

FURIOUS ADVANCE TRACKER
F A T



User manual

version 1.3.0-RC1

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FAT FuriousAdvanceTracker
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for 0.3.0

Thanks to **Guillaume Dualé** for his patience and encouragement.

Thanks to **Joan Dolç** for the ancient document's translation.

1.0.x and 1.1.x

After four years, **FAT** is again on the way !

A second thank to **Guillaume Dualé**. You are really enthousiast and it helps me a lot !

Thanks bro.

1.2.x

Big code refactoring and working on general stability.

This document is a translation from a french document. I'm not english ! That's why this document is really perfectible. If you want to help or correct my poor english, feel free to contact me ! Cheers.

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1 Presentation

1.1 Presentation and disclaimer

FAT is a musical software conceived for the Gameboy Advance. With FAT, you'll be able to make music directly on your console using its technical capacities. FAT is trying to be the simplest as possible but you'll probably have to learn how to use it in order to exploit all the features it provides.

The current version, version 1.3.0-RC1, is the first really stable. I tried to make it the safest and bugfree as possible but this software is probably a little bit buggy or not finalized. I'm currently working on FAT (well ... while I get motivation, I'll continue to develop it) so if you found a bug or an unusual case, please report me the issue. It's really important to make the software continue to grow. You can report any issue on <http://www.furiousadvancetracker.com>. Many thanks to you ! (and a kiss. But not a french one :D)

The FAT's GUI really looks like LSDJ. Actually, I considered LSDJ as my model when designing FAT while adding my personal touch and ideas. Some features are completely originals when others has disappeared.

Of course I'm not pretending FAT is as performant as LSDJ. I'm working hard to make this possible one day and I hope FAT will be an important software for the GBA chiptune's community.

So ... a great thanks to you, who are reading this manual. Thanks for trying FAT, hope you'll love it !

1.2 Why FAT ?

When I started this project, in 2011, several solutions already exist allowing you to compose music stuff on your GBA.

- Nanoloop 2.3/2.5
- M4G tracker
- and probably many others...

In my opinion, all of these seems to be incomplete although all of them are reasonably usable.

- Nanoloop 2.3/2.5 is an excellent software ! but it's quite difficult to get your hands on. It's also quite expensive (due to rarity probably).

- M4G tracker is also a good software: but it's development seems to be stopped. Well, like FAT a little while ago.
- I didn't find any other solutions...

Finally you know what ? Coding my own tracker has proven to be really fun !

1.3 How to use FAT ?

FAT is a gba file. This file is directly usable on your computer or smartphone with a GameboyAdvance emulator (such as VisualBoyAdvance).

Anyway, an emulated sound can never be equal than the true one. To execute FAT on a real GBA, you'll need :

- a true GBA or a Gameboy Micro. I personally prefer the second one but some says the screen is too small.
- an EZ-Flash, SuperCardToSD, or other cartridge ... You'll have to search the web in order to find one
- a SD card in the case your cartridge use one.

When you have bought all this cool stuff, all you have to do is to paste the FAT gba file (**with the provided cartridge's software**). It's really important to follow all the cartridge's constructor's instructions : FAT could not work correctly if you don't.




Warning ! Although this version has been considered as stable, it remains experimental. I think you don't have to waste money in order to try FAT but it's your choice !

If you really want to buy you own cartridge, the following sheet can help you.

1.4 GameboyAdvance cartridge comparison sheet

There's a lot of GBA cartridges. These cartridges allow you to execute "homebrew" program like FAT . Here are some cartridges tested with FAT .

Cartridge	Burning	Starting	Saving
	Use the official software	OK	The save features is working but you'll have to press R+L+A+START after each save.
	Use the official software	NOT TESTED	Not tested but should be similar with the SuperCardSD above.
	Use the official software and his USB linker	OK	Nothing to report, all is working ! This is far the better choice.
	Use the official software, GBA will be your linker	OK	Save feature is working.
...			

Cartridge	Burning	Starting	Saving
	???	KO	Not tested. Some users already reported this cartridge is not working with FAT :(
	FAT is starting and is usable. Use the provided software to burn the ROM.	OK	Save doesn't work ! Please use the instant save provided by the cartridge.
<p>On your smartphone</p> 	FAT is starting and being usable	OK	Check your online store to get a suitable emulator.

Best choice is ezflashl.



If you have a "black" cursor issue, then try this solution brought to you by [@maz.hoot](#) (thanks for your share !)

Howto : **Write FAT on NOR memory.**

1. switch on the console
2. one the welcome screen displayed, place the cursor on planet icon and press A twice (as usual).
3. press A to enter EZ-Disk directory
4. set the cursor on FAT.gba
5. press select. A dialog box appears.
6. press A. FAT.gba is now writing with NOR mode on the cartridge. It may take some time to finish, please wait.
7. now, you should see the EZ-Disk with FAT.gba below. If not please try to switch off and on your console.
8. start FAT.gba by kicking the A button. It should be faster to start and cursors should not been black anymore.

1.5 Changelog for version 1.3.0-RC1

Changelog for this FAT 's version:

- general stability improvements (all the code has been reworked)
- the samples and oscillator playback had been recoded (now it's stable)
- added a new screen : custom wave editor
- added a new project parameter : the sample rate determines the playback speed for samples and oscillators

1.6 Next version roadmap

The next version should be version 1.4.0.

- new commands
- total rework of custom wave screen
- seeking some help/documentation for synth FM

1.7 First sound

Let's start easy ! We gonna play our first sound with FAT .

When FAT starts, the SONG screen appears first. Don't move the curser, simply press on 'A' button. A "00" magically appears: this is a **sequence**.



Figure 1: SONG screen

Press the SELECT button (hold it) et move to the right only once : the interface has changed.



Figure 2: POPUP screen

Now, without to move the cursor, press again on the 'A' button. A new "00" appears but this time, it's a **block**.



Figure 3: BLOCKS screen

Press SELECT (hold it) and move to the right. Welcome to a new screen ! Press 'A' another time : here is your first **note** ! Let's hear it : simply press START. FAT is currently playing your first track on a GBA. Enjoy.



Figure 4: NOTES screen - press START !

1.8 Data structure

Ok, we have the "sequences", "blocks" and "notes" notions in mind. FAT is globally organized the same as LSDJ :

- a sequences table on 6 columns : GBA can natively play 6 sounds at the same time.
- for each sequence, we have 16 blocks.

- for each block, we have 16 notes.

The way to organize all the data is like "russians dolls". Sequences contains blocks which themselves contains notes. When FAT is playing a sequence, it's running all blocks in it one after others.

In order to avoid each notes ring like others, we "plug" an "instrument" on it. Each instrument provides you some parameters. If you change instrument's parameters, then your notes will ring differently. You also have to know that FAT provides you several types of instruments ! allowing you to make differents things on the GBA's channels.

1.9 Technical data

The GameboyAdvance provide us 4 "analogic" channels in order to generate sounds and noises. These channels are almost the same as on the first Gameboy (the grey-brick). In addition, GBA has 2 "numeric" channels : use them to play some elaborate sounds.

GBA's speaker is mono ! You'll have to plug your earphones to enjoy FAT's stereo capacities.

Channel 1 : PU1 This channel allow you to play melody and/or apply SWEEP effect on notes. Beware that the channel 1 is the only channel able to make SWEEP.

For example, you can use this channel to generate a kick with this SWEEP param or play bassy bass.

Channel 2 : PU2 This is exactly the same as the PU1 but without the SWEEP capability.

You can use this channel to play another bass or a melody.

Channel 3 : WAVE Channel 3 is able to play wave sound. It offers some cool capacities.

Make this channel a way to get more bass on your song or play some catchy saturated sound, like a cool electric guitar or so.

Channel 4 : NOISE Channel 4's purpose is to make some noise.

Use it to make some snare. You can also program some cool special effects such as beach wave sound for example.

Channel 5 : SOUNDA Play samples and loops with this channel.

Channel 6 : SOUNDB Play samples and loops with this channel.

These two channels are perfect to add some human voices or better kick and snare. It's fully possible to add your own samples and use it within FAT .

2 Screens

In order to let you to compose your track in the best condition, FAT had been divided into several screens. Each screen has its own purpose. For most of them you can access to an help screen by pressing R+L.

2.1 The switch popup

The switch popup, always accessible by pressing SELECT, allows you to switch across all the screens at anytime.

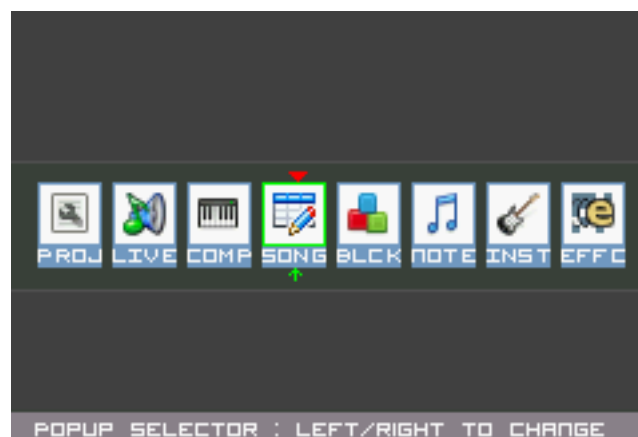


Figure 5: The switch popup (alone)

You can imagine this popup as a taskbar : change active screen by moving the cursor on the right or left then release the SELECT button to validate the change.

2.1.1 Commands

Key(s)	Effect
SELECT (hold)	Display the popup
SELECT (on release)	Validate the screen change order
LEFT/RIGHT or L/R	Move the cursor

2.2 SONG screen

This screen is the sequencer. Right here, you'll be able to organize your track's sequences order. When you'll want to play your song, FAT will read all the sequences line by line. When an empty spot has been detected, FAT will try to start from the first in the list.

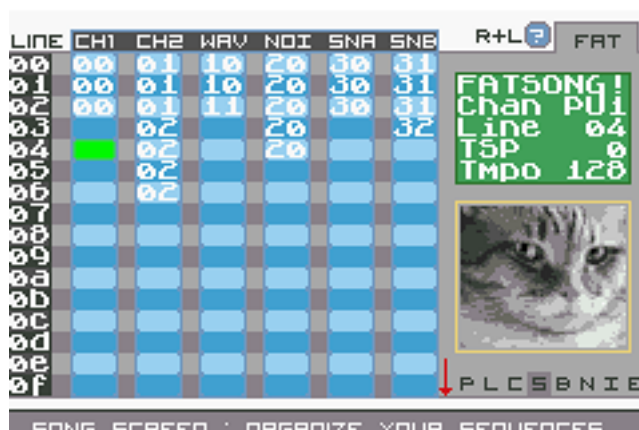


Figure 6: The SONG screen is like a big table.

2.2.1 Commands

Key(s)	Effect
SELECT	Show the switch popup
START	Start/stop song playback from the sequencer
R+L	Show help screen
L+UP	Move the cursor to top
L+DOWN	Move the cursor to bottom
R+UP	Move the cursor to one page up
R+DOWN	Move the cursor to one page down
A	Write last known sequence's number on the spot designated by cursor (default is "00")
A+DIRECTION	Modify value
L+A	Find a new available number and set the value on spot
R+A	Not used
B	IF NOT EMPTY SPOT — Cut sequence
B	IF EMPTY SPOT — Paste sequence
L+B	IF EMPTY SPOT — Paste sequence but changing number
L+B	IF NOT EMPTY SPOT — Change number of sequence while copying its content

2.3 BLOCKS screen

This screen lets you edit sequence's content : each sequence can contain up to 16 blocks. When **FAT** is going to play this sequence, it will begin by reading the first block and continue to bottom. When an empty spot has been reached, **FAT** will start again at the first line. In the case of there isn't any blocks in the current sequence, then **FAT** will never play it.

To make it simple, you can consider this screen a block list contained by a sequence (the sequence's number is displayed on the right top of screen).



Figure 7: BLOCKS screen

2.3.1 Commands

Key(s)	Effect
SELECT	Show the switch popup
R+L	Show the help screen
START	Start/stop blocks playback from currently edited sequence
L+HAUT	Move the cursor to top
L+BAS	Move the cursor to bottom
A	Write last known block's number on the spot designated by cursor (default is "00")
A+DIRECTION	Modify value
L+A	Find a new available number and set the value on spot
B	IF NOT EMPTY SPOT — Cut block
B	IF EMPTY SPOT — Paste block
L+B	IF NOT EMPTY SPOT — Change number of block while copying its content
L+B	IF EMPTY SPOT — Paste block but changing number
R+DROITE/GAUCHE	Change the currently edited sequence number

2.4 NOTES screen

With this screen, you'll be able to write notes for your tracks ! Only one note is allowed for a line and a block can contains up to 16 notes.

Each note has an assigned instrument (INST column) which setup some parameters in order to make your note sound differently each other. We'll see in the next

section how to setup instruments.



Figure 8: NOTES screen

2.4.1 Commands

Key(s)	Effect
SELECT	Show the switch popup
R+L	Show the help screen
START	Start/stop notes playback
L+UP	Move the cursor to top
L+DOWN	Move the cursor to bottom
A	Write a new note (default is "C 3")
A+UP/DOWN	NOTE COLUMN — Change note's octave under the cursor
A+LEFT/RIGHT	NOTE COLUMN — Change note's tonality under the cursor
A+DIRECTION	INSTRUMENT COLUMN — Change the instrument number affected to note
A+DIRECTION	CMD COLUMN — Change command value
L+A	INSTRUMENT COLUMN — Find a new free instrument number and set it to spot
R+LEFT/RIGHT	Change the currently edited block's number
B	IF NOT EMPTY SPOT — Cut note
B	IF EMPTY SPOT — Paste note

2.5 INSTRUMENT screen

This screen is subdivided into 5 parts: there are as many types of instruments in FAT

- PULSE

- WAVE
- NOISE
- KIT/SAMPLE
- OSCILLATOR

Each instrument is specialized in playing notes **on a certain channel**. Remember, the SONG screen is composed of 6 columns. These 6 columns actually represent each of the 6 channels of the GBA. So,

- PULSE instruments are specialists in channel 1 and 2: the PU1 and PU2
- the WAVE instruments are useful for channel 3 only: the WAV channel
- the NOISE instrument is intended for channel 4: the NOI channel
- the instruments of type KIT / SAMPLE officiate on channel 5 and 6: the SNA and SNB
- finally, the OSCILLATOR softly generate a basic sound (sinusoidal, square, triangular or sawtooth)

But FAT is flexible enough to allow the use of an instrument in a channel that is not dedicated to it: The behavior can be surprising ... or inaudible. It's up to you to see what you want to produce as sounds.

2.5.1 Commandes

Touche(s)	Effet
SELECT	Show the switch popup
R+L	Show the help screen
START	Start/stop blocks playback from currently edited block
B	Play note in simulator
B+DIRECTION	Change simulator's value
A+DIRECTION	Modify value
R+DROITE/GAUCHE	Change currently edited instrument's number
L+DROITE/GAUCHE	Change instrument's type

2.5.2 PULSE instrument

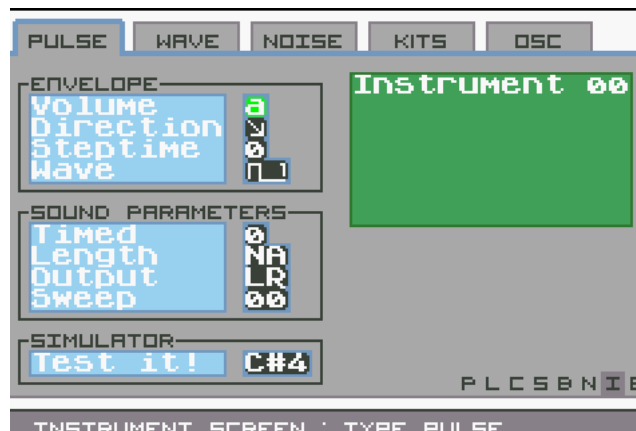


Figure 9: PULSE type

2.5.3 Parameters

Enveloppe: "Volume" from 0 to F. This value adjusts the volume of notes attached to this instrument.

- 0: muted
- F: maximum

Enveloppe: "Direction" or . Indicates whether the sound goes up or down.

Enveloppe : "Steptime" from 0 to 7. Acts on the length of the wave pitch.

- 0: paramètre not taken into account
- 1: rather short
- 7: really short

Enveloppe : "Wave" or or or . Modifies the shape of the wave played by the GameboyAdvance.

Parameter : "Timed" 0 or 1.

- 0: the sound is not timed
- 1: the sound is timed, set the duration with the parameter "Soundlength"

Parameter : "Soundlength" from 0 to 3F. This parameter can only be accessed if "Timed" has been set to 1.

- 0: sound is "infinite"
- 3f: sound is really, really short

Parameter : "Output" Select the sound output mode.

- L: the sound goes out to the left (LEFT)
- R: the sound goes out to the right (RIGHT)
- RL: the sound goes out to the left and right (LEFT/RIGHT)
- VIDE: sound does no go out anymore

Parameter : "Sweep" from 0 to 7F. Adds a particular effect on the note (the best is yet to test). Remember that this parameter does not apply on the PU1 channel.

Simulator Change the note written in this space: it will be played with the parameters of the instrument you are editing.

2.5.4 WAVE instrument



Figure 10: WAVE type

2.5.5 Parameters

Enveloppe : Volume from 0 to 4. This value adjusts the volume of notes attached to this instrument.

Parameter : "Timed" 0 or 1.

- 0: the sound is not timed
- 1: the sound is timed, set the duration with the parameter "Soundlength"

Parameter : "Soundlength" from 0 to FF. This parameter can only be accessed if "Timed" has been set to 1.

- 00: sound is "infinite"
- EB: sound is short
- FF: sound is really, really short

Parameter : "Voice" from 0 to 17. FAT includes 23 types of WAV instruments (hexadecimal, 17h = 23). Since version 1.2.0, it is possible to customize and use its own voices.

Parameter : "Bank" 0 or 1. The GBA's WAV channel is capable of loading 2 banks into its memory. You can decide which bank will be played, Knowing that the bank is directly loaded from the "Voice" parameter just above (each "Voice" has 2 banks).

Parameter : "Bankmode" "SIN" or "DUA". The WAV channel is able to synthesize the 2 banks loaded in memory (DUA mode = Dual) or to play only one (the SIN = Single mode). Note that if you set this parameter with SIN, FAT will play the selected bank with the "Bank" parameter.

Parameter : "Output" Select the sound output mode.

- L: the sound goes out to the left (LEFT)
- R: the sound goes out to the right (RIGHT)
- RL: the sound goes out to the left and right (LEFT/RIGHT)
- VIDE: sound does no go out anymore

Custom wave FAT allows you to store and use 3 customized voices. For more information, see "CUSTOM WAVE screen".

- an 'X' means that the instrument does not use a customized voice. The voice defined by FAT is therefore used.
- change this 'X' to a value between 0 and 2 to use the corresponding voice
- this selected voice can be edited by pressing "Go" (just below). FAT will display the edit screen for the selected voice.
- if a voice has never been edited before, it is initialized with the current voice of the instrument.

Key(s)	Effect
A+LEFT/RIGHT	Change custom wave number
A+UP/DOWN	Cancel customization on the instrument (reset to 'X')

Simulator Change the note written in this space: it will be played with the parameters of the instrument you are editing.

2.5.6 NOISE instrument



Figure 11: NOISE type

2.5.7 Parameters

Envelope: "Volume" from 0 to F. This value adjusts the volume of notes attached to this instrument.

- 0: muted
- F: maximum

Enveloppe: "Direction"  or . Indicates whether the sound goes up or down.

Enveloppe : "Steptime" from 0 to 7. Acts on the length of the wave pitch.

Enveloppe : "Polystep" 0 or 1. Changes the way the noise generator works.

- 0: simple noise
- 1: squeaking noise

Parameter : "Timed" 0 or 1.

- 0: the sound is not timed
- 1: the sound is timed, set the duration with the parameter "Soundlength"

Parameter : "Soundlength" from 0 to 3F. This parameter can only be accessed if "Timed" has been set to 1.

- 0: sound is "infinite"
- 3f: sound is really, really short

Parameter : "Output" Select the sound output mode.

- L: the sound goes out to the left (LEFT)
- R: the sound goes out to the right (RIGHT)
- RL: the sound goes out to the left and right (LEFT/RIGHT)
- VIDE: sound does no go out anymore

Simulator Change the note written in this space: _____ it will be played with the parameters of the instrument you are editing.

2.5.8 SAMPLE instrument

FAT is able to play samples on the SNA and SNB channels. A sample is a short-lived soundtrack included in a collection. A collection series is included by default in FAT :

- DEV-MESS : some test samples for development
- LS-MGDRV : Megadrive samples provided by Little-Scale ([Little-Scale website](#))
- C64DRUMS : drums and snares from Commodore64
- YM-DRUMS : drums and snares from Atari ST
- BATTERY : kicks, drums and snares from a "classical" battery
- RHYTHMS : some complet rhythms (but not exploitable because badly sampled)
- TR-606-7 : samples of this mythical machine

It's easy enough to add your own collection of samples. For more informations, please consult "[How to manipulate ROM in order to add your own samples kit](#)" section.



Figure 12: SAMPLE/KIT type

2.5.9 Parameters

Kit collection : "Name" The name of the collection of samples in which to draw.

Enveloppe : "Volume" Volume assigned to the sample: 50% (0) or 100% (1).

Parameter : "Loop" Is the sample played looped? If "YES", then the sample playback is repeated.

Parameter : "Timed" Sets whether the sample will be cut or not.

Parameter : "Length" If "Timed" is set to 1, this value sets the percentage cut-off of the total sample time.

Parameter : "Offset" Start offset for sample playback. As a percentage of the total duration of the sample.

Parameter : "Output" Select the sound output mode.

- L: the sound goes out to the left (LEFT)
- R: the sound goes out to the right (RIGHT)
- RL: the sound goes out to the left and right (LEFT/RIGHT)
- VIDE: sound does no go out anymore

Simulator Change the note written in this space: it will be played with the parameters of the instrument you are editing.

2.5.10 OSCILLATOR instrument

FAT is able to generate the simple sound of an oscillator. These instruments will surely be used one day For the FM synthesis. In the meantime, they remain usable as such in the SNA and SNB channels.





You will soon notice that sinusoidal oscillators do not have a "perfect" sound. This is due to 2 things. The first one is that the GBA processor does not support floating calculation (numbers with commas). The calculation of a sinusoidal wave requires a certain precision which can not therefore be obtained natively and easily. The second thing: it is nevertheless possible to do floating calculation, but in a software way. This kind of calculation is not, however, still used in FAT . There is therefore still room for progress on this subject.



Figure 13: OSCILLATOR type

2.5.11 Parameters

Oscillator : "OSC Shape" The waveform to generate. FAT supports 4 types of waves :

-  sinus
-  square
-  triangle
-  sawtooth

Oscillator : "Amplitude" This parameter is not yet available for use.

Envelope : "Volume" Volume assigned to the sample: 50% (0) or 100% (1).

Parameter : "Timed" Sets whether the sample will be cut or not.

Parameter : "Length" If "Timed" is set to 1, this value sets the percentage cut-off of the total sample time.

Parameter : "Output" Select the sound output mode.

- L: the sound goes out to the left (LEFT)
- R: the sound goes out to the right (RIGHT)
- RL: the sound goes out to the left and right (LEFT/RIGHT)
- VIDE: sound does no go out anymore

2.6 CUSTOM WAVE screen

The aim of this screen is to give you a way to edit soundwave for type WAV instruments.

This is the very first version of the screen. Wave has been displayed vertically (for technical reasons) but this is not optimal. This have to be reworked in the next version of FAT .

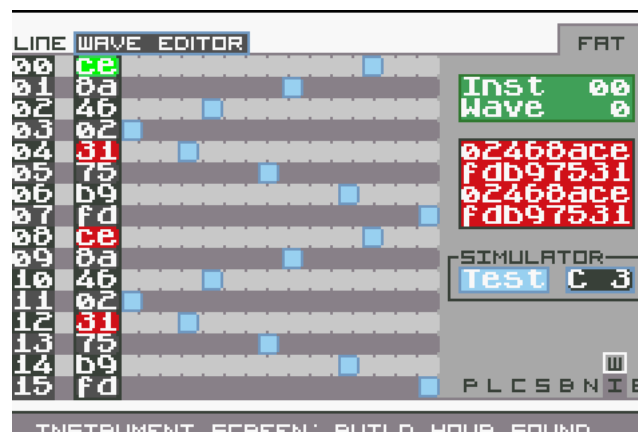


Figure 14: CUSTOM WAVE screen

2.6.1 Commands

Key(s)	Effect
SELECT	Show the switch popup
A+DIRECTION	Change the value under cursor
R+A+DIRECTION	Change all values
START	Start/stop song playback from the sequencer
B	Play simulator note
...	

Key(s)	Effect
B+DIRECTION	Change simulator note

There's no help screen yet.

2.7 PROJECT screen

The PROJECT screen acts as a property manager for your song.



Figure 15: PROJECT screen

2.7.1 Commands

Touche(s)	Effet
SELECT	Show the switch popup
R+L	Show the help screen
A+DIRECTION	Change value
START	Start/stop song playback from the sequencer

2.7.2 Parameters

Properties : "Tempo" Project tempo.

Properties : "Transpose" Set up all project's transposition.

Properties : "Sample rate" Sets the sampling speed for samples and oscillators.

Interface : "Keyrepeat" This parameter is used to set the waiting time between each press of a key. The larger the value, the slower the interface.

Interface : "Preview" Set this to YES to instruct FAT to play the note as it is written.

Interface : "GreedPlay" If enabled, the GreedPlay forces FAT to always seek to play the first sequence available in a set regardless of the line you are on. Ex: put several sequences (with notes to read) in succession, from line 0 to 5, then position on line 3. Press START. If greedPlay is enabled, playback will not start from line 3 but from 0.

Management : "New Prj" Creates a new project. Beware, unregistered data will be mercilessly erased, crushed, crushed, massacred, mutilated.

Management : "Save PRJ" (sauvegarder) Displays the backup screen (cf "FILESYSTEM screen"). This version of FAT remains experimental in terms of backup management.

Management : "Load PRJ" (charger) Displays the loading screen (cf "FILESYSTEM screen"). This version of FAT remains experimental in terms of backup management.

Live : "Buffering" Enables or disables buffering in the LIVE screen.

- activated, modification of the "volume", "transpose" and "tempo" data only applies when you release button A
- disabled, these changes are immediately taken into account

If you do not want to have a stair effect on the LIVE screen, leave the buffering enabled.

2.8 FILESYSTEM screen

FILESYSTEM screen allows you to save and load tracks from your cartridge system. Two modes are available for this screen : SAVE or LOAD. The two modes are visually very close: the possible actions are nevertheless different.

2.8.1 SAVE mode

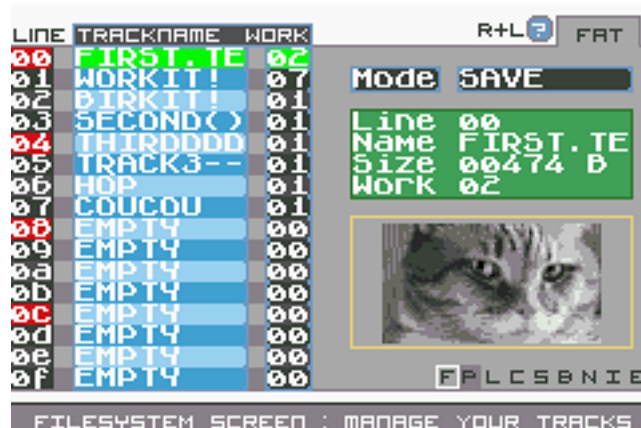


Figure 16: FILESYSTEM screen, SAVE mode

In SAVE mode, it is possible to save your project being edited. Select the slot you want to save on and press A: a keyboard appears. Write a really cool name for your track then press R (or START) to confirm. You can cancel with L (or SELECT).



Figure 17: Input keyboard

A final dialog box asks for confirmation before performing the backup: press R (or START) to confirm. You can cancel with L (or SELECT).



Figure 18: Confirmation

SuperCardSD User! Do not forget to "validate" your backup! Once the procedure is managed by FAT , press R+L+A+ START. This will cause the .sav file to be written to your SD card. If you do not do this, your backup will not be effective and you may lose your work.

2.8.2 Commands

Key(s)	Effect
SELECT	Show the switch popup
R+L	Show the help screen
A	Save data into selected slot

2.8.3 LOAD mode

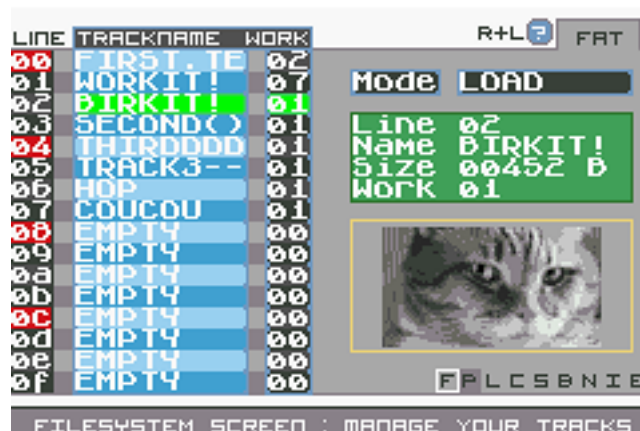


Figure 19: FILESYSTEM screen, LOAD mode

The LOAD mode works in much the same way as the SAVE mode: except that it allows to load a project. As with the SAVE mode, confirmation is required before loading the data.

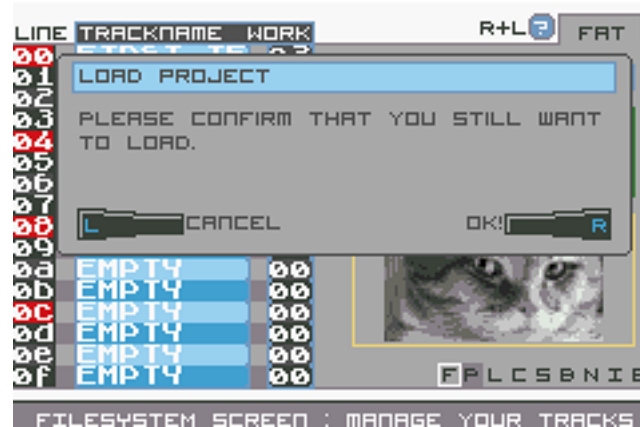


Figure 20: Confirmation

2.8.4 Commands

Key(s)	Effect
SELECT	Show the switch popup
R+L	Show the help screen
A	Load data from selected slot

Your songs can be saved individually on your computer! To do this, use the dedicated website : www.furiousadvancetracker.com

2.9 EFFECTS screen

This screen has not been implemented yet.

2.10 LIVE screen

Here you can play your song as you like. It is this mode that is to be privileged if you want to wet the shirt on stage. If you prefer to simply press START in the SONG screen and dance with the audience, free to you! Note however that the LIVE mode is there to allow you to modify the mechanics of your songs.



Figure 21: The LIVE screen appears like the SONG screen

The sequencer is displayed again but this time there is no question of editing the sequences on the board. However, you will be able to start each channel in the order that suits you. Once a channel is started, it is possible to perform several actions :

- change channel volume
- change channel transpose
- stop channel playback

Note that the LIVE screen has two modes: the MANUAL (MAN) mode and the AUTO mode. In MANUAL mode, FAT does NOT progress in the sequencer. The same sequence on the channel is replayed infinitely: it is up to you to advance the piece. Conversely, in AUTO mode, FAT behaves as in the SONG screen: all channels currently playing progress normally.

2.10.1 Commands

Key(s)	Effect
SELECT	Show the switch popup
R+L	Show the help screen
START	Stop/Start under cursor's channel playback
R+START	Stop/Start all channels playback
R+DOWN	Switch to screen's configuration part (volume change, tsp, tempo and mode)
R+UP	Switch to screen's sequencer part
A+DIRECTION	IN CONFIGURATION PART - Change value under cursor
A+L+DIRECTION	IN CONFIGURATION PART - Change value for all channel at the same time

2.10.2 About volume application

When you change the volume on the channel, **FAT** calculates a new volume to apply to each note.

- if the value is "df" in the LIVE screen, then the volume of the instrument or a possible command is applied. "Df" = "defined"
- if the value is other than "df", then the volume is an average calculated between the value written in the instrument (or within a command) and that requested in the LIVE

A volume of 00 does not necessarily set off the channel! It divides it by 2. There is currently no MUTE mode.

This method of volume application may need to change. If you have a notice, let me know.

2.10.3 About transpose application

As for the volume, **FAT** calculates the transpose value to be applied according to other parameters. The transpose value to be taken into consideration is calculated very simply as follows:

$$\text{project transpose} + \text{block transpose} + \text{live transpose} = \text{transpose}$$

2.11 COMPOSER screen

Imagine this screen as a mini-piano or a sampler machine : COMPOSER screen is going to transform your Gameboy Advance into a sound manager machine !

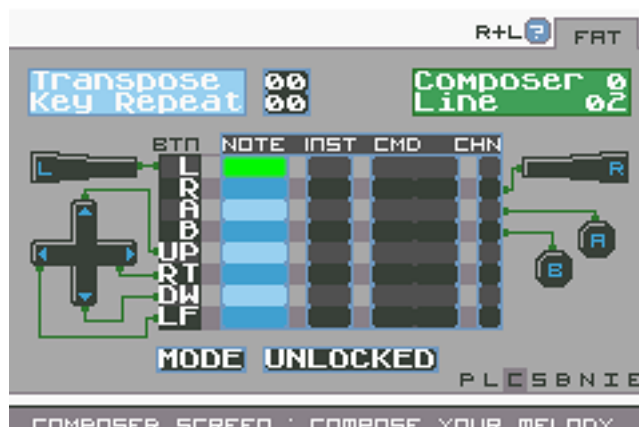


Figure 22: COMPOSER screen

Pinciple is quite simple. The screen shows you 8 note's spots. Each note has been affected to a physical button (only the SELECT and START buttons are not usable). Look at to bottom of screen, a word "UNLOCKED" appears : it means you are in "edition" mode. You can write any notes like you would do in screen BLOCK (with A button).

Once you have written all your notes (each notes can have different instrument), press START button. Mode's value change to "LOCKED" : you are now in "player" mode.

Press any key : FAT play assigned note in realtime. Press another key to play another note ! Easy isn't it ?

Take note that all data stored in the composer will be saved in your tracks. That's why you can setup your note's collection at home and then rocks your improvisation on the stage without effort !

Try it ! Compose some cool stuff then try to play with the composer while FAT is playing your track.

2.11.1 Commands

Key(s)	Effect
SELECT	Show the switch popup
R+L	Show the help screen
...	

Key(s)	Effect
START	Change composer mode (UNLOCKED/LOCKED)
KEYS	LOCKED — Play assigned note
A+DIRECTION	UNLOCKED — Change value

2.11.2 Parameters

There are some parameters you can set on the composer screen :



Figure 23: COMPOSER screen's parameters

Transpose from 0 to FF. Add a transpose value. This value will be added to all other values configured in the project. All composer's notes is going to be transposed with this value.

Key repeat from 0 to FF. Setup the key repeat : a time value waited between each note when you hold buttons. A high value means a bigger wait between two keys. Leave with zero to disable this feature.

3 Effects and commands

FAT is enriched with commands as it is designed. All are not yet present but it is only a matter of time! Patience :)

The current version of FAT defines a number of new commands. Even if they are included in the software, all of them are not completely completed: there is still work on some of them.

Here are the currently usable commands.

3.1 CH (Chord)

Works on PU1, PU2, WAVE and NOISE

Generates an arpeggio consisting of 3 notes. Ex: "C 4 CH3C" give "0,3,C,0,3,C, etc ..." arpeggio.

3.2 CV (Custom Voice)

Works on WAVE channel only

Selects a custom wave to apply to the note.

3.3 DL (DeLay)

Works on all channels

Play the note with a delay.

Caution, playing another effect or another note before the actual duration of the delay cancels it. FAT is not able to parallelize the management of the delay with respect to the other events constituted by the notes or the commands.

3.4 HO (Hop!)

Works on all channels

This command lets you jump directly to the next block. It can create time lags between blocks. The value you set is the line number to jump to.

3.5 KL (Kill)

Works on all channels

This command is used to stop the sound. You can specify a delay.

No value is currently available for this parameter.

3.6 OU (Output)

Works on all channels

Direct the sound to the right (_R), left (L_), both (LR) or neither (_)

3.7 RT (ReTrig)

Works on all channels

Replays the same note with the same parameters. The value of the effect indicates the speed of repetition.

3.8 SL (SLide)

Works on PU1, PU2 and WAVE channels

Applies a slide from one note to another.

3.9 SR (SampleRate)

Works on all channels but has impact only on SNA and SNB channels

Modifies the project parameter "SampleRate". This parameter changes the sampling speed for SAMPLE or OSCILLATOR instruments.

Caution, the parameter "SampleRate" applies for ALL the track (and not only the note concerned by the command)

3.10 SW (SWEEP)

Works on PU1 channel only

This command is effective only on channel 1 (PU1): it allows to modify the value of the sweep. This sweep replaces the one configured in the instrument.

3.11 TP (Tempo)

Change project's parameter "Tempo".

3.12 TS (Transpose)

Works on PU1, PU2 and WAVE channels

Modifies the transpose of a note. This transpose is added to that of the project, the block and the instrument.

3.13 VB (Vibrato)

Works on PU1, PU2 and WAVE channels

Applies a vibrato effect to the note. The value indicates the "power" of the vibrato.

3.14 VO (VOLUME)

Use this command to change the volume of the sound. #captainobvious. Note that depending on the channel, the value you pass is taken differently.

3.15 WA (WAVEFORM)

Works on PU1 and PU2 channels and on SNA and SNB channels for OSCILLATOR instruments

Changes the waveform to be applied to the note.

4 How to manipulate ROM in order to add your own samples kit

As of version 1.0.0, it is possible to add your own samples to FAT. This (technical) manipulation is possible on the website (and much simpler, the program on the site takes care of everything) but you are offered to do it yourself on your own computer if the heart tells you. And that you have nothing better to do. Let's see how to.

- collect your samples in any directory of your choice
- create a 0infos file and enter the name of your collection: "my-first" for example (8 characters required!)
- transform your sample files into the right format
- create the GBFS file that will be embedded in the ROM. Repeat for each kit.
- in another folder, create the file 00nbkit which counts the number of kits in the final ROM (the number of gbfs therefore)
- integrate the GBFS files into the "default" ROM

No worries ! I'll explain everything! Start by downloading the "default" ROM on the dedicated site.

Format The first thing to know is the target audio format: **pcm_s8, 16000Hz, mono**. This format is very important! If you do not respect it, your samples will not sound properly. At best you will have noise, at worst you will systematically plant your GBA.

Description file A collection of samples is described by a file always named **0infos**. The content of this text file is very simple: the first 8 letters on the first line are the name of your collection. The rest is ignored. Make sure to respect these 8 letters (leaving to put '-').

Convert audio files You are free to use the tool you want. For my part, I use "ffmpeg" which has the merit to run in command line and is therefore scriptable. Here is the script I use to transform a complete MP3 collection into the right format:

```
find . -name "*.mp3" -exec ffmpeg -i -ac 1 -ar 16000 -f s8 -acodec pcm_s8 {} .snd \;
```

Audacity or any other audio processing software is also appropriate. The important thing is that the format is respected. For convenience, name your formatted samples with the extension ".snd".

GBFS file This file is the container that will embed the description file followed by all your .snd file. To create it, use the utility "gbfs.exe". You can download this tool on [FAT Github](#) ([Github - gbfs.exe](#))

```
gbfs.exe monfichier_sample.gbfs samples/0infos samples/*.snd
```

The file "myfile_sample.gbfs" will be created. The order of this command is important: the 0infos file **MUST** be the first. **This utility works under Linux with Wine.**

00nbkit file When you have finished creating your GBFS files for each sample kit, a 00nbkit file must be created. Only one data inside this file: the number of kits that you will integrate into the ROM. If you have only one kit to integrate:

```
echo 1 >00nbkit
```

Once this file is created, it must also be transformed into GBFS.

```
gbfs.exe 00nbkit.gbfs 00nbkit
```

Final ROM integration Now that your GBFS and 00nbkit.gbfs files are created, just add them to the ROM. And it's as simple as this command:

```
cat FAT_default.gba 00nbkit.gbfs monfichier_sample.gbfs >FAT_v1.0.0_withsample.gba
```

Yes. A simple "cat". Be careful however, the file 00nbkit.gbfs **MUST** be the first. ([FAT](#) uses the data written in the file 00nbkit to know the number of kits in advance)

After all these manipulations, your ROM is ready: your samples are accessible on SNA and SNB channels with SAMPLE type instruments. Enjoy!

5 FAT's website

There is a FAT dedicated website on the web : maybe you download this document from this website ! www.furiousadvancetracker.com

This website allow you to manage your backups and tracks. You can also edit your samples and it provides a simple way to custom your ROM with your own sample's collections. Here's a little how-to video you can consult (but in french, sorry) : [Youtube - FAT Howto - Add samples](#)

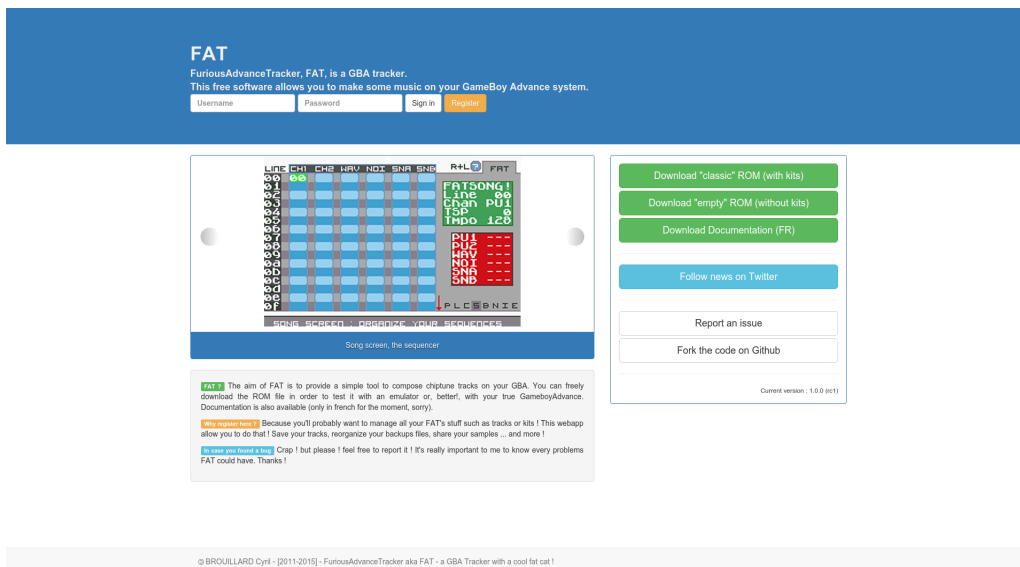


Figure 24: Website - Welcome page

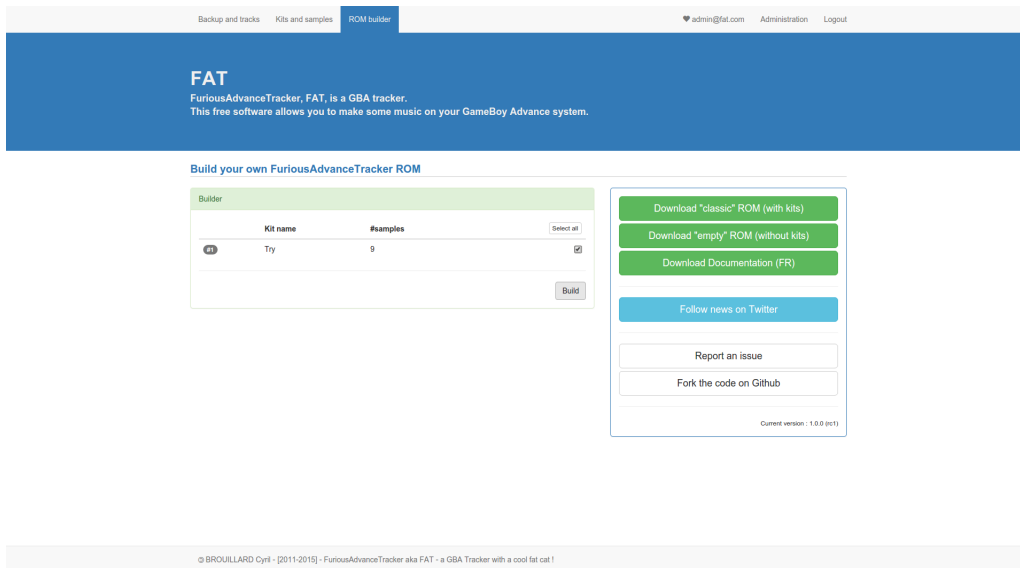


Figure 25: Website - ROM Builder

6 Some hints

This section will attempt to give you some initial parameter values in order to create "interesting" and get started faster in composing songs. For each example, I will give you the most complete procedure to follow.

6.1 Kick "Boom"

The kick "boom" is programmed on channel 1 exclusively. This is a way to get a kick.

- in the SONG screen, place the cursor on channel 1 (PU1).
- press L + A to place a new sequence number.
- press SELECT, hold down and select the BLOCKS screen.
- once in the BLOCKS screen, press L + A again to bring up an available block number.
- press SELECT, hold down and select the NOTES screen.
- in the NOTES screen, press A, hold down and select the "C 6" (or "C 7", "C 8") note with the cursor.
- edit the instrument settings. Press SELECT, hold and select the INSTRUMENTS screen.
- the instrument must be of the PULSE type. If this is not the case, change the type by pressing L and going to the left with the cursor.
- boost the volume thoroughly: F.
- the waveduty must be set to the value 2.
- set the sweep value to 41.
- press START !

Alternatives:

- by "timing" the instrument, the kick will be drier: "Timed = 1". Then change the value of the "SoundLength".
- try changing the sweep to 31 or 51. A value of 32 or 52 still gives different results.
- the octave of the note is also important! Try to go down to octave 5 and the kick will be less powerful. Conversely, octave 8 makes it possible to slam it harder.

Screenshot :

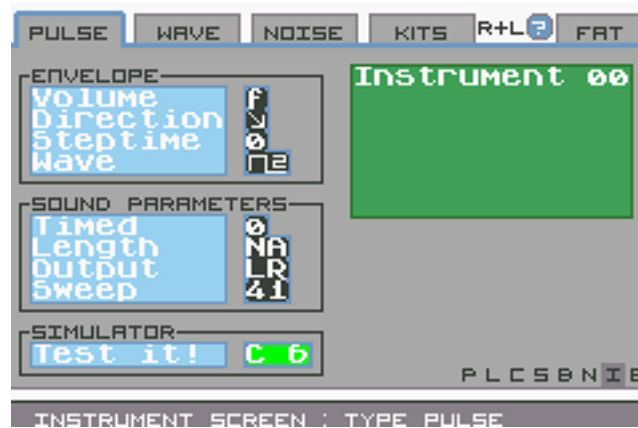


Figure 26: Instrument - Kickboom

6.2 Stereo sample

By default a sample is mono. However, it is possible to direct sound playback to the right or left with **FAT**. Let's suppose you want to create a stereo sample. Simply add 2 samples in the ROM (one for the right part and the other for the left) and then to configure 2 instruments with the **OUTPUT** parameter adjusted judiciously (or use the **OR** command, which saves you an instrument). The **SNA** channel takes care of reading the left one with an **Output 'Left'**. The **SNB** takes care of reading the right one with a **Output 'Right'**. The reverse is also possible. It does not matter. That's it ! You have a stereo sample.