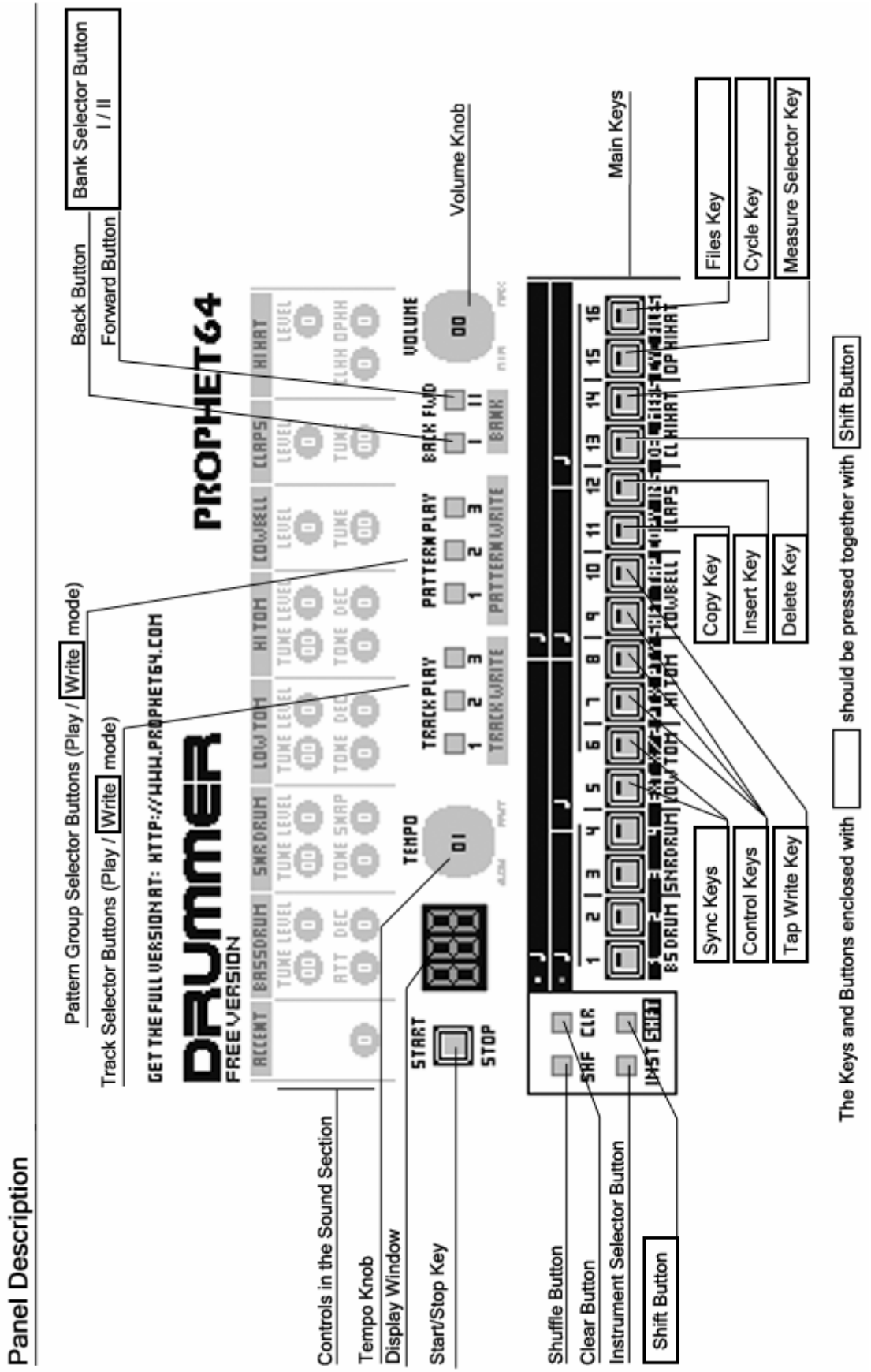
PROPHET64
SID MUSIC SOFTWARE

Drummer
(Free Version)

Panel Description



Introduction

Concept

The Prophet64 Drummer is a software drum machine for the Commodore 64. It closely resembles the design and sequencer functionality of the Roland TR-909 but does not attempt to emulate 909 sounds. Drummer brings back the classic wave table sounds created and used by renowned C64 musician Rob Hubbard in the C64 heydays.
As a drumtool, Prophet64 Drummer complements the other editions in the Prophet64 suite and adapts the same easy-to-use UI with quick keys and joystick/potentiometer. Of course it also implements DIN-sync with the s24-64 interface.

What is a wave table sound?

Wave table sounds (often called ”arpeggios”) refers to a simple technique for rapidly changing waveform and frequency of the C64 audio circuit every 20 milliseconds. The result is a unique sound effect that does not sound like any other synthesized sound.
During the first years of C64 game music most drum sounds, if any, were noise wave snare drums. In 1986-87 wave table sounds began to appear and game music such as ”Ace 2” and ”Mega Apocalypse” (both composed by Rob Hubbard) set a new standard with ”real” kickdrums and snares.

However, the ”correct” way of creating drums with a synthesizer is to use multiple oscillators with different waveforms and separate filters to shape the sound. One example is the Roland TR-909 snare drum built up by two slightly detuned sine wave sounds and a high pass filtered noise.
Because of the C64’s limit of three oscillators, the wave table technique therefore was a compromise but Prophet64 Drummer does not compromise. It uses the wave tables to bring back the unique sounds of the C64 era with a bonus of three independent voices.
[Note: The Prophet64 Drummer sounds are not 100% Rob Hubbard’s. Some of them have minor changes to better fit the Prophet64 concept and some of them are completely new.]

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General

Track vs. Pattern modes

Prophet64 Drummer works much like the Roland TR-909. There are two (four actually) modes in which to operate: Pattern Write/Play mode and Track Write/Play mode.

Patterns are the building blocks of a song. Created and edited in Pattern Write mode, they are later assembled to a full song in Track Write mode.
Pattern Play mode plays patterns and makes it possible to block play, (i.e. ”Chain Play” in Prophet64 Mono Synthesizer and Bassline). Track Play mode plays the tracks.

Manual play

Hitting the Main Keys in Track Play mode will play the instruments in real time.
Three at a time can play polyphonically even along the Drummer’s sequencer. Manual play only works in Track Play mode which is default at start up.

←,1,2,3,4,5,6,7,8,9,0,+,-,£,CLR/HOME,INST/DEL	Main Keys (1-16)

TIPS: The C64 keyboard’s key ”1” is not the same as Main Key 1, so things can get a bit tricky later on when editing. To overcome this, print out the keyboard overlay found in the back of this manual. When laid out on top of the C64’s keyboard it’s a great tool to visualize the Main Keys and not to get confused when accessing functions, selecting patterns or instruments.

Controls

The controls work in the same way as the other Prophet64 editions.
Quick keys on the C64 keyboard accesses parameters and a joystick or potentiometer alters the value. The main difference for Drummer is that the left shift key function for potentiometer triggering (to prevent overwriting values when changing parameters) is now on the right shift key as the left one serves as Drummer’s SHIFT-button.

To switch main control from joystick to potentiometer, press Shift button (**LEFT SHIFT** on C64) and then Main Key 7 (**6**) for pot. X or Main Key 8 (**7**) for pot. Y (both in port 2).
To activate the C64’s right shift key as pot trigger, press Shift button (**LEFT SHIFT**) and Main Key 9 (**8**). To bring back the joystick control, simply deselect any potentiometers with Main Key 7 or 8.

Controls in the Sound Section

Each drum sound (”instrument”) has a set of controls to shape it’s sound or to set the level and tuning. The controls are accessed via quick keys on the C64’s keyboard:

CONTROL	Accent level
Q W A S	Sound controls for Bass Drum
E R D F	Sound controls for Snare Drum
T Y G H	Sound controls for Low Tom
U I J K	Sound controls for Hi Tom
O L	Sound controls for Cowbell
P :	Sound controls for Hand Clap
* ; =	Sound controls for Hihats
↑	Main Volume level
C	Tempo (Internal Clock)

Level controls are provided for every instrument to control each volume.
All the sounds except hihats are also tunable.

[**BASS DRUM**]

- **Attack**
  This is to control the attack sound.

- **Decay**
  This adjusts the decay time.

[**SNARE DRUM**]

- **Tone**
  This changes the timbre of the sound.

- **Snap**
  This sets the amount of snappiness for the snare drum.

[**LOW TOM/HI TOM**]

- **Tone**
  This sets the timbre of the tom sound.

- **Decay**
  This adjusts the decay time.

[**HI-HAT**]

- **CLHH / OPHH**
  This sets the decay for closed and open hihat respectively.

Pattern Write and Play

There are two methods of writing, Step Write and Tap Write.

Step Write

To write a pattern Drummer must be in Pattern Write mode.

- Enter Pattern Write mode by pressing Shift Button (**LEFT SHIFT**) and any of the Pattern Group Selector buttons (**, . /**) which represents the group that holds the pattern to edit.
  (Users familiar with TR-909 editing might notice that Pattern Write mode immediately enters without flashing any Pattern Group Selectors.
  In Drummer, the latest pattern or block of patterns are always preselected (Pattern number 1 at start up).

- If the wrong pattern is selected, press the corresponding Main Key for the correct pattern, e.g. to edit pattern 5, press Main Key 5.

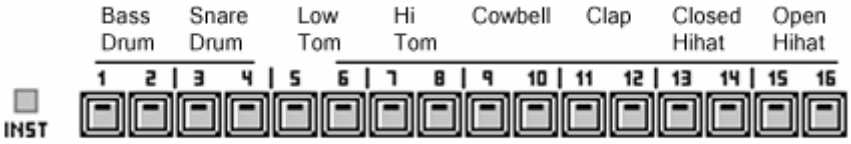
- Press Start/Stop key (**RUN/STOP**) to start playing. When running, the Main Keys indicator flashes from left to right (1 to 16) and Drummer is ready to accept pattern data. (Patterns can only be written when Drummer is running)

- Select a sound source (read below).

- Enter the instrument's notes on correct position within the pattern according to the rhythm chart (read below).

, . /	Pattern Group buttons
RUN/STOP	Start / Stop
← 1 2 3 4…	Main Keys
C=	Instrument Selector button

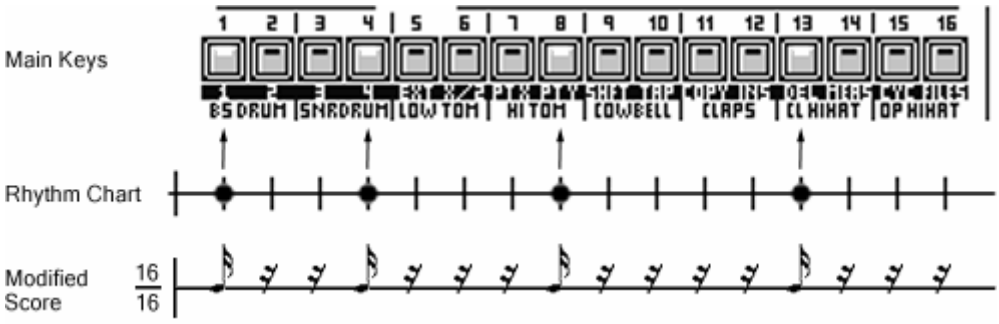
Selecting Sound Source



Pattern data is entered one instrument at a time.

- To select instrument press the Inst button (**COMMODORE key**). The indicator flashing from left to right pauses and Drummer shows the current selected instrument.
- To change instrument, keep Inst button down and press the Main Key for the new instrument.
  Any of the two keys for an instrument can be used to select it though they display different colors (While this mattered on the TR-909, it doesn't on Drummer).

Rhythm Chart



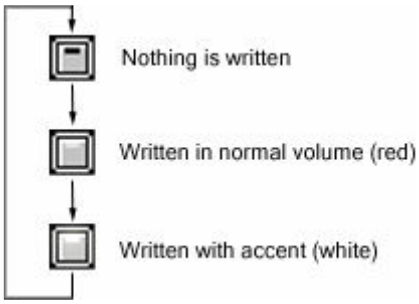
As seen on the Rhythm Chart above, each Main Key represents one 16th note within the pattern.

- To make the Kick Drum play every beat for instance, press Main Key 1, 5, 9 and 13 (←, **4**, **8**, –).
- To make the Snare Drum play every other beat, press Main Key 5 and 13 (**4**,-)

Drummer stores all the instruments entered into a pattern but when playing, only three at a time can play simultaneously. Priority is higher for sounds "to the left" i.e., Kick Drum, Snare Drum ,Toms play in prior to cowbells, hihats, etc.

How the Main Keys work in writing

The indicator on the Main Key changes by pressing the key as shown below.

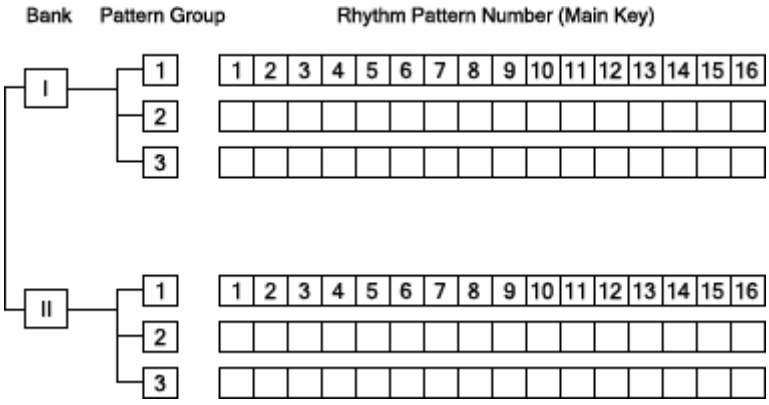


- To enter an instrument's note without accent, press the Main Key once.
- To enter an instrument's note with accent, press the Main Key twice.
- To cancel an instrument's note press the Main Key until the indicator goes out.

All notes for the selected instrument within a pattern can be deleted at once by pressing the Clear button (X) while Drummer is running in Pattern Write mode.

Some more useful information for Pattern Write

Memory Map



Each bank holds 3 pattern groups with 16 patterns and 3 tracks giving a total of 48x2 patterns and 6 tracks.

Selecting Bank

It is possible to switch banks in Pattern mode as opposed to the TR-909 but just the same the Drummer will not accept patterns from bank II for tracks in bank I and vice versa.

Tap Write

Instead of step writing notes into a pattern it is possible to play it real time on the Main Keys while Drummer is running.

- Activate Tap mode by pressing the Shift button together with Main Key 10 (9). When Drummer is running in Pattern Write mode, a guiding sound is heard in quarter note intervals.
- Play along the guiding sound using the Main Keys. The instrument's left Main Key records the sound with an accent where as the right one does not.
- To cancel accidentally written data, hold the Clear button (X) while playing the note at the same position once again.
- Selecting and viewing instrument does not affect the tap writing.
- Tapping multiple sounds by holding down several Main Keys at the same time is not possible.

Pattern Play

Pattern Play mode allows playing of patterns one after the other or any number of patterns following each other automatically (block play).

- To enter Pattern Play mode, press any of the Pattern Group buttons (, . /).
- Press the desired pattern's Main Key and then start the sequencer with the Start / Stop button (or start the external sequencer if Drummer is in external clock mode). The indicator flashes from left to right as the pattern plays.
- To switch pattern while still running, press the Main Key for the new pattern. Drummer plays the new pattern when the current one is finished.
- To play several patterns in a row ("block play"), press the Main Key for the first and last pattern simultaneously. The selected patterns are indicated in red color and the currently active pattern in white.
- Block Play works in Pattern Write mode also (select when not running). The current pattern playing is always the one being edited.
  Drummer automatically updates the visual Main Key rhythm chart.

Clear pattern

Simultaneously pressing the Clear button (X) and a pattern's Main Key erases the pattern from memory (works both for Pattern Play and Write mode).
Be aware, there is no yes/no-confirmation when clearing single patterns!

Copy Pattern

Patterns can be copied from one to another even if they are not in the same bank.

- Select the destination pattern (current pattern selected).
- Hold the Shift button and press the Copy key (0). Copy mode is now active. Do not release the Shift button until the whole copy is finished unless to cancel the operation.
- Use the Bank buttons (CRSR), the Pattern Group buttons (, . -) and the Main Keys to select a source pattern.
- Press RETURN key on C64 to confirm the copy or simply release the Shift button at any time to cancel.

LEFT SHIFT	Shift button
0	Copy key (Main Key 11)
, . /	Pattern Group buttons 1-3
CRSR UP/DOWN	Bank buttons I, II
← 1 2 3 . .	Main Keys (select pattern)
RETURN	Confirm copy

Track Program and Play

Track Program

A track is a song; a sequence of patterns put together. Any of the patterns created within a bank's three groups can be used for the tracks in the same bank.
Users familiar with the Roland TR-909 will notice that the process of track writing on the Drummer is slightly different from the 909.

In Track Write/Play mode, the Display Window shows the current Measure of the track.

- To edit a track, enter Track Write mode by pressing Shift button (**LEFT SHIFT**) and any of the Track Selector buttons (**B N M**)

- Use Main Keys and Pattern Group Selector buttons (**, . /**) to select the current measure's pattern. At start up, all the tracks consist of 1 measure containing pattern 1 from group 1.

- To advance to the next measure, press **RETURN** on C64. This adds a new measure to the track..

- Press Start / Stop key (**RUN/STOP**) at any time to listen to the pattern. The track does not advance to the next measure when the pattern is done, it just keeps playing. This is a convenient way to hear the edits.

- To exit Pattern Write mode, stop the sequencer if running and press any of the Track Selector buttons (**B N M**). It is not possible to directly jump to Pattern Write/Play mode from here, only via Track Play mode.
  Important: Prophet64 Drummer does not store a selected pattern into the track until the measure advances in some way. On the last measure, use **CRSR LEFT** to step backward before exiting Track Write mode or start playing.

A Drummer track has a maximum of 255 measures numbered 1 to 256.

Track Play

Track play in Track Play mode. Any of the Track Selector buttons (**B N M**) enter Track Play mode and set current position to measure 1. When playing starts, the sequencer always begin at the current position. To make it play from the beginning, a simple press on the Track Selector button resets the track's position at any time.

Cycle

When a track is done playing the last measure it either restarts at measure 1 or completely stops playing. Restarting is called "Cycle mode" and is default at start up. By pressing Shift button and Main Key 15 (**CLR/HOME**), Cycle mode is toggled on/off.

Jump to Measure

Instead of browsing through existing measures with the CRSR keys, this function is a neat way of accessing a measure directly by entering it's number with the Main Keys.

- Press Shift button and Main Key 14 (£)
- The display window now shows three dashes and awaits input.

- Still holding the Shift button, enter the measure's number with Main Keys 1 – 10 (10 is zero).
- When done, press RETURN to confirm jump or release Shift to cancel.

Editing Rhythm Track

Editing a track is no different from the procedure explained in the section "Track Program". Just remember that:

- RETURN key on C64 advances pattern. If used at last measure, it also adds a new measure to the track.
- CRSR-keys on C64 advances back and forth but does not add a new measure to the last one like RETURN does.
- A pattern entered into a measure is not stored until leaving the measure either with CRSR-keys or RETURN-key (in other words, exiting Track Write mode won't store the current pattern if changed).
- Entering Track Play/Write mode, sets the current measure to 1
  Use "Jump to Measure" function to swiftly recall a measure.

Delete Measure

The Delete function of Drummer works much like the delete key in any ordinary PC-text editor, it shortens the entire song by one measure and removes the pattern at the current position.
Though the real TR-909 was capable of deleting big blocks ("from – to") of measures, Drummer only works on one measure at a time.

- Jump to the measure within the track where a pattern is to be deleted.
- Press Shift button and Main Key 13 (-)
- Delete is carried out at once.

Insert Measure

The Insert function works opposite to the Delete function, expanding the track with one measure at a time and inserting the current position's pattern.

- Jump to the measure within the track where the new pattern is to be inserted.
- Press Shift button and Main Key 12 (+).
- Insert is carried out at once.
- Use Main Keys and Pattern Group buttons to enter a new pattern at the current position.

Clear Track

To clear a track:

- Press and hold the track's selector button (B N M)
- Press the Clear button (X)
- Press **RETURN** to Confirm or **RUN/STOP** to cancel (No other keys will work until this choice is made).
- Remember: While the track is completely cleared from pattern information the actual patterns are not erased.

B N M	Track Selector buttons
X	Clear button
RETURN	Confirm Clearing track
RUN/STOP	Cancel Clearing track

Files

To access the Drummer file options, press Shift button (LEFT SHIFT) and Main Key 16 (INST/DEL).
Navigate with CRSR-keys to move cursor up/down, RETURN to confirm choice/begin load etc. and ← to exit selection.
Pressing ← in main file menu exits back to Prophet64 Drummer main screen.

CRSR Up/Down	Navigate menus up/down
CRSR Left/Right	Alter parameter values
←	Go back
RETURN	Go back
1,2,3,4	Hot keys to menu items

Disk Saving:
DSAVE means Disk Save.

Enter a filename and press RETURN.
The suffix ".909" is automatically added and the file is saved to disk.
Key ← aborts.

A Prophet64 Drummer file contains sound parameters, patterns, control settings, shuffle, cycle and trig delay settings in 19 blocks of disk space which means an ordinary 5 1/4" floppy has room for about 30 files.

Even though the filename stays until the next time the save menu is entered, present files on the disk cannot be overwritten. No warnings are given at any attempt duplicating a filename except a flashing light on the disk drive.
When re-saving, use reference numbers to the latest save, i.e., 'MYMUSIC', 'MYMUSIC2', 'MYMUSIC3' etc.

Disk Loading
DLOAD means Disk Load. The option presents a directory list from which files are selected and loaded.

Only .909 files are listed in the file selector.

CRSR keys scroll up and down.
RETURN key selects a file to load.
← key cancels.

If there are no 909-files present on the current disk, a 'no files' message is displayed.

Tape Saving
TSAVE means Tape Save. The procedure is similar to disk save.

To start recording, REC & PLAY must be pressed on the tape device but Prophet64 does not sense any switches on a 1530/31 datasette. Instead it waits for the user to press **SPACE BAR.** That way any tape player, digital or analog, works as long as the audio out is routed into the datasette input on the back of the C64. Even the output of a PC sound card is theoretically possible to be the source of data. In practice, there is no need to carry around that clumsy 1541 to the studio anymore!

The file is saved in standard Commodore tape format, not turbo tape.
It takes up 30 numbers on an analog audio tape.

Operation is cancelled with the ← key. If saving already begun, **RUN/STOP** aborts.

Tape Loading
TLOAD means Tape Load.
Just like the saving procedure, the tape device has to be started and then confirmed with the **SPACE BAR**. The tape key sensor is not checked.

Prophet64 looks for Drummer files, that is ".909". If another file is found, operation is immediately aborted and an error message is displayed together with the name of the file that was found.

If a correct Prophet64 file is found, the screen turns green and the file loads. As it takes up about 30 numbers on the tape, loading time is approx. 1 min 50 seconds.

When loading is done, the screen goes back to normal and the filename is displayed.
Use the ← key to go back.

Loading is aborted with the **RUN/STOP** key. In case of aborting, the Prophet64 patterns and sounds might sound weird as not all the data has been loaded properly.

Other Functions

Shuffle

Shuffle means to get the music to "swing". This is achieved by delaying every second note instead of playing straight sixteenths. The more delay, the more it swings. Generally, higher tempo requires less swing, lower tempo can add more.

To set the amount of shuffle for Drummer:

- Press the Shuffle button (Z).
- The indicator on Main Keys 1 – 4 will display the current Shuffle setting 1-4 where 1 is no shuffle at all and 4 is the extreme setting. A value of 2 or 3 is recommended, 4 only works at a lower tempo and will most likely cause drop-outs at normal speed.
- Change shuffle setting by pressing the corresponding Main Key.
- Release Shuffle button to exit.

For more shuffle resolution, use the”Double Sync” feature.

Synchronization

The Prophet64 utilizes DIN-Sync (SYNC 24) to play along MIDI-sequencers. It requires both an S24-64 interface and a MIDI to SYNC 24 converter.
While MIDI to SYNC 24 converters are pretty cheap in the yellow pages or at the local dealer, the S24-64 is not available for purchase. It’s not a problem as it is really easy to build. Instructions are included in the ”Peripherals” (peripherals.pdf) document on the Prophet64.com website.

To switch Prophet64 Drummer to External clock (slave mode):

- Press Shift button and Main Key 5 (4)

Double Sync

Double Sync is a feature that doubles the amount of clock pulses for a 1/16th note: 12 instead of 6. The idea is to get a better resolution for shuffle. In practice, the Prophet64 plays on half speed.

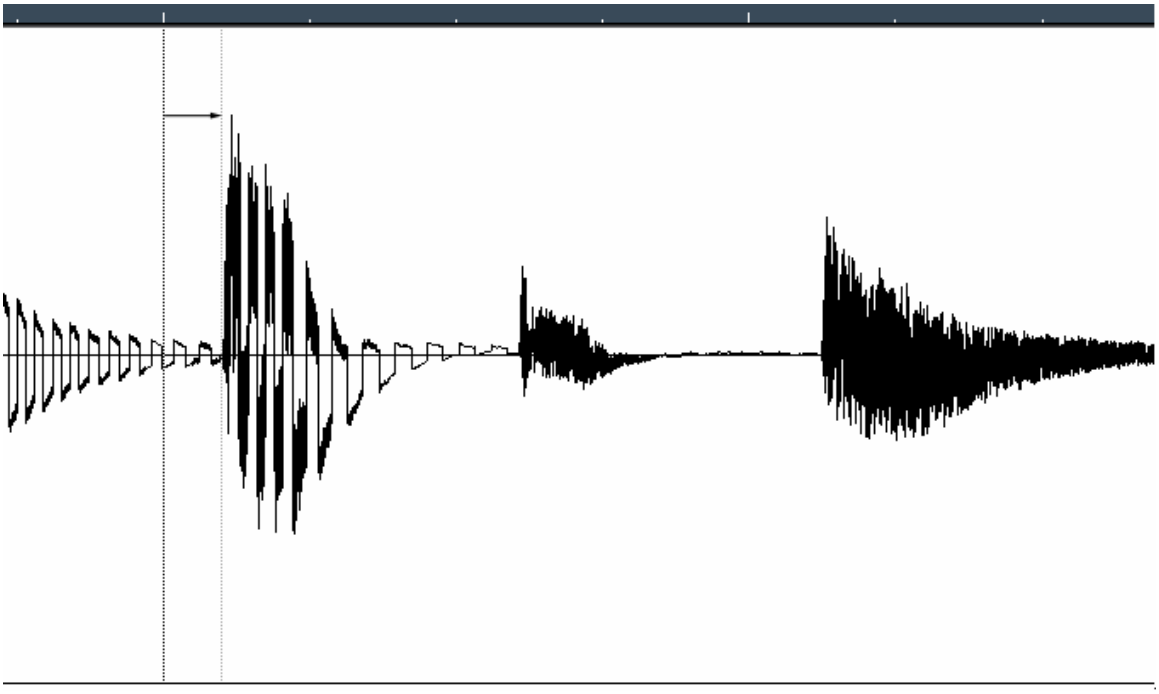
To activate double sync:

- Press Shift button and Main Key 6 (5) to select Double Sync (X/2).
- Double sync cannot be selected for internal clock.
- Hard disk record the Drummer and slow the sequencer down again to half the speed when playing back the audio.

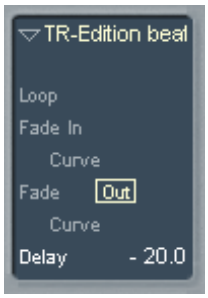
Trig Delay

To compensate for high shuffle settings or a moderate tempo that causes drop-outs or unwanted clicks and pops, Trig Delay is a handy function to adjust the waveform trig of the Drummer's sounds to what the SID can handle.

To get a visual understanding of trig delay, look at the graphics below – a screen shot from a hard disk recording of a Drummer pattern in Emagic Logic with a Trig Delay setting of 20 ms:



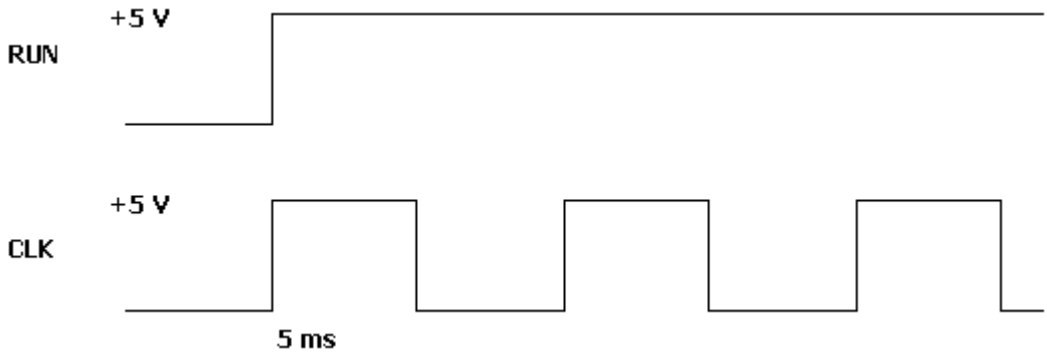
Trig Delay has no effect in Double Sync mode where all the sounds are delayed with about 20 ms no matter the setting. Because of this, hard disk recorded tracks with Double Sync must be adjusted manually after recording by setting a pre delay of 10-20 ms:



To Set Trig delay:

- Press Shift button.
- Press Main Key 1 – 4 for trig delay 1 – 4. Default is 1 (no delay).
- The very first note played by the sequencer is always delayed with about 20 ms no matter the Trig Delay setting.

SYNC 24
SYNC 24 alias ”DIN-Sync” was a standard for synchronizing drum machines and sequencers in the early 80s.
It uses +5V pulses that last for approx. 5 ms (Prophet64 accepts a pulse width of at least 2 ms). Six pulses equals a sixteenth note.

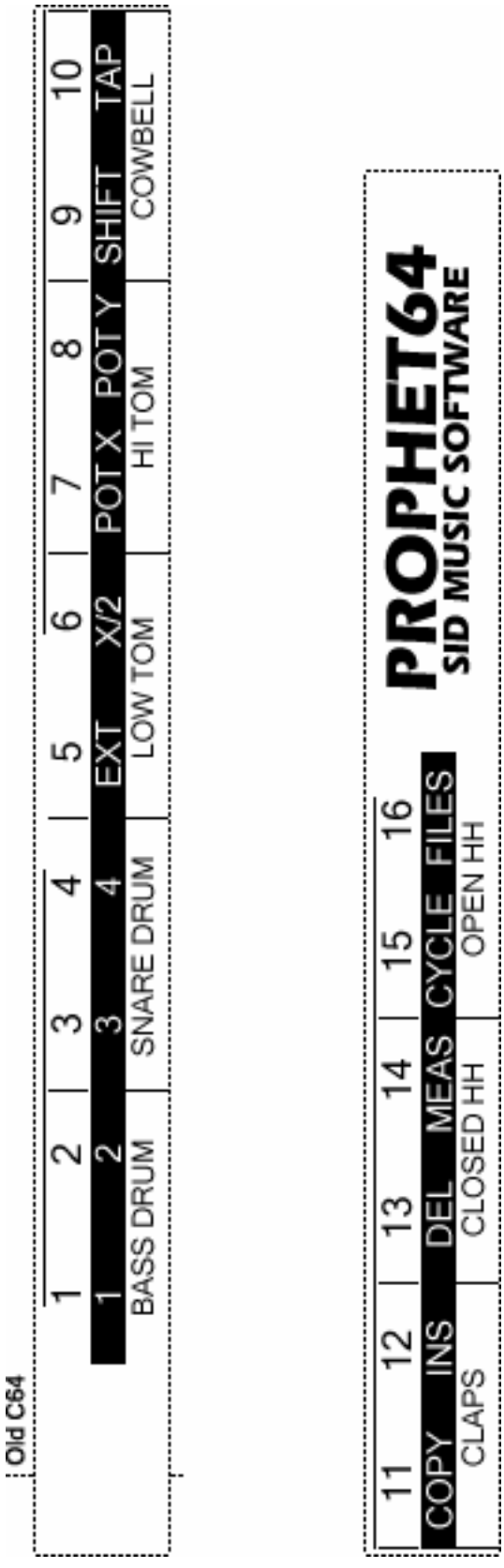


The Roland TB-303, MC-202, TR-808,TR-606, TR-909 were some of the machines using SYNC 24.

Blank Screen

Like the other Prophet64 editions, Drummer comes with a handy function to blank out the screen. The purpose is to lower VIC (graphic chip) interference with the audio signal.
To obtain the highest sound quality possible when recording, blank the screen with **SPACE BAR** on the C64 keyboard. All the controls still work in the background i.e., pressing sound controls, moving the joystick etc.
Space bar is a toggle, pressing it twice brings the screen back.

Keyboard Overlay



- Print this page out in full size
- Cut out the keyboard overlay with a hobby knife or a pair of scissors.
- Place the two pieces side by side on top of the C64's keyboard

- Put tape on the sides to keep it in place (optional)