STELLARIS OWNER'S MANUAL

Stellaris recreates the additive flagship of 1996, from Hamamatsu's other piano maker: 64 harmonics per source under a formant filter, in the S model with macro knobs and an arpeggiator. In Stellaris the original's own operating system 4.04 runs on an emulated processor, and the additive voices it drives are rebuilt from what it writes to the sound chips. This manual shows how to give Stellaris the files it needs, how to play and select its sounds from the panel, how to drive its knobs from your DAW or a MIDI controller, and how to use banks E and F, Level match and DEMO.

After the additive flagship · 1996

Formats VST3 · CLAP · AU (macOS) · LV2 (Linux)

Systems macOS 11+ (Apple Silicon and Intel) · Windows 10+ 64-bit · Linux 64-bit (glibc 2.35+)

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CHAPTER 0

ABOUT THIS MANUAL

This is the manual of Stellaris 0.1.1, the second alpha. It covers Stellaris's own panel and functions: the knobs and keys, the ROM panel, Level match, the expansion banks, DEMO and how Stellaris works in a DAW. The original's operating system runs inside Stellaris unchanged, so its pages on the display (editing a single, the multis, the system settings) work as the S model's owner's manual describes them. This manual shows how to reach them, not every parameter on them.

Stellaris is an alpha: it plays, but parts of the sound are still approximations. Appendix A says which.

Conventions

WRITTEN AS	MEANS
EDIT	A key on Stellaris's panel, as it reads there.
Cutoff	A knob on the panel.
ROM files…	A menu item or button of Stellaris's own, as it reads on screen.
`A001 PowerK5K`	Text on the original's display.
A001	A single: bank A, number 001. Multis are M01 to M64.

The screenshots show Stellaris 0.1.1 on macOS, with the factory banks. None of the original's files comes with Stellaris. Click any screenshot to open it at full size.

CHAPTER 1

INTRODUCTION

The original builds each sound from up to six sources. An additive source adds up to 64 harmonics, each with its own level and envelope, then passes them through a formant filter that can move over time. A PCM source plays one of the instrument's sampled waves. Two-cell filters, amplifiers, LFOs and effects follow. The S model adds the macro controls on its panel: knobs that move groups of parameters while you play.

How Stellaris plays it

`MIDI · PANEL` → `OS 4.04 ON AN EMULATED FR30` → `ADDITIVE AND PCM VOICES` → `EFFECTS` → `OUTPUT`

- **The operating system is the original's own.** Notes, controllers, program changes and SysEx reach it as they reached the instrument's MIDI IN, and its keys, knobs and display are the panel's. Singles, multis, the arpeggiator, the macro controls and the system settings behave as on the S model.
- **The voices are rebuilt.** What the OS writes to the sound chips (harmonic levels, envelopes, the formant filter, the DCF, the PCM wave and its pitch) drives Stellaris's own additive engine. Harmonic and formant levels follow Jens Groh's measurements on the real instrument.
- **The effects are imitations.** The original's effect processors run code nobody can run yet, so Stellaris imitates each effect type from its parameters.

What Stellaris adds

- **A panel to play from**: the rack version's display, keys and VALUE dial with the S model's knobs, as one resizable window.
- **Host parameters and MIDI learn** for every knob.
- **Level match**, which brings every single to about the same loudness.
- **A memory expansion that is always fitted**, for banks E and F.
- **DEMO**, which plays the S model's three demo songs when you have their files.

CHAPTER 2

SETTING UP

What you need

- **macOS 11 or later**, Apple Silicon or Intel: VST3, AU or CLAP. **Windows 10 or later**, 64-bit: VST3 or CLAP. **Linux**, 64-bit with glibc 2.35 or later: VST3, CLAP or LV2.
- A DAW or host that plays instrument plugins.
- **The original operating system 4.04**, the `.SYS` file of the S model's update disk. It does not come with Stellaris: you give it to Stellaris once, and Stellaris keeps a copy. The rack version's build of the same file is not accepted.
- Optionally, **the factory banks** `Abankint.kaa` and `ABank300.KAA` for banks E and F, and **the three demo songs** (`.MID` files) of the S model's supplement disk for DEMO.

Installing

Install Stellaris with DDS Hub, which also asks for the files above and keeps them where Stellaris finds them. You can also install it by hand from the downloads page: put `Stellaris.vst3`, `Stellaris.clap`, `Stellaris.component` (macOS) or `Stellaris.lv2` (Linux) in your system's plugin folder, then rescan the plugins in your DAW. Stellaris is listed by Digital Dream Synths, among the instruments.

The first start

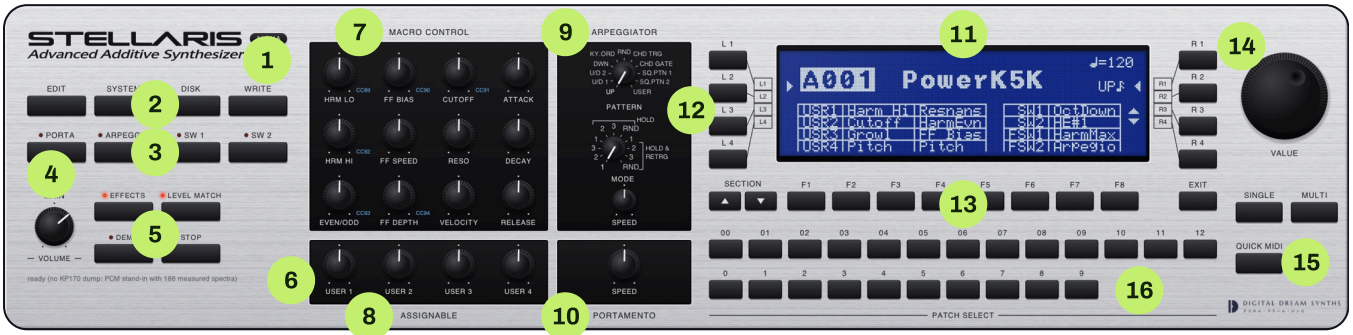
Add Stellaris to an instrument track. While the emulated original starts, its display reads `booting`; after a moment it shows single A001. If the operating system is missing, the ROM panel opens over the panel by itself: drop the `.SYS` file on it, or click **Load…** and choose it. Stellaris recognises it, keeps a copy and starts without being reloaded. If the factory banks and the demo songs are in the same folder, it takes them too, and they count from this first start.

Stellaris is an instrument with a stereo output and no audio input. It runs the original at its own sample rate and converts to your session's rate.

CHAPTER 3

THE PANEL

The panel joins two versions of the original. The display, its keys, the VALUE dial and the mode keys are the rack version's; the knobs, the arpeggiator, the switches and the patch keys come from the S model's keyboard. The window can be resized from its corner and keeps the panel's proportions.



Stellaris's panel, playing A001 PowerK5K. The numbers match the list below.

1. The **name**, with a badge for the release channel: **Alpha** for this version.
2. EDIT SYSTEM DISK WRITE, the original's mode keys: they open the operating system's edit, system, disk and write pages on the display (chapter 5).
3. PORTA ARPEGGIO SW 1 SW 2 switch portamento, the arpeggiator and the two assignable switches on and off. Their LEDs are the operating system's.
4. **Main volume**, Stellaris's output level: −24…+12 dB, 0 dB by default (chapter 10).
5. Stellaris's own keys: EFFECTS and LEVEL MATCH switch the effects and Level match on and off, with an LED; DEMO and STOP play and stop the demo songs.
6. The **status line**: the demo song playing, a knob waiting for a MIDI controller, or what Stellaris has to say, for example that the PCM waves play a stand-in.
7. **Macro control**: twelve knobs that move groups of parameters of the single playing (chapter 6).
8. **Assignable**: **User 1** to **User 4**, whose targets each single sets.
9. **Arpeggiator**: the **Pattern** and **Mode** switches and its **Speed**.
10. **Portamento**: its **Speed**.
11. The **display**, the operating system's own, 240 × 64 dots. Right-click it for its menu: colours and the ROM panel.
12. L 1 … L 4 and R 1 … R 4 choose the line of the display beside them.
13. F1 … F8 choose the item above them on the display's bottom line. ▲ ▼ (**Section**) move between the display's sections, and EXIT goes back.
14. The **VALUE dial** changes the value the cursor is on. Drag it up or down, or turn the mouse wheel over it.

15 SINGLE MULTI choose single or multi mode; QUICK MIDI opens the operating system's quick MIDI page.

16 **Patch select**: 00 ... 12 choose a group of ten, 0 ... 9 the number in it (chapter 4).

> **NOTE**
>
> The panel has no wheels, ribbon, floppy drive or headphone socket: your MIDI keyboard and DAW take their place. A click on a key holds it as long as the mouse button is down, so keys the operating system reads as held (such as WRITE with another key) work one at a time only.

CHAPTER 4

SELECTING AND PLAYING

A **single** is one sound of up to six sources. A **multi** layers or splits up to four singles, each on its own MIDI channel. Stellaris starts in single mode on A001.

From the panel

1. **Choose single or multi mode, and the bank.**
   Press SINGLE or MULTI. Each press of SINGLE in single mode moves to the next bank: A, D, then E and F on the memory expansion.

2. **Choose a group of ten.**
   Press 00 to 12: 01 is 010–019, 05 is 050–059, and so on.

3. **Choose the number.**
   Press 0 to 9. 01 then 4 selects A014.

Stellaris follows what you select on the panel: Level match and the project's state use it.



Single pressed again: bank D, D001 DaLead. Again: E001 Runner, then F001 Sphaera.



Multi: M01 MegaPowr and its four sections.

From MIDI

Stellaris passes everything your DAW sends to the original's MIDI IN, so program changes and bank select work as on the instrument. Bank select (control change 0) chooses the bank, program change the number:

BANK SELECT (CC 0)	BANK	PROGRAM CHANGE 0…127
100	A, the factory singles of OS 4.04	A001…A128 (A001…A100 are named)
101	Multis	M01…M64
102	D, the factory singles of OS 4.04	D001…D128 (D001…D040 are named)
103	E, on the memory expansion	E001…E128

BANK SELECT (CC 0)	BANK	PROGRAM CHANGE 0…127
104	F, on the memory expansion	F001…F128

The operating system answers on the channels set in its SYSTEM pages. Stellaris remembers the bank and program of MIDI channel 1 with your project (chapter 13).

CHAPTER 5

THE DISPLAY AND ITS KEYS

The display shows the operating system's pages exactly as the original does. The keys around it choose what is on it: L 1 ... L 4 and R 1 ... R 4 the line beside each key, F1 ... F8 the item above each key on the bottom line. The VALUE dial changes the value under the cursor and EXIT goes back.



Edit: the single's menu. L1–L4 and R1–R4 open its sections; F1–F6 choose the source (P a PCM source, A an additive one).

EDIT opens the editing menu of the single or multi playing, SYSTEM the system settings (MIDI, the arpeggiator, the foot switches, tuning), WRITE stores an edited single. For every page, see the S model's owner's manual.



System: Protect is off, so editors can write to banks E and F (chapter 11).

> **NOTE**
>
> Stellaris keeps the singles in banks A and D only until it is closed: the operating system accepts an edit stored there, but its flash memory is not emulated yet. Store your own singles in banks E and F, which Stellaris keeps (chapter 11). DISK opens the disk pages, but Stellaris has no floppy drive.

CHAPTER 6

KNOBS AND SWITCHES

The knobs are the S model's realtime controls. Each sends to the operating system what the instrument's knob sends, so the single playing reacts as it would on the original, and the change is heard on every note already sounding.

Using a knob

- **Drag** up or down. With SHIFT the knob moves five times finer. On **Pattern** and **Mode**, click a position's name to jump to it.
- **Turn the mouse wheel** over it: one step a notch.
- **Double-click** it to send it back to its start: the middle (no change) for the macro and user knobs, 120 BPM for the arpeggiator's speed, UP and 1 for its switches.
- While you turn a knob, its value is shown above it.

Macro control and assignable knobs

The middle position of each knob is *no change*; turning it left or right lowers or raises its parameters from the values the single stores. The knobs send these MIDI controllers, which the operating system also takes from your keyboard or DAW:

KNOB	CONTROLLER	KNOB	CONTROLLER
Hrm lo	16	Hrm hi	17
FF bias	18	FF speed	19
Cutoff	74	Reso	77
Attack	73	Decay	78
Even/odd	71	FF depth	75
Velocity	76	Release	72
User 1 … User 4	80 … 83	Portamento speed	5

Hrm lo, Hrm hi

The level of the lower and of the upper harmonics: the low and the high end of every note, not the low and high notes.

Even/odd

The balance of even and odd harmonics: to the right more even ones, to the left more odd ones.

FF bias, FF speed, FF depth

The formant filter's centre, and the speed and depth of the LFO or envelope that moves it.

Cutoff, Reso

The DCF's cutoff and resonance.

Attack, Decay, Release

The attack, first decay and release times of the DCA and DCF envelopes.

Velocity

How much the single responds to how hard you play.

User 1 … User 4

Whatever the single assigns to them, two targets each. The play page shows them as `USR1` to `USR4`.

The arpeggiator

Switch it on with ARPEGGIO. **Pattern** and **Mode** are eleven-position switches: click a position's name to jump to it, or drag the knob.

Pattern

UP, U/D 1, U/D 2, DWN, KY.ORD (the order you play), RND, CHD TRG and CHD GATE (chords), SQ.PTN 1 and SQ.PTN 2 (sequence patterns), and USER: one of the eight user patterns, chosen with the VALUE dial.

Mode

1, 2 and 3; HOLD 1, 2, 3 and RND; HOLD & RETRG 1, 2, 3 and RND. In the HOLD positions the arpeggio goes on after you release the keys.

Speed

The tempo, from 10 to 300 BPM; 120 in the middle.

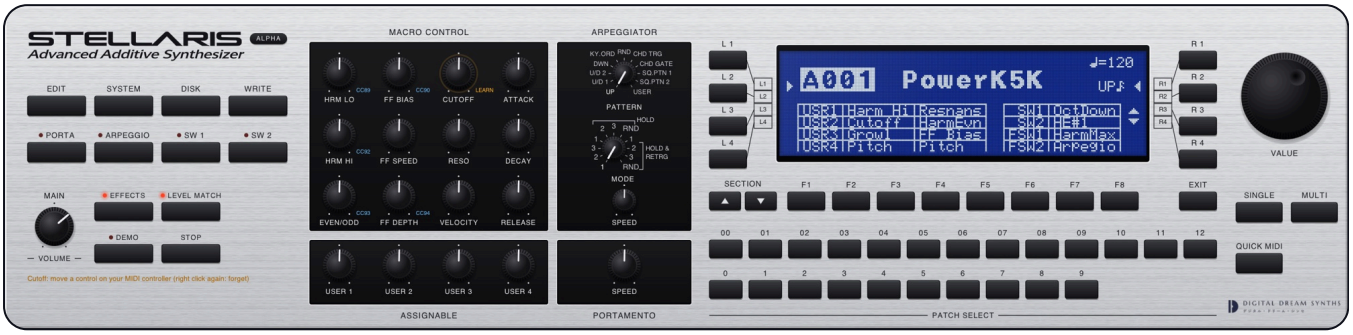
Portamento and the switches

PORTA switches portamento on and off; **Speed** under **Portamento** sets its time. SW 1 and SW 2 are the S model's assignable switches; the play page shows what each single gives them, for example `SW1 OctDown`.

CHAPTER 7

AUTOMATION AND MIDI LEARN

Every knob is a parameter your DAW can automate, named as on the panel (*Cutoff*, *Formant bias*, *Arpeggio pattern* ...), along with *Volume*, *Effects* and *Level match*. Any knob, Main volume included, can also follow a controller of your MIDI keyboard.



Cutoff waiting for a controller. The blue marks show the controllers other knobs follow.

1. **Right-click the knob**
   (or control-click it). A ring blinks around it and the status line asks for a controller.

2. **Move a knob or slider on your MIDI controller.**
   The knob now shows the controller's number, for example CC91, and follows it.

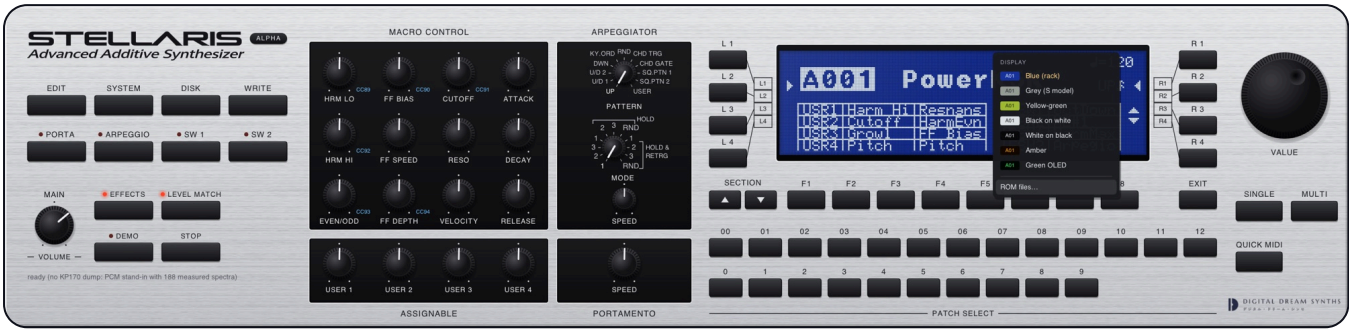
3. **To forget it**
   , right-click the knob again while it waits.

A learned controller drives the knob instead of reaching the original, and one controller drives one knob at a time. Your project keeps the assignments, and so does Stellaris: a new instance starts with the ones you learned last.

CHAPTER 8

THE DISPLAY MENU

Right-click the display (or control-click it) for its menu.



The display menu: the colour schemes, then **ROM files…**

Colours

Blue (rack), the default, Grey (S model), Yellow-green, Black on white, White on black, Amber and Green OLED. Stellaris remembers your choice for every instance.

ROM files…

Opens the ROM panel, to see which of the original's files Stellaris has or to give it more.

CHAPTER 9

THE ROM PANEL

Stellaris runs the original's operating system, which is not ours to give away, so it comes without it, and without the factory banks and demo songs. You give it your copies once. Stellaris recognises each file by its size and SHA-256, keeps a copy and checks it again at every start. The files stay on your computer: nothing is sent anywhere.



The ROM panel with all six files, just after the third demo song was dropped on it.

Giving a file

- **Drop it** on Stellaris's window while the ROM panel shows (macOS), or
- click **Load…** (or anywhere in the dashed area) and choose it.

A file Stellaris knows turns its slot green, and the panel says where it was kept. A file it does not know is not kept: the panel shows its size and SHA-256 so that you can compare them with the list below.

One file gives the set. Stellaris also looks at the other files in the same folder and takes each one that fills a slot still empty. Keep your files together in one folder, and giving any one of them gives Stellaris all of them. It reads only the files of a size an empty slot takes and keeps only those it knows by their SHA-256. It does not look into the folders inside, and the files beside the one you give never replace a file it already has. Each slot just given says so, with the name of its file. Dropping several files from one folder works the same way.

The ROM panel opens by itself while the operating system is missing, and Stellaris starts as soon as it has it, with the files that came with it. The other files count from the next start. With the operating system present, **Close** (or ESC) closes the panel; without it the button reads **Look again**.

The files

SLOT	FILE	SIZE	WHAT IT GIVES
Operating system *(required)*	The `.SYS` file of OS 4.04, the S model's build	1,048,576 bytes	The instrument itself.

SLOT	FILE	SIZE	WHAT IT GIVES
Bank E	`Abankint.kaa`, bank A of the first OS	134,660 bytes	Bank E of a new memory expansion, and the sounds the demo songs were written for.
Bank F	`ABank300.KAA`, bank A of OS 3.00	134,660 bytes	Bank F of a new memory expansion.
Demo songs 1–3	The three `.MID` files of the S model's supplement disk	45,606 · 61,183 · 62,283 bytes	The songs DEMO plays.

DDS Hub shows the same list in Stellaris's page and keeps the files in the same folder, so what you give one, the other sees. Appendix B gives the folder for each system.

> **NOTE**
> Only the S model's build of OS 4.04 is accepted: its SHA-256 begins with 8da1e5d1. The rack version's file has the same name but another content: its SHA-256 begins with 1b0b0f91.

CHAPTER 10

LEVEL MATCH AND OUTPUT

The original's singles differ a lot in loudness, and in the emulation the spread between the softest and the loudest is still about 50 dB, more than on the instrument. **Level match** evens it out: every single plays at about −22 LUFS for a note at velocity 100, with peaks around −12 dBFS.

- Stellaris recognises a single by its content, in any bank: the factory singles of A and D and every single of the factory banks, E and F included, have their own gain. A single it does not know gets the median gain, +8.8 dB.
- Level match applies to singles. In multi mode and during DEMO the sound is the emulation's own.
- LEVEL MATCH switches it off to hear the raw emulation. Your DAW can automate it.

Main volume

Stellaris's output level, −24…+12 dB, after everything else; 0 dB by default. Double-click it for 0 dB; the mouse wheel moves it 0.5 dB a step.

Effects

EFFECTS switches the effects off and on, to hear the voices alone.

Safety limiter

The output never goes above −1 dBFS: a limiter catches any peak above it, so a misbehaving single cannot blast your speakers.

The original's own Master VOL (SYSTEM) and MIDI volume work as on the instrument, before all this.

CHAPTER 11

EXPANSION BANKS E AND F

On the S model, banks E and F live on the memory expansion, an optional memory card. In Stellaris it is always fitted, and its memory is a file Stellaris keeps in its data folder, the way the card's battery kept it.

- **The first time**, the card gets bank A of the first OS in E (the singles of the demo songs: Runner, Creaturz, Clavaxx...) and bank A of OS 3.00 in F (Sphaera, StageMKI, AnlogKit...), if you have given those files. Without them E and F start blank.
- **Singles you store in E and F stay**, also those an editor sends over SysEx. Stellaris turns the operating system's `Protect` off after it starts, so that editors can write there.
- **To load another bank** into E or F, put any `.KAA` bank file in Stellaris's data folder (appendix B) as `E.kaa` or `F.kaa`. At the next start it replaces that bank. Giving a factory bank again on the ROM panel does the same.
- **To start over**, delete the card's `.bin` file from the data folder while Stellaris is closed.

Stellaris saves the card when your DAW stops it or closes it. Several instances share the same card: the last one to save wins.

CHAPTER 12

DEMO

The S model's supplement disk has three demo songs, written for the singles of the first OS's bank A. With the songs and that bank on the ROM panel, DEMO plays them on the emulated original.

- DEMO starts a song, and the next one each time you press it; its LED is lit while a song plays. STOP stops it.
- The status line shows the song's number, for example **Demo 1/3**, how far it has played and how long it is.
- While a song plays, bank A holds the first OS's singles; when it stops, the factory bank A comes back unchanged.

Without the files, DEMO does nothing and the status line says which files to give. Bank A of the first OS and any one of the songs are enough.

CHAPTER 13

STELLARIS IN YOUR DAW

Parameters

Volume, *Effects*, *Level match* and the twenty knobs, in the panel's order. The arpeggiator's *Pattern* and *Mode* take the values 0–10, one for each position.

What the project keeps

The parameters, the learned controllers, and the bank and program selected on MIDI channel 1, from your DAW or the panel. Reopening the project selects them again.

MIDI

Everything your DAW sends reaches the operating system: notes, controllers, program changes, bank select and SysEx, on the channels it is set to receive.

Several instances

Each runs its own emulated original. They share the files of the ROM panel, the memory expansion, the learned controllers and the display colours.

The window

Drag its corner to resize it; the panel keeps its proportions.

APPENDIX A

KNOWN LIMITS

- **PCM sources play a stand-in.** Nobody has dumped the original's wave ROM yet, so a PCM source plays a wave built from spectra measured on recordings of the factory singles, at the right pitch. About three quarters of the PCM notes of the factory singles have a measured spectrum; the others play a sawtooth or, for noisy waves, filtered noise.
- **The effects are imitations** made from their parameters: their character is not yet matched to recordings.
- **Banks A and D forget your edits** when Stellaris closes: their flash memory is not emulated yet. Use E and F.
- **No graphic editor yet**: edit on the panel, as on the instrument, or with an editor for the original over MIDI.
- **No floppy drive**: the DISK pages open, but there is no disk to read.
- **Drag and drop** on the ROM panel works on macOS only; on Windows and Linux use Load….
- It is an **alpha**: tell us what does not work, from DDS Hub.

APPENDIX B

FILES AND FOLDERS

WHAT	MACOS	WINDOWS	LINUX
The original's files (the ROM panel's)	`~/Library/Application Support/Digital Dream Synths/ROM/stellaris/`	`%APPDATA%\Digital Dream Synths\ROM\stellaris\`	`~/.local/share/digital-dream-synths/rom/stellaris/`
Stellaris's data	`~/Library/Application Support/Digital Dream Synths/stellaris/`	`%APPDATA%\Digital Dream Synths\stellaris\`	`~/.local/share/digital-dream-synths/stellaris/`

On Linux, `$XDG_DATA_HOME` replaces `~/.local/share` when it is set. The ROM folder holds one file per slot, named after it: `os.rom`, `bank-e.rom`, `bank-f.rom`, `demo-1.rom` … `demo-3.rom`. The data folder holds:

The `.bin` file
The memory expansion: banks E and F (512 KB). It is the only `.bin` file there.

`knobs.txt`
The controllers learned for the knobs.

`ui.settings`
The display's colours.

`E.kaa`, `F.kaa`
Only if you put them there: a bank to load into E or F at the next start.

On macOS, the first start moves the files of earlier test builds from `~/Library/Application Support/Stellaris` into the data folder.

APPENDIX C

TROUBLESHOOTING

The ROM panel says the operating system is missing

Give it the `.SYS` file of OS 4.04 from the S model's update disk. If the panel says the file is not one Stellaris knows, check its size and SHA-256 against the table: the rack version's file of the same name is not accepted.

My DAW does not list Stellaris

Rescan the plugins, and check that the plugin is in the folder your DAW scans. On macOS, Stellaris's AU and VST3 are universal; on Windows and Linux they are 64-bit only.

Studio One lists Stellaris but does not load it (Windows)

Stellaris has changed folder, for example when DDS Hub moved it to the folder for all users, and Studio One still remembers the old one. In Studio One's Plug-In Manager, choose **Remove Plug-In Settings**, confirm and restart Studio One; updating the plug-in list is not enough. Studio One then scans all your plugins again, which takes a few minutes; your favourites and folders stay. If another plugin stalls the scan, **Skip** leaves that plugin out until the next full scan.

The Demo key is dark

Give the demo songs and bank A of the first OS on the ROM panel, then reopen Stellaris.

Banks E and F are empty

Give `Abankint.kaa` and `ABank300.KAA` on the ROM panel and reopen Stellaris, or load a bank as `E.kaa` or `F.kaa` (chapter 11).

A single is much louder or softer than the others

Check that LEVEL MATCH is lit. In multi mode, and for singles Stellaris does not know, the level is the emulation's own.

A knob does not move the sound

Not every single uses every macro control; the assignable knobs do only what the single assigns to them. A knob with a learned controller follows that controller only.

Stellaris is part of Digital Dream Synths, a free, non-profit collection of emulations of 1990s synthesizers. The instrument that inspired this plugin is not named in this manual: its name is a trademark of its owner. Digital Dream Synths is not affiliated with, endorsed or sponsored by any instrument maker. Stellaris contains none of the original's files: the operating system, banks and demo songs are the user's own.

Stellaris owner's manual, version 0.1.1 alpha, October 2026.