

# Thorn Q-file

for Theatre Lighting Control

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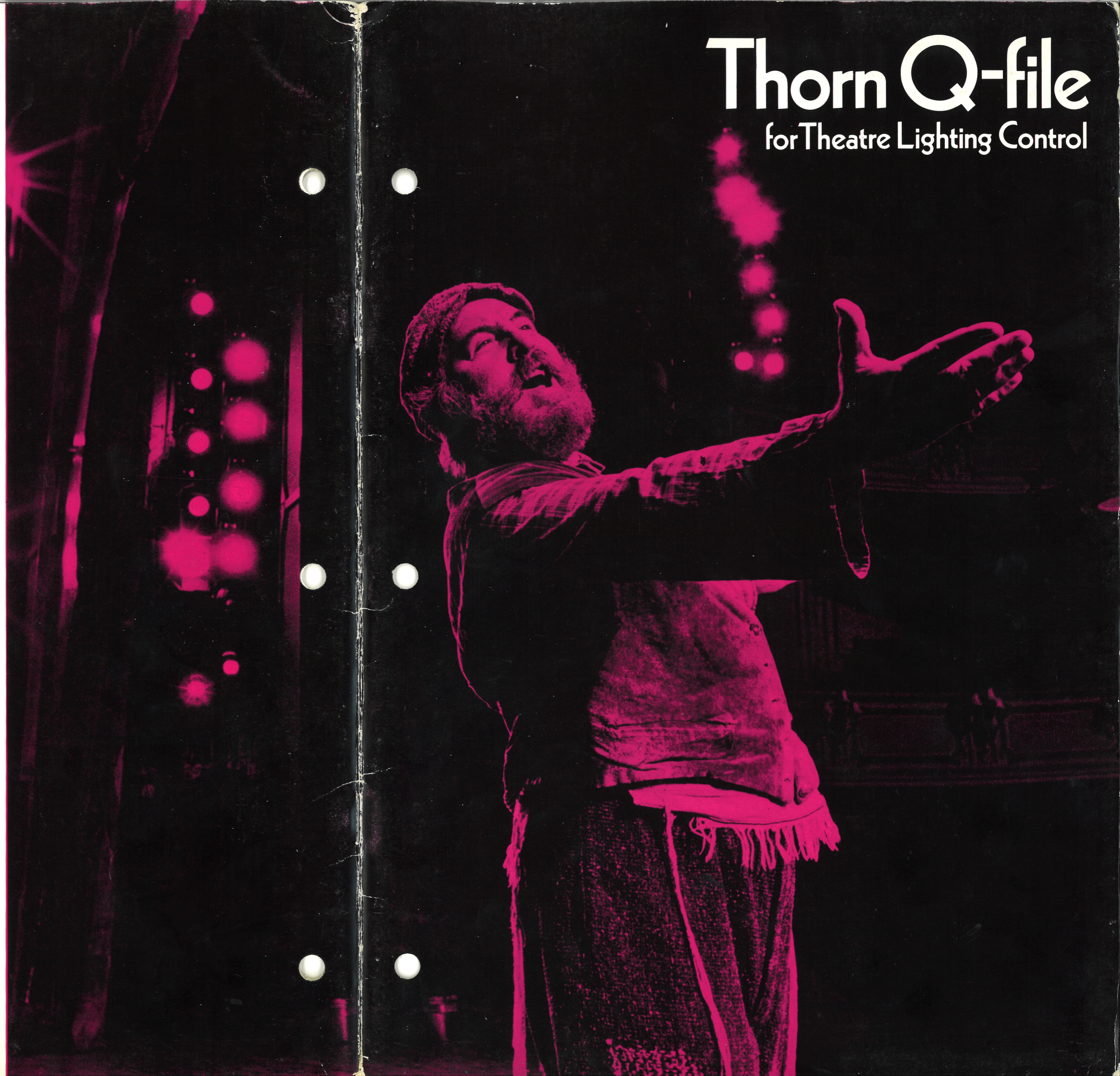
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# Why Q-file?

The title Q-FILE aptly describes an extremely versatile stage and studio lighting control system in which "cues" (i.e. lighting changes) are "filed" (i.e. memorised) during rehearsal. These cues may then be repeated during a production with supreme ease and accuracy.

Through this use of modern electronic technology the whole process of planning and using theatrical lighting becomes an "armchair" exercise. Even the most ambitious lighting changes can be initiated by the operation of no more than two push buttons.

## Highlights of Q-file

- 100 separate memories can be used individually or in any combination.
- Memories include full range of brightness levels.
- Memory recall as Instant Action or Automatic Fade/Crossfade.
- Independent control of four fades running simultaneously and at different speeds.
- Memories can be added or subtracted with instant effect during a Fade or Crossfade.
- Instant manual over-ride of all circuits at all times.
- Facility for "Blind" Plotting or modifying memories without affecting lighting in use.
- Ability to control up to 390 lighting circuits with individual power ratings of up to 10 kilowatts.
- Mimic diagram shows circuits in use at all times.

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# Advantages of Q-file

Q-FILE is the most sophisticated equipment of its type in the world and the most convenient and simple to operate.

## Convenient?

What other system offers full control of up to 390 circuits from a panel *approximately 2 square feet* in area?

One seated operator has every control at his fingertips, and foot operations are eliminated.

## Simple to Operate?

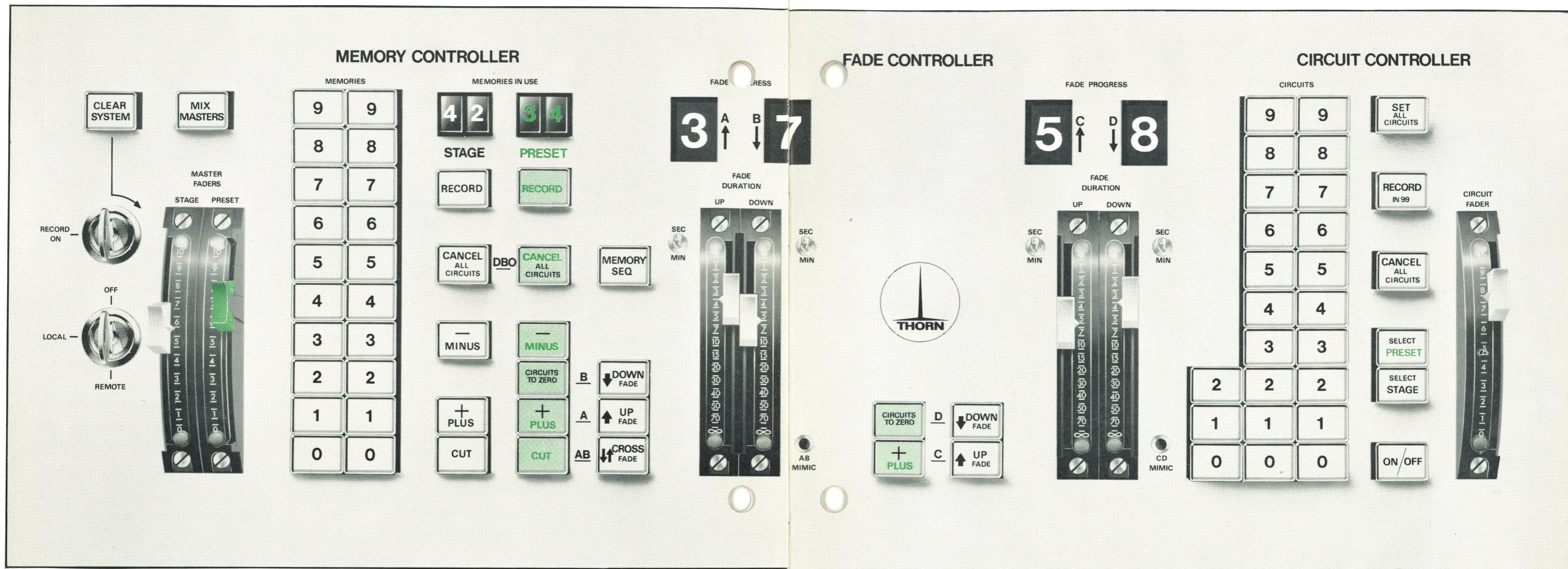
Simplicity and speed must be related, so consider the following evidence:

1. At the beginning of a lighting rehearsal, any or *all* lighting circuits can be switched On in groups of tens or hundreds in *about 3 seconds*. This time includes the selection of any required common starting level of intensity.
2. Any individual circuit can be selected and adjusted in *about 2 seconds* at all times. The need to match the fader to an existing memorised circuit level is eliminated by an automatic servo action.
3. The *complete* lighting situation at any time can be recorded in any selected memory in *less than 2 seconds*.
4. A succession of memorised lighting changes can be recalled at a speed in excess of *one change per second*. Also, except in rare instances, any lighting change can be initiated by pressing one push button. The timing of changes is therefore reduced to the ultimate simplicity of a *single operator action "on cue"*.

Front cover photograph of Lex Goudsmit as 'Tevee' in the London production of "Fiddler on the Roof" by courtesy of SUNDAY TELEGRAPH



# The Q-file Theatre Console Panel



The most noticeable feature of the Q-File control console is the absence of the usual banks and rows of circuit faders. This unnecessary and space-consuming arrangement has been superseded by a single servo controlled fader associated with a compact group of circuit selection push buttons, and although this involves some departure from traditional operating procedure, experience has shown that this new technique is easily learned and accepted with enthusiasm.

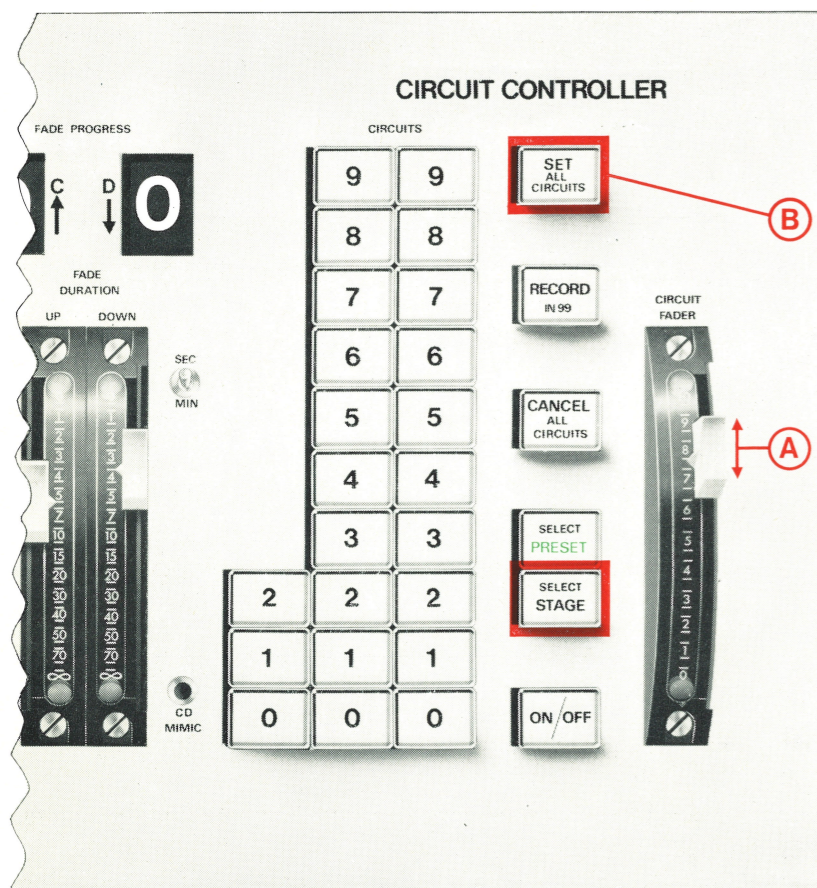
On examining the panel, it will be noticed that certain controls are grouped under the headings "Stage" and "Preset". These terms identify two computer type storage elements, in each of which electronic data representing individual lighting circuits can be assembled to represent a complete lighting scene.

The data in the Stage store determines the existing lighting while that in the Preset store can represent a follow-up lighting situation in

much the same way as the second preset in a conventional two scene preset manual system. However, in the Q-File equivalents, these two presets are coupled to a memory bank which enables one hundred different lighting scenes to be recorded from, and subsequently recalled to, either preset. The overall concept is therefore comparable to a manual system having 100 presets plus numerous added advantages due to the speed and flexibility of the electronic processes involved.

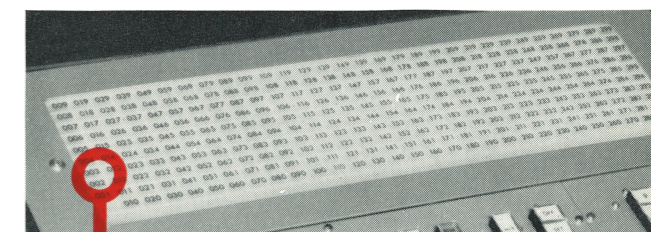
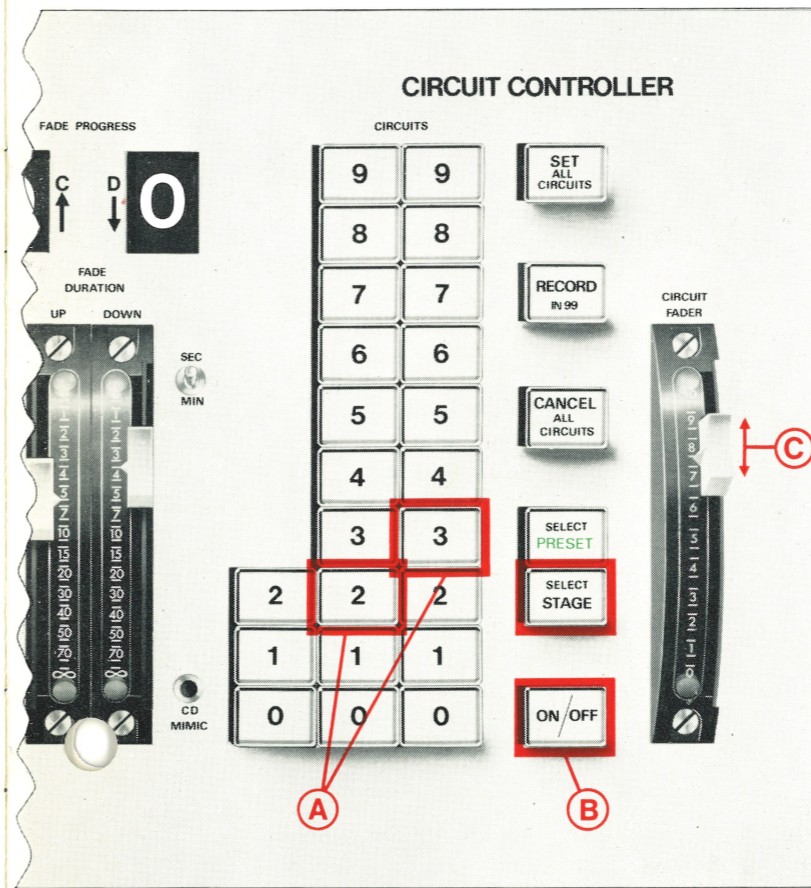
# Lighting a scene by use of the Circuit Controller

## 1 How to "Set all Circuits" to a Common Starting Level before switching on.



Firstly depress the "SELECT STAGE" button to obtain direct control of the lights.

## 2 How to Switch on Circuits and adjust their Individual Levels.



Mimic Diagram shows Circuits in use at all times

**Note**  
The CIRCUIT FADER has the ability to move automatically to the existing level for any selected circuit. Thus, if the SET ALL CIRCUITS facility has been used, the fader will return automatically to the common level whenever a new circuit is selected for switching On and individual adjustment.

- A** Move the CIRCUIT FADER to the required common brightness level.
- B** Press the button marked SET ALL CIRCUITS

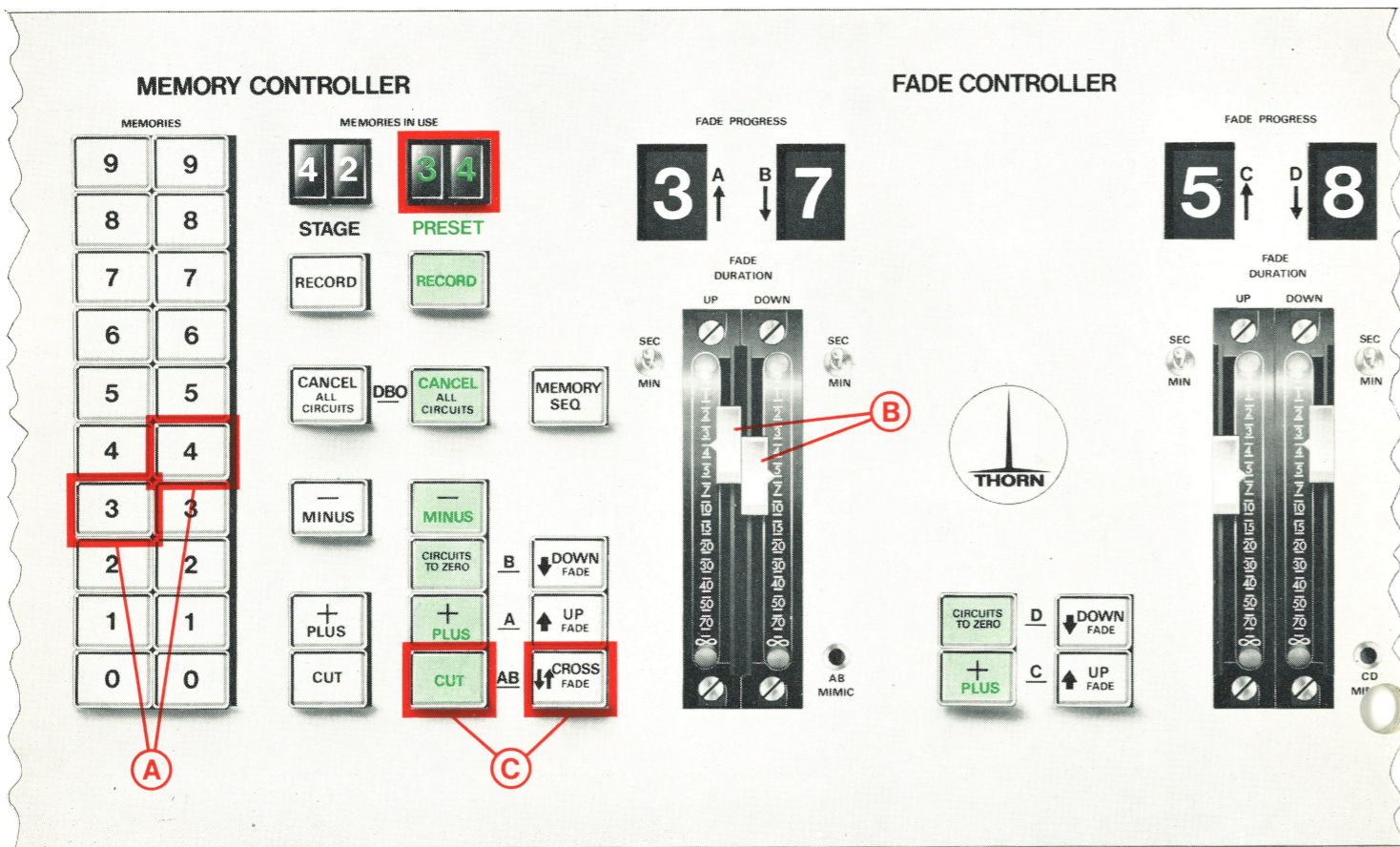
- A** Press the appropriate CIRCUIT buttons. For example, to select circuit number 23, press "2" in the left hand column and "3" in the right hand column.
- B** Switch on the circuit at the common starting level by pressing the ON/OFF button. (Note that repeated operation of this button will switch the circuit On and Off alternatively.)
- C** Readjust the CIRCUIT FADER to produce the required brightness level for this particular circuit.

**Repeat this process** of selecting, switching On and adjusting circuits until the required overall lighting effect is achieved. It should be noted that any number of separate circuits can be selected at the same time and controlled as a group.

**Note**  
This action provides the computer with its first instruction and individual circuits may now be switched On at the common level.

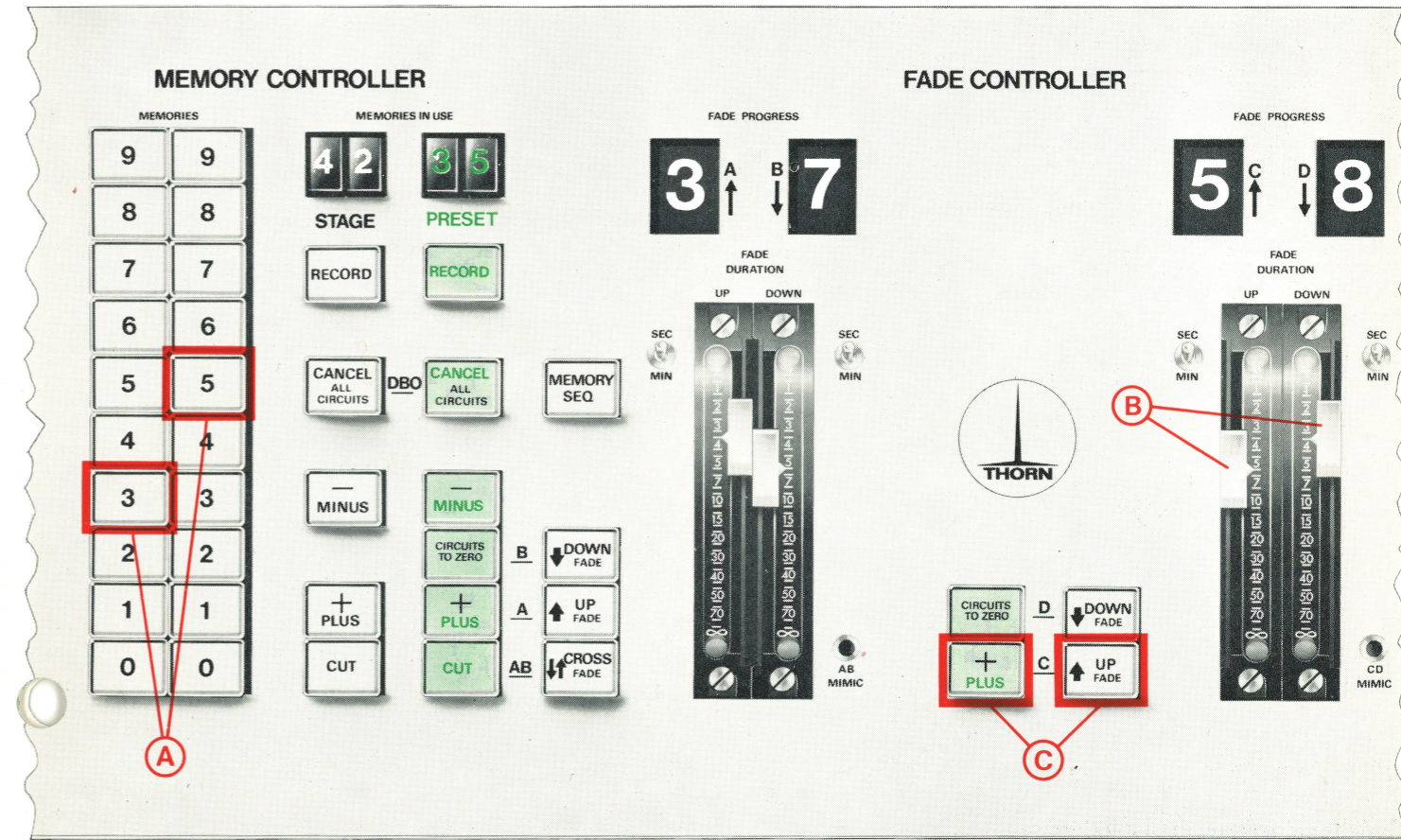
**Note:**  
The computer has now been instructed to switch On particular circuits and to set their levels in accordance with action (c). These two instructions will be separately remembered for each circuit until such time as a deliberate change is made. Thus, a subsequent switch Off action will not "lose" the chosen level.

# 1 How to Recall a Lighting Scene as a Fade Action (i.e. a crossfade).



- A** Select the Memory number (e.g. 34).
- B** Set the 'A' and 'B' FADE DURATION controls to the required times. Note that the time for fade UP and fade DOWN can be independently controlled and if necessary readjusted while the fade is taking place.
- C** Press the 'AB' group CUT and CROSSFADE buttons in that order or simultaneously. (These two buttons are mounted side by side for convenient simultaneous operation.)

# 2 How to recall a lighting scene as an additional and independent fade up or down action.



- A** Select the Memory number (e.g. 35).
- B** Set the "C" & "D" FADE DURATION controls to the required times. Note that the time for fade UP and fade DOWN can be independently controlled and if necessary readjusted while the fade is taking place.
- C** Press the "D" group PLUS and UP FADE buttons in that order or simultaneously AND/OR press the "C" group CIRCUITS TO ZERO and DOWN FADE buttons in that order or simultaneously.

Operation of the AB MIMIC or CD MIMIC buttons enables the mimic diagram to indicate which circuits are subject to the AB and CD fades respectively.

## Note: Independent Fade-Up and Fade-Down

When the CROSSFADE button is used, these two actions take place simultaneously. However, separate UP FADE and DOWN FADE buttons enable any groups of circuits to be added or removed from the existing lighting as an appropriate fade action.

A memory representing a new group of circuits is selected and added to the existing lighting by pressing the 'A' group PLUS and UP FADE buttons simultaneously. Use of the 'B' group CIRCUITS TO

ZERO and DOWN FADE buttons will fade out the circuits represented in the new memory.

## Interrupted Fades

It should be noted that either or both the UP and DOWN stages of a fade can be interrupted by a second operation of the appropriate starting button. A third operation of this button will restart the fade at the interrupted level. A similar action results from moving the fade duration levers to their stop (infinity) positions.

Subtlety of fade timing is vital to the theatre, and this requirement is satisfied by these two completely independent fade processes. An original state of lighting may be replaced by a new state by means of a crossfade, or modified by the addition and/or subtraction of other lighting at different fade speeds governed by

the 'A' & 'B' masters. At the same time, the 'C' & 'D' masters allow a further addition and/or subtraction to take place, also at independently controllable speeds!

While these four simultaneous fades are running, switch on and off cues can take place using the STAGE + and - facility.

# Other Q-file standard facilities

## Blind Plotting

In normal operation, the lighting in use is determined directly by the STAGE state of board but only indirectly by the PRESET state. In consequence, a complete lighting situation including brightness levels can be pre-programmed in PRESET without disturbing the STAGE lighting in use at that time. While this action is of course "blind", the mimic diagram indicates the selected circuits in PRESET, and the operator is able to plan ahead while a rehearsal is actually in progress. The lighting prepared in PRESET can be memorised and subsequently recalled in STAGE for actual use and modification where appropriate. In the same way, any existing memories can be recalled in PRESET and, if necessary, corrected and re-memorised.

## Mix STAGE/PRESET Facility and Master Faders

As explained above, the PRESET state does not normally have any direct influence on the lighting in use. However, if the MIX button is depressed, direct PRESET control becomes available simultaneously with that from STAGE. In these circumstances, the lighting represented by two separate memories can be combined under the control of the STAGE and PRESET master faders respectively. A simple manual crossfade is possible by this means.

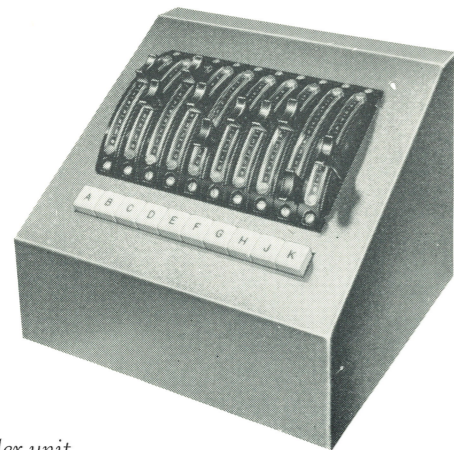
## Automatic Memory Sequencing

Before recalling a memory it is normally necessary to press the appropriate memory selector buttons. However, provided that memories are to be recalled in numerical sequence, it is possible for the selection of the following memory to take place automatically whenever a memory is brought into use by a CUT, PLUS, MINUS or ZERO action.

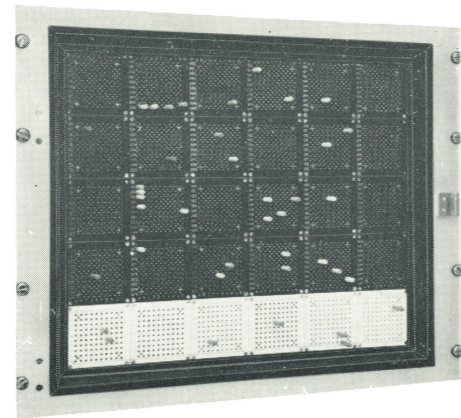
Automatic sequencing is initiated by depressing the MEMORY SEQ button.

## Auxiliary Fader Unit

This compact unit mounts ten manually operated faders, each of which, by means of a miniature patch panel, can be given control of any lighting circuit or combination of circuits. The association of circuits and faders is simply a matter of inserting small plugs into the appropriate holes in a plug matrix. These auxiliary faders can be given control of any lighting circuits which for some special reason are best manipulated by direct manual means, e.g. follow spots, orchestra lights, etc. Also, should a failure ever occur in the electronic control system, a previously established emergency lighting plot can be immediately brought into use by means of a single fader.



Auxiliary fader unit.



Plug matrix unit.

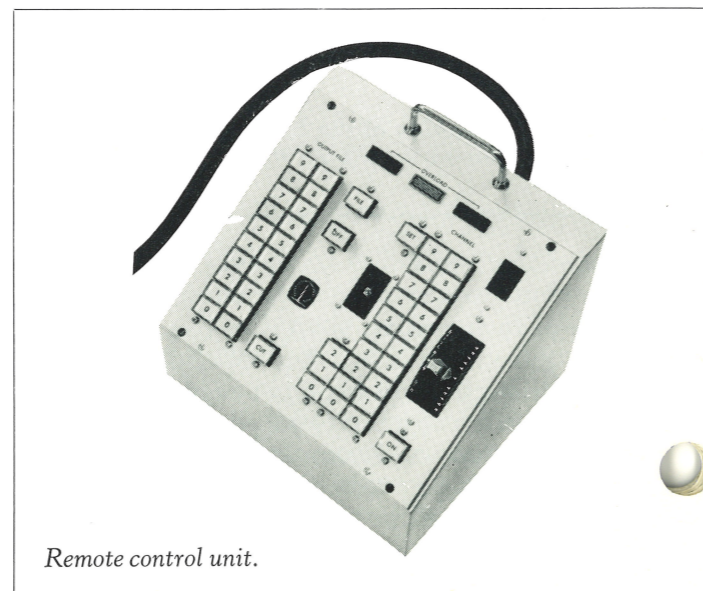
# Optional extra facilities

## Auto-Add

This useful facility provides an easy means of changing the levels of any circuits which may be incorrectly represented in any number of existing memories. The corrected levels are recorded in Memory No. 99 and with Auto-Add in operation, these Memory 99 levels will take charge whenever any other memory representing these circuits is recalled for use. This automatic over-ride avoids the need to correct individual memories, and saves time where a large number of these are involved.

## Remote Control Unit

This compact and portable unit enables lighting scenes to be set up, memorised and recalled from any convenient position in a theatre auditorium.



Remote control unit.

# Typical lighting exercises

## 1. DRAMA

REQUIRED LIGHTING EFFECT	PREPARATION	ACTION "ON CUE"
CUE 1 Fade in Room interior lit by dull daylight admitted via window.	Select memory 1 representing the appropriate lighting. Set fade duration control 'A' to 5 secs.	Press PLUS and UP FADE buttons. ('A' group)
CUE 2 Sun emerges from behind cloud. Room interior brightens rapidly.	Select memory 2 representing the sun and the increased room lighting. Set fade duration control 'A' to 10 secs.	Press PLUS and UP FADE buttons. ('A' Group).
CUE 3 Daylight fades slowly to night.	Select memory 3 representing night lighting. Set fade duration controls 'A' & 'B' to say 20 mins.	Press CUT and CROSSFADE buttons. ('AB' Group).
CUE 4 [While Q3 is running] Actor enters room and lights oil lamp: Daylight continues to fade.	Select memory 4 representing lamp and "fill" lights. Set fade duration control 'C' to say 5 secs.	Press PLUS and UP FADE buttons. ('C' Group).
CUE 5 [While Q3 is still running] Street lights snap on and flashing neon sign become visible through window.	Select memory 5 representing street lights and neon sign. (Flasher unit can be incorporated as an optional extra).	Press STAGE PLUS button.
CUE 6 Following a period of night lighting, the exterior lighting increases with approaching dawn.	Select memory 6 representing dawn lighting. Press PRESET CUT button. Add memories 4 and 5 (PRESET PLUS button) to retain the "fill" and street lighting. Set both fade 'A' & 'B' duration controls to, say, 10 mins.	Press CROSSFADE button. ('AB' Group).
CUE 7 [While Q6 is running] Actor departs, turning off lamp.	Select memory 4 representing lamp and "fill" lights. Set fade duration control 'D' to, say, 5 secs.	Press CIRCUITS TO ZERO and DOWN FADE buttons ('D' Group).
CUE 8 Street lighting and neon sign extinguished	Select memory 5 representing street lighting and neon sign.	Press STAGE MINUS button.

## 2. LIGHT ENTERTAINMENT

### Required Lighting Effect

Consider a setting in which a cyclorama undergoes a repeating cycle of ten rapid colour patterns while the foreground lighting remains constant. In addition, three follow spots require independent control.

### Preparation

1. Prepare ten memories, each of which represents a particular colour pattern plus the constant foreground lighting. These memories can be conveniently numbered 0 to 9 inclusive.
2. Allocate one auxiliary fader to each of the follow spot circuits.

### Action "On Cue"

The colour changes may take place either as "switch cues" in rapid succession, or as "dissolves" requiring a few seconds for each change.

### Switch Cues (i.e. Fast Changes)

Press memory selector button "0" in the left hand (tens) column. The ten memories can then be separately recalled in rapid succession by pressing the appropriate button in the right hand (units) column immediately followed by the

STAGE CUT button. The action is therefore 1 - CUT, 2 - CUT, 3 - CUT, etc.

**Note:** The foreground lighting remains unchanged since it is similarly represented in all the memories.

The above action can be further simplified by use of the automatic MEMORY SEQUENCE facility. Operation of the CUT button will then automatically select the next memory. Fast changes to music are possible by this means, and the 0 to 9 sequence will automatically repeat if the "0" button in the tens column is held in its depressed state.

### "Dissolves" (i.e. Fade Changes)

Set fade duration controls 'A' & 'B' to an appropriate "dissolve" time, say 5 seconds. Proceed as for Switch Cues but initiate the changes by pressing the PRESET CUT and CROSSFADE buttons simultaneously. The MEMORY SEQUENCE facility may again be used.

### Follow Spots

These may be faded in or out by direct manipulation of the individual auxiliary faders in the usual way.

# Choosing the size of system

Up to 390 lighting circuits can be controlled by a single Q-FILE installation and these circuits may have individual power ratings of 2.5, 5 or 10 Kilowatts in any combination depending on the types of dimmer supplied.

Because of the modular design of the electronic control elements, the cost of the equipment varies in discrete steps and a 200 circuit installation would, for example, be appreciably more costly than a 199 circuit installation.

For this reason, there are economic advantages in specifying numbers of lighting circuits approaching the upper end of the following groups:

Up to 80 circuits	200-240 circuits
81-99 circuits	241-299 circuits
100-160 circuits	300-320 circuits
161-199 circuits	321-390 circuits

# Duplex system

Within certain size limitations, an important cost saving can be achieved where two stages are located in reasonably close proximity to each other. Under such circumstances, it is possible for both stages to share common electronic equipment while at the same time retaining complete operational independence.

Taking into account certain technical considerations, the maximum economic advantage is realised when the number

of lighting circuits in each studio is close to but not more than the paired figures shown in the following table:

Stage A	Stage B
90 circuits	90 circuits
or 90 circuits	190 circuits
or 90 circuits	290 circuits
or 190 circuits	190 circuits

# The technical principle of Q-file

Figure 1 shows in block form the main functional elements of the system. The centre block, labelled Memories, represents the permanent record of lighting data. The blocks on either side represent electronic stores containing data in use, and this can be copied into or out of the memories.

These stores are named as the Stage and Preset store respectively. The data in the Stage store directly controls the dimmers and therefore determines the actual lighting situation at any time. The Preset store does not normally have direct control of the dimmers but provides a number of functions which will be explained later.

To set up a lighting scene the circuit controller is used to feed electronic data representing circuit On/Off states and levels into the Stage store. Since this store has direct control of the dimmers, the operator's actions are immediately manifest as a growing pattern of lighting. This may be permanently

recorded at any time simply by selecting one of the hundred memories and copying the store data into this by pressing the Stage RECORD button.

Once the state of lighting has been recorded, i.e. copied into a memory, the existing store data can be cancelled and a new lighting scene developed and memorised.

The instant recall of any memory can take place in three different ways:

- By a CUT action which replaces the original store data with that represented by the new memory.
- By a PLUS action which adds any new lighting circuits represented in the new memory and substitutes new levels for circuits which are already in use.
- By a MINUS action which switches Off all circuits represented in the new memory.

It may be useful on occasions to retain an original pattern of lighting for use during a rehearsal but at the same time to plan the next lighting cue in advance. This can be done by retaining the Stage store data and using the circuit controller to feed data into the Preset store.

Since this store does not directly control the dimmers, the existing lighting is not disturbed. However, the mimic diagram can also display the on/off state of circuits represented in the Preset store, and the operator is able to include data representing their brightness level by use of his calibrated fader control. When completed, this "blind" plot may be recorded and the corresponding memory can be subsequently "cut" into the Stage store for use and live adjustment. Operation of the Stage store RECORD button will then modify the original memory to correspond to the corrected lighting.

Apart from its use as an electronic notepad for the blind plotting of future cues, the Preset store also provides the means for examining and (if necessary) modifying existing memories without disturbing lights already in use. However, the most important role of this store occurs during a fade when it is fed with information representing the state of lighting required at the end of the fade. This data will normally result from "cutting", i.e. copying the next memory into this store. When the fade is initiated, the original Stage store data changes to match that in the Preset store in a time determined by the setting of the fade duration controls. It is important to note that during a fade, the only circuits which will change are those for which new data exists in the Preset store. Circuits represented as Off in the Preset store will remain unchanged. Thus, in a crossfade where original lights have to be extinguished, it is necessary to represent these circuits as ON at zero level in the Preset store. This occurs automatically whenever the CROSSFADE button is depressed. A "remainder zero" action is not always required and in this case the desired effect can be achieved by the simultaneous depression of two separate UP FADE and DOWN FADE buttons. Used individually, these two buttons enable simple up and down fades to be initiated independently if required.

While a fade is in progress, new data can be added to, or subtracted from either store, using either the circuit controller or the memory PLUS and MINUS buttons. In the case of the Stage store, the added data becomes immediately effective as actual lighting.

Thus, a practical light and its associated fill lights can be brought into use by adding a memory representing these lights to the data already in the Stage store. This added data is not affected by the fade process. In the event of the added data representing circuits which are already fading, these circuits are automatically excluded from the fade and immediately brought to the levels represented in the added memory.

If the new data is added to the Preset store, it becomes effective as a continuation of the fade, and will be completely matched in the Stage store in the time set by the fade duration controls.

Alternatively, a CIRCUITS TO ZERO button associated with this store enables all circuits in a selected memory to be faded to blackout. A special feature is the incorporation of a second set of PLUS, CIRCUITS TO ZERO, UP FADE and DOWN FADE buttons coupled with a further pair of fade

duration controls. This provision allows a second fade up and/or fade down to take place independently of an existing fade process governed by the first set of controls.

Notwithstanding its automatic electronic functions, Q-file retains various means of manual control familiar to operators of conventional systems. Individual circuit levels are adjusted by means of a quadrant fader in the usual way and a pair of master faders provide overall control of the lighting represented by the Stage store and Preset store data respectively. The operation of a MIX STAGE/PRESET button enables both stores to control the lighting simultaneously, thus providing a situation comparable to the conventional two scene, two master control board with manual crossfade.

## The Control Console

Apart from functional limitations, traditional lighting control boards have very frequently raised problems of location due to the need to accommodate possibly several hundred individual fader control levers. This one fader for each circuit concept presents a further problem when memories, including circuit levels, are also involved. This is due to the fact that whenever a previously prepared memory is recalled for manual readjustment, it is almost certain that the present settings of the faders will differ from those which were used in setting up the earlier memory. Thus, the resumption of manual control must in some way include a matching action between each fader and its previously memorised level.

In Q-file both space and matching problems have been solved by the use of a single servo-controlled fader which can be "addressed" to any circuit or group of circuits by means of a set of decimal coded preselector push buttons.

Figure 2 shows a typical panel arrangement. On the right hand side can be seen the servo-fader adjacent to the circuit preselector buttons. Operation of the appropriate buttons in the hundreds, tens and units columns enables the operator to assume control of any circuit or group of circuits. At the commencement of a lighting exercise some convenient common starting level for all circuits can be predetermined by use of the servo-fader and the SET ALL CIRCUITS button.

Individual circuits may then be preselected and switched On by use of the ON/OFF button (alternate operations of this button switch the preselected circuits On or Off).

Immediately a circuit number is preselected, the servo-fader will move automatically to the level represented for this circuit in the store at that time. If the operator now takes hold of the fader lever, an automatic sensing device disconnects the servo drive and enables the preselected circuit to be manually readjusted in a perfectly normal manner. On releasing the control lever, the servo drive is reconnected but the fader retains its new setting, since this is already matched by a corresponding level in the store.

Thus, by a process of successive circuit selection and adjustment, the desired state of lighting is achieved, and this is represented electronically in the Stage store in terms of circuit ON/OFF states and levels. A "blind" plotting exercise can be carried out in the Preset store in exactly the same way.

As previously stated, circuits represented as On in the stores are indicated by the illumination of numbered windows on the mimic diagram. Different colours are used to show the

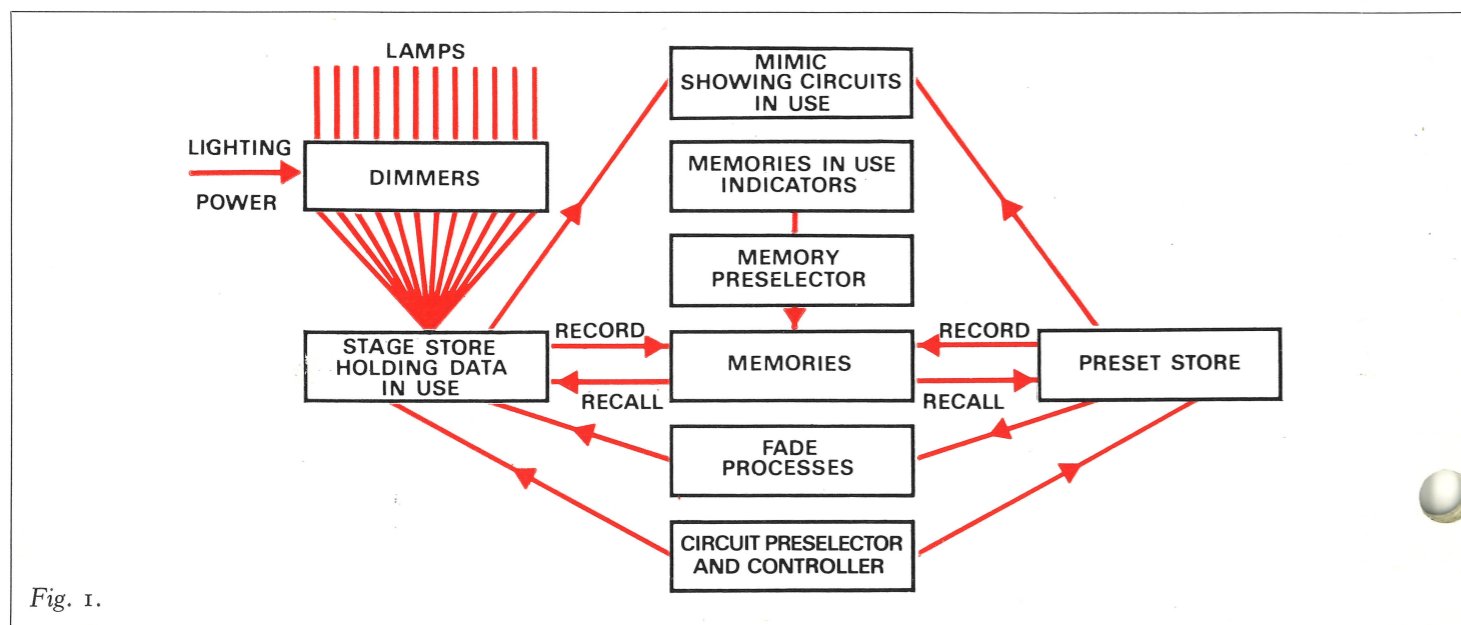


Fig. 1.

Fig. 2.

