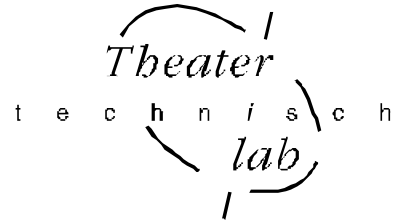# Manual of the Toddler3

For software version V1.x

Introduction

The operation of the Toddler is based upon the methodology of lighting used in the theatres. This means that the lighting course is divided into separate lighting situations (= scenes). A scene is the result of the intensity adjustments of several sources of light. For this purpose the same amount of steering signals/channels are needed, which can be generated by a steering table as the Toddler. As a consequence the operation of the Toddler boils down to the adjustment of the channel intensities and its recording in the memory. The last one with the purpose of being able to recall or to play back these settings afterwards again.

Important things to know

Symbols used in the manual

[.........] refers to buttons and faders. <......> refers to leds. Cursive words refer to the text on the display. Words in capital letters refer usually to a mode of the Toddler.

Next and live

In the CHANNEL CONTROL and MEMORY PLAY mode the words *next* and *live* will often occur on the display of the Toddler. Those words refer to two work memories that play a roll with the creation and playing off of scenes. The content of *live* appears at the exit of the Toddler (=DMXout). The scene to be faded (played) hereafter is loaded in *next*.
The work-memories *next* and *live* can be loaded with the existing scene-records or with *ZEROS* or *DMXin*. *ZEROS* is a programmed zero-scene and can serve as the starting point for the creation of a scene (see page 4). *DMXin* means the loading of information offered to the DMX input.

Master

The most right fader on the Toddler has a plural functions:
1. Master, under MEMORY PLAY mode,
2. Level control fader, for the selected channel in the CHANNEL CONTROL mode
3. Coarse fade time controller: to adjust the fade time coarsely. For fine adjustments use the [>>] or [<<] scroll buttons.
Remark: The fader is active and works, only if the led <level picked up> is burning. When the led isn't burning use the [set fader active] button.

Rapid scrolling

The speed of scrolling is raised by factor 10 when you first press the button of the desired scroll direction and then while keeping this button pressed you also press the other scroll-button.

Scene-name

With the Toddler a scene has a name. The scene-name is built up by a capital plus two figure symbols for example *E12*. The figure symbols do not necessarily refer to a play order. This method of naming eliminates the necessity of sub-numbers in case you want a new scene inserted in the list.

Memory capacity

The total number of scenes you can record depends on the number of channels you have chosen for (see text above). Default factory setting is 120 channels which gives 780 scene-memories. The possible ratio channel number/scene-memories are: 120/780, 240/420 or 512/210. If you have selected the record-display with [RECORD] the still available capacity of the memory can be considered. For this purpose you have to scroll to the beginning or end of the scene name-list and keep the scroll-button pressed. Line one of the display gives the text: *memory left xxx*.

Default scene attributes

When recording a scene, apart from the channel intensities, also the scene attributes are recorded with the default values. These default values are: fade-in=3[s], delay-in=0[s], fade-out=3[s], delay-out=0[s], autofollow=no, linked scene=none, and no return.

YES-, NO-, and DELETE-button

In case of y/n-settings you have to press [YES] if 'y' is the desired option and [NO] if 'n' is the option you want. Also options displayed with a '?' will be activated by pressing on [YES]. The button [DELETE] is often used to turn a particular setting in '...' what means 'nothing selected'. For instance the setting 'LinkedScene=A01' can be undone by pressing on [DELETE]. This results in the expression 'LinkedScene=...'.

Preserving of settings

In general there is no need to confirm a setting with [RECORD/enter] in order to preserve it in memory. Only options indicated with a ? should be confirmed with [YES] or can be cancelled with [NO].

```
RESET ALL!, with
XXX_channels?
```

Reset all

It is possible to put the setup settings into the default position and to clear the scene-list with the following actions: Push the [SETUP] button while switching the mains power on. On the display the adjacent text will then appear. Now also a different number of channels can be chosen: 120, 240 or 512.

```
Memory will be
erased! Sure?
```

Pushing [YES] will give the second display whereby [NO] offers as yet the possibility to cancel the action. If again [YES] is pressed the Toddler will start with the chosen number of channels and the default setup.

Crossfade and crossfader

A crossfade (in short a fade) is a gradual transition between 2 scenes. During a fade there will be channels of which the level will increase, decrease or remain unchanged. The result of all increases is called the fade in, that of the decreases the fade out. For a automatic crossfade (= autofade) you can set up a different time for the fade in and fade out.
A automatic crossfade is initiated by pushing on [GO stop] or on a external GO button. During the time that the fade is going, the led <GO stop> is flashing and the progress of the fade-in and fade-out is displayed proportionally. A fade can be stopped by pressing [GO stop]. With [cancel] the fade is being ended prematurely. Now you can select a new scene record for *next*.
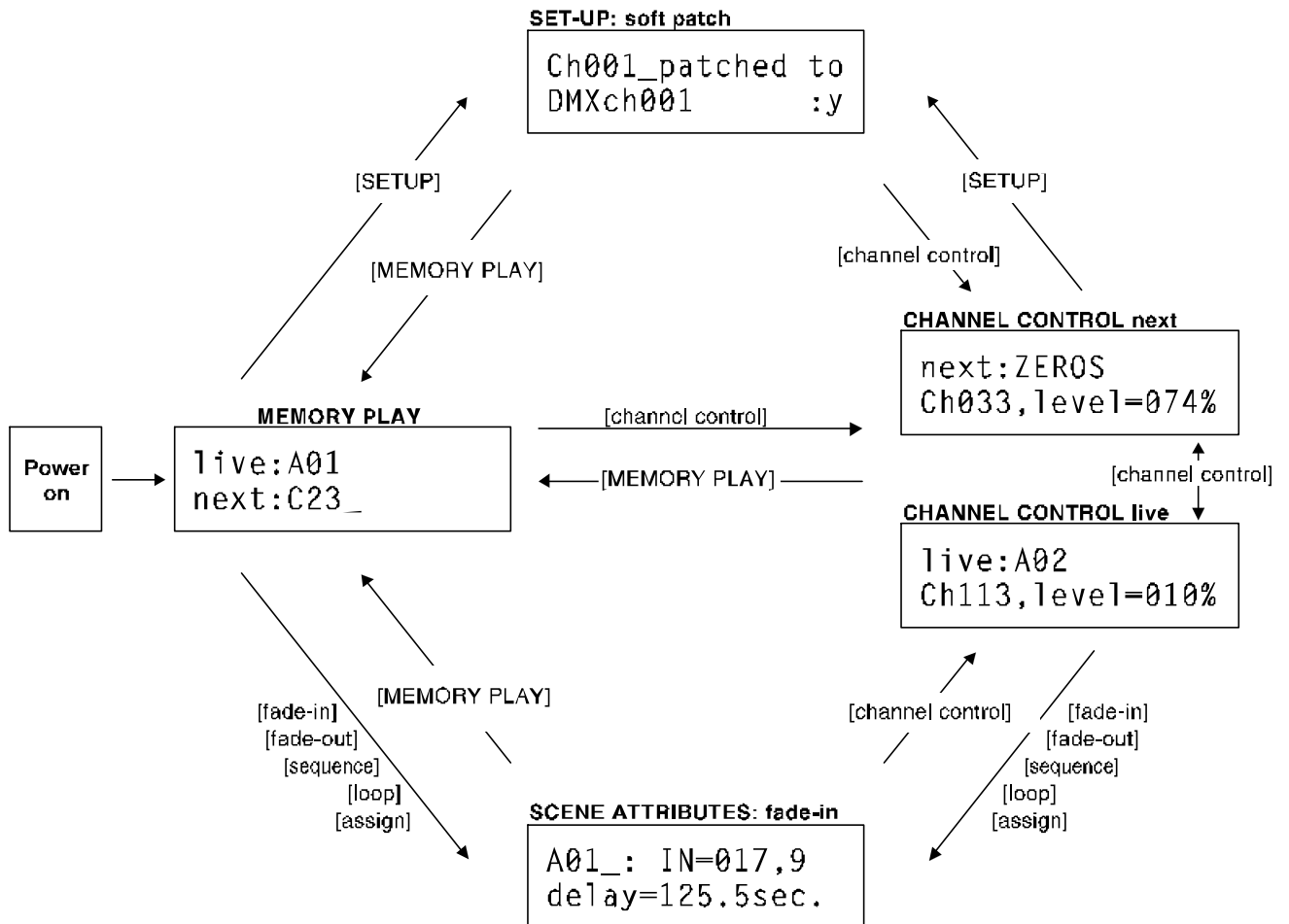A crossfade can also be made manually with the [CROSSFADER].
The crossfader consists of two parts (faders) and is only working in the MEMORY PLAY mode. Hereby one of the fader-LED's must be on. If that is not the case both the faders should be put in the same extreme position. The fader of which the led is on controls the fade-in. The other fader controls the fade-out. For example: In the case of a fade to a black-out (no lights on) the fader with the led on does not work. The fade is controlled completely by the fader of which the led is not on.
When a auto-crossfade (a automatic crossfade generated with a [GO stop]) is taking place, the crossfade can be taken over partially or completely with the crossfader. With a partial take over both faders are, when completing the auto-crossfade with [GO stop], in general not in the same extreme position. In order to make the crossfader active again this should be done as yet.

The global users interface

The users-scheme below shows the changes between the basic modes with the corresponding displays. The text between the symbols [......] refers to the buttons you have to use to change between those modes.
The basic modes are: CHANNEL CONTROL, MEMORY PLAY, SCENE ATTRIBUTES and SETUP, and they will be described separately in the next chapters.
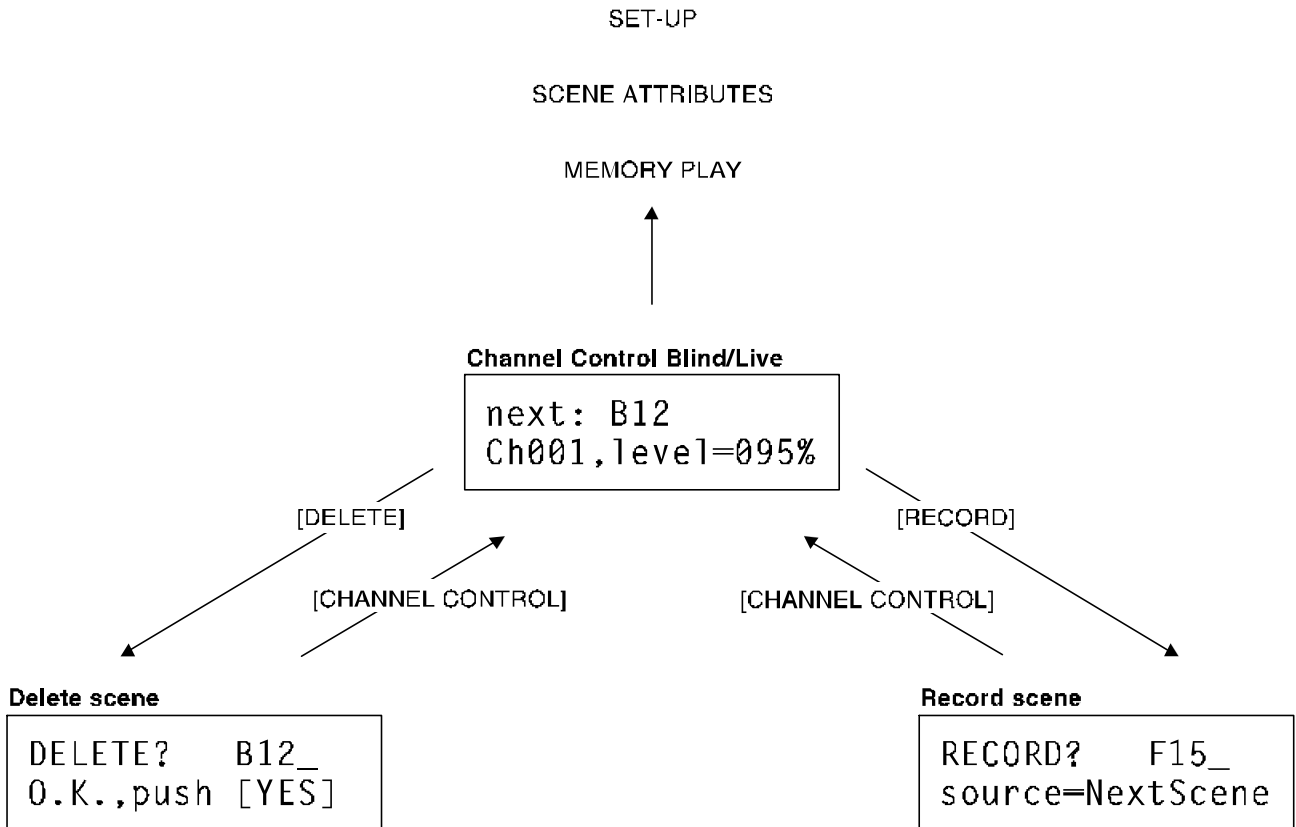
SET-UP: soft patch
```
Ch001_patched to
DMXch001       :y
```

[SETUP]

[SETUP]

[MEMORY PLAY]

[channel control]

CHANNEL CONTROL next
```
next:ZEROS
Ch033,level=074%
```

MEMORY PLAY
```
live:A01
next:C23_
```

[channel control]

[MEMORY PLAY]

[channel control]

CHANNEL CONTROL live
```
live:A02
Ch113,level=010%
```

Power on

[fade-in]
[fade-out]
[sequence]
[loop]
[assign]

[MEMORY PLAY]

[channel control]   [fade-in]
[fade-out]
[sequence]
[loop]
[assign]

SCENE ATTRIBUTES: fade-in
```
A01_: IN=017,9
delay=125.5sec.
```

Remarks:
- The first mode after the power on is the MEMORY PLAY. The MASTER will be initiated at 100%.
- When there is still no record made, the only selection you can make for live/next is ZEROS of DMXin
- The display under SETUP and SCENE ATTRIBUTES is one example of the possible displays you can get

See also the layout of the front panel on page 6

Channel Control

Under CHANNEL CONTROL mode you can adjust the channel-intensity of the displayed *next* or *live* scene. This mode is meant to create and record scenes or to modify existing scene-records. When you make or modify the scene in *next* (led <next> burns) you can't see on stage what you are doing: this is called blind control. When led <live> burns every thing you do is direct visible, (if the MASTER is open): the scene is made or modified *live*.
The next description counts for both live and blind channel control.

```
                              SET-UP


                         SCENE ATTRIBUTES


                          MEMORY PLAY
                               ↑
                               |
                               |


              Channel Control Blind/Live
              ┌─────────────────────────────┐
              │ next: B12                    │
              │ Ch001,level=095%             │
              └─────────────────────────────┘
     [DELETE]                                    [RECORD]


             [CHANNEL CONTROL]        [CHANNEL CONTROL]


 Delete scene                                      Record scene
 ┌─────────────────────────┐              ┌─────────────────────────────┐
 │ DELETE?    B12_          │              │ RECORD?    F15_             │
 │ O.K.,push [YES]          │              │ source=NextScene            │
 └─────────────────────────┘              └─────────────────────────────┘
```

Create a Scene

Coming into CHANNEL CONTROL the cursor is always on the channel number position: *CH00x*. This is on the second display line, see also the most above picture. With [change item] you can select the channel number. The channel levels are displayed in percents. You can set the level from the selected channel with the fader [MASTER/level control]. The latest is only possible if led <level pick up> is on: In general the position of the fader differs from the level that is displayed for the selected channel, led <level pick up> is off ...the fader doesn't work: in order to control the channel level the fader position must first match the already existing level. With button [set fader active] the level is set at once to the level corresponding the position of the fader. This feature speeds up channel setting enormously. It gives you the opportunity to quickly set successive channels to the same level: just keep [set fader active] pushed while scrolling with [select channel].
With [select item] you go to the first display line, which shows a scene (memory pre-set): for example *B12*. With [change item] you can select an other scene. The channel levels of the selected scene can now be viewed or modified.
Note: As long as you haven't record a scene, only the pseudo scenes *ZEROS* or *DMXin* can be selected.
You can use *ZEROS* (all channels are zero) or a existing scene as starting point for building a new scene. The text *modi* (= modify) will be displayed as soon as a channel level is changed.

Record a Scene

Create the scene (pre-set) you want to store in memory, by giving each channel the desired level (see above). By pushing [RECORD] you get the record scene menu. With [change item] you can select a scene name for the record. If the selected name is already used the word *MODIFY?* is displayed. Otherwise *RECORD?* Did you use *ZEROS* as the starting point for creating the scene, then the display will always gives *RECORD?* and the record name suggested is always the next in the scene-list. Confirm your choice with [YES]. By pressing [NO] you can cancel the record procedure. A record of a new scene is always placed on the end of the scene-list. See SEQUENCE on page 6 for changing this sequence.
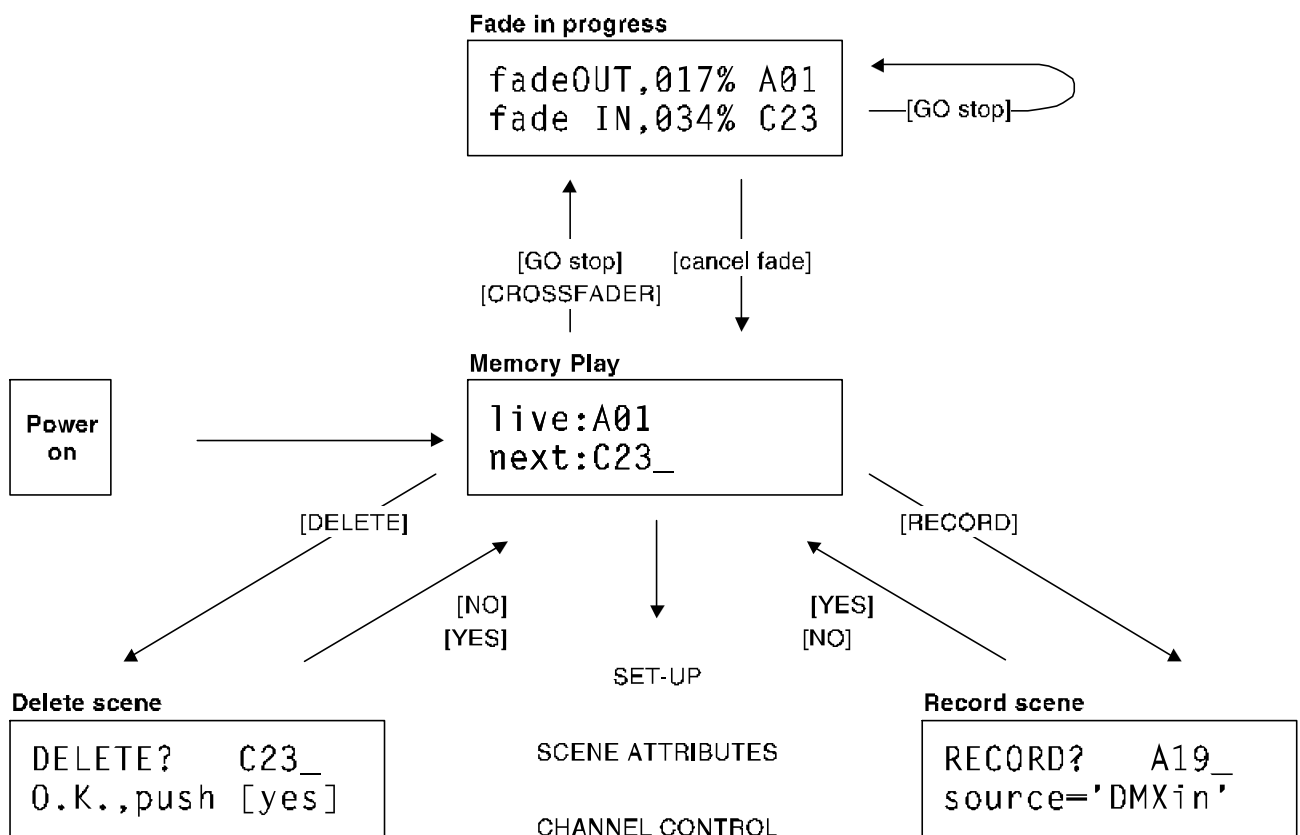
Delete scene

Under CHANNEL CONTROL mode it is also possible to delete/remove a record out of the scene-list. Push [DELETE], select with the scroll buttons [<<] or[>>] the scene you want to delete. Push on [YES] to confirm. Push on [NO] or any other button to cancel a delete procedure.

Memory Play

MEMORY PLAY is meant for playing off scenes recorded earlier in memory. Push the blue button [MEMORY PLAY], the yellow led next to this button will burn. In the middle of the below picture, you see an example of a possible display: *live:A01* is the scene which is on stage, *next:c23* is the scene which will be next on stage. With [change item] you can change *next: Xxx* scene. As long as no scene-record is made, you can only select the pseudo-scenes *ZEROS* (pre-programmed pre-set with all level zero*) or *DMXin*.
You can also play off a pre-set temporary made or a temporary changed scene. Push twice on the blue button [CHANNEL CONTROL]: the led <next scene> burns. Make a scene or change an existing scene. Go back to [MEMORY PLAY] and

Fade in progress

```
fadeOUT,017% A01
fade IN,034% C23
```

—[GO stop]—

[GO stop]   [cancel fade]
[CROSSFADER]

Memory Play

```
live:A01
next:C23_
```

Power on

[DELETE]   [RECORD]

[NO]   [YES]
[YES]   [NO]

SET-UP

SCENE ATTRIBUTES

CHANNEL CONTROL

Delete scene

```
DELETE?   C23_
O.K.,push [yes]
```

Record scene

```
RECORD?    A19_
source='DMXin'
```

Crossfade manual

With the [CROSSFADER] a gradual transition (=crossfade) is possible between the scene loaded in live and the scene loaded in next. The display shows which scenes are on and the progression of the fade (see the most above display). *ZER* refers to ZEROS and *DMX* refers to DMXin.
When you use [cancel fade] while making a crossfade manually the crossfader is deactivated and is put to work again only when you bring both faders into one of its most extreme position.

Crossfade automatic

Button [GO stop] initiates an auto-crossfade in the programmed fade times (see page 7 for setting of the fade time). While a fade is in progress, you can stop it by pressing [GO stop]. By pressing [GO stop] again you make the fade go again. With [cancel fade] the crossfade will be cancelled. The result of the cancelled crossfade is then loaded in *live*. The display says *MIXEDscenes.*
A GO-initiated crossfade is overrulable with the [CROSSFADER].
When you select for *next: DMXin* you can fade in the information received at the input of DMX-inlet, like a normal scene. Be aware that you can only make this selection if the option *SCENEmode* has been selected by *DMXin* in SETUP (see page 9).

MASTER control

In this situation the most right fader functions as MASTER, which means level control for all channels. Pay attention to the fact that the MASTER is active (led <level picked up> is on) and open. See also page 1.
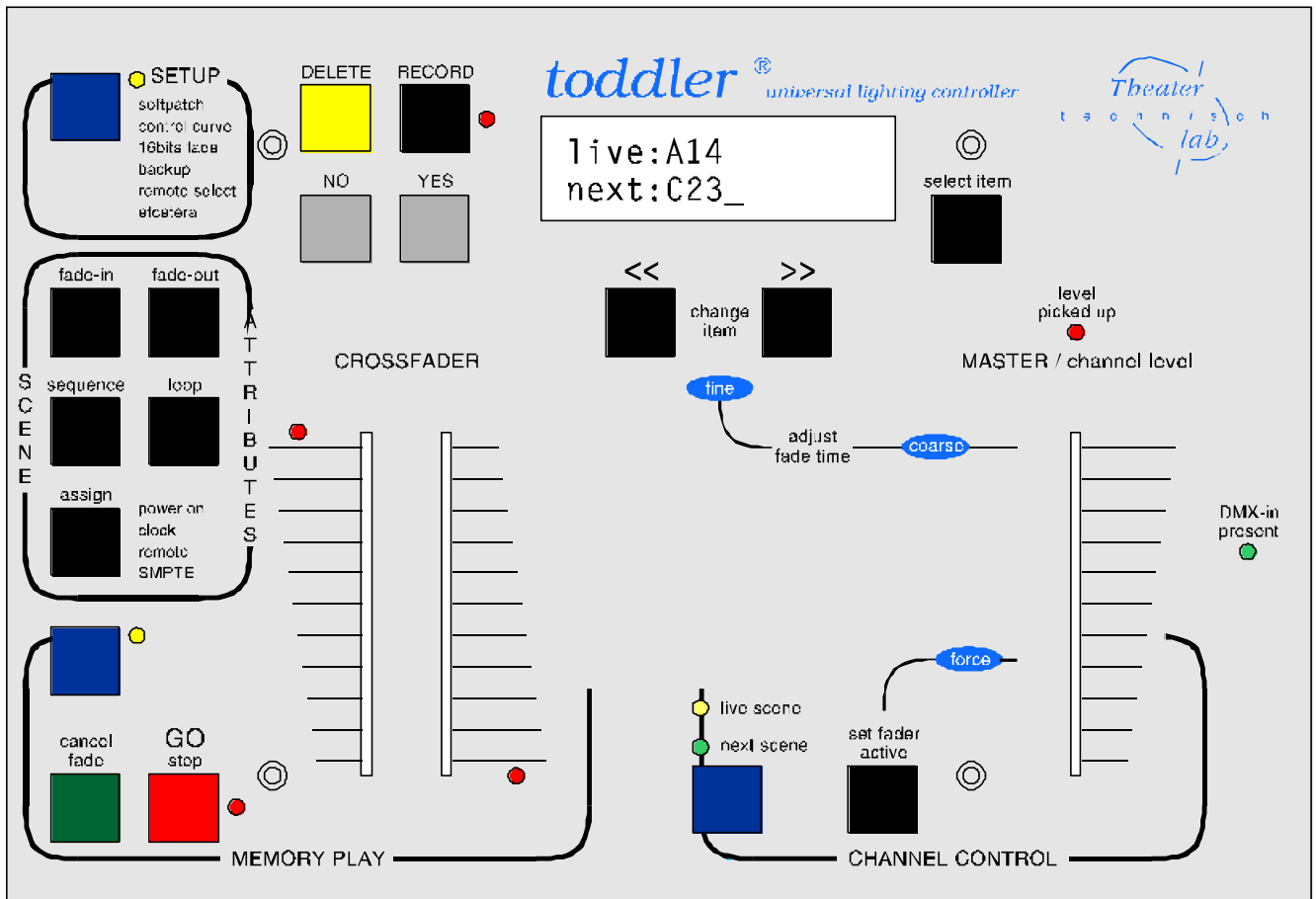
Record of DMXin or of the momentary result of a crossfade.

When during a crossfade the button [stop] is pressed the momentary result of that crossfade can be recorded: *source=crossfade.* When no crossfade is taking place, you can make a record of the information that the Toddler gets on its DMX input: *source=DMXin.* In both cases: Press [RECORD] and select with [change item] the desired scene name. If the selected name has already been used the word *MODIFY?* is displayed. Otherwise *RECORD?* Confirm your choice with [YES]. With [NO] you can cancel the operation. A record of a new scene is placed at the end of the scene-list. See SEQUENCE on page 6 for changing the sequence.

Delete scene

In the MEMORY PLAY mode it also possible to delete (remove) a record out of the scene-list. Push [DELETE], the suggested scene can be changed with [change item] and be replaced with every scene in the list. Push on [YES] to confirm or on [NO] or any other button to cancel/exit the delete-operation.

Beneath you find the front layout of the Toddler. Fader buttons are not visible.

Scene Attributes

[Fade-in]

```
A12_: t_IN=012,5
delay=015,5 sec.
```

Fade-in times

Maximum 999.9[s]. You can select only the existing records.
t_IN gives the time of the fade-in. *delay* is the time between the GO-command and the beginning of the fade-in. By using [select item] and [change item] you can select the desired scene and adjust both the times. You can also use the [MASTER/level control] for setting the time coarsely. Push on [set fader active] to activated the fader.

[Fade-out]

```
A12_:t_OUT=003,0
delay=002,0 sec.
```

Fade-out times

The fade-out times are the same as the fade-in times as long as you haven't set up this separately. t_OUT is the time of the fade-out, meaning the time the previous scene disappears. *delay* is the time between the GO-command and the beginning of the fade-out. By using [select item] and [change item] you can select the desired scene and adjust both the times. You can also use the [MASTER/level control] for setting the time coarsely. Push on [set fader active] to activated the fader.

[Sequence]

```
A12_:t_OUT=003,0
delay=002,0 sec.
```

Sequence of playing

Sequence menu 1: push once at [sequence]
The scenes are automatically played in the order they have been recorded. For this a scene-list is being created in the memory. *Bgn* and *End* refer to the begin and the end of this list.

Autofollow=Y: means that the fade of the selected scene, in this case *A32*, automatically follows the previous scene. To create a loop (=chase) the *autofollow* has to been put to on (*=Y*) for each scene in the loop. One can set *Y* simple by pressing [YES] and *N* by pressing [NO] without moving the cursor.
LinkedScene=A21: at the same time the fade to scene *A32* starts, also a fade starts to *A21* (with its own fade-times). This linked fade can have a link also. It is possible to link to a 'deep' of 5. With [DELETE] you can remove an existing link setting: the display changes in *LinkedScene=....*

```
SHIFTscene B22
select next:A23
```

Sequence menu 2: push twice at [sequence]
With *SHIFTscene* you can change the place of the scene in the scene-list. Scene *B22* is moved according to the scene chosen at *select next*. In this case the next scene is *A23*, so the sequence will be first *B22* and then *A23*.
What to do when you want to **insert a new scene you've just created**: Make a new scene and record it with a name, for example *B22*. This scene will be placed at the end of the list. Go to the menu *SHIFTscene B22* (push twice on [sequence]) and select the desired next scene, in this case *select next: A23*. Now you are ready and *B22* is inserted before *A23*. You can leave this menu by pressing any other button.

```
SkipBetween Bgn
select next:C25
```

Sequence menu 3: push three times at [sequence]
With *SkipBetween* it is possible to skip several successive scenes in the list. Practically this scene-block is moved totally to the end of the list. In the displayed example all scenes between the *Bgn* (= begin of table) and *C25* are skipped, and *C25* will be the first scene in the list.

Be aware: On the moment you change the item at *select next*, this change is taking place immediately.
You can always get back the old situation by:
1. Select by *select next* the old original scene, without changing of course the above line of the display.
2. Replace the scene or sceneblock again, but now back.
When you are going to make (a lot of) changes in the list, it is recommended to write the scene list down on a paper,.
Unfortunately with this software version of Toddler it is not yet possible to print the list.
To keep informed about the software updates please visit our website: www.theater-technisch-lab.nl.

[Loop]

```
D32:jump to D01
loop number=inf
```

Setup of loops or jumps

The automatic play of sequence, given in the scene-list, can be interrupted by the scene attribute *jump to* or *back to*. With *loop number* you can define the number of times of the jump or return. *inf.* refers to infinite. In this case after *D32, D01* will be played, and this will happen every time *D32* is faded out (*loop number* is set to *inf*). When you want to create a automatic loop (repeated sequence) it is also necessary to put *autofollow* on for each scene in this loop. See for more information under sequence page 6.

[assign] fade-control by:

In general:

- The menus below are only visible if there are already scenes recorded in the memory.
- Pressing once [assign] gives menu 1, pressing twice assign gives menu 2, etc.
- Getting menu a or b depend on the setting done under SEUP
- **In all menus you can use [DELETE] to make a setting undone**.

```
Autofade in at
POWERon : B21
```

1. Power on

In case you want to start a automatic fade-sequence or a fade-in of a particular scene by power-on you have to set the right scene-name in this assign menu.

```
Mom.01: Xxx in at
13:21 Friday
```

2.a Clock, time/day

To get this menu *Clock Control:* has to be set in *time-day mode* under SETUP (see page 10). With this menu one can set to start a fade-in from a scene/sequence by build-in real time clock. *Set01* in this menu refers to setting 1. You can program 14 setting. *Xxx* is the scene to select. *13.21 Friday* is the moment on which the scene *Xxx* has to be activated. For example: Given that scene *Xxx* is the beginning of a loop, then on every Friday on 13.21 this loop will start.

```
Mom.01:Xxx in at
13:21 13-12-98
```

2.b Clock, time/date

To get this menu *Clock Control:* has to be set in *time-date mode* under SETUP (see page 10). The same as above but now you can set a absolute time.

```
PRESET button XX
fades in Xxx
```

3.a Remote Preset controller

To get this menu *Remote Control=* has to be set in *PRESET selector* under SETUP (see page 10). Read also the application note according this item. For this you need a REMOTE control with 7 buttons. You can select the button number (*button XX=1,..28*) and the scene you want to be controlled by this button (*controls Xxx*). For *XX*>7 you need more then one preset control.

```
MIDI data    XX
fadesin Xxx
```

3.b MIDI

To get this menu *Remote Control=* has to be set in *MIDI* under SETUP (see page 10). Select on the first line the value of the data byte (0,..,99) of a MIDI message 'program change' and on the second line the scene that must be fade-in at the incoming of that MIDI message. See for a detailed description of MIDI and the Toddler at the end of this manual.

Toddler Setup

[SETUP]

```
Ch001_patched to
DMXch017        :n
```

Softpatch

The steering information for the dimmers appears on the DMX-output. The DMX signal consist for the Toddler of 512 information bytes (DMX channels). This display gives you the opportunity to patch a Toddler channel to a DMX channel. The default patch is Toddler *Ch00x patched to DMXch00x*, with x= 1 up to and including the channel number. Use [YES] to set a selected patch and [NO] to undo an existing patch. Scrolling of the channelnumber (of the Toddler): *Ch00x* results automatically in the displaying of the patched DMXchannel: *DMXch00x*. Scrolling will stop automatically if there is a channel with no patch to a DMXchannel. If there exist more then one patch, the patched DMXchannels will be displayed in a chase. During the scrolling of the item *DMXch* the scrolling will stop automatically by an existing patch of the selected Toddler channel.

[SETUP]

```
PATCHshift=0230_
Reset PATCH ?
```

This menu gives you the opportunity to shift the whole patch patron. In the example the patch patron will be shifted with 230; for example in case of a default patch, the steering information of Toddler channel 1 will appear at DMX channel 231, channel 2 will appear at DMX channel 232 etc. When you select *Reset PATCH ?* and push [YES] you will always get back the default patch situation: which means *ch00x patched to DMXch00x* and a zero PATCHshift.

[SETUP]

```
control curve
Ch001_: Linear
```

Control Curve

The Toddler knows for each channel five different corrections for the fade behaviour. This gives you the opportunity to improve the dimming behaviour for different type of lamps. Options are: *Linear* = no correction, *40W* =low voltage glow-lamp, *600W* and *1kW*. There is also the possibility to select *NONdim.* This setting gives a steering behaviour like a switch: on / off.

[SETUP]

```
NONdim ON:50%_
all Ch.:Linear?
```

NONdim ON: xx% gives the opportunity to determine the switch moment in the fade, for all channels with a nondim setting. Default setting is *50%.* This means as 50% of the fade is done, all those channels with a nondim setting will go from zero to 100%. With *all Ch.:Linear?* you can give all channels same correction (dimming behaviour) at once: select the wished correction and push [YES].

[SETUP]

```
DMXin:MERGEmode_
DMX-rate: slow
```

DMXin/out modi

'MERGEmode': with this selection for DMXin the incoming DMX-signal of an other device will be merged with the steering signal of the Toddler, according to the principal the highest takes precedence.

```
DMXin:SCENEmode_
DMX-rate: slow
```

'SCENEmode': with this setting the DMXin signal is like a scene which can be selected for *live* or *next* under CHANNEL CONTROL- or PLAYmode. In the last case DMXin can be faded in or out. When the Toddler is used as a back-up for another steering table, this setting should be selected.

DMX-rate: slow/high. Line two gives the opportunity to select the data-rate of DMX-out; *slow*=35[1/s] and *high*=44[1/s]. This is important for DMX-steered devices which can not handle full speed DMX.

[SETUP]

```
PAIR  Ch234&235_
for 16bit fade:n
```

Softfade or 16 bits fade
Default the minimal stepping size of a fade is 1/255 (=8 bits) of the total change in value. With this menu a smaller stepping size can be set for particular control channels by pairing them. Push to confirm [YES]. Each pair build up one 16 bit control channel: channel N is the highbyte and channel N+1 the lowbyte. This makes the minimal stepping size for a fade of the selected channels, in this case *Ch234 and Ch235,* 1/65535 (16 bits) of the total change in value. The real stepping size of the corresponding byte values in the DMX signal depends of the DMX-rate and the fade-time. Channel-pairing is only useful if the DMX steered devices can handle this. For example in case of moving lights; channel pairing gives the opportunity of a 16 bits positioning. With [NO] one can undone a previous pairing.

[SETUP]

```
Clock Control:
time-day mode
```

Clock Control
This menu gives the opportunity to enable fade-in control by the internal real time clock. Possible settings are:
* *Off* (clock control disabled)
* *CLOCK, time/day*: for example always at 17.15 on Tuesday.
* *CLOCK, time/date*: absolute time, for example 20.43 on 9-9-99.

Note 1: See also page 9 under [assign].
Note 2: 03-07-00 is 3 July 2000.

[SETUP]

```
Remote Control=
MIDI, Channel04
```

Remote Control
In this menu one can selected a possible remote control.
Possible settings are:
* *Off* (remote control input disabled)
* *PRESET selector* (= remote preset control with 7 buttons see page 8
* *MIDI, channelXx*

The example setting: MIDI control is enabled for a channel message 'control change' with channel number 4. More about MIDI in relation with the Toddler see at the end of this manual.
Note 1: See also page 9 under [assign].
Note 2: An external GO-button is not a remote control in this context.

[SETUP]

```
Adjust: Friday
13:48 13-12-98
```

Adjust clock
With this display it is possible to adjust the built-in clock.

[SETUP]

```
CREATE: memory
backup 1 ?
```

Memory Backup
It is possible to make 4 different copies (backups) of the hole setup and all scene-records (provided a flash ROM has been placed in the socket destined for this purpose). These copies are preserved in a not volatile memory and are numbered 1 up to and including 4. Select with the buttons [change item] the desired number and confirm this choice by pushing [YES]. During 5[s] the word *'busy'* will appear after which the word *'done'* will light up. In case the word *'failed'* would appear a new attempt should be made. If this repeats itself, a part of the memory is no longer useful. Then another backup number should be chosen, whereby an other part of the memory is used. Once a backup has been made it is possible to transfer the light program made, to another Toddler. Hereby the backup memory should only be taken from the socket and be transferred. See page 11 for restoring the memory.

[SETUP]

```
RESTORE memory
from backup 1?
```

Memory Restore
It is possible to put back in the working memory of the Toddler a backup earlier made. Select with the button [change item] the desired backup-number and confirm this choice by pushing [YES]. Then a warning will appear; the actual memory-contents, after again pushing [YES], will be replaced by the contents of the selected backup. After this the Toddler will restart.

For more information about the Toddler (software up-dates, applications) visit our website: www.theater-technisch-lab.nl

Appendix: The Toddler versus MIDI

The Toddler can be a slave in a MIDI configuration. The Toddler reacts only on MIDI channel messages of type 'program change'. You can use MIDI to remotely command the Toddler to start a particular fade-in of a previously recorded scene.

More about MIDI-connection
A MIDI-connection is a digital serial electronic connection, type current loop.
Explanation:
- '..... serial electronic....': a two wired connection across which digital data is send bit by bit.
- 'digital....current loop': the messages exist of current pulses.

Connecting MIDI to Toddler
The Toddler can only **accept** MIDI messages. For that purpose the Toddler has a MIDI **input** on the right side. The connector used is a 5-pin DIN (180 degree) male. Pin4=MIDI+, pin5=MIDI-. Note that pins 1, 2 and 3 are not used and should be left unconnected. Only in case a twisted pair cable is used, pin 2 should be used to connect the shielding of the twisted pair cable. The maximum length of the MIDI cable is 6 meters.

More about MIDI-messages
In a system where several devices are connected with each other by means of a MIDI-connection, one of the devices is the MASTER. This MASTER controls the others (SLAVES) by means of messages, which imply several commands. In general not every message is meant for all connected slaves; there are SLAVE specific messages.
Each SLAVE has a number between 1 up to 16 and SLAVE specific messages involves also a number between 1 up to 16. This number is called CHANNEL number and in this sense a SLAVE is called a CHANNEL. So it must be possible to define for a SLAVE a channel number. A slave selective message is called 'CHANNEL MESSAGE'; this kind of messages involves always a channelnumber.

Channel message of type: Program change
There are several types of channel messages. The Toddler (from Toddler2 software version 3.2) acts only on type PROGRAM CHANGE. This message exist of two bytes.
The **first byte**, STATUS BYTE, specifies the message type and the channel number; the value is Cn[hex], n=channelnumber (1,...16).
The **second byte** is called the DATA BYTE; bit-7 is always zero, byte value=0,...,127.

Running status
The MIDI-handler of the Toddler knows 'RUNNING STATUS'. This means: when a status byte is received and processed, the MIDI-handler remains in that status until a different status byte is received. This means that during the time the status is not changed, one only have to send data bytes in the succeeding messages. Further, the Toddler recognises SYSTEM REAL-TIME messages, in that way that RUNNING STATUS remains maintained.

The relation table below is applicable in case of the Toddler.

MIDImessage = status byte	+ data byte	--> start fade-in scene
Cn[h]	0	Xxx
Cn[h]	1	Xxx
Cn[h]	2	Xxx
,	,	Xxx
,	,	Xxx
Cn[h]	99	Xxx

'n' is the under 'SET-UP' chosen MIDI-channelnumber. [h] means hexadecimal.

Programming Toddler for MIDI-control

- To define a channelnumber to Toddler: set under [SET-UP] for *Remote control=* the option *MIDI.* Select in the same menu a channel number. (see page 10 in manuel Toddler)
- Record the desired scenes.
- Define under [assign] the relation between the second byte of the MIDI-message and the scene that must be fade-in. (see page 8 in manuel Toddler)

An example

For example: the Toddler is set on "MIDIchannel=4" and "MIDI data= 14 fades in A03". At the moment the MASTER sends the bytes "0C4[h]" and "0E[h]" (E[h]=14 decimal), the Toddler reacts by cancelling the going fade and fading in scene A03.