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INTRODUCTION AND INSTALLATION

Your unit comes complete with the lamp already fitted and requires no optimisation. Lamp replacement must be performed by qualified service personnel only and as specified in the technical manual.

To hang the fixture, install a 'C' clamp to the yoke through the 1/2" hole. The head is now ready for permanent installation. Hang the unit and position it as necessary and lock it with the thumb screw. The best working angle for scanners and effects is about 60 degrees with the connector bottom panel facing the floor, but this not critical. Only use the fixing components provided to attach the handle to the fixture. Safety chains should be attached to the metal tab on the rear of the unit and must be capable of handling the mass of the unit.

A suitably rated power cord set complying with the requirements of UL 817, type SV or SJ, 18AWG VW-1, with a minimum length of 1.5M must be used. The power supply spur / branch feeding the equipment must be individually fused to suit the power consumption (200W, a 5A fuse is recommended) of the unit. Suitable data cable conforming to the DMX standard (USITT DMX512 / 1990) must be used to conform to current CE legislation. Do not mount the unit near curtains or any flammable objects. Do not use if ambient (room) temperature is below 20 °C or above 40 °C. The IP rating of this product is 20. Overall enclosure complies with flame retardancy UL94 5V & CTI>175. This equipment is for indoor use only and must allowed to cool before moving. All personality options are set from the back panel of the fixture by means of the display and keyboard. The address can be changed at anytime. If the effect is to be portable, when siting the unit follow directions above and ensure the cables are routed in a safe manner and the unit is mounted securely above head height.

Safety Warnings

Caution - Always leave the fitting to cool down before removing the lid, with special regard to the lamp chamber. A minimum of 30 minutes is advised.

Caution - Remove all mains power to the unit before servicing as lethal voltages are present.

Caution - Never power the unit up without protection from the lamp as UVA and UVB radiation can be present.

Caution - This unit should be allowed to cool for 30 minutes before moving.

Caution - Internal temperature can reach 600°C

SAFETY FIRST!

Lethal voltages and high temperatures exist inside the lighting effects and must be only serviced by qualified personnel as outlined in the technical manual.

- 1) Read these instructions
- 2) Keep these instructions
- 3) Heed all warnings
- 4) Follow the instructions
- 5) Do not use this apparatus near water
- 6) Clean the unit only with a damp cloth, use a dry cloth on the optics.
- 7) Do not block any of the ventilation openings in the case.
- 8) Do not install near heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that, produce heat.
- 9) Do not defeat the safety purpose of the grounding plug. A grounding plug has two blades and a third grounding prong. The third prong is provided for your safety. When the third prong does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

- 11) Use only attachments / accessories supplied by the manufacturer.
- 12) Use only the cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.
- 13) Unplug the apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as power supply cord or plug damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate or has been dropped.
- 15) Do not look directly at the lamp.

RADIATION:

This apparatus does not emit radiation.

QUICK SET UP FOR USE WITH THE MAD-4-1 CONTROLLER:

Put the lights into position first, connect the power cables and turn on the power to the lights and wait approximately 15 seconds for the units to finish their reset and test cycle.

COLOUR CHANGER: Press either the ↑ or ↓ key and the channel number will be shown (as a letter c then a three digit number). While this is being displayed, press the ↑ or ↓ key to alter the channel number to either c003 (head 1) or c007 (head 2). This is displayed three times after you stop pressing the keys.

STAR (spinning barrel): Press either the ↑ or ↓ key and the channel number will be shown (as a letter c then a three digit number). While this is being displayed, press the ↑ or ↓ key to alter the channel number to c035 for the **STAR205HP** or c021 for the **STAR311HP**. This is displayed three times after you stop pressing the keys.

SCANNER (pan and tilt mirror): Press either the ↑ or ↓ key and the channel number will be shown (as a letter c then a three digit number). While this is being displayed, press the ↑ or ↓ key to alter the channel number. If you have **SCAN305HP's** set the channel to either c029 (head 1) or c032 (head 2) and if you have **SCAN411HP's** set these to either c001 (head 1) or c005 (head 2). This is displayed three times after you stop pressing the keys.

Note: You can have more than one effect on the same channel and the effects will remember the channel you set until re-programmed so there is no need to perform this task each time they are used. Now, connect the DMX leads between the units and insert the "end terminator" or blanking plug supplied with the controller into the last effect. Connect the power adapter to the MAD-4-1 now and allow about 10 seconds for it to self test. You are now ready to use your lights.

BUTTON 1: First press of this button is always blackout to "turn off" the lights so other lighting systems can be used, such as strobes. Each successive press of the button selects the next colour and will eventually scroll back to the blackout position again.

BUTTON 2: If this is pressed after button one and a colour was left selected, the lights will strobe on that colour. If it is pressed a second time or after blackout, the lights will strobe in white.

BUTTON 3: This activates the sound animated chases. Sound is picked up from the controllers built in microphone and bass beats are selected with a built automatic filter and level control. The programs are designed to drive the scanners in two different patterns (note the head 1 or head 2 setting above). If they are set differently, they will be in synchronisation sometimes and at other points the pan or tilt motions may be inverted. The sequence will automatically advance but if you do not like the sequence that is active, pressing the button again advances the program. Press and hold this button in for 1 second and the effects will go into their own local mode, pressing any key will return control to the MAD-4-1.

BUTTON 4: Slow scrolling patterns are created when this function is selected. Again, the use of head 1 and head 2 settings allow for more complex light sequences. This is not sound activated and further presses of the button will advance the program (these will change automatically if left).

The MAD-4-1 controller may appear to be basic, but some creative light shows can be achieved with a little practice.

ADVANCED USERS GUIDE

Programming the Fixture

You program the fixture using the four keys located by the DMX connectors near the rear of the fixture. Programming choices are indicated on the LED display. As the display characters are limited, here is a list of the symbols and their functions:

p	PAN mirror movement (horizontal)	c	Channel number
t	TILT mirror movement (vertical)	y	YES or ON
n	NO or OFF	L	LOCK (disables program saving)
o	OPTION (wide angle or normal mirror movement on pan or tilt)		

The keys are defined as:

MODE – press to accept or select a mode

SELECT – press to scroll between options in the selected mode

↑ (UP) / ↓ (DOWN) – changes modes, or adjusts the value of the selected option

Using Program Mode

Program mode allows you to set the DMX start channel, invert pan/tilt movement, set wide or narrow angle mirror movement and lock programming. Please note that if the channel number will not change in the “quick change” function, the memory lock is active. To remove this, see “Setting the programming lock” section below.

Setting the DMX Start Channel

To alter the DMX channel quickly (if the desired channel is close to the current channel), press either the **↑** or **↓** key to display the channel number. While it is flashing across the display, press either the **↑** or **↓** increase or decrease the number.

To set the fixture to any DMX channel:

1. Toggle to the c option using the **MODE** key.
2. Press **SELECT**. Each subsequent press of the **SELECT** key will show h (hundreds), t (tens) and u (units).
3. When you have selected a value to alter, press either the **↑** or **↓** to change the value.
4. Press **SELECT**.
5. To finish, press **MODE** until the channel flashes across the display.

Setting Angle of Movement

This option allows you to set the angle of mirror movement. If the option is selected (YES), the wide angle (164.7° pan / 119.5° tilt) movement is selected, this is also the factory default. If the option is not selected (NO), the standard angle mirror movement (123.3° pan / 55.8° tilt) will be selected. *This feature is only available on the SCAN305HP and SCAN411HP.*

To select the mirror movement angle:

1. Toggle to the o option using the **MODE** key.
2. Toggle using the **SELECT** key, P indicates pan angle setting and t indicates tilt angle setting.
3. Press the **↑** or **↓** key until one of the following appears in the display:
 - y (wide angle movement)
 - n (narrow angle movement)
4. Press **SELECT**.
5. To finish, press **MODE** until the channel flashes across the display.

Setting The Programming Lock

The programming lock prevents accidental / unauthorised programming of options or channel selection. If this is active, the first press of the **MODE** key will display L to indicate the lock has to be removed before programming.

To lock / unlock the fixture:

1. Press the **MODE** key until L appears in the display.
2. Press **SELECT**.
3. Press the **↑** or **↓** key until one of the following appears in the display:
 - y locks programming
 - n unlocks programming
4. Press **SELECT**.
5. To finish, press **MODE** until the channel flashes across the display.

Resetting fixture and displaying fixture details

It is possible to obtain model number and software versions through the keyboard and display. First press either the ↑ or ↓ to display the channel number for reference. Then change the DMX channel address to c997 (see section setting the “DMX starting channel” above). When the display has finished flashing the DMX channel (c997), pressing the ↓ key will show the model number and the ↑ key will show the software version (a 4 digit code is used). To leave this mode, pressing the select key will reset the fixture after a short delay and the previous DMX address will now be returned to.

THE FIXTURES IN CONTROLLER MODE

The effects have a digital display and are addressed in decimal, please see the section on setting the DMX channel for setting this. The unit will occupy one DMX channel per motor and will start at the channel selected by the user.

	COL211HP	STAR205HP	STAR311HP	SCAN305HP	SCAN411HP
Base	Gobo	BARREL	BARREL	PAN	PAN
Base +1	Colour	Gobo/Colour	Gobo	TILT	TILT
Base +2			Colour	Gobo/Colour	Gobo
Base +3					Colour

Special Functions:

Home all motors	Value of 1 on all channels for 4 seconds
Put fixtures in local mode	Value of 255 on all channels
Revert from local mode to controller mode	Reduce value of any DMX channel to below 210

How the DMX levels work:

PAN AND TILT positions/velocities are derived from a single DMX channel per axis. There is no need for separate velocity sliders due to advanced velocity prediction software. If you wish to move the pan at a specific velocity, get the controller to do a cross fade chase from a scene containing the start position to a scene containing the finish position.

BARREL used on the star effect is a variable velocity bi-directional effects barrel. Zero level DMX and dead centre equal zero velocity. Moving the slider either side of centre will cause a gradual linear increase in velocity. Turn in a clockwise direction on top half of slider and in an anticlockwise on bottom half of slider.

x05 Series GOBO / COLOUR position/velocity is also derived directly from a single DMX channel. The bottom of the level is blackout. As the level advances upwards, the 6 GOBOS are selected in turn, followed by each of them strobing or “flipping” between two, the top of the slider is a sound activated (via the built in mic) white flash.

x11 series COLOUR position/velocity is also derived directly from a single DMX channel. The lower half of the colour slider allows for scrolling to achieve colour splits and the last half of the wheel contains slotted positions for each colour for high speed use. This makes it easier to obtain whole colours using the slider and also the head will respond quicker to these positions. There are 3 auto scroll speeds selectable at DMX level 253 (slow), 254 (medium) and 255 (fast).

x11 series GOBO WHEEL The first 70% contains 14 slotted positions on the scanner and star, the colour changer has 6 GOBOS, 4 apertures, a frost filter and 2 colour shifters. The DMX goes from shuttered then clear to the last GOBO, followed by a second full open for “custom GOBO” use. The top 30% of this slider is used for the variable speed strobe. The very top of the slider puts the head into a sound activated strobe. This is a popular feature, normally only available when heads are in local mode.

USING THE FIXTURES IN LOCAL MODE

Set the first (master) fixture to channel c000. Other units may be slaved off this first unit by connecting the DMX leads between them in a daisy chain fashion and putting the other slaved units into controller mode. It is recommended that the DMX addresses of the slaved units are set to the following addresses so they perform odd / even head patterns. Note a 100 ohm termination plug must be put in the XLR connector of the last head (100 ohm between pins 2 & 3). It is not recommended that different effects be daisy chained together due to program differences. Suggested settings are:

	Scanners	Stars	Colour changers
Master head :	c000	c000	c000
Slaved odd heads :	c001	c002	c003
Slaved even heads :	c007	c008	c009

TROUBLE SHOOTING

Cleaning and General Maintenance: The case may be cleaned with a dry cleaning cloth. Should it be necessary to use a cleaning compound on the case, it is important to use a non-abrasive and non-bleaching cleaning compound which leaves no residue. Special care must be taken when cleaning the lens and mirror. Avoid touching any of the optical elements in the head with your fingers. This unit must not be immersed in water. See table below for further information.

FAULT	CHECK
Fixture does not turn on	Check power line connection. If still not functioning, return to your service depot.
Output power seems low	Check the mirror and the (removable) front lens is clean. Check lamp type A1/232 XHP type.
Fixture does not respond to DMX signal	Check the control cable from the controller and along the chain. Look for bad connection, bad cable. Check that pin 1 goes to pin1, 2 to 2 and 3 to 3. Check that terminator plug is fitted at end of chain. (100 ohm across pins 2 & 3 of XLR connector). Make sure the unit is set up and addressed properly and according to the table and instructions.
Fixture loses position on one or more of its functions	Check there is no packing or obstruction for the motor, such as a tight pan (mirror) motor. If the fixture still does not realign after reset, the fixture has an internal problem. Call the service centre for further instructions.
Fixture turns on but lamp does not turn on.	Send unit to nearest service centre for lamp replacement.
The head does not respond to the music in local or controller sound activated strobe.	Check that the unit is close enough to a mid range sound source. Try gently tapping the MIC to see if it responds. If so move closer to audio.

For any other faults contact your nearest service centre

TECHNICAL SPECIFICATIONS FOR EFFECTS

OPTICAL

Design: Originally designed and computer optimised optical system results in 50% higher output compared to other brand projectors.

Lenses: Top quality white crown glass lenses for maximum clarity. 2 plano-convex lenses are used.

Mirror: High quality second surface mirror for maximum reflectivity.

Beam angle: 14 degrees with the standard lens

MOVEMENTS

The position and velocity for each motor is defined from a single standard 8 bit DMX channel using special prediction software. This allows for easy tracking as separate velocity channels are not required. The colours are fixed to a GOBO on a 180° wheel on the x05 series and the x11 series have separate colour and gobo wheels.

PAN: 164.7°, 2928 step accuracy
 TILT: 119.5°, 2125 step accuracy
 GOBO / COLOUR: 180° movement, microstepped.
 COLOUR 320° movement, >1400 step accuracy
 GOBO 340° movement, half stepped
 BARREL: 360° rotation, 6,400 steps.

MECHANICAL SPECIFICATIONS

Motors : Type 17 stepper motor, one per channel.

Construction : Injection moulded thermo-polomer, high tolerance housing.

Cooling : Custom fan with special long life sleeve bearings for prolonged running times.

Finish : Colour impregnated thermo-polomer with spark finish.

Mounting : Yoke with two hex bolts with hand bolt for clamping into final position.

Mass : 5Kg. without packaging.

Dimensions : 495mm x 240mm x 200mm

Power: @230V 50Hz = 150W

ELECTRONICS

A great deal of research over many years has produced a very compact and reliable microprocessor board. Experience gained from Automotive and Military industries has been applied to ensure a long lasting product. The board reads DMX512 1990/91 all channels. The board can be based at any address in the 512 range. Two XLR connectors are provided and 1 Plug, 1 Socket to allow the unit to be easily daisy chained. This equipment must be earthed.

Due to continuous improvements, specifications may change without prior notice.

GUARANTEE

Mad Lighting Ltd guarantee the fixture to the original purchaser to be free from defects in workmanship or materials for a period of 1 year from the date of purchase provided the registration slip is returned within 14 days of purchase. This guarantee covers parts and labour. Proof of purchase must be provided by you for all guarantee repairs. This will usually be in the form of a dated receipt. In cases where no proof of purchase exists, date of manufacture will be used to determine the commencement of the guarantee period.

The guarantee does not cover any damages created through accident, miss-use, abuse, neglect, improper installation or alteration other than by Mad Lighting Ltd or its authorised representatives. Mad Lighting Ltd is not responsible for damages or loss during shipment. Lamps, mirrors, dichroic filters and lenses are not covered by this guarantee.

Repair or replacement will be made at the option of Mad Lighting Ltd. Mad Lighting Ltd or its agents will not be liable for any incidental or consequential damages for breach of any express or implied guarantee on this product. Except to the extent prohibited by applicable law, any implied guarantee of merchantability or fitness for a particular purpose on this product is limited to the duration of this guarantee.

Shipping for Repair

Never return a piece of equipment for repair until you have obtained a 'Return Authorisation Number' (RET #) from your dealer or distributor. Returned equipment will not be accepted without this. Shipping costs are the purchaser's responsibility. Mad Lighting Ltd will cover one way shipping costs for guarantee repairs within Europe. Never ship returns to us freight collect. Expedited deliveries are not covered under Guarantee.

GUARANTEE REGISTRATION SLIP.

SERIAL NO. _____ DATE PURCHASED _____

SUPPLIED BY :
ADDRESS :

YOUR NAME

TO BE RETURNED WITHIN 14 DAYS OF PURCHASE.