Little Sound Dj v5.6.4

Operating Manual

Little Sound Dj v5.6.4

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October 20, 2017

Contents

Chapter 1

Introduction

1.1   Hi!

First of all, thanks for trying out Little Sound Dj!

A lot of effort has been put into making this program as powerful and fast-worked as possible. If you don't have previous experience from similar "tracker"-like music editors, the amount of new concepts may seem a bit overwhelming at first. Please, try not to stress about it. Learn step by step, keep it fun and progress at your own pace. Within days, you should know enough about the program to make your own first songs.

This manual is mostly written as an absolute beginners guide, but also as a reference that covers everything in the program. However, there still is a lot of information that would not fit into a manual like this. I highly recommend checking out the user-maintained Wiki site at `http://wiki.littlesounddj.com` - it contains material like tutorials, tips and tricks, and hardware related DIY projects. Also, the Facebook group at `https://www.facebook.com/groups/LittleSoundDJ/` is useful for getting in touch with other users. If you have questions or bug reports, please e-mail info@littlesounddj.com.

Happy tracking!

/Johan

1.2   Important Notice

Turning off the Game Boy while playing may cause your songs to be lost, so please avoid that. Also, it is best to avoid using the program when batteries are low enough to risk that the Game Boy shuts down itself. Low battery

level is indicated by the red light on your Game Boy becoming faint, or the screen becoming dim.

1.3   Game Boy Sound

The Game Boy sound chip has four channels, each with 4-bit resolution.

Pulse Channel 1 Square wave with envelope and sweep functions.

Pulse Channel 2 Square wave with envelope function.

Wave Channel Soft synthesizer, sample playback and speech synthesis.

Noise Channel Noise with envelope and shape functions.

1.4   Key Presses

In this documentation, key presses are marked up in this fashion:

A A button

B B button

START start button

SELECT select button

LEFT left arrow

RIGHT right arrow

UP up arrow

DOWN down arrow

CURSOR pressing any arrow key

LEFT/RIGHT pressing left or right arrow

UP/DOWN pressing up or down arrow

SELECT+A pressing A while holding SELECT

SELECT+(B,B) pressing B twice, while holding SELECT

1.5 Navigating the Program

After starting up LSDj, you should be facing a screen like the one in figure 1.1.
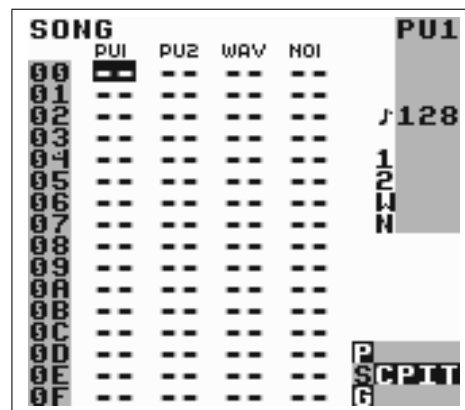
Figure 1.1: Song Screen

The SONG title at the top left of the window indicates that this is the song screen, the window where you arrange your songs. The four columns with dashes each represent a Game Boy sound channel. There are two pulse wave channels, one custom wave channel (which uses sampled drum kits or soft-synthesized wave forms), and one noise channel. You can move around between the different channels using the cursor key.
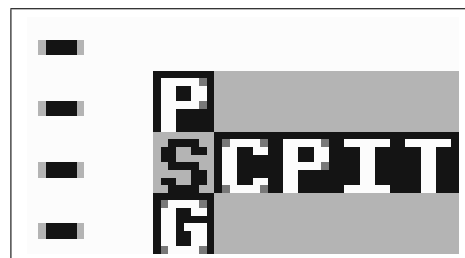
Figure 1.2: Screen Map

Little Sound Dj uses several screens, which are laid out on a 5×3 map, displayed in the bottom right of the screen (figure 1.2). The most useful screens are laid out in the middle row, also called the main row. It contains the song, chain, phrase, instrument and table screens. These screens are ordered after level detail. The leftmost song screen presents an overview over the entire song, whereas the rightmost table screen is for detailed

instrument programming. You can navigate between the different screens by holding SELECT and pressing the cursor key.

The song, chain and phrase screens are used for sequencing, and work together in a tree-structure fashion. The phrase screen is a 16-step sequencer where the actual note data is entered. The chain screen is a 16-step sequencer where you can enter sequences of phrases to be played back. The song screen is a 256 step long sequencer, where you enter sequences of chains to be played back.

1.6   Making Your First Sounds

Navigate to the song screen, and put the cursor on the PU1 column. Now tap the A button twice to insert a new chain. The digit 00 should appear at the cursor. You can now edit chain 0 by pressing SELECT+RIGHT and entering the chain screen. There, go through the same procedure: tap A twice to insert a new phrase, and press SELECT+RIGHT to go to the phrase screen.

Figure 1.3: Phrase Screen

In the phrase screen, you can enter notes to be played back. Move the cursor to the note column and press A to enter a note. The text C-3 will appear: C being the note, and 3 the octave. Press START to play back the phrase. Note how the phrase is played back from the top of the screen to the bottom. You can change the note value by holding A and pressing the cursor button. A+LEFT/RIGHT changes the note, and A+UP/DOWN changes octave.

You can now try to move the cursor up and down and insert more notes in other positions. If you want to delete a note, press A while holding B.

When you have finished listening, press START again to stop the phrase.

The clean pulse sound might get a bit dull after while. Let's move on to the instrument screen by pressing SELECT+RIGHT.
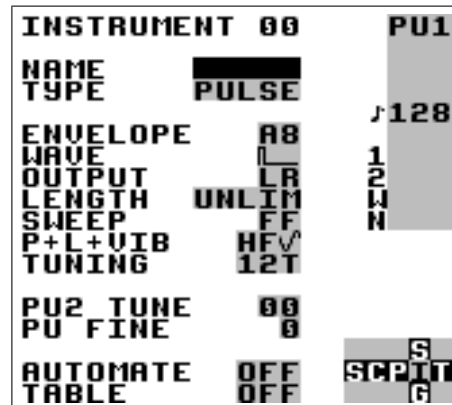
Figure 1.4: Instrument Screen

In the instrument screen, we can make the sound a little bit more interesting. Try to change the envelope and wave fields by moving the cursor there and pressing A+LEFT/RIGHT. Try to modify the envelope setting from A8 to A3. Now, press START again to hear any change in sound. The sound should now be more bouncy.

The type field sets the instrument type. The instrument types are specific for different channels – pulse instruments should only be played back in the pulse channels, wave and kit instruments in the wave channel, and noise instruments in the noise channel.

Let's try out the sampled drum kits. Now, we have to change channel to the wave channel. Go back to the song screen, move the cursor over to the wave channel, and create a new chain and a new phrase the way you did before (tapping A twice on empty steps). Then, move over to the INSTR column in the phrase screen, and tap A twice to create a new instrument. Press SELECT+RIGHT to edit that instrument, change the instrument type to KIT by pressing A+RIGHT once on the type field, then go back to the phrase screen. Now, you should be able to enter drum sounds the same way you entered notes before.

1.7 Initial Troubleshooting

Does Little Sound Dj behave strangely? Here are some things to try.

- If your cartridge doesn't start up at all, and only shows a garbled Nintendo logo at startup, the problem might be oxide on the cartridge pins. Try removing and re-inserting your cartridge about thirty, forty times.

- If the software starts to act up, it might be worth doing a full reset of the cartridge memory. This is done by navigating to the project screen and pressing SELECT+A+B on the LOAD/SAVE FILE button.

- Search for more help on the Little Sound Dj Wiki (http://wiki.littlesounddj.com) or ask in the Facebook group.

1.8   Hexadecimal Number System

Before moving on to the next chapter, now is a good time to get introduced with the hexadecimal number system that Little Sound Dj uses for representing values.

The hexadecimal number system works just the same way as the traditional decimal number system. The only difference is that it's base is 16 instead of 10. This means it consists of 16 unique symbols: the digits 0 to 9, followed by the letters A to F. For clarity, this manual will mark hexadecimal values with a dollar sign. As an example, let's print a table of numbers – first with decimal digits, then with hexadecimal digits...

Decimal	1	2	3	4	5	6	7	8	9	10
Hexadecimal	$1	$2	$3	$4	$5	$6	$7	$8	$9	$A
Decimal	11	12	13	14	15	16	17	18	19	20
Hexadecimal	$B	$C	$D	$E	$F	$10	$11	$12	$13	$14

Note that the hexadecimal and decimal values are really equal; just the representations differ. The reason to use the hexadecimal system here is to save screen space; with hexadecimal numbers, it is possible to represent every byte value using no more than two digits. (The value range is 0 to 255 – that is, $0 to $FF.)

Representing negative numbers with two digits only can be a problem. In Little Sound Dj, the numbers are wrapping. That means, when subtracting one from the smallest possible number ($0), it will jump to the highest possible value ($FF). So $FF can represent -1 as well as 255, depending on the situation.

If you don't get all this immediately – please don't worry too much – it will become clear to you as you spend time with the program.

Chapter 2

The Screens

As stated before, Little Sound Dj has several screens, laid out in a screen map of size 5×3. You can navigate between the screens by pressing SELECT+CURSOR.

2.1 Screen Map

Project		Wave	Synth	
Song	Chain	Phrase	Instr.	Table
Groove				

$\leftarrow$ Main Row

The song, chain and phrase screens are used for sequencing and arranging. The wave, synth, instrument and table screens are used for sound programming. [1]

The remaining screens, project and groove, have more general purposes. The bulk of your activities will however probably be in the so-called "main row," in the middle of the map, as that's where the composing is done.

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[1]There are also three hidden screens, not shown on the map: The file, word and help screens. We will get back to these later.

2.2   Starting and Stopping

When pressing START in the song screen, Little Sound Dj will always try to play all four channels. When pressing START in the other screens, Little Sound Dj will only try to play the channel that's indicated in the three-letter field at the right edge of the screen (PU1, PU2, WAV or NOI).

If you want to start playing all four channels from some other screen than the song screen, you can do that by pressing SELECT+START.

2.3   Song Screen
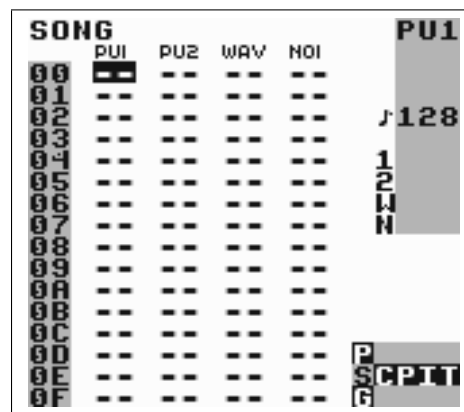
Figure 2.1: Song Screen

The song screen is the highest level of the sequencer. This is where you arrange your songs.

The screen contains four columns, one for each channel. The columns contain lists of chains, which will be played from top to down. Different chains are used for different channels.

To insert a chain, move the cursor to an empty step and press A. If you want to add a new chain, press A twice. To edit a chain, move the cursor to the chain number and press SELECT+RIGHT. To remove a chain, you can either press A twice or press B+A.

To start or stop playing all channels in the song screen, press START. To instantly re-start all channels in the song screen, press SELECT+START (this has the same effect as pressing START, START quickly).

TIP!

- *You can pull up down-below chains by pressing* B+A *on an empty step.*

- B+UP/DOWN *does page up/down.*

- *You can add or remove song screen bookmarks by tapping* B *three times (*B, B, B*). This will shade the area under the cursor.*

The number of rows in the song screen is limited to 255 ($00-$FE).

2.4   Chain Screen

Chains are used for stringing phrases together, thus creating a unit built out of many phrases. A chain can represent a longer rhythm block, a melody or a bass line.

The chain screen contains two columns. The first column contains the list of phrases that are to be stringed together, while the second column transposes the phrase on the same row.

Figure 2.2: Chain Screen

Example: The chain in figure 2.2 would play phrase 3, adding 5 semitones to each note, and then play each of the phrases 4, 5, 6, without transposing.

To add a phrase to the chain, move the cursor to an empty step and press A. If you want to insert a new phrase, press A twice. To edit a phrase, move the cursor to the phrase number and press SELECT+RIGHT.

When editing a chain, you can go to the chain in a neighboring channel by pressing B+LEFT/RIGHT. It is also possible to go to the next or previous chain in the song screen by pressing B+UP/DOWN.

The different channels all share the same set of chains; that is, no chain is ever assigned to a specific channel. The number of chains is limited to 128 ($00-$7F).

2.5 Phrase Screen

The phrase screen is the most fundamental part of the sequencer; this is where you enter the actual note data. The phrase screen has four columns: the note column, the instrument column, and the command and command value columns.

The different channels all share the same set of phrases; that is, any phrase may be played back on any channel. A phrase might however sound very different, depending on the channel it is played back on. Example: If you have programmed a phrase to play a melody using a pulse instrument, that phrase can be played back in either of the pulse channels with good results, but it usually doesn't make sense to play back the phrase in the wave or noise channels.

The note column may look different depending on which instrument type is used. Most instruments present the note followed by octave. Instruments that play back samples (KIT, SPEECH) do however present the sample names instead.

The instrument column is used for selecting instruments. In total, you can use 64 different instruments, editable in the instrument screen.

TIP!

- *It is possible to change the pitch without retrigging the instrument by leaving the instrument column empty.*

The command columns can be used to add effects to your phrase. For example, the K command kills the sound on the channel.

The number of phrases is limited to 255 ($00-$FE). The number of the phrase that is being edited is displayed in the top left corner of the screen.

TIP!

- *All phrases are 16 steps long by default, but it is also possible to set a shorter length by using the H (hop) command.*

2.6 Instrument Screen

Figure 2.3: Instrument Screen

There are five types of instruments available:

PULSE This instrument type produces pulse waves, and is used in pulse channels 1 and 2.

WAVE This instrument type can play back waves synthesized using the synth screen. It is used in the wave channel.

KIT This instrument type plays sampled kits, stored in ROM. (The samples are stored in 4 bits, 11,468 kHz.) It is used in the wave channel.

NOISE This instrument type produces filtered noise, and is used in the noise channel.

SPEECH This instrument is locked to instrument number $40, and is used for programming speech. For learning how to generate speech, please read chapter 7.

You can change the instrument type by going to the type row and pressing A+CURSOR.

Remember that instruments don't automatically play in the right channel. For example, if you want to use a kit instrument to play drum samples, you have to do the following:

1. Go to the song screen, move cursor to the wave column, and insert a new chain by tapping A twice.

2. Edit the chain by pressing SELECT+RIGHT.

3. Insert a new phrase by tapping A twice.

4. Edit the phrase by pressing SELECT+RIGHT. Now, you have a new phrase that is mapped to the wave channel.

5. Create a new instrument by moving the cursor to the instrument column and tapping A twice.

6. Press SELECT+RIGHT to edit the instrument.

7. Change the instrument type to KIT.

8. Go back to the phrase screen to start using your new instrument.

TIP!

- *In the instrument screen, press* SELECT+B *to copy instruments and* SELECT+A *to paste.*

2.6.1 General Instrument Parameters

These parameters are used in most instrument types.

NAME Name the instrument by pressing A. This is useful for keeping track of your instruments. The instrument name will also be shown in the border when selecting instruments in the phrase screen.

TYPE Use this to specify the instrument type.

LENGTH Change the sound length.

PAN Pan the sound to left/right/both/none speakers. (Use the headphone output to hear the difference!)

P+L+VIB Controls update speed for P/L/V commands, as well as vibrato shape and direction. In High Frequency (HF) mode, pitch is updated 360 times per second instead of once per tick. Press A+L/R to change speed and vibrato shape, A+U/D to change vibrato direction.

TUNING 12T : 12-tone equal tempered.

    FIX : non-transposable 12T.

    DRM : drum tuning, in which notes are re-tuned to make good sounding P kicks.

TABLE Selects a table to run when a note is played. If you want to edit the table, press SELECT+RIGHT to go to the table screen. To create a new table, press A,A. To clone the table, press SELECT+(B,A).

AUTOMATE This option extends the table functionality. When automation is activated, Little Sound Dj advances through the tables by one step for each time the instrument is triggered.

2.6.2 Pulse Instrument Parameters

Figure 2.4: Pulse Instrument Screen

ENVELOPE The first digit sets initial amplitude (0-$F); the second digit sets release (0, 8: none, 1-7: decrease amplitude, 9-$F: increase amplitude).

WAVE Choose the wave type to be used.

SWEEP Modulate the frequency. This only works on pulse channel 1. See Sweep/Shape (S) command documentation for further information.

The detune settings can be used to create interesting phase effects, when the same phrase is played on both pulse channels:

PU2 TUNE Detune pulse channel 2 in semitones.

PU FINE Detune pulse channel 1 downwards, channel 2 upwards.

2.6.3   Wave Instrument Parameters

The wave instrument can play back synth sounds generated by the soft synthesizer found in the SYNTH screen.

VOLUME Set amplitude (0=0%, 1=25%, 2=50%, 3=100%)

SYNTH Select the synth sound to play back. To edit the synth sound being used, press SELECT+UP to go to the SYNTH screen. If you want to use a new synth, tap A twice.

PLAY How to play back the synth sound: Once, loop, pingpong loop or manual. By selecting manual, only the first wave in the synth sound will be played, allowing you to step through the sound manually using the F command.

LENGTH Set the length of the synth sound.

REPEAT Set the loop point of the synth sound.

SPEED Set how fast the synth sound should be played back.

2.6.4 Kit Instrument Parameters
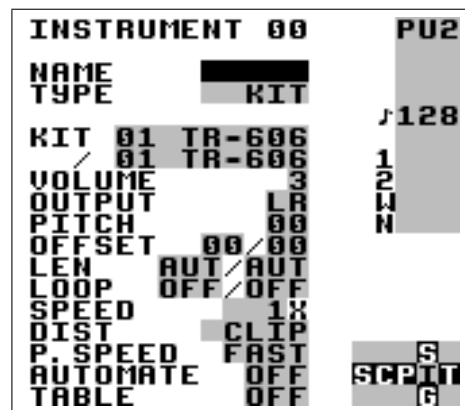
KIT Choose the kits to use. The first kit will be used in the left note column in the phrase screen; the second kit will be used in the right note column in the phrase screen.

PITCH Pitch shift.

OFFSET Set the start loop point. If LOOP is set to OFF, this value can be used for skipping the initial part of a sound.

LEN Set the sound length. (AUT=always play the sample to its end.)

LOOP Loop the sample. (OFF=don't loop, ON=loop sound and start playing from custom offset, ATK=loop sample and start playing from the beginning.)

SPEED Select full speed or half speed.

DIST Select the algorithm that should be used when two kits are mixed together. CLIP is the default type. SHAPE and SHAPE2 sound similar to CLIP, but with more high frequencies and less bass. WRAP can be used to add some interesting digital distortion. When pressing

A+(LEFT, LEFT) while CLIP value is selected, the program will jump
out of range and play back sound from raw memory when clipping.

P.SPEED P command pitch bend speed. FAST bends at 360 Hz, SLOW bends
every tick, STEP changes the pitch once and immediately.

TIP!

- *For those running LSDj on emulator or with backup gear, there is a Java
  application for replacing the original sample kits available at* http://
  littlesounddj.com/lsd/latest/lsd-patcher/.

2.6.5   Noise Instrument Parameters
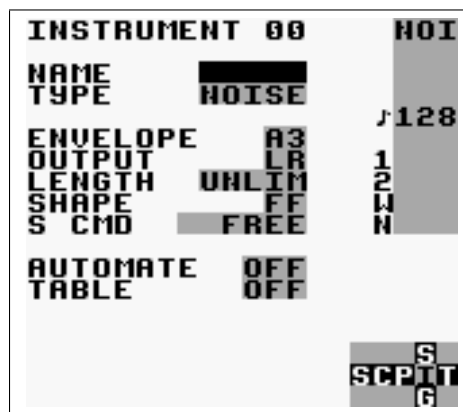
Figure 2.5: Noise Instrument Screen

ENVELOPE First digit is initial amplitude (0-$F); second digit is release (0,
8: none, 1-7: decrease amplitude, 9-$F: increase amplitude).

SHAPE Alter the noise shape. The first digit alters the pitch, the second
period alters the randomness.

S CMD When set to FREE, altering noise shape by the S command (5.14.3)
can in some circumstances[2] mute the sound. When set to STABLE,
the S command is limited so that the sound will never be muted by
accident.

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[2]The exact circumstances for when sound can get muted is when a shape that ends

2.6.6 Speech Instrument Parameters

For information about how to generate speech, please read chapter 7.
    The number of instruments is limited to 64 (hexadecimal: $00-$39).

2.7 Table Screen

Tables are sequences of transposes, commands and amplitude changes
which can be executed at any speed and applied to any channel. By setting
a table in the instrument screen, the table will start every time you play the
instrument. This allows you to create more interesting sounds than would
be possible using the instrument screen alone.
    Tables contain six columns. The first column is the envelope column,
used to create custom amplitude envelopes. Next is the transpose column,
used to transpose the played note by a number of semitones. The other
columns are command columns like the one in the phrase screen.
    The default table speed of one tick per step can be changed using the G
command.

TIP!

- *The transpose column has special functionality when using* KIT *or* NOISE
  type instruments. For KIT, *the transpose column works as a pitch shifter.
  For* NOISE, *the transpose column works like the* S *(shape) command.*

2.7.1 Custom Envelope Example

The first digit in the envelope column sets the amplitude; the second digit
sets for how many ticks that amplitude should remain.
    The table in figure 2.6 creates an amplitude envelope with short attack
and medium sustain. It could be used for a bass instrument.

2.7.2 Arpeggio Example

A typical use for tables is to create arpeggios. This is a musical term for
playing notes very fast, so that the listener will get the impression that a
chord is played. The table in figure 2.7 would emulate striking a major
chord.

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with digit 8-F is changed so that it ends with digit 0-7. In that case, the odds that the sound
will get muted is 1 out of 256.

Figure 2.6: Table Envelope Example

Figure 2.7: Arpeggio Example

Shorter arpeggios can just as well be created using the C (chord) command in phrases (see 5.2.1 for example). Tables however still have to be used for creating longer arpeggios.

To view different tables, press B+CURSOR.

TIP!

- *To give an instrument some attack, transpose the first table row a few steps up or down.*

- *There is a shortcut between the phrase and table screens. Press* SELECT+RIGHT *on an A command in the phrase screen to edit the table selected with the A command. To jump back, press* SELECT+LEFT.

The number of tables is limited to 32 ($00-$1F).

2.8 Groove Screen

Grooves define the speed by which your phrases and tables are played back. They can be used for giving your songs some extra swing. The different sound channels do not need to be synchronized to each other; this means that you can use a separate groove for each phrase and table.
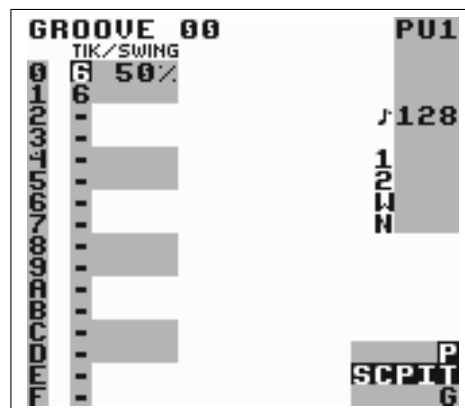

Figure 2.8: Groove Screen

To understand the groove concept, you need to know that the sequencer's time handling is based on an abstract time period called *tick*. The length of a tick varies with the song tempo, but is typically around

1/60th of a second. In the groove screen, you can specify for how many ticks each note step should be played. The groove in figure 2.8 would make the sequencer spend approximately 6/60th of a second on every note step.
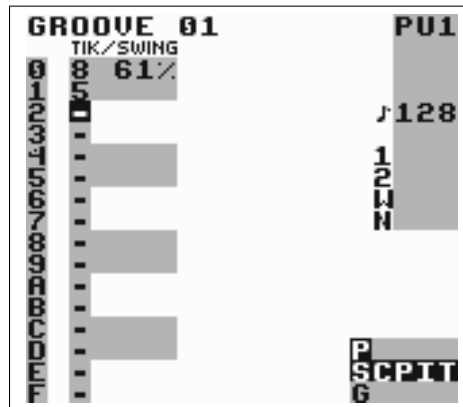

Figure 2.9: Swing Example

You can also use the groove screen to create custom rhythms. The groove in figure 2.9 would make the sequencer spend 8/60th of a second on even note steps, and 5/60th of a second on odd note steps. This would create a swing feeling. With thoughtful programming, grooves can also be used to create triplets and other complex rhythm structures.

Groove 0 is the default groove for all phrases. If you want to, you can easily switch to another groove using the groove (G) command in the phrase screen.

You can select the groove you wish to edit by pressing B+CURSOR.

TIP!

- *Pressing* A+UP/DOWN *will change the swing percentage, while keeping the total number of ticks – and thus, the resulting song speed – constant. (Example: Original value is 6/6 = 50%. Press* A+UP. *Now the value changes to 7/5 = 58%!)*

- *If you switch to the groove screen when the cursor is on a* G *command in the phrase or table screens, Little Sound Dj will display the groove that is selected with the groove command.*

2.9 Synth Screen

The synth screen features a soft synthesizer that generates sounds to be played back by the wave instruments. In total, there are 16 synth programs. You can choose the program to edit by pressing B+CURSOR.

TIP!

- *Each synth program uses $10 waves. Synth program 0 uses waves $00-$0F, synth program 1 uses waves $10-$1F, and so on. It is possible to look at the resulting synth sounds in the wave screen (Section 2.10).*
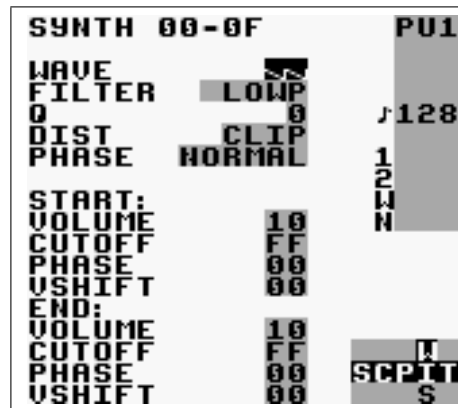
Figure 2.10: Synth Screen

2.9.1 General Parameters

WAVE Square, saw tooth or triangle.

FILTER Low-pass, high-pass, band-pass or all-pass.

Q Resonance control. Boost the signal around the cutoff frequency, to change how bright or dull the wave sounds.

DIST Use clip or wrap distortion.

PHASE Compress the waveform horizontally. It is applied after filtering with Q and cutoff. See figure 2.11 for examples.
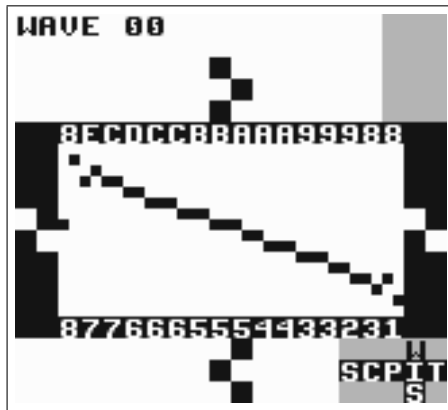
(a) Phase example. Original wave.
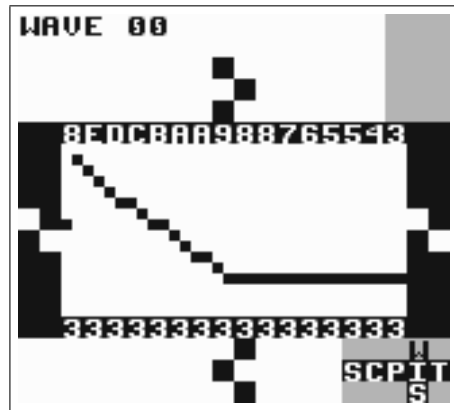
(b) NORMAL phasing. Compress horizontally, generate once.

(c) RESYNC phasing. Compress horizontally, loop.

(d) RESYN2 phasing. Loop, but don't compress.

Figure 2.11: Phase Examples

2.9.2 Start and End Parameters

Use these settings to specify values for the start and end of the sound. The program will then create a smooth fade between the start and end values.

VOLUME Wave volume.

CUTOFF Filter cutoff frequency.

PHASE 0 = no phase, $1F = maximum phase. See figure 2.11 for examples.

VSHIFT Shift the waveform vertically. See figure 2.12 for examples.

2.10 Wave Screen

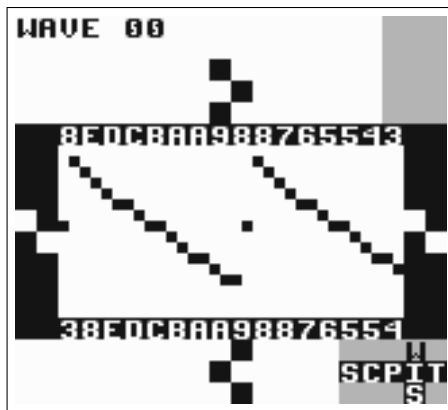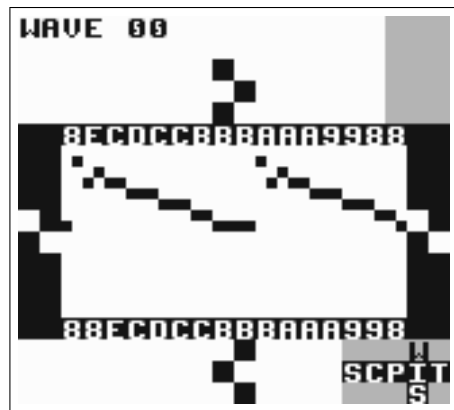In the wave screen, you can view and edit the individual waveforms of the synth programs. There are 16 ($10) synth programs, and each programs has $10 waves. This means that synth sound 0 uses waves $0-$F, synth sound 1 uses waves $10-$1F, and so on.

To change selected values, press UP/DOWN. To flip selected values, press A+CURSOR. B+CURSOR navigates between different waves.

It is possible to modify multiple values at once, using the regular key presses:

SELECT+B Start selection.

SELECT+B,B Select the entire wave.

B Copy selection to clipboard.

UP/DOWN Move selection up/down.

A+LEFT/RIGHT Flip selection horizontally.

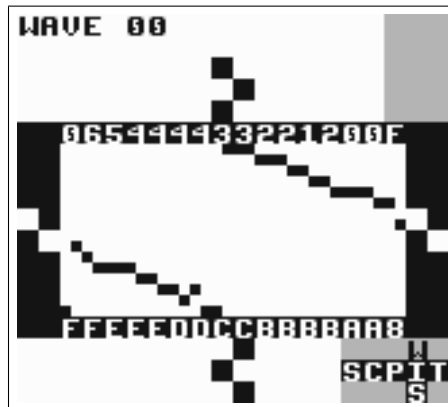**A+UP/DOWN** Flip selection vertically.

SELECT+A Paste from clipboard.

(a) Vshift example. Original wave.

(b) Vshifted wave. Vshift set to 40.

(c) Vshifted wave. Vshift set to 80.

Figure 2.12: Vshift Examples
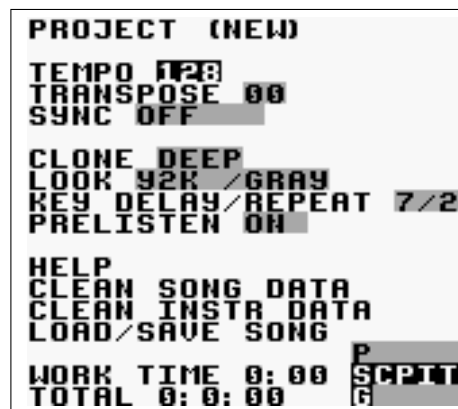
Figure 2.13: Project Screen

2.11 Project Screen

The project screen (figure 2.13) contains settings that affect the entire program.

TEMPO Change the tempo. It is possible to set a new tempo either by pressing A+CURSOR, or by tapping the A button in pace with the desired tempo. When being slave in sync mode, it is possible to temporarily play a little faster or slower by pressing A+LEFT/RIGHT.

TRANSPOSE Adjust the pitch of the pulse and wave instruments, by a given number of semitones.

SYNC Activate link-up over the serial port. (Read more about this in chapter 6!)

CLONE Select deep or slim chain cloning. Deep chain cloning will also clone the phrases of a chain when cloning, whereas slim cloning will re-use the old phrases. Read chapter 3 for a full explanation of cloning.

LOOK Change the font and color set.

KEY DELAY Set the delay time before key repeat is activated for the Game Boy buttons.

KEY REPEAT Set the key repeat speed for the Game Boy buttons.

PRELISTEN Play notes and instruments while entering them.

HELP Enter help screen. The help screen contains a quick reference for button presses and a command list.

CLEAN SONG DATA Clear all phrases and chains that are not used in the song. Also, if there are several phrases with the same content, they will be reduced to one.

CLEAN INSTR DATA Clear all instruments, tables, synths and waves that are not used in the song.

LOAD/SAVE SONG Enter file manager. [3]

This screen also contains two clocks. The WORK TIME clock displays the time Little Sound Dj has been used since the last memory reset, in hours and minutes. When playing, the clock is replaced by a PLAY TIME clock, which shows for how long the song has been playing. The TOTAL clock displays the time Little Sound Dj has been used in total, in days, hours and minutes.

2.11.1   Total Memory Reset

It is possible to reset the cartridge by pressing SELECT+A+B on LOAD/SAVE FILE. This will erase all songs and bring back the cartridge to its default state. This can be useful if memory got scrambled, or if you want to erase all songs quickly.

2.12   File Screen

The file screen (figure 2.14) is entered by pressing the LOAD/SAVE FILE button in the project screen. The file screen is used for saving the song you are working on to the storage memory. It can also be used to load songs from the storage memory to the work memory. The file screen allows you to keep up to 32 songs on one cartridge.

NOTE: The file screen is only available for cartridges that have 1 Mbit SRAM or more.

FILE Shows the file name of the song you are working on. The exclamation mark (!) indicates when changes have been made to a song.

---

[3]The file manager is only available for cartridges that have 1 Mbit SRAM or more. In case your cartridge doesn't have 1 Mbit SRAM, this button will be replaced with a RESET MEMORY button.

Figure 2.14: File Screen

LOAD Load a song. Press A, select the file to load and press A again.

SAVE Save song. Press A, select the slot to save to and enter the file name.

DEL Delete a song. Press A, select the file to delete and press A again.

BLOCKS USED Shows how much of the storage memory that is used. One block equals 512 bytes. The digits on the bottom are hexadecimal, meaning there is a total of $BF * 512 = 97,792 available bytes.

If you want to cancel an operation in this screen, simply press B.

 TIP!

- *There is a useful file manager application available at* http:// littlesounddj.com/lsd/latest/lsd-manager/.

2.12.1 Song List

The song list presents song name, version number and file size. When saving, the song is compressed, so the resulting file size will vary with different songs. If you want to start a new project, load from the (EMPTY) slot.

 TIP!

- While in the song list, it is possible to press SELECT+A to load a song without switching to the song screen, and START to start/stop songs. In this way, you can load and play songs without jumping back and forth between screens. This can be handy if you are playing a live show with prepared tracks and want fewer things to think about.

2.13   Border Information

A lot of useful data is displayed in the screen border (figure 2.15).
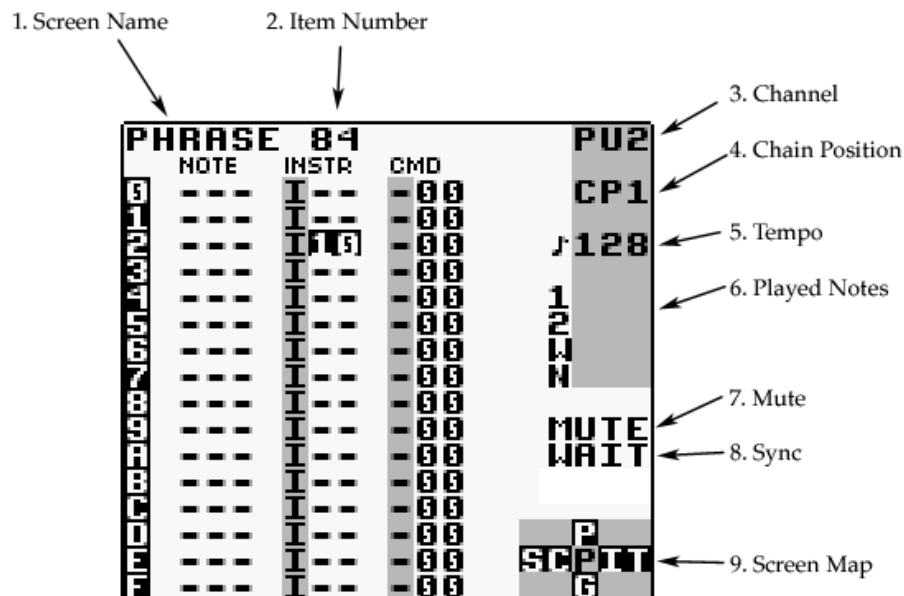

Figure 2.15: Border Information

1. Screen name.

2. Phrase/chain/instrument/table/frame/groove number.

3. Active channel.

4. Chain position being edited.

5. Current tempo, in beats per minute (BPM).

6. Notes being played.

7. Sync information.

8. Mute. (The characters will be lit when pressing B+SELECT or B+START.)

9. Screen map.

Chapter 3

Advanced Techniques

3.1   Copy and Paste

Little Sound Dj has a clipboard for temporary data storage. Pressing B+A will cut the value under the cursor and store it on the clipboard. The value can then be pasted by pressing SELECT+A.

In most screens, it is possible to mark up blocks by pressing SELECT+B and moving around the cursor. When having marked up a block, it can be copied to the clipboard by pressing B, or cut to the clipboard by pressing SELECT+A. The clipboard contents can then be pasted by pressing SELECT+A.

Some quick-mark button presses are implemented:

- SELECT+(B, B) = quick-mark a column or row.

- SELECT+(B, B, B) = quick-mark an entire screen.

When having marked a block, you can change all data inside that block by pressing A+CURSOR. This can be used, for example, to transpose several notes quickly.

3.2   Cloning

Cloning is a shortcut that can save you much unnecessary copy and paste action. It allows you to create copies of chains, phrases, instruments and tables directly from the song, chain, phrase and instrument screens.

Let's say you have a melody in chain 00, and you want to continue the song with the same melody, but a little changed. Then you copy 00 (SELECT+B, B) and paste one row down (SELECT+A), so you get:

```
00
00
```

Now, place the cursor on the second 00, and press SELECT+(B, A). You will now get a new chain (probably called 01) which is a copy of 00. Since it's a copy, you can play around with it as much as you want without touching 00.

3.2.1   Deep vs. Slim-Cloning

There are two different modes for cloning: slim-cloning and deep-cloning. You can select the mode in the project screen.

If you slim-clone 00, Little Sound Dj makes a new chain 01 that contains the same phrases as 00.

If you deep-clone 00, Little Sound Dj makes a new chain 00, and also clones the phrases within 00 into 01. That way, you can change 01's phrases without affecting 00.

The advantage of deep-cloning is that you have no risk of modifying old phrases by accident. The drawback is that it uses more phrases, so that you may run out of phrases faster. Also, your songs may take up more blocks when being saved using the file screen.

If you find yourself running out of phrases, try using CLEAN SONG DATA in project screen. (Section 2.11.)

3.3   The Importance of Backups

Some words of caution from many peoples hard-earned experience: If you use Little Sound Dj on a Game Boy cartridge, it might be a good idea to examine backup options like the Transferer or the MegaMemory Card. Game Boy cartridges are often rather unstable, as they are depending on an internal battery that is likely to run out sooner or later. If you are serious about your music, you should do regular backups, or at least try to record your songs once in a while.

3.4   Muting, Soloing and Panning on the Fly

It is always possible to mute a channel temporarily by pressing B+SELECT. If the B button is released before SELECT, the channel will stay muted until B is pressed again.

Correspondingly, a channel can be played solo by pressing B+START. If the B button is released before START, the other channels will stay muted. If the START button is released first, all channels will be turned on again.

It is also possible to pan channels left or right, by pressing B+LEFT/RIGHT in the song screen.

3.5 Live Mode

The live mode is a special flavor of the song screen. It can be reached by pressing SELECT+LEFT while in the song screen. In the live mode, it is possible to start and stop playing chains one by one. In contrast to the usual song screen, the different channels can be started and stopped independently. It is also possible to jump between different song positions while playing, without causing audio glitches or lost synchronization.

To play a chain, move the cursor to the chain and press START. To stop playing a chain, go to that channel and press SELECT+START. If another chain is already playing, the starts and stops will be queued until that chain has been played through. If you want to queue until the next phrase end instead, tap START twice to speed up the switch.

To switch back to song mode from live mode, just press SELECT+LEFT while in the song screen.

TIP!

- *To start or stop several chains at once, mark them before pressing* START *or* SELECT+START. *(Marking is described in section 3.1.)*

3.5.1 Chain Loops

Using chain loops is a useful live mode technique. This technique is based on the fact that the song sequencer (when being in the live mode) won't rewind the song position all the way up to the first song sequencer step when encountering end of track; instead, it stops rewinding as soon as it encounters an empty step.

Example: We have a setup that looks like figure 3.1.

Assume that we start playing pulse channel 1 at song position 4. The player will now loop chains 2 and 3. Defining a number of such chain loops to alternate between would provide a good starting point for a live performance.

Figure 3.1: Chain Loop Example

3.6   Creating Synthetic Drum Instruments

Creating good-sounding drum instruments without using the sampled drum kits might be a bit tricky, if you've had no prior experience with drum synthesis. Nevertheless, it's a very useful technique once you know it. Here are some starting-out ideas.

3.6.1   Bass Drum

Use pulse channel 1 for creating bass drum sounds. The amplitude envelope should have a strong attack and fast decay - try setting it to $C1. Wave should be 50-50 high/low, even though other waves can be used for making the instrument sound more distorted. The sweep value is maybe the most important part in creating a successful kick instrument. It should have a high initial frequency and decay. Try setting it to a value of $E3, and playing the instrument at note C-6. For a more snappy sounding kick, try experimenting with the envelope and length parameters. Set TUNING to FIX or DRM to prevent transposes from changing the pitch.

It is also possible to use the noise or wave channel for creating bass drums. Feel free to experiment around.

3.6.2   Snare Drum

Use the noise channel for creating snare drum sounds. The amplitude envelope should have a strong attack and fast decay - try setting it to $C1. Use the length parameter to create more snappy sounding snares. The

(a) Bass Drum

(b) Snare Drum

(c) Closed Hi-Hat

(d) Open Hi-Hat

(e) Cymbal

(f) Snare Drum Table

Figure 3.2: Synthetic Drum Instruments

shape parameter can be used for adjusting the timbre - shape values close to $EC might prove useful.

3.6.3   Hi-Hats and Cymbals

Hi-hats are created using the noise channel. Use a shape value of $FF for selecting a timbre with high frequency content. Change the envelope and length parameters for creating the desired amplitude envelope. For emulating cymbals, use a shape value near $EE to create a somewhat rougher timbre.

3.6.4   Taking Advantage of Tables

For adding that extra punch to snares, you can use a table that uses the transpose column to change the noise shape rapidly. (See figure 3.2f.)

Chapter 4

Overview of Key Presses

This is an overview of key presses valid in the phrase screen. The key pressing philosophy expressed here is used as consistently as possible throughout the entire program.

Editing Notes

A insert note on empty step

A+RIGHT note up

A+LEFT note down

A+UP octave/+10 up

A+DOWN octave/-10 down

B+A cut note to clipboard

Marking blocks

SELECT+B start marking

SELECT+(B, B) mark row

SELECT+(B, B, B) mark all

When Having Marked a Block...

A+LEFT all marked down

A+RIGHT all marked up

A+UP all marked octave/+10 up

A+DOWN all marked octave/-10 down

Copy/Paste Action

B copy marked block to the clipboard

SELECT+A cut the marked block to the clipboard

SELECT+(B, B, B, B) copy the entire screen to the clipboard

SELECT+A paste from the clipboard

Switching Phrases

B+LEFT view the phrase in the leftmost channel

B+RIGHT view the phrase in the rightmost channel

B+UP view previous phrase in chain

B+DOWN view next phrase in chain

Start/Stop in Song Mode

START start/stop playing this phrase

SELECT+START start/stop playing all channels

Start/Stop in Live Mode

START start playing selected chain after next chain end

START, START start playing selected chain after next phrase end

SELECT+START stop playing current chain when it ends

SELECT+(START, START) stop playing current chain after next phrase end

Muting and Soloing

B+SELECT mute this channel

B+START solo this channel

Chapter 5

Commands

Commands can be used in phrases and tables for altering the sound. There is a lot of power hidden in the commands, so it is suggested that you skim through this chapter at least once to get an idea of what they can do for you.

 TIP!

- *Tapping* A *on a command letter will display a scrolling help text in the top of the screen.* A+CURSOR *can then be used to browse through the existing commands. The text can be paused by holding* SELECT.

5.1   A: Table Start/Stop

Starts or stops tables in the current channel. Use the table number you want to start, or 20 for stopping.

A03 start table 3

A20 stop table

5.2   C: Chord

5.2.1   For Pulse and Wave Instruments:

Produce chords by doing a simple arpeggio that extends the base note with the given semitones.

C37 plays a minor chord: 0, 3, 7, 0, 3, 7, 0, 3, 7, . . .

C47 plays a major chord: 0, 4, 7, 0, 4, 7, 0, 4, 7, . . .

C0C plays 0, 0, C, 0, 0, C, 0, 0, C, . . .

CC0 plays 0, C, 0, C, 0, C, . . .

CCC plays 0, C, C, 0, C, C, 0, C, C, . . .

5.2.2   For Noise Instruments:

Applies S command with the given value every second tick.

5.3   D: Delay

Delay the triggering of a note with the given number of ticks.

5.4   E: Amplitude Envelope

This command functions in two different ways, depending on which instrument type it is used on.

5.4.1   For Pulse and Noise Instruments

The first value digit sets the initial amplitude (0=min, $F=max); the second digit sets the release (0,8: no change, 1-7: decrease, 9-$F: increase).

5.4.2   For Wave Instruments

E00 volume 0%

E01 volume 25%

E02 volume 50%

E03 volume 100%

5.5 F: Wave Frame/Finetune

5.5.1 For Pulse Instruments:

The first digit sets PU2 TUNE, the second PU FINE. (See section 2.6.2 for further explanation.)

5.5.2 For Kit Instruments:

Modifies the sample position. $00-$7F steps forward, $80-$FF steps back.

5.5.3 For Wave Instruments:

Change the wave frame that's being played on the wave channel. This command is relative, meaning that the command value will be added to the current frame number. This can be used for playing through synth sounds manually.

 TIP!

- *Since a synth sound contains 16 ($10) waves, issuing the command* F10 *will in effect jump to the next synth sound.*

Example:

F01 If wave frame 3 is being played, advance 1 frame and start playing frame number 4.

5.6 G: Groove Select

Select the groove to use when playing phrases or tables.

Example:

G04 select groove 4

5.7 H: Hop

H hops to a new play position. It can also be used to stop playing.

5.7.1   H in Phrases

H00-H0F Hop to next phrase. The digit sets destination phrase step.

H10-HFE Hop back within the phrase. The first digit sets number of times
     to hop back, the second digit sets destination step.

HFF Stop playing song (or channel, if in live mode).

 TIP!

- *If you want to compose in waltz time (3/4), put* H00 *commands on step* C
  in every phrase.

5.7.2   H in Tables

In the table screen, H is used for creating table loops. The first digit sets how
many times the hop should be done before moving on; 0 means "forever."
The second digit sets the table step to jump to. Loops can be nested; that is,
you can have smaller loops inside bigger ones.

  Example:

H21 hop twice to table position 1.

H04 hop to table position 4 forever.

5.8   K: Kill Note

  Example:

K00 kill note instantly

K03 kill note after 3 ticks

5.9   L: Slide

Slides to the target note in the given duration. The actual time depends
on the instrument's P+L+VIB setting; in HF mode the duration is n/360
seconds, otherwise the duration is in ticks. If the duration is set to 0, the
slide will happen instantly without stopping the P command.
  Example:

```
C-4 ---
F-4 L40
--- ---
C-4 L10
```

This will result in a slide that starts with C-4, bends to F-4, and then quickly bends back to C-4.

5.9.1   L in Tables

The L command also works in the left table command column, using the transpose column to set target note relative to the base note.

Regular transposes and slides are added together independently. In the above example, step 0 transposes one octave up. In step 1, the L command starts sliding one octave down while keeping the transpose from step 0 unchanged. In step 2, the L command is allowed to play out while the transpose stays one octave up. After some time, L will stop one octave down, cancelling out the transpose and in practice returning to the base note.

5.10   M: Master Volume

This command changes the master output volume. The first digit modifies the left output, the second digit the right. The volume can either be set with an absolute value, or changed by a relative value.

Values 0-7 are used to specify absolute volumes. Values 8-$F give the volume a relative change; 8 is no change, 9-$B increase, $D-$F decrease.

Examples:

M77 maximize volume

M08 minimize left volume, leave right volume unchanged

M99 increase volume with 1 step

MFE decrease left volume with 1 step, right volume with 2 steps

5.11   O: Set Output

Pan channel to left, right, none or both outputs.

5.12   P: Pitch Bend

5.12.1   For Pulse, Wave and Kit Instruments:

Does a pitch bend with the given speed. On KIT instruments, it gives an effect similar to pitch shift.

The actual speed depends on the instrument's P+L+VIB setting. In HF mode, the pitch will be updated at 360 Hz, otherwise it changes every tick.

Example:

P02 pitch bend up with speed 2

PFE pitch bend down with speed 2 ($FE=-2)

5.12.2   For Noise Instruments:

Applies S command with the given value every tick.

5.13   R: Retrig the Latest Played Note

Play the latest played note again. The first digit modulates the volume (0=no change, 1-7=increase, 8-$F=decrease). The second digit sets a period for the retriggering, zero being the fastest and E the slowest. $Period F$ means only retrig once.

Example:

R00 very fast retriggering

R0F retrigger once

RF3 medium speed retriggering, decreasing amplitude (echo effect)

5.14 S: Sweep/Shape

This command has different effects for different instrument types.

5.14.1 Pulse Instruments

S modulates pitch, using the Game Boy hardware. It is useful for creating bass drums and percussion. The first digit affects pitch, the second changes pitch bend velocity.

Note: S has no effect when being used in pulse channel 2!

5.14.2 Kit Instruments

S changes the loop points. The first digit modulates the offset value; the second digit modulates the loop length. (1-7=increase, 9-$F=decrease.) Used creatively, this command can be very useful for creating a wide range of percussive and timbral effects.

5.14.3 Noise Instruments

On the noise channel, S works like a noise shape filter. The first digit alters pitch, the second digit alters the randomness. The command is relative, meaning that the pitch/randomness values will be added to the currently used values.

In some cases, this command can randomly mute the sound. If that becomes a problem, set S CMD to STABLE in instrument screen.

5.15 T: Tempo

Change the tick frequency so that the given BPM will be produced. The BPM setting will be accurate only if the active groove has 6 ticks per note step. If the groove has some other number of ticks per note step, the BPM value should be adjusted according to the formula $lsdj\_bpm = (desired\_bpm \times ticks\_per\_step)/6$.

Example:

T80 set tempo to 128 ($80) ʙᴘᴍ

5.16 V: Vibrato

Add vibrato. Not available for noise instruments.

Example:

V42 period=4, depth=2

5.17 W: Wave

5.17.1 For Pulse Instruments:

Changes waveform.

5.17.2 For Wave Instruments:

The first digit sets synth sound speed, the second sets synth sound length.

5.18 Z: RandomiZe

The Z command repeats the last non-Z command, adding a random number to the original command value. The Z value controls the maximum value of each digit to be added.

Example:

Z02 adds one of 0, 1, 2 to the original value.

Z20 adds one of 0, 10, 20 to the original value.

Z22 adds one of 0, 1, 2, 10, 11, 12, 20, 21, 22 to the original value.

Note: Randomize does not work with Hop, Groove and Delay commands at the moment.

Chapter 6

Synchronization

LSDj can be synchronized with other devices, so that it is possible to run both in exactly the same tempo. You can activate synchronization by changing the SYNC mode in the project screen.

IMPORTANT: When running synchronized, use a groove based on 6 ticks/step. Otherwise, the resulting speed might be wrong.

6.1   Game Boy to Game Boy Sync

LSDj implements Game Boy to Game Boy sync. This requires two Game Boys, two LSDj cartridges and one Nintendo Game Link cable.

6.1.1   Activating Sync

Make sure that both Game Boys are turned off. Connect the Game Boys using the link cable. Now, turn on the Game Boys, and go to the project screens.

In the project screen, you'll find a SYNC parameter, which can be adjusted by pressing A+LEFT/RIGHT. Set the first Game Boy to MASTER and the second Game Boy to SLAVE. Now, the second Game Boy will receive ticks from the first Game Boy through the link cable, ensuring that they will play at the same tempo.

The sync works in two different ways, depending on whether the sequencer is in live mode or not. . .

6.1.2   Using Sync with Both Carts in Song Play Mode

Press START on the slave Game Boy. It will display the text WAIT in the bottom right corner, indicating that it is waiting for tick signals from the master Game Boy. Now, press START on the master Game Boy, and the slave Game Boy will start playing on the same song position as the master Game Boy.

Pressing START again on the master Game Boy will stop both Game Boys, putting the slave Game Boy in WAIT mode.

6.1.3   Using Sync with Both Carts in Live Play Mode

Both Game Boys are operated as usual, the difference being that they stay synced.

Sync will be lost on one occasion only: when the master Game Boy is stopped, and the slave Game Boy is still playing. Then, stop the slave Game Boy and start again.

6.1.4   Clipboard Transfer

When two Game Boys are linked and not playing, copying groove, phrase, instr, table or synth data on the master Game Boy will also transfer the copied data so it can be pasted on the slave Game Boy.

6.2   MIDI Sync

MIDI sync requires a special MIDI sync cable for Game Boy. For information on how to build a MIDI to Game Boy adapter, please refer to the website at `http://www.littlesounddj.com`.

Usage: Plug in the sync device before turning on your Game Boy. Then, set LSDj to MIDI slave sync mode. Pressing START will now make LSDj wait for and sync with any incoming MIDI clock signals. LSDj should use grooves based on 6 ticks.

6.3   Nanoloop Sync

Nanoloop is a Game Boy music program that can be found on `http://www.nanoloop.de`. Nanoloop can sync to LSDj using a normal Nintendo Game Link cable.

TIP!

- *When LSDj is slave, it is possible to temporarily play slower or faster by pressing* A+LEFT/RIGHT *on tempo in project screen. This can be very useful when being hooked up to some external hardware that has drifted slightly out of sync.*

Usage: Set LSDj to NANO master sync mode, and set Nanoloop to MIDI slave mode. LSDj should use grooves based on 6 ticks.

6.4 Analog In

LSDj can sync to music equipment that sends analog sync signals. This sync mode has been tested with the Korg Volca series, but works with other gear too; you can find a list at http://littlesounddj.wikia.com/wiki/Analog_Sync_Compatibility.

A cable should be easy to make, since no particular electronics are needed: all it takes is to splice a Nintendo Game Link Cable and a 3.5mm mini plug cable together. The wires should be connected as shown in the below diagram: GND goes to GND, CLK goes to CLK.
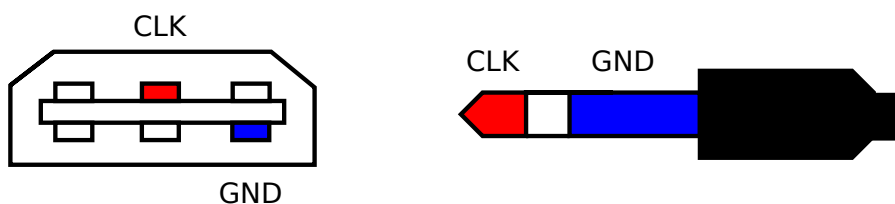
As a clarification, the above diagram is looking at the cable, and the wires are probably not red and blue in reality.

Once the cable is built, connect it to the Game Boy serial port and the SYNC OUT of your synthesizer. In project screen, set LSDj to ANALOG sync mode. The TICKS/STEP setting controls how many LSDj ticks should be generated for each incoming sync signal. Depending on the synthesizer, it may be necessary to change this setting to make LSDj run at the right speed. For Korg Monotribe, it should typically be set to 6, whereas for Korg Volca, it should be C.

6.5 Analog Out

Analog Out works similar to Analog In, except that in this mode, LSDj is responsible for sending the sync signal. The cable is different than the one used for Analog In. Build it by connecting the wires as follows:
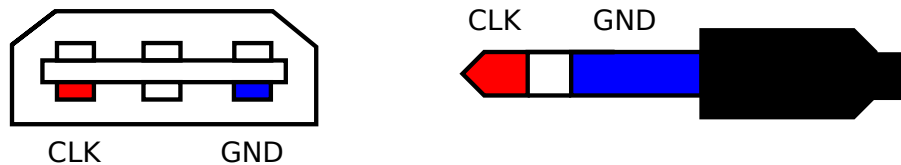
As a clarification, the above diagram is looking at the cable, and the wires are probably not red and blue in reality. This cable should be connected to SYNC IN of your synthesizer.

6.6 Keyboard Control

The KEYBD sync mode is not really about synchronization. Instead, it allows connecting a standard PC keyboard to the Game Boy, so it can be played as a piano. This is useful for live shows and improvisation. For information on how to build a PC keyboard to Game Boy adapter, please refer to the website at http://www.littlesounddj.com.

Important: To get a sound when playing on the keyboard, the sequencer must already be running. (Press START first!) The notes you play will be played back on the next step in the phrase sequencer. To get finer timing, use a faster groove for the phrase you are playing.

6.6.1 Keyboard Note Layout

SPACE play using custom table

F1/F2 octave down/up

F3/F4 instrument down/up

F5/F6 select custom table to assign to SPACE

F8 change pulse instrument playback channels (PU1, PU2, PU1+2)

F9-F12 toggle channel mute (switches on key press)

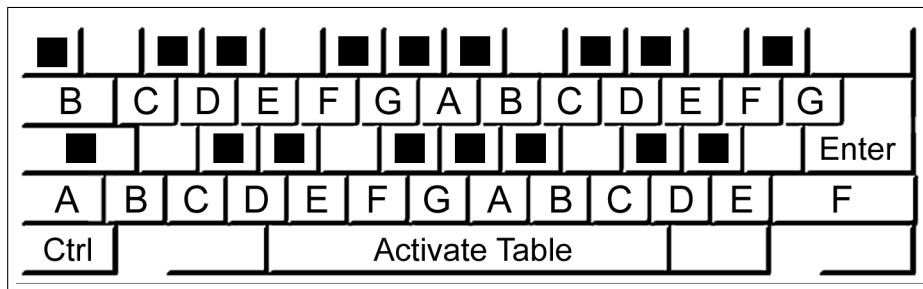**CTRL+(F9-F12)** tap channel mute (switches on key press and release)

Figure 6.1: PC Keyboard Map

CURSOR move around cursor

ENTER play chain

CTRL+ENTER stop chain

PAGE UP/DOWN B+UP/DOWN

Chapter 7

Speech Programming

7.1 Introduction

Little Sound Dj contains fifty-nine discrete speech sounds (called allophones), stored in the first four kit banks. By combining these sounds, it is possible to create any English word or phrase.

7.2 Linguistics

A few basic linguistic concepts will help you create your own library of words. First, there is no one-to-one correspondence between written letters and speech sounds; secondly, speech sounds are acoustically different depending on their position within a word.

The first problem compares to the problem that a child encounters when it learns to read. Each sound in a language may be represented by more than one letter, and conversely, each letter may represent more than one sound. Because of these spelling irregularities, it is necessary to think in terms of sounds, not letters, when using allophones.

The second, and equally important, point to understand is that the acoustic signal of a speech sound may differ depending on its position within a word. For example, the initial K sound in coop will be acoustically different from the K's in keep and speak.

7.3 Programming Words

Little Sound Dj has a special speech instrument. It is locked to instrument number $40 and can be used in the wave channel. It contains a set of 42

words, mapped out from note C-3 to note F-6.

Figure 7.1: Speech Instrument Screen

Figure 7.2: Example Word

If you want to edit a word, press SELECT+RIGHT to get to the word
screen. It has two columns; the left column contains the allophones to
be played, the right column sets duration. The word in figure 7.2 is pro-
grammed to say "Little Sound Dj."

In order to make things easy to remember, it is possible to rename the
words by tapping A in the speech instrument screen. If you want to, it is
also possible to cut and paste words in the speech instrument screen.

7.4 Guidelines for Using the Allophones

Allophones marked with * loop indefinitely.

7.4.1 Short vowels

*IH sitting, stranded

*EH extent, gentlemen

*AE extract, acting

*UH cookie, full

*AD talking, song

*AX lapel, instruct

7.4.2 Long vowels

IY treat, people, penny

EY great, statement, tray

AY kite, sky, mighty

OI noise, toy, voice

UW1 after clusters with YY: computer

UW2 in monosyllabic words: two, food

OW zone, close, snow

AW sound, mouse, down

EL little, angle, gentlemen

7.4.3 R-colored vowels

ER1 letter, furniture, interrupt

ER2 monosyllables: bird, fern, burn

OR fortune, adorn, store

AR farm, alarm, garment

YR hear, earring, irresponsible

XR hair, declare, stare

7.4.4   Resonants

WW we, warrant, linguist

RR1 initial position: read, write, x-ray

RR2 initial clusters: brown, crane, grease

LL like, hello, steel

YY1 clusters: cute, beauty, computer

YY2 initial position: yes, yarn, yo-yo

7.4.5   Voiced fricatives

VV vest, prove, even

DH1 word-initial position: this, then, they

DH2 word-final and between vowels: bathe, bathing

ZZ zoo, phase

ZH beige, pleasure

7.4.6   Voiceless fricatives

*FF fire, fox

*TH this, they

*SS sit, smile

SH shirt, leash, nation

HH1 before front vowels: YR, IY, IH, EY, EH, XR, AE

HH2 before back vowels: UW, UH, OW, OY, AO, OR, AR

WH white, whim, twenty

7.4.7 Voiced stops

BB1 final position: rib; between vowels: fibber, in clusters: bleed, brown

BB2 initial position before a vowel: beast

DD1 final position: played, end

DD2 initial position: down; clusters: drain

GG1 before high front vowels: YR, IY, IH, EY, EH, XR

GG2 before high back vowels: UW, UH, OW, OY, AX; and clusters: green, glue

GG3 before low vowels: AE, AW, AY, AR, AA, AO, OR, ER; and medial clusters: anger; and final position: peg

7.4.8 Voiceless stops

PP pleasure, ample, trip

TT1 final clusters before SS: tests, its

TT2 all other positions: test, street

KK1 before front vowels: YR, IY, IH, EY, EH, XR, AY, AE, ER, AX; initial clusters: cute, clown, scream

KK2 final position: speak; final clusters: task

KK3 before back vowels: UW, UH, OW, OY, OR, AR, AO; initial clusters: crane, quick, clown, scream

7.4.9 Affricates

CH church, feature

JH judge, injure

7.4.10   Nasal
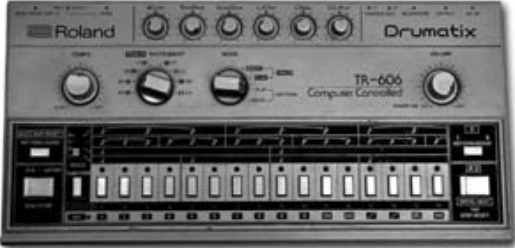
MM milk, alarm, example
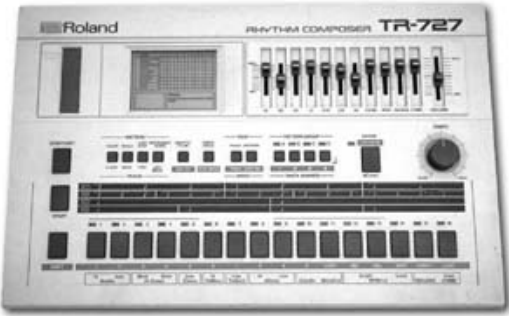
NN1 before front and central vowels: YR, IY, IH, EY, EH, XR, AE, ER, AX, AW, AY, UW; final clusters: earn

NN2 before back vowels: UH, OW, OY, OR, AR, AA

Chapter 8

The Sample Kits

Machine	Year	Info
SP0256-AL2 General Instruments	1981	The SP0256-AL2 Speech Processor IC contains a programmable digital filter that can be made to model a vocal tract. The 16k ROM stores both data and instructions. The pulse width modulated output can produce speech with a frequency range of 5kHz and a dynamic range of 42 dB.
TR-606 Roland	1981	The Roland TR-606 Drumatix is a programmable analogue drum machine. It was designed to couple with the TB-303 Bassline. The TR-606 has a very original sound and remains popular today.

Machine	Year	Info
TR-707 Roland	1984	The Roland TR-707 has the same functions as the TR-909 with all PCM sounds. Starting with this model, Roland began using an LCD display to show the rhythm matrix and tempo.
TR-727 Roland	1985	The Roland TR-727 is identical to the TR-707, with the exception that its sounds are Ethnic/Latin percussion. It is meant to complement a rhythm section, rather than be a main unit.
TR-808 Roland	1980	The Roland TR-808 has played a defining role for the 80's Hip Hop and Electro movement. It is still highly popular, thanks to its unmistakably original sounds.

Machine	Year	Info
TR-909 Roland	1983	The Roland TR-909 is one of the most popular drum machines ever. It has PCM sounds for cymbal and hi-hat, but all other instruments still come from analogue circuitry. The sounds are very useful for House and Techno music.
CR-78 Roland	1978	The Roland CR-78 is perhaps the most luxurious rhythm machine ever made. The guiro and tambourine are still unique as of today, and bass, snare and bongos sound very soft and rich.
CR-8000 Roland	1981	The Roland CR-8000 was introduced after the TR-808 – it has the same analog engine. The hi-hat sounds more realistic than older rhythm machines, but the hand clap sounds like an electric snare.

Machine	Year	Info
DR-55 Boss	1979	The Boss Dr. Rhythm range of drum machines is especially designed for guitar players who need a mobile drummer. The DR-55 is a simple analogue drum machine with a very rough and direct sound.
DR-110 Boss	1983	The DR-110, the successor of the DR-55, has analogue sound but is programmed digitally using a LCD rhythm matrix. It quite possibly has the best analogue handclap ever.
LinnDrum	1982	The LinnDrum originally sold for $3,000 and about 5.000 units were produced. It provided the rhythm tracks of many 1980's hit records.

Machine	Year	Info
Rhythm Ace	1973	Ace Tone was the first company to produce electric rhythm boxes in Japan. In the UK, Bentley Pianos (who put stickers on all their products) distributed Ace Tone, and thus the machine is also known as the Bentley Rhythm Ace.
Tom Sequential Circuits	1984	The sounds are a bit dirty and harsh sounding, especially next to its older brother Drumtraks, but that also gives Tom its character. The snare sounds like nothing else on this planet - it's electric!
Acieed House	1990's	This set of vocal samples was derived from a bunch of popular Acid House tracks. Can you dig it?

Machine	Year	Info
Ghetto Bass	1990's	A bunch of samples derived from classic Detroit/Chicago ghetto house tracks.
Animals Bud Melvin	2004	The winner of the 2004 Animal Sample Compo. A great selection of domestic animals. The Levi's 501 of animal kits!