

Laser Magic

PM20 Guide To Operations

Introduction

The PM20 Laser Desk is a powerful, single scan system that offers many features for the production of a wide range of striking laser lighting effects. This manual is designed to help you to get the best from your PM20 by offering an in-depth description of the unit and its operation. Please read this manual carefully with your PM20 controller at hand. Try the various operations in the manual as you read about them so that you can see for yourself what effects are produced. Remember, the better you know your controller, the better your laser displays will become.

The PM 20 Laser Desk

Although the PM20 controller is simple to operate, it offers a wide range of features that can compete with units costing considerably more. In this section, we will take a brief look at the facilities and features offered by the PM 20 before we take a detailed look at how to use those features later in the manual.

The features offered by the PM20 are as follows (please refer to Appendix A of this manual for a full technical specification of the product):

- Programmable beam positions.
- Preset pattern generation (with variations via modulation).
- High quality graphics (logos in PM20 terminology).
- Scrolling text (optional).
- Programmable sequences of up to 16 effects in length.
- A wide range of special modulation effects that may be applied to patterns, logos and text, with programmable rate.
- Audio modulation of patterns, text and logos.
- Audio triggering of sequences to provide sound to light synchronisation.
- The ability to control and program colour change mechanisms and other auxiliary optical effects such as diffraction gratings.
- Memories for the storage of programmed beams, patterns, text, logos or sequences.

↑
↓
GAIN = SIZE

0
1
2
3
4
5
6
7
8
9

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This represents a very complete list of features that, when used thoughtfully, can provide some very striking laser lighting effects. There are a number of additional, advanced features that will be mentioned later in this manual.

Basic Operations

The following paragraphs cover some of the basic operations that may be performed using the PM20 controller. These actions may be referred to in letter sections on programming effects.

Turning The PM20 On

To Turn the PM20 laser desk on, follow the simple procedure below:

- Turn on the remote effects head
- Switch the PM20 power switch into the '1' (on) position
- After a short while, all of the lights on memory buttons 1 - 16 will illuminate to let you know that the desk is waiting for you to enter your access code. Enter the special code that was supplied to you from Laser Magic using the first eight memory keys (labelled 1 - 8). If you enter the wrong pass code, all of the lights will stay illuminated. If, however, you enter the right password, all but one of the memory lights will go out and the desk will be ready to use.

Opening & Closing The Shutter

When you have first turned the desk on, the shutter will be closed. When the shutter is closed no output appears from the remote effects head and the light on the Red shutter button is not illuminated. To open the shutter, press the SHUTTER button. The shutter will open and the light on the button will illuminate. The shutter may be closed again by pressing the SHUTTER button again.

Before opening the shutter, it is normally good practice to press the PATTERN button. This will ensure that when the shutter is raised, a scanned pattern will be displayed rather than a point source. It is best that you always do this when you first turn the desk on in case someone else has programmed a stationary beam into the desk that might cause harm to other individuals when the shutter is raised.

Recalling a Previously Programmed Effect

To recall a previously programmed effect, the 16 Grey memory keys are used in conjunction with the Yellow shift key. To recall the contents of memories 1 - 16, simply press the memory key that corresponds with the memory number that you want to recall. The second bank of 16 memories use the same memory keys in combination with the Yellow shift key. The shift key is located to the left of the shutter key and is marked with a legend of an arrow pointing towards the top of the desk. To access a memory in the second bank of 16 memories, press the shift key and, while keeping it pressed down, press the desired memory key.

Changing The Laser Colour

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The PM20 desk is design especially with Green/Blue Argon systems in mind and has buttons for selecting either Green, Blue or Cyan (a mixture of Green and Blue). The colour control buttons are located in the top left-hand corner of the desk. To display Cyan, press the button labelled FULL. Blue and Green may be obtained by pressing the BLUE and GREEN buttons respectively. Only one colour button may be pressed at any one time.

Using The Effects Wheel

The PM20 effects head is fitted with an effects wheel that allows diffraction gratings and other effects to be introduced into the beam. The effects wheel has four positions: Clear, A, B and C. Normally, the clear position will contain no effect and the A position will contain a diffraction grating effect. The effects wheel is controlled from the row of four Black buttons. To clear the effects wheel, press the CLEAR button. The effects for the other positions may be obtained by pressing the A, B and C effects wheel buttons respectively.

Setting The Size Of An Effect

The size of any displayed effect (except for beams that may not be sized) may be changed using the size function. To activate the size function, press the shift key and the SIZE button at the same time. The size may now be changed using the cursor keypad. The cursor keypad is the group of five Blue keys arranged in a cross in the middle of the front panel. The size may be changed in either the x or the y axis by pressing the cursor keys as follows:

To make an effect appear at the default size, press the centre key in the cursor pad twice.

To increase/decrease the size in the x axis use the keys to the left and right of the centre key. The key to the left decreases the size and the one to the right increases the size.

To increase/decrease the size in the y axis use the keys above and below the centre key. The key below the centre key decreases the size and the one above increases the size.

Setting The Position Of An Effect

The position of any displayed effect may be changed using the position function. To activate the position function, press the shift key and the POS button at the same time. The position may now be changed using the cursor keypad. The position may be changed in either the x or the y axis by pressing the cursor keys as follows:

To make an effect appear centred, press the centre key in the cursor pad twice.

To position the effect left/right use the keys to the left and right of the centre key. The key to the left moves the position to the left and the button to the right moves the position of the effect to the right.

To position the effect up/down use the keys above and below the centre key. The key below the centre key moves the effect position down with the key above move the effect position up.

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The position may be set to its furthest left, right, up or down by pressing the centre key on the cursor pad followed by one of the other cursor keys (as described above).

Storing Effects

When you have programmed an effect (see below), it may be stored in the currently selected memory by pressing the orange STORE key.

Programming Effects

Programming Beam Positions

To program a beam position follow the procedure below. Always exercise care when programming beam position. If there are other individuals in your venue you must always be mindful of their presence and take care not to position beams of laser light such that a hazard might be caused to these persons.

- Select the memory that you want to program the beam into.
- Press the BEAM button (located above and to the right of the cursor key pad).
- Use the cursor key pad as described for the position function to move the beam to the desired location. Again, you must ensure that the location selected may never cause a hazard to either staff or members of the public visiting your venue.
- If you wish, you may change the colour and/or effects wheel setting to be stored as part of the beam position effect. Change them now, if required.
- Store the effect.

Programming Patterns

To program a pattern, follow the procedure described below:

- Select the memory that you want to program the pattern into.
- Press the PATTERN button.
- Use the up/down cursor keys (also labelled SELECT+ and SELECT-) to step through the available patterns.
- Once you have the pattern that you want displayed, you may then set the colour, effects wheel and modulation settings as desired to enhance the pattern.

Store the effect

Programming a Graphic (Logo)

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- Select the memory that you want to program the effect into.
- To program a graphic into a memory, use the following procedure:
- Select the memory that you want to program the effect into.
- Press the LOGO key.
- Use the up/down cursor keys (also labelled SELECT+ and SELECT-) to step through the available graphics.
- Use the left/right cursor keys (also labelled SPEED+ and SPEED-) to adjust the scanning rate of the graphic. Adjust the speed of the scanning until you have the best trade off between image quality and flicker.
- Once you have the graphic that you want displayed, you may then set the colour, effects wheel and modulation settings as desired to enhance the graphic.
- Store the effect.

Programming Modulation

Any displayed effect (except for beams) may have modulation applied to them in order to create new variations of the basic effect. There are two types of modulation available on the PM20 desk: Image modulation and Audio modulation.

Image Modulation

To program image modulation onto an effect, follow the steps described below:

- Recall the effect that you wish to modulate.
- Press the shift key and the MOD key together.
- Use the up/down cursor keys (also labelled SELECT+ and SELECT-) to step through the available types of image modulation (rotate, tumble, flip, pulse etc).
- Use the left/right cursor keys (also labelled SPEED+ and SPEED-) to adjust the rate (speed) of the image modulation.
- When you are happy with the modulated image, store the effect.
- If you wish to clear the image modulation and exit from the modulation function, press the centre key on the cursor key pad.

Audio Modulation

If you have connected an audio feed to the 0.25" jack plug at the rear of the PM20, then you may apply audio modulation to your image. The audio input at on the rear of the PM20 is fitted with an AGC (Automatic Gain Control) and will accept signals from line levels up to

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reasonable high amplifier outputs. Although the AGC is present, it is always best to connect the audio feed to a line level signal (from a mixer for example). There are two type of audio modulation (slow and fast). Slow modulation is good for creating effects that pulsate nicely with the beat of the music, while fast modulation is used to create oscilloscope type displays of the audio being received at the audio feed. To program audio modulation onto an image, follow the steps described below:

- Recall the image that you wish to modulate.
- Press the shift and AUDIO keys together.
- To slowly modulate the y axis size with audio, press the cursor up key. This may be cleared by pressing the cursor down key.
- To slowly modulate the x axis size with audio, press the cursor right key. This may be cleared by pressing the cursor left key.
- You may switch to fast audio modulation by pressing the centre key on the cursor key pad.
- When you are happy with the modulated image, store the effect.

The Sequencer

This section of the manual describes the operation of the PM20's sequencer. The sequencer is used to make one memory cycle through a number of different effects or graphics in sequence for beam chases and animations etc.

Programming Sequences

Programming sequences is almost identical to programming normal effects. A sequence allows you to store up to 16 individual effects on one memory key that may be stepped through automatically, in time with audio or manually.

To program a sequence, follow the steps described below:

- Select the memory that you want your sequence to go onto.
- Press the PROG SEQ button (the light on the button will go on and stay on to let you know that you are building a sequence).
- Program a beam, pattern or graphic (with modulation etc. as required) just as you normally would.
- When you are happy with a particular sequence element, you may press either STORE to store the element and move onto the next element or you may press the shift and END key together to store the effect as the final element and end the sequence.

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- Once the sequence has been programmed, pressing that memory key will cause the sequence to play in a manner that is determined by the sequencer mode (see below).

Setting the Sequencer Mode

The sequencer has three modes of operation: Audio (sequence runs in time with audio supplied at the audio feed), Auto (sequence runs at a speed determined by the SPEED slider) and Manual (sequences are stepped through manually).

To set the sequencer into audio mode, press the Yellow AUDIO button. The sequence will now run through, advancing from element to element at a rate determined by the characteristics of the audio input. If there is no audio input, the sequence will not advance from element to element.

To set the sequencer into auto mode, press the AUTO key. The speed of the sequence may now be set with the speed slider in the bottom right-hand corner of the panel.

To set the sequencer into manual mode, press the MAN button. You may now manually advance through the sequence with repeated presses of the MAN button, each press advancing one element.

Recovering From Memory Corruption

Occasionally, something will occur that causes the PM20 to totally lose its memory (for example, when the on board battery back-up fails or a spiky mains supply). When this happens, the controller must be switched OFF, and then powered up again in a special way that recovers from this condition. Unfortunately, this destroys the contents of the desk's memory. Only use this procedure if the desk fails to behave as expected:

Turn the controller ON using the power on switch. When this is done, the controller is activated and shows this by lighting all of the memory key-top LEDs. While in this mode, the PM20 is waiting for a passcode to be entered that allows access to the functions of the desk.

Instead of entering your normal passcode (using the memory keys), enter the following four digit code: **9 11 10 12 (press memory buttons '9', '11', '10' and '12' in succession).**

This is the special reset code and will always reset the internal contents of the PM20's memory to some set of default values. Once the code is entered, all of the LEDs will momentarily go off and a click will sound from within the controller itself. After the reset is complete, the controller re-lights all of the LEDs and awaits the normal passcode.

Enter your normal passcode and the desk will be ready to use. If the laser and effects head are on and are correctly connected, a circle will be displayed at this point in time.

Please note that, if this special reset procedure is not carried out, the contents of the controller's memory may contain garbage values that make the controller fail. If you experience any difficulty in starting the controller when entering the passcode, the special reset feature should be tried before calling Laser Magic and reporting a fault.

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The memory of the PM20 controller is retained on power down by a trickle-charged battery. In order for the battery to reliably maintain the memory of the controller, you should run the PM20 unit for at least 10 hours per week.