

ROLAND RD2000 EDITOR

DOCUMENTATION

Software Version 4.3.6 Rev. 004

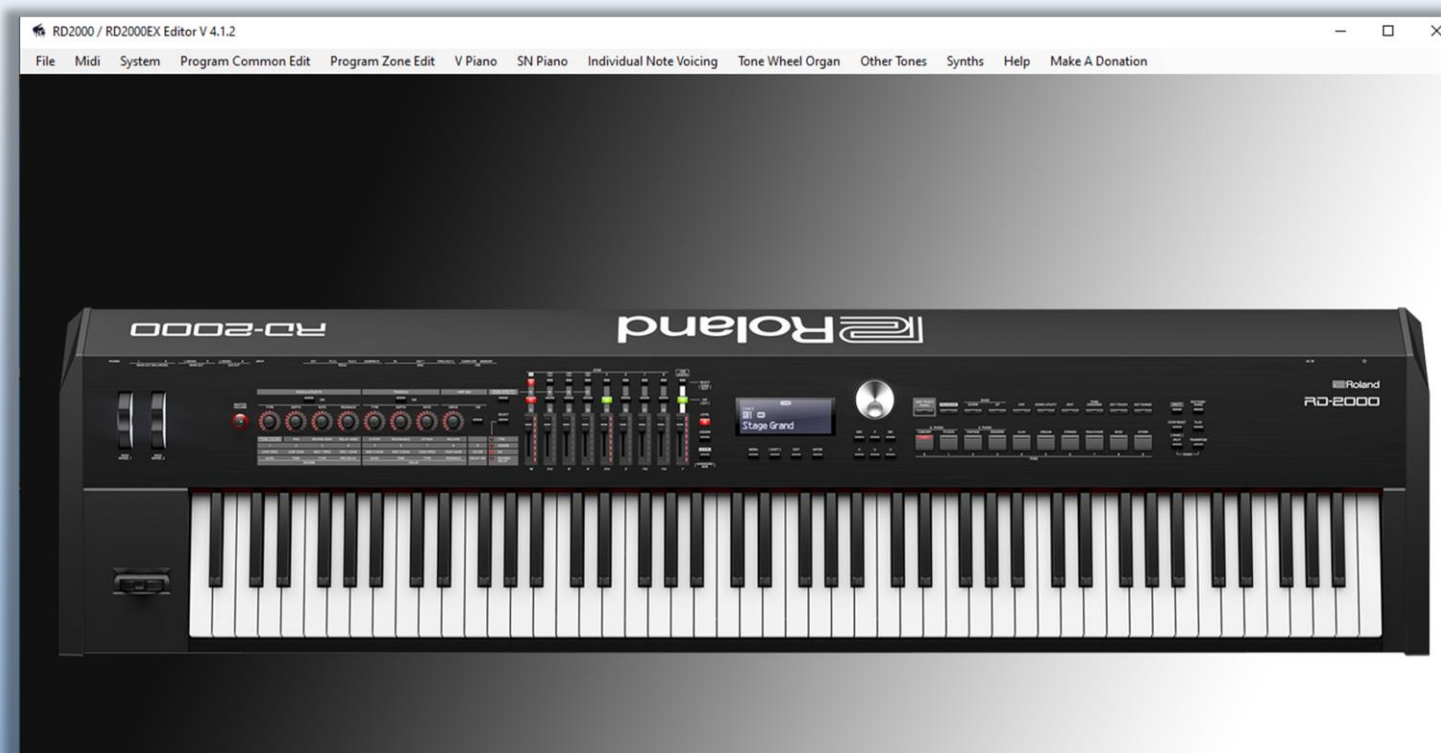
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See also Fractal Sequencer, Korg Triton Controller and Virtual Instruments

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rd



WELCOME

The Roland RD 2000 is one of the world's best stage pianos. It combines superb modelling and sampling technology with a marvellous action, beautiful build quality and it's also a great Midi controller. Thank you, Roland Corporation.

The RD has a small screen, but sometimes users want to see the controls without scrolling through lots of menus. I wrote this software to make life a bit easier by using the far larger screens of computers and added many extra features.

I would like to thank Gus at Roland Clan Forums for his tireless and thorough testing of the software. He has done a great job. And DesertBoat for his help with the deciphering of the Tremolo and some of the Mod fx sections.

Finally, thanks to Roland Corporation Customer Support in Los Angeles USA for answering questions in a helpful and timely way. Particularly, Alita, Dan, Travis and Alberto.

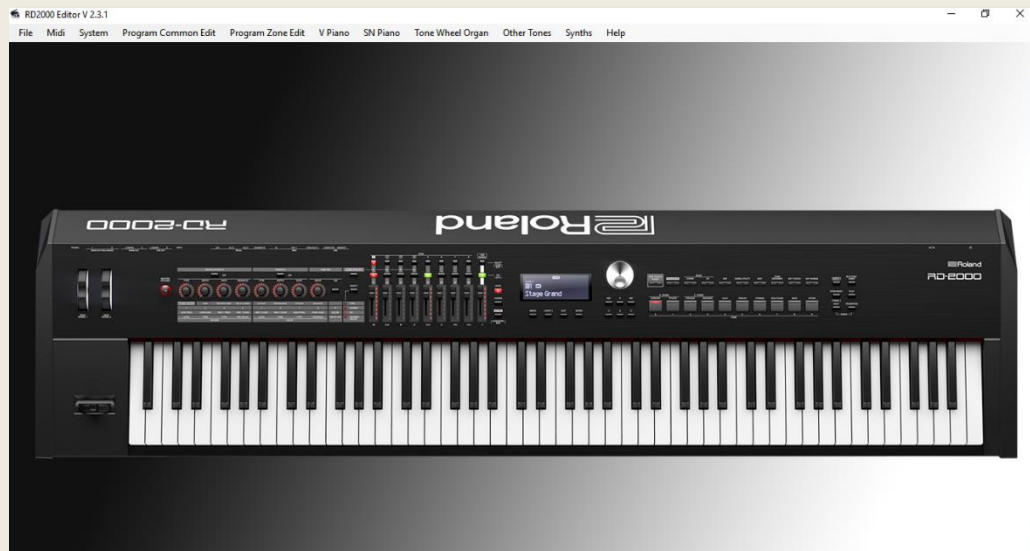
Have fun.

Stuart Pryer

Cornwall. UK

RD2000/RD2000 EX EDITOR

This software can be downloaded from my website for free. If you like the full version and want to support its development you can use [Paypal.com](https://www.paypal.com) to make a donation. My email address is stuartpryer@gmail.com. Remember to download the latest docs from my website and overwrite the rd2000.pdf file in the installation directory. It can run on a PC or a Mac (under the free Wine app).



RD2000 Editor running on a Windows PC

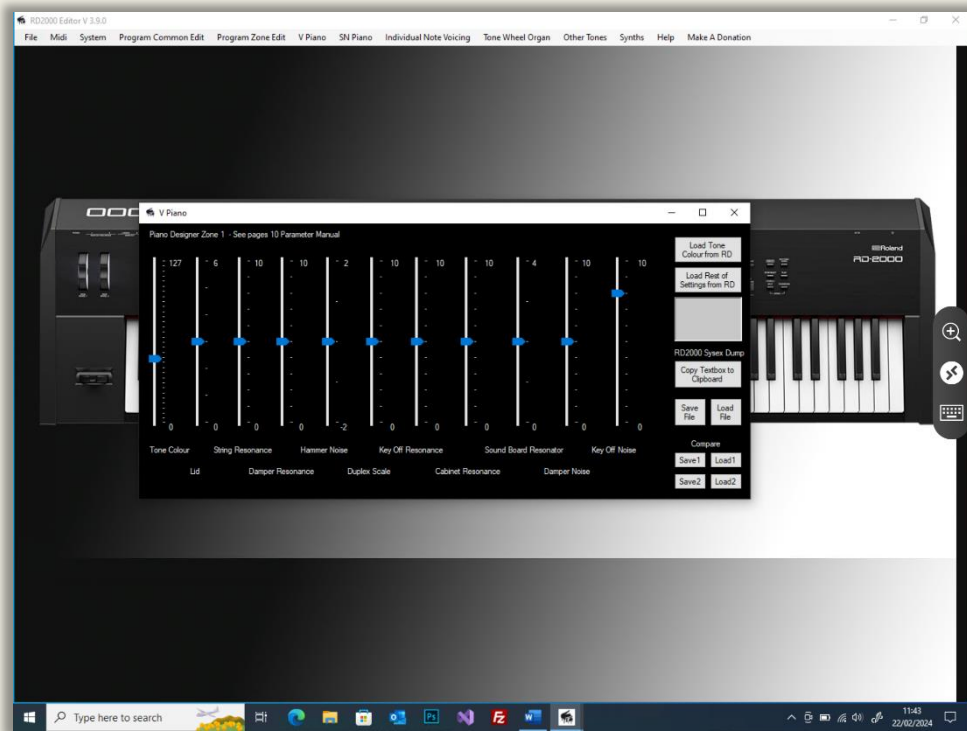
Midi can be sent and received between a pc running this software and a Mac - if say the Mac is your studio computer - To do this use RPTMidi which uses a wireless Midi protocol. You can use Microsoft remote desktop on a Mac, iPhone, iPad or Android phone or tablet to remotely control the software.



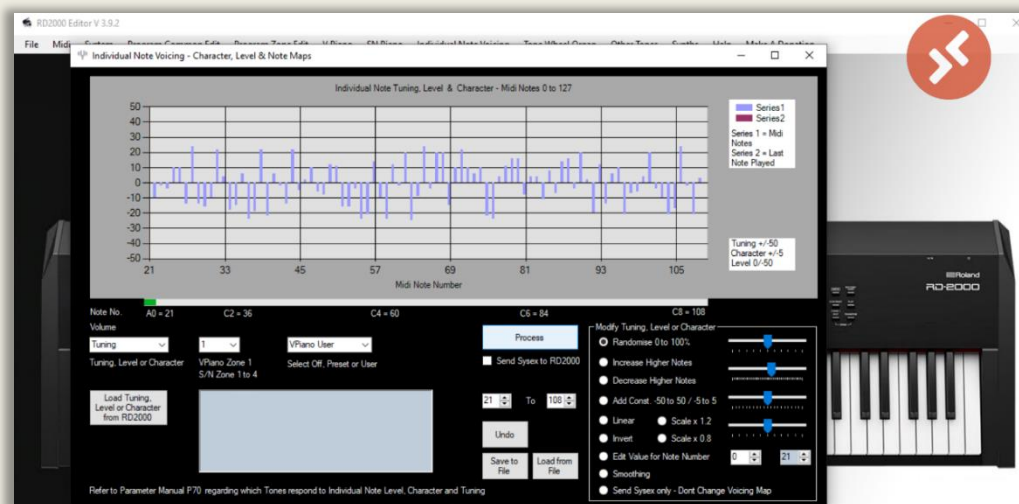
Running on a Mac

Running in the Wine 10.6 app on my Mac. It should also run on Linux and Android. Or you can control a PC running Microsoft Desktop from your Mac.

Welcome



The RD2000 Editor controlled from an iPad using Microsoft Remote Desktop. You can also use iPhones and Android or Linux devices running the Remote Desktop app. The VPiano editor form is loaded.



Here its running via an iPhone using Remote Desktop. The Individual note voicing form is loaded and ready to tune the RD2000.

CONTENTS

WELCOME	2
INTRODUCTION TO THE RD2000 EDITOR	10
ACCESSIBILITY	10
CONDITIONS OF USE	11
INSTALLING ON A PC - WINDOWS	12
INSTALLING ON A MAC - USING WINE	13
USING THE RD2000 EDITOR ON PC VIA A Mac.....	15
USING AN iPad, iPhone OR ANDROID DEVICE WITH THE SOFTWARE.....	16
STARTING THE SOFTWARE	18
WORKFLOW	19
THE RD2000 EDITOR – MAIN FORM.....	20
EXITING THE SOFTWARE	23
TOOLTIPS.....	23
VIDEOS.....	24
SETTING UP MIDI IN/OUT for THE SOFTWARE	25
SENDING NOTE DATA	27
SENDING MIDI CONTROL CHANGE MESSAGES CC	28
SENDING PROGRAM / BANK CHANGE	29
RECEIVING NOTE DATA MIDI MESSAGES	30
RECEIVING CONTROL CHANGE CC MIDI MESSAGES	31
RD 2000 MIDI CC.....	32
RECEIVING SYSEX MIDI MESSAGES	34
SENDING SYSEX	36
USING WITH VIRTUAL INSTRUMENTS	38
RECORDING USING SOFTWARE SUCH AS LOGIC, BITWIG, BANDLAB SONAR, CUBASE ETC.....	38
GUS’S 88 NOTE KEYBOARD	39
RD2000 OVERVIEW.....	40
MIDI ROUTING	41
AUDIO ROUTING.....	42
EDITING THE RD2000 SETTINGS	43
CREATING A PROGRAM.....	44
SAVE AND LOAD RD2000 SETTINGS ON YOUR COMPUTER.....	45
SYSTEM COMMON SETTINGS	47
SYSTEM COMPRESSOR	49
PROGRAM COMMON	50
PROGRAM LIBRARY	50
SEARCH.....	51
MULTIPLE SEARCHES	53
FAVOURITE PROGRAMS	54
PROGRAMS AND MEMOS	55
SCENE LISTS	56
PROGRAM NAME	58
SCENE MEMO	59
REVERB.....	60
EQUALISATION	62
DELAY	63
RHYTHM / SONG	64
ZONES INTERNAL / EXTERNAL	65

FOOT CONTROLLERS AND WHEELS.....	67
KNOB ASSIGNMENTS	68
KEY TOUCH.....	69
PROGRAM ZONE EDIT	71
TONE LIBRARY	71
ROLAND AXIAL EXPANSION SOUND LIBRARIES - FREE	77
GERMAN PIANO – VPIANO EXPANSION	78
RD2000EX UPGRADE.....	79
ESSENTIAL UPRIGHT PIANO – VPIANO EXPANSION	81
PROGRAM INTERNAL ZONE	83
TREMOLO AND AMP SIMULATIONS	84
MODULATION EFFECTS.....	85
PROGRAM EXTERNAL ZONE	87
THE PIANO / TONE DESIGNER.....	89
V PIANO EDITOR.....	89
VPIANO SETTINGS.....	91
VPIANO - QUICKLY COMPARING SETTINGS	92
SUPERNATURAL PIANO EDITOR	94
SYMPATHETIC RESONANCE.....	96
SYMPATHETIC RESONANCE OTHER SETTINGS	98
INDIVIDUAL NOTE VOICING – TUNING, LEVEL AND CHARACTER	99
LOADING INDIVIDUAL NOTE TUNINGS FROM THE RD2000.....	103
LOADING INDIVIDUAL NOTE LEVEL MAPS	105
LOADING INDIVIDUAL NOTE CHARACTER MAPS.....	106
INSPECTING VOICING VALUES.....	107
SHOWING NOTES PLAYED ON THE RD2000	108
ZOOM.....	109
TUNING	110
TUNING PRESETS.....	114
WHY HAVE DIFFERENT TUNINGS?	115
TUNING THEORY	116
INHARMONOCITY CURVES	118
TUNING CURVES	120
TUNING DIFFERENCES.....	123
GERMAN CONCERT GRAND EXPANSION TONES SA01 to SA17	125
ESSENTIAL UPRIGHT EXPANSION TONES SB01 to SB14	131
VPIANO CONCERT PIANO S01 TUNING CURVE	135
TUNELAB PRO 5.3 - CREATING A TUNING FILE	136
TUNING ACCURACY	141
THREE PART TUNING	142
CHANGING THE TUNING TYPE	145
ENTROPY TUNING.....	146
AUTOMATIC ENTROPY NOTE SAMPLING	151
FINE TUNING THE ENTROPY CALCULATION.....	153
PIANOMETER - CREATING A TUNING CURVE	157
HISTORICAL TEMPERAMENTS.....	161
LOADING TEMPERAMENT FILES.....	165
EDITING TEMPERAMENT FILES.....	166
CREATING YOUR OWN UNEQUAL TEMPERAMENT	167
CHANGING THE TONIC OR KEYNOTE.....	168

NORMALISE THE TUNING	169
SCALA TUNING FILES	170
MICROTONAL MUSIC	172
EDITING THE NOTE TUNING MAP	176
SAVE & LOAD NOTE VOICING MAPS TO FILE.....	176
EDITING FUNCTIONS	177
UNISON TUNNG	180
EDITING THE NOTE LEVEL & CHARACTER MAP	181
EDITING ONE NOTE AT A TIME	183
INCREASE HIGHER NOTES	184
DECREASE HIGHER NOTES	184
CONSTANT	185
LINEAR.....	186
INVERT.....	186
SCALE x 0.8 / 1.2.....	187
SMOOTHING.....	188
EDITING A SELECTED NOTE RANGE	189
UNDO	190
SEND SYSEX ONLY	190
SUBTRACTING, ADDING and COMPARING, TUNING CURVES	191
TONEWHEEL ORGAN EDITOR	194
OTHER TONES	197
MAPPING MIDI MESSAGES.....	199
MAPPING SYSEX MIDI MESSAGES	213
PART 2	219
THE SYNTHS	219
ROLAND SH1000 SYNTH	219
BLUE SYNTH 3 - PHASE MODULATED SYNTHESIZER.....	223
MIDI RECORDER	226
FRACTAL SEQUENCER.....	227
PART 3	228
TUTORIAL 1 – SETTING UP USB Midi & Audio	228
TUTORIAL 2A – SETTING UP A DAW	230
TUTORIAL 2B - THE RD2000 CONTROL SURFACE	231
TUTORIAL 3 – LAYERING AND SPLITTING THE KEYBOARD	233
TUTORIAL 4 - RD2000 RECOMMENDED ACCESSORIES.....	234
TUTORIAL 5 - A TWO or more KEYBOARD SETUP	235
TUTORIAL 6 – SHARING AND SAVING PROGRAMS	236
TUTORIAL 7 – SETTING UP BITWIG STUDIO.....	237
TUTORIAL 8 – RECORDING SYSTEM AUDIO IN A DAW	239
TUTORIAL 9 – CREATING A PROGRAM.....	241
TUTORIAL 10 - ELECTRONIC MUSIC.....	242
MIDI 1.0 MESSAGES – A BRIEF SUMMARY	245
TABLE OF MIDI CC MESSAGES	247
TUTORIAL 11 - USER TIPS.....	251
TUTORIAL 12 – COMPLIMENTARY SOUNDS.....	252
TUTORIAL 13 - SHOULD YOU BUY A WORKSTATION OR A COMPUTER?	
.....	253
FINALLY	254
REVISION HISTORY – Version numbers	254

Contents

USER COMMENTS.....	278
SO THAT'S IT?.....	280
LINKS TO WEB SITES	281
RECOMMENDED BOOKS.....	283
INDEX	284
BACKCOVER.....	289

Thanks to Gus for all of his exhaustive testing 😊



INTRODUCTION TO THE RD2000 EDITOR

The Software is a powerful editor which can change settings on the RD2000 / RD2000 EX using MIDI system exclusive messages - Sysex - and Control Change CC messages. The RD 2000 has a small screen and finding settings is not always easy, with many layers of controls and tabs. This software uses the large display of PCs' and Macs to lay out the controls in a friendly way. The software also works with screen readers so people with poor or no vision can edit the RD2000! You can also precisely tune the RD2000 pianos to different temperaments including historical temperaments. You can save settings on your computer and use them on other programs or share with others. You can search programs and tones. You can map midi messages. The list of features is long.

From version 3.9.7 it includes support for the RD2000 EX Expansion with 31 new VPiano tones - from 2 new models German Concert and Essential Upright piano. You need to purchase the EX-expansion from the Roland Cloud to use these new tones.

ACCESSIBILITY

From version 4.1.2 I have changed the code so that screen readers (spoken words) will work with this software. This will enable users with limited or no vision to edit the RD 2000. Screen readers include Windows Narrator, JAWS for Windows and NVDA and others. NVDA is free. You can move through the controls using the tab key. Arrow keys change values. Slider values are reported as 0% to 100 %. Text on buttons, combo boxes, data grids, headers and labels are read by the screen reader. The software also works with high contrast display settings.

[Accessibility](#) video

CONDITIONS OF USE

License Conditions for RD2000 Software

1. Please support this software's development. Donations for the software can be made at PayPal [Donate \(paypal.com\)](https://www.paypal.com/donate). Please Pay what you think it is worth. 😊 You can also get a link to my Paypal donation page in the Help Menu.
2. The licensee is entitled to install the full software on computers belonging to them.
2. The licensee shall not give the software to other people, resell it, distribute it, post it on a web site or attempt to decompile it or reverse engineer it.
3. The license is non-transferable.
4. At the moment the licensee will be entitled to free updates for future releases of the software. These updates will be available on my website.
5. The licensee may receive reasonable support from the author to assist them in operating the software.
6. Licensee's may request new features. The author may implement them if they are feasible and the code does not take too long to write.
7. The licensee is solely responsible for the consequences of use of the software and any damage to equipment or loss of data shall remain their responsibility.

If you accept the license terms then you may install the software. I would appreciate any feedback on layout, features, bugs, documentation, reviews, and tips' on using the software or the RD2000 or ideas on how to make it better. If you need any help at all please e-mail me.

Thank you once again.

Stuart Pryer

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INSTALLING ON A PC - WINDOWS

NB. To install on a Windows computer, log on with administrator rights and run the installer RD2000setup.msi.

The MSI contains the software, installer, free synths, settings files and pdf manuals. There is a separate executable setup.exe which checks the .net framework on your pc is up to date (4.8 or higher) and the software installation is properly managed. Note. The synths and documentation will be installed in the programme directory. C:\program files\rd2000setup for 32 bit operating systems or c:\program files (x86)\rd2000setup for 64 bit OS pcs.

NB. Software updates will normally consist of just an updated MSI file and setup.exe. The MSI installer will uninstall any previous version. The previous version must be uninstalled first. If not remove previous versions using windows control panel / add and remove programs. Then install.

The PC should be running preferably Windows 10 or 11. 32 or 64 bit. Updated with .net 4.8 or higher. Recommended PC spec. Intel Core i3 or higher, 4GB RAM, Screen resolution 1280x720 or higher. Min Spec. Intel Atom processor, 2GB RAM screen resolution 1024x600. The software takes up 47.8 MB of disk space. It may run in Windows 7 with a few minor limitations.

It has been written in the latest version of Microsoft Visual Studio 2022 and the installer has been created using the Microsoft Vsix installer project. It is a 32-bit application and will run on 32/64 bit systems.

Note. A shortcut will be placed on the windows desktop, add and remove programs list and the start menu.

[Installation video](#)

INSTALLING ON A MAC - USING WINE



You can run the software on a Mac (Intel or Apple Silicon) using Wine which is a great free app. I'm currently running Wine which runs my software perfectly on a Macbook. Wine is a Mac application which enables you to run windows applications in its compatibility layer. It can be downloaded at

<https://www.winehq.org/>



Download and install the latest release of Wine - I'm using Wine 10.6 - and also the GStreamer.framework. On the Mac, allow the software to run in the Mac's privacy settings as its not from the app store but from Github.

1. Once the two apps above are installed, just follow the wine command line instructions to run my rd2000setup.msi which will install the software from the folder your msi is in. I just place the rd2000setup.msi and the accompanying setup.exe in my user folder. Wines default folder.
2. The command line to install is `msiexec /i RD2000setup.msi`
3. The RD2000 software will be installed in a .wine hidden directory `username\.wine\drive_C\program files (x86)\rd2000\rd2000setup\rd2000.exe`
To see the hidden .wine folder on you mac `cmd +shift+(period .)`

4. Finally create an alias to the RD2000.exe file to put on your desktop so you can launch it easily.

Tip. This is optional. If you want to see the button colours so they are like windows button colours you just run `winecfg` from Wine Terminal, and goto graphics and change theme from Light to None. To uninstall run '`wine uninstaller`' in terminal. You can also 'install software' from the uninstaller form too!

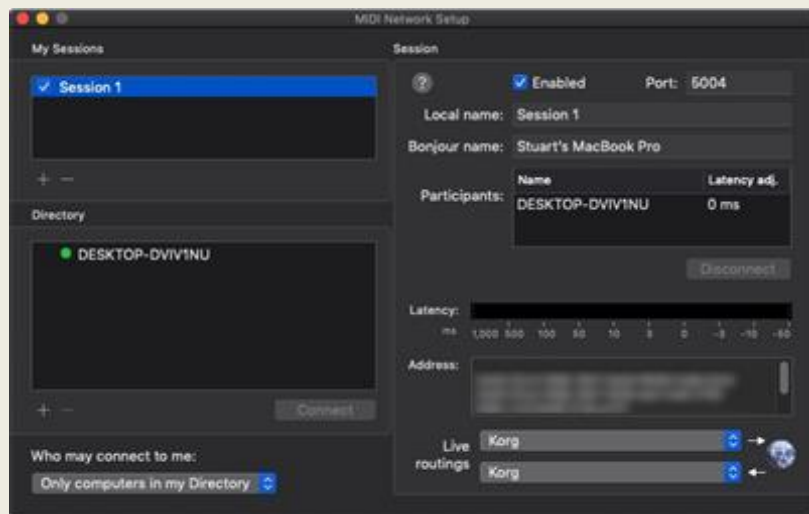
Mac min spec. OSX Mojave or higher, i3 or higher, 4gb ram or higher, Screen resolution 1280x720 or higher. Will run on Intel or Apple Silicon for M series cpu's (uses Rosetta).

Note. For soft synth users - The IAG driver (you just create Bus 1, Bus 2 etc in Audio/Midi setup) on a mac provides internal midi routing as standard. Macs are easier for routing internal midi. Windows requires third party software.

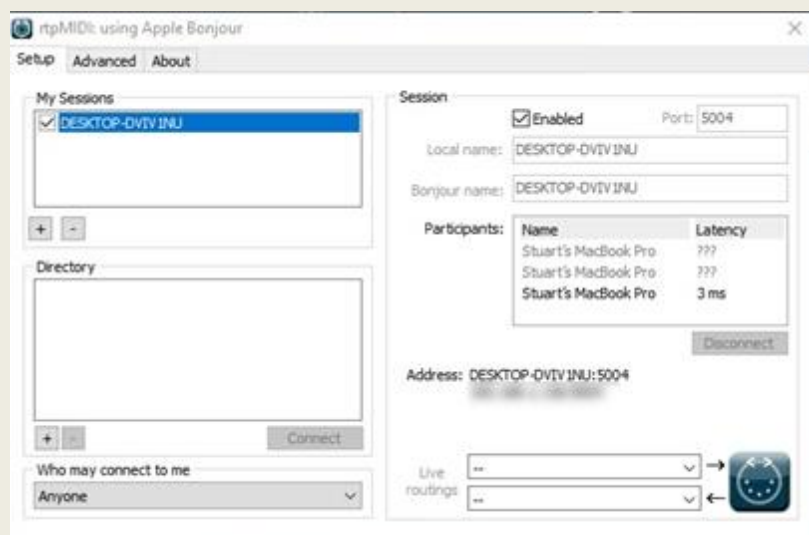
USING THE RD2000 EDITOR ON PC VIA A MAC

You can route two-way Midi data via a Mac using the free rtpMIDI program on a PC. [rtpMIDI | Tobias Erichsen \(tobias-erichsen.de\)](http://rtpMIDI.com), So if your studio computer is a Mac connected to your instruments you can run this software on a PC and connect to the Mac as an intermediary then to your instruments/midi interfaces.

Below is the Network Midi screen of the Mac (my Studio Computer). Mac Midi setup - Globe. Note the input and output ports are set to Korg -a midi interface connected to the RD2000. It is connected via my network connection (wirelessly or through a network switch) to rtpMidi running on my PC - computer name DESKTOP-DVIV1NU. The latency is 0 to 3ms. The Mac calls it Session1.



Below is my PC screen. rtpMidi is running and is connected to my Macbook. Enable the session by checking the Enabled box on the PC form.



So now a two-way MIDI connection is established between the PC and Mac. On the RD2000 Editor set midi input/ output to the name of your pc desktop. In my case Desktop-DVIV1NU

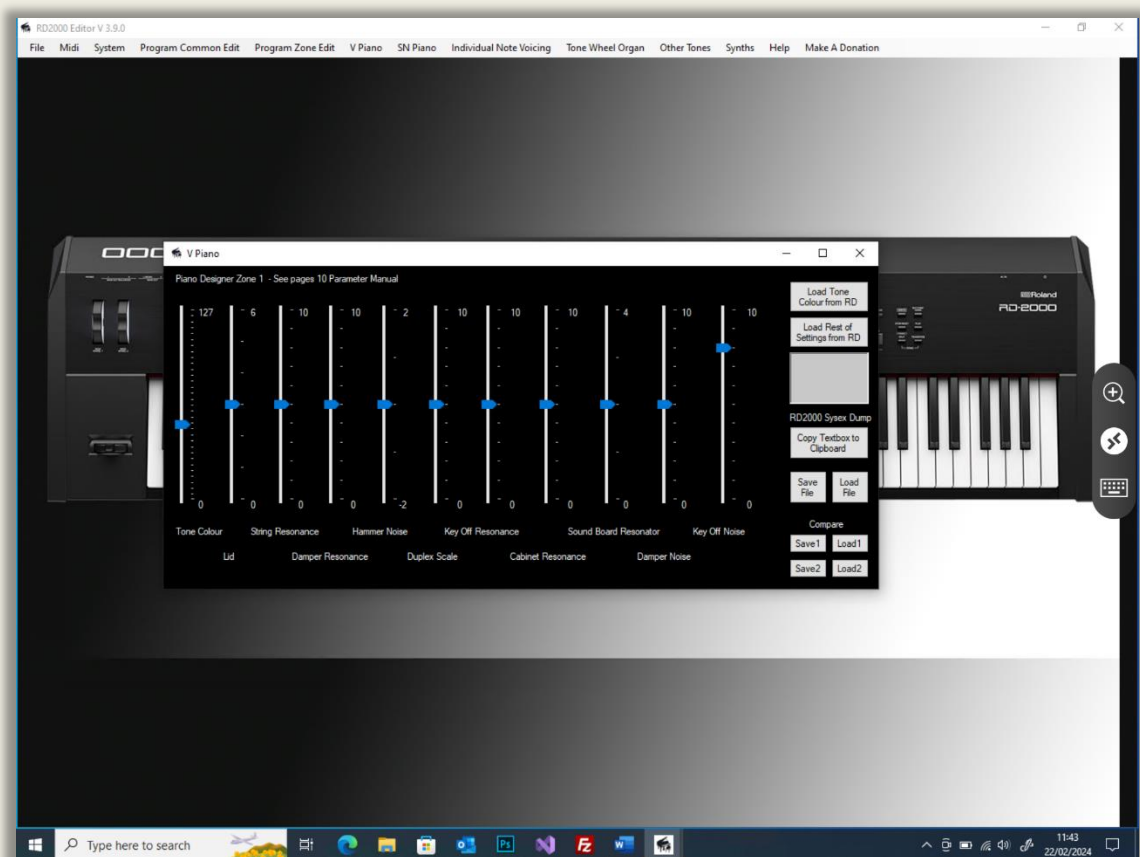
So, the RD2000 Editor on the PC is now connected midi in/midi out through the Mac to the Midi interface and the RD2000. If you want to control the PC and see the windows desktop on the Mac use Microsoft remote desktop on the Mac too. Get it free from the app store.

USING AN IPAD, IPHONE OR ANDROID DEVICE WITH THE SOFTWARE

The software can be controlled by an iPad or iPhone or Android Device etc. sitting on your RD2000. This makes it very convenient to use. In fact, any phone, tablet or computer which runs the 'new' 'Windows' app, previously called Microsoft Remote Desktop will work. So now you can control the software using the touch screen of the Tablet or phone. To use this setup, download the Free 'Windows' app on your device - from the App store or Play store. You can control all features of the software this way without needing to be near your PC. The PC only needs to be connected by Midi to the RD2000.

1. Open the Windows app on the handheld device. Make sure blue tooth is on both PC and the hand-held device. Both need to be on your local wireless network. On Windows app you need to enter your PC's name, your login and password for the PC. to connect.
2. In the Windows app make sure you send Audio to your remote PC and not the iPad. Otherwise, the RD2000 software will not be able to access your midi ports on your PC to connected to your RD2000. It will try to find the midi ports on the hand-held device.

Below is a screenshot of my iPad screen. The three 'Windows' app icons on the right allow you to zoom in and out by 'pinching', access to the RD home screen and onscreen qwerty keyboard. Instead of a mouse you use the hand-held devices touch screen. The whole windows 10 or desktop will be visible.



As you can see the image quality is excellent. You have access to all of the RD2000 software's controls and forms.



You can zoom into a form easily using your fingers on a touch screen. Here is the VPiano editor form filling the iPad screen. You now have a touch screen for the Rd2000, but much bigger than the Rd2000 screen and very responsive!

USER MANUAL

Important. This pdf help file rd2000.pdf will be copied to the same folder as the software's exe file during installation. Normally C:\program files...\RD2000\rd2000setup - do not change the pdfs name. NB. The help file won't work if you name it 'something else' or it's placed in another folder. You will be able to access it from the program 'Help' Buttons which will automatically open your browsers pdf reader and then open the file. Tool bar tips also appear most commands,

STARTING THE SOFTWARE

Your PC should be located above or adjacent to the keyboard. As the software is mainly mouse driven, all you really need near the RD2000 is a screen and mouse. Connect the two devices using midi cables or usb between the PC's midi port/usb port and the RD2000. USB hubs are not recommended unless they are powered.

Turn on the RD2000, turn on the pc and run the program. When you run the program, configure the midi device by using the '**MIDI**' form. Then set the midi channel of the software (I normally use 1 - this is the default value). Then open the midi port. Midi channel 16 is the default RD2000 program / bank change channel.

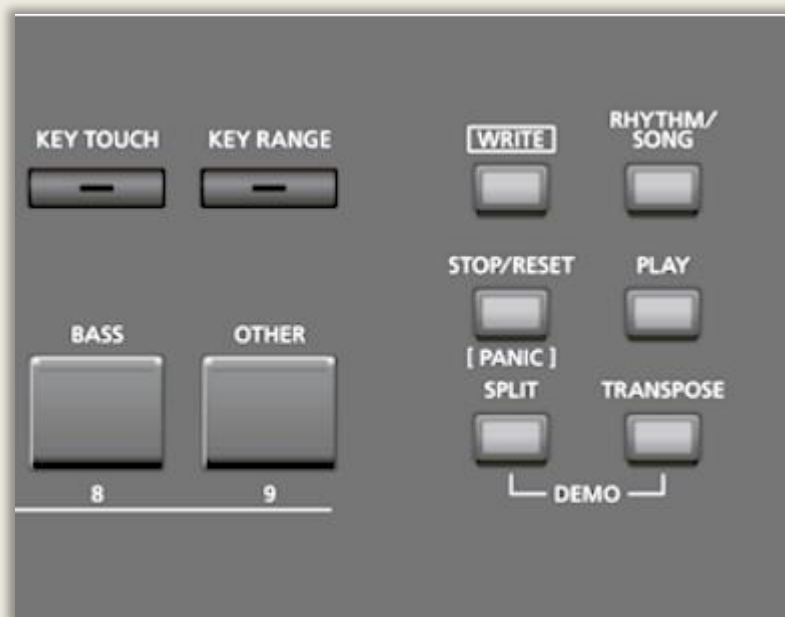
Please contact me if you have any problems.

[Editing settings using the Editor](#) Video

WORKFLOW

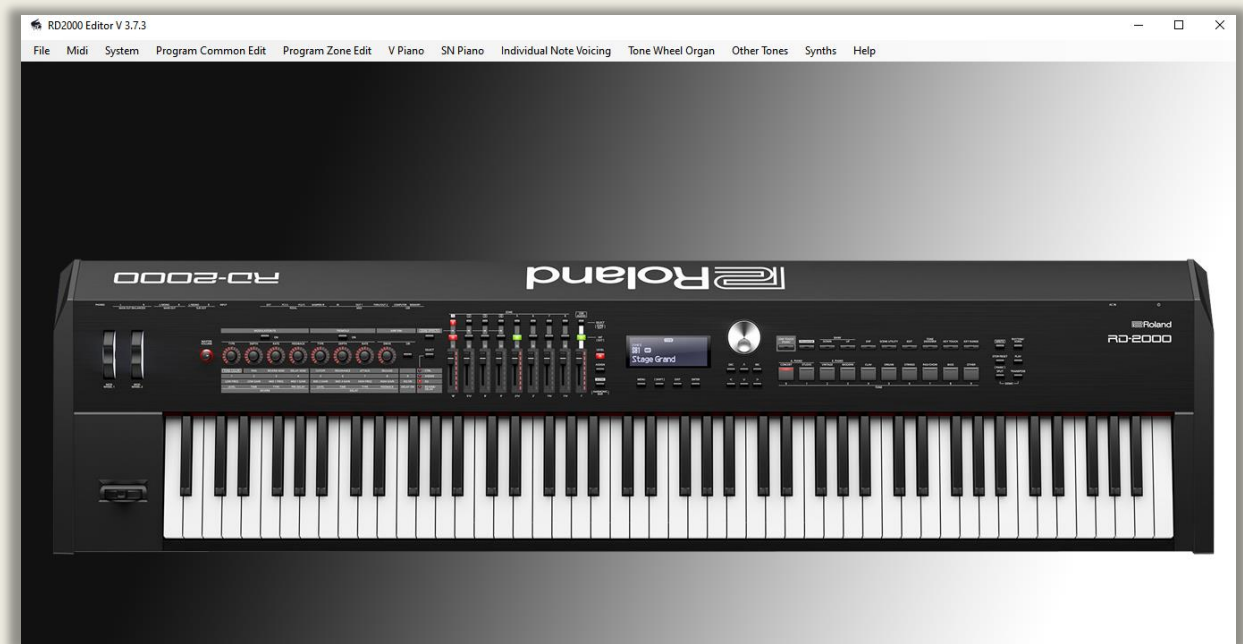
Two important points!

1. The software sends and receives Midi Channel Voice messages, Control Change CC messages and System Exclusive (Sysex) messages.
2. It can receive settings from the RD via Sysex.
3. When a program is created by a user it is stored in temporary memory of the RD2000. If the program is changed or the RD2000 switched off the edits will be lost. There is no way I know of 'Writing' the edits using MIDI. The user must **WRITE** the program using the RD2000 **WRITE** button at the top right of the control panel. This writes to User memory which will save the edits. The RD will ask for a name, the software can send the name the user types on the program name form. But the user must select a program slot on the RD2000 or overwrite one not required, to store the saved program.



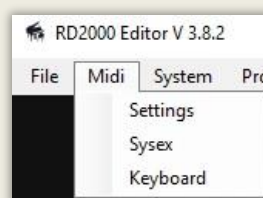
Remember. Once you have edited a sound it is still in the temporary memory of the RD2000. You have to **WRITE** it on the RD and save the program to a location in one of the 300 program banks. If you don't, it will be lost when you change RD programs or switch off.

THE RD2000 EDITOR - MAIN FORM

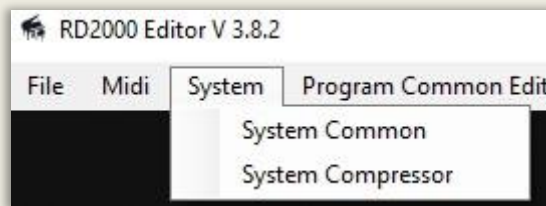


The main screen has a menu system at the top. Each menu item is described in detail later.

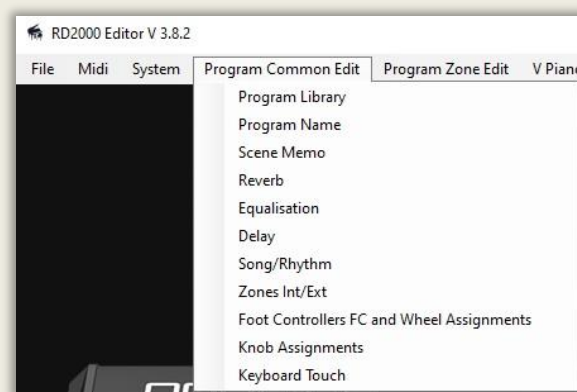
1. File /Exit- closes the midi port and application.
2. The Midi - menu allows the user to set up the midi input/output port for the software. This is used to turn on or off the midi in and out ports or if the user wants to change the midi routing. It also contains the Midi Mapper. There is also a two-octave keyboard. Note to use midi you need to have at least one midi in and one midi out connecting the RD. There is also a sysex viewer - - make sure midi thru is off. The second menu option enables sysex to be input and sent. As well as IRQ sysex dump requests from the RD2000. Finally, the third menu is an 88 note virtual keyboard.



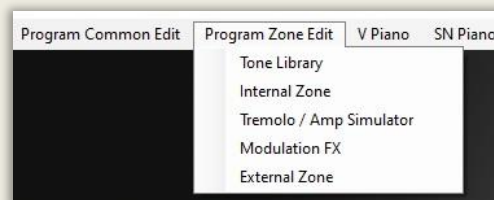
3. System - allows changes to system wide parameters of the RD2000
- system common and system compressor.



Program Common Edit - menu allows modification of the main functions such as delay etc. which are not zone specific

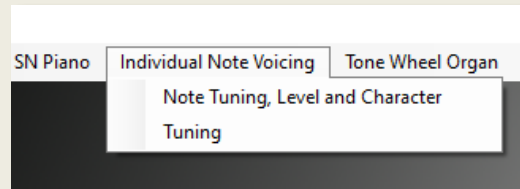


4. Program Zone edit - these are parameters which are zone specific.

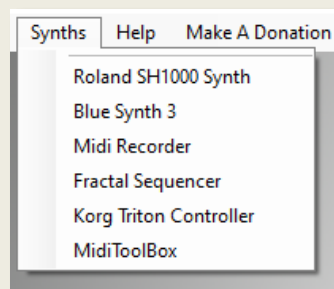


5. The V Piano - menu accesses the main control screen for the V Piano editor. VPiano only exists in Zone 1. This includes the German Piano expansion and Essential Upright Piano models if you have purchased the EX expansion from Roland Cloud - this is a lifetime license.
6. The SN Piano - menu accesses the main control screen for the Supernatural Piano editor. Select Internal Zone first which is the Zone in which the SN Piano you want to edit is loaded.

7. Individual Note Voicing - Note tuning, Level and Character menu item allows you to edit note by note Tuning, Character and Level and also download voicings for Vpiano, Supernatural Piano, Clav and EP tones, edit them, save them and load them. You can add historical or other temperaments' too. The Tuning Menu item is the equivalent of a digital tuning hammer and can be used with tuning apps.

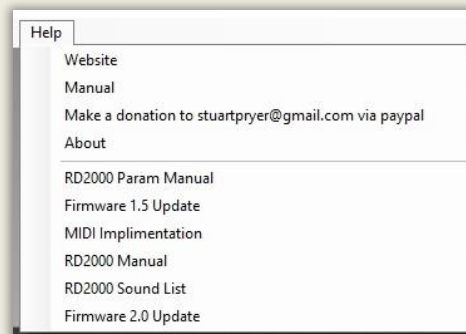


8. Tone Wheel Organ - emulation of a Hammond Tone wheel organ such as C3, B3 and A100.
9. Other Tones - editor for the remaining PCM tones
10. The 'Synths' menu shows a pdf of my free Roland SH1000 synth emulation. It runs in Reaktor 6.x (Full or free Player version) as a standalone or VST/AU plugin in a DAW, Windows and Mac. The sh1000v24.ens ensemble can be found in the RD2000 editor installation directory. There is also The Blue synth 3 VST dll plugin and the stand-alone version in the installation directory plus my Midi Recorder and arpeggiator. Finally, my Fractal Sequencer Korg Triton Editor and MidiToolBox app which can be used with the Entropy Tuner. See later.



The Help button accesses my website and the RD2000.pdf help file. This is installed automatically with the software in the installation directory. Updates can be downloaded from my website and the pdf file can be overwritten. Software Beta versions of the next release are now available on my website. If you want to revert from a beta, uninstall using add and remove programs. Then reinstall current version. Website Link on Help Menu.

There is a link to Paypal if you can make a donation for the software. There is also quick access to the RD2000 parameter manual. Owner's manual and midi implementation manual. Finally, firmware 1.5 and 2.0 update documents. Copyright Roland Corporation. Note RD2000 Firmware Version 2 update allows the addition of a new V-Piano engine - The German Piano. The EX upgrade also adds new EX firmware and the Essential Upright Piano model. [The Help Menu](#) Video



EXITING THE SOFTWARE

To Exit the program, click on the 'File/ Exit' drop down menu at the top left when the composer form is loaded. The software will close the midi port and terminate the program. Use this rather than closing down the window with the Window's 'X' top right-hand corner of the main window. This is so all notes are stopped and the midi port is closed properly.

TOOLTIPS

Tooltips are provided for all slider controls. Just hover the cursor over the control and the tool tip appears and shows the value. Hold Ctrl and arrow buttons for fine control.



A typical Slider Tooltip showing precise values. Hold Ctrl and use the arrow keys for precise movement.

VIDEOS

By popular request I have now recorded some videos on how to install and use the RD2000 Editor. They are on my website - see the screen shot of the RD2000 section on my home page below. This list of 15 support videos will change and I'm happy to take requests for new videos. The first video is the installation video.

Roland RD 2000 Editor

The Roland RD 2000 is one of the world's best stage pianos. It combines superb modelling and sampling technology with a marvellous action, beautiful build quality and it's also a great Midi controller. Thank you Roland Corporation. The RD has a small screen, but sometimes users want to see the controls without scrolling through lots of menus. So I wrote this software which uses the far larger screens of computers to make life a bit easier. It runs on Windows (11, 10, 8 or 7). Now includes the new German Vpiano expansion features plus more. Download the installer here: [Rb2000 editor Version 4.x](#). Run rd2000setup.msi to install. All documentation is included with the installer. To download just the documentation, click here [Documentation](#)

The software is donationware. To make a donation via Paypal please click on this link [Make a Donation](#) or in the application's menu or in the documentation.

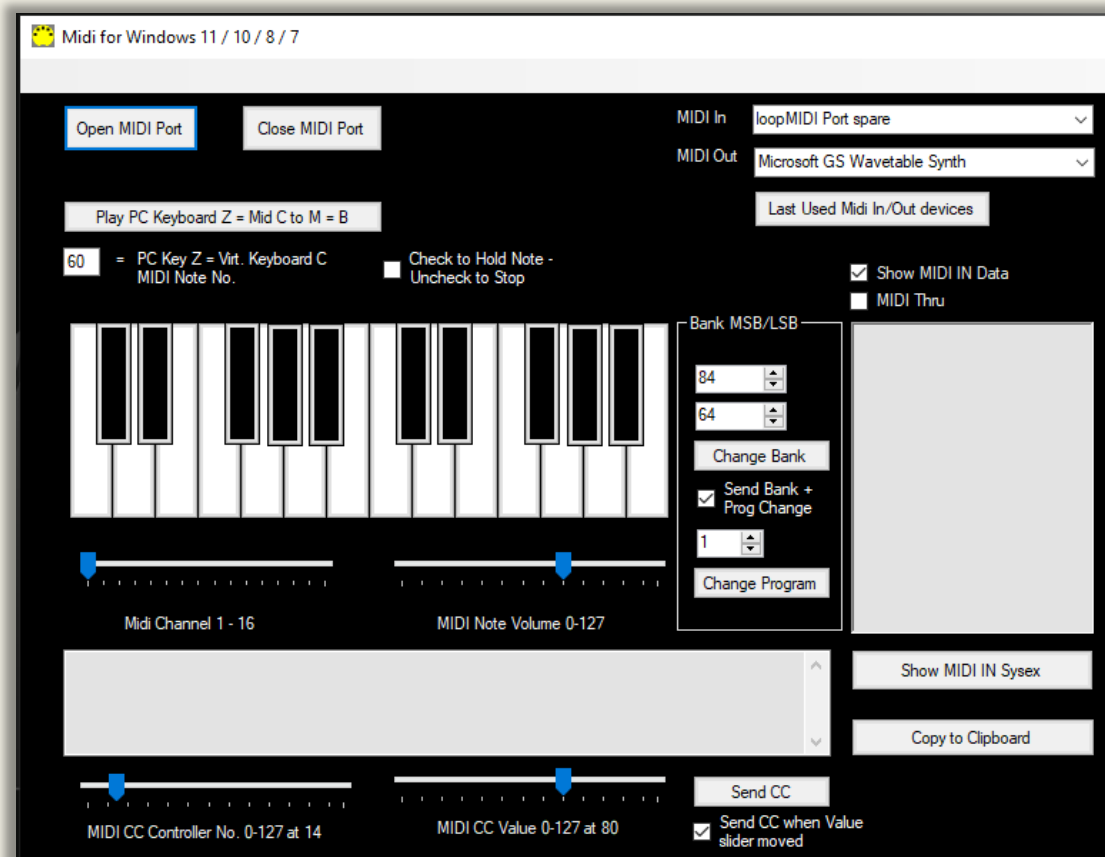


SUPPORT VIDEOS

[Installation video](#)
[Accessibility](#)
[Midi Settings Form](#)
[Editing settings using the Editor](#)
[Tone Library](#)
[Program Library](#)
[Loading Tuning Files](#)
[Editing Tuning Files](#)
[Saving and Loading Tuning Files](#)
[Controlling external instruments or VSTs](#)
[The Free Synths](#)
[The Help Menu](#)

Links to the various videos are included in this document as well.

SETTING UP MIDI IN/OUT FOR THE SOFTWARE



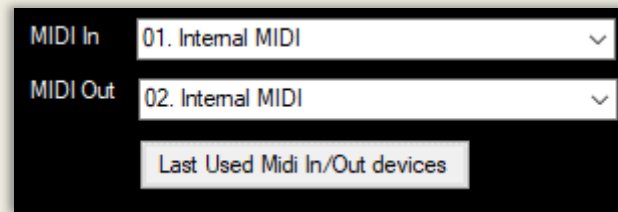
This software generates Channel Voice data, Control Change (CC) data and system exclusive (sysex) data for sending to the RD2000 and can also receive this data from the RD2000.

MIDI. Connect the RD Keyboard to the PC (midi ports or usb) midi out on the PC to midi in on the RD and midi in on the PC to midi out on the RD. Note. The generic driver is MIDI class compliant and uses the operating systems in-built midi driver. Win and Mac.

USB Audio Out. Make sure the Roland usb driver is installed (Vendor) if you want to use audio over USB for Windows and Mac. Select Vendor driver in RD2000 in system menu. Write the setting on the RD. Turn the RD2000 off and then On. You need to set USB audio out from the RD to on, showing red led, set RD2000 audio out volume level with the slider.

USB Audio In. Set volume level in to RD2000 to on showing green led for ext sounds volume slider coming in. Now usb audio comes in and goes out from the RD. Note. Audio in/out needs to be set to RD2000 on the PC or Mac.

[Midi Settings Form](#) Video



On the Settings/Midi Settings form select the MIDI In and Out devices (RD2000 for both unless you are Mapping - see later) and press 'Open MIDI Port' button. The button will turn Green. When you close the MIDI Port the Open Midi Port will turn pink and the software saves your selection of Midi In/Out devices to the Windows Registry, so next time you can just click 'Last Used Midi In/Out devices' and Open the Midi Port and you don't have to reselect. If your device list changes you will just need to manually select the devices again.

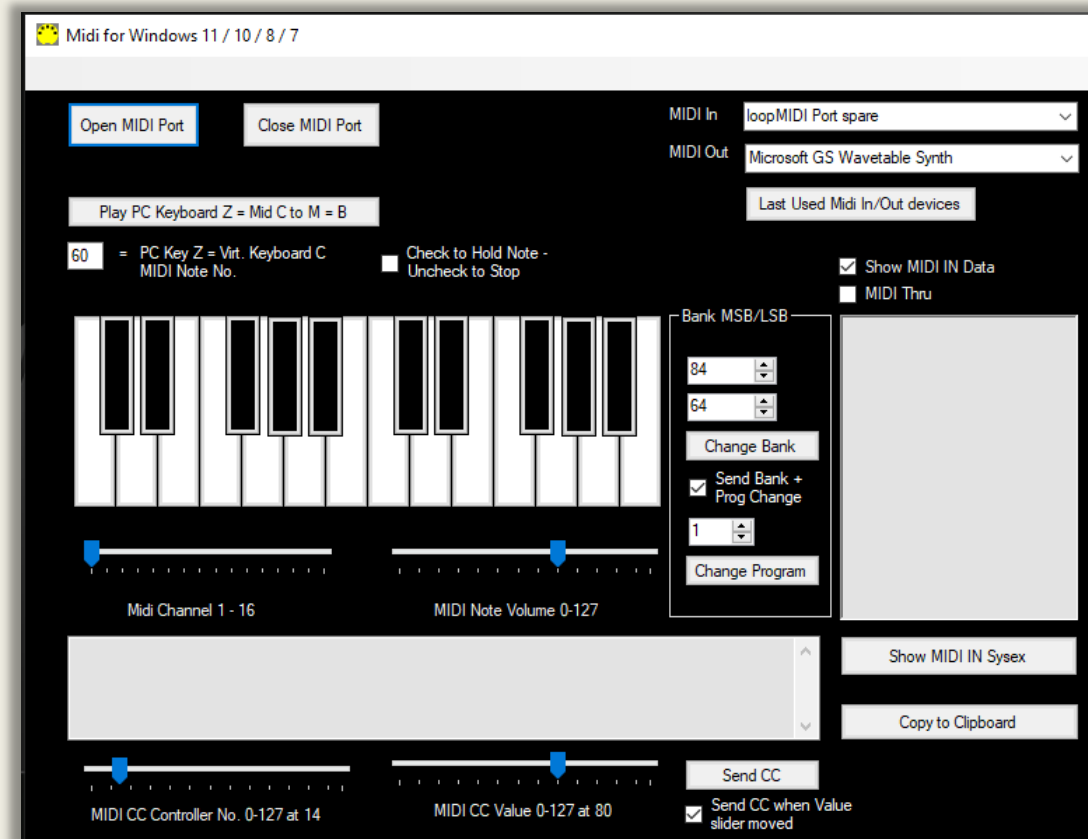
Midi/Settings on menu bar. An example of the midi devices in/out is shown above. Your list will look different. For downloading and sending settings from/to the RD2000 set both Midi In / Out to RD2000.

1. Set midi channel to correct channel - default on this software is 1.
2. To check all is working, use the mouse to play the virtual keyboard - OR
3. You can play the Midi software or device from the PC keyboard. Press 'Play PC Keyboard Z= Mid C...' button **immediately** before playing the pc keyboard.
4. The RD2000 should sound its current program.

You can hold a note set by the text box with 60 in it by checking the Hold Note checkbox. The Note number box will turn green. The note is releases when it's unchecked. You can change the Midi Note number from 60. 0 to 127.

The 'Midi Through' checkbox allows data to pass from the midi in port to the midi out port of this app. If unchecked it won't pass through - default. Note if midi thru is enabled in this software and your device you will get a midi loop and crash the app. Midi thru is used if you are generating midi from another app/device and monitoring it here before forwarding it with this app to yet another app/device.

SENDING NOTE DATA



The MIDI form has a nifty virtual keyboard for remotely playing the Midi software or device whilst you edit the sounds on the PC. The keyboard has a range of 2 octaves.

If you want to play the Midi software or device using the PC keyboard - press the 'Play PC Keyboard Z=....' Button on the midi settings form just before playing. You must press the 'PC keyboard' button every time - immediately before you use the PC keyboard to play the Midi software or device. PC Key z = Note C. s = note C#. x = note D. etc. The notes run from z s x d c v g b h n j m. Which map to C, C#, D, D# etc. The 'PC Keyboard' is polyphonic, so you can play chords. By the way the polyphony depends on your PC. My very old Pentium 2 - 400mhz could play 4 notes at once. My ancient laptop only two notes at once. Depends on their keyboard buffer.

The pitch of note Z can be set using PC Key Z or Virtual Keyboard C = Midi Note text box at the top left of the form. This facility to play from the PC keyboard has been added to enable the user to audition sounds whilst editing.

SENDING MIDI CONTROL CHANGE MESSAGES CC

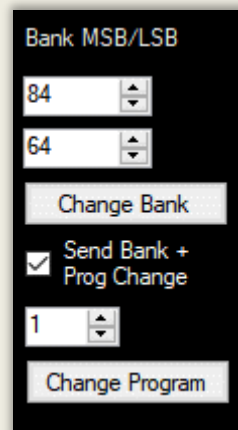
If you want to send Midi CC Control Change to the RD2000 then select the controller number 0 to 127 using the left-hand slider and the controllers value right hand slider at the bottom of the form.

Data is sent immediately if the 'Send CC when Value Slider is moved' check box is checked and the right-hand slider is moved. If unchecked press the Send CC button. See RD2000 midi implementation manual pages 1 to 4 for CC messages the RD responds to.

Note. Some CC controller numbers require two Midi CCs to be sent in quick succession - eg Bank Change - this has its own section on the form. These require a separate MSB/LSB as the number of values available is over 127.

SENDING PROGRAM / BANK CHANGE

You can change the MIDI Bank and Program on midi instrument using MIDI. Note. The RD2000 uses a MSB and LSB bank address. You can also use the Program Library instead which is easier. There are 128x128 banks available in the midi spec. and 128 programs.

A screenshot of a software interface for sending MIDI bank and program change messages. The interface is titled "Bank MSB/LSB". It features two numeric input fields: the top one contains "84" and the bottom one contains "64". Below these fields is a button labeled "Change Bank". Underneath the button is a checked checkbox followed by the text "Send Bank + Prog Change". At the bottom, there is another numeric input field containing "1", followed by a button labeled "Change Program".

Set the programme number 1 to 128 and press button "Change Program". The Bank MSB and LSB default are set for the RD2000 for Banks starting at 01. It easier to use the Program Library form to select Programs. See later.

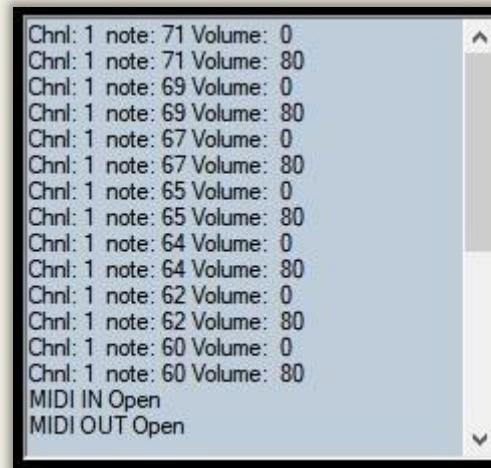
There are $128 \times 128 = 16384$ banks available in midi, with each one containing 128 programs. To try it on another midi instrument. Set Program to say 02 and click 'Change Bank'. Normally instruments need the program change message sent immediately after for this to work, so leave the check box ticked. See later how to change Tones, Rhythms and Program banks on the RD 2000.

Note that if you set the MIDI channel to "10", Bank 1, you will get the General Midi percussion instruments with each key sounding a different percussion instrument. There is no change if you vary the MIDI instrument number. If Bank 1 is set to 01 then you will get the General Midi instruments in the RD.

Note. Program change default channel on the RD is Midi channel 16.

RECEIVING NOTE DATA MIDI MESSAGES

Note data is a MIDI a Channel Voice Message and is sent whenever a midi instrument is being played.



In the example above I opened the midi port and sent a series of 7 notes to the app and they appeared like this. The list shows the Midi Channel (1 to 16), note number which will lie between 0 to 127. In this case 60 to 71 each with a volume of 80. (Volume range 0 to 127). With every note in this example there is a following note off message. Volume 0. The last note is at the top of the list with the oldest at the bottom.

RECEIVING CONTROL CHANGE CC MIDI MESSAGES

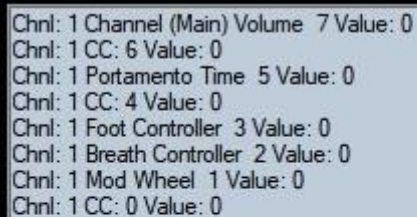
Data shown on the Main text box can be filtered by the check box 'Show Midi Data' as to whether to show Notes and CC messages as they arrive. Newest data at the top of the list. Notes, Sysex and CC data is only passed through from the Midi input to the output port of the app if midi thru is checked.

CC data takes the form for example - Bank change

Bn (data1) (data 2),

B in Hex is 176 in decimal (if n=0) to specify CC type message. n is the Midi Channel.

The Control Change CC data has the most common values described by text. See below where I have sent a series of CC messages to the app. Chnl is the MIDI channel the CC message is being sent to. Undefined CC messages just show CC. Defined ones such as 'Mod Wheel' = CC 1, Value 0.

A screenshot of a text box within an application window, displaying a list of MIDI Control Change (CC) messages. The messages are listed line by line, each showing the channel number, the CC number, and the value. The messages are: Chnl: 1 Channel (Main) Volume 7 Value: 0, Chnl: 1 CC: 6 Value: 0, Chnl: 1 Portamento Time 5 Value: 0, Chnl: 1 CC: 4 Value: 0, Chnl: 1 Foot Controller 3 Value: 0, Chnl: 1 Breath Controller 2 Value: 0, Chnl: 1 Mod Wheel 1 Value: 0, and Chnl: 1 CC: 0 Value: 0.

```
Chnl: 1 Channel (Main) Volume 7 Value: 0
Chnl: 1 CC: 6 Value: 0
Chnl: 1 Portamento Time 5 Value: 0
Chnl: 1 CC: 4 Value: 0
Chnl: 1 Foot Controller 3 Value: 0
Chnl: 1 Breath Controller 2 Value: 0
Chnl: 1 Mod Wheel 1 Value: 0
Chnl: 1 CC: 0 Value: 0
```

RD 2000 MIDI CC

Summary of RD2000 Controller Assignments

RD2000 Controller	Assign Mode CC Default values for a Program but you can set CC values	Ctrl Mode CC Values Fixed Midi Spec defined CC's
Knob 1	RD Tone CC14	Unassigned
Knob 2	RD Pan CC15	Pan CC10
Knob 3	RD Joystick CC16	Reverb CC91
Knob 4	RD Joystick CC17	Delay CC93
Knob 5	RD Cutoff CC18	Cutoff CC74
Knob 6	RD Resonance CC19	Resonance CC71
Knob 7	RD Attack CC20	Attack CC73
Knob 8	RD Release CC21	Release CC72
Button 9	Unassigned	Unassigned
1 Slider/ Midi Chnl/Zone	Master Volume CC7 for Chnl	Master Volume CC7 for Chnl
Damper/Sustain Pedal	Sustain CC64	Sustain CC64
Mod Wheel 1	Modulation CC1	Modulation CC1
Mod Wheel 2	Unassigned	Unassigned
Expression Pedal	Volume CC11 % of Master Volume	Volume CC11 % of Master Volume
Joy Stick Y	CC16	Modulation CC1
Joy Stick X	CC17	

Assign mode here you can set the midi CC values sent from the RD to the external sound module for an RD Program. Each program can have a different assignment. Hold shift button on the RD whilst moving an RD control to set the CC value. Two wheels, 1 slider, button 9 and 3 Pedals can be assigned to CC0 to 127 or Off. Note. You can only use one slider CC7 per midi channel unless you map. See the Parameter Manual Pages 7 and 8. Also see Foot Controllers and Wheels and Knob assignments pages in Program Common section. Default settings knobs 1 to 8 CC14 to 21. Ext Pedal CC7 Volume. Fader with level button lit CC7 Master Volume. Mod Wheel CC1 and Mod Wheel 2 unassigned by default. Assign to a CC as required.

Ctrl (Control) mode (Ctrl Button) the Midi Control Change CC values sent from the RD for the current external midi channel (Zone 5 to 8, midi chnl 1 to 4) and the control of some internal parameters. These are fixed. to: Knobs: 2 = Pan CC10, 3 = CC91 Reverb, 4 = CC93 Delay, 5 = Cutoff CC74, 6 = Resonance CC71, 7 = Attack CC73, 8 = Release CC72. 1 & 9 are not assigned. The sliders are all set to Midi Control Change CC07, master volume with the midi channel defined by the midi channel of the external zone selected. So only 1 slider per midi channel unless you map them. This is a Program Common setting.

See also Table of Midi CC messages at the end of this document and the RD2000 documentation for CCs' which it responds to.

HARMONIC BAR MODE

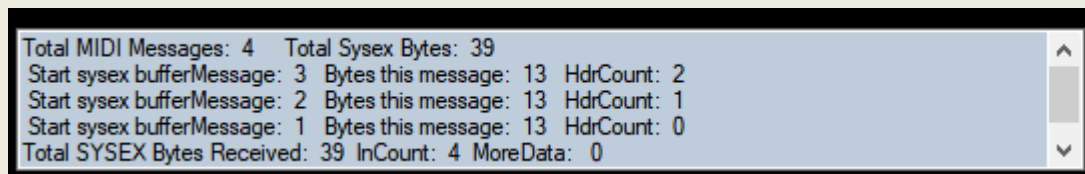
The Harmonic Bar (Drawbars) setting can be activated by pressing 'shift+scene'. Each drawbar setting can also be controlled by external Midi CC messages. Remember as you pull the drawbar out and towards you the sound gets louder, the opposite to a normal fader.

16' to 1' (slider 1 to 8) can be controlled using CC 102 to CC 110 sent from an external controller. Each drawbar responds to external CC values of 0, 16, 32, 48, 64, 80, 96, 112 and 127 covering the 0 to 8 drawbar positions.

In this Harmonic mode these sliders output these CC values too but Midi channel 1 to 4 for Zone 1 to 4 and midi channels 1 to 4 for zone 5 to 8 also.

RECEIVING SYSEX MIDI MESSAGES

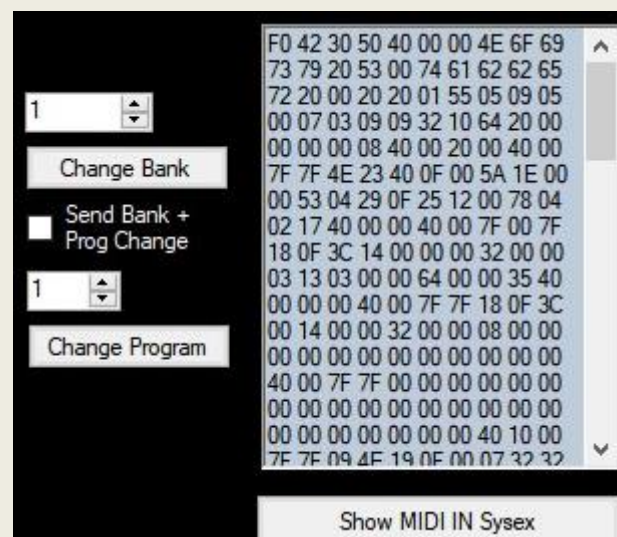
To receive a midi data dump from an instrument, set the instruments midi out to the midi in of the app. Instruct the instrument or software (This is done on the Load buttons in Vpiano for instance) to start the dump. Incoming data will be displayed as it comes in together with Sysex data. When the midi sysex dump is complete (F7 at end of sysex data), the bottom text box will report 'Start Sysex Buffer Message'. Together with its sysex message number in list starting at 1 and its size in bytes. HdrCount is message number - 1. See below.



Total MIDI Messages: 4 Total Sysex Bytes: 39
Start sysex bufferMessage: 3 Bytes this message: 13 HdrCount: 2
Start sysex bufferMessage: 2 Bytes this message: 13 HdrCount: 1
Start sysex bufferMessage: 1 Bytes this message: 13 HdrCount: 0
Total SYSEX Bytes Received: 39 InCount: 4 MoreData: 0

You can then display Sysex data received in the main textbox by clicking the 'Show MIDI IN Sysex button. Note the bottom text box shows the total number of midi messages received by the software. In the image above 4 messages were received in total, of which 3 were Sysex. The latest Sysex message is at the top of the list and can be displayed.

Tip. Sysex is only shown if the Show MIDI IN Sysex button is pressed to display it after a dump is complete. See below.



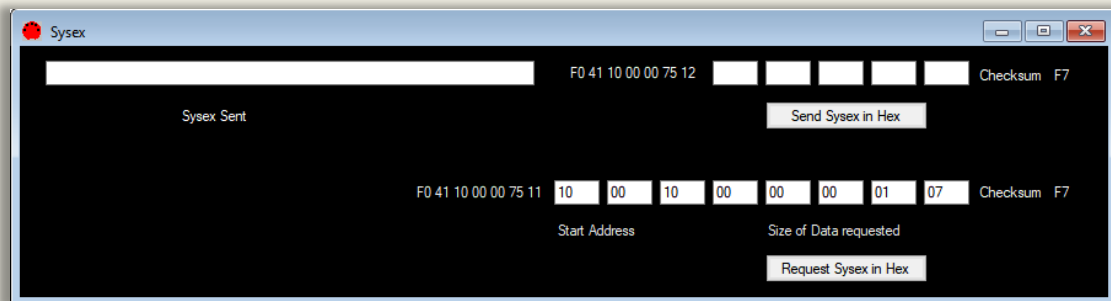
The entire main text box can be 'copied to the windows clipboard'. 'Copy to clipboard' button. This includes the complete dump sysex data.

Setting Up Midi

The 'Midi Through' checkbox allows data to pass from the midi in port to the midi out port of this app. If unchecked it won't pass through. Note if midi thru is enabled in the software and your device you will get a midi loop and crash the app. Midi thru is if you are generating midi from another app and monitoring it before forwarding it with this app to another device.

Note. If you are pulling setting of the RD - say VPiano - make sure that the Midi Thru is unchecked. Its default setting. Otherwise, you may get a midi loop unless Local Control is set to off on the RD.

SENDING SYSEX



Here you can send a Sysex string of your choice. The sysex will be sent to the output port and the sysex string will be displayed in the 'Sysex Sent' text box on this form and the midi form. Note some of the RD strings are longer such as the 4 bit ones. It's easier to use the Load button on say Vpiano to request and receive midi dumps.

Users can enter any sysex string, which complies with the RD2000 sysex implementation manual using the 'Enter Sysex feature'. Note values must be in hex as per the manual and in pairs. 0 to 9 and A to F. eg. A9, 00, 7C. Note 0 must be entered as 00. The Roland checksum is automatically calculated. Enter values and click "Enter Sysex in Hex"

Sending System Exclusive messages

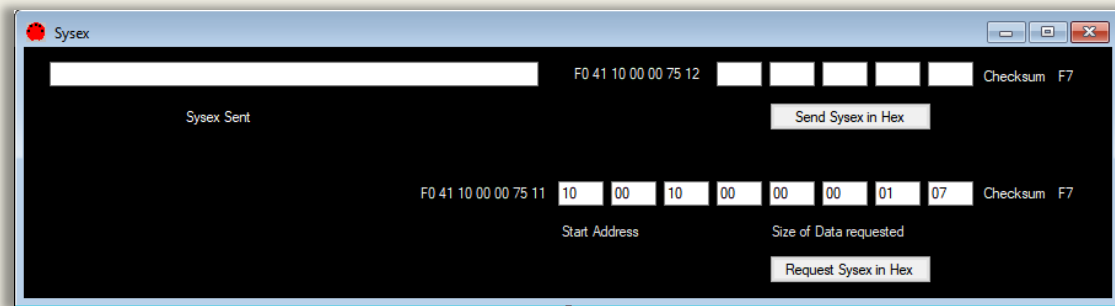
So is the first part of the string entered automatically =
F0 41 10 00 00 75 12

F0 = start of sysex string
41 = Roland ID
10 00 00 = Device ID
75 = instrument ID = RD 2000
12 = Message type for transmission of data to the RD2000

Enter HEX values in pairs in the 5 white text boxes of your choice =
PARAMETERS

The final part of the string is the Roland Checksum - to ensure the data is properly sent

F7 ends the sysex string.



The screenshot shows a window titled "Sysex" with a dark background. At the top, there is a text box labeled "Sysex Sent" and a "Send Sysex in Hex" button. Below this, there are two rows of hex input fields. The first row shows "F0 41 10 00 00 75 12" followed by four empty boxes and a "Checksum F7" label. The second row shows "F0 41 10 00 00 75 11" followed by four boxes containing "10", "00", "10", and "00", then two more boxes containing "00" and "01", and finally "07" and "Checksum F7". Below the second row, there are labels "Start Address" and "Size of Data requested" pointing to the respective groups of boxes. A "Request Sysex in Hex" button is at the bottom right.

Requesting MIDI dumps using Sysex

The Request Sysex button sends an IRQ - information request - command to the RD.

F0 = start of sysex string

41 = Roland ID

10 00 00 = Device ID

75 = instrument ID = RD 2000

11 = Message type for request for data from the RD2000

The first four boxes define the start address of the data which you enter. Enter values in Hex. MSB, address1, address2, Address LSB

The remaining 4 boxes define the size of the data being requested starting at the start address. Enter in Hex. MSB, size1, size2, Size LSB

The final part of the string is the Roland Checksum - to ensure the data is properly sent and is calculated automatically in this software.

F7 always ends a sysex string.

To capture the Midi Dump:

1. Press 'Request sysex in Hex' button on the sysex form
2. The sysex will be stored and can be displayed in the text box on the Midi form - press 'Show Midi in Sysex' button
3. Press 'Copy to clipboard' button on the Midi form will copy the entire contents of the text box to the windows clipboard for pasting into a text editor such as notepad. The check box 'put

sysex on clipboard' when checked stores just sysex on the clipboard.

USING WITH VIRTUAL INSTRUMENTS

If you want to connect the RD2000 to a virtual instrument you will need to route the RD midi signal to the PC. Set the midi in channel of the virtual instrument to the RD2000 Zones Midi channel number. By default external zones 5 to 8 map to midi out channel 1 to 4.

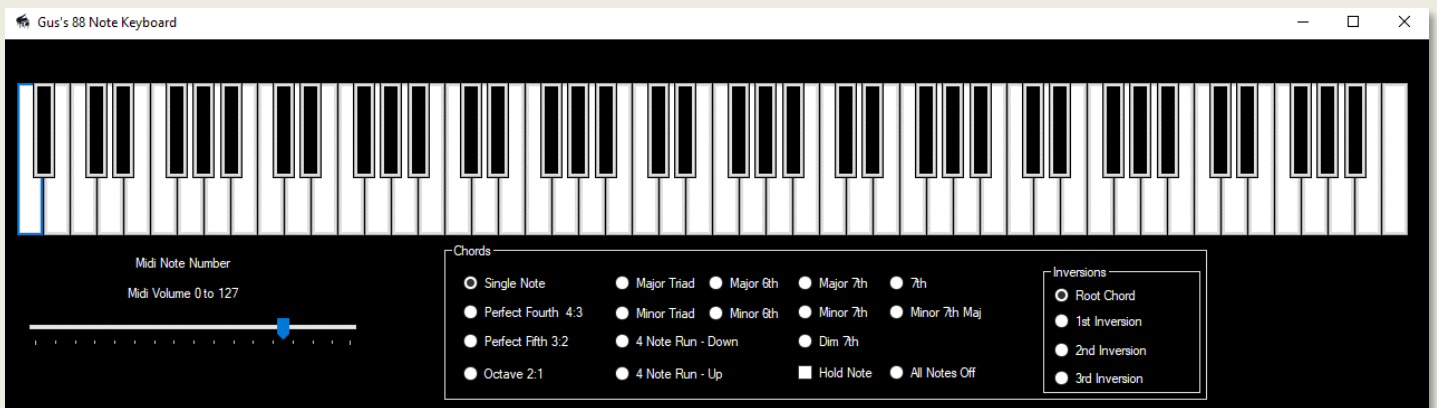
TIP. For internal PC midi routing, if you ever need to do this :-

1. On a PC Download the Freeware application for internal PC midi routing. I recommend the free LoopMIDI [Software | Tobias Erichsen \(tobias-erichsen.de\)](http://Software|TobiasErichsen(tobias-erichsen.de))
2. Set the Midi **output** of the RD2000 editor to say LoopMIDI (internal midi)
3. Set your virtual instrument midi **input** to LoopMIDI (internal midi)
4. You can now transfer midi from pc application to the other application on the same PC!
5. On a Mac you just use the inbuilt IAG driver.

RECORDING USING SOFTWARE SUCH AS LOGIC, BITWIG, BANDLAB SONAR, CUBASE ETC.

You can record from the RD2000 directly into a midi/audio PC sequencer/editor like Bitwig, Logic, Cubase or BandLab Sonar. The user can send RD2000 midi out and audio out to midi and audio in on the DAW. This will enable you to edit the recording as desired in the DAW. Then send midi and audio back to the RD. Remember the Roland generic driver will only transfer Midi. The Roland Vendor driver will transfer both Midi and audio. See tutorial 1.

GUS'S 88 NOTE KEYBOARD



The 88 Note Keyboard is dedicated to Gus at Roland Clan Forums for his fantastic efforts and hard work in testing the program.

The keyboard is useful when designing sounds as you can hear the entire range of the standard instrument keyboard. First set Midi ports and input/output on the Midi form. It's also useful when tuning.

The Midi volume is controlled by the slider on the form. The midi channel is set on the Midi settings form.

You can play single notes, hold notes (for creating chords with the mouse) until 'all notes off' selected. Various chord types are included too, together with their first and second inversions.

To help with aural tuning I've included Octave where two notes play an Octave apart. Perfect fourth and Perfect fifth. Finally, a 4-note run which plays 4 notes in a row running down and another running up.

This form is set to be on top of all other windows forms.

RD2000 OVERVIEW

The basic building blocks of RD2000 sounds are Tones. There are 1472 tones available in total. There are OS built in sounds, 6 free Axial expansions and two Vpiano expansions. They can be edited with the Vpiano editor for modelled Vpianos. Supernatural Piano editor, Tonewheel organ editor and Other tones editor.



Each internal Zone contains one tone. Each zone can have tremolo, amp simulator and modulation added. As well as Reverb and Delay send levels. These are Zone Effects.



A collection of Zones is a Program/Scene. There are up to 8 Zones available. The program can have EQ, compression added, delay and reverb added. These are System Common / Program Common effects. There are 300 programs in 15 banks = A-O with 20 in each. Scenes are basically programs that can be assigned to the Tone buttons 0-9 on the RD for quick recall. You can save up to 100 scenes.

I recommend using the Zones as follows :-

- Zones 1 to 4 for internal RD tones. RD Midi in Channels 1-4 by default. Red LED.
- Zones 5 to 8 for external tones from a hardware or software instruments using the RD as a midi controller. RD Midi out channels 1 to 4 by default. Green LED

There are 3 main hardware setups I use with the RD2000 :-

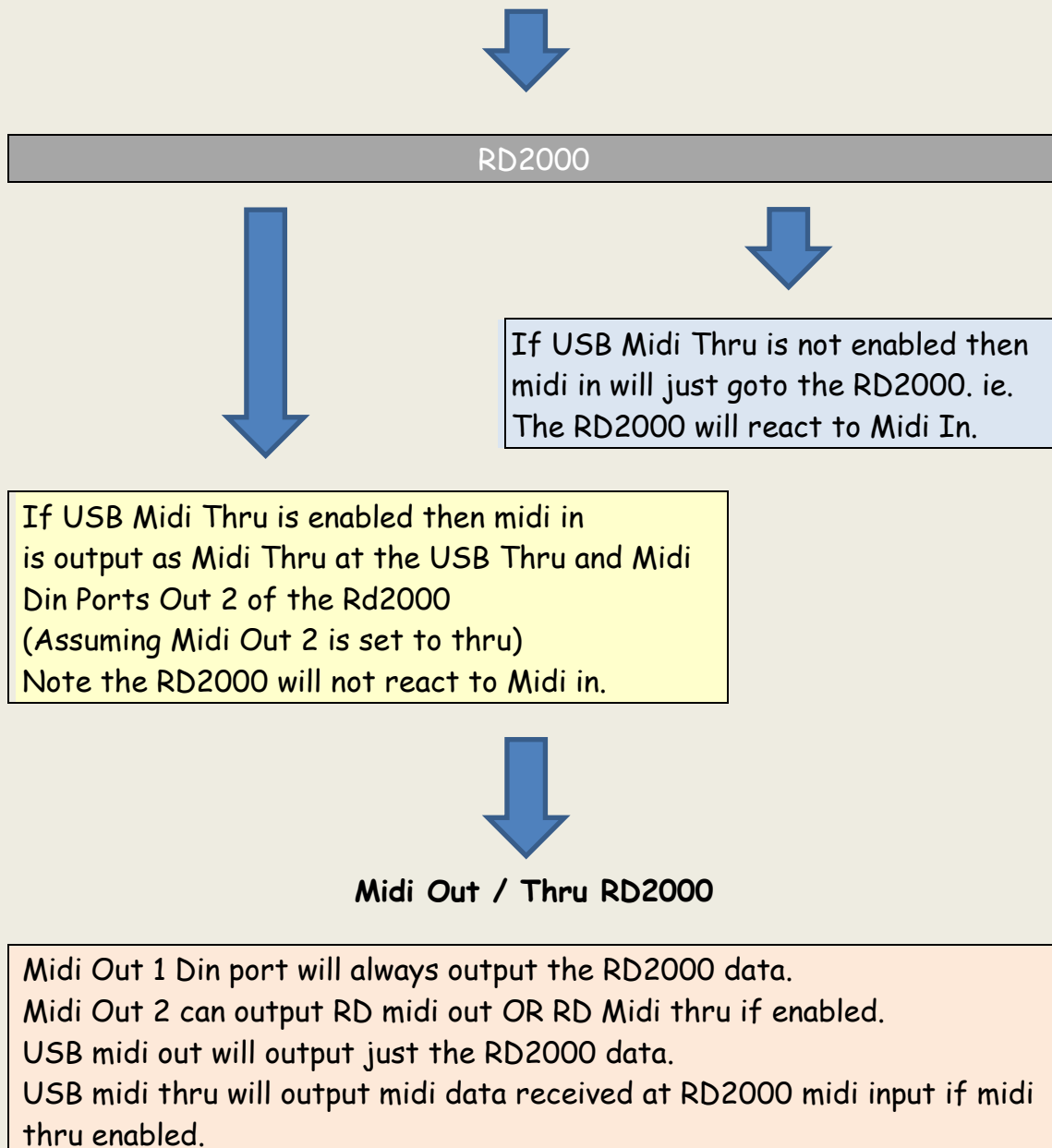
1. RD2000 only. See User Tips and Tutorials 3, 4 & 6
2. RD2000 with a second Keyboard connected. Tutorial 5
3. RD2000 Option 2 above and a computer for recording and/or using VSTs'. Tutorials 1, 2 & 7

MIDI ROUTING

Note that if you are using USB it is Midi class compliant in Windows and MacOS.

Midi In RD2000

Using Midi cables & USB. System edit / system - p33 Parameter manual.



AUDIO ROUTING

Note that if you want to use USB audio, it is not class compliant in Windows or MacOS. So, you will need to load the Roland vendor driver on your computer and set the Rd2000 to vendor driver and enable usb audio on the RD. P33 Parameter manual.

Audio Input to the RD2000

1. Analog signals sent to the 3.5mm analog input will not be routed to the USB audio out. There is no analog to digital converter in the RD.
2. Analog audio input, rhythms and songs will be mixed with the RD2000 audio at the analog audio XLR, 1/4inch outs and headphone out.
3. USB Audio in if enabled will be mixed with the RD2000 audio at the analog audio XLR, 1/4inch outs and headphone out.



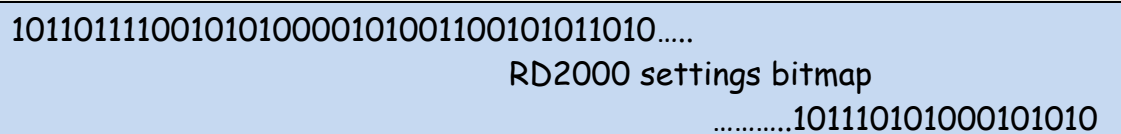
Audio Output of the RD2000

1. XLR L/R analog outputs
2. $\frac{1}{4}$ inch L/R analog outputs TR
3. Headphones $\frac{1}{4}$ inch TRS
4. Sub Outs - which take the analog data before sympathetic resonance, delay, reverb, EQ and compressor effects are applied.
5. USB digital audio from RD2000 if enabled using the USB Vendor driver for a Mac or PC will be output by USB. But will not include analog audio in - p26 & p33 Parameter manual to change settings USB audio

EDITING THE RD2000 SETTINGS



Above is a view of the RD2000 screen and some of its controls. When you use the software, you generally don't need the RD2000 screen. In fact, when you edit settings using the software the RD screen will probably be showing a different page. It does not matter, because both the screen and the software are just viewing different parts of the Temporary Memory settings bitmap. That is what you are editing.



RD Screen showing this parts settings



My favourite function on the RD is using 'Shift' and turn a knob or press a button or move a fader and its screen will go straight to the editing page for the knob, or button or slider.

To save your own starting Program for the One Touch button - Hold down the RD **WRITE** button and press 'One Touch' button. Click OK. NB. The name will be set to the Tone name not the Program Name. The Tone Buttons 1 to 9 on the right double up as Scene buttons. So you can quickly recall a program or form a Set List.

When you finish any editing, you must **WRITE** the Program on the RD using its **WRITE** button or it will be lost when you power down.

CREATING A PROGRAM

This is how you create a Program! See also Tutorial 8.

Tones - The basic sounds - Best to use Zones 1 to 4 as required

Edit Tones using Tone designer - V-Piano, S/N-Piano, Organ or Other

Set Reverb and Delay send levels if required per zone

Add amp or sim effects for tones other than V-Piano per zone

Set any controller settings such as damper, swell, mod wheels etc



Program - a collection of up to 8 Tones - I recommend

Zone 1 to 4 - contain different internal tones

Zone 5 to 8 - different external tones - such as a hardware instrument or VST and set up controller settings -assign knobs etc

Write the Program - Name with up to 16 characters



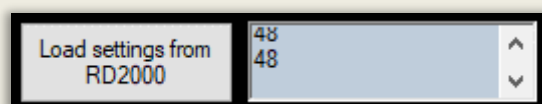
Final processing

Set up Equaliser settings and Compressor as required.

You can save a program as a scene - assign to a Tone button with a Scene Memo with up to 32 characters

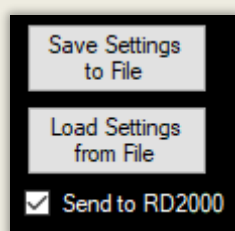
SAVE AND LOAD RD2000 SETTINGS ON YOUR COMPUTER

All forms allow you to load / transfer the RD2000 settings for the current program in its edit buffer to this software. This software's form's settings will then be updated.



Each form has a large blue coloured text box which shows plain text files contents or the RD2000 values from a Midi Dump.

On the software's settings forms you will see these two buttons. The Save Settings button which will store all of the forms settings as a plain text file on your computer. When you Load the file the forms settings will be updated. This is a great way to save your favourite settings and which can also be used on different programs!

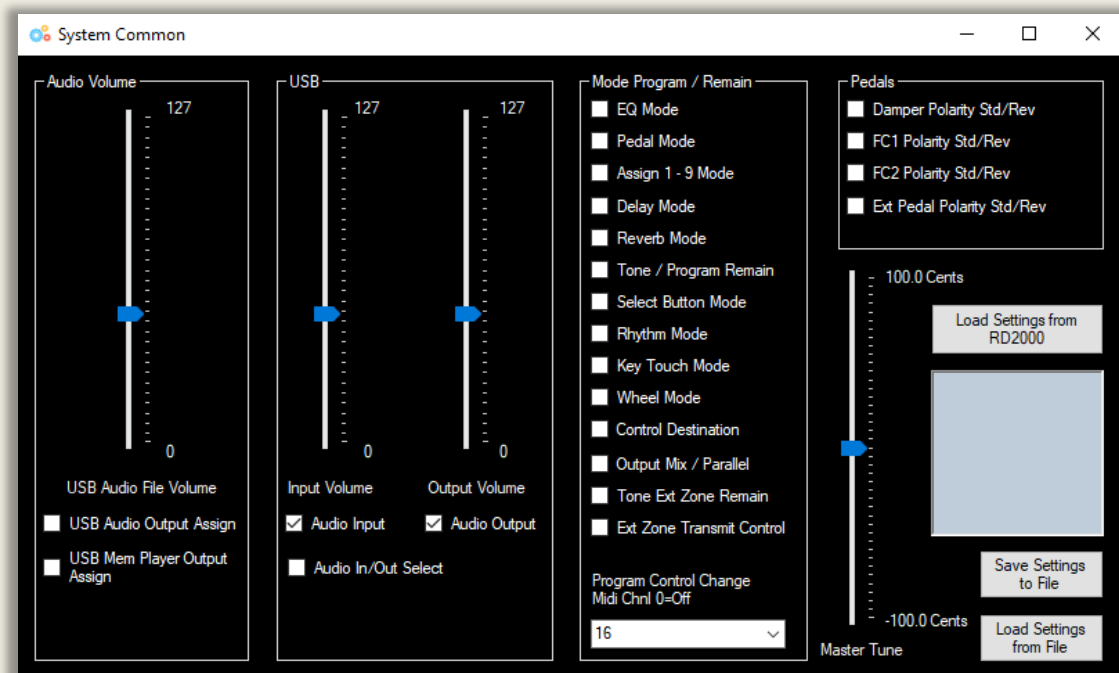


If you are using the Tone designer forms - VPiano, S/N Piano, Organ or Other Tones and the software's Midi in/Out port is set to the RD2000 then the settings will be sent straight to the RD which will be updated. For all other forms the settings on the form are updated and will be sent to the RD if the 'Send to RD2000' check box adjacent to the button is checked (default).

For instance, you might have favourite Equaliser settings you could reuse on various pianos. Or a favourite Reverb setting for Clavs. Or favourite VPiano settings etc. Make sure you name the text files so they have a meaning eg. 'VPiano EQ1.txt' or clav compressor3.txt. or VPiano7.txt etc. You can easily share these setting text files with other users! See demonstration video on my website. [Saving and Loading Settings.](#)

Any editing you do on the RD2000 is in temporary memory. You must **WRITE** the setting/program on the RD using its **WRITE** button or it will be lost when you power down.

SYSTEM COMMON SETTINGS



These settings are common to all zones. See Parameter manual pages 22 to 26.

1. If you record a song on a USB drive the playback volume is controlled by the first slider.
2. USB audio input/output volumes are the next two sliders. Enable audio in/out with check boxes. PC or Mac require RD2000 USB driver loaded and Vendor driver set in the RD2000 system settings. Write to save. Turn off RD2000. Then switch on to activate Vendor driver mode.
3. Audio in/out specified whether the RD volume control affects input or output volume for USB audio.
4. Program remain is a set of settings where you can fix the setting so that if you change programs the setting stays the same. Otherwise, the default settings are used for the program.
5. The program control change specifies which channel the program change CC message is sent on. Normally 16 (Off = 0 and Midi channels 1 to 16)

6. The Master Tune slider affects the whole instrument and can be varied by +/- 100.0 Cents in increments of 0.1 Cents. For precise control of slider hold shift key on PC and use up and down arrows to make small changes to within 0.1 cents. The Tooltip shows the current value. Frequency range equates to 415.3 Hz to 440Hz at A4 to 466.2 Hz. This is one semitone either side of Middle A. Midi Note 57.
7. Damper polarity is needed if you use another brand pedal. Eg. Korg pedals are reverse polarity to Roland pedals.

To Load Settings from the RD2000 click the Button 'Load Settings from the RD2000'. The incoming sysex dump is displayed in the big text box and the controls will be updated.

Note. Midi in and out has to be set to the RD2000 for the request to dump can be sent and the dump received.

You can 'Save the forms settings to a file'. When you 'Load settings from File' and if midi in/out is set to RD2000 it will update the form settings and the RD2000's settings by Midi sysex.

SYSTEM COMPRESSOR



The system compressor is applied at the output of the RD and is not specific to any zone. I normally don't compress audio unless I'm recording. See page 69 Parameter manual for details on each setting.

1. The check box turns the compressor On/Off.
2. The split Frequency changes where the Low to Mid and Mid to High boundary is in Hertz.
3. The Level slider sets the output level of the compressor 0 to 24db - one slider for the three ranges.
4. The Attack and Release times specify how quickly the compressor acts or switches off.
5. The Threshold sets where compression is applied -60 to 0 db.
6. The Compression Ratios sets the amount of compression from 1:1 to Infinity. 1:1 is unchanged. Infinity always reduces the output to the threshold.
7. You can Save the settings as a plain text file and then Load Settings at a later date.

Note. You can download the current Compressor settings by clicking on the 'Load settings from RD2000 button'.

PROGRAM COMMON

PROGRAM LIBRARY

The screenshot shows a window titled "Program Library" with a menu bar containing "File". Below the menu bar is a table with the following columns: Bank, Number, Program Name, MSB, LSB, and Program Number. The table contains 14 rows of data. To the right of the table is a vertical sidebar with buttons: "Load All Programs From RD2000", "Save Programs to File", "Favourites Click on Row and Click Button", and "Update Name / Memo". Below the table are several controls: a search bar with "Search" and "Clear Search" buttons, checkboxes for "Search All Rows at Once" and "Hide Rows if Search item not Found", a "Get Current" button, and a "Find Current ?" button. At the bottom left, there is a checkbox for "Use RD2000 default Program Change Control Midi Channel 16" and a note "Click on Row to select Program on RD2000 MSB / LSB / Prog No."

Bank	Number	Program Name	MSB	LSB	Program Number
A	1	German Concert	84	64	1
A	2	Honest EP Trem	84	64	2
A	3	FC1 Cry Wah Clav	84	64	3
A	4	Piano + ChoirPad	84	64	4
A	5	Tine EP Menu	84	64	5
A	6	1979 Envelope EP	84	64	6
A	7	1975 Ranger EP	84	64	7
A	8	Studio A Grand	84	64	8
A	9	Phaser Bright EP	84	64	9
A	10	1975 EP Bumer	84	64	10
A	11	1975 Soul Ballad	84	64	11
A	12	JP+OB Str	84	64	12
A	13	A800ChoirPad	84	64	13
A	14	MSage Grand	84	64	14

To load a Program on the RD2000 using midi, just click on the Row!

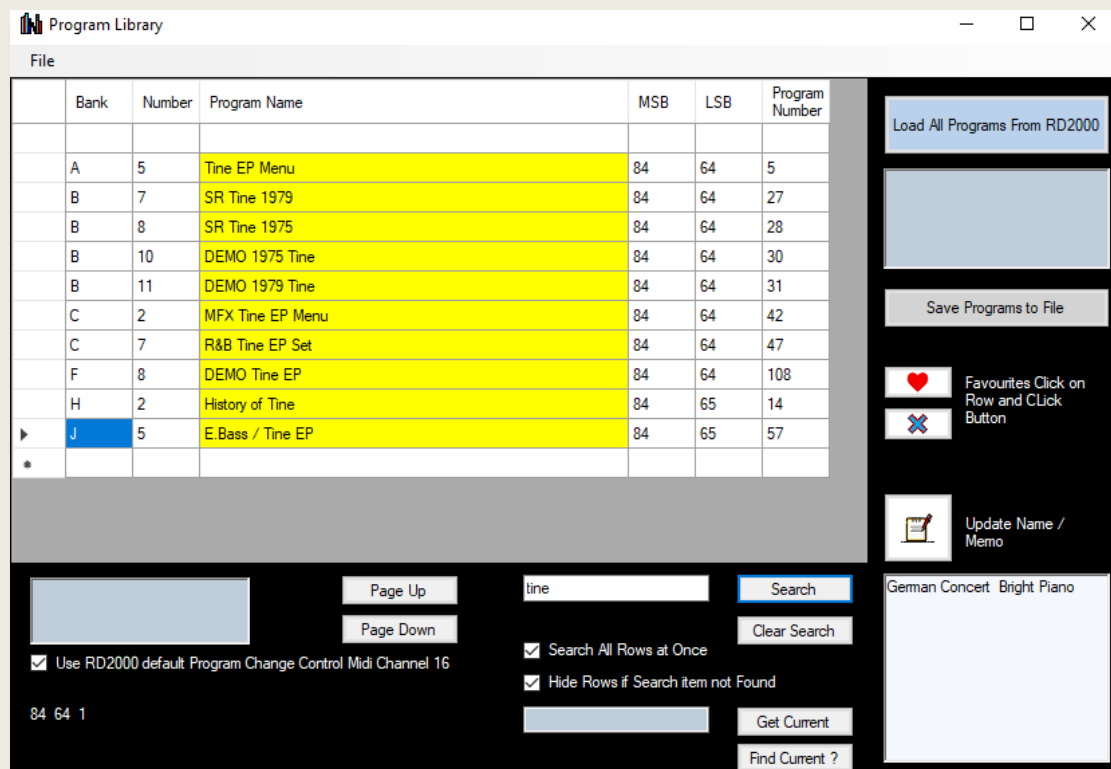
Over time you will create your own programs on the RD. This form enables you to see your own program library from the RD2000. To update this list so it's the same as your RD2000, you download the current program names from the RD2000 by Midi. The Midi in/out needs to be set to RD2000. Use the 'Load All Programs from RD2000' button. It takes about 4 minutes to download all 300 programs. The % complete is shown on the button.

Next, click 'Save Programs to File' button and save as a file called 'programs.txt' in your Documents folder. You must use this name.

Then copy and paste it to the RD2000 editor installation directory at C:\program files.... RD2000\rd2000setup This will overwrite the previous programs.txt file. This final step is needed as windows won't let you save it straight to the RD2000 installation directory. When you next open the form you will have your own program list loaded! You only need to do this procedure when you update the program names on the RD2000.

Note. Make sure your PC does not to let the USB Port 'sleep' whilst downloading program names otherwise you will lose your USB midi connection. On a PC - power options, advanced options - USB settings. On a Mac its 'System Preferences / energy saver'.

SEARCH



If the user types a word in the white 'Search' box, the first occurrence moving down the list will be marked with a yellow background. The next occurrence which will also be marked in yellow again and so on. Rows where search item is not found will be hidden if the lower check box checked - Default. All Rows will be searched at once if middle check box checked. Otherwise, you need to click search after each find. 'Clear search' clears the yellow search results and moves the caret to the first program. Current caret position in the list is coloured blue and searches are performed moving down the list. The search is not case sensitive so searching for 'Piano' will return Piano and piano.

Note. By default, the RD program Control Change Midi channel is set to 16. If you uncheck the checkbox the channel is determined by the drop-

down box on the System/System Common form. Leave it checked unless you change the channel on the RD. Make sure you adjust the midi channel on the software to match the RD channel if unchecked. Note.

Bank/Program change requests are Midi Control Change messages specific to the midi channel they are transmitted on. 16 by default on the RD.

'Init' means an Initialised Program - a place to store your own programs.

To get the Current Program Name of the Program loaded on the RD2000 click on the 'Get Current' button to retrieve it using Midi. The Program Name will appear in the blue text box. If you click on 'Find Current?' and if the Program is found in the List it will be shown on the list highlighted in yellow.

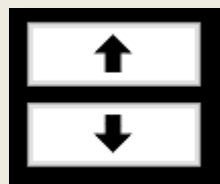
Sorting Data in a Column.

If you click on the column header you can sort the columns alphabetically and numerically. Click once on the column header to sort descending. Click the column header again to sort ascending.

- Clicking on Bank will sort the list alphabetically category by Bank.
- Clicking on Program Name will sort the Tones alphabetically
- Clicking on MSB or LSB or Program Number will sort numerically.

Page Up or Page Down

You can Page Up or Page Down the database 15 rows at a time using these two buttons.



[Program Library](#) Video

[Program Library Part 2](#) Video

MULTIPLE SEARCHES

	Bank	No.	Prog. Name	MSB	LSB	Prog No.
	A	1	*Piano 1.....	84	64	1
	A	2	\$2 Piano 2.....	84	64	2
	A	3	\$3 Piano 3.....	84	64	3
	A	4	*Piano 4.....	84	64	4
▶	A	5	\$Stu 1 setlist..	84	64	5
	A	6	Piano 4.....	84	64	6
	A	7	1975 Flanger EP	84	64	7
	A	8	Studio A Grand	84	64	8
	A	9	Phaser Bright EP	84	64	9
	A	10	1975 EP Bumer	84	64	10
	A	11	1975 Soul Ballad	84	64	11
	A	12	*Gus Piano 1.....	84	64	12
	A	13	*Gus Piano 2.....	84	64	13
	A	14	Init	84	64	14

This shows three searches - by Name, \$ and *

- Normal Program Name search (Grand and then Piano) in yellow
- Search in Green using an * before the Program name. * could represent a particular favourite for instance.
- Scene search in Pink using a \$ before the Program name.

The order of search sets the colour precedence.

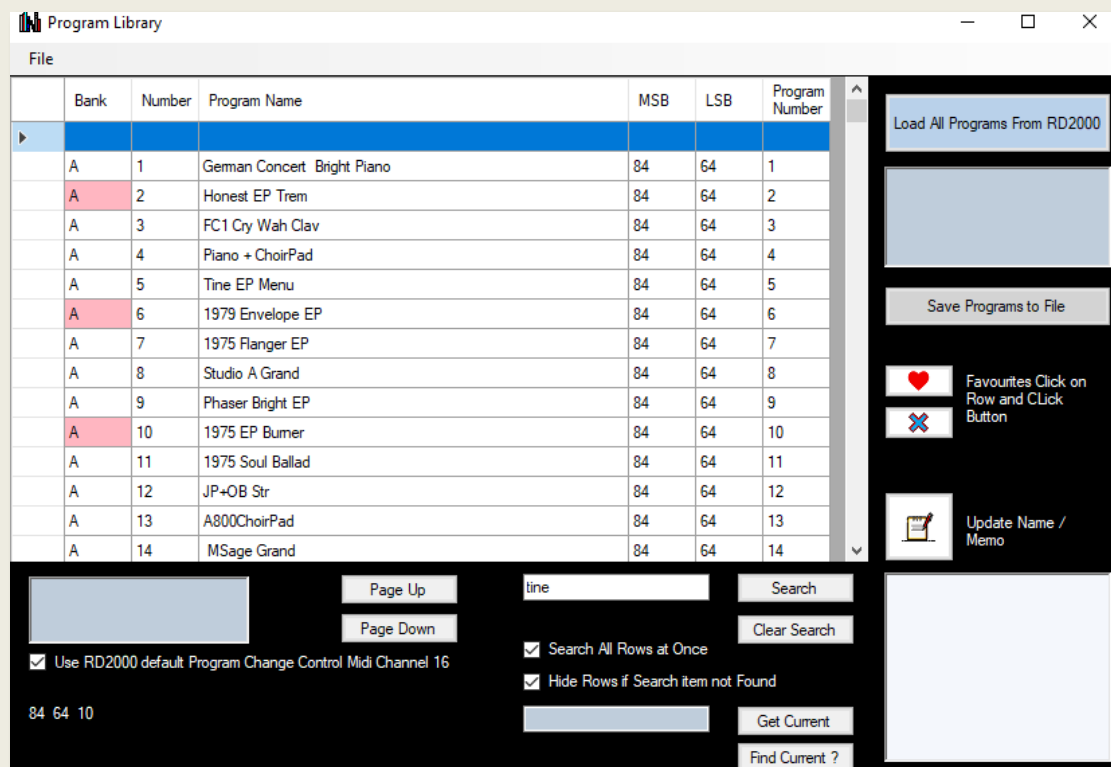
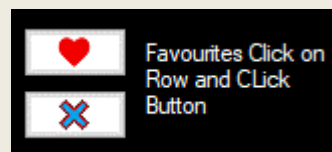
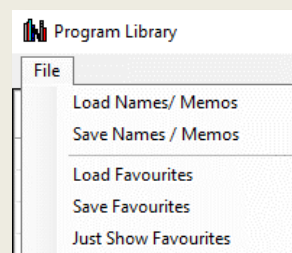
When you save files, you would have one called Scene1 and another called say Favourites1. You can have as many of these text files as you want.

And / Or Searches

- If you hide rows when search item is not found and then search again result will only show rows with both search 1 **and** search 2 in them,
- If you don't hide rows when search item is not found and then search again result will show rows with either search 1 **or** search 2 in them.

FAVOURITE PROGRAMS

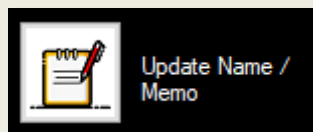
You might want to have a list of favourite programs. Say you have a program you like called 'Honest EP Trem'. If you click on its row and then click the 'heart button' it will make the first cell in the row pink. Save your favourite program list to a file called say 'Favourites1'. The file extension is '.fav'. To delete a favourite, click on the row to be removed and then the 'Cross' button. To load the favourite file just click on the 'Load Favourites' menu item.



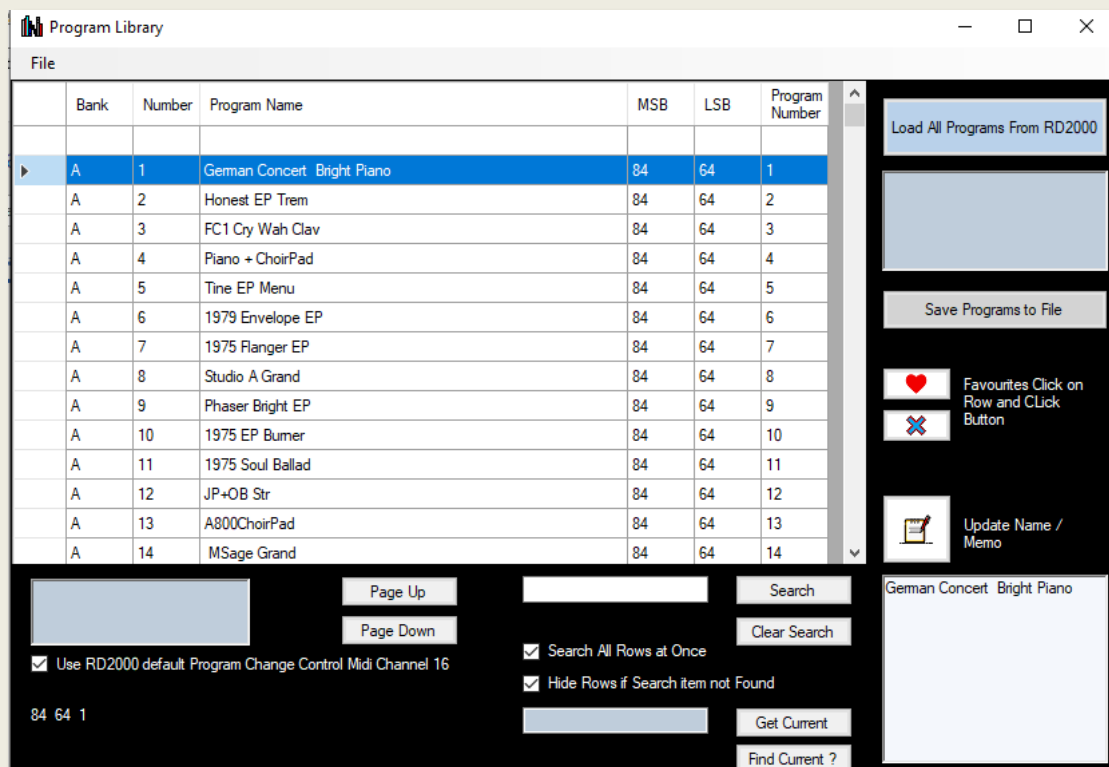
Note. By Keeping the favourites file separate from your program list file means you can have a favourite file for each different performance. You just load the favourites file when you need it. Clicking on 'Just show favourites' will only list the 'pink' favourite rows.

PROGRAMS AND MEMOS

On the RD2000 you can have a 32-character memo associated with a Scene. On this software you can create text notes of any length to remind you about the details of a Program/Scene or the song it is used for. First, I clicked on the row where I want to add text/a memo to the program name. I've then typed text into the white text box on the lower right the text 'bright piano'. Then clicked the memo button below. It's now added the new text to the program name. Clicking on the row again will show the full name/text in the lower right text box too.



You can describe multiple programs/scenes in one text file.



1. Click on 'Save Names/Memo' Menu item and call it say Memo1.
2. To Load, click on 'Load Names / Memos' menu item and load the file you named as say Memo1 to view it. The updated name list will appear.

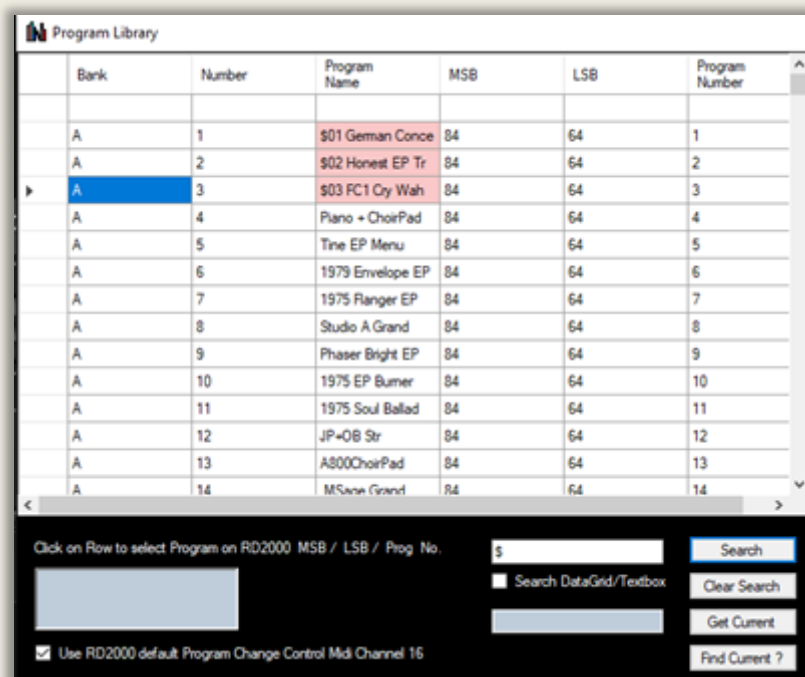
SCENE LISTS

Roland calls these Scenes. Korg call them Set Lists.

The idea of a Scene is that during a performance you can quickly go from one program to the next, in the order of play, without having to manually dial in the specific programs. Scenes are the same as Programs, but they can also be assigned to the Tone buttons on the RD and have Memos describing the sound. The Memo is limited to 32 characters on the RD, but is unlimited in this software.

This feature you use a \$ followed by a number. 01, 02, 10, etc. The number defines the order of play. \$01, \$02 etc. This format is used as the start of the Scene List program name. The number after the \$ orders the programs. Remember to save your file called say Scene.txt and then click 'Load My Programs from File'. Then search for \$ and click header to list numerically.

To summarise, just rename your programs for example I've chosen the first three programs - \$01 German Conce.... by saving it to your Scene file. Rename another program to say \$02 Honest EP Tr etc. Save the file. Now firstly open your Program List file then open the Scene file and search by '\$' Then click top of program name column to sort alphabetically with the Scene names in order of play \$01, \$02, \$03...etc.



Your Scene programs will now appear in order of play. Coloured Pink. See above.

\$01 German Concert
\$02 Honest EP Tr
\$03 FC 1 Cry Wah... etc

Once you have created your Scene List you could then assign the Program to the Scene (Tone) Buttons on the RD.

To Register a Scene to a Tone button on the RD2000:

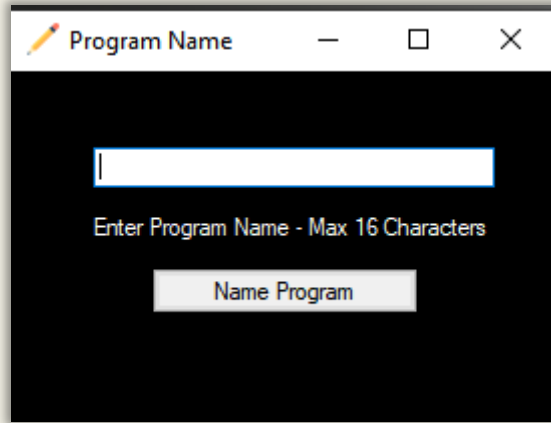
1. Hold the scene button
2. Press a blinking tone button which means free slot, or one that is lit, that will be overwritten.

To Recall a scene on the RD2000

1. Press the scene button
2. Press a tone button that is lit"

Note. By Keeping the scene file separate from your program list file means if you update your program list you don't necessarily need to update your scene file, as you load the Scene file immediately after current program list.

PROGRAM NAME

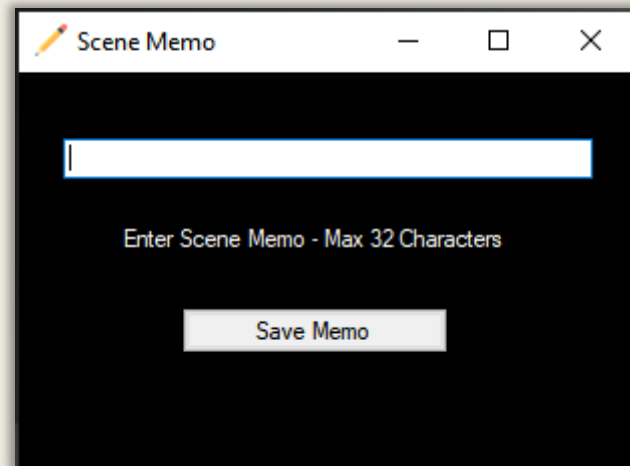
A screenshot of a software window titled "Program Name". The window has a dark background. At the top, there is a white title bar with a pencil icon on the left and standard window controls (minimize, maximize, close) on the right. Below the title bar, there is a white text input field. Underneath the input field, the text "Enter Program Name - Max 16 Characters" is displayed in a small, light-colored font. At the bottom center of the window, there is a white button with the text "Name Program".

To save a program name on the RD2000 you MUST **Write** it in a program using the RD2000 write button.

When you **Write** a program to one of the 300 slots in user memory on the RD2000 you will be prompted for a location and a name - 16 characters maximum. Anything longer will be truncated to 16 characters. You can enter this on the RD using the scroll wheel and buttons. However, it's far quicker using the computer keyboard using this feature. So, when prompted specify the bank and program position and send the program name using this form.

Remember you cannot **Write** a program using midi. You have to use the **Write** button on the RD2000 once you have edited a program.

SCENE MEMO

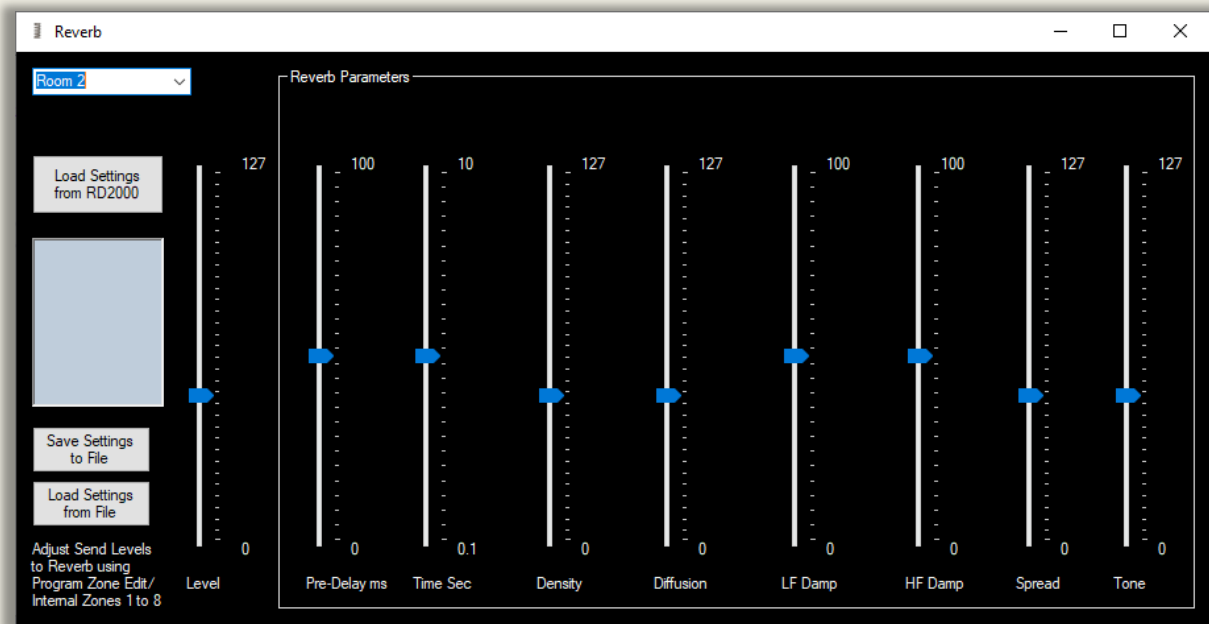
A screenshot of a software window titled "Scene Memo". The window has a dark background. At the top, there is a white title bar with a pencil icon, the text "Scene Memo", and standard window control buttons (minimize, maximize, close). Below the title bar, there is a white text input field. Underneath the input field, the text "Enter Scene Memo - Max 32 Characters" is displayed in a light gray font. At the bottom of the window, there is a white rectangular button with the text "Save Memo" in a dark gray font.

Scenes are very similar to programs. They contain one or more Tones and capture the setting on the instrument when the Scene was written. You can have up to 100 Scenes. There have two additional features over Programs: See Page 15 RD2000 Manual.

1. The ability to save a 'Scene' to a button on the RD2000 for instant loading. So, the instrument type buttons can be set to a Scene. Great for live performances/set lists. So your order of play could use tone button 1 for first song, tone button 2 for second song etc.
2. The ability to add a 32 character memo to the scene to remind the player for instance what song the scene is used for during a performance. Whereas Program names have to be 16 characters long or less.

Entering 32 characters using the RD scroll wheel is slow. Once you Write a Scene to a location and are prompted for the Memo text, just type it on the computer using this form and press 'Save Memo'.

REVERB



This form is used for editing the 5 reverb types. There is an overall reverb level which changes the length of the reverb, reverb type and 8 parameters associated with Reverb. Reverb is an effect applied to all Zones, but you can set the send level from each Zone separately in Program Common edit. See Parameter manual page 67 for specific details.

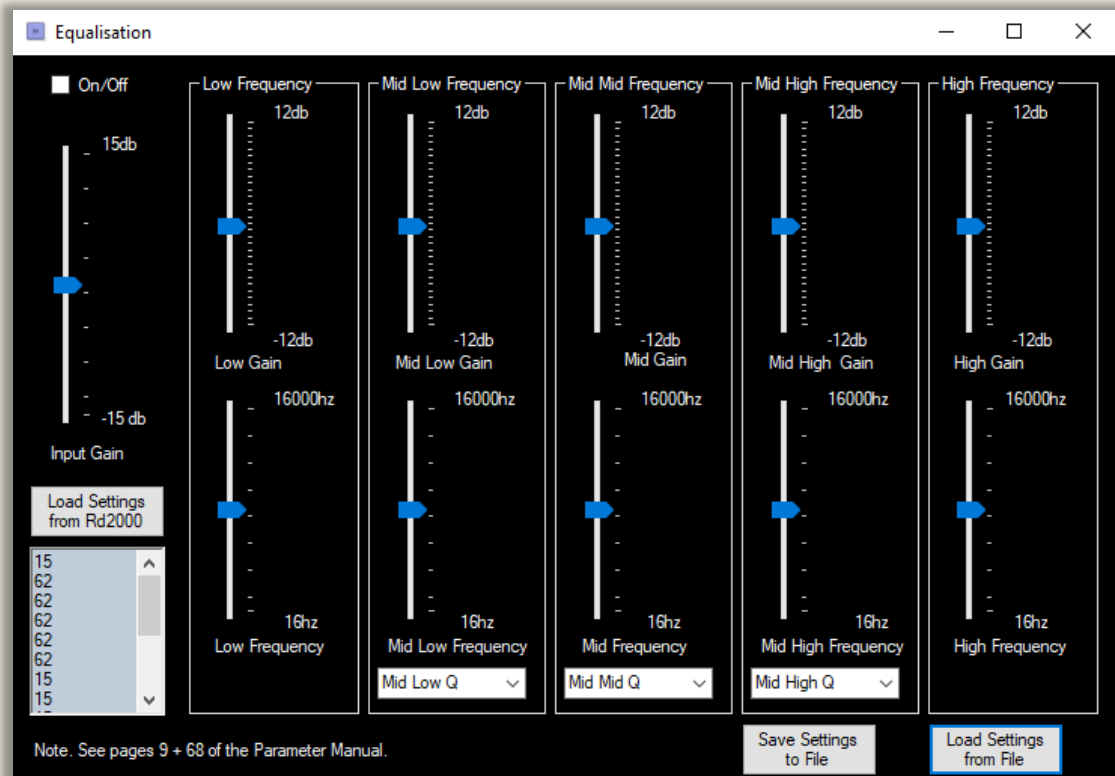
1. Drop down box sets reverb type. Room 1/2: Reverb that simulates the reverberation of a room Hall 1/2: Reverb that simulates the reverberation of a hall. Plate: Simulation of a plate echo (a reverb device that uses a metal plate)
2. Pre-Delay changes the time in milliseconds between the sound and when the reverb starts.
3. Time is the length of the reverb 0.1 to 10 seconds
4. Density changes the amount of reverb over time
5. Diffusion increases the density over time
6. LF & HF Damp adjusts the low/high frequency component of reverb
7. Spread adjusts the reverb spread
8. Tone adjusts the tone of the reverb

Remember. To set the Send levels from the Zones you want Reverb applied to in Program Zone Edit / Internal Zones form. If Send level set to zero you won't hear any Reverb.

If you click on 'Load Settings' the current settings on the RD2000 will be transferred to the software.

You can also save the delay parameters on this form by pressing the 'Save settings to File' button and 'Load settings from File' button. The settings are saved in a plain text file.

EQUALISATION

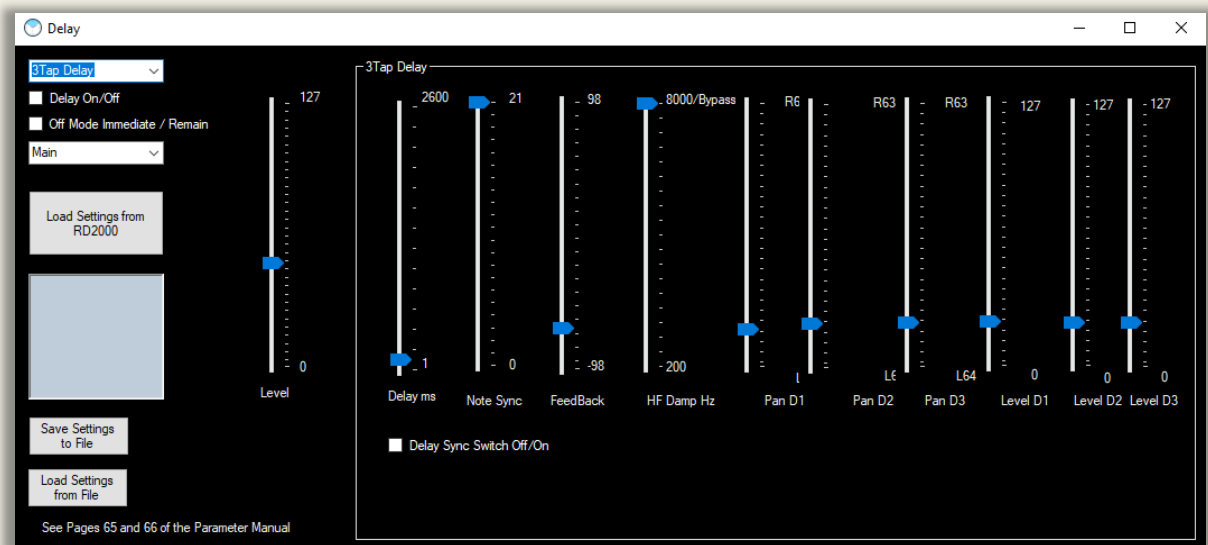


Here you can change how the audio level varies with frequency. Great for brightening up pianos or making sounds more mellow. The input gain boosts or cuts the input of the whole instrument. You can change the gain of the 5 frequency bands as well as the central frequency of the bands. Note the higher the value of Q the narrower the range of the frequency band. See Parameter Manual pages 9 and 68.

You can save this form's settings to a plain text file. Press 'Save Settings to File' button. Then reload them at a later date by pressing 'Load Settings from File' button.

You can also download from the RD2000 its current settings for EQ by clicking on 'Load Settings from RD2000'. To do this make sure midi in and out on this program is set to RD2000.

DELAY



A delay effect is like an 'echo' where the sound gradually repeats and dies away.

When you open the delay form there is no box of controls visible. Select delay type first. The box will appear with controls as above but depending on the delay type..

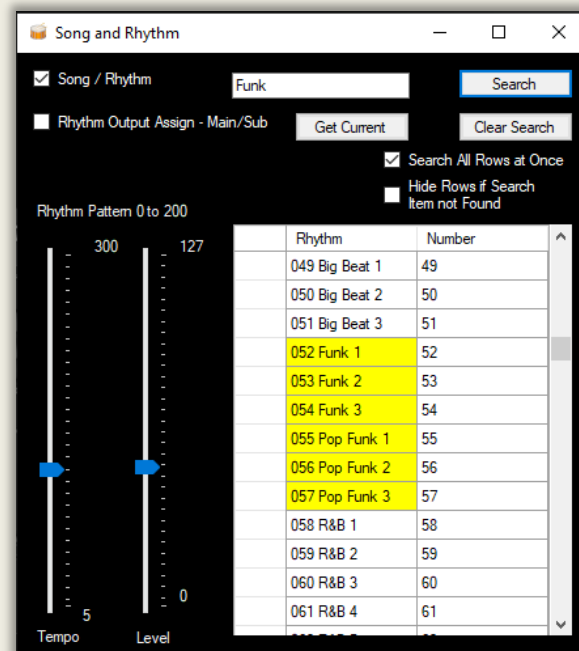
There are 5 delay types. You can switch the delay On and Off. Select the output. And decide if the effect remains when you switch programs. Finally a Level slider.

Within the box which appears once you choose delay type there are various parameters, different for each type of delay. See page 65 of the Parameter Manual.

Click the button 'Load settings from RD2000' to download the current programs delay settings.

You can also save the delay parameters on this form by pressing the 'Save settings to File' button and 'Load settings from File' button. The settings are saved in a plain text file.

RHYTHM / SONG

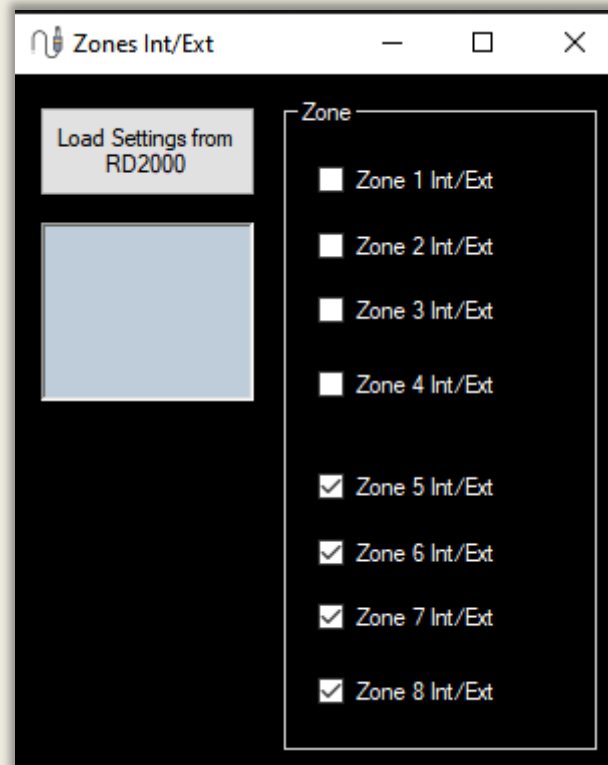


There are 201 Rhythms built into the RD2000 which include a selection of metronome time signatures. Great for practicing without a drummer. Rhythms can be sent to the Main outputs or the sub outputs. The Tempo, Level and Pattern type can be chosen. It also outputs Midi so you can record the sequence. The RD contains 21 Drum Kits (Tones) but you can't change the kit associated with the built-in rhythms, although you can play them using a midi sequencer or the RD keyboard.

To set the Current Rhythm on the RD2000 just click on the Row. Adjust volume and tempo.

If the user types a word in the 'Search' box the first occurrence moving down the list will be marked with a yellow background. Press 'Search' again to find the next occurrence. If 'Search all rows at once' checkbox is checked all instances found will be listed with one button press. Rows where search items not found will be hidden if lower checkbox is checked. See above example - search for 'funk'. Clicking on a row loads the Rhythm on the RD 2000. 'Clear search' clears the Yellow search results boxes, moves the caret to the first program and reloads the list. Note if you use the RD on-board audio recorder it will NOT record the rhythm or any audio from the audio in jack. To load the current Rhythm settings and number click 'Get Current'. Remember. When finished clear search so the search starts from the top rather than the current caret position.

ZONES INTERNAL / EXTERNAL



This form allows you to turn a Zone to an Internal or External Zone.

Red light on RD = Internal Zone.

Green light on RD = External Zone

The example above shows the first 4 zones 1 to 4 set to internal and zones 5 to 6 external. Checking a box changes the Zone to External and unchecking changes the zone to Internal..

My recommendation is:

Use zones 1 to 4 for internal sounds. Midi channels 1 to 4 Midi in. Tremolo and Mod fx only work with these zones. Midi out channels 1 to 4 default if set as external zones.

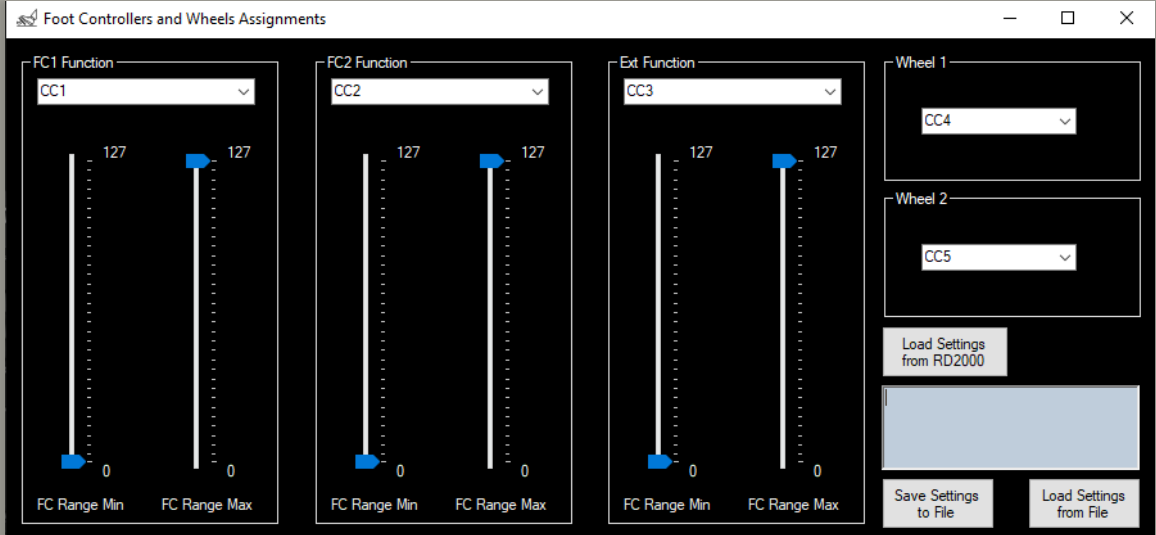
Use zones 5 to 8 for external sounds such as a DAW / virtual instruments and hardware instruments. Zones 5 to 8 midi out channels 1 to 4 by default. Midi in channels 5-8 if internal zones default.

Program Common

Note. Midi channel 10 is normally percussion. Midi channel 16 is the default program change channel. Zones 9 to 16 seem to be General Midi instruments but are not accessible from the RD.

To Load the Current Settings from the RD click the button 'Load Settings from RD'.

FOOT CONTROLLERS AND WHEELS



On this form you can assign the function of the foot controllers and the two wheels to Midi CC messages and a range of midi values to which they apply. 0 to 127.

You can download the current RD2000 settings by clicking on the button 'Load Settings from RD2000'.

There are two buttons on the lower right where you can also Save these settings to a plain text file and then Load them at a later time.

Note that the RD will only respond to certain CC values at its midi input and the controllers can only adjust certain parameters of the RD. See page 8 of the Parameter manual.

KNOB ASSIGNMENTS



On this form you can assign the function of the RD2000 knobs for use in Assign Mode to Midi CC messages and control the range of the knobs. Note that the RD will only respond to certain CC values at its midi input and the controllers can only adjust certain parameters of the RD. See page 8 of the Parameter manual.

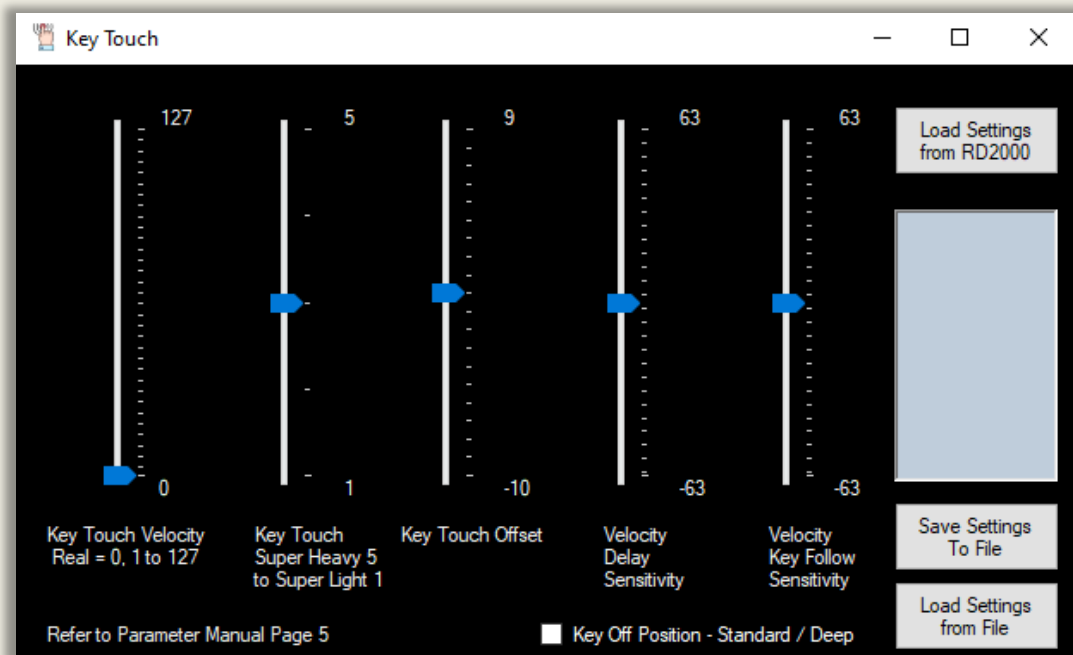
'The Load Settings from RD2000' button loads the current assignment map.

You can assign the knobs to CC 0 to 127 plus several other functions such as aftertouch, modulation depth and rate, tremolo depth and rate and amp sim drive.

The 'Set Knobs CC starting at' button is a quick way of setting the 8 knobs CC values sequentially. For instance, the soft controller assignments in Bitwig start at CC 20 and run to CC 27. The Korg Wavestate uses CC 24 to CC 31 for its default controller assignments. Native Instruments B4 ii CC 12 to 20 for upper drawbars.

There are two buttons on the lower right where you can also Save these settings to a plain text file and then Load them at a later time.

KEY TOUCH



The sensitivity of the keys determines the volume and tonal quality of your performance. Concert pianists will have a much heavier and more refined touch than beginners. This form allows you to modify the various parameters which the RD offers so you can match your playing style to the RD.

Summary of settings.

1. The Key touch velocity should be set to 0. Otherwise you will lose touch sensitivity and no matter how hard you play you will get a fixed velocity (volume) of the slider value.
2. A key touch of medium (3) is closest to an acoustic piano.
3. Key touch offset increases the how 'heavy' the touch sensitivity is.
4. Velocity Delay Sensitivity with lower values causes the sound to be delayed more when more force is used to play the keys. Higher values cause greater delay when less force is used.

5. Velocity Key Follow Sensitivity set at higher values causes the touch to become heavier in the higher registers and lower in the lower registers.
6. Key off as Standard (unchecked) replicates an acoustic piano. Deep is more suitable for electric pianos.
7. Save to File will save the current settings in a plain text file. Load from File will reload the control values.

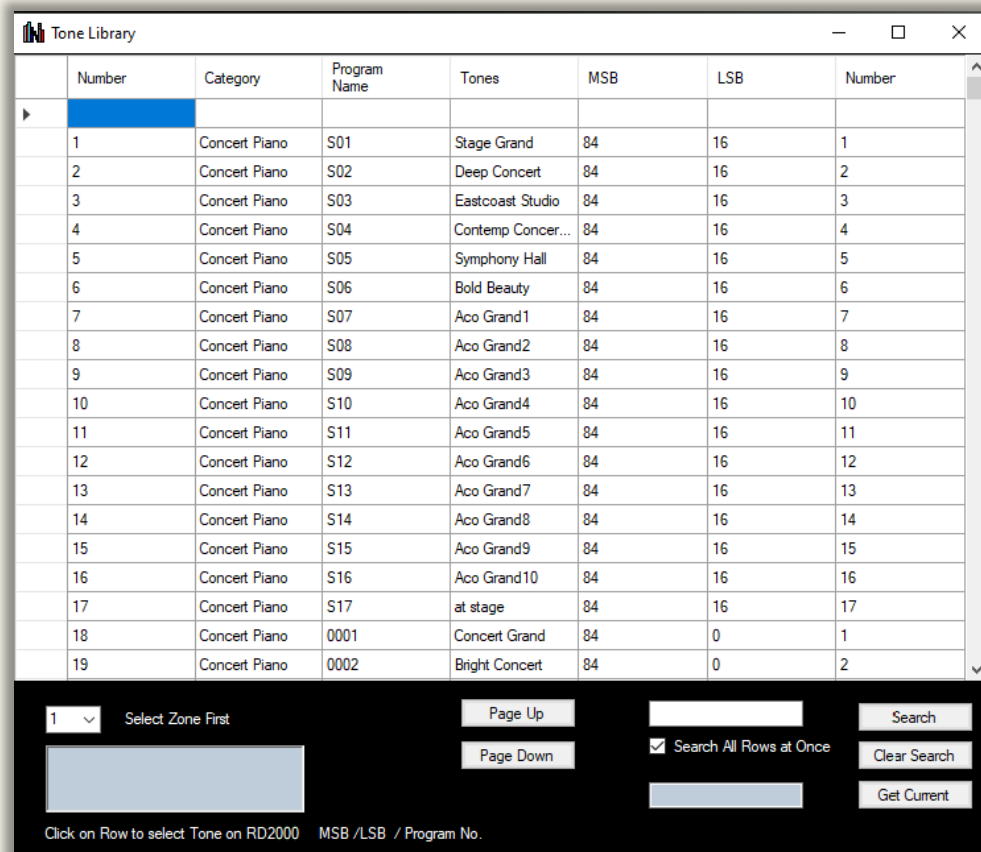
'The Load Settings from RD2000' button loads the current Key Touch settings using midi sysex.

You need to Write any settings you change and want to keep using the RD Write button otherwise they will be lost after you switch it off.

See page 5 of the Parameter Manual for details of what the settings do.

PROGRAM ZONE EDIT

TONE LIBRARY



	Number	Category	Program Name	Tones	MSB	LSB	Number
▶							
	1	Concert Piano	S01	Stage Grand	84	16	1
	2	Concert Piano	S02	Deep Concert	84	16	2
	3	Concert Piano	S03	Eastcoast Studio	84	16	3
	4	Concert Piano	S04	Contemp Concer...	84	16	4
	5	Concert Piano	S05	Symphony Hall	84	16	5
	6	Concert Piano	S06	Bold Beauty	84	16	6
	7	Concert Piano	S07	Aco Grand1	84	16	7
	8	Concert Piano	S08	Aco Grand2	84	16	8
	9	Concert Piano	S09	Aco Grand3	84	16	9
	10	Concert Piano	S10	Aco Grand4	84	16	10
	11	Concert Piano	S11	Aco Grand5	84	16	11
	12	Concert Piano	S12	Aco Grand6	84	16	12
	13	Concert Piano	S13	Aco Grand7	84	16	13
	14	Concert Piano	S14	Aco Grand8	84	16	14
	15	Concert Piano	S15	Aco Grand9	84	16	15
	16	Concert Piano	S16	Aco Grand10	84	16	16
	17	Concert Piano	S17	at stage	84	16	17
	18	Concert Piano	0001	Concert Grand	84	0	1
	19	Concert Piano	0002	Bright Concert	84	0	2

1 ▼ Select Zone First

Page Up

Page Down

Search

☒ Search All Rows at Once

Clear Search

Get Current

Click on Row to select Tone on RD2000 MSB /LSB / Program No.

Tones are the modelled or sampled sounds built into the RD. Currently there are 1472 tones available including the 6 axial expansions the German Vpiano expansion and the latest Upright VPiano expansion. The latter two turn the RD2000 into an RD2000EX. These Tones can be edited in a Program using the Tone Designer.

1. Tone designer. ie. Vpiano editor, Super Natural piano editor, Tonewheel Organ editor and Other Tones editor.
2. Apply Zone effects such as Tone Colour, and for non VPiano tones - Modulation, Amp Simulator and Tremolo to each Zone
3. Send the signal to Delay and Reverb
4. Stack tones one in each of Zones 1-4 you create Programs.
5. You can then apply EQ and Compression to the whole Program.

To set a Tone on the RD2000 from this list just select the Zone you want the Tone in and click on the Row.

The new German Concert Vpiano engine tones are included in the tone list which provide a further 17 Vpiano tones. From Version 4 the new Essential Upright Piano tones are included too giving another 14 tones. The German piano is brighter and cleaner than the stock S01 to S017 Vpianos and I recommend it. These 17 tones are added at the bottom of the list 1442 to 1458. Search by German will bring up first German Vpiano tone. The Essential Upright Tones are Tones 1459 to 1472. Search for Upright. Note that The German and Upright piano expansions have to be purchased from Roland as a lifetime license and are part of the EX upgrade.

Number	Category	Proname	Tones	MSB	LSB	No.
1442	German Piano	SA/SB 01	German Concert	84	17	1
1443	German Piano	SA/SB 02	Bold Grand	84	17	2
1444	German Piano	SA/SB 03	Calm Focus	84	17	3
1445	German Piano	SA/SB 04	Open Warm	84	17	4
1446	German Piano	SA/SB 05	Open Warm 2	84	17	5
1447	German Piano	SA/SB 06	Studio Pop	84	17	6
1448	German Piano	SA/SB 07	Studio Rock	84	17	7
1449	German Piano	SA/SB 08	Ballad Warm	84	17	8
1450	German Piano	SA/SB 09	Bright & Clear	84	17	9
1451	German Piano	SA/SB 10	Feelin' Hopping	84	17	10
1452	German Piano	SA/SB 11	Short Stick	84	17	11
1453	German Piano	SA/SB 12	Quiet Phrase	84	17	12
1454	German Piano	SA/SB 13	Bright Baby	84	17	13
1455	German Piano	SA/SB 14	Deep Open	84	17	14
1456	German Piano	SA/SB 15	Presence	84	17	15

Internal Zone

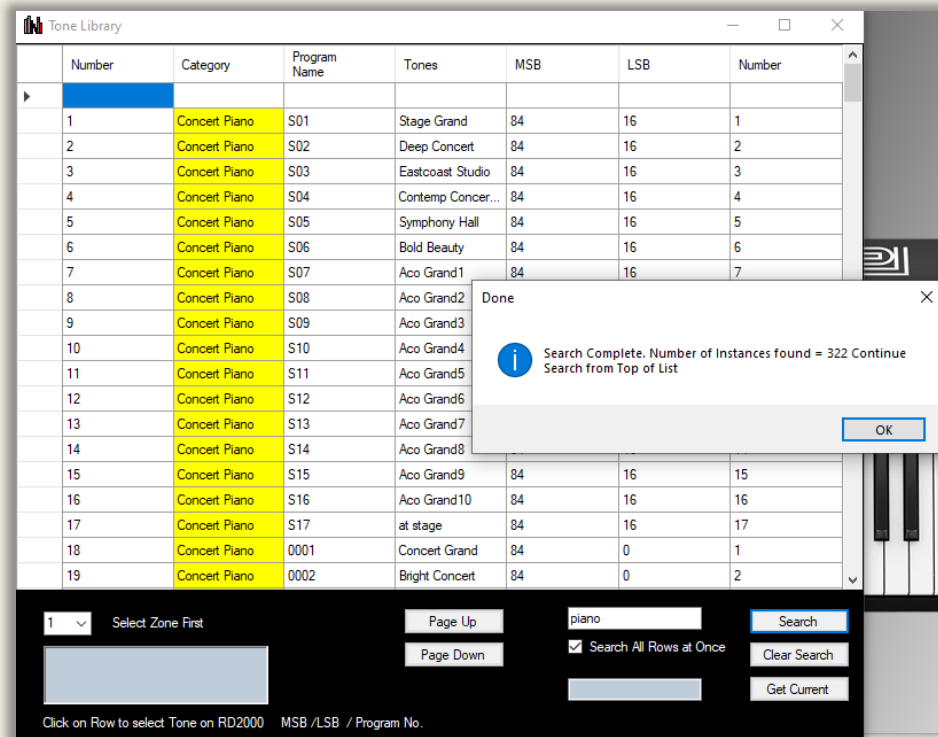
Click on Row to select Tone on RD2000 LSB / No.

Selecting a tone on the RD. First specify the internal Zone using the drop-down box labelled 'internal zone'. Remember Vpiano tones can only go to Zone 1. Then clicking on a rows first column sends the Tone number to the RD. The whole row will change colour to blue.

I recommend using:-

- Zones 1-4 for internal sounds (RD Tones) ie. A Program - Red LED
- Zones 5-8 for external sounds - by sending midi channels 1-4 the zone 5-8 default Midi chnls to external VST/hardware instruments. Green LED.

Searching for Tones. If the user types some text in the 'Search' box then all occurrences in the tone list will be marked with a yellow background and the list will then be updated and only include rows with the search text in. 'Clear search' clears the yellow search results boxes, moves the caret to the first row and re-lists all of the tones. The current caret position is shown in blue. Example. Search for 'Piano' below, 322 instances! Searches are not case sensitive. So 'Piano' is the same as 'piano'.



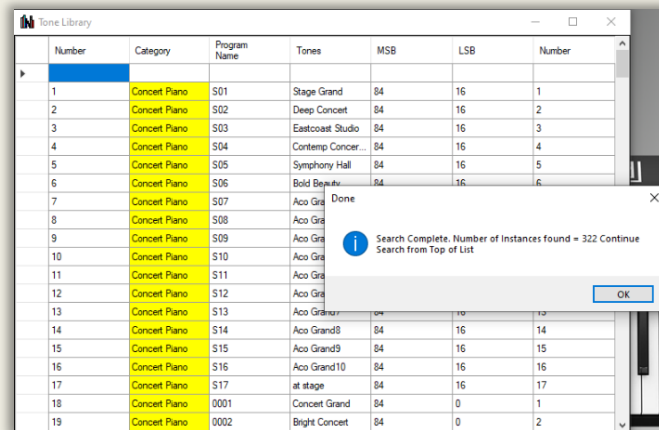
Search will highlight all of the search instances of text you enter in the white text box and only show the rows with the search text it finds, so you have a smaller list, the default state is with a check against 'Search All rows at Once'. If you search for 'Piano' you will get a shortened list with rows with Piano in. Then Search by 'German' and get an even shorter list which will include both Piano AND German on the same row. All instances where the search text is found will be Yellow.

And / Or Searches

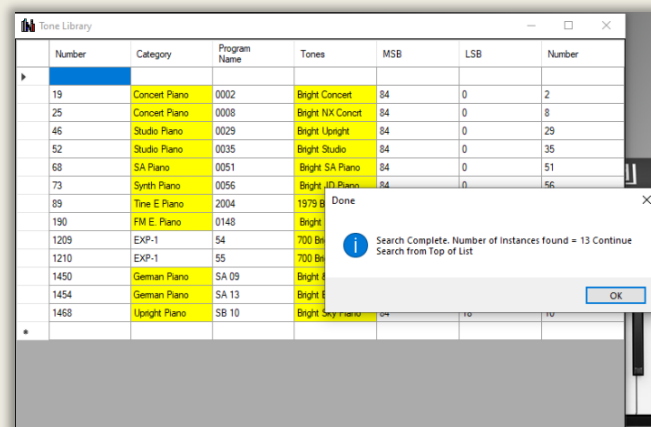
- If you hide rows when search item is not found and then search again result will only show rows with both search 1 **and** search 2 in them,
- If you don't hide rows when search item is not found and then search again result will show rows with either search 1 **or** search 2 in them.

Searching Tones - Advanced Search Filtering example

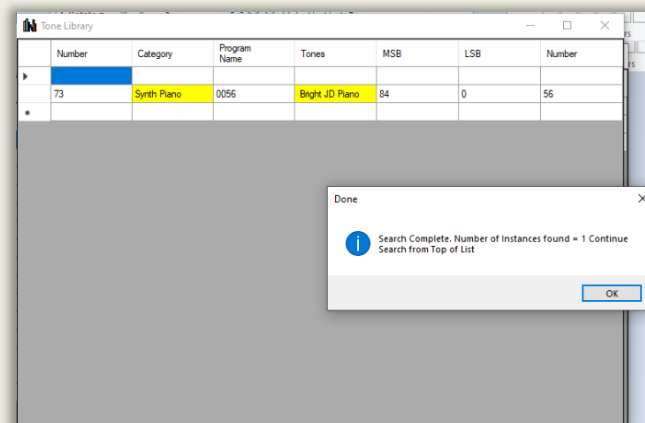
1. Search for 'Piano' = 322 occurrences found. See Below



2. Now search the above filtered list (of 'piano' searches) by filtering for 'bright' as well = 13 occurrences found of both 'Piano' and 'Bright'. See Below.



3. Now filter the above list for 'synth' = 1 occurrence found.



The search is narrowed down to a 'Piano Bright Synth' Tone - Tone number 73. Select the Zone you want the tone in and Click on the row to set the tone on the RD2000.

Searching one click at a time. If you uncheck the 'Search All Rows at Once' checkbox then search for the word 'bright' say, the Search will move one instance at a time for each Search button press. Cells where 'bright' are found will be coloured in green otherwise they will remain yellow or white depending what was searched before. Below the current search row, the rows will contain the normal sequential unfiltered tone data.

Page Up

Page Down

Piano

☒ Search All Rows at Once
☒ Hide Rows if Search Item not Found

Search

Clear Search

Get Current

No.

Tone Library

Number

Category

Program Name

Tones

MSB

LSB

Number

19	Concert Piano	0002	Bright Concert	84	0	2
25	Concert Piano	0008	Bright NX Concr	84	0	8
46	Studio Piano	0029	Bright Upright	84	0	29
52	Studio Piano	0035	Bright Studio	84	0	35
68	SA Piano	0051	Bright SA Piano	84	0	51
73	Synth Piano	0056	Bright JD Piano	84	0	56
74	Synth Piano	0057	Rock JD Piano	84	0	57
75	Synth Piano	0058	Comp JD Piano	84	0	58
76	Synth Piano	0059	Comp JD Piano2	84	0	59
77	Synth Piano	0060	Detuned JD Pia...	84	0	60
78	Synth Piano	0061	Chorus JD Piano	84	0	61
79	Synth Piano	0062	Phaser JD Piano	84	0	62
80	Synth Piano	0063	Lo-Fi JD Piano	84	0	63
81	Synth Piano	0064	Bite Piano	84	0	64
82	Synth Piano	0065	Pop Piano 1	84	0	65
83	Synth Piano	0066	Pop Piano 2	84	0	66
84	Synth Piano	0067	Pop Piano 3	84	0	67
85	Synth Piano	0068	LoFi Piano	84	0	68
86	Tine E Piano	2001	1975 Tine EP.	84	8	90

1

Select Zone First

Page Up

Page Down

bright

☐ Search All Rows at Once

Search

Clear Search

Get Current

Click on Row to select Tone on RD2000 MSB /LSB / Program No.

Search for 'bright'. One click of the Search button at a time. The 'bright' cells will go green.

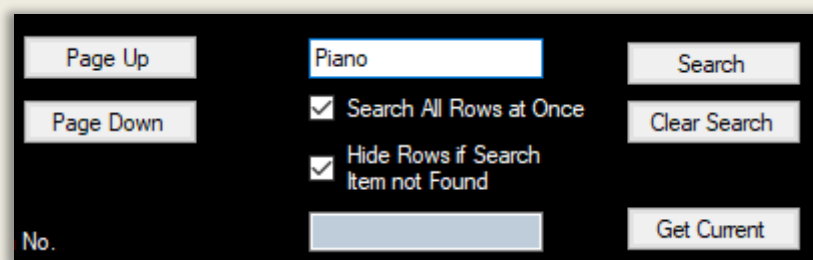
To Get the current tone from the Rd2000. Select the Zone number then click 'Get Current' tone button. The current tone will be highlighted in yellow. In the big blue text box, you can see the Sysex string dump. The Small blue text box shows the msb/lb/program number.

Sorting Data in a Column. If you click on the column header you can sort the columns alphabetically and numerically. Click once on the column header to sort descending. Click the column header again to sort ascending.

- Clicking on Category will sort the list alphabetically category by category. This is useful if you want to list all synths together say.
- Clicking on 'Proname' will sort the Tone names numerically
- Clicking on Tones will sort the list alphabetically tone by tone.
- Clicking on MSB or LSB or No. will sort numerically.

Note. When you edit tones, you use the Tone Designer - VPiano Designer, Supernatural Piano Editor, Tonewheel Editor or Other Tones Editor. For the VPiano and many of the SN Piano type tones there is also the individual note voicing editor. When you press Tone Designer on the RD 2000 the appropriate editor will come up. Or you can select the editor in this software.

[Tone Library](#) Video

The image shows a software interface for searching a tone library. It features a dark background with several white buttons and text boxes. On the left, there are two buttons labeled 'Page Up' and 'Page Down'. In the center, there is a search box containing the word 'Piano'. Below the search box are two checked checkboxes: 'Search All Rows at Once' and 'Hide Rows if Search Item not Found'. To the right of the search box are two buttons: 'Search' and 'Clear Search'. At the bottom left, there is a label 'No.' followed by a small empty text box. At the bottom right, there is a button labeled 'Get Current'.

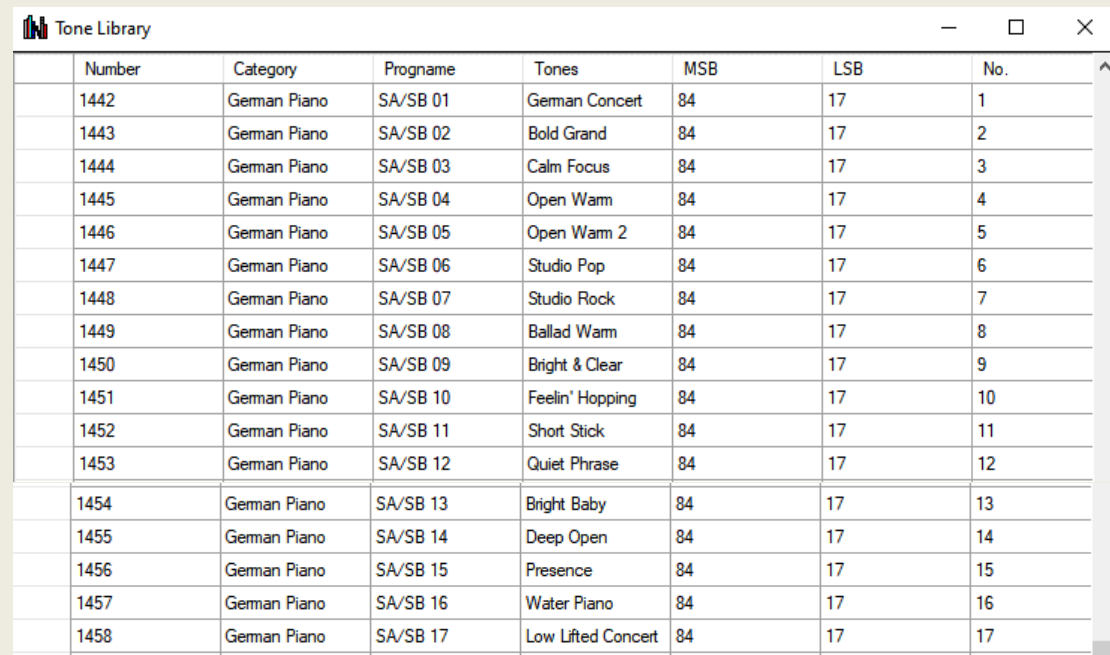
You can Page Up or Down the database 20 rows at a time using the two buttons on the left. If you don't want to hide Rows where the Search item is not found just uncheck 'Hide Rows if Search Item is not Found'.

ROLAND AXIAL EXPANSION SOUND LIBRARIES - FREE

Copyright Roland Corporation - [RD-2000 | Axial \(roland.com\)](http://www.roland.com)

EXP01	Stage piano sound collection from legendary RD series. RD-EXP01 offers popular RD-500/600/700 sounds on RD-2000. Still those sounds are often heard by many popular hit songs from early 90'.
EXP02	Stage piano sound collection from legendary RD series. RD-EXP02 offers popular RD-700SX sounds on RD-2000. In this 12 tones, you will find out familiar concert grand piano sounds and more.
EXP03	Stage piano sound collection from legendary RD series. Followed by RD-EXP02, RD-EXP03 offers remaining RD-700SX sounds on RD-2000. In this 8 tones, you will find out several types of concert grand piano sounds and more.
EXP04	Stage piano sound collection from legendary RD series. This RD-EXP04 offers RD-700GX and RD-700NX. In this 43 tones, you will find many useful piano sounds for your live performance and studio recording. Another great addition for your RD-2000.
EXP05	Virtual Tone Wheel Organ collection features 31 types of various organ sounds. Newly added ROTARY Type 2 with version 1.5 firmware updates, this powerful collection is comparable with a dedicated combo organ keyboard. Use Wheel 2 or TONE COLOR knob to change rotary speed. To enjoy these organ sounds, please make sure your RD-2000 is updated to Version 1.5. http://www.roland.com/global/products/rd-2000/downloads/
EXP06	Carefully selected vintage synth collection features famous Roland JUNO-106, Jupiter-80, D-50 and more. In addition to Roland synthesizers, other famous vintage synthesizer sounds are included in this very special collection. 125 tones are ready for your own customized vintage synth sound library. Enjoy vintage synth sounds on RD-2000. Using MOD WHEEL 2, you can easily tweak sounds. To enjoy these synth sounds, please make sure your RD-2000 is updated to Version 1.5. http://www.roland.com/global/products/rd-2000/downloads/

GERMAN PIANO – VPiano EXPANSION



The screenshot shows a window titled 'Tone Library' with a table of 17 new German Piano expansion sounds. The table has columns for Number, Category, Progame, Tones, MSB, LSB, and No. The sounds are listed from 1442 to 1458, each with a unique name and a corresponding number in the 'No.' column.

Number	Category	Progame	Tones	MSB	LSB	No.
1442	German Piano	SA/SB 01	German Concert	84	17	1
1443	German Piano	SA/SB 02	Bold Grand	84	17	2
1444	German Piano	SA/SB 03	Calm Focus	84	17	3
1445	German Piano	SA/SB 04	Open Warm	84	17	4
1446	German Piano	SA/SB 05	Open Warm 2	84	17	5
1447	German Piano	SA/SB 06	Studio Pop	84	17	6
1448	German Piano	SA/SB 07	Studio Rock	84	17	7
1449	German Piano	SA/SB 08	Ballad Warm	84	17	8
1450	German Piano	SA/SB 09	Bright & Clear	84	17	9
1451	German Piano	SA/SB 10	Feelin' Hopping	84	17	10
1452	German Piano	SA/SB 11	Short Stick	84	17	11
1453	German Piano	SA/SB 12	Quiet Phrase	84	17	12
1454	German Piano	SA/SB 13	Bright Baby	84	17	13
1455	German Piano	SA/SB 14	Deep Open	84	17	14
1456	German Piano	SA/SB 15	Presence	84	17	15
1457	German Piano	SA/SB 16	Water Piano	84	17	16
1458	German Piano	SA/SB 17	Low Lifted Concert	84	17	17

Listed above are the 17 new German Piano – VPiano expansion sounds. I think the model is based upon a Steinway Hamburg grand piano.

This expansion cost £149 and is well worth it! You can purchase it as a lifetime key from Roland Cloud. No subscription required. The 17 new tones are much brighter and clearer than the stock VPiano tones. They are based on a German Grand. It's not clear whether it's a Steinway or Bluthner. But it is my opinion an essential expansion to have.

You need to load Rd2000 firmware version 2.0 first and then load the expansion using an RD formatted USB stick in the USB update port – the one with the Rubber cover on the back of the RD.

Apart from brighter tones the Stretch tuning is greater than the original VPiano tones, but the Character and Level individual note voicings are more subtle. Representing a well maintained and tuned Grand piano.

This is loaded into one of the two new expansion areas A or B suggesting another expansion may be available later.

RD2000EX UPGRADE



In July 2024 Roland upgraded the RD2000 calling it the RD2000EX. Its available as hardware or existing owners can update their instruments to the EX by purchasing a firmware update/new VPiano model(s) from the Roland Cloud. This is a lifetime license. The cost is \$199 for both the updated firmware, German (Program Names SA 01 to SA 17) and Upright VPiano models (Program Names SB 01 to SB 14).

The EX upgrade is definitely worthwhile in my opinion. If you buy the RD2000 EX hardware from a shop rather than updating an RD2000 you get a sticker on the back saying RD2000EX! That's the only difference. If you have already purchased the German VPiano model Roland will send you an email with a discount coupon so you can buy the EX upgrade / Upright model, which means you won't need to buy the German Vpiano twice. The cost is then only \$50.

It's not clear if Roland have made any other changes under the hood as well and whether the existing tones sound better. One reviewer thought the playing sensitivity has improved?

Here is a rather nice review of the upgrade.

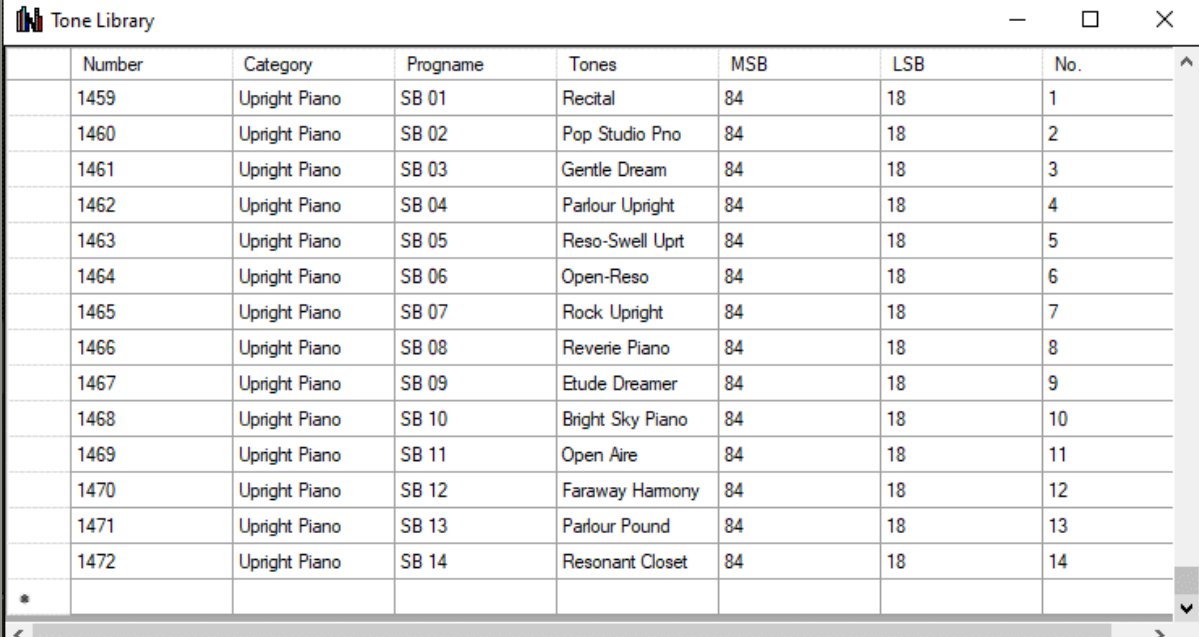
<https://www.youtube.com/watch?v=4nhdcOE17f4>



The RD2000 and its matching single tier stand.

ESSENTIAL UPRIGHT PIANO – VPIANO EXPANSION

This new VPiano expansion came out in July 2024. Together with the German VPiano expansion and slightly updated firmware EX 1.00 turns the RD2000 into the RD2000 EX. The new Essential Upright VPiano tones are shown below. A reviewer thought the VPiano model is based upon something like a Steinway upright K52.



The screenshot shows a 'Tone Library' window with a table of 14 tones. The table has columns for Number, Category, Progname, Tones, MSB, LSB, and No. The tones are numbered 1459 to 1472 and are all categorized as 'Upright Piano'. The prognames range from 'SB 01' to 'SB 14'. The tones are: Recital, Pop Studio Pno, Gentle Dream, Parlour Upright, Reso-Swell Uprt, Open-Reso, Rock Upright, Reverie Piano, Etude Dreamer, Bright Sky Piano, Open Aire, Faraway Harmony, Parlour Pound, and Resonant Closet. The MSB and LSB values are 84 and 18 respectively for all tones. The No. column ranges from 1 to 14.

Number	Category	Progname	Tones	MSB	LSB	No.
1459	Upright Piano	SB 01	Recital	84	18	1
1460	Upright Piano	SB 02	Pop Studio Pno	84	18	2
1461	Upright Piano	SB 03	Gentle Dream	84	18	3
1462	Upright Piano	SB 04	Parlour Upright	84	18	4
1463	Upright Piano	SB 05	Reso-Swell Uprt	84	18	5
1464	Upright Piano	SB 06	Open-Reso	84	18	6
1465	Upright Piano	SB 07	Rock Upright	84	18	7
1466	Upright Piano	SB 08	Reverie Piano	84	18	8
1467	Upright Piano	SB 09	Etude Dreamer	84	18	9
1468	Upright Piano	SB 10	Bright Sky Piano	84	18	10
1469	Upright Piano	SB 11	Open Aire	84	18	11
1470	Upright Piano	SB 12	Faraway Harmony	84	18	12
1471	Upright Piano	SB 13	Parlour Pound	84	18	13
1472	Upright Piano	SB 14	Resonant Closet	84	18	14

The 14 new Essential Upright VPiano Tones.

Note. If you purchase the EX upgrade you need to install the new EX 1.00 firmware - follow the instructions in the EX download. For firware update use USB mem slot holding 'Write' at boot)*. Then install the two new VPiano models using the USB slot with the cover near power button, hold 'Enter' at boot. Now when you boot the RD the splash screen will show RD2000 EX and the two models will be loaded in the expansion slots A and B.

*Never power down the RD when updating the firmware as you will risk 'bricking the instrument' and the only solution then is to return it to Roland who can do a flash rom update.

The new Essential Upright VPiano model does a really good job at emulating the tones from a good upright piano. You can edit these further with the Piano designer and individual note voicing.

All of the Essential Upright VPianos use stretch tuning variations. The Level is set at 0 throughout on all tones. The Character varies between -2 and + 5.

It's interesting to note the two Parlour pianos (Parlour Pound SB13 and Parlour Upright SB04) seem to have Unison detune applied - a great honky tonk sound, rather like a piano which has not been tuned for a while - which is not a parameter accessible via sysex or via the RD. This is where a note with say 3 strings have each string slightly detuned which gives a vibrato effect (beats). This was a parameter on the original VPiano which was accessible. The Faraway Harmony SB12 is also interesting as a slow attack is applied to each note. It also has more of a brass sound to it rather than a struck string!

Hopefully Roland will bring out further VPiano models such as Vanguard and add some extra editing features found on the original VPiano such as Unison Tune.

Note. Each of the 48 VPiano tones in the three VPiano models is a unique 'Piano'. They are not just simple variations of sound. You can't edit say one default Essential Upright Tone 1459 and turn it into another default Essential Upright Tone 1460 with the editing features the user has. Only Roland can do that, as there are many hidden parameters only accessible to them. This means every one of the 48 VPiano tones is unique and has the ability to be edited into your very own unique Piano.



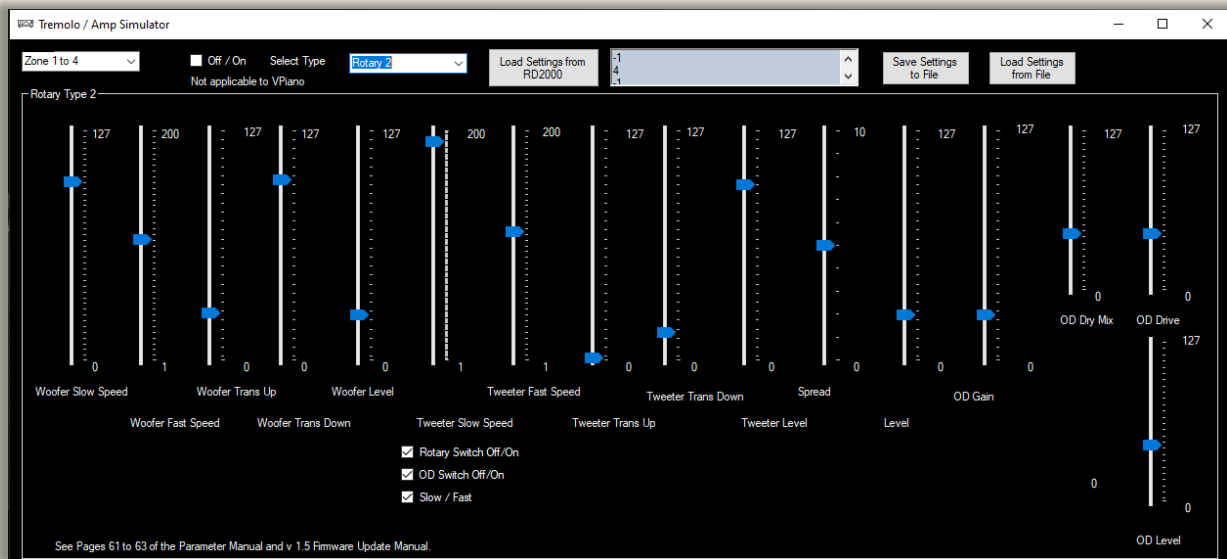
PROGRAM INTERNAL ZONE

On this form you can control various parameters associated with the how internal zones are set up on the RD2000. First, set the Zone you are working in using the combo-box at the top left. Zone 1 by default.

1. The first group box controls levels of the internal zone you have selected. Volume, Pan, Delay Send, Reverb and Resonance Sends plus voice reserve per zone. If you change the Send levels make sure the Reverb or Delay form has a volume set to > 0 otherwise you won't hear them.
2. The second group box has parameters for the RD keyboard.
3. The third is for tuning and transposing.
4. Finally, the various knobs and switch 9 can be assigned - On/Off. The assign check boxes 1 to 8 turn on or off the knobs 1 to 8. Check box 9 turns on or of the assign button 9.

To Load the Current Settings from the RD2000 click the button 'Load Settings from RD2000' button. You can Save the forms Settings as a plain text file and Load Settings at a later time using the two buttons at the top. If the midi in/out ports are open and set to the RD2000 the RD's settings will be updated. [Controlling Internal Zones](#) Video.

TREMOLO AND AMP SIMULATIONS



Ex. Rotary Speaker Type 2 Form shown above

Note. You cannot use Tremolo/Amp Simulations with the VPiano. Also they can only be applied to internal zones 1 to 4.

Currently there are 7 types of Tremolo effects and Amp Simulations, which include Normal, Acoustic Piano, E Piano, Guitar Amp, Rotary type 1, MKS 20 (Roland sound module tremolo effect) and Rotary type 2. The two types of Rotary speaker are Leslie speaker simulations. Speakers such as the Leslie 145, 147 and 122 are still widely used with Hammond Organs.

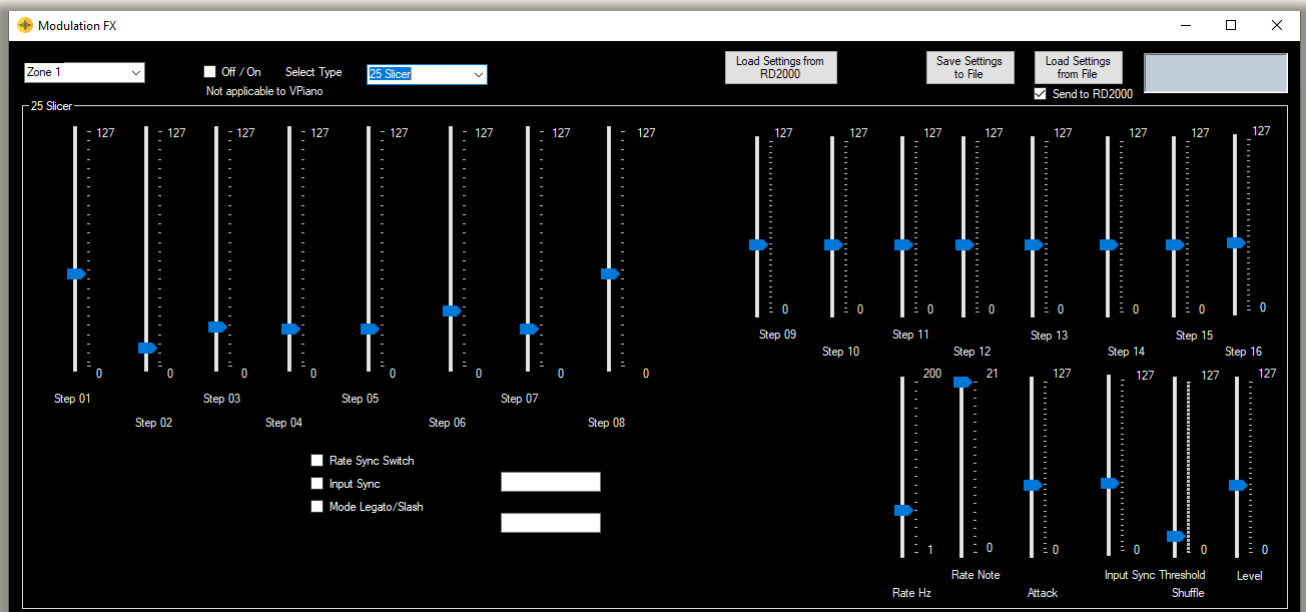
Firmware version 1.5 is required for Rotary 2. Each effect type has its own set of controls which are shown when the effect is selected.

Important - Select zone and then Tremolo type. Adjust the controls as required. See page 61 of the Parameter Manual.

You can download the current Tremolo settings by clicking on Load Settings from RD2000 **after selecting Zone and Tremolo type**. If you don't do that you will get an error message.

You can save the forms settings as a plain text file and reload at a later time using the two buttons at the top right. If the midi in/out ports are open and set to the RD2000 the RD's settings will be updated.

MODULATION EFFECTS



The RD2000 has 62 effects. So far, the following 20 have been included in this software. It has not been possible to include all Effects from the RD2000 as there is insufficient information in the Midi implementation manual. The setting values for these 20 effects can be loaded from the RD 2000 onto this form using the 'Load Settings from RD2000' button, so the sliders, checkboxes and drop-down boxes read the same as the RD2000.

To use, you must select Zone 1 to 4 and then the Modulation effect type you want from the drop-down list. Try different effects and settings until you get the one you like!

Note. You cannot use Modulation Effects with the VPiano. Also, they can only be applied to internal zones 1 to 4.

The 20 effects included in this software with their effect number:-

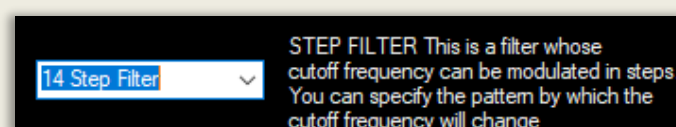
- 1 CE-1 Boss Chorus
- 2 SDD-320 Dimension Chorus
- 3 RE-201 Tape Echo
- 4 SBF-325 Analog Flanger

- 5 UNI-V Phaser type
- 6 SS PHASER
- 7 SCRIPT PHASER
- 8 CRY WAH
- 9 D-COMP Dynamic
Compression
- 10 T-SCREAM Overdrive
- 11 Equalizer
- 12 Enhancer Overtone Control
- 14 Step Filter
- 15 Spectrum (neutral)
- 16 Spectrum Filter
- 17 Humanizer
- 22 Ring Mod
- 25 Slicer
- 29 Hexa-Chorus
- 31 Space-D multiple chorus
- 46 Bit Crusher

TIP. To see the Mod FX editor on the RD2000 hold shift and turn a mod fx knob with zone effects button on.

You can save the forms settings as a plain text file and reload at a later time or share with others using the two buttons at the top. If the midi in/out ports are open and set to the RD2000 the RD's settings will be updated when you load the settings file.

See pages 34 to 60 of the Parameter Manual. A short description of the Modulation effect is shown beside the FX selector drop down menu.



Note. You can also route the audio out from the RD to send to external effects, pedals or VSTs'.

PROGRAM EXTERNAL ZONE

The 'Zone External' window is divided into three main sections for parameter control:

- Keyboard Section:** Contains sliders for 'Range A0 to Upper' (values 21 to 108), 'Velocity Range Upper' (values 0 to 127), 'Range Lower - C8' (values -48 to 48), 'Velocity Range Lower' (values 0 to 127), and 'Zone Transpose' (values -48 to 48).
- Midi Section:** Contains sliders for 'Midi TX Chnl' (values 1 to 16), 'Bank Select MSB CC0' (values 0 to 127), 'Bank Select LSB CC32' (values 0 to 127), 'Program Change' (values 0 to 127), 'Volume CC7' (values 0 to 127), 'Pan CC10' (values L-64 to R63), 'Coarse Tune 64' (values -48 to 48), and 'Fine Tune 64' (values -50 to 50). Below these are checkboxes for 'On/Off' for each parameter.
- Midi Other Section:** Contains sliders for 'PortaTime CC5' (values 0 to 127), 'Cutoff CC74' (values 0 to 127), 'Resonance CC71' (values 0 to 127), 'Attack CC73' (values 0 to 127), 'Decay CC75' (values 0 to 127), 'Release CC72' (values 0 to 127), 'Pitch Bend' (values 0 to 48), 'Mod Depth' (values 0 to 127), 'Chorus Send CC93' (values 0 to 127), 'Reverb Send CC91' (values 0 to 127), 'Utr Ctl Change 1 No.' (values 0 to 127), 'Utr Ctl Change 2 No.' (values 0 to 127), and '1 Val' (values 0 to 127). Below these are checkboxes for 'On/Off' for each parameter.

On the right side of the window, there is a list of assignable controls with checkboxes:

- Zone Switch
- Damper Control Switch
- FC1 Switch
- FC2 Switch
- Ext Pedal Switch
- Mod Switch
- Pitch Bend Switch
- Assign Ctl 1 Switch
- Assign Ctl 2 Switch
- Assign Ctl 3 Switch
- Assign Ctl 4 Switch
- Assign Ctl 5 Switch
- Assign Ctl 6 Switch
- Assign Ctl 7 Switch
- Assign Ctl 8 Switch
- Assign Ctl 9 Switch
- Wheel 1 Switch
- Wheel 2 Switch
- Mono/Poly On/Off
- ☒ Mono CC127/Poly CC127
- Portamento On/Off
- ☒ Portamento CC65

On this form you can control various parameters associated with external zones set on the RD2000. This enables you to control external midi instruments/VSTs'. To begin you specify the External Zone number. I normally use Zones 5 for an External zone. Midi channel 1.

Note. You would normally save these settings as a program on the RD2000 for your external VST or instrument. When you load the program all of these settings are applied to the external VST/AU or hardware instrument. Including the program Bank/number. The same applies if you save the settings as a plain text file. When you open the file the settings are applied to the external VST/AU or instrument.

1. The first box adjust keyboard settings.
2. The second box controls midi information sent out of the external zone. Such as Bank change, Volume and tuning.
3. The third box at the bottom sets the various standard midi CC message values and whether they are active.
4. The various knobs and switch 9 can be assigned - On/Off. The assign check boxes 1 to 8 turn on or off the knobs 1 to 8. Check box 9 turns on or of the assign button 9.
5. You can have 2 user defined CC messages/values

6. The foot controllers and wheels can be turned on or off. For instance, you would want the damper pedal to work on Pianos zone but not on a string zone.

You can load the current settings for the zone you choose by clicking on the 'Load Settings from RD2000' Button.

Note. If you want to change the midi transmit channel (Midi TX Chnl) from its default value then specify the number. Zone 5 default is Midi out channel 1. Zone 6 Midi out channel 2 etc. You can also specify the RD Midi out ports - All, Out 1, Out 2 or USB.

If you want to save your settings after power down you have to Write the program on the RD to a program slot.

You can save the forms settings as a plain text file and reload at a later time using the two buttons at the top . If the midi in/out ports are open and set to the RD2000 the RD's settings will be updated.

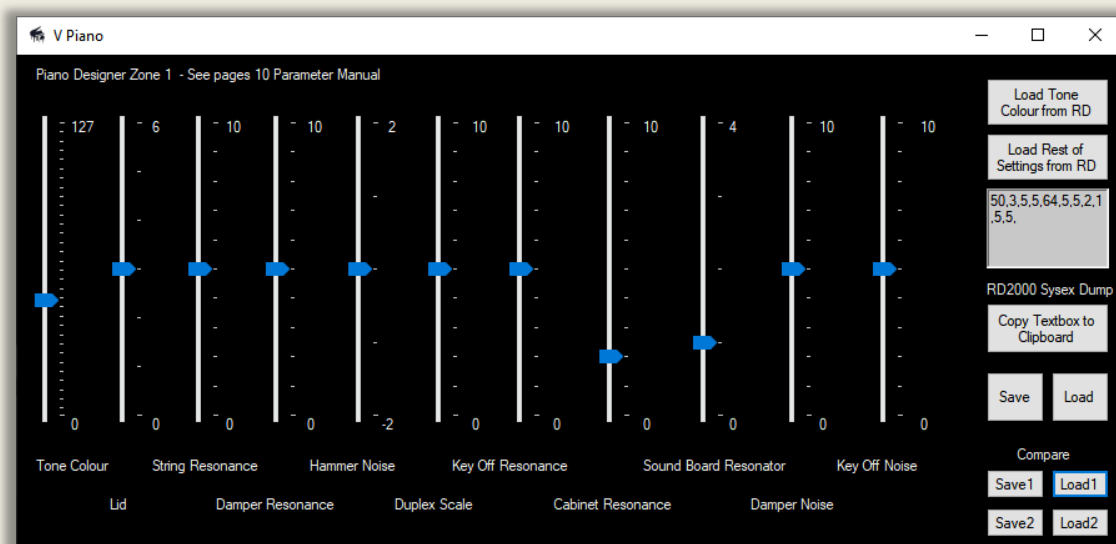
See pages 18 to 21 of the Parameter manual.

[Controlling external instruments or VSTs'](#) Video

[Controlling external instruments or VSTs' Part 2](#) Video

THE PIANO / TONE DESIGNER

V PIANO EDITOR



Roland's V Piano technology first appeared in 2009 in their V-Piano, a very expensive instrument and it is built into the RD2000. Roland's V-Piano does not use samples (recordings to make sounds) but mathematical functions to replicate strings being struck by hammers and the effect of a soundboard and damper pedal etc. The V-Piano is very expressive, has zero latency and unlimited polyphony. All VPiano programs are labelled MD - modelled. SN stands for supernatural (sampled) sounds. The VPiano is only available in Zone 1. RD firmware update 1.5 adds extra Vpiano tones bringing a total of 17.

Firmware version 2.0 with the German Piano expansion brings the total to 34 tones and the RD2000 EX Firmware v 1.00 Update adds an Essential Upright Piano model adding a further 14 tones making a total of 48 unique tones over the three models. Each of these tones can be edited. The German Concert and Essential Upright expansions can be purchased from the Roland Cloud.

The main differences between the RD V-Piano and the original V-Piano is that Unison Tune is not adjustable on the RD. Also, the earlier V-Piano had ultimately 7 piano expansions in all, including 1 Vanguard and 2 Vintage (grand and upright) whilst the RD now has 3. Vanguard is interesting as you could create futuristic piano sounds. It modelled silver wound strings, long string length and hard hammers and soundboard. Unison tune is

where there are two or three strings per note, but you can't adjust the tuning difference between them on the RD. It's in the engine and used by the Essential Upright Parlour Pianos, but not currently accessible by sysex or the RD interface. Maybe Roland could enable user editing with a Firmware / sysex update?

To use the VPiano editor, open the midi port on the RD2000 editor software (midi in and out to the RD). Pick a V Piano program - zone 1 only. Moving the sliders on the form above will change the V piano parameters on the RD. Moving the sliders up increases the value. Eg. Lid - raising the slider is like opening the lid of a grand piano. Refer to the Parameter manual for Details on what the various parameters do. The manual is available in the help menu as a pdf.

To load values from the RD, midi in and out must be set to the RD. So the request to dump the sysex file can be received by the RD and the data dump is sent back to the software from the RD.

To load the values directly from the RD click on the buttons - Load Tone colour from RD' and 'Load Rest of settings from RD. The sliders will then move to the current values on the RD - ie the current program in temporary memory.

You can save the contents of the text box to the windows clipboard by clicking on the button "Copy to Clipboard".

You can also 'Load' and 'Save' the current RD values on the Form as a plain text comma separated file by Clicking on Load/Save Buttons. These are User Presets that can be shared with other users or stored by you for further use. These can be recalled using the Load Button. If you go to the Tone designer/piano designer on the RD, you will see the values being updated when the Load button is clicked. Note that successive sysex messages are sent 30 milliseconds apart from the PC so that the RD Midi buffer does not fill up. Loading all settings takes about 0.5 seconds.

See page 10 - 11 of the Parameter Manual for details of the Vpiano designer parameters. A summary is on the next page.

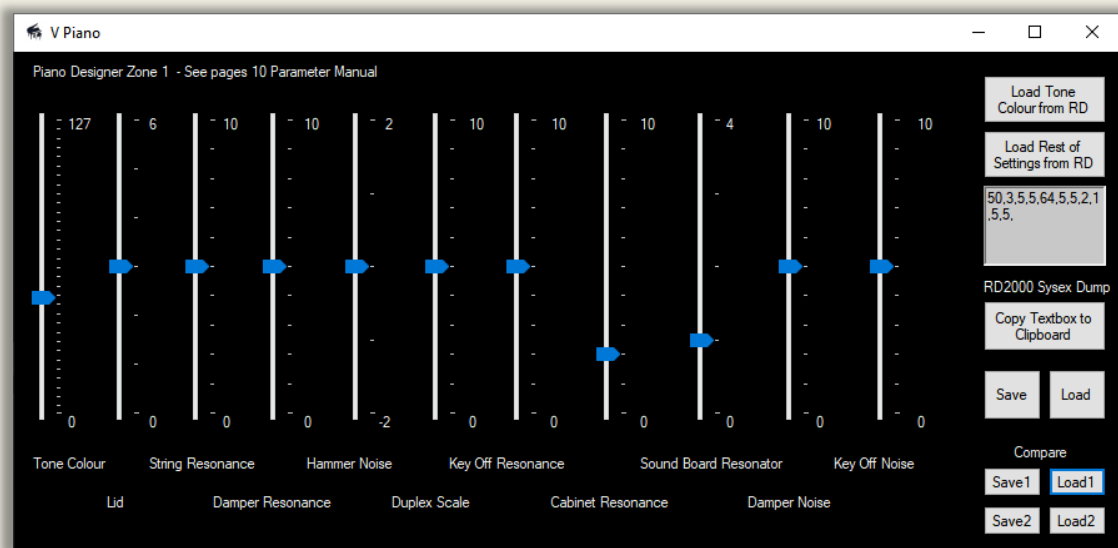
Note tooltips show slider values as you move them for all Tone Editor forms including Individual Note Voicing. You can use arrow keys and shift for fine adjustment. See below.

VPIANO SETTINGS

Tone Colour	Changes the timbre and stereo spread. Higher values brighten the sound.
Lid	Raising the lid makes the sound brighter.
String Resonance	Strings for keys already pressed resonate sympathetically when another key is played.
Damper Resonance	When the damper is pressed strings of keys not struck also vibrate sympathetically.
Hammer Noise	Adjusts the loudness / timbre of the sound of the hammer striking the string
Duplex Scale	Sympathetic resonance in the non-damped parts of strings. Ie the part of the strings adjacent to the bridge which is undamped.
Key Off Resonance	When a key is released, this reproduces the subtle resonance sound which result.
Cabinet Resonance	The body resonance of a piano. This emulates the piano body resonating with the strings you play.
Sound Board Resonator	Higher settings produce a clearer resonance. This emulates the sound board resonating with the strings you play. Higher values produce a clearer more beautiful resonance.
Damper Noise	The 'swoosh' noise when the damper is pressed.
Key Off Noise	The subtle resonances produced when a key is released.

Note. On the RD2000 you can also change settings on a per note basis for Tuning, Level (volume) and Character. These are stored as user presets. This software can create Level, Tuning and Character user presets - see later. The presets for Tuning which come with each model have been created by experienced piano tuners. But you can create your own and some novel ones too.

VPIANO - QUICKLY COMPARING SETTINGS



Comparing different V-Piano settings quickly

If you want to quickly compare before and after changing settings on the V-Piano - Then:

1. Save your initial settings - click on 'Save1' button
2. Change your settings - click on 'Save 2' button.
3. Then you can compare settings quickly by clicking between 'Load1' and 'Load2' buttons.

The current settings are not saved unless you click on the bigger 'Save' (to file on your PC) button. Note. When you close the program Save1 and Save2 settings will be lost.

Changing the V-Piano sound further.

1. Apart from the controls on the VPiano form,
2. You can adjust note by note - level, tuning and character.
3. You can add reverb and change the send level from the VPiano.
4. You can add delay and change the send level from the VPiano.
5. You can change key touch, velocity delay, velocity follow and offset plus other related parameters
6. You can layer the VPiano with Supernatural piano tones.
7. You can use the compressor to vary the dynamic range of the Program.
8. You can adjust the EQ for the Program - to brighten or soften.
9. You can pass the audio out through external effects - VST or hardware effects.

Tip.

To get that Elton John Piano sound try layering a VPiano German concert grand in Zone 1 with a RD1000 super natural piano in Zone 2. Elton often 'midied' up his Yamaha grand and layered it with a Roland RD 1000 piano sound. Tones 169 to 171 say.

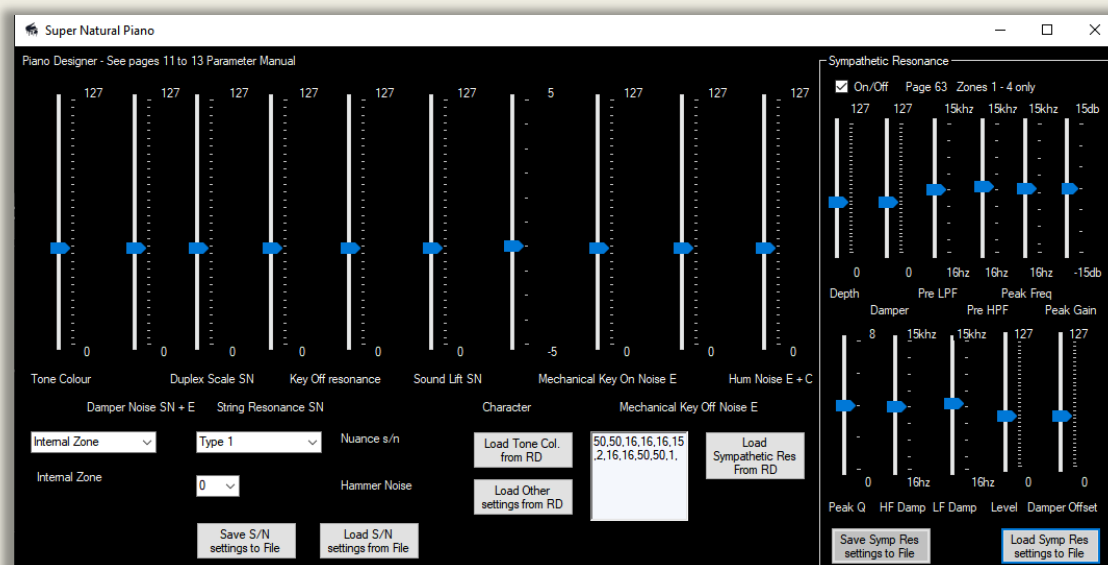
This is a link to an interesting article detailing a discussion with a legendary Roland Engineer Tadao Kikumoto on the VPiano.

<https://articles.roland.com/roland-engineering-v-piano/>



Above is the original Roland VPiano released in 2009 which took 10 years to develop and cost around \$6000. It used mathematical functions rather than samples to create piano tones. Each element of a piano was modelled from strings to sound board, giving the user the ability to create a wide variety of piano types and even create pianos which don't exist. The VPiano code lives on in the RD2000.

SUPERNATURAL PIANO EDITOR



Roland's super natural technology uses samples to create sounds. But it also uses other tricks such as smoothing the transition between sample layers to make the sound more realistic, sampling every note and using longer samples rather than looping. The RD2000 has a subset of the sounds - supernatural pianos, ePianos and claws - of the Integra 7 module. You can edit all of the parameters from this software.

- A setting with SN after it on the image above is applicable to supernatural pianos
- With e after it electric pianos
- With c after it claws
- With nothing after it applies to all 3 types of piano

To load values from the RD, midi in and out in the software must be set to the RD midi out/in. This is so the request to dump the sysex file can be received by the RD and the data dump is sent back to this software from the RD.

If you have a supernatural piano loaded in the current program you can pick up the settings from the RD in the software.

- Choose the zone the supernatural piano you want to load from the current program. By default zone 1
- Click 'Load Tone / Character' to see these settings in the software
- Click 'Load other settings from RD' to see the other values in this software.

If the dump is not successful or midi in and out are not set to the RD you will get an error message.

You can also Load and Save the current settings on the Form as a plain text comma separated file by Clicking on 'Save settings to File' Button. These are User Presets that can be shared with other users. These can be recalled using the 'Load Settings from File' Button. If you go to the Tone designer/S/N Piano designer on the RD, you will see the values being updated when the Load button is clicked. Note that successive sysex messages are sent 30 milliseconds apart from the PC so that the RD Midi buffer does not fill up. Loading all settings takes about 0.5 seconds.

The latest version of the Supernatural Pianos is version 3. This is not available on the RD2000 but is on the RD-88EX and the Fantom 6-8. However, I much prefer the VPiano which is not on the RD-88EX.

See page 10 - 13 of the Parameter Manual.

Tip.

If you play classical music you might want to watch this excellent youtube video.

https://www.youtube.com/watch?v=_d2U2rmS8HE

The approach is to use the Mellow NX Concert tone 26 or a German Concert VPiano.

Turn up reverb fully
Add some pre delay

I think this really does give the sound of a concert hall grand.

SYMPATHETIC RESONANCE

The screenshot shows the 'Sympathetic Resonance' control panel. At the top, there is a checkbox labeled 'On/Off' which is checked, and text indicating 'Page 63' and 'Zones 1 - 4 only'. Below this, there are two rows of sliders. The first row contains sliders for 'Depth' (0 to 127), 'Pre LPF' (0 to 127), 'Pre HPF' (15khz to 16hz), 'Peak Freq' (15khz to 16hz), and 'Peak Gain' (15db to -15db). The second row contains sliders for 'Damper' (8 to 0), 'HF Damp' (15khz to 16hz), 'LF Damp' (15khz to 16hz), 'Level' (127 to 0), and 'Damper Offset' (127 to 0). At the bottom, there are two buttons: 'Save Symp Res settings to File' and 'Load Symp Res settings to File'.

When a damper pedal is depressed on a piano, all the 88 strings can vibrate producing a rich tone. This models that effect. It is not zone specific as it's a system common setting and only applies to Supernatural pianos in zones 1 to 4 and applies only to certain tones.

Note there are 12 controls for this feature described in the Parameter Manual. These are included in this software. However, the midi sysex documentation actually details 28 settings?

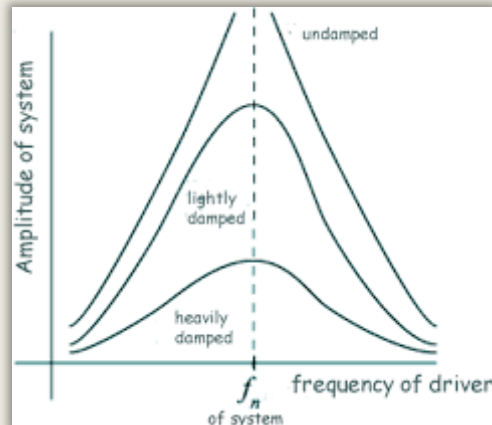
Click on "Load Sympathetic Res" to load the settings from the RD into this software,

You can also Load and Save the current settings on the Form as a plain comma separated text file by Clicking on 'Save settings to File' Button. These are User Presets that can be shared with other users. These can be recalled using the 'Load Settings from File' Button. If you go to the Tone designer/Sympathetic Resonance page on the RD, you will see the values being updated when the Load button is clicked. Note that

successive sysex messages are sent 30 milliseconds apart from the PC so that the RD Midi buffer does not fill up. Loading all settings takes about 0.5 seconds.

See page 64 of the Parameter Manual.

Sympathetic Resonance

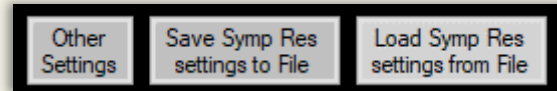


The graph above shows how a system responds to an external vibration. At a certain 'resonate frequency' the system will absorb the most energy. If the system is damped the energy will be absorbed by varying amounts.

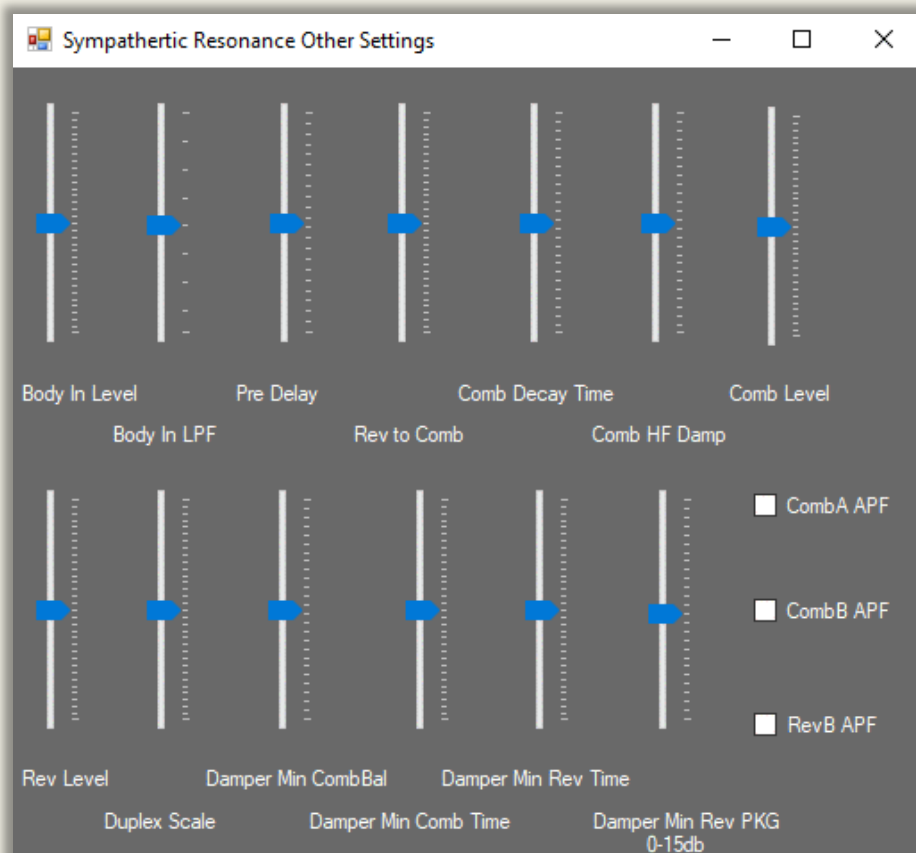
When a damper is lifted, piano strings will absorb energy from nearby sounding strings and resonate. This resonance model mimics how an acoustic piano behaves when a damper pedal is pressed. The sections of strings which are not damped at either end (aliquot) will also resonate and form 'duplex' strings. Certain manufacturers set these undamped lengths to be partials which sweeten and brighten the sound. On a piano, a soundboard is used to transmit acoustic energy to the air from the strings via the bridge. The soundboard is typically made from spruce, fir or pine and around 7mm thick, it is domed around 5mm in the centre towards the strings. Its resonant frequency is typically around 40Hz. The lower notes needing more help to transmit their energy than the higher notes. Not only do the strings and sound board resonate, but so does the case of the Piano and all of these contributions need to be modelled by the RD2000.

SYMPATHETIC RESONANCE OTHER SETTINGS

If you click on the 'Other Settings' button it will open another form. See Below.

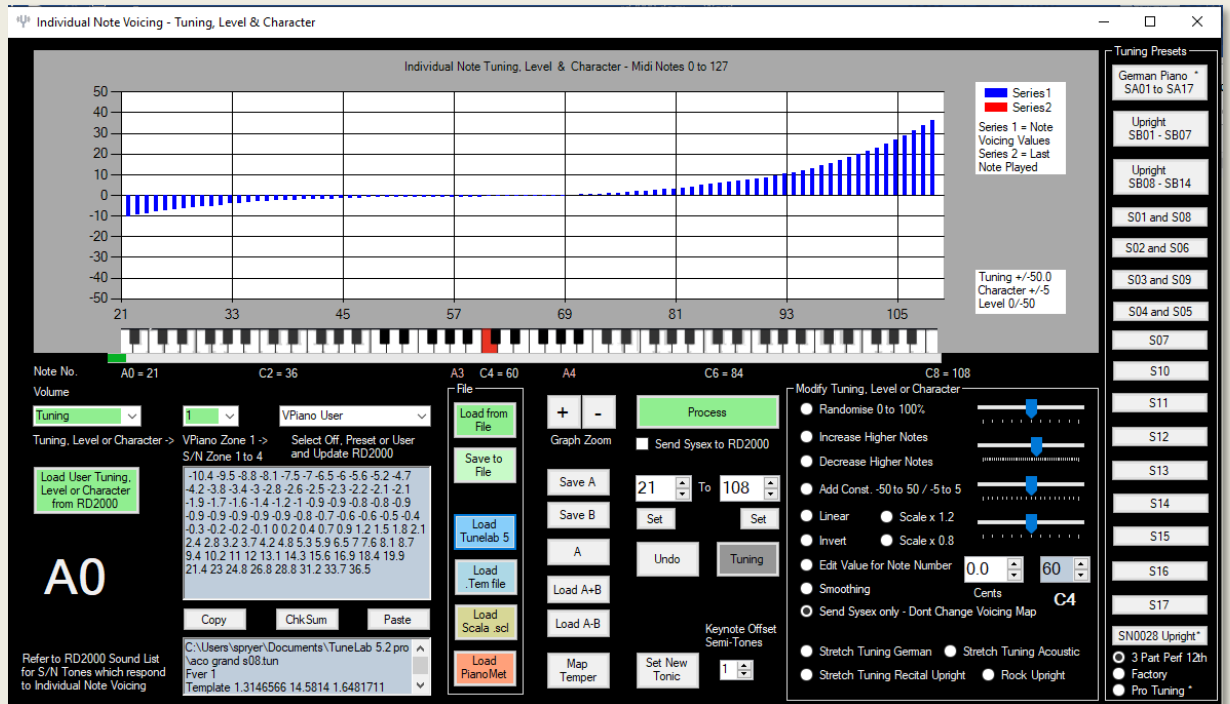


These settings are in the Midi Implementation manual but are not documented or defined in the Parameter Manual or accessible through the RD2000! So, I suggest play with these settings and see what they do! They work with the damper (sustain) pedal depressed for most S/N pianos, zones 1 to 4 but not the VPiano. It's strange they can't be edited on the RD and are only accessible using sysex? Pressing 'Load Sympathetic Res from RD' on the S/N form will load these settings too. The forms settings can be 'Saved to file' and 'Loaded from file' using the two buttons above. Note Individual note voicing and sympathetic all resonance settings can be used for Supernatural tones 0001 to 0039 and 0042 to 0045.



INDIVIDUAL NOTE VOICING - TUNING, LEVEL AND CHARACTER

The Individual Note Voicing Form



Receive RD2000 88
Note voicing Data
By Midi



Load Files
& Save
Files on
Computer

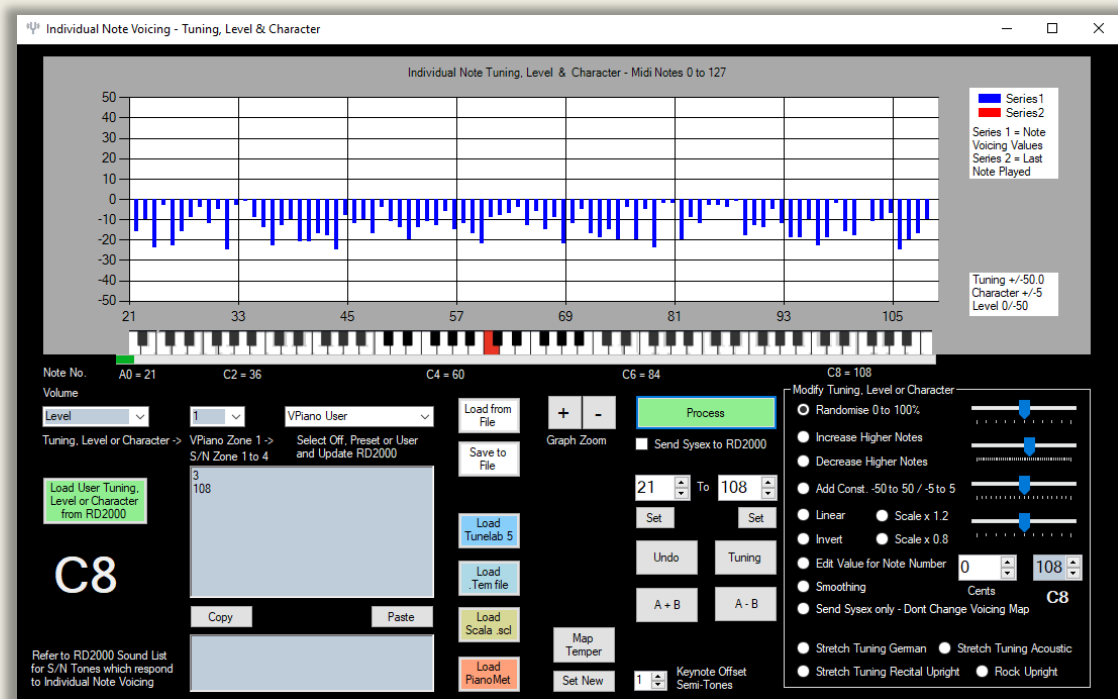


Edit Note Voicing Data
& Send to RD2000 by Midi



Tuning
Presets

INDIVIDUAL NOTE VOICING



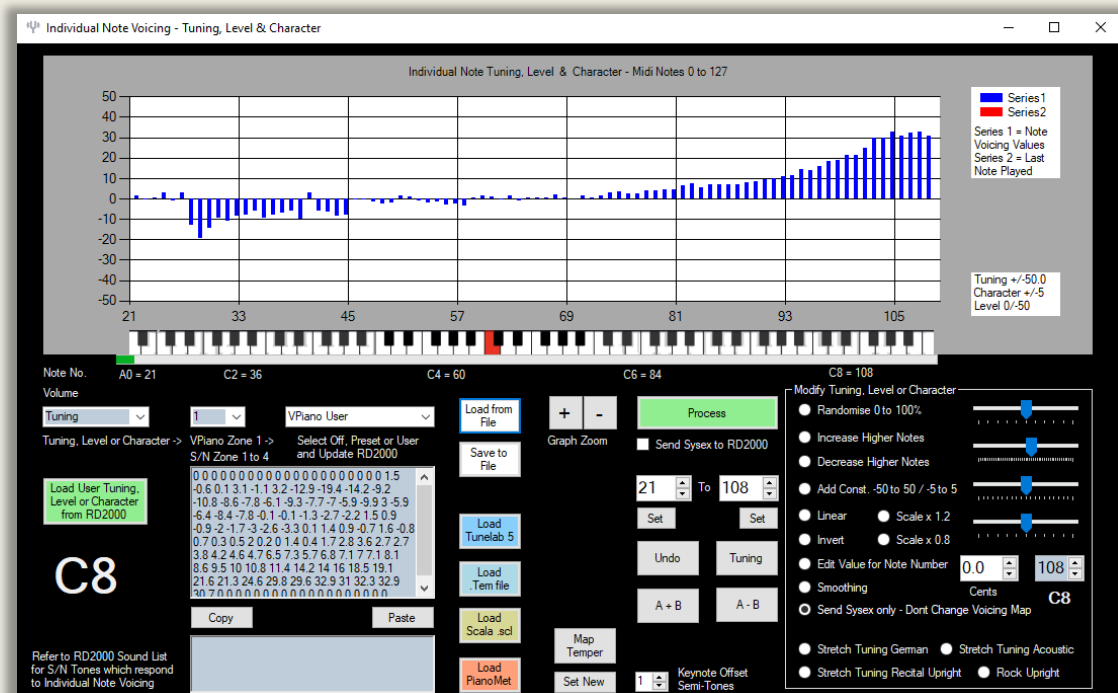
An Example of Level (Volume) randomly mapped to each note. In the image Middle C = C4 = midi note 60 is coloured red.

The RD2000 allows the user to adjust individual note voicing parameters for every individual note for certain piano type tones. This includes all of the V-Piano tones and the Super Natural Pianos 0001 to 0039 and 0042 to 0045 - See RD2000 Sound List. These parameters are Tuning, Level (volume) and Character (timbre /brightness). Above is an example of the Level histogram. Each notes Level is randomly adjusted. Because real Pianos are mechanical instruments the key pressure to generate a given volume on any note varies and the timbre (Character) of each note is slightly different. You can generate a random distribution to give a more realistic sound. On the RD its very time consuming to do this by hand for the 88 notes. This software does it with a couple of mouse clicks. New Pianos or well-maintained ones will have a lot less variation in timbre and level between notes than older or poorly maintained pianos.

Individual Note Voicing

LEVEL parameter can give a more authentic feel but don't overdo note volume variations. The variations are quite random in the inbuilt profiles. Aim for a range between 0 and -20 max. Roland have not applied any to the German Vpiano presets or the Essential Upright presets. This setting can replicate varying mechanical resistance from note to note on an acoustic piano. *Regulating the Piano.*

TUNING as a profession began in the 19th century. Before then, Pianos were tuned by performers. But triple stringing and increasing octaves made this more difficult. You can just use the RD2000 tuning profiles or you can create your own. The inbuilt ones all use stretch tuning to differing degrees. Above middle C the notes get sharper up to 30 cents at C8. Below middle C they become flat by up to -10 cents at C1. The stretch tuning on the German Concert Vpiano is slightly larger. The new Essential Upright expansion also uses stretch tuning. These tuning profiles on the RD have been set up by piano tuners. However, a tuning can be created on the RD2000 as a User Preset. The RD2000 can be tuned note by note to +/- 50.0 cents with the smallest increment 0.1 cents. Note the 88 note RD2000 keyboard can access midi note numbers 21 A0 to 108 C8.

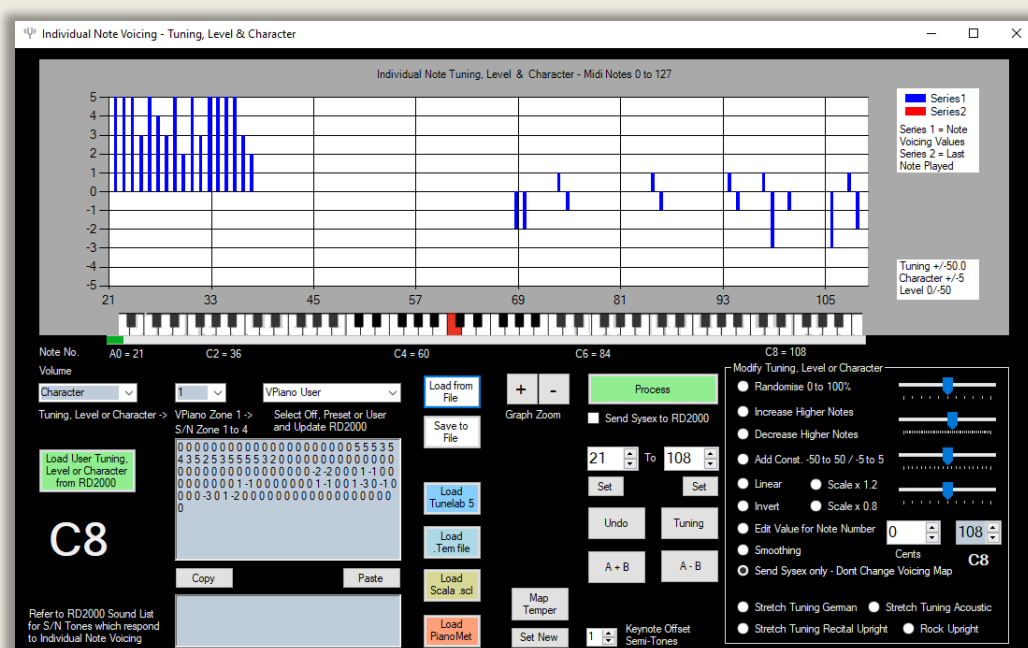


An example of Stretch Tuning on the RD2000
S04 VPiano Tone - Vertical Scale +/-50 Cents.

CHARACTER parameter has the biggest effect on the sound of the RD. The inbuilt profiles are again quite random. Values vary between +/- 5. On the German Vpiano and Upright models they vary between -2 and +5. This parameter replicates to some extent varying hammer felt hardness and other mechanical variations note to note on an acoustic piano. *Voicing the Piano.*



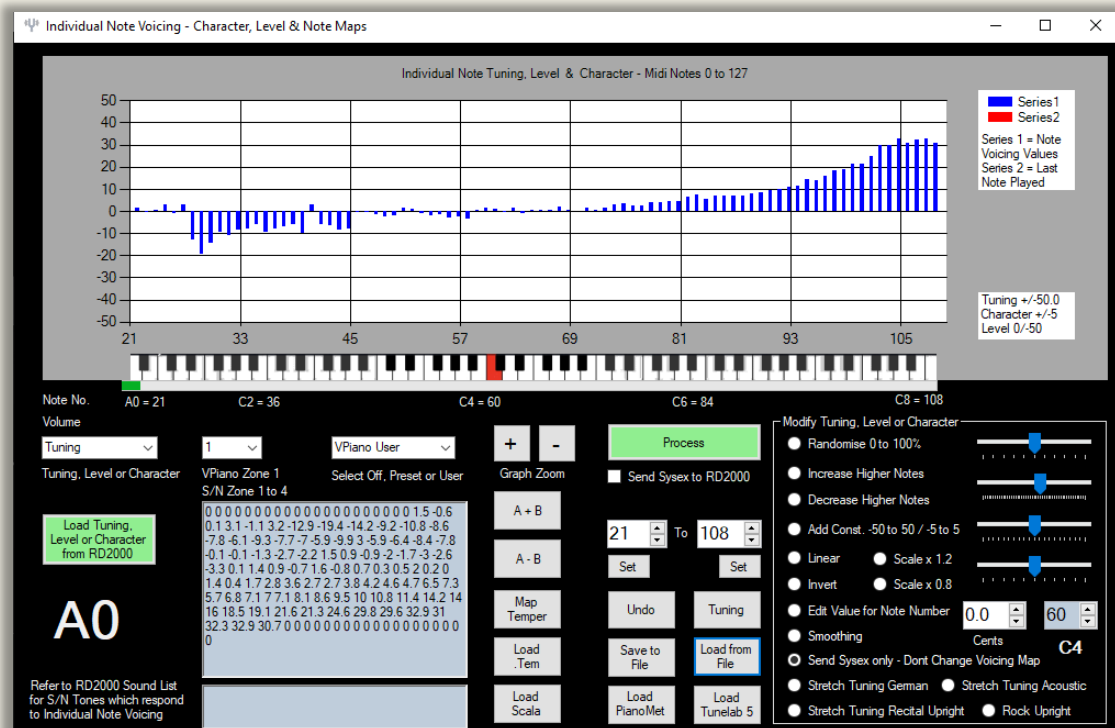
The very earliest Pianos in the 18th Century would have had hammers made from compressed paper which would have given the instrument a metallic tone, a bit like its ancestor the Harpsichord. Paper gave way to leather but by the 20th Century all pianos used felt on the hammers. New pianos have soft uncompressed felt, whereas old poorly maintained pianos have hard compressed felt giving a metallic tone. An experienced tuner can work the felt with needles and irons to get the right tonality. The Character setting simulates a little bit the varying felt hardness's. This can be further modelled using EQ and adjusting the Tone Colour.



An example of Character Map on the RD2000
S04 VPiano Tone - Vertical Scale ± 5 .

LOADING INDIVIDUAL NOTE TUNINGS FROM THE RD2000

Note. You can only download (by midi dump), edit and then save on the RD2000 the User - Tuning, Character and Level - profiles. The factory settings of the RD2000 are that the User and Preset Profiles for VPianos are initially the same. The User profiles are available for retrieving and editing and are in Temporary Memory. The Preset profiles are not accessible for download or editing and are in system memory. Note. When you change to say tuning or level or character the Tone Designer screen won't automatically change on the RD to tuning, level or character, but the settings can be edited still.



An example of Factory Stretch Tuning on the RD2000
VPiano Tone S04 - Vertical Scale +/-50.0 Cents.

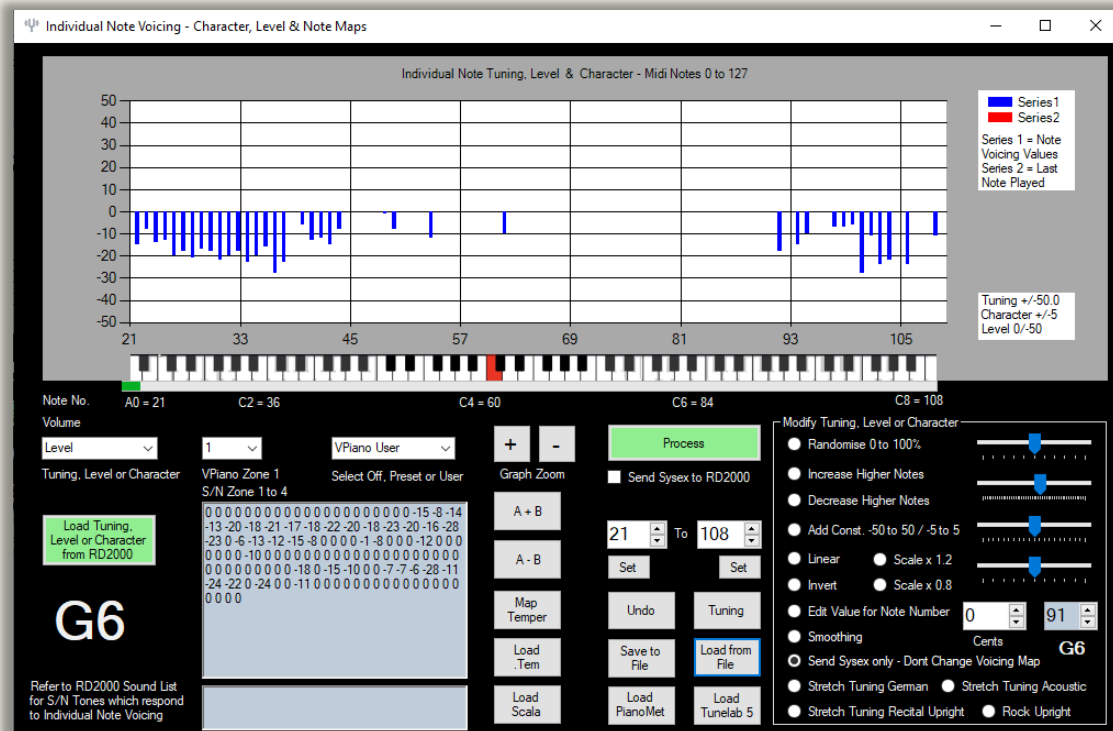
1. Make sure Midi in/ Out are both set to RD2000.
2. Select 'Tuning' from the drop-down menu. ->
3. Select Zone. VPiano always 1. ->
4. Set Drop down to VPiano User. This updates the RD2000 settings by sysex.
5. Click the 'Load Tuning, Level or Character from RD2000' - green button.
6. It will take less than 2 seconds to download the 88-note profile.

7. The Note Tuning on the RD is in Cents. +/- 50.0 cents with a 0.1 cent min increments. This is shown on the vertical axis on the graph.

Note. On the VPiano model - S01 to S17 - there are 13 different factory tunings. Four repeat. S01 = S08, S02 = S06, S03 = S09, S04 = S05.

Note you can download the Tuning, Level or Character profile for the piano tones you use and save it as a text file. Press the 'Save to File' button. You can then reload it using the 'Load from File' button. You can also apply it to other Tones. If you make any edits just save them too on your PC.

LOADING INDIVIDUAL NOTE LEVEL MAPS



Above is the Note Level map for the S04 VPiano

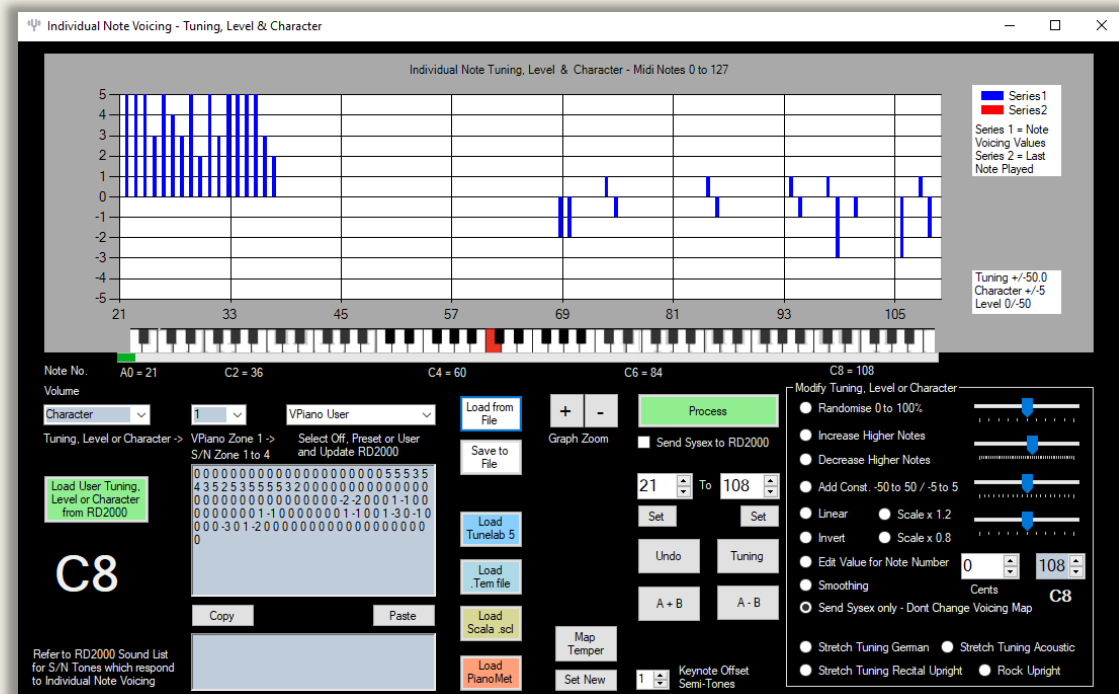
1. Make sure Midi in/ Out are both set to RD2000.
2. Select 'Level' from the drop-down menu. ->
3. Select Zone. VPiano always 1. ->
4. Set Drop down to VPiano User. This updates the RD2000 settings by sysex.
5. Click 'Load Tuning, Level or Character from RD2000' button.
6. It will take less than 2 seconds to download the 88-note profile.
7. The Level offset on the RD is 0 to - 50max. This is shown on the vertical axis on the graph.

Note Some Pianos such as S01, S02 and S03 don't have any preset Level or Character maps assigned so will return 0 values.



Roland RD2000 PHA-50 triple sensor action, hybrid wood and plastic.

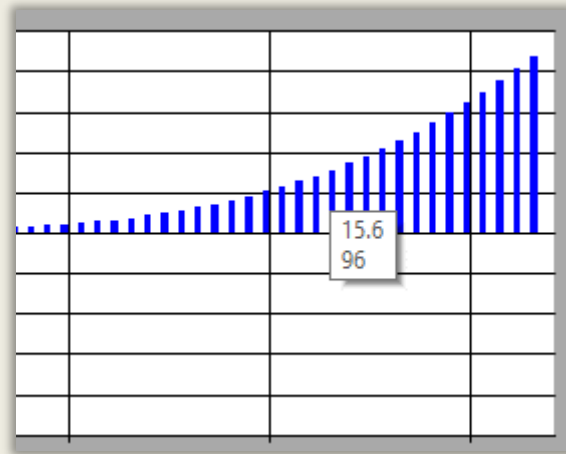
LOADING INDIVIDUAL NOTE CHARACTER MAPS



Above is the Note Character Preset map for S04 VPiano Tone

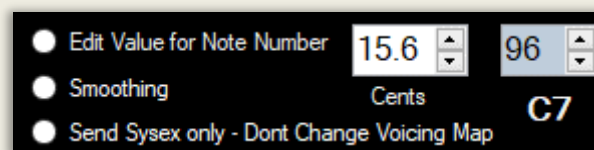
1. Make sure Midi in/ Out are both set to RD2000.
2. Select 'Character' from the drop-down menu. ->
3. Select Zone. VPiano always 1. ->
4. Set Drop down to VPiano User. This updates the RD2000 settings by sysex.
5. Click 'Load Tuning, Level or Character from RD2000' button. This requests a sysex dump.
6. It will take less than 2 seconds to download the 88-note profile.
7. The Character offset on the RD is +5/-5 max. This is shown on the vertical axis on the graph. This parameter affects the tone on the string - Toning. In an acoustic piano, factors such as hammer felt hardness affect this.
8. Note Some Pianos such as the VPianos' S01, S02 and S03 don't have any Level or Character maps assigned so will return 0 values.

INSPECTING VOICING VALUES

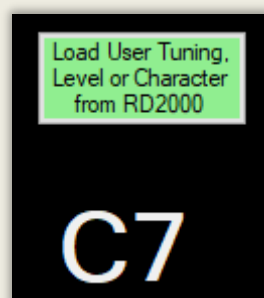


If you hover the mouse cursor over a bar on the chart, a tooltip will show you the height of the bar - *Tuning, Level or Character* - and below on the next line the *Midi note number*. See image above for a *Tuning Map*, showing a Note tuned sharp by +15.6 cents, Midi note number 96.

When you see a tooltip on the graph the values in the 'Edit Value for Note Number' up down boxes will be updated with the value for that note number. See image below. The left box is the value, the right light blue box the Midi Note Number. This shows +15.6 cents is assigned to note 96, which would be the same as the associated tooltip. You can also see the note = C7 (midi note 96) and a larger version in the bottom left of the window.

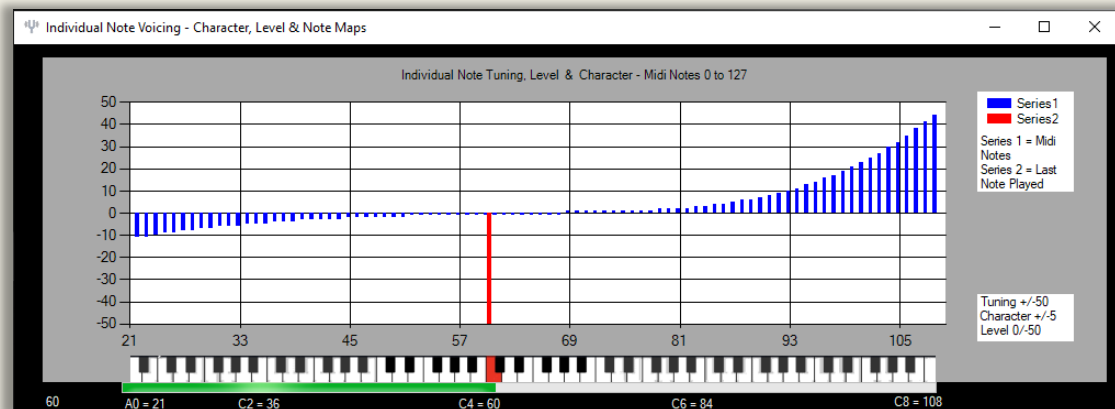


Here note C7 is either being inspected or played.



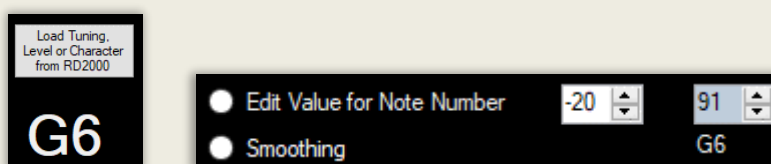
SHOWING NOTES PLAYED ON THE RD2000

If you play a note the RD2000 keyboard a horizontal green progress bar shows the position of the note. 21 to 108. See image below. The Midi note number is also shown on the bottom left. In this case 60. There is also a red bar which moves along the graph x-axis when you play a note on the RD keyboard to help you locate the position on the graph when editing sounds. This shows the last note played with its height proportional to midi note volume. See below note C4 midi note 60. The Red key on the keyboard always marks middle C.



The Red column shows last Midi-in note played on RD2000. The height of the bar represents the velocity of the note. Any blue note column fractionally to the right of it is the same note number. The blue up down box for note number will show the note number of this last note played, but this will update if you hover over a blue bar and its tooltip appears. Similarly, the white value box will also be updated.

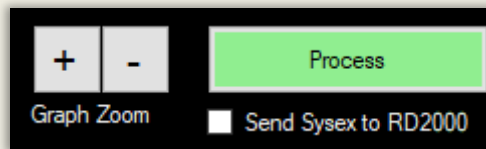
If the 'Edit Value for Note Number' radio button is selected, you can then adjust the note value up down box (or use up or down arrow keys) and press 'Process' with the 'Send Sysex to RD2000' checkbox checked. Playing the note again will audition the new value. This makes it easy to edit one note at a time. Below a value of -20 for midi note 91. Note G6. There is also displayed a bigger copy of the text showing G6.



ZOOM

If you click on the Zoom + plus button it will magnify the Y axis scale by reducing the maximum value by 5 for each click for Tuning or Level or 1 for Character to help you inspect smaller values.

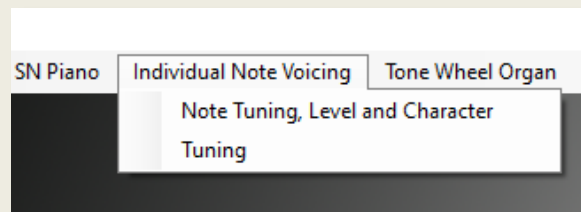
The Zoom - minus button adds 5 to the Y axis scale with each click for Tuning or Level or +1 for Character.



TUNING



When you want to tune the RD2000 here is a form you can use which is nice and compact and works with Tuning Apps. First click the 'Tuning' Menu item.



This opens a new form. This is the digital equivalent of a 'Piano Tuning Hammer' and will help you work with tuning apps. See later. You can tune one note at a time. You can select the note being edited with a key on the RD keyboard or click 'Play Note'. You can also use this form for Character and Level editing as well as Auto Tuning the Entropy Tuner.

Make sure your midi ports are set to RD2000 in/out the midi port is open. The Midi Channel is set on the Midi settings form. 1 = default value. Firstly, you load the voicing curve you are editing which should be the

same as the one loaded on the RD2000. I normally tune all 88 notes. The large white text shows the note you want to edit. Eg. C4 = midi note 60. On a digital piano I start at A0, midi note 21 working up to C8 midi note 108.

- You can use the updown arrows on the right of this form to set the Midi Note number you are tuning,
- If you play the note on the RD this sets the Midi Note in the right up down box.

The tuning sequence is as follows: -

Play the note, Adjust the Tuning and Repeat until the note is Tuned.



The Play Note button plays the current note. The note volume is controlled by the slider above the Play Note button. Or press a key on the RD. Check the tuning now. If it's not correct ->

Press 'Get Value from Current Curve' - that gets the current value of that note on the tuning curve loaded in this editor.

'Process +1 Cent' or 'Process -1 Cent' buttons. This will raise or lower the note value by -1 or +1 cents just click one of these two buttons. This also changes the updown box by ± 1 cent and presses the 'Process' button all with one click. The ± 0.3 cent buttons are similar but just apply to Tuning. The curve is updated too.



You can also Make the note Sharper or Flatter using the Value updown box which can be set between: -

- +- 50.0 cents for tuning. Smallest increment 0.1 cents.
- +- 5 for character. Smallest increment 1 cent.
- 0 to - 50 for level. Smallest increment 1 cent.

Then press 'Process' sends the new value to the RD2000 by sysex for just that note. It also updates the curve in the software and on the RD2000.

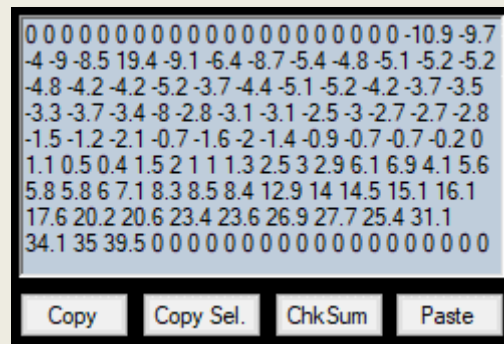
If you use a tuning app, this form will always sit on top of any other window. Keep adjusting the tuning in cents until the tuning app tells you the tuning is correct or the beats are minimised - see also books on aural tuning. Change to the next note and repeat for as many notes you want to up to 88 notes. When the tuning is completed don't forget to 'Write' your

User tuning file on the RD2000. You should then 'Save File' as a plain text file in this program too. You can then 'Load File' at a later date.

Note. There are additional tuning functions on the RD2000 and in this editor: -

- The RD2000 has a Master Tune function - System Common settings - which affects all zones. It can change the overall tune from 415.3 Hz to A4 = 440 Hz to 466.2 Hz.
- Then for each Zone - Internal & External Edit - there is Transpose +/- 48 semitones, Coarse Tune +/- 48 semitones (4 octaves) and Fine Tune +/- 50 Cents. These tuning options apply to both Internal and external zones.

COPY AND PASTE



A Note Voicing Array in the large Text Box

You can easily copy and paste the contents of the note voicing values in the large text box. Handy for sharing tunings on platforms such as Facebook where you can't share files but you can share text! Copy Text and paste to Facebook say for your friends. This copies all text and pastes all text in the windows clipboard.

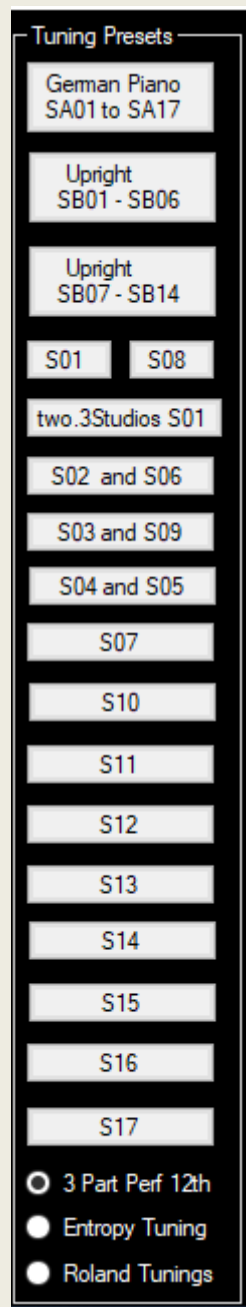
Your friends then Paste text from Facebook into Text box. Press 'Save File'. Then once they set the Zone and whether its VPiano or S/N Piano just 'Load File' which will populate the note voicing array and update the graph. Then the voicing can be sent to the appropriate Piano model by sysex. Don't forget to Write Program on the RD2000 if you want to keep the voicing.

You can also copy selected text which you highlight in the big text box. Just select the portion of text you want and click on 'Copy Sel'.

You can use the normal copy/cut/paste keyboard shortcuts here too. Ctrl C, Ctrl X and Ctrl V.

Chksum adds all of the current 88 note offsets so you can compare tuning curves and check for repeats.

TUNING PRESETS



On the right-hand side of the individual note voicing form are presets for individual note tunings for all of the VPiano tones. If you select the radio button labelled '3-Part perfect 12th' and you click on one of the buttons, then the optimised 3-part perfect 12th tuning (6:2,3:1,3:1) is opened for that VPiano model. This can be viewed, edited or sent to the RD2000 if the 'Send Sysex to RD2000' check box is checked and then click 'Process'. You can save the tuning profile as a User Preset in a program on the RD2000. The tuning profiles have been created using TuneLab 5.3.

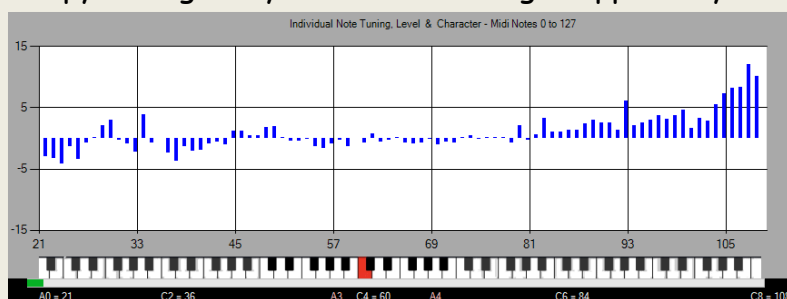
Inharmonicity constants were measured at C1 to C7' and F#1 to F#6. All the tunings are specific to the VPiano Tone on the button. You can of course edit them to suit. Or try different tunings. Or create historic unequal temperaments by adding temperament files. Don't forget to save them using the 'Save to File' button. Tuning is covered in detail in the next section.

The 'Roland Tunings' radio button option is a copy of the Roland preset factory tuning. The *German Concert* expansion uses the same factory tuning for all tones. I've measured the inharmonicity and compared SA01 SA02 and SA03 tunings and there is no significant difference <3 cents. The Upright Rock SB07 to SB14 factory tuning is the same as the S01 and S08 factory tuning? S14 and S15 are the same for notes above G#4 but the tuning below G#4 differs.

Checking the Entropy Tuning radio button and clicking a tone button loads the associated Entropy tuning curve. The acid test is how the tuning sounds. Feel free to edit and share with others by saving the tuning in a file using 'Save to File' button. There are entropy tunings for S/N pianos in the installation directory. There's also a professional tuning for S01 called Courtesy 'two:3Studios' Richard Bint created by Barry Mole.

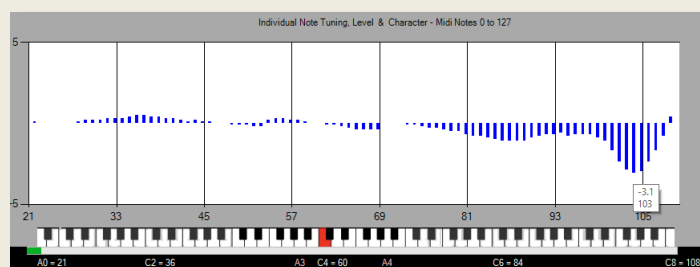
WHY HAVE DIFFERENT TUNINGS?

I have created a variety of tuning profiles for the VPiano tones, as I think the Roland factory tunings can be improved. Roland seem to use repeated tunings for some VPiano tones although the tones can have different inharmonicity curves? This may be because of expediency on Rolands part? However, it is clear their tunings can be bettered. So, you can choose pre-sets for my 3-Part perfect 12th tunings, or Roland Factory tunings, Entropy tunings or your own or tunings supplied by third parties.



Above - My tuning minus Rolands. The RD2000 Essential Upright SB01 Recital Piano model. The significant differences between my 3-part perfect 12th tuning A and the Roland Factory tuning B (A-B) shown above. Y axis +/-15 cents. Mine is noticeably sharper at the high end and I think has less dissonance. This can't be explained by different tuning types.

Tunings are applicable to their respective Tones. Roland only provide one profile for the SA expansion, as they imply it is applicable for all German VPiano tones. What do you think? If anyone wants to share their own or professional tunings just us the 'Save to File' button. You can of course create your own tuning files, save them and reload them, or employ a professional piano tuner to create them. Aural tuning is highly recommended. If anyone has any special tunings requests for VPiano or SuperNatural Piano tunings please let me know.



My SA01 minus my SA03 inharmonicity curves, max difference -3.1 Cents. Suggesting the same VPiano model as expected.

TUNING THEORY

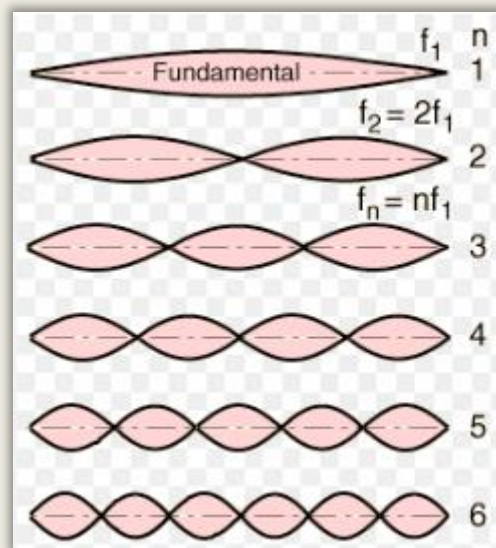
The frequency spectrum of a piano note varies with every note, the velocity applied and time elapsed from the note being struck. The partials (harmonics) of a string are not exactly integer multiples of the fundamental. This is due to the stiffness of the string being larger at higher frequencies. To make a pleasing tuning profile the higher notes are typically tuned sharp and the lower ones flat. This is called Stretch Tuning. Proper tuning is essential for any piano!

Every piano is different, no two pianos would have identical tuning curves and every piano tuner will tune slightly differently. Note I use the term partials rather than harmonics as the partials are normally not integer multipliers of the fundamental in a piano. The other point of interest is that there are many partials which don't follow any relationship to the fundamental pitch and are thought to be caused by longitudinal and lateral oscillations in the piano wire, rather than oscillations in the plane of the hammer. Where the string is struck it will create a node at the strike point and result in the partial being weaker. So, if a string is struck at the $1/8^{\text{th}}$ point along the speaking length the 8th partial and the 16^{th} partial etc. will be weaker. There are also other frequencies present due to cabinet resonance, sound board resonance, strike noise and key release noise which all need to be included in a good modelled piano.

Theory is just a guide, the ultimate test for good tuning is how the Piano sounds. A professional piano tuner can use theory and apps such as PianoMeter or TuneLab to tune a piano to within 98%, but may then finally adjust the tune by ear. There can be around 230 strings on an acoustic piano. This approach requires practice and I refer the reader to specialist books on the subject if you want to know more. The aim is to minimise disharmony between notes. As the RD is a digital piano you can play with the tunings as User Tunings and you won't lose the built-in presets.

The following graphs show piano notes in the frequency domain and show the partials peaks and troughs of a given note. Energy is the Y axis against frequency in the X axis. The shape of the graph would constantly change with time as a note is sounded, the amount of strike on the key, the condition of the piano and many other variables.

When tuning, note A4 is normally set to 440hz and the middle octave is set to an equal temperament scale. One approach for any two notes that are an octave apart, is that the lower notes second harmonic is the same frequency as the higher notes fundamental. If they are not aligned you will hear beat frequencies. For two frequencies the beat frequency $b = f_1 - f_2$. This is an amplitude modulation of the sound. A wobble in volume. As one of the notes are tuned, the beat frequency will drop to zero. This is how a piano tuner tunes a piano. But they often match higher partials. Tuning is never perfect as there are other partials which will beat to a lesser extent. The important thing is that you then finely adjust the tuning so it sounds as good as you can get it. Tuning is a compromise.

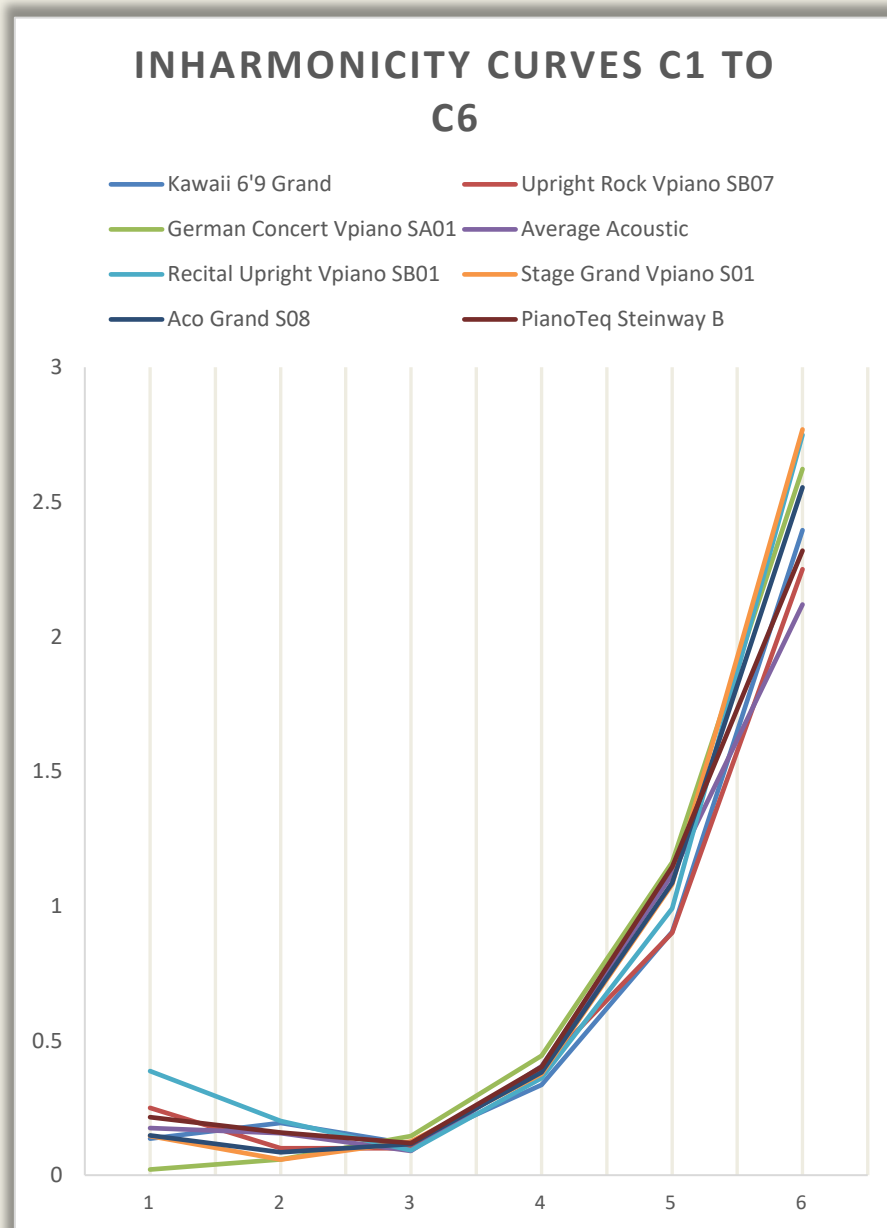


The first 6 vibrational modes of a string. Note that in reality the $f_n \neq nf_1$ for the nth partial does not hold. Higher notes and partials are sharp and lower notes and partials are flat as explained earlier. $n = 2, 4, 8$ etc are octaves. There are also other vibrational modes which are not shown.

Note. High notes produce far fewer partials so the fundamentals or first partials are used to adjust tuning. The base notes will have indistinct fundamentals but many partials, so higher partials will need to be used. The fundamental is often weak or non-existent. I've looked at a selection of notes in note C from C1 to C8 for the VPiano German Concert Grand and Upright models and also looked at the Pianoteq 8.x demo and compared it with the V Piano German Grand. Both Steinway model D piano models. See later.

INHARMONOCITY CURVES

The Inharmonicity curve is unique for each model of piano. It measures how the partials differ from integer multiples of the fundamental. If you know the Inharmonicity curve it's easy to calculate the theoretical frequency of the partials for any note. Tuning software can then use the two- or three-part tuning type to calculate the offsets in cents between the required and measured frequency of any partial. Various VPiano model curves are shown below as well as acoustic pianos. Note that the curves are all different.



Frequencies of partials given by,
 $F_n = n * F (1 + 0.5(n^2 - 1) * B)$ (Fletcher, Blackham & Stratton 1962)

F_n = frequency of partial (n) in Hertz

n = partial number

B = inharmonicity coefficient and is a function of Young's Modulus. This can typically range between 0.02 and 7. Higher for higher notes as they are 'stiffer'. B values vary with fundamental frequency.

According to <http://daffy.uah.edu/piano/page4/page3/index.html>, the B curve can be approximated by

$$B = a + bx + cx^2 + d/x + e/x^2$$

where x = frequency of note, and

$$a = 5.22964 \times 10^{-6}$$

$$b = 1.21012 \times 10^{-6}$$

$$c = 8.3666 \times 10^{-10}$$

$$d = -0.007927$$

$$e = 0.429601$$

These values produce an acceptable fit for a Steinway B.

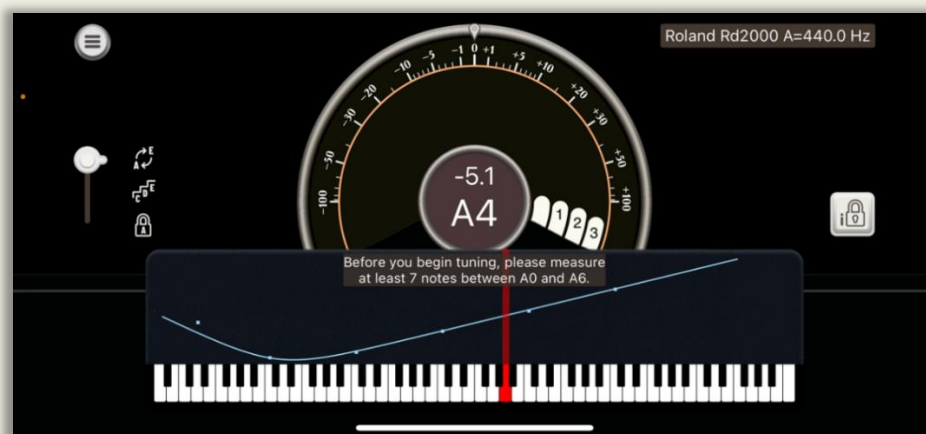
2. Frequency increase = $f = f' \times 2^{r/1200}$

f' is theoretical frequency without inharmonicity for the partial number

3. Beat Rate = $f - f'$ beats per second

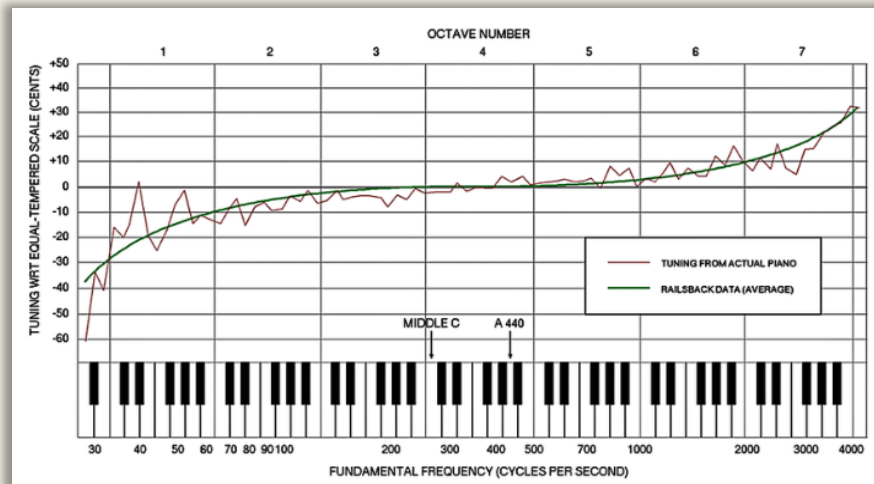
All of this is calculated by your tuning application!

4. f' is sharp or flat in cents c/w f in hz $\Rightarrow 1200 * \log_{10}(f'/f)/0.301$

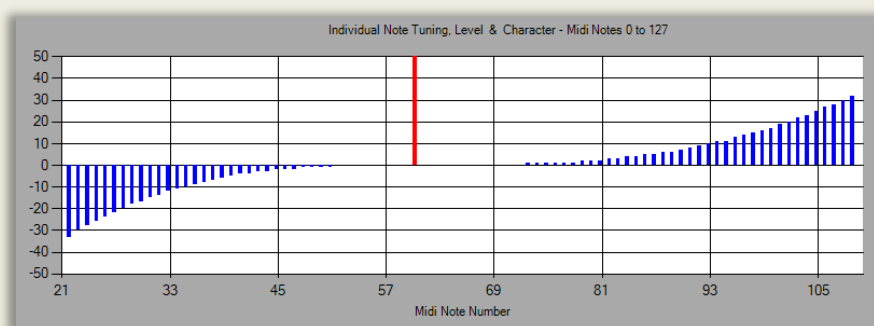


PianoMeter Inharmonicity curve - German Concert VPiano - Low notes and high notes are the most inharmonious. Their partials are not integer multiples of the fundamental. Vertical scale in this graph is logarithmic.

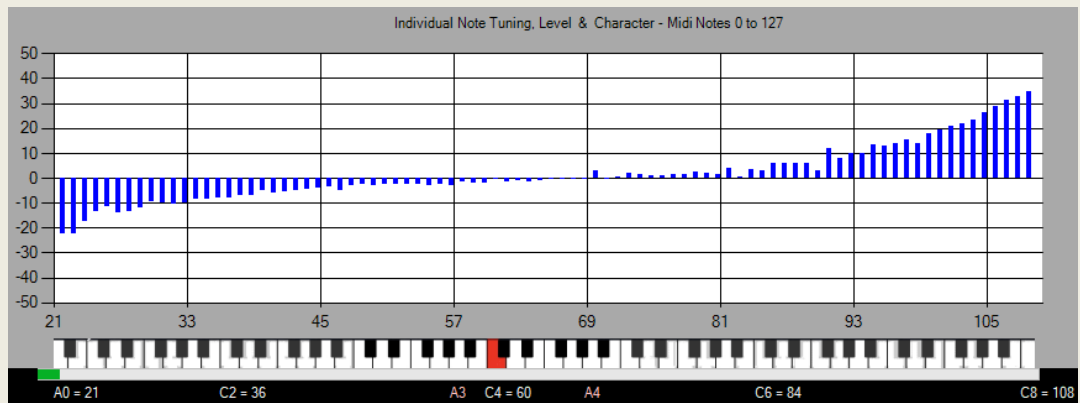
TUNING CURVES



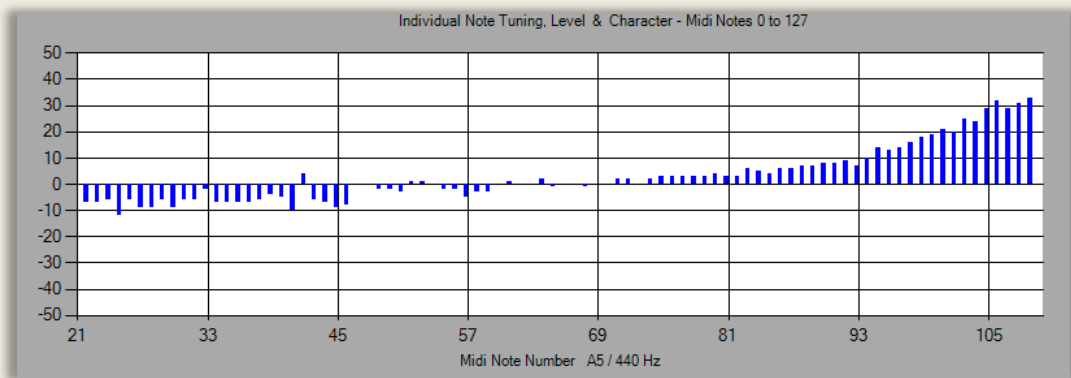
Above is a typical acoustic piano stretch tuning map. The Railsback curve, named after Dr Ora L. Railsback who was the first to measure it. This tuning approach also compensated to inharmonicity of string harmonics if tuned to a pure equal temperament. The reason partials are not properly harmonic in a string is to do with the stiffness of the string not being constant for different frequencies in the string. The waves velocity increases towards higher partials. There is no 'right' tuning map and its very personal. Notice above there is variation by the piano tuner from the smooth ideal curve. Vertical scale in cents deviation from equal temperament tuning.



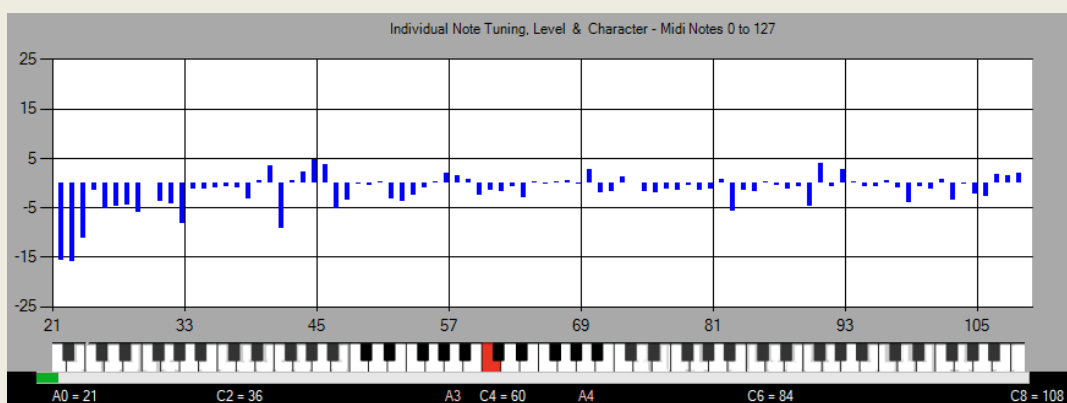
The Stretch Tuning Railsback radio button produces this 'idealised' curve which is a close approximation to a typical acoustic piano's Railsback curve. It's a pair of different cubic curves about C4. Red bar Midi note 60 C4.



This is the Essential Upright Stretch Tuning SB07 to SB14 pre-set which was created using Tune Lab, tuning every note.



The RD2000 Factory tuning Essential Upright (Rock) tuning curve SB07 to SB14.



TuneLab tuning minus Roland Factory tuning SB07. A-B. Y axis max 25 cents. The Tunelab curve is a lot Flatter at the lowest octave. To my ears my tuning has a lot less dissonance.



For interest. This is the Standard stretch tuning curve from the original Roland VPiano 2009.

Note. Unless you are an experienced Piano Tuner, electronic tuning aides are the best option. Here are two I recommend - PianoMeter and Tunelab 5. They both have free demo versions which are very useable and sufficient for the RD. They produce great tuning curves and agree well with each other. There are factory tuning curves in the installation directory for the VPiano models. These can be loaded in this software and transferred to the RD2000 by User presets using the Preset buttons on this form. For VPiano models there are my 3-part perfect 12th (6:2,3:1,3:1) tunings as well as factory tunings. Use the Radio Button to switch between which one you want to load.

TUNING DIFFERENCES

The most important thing you can do to a piano is to tune it well! Nothing will ruin a good piano more than bad tuning. Below are my VPiano - 3 Part perfect $1/12^{\text{th}}$ (6:2,3:1,3:1) tunings compared with factory tunings. Notice there are significant differences between my tuning, (done for every note on the RD2000) and the Roland factory tunings! Differences which cannot be explained by different tuning types. Eg. 2 part or 3 part. The feedback from users is that my tunings have far less dissonance, sound better and are in tune. They make Roland's VPianos sing.

VPiano Model/Type	Maximum differences in cents between my 3-Part perfect 12^{th} tuning and Roland's Factory tuning.	ChkSum Σ midi note offsets my 3 Part tunings	ChkSum Σ midi note offsets Roland Factory tunings
German Concert Grand SA 01, SA02 to Low Lifted Concert SA 17 * German Concert Ver 7.txt	SA01, SA02 and SA0 tested and identical. But SA01 3-part tuning and SA01 factory tuning different by up to 15 cents!	312.6 312.6	405.5
Recital Upright SB 01 to SB 06 * upright recital sb01 to sb06 rev 1.txt	SB01 3-part tuning and factory tuning different by up to 12 cents	150.9	69.8
Recital Upright SB 07 to SB 14 * upright rock sb07 to sb14 rev 1.txt	SB07 3-part tuning and factory tuning different by up to 16 cents	130.7	266.5 SB07 same as S01
S01 Stage Grand & S08 Aco Grand 2 * + + s01 3 part all notes.txt s08 every note 3 part.txt	S01 and S08 different by up to 9 cents 3-part tuning	217.8/280	266.5/266.5 SB07 same as S01
S02/S06 * Deep Concert / Bold Beauty s02 3 part 12ths all notes.txt	S02 3-part tuning and factory tuning different by up to 11 cents	249.9	175.3
S03/S09 * East Coast Studio / Aco Grand 3 s033part1.txt	S03 3-part tuning and factory tuning different by up to 8.0 cents	323.3	336.3

S04/S05 * Contemp Concerto/Symphony Hall s043part.txt	S04 3-part tuning and factory tuning different by up to 17.7 cents	301.2	347.6
S07 Aco Grand 1 s073partall.txt	S07 3-part tuning and factory tuning different by up to 10.0 cents	257.5	174.4
S010 Aco Grand 4 s103part1.txt	S010 3-part tuning and factory tuning different by up to 8.8 cents	245.6	232.6
S011 Aco Grand 5 S113part1.txt	S011 3-part tuning and factory tuning different by up to 11 cents	234.4	217.7
S012 Aco Grand 6 S123part1.txt	S012 3-part tuning and factory tuning different by up to 13.9 cents	311.6	314.5
S013 Aco Grand 7 S133part1.txt	S013 3-part tuning and factory tuning different by up to 15.0 cents	191.5	181.0
S014 Aco Grand 8 S143part1.txt	S014 3-part tuning and factory tuning different by up to 9.0 cents	217.7	280.1
S015 Aco Grand 9 S153part1.txt	S015 3-part tuning and factory tuning different by up to 9.0 cents	215.3	287.5
S016 Aco Grand 10 S163part1.txt	S016 3-part tuning and factory tuning different by up to 14.4 cents	309.0	226.4
S017 at Stage S173part1.txt	S017 3-part tuning and factory tuning different by up to 11.0 cents	243.3	270.1

Notes.

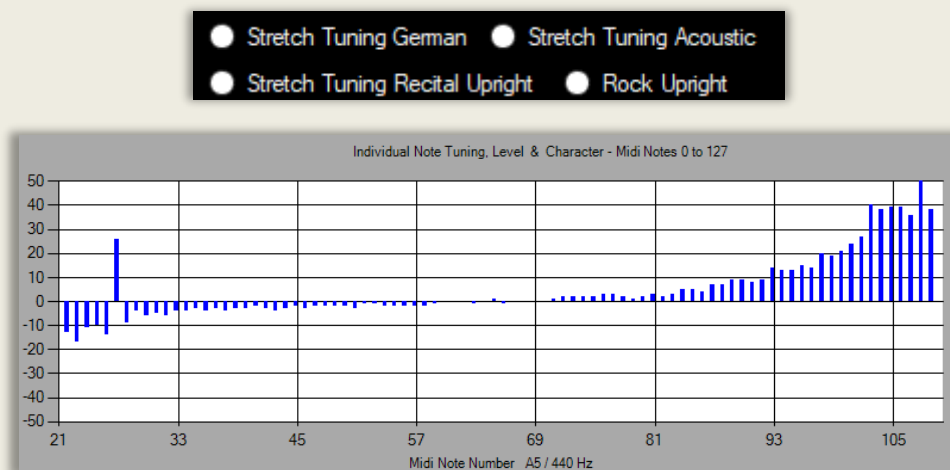
*Roland factory tunings which use the same Railsback curves.

ChkSum adds all of the note offset values in cents to compare tunings to see if they might be the same or different.

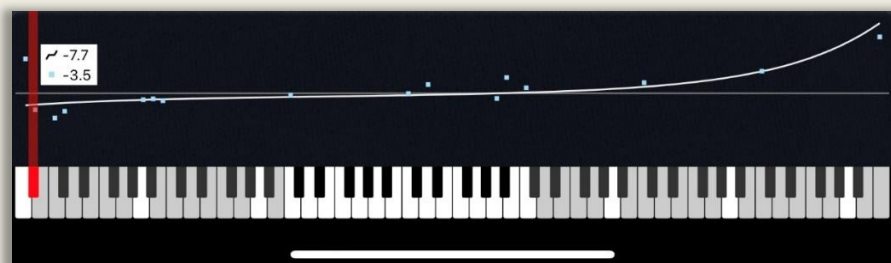
An inharmonicity curve in Tunelab with all the partials set to 1 approximates the individual note tuning curve. It is only approximate because variations note to note on the RD2000 VPiano model means the actual tuning curve is not smooth, neither is it in an acoustic piano's curve.

GERMAN CONCERT GRAND EXPANSION TONES SA01 TO SA17

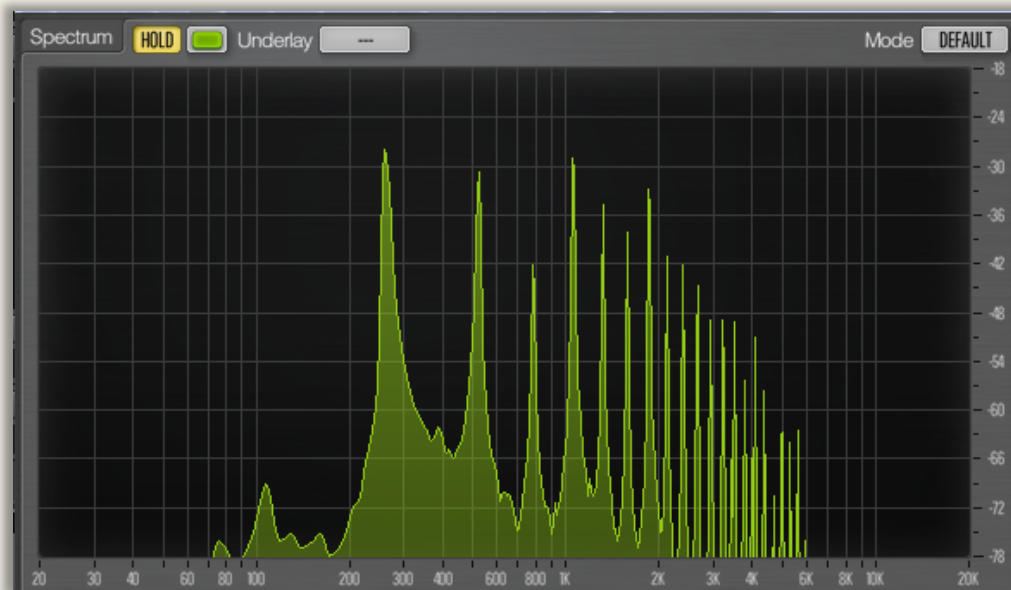
There is a built in Template in the software which is a generic RD2000 German Concert stretch tuning. This is one of four templates. Select 'Stretch Tuning German' which loads a template stretch tuning of the German Concert RD2000 Tuning profile. This profile uses a Cubic spline above $G\#4$ and another cubic curve below $G\#4$. These are based upon the spectrum analysis on the following pages and the analysis done by PianoMeter for the German concert grand curve used for all the tones in that model. The lower notes detuning falls less rapidly than an average acoustic piano. You can use these templates if you want to manually tune the RD2000 from scratch.



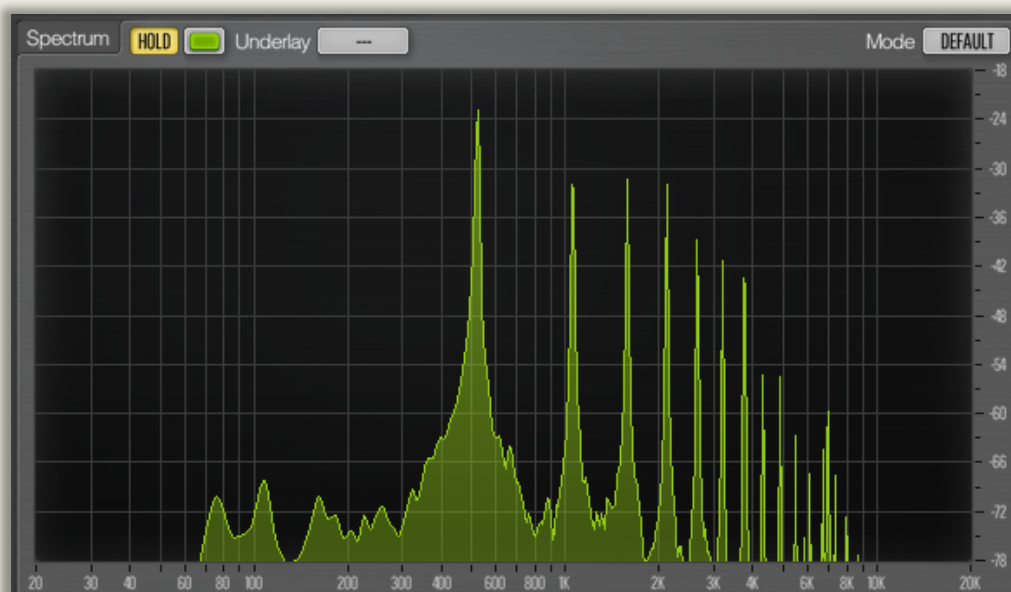
This is the Roland factory RD2000 German Concert Grand Tuning Curve Tones SA01 to SA17. There is a precise 3-part tuning for this VPiano model in the installation directory - German Concert Version 7.txt. and its also has a preset button in the software. The German Concert Version 7 rev 1.txt file in the installation directory is a slight variation you can try.



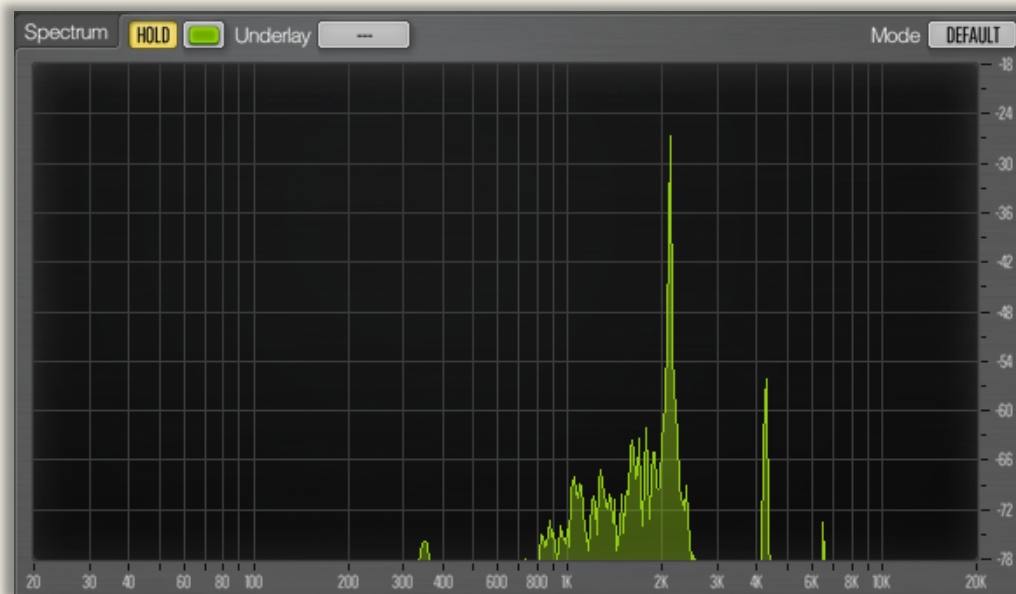
PianoMeter for IOS tuning curve German Concert Grand



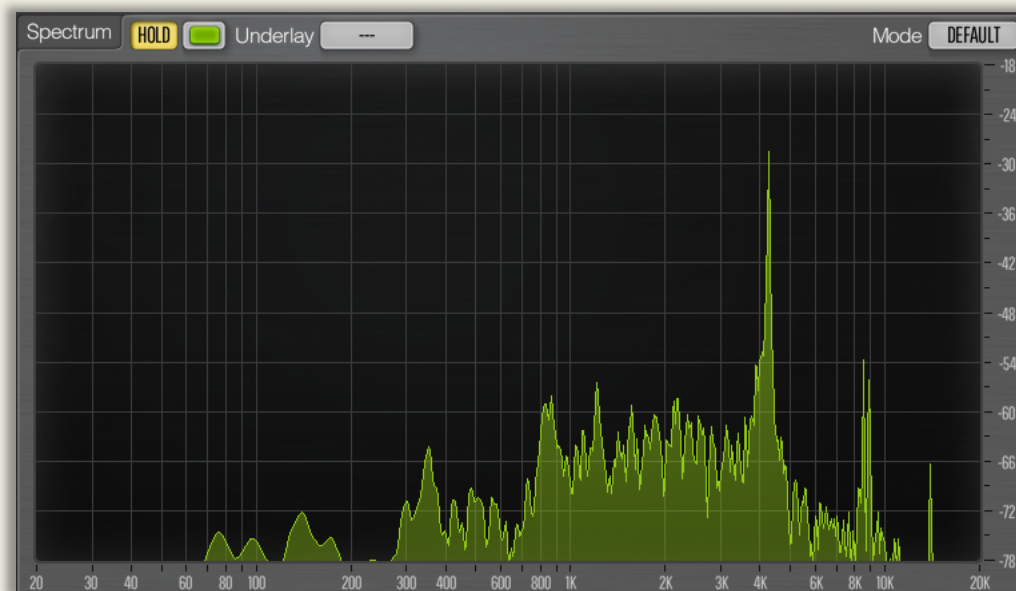
This is a spectrum analysis of the VPiano German Concert Grand for note C4. Played at medium velocity. 1 second into decay. The fundamental frequency is 261 hz. Notice the second partial is at 522 hz = 2×261 . The third is at 783hz and the fourth is sharp > 1044hz as expected. The frequencies below the fundamental are non-harmonic and are due to action noise etc.



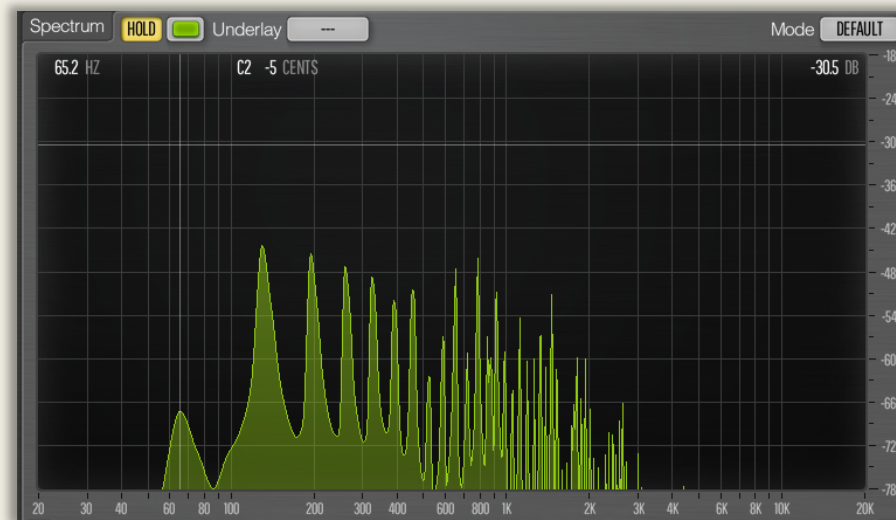
The frequency spectrum at C5 with a 522hz fundamental, second partial 1050 hz compared with $1044 = 2 \times 522$, third partial 1570 hz compared with 1566 hz. Fourth 2100 hz compared with 2088. The second and third partials here are slightly sharp. So, when tuning C6, the fundamental needs to be slightly sharp to sound 'tuned' with the second partial of C5. This minimises the 'beats' which a piano tuner and audience hears.



This is C7 with a fundamental frequency is 2093. The second partial is sharp at 4300 hz not 4186 hz as might be expected. The third partial is also sharp at 6470 hz not 6279 hz as expected, although this is a weaker harmonic. The partials become sharper as the notes go up the keyboard. The higher octaves need to be tuned sharper to sound 'correct'. So, in the German Concert Tuning map, C7 is set at 20 cents sharp.

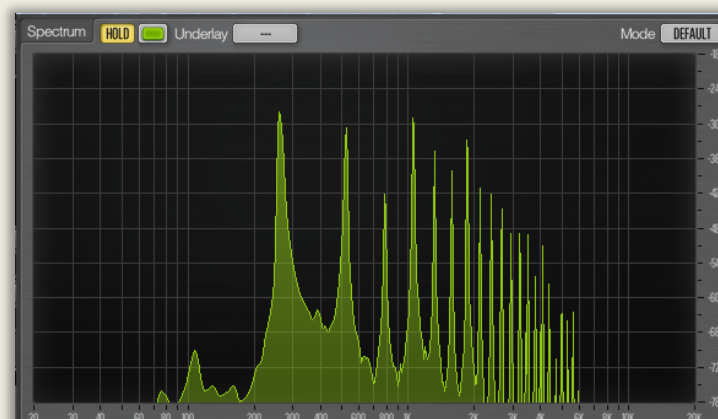
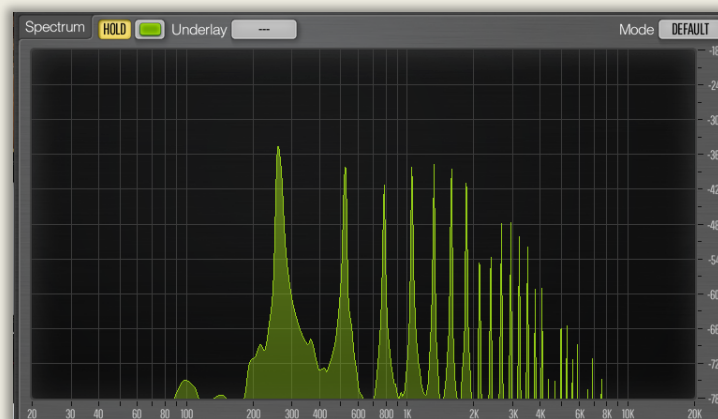


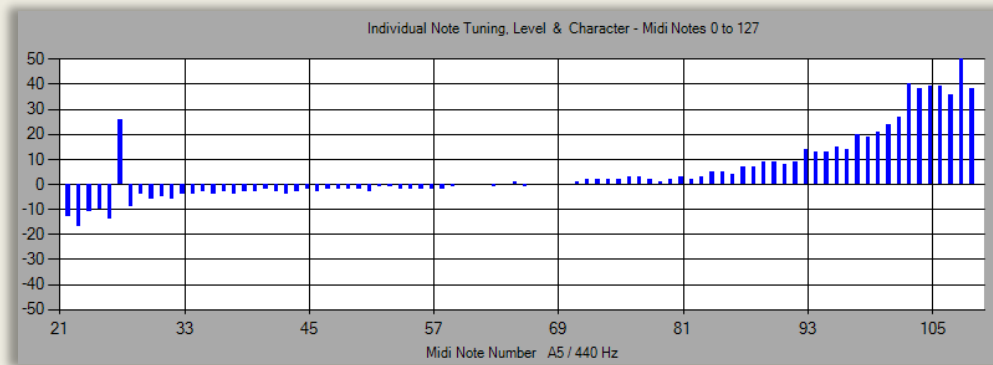
For note C8 the fundamental is set 35 cents sharp at 4270 hz. Note the second partial of C7 is 4300 so very close. The peaks of C7 second partial and the C8 fundamental line up in these two graphs.



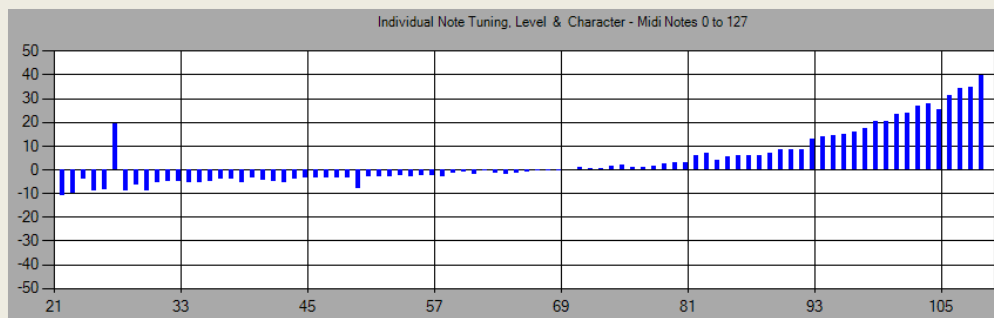
Above. The Low notes. At C2 the fundamental is -5 cents flat and weak. The second partial C3 is -3 cents flat and more prominent.

Below and for interest - Pianoteq v8.x demo top and RD2000 German Concert Grand bottom. Both using a Steinway model D - note C4 - A pretty similar spectrum within the limits of error in testing! When I listen to them both they are very similar and each can be fully edited. I find the RD bass notes better. I also like the RD's unlimited Polyphony and zero latency as well. I also find the Pianoteq model rather bright.

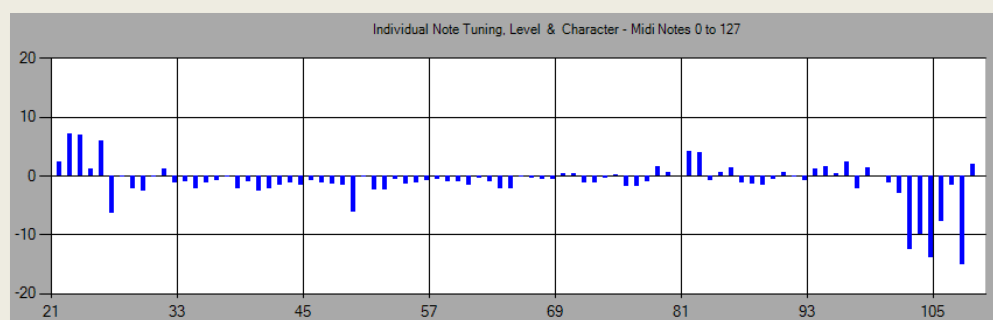




Here is the German Concert Grand factory note tuning map downloaded from the RD2000 used identically in all of its 17 tones. Note there appear to be an errant tuning at midi note no 26 D1 and the tuning does not sound right. PianoMeter and TuneLab do not agree with these factory values. D1 has very inharmonic partials!

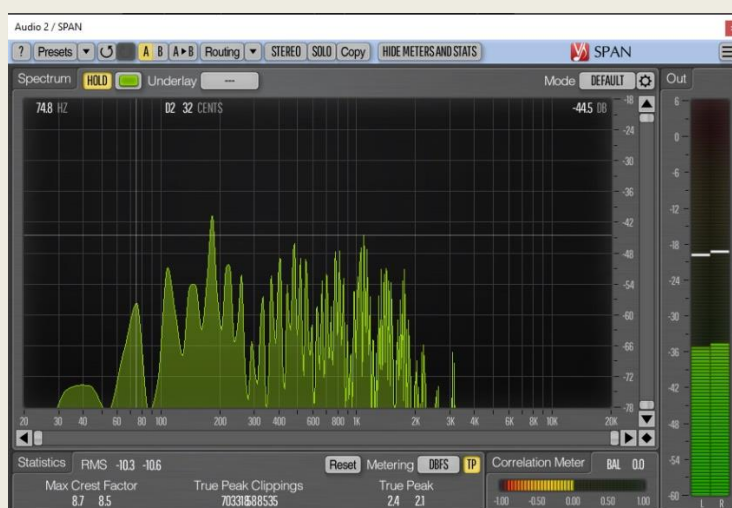


Above the German Concert ver 7.txt curve in the installation directory I created using TuneLab 5.3 Pro. The lowest octave and the highest were samples using every note to generate the inharmonicity curve. Then every note was tuned to 3-part perfect 12ths. I think this tuning is better than the factory tuning. It is far more harmonious!



The image above shows the difference between my German Concert VPiano tuning profile minus the Roland factory tuning profile. A-B.
Difference in Cents. Y axis max +/- 20 cents.

There is a tuning issue at D1 (the big peak) in the factory tuning which is tuned 25.7 cents sharp! This suggests a non-linearity in the VPiano model here. The Tunelab value for D1 is 19.4 cents sharp. I believe this sounds better. But the second partial of D1 beats slightly with the fundamental of D2. This might be expected as the 3-part tuning would aim to minimise beats for 6:2 ie. D1's second partial would be tuned with D4's fundamental to minimise beats. My main conclusion is the Note D1 for the German Concert Grand VPiano model is odd. Factory tuning sets D1 sharp by 25.7 cents. My 3-part perfect 12ths D1 is sharp by 19.4 cents. And a professional tuner sets its sharp by 11.7 cents. In fact, the Railsback curve note tuning at D1 ought to mean the note is flat! It seems the German VPiano model for this note's higher partials make them flat. There are a lot of differences where the factory tuning is sharper than the TuneLab tuning in the upper octave and flatter than the Tunelab tuning in the lowest octave.

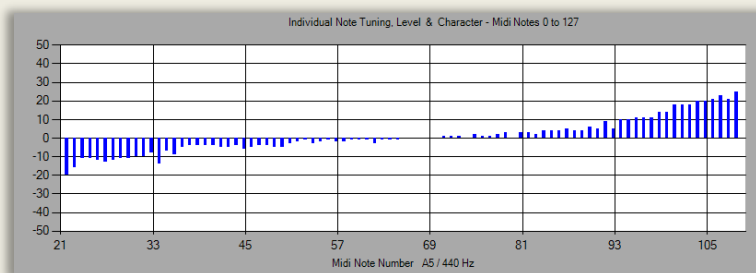


The German Concert VPiano at D1. Spectrum analysis. Factory tuning C1 -10.2% flat. D1 +25.7 cents sharp. E1 -4.2% flat. Partial offsets without tuning. Eg. D1. 1st Partial. 32 measured - 25.7 cents factory tuning = 6.3 cents sharp. Note the 2nd and higher partials for D1 are very flat. Hence the large +ve (sharp) offset required to tune this note.

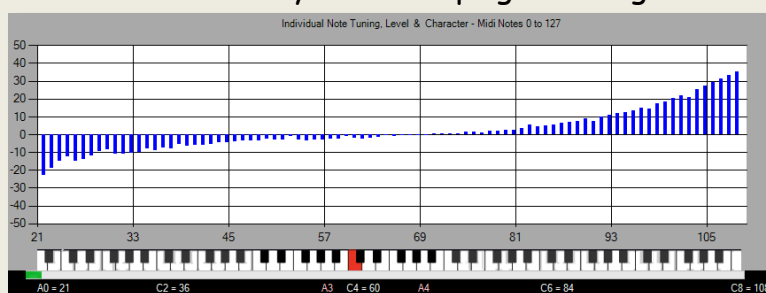
Fundamental		C1	D1	E1
1 st partial	Sharp +ve, Flat -ve cents	+3.2	+6.3	-11.8
	2 nd "	+3.2	-43.7	+0.2
	3 rd "	+1.2	-40.7	-1.8
	4 th "	-8.8	-45.7	-11.8
	5 th "	+0.2	-25.7	-1.2

ESSENTIAL UPRIGHT EXPANSION TONES SB01 TO SB14

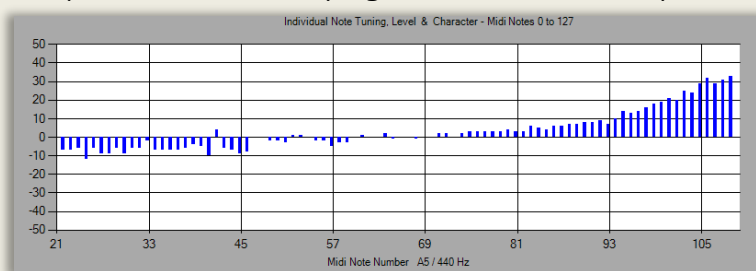
There seem to be two tuning curves built into the Essential Upright expansion. One for tones SB01 Recital Upright to SB06. And a second for SB07 Rock Upright to SB14. The former has less sharpening of the higher notes than the Rock Piano. But a greater flattening of the lower notes. There are my 3-part perfect 12th tunings for SB 01 and SB 07 in the tuning presets created using Tunelab. These sound much better!



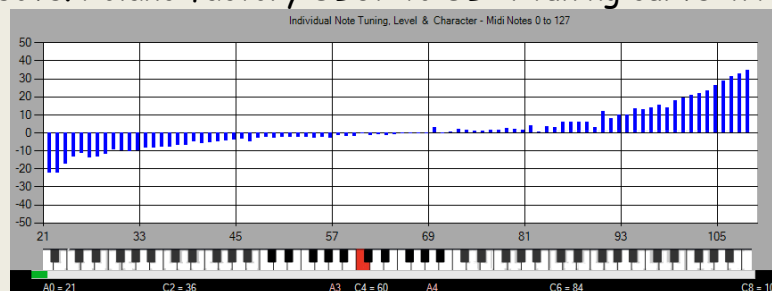
Above. Roland factory Recital Upright tuning in RD2000



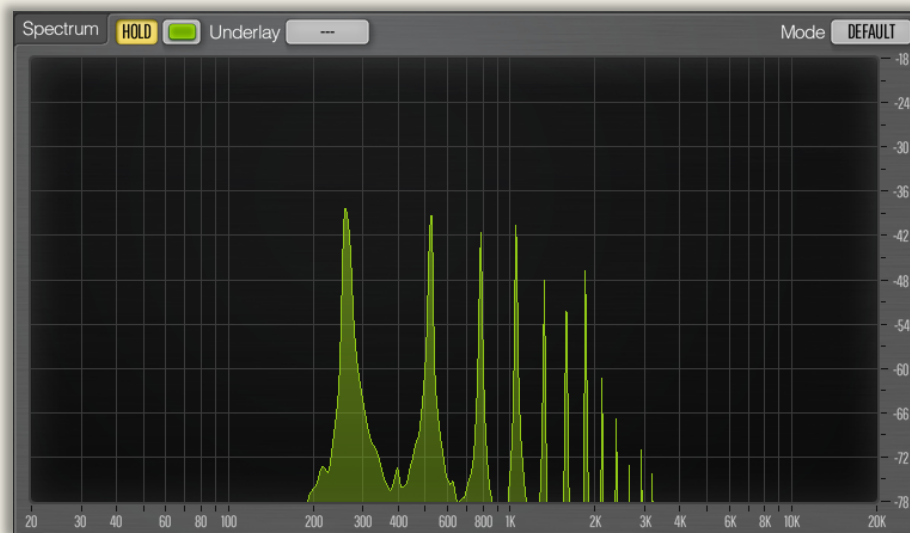
Above. My SB01 'Recital' Upright Preset - 3 Part perfect 12th.



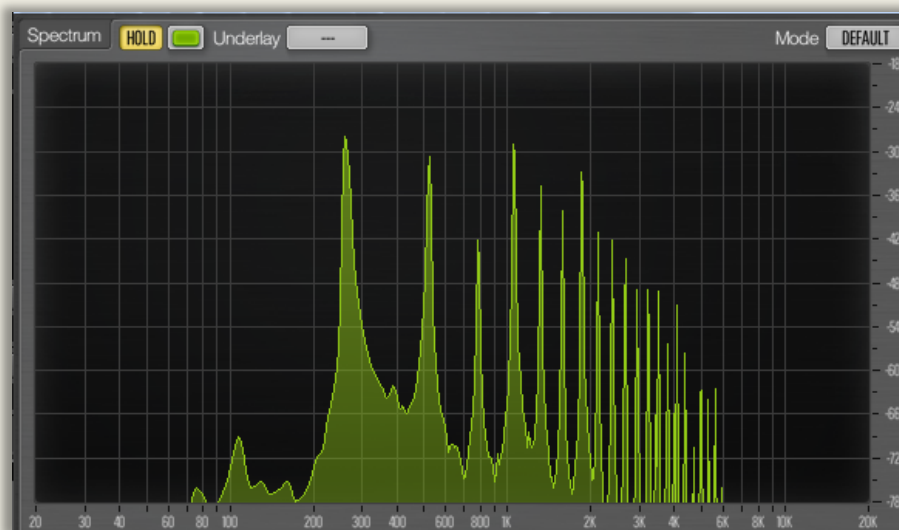
Above. Roland factory SB07 to SB14 tuning curve in RD2000



Above. My SB07 'Rock' Upright Preset - 3 part perfect 12^{ths}

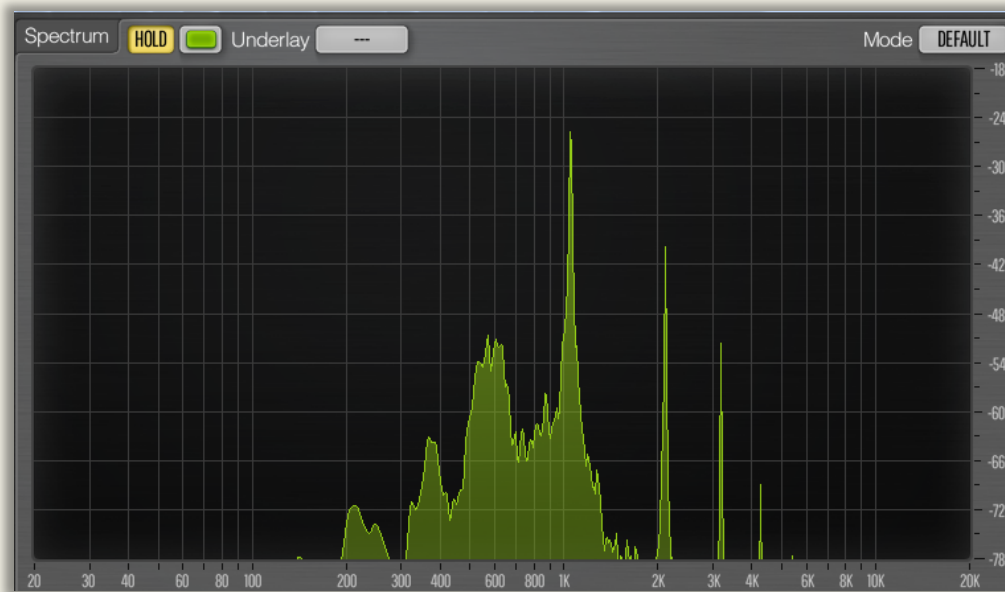


Comparison of the frequency spectrum between the Essential Upright Parlour Piano at C4 above and The German Concert Piano at C4.

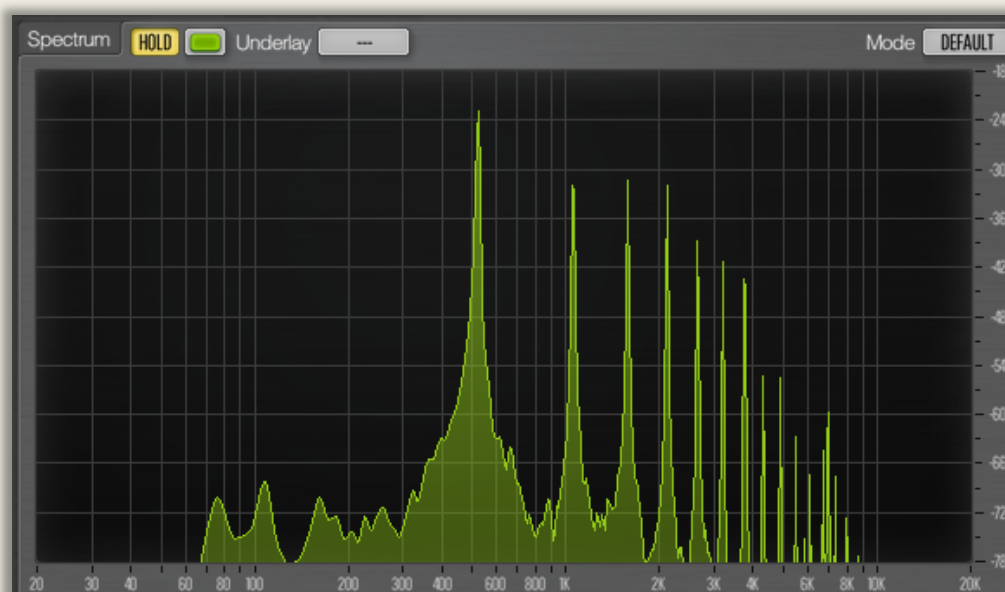


German Concert C4

The Upright Parlour has unison detune whereas the German Concert has unison tune and greater number of higher partials giving a more open and clearer sound.

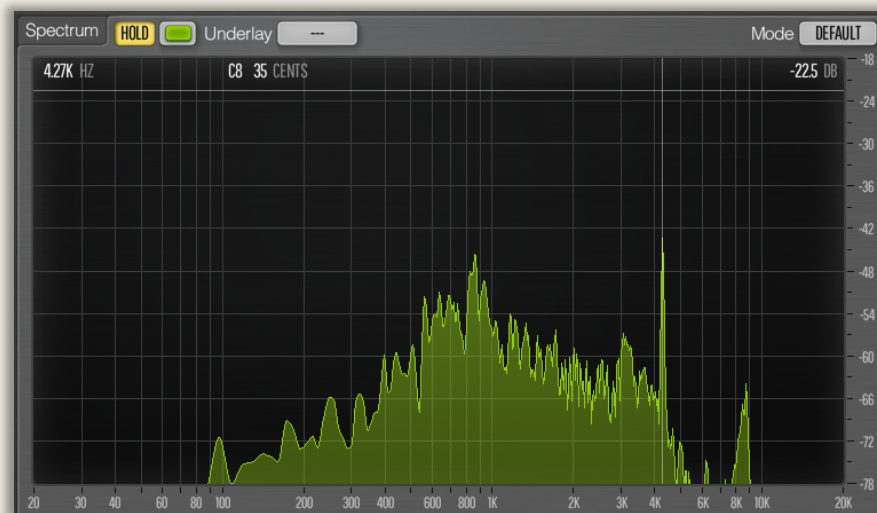


Upright Parlour Piano at C5



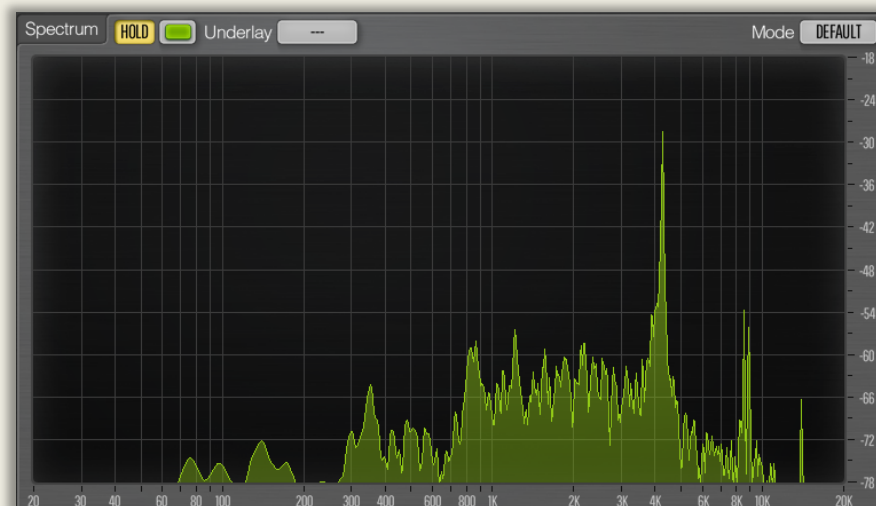
German Concert Grand at C5

Here the fundamental of the unison detuned Upright at C5 is less pronounced than its second partial compared with the German concert piano. The upright also has a broader peak reflecting the effect of detuning the unison strings by a few percent. Producing a 'honky tonk' tone.



Essential Upright at C8

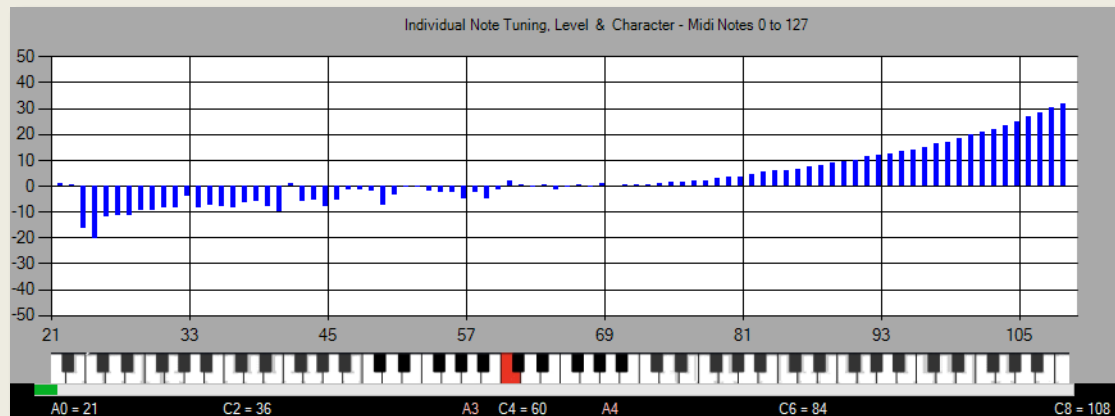
Above. The high notes! This is the Upright spectrum of the C8 Parlour Piano, one second after striking the key with medium velocity. Notice that the fundamental energy at C8 is only a small part of the overall energy in the sound, as most of the frequencies lie lower and are mainly the action, resonances, cabinet and strike noise, which is what you might expect from the sound. C8 is around 35 cents sharp. The second partial at C9 to the right is sharp by 30 cents and there is no acoustic energy above that note > 9.5kHz.



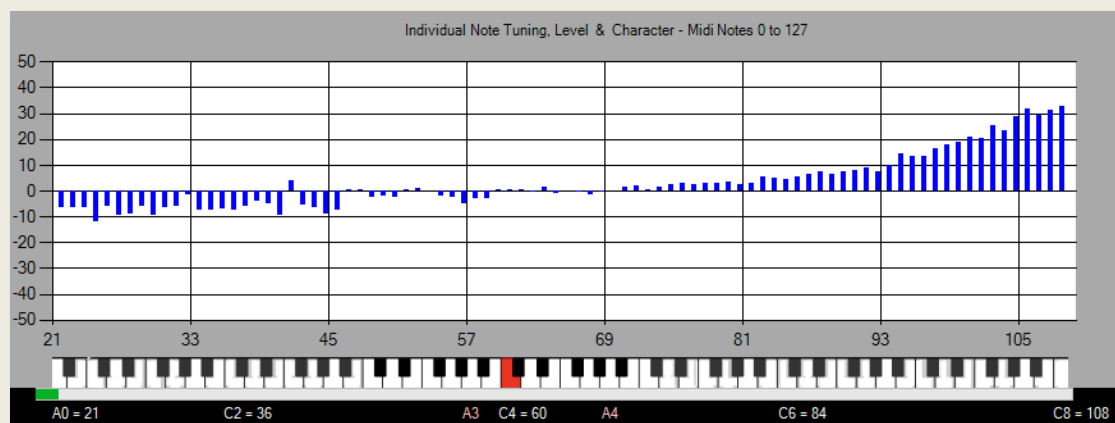
Above. The German Concert Grand at C8 has higher frequencies above this note and is generally brighter and clearer as you would expect from a grand. The fundamental delivers a greater proportion of the energy.

VPIANO CONCERT PIANO S01 TUNING CURVE

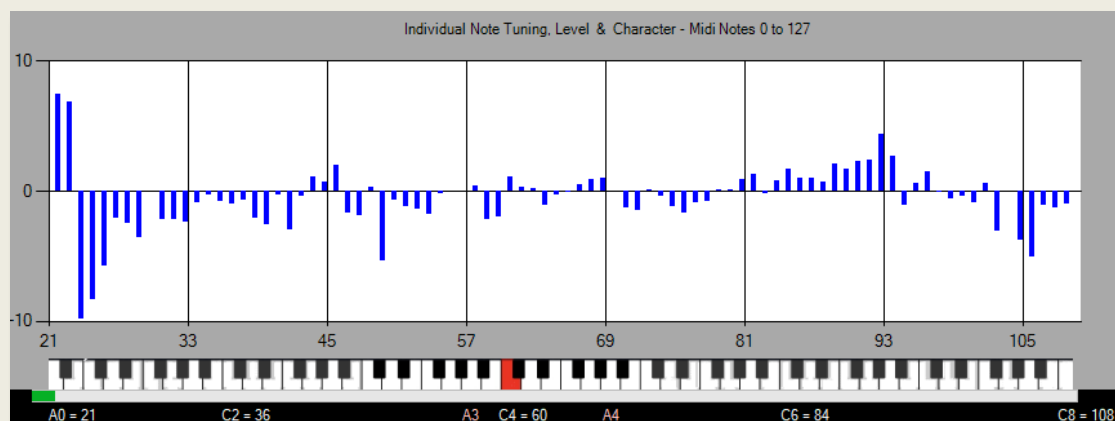
A comparison of S01 VPiano 3 part perfect 12th tuning and Roland's Factory tuning.



Above VPIANO S01 3 part perfect 12th tuning

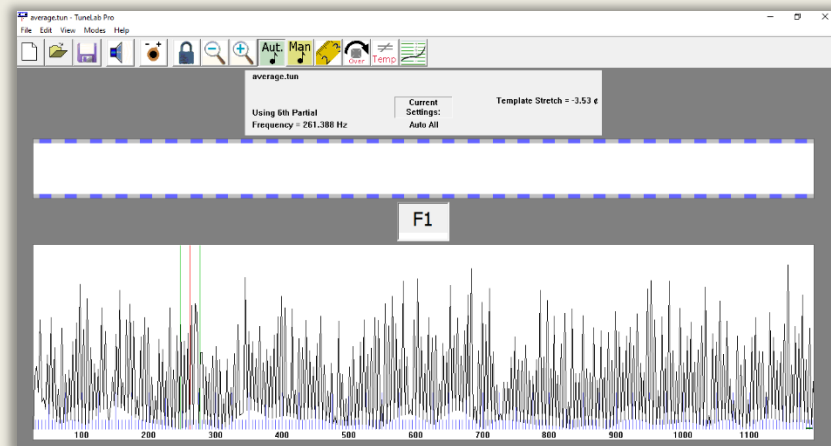


Above Roland's S01 Factory Tuning



The difference between 3 part perfect 12th tuning minus Roland's factory tuning is quite significant especially at the low end!
Y axis +/- 10 cents max.

TUNELAB PRO 5.3 - CREATING A TUNING FILE



This is an excellent tuning application. You can use the TuneLab 5.3 Pro software (above is the PC version at startup) to measure inharmonicity and create and save stretched tuning files for the RD2000. You can then load these easily into the RD2000 editor. The free demo version of TuneLab halts measurement for a couple of minutes occasionally every 14 notes if the note length is over 7 seconds. You just wait whilst it halts and then carry on measuring notes. Once the Inharmonicity curve is generated you save the tuning file, filename.TUN, load it into the RD2000 editor and send to the RD2000. (.tun is the TuneLab file extension.)

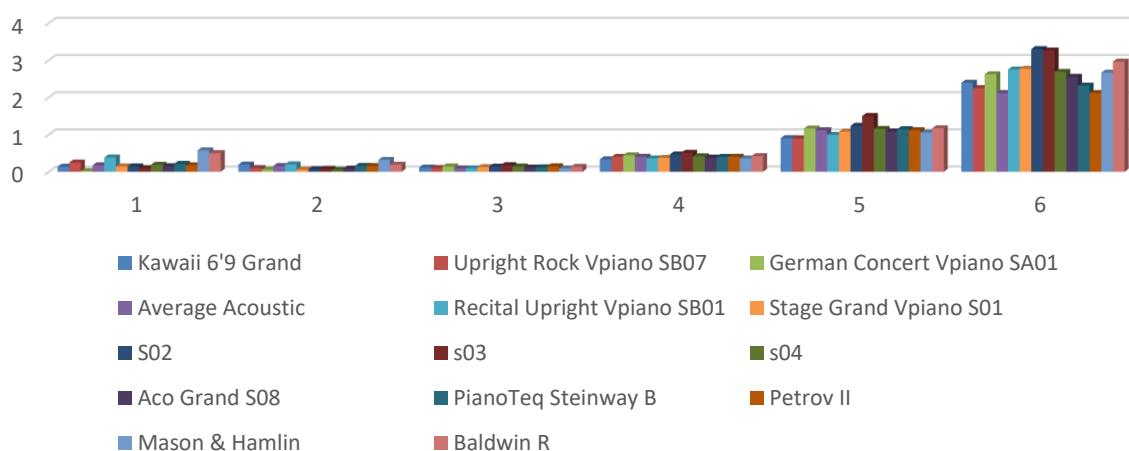
1. In the Windows version of TuneLab pro 5, I set my external digital audio interface driver or the RD2000 audio driver (vendor driver on RD) as the windows 'recording device' which routes the digital audio from the RD2000 to TuneLab. On the RD2000 turn on USB audio and set the output volume. Make sure the PC's internal microphone is disabled. Now TuneLab will use this driver as its 'Mic in' and not the PC microphone. This is much more accurate than using a Mic as there is no background noise and you have a very linear and wide frequency response.
2. Open a new tuning file'. In TuneLab make sure the Edit/Edit partials for all notes are set to 1. Remember in the RD you enter offsets for the fundamental and not higher partials. See image below. This is so the correction in tuning is for the fundamental in the RD2000, not partials. Set to Auto All. The aim is to first create the inharmonicity curve and then Tunelab will output the offsets in cents for the fundamental as a tuning curve once the parameters for 2- or 3-part tuning are entered.

- This note is from Robert Scott - Tunelab Author. 'The RD2000 is expecting offsets for the fundamental, so you need to edit the table of partials to use the fundamental for everything. You can avoid having to do this every time by doing it just once and then use the "Store as Default" button on the partial editing page. That way every time you start a new tuning file and measure inharmonicity, it will automatically initialize the table of partials to all 1s. The offsets in column 3 of a tuning file apply only to the partial in column 2.'

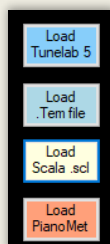
	Oct 0	Oct 1	Oct 2	Oct 3	Oct 4	Oct 5	Oct 6	Oct 7
C:	1	1	1	1	1	1	1	1
C#:	1	1	1	1	1	1	1	1
D:	1	1	1	1	1	1	1	1
D#:	1	1	1	1	1	1	1	1
E:	1	1	1	1	1	1	1	1
F:	1	1	1	1	1	1	1	1
F#:	1	1	1	1	1	1	1	1
G:	1	1	1	1	1	1	1	1
G#:	1	1	1	1	1	1	1	1
A:	1	1	1	1	1	1	1	1
A#:	1	1	1	1	1	1	1	1
B:	1	1	1	1	1	1	1	1

- Play notes into TuneLab to generate a custom Inharmonicity curve IH for the piano model. Default notes are Cs' and F#s' but you can edit the sequence and use any other notes - edit/edit options/measure sequence. See IH curves section. This analysis uses Fast Fourier Transforms FFTs. Ideally do the measurements 3 times for each note and make sure the IH values are close. Each note you select has its Inharmonicity value stored which is derived from a minimum of 2 partial's (offsets). Below are some Inharmonicity values C1 to C6 for different pianos.

INHARMONICITY VALUES C1 to C6



5. Then click File/Save tuning file. It will have a *.tun file extension. Where * is the name you give it. Once the Inharmonicity curve is saved it can be reused later and with different 'part' tunings or you can tune every note individually. To see the tuning curve - click - Tuning Curve View or Modify button and click on graph. Note. The software uses the inharmonicity curve to calculate the offsets for all 88 notes fundamental and partials.
6. You can now load the inharmonicity curve directly into the RD2000 Editor. Click the 'Load TuneLab 5' button and select the *.tun file you created. This is an approximate tuning curve.



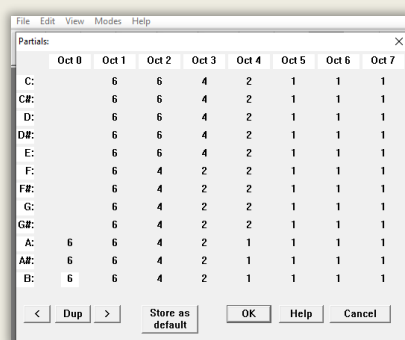
Now you can send (Process - send sysex only) the tuning curve straight to the RD2000 or do any curve edits (if needed) in the RD2000 editor and then send/save! This approach produces a good tuning as you know the tuning offsets for the fundamental for each note and you are sending the fundamental tunings to the RD. However, the most accurate way to tune is to tune every note based upon the inharmonicity curve, like you would with an acoustic piano. See Tuning Individual Notes.

Note. You can see the contents of a Tunelab File you open in the lower text box of the RD2000 editor. Including the IH inharmonicity constants.

Summary of Tunelab Pro 5.x tuning procedure.

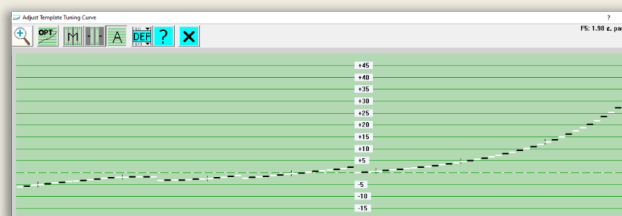
1. Create the inharmonicity curve for your piano model. This shows how the note partials vary from true harmonics over the keyboard range. Sample at least 2 notes per octave. Save file in Tunelab.
2. If the partial table is set to all 1s' then the inharmonicity curve can be used as an initial tuning for the RD2000 piano model and imported by using 'Load Tunelab 5' to the RD2000 editor. 'Save file' on RD2000 editor.
3. For the best tuning, use the inharmonicity curve above and return the partial table to its default values. Then tune every note to your chosen 2- or 3-part tuning system. Eg. 3-Part Perfect 12ths. Save file on the RD2000 editor and as an RD2000 Program (which will include the new User tuning curve). See next page.

Tuning Individual Notes. You will always get the best tuning by tuning all 88 notes. Individual note tuning is also worth doing if there are errant notes in the RD model which the inharmonicity curve does not identify and consequently the *.tun tuning file won't know about. You can tune individual notes of the RD2000 manually and use TuneLab as if you are tuning an acoustic piano, using your ears (aural tuning) and by using TuneLabs phase, current note and spectrum display. You have to make sure the Edit/Edit Partial table set to its start-up values and NOT all 1s. See below. This calculates the lower notes offsets using their higher partials, as their fundamentals are far less dominant and difficult to hear. Use the Tuning form in the editor to adjust the tuning of each note.

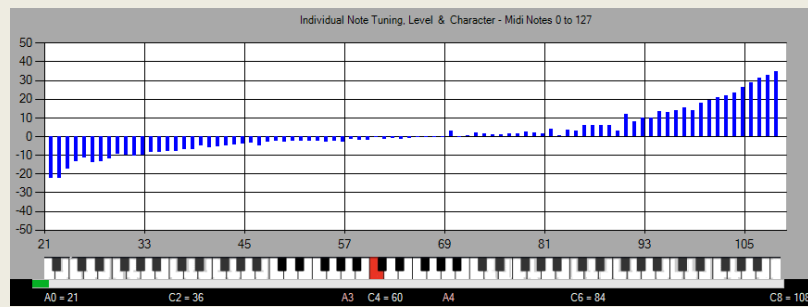


Partials:	Oct 0	Oct 1	Oct 2	Oct 3	Oct 4	Oct 5	Oct 6	Oct 7
C:		6	6	4	2	1	1	1
C#:		6	6	4	2	1	1	1
D:		6	6	4	2	1	1	1
D#:		6	6	4	2	1	1	1
E:		6	6	4	2	1	1	1
F:		6	4	2	2	1	1	1
F#:		6	4	2	2	1	1	1
G:		6	4	2	2	1	1	1
G#:		6	4	2	2	1	1	1
A:	6	6	4	2	1	1	1	1
A#:	6	6	4	2	1	1	1	1
B:	6	6	4	2	1	1	1	1

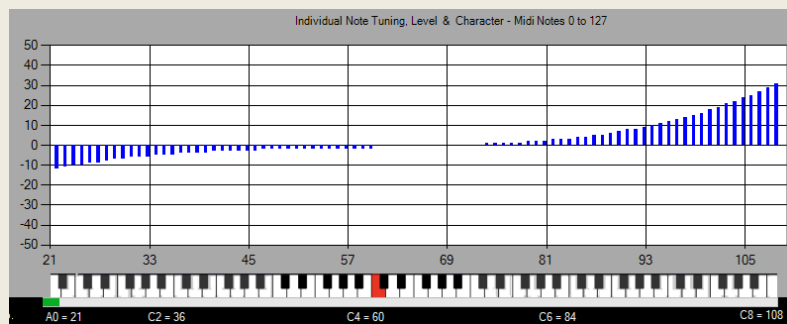
You open your *.tun tuning file, confirm the tuning type ie. 2 part or 3 part. Click on tuning graph to update. Then you can use you Piano models inharmonicity curve in the .tun file and then save as a new Tuning File with the start-up partial table as above. Now you 'can use the Tuning Form in the RD2000 Editor for the notes you need to fine tune. Tunelab will now use the higher partials to tune the lower notes. You manually tune some or all of the 88 notes. You adjust the tuning on the RD so that the note sounds right (aural tuning) or say the Phase display in TuneLab is stationary, just like you would with an acoustic piano. This obviously takes longer but is very precise and deals with any localised issues in the tuning file such as note D1 in the German Concert Vpiano. Remember to Save your tuning file in the RD2000 editor!



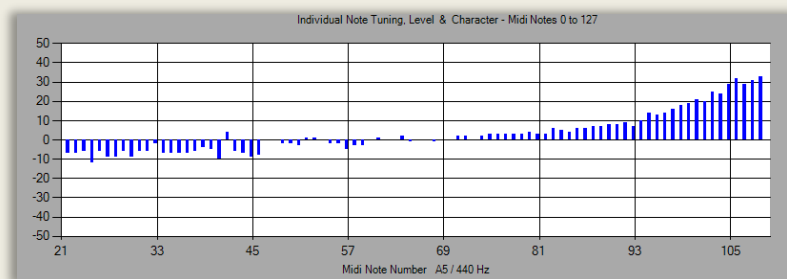
Above. This is the Rock Essential Upright inharmonicity curve generated by TuneLab Pro. 5.x based upon sampling notes C1 to C6 from the RD. VPiano Tones SB07 to SB14 (Rock). The steps are where the partials used for tuning change.



Above. Rock Upright tuning file from Tunelab Loaded into the RD2000 editor. Offsets in cents.



Above. The Rock Essential Upright Template SB07 to SB14 from PianoMeter

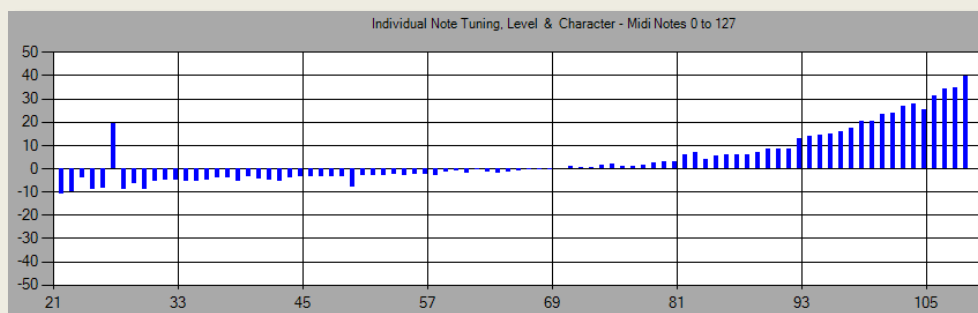


Above is the Inbuilt tuning curve in the RD2000 Essential Upright tones SB07 to SB14. Notice the curve is not smooth as each note is individually tuned.

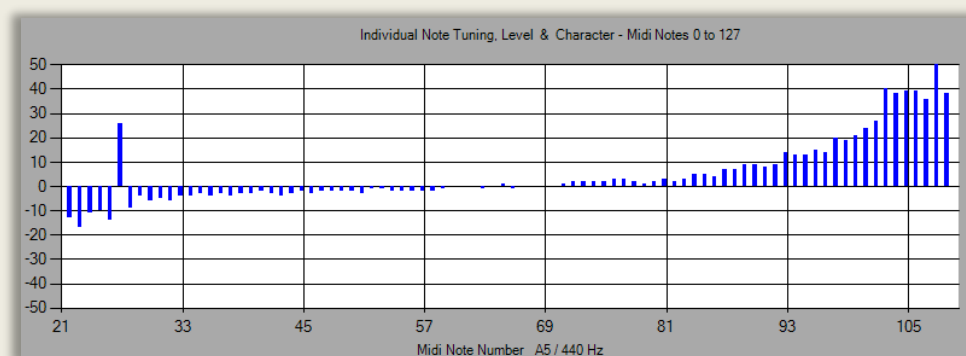
Note. Tunelabs Phase display works best for low or mid notes. Use the spectrum display for high notes. If you get two peaks centre the peaks.

TUNING ACCURACY

It is generally accepted that the smallest difference in tuning which can be detected by the human ear is 0.5 cents between adjacent notes. Piano tuners use beats to adjust tunings which is more precise but because of the mechanical nature of pianos, the best tuning generally achieved is around 0.5 cents. After tuning, pianos will start to go flat and after a year the best pianos will need retuning by several cents depending on the piano and environment. The RD2000 can be tuned to 0.1 cents which is accurate enough and it does not drift.



The 'German Concert ver 7.txt' VPiano tuning I created using TuneLab. 3-part tuning - Perfect 12^{ths}. This tuning is a preset. The inharmonicity curve was created by sampling all notes in lowest and highest octaves and 2 notes every octave in the middle. Then every note was tuned using the inharmonicity curve as a basis with the 'partials table' set back to its default values. Remember to save your program with the user tuning on the RD2000 and as a file on the RD2000 Editor.

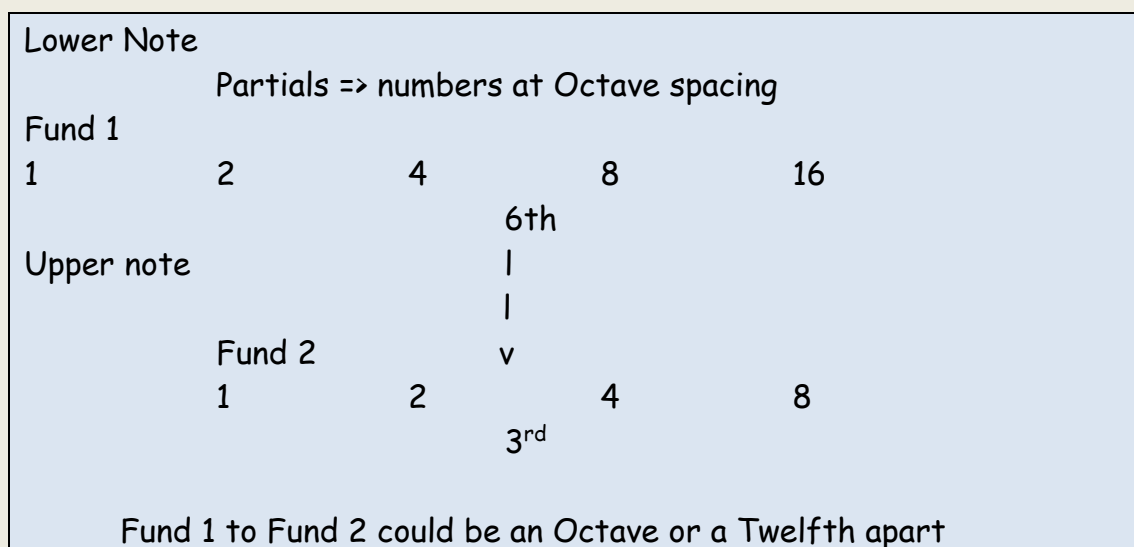


Roland's factory tuning for the German Concert SA1 to SA14. The curve looks rather odd at the low end (D1 particularly) and high ends and does not sound right in these octaves.

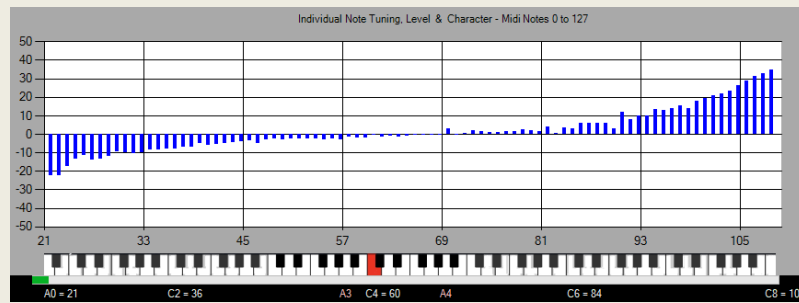
THREE PART TUNING

The latest version of TuneLab pro 5.3 includes Three Part Tuning. TuneLab recommends this method for all of your tuning! The approach is to divide the keyboard into three regions rather than just 2. A0 to A3, A3 to E5 and E5 to C8. A0 to A3 might be tuned 6:2, A3 to E5 3:1 and E5 to C8 3:1. This approach minimises the inharmonicities and controls the middle section so it's almost beat less. This is described in the TuneLab Videos and manual. This is all automated in TuneLab! For perfect 12th tuning use 6:2,3:1,3:1.

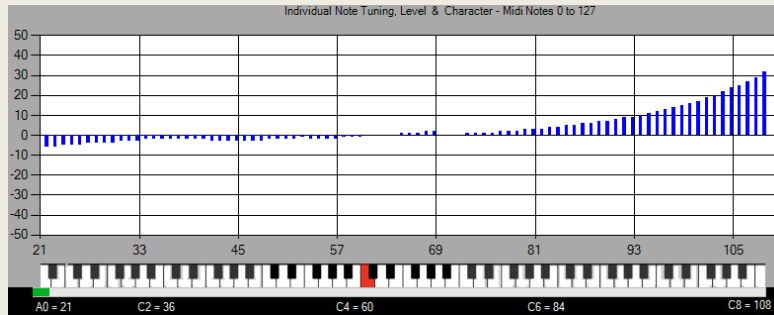
Note. In the octave being tuned, 2:1 means the second partial of the lower note = the 1st partial or fundamental of the upper note an octave higher. 4:2 means the 4th partial of the lower note matches the 2nd partial of the upper note. 6:3 means 6th partial lower matches 3rd partial upper. See below 6:3.



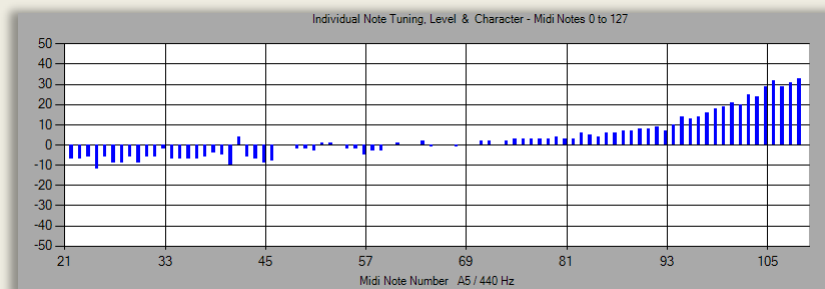
Perfect 12th Tuning. If tuning to 6:3 perfect 12ths then you are comparing two notes not an octave apart but a 12th apart such as D1 to A2 and comparing the 6th partial of the lower note with the 3rd partial of the upper note which is its twelfth.



Above. VPiano Upright Rock SB07 Perfect 12th Tuning using 6:2,3:1,3:1.

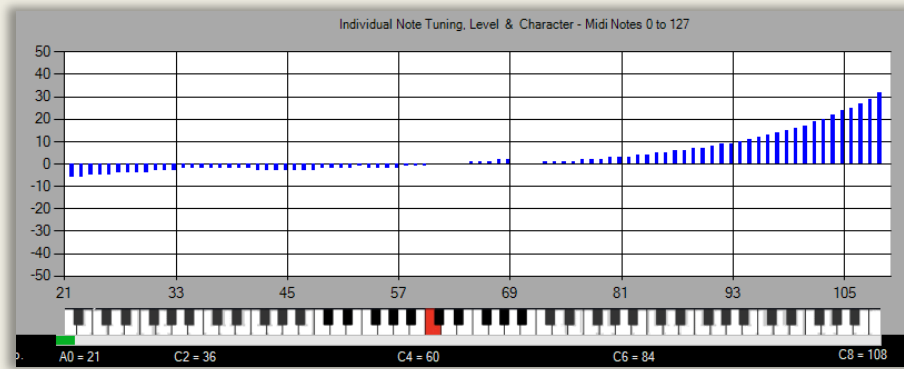


Above. Two-Part Tuning the Upright Rock SB07. Notice the subtle differences between the two curves particularly in the mids. The Three-part tuning is recommended for all tuning and is more harmonious.

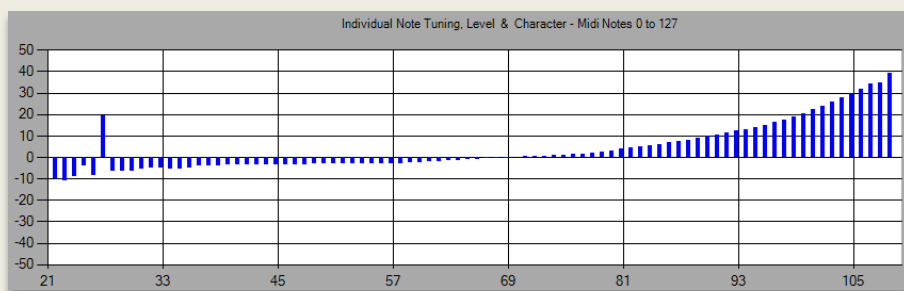


Above. Roland factory tuning for the VPiano Upright Rock SB07

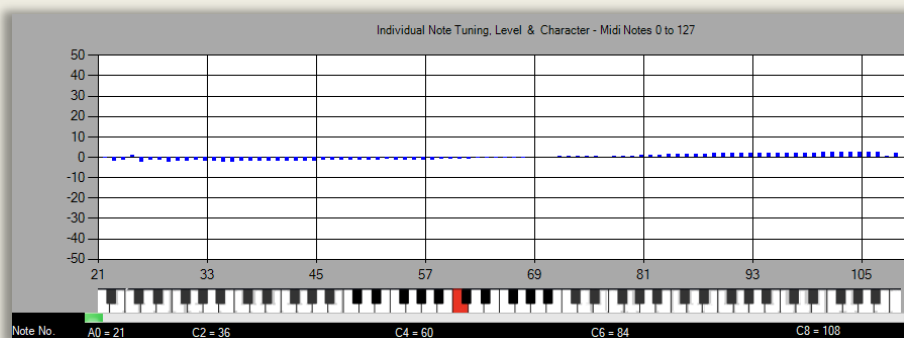
The tuning you use is ultimately a personal choice. But you have many options.



VPiano German Concert 2-part Tuning. Disharmony is concentrated on the 4^{ths} and 5^{ths}. Compared with three-part tuning using 12ths below,



VPiano German Concert ver 6.txt Tuning Perfect 12th 3-part Tuning using 8:2,3:1,3:1. Note D1 tuned aurally. Subtle but audible differences. More harmonious with 3-part Tuning Perfect 12th. Any disharmony is equally split between the 4^{ths}, 5^{ths} and octaves. D1 tuned aurally.

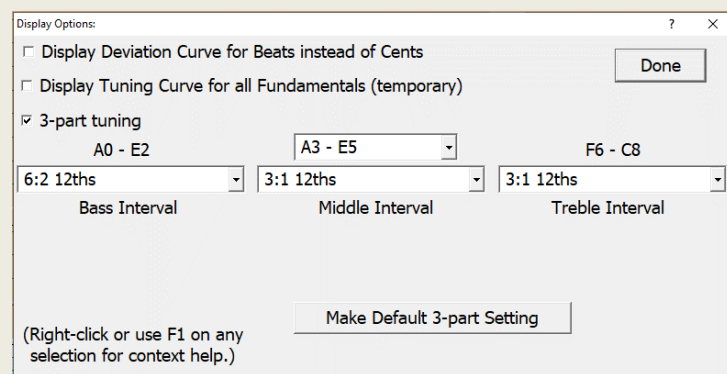


German Concert 3-part tuning 6:2,3:1,3:1 MINUS 2 part tuning 8:4 4:2. Notice 3 part is slightly sharper (+2.5 max difference) above C4 and flatter below C4 (-2.4 max difference). Note D1 using Tunelab individual note tuning.

CHANGING THE TUNING TYPE

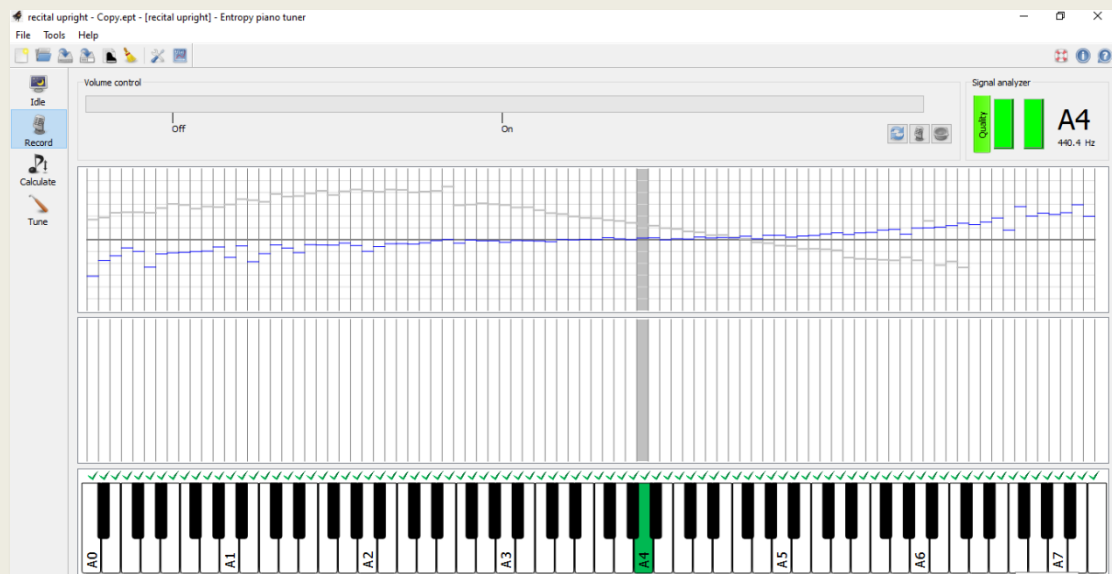
If you have created the inharmonicity curve and tuned every note it is possible to change the tuning type calculation without tuning every note again. For instance, you might have tuned every note to 3 part perfect 1/12ths but the want to try two part 8:4,4:1 tuning. This is how to do it without retuning every note.

- Using your previously created inharmonicity curve for the piano model in question, set partial table to all 1s' and change the tuning type to say 3 part perfect 12th tuning. Save as Tunelab file A
- Using your inharmonicity curve again, set partial table to all 1s' and change the tuning type to say 2 part 8:4 4:1 tuning. Save as Tunelab file B
- In the RD2000 editor do open File A and B and calculate File A - File B. Save this note tuning difference as say File C. This is essentially a tuning correction for each note being the difference between File A and B.
- Now add your 3-part perfect 1/12th individual note tuning to File C. This is your new tuning curve for 2 part 8:4 4:1 tuning. Save the File.
- Now send the new User tuning file to the RD2000 / the piano model you chosen and test it out! If you like it Write the User tuning as a program on the RD2000.



There are many Tuning Types you can choose from and Tunelab gives you loads of options. 3-Part Perfect 12ths has been chosen above. This tuning type balances inharmonicities across the keyboard range and is popular.

ENTROPY TUNING



The Entropy Tuner. The inverted Inharmonicity curve plotted with the tuning deviations for all Recorded 88 notes. Note A4 shows a good quality sample at 440 hz. German Concert SA01

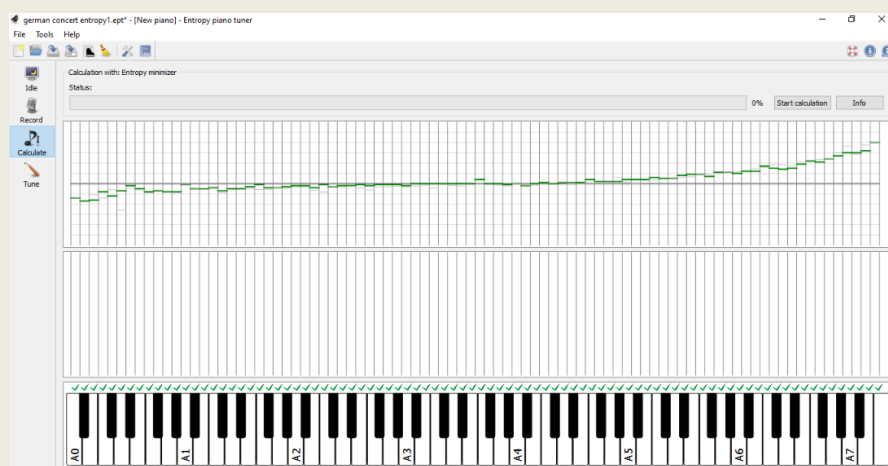
Authors of the Free Entropy Tuner 1.2.0. Copyright. Hays Hinrichsen and Christoph Wick Faculty for Physics and Astronomy University of Würzburg, Germany.

The Entropy tuner does not adhere to a specific part tuning. Octave stretches can vary slightly and the tuning curve can vary running the same input data into the calculation. It does not use an inharmonicity curve to produce the tuning. The minimum Entropy is defined where overlaps between partials are maximised. The resolution of this approach is 1 Cent. The search for the minimum entropy uses a Monte Carlo random walk approach. The tunings are said to be more like a human tuning. The aim is to minimise Entropy $H = -\sum P_i \log P_i$ where P_i is the energy intensity of the pitch at note i . The minimum Entropy approach minimises dissonance across all notes. With Entropy tuning you have to measure the energy spectrum of every note, calculate the minimum entropy in the software and then export the Computed Deviation tuning values to the RD2000 editor. You can get really harmonious tunings with minimal dissonance.

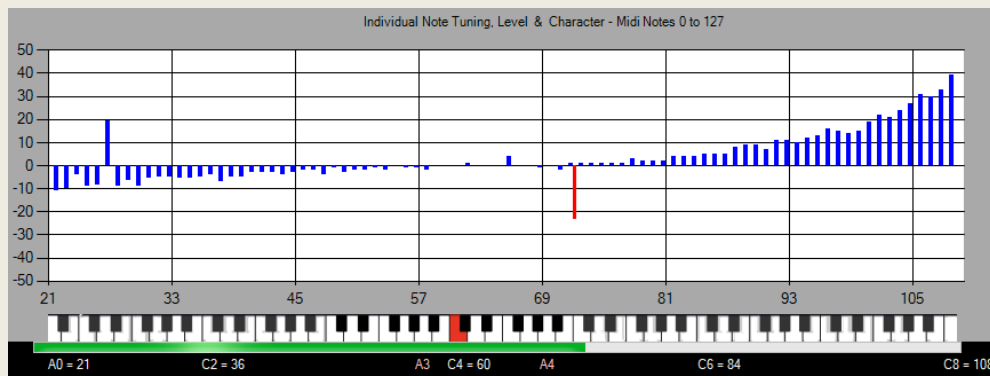
In the RD2000 installation directory is an Entropy tuning. 'German Concert Entropy Tuning.txt'. Use the Radio Button on the Presets or 'Load File' button to open it and try it out!

Entropy Tuning Procedure

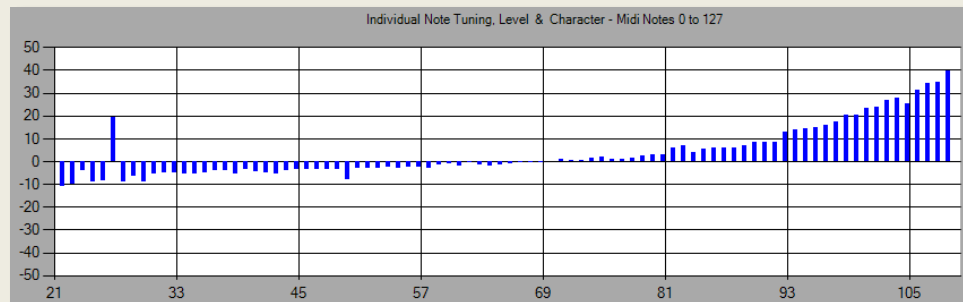
1. In Windows run the Entropy Tuner as an administrator and in compatibility mode for Windows 7. Right click on entropypianotuner.exe to do this. This avoids occasional crashes.
2. Sample all 88 notes. The software needs the energy spectrum of every note. ie Partial distribution and intensity. Use digital input to the computer from The RD2000 which avoids using a Mic. This produces a linear and low noise signal. I've automated this procedure. See later.
3. Calculate using a 'Calculation accuracy' of high or infinite (run until tuning adjustments on the screen are insignificant ~ 2 mins.). The software determines the computed tuning values of all 88 notes by shuffling the offsets and looking for minimised total energy. You can now Export the calculations as a CSV file and select the Computed Deviation Values column data and paste into the RD2000 editor. See later. Tune aurally any errant notes.
4. This step is not really required unless you have an acoustic piano. For manual Tuning. Select the tuning icon on the left-hand side of the Entropy tuner. Adjust each note until the strobe display is still or the spectrum display is centred. The CSV file once exported will record the Tuning Deviation values which are the manual tuning values. The Computed and Tuning deviations will be very close. See later.



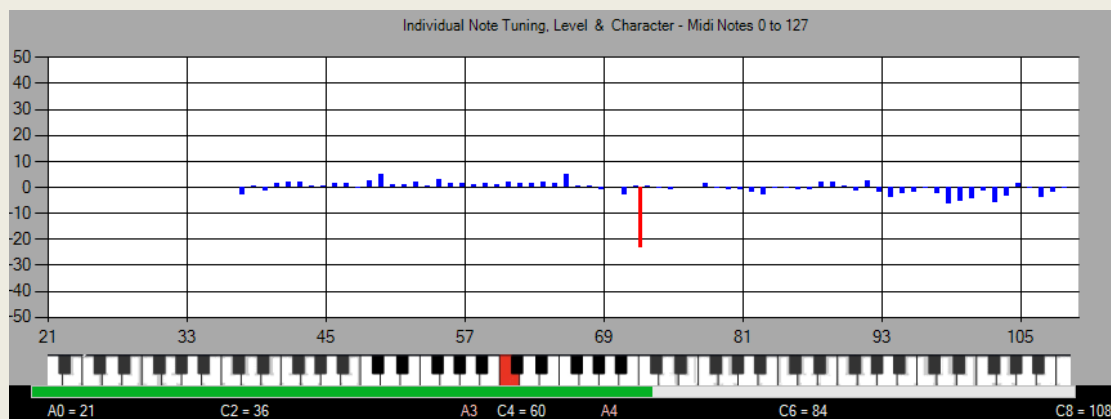
Entropy Tuner Computed Tuning Offsets (Deviations) from 0 being the equal temperament scale. Vertical scale 10 cents/division. This is the Piano models Railsback curve.



After Sampling and computing the deviations for every note, the Railsback Curve generated by Entropy Tuner has been imported into the RD2000 Editor. I've overwritten the map with the first 14 notes from the 3 Part perfect 12th tuning below. This provides a much better tuning for notes A0 to B1. German Concert SA01.



The Railsback Curve created using TuneLab. German Concert 3 Part Perfect 12th. SA01



German Concert Piano. Entropy tuning values minus 3 Part perf 12ths tuning values using TuneLab. Entropy tuning is really good above B0 and very sonorous. The curves agree well. The remainder are within 6 cents of the TuneLab tuning.

Importing Computed Tuning data into the RD2000 editor

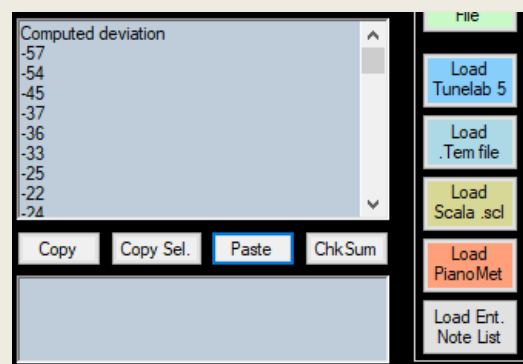
The Entropy Tuner App V 1.2.0 allows you to export tuning data in the form of a comma separated CSV file. Once you have sampled each note and the software has done the Calculation, you just Export the data. You don't need to manually tune 88 notes as you would with an acoustic piano. Just run the calculation and copy the Computed Deviation tuning directly from the Entropy Tuner into the RD2000 Editor. To do this:-

1. 'Copy' the 88-note list of 'Computed Deviation' tuning offsets in the CSV's file column F - that's the required tuning. You can copy whole column including the header or just the 88 note values or the first x notes after the header. If you copy less than 88 notes the remaining notes up to 88 will be set to a value of 0.

2.

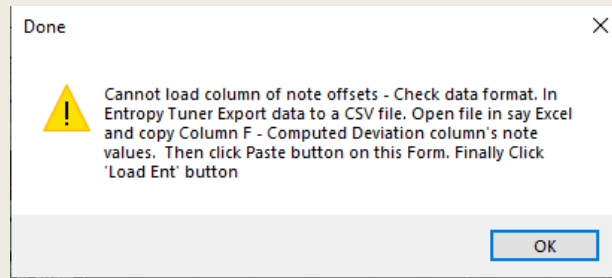
	A	B	C	D	E	F	G	H	I
1	Key index	Inharmon	Recorded	Recorded	Computed	Computed deviation	Tuned fre	Tuned dev	Quality
2	1	0.000485	27.012	-32.369	26.609	-57	26.613	-56.743	0.04978
3	2	0.000431	28.84	-19.029	28.24	-54	28.252	-53.306	0.11794
4	3	0.00033	30.624	-15.082	30.076	-45	30.108	-43.127	0.1393
5	4	0.000321	32.571	-8.3776	32.012	-37	32.03	-35.988	0.29362
6	5	0.000321	34.449	-11.329	33.935	-36	33.938	-35.852	0.42979
7	6	0.00033	36.218	-24.667	36.015	-33	36.03	-32.291	0.12496
8	7	0.000253	38.62	-13.478	38.333	-25	38.341	-24.652	0.31445
9	8	0.0002	40.939	-12.517	40.683	-22	40.706	-21.036	0.55831

3. Then click the 'Paste' button on the RD2000 Editor form - see below.



4. Finally, Click the 'Load Ent. Note List' Button. See above.

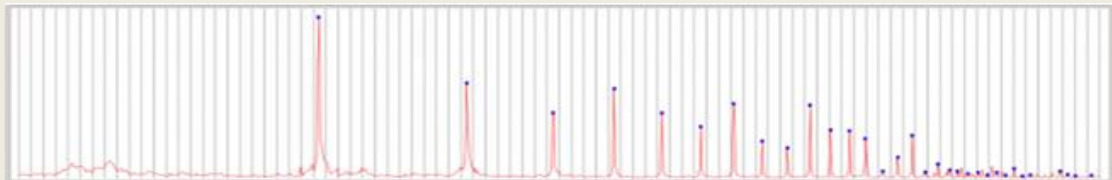
The computed tuning curve will be displayed. If the data is not in the correct format you will get an error message reminding you of the process.



Finally, Save the tuning file on the Editor. You can then send to the RD2000 as a User Tuning. Note the CSV file with the column headed 'Computed Deviation' shows the target tuning for each note. Manually check the tuning aurally and adjust any errant notes as required.

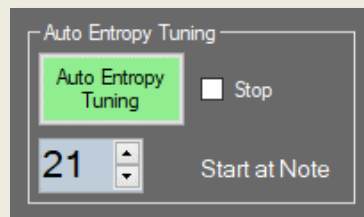
Tip 1. Entropy tunings are available as presets in the RD2000 software. Remember you can always manually tune any notes you don't like.

Tip 2. For the lowest $1\frac{1}{2}$ octaves when using the Entropy Tuner I normally check and adjust the suggested tuning aurally. The fundamental of these notes are so weak that using your ears is your best guide. This especially applies for most upright pianos or small grand pianos where the fundamental is almost non-existent.



Note A2's energy spectrum above. The fundamental is well pronounced. But for note A0 the fundamental is almost non-existent. At note A7 the only peak measurable is the fundamental. The entropy tuner tries to maximise the overlap of all notes partials so as to minimise the entropy. It's an iterative process and there can be many subtly different solutions. You can download the latest version of the Entropy Tuning app here from <https://Piano-tuner.org>. Currently available for Mac, Linux and Windows x86. Click link below. [Index of /Resources/Public/Downloads](#)

AUTOMATIC ENTROPY NOTE SAMPLING

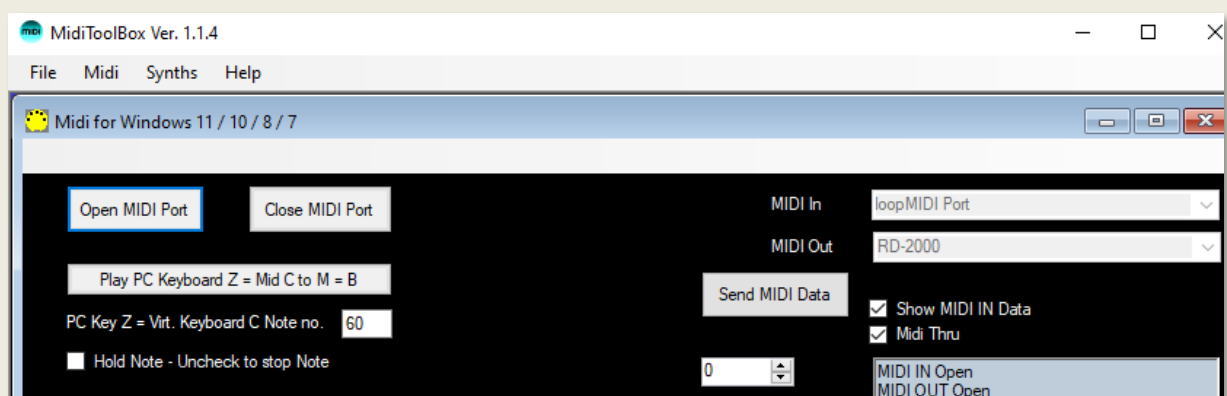


This feature enables the automation of the Entropy Tuner sampling process. Let it run whilst you have a coffee! This process saves you manually playing all 88 notes which can take about 25 minutes and is laborious. This feature is the bottom of the Tuning form. To automate the note sampling with the Entropy Tuner, this is what you do: -

1. Set midi out of the RD2000 Editor to an internal PC/Mac midi port. Let's call it 'Loopmidi port'. In windows I recommend the LoopMidi app. See Below for the midi out settings. On a Mac use the built in IAG Bus 1.

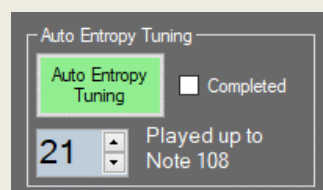
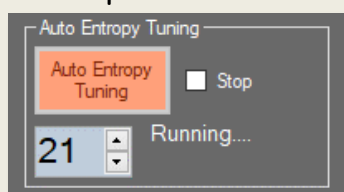


2. With Windows use a midi port forwarder such as my free Midi ToolBox (on my website) or Midi Ox and set Midi in as 'Loopmidi port' and Midi out to the RD2000. Also check Midi Thru checkbox. This sends note data to the RD2000 so the notes play for sampling by the Entropy Tuner's audio in. See setup below.



Midi Toolbox routing loopmidi port (from midi in of the app) to the RD2000 (via midi out of the app). You must Check the 'Midi Thru' checkbox on the app.

3. On the Entropy Tuner app. Set Midi in to 'Loopmidi port'.
Tools/Options
4. Check 'Automatic key selection'. Tools/Options
5. Make sure the digital audio is coming from the RD2000 or via your audio interface. Tools/Options
6. Set the Piano tone you are sampling on the RD2000.
7. On the RD2000 Editor - Tuning Form, the start note for the Record phase of the Entropy Tuner is set by default to midi note 21.
8. Click 'Auto Entropy' button. It will turn pink (Left image below) and all the notes from 21 to 108 will sound in sequence. You can specify the start note. When completed after 24 mins the button will turn green. (Right image below). You can stop the process any time by checking the 'Stop' check box and when the current note ends it will stop.



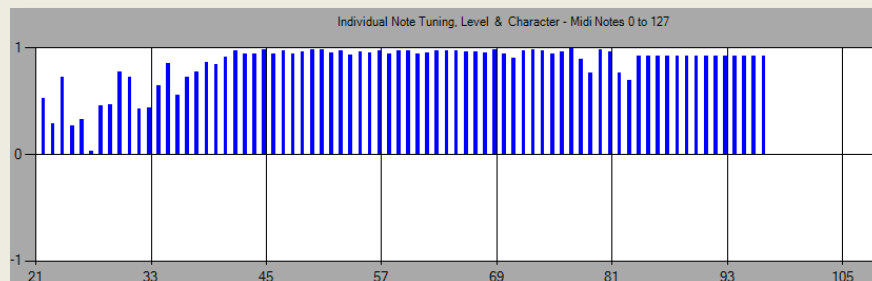
The Auto Entropy Tuning procedure reports the midi note number completed when the sampling is stopped. You can restart sampling by entering this note number in the updown box. Once the tuning file is saved on the Entropy Tuner you can Compute the Deviation from equal temperament in the Tuner and then export the CSV file. Then open it in say Excel and copy the Computed Deviation column and paste into the RD2000 editor as described earlier.

	A	B	C	D	E	F	G	H	I	J
1	Key index	Inharmon	Recorded	Recorded	Computed	Computed deviation	Tur Tuned deviation	Quality		
2	1	0.000485	27.012	-32.368	26.609	-57.001	27	-56.741	0.04978	
3	2	0.000431	28.84	-19.027	28.241	-53.999	28	-53.307	0.11794	
4	3	0.00033	30.624	-15.082	30.076	-45	30	-43.124	0.1393	
5	4	0.000321	32.571	-8.3783	32.012	-36.999	32	-35.988	0.29362	
6	5	0.000321	34.449	-11.33	33.935	-35.999	34	-35.851	0.42979	
7	6	0.00033	36.218	-24.665	36.015	-33	36	-32.289	0.12496	
8	7	0.000253	38.62	-13.477	38.333	-25	38	-24.652	0.31445	
9	8	0.0002	40.939	-12.515	40.683	-21.998	41	-21.037	0.55831	
10	9	0.000212	43.383	-12.151	43.053	-24.002	43	-21.739	0.68948	

Notice that the sampling 'Quality' values are generally below 0.3 in the lowest octave, so aural tuning is recommended for these notes. See next page for fine tuning.

FINE TUNING THE ENTROPY CALCULATION

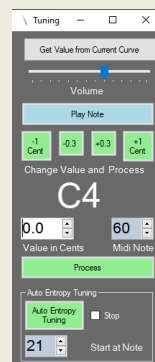
Once you have sampled all of the 88 notes you can fine tune the Computed Deviation values.



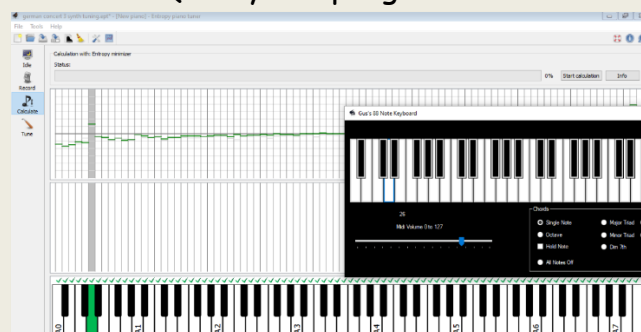
The Entropy sampling quality measured for the German Concert Grand. values 0 to 1 Y axis. The top 10 notes only require the fundamental which is easy to detect. The lowest octave shows variability with values < 0.3 .

Here the fundamentals are so weak the software has problems determining the frequency. So manual intervention is required.

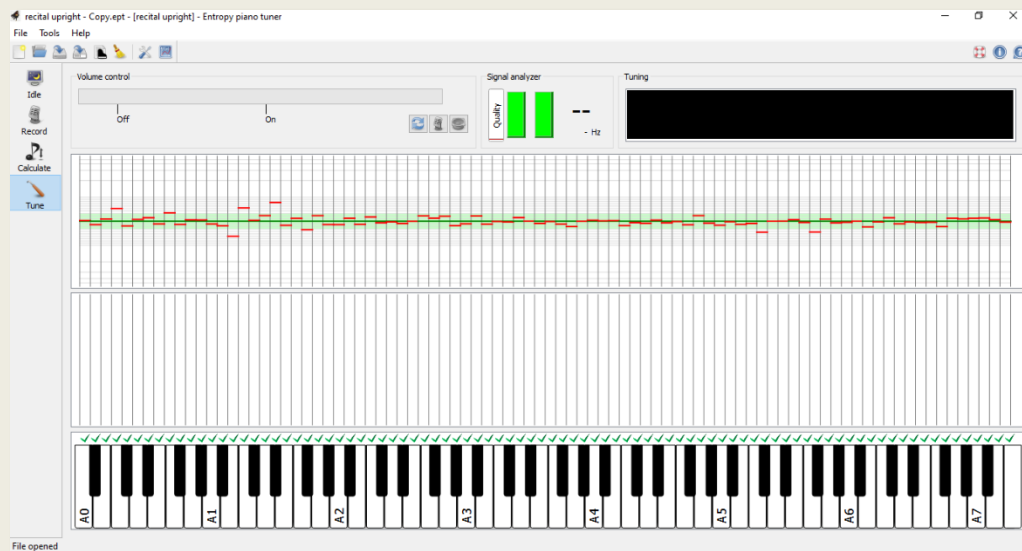
There are 3 approaches to get the low notes right. Use the one that suits you best.



Approach 1. I would normally aurally tune using the Tuning Form above in the RD2000 editor and use it to adjust the note values. Just load the Computed Deviation curve first. The main area to concentrate on is the lowest octave. Here the 'Quality sampling values' will be mostly < 0.3 .



Approach 2. You can also turn on synthesizer mode on the entropy app and play back a mixture of partials collected from the sampling. You can then check the tuning of the 88 notes by playing your midi keyboard or the virtual keyboard on the RD2000 Editor. On the calculation page above, you can slide the green bars up and down with the mouse to change the tuning of the calculated curve. A really nice feature! Just connect the two apps by midi using Loopmidi app or IAG bus 1 on a Mac. Then on the RD2000 Editor goto Midi / Keyboard for the 88-note keyboard, which is great for tuning. Above the RD2000 Editor 88-note keyboard window is set to be always on top as a default. When done export the csv again and copy the updated Computed Deviation column into the RD2000 editor.



The Entropy Tuning Form.

Approach 3. Click on the Tuning Icon on the left-hand side. You play one note at a time starting at A0 and use the strobe or spectrum window at the top right to finely tune the note, but for low notes use your ears! This is particularly useful for the lowest octave on the keyboard. You can use the Tuning Form to do this. The red bars above show the fine-tuning deviations about the horizontal equal temperament line.

Just use the tuner for the lowest octave and paste the remaining Computed Deviation values into the Tuned Deviation Column see below. You then copy and paste the Tuned Deviation column to the RD2000; just like the Computed Deviation Column described earlier. This will give you a more precise tuning. Manual for low notes, computed for the rest.

	A	B	C	D	E	F	G	H	I
1	Key index	Inharmon	Recorded	Recorded	Computer	Computed deviat	Tuned fre	Tuned deviation	Quality
2	1	0.000485	27.22	-10.589	26.872	-40	28.445	-40	0.046189
3	2	0.000485	28.839	-10.511	28.437	-42	28.45	-41.216	0.052721
4	3	0.000471	30.719	-1.2273	30.18	-39	30.291	-32.638	0.085817
5	4	0.000361	32.41	-8.4139	32.179	-28	32.218	-25.9	0.11757
6	5	0.000321	34.61	5.2694	34.151	-25	34.19	-23.014	0.37885
7	6	0.000311	36.561	0.19941	36.349	-17	36.317	-18.525	0.53198
8	7	0.000293	38.465	-11.928	38.667	-10	38.701	-8.4587	0.047731
9	8	0.000268	41.06	1.1014	41.037	-7	41.016	-7.9127	0.47073
10	9	0.000188	43.428	-1.8022	43.654	0	43.711	2.2724	0.69963
11	10	0.000206	46.094	1.3446	46.223	-1	46.224	-1	0.72977
12	11	0.000261	48.833	1.2607	48.689	-11	48.741	-11	0.78696
13	12	0.000232	51.879	6.0071	51.733	-6	51.807	-6	0.91311
14	13	0.000239	54.395	-11.995	54.494	-16	54.489	-16	0.068537
15	14	0.000194	57.973	-1.7138	58.203	-2	58.169	-2	0.84989

The Computed Deviations are very close to the Tuned Deviations above the first octave. It's not always necessary to tune 88 notes manually except for the lowest octave. Just watch out for low Quality values < 0.3 where aural tuning is recommended.

Notes on the Entropy Tuner.

1. The whole automated process takes 25 minutes. Don't let your computer sleep but do grab a coffee! For notes A0 to F2 I've set the software to take 25 seconds to sample each note. For Notes F2 to C4 to take 15 seconds and for C4 to C8 to take 5 seconds. There is always a 2 second gaps between a note off and the next note on. This approach uses longer sample times for lower notes and is more consistent than manually sampling and waiting for the note to diminish.
2. If any notes have a red cross ✗ above them after the procedure runs, redo the sampling of these notes manually. You can force a note selection by double clicking on the note on the tuner to stop the auto recognition from using the wrong note. A green ✓ tick signifies a usable sample.
3. This approach results in a consistent note velocity. Note Velocity and midi channel are controlled by sliders on the RD2000 Editor Midi Settings form. Default velocity 100 and Midi channel 1.
4. Set the calculation precision in the Entropy Tuner to "High" or "Infinite" but stop the latter after about 3 minutes or when the graph does not noticeably change.
5. The lowest will benefit from aural tuning adjustments. However, the same applies if you use other tuning apps.
6. You could use a good, previously created tuning for the first octave and use entropy tuning for the rest! See adding parts of curves.

A + B

7. Roland let you edit all of the individual note voicings for the VPianos' and the following Super Natural Pianos' 0001 to 0039 and 0042 to 0045 - See RD2000 Sound List.
8. In the installation directory There are Entropy Tunings for SA01 to SA17, German Concert, SB01 to SB06 Recital Upright and SB07 to SB14 Rock upright.
9. I've also included Tunings using Computed Values for all the remaining VPiano tones S01 to S17 and some Super Natural tones. Concert Grand. 'sn0001 ent.txt', Upright Piano 'sn0028 ent.txt' and others with an 'sn' prefix. I have not adjusted these aurally.

PIANOMETER - CREATING A TUNING CURVE

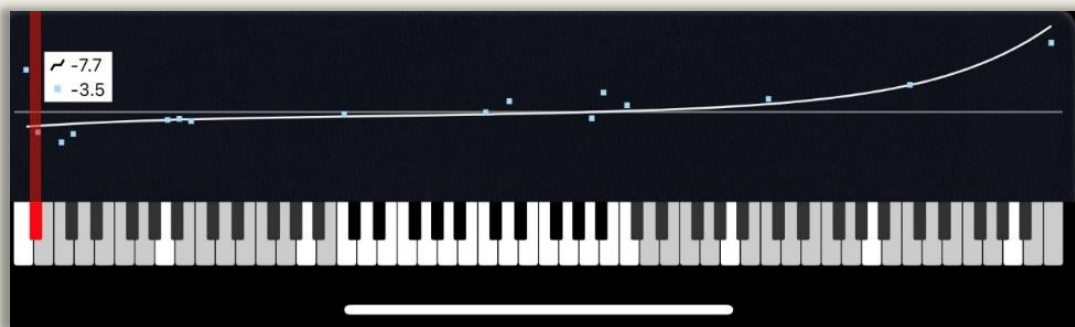
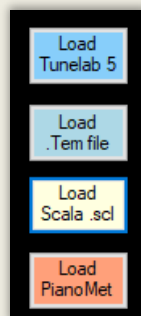
There is an alternative but excellent free tuning app for IOS or Android devices which helps you create a Railsback curve for your Piano model. Its free as you don't need the full version for tuning the RD2000, but I recommend the plus version at £25. You only need the Railsback curve values and you can enter the values of the curve to create the tuning map in my software. To get the Railsback curve values, play for instance all the Cs' or for greater accuracy the Fs' as well. The app will generate the best Railsback curve (most harmonious) using principals of minimised Entropy Tuning, but where you can individually weigh tuning parts such as double octaves or twelfths. See previous section for Entropy tuning. You can read off the values of the curve and enter them in my software using the editing tools to create an approximate tuning map! For precise tuning, tune the RD using the inharmonicity curve as you would an acoustic piano. The smallest you can adjust a value on the RD is by +/- 0.1 cent. The best acoustic piano tunings achieve only 0.5 cents accuracy.



PianoMeter on an iPhone. In PianoMeter you can input the data off the curve's 88 notes manually into the RD2000 Editor, if you don't need to tune every note. Eg. The note C6 needs to be set to the curve at +4.2 cents.

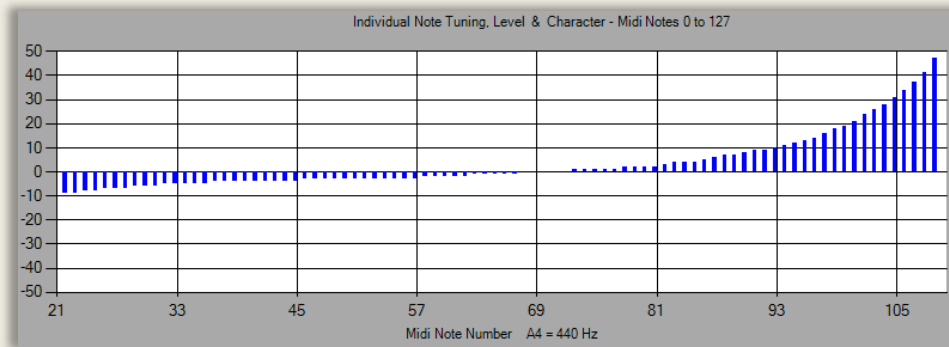
If you own the pro version of PianoMeter this is a quick way to load a generic Railsback tuning file. You will still have to make manual adjustments for any inharmonicity. However, you can also tune using the display like tuning an acoustic: -

1. Export your PianoMeter tuning file (only on pro version) - long press on file name on Android or iPhone - and share to yourself by email say.
2. Open the file in notepad its name will be pianometer***.etfz in ANSI format file.
3. Save file as a utf8 encoded text file in notepad. Pianometer***.txt
4. Now click 'Load PianoMet' button and select Pianometer***.txt file.
5. Remember - That's it for a generic Railsback curve!
6. Once you have created the inharmonicity curve, for precise tuning, the best thing to do is to tune every note as you would an acoustic piano. See PianoMeter help document for details. It's very straight forward.

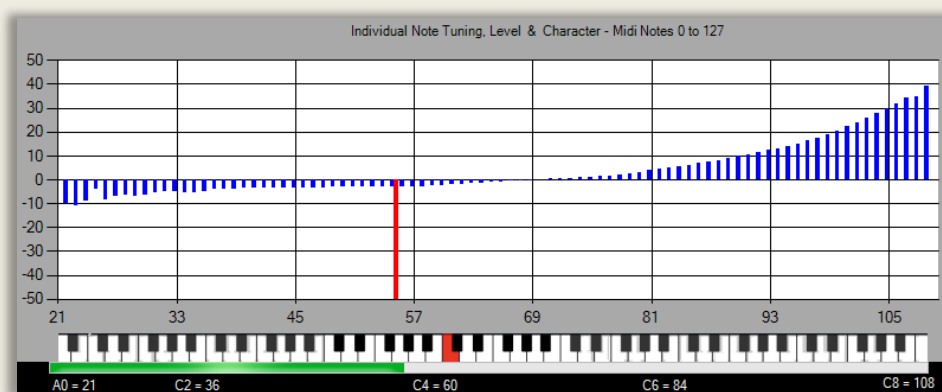


Above PianoMeter - At C#1 the German Concert curve needs to be at -7.7. The recorded value on the RD inbuilt preset is -3.5 so this point needs editing on the RD editor curve to make C#1 = -7.7 cents.

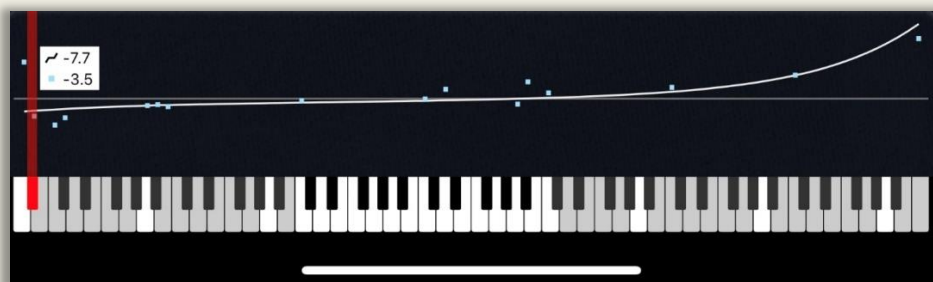
Tuning Theory



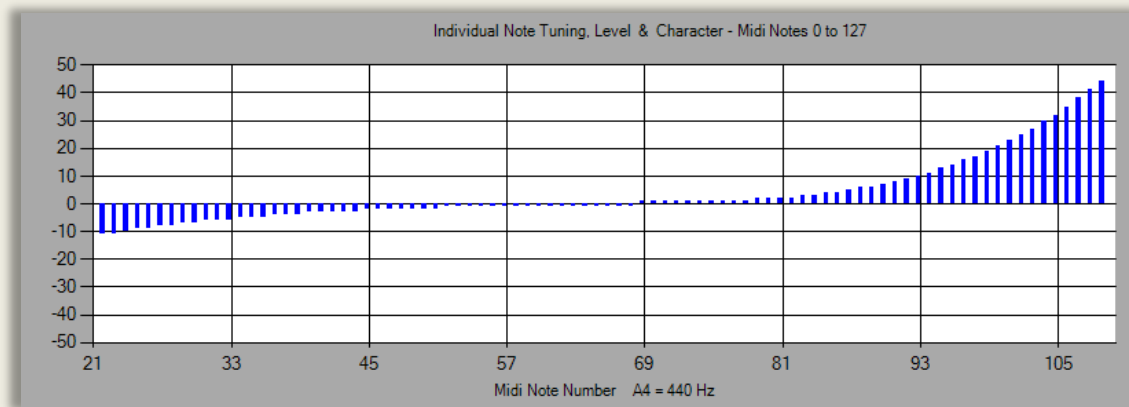
German Concert tuning map from PianoMeter. Always save your tuning map!



Above. For comparison, Three Part Tuning Perfect 12ths railsback curve in TuneLab. The two apps are in close agreement.



Above in PianoMeter the German Concert VPIano. I played all of the C's to PianoMeter free version then the complete lowest octave and the used the Railsback curve it generated. The next step is to tune every note for precise tuning.



Above is my RD2000 German Concert Template which you can select by its radio button. It uses two cubic curves to eplicate the German Concert PianoMeter Railsback curve and acts as a starting template which you can edit. Railsback tuning curve accurately. (+-2 cents) when compared with TuneLab 5.x curve.

HISTORICAL TEMPERAMENTS



A Bartolomeo Christofori Piano Circa 1720. One of the very earliest pianos made by the piano inventor's own company. Strings were struck, rather than plucked like a harpsichord and it could be played loudly and softly. It is thought the sound was somewhere between a harpsichord and a modern piano.

In Western music we are familiar with equal temperament tuning. This is where each note is equally spaced 100 cents from the next. But this temperament has only become nearly universal in Western cultures in the 20th Century. It is not used for instance in earlier music or the music other cultures where they sometimes divide the octave by more or less than 12 notes and where notes have unequal intervals. In fact, equal temperament tuning to some ears does not sound right! Unequal temperaments keep pure or nearly pure intonations in some keys and allow dissonance in less used keys. When an interval is tempered it is widened or narrowed to make certain ratios purer.

Most of the classical musical works by composers such as Bach and Beethoven were written in a different temperament. Some of these; including Bach's, have been lost to the passage of time! Some where the importance having pure thirds or fifths were more important. The Mean Tone unequal temperament is one such example which was popular up to the mid-17th Century but it had a keynote. This gave way to Well Temperament reflecting the change of composing styles. In fact, we can create thousands of different temperaments. See this brilliant video series. <https://www.youtube.com/watch?v=y6iwiQwVUIc>

Note. The demo version of Pianoteq 8 has a whole range of temperaments which can be presented as note offsets in cents and can be transcribed for this program. See *Creating your own unequal temperament* later.

The RD2000 has 8 different temperaments built in. Here is Roland's description from their *Parameter Manual*.

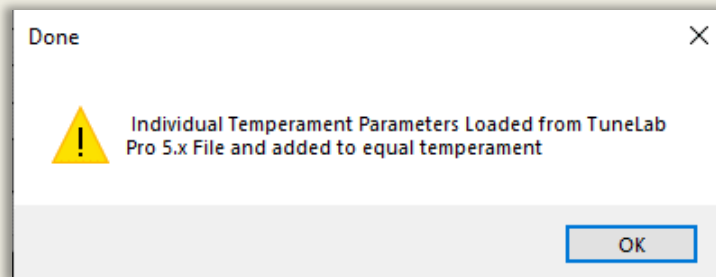
1. EQUAL Temperament. This tuning divides an octave into 12 equal parts. Every interval produces about the same amount of slight dissonance.
2. JUST Major. This scale eliminates dissonance in fifths and thirds. It is unsuited to playing melodies and cannot be transposed, but is capable of beautiful sonorities.
3. JUST Minor The scales of the major and minor just intonations are different. You can get the same effect with the minor scale as with the major scale.
4. PYTHAGOREAN. This scale, devised by the philosopher Pythagoras, eliminates dissonance in fourths and fifths. Dissonance is produced in thirds, but melodies are euphonious.
5. KIRNBERGER. This scale is a modification of the meantone and just intonations that permits greater freedom in transposition to other keys. Performances are possible in all keys
6. MEANTONE. This scale makes some compromises in just intonation, enabling transposition to other keys.
7. WERCKMEISTER. This is a combination of the meantone and Pythagorean scales. Performances are possible in all keys .
8. ARABIC. This scale is suitable for Arabic music

If you want to use a different historical temperament, then one way is to use the free version of TuneLab 5.3 for windows. When you install the free version of TuneLab it also loads a set of Temperament files which create note offsets to the current equal temperament tuning. File/Read Temperament File. If you need to cancel the Offsets just click on File/Cancel Temperament.

An historical temperament is defined by a set of 12 offsets from equal temperament. These 12 offsets are repeated in every octave. To load an historical temperament.

1. In TuneLab add the temperament offset to the normal equal temperament tuning you have open and that want to add temperament offsets to. File/Read Temperament File and save as say '*Temper.tun' say - Where * is your filename. Make sure partial table set to all 1s.
2. On the RD2000 editor - Press TuneLab5 button and select your file '*Temper.tun' file.

Now if a tuning file has temperament data it will have its offsets added to the equal temperament tuning and an extra message box will tell you it's been added.



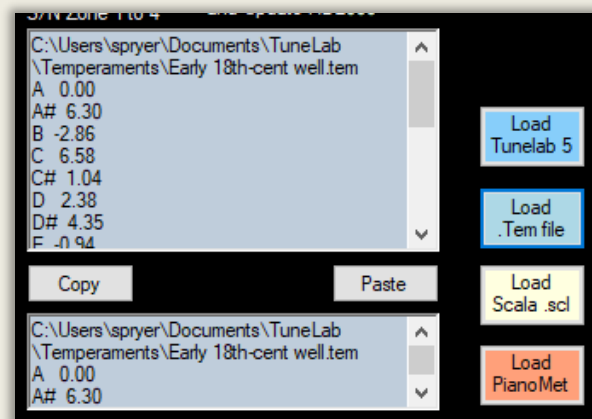
There are many historical and novel temperaments to choose from. Below is a list of over 80 temperaments in TuneLab!

1-4 Syntonic Meantone	Howard Willet Pyle Q-E
14th-cent Pythagorean	Improved William Hawkes meantone
1797 meantone	Jean-Le Rond D' Alembert
1799 meantone	Jean-Le Rond D' Alembert well
17th-cent meantone	Jean Jousse well
Alexander Metcalf Fisher	Jean Jousse Q-E
Alexander John Ellis 1875 Q-E ("Q-E" stands for "Quasi-Equal")	Johann George Neidhardt Pythagorean
Alexander John Ellis 1885 Q-E	Johann Philipp Kirnberger well
A Merrick Q-E	Johann Nepomuk Hummel Q-E
Almost Equal - Di Veroli	Johann Christian Gottlieb Graupner Q-E
Anton Bemetzrieder Pythagorean	John Holden 1 5th syntonic
Augustus De Morgan unequal	John Marsh 4 25th syntonic
Bach - Bradley Lehman	Kellner
(decoded from Bach's ornamental flourishes)	Kirnberger III
Balanced 16	Mark Wicks Q-E
Bremmer EBVT-1	Mersenne-Chaumont
Bremmer EBVT-2	Neidhardt-Marpurg-De Morgan Pythagorean
Bremmer EBVT-3	Peter Prelleur well
Broadwood Best	Pietro Aaron quarter syntonic
Charles E Moscow Pythagorean	Rep 18th cent well
	Rep Victorian well

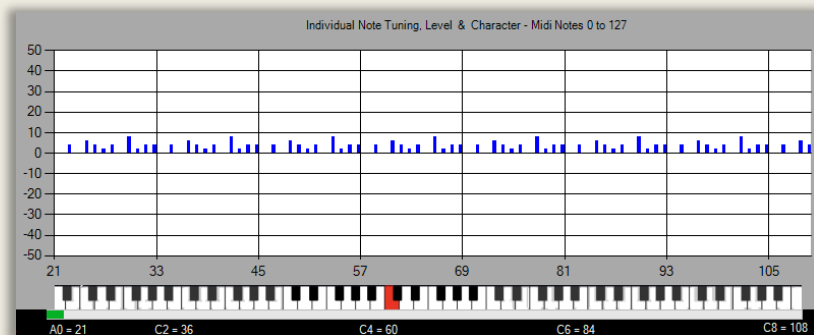
Christiaan Huygens 31 Coleman 11 (from Jim Coleman, Sr.) Coleman 16 (from Jim Coleman, Sr.) Coleman 4 (from Jim Coleman, Sr.) Early 18th-cent well Ellis tuner well 2 Ellis tuner well 4 Ellis tuner 5 Q-E Equal-beating Jean-Jacques Rousseau Equal-beating John Preston well Equal-beating Prinz well Equal-beating Charles Earl Stanhope Factory tuners 1840 Q-E Fisk II Francesco Antonio Vallotti well George Frederick Handel well Gioseffo Zarlino 2 7th Gottfried Keller 1 5th ditonic Harald Vogel 1-5 comma meantone Henricus Grammateus Pythagorean	Robert Smith 50 Rousseau French Standard Stanhope Equal Beating Stanhope 1-3 Comma Theoretical John Preston well Theoretical Charles Earl Stanhope Theoretical Jean-Jacques Rousseau Theoretical Prinz well Thomas Young 1 Tuner's Guide well 1 Tuner's Guide well 2 Tuner's Guide well 3 Tuner's Guide Marsh Q-E Tuner's Guide Becket Q-E Vallotti-Young well Vallotti Well (1750) Viennese Q-E Werkmeister III William Hawkes 1 6th Mecator William Hawkes meantone William Tans'ur well
---	--

You can also easily create/input your own Temperament files using the "Map Temper" button. See later.

LOADING TEMPERAMENT FILES



If you want to load a Temperament file (.Tem file extension) from TuneLab then click on the "Load .Tem file" button. The Temperament .Tem files are all stored in a folder called Temperaments under the TuneLab folder. Or without loading TuneLab here :- <https://tunelab-world.com/tempers/tempers.html> They specify offsets in Cents for each equal temperament note. See above.



Bach - Bradley Lehman Temperament file

Once the file is open you can add it (A+B button - see later) to an equal temperament file, or edit it and save it as a new temperament as a plain text file. There are over 80 temperaments to select from in the TuneLab temperament folder. If you need a temperament which is not listed you can create your own using the Temper button - see next page. If the formatting of the .Tem file is wrong you will get an error message advising you to check the format of the file. There are a couple of odd formats in the Temperament list. It's best to stick to eg. A# xx.xx two spaces in between A# and value.

[Loading Temperament Files](#) Video

EDITING TEMPERAMENT FILES

One way you can create your Temperament .Tem file is by editing an existing temperament .tem file. The other and simpler way to create one is to use this software using the 'Map Temper' button - see later.

You can edit the file using the RD2000 editor or use a plain text editor like Notepad to edit the offsets for the 12 Notes A to G#. Offsets are in cents. Just change the Offset values as required. Maximum +/- 50.0 cents.

Eg. To change the offset for A# from 10.95 to 9.70 cents just change

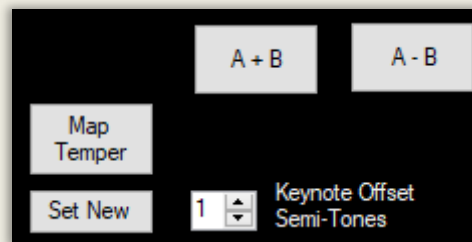
Original - Offset A# 10.95
to
New - Offset A# 9.70
etc

When you've edited the 12 notes just save it as a plain text file with a newname.tem

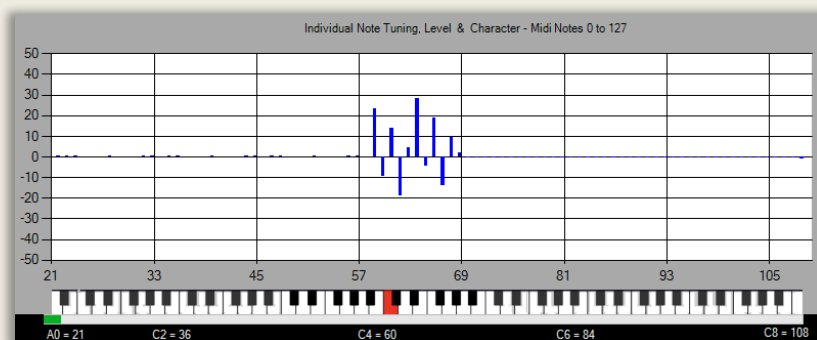
Below is an example of a complete temperament .tem file which can be edited and has the advantage that it can be used with any equal temperament tuning and is saved in the Tunelab/Temperaments folder. It's a plain text file with a .tem extension. The format is simply a Note followed by Offset in Cents. Starting with its KeyNote. This software will round to nearest 0.1 cents for the RD. A 0.01 cents difference is not audible!

```
C 5.86 Vallotti's Well Temperament (c. 1750)
C# 0
D 1.95
D# 3.91
E -1.95
F 7.82
F# -1.95
G 3.91
G# 1.95
A 0
A# 5.86
B -3.91
```

CREATING YOUR OWN UNEQUAL TEMPERAMENT



If you want to create your own unequal temperament file you just need to specify the offsets from Note 57 / A3 to Note 68 / G#4 using the 'Edit Value for Note Number' option. Add one note at a time. Then click the "Map Temper" button and it will copy across to all of the octaves the 12 note offsets. All A's will be the same offset. All B's will be the same offset etc. Then just save the file. Call it "name_temper.txt". You can then add it using the A+B button to any equal temperament tuning file.



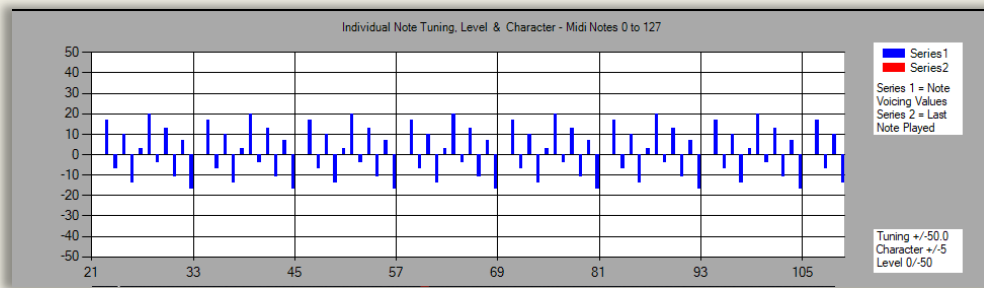
To create your own unequal temperament offset file you only need to specify 12 notes from A3 (note 57) to G#4 (note 68). Then Press the Map Temper Button. You can then add it using the A+B button to any equal temperament tuning.

There is a lot of information on the internet about unequal temperaments and historical temperaments with the necessary note offsets. For a comprehensive list of historical temperament files one place to go to is <https://tunelab-world.com/temper/temper.html> For any Temperament scale you can just manually enter the 12 note offsets in cents using this editor from note 57 to 68. Then Click "Map Temper" button and save the temperament file. Note if you want to make the offset of A = 0 cents just add or subtract a constant.

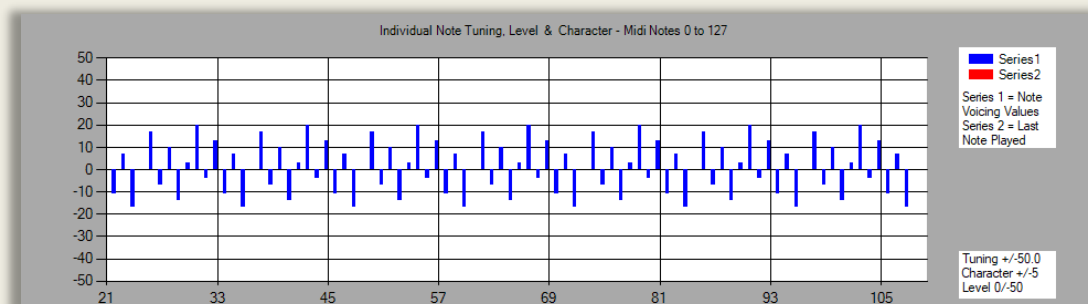
CHANGING THE TONIC OR KEYNOTE

You can edit the Tonic (Keynote) before you add the unequal temperament file to an equal temperament tuning. If you have an unequal temperament file the separation between notes will be generally uneven, more or less than 100 cents. So, the scale will have a Keynote /Tonic - a preferred key signature, for instance A. However, for instance you may wish to move the Tonic to C which is 3 semitones higher. To do this so the pattern of note separations is maintained from A to C you can use the Keynote offset feature.

Firstly load a Temperament file .tem or Scala File .scl or create your own temperament using the Map Temper button. A 1-4 Syntonic Meantone.tem temperament example is below.



Now set the keynote dropdown box to 3 (semitones) and just click 'Set New'. PS. Obviously if you set it to 12 nothing will change as that's an octave.



Now the keynote and graph bars have shifted to the right with keynote A now moved to a keynote C = 3 semitones shift. You can now add it to an equal temperament tuning curve. This enables you to rotate the keynote around a whole octave.

NORMALISE THE TUNING

You might want to ensure your tuning curve fixes the frequency for A3 at 440 Hz for instance or another frequency. However, once you apply a temperament file or edit the curve A3 may be several cents from 0 offset. It's easy to correct this. Just add or subtract a constant to the whole tuning. See *Global Array Processes - Add or Subtract a Constant*.

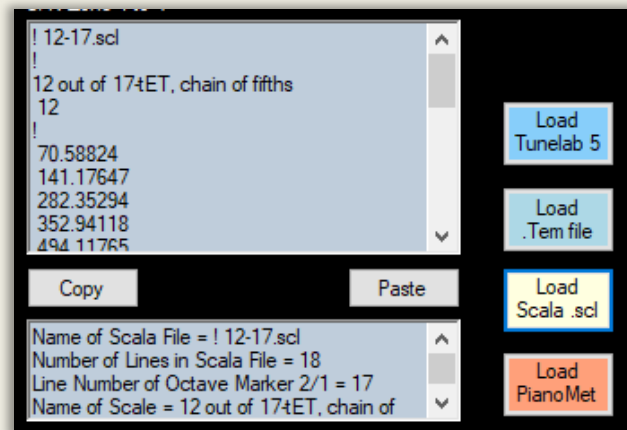
$$\text{Change tuning in Cents} = \text{Log}_{10} (f'/f) * (1200/0.301)$$

where f' and f are the new and original frequencies. 1 Octave = 1200 Cents.

Eg. New frequency $f' = 432$ and original frequency $f = 440$ hz. Change would be -31.7 cents.

SCALA TUNING FILES

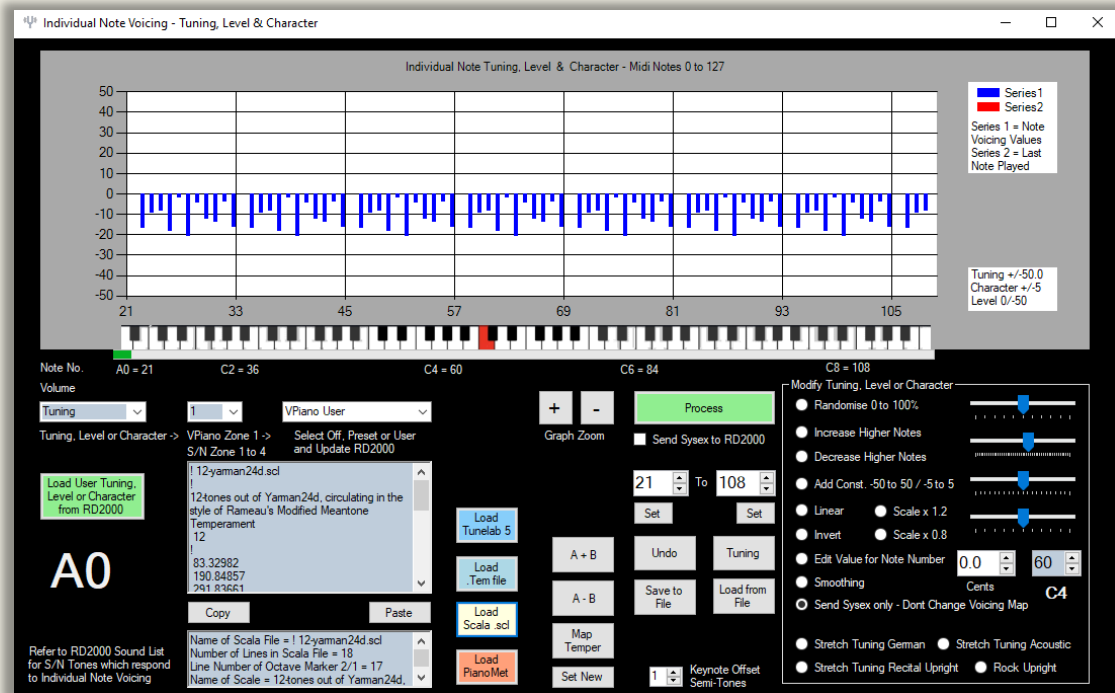
There is a large archive of unequal temperament tuning files at this website. <https://www.huygens-fokker.org/scala/> You can download over 3000 free temperament files. You can also view and load the contents of a Scala file without the Scala app by pressing the 'Load Scala' Button. Below. A Scala file (.scl extension) is a UTF-8 text file.



Above. The upper box is the raw Scala data. A summary of this 5 note/octave Scala file is shown in the lower text box with the scroll bar.

1. The first line is the file name preceded by an exclamation mark !
2. Any line beginning with a ! is a comment line. Ie. any text. Line 3 is also text.
3. 12 is the number of notes per Octave.
4. Any number is in cents - both 252 and 252.63158 are valid
5. Numbers such as 5/4 (a/b) are ratios such as thirds, fourths, fifths octave etc. Note. Ratio $a/b = \log_2(a/b) \times 1200$ cents
6. There can be any number of notes in an octave, the one above is 12 notes. Some can contain over 20 notes. Some as few as 5.
7. The last line is a ratio 2/1 meaning the octave above the first note. 1200 cents higher.
8. Values are in relation to the key note. The value above of 282.35294 is in cents above the key or starting note.

0:	1/1	0.000000 unison, perfect prime - Some Ratios in Cents
1:	9/8	203.9100 major whole tone
2:	5/4	386.3139 major third
3:	4/3	498.0452 perfect fourth
4:	3/2	701.9553 perfect fifth
4a	25/16	772.6278 classic augmented fifth
5:	5/3	884.3591 major sixth
6:	15/8	1088.269 classic major seventh
7:	2/1	1200.000 octave



A 12 Note Scala file can be automatically mapped using the RD2000 Editor software

12 notes / octave scales

If you load a 12 'note to the octave' Scala file, this software will map the note offsets for you! See Above. A 12 note Yarman 24d scale has been opened and is displayed with note offsets. If you add this (A+B) to your pianos equal temperament tuning you will get this new Yarman temperament. If you use any Scala files which are not 12 notes/octave then you need to manually map the notes if using internal RD2000 sounds. Occasionally the note offset will be larger than +/- 50 cents, the RD2000's range, so the value will be taken as 50 cents.

Less than 12 notes / octave scales

The RD2000 is not really designed to use scales other than 12 notes/octave for its internal sounds. If the scale has less than 12 notes/octave you need to decide how you will map these on your 12 note/octave RD keyboard. Example. you could use all the sharps for 5 note scales or the naturals for 7 note scales. Or duplicate notes for one or several frequencies. Enter the notes manually between A3 and G#4 and use the Temper button to map across the 88 notes.

Tip. How to convert to an offset in a Scala file, which is an offset from the keynote? If 195.34884 is the second note in the sequence. and A is the keynote say, the second note from A would be B. B in equal temperament is 200 cents above A. The required offset at B is $200 - 195.34884 = -4.7$ cents. Note. The RD 2000 works to the nearest 0.1 cents. The tuning range on some VSTs is larger and some support microtonal music well. With VSTs you map midi note numbers.

The best approach is to use a VST or hardware synth which works with temperaments' of more or less than 12 notes/octave and use the RD2000 as a great Midi controller. There are many Capable VSTs' such as Native Instruments Absynth, Kontakt, Reaktor, Pianoteq, Full Bucket Whispair (free), Surge XT synth etc.

MICROTONAL MUSIC

If the scale has 12 or more notes per octave and generally less than 100 cents between most notes you are into microtonal music. You may need to use more than one octave on the RD or miss out some notes of the scale if you are using its internal sounds. Remember you can only offset the tuning by +/- 50 cents per note on the RD so this approach will not work for most scales.

For Microtonal music it is best to use the RD2000 as a midi controller driving a VST or hardware synth which has microtonal capabilities. For information on Microtonal see sevish.com The tuning range on some VSTs is larger and they support microtonal music well. With VSTs you use the RD2000 as a midi controller. Note. You will use more than an octave on the RD keyboard to cover one octave on a Microtonal scale VST for example.

Note. You can import scala file scripts into Kontakt.

To listen to some microtonal music, check this video:

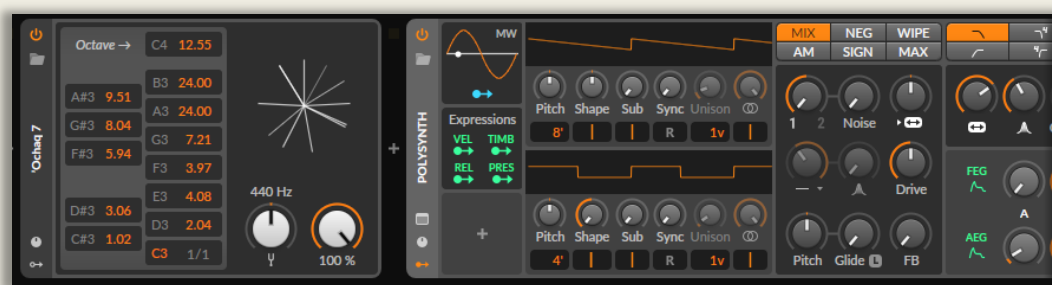
<https://www.youtube.com/watch?v=9oDSk9DeT5Y&list=PL87D8E237CD808D1C&index=2>

For some great and free microtonal compatible synths with scala.scl and .tun import - Win and Mac. <https://www.fullbucket.de/music/>



Above. The wonderful WhispAir free Microtonal VST for Windows or Mac. Full Bucket Music. Notice the temperament list and the ability to load Scala Files (Load Tuning) at the bottom of the list. This can be driven by a Midi Controller like the RD2000. See on the same website FB3300 an emulation of the Korg PS3300 which can be Microtonal.

Below. Some DAWs like Bitwig enable you to map incoming midi data and map each note to a different user defined scale. Below the Micro Pitch device on the left is turning incoming midi from the RD2000 into a Chinese scale micro tune for the Bitwig PolySynth instrument on the right.

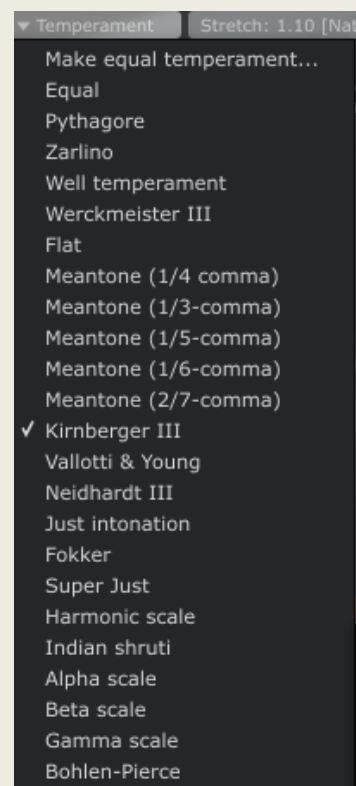
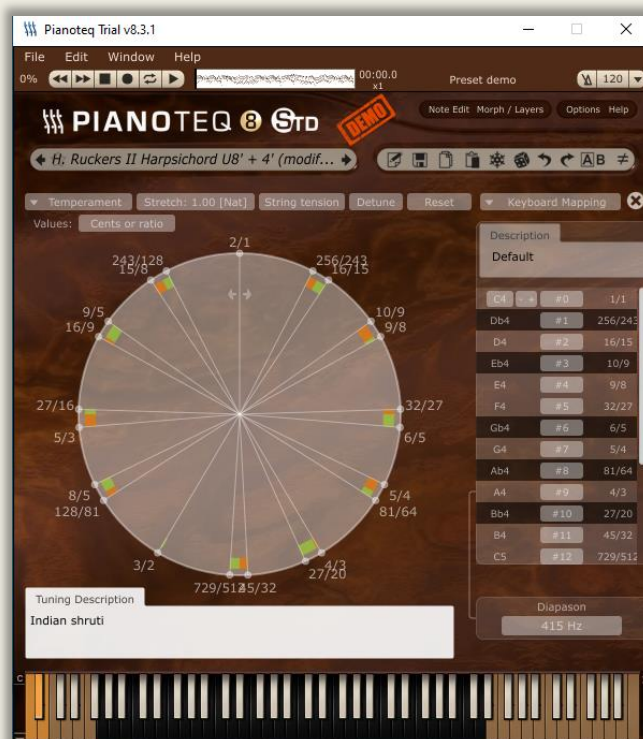


This Bitwig micro tune device can map incoming RD2000 midi to +/- 100 cents for a Bitwig device rather than the RD2000s' +/-50 cents for its internal sounds. It works on a 12-note scale. There are also many preset scales you can choose from. You can also drag and drop scala files. A nice feature is you can modulate the note offsets.

Tuning Theory



Above is Native Instruments Absynth 5.0 VST -Windows or Mac. There are options to load or create user tunings. Quite a few VSTs' allow you to import or create your own tunings.



Above. Pianoteq 8 - The Tuning page and Temperaments

Pianoteq Tuning Files. It's easy to turn one of the Pianoteq tunings into a scala file.

- In advanced note tuning (mu icon) - select the temperament.
- Click on 'temperament' menu and copy and paste to notepad

```
Meantone (1/4 comma) temperament Unequal temperament used in baroque music.  
12  
76.05  
193.16  
310.26  
5/4  
503.42  
579.47  
696.58  
25/16  
889.74  
1006.84  
1082.89  
2/1
```

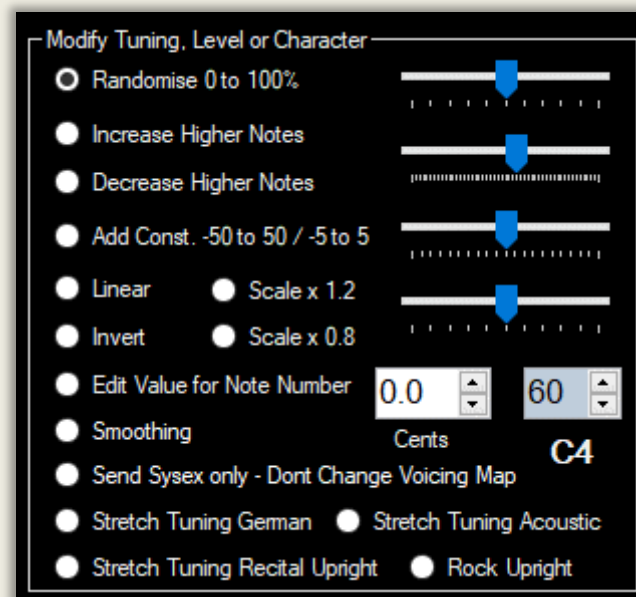
- Now edit the file to look like this. Just put an ! after the name and notes / octave 12

```
Meantone (1/4 comma) temperament Unequal temperament used in baroque music.  
12  
!  
76.05  
193.16  
310.26  
5/4  
503.42  
579.47  
696.58  
25/16  
889.74  
1006.84  
1082.89  
2/1
```

Now save as 'temperament name.scl' Note. .scl is a scala file extension

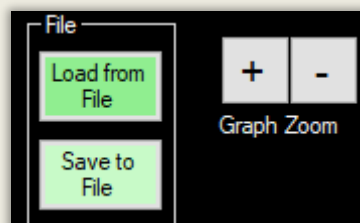
You can now open it as a Scala file in the RD2000 Editor!

EDITING THE NOTE TUNING MAP



If you downloaded a Note Voicing Map you can edit it or create one of your own from scratch. Note. You cannot overwrite the preset (Prst) voicing maps. These are built into the RD2000. But you can edit and update the User Voicing maps. If you want to see the edits update on the RD then just select User on the Tone designer/ individual note voicing/Tuning, Level or Character map screen on the RD.

SAVE & LOAD NOTE VOICING MAPS TO FILE



To Save a note voicing map to file - click on the 'Save to File' button. Name it as say Char001 or Tuning001 or Lev001 - it will be saved as a comma separated plain text file.

When you 'Load from File' a note voicing map, select the type Tuning, Character or Level from the drop-down box and load the appropriate Tuning, Character or Level file you created earlier. The file path will be shown in the lower text box. See [Saving and Loading Tuning Files](#) Video.

EDITING FUNCTIONS

- You can edit the Note voicing map without updating the RD2000 Make sure the 'Send Sysex to RD2000' checkbox is unchecked.
- To just Send Sysex to update the RD2000 using the current Voicing Map without further processing just check 'Send Sysex Only - Don't Change Map' Radio button. The check 'Send Sysex to RD2000' check box. Click 'Process'. Process Button goes red when pressed shows % Complete and goes green when done.
- To carry on processing the Voicing Map without sending sysex Uncheck the 'Send Sysex to RD2000' checkbox
- To Process the Voicing Map and also send sysex then Check the "Send Sysex to RD2000' checkbox and choose a processing Radio Button. Process Button goes red when pressed shows % Complete and goes green when done.

[Editing Tuning Files](#) Video

You can edit voicing maps as required or create them from scratch.

- Note. If you want to edit less than 88 notes just select the note range you want to edit with the updown buttons. Default 21 to 108.
- Clicking on Randomise will add a series of random values to the existing Tuning Map. Adjust the slider to vary the amount of Randomisation to add to the Map between the two note number bounds selected at the bottom left of the form. More randomisation to the right, less to the left. Be subtle with this adjustment.
- To increase or decrease higher notes in the existing array exponentially select the Increase/Decrease Higher notes exponentially Radio button between the two note number bounds selected at the bottom left of the form. This is useful for tuning maps particularly. Adjust the slider to the right to change the magnitude of the exp. function.
- You can add a constant value to the graph.

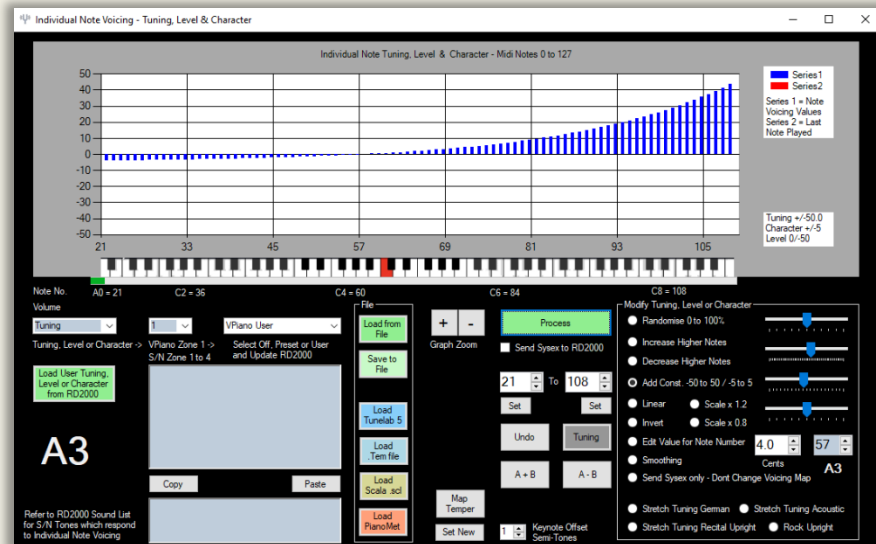
- Linear draws a straight line between the two note numbers with note bounds selected by the two updown buttons. Plus a constant of slider value. +/-5. Default 0 added.
- Invert reverses the sign of the notes between the two note number bounds selected at the bottom of the form.
- Scale multiplies the array of notes between the two note number bounds selected at the bottom of the form. 0.8 or 1.2 times. The slider to the right can change the multiplier between 0.5 and 0.9 for the 0.8x button and between 1.1 and 1.5 for 1.2x button.
- Edit One Note number sets the value of the chosen note in the array.
- +/- 50.0 cents in 0.1 cents increments for Tuning,
- +/-5 for Character or 0 to -50 for Level.
- Playing a key on the RD2000 will set the Note Number automatically. Useful to pin values for the Linear function too. Now adjust the 'Value'. If 'Send Sysex to RD2000' is checked the pressing process will update the RD2000 with the new value for just that note.
- Smoothing produces a rolling average of 3 note values.
- There are 4 tuning templates you can use as a starting point. As well as precise tuning files in the install directory which you can load.

To send the Tuning, Character or Level Map to the RD2000 check the Radio button 'Send Sysex Only - Don't change voicing map', which will then just Send the Sysex of the current voicing map. The other processing radio buttons will be unchecked. Then make sure you check 'Send Sysex to the RD2000' and then Press 'Process' button. To stop sending sysex just uncheck the check 'Send Sysex to the RD2000' checkbox.

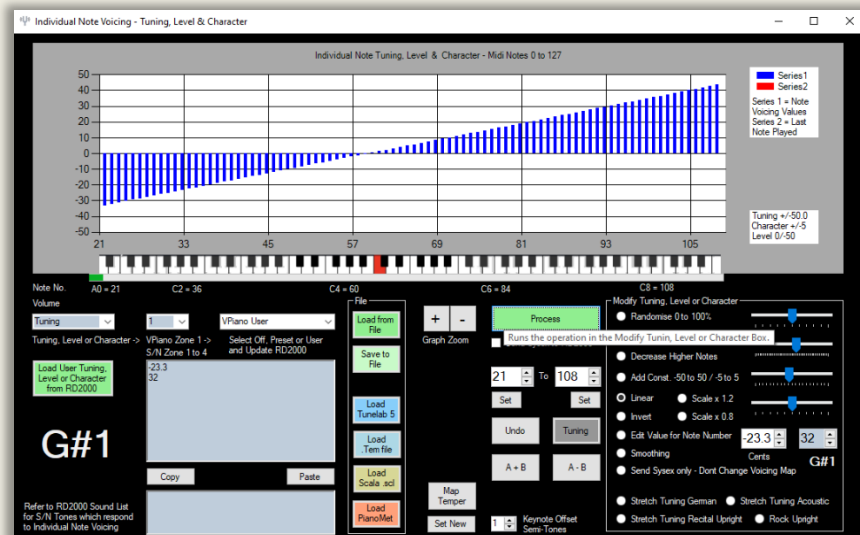
Once you have sent the data to the RD2000 you can then Write the Program on the RD to save it in a vacant program slot if you want to save it. Remember, you can 'Save' the Tuning Maps to a file on your PC and also

Editing the Tuning Map

reload (Load) them and apply to different Piano tones. Note. The stretch User tunings loaded in the RD2000 can be edited or new ones created in the Note Tuning User memory. You can also experiment with totally new tuning methods! The Preset note voicings on the RD cannot be overwritten, only the User note voicings.



A Stretch tuning profile generated by Increase Higher notes exponentially fn. Then add a constant of -4 to get 0 cents detuning at C4 midi note 60.



Above is an example of a linear operator applied to Note Tuning producing a novel profile - values -33 to 43 over note numbers 21 to 108. The value at C 60 is 0.

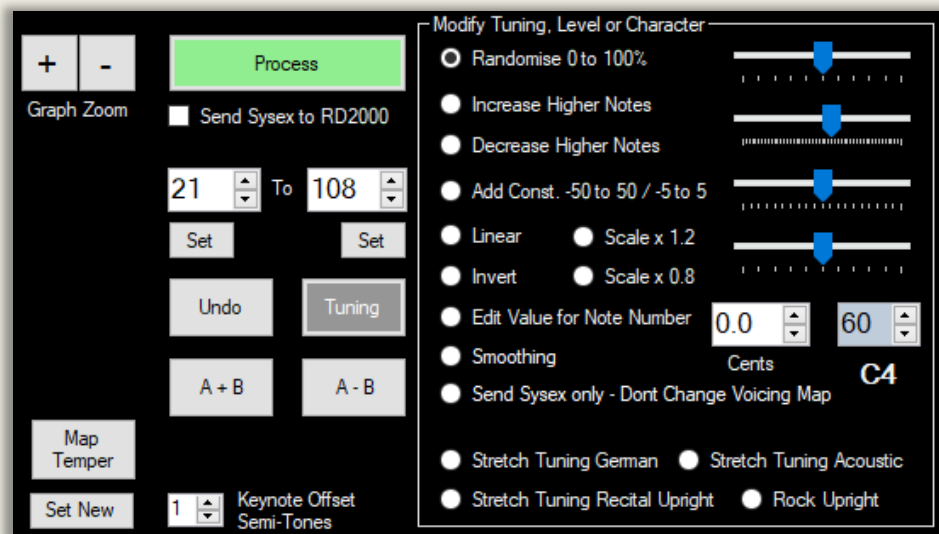
UNISON TUNNG

On the original V-Piano the tuning of the 3 or 2 strings per note could be adjusted individually. This was called Unison Tune.



On The RD you can only tune each note. The relative tuning of the two strings either side of the middle string can't be adjusted by the user. However, the parameters are in the engine, but just not accessible to the user. That's how the two Parlour Piano tones in the Essential Upright Piano were created by Roland. The strings either side of the middle string are unison detuned. This gives an 'old piano' or poorly maintained piano sound.

EDITING THE NOTE LEVEL & CHARACTER MAP



For Level and Character typically start off with an initial randomisation.

The 'Randomise 0 to 100%' Checkbox applies initial randomisation. Setting selected at Form load. 0% fills the array with zeros. Try different randomise slider positions.

If you want to Process a note Tuning, Level or Character array further, then select one of the other Radio-buttons. This enables you to stack processing steps. Press 'Process' to start each new mapping.

Sysex is only sent to the RD2000 if the 'Send Sysex to RD2000' checkbox is checked. Default setting unchecked. If you go to the RD2000 screen of Level, Character or Tuning you will see the settings sent from this program updating the screen from left to right on the graphs. You don't have to be on the particular screen on the RD for it to work though.

RANDOMISE THE LEVEL FOR EACH NOTE

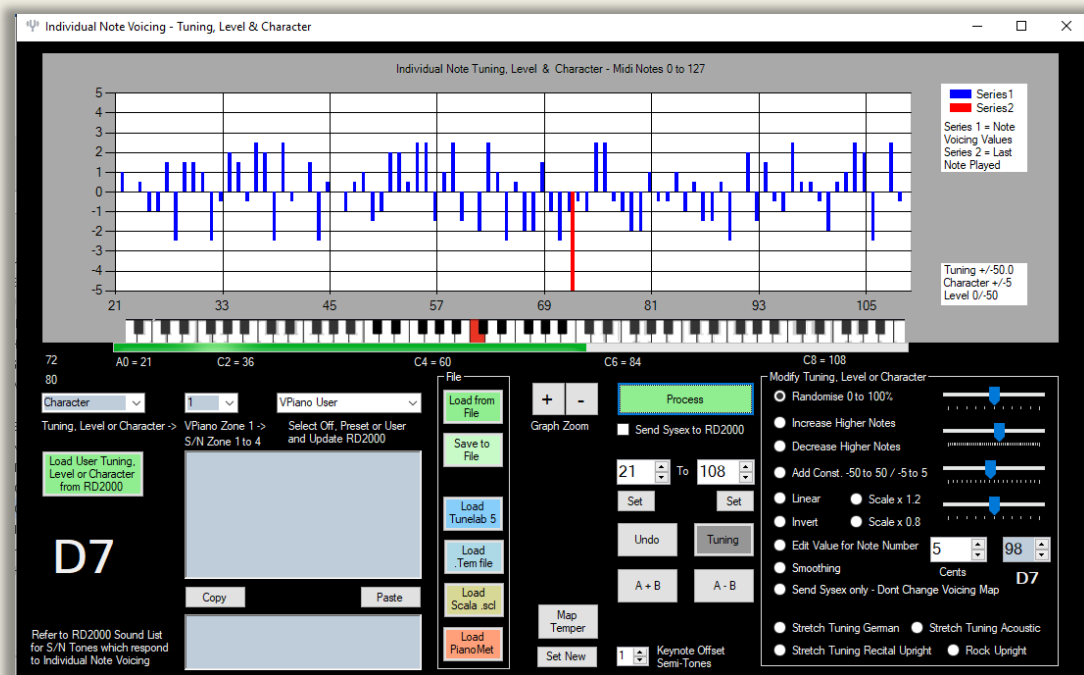
1. Select Tone Designer/individual note/ "User" voicing/Level on the RD2000 if you want to see the results on the RD screen as well.
2. In the software - Choose Zone the zone your piano tone is in - Vpiano is in zone 1 only. S/N Piano Zone 1 to 4.
3. Choose VPiano User or S/N Piano User in the drop down box
4. Choose Randomisation % of maximum value 0 to -50
5. Click 'Process'. Be subtle start at 20%

RANDOMISE THE CHARACTER FOR EACH NOTE

1. Choose 'Character' in the drop-down box.
2. Click on individual note voicing/character/user on the RD2000 to see results on the RD screen as well.
3. Choose Zone the tone is in. Vpiano is in zone 1 only. Zone 1 to 4.
4. Choose Randomisation % of maximum value (5) -5 to 5 be subtle start at 70%
5. Click 'Process'.

For both Tuning, Character and Level if Send sysex to RD2000 is checked Sysex will be sent to the RD2000. To send the settings takes under 1.3 seconds. To save the Program once finished you have to 'Write' it on the RD2000 to a program slot.

Note. Not all Supernatural Piano tones respond to Tuning, Character and Level settings. All VPiano do. Refer to Parameter Manual P70 to see which do.



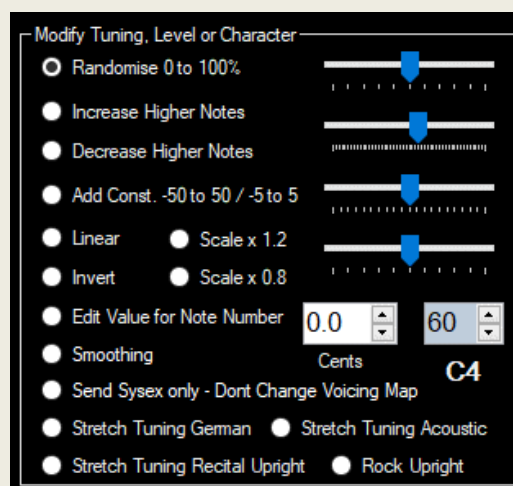
An Example of Character - Randomised - mapped to each Midi note 21 to 108. Last midi note played shown as red bar = note number 71. Note that the Y axis scale for Character maps is from 5 to - 5 as this shows the bar graph larger and clearer.

EDITING ONE NOTE AT A TIME

The 'Edit Value for Note Number' radio button at the bottom right allows you to adjust the value for just one note. Like a Piano Tuner. This works for Tuning, Character and Level. Note numbers 21 to 108. Tuning values +/- 50 Cents (0.1 cent increments). Character values -5 to 5. Level values 0 to -50. Both increment 1 cent. Useful for editing individual note values you want to modify. You can also use the up or down arrow keys if you click on the updown box.

Playing a key on the RD2000 will set the Note Number updown note button value automatically. If you play one note at a time it will help you find errant notes. Now adjust the 'Value'. If 'Send Sysex to RD2000' is checked the pressing 'Process' will update the RD2000 via sysex and the chart with your new value for just that note. Repeat until you are satisfied. This is the approach used on the RD2000.

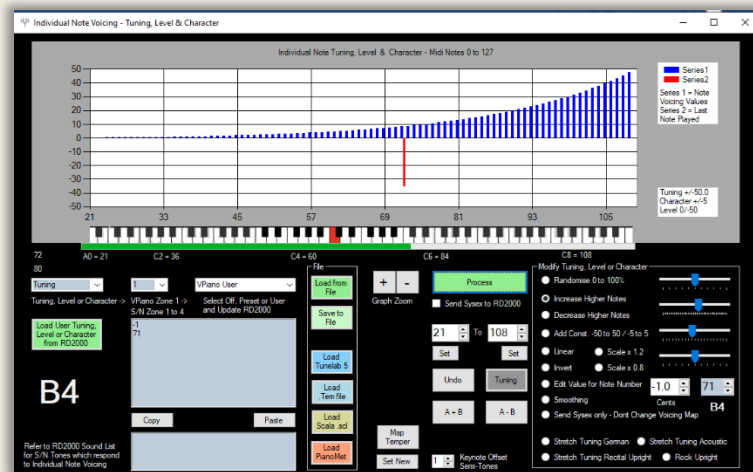
Note the RD piano keyboard starts from note A0 Midi note 21, followed by 88 notes, to note C8 midi note 108. C4 Midi note 60 is middle C. A4 midi note 69 normally has a frequency of 440Hz - this is the modern standard frequency of this note but it can be adjusted.



Remember. If you hover over the chart, the tooltip for the note will automatically set the values in the two updown boxes. The same happens when you play a note on the RD2000. Here is a note value of 0.0 for midi note 60 = C4. This makes it quick to edit a single note. Just change value and press 'Process'. You can also see that midi note 60 is "C4".

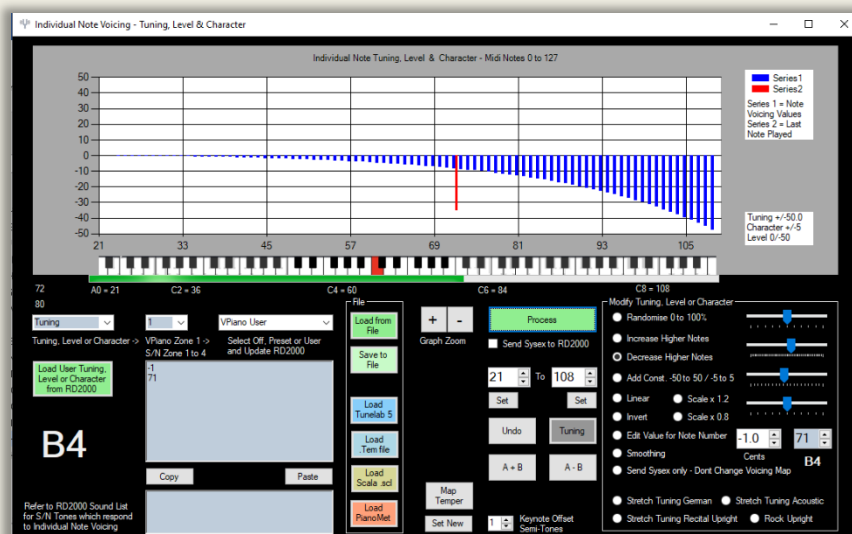
INCREASE HIGHER NOTES

Sometimes you may want to increase values for higher note numbers. To do this click the radio button on the lower right 'increase higher notes more' (exponentially). Try different slider positions for the slider and click 'Process'. See the example below. Moving the top 'slider' to the right magnifies this effect. Repeated clicks on Process stacks the effect across all 88 note numbers. See below with a little randomisation.



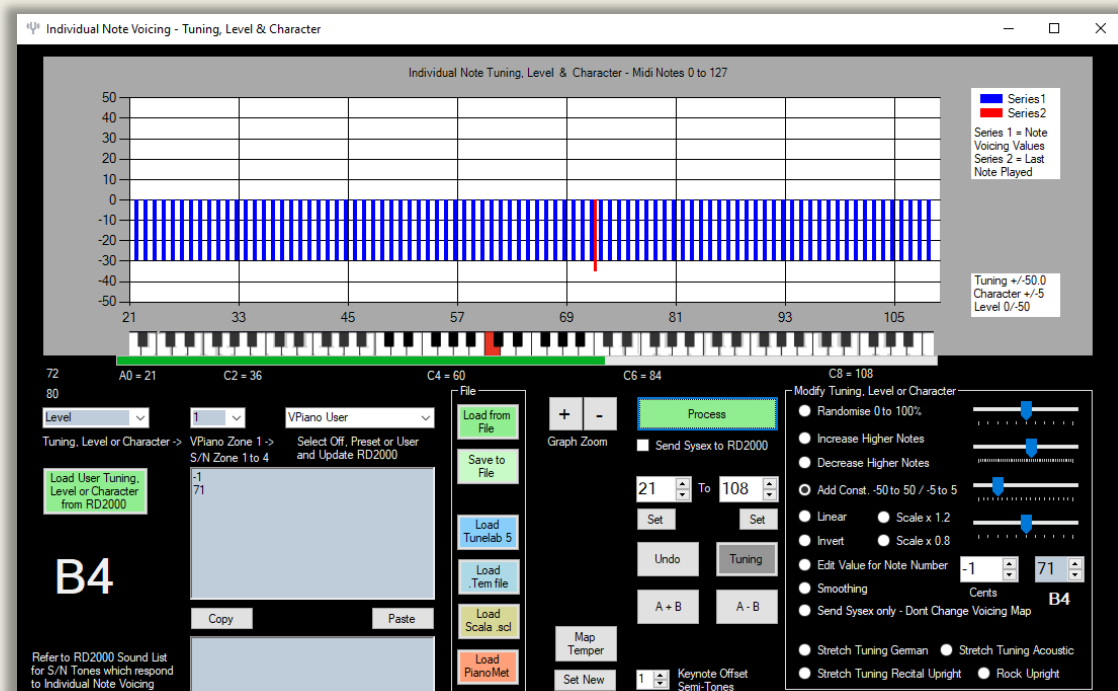
DECREASE HIGHER NOTES

Decrease the higher notes - using an exponential fn. To decrease the Tuning, Character or Level for Higher notes click on the 'Decrease Higher Notes' radio button and try different slider positions. Moving the adjacent slider to the right magnifies this effect. See below.



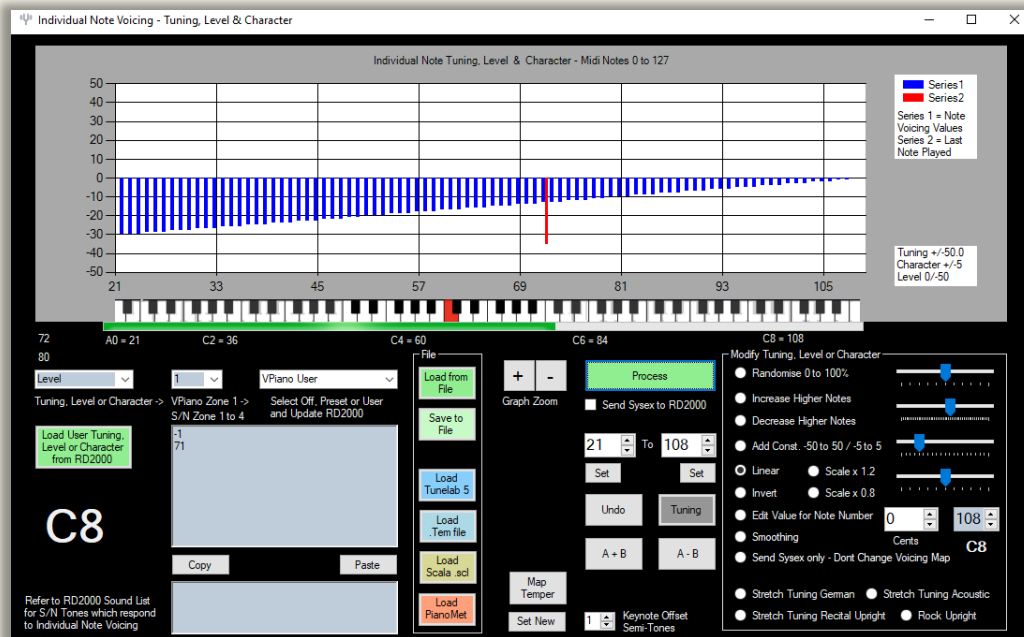
CONSTANT

Adding a constant value. This slider adds a constant between -5 to +5 to the array for Character, +50 to -50 for Level and -50.0 to +50.0 in 0.1 cent intervals for Tuning. Here a constant of -30 was added to an initial array of zero values for Level. You can also use this to normalise a keynote or shift the whole tuning. See below.



LINEAR

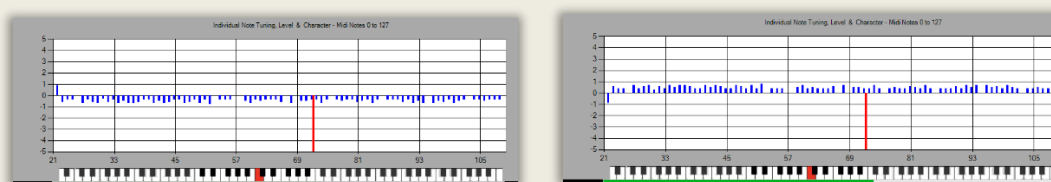
This produces a linear relationship between value and note number for Tuning, Character or Linear and draws a straight line between the two note number bounds selected by the two updown buttons below process. Plus a constant of the slider to the right. Slider value. +5. See image below.



A linear operator applied between notes 46 and 108 to an array Initially of constant value -50 for Note Level.

INVERT

The 'Invert' Radio button changes the sign of the note array values for Tuning and Character'. For Level the value is $(-50 + \text{abs}(\text{original value}))$. A Level of 0 goes to -50 and -50 goes to 0. See an inverted Character array below.

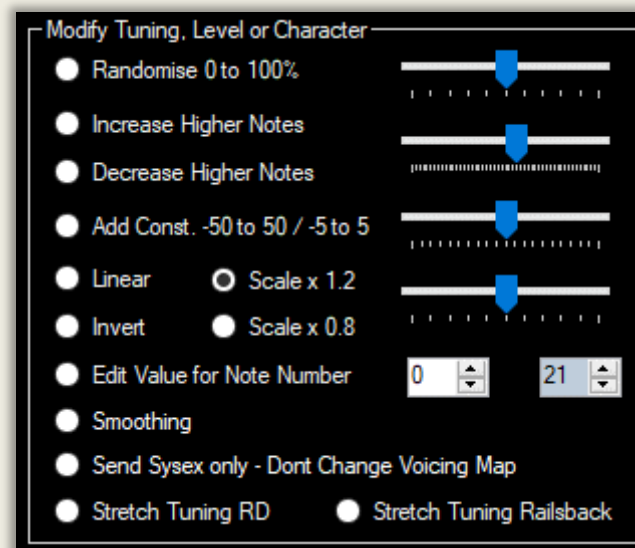


Original and Inverted maps.

SCALE X 0.8 / 1.2

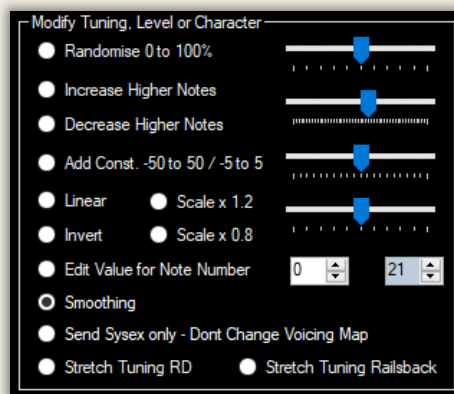
The 'Scale x 0.8' radio button multiplies each value in the array by 0.8. Sometimes you will want to reduce the overall scaling of the array after editing to make it more subtle. Clicking Process button multiple times (n) means each process multiplies the previous value by 0.8. ie. 0.8^n . The scale 1.2 button magnifies the note values.

The slider to the right modifies the multiplier. From 0.5 to 0.9 and 1.1 to 1.5 respectively. In the centre position the default values 0.8 and 1.2 apply. See below.

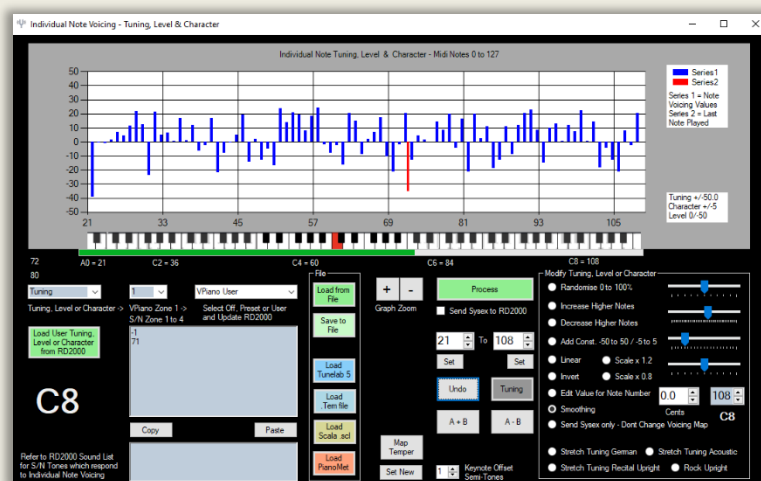


SMOOTHING

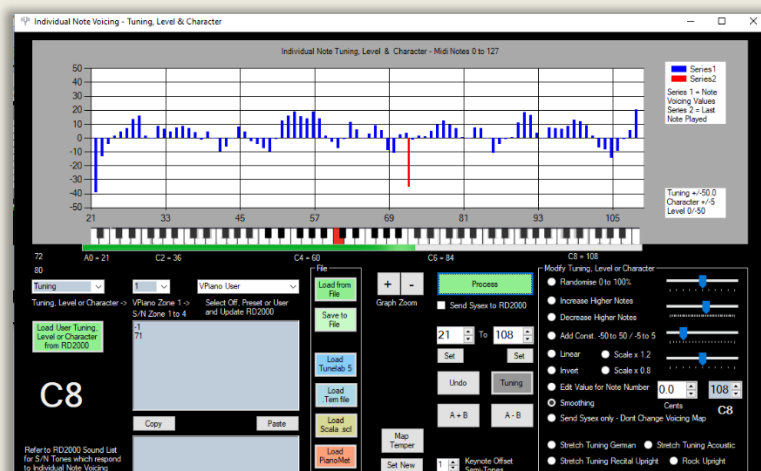
This Radio-button produces a rolling average of 3 successive note values. $(n1+n2+n3)/3$. One pass is normally sufficient to smooth a profile.



Before



After

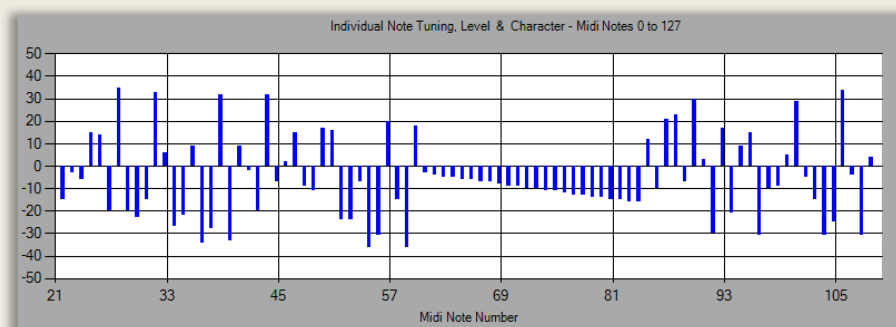
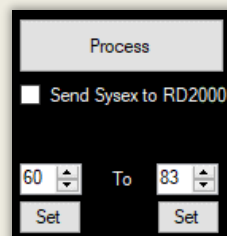


EDITING A SELECTED NOTE RANGE

If you just want to edit the notes say between note 60 and 83 for Tuning, Level or Character then set the range on the two numeric updown boxes to the range you want (or use up or down arrow keys). The default is 21 to 108. See below where they are set to lowest Midi note 60 and highest Midi note 83 for the editing range. Now process the range as required.

If you play a note on the keyboard you can set either up down boxes by clicking the respective 'Set' button. Play lowest note in the range you want and click 'Set' button below the left hand updown box. Then Play highest note in the range and click the 'Set' button below right hand updown box.

Also, if you hover the cursor over a bar on the graph the note number can also be set. Move cursor over lowest note in your range and click 'Set' button below the left hand updown box. Then move the cursor over highest note in your range and click the 'Set' button below right hand updown box.



A Linear operator applied between notes 60 and 83.

UNDO

This button reverts the note value array for Tuning, Character or Level to the previous processing step values.

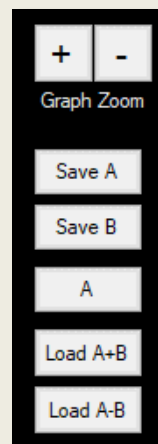
SEND SYSEX ONLY

This just sends the current note voicing map without further processing. Useful if you done some editing without sending to RD at each step and then you want to send the map to the RD at the end. Selecting this radio button and then check the 'Send Sysex to the RD2000' check box. Just click the 'Process' button.

Once sent uncheck the 'Send Sysex to the RD2000' if you want to stop sending sysex whilst you edit further.

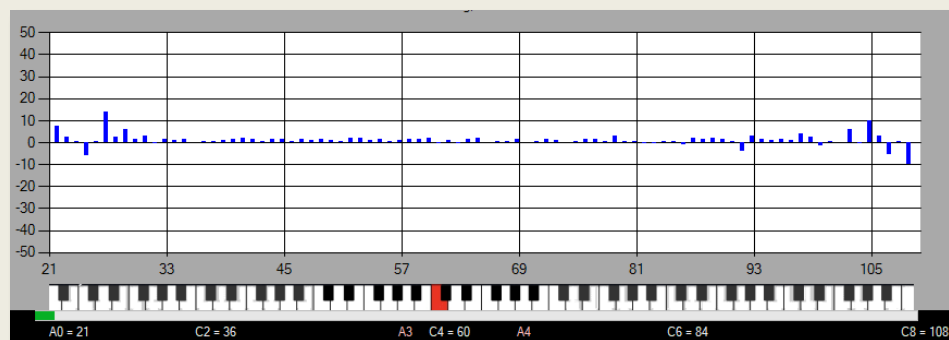
SUBTRACTING, ADDING AND COMPARING, TUNING CURVES

If you want to quickly compare tuning profiles you load the first profile on the graph. Then click 'Save A'. Load the second profile and click 'Save B'. The graph will then automatically switch to A. Then you can switch between the graphs and profiles by clicking the 'A' button, the profile and the button text will then toggle to B and next click will switch to A etc. You can keep toggling the button between A and B to see the differences in the profiles.



If you want to subtract tuning curve B from tuning curve A $\Rightarrow A - B$, then for each note, the subtraction of midi Note value A - Midi Note value B is done. To do this click 'Load A - B'.

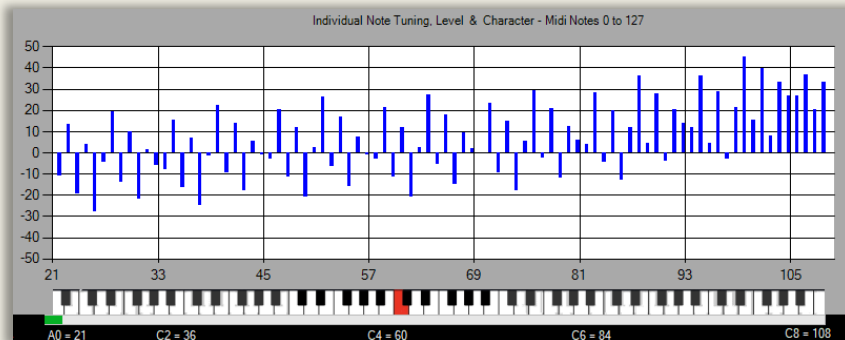
- If the value is positive then note A is sharper than note B.
- If the value is negative then note A is flatter than note B.



The German VPiano Factory tuning SA01 minus Professional Tuning. Notice the differences between the two particularly at the bottom and top octaves. The differences are not insignificant.

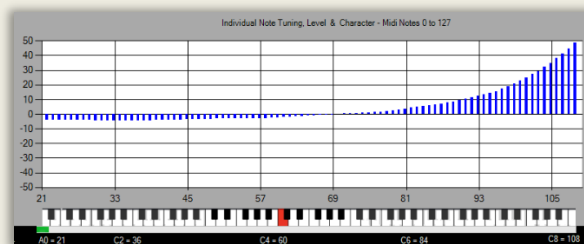
Editing the Tuning Map

You can also add (Load A+B) say TuneLab unequal temperament offsets .tem or Scala 12 note/octave files to equal temperament tuning curves to create unequal temperament and historic tunings.

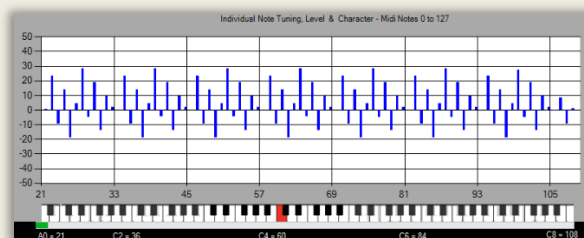


Mean Tone Temperament added to the Equal Temperament Upright SB07
Tuning Curve

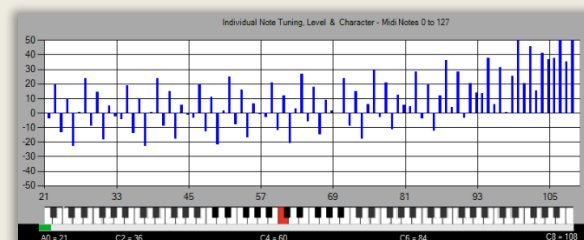
To apply an unequal temperament offset to any equal temperament tuning you first load the equal temperament tuning curve click Save A. Then Load the unequal temperament offset file click Save B. Then Load A+B



German Concert SA01 Equal Temperament - Save A



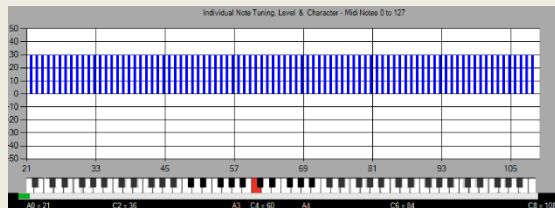
Unequal Temperament offsets for Mean Tone Temperament - Save B



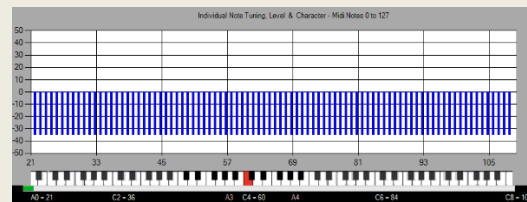
German Concert SA01 with Mean Tone Unequal Temperament
offsets added using - Load A + B

ADDING PARTS OF CURVES TOGETHER

Imagine you want to use the notes of curve A for some of the range and use curve B for the rest? Curve A might be 3-part tuning for a model, and B might be entropy tuning for the same model. See below. I created two simple maps. A is just a constant + 30 for all notes. And B is just a constant -35 for all notes.

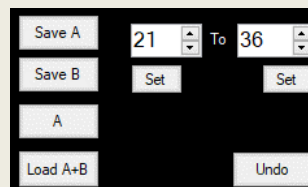


Curve A

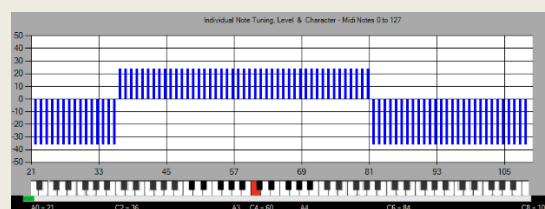
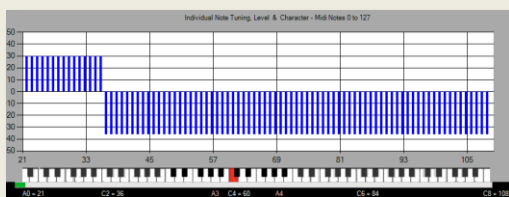


Curve B

1. Load curve A and 'Save A'
2. Load Curve B and 'Save B'
3. Change the right updown box to note 36 say. The transition point. See below.



4. Now click Load A + B and the curve for A will be used from note 21 to note 36. And the rest will be curve B from note 37 and higher. Left Hand Image below. Updown boxes' set to 21/36.



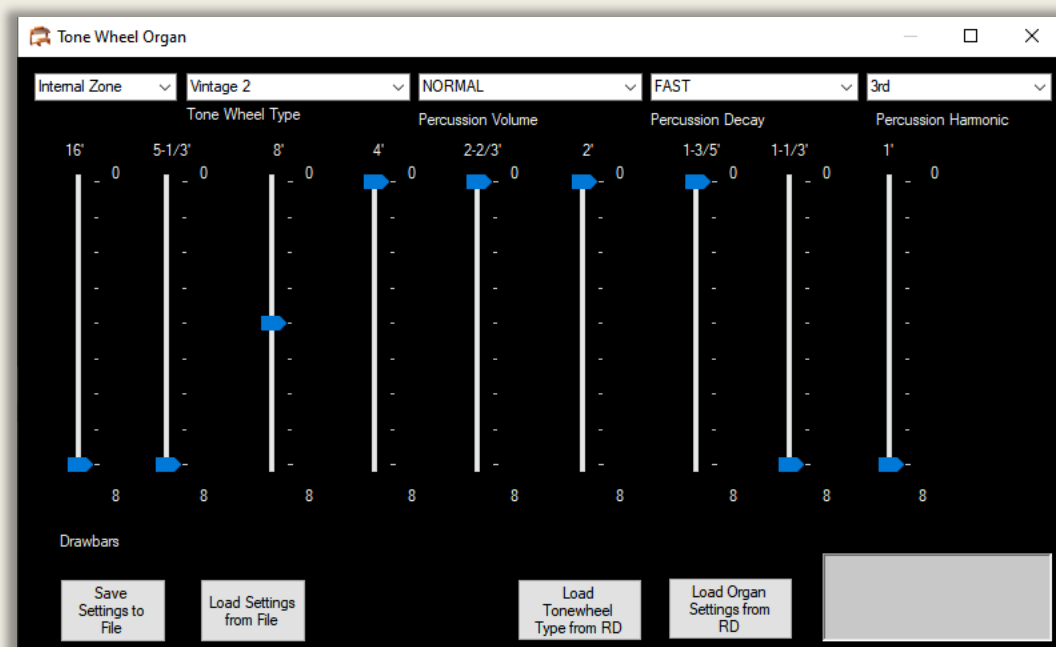
Right Hand Image above. You can also set the left updown box. A is only used now between 36 and 80 say. Updown boxes' set to 36/80. The two values always set the range of curve A.

Remember to change the updown box's back to 21/108 if you want simple addition. A+B.

TONEWHEEL ORGAN EDITOR



A Hammond A100 with a Leslie 145 speaker cabinet. The A100 was a B3/C3 with inbuilt speakers although most people used a Leslie with it. In the 1930's Laurens Hammond used his skill at making electric clocks and invented a new instrument, an electro-mechanical masterpiece.



This is an emulation of the famous Hammond Tonewheel organ such as the B3, C3 and A100. Based upon Roland's VK Organ.

The only part missing is a model of the organ's inbuilt vibrato feature. From firmware 1.5, the RD2000 improves the model with better Leslie speaker (rotary speaker type 2) emulation. See Tremolo effects for editing the Rotary 2 effect. By default, the Rotary speed (Leslie speaker speed) is controlled by the D beam. Good to use this with a swell pedal with keyboard split so there are different settings for the left and right hand in say different zones. Say zone 1 right hand, zone 2 left hand as a keyboard split.

To load values from the RD, midi in and out in the software must be set to the RD2000 midi out/in. This is so the request to dump the sysex file can be received by the RD and the data dump is sent back to this software from the RD.

To retrieve settings for the Organ and Tonewheel type, choose the zone the organ is in - default is zone 1. There are two button which can request a midi dump and pick up the settings. The dump is displayed in the text box bottom RHS.

Note when you select an organ on the RD the faders become drawbars. If they are not enabled as such, then hold the Shift and Scene (harmonic bars) buttons together. The scene button will flash in this mode.

You can also Load and Save the current settings on the Form as a plain comma separated text file by Clicking on 'Save settings to File' Button. These are User Presets that can be shared with other users. These can be recalled using the 'Load Settings from File' Button. If you go to the Tone designer/Tone Wheel designer on the RD, you will see the values being updated when the Load button is clicked. Note that successive sysex messages are sent 30 milliseconds apart from the PC so that the RD Midi buffer does not fill up. Loading all settings takes about 0.5 seconds.

You might want to save presets (setting text files) based upon famous settings. Save it as a program on the RD and possibly a Scene.

For instance, to get Jimmy Smith's favourite setting,

- Drawbars 8800 000 00
- Percussion Fast,
- Percussion normal,
- Percussion 3rd Harmonic
- Use Vintage 2 Tonewheel type
- Rotary 2 effect

If you want to learn more about the Hammond organ there are two books I recommend.

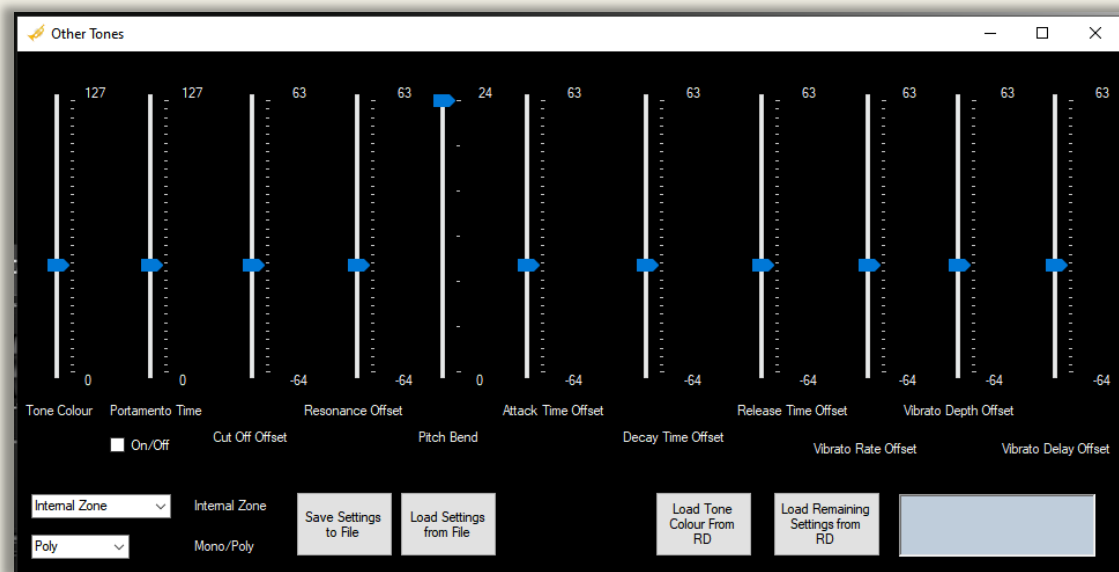
- The Hammond Organ - Beauty in the B by Mark Vale and
- The Dictionary of Hammond Organ stops - Schirmer - unfortunately out of print but can sometimes be found in bookshops.

For exponents of the Hammond check out Jimmy Smith, Dr Lonnie Smith Cory Henry, Keith Emmerson, Jon Lord, Tony Banks, Rick Wakeman, Barbara Dennerlein etc.

See page 17 of the Parameter Manual.

Note. The quality of sound you get with any Hammond VST or emulation depends a lot on the amplification and speaker. I used to use a Hammond A100 with a Leslie 145. The sound was incredible. I'm sure this sound through a Leslie would be fantastic.

OTHER TONES



Tones other than the V Piano, Supernatural pianos and Organs can be altered using this form. These tones are samples and can be edited in the RD2000 tone designer or in this software. Eg. Synths, acoustic instruments etc.

To load values from the RD, midi in and out in the software must be set to the RD midi out/in. This is so the request to dump the sysex file can be received by the RD and the data dump is sent back to this software from the RD.

If you have a tone other than VPiano, Supernatural Piano or Organ in the current program you can pick up the settings from the RD in the software using this form.

- Choose the zone the 'other tone' you want to load from the current program. By default, zone 1
- Click 'Load Tone Colour ' to see these settings in the software
- Click 'Load remaining settings' to see the other values in this software.

If the dump is not successful or midi in and out are not set to the RD you will get an error message.

You can also Load and Save the current settings on the Form as a plain comma separated text file by Clicking on 'Save settings to File' Button. These are User Presets that can be shared with other users or stored for your use. These can be recalled using the 'Load Settings from File' Button. If you go to the Tone designer/Other Tones designer on the RD, you will see the values being updated when the Load button is clicked. Note that successive sysex messages are sent 30 milliseconds apart from the PC so that the RD Midi buffer does not fill up. Loading all settings takes about 0.5 seconds.

See pages 12 to 13 of the Parameter Manual.

Note. For deep editing of synths, I recommend using a hardware instrument or a VST. See Complimentary Sounds later.

MAPPING MIDI MESSAGES

This software allows you to map any incoming Midi Control Change - CC messages from the RD (or any instrument) to a different Midi CC. Or a note to a CC or a cc to sysex! You might want to keep your midi assignments in Assign Mode on the RD kept at default, they are all by program. And just remap using this software to any VST or external instrument. The RD has some limitations around the faders. They can't be used with external synths or VSTs unless you use just a single fader. They all send master volume CC7 messages, one CC7 for each midi channel selected as an external channel. This matrix can fix this. Note the exception is if the Tonewheel designer screen is active in which case they transmit Midi CC 102 to 110 but again on different Midi channels.

RD2000 Assign Mode Controller Mapping to External Devices

	RD Controller	Midi Chnl in 1 - 15	Midi CC In 0 to 127	Midi Chnl Out 1 - 16	Midi CC Out 0 to 127	Enabled = 001 click column cell to toggle
▶						
	Note	001	---	001	---	001
	Knob 1	001	014	001	014	001
	Knob 2	001	015	001	015	000
	Knob 3	001	016	001	016	000
	Knob 4	001	017	001	017	000
	Knob 5	001	018	001	018	000
	Knob 6	001	019	001	019	000
	Knob 7	001	020	001	020	000
	Knob 8	001	021	001	021	000
	Button 9	001	013	001	013	000
	Slider 1	001	007	001	020	000
	Slider 2	002	007	001	021	000
	Slider 3	003	007	001	022	000

Start Mapping

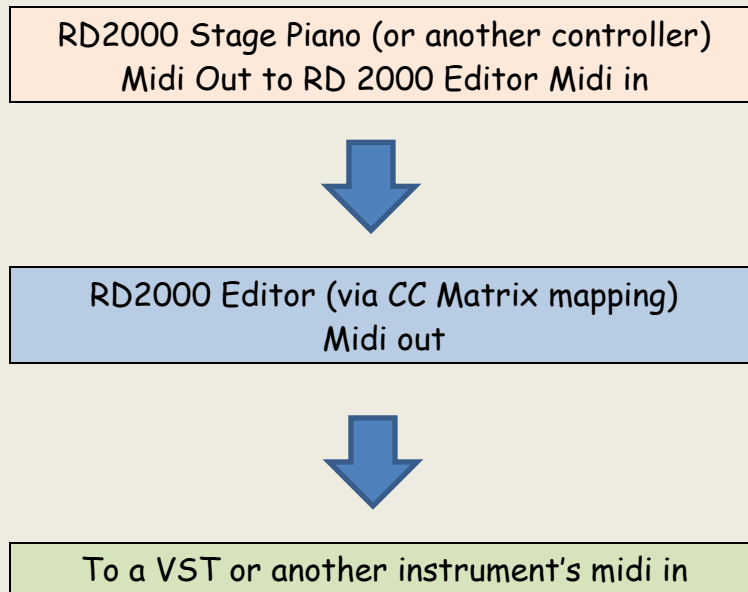
Set All Midi Out Chnls the same as note

☐ Set Harmonic Bar Slider CC in 102-110 CC out Starting 20

Save MIDI Map Load MIDI Map

The RD2000 controllers are listed in the left column of the Mapping Matrix above. But you could use other instruments if you edit the Midi CC in values for their controllers. You can sort alphabetically/numerically by clicking on the column headers. Those rows selected as active are coloured Green. Inactive ones in the matrix are pink. If the right-hand column is 001 the row is enabled. If its 000 if the row is not enabled. By clicking on a rows right hand column, you can toggle whether the RD controller/row is active or not in the matrix. *See assignable RD controller list p8 Parmeter manual.*

MIDI SIGNAL FLOW



Example. Here is how to make knob 1 CC 014 on Midi channel 1/zone 5 ext converted to Midi channel 002 CC 15 to send to another instrument. Note any values you enter **MUST** be in the form xxx. 3 digits. When you edit a value click on the row below to finalise it, notice the left-hand column icon changes when edited. To activate the row just clicking the rows right hand column. Row is now Green,

	RD Controller	Midi Chnl in 1 - 15	Midi CC In 0 to 127	Midi Chnl Out 1 - 15	Midi CC Out 0 to 127	Enabled = 001
	Note	001	---	001	---	001
	Knob 1	001	014	002	014	001
	Knob 2	001	015	001	015	000

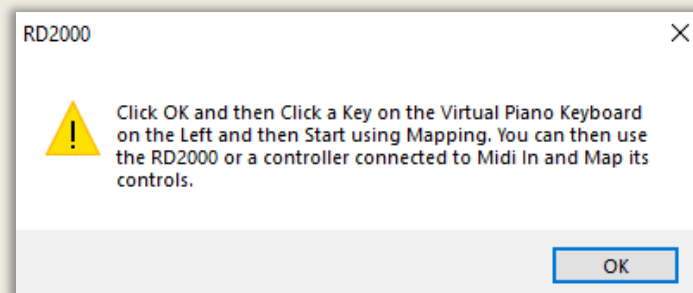
Edit mode for Knob 1 icon on left row is a pen.

	RD Controller	Midi Chnl in 1 - 15	Midi CC In 0 to 127	Midi Chnl Out 1 - 15	Midi CC Out 0 to 127	Enabled = 001
	Note	001	---	001	---	001
	Knob 1	001	014	002	015	001
	Knob 2	001	015	001	015	000
	Knob 3	001	016	001	016	000

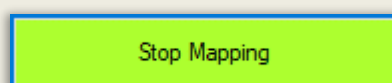
Edit for Knob 1 finalised by clicking on row below. Icon has now changed to a triangle. To deactivate the row, click on its right-hand column which will change from 001 to 000.

Example. How to Remap a Control Change CC Message

1. Set zone 5 as external zone on the RD (Green LED) midi channel 001 by default. Put the RD into assign mode using its dedicated button/LEDs. Note you can see the incoming CCs' in the text box to the left of the Matrix.
2. Make sure 'Midi Thru' is not checked on this software. Set midi in from the RD and midi out to your external synth/vst.
3. Set the knob 1 row of the matrix to incoming channel 001, Note. The Note Row of the matrix transmits the Note on/off/volume messages. So always use row 1 if you want notes transmitted and set it to the Midi output channel of the controller.
4. Set the CC output channel on the matrix for Knob 1 to Midi channel 002 and CC 015.
5. **To activate the matrix**, click on the 'Start Mapping' button. See below. You will then get the message box below which asks you to click a key on the virtual Piano keyboard to the left, which initialises the matrix. The 'Start Mapping' button will turn green.
6. **Note. Only edit the mapping matrix if the big mapping button is not green. Ie. You are not mapping otherwise values wont be updated.**

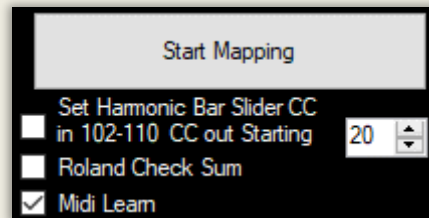


Now when you move knob 001 on the Rd2000 the software now sends it to Midi out on the new midi channel 002 and CC 15 with its values. So, you can control external synths and VSTs with ease. For instance, you could use all 9 sliders with different Midi CC remapped to another midi channel. You can stop the mapping function by clicking the Green Button.

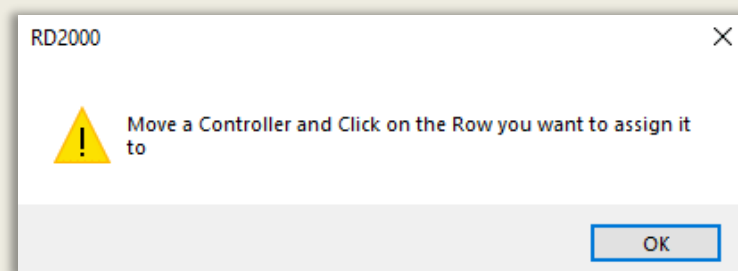


Midi Learn

Instead of entering the Incoming Midi Channel number and Midi CC/ Note Number arriving from your controller, you can just use Midi Learn.



1. Connect the RD2000/Instrument/ Controller to the software and open the Midi Ports
2. Check the 'Midi Learn' Checkbox - see above. You will get a Message box.



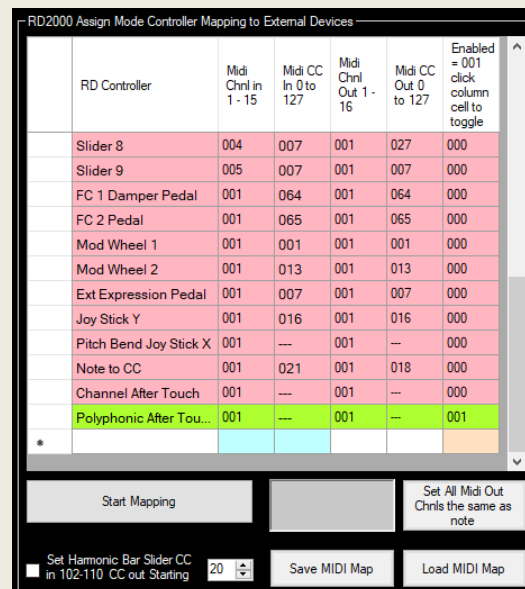
3. So just move a controller - Knob, slider, note etc and click on the appropriate row in the Matrix you want to assign it to. The new values will be set in the Matrix for the incoming Midi Channel and CC/note number.
4. Repeat point 3 for each controller
5. When finished uncheck the Midi Learn Checkbox

Note. For Pitch Bend, Channel or Polyphonic Aftertouch only the incoming Midi Channel is updated as this is all that is required.

Saving and Loading Midi Maps

You can Save and Load Midi maps as a plain text comma separated files. This means you can have a map for each of your setups. You can use any number of the rows. Note. If you click on the table header you can sort numerically / alphabetically. For instance, you can list so the remapped channels 001 on the right-hand column are at the top. Below is a view of the lower half of the Midi Mapper when you scroll down. If you want to rename the Controllers you can save the new names when you save the map and then reload them.

Note. A couple of fader maps are included in the installation directory as examples. `rd2000_fader_map.txt`. which sends CC messages out and Korg Nautilus drawbar map.txt which sends sysex out - see later.



Setting Midi Out Channel for All controls to the same channel. You will normally use the same midi out channel for all controllers. If you are controlling a VST or midi instrument you can use all of the RD2000 controllers if you want to. If you set the Note Midi out channel to the one you want. You can quickly set all the other controller Midi Out channels to the same value by clicking the button 'Set all Midi Channels out same as Note'. Remember the controllers you want to use need to be enabled by clicking in the right-hand column to turn the row green.

For information. CC Control Change messages start a Status byte of B followed by the Midi Channel (0 to 15). Hex(B0) to Hex(BF) in the Midi 1 Specification. -> 176 to 191 in decimal. Where B defines it's a CC message

and the second byte 0 to F is the Midi Channel - which is normally transposed to Channel 1 to 16 for the user.

Mapping a Midi CC to Channel After Touch

If your Keyboard, like the RD2000, does not produce Channel Aftertouch data you can assign a controller such as a Damper or Sustain pedal to generate the AT data. When you press a note, you can create the AT data by pressing a pedal, expression pedal or other controller.

To do this Choose your incoming channel number and incoming CC controller number (say channel 001 knob 1 - 014 as below). Then just set the outgoing channel number and set the Midi CC out value to 128. See Below.

	Controller	Midi Chnl in 1 - 15	Midi CC In 0 to 127	Midi Chnl Out 1 - 16	Midi CC Out 0 to 127	Enabled = 001 click column cell to toggle
	Note	001	---	001	---	001
	Knob 1	001	014	001	128	001
	Knob 2	001	015	001	021	000
	Knob 3	001	016	001	022	000

Then press 'Start Mapping'. Now when you play notes and move Knob 1 the channel after touch data will be sent.

Pitch Bend - Joy Stick X direction

Any Midi Data coming in as Pitch Bend data on the Pitch Bend Row (Joy Stick X direction) will be mapped and also sent out as Pitch Bend Data to the output channel specified by the user if the Midi CC out column is set to 128. If that column is set to 0 to 127 it will map pitchbend to a Midi Control Change CC message of your choice. In the example below pitch bend data is set as coming in on Midi channel 1 and being sent out on Midi channel 1. You can choose any channel between 1 and 16 for in and out. The right-hand column 001 means the row is active and hence the row is Green.

Midi Channel In column



	Ext Expression Pedal	001	007	001	007	000
	Joy Stick Y	001	016	001	016	000
	Pitch Bend Joy Stick X	001	---	001	128	001
	Note to CC	001	021	001	018	000
	Channel After Touch	001	---	001	---	000

128 = pitchbend or
0 to 127 = CC



Midi Channel Out column

For information. Pitch bend messages start a Status byte of E followed by the Midi Channel (0 to 15). Hex(E0) to Hex(EF) in the Midi 1 Specification. -> 224 to 239 in decimal. Where E defines Pitch Bend and the second byte 0 to F is the Midi Channel - which is normally transposed to Channel 1 to 16 for the user. Pitch bend is defined by two bytes which give a resolution of 128^2 values = 16384 values which give a smooth sweep in pitch, as 128 values would result in audible steps in the pitch bend.

Channel After Touch AT

The RD2000 keybed does not generate Channel or Polyphonic after touch, but the RD can respond to it. You can assign a controller to AT on the RD such as an expression pedal and send that AT data out to an External Zone. You can also use the matrix with a synth that does generate AT data and map to another synth that responds to AT. I've included Channel AT and Polyphonic AT for these purposes. You can map the incoming after touch data from one midi channel to another midi channel if a value of 128 is entered in the Midi CC out column. See below. You can also convert a channel AT message to a Midi CC message if a value between CC 000 and CC 127 is entered in the Midi CC out column.

Midi Channel In column



Note to CC	001	021	001	018	000
Channel After Touch	001	---	001	128	001
Polyphonic After Tou...	001	---	001	---	000



If CC out value = 128 then Chnl AT
if between 000 to 127 then CC



Midi Channel Out column

For information. Channel AT messages start a Status byte of D followed by the Midi Channel (0 to 15). Hex(D0) to Hex (DF) in the Midi 1 Specification. -> 208 to 224 in decimal. Where D defines Channel AT and the second byte 0 to F is the Midi Channel - which is normally transposed to Channel 1 to 16 for the user.

Polyphonic After Touch

Poly After Touch produces a different AT message for every midi note 0 to 127 and can be very expressive. The RD2000 keybed does not generate Poly AT, but I've included it in case you use a synth which does.

Ext Expression Pedal	001	007	001	007	000
Joy Stick Y	001	016	001	016	000
Pitch Bend Joy Stick X	001	---	001	---	000
Note to CC	001	021	001	018	000
Channel After Touch	001	---	001	---	000
Polyphonic After Tou...	001	---	001	---	001

This maps incoming Polyphonic AT to a different midi channel. Status byte A, Midi channels 001 to 016. -> 160 to 175 in decimal. It produces two data bytes - Midi Note number and its Poly AT value.

Setting up the Sliders 1 to 9

The Sliders on the RD200 operate in 2 modes for external zones.

1. Normal assign mode. Each external zone fader outputs CC 007 By default, zone 1 to 4 output on midi channels 1 to 4 and zones 5 to 8 midi channels 1 to 4 also.
2. In Harmonic bar mode the output of each fader is CC 102 to 110 with the midi channels as above. The faders also work in reverse so as you move them towards you the value increases.

I have assumed you will use Zones 1 to 4 for internal sounds and zones 5 to 8 for external sounds. The default settings on the matrix match the default settings on the RD. Of course, you can change all of this.

To use each slider/fader with an external instrument or VST, all you need to do is set their midi channel to the external instrument's Midi channel and assign a different Midi CC out to each slider. See below. Then enable their row by clicking on the righthand column so it becomes green. For any VST or external instrument refer to its manual for Midi CC's it responds to. Finally save your Midi CC map for future use. Turn on the RD2000 Sliders for sending Midi out with their Assign button on the panel and LED green for External Zone.

RD Controller	Midi Chnl in 1 - 15	Midi CC In 0 to 127	Midi Chnl Out 1 - 16	Midi CC Out 0 to 127	Enabled = 001 click column cell to toggle
Knob 7	001	020	001	020	000
Knob 8	001	021	001	021	000
Button 9	001	013	001	013	000
Slider 1	001	007	001	020	000
Slider 2	002	007	001	021	000
Slider 3	003	007	001	022	000
Slider 4	004	007	001	023	000
Slider 5	001	007	001	024	001
Slider 6	002	007	001	025	001
Slider 7	003	007	001	026	001
Slider 8	004	007	001	027	001
Slider 9	005	007	001	007	000
FC 1 Damper Pedal	001	064	001	064	000
FC 2 Pedal	001	065	001	065	000

Start Mapping

Set All Midi Out Chnls the same as note

☐ Set Harmonic Bar Slider CC in 102-110 CC out Starting 20

Save MIDI Map Load MIDI Map

Note the Slider Midi CC out column runs from 020 to 027. All sliders output on Midi channel one now.

Mapping Midi Messages

Start Mapping

Set All Midi Out Chnls the same as note

☐ Set Harmonic Bar Slider CC in 102-110 CC out Starting 20

Save MIDI Map

Load MIDI Map

In Harmonic bar (drawbar) mode (Shift & Scene) the 9 sliders work differently. See Midi CC section earlier. If the Tone Wheel/Designer screen is displayed they will send out Midi CC 102 to 110 instead. Outputting values 0 to 127 for drawbar positions 0 to 8. But each slider will still outputs different midi channels (External Zone Green LED) channel 1 and then incrementing channels by +1 for successive sliders, for zones 1 to 4 and starting again for 5 to 8.

RD Controller	Midi Chnl in 1 - 15	Midi CC In 0 to 127	Midi Chnl Out 1 - 16	Midi CC Out 0 to 127	Enabled = 001 click column cell to toggle
Knob 8	001	021	001	021	000
Button 9	001	013	001	013	000
Slider 1	001	102	001	020	001
Slider 2	002	103	001	021	001
Slider 3	003	104	001	022	001
Slider 4	004	105	001	023	001
Slider 5	001	106	001	024	001
Slider 6	002	107	001	025	001
Slider 7	003	108	001	026	001
Slider 8	004	109	001	027	001
Slider 9	005	110	001	028	001
FC 1 Damper Pedal	001	064	001	064	000
FC 2 Pedal	001	065	001	065	000
Mod Wheel 1	001	001	001	001	000

Start Mapping

Set All Midi Out Chnls the same as note

☒ Set Harmonic Bar Slider CC in 102-110 CC out Starting 20

Save MIDI Map

Load MIDI Map

The 'Set Harmonic Bar CC 102 to 110 check box sets slider midi in values to the matrix to these values. You also set the starting Midi CC for the faders on the CC out column starting at the value you select in the updown box'. You need to set the midi out channel if not 001. Finally activate the row so its Green. The aim is to help you set up the sliders if you are using them as controllers for an external instrument in Harmonic bar mode.

Mapping a Note to a CC

This row is a special mapping. It converts a note to a CC. You reserve one key on the 88-note keyboard to this function. Like before you choose the midi in channel and the mapped midi out channel. Below in is 001 and out is also 001. The midi note you might reserve for this feature is A0 midi note 021 (the lowest note on the RD keyboard) in this example, but can be any note up to C8 midi note 108. Generally best to choose one you won't use often for playing.

	Ext Expression...	001	007	001	007	000
	Joy Stick Y	001	016	001	016	000
▶	Joy Stick X	001	017	001	017	000
	Note to CC	001	021	001	018	001

Finally, you decide what Midi CC you want to map to. In this case 018. When you hit A0 the harder you hit the note the higher the CC's value. Notes output values (volume) 0 to 127. Note off, volume 0 is ignored here. You could use this feature for switches or variable CC values. Obviously gradual changes in CC value depend on how gradually you change your strike for subsequent A0 notes.

If Note to CC is enabled then the note number selected, 021 in this case - A0 - will only send Midi CC and note 021 will not sound. This is because you want to control CC value and only use the note as a controller. The 'louder' you play the A0 key the controller value will increase. As you play the note softer the CC value will reduce.

For information. Note messages start a Status byte of 9 followed by the Midi Channel (0 to 15). Hex(90) to Hex(9F) in the Midi 1 Specification. -> 144 to 159 in decimal. Where 9 defines it's a note and the second byte 0 to F is the Midi Channel - which is normally transposed to Channel 1 to 16 for the user.

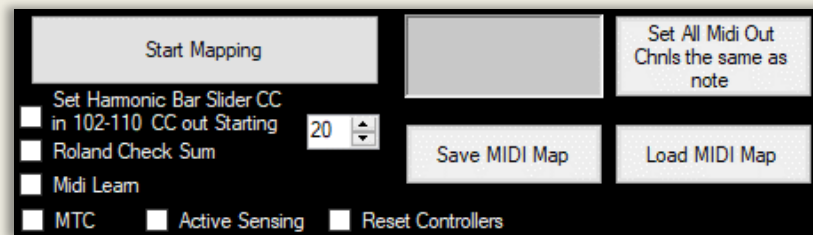
Summary Of Possible Mappings

To From	Notes	Poly After Touch	Midi CC	Chnl After Touch	Pitch Bend	Sysex 7 Bit and 4/4 Bit
Notes Note			5 			
Poly After Touch						
Midi CC			1a 	1b 		4 
Chnl After Touch (Pressure)			3a 	3b 		
Pitch Bend			2a 		2b 	

Notes

- 1a Set Midi CC out column value 0 to 127 to remap CC
- 1b Set Midi CC out column value to 128 to map CC to Chnl AT
- 2a Set Midi CC out column value 0 to 127 to map PB to CC
- 2b Set Midi CC out column to 128 to remap PB
- 3a Set Midi CC out column 0 to 127 to map Chnl AT to CC
- 3b Set Midi CC out column to 128 to remap Chnl AT
- 4 Set Right Hand Column to 001 for 7-bit and 002 / 003 for 4/4 bit and input sxstring /max/min values - See next section
- 5 Set chosen Midi note number Midi CC in Column and Set Midi CC out value 0 to 127

Mapping Midi System Real Time Messages



Some Midi Messages are channel independent but can be passed through the Midi Mapper if you wish.

MTC - Midi Timing Clock pulses (plus Start, Continue and Stop). This allows you to have the Timing master device transmit through this software and out to the slave devices. Just check MTC check box to allow these messages to pass through. The timing clock runs at a rate of 24 messages per quarter note. Hex Status byte F1 to FC

Active Sensing - This sends a signal at a minimum of every 0.3 seconds to check that a midi device is connected and not become disconnected. Check the Active Sensing check box to pass through. Not all devices recognise this but its part of the Midi specification. Hex Status byte FE

Reset Controllers - This returns all devices to their initialised power up configuration. Check the Reset Controller check Box to pass through. This would be sent from the input device by a manual command. Best to use with caution. Hex Status byte FF

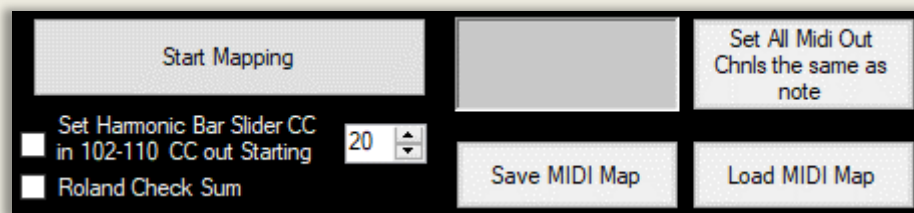
Note. MTC and Active sensing will pass quite a lot of Midi data through. Normally they work fine. However, if you get any problems with Midi data becoming corrupted uncheck the boxes for these messages. It will depend a lot on the hardware/software instruments you use and if they followed the Midi specification faithfully.

MAPPING SYSEX MIDI MESSAGES

Sysex (System Exclusive) messages can control almost all an instrument's settings. Now you can map a Midi CC message to a Sysex message. This can give you virtually total physical control of another synth/keyboard or the RD2000. A MIDI Sysex message always starts with a Status byte F0 and the message always ends with F7. Manufacturers can put mostly what they like in between but they have to start with a manufacturer ID and instrument ID.

There are four important points:-

- The user must have a reasonable understanding of the sysex implementation of the instrument you want to control. The user has to input the start of the sysex strings.
- If you use a Roland instrument you will probably need the Roland checksum. If it requires a checksum then check the checksum box - see image below.



The screenshot shows a software interface for mapping MIDI messages. It features a 'Start Mapping' button at the top left. Below it, there are two checkboxes: 'Set Harmonic Bar Slider CC in 102-110 CC out Starting' (checked) and 'Roland Check Sum' (unchecked). A numeric input field next to the first checkbox shows the value '20'. To the right of these options is a button labeled 'Set All Midi Out Chnls the same as note'. At the bottom right, there are two buttons: 'Save MIDI Map' and 'Load MIDI Map'.

- You can also control instruments from Korg, Yamaha and just about any manufacturer etc. from the RD (or any instrument/control surface which generates CC messages). Make sure in this case the Roland check sum box is unchecked.
- The sysex only sends the LSB values which means only one byte of data is sent. This is either 7 bit or 4/4 bit sysex data. To map from a CC value there is generally only one byte to use anyway.

When you enter the Sysex string the software adds the data generated from the Midi CC mapping, check sums if required and the final " F7" to end the string. Note you can only map Midi CCs. Notes, pitchbend or aftertouch are not allowed.

Example - Korg

A Korg sysex string (which has to be in Hex), would look like this for say the Triton Classic - setting a multisample:-

- User inputs start of sysex string "F0 42 30 50 41 03 00 01 00"
- Data collected from Midi CC input added by this software
- " F7" ends sysex string added by software.

The final string sent out is "F0 42 30 50 41 03 00 01 00 Data F7"

Example - Roland

Make sure the Roland Checksum check box is checked. Here is an example of the sysex string in Hex you would enter for the RD2000

"F0 41 10 00 00 75 12 xx xx xx xx"

F0 = start of sysex string

41 = Roland ID

10 00 00 = Device ID - change this as necessary for your Roland model

75 = instrument ID = RD 2000 - change this as necessary for model

12 = Message type for transmission of data to the Instrument

Enter HEX values xx in pairs xx xx xx xx = PARAMETERS from the midi implementation manual for the instrument

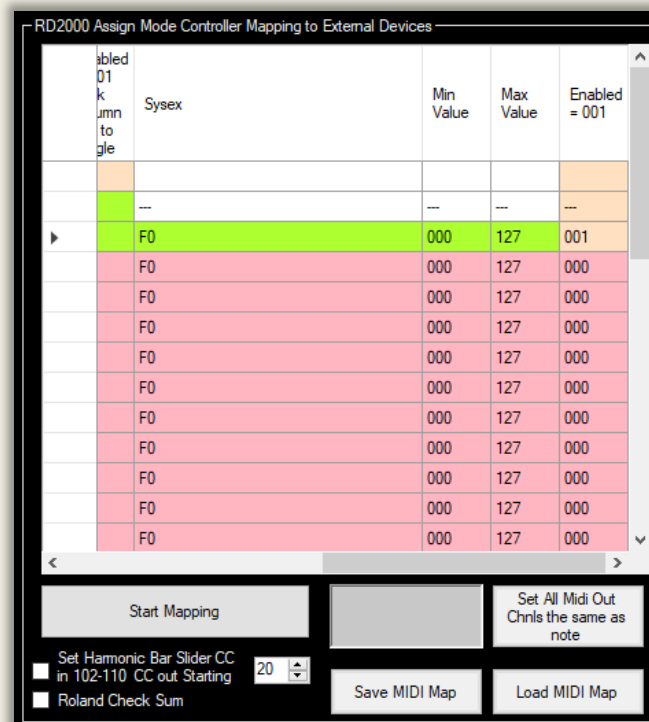
Data coming in from the Midi CC mapping - added by this software

The penultimate part of the string is the Roland Checksum - to ensure the data is properly sent - added by this software

Then " F7" end of sysex string - added by this software

How to Send Sysex

When you scroll to the right of the Mapping matrix you can see the Sysex mapping section.



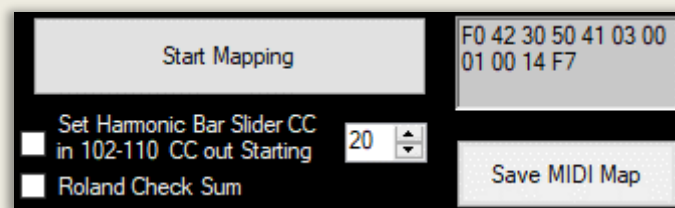
To send sysex the whole row has to be enabled "green" as before. To send Sysex instead of CC data, click on the right-hand column cell headed 'Enabled = 001' if the cell shows 000. The remaining part of the row will turn green. If you are sending to a Roland Instrument, check the Roland Checksum checkbox. Then Click "Start Mapping" button as before. A "---" means you can't use this controller. Eg, notes, pitchbend or aftertouch to map Sysex.

In the sysex column cell you enter the sysex string in Hex pairs starting with F0 with a space in between each pair and no trailing space. The Data part and F7 are added by the software. The Max and Min values turn the incoming Midi CC data to the range you want. For instance, a drawbar for a typical external instrument such as the Korg Kronos or Nautilus typically accepts a value range of 0 to 8. So incoming data 0 to 127 is scaled to 0 to 8 by the software if you set max value to 8 and min value to 0.

A Korg Triton Classic Synth example below for the "Knob 1" row.

	---	---	---	---
	F0 42 30 50 41 03 00 01 00	000	127	001
	F0	000	127	000
	F0	000	127	000
	F0	000	127	000

To check the sysex string works just open the Midi port and connect to your external instrument. Click on the green Sysex string Cell (F0 42 30.....) which you entered and the Sysex will be sent using a data value set by the updown box below the matrix - set to a permissible value. If it does not work you can edit the sysex string and try again! The grey textbox to the right of the 'Start Mapping' button shows the sysex that has been sent. See example below.



Start Mapping

Set Harmonic Bar Slider CC in 102-110 CC out Starting 20

Roland Check Sum

Save MIDI Map

F0 42 30 50 41 03 00 01 00 14 F7

Once its working save the Map. You can then Load it another time.

Now you can then turn on Mapping as described earlier by pressing "Start Mapping" and control the sysex values with a physical controller on your RD2000, or any other control surface, outputting Midi CC. In the example above Knob 1 will control the sysex values transmitted. You can then add further rows of sysex strings if you want to use more physical controllers.

Tip... You can use windows cut and paste to copy values in any of the cells. From version 3.9.5 you can reverse the sliders - to act as drawbars so the sound is louder as the slider comes towards you - by putting 004 in the right hand column instead of 001.

If you are comfortable with Sysex give it a try!

Using 4 bit / 4bit Sysex data

A bit of theory.

This software can map CC to 7 bit and 4/4 bit data.

- 7-Bit data takes values from 0 to 127 -> 00000000 to 11111110
- 4/4 bit splits a 7-bit value into 2 values 0 to 15 and 0 to 127 -> 00000000 to 1111xxx and 00000000 to 1111111 in steps of 16 - so 7 bits can portray two values. Two Drawbars for instance !

Most sysex is 7-bit but you can use 4/4 bit in the matrix with the range of max/min values possible would be between 0 and 15. In the drawbar example we only need values 0 to 8 for the drawbar positions. So

- The first drawbar would have a Min of 0 (00000000) and Max of 8 (00010000)
- The second drawbar would be represented by a Min of 0 and Max of 8 in the columns again but being mapped to 0 (00000000) to 127 (11111110) in steps of 16

Incoming CC of 0 to 127 would be scaled so that

- For the first drawbar incoming CC 0 to 127 is mapped 0 to 8 - Min 0, Max 8
- For the second drawbar incoming CC 0 to 127 is mapped 0 to 8 - Min 0 to Max 127 in steps of 16. So, 0 to 15, 16 to 31, 32 to 47 ... each produce a value of 0, 1, 2 etc.

The first 4 bits are accessed by putting 002 in the right column of the Matrix. The second 4 bits can be accessed by putting 003 in the right column.

To control the EXi CX3 16' upper drawbar on a Korg Nautilus or Kronos the sent 4 bit sysex in Hex would look something like this: -

"F0 42 30 00 01 5D 43 0C 06 00 01 09 00 00 Data F7" 16' Korg Nautilus
"F0 42 30 68 43 0C 06 00 01 09 00 00 Data F7" 16' Korg Kronos

Mapping Midi Messages

The right-hand column is set to 002 as this drawbar needs the first 4 bit data.

Remember. You enter a space between each pair of characters! When you input the string and there is no space after the last character you enter. "F0 42 30 00 01 5D 06 00 01 09 00 00" in the above example. Max val 8. Min val 0.

The next drawbar would use the second 4-bit value so 003 would be set in the right-hand column with the same sysex string. Mon 0 Max 8.

F0	000	127	000
F0 42 30 00 01 5D 43 0C 06 00 01 09 0...	000	008	002
F0 42 30 00 01 5D 43 0C 06 00 01 09 0...	000	008	003
F0	000	127	000

Here is an example of two sliders on your control surface generating the first 4-bit value and the second 4-bit value. Notice 002 and 003 are set in the right column. The sysex column in green would contain the same sysex string F0....etc.

The next two drawbars would use a different sysex string but using the first and second 4-bit values, and so on in pairs of drawbars.

PS. I need a Nautilus owner to check sysex string as I don't own one. If someone can confirm the correct string, please let me know.

Note. As Midi CCs only provide 7-bit data for their value, sysex parameters requiring an MSB & LSB can't be mapped. Nor can sysex requiring 4/4/4/4-bit data.

PART 2

THE SYNTHS

ROLAND SH1000 SYNTH

[The Free Synths](#) Video



INSTALLATION Version 2.5

Note you need Native Instruments Reaktor 6.x Player or Full Version installed on your PC or Mac. The SH1000v25.ens (ensemble file) can be found in the RD2000 Editor installation directory. Copy it to say your documents folder. Open this with NI Reaktor 6 or [Reaktor 6 Player](#) free download by double clicking on it. It can be run as a standalone or as a plugin in a DAW. VST/AU. Windows and Mac.

The SH-1000 is an emulation of the Roland SH-1000 synthesizer first released in 1973 and which was Roland's first synth. Its successor was the SH-2000 but that was designed to be more of a preset instrument and had far less flexibility. The SH-1000 was used by Vangelis, Blondie, The Band, Jethrow Tull, The Human League and Eddie Johnson (Roxy Music) as well as many others. This was also the first synth I owned.

It is available as a Native Instruments Reaktor 6 or a NI Reactor Player 6 instrument (if Player is run in demo mode).

See my website. [Www.stuartpryer.co.uk](http://www.stuartpryer.co.uk) for more VSTs and music applications.

Reaktor 6 can be a VST, AU or AAX plugin.

PC /Mac Specs. Windows 10 or 11 / OSX 10.14 or higher - Mac or PC

Main features

1. SH1000 comes with over 50 snapshots (programs) in 1 bank. Please lower volume when trying these as some are much louder than others.
2. I also recommend 'Simply Fast Shots'. A Bank by Paule Amca in the NI User Library for the SH1000. This is embedded in the ensemble as bank
3. I have tried to keep the instrument as the original as possible except for the settings and oscillator sections. If you use initialise snapshot 002 values it emulates the original instrument fully. The synth has info hints for all controls. You can adjust the waveform frequencies to apply slight mistune which gives a fuller sound. You can also vary the individual volume of the waveforms.

There is a Portamento switch to turn the effect on/off and you vary the amount by turning the knob like the original. The synth has the organ style tabs below the keyboard modelled. The preset instruments tabs link to the snapshots in Reaktor - 42 to 51. You can of course change these should you wish.

The settings box and oscillator box contain enhanced features over the original. If you want just the original instrument use program 002 initialise. In settings it's possible to vary the vibrato delay (value in milliseconds) and vibrato waveform. You can also vary the Growl and Waw waveform as well as cross fade parameters.

4. Pitch - adjust in Reaktor or on Instrument for fine tuning, in cents. Like original it has option to raise or lower by 1 octave.

5. Tremolo - cyclic variation in volume - choose waveform, depth and frequency. Tabs switches on/off and waveform type sine/triangle.
 6. Vibrato-cyclic variation in frequency. Choose delay in settings box (sine wave only) waveform, depth and frequency. Original had 2 waveforms. Tabs switches on/off, delay and waveform type. Noise - adjust cutoff frequency and resonance of noise generator - select HP, BP or LP filter using LEDs. Original had just white/pink option. = HP and LP.
 7. Growl - phase modulation. Waw cut off frequency modulation. You can Select waveform, depth and frequency'
 8. Portamento - when polyphony set to 1 notes glides in frequency. When polyphony set higher say 2. When third note played first note glides to it. Original SH-1000 was monophonic. Switch on panel switches on/off.
 9. The ADSR envelope and cut off frequency controls are modelled as faders as per the original instrument. Envelope can also control volume and cut-off frequency Filter - cut-off and resonance - filter type selectable - High Pass, Band Pass and Low pass - use yellow LEDs to select. Original was just high pass. VCF sensitivity knob added like the original.
- If the ADSR is used for the filter this over rides the cutoff slider. Note the instrument responds to touch sensitive keyboards (note velocity)
11. Polyphony 1 to 128 notes. Original monophonic. Adjust polyphony in Reaktor.
 12. Oscillator section - Waveform mixer - adjusts each waveform volume and de tuning. Original on/off only.
 13. Modulation wheel changes note frequency when moved up or down - use LED switch below it to activate. Original had simple glide button.
 14. Playing - use PC keyboard which is polyphonic or even better your own external midi keyboard. Full 128 midi notes accessible. Three octave on-screen monophonic keyboard activated by mouse will produce sounds which are not as rich as using the computer keyboard

or an external midi keyboard. Original limited to 3 octaves with pitch raise/lower by 1 octave.

15. Like Original has hold note tab which holds note until next note played.

16. See Fractal Sequencer on my website for advanced sequencer/generative music features which can be used with SH-1000. To connect use midi yoke freeware or LoopBe1 on windows or IAC driver on a Mac. Original had simple Random Note generator.

17 There are 128 available program slots in Reaktor for a Bank. Original had no option to save or load settings. Program/bank load and save.

18.Midi enabled - Original no midi.

19. Version 2.4 - has updated sound presets which are closer to the original. Fixed bug when changing presets. Added tool tips (info) for all controls.

20. Can be used as a plugin in via Reaktor in a host - Logic, Bitwig, Sonar, Cubase, Cantabile, Ableton etc. Host DAW controls the audio and Midi parameters.

21. Multiple instances of synth can be run if Reaktor is used as a plugin.

23.For plugin place Reaktor.xxx in your normal virtual instrument folder.

24.For more information email me at stuartpryer@gmail.com

25. My website with more synths is at www.stuartpryer.co.uk
Copyright Stuart Pryer - 25th November 2016 SH1000
This text updated 11th November 2023

BLUE SYNTH 3 - PHASE MODULATED SYNTHESIZER

A dedicated windows stand-alone/VST Phase Modulated synth. The blue3.exe file will be automatically installed in the RD2000 editor installation directory. Click on the 'Blue Synth' menu item in the 'Synths' menu to open it from within the software. The Windows VST 2.4 Blue Synth 3.dll plug-in is in the RD2000 installation directory as well so you can use in a DAW.



The top menu bar. Exe version only.

1. Midi in - allows the selection of all the available midi inputs
2. Midi out - allows the selection of all the available midi outputs including Microsoft GS wavetable synth often found on PC sound cards. Make sure midi in is different to midi out otherwise you will get a midi feedback loop.
3. Audio - allows the choice of ASIO or WDM sound drivers
4. Zoom on the executable version changes the size of the synth on the screen.

The Blue Synth is a touch sensitive, two oscillator phase modulation virtual synthesizer designed to provide a useful audio source for the

playing or recording. It can produce lush pads or powerful leads. It can run as a standalone application or run with the RD2000.

There are two oscillators to create the carrier waves which can both be phase modulated by a sine wave. The polyphony can be adjusted between 1 and 128 notes. You can choose the carrier waveform and apply an attack, decay, sustain and release envelope whose amount can be adjusted. The Modulator knobs control the detuning of the carrier from the modulator and the large knob the amount of modulation, Oscillator 2 can be detuned. The output can be fed through two filter banks with cutoff, resonance and track as well as ADSRs' affecting the filters. There is a ping pong delay and reverb. Programs can be saved. The built in Oscilloscope allows the user to view the wave forms and ensure the signal is not clipped. If it is you will get distortion. To stop this just reduce the 'amount' knobs of the two ADSRs on the left side.

There are 10 factory sounds preloaded in the synth courtesy of Yoa out of the 20 available program slots in each program bank. Programs/banks can be saved as text files.

Please set midi and audio preferences (direct sound or ASIO etc.) in synth menu before you use it.

All I ask is for feedback and ideas for additions or modifications. Also additional programs/banks welcome. I will host on my site.

PC Specs. Windows 7 to 11 - Laptop or PC - ideally >2gb ram and >2ghz processor. Also a mac running Wine 10.6 or Crossover for the .exe.

Main features

1. Touch sensitive.
2. Oscillator 1 and 2 have a choice of waveforms. Sine, square, Sawtooth, triangle and noise. 1 to 128 note polyphony.
3. Osc 2 Pitch - adjust by up to +- 5 octaves, semitone and fine. Slightly detuning and enriches the sound.
4. 2 Envelopes per oscillator control volume and cut-off frequency
5. Filter - cut-off and resonance - filter type selectable.
- 5b. Polyphony 1 to 128 notes.

6. 88 note on-screen keyboard activated by mouse or use PC keyboard keys or even better your own external touch sensitive midi keyboard. Full 128 midi notes accessible.
7. A stereo ping pong delay and reverb enriches the sound.
8. See fractal sequencer which can be used with synth and midi yoke or loopbe1 freeware to connect.
9. There are 20 factory sounds preloaded in the synth courtesy of Yoa (see link below) out of the 40 available program slots in each program bank. Programs/banks can be saved/loaded as text files. Program/bank load and save.
10. In standalone set midi in & midi out/audio/zoom feature at top of window.

For more information email me at stuartpryer@gmail.com

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MIDI RECORDER

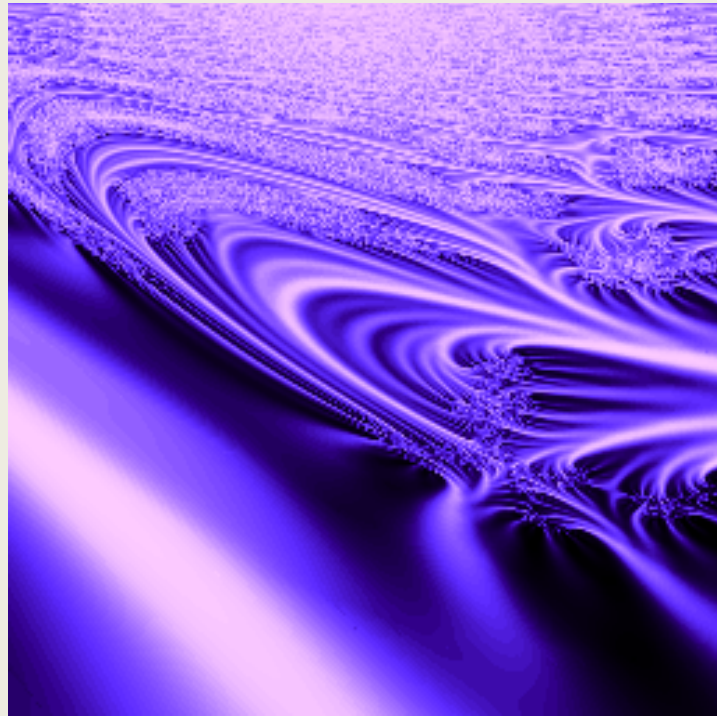


A Windows app.

The MIDI Recorder does three things

- You can record any midi signal coming into the recorder and play it back to its midi output.
- You can play standard MIDI files
- You can add an arpeggiator to any incoming MIDI note and send to its MIDI output. The arpeggio pattern can be designed by the user or a random pattr can be generated. The speed, mode and number of steps can be varied.

FRACTAL SEQUENCER



"A Different Sea"

Looking into the infinite!

Fractals are infinitely complex objects created by simple equations. The equations contain complex numbers, both real and imaginary. Fractals contain no straight edges or curves which can be differentiated. They have the property of self-similarity. That is similar patterns occur at different scales. If you zoom into a fractal, you will never reach an end. Detail continues forever. Our limitation in creating them is the finite precision of variables held in a computer's memory.

In the natural world there are fractal like objects like fern leaves, branching trees, snowflakes. But you cannot zoom in forever as you will reach the atomic and quantum world. At the plank length - length has no meaning.

This software enables you to explore the world of Fractals both as images and as musical sequences. The latter can drive via Midi both virtual synths VST's and real midi instruments.

Have fun. The more you experiment the more you will discover.

<https://stuartpryer.co.uk/VirtualInstruments.htm>

PART 3

TUTORIAL 1 - SETTING UP USB MIDI & AUDIO

The RD2000's sound pallet can be expanded limitlessly using a computer loaded with a virtual instrument host such as Bitwig, Apple Mainstage or Logic or PC DAWS such as Bitwig, BandLab Sonar and Cubase. The RD is a fantastic midi controller and has an inbuilt midi/audio interface. So how do you set up the RD and a DAW to work together so you can use the RD sounds and the sounds from a computer mixed together in the RD?

1. On the RD2000 menu/system set USB driver to 'Vendor' for audio and midi. Save the system settings by pressing the RD2000 **WRITE** button in the edit screen. Turn off RD 2000 and then turn it on again to initialise. You can use an Audio/ Midi interface OR the RD2000. The RD is midi class compliant for Midi so you can use the generic driver setting on the RD. *If you are using USB audio on the RD then - On the software go to system common/audio input switch to on.* OR on RD2000 in the zone area (top right) select USB audio input button. Switch to on.
2. Set an external zone on the RD 2000. Say set zone 5 to external. Use midi channel 1 say. Default for zone 5. The zone light will show green. Red is for internal zones. *In the software 'program common edit/zones Int/Ext' check zone 5 to make it external and 'Program Zone Edit/external zone' choose zone 5 and set midi port to USB.* OR On the RD2000 select the zone you want to transmit on, then holding shift press it again until it's LRD is green.
3. On the DAW set midi in chnl and midi out as nothing otherwise you may get a midi loop unless you turn off local control on the RD to 'uncouple' its keyboard for its sound engine. Set audio out to RD2000 or to your audio interface. Select an instrument on the DAW.
4. When you play a note on the RD, midi out note data is sent on Zone 5 channel 1 to the DAW which reads it. Produces a digital audio signal which is sent back by USB audio to the RD or audio interface where you can hear it mixed with the built-in sounds on internal zones.

5. Finally. You don't want to repeat this every time you turn the RD on. So use the EXIT button on the RD to return to the Program or Tone screen. It will show Edited on the display. Press the WRITE button on the RD. The program name screen appears. *In the software go to Program Common Edit/Program name and Name the program. Say "DAW".* Press 'Enter on the RD and choose an initialised (empty program slot to store the program. Press ENTER, then OK and Enter. All the settings are saved! Save DAW file too.

See pages 18, 19 & 23 of the RD2000 user manual for more information

Remember: -

Internal Zones 1 to 8 = midi in channels 1 to 8 by default.

External Zones 5 to 8 = midi in/out channels 1 to 4 by default.

You can change these if needed.

TUTORIAL 2A – SETTING UP A DAW

The RD2000 is a brilliant sound source and midi controller. This tutorial shows you how to set up the RD with a DAW (Digital audio workstation) so you can record your performance, add virtual instruments and edit your performance.

1. Make sure you load the RD2000 driver on your computer and enable 'Vendor' driver mode on the RD. This enables both MIDI and Audio input and output through USB. Or you can use a Midi USB interface.
2. On the RD in the system section there is a 'Record Mode'. Turn it on. This is a quick way to set the RD up for recording into a DAW.
3. Make sure the RD is set as the audio input and output. Create a new audio track. Make sure you can hear the RD playing through the DAW. I use a buffer of 256. Be careful not to drop the latency so low that you get pops and crackles or the cpu is overloaded.
4. In your DAW create a new midi track, make sure the RD is set as MIDI input. If you create a midi track you can edit your performance later and even change the instrument.
5. Bounce or export your track to a wav file etc. Note. In Logic if you play the wave file back it will probably play on iTunes or Quicktime player. These will normally output the sound to the inbuilt mac speakers not the RD. If you use speakers or headphones connected to the RD be prepared for that. You can change this in 'audio settings' on the Mac.

TUTORIAL 2B - THE RD2000 CONTROL SURFACE

You can use the RD2000 control surface - 8 knobs, 3 foot controllers FX1, FC2 and Ext pedal, switch 9, 2 mod wheels and 1 slider - to control external instruments or VST's. Set the zone - say 5 - to external. Press Shift and Zone switch to set LED to green. Note.

Ctrl (Control) mode (Ctrl Button) the Midi Control Change CC values sent from the RD for the current external midi channel (Zone 5 to 8, midi chnl 1 to 4), are fixed to: Knobs: 2 = Pan CC10, 3 = CC91 Reverb, 4 = CC93 Delay, 5 = Cutoff CC74, 6 = Resonance CC71, 7 = Attack CC73, 8 = Release CC72. 1 & 9 are not assigned. The sliders are all set to Midi Control Change CC07 midi channel master volume with the midi channel defined by the midi channel of the external zone selected. So only 1 slider per midi channel. This is a Program Common setting.



Assign

Assign mode When the Assign LED is lit you can set and then send midi CC values from the RD to the external instrument or VST for an RD Program. If you set program remain the assignment will stay when you switch programs on the RD. Hold shift button on the RD whilst moving an RD control to set the CC value. You can assign two wheels, 1 slider, 8 Knobs, button 9 and 3 Pedals each to CC0 to 127 or Off plus some others Midi messages. The midi channel transmitted depends which external zone is green and selected by the red zone button at the top of the Controls.

Note. You can only use one slider per midi channel. In Level Mode its set to CC7 master volume. But in Assign mode the slider can be set to CC0 to CC 127 if the Assign button by the Master Volume slider is lit.

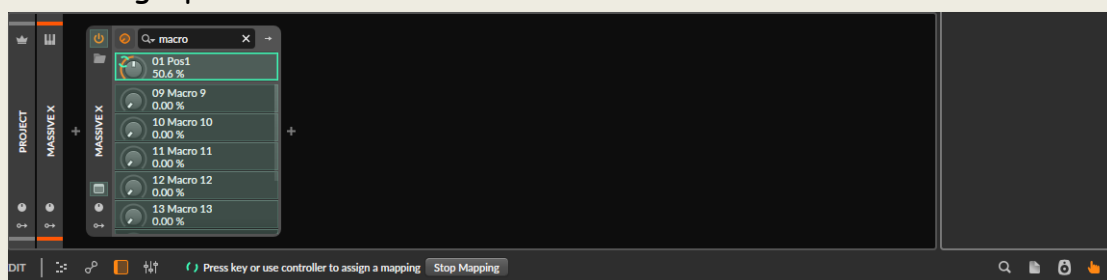


Assign Sliders to a CC

See the Parameter Manual Pages 7 and 8. If you use the Midi Mapper you can set the 9 sliders to send out CC or Sysex messages on the same channel.

Also see Foot Controllers and Wheels and Knob assignments pages in Program Common section. Default settings knobs 1 to 8 CC14 to 21. Ext Pedal CC11 expression = % of Master Volume. Slider with level button lit transmits CC7. Assign lit CC0 to 127. Mod Wheel CC1 modulation and Mod Wheel 2 unassigned by default, assign to a CC as required.

Midi Learn. For VST's it's often simpler to leave the CC values on the RD as they are and use Midi Learn on the VST/Daw if its available. Then save the project in your DAW to retain the midi learn values. The normal way of doing this for instance in Bitwig is to click on the 'hand' icon bottom right. It goes orange. Move the virtual knob on the vst, it will go to the top of the list on the left below. Then click on it. With the RD Assign LED lit on the RD and the zone set as an external Zone. move the controller on the RD. This sets the link between the RD controller and the VST graphical controller. Most DAWs/VST's have midi learn.



Above. Native Instruments Massive X - Macro Knob - 01 pos 1 is waiting for a controller on the RD to move so it maps the controller to the function. Repeat for all controllers you need.

Note. You can change Bank and Program on external synths using the jog wheel if you enter for the Ext Zone the Bank MSB/LSB of the external synth on the RD zone edit page! You can also rename the Ext Zone with the external sound module's name. See External Zone page in Program Zone Edit section for the settings.

TUTORIAL 3 - LAYERING AND SPLITTING THE KEYBOARD

The RD2000 is a very flexible instrument allowing up to 4 (maximum 8) programs to be layered or split. Normally I would only use up to 4 internal sounds to limit processor load.

Layering

Each Zone is a layer. Turning on the Zone using the Zone select button turns on the layer. Turning off the Zone turns off the layer. It's that simple. Layers can be internal or external zones. By holding down the tone button and then pressing a second and third it's easy to set up the layers in the order you press the buttons. Note V Piano can only be Zone 1.

Splits

Hold the 'Split' button and press a key to set the split point. Zone 1 will be to the right of the split point. Zone 4 will be to the left of the split point including the split point key. Press the split button again to turn off the split mode. This way you can split up to 8 zones - order being from left to right. For 2 zones it would be 4 on left/ 1 on right. The user can change the range and tones of the split regions. Splits can consist of a mix of internal and external zones.

TUTORIAL 4 - RD2000 RECOMMENDED ACCESSORIES

1. I use headphones most of the time. Do not scrimp here as you are using a very expensive and beautiful sounding instrument. I use Sennheiser HD 600s'. Classic neutral sounding headphones for listening and mixing. Remember the RD has a large dynamic range and requires Headphones which can handle this. Most CDs have compression applied and aren't so demanding. I cannot over emphasise how important good quality headphones are.
2. A good quality Headphone amp. I use Fiio but there are others. This provides a high impedance load for the RD output. And the ability to drive high impedance headphones like the HD600 at 300 ohms. The result is smoother and warmer sound.
3. Speakers for home use. I use Yamaha active monitors and a Yamaha active subwoofer. If you play to an audience either the house PA or good quality keyboard amps/speakers.
4. Use balanced connections when possible and high-quality leads.
5. Mac or PC i5 or higher ideally with an SSD and >8gb ram for virtual instruments - for recording and virtual instruments.
6. If you use another hardware instrument an Audio Interface or a mixer. I use a Native Instruments KA6 mk2.
7. A very sturdy stand. Either the dedicated Roland stand or a four-leg table stand. I use the latter, as it folds, is compact and very strong.
8. Roland RPU 3 triple pedal unit or DP7.
9. A Roland EXP 5 expression pedal mainly for organ.
10. Surge protector - to protect your instrument
11. Dust cover - to protect your instrument
12. A good Daw. For Mac I recommend a host such as Bitwig, Logic or Mainstage. For Windows I recommend Bitwig or Cantabile (Cakewalk by Bandland is free).
13. Virtual Instruments. I recommend Native instruments - Reaktor (Monark, Cloud Lab, my SH1000 and thousands more instruments) FM8, Absynth, Vintage Organs, Massive and Massive X. Kontakt is a great sample based VST with some interesting alternative Pianos. Una Corda, Alicias Keys, The Giant. Also Korg collection 5 - Triton plus Modwave, Wavestate and Opsix. I also use my own Virtual Instruments.
14. A synth action keyboard sitting above the RD. I use a Korg Triton Pro 76 with a Moss physical modelling board. An incredible synth with the best synth action keybed (made by Yamaha).

TUTORIAL 5 - A TWO OR MORE KEYBOARD SETUP

I prefer using two keyboards. The master keyboard being the RD2000 on the bottom rack and a top rack keyboard, a synth having a semi weighted action. I use a 76 note Korg Triton pro with an on-board Moss physical modelling board also use it as a Midi controller for Virtual instruments, but it could be any Midi keyboard. The benefit of this arrangement is that for synths I use the Synth action keyboard or virtual instruments either separately or layered with its internal sounds and get a quicker and lighter action for them. I can also use the upper keyboard for the top manual of Organs. So, in summary the upper keyboard just plays internal sounds or virtual instruments and the lower keyboard, the RD 2000 plays its internal sounds.

I strongly recommend using Mac computers for recording. Their Midi and Audio functionality are much better than Windows PCs. You can also easily set up ad hoc networks to send midi to Windows PCs or iPads with The IAC network driver built into the operating system. You can also set up aggregate audio devices.

I also strongly recommend a separate Midi interface. Note a midi output always goes to a midi input. For controller keyboards such as my Roland A800 Pro you generally only need Midi out as there are no onboard sounds.

For Audio I use a separate Audio interface - A Native Instruments KA6 mk 2. It is class compliant on a Mac and included midi in/out. This then drives my Yamaha active speakers and Yamaha Sub-Woofer (important in my opinion especially for synths and Pianos). I also use a laptop for editing / librarian functions for the Triton and RD2000 using my own software (Triton Controller and Rd2000 Editor - this software).

TUTORIAL 6 - SHARING AND SAVING PROGRAMS

Once you create a program on the RD 2000 you may want to share it with other users or save it on your computer. This is how you do it.

1. First you need to back up the RD2000's data on a RD2000 formatted memory stick. Go to Menu, Utility, format. Once formatted go to Menu, Utility, Backup Save
2. Then you can load the data from the memory stick in its entirety, or all the programs only.
3. But you can also import just a single program from a backup and put it into a program location of your choice. To do this insert the backup usb drive with the program(s) you want to import into the RD USB memory port.
 - On the RD goto Menu, Utility, Import.
 - Scroll to the program on the backup you want to import you can see the name and bank/number. Shift + up/down buttons scrolls banks quickly. Eg C 10.
 - Then specify the destination you want the program Bank/no. eg E 05.
 - Click OK.

TUTORIAL 7 - SETTING UP BITWIG STUDIO

Bitwig studio is the most intuitive DAW I have used. I have used many DAWs in the past! You can also build your own instruments and effects. So how do you set up the RD and Bitwig to work together so you can use the RD sounds and the sounds from a computer and maybe another hardware synth mixed together?

MIDI. In Bitwig I use the *Generic keyboard Controller Script*. Set midi in/out of the RD as say external zone 5 midi chnl 1 default to Bitwig midi in and midi out of Bitwig to the RD. If you are using VSTs then set their MIDI in from an RD external zone, Midi out ext zone 5 say, or maybe another hardware synth on say midi channel 5. NB. You need a Bitwig controller script for each hardware synth. Another good script is *DrivenbyMoss* with the *Generic Flexi* controller where you can map controllers on unsupported equipment - ie. where Bitwig does not have a dedicated controller script.

AUDIO. Set audio into Bitwig as RD 2000 or the audio out of your audio interface. Set audio out of Bitwig to RD2000 or your audio interface. Select a VST instrument on the DAW set audio out to the RD or your audio interface.

NB. Bitwig has the *Grid*, *Note* and *Polygrid* for creating your own effects and instruments! It supports VST 2/3 and 32/64 bit plug-ins and runs on Macs and PCs.

Setting up in Bitwig.

1. Define your Audio interface input and output - in Bitwig Settings - Audio
2. Each keyboard needs to be set up as a separate Midi controller. In Bitwig I use 'generic keys 2' as Korg and Roland are not well represented in Bitwig unfortunately. Give each controller a suitable name. The controller's inputs and outputs can be defined easily by name and Midi channels 1 to 16. - See Bitwig Settings.
3. I normally leave my Korg Triton on channel 5 for its midi transmit channel. Local control off to stop repeated notes and midi loops.
4. On the RD it is easy to toggle on/off Midi channels using the zone buttons on the control surface. Note Zones 1 to 4 map to Midi out Channels 1 to 4 by default. Ext Zones 5 to 8 by default also map to

Midi out channels 1 to 4. You can put the RD into Recording mode - Local Control on. This way when the buttons are red Midi is still transmitted.

5. In Bitwig add + a Hardware Controller (add device - HW controller) name the Controller you use eg. RD2000. Specify Midi-in to Bitwig in the left-hand box which appears when you click on the track. Do this by the controller(s) name and midi channel(s).
6. Midi out is specified in the device viewer at the bottom left of the arranger screen. Specify Controller(s) and Midi Channel(s)
7. Add the next hardware controller - repeat above. Etc.
8. Finally add another instrument track(s) for software synths. Specify Midi In routing as above and audio out routing. Repeat for as many VST's as you need.
9. Set up audio track(s) to record the VST and /or the RD and /or other hardware synth(s). Define the audio tracks Audio in.
10. Remember you will only hear the tracks which you select, by clicking on them. Multiple selections are possible using ctrl windows/Cmd Mac.
11. When it's all working save the project as a Bitwig Template. That way you won't need to set this up again.
12. The first track I lay down is usually percussion. I use the Bitwig Drum Machine which has a very large collection of drum samples and has randomisation. To do this, on a track add the Drum machine instrument. Load a drum kit using the folder icon under the power button. Then draw using the pencil on the note editor or play your hardware midi keyboard to create the drum midi sequence for each drum type. Set loop points and loop. Press 'play'.

Controller Mapping

I find I mainly tend to use 1 VST instrument per project as I have hardware instruments. I typically use 4 hardware knobs, so I manually map any hardware controllers I need.

1. Turn a knob or move a slider on the VST and in the vst device pane at the bottom the virtual controller 'knob' will move.
2. Right click and choose 'manually map the controller or key'.
3. Turn a knob on your hardware controller and it's is mapped! Goto 1. Repeat for each hardware controller knob/slider/key you need.
4. Save the project saves the mappings.

TUTORIAL 8 – RECORDING SYSTEM AUDIO IN A DAW

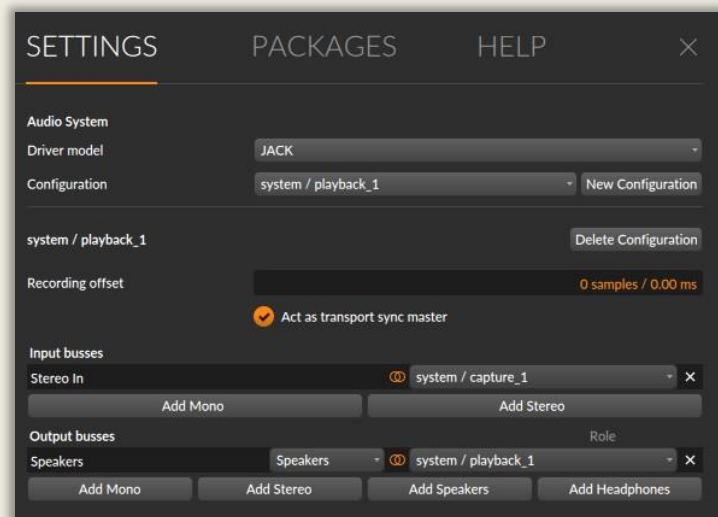
Sometimes you may want to sample sounds from the internet to use in your project. This is how you can do it. This requires internal audio routing. This does not come native with either Windows or Mac.

Windows

The Jack 2 audio driver works with any DAW. In Bitwig for instance; like Audacity (Waspi loop back), you can record system audio. Install the Jack 2 driver. Go to Settings/Audio in the DAW and set the Driver Model = Jack
Config = system/playback
Stereo in to DAW = Jack - system/capture
Stereo out from DAW = Jack - system/playback and speakers.

You can now record an audio sample track in your DAW. And then maybe use the audio clips in your project, subject to copyright. See setup below. This is in Bitwig as an example.

[Download | JACK Audio Connection Kit](#)



Mac

Note. Jack 2 currently only works on Windows. There seem to be Mac issues with the MacOS installer to do with OS security at the moment. Soundflower no longer works, so I recommend you use the free driver Black Hole. Install the driver.

DAW audio Input = Black Hole.

If you can't hear the audio but can record it, create a Multiple output device of Black Hole and Speakers in Mac/Utilities Audio/midi setup. Then select the Multiple output device in Mac settings/sound. Set that output in your DAW.

[Download BlackHole:](#)

TUTORIAL 9 - CREATING A PROGRAM

You can either edit an existing program to make it sound like you want or you can create a program from scratch using an Initialised Program. Here is how to do the latter.

1. Decide what sound you want? Let's say a Piano layered with strings.
2. Select an Initialised Program
3. Turn on internal Zone 1 - Red LED - and select a Piano. Say a VPiano. So Select a V-Piano Tone you like. Scroll through the different Tones using the piano tone button and the silver scroll wheel.
4. Adjust the V-Piano Tone Editor and note voicing settings to your liking.
5. Add any reverb send and select the reverb type
6. Add any Delay send and select the Delay type
7. For tones other than VPiano you can add Amp Sim or Effects.
8. Set any controller settings such as damper on/off, mod wheels etc.
9. Now do the same for the String Tone in zone 2 -> go through points 2 to 8
10. Set any external zones up as needed - say for VST or hardware instruments. Start at zone 5 - green LED.
11. Set any Compressor or Equaliser settings for the whole Program.
12. Write and Name the program to an initialised Program/Bank on the RD2000.

TUTORIAL 10 - ELECTRONIC MUSIC

AN INTRODUCTION TO MIDI

MIDI stands for Musical Instrument Digital Interface and allows externally generated signals to control an instrument. For instance a synth to control another synth, or a computer to control a synth. Not only can MIDI control what notes sound and the instrument played using short MIDI messages, but it can control most of the controls on a fully MIDI enabled instrument using system exclusive Sysex messages; long MIDI messages.

MIDI has been pivotal in the development of electronic music. One of the founders was Roland's Ikutaro Kakehashi the other was Tom Oberheim. It was first successfully demonstrated in 1983 with a Dave Smith Sequential Circuits Prophet 600 connected to a Roland Jupiter 6. The standard is largely unchanged and has enabled computers to fully integrate with synthesizers. Before then there were different standards of control voltages CVs' which meant people were tied to a manufacturer's standard. MIDI enables one instrument to control another or a computer to control, or be controlled, by an electronic instrument. It's now the basis of synth and sequencer communications

The first sequencer program I wrote was for the Korg MS20 in 1982. Without MIDI I had to use digital to analog converters to send the monophonic control voltage CV instructions to the synth. The synth then sent back CVs' which had to be converted to a digital value for the computer, I had to build my own circuit boards. It was not an easy task but something MIDI now handles with ease. The latest synthesizers or sound modules are called software or soft synths. See the Bluesynth 3 included with this software. These synths only exist as a program running on a computer and this approach is immensely powerful but the sound quality depends on the quality of the VST and the sound card in the PC. They have not replaced hard wired synths yet, but may do so in the future. See the MIDI association website. <https://www.midi.org/>

Virtually all midi instruments have a General MIDI instrument list of programs which can be called upon. 128 pre-programmed instrument sounds.

General MIDI 1.0 Instrument list. Note. The RD does not have this General Midi instrument bank, like many modern instruments which no longer use it. You just use the inbuilt tones.

Piano: 1 Acoustic Grand Piano 2 Bright Acoustic Piano 3 Electric Grand Piano 4 Honky-tonk Piano 5 Electric Piano 1 6 Electric Piano 2 7 Harpsichord 8 Clavinet Chromatic Percussion: 9 Celesta 10 Glockenspiel 11 Music Box 12 Vibraphone 13 Marimba 14 Xylophone 15 Tubular Bells 16 Dulcimer Organ: 17 Drawbar Organ 18 Percussive Organ 19 Rock Organ 20 Church Organ 21 Reed Organ 22 Accordion 23 Harmonica 24 Tango Accordion Guitar: 25 Acoustic Guitar (nylon) 26 Acoustic Guitar (steel) 27 Electric Guitar (jazz)	Strings: 41 Violin 42 Viola 43 Cello 44 Contrabass 45 Tremolo Strings 46 Pizzicato Strings 47 Orchestral Harp 48 Timpani Strings (continued): 49 String Ensemble 1 50 String Ensemble 2 51 Synth Strings 1 52 Synth Strings 2 53 Choir Aahs 54 Voice Oohs 55 Synth Voice 56 Orchestra Hit Brass: 57 Trumpet 58 Trombone 59 Tuba 60 Muted Trumpet 61 French Horn 62 Brass Section 63 Synth Brass 1 64 Synth Brass 2 Reed: 65 Soprano Sax 66 Alto Sax 67 Tenor Sax 68 Baritone Sax	Synth Pad: 89 Pad 1 (new age) 90 Pad 2 (warm) 91 Pad 3 (polysynth) 92 Pad 4 (choir) 93 Pad 5 (bowed) 94 Pad 6 (metallic) 95 Pad 7 (halo) 96 Pad 8 (sweep) Synth Effects: 97 FX 1 (rain) 98 FX 2 (soundtrack) 99 FX 3 (crystal) 100 FX 4 (atmosphere) 101 FX 5 (brightness) 102 FX 6 (goblins) 103 FX 7 (echoes) 104 FX 8 (sci-fi) Ethnic: 105 Sitar 106 Banjo 107 Shamisen 108 Koto 109 Kalimba 110 Bag pipe 111 Fiddle 112 Shanai Percussive: 113 Tinkle Bell 114 Agogo 115 Steel Drums 116 Woodblock 117 Taiko Drum
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28 Electric Guitar (clean) 29 Electric Guitar (muted) 30 Overdriven Guitar 31 Distortion Guitar 32 Guitar harmonics Bass: 33 Acoustic Bass 34 Electric Bass (finger) 35 Electric Bass (pick) 36 Fretless Bass 37 Slap Bass 1 38 Slap Bass 2 39 Synth Bass 1 40 Synth Bass 2	69 Oboe 70 English Horn 71 Bassoon 72 Clarinet Pipe: 73 Piccolo 74 Flute 75 Recorder 76 Pan Flute 77 Blown Bottle 78 Shakuhachi 79 Whistle 80 Ocarina Synth Lead: 81 Lead 1 (square) 82 Lead 2 (sawtooth) 83 Lead 3 (calliope) 84 Lead 4 (chiff) 85 Lead 5 (charang) 86 Lead 6 (voice) 87 Lead 7 (fifths) 88 Lead 8 (bass + lead)	118 Melodic Tom 119 Synth Drum Sound effects: 120 Reverse Cymbal 121 Guitar Fret Noise 122 Breath Noise 123 Seashore 124 Bird Tweet 125 Telephone Ring 126 Helicopter 127 Applause 128 Gunshot
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MIDI 1.0 MESSAGES – A BRIEF SUMMARY

All numbers are in Hex 0 to F. n is midi channel in Hex 0 to F. ie. Base 16.

MIDI Notes – Channel Voice messages.

8n (data1) (data 2), Note Off.

8n in Hex is 128 in decimal (n=0) to specify note off message. n is the Midi Channel. This is treated the same as a note on with volume 0.

9n (data1) (data 2), Note On.

9n in Hex is 144 in decimal (if midi channel n=0) to specify note on message. Data1 is midi note in hex 0 to 127, data2 volume 0 to 127. If data2 = 0 (volume 0) it is treated as a note off message.

Control Change CC messages

An Polyphonic aftertouch (data1) (data 2) - An = 160 in decimal if n=0.

Bn (data1) (data 2),

Bank Change is A Control Change message CC

First message MSB - most significant byte

B in Hex is 176 in decimal (if n=0) to specify CC type message.

n is the Midi Channel.

data1 is 00 and data 2 is 0 to 127 in decimal.

+

Second message LSB - least significant byte sent in quick succession

B in Hex is 176 in decimal (if n=0) to specify CC type message.

n is the Midi Channel.

data1 is 32 (20 in Hex) and data 2 is 0 to 127 in decimal.

Program Change is:

Cn (data1)

C in Hex (192 in decimal) if n=0 to specify message.

n is the Midi Channel.

data1 is 0 to 127 in decimal

Other messages

Dn Channel Aftertouch (data1) (none) - 208 in decimal if $n = 0$

En Pitch Bend (data1) (data 2) - 224 in decimal if $n = 0$

F0 System exclusive - 240 in decimal if $n=0$. (data length variable but includes Instrument manufacturer and instrument identifier at start) ends in F7 End of Exclusive EOX message.

FE (none) (none) Active Sensing (254 in decimal) - This data is filtered so they are passed through but don't show on the main text box as there would be a message every 0.3seconds. This feature was designed to turn off hung notes if a MIDI cable became disconnected. I never had this problem in 40 years of using MIDI.

TABLE OF MIDI CC MESSAGES

Undefined CC's in pink - you are free to use for your own purposes and they won't interfere with pre-programmed CCs.

CC Number	Purpose	Description
CC 0	Bank Select	Allows user to switch bank for patch selection. Program change used with Bank Select. MIDI can access 16,384 patches per MIDI channel.
CC 1	Modulation	Generally, this CC controls a vibrato effect (pitch, loudness, brightness). What is modulated is based on the patch.
CC 2	Breath Controller	Often times associated with aftertouch messages. It was originally intended for use with a breath MIDI controller in which blowing harder produced higher MIDI control values. It can be used for modulation as well.
CC 3	Undefined	
CC 4	Foot Controller	Often used with aftertouch messages. It can send a continuous stream of values based on how the pedal is used.
CC 5	Portamento Time	Controls portamento rate to slide between 2 notes played subsequently.
CC 6	Data Entry Most Significant Bit (MSB)	Controls Value for NRPN or RPN parameters.
CC 7	Volume	Control the volume of the channel
CC 8	Balance	Controls the left and right balance, generally for stereo patches. 0 = hard left, 64 = centre, 127 = hard right
CC 9	Undefined	
CC 10	Pan	Controls the left and right balance, generally for mono patches. 0 = hard left, 64 = centre, 127 = hard right
CC 11	Expression	Expression is a percentage of volume (CC7).
CC 12	Effect Controller 1	Usually used to control a parameter of an effect within the synth/workstation.
CC 13	Effect Controller 2	Usually used to control a parameter of an effect within the synth/workstation.
CC 14	Undefined	

CC 15	Undefined	
CC 16 - 19	General Purpose	
CC 20 - 31	Undefined	
CC 32 - 63	Controller 0-31 Least Significant Bit (LSB)	
CC 64	Damper Pedal / Sustain Pedal	On/Off switch that controls sustain. (See also Sostenuto CC 66) 0 to 63 = Off, 64 to 127 = On
CC 65	Portamento On/Off Switch	On/Off switch 0 to 63 = Off, 64 to 127 = On
CC 66	Sostenuto On/Off Switch	On/Off switch - Like the Sustain controller (CC 64), However it only holds notes that were "On" when the pedal was pressed. People use it to "hold" chords" and play melodies over the held chord. 0 to 63 = Off, 64 to 127 = On
CC 67	Soft Pedal On/Off Switch	On/Off switch - Lowers the volume of notes played. 0 to 63 = Off, 64 to 127 = On
CC 68	Legato Footswitch	On/Off switch - Turns Legato effect between 2 subsequent notes On or Off. 0 to 63 = Off, 64 to 127 = On
CC 69	Hold 2	Another way to "hold notes" (see MIDI CC 64 and MIDI CC 66). However notes fade out according to their release parameter rather than when the pedal is released.
CC 70	Sound Controller 1	Usually controls the way a sound is produced. Default = Sound Variation.
CC 71	Sound Controller 2	Allows shaping the Voltage Controlled Filter (VCF). Default = Resonance - also(Timbre or Harmonics)
CC 72	Sound Controller 3	Controls release time of the Voltage controlled Amplifier (VCA). Default = Release Time.
CC 73	Sound Controller 4	Controls the "Attack" of a sound. The attack is the amount of time it takes for the sound to reach maximum amplitude.
CC 74	Sound Controller 5	Controls VCFs cutoff frequency of the filter.

CC 75	Sound Controller 6	Generic - Some manufacturers may use to further shave their sounds.
CC 76	Sound Controller 7	Generic - Some manufacturers may use to further shave their sounds.
CC 77	Sound Controller 8	Generic - Some manufacturers may use to further shave their sounds.
CC 78	Sound Controller 9	Generic - Some manufacturers may use to further shave their sounds.
CC 79	Sound Controller 10	Generic - Some manufacturers may use to further shave their sounds.
CC 80	General Purpose MIDI CC Controller	Generic- On/Off switch 0 to 63 = Off, 64 to 127 = On
CC 81	General Purpose MIDI CC Controller	Generic - On/Off switch 0 to 63 = Off, 64 to 127 = On
CC 82	General Purpose MIDI CC Controller	Generic - On/Off switch 0 to 63 = Off, 64 to 127 = On
CC 83	General Purpose MIDI CC Controller	Generic - On/Off switch 0 to 63 = Off, 64 to 127 = On
CC 84	Portamento CC Control	Controls the amount of Portamento.
CC 85 - 90	Undefined	
CC 91	Effect 1 Depth	Usually controls reverb send amount
CC 92	Effect 2 Depth	Usually controls tremolo amount
CC 93	Effect 3 Depth	Usually controls chorus amount
CC 94	Effect 4 Depth	Usually controls detune amount
CC 95	Effect 5 Depth	Usually controls phaser amount
CC 96	(+1) Data Increment	Usually used to increment data for RPN and NRPN messages.
CC 97	(-1) Data Decrement	Usually used to decrement data for RPN and NRPN messages.

CC 98	Non-Registered Parameter Number LSB (NRPN)	For controllers 6, 38, 96, and 97, it selects the NRPN parameter.
CC 99	Non-Registered Parameter Number MSB (NRPN)	For controllers 6, 38, 96, and 97, it selects the NRPN parameter.
CC 100	Registered Parameter Number LSB (RPN)	For controllers 6, 38, 96, and 97, it selects the RPN parameter.
CC 101	Registered Parameter Number MSB (RPN)	For controllers 6, 38, 96, and 97, it selects the RPN parameter.
CC 102 - 119	Undefined	
MIDI CC 120 to 127 are "Channel Mode Messages."		
CC 120	All Sound Off	Mutes all sounding notes. It does so regardless of release time or sustain. (See MIDI CC 123)
CC 121	Reset All Controllers	It will reset all controllers to their default.
CC 122	Local On/Off Switch	Turns internal connection of a MIDI keyboard/workstation, etc. On or Off. If you use a computer, you will most likely want local control off to avoid notes being played twice. Once locally and twice when the note is sent back from the computer to your keyboard.
CC 123	All Notes Off	Mutes all sounding notes. Release time will still be maintained, and notes held by sustain will not turn off until sustain pedal is depressed.
CC 124	Omni Mode Off	Sets to "Omni Off" mode.
CC 125	Omni Mode On	Sets to "Omni On" mode.
CC 126	Mono Mode	Sets device mode to Monophonic.
CC 127	Poly Mode	Sets device mode to Polyphonic.

TUTORIAL 11 - USER TIPS

1. Download expansion packs 5 - tonewheel organs and 6 synths. Packs 1 to 4 add pianos from previous RD models. I think the organs and synths are more useful. I also recommend the Vpiano German Concert and Essential Upright expansion from Roland Cloud for more Vpiano tones. They are a fantastic addition.
2. The one area of weakness with the RD is Synth sounds. It is a stage piano primarily. To expand the possibilities with synths I recommend you use external software or hardware synths, which will enable deep editing of sounds. I have also designed several software synths - see synth section next page and my website.
3. Native Instruments produce good software synths and include samplers (Kontakt), FM synth (FM8), Absynth, Wavetable (Massive and Massive X) and Reaktor where you can design your own or download other's synths - Monark is a good Mini Moog emulation. Korg collection 5 is also excellent. Particularly Triton plus Modwave, Wavestate and Opsix.
4. If you want to use a second keyboard you can either use a hardware synth or use virtual instruments. Its personal preference. I like using a synth weighted midi controller keyboard the Korg Triton Pro (it has a superb Yamaha keybed, the best I've ever used) with a MOSS physical modelling board or the Roland A800 Pro 61 to control the virtual instruments and keep the RD controlling its own sounds. The second keyboard can also be used as the upper manual for Organ tones.
5. For live playing of Virtual instruments I have found Bitwig to be the most stable DAW I've used and its cross platform. I particularly like the way it sand boxes the VST's. So if a VST crashes the DAW doesn't. Alternatives are Mainstage (Mac) or Cantabile (Windows)
6. For recording I recommend Bitwig Studio. Version 5 or higher. You can also design your own instruments and effects with it.

Stuart

TUTORIAL 12 - COMPLIMENTARY SOUNDS

The RD2000ex sounds are really good. However, if you want to add some other great sounds to the RD, particularly synths, here are my recommendations.

TYPE OF SOUND	COMPLIMENTARY SOUNDS
Multi Samples	Korg Triton/Kronos Hardware / VST Native Instruments Kontakt VST Korg Collection VST
Acoustic Pianos	Roland German / Upright VPiano Expansions + Axial expansions Pianoteq VST 6.x or higher Kontakt - Alicia's Keys, Una Corda etc
Electric Piano	Lounge Lizard VST Pianoteq VST 6.x or higher
Organ (Hammond Tonewheel)	Native Instruments B4 11 NI Vintage Organs VST B-3X IK Multimedia
Mono Synths	Korg MS 20 VST Monark - NI Reaktor VST
Poly Synths	Blue Synth 3 Included in install dir. Roland Cloud - System 8. Korg Polysix VST Korg M1 VST
Analog Synth Model	SH1000 - Included in install dir. Roland Cloud Jupiter 8, SH 101 VST Korg Triton Moss - Hardware only NI Reaktor ensembles Cherry Audio - Korg P3300, GX80 Arturia Various- Buchala, Moog Modular
FM Synth	Korg Opsix Native Instruments FM 8
Strings	Korg Triton Moss or Kronos Native Instruments Kontakt various
Wave Table/Sequencer	Korg Modwave Korg Wavestate Serum Native Instruments Massive X Arturia Mini Freak
Drums	Korg Electribe-R Cherry Audio CR 78

TUTORIAL 13 - SHOULD YOU BUY A WORKSTATION OR A COMPUTER?

This is a common question and I'm assuming you use an RD2000. Modern computers, particularly Apple Silicon Macs M1 processors or later are very reliable and I think the case for using a Daw (digital audio workstation) running on a computer is stronger now than it's ever been.

If you play live to an audience, I think a stand-alone workstation may be easier than a DAW. However, most workstations' like the Kronos etc are just linux computers anyway. Many Pros mix workstations and computers.

The advantages of a workstation are:-

1. If it has a control surface it's works out of the box.

The disadvantages of a workstation are:-

1. You are limited to the sounds the manufacturer provides/allows.
You can't use VSTs or AUs which provide limitless possibilities
2. It is more expensive to replace/buy than say a new Macbook.

If you use your equipment at home or in a studio then I recommend a good DAW. I recommend MacBooks using Apple Silicon M1 or higher chips. If you use Windows 10/11 rather than a Mac I recommend you optimise the operating system. Load the latest drivers for your hardware, turn off antivirus, disc indexing, wireless networking, sleep modes for disc and USB etc. Windows use a lot of resources collecting information about the user which I do not like! You also need a good Midi keyboard! The RD2000 is superb. Maybe you also need a non-weighted midi keyboard also?

The advantages of a DAW are:-

1. Massive variety of VST/AU's (sounds) available
2. Cheaper overall and often better-quality sounds
3. Used with a good control surface gives you as good a control as a dedicated workstation
4. Much better sound editing features

The disadvantages are:

1. The Midi keyboard and controllers need setting up with the Daw and VSTs so the controllers are mapped to the controls you use.

FINALLY

My website details are <http://stuartpryer.co.uk> - the web site contains updates from time to time so keep checking. It also has my e-mail address. Please contact me if you find bugs or have suggestions on how to improve the software.

REVISION HISTORY - VERSION NUMBERS

For detailed change log/'blog' see Roland Clan Forums - RD2000

1.0.0 - 9th December 2018 - First release

First standalone version - Based upon Fractal Sequencer MIDI module.

1.05 added ability to send sysex

1.06 bug fixes

1.07 Added Program Edit form

1.7.4 Completed Tremolo effects and started Mod fx

1.8.4 Added 10 effects - Jan 2019

2.0.x February 2019 completed Midi implementation.

2.3.0 May 2019 - Programme complied using the latest version of Visual Studio - 2019. All documentation now included in the installer and deployed when installed.

2.3.1 Changed main form picture - courtesy of Gus and RD2000fan.

2.3.2 June 2019 - Corrected text in equaliser High Frequency groupbox which was labelled incorrectly as Low Frequency. Re-complied with Visual Studio 2019 update.

3.0.0 April 2023 Added the Roland Cloud German Vpiano expansion tones for firmware version 2. Complied with MS Visual Studio 2022.

3.1.0 Added ability to load Vpiano settings directly from RD using Midi. Also the ability to save the settings as a text file on

the PC and reload them from the text file and push to the RD2000.

- 3.2.2 Added ability to retrieve Supernatural Piano, Clav and ePiano settings from the RD2000 using Midi.
- 3.2.3 Added ability to retrieve Organ and Other Tones settings from the RD2000 using Midi.
- 3.2.4 Corrected bug with tone bar slider range
- 3.2.5 Added ability to retrieve Supernatural Piano, Clav and ePiano Sympathetic Resonance parameters from the RD2000 using Midi. Added tool tips to sliders to show values for supernatural piano tone editor.
- 3.2.6 Added tool tips to sliders to show values for VPiano, Organ and Other tones editors as well.
- 3.2.7 Minor bug fixes with tooltips/ labels on Vpiano form and SN pianos.
- 3.2.8 A couple of Minor bug fixes with tooltips/ labels on Vpiano form and SN pianos. Updated this documentation.
- 3.2.9 23rd April 2023. Added copy to clipboard button on VPiano form. The main form no longer obscures the windows task bar at certain resolutions. Updated this documentation.
- 3.3.0 Added facility to quickly compare before and after settings on the VPiano.
- 3.3.1 Added individual note voicing for Level and Character by note.
- 3.3.2 Added ability to modify character for high or low notes.
- 3.3.3 Added linear mapping for character v note number. Added ability to switch between Level or Character and VPiano User or S/N User and switch off both from the software.
- 3.3.4 Added Invert command to character map and the ability to tooltips which show chart Y values and midi note numbers.

- 3.3.5 30 April 2023. Added ability to stack processing commands for both Level and Character maps. Added ability to edit a single note voicing for Level and Character. Added global scale x 0.8 option.
- 3.3.6 2nd May 2023 Added ability to save to file an Individual Note voicing Character or Level map. Then reload the map from file.
- 3.3.7 Minor bug fixes. Added Firmware Version 2.0 manual which covers the new German Piano expansion tones. The latter can be purchased through Roland Cloud. Added tooltips for Individual Note Voicing sliders.
- 3.3.8 Added ability to load and view Individual Note Tuning Profiles.
- 3.3.9 Added ability to edit, Save and Load Tuning Maps to PC and load them into the RD2000. Added Undo processing. Added ability to edit between user defined note range.
- 3.4.0 Added bar to show note played on RD2000 keyboard on the Note voicing graph via a progress bar. Also shows the incoming note number as text and a red moving marker on the chart.
- 3.4.1 Improved graphics for note voicing chart. Made incoming note bar bigger 5 units tall, fixed y axis scale to +-50 and changed background to grey to match RD2000 display.
- 3.4.2 Downloading Individual Note Voice Tuning Maps now takes 2 seconds. Corrected bug in Individual Note Voicing for 'Scale' 0.8 and 1.2 function for both character and level. Stack processing for both character and level is now working properly.
- 3.4.3 Enlarged chart for Note Voicing so it's easier to see. It now shows just the 88 notes of the RD2000 keyboard. A0 to C8.
- 3.4.4 Corrected bug with show note in Note voicing form.
- 3.4.5 Added ability to download Reverb settings from RD2000 to this software.

- 3.4.6 Added ability to download EQ settings from RD2000 to this software.
- 3.4.7 You can download current Internal or External Zone status. Same as the Red/Green Zone switches.
- 3.4.8 You can now download settings from the Rd2000 for 'Program Zone Edit' / 'Internal Zones'. Changed code so Windows 7 does not throw a warning.
- 3.4.9 You can now download settings from the RD2000 for System Common settings. Various bug fixes to software.
- 3.5.0 Added ability to download all delay settings.
- 3.5.1 Added ability to Load Compressor settings and Foot controller /wheel controller settings from the RD. Various bug fixes in Delay section.
- 3.5.2 Added ability to Load Knob Assignments and Program External Zone settings
- 3.5.3 Added ability to Load Tremolo and Amp Sim Types 1 to 7.
- 3.5.4 Bug fixes to Tremolo/Amp Sim Types 1 to 7.
- 3.5.5 Bug fixes - program external.
- 3.5.6 Fixed bugs in Program External Form. Release version.
- 3.5.9 Fixed bug in Load Individual Note Tuning in 3.5.7/3.5.8
- 3.6.0 Modified layout colours in Note Tuning so the form works and appears properly Codeweavers Crossover for Mac 22.x.
- 3.6.1 Added ability to download from RD2000 Individual Note Level and Character maps.
- 3.6.2 Added ability to change Key Touch settings and Load them from the RD2000.
- 3.6.3 Added the ability to request the Current Program and Current Tone.

- 3.6.4 Added ability to load from the RD2000 the Current Rhythm settings
- 3.6.5 Added ability to import your own program list into the default program list database.
- 3.6.6 Added ability to download program names using Midi and save them on your PC.
- 3.6.7 Added ability to add Program memos and save favourites and set lists.
- 3.6.8 You can now search scene memos or for any text in the large text box.
- 3.6.9 You can now save Super Natural Piano / Sympathetic Resonance Settings, Organ (Tone wheel designer) settings and Other Tone Designer settings to a text file and reload them.
- 3.7.0 Squashed a bug in S/N piano settings, load from file. Improved Linear operator for individual note voicing. Improved Bank/program change on midi settings form.
- 3.7.1 The application is now in the Codeweavers C4 database for running under Codeweavers Crossover 22.x or higher on a Mac running OSX Mojave or higher. Improved note voicing exponential and constant function resolution.
- 3.7.2 3rd June 2023 - Playing a note on the RD2000 will now update the note number automatically in Individual Note Voicing - Edit One Note Number operator. Also hovering and getting a tooltip on a chart value will return note number and also the value to the 'Edit one Note at a Time' updown buttons.
- 3.7.3 Added smoothing function to individual note voicing.
- 3.7.4 Improved Load All Programs from RD2000 routine and % complete reported on buttons text.
- 3.8.0 In Program Library searching is now case insensitive for both data grid and textbox. Tidied up Midi Settings form.

- 3.8.1 Modified 'download all programs' routine - each program loads at 2 sec intervals to reduce load on RD2000 with successive sysex messages which increases speed of download. Updated required .net framework to 4.8. Updated these docs.
- 3.8.2 Minor tweaks and a donation menu item in the help menu.
- 3.8.3 Corrected bug in Tone Library search routine. Program library shows decimal MSB/LSB/Prog number now when program selected.
- 3.8.4 Added free synth for Native Instruments Reaktor / Player - Roland SH 1000 emulation. Windows and Mac - Runs in Reaktor which is also a Windows VST/ Mac AU.
- 3.8.5 Added note voicing text key. Swapped order of single note voicing updown boxes to match tooltips order. Fixed bug with tooltips on note voicing graph. Playing a note updates the note number and shows note value in the updown boxes (for Tuning, Character or Level).
- 3.8.6 Added a Radio button on the Note Voicing form so you can just edit the voicing map without sending sysex, or send sysex to the RD for the current voicing map or update Map and send sysex immediately at every edit.
- 3.8.7 Added a donation menu item on main form. Updated Blue Synth 3. Corrected bug in midi out short messages such as change bank and program for low parameter values and playing very low Midi note numbers from the virtual keyboard.
- 3.8.8 Added ability to send Midi CC Control Change data to the RD2000 on the Midi settings form.
- 3.8.9 Improved settings form to show sysex, cc and note data better. Added midi thru checkbox.
- 3.9.0 Feb.24 Added ability to use the software via an IPad, Android or Linux device.
- 3.9.1 Added Midi mapping matrix for Notes and CCs'.

- 3.9.2 Added button to set midi out chnl in matrix to note chnl. Harmonic mode for drawbar mappings. Bug Fixes.
- 3.9.3 Added the ability to map incoming Midi CCs to a Sysex string to send out giving vast control of instruments/vst. This works for 7-bit and 4/4-bit format sysex.
- 3.9.4 Added Midi Learn to the Matrix. Added facility to map Midi CC data to channel After Touch so you can send aftertouch data on a keyboard without aftertouch using a controller like a damper pedal or expression pedal, knob. Etc. Software now stores your previously selected Midi in /out devices in the Windows registry. Added MTC/active sensing and Controller reset to Mapping options.
- 3.9.5 06/04/24 Fixed a bug where current note played (Red bar and progress bar was not showing on the Individual Note Voicing tuning, character and level graph. In harmonic bar mode you can reverse the sliders to act as drawbars on an external instrument using sysex mapping and setting 004 in the right-hand column. Added two examples of midi maps in the installation directory.
- 3.9.6 Tidied up layout of Delay form. Updated these docs.
- 3.9.7 Updated software to include the new VPiano Essential Upright piano model / RD2000 EX upgrade. Software works for both the RD2000 and RD2000 EX. Updated the Roland RD2000 official manuals in the installer to the EX versions.
- 3.9.8 Corrected bug in Individual Note Voicing/Tuning/Smoothing where the smoothing was applied to all notes rather than the selected range. Corrected bug where Bank and Program change on the midi form were not working.
- 3.9.9 Added a Railsback stretch tuning curve - as a tuning template in individual note voicing/tuning.

Version 4.0.0 - 02/08/24

1. Added a generic RD2000 standard tuning template - in individual note voicing/tuning.
2. Added an Average tuning template.
3. Improved bar graph colours, darker blue - individual note voicing - for better clarity. And last note played brighter red.
4. When displaying note voicing Character magnified Y axis scale +-5 to show bar graph clearer.
5. Changed individual note voicing graph background to white to improve visibility and accessibility.
6. The 0.8x and 1.2 times radio buttons in individual note voicing can now be modified by the slider to the right giving a range of 0.5 to 0.9 and 1.1 to 1.5 respectively for finer control. Slider centred values are 0.8/1.2.
7. Individual note voicing - Editing Range - You can set the range by playing a lower and upper note numbers and clicking the respective Set buttons.
8. Updated these documents.

4.0.1

1. Individual note voicing - Changed smoothing routine to rolling average of three successive notes.
2. Individual note voicing - You can also change the note range by hovering the cursor over the lower and upper note numbers and clicking the respective Set buttons.
3. Individual note voicing - Improved RD2000 German Concert tuning template using two curves exponential and cubic.

4.0.2

1. Individual note voicing - Added Tuning templates for German Concert Grand and Essential Upright created using the PianoMeter app.
2. Added label to show note. Eg A#4 below midi note number for edit one note at a time.

4.0.3

1. Individual Note Voicing - Updated RD2000 German Concert template 'Stretch Tuning German' radio button to PianoMeter tuning curve to within 2 cents. Slightly smoother curve using two cubic splines.
2. Individual Note Voicing - Added large font showing note being played or inspected to help when editing maps. Bottom left of window.
3. Individual Note Voicing - Added Stretch Tuning 'german Pianometer curve.txt' in installation directory with exact PianoMeter values for notes A0 to C8 taken straight from PianoMeter curve.
4. Individual Note Voicing - Added keyboard image below graph to help with visualising which piano key is being 'tuned'.
5. Individual Note Voicing - Improved smoothing routine.
6. Individual Note Voicing - Added Essential Upright tuning templates for SB01 to SB06 (Recital) and another for SB07 to SB14 (Rock).
7. Fixed bug with 88 note virtual keyboard.

4.0.4

1. Individual Note Voicing - Increased size of font for clarity - edit one note and note range updown buttons.
2. Added ability to load TuneLab 5.x pro stretch tuning files straight into the RD20000 editor.
3. Added ability to load PianoMeter Pro stretch tuning files into the RD20000 editor to produce an approximate tuning curve. Inharmonicity is not adjusted yet. Manually entering transcribing values is the accurate way at the moment.

4.0.5

1. Added the Tuner Form - individual note voicing to help when using tuning apps.
2. Improved individual note voicing - Edit One Note - so that sysex is only sent for the edited note and not all 88.
3. Added German Concert Improved tuning file.txt in installation directory which corrects factory German Concert tuning errors.

4.0.6

1. Individual note voicing - Changed tuning minimum increment to 0.1 cents - the RD2000 smallest increment.
2. Changed tuning editing functions smallest increment to 0.1 cents too.
3. Added Upright VPiano SB07 to SB14 Modified Tuning template - 3 part perfect 12ths in installation directory.
4. Added VPiano SB01 Concert Grand Modified Tuning template - 3 part perfect 12ths in installation directory.
5. Set Tuning form to always be on top of any opened windows to work alongside tuning apps for instance.
6. You can now add Historical Temperaments to your tuning curves using the free version of TuneLab 5.3.
7. You can create your own Temperament files.
8. System Common - Master Tune. Fixed bug when downloading tuning RD2000 settings for this form. Increased resolution so range is - now +100.0 Cents to -100.0 Cents (+/-1 semitone) in increments of 0.1 Cents.
9. Updated this documentation.

4.0.7

1. Added Sympathetic Resonance Other Settings. These are not accessible through the RD2000 or documented in the Parameter manual! I've added them as they are in the Midi Manual for you to test and play with. They work with most pianos other than VPiano and work with the damper pedal.
2. Added error trapping for 'Load settings from RD2000' - System Common, System Compressor and Foot Controller for when midi in and out ports are not open or RD2000 not connected.
3. You can now compare two voicing curves by subtracting one from another. Curve A-B
4. Added a detailed tuning for the German Concert VPiano in installation directory. German Concert ver 5.txt
5. Built using latest version 17.11.1 of Microsoft Visual Studio.
6. Updated this documentation.

4.0.8

1. Individual note Voicing. Added Zoom + and Zoom - buttons to magnify Y axis scale on chart.
2. You can now combine two voicing curves by adding one to another. Curve A+B. you can use this to add temperament adjustments from a temperament file.
3. You can now create your own temperament files using the Temper Button once you input the offsets for 12 notes - A3 to G#4.
4. Added the ability to load TuneLab .tem temperament files.
5. This software is built using latest version 17.11.2 of Microsoft Visual Studio.
6. Checked current version is running and displaying properly in Codeweavers Crossover for Mac version 24.x
7. Updated this documentation.

4.0.9

1. You can open and load .tun tuning files from TuneLab etc.
2. Added a button to view a Scala Tuning file. "Scala"
3. This software can automatically map 12 note per octave Scala files to the RD2000 keyboard.
4. For other Scala files not 12 notes per octave you can manually map notes.
5. Added more tooltips to the Individual Note Voicing Form.
6. Details on using the RD2000 for microtonal music is in this updated documentation.
7. This software is built using latest version 17.11.3 of Microsoft Visual Studio.

4.1.0

1. Individual Note Voicing. Main text box copied to second text box for .scl and .tmp files, so data is not hidden if the value on graph is queried (tooltip).
2. Improved routine for opening temperament files.
3. Added facility to Save form settings to a plain text file and then Load them at a later time for the following windows forms:-
 - Key Touch settings.
 - Knob Assignments.
 - Foot Controllers and Wheel Assignments.
 - System Compressor.
 - Equaliser EQ.
 - Delay.
 - Reverb.
4. Updated 'Load Settings from File' Code on forms so when a file is loaded both the form values and the RD2000 values are updated by sending sysex to the RD2000, The latter requires the software's midi In/Out ports are opened and set to the RD2000).
5. Updated this Documentation.
6. This software is built using latest version 17.11.4 of Microsoft Visual Studio.

4.1.1

1. Added facility to Save form settings to a plain text file and then Load them at a later time for the remaining windows forms: -
 - Tremolo and amp simulations
 - System Common settings
 - Program Internal Zone settings
 - Program External Zone settings
 - Modulation Effects
2. Updated this Documentation.

4.1.2

1. Updated this software so that Screen Reader software will work with this application. This is to help people with limited or no vision control the RD 2000. Screen Reader facilities have been tested with Windows Narrator and NVDA, JAWS for Windows will work too plus others.
2. Fixed bug with program internal zone transpose, coarse and fine tune sliders.

4.1.3 - 18th October 2024

1. Accessibility - modified column header names in Program, Tone and Rhythm Libraries to make them more user friendly when using screen readers.
2. Added 15 videos on my website to help users install the software and edit the RD2000 using the RD2000 Editor.
3. Added a link on the main menu - Synths - to my Fractal Sequencer software.
4. Updated my free Roland SH1000 synth emulation to version 2.5
5. Updated this Documentation.
6. This software is built using latest version 17.11.5 of Microsoft Visual Studio.

4.1.4 - 26th October 2024

1. Updated program library form layout to make it more logical.
2. Bug fix. Fixed error when loading program Banks M, N and O. ie. program numbers 256 to 300.
3. Bug Fix. Stopped sysex being sent when editing forms opened. (trackbar.scroll instead of trackbar.valuechanged)
4. Program Library - Load Program Bank - Increased interval between sending Bank/Program change and requesting program name midi dump to 200ms and added 30 ms delay between sending bank/program change midi messages. This avoids RD2000 Midi buffer filling and repeated program names with fast computers. Changed code (string variables) so program list download does not create repeated program names in Windows 11.
5. It now takes 10 seconds to download a single Program Bank's list.
6. Increased speed downloading all Banks Program name lists - now takes 4 minutes.

4.1.5 - 1st November 2024

1. Finalised program library form layout to make it more logical.
2. Program Internal Zone. Added Resonance Send and Voice Reserve sliders and added accessibility properties.
3. Program Library - You can update the factory default RD2000 Program list with your own RD2000 bank(s) downloaded using Midi and 'Save My Programs to file' button. Then when you 'Load my Programs from File', the bank letter column background will be coloured grey for the bank(s) you updated.
4. The MSI installer will uninstall any previous versions first. If you have any issues just Uninstall previous versions first using windows add and remove programs. The software's version number is shown on the Main form's header. The assembly file version and file information will increment with each release. So will the Installer version. The installer will check for newer versions and warn you but will automatically remove older ones.
5. Updated this Documentation.

4.1.6 - 5th November 2024

1. When you load an RD2000 Settings file from your computer the new settings will be sent by midi sysex to the Rd2000 for the Tone Designer forms (Vpiano, SN Piano, Organ and Other tones).

Now this will work for ALL of the following forms:-

- System Common
- System Compressor
- Reverb
- Equalisation
- Delay
- Foot Controllers
- Knob Assignments
- Key Touch
- Program Internal Zone
- Tremolo/Amp Simulator
- Modulation FX
- Program External Zone

This enables you to keep your favourite settings for each form as a collection of files on your computer and easily reload them on the RD2000. For instance, you might have favourite Equaliser settings you could reuse on various pianos. Or a favourite Reverb setting for Clavs. Or favourite VPiano settings etc. Make sure you name the text files so they have a meaning eg. 'Piano_reverb 1.txt' or Clav_compressor3.txt. or VPiano7.txt etc. You can easily share these setting files with other users!

2. Added a 'Find Current tone' button on the Tone Library form. The current Tone displayed in the Get Current box will be used to search the Tone Library. Added Accessibility name.
3. Tone Library. Added 'Highlight All' checkbox for searching all text immediately rather than pressing the Search Button for each instance. Added Accessibility name.
4. Added Accessibility names for 'Send Midi to RD2000' check boxes on all forms.
5. Added all Accessibility names to 88 note keyboard form.
6. 88 Note Virtual Keyboard - Hold Note now works for Chords.
7. New [Saving and Loading Settings](#). Video.
8. Installing later versions of the software will always automatically uninstall earlier versions.
9. Updated this Documentation.

4.1.7 15th November 2024

- 1 Added ability to download 20 Effect Settings from the RD2000. Added buttons Accessibility name for screen readers
- 2 Added a description box describing the Effect when it is selected.
- 3 Effects - Humaniser - Removed unused Trackbar 17 on form.
- 4 Effects - Equaliser - Corrected Trackbar 5 and 6 plus labels which were not always visible when Equaliser selected.
- 5 Effects Enhancer - Track bar order when downloading settings and updating form from RD corrected. Rev 005.
- 6 Tone Library - Added Page Up and Down Buttons. Added their Accessibility names for screen readers. Rev 006.
- 7 Individual Note Voicing - Tuning - Add Constant. Smallest increment now 0.1 cents. Rev 007.
- 8 Individual Note Voicing - Red bar showing note played - height of bar proportional to midi note volume of note played. Rev 008.
- 9 Individual Note Voicing - Process Button goes red when pressed shows % Complete and goes green when done.
- 10 Updated this Documentation.
- 11 This software is built using latest version 17.12.00 of Microsoft Visual Studio 2022. Rev 009

4.1.8 20th November 2024

1. Individual Note Voicing - 'Load Tuning, Level or Character from RD2000' Button goes red when pressed and goes green when User voicing settings received. Button text shows % complete. Rev 1.
2. Individual Note Voicing - Selecting VPiano/S/N Piano User, Preset or Off always send midi regardless of Send Sysex to RD2000 check box state - routine now has better logic. Rev 2.
3. Individual Note Voicing - You can move the keynote for unequal temperaments. Rev 3
4. Program Zone Edit - Tone Library - Improved Search routine so when the whole tone data base is searched only the rows with the search string found are shown. This provides advanced search filtering as multiple searches can be performed. Rev 005
5. Program Zone Edit - Tone Library - Fixed minor bugs with page up/down. Find current button removed as duplicated Get current.
6. Updated this Documentation. Added chapter Headings.
7. This software is built using latest version 17.12.1 of Microsoft Visual Studio 2022. Rev 007.

4.1.9 25th November 2024

1. Program Zone Edit - Tone Library - Search all rows at once - if unchecked. List scrolls with each click of the search button. Rev 1.
2. Program Zone Edit - Tone Library - Added option to hide or not hide Rows if search item not found. Rev 2.
3. Individual Note Voicing - Added Copy and Paste for Large text box. Useful for sharing tuning files over eg. Facebook where you can only paste text, but not share files. Rev 3.
4. Individual Note Voicing - Improved clarity, logic and layout of form. Rev 4 to 6
5. Program Common - Program Library - Improved Search routine so when the whole program data base is searched only the rows with the search string found are shown. This provides advanced search filtering as multiple searches can be performed. Rev 007
6. Program Common - Song/Rhythm - Improved Search routine so when the whole program data base is searched only the rows with the search string found are shown. This provides advanced search filtering as multiple searches can be performed.
7. Updated this Documentation.
8. This software is built using latest version 17.12.2 of Microsoft Visual Studio 2022. Rev 007.

4.2.0 3rd December 2024

1. Super Natural Piano. Sympathetic Resonance - Other settings - can be saved and loaded from file. Rev 1.
2. Individual Note Voicing - When you load a Tunelab tuning file .tun the file path and contents are displayed in the lower text box.
3. Individual Note Voicing - When you load a tuning file .tun the file path and contents are displayed in the lower text box.
4. Individual Note Voicing - When you Add or Subtract curves A+B, A-B the two file paths displayed in the lower text box.
5. Added VPiano - Stage Grand S01 and Recital Upright SB 01 3 part perfect 12th tuning Curves in installation directory.
6. Tidied up form start up positions at load and minor cosmetic changes to note voicing form.
7. Updated this Documentation.
8. This software is built using latest version 17.12.3 of Microsoft Visual Studio 2022.

4.2.1 28th December 2024

1. Individual Note Voicing - Added buttons for the Factory Presets for all of the Vpiano models.
2. Individual Note Voicing - Added 3-part perfect 12th tuning presets (6:2,3:1,3:1) for all VPiano models.
3. Individual Note Voicing - Added ChkSum button so you can check voicings for repeats etc. Rev. 001
4. Program Common Edit - Program Library. I've Improved the logic, code and way the Program Library works. When the Program Library form opens, your current program library from the RD2000 is shown. A file programs.txt is in the installation directory containing current program list. This can be updated by the user by downloading the 300 program names by midi using this software. Rev 3. Updated search routine.
5. Updated this Documentation.

4.3.0 18th May 2025

1. Added in Individual Note Voicing - quick comparison of tuning profiles and graphs. Save A, Save B profiles. Also, a quick toggle button for Load A and Load B profiles to see differences.
2. Added button which Adds profiles = $A + B$ so you can add unequal temperament offsets (Scala Files, Temperament files and your own) to equal temperament tunings to create historical or novel tunings.
3. Added another button which subtracts profiles = $A - B$. You can then compare curves by showing the difference in values.
4. Improved my 3-part perfect 12th German Concert V piano tuning for notes D1 and E1 using aural tuning.
5. Added a professional tuning profile for the German Concert Grand VPiano and Supernatural Piano 0028.
6. Minor change to midi 'program change' code.
7. I now recommend running Wine 10.x or higher on a Mac to run the software. Codeweavers Crossover does not handle program change commands and sends erroneous characters "00 00". I've reported the issue to Codeweavers.
8. Changed button face colour on 3 buttons bottom right on program library form so the buttons show correctly on Mac Wine and Codeweavers Crossover.
9. Changed button face colours on Note Voicing form so if you use Wine on a Mac with graphic properties set to None rather than a Light Theme they show correctly.
10. Built using the latest Version of Microsoft Visual Studio 17.14.0
11. Updated this Documentation.

4.3.1 rev 000 27th May 2025

1. Updated German Concert 3 part tuning perfect twelfths. Every note adjusted using tunelab. German concert ver 7 rev 1.txt in installation directory and can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click German concert button at top right.
2. Updated Essential Upright SB07 to SB14 3 part tuning perfect twelfths. Every note adjusted using tunelab. 'Upright Rock SB07 to SB14 rev 1' in installation directory. It can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click preset SB07 to SB14 button near top right.
3. Updated Essential Upright Recital SB01 to SB06 3 part tuning perfect twelfths. Every note adjusted using tunelab. File name 'Upright recital SB01 to SB06 rev 1' in installation directory. It can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click preset SB01 to SB06 button near top right.
4. Updated S01 Stage Grand 3 part tuning perfect twelfths. Every note adjusted using tunelab. File name 'S01 3 part all notes' in installation directory. It can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click preset 'S01' button near top right.
5. Updated S08 Aco Grand 2 3-part perfect twelfths tuning. Every note adjusted using tunelab. File name 'S08 every note 3 part' in installation directory. It can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click preset 'S08' button near top right.
6. Updated S02 Deep Concert 2 3-part perfect twelfths tuning. Every note adjusted using tunelab. File name 'S02 3 part 12ths all notes' in installation directory. It can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click preset 'S02' button near top right.
7. Tuning Form - 'Play Note' button changes to cyan when pressed. Reverts to light blue when released.
8. Fixed a bug on the note tuning form where 'play note' would not sound unless a note was played on the Midi Settings form first.
9. Fixed a bug when sending Individual Note Voicing values for Notes A5 and A#5 to the RD2000.
10. Built using the latest Version of Microsoft Visual Studio 17.14.2

4.3.2 1st June 2025

1. Updated VPiano S03 3 part tuning perfect twelfths. Every note adjusted using tunelab. S033part1.txt in installation directory and can be accessed by selecting 3 part perfect 12th radio button on tuning form and then click German concert button at top right.
2. Tuned VPiano tones S04, S043part.txt and S07 and S073partall.txt - 3 part perfect 12th. Every note adjusted using Tunelab.
3. Tuned VPiano tones S05, S043part.txt 3 part perfect 12th. Every note adjusted using Tunelab.
4. Tuned VPiano tones S06, 3 part perfect 12th. Every note adjusted using Tunelab.
5. Tuned VPiano tones S07, S073partall.txt 3 part perfect 12th. Every note adjusted using Tunelab.
6. Tuned VPiano tones S08, S08 3 part all.txt 3 part perfect 12th. Every note adjusted using Tunelab.
7. Tuned VPiano tones S09, 3 part perfect 12th. Every note adjusted using Tunelab.
8. Tuned VPiano tones S10, S103part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
9. Tuned VPiano tones S11, S113part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
10. Tuned VPiano tones S12, S123part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
11. Tuned VPiano tones S13, S133part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
12. Tuned VPiano tones S14, S143part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
13. Tuned VPiano tones S15, S153part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
14. Tuned VPiano tones S16, S163part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
15. Tuned VPiano tones S17, S173part1.txt 3 part perfect 12th. Every note adjusted using Tunelab.
16. Added two buttons on Tuning Form to increase and process by ± 1 cent in one go.
17. Fixed a bug when using the Tuning Form or Individual Note Voicing form when editing one note at a time for Character or Level changes did not work.
18. Built using the latest Version of Microsoft Visual Studio 17.14.3

4.3.3 11th June 2025

1. Individual note voicing - Removed alternative tunings option from third parties. Better to import alternative tunings as a file rather than hard code.
2. Added to tuning form ± 0.3 cent adjustment & process buttons which apply for tuning only. Character and Lever value resolution ± 1 only.
3. Improved logical layout of Tuning Form - now a main menu item and not a button.
4. Added ability to import column note tuning offset data from the Export CSV file from the Entropy piano tuner or any column data of 88 note offsets. Copy column data and paste into RD2000 editor.
5. Added Radio Button on Tuning Pre-sets' to select Entropy Tuning curve for the following Expansion tones: - SA01 to SA17, SB01 to SB06 and SB07 to SB14.
6. Added Entropy tuning for VPiano S01
7. Added Entropy tuning for VPiano S02/S06
8. Added Entropy tuning for VPiano S03/S09
9. Added Entropy tuning for VPiano S04/S05
10. Added Entropy tuning for VPiano S07.
11. Added Entropy tuning for VPiano S08.
12. Added Entropy tuning for VPiano S10 to S017.
13. Added Entropy tuning for Supernatural Pianos sn0001 Concert Grand, sn0002 Bright Concert and sn0028 Upright Piano in installation directory.
14. Improved 'Load Ent 88 note' sub routine to handle scientific notation eg. $-1.92\text{E}-13$ and can load whole column from CSV with or without header.
15. Added the Automated Entropy Tuning Feature.
16. Added Octave option to 88 note keyboard form
17. 88-note Keyboard form set to always be on top of other forms.
18. Built using the latest Version of Microsoft Visual Studio 17.14.4

4.3.4 21st June 2025

1. 88 note keyboard - Added 4 note run down - to help with tuning.
2. 88 note keyboard - Added 4 note run up - to help with tuning.
3. Added ability to use part of tuning curve A - notes delimited by updown boxes, with the remaining notes set to tuning curve B. A + B procedure updated. Simple addition only if updown boxes are set to 21 and 108 respectively.
4. Fixed bug in curve A+B procedure. Note 108 was not calculated correctly.
5. When you load the entropy tuning note list, you can now copy the whole column, the note list without the header or the header and first x note lines. Example. Copy the first 10 notes only which will set the remaining note offsets from equal temperament to 0.
6. Edited the first 14 notes of the preset - German Concert SA01 tuning (Entropy version) to make for a much better tuning. Used 3 Part Perfect 12th values for first 14 notes.
7. Edited the first 18 notes of the preset - Recital Upright SB01 tuning (Entropy version) to make for a much better tuning. Used 3 Part Perfect 12th values for first 18 notes.
8. Edited the first 18 notes of the preset - Rock Upright SB07 tuning (Entropy version) to make for a much better tuning. Used 3 Part Perfect 12th values for first 18 notes.
9. Tuning Form. Auto Entropy Sampling procedure reports the current midi note number completed even if sampling is stopped. You can restart sampling by entering this note number.
10. Note Tuning, Level and Character form. Added a 'Copy Selected' text button for the main text box.
11. Scala files. When opened now shows file path in first line of lower text box.
12. 88 note keyboard. Added Perfect fourth and fifth intervals.
13. Added error catching for sysex form procedures.
14. Added in the Synth - menu - Links to the Korg Triton Controller and MidiToolBox software documentation.
15. Bug fix. Changed foreground colour of 'auto entropy button' text to show properly on a Mac.
16. Bug Fix. 88 note virtual keyboard - Midi notes are now able to be sent immediately form is open.
17. Fixed bug when saving files. Was to nearest integer in cents. Now to 0.1 cents.
18. Built using the latest Version of Microsoft Visual Studio 17.14.6

Version 4.3.6 003 - 2nd September 2025

1. Fully updated code for adding favourites to Program Library and adding memos to programs.
2. Added a professional piano tuner's tuning for VPiano S01. It's in the installation directory and called 'barrys tuning stage grand s01'. Courtesy of Richard Bint.
3. When saving your Program Library - pre-populated the file name with 'Programs.txt' which has to be used. Saved to say documents folder and then copied to installation directory.
4. Added arrows to page up/down buttons.
5. 03/08/2025 fixed minor bug with program change routine.
6. 209/2025 Changed background colour of 'buttons to show colours properly on a Mac - running wine light theme.
7. Built using the latest version of Visual Studio 2022. 17.14.13

Version 4.3.6 004 - 10 October 2025

1. Added a tuning button for a professional tuning for S01 courtesy Richard Bint of two:3Studios.
2. Built using the latest version of Visual Studio 2022. 17.14.16

USER COMMENTS

Gus - Roland Forums.

You did a great job. Everything is perfect....

V 3.x You have done an exemplary job

RD2000fan - Roland Forums

The RD2000 editor is a great job....

Johno - Facebook RD2000 Group

I only just received my new 2000ex. Came from the 700sx - big jump up I know. I still love my 700sx though. Was pretty underwhelmed by the Vpiano's and standard piano patches. Even loaded the Axial expansions to put the 700sx patches in to compare. Just couldn't get the German or upright to sing. Just sounded overly fake and thin.

Then came across this post. Installed the software on a VM on my Mac. Loaded across your Individual Note Voicing preset, change key touch to light (+2 > +5) and far out does it make a difference. So much better!!! Did try the key touch change first and helped a bit, but your tone designer change - it's chalk and cheese 🙌🙌 Have started looking at this voicing for the uprights now and they sound way better too. So much depth and presence now.

This is a must do RD-2000 fix for every user. It's easy as to do and takes 10-15mins from download to loaded onto piano - and that includes the time it took me to flick through Stuart's manual to find the Voicing load section.

David Truong – Facebook RD2000 Group

I love the new version of Stuart's free RD2000 editor. I am a blind musician / keyboard player and I have many keyboards with the RD2000 being one of my favourites because out of my keyboards it has given me the most access due to the many buttons, knobs and sliders it possesses

However, there were a number of settings I could not get access to due to not being able to see the RD2000 screen 😊. So I reached out to Stuart to see if he could add accessibility by making his program screen reader friendly. Being blind, I rely on a program which works within the operating system whether it be mac or PC and outputs to voice or Braille what is happening on the screen. We call this a screen reader. Screen readers do much more than this but I am only simplifying so you have an idea. Anyway, Stuart was able to get this happening and now I have a lot more access to my RD2000 than I ever had before. For example, I am now able to edit the virtual piano settings, access the compressor ETC which I did not have access to before. Having this extra access to my RD2000 thanks to Stuart is really a game changer for me and other blind and vision impaired keyboard players once I let them know about Stuart's free RD2000 editor.

So thank you so much Stuart for your hard work on this. I know I speak on behalf of all blind keyboard players who will enjoy your work that it is very much appreciated and valued. Thank you again Stuart for adding Accessibility to your free RD2000 editor.

P.S. If you enjoy Stuarts free RD2000 editor like I am, I would encourage you to donate whatever you can to insure Stuart can continue to deliver one of the finest free keyboard editors out there. I have 😊.

Evgeny Sazhin

Thank you very much for your great software

Richard Bint

Commenting on my German Concert 3 Part tuning - 'applying your tuning to that patch is stunning - you get loads of points - maybe you should consider tuning as a side hustle, you've hit it with me - try pitching it to a world class recitalist! just saying buddy'.

SO THAT'S IT?

If there are features you would like to add, let me know and if it is possible, I will add them. Feedback and a wish list for additional functions are always welcome, together with suggestions for improving the documentation! Have Fun ☺ !

Stuart Copyright 2018 - 2025

LINKS TO WEB SITES

1. For updates, Fractal Sequencer and a free virtual synth and midi file player/ arpeggiator visit my site <https://stuartpryer.co.uk>
2. To run the software on a Mac using Wine which is free <https://www.winehq.org/>
3. Roland Corporation, <http://www.Roland.com>
4. Roland Axial Website for more RD sounds www.axial.roland.com
5. Roland Cloud for the German Vpiano, Essential Upright/EX expansion etc.
6. For free Windows Midi utilities try MIDI Tools by Mountain Utilities [Mountain Utilities](http://www.midiox.com/) or Midi Ox at <http://www.midiox.com/>
7. For free internal PC midi routing I recommend LoopMidi [Software | Tobias Erichsen \(tobias-erichsen.de\)](http://www.nerds.de) or LoopBe1 <http://www.nerds.de>.
8. RPTMidi - for connecting a PC Midi to mac Midi. [Software | Tobias Erichsen \(tobias-erichsen.de\)](http://www.nerds.de)
9. For Windows internal audio routing - <https://jackaudio.org/>
10. KVR Forum - great place for electronic music information <http://www.kvraudio.com/>
11. Korg <http://www.korg.com> Korg Collection 5 - Superb synths plus Wavestate, Opsix and Modwave. Thanks to Dan Phillips Korg USA.
12. Native Instruments - Producers of a fantastic suite of virtual instruments and effects. <http://nativeinstruments.com> Thanks to Stephen Parker.
13. Bitwig 5.3 - a very modern DAW which runs on Macs or PCs. <http://bitwig.com>
14. Cantible 3 VST host by topten software. A great windows equivalent to Mainstage. www.cantiblesoftware.com Thanks to Brad.
15. Midi Designer Pro - RD2000 editor by J K Hiser. Midi Designer Pro is a paid for app which can run a free RD 2000 editor on iPads. [MIDI Designer \(for iOS\)](http://www.cantiblesoftware.com)
16. Facebook RD2000 and RD series user groups.
17. PianoMeter app for IOS and Android. Goto app store or google play. Free, Plus and Pro versions available. I recommend this app as it works so well! <https://pianometer.com/>. Many thanks to its author Anthony Willey for his help.
18. Voxengo Span an excellent and free Spectrum Analyser plugin. VST or AU. <https://www.voxengo.com/product/span/>

19. TuneLab Pro 5.3 Windows /iPhone or Android piano tuning software
<https://www.tunelab-world.com/> Many thanks to Robert Scott for his advice.
20. Pianoworld - <https://pianoworld.com>. Everything Piano.
21. For a description of unequal temperaments
<https://www.kylegann.com/histune.html>
22. PlugIn Buddy by Modalics - A free stand alone or VST3/AU/AAX plugin host for Windows or Mac that can load up to 4 VST3 plugins' For instance you could run VST3 plugins in ProTools using this as a wrapper. <https://www.modalics.com/products/plugin-buddy-free>
23. Richard Bint of - two:3Studios - and Barry Mole of the piano tuners' association of the uk for the tuning gift Richard has made to all owners of the rd2000 and rd2000ex. This is a professional tuning for the S01 Stage Grand VPiano in the installation directory.

RECOMMENDED BOOKS

1. All of the RD2000 Documentation. Roland Corporation 2024. Documentation for any hardware synths and VSTs.
2. MIDI for the professional - Paul D Lehermann. Amsco 1993.
3. The Midi Manuel - David Miles Huber. Focal press 1999.
4. Pianos in Practice - Eric Smith 1978. Sclar paperback
5. Pianos inside out - Mario Igrac. In Tune Press. 2013. A very comprehensive book on the Piano and its maintenance.
6. Piano Servicing, Tuning and Rebuilding - Arthur A Reblitz. Vestal Press. 1993. Another comprehensive book on the Piano.
7. Vintage Synthesizers - Mark Vail. Backbeat books. 2000.
8. The Synthesizer - Mark Vail. Oxford University Press. 2014.
9. Beauty in the B - The Hammond Organ - Mark Vail, Millar Freeman. 1997.
10. Dictionary of Hammond Organ Stops - Irwin. Schirmer 1961. Out of print but possible to get second hand.

INDEX

8

88 Note Keyboard, 39

A

ACCESSIBILITY, 10

ACCESSORIES, 234

After Touch AT, 206

AMP SIMULATIONS, 84

Assign mode, 32, 231

Audio in/out, 47

Audio Input, 42

Audio Interface, 234

Audio Output, 42

AXIAL EXPANSION, 77

axial expansions, 71

B

BACKCOVER, 289

balanced connections, 234

beat frequencies, 117

Bitwig, 38

BITWIG STUDIO, 237

Black Hole Driver, 239

BLUE SYNTH 3, 223

Bluesynth 3, 242

C

Cabinet Resonance, 91

Channel After Touch, 206

Channel Voice messages, 19

CHARACTER, 102

Christofori, 161

compression added, 40

CONSTANT, 185

Control Change **CC** messages, 19, 245

control surface, 231

Controller Assignments, 32

controller number 0 to 127, 28

CREATING A PROGRAM, 241

Ctrl (Control) mode, 33, 231

CVs, 242

D

D-50, 77

Damper Noise, 91

Damper polarity, 48

Damper Resonance, 91

Dave Smith, 242

DAW, 230

DECREASE HIGHER NOTES, 184

delay, 40

Delay, 83

DELAY, 63

Density, 60

Diffusion, 60

Din Ports, 41

donation, 23

Donations, 11

DP7, 234

Drum Machine, 238

dump., 34

Duplex Scale, 91

E

EDITING ONE NOTE AT A TIME, 183

EDITING THE NOTE LEVEL & CHARACTER MAP, 181

Editing Tuning Maps, 125

EQ, 40

EQUALISATION, 62

EXITING THE SOFTWARE, 23

F

F0 = start of sysex, 36, 214

F7 ends the sysex string, 37

Fast Fourier Transforms, 137

favourite programs, 54

FFT, 137

File /Exit, 20

Firmware version 1.5, 84

firmware version 2.0, 78

FOOT CONTROLLERS AND WHEELS, 67

Fractals, 227

G

General MIDI, 242, 243

GERMAN PIANO, 78, 81

German Vpiano expansion, 71

Green light, 65

H

Hammer Noise, 91

Hammond, 194

HARMONIC BAR MODE, 33

Headphone amp, 234
Help, 22
HEX, 36, 214
historical temperament, 163
Hold Note, 26

I

IAG driver, 14, 38
INCREASE HIGHER NOTES, 184
Individual Note Voicing, 22
INDIVIDUAL NOTE VOICING, 99
Initialised Program, 52
INVERT, 186
iPAD, 16
iPhone, 16

J

Jack, 239
Jack audio driver, 239
JAWS for Windows, 266
Jimmy Smith, 196
jog wheel, 232
JUNO-106, 77
Jupiter-80, 77

K

Key Off Noise, 91
Key Off Resonance, 91
KEY TOUCH, 69
KNOB ASSIGNMENTS, 68
Korg MS20, 242
Korg Triton, 235

L

LAYERING AND SPLITTING, 233
Leslie, 194
LEVEL, 101
Lid, 90
LINEAR, 186
Load Settings, 48
Local Control, 35, 238
Logic, 38
LoopMidi, 281
LoopMIDI, 38
LSB, 52

M

MAC, 13
Mac computers, 235
Mapping a Note to a CC, 210

MAPPING MIDI MESSAGES, 199
MAPPING SYSEX, 213
maps, 203
Master Tune, 48
matrix, 199
Mean Tone, 192
Microsoft Visual Studio, 12
Microtonal, 172
MIDI, 242
Midi - menu, 20
MIDI Bank, 29
Midi CC messages, 67
MIDI CC MESSAGES, 247
MIDI channel, 29
Midi In, 41
Midi interface, 235
Midi Learn, 202, 232
Midi Out, 41
MIDI RECORDER, 226
Midi Through, 26, 35
MIDI Tools, 281
midi transmit channel, 88
Midi/Settings, 26
Mod FX editor, 86
MODULATION EFFECTS, 85
Monte Carlo, 146
MOSS physical modelling, 251
MSB, 52
Multiple output device, 240

N

Native Instruments, 251
NOTE CHARACTER, 106
NOTE LEVEL, 105
NOTE TUNINGS, 103
NVDA, 266

O

Other messages, 246
Other Tones, 22
OTHER TONES, 197

P

Pan, 83
parameter manual, 23
partial, 116
Perfect 12th, 144
Perfect fifth., 39
Perfect fourth, 39
PianoMeter, 125
Pianoteq, 128
Pitch Bend, 205
Polyphonic After Touch, 207

Pre-Delay, 60
Program, 40, 44
PROGRAM COMMON, 50
Program Common Edit, 21
PROGRAM EXTERNAL ZONE, 87
PROGRAM INTERNAL ZONE, 83
PROGRAM LIBRARY, 50
PROGRAM NAME, 58
Program remain, 47
Program Zone edit, 21
PROGRAM ZONE EDIT, 71

R

Railsback curve, 120
random walk, 146
RANDOMISE THE CHARACTER FOR EACH NOTE, 182
RANDOMISE THE LEVEL FOR EACH NOTE, 181
RD2000EX UPGRADE, 79
RD2000setup.msi, 12
RD-500/600/700, 77
RD-700GX, 77
RD-700NX, 77
RD-700SX, 77
Red light, 65
Regulating the Piano, 101
Request Sysex, 37
reverb, 40
REVERB, 60
REVISION HISTORY, 254
RHYTHM, 64
Roland Axial Website, 281
Roland checksum, 213
Roland Checksum, 36, 214
Roland Cloud, 281
Roland Corporation, 281
Roland synthesiers, 77
RPTMidi, 3
RPU 3 triple pedal, 234
rtpMIDI, 15

S

SAVE & LOAD NOTE VOICING MAPS, 176
SCALE x 0.8 / 1.2, 187
Scene, 40
SCENE MEMO, 59
SCENE MEMOS, 55
Scenes, 56
Screen Reader, 266
screen readers, 10
scroll wheel, 58
searches, 53
SELECTED NOTE RANGE, 189
Send, 83

SENDING MIDI CONTROL CHANGE MESSAGES CC, 28
Sennheiser HD 600s', 234
SH-1000, 219
SHARING AND SAVING PROGRAMS, 236
Shift, 43
SMOOTHING, 188
SN Piano, 21
SONG, 64
Sorting Data, 52
Sound Board Resonator, 91
Spread, 60
Status byte, 203, 205, 206, 210
Steinway Hamburg, 78
Steinway upright K52, 81
Stretch tuning, 179
Stretch Tuning radio button, 120
String Resonance, 91
Sub Woofer, 235
SUPERNATURAL PIANO EDITOR, 94
SYMPATHETIC RESONANCE, 96
Synths, 22
Sysex, 36, 242
System, 21
system audio, 239
SYSTEM COMMON, 47
system compressor, 49
System Exclusive (Sysex) messages, 19
System Exclusive messages, 36

T

TEMPERAMENTS, 166
temporary memory, 19
Three Part Tuning, 142
TIPS, 251
Tone Colour, 91
TONE DESIGNER, 89
TONE LIBRARY, 71
Tone Wheel Organ, 22, 77
Tones, 40, 44
TONEWHEEL ORGAN EDITOR, 194
Tonewheel type, 195
Tonic, 168
tooltips, 90
Tooltips, 23
transposing, 83
TREMOLLO, 84
TUNELAB PRO, 136
TUNING, 101

U

UNDO, 190
Upright PIANO, 81
USB audio input, 47
USB drive, 47

Index

USB Midi, 41
USB Thru, 41
USER MANUAL, 18
USING AN iPad, iPhone OR ANDROID DEVICE, 16

V

V Piano, 21
V PIANO EDITOR, 89
Velocity Delay, 69
Velocity Key, 70
Vendor driver, 38
virtual instrument, 38
Virtual Instruments, 234
Voicing the Piano, 102

Volume, 83
VPIANO SETTINGS, 91

W

Werkmeister, 161
Windows Narrator, 266
Wine 10.6, 13
WRITE, 19, 43

Z

Zone, 40
Zones, 38
ZONES INTERNAL / EXTERNAL, 65

Index

Notes

BACKCOVER

