not working in that it only showed 0 or OFF.
20. Fixed bug where DRO display would clip when more than three axes were visible on lower screen resolutions
21. AcornSix Wizard: Removed PWMOut assignment when selecting JTech Radio buttons. Since AcornSix has its own dedicated PWM Out header connections this choice is unnecessary and could cause confusion.
22. Fixed Plasma Restart Mode adding duplicate block numbers causing job not restarting properly
23. Lathe Turret: Removed hard coded distance. To allow users to adjust Turret movement amounts easily. Added Distance to travel past and distance to travel behind in Axis Driven Turret ATC type. Parameters 853 and 854 respectively.
24. Color Picker: Added a color option for Keyboard Jogging Active text and changed the default color for this for more contrast.
25. Fixed a bug when "Rehome after estop" option is set, estop is hit and the software is restarted without ever rehomeing, the machine would not require a rehome
26. Fixed bug where homing message would display on top of g-code preview if "Rehome after estop" option was set
27. Lathe: moved exit key from F9 to F7 to prevent accidental exiting when using F10 Shut\Down.
28. Fixed a bug where PLC words on the vcp will display their last known value after losing connection with the skinning api
29. Fixed a bug in the lathe run time graphics where the z axis would appear multiple times on first launch and then disappear completely every subsequent job run
30. Fixed a bug where large files would clip while graphing
31. Oak/Allin1DC/Hickory: Added remaining number of days information for a trial license to the report.txt
32. The Skinning API functions GetMachineParameterValue and SetMachineParameter have been modified to allow the reading/writing of user variables 29000-34999 in any job state and in any menu
33. Wizard will not force a Legacy VCP skin if the plc is newer than vcp 2.0 (Feb 11, 2020)
34. Fixed a rare intermittent issue where a lost or dropped UDP packet could result in a digitizing move appearing to lock up. In such cases, pressing a key on the keyboard (other than ESC or space bar) would result in the continuation of the digitizing.
35. Restored "Backup Files" and "Restore Files" to the User Maintenance menu.  
Note this was previously removed in v.5.00, surprisingly some users are still using this old DOS like feature so we restored this functionality.
36. Wizard: Fixed bug where parm 44 was set to parm 11 if ToolTouchDetect input wasn't defined
37. Fixed a situation where VCP was not terminating fully when closed through the windows taskbar
38. Updated the Acorn/AcornSix Wizard generated M6 macro for ATC tool changes to fix this bug.  
<https://centroidcncforum.com/viewtopic.php?f=60&t=9250>

39. ALLIN1DC Lathe ATC Hardinge PLC: Fixed issue with Jogging 1st and 2nd axis in the PLC program.
40. Fixed issue in AcornSix, Oak, ALLIN1DC, and Hickory PLC's that caused WMPG Macro buttons 1-4 to be unresponsive after pressing Macro 4 button.
41. Wizard now explicitly sets probe and tool touch parameters to both look at the probe inputs if tool touch inputs are not set up.
42. Fixed Paired axis selection slider from AcornSix was inadvertently showing up in Acorn Wizard
43. Added Windows taskbar state information to the report.txt file
44. Added DRO display unit control to the wizard menu CNC Control Preferences. This changes JUST THE DRO DISPLAY units and not the machine tool units. In other words, the machine could be operating in millimeters and running g code in mm but the DRO display would be displaying position in Inches. The unit controls for this and machine units are in the CNC12 configuration menu.(F1 setup, F3 config, F1Contrl)
45. Added skinning calls SetDroImperialUnits and SetDroMetricUnits which set the dro units independently of the machine units
46. Added Skinning Call "IsAPIRestricted" which checks the state of CNC12 and returns true/false if there are any restrictions imposed on the API. Note, all skinning calls have different criteria for when they can be called. This call collects the more common criteria together.
47. Fixed a bug where restore report would fail if a directory for a file didn't exist. Restore report will now create that directory
48. Plasma Intercon: Improved graphing performance with an all new graphics engine.
49. Plasma Intercon: Fixed a bug where importing a DXF could cause duplicate events to appear
50. Plasma Intercon: Fixed a bug where using DXF presets could incorrectly post the part
51. Plasma Intercon: Fixed a bug where moving the origin would cause some Arc events to calculate incorrectly
52. CNC12 Legacy Load menu: Fixed wxwidgets crash when accessing files in the root directory in Windows thru CNC12. When P4=5 "cnc12 style of loading a file" crash would have occurred when attempting to load a file in the [c:\](#)
53. Wizard: Fixed a bug in the Axis Configuration screen where if the last accepted fast and slow jog rates exceeded the max rate, the Wizard will instead default back to the max rate available
54. CNC12: Fixed issue where the load meters were not working for an ACDC drive.
55. Added Command Line Arguments to the installer for OEM use
56. Improved start up ethernet packet handling reduces false alarm error messages on cnc12 start up.
57. Improved tangential knife support for when CSR is active with Tknife via machine parameters 580 which Identifies which axis is the Tangential Knife Axis and 581 which allows user to flip the sign of the Tknife rotation.

P580 Identifies which axis is the Tangential Knife Axis. This parameter is bit wise.

Examples: If Axis 1 is the Tknife axis then P580 = 1 ( $2^0$ ), Axis 2 = 2 ( $2^1$ ), Axis 3 = 4 ( $2^2$ ), etc.). P580 is what enables the axis as a Tangential knife so that CSR calculations are applied to this axis when active.

P581 "Tangential Knife Direction" (allows sign change to define which rotation CW or CCW is positive. Industry standard is CCW is positive. P581 default value is 0 = CCW is positive for any Tknife axis. This parameter exist only to flip the sign of the direction of the Tknife typically flipping the sign is not necessary, review axis setup (wiring and configuration) before adjusting this parameter. Determining Tknife CW or CCW rotation is viewed from above looking down.

To and value of bit per axis reverses sign to CW positive, so if axis 3 was Tknife add 4) to allow the knife angle to be adjusted according to any G68 rotation and/or WCS CSR rotation in effect.

Tangential Knife support: Since Tknife is actually treated as a linear axis we added a bit to "Display a Linear axis as a Rotary axis" to the CNC12 Axis properties parameters. This bit is Bit 17 (+131072) and when added will display a linear axis as degrees on the DRO, Machine coordinates display and the WMPG display, etc. Axis parameters are 91-94 for axis 1-4 and P166-169 for axis 5-8. Typical default value for a Tknife axis as the 3<sup>rd</sup> axis P93 = 131072

Note: For Acorn and AcornSix Tangential Knife Users. The Acorn Wizard "takes care" of these Tangential Knife parameter settings (above) for you so, no action by users is needed (besides configuring the Tknife axis with the Wizard).

58. Improved startup Ethernet packet handling removes the occurrence of random false communication error messages on CNC12 startup after a firmware update.
59. WMPG will now properly set Fast/Slow Jog rate when X10 or X100 is selected and Z-X100Lockout Feature is enabled.
60. Plasma Intercon: Improved dxf/svg import and determination of safe lead-in/out placements
61. Plasma Intercon: Lead-outs now support over cutting onto the beginning cut of a part
62. Plasma Intercon: Lead-in and Lead-out are now controlled separately
63. MPU will now reboot if a firmware update fails to install the first time, preventing a communication error message on startup
64. Fixed bug where the mini dro and mini machine coordinates were not removed when returning to the CSR menu from MDI causing graphical bugs in other menus
65. Defaulted parameter 3 to a value of 6 for Acorn and AcornSix router installs to set Zref = Z home which is the most common Router tool measurement method (i.e. not using a reference tool, all tool lengths are measured from Z home to the same position in space.)
66. Added check to the installer to close any Windows Explorer Image (single running instance) that has a lock on any directory running out of cncm or cnc12. This is intended to break hidden locks caused by the Windows system preventing the renaming (backup) of the current cnc12 install
67. Fixed bug where "Increment Mode" was displayed incorrectly and inaccurately in the WCS origin menu when cycling through pages.

68. Fixed a probe state indicator graphic anomaly where the graphic became skewed/disproportional (this has/had no effect on any operation, this was purely a display graphic issue where the probe state image was being stuffed into a window not using the same proportions as the graphic itself)
69. Parm 56, bit 0 (add 1) will apply an averaging filter to the feedrate display (does not affect the actual rate)
70. Wizard: Fixed an issue with the Wizard Generated rack mount tool change macro when "Maintain a tool library" is selected for Rack Mount Bins. Problem was caused by "lookahead" assigning the put back bin before CNC12 fully has a chance to update the bin. Simple change to the mfunc6.mac was all that is needed to prevent lookahead from parsing the Tool Change macro.
71. Plasma: Added a folder of Material Profiles specific to the Hypertherm PowerMax 45XP cutter.
72. Added the letters "sample\_" to the filenames of the sample g-code and intercon files included with the CNC12 installer so its easy to identify them as samples. Added sample Euclid CNC Machine test g code programs, one generated by MasterCam and the other by Intercon. The MasterCam generated one has use specifics in the comments within the g code file itself, edit as needed. The Intercon (.icn) file is also included for those that wish to modify the Intercon Euclid block test program to their specific needs as well. Either one does the same job in the end which is to determine machine accuracy and proper setup during final commissioning of a milling machine (or router).
73. Removed an old warning message that seems to be not too useful. The message "MPG moving too fast" will no longer appear if a user spins the MPG wheel really fast. No changes in any action or motion this change is simply is removing the message that would appear in the CNC12 message box.
74. PC Tuner: The NCnetic Notepad++ Gcode viewer/editor plugin is now included with the CNC12 installer. The PC Tuner now will install this nice plugin for use with Notepad++
75. Fixed bug where Oak/Allin1DC/Hickory/MPU11 systems would not update the distance to go DRO readout for a slaved axis if the slaved axis had a label.
76. Fixed bug where M200 wasn't displaying the formatted message for AcornSix
77. Fixed bug where Lathe RTG menu DRO showed X coordinates in Z location and vice versa
78. Fixed bug where two outputs could be assigned to OUT2 in the Wizard if PWM was enabled
79. Updated the "System Test Not Passed" message on main screen with graphics and hyperlink to TB 327.
80. Fixed bug where G-Code display would not update with a newly posted Intercon job
81. Created the Hickory absolute encoder paired axis gantry alignment/squaring procedure document.
82. Added a new bit to parameter 1 (Add16) that will flips the X Jog direction.
83. Laser: fixed a bug where the laser would stay on during a Feed Hold and Tool Check.
84. Secondary backup option added to installer so if renaming the cncm/cnct directory fails it will copy it.
85. Dynamic conversion between metric and imperial units added to the plasma profile manager. Previous version relied on the metric or imperial install version and would not convert if units were switched after install.

86. Issue with Plasma restart mode not rounding floating point numbers.

87. PC Tuner installation removed from the CNC12 Installer, PC Tuner is available as a stand alone download.

88. The v5.08 release will be the last 32 bit version of CNC12.

A 64 bit version of v5.08 will also be published at the same time for 64 bit testing.

Notes:

- Looking to the future, the next version of CNC12 will be released as 64 bit only version.

- In the future all 3<sup>rd</sup> party apps will be required to be compiled as a 64 bit program to run with CNC12 starting with the next major release (v5.20).

- If you are currently using a custom App that makes use of the Centroid APi (formerly known as "Skinning") tools, Use the 32 bit version of CNC12 v5.08 so you won't have to make any changes to the custom/3rd party App.