Q BIT

BIT CRUSHER WITH TIME HOLD

User Guide

Version 1.1

PULSAR MODULAR

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Q BIT
- Preface 2
- Get Started 3
- HOLD 4
  - 2.1 Sync and Your Loop 4
  - 2.2 The Green Arc 4
- The Sound 5
- Levels and the Display 6
- In Your DAW 7
  - 5.1 Presets 7
  - 5.2 A and B 8
  - 5.3 The Menu 8
  - 5.4 License 8
- Tips and Troubleshooting 9
  - 6.1 Starting Points 9
  - 6.2 If Something Seems Wrong 9
- Linux 10
  - 7.1 Troubleshooting 10
- iPad and iPhone 11
  - 8.1 Touch 11
  - 8.2 Presets on iPad and iPhone 11
- Appendix: Credits and Independence 12
  - Independence 12
  - Credits 13

Preface

I wanted to create an effect beyond the familiar chorus, delay, and filters. I started with a bit crusher, but the first results felt too ordinary: more like tape hiss than the new sound I was looking for.

So I asked: what if I pushed the sound further into the digital world? I wanted to do more than lower its quality. I wanted to reshape the signal itself, giving it the character and musicality of a retro sound chip, while keeping it relevant to modern production. That idea became Q BIT: a way to make digital reduction playable.

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CHAPTER ONE

Get Started

Q BIT is a bit crusher with a time hold. The crusher gives your sound its grit. HOLD grabs slices of your track and holds them, on your song's tempo or at its own pace.

1. Insert Q BIT on a drum loop, a synth or any other track, mono or stereo.
2. Leave **HOLD** Off for now. Under **MODEL**, keep Linear.
3. Lower **BITS** to 8 or 4 bit for stronger crushing. Lower **RATE** to 8 kHz for a more pronounced digital sound.
4. Set **HOLD** to Sync and **DIVISION** to 1/16. Each sixteenth note now starts a slice of your track and holds it until the next one.
5. Turn **SEGMENT** up and down. Higher keeps more of each slice; lower makes the hold, and the rhythm, stronger.
6. Blend your dry track back in with **MIX**, then match the level with **OUTPUT**, or let **MATCH** do it (chapter 4).

> **TIP: The help strip under the panel describes the control under your mouse, with its value. It starts off: click the strip, or choose Tooltip in the menu, to turn it on for every Q BIT window.**

CHAPTER TWO

HOLD

HOLD is the heart of Q BIT. At every grab, a slice of your track plays as it is; then the hold freezes its end and sustains it until the next grab. On a held note it sounds like a tremolo or a pulse; on drums, like a rhythm of short hits and held tones.

Control	What it does
HOLD	Off, Free or Sync. Off: no hold, the crusher still works. Free: grabs at HOLD RATE. Sync: grabs on your DAW's tempo, at DIVISION.
DIVISION	Sync only. The note value of the grabs, from 1/4 to 1/32, straight, dotted (.) or triplet (T). There is no dotted 1/32.
HOLD RATE	Free only. 1 to 16 grabs a second. Slow rates hold long and smooth; fast ones stutter.
SEGMENT	How much of each slice plays before the hold takes over, 10 to 90 %. Raise it to keep more of the performance; lower it for a stronger rhythm.

DIVISION and HOLD RATE are dimmed when their mode is not in use. All three are dimmed while HOLD is Off.

2.1 Sync and Your Loop

In Sync the grabs sit on your song's grid, not on the hits. For a loop that sounds the same on every pass, use whole bars; with a dotted DIVISION, three bars or a multiple of three. When the transport stops, Q BIT keeps grabbing at the last tempo.

2.2 The Green Arc

In Sync, a green arc on the SEGMENT ring shows the settings that keep every hit of the last bars intact. Set SEGMENT just inside the arc for the strongest rhythm that loses no hits.

The arc appears after a few clear hits and stays still while the groove is steady. A new DIVISION or tempo clears it until new hits come in. There is no arc in Free, and none on sounds without clear hits, such as a pad.

CHAPTER THREE

The Sound

MODEL picks the character of the crusher. Each model shows only its own boxes.

Model	Character	Its boxes
Linear	Flexible bit crushing: you set the bit depth and the sample rate.	BITS, RATE
SP-1200	A punchy, gritty drum-sampler character with a softer top end.	none
M.93	A vintage digital-delay character: clean on quiet sounds, gritty on loud ones.	MULTIPLY
ZX Spectrum 128	A coarse, retro home-computer character. Mono, like the original, or a chip for each side.	CHANNELS

BITS sets the bit depth, from 24 down to 2 bit. Fewer bits give more grit and noise. Q BIT starts at 16 bit, close to your track.

RATE sets the sample rate of the crusher, from Host (your session rate) down to 2 kHz. Lower rates turn the highs into the grit of an old sampler. Your session keeps its own rate.

MULTIPLY (M.93 only) is 1x, 2x, 4x or 8x. Each step makes the sound darker and grainier.

CHANNELS (ZX Spectrum 128 only) is Mono or Stereo. Mono is the machine as it was built: both sides play the same. Stereo gives each side a chip of its own; the two never quite agree, so a held sound moves across the field and drums crackle at the sides.

> **TIP: The M.93 is hardest on hats and cymbals. Give it a little less INPUT than the other models.**
>
> **NOTE: On the ZX Spectrum 128, INPUT sets how much of the chip's range you use. Up traces the tone more closely; down keeps the punch, with grittier tails. Very quiet input can crackle or fall silent: raise INPUT until the sound comes through, then set the level with OUTPUT.**

CHAPTER FOUR

Levels and the Display

Control	What it does
INPUT	The level into Q BIT, −24 to +24 dB. More drives the crusher harder; too much clips.
MIX	Blends the crushed sound (W) with your dry track (D). The readout shows the dry part: 0% D is all crushed, 100% D is all dry.
OUTPUT	The final level, −24 to +24 dB, after MIX.
MATCH	Holds the output at the loudness of bypass while you move the controls, so you judge the sound, not the volume. The button glows while it is on.
BYPASS	Switches Q BIT out. The button glows pink while bypassed. Your DAW's bypass does the same.

Hold SHIFT while you turn INPUT or OUTPUT, and the other one moves the opposite way: you change the drive and keep the level. Click the readout under any knob to type a value.

MATCH follows the level while your track plays and makes up for the level change of every INPUT move itself, so SHIFT does not link INPUT and OUTPUT while it is on. OUTPUT still sets the level above or below bypass. Together, OUTPUT and the correction stay between −24 and +24 dB: at either end, the help strip tells you how far from bypass the level still is, and whether to raise or lower INPUT. MATCH is for comparing: when you like the sound, click it off, and its correction moves into OUTPUT with no jump. A preset never switches MATCH, and A and B each keep their own.

The display shows your sound as it plays: the faint line is the sound going in, the bright stepped line the sound coming out. Fewer bits make the steps easier to see. At the right, OUT and IN show the peak levels in dBFS, one above the other, so you can compare them at a glance.

> **TIP: Turn MATCH on, then set the crush by ear with INPUT and BITS: switching BYPASS now compares the sound, not the level.**

CHAPTER FIVE

In Your DAW

Q BIT is a VST3, AU and AAX plug-in for macOS and Windows, and a VST3 and LV2 plug-in for Linux (chapter 7). For iPad and iPhone, see chapter 8.
It installs to these folders:
VST3, macOS: /Library/Audio/Plug-Ins/VST3/Pulsar Modular/
VST3, Windows: C:\Program Files\Common Files\VST3\Pulsar Modular\
AU, macOS: /Library/Audio/Plug-Ins/Components/
AAX, macOS: /Library/Application Support/Avid/Audio/Plug-Ins/Pulsar Modular/
AAX, Windows: C:\Program Files\Common Files\Avid\Audio\Plug-Ins\Pulsar Modular\
VST3, Linux: ~/.vst3/
LV2, Linux: /usr/lib/lv2/ (package) or ~/.lv2/ (archive)
To remove it on macOS or Windows, delete the Q BIT files (.vst3, .component, .aaxplugin) from these folders; on Linux, see chapter 7.

It runs on mono and stereo tracks. Your session saves every control and the window size. Every control on the panel but MATCH can be automated, and no change clicks, even while the music plays.

Drag the corner of the window to resize it. Q BIT tells your DAW its latency, and the DAW keeps everything in time.

A fresh insert starts clean: HOLD Off, MODEL Linear, 16 bit at your session rate, MIX all crushed, INPUT and OUTPUT at 0 dB, MATCH off, and the preset name reads INIT. To start from a sound of your own instead, see 5.1.

5.1 Presets

The strip above the panel holds your presets. The name in the middle is the preset you loaded; INIT means none. The arrows step through the presets of the bank, and a dot beside the name means a control moved since the last load or save.

Click the name to open the browser: folders on the left, presets on the right, a search box, and a star on each preset for your favorites. Click a preset to load it, double-click to load it and close. SAVE overwrites the preset you loaded; SAVE AS names a new one. Right-click a preset, or press and hold it, for the rest: rename, a description and tags, export and import, delete, and Save these settings as the startup default, which makes the sound you hear the one every new Q BIT opens with.

Presets are files on your disk. Open Preset Folder in the menu shows the bank, so you can back it up or carry it to another computer.

5.2 A and B

A and B are two complete settings to compare. Click a letter to switch; the lit one is what you hear. COPY makes the other letter match what you hear now, so you can tweak from there and flip back to compare. They are for the moment: your session saves the settings you hear, not both.

5.3 The Menu

The button at the right of the strip opens the menu. About shows the version. License Status opens the license window (5.4). Manuals opens this guide, dark for the screen or print for paper, in English, German or Japanese, and the Quick Guides on the web. Tooltip turns the help strip under the panel on or off for every window. Open Preset Folder shows your presets on your disk. Set Default Size makes the current window width the size every new window opens at.

5.4 License

Q BIT is free, but like every Pulsar Modular plug-in it needs a license: you get the key from pulsarmodular.com. Until Q BIT is activated, it plays a soft noise instead of your audio and the license window opens by itself; License Status in the menu opens it any time. Paste your license key and click Activate: the status line turns green and your audio returns at once, with no restart.

- **Activate:** activates this computer with the key.
- **Deactivate:** frees this computer's seat, even offline; the server hears at the next contact.
- **Refresh:** checks the license now.
- **Account:** opens your account page on the web, where you manage your computers.

The license renews online by itself. Q BIT keeps playing offline for a while; when it needs the server, a line across the top of the panel says so: click it for the license window. If you are leaving the computer for good, deactivate the license first.

CHAPTER SIX

Tips and Troubleshooting

6.1 Starting Points

- **Parallel crunch:** Linear, 4 bit, then MIX toward D.
- **Sixteenth pulse:** HOLD Sync, DIVISION 1/16, SEGMENT just inside the green arc.
- **Triplets over straight drums:** DIVISION 1/8T with SEGMENT around 75 %.
- **Free stutter:** HOLD Free, HOLD RATE 12 to 16 Hz, SEGMENT low.
- **Dark old delay:** M.93 with MULTIPLY at 4x or 8x.

6.2 If Something Seems Wrong

I hear a soft noise instead of my audio. Q BIT is not activated on this computer. Activate it (5.4).

HOLD does nothing. HOLD is Off. Set it to Sync or Free.

Hits sound cut off or missing in Sync. Raise SEGMENT, follow the green arc, or try another DIVISION.

Every pass of my loop sounds different. Trim the loop to whole bars; with a dotted DIVISION, to three bars or a multiple of three.

I cannot find BITS, RATE, MULTIPLY or CHANNELS. BITS and RATE belong to Linear, MULTIPLY to the M.93, CHANNELS to the ZX Spectrum 128. Each model shows only its own boxes.

The ZX Spectrum 128 is silent or crackles. Raise INPUT.

The sound is mono. The ZX Spectrum 128 starts in Mono, like the original. Set its CHANNELS to Stereo.

The help strip says HELP OFF. Click the strip, or choose Tooltip in the menu. The switch is shared by every Q BIT window.

CHAPTER SEVEN

Linux

Q BIT runs on 64-bit Intel and AMD Linux as VST3 and LV2, with glibc 2.34 or newer: Ubuntu 22.04, Debian 12, Fedora 35 or later, Arch and others. Check with getconf GNU_LIBC_VERSION in a terminal. Install one form, not both:

- **Package (.deb):** sudo apt install ./q-bit_*_amd64.deb in a terminal opened in the download folder. For every user on the computer; for an account added later, run sudo dpkg-reconfigure q-bit once.
- **Archive (.tar.gz):** unpack it and run ./install.sh in the unpacked folder. For your account only, with no admin rights.

Then rescan the plug-ins in your DAW, or restart Ardour or Mixbus. Use the VST3 in REAPER, which cannot automate the LV2, and in Bitwig Studio. The LV2 is stereo only: on a mono track, use the VST3.

An update never overwrites a preset. To remove Q BIT, run sudo apt remove q-bit, or ./uninstall.sh in the archive folder; both keep your presets. Before you reinstall Linux, deactivate the license (5.4): Q BIT may count the new installation as a new computer.

7.1 Troubleshooting

Q BIT does not appear in my DAW. Rescan plug-ins or restart the DAW, and check that the system has glibc 2.34 or newer.

Ardour or Mixbus crashes while scanning plug-ins. Q BIT may be installed twice, from the package and from the archive. Remove one of them.

I cannot automate Q BIT in REAPER. Use the VST3.

Crackles at small buffer sizes. Give your user real-time audio rights (your distribution's audio setup guide shows how), then log in again. On a laptop, also set the power profile to Performance.

CHAPTER EIGHT

iPad and iPhone

Q BIT is on the App Store as Q BIT Crusher, for iPad and iPhone, iOS 15 or later. It has the same sound, controls and presets. One download gives you:

- **AUv3 plug-in:** for Logic Pro for iPad, GarageBand, AUM, Cubasis and other AUv3 hosts.
- **Standalone app:** processes the microphone or an interface. It starts with the input muted against feedback: tap Unmute Input. With no DAW to follow, HOLD Sync runs at 120 BPM; for any other rate, use Free.

8.1 Touch

- **Adjust:** drag up or down, or tap the readout to type a value. **Reset:** double-tap.
- **Help:** with the help strip on, touch and hold a control; the strip describes it while your finger rests there.
- **Touch and hold:** a preset or a folder in the browser opens its menu, the one a right-click opens on a computer (5.1). To move one, choose Move to folder... in that menu: a finger only scrolls the browser.
- **INPUT / OUTPUT Link:** this menu entry takes the place of the SHIFT link (chapter 4). While it is on, turning one moves the other the opposite way, except while MATCH is on.

Turn the device sideways for the largest view; held upright, the panel sits in the middle of the screen. There is nothing to activate on iPad and iPhone, and the panel always fits the screen, so the menu has no License Status, Set Default Size or Open Preset Folder. In the app, Manuals opens these guides and the Quick Guides on the web. In the plug-in, Manuals copies the link instead: paste it into your web browser.

8.2 Presets on iPad and iPhone

Your presets live inside the app, shared by the plug-in and the app. Updates never touch them. The EXPORT button, or Export preset... in a preset's menu, shares a preset through the share sheet; IMPORT brings one in from Files, into the folder you have open. Deleting the app deletes your presets: export them first.

Appendix: Credits and Independence

Independence

Q BIT is not affiliated with, and is not endorsed by, the makers of the machines its models follow. All trademarks belong to their respective owners.

Credits

Q BIT is a product of **Pulsar Modular**.

Concept, Workflow & GUI Design:	Hisham Sidawi
DSP Coding:	Mesut Saygıoğlu
Additional Algorithms:	Ziad Sidawi
Quality Control:	Burak Öztop
iOS & Linux Development:	Burak Öztop
User Guide:	Ziad Sidawi
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Please kindly report any errors or omissions in this user guide to psupport@pulsarmodular.com.

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