ELEKTRALITE
division of group one

CP16/24 Operator's Manual

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Chapter 1

INTRODUCTION

The Elektralite CP16/24 is a small but powerful moving light controller designed to control up to sixteen moving light fixtures. Each moving light can have up to maximum of 24 channels. It is quick and easy to program and will do many of the things that up until now could only have been done with much more expensive lighting consoles.

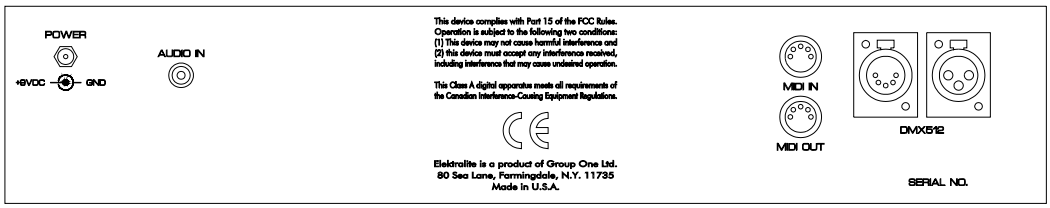
Features

- 19 inch rack mount, 2 rack space chassis.
- Battery backed RAM for 225 cues, 99 chases, and 50 macros.
- 32 character LCD display for easy programming.
- Simple panel layout with dedicated switches for ease of use.
- High quality 60mm faders for fixture feature control.
- Separate faders for crossfade and chase speed control.
- High quality joystick for pan and tilt control.
- 12 digit keypad for data entry.
- Audio input for chase speed control.
- Midi in and out for automation and memory backup.
- DMX512 output.
- Extensive library of fixture types.

Chapter 2

SYSTEM SETUP

After unpacking the CP16/24, plug in the external power supply and turn on the power switch on the front panel. The display should light up and display the product name along with the current software revision. If the display does not light up consult the troubleshooting chapter in this manual.



CP16/24 Rear Panel

DMX512

The moving light fixtures are connected to the CP16/24 via the DMX512 jacks on the rear panel. A standard 5 pin jack and a 3 pin jack is provided. The two jacks are wired in parallel with pin 1 to ground, pin 2 to data minus and pin 3 to data plus.

The CP16/24 is designed to control a variety of fixture types which accept up to 24 channels of control per fixture. The CP16/24 outputs 384 DMX512 channels. You can connect more than 16 fixtures but some will have to share channels and will operate in unison. The default starting addresses for the 16 fixtures are set at 24 channel intervals and are shown below, consult your particular fixture's instructions on how to set the starting channel address on the fixture. There is a soft patch feature in the CP16/24, which also allows you to change these starting addresses.

Fixture	Start Address	Fixture	Start Address
1	001	9	193
2	025	10	217
3	049	11	241
4	073	12	265
5	097	13	289
6	121	14	313
7	145	15	337
8	169	16	361

After the fixtures are connected and the start addresses set you must next tell the CP16/24 what type of fixture is connected at a particular address by making a selection from the fixture library. Consult the "System Programming" chapter of this manual for further instructions.

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AUDIO IN

Connect the audio input to a line level output from a mixing console or an audio preamp. Do not connect this to a power amp or any speaker level source. Consult the chapter on chases as to how this input is used.

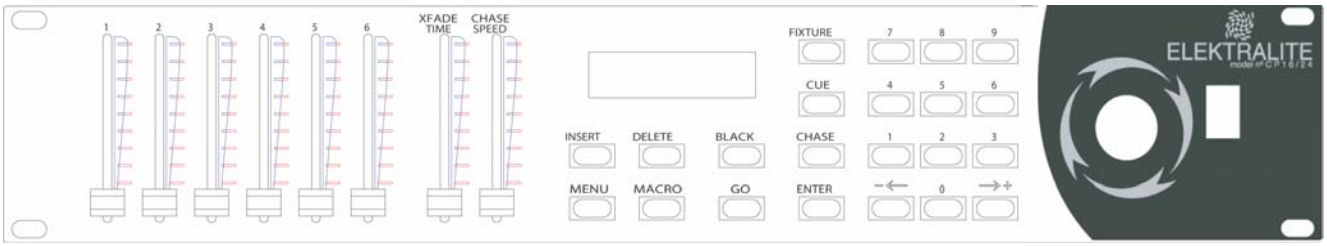
MIDI IN/OUT

If you are using MIDI with the CP16/24, connect the MIDI out on the CP16/24 to the MIDI in on your computer interface, sequencer, or data storage device. Connect the MIDI out on the CP16/24 to the MIDI in on the other device. Read the chapter on MIDI for more information.

Chapter 3

CUES

The CP16/24 allows you to store up to 225 cues in memory which can later be recalled directly using the numbered keyswitches and Go switch or recalled in automatic sequences using chases and macros.

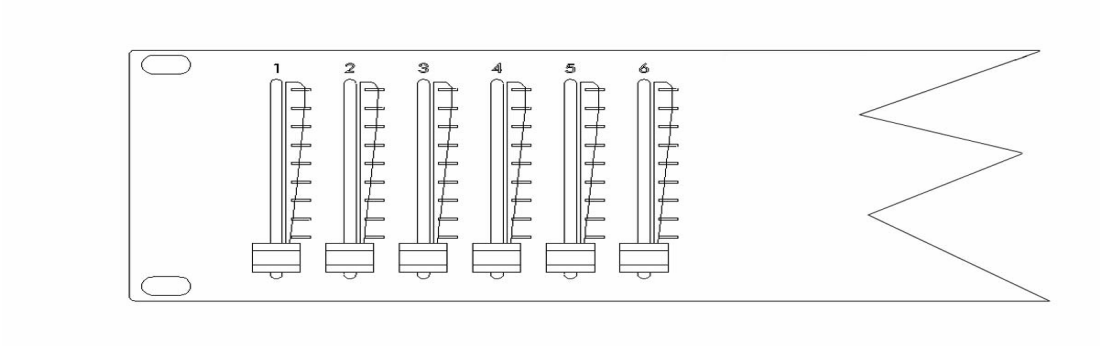


Programming Cues

To program a cue you must first create a "look" on stage. This is done by setting the control levels for each fixture. You can do this one fixture at a time or in any group combination. To select the fixture(s) you want to control, press "Fixture". The display will show the fixtures that are currently enabled

```
01 02 03 04 05
06 07 08
```

Use the numbered keyswitches to toggle fixtures on or off. You can enable any combination of fixtures. Use the **left** arrow switch to switch between selecting fixtures 1-8 and 9-16. When selecting 9-16, switch 0 selects fixture 10, switch one selects fixture 11, and so on. When a fixture is disabled the faders and joystick will have no effect but the fixture will still be controlled by cues or chases. Once a fixture is enabled you can control its pan and tilt with the joystick or any of its other settings with the faders. The faders are used to control channels within the fixture in ascending order. Use the **right** arrow switch to move from one fader bank to the next. This therefore allows you access to channels higher than 6.



Bank 1	**1ch**	**2ch**	**3ch**	**4ch**	**5ch**	**6ch**
Bank 2	**7ch**	**8ch**	**9ch**	**10ch**	**11ch**	**12ch**
Bank 3	**13ch**	**14ch**	**15ch**	**16ch**	**17ch**	**18ch**
Bank 4	**19ch**	**20ch**	**21ch**	**22ch**	**23ch**	**24ch**

So Fader Bank One **addresses channels 1 through 6 on faders 1 through 6.** Fader Bank 2 **addresses channels 7 through 12 on faders 1 through 6.** Fader Bank 3 **addresses channel 13 through 18 on faders 1 through 6.** Fader Bank 4 **addresses channels 19 through 24 .**
The display will give you the information about what fader bank and fader you are moving at any time. So for example if you are in fader bank 3 and move fader 3 to the top of its travel then the display will read as follows:-

```
FADER BANK 3
CHANNEL 15 100%
```

Consult your fixture manual for a description of what each channel does. Care must be taken when dealing with a fixture that has a control channel. Control channels usually turn on and off the lamp and also have a default setting. It is important to obey any default setting requirements.
NOTE: at all times the pan and tilt are "on" the joystick no matter what Fader Bank is active.
When creating a new cue from scratch, always start by pressing "Black". This will zero all channels at the start of the programming process. Next select fixtures as described in the preceding paragraphs. Use the joystick and control faders to program the fixtures that are to be used in the cue. Once the look has been established, store the cue in memory by pressing "Enter", then "Cue", the following message will be displayed:

```
ENTER CUE _
XFADE 00.0 SEC.
```

Next use the "Xfade Speed" fader to set the crossfade time for this cue. This will establish the speed at which the fixtures will crossfade to this new cue when called. Set this to 0 for the fastest possible movement. Next use the numbered keyswitches to select a cue number from 1 - 225 to store this cue to. It is not necessary to enter 3 digits. If for example you are saving cue 1, you only need to press keyswitch 1. Finally press "Enter" to store the cue. If a cue has already been saved at this location you will be prompted with the following display:

```
CUE 001 EXISTS,
ENTER OR CHANGE
```

Press "Enter" to write over the old cue or you can select a new number and then press "Enter" to save it at a different location. Once the cue has been saved the display will read:

```
CUE 001 SAVED
```

Recalling Cues

Once cues have been stored in memory they can be directly recalled by pressing "Cue". The display will read:

```
NEXT CUE _
```

Select the desired cue number (1 - 225) using the keyswitches. Press "Go" to call the cue. A bar graph will appear in the lower half of the display if there is a crossfade and will show the progress of the fade. Also the next consecutive cue number will automatically be displayed. This will allow you to press "Go" again without

having to select the next cue number in sequence. You can also use the "+" or "-" key to increment or decrement the next cue number.

NOTE: When a cue crossfades, only pan, tilt, and possibly dimming will actually crossfade as these are continuous type controls. All other non-continuous type settings; color, gobos, etc. snap to position at the end of the crossfade. You can reprogram each channel to crossfade, snap before or snap after fade to suit your application. Consult the "System Programming" chapter in this manual on how to do this.

Editing Cues

To edit an existing cue, first recall the cue as described in the previous paragraphs. Make any changes as needed using the control faders or joystick. Press "Enter", "Cue", then adjust the "Xfade" if desired. Select a cue number to store the edited cue to using the keyswitches. You can write over the original cue number or you can select a different one if you are copying this cue to another location. Finally press "Enter" to store the edited cue. If you are writing over the original cue, press "Enter" again to overwrite.

Fine Pan and Tilt

The joystick has a "fine" mode for pan and tilt control. To enable fine mode, press "Fixture". When the "Select Fixture" menu is active, pressing "Fixture" again will toggle fine mode on and off. The display will read:

```
01  02  03  04  05
06  07  08       FINE
```

With the joystick in fine mode, the pan and tilt will move in small increments making it easier for exact positioning. Use fine mode only after you first get the focus close to position with the joystick in normal mode. In normal mode the joystick controls the focus with absolute position, when the joystick is full left the pan is full left, and so forth. In fine mode the joystick control is relative. Moving the joystick will increment or decrement the focus from the current position. If in fine mode you run out of joystick when trying to position a focus, you can disengage the joystick by disabling the fixture you are using, then move the joystick to center, then enable the fixture again. From that point the joystick control will continue where it left off.

Pile-On

This feature gives the user the ability to create cleared or “transparent” channels within specific cues thus enabling you to recall two or more cues at the same time to pile on top of each other.

With PILE ON enabled the lighting programmer may designate cues that contain ONLY certain channel’s information. For instance, cues can be created with only Pan & Tilt information for preset positions on a stage while other cues contain the actual color and gobo look that will be “piled on” to that existing position.

Pressing the BLACK button clears all of the channels to start fresh. The actual DMX output of the controller sets all of the channels to 0%. However, the console “sees” that all of the DMX channels are transparent until an actual change is made.

Holding DELETE while moving a fader or recalling a cue will allow the channels to visibly change but will not include them into the new cue. This is particularly useful for creating a starting cue of an open white beam of light positioned in an area that is visible to the user.

Some may ask why a programmer would use this. The use of transparent channels is very handy for several different applications such as:

- on-the-fly changes of looks to other positions on a stage
- nightclub or rave style programming where the console is used in a different venue each week with the same programs (you only need to update your position cues instead of re-programming the whole show).
- Industrial or corporate shows where presenters or products need to be highlighted manually
- "flyaway" cues that take your existing stage looks and fly them out into the audience
- Creating preset focus cues.

This programming tool can be extremely powerful but is very often confusing to initially understand. We highly recommend trying the programming examples that follow:

EXAMPLES OF "PILE ON" PROGRAMMING:

1) First you must specify whether the PILE ON function will be enabled.
   Press: MENU , use the +/- keys to toggle to the "PILE ON" menu & hit ENTER. Use the +/- keys to enable the PILE ON feature.
2) Press BLACK to bring all DMX channels to 0%. This now also clears out all of the channel information thus making it "transparent".
3) Press the FIXTURE button and call up some fixtures to work with.
4) While holding the DELETE key open up the fixture's dimmer and shutters where applicable and move the pan & tilt to a position that is easily seen.
5) Now create a color without touching the dimmer, shutter, pan or tilt channels and store it as a CUE.
6) Create a different color and store it as another CUE.
7) Press BLACK again to clear out all of the information and repeat step 4.
8) Now create a gobo look and store it as a CUE.
9) And create another gobo look for another CUE.

What you have now are two cues that contain ONLY color information and another two cues that contain ONLY gobo information.

10) Now press BLACK and open up the dimmers and shutters WITHOUT holding the DELETE key.
11) Move the light beams all the way to the left and store this as a CUE with a 3 second XFADE time.
12) Move the light beams all the way to the right and store this as another CUE with a 3 second XFADE time.
13) Move the light beams to the center and store this as yet another CUE with a 3 second XFADE time.

You now have three cues that contain only position information. It is now time to recall some of these cues and see how transparent channels operate.

14) Press BLACK to turn all of the channels off.
15) Call up one of your position CUEs
16) Call up one of your gobo CUEs
17) Call up one of your color CUEs

You should be seeing your light beam staying in one position and piling on the other information.

5) Now call up another position CUE to see this newly created "look" move slowly to another position.

6) Repeat steps 15 through 18 to get a good feel for how this style of programming works.

With the PILE ON function engaged you must ALWAYS be mindful as to which channels you are and are not altering at any given moment. Your programming needs to be calculated & precise. Lack of attention when using this programming method, often results in a telephone call for technical support that could have easily been avoided.

Chapter 4

CHASES

The CP16/24 can store up to 99 chases each with up to 99 steps. A chase is a series of cues, which are called one at a time in order. Each cue in the chase is referred to as a step. The chase will loop continuously as it steps through each cue at a pre-programmed speed. In addition you can set the crossfade speed that the chase will use from one step to the next. If there is an audio signal at the audio input on the CP16/24, you can sync the chase to the beat by enabling audio.

Programming Chases

The cues in the chase are accessed from the cue memory so you must first create and store some cues as described in the previous chapter. Once you have done so you can then program a chase. To begin, press "Enter" then "Chase". The display will read:

```
CHASE _    BPM 120
STEP 01     CUE
```

Use the cursor keyswitches "-←" and "→+" to move the underline cursor on the display to the lower right corner of the display next to the word "CUE". Select the number for the first cue of the chase using the number keyswitches. Press "Enter". The display will automatically increment to the next step and the number next to "CUE" will go blank allowing you to enter the cue for the next step of the chase. Repeat this process until you have entered all of the cues for this chase.

After entering the cues, adjust the "Chase Speed" fader until the display shows the desired BPM (beats per minute). There are 128 different BPMs available from 0 (stopped) up to 999. Next adjust the "Xfade Speed" fader to the desired crossfade time. The display will switch from "BPM" to "XF" and show the selected crossfade as a percentage. There is only one crossfade speed for the entire chase, the crossfades that are stored with the cues are not used.

Crossfades are presented as a percentage for chases rather than in seconds as in cues. Setting the crossfade rate to 100% gives a smooth glide from step to step and 0% gives a quick snap from step to step. Only the channels which are programmed to crossfade are affected. The crossfade time will automatically adjust itself to the chase speed and will always be a percentage of the time between chase steps. Crossfade will always revert to 0% when a chase is controlled by audio.

After the chase is programmed, move the underline cursor back to the top line of the display next to the word "Chase" by pressing "Enter" once more or by using the cursor keyswitches. Select a number to assign the chase from 1-99 using the keyswitches. Press "Enter" again to store the chase at that location. As when storing a cue, if there is already a chase at that location the display will read:

```
CHASE 01 EXISTS,
ENTER OR CHANGE
```

Press "Enter" to write over that location or select a new location and press "Enter".

Recalling Chases

Once a chase has been stored in memory it can be recalled by pressing "Chase". The display will read:

```
SELECT CHASE _
```

Select the desired chase number with the keyswitches then press "Go". The display will read:

```
CHASE 01  BPM 120
STEP 01     CUE 001
```

As the chase runs, the display will increment with each step of the chase showing the current step and cue number. You can adjust the speed and crossfade rate while the chase is running. Pressing "Go" while the chase is running will advance the chase one step.

Audio Sync

If there is an audio signal present at the audio input jack on the rear panel, you can sync any currently running chase to it by enabling audio. The chase will try to derive a beat from the bass frequencies and trigger the steps from it. When the chase is using the audio signal for its speed, the display will show the message "AUD" next to BPM instead of a number.

Consult the chapter "System Programming" for information on how to enable audio and how to adjust the audio input level.

Editing Chases

Once a chase is programmed and stored in memory it can be edited and re-stored at any time. You can change the cue number at a step, you can remove steps, you can add or insert steps, you can change the speed and you can change the crossfade rate. You can also modify a chase and copy it to a different location while keeping the original.

NOTE: Whenever you edit a chase you must always store it again, either at the same location or at a new one.

To edit a chase, press "Enter" then "Chase". The display will read:

```
CHASE   _          BPM   120
STEP 01    CUE
```

Use the keyswitches to select the number of the chase you want to edit. That chase will be copied into an edit buffer where you can make changes to it without affecting the original which is stored in battery backed memory.

After the chase has been selected, use the cursor keys to move the underline cursor until it is underneath the step number. Select the step that you want to edit using the keyswitches. After a step is selected the display will show the cue that is stored at that step. If you want to change the cue number at that step, move the cursor until it is underneath the cue number then use the keyswitches to enter a new cue. Press "Enter". The step number

will automatically increment to the next step. If you don't need to edit that step press "Enter" again and the cursor will return to the chase number on the top line. To store the edited chase at the same location press "Enter" again. If you are copying the chase to another location, select a different chase number before pressing "Enter". If you are storing to the same location the display will read:

```
CHASE 01 EXISTS,
ENTER OR CHANGE
```

Press "Enter" to store the new edited chase over the old one.

To add more cues to the end of a chase, first load the chase into the edit buffer as explained earlier. Move the cursor to the step number on the display and select the step number that is one higher than the last step in the chase. The cue number will be blank for that step. Move the cursor to the blank cue field and select a cue number. Press "Enter". The display will automatically increment allowing you to enter more steps to the end of the chase. When you are finished press "Enter" and the cursor will return to the chase number. Press "Enter" again to overwrite the old chase or select a new location then press "Enter".

To delete steps from a chase, load the chase into the edit buffer as explained earlier. Select the step number that you want to delete by moving the cursor under the step number in the display and selecting it. Press "Delete". That step will be deleted from the chase and any steps above that one will move down to the next lower step number. The display will show that the cue that was at the next step has now moved down to the step that you just deleted. If the step you deleted was the last step of the chase, the cue field will go blank showing that there is now no cue at this step. Finally you must store the chase after you have edited it.

To insert a chase step into the middle of an existing chase, first load the chase into the edit buffer as explained earlier. Call the step number where you want to insert the new step by moving the cursor under the step number and selecting it. Press "Insert". A blank step will be inserted at this step number and any steps above this one will be moved up one step number. Move the cursor over to the cue number which will be blank. Select the cue number to insert at this location then press "Enter". The step number will automatically increment and you can insert another step by moving the cursor back to the step number and repeating the previous operation. Finally you must store the chase once you are finished editing.

To erase an entire chase from memory press "Enter" then "Chase". Select the chase number then press "Delete". The display will read:

```
ERASE CHASE 01?
+ = YES, - = NO
```

Press the "+" key to confirm the erase or press "-" to escape.

Programming & Operation of chases with "Pile On" enabled. First, enable the Pile On function via the Menu display. Press the button marked "Black" to clear all output. Create cues using the fixtures you want. Be VERY sure NOT to access channels of fixtures that you do not want in the cue, because the CP16/24 will record those values into the cue. Once completed place those cues in a chase. Repeat the above with fixtures OTHER THAN THE ONES previously used. Press "Chase # Go" to start the first chase. Press "Chase # Go" to start the second chase. If programmed correctly the result will be both chases running together at their programmed chase speed and Xfade time. Altering the chase speed and the Xfade time will affect only the most recently activated chase. To stop the chases press "Black". Up to 3 chases maybe run together. Trying to run a fourth chase will display the message "3 chases running" in the LCD display.

Chapter 5

MACROS

The CP16/24 can store up to 50 macros each with up to 99 steps. A macro is a list of cues, chases and blackouts, which are automatically called one at a time in order. Each item on the macro list is referred to as a step. A hold time is also stored with each macro step, which determines the amount of time that will elapse until the next macro step is automatically called. This allows you to pre-program an entire show that will loop continuously.

Programming Macros

To program a macro first press "Enter" then "Macro". The display will read:

```
MACRO _          STEP  01
CUE      HOLD 000
```

Use the cursor keyswitches to move the underline cursor on the display to the lower left corner of the display underneath the word "CUE". If the first step is to be a cue, press "Enter" and the cursor will move to the cue number. If instead you want to put a chase at this step press any of the numbered keyswitches to toggle the selection from "CUE" to "CHS". If you want to put a blackout at this step first set the "Xfade Speed" fader to the desired crossfade speed for the blackout then press "Black". After selecting "CUE", "CHS" or "CUE BLK" press "Enter". The cursor will move to the next field which selects the cue or chase number. Use the number keyswitches to select the desired cue or chase for this step. If you have selected a blackout for this step "BLK" will be displayed next to "CUE" and no additional selection is necessary. Press "Enter". The cursor will now move to the next field which selects the hold time for this step. Use the keyswitches to enter the hold time in seconds (0-999). Press "Enter". The cursor will return to the left of the display and will automatically increment to the next step number allowing you to repeat the previous operation for the next macro step.

Once all steps have been programmed, press "Enter" repeatedly or use the cursor keys until the underline cursor moves back to the top line of the display next to the word "Macro". Select a number to assign the macro from 1-50 using the keyswitches. Press "Enter" again to store the macro at that location. If there is already a macro at that location the display will read:

```
MACRO       01    EXISTS,
ENTER OR CHANGE
```

Press "Enter" to write over that location or select a new location and press "Enter".

Programming with "Pile on" enabled. The CP16/24 has the ability to run up to three chases simultaneously, by setting the "Hold" time of the first two chases to 000 and then setting the overall "Hold" time for the three chases on the third chase entered. A "Black" step in the macro is used to turn the chases off. The "Black" step can have a hold time of 000 if the next macro step needs to be an instanteous change to a cue or another chase/chases. Not entering a "Black" step will allow the three chases to continue running. (This is similar to activating three chases manually and then trying to activate a fourth). Specific key commands are as follows;

Press “Enter Macro #”. Then use the -/+ keys to move the cursor to the cue field. Press any number to toggle from “Cues” to “Chs” and the press “Enter”. Type in the chase number for the first chase. Press “Enter” two times to leave the Hold time at 000. Repeat the above for the other two chases but with the last chase, when it comes to the Hold time, type in a value other than 000. After typing in a Hold time press “Enter”. Use the “+” key to move the cursor to the cue number field and press “Black” to enter a black-out command. Press “Enter” to set the Hold time. This can be left at 000 to turn off the previous chases and immediately proceed to the next step. Continue to write the rest of the macro as normal.

Recalling Macros

Once a macro has been stored in memory it can be recalled by pressing "Macro". The display will read:

```
SELECT MACRO _
```

Select the desired macro with the keyswitches then press "Go". The display will read:

```
MACRO   01      STEP   01
CUE 001 HOLD 010
```

The display will change as the macro runs with each step of the macro showing the current step and what is stored there. The hold time will also count down on the display showing the time remaining until the next step is called. While it is running, you can pause the macro by pressing the "-" key then continue by pressing "+". "Go" will advance the macro to the next step.

Editing Macros

Once a macro is programmed and stored in memory it can be edited and re-stored at any time. You can change the cue or chase number as well as the hold time at any step. You can remove steps, add or insert steps. You can also modify a macro and copy it to a different location, keeping the original while creating a new one.

To edit a macro, press "Enter" then "Macro". The display will read:

```
MACRO   _       STEP   01
CUE     HOLD 000
```

Use the keyswitches to select the macro that you want to edit. The selected macro will be copied into an edit buffer where you can make changes to it without affecting the original which will still be stored in battery backed memory.

After the macro has been selected, use the cursor keys to move the underline cursor underneath the step number. Select the step that you want to edit using the keyswitches. When a step is selected the display will show the information that is stored at that step. If you want to change anything at that step, move the cursor until it is underneath the item you wish to change then use the keyswitches to enter a new value. Press "Enter" after each new entry. If you continue to press "Enter" the cursor will move to each item on the step display. If you do not want to change that item, press "Enter" and the cursor will move on then automatically increment to the next

step. If you don't need to edit the next step keep pressing "Enter" until the cursor returns to the macro number on the top line. To store the edited macro at the same location press "Enter" again. If you are copying the macro to another location, select a different macro number before pressing "Enter".

To add more steps to the end of a macro, first load the macro into the edit buffer as explained above. Move the cursor to the step number on the display and select the step number that is one higher than the last step in the macro. The cue and hold numbers will be blank for that step. Move the cursor under "CUE" if you want to change it to "CHS". Press "Enter". The cursor will automatically move to the next field so that you can enter the cue or chase number and finally the hold time for the new step. After entering a hold time and pressing, "Enter" the display will automatically increment allowing you to enter more steps to the end of the macro. When you are finished continue to press "Enter" or use the cursor keys to return the cursor to the macro number. Press "Enter" again to overwrite the old macro or select a new location then press "Enter".

To delete steps from a macro, load the macro into the edit buffer as explained above. Select the step number that you want to delete by putting the cursor under the step number in the display and selecting the desired one. Press "Delete". That step will be deleted from the macro and any steps above that one will move down to the next lower step number. The display will show that the values that were at the next step have now moved down to the step that you have just deleted. If the step you deleted was the last step of the macro, the cue and hold field will go blank showing that there is now nothing at this step. Finally you must store the edited macro as explained previously.

To insert a macro step into the middle of an existing macro, first load the macro into the edit buffer as explained. Call the step number where you want to insert the new step by moving the cursor under the step number in the display and selecting the desired step. Press "Insert". A blank step will be inserted at this step number and any steps above this one will be moved up one step number. Move the cursor over to the cue field, which will be blank. Select the cue, chase or blackout to insert at this location then press "Enter". Enter a new hold time and press "Enter". The step number will automatically increment and you can insert another step by moving the cursor back to the step number and repeating the previous operation. Finally you must store the edited macro.

To erase an entire macro from memory press "Enter" then "Macro". Select the macro to erase then press "Delete". The display will read:

```
ERASE       MACRO       01?
+ = YES, - = NO
```

Press the "+" key to confirm the erase or press "-" to escape.

Fast Hold Time

Programming a macro step with a hold time of 0 seconds will give you an actual hold time of .25 seconds. This allows you to program macro steps, which quickly refocus a fixture with the lamp off to achieve a dramatic effect. To do this, program a cue, which focuses the beam on the desired subject. Copy this cue to another cue number but with the lamp turned off. In your macro call the cue with the lamp off with a hold time of 0. With the next step of the macro call the cue with the lamp turned on giving it a longer hold time. This will create the effect of a beam, which appears rather than moves across the stage.

Chapter 6

PERFORMANCE

Live performance of the CP16/24 for the most part involves calling cues, chases, and macros. The easiest method of performance, which doesn't require an operator, is to call a macro or chase and let it loop continuously. The macro or chase will continue to run until it is interrupted by a call to another macro, chase, or cue, or by pressing "Black". A macro can be paused by pressing the "-" key. Pressing "+" will continue the macro, and "Go" will advance the macro to the next step.

You can also call cues directly by pressing "Cue", then the desired cue number, then "Go". The next cue number will automatically be displayed so that you can continue to press "Go" to call one cue after another in ascending order. The "+" and "-" keys can also be used to select the next cue.

Direct Control of Fixtures

During performance you can take direct control of any fixture or group of fixtures using the joystick and control faders. The current fixture selection is saved in battery-backed memory so that when the CP16/24 is turned off it will always power up as you left it.

Any fixtures that are enabled will respond to movement of the joystick or control faders. This gives the operator the option of live performance control even if a macro or chase is running. If there is a chase running, any channel settings that are adjusted using the faders or joystick will temporarily override the chase control of those channels. The chase memory will not be affected.

Use the joystick in fine mode when you want to manually follow with a focus on stage. Fine mode moves a focus relative to its previous position.

Black

Pressing the "Black" switch sets all DMX512 channels to 0. It also turns off any currently running chase or macro. The blackout will crossfade at whatever speed the "Xfade Speed" fader is currently set to.

Xfade Speed

If a crossfade is in progress it can be overridden by moving this fader. If the "select cue" or "black" displays are active, a bar graph is displayed showing the progress of the crossfade. If a chase is running, the crossfade affects the amount of glide between chase steps.

Chase Speed

If a chase is running, its speed can be adjusted by moving this fader. If audio is controlling the speed of the chase, this fader will have no effect.

Audio

With audio enabled, chases will try to sync to the beat of the audio signal. Consult the "System Programming" chapter on how to enable audio.

Auto Start

When the CP16/24 is switched off it will keep track of any cue, chase or macro that was running. When switched on it will restart the chase or macro from the beginning.

Chapter 7

SYSTEM PROGRAMMING

There are a number of features and settings for the CP16/24 that are to be programmed during installation that seldom if ever need to be set again. They are generally used by the installer to customize the system to the particular installation. These are all accessed using the "Menu" switch. Any menu selection that involves setting a value will be stored in battery-backed memory.

Press "Menu" and the display will read:

```
MENU SELECT + -
AUDIO ON/OFF
```

Use the "+" and "-" keys to select from the different menu items. In the above display, audio enable is the current selection. To select that item press "Enter". The display will go to the audio enable menu where you can then set the audio enable to the desired value. You do not need to press "Enter" once a menu item is programmed. You can press any other switch to continue. The various menu items are explained in the following paragraphs.

Audio On/Off

The audio enable display reads:

```
AUDIO IS OFF
USE +/- TO SET
```

Use either the "+" or "-" key to toggle the audio on or off. When audio is on, chases will attempt to sync to the beat of the audio signal. If there is no signal present the chase will not run. "AUD" will appear in the chase display next to "BPM". Xfade is automatically set to 0 when a chase is controlled by audio. The audio sensitivity can be adjusted from one of the following menu items.

Fixture Library

The fixture library display reads:

```
FIXTURE 01
GOLDENSCAN 2/3
```

Use the number keyswitches to select the fixture (01-16) then use the "+" and "-" keys to select from the fixture library. You must set each of the 16 fixtures separately. This allows the CP16/24 to patch its faders and joystick to match the selected fixture type.

Soft Patching

The soft patching display reads:

```
FIXTURE 01
START ADDR 001
```

Use the number keyswitches to select the fixture (01-16). Next use the right or left arrow switch to move the cursor under the start address number (in this case 001), then select a start address for that fixture from 001 to 384. To patch another fixture use the right or left arrow switch to move the cursor under the fixture number and select another fixture. If you select 0 as the starting address for a fixture it will be removed from the DMX output. If you try to select a number higher than 384 it will be ignored. Be careful not to allow channels from one fixture to overlap another.

The default soft patch is shown on page 2.

Xfade Mode

This allows you to program the way each of the 384 DMX512 channels executes a crossfade whenever a cue is called. This is done automatically for you whenever a particular fixture type is selected from the fixture library. Use this feature to override the settings used by the library. The crossfade mode display reads:

```
FIXTURE 01
CHNL 1  SNAP AF
```

You must select both the fixture number (01-16) and the channel number within the fixture (1-24). Use the arrow switches to move the cursor under the fixture number, the channel number or the crossfade mode. Use the number keyswitches to make a selection. **NOTE:** The channel number represents the number within the fixture and may not correspond to the fader number on the CP16/24. The choices for crossfade mode are "XFADE" which gives a timed crossfade, "SNAP BF" which instead of crossfading makes the channel snap to its new setting at the start of the crossfade, and "SNAP AF" which makes the channel snap to its new setting at the end of the crossfade.

NOTE: Whenever you select a new fixture from the library these settings will be set to the library defaults for that fixture.

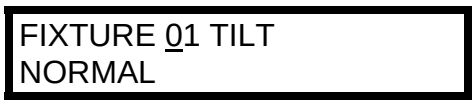
Pan Invert

The pan for a fixture can be inverted. The pan invert display reads:

Use the number keyswitches to select the fixture number then use the "+" or "-" switch to toggle between inverted or normal.

Tilt Invert

The tilt for a fixture can be inverted. The tilt invert display reads:



Use the number keyswitches to select the fixture number then use the "+" or "-" switch to toggle between inverted or normal.

Audio Level

The audio level display reads:

Select a value from (0-9) to control the sensitivity of the audio input, which is used to sync chase speed to audio. The audio input is a line level input meant to be connected to the output of a preamp. In order to be effective the music on this input must have some sort of pulsing beat to drive the chase. The sensitivity sets the trigger level with 0 being the least sensitive and 9 being the most sensitive. If the audio source can be adjusted, leave this setting at 5 and adjust at the source. If the signal can't be adjusted, try different settings until you get the best results. A setting of 9 would be for very weak audio signals and a setting of 0 would be for strong signals.

MIDI Channel

The MIDI channel display reads:

Use the keyswitches to select the MIDI channel (1-16) that the CP16/24 will send and receive on. Consult the MIDI chapter for more information.

MIDI Memory Dump

The MIDI memory dump display reads:

```
PRESS GO TO SAVE
MEMORY VIA MIDI
```

Press "Go" to initiate a memory dump via the MIDI out port. This will encode and send a copy of the cue, chase, macro and system parameter memory to a data storage device for backup or to another CP16/24. While transmitting, "SENDING" will appear in the display. This takes several minutes. The MIDI memory dump display will return when finished. Consult the MIDI chapter for more information.

Memory Lock

This feature is hidden from the other system programming features in order to better protect the memory. To access memory lock press "Enter", "Cue", "998", "Enter".

The memory lock display reads:

```
MEMORY LOCK OFF
USE +/- TO SET
```

Use the "+" or "-" key to turn memory lock on or off. With memory lock on, the cue, chase and macro memory will be protected from accidental writes from the front panel. If anyone tries to store a cue, chase or macro, the message "MEMORY LOCKED" will appear in the display.

Erase Memory

This feature is also hidden from the other system programming features. To erase the memory press "Enter", "Cue", "999", "Enter".

The erase memory display reads:

```
"DELETE" 5 TIMES
TO ERASE MEMORY
```

Press "Delete" 5 times to erase all cue, chase and macro memory as well as setting all system parameters to their factory settings. Use this feature with caution.

Control Lock

The front panel controls including all switches, faders and joystick can be disabled to protect an installation from any tampering. To disable the controls, power up the CP16/24 while holding the “Delete” switch, to re-enable the controls, power up while holding the “Insert” switch.

Chapter 8

MIDI

The CP16/24 has an extensive MIDI implementation, which will allow you to automate performances as well as backup cue, chase, macro and system memory to disk.

NOTE: This manual does not attempt to explain how MIDI works or how to sequence a lighting show.

MIDI Channel

The MIDI channel is set from the menu switch. Consult the "System Programming" chapter on how to do this. The MIDI channel will affect continuous controller messages and program changes, which are sent and received by the CP16/24. If you are only concerned with backing up the memory with MIDI, the MIDI channel need not be changed.

Continuous Controllers

The chase speed and crossfade controls will send and receive MIDI continuous controller messages. Continuous controller 1 is used for the "Xfade Speed" fader and continuous controller 2 for the "Chase Speed" fader. Each of these controls sends or receives a 7-bit control value from 0-127 (00H-7FH).

Continuous controller 0 is used as a bank select for the MIDI program change commands. Banks 0 through 5 select cues, bank 6 selects chases and bank 7 selects macros. The MIDI controllers with their corresponding CP16/24 controls are shown in the MIDI implementation chart, which follows.

Program Changes

The CP16/24 sends and receives MIDI program changes when selecting cues, chases, macros and blackouts. Because MIDI only allows for 127 program numbers, bank switching is used with continuous controller 0 selecting the bank (0-7). Whenever a cue, chase or macro is called from the CP16/24 panel, a bank number (as explained in the previous paragraph) is sent followed by a program change. The first 6 banks (0-5) are for cues with 100 cues per bank. Bank 0 is used for cues 1-100, bank 1 selects cues 101-200 and so forth. Bank 6 is used for chases 1-99 and bank 7 is used for macros 1-50. The MIDI program change number is equal to the cue, chase or macro number. A program change value of 0 is sent when "Black" is pressed with no bank select message needed. Instead of sending a bank number, "Black" first sends a crossfade value using controller 1 before sending a program 0 message.

System Exclusive (Memory Backup)

MIDI system exclusive messages are used by the CP16/24 to encode the memory contents of the cues, chases, macros and system parameters. A memory dump can be initiated from the front panel of the CP16/24 or requested through the MIDI in port using a system exclusive message. To back up or restore the CP16/24's memory using a computer or MIDI data storage device first consult the instructions for your particular storage device. To start the dump from the CP16/24, go to the memory dump menu item. Consult the "System Programming" chapter on how to do this.

When your receiver is ready, press "Go" to start the memory dump. The message "SENDING" will appear on the CP16/24 display. After the dump is complete the display will return to its previous state. The memory dump will require approx. 244K of disk space. When sending a memory dump back to the CP16/24 the message "RECEIVING MEMORY" will appear in the CP16/24 display. After the memory dump has been received the message "MEMORY RECEIVED" will appear in the display. If the "received" message does not appear, then the memory dump was improperly received. The memory dump takes several minutes. The CP16/24 must not be in enter cue, chase or macro mode when receiving a memory dump. The contents of the memory messages are shown in the MIDI implementation chart, which follows.

MIDI Implementation Chart

NOTE: All numbers are in hexadecimal unless stated otherwise.

Continuous Controllers (sent and received)

Bn 00 bb	Bank select
Bn 01 vv	Xfade Speed
Bn 02 vv	Chase Speed

n=MIDI channel (0-F)
bb=bank (0-7)
vv=7 bit value (0-7F)

Program Changes (sent and received)

Cn 00	Blackout
Cn vv	Cues, Chases and Macros

Note: cues, chases and macros are always preceded by a bank select message.

System Exclusive Messages

F0 00 00 19 06 01 dd ... F7	Memory dump
F0 00 00 19 06 00 F7	Memory dump request

dd=approx. 244K data bytes

TROUBLESHOOTING & SERVICE

Chapter 9

There are no user-serviceable parts inside the CP16/24. Any internal problem should be referred to a qualified service technician.

Cleaning and Maintenance

As with any type of control console, keep drinks away from the CP16/24. If you need to clean the front panel use a soft cloth. If necessary you can spray a small amount of glass cleaner on the cloth. Do not spray directly on the CP16/24. Do not spray electronic cleaners into the faders. Refer fader and switch maintenance to a service technician.

Power Supply

If the CP16/24 will not turn on, check the external power supply. There is no fuse inside the CP1/24. If the power supply should ever fail or become lost, only replace it with a U.L. or CE approved one with the same voltage and power rating. The supply must provide 9 volts DC at 500 ma. The plug has a 2.5mm hole with + voltage at the center.

Battery

The CP1/24 uses a battery to maintain its memory. On power up the battery voltage is always checked and the following message will be displayed if the battery voltage gets low.

```
WARNING, BATTERY
VOLTAGE BELOW 2V
```

If this happens, take the CP16/24 to a qualified service center to have the battery replaced. The battery can be replaced without losing the memory as long as it is carefully removed and replaced with the power on. Nevertheless it is always a good idea to back up your memory to disk in case of any possible memory loss. Do not leave your CP16/24 for months without recharging it. Otherwise it will fall below the minimum voltage (2Volts).

DMX512

If your fixtures are not responding to the CP16/24 check the dipswitches on the fixtures and refer to their instructions to make sure they are set properly. Also check your cabling and connectors for opens or shorts. Never connect the shield of your DMX cable to the shell of the connector. If you are running long lines you need to terminate the last fixture in your DMX512 chain with a special termination plug. If you don't have one you can make one by taking a 5 pin male XLR plug and soldering a 120 ohm resistor between pins 2 and 3. Plug this into the unused signal thru connector on the last fixture in your DMX512 chain.

RADIO AND TV INTERFERENCE

WARNING: This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class "A" digital device pursuant to Subpart B of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Changes or modifications not expressly approved by Group One Ltd. Could void the user's authority to operate the equipment.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment has been verified to comply with the limits for a class A computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception.

ELEKTRALITE WARRANTY

Elektralite products are warranted to be free from defects of material and workmanship for a period of two years from the date of delivery to the original user. Repair will be made at no cost for labor or materials within this time period. This warranty is void if the product has been modified without prior authorization or subjected to abuse.

Registering your CP10xt

It is very important that you register your CP10xt so that you can receive any updates and have your warranty in operation. To register please fill in the warranty form which can be found at www.myelektralite.com

All warranty repairs should be returned prepaid to:

Group One Ltd.
70 Sea Lane
Farmingdale, NY 11735
WWW.MYELEKTRALITE.COM

THE FIXTURE LIBRARY

Chapter 10

The following is a list of fixtures in the CP16/24 library. Chapter 7 page 21 explains about the feature of the Xfade. Every channel of a fixture listed in the library is calibrated to either Snap Before or Crossfade on movement. [There is a reason no channel is set at Snap After. If you use fixtures with Snap After turned on, and run them in cues that are also in chases with the chase crossfade set to 100%, then the cue never gets to the end of its time before the next cue starts and so the channels with SA set never works. So that's why we set up the library with only Snap Before and crossfade as the default settings].

CLAY PAKY STAGE COLOR 300
ELEKTRALITE MM 150
MINISCAN/SILVERADO
MINISCAN HPE
GOLDEN SCAN HPE
STAGE SCAN
ELEKTRALITE 575
ELEKTRIC EYE
ELEKTRALITE MY 250
ELEKTRALITE MM 200
STAGE COLOR 1200
STAGE LIGHT 300
STAGE ZOOM
ELEKTRALITE MY 150
ROBE WASH 575 XT 8 BIT
ROBE WASH 575 XT MODE 1
ROBE WASH 250XT 8 BIT

DIMMERS
STAGE COLOR 300
ROBE WASH 250XT MODE 2
ROBE WASH 250XT MODE 1
ROBE WASH 150XT MODE 1
ROBE WASH 150XT MODE 2
CYBERLIGHT MODE 1
CYBERLIGHT MODE 2
CYBERLIGHT MODE 3
INTELLABEAM 13 CHANNEL
INTELLABEAM 7 CHANNEL
INTELLABEAM 8 CHANNEL
STUDIO COLOR 575
STUDIO SPOT 575
STUDIO SPOT 250
STUDIO COLOR 250
TECHNOBEAM 14 CHANNEL
TECHNOBEAM 18 CHANNEL
TECHNOBEAM I 18CH
TRACKSPOT 2 8CH
TRACKSPOT 2 9CH
ROBE WASH 150XT MODE 4
GOLDEN SCAN 3X
SUPERSCAN 12CH
MARTIN MAC 250 MODE 1
MARTIN MAC 250 MODE 2
MARTIN MAC 250 MODE 3
MARTIN MAC 250 MODE 4
MARTIN MAC 300 MODE 1
MARTIN MAC 300 MODE 2
MARTIN MAC 300 MODE 3
MARTIN MAC 300 MODE 4
MAC 500 MODE 1
MARTIN MAC 500 MODE 2
MARTIN MAC 500 MODE 3
MARTIN MAC 500 MODE 4
MARTIN MAC 600 MODE 1
MARTIN MAC 600 MODE 2
MARTIN MAC 600 MODE 3
MARTIN MAC 600 MODE 4
ROBE SPOT 575XT 8 BIT
MARTIN PAL 1200 MODE 2
ROBE SPOT 575XT MODE 2
ROBE SPOT 575XT MODE 1
ROBE SPOT 250XT 8 BIT
ROBE SPOT 250XT MODE 2
MARTIN PAL 1200E MODE 4
MARTIN ROBOCOLOR
MARTIN ROBOCOLOR 2 MODE 1
MARTIN ROBOCOLOR 2 MODE 2
MARTIN ROBOCOLOR MSD
ROBE SPOT 250XT MODE 1
ROBE SPOT 160XT MODE 4
MARTIN ROBOSCAN CMYR 3
MARTIN ROBOSCAN CMYR 4
ROBE SPOT 160XT MODE 3
ROBE SPOT 160XT MODE 2
MARTIN ROBOSCAN P218 Mode 3
MARTIN ROBOSCAN P518 MODE 1
MARTIN ROBOSCAN P518 MODE 2
MARTIN ROBOSCAN P518 MODE 3
ROBE SPOT 160XT MODE 1
ROBE SCAN 150XT MODE 4
MARTIN ROBOSCAN P812 MODE 3
MARTIN ROBOSCAN P918 MODE 1
MARTIN ROBOSCAN P918 MODE 2
MARTIN ROBOSCAN P918 MODE 3
MARTIN ROBOSCAN P918 MODE 4
ROBE SCAN 150XT MODE 3
ROBE SCAN 150XT MODE 2
ROBE SCAN 150XT MODE 1
ROBOSCAN XR4
ROBE SCAN 575XT 8 BIT
ROBE SCAN 575XT MODE 2
ROBE SCAN 575XT MODE 1
SGM GALILEO 1200
SGM GALILEO 2
ROBE SCAN 250XT 8 BIT
SGM VICTORY 250
ROBE SCAN 250XT MODE 2
ROBE SCAN 250XT MODE 1

ROBE SCAN 1200XT 8 BIT
IRIDEON AR 500
IRIDEON AR 250
VARILITE AR 5 LOW RESOLUTION
VARILITE VL 1
VARILITE VL 5
VARILITE VL 6
VARILITE VLM
S.G.M. GIOTTO SP250
CLAY PAKY ASTROSCAN
VARILITE 3000 WASH
CATALYST DL1
ROBE RECESSED WASH 150 MODE 4
ROBE RECESSED WASH 150 MODE 3
ROBE RECESSED WASH 150 MODE 2
ROBE RECESSED WASH 150 MODE 1
ROBE RECESSED SPOT 170 MODE 4
ROBE RECESSED SPOT 170 MODE 3
ROBE RECESSED SPOT 170 MODE 2
FUTURELIGHT MH 660
ROBE RECESSED SPOT 170 MODE 1
ROBE ECOLOR 250 XT
ROBE DJ SCAN 250 XT
ROBE MSZOOM 250XT 8 BIT
ROBE MSZOOM 250XT MODE 2
FUTURELIGHT SC 780
ROBE MSZOOM 250XT MODE 1
ROBE DJ SCAN 150XT
ROBE ROLLER 150XT
GLP PATEND
ROBE COLORSPOT 250AT MODE 4
ROBE COLORSPOT 250AT MODE 3
ROBE COLORSPOT 250AT MODE 2
ROBE COLORSPOT 250AT MODE 1
ROBE COLORSPOT 170AT 16-BIT MODE 4
ROBE COLORSPOT 170AT 8-BIT MODE 3
ROBE COLORSPOT 170AT 16-BIT MODE 2
ABSTRACT VR8R
COEMAR PROWASH
COEMAR PROSPOT
ROBE COLORSPOT 170AT 16-BIT MODE 1
COEMAR CF7 HE
COEMAR CF7 Wash Zoom
COEMAR SUPER CYC
GLP POCKET
GLP JOY 150
GLP JOY 300
Mini Mac Spot Mode 1
Mini Mac Spot Mode 2
Mini Mac Spot Mode 3
Mini Mac Spot Mode 4
Mini Mac Wash Mode 1
Mini Mac Wash Mode 2
Mini Mac Wash Mode 3
Mini Mac Wash Mode 4
Martin MX-1
Martin MX-4
ROBE COLORSPOT 1200AT MODE 2 (chs 25 thru 32)
ROBE COLORSPOT 1200AT MODE 2 (chs 1 thru 24)
COEMAR CF 1200 Hard Edge Compact
COEMAR CF 1200 HARD EDGE
COEMAR CF 1200 SP
ROBE COLORSPOT 1200AT MODE 1
ROBE COLORMIX 250AT MODE 2
ROBE COLORMIX 250AT MODE 1
COEMAR ISPOT (ENG) 13 CHANNEL
COEMAR ISPOT (REC) 17 CHANNEL
COEMAR ISPOT (REM) 6 CHANNEL

ROBE COLORMIX 240AT MODE 2
ROBE COLORMIX 240AT MODE 1
ROBE COLORMIX 150AT WASH
ROBE COLORMIX 150AT SPOT
COEMAR PANORAMA CYC POWER
COEMAR PANORAMA CYC TOURING
COEMAR TX 360
ROBE BEAM 250XT
MAC 250 Krypton 16 BIT MODE
MAC 250 Krypton 16 BIT EX
MAC 250 ENTOUR 16 BT
MAC 250 ENTOUR 16 EX
Turbo 250R
General Purpose 1
General Purpose 2
General Purpose 3
General Purpose 4
General Purpose 5
General Purpose 6
General Purpose 7
General Purpose 8
General Purpose 9
General Purpose 10
General Purpose 11
General Purpose 12
General Purpose 13
General Purpose 14
General Purpose 15
General Purpose 16
General Purpose 17
General Purpose 18
General Purpose 19
General Purpose 20
General Purpose 21
General Purpose 22
General Purpose 23
General Purpose 24
General Purpose 25
General Purpose 26
General Purpose 27
General Purpose 28
General Purpose 29
General Purpose 30
General Purpose 31
General Purpose 32
General Purpose 33
General Purpose 34
General Purpose 35
General Purpose 36
General Purpose 37
General Purpose 38
General Purpose 39
General Purpose 40
General Purpose 41
General Purpose 42
General Purpose 43
General Purpose 44
General Purpose 45
General Purpose 46
General Purpose 47
General Purpose 48
General Purpose 49
General Purpose 50
ROBE WASH 150XT MODE 3
ROBE WASH 150XT MODE 4
ROBE SCAN 1200XT MODE 2
ROBE SCAN 1200XT MODE 1

GENERAL PURPOSE FIXTURES

General Purpose fixtures overcome the problem of not having the fixture you want to program in the library. To a CP16/24 the **only** channels in a fixture that matter are the **Pan** and **Tilt**. The Pan and Tilt need to be assigned to the joystick. For all other channels, they are assigned to a fader…..and which fader is irrelevant to the CP16/24!
To find which **G**eneral **P**urpose fixture you should use, consult your fixture manual and find out which channel is pan and which is tilt. Then use the chart below to use the correct **G**eneral **P**urpose fixture.

General Purpose Fixture	Pan Channel	Tilt Channel
1	1	2
2	2	3
3	3	4
4	4	5
5	5	6
6	6	7
7	7	8
8	1	3
9	2	4
10	3	5
11	4	6
12	5	7
13	6	8
14	7	1
15	8	2
16	8	9
17	9	10
18	10	11
19	11	12
20	12	13
21	13	14
22	14	15
23	15	16
24	16	17
25	17	18
26	18	19
27	19	20
28	20	21
29	21	22
30	22	23
31	23	24
32	24	1

General Purpose Fixture	Pan Channel	Tilt Channel
33	7	9
34	8	10
35	9	11
36	10	12
37	11	13
38	12	14
39	13	15
40	14	16
41	15	17
42	16	18
43	17	19
44	18	20
45	19	21
46	20	22
47	21	23
48	22	24
49	23	1
50	24	2