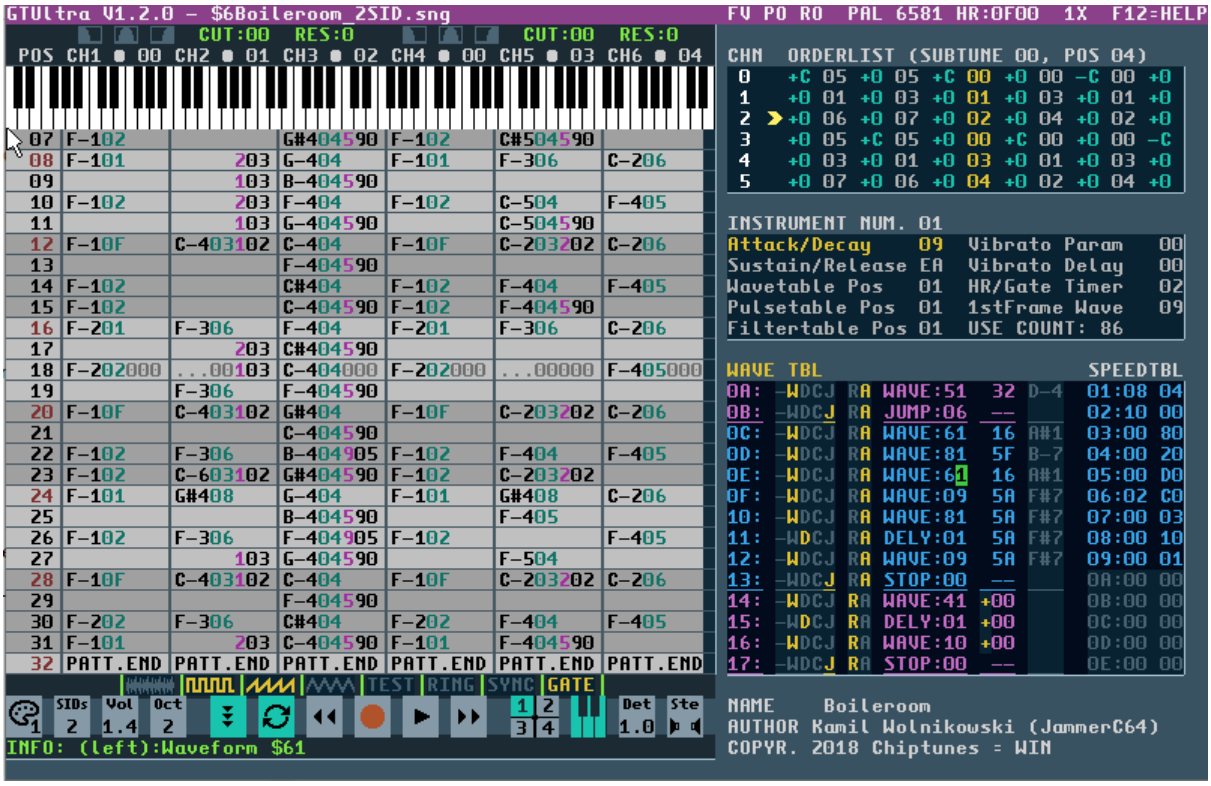
GTUltra - V1.2.0
May 17th 2022 - Jason Page / MultiStyle Labs



What is it?
GTUltra is an enhanced version of GoatTracker editor.

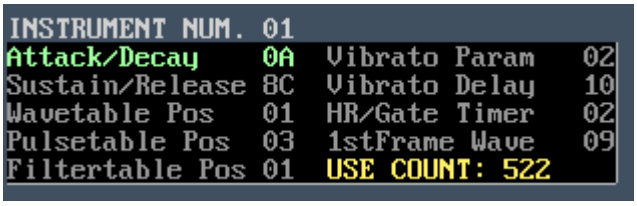
Credits:
Original GoatTracker Editor by Lasse Öörni (loorni\@gmail.com)
HardSID 4U support by Téli Sándor.
Uses reSID engine by Dag Lem.
Uses reSID distortion / nonlinearity by Antti Lankila.
Uses 6510 crossassembler from Exomizer2 beta by Magnus Lind.
Uses the SDL library.
Uses the RTMIDI library.
GoatTracker icon by Antonio Vera.
Command quick reference by Simon Bennett.
Patches by Stefan A. Haubenthal, Valerio Cannone and Raine M. Ekman.

GTUltra updates by Jason Page.
GTUltra inspiration - Thank you Daniel Larsson (SIDTracker 64)
GTUltra beta Testing - Thanks to: Russell Hoy, Jani Väisänen, Egon Sandar & Shogoon
GTUltra charset and palettes - Markus ‘LMan’ Klein
GTUltra Linux support - Special thanks to: tlr & theK
GTUltra Hall Of Fame. Thanks for feedback and bug reports:
acrouzet, JCH, spider-j, TheRyk, DeMOSic, Groepaz, Youth, zzarko,

And, of course, thanks to Emma. x

What's new?

1. **Updated display / skinning**
    a. User definable colour schemes
        i. Make it easier to visualise what is actually going on!
        ii. Presets are aimed to make you feel comfortable, with skins based on other trackers. If you don't like them - create your own!
2. **Undo (ctrl-z)**
    a. Yes. Really.
3. **Instrument Use count**
    a. Displays how many times an instrument has been used in all patterns
    b. Allows you to quickly find unused instruments



4. **Transport bar**

    a. Change Skin (Mouse L/R button) - 16 default presets
        i. Ctrl Left-Click = Open Palette editor
        ii. Ctrl+Shift+Left Click = Open Char editor
    b. Select SID count (Mouse L/R button - 1-4)
        i. Number of SID chips to be active during song playback
    c. Select output volume
        i. Left Mouse Button = Increase volume
        ii. Right Mouse Button = Decrease volume
    d. Select Octave (Mouse L/R button - 1-6)
        i. Select octave for QWERTY note playback
    e. Follow ON / OFF
        i. On = view will follow the current playback position
        ii. This can be enabled / disabled during playback
    f. Loop pattern ON / OFF
        i. On = playback will loop to start of the selected pattern when end of pattern is reached
        ii. On also enables inter-pattern looping (if a section of a pattern is marked for copy/cut, this section will loop)
        iii. See "Master Channel" section
    g. Rewind (similar to a *CD player rewind* control)
        i. Single left-click (or CTRL-Left Key)
            1. Move to row 0 of the selected pattern
            2. If already at row 0, move to the previous song position
        ii. Hold button
            1. Move to the start of the song

iii. During playback / follow enabled
1. Double click to move to the previous song position

h. Record ON / OFF
i. On = QWERTY will play monophonic. Notes will be recorded in the currently selected pattern.
ii. Off = JAM mode. This allows for up to 12 channels to play played at one time (4 SID chips)

i. Play / Pause
i. Play = song will play from the current position
ii. Pause = song will pause at the current position

j. Fast Forward
i. Move to the next song position (or CTRL-Right key)

k. JAM Mode - SID chip enable
i. Click on 1-4 to enable/disable SID chips for jam mode
ii. Example: If a single 3 channel SID song, you could enable SID Chips 2-4 to allow you to jam over the 3 channel SID without interrupting playing notes from the song.

l. Display piano keyboard On/Off / MIDI Port Select (SHIFT or CTRL)
i. Displays piano keyboard, showing playing notes
ii. Notes are calculated using the closest SID frequency, so this will take portamento / wild vibrato settings into account too.
iii. Press SHIFT or CTRL when clicking to open MIDI Port Select panel

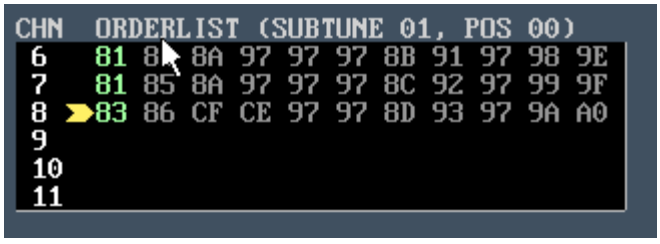
m. Detune (-100 cents > 100 cents)
i. 1 = normal pitch (440hz = A)
ii. 0 = -100 cents
iii. 2 = +100 cents
iv. This allows for testbit effects to be tuned to the music

n. Mono / Stereo
i. If more than one SID is selected, this will toggle between mono or stereo. In stereo mode, SIDs 1+3 will output from the left speaker. SIDs 2+4 will outputfrom the right speaker

5. 3,6,9 or 12 channel playback (1-4 SID support)

a. 7-12 channels require 2 songs (song 0+1, song 2+3, song 4+5…)
i. This ensures that the GT Stereo file format does not need to change (yet..)
ii. 3,6 or 9 channel .SID files can be exported. .SID file format only handles up to 3 SID chips. Not all SID players handle 3 SID chips.
iii. For 12 channel SIDs, 2 .SID files are saved. 6502 code to show how to sync these for playback on Mega65 will be released.

b. Example: 9 channel (3 SID) song shows SUBTUNE 01 as only 3 channels



6. **Song pattern selection**
    a. Hold Left button OR shift-left click on a pattern in order list:
        i. All correct patterns are selected for the song at that position
        ii. Takes into consideration order lists with patterns that may have repeated n times, or channel-specific tempo changes
7. **Song playback from anywhere**
    a. Double click on a pattern in order list:
        i. Playback will begin at the selected position
        ii. Any previously keyed on notes will also be heard correctly (as long as they were started within the previous 2 song positions)
8. **F3 = Shift/Space**
    a. Pressing F3 plays the from the current cursor position. Depending on where you are currently editing:
        i. From within the pattern, if you're editing the pattern, table or instrument data
        ii. From the correct position in the song if currently editing the order list
    b. All patterns are synced correctly (taking into consideration channel tempo and pattern lengths, etc.)
    c. Using F3 means that it's possible to play whilst also modifying instrument or table values
    d. Disabling FOLLOW allows for quick playing from a specific pattern position, whilst allowing you to edit instrument or table information.
9. **Jam Mode (when not in record mode)- Polyphonic**
    a. Up to 3 channels can be played for every enabled SID chip
        i. Enable SID chips via clicking the transport bar options 1-4

        ii. KeyOff (release) is automatically performed when releasing keys
10. **Displays note number and arp chord offsets in Jam Mode**
    a. Holding multiple notes will display note offsets:

    b. Holding a single note will display the number number

11. **MIDI note input**
    a. Connecting a MIDI keyboard *BEFORE STARTING GT-ULTRA* allows for MIDI keyboard input.
        i. MIDI keyboard input works in jam mode when also editing tables / instruments
    b. Shift-click on the keyboard button in the transport bar to go to Midi Settings panel
12. **Load / Save Screen**

a. Colour changed to GREEN (load) or RED (save) so that it's easier to realise that you're about to accidentally wipe over your work, rather than load it.

13. Move to the previous / next pattern in a song

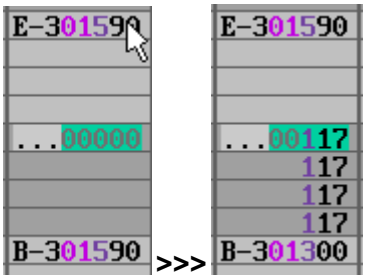
a. Scrolling to top or bottom of a pattern will automatically move to the previous / next song position, displaying correct patterns.

14. Tables separated by colour

a. Sections separated with an underline when a END/LOOP (FF) is detected
b. The table entry that is used by selected instrument is highlighted
c. Unused entries (00 00) are shown as muted (grey, in this screenshot)

15. Auto-Portamento key (SHIFT-Y)

a. Press SHIFT-Y to automatically calculate portamento value for commands 1 or 2 from the pitch at cursor location to the next note in the pattern.
b. Also changes the next note to be a tie
c. Correct portamento value is added to the speed table
d. Idea taken from the BRILLIANT SIDTracker 64 by Daniel Larsson



16. Displays the overall length of the song

a. Automatically calculated when loading / modifying song

17. Quick Save

a. Ctrl-S at any time to save song using current file name

18. Info line

a. Displays details based on what the cursor is currently over.
b. Example1: Displaying the pattern instruction value (1 = portamento up), as well as the corresponding value from the speed table ($0040)

c. Example2: Displaying the filter table information:

19. The Master Channel

a. To sync to the correct playing position, a channel needs to be selected as the "Master". Syncing will then take place, based on this channel. The Master channel is defined by the cursor position. Either:
   i. The channel number within the pattern editor when editing patterns
   ii. The channel number within the order list

b. The Master channel is always highlighted in the OrderList view as a yellow arrow (in this example, channel 2 is the Master Channel)

c. This then takes into consideration the different pattern lengths, pattern repeat commands, channel-specific tempo settings within the song.
(*If ALL patterns were the same length and there were no repeat commands in the order list or channel-specific tempo changes, life would have been far simpler..!)

20. F8 = Edit Tables ('cos Jammer said so)

a. This used to go to the Edit Name / Copyright section.

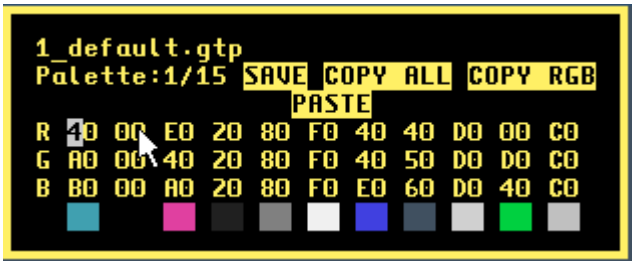
21. Filter Information

a. Displays the current filter type (green = active), cutoff and resonance for each SID channel above the corresponding SID channels

b. Also highlights when a channel has filter enabled (red dot)

22. Palette Editor

a. CTRL+Left Click on skin icon in transport bar
b. This will display palette information

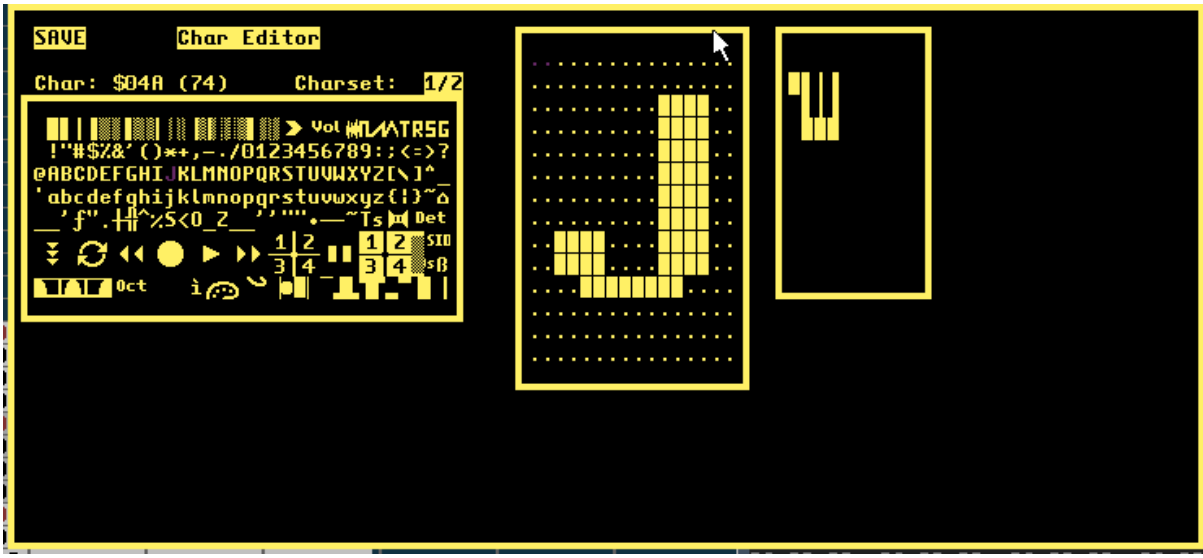


c. Each column displays RGB for a specific area (8 bits)
d. INFO text explains what each RGB is used for

e. There are 16 palettes to choose from
    i. File name and palette index is displayed
f. Press Ctrl-S or left-click on the SAVE text to save a palette file.
    i. User generated palette files will load automatically when starting GTUltra, if it is found within the gtpalettes folder.
    ii. Ctrl-S will automatically save over the existing palette file, if one has already been selected.
g. Press Ctrl-C to top current RGB (or click Copy RGB)
h. Click on COPY ALL to copy all RGBs for this preset
i. Press Ctrl-V or click PASTE to paste either current RGB or ALL (overwrites all RGBs for palette), depending on what was last copied.
j. WARNING: NO UNDO.

23. Char Editor

a. I needed to add this so that I could display nicer borders / piano keyboard and such like! Please excuse my programmer art.



b. CTRL-S or click on the SAVE text to save charset (charset.bin)
    i. If this file exists, it will automatically load when starting GTUltra.
    ii. Delete or rename charset.bin file to restore the default charset
c. Left panel
    i. Select char to edit
d. Middle panel
    i. Char editor
e. Right panel
    i. Sketch pad (draw selected char)
f. Largely untested and not exactly Photoshop - But it did the job.
g. Charset 1 / 2
    i. A second charset is used for specific purposes. Charsets can be selected by clicking on the 1 / 2 text next to the char set.

24. F2 - Change of function

a. F2 used to play the current pattern. F3 now does this.
b. F2 now enables/disables pattern follow or looping (Shift F2)

25. Modify values with mouse

a. Hold / Drag Left or Right to modify the currently selected value

b. Works for both Table and Instrument information only
c. AD or SR values will only change the nybble selected
    i. (Eg. Only change Attack OR Decay part of the Attack/Decay byte)

26. Looping

a. When pattern loop is enabled, playback will sync all channels to the correct song position (based on the Master Channel) within the song, taking into consideration different pattern lengths, channel-specific tempo changes and such like.

27. Copy (Ctrl-C) changes

a. Ctrl C will now always copy the information under the cursor, so no need to select a single entry via shift-Up/Down or shift-Left/Right
b. When Ctrl-C is used to copy a single entry within the pattern view, the current instrument will also change to match the copied entry. This allows for very quick selecting of instruments.
c. The functionality to copy the whole of a pattern row is still available via Shift-C

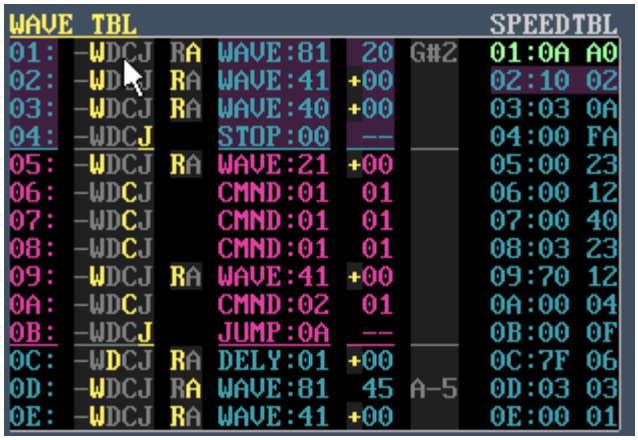
28. Inter-pattern looping

a. When pattern looping is enabled, if a highlighted section within the pattern is marked (shift + up / down to select an area), playback will loop within this area. As with pattern looping, all channels will loop correctly, using the highlighted channel as the Master Channel

29. Improved ENTER key functionality

a. Press ENTER to go to the correct table entry from anywhere
b. Press ENTER again to return to the previous cursor position

30. Detailed Table Editing: WaveTable



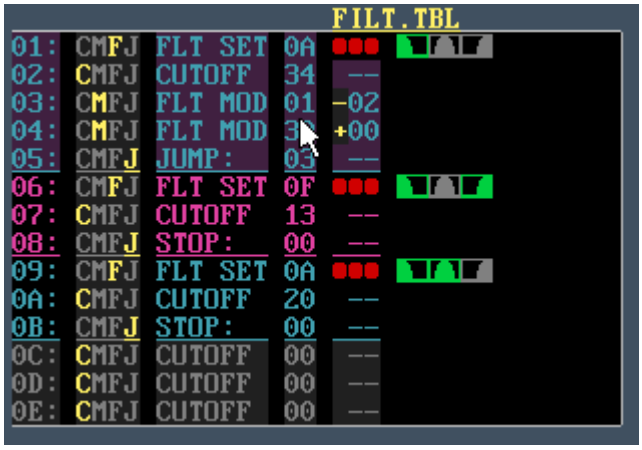
a. Clicking on the WAVE TBL title decodes the table data and displays it in a more user-friendly way
    i. Click on the title again to show the original table view
b. For each row, you can select functionality by clicking either -WDCJ
    i. -: Skip left column - only process note info in right column)
    ii. W: *WAVE* Set Waveform (0-$DF)
    iii. D: *DELY* Set Delay ($1-$F)
    iv. C: *CMND* Set Command (1-$F)
    v. J: *JUMP* Jump (1-$FF or 0 to Stop)
c. If WAVE or DELAY is specified above, you can then also set the note (pitch) information in the right column.

d. Note information can be either Relative or Absolute (offset from the note that is initially played.) RA
   i. Select either R or A for Relative or Absolute note values
   ii. Disabling both leaves the pitch unmodified
e. For Relative notes, you can also click on the + or - to swap between positive or negative offsets +24
f. Pressing ENTER when the cursor is on a command value will move the cursor to the correct entry within the speed table (if applicable)
g. Remember that the combination of CTRL-C / CTRL-V can be used to quickly copy & paste single entries

31. Detailed Table Editing: Pulse Table

a. Clicking on the PULSETBL title decodes the pulse table data and displays it in a more user-friendly way
   i. Click on the title again to show the original table view
b. For each row, you can select functionality by clicking either SMJ
   i. S: *"PLS SET"* Set Pulse Width (0-$FFF)
   ii. M: *"PLS MOD"* Modify Pulse Width (left column = time, right column=speed)
   iii. J: Jump (1-$FF or 0 to Stop)
c. When modifying pulse width, the right column (speed can be change from + to - by clicking on the + or - symbol +24
d. Remember that the combination of CTRL-C / CTRL-V can be used to quickly copy & paste single entries

32. Detailed Table Editing: Filter Table

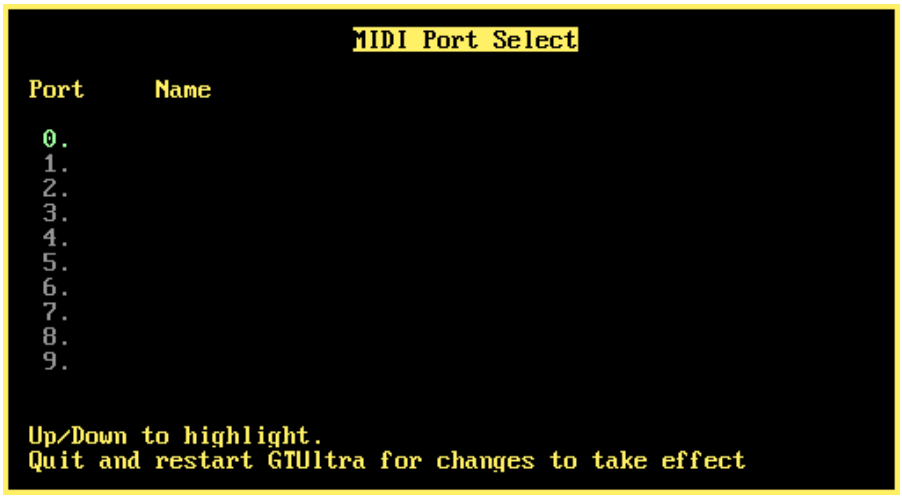


a. Clicking on the FILT.TBL title decodes the filter table data and displays it in a more user-friendly way
    i. Click on the title again to show the original table view
b. For each row, you can select functionality by clicking either 
    i. C: *"CUTOFF"* Set Filter Cutoff (0-$FF)
    ii. M: *"FLT MOD"* Modify Filter Cutoff (left column = time, right column=speed)
    iii. F: "*FLT SET"* Filter Info (Resonance, Channel On/Off, Filter Type)
    iv. J: Jump (1-$FF or 0 to Stop)
c. Filter Info 
    i. The 3 circles represent the channels which will be affected by the filter
        1. Red = filter is active on the channel
        2. Grey = filter is not active on the channel
        3. Click on the circles to enable / disable filters
    ii. The filter type (lowpass, bandpass, high pass) is shown as 3 icons
        1. Green = filter type is enabled
        2. Grey = filter type is disabled
        3. Click on the icons to enable / disable filter types
d. When modifying filter cutoff, the right column (speed can be change from + to - by clicking on the + or - symbol 
e. Remember that the combination of CTRL-C / CTRL-V can be used to quickly copy & paste single entries

33. Waveform editor

a. When editing any waveform parameter, the current waveform settings are displayed (replacing the timer display above the transport bar)
b. Click on the waveforms / test bit (TEST), ringmod (RING), sync or gate bit (GATE) information to toggle enable / disable

34. MIDI Port Select



a. Click on the keyboard icon in the transport bar, whilst holding either CTRL or SHIFT
b. This opens the MIDI Port Select Panel.
c. Use up/down to select MIDI port
d. Exit and restart GTUltra for the newly selected MIDI port to take effect.

35. Ctrl+Left / Ctrl+Right keys to quickly move to previous / next song position

a. These key combinations emulate clicking on the previous / next icons in the transport bar.

36. SID export

a. Uses original GoatTracker 3 channel assembly code if saving a 3 channel SID
b. Saves as V3 .SID format if saving 9 channel SID (note: not all sid players can handle this format)
c. Saves 2* 6 channel SID files if saving 12 channel SID.SID file format only allows up to 3 SIDs to be selected. So 12 channel SID files can only be played on compatible hardware or Mega65.
d. 12 channel SID files need to be synced together. Info to follow.