PXTONE MANUAL

AND HOW TO CREATE COOL MUSIC FOR VIDEOGAMES

TABLE OF CONTENTS

FOREWORD by Pixel....3

INTRODUCTION....4

1.BASICS....5

1.1 OVERVIEW 6
1.2 VOICE 12
1.3 UNIT 13
1.4 KEYBOARD....20

2. HOW TO... 25

2.1 CHOOSE INTRUMENTS 26
2.2 ARRANGE A VIDEOGAME SONG....29
2.2.1 One - three channel example....31
2.2.2 Four channel example....36
2.2.3 Eight - ten channel example....41
2.3 USE PXTONE EASY AND QUICK....46

3. TIPS, TRICKS AND ARTICULATIONS....48

3.1 TRACK ARRANGE: MELODY....49
3.2 TRACK ARRANGE: BASS....57
3.3 TRACK ARRANGE: CHORDS....62
3.4 TRACK ARRANGE: DRUMS....67
3.5 APPENDIX: IN GAME SOUND FX....72
3.6 OVERALL MIXING....73

4. APPENDIX: GAME MAKER AND PXTONE....77

5. RECOMMENDED STUFF....78

6. FINAL WORDS....95

FOREWORD by Pixel

私は自分のゲームを作るためにプログラミング技術を身につけました。
実際にゲームを作るとなると、身近な音源は MIDI か WAVE に限られてしまいました。
WAVE ファイルは容量が大きくなってしまって、インターネットで配信するのに向かない。
MIDI はプレイヤー自信が使っている音源によって音色が変わってしまうし、
矩形波やサイン波などのシンプルな音色が使えない。

それで私はどんな環境（ここでは windows に限る）でも同じ音が鳴り、
容量が小さくてインターネットで配布しやすい音楽モジュールを作ることにした。
そして PXTONE は私が作った 3 代目の音楽モジュールです。

もともとゲームの BGM を目的にしていたので、
80 年代のようなゲーム音楽を作るのに向いていますが、
各個人が作成した波形データを音色として使えることで、
ユーザー自信の表現力を反映しやすくなりました。
自分で集めた音を使って独創的な音楽製作をお楽しみください。

"It was the desire to create my own game that motivated me to teach myself programming. When I started out as a game developer, the only audio formats available to me were MIDI and WAV.
WAV files were massive in size and burdensome to distribute online. The sound quality of MIDI could vary and was incompatible with simple sound waves like sine waves and square waves. This was what compelled me to build my own sound editor for Windows to function under any circumstances and produce files small enough to distribute online.

PXTONE is my third generation sound editor. Originally it was intended to develop background music for games in a 80's style. It turns out to be a convenient resource for those who are looking to integrate their own sound waves.

Please enjoy creating music with the sounds you have assembled yourself".

25 / 11 / 2010
Daisuke Amaya (AKA Pixel)

Translation by Yoshi Miyamoto

INTRODUCTION

This manual is intended to be easy-to-use, and it has four main chapters. The first is about PxTone Collage basic use. The second is about videogame music concepts and how to extress your ideas in Pxtone Collage simply. Chapter three is about 'fine surgery': all those articulations and tricks often used in videogame songs. The final section introduces recommended videogame soundtracks, with an emphasis on those heard on arcade machines, home computers and consoles.

Since the Pxtone tracker is a freeware program, this manual and the example files are free to use. With this text, I would like to contribute to the free resources at the disposal of the indie game community. I invite everyone from the beginner to the experienced videogame musician to read the following pages in case it might be of use.

I would also like to thank the great Pixel, the developer of Pxtone, for his enormous contribution to the world of gaming. PxTone is, in fact, a powerful tool for making complex musical arrangements with as many details as the professional soundtracks of 80's and 90's arcade machines.

Why PxTone?

PxTone has incredible flexibility as an arranger and tracker. It is accurate enough, and what's more, is compatible with other programs like Game Maker. Another advantage is the song file size. If you don't use large samples, the standard size is only about 50-100 Kb. You can use it as a music engine through its *.dll library, or if you prefer, you can export any song into *.wav format and further convert it into MP3, OGG, or any standard format used in your videogame (VG).

Many musicians use Pxtone in different ways, not only for VG music. The style and treatment of this manual will be focused on the 'classic era' of Donkey Kong (Nintendo, 1981), Ghosts'n Goblins (Capcom, 1985), Legendary Wings (Capcom, 1986), Double Dragon (Technos Japan, 1987), Shinobi (Sega, 1988), among others. If you are involved in the videogame industry, you may find this manual helpful, even if you don't happen to use Pxtone.

Have fun and enjoy.

G87

1. BASICS.

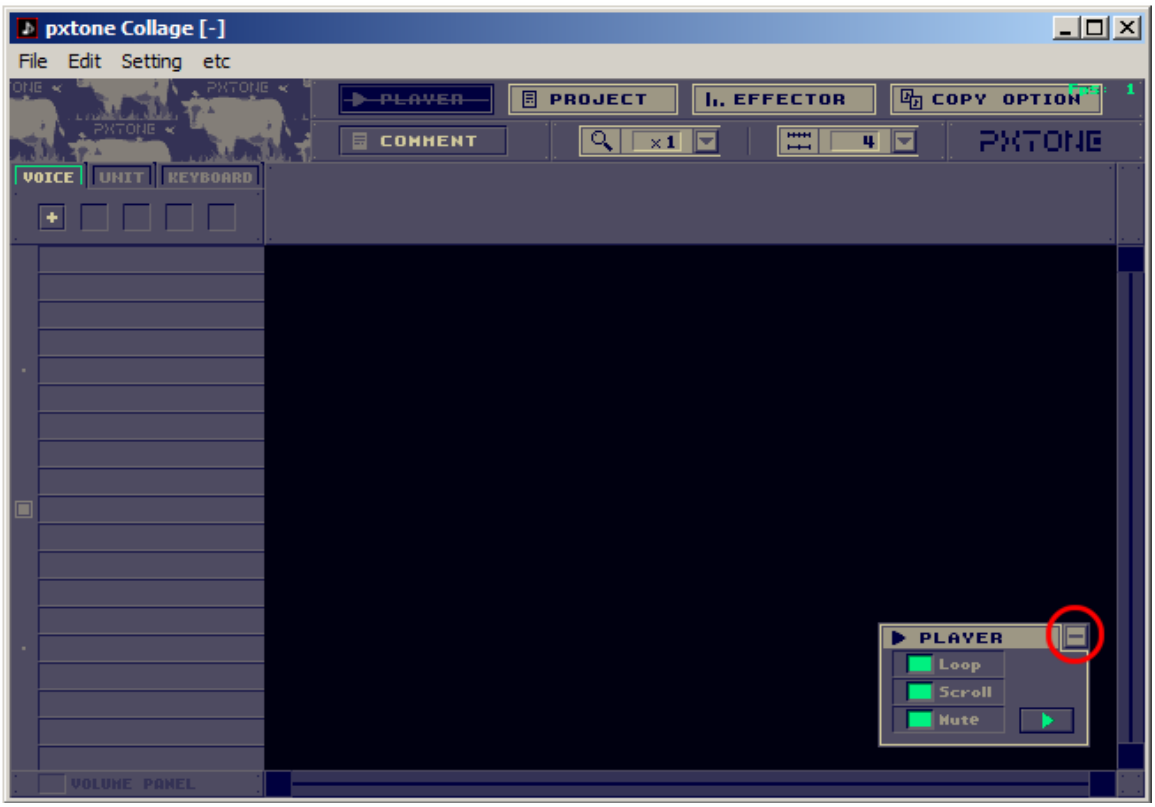
In this chapter will familiarize ourselves with menus and commands of Pxtone Collage. First, I recommend extracting files into a single, easy to access folder. For example: desktop/PXTONE TUTORIAL. The list of files and folders provided are:

Name of file/folder	Type	Description
Pxtone manual.pdf	pdf file	This manual
ptCollage.exe	Program	Main arranger/tracker program
ptVoice.exe	Program	Voice builder program
ptNoise.exe	Program	Wav based voice editor program
ptPlayer.exe	Program	Ptcop format player for quick listening
Voices	Folder	Sound resource for using in ptCollage
Songs	Folder	Full arranged songs in ptcop format
Examples	Folder	Short examples in ptcop format
pxtone.dll and pxwrap.dll	dll files	Used as music engines in Game Maker
PXtone.gml	script	Used for importing to Game Maker as a script
pxtoneTool.dll	dll file	Used to run any program

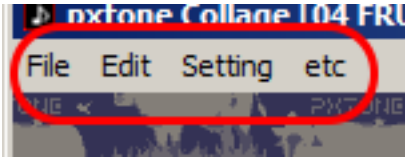
(New folders and files will be created automatically when you use the programs)

1.1 OVERVIEW.

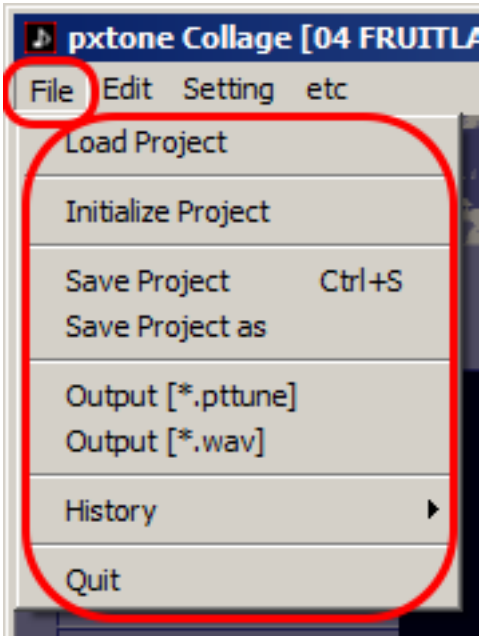
When we run ptCollage.exe for the first time, the screen shows this:



Ok, let's explain bit by bit. Before starting, please click on the red circle to close that little window (Player). We will talk about this feature later.

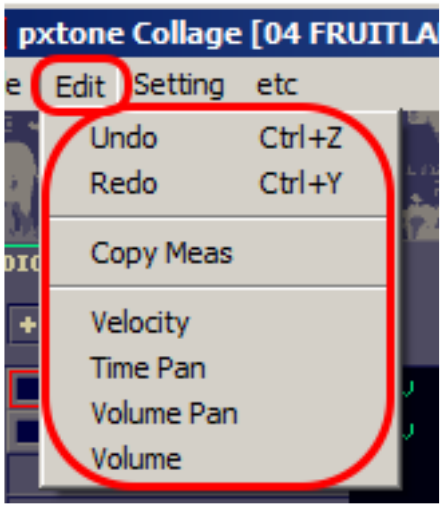
a) **Upleft menu**: 

▶ Click on **File**. The screen shows this:



It is a pretty simple menu: **Load project** is used for loading arrangements in *.ptcop format, **Initialize Project** is used to start a new arrangement from a blank sheet. **Save Project** is used to save the CURRENT project. **Save Project as** is used to save the arrange for the first time, or save it with other name. **Output [*.pttune]** is used to export a song in pptune format. **Output [*.wav]** is used to export a song in wav format. **History** is used to quick-load a recent project and **Quit** to exit the program.

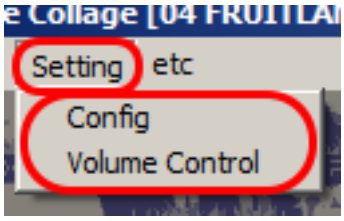
▶ Click on **Edit**. The screen shows this:



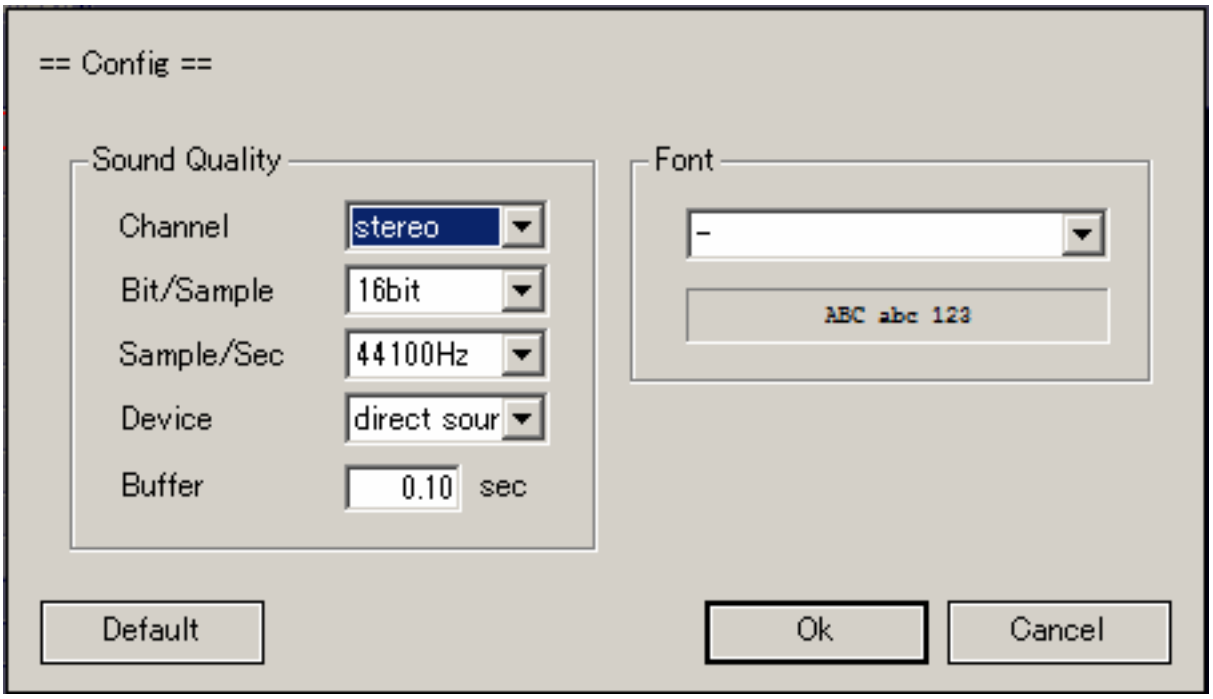
Undo and **Redo** are used VERY OFTEN while writing arrangements, so familiarize yourself with Ctrl+Z and Ctrl+Y to correct errors and compare results.

For the rest: **Copy Meas** (copy measure), **Velocity**, **Time Pan**, **Volume Pan** and **Volume**, these commands are used with each track, in a LOGICAL SCRIPT way, with numerical data entry. I rarely use these, since there is an extraordinary VISUAL INTERFACE (Unit section 1.3, p.17-18) to do all duties mentioned above in an easier way.

▶ Click on **Setting**. The screen shows this:



Click on **Config**:



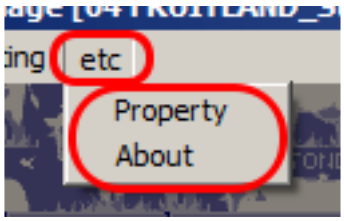
These are the main options for the project. The resolution parameters are set with **Channel** (Mono/Stereo), **Bit/Sample** (8 or 16 bits) and **Sample/Sec** (11025 Hz, 22050 Hz or 44100 Hz). **Device** is used for the main output system. There are two options:

Wave Mapper is the regular Windows output system. If you have multiple sound cards installed, you can select from the combo box the one you want to use. Selecting "Wave Mapper" will use the default Wave Out device of the system. If you find any problems with this output mode, switch to DirectSound, which is the recommended output mode for Windows 2000 and later.

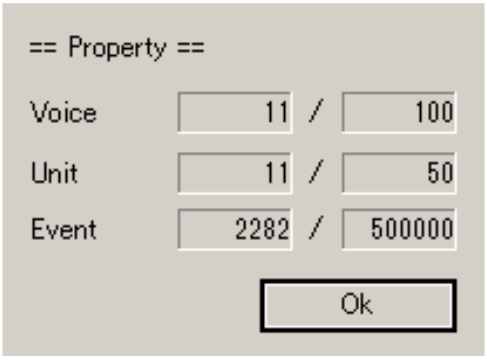
Direct Sound is the recommended output mode for Windows 2000 and later. On older platforms you might be better off with the regular Wave Mapper. If you find any problems with this output mode, switch to Wave Mapper.

Buffer is the preloaded quantity of audio. If you have enough RAM memory (over 3GB), don't sweat it. **Font** is used for screen layout (TAHOMA or VERDANA fonts are recommended for easy reading).
Back to the **Setting** menu: if you click on **Volume control**, you are redirected to Windows volume control. There's nothing special with this option.

▶ Click on **etc**. The screen shows this:



Property shows the statistics: Number of Voices, Units and Events used in a single project.



About shows the current version and date of the software:

b) **Upright menu**:

▶ Click on **Player**. The screen shows this pop-up menu:

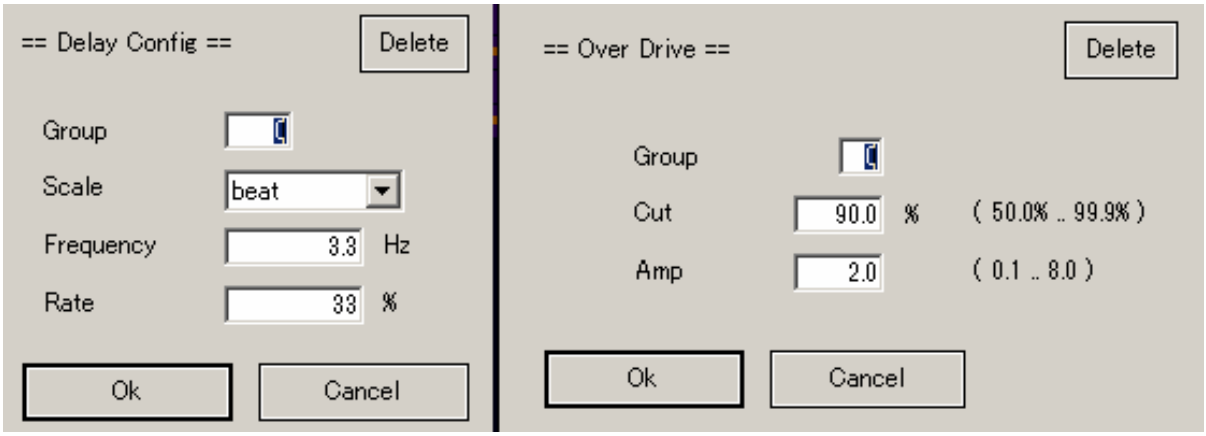
You can turn on/off: Loop, Scrolling view or Mute sounds, and play/stop clicking on the buttons. I rarely use this window. For play/stop I use the space bar.

▶ Click on **Project**. The screen shows this:

If you click once more over the lower righthand icon (the red circle) you can change the parameters: **Name**, **Beat** (parts per measure: one value for the whole song. You cannot insert beats and tempo changes), **Beat tempo** (BPM, or beats per minute. This is used for making a song slower or faster) and number of **measures** (if you are writing the song by adding measures with any track, this value changes automatically).

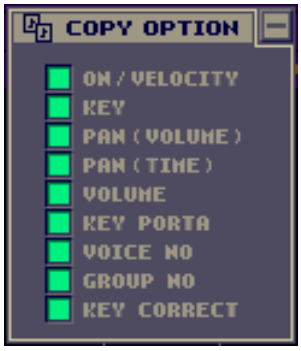
▶ Click on **Effector**. The screen shows this:

Here you can set up to four types of 'Delay' and two types of 'Overdrive' (to use with any track). Simply click on the respective lines (either red or green cross) to set the parameter window for each one:



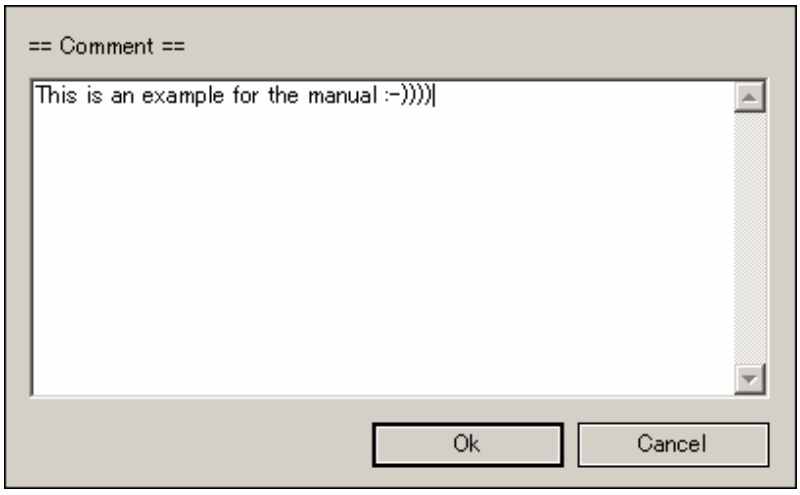
For **Delay Config**, you can define 4 independent groups, each one with its own parameters: **Scale** system (Beat, Measure or Second based), **Frequency** or velocity and **Rate** or feedback. It would be better to test with different values when using it over voices.
For **Over Drive**, you can define 2 independent groups, each one with its own parameters: **Cut off** point (50%-99.9%) and **Amp**litude factor value (x0.1 - x8.0 times). This kind of overdrive is pretty raw. It sounds sort of like a bitcrusher when use extreme values over tracks.
In a later section (1.4 Keyboard, p. 24) we will give detailed information about how to use them. Remember to avoid *group 0*, which is reserved for 'no effect mode'.

► Click on **Copy Options**. The screen shows this:



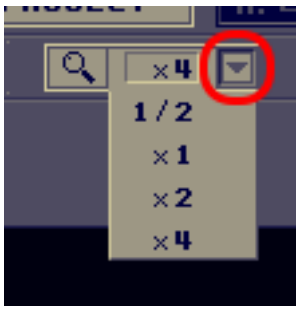
By clicking on every green box you can enable/disable which parameters have to be copied when copy/paste is executed for a single track or a group of them.

► Click on **Comments**. The screen shows this:



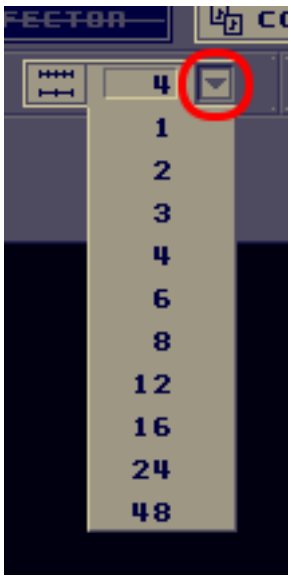
This is just a notebook, you can use it to save a text file associated with the project: date, author, genre, etc...

▶ Click and HOLD button on **Zoom Tool** (on red circle). The screen shows this:



This is the 'window detail level'. You can choose among four views. For overview, I recommend 1/2, and if you are writing accurate articulations, choose x4. It depends on what are you doing each time.

▶ Click and HOLD button on **Resolution Tool** (on red circle). The screen shows this:



This is the 'note size' tool, used to write notes, articulations and more. The number indicates **how many notes** fill exactly in ONE BEAT. For example, if you choose 2, you can write 2 notes per beat with two single clicks. If you choose 3, a triplet can be written in one beat. I would like to emphasize **the importance of this tool**. I use it very often. From here on, we will refer to it as the **RT** (resolution tool).

c) **Labels**:

These 3 labels require a section for each one. Select one of them simply by clicking on it. Here we go:

1.2 VOICE.

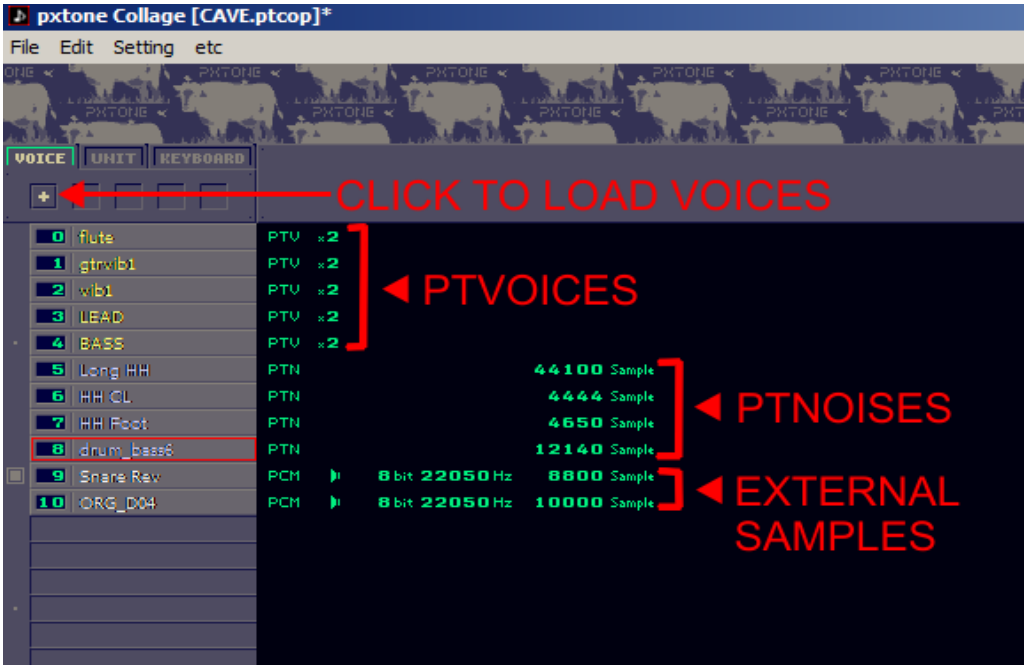
Click on the  icon to load voices. These are tones which can be produced with Ptvoice.exe (PTV, yellow), Ptnoise.exe (PTN, grey) or external samples (PCM, white). Either *.wav or *.ogg format can be loaded as external samples, at any resolution (8 or 16 bits), in any frequency (11025 Hz, 22050 Hz, 44100 Hz). Load the palette of sounds you are going to use in your arrangement. This is the **sound set**, not the tracks.

Ptnoises and External samples are recommended for unique pitched sounds like drum elements, percussion and FX. I have tried to building several melodic voices from single external samples based on A note (440Hz), but for other notes they have sounded dirty and unclear (with noises due to oversample and transpose processes), so I strongly recommend this method:

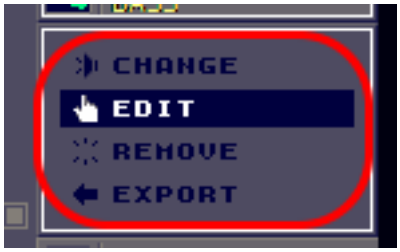
1. For melodic voices: Ptvoices created with ptVoice.exe
2. For percussion, drums, FX and 'accidental' sounds: Ptnoises and external samples.

In fact, most of the original arcade machines sounded just this way. They usually had a double pair of chipset (YM2203 x2 and K007232 x2, or YM2151 x2 and PCM x2 etc....). Thus, the first pair were used for melodic part (bass, melody and chords) and the second pair for drums and percussion (snare, bassdrum, Hihats, fx, etc) since they were based on samples. We will use the same configuration, but keep in mind that anything is possible.

Once we have loaded the sounds, the screen shows this:



If we click on the different lines (sounds) we hear how it sounds (on 'A' note). However, if we click with right mouse button, this small window will appear:



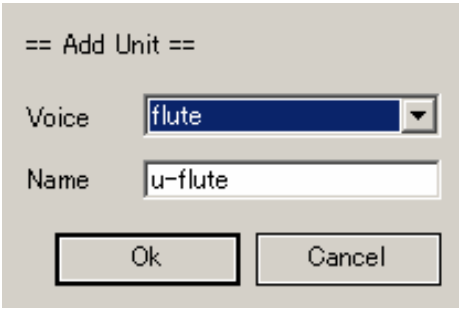
Change is used to replace voices from any folder, **Edit** is used only for changing the name of the instrument, **Remove** for erasing it, and **Export** is especially of interest: you can use it to save the instrument from any arrangement. If you like any track or instrument from a *.ptcop song, you can extract it to your personal collection of voices with this feature.

Please note: if you load complex stereo samples, the project size will increase depending on the sample size. For a decent drumset (snare, toms, bassdrum, hihats and crash cymbals) the size is irrelevant. We will explain more about the set of voices/drums in a later section (2.1: How to choose instruments).

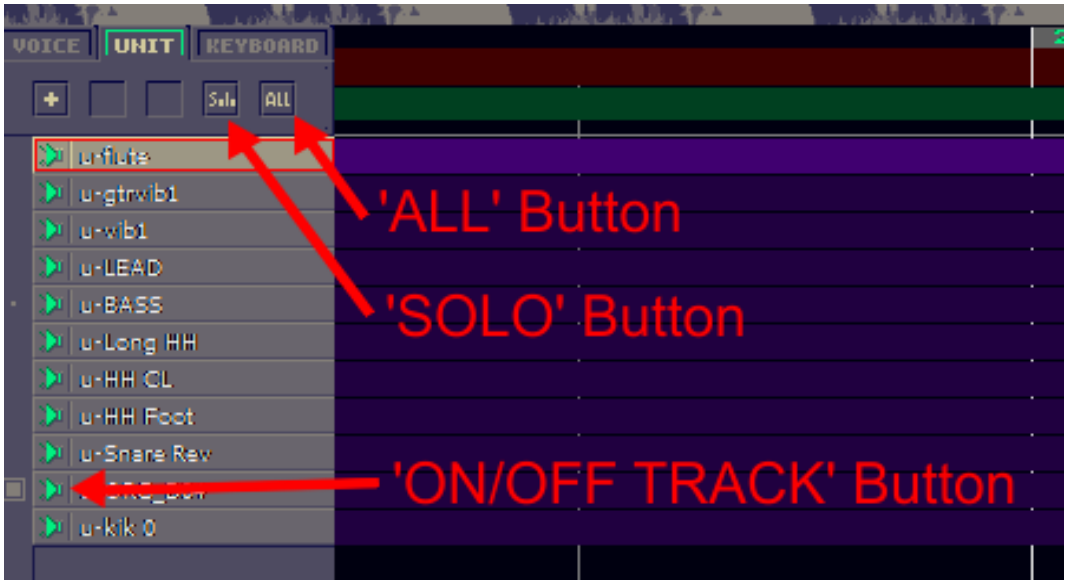
Now you can load some of the instruments provided and experiment with them. Good luck!

1.3 UNIT.

Click on the  icon to create a new unit. Units are voice tracks. The screen shows this and you have to choose among the voice set (previous label). At this point, you write the unit name:



Each **unit** is monophonic, and this label shows all tracks of the project. There could be for example: one voice (piano) and three units (tracks) created from that voice in order to write a 3-note chord simultaneously: each note in one separate unit. Remember: each unit is a monophonic sound track. Notice that if we click on one unit name, we hear its sound.

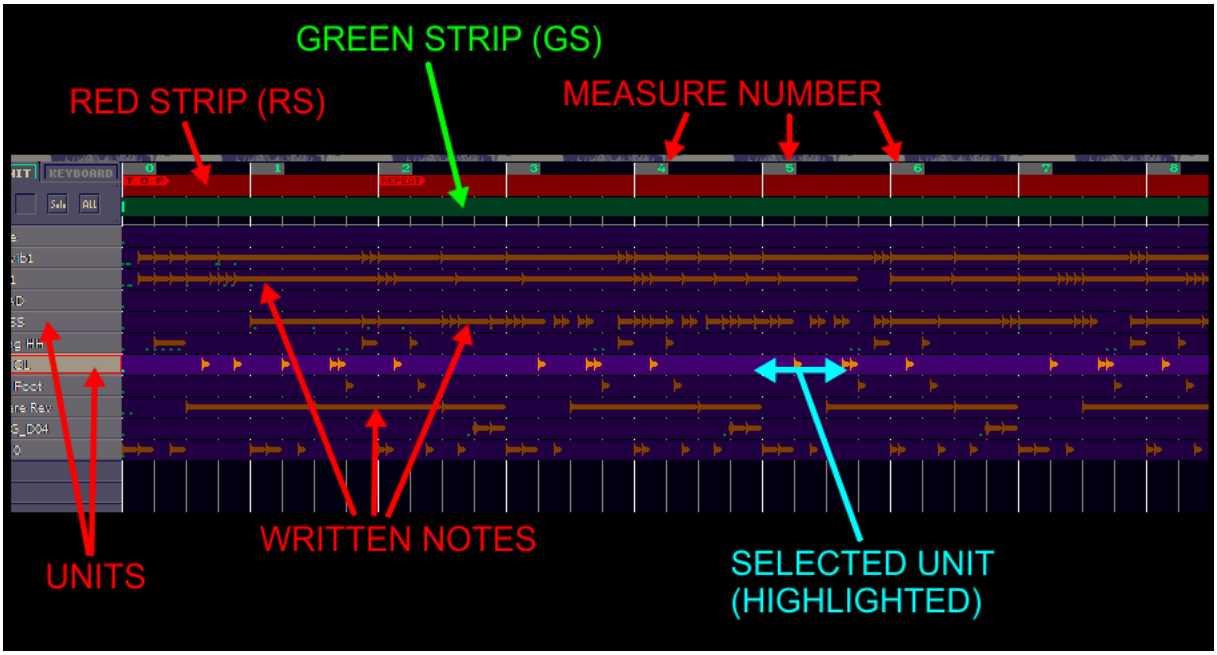


You can select which tracks are sounding by clicking on the **'ON/OFF' icon**, or select one single track with the **'solo'** button. If you want to hear the whole set, click the **'All'** button. These features are very important when mixing. There is a whole section dedicated to this (3.6 overall mixing).

When you click with the right mouse button on one unit, this small window will appear:

There's no secret with this: **Edit** is used only for changing the name of the unit (track), and **Remove** for erasing it. Nothing special.

But if you look at the rest of the screen, there's more to explain and this is really important:



There is a lot we can do here. Please load an entire song (for example: 'Towervania Action Theme.ptcop') for testing this feature. Let's explain bit by bit again:

a) **Red Strip (RS)**: This is used for setting the **start** point, **top** point, **repeat** and **end/last** point. Since there are many compositions in videogames with this structure: INTRO-->(MAIN THEME)x repeat. **Top** is really the starting point, and then, you can set the interval [repeat⇔end/last] for looping. When working in an arrangement or project, I use **start** to set the measure I am writing on by placing the mouse pointer below the measure number and clicking to set. Then, with space bar I start/stop the song from the same measure. But the song always keeps the same structure when you save it: TOP-->[REPEAT-END] loop. This will be explained with details in section 2.2 (Arrange a videogame song). Also if you click with the right mouse button, this small window will appear:

This menu is very intuitive and easy: Depending on what measure you are looking at, you can perform these actions: **Set Repeat** point, **Set LAST**, or **cut** them from their original position.

So, experiment yourself on the RED STRIP by placing the mouse pointer and setting different markers. Also test the **start** point and place it on different measures and start/stop the song from it with the space bar.

b) **Green Strip (GS)**: This is used for edit/select tracks and it's a **very important feature**. First, select a unit by clicking on it (left list). It is shown highlighted (see image on previous page). Notice you can select more than one track (unit). If you press CTRL and click on some tracks, they are shown highlighted. Therefore, depending on the operation you will select one or more tracks at the same time. Now different actions can take place on the GS:

1. **Select a range** simply by the click'n'hold technique: click on the start point and hold the button while you cover a range to the right. Then release the button:

(notice this click'n'hold technique is going to be used widely throughout project creation)

2. **Righ click using the mouse** on the selected range (light green) and this small window will appear:

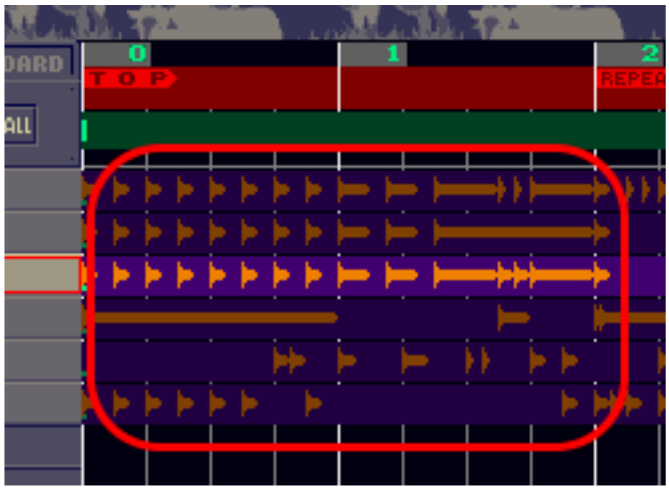
These six actions can be executed over the SELECTED UNITS (tracks). **Copy** and **cut** are intuitive and very useful. For example: to copy an entire drum section with all elements or certain articulation you want to duplicate and paste later in the composition. **Clear** is used to erase the highlighted section, and **Delete** is used for erasing and moving the following written part to fill the gap (selected area). **Transpose** is very useful in pitching an entire melodic section up or down: a dialog box will appear and you can enter positive/negative values (semitones) to transpose the selection. Notice this will have an 'undesired effect' over the drums. It's not a good idea to transpose the snare or hihat 12 semitones. **Scope** is simply an informative window about the RANGE SELECTION parameters: start and end point. Of course you can enter the numbers rather than click'n'hold the range selection.

I rarely use this. Once you have chosen **Copy** or **Cut**, if you click on any other part of GS, this small window will appear:

Paste will overwrite the existing material from the chosen point, and **Insert** will move the written notes to the right to make room for the copied material. **Scope** has the same informative window mentioned on previous page.

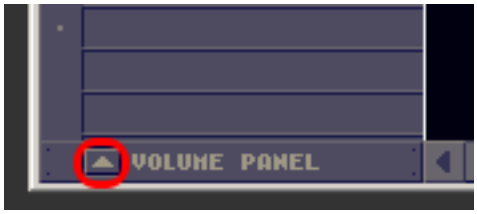
So, the procedure is: a) select a range, b) choose an action (right button) and c) execute, insert or paste it.

c) **Note Matrix (NM)**:

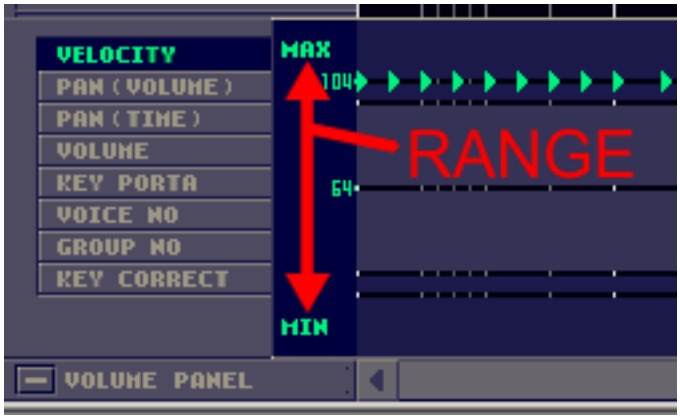


Written notes are shown as orange lines. You can **delete** them manually by click'n'hold with the right mouse button (a thick red line will appear). Also, you can **write** notes here directly by click'n'holding the left mouse button. If you choose a proper resolution from RT (resolution tool), simply one click will write the note. This is highly useful when writing DRUMS, PERCUSSION and FX tracks (unique pitched sounds), because you can write them on the note matrix directly on each unit. A detailed section will show you how to do this (3.4 How to arrange a drum track). For the rest, it is not useful to write melodic tracks on Note Matrix. For this duty there is an entire label: KEYBOARD.

Before we explain the 'keyboard' label, there is one more feature, and it has the same view and functions either if we choose it in the 'UNIT' or 'KEYBOARD' label. Just look at the bottom left corner:

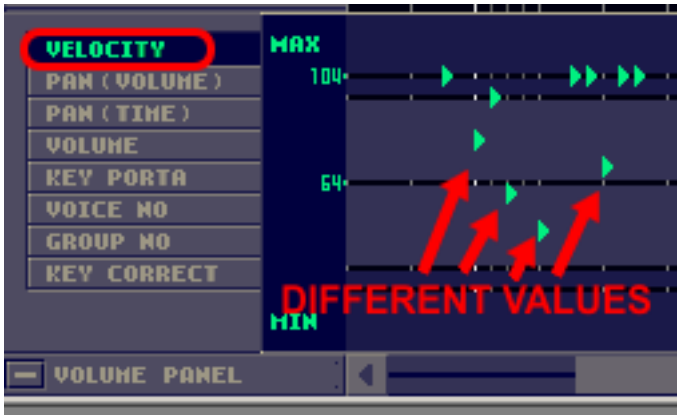


Click on the red circle to open the pop-up menu 'VOLUME PANEL'. This window will appear:

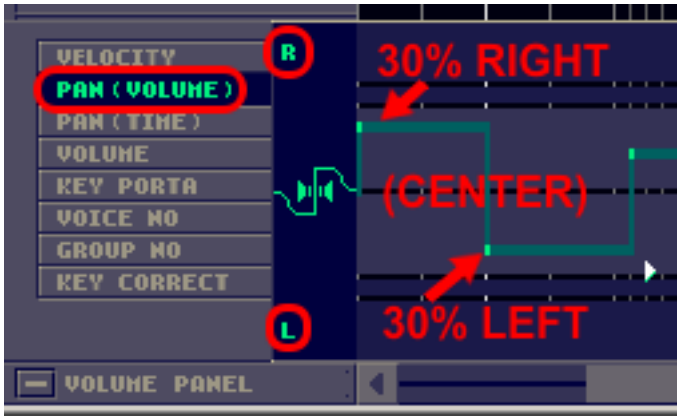


Eight functions will appear: VELOCITY, PAN/VOLUME, PAN/TIME, VOLUME, KEY PORTA, VOICE NO, GROUP NO and KEY CORRECT. Each one is fully programmable, and what's more, it can be written easily with the visual interface (right side). Let's explain this one by one:

a) **VELOCITY**: It is each note level. Under the Note Matrix, a green triangle marks the note velocity. You can move them simply by clicking at different ranges. Try it:



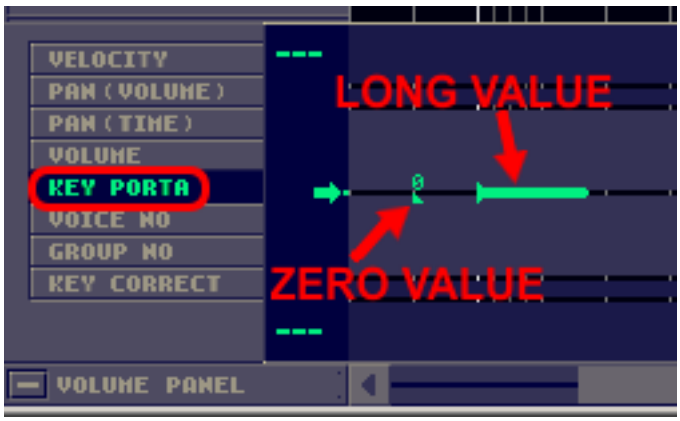
b) **PAN (VOLUME)** : This line is used to balance one unit (track) in stereo field. Of course you can write the line by clicking with a proper RT (resolution tool):



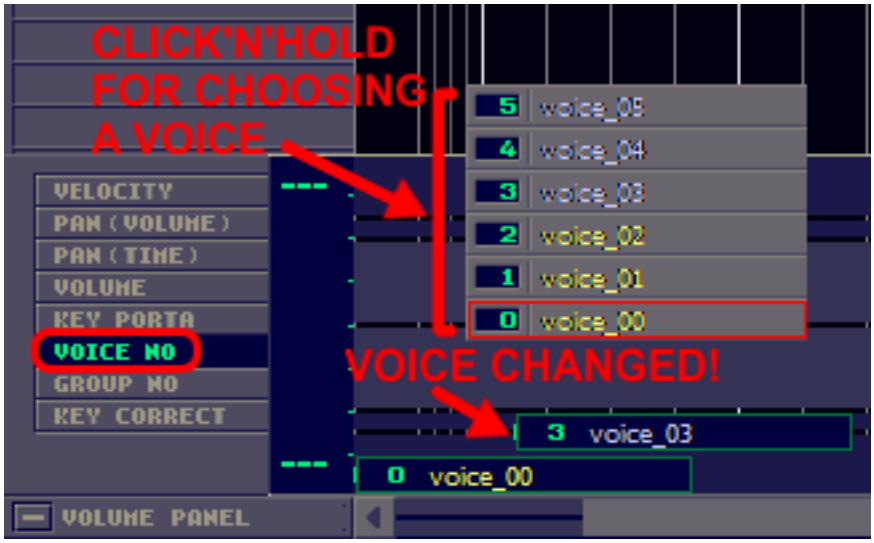
c) **PAN (TIME)** : This line is used to create a stereo expander over the voices. It's some kind of artificial stereo. I see no special use for this, but you can try it.

d) **VOLUME**: This line is used to set the volume at any time. This feature is very useful when mixing, and also when creating articulations like 'crescendo':

e) **KEY PORTA**: This line is used to set the *portamento* time of a multiple note slur by click'n'hold. Better test different values for this. If you set it to zero, you will have a *legato* articulation. There will be a detailed explanation for this feature in the next section and later in chapter 3 (tips, tricks and articulations):



f) **VOICE NO**: This feature is useful, because it lets you change voices within a single unit (track). For example you start a melody with a flute, and then you decide to change it for a saw solo wave in a later measure. Simply click and choose (right button click'n'hold to erase):



g) **GROUP NO**: This function is used to send a unit through an effect bus. You can select a group with click'n'hold. Beyond that point, the track will sound through the effect labelled with the group number (see page 10: effector parameters). Group 0 works as 'effect off' for each track:

h) **KEY CORRECT**: With this function we can detune or correct the intonation pitch (tuning) over the tracks. If you click on the strip, a small calculator appears. Then enter the value and press ok:

The following table shows the conversion ratio:

VALUE	TUNE
1.000	+/- 0 semitones (Equal)
2.000	+12 semitones (+1 octave)
4.000	+24 semitones (+2 octaves)
0.500	-12 semitones (-1 octave)
0.250	-24 semitones (-2 octaves)
x	$1200 \cdot \log_2(x)$ (units in CENTS)

If you want to know what number you must enter to obtain a certain frequency, please pay attention (not recommended for Maths beginners! hehe):

From one octave to another there are 1200 cents. So, one semitone is 100 cents above one tone. The following table shows how to express it:

TUNE	ENTER VALUE:
+1 semitones (+100 cents)	1.05946
+2 semitones (+200 cents)	1.12246
+3 semitones (+300 cents)	1.18920
+4 semitones (+400 cents)	1.25992
+5 semitones (+500 cents)	1.33483
+6 semitones (+600 cents)	1.41421
+7 semitones (+700 cents)	1.49830
...	...
+f cents	$\sqrt[1200]{2^{f}}$

If you want to decrease cents, here is the table:

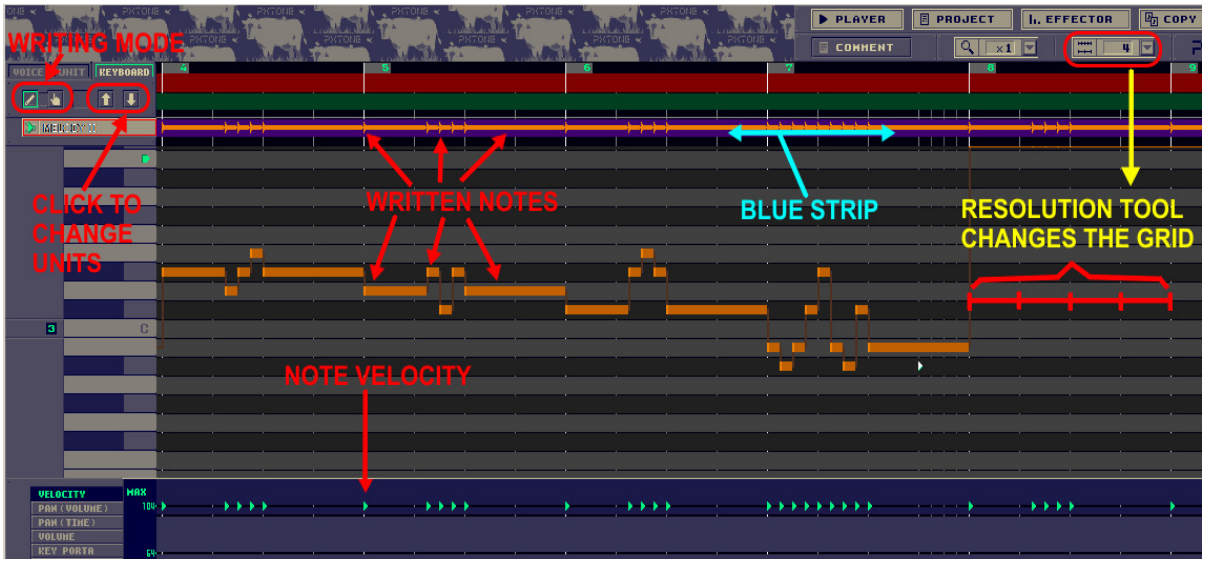
TUNE	ENTER VALUE:
-1 semitones (-100 cents)	0.94387
-2 semitones (-200 cents)	0.89090
-3 semitones (-300 cents)	0.84090
-4 semitones (-400 cents)	0.79370
-5 semitones (-500 cents)	0.74915
-6 semitones (-600 cents)	0.70710
-7 semitones (-700 cents)	0.66741
...	...
-f cents	$\sqrt[1200]{\frac{1}{2^{f}}}$

But more important than understanding those frequency conversions is writing your own music. Anyway, you can transpose tracks using the 'transpose' feature (page 15, green strip, point 2).

1.4 KEYBOARD.

Last label is used to write notes and articulations for each unit (track): one by one.
First, select a track from UNIT label, then click on 'Keyboard' label:

We just enter the 'piano roll' editor, a simply but effective tool to write music:



There's a lot to explain. Once again, bit by bit:

It's obvious that notes are represented on the Note Matrix in orange colour: every note appears also on the blue strip and its velocity is shown on the volume panel.

a) **Writing mode**: you can choose between pencil tool:  , and hand tool: 

Pencil tool is the MAIN TOOL. You are able to write notes simply by selecting this tool, selecting a proper resolution tool and clicking on the Note Matrix. Remember: click'n'hold technique lets you write/erase easy and quickly.

Hand tool is used ONLY when a slur articulation or portamento is written, and also for changing notes without changing events. We will talk about this later.

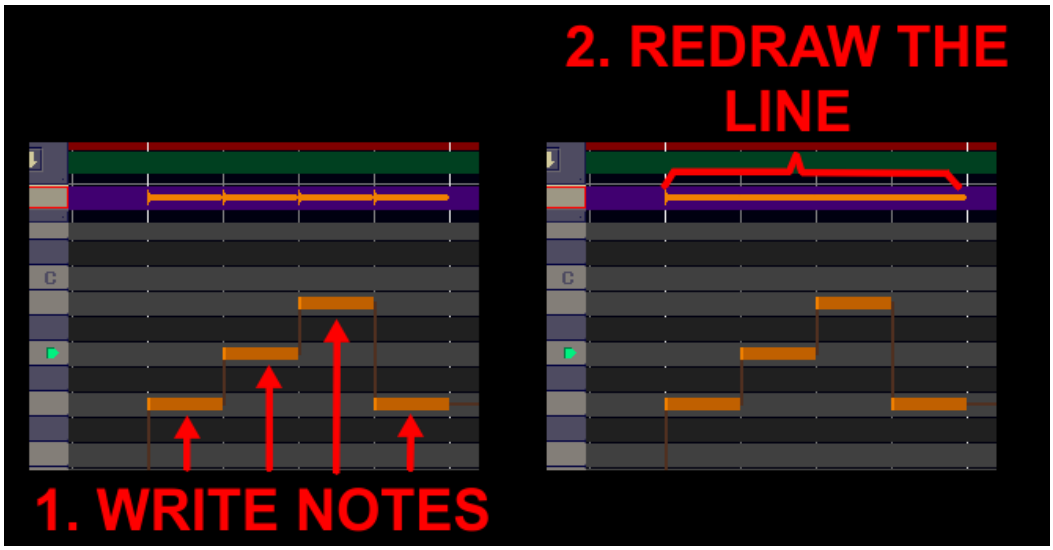
b) **Arrows** (under 'KEYBOARD' label): They are used to change the current unit for editing. I think it's better to click on unit, select track and click on keyboard label again, but it's my opinion, since the arrows select next/previous unit in each step.

c) **Blue Strip (BS)**: On the blue strip, the length of each note is represented with a continuous segment:

Notice that you can write/erase notes directly with click'n'hold technique on the Blue Strip. This is very useful when writing slur and legato articulations. Let me show you an example:

1. Select a Resolution Tool value of 1 and write four different notes (notice there will be four lines over the Blue Strip).

2. Then convert these four lines into one single note by click'n'hold technique. Now you have a slur or legato. You also can vary the transition time between notes with KEY PORTA label in VOLUME PANEL (See page 18, section e).



3. If you want to change the notes WITHOUT BREAKING the slur or changing events (velocity, volume pan, etc), then select the hand tool and write them without any worries. You will notice the line over the blue strip keeps the whole size.
That's the utility of the hand tool ( ). But: with a little practise, you can do ALL EDIT ACTIONS with pencil tool: even slur, portamentos, legatos, and much more.

d) **Resolution tool and grid**: Depending on what you choose, the gridlines can vary from even music figures to triplets. Since the **RT** sets the number of notes per beat, the following table explains the correspondence with traditional music notation:

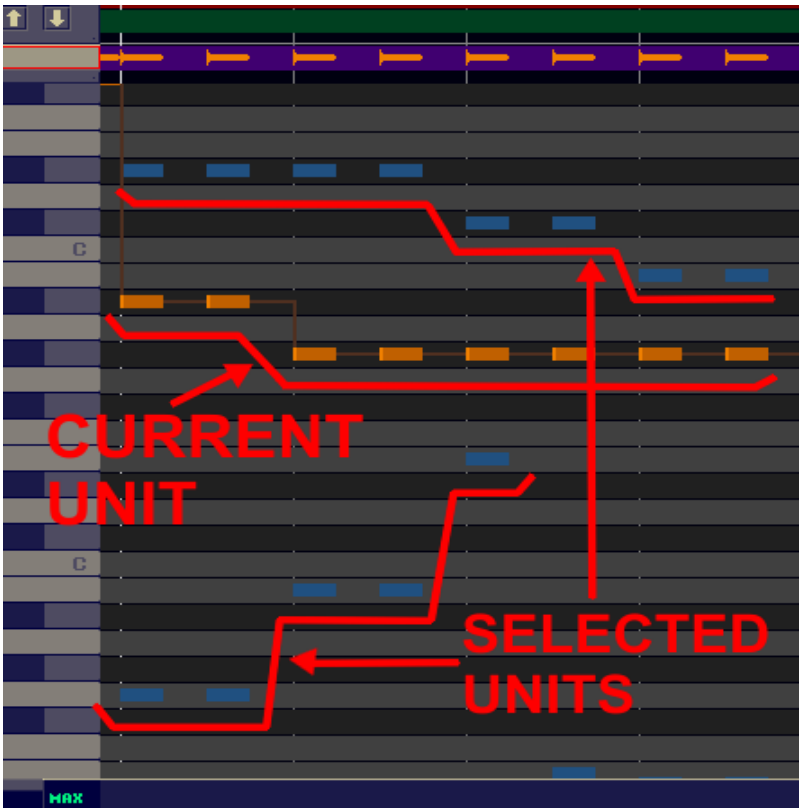
Res. Tool number	Note size	Res. Tool number	Note size
1	♩	3	♪ *triplet*
2	♪	6	𝅘𝅥𝅯 *triplet*
4	𝅘𝅥𝅯	12	𝅘𝅥𝅯 *triplet*
8	𝅘𝅥𝅰	24	𝅘𝅥𝅰 *triplet*
16	𝅘𝅥𝅱	48	𝅘𝅥𝅱 *triplet*

(For example: three notes "♪ *triplet* " are written: 

)

e) **Comparing several units on the Note Matrix**: If you choose two or more units (tracks) with Ctrl + click on unit label, then you can have the view of multiple tracks selected on keyboard note matrix:

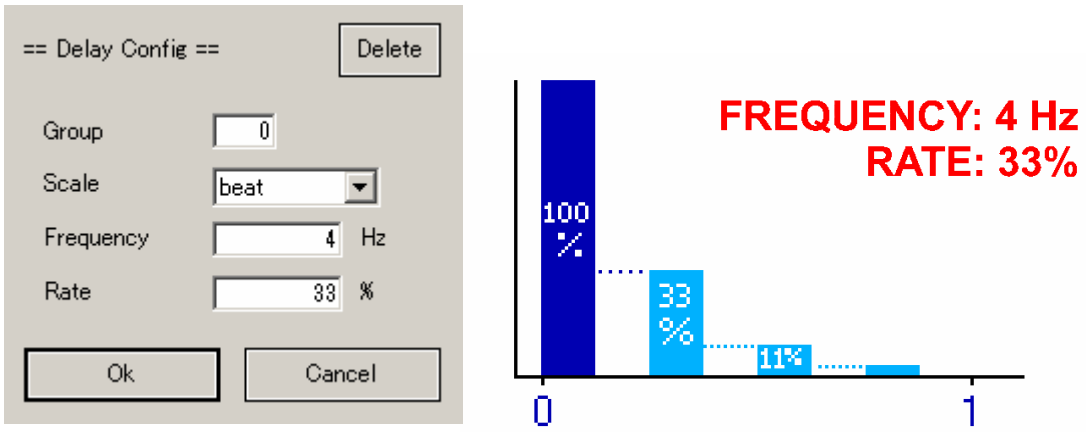
1. Click on several units with CTRL and then select keyboard label.



2. Current editable unit is shown in orange colour, and selected units (non editable) in dark blue. This is useful for comparing melodies, chords, harmonies and intervals. At any time, if you click on piano keys you will hear the respective notes of selected unit's sound.

f) **Appendix**: Effect parameters (Delay and Overdrive):

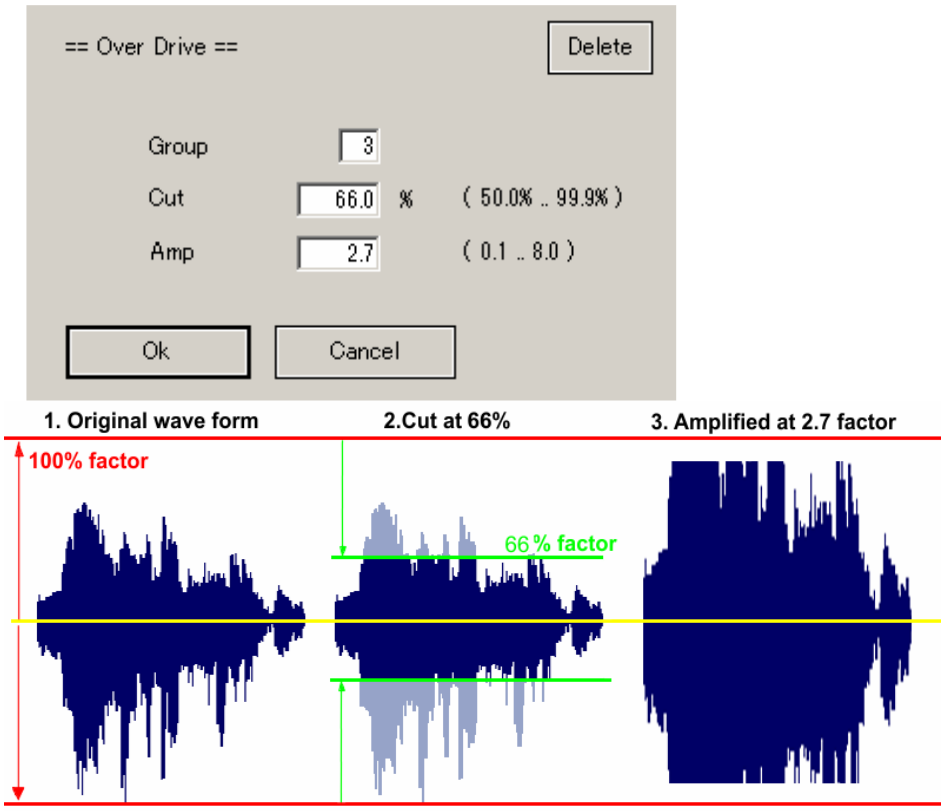
1. **Delay**. Parameter window (example):



(Source: image based on Pxtone Japanese manual written by Pixel himself)

Parameter explanation: **Group number** (1-6) is used to identify the group on "Group No" (Volume panel, p. 19). **Scale** and **Frequency**: frequency value indicates **how many delay notes** fill exactly into ONE SCALE UNIT: Beat, Measure or one second. **Rate** is the volume percentage of next delay note respective to the previous one. In the image-example, we divide ONE BEAT into four delays (original note included), at 33% of volume loss.

2. **Overdrive**. Parameter window (example):



(Source: image based on Pxtone Japanese manual written by Pixel himself)

Parameter explanation: **Group number** (1-6) has the same use as above. **Cut** represents the % of reduction applied over the waveform. **Amp** is used to raise the volume of waveform's previous result, with a factor of 0.1 to 8.0 times. Better try different parameters to reach the desired result.

2. HOW TO...

In this chapter we are going to open a discussion about videogame music aesthetics. This idea drives us to some important questions:

What is 'correct' or 'proper' VG music? When is it supposed to be used in this or that project? Is Pxtone enough to create it?

Of course, it depends on what your aim is, and what the VG's aim is. The idea of 'music' for an arcade is not the same as for a slot machine, or for a RPG action game as opposed to a labyrinth one. There is not an accurate answer for this, and what's more: In this chapter I'm going to express my personal view about VG music, based only on my experience both as player and musician, and it is not necessarily the best orientation. Everyone has their own point of view, ideas and experiences about videogames. So, let's start with some premises:

a) *The simpler VG, the simpler music.*

For simpler videogames we will try to make simple melodies of one, two or three simultaneous channels maximum. Also the sounds have to be simple. I'm talking about square/sine/triangle/etc waveforms. Pxtone is capable of this without any doubt.

b) *Videogames are just like movies.*

They have their own mood: happy / aggressive / quiet / mysterious / easy-going / epic / decadent / sneaking / apocalyptic / "fruit-chasing"...So, determine the "mood of the game" and you will have an important part done.

c) *The best piece of music is not always the most arranged piece.*

For example it's better to create a piece of 'ambience' in some parts of the game than a symphony of voices. It's more appropriate to create the proper environment than a display of sounds and articulations.

d) *Images and music have to live together.*

For some reason, this is incredibly true. If you try some melodies or arrangements with the VG images, sometimes the ensemble fits like a glove, and sometimes you have created a monster and regrettably you have to erase it all and start from zero again. This is the point: Don't expect your music fits the VG at first attempt. You have to test it and find the proper solution for each case. You have to *balance* the tension between images and music.

e) *Make it diverse.*

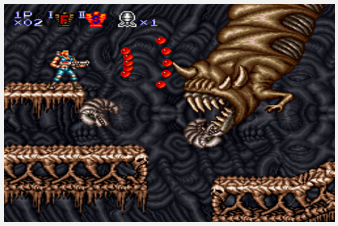
For best results try to make room for any moment of the VG: "Opening", "Start game", "Game over", "when you lose a life", "when you find a secret", "when you finish a certain level"... You can create an intense musical moment even if it lasts a few seconds.

With these five premises we are going to build a solid soundtrack for our project.

2.1 HOW TO CHOOSE INSTRUMENTS.

The golden rule is: "Images and sounds **must work together**."

With this in mind, I propose this table to explain what I'm trying to say:

GRAPHICS STYLE	MUSIC CHOICE
8-bit, very retro:  (Image: Jet set Willy for Zx Spectrum, 1984)	1 to 3 monophonic channels, with **very simple wave forms**: Square, triangle, sine, sawtooth up/down, etc.
8-bit, retro style:  (Image: Shinobi arcade version, 1987)	4 to 8 monophonic channels, **non real sounds** (just plain imitations of real instruments).
16-bit, (SNES, Genesis type):  (Image: Contra III for SNES, 1992)	4 to N channels, with some effects and **almost real sounds**.
16-bit/32-bit, (arcade and consoles):  (Image: Castlevania SOTN for Sony PSX, 1997)	N channels, full arrangements with **best virtual instruments and effects**.
32-bit/64-bit/full HD (nowadays):  (Image: Silent Hill II for PS2, 2001)	Full arrangements with **real** instruments, bands, orchestras, synths and more. These involve professional recording studios and high cost budgets, by the way.

(Jet Set Willy © by Software Projects. Shinobi © by Sega. Contra, Castlevania and Silent Hill © by Konami)

Of course this table is an approach based on statistics and standard videogames, but everything is possible: A realistic modern warfare VG with one-channel-squarewave music, but: Is this the desired result? On the other hand, if we choose a smart and clever piano melody for a simple but polished videogame, this could be pretty fine. The thing is: Modern videogames vary from a hundred person staff of to a small team of programmers to create them, and so the music can vary in many ways from simple to highly complex pieces.

When we talk about different set of instruments, we mean a proper configuration to reach the result we are looking for. Pxtone is an excellent tracker to create music oriented to the first three types of videogames mentioned in the previous table. For the rest, it's better to use powerful synthesizers, guitars, pianos, and samples. I remark: Everything is possible, and consider these lines only as standard advices based on general audiovisual experience.

Basic Music Configuration

We are going to start from the simplest form: One single monophonic channel. This simplicity contains, however, a high difficulty of concept and implementation, because you have to do all melodies, basses and rhythms with only one sound. For this we have to choose one sound, and simple waveforms are the solution: square, sine, sawtooth and triangular are good. All those simple waveforms are provided in folder "Voices". Check them out!

Later, we will try with two-three simultaneous sounds. We will keep the same waveforms for this, and the best choice is:

Channel 1: Bass
Channel 2: Melody
Channel 3: Side melody/ornament track

When we have 4 or more channels, there is a lot of possibilities:

Channel 1: Drums
Channel 2: Bass
Channel 3: Melody
Channel 4: Side melody/ornament track

Channel 5: Chords/ornaments
Channel 6: Chords/ornaments
Channel 7: Chords/ornaments
Channel 8: Chords/ornaments

With this configuration, a musical universe expands in front of us. If we choose the instruments and arrangements carefully, we can reach a complete sensation of fullness.

Since *images and sounds must work together*, as the graphics are more real, the more real the sounds have to be. So, if you have a videogame with 8-bit full color graphics (like 'Shinobi'), the thing is: not to choosing too realistic sounds.

I mean: Drums with poor realistic quality, and for the rest, the same. There are really beautiful sounds among Ptvoice's generated ones, and perfectly suited for that kind of videogames. The provided folder (voices) has a pretty good collection of those sounds: Basses, pianos, cellos, pads, bells, guitars, drums, etc.

But Pxtone has its limits. If we abuse the number of tracks, chords, fx and melodies at the same time, the sound turns blurred and muddy. In the final point of chapter 3 (3.6 Overall Mixing) several advices are given to avoid undesired results: muddiness and undefined sound.

Choosing instruments in Pxtone is easy and quick. From voice label we load the set of sounds we are going to use in the arrangement. The following table shows a standard choice for instrument set:

TYPE OF ARRANGEMENT	VOICES	UNITS (TRACKS)
1 CHANNEL	-SIMPLE WAVEFORMS (DECAY) -SIMPLE WAVEFORMS (SUSTAIN) (We can choose: Square, triangle, sine, sawtooth up/down, etc.)	1. MELODY (swap voices if needed)
2-3 CHANNELS	-SIMPLE WAVEFORMS (DECAY) -SIMPLE WAVEFORMS (SUSTAIN) (We can choose: Square, triangle, sine, sawtooth up/down, etc.)	1. BASS 2. MELODY (swap voices if needed) ---------- 3. SIDE MELODY/ORNAMENTS
4-N CHANNELS	-SNARE (SD) -BASSDRUM (BD) -HIHAT OPEN (HO) -HIHAT CLOSED (HH) -CRASH CYMBAL (CR) -TOMS (TOM) } (DRUMS) -BASS -LEAD -PAD -BELLS -PIANO -FLUTE -GUITAR [...] ETC.	1. SNARE 2. BASSDRUM 3. HIHAT OPEN 4. HIHAT CLOSED 5. CRASH CYMBAL 6. TOMS } (DRUMS) 7. BASS 8. MELODY 9. CHORD A 10. CHORD B 11. CHORD C 12. ORNAMENTS/FX 13. SIDE MELODY [...] ETC.

Drums are treated as one single track, but it has to be written in several units, since they have different sounds (SD, BD, HH, TOM, etc). This has the advantage of writing drums directly on note matrix (Unit label). Also we can swap voices on one single unit (see p. 18: "Voice No"). There are many possibilities.

Once we have chosen the proper sound set and units, let's talk about the arrangement itself.

2.2 HOW TO ARRANGE A VIDEOGAME SONG.

To illustrate this, we are going to analyze the pieces of three fictitious VG projects:

A) "FruitLand", a maze style game where you have to collect fruits and there are some dangers. Very retro and simple:

FruitLand gameplay (fictitious screen)

B) "Horrorville", a dark VG whose gameplay takes place in a mansion, with action moments and some mystery. Retro style with nice 8-bit graphics (like the NES or SEGA MASTER SYSTEM console). Think of "Nightmare on Elm St." or "Maniac Mansion" for NES console:

"Nightmare on Elm St."
© by LNJ (1989)


"Maniac Mansion"
© by Lucasfilm games (1987)

C) "Camelot", an action-arcade VG with gorgeous 16-bit graphics and detailed characters. A world of knights, wizards, weapons and sorcery. Think of "Magic Sword", "Knights of the round" and "Golden Axe" arcades to have an idea:

"Magic Sword"
© by CAPCOM (1990)

"Knights of the Round"
© by CAPCOM (1992)

"Golden Axe"
© by SEGA (1989)

Well, here is the starting point. With this information we can determine several concepts before we work on these fictitious VG:

(Let me show another table, I love them!):

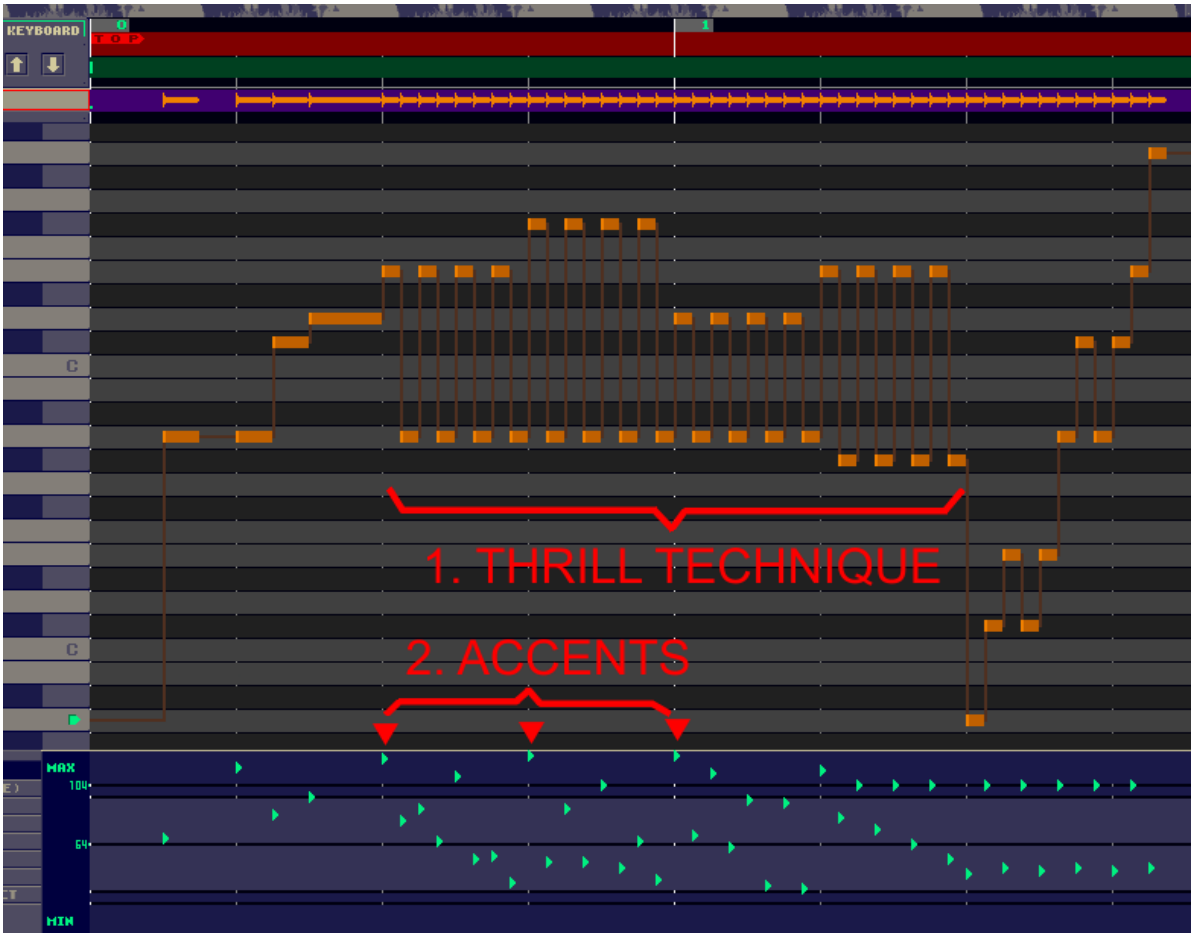
GAME	MUSIC CHOICE	MOOD	COMMENTS (notes)
A) "FruitLand"	1-3 channels, simple sounds and direct style.	Cheerful, easy-going and funny. Simple but catchy melodies.	These games are close to slot machines, so the melodies must be very addictive.
B) "Horrorville"	4-5 channels, horror type sounds and scary musical fx.	Dark, mysterious and sometimes shocking and horrific.	We will try to make a soundtrack suited for a videogame adapted from a horror movie: just like that.
C) "Camelot"	8-10 channels, strong melodies, action beats.	Epic, "adventuresque", strong, powerful and legendary.	This music has to be intense in all senses: you have to stay alert for the enemy's attacks. With legendary moments of glory...

With these **general concepts** in mind we are ready to compose the soundtrack for each one. When composing music, I recommend turning on a keyboard, guitar or whatever you want to help you with melodies, harmonizations, basslines, chords, transitions, etc. You have to test everything before starting to write music in pxtone Collage.

The following sections are detailed examples of different type of song, concepts, articulations and configurations. Please pay attention:

2.2.1 One - Three channel example: "FruitLand"

Let's design the following pieces for this videogame: "Game start", "One life lost", "Stage1" and "Game Over". Start point is the concept. It has to be simple in all senses. Please load song No. 01 "FRUITLAND_Game_Start" from Songs folder, and listen to it:



Notice there is only one monophonic channel, and the sound is pretty simple: a square waveform. To create an auditory illusion, thrill technique (1) is used here: two (or three if needed) sounds are playing very fast in order to swap them. Your brain tends to blend those two sounds creating a bi-chord, an illusion of simultaneousness. But velocities must be edited to accent the first beats and create dynamics (2), while weak notes are low in volume.

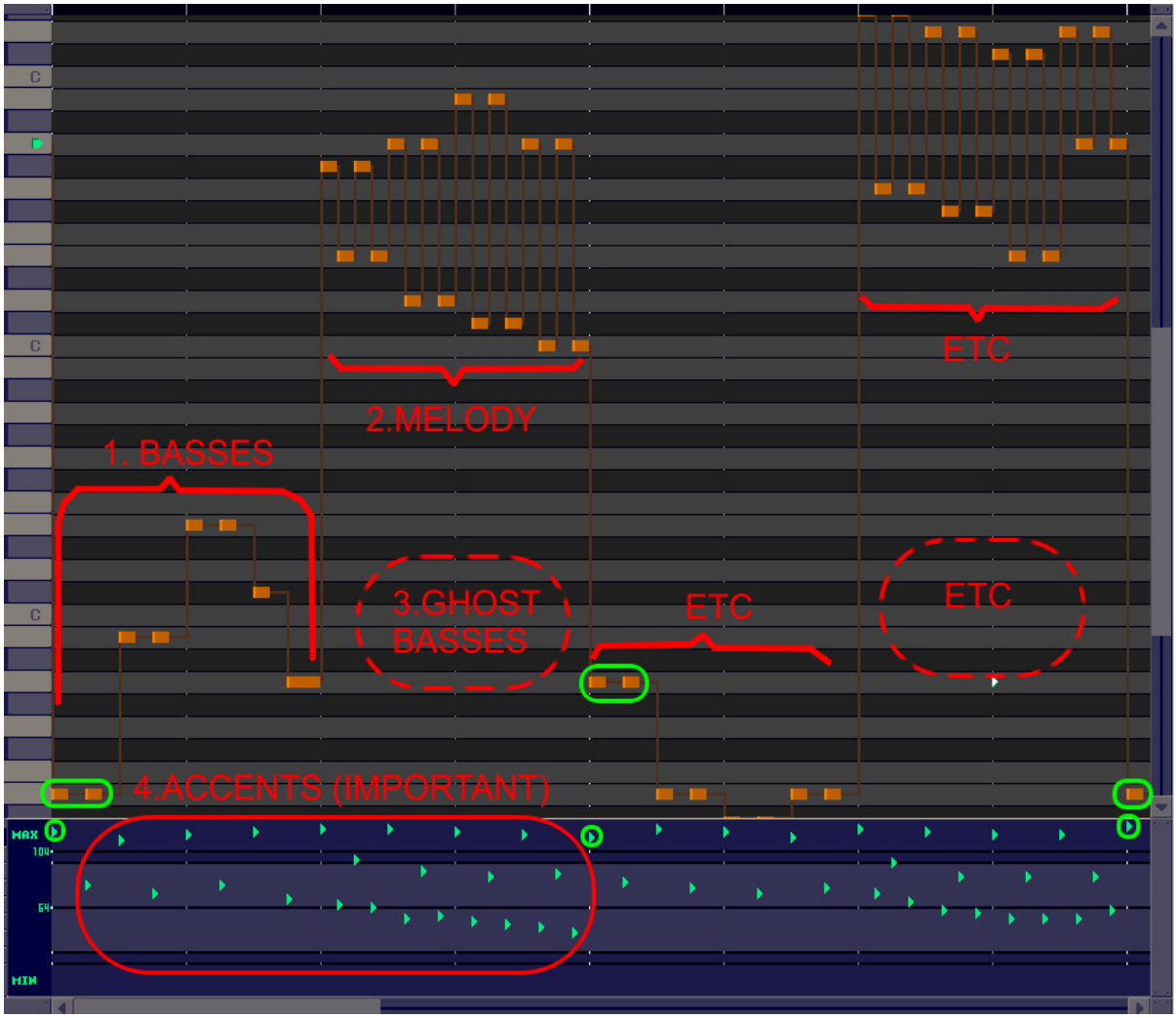
At the end there is an *arpeggio* which tells the player: *"The game starts HERE!! GO!!"* Simple and direct.

Please load song No. 02 "FRUITLAND_Life_lost". Here we use the thrill to create a "falling down" sensation every time you lose a life:

This piece is close to slot machine sounds.

Please load song No. 03 "FRUITLAND_Game_Over". Again, here is the idea of 'falling down' and a certain 'mocking' mood because you lost all your lives. Also the tune reminds the famous tagline: *"That's all folks"* (and the game is over). Nothing special with this. Remember: simple and direct.

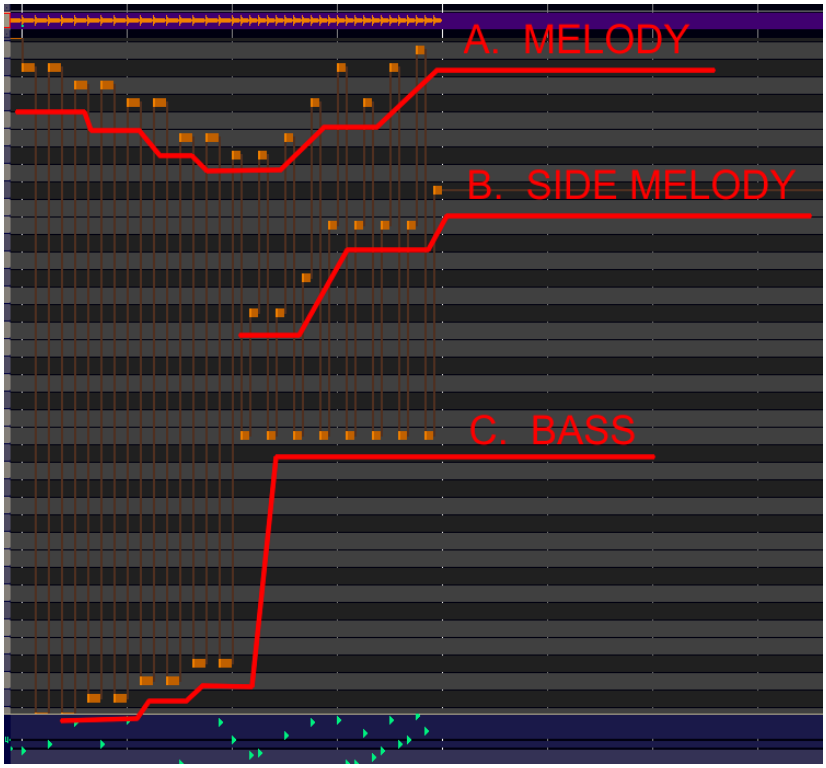
Please load song No. 04 "FRUITLAND_Stage1". Here the idea is a labyrinth full of fruits and dangers that you are moving within. A very simple game: funny and entertaining. A rock'n'roll structure is suitable for this. We have to do it all with only one channel, and it's a total challenge. Observe the notes:



Notice that we start with a bassline (1), and then a thrill-melody follows (2). Your brain fills the gap and creates "ghost basses" (3): you are able to imagine the bass while the melody is playing, but there is no bass. The secret is to accent the first bass notes (green circles) to assure tonality. Also the accented notes (4) are important. The song structure is very simple:

THEME ▶ RESOLUTION ▶ LOOP

The resolution part involves three channels mixed into one single monophonic:

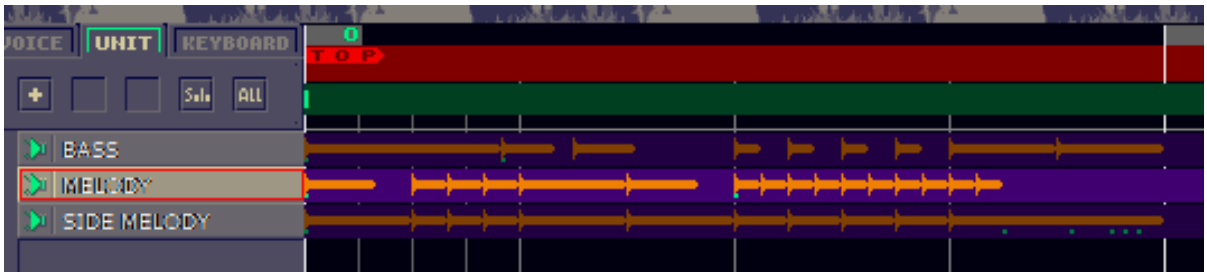


Notice that (A), (B) and (C) are blended together to create a full-voice arrangement. But this is an illusion.

There is one problem with these songs: If we use only one channel, the music sounds faltering and hasty. Too many different notes following each other, but this kind of pieces works fine with certain retro VG. If we increase the number of channels to 2 or 3, the possibilities are many:

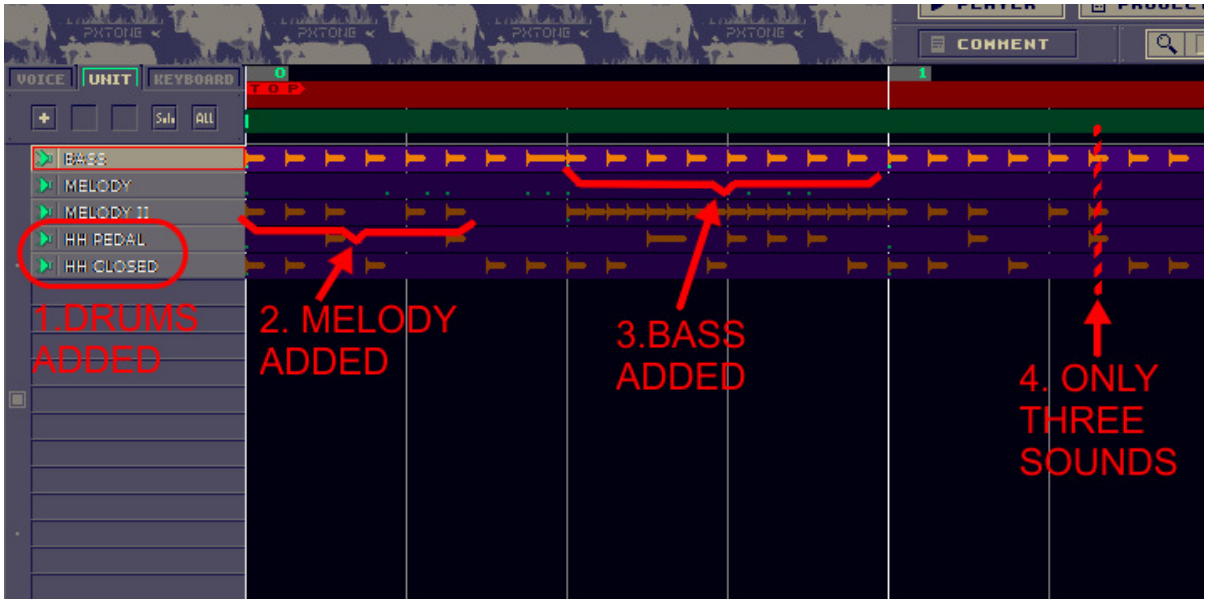
Please load song No. 05 "FRUITLAND_Game_Start_x2_CH" and compare it to song No. 01. Here we only have added one channel (bass) and it's enough to fill the gap in the piece. Notice that original melody is just the same. This arrangement is perfectly suitable for the same type of VG. Now let's comment on a couple of pieces:

Please load song No. 06 "FRUITLAND_Game_Over_x3_CH" and compare it to song No. 03. Here we have three monophonic channels (BASS, MELODY and SIDE MELODY):

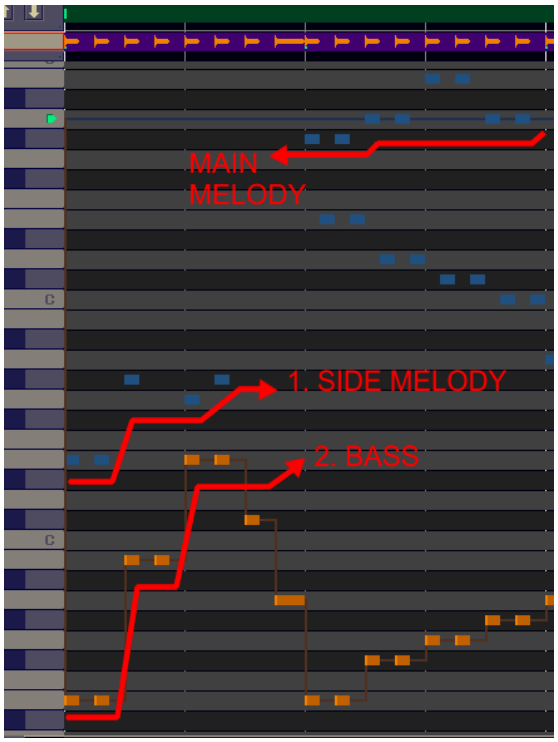


Basically, this piece sounds similar to the original, but here we have added a BASS track and a SIDE MELODY, to harmonize the main one. The result obviously is brighter than before. Notice that the original track (MELODY) still remains here -just an exact copy- and that the rest of the tracks have been added to complete the piece. Another concept is used for the next piece:

Please load song No. 07 "FRUITLAND_Stage1_x3_CH". Here we have had to re-arrange the original song with three channels:



First, we load two Low Quality (LQ) sounds for 'drums'. Only a Hi-Hat ones (1). Then we write the same song No. 4, but this time melodies and basses are present throughout the whole composition (2, 3), and the rhythm as well. Although there are five tracks, only three are sounding at the same time (4). Notice that sounds used are still simple waveforms. Here we have changed a couple of times the sound of melodies to create 'colour' and variety.



◄ Also the side melody (1) is played at lower volume to create a solid rhythm section, close to the bass range (2), but a bit higher.

One important thing is to be homogeneous for all pieces. I mean keeping the same style and sound sets. If we change the number of tracks (increasing them) or the voice set, a problem may occur:

Please load song No. 08 "FRUITLAND_Stage1_x3_CH_FULL_SOUND" and listen to it: Here we have just changed the simple waveforms and LQ samples for gorgeous sounds and added a complete HQ drum set: BD, SD, HH. The first thing we think is: "Wow! what a sound!" but this is only a sensation. If we think deep and carefully about this, we will realize that the piece is too much produced for our 8-bit style VG. Please compare to song No. 07 and think of the screen and gameplay. It has to be simpler, and maybe this arrangement is too much and far from the desired result. In the next example (Horrorville) we will use better sounds and capacities.

Final Notes about "FRUITLAND"

1. Start from the concept of simplicity and keep in mind the game mood every time.

2. Limit yourself to 1-3 channels and simple waveforms.

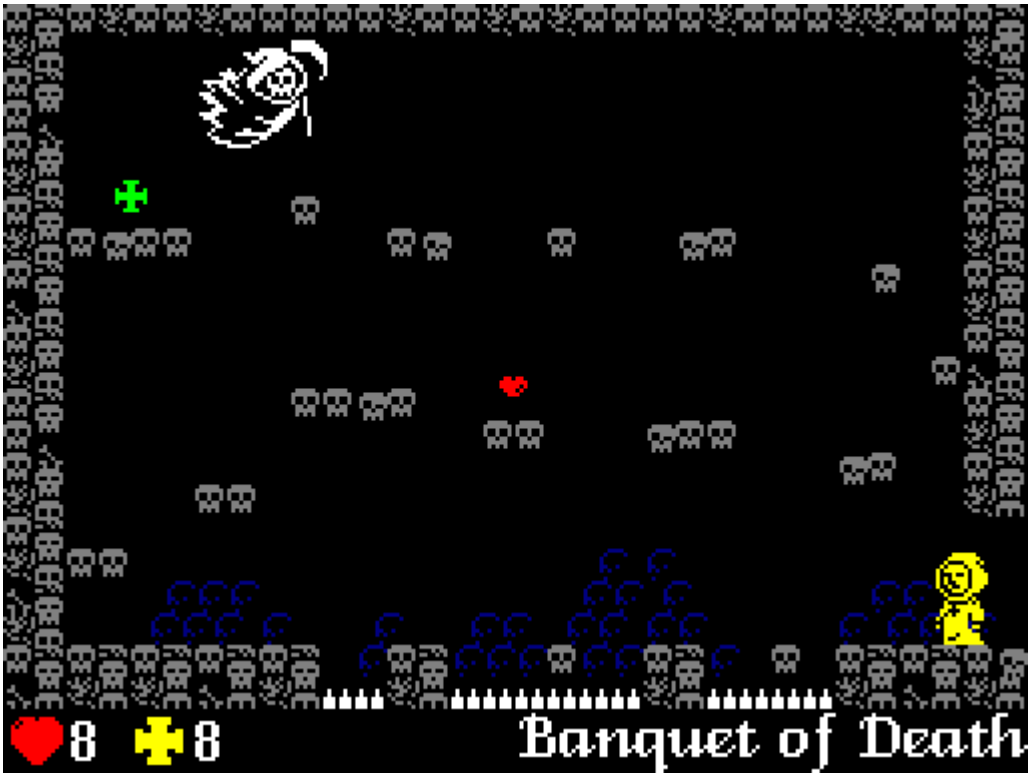
3. Keep an instrument at hand (keyboard, guitar, etc) for practising melodies and harmonies.

4. Watch the basic track parameters: volume and velocity.

5. Listen to the song again and again until you achieve the desired result.

INTERLUDE

It's time to take a rest. Please load song No. 09 "Evil Fight". I used this on freeware VG called "L'Abbaye des Morts". It's composed in only one channel and it has multiple tricks and articulations. Pay attention to volumes, accents and thrill technique. By measure 7 there are almost 5 virtual channels into one. Hope you like it. This is just the screen for that piece:



L'Abbaye des Morts © 2010 by Locomalito games (www.locomalito.com)

2.2.2 Four channel example: "Horrorville"

Now is the turn for horror movies. The design is one step beyond the previous VG. Here we can use the full palette of sounds (ptVoices), but still LQ drumset. This is used to create a proper environment when an 8-bit VG (NES style) is our project. Think about a few colours (palette of 16 basic colours) and nice graphics. The rule is: You can use all sounds and articulations in only **four** monophonic channels. This is the only limit. Ok, let's start.

For this VG we are going to create the pieces: "Prologue", "Stage1" and "Mystery theme". Now we must focus on two ideas:

1. To create a mystery environment.
2. To use four channels with no waveform restrictions.

Four channels are enough to create something decent and detailed. If we use the features of Pxtone wisely, we can do it for sure. Please load song No. 10 "HORRORVILLE_Prologue" and press space. This song may be used for an opening sequence, a short prologue about the mansion and its mysteries. I imagine a dark screen with a mansion over the hill, and some scrolling text like this:

"Long time ago,
an ancient woman swore a terrible curse against the Mc Neill family.
Nobody survived.
[...]
Now you have to enter the house and solve the mystery"

Well, let's analyze the piece: Why does it sound so *mysterious*?

It's a simple trick and some "audiovisual heritage". We all have developed a collection of "thematic libraries" in our minds due mainly to movies, documentaries, TV series, video games and more. When we say: "Oh! it's sounds *Egyptian*!" or "This is a *Roman Empire fanfare*" we are only saying that the music reminds us of some popular film, but I can assure you that Egyptians didn't arrange music in that spectacular way. Horror movies are the best examples for this: music could become shocking and horrific when certain elements are put together.

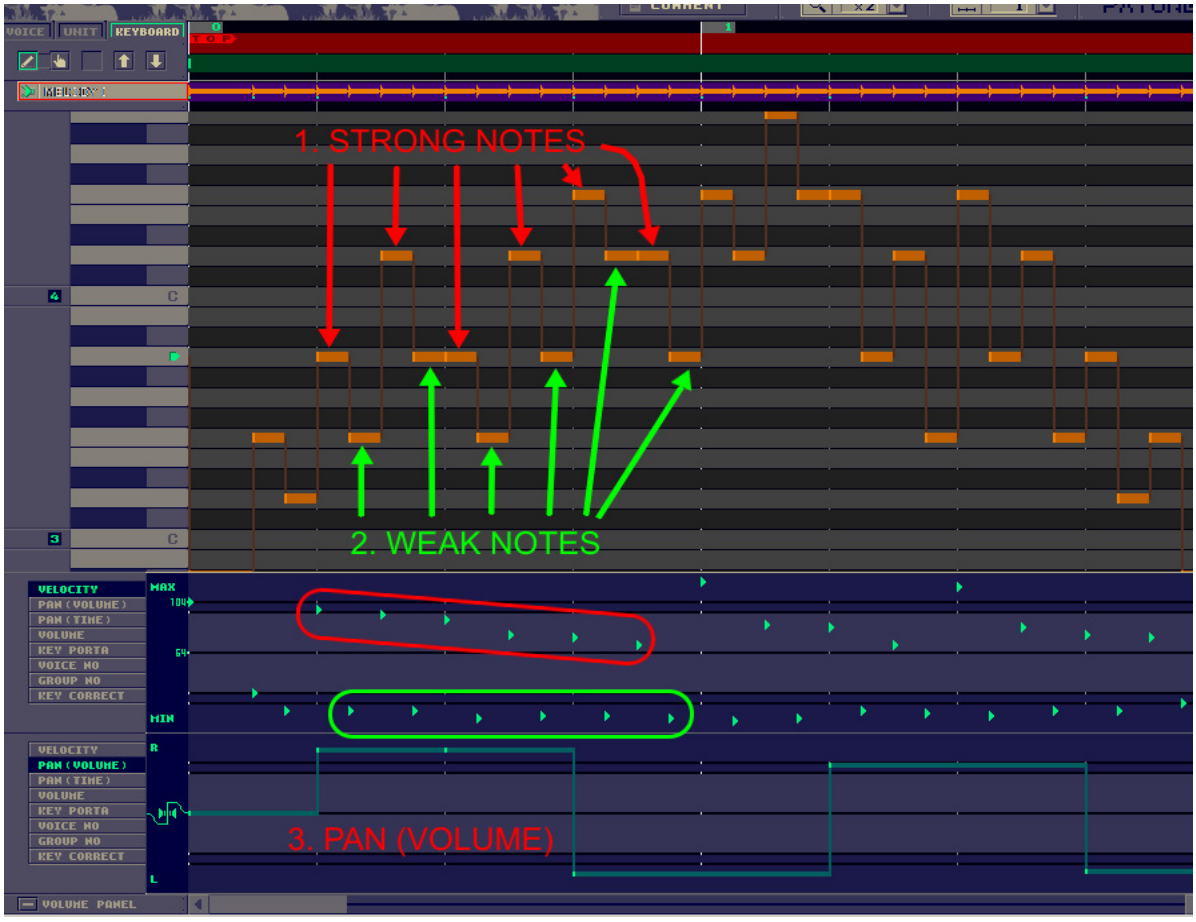
The sound set for this piece is:

DRUMS (BD, SD, HH, TOM), BASS, BELL, HORROR FLUTE and PAD TREBLE.

To create the proper ambience, there are three concepts:

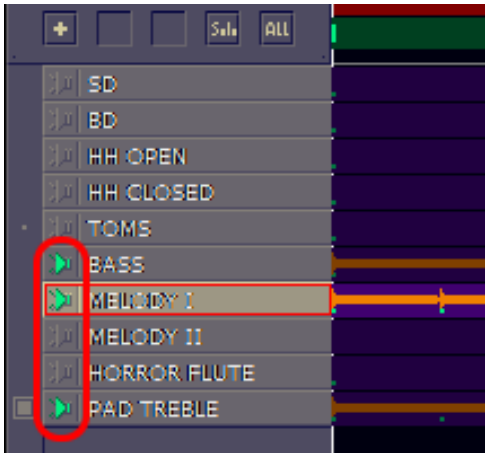
1. Choice of harmonies and chords which remain a horror movie (all are minor ones).
2. Choice of instruments used often for this, like the flute (or "theremin").
3. Choice of articulations like slides, vibratos, delays and drops.

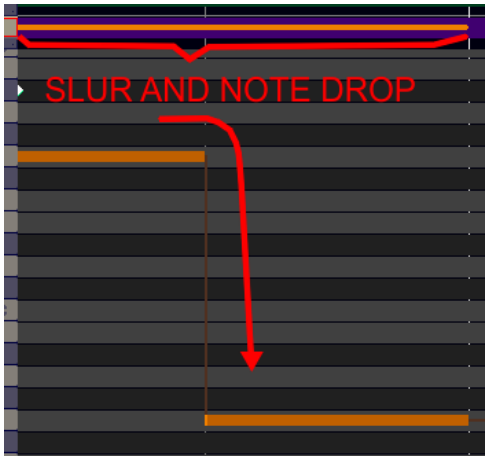
The idea of 'moving chords' is the main motif. For this we use the bells in the higher range with a simple trick: the fake delay. Let's have a look: choose the unit called MELODY I and press solo button to hear it alone:



This is a 'fake delay', and it is achieved by editing notes and velocities. Odd timing notes are strong (accented) ones, and even notes are weak (lowered). If we add some panpot, this track will fill an important part of the arrangement.

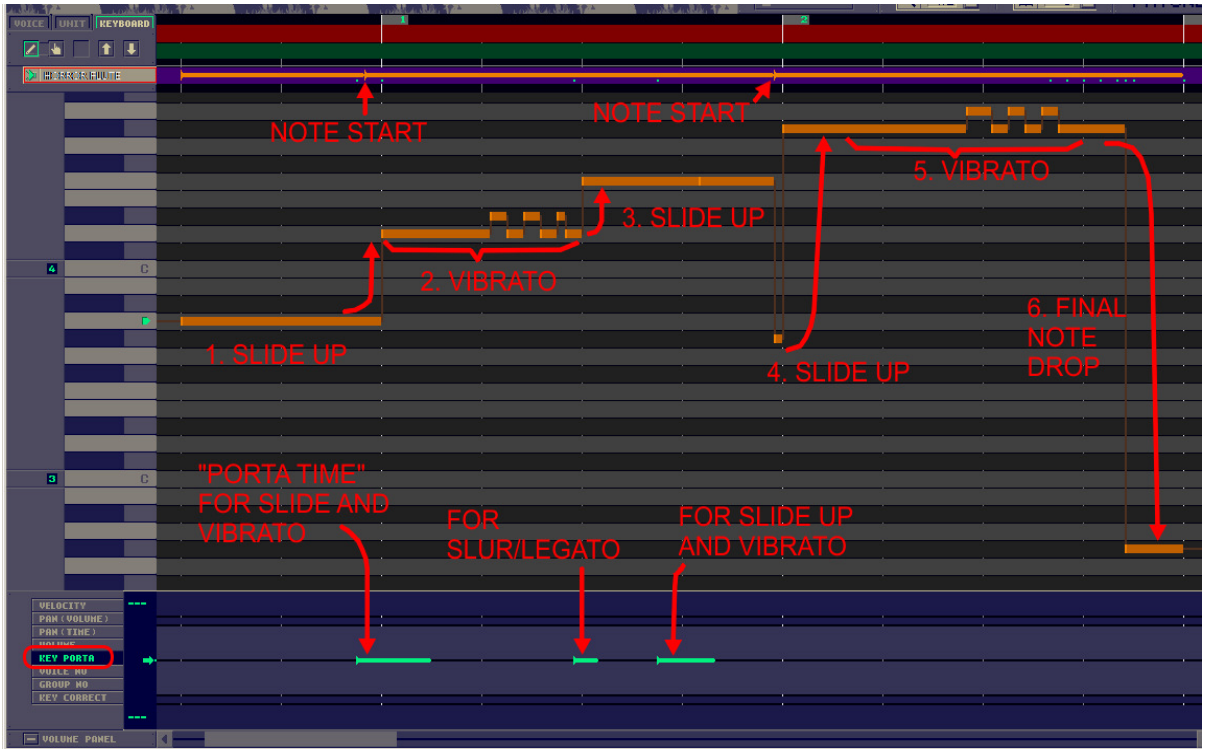
With the bell track sounding in that way, let's add two more: BASS and PAD. Please activate them by the switch and listen:





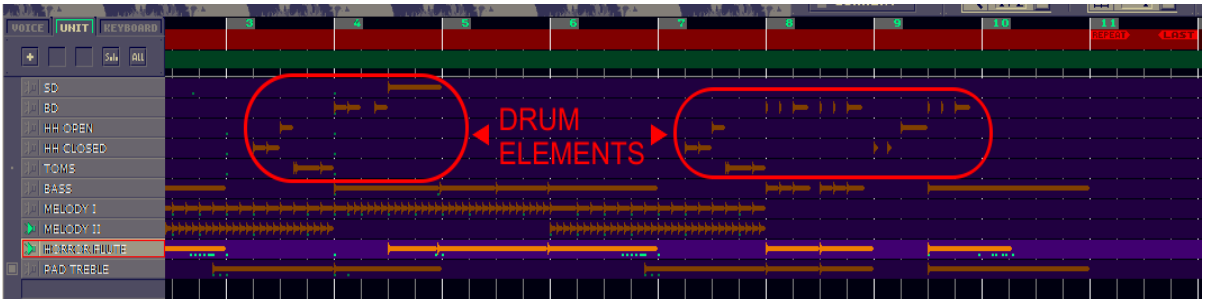
We add the effect of "note drop" over the bass and pad, a simply but effective articulation.

Please activate MELODY II track and listen to the overall effect. Now we have the perfect base for including a tricky flute melody. This flute has a simple timbre (only one element) but close to old theremin sound of the 50's Sci-Fi movies. Please select 'Horror Flute' track and pay attention to the articulations for this unit (see image on next page):



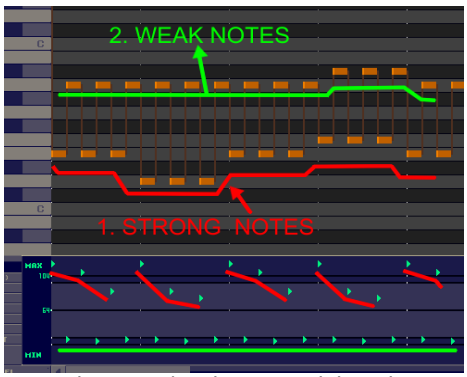
This flute melody has two main articulations: slides and vibratos. In chapter 3 we are going to give detailed information about how to create them. The thing is to achieve the most expressive melody possible over the base (bells, pad, bass).

Finally, we put some drum elements for adding tension in certain moments:



That's all. A little bit tricky but only four channels. The next piece has a slightly different mood: more action-oriented and with full rhythm section.

Please load song No. 11 "HORRORVILLE_Stage1" and press space. Here the main idea is "movement and tension". Because of this, there is a continuous thrill bassline at the beginning. Select DARK PIANO track and play it in SOLO mode:



Notice the strong/weak notes and the velocities

With this motif, we build the rest of the piece adding ornaments in order to create a slight sensation of tension and fear. Please select PAD TREBLE track and play it in SOLO mode. It sounds strange and odd, doesn't it?. When these two tracks are played together, we get the ambience base. At measure 3 there is a drum fill in to prepare the entrance of rhythm. Now we are ready to introduce the main theme at measure 4: here comes the rhythm and some movement. Also we add our beloved 'Horror flute' for scary melodies. Please pay attention to these elements (set the start point at **measure No. 4** for testing):

1. BASE: Drum section (first 5 tracks), BASS and MELODY I tracks are used to stand the whole set. Select only these and press play. You can hear a solid rhythm with strong bass section. Observe the note drop on both tracks at the end of each group (beat 2).

2. ORNAMENT: MELODY II track is used to complete the base. Notice that the fake delay technique is used to fill the later beats in every measure (3 and 4 beats).

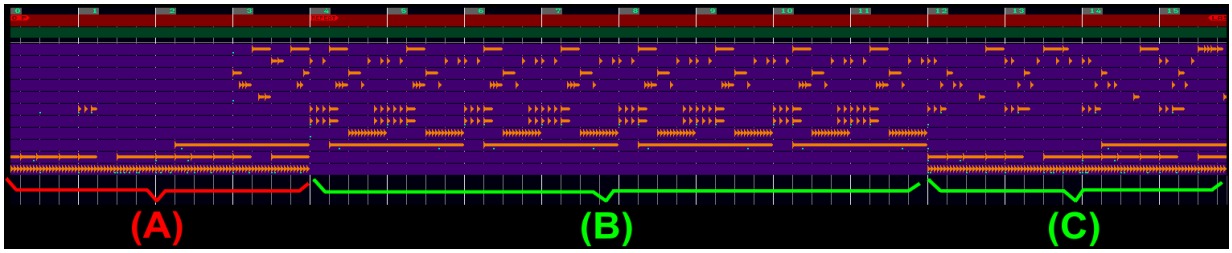
3. MAIN MELODY: HORROR FLUTE track is used to keep the tension ambience with articulations on purpose: slides and vibratos (see previous page).

Song Structure

The song structure is very simple:

INTRO (A)► [THEME (B)► RESOLUTION(C)] ► LOOP(B,C)

Here we have the intention to create a crescendo model: We begin with the intro (A) in measures 0-3, and no drums are used here. Then continue with the Main theme (B) in measures 4-11, and finally we play the intro again, but this time we add the rhythm (C) to emphasize the motif (A) in measures 12-15, and enable the loop (B-C-B-C-B-C-....):



This is very effective with videogames: When you enter a new area, the music plays an introduction, and then the main theme sounds with a loop. When you lose a life the song begin again from the intro and this encourages you to do it better. Very simple.

Please load song No. 12 "HORRORVILLE_Mystery_theme" and press space. This piece could be used for a 'Collecting clues' part in the game, when you are in the mansion library, or looking for evidence in the main bedroom. The idea is a quiet moment while you have to stay alert in case a sudden danger occurs. Tension, mystery and thrill mixed altogether.

This song is very simple and loops from beginning to end. Articulations of previous songs are used here: Note drops, fake delays, accents, etc. At this time you have to be able to check these features and analyze the song by yourself. Be prepared for the next VG example.

How to achieve better results

If we add some delay on one or two tracks (Melodies and ornaments) the result is simply SPECTACULAR. Please load song No. 10B "HORRORVILLE_Prologue_FX" and press space.

Now it sounds completely surrounding and perfect. We just added a delay FX over the MELODY I and HORROR FLUTE tracks. But, is this the desired result for our project?

Keep in mind the golden rule: *images and sounds must work together.*

Old NES videogames only had 4-5 monophonic channels maximum with NO FX. But this is only a specification. In modern VG everything is possible, so: **Why not?**

If we add some nice FX on selected tracks the music could have a better finish and this helps to increase the VG quality.

Final Notes about "HORRORVILLE"

1. Start from the concept of movement and tension. Keep in mind the game mood every time.
2. Limit yourself to 4-5 channels, LQ drum samples and proper ptvoices (all are allowed).
3. Keep an instrument at hand (keyboard, guitar, etc) for practising melodies and harmonies.
4. Watch the basic track parameters (volume and velocity). Add some articulations and tricks over the main tracks (fake delays, note drops, legatos, vibratos, slides, etc).
5. Check the song structure and make it loop when needed.
6. Listen to the song again and again until you achieve the desired result.

INTERLUDE

It's time to take a rest again. Please load song No. 12B "Towervania_action_theme". This was my very first composition using Pxtone. Everything began with a freeware VG called "The Soul of Dracula". I like it a lot, because it reminds me of the legendary "Haunted Castle" (© Konami, 1988). The Soul of Dracula uses PxTone as music engine, and I took a time to study it, and composed this little piece inspired by stage1. It has only 4-5 channels with no FX or articulations, but melodies are tricky and baroque. Check them out!
Since that moment I thought deeply about the possibilities of Pxtone. I would like to thank Bunaguchi for making this excellent videogame and letting me discover Pxtone.

The Soul of Dracula © 2010 by Bunaguchi
(http://hp.vector.co.jp/authors/VA049213/index.html)

Haunted Castle © 1988 by Konami
It's one of my all time favourites!

2.2.3 Eight - Ten channel example: "Camelot"

Are you ready to play in the Major Leagues?

Prepare yourself to deploy all the forces of your arsenal: The best voices, FX, articulations, high quality drum samples with no limits of tracks. Let's squeeze PxTone to the maximum.

For this proposal we have to act with caution and proceed with care to avoid the disaster: messy sound and muddiness. It's easy to commit such 'crimes' when you have it all.

Camelot main concept

The first thing you think is: "Wow! Let's put dozens of trumpets, hundred of drums and tons of tracks to create a wall of sound". If you do this, you probably will get involved in serious trouble. Now you have to sit down and think well of configuration, structure, parts and sounds. Here is my approach point by point:

1. "Camelot" is an action game. It has to be strong and encouraging. For this we need a solid base: HQ drumset, bass and side melodies in the mid-lower section.

2. "Camelot" is about knights, castles and battles, so brass sounds and trumpets are required for main melodies and passages.

3. "Camelot" is a videogame, not a movie. Because of this we must add articulations and sounds adapted for a VG: Bells, melodies and non-real sounds. On the other hand, appropriate compositions and fanfares just like the epic films are very suitable. The idea is: The notes and chords but not the movie sound, just VG sound.

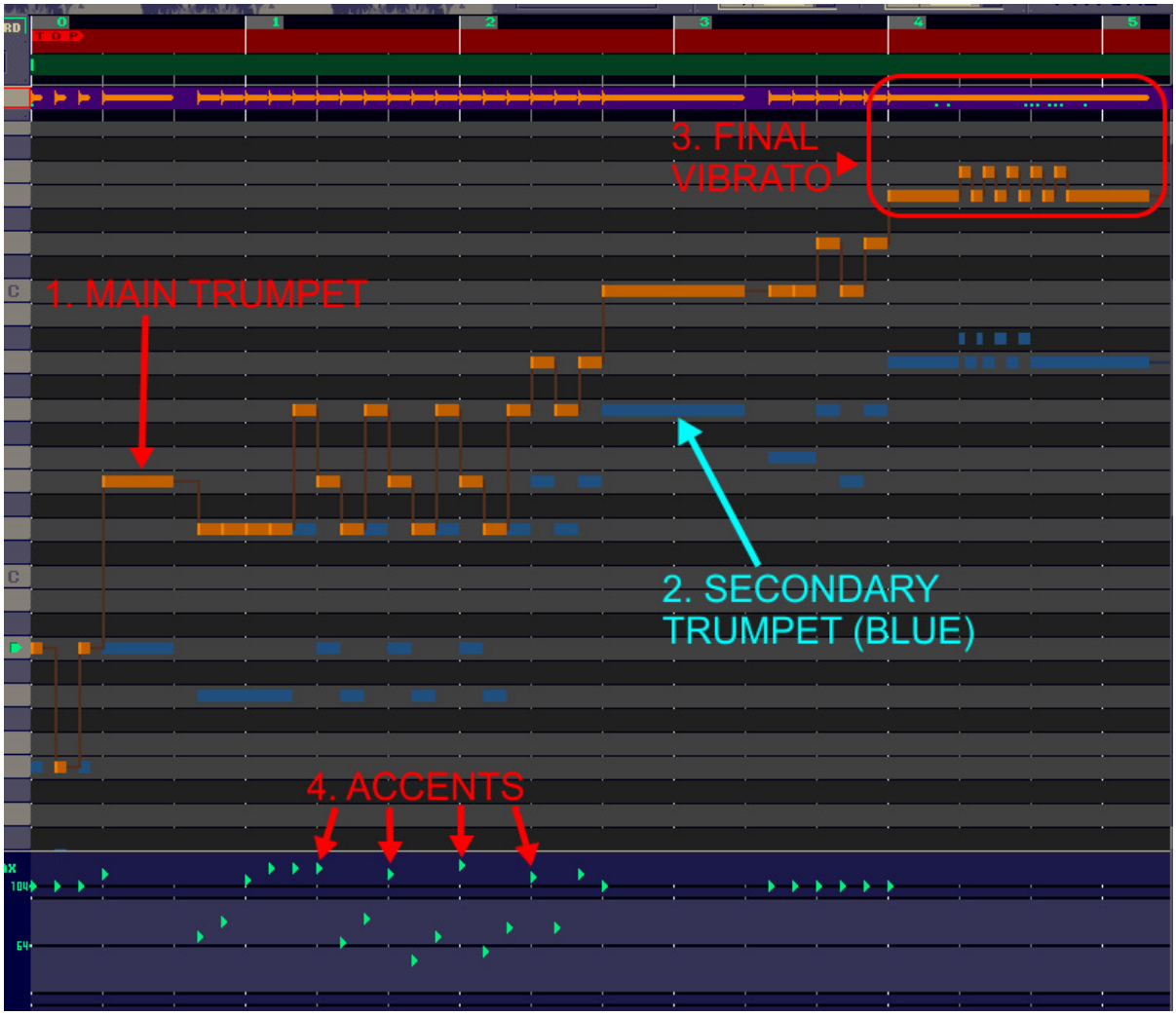
We are going to create the pieces: "Main Title", "Stage 1", "Stage Clear" and "Game Over".

Ok, let's start.

Imagine a screen like this: A beautiful landscape with a gorgeous castle over the hill (not a horror mansion!) and a camera coming from the left discovers us a medieval banner standing by a knight. In that moment there is a fade to black and a bright arms shield appears with the main title: "Camelot" (see image on p.29 section C)

When I imagined this, only one instrument sounded in my mind: the trumpet. I got to create a medieval fanfare to make the player enter this world at first glance.

Please load song No. 13 "CAMELOT_Main_Title" and press space. This theme begins with a fanfare of trumpets and it's supported by a military snare, toms and bass hits. Please select BRASS I and BRASS II tracks and play them in solo mode. Observe the sound: It has a delay FX and some articulations at the end (vibrato). Also accents are important and what's more: since they are a PAIR of harmonized melodies, we can separate them slightly with PAN (Volume) feature: each one in 50% (left and right respectively). Select both tracks with Ctrl and visualize them in keyboard label screen:



The rest of the tracks have the function of supporting the main fanfare in order to enhance it and give it power. Bass, drums, cymbals and side melodies are combined together in order to achieve a punchy sound.

Please load song No. 14 "CAMELOT_Stage1" and press space. An action arcade game must have a very powerful beginning and jump right at you.

Overview

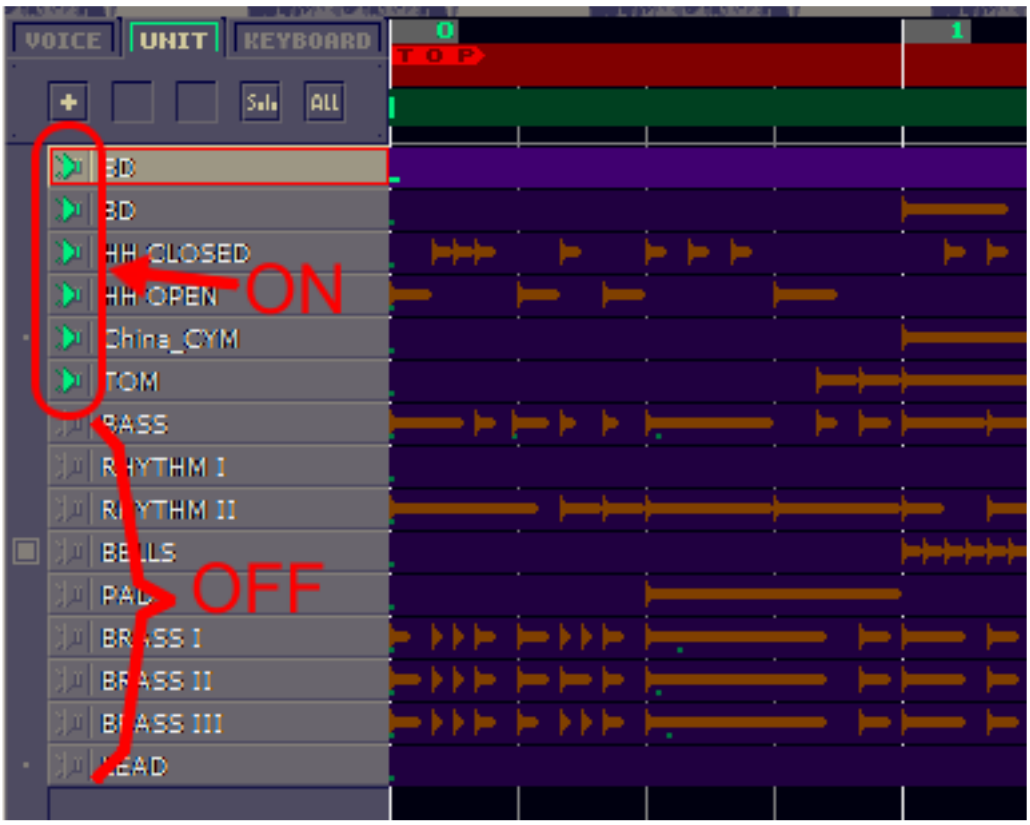
The first two measures (0 and 1) are used for the introduction section, and it tells the player:

"Ready to fight...? GO!!!"

Then, in a few seconds the rhythm section bursts into the stage with a strong base: Drums (SD, BD, HHs, China CYMBAL, TOMS) and Bass-rhythm section (BASS, RHYTHM I and RHYTHM II). Along with this, there are ornament tracks: BELLS and PAD. They are used to give unity and continuity to the whole set. Over all of these, we've got the main melody (LEAD) and the trumpets again (BRASS I, II and III). Let's have a look at different sections. Please set the start point on measure No. 2.

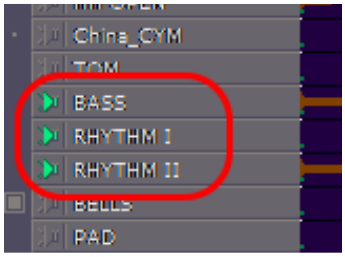
Section Treatment

Select the first 6 tracks (drum section) and play them in solo mode:



Hear the drum section to have an idea of the "action mood" we are looking for.

Now turn on the Bass-Rhythm section (BASS, RHYTHM I and RHYTHM II) and play them in solo mode. Only these three units:

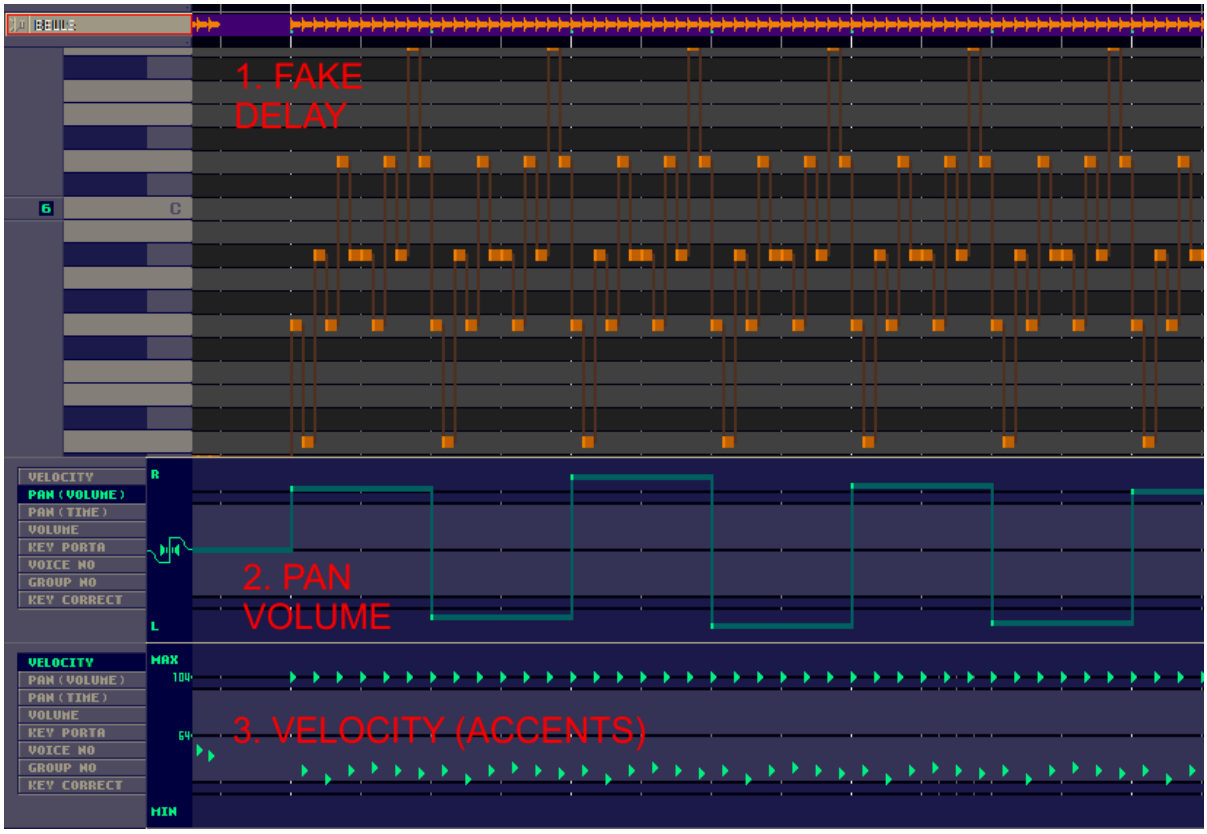


◄ Listen carefully and observe the accents and stereo location of each instrument. With this stereo distribution there is more room for further elements.

It's time to hear the Drums and Bass-Rhythm sections together. Select the first nine tracks and play them (the rest must be *off*). This is the BODY of the song. It has to be strong and solid enough to support all the rest.

Let's talk about BELLS and PAD.

Bells are used to create continuity and of course VG nature. Since this track is an ornament, we must keep it at low volumes. But we can do a lot of articulations: Stereo swapping and fake & real delay at the same time. Please play it in solo mode and hear through the headphones if possible:



PAD is used to add a little brushstroke over the rhythm with a note drop articulation. Nothing special with this.

Well, we are ready to give an explanation of LEAD and BRASS I, II and III.

Since this section are over all tracks in volume, we can apply some nice delay FX to enhance the power of melodies and fanfares.

In measures 6 to 13 the main melody is played by LEAD track, and BRASSES work in *response* to LEAD phrases. If you set the start point at measure No. 6 and play these four tracks in solo mode you will hear this 'dialog' between LEAD and BRASSES. Of course, Brasses are located strategically in stereo field to make room.

Now the roles change: In measures 14 to 19 we got a full medieval fanfare of trumpets and here BRASSES are the main characters of the film.

The following table shows the relevance of each section:

SECTION	RELEVANCE	VOLUME (%)	COMMENTS
DRUMS	HIGH	80%	They have to sound loud and clear.
BASS - RHYTHM	HIGH	80%	They have to provide punch to the piece.
BELLS - PAD	MID-LOW	50% - 40%	They are ornaments, but have to be present.
BRASS I, II & III	MID when side/ HIGHEST if leads	60% / 90%	Lower for side function and highest for fanfare.
LEAD	HIGHEST	90%	The melody is the most important part and must be heard ABOVE ALL PARTS.

Ok, let's analyse the song structure:

INTRO► [RHYTHM► THEME► FANFARE►RHYTHM (TENSION)]► LOOP [...]

Here we have the intention to create an action model. Let me explain bit by bit again:

1. We begin with the intro in measures 0-1. It has to be powerful and short.

2. In measures 2-5 we let the rhythm play and settle in our heads like a heavy metal song (yes, you can move your head with the beats).

3. Then we introduce a dramatic melody in measure 6 to 13, to create a fighting ambience.

4. In measure 14 to 19 an epic medieval fanfare sounds loud encouraging us to fight for the glory of the Holy Grail (hehe).

5. Finally, the measures 20 to 23 tell us: *"Stay alert and don't let your guard down".* This moment of tension has the same bass-rhythm section as measures 2-5. With a small change on the drum treatment we achieve the desired result and what's more: It's a *perfect bridge* between the final and the loop part: two birds with one stone.

Please load song No. 15 "CAMELOT_Stage_Clear" and press space. This theme has the same treatment as song No. 13 (Main title). The unique difference is the tempo. When you beat a boss, or clear an entire area, this piece alerts you to prepare for the next, while taking a little rest. For example, during this tune the screen may show the current score, lives, items collected, statistics, people killed, princesses saved,... A short but intense song. Nothing special with this.

Please load song No. 16 "CAMELOT_Game_Over" and press space. The moment that you loose all your lives is a very sad one. Due to this mood (remember: keep in mind the mood every time), drums and disturbing elements are removed. I think of this moment as a lullaby, with the dead knight laying on cold stone in a cathedral, and surrounded by his companions. The theme ends with a very effective trick: the *ritardando,* or slow down the tempo. Since Pxtone is NOT able to set series of tempo changes, we can do it manually with certain rules. In chapter 3 we will explain how to do it.

Final Notes about "CAMELOT"

1. Start from the concept of Power/Action/Adventure and keep the game mood every time.

2. Although you have no limits, take the time to think about channels, sounds and sections.

3. Keep an instrument at hand (keyboard, guitar, etc) for practising melodies and harmonies.

4. Watch these track parameters: volume, velocity, pan-volume and FX.

5. Listen to the song again and again until you achieve the desired result.

2.3 HOW TO USE PXTONE EASY AND QUICKLY

In this short section we are going to explain how to write music with Pxtone in a comfortable way. Some practical advice will be given to avoid disasters and save time and effort.

Ok, imagine that you have a song clear in mind and know all notes and articulations. Also you are able to play it with your guitar or piano, even sing it. Now you are going to write it in Pxtone. Let's proceed bit by bit:

Song writing

1. Determine the quality of the sounds and load them in voice label slots.
2. Set the beat, tempo and working title for your song in 'project' menu.
3. Create the tracks (units) and give them a logical name in capital letters (for best reading).
4. Decide which track (unit) you are going to write first. For example: MELODY I.
5. Select the proper Resolution (RT) and start to write notes from the chosen track in a preliminary mode: one click for each note. Drag them if necessary to enlarge duration.
6. When a few measures are finished, check the tempo with start/stop (space bar).
7. Choose another basic track and write it. For example: BASS.
8. You can either write the rest of the tracks or give a few of them shape with articulations. You decide.
9. I recommend writing all tracks in parallel mode: a few measures or passages for each one and then continue writing the next measures.
10. When all tracks are written, give each one the proper volume, velocities, legatos, FX and any articulation if needed. Take your time to check the transitions and changes carefully: music has to flow from beginning to end.
11. Check the entire song by trial-and-error while listening to it, and do the fine calibration with volumes, panpot, and also voices (sometimes a voice change is the solution).
12. Check different sections by listening to them in solo mode, and stay alert if an error occur. Be sure everything works fine.

Now let's give you some advice about functions and procedures often used when working with Pxtone:

General tips

1. Remember: CTRL+Z to Undo and CTRL+Y to Redo. This is very useful if you make a mistake.
2. With Click'n'Hold technique you can enlarge note's duration and erase them quickly. Also this is a valid erasing parameter to use in 'Volume Panel'.
3. With fine RT (higher numbers) you can create volume curves, slides, note drops and more. In chapter three we will show you how.
4. You can copy an entire section in order to repeat them from a desired measure. For example: a rhythm drum section. Remember: to select various tracks, simply click them with CTRL key pressed.
5. If you want to experiment with sounds and articulations but not in the original file, work with a copy of the file. Here you have no limits to test whatever you want.
6. Place the start point always in the measure you are working on for quick listening from there.
7. Change the Zoom tool: zoom in for details and zoom out for overview.
8. When you have progressed a bit, please SAVE your work. Note that saving frequently can avoid wasting of hours of work if a power outage occurs.
9. Don't forget the RED STRIP functions: 'repeat', 'end', 'top' and 'last'. These features are used very often in videogames. Indeed, Pxtone is created by a great programmer and he knows what a good tracker really needs.
10. When a song is finished, take a couple of days for resting and then play it again. This is a trial by fire: if the song is good enough, it will sound fine to your *fresh* ears. If it sounds odd, probably you have to check it again and make some changes. A famous painter (whose name I don't remember, Titian maybe..) covered his works with a large cloth for three years (!!!) and then he looked at his paintings again to finally judge them correctly. Curious!
11. On the other hand, you can play the song to your friends (and enemies) to collect the most objective opinion about it. That's a good procedure.
12. Listen to the song using as many sources as possible: headphones, speakers, Hi-fi, laptop, your friend's computer,... and make some changes if necessary.

3. TIPS, TRICKS AND ARTICULATIONS

In this chapter we are going to talk about each track's nature, focusing on expression, sound and fluidity. This approach -of course- has to be taken under a videogame view: with proper application to visuals and gameplay, the characteristic feeling that only videogames have.

Music and sounds of videogames

Aesthetically, we have an idea of *'what a VG is supposed to sound like'* , since there is an audiovisual heritage in our minds. If I ask you: *"How does a military film sound?",* you think at once of machine guns, bombs, snare drums in marching rhythm, epic and glorious fanfares, etc. This is because of films, TV movies, military parades and more. When you think of a VG, the music concept is wide and complex: from slot machine beeps to large orchestral passages. But, what is the most appropriate?

Classic VG music was a mix of well defined sounds and sophisticated ornaments, melodies and rhythms. Of course there has been an *evolution*. VG music has become more and more real and more and more produced, but at the same time, it has moved away from *genuine* VG style. This manual and the examples given are focused on that particular period (1984-1992) when music for VG was totally unmistakable, with those frenetic rhythms, impossible-to-play melodies and retrofuturistic sounds. From the single monophonic notes of 'Space invaders' to the orchestra with a hundred of musician (choir included) of 'Final Fantasy' series, there must be an intermediate point.

Evolution

Recently I was watching some modern VG: 'Halo', 'Gears of War II' and 'Assassin's Creed II'. Without doubt these ones are so close to movies, that you have to say: 'Wow! What an awesome production!' The images, FX, dynamics, visuals, movement, music and gameplay is nearly perfect: almost real. Music for those creations has the same quality as film ones.

So, is this music for films? or for videogames?

Great soundtracks like previously mentioned are incredibly astonishing, but you can get surrounded by its ostentation and confuse them with an action or epic film. Of course if you are looking for this way of composing, this manual is completely unusable. The aim of this chapter is approaching classic videogame arrangement within the limits of Pxtone and similar trackers/programs.

Chiptune music

Nowadays there seems to be a revival for classic VG and what's more: chiptune music is gaining respect and importance from casual gamers. Videogame culture is flourishing with renewed power and different genre of VG live beside each other without trouble. 'VVVVVV', 'La Mulana', 'Cave Story' or 'Spelunky' are examples of this. People want to play that way. This 'old school' style doesn't have to disappear. I think it's very nice, just like the retro sci-fi pulp novels.

Well, enough talk and let's get started!

3.1 TRACK ARRANGE: MELODY

Basically, the melody has to be solid, catchy and strong. It has to sound within your head when you're on the bus, when you are waiting for the dentist or when working on your garden...

Great songs are created out of great melodies, but not necessarily from them. The bass or rhythm are good *generators* of songs. Think of Michael Jackson's *'Smooth Criminal'* or *'Bad'.* These fantastic songs are focused on powerful bass riffs. *'We will Rock you'*, the immortal song of Queen is built on a simple rhythm. Everything is possible!

A good melody can be enhanced by side ornaments and bass, as well as proper FX. Let's take a look at a standard treatment in four steps:

1. Plain melody. Just the idea.

Please load Example No. 01 "melody_ARRANGE" from Examples folder. Here is one melody with three stages. Four Hi-Hat beats set the tempo:

a) Plain melody with simple waveform and no articulations (measures 0-3).
b) Melody arranged with proper articulations and simple WF (measures 4-7).
c) Melody arranged and articulated with a proper voice (measures 8-11).

2. Enhancement with FX.

Please load Example No. 02 "melody_FX". We add an exact copy of the melody in track FX to create a DELAY. Four Hi-Hat beats set the tempo:

a) Melody arranged and articulated with a proper voice (measures 0-3).
b) An exact copy is added in FX channel to create a DELAY at lower volume (measures 4-7).

3. Enhancement with ornaments.

Please load Example No. 03 "melody_ORNAMENTS". We added arpeggio bells to create a solid ornament. Four Hi-Hat beats set the tempo:

a) Melody and FX (delay) sound with a proper voice and articulations (measures 0-3).
b) An arrangement of bells with arpeggios and fake delay is added (measures 4-7).

Notice than both FX and bells are lowered in volume and located strategically in stereo field.

4. Enhancement with BASS.

Please load Example No. 04 "melody_FULL". With a good BASS everything changes and becomes as solid as a rock. Four Hi-Hat beats set the tempo:

a) Melody, FX (delay) and bells sound with a proper voice and articulations (measures 0-3).
b) A proper BASS is added to enhance the whole set (measures 4-8).

I think it sounds fine with only four channels. Notice that by making the bass a little more percussive we gain dynamics and punch. In a later section we are going to talk about this.

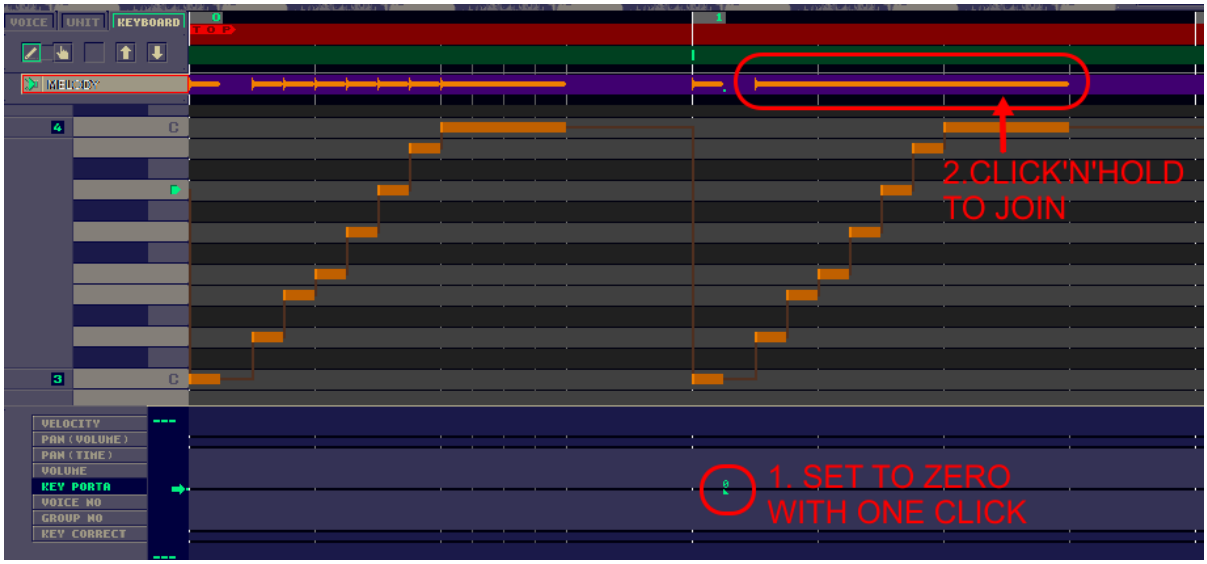
Melody articulations

We are about to give several ways to enhance the melody itself. Each one will have an example and a little explanation. The example given will sound WITHOUT and WITH the articulation/FX to compare both results. Here we go:

1. Legato (load Example No. 05 "melody_LEGATO"):

Set the 'key porta' to **zero** and do the slur:

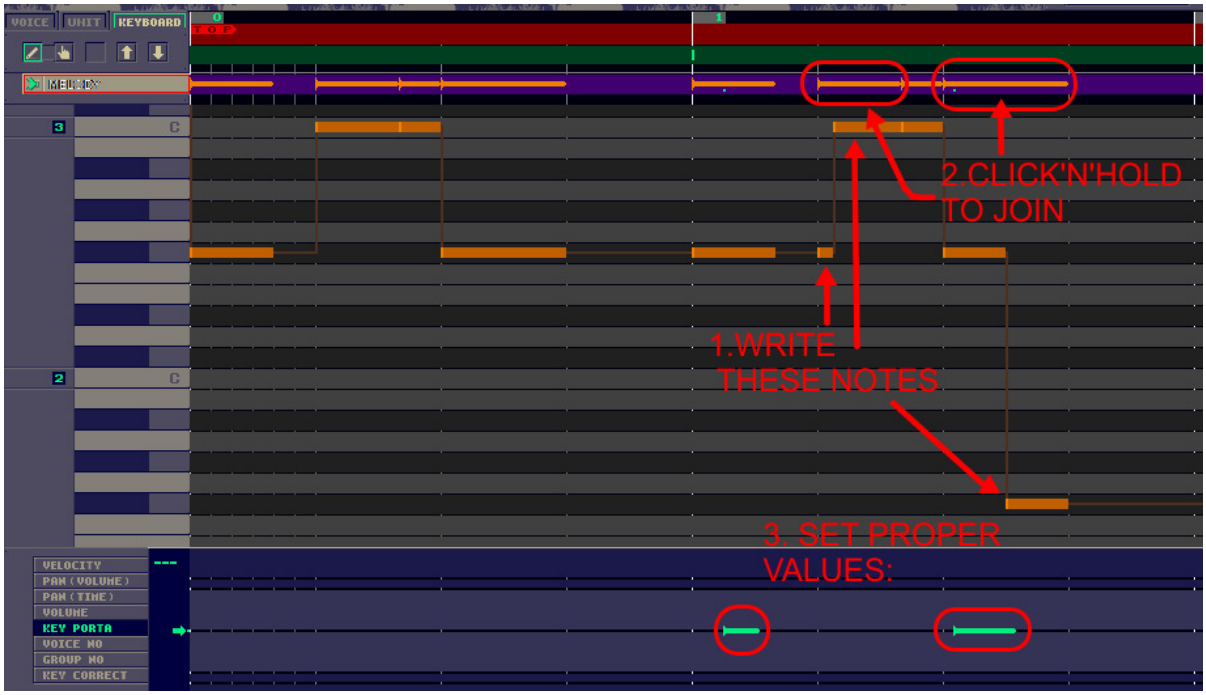
WITHOUT: WITH:



2. Slide UP/DOWN (load Example No. 06 "melody_SLIDES"):

Write the slide notes to set the 'jump', do the slur and set the 'key porta' to proper value:

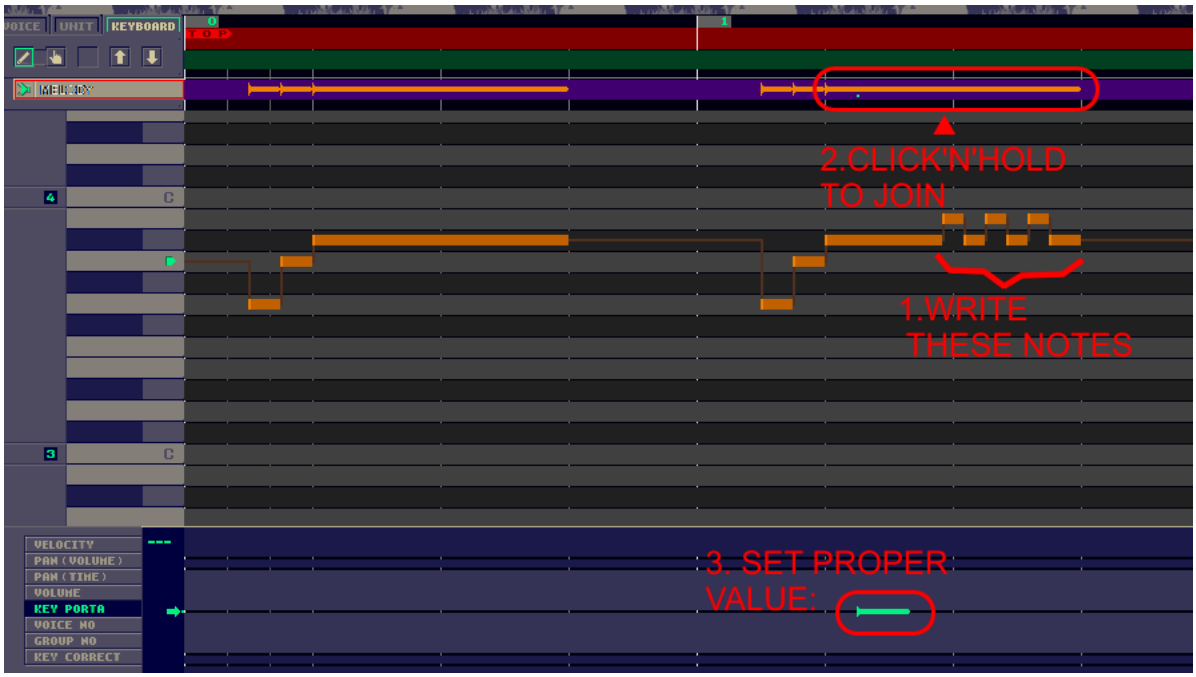
WITHOUT: WITH:



3. Vibrato (load Example No. 07 "melody_VIBRATO"):

Write close notes (above or below) to the main one and do the slur, setting the 'key porta' to proper value avoiding the legato but permitting a slight tonal movement:

WITHOUT: WITH:



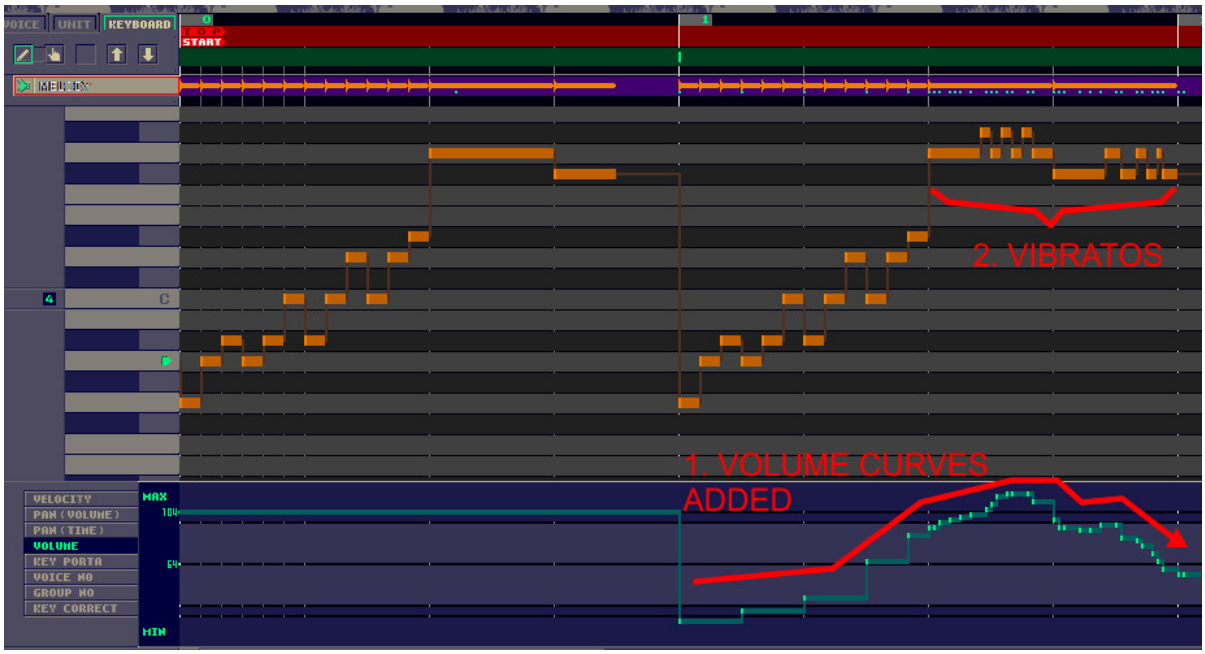
Notice that vibrato can vary a lot due to 'performance' intention. There are millions of possibilities. Please experiment yourself with examples given:

You can combine several notes, 'porta times' and slurs in a single articulation. Vibrato is highly recommended for long notes. It's just like an electric guitar solo playing various notes fast and finally resolving to a long note. Here a vibrato sounds cool.

4. Dynamics: Volume (load Example No. 08 "melody_VOLUME"):

With a volume curve you can achieve more expression. A BASS track is added to the second melody to enhance the articulation:

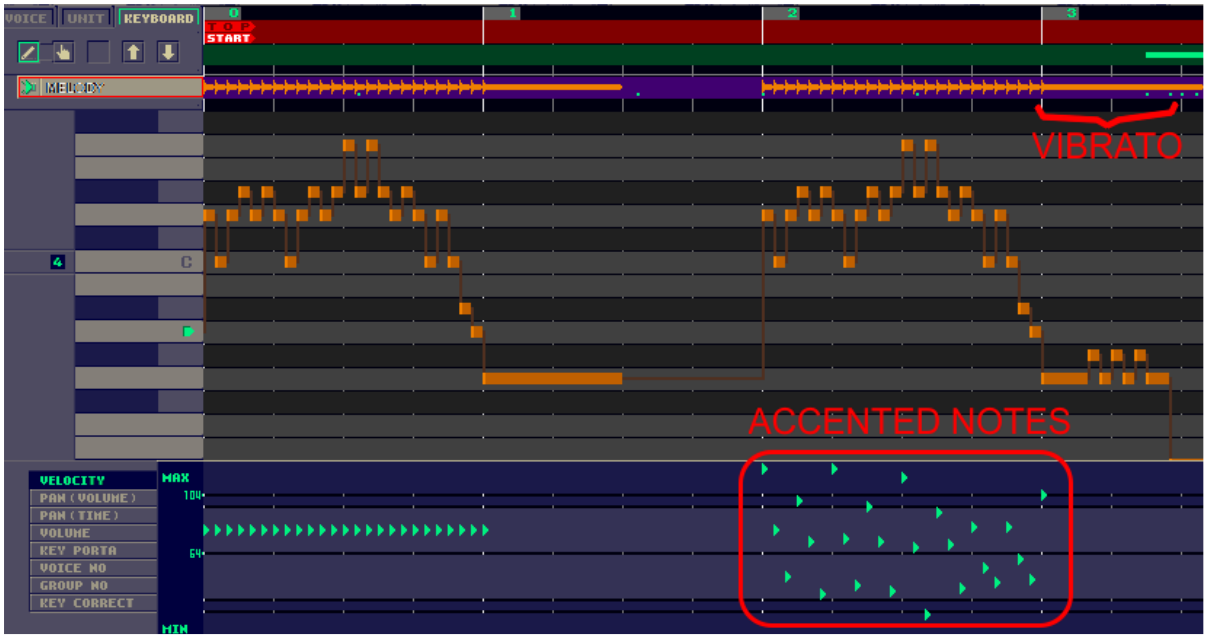
WITHOUT: WITH:



5. Dynamics: Velocity accents (load Example No. 09 "melody_ACCENTS"):

The incorporation of accents can bring a melody to life. If you set the velocities in strategic locations, you will have a dynamic and moving note articulation. A BASS track is added to the second melody to enhance the effect:

WITHOUT: WITH:



6. Thrill technique (load Example No. 10 "melody_THRILL"):

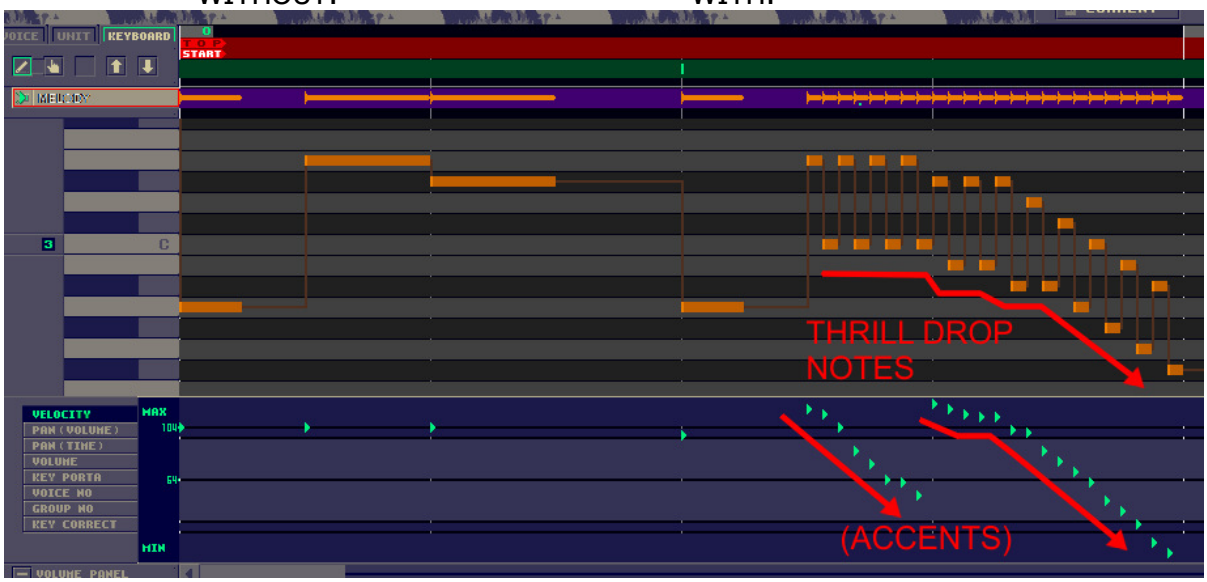
This is used for certain moments. Write the note with a high resolution tool and set the proper velocities. A BASS track is added to the second melody to enhance the articulation:

WITHOUT: WITH:

7. Natural drop (load Example No. 11 "melody_THRILL_DROP"):

The same as above, but with a tricky writing:

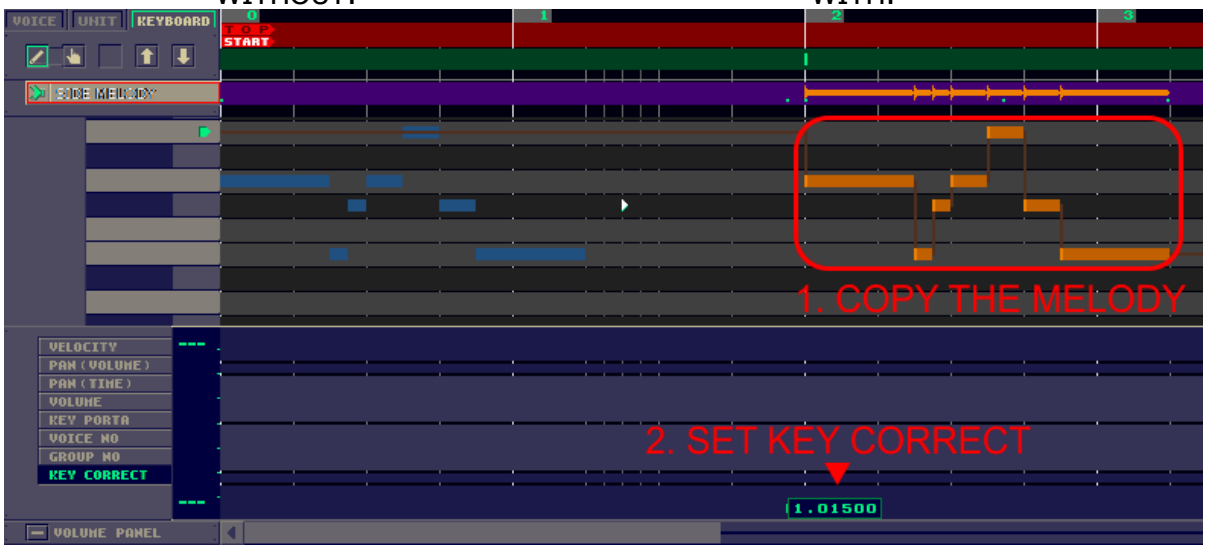
WITHOUT: WITH:



8. Chorus FX (load Example No. 12 "melody_CHORUS"):

This effect is pretty similar to the one used for electric guitar: a copy of the melody is slightly detuned to get the desired result. Simply copy the melody to another track (unit) and detune it with the 'Key correct' function. Balance both with volume and pan (volume):

WITHOUT: WITH:

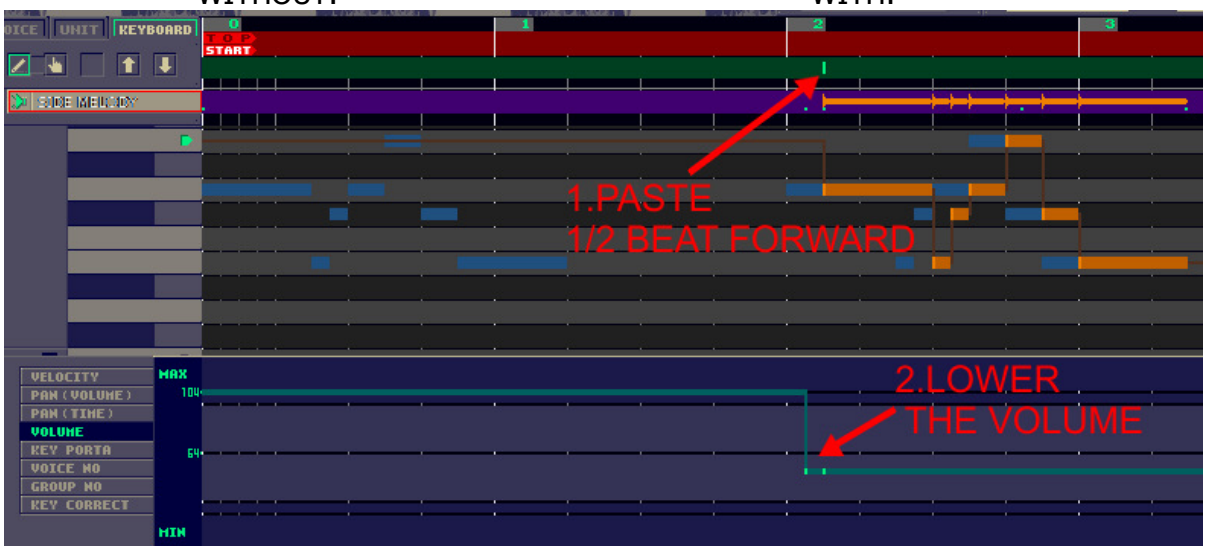


If you set the 'key correct' from 0.9800 to 1.0200, detune is acceptable for chorusing.

9. Delay FX (load Example No. 13 "melody_DELAY"):

If you want to create a delay effect WITHOUT using the native effector unit of the program, simply copy the melody and paste it in another track, but slide the point a bit forward. 1/4 beat, 1/2 beat, 1 beat or 2 beats give good results. Don't forget to lower the volume of the FX track:

WITHOUT: WITH:



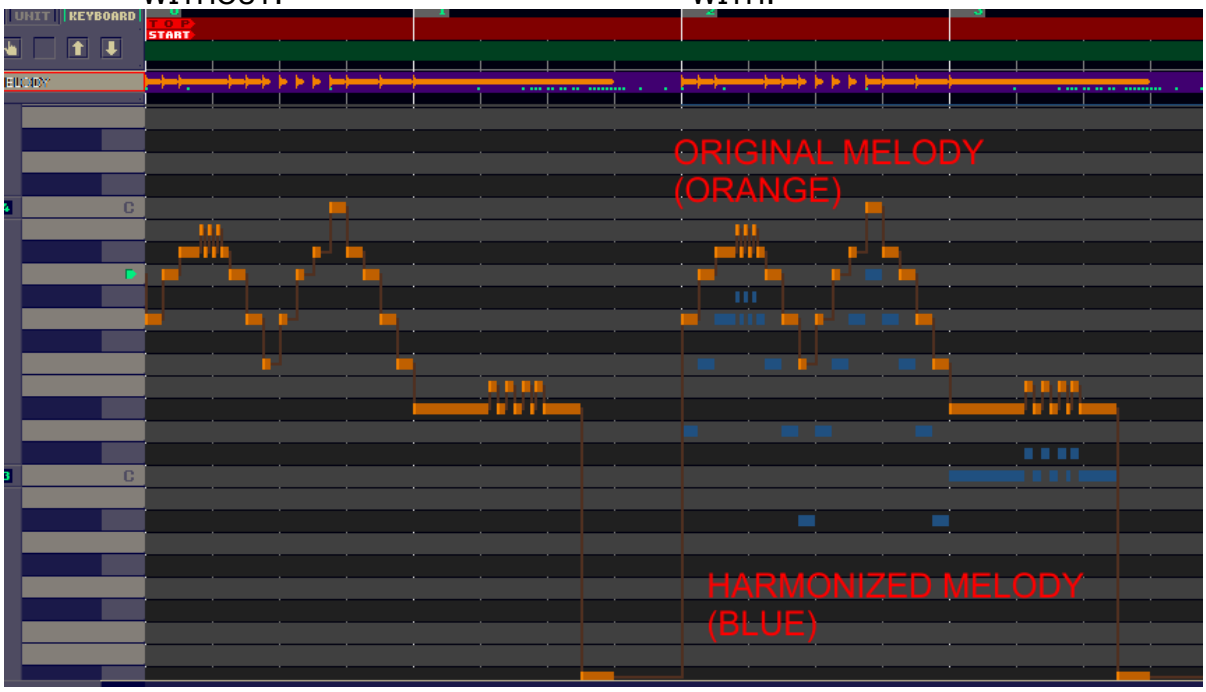
You can do this with three or more delays (copying tracks), separating them at equal distance and lowering the volume respectively.

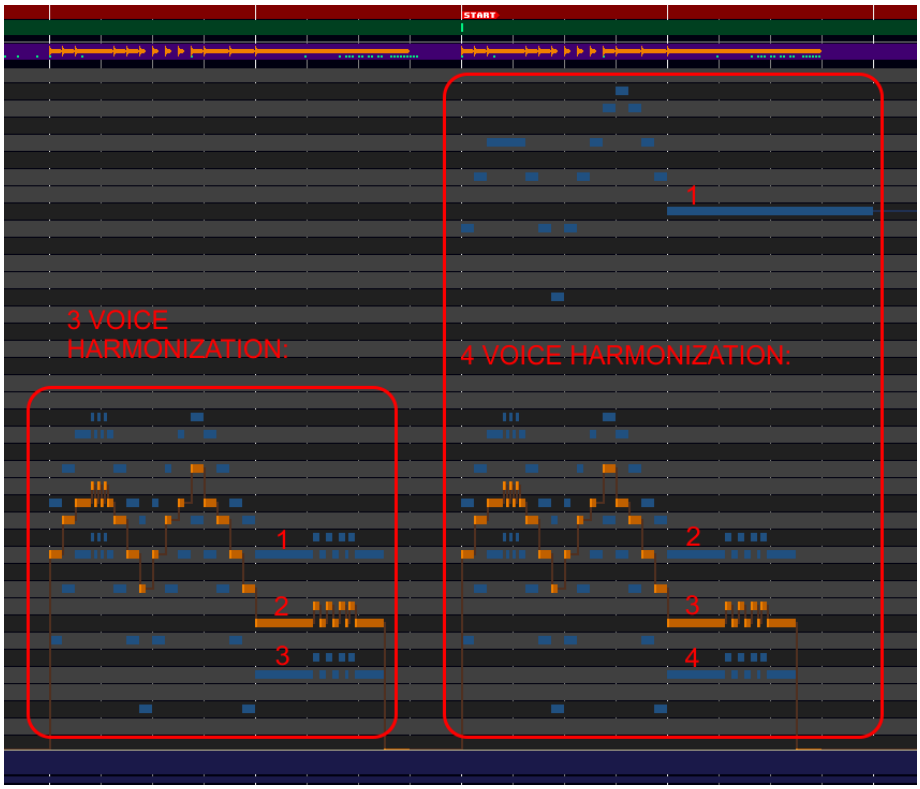
Next articulations involve two or more independent melody tracks.

10. Melodies harmonization (load Example No. 14 "melody_HARMONY"):

This is one of my favourites, and it is used very often in VG. Simply follow the main melody with the proper tones below (or above, or both) within the same musical scale. The example given has two, three and four harmonisations of the same melody:

WITHOUT: WITH:

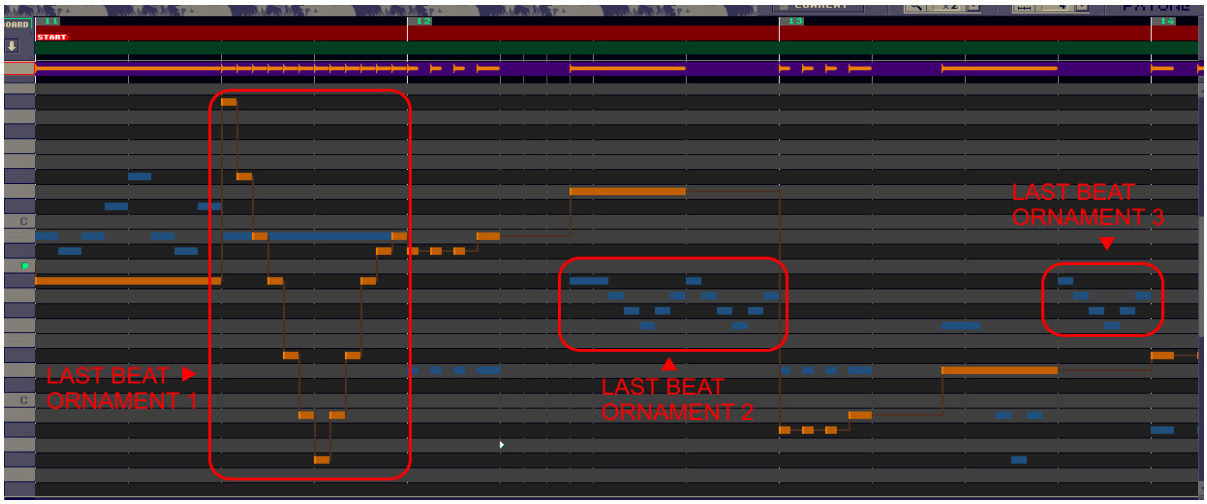




◄ Melodies are harmonized in parallel mode. To break this, we can do some movements over the side melodies to create 'fugues' or non-parallel melodies.

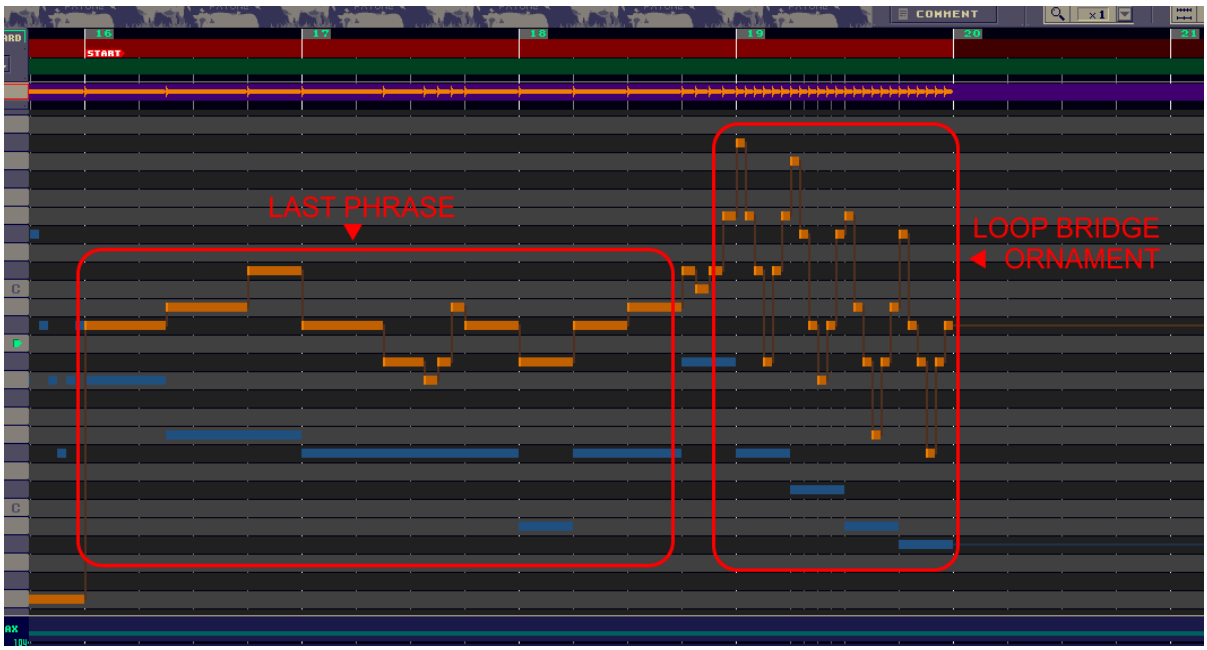
11. Ornaments in last beat (load Example No. 15 "melody_LASTBEAT"):

Old School videogames were known for saving resources: memory, graphics and sound channels. Due to this limitation the music had a particular feeling: the ornaments in the last beat. To save channels we can do nice and tricky articulations on melodies when they are about to change its tension. The example given is a very good one: 'Towervania action theme' (see p. 40). Please listen carefully and especially to measure 11, 12 and 13. The following image shows MELODY I and MELODY II notes together. Notice that ornaments take place at last beats:



(*Ornaments by measures 11, 12 and 13)*

There are more notable ornaments. Throughout the piece, melodies are both different and they complete each other. Please stay alert at the end of measure 15, and the most important: the bridge ornament between parts (loop bridge). In measure 16 the last phrase or *motif* sounds and by measure 19 the last ornament takes place to engage again with the beginning:



(*Last phrase from measure 16)*

3.2 TRACK ARRANGE: BASS

This instrument is, indeed, one of the most important. I define it as a hybrid between the melodic and the percussive. But it's neither one nor the other: It is just the *BASS...*

Bass sound

For simpler VG, we will use simple waveforms as we remarked in section 2.1. For the rest of the cases we will use mainly two types of bass sound:

- With slow attack like 'Contrabass' or 'Pad'. This is used for long note passages and ambience pieces.
- With acute attack and chorus (provided basses have these features). Those basses have more body due to chorus fx and percussive sound because of the attack. They are perfectly suited for almost all types of compositions based on the standard instrument set (BASS/DRUMS/MELODY/CHORUS).

Ok, let's explain some nice techniques to get the maximum performance:

Bass treatment

Since the bass belongs to the percussive and melodic world, it's recommended to use short notes when a rhythm section is playing. In fact, when we only have three channels, the bass *must be treated as the drum section*. This is how I conceive this:

a) Use short notes with attack (It's called *staccato* playing)
b) Lower notes are used to simulate the bassdrum
c) Higher notes are used to simulate the snaredrum

Of course, as we have mentioned above, there are more styles and musical moods which require other type of bass arrangement. The best thing you can do is to listen carefully to the music you are looking for and compare the bass lines. Then you can decide what type of bass and arrangement was chosen. For example, if you are going to compose a heavy metal theme, listen to a similar song and take notes about the bass line (and also about the rest of instruments are recommended).

When you have this clear in mind, begin to write it in Pxtone. Once you have the bass and some drums working together, it's time to judge the suitability and go on with the composition.

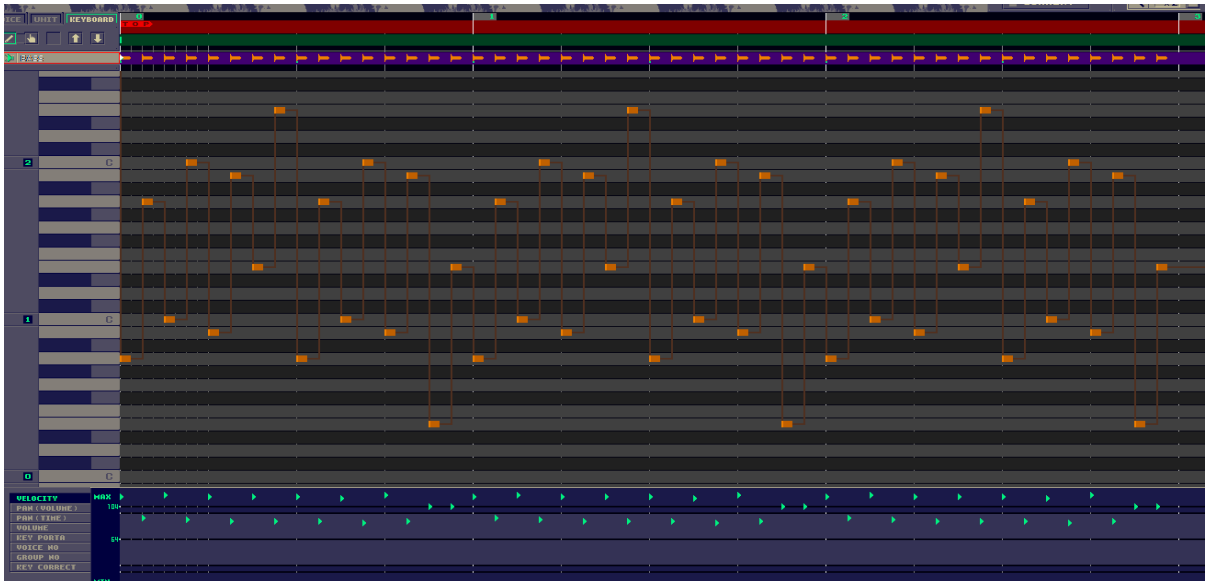
The following example is about the bass treatment on a simple videogame. Nothing like the base form describes the original treatment and the targets of the *bass function* within a VG piece. I think those 'old school' VG are the best examples for understanding the construction and structures.

And beyond this point we can build further pieces with more sophisticated lines and tracks.

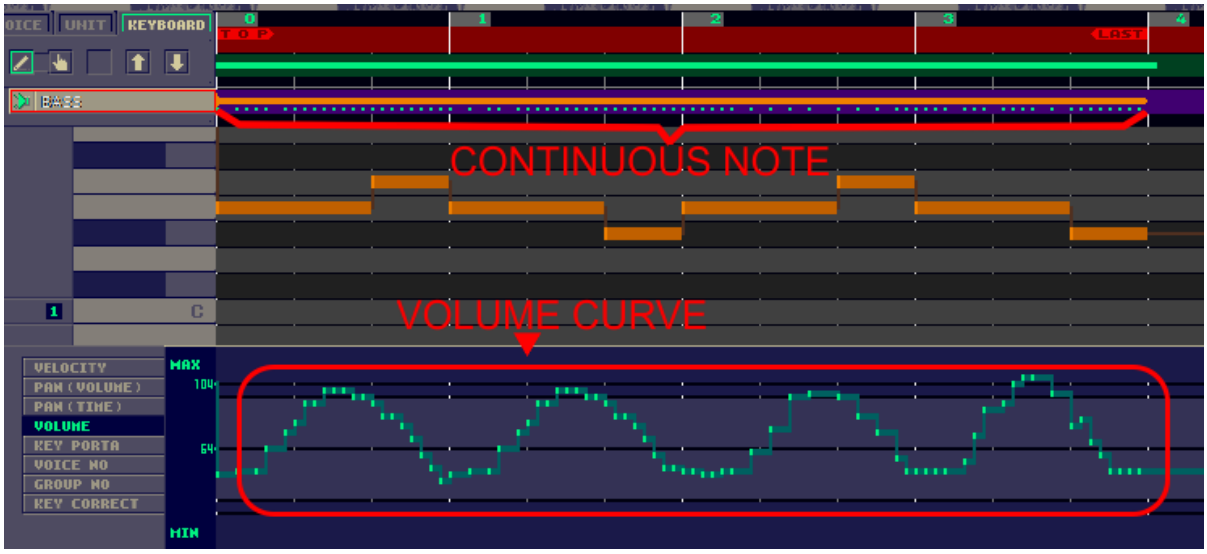
Please load Example No. 16 "bass_PERCUSSIVE":

Here the bass has a double function: harmonic base and rhythm. This hybrid character provides us with an advantage: in one single channel you have two elements. Two birds with one stone.

There are tons of combinations and rhythm patterns. Please load Example No. 17 "bass_MOVING". Here we consider the bass as percussive and melodic, but moving every time. These kind of patterns were used very often in old school videogames, and due to its nature they have an addictive effect over the gameplay, just like the slot machines. Let's have a look at the bass diagram:



Of course there are more bass lines' styles. One of them is the 'continuous bass', with long and sometimes modulated notes. Please load Example No. 18 "bass_CONTINUOUS": Here the bass oscillates between three notes with portamento effect (please observe the 'key porta' value). This creates an ambience illusion and a particular atmosphere:



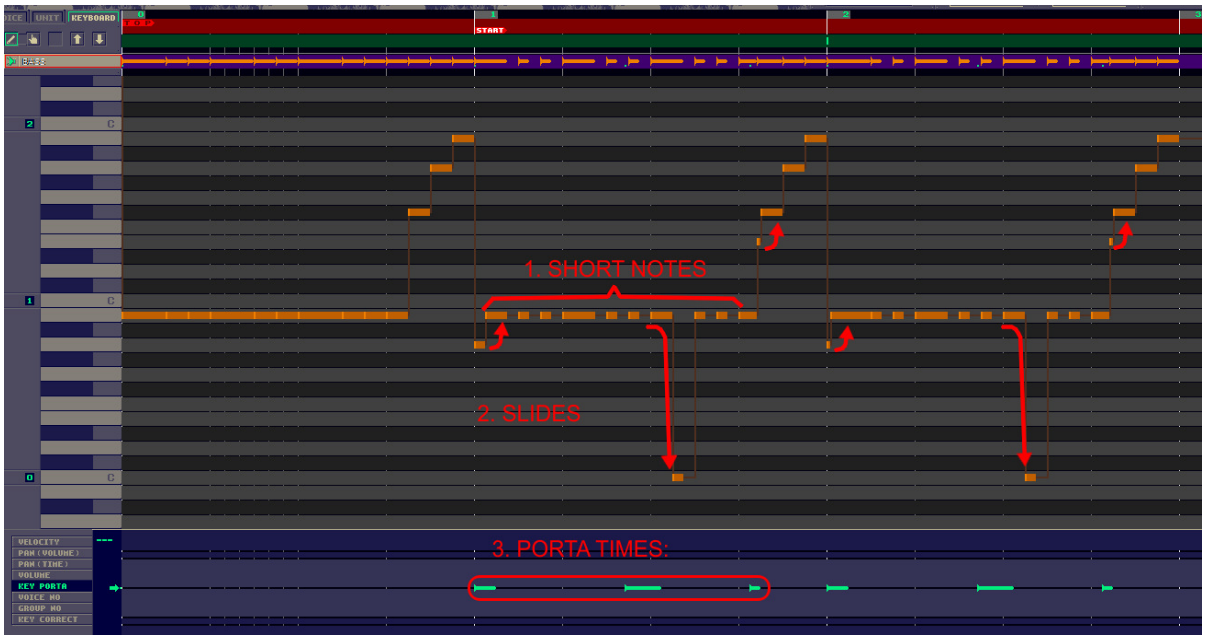
Bass articulations

The following examples are focused on standard ways to arrange the bass for VG. Each one will have a little explanation. The file given will sound WITHOUT and WITH the articulation to compare both results. Here we go again:

1. Slide UP/DOWN (load Example No. 19 "bass_SLIDES"):

In order to get more movement, a simple bassline could be emphasized with a few slides. Notice that jumps between notes are short:

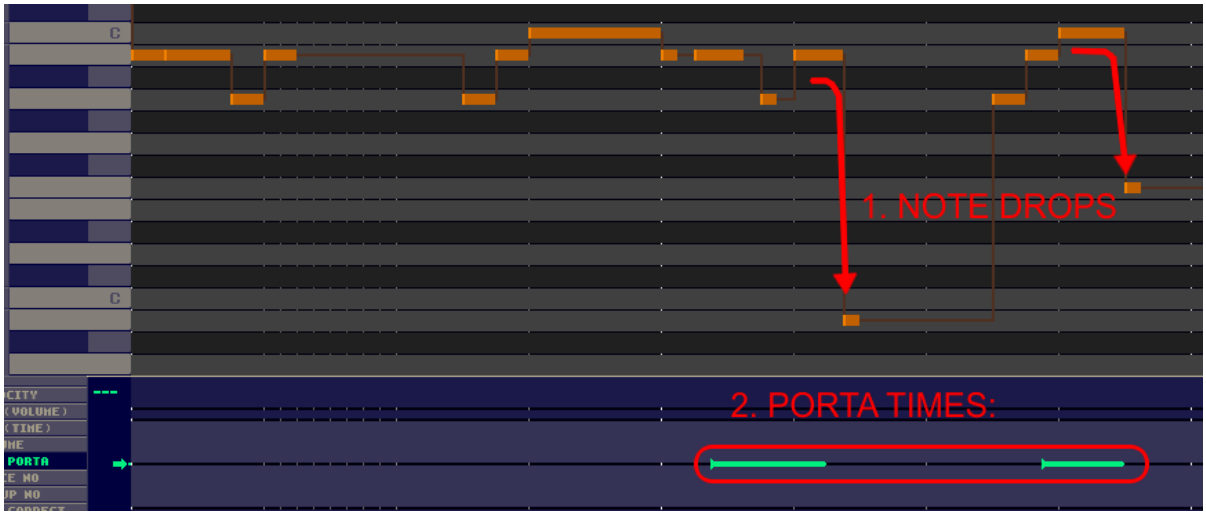
WITHOUT: WITH:



2. Note drop (load Example No. 20 "bass_DROP"):

This is a variation of previous articulation. When a bass note is on strong beat and alone, if we do a little drop it sounds cool and musical:

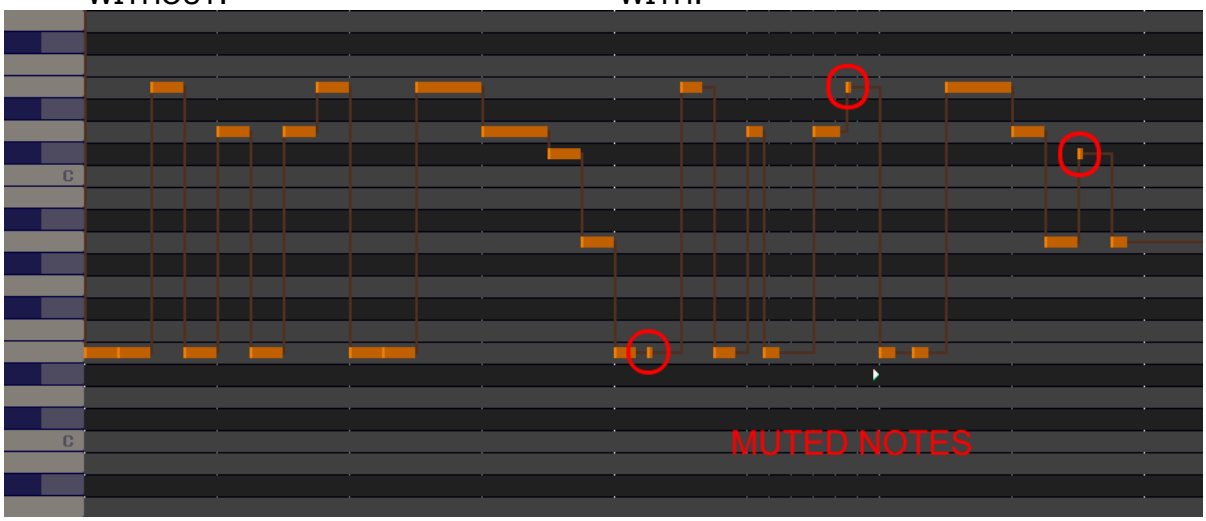
WITHOUT: WITH:



3. Muted notes (load Example No. 21 "bass_MUTED"):

Sometimes a Slap bass line needs to be more percussive, and this technique is very suitable for that. You have to shorten certain notes at least with RT (Resolution Tool) number of 24 (with tempo of 150 bpm). For lower tempos use a RT number of 48. Slap bass articulations are perfect for ninja's videogames (hehe):

WITHOUT: WITH:

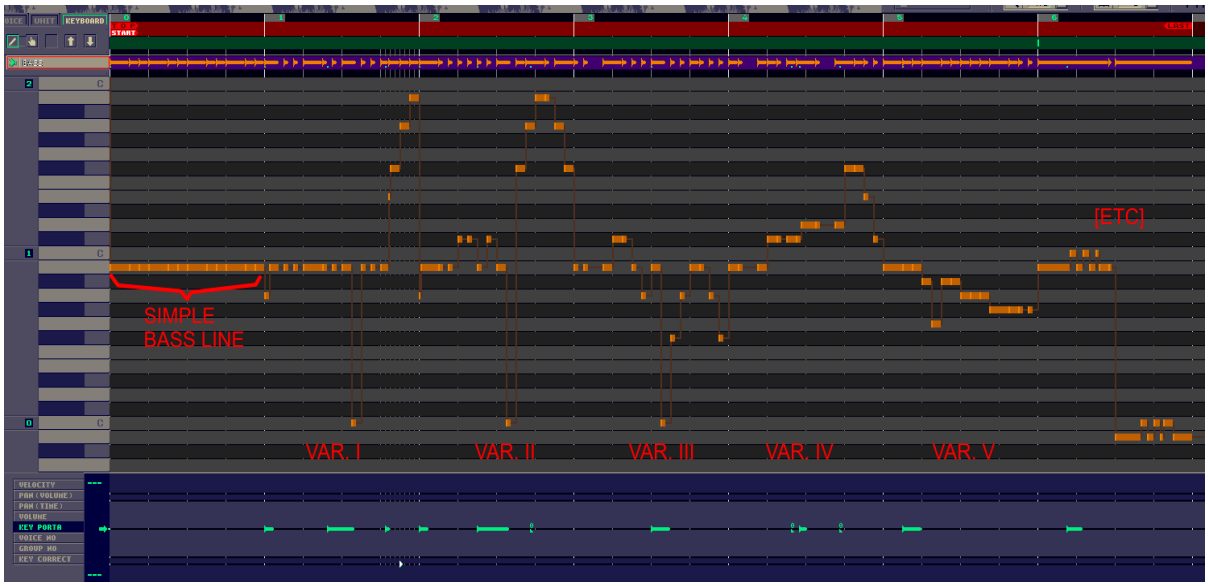


4. Unison bass motif (load Example No. 22 "bass_UNISON"):

A good bass riff can be the *leitmotif* of the whole piece. This example begins with a single bass phrase, and it is played in octaves by the rest of melodic channels. By measure 4 a new melody appears, but the bass riff is already *installed in your mind.* This is the concept. In Songs folder, the file No. 14 "CAMELOT_Stage1" is based on a bass riff, and there is nothing wrong with that. Believe it or not, the bass is a very important part of the arrangement.

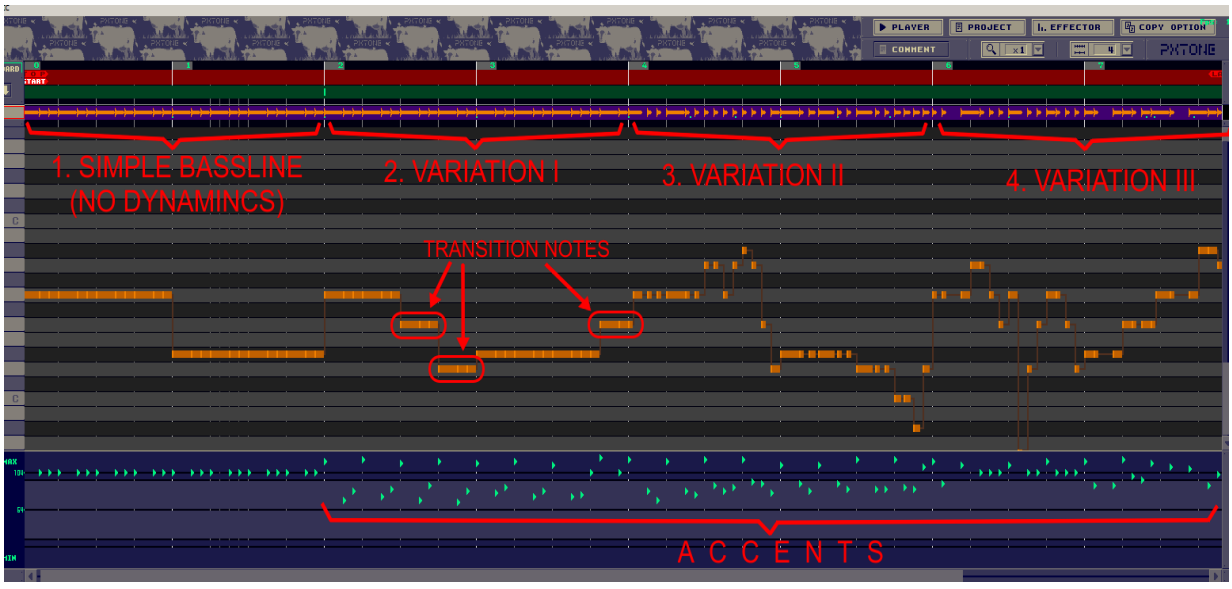
5. Bass variations (load Example No. 23 "bass_VARIATIONS"):

You can choose either writing a simple bass line (for simpler VG it works fine) or changing the phrases to achieve more movement. By first measure we got a simple bass pattern, and then we write a series of articulations. Variations tend to focus on the 5th and the octave notes starting from the tonic. They are on the rhythm, durations, notes, slides, drops and accents. Also notice that 'porta time' values are modified to perform legatos, slides, vibratos and note drops. I remark: Variations are needed if the VG nature asks for that.
On the other hand, if we abuse variations, the result could be too 'baroque' or 'overproduced'. We must look for the intermediate point.



6. Bass transitions (load Example No. 24 "bass_TRANSITIONS"):

In order to make changes without abruptness, there are some 'passing notes' between one tonality and the following. This is optional and -of course- it's a matter of taste. The example given shows some solutions to change smoothly from one tone to another. Variations II and III are rhythms pattern adapted from the previous example:



3.3 TRACK ARRANGE: CHORDS

Actors in supporting roles are not the main characters, but important enough to bring a movie to life. There are certain tracks necessary in order to *enhance* the overall, providing clamping elements, bass reinforcements, harmony supports, melody pads, etc.

I'm talking about:

a) Chords
b) Melodic rhythm lines
c) Ornaments
d) Side melodies

These figures are intended to fill the gaps between bass and main melody, or the 'aerial space' in higher ranges. Very often, the secondary tracks are pretty difficult to write or conceive. There are a lot of possibilities, but only a few are really suitable.

Looking for the right sound

Since these tracks are played always at lower volume than bass, drums or melody, we must be careful and give them a proper sound. Depending on what treatment we are going to choose, the sounds may vary from a diverse set of voices. Let's have a look:

SECONDARY TRACK	SOUND CHOICE	COMMENTS (notes)
CHORDS	-Pianos (rhythmic sound) -Pads (soft ambience) -Synths (techno or similar)	Always must sound lower than main melody.
RHYTHM LINES	-Guitars (attacked sounds) -Pianos (soft attack)	Must work together with bass and drum line.
ORNAMENTS	-Bells (fast arpeggios) -Pads (for highest long notes)	These voices can be heard at very low volumes.
SIDE MELODIES	-Similar to lead melody -Darker than main lead melody	They must not cover up the main melody, just enhance it.
OTHER	-Fx, drops, slides and noisy sounds	Enhances the overall with a light 'brushstroke' in selected parts.

Of course, this is a standard choice, oriented to help in general cases. The main idea is filling the gaps and building harmonic support. There are millions of side track models.

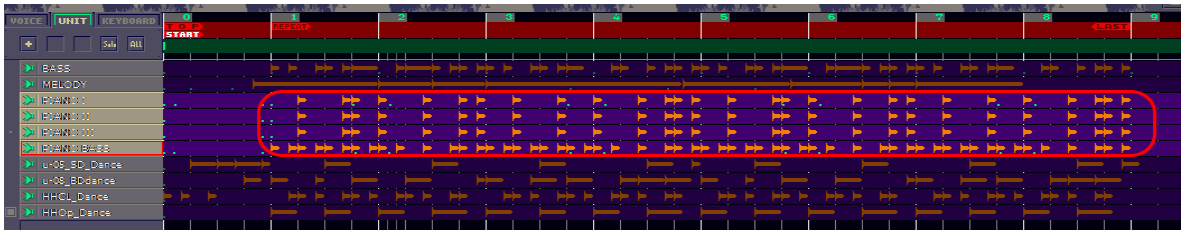
A whole book could be written about chords, accompaniment, ornaments and secondary tracks. In fact there are many strict treatises on these concepts. For VG we are not going to be severe or academic, but general advice will be given to provide a set of arrangements that *works* for a VG music piece.

Chord treatment

The first thing we have to consider is the *dynamic character* of the piece. If we insert chords and ornaments in every measure, the piece turns boring, monotonous and flat. We must keep the surprise, the crescendo and tension by managing these tracks when necessary. That's the point. The following examples are partial treatments of these secondary tracks, with a little discussion on their role in the song. In previous chapter (2. How to...) we have already talked about those tracks, especially in the 'Camelot' example. Now we are going to focus on chords, ornaments and side tracks.

1. Rhythmic chords (load Example No. 25 "chords_RHYTHMIC"):

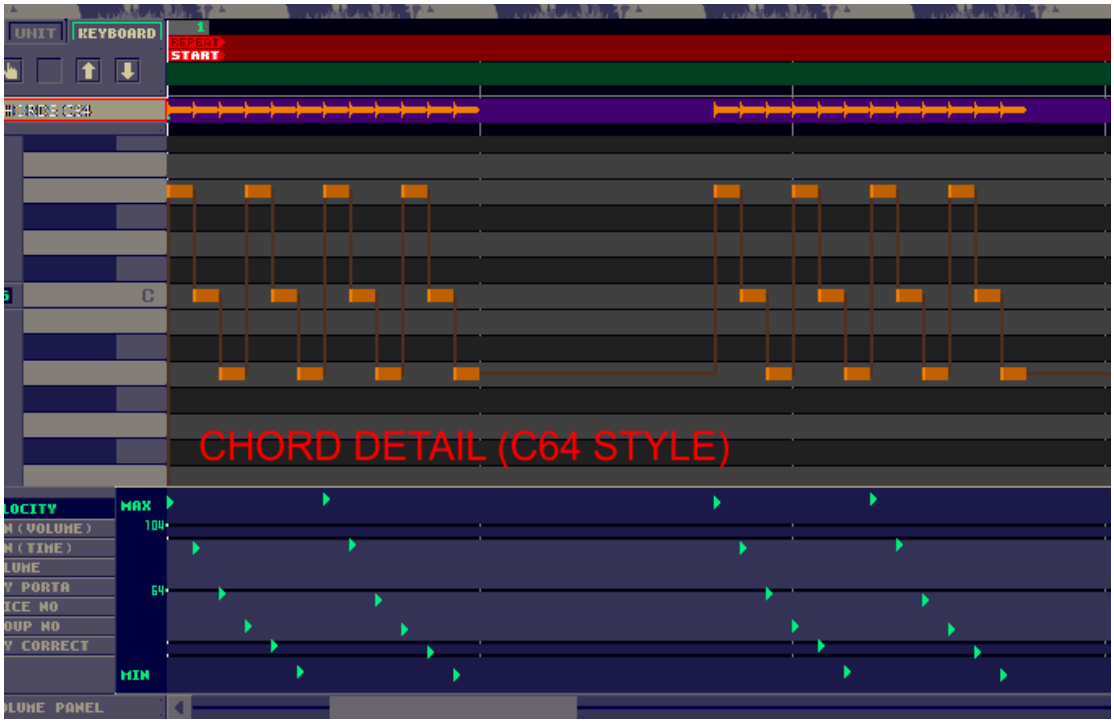
In this example we introduce the rhythm through the piano chords. Indeed, it is a *dance* motif. If you turn off the units 2 to 4 (all pianos), the piece 'suffers' a severe loss of body. For certain types of music, secondary tracks are strictly necessary.



(Piano section is highlighted)

2. 'C64 style' chords (load Example No. 26 "chords_C64"):

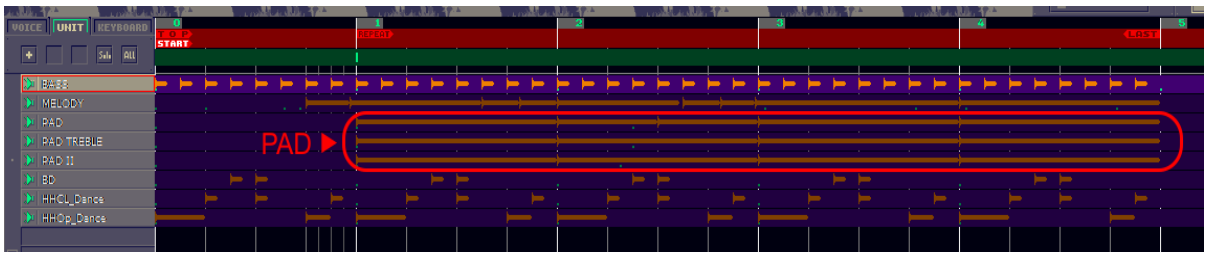
This technique is used only on one channel, with very fast thrill over three notes. We achieve two concepts: a secondary track of chorus and percussive rhythm effect. In fact, this kind of articulation is *genuine* of chiptune music:



(Melody taken from VG Hydorah ©2010. Courtesy of Locomalito games)

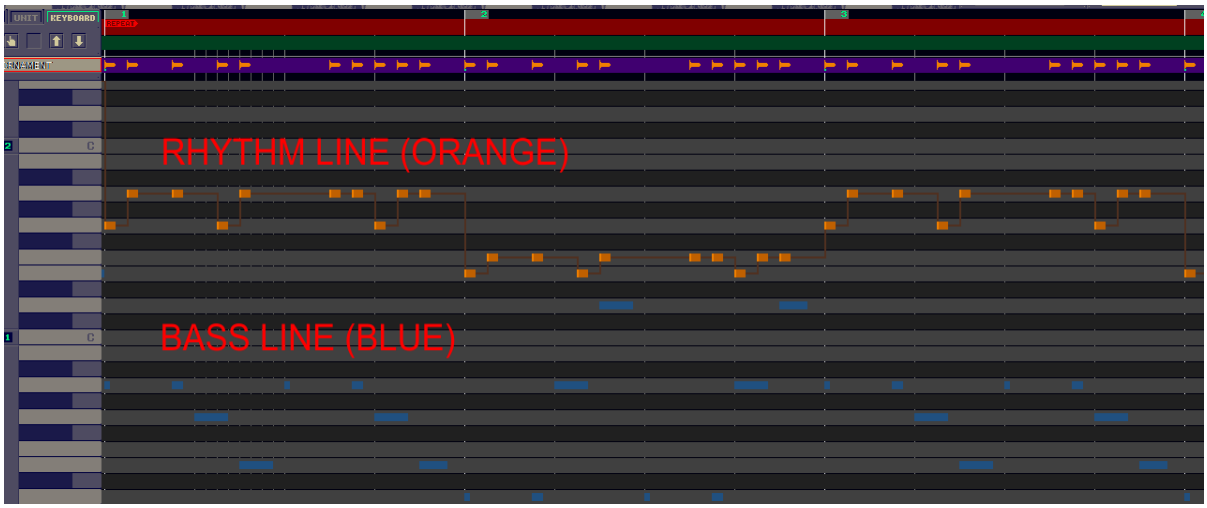
3. Pad chords (load Example No. 27 "chords_PAD"):

This treatment is focused on ambience and softness. Chords are changing with smooth transitions. If you want to create a strange environment, moving and odd, we recommend this. We have used the same motif from the previous example.



4. Rhythm lines (load Example No. 28 "chords_RHYLINES"):

The perfect alignment between bass and drums can be powered by an auxiliary rhythm line. First, we have to choose a sharp attack instrument and then place it in the mid-range, just below the main melody, giving it a movement pattern and always testing it only with bass and drums. Guitars and pianos are suitable for this purpose. Let's listen to some lines:



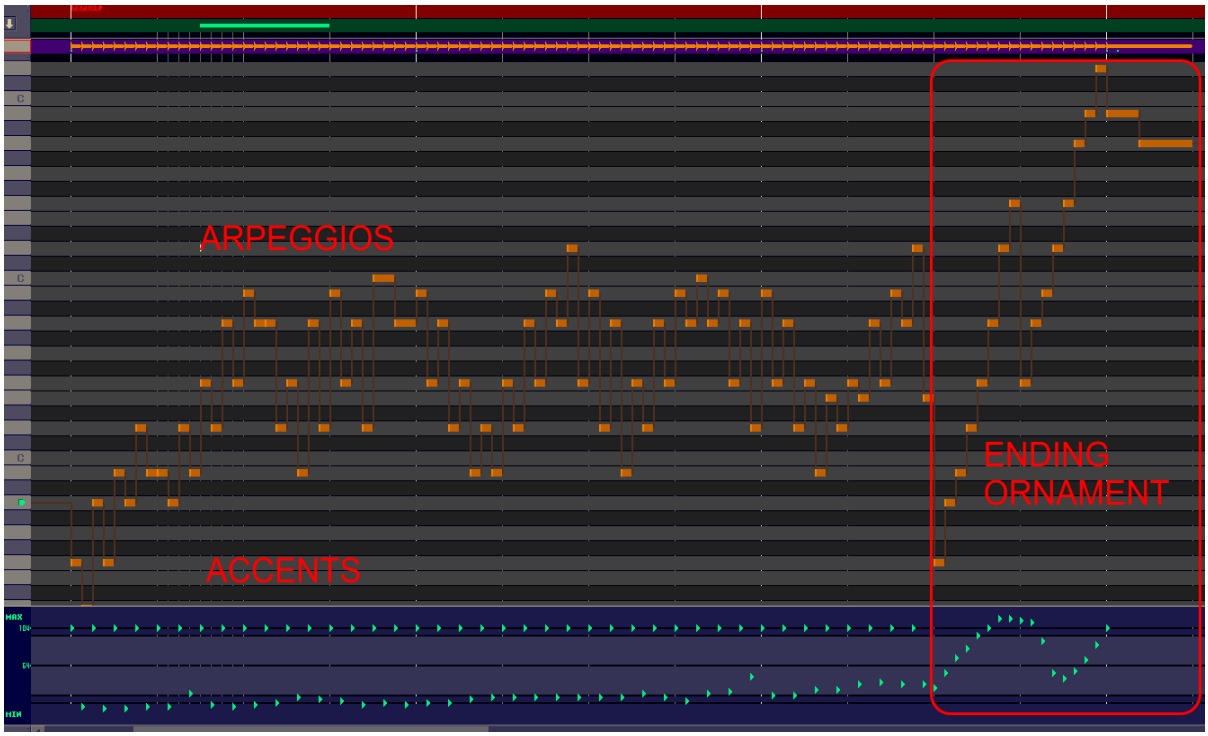
Here you can listen to both units in solo mode (bass and rhythm line) and test them with the rest of the tracks. This rhythm line adds percussive notes to the piece and reinforces the base. If the song has more tracks, the rhythm line unit is also a good support for the whole set.

Rhythm lines can be written by pairs, especially when a guitar power chord (interval of fifth) is added to enhance the bass section. If you remember the 'Camelot' examples, the song No. 14 "CAMELOT_Stage1" has a powerful rhythm line, and by measure 2 reinforces the all the song.

Once again, I remark: there are millions of combinations to choose from if you want to write a decent rhythm line. The function is filling the gaps in the mid-range.

5. Ornaments: Arpeggios (load Example No. 29 "chords_ARPEGGIOS"):

Once you have a solid and balanced base and melody, an *arpeggio* (or chord separated note by note and performed ascending or descending) is a powerful ornament to give the piece some movement. The example has only three melodic lines: bass, melody and the arpeggio. You can play the song with this track in solo mode and study the structure of notes and accents. Also the final ornament is an arpeggio modelled by velocity values.



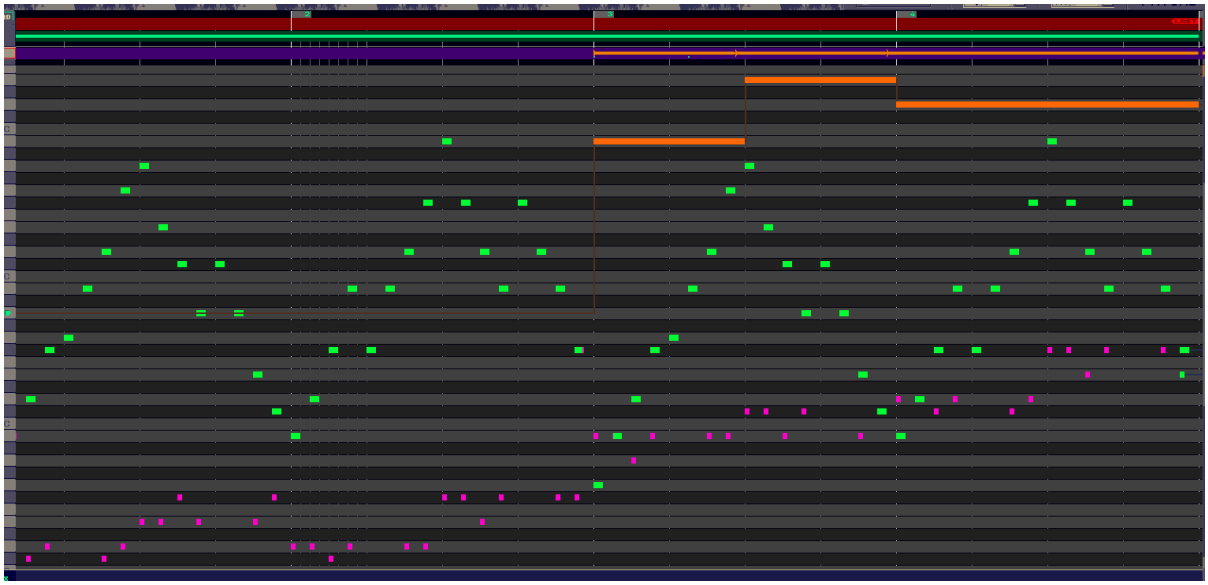
(In this example, the 'fake delay' effect is performed)

Arpeggio treatment

The above example has an arpeggio to support the whole melody, like dance and ambience songs, but more interesting is to insert them when we have the intention to create some tension changes. Please read page 56 again and pay attention to example No. 15 "melody_LASTBEAT". Indeed, those arrangements are arpeggios, and they are used to bring some 'roller coaster' character over the piece. When arpeggios are written, you must be careful with the sound chosen and also with velocities, effects and dynamics. Remember: the melody has 90% relevance, and side tracks no more than 60-65%.

6. Ornaments: Pad in higher range (load Example No. 30 "chords_HIGHPAD"):

This ornament is recommended when a melody or theme is played twice. It adds continuity and dramatic quality over the piece. In the example given, a motif is played and then repeated with this pad effect at high pitched range. To have success with this, the notes must be long and expressive. If you change them frequently, I recommend using portamento or legato for slur articulations. The sound might be close to violins, or synthesized soft voices. In the example there are arpeggios and rhythm line, too. So you can turn them on/off to compare results (see diagram shown on the next page):



(*Arpeggios* are shown in green, *rhythm line* in purple and *Pad in higher range* in orange)

With this example we are covering three forms of accompaniment, but we have to use them with care. Now we have an important question about all of the above:

What is the proper ornament or articulation?

Once again, there is no right or accurate answer for this. It highly depends on what type of music you are searching for. The best advice I can give is: *Listen to music related to your project and adapt it.* This is a matter of choice, since some VG have different parts and passages, especially adventures and RPG, and due to this diversity, every piece of music has its own treatment. For example, *SD-Snatcher* (© 1990 by Konami, MSX2 system) is an Action-RPG VG with tons of brilliant songs and passages suited for each moment. Without any doubt, this is a masterwork of VG music.

Here is a proposal-table (not complete, only a few examples):

GENRE OF VG	**CHANNELS**	**ORNAMENTS/CHORDS (recommended by priority)**
Simple: Maze or Platform	3-5	RHYTHM LINES/ARPEGGIOS/C64 STYLE
Simple: RPG/Adventure	3-5	CHORDS/HI NOTE PAD/ARPEGGIOS/ C64 STYLE
Average: Beat'em up	5-8	RHYTHM LINES/ARPEGGIOS/C64 STYLE
Average: Shoot'em up	5-8	RHYTHM LINES/CHORDS/ HI NOTE PAD/ARPEGGIOS/C64 STYLE
Average: Vehicle Simulation	5-8	RHYTHM LINES/ARPEGGIOS/CHORDS
Advanced: Sports	8-N	RHYTHM LINES/ARPEGGIOS/CHORDS
Advanced: Strategy	8-N	CHORDS/HI NOTE PAD/ARPEGGIOS
Advanced: Dance/Music	8-N	Adapted from original

(This table is far from an extensive list of all uses and genres. There are millions of choices)

3.4 TRACK ARRANGE: DRUMS

This part is only related to rhythmic music or particular symphonic moments (when a percussive hit is performed), and its treatment is widely used in all-time VG music. According to the type of VG (see p. 26) we have to choose the quality of the drumset among the given samples. It doesn't matter whether your choice is LQ or HQ, the treatment will be the same.

Basic drum elements

For videogame music we have all coverage done with only five or six elements. Each one can have a few variations, but essentially they are the base. Let me show another grey table:

DRUM ELEMENT	BASIC FUNCTION	COMMENTS
BASS DRUM (BD)	- Hit on 1st beats (odd numbers) and hits in general. - Rhythm basic.	Essential. 99% of drum sections have it.
SNARE DRUM (SD)	- Hit on half measure (even numbers). - Fill in. - Rhythm reinforcement.	Essential. 99% of drum sections have it.
HI HAT (HH)	- Rhythm support. - They add continuity.	Essential. 99% of drum sections have it. There are open HH (long notes) and close HH(short notes).
CYMBALS (CYM)	- Hits mainly (Crash cymbals). - Bridge section rhythms. (Ride cymbals).	Recommended for 7 tracks music and above. Not essential.
TOMS (TOM)	- Used for intros and fill in.	Recommended for rhythm based songs. Not essential, but highly effective.
OTHER (COWBEL, RIM, LATIN PERCUSSION, ETC)	- Rarely used. - Exotic rhythms.	Not used very often in VG, except for the exotic variety. For example: Monkey Island. (© 1990 Lucas Arts games)

This table is conceived as a standard choice. With those drumsets, almost any rhythm can be written and adapted to your projects, no matter what genre or style they have.

Drum treatment

Basically, drum treatment is supported by *rhythm patterns*. Once you have chosen the quality of voices and a proper drumset, you have to set the tempo signature. Pxtone is not able to change the series of tempos or signatures. So, you can only set a number for the tempo and beat (see p. 9 'project values'). Anyway, there are a few tricks to avoid this. Some examples will be given later.

Just like retro synthesizers, the following examples are rhythm patterns or *styles*. Each one comes with an intro measure, fill in, bass line and some chorus for free (take advantage of this Special Offer!!!). Only selected beats are listed, so don't expect to find *'Caribbean Mambo fusion 9/14 beat'* or *'Space retro rock for caverns 7/8 beat'*. Ok, here we go:

RHYTHM PATTERN	EXAMPLE No.	COMMENTS (notes)
1. POPS A	31 "drums_POPS_A"	-Recommended for opening sequences. -Used on urban themes. -Quiet mood.
2. POPS B	32 "drums_POPS_B"	-Recommended for action games. -Used for urban or space themes.
3. ROCK (SLOW)	33 "drums_SLOWROCK"	-Recommended for opening or action sequences. -Used on urban themes. -Mid-tempo mood.
4. ROCK A	34 "drums_ROCK_A"	-Recommended for action sequence or gameplay. -Suitable for 'boss fighting'. -Fast tempo mood.
5. ROCK B	35 "drums_ROCK_B"	-Recommended for action sequence or gameplay. -Moderate tempo mood.
6. ROCK C	36 "drums_ROCK_C"	-Recommended for action sequence or gameplay. -Moderate tempo mood.
7. DANCE A	37 "drums_DANCE_A"	-Used often in *beat'em up* games. -Used occasionally in *shmup* games. -Used rarely in *Platform* games.
8. DANCE B	38 "drums_DANCE_B"	-Used often in *beat'em up* games. -Used occasionally in *shmup* or *Platform* games. -Fast tempo.
9. JAZZ	39 "drums_JAZZ"	-Used in *cards* or *puzzle* games. -Soft melodies to think of the next move...
10. JAZZ WALTZ	40 "drums_JAZZWALTZ"	-Used in *sport* or *puzzle* games. -Soft melodies to think of the next move...

(Load them from 'Examples' folder. You can listen to the bass, chords and drums separately)

Ten more styles:

RHYTHM PATTERN	EXAMPLE No.	COMMENTS
11. JAZZ ROCK	41 "drums_JAZZROCK"	-Perfectly suited for *sneaking or beat'em up* games. -Also suited for *ninja* games.
12. JAZZ FUSION	42 "drums_JAZZFUSION"	-Perfectly suited for *space shmup* games. -Also for weird and odd scenarios.
13. FUNK	43 "drums_FUNK"	-Used often in *beat'em up* games. -Used occasionally on *shmup* games (choice screen). -Used rarely in *platform* games. -Also suited for *ninja* games.
14. REGGAE	44 "drums_REGGAE"	-Suited for *exotic adventure* games.
15. SAMBA	45 "drums_SAMBA"	-Perfectly suited for *puzzle or maze* games. -Suited for exotic adventure games.
16. BOSSA NOVA	46 "drums_BOSSANOVA"	-Suited for *text adventures*. -Used in *sports* (golf, billiards, etc).
17. SHUFFLE	47 "drums_SHUFFLE"	-Perfectly suited for *puzzle or maze* games. -Suited for *platform* games.
18. COUNTRY	48 "drums_COUNTRY"	-Used for *text adventures* , *cards* or *western theme* games.
19. DISCO'70	49 "drums_DISCO70"	-Same use as DANCE examples.
20. FLAMENCO	50 "drums_FLAMENCO"	-Used in *Spanish folk* games (bullfighting, PACO games and Meson de la Taberna tablaos).

These patterns could be modified, extended, or arranged to fit into the project. Also sound changes are possible adjustments you can do. There are millions of rhythm patterns, just listen to your favourite music and pay attention to the drum section. Write down the snare, bassdrum, toms, hihats, cymbals and toms. Listen carefully and try to reproduce them in Pxtone.

The next examples are particular articulations used for drum dynamic range and performance. Although VG music pieces are not as detailed as real performance, they can achieve a decent amount of polish.

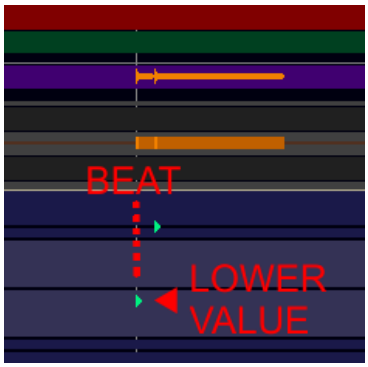
Particular articulations

In order to create dynamic range, a few things can be done to get a proper sound: accents, volumes, tempos and auxiliary notes. Let's have a look and complete this section.

1. Flam (load Example No. 51 "drum_FLAM"):

Flam is executed when a double hit is performed on the snare drum, or toms. The distance between written notes depends on the tempo. Write them selecting a high RT (16, 24, 48). To get a natural sound, it's highly recommended to accent these two notes with different values. There are three ways to do it. The example has each type in every measure (0, 1 and 2). I prefer the sound of type I:

1. *Straight*: Place the first note on the beat, and accent the second note with higher value:

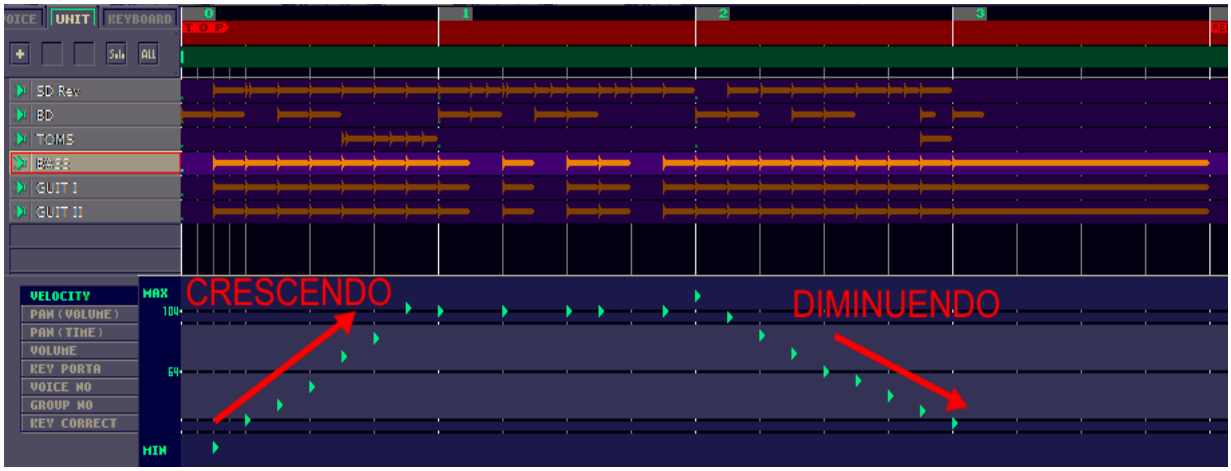


2. *Decay:* Place the first note on the beat, and accent the second note with lower value:

3. *Average:* Place the first note slightly before the beat, and accent the second note with lower value, a little bit after the beat (you can also swap accents):

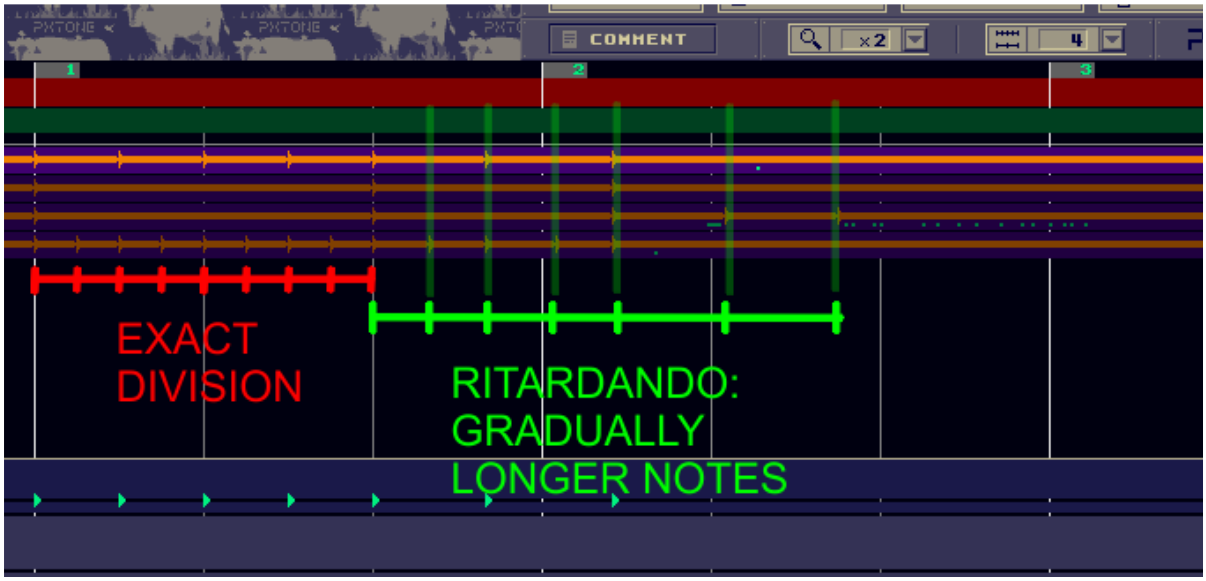
2. Crescendo / Diminuendo (load Example No. 52 "drum_CRES_DIM"):

When we want to change gradually the intensity (ascending or descending), the best way to achieve this is by changing ALL velocities and volume curves with a 'slope' pattern over ALL tracks. Pay attention to the example and listen carefully:



3. Ritardando / Accelerando (load Example No. 53 "drum_RIT_ACC"):

When we want to change gradually the tempo (faster or slower), the best way to achieve this is by changing ALL durations with RT writing over ALL tracks in parallel mode. This is a very tricky articulation, since PxTone is not able to insert tempo changes. In the example given there is a *ritardando* articulation (used mainly on endings sections, 'game over', and similar). Pay attention to RT and how gridlines are passing by:



By measures 0 and 1, notes are right written over the grid. By beat three of measure 1 (when green line starts) we begin to write notes slightly longer than before, gradually with higher RT value. Then we lose completely the gridlines and measure tempo, but we gain the 'slow down' effect. If we want to run faster, we must shorten all notes gradually. This could be suitable for time-limit games, or typical 'continue' screen.

3.5 APPENDIX: IN GAME SOUND FX

PxTone is not only capable of producing music. Since old school VG had nice sound effects, they often were built from musical notes and particular articulations. They didn't need to be realistic, but had to work with images and animations. Nowadays, the sound effects tend to be like the action movies. Explosions, machine guns, vehicles, screams,...etc are top-notch. Arcade machines and 8-bit computers had a sound chipset with a noise generator, which tweaked properly, were able to simulate a decent amount of effects. This was a challenge for the sound programmer's creativity, and fantastic sound Fx from the chips came out in that era.

With PxTone, we can load noise samples and compose music articulations in order to create some nice effects. Examples given are proposals for certain parts of the VG: 'One life lost', 'Item collected', 'Power up', 'Weapon attack', etc... It's only a matter of imagination.

Please load examples No. 54 to 57 and listen carefully. These four artificial effects are short non-realistic samples, but effective enough to insert them on proper VG. You can export each one into waveforms (*.wav format) to use separately in Game Maker or another suitable program:

EXAMPLE No.	USE	COMMENTS (notes)
54 "sound_fx1"	8-16 bit game (polyphonic)	-Suitable for 'ONE LIFE LOST' or 'WRONG ANSWER'.
55 "sound_fx2"	8-16 bit game (polyphonic)	-Suitable for 'ITEM COLLECTED' or 'SECRET FOUND'.
56 "sound_fx3"	8 bit game (monophonic)	-Suitable for 'GATE OPENED' or 'MECHANISM ACTIVATED'.
57 "sound_fx4"	8 bit game (monophonic)	-Suitable for 'MECHANISM WORKING'.

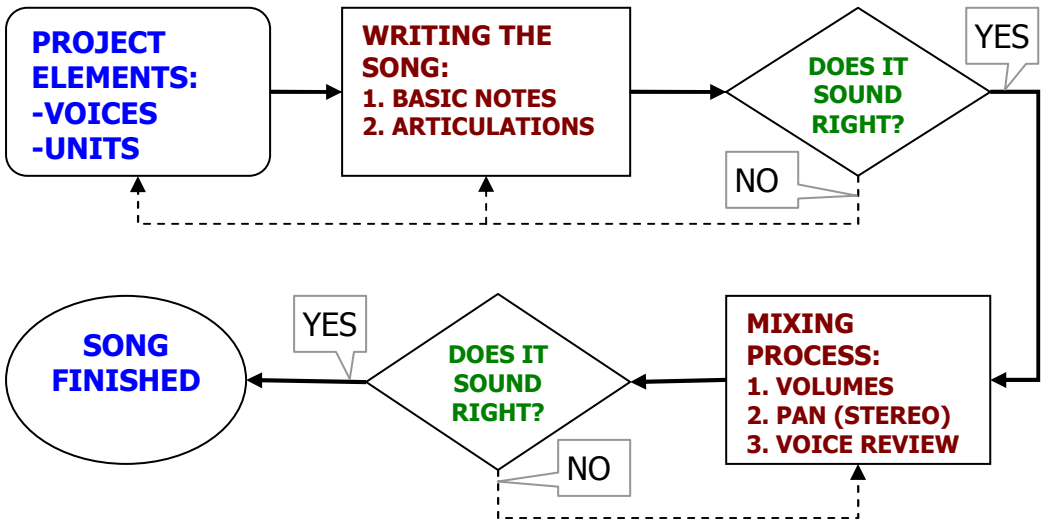
Examples given are built with simple Ptvoices provided in the folder. Use your imagination and write experimental articulations like *portamentos, C64 arpeggios, fake delays, ultra low or high notes, noise volume curves,* etc. Mix them and think carefully about what could be their function as sound effects. Remember: VG music and effects don't need to be realistic to work with images and animations.

3.6 OVERALL MIXING

It's time to perform some fine adjustment over the project. First we have to answer the following questions:

1. Have we reached the desired result?
2. Does the project sound just as we like?
3. Can we hear each and every one of the instruments clearly?
4. Are the transitions and changes smooth and fluent enough?
5. Does the piece work with the images?
6. Is the project's length appropriate for your VG?

These questions will help us to detect potential problems. Depending on what is the issue, we will have to provide a solution and pass the review again. If we have chosen the voices and tracks carefully, an important part is done. Also the arrangement itself is important. Let's have a look at the following flowchart:



The main processes are: **writing the song** and **mixing it**, but selecting proper sounds is also important. From the very beginning we have to choose the instruments and then start to work with them. In the next step, we have all the tracks written, arranged and articulated. The first question appears:

> *Have we reached a decent result in this preliminary step?*

I mean: Are the notes, transitions, articulations and parts suitable for the project?
In this case, we can go on with fine adjustment and further mixing process: volumes, groups, velocities, effects and pan (stereo). If an error occurs or there is an undesirable result, we must go back and reconsider several concepts. Let me explain this with a nice troubleshooting grey table:

PROBLEM	CAUSES	SOLUTIONS
MUDDY SOUND	-Bad sound choice. -Bad note choice. -Bad composition. -Too much effects.	-Select proper sounds or change them. -Don't overwrite the same notes in different tracks. -Don't cross two main melodies. -Review the effect mix. -Balance groups of voices in stereo field.
FLAT SOUND	-Bad articulations. -No accents. -No volume curves.	-Review velocities and articulations. -Review the volume curve. -Treat the melody in a musical sense by adding articulations.
ABRUPT TRANSITIONS	-Copy and paste without reviewing. -Writing without listening.	-Work track by track and listen to them carefully. -Play from transition point again and again and do the proper corrections. -Change the articulations or voices if necessary to 'flatten the terrain'.
ABRUPT PERFORMANCE	-Bad composition. -Hard transitions on chords or melodies. -Hard changes of sounds.	-Work track by track and listen to them carefully. -Play from the beginning to the end again and again and do the proper corrections. -Change the articulations or voices if necessary to 'flatten the terrain'. -Review chord and melody changes.
MONOTONOUS MUSIC	-Abuse of chords and rhythm lines any time. -No volume or velocity variations.	-Select a proper sound for each track. -Manage the side tracks (chords, rhythm lines, ornaments) wisely and don't use them at any time. -Review velocities and articulations. -Review the volume curve. -Balance groups of voices in stereo field.
EMPTY MUSIC WITHOUT BODY	-No mid-range tracks are written. -Instruments are thin-sounded or inappropriate.	-Select thicker sounds where necessary. -Add some side tracks (chords, rhythm lines, ornaments) wisely and don't use them at any time, but swap them. -Add some effects over the main melody. -Balance groups of voices in stereo field.
IMAGES AND MUSIC DON'T WORK TOGETHER	-Imbalance between images and sounds. -Music is not suitable for that VG part.	-Change the song concept. -Change the sound set quality. -Play the game without music and imagine it in your mind. Then try to write it.

Mixing process

Once we have passed the hard task of writing an appropriate song with all voices, articulations and effects, it's time to check track by track or by a group of tracks in order to achieve the best possible results. The following algorithm is recommended if we are looking for a well-balanced song:

Step 1: Drums

Mute all tracks except the drum section. Listen carefully to the elements (BD, SD, HH, TOMS and others). The sound must be clear and powerful. Snare and Bassdrum are the highlighted elements in volume. Then Hi-hat, Toms and cymbals. Maybe you can place some elements in stereo (hi hats a little on the right, and toms or cymbals from left to right depending on the range).

When a clear sound is achieved, then turn on the bass.

Step 2: Drums and bass

Mute all tracks except the drum and bass section. Listen carefully to the twin section (Bass and Drums). The sound must be clear and powerful again, but you must pay attention to this concept: *the bass must work with the drums.* I mean there has to be a perfect musical relationship between these two sections. Now it is time to reconsider some changes to the bass or drum lines, to join them in the best possible way. Please adjust the volume between the bass and drums: you must reach the perfect point to hear everything clearly balanced, with powerful and articulated sound.

Step 3: Main melody

Add to the previous section the main melody. Now you have a 'power trio', with three forces fighting together, but don't be worried: these tracks have enough room for each one. Melodies are normally located on mid-higher ranges, basses at the bottom and drums are *transient elements*, that is to say, percussive and short. With the proper amount of volume these three elements must sound clear and present. You have to realize what is happening to all articulations from bass and melody, and every performance note on drums. Correct any error if necessary and listen again. Now it is the turn of the side tracks and ornaments.

Step 4: Rest of tracks

As we showed in page 44, side tracks are placed in background. This idea is simple but difficult to perform, since these tracks are frequently groups of chords, rhythm lines, ornaments and auxiliary effects. Without exception, they must be lowered in volume according to the main melody, bass or drums. The difficulty lies on ***how much*** we have to lower them. If we put them high, the main melody could be buried alive. On the other hand, if we turn down the volume, the whole set will sound empty and 'half-baked'. The solution is achieved by volume curves, stereo positioning and the wise choice of voices. This is the most important part of mixing process: the final balance. You have to get these secondary tracks sound below the main melody, but present enough to reinforce the whole song.

Step 5: Overall listening

With all of the above done, simply press play and listen to the piece. A pair of studio monitors is highly recommended for accurate listening. Also it's a good idea to let a few days or a week pass before you listen again to the result with a clearer mind and fresh ears. Another good idea is to show the composition to your close friends and enemies (they never lie when it comes to mistakes). By that time, it's possible to find some errors that we feel uncomfortable about. Making the proper corrections we can achieve the desired result for sure.

To put an ending note to this chapter, a mixing process table is shown:

SECTION	RELEVANCE (in volume)	COMMENTS (notes)
1. DRUMS	80%	-They **must sound clear** and present, with the bass.
2. BASS	80%	-It **must sound clear** and present, with the drums.
3. MAIN MELODY	90%	-It has to sound over all parts. Also a **chord phrase**, **arpeggio** or even an **ornament** could be the **main melody** in certain parts of the song.
4. SIDE TRACKS (CHORDS, RHYTHM LINES, ORNAMENTS, FX)	50-70%	-They must support the **body** of the piece in the **mid-range** and **highest range** occasionally.

4. APPENDIX: GAME MAKER AND PXTONE.

With the help of Ben Hickling (http://www.cursesfoiled.co.uk/about/) and Locomalito (www.locomalito.com), some instructions have to be given to insert Pxtone properly in Game Maker code. The following are Locomalito's own words:

Installation

To start using PXTone into your Game Maker games, you need to copy both "pxtone.dll" and "pxwrap.dll" into your game directory.

Then, you must import the Game Maker scripts into your game, so open your Game Maker game, select "Scripts / Import Scripts", and then load the "PXtone.gml" into your game. This will add a PXtone folder with various scripts into your scripts folder.

From now on, you can use the PXTone functions with the Game Maker "script execute" command:

script_execute(scriptname, argument0, argument1, argument2, ...);

Let's take a look to the PXTone function list:

FUNCTION	DESCRIPTION	ARGUMENTS
pxt_init	Start the PXtone sound system	window handle, channels(1/2), rate(11025,22050,44100), bits(8/16), buffer size (0.1-1.0), use Directsound instead of wave mapper (true/false)
pxt_load	Load a PXtone song, .pttune or .ptcop format	filename (example: "song.ptcop")
pxt_play	Begin playing the loaded song	Unknown, fade in time (milliseconds), loop song (true/false)
pxt_volume	Set the volume for the current song	volume (0.0 - 1.0)
pxt_fadeout	Fade out the current song for X amount of time	time (milliseconds)
pxt_setloop	Enable/Disable looping	true/false
pxt_release	Release the current song ready to load the next one	none
pxt_shutdown	Unload the PXtone sound system from memory	none

(PXtone Wrapper © BenH 2007 - http://www.cursesfoiled.co.uk)

5. RECOMMENDED STUFF.

This chapter is about a particular list of VG soundtracks sorted by genre and type. It has an educational purpose focusing on the learning of chiptune music. I found a universe of music among those VG, and learned a lot from them. This is a personal choice, based on my experience with arcade machines and certain computers, and I hope you may find it useful.

GENRE	**GAME (year, company, system)**	**COMMENTS**
MAZE/ PLATFORMS	-AMIDAR (1981, Konami, Arcade).....	Simple but catchy.
	-SONIC THE HEDGEHOG (1991, Sega, Genesis).....	Jazzy chords. A Masterwork.
	-JAMES POND2-ROBOCOD (1991, Millennium, Amiga)	Catchy and easy-going.
	-VVVVVV (2010, Terry Canavagh, PC).....	Retro style. A Masterwork.
ADVENTURE/ RPG	-PENGUIN ADVENTURE (1986, Konami, MSX).....	Incredible three channel music.
	-GOLVELLIUS I, II (1987-8, Compile, MSX2).....	Incredible ambience music.
	-YS I & II (1987-8, Falcom, MSX2).....	Awesome adventure music.
	-SD SNATCHER (1990, Konami, MSX2).....	Simply one of the best. AWESOME!
	-METAL GEAR II (1990, Konami, MSX2).....	Military ambience music. Excellent.
	-MONKEY ISLAND (1990, LucasArts, PC).....	Exotic ambience music.
	-ECCO THE DOLPHIN II (1994, Novotrade, Genesis)..	New age ambience music.
	-LIGHT CRUSADER (1995, Treasure, Genesis).....	Awesome ambience and music.
	-CASTLEVANIA SOTN (1997, Konami, PSX).....	Simply a Masterwork.
ACTION: BEAT'EM UP	-IRON HORSE (1986, Konami, Arcade).....	Western and simple music.
	-DOUBLE DRAGON I, II (1987-8, Technos, Arcade)....	Incredible rock-funk music.
	-GOLDEN AXE I, II (1989-91, Sega, Arcade/Genesis)..	Awesome adventure music.
	-ALIENS (1990, Konami, Arcade).....	Incredible tension-ambience music.
	-SUNSET RIDERS (1991, Konami, Arcade).....	Western action music.
	-STREETS OF RAGE (1991, Sega, Genesis).....	Astonishing dance music. Perfect.
	-SOUL EDGE (1996, Namco, PSX).....	One of the best. INCREDIBLE!!
ACTION: PLATFORMS	-RASTAN (1987, Taito, Arcade).....	Epic adventure music.
	-SHINOBI (1987, Sega, Arcade).....	One of my favourites. Funk style.
	-HAUNTED CASTLE (1988, Konami, Arcade).....	Epic adventure music.
	-GHOULS'N GHOSTS (1988, Capcom, Arcade).....	Simply a Masterwork. INCREDIBLE!
	-SUPER CONTRA (1988, Konami, Arcade).....	Awesome action music.
	-STRIDER (1989, Capcom, Arcade).....	Simply a Masterwork of composing.
	-JEWEL MASTER (1991, Sega, Genesis).....	Interesting progressive rock.
ACTION: SHOOT'EM UP	-NEMESIS SAGA (1986-1989, Konami, MSX).....	Best suited music for each planet.
	-GRADIUS SAGA (1986-?, Konami, Arcade).....	Best suited music for each planet.
	-LEGENDARY WINGS (1986, Capcom, Arcade).....	Epic adventure music. FM synth.
	-AFTER BURNER II (1987, Sega, Arcade).....	Awesome action music.
	-GALAXY FORCE II (1988, Sega, Arcade).....	Awesome jazz-fusion action music.
	-SPACE MANBOW (1990, Konami, MSX2).....	Interesting space music.
	-GYNOUG (1991, Sega, Genesis).....	Interesting compositions.

GENRE	GAME (year, company, system)	COMMENTS
PUZZLE	-KING'S VALLEY II (1988, Konami, MSX)..... -PUZZLE BOBBLE (1994, Taito, Arcade)..... -PSYCHO PINBALL (1995, Code Masters, PC).....	Oriental-Arabian ambience music. Exotic and very catchy music. Incredible ambience music. Very addictive.
HORROR	-SPLATTERHOUSE (1988, Namco, Arcade)..... -SILENT HILL SAGA(1999-?, Konami, PSX-PS2).....	Incredible horror-ambience music. Simply a Masterwork.
SPORTS	-OUT RUN (1986, Sega, Arcade)..... -THE HUSTLER (1987, Konami, Arcade)..... -NEO TURF MASTERS (1996, Nazca, Arcade).....	Exotic and well-composed music. Smooth jazz for a billiards game. Jazz fusion perfectly suited for a golf VG.

Of course this list is not complete, and I'm sure that I forgot to mention many of the best VG soundtrack of history. This is only a selection of a few, but enough to cover standard genres or styles. I apologize for any inconvenience if your favourite game doesn't appear here, but I filled the list with the VG I've played that amazed me with their music.

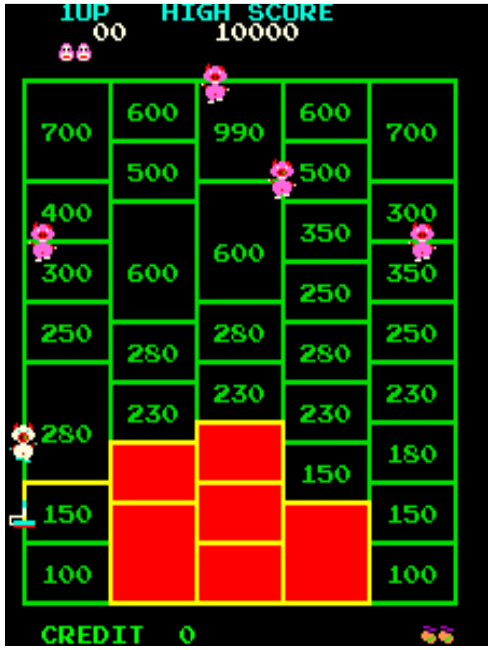
Let me write a few lines about music treatment in these gems. A brief review which, without any doubt, some of these video games deserve. Also I include some links on youtube.

Simple and direct

Amidar, Penguin Adventure or Iron Horse are examples of VG with a very polished music written in three channels. *Amidar* has easy-going and catchy melodies, *Penguin Adventure* has a dramatic and intense soundtrack perfectly suited for each moment, and *Iron Horse* has some nice western themes.

IRON HORSE (1986, Konami, Arcade)

PENGUIN ADVENTURE (1986, Konami, MSX)

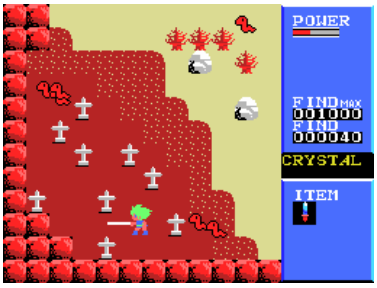


AMIDAR (1981, Konami, Arcade)

Check these links:
http://www.youtube.com/watch?v=VE6bpKXV2QU (Amidar)
http://www.youtube.com/watch?v=S4rXIXuGZuU (Iron Horse)
http://www.youtube.com/watch?v=5T3woiAcaE0 (Penguin Adventure)

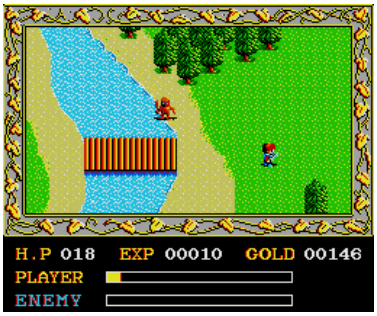
Adventures and RPG

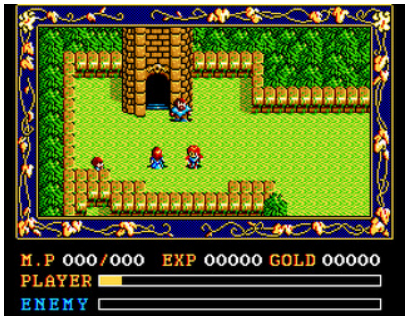
Nothing is as exciting as a good adventure. Here the music is essential to set the mood and create tension. Golvellius, Ys I & II, or Light Crusader are perfectly orchestrated for this proposal. The music turns dramatic, mysterious, epic and sometimes dark in these games.



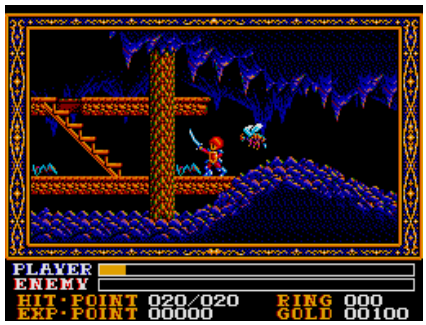
GOLVELLIUS (1987, Compile, MSX)

LIGHT CRUSADER
(1995, Treasure, Genesis)





YS I & II (1987-8, Falcom, MSX2)



YS III (1989)

Golvellius and *Ys series* have three channel music, with optimized treatment of sounds and effects, such as fake delay or bass and snare swapping in one channel. *Light crusader* is also an excellent RPG-Adventure VG, with a gorgeous soundtrack.

Check these links:
http://www.youtube.com/watch?v=PjPSkJWpXGo (Light Crusader)
http://www.youtube.com/watch?v=lgmS4zmh7Sg (Golvellius MSX)
http://www.youtube.com/watch?v=mTRDpPQoqCM (Ys II intro)

The following song is from *GAUNTLET4* (song name: 'Sortie', 1993, Sega Genesis), one of the most inspired and best suited pieces I've ever heard for an epic/adventure VG. Pay attention to changes, chords, tension and variations. A masterpiece composed by Hitoshi Sakimoto:

http://www.youtube.com/watch?v=BOagvSmosBg
http://www.youtube.com/watch?v=VoPBLs-31Dc (other version)

Adding tension and atmosphere

Good music is able to make you feel thrill and suspense, or even fear. Aliens, Silent Hill or Splatter House are excellent examples. *Aliens* had two versions (MSX and arcade), and although they were developed by different companies, the musical concept matches in both: Tension and suspense. *Splatter house* is the perfect combination of action and horror, and without any doubt, it has a soundtrack particular among all VG. *Silent Hill* was a real revolution in survival horror genre: A new form of music was born.

ALIENS (1987, Square, MSX)

ALIENS (1990, Konami, Arcade)

SPLATTERHOUSE (1988, Namco, Arcade)

SILENT HILL 2 (2001, Konami, PS2)

Akira Yamaoka composed all music for the *Silent Hill series*, and that music definitely crossed the borders of VG soundtracks, with its industrial-nightmarish style and the personal traces of the author. It's worth a listen.

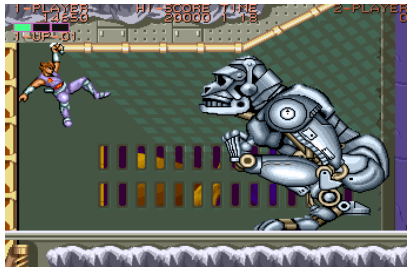
Check these links:
http://www.youtube.com/watch?v=j7jEgOohF2A (Aliens MSX stage1. Music turns dark later)
http://www.youtube.com/watch?v=hjZ21QSXshk (Aliens arcade)
http://www.youtube.com/watch?v=j9wx6K12lq0 (Spatter House)
http://www.youtube.com/watch?v=CumLLU3obG4 (Silent Hill 1)
http://www.youtube.com/watch?v=6aPLV57jyXE (Silent Hill 1: Hospital industrial music)
http://www.youtube.com/watch?v=Gk-nJhS9FR8 (Silent Hill: Industrial theme)
http://www.youtube.com/watch?v=_EN-_1OGtUY (Silent Hill 1: Opening. A master piece)

Exotic and non standard music

A selected group of videogames have strange (but incredibly beautiful) music. From jazz fusion to progressive rock, from Latin bossa-nova to free compositions, these pieces show that everything is possible in VG world. Music and images really work with this explosive cocktail. Galaxy Force II, Jewel Master, Out Run, Strider or Neo Turf Masters are some examples. These risky bets are amazing.

GALAXY FORCE II
(1988, Sega, Arcade)

JEWEL MASTER
(1991, Sega, Genesis)



STRIDER
(1989, Capcom, Arcade)

OUT RUN
(1986, Sega, Arcade)

NEO TURF MASTERS
(1996, Nazca, Arcade)

With two pairs of sound chips, *Out Run* was fully equipped in 1986. For an earlier VG like that, the soundtrack was absolutely awesome for that era. Latin rhythms and exotic samba fitted like a glove for a driving game. A wonderful idea.

Jewel Master has some interesting pieces. The way they are composed is risky and brave, and the rhythms are not conventional in some cases (check the song below). *Neo Turf Masters* has a smooth jazz soundtrack with exquisite treatment of the instruments, it's just like a band's performance. *Galaxy Force II* introduces you into a fantastic world full of space-age landscapes, richly ornamented with a superb jazz fusion composition. But *Strider* is top-notch. No soundtrack is as imaginative as this one, or risky enough to play quiet and strange notes for an action scenario (listen to 'Siberian Tunnel') or the majestical entrance for stage 1 ('Raid' song). This real masterwork is composed by Junko Tamiya and worth a listen.

Strider: A gorgeous videogame and soundtrack.

Check these links:
http://www.youtube.com/watch?v=EaLRLo2yB04 (Galaxy Force II)
http://www.youtube.com/watch?v=W6YXFj1StSQ (Jewel Master. Song:'The Gate of Delirium')
http://www.youtube.com/watch?v=WiWiTXq4yYY (Out Run)
http://www.youtube.com/watch?v=o_m_EXeBKPE (Neo Turf Masters)

http://www.youtube.com/watch?v=zaQwum7FGsw (Strider. Song: 'Raid')
http://www.youtube.com/watch?v=UMZ9V1QX1ko (Strider. Song: 'Siberian Tunnel')
http://www.youtube.com/watch?v=-p7-CjRYaKU (Strider. Song: 'Fujin')
http://www.youtube.com/watch?v=gJkCfNAIiOg (Strider: general gameplay)

We can also find exotic soundtracks in videogames like Monkey Island, Ecco the Tides of Time or Sonic the Hedgehog. Their music is just amazing, and perfectly suited for each passage.

ECCO THE DOLPHIN II
(1994, Novotrade, Genesis)

SONIC THE HEDGEHOG
(1991, Sega, Genesis)

MONKEY ISLAND
(1990, LucasArts, PC)

Ecco the Dolphin II is an awesome unique videogame, with an ecological atmosphere and a beautiful new age soundtrack. If you think carefully about the ocean and dark blue abyss, that game sound is just what you expect. *Sonic the hedgehog* has a direct but nice soundtrack full of jazz chords and awesome changes. Perfect for a colourful game like this, and *Monkey Island* is one of the best five videogames I've ever played in my life. The music is just astonishing. It fits like a glove. Recently there has been a special edition and the soundtrack has been re-orchestrated. Give it a chance.

Here are the links:
http://www.youtube.com/watch?v=32S2oJuANxo (Ecco II)
http://www.youtube.com/watch?v=SJ0IaeXa7VA (Sonic)

http://www.youtube.com/watch?v=VilD37_deNU (Monkey Island original)
http://www.youtube.com/watch?v=ZohwuRsZ2s8 (Monkey Island re-orchestrated)
http://www.youtube.com/watch?v=wnAghYUxLms (Monkey Island re-orchestrated)
http://www.youtube.com/watch?v=LAvS1dAlMi0 (Comparison between two versions)

Nemesis / Gradius series

These videogames deserve an entire section due to their particular universe of music and atmosphere. From the arcade to home computer version, from *Salamander saga* to *Nemesis* episodes, each and every of these games have music incredibly suited for all situations, planets, bonus stages, etc. They are in sum MASTERWORKS with capital letters. Let's mention some selected passages.

NEMESIS II
(1986, Konami, MSX)

NEMESIS II
(1987, Konami, MSX)

NEMESIS III
(1989, Konami, MSX)

First we are going to talk about MSX computers. Nemesis appeared in 1986, with three channel music, but enough to amaze with its beauty and direct style. Then appeared Nemesis II, with a revolutionary 8-voice soundchip (SCC), which reached arcade machines quality. That sound was professional and polished, and more titles were about to come. On the other hand, the compositions were adapted for each planet and really worked! I always remember that era with a smile on my face.

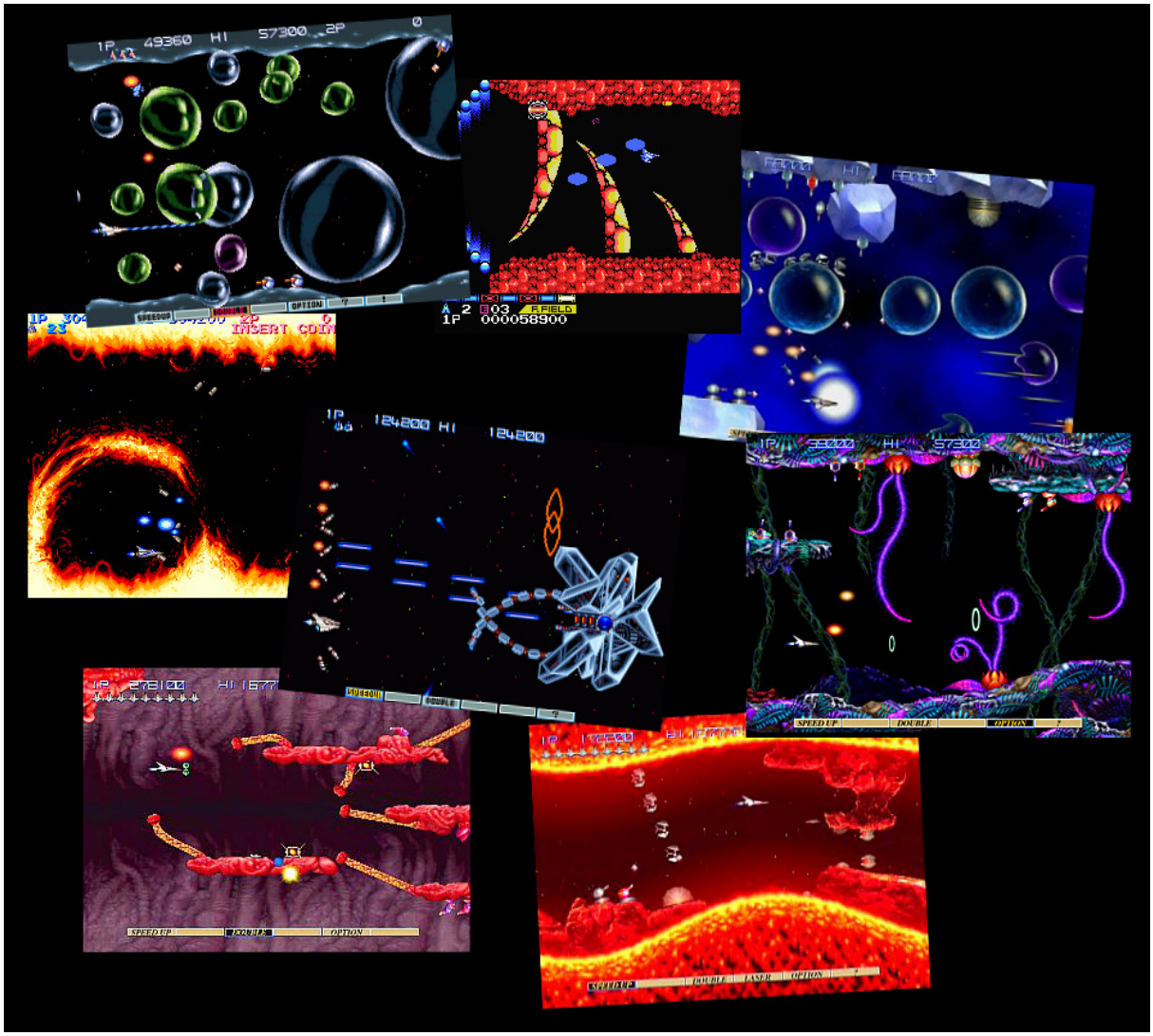
The music was intentionally composed using the theme and nature of each planet and the effect achieved was awesome. The Greek planet sounded 'Greek', the giant plant planet sounded 'mysterious and vegetal', the ocean planet sounded 'oceanic'... but there was a common and solid style for all together.

Giant Statue Planet, NEMESIS II
(Open space theme)

Greek Planet, NEMESIS II
(Greek style music)

Dragon Planet, NEMESIS III
(Strange atmosphere music)

This particular way of composition has been present in all games of the saga: Nemesis I, II, III, Salamander, Gradius I, II, III, IV, Gaiden, etc.



From left to right: GRADIUS III arcade: Bubble planet, SALAMANDER MSX: Stage I, GRADIUS IV: Bubble planet, SALAMANDER arcade: Fire planet, GRADIUS II arcade: stage 3 BOSS, GRADIUS IV: Vegetal planet, GRADIUS IV: Living planet, GRADIUS IV: Lava planet. All of these stages have an awesome music, and it's worth a listen.

For arcade machines, the *Gradius saga* was shocking and awesome. One VG after another was highly detailed, and the music too.

For *Nemesis/Gradius* series, I propose one section for each game, but you can search youtube for more. They all have interesting stuff for listening.

MSX Stuff:
http://www.youtube.com/watch?v=Kmwfp6I9Nkc (NEMESIS I MSX)
http://www.youtube.com/watch?v=Te1zJHoTweY (NEMESIS I SCC MSX. VERY RARE!)
http://www.youtube.com/watch?v=yjKCq-Pb3CY (NEMESIS II MSX)
http://www.youtube.com/watch?v=qHlTlLZ5a1I (NEMESIS III MSX)
http://www.youtube.com/watch?v=yaEp8q6PG9U (SALAMANDER MSX. Excellent!)

MSX not from the saga, but interesting enough:
http://www.youtube.com/watch?v=tdyd19HGO6k (SPACE MANBOW)
http://il.youtube.com/watch?v=2EAQ0U_KAfw (PARODIUS. Stage1)

Arcade stuff:
http://il.youtube.com/watch?v=bLr6-GZNgHk (GRADIUS I)
http://www.youtube.com/watch?v=mdWdAAtZ2I4 (GRADIUS II)
http://www.youtube.com/watch?v=QlSPFn8IfJ0 (GRADIUS III. Stage3. I love this song!)
http://www.youtube.com/watch?v=zCSe_psFd2w (GRADIUS IV. Stage3. This is awesome!)
http://www.youtube.com/watch?v=Wv9iH9QhkNA (GRADIUS IV gameplay)

PARODIUS
(1988, Konami, MSX)

SPACE MANBOW
(1990, Konami, MSX2)

VULCAN VENTURE/GRADIUS II
(1988, Konami, Arcade)

SD Snatcher (Konami, 1990)

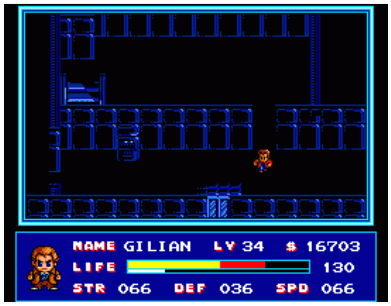
This wonderful videogame has enough music to cover an entire section. First published in 1990 for MSX2 computers, it used a double soundchip (PSG-SCC) and had more than 50 pieces, mainly composed by Masahiro Ikariko, and his collaborators: Mutsuhiko Izumi, Motoaki Furukawa, Michiru Yamane, Yuji Takenouchi, Harumi Ueko, Yuko Kurahashi, Tomoya Tomita, Tsuyoshi Sekito and Kazuhiko Uehara. This precious diamond is one of the most all-encompassing thrillers I've ever played. Despite its RPG/Action format, this VG is a cyber-punk adventure with some similarities to the *'Blade Runner'* film with its retrofuturistic look. The treatment of instruments like bass, chords, drums and melodies are top-notch and very educational for learning. I highly recommend a listen to all *SD-Snatcher* and also *Snatcher* stuff, if you want to know how classic videogames sounded.

MAIN LOGO

CITY GRAPHIC

CHURCH
(incredible baroque music)

The atmosphere reached is just like a movie, but in 8-bit scenario. Many melodies are remarkable, and each one is suited for a special situation, creating the proper ambience for the sequences in gameplay.



A DARK HOSPITAL
(this makes your hair stand on end)

ARCADE CENTER
(music here is a nice ambience fx)

MIRROR MAZE
(from an amusement park)

Some few links:
http://www.youtube.com/watch?v=d2Bb34ZoI7s (Intro)
http://www.youtube.com/watch?v=ciblRYm0tE0 (Beginning)
http://www.youtube.com/watch?v=KUkFS9MimII (Amusement park. Deleted stage)

Do yourself a favor and play this gem. You will not regret it.

Action, action and action!

Many of the arcade machines were action games. This is by far the most developed genre in VG soundtracks, and it has as many subgenres as you can imagine: war, street gangs, Japanese folklore, western, futuristic, mythological, medieval,...

This music has a lot of variations and thematic influence. Japanese music is treated on some nice VG like The Legend of Kage, Shinobi, Kabuki Z or Sengoku:

SHINOBI. Main Title.
(1987, Sega, Arcade)

SHINOBI. Gameplay.
(1987, Sega, Arcade)

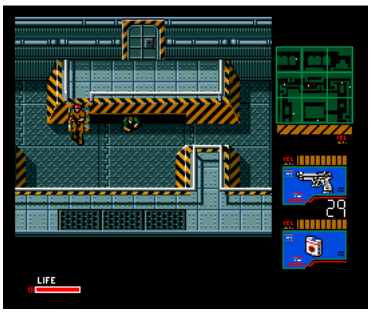

Kabuki Z
(1988, Taito, Arcade)

Music used for those VG is exotic and very appropriate. *Shinobi* has some very well composed sequels on Sega Genesis consoles, mixing Japanese phrases and jazz fusion rock.

Here are some links of Japanese influenced soundtracks:
http://www.youtube.com/watch?v=lr6Q_71sofo (The Legend of Kage, 1985, Taito)
http://www.youtube.com/watch?v=6_6Jwgd8b6E (Shinobi, arcade)
http://www.youtube.com/watch?v=YmDaSVHlH3U (Shinobi III, Genesis. I love this tune!)

Warfare and military VG often have powerful soundtracks. Metal Gear, Gryzor, Super Contra or After burner II have excellent arranged soundtracks, full of intense moments and spectacular effects.

METAL GEAR
(1987, Konami, MSX2)



METAL GEAR II
(1990, Konami, MSX2)

AFTER BURNER II
(1987, Sega, Arcade)

First *Metal Gear* had three channel music, but interesting enough. *Metal Gear II* music was composed by Masahiro Ikariko, and has eight channel sound due to the SCC system. Mystery, action, military and sometimes drama mood for this fantastic VG. *After Burner II* had two pair of sound chips: the first pair for melodic instruments and the second for distorted guitars, drums and effects. The result: awesome!

Some links:
http://www.youtube.com/watch?v=T-H0fmG9ffI (Metal gear II, Intro. Just astonishing!)
http://www.youtube.com/watch?v=Kh_SC-oZLMg (Metal Gear II gameplay)
http://www.youtube.com/watch?v=PkkQNDvKEdg (After Burner II gameplay and music)

This technique of paired chip was extensively used in many arcade machines, and the results were incredible. Contra and Super Contra have been treated this way, and their soundtracks are top-action-packed and powerful ones:

GRYZOR
(1987, Konami, Arcade)

GRYZOR. Main Title
(1987, Konami, Arcade)

SUPER CONTRA
(1988, Konami, Arcade)

Modern *Metal Gears* (PSX, PS2, PS3, XBOX) have a professional soundtrack, very intense and film oriented. Harry Gregson-Williams, the Hollywood composer, is the author of MGS II, III and IV music, and these compositions are much closer to films than to old school VG. Despite this chapter focused on classics, I believe that some of these pieces are really impressive, with a high budget production like 'Narnia Chronicles' (indeed, Harry G-W himself is the composer of recent Hollywood hits like this).

Back to the classics, check this out:
http://www.youtube.com/watch?v=pjQitUaDAhk (Super Contra gameplay)

Many action arcade videogames take place in a particular period of time or era, and this gives much play for music atmosphere. Sunset Riders, Rastan, and Golden Axe are good examples.


SUNSET RIDERS
(1991, Konami, Arcade)


RASTAN (detail)
(1987, Taito, Arcade)

GOLDEN AXE
(1989, Sega, Arcade)

Sunset Riders has a 'TexMex' western style, very polished. *Rastan* is close to 'Conan the Barbarian' motif and also has excellent music. *Golden Axe saga* is a masterwork set in medieval times. The concept and music have a 'Sword and Sorcery' mood, and it is a shocking and exciting VG, really enjoyable.

Some pieces:
http://www.youtube.com/watch?v=3Qm8E8d9qkE (Sunset Riders: Intro and gameplay)
http://www.youtube.com/watch?v=0DdXI0oYZGQ (Rastan)
http://www.youtube.com/watch?v=h1_xSBHBQlU (Golden Axe, Main theme)
http://www.youtube.com/watch?v=BzgDIF3CmdE (Golden Axe II, stage 2)

One of the most popular genres within action arcade games is *'Beat'em Up'* or *Street Gangs* VG. I don't remember having spent so many coins and plays as in Double Dragon, the cornerstone of all those videogames. Also we have to mention Final Fight and Streets of Rage saga, with fabulous dance music, perfectly suited for fighting action.

DOUBLE DRAGON
(1987, Technos, Arcade)

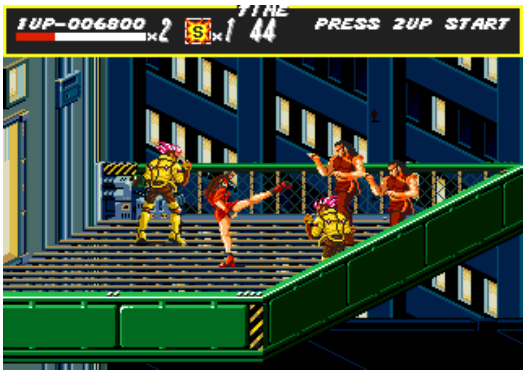
DOUBLE DRAGON II
(1988, Technos, Arcade)

FINAL FIGHT
(1989, Capcom, Arcade)

Double Dragon and *Double Dragon II* have a genuine videogame musical style based on funk rock/pop, very polished and richly ornamented with arpeggios, chords, slap bass, and nice and catchy melodies. On the other hand we have the very personal world of *Streets of Rage,* a universe of dance music adapted for a VG. Give them a try:

http://www.youtube.com/watch?v=S0-2xhQAO9k (Double Dragon)
http://www.youtube.com/watch?v=DZHX6PHI4LI (Double Dragon II)
http://www.youtube.com/watch?v=hikFCwduCIQ (Streets of Rage: Opening)
http://www.youtube.com/watch?v=U3YbN-K2zL8 (Streets of Rage: Stage1)
http://www.youtube.com/watch?v=YEkSppihYM4 (Streets of Rage music compilation)

DOUBLE DRAGON
(Main Title)



STREETS OF RAGE
(1991, Sega, Genesis)

There is an action fighting game which deserves a special mention: Soul Blade / Soul Edge (1996, Namco, PSX / Arcade). It has three soundtrack collections inside, and you can choose the one you like. I have to say that I felt highly impressed by the quality of the music, from the opening song to the stages pieces. They are brilliantly arranged in orchestral way, with a jazz touch in some chords. Without any doubt, a Masterwork composed by Takayuki Aihara.

Soul Edge: Music goes beyond gameplay

Some music samples from this VG:
http://www.youtube.com/watch?v=rTFLRhV2vI8 (Opening Song)
http://www.youtube.com/watch?v=H9schz2UJ64 (Epic Calling. Select player screen)
http://www.youtube.com/watch?v=u3aoZsjpUK4 (Dragon's Call)
http://www.youtube.com/watch?v=TErmAQfaLFE (Horangi Arirang)

The famous Castlevania series (Konami) have by this time up to 44 different games since 1986. These games have a particular image style, based on vampires, castles, knights, sorcery, demons, cathedrals, etc. Everything is surrounded by baroque and neoclassical soundtrack, more or less mixed with modern rhythms and arrangements. I had the first one for MSX2, Vampire Killer, with three monophonic channels. The music was awesome for that era, but more interesting pieces were about to come. To mention a few, Castlevania: Bloodlines (1994, Sega Genesis) has a very polished and well composed soundtrack, by master Michiru Yamane. She also composed the tremendous soundtrack for Castlevania: Symphony of the Night, an extensive collection of exquisite pieces suited for a large PSX videogame, with the best virtual instruments and performances (non-chiptune music). One of my favourite videogames of this saga is Haunted Castle, with a nice soundtrack written for two paired chips.

HAUNTED CASTLE
(1988, Konami, Arcade)

HAUNTED CASTLE
(Main Title)

CASTLEVANIA: Symphony of the Night
(1997, Konami, PSX)

You can delve deeper into *Castlevania* series and music, and you will find a universe of sounds and textures with a common body. Now let me list a few interesting links:

http://castlevania.wikia.com/wiki/Castlevania_Wiki (Website about Castlevania series)
http://www.youtube.com/watch?v=o-TPhBIuTJc (Castlevania: SOTN. Introduction)
http://www.youtube.com/watch?v=KbLiwvQCaoc (Vampire Killer for MSX2)
http://www.youtube.com/watch?v=yx_b6KfMS_Y (Haunted Castle: Don't wait until Night)
http://www.youtube.com/watch?v=I0GlqyiFXV4 (Haunted Castle: Crucifix Held Close)
http://www.youtube.com/watch?v=EavwbzTF6TY (Haunted Castle: Clocktower Fear)
http://www.youtube.com/watch?v=k9KyV4zrdvE (Castlevania Bloodlines: Sinking old sactuary)
http://www.youtube.com/watch?v=uPGZJhxI4xE (Castlevania Bloodlines: Versailles stage)
http://www.youtube.com/watch?v=WTvCemtacek (Castlevania PS2: Garden forgotten)
http://www.youtube.com/watch?v=GiXCote6N6s (Castlevania PS2: Abandoned Castle)

CASTLEVANIA MAIN CHARACTERS
(Richter, Alucard, Simon and Leon)

POSTER FOR AN UPCOMING MOVIE
(The real castle is located in Segovia, Spain)

Castlevania has experienced an evolution through time: almost 25 years of VG music.

FM sound

In the middle eighties a famous synthesizer was born: the YAMAHA DX7. With this model, a new type of synthesis was developed: The FM or *Frequency Modulation*. Yamaha also produced soundchips for the arcade machines based on this particular architecture: Some of the YM series. *YM2151* and *YM2203* were the most popular, and this sound was genuine for classic videogames like Commando, Legendary Wings, Trojan, Gun Smoke, Ghost'n Goblins, etc.

It has an unmistakeable, clean and rounded sound, cornerstone of the golden age of arcade machines. Later videogames used a pair of FM chips, and joined together with some PCM chips for the drum samples, but they kept this FM sound.

COMMANDO
(1985, Capcom, Arcade)

LEGENDARY WINGS
(1986, Capcom, Arcade)

Some samples:
http://www.youtube.com/watch?v=xmlM1KS7txE (Commando)
http://www.youtube.com/watch?v=EndTuwNsc6g (Legendary Wings. Stage 1)
http://www.youtube.com/watch?v=_ZxCfNJ-568 (Legendary Wings. Stage 2)
http://www.youtube.com/watch?v=VKcU5lcXpOU (Trojan. Gameplay)
http://www.youtube.com/watch?v=f1HWTDEHgv4 (Ghosts'n Goblins. Gameplay)
http://www.youtube.com/watch?v=iWIC9EGSOeM (Ghouls'n Ghosts. Gameplay)

GHOSTS'N GOBLINS
(1985, Capcom, Arcade)

GHOULS'N GHOSTS
(1988, Capcom, Arcade)

FM Suggestion for Pxtone

There is a model of YM2151 for VST (Virtual Studio Technology) format, based on chip modelling by MAME (Multiple Arcade Machine Emulator) platform: the VOPM, and also the source code is open. You can find it here:

http://www.geocities.jp/sam_kb/VOPM/

Also, there is a OST player (M1) for any arcade soundtrack. Link is here (just below a few lines):

http://www.x68000.de/soundchips/ym2151/

If PXTONE could incorporate a voice editor based on VOPM, and the voices created were imported to PTCollage for multitrack duties, I can assure you that no-one would pass by these features if they were available in a single tracker/song editor. For sure, the potential of PXtone would be higher and unique.

I'm not very skilful with programming, but if I could, I would do it. At this point, I invite anyone to dare try it.

Modern Retro-Videogames

In these last years, videogame development has been divided into two branches: The commercial (mainstream) and the independent. Some people talk about an intermediate branch between these two: the 'Mindie'. Here is the link of the topic:

http://www.doolwind.com/blog/mindie-bridging-the-gap-between-mainstream-and-indie/

The thing is that some large companies are opting to hire small groups of programmers to develop 'handmade' games with 'slow design', let's say: with much dedication, passion and time. Megaman 9 and 10 are official sequels, released by Capcom in this year.

VVVVVV is another amazing game of this year. Music composed by Magnus Pålsson is just awesome with retro computer style, and fits like a glove with the game.

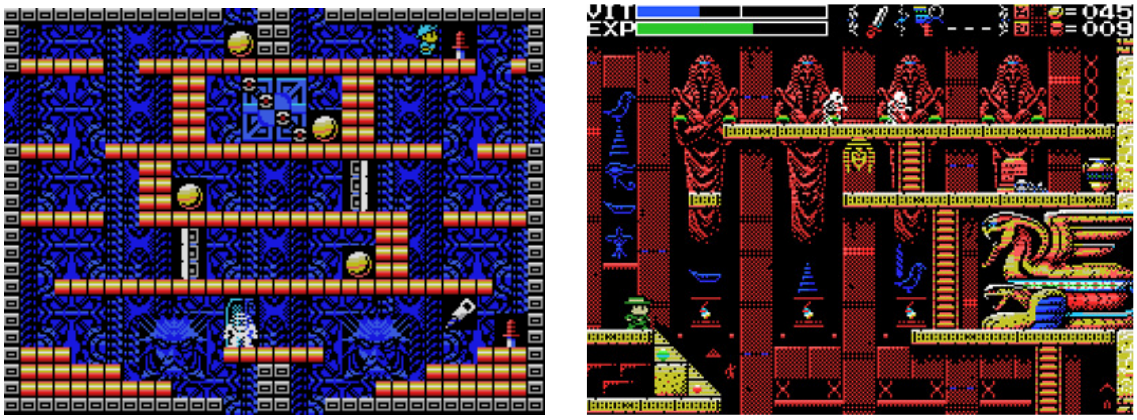
VVVVVV (2010, Terry Canavagh, PC)

You can hear the main theme (Passion for exploring) here:

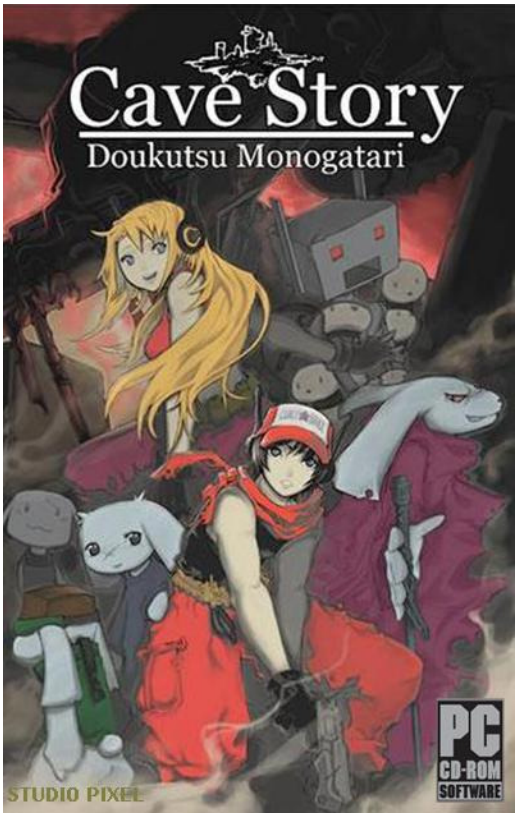
http://www.youtube.com/watch?v=Qwtg8GtsSQ4

In 2005, a videogame called 'La Mulana' appeared as freeware in the indie scene. I discovered it two years ago, and played it for three weeks. What a surprise! It has identical gameplay, feeling and action as old MSX games like 'King's Valley II' or 'The Maze of Galious'. *La Mulana* is highly acclaimed by most of the gamers worldwide. It took five years to develop by a small team of three people (Nigoro), and recently it has been ported to Wii-ware system (still in progress), due to the huge success. If you are a riddle and puzzle lover, this game is a 'must'. Do yourself a favor and download it. Here is the link:

http://agtp.romhack.net/project.php?id=lamulana



Similarities between *'King's Valley II'* (1988, left) and *'La Mulana'* (2005, right) are done on purpose. Both are great videogames

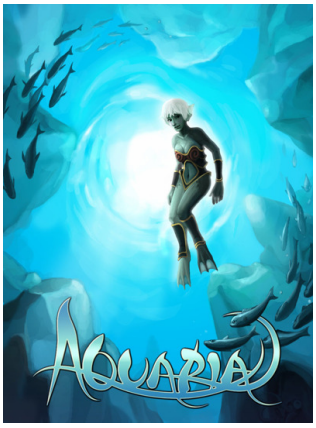


Cave Story Cover

◄ Also Cave Story, written and developed by Daisuke Amaya (A.K.A. Pixel, author of Pxtone too) in 2004, is a free videogame which has trespassed the borders of mainstream and is in demand by gamers over the world. It took five years to program it and recently it has been ported to other systems like PSP, Wii or DS. Incredible work for a single person.

You can get it here: http://www.acid-play.com/download/cave-story/

Derek Yu is a very talented indie developer: He is brave at painting, programming, designing,... This man has created Aquaria and Spelunky, two of the most popular videogames released by independent programmers.



Aquaria (left) and Spelunky (right) are excellent creations of Derek Yu

There is a lot of talented programmers who are encouraging each other day by day creating new game concepts and entertainment forms. Cactus, Virtanen, Edmund McMillen, Playdead Studios, Locomalito and many others mentioned before have been working with much effort and dedication to create new and exciting videogames made with love. Please forgive me if I have not mentioned other important programmers.

To close this chapter, let me write the last lines about a PC videogame which entertained me for tons of hours: Psycho Pinball (1995, Code Masters, PC).

It had four different pinball tables, and there was one with a Halloween theme: 'Trick or Treat'. The music and atmosphere were incredibly good, with all those 'mild horror' effects, voices and tunes.

This clown head appeared from black and then disappeared again. Very funny!

This pinball had a lot of secrets inside and pieces of interesting music, as well.

Time will tell whether old school videogames are reborn to live eternally or not...

6. FINAL WORDS.

It's time for the acknowledgements. First I would like to thank you for reading this manual. I hope you found it entertaining and learned a bit about music and videogames. The aim of this book is to show what the old school VG looked like, and how chiptune music has its own space and suitability within the VG world. Also PxTone is shown as being a versatile tool for making your own music is an easy way, and many pieces, styles and genres can be achieved from this fabulous freeware tracker.

Special thanks to...

- Roman Empress, for text corrections and suggestions about contents.
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- Jacobo García, for image and layout suggestions.
- Jerry (Jeriaska) for his support in different web pages and projects and text correction.
- 'IO the wizard', for sharing his knowledge about art and life.

This book is dedicated to all videogame lovers: past, present and future.

Videogames will not disappear as long as people are willing to play them.

G87

NOW GO
AND DO THE RIGHT THING