

The image shows the front cover of a circular book. The cover has a dark green outer ring and a light cream-colored center. The word "GEMINI" is printed in large, bold, black, sans-serif capital letters across the middle of the cream circle. Below it, the words "MEMORY LIGHTING CONTROL" and "OPERATOR'S HANDBOOK" are printed in smaller, bold, black, sans-serif capital letters, stacked on two lines. The cream-colored area shows signs of wear, including some faint smudges and a small dark mark near the top edge.

**GEMINI**

**MEMORY LIGHTING CONTROL**

**OPERATOR'S HANDBOOK**



# Strand Lighting

# GEMINI

MEMORY LIGHTING CONTROL

OPERATOR'S HANDBOOK



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Strand Lighting

GEMINI

MEMORY LIGHTING CONTROL

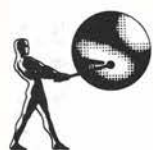
OPERATOR'S HANDBOOK

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# Strand Lighting

GEM000

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## GEMINI MEMORY LIGHTING CONTROL

### OPERATOR'S HANDBOOK

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## CHAPTER 1

### INTRODUCTION

#### 1.1 GENERAL

Gemini is a new memory lighting control system which is intended for use in medium sized theatres and television studios. It offers many of the sophisticated facilities previously available only on much more expensive systems and has an added advantage in that it often may be incorporated in an existing manual system with the minimum of rewiring.

The system consists of a Control Console which may be supplied for desk-top mounting, as a free-standing console, or built into a desk assembly with other equipment, and a colour monitor which provides the mimic display.

Gemini can control up to 180 lighting channels and has a Channel-to-dimmer patch facility which gives the flexibility often needed in the modern theatre and television studio. The dimmer control outputs are multiplexed and can drive a wide range of dimmers, via a special interface which must be fitted in each dimmer rack; this interface is supplied already fitted to the latest, multiplexed dimmers.

In addition, the system may be used with the Tempus M24 Multiplex Interface unit. This produces the dimmer control signals for 24 lighting channels and will also accept inputs from another lighting control system, e.g. an AMC desk; the contribution from the second system combines with the output of Gemini on a 'Highest-takes-precedence' basis and may be recorded in the Gemini memories. Versions of the Multiplex Interface unit are also available to permit Gemini to control dimmers from other manufacturers.

Gemini uses an intelligent memory packing system, whereby only those channels which are On in a lighting state are recorded, so that the amount of system memory used for each memory depends on the number of channels which are On in that cue. The number of memories available will therefore vary from production to production, but will be found to be adequate for all but the largest. The memory may be supplemented, if required, by the optional floppy-disc unit, so that, on the rare occasions when additional memory is required, cues may be loaded very quickly from floppy disc. The percentage of the memory which is 'in use' is shown on the Video Mimic.

Gemini uses battery-maintained electronic memories which will retain their data for at least a month if the system is not used. If longer term storage is required, the floppy-disc unit must be used.



## 1.2 CONTROLS

The Gemini control console provides all the facilities necessary for effective lighting control. The panel consists of six sections: Channel Control, Red and Green Playbacks, Memory Control, Output control and Sub-masters.

### 1.2.1 Channel Control

Comprehensive facilities are provided to vary the intensity of any individual channel or of a number of channels by means of a decimal keypad and a fader-wheel. Levels may also be set by use of the 'a' key. Groups of channels may be controlled by directly calling up the channels, or by selecting previously recorded groups or memories. To provide clear information to the operator numeric displays above the keypad show the last number entered and the level of the selected channel.

Any modifications made by the channel control may be effected in the system output store (i.e. their effect will be seen live) or in any one of the eight Sub-master stores.

It is possible, either for identification or special effect, to flash the selected channel or channels to full or zero.

### 1.2.2 Playbacks

These controls provide the means by which memories are normally recalled. Memories are selected on the MEMORY CONTROL keypad (see next section) and recalled using either FADE button. The recall action takes place in the time set on the associated Fade Duration controls (one for channels fading up and the other for those fading down), the time being variable between instant and 20 minutes. An infinity position on each control allows either part of the associated fade to be stopped at any point.

Other facilities include the use of recorded fade times, manual fades and automatic memory sequence.

### 1.2.3 Memory Control

Once a scene has been lit it may be recorded in the system's permanent memory. This is done by allocating to the scene a unique number by which the lighting state may be subsequently identified.

The memory numbers are called up using a decimal keypad on the Memory section of the control panel. Numbers may be in the range 0.1 to 999.9 (0.0 is not available), but it is recommended that integers are used initially and scenes recorded in the running order

of the show. This allows memories with decimal points (e.g 36.5) to be inserted later if required. The number of the currently selected memory is displayed in a window above the Memory keypad.

It is possible at any time to record the current lighting state or the state set on any of the eight Sub-masters.

A lockable keyswitch is provided to protect the memory from over-recording and to allow all or some part of the memory to be cleared. If an attempt is made to over-record an existing memory a warning will sound and the recording will not take place. Should this be a deliberate action, the record push should be pressed twice in rapid succession for a successful recording.

A Link facility is provided whereby an existing memory may be linked to the next memory required in the sequence of a performance. In this way a show which has been recorded in random order may be strung together to run as required. This facility is also useful for chase loops of memories.

The Gemini system allows the operator to record a fade type, fade times and a wait time with each memory. When used in combination, these make it possible to set-up complex fade sequences which take place completely automatically.

#### 1.2.4 Output Control

This section of the panel has a master fader which controls the output of the Gemini system. There is also a blackout switch, a Record Total ('REC  $\Sigma$ ') push-button and a Memory Recall (' $\downarrow$  MEM') button.

#### 1.2.5 Sub-masters

This section of the control panel provides eight stores, each of which may hold a complete lighting scene. The stores each have a Sub-master fader which proportionally fades the content of that store to the output. The eight stores normally interact between themselves and with the main system on a 'highest-takes-precedence' basis, i.e. if a channel is On in two or more active stores the output level will be the highest of them.

With these controls it is possible to preset up to eight lighting scenes, so that they are readily available. Each scene may then be introduced by raising the appropriate fader - a very useful facility if rehearsal time has been limited and it is necessary to 'Vamp' the performance. The panel also allows channels or complete memories to be simultaneously balanced against each other before the total effect is recorded.



An alternative method of using each Sub-master (Inhibit mode) allows the operator to proportionally reduce the dimmer levels of the channels which are On in the Sub-master store. A common use for this facility is in the control of Front-of-house lighting.

Channels may be set or modified in any Sub-master store by the Channel Control (operating in Sub-master mode). Any previously recorded memory may be loaded into a store by calling up its number on the Memory keypad and pressing the appropriate memory recall (MEM) button.

Facilities are provided to display and interrogate the contents of each Sub-master store. A master fader (A-H) is also provided for this section of the control panel.

#### 1.2.6 Video Mimic

The standard mimic display is a colour Video Display Unit (VDU).

In normal operation the main part of the screen shows up to 180 channels and if a channel is On, its number appears on the screen, together with its level, expressed as a percentage; channels which are Off have their channel number displayed dimly. Any channels under the control of a Channel Controller are identified on the mimic by their entries appearing in inverse video. If required, channels may be assigned numbers relating to their geographic position in the installation.

The bottom section of the display shows the current status of the various parts of the control panel, e.g. channels under control, memories fading, selected memory, etc. Different colours are used for the different areas on the screen in order to enhance the clarity of the display.

The mimic display may be used to show the current scene being output, the contents of any of the eight Sub-master stores, the levels recorded in a selected memory (so that it may be previewed before use), a list of the memories recorded or the assignment of channels to dimmers. In all of these cases the title of the display is shown on the top line of the screen. Paging is provided for use when displaying a list of memories; this will normally be too long to display in its entirety.

#### 1.2.7 Memory Back-up System

A simple, independently powered control system with an electronic on/off memory is available to act as a back-up to Gemini.

The control panel has eight patch master faders to which any one of ten eight-memory 'presets' may be assigned; a keypad is provided for



the selection of dimmers and presets. Dimmer may be set On or Off individually or in groups using the keypad, or the On/Off states of the dimmers contributing to the current lighting may be copied into the selected memory.

### 1.3 OPTIONAL EXTRAS

#### 1.3.1 Floppy Disc Unit

For long term storage of lighting states, e.g. for use in repertory theatre, an optional floppy disc unit may be supplied. This enables some or all of the memories recorded in the Gemini system to be duplicated on a 3.5" magnetic disc. The disc may be removed from the drive unit and stored until that production is next performed. The Gemini memory may then, of course, be over-recorded.

Floppy discs may also be used to store the contents of the memories during periods when the system is in infrequent use and the memory retention period of one month may be exceeded.

#### 1.3.2 Printer

A computer type dot-matrix printer is available for connection to the Gemini system. This may be used to produce paper copies of memories, the channel-to-dimmer assignment and the recorded special effects.

#### 1.3.3 Special Effects Panel

The increased use of lighting to accentuate pop-music has produced a need for a lighting control system which may be used in variety entertainment to provide programmable automatic lighting effects. Such effects include automatic chases, sound activated lighting, automatic flashing and sequencing effects. The use of these effects is not, however, restricted to variety entertainment and the Gemini effects panel is very useful for dramatic productions where continually changing lights, such as a flickering fire or a flashing neon sign, need not monopolize the operator's time.

The Gemini effects panel may be set-up to control both individual channels and, in conjunction with the Sub-master stores, complete memories. An effect may be one of several types (e.g. Chase, Regular or Pseudo-random Flash, Sound-to-light) and may include instructions to load new memories into the Sub-masters or to synchronise the effect with the start of a fade on a Playback. Each effect may be executed a specific number of times, may be set to run for a defined time, or may continue until stopped, either manually or by the start of a fade on a Playback. Up to 99 separate effects

may be recorded and a number of different effects may be performed simultaneously.

#### 1.3.4 Remote Control

Provision is included in Gemini to accept commands from the standard Rigger's Control or from a portable Designer's Control. Details of the operation of these units are published in separate handbooks, available from Strand Lighting.

CHAPTER 2EQUIPMENT2.1 GENERAL

The basic Gemini system consists of two units: the Control Console and a television monitor to act as the Video Mimic. Optional additional equipment includes a stand, Multiplex Interface Units for connection to the dimmers, a manual fader wing and a printer.

2.2 CONTROL CONSOLE

The Gemini control console is a self-contained unit which may be placed on a desk, or mounted on a stand (available as an option). It requires two mains inputs, one for the main control system and one for the memory back-up unit; these supplies must be 220/240V or 110/120V a.c. single phase (L. N. and E.). The mains inputs connect via I.E.C. 3-pin plugs at the rear of the desk. Suitable mains cables are provided, but these must be fitted with mains plugs by the user.

An illuminated power on/off switch is provided adjacent to the control system mains input, and four switched mains outputs (via I.E.C. 3-pin sockets) are provided for connection to peripheral equipment (Video Mimic, etc.).

Other connections are as follows:

- i) Data link to multiplexed dimmers or to Multiplex Interface units (whichever are provided). The cable should be two-core 0.5mm<sup>2</sup> with overall screen, fitted with 3-pin type XLR connectors wired as follows:

Pin 1	Screen	0V
Pin 2	Red	Multiplexed Input (to desk)
Pin 3	Blue	Multiplexed Output (from desk)

The Control Desk is supplied with a suitable cable 5 metres in length; longer (25 metre) cables are available if required.

- ii) Output to Video Mimic. Four 75 Ohm BNC output connectors are provided; three of these carry separate R. G. B. signals for connection to the colour monitor supplied, while the fourth carries a composite video output for use with a monochrome monitor. A cable assembly for connection to the colour monitor is provided.



- iii) Output to Printer. This is a standard RS232 signal and is connected via a 9-way D-type connector. A suitable cable is supplied with the printer, wired as follows:

Pin 1	Red	Signal GND
Pin 3	Blue	TXD (to printer)
Pin 4	Green	RXD (from printer)
Pin 9	Yellow and screen	DTR

- iv) Audio Input to Effects Panel. This connects via a 5-pin DIN socket, wired as follows:

Pin 2	Audio 0V
Pin 3	Left-hand channel
Pin 5	Right-hand channel

The Effects system is intended to be driven from the pre-amplifier stage of a tape recorder, etc., and the input must not under any circumstances exceed 5V peak-to-peak. If the source of the audio signal is mains powered, use an isolating transformer to prevent earth loops.

In addition, there is a six-way Smiths Hypertac socket for connection to a Rigger's/Designer's bus. See the appropriate User's Handbook for details.

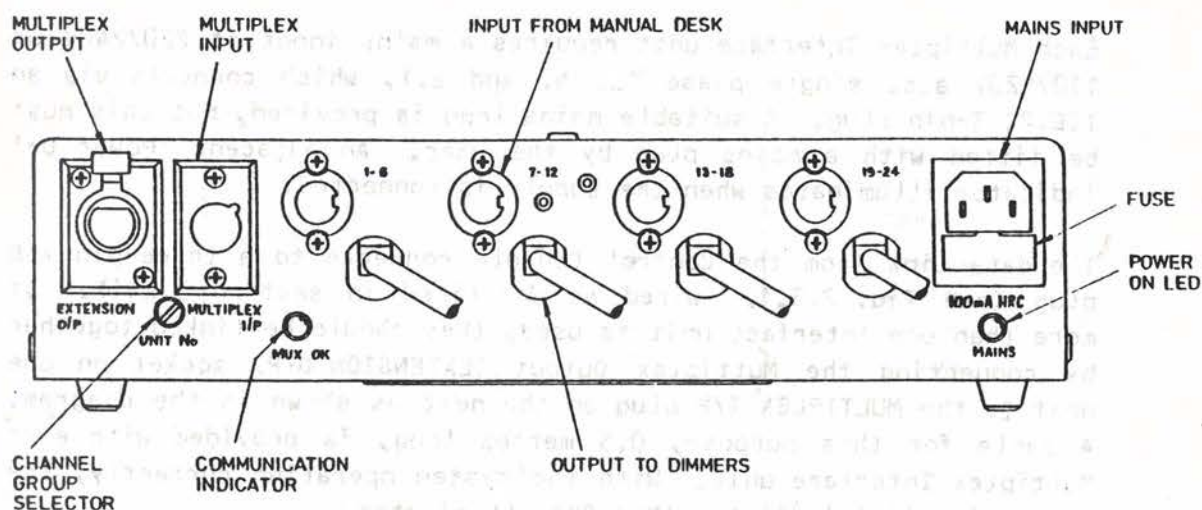
## 2.3 DIMMER INTERFACE

The Gemini dimmer control outputs are multiplexed and can drive a wide range of dimmers via a special interface which must be fitted in each dimmer rack; this interface is supplied already fitted to the latest, multiplexed dimmers.

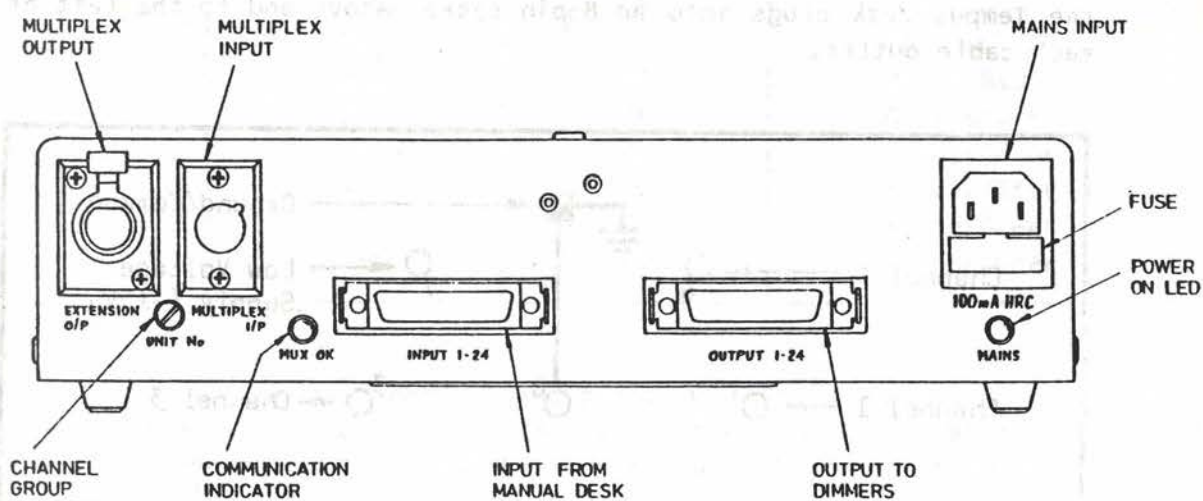
Alternatively, the system may be used with the Tempus M24 Multiplex Interface unit. This produces the dimmer control signals for 24 lighting channels and will also accept inputs from another lighting control system, e.g. an AMC desk; if the second system is connected in this way, its contribution combines with the output of Gemini on a 'Highest-takes-precedence' basis and may be recorded in the Gemini memories.

### 2.3.1 Multiplex Interface Unit

Two types of Multiplex Interface Unit are available: one intended for use with Tempus dimmer packs and control desks, and the other for use with other types of equipment (e.g. Permus dimmers and AMC control desks). Each unit provides control outputs for 24 dimmers, the units linking together, so that only a single connection is necessary from the Control Console.



### Tempus/Bleecon Type



### D-Connector Type

## MULTIPLEX INTERFACE UNITS

Fig. 2.3.1

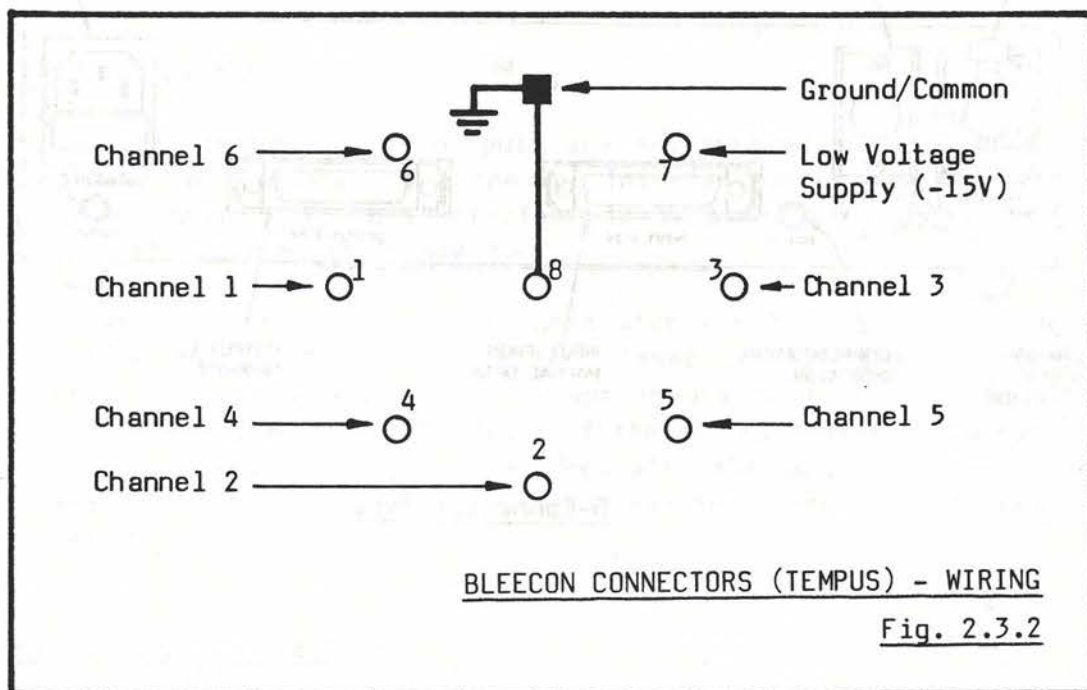


### 2.3.1.1 Connections

Each Multiplex Interface unit requires a mains input of 220/240V or 110/120V a.c. single phase (L. N. and E.), which connects via an I.E.C. 3-pin plug. A suitable mains lead is provided, but this must be fitted with a mains plug by the user. An adjacent 'Power On' indicator illuminates when the supply is connected.

The data link from the Control Console connects to a three-pin XLR plug (see Fig. 2.3.1), wired as described in section 2.2(i). If more than one Interface unit is used, they should be linked together by connecting the Multiplex Output (EXTENSION O/P) socket on one unit to the MULTIPLEX I/P plug on the next as shown in the diagram. A cable for this purpose, 0.5 metres long, is provided with each Multiplex Interface unit. With the system operating correctly, the 'Communication' indicator (MUX OK) illuminates.

The units for use with Tempus dimmers and control desks are fitted with four control cables, one for each group of six channels (i.e. 1-6, 7-12, etc.). Each cable is fitted with the necessary 8-pin plug, wired as shown in Fig. 2.3.2, for connection to a Tempus dimmer pack. The control cable for the corresponding channels on the Tempus desk plugs into an 8-pin socket above and to the left of each cable outlet.



The other type of unit has two 25-way D-type connectors labelled OUTPUT 1-24 and INPUT 1-24 for connection to the dimmers and the manual desk respectively. Suitable connectors and prewired cables are available from Strand Lighting; wiring details are given in Table 2.3.3.



Table 2.3.3

Dimmer	Pin	Colour
1	1	Red
2	2	Blue
3	3	Green
4	4	Yellow
5	5	White
6	6	Black
7	7	Brown
8	8	Violet
9	9	Orange
10	10	Pink
11	11	Turquoise
12	12	Grey
13	13	Red/Blue
14	14	Green/Red
15	15	Yellow/Red
16	16	White/Red
17	17	Red/Black
18	18	Red/Brown
19	19	Yellow/Blue
20	20	White/Blue
21	21	Blue/Black
22	22	Orange/Blue
23	23	Yellow/Green
24	24	White/Green
Common	25	Orange/Green

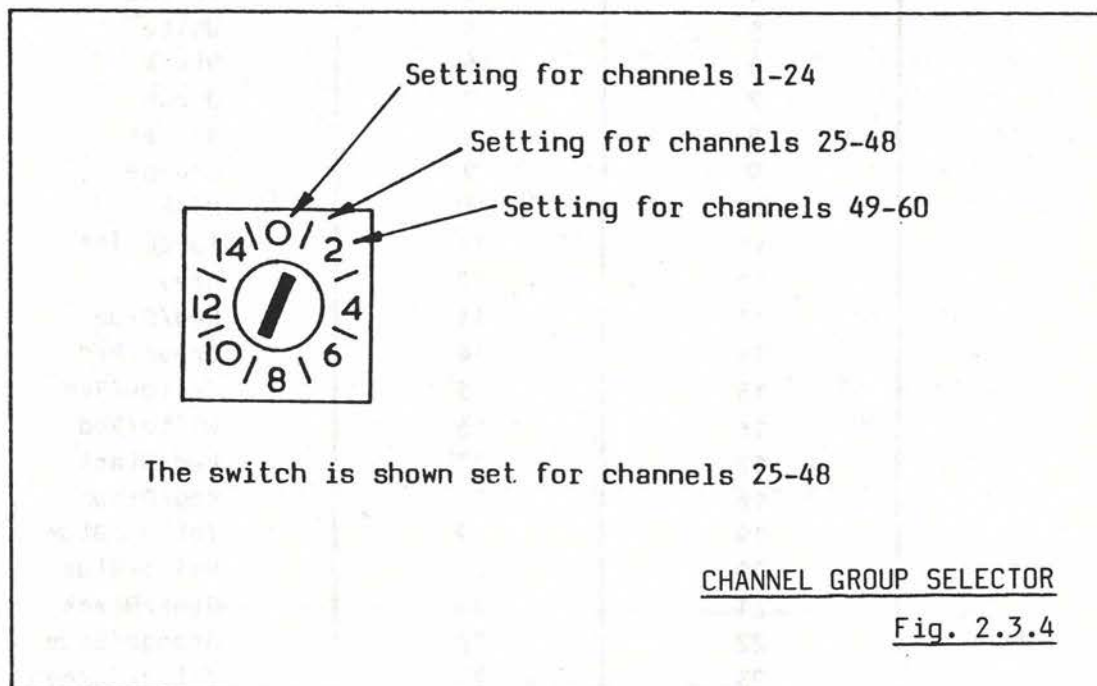
Other combinations of equipment are possible, but may necessitate the construction of special cables and/or distribution boxes. Connectors of various types are available for this purpose.

Note: Dimmers manufactured by Rank Strand Limited require a control voltage of -10V (full) to 0V (zero). For systems using other types of dimmers, Multiplex Interface units giving different control voltage outputs, positive or negative, are available.

#### 2.3.1.2 Setting-up

Before the Multiplex Interface Units may be used the Channel Group Selector on each must be set to the required group of 24 dimmer numbers. The selector is normally set before despatch, but may easily be adjusted by the user if necessary.

Access to the selector switch requires the use of a small electrical screwdriver and is via a hole (labelled UNIT NO. - see Fig. 2.3.1) in the connector panel. The switch starts at 0 for channels 1-24 and should be turned clockwise one position for each additional 24 channels (see Fig. 2.3.4). As a reminder, the switch setting may be noted on the adjacent panel using a 'Chinagraph' pencil or an adhesive label.



## 2.4 ENVIRONMENT

The Gemini system will operate in ambient temperatures within the range 0°C to 35°C. All electronic components gradually suffer an ageing process which is accelerated as the temperature rises, i.e. the higher the ambient temperature, the more likely faults become. Similarly, wide fluctuations in temperature will adversely affect the reliability of the system. To maximise system reliability and minimise operator fatigue and discomfort, an operating temperature between 18°C and 25°C is recommended. Relative humidity should be between 10% and 90% (non-condensing).

**WARNING:** The rear of the console incorporates a ventilation grille. **THIS MUST NOT BE OBSTRUCTED.**

The cleanliness of the surroundings has a direct effect on the life expectancy of the system. Excessive dust and fluff obstruct ventilation and accumulation of cigarette ash can cause partial short circuits.



Both the control panel buttons and the slider faders may be damaged by an accumulation of grime, smoke or other contaminants. In particular, liquids must not be spilt on the equipment, as the effect on the electronics immediately below could be destructive. In the event of any liquids being spilt onto the electronics, power must be turned off immediately; then notify the Strand Lighting service department.

The paint finish of the equipment will be damaged by direct heat such as cigarettes or soldering irons. To clean, a judicious application of anti-static aerosol cleaner is suitable. Under no circumstances should spray polishes be used near the panels as they may destroy the slider faders.

If a carpet is fitted in the control room, suitable precautions should be taken to ensure that this does not lead to a build-up of Static Electricity. All wool carpets or synthetic carpets with woven-in conductive threads overcome this problem. Alternatively, anti-static treatments for nylon or polyester carpets are available.

## 2.5 INSTALLATION

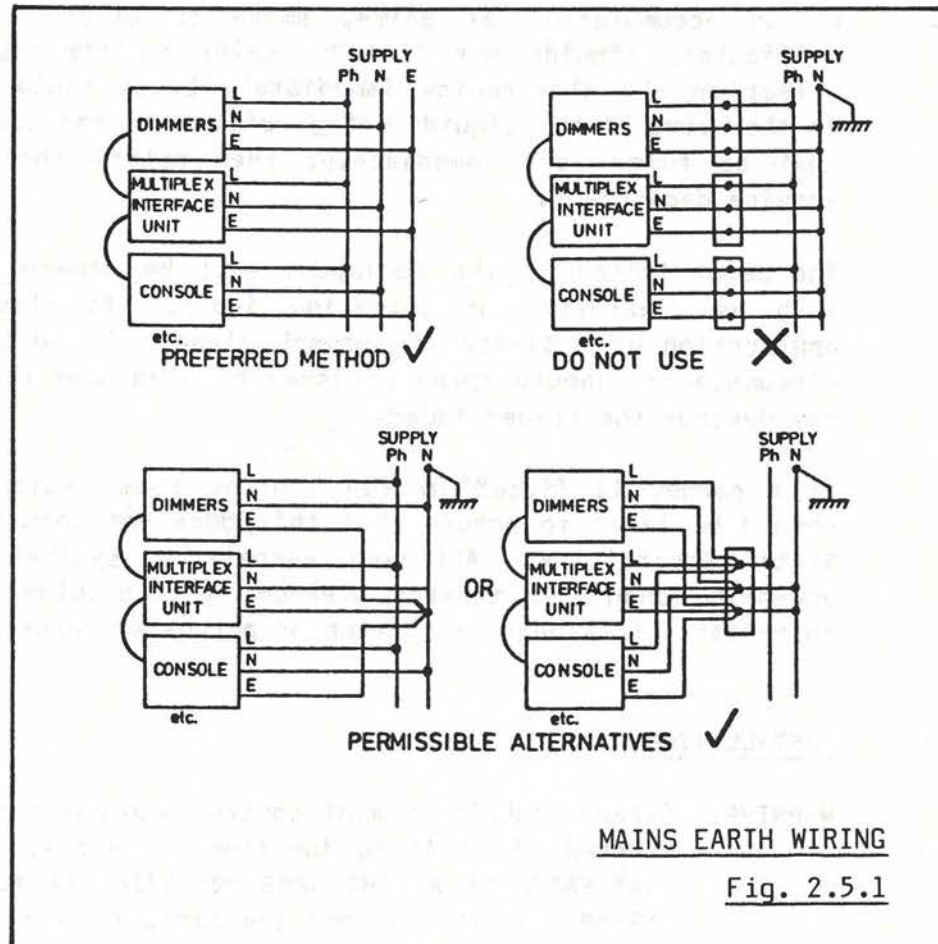
**WARNING:** Strand Lighting Gemini control equipment must be properly earthed if it is to function correctly. IT IS ESSENTIAL THAT EARTH BE AT THE SAME POTENTIAL AT ALL POINTS IN THE SYSTEM. If this is not the case, circulating currents may be generated in the signal earth connections, leading to fluctuating light levels and, in extreme cases, severe damage to the equipment.

In cases where the earth is provided via the supply neutral, all units (i.e. Console, Manual Fader Wing, Multiplex Interface units, Effects unit and dimmers) should ideally be powered from the same source via adequately rated three core (L. N. E.) cable. If this is not possible, a single earth point must be chosen and all the units earthed ONLY AT THIS POINT (see Fig. 2.5.1). The conductors used must be able to carry any potential fault current.

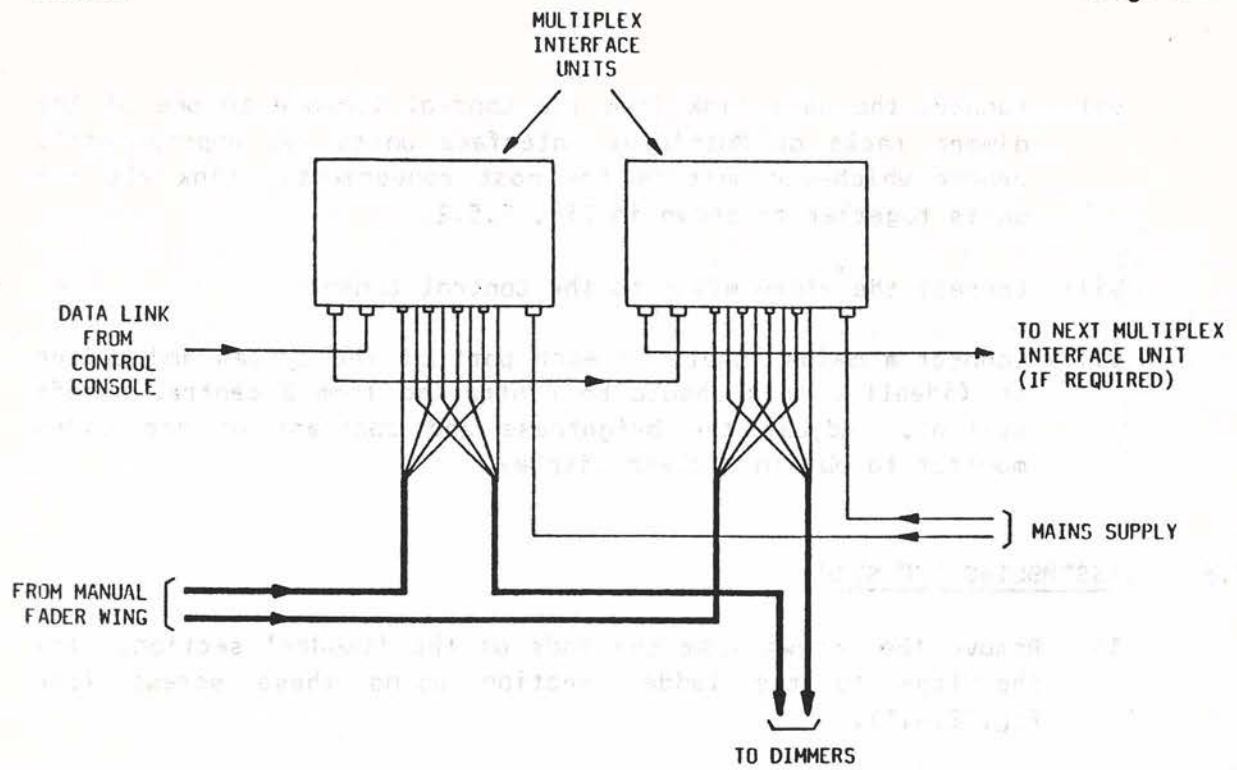
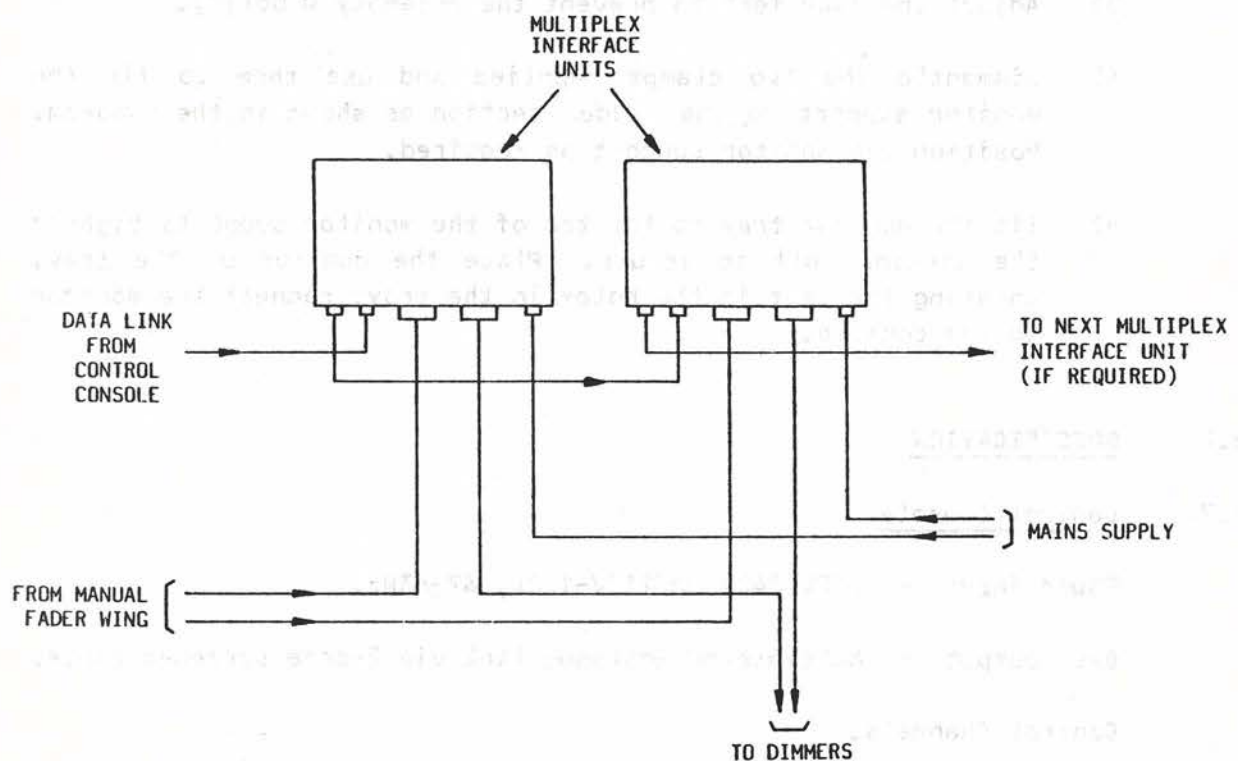
If damage is caused as a result of failure to observe the above recommendations, any warranty will be invalidated. If in doubt, your local Strand Lighting agent will be pleased to advise.

- i) Assemble the stand (if provided), as described in section 2.4.
- ii) Install the dimmers and connect the dimmer loads in accordance with the instructions supplied with the racks.





- iii) If Multiplex Interface units are provided, connect the outputs of these to the appropriate dimmer control inputs. On installations using Tempus dimmers the output cables simply plug into the dimmer packs (extension cables are available for use where the dimmers are further than 2 metres away from the desk). Where other types of dimmer are used, the racks must be 'hard-wired'; the colour codes used in the cable supplied for the purpose by Strand Lighting are given in Table 2.3.3.
- iv) Decide which dimmer rack or Multiplex Interface unit will serve which group of channels and set the Channel Group Selector on each accordingly.
- v) If Multiplex Interface units are to be used for connection of a Manual Fader Wing, connect the appropriate outputs of the latter to the Multiplex Interface units. As in the case of the dimmers, the output cables from Tempus desks simply plug into the appropriate sockets on the Multiplex Interface units, while other types of desk must be hard-wired; refer to Table 2.3.3 for wiring details.

Tempus/Bleecon TypeD-Connector TypeMULTIPLEX INTERFACE UNIT CONNECTIONSFig. 2.5.2

- vi) Connect the data link from the Control Console to one of the dimmer racks or Multiplex Interface units (as appropriate); choose whichever unit is the most convenient. Link all the units together as shown in Fig. 2.5.2.
- vii) Connect the video mimic to the Control Console.
- viii) Connect a mains supply to each part of the system and switch on (ideally, this should be controlled from a central on/off switch). Adjust the brightness and contrast of the video monitor to obtain a clear display.

## 2.6 ASSEMBLING THE STAND

- 1) Remove the screws from the ends of the 'ladder' section. Fix the legs to the ladder section using these screws (see Fig. 2.4.1).
- 2) Lower the Gemini control console onto the stand; the wooden end panels rest on the top of the legs. Fix the console in place using the screws supplied.
- 3) Adjust the four feet to prevent the assembly wobbling.
- 4) Dismantle the two clamps supplied and use them to fix the monitor support to the ladder section as shown in the diagram. Position the monitor support as required.
- 5) Fit the monitor tray to the top of the monitor support; tighten the locking bolt to secure. Place the monitor on the tray, locating the feet in the holes in the tray; connect the monitor to the console.

## 2.7 SPECIFICATION

### 2.7.1 Control Console

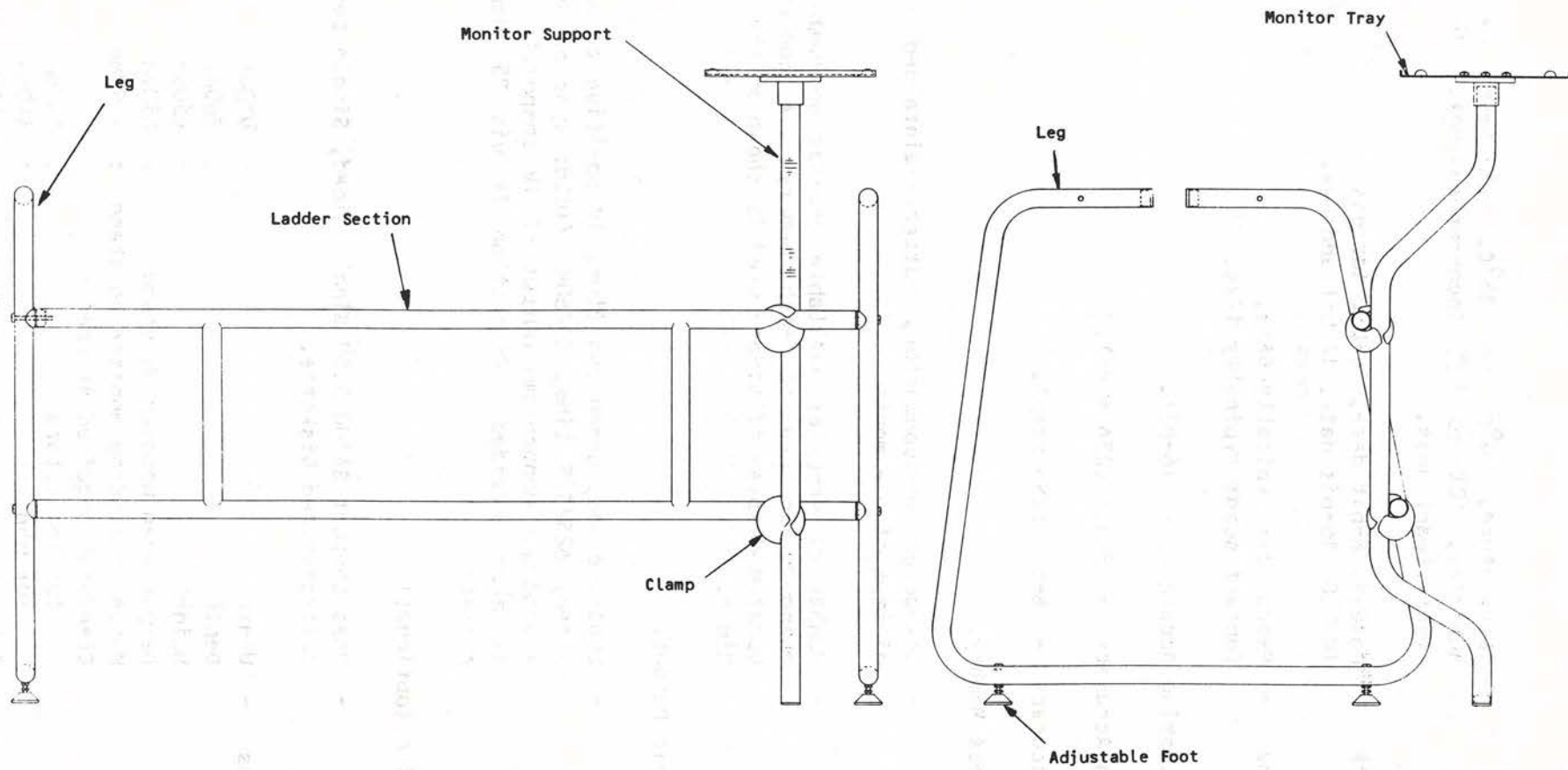
Power input - 220V-240V or 110V-120V, 47-63Hz.

Desk output - Multiplexed analogue link via 2-core screened cable.

Control Channels.

- 50, 80, 96, 100, 120, 140, 144, 160 or 180 channels.  
Switch selectable.



STAND ASSEMBLYFig. 2.6.1

## Operating Environment.

- Temperature, 0°C to 35°C. Maximum relative humidity, 10% to 90% (non-condensing). 'Office' level cleanliness.

Processors - M68B09: 8-bit data, 16-bit address.  
TMS320: 16-bit data, 12-bit address.

Cycle Time - Executive: typically 48ms.  
Contact scan: typically 12ms.

Fade Processing Accuracy - 16-bit.

Recording Accuracy - 8-bit (256 step).

Output Accuracy - 8-bit (256 step).

## Fast Access Memory.

- Low-power semiconductor, battery-maintained for a minimum of one month.
- Number of memories available depends on number of channels in use in each memory. A constantly updated display of memory used is shown on the Video Mimic.

## Video Mimic Output.

- Separate Red, Green and Blue, 1V positive composite video, 625/525 Line, 50/60Hz field; sync on Green. A separate monochrome output of 1V composite video is also provided. Connection is via 75 ohm BNC sockets.

## Floppy Disc (optional)

- Uses Shugart SA300 3.5" Single Sided, Single Density soft-sectored Diskette.

Dimensions	- Width	:	970mm
	Depth	:	560mm
	Height	:	250mm
	Height when mounted on stand	:	850mm
	Height including monitor on stand	:	1190mm
	Clearance required at rear -		
	for connectors	:	100mm
	for monitor	:	440mm
	Cut-out for desk-top mounting	:	910mm x 460mm
	Maximum thickness of desk-top	:	25mm

### 2.7.2 Video Monitor

Dimensions - Width : 380mm  
Depth : 420mm  
Height : 330mm

### 2.7.3 Multiplex Interface Unit

Power input - 220V-240V or 110V-120V, 47-63Hz.

Control input - Multiplexed analogue link via 2-core screened cable.

Dimmer drive outputs

- 0V (Off) to -10V (Full) via 10k ohm and silicon diode.
- Optionally 0V (Off) to +10V (Full) via 1k ohm and silicon diode.
- Other control voltages are possible, within the limits +/-15V.

Connection is via 4 x 2m long control cables, each terminated in an 8-pin 'Bleecon' plug to mate with Tempus dimmer packs, or via a 25-way 'D' type connector.

Input from Manual Fader Desk or Wing.

- As for dimmer drive outputs.

Control Channels.

- One Multiplex Interface unit is required for each 24 channels.

Dimensions - Width : 280mm  
Depth : 75mm  
Height : 200mm  
Clearance required at front : 110mm





## CHAPTER 3

### OUTLINE OPERATIONAL DESCRIPTION

#### 3.1 HOW TO SWITCH THE SYSTEM ON

Before any lighting may be controlled, the mains supply to the dimmers and the Control Console must be turned on. Also turn on the power to the manual fader wing, if this is provided (in many cases the power to the latter will be provided from the dimmer racks). The equipment is now ready for use.

The initial state of the system on power-up is as follows:

- i) O/P (Output) indicator illuminated and Video mimic showing OUTPUT display. A Power-up message (normally 'POWER-UP O.K.') will be passing across the Back-up keypad display and the RATE indicator on the Effects panel will be illuminated in green. All other indicators and displays are cleared.
- ii) All channels are restored to the states which were current when the system was switched off. However, no channels or memories will be selected, no fades will be running and no special facilities (USE TIME, SEQ, MAN, etc.) will be selected.

Before starting to control lights, check that the OUTPUT master fader is at full and that the master fader on any Manual Fader Wing is at zero. Check also that the blackout switch is in the up (⬆) position.

#### 3.2 HOW TO GET LIGHTS UP

- i) Check that the O/P indicator above the CHANNEL CONTROL keypad is lit. If not, press the O/P button.
- ii) Enter the number of the first channel to be controlled on the CHANNEL CONTROL keypad. The number entered will appear in the display window above the keypad.
- iii) Adjust the channel to the required level using the channel control wheel.
- iv) Select the next channel and adjust its level as required.
- v) Continue as above until the lighting scene is complete.

Note that there is no need to press the Clear (CL) key between entries as the system assumes that once a channel has been controlled, the next key entry will be a new channel number.

### 3.3 HOW TO MODIFY THE LEVEL OF A CHANNEL ALREADY ON

This procedure is identical to that outlined above. The channel is simply selected on the keypad and the wheel is used to adjust it upwards or downwards to the new level.

### 3.4 HOW TO RECORD A SCENE

Once a lighting state has been set-up to the satisfaction of the operator it may be recorded in the memory. It is important, at this stage, to know if previously recorded memories are still required - whether they may be overwritten or should be preserved. If in doubt, the memory contents may be saved on disc (see section 4.8).

- i) Enable recording by inserting a key (TOK4) in the LOCK keyswitch and turning it 90° clockwise to the horizontal, CLEAR position. The key cannot now be removed without turning it back to the vertical position.
- ii) Enter the required memory number on the MEMORY CONTROL keypad. The number will appear in the display window above the keypad.
- iii) Press the 'RECΣ' button once to record the lighting scene. The indicator above the button illuminates for a few seconds to indicate a successful recording. If the system alarm sounds and the button does not light, one of four errors has occurred.
  - a) The Record Lock is in the wrong position.
  - b) No memory number has been entered.
  - c) There is already a memory with the number that has been selected. To over-write a previously recorded memory, press the Record button twice in rapid succession. The old memory will then be erased and the new state recorded.

Note: If a manual fader wing is provided, any lighting which it contributes to the scene will also be recorded. To prevent this, set the master fader on the Manual Fader Wing to zero.

### 3.5 HOW TO PLAY-BACK MEMORIES

- i) Ensure that the OUTPUT master fader is at maximum.
- ii) Select the memory number corresponding to the required lighting state on the MEMORY CONTROL keypad.



- iii) Set the Fade Duration controls on one of the two Playbacks to the required fade time (instant to 20 minutes). Alternatively, select USE TIME (the indicator above the button will light).
- iv) On cue, press the appropriate FADE button to start the fade.

A crossfade will be carried out automatically in the time set on the Fade Duration controls or, if USE TIME is selected, that recalled with the memory. The fade rate may be adjusted at any time, although if USE TIME is in use this must first be deselected. In the latter case, to avoid a sudden change of speed, the Fade Duration controls should first be matched to the active fade rate by means of the appropriate part of the Video Mimic display.

Once a fade has been started, the next memory number may be selected, ready for recall. Alternatively, to eliminate unnecessary button operations, a sequence mode may be selected. When either SEQ button is pressed, the associated lights and the next memory in numeric sequence will then be automatically selected each time a fade is started on the corresponding Playback.

Two types of fade are possible: a Crossfade, in which the state recalled from the memory totally replaces the old lighting state, and a Move-fade, in which the channels which are On in the memory change to new levels, but those which are Off in the memory remain unaffected. A Move-fade is selected by prefixing the memory number with '+' on selection. If there is no prefix, a Crossfade results. (A '-' prefix gives a special type of Move-fade - a Dim-fade - where the channels On in the memory fade to zero.)

A blackout state may be obtained by performing a fade action with no memory selected.

### 3.6 'BLIND' PLOTTING AND MODIFICATION

Should it be necessary to set-up or modify a memory without the lighting being seen, the Channel Control should be routed to Sub-masters by pressing the SUB button. Any channels now modified by the Channel Control will now be set On in the selected Sub-master store (shown by the corresponding indicator at the top of the SUB-MASTERS section of the control panel).

The modified lighting state in the selected Sub-master store may be recorded by selecting the memory number in the usual way, but pressing the REC SUB button rather than 'REC  $\Sigma$ '.

The first part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

The second part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

The third part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

The fourth part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

The fifth part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

The sixth part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

#### Summary of the work done during the last year

The seventh part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

The eighth part of the report is a summary of the work done during the last year. It is followed by a detailed account of the work done during the last year, and then a summary of the work done during the last year.

## CHAPTER 4

### DETAILED OPERATIONAL DESCRIPTION

#### 4.1 CONTROL HIERARCHY

The control of any channel in the Gemini memory system is primarily based on a 'Latest-takes-precedence' philosophy, which means that the level of each channel is always determined by the last action which involved that channel. For example, if a channel which is fading up as a result of a fade action is becoming too bright, it may easily be adjusted while the fade is running; the channel is simply selected on the Channel Control keypad and reduced in level by means of the fader wheel. When the fade is complete, the channel will be at the level set using the wheel, the later instruction having taken precedence over the earlier.

The above, however, is not true of the Sub-masters, the outputs of which combine with each other and with the system output store on a 'Highest-takes-precedence' basis, subject to the settings of the appropriate master faders. This means that if the same channel is contributed to a lighting scene by two different Sub-masters, the level which appears on stage will be that produced by the highest combination of channel and master fader level. For example, if channel 15 is at Full on Sub-master A and at 50% on Sub-master B, and both master faders are fully raised, the output level of that channel will be Full. If Sub-master A is now lowered, the channel will dim until 50% is reached, when the level produced by Sub-master B becomes the higher. To reduce the level further, both faders must be lowered.

#### 4.2 CHANNEL CONTROL

The Channel Control allows setting and modification of channel levels; either directly onto the system output, or into one of the eight Sub-master stores. Levels may be varied in a continuous manner by the fader wheel (256 discrete steps) or, for rapid setting, they may be keyed in using the '@' button.

In addition to the control of individual channels, groups, previously recorded groups and memories, or combinations of all of these may be selected and controlled.

The keypad and fader wheel may be used to control channels in either the output store, or in any Sub-master store. The required operating mode is selected by means of two buttons, labelled O/P (Output) and SUB (Sub-master) respectively. These are mutually exclusive, either, when operated, illuminating and extinguishing the other. Changing the Channel Control mode from O/P to SUB or vice-



versa automatically clears the keypad selection, without changing the levels of any channels which were under control.

#### 4.2.1 Channel Selection

Channel numbers are selected on the keypad as on a calculator and appear in the CHAN/MEM (Channel/Memory) display window. If an attempt is made to change the level of a channel which does not exist, the Error alarm will sound momentarily and the display will blank.

An alternative method of selecting channels is provided by the NEXT and LAST keys. The NEXT key selects the next channel number and the LAST key the previous. When adjusting a sequence of channels, use of these keys makes the selection of the individual channel number digits unnecessary.

#### 4.2.2 Setting Channel Levels

Following selection of a channel number, its level may be set by any of the following methods:

- i) By operation of the '@' key, followed by a single digit, or by two digits separated by a decimal point ('.'). These digits represent levels on a scale of ten and may be considered as a percentage; thus 5 will set the selected channel to 50% and 5.5 to 55%. The FULL key selects maximum level (100%). The resulting channel level is shown as a percentage (maximum level is shown as '100') in the LEVEL display window above the fader wheel.

When the '@' key is pressed, the adjacent indicator lights to warn that the next entry will be interpreted as a level. Once the first level digit has been entered, the indicator is extinguished, but it will light again if the '.' key is operated, to indicate that the least significant digit of the level may be entered.

Note that in the case of the FULL key, it is in fact unnecessary to first press the '@' key.

- ii) By use of the fader wheel. Movement of this away from the operator increases the level of the channel and vice versa. One sweep of the exposed section of the wheel corresponds to slightly more than a fade from zero to full.

When a channel level has been set (by either of the above methods) the keypad becomes immediately available for a new selection. There is no need to operate the Clear (CL) key before selecting the next channel.

#### 4.2.2.1 On at Zero

When a lighting state is memorised, channels which have been set to level 0 will be recorded as Off and these channels will then not take part in Move-fades involving the memory concerned. There are occasions, however, when it is required to fade some channels to zero and switch them Off while leaving others unaffected. This may be achieved by setting the channels which must fade out 'On at zero' in the memory.

When setting-up lighting, the selected channel(s) may be set into the 'On at zero' state by typing '@', '.' (decimal point); the channel(s) concerned will be shown at level '00' on the Video mimic. Note that when setting channels in this way, the CL (Clear) button on the keypad must be pressed before entering the next channel number, as the latter would otherwise be interpreted as a level.

#### 4.2.2.2 Use of the ON Button

The ON facility provides a convenient method of rapidly setting channels which are Off to a preferred level. A separate 'ON' level (initially 70%) is stored for each channel and this level will be retained when the system is switched off.

What happens when the 'ON' button is operated depends on the On/Off state of the channel whose number is shown in the CHANNEL CONTROL display window (where a number of channels are selected as a group this will be the channel whose number was the last entered); there must be a valid channel selection, or the error alarm will sound. If the channel whose number is shown in the display is Off, the indicator associated with the 'ON' button will be off and pressing the 'ON' button turns the selected channel or channels On. If, however, the last selected channel is On, the 'ON' indicator lights and operating the 'ON' button turns the channels Off; in the latter case, the 'ON' level stored for each of the selected channels will be changed to that which was current immediately prior to operation of the 'ON' button.

The ON button will operate on individual channels or groups; groups may be selected using the '+', '-' and THRU buttons, or recalled from memory using the GRP (Group) button. The 'ON' button is inhibited, however, if a Move-fade is being controlled (see section 4.6.4).

Unlike on other Strand systems such as Galaxy, on Gemini the 'ON' level is also automatically updated when a lighting state is memorised; in this case, channels which are at levels above zero will have their the stored 'ON' level set to the last recorded level.



Stored Channel ON levels will be transferred to or from disc as part of Memory 0 and will be reset to 70% if the memory is re-initialised.

#### 4.2.3 Modifying Channel Levels

The level of any channel which is already contributing to the lighting may be easily adjusted by selecting the channel required and then using the '@' key or the fader wheel.

If required, the '@' key may be used in conjunction with the '+' and '-' keys to adjust the level by a predetermined amount. For example, to raise channel 8 by 10% press 8, '@', '+', 1. Use of the decimal point as previously described allows modification to 1% accuracy. The LEVEL display always shows the actual level of the channel whose number is in the CHAN/MEM window. The effect of the 'Σ' master fader and any contribution from the Sub-masters are ignored.

The Channel Control is able to take control of any channel at any time and modify its level even if the channel is fading under the control of a Playback. When this becomes necessary, however, corrective action is usually required as quickly as possible because circuits are becoming too bright or are not bright enough; often in the time taken to type-in the channel number it is too late to stop the fade being spoilt. The Channel Control has special facilities therefore to help overcome this problem.

A channel which may need to be over-ridden during a Playback fade is selected up on the Channel Control. The fade is then started and by the latest-takes-precedence philosophy (outlined in section 4.1), control of this channel is passed to the appropriate Playback. If no further action is taken the channel remains under the control of the Playback until the fade ends. However, if the Channel Control fader wheel is moved, control of the channel is immediately and automatically transferred to the Channel Control, thus allowing that channel to be controlled manually.

#### 4.2.4 Selection and Control of Groups of Channels

The ability to control the level of several channels simultaneously (i.e. as a group) is highly desirable and speeds up rehearsals considerably. The channels constituting a group may be selected individually by the following procedure:

- 1) Enter first channel, e.g. 2.
- 2) Enter '+'.  
3) Enter second channel, e.g. 3.



3) Enter second channel, e.g. 18.

4) Enter '+'.  
5) Enter third channel, e.g. 11.

Etc. ...

Channels 2, 11 and 18 would then be controlled together as one channel.

Similarly, a channel may be removed from control as follows:

1) Enter '-'.

2) Enter channel, e.g. 11.

The CHAN/MEM window shows the number of the last channel selected, preceded by '+' or '-' as appropriate.

If all the channels selected are at the same level when taken under control they remain together when the fader wheel is moved. If, however, the channels are at different levels, an equal amount is added to or subtracted from each channel as they fade up or down. This type of fade is not proportional and is usually referred to as a 'Group' or 'Shaft' fade.

The wheel may be moved up until one-by-one all channels reach full. Moving the wheel in the reverse direction will then restore the original balance, while further downward movement reduces the levels until one-by-one the channels reach zero.

The THRU button may be used to call-up a contiguous group of channel numbers for control, as follows:

1) Enter the first number, e.g. 7.

2) Press THRU.

3) Enter the last number, e.g. 13.

THRU may also be used to remove a sequence of channels from control by prefixing the first number with minus (-).

When using THRU, any numbers may be entered, but the second must be higher than the first or the Error alarm will sound. Similarly, the first number must be within the range of valid channel numbers. Only channels which exist within the range entered will be selected. Note that the THRU button is inoperative if the keypad is being used for memory number selection.

#### 4.2.4.1 Recalling Memorised Groups

An alternative method of selecting a group of channels for control is to call up a previously recorded memory. Considerable time may be saved at a lighting rehearsal if some basic 'building-blocks' of lighting have been set-up and recorded as memories. Such typical 'blocks' may be all the red channels of the cyclorama, or the channels in a blue wash for a night scene. These memories are recorded in the normal manner by selecting the required channels and setting levels, and then selecting a memory number and recording. The memory numbers used for these groups should be outside the range of numbers likely to be used for a production, and it is suggested that a set of numbers (for example, those above 900) be reserved for groups. This is extremely relevant if the groups that are set up are not specific to one production and may be used each time a show is lit, as it is obviously undesirable for these memories to be erased accidentally.

All the channels On in a recorded memory are taken under the control of the Channel Control by pressing the GRP (Group) button and then entering the number of the required memory on the channel keypad. Note, however, that no level is shown in the LEVEL display window if the last channel selection action was the recall of a recorded group.

Channels may be added to recorded groups or deleted from them in the usual way, by use of the '+' and '-' keys. Similarly, groups may be added together or their channels removed from control using the following procedure:

- 1) Press the GRP button.
- 2) Select the first memory number on the channel keypad.
- 3) Press the '+' or '-' button as required.
- 4) Press the GRP button a second time.
- 5) Select the second memory on the channel keypad.
- 6) If required, continue until the desired combination is obtained.

#### 4.2.5 The RETURN Button

A feature of the fader wheel, owing to its 'positionless' character, is the ease with which channel levels may be modified. If, however, the initial level is not noted, it can be difficult to correct levels changed in error. To overcome this, an internal return memory is provided, which retains the starting level of each channel whenever a channel or group of channels is modified.



When a channel or a group of channels is selected and the level changed, the indicator adjacent to the RETURN button illuminates. If the levels are then manually restored to within about 3% of their original settings the indicator is extinguished.

If a channel level is changed by mistake and a rapid return to the original level is necessary, pressing the RETURN button causes all the channels under control to be instantly returned to the levels which were current when they were selected. When this is done the RETURN indicator will be extinguished.

#### 4.2.6 Flash

The Flash switch (labelled '⚡') is a three-position centre-biased lever switch. When held in the up position, the channels selected on the keypad are turned on at full, while the down position switches them to zero. When the switch is released, the original channel levels are restored. Note that the Flash switch always operates directly on the system output, regardless of the Channel Control mode (i.e. O/P or SUB).

The most obvious use of the Flash switch is for lightning effects, etc. However, it may also be used to identify the contributions of individual channels to a complete scene. This is done by holding the switch up or down and stepping through the channels with the NEXT or the LAST key.

### 4.3 CHANNEL-TO-DIMMER PATCH

The Gemini Patch facility permits the connection of any channel on the system to any of the available dimmers; up to 384 dimmers may be used. Any number of dimmers can be allocated to each channel, but only one channel may be patched to each dimmer. In addition, lighting channels may be renumbered, thus permitting a range of numbers to be allocated to each geographic area of the stage or studio; any channel number between 1 and 999 may be used.

#### 4.3.1 Entering Patch Mode

When the PTCH (Patch) button on the Channel Control is operated, the Video Mimic display changes to the following:



```

PAGE 1 OF 2          PATCH          LAST REC 238.5          MEM USED 33%
001:001 @ +00% 002:002 @ 80% 003:003 @ +00% ...
006:006 @ +00% 007:007 @ +00% ...
011:011 @ +00% 012:012 @ +00% ...
016:016 @ +00% ...
...
etc.....

```

The above shows the unchanged, 1:1 display. It consists of a list of dimmers, each of which is followed by the number of the channel to which it is patched and the 'patch level'. The latter is the level which will appear at the dimmer output, expressed as a percentage of channel level.

Entries for dimmers which have the normal 1:1 patch and an unchanged patch level are shown in dim yellow; entries which have been changed in any way are highlighted by appearing in bright yellow. When patch data is being entered, the selected dimmer is marked with a red background; at the same time any other dimmers which are patched to the same channel appear in red on a black background.

#### 4.3.2 Changing the Patch

The Dimmer/Channel patch may be changed in several ways:

- 1) To patch a dimmer to a channel without changing the patch level, enter the Dimmer number and press the ON button; then enter the Channel number and press ON again. For example, to patch dimmer 149 to channel 76, enter '149, ON'; the display entry for dimmer 149 will be highlighted in red. Then enter '76, ON'. The appropriate item in the dimmer list will change to '149:076 @ +00%' and will return to its normal yellow colour; it will now, however, appear brighter on the display than the unchanged entries.
- 2) To change the patch level of a dimmer without changing the dimmer-to-channel assignment enter the dimmer number and press the '@' button; then enter the required level and press the ON button. For example, to change the patch level of dimmer 149 to 80% enter '149, @, 8, ON'; the appropriate item in the dimmer list will change to '149:149 @ 80%'. Note that the dimmer-to-channel assignment remains unchanged.

Any patch level between 0% and 99% may be entered, either as a single digit, or as two digits separated by a decimal point. These represent levels on a scale ten and will be displayed as a percentage of full level; thus 5 will select a patch level of 50% and 5.5 will select 55%. If the first digit is preceded by '+', the percentage entered will be added to full level, thus

allowing the dimmer level to be higher than that of the channel; note, however, that dimmers patched in this way cannot be driven higher than full and will therefore exhibit a 'plateau' effect at higher channel levels.

The normal 1:1 patch level is entered as '+0' and appears on the display as '+00%'.

- 3) To change both the dimmer-to-channel assignment and the dimmer patch level, enter the dimmer number, press ON and then enter the channel number; then press '@' followed by the required patch level. For example, to patch dimmer 149 to channel 76 at a patch level of 80%, enter '149, ON, 76, @, 8'; the appropriate item in the dimmer list will change to '149:076 @ 80%'.
- 4) Unused dimmers may be removed from the patch by entering the dimmer number, pressing ON and then clearing the keypad with the CL key before pressing ON the second time. Dimmers removed in this way will disappear from the 'PATCH' display, leaving a blank space.

#### 4.3.3 Geographic Patching

When patching dimmers to channels, any channel number from 1 to 999 may be used, thus allowing groups of channel numbers to be allocated to different geographic areas of the stage or studio. It is not possible, however, to use more channel numbers than there are channels in the system (normally 180), and a channel must be 'released' before a new number can be brought into use. The operations required are as follows:

- 1) Decide which of the existing channels is to be renumbered and enter the number of the dimmer to which this is currently patched.
- 2) Press ON, CL, ON to remove this dimmer from the display.
- 3) Repeat for any other dimmers to which the channel is patched.
- 4) Enter the number of the dimmer to which the new channel is to be patched. Then press ON.
- 5) Now enter the new channel number and press ON a second time.
- 6) Repeat the last three steps for any other dimmers which are to be patched to the new channel.

The error alarm will sound if any illegal actions are attempted.



#### 4.3.4 Using the Patch Facility

##### 4.3.4.1 Memory Back-up System

When the Gemini Memory Back-up system is in use, the Channel-to-dimmer patch is NOT taken into account. If possible, Back-up memories should be prepared which minimise the need to control individual dimmers.

##### 4.3.4.2 Manual Fader Wing

When a Manual Fader Wing is provided, there are some restrictions on the use of the Patch facility. Firstly, because it is not possible to renumber the manual wing faders full geographic patching is not possible; the maximum available channel number is limited to the number of channels in the system (normally 180). Secondly, any Channel-to-dimmer patch will not be effective if the Gemini desk is not in operation; it is recommended that patching be kept to a minimum, so that control may be easily transferred to the Manual Fader Wing should a breakdown of the main system occur.

#### 4.4 OUTPUT CONTROL

##### 4.4.1 The Blackout Switch

In the down (Ⓚ) position, this switch turns Off all control signals to the dimmers from the Gemini system; the message 'BLACKOUT' appears on the Video Mimic. When returned to the up (Ⓢ) position, the switch restores the previous lighting. The blackout switch does not stop fades progressing nor alter any system modes.

##### 4.4.2 The Output Master Fader

If this fader is moved down from 'F' towards '0', the lighting scene set on the Gemini system (including the Sub-masters) is proportionally faded out; returning the fader to 'F' restores the lighting. Any fades which are in progress continue to run while the fader is below maximum and all system modes are unaltered.

#### 4.5 SELECTION OF MEMORY NUMBERS

##### 4.5.1 General

The MEMORY CONTROL keypad is used for selection of memory numbers for recording, or for recall to the Playbacks or the system output. Any integer between 1 and 999 may be selected on the keypad and a lighting state recorded in the associated memory. In addition, nine memory numbers, identified by a digit following a decimal point, are available between each integer, e.g. 32.1, 32.2, 32.3, etc.



Normally, when recording, integer numbers would be used first (1, 2, 3, etc.) and then, if it became necessary to insert a state between memory 2 and 3, for example, memory 2.5 could be used.

Memories may also be selected using the NEXT and LAST keys. NEXT steps the number to the next highest memory number recorded; LAST steps it back to the next lowest recorded memory, rolling through zero.

If an attempt is made to recall a memory which has not been recorded, the Error alarm will sound. The number is then regarded as having been used and subsequent entry will be treated as a new number.

The number selected will be used when any of the following buttons are operated: '?' (Preview); any of the Record buttons; any of the memory recall buttons (i.e. the Output '↓MEM' button, either of the Playback FADE buttons and any of the Sub-master '↓MEM' buttons); PRNT (Print); and either of the disc action buttons, MEM-DISC or DISC-MEM. Once a memory number has been used for recording or playback, any subsequent entry on the keypad is assumed to be a new number, making it unnecessary to press CL (Clear) before every entry. The CL key need only be used if an incorrect number has been typed in or when clearing the keypad prior to initiating a fade to blackout.

#### 4.5.2 Combining Memories with the Plus (+) and Minus (-) Keys

As in the case of channels, which may be combined into groups, memories may be combined prior to recall by means of the Plus and Minus keys. In addition, these keys may be used to prefix a memory number in order to affect the way in which the memory combines with the current output when a memory recall button is operated.

When recording, if the memory number is prefixed with a Plus or Minus sign, the prefix will also be memorised so that the required fade type will be selected automatically when the memory is recalled in Sequence mode (see section 4.7.2.6).

##### 4.5.2.1 Adding Memories

Any memory may be added to the existing channels contributing to the output by prefixing the memory number with '+' on selection. While a normal fade would totally substitute the selected memory for the previous lighting (Crossfade), the recall of a memory with a plus prefix will simply add in the extra channels at their memorised levels (Move-fade). A channel which is On both at the output and in the memory added, will be set, on completion of the fade, to the memorised level, in accordance with the 'Latest-takes-precedence' philosophy.

#### 4.5.2.2 Subtracting Memories

If a memory number is prefixed with minus, the channels which are On in the memory will fade to zero at the output when recalled.

#### 4.5.2.3 Combining Memories Prior to Recall

Memories may be combined prior to recall using the Plus and Minus buttons in the same way as when combining channels into groups. In the case of common channels, the resulting level will be in accordance with the Latest-takes-precedence philosophy. If a memory number is prefixed with Minus, the channels On in the memory will be removed from the combination.

As in the case of individual memories, whole groups may be prefixed with '+' or '-'. The complete combination will then combine with the current lighting as described in sections 4.5.2.1 and 4.5.2.2 above.

#### 4.5.3 Memory Preview

The button labelled '?' changes the mimic display while held down; the lighting state recorded in the selected memory is shown.

#### 4.5.4 Memory Full Warning

As described elsewhere, the number of memories available to a Gemini system is dependent on the capacity of the memory fitted and the number of channels On in each state recorded. A tally of memory used is, therefore, constantly shown on the top line of the Video mimic. If an attempt is made to record a memory which requires more space than is available the action is aborted and the following error indications given:

- i) The Error alarm sounds momentarily.
- ii) A 'MEMORY FULL' message appears on the Video mimic.
- iii) The appropriate RECORD button does not light.

The only immediate action possible is to clear some memories, if necessary first storing them on a disc.

The error messages may be cleared by re-selecting the current Video mimic display.



#### 4.5.5 Clearing Memories

It is not strictly necessary to clear a memory before that number can be used to record again, as a recorded memory will be overwritten if the record button is pressed twice in close succession. However, when lighting a production it is sometimes desirable to start with a 'clean slate' so that old and new lighting does not become confused, and the progress of recording can be clearly seen with Memory List.

Any or all memories may be erased by using the CLEAR position on the Record Lock keyswitch. When erasing more than one memory, the THRU button on the MEMORY CONTROL keypad may be used to select a range of numbers.

The memory clear operation is interlocked to prevent accidental erasure. The following procedure is required:

- 1) Select the first memory to be cleared.
- 2) If erasing a range of memories, press the THRU button; the associated indicator illuminates. Then enter the the number of the last memory in the range.
- 3) Insert the key (TOK 4) into the Record Lock keyswitch and turn it 90° clockwise to enable recording.
- 4) Rotate the key a further 45° against the spring to the CLEAR position and while holding it there press 'REC Σ'. This requires the use of both hands.

The 'REC Σ' button will light momentarily, the indicator above the THRU button will be extinguished and the 'MEMORY USED' display will be updated as the extra memory becomes free.

##### 4.5.5.1 Memory Initialisation

The one situation where it is essential to clear the memory is if the memory directory is corrupted; this should only occur if a memory board has been exchanged, or if the batteries have become discharged.

Memory initialisation is carried out by clearing memories 0 THRU 999.9 as described above; the memory will be totally erased, and a new directory written. Note that this procedure will also erase the Channel-to-dimmer patch and the recorded effects; these must then be re-entered, either manually or from Floppy Disc.



## 4.6 RECORDING

### 4.6.1 General

Once a lighting scene has been set-up to the operator's satisfaction, it may be recorded in the memory. The data is not stored in the system's long term memory until a record button is pressed. To prevent unauthorised or accidental modification of memories, a Record Lock keyswitch is fitted; the key may only be removed from this if the memory is locked.

Record actions are disabled under the following circumstances:

- i) If the Memory Lock keyswitch is not in the OPEN position.
- ii) If no memory number is selected.
- iii) If the memory is full.
- iv) If the selected memory number is that of an existing memory. In this case, however, a second operation of the Record button (within 2 seconds) will overwrite the old memory.

Separate record buttons are provided for recording channel levels from the output or from the Sub-masters, for recording Fade and Wait times and for recording links to memories. Most of these buttons are red in colour to emphasise their function; exceptions are LINK and WAIT.

If the memory number is prefixed with a Plus or Minus sign when recording, the prefix will also be memorised. The required fade type will then be selected automatically when the memory is recalled in Sequence mode (see section 4.6.2.6).

Note that if an existing memory includes a link, this will be unchanged when a new or modified lighting state is recorded in that memory. This is obviously desirable when modifying existing memories, but if a new memories has been created it will be necessary to delete the link after recording (see section 4.6.6).

### 4.6.2 Recording System Output (REC $\Sigma$ )

When pressed, this button copies the total lighting state currently seen into the selected memory. The state recorded is that displayed on the Video mimic when O/P is selected and includes the effect of the Grand Master fader. Lighting contributed by the Sub-masters is included, as is that contributed by an external Manual Fader Wing, if this is connected via Strand Multiplex Interface Units (see section 1.1).

Recording may take place at any time, even while fades are in progress, the lighting set-up remaining totally unaffected.

#### 4.6.3 Recording Blind

It is often necessary to set-up lighting while the stage is in use and it is useful under these circumstances to be able to record new scenes without affecting the current output state. To facilitate this, a REC SUB (Record Sub-masters) button is provided, which records the lighting contributed by the selected Sub-master; the settings of the various master faders are ignored, thus allowing lighting to be prepared and recorded 'blind', with the appropriate Sub-master at zero.

#### 4.6.4 Making a Copy of a Memory

If a copy of an existing memory is required, this may be made by recalling the memory concerned, selecting a new memory number and re-recording.

#### 4.6.5 Recording Time

The time taken for a fade when a memory is played-back may be recorded with each memory. However, as details of fades are not always known at the rehearsal where lighting is being set, recording time is a separate operation which may therefore be performed at a later time.

Each Playback has a REC TIME push which, when pressed, stores the time currently set on the associated Fade Duration controls with the memory selected on the Memory keypad; if either Fade Duration control is at '∞', the appropriate time will be recorded as 20 minutes. The recorded channel levels will not be affected; similarly re-recording the channel levels will not change a previously recorded time.

It is possible to record a time 'manual', so that Manual mode will be selected automatically when the memory is recalled to a Playback (see section 4.6.2.4). The latter is achieved by pressing the 'MAN' button on the appropriate Playback to select manual mode before pressing the REC TIME button. Manual mode may then be cancelled by pressing MAN a second time.

#### 4.6.6 Recording Links

When recalling memories on a Playback with Sequence (SEQ) selected, the next memory in numeric sequence will normally be automatically selected each time a fade is started, ready for recall. It is, however, possible to change the order in which the memories are



recalled by recording a link, i.e. the number of the next memory required in the sequence, with each memory. If no link is recorded with a memory, the normal numeric sequence will be used.

The link facility allows the insertion of additional memories in a numeric sequence and allows memories to be recorded as convenient and put into the required order for playback when this has been finalised.

Links are recorded as follows:

- 1) Ensure that recording is enabled.
- 2) Enter the number of the memory with which the link is to be recorded.
- 3) Press the LINK button. The associated indicator will light and any existing link will be shown in the keypad display window.
- 4) If required, enter the new link memory number.
- 5) Press LINK a second time. The associated indicator will be extinguished and the number of the selected memory will again appear in the display window.

For example, to cause memory 84 to be inserted between memories 16 and 17, when recalled with SEQ selected, a link to number 84 must be recorded with memory 16 and memory 84 should be linked to number 17 as follows:

- 1) Enable recording.
- 2) Select memory 16 on the MEMORY CONTROL keypad.
- 3) Enter LINK, 84, LINK.
- 4) Select memory 84.
- 5) Enter LINK, 17, LINK.

A link may be cleared by entering the required memory number followed by LINK, Clear (CL), LINK.

If recording is not enabled links may still be examined using the LINK button. Under these circumstances, however, links may not be changed and the window will return to its previous display when the button is released.



#### 4.6.7 Recording WAIT Times

If a Playback has USE TIME selected, it will operate using Wait times which may be recorded with each memory. A Wait time determines the time between the start of one fade and auto-execution of the next; if the next memory in sequence (taking into account any recorded link) has a Wait time, a fade to the memory concerned will begin automatically when the Wait time has expired. A countdown of the Wait time will appear at the bottom of the appropriate Playback Status display on the Video Mimic. Complex fade sequences may thus be performed completely automatically.

Wait times are recorded as follows:

- 1) Enter the required memory number on the MEMORY CONTROL keypad.
- 2) Press the WAIT button beside the keypad; the associated indicator illuminates to show that Wait mode is selected. Any previously recorded Wait time is shown in the MEMORY CONTROL display.
- 3) Enter the required Wait time.
- 4) Press WAIT a second time to perform the record action; the WAIT indicator extinguishes to show that the Wait time has been recorded.

Any time between 0 and 19 minutes 59 seconds may be entered, as follows:

- i) A time of zero (instant) is entered by pressing the decimal point only.
- ii) Times of less than 10 seconds are entered as seconds and tenths of seconds, separated by a decimal point; e.g. for a time of 5.7 seconds enter '5', '.' (point), '7'.
- iii) Times longer than 10 seconds and less than 100 seconds are entered as two digits with no decimal point; e.g. for a time of 45 seconds enter '4', '5'. When the WAIT button is pressed the second time, this will be automatically converted to minutes and seconds if appropriate. If, following entry of the digits, the decimal point key is pressed the Error alarm will sound.
- iv) Times longer than 1 minute are entered as three or four digits, with no decimal point; e.g. for time of 5 minutes 30 seconds enter '5', '3', '0'. If the number of seconds is greater than 59, these will be converted to minutes and seconds as before. As in the previous case, the Error alarm will sound if the decimal point key is pressed following entry of the digits.

If a time greater than 19 minutes 99 seconds is entered the display will blank and only the last digit entered will appear. Times between 19 minutes 59 seconds and 19 minutes 99 seconds will be automatically reduced to 19 minutes 59 seconds.

A Wait time may be cancelled by pressing WAIT, followed by CLEAR or '0', and then WAIT a second time.

Recording a Wait time with a memory does not affect previously recorded channel levels, fade times or links.

If recording is not enabled, Wait times may still be examined using the WAIT button. Under these circumstances, however, Wait times may not be changed and the window will return to its previous display when the button is released.

## 4.7 MEMORY PLAYBACK

### 4.7.1 General

There are three ways in which memories can be recalled on Gemini. The normal method is by using one of the two Playbacks. The memories are selected on the keypad in Memory mode, the fade time set on the appropriate Up (↑) and Down (↓) Fade Duration controls and the fade is started by pressing the corresponding FADE button. The fade is then carried-out automatically and completes in the time set.

A second method is by use of the '↓MEM' (Memory Recall) button above the 'Σ' Master Fader. This allows the memory displayed in the memory number window to be 'cut' immediately to the system output; memories may thus be recalled very quickly, without the need to use a playback. Alternatively, the selected memory may be recalled to one of the eight Sub-masters (see section 4.7.2); the lighting may then be introduced as a manual fade or that assigned to a number of Sub-masters may be rapidly balanced using the corresponding faders.

The third method of recalling memories is intended for use when setting-up lighting and involves using the Channel Control in Move mode. This mode is selected by means of the MOVE button above the keypad and permits the selection of memories on the Channel Control; these are then introduced by moving the fader wheel upwards or by setting a level using the '@' button.

### 4.7.2 Fade System

When using either automatic fade system, the fade times must first be set on the appropriate Fade Duration controls, or alternatively, the fade times recorded with each memory may be used by selecting USE TIME (the adjacent indicator lights when this facility is



selected). The fastest fade rate is almost instant, for 'snap' cues, while at the slowest speed a fade will take 20 minutes to complete. The lowest position on each control is an infinity ( $\infty$ ) setting, at which the fade is stopped. Separate times may be set for those channels increasing and those decreasing in intensity, using the '▲' (up) and '▼' (Down) Fade Duration controls respectively.

When the FADE button is pressed to start a fade, the associated indicator lights and the number of the incoming memory is shown in the ACTIVE MEMORY display window. The progress of the fade is shown on the Up and Down column indicators on either side of the Fade Duration controls. The FADE indicator remains lit until the fade completes, while the memory number remains displayed after completion until another fade is started.

A total of up to twenty four fades, started on either or both Playbacks, may be running at once and the last of these to be started by each Playback may be speeded-up, slowed-down, completed instantly or halted by adjusting the settings of the appropriate Fade Duration controls (USE TIME must first be de-selected - see section 4.6.2.7). It is also possible to manually profile a fade, using the Fade Duration controls as master faders - see section 4.6.2.4.

#### 4.7.2.1 Crossfades and Move-fades

When a memory is selected for recall, it will normally have no prefix and, when faded, will completely replace the current output. However, if the memory number is given a prefix ('+' or '-') the memory will be added to (or subtracted from) the current lighting. These two types of fade are known as Crossfades and Move-fades respectively.

When the memory number is given a '+' prefix, the Move-fade changes those channels which are On in the memory from their current levels to their memorised levels. If the prefix is '-', however, the channels which are On in the memory will fade to zero at the output; this is a special type of Move-fade, sometimes called a 'Dim-fade'. Move-fades are usually used to add channels or to remove them from an existing scene. Gemini may perform several Move-fades, at different speeds, simultaneously.

A Crossfade (i.e. a fade to a memory selected without any prefix) substitutes the scene in the memory for the current lighting, including channels which are not On in the memory - the latter fade to zero. To do this, all channels are taken under control and thus only one Crossfade may take place at a time, the latest cancelling any previous Crossfades and Move-fades.



Fades do not affect lighting contributed by the Sub-masters. All fades are 'dipless'; channels progress linearly from old to new levels and channels which are at the same level in both states do not change during the fade.

#### 4.7.2.2 Instant Fades

Any fade may be actioned instantly by pressing the INST (Instant) button at the same time as pressing FADE. If INST is pressed while fades are running the latest fade on the corresponding Playback will complete instantly.

#### 4.7.2.3 Reversing a Fade

When the REV (Reverse) button is pressed it lights, and reverses the direction of the last fade started, restoring the original lighting. The reverse fade is carried out at the same speed as the forward fade, but, provided USE TIME is not selected, this may be adjusted at any time by using the Fade Duration controls.

Pressing the REV button a second time causes the fade direction to change again, thus repeating the original fade. Note that the FADE button should normally only be used to start the next fade; it will not necessarily produce a repeat of the same fade.

#### 4.7.2.4 Manual Fades

The need to manually profile a fade to match the action is quite common, particularly in theatre or television drama. Manual fades may be carried out on Gemini as follows:

- 1) Select the next memory on the MEMORY CONTROL keypad, prefixing the number with '+' or '-', if required, to determine the type of fade.
- 2) Press the MANUAL button. The associated indicator lights to indicate that Manual mode is selected (if USE TIME is in use, this must first be deselected).
- 3) Press the FADE button to start the fade. The associated indicator lights to indicate that the fade is under control.
- 4) Move the Fade Duration controls, which are now manual masters, to the bottom to 'collect' the fade. The fade is then actioned by moving the controls from the bottom to the top at the required rate; the Fade Progress indicators on either side of the faders will track the movement of the two faders.

The fade may be reversed at any time by simply moving the faders down again.

Manual mode may be selected or de-selected while a fade is in progress. In the former case, the fade will stop and the faders must then be moved to the top or bottom before being matched to the appropriate point of progress using the Fade Progress indicators beside the faders. The faders will not collect the fade unless they have first been moved to one end; choose the end which will allow the faders to continue in the required direction when the fade has been collected.

If Manual mode is de-selected while a fade is in progress, the fade will immediately resume at the speed currently set on the faders. If USE TIME is selected, this will have to be de-selected before the speed can be adjusted.

If it is known that a particular fade will be carried-out manually at each performance, a 'time' of Manual may be recorded (see section 4.5.5). Manual mode will then be selected automatically if the memory is recalled with USE TIME selected.

**Note:** Because only the latest fade may be controlled by the Fade Duration controls, it is impossible to continue a Manual fade on the same Playback once another fade has been started. As a result, only one manual fade may be in progress on each Playback at a time.

#### 4.7.2.5 Multiple Move-fades

As indicated in section 4.6.2, up to twenty four fades may be in progress at once, each at different speeds. These may be on either Playback, but each Playback may also control multiple Move-fades. On each Playback, as each fade is started, control of the previous one is lost and it continues at its last speed setting until it completes or until a Crossfade is started. This means that Manual fades will, in effect, cease to run once the next fade is started. When a Crossfade is started all other fades will stop, leaving only the Crossfade.

If there are twenty four fades already in progress and a twenty fifth is started, the fade which is closest to completion stops.

#### 4.7.2.6 Sequential Playback of Memories

When a fade action has been started, the next memory required may be selected on the keypad. Alternatively, the system may be switched to Sequence mode.



When the SEQ button is pressed, the associated indicator lights. Then, each time a fade is started, the next memory is automatically selected ready for the next fade. The next memory in numeric sequence will normally be selected, but any recorded links will be taken into account.

When Sequence is in use, holding down the '?' (Preview) button and then pressing SEQ will cause the contents of the next memory in the appropriate sequence to be displayed on the Video Mimic.

#### 4.7.2.7 Using Recorded Times

The current settings of either pair of Fade Duration controls are recorded in the selected memory when the corresponding REC TIME button is operated (see section 4.5.5). The recorded times will only be used, however, if the USE TIME button has been pressed (the associated indicator lights to indicate that USE TIME is selected).

When a memory is recalled with USE TIME selected, the current settings of the Fade Duration controls will be ignored and adjusting them will have no effect. However, the latest fade may be speeded-up or slowed-down if USE TIME is deselected. It is best, though not essential, to match the Fade Duration controls to the current fade times before deselecting USE TIME mode, so as to avoid a sudden change of speed. The Fade Time displays on the Video Mimic permit this to be done.

USE TIME mode may be reselected immediately if required, ready for the next fade action. The current fade will continue at the speed which was set on the Fade Duration controls at the moment USE TIME was reselected.

#### 4.7.2.8 Recorded Wait Times

If required, the Playbacks may operate using Wait times recorded with each memory. These are used to determine the time between starting one fade and auto-execution of the next. When this facility is used, fade actions will take place completely automatically, using, in addition to Wait times, the Fade times and Fade Types which may be recorded with each memory.

If a memory has a recorded Wait time, and USE TIME and SEQ are selected, executing the previous fade will start a Wait countdown, auto-execution of the second fade occurring at the end of the Wait time. If there is no Wait time, the fade must be initiated using the fade initiation buttons in the normal way.

Wait times may be over-ridden in two ways: a Wait may be cut short by pressing the appropriate FADE button; or it may be lengthened by de-selecting USE TIME and then initiating the fade with the FADE



button. Once USE TIME has been de-selected, it may be reselected without restarting the Wait countdown.

#### 4.7.3 Memory Recall directly to the Output Store (↓MEM)

The memory recall button immediately above the 'Σ' Master fader allows the memory displayed in the memory number window to be 'cut' immediately to the system output. The purpose of the button is to allow memories to be replayed very quickly, without the need to use a Playback. The effect which is produced is that of an instant crossfade, clearing any previous lighting and substituting the new state. Any contribution to the scene from the Sub-masters remains unaffected. Any fades which may be in progress when the button is operated are immediately halted.

Note that if the memory number is prefixed with a Plus or Minus the existing lighting will not be cancelled and the memories will combine as outlined in section 4.4.2.

##### 4.7.3.1 Random Cut

If the Output '↓MEM' button is held depressed, memories may be cut to the output, simply by selecting them on the memory keypad. In practice, only memories with whole numbers between 1 and 9 may be recalled in this way, although, if required, the NEXT and LAST buttons may be used.

##### 4.7.3.2 Instant Blackout

During rehearsal it is often desirable to cancel all the current lighting and start again from a blackout. This is best achieved by recalling memory 0 or 'Blank' to the system output by use of the Memory Recall button ('↓MEM'). The associated indicator will be extinguished, all channels switched Off and all fades cancelled. The Sub-masters remain unaffected and, if a totally clear state is required, they must be wiped individually by recalling memory 0 to each in turn. If the Sub-masters are not in use, the Sub-master Grand Master fader may be set to zero to avoid confusion.

#### 4.7.4 Recalling Memories using Channel Control Move Mode

An alternative method of recalling memories is provided; this is the Move mode on the Channel Control. This is primarily intended for use during lighting rehearsals. It allows previously recorded memories to be used as building blocks in the design of new lighting scenes; each memory can be added proportionally until the required effect is produced. For example, if separate memories are prepared containing the red, blue and green cyclorama channels at pre-

balanced levels, these may then be introduced by means of Move mode and balanced using the fader wheel.

Move mode also permits the operator to use the Channel Control as a third Playback, thus giving simultaneous manual control of three dipless fades.

Note: It is recommended that, if it is intended to use the Channel Control in Move mode while recalling memories on the Playbacks, only Move-fades be recorded. If Crossfades are used, the Latest-takes-precedence philosophy will mean that each time a new fade starts, the channels under Move control will be 'stolen' by the fade system.

Move mode is selected by pressing the MOVE button above the Channel Control keypad; the associated indicator lights and the previous selection is cancelled. If a memory number is now entered, the corresponding memory may be introduced as a Move-fade by moving the fader wheel upwards. Both up and down parts of the fade occur simultaneously and, once the channels concerned have reached their recorded levels, further forward movement of the wheel has no effect. The fade may be reversed by moving the wheel towards the operator until the starting levels are restored or, for a rapid return to the original state, the RETURN button may be used. The progress of the fade is shown as a percentage in the LEVEL display window.

As an alternative to using the fader wheel, the '@' key may be used in conjunction with the keypad. The 'level' entered is interpreted as the percentage of the fade which is to be carried out and the channels are set immediately to the levels that they would reach by fading. For example, MOVE, 10, '@', 5 would switch channels from their current levels to the levels they would reach half-way (50%) through a Move-fade to memory 10.

Only Move-fades may be carried out in this way, entering the memory number without a prefix having the same effect as using a '+' prefix. The '-' prefix, however, will still produce a Dim-fade, the channels on in the memory fading out as the wheel is moved upwards.

As on the Memory Control keypad, memories may be combined in Move mode before being introduced; see section 4.5.2.3. Note, however, that once a fade has been carried out, the keypad will automatically revert to channel selection mode on entry of the next number; each memory or group selection must therefore be preceded by operation of the MOVE button, as follows:

- 1) Press the MOVE button.
- 2) Select the first memory on the channel keypad.
- 3) Press the '+' button.



- 4) Press the MOVE button.
- 5) Select the second memory.
- 6) Continue until the required combination is obtained.

As on the Memory Control keypad, the THRU key may not be used to select a contiguous sequence of memory numbers for recall; the system alarm will sound if this is attempted.

Note: If additional channels or groups are added to a combination prepared using Move mode as above, the whole selection becomes a group and the fade changes from a 'Move' to a 'Group' or 'Shift' fade. This is because there are no recorded destinations for the additional channels.

## 4.8 THE SUB-MASTERS PANEL

### 4.8.1 General

This section of the control panel comprises eight Sub-master faders, each of which has an associated Memory Recall button (↓MEM). At the top of the panel is a row of eight buttons (each with an associated indicator) labelled A, B, C, etc. which are used to select the required Sub-master when using the Channel Control in SUB (Sub-master) mode, or when recording lighting states using the REC SUB button. Above the latter buttons is a display window which shows the number of the memory (if any) last recalled to the selected Sub-master store.

The eight Sub-master stores are totally independent of each other. Each may hold a complete lighting scene, which may include channels set at different levels in other Sub-master stores or at the output. The outputs of the eight Sub-master stores combine on a highest-takes-precedence basis, and the combined output may be controlled using the Master fader labelled A-H.

### 4.8.2 Setting-up lighting using the Sub-masters

Lighting may be set up either 'blind' or 'live' in any one of the eight Sub-master stores, using the Channel Control set to SUB. The Sub-master store required is selected by means of the selection buttons (A, B, C, etc.) and the setting of the appropriate master fader determines the blind/live state (Note that the A-H Fader must be above zero when working live). Channels selected and adjusted on the Channel Control will immediately be set in the appropriate Sub-master store and the indicator adjacent to the Memory Recall (↓MEM) button will light to show that the Sub-master is in use. Adjusting the Sub-master fader will then vary proportionally the levels of all the channels set in the corresponding Sub-master store.

The lighting controlled by any of the Sub-masters may be recorded independently of any other lighting by means of the REC SUB button. The required memory is selected on the MEMORY CONTROL keypad, and the Sub-master store by means of selection buttons A to H. Note that the channel levels recorded will be those in the Sub-master store. No account will be taken of any master fader settings.

#### 4.8.3 Recalling Memories to the Sub-masters

A memory may be recalled to a Sub-master at any time by selecting the required memory on the MEMORY CONTROL keypad and pressing the appropriate Memory Recall (↓MEM) button. Unless the number is prefixed by '+' or '-', the previous lighting in the store will be completely replaced with the new. The corresponding Sub-master selection indicator need not be illuminated. If the memory number selected is prefixed by '+' or '-', the new memory will combine with that already present in the Sub-master store as described in Section 4.4.2.

The number of the last memory recalled to the selected Sub-master store (prefixed by '+' or '-' if appropriate) is displayed in the window at the top of the Sub-masters section of the control panel.

##### 4.8.3.1 Gang-loading the Sub-masters

This facility allows a number of Sub-masters to be simultaneously loaded, each with a different memory from a range selected on the memory keypad. Only memories which exist will be used.

The facility is best understood by means of an example. Memories 12, 13.5, 14 and 16 have been recorded and these are to be loaded onto Sub-masters D to G. First select memories 12 'THRU' 16 on the memory keypad and then press the Sub-master D '↓MEM' button. The memories will be simultaneously loaded, 12 onto Sub-master D, 13.5 onto E, 14 onto F and 16 onto G. The first memory in the range is always loaded onto the Sub-master whose '↓MEM' button is operated and the memories are assigned in numeric order.

If required, the range of memories may be left open ended. For example, 1 THRU ↓MEM(A) will assign each of the first eight memories to a Sub-master. The masters to the left of that on which the '↓MEM' button is operated will remain unaffected.

Selecting CLEAR, THRU on the memory keypad allows the Sub-masters to be simultaneously cleared.

Note: Although, in general, memories may be combined before recall by using the '+' and '-' keys on the memory keypad, this is not possible when gang-loading the Submasters. If simultaneous entry of both a memory combination and a range



of memories is attempted on the memory keypad, the error alarm will sound.

#### 4.8.4 Sub-master Mimic Display

The contents of any of the Sub-master stores may be displayed on the VDU by holding down the appropriate Sub-master selection button. The contents of the selected Sub-master store will also be shown when using the Channel Control in Sub-master mode. The channel levels shown will be those in the appropriate store, with no account taken of master fader level, etc.

#### 4.8.5 Common Channels

If the same channel is On in one or more Sub-master stores, the level which appears at the system output will be that produced by the highest combination of channel and fader level, i.e. the level is subject to a 'Highest-takes-precedence' rule. For example, if channel 15 is at full in Sub-master A and at 50% in Sub-master B, and both faders are fully raised, the output level of that channel will be Full. If fader A is now lowered, the channel will dim until 50% is reached, when the level produced by Sub-master B becomes the higher. To reduce the level further, both faders must be lowered.

The combined outputs of the Sub-masters and the main system output are also subject to the 'Highest takes Precedence' rule.

#### 4.8.6 The A-H Master Fader

The combined output of the eight Sub-masters may be reduced proportionally to zero by means of the A-H Master fader to the right of the Sub-master faders.

#### 4.8.7 Using the Sub-master Faders in Inhibit Mode

If required, individual Sub-masters may be set into Inhibit mode. They can then be used to proportionally reduce the output levels of selected channels, the channels concerned being selected by setting them On in the appropriate Sub-master store. Any number of channels may be inhibited in this way by a single Sub-master fader.

A Sub-master is set into Inhibit mode by holding down the INH (Inhibit) button to the right of the faders and then operating the '↓MEM' button above the required Sub-master fader; the appropriate Inhibit indicator (above the '↓MEM' button) lights to show that the Sub-master is in Inhibit mode. Inhibit mode is cancelled by repeating the above actions.

The Sub-master inhibit facility does not simply reduce the maximum levels of the channels concerned, but actually reduces the levels in proportion. For example, if a channel set to 50% is also On in a Sub-master store working in Inhibit mode, and the Sub-master fader is set to 50%, the resulting channel output will be 25%. If the Sub-master concerned is at Full, it will have no effect.

If the same channel is assigned to more than one Sub-master working in Inhibit mode, the lowest of the Sub-masters will take precedence.

#### 4.9 VIDEO MIMIC

##### 4.9.1 General

The Video Mimic is normally used to display the combined outputs of the Gemini system and the Manual Fader Wing (if provided - see section 1.1) showing the channels which are On, together with their levels. It may, however, be switched to display the lighting set in any Sub-master store or recorded in a memory. In addition, it may display a list of memories, the Channel-to-dimmer patch or the set-up information for the Effects panel.

##### 4.9.2 Screen Format

The screen is divided into two sections, the top part normally displaying the channels controlled by the system, while the bottom part shows system status information such as fades in progress, selected memory, etc.

The top line of the screen is used to show headings and details of the system's memory:

Line 1 Example:

PAGE 1 OF 1	OUTPUT	LAST REC 238.5	MEM USED 33%
Page of display (used on Patch and Memory List)	Title of display	Last memory recorded (Blank if memory locked)	Running tally of memory currently recorded

The bottom part of the screen is divided into five sections: 'SUBMASTERS', 'MEMORY', 'GREEN PLAYBACK', 'RED PLAYBACK' and 'CHANNEL'. This status information remains unchanged as the various alternative displays are selected.



#### 4.9.3 Sub-masters Status Display

Under the heading 'SUBMASTERS' is shown the number of the last memory recalled to each of the eight Sub-masters. Sub-masters which are operating in Inhibit mode (see section 4.7.7) are highlighted in inverse video.

Example:

```

---SUBMASTERS---
A+184.6 E 230
B      F
C+   .7 G   6
D      H   3.5

```

The bottom line of the 'SUBMASTERS' display gives details of the current Effect.

#### 4.9.4 Memory Control Status Display

Under the heading 'MEMORY' are displayed the currently selected memory, the fade times and Wait time (if any) recorded with that memory and the memory to which the selected memory is linked, if any. For example:

```

-MEMORY-
MF+ 73.9
UP  4:15
DN  3:45
WT  :10
LK 102

```

The 'UP', 'DN', 'WT' and 'LK' displays do not appear if there is no memory selected, 'WT' appears only if the selected memory has a Wait time, and 'LK' appears only if the selected memory has a link recorded.

Note: When a range of memories is selected (e.g. for recall to the Sub-masters or for copying to or from disc) the memories concerned are shown as follows:

```

-MEMORY-
>100

```

#### 4.9.5 Playbacks Status Display

Below each of the headings 'GREEN PLAYBACK' and 'RED PLAYBACK' in the bottom half of the screen are two sub-headings, 'UP' and 'DOWN',

and below these, up to three lines of information about fades which are in progress.

When the system is first switched on, or following the recall of memory 0 directly to the output (using the 'MEM' button above the 'Σ' master fader), only the settings of the corresponding Fade Duration controls are shown. When a fade is started on the associated Playback, the following information appears: type of fade ('M' equals Move-fade, 'D' equals Dim-fade and 'X' equals Crossfade); active memory at start of fade; up-fade time ('minutes'.'seconds'); up-fade progress; down-fade progress; and down-fade time. For example:

```

-----GREEN PLAYBACK-----
              ----UP---- -DOWN--
+130      .30  1 1      .30
- 27      .20  7 8      .15
   5      2.55  6 5      3.20

```

Each time a new fade is started, the appropriate status information appears on the top line and the details of any other fades which are running move down to make room. If the new fade is a Crossfade, all other fades will stop (see section 4.6.2.1) and their details will be removed from the display. Similarly, as each fade completes, it is removed leaving a blank line. The latest fade, however, remains on the screen.

If either Fade Duration control is at '∞', the appropriate fade time is shown as '\*\*.\*\*'. If the fade is completely stopped (i.e. both controls are at '∞') and another fade is started, the fade which was stopped disappears from the display, as it cannot now be restarted.

The bottom line of the Playback status display only appears if Sequence is selected. It will then normally show the fade type, number and recorded fade times for the memory which will be recalled when the appropriate FADE button is next operated. If, however, USE TIME is also selected and the memory concerned has a recorded Wait time, this line changes to show the fade type and memory number, followed by a countdown of the remaining Wait time. For example:

```

M235.8      WAIT  10:29

```



iii) Set the Fade Duration controls on one of the two Playbacks to the required fade time (instant to 20 minutes). Alternatively, select USE TIME (the indicator above the button will light).

iv) On cue, press the appropriate FADE button to start the fade.

A crossfade will be carried out automatically in the time set on the Fade Duration controls or, if USE TIME is selected, that recalled with the memory. The fade rate may be adjusted at any time, although if USE TIME is in use this must first be deselected. In the latter case, to avoid a sudden change of speed, the Fade Duration controls should first be matched to the active fade rate by means of the appropriate part of the Video Mimic display.

Once a fade has been started, the next memory number may be selected, ready for recall. Alternatively, to eliminate unnecessary button operations, a sequence mode may be selected. When either SEQ button is pressed, the associated lights and the next memory in numeric sequence will then be automatically selected each time a fade is started on the corresponding Playback.

Two types of fade are possible: a Crossfade, in which the state recalled from the memory totally replaces the old lighting state, and a Move-fade, in which the channels which are On in the memory change to new levels, but those which are Off in the memory remain unaffected. A Move-fade is selected by prefixing the memory number with '+' on selection. If there is no prefix, a Crossfade results. (A '-' prefix gives a special type of Move-fade - a Dim-fade - where the channels On in the memory fade to zero.)

A blackout state may be obtained by performing a fade action with no memory selected.

### 3.6 'BLIND' PLOTTING AND MODIFICATION

Should it be necessary to set-up or modify a memory without the lighting being seen, the Channel Control should be routed to Sub-masters by pressing the SUB button. Any channels now modified by the Channel Control will now be set On in the selected Sub-master store (shown by the corresponding indicator at the top of the SUB-MASTERS section of the control panel).

The modified lighting state in the selected Sub-master store may be recorded by selecting the memory number in the usual way, but pressing the REC SUB button rather than 'REC  $\Sigma$ '.

#### 4.9.5.1 Manual Fades

If a fade is under Manual control, both fade times appear as '<MAN>'. As in the case of fades which are stopped, if another fade is started, a Manual fade will disappear from the display, as control of this fade is no longer possible.

#### 4.9.5.2 Fading Combined Memories

When fading single memories, the prefix (or the lack of a prefix) in the keypad window determines the 'type of fade' display (i.e. 'X', 'M' or 'D') and the active memory number appears without a prefix. If memories are combined before fading, however, the 'type of fade' is determined by the prefix to the first number selected and the active memory number is that which was shown in the keypad window at the moment the fade was started; no prefix is shown, however.

#### 4.9.6 Channel Control Status Display

Under the heading 'CHANNEL' are displayed the store to which the Channel Control is routed (e.g. 'OUTPUT', 'SUB A', etc.); the number and level of the last channel controlled; the numbers of the last two channels controlled before that; and a display giving the current setting of the channel control wheel. For example:

```

---CHANNEL---
  OUTPUT
    + 43 @ 90
    > 27
    15
<WHEEL> @+50%

```

The symbol '>' indicates THRU and the above display therefore shows that channels '15 THRU 27 + 43' were selected as a group. Their levels were then increased by 50% so that the current level of channel 43 is 90% of full.

As each new channel selection is made, the number is added at the top of the list and those already displayed move down to make room. When numbers are being entered, the top line duplicates the information in the keypad display window (including any prefix).

When the level of the selected channel is adjusted using the wheel, the '<WHEEL>' display shows the extent of the change (as a percentage of full level) and the line below the heading shows the absolute level of the last selected channel.

When the '@' button is used to change the channel level, the '<WHEEL>' display will show the extent of the change only if the '+'



and '-' are used to prefix the level entry (see section 4.2.3). If several adjustments are made, using both the '@' button in conjunction with the '+' and '-' keys and the fader wheel, the '<WHEEL>' display shows the combined result of all the changes. If, however, an absolute level is entered using the '@' button, the '<WHEEL>' display is set directly to the level entered.

Only the line below the heading is affected when channel levels are adjusted. The remaining channel lines show only the channel number.

When memorised groups of channels are selected, the memory number is shown with the prefix 'G', preceded by '+' or '-' if appropriate. As there is no single channel selected for which an absolute level can be shown, the level display shows the percentage change. For example:

+G184.3 @+30%

If memories are recalled using channel controller Move mode the memory number is given the prefix 'M' (preceded by '+' or '-' if appropriate). The proportion of the fade which has been carried out is shown beside the memory number, and the extent of the last change on the '<WHEEL>' display. For example, if memory 85.7 is added to the current lighting as a Move-fade and 53% of the fade is performed using the wheel, followed by a further 20% using the '@' button, the display will appear as follows:

---CHANNEL---  
OUTPUT  
+M 85.7 @ 73

<WHEEL> @+20%

#### 4.9.7 Output and Sub-master Displays

These two displays are each selected automatically when the corresponding Channel Control keypad mode is selected. In both cases, the top section of the screen shows, in tabular format, up to 180 of the channels controlled by the system. For example, channels 1 to 3 appear as follows:

001:45 002:80 003:60

The levels are shown as a percentage of full as in the LEVEL window on the desk, with full level appearing as 'F'. Any channel being modified in the selected store by the Channel Control has its number and level shown in reverse video, while any channel which has been modified since the CLEAR key was last operated has the colon between the number and level in reverse video. Channels which are at zero

and not currently being modified appear at reduced brightness with no level shown.

In the case of the Sub-master display the screen shows the contents of the selected Sub-master store.

#### 4.9.8 Memory List

The Memory List display is selected by operating the 'MEM LIST' button above the CHANNEL CONTROL keypad. Note that this does not affect the current Channel Control mode, the appropriate indicator remaining illuminated, and that the Output or Preset display may be reselected by operating the corresponding selection button.

The Memory List display gives a table, in numerically ascending order, of the memories, that have been recorded. One line is allocated per memory, and this includes recorded Fade times, Wait times and Links. In addition, the numbers of any effects which start or stop on recall of the memory concerned.

Note: Only one effect number is shown under 'START EFFECT' and one under 'STOP EFFECT'. If several effects are started or stopped by recalling the memory, only the first (in numerical order) is shown, a plus sign ('+') following the number indicating that this is not the only effect concerned.

The Memory keypad is used to set the first number to be listed and all subsequent recorded memories are then displayed. Further pages of the list may be viewed by pressing the PAGE button.

Example:

PAGE 1		MEM LIST			LAST REC 32	MEM USED 39%	
MEMORY		UP TIME	DN TIME	LINK	WAIT	START EFFECT	STOP EFFECT
1	XF	08.50	06.30				
1.5	MF	10.00	10.00		01.15.0		
2	XF	00.10	00.10		10.30.0	01+	
3	DF	00.03	00.05	113	00.05.7		01+
4	MF	01.30	02.00		03.50.0		
5	XF	00.30	00.70				

etc.....

Following the list of memories is a list of Effects. As in the case of memories, one line is allocated per effect, and this includes additional information: Effect Type, Step Type, Next Effect number (link), Start Memory and Stop Memory.



Example:

EFFECT	TYPE	STEP	LINK	START MEM	STOP MEM
1	CHASE	AUTOMATIC		2	3
2	FLASH	BEAT	4	11	12
3	LIGHTNING	MANUAL		11	13
4	FLASH	BEAT			13

etc.....

#### 4.9.9 Patch Display

This display is described in section 4.3.

#### 4.9.10 Page

The 'PATCH' and 'MEMORY LIST' displays will often include more information than can be shown on the Video Mimic screen. The display will then be split into 'pages' which may be viewed by operating the PAGE button. Pressing the button steps the display to the next page, returning to page 1 after the last page.

#### 4.10 FLOPPY-DISC UNIT

This unit may be provided to allow the data recorded in the system memory to be transferred to a removable 3.5" micro-floppy disc for library storage. The discs may subsequently be reloaded and the data transferred back to the Gemini Memory.

##### 4.10.1 Discs

##### 4.10.1.1 Disc Specification

SHUGART SA130 SINGLE DENSITY DISKETTE SINGLE SIDED 3.5 INCH SOFT  
SECTORED

NOTE: Only the above discs, or a Strand Lighting approved equivalent should be used, as inferior discs may cause excessive wear of the drive mechanism and heads.

##### 4.10.1.2 Disc Care

The discs recommended are of the highest quality. However, due to the delicate nature of this medium, care is necessary to ensure that they are not damaged when handling. To guard against premature disc

failure and excessive disc errors, the following precautions should be taken:

- i) Return the disc to storage immediately it is removed from the drive mechanism.
- ii) Do not lay discs horizontally or stand things on them.
- iii) Keep discs away from food, liquids, grime or cigarette smoke.
- iv) Do not expose discs to strong magnetic fields, e.g. by laying them on top of a loud-speaker, or a T.V. monitor or VDU.
- v) Do not subject discs to heat or direct sunlight.
- vi) If the information stored on the disc is particularly valuable, or the disc likely to be heavily used, record a second copy as a back-up.
- vii) Ensure that discs, once recorded, have the write protect tab set to the Safe position, i.e. with the small window in the corner of the disc pack open. This will prevent the recorded memories being overwritten.
- viii) Ensure that the drive mechanism is regularly maintained, and is not subjected to excessive dirt.
- ix) Never touch the disc surface, or attempt to open a disc.

#### 4.10.1.3 Loading a Disc

Discs must be loaded into the drive mechanism with the identifying label facing away from the ejection button and with the metal cover entering first; the disc latches into place. The disc transfer may now be actioned.

The disc should never be ejected while the disc is being accessed, as this may cause disc damage or data corruption. A red indicator on the Disc Unit lights to show that it is in use.

#### 4.10.2 Disc Operations

Disc operations are controlled by the MEM-DISC and DISC-MEM buttons above the MEMORY CONTROL keypad. These functions are clearing and initialising a disc, and transferring some or all of the memories from system memory to disc or from disc to system memory.

The disc unit checks the validity of the data it reads, and attempts to correct any errors it locates. If the problems cannot be overcome, error messages are displayed on the VDU.



#### 4.10.2.1 Disc Clear and Initialisation

Before a new disc may be used to store memories, it must first be erased and formatted. The write protect on the disc should be set to the Write position; then load the disc into the drive and insert a key (TOK 4) into the Record Lock keyswitch. Turn the key clockwise against the spring to the CLEAR position and then press the MEM-DISC button. The MEM-DISC indicator and the indicator on the Disc Unit light to show that the disc initialisation is in progress.

Discs which have been previously recorded may be erased in exactly the same manner. It is only possible to completely re-initialise a disc - memories cannot be selectively erased; care must therefore be taken to ensure that none of the recorded data is still required. Data cannot be retrieved once the initialisation sequence has commenced.

A disc which has its Write Protect tab in the Safe position, i.e. with the small window in the corner of the disc pack open, cannot be cleared, and a 'DISC SAFE' error message will be given on the VDU.

If the indicator on the Disc Unit flashes during the initialisation process, this indicates a faulty disc which should not be used.

#### 4.10.2.2 Copying Memories from Memory to Disc

Any memory or range of memories may be copied onto disc, and if required, this may include the Channel-to-dimmer Patch information. The procedure for copying memories from the system memory onto disc is as follows:

- 1) Insert a disc into the drive. Ensure that the disc has been initialised and that the Write Protect tab is in the Write position.
- 2) Select the memory number or, using the THRU button, the range of numbers on the MEMORY CONTROL keypad. If memory 0 is included, the Channel-to-dimmer Patch information will be copied in addition to the memories.
- 3) Press the MEM-DISC (Memory to Disc) button to initiate the disc action. The associated indicator and that on the Disc Unit illuminate to show that the disc action is taking place.

A second operation of the MEM-DISC button, while the adjacent indicator is illuminated, will cause the disc action to terminate once the current memory has been copied.

Any state read from the memory will over-write the state which has the same number on the disc. If a range of memories is being copied, only those cues which exist in the memory will be over-written on the disc; cues which are recorded on the disc, but not in the memory will not be erased during the disc action. If no cues in the defined range are found in the memory, an error message is given on the Video mimic.

Note: A lighting plot saved on disc will normally be recalled in its entirety for modification, the revised version of the complete plot being saved on disc again. If the same disc is to be used to store the revised version, the disc concerned should be re-initialised before re-saving. If this is not done, any memories which have been deleted will remain on the disc and could be recalled in error when the plot is next used.

It should be noted that the time taken for the memory to disc action is rather longer than the time to transfer from disc to memory, as each memory is checked for errors after writing.

#### 4.10.2.3 Copying Memories from Disc to Memory

The procedure for copying of memories from disc to memory is similar to that for memory to disc, the DISC-MEM button being used to initiate the disc action. Note, however, that the Memory Lock keyswitch must be in the OPEN position for the action to take place.

Any memory read from the disc will over-write the cue which has the same number in the Gemini memory. If a range of memories is being copied, only those cues which exist on the disc will be over-written in the memory; cues which are recorded in the memory but not on the disc will not be erased during the disc action. If no memories in the defined range are found on the disc, an error message is given on the Video mimic.

As in the case of Memory to Disc, a second operation of the DISC-MEM button while the adjacent indicator is illuminated will cause the disc action to terminate once the current memory has been copied.

As the memories are written into the Gemini memory, the 'LAST REC' number on the top line of the Video mimic display is updated, showing the last memory to be recorded.

#### 4.10.2.4 Saving Special Effects on Floppy Disc

Special Effects prepared on the optional Programmable Effects Panel also may be copied to and from disc. The appropriate procedures are described in Chapter 6.



#### 4.11 PRINT

If required, a printer may be connected to the Gemini desk to provide the operator or lighting designer with a paper record of the lighting states which have been recorded; of the Channel-to-dimmer Patch; or of the special effects prepared on the Programmable Effects Panel (if fitted).

##### 4.11.1 Preliminary

Before starting to print, the following should be checked:

- 1) Ensure that the Printer has power available and that it is connected to the Gemini desk.
- 2) Check that there is sufficient paper.
- 3) Switch the Printer on and check that the POWER indicator illuminates.
- 4) Ensure that the paper 'top-of-form' is correctly adjusted. If this is not done, the Printer may print across the perforated folds in the paper.

The correct setting is with one of these perforated folds just above the print head. If the setting is incorrect, the paper may be advanced one line at a time by pressing the LINE FEED button; the printer must be set Off Line for this to be done. Operating the FORM FEED button will cause the paper will feed continuously until the current Top-of-Form is reached. When the paper is correctly adjusted switch the printer Off and then On again.

- 5) Check that the ON LINE indicator is illuminated. If not press the adjacent ON LINE button.

Further details regarding the above may be found, together with instructions on how to insert paper, change the ribbon, etc., in the handbook supplied by the Printer manufacturer.

##### 4.11.2 Printing Memories

Memories are printed by entering a single number or a range of numbers (using the THRU button) on the MEMORY CONTROL keypad and then pressing PRNT (Print). The indicator adjacent to the PRNT button illuminates while the print action is in progress.

The printout starts with a list of the memories in the same format as on the 'MEMORY LIST' mimic display, i.e. including fade type, Fade and Wait times and Link. This is followed by the memories

themselves, again in the same format as on the Video Mimic. Each memory starts on a fresh sheet of paper.

#### 4.11.3 Printing the Channel-to-dimmer Patch

If memory number 0 is entered, or if memory 0 is included in a range of memories, the Channel-to-dimmer patch will be printed.

#### 4.11.4 Printing the Special Effects

This is described in Chapter 6 - Programmable Effects Panel.

#### 4.11.5 Stopping the Printer

A Print action may be stopped by operating the PRNT button a second time; i.e. while the associated indicator is illuminated. The Print action will not stop immediately, because the system works by filling a buffer store in the Printer which then prints the stored information automatically. Only when all the buffer store contents have been printed will the Print action end.

Once it has been stopped, the Print action cannot be restarted without reselecting the Print facilities required.



1. The first part of the report is a summary of the work done during the last year.

2. The second part is a detailed account of the work done during the last year.

3. The third part is a summary of the work done during the last year.

4. The fourth part is a summary of the work done during the last year.

5. The fifth part is a summary of the work done during the last year.

6. The sixth part is a summary of the work done during the last year.

7. The seventh part is a summary of the work done during the last year.

## CHAPTER 5

### MEMORY BACK-UP SYSTEM

#### 5.1 INTRODUCTION

The Gemini Memory Back-up system is designed to provide simple control facilities which permit continued operation in the unlikely event of failure of the main console. It operates in a similar way to the pin matrix hitherto provided as a back-up to larger memory systems, but features ten 'presets', each consisting of eight electronic on/off memories (R - Z). Eight 'Patch' master faders are provided, one for each of the eight memories in the selected Preset.

The system can control up to 384 dimmers and these are assigned to the faders as required, using a keypad and an on/off button; alternatively, the current lighting state may be 'copied' onto the selected fader, dimmers above 10% intensity being set On and the remainder Off. The memories will retain their contents for at least a week if the equipment is not used.

**WARNING:** When the Back-up system is in use, the Gemini Channel-to-dimmer patch is NOT taken into account. For this reason, lighting channels are referred to as 'Dimmers' throughout this chapter.

#### 5.2 OPERATION

##### 5.2.1 Switching the System On

The Back-up system does not have an On/Off switch and comes into operation as soon as power is applied; it will not however be able to control lighting unless the latching BACK-UP button is illuminated. When the Back-up system is selected it has complete control of the lighting, the multiplexed output from Gemini being disconnected.

On power-up, the keypad will be cleared and the Preset which was selected on power-down will be automatically re-selected, together with Patch Master R. Otherwise the initial state will depend on the settings of the controls. The message 'POWER-UP OK' will pass across the DIMMER display window to show that the equipment is functioning correctly; this message may be cleared by pressing any key on the keypad, with the exception of '0/1', '>' and '+'. Error messages are also possible - see section 5.3.



### 5.2.2 Preset Selection

The required Preset is selected by means of the PRESET button to the right of the DIMMER display. The first operation of this button displays the number of the currently selected Preset; the number of the Preset required (1-10) may then be entered and the selection changed by pressing PRESET a second time. If PRESET is pressed a second time without entering a new number, the Preset selection will remain unchanged.

If the Back-up system is actually controlling dimmers when the second operation of the PRESET button takes place, the dimmer levels will normally change immediately to those in the newly selected preset, taking into account the settings of the Patch Master faders. If continuity of lighting is required, the lighting assigned to one or more Patch masters may be retained by holding the corresponding SELECT buttons down while the PRESET button is operated the second time. This is best illustrated by a practical example:

The current lighting is under the control of Patch masters Y and Z, master R to X being set to zero. The next scene is to be lit by masters R and S, using the lighting stored in Preset 4, and a slow fade to the new lighting is required. First the PRESET button is operated and Preset 4 is selected; then the SELECT buttons above masters Y and Z are pressed and, without releasing them, PRESET is operated a second time. Masters R to X have now been loaded with the corresponding lighting from Preset 4, but Y and Z are unchanged. Y and Z may now be faded down and R and S up to perform the slow fade. When the change is complete, pressing PRESET twice will reload all the Patch masters, including Y and Z, but as R to X have already been loaded and Y and Z are now at zero, there will be no visible change.

### 5.2.3 Patch Masters

Each master fader has overall proportional control of a patch memory in which dimmers may be set either On at full or Off.

Dimmers may be assigned to the master faders by means of the keypad to the right of the faders. The required master must first be selected by pressing the corresponding SELECT button in the row at the top of the panel; the associated indicator lights to show the current selection. Only one can be selected at a time.

Dimmer numbers are called-up using the numeric keys on the keypad in the same way as on a calculator and the digits entered appear in the DIMMER display window above the keypad. It is not possible to enter numbers greater than 180, all but the last digit being ignored if this occurs. The dimmer selection may be cleared by pressing the 'CL' key.

Once a dimmer has been selected, it may be set On or Off in the selected patch memory by operating the '0/1' key; the indicator (ON) beside the DIMMER window lights if the dimmer is On. The '0/1' key has an alternate, 'toggle' action, each operation setting the selected dimmer On if it is currently Off, or Off if it is On.

Dimmers may also be selected by pressing the '+1' and NEXT ON keys. The '+1' key selects the next dimmer in numeric sequence; note that if the DIMMER window is blank this will be dimmer 1. The NEXT ON key finds the next dimmer which is assigned to the selected master; this is most useful for checking which dimmers are assigned to each master.

#### 5.2.4 Selection of Groups of Dimmers

Several dimmers may be selected at once by using the '+' (Plus) and '>' (Thru) keys. For example, to assign dimmers 5 and 17 to fader T, first press SELECT button T and then enter 5, '+', 17 on the keypad, followed by '0/1'. Similarly, 9, '+', 21, '+', 45 will allow dimmers 9, 21 and 45 to be set On or Off in the selected patch memory. Note that the ON indicator shows the current state, in the selected memory, of the last dimmer entered. When the '0/1' key is operated, all of the selected dimmers, whatever their previous state, will be set to the same state, i.e. the new state of the dimmer whose number is shown in the DIMMER window.

A range of dimmers may also be selected. For example, to select dimmers 20 to 30 inclusive, enter 20, '>' (Thru), 30.

#### 5.2.5 Load Output

Dimmers may also be assigned to the selected fader by using the LOAD button beside the DIMMER display window. When this button is operated, the Gemini system output, including the contribution of a Manual Fader Wing if this is provided, (i.e. the state shown on the 'OUTPUT' display on the Gemini Video Mimic), is 'copied' onto the selected fader, with dimmers above 10% level being set On and the remainder Off. The dimmers already assigned to the selected fader will be over-written.

Note that because the dimmers allocated to a Patch Master may only be On at full or Off, a lighting scene copied to the Back-up System using LOAD will not normally be identical to the corresponding scene on Gemini. However, a compromise can usually be produced by allocating the various dimmers to different Patch Masters and setting these to appropriate levels.



### 5.2.5.1 Blind Record

The LOAD button can also be used while the Back-up system is in use, for recording 'blind', into a Preset which is not currently selected. Press the PRESET button once, select the required Preset and then operate LOAD; the On/Off states of the dimmers contributing to the current lighting scene will be copied into the currently selected Patch memory in this Preset, without disturbing the current lighting. To return to normal control press the CL button on the keypad and then operate the PRESET button a second time.

## 5.3 ERROR MESSAGES

Two error messages are possible on power-up, replacing the 'POWER-UP OK' message which normally appears in the DIMMER display window. These messages are as follows:

**DATA FAIL** - An error has been found in the memory. This will normally occur if the equipment has not been used for over a week; the memories may be corrupted, but the system is otherwise fully functional. If, however, this message appears when the system is in regular use, notify your local Strand Lighting service agent.

The message may be cleared by pressing any key on the keypad, with the exception of '0/1', '>' and '+'; it will, however, reappear when the system is next used unless the memory has changed.

**PROM FAIL** - An error has been found in the microprocessor program; notify your local Strand Lighting service agent.

## CHAPTER 6

### PROGRAMMABLE EFFECTS PANEL

#### 6.1 INTRODUCTION

The Gemini Programmable Effects Panel allows the operator to set-up and control complex automatic lighting effects. It may be set-up to control both individual channels and, in conjunction with the Sub-master stores, complete memories. An effect may be one of several types (e.g. Chase, Flash, Sound-to-light, Lightning, Pseudo-random Flash) and may include instructions to load new memories into the Sub-masters or to synchronise the effect with the start of a fade on a Playback. Each effect may be executed a specific number of times, may be set to run for a defined time, or may continue until stopped, either manually or by the start of a fade on a Playback. Up to 99 separate effects may be recorded and up to ten different effects may be performed simultaneously.

##### 6.1.1 Controls

The effects controls comprise a keypad and display for the selection of effect numbers, lighting channels, etc.; four cursor control keys; eight keys (A-H) corresponding to the eight Sub-master faders; manual Chase and Flash controls; and Audio (Sound-to-light) controls. The output of the effects system is under the overall control of a MASTER fader and effects may be started and stopped using GO and STOP buttons. An ENABLE switch allows the A-H buttons to be used for manually controlled flash effects.

Once running an effect may be speeded-up or slowed-down by a RATE control, and a SEQ (Sequence) button allows the next effect to be preselected automatically.

The Effects panel operates in two modes, normal and Set-up, controlled by the SET-UP button at the top right of the panel. When in normal mode, effects may be selected on the keypad, and started and stopped as required. When in Set-up mode, the VDU display changes to allow the entry of effects information which is then stored in one of 99 Effects memories.



### 6.1.2 EFFECTS SET UP Display

Pressing the SET UP EFFECT button changes the Video Mimic display to the following:

#### EFFECTS SET UP

FUNCTION - EFFECT      EDIT

EFFECT NO.

SOURCE EFFECT NO.

This display permits the selection of the principal Effects Set-up options, i.e. the Effects Editor, Print Effects, Effects to Disc, Effects from Disc (to memory) and Delete Effects. The Effect numbers displayed will always initially be the same as that shown in the Effects keypad display window.

### 6.1.3 Principle of Operation

In order to use the various Effects Set-up facilities, the operator enters information into 'fields' on the Video Mimic display. These fields are of two types: those which have preset options (referred to in this description as Option Fields); and those which are intended for the entry of times, memory numbers, etc. (Data Fields).

The various fields are selected by moving a 'cursor' around the screen, using the four cursor control keys ('^', 'v', '<' and '>') to the right of the Effects keypad. The selected field is indicated by being displayed in inverse video and, where appropriate (i.e. in Data Fields), the position of the cursor within the field is shown by a coloured block. Information entered into or changed within a field does not take effect until the cursor leaves that field; this is particularly important, as changing certain fields will delete or reset others.

The options available within each Option Field are selected by means of the 'SEL' (Select) key on the Effects keypad. An Option Field always displays one of its available options and pressing 'SEL' will step through these, returning eventually to that initially shown; it is not possible to select an invalid option. If the SEL key is operated while a Data Field is selected, the system alarm will sound.

Information is entered into Data Fields by using the Effects keypad and the A to H keys. Only valid data can be entered, the system alarm sounding either if an invalid entry is attempted or on

attempting to leave the field, depending on the nature of the error. Existing data can be changed by overtyping, or cleared by operating the 'CL' key; the '<' and '>' keys allow the operator to move the cursor within the field.

#### 6.1.4 Entering Times

Some Data Fields require the entry of time; this is done in a similar way to Wait times on the main Control Console. Any time between 0 and 59 minutes 59 seconds may be entered, as follows:

- i) Times up to 100 seconds may be entered as two digits; e.g. for a time of 45 seconds enter '4', '5'. On leaving the Data Field, this will be automatically converted to minutes and seconds if appropriate. If tenths of seconds are required, these must be separated from the seconds by a decimal point; e.g. for a time of 5.7 seconds enter '5', '.' (point), '7'.
- ii) Times longer than 1 minute may be entered as three or four digits; e.g. for time of 5 minutes 30 seconds enter '5', '3', '0'. If the number of seconds is greater than 59, these will be converted to minutes and seconds as before. As in the case of seconds, tenths of seconds may be entered following a decimal point.

If a time greater than 59 minutes 99 seconds is entered the message 'FIELD ERROR' will appear at the bottom of the Effects display (on the same line as the 'COMMAND' field) and the system alarm will sound. Times between 59 minutes 59 seconds and 59 minutes 99 seconds will be automatically reduced to 59 minutes 59 seconds.

#### 6.2 SETTING-UP OR EDITING AN EFFECT

The Effects Editor is selected by operating the SET UP EFFECT button and then selecting the EDIT option in the 'FUNCTION - EFFECT' Option Field. As this option is always pre-selected on entry it is normally only necessary to operate the 'v' button (to the right of the keypad) to make the selection.

Note: Effects can only be Set-up or Edited if the Memory Lock keyswitch is in the OPEN position. If it is not, they can only be previewed (see section 6.3.5).

As mentioned in section 6.1.2, the numbers in the 'EFFECT NO.' and 'SOURCE EFFECT NO.' Data Fields will initially be that shown in the Effects keypad display window. These may be changed if required, as follows:



- i) Change only the Effect number (or leave it unchanged).

The new number will be copied to the Source Effect number on exit from the field. This permits an existing effect to be modified or used as a basis for a new effect. Valid Effect numbers are from 1 to 99.

- ii) Carry out the above and then enter a different number into the 'SOURCE EFFECT NO.' Data Field.

The parameters for the Source Effect will be used as a basis for the new effect.

- iii) Enter a valid number into the 'EFFECT NO.' field, but clear the 'SOURCE EFFECT NO.' field.

The selected effect will be reset to the default state described in the next section.

On using the 'v' button to exit from the 'SOURCE EFFECT NO.' Data Field, the display will change to allow the selected effect to be set-up.

### 6.2.1 Effects Editor

The default Effects Editor display is shown below:

EFFECTS SET UP			
EFFECT TYPE <input type="text" value="CHASE"/>		EFFECT NO. <input type="text" value="1"/>	
STEP TYPE <input type="text" value="MANUAL"/>		START EFFECT <input type="text" value="MANUAL"/>	
CHANNEL LEVEL <input type="text" value="100"/>		END EFFECT <input type="text" value="MANUAL"/>	
		FINAL STATE <input type="text" value="OFF"/>	
		CONCLUSION <input type="text" value="IMMEDIATE"/>	
PRELOAD		STEPS	
S/M	MEMORIES	STEP	GROUP
A		001	
B			
C			
D			
E			
F			
G			
H			
COMMAND <input type="text" value="RECORD"/>			

As can be seen from the above, the display is divided into six sections, five of which have a number of Option and Data fields. Note that the bottom section of the Video Mimic screen does not change, but continues to show the status of the various sections of the main control panel.

The most important field on the display is the 'EFFECT TYPE' Option Field in the top left corner; five options are available: CHASE, FLASH, AUDIO, LIGHTNING and FLICKER. The remaining fields vary according to which of these options is selected and will be described in the following paragraphs.

## 6.2.2 Types of Effect

### 6.2.2.1 Chase

A chase is an effect which has a number of steps taking place one after the other; each step has an associated group of lights (see section 6.2.3.11) which are faded to a preset maximum level. As each step occurs, one group of lights is faded down, to be replaced by a new group. A Chase may have any number of steps, up to a maximum of 255.

### 6.2.2.2 Flash

A Flash effect has only two groups of lights, an ON group and an OFF group. When the effect is running, the system will flash between the two groups.

### 6.2.2.3 Audio

The Audio effect allows the operator to set-up three groups of lights which are assigned to the BASS, MID and TREBLE frequencies respectively of an audio input. The SOURCE switch on the Effects control panel permits the selection of the Left- or Right-hand channels of a stereo input, or of a pseudo-random flicker generator.

### 6.2.2.4 Lightning

The Lightning effect causes a single group of lights to flash randomly for a pre-determined period each time a trigger occurs.

### 6.2.2.5 Flicker

The Flicker effect has eight random flicker generators to which groups of lights may be assigned.



### 6.2.2.6 Cycle

The Cycle effect is similar to Chase, but permits separate up- and down-fade times to be set.

## 6.2.3 General Description of Options

The various options available in each field are common to most effect types. Each field is described below.

### 6.2.3.1 STEP TYPE (Chase, Flash, Lightning and Cycle only)

Determines what triggers the transition from one stage of the effect to the next. Note that the MANUAL, BEAT and SYNC options are not available if CYCLE is selected.

<u>Option</u>	<u>Function</u>
MANUAL (not Cycle)	Each stage of the Effect must be performed by operating the appropriate STEP button on the Effects panel. In the case of Lightning, an additional Data Field (TIME) appears (in the 'STEPS' section of the display) into which the required flash period must be entered; the FLASH-STEP button is then used as a trigger.
BEAT (not Cycle)	The Effect is controlled by the Bass frequencies of an audio input. In the case of Lighting, the period must be entered as described above.
SYNC (not Cycle)	A Step Rate may be set using the appropriate STEP button; this will continue if the button is held down until the next step has occurred; this is particularly useful for disco effects, where the same Chase or Flash may be used with records at different tempi. In the case of Lightning, the period must be entered as described for MANUAL.

<u>Option</u>	<u>Function</u>
AUTOMATIC (Chase, Flash and Cycle only)	<p>The Effect is controlled by the timing data entered in the STEPS section of the display.</p> <p><b>Chase:</b> For each group of lights, the time before the next step occurs may be entered in the 'TIME' field (which appears in the 'STEPS' section of the display) and a fade up/down time may also be set. The latter is entered into the 'SLOPE %' field) as a percentage of the TIME value; see section 4.2.2 for details of how to enter percentages.</p> <p>Note that if nothing is entered into the 'TIME' field, the settings of the CHASE and RATE controls are combined to produce a default value.</p> <p><b>Flash:</b> In this case a time may be set for the complete Flash cycle ('TIME' field) and a Mark-space ratio from 0 to 9 ('M-S RATIO' field). As in the case of CHASE, the settings of the appropriate controls will be used as default settings if nothing is entered into these two fields.</p> <p><b>Cycle:</b> Cycle is similar to Chase, but has two 'SLOPE %' fields, 'UP' and 'DN'. If nothing is entered into the 'TIME' field, a default value will be calculated from the current settings of the CHASE and RATE controls.</p>
VARIABLE (Chase, Flash and Cycle only)	<p>The Step Rate is controlled by the appropriate control (i.e. CHASE or FLASH) on the Effects panel. In the case of Chase and Cycle, fade-up and fade-down times may be set in the 'SLOPE %' field (see above), while in the case of Flash, the Mark/Space ratio may also be varied, using the appropriately labelled control.</p>

#### 6.2.3.2 CHANNEL LEVEL

This Data Field permits the operator to set a nominal level between 0 and 100 (Full) for all individual channels taking part in the effect; channels assigned to the Sub-masters will be unaffected. The default value is 100.



#### 6.2.3.3 START EFFECT

This Option Field permits the operator to select whether the effect will always be started manually using the GO button (MANUAL) or whether the start will be synchronised with the recall of a particular memory, either directly to the output or on one of the Playbacks (PLAYBACK). If PLAYBACK is selected, an additional Data Field for the number of the required memory appears to the right of the 'START EFFECT' field.

Note that if 'PLAYBACK' is selected, the effect will start on recall of the memory concerned regardless of the current selection on the effects keypad; the effect may, however, still be started manually by pressing the GO button.

In the case of fades performed in Manual mode (i.e. with the appropriate MANUAL indicator illuminated) the effect will not start on recall of the memory concerned, but will wait until the fade is 'collected' - see section 4.6.2.4.

Up to ten effects may be in progress at the same time. These will normally all be different, but it should be noted that it is possible to start the same effect several times; this will result in a number of identical effects running simultaneously, but out of phase with each other. This possibility must particularly be borne in mind when editing effects and testing them immediately by using the GO button (see section 6.2.3.12).

#### 6.2.3.4 IN TIME

The 'In Time' is the time taken for the lights taking part in an effect to fade from zero to full; in the case of individual channels, this time will be proportionally reduced if a level less than 100 has been set in the 'CHANNEL LEVEL' field. The time is entered as described in section 6.1.2.1.1. Note that channels concerned combine with the output of the main console on a 'Highest-takes-precedence' basis.

#### 6.2.3.5 END EFFECT

The field is similar to the 'START EFFECT' field, but determines what will cause the effect to terminate. The available options are as follows:

<u>Option</u>	<u>Function</u>
MANUAL	The effect must be terminated by operating the STOP button on the Effects control panel.
TIMED	The effect will end automatically when a preset time has elapsed. The time is entered into an additional Data Field which appears to the right of the 'END EFFECT' field on leaving the 'END EFFECT' field.
COUNT	The effect will end after a number of complete cycles. As in the case of TIMED, an additional Data Field appears to allow the number of cycles to be entered.
PLAYBACK	The effect will end when a particular memory is recalled either directly to the output or on either of the Playbacks (as in the case of START EFFECT, Manual fades must be 'collected'). An additional field appears to allow the memory number to be entered.

Note that if 'TIMED', 'COUNT' or 'PLAYBACK' is selected, the effect may still be terminated manually by pressing the STOP button.

#### 6.2.3.6 FINAL STATE

This Option Field allows the operator to determine whether, when the effect is terminated, the lights taking part will fade out (OFF) or remain in their finishing states, whatever these may be (ON). If 'OFF' is selected, a fade-out time may be entered into the 'OUT TIME' Data Field (see section 6.2.3.7); with 'ON' selected, the latter has no purpose and therefore disappears from the display.

#### 6.2.3.7 OUT TIME

The function of this field is described in the previous section. Note that when the effect is stopped, the 'GO' indicator will remain illuminated until the OUT TIME has elapsed.

#### 6.2.3.8 CONCLUSION

This field offers two options, 'IMMEDIATE' and 'CYCLE' (note that this is not the same as the CYCLE Effect Type). In the former case, when terminated, the effect will always stop immediately. In the latter, however, the result depends on which option is selected in the 'END EFFECT' field. If 'TIMED' or 'PLAYBACK' is selected, the effect, if terminated normally, will continue to run until the end



of the current cycle. Pressing the STOP button, whether MANUAL is selected or not, will always stop the currently selected effect immediately. If 'COUNT' is selected, the effect will, by definition, always run to the end of a cycle (see section 6.2.3.5).

#### 6.2.3.9 NEXT EFFECT

The 'NEXT EFFECT' Data Field appears when an STEP TYPE other than 'MANUAL' is selected. It allows the operator to 'chain' effects together, the effect whose number is displayed in the field starting automatically as the current one ends (at the start of any 'OUT TIME'). The facility is inoperative if there is no 'NEXT EFFECT' number or if the STOP button is used to terminate all effects simultaneously.

#### 6.2.3.10 Preload

If required, pre-selected memories may be automatically loaded into the eight Sub-master stores at the start of an effect, the numbers of the memories required being entered into the eight Data Fields (A to H) in the 'PRELOAD' section of the Effects display.

If the memory number is preceded by '+' or '-', the new memory will combine with the lighting already present in the Sub-master store (see section 4.5.2). Combinations of memories may also be pre-loaded; enter the numbers of the memories concerned, separated by '+' or '-' as required; the memories will combine on loading as described in section 4.5.2.3. If the 'PRELOAD' field is left blank, the contents of the Sub-master store will be left unchanged.

Unlike the normal method of recalling memories to the Sub-masters, Effects Pre-load does not include the Gang-loading facility. If a range of memories is entered using the THRU button, the 'FIELD ERROR' message will appear and system alarm will sound on attempting to leave the field concerned.

If a number of memories is to be combined for Pre-load and the available field space is exceeded, the field concerned will 'scroll' sideways to allow the entry to continue.

#### 6.2.3.11 Groups

Under the heading 'GROUP' in the 'STEPS' section of the display are the Data Fields into which the channel groups for each step in the effect are entered. The information entered may consist of combinations of channel numbers and the letters A to H, the latter representing the corresponding Sub-master stores.

Note: The effects system is primarily intended to be used in conjunction with the Sub-master stores, the Preload facility being used to recall pre-recorded memories at the start of each effect. Although individual channel numbers may be entered, this should not be done if the effect required can be achieved using the Sub-masters. Running an effect which controls a large number of individual channels directly may result in increased system response time.

In addition to the above, using a Sub-master rather than individual channels gives added flexibility, as the channels concerned may each be set to a different level in the Sub-master store. Where individual channels are used, a maximum level may be set, but this will be the same for all the channels used.

The contents of several Sub-masters may be combined into a group using the '+' key, and individual channels may be formed into groups using the '+', '-' and THRU keys. If a group is prefixed '+' or '-', the Sub-masters and channels concerned will be added to or subtracted from the group assigned to the previous step. The THRU key may not be used when producing groups of Sub-master stores; if this is done, the error alarm will sound on attempting to leave the field concerned.

If complex combinations of Sub-masters and channels are entered, the Effects Editor will rationalise the display to avoid confusion; for instance, entering '1 THRU 10 - 6' will result in the display '-1>10-6', but on leaving the field, the display will change to '1>5+7>10'.

#### 6.2.3.12 COMMAND Field

There are three ways of leaving the Effects Editor. The first way is to use the 'v' key to move the cursor to the bottom of the display and into the 'COMMAND' Option Field. This field has three options, RECORD, CONTINUE and ABORT: the RECORD option causes the effect to be recorded in the memory, the display changing to 'EFFECTS SET UP'; the CONTINUE option allows the operator to continue editing the currently selected effect; and the ABORT option allows the operator to exit from the editor without recording the effect. On leaving the 'COMMAND' field, the currently selected option will be actioned.

The second way of leaving the Effects Editor is to operate the SET-UP button. This can only be done if the contents of the currently selected field are valid and will cause the option currently displayed in the 'COMMAND' field to be actioned. It will also result in a direct return to the normal Video Mimic display (that selected on the main Gemini control panel).



The third way to leave the Effects Editor is to start the effect concerned using the 'GO' button. This will have the same effect as pressing SET-UP followed by 'GO'.

### 6.3 USING EFFECTS

Many ways in which effects may be used have been described in the previous paragraphs. This section covers the controls which have not yet been described and the interaction of the Effects system with the rest of the Gemini controls.

#### 6.3.1 Sequence

The 'SEQ' (Sequence) button on the Effects Panel operates in a similar way to those on the main control panel. The button is alternate action, the associated indicator lighting when Sequence mode is selected.

When the SEQ indicator is illuminated, starting an effect (whether manually, using the GO button, or automatically, by recalling a memory or as a result of a pre-programmed 'NEXT EFFECT') will cause the next effect which has been recorded to be selected automatically, its number being displayed in the window above the effects keypad. The number displayed will always be that of the effect which has the next higher number relative to the effect which has just started; if, however, the highest numbered effect recorded is started, the sequence will start again at the beginning.

Note: The next effect is only selected ready for use; if a number of effects are to follow each other automatically, the NEXT EFFECT facility must be used (see section 6.2.3.9).

#### 6.3.2 Audio Controls

The only controls not so far described which allow manual control as part of an effect are the Audio controls at the top of the Effects panel. These consist of three FREQUENCY gain controls (BASS, MIDDLE and TREBLE) and a three position SOURCE selector switch. The latter permits the audio input to be taken from the left- and right-hand channels of a stereo signal, or from a pseudo-random flicker generator.

#### 6.3.3 Manual Override

In addition to the various manual control options which may be selected when an effect is set-up, there are four ways in which effects which are already in progress may be controlled:

- 1) The effect selected on the keypad may be stopped by operating the STOP button. Any NEXT EFFECT will then start automatically.
- 2) All effects may be stopped by clearing the keypad display and pressing STOP. Note that in this case, any NEXT EFFECT instructions will be ignored.
- 3) The maximum intensity of the channels taking part in the effects may be adjusted by means of the Effects MASTER fader. Reducing the fader to zero will fade all effects out completely.
- 4) The effects may be speeded up or slowed down by means of the RATE control. The associated indicator is coloured green if the speed is as programmed, but red if it has been changed.

Note that 3 and 4 above will affect all effects which are in progress. Adjustments can only be made to individual effects if they have been programmed to allow this.

In addition to the above, any effect, even if programmed to start automatically on recall of a memory, may be started by selecting its number on the Effects keypad and pressing the GO button.

#### 6.3.3.1 Sub-master Faders

As described in section 6.2.3.11, the effects system is primarily intended to be used in conjunction with the Sub-master stores. Once a Sub-master store has been loaded with a memory, its output can be controlled by both the corresponding fader (subject to the setting of the A-H fader) and the Effects system, the two interacting on a highest-takes-precedence basis. For this reason, the A\_H fader should normally be set to zero when the Effects panel is in use. If required, however, the A-H fader may be raised above zero and the the Sub-master faders used to determine a minimum setting for their assigned channels.

Individual channels under effects control are only subject to the Effects MASTER fader setting and will not be affected by adjustment of the Sub-master or A-H faders, except as determined by the highest-takes-precedence rule.

#### 6.3.3.2 Flash buttons

In addition to their use when setting-up an effect (see section 6.2.3.11), the A to H keys may be used to flash the contents of the Sub-master stores. A switch above the buttons allows them to operate in three different ways:



## 1) FLASH

When the switch is in the FLASH position, pressing one of the buttons will flash the contents of the corresponding Sub-master store to their stored levels (subject to the setting of the MASTER fader). This level will be retained until the button is released.

## 2) KILL

In this case, the effect will be to reduce all the channels in the corresponding Sub-master store to zero while the button is operated. The effect is the same as setting a Sub-master fader at full level into inhibit mode (see section 4.7.7).

## 3) LATCH

When the switch is set to LATCH, the effect is the same as FLASH, except that the channels concerned will remain On when the button is released. A second operation will then reverse the process. All eight Sub-masters may be unlatched at once by pressing the 'CL' button on the Effects keypad or by operating the ENABLE switch.

The above functions may be inhibited to prevent accidental operation by setting the ENABLE switch beside the 'H' key into the up position. They are also inhibited while setting-up effects.

#### 6.3.3.3 Previewing an Effect

There are two ways in which an effect may be previewed before use:

- 1) If the Memory Lock keyswitch is in the LOCK position, operating the SET-UP button will cause the Video Mimic to show the Effects Editor display for the currently selected effect. A second operation will return the display to that selected on the Channel Control.
- 2) The LED indicators above the A to H buttons mimic the outputs of the corresponding Sub-master stores (under effects control). If the MASTER fader is set to zero, these indicators may be used to preview an effect, without changing the lighting on stage.

#### 6.3.4 PRINTING EFFECTS

A printout of the Effects Editor display for any effect may be produced by pressing SET-UP and then using the 'SEL' button to select the effects PRINT option. Note that the Memory Lock

keyswitch must be in the OPEN position, as the required EFFECTS SET UP display cannot otherwise be selected.

The starting and finishing numbers of the required range of effects should then be entered into the appropriate fields. On using the 'v' button to exit from the 'LAST EFFECT' field, the printout will commence. While the print is in progress, the message 'PRINT IN PROGRESS' will appear on the Video Mimic and the indicator above the PRNT button on the main control panel will light.

The printout may be terminated at any time by pressing the PRNT button.

#### 6.3.5 SAVING EFFECTS ON DISC

Effects may be copied to and from disc by operating the SET-UP button and then selecting either the 'TO DISC' or the 'FROM DISC' option. Note that in either case the Memory Lock keyswitch must be in the OPEN position, as the required EFFECTS SET UP display cannot otherwise be selected.

The starting and finishing numbers of the required range of effects should then be entered into the appropriate fields. On using the 'v' button to exit from the 'LAST EFFECT' field, the disc action will commence. While this is in progress, the message 'DISC IN PROGRESS' will appear on the Video Mimic and the indicator above the appropriate disc action button on the main control panel will light. If this button is operated while the associated indicator is illuminated the disc action will terminate once the current effect has been copied.

Details of disc care, etc. are given in section 4.8.1.

#### 6.3.6 DELETING EFFECTS

This facility is similar to those described above. Press the SET-UP button and then operate the 'SEL' button until 'DELETE' appears in the 'FUNCTION - EFFECT' Option field. The starting and finishing numbers of a range of effects should then be entered into the appropriate Data fields. On using the 'v' key to leave the 'LAST EFFECT' field the effects will be deleted.





CHAPTER 7FIRST LINE SERVICING7.1 INTRODUCTION

The Gemini system is extremely reliable and should give no trouble, provided the environment is as recommended in section 2.4. In the unlikely event of a fault, users should not, in general, attempt to repair the equipment themselves, but should immediately notify their local Rank Strand service agent. Before doing this, however, the user should check for obvious faults such as lack of mains power and blown fuses. The fuses are detailed in Table 7.1.

Table 7.1

<u>Fuse</u>	<u>Rating</u>	<u>Size</u>
Console Mains Fuse	5A HRC	20mmx5mm ceramic
Back-up Mains Fuse, 240V	2A HRC	20mmx5mm ceramic
Back-up Mains Fuse, 110V	3.15A HRC	20mmx5mm ceramic
Multiplex Interface Unit, mains fuse	100mA anti-surge	20mmx5mm



