

# **superOS-909**

**OWNER'S MANUAL**

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### PRECAUTIONS:

Installing this firmware means replacing the program EPROM, which you do entirely at your own risk. Moving from the original firmware erases the pattern memory at the first start (Basic Course 1), and its SysEx dumps cannot be loaded into this firmware. Keep a dump made with the original firmware if you may want to go back to it. We are not responsible for damage to your instrument, loss of data, or any reduction in the value of vintage hardware resulting from installation, modification, or use of this firmware.

## INTRODUCTION

### 1 ABOUT SUPEROS-909

superOS-909 is replacement firmware for the TR-909. It goes into the 8 KB program EPROM socket; nothing else on the boards changes. The sounds, the panel and the way you write patterns stay as they were. Everything this manual does not describe works exactly as on the original firmware.

What it adds is control while the machine plays: switch between playing and writing without stopping, change pattern or bank at once, mute and solo voices, give each instrument its own length, let the pattern run backward or at random, repeat or loop voices live, and drive it all over MIDI.

#### A. WHAT IT ADDS

- Starts in Pattern Play, ready to play. Formats its own memory when the memory is blank or corrupt.
- Pattern Play and Pattern Write, step write and tap write all switch while running.
- Instant pattern change, and bank change from Pattern Play.
- A mute layer with solo, mirrored by MIDI CCs.
- A free MIDI note for every key of the EXT INST lane.
- Per-instrument lengths, locked to the pattern or running as a polymeter, and nudge.
- Randomize per instrument, at 16 densities.
- Pattern direction: forward, backward, ping-pong or random.
- Repeat layer (note repeat at 1/4 to 1/32) and reslice layer (live loops).
- MIDI pattern select by program change and by note, switchable MIDI thru and clock output.
- A whole-memory SysEx backup and an editor that reads and writes it.

To make room, the cassette save, verify and load and the cartridge copy were removed, and Track mode stores fewer measures (Reference 3).

### 2 HOW TO USE THIS MANUAL

The Basic Course covers what changes the moment you switch on. The Intermediate Course covers the pattern functions, the Advanced Course the live layers and Track mode. The Reference lists the MIDI messages, the backup and a one-page summary of every key combination.

#### A. PANEL NAMES

Controls are written as they are printed on the panel, for example **SHIFT**, **CLEAR**, **EXT INST**, **INST SELECT**, **LAST STEP**, **SCALE**, **SHUFFLE/FLAM**, **CYCLE**, **TEMPO**, **BACK**, **FWD**, **AVAIL MEAS**, **TAPE SYNC**, **ENTER**, **START** and **STOP/CONT**. There are four **TRACK** keys, three **PATTERN GROUP** keys and 16 main keys, **1** to **16**.

## B. HOW KEY COMBINATIONS ARE WRITTEN

- **SHIFT** + **CYCLE**: hold the first key, then press the second.
- **Tap**: press and release with no other key held.
- **Running**: the sequencer is started. **Stopped**: it is not.
- LEDs: ○ off, ● lit, ● blinking.
- **1** is the three-digit display, blanks included.

The black **WORKS IN** tab at the top of a section says in which mode, and whether stopped or running, the section applies.

## BASIC COURSE

## 1 POWER-ON AND MEMORY FORMAT

## A. POWER-ON

The machine starts in **Pattern Play, group I, pattern 1, stopped**, with the display blank. Press **START** and pattern 1 plays. **TRACK 1** takes you to Track Play.

| HELD WHILE SWITCHING ON                 | RESULT                                    |
|-----------------------------------------|-------------------------------------------|
| nothing                                 | Pattern Play, group I, pattern 1, stopped |
| <b>TRACK 1</b>                          | Version display: main key 6 blinks        |
| <b>TRACK 1</b> + <b>PATTERN GROUP I</b> | Memory format                             |

## B. MEMORY FORMAT

A format erases every pattern and every track in both banks. No demo patterns are written. It also sets the EXT INST notes back to 36 to 51, MIDI thru back to on and MIDI clock output back to always.

| 1 Format the memory |                                                                         |                                            |                                                           |
|---------------------|-------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------|
|                     | Operation                                                               | Result                                     | Notes                                                     |
| 1                   | Switch the power off.                                                   |                                            | Back up first if you want to keep anything (Reference 2). |
| 2                   | Hold <b>TRACK 1</b> and <b>PATTERN GROUP I</b> and switch the power on. | The memory is erased.                      |                                                           |
| 3                   | Release the keys.                                                       | Pattern Play, group I, pattern 1, stopped. |                                                           |

The memory is now empty and ready to write.

## C. AUTOMATIC FORMAT

At every power-on the firmware checks that its memory is set up, and formats it by itself if it is not. A new machine, a flat backup battery or no battery at all therefore comes up empty and ready to play rather than full of random data. Very rarely, random memory can pass the check. If the machine ever starts with nonsense patterns, format it by hand as above.

## D. FIRST START AFTER ANOTHER FIRMWARE

Memory written by the original firmware does not pass the check, so the first start formats it and **every pattern and track is erased**. Dumps made with the original firmware cannot be loaded into this one (Reference 2).

Memory from an earlier superOS-909 build keeps its patterns, but its tracks are cleared once, because this build stores its instrument lengths and directions where the old Track mode kept its songs.

## 2 SYNC MODE AND MIDI SETTINGS

### A. SYNC MODE

**WORKS IN** Any mode, stopped

**SHIFT** + **TAPE SYNC** steps through internal clock, MIDI sync and DIN sync. The display shows which one is selected; hold **TEMPO** to see it again at any time.

| MODE           | DISPLAY                    |
|----------------|----------------------------|
| Internal clock | the tempo, for example 120 |
| MIDI sync      | 1                          |
| DIN sync       | 2                          |

MIDI Start and Continue are obeyed only in MIDI sync. MIDI Stop stops the machine in every mode. In DIN sync the machine stops as soon as the master stops.

While running, **SHIFT** + **TAPE SYNC** opens the reslice layer instead (Advanced Course 2).

### B. MIDI THRU ON OR OFF

**WORKS IN** Pattern Play, stopped

Press **CYCLE**. Each press switches MIDI thru on or off; while you hold the key the display shows 1 (on) or 0 (off). The setting is kept when the power is off. On is the default.

- **Thru on:** notes, controllers, program changes, pitch bend, pressure and SysEx received at MIDI IN are copied to MIDI OUT.
- **Thru off:** only SysEx is still copied.
- Either way, received MIDI Start, Continue and Stop are always passed on, and received MIDI clock is passed on in MIDI sync.

### C. MIDI CLOCK OUTPUT

**WORKS IN** Pattern Play, stopped

Hold **BACK** and press **CYCLE**. On the internal clock, each press switches between sending MIDI clock all the time and only while running; while you hold the keys the display shows the new setting. The setting is kept when

the power is off.

| DISPLAY | MIDI CLOCK OUT       |
|---------|----------------------|
| 1       | Always (the default) |
| 0       | Only while running   |

In MIDI or DIN sync the machine passes the master's clock on to MIDI OUT, whatever this setting.

## D. MIDI CHANNELS

**WORKS IN** Pattern Play or Track Play, stopped

**LAST STEP** + main key sets the send channel (EXT INST notes and mute CCs). **SHUFFLE/FLAM** + main key sets the receive channel and turns omni off. While either key is held the display shows its channel. Both work as on the original firmware, but now from Pattern Play too.

### NOTE:

The channels are not kept when the power is off. At every power-on the receive channel is 10 and the send channel is 11.

## 3 WRITING WHILE RUNNING

**WORKS IN** Pattern Play and Pattern Write, running

- **SHIFT** + the lit **PATTERN GROUP** key switches between Pattern Play and Pattern Write without stopping. The pattern keeps its place. The group LED blinks 🎵 in Pattern Write.
- In Pattern Write, **SHIFT** + **TEMPO** selects step write and **SHIFT** + **BACK** selects tap write, running or stopped. Steps are written while the pattern runs; stopped, the main keys pick the pattern to write, as before.
- Entering Pattern Write selects BD for step write. **INST SELECT** + main key picks another instrument.

## A. ROLLING ACROSS THE KEYS

In step write you can roll a finger across the main keys: every key you touch sets its step, without lifting in between. In every other mode the keys work as before, so a held key and a second key still make a chord.

## 4

## CHANGING PATTERNS AND BANKS

## WORKS IN

Pattern Play, stopped or running

| KEYS                    | RESULT                                                                                                                                                                        |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| main key                | A new chain, which starts when the current chain ends (as before).                                                                                                            |
| <b>SHIFT</b> + main key | Switches to that pattern <b>at the next step</b> , keeping the step position. The chain then carries on from that pattern. Last step, scale, shuffle and flam change with it. |
| <b>AVAIL MEAS</b>       | Bank II.                                                                                                                                                                      |
| <b>FWD</b>              | Bank I.                                                                                                                                                                       |

A bank change happens at once when stopped, and at the end of the current chain when running. The bank LED shows the bank.

Patterns can also be selected over MIDI by program change or by note (Reference 1).

## INTERMEDIATE COURSE

### 1 MUTE AND SOLO

**WORKS IN** Pattern Play and Pattern Write, stopped or running

The mute layer turns the main keys into one mute key per instrument. Mutes stay in force when you leave the layer, so you can open it, set the mutes and go back to writing.

| MAIN KEY   | 1 / 2 | 3 / 4 | 5 / 6 | 7 / 8 | 9 / 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|------------|-------|-------|-------|-------|--------|----|----|----|----|----|----|
| Instrument | BD    | SD    | LT    | MT    | HT     | RS | HC | CH | OH | CR | RD |

| 1 Mute instruments |                            |                                                                |                                                                      |
|--------------------|----------------------------|----------------------------------------------------------------|----------------------------------------------------------------------|
|                    | Operation                  | Result                                                         | Notes                                                                |
| 1                  | Tap <b>EXT INST</b> .      | STEP and TAP light ●●. The main-key LEDs show the mutes.       | You are in the mute layer.                                           |
| 2                  | Press a main key.          | That instrument is muted; its LED stays lit ●.                 | Press again to unmute. Unmuted keys flash as their instrument plays. |
| 3                  | Press <b>CLEAR</b> .       | Every instrument is unmuted.                                   |                                                                      |
| 4                  | Tap <b>EXT INST</b> again. | STEP and TAP go off; the main keys return to their normal job. | The mutes stay in force.                                             |

| 2 | Solo instruments                                           |                                                                                                                                                              |                                                      |
|---|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
|   | Operation                                                  | Result                                                                                                                                                       | Notes                                                |
| 1 | In the mute layer, hold <b>SHIFT</b> and press a main key. | Only that instrument plays. While running, STEP and TAP blink  once a beat. | Stopped they stay lit.                               |
| 2 | Press other main keys (no <b>SHIFT</b> needed).            | Each adds or removes an instrument from the solo.                                                                                                            | Removing the last one ends the solo.                 |
| 3 | Press <b>CLEAR</b> .                                       | The solo ends and your earlier mutes come back.                                                                                                              | <b>CLEAR</b> does not clear the mutes during a solo. |

## A. LEAVING THE LAYER

Tap **EXT INST**, or change mode: **SHIFT** + **PATTERN GROUP**, **SHIFT** + **TEMPO**, **SHIFT** + **BACK**, a **TRACK** key, or, in Pattern Write, **SHIFT** + **EXT INST** (which goes on into the EXT INST lane). Mutes and a solo stay in force until you clear them or switch off. Tap **EXT INST** in any pattern mode to see them again.

### NOTE:

- A mute stops new hits; a sound already playing rings out.
- Muted instruments are silent from the main keys too (tap write, and auditioning with **INST SELECT**), and in the repeat layer.
- CH mutes the closed hat at both levels and leaves the open hat. OH mutes only the open hat.
- In the layer the main keys are mute keys only; **INST SELECT** does nothing there.
- Mutes are not stored and do not work in Track mode.
- Every mute change sends a MIDI CC, and received CCs set the mutes (Reference 1).

## 2 EXT INST LANE AND NOTES

**WORKS IN** Pattern Write, stopped or running

The EXT INST lane is 16 extra tracks stored with each pattern, one per main key, which play MIDI notes on the send channel. Each key now has a note of your choice (36 to 51 after a format), kept in memory. The lane always plays; you only open it to see and write it.

## A. WRITING THE LANE

**SHIFT** + **EXT INST** opens and closes the lane, and leaves the mute layer if it was open. In the lane the main keys write the steps of the selected track, and **INST SELECT** + main key picks which of the 16 tracks you write, as it picks an instrument normally. Step write and tap write work as usual.

| 1 Set the note of a key |                                                        |                                                        |                                              |
|-------------------------|--------------------------------------------------------|--------------------------------------------------------|----------------------------------------------|
|                         | Operation                                              | Result                                                 | Notes                                        |
| 1                       | In the lane, hold <b>SHIFT</b> and press the main key. | The display shows its note, for example <b>36</b> .    | The number stays after you release the keys. |
| 2                       | Press <b>FWD</b> or <b>BACK</b> .                      | The note goes up or down by one and is stored at once. | Range 0 to 127.                              |
| 3                       | Press any main key without <b>SHIFT</b> .              | The display returns to normal.                         | That key also writes its step.               |

Leaving the lane, opening the mute layer or changing mode also ends the note display. A memory format puts every key back to notes 36 to 51.

### 3 INSTRUMENT LENGTHS AND POLYMER

**WORKS IN** Pattern Write, step write, running

Each instrument in a pattern can play its own number of steps. Start the pattern and select step write (**SHIFT** + **TEMPO**) first: these keys work only while running. All settings apply to the instrument picked with **INST SELECT** + main key, and are stored with the pattern. CH and OH share one setting. Accent and the EXT INST lane always follow the pattern.

| KEYS                                                                   | RESULT                                                                                                                           |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>SHIFT</b> + <b>LAST STEP</b> + main key n                           | The instrument plays n steps. ( <b>LAST STEP</b> + key without <b>SHIFT</b> still sets the pattern's last step.)                 |
| <b>SHIFT</b> + <b>SCALE</b>                                            | Polymer on or off. While <b>SHIFT</b> is held the display shows <b>1</b> (polymer) or <b>0</b> (locked). Works in tap write too. |
| <b>SHIFT</b> + <b>INST SELECT</b> held, then <b>FWD</b> or <b>BACK</b> | Nudge: the instrument's steps move one place later or earlier, wrapping round inside its length.                                 |

#### A. LOCKED AND POLYMER

- **Locked** (the default): the instrument starts over with every pass of the pattern, so every bar sounds the same.
- **Polymer**: the instrument loops on its own length and drifts against the pattern. It goes back to its first step only at **START** and at the start of every 8th bar, never in the middle of a bar.

#### B. WHAT YOU SEE

- Steps past the instrument's length are dark and cannot be set. They are kept: make the length longer and they come back.

- The running light follows the selected instrument's own step.
- Tap write records, and **CLEAR** + key erases, each instrument at its own step.
- An edit is heard from the next step; a sound that is playing is not cut.
- Clearing a pattern resets its lengths, polymeter settings and direction. Copying a pattern takes them along.

## 4 RANDOMIZE

**WORKS IN** Pattern Write, stopped or running

| 1 Fill an instrument at random |                                                        |                                                                         |                                                                                   |
|--------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|                                | Operation                                              | Result                                                                  | Notes                                                                             |
| 1                              | <b>INST SELECT</b> + main key.                         | The instrument is selected.                                             | BD is selected when you enter Pattern Write. Not for accent or the EXT INST lane. |
| 2                              | Hold <b>SHIFT</b> and <b>CLEAR</b> , press main key n. | The instrument's steps are filled at random: about n of every 16 steps. | <b>16</b> fills every step.                                                       |
| 3                              | Press the main key again.                              | A new random fill.                                                      |                                                                                   |

- Every hit is written at the level the key you selected the instrument with gives on a first press in step write. Step over the hits afterwards to change single levels.
- Only that instrument's visible steps change. Other instruments, steps past its length and the pattern settings stay as they are.
- In Pattern Play the combination does nothing. **CLEAR** without **SHIFT** works as before.

## 5 PATTERN DIRECTION

**WORKS IN** Pattern Play and Pattern Write, stopped or running

Each pattern has its own playing direction, stored with the pattern.

| 1 Set the direction |                                       |                                                                       |                                    |
|---------------------|---------------------------------------|-----------------------------------------------------------------------|------------------------------------|
|                     | Operation                             | Result                                                                | Notes                              |
| 1                   | <b>SHIFT</b> + <b>CYCLE</b> .         | The direction layer opens; the display shows the pattern's direction. | The main keys belong to the layer. |
| 2                   | Press main key <b>1</b> to <b>4</b> . | The direction changes from the next step.                             | See the table below.               |
| 3                   | <b>SHIFT</b> + <b>CYCLE</b> again.    | The layer closes.                                                     | A mode change also closes it.      |

| KEY      | DISPLAY | DIRECTION                                                               |
|----------|---------|-------------------------------------------------------------------------|
| <b>1</b> | 1       | Forward (the default)                                                   |
| <b>2</b> | 2       | Backward: last step first                                               |
| <b>3</b> | 3       | Ping-pong: forward one bar, backward the next; the end steps play twice |
| <b>4</b> | 4       | Random: a random step of the pattern on every step                      |

The bar itself always runs forward, so the pattern stays in time with the clock and with other gear. Locked instruments, accent and the EXT INST lane follow the direction; polymeter instruments keep looping forward. This **CYCLE** press does not touch the MIDI thru setting.

## ADVANCED COURSE

### 1 REPEAT LAYER

**WORKS IN** Pattern Play and Pattern Write, running

The repeat layer retriggers the voices you hold at a fixed rate, in time with the pattern.

| 1 Repeat a voice |                                           |                                                      |                                                          |
|------------------|-------------------------------------------|------------------------------------------------------|----------------------------------------------------------|
|                  | Operation                                 | Result                                               | Notes                                                    |
| 1                | <b>SHIFT</b> + <b>SHUFFLE/FLAM</b> .      | The layer opens.                                     | It opens when stopped too, but plays only while running. |
| 2                | Press <b>TRACK 1</b> to <b>TRACK 4</b> .  | Rate 1/4, 1/8, 1/16 or 1/32. The TRACK LED shows it. | 1/16 after power-on.                                     |
| 3                | Hold one or more main keys.               | Those voices repeat; the held keys light.            | The odd/even key of BD to HT picks full or weak.         |
| 4                | <b>SHIFT</b> + <b>SHUFFLE/FLAM</b> again. | The layer closes.                                    |                                                          |

- **1/4, 1/8 and 1/16** fall on the pattern's own steps, so they swing with the shuffle and land where the running light lands.
- **1/32** plays two hits in every 16th; **SHUFFLE** pushes every second one later.
- Repeats between steps play without accent. The step's own hit keeps its accent.
- While the layer is open the main keys, tap write and instrument select belong to it. Mutes apply to the repeats.
- While the layer is open the **TRACK** keys set the rate and do not enter Track mode.
- The layer also closes on **SHIFT** + **TEMPO**, **SHIFT** + **BACK**, any mode change, or opening the mute or reslice layer.

### 2 RESLICE LAYER

**WORKS IN** Pattern Play and Pattern Write, running

The reslice layer loops a short piece of the pattern for as long as you hold a key.

| 1 Loop part of the pattern |                                                  |                                                                   |                                                   |
|----------------------------|--------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------|
|                            | Operation                                        | Result                                                            | Notes                                             |
| 1                          | While running, <b>SHIFT</b> + <b>TAPE SYNC</b> . | The layer opens; all TRACK LEDs light.                            | Stopped, the same keys select the sync mode.      |
| 2                          | Hold main key n (1 to 15).                       | The pattern loops n steps, starting at the step that was playing. |                                                   |
| 3                          | Hold main key <b>16</b> .                        | A random step of the pattern plays on every step.                 |                                                   |
| 4                          | Release the key.                                 | The pattern carries on where it would have been, on the beat.     |                                                   |
| 5                          | <b>SHIFT</b> + <b>TAPE SYNC</b> again.           | The layer closes.                                                 | <b>STOP/CONT</b> or a mode change also closes it. |

While the layer is open the main keys, tap write and instrument select belong to it.

### 3 TRACK PLAY

**WORKS IN** Track Play, stopped or running

A track is a list of measures, each measure a pattern chain. Track mode works as on the original firmware. From a pattern mode, stopped, **TRACK 1** to **4** enters Track Play and **SHIFT** + **TRACK** enters Track Write. **PATTERN GROUP** or **SHIFT** + **PATTERN GROUP** goes back to the pattern modes.

| KEYS                                                          | RESULT                                                                                                                                                                         |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FWD</b> / <b>BACK</b>                                      | Next or previous measure. The display shows the measure number; <b>0</b> means the track is empty.                                                                             |
| <b>START</b>                                                  | Plays from measure 1.                                                                                                                                                          |
| <b>STOP/CONT</b>                                              | Stops; pressed again, continues from the measure shown.                                                                                                                        |
| <b>CYCLE</b>                                                  | LED lit: the track starts over at the end. Off: it stops at the end.                                                                                                           |
| <b>TEMPO</b> + <b>ENTER</b>                                   | Stores the current tempo with the track (internal clock only). Hold <b>TEMPO</b> while selecting the track to recall it; the knob takes over once you turn it past that value. |
| <b>SHIFT</b> + <b>FWD</b> / <b>AVAIL MEAS</b>                 | Bank I / bank II.                                                                                                                                                              |
| <b>SHIFT</b> + keys 1 to 10, then <b>SHIFT</b> + <b>ENTER</b> | Types a measure number (keys 1 to 9 are the digits, 10 is 0) and jumps there.                                                                                                  |
| <b>SHIFT</b> + <b>CYCLE</b>                                   | Shows the track's length; <b>SHIFT</b> + <b>ENTER</b> then jumps to the last measure.                                                                                          |
| main keys                                                     | Play the voices.                                                                                                                                                               |

Hold **SHIFT** through the whole of a **SHIFT** entry: releasing it cancels.

## 4 TRACK WRITE

**WORKS IN** Track Write, stopped or running

The TRACK LED blinks  in Track Write. **START** plays the picked pattern chain, which loops; you can write while it plays. Bank changes are made in Track Play.

| 1 Write a track |                                                    |                                                                              |                                                                                       |
|-----------------|----------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                 | Operation                                          | Result                                                                       | Notes                                                                                 |
| 1               | <b>SHIFT</b> + <b>TRACK 1</b> .                    | Track Write for track 1; the TRACK 1 LED blinks.                             |                                                                                       |
| 2               | Press a <b>PATTERN GROUP</b> key, then a main key. | That pattern is picked.                                                      | Two main keys pick a range of patterns.                                               |
| 3               | Press <b>ENTER</b> .                               | The pattern is written into the measure shown, and the display moves on one. | Past the last measure it is added at the end. A range writes one measure per pattern. |
| 4               | Repeat steps 2 and 3.                              | The track grows measure by measure.                                          |                                                                                       |

The track is now written. Press **TRACK 1**, then **START**, to play it.

## A. EDITING A TRACK

| KEYS                                                                                          | RESULT                                                                                           |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>FWD</b> / <b>BACK</b>                                                                      | Move through the measures ( <b>FWD</b> stops at the last one).                                   |
| <b>AVAIL MEAS</b> held                                                                        | Shows how many measures are free.                                                                |
| <b>SHIFT</b> + <b>12</b> , then <b>SHIFT</b> + <b>ENTER</b>                                   | Inserts the picked pattern(s) before the measure shown.                                          |
| <b>SHIFT</b> + <b>13</b> , a measure number, then <b>SHIFT</b> + <b>ENTER</b>                 | Deletes from the measure shown to the typed one. With no number, deletes only the measure shown. |
| <b>SHIFT</b> + keys 1 to 10 or <b>SHIFT</b> + <b>CYCLE</b> , then <b>SHIFT</b> + <b>ENTER</b> | Jump to a measure, or to the last one, as in Track Play.                                         |
| <b>TRACK</b> / <b>SHIFT</b> + <b>TRACK</b>                                                    | Track Play / Track Write of that track.                                                          |

## B. TRACK MEMORY

Each bank holds **362 measures**, shared by its four tracks. When the memory is full, a write or insert shows **0** and nothing is written. A measure stores the first pattern of its chain, so changing a pattern's chain later changes how the track plays.

### NOTE:

An insert or delete near the start of a long track can make a running Track Write play a few steps late.

## REFERENCE

## 1 MIDI IMPLEMENTATION

Messages are received on the receive channel (default 10). EXT INST notes and mute CCs are sent on the send channel (Basic Course 2). Notes 35 to 51 play the voices, and MIDI clock, start, stop and continue work as described in Basic Course 2.

| MESSAGE                   | FUNCTION                                                                                                                             |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Program change 0 to 47    | Selects pattern 1 to 48: 0 to 15 group I, 16 to 31 group II, 32 to 47 group III. Stopped: at once. Running: at the end of the chain. |
| Program change 64 to 111  | The same patterns, switched <b>at once</b> while running.                                                                            |
| Note on 52 to 99          | Selects pattern 1 to 48 at once: 52 is group I pattern 1, 68 group II pattern 1, 84 group III pattern 1.                             |
| CC 48 to 58 in            | Mutes: 48 BD, 49 SD, 50 LT, 51 MT, 52 HT, 53 RS, 54 HC, 55 CH, 56 OH, 57 CR, 58 RD. Value 64 to 127 mutes, 0 to 63 unmutes.          |
| CC 48 to 58 out           | Sent on every mute change made on the panel, <b>CLEAR</b> included: 127 muted, 0 unmuted.                                            |
| CC 59 in                  | MIDI clock output. 64 to 127: only while running. 0 to 63: always.                                                                   |
| CC 60 in                  | MIDI thru. 64 to 127: off. 0 to 63: on.                                                                                              |
| CC 124 to 127 in          | Omni off, omni on, mono and poly, as on the original firmware. Omni is off at every power-on.                                        |
| Start, Continue, Stop out | Sent by <b>START</b> and <b>STOP/CONT</b> ; no Stop is sent when the machine follows MIDI sync.                                      |

Program change and pattern notes work in Pattern Play only. CC 59 and CC 60 change the same settings as the panel and are kept when the power is off. Song position and song select are not sent or acted on. What is copied to MIDI OUT is set by MIDI thru (Basic Course 2).

## 2 MEMORY BACKUP OVER SYSEX

**WORKS IN** Any mode, stopped

The whole memory, both banks with patterns, lengths, directions, tracks, EXT INST notes and settings, goes out and comes back in as 32 SysEx pages. The superOS-909 Studio editor does this for you and can also fetch, send, save and load single patterns. To do it by hand:

| MESSAGE                  | MEANING                                                                                                                                  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| F0 7D 09 01 F7           | Dump request. The machine answers with 32 pages and then F0 7D 09 03 F7 , in about 6 seconds.                                            |
| F0 7D 09 02 pp<br>... F7 | One page (pp = 00 to 1F), in either direction. When loading, the machine answers 04 pp (received) or 05 pp (error: send the page again). |
| F0 7D 09 03 F7           | End of a load: the machine reloads the current pattern.                                                                                  |

Record a dump with any SysEx utility and send it back the same way, waiting for each 04 before sending the next page. A page answered with 05 has already been written, so always send it again. Dumps from other firmware are not accepted.

**NOTE:**

The panel goes dark while a dump is being sent. After a load, the new pattern is loaded the next time a pattern mode is active.

## 3 REMOVED FUNCTIONS

- Cassette save, verify and load. **SHIFT** + keys 14 to 16 in Track mode do nothing. Tape sync still works.
- The original SysEx dump and load (replaced, Reference 2).
- The cartridge copy (**SHIFT** + key 11 in Track Play).
- MIDI song position and song select.
- Track memory is 362 measures per bank instead of 896.

## 4 LIMITS

- Mutes are live only: they are not stored and do not work in Track mode.
- The MIDI channels and omni setting return to their defaults at every power-on.
- The EXT INST lane has one channel and one velocity for all keys.
- CH and OH share one length, polymeter setting and nudge.
- Randomize writes one level per instrument.
- An instant pattern change to a pattern with a different scale can make one step slightly long or short.
- Mute changes received by CC light the main keys only while the mute layer is open.

## 5 QUICK REFERENCE

| KEYS                                                                 | FUNCTION                                          |
|----------------------------------------------------------------------|---------------------------------------------------|
| <b>POWER-ON</b>                                                      |                                                   |
| <b>TRACK 1</b> held                                                  | Version display                                   |
| <b>TRACK 1</b> + <b>PATTERN GROUP I</b> held                         | Memory format                                     |
| <b>STOPPED</b>                                                       |                                                   |
| <b>SHIFT</b> + <b>TAPE SYNC</b>                                      | Sync mode: tempo, <b>1</b> MIDI, <b>2</b> DIN     |
| <b>CYCLE</b> (Pattern Play)                                          | MIDI thru on / off                                |
| <b>BACK</b> + <b>CYCLE</b> (Pattern Play)                            | MIDI clock out always / only while running        |
| <b>LAST STEP</b> / <b>SHUFFLE/FLAM</b> + main key                    | Send / receive channel (Pattern Play, Track Play) |
| <b>PATTERN PLAY</b>                                                  |                                                   |
| <b>SHIFT</b> + main key                                              | Change pattern at the next step                   |
| <b>FWD</b> / <b>AVAIL MEAS</b>                                       | Bank I / bank II                                  |
| <b>SHIFT</b> + lit <b>PATTERN GROUP</b>                              | Pattern Play / Pattern Write, also running        |
| <b>PATTERN WRITE</b>                                                 |                                                   |
| <b>SHIFT</b> + <b>TEMPO</b> / <b>BACK</b>                            | Step write / tap write, also running              |
| <b>SHIFT</b> + <b>LAST STEP</b> + key n                              | Instrument length n (step write, running)         |
| <b>SHIFT</b> + <b>SCALE</b>                                          | Polymeter on / off (running)                      |
| <b>SHIFT</b> + <b>INST SELECT</b> + <b>FWD</b> / <b>BACK</b>         | Nudge later / earlier (step write, running)       |
| <b>SHIFT</b> + <b>CLEAR</b> + key n                                  | Randomize, density n/16                           |
| <b>SHIFT</b> + <b>EXT INST</b>                                       | EXT INST lane on / off                            |
| <b>SHIFT</b> + main key, then <b>FWD</b> / <b>BACK</b> (in the lane) | EXT INST note of that key                         |
| <b>PATTERN PLAY AND PATTERN WRITE</b>                                |                                                   |
| Tap <b>EXT INST</b>                                                  | Mute layer on / off                               |
| <b>SHIFT</b> + main key (mute layer)                                 | Solo                                              |
| <b>CLEAR</b> (mute layer)                                            | End solo, or unmute all                           |

|                                               |                                                        |
|-----------------------------------------------|--------------------------------------------------------|
| <b>SHIFT</b> + <b>CYCLE</b> , then key 1 to 4 | Direction: forward, backward, ping-pong, random        |
| <b>SHIFT</b> + <b>SHUFFLE/FLAM</b>            | Repeat layer; <b>TRACK 1</b> to <b>4</b> = 1/4 to 1/32 |
| <b>SHIFT</b> + <b>TAPE SYNC</b> (running)     | Reslice layer; hold key n to loop n steps              |

Every function drawn on the panel, with its LEDs and display: [superOS-909 Shortcut Guide](#).

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