MERCURY OWNERS MANUAL

September 1985

Mercury is an advanced microprocessor based four channel, four zone lighting controller. It is the intelligent "heart" of a complete integrated club lighting control system. Mercury is designed for use with Zero 88's Sigma and Delta power packs for controlling all types of lighting including motors and projectors. The Ov to +10v output also makes it compatible with most other power packs.

The following pages describe using Mercury step by step showing how the simply operated features can build up into a complete light show.

A separate guide to installation and setting up accompanies this manual.

A FOUR ZONE EFFECTS MACHINE

Sixteen channels of output are arranged in four zones of four channels each. Effects are created in each zone by controlling the sequence of operation of each channel. It is possible to have different effects operating on each zone simultaneously, or if desired, link zones together to produce even bigger effects.

Experimenting with Mercury will demonstrate its versatility.

SETTING UP THE MERCURY

At installation, the Mercury will have been set up by the lighting designer or installer so that it will provide the best lighting control available. For example it is possible to set up Zones 1 and 2 for normal Zone control, Zone 3 for Matrix operation, and Zone 4 for Strobes.

Throughout these instructions there will be references to 'if set up'. Try your Mercury as set out below to find out how it has been set up:

SWITCH ON

1. Switch on sound source.
2. Ensure effects level is full up.
3. Switch the machine on.

The Mercury will have been set up to start in either normal or "Super Auto" mode at switch on. If it starts in "Super Auto" (and "Super Zone" if more than one zone has been set up for auto zoning), a complete automatic light show operates. If it starts in normal operation, pattern 1 will appear on the red Pattern No. display.

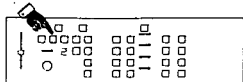Other features that have been set up are shown by:

If Zone 4 standby light comes on, that zone is set for Strobe control.

If a green Motor/Matrix light is on, that Zone has been set up for matrix control.

Zero 88 reserves the right to change specifications without prior notice.
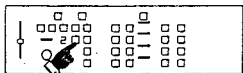
1. CHOOSING AN EFFECT

Select an effect from Sound to Light   )   Requires
Ripplesound   )   sound
Sound Chase   )   source
Varispeed Chase   )   input
Auto Chase

Choice will be indicated by a red light and the effect
will appear on the red monitor.
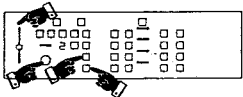
2. CHOOSING A PATTERN

Select the pattern (if any) required using the pattern
number buttons (+) or (-)

Patterns 1-7 are single zone patterns
Pattern 8-14 are cross zone patterns
The pattern number will appear on the red display

NOTE Sound to Light and Ripplesound do not have patterns.

3. MODIFYING AN EFFECT

Select the modifications (if any) required

Choose from Speed (not Sound to Light & Ripplesound)
Level
Direction (not Sound to Light)
Attack (not Sound Chase or Varispeed Chase)

Choice (where permitted) will be indicated by a red light.

4. TRANSFERRING AN EFFECT TO AN OUTPUT ZONE

Press the desired (zone) transfer button. It will briefly
flash yellow to indicate that the effect now showing on
the red light monitor has been transferred into the zone's
memory.

The zone output will appear on the green output monitor of
the zone selected at the speed, level, etc. chosen.

Repeat step 1-4 for all four zones to get four different
effects operating on four separate zones.

5. CHANGING AN EFFECT ALREADY RUNNING ON AN OUTPUT ZONE

Simply follow steps 1-4

6. TO STOP A ZONE RUNNING
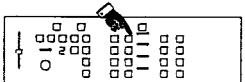
Press the zone standby button. This stops the effect
running on that zone. The yellow standby light will come
on. The effect remains stored in memory for recall.

Press the standby button again to recall the effect onto
the zone. The yellow standby light will go out.

7. PROGRAMMING WITHOUT DISPLAY

Press the standby button on the zone to be changed.
Reselect a new effect and transfer it as in steps 1-4.
The green zone output lights will not come on although the
new effect is held in memory.

To output the effect to the zone press the zone standby
button again, the standby light will go off and the new
effect is displayed.

## 8. DIRECT OUTPUT (TRANSFER LOCK)
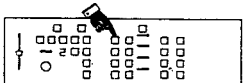
Choose an effect as in steps 1-3. Press and hold the
transfer button. The yellow light will flash (as before)
but will then stay on. The zone is now locked to the
output of the effects generator. Alter the effect as in
steps 1-3 to demonstrate this point.

To switch the transfer lock OFF, press the transfer button
again. The yellow light will go out and the zone output
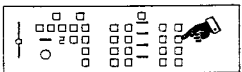will continue in the last effect chosen.

STATIC LIGHTING

9. ON STATIC
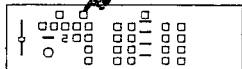
Press on static to switch all monitor outputs ON. This is not an effect but can be transferred with level to any zone as in step 4.

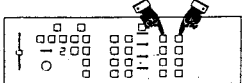## MOTOR CONTROL

10. MOTOR CONTROL

Press a motor button to switch on. A green light will come on to indicate the motor is operating. Motors act independently of the zone controls even when they are in Super Auto and Super Zone.

Press the motor button again to switch the motor OFF. The green light will go out.

MATRIX CONTROL

11. MATRIX CONTROL

If a zone (or number of zones) has been set up at installation to act as a matrix, the pair(s) of motor switches adjacent to each matrix zone are designated X and Y (either one or both green lights will always be on). They will be labelled as a matrix.
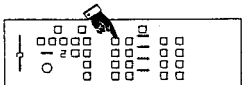
Select an effect as in steps 1-4. The pattern on the green zone output will appear on either X or Y axis or if pressed together Z. To cancel Z, press X or Y again.

CROSS ZONE CONTROL (FOR MULTI ZONE OPERATION)

12. CHOOSING A CROSS ZONE PATTERN

Choose an effect using steps 1-3, but using patterns 8-14.

13. TRANSFERRING A CROSS ZONE PATTERN

Press Zone 1 transfer button only. (All cross zone patterns begin at Zone 1).

Outputs for Zones 2, 3 and 4 are automatically transferred and previous patterns and standbys are cancelled for those zones. However, using two and three zone patterns, the remaining zone outputs will not be affected.

14. REMOVING A CROSS ZONE PATTERN

Select an effect using steps 1-3, using patterns 1-7.

Transfer this effect to any zone over which the multi-zone pattern is running. The yellow transfer light for that zone will flash and the effect selected will transfer to that zone and will be displayed on the green output lights. The remaining zones of the multi-zone pattern will return to the memory previously in use.

Zone 1 will change to a single zone chase with the same speed, direction, attack and level attributes as the multi-zone pattern previously transferred, unless the effect selected was transferred to this zone.

STROBE CONTROL

15. STROBE CONTROL
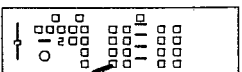
Select an effect as in steps 1-4 and transfer it to Zone 4 (Sound to Light and Ripplesound not permitted).

To select strobes press the standby button. The yellow standby light on Zone 4 will go out and strobes will operate. Unless excluded when the Mercury was set up, all other zone outputs will be automatically placed in standby (the yellow lights will come on). Press Zone 4 standby button again to switch off the strobes and return the other zone outputs will be returned to their previous state.
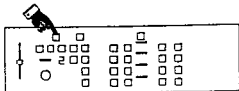
16. SUPER AUTO

Press Super Auto – a red light will come on in addition to one of the five effects. Watch the red monitor as effect, pattern, attack and direction will change automatically at a rate determined by the speed control and also by the dynamics of any music source provided. On a matrix zone, X and Y are also switched alternately from time to time. NOTE Super Auto will not vary the effects level.

17. SPEED CONTROL IN SUPER AUTO
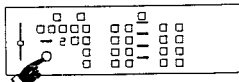
Speed control will not only alter the speed of chases etc. (as before) but will speed up the rate of change of pattern and effect, and set attack as follows.
Turn speed to left of '0' markings– always slow attack
Turn between   '0' markings– auto choice of attack
Turn speed to right of '0' markings– always fast attack

18. TRANSFERRING SUPER AUTO

As in step 4, simply press the desired zone transfer button.
NOTE: Super Auto will only run on a zone as long as Super Auto is selected in the effects section.

19. LEVEL CONTROL IN SUPER AUTO
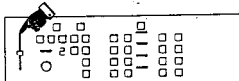
Providing that the Super Auto light is on, changing the level fader will cause the red monitor lights to dim and the green zone output lights of any zone in the Super Auto effect will also dim.

20. TO REMOVE SUPER AUTO
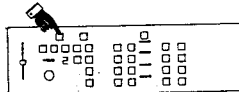
Press Super Auto button a second time. The red light will go out. (Zones previously in Super Auto will continue in the last effect). Other zones may now be programmed as in steps 1-4. Super Auto may be returned to operation on any zone previously in Super Auto simply by re-engaging the Super Auto button. No transfer is necessary.
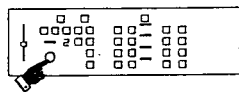
21. SUPER ZONE
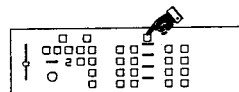
Super Zone will automatically choose between one and all available zone outputs. It will hold undisplayed outputs in memory for recall. Changes are automatic. Any zones designated matrixes will also change automatically between X and Y.

To achieve the best results, transfer four different effects to four different zones as in steps 1-4. Press Super Zone - a yellow light will come on.

To return to "all zone" output, press Super Zone again. The yellow light will go out, those zones in standby will remain in standby.

NOTE: Super Zone will only work if the Mercury has been set up so that more than one zone may be autozoned.

22. SPEED CONTROL IN SUPER ZONE

Speed control will also influence how fast or slow the Super Zone changes occur and how frequently X and Y on a matrix is switched. Turn the speed control to observe this.

23. AUTOMATIC LIGHT SHOW
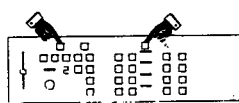
Select Super Auto and/or Super Zone for a completely automatic light show. Note that Strobes (if Zone 4 is set for them) and Motor/Matrix Switches (if set up for Motors) are always switched manually.

INSTALLATION INSTRUCTIONS FOR THE MERCURY EFFECTS CONTROLLER

The Mercury four channel, four zone effects controller is designed to be extremely versatile so that most small and medium installations may be controlled simply and easily.

CONTROL CONNECTIONS

Because the Mercury system uses dioded outputs, these may be 'mixed' with the output from any other component in the Mercury range (eg a fader panel or touch panel).

This enables, for example, a fader and a Mercury output to be connected together simply by wiring both into the same pack input. The highest signal will prevail, so if set to maximum, the fader will override the Mercury output at all times, useful in an emergency or during cleaning.

To connect other non Mercury controls to the system, connect each output via a small diode (eg 1N4148) to the Mercury system.

Four sample installation wiring diagrams are shown overleaf.

PROGRAMMING SWITCH SETTINGS (Turn off the Mercury before changing the settings)

UPPER SWITCHES
1- 5 Settings depend on configuration - see System Diagrams for examples
    NOTE that only zone 4 can be used for Strobe Control.
6   Selects Super Auto startup. When selected the Mercury will start running Super Auto on all
    available zones as soon as it is switched on.
7-10 Determines whether a zone may be controlled automatically by Super Zone.
    For example: If three zones are used for one area, Super Zone may be used to automatically
    control zone changes in the area. The fourth zone should be set to 'Manual Select Only' to stop
    Super Zone selecting it.

LOWER SWITCHES
1- 5 Settings depend on configuration - see System Diagrams for examples
 - 6 When zone 4 is being used as a strobe controller, the other zones may be automatically switched
    off for maximum effect. If any zone is to be left running when the strobes are in use, 'Zone
    Not Overridden By Strobes' should be set.
7-10 Set Normal or Staccato Attack. Staccato should be used whenever slow reacting lights are used
    on a zone, for example Pinspots and other transformer driven lamps.
    Some experimenting with this feature in a particular installation may be instructive.

FRONT PANEL LABELS

Each Mercury is supplied with a set of eight self adhesive labels which may be stuck on the front panel to show how the controller is set up.

There are four matrix zone labels and four normal zone labels:

        Matrix Zone X-Z-Y   (Four supplied)
        Zone 1 / Motor 1 and 2
        Zone 2 / Motor 3 and 4
        Zone 3 / Motor 5 and 6
        Zone 4 / Motor 7 and 8

They may be used in any order as required for the installation.

Do not forget to check that the labels agree with the switch settings.

It is recommended that the labels are stuck on ONLY when the installation is complete as they are difficult to remove.

FRONT PANEL CUTOUT
Cutout Size: 425mm x 120mm (16.75inches x 4.75inches)
Unit Depth: 75mm (3.0inches); Add a further 75mm (3.0inches) for connectors or 130mm
                (5.2inches) if using Product No 142, 25 way Splitter - 'D' to terminals

CONNECTIONS
Product No 142, 25 way Splitter - 'D' to terminals is a printed circuit board which has a 25 way 'D' connector to fit the Mercury or a 25 way 'D' cable and a set of terminal blocks. This makes wiring the unit quick and easy.

SPECIFICATION: CONTROL
OUTPUTS:	Total of 24 channels:	Zone outputs 0 to 10v analogue
		Motor/Matrix outputs 0 to 10v switched
		Strobe outputs (Zone 4) 0 to 10v at 10mA (for 10msec)

            Each output will drive up to 20 Sigma or Delta pack inputs BUT only ONE inhibit
            input. Thus each Mercury matrix zone can only drive one X pack and one Y pack.

                    ALL OUTPUTS ARE SHORT CIRCUIT PROTECTED

AUDIO INPUT: 30mV to 100v Stereo, unbalanced, 22k Ohm input impedance via 0.25inch stereo jack socket

POWER SUPPLY: 200 to 265v, 50/60Hz or 100 to 130v, 50/60Hz (Factory Set) via IEC fixed plug.

   **** If fitting to a 'dirty' mains supply, fit a Mains Conditioning Unit, Product No 140 ****

SYSTEM 1: 4 ZONES
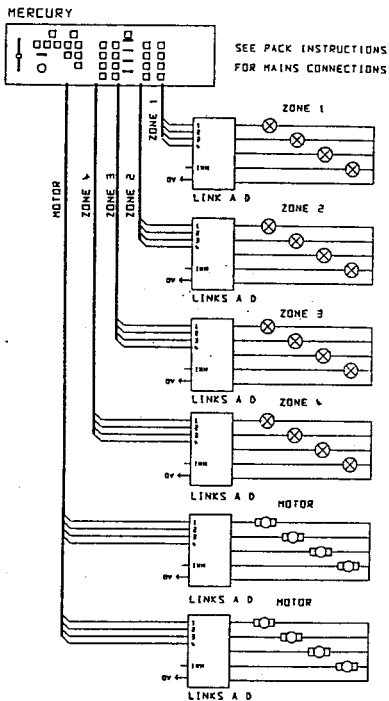   8 MOTORS

SWITCH POSITIONS
1.
2.
3.
4.
5.
5. installer option
7. installer option
8. installer option
9. installer option
10. installer option

1.
2.
3.
4.
5.
6.
7. installer option
8. installer option
9. installer option
10. installer option

25 WAY OUTPUT FUNCTIONS	
1.ZONE 1 CH 1	14.ZONE 4 CH 2
2.ZONE 1 CH 2	15.ZONE 4 CH 3
3.ZONE 1 CH 3	16.ZONE 4 CH 4
4.ZONE 1 CH 4	17.MOTOR 1
5.ZONE 2 CH 1	18.MOTOR 2
6.ZONE 2 CH 2	19.MOTOR 3
7.ZONE 2 CH 3	20.MOTOR 4
8.ZONE 2 CH 4	22.MOTOR 5
9.ZONE 3 CH 1	22.MOTOR 6
10.ZONE 3 CH 2	23.MOTOR 7
11.ZONE 3 CH 3	24.MOTOR 8
12.ZONE 3 CH 4	25.0V REF
13.ZONE 4 CH 1	

MERCURY

SEE PACK INSTRUCTIONS
FOR MAINS CONNECTIONS

ZONE 1
LINK A D

ZONE 2
LINKS A D

ZONE 3
LINKS A D   ZONE 4

LINKS A D

MOTOR
LINKS A D   MOTOR

LINKS A D

ZONE 1
ZONE 4
ZONE 3
ZONE 2
MOTOR
0V

FADER PANEL CONNECTIONS

FADER PANEL
+20V
1
2
3
4
0V

+20V SIGMA
(50mA) or
1   DELTA
2
3
4
0V

SYSTEM 2: 2 ZONES.
          1 MATRIX ZONE.
          1 STROBE ZONE.
          6 MOTORS.

SWITCH POSITIONS

1.
2.
3.
4.
5.
6. installer option
7. installer option
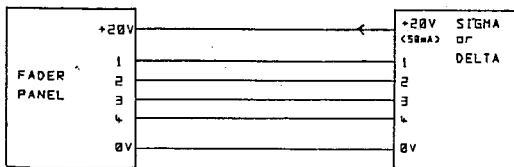8. installer option
9. installer option
10. installer option

1.
2.
3.
4. installer option
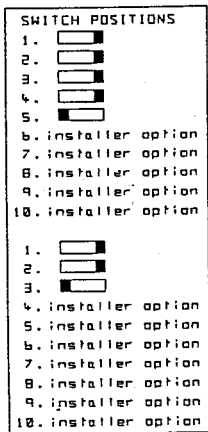5. installer option
6. installer option
7. installer option
8. installer option
9. installer option
10. installer option

MERCURY

SEE PACK INSTRUCTIONS
FOR MAINS CONNECTIONS

ZONE 1

LINKS A D

ZONE 2

LINKS A D

MATRIX 1

MATRIX Y

LINKS B E

LINKS B E

STROBES

MOTORS

LINKS A D

MOTOR 5
MOTOR 6

LINKS A D

25 WAY OUTPUT FUNCTIONS	
1.ZONE 1 CH 1	14.STROBE 2
2.ZONE 1 CH 2	15.STROBE 3
3.ZONE 1 CH 3	16.STROBE 4
4.ZONE 1 CH 4	17.MOTOR 1
5.ZONE 2 CH 1	18.MOTOR 2
6.ZONE 2 CH 2	19.MOTOR 3
7.ZONE 2 CH 3	20.MOTOR 4
8.ZONE 2 CH 4	22.MATRIX X
9.MATRIX CH 1	22.MATRIX Y
10.MATRIX CH 2	23.MOTOR 5
11.MATRIX CH 3	24.MOTOR 6
12.MATRIX CH 4	25.0V REF
13.STROBE 1	
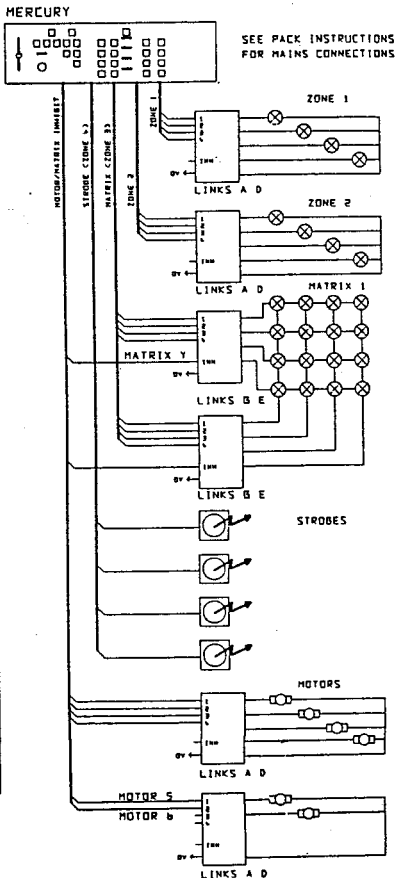
SYSTEM 3: 2 ZONES (with manual overide)
4 ZONES (using single zone output controlled manually via inhibits)
1 MATRIX
2 MOTORS

25 WAY OUTPUT FUNCTIONS
1. ZONE 1 CH 1
2. ZONE 1 CH 2
3. ZONE 1 CH 3
4. ZONE 1 CH 4
5. ZONE 2 CH 1
6. ZONE 2 CH 2
7. ZONE 2 CH 3
8. ZONE 2 CH 4
9. Z 3,4,5&6 CH 1
10. Z 3,4,5&6 CH 2
11. Z 3,4,5&6 CH 3
12. Z 3,4,5&6 CH 4
13. MATRIX CH 1
14. MATRIX CH 2
15. MATRIX CH 3
16. MATRIX CH 4
17. MOTOR 1
18. MOTOR 2
19. Z3 CONTROL
20. Z4 CONTROL
21. Z5 CONTROL
22. Z6 CONTROL
23. MATRIX X
24. MATRIX Y
25. 0V REF

FADER PANEL   FADER PANEL   MERCURY

SEE PACK INSTRUCTIONS
FOR MAINS CONNECTIONS

ZONE 1   LINKS A D
ZONE 2   LINKS A D
ZONE 3   LINKS A E
ZONE 4   LINKS A E
ZONE 5   LINKS A E
ZONE 6   LINKS A E

MATRIX   LINKS B E
LINKS B E
MOTOR   LINKS A D

MOTOR AND ZONE CONTROL
MATRIX CZONE
ZONE 1
ZONE 2
ZONE 3
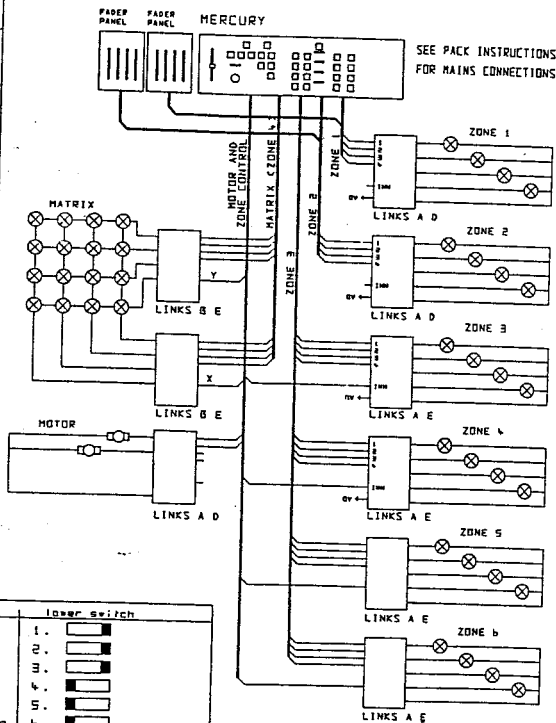
SWITCH POSITIONS

lower switch	
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6. installer option	6.
7. installer option	7. installer option
8. installer option	8. installer option
9. installer option	9. installer option
10. installer option	10. installer option